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SOLID WASTE MANAGEMENT PRACTICES: AN ANNOTATED BIBLIOGRAPHY AND PERMUTED-TITLE AND KEY-WORD INDEX

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W. J. Boegly, Jr.,
W. L. Griffith,
O. M. Sealand,
and W. E. Baldry

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Trivial Word List

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DIRECTOR'S DIVISION
Civil Defense Research Project

SOLID WASTE MANAGEMENT PRACTICES: AN ANNOTATED BIBLIOGRAPHY AND PERMUTED-TITLE AND KEY-WORD INDEX

by

W. J. Boegly, Jr., W. L. Griffith, O. M. Sealand, and W. E. Baldry

Work supported by the Department of Housing and Urban Development and the U.S. Atomic Energy Commission under Interagency Agreement No. IAA-H-4-69 AEC 40-155C-68.

FEBRUARY 1970

OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee
operated by
UNION CARBIDE CORPORATION
for the
U. S. ATOMIC ENERGY COMMISSION

Printed in the United States of America. Available from Clearinghouse for Federal Scientific and Technical Information, National Bureau of Standards, U.S. Department of Commerce, Springfield, Virginia 22151
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SOLID WASTE MANAGEMENT PRACTICES: AN ANNOTATED BIBLIOGRAPHY AND PERMUTED-TITLE AND KEY-WORD INDEX

INTRODUCTION

In 1968 the U.S. Department of Housing and Urban Development (HUD) initiated a study at the Oak Ridge National Laboratory to review the problems associated with solid waste collection and disposal in high-density urban areas and to suggest areas where advanced technology could be applied. As a part of this effort, a review of the literature on solid waste practices was performed.

This Bibliography represents a compendium of abstracts of about 2200 articles published between 1958 and the beginning of 1970. Many of the abstracts included were taken directly from *Chemical Abstracts* and *Engineering Index* with permission of the publishers, and from other bibliographies of solid waste literature, such as those prepared by the U.S. Public Health Service and their research contractors. However, many of the articles had not been abstracted in published works, and abstracts were prepared for inclusion in this Bibliography.

In general, this Bibliography covers references pertaining to municipal refuse collection and disposal practices. No attempt was made to cover in detail the literature on agricultural or industrial solid wastes; however, some articles on these subjects have been included. Articles prior to 1958 and many foreign articles are not included. Also, in the references are extensive bibliographies on incineration[1] and composting;[2] the majority of these articles are not included.

Two general observations should be made concerning the literature on solid wastes. First, the literature is voluminous, and much of it is contained in hard-to-obtain journals. Also, because of the increased concern with solid wastes, a significant recent increase can be noted in the number of papers being written on this subject. Second, there appears to be a need for a technical journal to allow investigators working in the solid waste field a place to publish their research results in a common forum. At the present time, for example, articles on collection are found in *Refuse Removal Journal* or *The American City,* on composting in *Compost Science,* and on incineration in the *Journal of the Air Pollution Control* or in the *Proceedings of the American Society of Mechanical Engineers.* Thus it is necessary to have access to a number of publications to provide an overall view of the solid waste problem. It is hoped that this Bibliography will be beneficial in research in the solid waste field.

Copies of most of the articles and books referenced in this Bibliography are on file at the Oak Ridge National Laboratory. Since this collection is at the present time for use by the Laboratory staff, copies cannot be generally furnished to outside requesters; however, information on how to obtain a document will be provided when possible.

BIBLIOGRAPHY SECTION

The references in this section are grouped into 11 major fields and into several minor fields under each major heading. Selection of the fields and subfields was at the discretion of the authors, to meet their special requirements. These fields and subfields are outlined in Table 1. The number of each reference includes field and subfield as the first two sets of two digits, as shown in the example in Fig. 1. The last five digits in the reference number (acquisition number) are unique, without regard to the field or subfield assigned. It should be understood that documents were assigned field, subfields, and key words, solely at the discretion of the authors. Where a document related to several fields, assignment was made more or less

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[1] "Bibliography of Incineration of Refuse," prepared by the Incinerator Committee TA-3, *J. Air Pollution Control Assoc.* 12(7), 334–39 (July 1962).

[2] J. S. Wiley, *Composting of Organic Wastes – An Annotated Bibliography,* U.S. Department of Health, Education, and Welfare, Public Health Service, Savannah, Ga. (February 1958); suppl. 1 (June 1959); suppl. 2 (April 1960).

Table 1. Major Fields and Subfields Used in Bibliography

01 Articles of General Interest
- 01 Surveys, Reviews, and Bibliographies
- 02 Economics
- 03 Financing
- 04 Regulations and Legal Aspects
- 05 Regional Approaches to Problems
- 06 Safety and Health Aspects
- 07 Bulky Wastes
- 08 Toxic Wastes
- 09 Agricultural Wastes
- 10 Industrial Wastes
- 11 Demolition Wastes
- 12 Other General Articles

02 Production of Solid Wastes
- 01 Quantities
- 02 Composition
- 03 Future Projections
- 04 Analysis of Refuse (Methods)
- 05 Demolition Waste
- 06 Bulky Waste

03 Solid Waste Collection
- 01 Collection Methods
- 02 Collection Vehicles
- 03 Transfer Equipment and Stations
- 04 Collection Containers
- 05 Compaction (Stationary)
- 06 Collection Frequency
- 07 Collection Scheduling
- 08 Collection Costs
- 09 Use of Sacks
- 10 Use of Computers
- 11 Health Aspects
- 12 Chutes
- 13 Other General Articles

04 Salvage and Reclamation
- 01 Potential Values
- 02 Marketing of Salvage
- 03 Processes Used in Salvage
- 04 Classification and Standards

05 Size Reduction and Separation
- 01 Hammermills
- 02 Hammermills with Ballastic Separation
- 03 Crushers
- 04 Pulpers and Shredders
- 05 Grinders or Pulverizers
- 06 Rasping Machines
- 07 Hand Sorting
- 08 Mechanical Sorting
- 09 Other General Articles

06 Composting
- 01 Research Results
- 02 Pilot Plants
- 03 Full-Scale Operations
- 04 Processes and Special Equipment
- 05 Economics
- 06 Value in Agriculture
- 07 Analysis of Compost
- 08 Properties of Compost
- 09 Health Aspects
- 10 Mulching
- 11 Use on Agricultural Wastes
- 12 Other General Articles

07 Sanitary Landfill (Tipping)
- 01 Current Practices
- 02 Special Equipment
- 03 Site Selection
- 04 Land Requirements
- 05 Pest Control
- 06 Groundwater Pollution
- 07 Settlement
- 08 Decomposition Products
- 09 Cover Material
- 10 Use of Filled Land
- 11 Standards and Ordinances
- 12 Economics
- 13 Landfill Machines
- 14 Other General Articles

08 Incineration
- 01 Apartment House
- 02 Commercial
- 03 Municipal
- 04 Industrial
- 05 Household
- 06 Air Pollution and Emission Control
- 07 Bulky Waste
- 08 Corrosion and Metallurgical Aspects
- 09 Refractories
- 10 Residue
- 11 Combustion
- 12 Standards
- 13 Design
- 14 Economics

09 Other Processes and Operations
- 01 Disposal in Sewage Treatment Plant
- 02 Land Application
- 03 Open Dumps
- 04 Ocean Disposal
- 05 Animal Feeding
- 06 Barging
- 07 Home Garbage Grinders
- 08 Garchy System

10 New Process Applications
- 01 Wet Oxidation
- 02 Pyrolysis
- 03 Compaction into Building Material
- 04 Briquetting into Fuel
- 05 Fuel Cells
- 06 Fluidized-Bed Incinerators
- 07 Ceramic-Metal Products
- 08 Rail Haul
- 09 Slurry Pumping and Pneumatic Transport
- 10 Aerobic Landfills
- 11 Tezuka Baler
- 12 Conveyor Belt Transport
- 13 Chemical and Biological Methods
- 14 High-Temperature Incineration (Slagging)
- 15 Other General Articles

11 Alternative Packaging Materials
- 01 Research
- 02 Future Needs and Trends

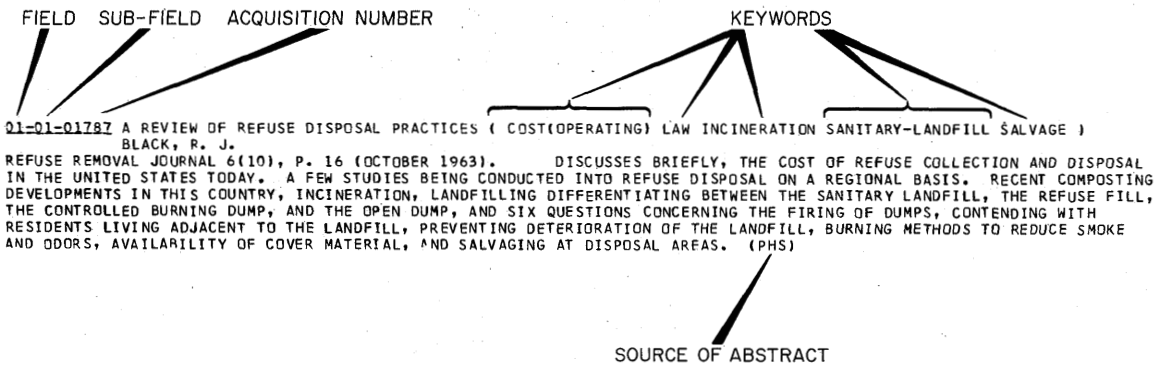

Fig. 1. Typical Citation in Bibliography.

arbitrarily, although key words are generally included to facilitate retrieval. Thus, if one is interested in heat recovery from incinerators, the permuted-title lists must be used with "heat recovery" as the key word because there is no subfield to cover this category only. However, the majority of articles on this subject are found in Incineration, Municipal (08 03). The authors feel that the most satisfactory method of locating articles of interest is by the use of the Key-word Index rather than by searching the subfields directly.

Bibliographic information includes the title, supplemented by descriptors, authors, reference, abstract, and source of the abstract. Many abstracts were obtained in whole or in part from the sources listed in Table 2, which greatly facilitated the preparation of this document. Some editing was frequently required on these abstracts from published sources to shorten the text or otherwise make it compatible with the character set and format used in the computer program. No indications are included where omissions or changes were made. Credit for abstracts obtained from published sources is enclosed in parentheses, denoted by the abbreviations given in Table 2, at the end of the abstract text.

The descriptors added to the title by the authors are enclosed in parentheses at the end of the title to indicate that they are not part of the document title.

Table 2. Sources of Published Abstracts

Symbol Used	Source
(EI)	*Engineering Index*
(CA)	*Chemical Abstracts*
(WPA)	*Water Pollution Abstracts*
(PHEA)	*Public Health Engineering Abstracts*
(PHS)	Public Health Service
(UC)	University of California
(AUTH)	Author abstract
(COMB)	*Combustion Magazine*

AUTHOR INDEX

All of the authors of the articles in this Bibliography are listed in the Author Index. No indication is given whether an individual is the sole author or one of several authors. Reference should be made to the Bibliography Section by means of the associated document number for this information. Authors will be found under the prefix when their name is preceded by any of the following prefixes: De, St., Van, or Von. Please note that names beginning with Mc and Mac are grouped separately in alphabetical order.

KEY-WORD INDEX

The Key-Word Index is a modified permuted-title and KWIC (Key Word-in-Context) index supplemented by descriptors added to the title by the author. Each document title can be found under all the significant words that it contains. The title is shifted to align each successive significant word with a column near the middle of each page. Each line is sorted alphabetically (including blanks, numbers, and special symbols) from this column to the right using the sorting sequence for characters in the same column, as shown in Table 3. After sorting it becomes easy to locate all documents containing the same word, descriptor, or phrase by means of the document number listed at the right-hand side of the page. Since each line is a separate unit, titles longer than one line are truncated. A virgule (/) is placed next to the chopped portion if the title ends on the line.

In general, to read a title and descriptors, begin after the virgule (or at the left if the virgule is at the end). The line is read to the right-hand end and continued from the left-hand side to the end. In cases where the title and descriptors have been chopped on both ends, no virgule is printed, and the chopped portion is read from left to right.

When language titles contain both the foreign language title and a translation, both are permuted. Approximately 250 words are considered trivial and are not permuted. These trivial words are listed inside the back cover.

Table 3. Character Set Used and Sorting Sequence[a] in Permuted Titles

Symbol	
	Blank
.	Period, decimal point
<	Less than sign
(	Left parenthesis
+	Plus sign
|	Vertical bar
&	Ampersand
!	Exclamation point
$	Dollar sign
*	Asterisk
)	Right parenthesis
;	Semicolon
¬	Logical not
–	Minus, hyphen
/	Slash
,	Comma
%	Percent sign
—	Underscore
>	Greater than sign
?	Question mark
:	Colon
#	Number sign
@	At sign
'	Apostrophe, prime
=	Equals sign
"	Quotation marks
A–Z	Alphabetic characters
0–9	Numerical characters

[a]Sorting sequence is order of appearance in table.

Bibliography

01 Articles of General Interest

01 01 SURVEYS, REVIEWS, AND BIBLIOGRAPHIES

01-01-00069 REFUSE DISPOSAL AS ORGANIZATIONAL TASK (QUANTITY)
FEFBER, M.
DAS MUELLPROBLEM ALS ORDNUNGSAUFGABE, BRENNSTOFF-WAERME-KRAFT 16(8), P. 373-375 (AUGUST 1964). DEPENDENT UPON LOCALLY GIVEN CONDITIONS, PLANS MUST CONSIDER FORSEEABLE DEVELOPMENT AND TRY TO FIND MOST ECONOMICAL SOLUTION AMONG VARIOUS POSSIBILITIES, CONTROLLED DUMPING, COMPOSTING, COMBUSTION, OR COMBINATION OF SEVERAL METHODS. REFUSE PRODUCERS, COMMERCIAL AND INDUSTRIAL OPERATORS, AND PACKAGING INDUSTRY ARE URGED TO EXAMINE WHAT INTERNAL MEASURES CAN BE TAKEN TO STEM REFUSE FLOOD AT ORIGIN. (EI)

01-01-00070 THE REFUSE DISPOSAL PROBLEM (COST(OPERATING) SANITARY-LANDFILL COMPOSTING INCINERATION HEAT-RECOVERY)
CANNELLA, A. A.
PUBLIC WORKS 99(2), P. 116-121 (FEBRUARY 1968). THE SOLID WASTE PROBLEM IS DEFINED AND CURRENT DISPOSAL METHODS ARE REVIEWED.

01-01-00097 SOLID WASTE DISPOSAL (COST(DISPOSAL) QUANTITY REQUIREMENTS(SANITARY LANDFILL) HEAT-RECOVERY HEATING(SPACE) LAND(UTILIZATION) REVIEW)
FLEMING, R. R.
THE AMERICAN CITY 81(1), SANITARY LANDFILLS, P. 101-103 (JANUARY 1966), AND 81(2), INCINERATION AND COMPOSTING, P. 94-96 (FEBRUARY 1966). PRODUCTION OF URBAN REFUSE IS ALMOST 100 MILLION TONS ANNUALLY. DUMPS ARE USED BY FIFTY PERCENT OF CITIES HAVING A POPULATION GREATER THAN 2,500. THE COST OF DUMPS LIES IN PUBLIC HEALTH ASPECTS, SINCE DUMPS SERVE AS BREEDING PLACES FOR FLIES AND RATS, AND AS FOCAL POINTS FOR DOGS. DUMPS ARE ODOROUS. SMOKE COMES FROM BURNING TRASH. APWA LISTS THE FOLLOWING REQUIREMENT FOR A SANITARY LANDFILL - (1) VECTOR BREEDING AND SUSTENANCE MUST BE PREVENTED. (2) AIR POLLUTION BY DUST, SMOKE, ODOR MUST BE CONTROLLED. (3) FIRE HAZARDS MUST BE AVOIDED. (4) POLLUTION OF SURFACE AND GROUND WATER MUST BE PRECLUDED. (5) ALL NUISANCES MUST BE CONTROLLED. COMPLETED LANDFILLS ARE MOST SUITABLE FOR PARKS AND RECREATION AREAS. STRUCTURES MUST INCORPORATE PROVISIONS FOR SETTLEMENT AND METHANE GAS DISPOSAL. THE AVERAGE CITY RESIDENT CONTRIBUTES ABOUT THREE-FOURTHS TON OF REFUSE ANNUALLY. ONE YARD OF TRACTOR BUCKET OR BULLDOZER CAPACITY IS NECESSARY FOR EACH 15,000 POPULATION. DELAWARE COUNTY, PENNSYLVANIA (EMBRACES 49 MUNICIPALITIES) WOULD HAVE NEEDED 1,000 ACRES OF LANDFILL OVER NEXT 20 YEARS. HOWEVER, SITES WERE RAPIDLY BECOMING UNAVAILABLE. THEREFORE, COUNTY OFFICIALS BUILT A 500 TON INCINERATOR AT A COST OF $6.9 MILLION TO SERVE THE WHOLE AREA. METROPOLITAN AREAS IN THE NORTH, CENTRAL, EASTERN, AND SOUTHERN U.S.A. ARE RAPIDLY RUNNING OUT OF SUITABLE LANDFILL SITES. A DECADE AGO, MUNICIPALITIES IN LOS ANGELES COUNTY OPERATED NINE INCINERATORS, BUT NOW NONE ARE IN OPERATION DUE TO AIR POLLUTION REGULATIONS. MORE THAN ONE-THIRD OF 175 CITIES WHICH HAD INCINERATORS HAVE ABANDONED THEM IN FAVOR OF OTHER METHODS OF DISPOSAL. EVEN WELL-DESIGNED INCINERATORS SMOKE WHEN OVERLOADED, AND PLANNING AND ENLARGING OF CAPACITY IS NECESSARY TO PREVENT FUTURE NUISANCE. ELECTROSTATIC PRECIPITATORS CAN REMOVE UP TO 98 PERCENT OF PARTICULATE POLLUTANTS. A LAZY FLAME LOWERS CHAMBER VELOCITY AND PARTICLES CAN BE PRECIPITATED IN THE EXPANSION CHAMBER WITHOUT NEED FOR ADDITIONAL AIR POLLUTION EQUIPMENT. SANITARY LANDFILL COSTS RANGE FROM 50 CENTS TO $2/TON, WHILE INCINERATOR COSTS ARE AROUND THREE TO SIX DOLLARS, OF WHICH ABOUT SEVENTY CENTS REPRESENTS CAPITAL INVESTMENT. INCINERATOR RESIDUES COMMONLY TOTAL 5 PERCENT TO 20 PERCENT OF THE INITIAL REFUSE VOLUME, OR ABOUT THREE-FOURTHS CU-YD/TON OF REFUSE BURNED. THIS RESIDUE IS USED IN EUROPEAN CITIES AND A FEW AMERICAN CITIES AS A SUBBASE MATERIAL FOR ROADS. MOST OF THE AMERICAN CITIES DISPOSE OF IT IN LANDFILLS. IN EUROPE, PROVISION USUALLY IS MADE FOR USING THE WASTE HEAT. IN THE U. S. THIS IS DONE ONLY AT ATLANTA (STEAM HEAT FOR COMMERCIAL BUILDINGS), BOSTON (FOR HOSPITAL HEATING), MIAMI (FOR HEATING A HOSPITAL AND PUMPING WATER), AND NEW YORK CITY (FOR HEATING ITS NEW TWENTY-TWO MILLION DOLLAR PUBLIC WORKS GARAGE). THE NEW PLANT IN OCEANSIDE, NEW YORK, SUPPLIES STEAM TO POWER A DESALTING PLANT. COMPOSTING HAS NOT BEEN POPULAR IN THE UNITED STATES DUE TO LACK OF DEMAND FOR THE FINISHED PRODUCT. (UC)

01-01-00105 THE IMMINENT SOLID WASTE CRISIS
MCKINNEY, R. E.
THE AMERICAN CITY 81(6), P. 23 (JUNE 1966). A DESCRIPTION OF THE MAGNITUDE OF THE SOLID WASTE PROBLEM IS GIVEN. EMPHASIS MUST BE GIVEN TO THE OVERALL POLLUTION PROBLEM BOTH SOLIDS, LIQUIDS AND AIR WHEN ATTEMPTING TO DEVELOP SOLUTIONS.

01-01-00108 EUROPEAN REFUSE-DISPOSAL (COST(CAPITAL) COST(OPERATING) INCINERATION HEAT-RECOVERY SANITARY-LANDFILL COMPOSTING SALVAGE)
FIFE, J. A.
THE AMERICAN CITY 81(9), P. 125-128 (SEPTEMBER 1966). A SUMMARY REPORT ON THE AUTHORS VISIT TO EUROPE TO STUDY WASTE DISPOSAL PRACTICES. IN GENERAL THEY PERFORM MORE SALVAGE THAN IS DONE IN THE U.S., AND BECAUSE OF HIGHER FUEL COST, HEAT RECOVERY IS PRACTICED TO A GREATER EXTENT. A TABLE IS PRESENTED COMPARING METHODS, COSTS, ETC. FOR THE UNITED KINGDOM, CONTINENT, AND THE U.S.A. FOR SANITARY LANDFILL, INCINERATION, AND COMPOSTING.

01-01-00166 SOLID WASTE RESEARCH PROJECTS
THE AMERICAN CITY 82(6), P. 63 (1967). A DESCRIPTION IS GIVEN OF THE FIRST 16 DEMONSTRATION GRANTS AWARDED BY THE OFFICE OF SOLID WASTES, PUBLIC HEALTH SERVICE.

01-01-00168 REFUSE COLLECTION AND DISPOSAL - AN ANNOTATED BIBLIOGRAPHY 1954-1955
WEAVER, L.
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH BIBLIOGRAPHY SERIES NO. 4, SUPPLEMENT B (1956, REPRINTED JANUARY 1967). A BIBLIOGRAPHY OF 275 REFERENCES AND ABSTRACTS COVERING ALL ASPECTS OF THE SOLID WASTE COLLECTION AND DISPOSAL PROBLEM.

01-01-00178 SCOPE OF SOLID WASTE PROBLEM (LAW GOAL(NATIONAL))
GILBERTSON, W. E.
PROC AM SOC CIVIL ENGRS J SANIT ENGRG DIV 92(SA3), P. 1-8 (JUNE 1966). ALTHOUGH SOLID WASTE COLLECTION AND DISPOSAL SERVICES ARE INHERENTLY LOCAL I.E., COMMUNITY OR COUNTY RESPONSIBILITY, URBAN, SUBURBAN, AND RURAL SECTORS ARE SO CLOSELY BUNCHED TOGETHER IN DENSELY SETTLED PARTS OF COUNTRY THAT SOLID WASTE MANAGEMENT CAN NO LONGER BE EFFECTIVELY ACHIEVED SOLELY BY INDEPENDENT ACTION OF ANY SINGLE SECTOR. IMPLEMENTATION OF THE SOLID WASTE DISPOSAL ACT WILL REQUIRE THE ENGINEERING AND OTHER PROFESSIONS TO REVISE THEIR THINKING ON SOLID WASTE COLLECTION AND DISPOSAL PROBLEMS AND PROJECTS. SOLID WASTE PROBLEMS CANNOT BE SOLVED BY MINOR ADJUSTMENTS IN, AND PERFECTIONS OF, THE METHODS OF YESTERYEAR. ALTHOUGH COST IS AN IMPORTANT FACTOR, HIGH QUALITY IS MORE IMPORTANT. SOLID WASTE PROBLEMS CAN BE SOLVED ONLY BY DYNAMIC ENGINEERING ACTION. (EI)

01-01-00202 HOUSE REFUSE DISPOSAL IN THE WEST GERMAN FEDERAL REPUBLIC (INCINERATION)
DIETERICH, B.
MUELLBESEITIGUNG IN DER BUNDESREPUBLIK, TECH WETENSCH TIJDSCHR 32(3), P. 90-95 (MARCH 1963). IN WEST GERMANY, THE DUTY OF HOUSE REFUSE DISPOSAL RESTS PRIMARILY WITH THE LOCAL AUTHORITIES. THIS PROBLEM IS BECOMING MORE AND MORE ACUTE. AT PRESENT ONLY 6.3 PERCENT OF THE TOTAL AMOUNT OF GARBAGE IS BEING BURNED OR MADE INTO A COMPOST, ALL THE REST STILL BEING DISPOSED OF ON DUMPS. ALTHOUGH THE TECHNICAL PROBLEM INVOLVED IN GARBAGE DISPOSAL HAS DULY BEEN SOLVED, FINANCIAL DIFFICULTIES HAVE SO FAR PREVENTED AN EXTENSION OF THE MODERN METHODS. THE NECESSARY FUNDS MUST IN THE FIRST PLACE BE PROVIDED BY THE INHABITANTS. THE CHOICE BETWEEN BOTH SYSTEMS WILL ULTIMATELY DEPEND ON LOCAL CIRCUMSTANCES. (IN GERMAN) (AUTH)

01-01-00211 ENGINEERING ASPECTS OF TOWN REFUSE DISPOSAL (QUANTITY COMPOSITION COLLECTION COMPOSTING SALVAGE(METALS) INCINERATION OCEAN-DISPOSAL GARCHEY)
WATSON, J. L. A.
SURVEYOR 120(3616), P. 1163-1166 (SEPTEMBER 28, 1961). COMPOSITION OF REFUSE VARIES GREATLY ACCORDING TO CLIMATE, TOPOGRAPHY, LOCAL HABITS OF PEOPLE, AND POPULATION DENSITY. STAGES OF HANDLING REFUSE ARE STORAGE, COLLECTION, HAUL, AND DISPOSAL. USE OF DUST BINS, THEIR TYPES AND LOCATIONS. IMPORTANCE OF COLLECTION PLANNING. ASPECTS OF COMPOSTING OF SANITARY LANDFILL, INCINERATION, AND BARGING TO SEA. USE OF DRY CHUTES AND INCINERATORS IN TALL BUILDINGS. EXAMPLES FROM GREAT BRITAIN, UNITED STATES, AND ISRAEL. (EI)

01-01-00213 DISPOSAL GAP (SALVAGE SANITARY-LANDFILL COMPOSTING INCINERATION)
BARNES, S.
MACHINE DESIGN 38(7), P. 144-150 (MARCH 17, 1966). REVIEW OF EXISTING REFUSE DISPOSAL TECHNOLOGY IS PRESENTED WHICH INCLUDES INCINERATION, SANITARY LANDFILLS, AND COMPOSTING (OR SALVAGE AND RECLAMATION). AT PRESENT, IT IS FELT THAT SANITARY LAND FILLING IS BETTER THAN OPEN DUMPING, INCINERATION IS BETTER THAN OPEN BURNING, AND COMPOSTING HAS YET TO PROVE ITS ADVANTAGES. (EI)

01-01-00215 DEALING WITH DOMESTIC REFUSE (COLLECTION SACK(PAPER) DEVA-SYSTEM CENTRALZUG COMPACTORS SALVAGE TIPPING COMPOSTING INCINERATION GRINDING)
ENGINEERING 203(5267), P. 499-508 (MARCH 31, 1967). SURVEY OF EQUIPMENT AVAILABLE FOR COLLECTION AND DISPOSAL OF REFUSE IN UNITED KINGDOM. IT VARIES FROM RANGE OF DUST-BINS AND PAPER SACKS TO CENTRALIZED AUTOMATED COLLECTING SYSTEMS, FROM OPEN TRUCKS TO ENCLOSED CONTAINERS WITH COMPRESSING DEVICES, AND FROM OPEN TIPS TO POWER-GENERATING INCINERATORS AND COMPOSTING PLANT. SOME PHOTOGRAPHS AND DIAGRAMS OF EQUIPMENT ARE INCLUDED. (EI)

01-01-00233 EDITORIAL
REFUSE REMOVAL JOURNAL 10(12), P. 10 (DECEMBER 1967). A CRITICAL EDITORIAL ON THE RECENT ARTICLE IN FORTUNE BY TOM ALEXANDER IS PRESENTED.

01-01-00240 SOLID WASTE PROBLEMS IN METROPOLITAN AREAS (QUANTITY COMPOSTING INCINERATION)
WILEY, J. S.
COMPOST SCIENCE 4(2), P. 21-25 (SUMMER 1963). BASIC REQUIREMENTS FOR STORAGE, COLLECTION AND DISPOSAL OF SOLID REFUSE, PROPER STORAGE OF PUTRESCIBLE SOLID WASTES, FREQUENCY OF COLLECTION OF MIXED REFUSE OR OF VARIOUS CONSTITUENTS OF REFUSE STORED SEPARATELY, REFUSE TRANSFER STATIONS, AND ACCEPTABLE METHODS OF DISPOSAL FOR HANDLING COMBINED REFUSE. SANITARY LANDFILL, INCINERATION AND COMPOSTING ARE DISCUSSED. (EI)

01-01-00298 TECHNICAL DEVELOPMENTS IN REFUSE COLLECTION AND DISPOSAL (COMPOSITION COLLECTION TRANSFER-STATION DISPOSAL(METHODS) EMISSION(CONTROL))
SUMNER, J.
CHARTERED MUNIC ENGR 91(3), P. 95-101 (MARCH 1964). DEVELOPMENTS IN FIELD OF REFUSE COLLECTION AND DISPOSAL ARE REVIEWED. YIELD AND CHARACTER OF REFUSE, REFUSE STORAGE, AND REFUSE COLLECTION VEHICLES. METHODS OF COLLECTION AND DISPOSAL, TRANSFER LOADING STATIONS, WATER POLLUTION AND WET TIPPING, MECHANICAL METHODS OF DISPOSAL, DUST EXTRACTION PLANT, TRADE WASTES INCINERATION. (EI)

01-01-00302 PUTTING TECHNOLOGY TO WORK ON WASTE (COLLECTION DISPOSAL(METHODS) SALVAGE)
PUBLIC CLEANSING 57(3), P. 145 (MARCH 1967). THIS REPORT, PREPARED BY THE OFFICE OF SOLID WASTES, PUBLIC HEALTH SERVICE, U.S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE, FOR THE NATIONAL COMMISSION ON TECHNOLOGY, AUTOMATION AND ECONOMIC PROGRESS, EXAMINES THE PROBLEMS OF REFUSE DISPOSAL IN U.S.A. AND DISCUSSES POSSIBLE TECHNICAL SOLUTIONS AND THE SCOPE FOR RESEARCH. THE RECOMMENDATIONS DRAW ATTENTION TO THE NEED FOR A GREATER NATIONAL RECOGNITION OF THE PROBLEMS. (AUTH)

01-01-00407 MUNICIPAL SOLID-WASTE DISPOSAL - PART VIII - AN OVER-ALL ENGINEERING EVALUATION (DEFINITIONS OPEN-DUMP SANITARY-LANDFILL POLLUTION)
LANE, J. M.
THE AMERICAN CITY 77(9), P. 205 (SEPTEMBER 1962). AN OVERALL ENGINEERING EVALUATION OF MUNICIPAL SOLID WASTES DISPOSAL. INCLUDES - (1) A BRIEF HISTORY OF SOLID WASTE DISPOSAL. (2) DEFINITION OF TERMS - WASTES, REFUSE, SEWAGE, GARBAGE, RUBBISH, COMBUSTIBLE RUBBISH, AND SEWAGE SOLIDS. (3) QUANTITY AND COMPOSITION OF REFUSE. (4) OPEN DUMPING. (5) HOG FEEDING. (6) COMBINED DISPOSAL OF GARBAGE AND SEWAGE SOLIDS. (7) SANITARY LANDFILLING. (PHS)

01-01-00411 MUNICIPAL SOLID-WASTE DISPOSAL - PART I - NATURE AND MAGNITUDE (QUANTITY COMPOSITION INCINERATION PESTS GRINDER(GARBAGE))
FOSTER, W. S.
THE AMERICAN CITY 77(2), P. 105 (FEBRUARY 1962). DISCUSSES THE NATURE AND MAGNITUDE OF THE MUNICIPAL SOLID-WASTE DISPOSAL PROBLEM TODAY. EMPHASIZES "HUMAN NATURE" AS AN IMPORTANT FACTOR TO CONSIDER IN ATTEMPTING TO SOLVE THE PROBLEM. TALKS ABOUT REFUSE QUANTITIES, THE INCINERATOR TREND, VECTOR PROBLEMS CAUSED BY THE OPEN DUMPING OF GARBAGE, AND THE USE OF HOME GARBAGE GRINDERS. LISTS EIGHT PROBLEMS WHICH MUST BE SOLVED IN ORDER TO MEET FUTURE REFUSE DISPOSAL NEEDS. (PHS)

01-01-00419 CONNECTICUT HAS GROWING DISPOSAL WOES (OPEN-DUMP SANITARY-LANDFILL INCINERATION COST(CAPITAL) COST(OPERATING))
REFUSE REMOVAL JOURNAL 5(7), P. 29 (JULY 1962). REFUSE DISPOSAL IS AN INCREASING PROBLEM FOR CONNECTICUT MUNICIPALITIES. GROWING POPULATIONS AND HIGHER SANITATION STANDARDS ARE MAKING THE OPEN-FACED DUMP INADEQUATE. ALTHOUGH THE SANITARY LANDFILL IS STILL THE MOST SATISFACTORY METHOD OF DISPOSAL FOR THE LEAST AMOUNT OF MONEY, LIMITED AVAILABLE LAND PRECLUDES ITS USE IN MANY COMMUNITIES. SOME MUNICIPALITIES HAVE BEEN TURNING TO INCINERATION, WHICH THOUGH PROBABLY THE MOST EFFICIENT, SANITARY, AND NUISANCE-FREE METHOD OF DISPOSAL, IS ALSO THE MOST COSTLY. (PHS)

01-01-00422 MEETING THE CHALLENGE OF SOLID WASTE DISPOSAL (PROTECTIONS VOLUMES LAW)
GILBERTSON, W. E. + BLACK, R. J. + FLIEGER, K.
PROC OF THE 1966 NATIONAL INCINERATOR CONF, ASME, P. 49-53 (MAY 1-4, 1966). PROJECTIONS OF REFUSE VOLUMES (PER CAPITA AND TOTAL) TO THE YEAR 2000 ARE PRESENTED. A DESCRIPTION OF THE SOLID WASTE ACT IS ALSO GIVEN.

01-01-00456 VIII INTERNATIONAL CONFERENCE ON PUBLIC CLEANSING, VIENNA
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULLETIN NO. 20, (MAY 1964). THE VIII INTERNATIONAL CONGRESS ON PUBLIC CLEANSING OF THE INTERNATIONAL ASSOCIATION OF PUBLIC CLEANSING (INTAPUC) WAS HELD APRIL 14-17, 1964, IN VIENNA. ALONG WITH THE CONGRESS

THERE WAS A LARGE INTERNATIONAL VEHICLE AND EQUIPMENT SHOW. ORGANIZATION AND CONDUCT OF THE CONGRESS WAS DONE BY OBERSENATSRAT KOJETINSKY, VIENNA, WHO ALSO TOOK OVER AS PRESIDENT OF INTAPUC FOR THE NEXT FOUR YEARS. FORMER INTAPUC PRESIDENT, ING. BJORKMAN, STOCKHOLM, SAID AT A PRESS CONFERENCE THAT THE PROBLEMS OF PUBLIC CLEANSING ARE EVER-INCREASING WITH THE GROWTH OF CITIES AND THE INCREASE IN TRAFFIC AND MOTORIZATION. THE TRANSITION FROM HAND LABOR TO MOTORIZED AND MECHANIZED PUBLIC CLEANSING WAS ASSOCIATED WITH CERTAIN DIFFICULTIES. THE MAIN POINTS OF THE LECTURES AND DISCUSSIONS WERE ON FOUR BASIC TOPICS - I. SUCCESS AND WORK PERFORMANCE IN PUBLIC CLEANSING. LECTURERS - A. E. BARTON, DIRECTOR, BIRMINGHAM REFUSE UTILIZATION PLANT AND CHAIRMAN, INSTITUTE OF PUBLIC CLEANSING, AND ENGINEER S. SUNDQVIST, DIRECTOR, STOCKHOLM PUBLIC CLEANSING DEPARTMENT. II. NEW RESEARCH WORK OF THE IRGRD. LECTURER DR. R. BRAUN, EAWAG, ZURICH, SECRETARY OF IRGRD. THE SPEAKER SUMMARIZED THE LATEST RESEARCH DONE BY INSTITUTIONS, RESEARCH LABORATORIES AND PROFESSIONAL GROUPS ASSOCIATED WITH IRGRD. HE INDICATED THAT TO DATE, EXPERIMENTS WITH REFUSE MATERIALS HAVE BEEN LIMITED TO ANALYSIS OF DOMESTIC REFUSE. III. EXPERIENCES WITH THE NEWEST INCINERATOR PLANTS. LECTURERS DIR. R. DIJKSHOORN, DIRECTOR, ROTTERDAM PUBLIC CLEANSING, AND SENATSRAT DIPL. ING. F. FISCHER, DIRECTOR, VIENNA PUBLIC CLEANSING. IT HAS BEEN NOTED IN WESTERN EUROPE THAT THE QUANTITY INCREASES WITH THE GROWING PROSPERITY. IT HAS ALSO BEEN SHOWN THAT THE CALORIFIC-VALUE OF REFUSE INCREASES. FOR EXAMPLE, THE CALORIFIC-VALUE OF SUMMER REFUSE IN ROTTERDAM HAS INCREASED 60 PERCENT IN THE LAST 10 YEARS. THE REFUSE QUANTITY HAS INCREASED 15 PERCENT IN THE LAST 3 YEARS, EVEN THOUGH THE POPULATION OF ROTTERDAM HAS HARDLY CHANGED. VERY GOOD UTILIZATION OF EXCESS HEAT WAS ENVISIONED FOR THE VIENNA PLANT PLANNED FOR THE WEST OF THE CITY BY THE HEATING OF TWO LARGE HOSPITAL COMPLEXES SITUATED NEAR THE FLOETZERSTEIG. IN ADDITION, A MUNICIPAL CENTRAL LAUNDRY WILL BE ADDED LATER IN THE SAME VICINITY. IV. MODERN VEHICLES AND EQUIPMENT FOR GERMAN PUBLIC CLEANSING PLANTS. LECTURERS DIR. I. R. W. KAUPERT, BAD SCHWARTAU, MANAGER, TECHNICAL COMMITTEE OF VKF, AND BAUDIR. DIPL. ING. O. TOPE, HANNOVER. (AUTH)

01-01-00462 SOLID WASTE MANAGEMENT IN GERMANY (INCINERATION COMPOSTING COMPOSITION QUANTITY HEAT-RECOVERY SANITARY-LANDFILL EMISSION(CONTROL) WATER-WALL SALVAGE(METAL))
REPORT OF THE U.S. SOLID WASTES STUDY TEAM VISIT (JUNE 25-JULY 8, 1967). U.S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE PUBLIC HEALTH SERVICE. THE U.S. SOLID WASTES STUDY TEAM FOUND THE TECHNOLOGY AND PRACTICE OF DOMESTIC REFUSE MANAGEMENT IN GERMANY TO BE OF VERY HIGH CALIBER. SPECIFIC OBSERVATIONS WERE MADE, WHICH CAN BE SUMMARIZED AS FOLLOWS - 1. GERMAN DOMESTIC REFUSE IS QUITE SIMILAR TO AMERICAN DOMESTIC REFUSE, HOWEVER, IT DOES CONTAIN SLIGHTLY MORE ASH, BUT FEWER CANS AND BOTTLES, AND LESS PAPER. 2. THE PRINCIPAL STORAGE CONTAINER FOR GERMAN DOMESTIC REFUSE HAS BEEN A 110-LITER REFUSE CAN. THIS IS STILL COMMON, BUT LARGER CONTAINERS - 1.1, 4, AND 6 CU-M - ARE BECOMING MORE POPULAR. 3. DOMESTIC REFUSE COLLECTION IS ALMOST INVARIABLY HANDLED BY THE MUNICIPAL GOVERNMENT. COLLECTION IS FROM CURBSIDE, AND CONTAINERS ARE DUMPED INTO THE COLLECTION VEHICLE BY A MECHANIZED LIFTING DEVICE. THE " DUSTLESS " DUMPING ORIGINATED BECAUSE OF THE HIGH ASH CONTENT. 4. LANDFILLS FREQUENTLY HAVE THE SAME ILL REPUTE AS AMERICAN LANDFILLS. CONTROLLED LANDFILLS ARE OFTEN BUILT CONSIDERABLY ABOVE THE SURROUNDING LAND ELEVATION. NO SANITARY LANDFILLS WERE OBSERVED. 5. COMPOSTING IS PRACTICED IN NINE LOCATIONS IN WEST GERMANY, BUT IT IS NOT A MAJOR REFUSE DISPOSAL PROCESS. THE ECONOMICS, ESPECIALLY OF MARKETING THE COMPOST, ARE NOT FAVORABLE. 6. REFUSE INCINERATION THAT PRODUCES STEAM OR ELECTRICITY IS COMMON IN GERMANY. SUCH INCINERATOR PLANTS ARE MODELS OF EFFICIENCY AND GOOD ENGINEERING. HOWEVER, REFUSE IS NOT A " FREE " FUEL, IT COSTS MORE TO PRODUCE STEAM OR ELECTRICITY FROM REFUSE THAN FROM CONVENTIONAL FUELS. THE ADDITIONAL COST IS CHARGED TO REFUSE DISPOSAL. ELECTROSTATIC PRECIPITATORS ARE USED ON ALL THE POWER-PRODUCING INCINERATORS, AND THIS RESULTS IN HIGH QUALITY STACK DISCHARGES. SPECIAL ATTENTION WAS PAID TO THE GERMAN PRACTICE OF STEAM AND ELECTRICITY PRODUCTION USING REFUSE AS A FUEL. THE STUDY TEAM WAS IMPRESSED BUT CONCLUDED THAT CONSIDERATION OF THE SIGNIFICANT ECONOMIC, POLITICAL, AND PHILOSOPHICAL DIFFERENCES BETWEEN THE SITUATION IN GERMANY AND THAT IN THE UNITED STATES WAS PARAMOUNT IN EVALUATING APPLICATION OF THIS SYSTEM TO ANY GIVEN U.S. COMMUNITY. (AUTH)

01-01-00493 FEDERAL SOLID WASTES PROGRAM
VAUGHAN, R. D. + BLACK, R. J.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 381-321 (MAY 5-8, 1968). SUBJECT OF SOLID WASTES HAS BEEN EXAMINED IN DETAIL BY FOUR TOP LEVEL SCIENTIFIC AND ADVISORY GROUPS--COMMITTEE ON POLLUTION OF NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL., ENVIRONMENTAL POLLUTION PANEL OF PRESIDENT'S SCIENCE ADVISORY COMMITTEE, NATIONAL COMMISSION ON TECHNOLOGY, AUTOMATION, AND ECEONOMIC PROGRESS AND, TASK FORCE ON ENVIRONMENTAL HEALTH AND RELATED PROBLEMS. (EI)

01-01-00505 A BRITISH VIEW OF DISPOSAL PROBLEMS (SANITARY-LANDFILL INCINERATION COMPOSTING)
REFUSE REMOVAL JOURNAL 5(12), P. 18 (DECEMBER 1962). DISCUSSES THE THREE MAIN METHODS OF REFUSE DISPOSAL--SANITARY LANDFILLING, INCINERATION, AND COMPOSTING. LANDFILLING IS THE CHEAPEST METHOD, BUT IT IS GOVERNED BY THE AVAILABILITY OF SPACE. A SALVAGE AND PULVERIZING PLANT HAS RECENTLY BEEN DEVELOPED TO CONSOLIDATE THE REFUSE, THEREBY INCREASING THE LIFE OF THE LANDFILL. INCINERATION IS AN ATTRACTIVE METHOD OF REFUSE DISPOSAL IN THE LARGE POPULATION AREAS. A DANISH COMPANY HAS DEVELOPED A VERY EFFICIENT INCINERATOR WHICH HAS A PREDRYING MOVING GRATE AND A ROTATING INCINERATION KILN. COMPOSTING REQUIRES A CAREFUL PRELIMINARY STUDY OF RAW MATERIALS AND LOCAL CONDITIONS BEFORE INSTALLATION. THE DESIGN OF A COMPOSTING PLANT MAY BE DIVIDED INTO TWO PARTS- THE RECEPTION HOPPER, SALVAGE RECOVERY PLANT, AND PULVERIZER, AND THE FERMENTATION MACHINERY. (PHS)

01-01-00516 REFUSE COLLECTION AND DISPOSAL - AN ANNOTATED BIBLIOGRAPHY 1956-1957
WILLIAMS, E. R.
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH BIBLIOGRAPHY SERIES NO. 4, SUPPLEMENT C (1958, REPRINTED JANUARY 1967). A BIBLIOGRAPHY OF 163 REFERENCES AND ABSTRACTS COVERING ALL ASPECTS OF THE SOLID WASTE COLLECTION AND DISPOSAL PROBLEM.

01-01-00540 REFUSE COLLECTION AND DISPOSAL - AN ANNOTATED BIBLIOGRAPHY 1958-1959
WILLIAMS, E. R. + BLACK, R. J.
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH BIBLIOGRAPHY SERIES NO. 4, SUPPLEMENT D (1961, REPRINTED JANUARY 1967). A BIBLIOGRAPHY OF 358 REFERENCES AND ABSTRACTS COVERING ALL ASPECTS OF THE SOLID WASTE COLLECTION AND DISPOSAL PROBLEM.

01-01-00584 REFUSE COLLECTION AND DISPOSAL - AN ANNOTATED BIBLIOGRAPHY 1960-1961
BLACK, F. J. + DAVIS, P. L.
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH BIBLIOGRAPHY SERIES NO. 4, SUPPLEMENT E (1963, REVISED DECEMBER 1966). A BIBLIOGRAPHY OF 627 REFERENCES AND ABSTRACTS COVERING ALL ASPECTS OF THE SOLID WASTE COLLECTION AND DISPOSAL PROBLEM.

01-01-00611 A WIDER ENVIRONMENT OF ECOLOGY AND CONSERVATION
DARLING, F. F.
DAEDALUS, P. 1003-1019 (FALL 1967). IMPORTANT NEW RESEARCHES ARE CALLED FOR. THE DISCIPLINE MUST BE CAPABLE OF ADJUSTMENT AND COMPROMISE IN A COMPLEX WORLD WHERE POLITICS IS A MAJOR ECOLOGICAL FACTOR IN THE TOTAL ENVIRONMENT. AMONG THE MANY INTERESTING STATEMENTS MADE IN THE ARTICLE ARE THE FOLLOWING- "OUR CONSERVATION MUST NOT BE JUST THE CLASSIC CONSERVATION OF PROTECTION AND DEVELOPMENT, BUT A CREATIVE CONSERVATION OF RESTORATION AND INNOVATION. ITS CONCERN IS NOT WITH NATURE ALONE BUT WITH THE TOTAL RELATION BETWEEN MAN AND THE WORLD AROUND HIM.... AND THE ECOLOGIST SHOULD NOT AVOID CONSIDERING SUBJECTIVE VALUES ECOLOGICAL FACTORS. PSYCHOSOMATIC DISEASES ARE MANIFESTATION OF VARIED PATTERNS OF ENVIRONMENTAL CONDITIONS BEARING ON PERSONS OF DIFFERENT HABITUS TYPES .... PURE WATER AND PURE AIR ARE ACCEPTED AS BEING DESIRABLE, BUT THE NATURE OF THE ENVIRONMENT IS TOO LITTLE CONSIDERED. THE SO-CALLED RISE IN THE STANDARD OF LIVING IS BEING ATTENDED BY A DEFINITE LOWERING OF THE STANDARD OF LIVING IN ENVIRONMENTAL TERMS. ECOLOGISTS MIGHT CONDUCT SURVEYS METHODOLOGICALLY SIMILAR TO THE 'SCENARIOS' OF THE HUDSON INSTITUTE. THERE IMAGINARY DEBACLES ARE SET FORTH, INCLUDING THE HYPOTHETICAL DROPPING OF ATOMIC BOMBS .... THE CONSEQUENCES ARE FOLLOWED THROUGH

IN CONSIDERABLE ECOLOGICAL DETAIL BY THE TIME THE SCENARIO IS PRESENTED. ECOLOGISTS COULD LEARN MUCH FROM THIS TECHNIQUE. IN THE SAME LINE OF THOUGHT, ECOLOGICAL RECONNAISSANCE CAN BE DEVELOPED FURTHER TO GIVE FAIRLY ACCURATE, REASONABLY QUICK ANSWERS TO SPECIFIC PROBLEMS. POLLUTION OF THE ENVIRONMENT IS A PRODUCT OF OUR AGE, RESULTING FROM INCREASE OF HUMAN POPULATION, FROM TECHNOLOGICAL ACTIVITY, AND FROM THE LINKED PHENOMENON OF URBANIZATION. (UC)

01-01-00612 THE ART OF THE IMPOSSIBLE
PATTERSON, R. W.
DAEDALUS, AMERICA'S CHANGING ENVIRONMENT, P. 1023-1033 (FALL 1967). " DESPITE ITS INNUMERABLE TECHNICAL AND ECONOMIC COMPLICATIONS, CONSERVATION IS BASICALLY A SOCIAL PROBLEM. ANY ACCOMPLISHMENT IN CONSERVATION REQUIRES CHANGE IN HABIT AND THINKING, A WILLINGNESS TO PAY BOTH IN DOLLARS AND FREEDOM OF ACTION. GIVEN THAT WILLINGNESS, TECHNICAL OBSTACLES COULD BE OVERCOME, WITHOUT THE ONE, THE OTHER WILL ALWAYS HOLD US BACK,.... " THE AUTHOR EQUATES A LARGE PART OF OUR PRESENT POLLUTIONAL PROBLEM WITH AN UNWILLINGNESS TO PAY THE PRICE OF ALLEVIATING IT. "WE KNOW FOR EXAMPLE, THAT THE MANY FORMS OF POLLUTION MUST BE CONTROLLED. NEVERTHELESS, ALTHOUGH WE LIKE TO ADD " AT ALL COSTS, " WE DO NOT YET MEAN IT. IN ALMOST EVERY CASE, THE REAL STUMBLING BLOCK IS COST - COST IN DOLLARS - THE ONLY MEASUREMENT THAT WE HAVE LEARNED TO USE. ONLY BY IMPOSING EQUAL REQUIREMENTS ON EVERYONE CAN WE ELIMINATE THE DEADLY COMPETITION THAT TEMPTS STATES, CITIES, BUSINESS, AND INDUSTRY TO GAIN AN ADVANTAGE BY NOT SPENDING MONEY ON THE PROTECTION OF THE ENVIRONMENT. AMERICA WAS FOUNDED ON THE PRINCIPLE THAT THE RIGHTS OF MINORITIES BE PROTECTED, BUT TODAY THE PUBLIC OPINION SURVEY HAS TAKEN THE PLACE OF THOUGHT." (UC)

01-01-00617 COMPOSTING OF ORGANIC WASTES - AN ANNOTATED BIBLIOGRAPHY, SUPPLEMENT 2
WILEY, J. S.
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE, BUREAU OF STATE SERVICES, COMMUNICABLE DISEASE CENTER, SAVANNAH, GEORGIA, (APRIL 1960). THIS IS THE THIRD IN A SERIES OF BIBLIOGRAPHIES. THE INITIAL ONE WAS PUBLISHED IN FEBRUARY 1958 (ABSTRACT 1-145) AND THE FIRST SUPPLEMENT, IN JUNE 1959 (ABSTRACT 146-287).

01-01-00624 SOLID WASTE DISPOSAL - WHERE TO GO FROM HERE (INCINERATION EMISSION(CONTROL) BULKY-WASTE SANITARY-LANDFILL OCEAN-PUMPING)
KEARING, S. J.
PROC OF THE MECAR SYMPOSIUM, INCINERATION OF SOLID WASTES, NEW YORK, NEW YORK, P. 43 (MARCH 21, 1967). A DESCRIPTION OF THE PROBLEMS FACING NEW YORK CITY IN THE DISPOSAL OF SOLID WASTES ARE DESCRIBED. PROBLEMS WITH BULKY-WASTES ARE DESCRIBED ALONG WITH POSSIBLE SOLUTIONS. PROBLEMS WITH INCINERATOR AIR POLLUTION ARE ALSO ENUMERATED.

01-01-00638 THE RAPE OF THE LAND
BAGDIKIAN, B. H.
THE SATURDAY EVENING POST 239(6), P. 25-29 (JUNE 18, 1966). AS OUR CITIES SPREAD OUT CANCEROUSLY IN ALL DIRECTIONS, WE ARE DESTROYING - FOR PROFIT - TOO MANY OF THE GREEN AND OPEN PLACES WE NEED TO MAKE LIFE LIVABLE. (UC)

01-01-00657 WILL WE BURY OURSELVES IN GARBAGE (PROJECTIONS BULKY-WASTE INCINERATION SANITARY-LANDFILL COMPOSTING COLLECTION)
ENGRG NEWS-RECORD, P. 25-27 (MAY 1966). PROJECTIONS ARE MADE OF SOLID WASTE PRODUCTION IN 1986. IT IS ESTIMATED THAT 2.4 MILLION POUNDS WILL BE PRODUCED BY 265 MILLION PEOPLE. TYPICAL EXAMPLES OF WHAT LARGE CITIES IN THE UNITED STATES DO WITH SOLID WASTES ARE LISTED. NEW DEVELOPMENTS IN LANDFILL, INCINERATION, AND COMPOSTING ARE DISCUSSED. PROBLEMS IN BULKY-WASTES SUCH AS AUTOMOBILES AND DEMOLITION WASTES ARE ALSO DISCUSSED.

01-01-00663 AS JAPANESE TRAIL IN WASTE DISPOSAL (INCINERATION SANITARY-LANDFILL SALVAGE COMPOSTING)
KOJIMA, R.
REFUSE REMOVAL JOURNAL 10(4), P. 6-8, 38 (APRIL 1967). THE BIGGEST PROBLEM IN THE ADMINISTRATION OF WASTE DISPOSAL IN JAPAN IS EMPLOYEE EFFICIENCY. THE COLLECTION AND TRANSPORTATION OF WASTES, AS WELL AS THEIR FINAL DISPOSAL, ARE BEING MECHANIZED AND MODERNIZED, BUT THE PROCUREMENT OF EFFICIENT WORKERS IS DIFFICULT BECAUSE OF THE POOR PAY AND UNDESIRABLE WORKING ENVIRONMENT. (PHEA)

01-01-00675 A SURVEY BY PUBLIC WORKS - CITY PRACTICES FOR REFUSE COLLECTION AND DISPOSAL (QUANTITY SANITARY-LANDFILL INCINERATION OPEN-DUMP)
PUBLIC WORKS 84(10), P. 73-74 (OCTOBER 1953). RESULTS OF A SURVEY OF 1000 MUNICIPALITIES ON SOLID WASTE PRACTICES ARE REPORTED. NUMBER OF CITIES USING MUNICIPAL VERSUS CONTRACT COLLECTION, PERCENT OF HOMES COVERED, AND METHOD OF CHARGING ARE LISTED. OF THE MUNICIPALITIES REPORTING 31.2 PERCENT USE SANITARY LANDFILL, 11.8 PERCENT USE INCINERATION AND 52 PERCENT USE DUMPS. BASICALLY SINCE 1946 THE NUMBER OF LANDFILLS HAS INCREASED, INCINERATION HAS REMAINED ABOUT THE SAME. ATTEMPTS TO DETERMINE THE AMOUNT OF REFUSE COLLECTED PER PERSON AND THE PERCENT WHICH IS GARBAGE WERE UNSUCCESSFUL.

01-01-00680 REFUSE COLLECTION AND DISPOSAL - AN ANNOTATED BIBLIOGRAPHY 1962-1963
BLACK, R. J. + WHEELER, J. B. + HENDERSON, W. G.
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH BIBLIOGRAPHY SERIES NO. 4, SUPPLEMENT F (1966). A BIBLIOGRAPHY OF 817 REFERENCES AND ABSTRACTS COVERING ALL ASPECTS OF THE SOLID WASTE COLLECTION AND DISPOSAL PROBLEM.

01-01-00685 REPORT UPON THE COLLECTION AND DISPOSAL OF REFUSE IN THE COUNTY SANITATION DISTRICTS OF LOS-ANGELES COUNTY, CALIFORNIA (SANITARY-LANDFILL OPEN-DUMP QUANTITY CHARACTERISTICS INCINERATOR SEWER(DISPOSAL) COMPOSITION ANIMAL-FEED)
RAWN, A. M.
141 PP. (OCTOBER 1950). THE REPORT IS CONCERNED PRIMARILY WITH THE COUNTY SANITATION DISTRICTS OF LOS-ANGELES COUNTY. THE NATURE AND CLASSIFICATION OF REFUSE AND THE QUANTITIES GENERATED ARE DEALT WITH IN THE FIRST SECTION. IN THE SECOND, THE COLLECTION OF REFUSE RECEIVES CONSIDERATION. INCLUDED IN THIS SECTION IS A DISCUSSION OF THE COLLECTION OF REFUSE, FACTORS AFFECTING REFUSE COLLECTION, AND AN ANALYSIS OF REFUSE COLLECTION SYSTEMS. THE CHAPTER CONTAINS A LIST OF RECOMMENDED PRACTICES, AMONG WHICH ARE - (1) THE CURBSIDE TYPE OF COLLECTION SHOULD BE USED. (2) REFUSE SHOULD BE SEGREGATED AT THE HOUSEHOLD. (3) HOUSEHOLD GARBAGE SHOULD BE COLLECTED TWICE EACH WEEK. (4) THE SIZE OF THE REFUSE SHOULD BE CONTROLLED. THE THIRD SECTION IS CONCERNED WITH THE DISPOSAL OF REFUSE. FACTORS CHARACTERISTIC OF LOS-ANGELES AND WHICH HAVE A BEARING ON REFUSE DISPOSAL ARE AIR POLLUTION, LACK OF LANDFILL SITES, AND DENSITY OF POPULATION. METHODS OF DISPOSAL INCLUDE DUMPS AND LANDFILLS FOR NONCOMBUSTIBLE REFUSE AND ASH RESIDUE. INCINERATION (HIGH TEMPERATURE INCINERATION IN STRUCTURES CAREFULLY AND ADEQUATELY DESIGNED TO PREVENT AIR POLLUTION), GARBAGE GRINDING TO SEWERS, GARBAGE FEEDING TO HOGS, COMPOSTING, AND SALVAGE. THE FOURTH SECTION IS AN ANALYSIS OF DISTRICT PARTICIPATION IN THE COLLECTION AND DISPOSAL OF REFUSE. IT IS FELT THAT THE PROBLEM OF WASTE DISPOSAL IS TOO LARGE FOR A PRIVATE APPROACH AND THAT SOME SORT OF A COOPERATIVE ENTERPRISE IS NEEDED. ENABLING LEGISLATION AND METHODS OF FINANCING ARE DISCUSSED. AMONG THE INTERESTING FACTS RELATED IN THE REPORT ARE THE FOLLOWING - THE AVERAGE DAILY PRODUCTION PER CAPITA IN ALL THE DISTRICTS AVERAGES 3.24 LB. OF THIS, 0.65 LB IS GARBAGE, 0.59 LB, NONCOMBUSTIBLE MATERIAL, 1.16 LB, COLLECTED COMBUSTIBLE MATERIAL, AND 0.84 LB, COMBUSTIBLE MATERIAL BURNED IN THE HOME INCINERATOR. ADDED TO THE 3.24 LB ARE ABOUT 0.40 LB PER CAPITA PER DAY OF REFUSE NOT SUBJECT TO ROUTINE COLLECTION. OF THE 1,700,000 DISTRICT POPULATION, REFUSE FROM THE HOMES OF BUT 145,000 IS COLLECTED FROM THE BACKYARD. THE OPERATIONAL COSTS OF " FILL AND COVER " VARIES FROM ABOUT $0.30 TO $0.60 PER TON. THE OVERALL COST VARIES FROM $0.40 TO $1.00 PER TON. ADDITIONAL EXCAVATION IN THE "CUT AND COVER" INCREASES THE OVERALL COST OF THE PROCESS BY 20 PERCENT. A MODERN TWO-STAGE INCINERATOR WILL COST APPROXIMATELY $2,000 PER RATED TON OF CAPACITY BASED ON 24-HR OPERATION. THE TOTAL COST PER TON FOR INCINERATION WILL APPROXIMATE $2.00 (24-HR OPERATION). THE AREA HAS 13 HOG RANCHES FOR GARBAGE FEEDING. (UC)

01-01-00688 CITIES VS. GARBAGE - WHO WILL WIN (INCINERATION HEAT-RECOVERY COMPOSTING SANITARY-LANDFILL EMISSION(CONTROL) PROJECTIONS
U.S. NEWS AND WORLD REPORT, P. 116 (OCTOBER 23, 1967). ON TOP OF OTHER TROUBLES, CITIES ARE CAUGHT IN A GARBAGE CRISIS. MANY ARE OUT OF PLACES TO BURY REFUSE. IN WASHINGTON, D.C., AN INCINERATOR HAD TO BE CLOSED. IN PHILADELPHIA, A TEN-YEAR CONTRACT WAS LET TO HAUL 1,200 TONS OF REFUSE PER DAY TO STRIP MINES IN CENTRAL PENNSYLVANIA. IN MASSACHUSETTS, THE MAJORITY OF DUMPS IN THE EASTERN PART OF STATE WILL BE FILLED IN FOUR YEARS. NEW YORK BURNS MOST OF ITS RUBBISH. STOPPING 40 PERCENT OF THE CITY'S 20,000 APARTMENT HOUSES FROM BURNING THEIR RUBBISH WOULD INCREASE THE TRUCK DEMAND BY 800 EXTRA UNITS. IT IS ESTIMATED THAT 3 BILLION DOLLARS WERE SPENT IN 1966 IN THE U.S. TO COLLECT AND DISPOSE OF 165 MILLION TONS OF SOLID WASTES. THIS YEAR (1967) THE AMOUNT IS EXPECTED TO BE 260 MILLION TONS. IN HEMPSTEAD, NEW YORK, AN INCINERATOR PRODUCES POWER AND DESALINATES 4,000,000 GALLONS SEA WATER/DAY. IN ONE COMMUNITY GARBAGE IS GROUND INTO SEWERS THEREBY REDUCING TRASH COLLECTION COSTS BY TWO-THIRDS, AND FREQUENCY TO ONCE EVERY TWO WEEKS. (UC)

01-01-00690 CAN ENGINEERING CCPE WITH THE DEBRIS OF AFFLUENCE (COST-BENEFIT SYSTEMS-ANALYSIS OPEN-DUMP SANITARY-LANDFILL INCINERATION PACKAGING COMPOSTING FERTILIZER(COMPOST) SALVAGE(METAL) BULKY-WASTE RAIL-HAUL)
PRODUCT ENGRG , P. 37 (OCTOBER 9, 1967). THE SOLID WASTE PROBLEM IS SURVEYED FROM A SYSTEM ANALYSIS VIEWPOINT. DISPOSAL METHODS REVIEWED ARE (1) OPEN-DUMPING (2) SANITARY LANDFILL, (3) INCINERATION, (4) COMPOSTING. RECENT INNOVATIONS FOR SALVAGE OF METALS INCLUDING FROM JUNKED AUTOMOBILES ARE DISCUSSED. NEW IDEAS FOR PACKAGING ARE DESCRIBED. HIDDEN CCSTS TO SOCIETY ARE DISCUSSED. MOST PEOPLE THINK OF ECONOMICS SOLELY IN TERMS OF SAVING MONEY, OF MINIMIZING DIRECT COSTS. THEY SHOULD BE THINKING OF MAKING THE BEST USE OF THEIR COMMUNITY'S RESOURCES. THEN THE CHOICE WOULD BE CLEAR WHEN IT COMES TO A QUESTION OF PAYING MORE IN TAXES FOR BETTER WASTE-DISPOSAL METHODS OR OF IMPAIRING THE COMMUNITY'S HEALTH AND ATTRACTIVENESS.

01-01-00696 SOLID WASTE HANCLING IN METROPOLITAN AREAS (ROLE(PHS) QUANTITY SAFETY HEALTH LAW PUBLIC-CCNCERN POLICY-QUESTIONS STANDARDS REGIONAL-APPROACH AUTHORITY(STATE) RESPONSIBILITY(STATE) PROGRAMS(STATE))
PREPARED BY THE DIVISION OF ENVIRONMENTAL ENGINEERING AND FOOD PROTECTION, PUBLIC HEALTH SERVICE, DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE PUBLIC HEALTH SERVICE FOR THE SURGEON GENERAL'S ADVISING COMMITTEE ON URBAN HEALTH PROBLEMS. A SURVEY COVERING THE FOLLOWING TOPICS- (1) THE PROBLEM, (2) PUBLIC HEALTH IMPLICATIONS, (3) ECONOMIC IMPACT (4) LEGAL ASPECTS, (5) EFFECT OF COMMUNITY DIFFERENCES AND TECHNOLOGICAL ADVANCES, (6) EACH OF PUBLIC CONCERN, (7) DEVELOPMENT OF STANDARDS, (8) RESEARCH AND TRAINING, (9) THE METROPOLITAN-WIDE APPROACH, (10) STATE AND LOCAL ACTION, (11) RCLE OF THE PHS, (12) POLICY QUESTIONS, (12) BIBLIOGRAPHY.

01-01-00726 MUNICIPAL REFUSE DISPOSAL (QUANTITY COMPOSITION SANITARY-LANDFILL INCINERATION GRINDING ANIMAL-FOOD COMPOSTING SALVAGE RECLAMATION OPEN-DUMP LAW HEALTH COST(CAPITAL) COST(OPERATING) HAULING INDUSTRIAL-WASTE BULKY-WASTE REGIONAL-APPROACH SITE-SELECTION ODOR EMISSION(CONTROL) REFRACTORIES RESIDUE HANCLING DESIGN SAFETY POLLUTION GRINDER(GARBAGE) MANAGEMENT HISTORY PATHOGENS PUBLIC ACCEPTANCE)
AM PUBLIC WORKS ASSOC, COMMITTEE ON REFUSE DISPOSAL, 522 PP. (1961). THIS MANUAL CONTAINS THE FOLLOWING INFORMATION- OPERATIONS OF 7 MAJOR DISPOSAL METHODS--SANITARY LANDFILLS, CENTRAL INCINERATION, ON-SITE INCINERATION, GARBAGE GRINDING, FEEDING GARBAGE TO SWINE, COMPOSTING, AND SALVAGE AND RECLAMATION. A GUIDE FOR MUNICIPAL OFFICIALS WHO MUST DETERMINE WHAT DISPOSAL METHODS THE CITY SHOULD USE. SUCH FACTORS AS SIZE AND TYPE OF CITY, GEOGRAPHY AND CLIMATE, PUBLIC HEALTH, COSTS AND FINANCING, PUBLIC ACCEPTANCE, RELATIONSHIP TO COLLECTION PRACTICES, AND EFFECTS ON OTHER MUNICIPAL SERVICES. DETERMINATION OF THE QUANTITIES OF REFUSE THAT A MUNICIPALITY MUST COLLECT AND DISPOSE OF, HANDLING OF SUCH SPECIAL PRCBLEMS AS DISPOSAL OF CONSTRUCTION AND DEMOLITION WASTES, AUTOMOBILES, CONDEMNED FOODS, INDUSTRIAL WASTES, EXPLOSIVE AND HAZARDOUS WASTES, PATHOLOGICAL WASTES, AND REFUSE FROM DISASTERS. HOW DISPOSAL IS HANDLED THROUGH CONTRACTS WITH PRIVATE DISPOSAL COMPANIES AND ADMINISTRATION AND MANAGEMENT OF A MUNICIPAL REFUSE DISPOSAL AGENCY ARE INCLUDED. APPENDIXES GIVE ORDINANCE PROVISIONS FOR REFUSE DISPOSAL, METHODS OF ANALYZING REFUSE AND COMPOST, PROVISIONS FOR CONTRACT DISPOSAL, AND STANDARDS FOR DESIGN AND INSTALLATION OF DOMESTIC INCINERATORS. (PHEA)

01-01-00785 REFUSE DISPOSAL - A COMMUNAL OR A THERMOECONOMICAL PROBLEM (HEAT-RECOVERY INCINERATION POWER COMPOSTING)
BRENNSTOFF-WAERME-KFAFT 14(5), P. 213-214 (MAY 1962). MULLBESETIGUNG-EINKOMMUNALES ODER EIN WARMEWIRTSCHAFTLICHES PROBLEM? COMBUSTION 34(4), P. 54 (OCTOBER 1962). REFUSE INCINERATION PLANTS COMBINED WITH STEAM AND POWER GENERATION WERE ERECTED BEFORE AND AFTER THE FIRST WORLD WAR BUT CLOSED DOWN AGAIN BECAUSE THEY PROVED UNECONOMICAL. IN LARGE TOWNS REFUSE SHOULD BE REGARDED AND USED AS AUXILIARY FUEL AND BURNED TOGETHER WITH COAL, OIL, OR GAS. IN SMALLER TOWNS COMPOSTING OF FUEL APPEARS TO BE PREFERABLE AND MORE ECONOMICAL THAN INCINERATION. (PHEA)

01-01-00841 TREATMENT OF REFUSE IN SOVIET UNION (COMPOSITION COMPOSTING TIPPING FREQUENCY COLLECTION ANIMAL-FOOD SEGREGATION SALVAGE)
MILLER, M.
COMPOST SCIENCE 5(2), P. 17-19 (SUMMER 1964). SOLUTION OF PROBLEM OF CITY CLEANING, REFUSE DISPOSAL AND IN PARTICULAR WITH UTILIZATION OF REFUSE IN MOSCOW IS DESCRIBED WITH SPECIAL ATTENTION TO NEW COMPOST PLANT. (EI)

01-01-00848 OKLAHOMA STUDIES REFUSE PRACTICES (COLLECTION SANITARY-LANDFILL FEE(COLLECTION) COST(DISPOSAL))
THE AMERICAN CITY 75(1), P. 37 (JANUARY 1960). THE DIVISION OF SANITARY ENGINEERING, OKLAHOMA STATE DEPARTMENT OF HEALTH, RECENTLY HAS COMPLETED A STUDY OF STATE-WIDE MUNICIPAL REFUSE-HANDLING. THE VECTOR CONTROL SECTION OF THE DIVISION SENT QUESTIONNAIRES TO 292 OKLAHOMA CITIES AND TOWNS WITH 500 OR MORE RESIDENTS (1950 CENSUS). ANSWERS WERE RECEIVED FROM 141, WITH 88 OF THESE REPORTING A REGULAR SYSTEM OF REFUSE HANDLING. THE REMAINING 53 HAC NO PROGRAMS AT ALL. LESS THAN 50 PERCENT OF THESE REQUIRE SPECIAL TYPES AND SIZES OF CONTAINERS AND MOST DO NOT REQUIRE SEPARATION OF GARBAGE FROM OTHER REFUSE. OF THE 88 MUNICIPALITIES PERFORMING REGULAR REFUSE SERVICE, 67 PROVIDE THEIR OWN COLLECTION AND DISPOSAL. THE REST REPORTED USE OF CONTRACT COLLECTION AND OTHER METHODS. THERE WERE 58 THAT REPORTED MUNICIPAL COLLECTION IN BOTH BUSINESS AND RESIDENTIAL AREAS. IN A FEW INSTANCES, THE BUSINESS AREA IS SERVED BY MUNICIPAL COLLECTION AND THE RESIDENTIAL AREA BY CONTRACT OR VICE-VERSA. OF THOSE INDICATING MUNICIPAL REFUSE COLLECTION, 53 REPORTED DAILY COLLECTION IN BUSINESS AREAS AND 54 REPORTED ONE OR TWO COLLECTIONS PER WEEK IN RESIDENTIAL AREAS (32 COLLECT TWICE--22 COLLECT ONCE). OF THE 67 COMMUNITIES WITH MUNICIPAL COLLECTIONS, MORE THAN 20 PERCENT CHARGE A MONTHLY RESIDENTIAL RATE OF $.50. A RATE OF $1 PER MONTH IS CHARGED BY 34.3 PERCENT. NO CHARGE AT ALL IS LEVIED AGAINST RESIDENTS IN 16.4 PERCENT OF THE CITIES. OF THOSE REMAINING, 10.4 PERCENT MADE NO REPORT AND THE REST QUOTED CHARGES RANGING FROM 25 CENTS TO $2 PER MONTH. ONLY ONE-FIFTH OF THE COLLECTION-PROGRAM CITIES OPERATE THEIR OWN LANDFILLS AND CNLY A SMALL PORTION OF THESE WOULD BE CLASSIFIED AS SANITARY LANDFILLS. PER-CAPITA-PER-MONTH COST OF COLLECTION AND DISPOSAL OF REFUSE FOR 50 OF THE REPORTING COMMUNITIES RANGED FROM A LOW OF 10 CENTS TO A HIGH OF 67 CENTS. THE AVERAGE WAS 27 CENTS. PROBABLY THE GREATEST RANGE IN OPERATIONAL COSTS WAS REPORTED IN THE COST OF COLLECTION AND DISPOSAL OF ONE TON OF REFUSE. FOR 36 COMMUNITIES THAT REPORTED DISPOSAL OF EACH TON RANGED FROM A LOW OF $1.19 TO A HIGH OF $16.50. THE OVERALL AVERAGE COST OF DISPOSAL WAS $5.56 PER TON OF MATERIAL. THE STUDY ESTABLISHED THAT A TWO-MAN CREW PROVIDING ALLEY OR CURB PICK-UP SERVICE SHOULD COLLECT FROM ABOUT 1,200 RESIDENCES PER 40-HOUR WEEK OR 1,320 RESIDENCES PER 44-HOUR WEEK. A SIMILAR SCHEDULE SHOULD BE MAINTAINED IN BACKYARD PICKUP BY ADDING ONE MAN TO THE TWO-MAN CREW.

01-01-00850 BIBLIOGRAPHY ON INCINERATION OF REFUSE
TA-3 INCINERATOR COMMITTEE J AIR POLLUTION CONTROL ASSOC 12(7), P. 334-339 (JULY 1962). 292 REFERENCES DEALING WITH ALL ASPECTS OF REFUSE DISPOSAL BY INCINERATION.

01-01-00925 INCINERATION VERSUS COMPOSTING
PUBLIC CLEANSING 52(3), P. 109 (MARCH 1962). A BRIEF DISCUSSION OF ADVANCEMENTS BEING MADE IN THE INCINERATION AND COMPOSTING METHODS OF MUNICIPAL REFUSE DISPOSAL. TALKS ABOUT EFFICIENT COMBUSTION, DUST AND FLY ASH ARRESTING, RESIDUE REMOVAL, THE NEED FOR EFFECTIVE DEMAND FOR COMPOST, AND MECHANICAL HANDLING IN FERMENTATION. (PHS)

01-01-00932 ACTION ON THE SOLID WASTE PROBLEM
BLACK, R. J. + WEAVER, L.
AM SOC CIVIL ENGRS J SANIT ENGRG DIV 93(SA6), P. 91 (DECEMBER 1967). IT IS CLEAR THAT THE SOLID WASTE PROBLEM IS OF SUCH INCREASING MAGNITUDE AS TO DEMAND THE UTMOST IN IMAGINATION AND INNOVATION. ENGINEERS ASSOCIATED WITH SOLID WASTES DISPOSAL ACTIVITIES WOULD DO WELL TO KEEP IN MIND THE AVAILABILITY OF THE GRANT MECHANISM UNDER THE SOLID WASTES PROGRAM. IT OFFERS A UNIQUE OPPORTUNITY TO MAKE IMPORTANT TECHNICAL CONTRIBUTIONS THAT WILL HELP MANY U.S. COMMUNITIES SOLVE WASTE MANAGEMENT PROBLEM OF SERIOUS, AND OFTEN CRITICAL PROPORTIONS, BY RECOVERY AND UTILIZATION OF POTENTIAL RESOURCES IN SOLID WASTES, AND TO PROVIDE TECHNICAL AND FINANCIAL ASSISTANCE TO STATE AND LOCAL GOVERNMENTS AND INTERSTATE AGENCIES IN THE PLANNING, DEVELOPMENT, AND CONDUCT OF SOLID WASTE DISPOSAL PROGRAMS. (UC)

01-01-00956 PRESERVING OUR NATURAL HERITAGE
JOHNSON, L. B.
89TH CONGRESS, 2ND SESSION, DOCUMENT NO. 387, (FEBRUARY 23, 1966). PROGRAMS FOR CONTROLLING POLLUTION AND PRESERVING THE NATURAL AND HISTORICAL HERITAGE ARE OUTLINED. (UC)

01-01-00963 WASTE DISPOSAL WITHOUT AIR POLLUTION (SANITARY-LANDFILL INCINERATION EMISSION(CONTROL) RESIDUE(DISPOSAL)

COMPTON, C. R. + BOWERMAN, F. R.
J AIR POLLUTION CONTROL ASSOC 10(1), P. 57-59, 95 (FEBRUARY 1960). A DISCUSSION OF THE POTENTIAL AIR POLLUTION RESULTING FROM LIQUID AND SOLID WASTE DISPOSAL. ARTICLE DISCUSSES INCINERATION AND THE EMISSION CONTROLS NECESSARY TO REDUCE AIR POLLUTION. SANITARY LANDFILL IS DESCRIBED AS A METHOD OF DISPOSAL WHICH DOES NOT RESULT IN AIR POLLUTION IF PROPERLY OPERATED. DISCUSSION OF LIQUID AND SOLID INDUSTRIAL WASTE DISPOSAL IS PRESENTED.

01-01-00972 MANAGEMENT OF SOLID WASTE STUDIED AT M.I.T. (PYROLYSIS COST SACK(PAPER) RAIL-HAUL SANITARY-LANDFILL INCINERATORS BULKY-WASTE SALVAGE ADMINISTRATION REGIONAL-APPROACH COMPOSTING)
AM SOC CIVIL ENGRS P. 89 (DECEMBER 1968). TRASH DISPOSAL, WHICH IS COSTING $3 BILLION A YEAR, WILL REQUIRE LARGE-SCALE, MODERNIZED METHODS IF ITS PROBLEMS ARE TO BE SOLVED. THIS IS THE MAJOR CONCLUSION OF A REPORT ON A STUDY OF THE MANAGEMENT OF SOLID WASTES RECENTLY COMPLETED AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY. AMONG THE GROUP'S FINDINGS WERE THE FOLLOWING - (1) FOR URBAN AREAS PRODUCING AS LITTLE AS 200 TONS OF REFUSE A DAY, THE COST OF DISPOSAL IS LIKELY TO BE $10C/TON. IT IS CONCEIVABLE THAT BY JOINING FORCES IN ORDER TO USE FACILITIES WITH A 2,000-TON CAPACITY THE COST COULD BE CUT TO $5. (2) A UNIFORM BASIS FOR BIDS SHOULD BE ESTABLISHED. (3) NEW METHODS OF COLLECTION, LAND-FILL, INCINERATION AND SALVAGE SHOULD BE EXPLORED. (4) THERE IS NEED FOR HIGH-CALIBER PERSONNEL TO MANAGE DISPOSAL. (5) PRIVATE INDUSTRY SHOULD BE ENCOURAGED TO UNDERTAKE LARGE-SCALE OPERATIONS. (6) RAT-PROOF, FLY-PROOF, WEATHER-PROOF PAPER BAGS HAVE ADVANTAGES OVER THE BATTERED, NOISY AND UNSANITARY METAL CANS AND COULD BE COMPACTED BY NEW KINDS OF VEHICLES. TWO-SHIFT COLLECTIONS WOULD INCREASE EFFICIENCY. (7) ROUND-THE-CLOCK OPERATION OF INCINERATORS, WITH BY-PRODUCTS SUCH AS HEAT, POWER AND GAS, SHOULD BE INVESTIGATED. (8) CODES SHOULD BE ADOPTED FOR WASTE HANDLING IN BUILDINGS. AMONG OTHER OBSERVATIONS MADE IN THE REPORT WERE THESE - (1) RAILROADS ARE INTERESTED IN HAULING AWAY TRASH, ESPECIALLY IF IT IS PREPARED BY BEING PRESSED INTO 2,000-LB CUBES, WHICH CAN BE WRAPPED IN POLYETHLENE SHEETS. (2) DISPOSAL OF WASTES IN LANDFILLS ALONG HIGHWAY RIGHTS-OF-WAY NOT ONLY HELP GET RID OF MATERIAL BUT WOULD BUILD UP THE SHOULDERS OF EXPRESSWAYS AND THUS REDUCE THE SEVERITY OF AUTOMOBILE ACCIDENTS. (3) MANY INCINERATORS IN THE U.S. ARE TOO SMALL, POORLY DESIGNED AND POORLY OPERATED AND DO NOT HAVE ADEQUATE AIR-POLLUTION CONTROL. THE PRODUCTION OF HYDROCHLORIC-ACID GAS IN THE BURNING OF PLASTICS IS OFFERING A NEW PROBLEM. (4) OPERATION OF INCINERATORS TO PRODUCE HEAT OR ELECTRIC POWER HAS BEEN FOUND FEASIBLE IN EUROPE, BUT ECONOMIC INDUCEMENTS IN THIS COUNTRY HAVE NOT BEEN SUFFICIENT TO INTEREST UTILITY COMPANIES. (5) INCINERATORS EFFICIENT ENOUGH TO TURN REFUSE INTO RESIDUE ACCEPTABLE FOR USE IN BUILDING ROADS HAVE BEEN OPERATING IN EUROPE. ONE TO PRODUCE MOLTEN SLAG IS UNDER DEVELOPMENT AT WHITMAN, MASS. (6) PYROLYSIS--THE HEATING OF DISCARDED LUMBER IN CLOSED VESSELS WITHOUT AIR--CAN PRODUCE GASES, TAR AND CHARCOAL WITH COMMERCIAL VALUE. THE SYSTEM HAS SOME TECHNICAL AND ECONOMIC OBSTACLES, HOWEVER. (7) SEPARATION OF TRASH, TO REMOVE PAPER, METAL, RAGS AND OTHER SALVAGEABLE MATERIALS, AS IS NOW DONE IN HOUSTON, TEXAS, IS A PROMISING METHOD OF DISPOSAL. THE RESIDUE CAN BE GROUND UP AND DECOMPOSED TO PRODUCE COMPOST. (8) OLD AUTOMOBILES, REFRIGERATORS AND OTHER BULKY APPLIANCES ARE CREATING ONE OF THE COUNTRY'S BIGGEST PROBLEMS--IN PART BECAUSE LESS SCRAP IS USED IN MODERN STEELMAKING. MODIFICATIONS OF PRESENT METHODS OF STEELMAKING, HOWEVER, WOULD MAKE POSSIBLE INCREASED USE OF SCRAP. (AUTH)

01-01-00973 THE PROBLEM (COMPOSTING AEROBIC POLLUTION(WATER))
SNELL, J. R.
NATIONAL ACADEMY OF SCIENCES NATIONAL RESEARCH COUNCIL, COMMITTEE ON POLLUTION (SEMINAR) TECHNOLOGY PANEL (LAND SUB-PANEL) UNPUBLISHED REPORT, P. 1-7, WASHINGTON, D.C. (APRIL 25, 1965). A SUMMARY OF THE PROBLEM OF POLLUTION OF GROUND WATER BY SOLID AND LIQUID WASTES. MAJOR EFFORT SHOULD BE GIVEN TO EFFECTS OF TRACES OF PESTICIDES AND CHEMICALS USED IN AGRICULTURAL OPERATIONS. POSSIBLE METHODS OF SELF PURIFICATION OF REFUSE THROUGH CONTROLLED COMPOSTING BY FORCED AIR AND PREGRINDING IS ALSO MENTIONED.

01-01-00979 TOWN OF HEMPSTEAD FACES REFUSE DISPOSAL PROBLEMS (INCINERATION RAIL-HAUL BULKY-WASTE VOLUME-REDUCTION COST(UNIT) COMPACTION SANITARY-LANDFILL SHREDDING)
PENDER, M. R. + HYLAND, W. L.
PUBLIC WORKS 99(11), P. 62-64 (1968). THE TOWN OF HEMPSTEAD, LONG ISLAND, IS THE MOST HIGHLY POPULATED TOWNSHIP IN THE UNITED STATES, HAVING A POPULATION OF OVER 800,000, WHICH IS DOUBLE THAT OF 1950. REFUSE COLLECTION PRACTICES VARY CONSIDERABLY THROUGHOUT THE THIRTY UNINCORPORATED COMMUNITIES AND 19 INCORPORATED VILLAGES IN THIS TOWN. THE COLLECTION COSTS OF THE VARIOUS REFUSE SUBDIVISIONS AVERAGE $8.65 PER CAPITA PER YEAR. THE COLLECTION COST PER ACRE PER YEAR RANGED FROM $77.20 TO $168.50 WITH A MEAN COST OF $102.00 PER ACRE. ONE OF THE CRITICAL PROBLEMS CONFRONTING THE TOWN IS THE RAPIDLY DIMINISHING CAPACITY OF ITS SANITARY LANDFILL AREAS. THE CURRENT AVERAGE WEEKLY PRODUCTION OF REFUSE IS 12,500 TONS. OF THIS, 7,800 TONS ARE INCINERATED AND 4,700 TONS ARE DISPOSED OF BY LANDFILL. FOR THE FUTURE, IT IS PROPOSED TO PROCESS ALL COMBUSTIBLE MATERIAL, THEREBY CONSERVING TO THE MAXIMUM THE LIMITED EXISTING LANDFILL CAPACITY. TWO POSSIBLE MODIFICATIONS IN PRESENT DISPOSAL PRACTICES ARE UNDER ACTIVE CONSIDERATION. THE FIRST INVOLVES THE ADDITION OF A SHREDDER AND SEPARATOR TO THE EXISTING REFUSE DISPOSAL PLANTS TO INCREASE THE VOLUMES OF COMBUSTIBLE MATERIAL WHICH CAN BE PROCESSED. THE SECOND INVOLVES THE INSTALLATION OF COMPACTION EQUIPMENT WHICH IS CREDITED WITH REDUCING SOLID WASTE VOLUME AT A RATIO OF 7 TO 1 AND HIGHER, DEPENDING ON THE COMPOSITION OF THE REFUSE. THE COMPACTED MATERIAL WOULD THEN EITHER GO DIRECTLY INTO THE LANDFILL AREAS, OR BE TRANSFERRED BY RAIL OR SHIP TO OTHER DISPOSAL SITES. THE SHREDDING OPERATION WOULD REDUCE THE BULKY REFUSE ITEMS TO SUCH A SIZE THAT THE COMBUSTIBLE ELEMENTS COULD BE INTRODUCED INTO THE FURNACES. THE ESTIMATED COST OF THE SHREDDING OPERATION, INCLUDING INTEREST AND AMORTIZATION, LABOR AND POWER, WOULD BE ROUGHLY $2.00 PER TON. SEVERAL METHODS AND SYSTEMS FOR COMPACTION OF REFUSE HAVE BEEN PROPOSED AND ARE CURRENTLY UNDERGOING ANALYSIS. ESSENTIALLY ALL OF THESE SYSTEMS INVOLVE THE PLACING OF THE REFUSE IN LARGE HYDRAULIC PRESSES, WHICH THEN COMPACT THE MATERIAL INTO SOLID BALES. ADVANTAGES OF A HIGH-COMPRESSION SYSTEM, BEYOND THE OBVIOUS ONE OF REDUCED REFUSE VOLUME, INCLUDE ELIMINATION OF THE NEED TO SEPARATE REFUSE MATERIALS INTO COMBUSTIBLE AND NONCOMBUSTIBLE ITEMS, AND THE RELATIVELY LOW LEVEL OF MAINTENANCE REQUIRED. PERHAPS IT IS A COMBINATION OF BOTH OF THESE SYSTEMS, TOGETHER WITH SOME COMPLETELY NEW CONCEPT, THAT WILL PROVIDE THE ULTIMATE ANSWER.

01-01-01014 DISCARDED BIT OF TRASH (POLLUTION)
ATKINSON, B.
OAKLAND TRIBUNE, P. 26 (JULY 24, 1966). AMERICA'S RIVERS ARE AN IMPORTANT PART OF HER TRADITION, YET THE POPULATION POLLUTES THESE RIVERS AT AN EVER INCREASING RATE. OF THE 11,240 U.S. COMMUNITIES WITH SEWERS, 2,139 CONTINUE TO DUMP THEIR RAW SEWAGE INTO LOCAL STREAMS AND WATERSHEDS. NOT ONLY THAT, BUT PICNICKERS AND BOATERS POLLUTE WITH THEIR WASTES THE WATERS THEY USE. CONSERVATIONISTS HOPING TO HELP CLEAN UP THE POTOMAC RIVER FOUND OLD AUTOMOBILE TIRES, MATTRESSES, BOXES, DISCARDED AUTOMOBILE BATTERIES, AND A SEWING MACHINE. INDUSTRY POLLUTES RIVERS WITH ITS EFFLUENTS. IN 1963, THE TREATMENT PROJECTS THEN NEEDED WOULD COST THE COUNTRY $2,2 BILLION, AND THAT FIGURE HAS GROWN SINCE THEN. POLLUTION IS NOT ONLY A MATTER OF AESTHETICS, BUT ONE OF PUBLIC HEALTH. WATERS WILL HAVE TO BE REUSED IN THE NEAR FUTURE AS THE DEMANDS OF THE CITIES INCREASE. POLLUTED WATERS CARRY DISEASE PRODUCING ORGANISMS AND KILL FISH AND SHELLFISH, THEREBY ENDANGERING THE PUBLIC THAT EATS THE FISH. ALTHOUGH HUMAN BEINGS LOVE THEIR RIVERS, THEY OFTEN USE THEM CONTEMPTUOUSLY.

01-01-01046 SOLID WASTES - EVERY DAY, ANOTHER 800 MILLION POUNDS (QUANTITY PROJECTION BULKY-WASTE SANITARY-LANDFILL INCINERATION)
MIX, S. A.
TODAY'S HEALTH, P. 46 (MARCH 1966). APPROXIMATELY 1,420 LB/CAPITA/YEAR (URBAN U.S.), OR 800 MILLION LBS/DAY OF SOLID WASTES, ARE PRODUCED IN THE U.S. THE AMOUNT IS EXPECTED TO BE THREE TIMES AS GREAT BY 1980. THE ANNUAL OUTLAY FOR COLLECTION AND DISPOSAL IS $1.5 BILLION. SPECIAL PROBLEMS OF VARIOUS COMMUNITIES ARE DESCRIBED. SALVAGE AND USE OF WASTE AS AN ENERGY SOURCE ARE AREAS TO BE EXPLOITED. A SEVERE PROBLEM IS THAT OF THE IGNORANCE ON THE PART OF PUBLIC AND LOCAL OFFICIALS. (UC)

01-01-01070 SOLID WASTES - RESEARCH CHALLENGE (TRAINING)
MCKINNEY, R. E.
AM SO CIVIL ENGRS ENVIRONMENTAL ENGRG CONF, PREPRINT 249, (OCTOBER 18-22, 1965). REAL AND PRESSING NEED FOR RESEARCH IN ALL AREAS OF SOLID WASTES, FROM ANALYSIS TO STORAGE AND COLLECTION, TO TRANSPORTATION, TO PROCESSING, AND TO ULTIMATE DISPOSAL IS EMPHASIZED. IT IS SHOWN THAT INCREASED EDUCATIONAL EFFORTS ARE NEEDED IMMEDIATELY IF COMPETENT PERSONNEL ARE TO BE TRAINED TO MEET NEEDS OF NEXT FEW DECADES. CHALLENGE FOR ENGINEERS IN SOLID WASTES IS TO REDUCE THEIR VOLUME TO MINIMUM AND TO RETAIN VALUE OF LAND FOR ULTIMATE DISPOSAL. (UC)

01-01-01087 SURVEY OF PRESENT STATUS OF REFUSE ENGINEERING RESEARCH AND DEVELOPMENT
AM SOC CIVIL ENGRS J SANIT ENGRG DIV 84(SA1), (FEBRUARY 1958). RESULTS OF SEVERAL YEARS INVESTIGATION TO ASCERTAIN PRESENT PROFESSIONAL STATUS OF REFUSE COLLECTION AND DISPOSAL ACTIVITIES IN UNITED STATES AND ABROAD ARE SUMMARIZED AND EVALUATED. DATA CONCERNING NEW DEVELOPMENTS AND RECOMMENDATIONS FOR IMPROVED PRACTICES ARE REVIEWED. (EI)

01-01-01094 TREATMENT AND DISPOSAL OF WASTES (RESEARCH-NEEDS)
WORLD HEALTH ORGANIZATION TECHNICAL REPORT SERIES NO. 367 W.H.O., GENEVA, (1967). THE REPORT IS A SURVEY OF THE STATUS OF WASTE WATER AND SOLID WASTES TREATMENT IN THE WORLD. MAJOR PROBLEMS ARE - (1) AN INCREASE NOT ONLY IN QUANTITY OF WASTE WATER BUT ALSO IN CONCENTRATION AND DIVERSITY OF POLLUTANTS IN THE WATER. (2) A DECREASE IN AVAILABILITY OF DILUTION WATERS. (3) INADEQUATE COLLECTION AND DISPOSAL OF SOLID WASTES (IN INDUSTRIALIZED COUNTRIES AS MUCH AS 20 PERCENT OF THE TOTAL BUDGET IS SPENT ON THESE ITEMS). (4) HIGH COST OF INSTALLING AND OPERATING COMPLEX SYSTEMS FOR COLLECTION AND DISPOSAL OF WASTES. (5) A GREAT DEAL OF PRIVATE AND PUBLIC INDIFFERENCE. STATEMENTS ON THE STATUS OF MANAGEMENT AND DISPOSAL METHODS REFLECT U.S. CONDITIONS RATHER THAN WORLDWIDE CONDITIONS, AND ARE GENERAL IN NATURE. (UC)

01-01-01115 COMPREHENSIVE STUDIES OF SOLID WASTES MANAGEMENT (WET-OXIDATION SALVAGE RESEARCH-NEEDS SIMULATION ECONOMICS HEALTH COMPOSTING BIOLOGICAL-FRACTIONATION SLUDGE(SEWAGE) INCINERATION SANITARY-LANDFILL COMPOSITION SITE-LOCATION)
GOLUEKE, C. G. + MCGAUHEY, P. H.
FIRST ANNUAL REPORT, SERL REPORT NO. 67-7, SANITARY ENGINEERING RESEARCH LABORATORY AND SCHOOL OF PUBLIC HEALTH, UNIVERSITY OF CALIFORNIA, BERKELEY, (MAY 1967). THE REPORT IS OF THE NATURE OF A PROGRESS REPORT COVERING THE FIRST YEAR OF A COMPREHENSIVE STUDY OF SOLID WASTES MANAGEMENT. THE RESEARCH PLAN ON WHICH THE STUDIES ARE BASED CALLED FOR AN INITIAL ORGANIZATIONAL AND GENERAL DATA-COLLECTING PHASE, COVERING A MAJOR PART OF THE FIRST YEAR, FOLLOWED BY A SECOND PHASE OF DEFINITIVE RESEARCH ON SUCH ASPECTS AS OPERATIONS RESEARCH, PLANNING, ECONOMICS, PUBLIC HEALTH, AND TECHNOLOGY OF WASTES MANAGEMENT SYSTEMS. THE FIRST PHASE HAVING BEEN SUCCESSFULLY COMPLETED, THE REPORT ON THIS ASPECT IS ESSENTIALLY A FINAL REPORT INTENDED TO ACQUAINT THE READER WITH THE UNDERLYING CONCEPTS OF THE SOLID WASTES PROBLEM AND WITH THE DETAILS OF THE MULTIDISCIPLINED RESEARCH PROGRAM SET UP TO ATTACK THE PROBLEM. ON THE DEFINITIVE RESEARCH PHASE OF THE PROGRAM, PROGRESS AND PRELIMINARY FINDINGS OF A NUMBER OF COORDINATED RESEARCH TEAMS ARE PRESENTED IN DETAIL. (AUTH)

01-01-01116 DIMENSIONS OF THE SOLID WASTE PROBLEM (COST(UNIT) VECTOR)
MCKEE, J. E.
PROC OF THE NATIONAL CONFERENCE ON SOLID WASTE RESEARCH, AM PUBLIC WORKS ASSOC, CHICAGO, ILL., P. 1-7 (DECEMBER 1963). KEYNOTE SPEECH OF CONFERENCE. TOPICS COVERED WERE - (1) SOLID WASTES IN PERSPECTIVE, (2) THE APPLICATION OF BRAINPOWER, (3) PUBLIC HEALTH ASPECTS, (4) ECONOMIC ASPECTS, (5) PUBLIC RELATIONS ASPECTS, (6) RESEARCH NEEDS.

01-01-01120 WASTE MANAGEMENT AND CONTROL
NATIONAL ACADEMY OF SCIENCES, NATIONAL RESEARCH COUNCIL, WASHINGTON, D.C., PUBLICATION 1400, (1966). TABLE OF CONTENTS TOPICS ARE - (1) THE NATURE OF THE PROBLEM. (2) LEGAL, LEGISLATIVE, AND INSTITUTIONAL PROBLEMS. (3) AREAS OF INADEQUACY. (4) POSSIBLE IMPROVED APPROACHES. (5) RECOMMENDATIONS. (6) POLLUTION PROCESSES IN ECOSYSTEMS. (7) CRITERIA, INSTRUMENTATION, AND MONITORING. (8) THE TRANSPORT SYSTEM. (9) THE RESIDUE SITUATION - CURRENT AND FUTURE. (10) POLLUTION - ABATEMENT TECHNOLOGY. (11) LEGAL AND PUBLIC ADMINISTRATION ASPECTS. (12) PUBLIC POLICY AND INSTITUTIONAL ARRANGEMENTS. (13) A BRIEF ANALYSIS OF POLLUTION IN THE DELAWARE ESTUARY. (14) BIBLIOGRAPHY. (UC)

01-01-01131 COOPERATION - KEY TO HEALTHFUL SOLID WASTE MANAGEMENT (RESEARCH-NEEDS TRAINING REGIONAL-APPROACH)
GILBERTSON, W. E.
PUBLIC HEALTH NEWS 48(1), P. 19 (JANUARY 1967). THE PRESENT SITUATION OF SOLID WASTE MANAGEMENT IS DESCRIBED. SIX CATEGORIES OF NATIONWIDE NEEDS IN SOLID WASTE MANAGEMENT ARE MENTIONED AND WAYS OF INTERAGENCY COOPERATION ARE INDICATED. THE PRINCIPAL NEEDS ARE - BASIC AND APPLIED RESEARCH, NEW AND IMPROVED TECHNOLOGY, THE DEVELOPMENT OF REGIONAL APPROACHES TO SOLID WASTES MANAGEMENT, STATEWIDE SURVEYS AND PLANNING OF DISPOSAL REQUIREMENTS, SOLID WASTES PERSONNEL TRAINING, AND STRENGTHENED TECHNICAL CAPACITIES AT ALL LEVELS OF GOVERNMENT. (UC)

01-01-01175 WHAT'S INVOLVED IN A SOLID WASTE PROGRAM (REGIONAL-APPROACH BOSTON)
DOHERTY, R. M.
COMPOST SCIENCE 7(2), P. 15-16 (AUTUMN 1966).

01-01-01176 THE INTERNATIONAL PICTURE OF REFUSE DISPOSAL (COMPOSTING INCINERATION SANITARY-LANDFILL)
GOTHARD, S. A.
COMPOST SCIENCE 7(2), P. 23-24 (AUTUMN 1966). REFUSE CONDITIONS AND TREATMENT METHODS IN DIFFERENT PARTS OF THE WORLD ARE DESCRIBED. (PHEA)

01-01-01178 THE MARCH OF THE PHS (SALVAGE COMPOSTING GRINDING INCINERATION SANITARY-LANDFILL GRANTS)
COMPOST SCIENCE 7(2), P. 26-30 (AUTUMN 1966). A DESCRIPTION OF THE EFFORTS OF THE PUBLIC HEALTH SERVICE UNDER THE NEW SOLID WASTE ACT. TYPES OF GRANTS AND CONTRACTS ARE DISCUSSED AND EXAMPLES ARE GIVEN.

01-01-01237 DEVELOPMENTS IN REFUSE DISPOSAL (HEALTH INCINERATION SANITARY-LANDFILL GRINDING VECTOR PEST COMPOSTING)
OATES, E. T.
THE SANITARIAN 71(2), P. 61-74, 184 (NOVEMBER 1962). A REVIEW OF REFUSE DISPOSAL METHODS AND PROBLEMS IN THE UNITED KINGDOM IS GIVEN, INCLUDING THE PROBLEMS OF SITE ACQUISITION FOR "CONTROLLED TIPS" (SANITARY LANDFILLS), OPERATIONAL METHODS AND COMMON PROBLEMS, AND THE DEVELOPMENT OF NEW METHODS OF REFUSE DISPOSAL. THE AUTHOR RECOMMENDS THAT IN UNIFORM LAYERS UP TO 8 FT. IN DEPTH, LAYERS BE PROPERLY COMPACTED, AND EACH LAYER BE COVERED WITH AT LEAST 9 IN. OF SUITABLE COVER. NEW METHODS OF REFUSE DISPOSAL DISCUSSED INCLUDE PULVERIZATION AND TIPPING OF REFUSE (GRINDING AND SANITARY LANDFILL), INCINERATION, SALVAGE AND SANITARY LANDFILL, AND SALVAGE PLUS GRINDING AND COMPOSTING. A METHOD OF DISPOSING OF REFUSE IS DESCRIBED WHEREIN REFUSE IS GROUND INTO PARTICLES UP TO 4 IN. IN DIAMETER AND DISPOSED IN A MANNER SIMILAR TO SANITARY LANDFILL, BUT WITHOUT PROVISION OF COVER. THIS TECHNIQUE IS REPORTED TO RESULT IN A 50 PERCENT REDUCTION IN VOLUME, IN IMPROVED COMPACTION, IN DESTRUCTION OF FLIES, EGGS AND LARVAE, (IN THE GRINDING PROCESS), AND IN EARLY INITIATION OF DECOMPOSITION PROCESSES. NO INSECT OR RODENT INFESTATION WAS REPORTED ON SUCH LANDFILLS. AND THE CONSOLIDATED MATERIAL IS REPORTED TO BEAR THE WEIGHT OF REFUSE-HANDLING VEHICLES. DETAILS OF TYPICAL EQUIPMENT ARE PROVIDED. (PHEA)

01-01-01275 RESTORING THE QUALITY OF OUR ENVIRONMENT (QUANTITIES POLLUTION HEALTH RESEARCH-RECOMMENDATIONS COMPOSITION)
PRESIDENT'S SCIENCE ADVISORY COMMISSION REPORT OF THE ENVIRONMENT POLLUTION PANEL, PRESIDENT'S SCIENCE ADVISORY COMMISSION, THE WHITE HOUSE, (NOVEMBER 1965). SECTIONS ABSTRACTED AND REVIEWED HEREIN ARE " THE SOURCES OF POLLUTION, " " SOLID WASTES - MAGNITUDE OF THE PROBLEM, " AND " SALVAGING AND RECLAIMING. " THE EXCRETA OF FARM ANIMALS ARE A MAJOR SOURCE OF WATER POLLUTION THROUGH SURFACE RUNOFF OR UNDERGROUND SEEPAGE. URBAN SOLID WASTES, INCLUDING PAPER, GRASS, BRUSH CUTTINGS, GARBAGE, ASHES, METAL AND GLASS, AMOUNT TO 1600 LB/CAPITA/YR - AN EQUIVALENT OF A TOTAL OF 125 MILLION TONS/YEAR. A LARGE FRACTION OF CONSUMER GOODS ENDS UP AS URBAN SOLID WASTES. THUS, SCRAP IRON AND STEEL ARE GENERATED AT 12-15 MILLION TONS/YEAR. OF THIS, ONE-THIRD COMES FROM DERELICT AUTOMOBILES. OF THE 25-30 MILLION TONS OF PAPER PRODUCED PER YEAR, ABOUT 10 MILLION TONS ARE SALVAGED. IN 1962, PLASTICS TO THE EXTENT OF 8 BILLION POUNDS WERE PRODUCED, 10 PERCENT OF THE DISCARDED MATERIAL WAS SALVAGED. IN THE SAME YEAR, 263,000 TONS OF RUBBER WERE RECLAIMED. THIS WAS 15 PERCENT OF THE TOTAL PRODUCTION OF RUBBER FOR THAT YEAR. FORTY-EIGHT BILLION CARTONS/YEAR (250/PERSON), 26 BILLION BOTTLES AND JARS (135/PERSON), AND 65 BILLION METAL AND PLASTIC CAPS AND CROWNS PER YEAR ARE PRODUCED. THE SALVAGE INDUSTRIES OPERATE AT A LEVEL OF 5-7 BILLION DOLLARS PER YEAR. THE NATURE OF SOLID WASTES IS HIGHLY VARIABLE. THEIR COMPOSITION AND DISTRIBUTION ARE CLOSELY LINKED WITH NATIONAL GROWTH AND TECHNOLOGICAL ADVANCE. COMPREHENSIVE STATISTICS ON MAGNITUDE ARE NOT AVAILABLE. THE PROBABLE COMPOSITION OF WASTES GENERALLY MAY BE AS FOLLOWS- PAPER, 45 PERCENT, GRASS AND BRUSH CUTTINGS, 15 PERCENT, GARBAGE, 12 PERCENT, ASHES 10 PERCENT, METALLICS 8 PERCENT, GLASS AND CERAMICS, 6 PERCENT, AND MISCELLANEOUS 4 PERCENT. AN EXAMPLE OF THE GRADUAL CHANGE IN COMPOSITION IS THAT OCCURRING IN PHILADELPHIA. IN 1959, THE RUBBISH COLLECTED AMOUNTED TO 380,000 TONS, AND IN 1964, TO 567,000 TONS. IN 1959 IN PHILADELPHIA, 120,000 TONS OF ASHES WERE COLLECTED, IN 1964, ONLY 37,000 TONS. GARBAGE PRODUCTION IN 1957 AMOUNTED TO 162,000 TONS, WHEREAS IN 1964 IT WAS 128,000 TONS. IN 1959, THE AMOUNT OF STREET SWEEPINGS WAS 100,000 TONS, AND IN 1964 IT WAS 137,000 TONS. (UC)

01-01-01277 WE LEAD THE WORLD (SALVAGE BULKY-WASTE INCINERATION)
BEVAN, R. E.
PUBLIC CLEANSING 58(6), P. 273-282 (1968). BRITAIN'S MR. BEVAN, MANCHESTER'S DIRECTOR OF CLEANSING TAKES THE TIME TO GIVE HIS COUNTRYMEN A PAT ON BACK FOR HAVING THE BEST REFUSE DISPOSAL AND COLLECTION PROGRAM IN THE WORLD. HE DESCRIBES PAST, PRESENT, AND FUTURE COLLECTION AND DISPOSAL METHODS. METHODS LIKE PIPING REFUSE IN PIPE LINES WITH WATER, AND THEIR WEAKNESSES, TRANSPORT BY VACUUM IN LARGE DIAMETER PIPES, AND RELATED PROBLEMS IN PLACING THEM ADJACENT TO EXISTING UTILITIES. HE IS MOST EAGER TO IMPROVE THE COLLECTION AND DISPOSAL IN MULTISTORIED DWELLINGS. HE SPEAKS OF THE WIDE RANGE OF REFUSE TYPES GENERATED BY DIFFERENT ECONOMIC AND SOCIAL GROUPS, AS WELL AS THE INCREASED PROBLEM OF ABANDONED AUTOMOBILE BODIES. ONE OF THE BIG PROBLEMS IS THE LACK OF LAND AREA SUITABLE FOR TIPPING. THE PROBLEM OF BEING ABLE TO GET DEPENDABLE MEN TO COME INTO WASTE DISPOSAL FIELD BECAUSE OF THE ECONOMIC STANDARD THEY ARE USUALLY PLACED IN. THEY MUST CONTINUE TO ENCOURAGE CAPABLE MEN WHO WILL BE ABLE TO ADJUST TO THE RAPID CHANGE THAT IS BROUGHT ABOUT BY RAPID CHANGE IN WASTE TYPES.

01-01-01308 PRESENT CONDITION AND FORECASTS FOR THE FUTURE OF REFUSE DISPOSAL IN ITALY (QUANTITY)
FRANGIPANE, E. D. F.
PUBLIC CLEANSING 55(11), P. 641-642 (1965). IN A SURVEY OF SIXTY HEAVILY POPULATED CITIES IN 1964 THE REFUSE PER INHABITANT PER DAY RANGED 0.52 KGS TO 0.68 KGS. IN SOME CASES THE AVERAGE DECREASED AS THE NUMBER OF INHABITANTS INCREASED. THE AVERAGES IN ITALY WERE LOWER THAN SOME EUROPEAN COUNTRIES AND HIGHER IN OTHERS. THE AUTHOR COMMENTS ON THE NUMBER OF UNCONTROLLED TIPPING OPERATIONS AND HOW SOME OF THESE COULD BE IMPROVED.

01-01-01317 REFUSE DISPOSAL - SURVEY AND PROPHECY (SANITARY-LANDFILL COMPOSTING RAIL-HAUL INCINERATION COST(OPERATING))
SHULTS, F. S.
PUBLIC CLEANSING 55(1), P. 39-62 (1965). A PAPER MAKING A GENERAL SURVEY OF PAST, PRESENT AND FUTURE METHODS OF REFUSE COLLECTION, PRE-TREATMENT, AND DISPOSAL. LOOKING INTO THE FUTURE THE AUTHOR SEES MANY PATTERN CHANGES THAT MUST BE MADE IN ALL PHASES OF COLLECTION AND DISPOSAL. ALSO THERE IS A QUESTION AND ANSWER SESSION COVERING A WIDE VARIETY OF PROBLEMS FACING VARIOUS SITES.

01-01-01342 THE BACKGROUND AND PERSPECTIVE OF SOLID WASTES MANAGEMENT (VOLUMES(WASTE) BULKY-WASTE COMPOSTING)
MCGAUHEY, P. H. + GOLUEKE, C. G.
PRESENTED AT THE 59TH ANNUAL MEETING APCA, SESSION XXIV WASTE DISPOSAL, SAN-FRANCISCO, CALIFORNIA, APCA PROC, P. 59 (JUNE 1966). A STUDY OF THE VARIOUS REPORTS GENERATED AS A RESULT OF THE SURGE IN INTEREST AND CONSEQUENT ACTIVITIES CONCERNED WITH WASTES MANAGEMENT SHOWS THAT THE FUNDAMENTAL FACTORS UNDERLYING WASTES MANAGEMENT RANGE FROM THE STRUCTURE OF THE MODERN COMMUNITY AND THE CULTURAL ATTITUDES OF ITS CITIZENS TO CONSIDERATIONS OF TECHNOLOGY, ECONOMICS, AND RESOURCES UTILIZATION. AMONG THE MORE IMPORTANT FACTORS ARE URBANIZATION, PUBLIC ATTITUDES, EDUCATIONAL DEFICIENCIES, VARIETY, NATURE, AND VOLUME OF WASTES, AND INADEQUATE TECHNOLOGY. TO CONDUCT AN EFFECTIVE SEARCH FOR THE SOLUTION OR SOLUTIONS TO THE REFUSE MANAGEMENT PROBLEM, CERTAIN GENERAL CONCEPTS ARE NEEDED. ONE IS THAT FOR THE FORESEEABLE FUTURE, ALL WASTES MUST REMAIN SOMEWHERE IN THE EARTH OR ITS GASEOUS ENVELOPE. A SECOND IS THAT " WASTES " ARE MORE PROPERLY DEFINED AS RESIDUES OF RESOURCE USE WHICH RESULT FROM THE APPLICATION OF CURRENT TECHNOLOGY UNDER PRESENT CONCEPTS OF ECONOMICS AND SOCIAL OBJECTIVES. (AUTH)

01-01-01343 SOLID WASTES IN PERSPECTIVE (RESEARCH-NEEDS)
PROC OF A SYMPOSIUM ON RESEARCH NEEDS, SPONSORED BY APWA RESEARCH FOUNDATION AND APWA INSTITUTE FOR SOLID WASTES, PHILADELPHIA, PENNSYLVANIA, (JANUARY 28-29, 1966). AIDED BY A GRANT FROM THE FORD FOUNDATION, THE APWA RESEARCH FOUNDATION, IN COOPERATION WITH THE APWA INSTITUTE FOR SOLID WASTES, INVITED THIRTY-NINE PERSONS TO PHILADELPHIA, PA., IN 1966 TO PARTICIPATE IN A SYMPOSIUM ON SOLID WASTES RESEARCH NEEDS. THE PARTICIPANTS WERE CAREFULLY SELECTED SO AS TO INCLUDE REPRESENTATIVES OF MANY, DIVERSE ACTIVITIES AND PROFESSIONS. THE BASIC OBJECTIVE OF THE SYMPOSIUM WAS TO IDENTIFY AND EVALUATE NEEDED RESEARCH THROUGH A SERIES OF CONCENTRATED DISCUSSIONS. A TOTAL OF 115 INDIVIDUAL PROJECT SUGGESTIONS WERE MADE. THESE WERE CONSOLIDATED INTO TWENTY PROPOSED RESEARCH PROJECTS. THE SYMPOSIUM PARTICIPANTS RATED FOURTEEN OF THESE TWENTY PROJECTS AS BEING MOST DESIRABLE AND NEEDED. OF THESE FOURTEEN SUGGESTIONS, TWO WERE REPEATEDLY PROPOSED IN ALMOST EVERY DISCUSSION SESSION AND WERE ALSO RANKED HIGHEST BY EACH OF THESE DISCUSSION GROUPS. THESE TWO PROJECT SUGGESTIONS CONCERN - (1) THE APPLICATION OF SYSTEMS ANALYSIS, SYSTEMS ENGINEERING AND OPERATIONS RESEARCH METHODS TO THE WASTE DISPOSAL FIELD, AND (2) THE DEVELOPMENT OF ADEQUATE AND RELIABLE DATA RELATING TO THE QUANTITY AND COMPOSITION OF SOLID WASTES PRODUCED, AS WELL AS DATA RELATING TO CURRENT COLLECTION AND DISPOSAL OPERATIONS. THE MAJOR CONCLUSION DRAWN FROM THE SYMPOSIUM IS THAT THE TIME HAS COME TO START DOING SOLID WASTES RESEARCH, AND THAT EFFORTS AND FUNDS EXPENDED IN THIS DIRECTION WILL BE PRODUCTIVE. (AUTH)

01-01-01379 FUTURE TRENDS IN WASTE STORAGE AND DISPOSAL (GONDARD COMPOSTING GRINDER(HOME) INCINERATION(IN-SITU) SACK PLASTIC-CANS RECLAMATION(LAND) INCINERATION GRINDING)
DAVIES, A. G.
ROYAL SOC OF HEALTH JOURNAL 6(6), P. 289-296 (NOVEMBER-DECEMBER 1962). THE CHANGING CHARACTER OF REFUSE DURING POSTWAR YEARS HAS HAD AN INFLUENCE UPON ITS METHODS OF DISPOSAL. BECAUSE SEWERS DO NOT FLOW TO CAPACITY IT WOULD BE ECONOMICAL TO USE THIS FORM OF WASTE DISPOSAL, EVEN THOUGH GREATER TREATMENT CAPACITY WOULD BE REQUIRED AT THE TREATMENT PLANT. AN ALTERNATIVE WOULD BE TO INSTALL SMALL GAS OR ELECTRIC INCINERATION UNITS IN RESIDENCES. THE PAPER SACK MERITS CONSIDERATION AS A WASTE CONTAINER BECAUSE IT OFFERS A REDUCTION IN DEADWEIGHT FOR THE REFUSE COLLECTORS. THE PLASTIC BIN HAS AN ADVANTAGE OVER EXPENDABLE SACKS EVEN THOUGH ITS COST MAY BE HIGHER THAN A GALVANIZED CONTAINER. ECONOMICS HAVE FORMED A MAJOR ISSUE FOR ULTIMATE DISPOSAL BECAUSE LAND DISPOSAL SCHEMES HAVE APPEARED TO BE CHEAPER THAN INCINERATION. IN MANY CASES CHEAPNESS HAS BEEN ACHIEVED ONLY AT THE EXPENSE OF ECONOMY. LAND RECLAMATION BY CONTROLLED TIPPING IS OFTEN PREFERRED BY MUNICIPAL AUTHORITIES, BUT THIS METHOD IS STILL A PRIMITIVE ONE. AUTHORITIES TURN TO INCINERATION AS SUITABLE LAND SITES BECOME SCARCE. INCINERATION PLANTS BECOME OBSOLETE AND OFTEN INADEQUATE IN CAPACITY, SO THE PENDULUM SWINGS BACK AND FORTH. THERE IS INTEREST AGAIN IN PULVERIZING AS A FORM OF REFUSE TREATMENT OVER DISPOSAL BECAUSE IT REDUCES THE DEMAND ON TIPPING SPACE AND THE NUISANCE FROM FLIES AND RATS. IT IS A STAGE IN COMPOSTING AND HAS BEEN USED IN AGRICULTURE. PROPRIETARY EQUIPMENT IS AVAILABLE. INTEREST HAS BEEN DEVELOPING IN THE POSSIBILITY OF COMPOSTING THE ORGANIC CONTENT OF REFUSE, WITH OR WITHOUT THE ADDITION OF SEWAGE SLUDGE. THIS METHOD WOULD RETURN TO THE SOIL ORGANIC MATERIAL THAT IS NECESSARY FOR THE GROWTH OF PLANT LIFE. IT DOES NOT PROVIDE A UNIVERSAL ANSWER TO THE PROBLEM OF WASTE DISPOSAL, BUT IT IS THE BEST PRESENT ALTERNATIVE. (PHEA)

01-01-01382 FORWARD LOOK AT PUBLIC CLEANSING (QUANTITY COMPOSITION COLLECTION INCINERATION SANITARY-LANDFILL COMPOSTING SLUDGE(SEWAGE))
GASKELL, J.
PUBLIC HEALTH INSPECTOR 73, P. 142-156, 162 (NOVEMBER 1964). A SHORT, CONCISE DISCUSSION ON GARBAGE AND REFUSE DISPOSAL IN ENGLAND AND WALES IS UNDERTAKEN. THE ARTICLE CONTAINS SECTIONS ON YIELD, CHARACTER AND COMPOSITION OF REFUSE, STORAGE OF REFUSE, DISPOSAL OF REFUSE AT SOURCE, REFUSE COLLECTION VEHICLES, METHODS OF COLLECTION, DISPOSAL--CONTROL TIPPING, DIRECT INCINERATION, SEPARATION--INCINERATION, PULVERIZATION, AND COMPOSTING. (PHEA)

01-01-01396 RESEARCH AND ENGINEERING ARE KEYS TO PROGRESS IN SOLID WASTE MANAGEMENT
LOEHR, R. C.
WESTERN CITY, P. 46 (SEPTEMBER 1966). THE ACCUMULATION OF PEOPLE WHO PRODUCE THE WASTE, THE INCREASED QUANTITIES AND TYPES OF SOLID WASTES, THE LACK OF ENOUGH QUALIFIED PEOPLE TO SOLVE THE PROBLEM, THE GENERAL DISINTEREST AND APATHY OF PEOPLE, AND THE RELATIVELY FEW PEOPLE WHO CAN THINK CREATIVELY AND IMAGINATIVELY TO PROVIDE NEW IDEAS AND POSSIBILITIES--ALL ARE FACTORS IN THE FUNDAMENTAL CAUSE OF THE SOLID WASTE PROBLEM. CONTRIBUTIONS TO SOLVE THE PROBLEM WILL COME FROM EXPERTS IN LAW, MANAGEMENT, PLANNING, EDUCATION, AND ENGINEERS. (UC)

01-01-01398 SAN FRANCISCO SOLID WASTE DISPOSAL PROBLEM (OCEAN-DISPOSAL RAIL-HAUL INCINERATION ECONOMICS)
SAN FRANCISCO PLANNING AND URBAN RENEWAL ASSOC, A SPUR REPORT AND RECOMMENDATIONS, 4 PP. (SEPTEMBER 1967). A SUMMARY REPORT IS GIVEN ON THREE PROPOSALS FOR THE DISPOSAL OF SAN FRANCISCO'S REFUSE. IT INCLUDES A LIST OF ADVANTAGES AND DISADVANTAGES AND A DISCUSSION OF PROPOSED UNIT-TRAIN, INCINERATION, AND OCEAN DISPOSAL METHODS OF WASTE TREATMENT. (PHEA)

01-01-01415 THE CHANGE CAME GRADUALLY (HISTORY COLLECTION)
MANN, D.
THE AMERICAN CITY 71(6), P. 120 (JUNE 1956). A SUMMARY OF THE DEVELOPMENT OF MODERN REFUSE COLLECTION AND DISPOSAL PRACTICES AT NIAGARA FALLS, NEW YORK, 1926-1956. (PHS)

01-01-01426 TRENDS IN THE TREATMENT OF TOWN WASTES, PART II (COMPOSTING SLUDGE(SEWAGE) GARCHEY GRINDER(HOME) PATHOGEN PROPERTIES(COMPOST))
KNOLLES, A. S.
MUNIC ENGR 137, P. 1715-1717 (1960). IN THE SECOND PART OF A PAPER PRESENTED AT THE CONFERENCE OF THE INSTITUTE OF WORKS AND HIGHWAYS SUPERINTENDENTS AT FOLKESTONE IN SEPTEMBER 1960, THE AUTHOR DESCRIBED AND DISCUSSED, BRIEFLY, THE COMPOSTING OF SEWAGE SLUDGE AND HOUSEHOLD REFUSE, AND IN MORE DETAIL, THE COLLECTION AND DISPOSAL OF SEWAGE TO SEWAGE-TREATMENT PLANTS AND OF REFUSE BY SINK UNITS FOR HOUSEHOLD USE. (WPA)

01-01-01457 REFUSE DISPOSAL IN TENNESSEE (SURVEY(DISPOSAL))
THE AMERICAN CITY 72(6), P. 36 (JUNE 1957). THIS IS A BRIEF REPORT OF A SURVEY BY THE TENNESSEE STATE PLANNING COMMISSION LISTING DATA ON COLLECTION AND DISPOSAL PRACTICES IN 144 (56 PERCENT) OF TENNESSEE'S INCORPORATED CITIES. FOR DISPOSAL 36 PERCENT OF THE CITIES USED OPEN DUMPS, 22 PERCENT SANITARY LANDFILLS AND 1 PERCENT INCINERATION. SEVEN PERCENT REPORTED NO REFUSE COLLECTION SERVICE PROVIDED IN THE CITY. (PHS)

01-01-01494 THE SOLID WASTE PROBLEM IN METROPOLITAN AREAS (VECTOR COST(OPERATING) POLLUTION(WATER) REGIONAL-APPROACH LEGAL-ASPECTS)
BLACK, R. J.
CALIFORNIA VECTOR VIEWS 11(9), P. 51 (SEPTEMBER 1964). THE ARTICLE DEALS WITH THE HEALTH, ECONOMIC, LEGAL, AND REGIONAL ASPECTS OF THE SOLID WASTES DISPOSAL PROBLEM. THE PRESENT SETUP, ONE WITH MANY OPEN DUMPS, FAULTY INCINERATORS, AND WITH A LACK OF REGIONAL PLANNING, MUST BE CHANGED, AND THIS REQUIRES A PUBLIC INTEREST. GARBAGE MEN SUFFER WORSE OCCUPATIONAL HAZARDS THAN ANY OTHER PUBLIC WORKERS. THEY HAVE AN EXTREMELY HIGH INJURY FREQUENCY RATE, WHICH INCLUDES SUCH INJURIES AS ARTHRITIS, MUSCLE AND TENDON DISEASES (ESPECIALLY IN THE BACK), SKIN DISEASES, AND HERNIA. HEALTH HAZARDS TO THE PUBLIC BEING SERVED INCLUDE WATER POLLUTION AT SANITARY LANDFILL SITES, FLY MIGRATION FROM GARBAGE CANS, AIR POLLUTION FROM IMPROPER BURNING OF REFUSE AT OPEN DUMPS AND INCINERATORS, AND THE FEEDING OF RAW GARBAGE TO SWINE. STORAGE, COLLECTION, AND DISPOSAL RANK JUST BEHIND SCHOOLS AND ROADS AS THE LEADING PUBLIC EXPENDITURES. COLLECTION INVOLVES 85 PERCENT OF THE EXPENSE. MUCH OF THIS EXPENSE IS IN SALARY FOR THE GARBAGE MEN. NEW METHODS OF COLLECTION WOULD ALLEVIATE THE BURDEN TO SOME EXTENT. A METROPOLITAN-WIDE APPROACH IS THE MOST FEASIBLE TODAY, FOR AS CITIES EXPAND, LAND AVAILABLE FOR DISPOSAL OF REFUSE BECOMES MORE AND MORE SCARCE. HOWEVER, FEW STATES PROVIDE FOR THIS AREA-WIDE EFFORT IN THEIR CONSTITUTION, AND THIS LEGAL BARRIER MUST BE HURDLED AS A FIRST STEP TO A REGIONAL PROGRAM OF DISPOSAL. (UC)

01-01-01504 SELECTED PATENTS ON REFUSE HANDLING FACILITIES FOR BUILDINGS (PATENT EQUIPMENT MANAGEMENT PROCESS DESIGN DOMESTIC)
CONNOLLY, J. A.
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE PUBLICATION 1793, WASHINGTON, D.C. (1968). THIS VOLUME CONTAINS 261 ABSTRACTS OF PATENTED EQUIPMENT AND METHODS FOR REFUSE HANDLING IN RESIDENTIAL AND OFFICE BUILDINGS. THESE INVENTIONS ARE NOT NECESSARILY LIMITED TO USE WITHIN BUILDINGS. AREAS OF INTEREST INCLUDE BALING MACHINES, BULK PRESSES, REFUSE CHUTES, CRUSHERS, DOMESTIC AND ON-SITE COMPACTORS, GRINDERS, SACKHOLDERS, RECEPTACLES, REFUSE VEHICLES WITH DETACHABLE CONTAINERS, AND MISCELLANEOUS ITEMS. EQUIPMENT DIAGRAMS ACCOMPANY MANY OF THE ABSTRACTS. INDICES OF CONTRIBUTING INVENTORS AND SUPPORTING COMPANIES ARE SUPPLIED. THIS VOLUME IS DESIGNED TO AID INVESTIGATORS SEEKING ORIGINAL IDEAS RELATING TO SOLID WASTE HANDLING. THE OBJECTIVES OF EACH INVENTION ARE PRESENTED, AS WELL AS THE APPARATUS INVOLVED IN ITS APPLICATION. (AUTH)

01-01-01506 SUMMARIES OF SOLID WASTES RESEARCH AND TRAINING GRANTS 1968 (PLANNING PERSONNEL RESEARCH)
LEFKE, L. W.
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE PUBLICATION 1596, WASHINGTON, D.C., (1968). THIS PUBLICATION IS A NEW COMPILATION OF SUMMARIES OF ALL RESEARCH AND TRAINING GRANTS (BOTH TERMINATED

AND ACTIVE) FUNDED BY THE SOLID WASTES PROGRAM OF THE U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE. THE COMPILATION INCLUDES PROGRESS THROUGH DECEMBER 31, 1967. THE MAJORITY OF THE RESEARCH HAS BEEN UNDERWAY FOR THREE YEARS OR LESS. SINCE THE CHARACTERISTICS OF SOLID WASTES ARE CONSTANTLY CHANGED BY PRODUCT INNOVATIONS, INDUSTRIAL PROCESS MODIFICATIONS, CONSUMER BUYING PATTERNS, ETC., THE EFFORT OF THE SOLID WASTES PROGRAM IS TO DEVELOP EFFICIENT AND ECONOMICAL MANAGEMENT PRACTICES TO MEET THE CHANGING NATIONAL NEEDS. THUS, MANY SOLID WASTES PROBLEMS ARE BEING INVESTIGATED BY THE PROGRAM. SOME OF THESE STUDIES ARE CARRIED OUT THROUGH RESEARCH GRANTS AND INCLUDE SUCH AREAS AS-BACTERIAL CONTAMINATION FROM HOSPITAL SOLID WASTES, PHYSICAL AND CHEMICAL COMPOSITION OF MUNICIPAL REFUSE, HANDLING, TREATMENT, AND DISPOSAL OF ANIMAL WASTES, UTILIZATION OF AGRICULTURAL WASTES, PIPE TRANSPORT OF WASTES, AND PYROLYSIS OF WASTES. A TOTAL OF 53 RESEARCH GRANTS ARE SUMMARIZED. THE TRAINING GRANT PROGRAM HAS AS ITS OBJECTIVES TO DEVELOP QUALIFIED PROFESSIONAL PERSONNEL IN THE SOLID WASTES FIELD IN ORDER TO UTILIZE THE RESULTS OF RESEARCH. INSTITUTIONS INVOLVED IN THE EIGHT SOLID WASTES TRAINING GRANTS ARE PRESENTED, AS WELL AS A BRIEF DESCRIPTION OF THE RESPECTIVE PROGRAMS. RESEARCH PROJECT AND TRAINING PROGRAM DIRECTORS ARE INDEXED. (AUTH)

01-01-01507 SUMMARIES, SOLID WASTES DEMONSTRATION GRANT PROJECTS 1968 (GRANT MANAGEMENT)
SPONAGLE, C. E.
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE PUBLICATION 1821, WASHINGTON, D.C. (1968). THE DEMONSTRATION GRANTS ACTIVITY OF THE SOLID WASTES PROGRAM, U.S. PUBLIC HEALTH SERVICE, HAS COMPILED SUMMARIES OF THE DEMONSTRATION GRANT PROJECTS AWARDED PROGRAM SUPPORT DURING THE PERIOD JUNE 1, 1966, TO DECEMBER 31, 1967. THIS VOLUME SUPERSEDES THE EARLIER PUBLICATIONS DEMONSTRATION PROJECT ABSTRACTS, SOLID WASTES PROGRAM AND SUPPLEMENT A. THE PROJECTS ARE OF TWO KINDS. SOME ARE DESIGNED TO DEMONSTRATE THE FEASIBILITY OF NEW AND IMPROVED TECHNOLOGY FOR SOLID WASTES DISPOSAL. OTHERS ARE TO INVESTIGATE THE DEVELOPMENT OF AREA-WIDE SOLID WASTE MANAGEMENT SYSTEMS TO REPLACE UNSANITARY AND UNECONOMIC OPERATIONS BY INDIVIDUAL COMMUNITIES. SUBJECTS WHICH RELATE TO SOLID WASTE MANAGEMENT, SUCH AS INCINERATION, SANITARY LANDFILL, COMPOSTING, SALVAGE, STORAGE, ETC., ARE INCLUDED IN THE 53 PROJECT SUMMARIES. REMARKS WITHIN THE INTRODUCTION SERVE TO CLARIFY THE SIGNIFICANCE OF ITEMS CONTAINED IN THE VOLUME. FIVE INDICES - SUBJECT, GEOGRAPHICAL, GRANTEES, PROJECT DIRECTORS AND CONSULTANTS - PROVIDE CROSS-REFERENCE FOR THE READER. (AUTH)

01-01-01508 SANITARY LANDFILL (BIBLIOGRAPHY)
STEINER, R. L. + KANTZ, R.
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE PUBLICATION 1819, WASHINGTON, D.C. (1968). A COMPREHENSIVE BIBLIOGRAPHY OF ARTICLES RELATED TO SANITARY LANDFILLS SELECTED FROM A WIDE VARIETY OF AMERICAN AND BRITISH PERIODICALS. ENTRIES ARE ARRANGED CHRONOLOGICALLY, RANGING FROM 1925 THROUGH 1968. THE SEARCH TO OBTAIN THIS INFORMATION WAS SUPPORTED BY A PUBLIC HEALTH SERVICE RESEARCH GRANT FROM THE SOLID WASTES PROGRAM TO THE DREXEL INSTITUTE OF TECHNOLOGY. THE PUBLICATION REPRESENTS A REVISED EDITION OF A 1967 BIBLIOGRAPHY PUBLISHED BY DREXEL INSTITUTE (SERIES I, NUMBER 2). AN EXTENSIVE LIST OF REFERENCES USED IN THE SEARCH IS ALSO INCLUDED. ARTICLES REFLECT A WIDE RANGE OF TOPICS RELATED TO SANITARY LANDFILLS, NUMEROUS CITY OR STATE LANDFILL REPORTS, ECONOMIC FEASIBILITY STUDIES, DISEASE AND POLLUTION ASPECTS, MANPOWER AND EQUIPMENT FACTORS, AND FUTURE POTENTIAL AND RESTRICTIONS FOR THE SANITARY LANDFILL. (AUTH)

01-01-01510 PRELIMINARY DATA ANALYSIS, 1968 NATIONAL SURVEY OF COMMUNITY SOLID WASTE PRACTICES (PLANNING GRANT MANAGEMENT)
MUHICH, A. J. + KLEE, A. J. + BRITTON, P. W.
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE PUB 1867, (1968). THROUGH PROVISIONS OF THE SOLID WASTE DISPOSAL ACT OF 1965 THE SOLID WASTES PROGRAM OF THE PUBLIC HEALTH SERVICE HAS UNDERTAKEN A NATIONWIDE SURVEY OF SOLID WASTE DISPOSAL PRACTICES AND PROBLEMS. THE SURVEY IS BEING CONDUCTED IN CONJUNCTION WITH A STATE AND INTERSTATE PLANNING GRANT PROGRAM. DATA FROM THIRTY STATES AND THE DISTRICT OF COLUMBIA RECEIVED BEFORE JULY 1, 1968, IS INCLUDED IN THIS PUBLICATION. INFORMATION FROM THESE ADDITIONAL STATES PARTIALLY SURVEYED BY SOLID WASTES PROGRAM PERSONNEL IS ALSO PRESENTED. THE PUBLICATION GIVES BASIC STATISTICAL SUMMARIES OF THE NATIONAL SURVEY DATA. IT NOT ONLY REPORTS ON COMMUNITY PRACTICES BUT ASSESSES DISPOSAL SITES AND FACILITIES AS WELL. NATIONAL ANALYSES ARE PRESENTED FOR COMMUNITY DATA AND LAND DISPOSAL SITES AND FACILITIES. REGIONAL ANALYSES ARE GIVEN FOR THE COMMUNITY DATA AND THE LAND DISPOSAL SITES. IN ADDITION, AN URBAN-RURAL COMPARISON IS PROVIDED FOR THE COMMUNITY DATA. A SEPARATE ANALYSIS FOR INCINERATORS IS GIVEN. THIS VOLUME DEALS WITH ATTRIBUTIVE AND CONTINUOUS TYPES OF RESPONSE. "SAMPLE SIZE" AND "PERCENT RESPONSE" ARE GIVEN FOR BOTH TYPES. ATTRIBUTIVE RESPONSE APPLIES WHEN AN ANSWER CAN BE PLACED IN A LIMITED NUMBER OF CATEGORIES, E.G., "YES" OR "NO", "REGULATIONS ENFORCED", "NO REGULATIONS", OR "REGULATIONS NOT ENFORCED". THE CONTINUOUS RESPONSE, DEALING WITH QUANTITATIVE DATA, IS TREATED SOMEWHAT DIFFERENTLY. SUCH DATA APPLIES WHEN AN ANSWER IS A COUNT OR MEASUREMENT (NUMBER OF ANIMALS, ESTIMATE IN YARDS, ETC.) AND IS SUMMARIZED AS "TOTAL", "MEAN", "STANDARD DEVIATION", "1967 POPULATION RESPONDING" AND "MEAN PER THOUSAND". (PHS)

01-01-01519 BIBLIOGRAPHY ON DISPOSAL OF ORGANIC REFUSE BY COMPOSTING
GOTAAS, H. B.
UNIVERSITY OF CALIFORNIA, BERKELEY, SANITARY ENGINEERING RESEARCH LABORATORY, INSTITUTE OF ENGINEERING RESEARCH SERIES 37, TECH BULL 2, (AUGUST 1950). THE BIBLIOGRAPHY IS AN EXHAUSTIVE LIST OF 610 ARTICLES ON COMPOSTING. IT WAS COMPILED AFTER A CRITICAL REVIEW OF THE LITERATURE. THE MAIN SOURCE OF REFERENCES FROM WHICH THE BIBLIOGRAPH WAS COMPILED WAS CHEMICAL ABSTRACTS. IN THOSE CASES WHERE THE ORIGINAL ARTICLES WERE NOT AVAILABLE OR COULD NOT BE READILY TRANSLATED, THE ARTICLES EITHER WERE CONDENSED FROM CHEMICAL ABSTRACTS OR REPRODUCED VERBATIM. (UC)

01-01-01530 ACCUMULATION AND DISPOSAL OF HOUSEHOLD AND INDUSTRIAL WASTES (QUANTITY CHARACTERISTICS COMPOSITION COLLECTION HEAT-RECOVERY INCINERATION)
KAMPSCHULTE, J.
ANFALL UND BESEITIGUNG VON HAUSMUELL UND INDUSTRIEABFAELLEN GESUNDHEITS-INGENIEUR 86(2), P. 42-54 (FEBRUARY 1965). SURVEY OF MODERN HERMETICALLY SEALED DUST-FREE GARBAGE COLLECTION CONTAINERS AND VEHICLES, COMPOSTING INSTALLATIONS, AND REFUSE INCINERATOR PLANTS WITH AND WITHOUT WASTE HEAT UTILIZATION. (EI)

01-01-01620 RESEARCH NEEDED ON SOLID WASTE
VARGAS, D. J.
PUBLIC CLEANSING 52, P. 421-425, 429 (1962). THE DIRECTOR OF RESEARCH FOR THE A.P.W.A. OUTLINES SOME OF THE AREAS OF SOLID WASTE DISPOSAL THAT RESEARCH IS NEEDED AND WHY IT IS NEEDED. SOME PROPOSALS ARE DISCUSSED ON WAYS SETTING UP PROGRAMS TO BETTER INFORM INTERESTED PEOPLE ON THE SUBJECT OF WASTE DISPOSAL.

01-01-01625 APWA SESSION ON SOLID WASTES RESEARCH NEEDS
REPORT - APWA SESSION ON SOLID WASTE RESEARCH NEEDS, (FEBRUARY 1962). THIS PAPER IS A ROUGH DRAFT OF A PANEL DISCUSSION AMONG THE LEADING RESEARCHERS AND ADMINISTRATORS IN THE FIELD OF SOLID WASTE DISPOSAL. THE PURPOSE OF THE DISCUSSION WAS TO FIND A POSSIBLE BEST SOLUTION TO THE DISPOSAL PROBLEM, AND TO POINT OUT THE AREAS WHERE THE MOST PRODUCTIVE RESEARCH MIGHT BE DONE. MANY PROPOSALS WERE DISCUSSED - LEADING TO POSSIBLE AREAS OF RESEARCH AND FURTHER STUDY. THE IDEA OF RESTRICTION OF SOLID POLLUTANTS, AS WAS DONE WITH THE AIR POLLUTION PROBLEM, WAS CONSIDERED. IF THE GENERAL PUBLIC AND/OR INDUSTRY WILL NOT COOPERATE WITH PROPOSALS AIMED AT PRESERVING HEALTH STANDARDS, THEN EITHER FEDERAL OR LOCAL JURISDICTIONS SHOULD HAVE THE POWER TO FORCE OFFENDERS TO OBEY REGULATIONS. THE IDEA OF GRINDING REFUSE AND DEPOSITING IT IN TRUCK SEWERS WAS DISCUSSED OFTEN. THE REDUCTION IN HAULING AND DISPOSAL COSTS MAKE THIS METHOD ONE WORTH LOOKING INTO. FURTHER RESEARCH INTO PREVENTING AIR POLLUTION FROM INCINERATION WAS RECOMMENDED, AS WAS THE INVESTIGATION OF THE VALUE OF COMPOST AS A FERTILIZER. THE POSSIBLE DEVELOPMENT OF WASTES FOR USE AS BY-PRODUCTS WAS MENTIONED. IN THE CASE OF AIR POLLUTION, WHEN INDUSTRY WAS FORCED TO CONTROL POLLUTANT EMISSIONS, IT FOUND THAT ESCAPING GASES COULD BE REUSED. PERHAPS SOME OF OUR SOLID WASTES CAN BE CONVERTED INTO A BENEFICIAL BY-PRODUCT ALSO. PNEUMATIC PIPELINES WERE DISCUSSED AS A POSSIBLE MEANS OF TRANSPORTING WASTES TO A TRANSFER STATION.

RESEARCH WAS RECOMMENDED IN THE AREA OF THE USE OF INCINERATORS IN SMALL RURAL COMMUNITIES. IT WAS RECOMMENDED THAT STUDIES BE MADE OF THE PRESENT REFUSE PRODUCTION BY MUNICIPALITIES. WITH THE USE OF SUCH DATA, AND THE PREDICTIONS OF FUTURE CHANGES IN THE PACKAGING INDUSTRY, PLANS FOR TOMORROW CAN BE FORMULATED. (UC)

01-01-01636 A BRITISH SURVEY OF FOREIGN REFUSE PRACTICE (COLLECTION LITTER-REMOVAL SANITARY-LANDFILL INCINERATION GRINDING DISPOSAL(WATER) OPEN-DUMP COMPOSTING)
WILSON, N. G.
REFUSE REMOVAL JOURNAL 2(3), P. 15 (MARCH 1959). MR. WILSON REVIEWS THE OVERSEAS PROGRAMS OF "PUBLIC CLEANSING" IN A DETAILED MANNER. MECHANICAL CLEANSING, LITTER, CAMPAIGNS, AND COMPOSITION OF REFUSE ARE AMONG THE ASPECTS OF REFUSE PRACTICE CONSIDERED. (UC)

01-01-01668 SOME VIEWS OF BRITON ON SANITATION IN THE U.S. (INCINERATION COMPOSTING)
WILSON, N. G.
REFUSE REMOVAL JOURNAL 2(11), P. 22 (NOVEMBER 1959). WILSON, ENGINEER AND MANAGER OF THE LIGHTING AND CLEANSING DEPARTMENT IN EDINBURGH, SCOTLAND, DISCUSSES INCINERATION IN THE UNITED STATES AND COMPOSTING IN EUROPE. (UC)

01-01-01777 SHIPS TRASH PROBLEM IN GREAT LAKES PORTS (INCINERATION MARINE(WASTE))
REFUSE REMOVAL JOURNAL 6(12), P. 30 (DECEMBER 1963). A RECENT SURVEY BY THE U.S. DEPARTMENT OF AGRICULTURE REVEALED THAT 170 VESSELS GENERATE 1,000 TO 2,000 TONS OF GARBAGE YEARLY WHILE IN THE GREAT LAKES, AND THAT ONLY A LIMITED NUMBER OF GREAT LAKES CITIES HAVE FACILITIES APPROVED FOR THE DISPOSAL OF SHIPS WASTE. INCINERATION IS ABOUT THE ONLY PRACTICAL WAY TO DEAL WITH THE REFUSE. SUCH FACILITIES SHOULD BE REQUIRED IN EVERY PORT DEVELOPMENT PROGRAM UNLESS A SUITABLE ALTERNATIVE PROVISION HAS BEEN MADE FOR ITS ACCEPTANCE, HANDLING, AND DISPOSAL. (PHS)

01-01-01787 A REVIEW OF REFUSE DISPOSAL PRACTICES (COST(OPERATING) LAW INCINERATION SANITARY-LANDFILL SALVAGE)
BLACK, P. J.
REFUSE REMOVAL JOURNAL 6(10), P. 16 (OCTOBER 1963). DISCUSSES BRIEFLY, THE COST OF REFUSE COLLECTION AND DISPOSAL IN THE UNITED STATES TODAY. A FEW STUDIES BEING CONDUCTED INTO REFUSE DISPOSAL ON A REGIONAL BASIS. RECENT COMPOSTING DEVELOPMENTS IN THIS COUNTRY, INCINERATION, LANDFILLING DIFFERENTIATING BETWEEN THE SANITARY LANDFILL, THE REFUSE FILL, THE CONTROLLED BURNING DUMP, AND THE OPEN DUMP, AND SIX QUESTIONS CONCERNING THE FIRING OF DUMPS, CONTENDING WITH RESIDENTS LIVING ADJACENT TO THE LANDFILL, PREVENTING DETERIORATION OF THE LANDFILL, BURNING METHODS TO REDUCE SMOKE AND ODORS, AVAILABILITY OF COVER MATERIAL, AND SALVAGING AT DISPOSAL AREAS. (PHS)

01-01-01864 THE STATUS OF SOLID WASTE MANAGEMENT IN CALIFORNIA (QUANTITY POLLUTION QUANTITY(INDUSTRIAL) QUANTITY(AGRICULTURAL))
ROGERS, P. A. + ANDRES, D. R. + CORNELIUS, J. + BURCH, L. A. + RICHARDSON, S. E. JR.
CALIFORNIA VECTOR VIEWS 15(12), P. 123-129 (DECEMBER 1968). A COMPREHENSIVE REPORT PUBLISHED BY THE CALIFORNIA DEPARTMENT OF PUBLIC HEALTH IN OCTOBER 1968 ENTITLED THE " STATUS OF SOLID WASTE MANAGEMENT IN CALIFORNIA" IS SUMMARIZED AND DISCUSSED. THIS REPORT PRESENTED THE FINDINGS OF AN INTENSIVE STATEWIDE STUDY AND EVALUATION OF CURRENT SOLID WASTE MANAGEMENT PRACTICES IN CALIFORNIA. THE REPORT WAS INTENDED TO BE A FACTUAL PROGRESS REPORT, OR SUMMARY DATA BANK ON THE EXISTING SYSTEM OF SOLID WASTE MANAGEMENT, AND AS SUCH DID NOT CONTAIN RECOMMENDATIONS FOR ACTIONS TO BE TAKEN. A SECOND REPORT, TO BE COMPLETED LATE IN 1969, WILL PRESENT A COMPREHENSIVE RECOMMENDED PROGRAM OF ACTION WHICH WILL BE SUBMITTED TO THE STATE LEGISLATURE. (AUTH)

01-01-01873 THE SUNDERLAND STORY (QUANTITY DEMOLITION)
JACKSON, D.
PUBLIC CLEANSING 53(11), P. 536 (1963). IN A SUMMARY OF A REPORT GIVEN TO THE BOROUGH COUNCIL, MR. JACKSON POINTS OUT THE PROBLEMS FACING MUNICIPALITIES IN THE FUTURE REGARDING SOLID WASTE DISPOSAL. THE DEMOLITION REFUSE FROM URBAN DEVELOPMENT, LACK OF LAND FOR LANDFILLS, CHANGES IN TYPES AND VOLUMES OF REFUSE, CHANGES IN REFUSE DISPOSAL METHODS ARE ALL DISCUSSED.

01-01-01887 DISPOSAL PROBLEMS IN THE COUNTY OF STERLING (OPEN-DUMP SANITARY-LANDFILL INCINERATION COMPOSTING)
LYLE, J.
PUBLIC CLEANSING 54(9), P. 1170 (1964). IN HIS 1963 ANNUAL REPORT MR. LYLE, THE SANITARY INSPECTOR AND DIRECTOR OF CLEANSING OF STERLING COUNTY, MAKES THE SAME COMMENTS ON PROBLEMS FACING CLEANSING OFFICERS AND REFUSE DISPOSAL. ITEMS SUCH AS OPEN DUMPS, CONTROLLED TIPPING, INCINERATION, AND COMPOSTING ARE ALL REVIEWED ALONG WITH THE COST RELATED TO SOME OF THE METHODS OF DISPOSAL.

01-01-01888 THE ECONOMIC DISPOSAL OF TOWN'S REFUSE (OPEN-DUMP HISTORY COMPOSITION QUANTITY INCINERATION.)
GOODRICH, W. F.
LONDON, P. S. KING AND SON, (NEW YORK, J. WILEY AND SONS), (1901). THE BOOK IS AN INTERESTING TEXT ON INCINERATION, WHICH ALSO INCLUDES A REVEALING CHAPTER ON OPEN DUMPS, AND ANOTHER ON DUMPING AT SEA. IT CONTAINS MANY BITS OF INFORMATION WHICH WHEN TAKEN TOGETHER SHOW THAT UNTIL WITHIN THE LAST FEW YEARS, THE ADVANCE MADE IN REFUSE MANAGEMENT AND TECHNOLOGY HAS BEEN FAR FROM SPECTACULAR. FOR INSTANCE THE IDEA OF GENERATING STEAM WITH THE WASTE HEAT FROM INCINERATORS (CALLED "DESTRUCTORS" AT THAT TIME) WAS WIDELY BROACHED. THE FOLLOWING ARE TWO QUOTATIONS WHICH ILLUSTRATE THE CONCERN WITH STEAM GENERATION AND AIR POLLUTION. "AS LATE AS 1888, IT WAS ONLY CLAIMED THAT A LOW TEMPERATURE CELL DEALING WITH ABOUT 5 TONS OF REFUSE PER DAY COULD PROVIDE STEAM FOR 6 INDICATED HORSEPOWER AS A MAXIMUM. WITH THE FORCED DRAUGHT CELLS, IT IS SEEN BY REASON OF THE GREATER QUANTITY OF REFUSE BURNED PER CELL AND THE HIGHER TEMPERATURE SECURED, AS MUCH AS 30 INDICATED HORSEPOWER PER HOUR COULD BE OBTAINED FROM ONE CELL." "MR. CHARLES JONES, M.I.C.E. OF EALING, WHO ERECTED THE FIRST DESTRUCTOR IN THE VICINITY OF LONDON IN 1883, WAS THE FIRST TO GRAPPLE TO ANY EXTENT WITH THE TROUBLE CAUSED BY THE 'JONES FUME CREMATOR.' THE CREMATOR WAS AN INDEPENDENT FURNACE CONSISTING OF A REVERBERATORY BRICK ARCH, WITH RINGS OF FIREBRICKS PLACED IN THE DIRECTION OF THE GASES TRAVELING FROM THE DESTRUCTOR CELLS. THE GASES WERE DEFLECTED TO THE RED HOT MASS OF FIRE BENEATH. THE NEXT STEP WAS TO DESIGN THE DESTRUCTOR (INCINERATOR) SUCH THAT HIGH TEMPERATURES COULD BE OBTAINED AT WHICH THE GASES WOULD BE BURNED IN IT. THIS WAS DONE BY APPLYING A FORCED DRAUGHT. THUS, THE MINIMUM TEMPERATURE, 1250 DEGREE F, CLAIMED TO BE NECESSARY FOR GOOD BURNING, WAS READILY ATTAINED." IN HIS DISCUSSION OF TIPPING, GOODRICH STATES-- "HERE AGAIN, THE 'ECONOMIC' TRIUMPHS OVER THE DEMAND FOR SANITARY DISPOSAL ... DR. FRASER'S REPORT WHERE HE SAYS - THE ONLY ARGUMENT IN FAVOR OF TIPPING IS ITS ANTIQUITY." THE BOOK CONTAINS CHAPTERS ON LAWS CONCERNING REFUSE COLLECTION AND DISPOSAL. IT DISCUSSES THE DESIGN OF INCINERATORS AND THE STATUS OF THE PRACTICE. A SECTION IS DEVOTED TO A DISCUSSION OF THE STATE OF REFUSE DISPOSAL IN THE U.S. TABLES OF TYPICAL WASTE COMPOSITIONS, AND CALORIFIC-VALUES ARE PRESENTED. (UC)

01-01-01925 THE GLASGOW REPORT - THE BIGGEST CLEANSING UNIT IN THE COUNTRY
PUBLIC CLEANSING 54(3), P. 767 (1964). THE TASK OF OPERATING THE LARGEST PUBLIC CLEANSING UNIT IN THE BRITISH ISLES, CAN BEST BE EXEMPLIFIED BY SOME OF THE EXPENDITURES, REVENUE, AND REFUSE DISPOSED OF. GROSS EXPENDITURES OF 2,634,522 POUNDS, TOTAL REVENUE 280,112 POUNDS, TONS OF DOMESTIC REFUSE AND TRADE WASTE 383,051 TONS, TOTAL MATERIAL RECEIVED FOR DISPOSAL 404,808 TONS. THE POLMADE WORKS WAS ORIGINALLY DESIGNED TO DISPOSE OF 40 PERCENT OF THE REFUSE COLLECTED BUT IS DISPOSING OF 60 PERCENT BY WEIGHT.

01-01-01929 NEW USES FOR ORGANIC SOLID WASTES (SALVAGE RECLAMATION)
COMPOST SCIENCE 7(3), P. 7-12 (WINTER 1967). A SELECTED BIBLIOGRAPHY IS GIVEN OF UNCONVENTIONAL USES FOR WASTE MATERIALS. 330 REFERENCES. (PHEA)

01-01-01969 DAS KEHRICHTPROBLEM IN DER SCHWEIZ (THE RUBBISH PROBLEM IN SWITZERLAND) (COMPOSTING)
BRAUN, R.
PUB OF SWISS ASSOC FOR PROTECTION OF WATERS, PLAN 3, (1956). THE AUTHOR POINTS OUT THAT IN SWITZERLAND THE METHODS USED FOR TREATMENT OF WASTES ARE LARGELY UNSATISFACTORY. NOT ONLY ON AESTHETIC AND HYGIENIC BASES, BUT ALSO WITH REGARD TO THE MENACE TO SURFACE AND UNDERGROUND WATERS, SHOULD THIS SITUATION BE REMEDIED. WHILE IN FOREIGN LANDS THE QUESTION IS JUDGED RATIONALLY FROM THE POINT OF VIEW OF THE PUBLIC ECONOMY AND IT IS SOUGHT TO TREAT DOMESTIC WASTES BY TRANSFORMING THEM INTO A PRODUCT BENEFICIAL TO THE SOIL, IN SWITZERLAND IT IS SOUGHT TO ELIMINATE THESE WASTES AS CHEAPLY AS POSSIBLE, WITHOUT THEREBY CAUSING INJURY TO MANKIND OR TO ANIMALS, TO AGRICULTURE OR WATERWAYS. THE POSSIBILITIES OF THE DISPOSAL OF DOMESTIC WASTES AND THE EVALUATION OF USES FOR DOMESTIC WASTE COMPOST UNDER SWISS CONDITIONS ARE BRIEFLY DISCUSSED. (AUTH)

01-01-01989 MULL-UND ABFALLBESEITIGUNG (REFUSE AND WASTE REMOVAL)
KUMPF, W. + MAAS, K. + STRAUB, H.
ERICH SCHMIDT, BERLIN, 276 PP. (1964). THIS LOOSE LEAF WORK PRESENTS A COMPREHENSIVE REPRESENTATION AND EXPLANATION ON THE ENTIRE SUBJECT OF COLLECTION, REMOVAL, AND UTILIZATION OF REFUSE FROM HOUSEHOLDS, COMMUNITIES, INDUSTRY, AND TRADE. EXTENSIVE COLLABORATION WITH LOCAL AND FOREIGN SPECIALISTS ENSURE COMPLETE AND FUNDAMENTAL EXPLANATION, INCLUDING SPECIAL PROBLEMS. IT COVERS ALL THOSE PROBLEMS OF TECHNICAL, ORGANIZATIONAL, AND ECONOMICAL KIND, WHICH ALWAYS OCCUR IN PRACTICE. EXTENSIVE INFORMATION IS ALSO GIVEN ABOUT LEGAL REQUIREMENTS. (AUTH)

01-01-01991 COMPREHENSIVE STUDIES OF SOLID WASTE MANAGEMENT - ABSTRACTS AND EXCERPTS FROM THE LITERATURE (COMPOSTING COLLECTION INCINERATION SANITARY-LANDFILL BIBLIOGRAPHY)
GOLUEKE, C. G.
UNIVERSITY OF CALIFORNIA, BERKELEY, CALIFORNIA, SERL REPORT NO 68-3, (JUNE 1968). THIS REPORT IS A COLLECTION OF ABSTRACTS AND EXCERPTS OF LITERATURE REVIEWED DURING THE FIRST AND SECOND YEAR OF THE PROJECT, "COMPREHENSIVE STUDIES OF SOLID WASTE MANAGEMENT.

01-01-02005 TWENTIETH CENTURY PUBLIC CLEANSING (COMPOSITION)
STEPHEN, J.
64TH ANNUAL CONF OF THE INSTITUTE OF PUBLIC CLEANSING, HASTINGS, (JUNE 4-8, 1962). THE PROGRESS OF THE LAST ONE HUNDRED YEARS OF PUBLIC CLEANSING IS DESCRIBED AND HOW THE EMPHASIS HAS CHANGED FROM A PRACTICE OF CURE TO A PROGRAM OF PREVENTION THROUGH THE CONTROL OF REFUSE AND PESTS ASSOCIATED WITH THE WASTE DISPOSAL PROBLEM. THE CHARACTERISTICS OF REFUSE ARE DESCRIBED BREAKING THEM DOWN INTO COMPONENTS BY PERCENT, THE STORAGE OF REFUSE, VARIOUS COLLECTION METHODS, TRANSPORTATION PROBLEMS, DISPOSAL METHODS, AND ECONOMICS ARE ALL DISCUSSED.

01-01-02017 TECHNICAL-ECONOMIC STUDY OF SOLID WASTE DISPOSAL NEEDS AND PRACTICES (INCINERATION QUANTITY COMPOSTING)
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE PUB 1886, WASHINGTON, D.C., (1969).
DURING THE FALL OF 1966 AND THE SPRING OF 1967, APPROXIMATELY 600 CITIES WERE SURVEYED AND MUNICIPAL OFFICIALS IN 50 OF THESE CITIES WERE INTERVIEWED IN PERSON TO DEFINE IN LIMITED DEPTH THE PROBLEM AREAS OF MUNICIPAL REFUSE GENERATION, COLLECTION, AND DISPOSAL. FROM THE INFORMATION OBTAINED IN THESE SURVEYS AND INTERVIEWS, THE AMOUNT OF REFUSE GENERATED FROM RESIDENTIAL AND COMMERCIAL SOURCES WAS DETERMINED. THE NUMBER OF INSTALLED INCINERATORS AND COMPOSTING PLANTS IN OPERATION IN THE UNITED STATES WAS ALSO DEFINED. IT WAS FURTHER DETERMINED THAT THERE IS AN APPARENT LACK OF WELL KEPT RECORDS ON SOLID WASTE DISPOSAL PRACTICES AND AN APPARENT DEFICIENCY IN ADEQUATE PLANNING FOR SOLID WASTE DISPOSAL FACILITIES IN THE MAJORITY OF COMMUNITIES. MATHEMATICAL MODELS (EQUATIONS) WERE DEVELOPED TO PREDICT THE CAPACITY OF INSTALLED WASTE REDUCTION FACILITIES (I.E. INCINERATORS AND COMPOSTING PLANTS) IN 1975 IN THE UNITED STATES. IN ADDITION, A MATHEMATICAL MODEL WAS DEVELOPED FOR THE STATE OF CONNECTICUT TO PREDICT QUANTITIES OF COMMERCIAL, RESIDENTIAL, AND INDUSTRIAL WASTE PRODUCTION AND THE REQUIREMENTS FOR WASTE REDUCTION FACILITIES TO HANDLE THESE WASTE STREAMS IN 1975. (AUTH)

01-01-02018 OBSERVATIONS OF CONTINENTAL EUROPEAN SOLID WASTE MANAGEMENT PRACTICES (COMPOSTING INCINERATION SANITARY-LANDFILL SIZE-REDUCTION)
JENSEN, M. E.
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE PUB 1880, WASHINGTON, D.C., (1969). THIS REPORT WAS WRITTEN BY A STAFF ENGINEER OF THE BUREAU OF SOLID WASTE MANAGEMENT, ASSIGNED TO A 90-DAY TOUR OF DUTY WITH THE U.S.-GERMAN COOPERATIVE PROGRAM ON NATURAL RESOURCES, POLLUTION CONTROL, AND URBAN DEVELOPMENT. IN ADDITION, THE AUTHOR ATTENDED THE INTAPUC CONFERENCE, ACCOMPANIED THE U.S. STUDY TEAM TO GERMANY, AND THEN TOURED SWITZERLAND, HOLLAND, SWEDEN, DENMARK, AND FRANCE, TO OBSERVE AND COMPARE SELECTED EUROPEAN AND AMERICAN SOLID WASTE MANAGEMENT PRACTICES. THE RESULT IS INTENDED NOT AS A COMPREHENSIVE CRITIQUE, BUT RATHER AS AN OVERVIEW OF CERTAIN CONTINENTAL EUROPEAN SOLID WASTE OPERATIONS AS OBSERVED WITH INTELLECTUAL CURIOSITY AND A FRESH VIEWPOINT. TWO OF THE CONCLUSIONS ARE OF CURRENT INTEREST. THE AUTHOR INDICATES (DESPITE THE TODO ABOUT EUROPEAN "ADVANCED" SOLID WASTE MANAGEMENT TECHNIQUES) THAT EUROPEAN PRACTICES ARE NOT USING AN ADVANCED TECHNOLOGY. INSTEAD, THE ECONOMIC SITUATION IS SUCH THAT A MORE EXPENSIVE SYSTEM FOR REFUSE DISPOSAL CAN BE JUSTIFIED. THE AUTHOR ALSO DEMONSTRATES WELL THE IMPORTANCE OF THE INTERNATIONAL SOLID WASTE FIELD AS AN EXTENSION OF THE BASIC VALUE OF THE REGIONAL APPROACH TO THE MANAGEMENT OF SOLID WASTES. (PHS)

01-01-02021 ENVIRONMENTAL POLLUTION CONTROL - A STATE OF THE ART REVIEW
MIDWEST RESEARCH INSTITUTE, (JANUARY 5, 1967). A COMPREHENSIVE REVIEW OF AIR, WATER, AND LAND POLLUTION. PROCESSES USED FOR THE CONTROL OF VARIOUS POLLUTANTS ARE TABULATED AND DISCUSSED. AN EVALUATION OF CURRENT AND PROPOSED METHODS OF SOLID WASTE TREATMENT AND DISPOSAL IS MADE. REPRESENTATIVE COSTS AND OPERATING PROBLEMS ARE LISTED. POTENTIALS OF THE VARIOUS PROCESSES ARE ASSESSED.

01-01-02098 MECHANICAL METHODS OF REFUSE DISPOSAL (SALVAGE SANITARY-LANDFILL INCINERATION SACK(PAPER) COMMERCIAL-REFUSE BULKY-WASTE GRINDING)
HARVEY, K.
66TH ANNUAL CONF OF THE INSTITUTE OF PUBLIC CLEANSING, MARGATE, (JUNE 9-13, 1964). THE DECREASING SITES SUITABLE FOR TIPPING, THE IMPROVED STANDARDS OF DISPOSAL TO PREVENT POLLUTION, CHANGES IN WASTE TYPES AND VOLUME ARE MAKING THE METHODS OF DISPOSAL MORE AND MORE IN FAVOR OF MECHANICAL DISPOSAL. THIS PAPER COVERS THE TOPICS OF MECHANICAL DISPOSAL SUCH AS SEPARATION AND SALVAGE, INCINERATION, COMPOSTING, PULVERISATION, BULK TRANSFER, AND PROBLEMS RELATED TO EACH METHOD.

01-01-02109 PROCEEDINGS OF 1966 INSTITUTE OF SOLID WASTES (INCINERATION RESIDUE ORGANIZATION COLLECTION COMPUTERS SITE-LOCATION REGIONAL-APPROACH)
AMERICAN PUBLIC WORKS ASSOC, CHICAGO, ILLINOIS, (SEPTEMBER 13-15, 1966). THESE PROCEEDINGS INCLUDE THE PAPERS AND DISCUSSION PRESENTED AT THE TECHNICAL SESSIONS AND PROCEEDINGS OF A JOINT MEETING OF THE EXECUTIVE COUNCIL OF THE INSTITUTE OF SOLID WASTES AND THE INTERNATIONAL ASSOCIATION OF PUBLIC CLEANSING. PRINCIPAL TOPICS INCLUDE - REFUSE COLLECTION, PUBLIC OR PRIVATE - COMPUTERS IN SOLID WASTES - REFUSE DISPOSAL, SITE LOCATION PROBLEMS - ON-SITE HANDLING OF REFUSE - REGIONAL APPROACHES TO REFUSE DISPOSAL - AND CHARACTERISTICS OF INCINERATOR RESIDUES.

01-01-02111 PROGRESS UNDER THE FEDERAL SOLID WASTES PROGRAM
BLACK, R. J.
ANNUAL MEETING AM PUBLIC HEALTH ASSOC, SAN FRANCISCO, CALIFORNIA, (NOVEMBER 2, 1966). THE AUTHOR EXPLAINS THE FUNCTION OF THE SOLID WASTES PROGRAM AND THE RESEARCH PROGRAMS BEING CONDUCTED TO ACQUIRE TECHNOLOGY.

01-01-02117 PRIVATE CONTRACTOR OPPORTUNITIES IN THE SOLID WASTES PROGRAM
BLACK, R. J.
NATIONAL REFUSE EQUIPMENT SHOW AND CONGRESS, SAN FRANCISCO, CALIFORNIA, (JUNE 2-4, 1967). THE AUTHOR DESCRIBES THE SOLID WASTE PROGRAM, THE DEMONSTRATION PROGRAMS, CURRENT PROBLEMS AND RESEARCH, AND INFORMATION AVAILABILITY.

01-01-02119 REVIEW OF THE NATIONAL SOLID WASTES PROGRAM
BENDIXEN, T. W.
1967 WINTER MEETING OF THE AM SOC AGRIC ENG, DETROIT, MICHIGAN, (DECEMBER 12-15, 1967). THE AUTHOR REVIEWS THE SOLID WASTE DISPOSAL ACT OF 1965. HE BRIEFLY DESCRIBES PROGRAMS UNDERWAY AND AREAS OF RESEARCH, TRAINING, TECHNICAL SERVICES, ETC., THAT ARE AVAILABLE TO THE URBAN AND RURAL AREAS.

01-01-02120 AD HOC CONFERENCE ON SOLID WASTE TRAINING
SOLID WASTE ENGINEERING SECTION, U.S. PUBLIC HEALTH SERVICE, ROBERT A. TAFT SANITARY ENGINEERING CENTER, CINCINNATI, OHIO, (NOVEMBER 4-6, 1964). THIS CONFERENCE ATTEMPTED TO POINT OUT THE WEAK POINTS IN THE SOLID WASTE SERVICES AND FACILITIES, AND MAKES RECOMMENDATIONS FOR IMPROVEMENT.

01-01-02130 REFUSE COLLECTION (BULKY-WASTE SALVAGE COST(LABOR)
CRITCHLEY, H. F.
PUBLIC HEALTH INSPECTOR 75(2), P. 83-97, 120 (NOVEMBER 1966). THIS PAPER GIVES A GENERAL LOOK AT THE REFUSE COLLECTION SYSTEM OF TODAY. IT REFERS TO THE RESPONSIBILITY OF THE VARIOUS GOVERNMENTAL AGENCIES WHO SHOULD HAVE THE POWER TO MAKE DECISIONS WHEN CHANGES ARE TO BE MADE. THE CHANGING COMPOSITION OF WASTES, STORAGE, COLLECTION, INCINERATION, COLLECTION VEHICLES, AUTO DISPOSAL, AND PRIVATE CONTRACTORS VERSUS MUNICIPAL COLLECTION AND DISPOSAL ARE ALL DISCUSSED.

01-01-02143 SOLID WASTES IN PERSPECTIVE (RESEARCH-NEEDS)
PROC OF SYMP ON RESEARCH NEEDS, PHILADELPHIA, PENNSYLVANIA, AM PUBLIC WORKS ASSOC RESEARCH FOUNDATION, 17 PP. (JANUARY 28-29, 1966). SOLID WASTES WAS SELECTED AS THE SUBJECT MATTER FOR THIS FIRST OF A SERIES OF A APWA SYMPOSIA ON RESEARCH NEEDS BECAUSE OF THE URGENT NEED FOR ACTION, AND ALSO, BECAUSE OF THE ENACTMENT OF THE SOLID WASTES ACT OF 1965. THIS LEGISLATION PROVIDES FOR THE DISTRIBUTION OF A SUBSTANTIAL AMOUNT OF FEDERAL FUNDS TO ORGANIZATIONS AND INDIVIDUALS IN THE FORM OF RESEARCH, DEMONSTRATION AND TRAINING GRANTS. THE ACT PROVIDES FUNDS FOR DISTRIBUTION TO QUALIFIED EDUCATIONAL INSTITUTIONS AND ALSO TO INDIVIDUALS SEEKING SPECIALIZED KNOWLEDGE AND TRAINING IN THE HANDLING AND DISPOSAL OF SOLID WASTES. IN ADDITION, FUNDS ARE AVAILABLE FOR THE DEVELOPMENT OF NEW AND IMPROVED METHODS OF DISPOSING OF SOLID WASTES AND FOR DEMONSTRATIONS OF THE EFFECTIVENESS OF THESE METHODS. IN THE SYMPOSIUM DISCUSSIONS, EMPHASIS WAS PLACED UPON THE " COLLECTION " ASPECT OF SOLID WASTES, RATHER THAN UPON " DISPOSAL " METHODS. PARTICIPANTS WERE ENCOURAGED, IN ADVANCE, TO EMPHASIZE THE COLLECTION ASPECT SINCE 75 PERCENT, OR MORE, OF ALL SOLID WASTES REMOVAL COSTS CAN GENERALLY BE ATTRIBUTED TO THE COLLECTION OPERATION.

01-01-02149 SOLID WASTE MANAGEMENT - THE FEDERAL ROLE
VAUGHAN, R. D.
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE, 22 PP. (1969). SYMP ENVIRONMENTAL EQUILIBRIUM - CRITERIA, COST, COOPERATION, NATIONAL POLLUTION CONTROL CONF AND EXPOSITION, HOUSTON, TEXAS (APRIL 22-24, 1969). A GENERAL PAPER REVIEWING THE SCOPE OF THE WASTE DISPOSAL ACT OF 1965, THE TREMENDOUS INCREASE IN THE MUNICIPAL, COMMERCIAL, INDUSTRIAL AND AGRICULTURAL WASTES. TOPICS SUCH AS WASTE TYPES AND HOW THEY CHANGE REFUSE COLLECTION, TRANSPORTATION, RECYCLING AND REUSE, TRAINING AND TECHNOLOGY, PLANNING, HEAT UTILIZATION.

01-01-02161 TRASH - OUR $3 BILLION PROBLEM (REGIONAL-APPROACH)
AYERS, J. B.
BOSTON SUNDAY GLOBE 196(76), P. 1, 30 (SEPTEMBER 14, 1969). WASTE COLLECTION AND DISPOSAL COST THE AMERICAN PUBLIC $1 BILLION EACH YEAR, WITH THE PEOPLE OF EASTERN MASSACHUSETTS ALONE SHELLING OUT $15 MILLION. ALTHOUGH THIS FIGURE CONTINUES TO RISE AS AMERICANS TOSS OUT MORE REFUSE, COLLECTION AND DISPOSAL METHODS REMAIN WOEFULLY OUT OF DATE. ABOUT 80 PERCENT OF THE $3 BILLION GOES FOR COLLECTION WHERE PRESENT TECHNIQUES " ARE LITTLE BETTER THAN HORSE AND BUGGY SYSTEMS WITH GASOLINE DRIVEN ENGINES," A REPORT TO THE FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY DECLARED. THE REMAINDER OF THE COST IS FOR DISPOSAL, WHICH TODAY IS PRACTICED ON A 19TH CENTURY LEVEL WITH OBNOXIOUS OPEN DUMPS AND AIR POLLUTING INCINERATORS, ACCORDING TO A RECENT MASSACHUSETTS INSTITUTE OF TECHNOLOGY REPORT ON SOLID WASTE DISPOSAL. ALTHOUGH EXPERTS CONTINUALLY STRESS THAT COSTS CAN BE CUT ONLY THROUGH REGIONAL DISPOSAL PROGRAMS, NO REGIONAL WASTE DISPOSAL DISTRICTS HAVE BEEN SET UP IN MASSACHUSETTS SINCE LEGISLATION WAS PASSED IN 1965 AUTHORIZING THEIR FORMATION. SUPPORT FOR REGIONAL PROGRAMS WAS DECLARED IN THE MIT STUDY PRESENTED IN A SEPTEMBER 1968 MEETING CHAIRED BY PROF. JOHN F. COLLINS, FORMER MAYOR OF BOSTON, WHICH STATED "IN SOLID-WASTE MANAGEMENT THERE APPEARS TO BE OVERWHELMING COST ADVANTAGES IN BEING BIG." " FACILITIES OF SEVERAL TYPES WHICH HANDLE 2000 TONS PER DAY SEEM CAPABLE OF BRINGING THE TREATMENT OR DISPOSAL COST TO BELOW $5/TON, AFTER COLLECTION AND DELIVERY. URBAN AREAS HANDLING 200 TONS PER DAY HAVE DIFFICULTY IN DISPOSING OF THEIR WASTE AT A REAL COST OF LESS THAN $10/TON. THESE ARE THE ECONOMIC INCENTIVES TO THE LOSS OF SOME SOVEREIGNTY INTO LARGER GROUPINGS, " THE REPORT STATED. A $200,000 STUDY OF WASTE DISPOSAL IN EASTERN MASSACHUSETTS BY THE METROPOLITAN AREA PLANNING COUNCIL CONCLUDED THAT CONSTRUCTION OF NINE REGIONAL INCINERATORS AND EIGHT REGIONAL SANITARY LANDFILLS WOULD COST THE 79 PARTICIPATING COMMUNITIES ALMOST $4 A TON LESS THAN IF THEY CONTINUED TO GO IT ALONE BUILDING SEPARATE FACILITIES. THIS WOULD MEAN AN ANNUAL COST SAVING TO THE COMMUNITIES FOR DISPOSING THE PRESENT 2.65 MILLION TONS OF WASTE GENERATED IN THE AREA OF $10.6 MILLION. THE SAVING WHEN REFUSE IS EXPECTED TO CLIMB TO 4.9 MILLION TONS IN 1990 COMES TO $19.6 MILLION. (AUTH)

01 02 ECONOMICS

01-02-00196 EXAMINING COSTS IN SOLID WASTE DISPOSAL (COLLECTION)
ARORA, S. R. + BUNKER, W. R.
PUBLIC WORKS 98(10), P. 134-136 (OCTOBER 1967). A MATHEMATICAL MODEL IS DESCRIBED THAT CAN BE USED TO QUANTIFY THE COST OF COLLECTION AND HAULING. TWO SYSTEMS ARE USED, ONE TRUCK SERVING EACH ROUTE WITH BACK AND FORTH MOVEMENTS TO THE DISPOSAL SITE, AND A CONTINUOUS FLOW PROCESS IN WHICH TRANSFER OF THE MATERIAL FROM THE COLLECTION TRUCK TO A TRANSFER VEHICLE IS USED.

01-02-00220 FINDING LOWEST COST FOR REFUSE DISPOSAL (COMPUTER)
BAKER, J. S.
PUBLIC WORKS 94(11), P. 84-86 (NOVEMBER 1963). COST OF REFUSE DISPOSAL IS INFLUENCED BY MANY FACTORS, INCLUDING METHOD USED, SIZE OF VEHICLE AND HAUL DISTANCE. PROCEDURE TO DETERMINE LOWEST UNIT COSTS BY USE OF ELECTRONIC DIGITAL COMPUTER, WITH " FREE CHOICE " APPROACH IS DESCRIBED. (EI)

01-02-00222 SYSTEMS ANALYSIS OF SOLID WASTE DISPOSAL PROBLEMS (SYSTEMS-ANALYSIS COSTS)
WOLFE, H. B. + FINN, R. E.
PUBLIC WORKS 98(9), P. 99-102 (SEPTEMBER 1967). A SYSTEMS ANALYSIS APPROACH TO SOLID WASTE MANAGEMENT IS DESCRIBED. A BLOCK DIAGRAM SHOWING ALTERNATIVE PARTS IN SOLID WASTE MANAGEMENT AND THE TRANSPORTATION STEPS IS SHOWN. A SAMPLE PROBLEM IS OUTLINED.

01-02-00223 SPIRALING COSTS MARK WASTE INDUSTRY OVER THREE DECADES
LIPPMAN, A. J.
SOLID WASTES MANAGEMENT/RRJ 11(1), P. 86 (JANUARY 1968). A TABLE IS PRESENTED INDICATING HOW COSTS HAVE INCREASED FROM 1937 TO 1967. CHANGES IN FUEL COSTS, VEHICLES, WAGES, ETC., ARE GIVEN.

01-02-00405 MUNICIPAL SOLID-WASTE DISPOSAL - PART IX - AN OVER-ALL ENGINEERING EVALUATION (INCINERATION COMPOSTING ECONOMICS)
LANE, J. M.
THE AMERICAN CITY 77(10), P. 137 (OCTOBER 1962). A CONTINUATION OF AN OVERALL ENGINEERING EVALUATION OF MUNICIPAL SOLID-WASTE DISPOSAL, DISCUSSING INCINERATION AND COMPOSTING. INCLUDES (1) PREREQUISITES FOR THE SUCCESSFUL DESTRUCTION OF REFUSE BY INCINERATION - A SOURCE OF HEAT, SUPPLY OF AIR, SUFFICIENT FURNACE, COMBUSTION CHAMBER, AND FLUE VOLUMES, INTIMATE MIXING OF PRODUCTS OF COMBUSTION AND AIR, AND AGITATION OF THE MATERIALS. (2) REASONS WHY COMPOSTING HAS NOT BEEN SUCCESSFUL IN THE UNITED STATES UP TO THE PRESENT TIME. (3) INCINERATION OF SEWAGE SLUDGE SOLIDS. (PHS)

01-02-00655 REFUSE DISPOSAL AN ANALYSIS OF ALTERNATIVES (COST(OPERATING) COLLECTION TIPPING SALVAGE ECONOMICS)
WHITWORTH, B.
PUBLIC CLEANSING 57(6), P. 321-335 (JUNE 1967). COVENTRY, ENGLAND, DISPOSES OF ABOUT 100,000 TONS OF REFUSE A YEAR. COLLECTION COSTS ABOUT 70 SHILLINGS, AND DISPOSAL ABOUT 7 SHILLINGS. AN ANALYSIS WAS MADE TO DETERMINE IF ALTERNATIVE COLLECTION AND DISPOSAL METHODS COULD BE USED FOR COST REDUCTION. COLLECTION COSTS CAN BE REDUCED BY CONSTRUCTION OF BETTER ROADS, OR THE USE OF TRANSFER VEHICLES. COST OF DISPOSAL, INCOME FROM SALVAGE AND INCOME FROM DISPOSAL OF TRADE WASTES ARE ALSO CONSIDERED. ALSO THE EFFECT OF CHANGES IN REFUSE QUANTITIES AND CHARACTERISTICS ON THE OPERATION COSTS ARE CONSIDERED.

01-02-00665 FIGURE IN APWA RELEASE GIVES WRONG IMPRESSION (COST(OPERATING))
REFUSE REMOVAL JOURNAL 5(10), P. 6 (OCTOBER 1966). THE APWA ESTIMATES THAT $1.5 BILLION ARE SPENT EACH YEAR FOR REFUSE COLLECTION AND DISPOSAL. IT IS POINTED OUT THAT THIS IS FOR MUNICIPAL COLLECTION ONLY AND DOES NOT INCLUDE THE PRIVATE SECTOR OF THE BUSINESS. THE RIGHT FIGURE IS FELT TO BE 2.8 BILLION PLUS.

01-02-00668 REFUSE COST THIRD IN COLORADO BUDGET (COST(OPERATING) PROJECTIONS QUANTITY)
SOLID WASTES MANAGEMENT/RRJ 11(5), P. 55 (MAY 1968). THE ANNUAL COST OF SOLID WASTE DISPOSAL IN COLORADO BY 1970 WILL BE $20,880,000, WHICH WILL BE EXCEEDED ONLY BY SCHOOLING AND HIGHWAYS. TOTAL SOLID WASTE PRODUCTION WAS ESTIMATED AT 2,585,000 TONS FOR 1970. IN THE YEAR 2000 IT WAS ESTIMATED THAT 7 LBS PER PERSON PER DAY WOULD BE PRODUCED.

01-02-00962 REFUSE COLLECTION AND DISPOSAL IN KENOSHA
PUBLIC WORKS 96(7), P. 135 (JULY 1965). DURING 1964, KENOSHA, WISCONSIN, COLLECTED 12,296 TONS OF COMBUSTIBLES. THE COST FOR COLLECTION AND INCINERATION WAS $21.25 PER TON, THE COST FOR INCINERATION BEING ABOUT $3.85 PER TON. IN ALL, HOWEVER, 15,019 TONS WERE INCINERATED AND THE RESIDUE FROM THE INCINERATOR AMOUNTED TO 3,185 TONS. THE CITY ALSO COLLECTED 13,098 TONS OF NON-COMBUSTIBLES WHICH COST $16.67 PER TON FOR COLLECTION AND DUMP MAINTENANCE OF WHICH $1.57 WAS FOR DUMP MAINTENANCE. INCLUDING NON-COMBUSTIBLES FROM OTHER SOURCES, TOTAL MATERIAL RECEIVED AT THE DUMP WAS 35,219 TONS.

01-02-01089 WHICH METHOD FOR RURAL AREAS - INCINERATION OR COMPOSTING (COST(CAPITAL) COST(OPERATING))
WUHRMANN, K.
COMPOST SCIENCE 6(1), P. 16-18 (SPRING 1965). ECONOMICS OF WASTE TREATMENT METHODS ARE ANALYZED BY AUTHOR WHO IS ASSOCIATED WITH INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ZURICH, SWITZERLAND. APPROXIMATE ANNUAL COSTS ARE DETERMINED ON BASIS OF COMPLETED PROJECT COMPARISONS SHOWN IN TABLES. CALCULATION OF OPERATING COSTS TAKES INTO ACCOUNT POWER AND WATER USE, AND MAINTENANCE AND REPAIRS. STUDY TO FIND RELATIONSHIP BETWEEN POPULATION DENSITY, REGIONAL AREA AND AVERAGE HAULING DISTANCE, AND TO CHECK RESULTS OF THESE STATED VALUES BY MEANS OF PRACTICAL EXAMPLE. (EI)

01-02-01327 REFUSE SERVICE CHARGES (COST(REFUSE-SERVICE))
SCHNEIDER, C.
THE AMERICAN CITY 68(5), P. 92-93 (1953). A REVIEW OF SEVERAL CITIES AND THE CHARGES THEY LEVY FOR CERTAIN SERVICES IN REFUSE COLLECTION AND DISPOSAL. THERE IS A TABLE BREAKING THESE DOWN IN CATEGORIES.

01-02-01395 USE OF COMPUTERS FOR REFUSE DISPOSAL METHODS AND COSTS (ECONOMICS)
SURVEYOR 123(3742), P. 59-60 (FEBRUARY 22, 1964). IN CONDUCTING EXPERIMENTS IN USE OF COMPUTERS ON PROBLEMS OF REFUSE DISPOSAL, PILOT PROGRAM WAS ESTABLISHED USING 25 REFUSE COLLECTION AREAS AND 18 DIFFERENT POSSIBLE REFUSE DISPOSAL SYSTEMS AND SITES. EXERCISE OCCUPIED 35 SEC OF COMPUTER TIME WHILE IT WOULD HAVE TAKEN ONE MAN, WITH ASSISTANCE OF STANDARD CALCULATOR, 6 MONTHS TO ACHIEVE SAME RESULT. IN EXERCISE OF GREATER MAGNITUDE, 110 REFUSE COLLECTION AREAS WERE CONSIDERED IN RELATION TO 65 ALTERNATIVE DISPOSAL SYSTEMS AND SITES, AND RESULTS WERE AVAILABLE IN ONLY FEW WEEKS OF WORK, WHICH IF PERFORMED MANUALLY WOULD HAVE OCCUPIED SEVERAL YEARS. (EI)

01-02-01464 PERFORMANCE BUDGETING - ITS VALUE AND SHORTCOMINGS (SANITARY-LANDFILL COST(OPERATING) COST(COLLECTION))
ERVIEN, H. G.
THE AMERICAN CITY 72(3), P. 129 (MARCH 1957). ALBUQUERQUE, NEW MEXICO, REPORTS SUCCESSFUL ADOPTION OF PERFORMANCE BUDGETING FOR CONTROL OF OPERATING COSTS. THE DEPARTMENT OF SANITATION HAS MADE A COMPILATION OF LUMP SUM COSTS (SALARIES, EXPENSES, AND CAPITAL IMPROVEMENTS). FOR THEIR 175,000 POPULATION, THE COST FOR REFUSE DISPOSAL IS $4.60 PER CAPITA PER YEAR. THE SANITARY LANDFILL METHOD OF DISPOSAL IS USED. (PHS)

01-02-01527 IN DEFENSE OF WASTE (SALVAGE)
TIME, (NOVEMBER 18, 1966). THE PRESENT ECONOMIC SITUATION AND HOW THE WASTE PROBLEM FITS INTO THIS ECONOMY ARE DESCRIBED. FACTORS WHICH ARE CONSIDERED ARE MATERIALS RELATIVELY CHEAPER THAN LABOR, PRINCIPLE OF USE RATHER THAN POSSESSION, LUXURY VS. NECESSITY, AND MATERIAL VS. HUMAN. (UC)

01-02-01852 AN EDITORIAL (ECONOMICS COLLECTION)
REFUSE REMOVAL JOURNAL 8(7), P. 12 (1965). OPERATION OF A REFUSE COLLECTION AND DISPOSAL BUSINESS IS NOT A SIMPLE MATTER OF COLLECTING AND SPENDING MONEY. FOR PRIVATE CONTRACTORS AND CITY GOVERNMENTS ALIKE THERE ARE TAXES, CHARGES, FACTORS OF COST AND MARGINS OF PROFITS AND LOSS. LISTED ARE SOME OF THE VARIOUS AREAS AND DATA OF A TYPICAL CONTRACTOR.

01-02-01877 FURTHER THOUGHTS ON REFUSE DISPOSAL IN GREAT BRITAIN (ECONOMICS)
STREINIGUNG
PUBLIC CLEANSING 53(9), P. 439 (1963). IN THIS ARTICLE WRITTEN UNDER AN ASSUMED NAME, THE AUTHOR TAKES ISSUE WITH AN ARTICLE WRRITTEN BY MR. SHULTZ'S THAT APPEARED IN THE JULY ISSUE OF PUBLIC CLEANSING. IN SO DOING HE OUTLINES A SIX-POINT PROGRAM THAT THE CLEANSING COMMITTEE SHOULD FOLLOW IN ATTACKING THE PROBLEMS OF REFUSE DISPOSAL.

01-02-01990 AN INVESTIGATION ON THE SIGNIFICANCE OF PLANT SIZE FOR REFUSE DISPOSAL BY INCINERATION OR COMPOSTING IN RURAL AREAS (INCINERATION HAULING(COST))
WUHRMANN, K.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY THE U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 20, (MAY 1964). THE SAFE DISPOSAL OF RESIDENTIAL AND INDUSTRIAL REFUSE IS NOT ONLY

AN URGENT HEALTH PROBLEM BUT ALSO AN ECONOMIC PROBLEM. FORMERLY IT SUFFICED IF ONE SIMPLY HAULED THESE MATERIALS OUT OF SEEING DISTANCE AND ALSO, IF POSSIBLE, OUT OF SMELLING DISTANCE. THE REST WAS LEFT TO NATURE. EVEN SMALL COMMUNITIES AND LESS DENSELY POPULATED AREAS CAN NO LONGER AVOID THE SAFE DISPOSAL OF THEIR REFUSE, WHICH FACT PLACES URGENT AND DIFFICULT PROBLEMS BEFORE THEM. THE FACT, KNOWN FROM INDUSTRY, THAT PLANT SIZE PLAYS A VERY IMPORTANT ROLE IN SPECIFIC OPERATING COSTS IS ESPECIALLY APPARENT IN REFUSE DISPOSAL PLANTS IN WHICH ONLY LOW VALUE PRODUCTS ARE TREATED. EVEN THE PER CAPITA INVESTMENT FOR THE PLANT ITSELF, WHETHER FOR COMPOSTING OR INCINERATION, INCREASES AS THE COMMUNITY SIZE DECREASES. PLANT CONSTRUCTION COSTS FOR A CITY OF 100,000 INHABITANTS IS APPROXIMATELY TWICE AS HIGH PER CAPITA AS IT IS FOR A LARGE METROPOLIS. THE SAME APPLIES TO ANNUAL OPERATING COSTS. IF THE PLANT IS BUILT ON A STILL SMALLER SCALE, THEN TODAY'S REQUIREMENTS FOR A COMPLETE, TOTALLY SATISFACTORY PLANT, DRIVE THE COSTS TO THE LIMIT THAT CAN BE BORNE. THERE IS AN UNAVOIDABLE DEMAND FOR CENTRALIZATION AND JOINT CONSTRUCTION, THAT IS, THE JOINING OF INDIVIDUAL COMMUNITIES IN A REGION. IT IS EVIDENT THAT THE REFUSE DESTINED FOR REGIONAL DISPOSAL PLANTS MUST BE TRANSPORTED GREATER DISTANCES, NOT ONLY IN COMPARISON WITH IMPERFECT DISPOSAL METHODS PRACTICED TILL NOW, BUT ALSO IN COMPARISON WITH PLANTS CONSTRUCTED FOR LARGE CITIES OR DENSELY POPULATED AREAS. IN FACT, UNTIL JUST RECENTLY, THERE HAS BEEN A TENDENCY TO CHOOSE UNREASONABLY LOW FIGURES FOR THE CALCULATION OF OPERATING EXPENSES OF REFUSE TREATMENT PLANTS WHICH HAS GIVEN RISE TO A FALSE IDEA OF THE EXISTING CONNECTION BETWEEN TRANSPORTING AND OPERATING COSTS - A CONNECTION IMPORTANT FOR REGIONAL PLANNING. OPTIMUM USE OF OPERATING FUNDS CAN OCCUR ONLY IF THE VARIOUS COST COMPONENTS ARE KNOWN ON THE BASIS OF EFFECTIVE VALUE BASED ON PRACTICAL EXPERIENCE. PROJECTED OPERATING COSTS OFTEN PROVE TO BE VERY ILLUSORY IN THIS NEW AREA OF SCIENCE. SAMPLE CALCULATIONS ARE INCLUDED TO ILLUSTRATE HIS ANALYSIS. (AUTH)

01-02-02012 PUBLIC CLEANSING COSTING
RUSCOE, J.
INSTITUTE OF PUBLIC CLEANSING A REVIEW OF THE NEED OF THE PUBLIC CLEANSING ADMINISTRATIONS TO BE EVER MINDFUL OF THE NEED TO REDUCE THE COSTS OF PUBLIC CLEANSING. LISTED ARE TABLES OF VARIOUS METHODS OF ARRIVING AT SOME OF THE COSTS FROM VARIOUS TOWNSHIPS.

01-02-02108 A MATHEMATICAL MODEL FOR THE OPTIMIZATION OF A WASTES MANAGEMENT SYSTEM (LINEAR-PROGRAMMING OPTIMIZATION ECONOMICS)
ANDERSON, L. E.
SANITARY ENGINEERING RESEARCH LABORATORY, UNIVERSITY OF CALIFORNIA, BERKELEY, SERL REPORT 68-1, (FEBRUARY 1968). THE REPORT IS A PROGRESS REPORT COVERING ONE PHASE OF A COMPREHENSIVE STUDY OF SOLID WASTE MANAGEMENT, RELATING TO THE DEVELOPMENT OF A LINEAR PROGRAMMING MATHEMATICAL MODEL FOR THE OPTIMIZATION OF A WASTES MANAGEMENT SYSTEM AND IS CONCERNED WITH THAT PART OF A WASTES COLLECTION-TREATMENT AND DISPOSAL MODEL DESCRIBED IN A PREVIOUS REPORT (SERL 67-7) WHICH DEALS WITH THE OPTIMIZATION OF THE FLOW OF WASTES FROM THE SOURCE TO FINAL DISPOSAL.

01 03 FINANCING

01-03-00954 FINANCING WATER, SEWAGE AND SOLID WASTE DISPOSAL
PUBLIC WORKS 98(10), P. 174 (1967). A NEW WAY TO FINANCE WATER, SEWER, AND GARBAGE DISPOSAL SYSTEMS IS NOW AVAILABLE TO UPPER PENINSULA (MICHIGAN) COMMUNITIES THROUGH AMENDMENTS TO ACT 185, P. A. OF 1957. THESE AMENDMENTS AUTHORIZE U. P. COUNTIES TO ESTABLISH DEPARTMENTS AND BOARDS OF PUBLIC WORKS FOR THE PURPOSE OF PROVIDING THESE SERVICES TO THE RESIDENTS OF A COUNTY.

01 04 REGULATIONS AND LEGAL ASPECTS

01-04-00127 REFUSE DISPOSAL BY CONTRACT EXTRAORDINARY (SANITARY-LANDFILL INCINERATION)
THE AMERICAN CITY 79(2), P. 38 (FEBRUARY 1964). ST. PETERSBURG, FLORIDA, HAS CALLED FOR BIDS TO DESIGN, FINANCE, CONSTRUCT AND OPERATE A SOLID WASTE DISPOSAL FACILITY TO RECEIVE 300 TONS PER DAY OVER A 20 YEAR PERIOD. THE CITY WILL PAY ON A TONNAGE BASIS FOR REFUSE DELIVERED AT THE SITE, PLUS A MINIMUM CHARGE PER WEEK ON THE BASIS OF 1500 TONS IF THEIR CREWS DELIVER LESS THAN THIS AMOUNT PER WEEK. ANY PROVEN PROCESS CAN BE PROPOSED, BUT CLAUSES IN THE SPECIFICATIONS APPEAR TO RULE OUT ALL BUT SANITARY-LANDFILL AND INCINERATION. CONTROL OF THE OPERATION WILL BE BY A COMMITTEE COMPOSED OF ONE MEMBER FROM THE CONTRACTOR, ONE FROM THE CITY, AND ONE SELECTED BY BOTH THE CITY AND THE CONTRACTOR.

01-04-00142 DISPOSAL MAKES VARIETY OF LOCAL ORDINANCES (LAW)
REFUSE REMOVAL JOURNAL 4(11), P. 24-26 (1961). TYPICAL PROVISIONS IN MUNICIPAL ORDINANCES FOR REGULATING THE DISPOSAL OF REFUSE ARE PRESENTED HERE AS A GUIDE TO LOCAL OFFICIALS IN DEVELOPING A NEW ORDINANCE OR REVISING AN OLD ONE. ORDINANCES ARE NOT REPRODUCED IN THEIR ENTIRETY BECAUSE IT IS MOST IMPROBABLE THAT ANY TWO CITIES ARE CONFRONTED WITH ALL OF THE SAME LOCAL CONDITIONS AND THEREFORE NEED ALL OF THE SAME PROVISIONS.

01-04-00198 THE SOLID WASTE DISPOSAL ACT (LAW)
OFFICE OF SOLID WASTE SERIES - SW-1 U.S. DEPT. OF HEALTH, EDUCATION, AND WELFARE TITLE II OF PUBLIC LAW 89-272-89 CONGRESS, S-306 OCTOBER 20, 1965.

01-04-00232 IMPACT OF THE SOLID WASTE DISPOSAL ACT (INCINERATION SANITARY-LANDFILL EMISSION(CONTROL) QUANTITY)
GILBERTSON, W. E.
OFFICE OF SOLID WASTES, U.S.P.H.S., WASHINGTON, D.C., PAPER D-4 (DECEMBER 1966). THE MANNER IN WHICH THE PUBLIC HEALTH SERVICE ADMINISTERS THE SOLID WASTE DISPOSAL ACT IS DESCRIBED. THE IMPACT OF QUANTITIES FORECAST IS DISCUSSED AND CURRENT STATUS IS SUMMARIZED.

01-04-00287 GRANTS FOR SOLID WASTE DISPOSAL PROJECTS (LAW)
FEDERAL REGISTER 31(61), PART III, (MARCH 30, 1966). RULES AND REGULATIONS PERTAINING TO GRANTS FOR SOLID WASTE PROJECTS UNDER THE SOLID WASTE DISPOSAL ACT ARE PRESENTED.

01-04-00542 REORGANIZATION CUTS REFUSE COLLECTION COSTS
PEDO, D. J.
PUBLIC WORKS 95(7), P. 110 (JULY 1964). IN SOUTH MILWAUKEE, WISCONSIN, THE REFUSE COLLECTION SCHEDULES AND ROUTES PROVED TO BE INSUFFICIENTLY FLEXIBLE TO MEET NEEDS OF POPULATION GROWTH AND DISRUPTIONS DUE TO HOLIDAYS, HEAVY SNOW, ETC. ITS REFUSE ORDINANCES WERE TOO VAGUE EITHER TO BE ENFORCED OR TO BE INTERPRETED BY CITIZENS. PUBLIC PRESSURE FOR A CHANGE WAS IMPLEMENTED THROUGH THE LOCAL NEWSPAPERS, PAMPHLETS DELIVERED BY THE SERVICE CREWS, AND THROUGH THE CITY COUNCIL. BASIC CHANGES IMPLEMENTED IN NEW ORDINANCES WERE- 1) BURNABLES WERE TO BE SEPARATED FROM NONBURNABLES IN DIFFERENT CONTAINERS. 2) SIZE AND LOCATION OF CONTAINERS WERE SPECIFIED. 3) BETTER HOUSEKEEPING OF STORAGE AREAS THROUGH THE USE OF RACKS AND OTHER DEVICES TO KEEP CONTAINERS OUT OF STANDING WATER, SNOW, AND MUD WAS SPECIFIED. (UC)

01-04-00965 DISPOSAL SITE OPERATION RAISES LIABILITY QUESTIONS
PUBLIC WORKS 100(1), P. 129 (1959). ORDINARILY, A MUNICIPAL CORPORATION WILL BE HELD LIABLE FOR INJURIES RESULTING FROM THE TORTIOUS CONDUCT OF AN INDEPENDENT CONTRACTOR IN THE PERFORMANCE OF A MUNICIPALITY'S NONDELEGABLE DUTIES.

MOREOVER, THE GENERAL RULE OF NONLIABILITY OF A MUNICIPALITY FOR ACTS OF AN INDEPENDENT CONTRACTOR HAS NO APPLICATION, WHERE THE WORK CONTRACTED TO BE PERFORMED WILL, IN ITS PROGRESS, HOWEVER CAREFULLY OR SKILLFULLY EXECUTED, BE NECESSARILY OR INTRINSICALLY DANGEROUS, OR CREATE A NUISANCE. HENDRIX V. CITY OF MARYVILLE, TENN. 431 S.W. 3D 292 WAS AN ACTION BY A LESSEE AGAINST TWO CITIES AND A COUNTY FOR DAMAGES SUSTAINED AS A RESULT OF THE MAINTENANCE AND OPERATION OF A REFUSE DISPOSAL SITE ADJACENT TO A GOLF COURSE AND RESIDENCE. THE TRIAL COURT DISMISSED THE ACTION AGAINST ONE OF THE CITIES ON THE BASIS THAT THE OTHER CITY WAS AN INDEPENDENT CONTRACTOR IN CONCLUSIVE CONTROL OF THE OPERATION OF THE DISPOSAL SITE. ON APPEAL, THE COURT CITED THE ABOVE RULES OF LAW AND THEN REMANDED THE CASE FOR A NEW TRIAL.

01-04-00969 RESEARCH ACTIVITIES OF THE SOLID WASTE PROGRAM OF THE PUBLIC HEALTH SERVICE
BREIDENBACH, A. W.
THE INTERNATIONAL SYMPOSIUM ON SOLID-LIQUID FLOW IN PIPES AND ITS APPLICATION TO SOLID WASTE COLLECTION AND REMOVAL, PHILADELPHIA, PENNSYLVANIA, (MARCH 4-6, 1968). A DISCUSSION OF THE SCOPE OF THE SOLID WASTE PROBLEM AND THE EFFORTS OF THE SOLID WASTE PROGRAM IN SOLVING THE PROBLEM. THE SOLID WASTE ACT OF 1965 IS OUTLINED. RESEARCH EFFORTS FUNDED BY THE SOLID WASTE PROGRAM ARE DESCRIBED. TABLES ARE PRESENTED OUTLINING THE AMOUNTS OF MONEY GRANTED FOR VARIOUS ACTIVITIES AND TYPES OF GRANTS MADE.

01-04-01012 COOPERATION IS KEY TO SOLID WASTES MANAGEMENT (BULKY-WASTE VECTOR PEST SALVAGE LAW)
GILBERTSON, W. E.
PUBLIC WORKS 97(12), P. 130 (1966). SINCE THE ENACTMENT OF THE SOLID WASTES ACT BY CONGRESS THERE ARE ABOUT 70 INDIVIDUAL GRANTS TO FEDERAL, STATE AND PRIVATE GROUPS TO STUDY SOLID WASTES DISPOSAL. FEDERAL RESPONSIBILITIES FOR WORKING WITH LOCAL AND STATE AGENCIES TO STRENGTHEN TECHNICAL CAPABILITIES ARE BEING HANDLED BY THE OFFICE OF SOLID WASTES PERSONNEL. ANY MEANS TO REDUCE THE VOLUME OF WASTES THAT IMPROVE HEALTH HAZARDS AND IMPROVE THE SCENIC VALUE OF OUR ENVIRONMENT ARE BEING STUDIED TECHNICALLY AND ECONOMICALLY. THE POSSIBILITIES OF BY-PRODUCTS SUCH AS WASTE HEAT, POWER GENERATION, SCRAP METALS ARE BEING EXAMINED ESPECIALLY THE PROBLEMS THAT INVOLVE REMOVING TITLE TO JUNKED AUTOS WHICH IS RAPIDLY BECOMING OUR GREATEST PROBLEM.

01-04-01074 WHAT YOU SHOULD KNOW ABOUT THE NEW " CLEAN-AIR " ACT (POLLUTION(AIR) EMISSION(CONTROL) LAW)
PUBLIC WORKS 95(5), P. 156, 158, 160, 161 (1964). ENACTMENT OF LEGISLATION BY CONGRESS HAS GIVEN THE SECRETARY OF HEALTH, EDUCATION AND WELFARE THE POWER TO STOP AIR-BORNE CONTAMINATION WHICH LOCAL AGENCIES HAVE BEEN UNABLE TO ENFORCE. UNDER THE NEW LAW THE HEW HAS TO CONSIDER THE EXTENT OF THE ACTUAL OR POTENTIAL AIR POLLUTION PROBLEM AND THE FINANCIAL AID NEED IN APPROVING REQUEST. ASIDE FROM PROVIDING MONEY FOR DIRECT GRANTS THE LAW AUTHORIZES A " NATIONAL RESEARCH AND DEVELOPMENT PROGRAM " THAT ALLOWS FUNDING FOR INVESTIGATION AND DEMONSTRATIONS. THE ACT EMPOWERS HEW TO APPROACH STUBBORN POLLUTERS THROUGH STATE AND LOCAL LEVELS TO CLEAN UP THEIR POLLUTION.

01-04-01190 DAVENPORT'S COMPREHENSIVE REFUSE COLLECTION ORDINANCE (LAW)
THE AMERICAN CITY 73(1), P. 9 (JANUARY 1958). THE ENTIRE REFUSE COLLECTION ORDINANCE FOR DAVENPORT, IOWA, IS GIVEN. THE ORDINANCE COVERS REFUSE STORAGE AND COLLECTION AND INCLUDES FEES AND PENALTIES. (PHS)

01-04-01291 U.S. SOLID WASTE DISPOSAL ACT (LAW)
PUBLIC CLEANSING 56(3), P. 127-129 (1966). A SUMMARY OF THE UNITED STATES SOLID WASTES DISPOSAL ACT OF 1965 IS THE FIRST MAJOR NATIONAL EFFORT TO CONTROL THE VAST AMOUNT OF REFUSE BEING ACCUMULATED IN THIS COUNTRY.

01-04-01477 THE WATER LAW AND ITS EFFECTS ON THE DISPOSAL OF REFUSE (POLLUTION(WATER) COMPOSTING INCINERATION)
PREUNER, R.
STAEDTEHYGIENE 11, P. 193-195 (1960). THE AUTHOR DISCUSSES THE POLLUTION OF GROUND AND SURFACE WATER FROM REFUSE HEAPS AND THE APPLICATION TO THIS METHOD OF DISPOSAL OF REFUSE OF VARIOUS SECTIONS OF THE 1957 WATER LAW, ESPECIALLY SECTIONS REGARDING THE USE OF WATERS AND ALTERATIONS IN THE COMPOSITION OF WATERS. DISPOSAL OF REFUSE BY INCINERATION AND BY COMPOSTING IS THEN DISCUSSED, WITH REFERENCE TO THE RISKS OF POLLUTION AND PRECAUTIONS REQUIRED IN BOTH THESE METHODS. (WPA)

01-04-01557 WICHITA ORDINANCE (COLLECTION LAW)
REFUSE REMOVAL JOURNAL 1(4), P. 15 (APRIL 1958). THE IMPORTANT SECTIONS OF THE REFUSE STORAGE AND COLLECTION ORDINANCE ADOPTED BY THE CITY OF WICHITA, KANSAS, IN FULL. (PHS)

01-04-01564 DAVENPORT WRITES NEW REFUSE COLLECTION, DISPOSAL ORDINANCE (LAW)
GRAHAM, R. C.
REFUSE REMOVAL JOURNAL 1(3), P. 16 (MARCH 1958). COMPLETE TEXT OF THE REFUSE COLLECTION ORDINANCE FOR DAVENPORT, IOWA. (PHS)

01-04-01567 REFUSE LAWS ARE A WEB OF CONTRADICTIONS (LAW)
REFUSE REMOVAL JOURNAL 1(3), P. 9 (MARCH 1958). A BRIEF REVIEW OF LOCAL REFUSE COLLECTION ORDINANCES AND REGULATIONS WITH EXAMPLES OF SOME OF THEIR PECULIARITIES. (PHS)

01-04-01605 PUBLIC ACCEPTANCE OF DISPOSAL IS DIFFICULT (TEPEE SANITARY-LANDFILL LEGAL)
REFUSE REMOVAL JOURNAL 1(9), P. 7 (SEPTEMBER 1958). A COURT CASE BROUGHT BY A PHILADELPHIA DISPOSAL SITE OPERATOR AGAINST PROTESTING NEIGHBORS WHO USED A " HUMAN BARRICADE " TO BLOCK TRUCKS FROM ENTERING THE LANDFILL GROUNDS. (PHS)

01-04-01615 KANSAS CITY ENACTS NEW REFUSE ORDINANCE (LAW)
REFUSE REMOVAL JOURNAL 1(11), P. 10 (NOVEMBER 1958). THE COMPLETE TEXT OF A COMPREHENSIVE NEW ORDINANCE ON LITTERING AS ADOPTED BY KANSAS CITY, MISSOURI. (PHS)

01-04-01645 REFUSE BOOK SHOWS GREAT RANGE OF U.S. ORDINANCES PART 1 (LEGAL LAW)
REFUSE REMOVAL JOURNAL 1(4), P. 17 (APRIL 1959). A CONTINUATION OF SOME OF THE REGULATIONS PERTAINING TO THE COLLECTION AND DISPOSAL OF REFUSE.

01-04-01647 REFUSE BOOK SHOWS GREAT RANGE OF U.S. ORDINANCES PART 2 (LEGAL LAW)
REFUSE REMOVAL JOURNAL 1(5), P. 14 (MAY 1958). SOME EXAMPLES OF DIVERSE REGULATIONS GOVERNING REFUSE COLLECTION BY BOTH PUBLIC AND PRIVATE AGENCIES.

01-04-01653 REFUSE BOOK SHOWS GREAT RANGE OF U.S. ORDINANCES PART 3 (LEGAL LAW)
REFUSE REMOVAL JOURNAL 2(7), P. 16 (JULY 1959). THE REFUSE COLLECTION ORDINANCES OF SEVERAL U.S. CITIES ARE CITED. GREAT VARIANCE IN THESE IS NOTED.

01-04-01669 REFUSE BOOK SHOWS GREAT RANGE OF U.S. ORDINANCES PART 4 (LAW)
REFUSE REMOVAL JOURNAL 2(10), P. 25 (OCTOBER 1959). A CONTINUATION OF SOME OF THE VARIOUS ORDINANCES GOVERNING REFUSE COLLECTION AND DISPOSAL.

01-04-01717 NEW JERSEY ASSOCIATION JOINS USE TAX PROTEST (LAW)
REFUSE REMOVAL JOURNAL 3(6), P. 10 (JUNE 1960). TWO MEMBERS OF THE NEW JERSEY STATE MUNICIPAL CONTRACTORS ASSOCIATION HAVE JOINED FORCES WITH CALIFORNIA GROUPS IN PROTESTING THE IMPOSITION OF THE FEDERAL HIGHWAY USE TAX. (PHS)

01-04-01729 CALIFORNIA GROUP FIGHTS HIGHWAY ACT'S TAX LAW (LAW COLLECTION)
REFUSE REMOVAL JOURNAL 3(1), P. 10 (JANUARY 1960). THE SAN FERNANDO VALLEY RUBBISH COLLECTORS ASSOCIATION IS ATTEMPTING TO ELIMINATE PROVISIONS OF THE FEDERAL HIGHWAY USE TAX CONSIDERED DISCRIMINATORY AGAINST REFUSE HAULERS. ALTHOUGH BOTH TRAVERSE THE SAME STREETS AND AVENUES, TAX IS LEVIED ON THE HEAVY REFUSE COLLECTING VEHICLES BUT NOT ON OTHER PUBLIC SERVICE VEHICLES OF LIGHTER WEIGHT. (PHS)

01-04-01736 ASTORIA'S ORDINANCE PROVIDES FOR CONTRACT (LAW)
REFUSE REMOVAL JOURNAL 2(11), P. 18 (NOVEMBER 1959). THE RECENTLY PASSED ASTORIA ORDINANCE IS GIVEN. IT SETS UP A SINGLE CONTRACT, PROVIDES CONDITIONS HAULER MUST MEET, AND CONTAINS MEASURES TO PROTECT HIM. (PHS)

01-04-01738 PENNSYLVANIA GETS NEW SOLID WASTES MANAGEMENT ACT (LAW)
SOLID WASTES MANAGEMENT/RRJ 12(4), P. 14, 26, 48-49 (1969). AN ACT PROVIDING FOR THE PLANNING AND REGULATION OF SOLID WASTE STORAGE, COLLECTION, TRANSPORTATION, PROCESSING AND DISPOSAL SYSTEMS, REQUIRING MUNICIPALITIES TO SUBMIT PLANS FOR SOLID WASTE MANAGEMENT SYSTEMS IN THEIR JURISDICTION, AUTHORIZING GRANTS TO MUNICIPALITIES, REQUIRING PERMITS FOR OPERATING PROCESSING OR DISPOSAL SYSTEMS, IMPOSING DUTIES ON AND GRANTING POWERS TO MUNICIPALITIES, AUTHORIZING THE DEPARTMENT OF HEALTH TO ADOPT RULES, REGULATIONS, STANDARDS AND PROCEDURES, CREATING AN ADVISORY COMMITTEE, PROVIDING REMEDIES, PRESCRIBING PENALTIES AND MAKING AN APPROPRIATION. THE PENNSYLVANIA SOLID WASTE MANAGEMENT ACT IS A FORWARD-LOOKING AND FAR-REACHING DOCUMENT IN ITS OUTLOOK AND STRONGLY ENDORSES " UTILIZATION OF THE CAPABILITIES OF PRIVATE ENTERPRISE IN ACCOMPLISHING THE OBJECTIVES OF AN EFFECTIVE PROGRAM ". UNFORTUNATELY, THE 22 MEMBER ADVISORY COMMITTEE, APPOINTED BY THE GOVERNOR, UNDER THE ACT, DOES NOT INCLUDE A MUNICIPAL SANITATION EXECUTIVE OR A REFUSE CONTRACTOR. THE ACT IS PRESENTED IN ITS ENTIRETY.

01-04-01758 WICHITA'S ORDINANCE ON SANITATION PROCEDURES (LAW)
REFUSE REMOVAL JOURNAL 6(2), P. 27 (1963). SOME EXCERPTS FROM CITY ORDINANCES THAT ARE FELT TO BE NECESSARY FOR RELIABLE REFUSE COLLECTION SYSTEM FOR BOTH COMMERCIAL AND HOME COLLECTION.

01-04-01761 NEW YORK STATE AMENDS SANITARY CODE FOR 1963 (LAW)
REFUSE REMOVAL JOURNAL 6(1), P. 12, 28 (1963). UNTIL 1963 NEW-YORK STATE HAD OVER 1500 OPEN REFUSE DUMPS WHICH RECEIVED OVER 10,000 LOADS OF REFUSE DAILY WITHOUT ANY GOVERNING REGULATIONS. NEW STATE REGULATIONS LIMIT OPEN DUMPING TO ONLY APPROVED SITES, LEGITIMATE REFUSE HAULERS, CONTROLLED BY LOCAL OR STATE PUBLIC HEALTH OFFICERS.

01-04-01781 NEW YORK STATE HEALTH DEPARTMENT PUTS CURB ON OPEN DUMPS (OPEN DUMP SANITARY-LANDFILL LAW INCINERATION POLLUTION(WATER) VECTOR(CONTROL) COST(DISPOSAL) BULKY-WASTE)
BASKOUS, A. A.
REFUSE REMOVAL JOURNAL 6(12), P. 8 (1963). ON JANUARY 1, 1963, NEW-YORK STATE SANITARY CODE WENT INTO EFFECT. THIS WILL BRING THE OPERATION OF ALL REFUSE DISPOSAL OPERATIONS UNDER THE CONTROL OF THE STATE PUBLIC HEALTH OFFICE. ALL LANDFILL OPERATION WILL HAVE TO BE CARRIED OUT ACCORDING TO THE REGULATIONS OF THE STATE SANITARY CODE.

01-04-01823 SOLID WASTE BILL TO PROVIDE $43 MILLION (LAW HISTORY COMPOSTING COLLECTION INCINERATION SANITARY-LANDFILL)
REFUSE REMOVAL JOURNAL 8(5), P. 16 (1965). AN ARTICLE DESCRIBING SOME OF HISTORICAL BACKGROUND AND THE AREAS IN WHICH TECHNOLOGY MAY BE BETTER USED TO IMPROVE OUR METHODS OF SOLID WASTE DISPOSAL. THESE DESCRIPTIONS WERE MADE AT THE TIME THE SOLID WASTE DISPOSAL ACT OF 1964 WAS INTRODUCED TO THE HOUSE OF REPRESENTATIVES.

01-04-01879 EDITORIAL - RESEARCH (LAW)
PUBLIC CLEANSING 54(9), P. 1127 (1964). THE EDITOR PRAISES THE FORMATION OF A RESEARCH SUBCOMMITTEE, BY PUBLIC CLEANSING INSTITUTE. IT IS THE INTENTION OF THE COMMITTEE TO FOSTER THE NECESSARY RESEARCH AND TECHNOLOGY THAT IS NEEDED TO MEET THE CHALLENGE OF THE SOLID WASTE DISPOSAL PROBLEM. THE COMMITTEE IS COMPARED WITH THE A.P.W.A. IN THE U.S.A. MENTION IS MADE OF THE SOLID WASTE DISPOSAL ACT OF 1965 IN THE U.S.A. AND IF NECESSARY THE BRITISH SHOULD CONSIDER A SIMILAR PROGRAM.

01-04-01905 SOLID WASTE PROGRAMS (LAW)
REFUSE REMOVAL JOURNAL 8(12), P. 20 (1965). IN HIS MESSAGE TO CONGRESS ON NATURAL BEAUTY, PRESIDENT JOHNSON EMPHASIZED THE NEED FOR PROPER SOLID WASTE DISPOSAL AS A VITAL FACTOR IN MAINTAINING AND IMPROVING THE HEALTH OF OUR NATION AND THE BEAUTY OF THE ENVIRONMENT IN WHICH WE LIVE. HE POINTED OUT THAT- "CONTINUING TECHNOLOGICAL PROGRESS AND IMPROVEMENT IN METHODS OF MANUFACTURE, PACKAGING, AND MARKETING OF CONSUMER PRODUCTS HAS RESULTED IN AN EVER-MOUNTING INCREASE OF DISCARDED MATERIAL. WE NEED TO SEEK BETTER SOLUTIONS TO THE DISPOSAL OF THESE WASTES." AND HE RECOMMENDED LEGISLATION TO- "ASSIST THE STATES IN DEVELOPING COMPREHENSIVE PROGRAMS FOR SOME FORMS OF SOLID WASTE DISPOSAL, AND PROVIDE FOR RESEARCH AND DEMONSTRATION PROJECTS LEADING TO MORE EFFECTIVE METHODS FOR DISPOSING OF OR SALVAGING SOLID WASTES."

01-04-01916 WOMEN VOTERS TACKLE TOWN'S REFUSE DILEMMA (LAW SANITARY-LANDFILL)
REFUSE REMOVAL JOURNAL 8(9), P. 20 (1965). AN ORDINANCE PASSED BY A NEIGHBORING TOWNSHIP MAY DENY THE TOWN OF SUMMIT, NEW-JERSEY, ACCESS TO THE LANDFILL IT HAS BEEN USING FOR SO LONG. ON HEARING OF THIS PROBLEM THE WOMEN'S LEAGUE OF VOTERS FROM SUMMIT, ORGANIZED A COMMITTEE TO STUDY THE REFUSE DISPOSAL PROBLEM. ALTHOUGH NO TIME LIMIT HAS BEEN PLACED ON RESTRICTING SUMMIT'S DISPOSAL OF REFUSE AT NEIGHBORING SITES, THE LEAGUE RECOMMENDS LOOKING AT OTHER LANDFILL SITES AND OTHER METHODS SUCH AS COMPACTION FOR RAIL-HAUL AND POSSIBLY AN INCINERATOR.

01-04-01941 COURT HOLDS CITY LIABLE FOR DAMAGE (SANITARY-LANDFILL)
REFUSE REMOVAL JOURNAL 9(1), P. 36 (JANUARY 1966). A WEST VIRGINIA COURT RULED THAT A MUNICIPALITY WAS LIABLE FOR DAMAGES CAUSED BY A PORTION OF ITS LANDFILL WHEN IT WASHED INTO A NEARBY RESIDENTIAL AREA. A HOMEOWNER SUED THE CITY OF HINTON, W. VA., (POPULATION 5,100) FOR DAMAGES TO HIS PROPERTY RESULTING FROM NEGLIGENT OPERATION OF THE CITY DUMP. TESTIMONY BROUGHT OUT THAT THE DUMP WAS IN AN UNSATISFACTORY LOCATION AND FORMED A HAZARD BECAUSE IT WAS ON TOO STEEP AN INCLINE. IT WAS SAID CRACKS WERE APPEARING OWING TO A SETTLING PROCESS AND PORTIONS OF THE DISPOSAL SITE WOULD BREAK OFF. FURTHERMORE, THE MUNICIPALITY WAS SAID TO BE AWARE OF THE CONDITIONS.

01-04-02009 REPORT OF THE WORKING PARTY ON REFUSE COLLECTION, LEGAL AND ADMINISTRATIVE ASPECTS (LAW)
69TH ANNUAL CONF OF THE INSTITUTE OF PUBLIC CLEANSING, BLACKPOOL, (JUNE 6-9, 1967). THIS REPORT IS A GENERAL REVIEW OF THE LEGAL RESPONSIBILITY, NUMBER OF PERSONNEL, VEHICLES, POPULATION SERVICED, AND TYPES AND CLASSIFICATIONS OF REFUSE THAT THE PUBLIC CLEANSING DEPARTMENTS MUST DEAL WITH IN THE COURSE OF THEIR DUTIES.

01-04-02142 ILLINOIS MEASURE AIMS AT UPGRADING DISPOSAL (LAW)
REFUSE REMOVAL JOURNAL 9(2), P. 18 (FEBRUARY 1966). ILLINOIS HEALTH OFFICIALS WILL BEGIN ENFORCING A NEW LAW DESIGNED TO ELIMINATE OPEN AND UNSANITARY REFUSE DUMPING IN THE STATE. UNDER THE NEW LAW THE HEALTH DEPARTMENT IS EMPOWERED TO PREPARE AND ADOPT MINIMUM STANDARDS FOR THE LOCATION, DESIGN, CONSTRUCTION, OPERATION, AND MAINTENANCE OF REFUSE DISPOSAL SITES AND FACILITIES.

01-04-02165 D.P.W. GIVEN OK TO DISPOSE OF SOLID WASTE MATERIAL
PATTERSON, R.
BOSTON SUNDAY GLOBE 196(76), P. 31-32 (SEPTEMBER 14, 1969). RECENTLY GOVERNOR SARGENT SIGNED A BILL AUTHORIZING THE STATE DEPARTMENT OF PUBLIC WORKS TO DISPOSE OF SOLID WASTES, A MEASURE AIMED AT HELPING COMMUNITIES WHICH SUFFER FROM LACK OF ADEQUATE FACILITIES. THE BILL ALLOWS LATITUDE IN SELECTION OF THE TYPE OF FACILITIES AND MODE OF OPERATION AND PERMITS EACH MUNICIPALITY TO REVIEW AND APPROVE BUDGETS. PROVISIONS ARE MADE FOR PAYMENT IN LIEU OF

TAXES TO THE COMMUNITY IN WHICH A FACILITY WOULD BE LOCATED. THE LEGISLATION HAS MET WITH MIXED REACTIONS. LISTED ARE SOME OF THE VARIOUS PROBLEMS THAT HAVE BEEN ENCOUNTERED BY AN EIGHT COMMUNITY EFFORT TO SOLVE THEIR REFUSE DISPOSAL PROBLEMS.

01-04-02173 PUBLIC CORPORATION PROPOSED TO HANDLE SOLID WASTES (LAW REGIONAL-APPROACH)
COMPOST SCIENCE 9(2), P. 5-6 (SUMMER 1968). PROPOSED LEGISLATION IN THE STATE OF NEW YORK WOULD CREATE A PUBLIC CORPORATION FOR THE PURPOSE OF IMPROVING THE HANDLING OF SOLID WASTES AND REDUCING ENVIRONMENTAL POLLUTION. THE COMPLETE TEXT OF THE BILL IS PRESENTED.

01 05 REGIONAL APPROACHES TO PROBLEMS

01-05-00068 REFUSE DISPOSAL AS REGIONAL PROBLEM (SURVEY)
ZEHNDER, E.
ABFALLBESEITIGUNG ALS REGIONALES PROBLEM, BRENNSTOFF-WAERME-KRAFT 17(8), P. 375-378 (AUGUST 1965). TECHNICAL AND ECONOMIC CONSIDERATIONS SHOULD GUIDE COMMUNITY DISPOSAL OF REFUSE. RULES ALONE CAN NOT SOLVE PROBLEM WHICH REQUIRES AUTHORITY TO PLAN SENSIBLE AND ECONOMICAL REFUSE DISPOSAL POLICY. SOLUTIONS HAVE TO BE ACCEPTABLE TO VARIED LOCAL POLITICAL GROUPS. (EI)

01-05-00084 REGIONAL APPROACH THE BEST SOLUTION (INCINERATOR SANITARY-LANDFILL GRINDER(GARBAGE))
THE AMERICAN CITY 80(5), P. 44 (MAY 1965). THE DETROIT METROPOLITAN AREA REGIONAL PLANNING COMMISSION ARGUES THAT A METROPOLITAN REGION CAN BEST SOLVE ITS REFUSE PROBLEMS BY COMBINING THE EFFORTS OF THE MUNICIPALITIES ON A REGION-WIDE SCALE. IN ITS NEW REPORT, IT ALSO RECOMMENDS PUBLIC OWNERSHIP AND OPERATION OF DISPOSAL FACILITIES - LIMITING DUMPS IN THE DETROIT AREA AND UTILIZING LANDFILLS, INCINERATORS, AND ON-SITE DISPOSAL METHODS SUCH AS DOMESTIC INCINERATORS AND GARBAGE GRINDERS. (UC)

01-05-00147 A REGIONAL APPROACH TO REFUSE DISPOSAL (INCINERATOR COST(CAPITAL) COST(OPERATING))
THE AMERICAN CITY 79, P. 94-95 (JUNE 1964). A 750 TON/DAY CAPACITY INCINERATOR WAS BUILT TO SERVE NEW HAVEN, CONN. AND TWO ADJOINING TOWNS OF HAMDEN AND EAST HAVEN. THE FORMULA USED FOR CAPITAL COST DISTRIBUTION WAS BASED ON A SURVEY OF HOW MUCH REFUSE EACH COMMUNITY WOULD CONTRIBUTE. OPERATING COSTS ARE ALLOCATED FROM THE ACTUAL TONNAGES DELIVERED.

01-05-00182 LOOKING TO FUTURE WITH REGIONAL REFUSE DISPOSAL PLAN (REGIONAL SANITARY-LANDFILL INCINERATION POLLUTION(WATER) POLLUTION(AIR))
KORBITZ, W. E.
PUBLIC WORKS 98(6), P. 120-121 (JUNE 1967). SEVEN GOVERNMENTAL AGENCIES IN OMAHA AREA ARE DEVELOPING PLANS FOR REGIONAL REFUSE DISPOSAL STUDY COVERING FOUR-COUNTY OMAHA METROPOLITAN AREA. STUDY MUST DETERMINE METHODS OF DISPOSAL FOR INDEFINITE FUTURE RATHER THAN FOR ONLY 5 OR 10 YR. MOST ECONOMICAL METHODS MUST BE DETERMINED AND USED, AND MOST ECONOMICAL HAUL DISTANCES. AIR POLLUTION AND WATER POLLUTION POSSIBILITIES FROM DISPOSAL FACILITIES MUST BE MINIMIZED. (EI)

01-05-00207 WE PUT PROGRESS ABOVE POLITICS (SANITARY-LANDFILL COST(OPERATING))
FISHER, F. E.
THE AMERICAN CITY 83(7), P. 113-115 (JULY 1968). A REGIONAL APPROACH TO REFUSE DISPOSAL IS DESCRIBED. FOUR TOWNSHIPS AND THE BOROUGH OF STATE COLLEGE, PENNSYLVANIA COMBINED TO OPERATE A LANDFILL. LEGAL PROBLEMS ASSOCIATED WITH ORGANIZING THE PROJECT ARE DISCUSSED.

01-05-00210 METROPOLITAN PLANNING FOR SOLID WASTE
ZEIZEL, A. J.
PLANNING 1967 P. 221-225, AM SOC OF PLANNING OFFICIALS (1967). THE NEED FOR COORDINATED PLANNING FOR SOLID WASTE DISPOSAL ON A REGIONAL SCALE IS BEING RECOGNIZED BY ALL LEVELS OF GOVERNMENT. HOWEVER, PLANS AND POLICIES FOR SOLID WASTE DISPOSAL AT THE LOCAL, STATE, AND REGIONAL LEVELS, IN GENERAL, STILL REMAIN TO BE FORMULATED. THE FEDERAL GOVERNMENT HAS RECOGNIZED ITS RESPONSIBILITIES IN THIS FIELD. IN ADDITION TO FORMALLY SUPPORTING THE INITIATION OF INTERLOCAL AND INTERSTATE SOLID WASTE DISPOSAL ACTIVITIES, GRANTS ARE NOW BEING MADE TO STATE AND INTERSTATE PLANNING AGENCIES TO FACILITATE SURVEYS OF SOLID WASTE DISPOSAL PRACTICES AND PROBLEMS AND THE DEVELOPMENT OF REGIONAL DISPOSAL PLANS. THE MAGNITUDE OF THE SOLID WASTE DISPOSAL PROBLEM IN METROPOLITAN AREAS HAS REACHED THE POINT WHERE OUR SOCIETY IS DEMANDING A SOLUTION. COMPREHENSIVE METROPOLITAN PLANNING CAN CONTRIBUTE TO THIS SOLUTION. WHAT IS NEEDED IS THE RECOGNITION OF THESE RESPONSIBILITIES BY THE PLANNING PROFESSION.

01-05-00229 NEW JERSEY REVIEW TRAINING PROGRAM AND LONG TERM EVALUATION OF SANITARY LANDFILL (QUANTITY SANITARY-LANDFILL INCINERATION)
ZEMLANSKY, J.
REFUSE REMOVAL JOURNAL 10(11), P. 22, 34 (NOVEMBER 1967). THE APPROACH USED BY NEW JERSEY TO IMPROVE SOLID WASTE DISPOSAL PRACTICES IS DESCRIBED.

01-05-00310 NEW APPROACH TO RURAL REFUSE COLLECTION (REGIONAL-APPROACH)
GARRISON, W. T. + GAY, O. F. + BOGUE, M.
PUBLIC WORKS 95(6), P. 121-123 (JUNE 1964). MANY AREAS OF MADISON COUNTY, ALABAMA, ARE CONSIDERED RURAL ONLY BECAUSE THEY ARE NOT WITHIN MUNICIPAL BOUNDARIES. IN OTHER RESPECTS THEY ARE IDENTICAL TO MUNICIPAL AREAS. TO MEET THEIR PECULIAR PROBLEM, DETACHABLE BULK-STORAGE REFUSE CONTAINERS (OF 6 OR 8 CU-YDS) ARE PLACED AT INTERSECTIONS AND OTHER LOCATIONS ALONG COUNTY ROADS AND HIGHWAYS IN EACH RURAL AREA. THE CONTAINERS WERE PURCHASED BY CONTRIBUTIONS FROM THE RESIDENTS IN EACH AREA, AND A SPECIALLY EQUIPPED COMPACTION TYPE TRUCK WHICH MECHANICALLY EMPTIES THE CONTAINERS WAS PURCHASED BY THE COUNTY. LARGE CONTRIBUTIONS FOR CONTAINERS WERE DISCOURAGED, WHILE EVERYBODY IN THE COMMUNITY WAS PROVIDED WITH AN OPPORTUNITY TO CONTRIBUTE, NO MATTER HOW LITTLE. THIS GENERATED A SENSE OF PRIDE, POSSESSION, AND OWNERSHIP IN THE LOCAL CONTAINER ON THE PART OF EVERY INDIVIDUAL IN THE COMMUNITY. THE CONTAINERS WERE OVERLOADED AT FIRST, BUT LATER THE TENDENCY TO OVERLOAD SUBSIDED. AT THE END OF THE FIRST YEAR, 46 CONTAINERS WERE IN USE. EIGHT MORE WERE PUT INTO SERVICE IN 1963. THE COST OF THE 53 CONTAINERS WAS APPROXIMATELY $28,850. ONE WAS PURCHASED BY A LOCAL FIRM FOR PUBLIC USE. SIX CU-YD CONTAINERS COST $435 AND 8 CU-YD CONTAINERS COST $525. (UC)

01-05-00403 MUNICIPAL SOLID-WASTE DISPOSAL - PART X - THE AREA-WIDE APPROACH TO REFUSE DISPOSAL (COLLECTION REGIONAL-APPROACH)
DOVE, L. A.
THE AMERICAN CITY 77(11), P. 112 (NOVEMBER 1962). DISCUSSES THE AREAWIDE APPROACH TO REFUSE DISPOSAL. INCLUDES - (1) THE EFFECTS OF REFUSE DISPOSAL ON PUBLIC HEALTH - BREEDING VECTORS OF HUMAN DISEASE AND CREATING WATER AND AIR POLLUTION. (2) THE EFFECTS OF REFUSE DISPOSAL ON STREET AND HIGHWAY SYSTEMS. (3) LEGISLATIVE ACTS AND POLICY MEASURES A REGIONAL BODY SHOULD CONSIDER WITH REGARD TO AREAWIDE REFUSE DISPOSAL. (4) FIELD AND OFFICE STUDIES AND SURVEYS TO REVIEW THE OVERALL PROBLEM AND REORGANIZE DISPOSAL METHODS IN A MORE LOGICAL MANNER. (5) REGULATING AND FINANCING AREA-WIDE REFUSE DISPOSAL. (PHS)

01-05-00590 A WORKABLE SOLUTION TO REFUSE DISPOSAL
THE AMERICAN CITY 77(11), P. 112 (NOVEMBER 1962). A STUDY BY THE REFUSE DISPOSAL STUDY COMMITTEE, INSTITUTE OF LOCAL GOVERNMENT (UNIVERSITY OF PITTSBURGH) RECOMMENDS (1) THE COUNTY SHOULD ASSUME RESPONSIBILITY FOR REFUSE DISPOSAL

FACILITIES AND HAVE EXCLUSIVE JURISDICTION OVER THEM. (2) COLLECTION SHOULD REMAIN THE RESPONSIBILITY OF EACH BOROUGH, CITY, AND TOWNSHIP. (3) ALL ACCEPTABLE METHODS RATHER THAN A SINGLE SYSTEM SHOULD BE USED. (4) EXISTING SYSTEMS WHICH ARE DETERMINED AS BEING SUITABLE FOR INCLUSION IN THE COUNTY SYSTEM SHOULD BE BOUGHT, THOSE DETERMINED UNSUITABLE SHOULD BE CLOSED, AND THOSE SUITABLE BUT NOT INCLUDED SHOULD BE CERTIFIED AND ALLOWED TO OPERATE FOR FIVE YEARS. (5) CAPITAL INVESTMENTS FINANCED FROM GENERAL COUNTY TAXATION AND OPERATING COSTS FINANCED BY UNIFORM FEES SHOULD BE ASSESSED AGAINST MUNICIPALITIES AND PRIVATE HAULERS. (UC)

01-05-00618 URGE COOPERATION BETWEEN REGIONAL PLANNERS AND PRIVATE CONTRACTORS (INCINERATION SANITARY-LANDFILL SITE-SELECTION REGIONAL-APPROACH)
REFUSE REMOVAL JOURNAL 10(2), P. 6-7 (FEBRUARY 1967). THE EFFORTS BY SEVEN NEW JERSEY CITIES TO REACH A DECISION ON A JOINT REFUSE HANDLING METHOD IS DISCUSSED.

01-05-00656 STATE IS FAR BEHIND IN USE OF FACILITIES (SANITARY-LANDFILL COMPOSTING INCINERATION COLLECTION REGIONAL

ROBINSON, C. M. + DAY, D. E.
REFUSE REMOVAL JOURNAL 10(4), P. 14, 28, 42 (APRIL 1967). A SUMMARY OF THE PROBLEMS FACING THE STATE OF OHIO AT THE PRESENT AND IN THE FUTURE. COMPOSTING, INCINERATION, AND LANDFILL ARE ACCEPTABLE DISPOSAL METHODS IN OHIO. ESTIMATED COSTS OF OPERATION FOR LANDFILL AND INCINERATION ARE PRESENTED. THE FUTURE PROGRAM FOR THE STATE AND ITS GOALS ARE LISTED.

01-05-00945 JOINTLY SPONSORED SANITATION PROGRAM (COLLECTION STORAGE)
NEUDECKER, R. M.
THE AMERICAN CITY 75(4), P. 169-170, 173-174 (APRIL 1960). AS A PART OF A COMPREHENSIVE VECTOR CONTROL PROGRAM AN ENVIRONMENTAL SANITATION SURVEY WAS MADE OF JACKSON, TENNESSEE. THIRTY-SIX PERCENT OF THE HOUSEHOLDS WERE USING APPROVED METAL CONTAINERS. IN THE CASE OF 279 HOUSEHOLDS NO GARBAGE CONTAINER OF ANY KIND WAS USED. IN 1958 AN ORDINANCE WAS PASSED CONTROLLING GARBAGE COLLECTION AND THE STORAGE OF GARBAGE AND RUBBISH. IT IS HOPED THAT OVER 90 PERCENT OF THE HOUSEHOLDS WILL BE USING APPROVED GARBAGE CANS WITHIN A SHORT TIME PERIOD.

01-05-00978 DECISION-TREES IN SOLID WASTES PLANNING (SIMULATION COMPUTER-APPLICATION)
KLEE, A. J. + GARLAND, G. A.
PUBLIC WORKS 97(11), P. 74-77 (1968). THE MULTIPLICITY OF ALTERNATIVES WHICH MUST BE CONSIDERED IN PLANNING FOR SOLID WASTE DISPOSAL SYSTEMS IS FURTHER COMPOUNDED BY UNCERTAINTIES IN THE PREDICTION OF THOSE EVENTS BEYOND OUR CONTROL AND THE COST ESTIMATES UPON WHICH DECISIONS ARE BASED. THE DECISION PROCESS, THEREFORE, MUST NOT ONLY TAKE INTO CONSIDERATION THE POSSIBLE ECONOMIC CONSEQUENCES OF OUR ACTIONS, BUT THEIR PROBABILITIES AS WELL. ONE TECHNIQUE USEFUL IN RESOLVING SUCH PROBLEMS IS THAT OF DECISION TREE ANALYSIS. ALTHOUGH THE CONCEPT IS SIMPLE, THE AUTHOR HAS USED A HYPOTHETICAL EXAMPLE AS THE MOST CONVENIENT METHOD OF EXPLAINING THIS PROCEDURE. FURTHER REFINEMENT OF DECISION TREES TO TAKE INTO ACCOUNT CONTINUOUS PROBABILITY DISTRIBUTIONS OF EVENTS AT CHANCE EVENT NODES, OR THE COST ESTIMATES THEMSELVES, IS POSSIBLE WITH THE AID OF COMPUTERS AND SIMULATION TECHNIQUES. SINCE ASSESSMENT OF PROBABILITIES IS CLEARLY A CRITICAL FACTOR IN THE SUCCESSFUL APPLICATION OF DECISION TREES, AS MUCH CARE MUST ENTER INTO THEIR DETERMINATION AS IS EXERCISED IN THE ESTIMATION OF MONETARY PAYOFFS. IN ITS SIMPLIFIED FORM, THE DECISION TREE IS A USEFUL TOOL IN SOLID WASTE PLANNING, ONE THAT COMBINES ESTIMATES OF UNCERTAINTY WITH THE ECONOMIC CONSEQUENCES OF ALTERNATIVE ACTS. ALTHOUGH NEITHER A PANACEA NOR A SUBSTITUTE FOR THINKING, IT MAY ASSIST THE DECISION-MAKER IN RESOLVING SOME OF THE COMPLEXITY INVARIABLY ASSOCIATED WITH PLANNING FOR SOLID WASTE DISPOSAL SYSTEMS.

01-05-01135 SYSTEMS ANALYSIS FOR SOLID WASTES PROBLEMS
LYNN, W. R.
PROC OF THE NATIONAL CONF ON SOLID WASTES RESEARCH, AM PUBLIC WORKS ASSOC., CHICAGO, ILLINOIS, P. 69-74 (DECEMBER 1963). SYSTEMS ANALYSIS PROVIDES A TOOL FOR EXAMINING COMPLEX INTERRELATED MUNICIPAL ACTIVITIES AND THE SOLUTIONS OBTAINED BY THESE METHODS PROVIDE A SOUND BASIS FOR REACHING DECISIONS. THESE ANALYSES ARE NOT AN END IN AND OF THEMSELVES BUT RATHER ARE INTENDED TO SERVE THE END OF EFFICIENT AND EFFECTIVE DECISION MAKING. ALTHOUGH SOME OF THE TECHNIQUES USED IN THESE APPROACHES MAY BE ABSTRACT AND MATHEMATICALLY COMPLEX THE PRIME MOTIVATION FOR THE ANALYSIS IS TO OBTAIN USEFUL RESULTS AND SOLUTIONS. (PHS)

01-05-01255 MASTER PLAN FOR TOWN REFUSE DISPOSAL (REGIONAL-APPROACH)
WATSON, J. L. A.
PUBLIC CLEANSING 58(4), P. 161-163 (1968). GOVERNMENT AND MUNICIPAL AUTHORITIES OF ISRAEL HAVE UNDERTAKEN A STUDY TO DEVISE A MASTER PLAN TO DISPOSE OF ALL FORMS OF MUNICIPAL SOLID WASTES. THE FIRST PART OF THE STUDY WILL DEAL WITH THE AREA OF TEL-AVIV LOOKING AT LOGISTICS, ECONOMIC, AND ENGINEERING ASPECTS. EVENTUALLY THE PLAN WILL BE EXPANDED TO ALL OF ISRAEL.

01-05-01293 REFUSE DISPOSAL NEEDS AND PRACTICES IN NORTHEASTERN ILLINOIS METROPOLITAN AREA PLAN (OPEN-DUMPING SANITARY-LANDFILL INCINERATOR RESEARCH-NEEDS ANIMAL-FEED POLLUTION(WATER) SITE-SELECTION)
SHEAFFER, J. R. + VON-BOEHM, B. + HACKETT, J. E.
NORTHEAST ILL. PLANNING COMM. TECH REPT 3, 72 PP. (1963). THE PURPOSE OF THE REPORT IS TWO-FOLD - (A) TO FURNISH A STRONG FACTUAL BASIS FOR THE PLANNING COMMISSION BOTH IN DEVELOPING POLICIES ON REFUSE DISPOSAL AND IN BRINGING TO COMPLETION ITS COMPREHENSIVE METROPOLITAN PLAN OF LAND USE, TRANSPORTATION AND PUBLIC FACILITIES, AND (B) TO PROVIDE LOCAL GOVERNMENTS IN NORTHEASTERN ILLINOIS WITH DATA AND EXPERT ADVICE ON ONE OF THE IMPORTANT FUNCTIONAL PROBLEMS WHICH THEY TOO MUST ACT UPON. THE NORTHEASTERN ILLINOIS PLANNING COMMISSION WAS ESTABLISHED BY THE ILLINOIS LEGISLATURE AS AN ADVISORY AGENCY SERVING THE METROPOLITAN COUNTIES OF COOK, DUPAGE, KANE, LAKE, MCHENRY AND WILL AND THEIR MUNICIPALITIES. UNDER ITS ENABLING ACT, THE COMMISSION IS AUTHORIZED TO "PREPARE AND RECOMMEND TO UNITS OF GOVERNMENT...GENERALIZED COMPREHENSIVE PLANS AND POLICIES WHICH ARE METROPOLITAN IN CHARACTER." THESE ARE SPECIFIED TO INCLUDE PLANS AND POLICIES FOR SEWAGE AND REFUSE DISPOSAL AND THE REDUCTION OF AIR AND WATER POLLUTION. (AUTH)

01-05-01299 METROPOLITAN APPROACH TO REFUSE DISPOSAL (COLLECTION REGIONAL-APPROACH)
MOSSEY, E. A.
PUBLIC CLEANSING 55(5), P. 313-329 (1965). IN A PAPER PRESENTED BEFORE THE AMERICAN PUBLIC WORKS ASSOCIATION THE AUTHOR GIVES THE HISTORY OF WASTE DISPOSAL PROBLEMS IN LONDON DATING BACK TO THE FOURTEENTH CENTURY. HE ELABORATES ON SOME OF THE MANY PROBLEMS THAT WASTE DISPOSAL HAS ENCOUNTERED THROUGH THE YEARS. HE SUGGESTS THAT NEW COUNCILS MUST BE FORMED TO SHAPE NEW LAWS TO MEET THE NEEDS OF PRESENT DAY HEALTH, HYGIENE, AND REFUSE DISPOSAL PROBLEMS. RESEARCH MUST BE DONE IN ORDER TO IMPROVE THE METHODS OF DISPOSAL, ECONOMIC EVALUATIONS MUST BE VALIDATED FOR A PARTICULAR SYSTEM FOR A PARTICULAR CITY.

01-05-01309 COUNTY PROBLEMS
JOHNSTON, P.
PUBLIC CLEANSING 55(11), P. 652-657 (1965). IN A PAPER PRESENTED AT A CLEANING CONFERENCE, THE AUTHOR OUTLINES THE DUTIES AND THE PROBLEM THAT CONFRONT THE COUNTY CLEANING SERVICE OFFICER. ADMINISTRATION, RESEARCH, TIPPING, ANIMAL DISPOSAL, TRADE WASTES ARE SOME OF THE TOPICS HE COVERED.

01-05-01497 THE CALIFORNIA INTEGRATED SOLID WASTE MANAGEMENT PROJECT
MAIER, P. P. + ROGERS, P. A.
CALIFORNIA VECTOR VIEWS 14(10), P. 60 (OCTOBER 1967). THE CALIFORNIA INTEGRATED SOLID WASTE MANAGEMENT PROJECT IS AN INTENSIVE STUDY OF SOLID WASTE MANAGEMENT IN AN AREA OF APPROXIMATELY 1200 SQUARE MILES SURROUNDING THE CITY OF FRESNO, CALIFORNIA. THE OBJECTIVES OF THE STUDY ARE TO INVESTIGATE, PLAN, AND DESIGN A REGIONAL SOLID WASTES MANAGEMENT SYSTEM THAT WILL HANDLE URBAN, INDUSTRIAL, AND AGRICULTURAL WASTES. (AUTH)

01-05-01498 THE DEVELOPMENT OF A COMPREHENSIVE SOLID WASTE MANAGEMENT PLAN FOR CALIFORNIA--A PRELIMINARY REPORT
ROGERS, P. A.
CALIFORNIA VECTOR VIEWS 13(12), P. 83 (DECEMBER 1966). A COMPREHENSIVE ANALYSIS OF THE MAGNITUDE OF THE SOLID WASTES PROGRAM IN CALIFORNIA IS DISCUSSED. ATTENTION IS FOCUSED ON THE INADEQUACY OF PRESENT METHODS OF SOLID WASTES MANAGEMENT AS EVIDENCED BY AIR, LAND, AND WATER POLLUTION, AESTHETIC BLIGHT, AND VARIOUS PUBLIC HEALTH HAZARDS INCLUDING THE PRODUCTION OF FLIES AND RODENTS. A THREE-YEAR STUDY PROPOSAL DESIGNED TO DEVELOP A COMPREHENSIVE PLAN FOR THE EFFECTIVE AND ECONOMICAL MANAGEMENT OF SOLID WASTES IN CALIFORNIA IS PRESENTED. THE STUDY WILL INCLUDE A COMPREHENSIVE INVENTORY AND EVALUATION OF DATA RELATING TO WASTE PRODUCTION QUANTITIES, MANAGEMENT PRACTICES, DISPOSAL FACILITIES, PLANNING PROGRAMS, AND ENVIRONMENTAL EFFECTS OF SOLID WASTES HANDLING. THE INDIVIDUAL AND COLLABORATED ROLES OF LOCAL, REGIONAL, AND STATE GOVERNMENTS AS WELL AS PRIVATE INDUSTRY ARE STRESSED. (AUTH)

01-05-01558 N. J. CONTRACTORS ASSOCIATION ENTERS ITS THIRD YEAR (LAW OPEN-DUMP)
REFUSE REMOVAL JOURNAL 1(4), P. 14 (APRIL 1958). THE AIMS AND PURPOSES OF THE NEW JERSEY STATE MUNICIPAL CONTRACTORS' ASSOCIATION WITH A DISCUSSION OF SOME OF THE COMMON PROBLEMS OF PRIVATE AND CONTRACT REFUSE COLLECTORS IN OTHER AREAS. (PHS)

01-05-01734 BOLD PLANS NEEDED FOR REFUSE DISPOSAL IN LONDON (TRANSFER SANITARY-LANDFILL)
PUBLIC CLEANSING 53(2), P. 72 (FEBRUARY 1963). DISCUSSES A BOLD PLAN FOR FUTURE DISPOSAL OF REFUSE IN LONDON, ENGLAND, USING THE AREA WIDE APPROACH TO THE PROBLEM. UNDER THE PLAN, THE RESPONSIBILITY FOR REFUSE COLLECTION WOULD REMAIN WITH THE BOROUGH COUNCILS, BUT DISPOSAL OF ALL AREA REFUSE, DOMESTIC AND TRADE REFUSE, AND STREET SWEEPINGS, WOULD BE THE RESPONSIBILITY OF THE GREATER LONDON COUNCIL. LONDON REFUSE DISPOSAL IS MAINLY A BULK TRANSFER JOB--REMOVING LARGE QUANTITIES OF REFUSE AS QUICKLY AND AS FAR AWAY AS POSSIBLE FROM THE PLACE OF ORIGIN, AND IT SHOULD BE MORE ECONOMICAL TO TACKLE SUCH A TASK ON A REGIONAL BASIS. THERE ARE THREE INTERLOCKING FACTORS WHICH MUST BE BALANCED IN PLANNING THE FUTURE. THE REFUSE MUST BE BROUGHT BY THE COLLECTING AUTHORITIES TO CERTAIN ARRANGED POINTS REASONABLY CLOSE TO THE BOROUGH BOUNDARIES, FROM THERE IT MUST BE TRANSPORTED TO THE DISPOSAL POINTS BY ROAD, RAIL, OR RIVER, AND AT THE DISPOSAL POINTS, OPERATIONS MAY BE LARGE-SCALE LAND RECLAMATION, COMPOSTING SCHEMES, A SERIES OF SMALLER TIPPING SITES, OR A COMBINATION OF THESE. (PHS)

01-05-01747 COLLECTION COSTS PUSH ILLINOIS TAX LIMIT CEILING (COST(COLLECTION) COLLECTION INCINERATION
SANITARY-LANDFILL)
REFUSE REMOVAL JOURNAL 6(6), P. 6 (1963). SEVERAL SMALL MUNICIPALITIES IN THE CHICAGO AREA FIND IT MORE ECONOMICAL TO CONTRACT THEIR REFUSE DISPOSAL TO CONTRACTORS. THEIR NEARNESS TO EACH OTHER PROHIBITS THEM FROM ESTABLISHING LANDFILLS FOR DISPOSAL AND OTHER METHODS ARE TOO EXPENSIVE. SOME OF THE METHODS AND PROBLEMS ARE DISCUSSED.

01-05-01755 NEW STATEWIDE ASSOCIATION IN WEST VIRGINIA
REFUSE REMOVAL JOURNAL 6(3), P. 21 (MARCH 1963). A NEW STATEWIDE ASSOCIATION OF PRIVATE REFUSE OPERATORS, THE WEST VIRGINIA REFUSE HAULERS ASSOCIATION, HAS RECENTLY BEEN FORMED IN THAT STATE. SOON AFTER FORMATION OF THE NEW ASSOCIATION, THE MEMBERS HAD REASON TO BE GRATEFUL THAT THEY WERE ORGANIZED. A BILL HAD BEEN INTRODUCED INTO THE STATE HOUSE OF DELEGATES UNDER WHICH REFUSE HAULERS WOULD BE REMOVED FROM CONTROL OF THE STATE PUBLIC SERVICE COMMISSION. THIS COULD HAVE BEEN RUINOUS FOR THE REFUSE HAULERS, AND THE NEWLY FORMED ASSOCIATION WAS USED TO VOICE OPPOSITION TO THE BILL, WHICH WAS EVENTUALLY DEFEATED. (PHS)

01-05-01764 FLORIDA COLLECTORS FORM NEW STATE ASSOCIATION
REFUSE REMOVAL JOURNAL 5(1), P. 8 (OCTOBER 1963). A NEW ASSOCIATION OF PRIVATE REFUSE CONTRACTORS HAS BEEN FORMED IN FLORIDA WITHIN THE FRAMEWORK OF THE FLORIDA TRUCKING ASSOCIATION. THE MEMBERS FEEL THAT THE BENEFITS OF ORGANIZING IN THIS MANNER ARE TWOFOLD - THE MEMBERSHIP WILL NOW HAVE ACCESS TO ALL OF THE FINANCIAL BACKING, LEGAL TALENT, POLITICAL INFLUENCE, AND PUBLIC RELATIONS FACILITIES OF THE F.T.A., AND THE MEMBERSHIP WILL RECEIVE BENEFITS FROM THE EXCHANGE OF IDEAS AND DISCUSSION OF PROBLEMS WHICH ARE COMMON TO ALL MEMBERS OF THE REFUSE INDUSTRY. (PHS)

01-05-01783 FOURTEEN MICHIGAN CITIES FORM CO-OPERATIVES FOR TRASH DISPOSAL (REGIONAL-APPROACH SANITARY-LANDFILL)
REFUSE REMOVAL JOURNAL 6(11), P. 16 (1963). FOURTEEN MUNICIPALITIES OF SOUTH OAKLAND COUNTY, MICH. HAVE CREATED AN AUTHORITY FOR THE DISPOSAL OF RUBBISH. THIS EFFORT BY THESE COMMUNITIES HAVE COLLECTIVELY COMPLETED A PROGRAM THAT IS ECONOMICALLY ADVANTAGEOUS TO ALL.

01-05-01796 COUNTY PLANS DISPOSAL NEEDS TO YEAR 2000 (COST(COLLECTION) REGIONAL-APPROACH)
REFUSE REMOVAL JOURNAL 6(7), P. 24 (JULY 1963). ORANGE COUNTY, CALIFORNIA, HAS SET UP A CONTINUING STUDY OF ITS REFUSE DISPOSAL SYSTEM WITH THE HELP OF THE U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE AND THE STANDFORD RESEARCH INSTITUTE. A MAJOR POINT OF THE STUDY IS THE PLAN TO COMBINE THE REFUSE DISPOSAL SYSTEM WITH FLOOD CONTROL, AND REGIONAL PARK DEVELOPMENT. ORANGE COUNTY IS TO HAVE FIVE DISPOSAL SITES AND A SCATTERING OF TRANSFER STATIONS. THE COUNTY PLAN HAS BEEN PROJECTED TO SERVE A POPULATION OF 3 MILLION UNTIL THE YEAR 2000. (PHS)

01-05-01830 THE ORANGE COUNTY REFUSE DISPOSAL SYSTEM (PROJECTION SANITARY-LANDFILL COST(OPERATING) COST(TRANSFER)
TRANSFER-STATION COMPOSTING INCINERATION)
ORANGE COUNTY ROAD DEPARTMENT (SEPTEMBER 20, 1968). AN UPDATING OF THE REPORT COVERING THE FIRST FIVE YEARS OF OPERATING UNDER THE MASTER PLAN OF REFUSE DISPOSAL (1959). ALTHOUGH SOME MODIFICATION OF THE ORIGINAL MASTER PLAN HAS BEEN REQUIRED, THE BASIC PRINCIPLE OF LANDFILL DISPOSAL SUPPLEMENTED BY REFUSE TRANSFER, REMAINS THE MOST SATISFACTORY METHOD OF HANDLING THE REFUSE DISPOSAL REQUIREMENTS OF ORANGE COUNTY.

01-05-01943 ASK WHAT PUBLIC IS WILLING TO PAY FOR CLEANER SURROUNDING (COST(ENVIRONMENTAL-IMPROVEMENT))
REFUSE REMOVAL JOURNAL 9(1), P. 32 (JANUARY 1966). THE AEROJET-GENERAL CORP. A SUBSIDIARY OF GENERAL TIRE + RUBBER CO., IN EL MONTE, CALIFORNIA, RECEIVED A $100,000 CONTRACT FROM THE STATE OF CALIFORNIA TO CREATE A WASTE MANAGEMENT SYSTEM. THIS HAS BEEN AN UNUSUAL TASK FOR A FIRM WHOSE CONCERN HAS LARGELY BEEN WITH SPACE-AGE ROCKET AND MISSILE RESEARCH, DEVELOPMENT AND MANUFACTURING, NOT WITH SUCH DOWN-TO-EARTH SUBJECTS AS REFUSE. THE STUDY IS THE INITIAL STEP IN THE DEVELOPMENT OF A SYSTEM TO HELP CALIFORNIA COPE WITH LAND, AIR AND WATER POLUTION IN THE FUTURE. ITS AIM IS TO DEVELOP A PLAN IN SUFFICIENT DETAIL TO ENABLE USEFUL PROJECTS TO BEGIN SHORTLY AND TO PROJECT A 25-YEAR DEVELOPMENT AND CONSTRUCTION PROGRAM. IT IS A CLASSICAL SYSTEMS-DEVELOPMENT STUDY OF THE SORT USED IN CREATING COMPLEX AEROSPACE SYSTEMS. THE FULL REPORT IS EXPECTED TO BE REVIEWED IN THE SPRING.

01-05-01951 MOUNTAINS OF SOLID-WASTES (SANITARY-LANDFILL)
BIONOMICS BRIEFS, PROTECTION AND TOXICOLOGY CENTER, UNIVERSITY OF CALIFORNIA, DAVIS, 1(5), P. 1-14 (SEPTEMBER 1967). IN THE ISSUE IS EXAMINED THE SAN FRANCISCO GARBAGE "CRISIS" AND RELATED FACTORS. "IN EVALUATING THE EXTENSIVE PUBLISHED MATERIAL ON THE MANY FACETS OF URBAN GARBAGE DISPOSAL, AND SAN FRANCISCO'S PLIGHT IN PARTICULAR, IT IS CLEARLY EVIDENT THAT THE TOTAL PROBLEM, AS WELL AS OTHER PROBLEMS OF POLLUTION CONTROL, MUST BE APPROACHED ON A REGIONAL BASIS." 1. COSTS OF MUNICIPAL SOLID WASTES HANDLING USUALLY FAR EXCEED THOSE OF ALL PUBLIC HEALTH FUNCTIONS COMBINED. 2. HANDLING OF SOLID WASTES IS CARRIED OUT PRINCIPALLY BY UNSKILLED AND SEMISKILLED LABORERS. THIS CLASS OF PERSONNEL SELDOM IS FOUND IN HEALTH AGENCIES, WHICH ARE PREDOMINATELY PROFESSIONAL IN MAKEUP. ALTHOUGH SOLID WASTES MAY RATE LOW ON A SCALE OF SOURCES OF TRANSMISSIBLE DISEASE, IMPROPER DISPOSAL PRACTICES CAN CAUSE SERIOUS AIR, WATER, AND LAND POLLUTION PROBLEMS OF A NONINFECTIOUS NATURE. WHEN BUILDINGS ARE ERECTED ON OLD LANDFILLS, CARE MUST BE TAKEN TO PREVENT MIGRATION OF TOXIC AND EXPLOSIVE GASES FROM THE SUBTERRANEAN FILL TO THE INTERIOR OF THE BUILDINGS. THE FOLLOWING ARE A FEW STATISTICS OF PARTICULAR INTEREST - ONLY ONE-THIRD OF 48 MILLION TONS REACHING THE U. S. MARKET ANNUALLY IS SALVAGED. FORTY-EIGHT BILLION CANS, 26 MILLION BOTTLES, AND 8 BILLION LB OF NEW PLASTICS ARE DISCARDED ANNUALLY (10 PERCENT OF THE PLASTICS ARE RECOVERED). IN LOS ANGELES, 36 PERCENT OF THE SOLID WASTES EITHER ARE NONCOMBUSTIBLE, OR CANNOT BE HANDLED IN AN INCINERATOR. RAW WASTE LEFT AFTER MODERN INCINERATION IS 50 PERCENT BY WEIGHT OF THE ORIGINAL.

01-05-01958 ORANGE COUNTY ADOPTS MASTER PLAN OF REFUSE DISPOSAL
STORM, M. I.
CALIFORNIA VECTOR VIEWS 7(5), P. 32 (MAY 1960). ORANGE COUNTY MADE A BIG STEP FORWARD WHEN IN NOVEMBER, 1959, THE BOARD OF SUPERVISORS ADOPTED A MASTER PLAN OF REFUSE DISPOSAL. THE RESULT OF THIS WAS A RECOMMENDATION OF A COMBINED SYSTEM OF FIVE LANDFILL SITES LOCATED IN THE FOOTHILL PERIMETER OF THE COUNTY. WHILE THE COUNTY WOULD MAINTAIN THE DISPOSAL RESPONSIBILITIES, THE MATTER OF COLLECTION OF REFUSE WOULD BE LEFT TO THE INDIVIDUAL COMMUNITIES. FOUR LANDFILL SITES HAVE BEEN PUT INTO OPERATION. A NEW 160-ACRE SITE HAS BEEN PURCHASED AND THIS SITE IS DESIGNATED TO SERVE THE NORTHERN PART OF THE COUNTY UNTIL THE YEAR 2000. THE MOST IMPORTANT ASPECT OF THE MASTER PLAN IS THE FACT THAT THERE IS NOW A POLICY OF LONG RANGE PLANNING - LOOKING AHEAD TO THE SOLID WASTE DISPOSAL PROBLEMS OF THE FUTURE. (UC)

01-05-01962 THE STATUS OF SOLID WASTE MANAGEMENT IN CALIFORNIA (QUANTITY REGIONAL-APPROACH SANITARY-LANDFILL)
ROGERS, P. A.
PUBLIC WORKS 100(5), P. 80-83 (MAY 1969). THE QUALITY OF THE CALIFORNIA ENVIRONMENT IS BEING THREATENED BY EVER-INCREASING QUANTITIES OF SOLID WASTES BEING DISPOSED OF INTO AIR OR WATER AND ONTO LAND. SOLID WASTES ARE CREATING HEALTH HAZARDS AND NUISANCES. THEY ARE STEADILY DEGRADING LAND VALUES AND ARE IMPOSING A RISING ECONOMIC BURDEN ON THE STATE'S POPULATION. DURING 1967, MUNICIPALITIES, INDUSTRIES, AND AGRICULTURAL ENTERPRISES GENERATED AN ESTIMATED 70 MILLION TONS OF SOLID WASTES, AN AVERAGE OF 20 LBS/PERSON/DAY. THE PRESENT SYSTEM OF SOLID WASTE MANAGEMENT, WHICH DIRECTLY AFFECTS ALL OF OUR NATURAL RESOURCES, IS CLEARLY INADEQUATE TO ASSURE THE PRESERVATION OF THE QUALITY OF THESE RESOURCES AT LEVELS WHICH BEST SERVE THE PUBLIC INTEREST. THESE OMINOUS FINDINGS ARE THE RESULT OF THE MOST COMPREHENSIVE STUDY OF STATEWIDE SOLID WASTE PROBLEMS EVER UNDERTAKEN IN CALIFORNIA. THE STATUS REPORT PRESENTS A SUMMARY OF SELECTED DATA ON THE FOLLOWING SUBJECTS - 1) SOLID WASTE PRODUCTION, 2) ADMINISTRATION AND CONTROL, 3) SOLID WASTE COLLECTION, 4) SOLID WASTE DISPOSAL, 5) ENVIRONMENTAL EFFECTS OF SOLID WASTE AND 6) CURRENT STATUS OF SOLID WASTE PLANNING. AN ANALYSIS OF THE DATA RESULTS IN THE CONCLUSION THAT SOLID WASTE MANAGEMENT, AS CURRENTLY PRACTICED IN CALIFORNIA, IS MOST UNSATISFACTORY. THE AREAS OF DEFICIENCY CAN BE SUMMARIZED UNDER THE FIVE FOLLOWING CATEGORIES - A) A FRAGMENTED AUTHORITY AND LACK OF COOPERATION, B) INADEQUATE PLANNING, C) INADEQUATE STANDARDS, D) POORLY DEVELOPED TECHNOLOGY, E) INADEQUATE FINANCING. IT IS IMPERATIVE THAT CALIFORNIA ASSUME LEADERSHIP AND INITIATIVE IN COPING WITH THESE PROBLEMS.

01-05-02006 REFUSE DISPOSAL IN GREATER LONDON (COMPOSITION COST(COLLECTION) BULKY-WASTE)
VICK, E. H. + FLINTOEF, F. L.
68TH ANNUAL CONF OF THE INSTITUTE OF PUBLIC CLEANSING, BOURNEMOUTH, (JUNE 7-10, 1966). THIS PAPER REVIEWS THE PROBLEMS OF REFUSE COLLECTION AND DISPOSAL IN THE GREATER LONDON AREA. TOPICS COVERED ARE THE ORGANIZATION OF THE COLLECTION AND DISPOSAL SYSTEMS, FORMULA FOR DETERMINING COLLECTION AND DISPOSAL COSTS, CHARTS ON REFUSE ANALYSIS, METHODS OF DISPOSAL, MOTOR VEHICLE DISPOSAL, AND INCOME FROM SALVAGED MATERIALS.

01-05-02019 A SYSTEMS STUDY OF SOLID WASTE MANAGEMENT IN THE FRESNO, AREA
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE PUB 1959, WASHINGTON, D. C., (1969). THE BASIC OBJECTIVES OF THE FRESNO REGION SOLID WASTE MANAGEMENT STUDY WERE TO (A) DETERMINE AN OPTIMUM SYSTEM FOR THE MANAGEMENT OF SOLID WASTES IN THE FRESNO REGION AND (B) TO DEVELOP A TECHNOLOGY FOR THAT DETERMINATION THAT WOULD BE APPLICABLE TO OTHER SIMILAR REGIONS THROUGHOUT CALIFORNIA AND THE NATION. TO DO SO MEANT THE DEVELOPMENT OF A METHOD FOR EVALUATING THE INTEGRATED ADVERSE ENVIRONMENTAL EFFECTS OF SOLID WASTES. THIS DECISION-MAKING MACHINERY ENCOMPASSES ALL THE ADVERSE EFFECTS OF SOLID WASTES INCLUDING HUMAN DISEASE, ANIMAL DISEASE, FLIES, RODENTS, INSECTS, PLANT DISEASE AND CROP DAMAGE, SAFETY HAZARDS, TOXICITY HAZARDS, AND THE ESTHETIC FACTORS OF ODOR AND UNSIGHTLINESS. OF PARTICULAR SIGNIFICANCE ARE THE FOLLOWING RESULTS OF THE STUDY,(1) FOLLOWING A COMPREHENSIVE REVIEW AND ENGINEERING ANALYSIS, A CONCEPTUAL SYSTEM HAS BEEN DEVELOPED TO ECONOMICALLY, EFFICIENTLY, AND SATISFACTORILY HANDLE THE 5.5 MILLION TONS OF MUNICIPAL, INDUSTRIAL AND AGRICULTURAL WASTES EXPECTED TO BE PRODUCED ANNUALLY IN THE STUDY AREA. (2) THE DEVELOPMENT AND DOCUMENTATION OF A METHOD OF MEASUREMENT BY WHICH THE EFFECTIVENESS OF ANY SYSTEM OF SOLID WASTES MANAGEMENT MIGHT BE EVALUATED AND COMPARED WITH ALTERNATIVE SYSTEMS IN TERMS OF THE EXTENT TO WHICH THEY SOLVE THE ENVIRONMENTAL, SOCIOECONOMIC, AND AESTHETIC PROBLEMS ENGENDERED BY SOLID WASTES. (3) A DETAILED IDENTIFICATION, CLASSIFICATION, AND EVALUATION, OF SOLID WASTES AND THE PROBLEMS THEY CREATE IN THE ENVIRONMENT AS WELL AS THE GROUPS OR AGENCIES AFFECTED BY THESE PROBLEMS. THE STUDY WAS PERFORMED BY AEROJET-GENERAL CORPORATION.

01-05-02089 RECOMMENDED REFUSE DISPOSAL PLAN (REGIONAL-APPROACH COLLECTION BULKY-WASTE INCINERATION SANITARY-LANDFILL)
SOUTHEASTERN CONNECTICUT REGIONAL PLANNING AGENCY, NORWICH, CONNECTICUT (FEBRUARY 1968). DURING THE PAST SEVERAL YEARS, THE DISPOSAL OF SOLID WASTES, RANGING FROM GARBAGE TO ABANDONED AUTOMOBILES, HAS BECOME ONE OF THE MOST PRESSING AND PERSISTENT PROBLEMS FACING MUNICIPAL GOVERNMENT IN SOUTHEASTERN CONNECTICUT. EACH DAY OF THE YEAR, THE REGION'S LOCAL GOVERNMENTS MUST FIND SOME WAY TO DISPOSE OF AN AVERAGE OF 441 TONS OF ORDINARY HOUSEHOLD, STREET, AND INDUSTRIAL REFUSE. IN ADDITION, ON AN AVERAGE DAY 22 JUNKED VEHICLES AND 147 TONS OF FLY ASH PRESENT SPECIAL DISPOSAL PROBLEMS. CAN THIS GROWING HEAP OF RUBBISH BE DISPOSED OF MORE ADEQUATELY BY NEW METHODS? DOES INCINERATION OFFER AN ECONOMICALLY FEASIBLE MEANS OF DISPOSAL IN GROWING SUBURBAN TOWNS? CAN ECONOMIES BE REALIZED BY COMBINING DISPOSAL FACILITIES TO SERVE MORE THAN ONE COMMUNITY? THESE AND RELATED QUESTIONS ARE INVESTIGATED IN THIS REPORT, WHICH IS THE FIRST OF A SERIES OF STUDIES DESIGNED TO PROVIDE A BASIS ON WHICH TO IMPLEMENT THE REGIONAL DEVELOPMENT PLAN FOR SOUTHEASTERN CONNECTICUT ADOPTED MAY 17, 1967. (AUTH)

01-05-02101 QUAD-CITY SOLID WASTES PROJECT - AN INTERIM REPORT (COMPOSITION INCINERATION BULKY-WASTE SANITARY-LANDFILL POLLUTION(WATER))
INGRAM, W. T. + FRANCIA, F. P.
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE, CINCINNATI, OHIO, (1968). THIS REPORT COVERS THE WORK DONE TO DATE IN TRYING TO EVALUATE THE REFUSE DISPOSAL PROBLEMS OF FOUR NEW JERSEY COMMUNITIES IN OPERATING A COMBINED REFUSE DISPOSAL PROGRAM. DATA IS GIVEN ON THE VOLUMES OF WASTES EXPECTED, TYPES OF DISPOSAL, AND ECONOMICS OF THE COMBINED EFFORT.

01-05-02129 REGIONAL REFUSE DISPOSAL IN THE NORTH EAST (REGIONAL-APPROACH OPTIMIZATION ECONOMICS)
COLLINS, L.
70TH ANNUAL CONF OF THE INSTITUTE OF PUBLIC CLEANSING, BRIGHTON, (JUNE 10-14, 1968). IN GENERAL TERMS, THE REPORT INDICATES THAT IN THE LONG TERM A COOPERATIVE POLICY OF REFUSE DISPOSAL USING SIX MAJOR PLANTS WILL PROVE TO BE THE MOST ECONOMIC. ALL THE PREDICTIONS ARE BASED ON VERY CONSERVATIVE ESTIMATES WHICH WEIGHT THE CONCLUSIONS TOWARDS DELAYING THE INSTALLATION OF PLANTS. EVEN SO, THE EVIDENCE IS IN FAVOR OF INITIATING A POLICY OF COOPERATION WHOSE SUBSEQUENT DEVELOPMENT SHOULD BE REAPPRAISED IN THE LIGHT OF ACTUAL EXPERIENCE.

01-05-02148 CHILTON COUNTY LANDFILL PROJECT - CLEAN AND GREEN (SANITARY-LANDFILL)
U.S. PUBLIC HEALTH SERVICE, BUREAU OF SOLID WASTES MANAGEMENT, ENVIRONMENTAL CONTROL ADMINISTRATION, 15 PP. (MARCH 25, 1969). A SUMMARY REPORT OF A DEMONSTRATION PROJECT IN CHILTON COUNTY, ALABAMA. A DESCRIPTION IS GIVEN OF THE GEOGRAPHICAL LOCATION, POPULATION, AND TYPE OF INDUSTRY, ALONG WITH ENVIRONMENTAL CONDITIONS BEFORE THE PROJECT WAS INITIATED, DESCRIPTION OF THE PROGRAM AND COSTS.

01-05-02150 SAN FRANCISCO BAY PLAN SUPPLEMENT (REGIONAL-APPROACH)
SAN FRANCISCO BAY CONSERVATION AND DEVELOPMENT COMMISSION (JANUARY 1969). THIS DOCUMENT CONTAINS ALL OF THE SUMMARY BACKGROUND REPORTS THAT ARE THE FOUNDATION OF THE SAN FRANCISCO BAY PLAN. THE BAY COMMISSION STAFF AND CONSULTANTS HAVE REPORTED ON 25 ASPECTS OF THE BAY, INCLUDING SUCH ASPECTS AS POLLUTION, PORT DEVELOPMENT, REFUSE DISPOSAL, RECREATION, TIDAL MOVEMENT, ECONOMICS, TRANSPORTATION, AIRPORTS, WATERFRONT INDUSTRIES, FLOOD CONTROL, ETC.

01-05-02151 SAN FRANCISCO BAY PLAN (REGIONAL-APPROACH)
SAN FRANCISCO BAY CONSERVATION AND DEVELOPMENT COMMISSION (JANUARY 1969). THE BAY PLAN WAS PREPARED DURING THREE YEARS OF STUDY AND PUBLIC DELIBERATION BY THE MEMBERS OF THE SAN FRANCISCO BAY CONSERVATION AND DEVELOPMENT COMMISSION. THIS REPORT PRESENTS THE TWO ESSENTIAL PARTS OF THE BAY PLAN, THE RECOMMENDED POLICIES TO GUIDE FUTURE USE OF THE BAY AND SHORELINE, AND THE RECOMMENDED MAPS THAT APPLY THESE POLICIES TO THE PRESENT BAY AND SHORELINE. THE PLAN INCLUDES RECOMMENDED PROCEDURES FOR POLICIES AND MAPS IN LIGHT OF CHANGING CIRCUMSTANCES AND NEW INFORMATION IN THE FUTURE. IT IS RECOMMENDED THAT A GOVERNMENTAL AGENCY BE CREATED TO CARRY OUT THE BAY PLAN. REFUSE DISPOSAL IN THE BAY AREA IS CONSIDERED.

01-05-02168 CALIFORNIA WASTE MANAGEMENT STUDY (QUANTITY COMPOSITION REGIONAL-APPROACH)
AEROJET-GENERAL CORP, REPORT 3056 TO THE STATE OF CALIFORNIA DEPARTMENT OF PUBLIC HEALTH, (MAY 22, 1968). TYPES OF WASTE, THEIR CHARACTERISTICS, THE QUANTITIES GENERATED UNDER VARIOUS CONDITIONS, AND THE EFFECTS THESE HAVE ON PEOPLE, ANIMALS, PLANTS, AND OBJECTS OF VALUE ARE CONSIDERED IN CHAPTER 2. IN CHAPTER 3, VARIOUS METHODS OF PROCESSING AND DISPOSING OF WASTE ARE REVIEWED. IN CHAPTER 4, THE SYSTEMS CONCEPT IS BRIEFLY DESCRIBED, ESPECIALLY AS IT APPLIES TO MANAGEMENT OF WASTES IN CALIFORNIA. CHAPTER 5 DISCUSSES THE RESULT AND PURPOSE OF WASTE MANAGEMENT - THE QUALITY LEVELS AT WHICH MAN CAN AND WANTS TO MAINTAIN HIS ENVIRONMENT. IN CHAPTERS 6 AND 7, THE STRUCTURE OF WASTE MANAGEMENT SYSTEMS IS CONSIDERED, AND COSTS OF VARIOUS SYSTEMS AND ENVIRONMENTAL QUALITY LEVELS ARE COMPARED. CHAPTER 8 CONSIDERS THE GOVERNMENTAL FUNCTIONS AND ORGANIZATION REQUIRED IN IMPLEMENTING A SYSTEMS APPROACH TO WASTE MANAGEMENT. A PLAN FOR FUTURE ACTIONS DIRECTED TOWARD ESTABLISHING A WASTE MANAGEMENT SYSTEM IS GIVEN IN CHAPTER 9. FINALLY, A DETAILED ANALYSIS OF THE SACRAMENTO AREA, USED AS A PILOT MODEL FOR THE MORE GENERAL APPROACH, IS INCLUDED AS AN APPENDIX. (AUTH)

01 06 SAFETY AND HEALTH ASPECTS

01-06-00282 SAFETY IN REFUSE COLLECTION (ACCIDENTS INJURY)
CARRELL, J. J.
PUBLIC WORKS 91(4), P. 89-92, 198, 200 (APRIL 1960). ACCIDENTS IN REFUSE COLLECTION INCLUDE STRAINS AND HERNIAS, VEHICLE HAZARDS, CUTS, AND OTHER INJURIES FROM HANDLING MATERIALS, DISEASE HAZARDS, AND DOG BITES. FREQUENCY AND SEVERITY RATES, NUMERICAL DATA FOR NEW YORK CITY AND OTHER CITIES ARE GIVEN CONCERNING CAUSES AND PART OF BODY INJURED, SAFETY TRAINING PROGRAMS, ROLE OF HUMAN FACTOR, PHYSICAL, PSYCHO-PHYSICAL, KNOWLEDGE, AND ATTITUDE TESTS. SAFETY COMMITTEES AND MEETINGS, PROGRAM OF SAFETY DIVISION OF DEPARTMENT OF SANITATION IN NEW YORK CITY. (EI)

01-06-00961 EMPLOYEE SAFETY IN THE SOLID WASTE INDUSTRY
BEEK, G. V.
PUBLIC WORKS 99(12), P. 74 (1968). A STUDY PERFORMED BY THE AMERICAN PUBLIC WORKS ASSOCIATION AND THE NATIONAL SAFETY COUNCIL ESTABLISHED - (1) THE WORK INJURY (FREQUENCY) RATE AMONG EMPLOYEES OF THE SOLID WASTE INDUSTRY IS NEARLY 900 PERCENT GREATER THAN THE AVERAGE OF ALL INDUSTRY IN THE U.S. (2) THE SEVERITY RATE IS 300 PERCENT GREATER THAN THAT OF ALL INDUSTRIAL EMPLOYEES. (3) PRIVATE CONTRACTORS ARE SPENDING A GREATER PERCENTAGE OF THEIR GROSS INCOME ON ACCIDENT COSTS THAN THEY ARE RECEIVING IN PROFITS.

01-06-01045 ENVIRONMENTAL HAZARDS - URBAN SOLID WASTE MANAGEMENT (VECTORS PATHOGEN QUANTITY SANITARY-LANDFILL INCINERATION HEAT-RECOVERY COLLECTION BULKY-WASTE)
FIRST, M. W.
NEW ENGLAND J MEDICINE 275(26), P. 1478 (DECEMBER 1966). THE PUBLIC HEALTH ASPECTS OF SOLID WASTES ARE NOT AS WELL DEFINED AS ARE THOSE FOR LIQUID WASTES. HITHERTO, PUBLIC HEALTH AUTHORITIES HAVE BEEN CONTENT IN RECENT YEARS TO DELEGATE HANDLING OF SOLID WASTES TO DEPARTMENTS OF PUBLIC WORKS. MODERN EPIDEMIOLOGICAL EVIDENCE THAT DISEASE IS SPREAD FROM ACCUMULATIONS OF GARBAGE AND RUBBISH IS LARGELY LACKING. WITH THE EXCEPTION OF FEEDING UNCOCKED GARBAGE TO HOGS (TRICHINOSIS), REFUSE HAS NOT BEEN DEMONSTRATED TO BE A RESERVOIR FOR DISEASE AGENTS TRANSMITTED BY VECTORS (RATS, FLIES, ETC.). (UC)

01-06-01580 DRIVER DIES AFTER FALL IN INCINERATOR (SAFETY)
REFUSE REMOVAL JOURNAL 1(6), P. 11 (JUNE 1958). A WILKES-BARRE, PENNSYLVANIA, REFUSE TRUCK DRIVER WAS WALKING BACKWARD GUIDING A TRUCK INTO DUMPING POSITION ON A CONCRETE PLATFORM JUST ABOVE THE FIRE BED WHEN HE STEPPED INTO AN OPENING AND FELL INTO THE FLAMES. BEFORE OTHER WORKERS COULD HELP HIM OUT OF THE INCINERATOR, 90 PERCENT OF HIS BODY HAD THIRD-DEGREE BURNS. DEATH OCCURRED SHORTLY AFTER HIS ARRIVAL AT THE HOSPITAL. (PHS)

01-06-01598 IS SANITATION WORK THE RISKIEST OF CITY JOBS (COLLECTION ACCIDENT)
REFUSE REMOVAL JOURNAL 1(8), P. 14 (AUGUST 1958). A DOCTORAL THESIS IN PHYSICAL EDUCATION BY DR. ELENA M. SLIEPCEVICH AT SPRINGFIELD COLLEGE, SPRINGFIELD, MASSACHUSETTS, SHOWS THAT NEW YORK SANITATION CREWMEN HAD 69.2 DISABLING INJURIES FOR EACH MILLION MAN-HOURS OF EXPOSURE. LOGGERS WERE THE ONLY OCCUPATIONAL GROUP WITH A HIGHER INJURY FREQUENCY RATE. (PHS)

01-06-01651 CARE AND PREVENTION OF OCCUPATIONAL BACK-ACHE (ACCIDENTS SAFETY)
REFUSE REMOVAL JOURNAL 2(6), P. 16 (JUNE 1959). ONE OF THE COMMONEST CAUSES OF DISABILITY IN SANITATION CREWMEN, BACKACHE, IS DISCUSSED BY THE MEDICAL OFFICER OF THE NEW YORK CITY SANITATION DEPARTMENT. THE CAUSES, SYMPTOMS, TYPES, TREATMENT, AND PREVENTION OF THIS PREVALENT AILMENT ARE DESCRIBED. (PHS)

01-06-01745 MUNICIPALITY WORKS AROUND THE CLOCK (SAFETY TRAINING COLLECTION)
REFUSE REMOVAL JOURNAL 6(6), P. 12 (JUNE 1963). A DETAILED DESCRIPTION OF THE JOB OF REFUSE COLLECTOR IN THE NEW YORK CITY BUREAU OF CLEANING AND COLLECTION. INCLUDES TRAINING, SALARIES, WORK SCHEDULES, SCRUTINY BY SUPERVISORS, THE SETTLING OF ACCUSATIONS AGAINST COLLECTORS, HAZARDS INVOLVED IN THE JOB, FRINGE BENEFITS (VACATIONS, SICK LEAVE, PENSION PLAN) PROMOTIONS, AND ALTERNATIVE JOB OPPORTUNITIES. (PHS)

01-06-01843 ACCIDENT RATE HIGHEST FOR TRASH WORKERS (SAFETY)
SHEPPARD, P. E.
REFUSE REMOVAL JOURNAL 8(8), P. 26 (1965). IN A RECENT SURVEY CONDUCTED BY THE NATIONAL SAFETY COUNCIL AND AMERICAN PUBLIC WORKS ASSOCIATION, IT WAS DISCOVERED THAT SANITATION WORKERS HAVE A HIGHER ACCIDENT FREQUENCY RATIO THAN ANY OTHER INDUSTRY. THERE ARE FIVE CHARTS COVERING ACCIDENT EXPERIENCE, ACCIDENT FREQUENCY OF OTHER INDUSTRIES, ACCIDENTS BY MUNICIPAL DEPARTMENTS, INSURANCE COSTS, AND SAFETY PROGRAMS.

01-06-01999 THE PROBLEMS OF INJURIES AND CUMULATIVE STRAINS IN THE PUBLIC CLEANSING SERVICES
FINNIE, T. B. + ANDERSON, T. M.
62ND ANNUAL CONF OF THE INSTITUTE OF PUBLIC CLEANSING, PORTSMOUTH AND SOUTHSEA, (JUNE 14-17, 1960). THIS IS A TWO PART PAPER COVERING INVESTIGATIONS OF PUBLIC CLEANSING RELATED INJURIES, EXPERIMENTAL INVESTIGATIONS ON PREVENTATIVE MEASURES, AND EDUCATIONAL PROGRAMS NEEDED TO PROPERLY INFORM EMPLOYEES OF THE NECESSARY PRECAUTIONS TO BE TAKEN WHILE ON THEIR JOBS.

01-06-02015 AN OCCUPATIONAL HEALTH SERVICE IN A TRANSPORT AND CLEANSING DEPARTMENT (SAFETY)
MARKHAM, J. W.
69TH ANNUAL CONF OF THE INSTITUTE OF PUBLIC CLEANSING, BLACKPOOL, (JUNE 6-9, 1967). A PAPER RELATING SOME OF THE EFFORTS MADE WITHIN THE TRANSPORTATION AND PUBLIC CLEANSING DEPARTMENT TO ANALYSE SOME OF THE HAZARDS AND CAUSES OF ACCIDENTS AND SICKNESS RELATED TO AN EMPLOYEES JOB, ALONG WITH WAYS AND MEANS TO PREVENT SOME OF THESE INCIDENTS.

01 07 BULKY WASTES

01-07-00564 COLLECTION AND DISPOSAL OF OVERSIZED BURNABLE WASTES (QUANTITIES GRINDING)
ROGUS, C. A.
PUBLIC WORKS 97(4), P. 106 (APRIL 1966). OVERSIZED BURNABLE WASTES ARE COMPRISED OF ITEMS NOT READILY COLLECTED IN NORMAL MECHANIZED COMPACTICN TRUCKS OR DISPOSED OF IN A CONVENTIONAL INCINERATOR. THE ANNUAL INCREASE IN AMOUNT OF OVERSIZED BURNABLE WASTES PRODUCED PER PERSON IS FROM 2 TO 3 PERCENT. IN EUROPE, THE INCREASE IS FROM 1/3-1/2 THAT IN THE U.S. TABLE GIVING QUANTITIES OF THESE WASTES FOR NEW YORK CITY AND USA IS PRESENTED. SEPARATE COLLECTION IN MANUALLY LOADED OPEN-TYPE DUMP TRUCKS IS COSTLY, UNSIGHTLY, AND UNSANITARY. MOST OF THE OVERSIZED WASTES CAN BE HANDLED IN THE LARGE HOPPERED MECHANICAL CRUSHING TRUCK OF 25-30 CU YD CAPACITY. ONLY EXTREMELY LARGE-SIZED LUMBER, TIMBER, AND FURNITURE REQUIRE SEPARATE COLLECTION. DISPOSAL METHODS- (1) ON-SITE BURNING IS SIMPLE AND INEXPENSIVE, BUT CREATES A FIRE HAZARD AND A CONSIDERABLE AMOUNT OF AIR POLLUTION. (2) BURNING AT SEA IS DIRECT AND ECONOMICAL, HOWEVER, A CHANGE IN WIND BRINGS SMOKE TO ON-SHORE COMMUNITIES. (3) SALVAGING IS NOT GENERALLY PRACTICAL BECAUSE OF THE HIGH CCST OF CLEANING BUILDING MATERIALS. REUSE IS LIMITED TO LUMBER. (4) LANDFILL IS LIMITED BY THE NECESSITY OF CRUSHING THE MATERIAL FOR THE FILL AND BY THE HIGH COST OF LAND. (5) INCINERATION- MOST INCINERATORS HAVE BEEN BUILT TO HANDLE NORMAL SIZED REFUSE. SPECIAL CENTRALIZED INCINERATORS COULD BE BUILT TO HANDLE OVERSIZED WASTES FOR A LARGE AREA. " HOGGING " REDUCES THE SIZE OF LARGE REFUSE. IT IS NOT COMMON IN THE U. S., BUT IT HAS BEEN SUCCESSFULLY TRIED IN EUROPE. SUCH A DEVICE IS DESCRIBED. COMPOSTING IS NOT PRACTICAL FOR THESE WASTES. (UC)

01-07-00570 TODAY'S PRIDE AND JOY, TOMORROW'S REFUSE PROBLEM (BULKY-WASTE AUTOMOBILES)
CREISLEF, J.
PUBLIC WORKS 98(1), P. 65 (JANUARY 1967). IN THE ARTICLE ARE DISCUSSED THE LEGAL PROBLEMS WHICH BESET THE HANDLING OF JUNKED ABANDONED AUTOS. DEL NORTE COUNTY, CALIFORNIA, HAS ESTABLISHED A PUBLIC DISPOSAL SITE AT WHICH PRIVATE AND COMMERCIAL OWNERS CAN DISPOSE OF JUNKED CARS. THE BODIES ARE PILED AND THEN BURNED TO HASTEN THE OXIDATION OF THE METAL. THEN A BULLDOZER IS USED TO CRUSH THE CARS TO AN UNRECOGNIZABLE MASS AND TO A FRACTION OF THEIR ORIGINAL VOLUME. THE MESS IS BURIED. PROBLEMS TO BE SOLVED ARE UNTANGLING THE LEGAL WEB, AND HAULING THE CARS TO THE DISPOSAL SITE. (UC)

01-07-00684 NEW YORK CITY - PLANT TO ACCEPT BIDS FOR CONTRACT-REMOVAL OF JUNK CARS (COLLECTION BULKY-WASTE)
SOLID WASTES MANAGEMENT/RRJ, 11(8), P. 43 (AUGUST 1968). A MAJOR PROBLEM IN NEW YORK CITY IS THE REMOVAL OF ABANDONED AUTOMCBILES. IN 1967 THERE WERE 25,842 CARS TO DISPOSE OF. IT IS ESTIMATED IT COST 50 DCLLARS FOR EACH CAR REMOVED. UNDER CONTRACT REMOVAL 5000 CARS HAVE BEEN REMOVED AND THE CITY HAS RECEIVED ABOUT 13,000 DOLLARS FOR THE VEHICLES.

01-07-00742 AUTCMOBILE DISPCSAL A NATIONAL PROBLEM (BULKY-WASTE COST(DISPOSAL) SALVAGE(FERROUS) SALVAGE(NON-FERROUS))
U.S. DEPARTMENT OF THE INTERIOR, BUREAU OF MINES, WASHINGTON, D.C., 569 PP. (1967). THE PUBLICATICN IS A COMPREHENSIVE TREATMENT OF THE ENTIRE PROBLEM OF THE DISPOSAL OF JUNKED AUTOMOBILES. IT PRESENTS CASE STUDIES OF FACTORS THAT INFLUENCE THE ACCUMULATION OF AUTOMOBILE SCRAP. (UC)

01-07-00976 OPERATICN JUNKLIFT - A COMMUNITY PUBLIC WORKS PROGRAM (BULKY-WASTE SANITARY-LANDFILL SALVAGE(METAL))
ANDREWS, J. B.
PUBLIC WORKS 99(4), P. 96-98 (1968). THE MUCH ABUSED PRACTICE OF ABANDONING AUTOMOBILES CREATED A PRCBLEM TO THE TOURIST ORIENTED CITY OF PORTLAND, MAINE. AFTER MUCH EFFORT FROM CITY ADMINISTRATION AND CIVIC GROUPS, THE PROBLEM WAS FINALLY RESOLVED. WITH MINIMUM SUPPORT FROM THE CITY PUBLIC WORKS, NEIGHBORHOOD YOUTH CORPS AND VOLUNTEERS, LEGAL RELEASES FROM THE AUTO CWNERS OR PROPERTY OWNER WERE OBTAINED. AN ABANDONED LANDFILL AREA WAS USED AS A COLLECTION AREA, WHERE OVER 1,000 AUTOMOBILES WERE COLLECTED. THEN THEY WERE COMPACTED AND TRANSPORTED TO METAL PROCESSING PLANTS. IN CONCLUSION IT MAY BE ADVISABLE TO MAKE A SITE AVAILABLE TO ABANDON AUTOMOBILES AND ALLOW THE JUNK DEALERS TO ABSORB THE COST FOR REMOVING THE AUTOS TO METAL PROCESSING PLANTS.

01-07-01019 DISPOSAL OF BULK WASTES (QUANTITY)
LUCIA, F. J.
PUBLIC WORKS 95(10), P. 100 (OCTOBER 1964). IN NEW YORK CITY, OVER 600,000 TONS DEMOLITION AND CONSTRUCTION WASTES WERE PRODUCED IN 1963. OF THIS DEBRIS, 40 PERCENT WAS COMBUSTIBLE. BURNING-PITS WERE USED FOR INCINERATING THE COMBUSTIBLES. THE PITS WERE CONSTRUCTED AS FOLLOWS- A BERM OF RESIDUE 10 TO 15 FEET HIGH WAS SETUP TO FORM A HORSESHOE-SHAPED ENCLOSURE 350 FT BY 350 FT. A DIVIDING BERM ERECTED IN THE CENTER FORMED TWO SEPARATE PITS WITH A COMMON ENTRANCE. WASTE LUMBER IS DUMPED IN ONE PIT IN A SERIES OF CONSECUTIVE PILES, 30 TO 50 CU YD PER PILE. TEN PILES WERE BROUGHT IN PER 8-HR SHIFT. WHILE ONE IS BURNING, THE OTHER IS FORMED. FIRE IS KEPT UNDER CONTROL BY BULLDOZER AND FLUSHER. DATA PERTAINING TO THE YEAR 1964- THE FEES FOR USING THE DISPOSAL SITE WERE $2.00 PER TRUCKLOAD OF 10,000 LB OR LESS GROSS WEIGHT, $5.00 PER TRUCKLOAD OVER 10,000 LB GROSS WEIGHT, AND $10.00 PER TRACTOR-TRAILER LOAD. OVER 25,000 ABANDONED VEHICLES WERE COLLECTED. THE WEIGHT OF THE BULKY REFUSE (FURNITURE, BABY CARRIAGES, STOVES, ETC.) WAS 110,000 TONS. OVER 500,000 CHRISTMAS TREES WERE DISCARDED. PIER AND DEMOLITION DEBRIS ARE BARGED TO SEA AND BURNED. BURNING REQUIRES 36 HOURS. THE COST PER TRIP RANGES FROM $1,300 TO $1,800. (UC)

01-07-01035 OPERATION CLEANUP YIELDS 4,700 TONS OF WASTE (BULKY-WASTE)
PHELPS, J. G.
PUBLIC WORKS 92(11), P. 99 (NOVEMBER 1961). AN ACCOUNT OF THE ORGANIZATION OF AND DISPOSAL METHODS USED IN A RECENT MIAMI, FLORIDA, CLEANUP CAMPAIGN. THE SPECIAL COLLECTION, NETTING 4,714 TONS OF REFUSE, WAS COMBINED WITH THE REGULAR WEEKLY REFUSE COLLECTION AND SERVED AS BOTH A SANITARY AND FIRE PREVENTION MEASURE. (PHS)

01-07-01248 COLLECTION AND PREPARATION OF BULKY REFUSE (TEPEE BULKY-WASTE CHARACTERISTICS COMPOSTING INCINERATION SANITARY-LANDFILL)
JAEGER, B.
SAMMLUNG UND AUFBEREITUNG VON SPERRMUELL, AUFBEREITUNGS-TECHNIK 5(3), P. 99-103 (MARCH 1964). SPECIAL VEHICLES FOR COLLECTION OF BULKY MATERIAL FEATURE LARGE VOLUME CONTAINERS, LARGE FEEDING OPENINGS AND INSTALLATIONS FOR PULVERIZATION OF ESPECIALLY BULKY REFUSE. VOLUMETRIC WEIGHT OF BULKY REFUSE CAN BE INCREASED FROM 0.1 TON/CUBIC METER AND LESS TO 0.3 TON/CU-M. PULVERIZED BULKY REFUSE CAN BE COMPOSTED TOGETHER WITH DOMESTIC REFUSE AND SEWAGE SLUDGE ONLY IN EXCEPTIONAL CASES. AS RULE, BULKY REFUSE SHOULD BE BURNT FOR WHICH NUMEROUS FURNACE DESIGNS ARE AVAILABLE. MACHINES ARE AVAILABLE FOR HANDLING OF EXTREMELY BULKY REFUSE. (EI)

01-07-01312 BULKY REFUSE
CROWTHER, G.
PUBLIC CLEANISING 55(10), P. 599-301 (1965). BULKY TYPE MATERIAL PRESENTS A REAL PROBLEM TO THE WASTE COLLECTORS AND DISPOSALS OPERATORS. SINCE THEY CONTRIBUTE SUCH A PROBLEM ASIDE FROM REGULAR HOUSEHOLD REFUSE MANY COLLECTORS CHARGE A DIFFERENT RATE FOR COLLECTION AND DISPOSAL. SOME OF THE MOST TROUBLESOME REFUSE IS CARDBOARD CARTONS, DISCARDED FURNITURE, DEMOLITION RUBBLE, AND GARDEN REFUSE.

01-07-01903 NEED MEASURES TO AID ABANDONED CAR SALVAGE (BULKY-WASTE LAW)
STORY, W. S.
REFUSE REMOVAL JOURNAL 8(11), P. 20 (1965). ABANDONED JUNK AUTOS, WHICH PREVIOUSLY WERE ALLOWED TC STAND IDLE FOR 90 DAYS, MUST NOW BE MOVED AFTER 15 DAYS, ACCORDING TO AN ORDINANCE RECENTLY PASSED IN ELYRIA, OHIO.

01-07-01960 GRANT OF THREE MILLICN DOLLARS TO PUT UP SCREENS AROUND AUTO YARDS (BULKY-WASTE)
REFUSE REMOVAL JOURNAL 9(1), P. 16 (JANUARY 1966). ONE OF THE PRIMARY AIMS OF PRESIDENT JOHNSONS HIGHWAY BEAUTIFICATION PROGRAM IS TO REMOVE OR SCREEN OFF SCRAPYARDS AND AUTOMOBILE GRAVEYARDS THAT ARE VISIBLE FROM MAJOR U. S. AND STATE ROADS. UNDER THE RECENTLY PASSED HIGHWAY BEAUTIFICATION ACT, $3 MILLION HAS BEEN ALLOCATED TO THIS TASK. THE MONEY WILL BE USED ALONG THE 41,000 MILES OF INTERSTATE AND OTHER FEDERAL FINANCED HIGHWAYS.

01-07-02013 ABANDONED VEHICLES - THE GREATER LONDON COUNCIL SCHEME (BULKY-WASTE)
SHULTS, F.
70TH ANNUAL CONF OF THE INSTITUTE OF PUBLIC CLEANSING, BRIGHTON, (JUNE 11-14, 1968). A PAPER REVIEWING THE PROBLEMS AND HAZARDS OF ABANDONED VEHICLES AND LEGISLATION DEALING WITH ABANDONED VEHICLES. THERE ARE SOME COST FIGURES FOR REMOVING ABANDONED VEHICLES PER TON. A DESCRIPTION OF A PROCESSING PLANT FOR RECOVERY OF SCRAP METAL FROM VEHICLES AS WELL AS FROM ABANCONED APPLIANCES IS GIVEN.

01-07-02139 PRCHIBIT ABANDCNED VEHICLES IN YARDS (LAW BULKY-WASTE)
REFUSE REMOVAL JOURNAL 9(2), P. 12 (FEBRUARY 1966). THE NATIONAL ASSOCIATION OF REAL ESTATE BOARDS ARE ENCOURAGING LOCAL GOVERNMENTS TO ENACT STRICT ORDINANCES TO PROHIBIT THE PARKING OF JUNKED AUTOMOBILES IN YARDS, DRIVES, AND STREETS. DUE TO A LACK OF DISPOSAL SITES FOR AUTOS THESE ORDINANCES ARE USUALLY OVERLOOKED. ABOUT SIX MILLION AUTOS ARE SCRAPPED EACH YEAR TO MEET THE NEED OF METAL IN THE STEEL INDUSTRY.

01 08 TOXIC WASTES

01-08-01249 DISPOSAL OF TOXIC SOLID WASTES
PUBLIC CLEANSING 56(4), P. 150 (1966). THE COMMITTEE ON THE DISPOSAL OF TOXIC SOLID WASTES WHICH WAS SET UP BY THE MINISTER OF HOUSING AND LOCAL GOVERNMENT IN OCTOBER, 1964, HAS ASKED FOR FORMAL WRITTEN EVIDENCE FRCM INTERESTED ORGANIZATIONS AND INDIVIDUALS. IT IS HOPED THAT EVIDENCE WILL BE SUBMITTED BEFORE THE END OF APRIL, 1966. THE COMMITTEE'S TERMS OF REFERENCE ARE - " TO CONSIDER PRESENT METHODS OF DISPOSAL OF SOLID AND TOXIC WASTES FROM THE CHEMICAL AND ALLIED INDUSTRIES, TO EXAMINE SUGGESTIONS FOR IMPROVEMENT, AND TO ADVISE WHAT, IF ANY, CHANGES ARE DESIRED IN CURRENT PRACTICE, IN THE FACILITIES AVAILABLE, FOR DISPOSAL, AND IN CONTROL ARRANGEMENTS, IN ORDER TO ENSURE THAT SUCH WASTES ARE DISPOSED OF SAFELY AND WITHOUT RISK OF POLLUTING WATER SUPPLIES AND RIVERS."

01-08-02008 PROGRESS IN DISPOSAL OF SOLID RADIOACTIVE WASTES (TOXIC-WASTE)
BAINES, N. D.
69TH ANNUAL CONF OF THE INSTITUTE OF PUBLIC CLEANSING, BLACKPOOL, (JUNE 6-9, 1967). THIS PAPER OUTLINES THE DEVELOPMENTS WHICH HAVE TAKEN PLACE SINCE A PAPER WAS PRESENTED TO THE INSTITUTE OF PUBLIC CLEANSING IN 1959. TOPICS COVERED ARE RADIOLOGICAL SAFETY CRITERIA, RADIOACTIVE WASTE DISPOSAL, USES OF RADIOACTIVE MATERIALS, HANDLING OF RADIOACTIVE MATERIALS, AND LAWS GOVERNING THE USE AND DISPOSAL OF THESE MATERIALS.

01-08-02016 THE DISPOSAL OF RADIOACTIVE SOLID WASTES (TOXIC-WASTE)
KENNY, A. W.
61ST ANNUAL CONF OF THE INSTITUTE OF PUBLIC CLEANSING, BRIGHTON, (JUNE 9-12, 1959). WITH THE INCREASED USE OF NUCLEAR ENERGY AND THE USE OF RADIONUCLIDES IN RESEARCH, INDUSTRY, AND MEDICINE, WASTES ARE GENERATED IN INCREASED AMOUNTS. IT IS NECESSARY TC LCOK AT PRESENT DISPOSAL METHODS AND NEW METHODS REQUIRED FOR CERTAIN ISOTOPES.

01 09 AGRICULTURAL WASTES

01-09-01121 AGRICULTURAL SOLID WASTES (QUANTITY COMPOSITION)
TAIGANIDES, E. P.
PROC OF THE NATIONAL CONF ON SOLID WASTE RESEARCH, AM PUBLIC WORKS ASSOC, CHICAGO, ILLINOIS, P. 39-50 (DECEMBER 1963). THE PROBLEMS ASSOCIATED WITH FARM WASTE HANDLING, TREATMENT AND DISPOSAL HAVE BEEN COMPCUNDED WITH THE RECENT TREND IN CONFINEMENT HOUSING. UNITS WITH POPULATION EQUIVALENTS OF 10,000 TO 20,000 ARE ALREADY IN EXISTENCE, AND THEIR NUMBER IS STEADILY INCREASING. FURTHERMORE, THE LACK OF ENGINEERING INFORMATION ON MANURE DISPOSAL, THE ENCROACHMENT OF URBAN AREAS TO PREVIOUSLY RURAL REGIONS, THE SCARCITY OF LAND FOR DISPOSAL AND THE CHARACTERISTICS OF THE MANURES THEMSELVES COMPLICATE THE PROBLEM OF AGRICULTURAL WASTE MANAGEMENT. ALTHOUGH MANURE DISPOSAL IS PERHAPS THE NUMBER ONE PROBLEM IN LIVESTOCK PRODUCTION, THERE ARE FIVE OTHER DISTINCT SOURCES OF AGRICULTURAL WASTES WHOSE HANDLING AND DISPOSAL CAN BE JUST AS PROBLEMATIC. THESE INCLUDE HUMAN WASTES FROM THE RURAL POPULATION, CROP RESIDUES, WASTES FROM RURAL INDUSTRIES, AGRICULTURAL CHEMICAL RESIDUES AND DISPOSAL OF 30 MILLION DEAD BIRDS FROM POULTRY PRODUCTION UNITS. THE PHYSICAL AND CHEMICAL PROPERTIES OF THE FARM MANURES WERE REVIEWED AND GUIDE VALUES FOR THE MAJOR PROPERTIES WERE PRESENTED. AN ANALYSIS OF THE PRESENT METHODS OF MANURE DISPOSAL SHOWED THAT NO REALLY SATISFACTORY METHOD OF FARM WASTE DISPOSAL HAS BEEN ADVANCED. THE FARMER IS WILLING, MORE THAN HE GENERALLY ACCEPTED, TO ADOPT NEW IDEAS TO COMBAT THE WASTE DISPOSAL PROBLEM. HOWEVER, NEW IDEAS ARE SLOW IN COMING FROM THE ENGINEERS AND SCIENTISTS IN THE FIELD.

01-09-01153 WASTE PROBLEMS OF AGRICULTURE AND FORESTRY (QUANTITY)
ENVIRONMENTAL SCIENCE TECH 2(7), P. 498-503 (JULY 1968). THIS ARTICLE IS A SUMMARY OF A RECENT DEPARTMENT OF AGRICULTURE REPORT ON SOLID AND LIQUID WASTE DISPOSAL PROBLEMS IN AGRICULTURE. THE REPORT, " WASTES IN RELATION TO AGRICULTURE AND FORESTRY, " SURVEYS 10 MAJOR CONTAMINANTS OF AIR, WATER, AND LAND SOIL PRODUCED BY AGRICULTURE AND FORESTRY, AND HOW THE CONTAMINANTS AFFECT THE TWO INDUSTRIES IN TURN. IN ADDITION TO ANIMAL WASTES, OTHER ORGANIC WASTES--SUCH AS FOREST, CROP, AND PROCESSING RESIDUES--ARE ALSO PRODUCED AS BYPRODUCTS OF THE TWO INDUSTRIES. THESE SUBSTANCES, CARRIED IN WATER, INCUR A HIGH BIOCHEMICAL OXYGEN DEMAND. DRY ON LAND, THEY CAN BURN, PRODUCE ODORS, OR ATTRACT FLIES AND VERMIN.

01-09-01173 TWC BILLION TONS OF - WHAT (ANIMAL-WASTE QUANTITY)
EBY, H. J.
COMPOST SCIENCE 7(2), P. 7-10, (AUTUMN 1966).

01-09-01221 PROCESSING AGRICULTURAL WASTES (FEEDLOT-PROBLEM COMPOSTING DIGESTION LAGOONS FIELD-TRASH WASTE-MANAGEMENT)
HART, S. A.
PROC OF THE NATICNAL CONF ON SOLID WASTE RESEARCH, AM PUBLIC WORKS ASSOC, CHICAGO, ILLINOIS, P. 168-174 (DECEMBER 1963). AGRICULTURAL WASTES - BOTH MANURES AND FIELD TRASH - ARE NOT WASTES SEPARATE FROM THE REST OF SOCIETY'S DISCARDS. AGRICULTURE ITSELF IS A SEGMENT OF OUR WHOLE SOCIETY, JUST AS ARE MUNICIPALITIES AND IS INDUSTRY. NONE EXISTS ALONE, NOR SHOULD THE MANAGEMENT OF ANY ONE OF THE WASTES BE CONSIDERED UNRELATED TO THE OTHERS. AS OUR POPULATION EXPLCSION CONTINUES, IT WILL CREATE PRESSURES IN WHICH ORGANIC SOLID WASTES, INCLUDING THOSE FROM AGRICULTURE, WILL HAVE AN IMPORTANT ROLE. AS THE POPULATION INCREASES, OUR LEVEL OF SANITATION MUST BE MAINTAINED AND IMPROVED SO THAT MAN MAY LIVE SATISFACTORILY IN CLOSER RELATIONSHIP WITH HIS FELLOW MAN. THE LAND AREA PRODUCING FOOD FOR THE RISING POPULATION WILL REMAIN RELATIVELY CONSTANT. THERE WILL THUS BE GREATER OPPORTUNITY AND NEED TO USE PROCESSED ORGANIC WASTES TO AID IN PRODUCING MORE FOOD FROM THE LIMITING LAND. THERE IS LITTLE QUESTION BUT THAT THE

MAJOR SINK OR REPOSITORY FOR MUCH OF OUR PROCESSED SOLID ORGANIC WASTES WILL BE UPON AGRICULTURAL LANDS. ON THE OTHER HAND, THE FARMER CAN USE THESE ORGANIC MATERIALS ONLY AS THEY BENEFIT HIM AND INCREASE HIS YIELDS AND PROFITS. RESEARCH IS NEEDED TO ANTICIPATE THIS ERA OF MORE COMPLETE UTILIZATION OF ORGANIC MATTER. WE NEED TO DEVELOP TECHNIQUES AND PROCESSES THAT WILL ENABLE US TO COMBINE AND CONSERVE SOLID WASTES FROM ALL OF SOCIETY TO UTILIZE THEM ECONOMICALLY FOR OUR GREATEST BENEFIT.

01-09-01380 RURAL WASTES AND AGRICULTURAL ENGINEERING
HART, S. A. + SCHLEUSENER, P. E.
AGRIC ENGR 44(3), P. 142-143 (MARCH 1963). PROBLEMS IN HANDLING, TREATING, AND DISPOSING OF RURAL WASTES, ENGINEERING PROBLEMS IN AREAS OF CROP RESIDUE DISPOSAL AND LIVESTOCK MANURE MANAGEMENT. (EI)

01-09-01538 RESEARCH NEEDS IN RURAL WASTE UTILIZATION (AGRICULTURAL WASTE)
SCHLEUSENER, P. E.
AGRIC ENGR 45(9), P. 492-495 (SEPTEMBER 1964). RESEARCH PROBLEMS IN DISPOSAL AND UTILIZATION OF RURAL WASTES ARE DISCUSSED AND CHALLENGE PRESENTED TO AGRICULTURAL ENGINEERS TO TAKE LEAD IN FINDING SOLUTIONS, AREAS OF RESEARCH ARE SUGGESTED. (EI)

01-09-01957 A STUDY OF FIELD BURNING UNDER VARYING ENVIRONMENTAL CONDITIONS
MELAND, B. R. + BOUBEL, R. W.
PAPER - 59TH ANNUAL MEETING, AIR POLLUTION CONTROL ASSOCIATION, SAN FRANCISCO, CALIFORNIA, (JUNE 1966). A FIELD STUDY ON GRASS FIELD BURNING WAS CONDUCTED IN THE WILLAMETTE VALLEY OF OREGON DURING THE SUMMER OF 1965. APPROXIMATELY 230,000 ACRES OF GRASS FIELDS ARE BURNED IN THE VALLEY DURING AUGUST AND SEPTEMBER, RESULTING IN SERIOUS AIR POLLUTION PROBLEMS. THE RELATIONSHIP BETWEEN CERTAIN VARIABLES WERE COMPUTED BOTH BY COMPUTING A MATRIX OF CORRELATION COEFFICIENTS AND BY STEPWISE LINEAR REGRESSIONS. THE INDEPENDENT ENVIRONMENTAL VARIABLES WERE FROM TIME OF HARVEST TO TIME OF BURNING, TIME OF DAY, AIR TEMPERATURE, RELATIVE HUMIDITY, SOIL AND STRAW MOISTURE, WIND SPEED AND DIRECTION, AND FUEL DENSITY. DEPENDENT VARIABLES WHICH WERE MEASURED WERE PARTICULATE EMISSION AND SIZE DISTRIBUTION, COMBUSTION TEMPERATURE, BURN RATE, AMOUNT OF ASH, PERCENT OF ORGANICS IN THE PARTICULATES, AND SMOKE APPEARANCE. SUSPENDED PARTICULATES CORRELATED SIGNIFICANTLY WITH PERCENT ORGANICS IN COMMON (ANNUAL) RYEGRASS. OTHER VARIABLES DID NOT CORRELATE SIGNIFICANTLY. (UC)

01-09-02118 A NATIONAL PROGRAM OF RESEARCH FOR ENVIRONMENTAL QUALITY - POLLUTION IN RELATION TO AGRICULTURE AND FORESTRY
JOINT TASK FORCE OF THE U.S. DEPARTMENT OF AGRICULTURE AND THE STATE UNIVERSITIES AND LAND GRANT COLLEGES, (SEPTEMBER 1968). THIS REPORT PRESENTS A PROPOSED " POLLUTION RESEARCH PROGRAM ", FOR AGRICULTURAL AND FORESTRY RESEARCH. IT IS CONCERNED WITH PROBLEMS ARISING FROM ALL POLLUTANTS EFFECTING FARMS, FORESTS, AND RURAL AREAS. IT IS ALSO CONCERNED WITH POLLUTANTS THAT EFFECT THE ENVIRONMENT, SUCH AS THOSE ARISING FROM THE PROCESSING OF FARM AND FOREST PRODUCTS.

01 10 INDUSTRIAL WASTES

01-10-01122 INDUSTRIAL SOLID WASTES - THE PROBLEMS OF THE FOOD INDUSTRY (SANITARY-LANDFILL OCEAN-DISPOSAL COMPOSTING)
MERCER, W. A.
PROC OF THE NATIONAL CONF ON SOLID WASTE RESEARCH, AM PUBLIC WORKS ASSOC., CHICAGO, ILLINOIS, P. 51-58 (DECEMBER 1963). AN URGENT NEED EXISTS FOR AESTHETICALLY-ACCEPTABLE RAPID, RELIABLE, AND ECONOMICALLY-FEASIBLE METHODS FOR DISPOSAL OR UTILIZATION OF THE WASTES ACCUMULATED IN THE GROWING, HARVESTING, AND PROCESSING OF FRUITS AND VEGETABLES. IT IS AN ALARMING FACT THAT IF OPEN DUMPING OR LAND-FILL DISPOSAL WERE SUDDENLY, CATEGORICALLY PROHIBITED, NO ALTERNATIVE METHODS HAVING ESTABLISHED RELIABILITY AND FEASIBILITY ARE AVAILABLE.

01-10-01716 NEW HIGH-STRENGTH STEEL AIDS SLAG-HAULING FIRM (INDUSTRIAL-WASTE)
REFUSE REMOVAL JOURNAL 3(6), P. 16 (JUNE 1960). LOAD BOXES MADE OF A NEW HIGH-STRENGTH, HIGHLY ABRASION-RESISTANT STEEL HAVE INCREASED LOAD BOX LIFE TO FIVE YEARS, REDUCED MAINTENANCE COSTS 50 PERCENT AND ANNUAL STEEL TONNAGE REQUIREMENTS 30 PERCENT, AND HAVE PROVIDED LARGE OVERALL SAVINGS IN OPERATIONAL COSTS FOR A DETROIT, MICHIGAN, SLAG-HAULING FIRM. (PHS)

01-10-01921 INDUSTRIAL WASTE REMOVAL (COLLECTION SITE-SELECTION SANITARY-LANDFILL)
PUBLIC CLEANSING 54(2), P. 715 (1964). THE PROBLEM OF WASTE COLLECTION AND STORAGE IS A COMPLEX ONE, MADE ALL THE MORE SO WITH THE AVALANCHE OF DEVELOPMENT OF LIGHT INDUSTRY WITH ITS VARIED QUANTITIES OF EVEN MORE VARIED WASTE ARISING FROM THE PROCESSES INVOLVED. THERE IS NO STATUTORY OBLIGATION UPON A MUNICIPAL AUTHORITY TO MAKE PROVISION FOR EITHER COLLECTION OR DISPOSAL OF THIS TYPE OF MATERIAL AND ALTHOUGH THE NUMBER OF AUTHORITIES WHICH IN THE PAST HAVE DONE SO IS COMMENDABLY HIGH, THE DIFFICULTIES OF INSURING ECONOMIC DISPOSAL SITES IS CAUSING MANY OF THESE AUTHORITIES TO CURB THEIR ACTIVITIES IN THIS DIRECTION. THERE IS OFTEN FELT TO BE A MORAL OBLIGATION INVOLVED BUT THE OVERRIDING CONSIDERATION OF FINDING DISPOSAL SITES WITHIN AN ECONOMIC TRAVELING DISTANCE IS BECOMING AN INSUPERABLE PROBLEM.

01-10-02014 THE STORAGE, COLLECTION, AND DISPOSAL OF TRADE AND INDUSTRIAL REFUSE
LAWRENCE, R. J.
63RD ANNUAL CONF OF THE INSTITUTE OF PUBLIC CLEANSING, ABERDEEN, (JUNE 6-9, 1961). THE PUBLIC IN GENERAL, WHICH INCLUDES OWNERS OF BUSINESS PREMISES AND FACTORIES ARE DEMANDING IN EVER INCREASING NUMBERS THAT A COMPREHENSIVE SERVICE OF COLLECTION AND DISPOSAL BE PROVIDED BY THE LOCAL AUTHORITY, THE FINANCE FOR WHICH WOULD BE PROVIDED BY THE GENERAL RATE FUND.

01-10-02082 INDUSTRIAL SOLID WASTE PRODUCTION AND DISPOSAL IN CALIFORNIA (QUANTITIES)
CORNELIUS, J.
CALIFORNIA VECTOR VIEWS 16(5), P. 35-56 (MAY 1969). A SUMMARY OF THE CALIFORNIA DEPARTMENT OF PUBLIC HEALTH DATA ON INDUSTRIAL SOLID WASTES IS PRESENTED. THESE DATA WERE DEVELOPED AS A PORTION OF THE CALIFORNIA SOLID WASTE PLANNING STUDY. INCLUDED IS A CLASSIFICATION SYSTEM FOR INDUSTRIAL SOLID WASTES AND DATA ON THE PRODUCTION AND DISPOSAL OF THESE WASTES IN CALIFORNIA. INDUSTRIAL SOLID WASTE PRODUCTION PRESENTLY INCLUDES AN ESTIMATED 2.1 MILLION TONS OF FOOD PROCESSING WASTES, 8.0 MILLION TONS OF LUMBER PROCESSING WASTES, 0.5 MILLION TONS OF CHEMICAL AND PETROLEUM PROCESSING WASTES, AND 3.1 MILLION TONS OF MANUFACTURING WASTES. BY THE YEAR 2000, IT IS PROJECTED THAT THERE WILL BE A MAJOR REDUCTION IN LUMBER PROCESSING WASTES TO LESS THAN ONE MILLION TONS PER YEAR. HOWEVER, THE TOTAL PRODUCTION OF INDUSTRIAL SOLID WASTES IS PROJECTED TO INCREASE TO 15 MILLION TONS PER YEAR BECAUSE OF MAJOR INCREASES IN THE QUANTITIES OF FOOD PROCESSING WASTES AND MANUFACTURING WASTES PRODUCED. IT IS CONCLUDED THAT THE PRESENT METHODS OF DISPOSING OF INDUSTRIAL SOLID WASTES IN CALIFORNIA ARE CAUSING HEALTH HAZARDS AND IMPAIRMENT OF THE STATE'S AIR, WATER, AND LAND. THE FINAL CONCLUSION IS THAT A COOPERATIVE INDUSTRIAL GOVERNMENTAL PROGRAM IS NEEDED TO COPE WITH THESE PROBLEMS. (AUTH)

01 11 DEMOLITION WASTES

01-11-01630 'DEMOLITION REFUSE' HAS PROBLEM PROPORTIONS (TEPEE BULKY WASTE)
REFUSE REMOVAL JOURNAL 2(2), P. 7 (FEBRUARY 1959). THE PROBLEM OF DISPOSAL OF DEMOLITION TIMBER AND DEBRIS, WHICH IS ASSUMING LARGE DIMENSIONS WITH THE INCREASING NUMBER OF LARGE-SCALE DEMOLITION PROGRAMS IN THIS COUNTRY, IS DISCUSSED. POSSIBLE SOLUTIONS ARE DESCRIBED. (PHS)

01-11-01688 THE USE OF RUBBISH FROM CITY RUINS FOR LIME FERTILIZATION (DEMOLITION)
EHRENBERG, P. + BUCHNER, A.
Z PFLANSENERNAEHR DUENGUNG U BODENK 42, P. 20-30 (1948). THE ASSERTION THAT RUBBISH FROM RUINS OF CITIES HAS A MORE FAVORABLE EFFECT ON PLANTS THAN COM. MARL COULD NOT BE CONFIRMED. THE ONLY INSTANCES OF A MORE FAVORABLE EFFECT OF THE RUBBLE WERE WITH CERTAIN LIME-SENSITIVE PLANTS SUCH AS CLOVER OR PASTURAGE WHERE THE FINE DIVISION OF THE MARL CAUSED SOME DAMAGE. (CA)

01 12 OTHER GENERAL ARTICLES

01-12-00614 WHERE WILL WE PUT ALL THAT GARBAGE (PACKAGING SANITARY-LANDFILL RECLAMATION(LAND COST(OPERATING) COMPOSTING)
ALEXANDER, T.
FORTUNE (10), P. 149 (OCTOBER 1967). THE ARTICLE CONTAINS PICTURES OF AN UNSIGHTLY DUMP ONLY FOUR MILES FROM DOWNTOWN WASHINGTON, D.C., AS WELL AS OF A BEAUTIFUL CANYON IN LOS ANGELES RECLAIMED BY LANDFILL. AMONG THE ITEMS INCLUDED IN THE ARTICLE, ARE THE FOLLOWING - NEW-YORK ANNUALLY USES 150 ACRES OF THE SOUTHERN END OF STATEN ISLAND FOR REFUSE DISPOSAL, I.E., DISPOSAL OF RESIDUE FROM INCINERATORS. IT COSTS ABOUT $30/TON TO COLLECT, TRANSPORT, AND DISPOSE OF NEW YORK'S REFUSE. (3 TIMES THE COST OF A TON OF WEST VIRGINIA COAL, MINED AND DELIVERED TO NEW YORK.) THE COST OF PROPERLY OPERATING AN INCINERATOR IS FROM 5 TO 6 TIMES THAT OF OPERATING A SANITARY LANDFILL. CURRENT ECONOMIC TRENDS RENDER SALVAGE UNATTRACTIVE. IN NEW YORK THERE IS NO DEMAND FOR WASTE PAPER. OFFICES NOW PAY AS MUCH AS $37/TON TO HAVE IT HAULED AWAY. NEW STEEL MELTING PROCESS HAS REDUCED THE DEMAND FOR SCRAP. THE PROBLEM OF COMPOST- IT HAS BEEN SUGGESTED THAT THE CITY PAY FARMERS FOR THE COST OF PLOWING COMPOST IN THE FIELDS JUST TO GET RID OF IT. CHICAGO IS INVESTIGATING THE POSSIBILITY OF PUMPING SLUDGE TO FARMED-OUT LANDS IN KANKAKEE COUNTY (90 MILES AWAY). THE AUTHOR USES THE FOLLOWING EXAMPLE TO STRESS THE NEED FOR A REGIONAL APPROACH - WEGMAN ENGINEERS DEVELOPED A MODERN PLAN FOR A COMMON DISPOSAL FACILITY FOR THREE CONNECTICUT TOWNS--EAST HARTFORD, GLASTONBURY, AND MANCHESTER. THE INCINERATOR IN EAST HARTFORD WAS TO HAVE BEEN MODERNIZED FOR HANDLING ALL OF THE REFUSE. WHEN THE CITIZENS OF EAST HARTFORD REFUSED TO HAVE THE REFUSE OF THE OTHER TWO TOWNS IN THEIR CITY, THE PLAN FELL THROUGH. FOR AN EXAMPLE OF LACK OF ORGANIZATION, HE GIVES THE FOLLOWING - AIR POLLUTION CONTROLLERS DISCHARGE WASTES TO RIVERS, WATER POLLUTION CONTROLLERS PUT THEIRS ON LAND, AND SOLID WASTES CONTROLLERS POLLUTE ALL THREE. LOS ANGELES IS A GOOD EXAMPLE OF THE PROPER APPROACH. IN THE LOS ANGELES AREA, A COOPERATIVE OF 70 MUNICIPALITIES AND A PART OF THE CITY OF LOS ANGELES WAS FORMED. AS A RESULT THE COLLECTION AND DISPOSAL COSTS ARE LOWEST IN THE NATION. (UC)

01-12-00720 TREATMENT OF ORGANIC INDUSTRIAL WASTES BY LAGOONING
COOPER, R. C. + OSWALD, W. J. + BRONSON, J. C.
PURDUE UNIVERSITY, ENGRG BULL OF PURDUE UNIV, PROC OF THE TWENTIETH INDUSTRIAL WASTE CONF, LAFAYETTE, INDIANA, (MAY 1965). A BRIEF DESCRIPTION IS GIVEN OF AEROBIC, FACULATIVE, AND ANAEROBIC PONDS. THE OXIDATION POND IS RECOMMENDED FOR INDUSTRIAL WASTE TREATMENT. SOME INDUSTRIAL INSTALLATIONS HAVE BEEN STUDIED. THESE INCLUDE THE LAGOONING OF WASTES FROM AN ANIMAL-RENDERING PLANT, FROM A HIDE-CURING PLANT, FROM A PETROLEUM PLANT, AND FROM A CHICKEN-RAISING OPERATION. (UC)

01-12-00895 HOW CITIES DISTRIBUTE SLUDGE AS SOIL CONDITIONER (SOIL-CONDITIONER)
OLDS, J.
COMPOST SCIENCE 1(3), P. 26-30 (AUTUMN 1960). METHODS USED BY VARIOUS CITIES TO MARKET AND DISTRIBUTE SLUDGE FOR SOIL CONDITIONING, INCLUDING DISTRIBUTION TO OTHER MUNICIPAL DEPARTMENTS AND LOCAL FARMERS, BULK SALES TO FERTILIZER MANUFACTURERS, AND SALE AT PLANT SITE. SUGGESTIONS MADE TO IMPROVE AND EXPAND MARKETING POTENTIALS INCLUDE EFFICIENT PROCESSING, LIMITING MARKETING AREA, EMPLOYING MODERN MERCHANDISING METHODS, AND COMPLETELY HONEST REPRESENTATION OF PRODUCT. (UC)

01-12-00918 PACKAGED REFUSE DISPOSAL PLANTS (TRANSFER INCINERATION COMPOSTING SEGREGATION SALVAGE)
PUBLIC CLEANSING 53(10), P. 476 (OCTOBER 1963). BRIEFLY DISCUSSES THE STANDARD-UNIT REFUSE DISPOSAL PLANTS WHICH HAVE BEEN PRODUCED BY A BRITISH MANUFACTURER. THE IDEA OF PRODUCING STANDARDIZED PLANTS HAS NOT BEEN THOUGHT TO BE A WORKABLE CONCEPT BECAUSE OF THE MANY VARIABLES WHICH OCCUR IN BOTH THE NATURE OF REFUSE AND THE REQUIREMENTS OF AREAS. BUT IN THIS INSTANCE, IT SEEMS THAT THE VAST MAJORITY OF THE MAJOR VARIABLES HAS BEEN TAKEN INTO CONSIDERATION. BASICALLY THE DESIGNS COVER A RANGE OF 12 STANDARD-UNIT PLANTS FOR REFUSE TRANSFER, INCINERATION AND COMPOSTING, EACH OF THE PROCESSES BEING PRECEDED BY SEPARATION, SALVAGING, AND PULVERIZING, AND ALL-EMBRACING AUTOMATIC CONTROL FEATURES. THE PRINCIPLE HAS BEEN TO PROVIDE FOR LOW CAPITAL AND RUNNING COSTS, THE MINIMUM UTILIZATION OF SITE SPACE, THE REDUCTION OF MAINTENANCE REQUIREMENTS, AND FOR CONVENIENT EXTENSION OR MODIFICATION. THE STANDARD PLANTS COMPRISE FOUR SIZES, HANDLING 50, 100, 200, AND 300 TONS OF REFUSE PER DAY. (PHS)

01-12-00948 THE HISTORICAL ROOTS OF OUR ECOLOGIC CRISIS
WHITE, L., JR.
SCIENCE 155(3767), P. 1203 (1967). WITH THE POPULATION EXPLOSION, THE CARCINOMA OF PLANLESS URBANISM, THE NEW GEOLOGICAL DEPOSITS OF SEWAGE AND GARBAGE, SURELY NO CREATURE OTHER THAN MAN HAS EVER MANAGED TO FOUL ITS NEST IN SO SHORT A TIME. THE SIMPLEST SOLUTION TO ANY SUSPECT CHANGE IS, OF COURSE, TO STOP IT, OR BETTER YET, TO REVERT IT TO A ROMANTICIZED PAST.... BUT NEITHER ATAVISM NOR PRETTIFICATION WILL COPE WITH THE ECOLOGIC CRISIS OF OUR TIME. WHAT SHALL WE DO? NO ONE YET KNOWS. UNLESS WE THINK ABOUT FUNDAMENTALS, OUR SPECIFIC MEASURES MAY PRODUCE NEW BACKLASHES MORE SERIOUS THAN THOSE THEY ARE DESIGNED TO REMEDY. CHRISTIANITY, IN ABSOLUTE CONTRAST TO ANCIENT PAGANISM AND ASIA'S RELIGIONS, ... NOT ONLY ESTABLISHED A DUALISM OF MAN AND NATURE BUT ALSO INSISTED THAT IT IS GOD'S WILL THAT MAN EXPLOIT NATURE FOR HIS PROPER ENDS. (UC)

01-12-01015 SOME DAY - PAPER SHIRTS YOU WASH DOWN THE SINK (COMPOSITION)
CARBERRY, J.
BERKELEY DAILY GAZETTE 14, P. 27 (OCTOBER 1965). PRODUCT DESIGNERS NEED TO CONSIDER THE ULTIMATE DISPOSAL OF THEIR MERCHANDISE. ALONG THESE LINES, DISPOSABLE CLOTHING SUCH AS SHIRTS MAY BE THE STYLE OF TOMORROW. BUSINESSMEN OF TOMORROW MAY BE ABLE TO COME HOME FROM WORK, TAKE OFF THEIR PAPER SHIRTS, AND WASH THEM DOWN THE KITCHEN SINK. RAILROADS AND SEWAGE SYSTEMS MAY BE USED IN THE FUTURE TO HANDLE THE BULK OF REFUSE-- TRANSPORTING THE WASTES TO A MORE SUITABLE AREA OF DISPOSAL THAN THEIR SOURCE. REGIONAL PLANNING--DISREGARDING POLITICAL BOUNDARIES--MUST BE SET UP SO THAT WASTES CAN BE DISPOSED OF IN THE MOST EFFICIENT MANNER POSSIBLE. PROFESSOR P. H. MCGAUHEY OF THE UNIVERSITY OF CALIFORNIA HAS DOUBTS, HOWEVER, CONCERNING THE BALING OF REFUSE AND THE ULTIMATE DUMPING OF THESE BALES IN THE OCEAN, AS DO MARINE BIOLOGISTS AND OTHERS FAMILIAR WITH SEA LIFE. A PROGRAM MUST BE STARTED TO EDUCATE THE GENERAL PUBLIC ON THE SCOPE OF THE SOLID WASTES PROBLEM. ONCE THE PUBLIC BECOMES CONCERNED, PRIVATE INDUSTRY WILL BE STIMULATED TO INVESTIGATE EFFICIENT, AND PROFITABLE, METHODS OF WASTES DISPOSAL. (UC)

01-12-01311 WASTE DISPOSAL METHODS - SCOPE AND LIMITATIONS (POLLUTION(WATER) OPEN-DUMPING)
WUHRMANN, K.
PUBLIC CLEANSING 55(10), P. 576-578 (1965). IN ASSESSING THE METHOD OF DISPOSAL FOR A PARTICULAR SITUATION ONE MUST BE PREPARED TO MAKE INTELLIGENT AND VALID DECISIONS AS TO WHY HE SELECTS A PARTICULAR PROCESS. THIS ARTICLE IS A GENERAL DISCUSSION OF THIS PROBLEM.

01-12-01352 PROWLERS - SANITATION UNIFORMS ATTRACT BETTER MEN
BERGMANN, J. W.
THE AMERICAN CITY 76(8), P. 104 (AUGUST 1961). IN HYATTSVILLE, MARYLAND, A TOWN NEAR WASHINGTON, D.C. AND HAVING A POPULATION OF 15,167, TRASH COLLECTORS WERE ACCUSED OF THEFT AND WERE MISTAKEN FOR PROWLERS UNTIL UNIFORMS WERE PROVIDED THEM. SINCE THE CITY HAS BEGUN TO SUPPLY UNIFORMS TO THE REFUSE COLLECTORS, ACCUSATIONS HAVE STOPPED, CALLS TO THE POLICE HAVE DECLINED FROM 200 TO TWO OR THREE WEEKLY, WORKER MORALE HAS RISEN, AND BETTER MEN HAVE BEEN WILLING TO TAKE ON THE JOB. (UC)

01-12-01357 SOLID WASTE RESEARCH PROJECTS
THE AMERICAN CITY 82(6), P. 63 (1967). THE FIRST SOLID-WASTES DEMONSTRATION PROJECTS, FINANCED IN PART (50 PERCENT) BY FEDERAL FUNDS UNDER THE SOLID WASTE DISPOSAL ACT, HAVE TWO DISTINCT AIMS. SOME ARE DESIGNED TO DEMONSTRATE THE FEASIBILITY OF NEW AND IMPROVED TECHNOLOGY FOR SOLID WASTE DISPOSAL, WHILE OTHERS ARE INVESTIGATING THE DEVELOPMENT OF AREA- WIDE SOLID WASTE MANAGEMENT SYSTEMS, LISTED ARE 17 SUCH PROJECTS.

01-12-01463 WEIGH REFUSE ELECTRONICALLY
ROGUS, C. A.
THE AMERICAN CITY 72(4), P. 128 (APRIL 1957). NEW YORK CITY HAS STARTED TO WEIGH REFUSE ELECTRONICALLY AS AN EFFICIENT MEANS OF OBTAINING ACCURATE OPERATING AND PRODUCTION DATA FOR THE MANAGEMENT OF THE SANITATION DEPARTMENT. THEIR OPERATION IS DESCRIBED IN THREE PHASES: (1) THE ELECTRONIC WEIGHING SYSTEM, INCLUDING THE WEIGHING OPERATION, ACCURACY, MERITS OF THE SYSTEM, ECONOMICS. (2) USE OF PERFORMANCE TICKETS FOR RECORDING STATISTICAL DATA FOR USE AT THE VARIOUS ADMINISTRATIVE LEVELS. (3) PERSONNEL AND EQUIPMENT USAGE. (PHS)

01-12-01465 REFUSE SANITATION STUDY GROUP
THE AMERICAN CITY 72(3), P. 212 (MARCH 1957). THE PUBLIC HEALTH SERVICE IS CONVENING AN AD HOC STUDY GROUP TO CONSIDER THE PROBLEM OF COMMUNITY SOLID WASTE DISPOSAL. THE ARTICLE ENUMERATES THE AIMS OF THE MEETING AND GIVES THE NAMES OF INDIVIDUALS AND ORGANIZATIONS INVITED. (PHS)

01-12-01545 PHILADELPHIA YOUTH'S PERSISTENCE FINDS BURIED TREASURE--IN A DUMP
REFUSE REMOVAL JOURNAL 1(1), P. 14 (JANUARY 1958). A BOX OF ARCHEOLOGICAL TREASURES WERE RECOVERED FROM A DUMP BY DEDUCTIVE REASONING AND QUICK ACTION. (PHS)

01-12-01577 MANAGING MAN'S ENVIRONMENT IN CALIFORNIA AND THE BAY AREA
STEAD, F. M.
INSTITUTE OF GOVERNMENTAL STUDIES, UNIVERSITY OF CALIFORNIA, BERKELEY, (1963). THE HISTORICAL CONCEPT OF ENVIRONMENT SANITATION IS DESCRIBED WITH RESPECT TO AIR SANITATION, WATER SANITATION, FOOD SANITATION, AND SHELTER SANITATION. THE PRESENT RESOURCES OF AIR, WATER, FOOD, AND LAND ARE EVALUATED, AND THE NEEDS FOR DETERMINATION OF ENVIRONMENT VALUES AND SYSTEMS OF DECISION-MAKING ARE DISCUSSED. (UC)

01-12-01582 WE NEVER REFUSE REFUSE IS CHICAGO MAN'S SLOGAN
REFUSE REMOVAL JOURNAL 1(6), P. 24 (JUNE 1958). A FATHER AND SON FIRM USES A FLEET OF SEVEN PACKERS FOR REFUSE COLLECTION SERVICE IN CHICAGO AND ITS SUBURBS. (PHS)

01-12-01592 CHICAGO HAULER GIVES VIEWS ON NATIONAL GROUP
REFUSE REMOVAL JOURNAL 1(5), P. 10 (MAY 1958). A MEMBER OF THE CHICAGO AND SUBURBAN ASH AND SCAVENGER ASSOCIATION CITES ADVANTAGES WHICH BOTH CONTRACTORS AND MANUFACTURERS MIGHT ENJOY BY THE FORMATION OF A NATIONAL ASSOCIATION OF PRIVATE REFUSE CONTRACTORS. (PHS)

01-12-01655 PARADE FEATURES DRIVE FOR CLEANER CITY (PUBLIC-RELATIONS)
REFUSE REMOVAL JOURNAL 2(7), P. 6 (JULY 1959). THE CITY OF CHICAGO RECENTLY HELD A CLEANER SIDEWALK WEEK, IN ADDITION TO ITS SEVENTH ANNUAL PARADE FOR A CLEANER CITY. AS A PART OF THE EFFORT FOR CLEANER SIDEWALKS, 500 WOMEN VOLUNTEERS OBTAINED PLEDGES OF COOPERATION FROM 20,000 LOCAL BUSINESSES. (PHS)

01-12-01659 PUBLIC SERVICE GROUP FIGHTS LITTER MENACE (LITTERING)
REFUSE REMOVAL JOURNAL 2(8), P. 20 (AUGUST 1959). MANY ORGANIZATIONS ARE COOPERATING TO COMBAT THE POSITIVE DANGERS RESULTING FROM UNCONTROLLED LITTERING OF OUTDOOR AREAS. ONE ORGANIZATION POINTS OUT THESE DANGERS AS WELL AS THE OBVIOUSLY UNPLEASANT VISUAL EFFECT. VARIOUS STATE FINES AND REGULATIONS ARE CITED. (PHS)

01-12-01676 MUCH OF YEARLY FIRE LOSS LAID TO LITTER
REFUSE REMOVAL JOURNAL 2(10), P. 12 (OCTOBER 1959). THE NATIONAL ECONOMIC BURDEN OF LITTER-CAUSED FIRES IS GREAT. A PUBLIC SERVICE GROUP'S RESEARCH SHOWS STARTLING DECLINES IN FIRE LOSSES WHENEVER CAMPAIGNS AGAINST LITTERING HAVE BEEN SUCCESSFUL. (PHS)

01-12-01718 MANAGEMENT OF REFUSE DISPOSAL FACILITIES
MICHAELS, A.
REFUSE REMOVAL JOURNAL 3(3), P. 14 (MARCH 1960). THE CHIEF SANITATION ENGINEER OF PHILADELPHIA DISCUSSES THE FOLLOWING CONSIDERATIONS IN REFUSE DISPOSAL MANAGEMENT - (1) THE GOAL, (2) THE INDIVIDUAL EMPLOYEE, (3) THE ORGANIZATION FORM, (4) PERSONNEL POLICIES AND EMPLOYEE RELATIONS, (5) FACILITY DESIGN, OPERATION, AND MAINTENANCE, (6) ACCOUNTING AND FISCAL POLICY, (7) PLANNING AND RESEARCH, AND (8) PUBLIC RELATIONS. (PHS)

01-12-01737 AMOUNT OF TRASH THROWN AWAY IS STATUS SYMBOL (QUANTITY)
SOLID WASTES MANAGEMENT/RRJ 12(4), P. 56 (1969). TRASH IS A STATUS SYMBOL IN SOME SUBURBAN SECTIONS OF OUR COUNTRY. A MAN IS NOT WHAT HE EATS, BUT WHAT HE THROWS AWAY, ACCORDING TO A KANSAS CITY WAG. HE OBSERVES THAT RESIDENTS OF AN OUTLYING SUBURB PREFER SEMIWEEKLY PICKUPS OF REFUSE EVEN THOUGH THIS SERVICE IS NOT NEEDED AND ENCOMPASSES A SLIGHTLY HIGHER FEE. IT IS ALWAYS MORE EXPENSIVE, HE NOTES, TO TRAVEL FIRST CLASS.

01-12-01746 ART BUCHWALD INTERVIEWS
BUCHWALD, A.
REFUSE REMOVAL JOURNAL 6(6), P. 8 (JUNE 1963). A HUMOROUS ARTICLE CONCERNING THE REFUSE DISPUTE IN LOS-ANGELES, CALIFORNIA. TWO HOLLYWOOD CELEBRITIES WHO WERE INTERVIEWED BY THE AUTHOR COMMENT ON THE SEPARATE COLLECTION OF BOTTLES, TIN CANS AND OTHER REFUSE, AND ON THE RECENT LAW PASSED BY THE CITY COUNCIL MAKING VIOLATIONS PUNISHABLE BY A $500 FINE AND 6 MONTHS IN JAIL. (PHS)

01-12-01754 SUCCESSFUL MEETING OF CALIFORNIA COUNCIL HELD (ASSOCIATION)
REFUSE REMOVAL JOURNAL 6(3), P. 22 (MARCH 1963). AN ACCOUNT OF A FEBRUARY 1963, MEETING OF THE CALIFORNIA REFUSE REMOVAL COUNCIL. NEARLY 100 OPERATORS AND SUPPLIERS FROM ALL OVER CALIFORNIA, AND EVEN SOME FROM NEVADA ATTENDED THE MEETING. THE PURPOSE OF THE MEETING WAS TO PRESENT A PROGRESS REPORT ON STATEWIDE AND NATIONAL ACTIVITIES, TO REAFFIRM THE PURPOSE OF THE ORGANIZATION, TO SECURE CONTINUED INDUSTRY SUPPORT, AND TO REVIEW PROGRESS REPORTS OF MEMBERSHIP, BYLAWS, AND WAYS AND MEANS COMMITTEES. ALSO A BOARD OF DIRECTORS WAS CREATED AND THE NAME OF THE ASSOCIATION WAS CHANGED FROM CALIFORNIA WASTE REMOVAL COUNCIL TO THE NAME CITED ABOVE. (PHS)

01-12-01768 NO BED OF ROSES, SAYS NEOPHYTE OF COLLECTIONS (COLLECTION)
REFUSE REMOVAL JOURNAL 5(1), P. 18 (JANUARY 1962). AN AMUSING AND ILLUMINATING STORY BY A TULSA, OKLA., NEWSPAPER REPORTER ABOUT HIS EXPERIENCES ONE DAY COLLECTING REFUSE WITH A PRIVATE CONTRACTOR.

01-12-01788 WHY CONTRACTORS JOIN ASSOCIATIONS (SANITARY-LANDFILL SITE-SELECTION)
ROFF, B.
REFUSE REMOVAL JOURNAL 6(10), P. 12 (OCTOBER 1963). BRIEFLY STATES WHY REFUSE CONTRACTORS JOIN ASSOCIATIONS. AS INDIVIDUALS THE CONTRACTORS WILL LACK THE STRENGTH TO REMEDY THE FUTURE PROBLEM OF LENGTHY HAUL DISTANCES TO DISPOSAL AREAS, BUT AS A GROUP THEY WILL HAVE THE STRENGTH AND ABILITY TO SECURE ADEQUATE DISPOSAL FACILITIES. THROUGH THE RULES OF THE REFUSE CONTRACTOR ASSOCIATIONS, STANDARDS IN THE INDUSTRY CAN BE RAISED TO REFLECT THE IMPORTANCE OF THE INDUSTRY TO THE OVERALL ECONOMY OF THE AREA. THE ASSOCIATIONS WILL MAKE IT POSSIBLE TO REALIZE SAVINGS IN GROUP PURCHASING OF TRUCKS, EQUIPMENT, AND INSURANCE. (PHS)

01-12-01811 INTERIM REPORT OF INDUSTRY BASED ON UNSOUND RESEARCH (SURVEY COLLECTION QUANTITIES)
SOLID WASTES MANAGEMENT/RRJ 12(3), P. 6-7, 49 (MARCH 1969). A COMMENTARY ON THE " INTERIM REPORT ON THE NATIONAL SURVEY OF SOLID WASTES " PRODUCED BY THE SOLID WASTES PROGRAM. SURVEY SAMPLING IS QUESTIONED AS WELL AS DATA ON AMOUNTS PRODUCED, NUMBER OF VEHICLES, PERSONNEL, ETC. THE ARTICLE RAISES SERIOUS QUESTIONS AS TO THE USEFULNESS OF THE DATA.

01-12-01819 GOT TRASH TO SELL? CALL THE CITY OF CHICAGO (COMPACTION COMPOSITION)
SOLID WASTES MANAGEMENT/RRJ 12(3), P. 9 (MARCH 1969). THE CITY OF CHICAGO HAS RECENTLY ANNOUNCED BIDS FOR COMPONENTS OF STANDARD REFUSE FOR USE IN THEIR STUDIES ON REFUSE COMPACTION. ITEMS SUCH AS CORRUGATED PAPER, TIN AND ALUMINUM CANS, JUNK MAIL, PLASTIC PRODUCTS ARE INCLUDED. THEY ARE ALSO CALLING FOR "USUAL HOUSEHOLD REFUSE", WHICH THEY FEEL WILL BE DIFFICULT TO OBTAIN.

01-12-01853 PRESIDENT JOHNSON SPURS NATION TO ACT ON SOLID WASTE PROBLEMS
BLACK, R. J.
REFUSE REMOVAL JOURNAL 8(7), P. 8 (1965). JUST A FEW WEEKS AGO, PRESIDENT JOHNSON CALLED SPECIAL ATTENTION TO SEVERAL ASPECTS OF THE SOLID WASTE PROBLEM IN HIS NATURAL BEAUTY MESSAGE TO CONGRESS. HE SAID- " THE MODERN TECHNOLOGY, WHICH HAS ADDED MUCH TO OUR LIVES CAN ALSO HAVE A DARKER SIDE. ITS UNCONTROLLED WASTE PRODUCTS ARE MENACING THE WORLD WE LIVE IN, OUR ENJOYMENT, AND OUR HEALTH. THE AIR WE BREATHE, OUR WATER, OUR SOIL, AND WILDLIFE, ARE BEING BLIGHTED BY THE POISONS AND CHEMICALS WHICH ARE THE BYPRODUCTS OF TECHNOLOGY AND INDUSTRY. THE SKELETONS OF DISCARDED CARS LITTER THE COUNTRYSIDE. THE SAME SOCIETY WHICH RECEIVES THE REWARDS OF TECHNOLOGY, MUST, AS A COOPERATING WHOLE, TAKE RESPONSIBILITY FOR CONTROL. TO DEAL WITH THESE NEW PROBLEMS WILL REQUIRE A NEW CONSERVATION. WE MUST NOT ONLY PROTECT THE COUNTRYSIDE AND SAVE IT FROM DESTRUCTION, WE MUST RESTORE WHAT HAS BEEN DESTROYED AND SALVAGE THE BEAUTY AND CHARM OF OUR CITIES."

01-12-01966 MEASURING THE IMPROVEMENTS IN THE CONTROL ASPECTS OF PROGRAMS AIDED BY FEDERAL GRANTS (EMISSION(CONTROL))
YAFFE, C. D. + JOHNSON, W. F.
J AIR POLLUTION CONTROL ASSOC 17(5), P. 316-318 (MAY 1967). AMBIENT AIR STANDARDS, EMISSION STANDARDS, AND PROGRAM ACTIVITIES ARE CONSIDERED IN A SEARCH FOR APPROPRIATE INDICES FOR MEASURING PROGRAM PROGRESS AND EFFECTIVENESS. THE AUTHORS SUGGEST THAT SUCH INDICES CAN BEST BE BASED ON DATA RELATED TO WEIGHT OF EMISSIONS. SEVERAL METHODS FOR EXPRESSING ACCOMPLISHMENT ARE PRESENTED FOR CONSIDERATION. (AUTH)

01-12-01997 THE NATURE OF RECORDS REQUIRED TO BE KEPT BY A CLEANSING DEPARTMENT FOR COSTING AND STATISTICAL PURPOSES
HENDERSON, R.
64TH ANNUAL CONF OF THE INSTITUTE OF PUBLIC CLEANSING, HASTINGS, (JUNE 5-8, 1962). IN ORDER THAT A BUSINESS OR SERVICE OPERATE SUCCESSFULLY THE ADMINISTRATION MUST BE FAMILIAR WITH THE ORGANIZATION. NO BETTER WAY TO BECOME FAMILIAR WITH AN ORGANIZATION IS THROUGH THE USE OF STATISTICAL DATA COLLECTED FROM ITS OPERATIONS THROUGHOUT THE YEAR. SOME AREAS OF INFORMATION NEEDED AND WHY ARE LISTED.

01-12-02001 THE LIFELINE OF COMMUNICATIONS - THE PUBLIC RELATIONS OF PUBLIC CLEANSING DEPARTMENTS
EVANS, L.
69TH ANNUAL CONF OF THE INSTITUTE OF PUBLIC CLEANSING, BLACKPOOL, (JUNE 5-9, 1967). AT A TIME WHEN MOST EVERYONE IS CONCERNED ABOUT THE BEAUTY OF OUR CITIES AND COUNTRYSIDE AND IS TRYING TO REDUCE POLLUTION OF VARIOUS TYPES, THE AUTHOR FEELS IT IS NECESSARY TO CONDUCT AN EXTENSIVE PUBLIC RELATIONS EFFORT TO KEEP THE PUBLIC INFORMED ABOUT THE RESPONSIBILITIES OF THE GOVERNMENT AS WELL AS THE PUBLIC.

01-12-02003 INSURANCE IN PUBLIC CLEANSING
ROBERTSON, J. S.
71ST ANNUAL CONF OF THE INSTITUTE OF PUBLIC CLEANSING, HARROGATE, (JUNE 17-20, 1969). A PAPER IN WHICH THE AUTHOR MAKES A GENERAL SURVEY OF INSURANCE IN ITS RELATION AND FUNCTION TO THE PUBLIC CLEANSING DEPARTMENTS. THE THREE MAIN CATAGORIES COVERED ARE FIRE, ACCIDENT, AND ENGINEERING INSURANCE WITH SUBTOPICS UNDER EACH OF THE THREE MAIN CATAGORIES.

01-12-02010 THE CLEANSING SERVICES OF A HOLIDAY RESORT
LAWRENCE, R. J.
SPRING MEETING, THE INSTITUTE OF PUBLIC CLEANSING, SOUTHEND-ON-SEA, (MARCH 18, 1966). THE PUBLIC CLEANSING DEPARTMENT THAT HAS THE RESPONSIBILITY FOR CLEANING THE BEACHES AND RECREATION PARKS IN RESORT AREAS MUST HAVE A FLEXIBLE SCHEDULE IN ORDER TO MEET ITS REGULAR RESIDENTIAL AND COMMERCIAL SCHEDULE. THIS PAPER OUTLINES SOME OF THE METHODS IN WHICH SUCH A PROGRAM IS HANDLED.

01-12-02011 THE APPLICATION OF PLASTICS TO PUBLIC CLEANSING (COLLECTION CONTAINER)
PERRY, G. F.
67TH ANNUAL CONF OF THE INSTITUTE OF PUBLIC CLEANSING, SCARBOROUGH, (JUNE 1-4, 1965). A SURVEY OF PLASTIC MATERIALS USED IN THE PUBLIC CLEANSING INDUSTRY. LISTED ARE SOME OF THE ADVANTAGES AND DISADVANTAGES OF PLASTIC CONTAINERS, AS WELL AS PROBLEMS ENCOUNTERED IN COMPOSTING AND INCINERATION.

01-12-02088 PROCEEDINGS OF THE SECOND ANNUAL MEETING OF THE INSTITUTE FOR SOLID WASTES (COLLECTION COST(COLLECTION) HEAT-RECOVERY INCINERATION)
AM PUBLIC WORKS ASSOC, CHICAGO, ILLINOIS, (OCTOBER 3-5, 1967). THESE 1967 PROCEEDINGS INCLUDE ALL TECHNICAL PAPERS PRESENTED AT THE SECOND ANNUAL MEETING OF THE INSTITUTE IN BOSTON, MASSACHUSETTS OCTOBER 3-5. ALSO INCLUDED ARE THE REPORT TO THE MEMBERSHIP, A LIST OF ALL COMMITTEES AND THEIR MEMBERS, A REPORT ON THE NINTH CONGRESS OF THE INTERNATIONAL PUBLIC CLEANSING ASSOCIATION (INTAPUC), HELD IN PARIS, FRANCE IN JUNE OF 1967. THIS CONGRESS WAS ATTENDED BY A NUMBER OF ISW MEMBERS, SEVERAL OF WHOM PARTICIPATED IN THE MEETING. THE UNITED STATES AND CANADA IS FORMALLY REPRESENTED IN INTAPUC BY THE ISW, AND THE SECRETARY-TREASURER OF THE INSTITUTE SERVES ON THE INTAPUC GOVERNING BODY. THE PROCEEDINGS ALSO CONTAINS A DIRECTORY OF INSTITUTE MEMBERS ARRANGED ALPHABETICALLY AND GEOGRAPHICALLY. THE 1968 EXECUTIVE COUNCIL, INSTALLED AT THE ANNUAL MEETING, IS LIKEWISE INCLUDED.

02 Production of Solid Wastes

02 01 QUANTITIES

02-01-00234 DEVELOPING CLASSIFICATIONS FOR REFUSE (QUANTITY COMPOSITION)
SUSAG, R. H.
SOLID WASTES MANAGEMENT/RRJ 11(3), P. 20, 37 (MARCH 1968). PER CAPITA SOLID-WASTE GENERATION RATES ARE DISCUSSED. THE USUAL PER-CAPITA BASIS INCLUDING INDUSTRIAL CONTRIBUTIONS. THE DATA FOR THE WEEK OF JULY 2-8, 1967 FOR A FAMILY OF SIX ARE PRESENTED.

02-01-00283 REFUSE QUANTITIES AND FREQUENCY OF SERVICE (COLLECTION)
QUON, J. E. + TANAKA, M. + CHARNES, A.
PROC AM SOC CIVIL ENGRS J SANIT ENGRG DIV 94(SA2), P. 403-420 (APRIL 1968). DETERMINATION OF SIGNIFICANT CHANGES IN QUANTITIES OF REFUSE FROM WARDS 17 AND 25, CITY OF CHICAGO, AS RESULT OF INITIATION IN 1966 OF TWICE-A-WEEK PICKUP SERVICE IN APPROXIMATELY ONE-THIRD OF LIVING UNITS SERVICED IS STUDIED. METHOD FOR MAKING COMPARISONS BASED ON INFORMATION FROM SIMILAR NEIGHBORHOODS AND IDENTICAL TIME PERIODS WAS DEVELOPED AND USED IN ANALYSIS.

02-01-00515 PER CAPITA FIGURE OF 5.1 POUNDS OF MATTER DAILY INDICATED BY NATIONAL SURVEY (QUANTITY COLLECTION)
SOLID WASTES MANAGEMENT/RRJ 11(14), (MARCH 1968). APPROXIMATELY ONE BILLION, 380 MILLION POUNDS OF RESIDENTIAL, COMMERCIAL, AND INDUSTRIAL WASTES, OR 5.1 LB PER CAPITA ARE GENERATED EACH DAY IN THE U.S., ACCORDING TO A REPORT MADE BY COMBUSTION ENGINEERING CO. FOR THE U.S.P.H.S. APPROXIMATELY 600 CITIES WERE SURVEYED, AND OFFICIALS IN 50 OF THESE WERE INTERVIEWED PERSONALLY. APPROXIMATELY 20 PERCENT OF THE COMMUNITIES HAVING POPULATIONS OVER 25,000 USE INCINERATION TO DISPOSE OF THEIR SOLID WASTES. ON A NATIONAL BASIS, THIS ACCOUNTS FOR THE INCINERATION OF ONLY 9 PERCENT OF ALL URBAN REFUSE. ABOUT 50 PERCENT OF THE CITIES WITH POPULATIONS OVER 25,000 ARE CURRENTLY USING SANITARY LANDFILL WHOSE CAPACITY AT EXISTING SITES WILL BE EXHAUSTED WITHIN SIX YEARS. (UC)

02-01-01016 GROWING MOUNTAIN OF GARBAGE (QUANTITY INCINERATOR COST(CAPITAL))
ZANE, M.
SAN-FRANCISCO CHRONICLE 5 (JULY 4, 1966). SAN FRANCISCO PRODUCES 1,500 TONS OF GARBAGE/DAY WHICH ARE COLLECTED BY TWO FAMILY FIRMS, GOLDEN GATE DISPOSAL COMPANY AND THE SUNSET SCAVENGER COMPANY. THE JOB IS HAZARDOUS AND UNPLEASANT AND PAYS $3.30 PER HOUSE. FILL AREAS ARE CANDLESTICK LAGOON AND BRISBANE. HOWEVER, THE LATTER'S PERMIT HAS BEEN REVOKED. NONSMOG INCINERATORS WOULD COST $5,500 PER TON, OR $8,250,000 FOR 1,500 TONS CAPACITY. (UC)

02-01-01063 REFUSE INVESTIGATION STANDARDS (VOLUME COMPOSITION)
JAEGER, B.
RICHTINIEN FUER DIE UNTERSUCHUNG VON MUELL AUFBEREITUNGS-TECHNIK 3(5), P. 195-198 (MAY 1962). IN SPECIFICATIONS, MEASURES RECOMMENDED DEAL WITH INVESTIGATIONS TO BE CARRIED OUT BY TOWNS. WORK TO BE UNDERTAKEN BY TOWN IN SPECIALIZED ANALYSES SERVICE AND WORK TO BE CARRIED OUT BY LABORATORIES AND INSTITUTES. (EI)

02-01-01119 REFUSE QUANTITIES AND CHARACTERISTICS (RECLAMATION COLLECTION AIR-POLLUTION SANITARY-LANDFILL INCINERATION DEFINITION COMPOSTING)
ROGUS, C. A.
PROC OF THE NATIONAL CONF ON SOLID WASTE RESEARCH, AM PUBLIC WORKS ASSOC, CHICAGO, ILLINOIS, P. 17-27 (DECEMBER 1963). MOST OF THE AVAILABLE INFORMATION WAS GATHERED SPORADICALLY AND USUALLY FOR SHORT TIME CYCLES BY INDIVIDUAL MUNICIPALITIES TO SERVE THEIR SPECIAL NEEDS. IN THE ABSENCE OF AUTHORITATIVE GUIDELINES, THIS INFORMATION LACKS UNIFORMITY AND CONSISTENCY. NEVERTHELESS THE DATA IN THEM DO REPRESENT TRENDS. CONCLUSIONS WERE MADE - (1) THERE NOW EXISTS A LACK OF CONSISTENTLY DEPENDABLE KNOWLEDGE OF REFUSE QUANTITIES AND THEIR SEASONAL AND YEARLY VARIATIONS AND CHANGES. (2) THERE IS A SIMILAR LACK OF INFORMATION AS TO THEIR CHARACTERISTICS, AND PHYSICAL AND CHEMICAL PROPERTIES. (3) PRACTICALLY NO INFORMATION IS AVAILABLE ON SOME OF THE NEWER SPECIAL WASTES. AMONG THESE ARE DEMOLITION AND CONSTRUCTION WASTES, MISCELLANEOUS OUTSIZED MATERIALS, VARIOUS CHEMICAL AND SYNTHETIC DISCARDS, AND SOME OF THE NEWER HAZARDOUS WASTES INCLUDING RADIOACTIVE MATERIALS. (4) THE ABSENCE OF THIS ESSENTIAL INFORMATION LARGELY EXISTS BECAUSE THE REQUIRED OVERALL NATION-WIDE DEVELOPMENT OF UNIFORM STANDARDS OF MEASUREMENT AND OF ANALYSIS HAS NOT BEEN MADE TO DATE. (5) LACKING THIS DETAILED INFORMATION THE DESIGNS OF EXISTING FACILITIES HAVE BEEN HANDICAPPED AS TO THEIR EFFECTIVENESS AND EFFICIENCY AND GENERALLY RESULT IN COSTLIER AND LESS SANITARY OPERATIONS. (6) A CONCENTRATED NATION-WIDE EFFORT COULD DEVELOP AND ESTABLISH THE NECESSARY INFORMATION TO GUIDE IMPROVEMENTS ON EXISTING SYSTEMS AND FACILITIES AND TO PROMOTE MORE EFFICIENT FUTURE DESIGNS AND OPERATIONS.

02-01-01601 NEW FOODS BUILD UP REFUSE PILE (QUANTITY)
REFUSE REMOVAL JOURNAL 1(8), P. 28 (AUGUST 1958). TRASH PRODUCTION HAS INCREASED FROM AN AVERAGE OF 1-1/2 TO 3 POUNDS PER PERSON PER DAY IN PHILADELPHIA DURING THE PAST TEN YEARS. (PHS)

02-01-01741 STATE PRODUCES 71.5 MILLION TON MOUNTAIN OF REFUSE EVERY YEAR (QUANTITY COLLECTION FREQUENCY BULKY-WASTE SANITARY-LANDFILL TRANSFER-STATION INDUSTRIAL(QUANTITY) BILLING OPEN-DUMP LAW AGRICULTURAL(QUANTITY))
SOLID WASTES MANAGEMENT/RJJ 12(4), P. 31-34, 50 (APRIL 1969). CALIFORNIA HAS 50 COUNTIES, 399 CITIES, 1162 SPECIAL DISTRICTS AND 12 STATE AGENCIES TO REGULATE SOLID WASTE MANAGEMENT. THE STUDY REPORTS THAT DISPOSAL IS STILL BASED ON A FRAGMENTAL JURISDICTIONAL APPROACH. IN CALIFORNIA, EACH MEMBER OF THE STATE'S 19.5 MILLION POPULATION GENERATES 20.2 POUNDS OF REFUSE DAILY. THIS IS AN ALL-INCLUSIVE FIGURE, BREAKING DOWN TO 6.5 POUNDS OF URBAN REFUSE (STILL 1.1 POUNDS ABOVE THE NATIONAL AVERAGE), 9.8 POUNDS OF AGRICULTURAL WASTES AND 3.9 POUNDS OF INDUSTRIAL TRASH. THE STUDY INDICATES THAT THERE HAS NOT BEEN ADEQUATE PLANNING TO COPE WITH INCREASING VOLUME. WHILE 42 OF CALIFORNIA'S 58 COUNTIES HAVE SOME FORM OF SOLID WASTE ORDINANCE, ONLY 17 ACTUALLY REGULATE DISPOSAL. ONLY 16 COUNTIES HAVE EVER UNDERTAKEN ANY FORM OF PLANNING FOR DISPOSAL AND MANY OF THESE PLANS HAVE NOT BEEN ADOPTED OR IMPLEMENTED. VERY FEW OF THE PLANS INCLUDE PROVISIONS FOR ACCOMMODATING MAJOR INDUSTRIAL WASTES, SUCH AS CANNERY AND FROZEN FOOD REFUSE, OR CONSIDER THE NEEDS AND PROBLEMS OF ADJACENT COUNTIES OR CITIES. AT THIS MOMENT NO COUNTY HAS A COMPLETE SOLID WASTES MANAGEMENT PROGRAM. THERE ARE ONLY 21 MAJOR TRANSFER STATIONS IN CALIFORNIA AND THEY HANDLE ROUGHLY 4 PERCENT (900,000 TONS) OF THE STATE'S YEARLY REFUSE. AND, INTERESTINGLY ENOUGH, 80 PERCENT OF THAT TOTAL IS HANDLED BY THE FIVE LARGEST STATIONS, ALL OF WHICH ARE CITY, COUNTY OR DISTRICT OPERATED. OF THE 716 DISPOSAL SITES IN CALIFORNIA, ONLY 67 OF THEM (LESS THAN 10 PERCENT) QUALIFY AS SANITARY LANDFILL AND ONLY 96 MORE AS MODIFIED SANITARY LANDFILL (COVERED PERIODICALLY, BUT NOT DAILY.) OPEN BURNING DUMPS TOTAL 511, OR 72 PERCENT OF ALL EXISTING SITES. TOTAL LAND DEVOTED TO DISPOSAL SITES AT THIS TIME IS APPROXIMATELY 56 SQUARE MILES. OPEN BURNING DUMPS OCCUPY 35 PERCENT OF THAT LAND (12,320 ACRES), BUT DAILY ONLY RECEIVE 3,200 TONS OF REFUSE, LESS THAN 6 PERCENT OF THE STATEWIDE TOTAL. IT IS MOST SIGNIFICANT THAT 72 PERCENT OF THE STATE'S DISPOSAL SITES RECEIVE SUCH A SMALL PERCENTAGE OF THE TOTAL REFUSE. ON THE OTHER HAND, SANITARY LANDFILL, 9 PERCENT OF THE TOTAL SITES, COVER 27 PERCENT (9,755 ACRES) OF DISPOSAL AREA AND DAILY RECEIVES 33,500 TONS, OR 63 PERCENT OF THE GROSS REFUSE. MODIFIED SANITARY LANDFILL HAVE 37 PERCENT (13,136 ACRES) OF THE LAND AND HANDLE 29 PERCENT OF THE DAILY VOLUME. THE TOTAL REMAINING CAPACITY OF ALL EXISTING SITES IN CALIFORNIA IS 718,800 ACRE FEET, OR 25 SQUARE MILES BY ROUGHLY 45 FEET DEEP. APPROXIMATELY 54 PERCENT OF THIS CAPACITY IS IN 16 (2 PERCENT) OF THE TOTAL SITES. WITHIN FOUR YEARS 27 PERCENT OF THE TOTAL EXISTING SITES WILL BE FILLED AND THREE-QUARTERS OF THESE HAVE NO REPLACEMENT PLANNED. THE ENTIRE OUTLOOK FOR DISPOSAL IS GRIM. WITHIN 20 YEARS, 630 OF THE 716 GENERAL DISPOSAL SITES WILL BE FILLED--AND, AS OF NOW, ONLY 86 FUTURE SITES HAVE BEEN PLANNED.

02-01-01863 REFUSE AND LITTER CONTROL IN RECREATION AREAS (QUANTITY SANITARY-LANDFILL INCINERATION COLLECTION COMPOSITION)
WEAVER, L.
PUBLIC WORKS 98, P. 126-128, 160 (APRIL 1967). THE TWO PRINCIPAL DISPOSAL METHODS AVAILABLE FOR USE IN RECREATIONAL AREAS ARE SANITARY LANDFILLING AND INCINERATION. WHERE SUITABLE LAND IS AVAILABLE, THE SANITARY LANDFILL METHOD IS THE MOST ECONOMICAL. INCINERATION SHOULD BE USED IF GROUND OR OTHER CONDITIONS ARE SUCH THAT OPERATION OF A SANITARY LANDFILL IS NOT FEASIBLE. (PHS)

02-01-02102 COLLECTION AND DISPOSAL OF SOLID WASTE FOR THE DES MOINES METROPOLITAN AREA (QUANTITY COST(ANALYSES) SANITARY-LANDFILL)
U.S. DEPARTMENT OF HEALTH EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE, CINCINNATI, OHIO, (1968). A DETAILED REPORT ON AN OVERALL WASTE COLLECTION AND DISPOSAL SYSTEM COVERING VOLUMES, ENGINEERING, AND COSTS RELATED TO THE VARIOUS TYPES OF WASTE PRODUCED.

02-01-02172 80,000,000 BOTTLES A DAY (LITTERING)
SEYMOUR, W. N., JR.
COMPOST SCIENCE 9(2), P. 18-21 (SUMMER 1968). A DETAILED DESCRIPTION OF THE MAGNITUDE OF THE LITTER PROBLEM IN THE UNITED STATES. DATA IS PRESENTED ON THE NUMBER OF BOTTLES, CANS, JARS, AND THE AMOUNT OF PAPER USED FOR PACKAGING MATERIALS IN THE UNITED STATES IN 1965. RESULTS OF SURVEYS MADE IN FIVE STATES OF THE AMOUNT AND KIND OF LITTER FOUND PER MILE ARE TABULATED. IN MICHIGAN IT IS ESTIMATED THAT IT COSTS $2,500 PER MILE TO PICK UP THE LITTER EACH YEAR. POSSIBLE SOLUTIONS TO THE PROBLEM ARE DISCUSSED.

02 02 COMPOSITION

02-02-00021 INCINERATION OF SOLID WASTES (MOISTURE CONTENT CALORIFIC-VALUE COMBUSTION PRODUCTS)
KAISER, E. R.
PAPERS PRESENTED AT METROPOLITAN ENGRS COUNCIL ON AIR RESOURCES SYMPOSIUM, NEW-YORK, NEW-YORK, (MARCH 21, 1967). TYPICAL COMPOSITION AND MOISTURE CONTENTS OF RAW REFUSE OBTAINED FROM THE OCEANSIDE REFUSE DISPOSAL PLANT, LONG ISLAND, NEW-YORK, ARE PRESENTED. PROXIMATE ANALYSES AND ULTIMATE ANALYSES WERE DETERMINED. HEATING VALUES, AIR REQUIRED FOR COMBUSTION, AND THE COMPOSITION OF COMBUSTION PRODUCTS WERE CALCULATED.

02-02-00027 GOLD, SILVER CONTENT SEEN AT FOURTEEN DOLLARS PER TON (SALVAGE INCINERATOR(ASH))
SOLID WASTES MANAGEMENT/RRJ 11(5), 78 (MAY 1968) INCINERATOR ASH SAMPLES TAKEN FROM THE INCINERATORS IN THE WASHINGTON, D. C. METROPOLITAN AREA ASSAYED 2-9 OZ./ TON SILVER AND .02 TO .15 OZ./TON GOLD.

02-02-00163 REFUSE IS THE SWEETEST FUEL
THE AMERICAN CITY 82(5), P. 116-118 (1967). (SEE 02-02-00021)

02-02-00203 REFUSE DUE FOR MORE CHANGES
THE AMERICAN CITY 78(8), P. 27 (AUGUST 1963). JUST AS THE CHARACTERISTICS OF REFUSE HAVE CHANGED MARKEDLY IN THE PAST, THEY APPARENTLY ARE SCHEDULED FOR FURTHER CHANGES IN THE FUTURE. JUST AS PACKAGING AND PROCESSING OF FOOD PRODUCED MANY OF THESE CHANGES IN THE PAST, FURTHER INNOVATIONS IN PACKAGING WILL PRODUCE MORE CHANGES IN THE FUTURE. AND NONE OF THESE CHANGES WILL MAKE REFUSE ANY EASIER TO DESTROY IN AN INCINERATOR. FUTURE REFUSE WILL HAVE MORE PAPER, ESPECIALLY THE PLASTIC-COVERED VARIETY, MORE PLASTICS, LESS METAL AND LESS GLASS. PAPER CANS THAT HOLD MOTOR OIL WILL REPLACE THOSE OF TIN OR ALUMINUM. PLASTIC BOTTLES WILL PROBABLY INCREASE. WOOD AND TEXTILE PACKAGING PROBABLY WILL CONTINUE TO DISAPPEAR.

02-02-00242 TIP TALK AT N. W. MEETING (COMPOSITION)
PUBLIC CLEANSING 57(6), P. 309 (JUNE 1967). THE CHANGING NATURE OF REFUSE WAS EVIDENCED BY THE FACT THAT IN THE YEARS BETWEEN 1934 AND 1964 THERE HAD BEEN A 29.2 PERCENT DECREASE IN DUST AND CINDER AND IN THE TWO YEARS BETWEEN 1964 AND 1966 A FURTHER DECREASE OF 17.33 PERCENT. CORRESPONDING INCREASES IN THE PAPER AND VEGETABLE CONTENT FROM 13.8 PERCENT IN 1934 TO 40.12 PERCENT IN 1964 AND 50.12 PERCENT IN 1966. IT WAS CONTENDED THAT THIS MEANT THAT FEW IF ANY AUTHORITIES COULD TIP IN A HYGENIC MATTER BECAUSE OF THE ALMOST NON-EXISTENCE OF COVER MATERIAL.

02-02-00290 EXAMINATION OF HOUSEHOLD REFUSE IN TORONTO (QUANTITY COMPOSITION)
CAMPBELL, L. A.
CAN CHEM PROCESSING 36(12), P. 90-92 (1952). REFUSE COLLECTED ACCORDING TO A SPECIFIED SAMPLING PROCEDURE WAS SORTED INTO TABLE REFUSE, PAPER (WRAPPING), PAPER (NOT WRAPPING), CANS, BOTTLES, AND MISCELLANEOUS. FREQUENCY DATA ON TOTAL OUTPUT PER HOUSEHOLD PER COLLECTION, THE MEAN OUTPUT PER PERSON PER COLLECTION FOR EACH CLASSIFICATION, AND THE MEAN PHYSICAL COMPOSITION ARE GIVEN. ANALYTICAL DATA FOR SOLIDS, N, FAT, AND AVAILABLE SUGAR CONTENT ARE PRESENTED. CONCLUSION - TORONTO HOUSEHOLD WASTE IS LARGELY PAPER. (CA)

02-02-00299 WORLD SURVEY FINDS LESS ORGANIC MATTER (COMPOSITION)
REFUSE REMOVAL JOURNAL, P. 26 (SEPTEMBER 1967). VARIATIONS EXIST BETWEEN THE REFUSE COMPOSITION OF VARIOUS COUNTRIES. IN THE UNITED STATES RISING AMOUNTS OF PAPER AND PLASTICS WASTES ARE ACCOMPANIED BY FALLING AMOUNTS OF FOOD WASTES. BASICALLY THE SAME IS SEEN IN CANADA AND THE UNITED KINGDOM. ASH CONTENT IN MOST EUROPEAN WASTES IS DECREASING. DATA FOR 15 COUNTRIES IS PRESENTED GIVING ASH, PAPER, ORGANIC, METAL, GLASS, AND MISCELLANEOUS AS A PERCENT OF TOTAL.

02-02-00427 CHEMICAL ANALYSES OF REFUSE COMPONENTS (COMPOSITION CALORIFIC-VALUE INCINERATION ANALYSIS(PROXIMATE) ANALYSIS(ULTIMATE))
KAISER, E. R.
PROC OF THE 1966 NATIONAL INCINERATOR CONF, ASME, P. 84-88 (MAY 1-4, 1966). THE PROXIMATE AND ULTIMATE ANALYSES OF 20 CONSTITUENTS OF MUNICIPAL AND COMMERCIAL REFUSE ARE PRESENTED, TOGETHER WITH THE CALORIFIC-VALUES. THE ANALYSES ARE USEFUL TO INCINERATOR ENGINEERS AS THEY ARE THE BASIS FOR CALCULATING AIR REQUIREMENTS, FLUE-GAS VOLUMES, AND HEAT AND MATERIAL BALANCES. THE ANALYSES OF COMPONENTS OF REFUSE PERMIT THE CALCULATION OF COMPOSITE ANALYSES OF MIXED REFUSE FROM KNOWN PROPORTIONS. FUTURE INVESTIGATIONS ARE SUGGESTED TO OBTAIN MORE COMPLETE REFUSE DATA AND TO DETERMINE THE VARIABILITY OF MUNICIPAL REFUSE. (AUTH)

02-02-00517 COMPOSITION OF REFUSE (DENSITY(REFUSE) SAMPLING MOISTURE-CONTENT)
BLOODGOOD, D. E.
REFUSE REMOVAL JOURNAL 3, P. 17-19, 20, 22, 26 (1960). A DISCUSSION OF REFUSE COMPOSITION AND ITS IMPORTANT EFFECTS UPON REFUSE-HANDLING PRACTICES. SINCE THE BEGINNING OF THE CENTURY THE DENSITY OF REFUSE HAS DECREASED FROM 40 LBS TO 6 LBS/CU-FT. THIS INDICATES THAT REFUSE NOW CONTAINS MORE PAPER AND OTHER COMBUSTIBLE MATERIAL AND LESS GARBAGE. CONSIDERABLE CHANGES IN REFUSE COMPOSITION ALSO OCCUR FROM PLACE TO PLACE AND SEASON TO SEASON. (PHS)

02-02-00666 AFFLUENCE PLUS PAPER EQUALS MOUNTAINS OF DEBRIS (COLLECTION QUANTITY COMPOSITION SACKS(PAPER))
REFUSE REMOVAL JOURNAL 10(10), P. 18 (OCTOBER 1967). SWEDEN'S HIGH STANDARD OF LIVING AND USE OF PAPER PRODUCES A HIGH REFUSE VOLUME. THE AVERAGE AMOUNT IS ABOUT 8.8 POUNDS OF REFUSE PER WEEK. DENSITY VARIES FROM 283 TO 161 LBS/CU-YD IN CITIES. REFUSE CONSISTS OF 55 PERCENT PAPER, 15 PERCENT GLASS, 12 PERCENT ORGANIC PUTRESCIBLE MATTER, 12 PERCENT MISCELLANEOUS, AND 6 PERCENT METALS. VACUUM COLLECTION IS BEING TRIED IN ONE CITY. PAPER SACKS ARE ALSO USED.

02-02-00711 DETERMINING COMPOSITION (CATEGORIES(URBAN-WASTE)
SOLID WASTES MANAGEMENT/RRJ 11(4), P. 22 (APRIL 1968). RECENT RESEARCH CARRIED OUT BY THE PHS IS SUMMARIZED. THE FOLLOWING CATEGORIES OF URBAN SOLID WASTES WERE DEVISED - PAPER, FOOD WASTES, METAL, GLASS, BULK LEAVES AND GRASS, WOOD, PLASTIC, AND CLOTH (INCLUDING RUBBER AND LEATHER). THESE CATEGORIES PROVIDE THE INCINERATOR, COMPOST, OR SANITARY LANDFILL ENGINEER WITH THE NEEDED INFORMATION AND SUPPLY THE ECONOMIST AND MARKETING EXPERT WITH DATA SUITABLE FOR COST TRADE-OFF AND COST BENEFIT STUDIES. DIRT, WHICH WILL OCCUR IN ALL URBAN SOLID WASTES, IS ALMOST IMPOSSIBLE TO SEPARATE FROM FOOD WASTES AND WOULD NORMALLY HAVE TO BE INCLUDED WITH FOOD WASTES, EXCEPT WHERE LARGE IDENTIFIABLE AMOUNTS OCCUR. IN PLACE OF THESE BASIC CLASSES, OTHER TERMS MIGHT BE SUBSTITUTED, SUCH AS CERAMICS, WHICH MIGHT BE A BETTER TERM THAN GLASS AND WOULD INCLUDE CROCKERY, BROKEN POTTERY, AND SIMILAR MATERIALS. IN SOME INSTANCES, BULK LEAVES AND GRASS MIGHT BE INCLUDED WITH FOOD WASTES, OR ALL OF THE MATERIALS WHICH CAN READILY BE DECOMPOSED BY BACTERIA MIGHT BE INCLUDED UNDER ONE CATEGORY. USING THE 8 CATEGORIES LISTED IN THE PREVIOUS PARAGRAPH, EXISTING DATA ON THE COMPOSITION OF ALL URBAN SOLID WASTES HAVE BEEN COLLECTED AND ANALYZED. THE BASIC PURPOSE OF THE ANALYSIS WAS TO DETERMINE IF THERE WERE WIDE GEOGRAPHIC VARIANCES IN THE PERCENTAGE OF EACH CATEGORY BY WEIGHT, OR IF THE PERCENTAGES REMAINED RELATIVELY CONSTANT NATIONALLY. THE SECOND PURPOSE OF THE ANALYSIS WAS TO ESTABLISH, WITH SOME DEGREE OF ACCURACY, A FIGURE OR A RANGE, USEFUL FOR EACH CATEGORY. REVIEW OF THE DATA INDICATES THAT VARIATION BETWEEN CITIES IS NOT STATISTICALLY SIGNIFICANT. SECONDLY, PERCENTAGE VARIATIONS WITHIN ANY ONE CITY APPEAR TO BE THE RESULT OF SEASONAL VARIATIONS. ONE CAN ALSO EXPECT A CERTAIN VARIABILITY BECAUSE OF THE DIFFERENT TECHNIQUES USED IN SEPARATION. THERE WAS NOT SUFFICIENT DATA TO ALLOW DEVELOPMENT OF STATISTICALLY ACCEPTABLE RANGES FOR EACH CATEGORY. HOWEVER, WHEN SUFFICIENT DATA IS ACCUMULATED, IT IS BELIEVED STANDARD WEIGHT PERCENTAGE VALUES FOR THE VARIOUS CLASSIFICATIONS CAN BE DEVELOPED. THESE VALUES WILL REDUCE THE AMOUNT OF SEPARATION THAT IS NORMALLY DONE IN PRESENT STUDIES.

02-02-00809 REFUSE COMPOSITION AND FLUE-GAS ANALYSES FROM MUNICIPAL INCINERATORS (COMPOSITION EMISSION(ANALYSIS) FLUE-GAS-ANALYSIS CALORIFIC-VALUE)
KAISER, E. R.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 35-51 (MAY 18-20, 1964). ANALYSES OF COMPONENTS OF MUNICIPAL REFUSE WERE ASSEMBLED, FROM WHICH AVERAGE COMPOSITE ANALYSIS WAS CALCULATED. ANALYSES OF FLUE AND STACK GASES FROM 18 MUNICIPAL INCINERATORS WERE TABULATED AND PLOTTED. MARKED DIFFERENCE WAS NOTED BETWEEN ANALYSES OF STACK GASES AND THOSE TO BE EXPECTED FROM COMBUSTION OF COMPOSITE REFUSE. MUCH OF DIFFERENCE CAN BE ACCOUNTED FOR BY CARBON LOSS IN RESIDUE AND OXIDATION OF METALLICS. (AUTH)

02-02-01064 COMPOSITION OF GARBAGE AND GARBAGE INCINERATION
PALM, R.
MUELLZUSAMMENSETZUNG UND MUELLVERBRENNUNG. AUFBEREITUNGS-TECHNIK 4(12), P. 561-565 (DECEMBER 1963). GARBAGE IS DIFFERENTIATED ACCORDING TO VARIOUS MIXING PROPORTIONS OF LIGNITIC CONSTITUENT AND COAL COMPONENT. KINDS OF MIXTURES WITHIN LIGNITIC CONSTITUENT AND COAL COMPONENT ARE CLASSIFIED IN ACCORDANCE WITH PERCENTAGE OF COMBUSTIBLE MATERIALS AND TRUE SLAG CONTENT. QUANTITIES OF SMOKE GAS PRODUCED AND BURNING TEMPERATURES OF THESE GROUPS AS FUNCTION OF USEFUL HEATING POWER CAN BE DETERMINED PROVIDED THAT ESTIMATED MELTING POINT OF SLAG IS TAKEN INTO ACCOUNT. PROPERTIES OF SLAG WILL INFLUENCE NOT ONLY COMBUSTION CONDITIONS, BUT THEY WILL DETERMINE WHETHER FLUE GASES ARE SUITABLE FOR PRODUCTION OF ENERGY. (EI)

02-02-01117 CHARACTERISTICS OF MUNICIPAL REFUSE
BELL, J. M.
PROC OF THE NATIONAL CONF ON SOLID WASTE RESEARCH, AM PUBLIC WORKS ASSOC, CHICAGO, ILLINOIS, P. 28-38 (DECEMBER 1963). 1. TO DATE, A STUDY OF REFUSE SAMPLING PROCEDURES HAS BEEN LIMITED TO ONLY A RELATIVELY FEW CITIES. THE FOUR PRINCIPAL CITIES USED IN THE PURDUE PROJECT WERE OF DIFFERENT SIZE AND THE SAMPLING PROCEDURES INVOLVED DIFFERENT SAMPLING RATIOS AND APPROXIMATELY EQUAL NUMBER OF SAMPLING AREAS. IN ORDER TO DETERMINE WHETHER ANY OF THESE FACTORS ARE INTERRELATED, IT IS RECOMMENDED THAT REFUSE SAMPLING STUDIES BE CONDUCTED. (A) CITIES OF THE SAME SIZE - BUT DIFFERENT SAMPLING RATIO. (B) CITIES OF DIFFERENT SIZES - BUT SAME SAMPLING RATIO. (C) CITIES WITH A DIFFERENT NUMBER OF SAMPLING AREAS, OR STRATUM, AND WITH THE SAME NUMBER OF SAMPLING AREAS FOR THE CASES OF A AND B. 2. IT IS RECOMMENDED THAT THE PERCENT SAMPLING ERRORS BE INVESTIGATED IN CITIES WITH A SAMPLING RATIO ABOVE AND ESPECIALLY BELOW THE RANGE OF RATIOS THAT WERE USED BY THE FOUR CITIES REPORTED HEREIN, I.E., ABOVE 0.0244 AND BELOW 0.0006. (3) IT IS RECOMMENDED THAT STUDIES BE CONDUCTED IN ORDER TO DEVELOP A RELIABLE SAMPLING PROCEDURE FOR DETERMINING THE QUANTITY AND QUALITY OF REFUSE FROM COMMERCIAL AND INDUSTRIAL ESTABLISHMENTS. 4. MORE INFORMATION ABOUT THE ACTUAL LABOR AND COST INVOLVED IN A REFUSE SURVEY FOR VARIOUS CITIES WOULD BE DESIRABLE. 5. IT HAS BEEN SUGGESTED THAT A SOLID WASTE TESTING PROGRAM BE UNDERTAKEN TO OBTAIN DATA ON THE QUALITY AND QUANTITY OF REFUSE PRODUCED IN VARIOUS CITIES THROUGHOUT THE COUNTRY. A MOBILE TESTING LABORATORY HAS BEEN SUGGESTED FOR CONDUCTING SUCH A PROGRAM. SHOULD IT BE DECIDED, HOWEVER, TO PROCESS THE SAMPLES AT SEVERAL SPECIFIC LOCATIONS, IT IS SUGGESTED THAT SOME STUDY BE MADE AS TO THE BEST TYPE OF SHIPPING CONTAINERS AND MODE OF TRANSPORTATION OF THE SAMPLES. 6. THE TENTATIVE METHODS OF REFUSE ANALYSIS AS PUBLISHED IN THE APWA BOOK MUNICIPAL REFUSE DISPOSAL ARE NOT ALL INCLUSIVE, NOR ARE THEY BEYOND FURTHER REFINEMENTS. ADDITIONAL STUDIES ARE SUGGESTED IN ORDER THAT SOME TYPE OF " STANDARD METHODS FOR THE EXAMINATION OF MUNICIPAL REFUSE " MIGHT BE FORMULATED.

02-02-01294 REFUSE ANALYSIS AT MIDDLETON (COMPOSITION QUANTITY)
PUBLIC CLEANSING 55(12), P. 683-685 (1965). IN ORDER TO MEET THE DEMAND OF THE SHORTAGE OF TIPPING SPACE THE CLEANSING SUPERINTENDENT OF THE BOROUGH OF MIDDLETON, HAS DEVELOPED A REFUSE ANALYSIS PROGRAM TO HELP DETERMINE THE TYPE DISPOSAL METHODS TO BE USED IN THE FUTURE. THERE ARE TWO TABLES INDICATING THE TYPES OF WASTES AND QUANTITIES COLLECTED.

02-02-01301 SO MUCH RUBBISH (SALVAGE COMPOSITION)
FAIRLIE, P. D.
PUBLIC CLEANSING 55(3), P. 149-150 (1965). AS OUR SOCIAL STANDARDS CHANGE SO DO THE TYPES AND VOLUMES OF REFUSE CHANGE. NEW HEATING AND EATING HAVE BROUGHT ABOUT GREAT CHANGES IN REFUSE DISPOSAL. NEW PRODUCTS ESPECIALLY IN THE PLASTICS FIELD HAVE CREATED MANY PROBLEMS, THE DESIRE OF THE PUBLIC TO ACQUIRE NEWER AND MORE FASHIONABLE MATERIALS HAS GREATLY INCREASED THE VOLUME AS WELL AS PROBLEMS OF COLLECTION AND DISPOSAL.

02-02-01316 REFUSE ANALYSIS - RECENT TESTS IN MANCHESTER (COMPOSITION(REFUSE))
BEVAN, R. E.
PUBLIC CLEANSING 55(1), P. 33-36 (1965). A REFUSE ANALYSIS EXPERIMENT CONDUCTED IN MANCHESTER TO DETERMINE THE CHARACTERISTICS OF REFUSE, THE EFFECT UPON COLLECTION AND DISPOSAL, AS WELL AS THE ECONOMICS OF DIFFERENT MEANS OF COLLECTION AND DISPOSAL. ACCOMPANYING TABLES INDICATE SOME OF THE DATA COLLECTED.

02-02-01834 COMPOSITION OF SOLID WASTES (DENSITY)
REFUSE REMOVAL JOURNAL 8(3), P. 19 (1965). THE DENSITY OF REFUSE GENERALLY VARIES FROM 250 TO 500 LBS/CU-YD AS RECEIVED AT DISPOSAL SITES. AN EXAMPLE OF DETAILED ANALYSIS OF HOUSEHOLD, COMMERCIAL AND MIXED REFUSE IS GIVEN IN A TABLE.

02-02-01993 CHARACTERISTICS OF MUNICIPAL SOLID WASTES (COMPOSITION ANALYSIS QUANTITY)
HICKMAN, H. L., JR.
SCRAP AGE, (FEBRUARY 1969). MUNICIPAL SOLID WASTE IS A CONGLOMERATE COMPOSED OF DISCARDS OF OUR URBAN CIVILIZATION. ITS STRUCTURE IS SO COMPLEX THAT EVEN THOSE PERSONS WHO ARE MOST FAMILIAR WITH SOLID WASTE MANAGEMENT HAVE NOT DEFINED ADEQUATELY ITS COMPOSITION. THE GEOGRAPHICAL VARIATION OF MUNICIPAL SOLID WASTES DOES NOT DIFFER AS SIGNIFICANTLY AS WE ORIGINALLY BELIEVED IT DID. THERE IS A GENERAL INDICATION OF NATIONAL CATEGORICAL CONSISTENCY.

THIS INDICATION LEADS US TO BELIEVE THAT WE CAN WITH FURTHER WORK DEFINE REASONABLE RANGES FOR THE MOST IMPORTANT PHYSICAL CATEGORIES. TECHNOLOGY HAS NOT ADDRESSED ITSELF TO DEVELOPING ADEQUATE ANALYTICAL PROCEDURES TO DEFINE SCIENTIFICALLY THE CHEMICAL CHARACTERISTICS OF SOLID WASTE. EXISTING METHODS ARE TENTATIVE, TEDIOUS, AND UNRELIABLE. THIS IS DUE BOTH TO THE OVERALL PROBLEM OF THE MAKEUP OF SOLID WASTE AND THE DIFFICULTY OF SAMPLING PROCEDURES. THE BUREAU OF SOLID WASTE MANAGEMENT THROUGH INTRAMURAL AND EXTRAMURAL EFFORTS IS INITIATING STUDIES AND PROJECTS TO BEGIN TO DEFINE THE PHYSICAL, CHEMICAL, AND BIOLOGICAL MAKEUP OF RESIDENTIAL, COMMERCIAL, MUNICIPAL, INDUSTRIAL, AND AGRICULTURAL SOLID WASTE. THESE STUDIES AND PROJECTS SHOULD WITHIN THE NEXT FEW YEARS, PROVIDE THE BASIC INFORMATION NEEDED TO ADEQUATELY DEFINE THE CONGLOMERATE NOW CALLED MUNICIPAL SOLID WASTE. (AUTH)

02 03 FUTURE PROJECTIONS

02-03-00074 IN 1978 - SEVENTY-FIVE PERCENT OF THE POPULATION WILL LIVE IN CITIES IN TEN YEARS (COMPOSITION QUANTITY PROJECTIONS)
MICHAELS, A.
SOLID WASTES MANAGEMENT/RRJ, P. 79-94 (JANUARY 1968). IT IS ESTIMATED THAT PER CAPITA PRODUCTION OF REFUSE WILL INCREASE TO APPROXIMATELY 5.7 LBS PER DAY BY 1978. THE COMPOSITION OF THE REFUSE WILL ALSO CHANGE WITH AN INCREASE IN THE AMOUNT OF PACKAGING MATERIAL AND A DECREASE IN THE AMOUNT OF FOOD WASTES. IT IS ESTIMATED THAT 75 PERCENT OF THE POPULATION WILL BE IN URBAN AREAS, WHEREAS ONLY 66 PERCENT LIVE IN URBAN AREAS NOW. IF PRACTICES DO NOT CHANGE SIGNIFICANT PROBLEMS WILL EXIST IN 1978.

02-03-00076 ESTIMATED 12 MILLION TONS A YEAR BY 1980 IN SOUTHERN CALIFORNIA (PROJECTIONS SANITARY-LANDFILL SALVAGE(METALS))
REFUSE REMOVAL JOURNAL 10(11), P. 38 (NOVEMBER 1967). PROJECTIONS ARE MADE TO THE YEAR 1980. IT IS ESTIMATED THAT THERE WILL BE NINE AND ONE-HALF MILLION PEOPLE AND THEY WILL PRODUCE 12 MILLION TONS PER DAY OF REFUSE. DATA IS PRESENTED ON LANDFILL FACILITIES IN LOS-ANGELES COUNTY AND THEIR LIFE EXPECTANCY.

02-03-00225 $214 MILLION SOUGHT IN NEW YORK CITY (PROJECTIONS VOLUMES INCINERATION)
SOLID WASTES MANAGEMENT/RRJ 11(2), P. 22 (FEBRUARY 1968). AN ACCOUNT OF THE CAPITAL AND OPERATING BUDGET FOR NEW YORK CITY. DATA IS PRESENTED ON CURRENT AND FUTURE NEEDS FOR HANDLING AND DISPOSAL OF REFUSE IN NEW YORK CITY.

02-03-01499 SAN-FRANCISCO BAY AREA SOLID WASTE MANAGEMENT AND PLANNING PROBLEMS (QUANTITY COST(COLLECTION) COST(OPERATING) SANITARY-LANDFILL)
ROGERS, P. A.
CALIFORNIA VECTOR VIEWS 12(10), P. 51 (OCTOBER 1965). THE ARTICLE POINTS OUT THE TRENDS IN WASTES PRODUCTION UP TO THE YEAR 2000. IT EMPHASIZES THE FACT THAT THE EXISTING FACILITIES WILL NOT BE ABLE TO COPE WITH THE HUGE VOLUME THAT WILL BE PRODUCED. IN THE NINE BAY AREA COUNTIES, THE AREA DEALT WITH BY THE ARTICLE, EXISTING FACILITIES WILL BE ABLE TO HANDLE REFUSE UNTIL THE YEAR 1979. A TOTAL OF 33,125 ACRES OF LAND WOULD BE REQUIRED TO ACCOMMODATE THE BAY AREA REFUSE DISPOSAL NEEDS TO THE YEAR 2000. IN COMPUTING THE FUTURE NEEDS OF AN AREA, A STANDARD OF 3-4 LB/CAPITA/DAY IS USED. THIS FIGURE IS NOT ALWAYS ACCURATE, FOR OFTEN IT DOES NOT TAKE INTO ACCOUNT AGRICULTURAL AND SPECIAL WASTES. FOR THE BAY AREA, 5.7 LB/CAPITA/DAY WERE PRODUCED IN 1963, INCLUDING WASTES FROM ALL CLASSIFICATIONS AND ORIGINS. FOR NORMAL REFUSE (REFUSE DISPOSED OF AT A SANITARY LANDFILL SITE), THE FIGURE WAS 3.8 LB/CAPITA/DAY. THE STATE DEPARTMENT OF PUBLIC HEALTH IN ITS REPORT TO THE ASSOCIATION OF BAY AREA GOVERNMENTS RECOMMENDED THE FOLLOWING - (1) INVESTIGATION OF NEW OR ALTERNATIVE METHODS OF SOLID WASTE DISPOSAL, INCLUDING THE ESTABLISHMENT OF DEMONSTRATION PLANTS IN THE BAY AREA. (2) ACQUISITION OF ADDITIONAL LANDFILL SITES IN ACCORDANCE WITH A MASTER PLAN FOR THE ENTIRE REGION. (3) INVESTIGATION OF THE FEASIBILITY OF ESTABLISHING A SERIES OF REFUSE TRANSFER STATIONS. (4) IMPROVEMENT OF OPERATIONAL PRACTICES AT EXISTING SITES. (5) INVESTIGATION OF THE PROSPECTS OF CREATING ONE OR MORE LARGE DISTRICTS TO CONSOLIDATE PLANNING AND OPERATION OF DISPOSAL FACILITIES. (UC)

02 04 ANALYSIS OF REFUSE (METHODS)

02-04-00387 REFUSE ANALYSES
HAEFELI, R. J.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 15, (AUGUST 1962). THE METHODS OF REFUSE ANALYSES AS DESCRIBED, FREQUENTLY SERVE AS A PREREQUISITE TO THE CONSTRUCTION OF LARGE INCINERATORS. ANALYSES OF REFUSE FOR INCINERATION PLANTS ARE MOST DIFFICULT TO MAKE BECAUSE THE REFUSE MAY CONTAIN ANY AND ALL SUBSTANCES HAVING ANY CONNECTION AT ALL TO MANKIND. A METHOD FOR ANALYSES IS DESCRIBED WHICH IS SIMPLE, REPRODUCIBLE, ETC.

02-04-01228 NEW METHOD FOR DETERMINATION OF CALORIFIC-VALUE OF HETEROGENEOUS MATERIAL WITH HIGH CONTENT OF INERT COMPONENTS (CALORIFIC-VALUE(DETERMINATION))
HILLER, H. + MACKOWSKI, L.
UEBER EINE METHODE ZUR BESTIMMUNG DES HEIZWERTES VON INHOMOGENUM UND BALLASTREICHEM MATERIAL (STAEDTISCHER MUELL), GAS-WASSER-WAERME 18(2), P. 26-9 (FEBRUARY 1964). DESIGN OF APPARATUS FOR DETERMINATION OF CALORIFIC-VALUE OF REFUSE. USE OF EXPERIMENTAL DATA IN DETERMINATION OF TOTAL HEAT CAPACITY, USEFUL HEAT CAPACITY, AND LOSS OF HEAT DURING INCINERATION OF REFUSE. (EI)

02-04-01246 NEW GENERAL DIRECTIONS FOR TESTING OF REFUSE, IMPORTANCE OF TAKING REPRESENTATIVE SAMPLE OF 3 CU M SIZE (SAMPLING ANALYSIS)
JAEGER, B.
NEUE RICHTLINIEN FUER DIE UNTERSUCHUNG VON MUELL, AUFBEREITUNGS-TECHNIK 6(5), P. 257-261 (MAY 1965). EFFECTIVE PREPARATION OF REFUSE FOR LABORATORY AND ANALYSIS SAMPLES BY MEANS OF SEVERAL COMMINUTION AND MIXING PROCEDURES IS STRESSED. FOR JUDGING REFUSE AS FUEL, IT SHOULD BE ANALYZED WITH RESPECT TO WATER AND ASH CONTENT AND CALORIFIC-VALUE, TEST FOR COMPOSTABILITY SHALL COMPRISE WATER CONTENT, CONTENT OF EFFECTIVE ORGANIC SUBSTANCES, CONTENT OF AVAILABLE NITROGEN, SELF-HEATING TESTS. (EI)

02-04-01254 REFUSE ANALYSIS AT ABERDEEN
PUBLIC CLEANSING 58(2), P. 70-71 (1968). THE ABERDEEN CLEANSING DEPARTMENT HAS DEVISED A THREE TIERED METAL TRAY, WITH EACH TRAY HAVING DIFFERENT SIZE MESH SCREENS IN THE BOTTOM TO GRADE THE SIZE OF REFUSE. THE REFUSE COLLECTORS GO OUT AND SELECTIVELY COLLECT REFUSE FROM A LARGE CROSS SECTION OF PROPERTIES. THE TRAYS ARE WEIGHED TO DETERMINE REFUSE COLLECTED. THE WEIGHT RANGED FROM 140 LB TO 332 LB. THE ECONOMIC STANDARDS HAVE A DEFINITE BEARING ON THE AMOUNT AND TYPE OF REFUSE COLLECTED.

02-04-01890 DEVELOPMENT OF A METHOD FOR SAMPLING AND ANALYZING REFUSE (QUANTITY COMPOSITION ANALYSIS(REFUSE))
BELL, J. M.
THESIS - PURDUE UNIVERSITY (JANUARY 1963). EXPERIMENTAL STUDIES WERE CONDUCTED UNDER A NATIONAL INSTITUTES OF HEALTH SPONSORED RESEARCH PROJECT DIRECTED TOWARD THE DEVELOPMENT OF A RELIABLE METHOD OF REFUSE SAMPLING AND ANALYSIS. INDIVIDUAL REFUSE SAMPLING PROJECTS WERE CONDUCTED BY PURDUE UNIVERSITY IN COOPERATION WITH THE CITIES OF

MILWAUKEE, WISCONSIN, TOLEDO, OHIO, BLOOMINGTON, INDIANA, AND INDIANAPOLIS, INDIANA, WITHIN THE PERIOD OF AUGUST 1959 TO APRIL 1962 DURING WHICH TIME A TOTAL OF 2400 REFUSE SAMPLES WERE OBTAINED AND ANALYZED. FIELD STUDIES WERE CONDUCTED IN ORDER TO OBTAIN SAMPLES OF REFUSE FOR LABORATORY ANALYSIS AS WELL AS TO ESTIMATE THE ACCURACY OF THE METHOD USED IN OBTAINING THESE SAMPLES. SAMPLE AREAS WERE SELECTED BY STRATIFIED RANDOM SAMPLING AFTER THE CITY HAD BEEN CLASSIFIED INTO HIGH, MEDIUM, AND LOW SOCIO-ECONOMIC STRATA ON THE BASIS OF HOUSING AND/OR PROPERTY MARKET VALUE. WEEKLY SAMPLES OF REFUSE WERE OBTAINED FROM THE SAMPLE AREAS AND AN ESTIMATE MADE OF THE TOTAL CITY WEIGHT OF REFUSE BY SIMPLE EXTRAPOLATION PROCEDURES. PERIODIC WEIGHINGS OF THE TOTAL CITY REFUSE ALLOWED THE DETERMINATION OF THE PERCENT ERROR OF THESE ESTIMATES. SIGNIFICANT DIFFERENCES WERE FOUND IN THE AVERAGE PERCENT ERROR OF THESE ESTIMATES BETWEEN THREE OF THE FOUR CITIES. DIFFERENT SAMPLING RATIOS (POPULATION OF ALL SAMPLE AREAS DIVIDED BY TOTAL CITY POPULATION) WERE USED IN EACH CITY. THEY RANGED FROM 0.0244 IN BLOOMINGTON TO 0.0006 IN MILWAUKEE. A LOGARITHMIC RELATIONSHIP WAS FOUND BETWEEN THE SAMPLING RATIO AND THE AVERAGE PERCENT SAMPLING ERROR. AN ANALYSIS OF THE FIELD STUDIES WITH RESPECT TO THE PARAMETERS OF LBS/CAPITA/DAY AND CU-FT/CAPITA/DAY INDICATED A SIGNIFICANT DIFFERENCE BETWEEN THE HIGH, MEDIUM, AND LOW SOCIO-ECONOMIC CLASSIFICATIONS AS WELL AS BETWEEN THE VARIOUS SEASONS OF THE YEAR. USING INFORMATION AND EXPERIENCE FROM THREE AND ONE-HALF YEARS OF RESEARCH A RECOMMENDED PROCEDURE FOR THE SAMPLING AND ANALYSIS OF REFUSE WAS FORMULATED. INCLUDED ARE A DETAILED DESCRIPTION OF THE SAMPLING TECHNIQUE TO BE EMPLOYED BOTH IN THE FIELD AND LABORATORY.

02 05 DEMOLITION WASTE

02 06 BULKY WASTE

02-06-00124 NO REFUSE REFUSED (BULKY-WASTE COLLECTION QUANTITY)
MIRTO, H. A.
THE AMERICAN CITY 79(4), P. 117-118 (APRIL 1964). AN ALL OUT CAMPAIGN WAS CONDUCTED IN WATERBURG, CONNECTICUTT, TO RID THE AREA OF REFUSE. THE RESULTS WERE STAGGERING. THE COLLECTION WEIGHED 5000 TONS AND INCLUDED 600 REFRIGERATORS, 500 STOVES, 350 WATER TANKS, AND THOUSANDS OF BED SPRINGS.

03 Solid Waste Collection

03 01 COLLECTION METHODS

03-01-00066 REFUSE COLLECTION PRACTICE (COLLECTION(EQUIPMENT) QUANTITIES COST(COLLECTION) FREQUENCY LAW COLLECTION(METHODS) RECORD-SYSTEMS)
PUBLIC ADMINISTRATION SERVICE, CHICAGO, ILLINOIS, (1966) THIRD EDITION. THIS BOOK, PREPARED BY THE APWA COMMITTEE ON SOLID WASTES DISPOSAL DISCUSSES - (1) THE REFUSE COLLECTION PROBLEM, (2) QUANTITITES AND CHARACTERISTICS OF REFUSE, (3) PREPARATION OF REFUSE FOR COLLECTION, (4) FACTORS AFFECTING REFUSE COSTS, (5) REFUSE COLLECTION METHODS, (6) REFUSE COLLECTION EQUIPMENT, (7) PLANNING OF REFUSE COLLECTION SYSTEMS, (8) SUPPLEMENTAL TRANSPORTATION OF REFUSE, (9) COLLECTION PROBLEMS, AND (10) COMPARISON OF MUNICIPAL, CONTRACT, OR PRIVATE COLLECTION OF REFUSE.

03-01-00086 KEEP REFUSE COLLECTORS ON THE ROUTE (TRAIN(VEHICULAR) COLLECTION)
GREEN, L. B.
THE AMERICAN CITY 80(6), P. 110-111 (JUNE 1965). MONTGOMERY, ALABAMA HAS STARTED TO USE REFUSE TRAINS ON THEIR COLLECTION ROUTES. TEN TRAINS CONSISTING OF A DRIVER AND THREE 5 CU-YD TRAILERS. THREE LARGE TRUCKS OF 28-YD CAPACITY EACH SERVICE THE TRAINS. TRAILERS ARE LEFT AT SPECIAL STORAGE YARDS WHEN NOT IN USE TO ELIMINATE RETURNING THEM TO THE CENTRAL GARAGE. GASOLINE CONSUMPTION HAS BEEN REDUCED TO ABOUT ONE-THIRD BY THE USE OF THE TRAINS. IT IS REPORTED THAT THE BOUNCING OF THE TRAILERS COMPACTS THE REFUSE BY ABOUT 25 PERCENT.

03-01-00088 MORE REFUSE COLLECTED WITH LESS WORK (COLLECTION TRUCK)
THE AMERICAN CITY 80(7), P. 26 (JULY 1965). IN WYANDOTTE COUNTY, KANSAS, A SMALL 3-WHEELED CUSHMAN DUMP TRUCKSTER IS USED TO SERVICE LONG DRIVEWAYS AND WIDELY SPACED HOUSES IN THE SUBURBS. THE HOPPER HOLDS 1-1/2 CU-YDS OF REFUSE, OR 1,000 LBS, AND CAN BE DUMPED DIRECTLY INTO THE LARGE TRUCK WITH WHICH IT IS USED. THE VEHICLE'S SMALL SIZE PERMITS IT TO BE TURNED AROUND IN NARROW DRIVEWAYS. (UC)

03-01-00103 ONE TRUCK SERVES 4,400 PEOPLE (COLLECTION)
THE AMERICAN CITY 80(4), P. 21 (APRIL 1965). THE WAYNESBOROUGH, GEORGIA, SANITATION DEPARTMENT USES A COMPACTION TYPE TRUCK WHICH LOADS AT THE SIDE NEAR THE FRONT. IT NEEDS NO TAIL GATE. IT SERVES 4,400 RESIDENTS. (UC)

03-01-00136 MINNEAPOLIS SANITATION SYSTEM SHOWS EFFICIENCY (COLLECTION)
REFUSE REMOVAL JOURNAL 4(9), P. 12-13, 22, 48 (1961). CURRENT PRACTICE IN 1961 IN MINNEAPOLIS FOR REFUSE COLLECTION IS DESCRIBED.

03-01-00181 TRASH DISPOSAL PROBLEMS GROW WITH POPULATION
OGDEN, M.
DIESEL AND GAS TURBINE PROGRESS 33(11), P. 30-31 (NOVEMBER 1967). SILVER STATE DISPOSAL CO HAS 18-YR CONTRACT WITH CITY OF LAS VEGAS TO COLLECT TRASH AND GARBAGE AND HAUL IT TO LAND-FILL DUMP IT OPERATES 13 MI EAST OF CITY. TWO SHIFTS OF DRIVERS WORK SIX DAY WEEK. FIRST SHIFT STARTS AT 3 A.M. AND GOES TO 11 30. SECOND SHIFT WORKS FROM NOON UNTIL 8 P.M. COMPANY OPERATES 16 CUMMINS C-180 ENGINES IN NEW WHITE MODEL 1564 CAB-OVER-ENGINE TRUCKS. BEHIND DIESELS ARE ALLISON MT41 AUTOMATIC TRANSMISSIONS. (EI)

03-01-00296 MANAGEMENT INFORMATION SYSTEM STUDIED FOR LOS ANGELES
HUME, N.
REFUSE REMOVAL JOURNAL 10(11), P. 39, 44, 46 (NOVEMBER 1967). THE LOS ANGELES REFUSE COLLECTION AND DISPOSAL DIVISION SERVES THE THIRD LARGEST CITY IN THE COUNTRY. THE COLLECTION FLEET LOGS 7 MILLION MILES PER YEAR. THE DIVISION COVERS 454 SQUARE MILES. OVER 1,130,000 TONS OF RUBBISH ARE HAULED ANNUALLY. IT IS MOSTLY RESIDENTIAL IN ORIGIN. THE LABOR FORCE CONSISTS OF MORE THAN 350 EMPLOYEES. THE SERVICES INCLUDE MORE THAN 950 INDIRECT ACTIVITIES. APPROXIMATELY 4,000 TONS OF GARBAGE PER DAY ARE COLLECTED BY 500 TRUCKS. INFORMATION SYSTEM RESEARCH PROVIDES- 1. INFORMATION AT EACH SUPERVISORY LEVEL TO INCREASE VISIBILITY CONTROL OF OPERATIONS, FACILITATE DECISION MAKING, AND ASSIST IN IDENTIFICATION AND SOLUTION OF PROBLEMS, 2. HISTORICAL DATA FROM WHICH INFORMATION FOR SPECIAL STUDIES COULD BE RETRIEVED AND ANALYZED, 3. DEVELOPMENT OF PROCEDURES FOR ELIMINATING NEED OF INTERMEDIATE MANUAL PROCESSING BETWEEN ACQUISITION OF SOURCE DATA AND PREPARATION OF PAYROLL, PERSONNEL, AND COST ACCOUNTING, 4. REDUCTION OF THE TIME LAG BETWEEN THE CLOSE OF THE REPORTING PERIOD AND THE DISTRIBUTION OF COST AND ANALYTICAL REPORTS MANAGEMENT. A DESCRIPTION IS GIVEN OF THE ORGANIZATION OF COLLECTION ACTIVITIES, DECISIONS MAKING, AND SPECIFICATIONS OF THE MANAGEMENT INFORMATION SYSTEM. (UC)

03-01-00361 WE SAVE 37 PERCENT ON REFUSE COLLECTION (COST(OPERATING))
KNOWLES, V. C.
THE AMERICAN CITY 77(1), P. 90-91 (JANUARY 1962). OAK PARK CITY, MICHIGAN, SWITCHED FROM A MUNICIPALLY OWNED REFUSE DISPOSAL SYSTEM TO A CONTRACT SYSTEM. WHEN THE CITY OWNED THE OPERATION, COSTS PER YEAR WERE APPROXIMATELY $140,000 FOR REFUSE COLLECTION AND DISPOSAL. UNDER PRIVATE CONTRACT, THE COSTS PER YEAR DROPPED TO $87,000 THE CONTRACTOR PROVIDES A CURB SIDE SERVICE, AND REQUIRES SEPARATION OF COMBUSTIBLES AND NONCOMBUSTIBLES. COLLECTIONS ARE MADE IN SEPARATE VEHICLES. DISPOSAL IS NO PROBLEM. OAK PARK IS ONE OF 14 CITIES BELONGING TO THE SOUTHEASTERN OAKLAND COUNTY RUBBISH AND GARBAGE AUTHORITY, WHICH INCINERATES REFUSE AND DISPOSES OF RESIDUES AND NONCOMBUSTIBLES AT AN 80-ACRE SANITARY LANDFILL SITE. THE CONTRACTOR SUPERVISED THE TRANSFORMATION OF THE OLD CITY DUMP INTO A SANITARY LANDFILL OPERATION, AND THE DISPOSAL SITE IS NOW FREE FROM PESTS AND ODORS. THE COMPANY PROVIDES WEEKLY GARBAGE COLLECTION TO THE RESIDENTS. (UC)

03-01-00417 DUSTLESS COLLECTION PROGRESSES IN BRITAIN (SALVAGE COMPACTION)
REFUSE REMOVAL JOURNAL 5(8), P. 12 (AUGUST 1962). ALTHOUGH THE DUSTLESS REFUSE COLLECTION SYSTEM WAS FIRST INTRODUCED IN GREAT BRITAIN 30 YEARS AGO, IT HAS ONLY RECENTLY BEEN ADOPTED IN MANY AREAS. THE MAIN REASON FOR THE SLOW RATE OF PROGRESS SEEMS TO BE THE HIGH COSTS INVOLVED IN INSTALLING THE SYSTEM. BIRMINGHAM, BRISTOL, EDINBURGH, GLASGOW, ST. MARYLEBONE, SHEFFIELD, TOTTENHAM, AND A FEW OTHER AUTHORITIES HAVE INTRODUCED DUSTLESS COLLECTION WITH FAVORABLE RESULTS. THE ARTICLE DESCRIBES THE SYSTEM IN OPERATION IN ST. MARYLEBONE. (PHS)

03-01-00418 NEW SYSTEM IN SIOUX CITY (COLLECTION)
REFUSE REMOVAL JOURNAL 5(7), P. 26 (JULY 1962). SIOUX CITY, IOWA, IS AN EXAMPLE OF A COMMUNITY SUCCESSFULLY COMBINING THE PRIVATE CONTRACT AND MUNICIPAL SYSTEMS OF REFUSE COLLECTION. UNDER A NEW COLLECTION SYSTEM, THE CITY IS SUPPLYING SEVEN MODERN PACKER TRUCKS WHICH ARE OPERATED BY PRIVATE HAULERS ON A CONTRACT BASIS. THE NEW SYSTEM REPLACES THE OLD SYSTEM IN WHICH 11 DIFFERENT ROUTES WERE OPERATED BY 11 CONTRACTORS USING OPEN REFUSE TRUCKS. THE ARTICLE GIVES THE WORDING OF THE NEW CONTRACT WHICH THE CITY IS USING. (PHS)

03-01-00447 NEW ORLEANS DEPARTMENT FACES SPECIAL PROBLEMS (COLLECTION SANITARY-LANDFILL INCINERATION)
REFUSE REMOVAL JOURNAL 5(9), P. 14 (SEPTEMBER 1962). DESCRIBES SANITATION OPERATIONS IN NEW ORLEANS, LA. UP UNTIL 1953 NEW ORLEANS WAS STILL COLLECTING REFUSE IN MULE-DRAWN OPEN WAGONS, BUT THE MULE HAS GIVEN WAY TO A FLEET OF COMPACTION REFUSE TRUCKS. GARBAGE IS PICKED UP THREE TIMES A WEEK, AND TRASH ONCE A WEEK. SUCCESSFUL EXPERIMENTATION IS BEING DONE IN COMBINED COLLECTION OF GARBAGE AND TRASH, AND THIS SYSTEM WILL PROBABLY BE EXTENDED IN THE FUTURE. REFUSE DISPOSAL IS ACCOMPLISHED THROUGH SANITARY LANDFILLING AND INCINERATION AT THE PRESENT, BUT GRADUALLY THE CITY IS SHIFTING TOWARD A SYSTEM OF TOTAL INCINERATION. NARROW STREETS AND PARKED CARS PRESENT PROBLEMS FOR STREET CLEANING OPERATIONS. THE CITY HAS TO EMPLOY MEN ON FOOT WITH PUSHBROOMS TO REACH SOME AREAS. TREES ALSO CREATE PROBLEMS IN NEW ORLEANS, THE CITY HAS SOME 150,000 TREES, MAKING LEAF REMOVAL A BIG JOB EACH FALL. THE ANNUAL MARDI GRAS PRESENTS SPECIAL LITTER PROBLEMS FOR THE CITY OF NEW ORLEANS WHICH MUST BE COPED WITH. (PHS)

03-01-00457 PROMINENT NEW ORLEANS HAULER HAS LONG HISTORY (COLLECTION)
REFUSE REMOVAL JOURNAL 5(9), P. 16 (SEPTEMBER 1962). DESCRIBES THE LARGEST PRIVATE REFUSE HAULING FIRM IN THE NEW-ORLEANS, LOUISIANA, AREA, WHICH GREW OUT OFA 91-YEAR-OLD FAMILY ORGANIZATION THAT USED TO HAUL PASSENGERS AND BAGGAGE UNDER CONTRACT WITH THE RAILROADS. THE COMPANY HANDLES OVER 600,000 CU-YDS OF MATERIAL ANNUALLY FROM OVER 800 CUSTOMERS, INCLUDING BUSINESSES, INSTITUTIONS, AND MILITARY INSTALLATIONS. ALL COLLECTION UNITS ARE RADIO-EQUIPPED. PRIVATE CONTRACTORS IN NEW ORLEANS ARE NOT ALLOWED TO USE MUNICIPAL INCINERATORS, SO ALL OF THE REFUSE IS DEPOSITED IN THE CITY DUMP. (PHS)

03-01-00500 HAULAWAY, INC., SERVES A LARGE, VARIED CLIENTELE
REFUSE REMOVAL JOURNAL 5(11), P. 6 (NOVEMBER 1962). DESCRIBES THE BEGINNING AND GROWTH OF ONE OF THE LARGEST PRIVATE REFUSE HAULING FIRMS IN THE COUNTRY, LOCATED IN OMAHA, NEBRASKA. EMPHASIS UPON GOOD SERVICE, A POLICY OF HANDLING ALL KINDS AND QUANTITIES OF REFUSE AND AN AGGRESSIVE ADVERTISING PROGRAM HAVE HELPED THIS REFUSE FIRM TO EXPAND. THE COMPANY SERVES A VARIETY OF CUSTOMERS--MANUFACTURING PLANTS, RETAIL STORES, BUILDINGS (PUBLIC AND PRIVATE), HOSPITALS, APARTMENTS, A RACE TRACK, THE OMAHA AIRPORT, AND AN ARMY INSTALLATION. (PHS)

03-01-00504 REPORT ON THREE METHODS OF COLLECTION IN EUROPE (COLLECTION SACK(PAPER))
REFUSE REMOVAL JOURNAL 5(11), P. 16 (NOVEMBER 1962). DISCUSSES THREE METHODS OF REFUSE COLLECTION PRESENTLY BEING USED IN EUROPE--DUSTLESS, SKEP, AND PAPER BAG. THE DUSTLESS SYSTEM IS BEING INTRODUCED IN BIRMINGHAM, ENGLAND, WHERE THE SKEP SYSTEM HAS PREVIOUSLY BEEN USED, AND THE NEW METHOD HAS OFFERED SEVERAL ADVANTAGES OVER THE OLD ONE, INCLUDING ELIMINATION OF SPILLAGE, PREVENTION OF REFUSE FROM GETTING WET, AND IMPROVED WORKING CONDITIONS. A COMPARISON WAS MADE OF CURB, BACK DOOR (BY SKEPS) AND SACK COLLECTIONS. IT WAS FOUND THAT THE PAPER SACK COLLECTION SYSTEM IS MORE HYGENIC, IS MUCH MORE APPRECIATED BY WORKERS, IS VERY NEARLY A DUSTLESS LOADING SYSTEM AND IS WITHOUT THE INHERENT DISADVANTAGES OF COST AND HEAVINESS OF THE JOB INVOLVED IN THE SKEP SYSTEM. EXPERIMENTS HAVE SHOWN THAT SACKS ARE SUITABLE FOR WINTER AND SUMMER COLLECTIONS, AND THE RISK OF FIRE IS SMALL. OUT OF 14,000 SACKS USED IN THE EXPERIMENTS, THERE WERE ONLY NINE FAILURES, AND THESE WERE DUE TO HOUSEHOLDERS' ATTEMPTS TO OVERFILL THE SACKS. (PHS)

03-01-00519 MOUNT HOLLY'S REFUSE PROGRAM (COLLECTION SANITARY-LANDFILL COST(OPERATING))
VAN DEUSEN, R. H. + GREENWALD, J.
THE AMERICAN CITY 76(7), P. 118 (JULY 1961). A DESCRIPTION OF REFUSE COLLECTION AND DISPOSAL PRACTICES IN MOUNT HOLLY, NEW JERSEY. THE CITY PROVIDES A GOOD, EFFICIENT SERVICE AT AN ANNUAL COST OF ONLY $2.24 PER CAPITA. (PHS)

03-01-00522 REFUSE IMPROVEMENT GAINS CUSTOMERS (COLLECTION)
WILSON, J.
THE AMERICAN CITY 76(5), P. 29 (MAY 1961). A NEW COMPACTION TRUCK, IMPROVEMENTS IN COLLECTING AND BILLING, AND AN INTENSIVE PUBLIC RELATIONS CAMPAIGN HAVE ADDED NEW REFUSE COLLECTION CUSTOMERS IN AN EFFORT TO UPGRADE SANITARY CONDITIONS IN BRINKLEY, ARKANSAS. OTHER IMPROVEMENTS ANTICIPATED IN THE FUTURE ARE COMPULSORY REFUSE COLLECTION AND CONVERSION OF THE CITY DUMP INTO A SANITARY LANDFILL. (PHS)

03-01-00524 DOUBLED REFUSE COLLECTIONS COST US LESS
IVAN, S.
THE AMERICAN CITY 76(4), P. 102 (APRIL 1961). REPLACEMENT OF OLD REFUSE-COLLECTING TRUCKS WITH MODERN, HIGH-COMPACTION UNITS HAS ENABLED THE CITY OF HAMMOND, IND., TO EXTEND ITS SERVICE TO TWICE-WEEKLY COLLECTIONS AND AT THE SAME TIME REDUCE COLLECTION COSTS AND INCREASE SAFETY IN OPERATIONS. (PHS)

03-01-00526 PRIVATE REFUSE COLLECTION DOES WORK
MITCHELL, J. M.
THE AMERICAN CITY 76(3), P. 153 (MARCH 1961). A DISCUSSION OF REFUSE COLLECTION IN MARPLE TOWNSHIP, PA. FIVE PRIVATE HAULERS, LICENSED AND CONTROLLED BY THE MUNICIPAL AUTHORITY, PROVIDE A GOOD SERVICE AT LOW COST. (PHS)

03-01-00529 SELF-SUPPORTING REFUSE PROGRAM (COLLECTION)
BRONOW, J. A.
THE AMERICAN CITY 76(1), P. 78 (JANUARY 1961). DESCRIBES REFUSE COLLECTION AND DISPOSAL OPERATIONS IN TACOMA, WASH. A UTILITY WITHIN THE PUBLIC WORKS DEPARTMENT IS RESPONSIBLE FOR REFUSE COLLECTION AND MUST PROVIDE A SELF SUPPORTING SERVICE. AN ENTIRE NEW REFUSE FLEET WAS RECENTLY INSTALLED TO KEEP PRICES AT A MINIMUM. EVERY YEAR DURING CLEANUP WEEK AN "OPEN HOUSE" AT THE CITY DUMP IS HELD. THE CITY'S ONLY REFUSE PROBLEM IS LACK OF LANDFILL SITES FOR FUTURE DISPOSAL. (PHS)

03-01-00531 MORE SERVICE AT LESS COST (COLLECTION COST(OPERATING))
FARRIS, W. W.
THE AMERICAN CITY 76(2), P. 25 (FEBRUARY 1961). THE USE OF COMPACTOR REFUSE COLLECTION UNITS INSTEAD OF OPEN TRAILERS IS SAVING THE CITY OF MEMPHIS, TENNESSEE, $28.16 PER UNIT DAILY AND INCREASING BY 75 PER DAY THE NUMBER OF HOMES SERVED. (PHS)

03-01-00538 ONLY MODERN WASTE COLLECTION PROGRAMS CAN USE LABOR EFFICIENTLY (COST(LABOR))
WILCOX, F. F.
PUBLIC WORKS 86(5), P. 99 (MAY 1955). THE USE OF MODERN PACKER TRUCKS IN LYNBROOK, N. Y., INCREASED WORKER EFFICIENCY BY REDUCING STRAIN, INCREASING SPEED OF LOADING, AND DECREASING INJURIES. THE WORK IS ORGANIZED SO THAT EACH CREW HAS THE SAME SHARE OF RESIDENTIAL AND BUSINESS COLLECTIONS. THE MEN ARE ALLOWED TO SALVAGE RAGS, WASTE PAPER, AND SCRAP IRON. THIS INCREASED WORKER SATISFACTION AND REDUCED THE AMOUNT OF WASTE THAT MUST BE DISPOSED OF BY THE CITY. COST IN 1953 WAS 120,000 DOLLARS - A PER CAPITA COST OF $4.80 FOR TWO HOUSEHOLD COLLECTIONS EACH OF GARBAGE AND RUBBISH, AND FOR DAILY BUSINESS COLLECTIONS. (UC)

03-01-00543 PLANNED REFUSE VEHICLE REPLACEMENT- BETTER SERVICE, LOWER MAINTENANCE (INCINERATION COLLECTION-EQUIPMENT COST(OPERATING))
PUBLIC WORKS 95(3), P. 105 (MARCH 1964). THE COST OF INCINERATION IS $2.85 PER TON OF GARBAGE AND SLUDGE BURNED. A DISPOSAL AREA FOR LARGE COMBUSTIBLES AND NONCOMBUSTIBLES WAS OPERATED AT A COST OF $1.11 PER TON, OR 23 CENTS PER CAPITA FOR THE YEAR. UNIT COSTS OF COLLECTION, NOT INCLUDING EQUIPMENT REPLACEMENT, WERE $3.97 PER CAPITA OR $16.92 PER TON FOR GARBAGE AND COMBUSTIBLES AND $25.30 PER TON OR $0.99 PER CAPITA FOR NONCOMBUSTIBLES. AVERAGE PER CAPITA WASTES (TOTAL OF BOTH KINDS) WAS OVER 1,000 LB PER YEAR OR A BIT LESS THAN 3 LB PER PERSON PER DAY. THE POLICY OF TIMELY REPLACEMENT OF WORN REFUSE COLLECTION UNITS RESULTED IN CHARGES OF $13,750 IN 1962 FOR VEHICLE MAINTENANCE - A REDUCTION OF $10,000 FROM THE TWO PREVIOUS YEARS. A RADICAL DECREASE WAS NOTED IN THE PROBLEMS OF KEEPING A PROPERLY OPERATING FLEET ON THE ROUTES. (UC)

03-01-00554 REFUSE COLLECTION AND DISPOSAL IN WESTERN EUROPE - PART I- REFUSE COLLECTION AND STREET CLEANING (FREQUENCY COMPOSITION QUANTITY)
ROGUS, C. A.
PUBLIC WORKS 93(4), P. 98 (APRIL 1962). SOLID WASTE PROBLEMS IN EUROPE ARE GENERALLY HANDLED ON A METROPOLITAN, SOMETIMES ON A REGIONAL, AND IN SOME INSTANCES ON NATIONAL LEVELS. REFUSE IS TREATED AS CONGLOMERATE MATERIAL FROM WHICH VALUABLE COMPONENTS CAN BE EXTRACTED FOR INDUSTRY, AND AGRICULTURE. (UC)

03-01-00555 BETTER REFUSE COLLECTION FOR LESS MONEY (COST(OPERATION))
WARNER, W. P.
PUBLIC WORKS 93(12), P. 70 (DECEMBER 1962). BY CHANGING TO COMPACTION TYPE TRUCKS, LAKELAND, FLORIDA, IS NOW ABLE TO COLLECT TRASH WITH GARBAGE TWICE A WEEK, AS OPPOSED TO THE SEPARATE BUT LESS FREQUENT COLLECTION OF THE TWO. DUMPMASTER CONTAINERS ARE NOW USED FOR SCHOOLS AND COMMERCIAL ESTABLISHMENTS. THREE 20-YD DEMPSTER DUMPMASTER PACKERS NEEDED. CONTAINERS SERVE 580 ESTABLISHMENTS, HAVE A TOTAL STORAGE CAPACITY OF 1,707 CU YD, AND ARE EMPTIED ON AN AVERAGE OF THREE TIMES PER WEEK. THE ANNUAL OPERATING BUDGET HAS BEEN REDUCED FROM $281,000 IN FISCAL YEAR 1960-1961, TO $215,000 IN FISCAL YEAR 1961-1962, TO $200,106 IN FISCAL YEAR 1962-1963. THE TOTAL NET SAVINGS EXPECTED DURING THE LIFE OF THE EQUIPMENT ARE $3 MILLION. (UC)

03-01-00557 REFUSE COLLECTION AND DISPOSAL IN WESTERN EUROPE - PART II - REFUSE COLLECTION AND STREET CLEANING - OPERATING TECHNIQUES AND EQUIPMENT (COST(OPERATING) VEHICLES)
ROGUS, C. A.
PUBLIC WORKS 93(5), P. 99 (MAY 1962). IN THE BRITISH ISLES AND ON THE CONTINENT, REFUSE IS BROUGHT TO A CENTRAL STATION FOR PROGRESSIVE SEPARATION BEFORE FINAL DISPOSAL. FIRST OF ALL, FINE DUST, DIRT, AND ASH ARE REMOVED FOR SUBSEQUENT USE IN FARMING, THEN CINDERS AND UNBURNED COAL ARE SALVAGED FOR REUSE AS A FUEL. METALS ARE MAGNETICALLY SEPARATED AND FINAL, OTHER RESALVABLE MATERIALS ARE REMOVED. THE REMAINDER, I.E., TAILINGS, EITHER GO DIRECTLY TO LANDFILLS, OR ARE INCINERATED AND LATER REMOVED TO LANDFILLS. THUS, THE TAILINGS ARE CONSIDERABLY LESS BOTH IN VOLUME AND IN WEIGHT THAN WAS THE ORIGINAL REFUSE AS COLLECTED. GENERALLY, A SINGLE AGENCY IS CHARGED WITH THE COLLECTION, TREATMENT, AND DISPOSAL OF REFUSE. RESPONSIBILITY FOR REMOVING DIRT, LITTER, AND SNOW AND ICE FROM STREETS IS AS CONFUSED IN ITS ORGANIZATION AND JURISDICTIONAL AUTHORITY IN EUROPE AS IN THE U.S. - ALTHOUGH THE TREND IS TO ASSIGN THIS TO THE REFUSE COLLECTION AGENCY. MAJOR DIFFERENCES BETWEEN EUROPEAN AND AMERICAN COLLECTION SYSTEMS ARE - 1. INCREASING USE OF INCENTIVE SYSTEMS IN EUROPE. 2. USE OF LARGER TRUCK CREWS--4 OR 5 TO AS MANY AS 7. 3. INCREASING USE OF THE " DUSTLESS " COLLECTION SYSTEM. 4. THE OFTEN-TIMES LIMITING OF THE COLLECTION TO A SINGLE MORNING TRUCKLOAD WITH A SUBSEQUENT REASSIGNMENT OF PERSONNEL TO STREET CLEANING. DATA ARE PRESENTED ON COLLECTION PERFORMANCES AND COSTS IN SIX EUROPEAN COUNTRIES AND IN THE U.S., AND ON CHARACTERISTICS OF THE TRUCKS USED. GENERALLY EUROPEAN MUNICIPALITIES USE FEWER TRUCKS, LARGER IN CAPACITY, AND MORE HIGHLY MECHANIZED. ALTHOUGH THE CAPITAL COSTS OF THESE TRUCKS ARE HIGHER, PER CAPITA COSTS ARE LESS DUE TO GREATER LONGEVITY AND LOWER INVENTORY. TRUCKS ARE SUPERIOR BECAUSE OF THE USE OF ALUMINUM ALLOYS AND REINFORCED FIBERGLASS MATERIALS, AND OF THE STREAMLINED DESIGN FOR THE BODY HOUSING, WHICH PROVIDES SMOOTH, READILY CLEANABLE SURFACES, CORROSION RESISTANCE, AND REDUCTION OF BODY MAINTENANCE. GENERALLY, DEAD WEIGHT ALSO IS REDUCED. FOUR TYPES OF COMPACTION TRUCKS ARE DESCRIBED. THE HERMETIC DUSTLESS SYSTEM IS WIDELY USED. THE ESSENTIAL COMPONENTS OF THE SYSTEM ARE UNIFORMLY SIZED RUGGED CONTAINERS WITH HINGED LIDS, AND A COMBINATION LIFTING, TILTING, AND SHUTTER MECHANISM ON THE TAILGATE. A MAJOR ADVANTAGE IS THAT IT IS INHERENTLY HYGIENIC AND PERMITS AN AESTHETIC COLLECTION OPERATION. MAJOR DISADVANTAGES ARE THE HIGH CAPITAL COST, NOISY OPERATION, INABILITY TO HANDLE BULKY MATERIALS, TENDENCY TO CLOG WITH RAGS, WIRES, AND STRINGY MATERIALS, RELATIVELY POOR COMPACTABILITY, AND THE MANDATORY NEED FOR STANDARDIZED COSTLY CONTAINERS. BATTERY POWER AND DIESEL ENGINE POWERED EQUIPMENT IS COMMON IN EUROPE. EUROPEAN CITIES SPEND A HIGHER PROPORTION OF THEIR STREET CLEANING AND REFUSE DISPOSAL BUDGETS ON STREET CLEANING THAN DO AMERICAN CITIES, ALTHOUGH THEIR AMOUNTS OF STREET LITTER AND DIRT ARE SMALLER. IN ADDITION, SNOW IS LESS OF A PROBLEM. (UC)

03-01-00559 REFUSE COLLECTION EQUIPMENT WILL PAY FOR ITSELF IN TWO YEARS
HENNING, E. G.
PUBLIC WORKS 93(5), P. 112 (MAY 1962). THE ARTICLE CONCERNS ORLANDO, FLA. THE CITY HAS SWITCHED TO 100 PERCENT CONTAINERIZATION. INVOLVED ARE 72,000 PICK-UP AND CURB SIDE TRASH AND TRIMMINGS PICK-UPS/WEEK. THE CONTAINERIZATION SYSTEM SAVES $600,000/YR. IN 1960 " DUMPMASTER " PRINCIPLE WAS ADOPTED IN WHICH CONTAINERS ARE EMPTIED ON THE SPOT IN A SELF-LOADING PACKER. THE CITY ALSO SWITCHED TO FRONT-END LOADERS FOR HAND-COLLECTION ROUTES. THE MASTER PLAN INCLUDES THE FOLLOWING FEATURES - 1. A PROPERLY SIZED CONTAINER IS PLACED AT EACH LOCATION. 2. TWENTY 24 CU-YD SELF-LOAD DEMPSTER DUMPMASTER TRUCKS, AND 1100 CONTAINERS OF 3 TO 8 CU-YD CAPACITY MAKE UP THE PHYSICAL EQUIPMENT. 3. ALL COMMERCIAL SERVICES ARE CONTAINERIZED. 4. WAGES AND FRINGE BENEFITS FOR "HAND PICK-UP" CREWS WERE INCREASED. DRIVERS WERE MADE CREW BOSSES. 5. LIGHT FIBERGLASS 40-GAL TOTE CONTAINERS WERE PURCHASED FOR THE PICK-UP MEN. 6. THE CREWS WORK ON A COMBINATION HOURLY TASK-FORCE BASIS (EXAMPLE, A HARD WORKING CREW CAN FINISH THE DAY'S ASSIGNMENT IN 5 HOURS AND YET GET 8-HR PAY). 7. EIGHTEEN HAND-COLLECTION ROUTES WITH TWICE-A-WEEK PICKUP FOR 36,000 DWELLING UNITS WERE ESTABLISHED. WEEKLY TRASH AND TRIMMING PICK-UPS AMOUNTED TO 38,000. EACH DUMPMASTER WAS ALLOTTED 6,000 PICK-UPS PER WEEK. 8. COMMERCIAL PICK-UPS ARE MADE AT NIGHT BY 5 DUMPMASTERS. (UC)

03-01-00563 REFUSE COLLECTION WILL SAVE $600,000 ANNUALLY
JACOBSON, A. R.
PUBLIC WORKS 93(6), P. 186 (JUNE 1962). IN ORLANDO, FLORIDA, A 100 PERCENT CONTAINERIZED SYSTEM IS USED. IT CONSISTS OF 78,000 CARRY-OUT REFUSE PICKUPS AND 38,000 CURBSIDE TRASH AND TRIMMINGS PICKUPS. THE NEW SYSTEM SAVES THE CITY $600,000 ANNUALLY. (SEE ALSO ENTRY 03-01-00559.) (UC)

03-01-00569 REFUSE COLLECTION AND REFUSE CHARACTERISTICS (QUANTITY GARCHEY-SYSTEM CHARACTERISTICS COMPOSITION)
ROGUS, C. A.
PUBLIC WORKS 97(3), P. 96 (MARCH 1966). THE CONTINUING TREND IN BOTH EUROPE AND THE U.S. IS TO COLLECT AND TREAT MIXED, UNSEGREGATED REFUSE IN A SINGLE SYSTEM. THE EXCEPTION IS IN THE HANDLING OF OVERSIZED WASTES SUCH AS LUMBER, TIMBER, AND FURNITURE. DETAILED INFORMATION ON THE COMPOSITION AND PROPERTIES OF REFUSE IS NECESSARY EVEN WITH A SINGLE TREATMENT SYSTEM FOR MIXED REFUSE BECAUSE- (1) THE LAYOUT OF COLLECTION ROUTES AND THE DESIGN OF COLLECTION EQUIPMENT ARE GOVERNED BY THE TOTAL REFUSE OUTPUT FOR ANY GIVEN PERIOD, ITS DAILY AND SEASONAL VARIATIONS, ITS DENSITY, COMPACTION, AND COMPARISON. (2) INCINERATOR DESIGN AND OPERATION COMPUTATIONS REQUIRE A KNOWLEDGE OF THE AMOUNTS OF COMBUSTIBLES, THEIR ABRASIVENESS, THEIR MOISTURE AND CALORIFIC CONTENTS, AND THE AVAILABILITY OF C, H, O, ETC. (3) DENSITY AND COMPACTABILITY MUST BE KNOWN TO ESTIMATE THE AREA, SPACE NEEDS, AND USEFUL LIFE OF LANDFILL SITES. CHEMICAL COMPOSITION MUST BE KNOWN SO AS TO ENABLE THE PREDICTION OF ODOR AND METHANE GAS PRODUCTION. EUROPEAN REFUSE COLLECTED PER CAPITA FOR SEVEN CONTINENTAL CITIES HAS RISEN FROM 475 LB/CAPITA/YEAR IN 1953 TO 725 LB/CAPITA/YR IN 1964, A 53 PERCENT INCREASE IN 11 YEARS. THE DENSITY OF THE REFUSE DECREASED IN THESE SAME YEARS FROM 485 TO 390 LB/CU YD, DUE TO AN INCREASE IN THE PERCENTAGE OF PAPER, PAPER PRODUCTS, AND SYNTHETIC WRAPPINGS. NEVERTHELESS, IT IS HEAVIER THAN AMERICAN REFUSE--MAINLY BECAUSE OF HIGH OUTPUT OF DOMESTIC ASHES. IN EUROPEAN CITIES, THE USE OF DUSTLESS REFUSE COLLECTION TRUCKS IS BECOMING WIDESPREAD DESPITE THE SMALL CAPACITY OF THE TRUCKS, VIZ., AN AVERAGE OF ABOUT 16 CU-YD. THE TREND IN THE U.S. IS TOWARDS LARGER (20-30 CU YD) TRUCKS. SEVERAL COLLECTION AIDS ARE FOUND IN BUILDINGS. (ON-SITE APARTMENT HOUSE BURNING OF REFUSE IS FROWNED UPON IN EUROPE.) THESE INCLUDE APARTMENT HOUSE DUAL TYPE SHAFTS, CENTRAL PNEUMATIC TUBE SYSTEMS, AND THE GARCHEY HYDRAULIC SYSTEM. ALL OF THESE ARE FULLY DESCRIBED. IN THE GARCHEY HYDRAULIC SYSTEM DOMESTIC REFUSE IS TRANSPORTED HYDRAULICALLY FROM A SPECIAL RECEIVER IN EACH APARTMENT THROUGH A VERTICAL 6-8 INCH STACK TO UNDERGROUND COLLECTION CHAMBERS. IT IS USED IN FRANCE. GRAPHS OF REFUSE CHARACTERISTICS ARE ALSO PRESENTED IN THE ARTICLE. (UC)

03-01-00591 BARGES SERVE AS TRUCKS FOR REFUSE COLLECTION (COLLECTION)
THE AMERICAN CITY 74(2), P. 25 (FEBRUARY 1959). IN VENICE, ITALY, REFUSE IS COLLECTED IN CONTAINERS MOUNTED ON CYCLES. THE REFUSE IS LOADED ON BARGES EQUIPPED WITH COMPRESSOR BODIES AND HAVING A CAPACITY OF 10 CU-M. THE BARGES ARE TOWED TO AREAS AT WHICH THE REFUSE IS USED AS A FERTILIZER. SOME OF THE REFUSE IS HAULED BY TRUCK TO DUMPS. HERE THE REFUSE IS ALLOWED TO DECAY. THE DECOMPOSED MATERIAL IS USED AS A FERTILIZER. (UC)

03-01-00605 CONTRACTOR REFUSE COLLECTION (SANITARY-LANDFILL)
JOHNSON, T. F.
THE AMERICAN CITY 74(6), P. 104 (JUNE 1959). IN 1956 THE CITY OF ROCKFORD, ILLINOIS DECIDED TO GIVE UP THE CITY-OWNED SANITATION UNIT IN FAVOR OF A PRIVATE HAULER. THE ENTIRE PROBLEM WAS TURNED OVER TO THE ROCKFORD DISPOSAL SERVICE, WHICH WAS ALREADY SERVING MANY CITIES IN THE AREA. IN 1959 THE CITY PAID AN ESTIMATED $333,000 FOR GARBAGE AND RUBBISH COLLECTION. IN 1955, WHEN THE CITY OWNED THE DISPOSAL SERVICE, $345,000 WAS SPENT, AND THAT WAS WHEN THE POPULATION WAS SMALLER AND LABOR COSTS, ETC., WERE LOWER. (UC)

03-01-00647 MUNICIPAL REFUSE PRACTICES IN OKLAHOMA (COLLECTION FREQUENCY)
RACHELS, L. K.
PUBLIC WORKS 91(5), P. 134 (MAY 1960). A SURVEY OF MUNICIPAL REFUSE COLLECTION AND DISPOSAL IN 292 CITIES AND TOWNS WAS CONDUCTED BY THE OKLAHOMA STATE DEPARTMENT OF HEALTH. THE SURVEY COVERED REFUSE STORAGE AND COLLECTION (FREQUENCY RATES, FINANCE, OPERATIONAL COSTS, AND COLLECTION TIMES). INFORMATION GIVEN REFLECTS CONDITIONS IN 1957 AND 1958. (PHS)

03-01-00654 FACTORS IN AN EFFICIENT REFUSE COLLECTION SYSTEM
MENDOZA, E.
PUBLIC WORKS 94(1), P. 128 (JANUARY 1963). DESCRIBES THE HIGHLY EFFICIENT REFUSE COLLECTION SYSTEM IN SAN-DIEGO, CALIFORNIA. THE CITIZENS ARE EXPECTED TO ASSIST IN COLLECTION IN SEVERAL WAYS, AMONG WHICH ARE PLACING REFUSE CANS AT THE CURB BEFORE 8 A.M. AND OBEYING THE CITY SPECIFICATIONS REGARDING THE REFUSE CANS. THE CITY USES AN INCENTIVE SYSTEM FOR REFUSE COLLECTION PERSONNEL. CREW MEMBERS ARE ALLOWED TO QUIT WORK AT 3 15 P.M. INSTEAD OF THE REGULAR 4 30 P.M. IF THEIR ROUTES HAVE BEEN PROPERLY COLLECTED. THIS INSURES THAT THE COLLECTORS WORK AT A REASONABLY RAPID RATE WITHOUT HAVING THE NEED FOR LARGE NUMBERS OF SUPERVISORY PERSONNEL WATCHING THEM. THE SANITATION DIVISION MAINTAINS RADIO CONTACT WITH ITS EIGHT FIELD FOREMEN SO THAT ANY COMPLAINTS OR INQUIRIES CAN BE ANSWERED QUICKLY AND EFFECTIVELY. (PHS)

03-01-00658 FINLAND'S REFUSE HANDLING METHODS, COMPUTATION WITHOUT ORGANIZATION (COLLECTION CONTAINERS)
REFUSE REMOVAL JOURNAL 10(12), P. 20, 26 (DECEMBER 1967). SOLID WASTE HANDLING IS NOT FORMALLY ORGANIZED IN FINLAND. THE HOUSE OWNER IS RESPONSIBLE FOR OBTAINING SUCH A SERVICE OR MUST HANDLE IT HIMSELF. A SYSTEM OF INTERCHANGEABLE BOXES IS USED FOR STORAGE AND COLLECTION. STANDARD STEEL BINS HOLDING 176 OR 247 CU-FT ARE USED. THEY ARE CURRENTLY SWITCHING OVER TO A SWEDISH SYSTEM USING 10 CU-FT BOXES. VEHICLE PICKUP MUST BE ABOUT 77 CU-YDS TO BE ECONOMICAL.

03-01-00670 BEHIND THE SCENES, REFUSE COLLECTIONS AT PURDUE UNIVERSITY (COLLECTION-EQUIPMENT)
THE STREET CLEANER 44, P. 1-2 (1960). THE COLLECTION AND DISPOSAL SYSTEM USED AT PURDUE UNIVERSITY BY A PRIVATE CONTRACTOR IS DESCRIBED. CONTRACTUAL COST IS $39,000 PER YEAR FOR THE 2 SHIFT-SIX DAY OPERATION.

03-01-00671 HOW IT'S DONE IN SWEDEN (COMPOSITION QUANTITY HEAT-RECOVERY CONTAINER(REFUSE) HEAT(SPACE) INCINERATION OPEN-DUMP SACK(PAPER) COMPACTION DAND COMPOSTING)
BJORKMAN, A.
REFUSE REMOVAL JOURNAL 3(12), P. 10 (DECEMBER 1960). A REPORT OF REFUSE COLLECTION AND DISPOSAL AND STREET CLEANING PRACTICES IN SWEDEN. REFUSE CHUTES, PAPER REFUSE-STORAGE BAGS, AND COMPACTING MACHINES ARE WIDELY USED. SEVENTY-FIVE PERCENT OF REFUSE DISPOSAL IS BY SANITARY LANDFILLING. THE REMAINDER IS BY INCINERATION AND HEATING PLANTS WHICH USE THE REFUSE AS AN AUXILIARY FUEL. STREET CLEANING IS DONE BY A COMBINATION OF MANUAL LABOR AND SWEEPING MACHINES. INCLUDES ALSO A DISCUSSION OF THE ADMINISTRATION OF THE SANITATION DEPARTMENT, INCENTIVE PAY FOR EMPLOYEES, AND THE LITTER PROBLEM. (PHS)

03-01-00672 ST. CATHARINES SEES SAVINGS (COST(COLLECTION) (COLLECTION)
REFUSE REMOVAL JOURNAL 5(9), P. 34 (SEPTEMBER 1962). THE CITY COUNCIL OF ST. CATHARINES, ONTARIO, HAS BEEN INVESTIGATING THE POSSIBILITY OF HAVING REFUSE COLLECTED BY PRIVATE CONTRACTORS AND BELIEVES THAT SUCH A SYSTEM COULD SAVE THE TAXPAYERS A CONSIDERABLE SUM. BIDS FROM FIVE FIRMS WERE OPENED RECENTLY, EACH ONE COVERING THREE PRICES--FOR ONCE-A-WEEK COLLECTION THE YEAR AROUND, FOR ONCE WEEKLY FOR NINE MONTHS AND TWICE WEEKLY DURING THE SUMMER MONTHS, AND YEAR AROUND TWICE A WEEK. EXTRA COSTS TO HAVE REFUSE SET OUT AT THE CURBS WERE ALSO LISTED IN EACH CASE AS A SEPARATE CHARGE. THE LOWEST BID IN EACH OF THESE CATEGORIES WAS BELOW WHAT THE COUNCIL ESTIMATED THE EXPENSE WOULD BE IF HANDLED BY THE CITY. FOR EXAMPLE, COLLECTING TWICE A WEEK DURING THE THREE SUMMER MONTHS AND ONCE A WEEK THE REST OF THE YEAR HAD BEEN ESTIMATED AT $228,393 WITH AN EXTRA $121,292 FOR SET-OUT SERVICE. THE LOWEST BIDDER IN THIS CATEGORY WAS $220,967, BUT ONLY $44,193 FOR THE SET-OUT SERVICE.

03-01-00682 REFUSE COLLECTION PROBLEMS IN A RESORT CITY (COST(OPERATING) BULKY-WASTE INCINERATOR)
WRIGHT, C. E.
PUBLIC WORKS 86(2), P. 71-72 (FEBRUARY 1955). A REVIEW OF THE PROBLEMS, TYPES OF REFUSE AND COLLECTION METHODS THAT ARE REQUIRED IN THE RESORT CITY AT MIAMI BEACH, FLORIDA. EQUIPMENT AND UNIT COSTS ARE ALSO DISCUSSED.

03-01-00702 CONTRACT METHOD OF REFUSE COLLECTION (FREQUENCY COST(OPERATING))
ANDERSEN, D. A.
THE AMERICAN CITY 74(1), P. 113 (JANUARY 1959). THE BASIC PROVISIONS AND THE METHOD OF PAYMENT OF SEATTLE CONTRACT ARE THOROUGHLY DISCUSSED BY MR. ANDERSON. THE ADVANTAGES AND DISADVANTAGES OF THE CONTRACT COLLECTION ARE ALSO DESCRIBED. (PHS)

03-01-00703 CULVER-CITY TAKES OVER (COLLECTION TRANSFER-SYSTEM COST(OPERATING) COST(EQUIPMENT)
SEEGER, D.
THE AMERICAN CITY 74(8), P. 94 (AUGUST 1959). CULVER-CITY, CALIFORNIA, RECENTLY ABANDONED A 30-YEAR-OLD PROGRAM OF PRIVATE REFUSE COLLECTION FOR A MUNICIPALLY OPERATED SYSTEM. THE DETAILS OF THIS CHANGEOVER AND SUCCESS OF EARLY OPERATION OF THE NEW SYSTEM ARE DISCUSSED. (PHS)

03-01-00733 BULK REFUSE COLLECTION HELPS KEEP NEW YORK CLEAN (BULKY-WASTE)
SCREVANE, P. R.
PUBLIC WORKS 92(2), P. 90-92 (FEBRUARY 1961). NEW YORK CITY OPERATES AN " ON CALL " SPECIAL COLLECTION SERVICE FOR BULKY DISCARDED OBJECTS. SUPPLEMENTING 148 MODIFIED DUMP TRUCKS, 20 SPECIAL DUMP TRUCKS WERE PURCHASED FOR THIS SERVICE AND 25 MORE WITH HOISTS AND HYDRAULIC TAILGATES ARE ON ORDER. THE PROGRAM, STARTED IN 1955 HAS EXPANDED GREATLY WITH OVER 29,000 LOADS WEIGHING 56,000 TONS HAVING BEEN COLLECTED JANUARY 1 TO AUGUST 31, 1960. THE NEWEST TRUCKS WILL ALSO BE USABLE FOR SNOW PLOWING OR CARRYING ROCK. (PHEA)

03-01-00803 BLACKBURN'S METHOD OF DUSTLESS LOADING
PUBLIC CLEANSING 52(12), P. 553 (DECEMBER 1962). BRIEFLY DISCUSSES REFUSE COLLECTION IN BLACKBURN, ENGLAND. THE CITY DWELLINGS ARE MAINLY OF THE TERRACE-TYPE WITH BINS IN THE BACKYARDS WHICH OPEN ONTO THE STREETS IN WIDTHS VARYING FROM 8 TO 12 FT. THESE CONDITIONS SEVERELY LIMIT THE SIZE OF VEHICLE USABLE. BLACKBURN HAS SOLVED THIS PROBLEM WITH THE USE OF COMPRESSION VEHICLES, ENABLING THE SMALL REFUSE TRUCKS TO HOLD MORE REFUSE THAN WITHOUT THE COMPRESSION MECHANISMS. THE CITY IS NOW EXPERIMENTING WITH A DUSTLESS COLLECTION VEHICLE. THIS VEHICLE LIFTS AND EMPTIES REFUSE BINS OF ANY SHAPE AND SIZE WITH THE ABSOLUTE MINIMUM OF DUST EMISSION AND HAS AMPLE AND EASY FACILITIES TO LOAD ARTICLES OTHER THAN THE CONTENTS OF THE BIN. (PHS)

03-01-00843 SMALL TOWN REFUSE HANDLING (COLLECTION COST(OPERATING) SANITARY-LANDFILL)
WALDROP, R. H.
THE AMERICAN CITY 75(6), P. 96-97 (JUNE 1960). STRATFORD, OKLAHOMA'S REFUSE HANDLING IS A ONE MAN OPERATION. A MONTHLY CHARGE OF 1 DOLLAR PER RESIDENCE AND 3 DOLLARS FOR EACH BUSINESS. THERE ARE 410 RESIDENCES AND 30 BUSINESSES, OR A MONTHLY INCOME OF 470 DOLLARS. A TRACTOR IS USED TO PULL THE COLLECTION TRAILER AND TO OPERATE THE SANITARY LANDFILL. RESIDENTIAL COLLECTION IS TWICE A WEEK, AND BUSINESSES EVERY DAY. THIS OPERATION ILLUSTRATES THAT EFFICIENT COLLECTION AND DISPOSAL CAN BE CARRIED OUT IN SMALL TOWNS AT SMALL EXPENSE. (EI)

03-01-00914 REDEVELOPMENT PROBLEMS IN BIRMINGHAM (COLLECTION SACK(PAPER) BULKY-WASTE)
PUBLIC CLEANSING 53(7), P. 349 (JULY 1963). THE PAPER DESCRIBES REFUSE COLLECTION IN BIRMINGHAM, ENGLAND, IN VIEW OF THE EXTENSIVE REDEVELOPMENT GOING ON IN THAT CITY. (PHS)

03-01-00915 CLEAN AND QUIET (NOISE(COLLECTION) STORAGE(UNSANITARY) CONTAINERS(COLLECTION) COLLECTION)
MCCARTHY, F. L.
PUBLIC CLEANSING 52(12), P. 565 (DECEMBER 1962). A LENGTHY DISCUSSION OF CLEANLINESS AND QUIETNESS IN REFUSE STORAGE AND COLLECTION. INCLUDES- (1) REQUIREMENTS OF CLEANLINESS AND HYGIENE WHICH A METHOD OF REFUSE STORAGE AND COLLECTION SHOULD MEET, (2) PROBLEMS INVOLVED WITH SETTING STANDARDS OF QUIETNESS. ALTHOUGH THERE HAS BEEN DIFFICULTY IN SPECIFYING A STANDARD PERMISSIBLE NOISE LEVEL, RESEARCH HAS SUGGESTED THAT ANYTHING EXCEEDING A LEVEL OF 80 DECIBELS MAY BE CONSIDERED A NUISANCE, (3) UNSANITARY AND NOISE PROBLEMS RESULTING FROM PRESENT REFUSE STORAGE METHODS USED IN GREAT BRITAIN INCLUDING THE DUSTBIN, BULK CONTAINER, AND CHUTE SYSTEMS. GIVES SOUND LEVEL RECORDINGS OF LIDS BEING DROPPED DOWN REFUSE CHUTES, AND DISCUSSES AT LENGTH THE CLEANING OF BULK CONTAINERS, (4) ADVANTAGES AND DISADVANTAGES OF ADOPTING A SYSTEM OF DUSTLESS COLLECTION. ONE OF THE PRINCIPAL DISADVANTAGES WHICH IS EXTENSIVELY DISCUSSED IS THE EXCESSIVE WEIGHT OF THE DUSTLESS BIN. DESCRIBES DEVELOPMENTS IN THE CREATION OF LIGHTWEIGHT BINS MADE FROM LIGHT ALLOYS AND PLASTICS AND COMBINATIONS OF STEEL AND THESE MATERIALS, (5) ADVANTAGES AND DISADVANTAGES OF PAPER SACKS FOR REFUSE STORAGE, (6) COMPARATIVE COSTS FOR THE INSTALLATION AND OPERATION OF THE DUSTLESS PAPER SACK, AND DUSTBIN SYSTEMS FOR 1,000 PROPERTIES IN A RESIDENTIAL AREA, AND (7) CLEANLINESS AND QUIETNESS IN REFUSE COLLECTION VEHICLES. DISCUSSES VEHICLE BODY DESIGN, BULK CONTAINER VEHICLES, ATMOSPHERIC POLLUTION BY VEHICLES, AND NOISE CREATED BY THE REFUSE VEHICLE MOTORS AND AUXILIARY MECHANISMS. (PHS)

03-01-00916 DINOSAUR TRANSPORT SOLVES A CLEANSING PROBLEM (COLLECTION)
PUBLIC CLEANSING 53(11), P. 550 (NOVEMBER 1963). THE DINOSAUR SYSTEM OF CONTAINERIZED REFUSE REMOVAL IS FELT BY MANY AUTHORITIES IN GREAT BRITAIN TO BE TOO MASSIVE AND EXPENSIVE FOR GENERAL ADOPTION IN THAT COUNTRY. THE CITY OF GLASGOW, SCOTLAND, HOWEVER, HAS REPLACED RAIL TRANSPORT OF RESIDUE FROM ITS KELVINAUGH WORKS WITH A DINOSAUR TRANSPORT SYSTEM, RESULTING IN A SAVING OF 15,000 POUNDS. (PHS)

03-01-00922 REFUSE COLLECTION AT WALTHAMSTOW
PUBLIC CLEANSING 53(12), P. 606 (DECEMBER 1963). THE CITY OF WALTHAMSTOW, ENGLAND, RECENTLY REORGANIZED ITS REFUSE COLLECTION SYSTEM BY REPLANNING COLLECTION ROUTES AND REPLACING ITS SIDE LOADING COLLECTION VEHICLES WITH PACKERS. THE RESULT HAS BEEN A DECREASE IN THE NUMBER OF REFUSE TRUCKS NEEDED FROM 16 TO 8. THE CITY ALSO BOASTS AN EXCELLENT SYSTEM OF RECORD KEEPING WHICH PROVIDES THE FACILITY FOR COMPREHENSIVE DETAIL AND SPEEDY MEANS OF REVIEWING AGE AND MAINTENANCE COSTS. A MARKET WHICH IS HELD EVERY MORNING OF THE WEEK PRESENTS A SPECIAL REFUSE PROBLEM. EIGHT MOBILE TRAILERS ARE USED TO CONTAIN THE LITTER AND DEBRIS OF THE MARKET. (PHS)

03-01-00946 BIG REFUSE CONTAINERS PAY DIVIDENDS (COLLECTION)
BLACK, R. P.
THE AMERICAN CITY 75(5), P. 102-103 (MAY 1960). BY CHANGING THE SYSTEM OF REFUSE COLLECTION AND STORAGE THE CITY OF DOTHAN, ALABAMA, HAS BEEN ABLE TO SAVE A MINIMUM OF $50,000 PER YEAR, ELIMINATE SPILLED REFUSE IN THE BUSINESS DISTRICT AND IMPROVE SERVICE IN THE RESIDENTIAL AREAS. TWO DEMPSTER DUMPMASTERS AND 220 METAL CONTAINERS VARYING FROM HALF TO EIGHT CU-YDS ARE USED. DISPOSAL IS BY SANITARY LANDFILL.

03-01-00981 JAPANESE CITY ADDS MECHANIZED SYSTEM (COLLECTION-EQUIPMENT)
SOLID WASTES MANAGEMENT/RRJ 10(11), P. 4 (NOVEMBER 1967). TO MEET THE INCREASING PRODUCTION OF WASTES IN AREAS OF HEAVY POPULATION DENSITY, A MECHANIZED SYSTEM FOR COLLECTION HAS BEEN IMPLEMENTED IN CHIBA, 25 MILES FROM TOKYO, JAPAN. IT COMBINES THE ACTION OF A COLLECTION TRUCK WITH A CRANE AND A NEW TYPE OF CONTAINER. THE CRANE IS LOCATED IN APPROPRIATE PLACES, SUCH AS UNDER APARTMENT HOUSES. IN USE, THE CRANE LIFTS THE BIN, EMPTIES ITS CONTENTS INTO THE VEHICLE, AND RETURNS IT TO ITS ORIGINAL POSITION. THE TRUCK IS EQUIPPED WITH A SPRAYER TO DISINFECT THE CONTAINER. THREE-HUNDRED AND SIXTY HOUSEHOLDS CAN BE SERVED DURING A 9-HOUR DAY. (UC)

03-01-00997 PACK REFUSE INTO PAPER SACKS WITH AUTOMATIC UNITS (DEVA-SYSTEM)
REFUSE REMOVAL JOURNAL 9(7), P. 18, 33 (1966). THIS DEVA REFUSE COMPRESSION SYSTEM IS MARKETED IN U.S.A. BY AUTOMATIC REFUSE SYSTEMS, INC. MATERIAL OF ALMOST ANY TYPE - SUCH AS CANS, GLASS AND PLASTIC BOTTLES, FOOD WASTES, AND PAPER - ENTER THE SYSTEM FROM A CHUTE. THE MACHINES THEN AUTOMATICALLY COMPRESS AND PACK THE MATERIAL INTO DISPOSABLE PAPER SACKS. FOR BUILDINGS HAVING NO REFUSE CHUTES, THERE ARE MODELS DESIGNED FOR DEPOSITING THE WASTE DIRECTLY INTO THE PAPER SACK WHOSE CONTENTS ARE THEN COMPRESSED. AUTOMATIC UNITS ARE MADE IN SEVERAL TYPES OFFERING BOTH HIGH AND LOW COMPACTION, INCLUDING A CARROUSEL ARRANGEMENT.

03-01-01000 A STUDY OF REFUSE COLLECTION AND DISPOSAL SYSTEM (OPEN-DUMPING COST(OPERATING))
DIVEN, M. H.
PUBLIC WORKS 91(10), P. 128 (OCTOBER 1960). OUTLINES A REFUSE COLLECTION AND DISPOSAL SYSTEM FOR THE BOROUGH OF MOUNT UNION, PA., ON THE BASIS OF RESULTS OBTAINED FROM A STUDY OF PRESENT CONDITIONS. INCLUDES TIME AND FREQUENCY OF COLLECTIONS, DISPOSAL SITE, SUPERVISION AND EQUIPMENT, ESTIMATED COSTS AND RATES FOR COMPLETE SERVICES, AND REGULATIONS GOVERNING REFUSE HANDLING PRACTICES. (PHS)

03-01-01032 HOW COLLECTION EFFICIENCY INFLUENCES REFUSE COSTS (EQUIPMENT(COLLECTION) COST(OPERATION))
ROW, H. J.
PUBLIC WORKS 92(6), P. 135 (JUNE 1961). REFUSE COLLECTION EQUIPMENT OF INFERIOR PERFORMANCE IS PURCHASED TOO OFTEN BECAUSE PROPOSALS ARE EVALUATED ON THE BASIS OF BID PRICE ALONE AND NOT RELATIVE PERFORMANCE. WHEN NEW EQUIPMENT IS PURCHASED, A LOOK AT THE COST FACTOR INVOLVED IN OPERATION MAY HELP DETERMINE THE BEST BUY.

03-01-01041 CITY ESTABLISHES PROFITABLE REFUSE COLLECTION SYSTEM
TAGG, J. J.
PUBLIC WORKS 94(6), P. 100 (JUNE 1963). BRIEFLY DESCRIBES THE RECENTLY IMPROVED REFUSE COLLECTION SERVICE IN MIRAMAR, FLORIDA. TWO 23 CU-YD PACKERS WERE OBTAINED ON A LEASE-PURCHASE BASIS, THE CITY WAS DIVIDED INTO THREE SECTIONS AND ROUTES WERE LAID OUT FOR EACH TRUCK, LAND FOR A SANITARY FILL WAS OBTAINED, AND CITIZENS WERE INFORMED BY LETTER OF THE NEW SERVICE.

03-01-01048 THREE COMMUNITIES IN NEW YORK CONSIDER MUNICIPAL COLLECTION
REFUSE REMOVAL JOURNAL 10(11), P. 24 (NOVEMBER 1967). NEW ROCHELLE, YORKTOWN, AND NEW CASTLE, NEW YORK ARE CONSIDERING MUNICIPAL COLLECTION OF REFUSE IN COMPETITION WITH PRIVATE CONTRACTORS, BECAUSE OF A FEDERAL REPORT THAT INDICATED THAT PRIVATE CARTING COMPANIES IN THE AREA HAD BEEN GUILTY OF ACTS OF VIOLENCE, INTIMIDATION, AND COLLUSION. A STUDY IS UNDERWAY TO DETERMINE IF COLLECTIONS AT HOME AND BUSINESSES CAN BE PAID FOR FROM TAX REVENUES OR BY SPECIAL ASSESSMENTS. ANOTHER REPORT IS QUOTED THAT INDICATES THAT THE U.S. ATTORNEY GENERAL HAS FOUND THAT 90 PERCENT OF THE TRADE WASTE DISPOSAL IN THE COUNTY WAS HANDLED BY COMPANIES CONTROLLED BY MEMBERS OF THE FAMILIES LONG ASSOCIATED WITH THE MAFIA. PRINCIPALS OF THE LARGE COMPANIES HAVE DENIED THIS.

03-01-01068 REFUSE COLLECTION TRAIN IMPROVES SERVICE (TRAIN(VEHICULAR))
TYSON, C. B.
PUBLIC WORKS 95(1), P. 99-100 (1964). THE CITY OF VALDOSTA, GEORGIA, HAS TWO VEHICULAR GARBAGE TRAINS THAT RE BEING USED TO IMPROVE THE REFUSE COLLECTION PROCESS. WHILE THE TRAINS ARE MAKING HOUSE TO HOUSE COLLECTIONS, THE LARGE COMPACTOR IS SERVICING ONE OR THE OTHER TRAIN OR SERVICING THE COMMERCIAL DISTRICTS. THE SYSTEM HAS REDUCED THE AMOUNT OF LOST TIME OF CREWS GOING TO THE DUMP AS WELL AS REDUCING THE NUMBER OF MEN IN THE CREWS, AS WELL AS THE NUMBER OF LARGER MORE EXPENSIVE EQUIPMENT.

03-01-01081 300 PERCENT BIGGER PAY LOADS (COLLECTION)
THE AMERICAN CITY 69(4), P. 27 (1954). THE CITY OF CEDAR-RAPIDS, IOWA, IN A FIVE-YEAR REPLACEMENT PROGRAM HAS REPLACED ALL THEIR OPEN TYPE REFUSE COLLECTION WITH A FLEET OF 11 CLOSED PACKERS. EIGHT PACKERS WERE PURCHASED NEW AND THREE WERE PURCHASED SECOND HAND FROM A PRIVATE COLLECTOR WHO WAS FORCED OUT OF BUSINESS BY A STATE LAW WHICH PROHIBITS THE FEEDING OF RAW GARBAGE TO HOGS. THE ACQUISITION OF THE PACKER TYPE EQUIPMENT REDUCED THE MONTHLY MILEAGE BY 479 AND THE NUMBER OF TRIPS BY 329 WHILE THE TONNAGE INCREASED BY 219 TONS PER MONTH.

03-01-01102 MODERN PACKER TRUCKS AND INCINERATION (COLLECTION ECONOMICS)
HYLAND, G. G.
THE AMERICAN CITY 59(12), P. 97 (DECEMBER 1954). A REPORT BY THE COMMISSIONER OF PUBLIC WORKS, BOSTON, MASSACHUSETTS, RELATING THE SUCCESSFUL EMPLOYMENT OF PRIVATE COLLECTORS ON A CITY-WIDE BASIS AND THE FAVORABLE EMPLOYMENT OF MODERN, COMPACTOR-TYPE TRUCKS. PLANNING OF 2 INCINERATORS OF 750 AND 600 TONS CAPACITY IS ALSO REPORTED, TO REPLACE PRESENT PRACTICES OF USING OPEN DUMPS ON THE MAINLAND AND ON ONE ISLAND IN BOSTON HARBOR. (PHS)

03-01-01110 TIFFIN, OHIO, BUYS BETTER REFUSE SANITATION (COLLECTION CHARGES(COLLECTION))
STAIB, F. C.
THE AMERICAN CITY 69(7), P. 113 (JULY 1954). A REVIEW OF THE PROGRAM IN TIFFIN WHICH CAUSED THE REPLACEMENT OF CONTRACT SERVICE BY MUNICIPAL SERVICE ON A FEE BASIS. INCLUDED ARE DATA ON QUANTITIES OF REFUSE COLLECTED, PICKUPS, EQUIPMENT, RATE OF FEE CHARGES, AND SANITARY LANDFILL OPERATION. (PHS)

03-01-01139 MUNICIPAL COLLECTION IN LIMA, OHIO
THE AMERICAN CITY 68(10), P. 21 (1953). THE CITY OF LIMA, OHIO, WITH A POPULATION OF 50,226 AND 15,800 RESIDENTIAL UNITS, RECENTLY WENT TO A MUNICIPAL GARBAGE COLLECTION SYSTEM. THE COST HAS BEEN REDUCED FROM $1.50 PER PICKUP TO $1.33. THEY USE BOTH A SANITARY LANDFILL AND AN INCINERATOR.

03-01-01183 NEW IDEAS IN REFUSE SANITATION
MCDONALD, C. T.
THE AMERICAN CITY 68(11), P. 92-93 (1953). GREENBELT, MARYLAND, WAS BUILT AS A MODEL MODERN CITY. EACH RESIDENTIAL UNIT HAS A UTILITY CLOSET WHERE METAL GARBAGE CANS ARE KEPT. REGULATIONS REQUIRE ALL GARBAGE TO BE WRAPPED, HOWEVER, BOTH GARBAGE AND REFUSE MAY BE PLACED IN THE SAME CAN. VIOLATORS ARE WARNED BY A CARD FROM THE COLLECTORS. A 15-YD PACKER WITH 4 MEN MAKES TWO COLLECTIONS AT EACH HOUSE UNIT EACH WEEK. BY ARRANGEMENT OF CREWS WHO DOUBLE AS EQUIPMENT OPERATORS 64 MAN HOURS ARE SAVED EACH WEEK. WEATHER PERMITTING REFUSE IS EMPTIED DIRECTLY INTO THE TRENCH. ALL REFUSE IS COVERED EACH DAY AND PACKED. COMPLETE SANITARY COLLECTION AND DISPOSAL SERVICES ARE FURNISHED TO THEIR CITIZENS AT A COST OF $1.25/UNIT/MONTH.

03-01-01189 SANITATION OPERATIONS IN FRANKFURT GERMANY (SALVAGE COLLECTION OPEN-DUMP)
DAVIES, A. G.
THE AMERICAN CITY 73(2), P. 94 (FEBRUARY 1958). FRANKFURT'S COLLECTION SYSTEM RIVALS THAT OF ANY U.S. CITY OF COMPARABLE SIZE. THE CITY HAS LAID OUT $180,000/YR FOR EQUIPMENT, AND THE CAPITAL VALUE OF DEPOT BUILDINGS AND EQUIPMENT IS OVER $750,000. THE CONTAINERS IN WHICH RESIDENTIAL REFUSE IS STORED ARE MUNICIPALLY OWNED. WHEN THEY ARE IN NEED OF REPAIR THE CITY FIXES THEM AT NO CHARGE TO THE RESIDENT. FIRE EQUIPMENT AT THE OPEN DUMP IS VALUED AT OVER $9,000. DESPITE THE EXCELLENT COLLECTION FACILITIES, FRANKFURT'S DISPOSAL METHODS ARE VERY POOR. AN OPEN DUMP IS OPERATED AND DUMPING FACILITIES ARE EXTREMELY LIMITED. HOWEVER, THE CITY IS CONTEMPLATING THE INSTALLATION OF AN INCINERATOR FOR REFUSE DISPOSAL. (UC)

03-01-01193 CENTRALIA, WASHINGTON, ADOPTS A REFUSE PROGRAM (COLLECTION CHARGES(COLLECTION))
JONES, B. E.
THE AMERICAN CITY 73(3), P. 201 (MARCH 1958). A NEW REFUSE COLLECTION AND DISPOSAL PROGRAM REPLACES A DO-IT-YOURSELF SYSTEM. CITY ORDINANCE PROVIDES MODERN COLLECTION VEHICLES AND SANITARY LANDFILL. SERVICE CHARGES ARE GIVEN, PARTICIPATION IS MANDATORY. (PHS)

03-01-01194 NEW YORK CITY GETS MORE REFUSE TRUCKS (EQUIPMENT(COLLECTION))
THE AMERICAN CITY 73(3), P. 15 (MARCH 1958). ADDITION OF 300 NEW COMPACTION TRUCKS BRINGS THE NEW YORK CITY TOTAL TO 1,000. NEW REGULATIONS PROHIBIT BURNING OF ANY KIND ON PRIVATELY OWNED LAND WITHIN THE CITY. (PHS)

03-01-01205 DETROIT EDUCATES CITIZENS TO IMPROVE SANITATION (COLLECTION)
RUSKIN, J. H. + BLANDING, H. G.
THE AMERICAN CITY 73(4), P. 114 (APRIL 1958). THE EDUCATIONAL ENFORCEMENT APPROACH IN DETROIT'S " CLEANER, HEALTHIER CITY " CAMPAIGN HAS PROVEN TO BE AN EFFECTIVE ONE. THE OBJECTIVE OF PROPER HOUSEHOLD STORAGE OF GARBAGE AND RUBBISH WAS ACHIEVED WITHIN TWO YEARS. (PHS)

03-01-01211 REFUSE COLLECTION BY CONTRACT (SANITARY-LANDFILL)
THE AMERICAN CITY 73(7), P. 96 (JULY 1958). THE CONTRACT REFUSE COLLECTION SYSTEM, IN OPERATION FOR SEVERAL YEARS NOW IN PEORIA, ILLINOIS, IS DISCUSSED. THIS SYSTEM IS SEEN AS A SOUND ONE, WITHOUT A MAJOR INVESTMENT. (PHS)

03-01-01212 LARGE CONTAINER COLLECTION COSTS
THE AMERICAN CITY 73(11), P. 38 (NOVEMBER 1958). A BRIEF REPORT ON WINSTON-SALEM'S LARGE-CONTAINER COLLECTION SYSTEM IS GIVEN. THIS SERVICE, COSTING ON THE AVERAGE $2.01 PER LARGE CONTAINER PER YEAR, IS IN ADDITION TO REGULAR RESIDENTIAL AND COMMERCIAL GARBAGE AND REFUSE COLLECTION. (PHS)

03-01-01213 TOWN OF OYSTER BAY ADOPTS MUNICIPAL REFUSE COLLECTION
DOWLING, J. C.
THE AMERICAN CITY 73(11), P. 106 (NOVEMBER 1958). THE TOWN OF OYSTER BAY ON LONG ISLAND HAS GROWN FROM 80,000 IN 1950 TO 270,000 IN 1958. DUE TO ACCOMPANYING PROBLEMS, A MUNICIPALLY OPERATED SYSTEM OF REFUSE COLLECTION WAS INAUGURATED. DETAILS OF THIS HIGHLY SUCCESSFUL SYSTEM ARE GIVEN. (PHS)

03-01-01326 PRESENT STATUS AND TRENDS IN REFUSE COLLECTION PRACTICE (SALVAGE INCINERATORS SACKS)
AYERS, F. E.
CAN MUN UTILITIES 101(12), P. 26-28 (DECEMBER 1963). CANADIAN PRACTICES AND TRENDS IN COLLECTION AND DISPOSAL OF MUNICIPAL REFUSE INCLUDE USE OF POLYETHYLENE BAGS, LIGHT PLASTIC BARRELS MOUNTED ON RUBBER WHEELS, SPECIAL-TYPE HOISTING AND CARRYING EQUIPMENT FOR LARGE VOLUME REFUSE PRODUCERS, RESIDENTIAL INCINERATOR PROGRAM, AND CONTRACTING OF COLLECTION SERVICE TO PRIVATE CONTRACTORS BY PUBLIC TENDER SYSTEM. (EI)

03-01-01332 MOTOR GARBAGE COLLECTION STARTS IN CHILE'S CAPITAL CITY
THE AMERICAN CITY 68(3), P. 104-105 (1953). AFTER ONE YEAR OF COMPETITIVE TESTING AND COMPARISON OF REFUSE COLLECTING EQUIPMENT, SANTIAGO, CHILE, RECEIVED A LOAN FROM U.S. BANKS, TO BUY 54 LOADER-PACKERS. AFTER RECEIVING 20 OF THE VEHICLES, THERE WAS A PROGRAM TO TEACH THE HORSE DRIVERS TO OPERATE THE TRUCKS.

03-01-01339 TOLEDO USES ZONE COLLECTION (COST(COLLECTION))
THE AMERICAN CITY 68(1), P. 5 (1953). BY DIVIDING THE CITY INTO ZONES AND ASSIGNING CREWS TO A CERTAIN ZONE WITH THE TYPE OF COLLECTION BEST SUITED FOR HIS ZONE, THE COST OF COLLECTION HAS DROPPED CONSIDERABLY. EACH CREW AVERAGES 335 STOPS PER DAY, 19.3 CENTS PER STOP WEEK. COLLECTIONS AVERAGE 1.7 CU-YD PER MONTH PER PERSON, 13-1/4 CU-YD PER TRUCK LOAD, $24.81 PER TRUCK LOAD, $1.87 PER CU-YD, AND $3.17 PER CAPITA PER MONTH.

03-01-01425 WORK STUDY AND INCENTIVE BONUS AS APPLICABLE TO REFUSE COLLECTION AND DISPOSAL AT WORTHING (
COST(OPERATING) SALVAGE)
EAST, E. W. + GOSLING, V.
CHARTERED MUNIC ENGR 91(2), P. 53-58 (FEBRUARY 1964). WORK STUDY CARRIED OUT ON REFUSE COLLECTION AND DISPOSAL IN WORTHING, ENGLAND. MAIN LINES OF ADMINISTRATIVE AND SUPERVISORY AUTHORITY APPLICABLE TO REFUSE COLLECTION AND DISPOSAL SECTION AT TIME OF WORK STUDY SURVEY ARE OUTLINED. (EI)

03-01-01433 PORTLAND ADOPTS MUNICIPAL REFUSE COLLECTION SERVICE
ORR, J. H.
THE AMERICAN CITY 71(8), P. 106 (AUGUST 1956). A REPORT OF HOW PORTLAND, MAINE (1950 POPULATION 77,634) PLANNED AND INITIATED A BI-WEEKLY RUBBISH COLLECTION PROGRAM. DATA FOR PLANNING INCLUDED ASSUMPTION OF 15,000 PICKUP POINTS IN THE CITY AND ONE TRUCK CAN HANDLE 360 PICKUPS PER DAY, AND AN ADEQUATE BUDGET FOR 1956 WOULD BE $50,440. A BRIEF DESCRIPTION OF PUBLIC RELATIONS EFFORTS IS ALSO GIVEN. (PHS)

03-01-01438 ZONE-TYPE REFUSE CONTRACTS (LAW)
GOERLICK, H. L.
THE AMERICAN CITY 71(10), P. 167 (OCTOBER 1956). LAKEWOOD, CALIFORNIA REPORTS THE SATISFACTORY ARRANGEMENT FOR MULTIPLE CONTRACTS FOR TRASH COLLECTION UNDER A CAREFULLY DEVELOPED SET OF SPECIFICATIONS AND REGULATIONS. INCLUDED IS AN OUTLINE OF ORDINANCE AND BOND SPECIFICATIONS. (PHS)

03-01-01454 WE LOWERED THE COST AND IMPROVED THE SERVICE (COLLECTION)
FITZGERALD, C. V.
THE AMERICAN CITY 72(8), P. 126 (AUGUST 1957). SANTA-MONICA, CALIFORNIA, REPORTS ON A STUDY OF ITS REFUSE COLLECTION PROGRAM WHICH RESULTED IN THE ACQUISITION OF COMPACTION TYPE COLLECTION TRUCKS TO REPLACE OPEN TOP, SIDE LOADING TRUCKS, AND A REVISION OF THE ROUTE SYSTEM AND COLLECTION SCHEDULES. AUXILIARY POWER UNITS WERE INSTALLED IN THE NEW TRUCKS TO AFFORD CONTINUOUS OPERATION OF THE PACKING MECHANISM WHILE THE VEHICLES WERE IN MOTION. THE COLLECTION SYSTEM WAS REVISED FROM EACH CREW HAVING DEFINITE WORK ROUTE TO A CONCENTRATION OF ALL EQUIPMENT AND PERSONNEL TO A DESIGNATED AREA EACH DAY. THIS IS REPORTED TO BE QUITE ADVANTAGEOUS, INCREASING MORALE AND EFFICIENCY. (PHS)

03-01-01458 31 PERCENT MORE REFUSE WITH 40 PERCENT FEWER TRUCKS (COLLECTION SANITARY-LANDFILL COST(OPERATING))
SMITH, C.
THE AMERICAN CITY 72(6), P. 131 (JUNE 1957). CEDAR-RAPIDS, IOWA, HAS CHANGED OVER FROM THE USE OF 17 CANVAS-COVERED TRUCKS AND NOW EMPLOYS 10 COMPACTOR-TYPE TRUCKS FOR THE COLLECTION OF RESIDENTIAL REFUSE. MORE MATERIAL IS COLLECTED USING FEWER EMPLOYEES AND AT A DECREASED COST. THE USE OF THE TASK SYSTEM REPORTEDLY KEEPS MORALE AND EFFICIENCY HIGH. REFUSE IS DISPOSED OF IN A SANITARY FILL USING THE AREA-FILL METHOD. (PHS)

03-01-01462 BALTIMORE'S CONTINUAL " CLEAN CITY " CAMPAIGN (COLLECTION)
FANNON, W. P.
THE AMERICAN CITY 72(4), P. 107 (APRIL 1957). THE SUCCESSFUL RESULTS OF A NINE YEAR OLD CONTINUOUS INTENSIVE CLEAN CITY PROGRAM IN BALTIMORE ARE REPORTED. DESCRIBED IS USE OF INCENTIVE SYSTEMS AND SCHOOLS FOR EMPLOYEES COOPERATION WITH THE CITY'S DIVISION OF PLANNING AND THE POLICE DEPARTMENT AS WELL AS UTILIZATION OF CIVIC GROUPS INCLUDING A SPECIAL " CLEANUP CHARLIE CLUB. " (PHS)

03-01-01551 MODERN EQUIPMENT PLUS NEW PLAN LOWER COSTS (COLLECTION-EQUIPMENT)
REFUSE REMOVAL JOURNAL 1(1), P. 28 (JANUARY 1958). COMPACTION TRUCKS, EQUIPPED WITH A SEPARATE ENGINE TO PERMIT COMPACTION OF REFUSE WHILE THE TRUCKS ARE IN MOTION, INCREASE EFFICIENCY. THE ROUTE SYSTEM OF COLLECTION WAS ABANDONED AND ALL EQUIPMENT AND PERSONNEL CONCENTRATED IN A SPECIFIED AREA ON GIVEN DAYS TO MAKE SUPERVISION EASIER. (PHS)

03-01-01555 DETROIT SHOWS WAY TO CLEAN UP AT A SAVING TO EVERYBODY (COLLECTION CONTAINER)
REFUSE REMOVAL JOURNAL 1(4), P. 18 (APRIL 1958). THE CITY OF DETROIT'S CAMPAIGN TO IMPROVE REFUSE STORAGE CONDITIONS. A COMBINED APPROACH OF EDUCATION AND ENFORCEMENT WAS TESTED IN A 392 BLOCK AREA OF THE CITY, FOUND EFFECTIVE, AND THEN WAS USED CITY-WIDE. ONE OF THE FIRST OBJECTIVES WAS TO END THE USE OF THE OPEN 55-GALLON OIL DRUM AS A REFUSE RECEPTACLE. (PHS)

03-01-01559 KENTUCKY TOWN HAS NEW LOOK (COLLECTION(CONTAINER))
REFUSE REMOVAL JOURNAL 1(4), P. 13 (APRIL 1958). A TOUR OF THE ALLEYS IN HOPKINSVILLE, KENTUCKY, MADE BY THE JUNIOR CHAMBER OF COMMERCE, TRIGGERED A CAMPAIGN TO IMPROVE REFUSE STORAGE. CITY MERCHANTS PURCHASED 25 ATTACHABLE CONTAINERS WHICH ARE SERVICED BY A CITY PACKER TRUCK. (PHS)

03-01-01562 SUPER SERVICE SELLS FOR BIGGEST MONTREAL HAULER (COLLECTION-EQUIPMENT)
REFUSE REMOVAL JOURNAL 1(4), P. 6 (APRIL 1958). A BRIEF ACCOUNT OF THE CONTRACT REFUSE COLLECTION SERVICE PROVIDED FOR MONTREAL, CANADA, AND 14 SUBURBAN COMMUNITIES BY THE LARGEST CONTRACTOR SERVING THE AREA. OPERATIONS ARE DIVIDED INTO THREE PARTS - THE CITY OF MONTREAL, THE 14 SUBURBAN COMMUNITIES, AND INDUSTRIAL COLLECTION. COLLECTION IS MADE IN MONTREAL FOR A FEE OF $8.00 PER TON. DISPOSAL WITHIN THE CITY IS AT MUNICIPAL INCINERATORS, WHILE LANDFILL DISPOSAL IS USED FOR MANY OF THE OUTLYING COLLECTION DISTRICTS. (PHS)

03-01-01563 CITY IN LOS ANGELES COUNTY TURNS TO PRIVATE HAULING FIRM (COST(COLLECTION) COLLECTION)
REFUSE REMOVAL JOURNAL 1(3), P. 22 (MARCH 1958). PARAMOUNT, CALIFORNIA, AWARDS A 5-YEAR CONTRACT TO A PRIVATE CONTRACTOR FOR BOTH RESIDENTIAL AND COMMERCIAL COLLECTION SERVICE. RESIDENTS PAY A FLAT FEE OF $1.25 PER MONTH FOR ONCE-A-WEEK COMBINED COLLECTION. RIGHT-HAND DRIVE PACKER TRUCKS PROVIDE CURB SERVICE. (PHS)

03-01-01568 PROGRESSIVE IDEAS HELP NEW-JERSEY PRIVATE CONTRACTOR (COLLECTION(VEHICLE) COLLECTION(CONTAINER))
REFUSE REMOVAL JOURNAL 1(3), P. 7 (MARCH 1958). PRIVATE CONTRACTOR USES COMPACTOR TRUCKS AND LARGE DETACHABLE CONTAINERS TO PROVIDE MODERN SERVICE TO THE CITY OF PASSAIC, NEW-JERSEY, THE TWO NEARBY BOROUGHS OF TOTOWA AND NORTH HAILDEN, AND THE TOWN OF CEDAR-GROVE. (PHS)

03-01-01570 ' DUSTLESS ' COLLECTION IS TREND IN MUCH OF EUROPE (COLLECTION(CONTAINER))
REFUSE REMOVAL JOURNAL 1(2), P. 21 (FEBRUARY 1958). THE FEATURES AND ADVANTAGES OF " DUSTLESS " REFUSE COLLECTION SYSTEM, DEVELOPED IN GERMANY IN 1895, ARE EXPLAINED. (PHS)

03-01-01571 CHICAGO'S CONTRACTORS SUPPORT CITY AIR LAW (POLLUTION(AIR) COLLECTION(EQUIPMENT))
REFUSE REMOVAL JOURNAL 1(2), P. 15 (FEBRUARY 1958). PRIVATE SCAVENGERS SUPPORT PROPOSED ORDINANCE THAT WOULD MAKE IT ILLEGAL TO HANDLE ASHES, CINDERS, OR DUST WITHOUT TAKING PRECAUTIONS TO MINIMIZE AIR POLLUTION. (PHS)

03-01-01574 PRIVATE FIRM LICKS COLISEUM REFUSE JOB (COLLECTION(PUBLIC-BUILDING))
REFUSE REMOVAL JOURNAL 1(2), P. 7 (FEBRUARY 1958). THE NEW YORK COLISEUM'S SPECIALIZED REFUSE HANDLING NEEDS ARE MET THROUGH A COMBINATION OF GOOD BUILDING DESIGN AND PLANNING ON THE PART OF THE PRIVATE REFUSE CONTRACTOR. ATTACHABLE CONTAINERS AND COMPACTOR TRUCKS ARE UTILIZED. (PHS)

03-01-01576 FORMER NEW-YORK CHIEF FINDS PRIVATE HAULERS NEEDED (COLLECTION)
REFUSE REMOVAL JOURNAL 1(4), P. 9 (APRIL 1958). NEW YORK CITY'S POLICIES AND ACCOMPLISHMENTS UNDER THE DIRECTION OF FORMER COMMISSIONER OF SANITATION, ANDREW W. MULRAIN. (PHS)

03-01-01579 HAULER SERVING U.N. IS ONE OF NEW-YORK'S LARGEST (COLLECTION)
REFUSE REMOVAL JOURNAL 1(6), P. 7 (JUNE 1958). A PRIVATE CONTRACTOR USES PACKER TRUCKS AND REGULARLY SCHEDULES DOUBLE SHIFTS FOR MOST EQUIPMENT TO HANDLE LARGE VOLUME OF REFUSE PRODUCED AT THE UNITED NATIONS HEADQUARTERS IN NEW-YORK. (PHS)

03-01-01581 HOW BIGGEST CLEANUP CAMPAIGN WAS HANDLED (COLLECTION)
MULRAIN, A. W.
REFUSE REMOVAL JOURNAL 1(6), P. 13 (JUNE 1958). NEW YORK CITY'S CLEANUP CAMPAIGN IS DESCRIBED IN DETAIL BY A FORMER COMMISSIONER OF SANITATION. AS A RESULT OF THE ESTABLISHMENT OF A LITTER BASKET AND ANTI-LITTER PROGRAM, APPROXIMATELY 100,000,000 POUNDS OF LITTER PER YEAR ARE NOW DEPOSITED IN LITTER BASKETS INSTEAD OF BEING THROWN INTO THE STREETS. AN ALTERNATE-SIDE, RESTRICTED PARKING CONTROL PROGRAM WAS EVOLVED TO ASSIST IN THE CLEANING OF STREETS. VACANT LOTS WERE CLEANED UP AND A REGULAR JUNK COLLECTION SERVICE PROVIDED. AN EXTENSIVE EDUCATIONAL PROGRAM WAS CONDUCTED TO ENLIST PUBLIC SUPPORT, AND FINALLY AN ENFORCEMENT PROGRAM WAS INSTITUTED TO SECURE COMPLIANCE. APPROXIMATELY $100 MILLION PER YEAR IS THE VALUE PLACED ON THE PUBLIC COOPERATION NOW BEING RECEIVED. (PHS)

03-01-01588 INTERNATIONAL AIRPORT CONTRACT IS DEMANDING (COLLECTION)
REFUSE REMOVAL JOURNAL 1(7), P. 7 (JULY 1958). SPECIALIZED 24-HOUR REFUSE COLLECTION SERVICE PROVIDED BY A CONTRACTOR FOR NEW-YORK INTERNATIONAL AIRPORT. (PHS)

03-01-01589 SCOTTISH AUTHORITY TELLS OF BRITISH PRACTICES (SANITARY-LANDFILL COMPOSTING COLLECTION)
WILSON, N. G.
REFUSE REMOVAL JOURNAL 1(7), P. 25 (JULY 1958). BRITISH REFUSE STORAGE, COLLECTION AND DISPOSAL PRACTICES, AND STREET-CLEANING PRACTICES. THE COMPOST PRODUCED BY EDINBURGH'S 100-TONS-PER-WEEK UNIT IS MARKETED AT A PRICE OF TWO POUNDS PER TON. (PHS)

03-01-01593 ROCKEFELLER CENTER'S REFUSE SYSTEM A MODEL (COLLECTION)
REFUSE REMOVAL JOURNAL 1(5), P. 7 (MAY 1958). ROCKEFELLER CENTER'S REFUSE COLLECTION SERVICE HAS BEEN PROVIDED BY THE SAME CONTRACTOR SINCE 1932. THE CONTRACTOR USES 20-YARD PACKER TRUCKS FOR RUBBISH COLLECTION SERVICE IN THE " CITY WITHIN A CITY ". (PHS)

03-01-01600 EVOLUTION OF 'DUSTLESS' COLLECTION IN GERMANY (SACK COMPOSITION COLONIA)
ERHARD, H.
REFUSE REMOVAL JOURNAL 1(8), P. 20 (AUGUST 1958). THE EVOLUTION AND HISTORY OF GERMANY'S UNIQUE "DUSTLESS" SYSTEM OF REFUSE COLLECTION ARE COVERED FROM 1895 TO THE PRESENT. (PHS)

03-01-01610 HOW THEY CLEANED THE BRUSSELS WORLD'S FAIR (COLLECTION)
REFUSE REMOVAL JOURNAL 1(10), P. 18 (OCTOBER 1958). THE BEHIND-THE-SCENES STORY OF HOW CLEANING SERVICES WERE PLANNED AND CONDUCTED AT THE 1958 BRUSSELS EXHIBITION BY THE DEPARTMENT OF PUBLIC CLEANSING. (PHS)

03-01-01618 PEORIA CONTRACTORS RUN A 'HEADS UP' OPERATION (COLLECTION SANITARY-LANDFILL)
REFUSE REMOVAL JOURNAL 1(11), P. 24 (NOVEMBER 1958). PRIVATE CONTRACTOR, IN SERVING SUBURBAN AREA NEAR PEORIA, ILLINOIS, PROVIDES NOVEL FEATURES FOR CUSTOMERS. INCLUDED ARE PACKER TRUCKS, ATTACHABLE CONTAINERS FOR COMMERCIAL ESTABLISHMENTS, DRIVE-IN PAYMENT WINDOW, SALES OF REFUSE CANS, AND SANITARY LANDFILL DISPOSAL. (PHS)

03-01-01624 CREATIVE THINKING HAS HELPED CHANGE INDUSTRY (COLLECTION-EQUIPMENT)
REFUSE REMOVAL JOURNAL 1(12), P. 10 (DECEMBER 1958). EXAMPLES OF KANSAS CITY, MISSOURI, CONTRACTOR'S ADAPTATIONS OF DETACHABLE CONTAINER EQUIPMENT TO SERVE LOCAL INDUSTRY. (PHS)

03-01-01626 SEATTLE DISPOSAL COMPANY RUNS ALERT OPERATION (COLLECTION CONTRACT COST(COLLECTION))
REFUSE REMOVAL JOURNAL 2(1), P. 6 (JANUARY 1959). A SINGLE CONTRACTOR SERVES SEATTLE AND SURROUNDING AREA IN REFUSE COLLECTION. AN EXCELLENT RECORD OF ECONOMY AND SERVICE HAS BEEN MAINTAINED. THE FACTORS CONTRIBUTING TO THIS EXCELLENT RECORD ARE PRESENTED. (PHS)

03-01-01631 COLLECTION AND DISPOSAL IN ANCHORAGE, ALASKA (SANITARY-LANDFILL)
SHANNON, G. C.
REFUSE REMOVAL JOURNAL 2(2), P. 10 (FEBRUARY 1959). THE METHOD OF REFUSE COLLECTION WHICH AIDS THE CITY OF ANCHORAGE IN MAINTAINING A HIGH STANDARD OF PUBLIC SANITATION IS DESCRIBED. DAILY COMMERCIAL PICK-UPS AND WEEKLY RESIDENTIAL SERVICE ARE DESCRIBED. (PHS)

03-01-01640 DELAWARE FIRM FEATURES SERVICE AND CLEANLINESS (COLLECTION)
REFUSE REMOVAL JOURNAL 2(5), P. 12 (MAY 1959). THE USE OF RADIO HAS INCREASED SPEED AND EFFICIENCY OF A WILMINGTON, DELAWARE, REFUSE COLLECTION SERVICE. THE BEST APPEARANCE IN ALL COMPANY EQUIPMENT IS STRESSED HERE. (PHS)

03-01-01642 TEN BROTHERS ACTIVE IN NEW YORK HAULING FIRM
REFUSE REMOVAL JOURNAL 2(5), P. 17 (MAY 1959). THE INTERESTING DEVELOPMENT OF A FAMILY REFUSE COLLECTION BUSINESS IS TRACED. BEGUN IN 1900 WITH A HORSE AND CART, THE BUSINESS, NOW RUN BY THE TEN SONS, IS A LARGE AND MODERN OPERATION. (PHS)

03-01-01643 SINGLE HAULER PLEASES BATTLE-CREEK CUSTOMERS (COLLECTION)
REFUSE REMOVAL JOURNAL 2(5), P. 24 (MAY 1959). THE REASONS FOR THE SATISFACTION OF BATTLE-CREEK CITIZENS WITH ITS REFUSE SERVICE ARE OUTLINED. TWO STOPS PER WEEK FOR RESIDENTIAL AREAS AND SIX PER WEEK FOR COMMERCIAL AND INDUSTRIAL CUSTOMERS ARE IMPORTANT FACTORS. (PHS)

03-01-01646 CANTON REFUSE STUDY MAKES MANY INTERESTING POINTS (COLLECTION COST(OPERATING) GRINDER(GARBAGE))
REFUSE REMOVAL JOURNAL 2(5), P. 10 (MAY 1959). THE 1958 REFUSE COLLECTION AND DISPOSAL SYSTEM STUDY OF CANTON ENGINEERS IS REPORTED. THE IMPORTANCE OF MODERN EQUIPMENT IN ECONOMY AND EFFICIENCY OF OPERATION IS STRESSED.

03-01-01648 TENNESSEE HAULER GETS PLAUDITS OF SANITARIANS (VECTOR COLLECTION)
REFUSE REMOVAL JOURNAL 2(6), P. 8 (JUNE 1959). THE WORK OF A PRIVATE SANITATION COMPANY IN SUBURBAN JACKSON, TENNESSEE, IN CONTROLLING ROADSIDE DUMPING OF REFUSE IS DESCRIBED. A GREAT DEAL OF CREDIT IS GIVEN C. H. TRAVIS FOR ORGANIZING AND CONDUCTING THIS OUTSTANDING VECTOR CONTROL PROJECT. (PHS)

03-01-01649 PRIVATE HAULERS ARE THE DIFFERENCE TO NEW YORK
REFUSE REMOVAL JOURNAL 2(6), P. 6 (JUNE 1959). THE LARGEST MUNICIPAL SANITATION SERVICE IN THE U.S. AND ONE OF THE MOST CAREFULLY ORGANIZED AND ADMINISTERED - THAT OF NEW YORK CITY - IS DESCRIBED. THE IMPORTANCE OF THE PRIVATE REFUSE CONTRACTOR IN THE SYSTEM IS STRESSED. (PHS)

03-01-01652 BARCELONA'S METHODS ARE MIXTURE OF OLD AND NEW (COLLECTION(VEHICLE))
REFUSE REMOVAL JOURNAL 2(7), P. 18 (JULY 1959). THE REFUSE COLLECTION SERVICE OF THIS SPANISH METROPOLIS IS DISCUSSED. THE INTERESTING COMBINATION OF HORSE-DRAWN VEHICLES AND MODERN EQUIPMENT IS DESCRIBED. (PHS)

03-01-01663 PRIVATE HAULERS HOLD STRONG OREGON POSITION (COLLECTION)
REFUSE REMOVAL JOURNAL 2(8), P. 8 (AUGUST 1959). REFUSE COLLECTION SYSTEMS OF SEVERAL OREGON CITIES ARE DISCUSSED. MOST CITIES CONTRACT OUT COLLECTIONS TO PRIVATE INTERESTS. SOME GIVE EXCLUSIVE FRANCHISES, AND OTHERS HAVE MULTIPLE LICENSES FOR REFUSE WORK. (PHS)

03-01-01674 VIGOROUS CAMPAIGN EASES TOWNSHIP LITTER PROBLEM (COLLECTION)
REFUSE REMOVAL JOURNAL 2(10), P. 20 (OCTOBER 1959). THE TOWN OF HEMPSTEAD, LONG ISLAND, NEW YORK, THE LARGEST U. S. TOWNSHIP, HOLDS AN ANNUAL MONTH-LONG CLEANUP CAMPAIGN AND USES YEAR-ROUND PUBLICITY TO AWAKE CIVIC PRIDE OF RESIDENTS. THE RESULT - A CLEANER, MORE SANITARY APPEARANCE. (PHS)

03-01-01677 LOS-ANGELES RESIDENTS WANT COMBINED SERVICE (COLLECTION)
REFUSE REMOVAL JOURNAL 2(10), P. 8 (OCTOBER 1959). RESIDENTS IN LOS-ANGELES RECENTLY GAVE MAYOR PAULSON THEIR VIEWS ON A QUESTION CONCERNING REFUSE. A STRONG PREFERENCE (9 TO 1) FOR COLLECTION OF COMBUSTIBLE AND NONCOMBUSTIBLE REFUSE WITHOUT PRIOR SEPARATION WAS SHOWN. (PHS)

03-01-01679 PACKER PURCHASE BETTERS COAST HAULER'S POSITION (COLLECTION(VEHICLE))
REFUSE REMOVAL JOURNAL 2(9), P. 24 (SEPTEMBER 1959). A SEATTLE CONTRACTOR HAS IMPROVED HIS REFUSE HAULING BUSINESS, INCREASED EFFICIENCY, AND LOWERED COSTS WITH THE ACQUISITION OF A MODERN, 16 YARD COMPACTOR BODY. (PHS)

03-01-01684 VILLAGE OF OAK PARK SOLVES REFUSE PROBLEM (COLLECTION)
SMILEY, F.
REFUSE REMOVAL JOURNAL 2(6), P. 25 (JUNE 1959). THE CITY OF OAK PARK, ILLINOIS, HAS REDUCED COLLECTION AND DISPOSAL COSTS BY 30 PERCENT OR $125,000. IN A CAREFUL RESEARCH ANALYSIS PROGRAM THE REFUSE PROGRAM WAS COMPLETELY OVER HAULED.

03-01-01698 REFUSE COLLECTION AND DISPOSAL IN 194 WESTERN CITIES (FREQUENCY GRINDER(HOME) CREW(COLLECTION) CHARGE(COLLECTION) COST(OPERATING) DANO ANIMAL-FEED CONTAINER(REQUIREMENTS) CONTAINER(SIZE))
UPDEGRAFF, W. R. + BOWERMAN, F. R.
WESTERN CITY 34(5,6,7), P. 32-40 (MAY 1958), P. 32-34 (JUNE 1958)8 P. 28-34 (JULY 1958). 8 SURVEY ON COLLECTION AND DISPOSAL PROCEDURES AND COSTS. MAY - METHODS AND COSTS IN 79 CITIES USING MUNICIPAL CREWS AND EQUIPMENT. JUNE - 68 CITIES WHERE PRIVATE COLLECTORS NEGOTIATE DIRECTLY WITH HOME OWNERS, PRACTICE IN OREGON AND IN SAN FRANCISCO. JULY - 46 CITIES WHERE CITY GOVERNMENT PAYS CONTRACTOR OR CONTRACTORS FOR SPECIFIED SERVICE, PRACTICE, IN SEATTLE, FUTURE TRENDS. (EI)

03-01-01701 THE WORLD'S LARGEST SANITATION DEPARTMENT (COLLECTION SANITARY-LANDFILL INCINERATION BARGE)
REFUSE REMOVAL JOURNAL 3(8), P. 8 (AUGUST 1960E. DESCRIBES THE ORGANIZATION AND OPERATION OF NEW-YORK-CITY'S SANITATION DEPARTMENT. FOURTEEN THOUSAND EMPLOYEES USING 4,000 PIECES OF EQUIPMENT COLLECT AND DISPOSE OF 4-1/2 MILLION TONS OF REFUSE ANNUALLY. REFUSE DISPOSAL IS DONE BY INCINERATION AND SANITARY LANDFILL REACHED BY TRUCKS AND BARGES. CONTRARY TO POPULAR BELIEF NO REFUSE HAS BEEN DUMPED AT SEA SINCE 1934. (PHS)

03-01-01703 FLORIDA HAULER RUNS A UNIQUE OPERATION (COLLECTION COLLECTION(CONTAINER))
REFUSE REMOVAL JOURNAL 3(10), P. 6 (OCTOBER 1960E. A JACKSONVILLE, FLORIDA, REFUSE HAULER HAS A UNIQUE COMMERCIAL COLLECTION SYSTEM. MAINTENANCE OF VEHICLES RECEIVES CLOSE ATTENTION. THE ENTIRE FLEET IS WASHED AND DEODORIZED DAILY, WAXED REGULARLY, AND PAINTED QUARTERLY. ALL DRIVERS WEAR MILITARY-TYPE UNIFORMS. RADIO EQUIPMENT HAS BEEN PLACED IN ALL REFUSE VEHICLES. ANY CUSTOMER COMPLAINTS ARE ATTENDED TO IMMEDIATELY. (PHS)

03-01-01706 HAULER HELPED PHOENIX, ARIZONA, WIN CITY AWARD (COLLECTION)
REFUSE REMOVAL JOURNAL 3(8), P. 20 (AUGUST 1960). A PRIVATE HAULING COMPANY'S HIGH STANDARDS IN REFUSE COLLECTING WERE A MAJOR FACTOR IN PHOENIX'S WINNING THE ALL AMERICAN CITY AWARD IN 1958. THE PRESIDENT OF THE FIRM ATTRIBUTES THE HIGH STANDARDS TO HIS NEWLY INSTALLED REFUSE PACKERS. (PHS)

03-01-01707 REFUSE COLLECTION IN THE CITY OF LOS-ANGELES
HUME, N. B. + KERKIS, J. I.
REFUSE REMOVAL JOURNAL 3(9), P. 8 (SEPTEMBER 1960). A DETAILED REVIEW OF REFUSE COLLECTION OPERATIONS IN LOS-ANGELES, CALIFORNIA. TO COPE WITH THE MANY PROBLEMS OF COLLECTION, THE CITY USES TWO BASIC METHODS OF SCHEDULING. (PHS)

03-01-01710 MASSACHUSETTS HAULER RELIES ON SUPERIOR SERVICE (COLLECTION)
REFUSE REMOVAL JOURNAL 3(7), P. 6 (JULY 1960). DESCRIBES CLEAN, EFFICIENT, ODOR-FREE REFUSE-COLLECTING OPERATIONS IN WEST NEWTON, MASS. A PRIVATE HAULER HANDLES THE REFUSE ON A SINGLE 3-YEAR CONTRACT BASIS WITH MUNICIPAL AUTHORITIES. (PHS)

03-01-01715 COMBINED PICKUP DEBATED IN LOS ANGELES COUNTY (COLLECTION SALVAGE)
REFUSE REMOVAL JOURNAL 3(6), P. 14 (JUNE 1960). A DEBATE OVER WHETHER OR NOT WRAPPED GARBAGE SHOULD BE MIXED WITH OTHER FORMS OF REFUSE IN A COMBINED COLLECTION PROGRAM IS TAKING PLACE IN LOS ANGELES COUNTY, CALIFORNIA. SOME ARE OPPOSED TO THIS SYSTEM BECAUSE IT ELIMINATES SALVAGE, BUT COUNTY AND CITY HEALTH AUTHORITIES AGREE THAT IT WILL CREATE NO HEALTH HAZARD AND WILL SAVE TAXPAYERS THE MONEY INVOLVED IN SEPARATE COLLECTIONS. (PHS)

03-01-01719 AN OPEN LETTER TO BALTIMORE (COLLECTION)
REFUSE REMOVAL JOURNAL 3(1), P. 6 (JANUARY 1960). A SUGGESTION TO OFFICIALS OF BALTIMORE'S SANITATION DEPARTMENT TO CONSIDER INCREASED USE OF PRIVATE CONTRACT COLLECTING IN OBTAINING MORE EFFICIENCY IN THEIR REFUSE COLLECTION SERVICE. (PHS)

03-01-01721 IMPORTANT CHANGES MARK PHILADELPHIA SANITATION (ANIMAL-FEED LAW)
REFUSE REMOVAL JOURNAL 3(4), P. 6 (APRIL 1960). DESCRIBES PHILADELPHIA'S SANITATION SERVICES AND PROGRAMS. COMMERCIAL AND INDUSTRIAL REFUSE COLLECTIONS ARE HANDLED BY PRIVATE CONTRACTORS. RUBBISH AND GARBAGE ARE SEPARATED. NINETY- SIX PERCENT OF THE GARBAGE IS COLLECTED AND DISPOSED OF BY AREA PIG FARMERS, AND THE REMAINING REFUSE IS INCINERATED. THE SPECIAL PROBLEM OF NARROW STREETS AND ALLEYS IS SOLVED BY A REFUSE COLLECTION VEHICLE DESIGNED TO FIT IN SMALL SPACES. STREET CLEANING IS DONE ONCE OR TWICE A WEEK. " PREVENTIVE EDUCATION " IN THE CITY INCLUDES THE ESTABLISHMENT OF 300 JUNIOR SANITATION GROUPS AND MANY " CLEAN BLOCK " CAMPAIGNS. CITY REGULATIONS COVER THE OPERATIONS OF PRIVATE WASTE COLLECTORS. (PHS)

03-01-01726 FREE COMPETITION IS THE SYSTEM IN LINCOLN, NEBRASKA (COST(COLLECTION) COST(OPERATING) SANITARY-LANDFILL)
REFUSE REMOVAL JOURNAL 3(3), P. 10 (MARCH 1960). APPROXIMATELY 50 PRIVATE CONTRACTORS SHARE LINCOLN'S HAULING BUSINESS. THE LINCOLN GARBAGE HAULERS' ASSOCIATION HAS DIVIDED RESIDENTIAL AREAS INTO DISTRICTS TO IMPROVE A NEAR-CHAOTIC REFUSE-COLLECTION SITUATION. COLLECTION SERVICE, COSTING $21 ANNUALLY, PROVIDES TWICE-WEEKLY BACKYARD PICKUPS. DISPOSAL BY CITY-OWNED SANITARY LANDFILL COSTS EACH FAMILY $0.67 ANNUALLY. (PHS)

03-01-01730 PRIVATE COMPANY DOES BIG STOCKHOLM BUSINESS (COLLECTION(VEHICLE))
REFUSE REMOVAL JOURNAL 3(1), P. 8 (JANUARY 1960). DESCRIBES THE OPERATIONS OF ONE OF THE FEW PRIVATE REFUSE CONTRACTORS IN EUROPE. THIS FIRM HANDLES 35 PERCENT OF ALL REFUSE IN STOCKHOLM, SWEDEN, INCLUDING THAT OF THE SWEDISH ROYAL FAMILY. THE CITY-OWNED INCINERATOR IS USED FOR DISPOSAL OF THE REFUSE. (PHS)

03-01-01749 NEW EQUIPMENT AIDS CHICAGO CONTRACTORS (COLLECTION)
REFUSE REMOVAL JOURNAL 6(5), P. 16 (MAY 1963). TWO CHICAGO, ILLINOIS, REFUSE-HAULING CONTRACTORS HAVE FOUND A WAY TO AVOID THE NECESSITY OF SENDING OUT EXPENSIVE, HEAVY EQUIPMENT AND FEWER MEN. THEY RECENTLY PURCHASED A SMALL TRAILER TO PICK UP AND DELIVER EMPTY CONTAINERS THAT NEED REPAIRS, TO PICK UP REFUSE ON WIDELY SCATTERED ACCOUNTS, AND TO COLLECT BULKY ITEMS. THE NEW TRAILER, WHICH CAN BE TOWED BY A SMALL TRUCK OR CAR, RAISES AND LOWERS HYDRAULICALLY, ELIMINATING THE LABOR OF LIFTING, AND FEATURES A LOAD LEVELIZER TO COMPENSATE FOR NONUNIFORM LOAD DISTRIBUTION. (PHS)

03-01-01750 LOS ANGELES EMBROILED IN HOT REFUSE DISPUTE (LAW SEPARATION SALVAGE)
REFUSE REMOVAL JOURNAL 6(4), P. 20 (APRIL 1963). PRESENTS THE HISTORY AND PRESENT-DAY STATUS OF THE REFUSE DISPUTE IN LOS ANGELES, CALIFORNIA. BY LAW, RESIDENTS ARE SUPPOSED TO SEPARATE THEIR GARBAGE AND REFUSE FROM TIN CANS AND SALVAGE METALS. GARBAGE AND REFUSE COLLECTION OCCURS ONCE A WEEK AND METAL PICKUP ONCE A MONTH. THE MAYOR OF LOS ANGELES HAS HOWEVER, TOLD RESIDENTS TO IGNORE THE CITY COUNCIL EDICT AND TO MIX THEIR TRASH WITHOUT FEAR OF RETRIBUTION. COUNCILMEN HAVE NOT TRIED TO HAVE LAW BREAKERS PROSECUTED BECAUSE THEY HAVE COME UP AGAINST THE THREAT OF DEFEAT IN THE NEXT ELECTION OR HAVE HEARD THE RUMBLES OF A RECALL MOVEMENT. (PHS)

03-01-01759 SINGLE PACKER DOES AIR FORCE BASE JOB (COLLECTION)
REFUSE REMOVAL JOURNAL 6(2), P. 22 (FEBRUARY 1963). THIS COMPANY HANDLES ALL THE GARBAGE AND REFUSE FROM 1,500 HOMES ON THE K. I. SAWYER AIR FORCE BASE NEAR MARQUETTE, MICH., USING ONLY ONE REFUSE COMPACTION TRUCK AND A THREE-MAN CREW. (PHS)

03-01-01760 CANADIAN CITY PICKS CONTRACT COLLECTION
REFUSE REMOVAL JOURNAL 6(2), P. 6 (FEBRUARY 1963). BRIEFLY DESCRIBES REFUSE COLLECTION IN BURLINGTON, ONTARIO, CANADA, WHICH IS ACCOMPLISHED BY THE CONTRACT SYSTEM. THE REFUSE COMPANY SERVING THE AREA USES ONE-MAN UNITS FOR ITS COLLECTION SERVICE, THEREBY GIVING IT AN ADVANTAGEOUS COMPETITIVE BIDDING POSITION. THE FIRM IS ABLE TO USE THE ONE-MAN UNITS FOR TWO REASONS - THE COMPACTION TRUCKS USED HAVE WALK-IN CABS AND STANDUP CONTROLS, AND A MUNICIPAL BYLAW REQUIRES ALL REFUSE RECEPTACLES TO BE PLACED AT THE CURB FOR COLLECTION. (PHS)

03-01-01762 MONTREAL CHANGES COLLECTION HOURS
REFUSE REMOVAL JOURNAL 6(1), P. 18 (JANUARY 1963). THE CITY OF MONTREAL, CANADA, HAS CHANGED ITS REFUSE COLLECTION OPERATIONS BY CONTRACT FROM DAYTIME TO NIGHTTIME TO AVOID TRAFFIC PROBLEMS, THE DIRTY APPEARANCE OF THE STREET, ETC. THE REFUSE CONTRACTORS ARE NOW REQUIRED TO REMOVE REFUSE BETWEEN 8 P.M. AND MIDNIGHT DURING THE SUMMER AND BETWEEN 7 P.M. AND MIDNIGHT DURING THE WINTER. THE COLLECTION SYSTEM IS CURBSIDE AND HOUSEHOLDS ARE NOT PERMITTED TO PUT OUT THEIR REFUSE CANS UNTIL 6 P.M. (PHS)

03-01-01766 WASHINGTON FIRM MISSES NO CHANCE FOR SERVICE (PUBLIC-RELATIONS COLLECTION COMPLAINTS RADIO)
REFUSE REMOVAL JOURNAL 5(5), P. 8 (MAY 1962). DESCRIBES THE OPERATIONS OF A WASHINGTON, D.C., REFUSE HAULING FIRM WHICH SERVES CUSTOMERS IN NEARBY MARYLAND AND VIRGINIA AS WELL AS THE NATION'S CAPITAL. THE COMPANY EMPLOYS FROM 45 TO 50 PEOPLE, 10 OF WHOM WORK PRINCIPALLY IN THE OFFICE. FIELD OPERATIONS ARE CONTAINERIZED AS MUCH AS POSSIBLE, AND AT PRESENT 24 PACKERS AND 6 OPEN TRUCKS ARE USED. THE MAJORITY OF THE FLEET IS RADIO-EQUIPPED SO THAT HEADQUARTERS CAN KEEP IN CLOSE CONTACT WITH THE FIELD UNITS. ANY COMPLAINTS RECEIVED ARE IMMEDIATELY INVESTIGATED AND CORRECTED, AND IF A COMPLAINT IS THE RESULT OF THE NEGLIGENCE OF AN EMPLOYEE $2.50 IS DOCKED FROM HIS PAY CHECK. THE FIRM ALSO HAS AN INCENTIVE SYSTEM FOR EMPLOYEES- ANY CREW MEMBER WHO SELLS A NEW CUSTOMER ON THE REFUSE SERVICE RECEIVES A COMMISSION, AND PRIZES ARE GIVEN TO THE EMPLOYEE WHO DOES THE BEST JOB OF MAINTAINING HIS TRUCK. (PHS)

03-01-01770 MEMPHIS-BASED COLLECTOR RUNS THREE-CITY COMPANY (COLLECTION(CONTAINER) COLLECTION(VEHICLE))
REFUSE REMOVAL JOURNAL 5(4), P. 8 (APRIL 1962). DESCRIBES THE DEVELOPMENT AND EXPANSION OF A REFUSE HAULING FIRM WHICH BEGAN LESS THAN 10 YEARS AGO WITH A SMALL OPERATION IN MEMPHIS, TENNESSEE, AND WHICH NOW OPERATES REFUSE COLLECTION SERVICES IN HOUSTON, TEXAS, AND SAN-JUAN, PUERTO-RICO, AS WELL AS IN MEMPHIS. PREVIOUS EXPERIENCES IN THE TRANSFER BUSINESS HELPED THE EMBRYO REFUSE HAULING FIRM IN MAKING THE RIGHT MOVES IN PERSONNEL SELECTION, CREDIT POLICY, ACCOUNTING PROCEDURES, MAINTENANCE METHODS, AND THE PURCHASE OF DEPENDABLE EQUIPMENT. THE MEMPHIS OPERATION WAS FIRST BUILT UP, AFTER WHICH THE FIRM ESTABLISHED SERVICES IN HOUSTON AND THEN IN SAN-JUAN, EMPLOYING SIMILAR SALES TECHNIQUES IN ALL THREE CITIES. EQUIPMENT EMPLOYED IS DIFFERENT BECAUSE OF THE VARIATIONS IN CONDITIONS IN THE THREE CITIES. (PHS)

03-01-01771 UNUSUAL SYSTEM OF COLLECTION IN FRENCH CAPITAL
REFUSE REMOVAL JOURNAL 4(8), P. 18 (AUGUST 1961). AN ACCOUNT OF A UNIQUE SYSTEM OF REFUSE COLLECTION IN PARIS, FRANCE. PARIS BUYS ALL OF ITS DISPOSAL TRUCKS AND HIRES REFUSE-COLLECTING CREWS, BUT A PRIVATE CONTRACTOR PROVIDES MAINTENANCE, REPAIRS, AND THE DRIVERS FOR THE VEHICLES. (PHS)

03-01-01775 TWO-WAY RADIO CUTS TRUCK TIME, MILEAGE FOR CHICAGO HAULER (COLLECTION)
REFUSE REMOVAL JOURNAL 6(11), P. 30 (NOVEMBER 1963). DESCRIBES THE USE OF THE TWO-WAY RADIO SYSTEM WHICH COORDINATES INDUSTRIAL REFUSE OPERATIONS FOR A REFUSE HAULING COMPANY IN THE CHICAGO, ILL., AREA. CENTRAL CONTROL OF THE RADIO SYSTEM IS HANDLED AT THE COMPANY HEADQUARTERS. THERE, THE SECRETARY-DISPATCHER OPERATES A 60-WATT BASE STATION TO ESTABLISH CONTACT WITH DRIVERS IN RADIO-EQUIPPED VEHICLES. TO INSURE PICKUPS ARE MADE PROMPTLY, THE DISPATCHER MAINTAINS CONTACT WITH DRIVERS AS THEY MAKE THEIR ROUNDS. REQUESTS FOR SPECIAL SERVICE ARE QUICKLY RELAYED TO THE DRIVERS WHO THEN MAKE THE CALLS. RADIO IS ALSO USED TO ROUTE DRIVERS OF THE LOAD-LUGGER TRUCKS AS THEY PICK UP INDUSTRIAL WASTE AND SCRAPS FROM MANUFACTURING PLANTS, AND TO COORDINATE THE COLLECTION OF SOLID FILL AND RUBBLE AT CONSTRUCTION SITES. (PHS)

03-01-01782 CO-OP VENTURE SUCCESS FOR FIVE CALIFORNIANS (COLLECTION)
REFUSE REMOVAL JOURNAL 6(12), P. 6 (DECEMBER 1963). DESCRIBES A REFUSE REMOVAL, PROCESSING, AND SALVAGING BUSINESS IN LOS-ANGELES COUNTY, CALIFORNIA, WHICH REPORTS A GROSS ANNUAL INCOME OF NEARLY $1 MILLION. BEFORE 1950 THE OWNERS OF THIS REFUSE FIRM OPERATED TWO SMALL, SEPARATE REFUSE BUSINESSES. REALIZING THE POTENTIAL OF THE REFUSE INDUSTRY IN THE RAPIDLY GROWING SOUTHERN CALIFORNIA AREA, THESE TWO BUSINESSES MERGED INTO ONE IN 1950. THE NEW FIRM RAPIDLY GREW FROM THREE WORNOUT OBSOLETE REFUSE TRUCKS AND A COMPLETE LACK OF ORGANIZATION TO A 13-TRUCK FLEET, AND A ROOMY ADMINISTRATION AND MAINTENANCE HEADQUARTERS ON A 1-ACRE PLOT IN THE CITY OF BELL. THE FIRM NOW SERVICES NINE ROUTES WITH 2,000 COMMERCIAL AND INDUSTRIAL PICKUPS, ALL IN LOS-ANGELES COUNTY. (PHS)

03-01-01791 DETROIT INCENTIVE SYSTEM SAVES $2 MILLION YEARLY (COST(OPERATING) ECONOMICS COLLECTION)
REFUSE REMOVAL JOURNAL 6(9), P. 18 (1963). BY ADOPTING A ROUTE INCENTIVE PLAN WHEREBY A COLLECTION CREW IS ASSIGNED A SPECIFIC TASK TO BE COMPLETED BY THE END OF THE WORKING DAY, THE USE OF 64 TRUCKS, AND 18 MEN HAVE BEEN ELIMINATED. THE RESULT IS MORE EFFICIENT COLLECTION SERVICE AND A CONSIDERABLE SAVING TO THE CITY.

03-01-01792 AUTO MANUFACTURERS REPORT 400 POUNDS OF REFUSE FOR EACH NEW UNIT ASSEMBLED ON LINE (COLLECTION(CONTAINER))
REFUSE REMOVAL JOURNAL 6(9), P. 12 (1963). BECAUSE OF THE VAST AMOUNT OF PARTS AND ACCESSORIES THAT ARE SHIPPED IN CONTAINERS THE AUTO MANUFACTURERS FIND THEY HAVE ABOUT 400 POUNDS OF PACKING MATERIALS FOR EACH AUTO THEY ASSEMBLE. SOME OF THE MEANS OF REMOVING THE REFUSE FROM THE ASSEMBLY LINE IS DISCUSSED.

03-01-01794 CONTRACTOR CUTS CITY COLLECTION COSTS ONE-THIRD (COLLECTION(CONTAINER))
REFUSE REMOVAL JOURNAL 6(8), P. 14 (AUGUST 1963). DESCRIBES THE GROWTH OF A REFUSE CONTRACTOR IN THE CITY OF KITCHENER, ONTARIO, CANADA. THE CITY RECENTLY CHANGED ITS MUNICIPALLY OPERATED REFUSE COLLECTION SERVICE TO COLLECTION BY PRIVATE CONTRACT AND HAS SUBSEQUENTLY REDUCED ITS ANNUAL COSTS BY OVER $67,000. THE PRIVATE CONTRACTOR WAS ABLE TO IMPROVE THE EFFICIENCY OF REFUSE COLLECTION AND EXPAND SERVICES BY ADJUSTING ROUTES, MAINTAINING CLOSE SUPERVISION OF WORKING CREWS, REPLACING OLDER MACHINES WITH MORE ADVANCED EQUIPMENT, AND INTRODUCING CONTAINERIZED COLLECTION AT COMMERCIAL ACCOUNTS. (PHS)

03-01-01799 EX-FOOD CATERER BUILDS 28 TRUCK TOLEDO ROUTE (COLLECTION(VEHICLE) COLLECTION(CONTAINER))
REFUSE REMOVAL JOURNAL 6(7), P. 8 (JULY 1963). DESCRIBES THE OPERATIONS OF A REFUSE REMOVAL BUSINESS IN TOLEDO, OHIO. THE FIRM, WHICH IS OWNED AND MANAGED BY A WOMAN, SERVES MOSTLY COMMERCIAL ACCOUNTS. OF SPECIAL INTEREST IS THE STATIONARY COMPACTION SYSTEM WHICH THE FIRM OPERATES. (PHS)

03-01-01800 MEN MAKE 19,000 PICKUPS EVERY WEEK (FREQUENCY COLLECTION(VEHICLE))
REFUSE REMOVAL JOURNAL 6(6), P. 15 (JUNE 1963). BRIEFLY DESCRIBES THE REFUSE COLLECTION SERVICE IN GRAND PRAIRIE, TEX. THE SANITATION DEPARTMENT EMPLOYS 24 MEN, ONE 16 CU-YD PACKER, AND FOUR 20 CU-YD PACKERS TO MAKE TWICE-WEEKLY PICKUPS FROM OVER 9,000 RESIDENCES AND COMMERCIAL ESTABLISHMENTS. (PHS)

03-01-01807 THE CONSIDERABLE ADVANTAGES OF ONE-MAN COLLECTION (COLLECTION(VEHICLE) SAFETY)
THE AMERICAN CITY 84(4), P. 97-98 (APRIL 1969). USE OF ONE MAN COLLECTION VEHICLES IN INGLEWOOD, CALIFORNIA, IS DESCRIBED. CONCERN OVER SAFETY AND EMPLOYEE MORALE WERE FOUND TO BE UNNECESSARY. THE ACCIDENT RATE HAS ACTUALLY FALLEN BY 65 PERCENT. DATA IS PRESENTED ON THE CHANGES IN MANHOURS AND TONS OF REFUSE COLLECTED OVER THE PAST 8 YEARS.

03-01-01813 FIRST AND LAST PLACE BIG LEAGUE BALL TEAMS USE SAME CONTRACTOR (COLLECTION(CONTAINER) COST(DISPOSAL))
REFUSE REMOVAL JOURNAL 8(1), P. 8 (1965). YANKEE AND SHEA STADIUMS ARE SERVICED BY THE SAME CONTRACTOR. ABOUT 90 CU-YDS ARE COLLECTED FROM SHEA STADIUM AND ABOUT 105 CU-YDS ARE COLLECTED FROM YANKEE STADIUM AFTER EACH OF THE BALL GAMES. REFUSE COLLECTED FROM THE STADIUM IS DISPOSED AT THE NEW YORK CITY'S MARINE TRANSFER STATION OR HUNTERS POINT WHERE BARGES HAUL IT TO FRESH KILLS LANDFILL AT A COST OF $1.10 PER CU-YD FOR COMPACTED REFUSE AND $0.80 PER CU-YD FOR LOOSE REFUSE.

03-01-01814 400 YEAR OLD FLORIDA CITY MODERNIZES WITH CONTAINERS (COLLECTION(CONTAINER) SANITARY-LANDFILL COST(OPERATING))
REFUSE REMOVAL JOURNAL 8(1), P. 16 (1965). ST.-AUGUSTINE, FLORIDA, THE OLDEST CITY IN THE U.S. ATTRACTS A LARGE SEGMENT OF TOURIST TRADE. IN ORDER TO MAINTAIN A CLEAN ATMOSPHERE FOR THE TOURIST THE CITY PAYS A PRIVATE CONTRACTOR $18,000 ANNUALLY TO OPERATE A 500-ACRE LANDFILL OPERATION. THEY ARE RECLAIMING THE WASTE MARSHLAND BY FILLING IN THE REFUSE, WHICH WILL GIVE THEM MUCH NEEDED LAND AREA.

03-01-01822 PACKER SPEEDS CONDITIONING IN SANTA FE FREIGHT YARDS (COLLECTION(VEHICLE) COMPACTION)
REFUSE REMOVAL JOURNAL 8(6), P. 8 (1965). THE USE OF A PACKER HAS REDUCED THE CONDITIONING TIME REQUIRED TO CLEAN A BOX CAR AND PREPARE IT FOR CONSIGNMENT. THE PAPER, WOOD, CARDBOARD, DUNNAGE AND METAL STRAPS ARE REMOVED FROM THE BOX CARS AND PLACED DIRECTLY INTO THE PACKER WHERE IT IS THEN TRANSFERED TO THE DUMP. FEWER MEN NOW SERVICE TWICE AS MANY CARS.

03-01-01827 CONTRACTOR MATCHES COMMUNITY GROWTH (SALVAGE(PAPER) COLLECTION)
REFUSE REMOVAL JOURNAL 8(4), P. 36 (1965). THE IMPACT OF A CHANGE FROM ORANGE GROWING INDUSTRY IN ANAHEIM, CALIFORNIA IS DESCRIBED. FROM A 1 VEHICLE, $300 MONTHLY CONTRACT FOR 10,000 PEOPLE 16 YEARS LATER THIS SAME CONTRACTOR IS SERVING APPROXIMATELY 160,000 PEOPLE 35 VEHICLES AND A $1 MILLION YEARLY INCOME. COLLECTING 6 DAYS PER WEEK, THE CONTRACTOR COLLECTS 125 TONS FROM COMMERCIAL FIRMS, 75 TONS FROM 60 INDUSTRIES, AND 50 TONS FROM DISNEYLAND EACH DAY.

03-01-01842 ENGLAND'S OLDEST "HAULIER" SERVES NATION'S INDUSTRIAL HUB (COLLECTION SANITARY-LANDFILL)
REFUSE REMOVAL JOURNAL 8(9), P. 10 (1965). THE FIRM OF THOMAS HANCOCK, LTD., WHICH WAS FOUNDED IN 1901, OWNS 28 LANDFILL OPERATIONS. THE COMPANY IS THE LARGEST CONTRACTOR IN ENGLAND AND SERVES MOST OF THE INDUSTRIAL COMPLEXES.

03-01-01844 FLEXIBILITY - CONTRACTOR'S KEY TO SPORTS ARENA COLLECTIONS
REFUSE REMOVAL JOURNAL 8(8), P. 24 (1965). THE FLEET DISPOSAL, INC., OF LOS-ANGELES, CALIFORNIA, IN A NEVER ENDING SEARCH FOR MORE EFFICIENT METHODS OF OPERATING, OUTLINES THE FLEXIBILITY THAT ONE MUST HAVE TO SERVICE THE VARIETY OF AREAS AND TYPES OF WASTE AND VOLUMES OF WASTES THEY MUST HANDLE.

03-01-01846 FAST-GROWING CITY KEEPS HAULER ON THE GO (COLLECTION RECLAMATION(LAND))
REFUSE REMOVAL JOURNAL 8(8), P. 34 (1965). THE CITY OF SANTA-ANA, CALIFORNIA, IN TWO YEARS HAS EXPERIENCED A 17 PERCENT POPULATION INCREASE. THE PRIVATE CONTRACTOR HANDLING THE REFUSE FOR THE CITY HAS ALSO HAD TO EXPAND TO MEET THE DEMAND OF THE CITY'S GROWTH. THE ARTICLE GIVES A DESCRIPTION OF THE EQUIPMENT AND WASTE TYPES THAT ARE BEING DEALT WITH IN THIS CITY.

03-01-01876 MANCHESTER SHOWS ITS PRIDE (MAINTENANCE)

PUBLIC CLEANSING 53(11), P. 539 (1963). AN ARTICLE OUTLINING A SCHEME CONDUCTED BY THE MANCHESTER CLEANSING DEPARTMENT WHEREBY REWARDS ARE GIVEN TO DRIVERS OF VEHICLES AS AN INCENTIVE TO TAKE BETTER CARE OF THE VEHICLES THEY DRIVE. ROUTINE INSPECTIONS ARE MADE PERIODICALLY AT WHICH AWARDS ARE GIVEN AND THEN AT A FINAL INSPECTION DRIVERS WITH THE HIGHEST ACCUMULATED POINTS ARE GIVEN MONETARY AWARDS AT AN ANNUAL PARADE OF THEIR VEHICLES.

03-01-01884 DUSTLESS LOADING (COLLECTION CONTAINER)
PUBLIC CLEANSING 54(10), P. 1217 (1964). THERE ARE MANY METHODS THAT ARE SUPPOSEDLY PRACTICED TO REDUCE THE DUST RELATED TO COLLECTION AND DISPOSAL OF HOUSEHOLD WASTES. SOME OF THE VARIOUS METHODS AND TYPES OF EQUIPMENT, EQUIPMENT DESIGN, ALONG WITH THE PROS AND CONS ARE DISCUSSED.

03-01-01932 REFUSE COLLECTION (COMPOSITION SURVEY COLLECTION(METHODS) COLLECTION(EQUIPMENT))
CRITCHLEY, H. F.
PUBLIC HEALTH INSPECTOR 75(2), P. 83 97, 120 (NOVEMBER 1966). THE AUTHOR SURVEYS REFUSE COLLECTION AND CONSIDERS THE POWERS AND DUTIES OF LOCAL AUTHORITIES, THE CHANGING COMPOSITION OF REFUSE, COLLECTION METHODS AND VEHICLES, STORAGE AND REMOVAL FROM MULTIPLE-FLOOR BUILDINGS, AND ON-SITE TREATMENT. (PHEA)

03-01-01959 COMMUNITY SERVICES DISTRICT USED TO SOLVE URBAN REFUSE SANITATION PROBLEMS
MORTENSON, E. W. + SCOTT, F. W.
CALIFORNIA VECTOR VIEWS 7(8), P. 49-50 (AUGUST 1960). THE UNINCORPORATED COMMUNITY OF AVENAL IN SOUTHERN CALIFORNIA HAS UNDERGONE AN INTERESTING TRANSFORMATION IN ITS REFUSE STORAGE, COLLECTION, AND DISPOSAL METHODS. BEFORE THE CHANGEOVER, ONLY 40 PERCENT OF THE RESIDENCES WERE SERVED BY A PRIVATE CONTRACTOR WITH ONE PER WEEK SERVICE. THE REMAINDER OF THE COMMUNITY AND THE CONTRACTORS DUMPED GARBAGE IN A LARGE RAVINE IN THE HILLS OUTSIDE THE TOWN. MANY OF THE RESIDENTS WITH NO PICKUP OF REFUSE BURNED IT THEMSELVES, LITTERING THEIR BACKYARDS AND ALLEYWAYS. THE RESIDENTS DECIDED TO DO SOMETHING ABOUT THE PROBLEM, AND VOTED FOR A PROPOSAL THAT MADE REFUSE COLLECTION AND DISPOSAL A RESPONSIBILITY OF THE CITY. THE CITY HIRED THE SAME CONTRACTORS, BUT WITH THE HELP OF KINGS COUNTY, CHANGED THE OPEN DUMP INTO A SANITARY LANDFILL OPERATION IN WHICH COVER MATERIAL WAS ADDED AT THE END OF EACH 48-HOUR PERIOD. ALL REFUSE IS STORED IN 30-GALLON CONTAINERS, AND IS PICKED UP TWICE WEEKLY. AT THE BEGINNING OF THE NEW SERVICE, THE CONTRACTORS SENT A DUMP TRUCK AROUND TO PICKUP ALL THE OLD REFUSE WHICH HAD ACCUMULATED IN THE BACKYARDS OF THOSE WHO HAD NOT HAD SERVICE PREVIOUSLY. THIS WAS IN ADDITION TO THE REGULAR GARBAGE COLLECTION. THE NEW REFUSE DISPOSAL PROGRAM HAS RESULTED IN A MARKEDLY IMPROVED REFUSE SANITATION SITUATION AND IN GREATLY CUTTING DOWN ON THE AMOUNTS OF FLIES. (UC)

03-01-02020 A STUDY OF SOLID WASTE COLLECTION SYSTEMS COMPARING ONE-MAN WITH MULTI-MAN CREWS (COST(COLLECTION))
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE PUB 1892, WASHINGTON, D.C., (1969). AN ESTIMATED 125 MILLION TONS OF URBAN REFUSE ARE PRODUCED IN THE U.S. EACH YEAR. ACCORDINGLY, REFUSE MANAGEMENT HAS BECOME BIG BUSINESS, WITH COLLECTION REPRESENTING 70 TO 80 PERCENT OF THE APPROXIMATELY $3 BILLION SPENT PER ANNUM. WITH THE TOTAL POPULATION AND INDUSTRY OF THE COUNTRY EXPECTED TO DOUBLE WITHIN FIFTY YEARS, IN-DEPTH STUDIES OF EQUIPMENT AND OPERATIONAL PRACTICES, INCLUDING THE HUMAN FUNCTIONS ELEMENT, WILL OBVIOUSLY CONTRIBUTE MUCH TO IMPROVE EFFICIENCY AND ECONOMICS. THIS INVESTIGATION WAS FUNDED AS CONTRACT PH 86-67-248 BY THE BUREAU OF SOLID WASTE MANAGEMENT OF THE U.S. PUBLIC HEALTH SERVICE. RALPH STONE AND COMPANY, INC., ENGINEERS, PERFORMED THE INVESTIGATION, UTILIZING FOUR BASIC ANALYTICAL TECHNIQUES, COMPREHENSIVE FIELD SURVEYS, NATIONWIDE SURVEY DATA ANALYSIS, TIME AND MOTION STUDIES, AND A MATHEMATICAL MODEL. THE PRIME PURPOSES OF THE STUDY WERE TO DEFINE THE NATURE OF THE POSSIBLE SAVINGS DUE TO A ONE-MAN CREW, TO COMPARE THE EFFICIENCY OF ONE-MAN CREWS WITH TWO AND THREE-MAN CREWS, AND TO PROJECT THE FUTURE USE OF THE ONE-MAN SYSTEM FOR REFUSE COLLECTION. IN ADDITION, A CATALOG OF THE EQUIPMENT AVAILABLE FOR ONE-MAN OPERATIONS WAS COMPILED. CONCLUSIONS ARE PRESENTED, ALONG WITH SUPPORTIVE TABLES AND CHARTS. (PHS)

03-01-02081 HIGH RISE DISPOSAL PROBLEMS (GARCHY-SYSTEM CHUTES VOLUME-REDUCTION SEWER(DISPOSAL) SACK(PAPER))
GOVEN, F. A.
REFUSE REMOVAL JOURNAL 10(6), P. 6-7, 36, 38-39 (MARCH 1967). THE ARTICLE IS CONCERNED WITH THE REMOVAL OF WET AND DRY HOUSEHOLD WASTES FROM APARTMENTS, ITS TRANSFER TO A COLLECTION SYSTEM, TYPE OF ON-SITE DISPOSAL, AND DELIVERY TO THE COLLECTION AGENCY. IN IT IS NOTED THAT LOW INCOME TENANTS PRODUCE REFUSE AT 3 LB/PERSON/DAY WITH A UNIT WEIGHT OF 6 LB/CU-FT, AND A COMPOSITION OF 50 PERCENT RUBBISH AND 50 PERCENT GARBAGE. MIDDLE LUXURY CLASS DWELLERS GENERATE 2 LB/PERSON/DAY AT 5 LB/CU-FT, AND COMPOSITION OF 80 PERCENT RUBBISH AND 20 PERCENT GARBAGE. THE REASON FOR THE DIFFERENCES IS THAT MENUES OF THE POOR TEND TOWARDS LOWER GRADES OF MEAT AND POULTRY AND TO THE INCLUSION OF FRESH VEGETABLES AND FRUIT, WHEREAS THOSE OF THE MORE AFFLUENT INCLUDES MORE OF THE PREPACKAGED AND PREPREPARED FOODS. THE CENTRAL CHUTE IS RECOMMENDED BECAUSE OF CONVENIENCE, FLEXIBILITY, SHORT TERM OF STORAGE IN APARTMENT UNITS, ELIMINATION OF TRASH ACCUMULATION, CENTRAL COLLECTION, SINGLE SOURCE OF STORAGE, LOW FIRE HAZARD, EASY ADAPTATION TO END-USE DESTRUCTION OR COLLECTION DEVICES, AND POTENTIALLY SATISFACTORY ENVIRONMENTAL CONDITIONS. THE AUTHOR GIVES DESIGN SPECIFICATIONS FOR THE CHUTE SYSTEM. ALTHOUGH MUCH REMAINS TO BE LEARNED ABOUT THE DESIGN OF INCINERATORS, THEY ARE NECESSARY BECAUSE WITH THEIR USE, REFUSE IS REDUCED TO 30 PERCENT OF ITS ORIGINAL WEIGHT AND TO 20 PERCENT OF ITS ORIGINAL VOLUME. CRUSHERS, DISINTEGRATORS, AND BALERS ARE NOT FEASIBLE FOR SINGLE MULTI-FAMILY UNITS. A DESCRIPTION IS GIVEN OF A BRITISH METHOD FOR SERVICING A NUMBER OF MULTI-FAMILY UNITS. THE METHOD ESSENTIALLY IS ONE OF GRINDING AND RESORTING TO THE LIQUID TRANSPORT OF GROUND REFUSE THROUGH SEALED PIPES TO A CENTRAL STORAGE AREA. FROM THIS STORAGE FACILITY, THE SUSPENDED SOLIDS ARE TRANSPORTED TO THE MUNICIPAL DISPOSAL PLANT. (UC)

03-01-02086 DUSTLESS REFUSE COLLECTION IN THE CITY OF BIRMINGHAM - A PROGRESS REPORT (PROTECTIVE-CLOTHING BULKY-WASTE)
PRESENTED AT THE 65TH ANNUAL CONF OF THE INST PUBLIC CLEANSING, SOUTHPORT, (JUNE 17-21, 1963). SOME 4-1/2 YEARS HAVE PASSED SINCE THE DAY IN JANUARY 1959, WHEN THE FIRST COLLECTIONS WERE MADE IN BIRMINGHAM UNDER THE NEW DUSTLESS SYSTEM. THE MAIN POINTS LEARNED WERE - (A) THAT THE SYSTEM IS WELCOMED BY THE PUBLIC AS BEING MOST HYGIENIC AND A GREAT IMPROVEMENT OVER THE OLD METHOD. THERE IS NO SPILLAGE AND SCATTERING OF DUST AS THERE IS WHEN BINS ARE EMPTIED INTO SKEPS AND WHEN SKEPS OR BINS EMPTIED INTO THE CONVENTIONAL VEHICLE. (B) THE USE OF THE HINGED LID ON THE BIN MEANS THAT IF REFUSE IS DRY WHEN IT IS PLACED IN THE BIN, IT WILL REMAIN SO AND THE BIN WILL NOT BECOME OFFENSIVE. FURTHER, THE BIN DOES NOT SUFFER THE SAME ROUGH TREATMENT AS THE NORMAL TYPE, AS THERE IS NO BANGING ON THE VEHICLE DURING THE EMPTYING PROCESS. (C) IF ALL REFUSE IS CONTAINED IN THE BIN NEITHER THE PUBLIC NOR THE COLLECTORS SEE ANY DURING THE LOADING PROCESS, THE BINS AND VEHICLES BEING FULLY ENCLOSED AT ALL TIMES. (D) THE WORKING CONDITIONS FOR THE REFUSE COLLECTORS HAVE BEEN IMPROVED BEYOND MEASURE. HEAVY MANUAL EFFORT HAS BEEN ELIMINATED AND WHAT WAS ONCE A DIRTY AND UNPLEASANT TASK IS NOW AN ACCEPTABLE JOB TO WHICH MEN ARE ATTRACTED AND AT WHICH THEY ARE WILLING TO REMAIN. WHEN REFUSE COLLECTION IS CARRIED OUT ON THESE MODERN HYGIENIC LINES, AND THE REMUNERATION IS MADE WORTH WHILE, THERE WOULD APPEAR TO BE NO REASON WHY LOCAL AUTHORITIES SHOULD NOT STAND AN EQUAL CHANCE WITH INDUSTRY OF RECRUITING LABOR, IN THIS CASE FOR REFUSE COLLECTION. THESE THEN ARE THE MAIN ADVANTAGES - WHAT ARE THE DISADVANTAGES? THERE CAN ONLY BE ONE, THE ADDITIONAL COST, DETAILS OF WHICH ARE DISCUSSED IN THE PREVIOUS SECTION OF THIS PAPER. AS ALREADY INDICATED, BIRMINGHAM IS CONVERTED TO THE IDEA OF A DUSTLESS REFUSE SYSTEM AND THE CITY COUNCIL IS EXTENDING THE SYSTEM THROUGHOUT THE WHOLE OF THE CITY OVER A PERIOD OF YEARS. (AUTH)

03-01-02087 TENEMENT REFUSE DISPOSAL SYSTEMS AND ARTIFICIAL ILLUMINATION OF COMMUNAL AREAS (COLLECTION COST(COLLECTION) INCINERATION POLLUTION(AIR))
FEDERAL HOUSING ADMIN CONTRACT NO. FH-940, REPORT NO. PB 180879, (MARCH 1967). A TENEMENT REFUSE DISPOSAL SYSTEM AND ARTIFICIAL ILLUMINATION OF COMMUNAL AREAS ARE CONSIDERED ESSENTIAL AREAS IN THE EFFORT TO GIVE PERMANENT IMPROVED LIVING CONDITIONS. BOTH ARE ASPECTS OF THE MORE GENERAL PROBLEM OF CREATING A PLEASANT AND HEALTHFUL LIVING ENVIRONMENT AS OUTLINED BY THE AMERICAN PUBLIC HEALTH ASSOCIATION'S "BASIC PRINCIPLES OF HEALTHFUL HOUSING." THE REPORT PRESENTS A COMPREHENSIVE REVIEW OF THESE TWO IMPORTANT SUBJECTS.

03-01-02096 SOLID WASTES HANDLING IN HOSPITALS (QUANTITIES COLLECTION INCINERATION)
BLACK, R. J.
ENVIRONMENTAL ASPECTS OF THE HOSPITAL AND MEDICAL FACILITIES SERIES, THE HILL-BURTON PROGRAMS, VOL. 2, CHAPTER 2, SOLID WASTES HANDLING. A BRIEF DESCRIPTION OF THE VARIOUS TYPES OF WASTES FROM HOSPITALS AND THE VARIOUS METHODS FOR DISPOSING OF THEM. DATA ARE GIVEN FOR DETERMINING THE PROPER TYPE AND SIZE OF DISPOSAL UNIT.

03-01-02114 CONTRACTOR'S FEATHER RUN IS HEAVY WEIGHT TASK (COLLECTION(FEATHERS))
REFUSE REMOVAL JOURNAL 9(1), P. 8-9 (JANUARY 1966). TWO LOADERS TRAVEL APPROXIMATELY 1,000 MILES PER NIGHT TO COLLECT THE REFUSE FROM THE POULTRY INDUSTRY IN CANADA. THE LOADERS ARE USED FOR REFUSE COLLECTION FROM HOUSEHOLD SOURCES DURING THE DAY, AND SERVICE THE COMMERCIAL AND INDUSTRIAL AREAS AT NIGHT.

03-01-02122 DUSTLESS REFUSE COLLECTION
MILLARD, R. F.
THE INSTITUTE OF PUBLIC CLEANSING, 61ST ANNUAL CONF, (JUNE 9-12, 1959). A GENERAL DISCUSSION OF THE COLLECTION SYSTEM KNOWN AS DUSTLESS COLLECTION. THE AUTHOR DISCUSSES COLLECTION METHODS, TYPES OF COLLECTION VEHICLES AND EQUIPMENT, AND MAINTENANCE AND OPERATING COSTS FOR SEVERAL EUROPEAN COUNTRIES.

03-01-02140 HAULER PLAYS KEY PART IN BOSTON'S DEVELOPMENT (COLLECTION)
REFUSE REMOVAL JOURNAL 9(2), P. 8-9, 50 (FEBRUARY 1966). PRIOR TO 1950, THERE HAD BEEN NO APPRECIABLE CHANGE IN BOSTON'S REFUSE AND DISPOSAL SYSTEM FOR ALMOST 25 YEARS. WITH THE CITY'S MODERNIZATION PLANS, AND WITH PRIVATE AND PUBLIC REFUSE COLLECTION INCREASING IT WAS DECIDED TO USE PRIVATE CONTRACTORS FOR REFUSE PICKUP SERVICE. THE CITY WAS DIVIDED INTO REGIONS AND CONTRACTS WERE LET BY REGIONS. THE FREANY CO. BID ON ONE REGION, BUT WAS AWARDED CONTRACTS FOR FIVE REGIONS. THE COMPANY OPERATES OVER 50 VEHICLES OF ASSORTED TYPES IN ORDER TO HANDLE THE REFUSE PICKUP SERVICE PROPERLY.

03-01-02155 AUTOMATED REFUSE HANDLING - CALIFORNIA STUDY LOOKS INTO THE FUTURE (QUANTITY COLLECTION COST(COLLECTION))
REFUSE REMOVAL JOURNAL 9(4), P. 20, 40-41 (APRIL 1966). THIS IS A REVIEW OF SOME OF THE PRELIMINARY PROPOSALS MADE FOR FUTURE HANDLING OF REFUSE IN A RECENT CALIFORNIA WASTE MANAGEMENT STUDY. BASED ON SCIENTIFIC PLANNING METHODS, THE STUDY ATTEMPTS TO PRESENT GUIDELINES FOR HANDLING ALL KINDS OF WASTE IN THE FUTURE SUCH AS SOLID, LIQUID, GASEOUS, AND RADIOACTIVE. IT IS FELT THE REPORT MIGHT BE SOMEWHAT MISLEADING SINCE THERE HAS BEEN GIVEN NO CONSIDERATION OF WASTES GENERATED BY COMMERCIAL AND INDUSTRIAL SOURCES.

03 02 COLLECTION VEHICLES

03-02-00115 REFUSE TRAINS BRING THREE-WAY SAVINGS (COLLECTION TRAINS(VEHICULAR) COST(OPERATING) COST(CAPITAL))
KILDAY, G. W.
THE AMERICAN CITY 80(1), P. 88-90 (JANUARY 1965). AFTER OPERATING FIVE REFUSE TRAILER TRAINS FOR SIX MONTHS WINSTON-SALEM WAS READY TO ADOPT THE NEW SYSTEM FOR ALL RESIDENTIAL ROUTES. SAVING WILL ACCRUE IN THREE WAYS. FIRST, ON INITIAL COST, THE EQUIPMENT REPRESENTS A 20 PERCENT SAVINGS OVER AN ALL-PACKER-TRUCK SYSTEM, MEANING THAT WE CAN REDUCE AMORTIZATION MORE THAN 8 THOUSAND DOLLARS ANNUALLY. SECONDLY, WE CAN OPERATE WITH ONE LESS ROUTE. THIS SAVES THE CITY APPROXIMATELY SIXTEEN THOUSAND DOLLARS A YEAR. FINALLY, MAINTENANCE AND OPERATION COSTS HAVE DROPPED ABOUT TWO THOUSAND DOLLARS A MONTH, INCLUDING EQUIPMENT USED TO SERVE 20 THOUSAND PEOPLE NOT SERVED UNDER THE OLD SYSTEM.

03-02-00160 WE'RE SWITCHING TO DIESEL-DRIVEN REFUSE TRUCKS (COLLECTION-EQUIPMENT COST(COLLECTION))
ATTEBERY, J. E.
THE AMERICAN CITY 82(8), (1967). THE USE OF DIESEL-POWERED TRUCKS IN PHOENIX, ARIZONA, TO REDUCE VEHICLE OPERATION COSTS IN COLLECTION OF REFUSE IS REPORTED. COST REDUCTION OF FUEL AND MAINTENANCE RANGED FROM 6.3 TO 10.7 CENTS/MILE.

03-02-00575 REFUSE COLLECTION TRUCK PURCHASE INCLUDES GUARANTEED MAINTENANCE PROGRAM
EPPIG, T. C.
PUBLIC WORKS 96(8), P. 98 (AUGUST 1965). IN CHICAGO, ILLINOIS A NEW CONCEPT FOR ACQUIRING COLLECTION VEHICLES WAS INTRODUCED, VIZ., " TOTAL COST " . IN THE " TOTAL COST " SYSTEMS, BIDS INCLUDE THE COST OF TRUCKS, REFUSE COLLECTION BODIES, AND A GUARANTEED MAINTENANCE PROGRAM FOR THE ANTICIPATED USEFUL LIFE OF THE TRUCKS. THE REASON FOR THE ADOPTION OF THE POLICY WAS THE NEED FOR EXPANDING THE FLEET TO INCREASE THE NUMBER OF DAILY TRUCK ASSIGNMENTS, AND THUS REDUCE COLLECTION CREW OVERTIME AND COMPENSATE FOR THE EVER INCREASING VOLUME OF REFUSE PRODUCTION. PROBLEMS INVOLVING RATES OF PAY, EMPLOYMENT PRACTICES, AND FRINGE BENEFITS ALSO WERE CONSIDERATIONS. A COMPARISON WAS ARRANGED BY BUYING 75 TRUCKS ON THE NEW BASIS AND 25 ON THE OLD BASIS (I.E., NO MAINTENANCE). THE 25 WERE MAINTAINED AT THE CITY SHOPS. A LIST OF CONTRACT SPECIFICATIONS IS GIVEN IN THE ARTICLE. AT THE TIME OF WRITING IT WAS TOO SOON AFTER THE INITIATION OF THE POLICY TO EVALUATE IT. (UC)

03-02-00587 CONTAINERIZATION OF COMMERCIAL REFUSE SAVES $1000 PER WEEK (COLLECTION)
PUBLIC WORKS 91(5), P. 106-108 (MAY 1960). DEMPSTER DUMPMASTER SELF-LOADING PACKER TRUCKS AND STEEL CONTAINERS OF VARIOUS SIZES ARE USED BY CITY OF DOTHAN, ALABAMA. DETACHABLE STORAGE CONTAINERS ARE PLACED AT POINTS OF REFUSE ACCUMULATION TO BE EMPTIED BY PACKER TRUCKS. IN TRUCKS MATERIAL IS COMPRESSED TO FRACTION OF ITS FORMER VOLUME BY ACTION OF HYDRAULICALLY-POWERED PACKER PLATE. (EI)

03-02-00801 THE NORBA SYSTEM (COLLECTION)
PUBLIC CLEANSING 52(1), P. 19 (JANUARY 1962). DESCRIBES THE NORBA SYSTEM OF REFUSE COLLECTION, A METHOD BY WHICH DUSTBINS ARE AUTOMATICALLY EMPTIED IN A CLOSED CONDITION INTO THE CONTAINER OF THE COLLECTING VAN THROUGH A SPECIALLY DESIGNED DELIVERY SHUTTER IN SUCH A WAY THAT THE CONTENTS OF THE DUSTBIN ARE NEVER EXPOSED. THE TWO MAIN COMPONENTS OF THE SYSTEM ARE THE NORBA-REFUSE COLLECTING VANS OF WHICH THERE ARE SEVERAL TYPES, AND THE DUSTBINS WHICH HAVE TIGHT-FITTING, HINGED LIDS. AT THE REAR OF THE TRUCK BODY THERE IS AN AUTOMATICALLY OPERATED HYDRAULIC LIFT WHICH RAISES THE DUSTBINS FROM THE GROUND AND TIPS THEM INTO THE CONTAINER THROUGH A DUSTLESS EMPTYING SHUTTER. THE REFUSE DROPS ONTO A ROTATING CAST-STEEL SCREW AND IS PROPELLED INTO THE CONTAINER UNDER HEAVY PRESSURE. AFTER THE DUSTBIN HAS BEEN EMPTIED, THE LIFT AUTOMATICALLY LOWERS IT AND SIMULTANEOUSLY THE DUSTBIN LID CLOSES. EMPTYING OF THE CONTAINER AT THE DISPOSAL SITE IS ALSO ACCOMPLISHED AUTOMATICALLY.

03-02-00802 MAGIRUS MACHINES ARE EFFICIENT AND SIMPLE (COLLECTION-VEHICLE)
PUBLIC CLEANSING 52(2), P. 84 (FEBRUARY 1962). DESCRIBES IN DETAIL A 14 CU-YD, DUSTLESS REFUSE COLLECTOR MANUFACTURED IN ULM, GERMANY, THE VEHICLE WAS DEVELOPED ON THE BASIS OF EXPERIENCE GATHERED IN MANY YEARS OF PRACTICE

WITH AN EYE FOR EFFICIENCY AND SIMPLICITY. THERE ARE NO MOVING PARTS ROTATING IN THE REFUSE. A NOVEL DOUBLE-SHOVEL LOADING SYSTEM PUSHES THE REFUSE TO THE INTERIOR OF THE BODY AND COMPACTS THE LOAD, ELIMINATING VOIDS. THE REAR HOPPER SHOVEL HAS A CAPACITY OF 1.4 CU-YDS AT A LOADING HEIGHT OF ONLY 39.3-IN. LOADING AND PACKING SHOVELS ARE OPERATED BY HYDRAULIC CYLINDERS, AND DUMPING IS DONE BY HYDRAULIC HOIST CYLINDER CONTROLLED BY TWO HYDRAULIC SWITCHES. (PHS)

03-02-00931 FACTORS IN PURCHASE OF REFUSE COLLECTION UNITS
EPPIG, T. C.
REFUSE REMOVAL JOURNAL, 2(11), 13, (NOVEMBER 1959). EPPIG EMPHASIZES THE GENERAL AREAS OF CONSIDERATION WHICH MUST BE DEFINED IN TERMS OF A CITY'S OWN SPECIFIC REQUIREMENTS IN SELECTING REFUSE COLLECTION EQUIPMENT. THE FACTORS IN SELECTION GIVEN PRECEDENCE IN MR. EPPIG'S DISCUSSION ARE SELECTION OF A " CHASSIS " AND THAT OF A TRUCK BODY. TRUCK CAPACITY, TYPE OF REFUSE MATERIAL, COLLECTION METHOD, MECHANICAL FEATURES OF TRUCKS, APPEARANCE, VERSATILITY OF EQUIPMENT, AND SAFETY ARE ALSO DISCUSSED AS SELECTION CONSIDERATIONS.

03-02-01011 NORTHWESTERN HAULERS ENTHUSE OVER PACKERS (COLLECTION-EQUIPMENT COMPACTION)
REFUSE REMOVAL JOURNAL 5(7), P. 8 (JULY 1962). EVEN THOUGH THERE HAS BEEN SWIFT PROLIFERATION OF COMPACTION REFUSE BODIES THROUGHOUT THE COUNTRY DURING THE PAST SEVERAL YEARS THERE ARE STILL MANY THOUSANDS OF OPEN TRUCKS USED FOR REFUSE COLLECTION. THIS ARTICLE RELATES THE ENTHUSIASM OF SEVERAL REFUSE HAULERS IN THE PACIFIC NORTHWEST AREA WHO HAVE RECENTLY PURCHASED COMPACTION REFUSE TRUCKS. SOME OF THE GAINS REALIZED FROM THIS TYPE OF REFUSE TRUCK WERE A GREAT SAVINGS OF TIME AND EFFORT, AND A REDUCTION IN FUEL EXPENDITURES. (PHS)

03-02-01109 HIGH BID GETS CONTRACT (COLLECTION)
THE AMERICAN CITY 59(12), P. 137 (DECEMBER 1954). NEW YORK CITY BUYS 165 NEW ESCALATOR-TYPE REFUSE TRUCKS. ACCEPTANCE OF HIGHEST OF 3 BIDS SUBMITTED WAS JUSTIFIED BY PERFORMANCE TESTS CONDUCTED BY THE DEPARTMENT OF SANITATION. (PHS)

03-02-01296 EFFICIENCY OF MPL BULK REFUSE SYSTEM PROVED (VOLUME-REDUCTION COMPACTION TRANSFER-STATION)
PUBLIC CLEANSING 55(8), P. 485-490 (1965). THE MAXIMUM PAY LOAD (MPL) SYSTEM IS A TRANSFER STATION COMPACTION OPERATION WHERE REFUSE OF UNSORTED VARIETIES IS BROUGHT TO A STATIONARY PRESS AND COMPACTED. THE REFUSE IS COMPACTED TO DENSITIES IN THE RANGE OF 1,000 LBS/CU-YD. THE UNITS ARE BUILT IN A VARIETY OF SIZES TO MATCH THE SIZE OF THE TRUCK CHASIS THE UNIT IS TO BE MOUNTED ON. THE HAMMERSMITH BOROUGH IS PRESENTLY OPERATING UNITS 20 FEET LONG BY 7 FEET DIAMETER TO TRANSPORT THE REFUSE TO THE DISPOSAL SITE.

03-02-01313 RENO II -- AN INTERESTING AND EXCITING MACHINE OFFERING POSSIBILITIES IN BOTH REFUSE COLLECTION AND DISPOSAL
PUBLIC CLEANSING 55(10), P. 564-566 (1965). A DANISH MANUFACTURED MACHINE FOR REFUSE COLLECTION WHICH HAS SOME INTERESTING FEATURES SUCH AS - (1) BUILT-IN VACUUM TO REDUCE DUST PROBLEMS. (2) HEATED WATER SPRAY FOR CLEANING GARBAGE CANS AND WETTING THE REFUSE TO BREAK IT DOWN BEFORE TIPPING. (3) COMPACTION DEVICE TO ACCEPT ALL TYPES OF REFUSE WITHOUT SEPARATION TO REDUCE COLLECTION TIME AS WELL AS INCREASE THE PAY LOAD.

03-02-01344 MOTORIZED REFUSE COLLECTORS
JOHNSON, B. B.
THE AMERICAN CITY 70(2), P. 103-104 (FEBRUARY 1964). SMALL TRANSFER VEHICLES THAT CARRY REFUSE FROM BACKYARDS TO COLLECTION TRUCK ARE KEY ELEMENT IN COST CUTTING REFUSE COLLECTION PROGRAM AT CLAREMONT, CALIFORNIA. NEW ELECTRIC POWERED TRANSFER VEHICLES WITH 1 1/6-CU-YD HYDRAULIC DUMP BODIES ARE BASED ON CUSHMAN TRUCKSTER CHASSIS. (EI)

03-02-01544 NEBRASKA MAN WINS WITH SCOOTER PLAN (COLLECTION)
REFUSE REMOVAL JOURNAL 1(1), P. 10 (JANUARY 1958). MOTOR SCOOTERS ARE USED AT LINCOLN, NEBRASKA, FOR COLLECTING REFUSE IN RESIDENTIAL AREAS OF LARGE, WIDELY SPACED HOMES TO REDUCE COSTS. (PHS)

03-02-01546 KALAMAZOO HAULERS BUY NEW COMPACTORS AFTER CITY ORDINANCE BAYS OPEN TRUCKS (COLLECTION(VEHICLE))
REFUSE REMOVAL JOURNAL (1), P. 16 (JANUARY 1958). A DOZEN CONTRACTORS SWITCH TO COMPACTOR TRUCKS IN KALAMAZOO, MICHIGAN. TWO TRUCKS ARE EQUIPPED WITH STEAM CLEANERS TO CLEAN EVERY GARBAGE CAN AT LEAST ONCE A MONTH. (PHS)

03-02-01547 CONTRACTOR'S TRAILER IDEA WINS HIM INDUSTRIAL DISPOSAL CONTRACT (COLLECTION-EQUIPMENT)
REFUSE REMOVAL JOURNAL 1(1), P. 17 (JANUARY 1958). A DETROIT CONTRACTOR PARKS A TRAILER-MOUNTED COMPACTOR WITH A 30-HORSEPOWER ELECTRIC MOTOR AT A FACTORY TO PROVIDE BETTER COLLECTION SERVICE AT LESS COST. (PHS)

03-02-01550 GIGANTIC TASK BEGAN FOR LOS-ANGELES WHEN BACKYARD INCINERATORS WERE BANNED (COLLECTION(VEHICLE) COST(OPERATING))
REFUSE REMOVAL JOURNAL 1(1), P. 26 (JANUARY 1958). LOS-ANGELES CITY PURCHASES 178 TRUCKS TO INITIATE RESIDENTIAL RUBBISH COLLECTION SERVICE AT AN ESTIMATED COST OF 40 CENTS PER DWELLING PER MONTH. THE RIGHT-HAND DRIVE TRUCKS EQUIPPED WITH TORQUE CONVERTERS AND COMPACTION BODIES ARE OPERATED BY A TWO-MAN CREW. (PHS)

03-02-01586 CHICAGO MANUFACTURER HAS UNUSUAL PRODUCTS (COLLECTION(EQUIPMENT))
REFUSE REMOVAL JOURNAL 1(7), P. 20 (JULY 1958). THE USE OF A SPECIALLY DESIGNED LIFT GATE, WHICH PERMITS THE USE OF CLOSED REFUSE BODY TRUCKS WITHOUT A PACKER MECHANISM, IS EXPLAINED. (PHS)

03-02-01603 NEW REFUSE BODY - FROM ECON-O-PACKER (COMPACTION COLLECTION)
REFUSE REMOVAL JOURNAL 1(9), P. 26 (SEPTEMBER 1958). A BRIEF DESCRIPTION OF A NEW MODEL REFUSE COMPACTION BODY WITH MECHANICAL FRONT END LOADER, DESIGNED FOR USE WITH DETACHABLE CONTAINERS. (PHS)

03-02-01606 CITY SAVES BY USE OF LPG IN REFUSE TRUCKS (COLLECTION)
REFUSE REMOVAL JOURNAL 1(9), P. 13 (SEPTEMBER 1958). AFTER 350,000 MILES AND FOUR YEARS OF SERVICE, A REFUSE TRUCK USED IN HUTCHINSON, KANSAS, WAS FOUND TO HAVE NO TRACE OF OIL SLUDGE IN THE MOTOR. THIS WAS ONE OF FOUR TRUCKS USING LPG (LIQUID PETROLEUM GAS) FUEL. (PHS)

03-02-01617 NEW ENTRY IN CONTAINER FIELD CITES ADVANTAGES (COLLECTION)
REFUSE REMOVAL JOURNAL 1(11), P. 16 (NOVEMBER 1958). A SIDE-LOADING, EJECTION-DUMPING TYPE PACKER, WITH A CABLE-OPERATED PACKER PLATE, HAS BEEN MODIFIED WITH A HYDRAULIC LOADER TO HANDLE ATTACHABLE CONTAINERS AUTOMATICALLY. (PHS)

03-02-01654 BRITON SURVEYS MODERN REFUSE VEHICLE DESIGN (COLLECTION(VEHICLE) CONTAINER)
REFUSE REMOVAL JOURNAL 2(7), P. 8 (JULY 1959). THIS ARTICLE, BY A BRITISH WRITER, IS A REVIEW OF PRESENT TRENDS AND SPECULATION ON FUTURE POSSIBILITIES IN COLLECTION-TRUCK DESIGN. SIMILARITIES IN PROBLEMS AND THINKING BETWEEN BRITAIN AND THIS COUNTRY ARE REVEALED. (PHS)

03-02-01670 NEW PACKER MARKETED BY CALIFORNIA COMPANY (COLLECTION(VEHICLE))
REFUSE REMOVAL JOURNAL 2(11), P. 16 (NOVEMBER 1959). A NEW PACKER, WHICH USES THE PRINCIPLE OF A HYDRAULIC PUMP, HAS BEEN DEVELOPED. THE IMPORTANT FEATURES OF THIS SIDE LOADER ARE REVIEWED. (PHS)

03-02-01673 MANUFACTURER INTRODUCES NEW COLLECTION SYSTEM
REFUSE REMOVAL JOURNAL 2(10), P. 21 (OCTOBER 1959). A NEW ENTRY IN THE SANITATION EQUIPMENT MARKET IS DISCUSSED IN TERMS OF ITS ADVANTAGEOUS FEATURES. VERSATILITY AND ECONOMY OF OPERATION ARE SAID POSSIBLE WITH ITS USE. (PHS)

03-02-01681 SPECIAL REFUSE CHASSIS DESIGNED BY TRUCK MAKER (COLLECTION(VEHICLE))
REFUSE REMOVAL JOURNAL 2(9), P. 16 (SEPTEMBER 1959). A MOTOR TRUCK MANUFACTURER CONDUCTED A LONG SURVEY RESULTING IN A SPECIALLY DESIGNED CHASSIS FOR REFUSE COLLECTION BODIES. DESIGN DETAILS AND ADVANTAGES ARE DISCUSSED. (PHS)

03-02-01722 EXPERIMENTAL UNIT PROMISES WELL IN DADE COUNTY, FLORIDA (COLLECTION)
REFUSE REMOVAL JOURNAL 3(4), P. 11 (APRIL 1960). A SPECIAL COMBINATION CRANE AND SELF-PACKING TRAILER UNIT IS PROVIDING A LABOR SAVING, FAST, AND ECONOMICAL TRASH PICKUP SERVICE FOR DADE COUNTY, FLORIDA (PHS)

03-02-01725 MANUFACTURER CITES IMPROVED FEATURES OF NEW COMPACTOR (COLLECTION(VEHICLE))
REFUSE REMOVAL JOURNAL 3(2), P. 20 (FEBRUARY 1960). A MANUFACTURING COMPANY CLAIMS VERSATILITY AND LOW COST PER TON-MILE FOR A COMPACTOR WHICH EMPLOYS NEW LOADING AND COMPACTING PRINCIPLES. (PHS)

03-02-01733 AN ENGLISH COMMENT ON MODERN EQUIPMENT (COLLECTION COMPACTION SACK(PAPER) VEHICLE(TRANSFER))
REFUSE REMOVAL JOURNAL 6(1), P. 26 (JANUARY 1963). A DESCRIPTION OF MODERN TRENDS IN REFUSE EQUIPMENT. INCLUDES BRIEF DISCUSSIONS OF THE FOLLOWING EQUIPMENT - REAR-LOADING REFUSE TRUCKS, MULTIPURPOSE VEHICLES, CONTINUOUS LOADING EQUIPMENT, DUSTBIN REFUSE COLLECTION, BULK TRANSPORTATION VEHICLES, COMPACTION PLATE COMPRESSION, TRANSFER DEPOTS, EQUIPMENT WITHIN THE REFUSE VEHICLE MOTORS, AND STREET-CLEANING VEHICLES. (PHS)

03-02-01790 WASTE COLLECTION COST CUT BY PORTABLE BALER (COLLECTION(EQUIPMENT))
REFUSE REMOVAL JOURNAL 6(9), P. 30 (SEPTEMBER 1963). A VENTURA, CALIFORNIA, SALVAGE COMPANY IS USING A LARGE PORTABLE CORRUGATED BALING MACHINE TO REDUCE COSTS OF REFUSE SALVAGING. THE BALER, WHICH CAN BE OPERATED BY ONE MAN, IS TOWED BEHIND A FLAT-BED TRUCK AS IT MAKES ITS ROUNDS OF MARKETS, INDUSTRIAL AND BOTTLING PLANTS, AND OTHER PRODUCERS OF LARGE QUANTITIES OF WASTE. (PHS)

03-02-01797 MEASURE JOB, THEN PURCHASE EQUIPMENT (COLLECTION(VEHICLE))
REFUSE REMOVAL JOURNAL 6(7), P. 20 (JULY 1963). DISCUSSES CONSIDERATIONS WHICH SHOULD BE MADE IN PURCHASING REFUSE COLLECTION EQUIPMENT. TWO NECESSARY ITEMS WHICH SHOULD TAKE PRECEDENCE ARE THE SELECTION OF THE CHASSIS AND SELECTION OF THE REFUSE BODY. LOAD AND GROSS VEHICLE WEIGHT, SPEED AND GRADABILITY OF THE REFUSE TRUCK, AND TURNING RADIUS ARE CONSIDERATIONS IN CHOOSING THE TRUCK CHASSIS, CAPACITY, TYPE OF REFUSE, METHOD OF COLLECTION, MECHANICAL FEATURES, APPEARANCE, SANITATION, AND USABILITY FOR OTHER TYPES OF WORK ARE FACTORS WHICH SHOULD BE TAKEN INTO CONSIDERATION IN THE SELECTION OF THE REFUSE BODY. (PHS)

03-02-01805 WRONG BODY AND CHASSIS COMBINATION MAY HAVE DRASTIC EFFECT ON COSTS (COLLECTION(VEHICLE))
REFUSE REMOVAL JOURNAL 7(12), P. 24 (1964). THE WELL INFORMED BUYER WILL NOT BUY THE CHEAPEST PIECE OF EQUIPMENT JUST BECAUSE IT HAS THE LOWEST SALE VALUE. HE WILL USUALLY COMPARE JOB RATED TRUCK CHASSIS AND COMPACTORS IN ORDER TO REDUCE THE COST OF MAINTENANCE AND LABOR. WHEN EQUIPMENT IS NOT PROPERLY MATCHED, ONE PIECE OR THE OTHER WILL BE OVERLOOKED AND SUBJECTED TO UNUSUAL WEAR AND TEAR WHICH BECOMES AN EXPENSIVE PIECE OF EQUIPMENT.

03-02-01878 VEHICLES IN VARIETY AND QUANTITY FROM KRUPP (COLLECTION-EQUIPMENT)
PUBLIC CLEANSING 53(8), P. 408 (1963). SOME IMPRESSIONS OF A BRITISH COUNTERPART TO A VISIT TO THE KRUPP AUTO WORK IN ESSEN, GERMANY. COMMENTS ARE MADE AS TO THE VARIETY OF BODY STYLES ADAPTED FOR TYPES OF JOBS.

03-02-01892 WHY NOT MAMMOTH COLLECTION VEHICLES (TRANSFER-STATION)
PUBLIC CLEANSING 54(4), P. 843 (1964). WITH THE INCREASED OPPOSITION TO TIPPING SITES NEAR THE CITIES OR RESIDENTAL AREAS, AND THE UNSANITARY REFUSE TRANSFER STATIONS, REFUSE HAULING IS BECOMING A BIG PROBLEM. ACCEPTABLE TIPPING SITES ARE BECOMING MORE DIFFICULT TO ACQUIRE NEAR THE CITY SO IN ORDER TO MEET THE EXTRA COST OF THE EXTRA MILES OF HAULING LARGER VEHICLES ARE NEEDED. COLLECTION VEHICLES WILL HAVE TO BE LARGE ENOUGH TO HANDLE THE DAILY COLLECTIONS AND TO MAKE LONG TRIPS TO THE TIP ONLY ONCE A DAY.

03-02-01893 MODERN VEHICLES AND EQUIPMENT IN GERMANY (COLLECTION)
KAUPERT, W. + TOPE, O.
PUBLIC CLEANSING 54(6), P. 945 (1964). THE AUTHORS SUMMARIZE THE VARIOUS DESIGNS OF VEHICLES AND THE USE FOR WHICH THEY WERE DESIGNED. MR. KAUPERT CONFINED HIS COMMENTS TO THE REFUSE COLLECTION EQUIPMENT AND MR. TOPE TO DUSTLESS STREET CLEANING EQUIPMENT.

03-02-01899 VEHICLE TESTS IN SHEFFIELD (COLLECTION EQUIPMENT)
TROW, J.
PUBLIC CLEANSING 54(7), P. 990 (1964). ON BEING APPOINTED SUPERINTENDENT OF REFUSE COLLECTION A SURVEY OF DIFFERENT TYPES OF REFUSE COLLECTION VEHICLES WAS MADE TO DETERMINE WHICH TYPE WOULD BE BEST SUITED TO SHEFFIELD'S PROGRAM. THE AUTHOR MAKES SOME GENERAL COMMENTS ABOUT THE EQUIPMENT AND HOW THEY ARE SERVING AT SHEFFIELD.

03-02-01942 DEVELOP COMBINATION PACKER (COLLECTION-EQUIPMENT)
REFUSE REMOVAL JOURNAL 9(1), P. 36 (JANUARY 1966). THE GAR WOOD T-100 SERIES REFUSE TRUCKS ARE SELF-CONTAINED UNITS IN DESIGN, OPERATION, AND APPEARANCE. THE PACKER BODY IS AVAILABLE IN 30, 40, AND 50 YD. MODELS WITH VARIOUS COMBINATIONS OF FRONT AND/OR REAR CONTAINER LOADING MECHANISMS.

03-02-01948 SPECIAL UNITS COLLECT MOVIE LOT SAWDUST (COLLECTION-EQUIPMENT)
REFUSE REMOVAL JOURNAL 8(11), P. 10 (NOVEMBER 1965). THREE BROTHERS HEAD UP THE G.I. RUBBISH CO. OF HOLLYWOOD CALIFORNIA WHO EMPLOY ABOUT 300 PEOPLE. THE COMPANY USES 115, 18 YD. TRANSFER BODIES AND ABOUT 2,000, 1 1/2 YD TO 4 YD. CONTAINERS WITH 31 TRUCKS TO HANDLE THE REFUSE OF THEIR CLIENTS. SOME OF THEIR LARGEST ACCOUNTS ARE THE VARIOUS MOVIE INDUSTRY COMPANIES, WHICH REQUIRES SPECIAL TECHNIQUES OF DISPOSING OF STAGE REFUSE. BY FURNISHING THE TYPE OF SERVICE THEIR CLIENTS REQUIRE THEY ARE ABLE TO CONTINUE TO BE IN DEMAND BY THE HOLLYWOOD POPULATION.

03-02-02084 THE BEHAVIOUR OF REFUSE UNDER COMPRESSION AS RELATED TO REFUSE COLLECTION VEHICLES
LEWIS, W. A.
64TH ANNUAL CONF OF THE INSTITUTE OF PUBLIC CLEANSING, HASTINGS, (JUNE 4-8, 1962). AS REFUSE BECOMES LIGHTER AND THE BULK INCREASES, COMPRESSION BY THE COLLECTING VEHICLE ASSUMES GREATER IMPORTANCE IF REASONABLY HEAVY LOADS ARE TO BE CARRIED. COMPRESSION PRESSURES WHICH WILL ENSURE A FINAL DENSITY OF ABOUT 7 CWTS/CU-YD ARE NECESSARY BUT, AS HAS BEEN SHOWN, A PRESSURE OF 6 OR 7 PSI OF COMPRESSION SURFACE IS SUFFICIENT TO ACHIEVE THIS IN ITSELF, ALTHOUGH VERY MUCH HIGHER PRESSURES ARE REQUIRED TO OBTAIN EVEN SMALL REDUCTIONS IN VOLUME AFTER THIS LIMIT HAS BEEN REACHED. TODAY'S COMPRESSION VEHICLES APPLY A FORCE WHICH, IN MOST CASES IS WELL ABOVE THIS FIGURE, TOTAL THRUSTS VARYING FROM 10 TO 30 TONS. THE EXTRA " PUSH " IS REQUIRED IN PACKING THE REFUSE INTO THE VEHICLE, BUT IT APPEARS THAT THE ONLY TYPES WHICH ACHIEVE A UNIFORM DENSITY THROUGHOUT THE LOAD ARE THOSE VEHICLES IN WHICH THE PACKING APPARATUS OPERATES THROUGHOUT THE LENGTH OF THE BODY. IF PRESSURES INCREASE IN THE FUTURE, THIS WILL CERTAINLY HAVE THE ADVANTAGE OF GIVING MORE UNIFORMLY PACKED LOADS, BUT IT IS DOUBTFUL IF HIGHER COMPRESSION RATIOS THAN THOSE NOW OFFERED ARE REQUIRED, OR INDEED, ARE WORTH SEEKING IN VIEW OF THE EXTREMELY HIGH PRESSURES AND HEAVIER VEHICLES WHICH WILL BE NEEDED IN ORDER TO ACHIEVE REDUCTIONS GREATER THAN THE 65 TO 70 PERCENT WHICH IS ATTAINABLE WITH TODAY'S VEHICLES.

03 03 TRANSFER EQUIPMENT AND STATIONS

03-03-00083 REFUSE GIANTS (COLLECTION TRUCK(TRANSFER))
THE AMERICAN CITY 80(5), P. 44 (MAY 1965). IN KING COUNTY, WASHINGTON, GIANT TRAILERS ARE USED FOR HAULING REFUSE FROM TRANSFER STATIONS TO A CENTRAL DISPOSAL SITE. EACH TRAILER CONSISTS OF TWO 20-FT LONG BOXES OF 45-YD CAPACITY EACH, GIVING A TOTAL OF 90 YARD CAPACITY. THE GROSS WEIGHT OF TRACTOR AND SEMI-TRAILER IS 72,000 LB. THE COUNTY HAS 10 OF THESE UNITS. (UC)

03-03-00110 A BIG TRANSFER TRAILER (SANITARY-LANDFILL TRANSFER-STATION VEHICLE(TRANSFER)
SIMMONS, R. G.
THE AMERICAN CITY 81(10), P. 108-109 (OCTOBER 1966). WINTER PARK, FLORIDA, USES TWO LANDFILLS, ONE FOR GARBAGE AND ONE FOR COMBUSTIBLE TRASH. HOWEVER THE HAULING DISTANCE WAS FAR AWAY. IT WAS FOUND THAT ONE-HALF THE COLLECTION DAY WAS SPENT ON TRIPS TO THE LANDFILLS. IN 1961 A 42-YD PACKER WAS BOUGHT WHICH WOULD HANDLE THE REFUSE FROM FOUR 17-YARD COLLECTION PACKERS. USE OF THIS SYSTEM SAVED 40 HOURS PER DAY. LATER A 60-YD PACKER WAS ADDED TO HANDLED THE GREATER VOLUME OF THE COMBUSTIBLE TRASH COLLECTION.

03-03-00123 PREPACKED REFUSE INCREASES PAYLOAD
THE AMERICAN CITY 78(8), P. 82 (AUGUST 1963). DESCRIPTION OF A TRANSFER STATION IN WHICH THE REFUSE IS COMPRESSED INTO A CARTRIDGE WHICH IS THEN EJECTED INTO THE HAULING VEHICLE (MPL SYSTEM). IN THIS MANNER THE TRANSFER TRUCK IS LIGHTER BECAUSE THERE IS NO COMPACTION EQUIPMENT INSTALLED ON IT, AND AS A RESULT THE PAYLOAD IS LARGER.

03-03-00173 HOW TO TRANSFER REFUSE ELEGANTLY (TRANSFER-STATION COMPACTION COST(OPERATING) SANITARY-LANDFILL)
LAUSCH, JACK
THE AMERICAN CITY 83(10), P. 85-87 (OCTOBER 1968). A REFUSE TRANSFER STATION IN LANCASTER, PA. IS DESCRIBED. HAULING DISTANCE TO THE LANDFILL IS 17 MILES AND 65 TON TRANSFER TRUCKS ARE USED. TWO REFUSE COMPACTORS ARE USED TO LOAD THE TRANSFER TRUCKS. CAPACITY IS ABOUT 300 TONS PER DAY. CHARGES AT THE STATION ARE ON A WEIGHT BASIS.

03-03-00238 TRANSFER STATION SHRINKS THE DEAD HAUL (QUANTITY)
VONDRAK, G. H.
THE AMERICAN CITY 83(2), P. 100 (FEBURARY 1968). A TRANSFER STATION AT DEARBORN, MICHIGAN, HAS BEEN BUILT TO CUT DOWN ON VEHICLE TRIPS TO THE DISPOSAL SITE. PRIOR TO BUILDING THE STATION ABOUT 60 TO 65 TRIPS TO THE LANDFILL. NOW, USING 60 YARD COMPACTION TRAILERS THE NUMBER OF TRIPS HAS BEEN CUT TO 15, AND THE COLLECTION VEHICLES DO NOT HAVE TO MAKE THE 26-MILE TRIP TO THE LANDFILL AND BACK.

03-03-00502 TRANSFER STATION SAVES SANTA MONICA $60,000 (SANITARY-LANDFILL COST(OPERATING) COLLECTION)
KING, M. M.
REFUSE REMOVAL JOURNAL 5(11), P. 10 (NOVEMBER 1962). DESCRIBES THE UNIQUE REFUSE TRANSFER STATION IN SANTA MONICA, CALIFORNIA. INCREASING INCINERATION COSTS, THE SMOG PROBLEM, AND THE OPENING OF THE MISSION CANYON SANITARY LANDFILL PROMPTED THE CITY TO CHANGE ITS REFUSE DISPOSAL METHOD FROM INCINERATION TO LANDFILLING AND TO BUILD THE TRANSFER STATION. TOTAL INITIAL COST OF THE TRANSFER STATION AND ACCESSORY EQUIPMENT WAS $98,000, BUT DISPOSAL COSTS HAVE BEEN REDUCED FROM $4.10 TO $2.40 PER TON OF REFUSE. ANOTHER ADVANTAGE OF THE NEW SYSTEM IS THAT COMBINED COLLECTION OF REFUSE CAN NOW BE MADE. (PHS)

03-03-00551 MODERN WEIGHING METHODS SPEED REFUSE DISPOSAL (TRANSFER(EQUIPMENT))
GRINDROD, J.
PUBLIC WORKS 94(1), P. 74 (JANUARY 1963). THE WANDSWORTH BOROUGH COUNCIL IN LONDON HAS INSTALLED A WEIGHING INFORMATION SYSTEM WHICH RECORDS AND ANALYZES DETAILS OF VEHICLES EMPTYING THEIR LOADS AT A REFUSE TRANSFER STATION. ANALYSIS OF THE TONNAGE RECORD IS USED AS AN ULTIMATE DISPOSAL POINT, AND FOR THE CHARGES MADE BY THE COUNCIL TO PRIVATE PERSONS OR COMPANIES WHO USE THE TRANSFER STATION FACILITIES. THE WEIGHBRIDGE INDICATOR HAS BEEN ADAPTED BY INCORPORATING A SPECIALLY DESIGNED CODING SWITCH TO TRANSPOSE THE ANGULAR POSITION OF THE PRINTER INTO DIGITAL FORM. AN INTERNAL MASTER RECORD AND A PUNCHED TAPE ARE PROVIDED. BOTH ARE REMOVED DAILY. (UC)

03-03-00579 TRANSFER STATIONS REPLACE LIMITED MAINTENANCE DUMPS (COST(CAPITAL) REGIONAL)
KAROLEVITZ, B.
PUBLIC WORKS 94(4), P. 91-94 (APRIL 1963). REFUSE DISPOSAL IMPROVEMENT PROGRAM WHICH REPLACES MULTIPLE DUMP SITES WITH SINGLE PRIMARY DISPOSAL AREA AND PROVIDES SERIES OF TRANSFER STATIONS NEAR POPULATION CENTERS CONDUCTED IN KING COUNTY, WASHINGTON IS DESCRIBED. SIDE-DUMP TRAILERS ARE USED IN DISPOSAL WORK, PORTABLE RAMPS PREVENT TRAILERS FROM RUNNING OVER LOAD BEING DUMPED. (EI)

03-03-00700 SEVENTH TRANSFER OPERATION SINCE 1959 OPENS IN SEATTLE
REFUSE REMOVAL JOURNAL 10(2), (FEBRUARY 1967). SEVEN TRANSFER STATIONS ARE CURRENTLY USED IN SEATTLE. ONE LARGE SANITARY LANDFILL AND FOUR OPEN DUMPS ARE USED FOR DISPOSAL.

03-03-00909 REFUSE COMPRESSION AT TRANSFER STATIONS (MPL VOLUME-REDUCTION)
PUBLIC CLEANSING 53(3), P. 109 (MARCH 1963). DESCRIBES THE NEW MPL REFUSE TRANSFER SYSTEM DEVELOPED BY A BRITISH FIRM. HEART OF THE SYSTEM IS A GIANT CYLINDRICAL PRESS, CONTAINING TWO ADJOINING SECTIONS - A CHARGING CHAMBER, AND A COMPRESSION CHAMBER 7-FT IN DIAMETER WITHIN WHICH A CLOSE-FITING PISTON OPERATES. REFUSE IS DUMPED AT THE TRANSFER STATION ON A PLATFORM LOCATED ABOVE THE PRESS BODY. A SLIDING DOOR CLOSES THE HATCH AND A PISTON MOVEMENT TRANSFERS THE REFUSE INTO THE COMPRESSION CHAMBER WHERE IT IS COMPACTED UNDER EXTREMELY HIGH PRESSURE. SEVERAL CHARGES ARE NEEDED TO FILL THE CHAMBER. THE REFUSE IS COMPACTED INTO A CARTRIDGE WEIGHING UP TO 14 TONS WHICH IS THEN PUSHED INTO A SPECIALLY DESIGNED CYLINDRICAL VEHICLE FOR TRANSFER TO THE DISPOSAL SITE. THE PLANT IS EQUIPPED WITH A CONTROL CABIN IN WHICH THE WEIGHT AND LENGTH OF THE REFUSE CARTRIDGE BEING FORMED ARE CAREFULLY OBSERVED. THE TIME TAKEN TO PRODUCE ONE CARTRIDGE AND TRANSFER IT TO THE VEHICLE AVERAGES ABOUT 40 MINUTES. GIVES VITAL STATISTICS OF THE PRESS UNIT AND TRANSPORT VEHICLE. (PHS)

03-03-00917 BULK TRANSPORT CONSIDERATIONS
PUBLIC CLEANSING 53(6), P. 266 (JUNE 1963). A GENERAL DISCUSSION OF THE DEVELOPMENT, PRESENT STATUS, AND FUTURE POSSIBILITIES IN THE BULK TRANSPORTATION OF REFUSE. A JOINT DISPOSAL SCHEME INTRODUCED BY EAST HAM, ILFORD, WEST HAM, AND BARKING WAS PROBABLY THE FIRST RECORDED INSTANCE OF THE USE OF THE BULK TRANSPORT VEHICLE FOR THE TRANSPORT OF REFUSE COMPARATIVELY LONG DISTANCES. A FUTURE DEVELOPMENT MAY BE THE USE OF HUGE TRAILERS, PERHAPS 60 FEET IN LENGTH AND WITH A MAXIMUM WIDTH, FOR HAULING REFUSE ON SCHEDULED ROUTES DURING THE NIGHT HOURS. (PHS)

03-03-00995 DENVER TRANSFER STATION HANDLES 30 CITY PACKER TRUCKS DAILY (COST(COLLECTION) QUANTITY)
REFUSE REMOVAL JOURNAL 9(11), P. 8 (NOVEMBER 1966). FOUR 60-YD TRANSFER TRAILERS CAPABLE OF HOLDING 3-4 COLLECTION LOADS CONSTITUTE THE TRUCKING EQUIPMENT. THEY MAKE FROM 8 TO 10 TRIPS PER DAY TO THE DISPOSAL SITE. THE DISTANCE TO THE DISPOSAL SITE IS 10 MILES. THE COLLECTION COSTS FOR THE DENVER MUNICIPALITY ARE $8.43 PER TON OR $2.11 PER CU YD OF COMPACTED REFUSE. THE BASIS OF THE COSTS IS THREE MEN PER TRUCK AT TWO TRIPS PER DAY AND 5 TONS PER TRIP. COLLECTION COSTS FOR COMMERCIAL HAULERS ARE $7.98 PER TON OR $2.00 PER CU YD COMPACTED REFUSE. THE BASIS IS 2 MEN PER TRUCK AT 3 TRIPS PER DAY AND 5 TONS PER TRIP. AT THE TRANSFER STATION LIBERAL USE IS MADE OF HYDRAULICALLY OPERATED DOORS. TRANSFER IS MADE FROM THE COLLECTION TRUCK TO THE TRANSFER TRUCK WITH A MINIMUM OF DUST AND DEBRIS. ALL CONTROLS ARE TIED TO ONE SYSTEM, WHICH IS CONTROLLED BY A SINGLE OPERATOR. THE STATION IS DESIGNED TO HANDLE 145,000 CU YD OF COMPACTED REFUSE PER YEAR. THE OPERATION COSTS ARE $0.11 PER CU YD. THIS COVERS AMORTIZATION, SALARIES FOR TWO MEN, AND EQUIPMENT MAINTENANCE. (UC)

03-03-01017 NOVEL REFUSE TRANSFER STATION (SANITARY-LANDFILL ECONOMICS COMPACTION)
BUNDY, G.
THE AMERICAN CITY 76(6), P. 122 (JUNE 1961). A DESCRIPTION OF THE NEW CONCRETE REFUSE TRANSFER STATION IN SANTA MONICA, CALIFORNIA. REFUSE IS TRANSFERRED FROM THE COLLECTING VEHICLES TO LARGE TRAILER TRUCKS FOR HAULING TO THE MISSION CANYON SANITARY FILL. THE STATION IS EQUIPPED WITH ITS OWN DEVICE TO COMPACT REFUSE IN THE TRAILER TRUCKS. CONVERSION FROM INCINERATION TO THIS NEW REFUSE TRANSFER AND DISPOSAL SYSTEM SAVES THE CITY $5,000 A MONTH. (PHS)

03-03-01210 LOS ANGELES' ANSWER TO THE LONG HAUL PROBLEM (SANITARY-LANDFILL TRANSFER-STATION COST(OPERATING))
BOWERMAN, F. R.
THE AMERICAN CITY 73(10), P. 132 (OCTOBER 1958). THE LOS ANGELES COUNTY BAN ON HOME INCINERATORS CAUSED THE NEED FOR THE CONSTRUCTION AND OPERATION OF COUNTY SANITARY LANDFILLS AND TRANSFER STATIONS. THE DETAILS OF THE DISTRICT PROGRAM, WHICH FOLLOWED A COMPREHENSIVE STUDY, ARE GIVEN. (PHS)

03-03-01239 CONVERTED INCINERATOR MAKES EXCELLENT TRANSFER STATION (COLLECTION)
MARQUEZ, A.
THE AMERICAN CITY 73(12), P. 73 (DECEMBER 1958). TENAFLY'S NEW GARBAGE DISPOSAL OPERATION RESULTS IN BETTER SERVICE AT LESS COST. THE 1938 INCINERATOR WAS CONVERTED INTO A TRANSFER STATION. LANDFILL DISPOSAL BEGAN. THE SUCCESS OF THE NEW SYSTEM IS DISCUSSED ALSO IN TERMS OF BETTER SERVICE. (PHS)

03-03-01318 19 MILES NOT TOO LONG FOR TOULON (BULK-TRANSPORTATION)
PUBLIC CLEANSING 55(2), P. 75-78 (1965). THE NEED TO HAUL REFUSE LONGER DISTANCES HAS BROUGHT ABOUT A REVOLUTION IN EQUIPMENT TYPES TO MEET THE DEMAND. A DESCRIPTION OF A LONG HAUL SYSTEM IN TOULON, FRANCE IS MADE, AS TO HOW THEY INCREASED THE SIZE OF EQUIPMENT FOR LARGER PAY LOADS YET ABIDING BY LOCAL LOAD LIMITS PLACED ON THE ROADS.

03-03-01466 A 40-YARD TRANSFER TRUCK-AND-TRAILER (TRANSFER-STATION)
GUIDER, C. H.
THE AMERICAN CITY 72(3), P. 15 (MARCH 1957). DETROIT HAS DEVELOPED AN EFFICIENT WAY TO RELAY REFUSE TO OUTLYING DISPOSAL POINTS 28 MILES AWAY BY USE OF 40 CU-YD TRANSFER TRUCKS AND TRAILERS. THEY PREVIOUSLY USED 28 CU-YD SEMI-TRAILERS. (PHS)

03-03-01705 MAMMOTH NEW TRAILER TO MAKE BOW ON MARKET (TRANSFER-EQUIPMENT)
REFUSE REMOVAL JOURNAL 3(8), P. 28 (AUGUST 1960). A NEW 60-CUBIC-YARD TRAILER FOR REFUSE HANDLING HAS RECENTLY APPEARED ON THE MARKET. FEATURES INCLUDE A PACKER PLATE THAT TRAVELS IN BOTH DIRECTIONS FROM THE CENTER OF THE TRAILER'S CYLINDRICAL BODY AND EXERTS 75,000 POUNDS OF PACKING PRESSURE, AND UNLOADING DOORS AT BOTH ENDS OF THE BODY. (PHS)

03-03-01712 FORT WORTH, TEXAS, ADOPTS LARGE TRAILER METHOD (TRANSFER-EQUIPMENT)
REFUSE REMOVAL JOURNAL 3(7), P. 18 (JULY 1960). THE CITY OF FORT WORTH, TEXAS, HAS PUT INTO OPERATION A GIANT CLOSED GARBAGE COLLECTION TRAILER WHICH HOLDS THREE TIMES AS MUCH AS A SMALLER COLLECTION BODY AND REDUCES THE NUMBER OF TRIPS TO THE DUMP. (PHS)

03-03-01731 ENGINEER DISCUSSES THE CITY TRANSFER STATION (COST(DISPOSAL) SANITARY-LANDFILL)
BOWERMAN, F. R.
REFUSE REMOVAL JOURNAL 6(1), P. 10 (JANUARY 1963). A DISCUSSION OF THE REFUSE TRANSFER STATION OPERATED BY THE LOS ANGELES COUNTY SANITATION DISTRICT. AT THE STATION, COLLECTION TRUCKS DUMP THEIR LOADS DIRECTLY INTO NONPACKING TRAILERS HAVING A CAPACITY OF 60 CU-YDS EACH. TWO TRAILERS ARE HAULED IN TANDEM BY EACH TRUCK TRACTOR, 22 MILES TO THE LANDFILL SITE. HERE REFUSE IS PULLED OUT OF THE TRAILER BODIES THROUGH A CABLE PULLOFF SYSTEM. (PHS)

03-03-01851 ODORS CURTAILED AT TRANSFER POINT CLOSE TO CAPITOL HILL (TRANSFER-STATION SANITARY-LANDFILL ODOR COLLECTION QUANTITY)
ROEDER, W. F.
REFUSE REMOVAL JOURNAL 8(7), P. 14 (1965). THE LACK OF SUITABLE LANDFILL SITES CLOSE TO THE CENTER OF THE CITY WHERE MOST OF THE REFUSE IS COLLECTED HAS PROMPTED WASHINGTON, D.C., TO BUILD REFUSE TRANSFER STATIONS TO ECONOMIZE ON TRANSPORTATION. ALONG WITH THE TRANSFER STATION ARE THE OBJECTIONABLE ODORS ASSOCIATED WITH IT. A DESCRIPTION IS GIVEN OF THE MODERN ENCLOSED TRANSFER STATION ALONG WITH EQUIPMENT COSTS, WASTE PRODUCTION, WASTE TYPES.

03-03-02125 THE COMPACTION OF REFUSE FOR BULK TRANSPORTATION (TRANSFER-STATION BALING)
BROWN, G. J.
62ND ANNUAL CONF OF THE INSTITUTE OF PUBLIC CLEANSING, (JUNE 14-17, 1960). THIS IS A REVIEW OF WAYS AND MEANS OF REDUCING THE BULK-WEIGHT RATIO OF THAT PORTION OF MUNICIPAL REFUSE WHICH WOULD, AFTER REMOVING SALEABLE SALVAGE, BE LOADED IN BULK TRANSFER TO THE FINAL SITE BY ROAD, RAIL, OR WATER BARGE. SOME OF THE ADVANTAGES OF COMPACTION ARE FEWER VEHICLES, FEWER MILES DRIVEN, LOWER MAINTENANCE COST, SMALLER VEHICLES, AND LESS TRAFFIC CONGESTION.

03 04 COLLECTION CONTAINERS

03-04-00121 TOTE BARRELS (COLLECTION)
COLTRELL, W. F. + YOUNG, K. E.
THE AMERICAN CITY 78(5), P. 117-118 (MAY 1963). WHEN MIDDLETOWN, OHIO, ELIMINATED THE FEE FOR REFUSE COLLECTION THE NUMBER OF CUSTOMERS INCREASED 62 PERCENT BUT IMPROVED COLLECTION TECHNIQUES HELD CREW INCREASES TO 20 PERCENT BY THE USE OF TOTE BARRELS. USE OF THE BARREL ELIMINATES NEED TO CARRY CAN FROM HOUSE TO STREET AND BACK.

03-04-00152 FLYLESS REFUSE COLLECTION (RODENT INSECT CAN(GARBAGE) SACK(PAPER) LAW)
SMITH, C. D.
THE AMERICAN CITY 78(12), P. 81-82 (1963). IMPROPERLY STORED HOUSEHOLD WASTES CREATE MORE THAN SIMPLY DISAGREEABLE ODORS AND UNSIGHTLINESS. THEY PROVIDE BREEDING AREAS FOR FLIES, OTHER INSECTS, AND RATS. THE CITY CAN DO MUCH TO OVERCOME THIS PROBLEM BY PASSING A GOOD REFUSE-STORAGE ORDINANCE AND ENFORCING IT.

03-04-00180 BULK STORAGE AND MECHANIZED COLLECTION OF COMBINED REFUSE
FEHN, C. F. + HALL, J. O. + ROSENTHAL, M. + CAIN, J. R. + RIGSBY, J. H. + FARMER, H.
PUBLIC WORKS 95(9), P. 130-131 (SEPTEMBER 1964). BULK STORAGE AND MECHANIZED COLLECTION SYSTEMS OF REFUSE HAVE PROVED TO BE ECONOMICAL AS WELL AS PRACTICAL FOR COMMERCIAL, INDUSTRIAL AND PUBLIC HOUSING AREAS. THE LARGE VOLUMES OF REFUSE GENERATED AT RECREATION PARKS, COMMUNITY EVENTS SUCH AS FAIRS, BALL GAMES, RODEOS, MAY BE HANDLED ADEQUATELY, HOWEVER, THERE ARE SOME DISADVANTAGES SUCH AS KEEPING LOADING DOORS CLOSED TO PREVENT THE BREEDING OF FLIES. WITH SOME EFFORT ON THE PART OF THE USERS AND SOME IMPROVEMENT BY THE MANUFACTURER THE DISADVANTAGES MAY BE OVERCOME. (EI)

03-04-00395 HEAVY INDUSTRY SERVED BY BIG CONTAINER IDEA (COLLECTION)
REFUSE REMOVAL JOURNAL 5(6), P. 12 (JUNE 1962). DESCRIBES THE DEVELOPMENT AND EXPANSION OF A COMMERCIAL REFUSE HAULING FIRM IN CHICAGO, ILL. ESTABLISHED IN 1914, THIS COMPANY NOW USES THE LARGE, DETACHABLE CONTAINER SYSTEM TO SERVE INDUSTRIAL ACCOUNTS WITHIN A 30-MILE RADIUS OF THE CITY. THE FIRM'S CUSTOMERS HAVE FOUND MANY ADVANTAGES TO THE SYSTEM, INCLUDING A REDUCTION IN REFUSE COLLECTION COSTS AND IN INTERNAL HANDLING OF WASTE. THIRTY-TWO CONTAINERS OF 15- AND 20-CUBIC- YARD CAPACITIES AND THREE HOISTS ARE BEING EMPLOYED AT THE PRESENT BY THE REFUSE HAULING COMPANY. WITH THIS EQUIPMENT AN AVERAGE OF 400 TONS OF REFUSE ARE PICKED UP DAILY. (PHS)

03-04-00416 CONTAINERS AND PLANNING AID DELAWARE CONTRACTOR (COLLECTION)
REFUSE REMOVAL JOURNAL 5(8), P. 6 (AUGUST 1962). INSTALLATION OF THE CONTAINERIZED SYSTEM AND CAREFUL COLLECTION ROUTE PLANNING HAVE AIDED A WILMINGTON, DEL., REFUSE CONTRACTOR IN OPERATING AN EFFICIENT AND SANITARY BUSINESS. THE APPEARANCE OF A MODERN GARDEN APARTMENT BUILDING WHICH THE CONTRACTOR SERVES HAS BEEN GREATLY IMPROVED BY THE REPLACEMENT OF 254 UNSIGHTLY GARBAGE CANS WHICH HAD BEEN SCATTERED ABOUT THE APARTMENT GROUNDS, WITH 50 RELATIVELY ATTRACTIVE REFUSE CONTAINERS. THE CONTRACTOR ALSO SERVICES AN ADDITIONAL THIRTY 1- AND 2-CUBIC-YARD CONTAINERS AT VARIOUS OTHER ACCOUNTS. THROUGH CAREFUL PLANNING, THE CONTRACTOR IS ABLE TO MAKE PICKUPS AT THE PRECISE TIME MOST CONTAINERS HAVE THEIR MAXIMUM LOADS AND IS ABLE TO MAKE THE LAST PICKUP ONLY MINUTES AWAY FROM THE DISPOSAL AREA. (PHS)

03-04-00662 URGE EMPLOYING OF PLASTIC BINS AND CONTINUOUS-LOADING VEHICLES (COLLECTION SACKS(PAPER))
SOLID WASTES MANAGEMENT/RRJ 11(2), P. 47 (FEBRUARY 1968). A REPORT PREPARED BY THE LONDON, ENGLAND DEPARTMENT OF PUBLIC HEALTH ENGINEERING SUGGESTS THAT MAKING LOCAL AUTHORITIES RESPONSIBLE FOR PROVIDING STANDARDIZED PLASTIC BINS WOULD RESULT IN INCREASED COLLECTION EFFICIENCY. THE USE OF CONTINUOUS VEHICLES ALSO INCREASES EFFICIENCY. DISPOSABLE SACKS FOR COLLECTION REDUCE COLLECTION COSTS ABOUT 20 PERCENT.

03-04-00701 LEVITTOWN GARBAGE CANS " SMELL LIKE A LILY " (ODOR(CAN))
THE AMERICAN CITY 74(2), P. 89 (FEBRUARY 1959). DURING A MONTH-LONG TEST, HOMEOWNERS IN LEVITTOWN, NEW YORK, WERE SO ENTHUSIASTIC OVER FLORAL-SCENTED, SANITIZING SPRAY THAT THE ENTIRE FLEET OF COLLECTION TRUCKS WILL BE SO EQUIPPED BY THE SPRING OF 1960. ESTIMATED COST OF INSTALLATION OF SPRAYING EQUIPMENT- $50-100 PER YEAR, YEARLY COST OF CHEMICALS- $1,000. (PHS)

03-04-01020 PLASTIC BARRELS SAVE MONEY ON REFUSE COLLECTION (ECONOMICS)
PUBLIC WORKS 92(5), P. 186 (MAY 1960). THE CONVERSION FROM THE CONVENTIONAL SET-OUT AND SET-BACK REFUSE COLLECTION SYSTEM TO A PLASTIC BARREL SYSTEM HAS SAVED THE NEW ROCHELLE, NEW YORK, SANITATION DEPARTMENT $50,000 IN LABOR COSTS ANNUALLY. THE BARRELS HAVE 55-GALLON CAPACITIES AND WEIGH ONLY 7 POUNDS. (PHS)

03-04-01146 CONTAINERIZATION
SHAYNE, P. E.
PROC OF THE NATIONAL CONF ON SOLID WASTE RESEARCH, AM PUBLIC WORKS ASSOC, CHICAGO, ILLINOIS, P. 80-84 (DECEMBER 1963). THE NUMBER ONE PROBLEM IN THE CONTAINER INDUSTRY TODAY IS CLEANING THE CONTAINERS. ACTUALLY LOCAL HEALTH DEPARTMENT AUTHORITIES HOLD THE CUSTOMER RESPONSIBLE FOR KEEPING THE TRASH CONTAINERS ON HIS PREMISES IN A SANITARY CONDITION, BUT THE CUSTOMER DEMANDS THIS SERVICE OF HIS TRASH REMOVAL CONTRACTOR. BECAUSE OF THE MANPOWER AND TIME IT TAKES, CLEANING CONTAINERS RAISES THE COST. COLLECTION TRUCKS, BECAUSE THEY REPRESENT SUCH A BIG INVESTMENT, HAVE TO TAKE IN ABOUT $30.00 AN HOUR (PRODUCTIVE TIME), OR 50 CENTS A MINUTE. IT TAKES ABOUT 5 MINUTES TO CLEAN THE CONTAINER. THAT COSTS $2.50.

03-04-01192 GOOD REFUSE CONTAINERS COME FIRST (VECTOR PEST)
RAMKAR, D. F.
THE AMERICAN CITY 73(5), P. 174 (MAY 1958). CONTROL OF INSECTS AND RODENTS THROUGH IMPROVED SANITATION PRACTICES, BEFORE ACUTE CONDITIONS ARISE AND WITHOUT THE IMPOSITION OF TAX INCREASES, IS THE COOPERATIVE GOAL OF THE HAMMOND, INDIANA HEALTH DEPARTMENT, THE U. S. PUBLIC HEALTH SERVICE, AND THE INDIANA STATE BOARD OF HEALTH. THE FIRST STEP IN THE PROGRAM WAS A " GARBAGE CAN SELLING CAMPAIGN ". A LONG-RANGE VECTOR CONTROL PLAN HAS ALSO BEEN DEVELOPED. (UC)

03-04-01260 COLLECTION OF INDUSTRIAL WASTE AT GREENOCK (COLLECTION CONTAINERS)
PUBLIC CLEANSING 58(6), P. 265-266 (1968). THE BURGH OF GREENOCK EMBARKED UPON A PROGRAM WHEREBY IT WOULD FURNISH CLOSED CONTAINERS TO INDUSTRIALISTS IN WHICH TO DISPOSE THEIR WASTES. AFTER MUCH EFFORT ON THE PART OF THE CLEANING OFFICIALS AN OUTLAY OF 16,000 POUNDS FOR 42 CONTAINERS AND 3,000 POUNDS FOR OPERATING EXPENSE THEY WERE IN BUSINESS. A CHARGE WAS EVENTUALLY SET UP TO DEFRAY THE COST OF THE OPERATION AND TO PAY FOR THE CONTAINER. THE OPERATION HAS PROVEN TO BE VERY POPULAR WITH INDUSTRY. THE NUMBER OF UNITS IN USE HAS INCREASED FROM 42 TO 70 IN ONLY SIX MONTHS.

03-04-01371 FLY-RODENT-DOG PROOF GARBAGE CONTAINER
CROSS, M. H.
J ENVIRONMENTAL HEALTH 26(5), P. 321-323 (MARCH-APRIL 1964). ALTHOUGH THE APPARATUS DESCRIBED IS AN EXPERIMENTAL MODEL, IT IS BELIEVED TO OFFER AN INEXPENSIVE METHOD OF INCORPORATING THE 55-GAL OIL DRUM INTO AN ACCEPTABLE CONTAINER OF GARBAGE AND REFUSE. THIS APPARATUS WAS DESIGNED FOR USE IN MIGRANT FARM LABOR CAMPS, BUT IT IS HOPED THAT ITS USEFULNESS WILL NOT BE SO LIMITED. LITTER BARRELS AND GARBAGE RECEPTACLES ALONG OUR HIGHWAYS MIGHT ALSO USE THIS OR A SIMILAR DEVICE RATHER THAN REMAIN UNCOVERED. (PHEA)

03-04-01401 BULK STORAGE AND MECHANIZED COLLECTION OF COMBINED REFUSE (COST(COLLECTION))
FEHN, C. F. + HALL, J. O. + ROSENTHAL, M. + CAIN, J. R. + RIGSBY, J. H. + FARMER, H.
PUBLIC HEALTH REPORT 79, P. 413-416 (MAY 1964). SYSTEMS FOR BULK STORAGE AND MECHANIZED COLLECTION OF REFUSE HAVE PROVED EFFECTIVE AND ECONOMICAL FOR USE IN COMMERCIAL, INDUSTRIAL, AND PUBLIC HOUSING AREAS. THEY ALSO HAVE APPLICATION FOR ELIMINATION OF ACCUMULATIONS OF BULK REFUSE AT PARKS, ROADSIDE REST STOPS, AND OTHER RECREATIONAL SITES. WITH CONTINUED IMPROVEMENT AND MODIFICATION, THESE SYSTEMS MAY HAVE EVEN WIDER APPLICATION INCLUDING SERVICE FOR RESIDENTIAL AREAS. IT IS, THEREFORE, RECOMMENDED THAT MANUFACTURERS CONSIDER THE FOLLOWING IMPROVEMENTS- (1) PROVISION OF SIDE-LOADING DOORS OF HEAVY-GAUGE METAL ON ALL BULK-STORAGE CONTAINERS, (2) DEVELOPMENT OF SELF CLOSING DEVICES FOR CONTAINER DOORS, (3) MODIFICATION OF DOOR DESIGN TO MAKE CONTAINERS INSECT AND RODENT PROOF, (4) DEVELOPMENT OF A PRACTICAL MECHANICAL METHOD OF CLEANING BULK CONTAINERS AT THE STORAGE POINT, (5) LOWERING OF THE NOISE LEVEL CAUSED BY THE EMPTYING PROCESS, AND (6) PROVISION OF A MEANS TO SERVICE BULK CONTAINERS PLACED IN CONFINED AREAS. (PHEA)

03-04-01408 WE ARE TRYING A KING-SIZED TRUCK (COLLECTION-EQUIPMENT)
GRAYDON, S. W.
THE AMERICAN CITY 71(2), P. 125 (FEBRUARY 1956). ATLANTA, GEORGIA REPORTS ON THE USE OF LARGE PORTABLE CONTAINERS IN CONJUNCTION WITH A SPECIALLY DESIGNED 32 CU-YD COMPACTOR TYPE SEMI-TRAILER FOR REDUCING THE COST OF HAUL TO THE DISPOSAL AREA. (PHS)

03-04-01413 OAKLAND PARKS USE CARDBOARD TRASH CONTAINERS
THE AMERICAN CITY 71(5), P. 27 (MAY 1956). A BRIEF REPORT ON THE OAKLAND, CALIFORNIA, PARK DEPARTMENT'S USE OF LIGHT WEIGHT COLORFUL CARDBOARD TRASH CONTAINERS. THE CONTAINERS ARE PLACED IN A METAL FRAME. THEY ARE USUALLY IN USE THREE OR FOUR WEEKS BEFORE REQUIRING REPLACEMENT. (PHS)

03-04-01417 BIG CONTAINERS, BETTER COLLECTION
BARNES, W. P.
THE AMERICAN CITY 71(5), P. 114 (MAY 1956). AN ACCOUNT OF AUGUSTA, GEORGIA'S PROGRAM TO MODERNIZE THEIR REFUSE COLLECTION AND DISPOSAL METHODS. STARTING IN 1953, THE SANITARY LANDFILL METHOD WAS INSTITUTED AND COMPACTOR-TYPE COLLECTION VEHICLES WERE OBTAINED. LARGE PORTABLE-TYPE CONTAINERS WERE FOUND ESPECIALLY USEFUL IN COMMERCIAL AREAS. (PHS)

03-04-01565 TWO FIRMS MARKET CONTAINERS (COLLECTION(CONTAINER))
REFUSE REMOVAL JOURNAL 1(3), P. 12 (MARCH 1958). TWO NEW DETACHABLE REFUSE CONTAINER SYSTEMS FOR USE WITH PACKER TRUCKS. BOTH FEATURE TAILGATE LOADING.

03-04-01583 CONTAINER SYSTEM SOLVES DOUGLAS PLANT'S PROBLEM (COLLECTION(CONTAINER))
REFUSE REMOVAL JOURNAL 1(6), P. 26 (JUNE 1958). MOBILE ATTACHABLE CONTAINERS AND PACKER TRUCKS PROVIDE LOW- COST, COMBUSTIBLE REFUSE REMOVAL SERVICE IN AIRCRAFT FACTORY IN SANTA MONICA, CALIFORNIA. FURTHER SAVINGS WERE MADE BY CONVERTING TRUCK ENGINE FROM GASOLINE TO PROPANE AND USING A 5-HORSEPOWER ELECTRIC MOTOR WHENEVER POSSIBLE IN PLACE OF THE POWER TAKEOFF MECHANISM TO LOAD THE TRUXK. (PHS)

03-04-01599 VERY LARGE CONTAINERS ARE DEFINITE NEW TREND (COLLECTION(CONTAINER))
REFUSE REMOVAL JOURNAL 1(8), P. 24 (AUGUST 1958). THE OPERATION OF A COMMERCIAL SYSTEM USING CONTAINERS WITH A CAPACITY OF UP TO 40 CU-YDS IS DESCRIBED. (PHS)

03-04-01608 GALVANIZED WARE COUNCIL BOOSTS RIGHT CONTAINERS
REFUSE REMOVAL JOURNAL 1(10), P. 8 (OCTOBER 1958). HOW THIS MANUFACTURER TRADE ASSOCIATION WORKS WITH GOVERNMENTAL OFFICIALS AND PRIVATE CONTRACTORS TO PROMOTE THE USE OF GALVANIZED STEEL REFUSE CONTAINERS WITH CLOSE-FITTING COVERS. (PHS)

03-04-01611 NEW LINE'S ENGINEERING DEVELOPED IN PAST YEAR (HAULING)
REFUSE REMOVAL JOURNAL 1(10), P. 13 (OCTOBER 1958). A COMMERCIAL SYSTEM OF MATERIALS HANDLING IS REVIEWED. DETACHABLE CONTAINERS, IN CAPACITIES TO 40 CU-YDS AND 30,000 POUND NET PAYLOADS, ARE LOADED ONTO THE TRUCK AND UNLOADED AUTOMATICALLY. (PHS)

03-04-01612 INVENTIVENESS WINS FOR KANSAS CITY CONTRACTOR (COLLECTION(COMMERCIAL))
REFUSE REMOVAL JOURNAL 1(11), P. 7 (NOVEMBER 1958). AN ENTERPRISING PRIVATE CONTRACTOR MODIFIES DETACHABLE CONTAINER SYSTEM TO SERVE THE SPECIAL NEEDS OF LARGE INDUSTRIES. (PHS)

03-04-01621 REFUSE HOPPER DESIGNED FOR DOCK-LEVEL DUMPING (COLLECTION)
REFUSE REMOVAL JOURNAL 1(12), P. 14 (DECEMBER 1958). A NEW GRAVITY DUMP REFUSE CONTAINER HAS BEEN INTRODUCED TO SOLVE DOCK-LEVEL REFUSE HANDLING PROBLEMS WHERE OTHER ATTACHABLE CONTAINERS CANNOT BE EFFECTIVELY USED. (PHS)

03-04-01657 THE EVOLUTION OF A NEW REFUSE COLLECTION HELPER (COLLECTION(CONTAINER))
REFUSE REMOVAL JOURNAL 2(8), P. 10 (AUGUST 1959). THE TRIAL AND ERROR METHOD ENABLED A LONG ISLAND CHEMICAL FIRM TO PRODUCE A USEFUL NEW COLLECTION CONTAINER. THE CONTAINER SIMPLIFIES BACKYARD COLLECTIONS BY REDUCING NUMBER OF TRIPS TO TRUCK THROUGH GREATLY LESSENED WEIGHT AND INCREASED CAPACITY. (PHS)

03-04-01662 CONTAINER SYSTEM HELPS OAK PARK BETTER SERVICE (COLLECTION(CONTAINER))
REFUSE REMOVAL JOURNAL 2(8), P. 12 (AUGUST 1959). THE CITY OF OAK PARK, MICHIGAN, HAS INCREASED REFUSE COLLECTION FREQUENCY AND REDUCED COST THROUGH THE USE OF LEACH ATTACHABLE CONTAINERS. A LARGE REDUCTION IN NECESSARY MAN-HOURS HAS ALSO OCCURRED. (PHS)

03-04-01675 CONTAINERS BETTER CARO, MICHIGAN, BUSINESS CENTER (COLLECTION(CONTAINER))
REFUSE REMOVAL JOURNAL 2(10), P. 14 (OCTOBER 1959). CARO, MICHIGAN, HAS RECENTLY DISCARDED EIGHT BACK-ALLEY INCINERATORS FOR CONTAINER SYSTEM. A GREAT IMPROVEMENT IN APPEARANCE, MORE ECONOMICAL OPERATION, AND REMOVAL OF SERIOUS FIRE HAZARD HAVE RESULTED. (PHS)

03-04-01680 PRIVATE HAULER TESTS COMPANY'S NEW PRODUCT (COLLECTION(CONTAINER))
REFUSE REMOVAL JOURNAL 2(9), P. 18 (SEPTEMBER 1959). A NEW 3-YARD HYDRAULIC CONTAINER HAS BEEN FIELD TESTED FOR SEVERAL MONTHS AND IS NOW READY FOR THE MARKET. SPECIFICS OF THIS PRODUCT ARE DISCUSSED. (PHS)

03-04-01711 TEXAS CONTRACTOR LAUDS USE OF CONTAINER SYSTEM (COLLECTION)
REFUSE REMOVAL JOURNAL 3(5), P. 14 (MAY 1960). A FT. WORTH, TEXAS, CONTRACTOR FINDS THAT CONTAINERIZED REFUSE STORAGE AND COLLECTION IS CLEANER, MORE EFFICIENT, AND MORE ACCEPTABLE THAN ANY OTHER SYSTEM. (PHS)

03-04-01748 SAFE AND SANITARY HOME REFUSE STORAGE (CONTAINER HEALTH SAFETY BULKY-WASTE)
REFUSE REMOVAL JOURNAL 6(5), P. 18 (MAY 1963). DISCUSSES SIX STEPS TO FOLLOW IN HANDLING REFUSE TO ENSURE ATTRACTIVE AND SANITARY CONDITIONS - (1) PROVIDING AND USING PROPER CONTAINERS (2) MAINTAINING THE CONTAINERS IN A SANITARY CONDITION (3) TIME (4) DRAINING AND WRAPPING GARBAGE AND BUNDLING BULKY REFUSE (5) WHERE REQUIRED, SEPARATING GARBAGE, ASHES, AND RUBBISH, AND (6) REMOVING ANY TRASH FROM YARD, BASEMENT, OR ATTIC EACH WEEK AND SETTING IT OUT FOR COLLECTION. ALSO, BRIEFLY DEFINES GARBAGE, ASHES, AND RUBBISH. (PHS)

03-04-01757 MIDLAND, TEXAS FINDS CONTAINERS INVALUABLE (CONTAINER)
REFUSE REMOVAL JOURNAL 6(3), P. 6 (MARCH 1963). THE CITY OF MIDLAND, TEX., RECENTLY INCREASED ITS REFUSE COLLECTION SERVICE AND SIMULTANEOUSLY REDUCED ITS SANITATION LABOR FORCE BY 12 AND EXPENDITURES BY $55,000. TWO REASONS WERE CITED FOR THIS, THE INSTALLATION OF THE CONTAINER SYSTEM FOR COMMERCIAL REFUSE COLLECTIONS, AND HELP RECEIVED FROM THE CITIZENS OF MIDLAND. THE ARTICLE DESCRIBES THE CONTAINER SYSTEM AND DISCUSSES SOME GENERAL ASPECTS OF REFUSE COLLECTION IN THE CITY. (PHS)

03-04-01798 LARGER CONTAINERS ALLOW MORE STOPS WITH SMALLER CREWS (COLLECTION(CONTAINERS))
REFUSE REMOVAL JOURNAL 6(7), P. 10 (JULY 1963). DESCRIBES A REFUSE HAULING BUSINESS IN THE BOSTON, MASS., AREA. THE FIRM HAS FOUND THAT THE USE OF A CONTAINER SYSTEM FOR COMMERCIAL PICKUPS SUBSTANTIALLY DECREASES TRUCK WEAR AND TEAR AND REDUCES LABOR AND GASOLINE COSTS. (PHS)

03-04-01828 CALIFORNIA CITY MAKES WAR ON ILLEGAL RECEPTACLES (LAW COLLECTION(CONTAINER))
REFUSE REMOVAL JOURNAL 8(4), P. 30 (1965). ILLEGAL REFUSE RECEPTACLES ARE CONDEMNED ON SIGHT IN MERCED, CALIFORNIA, AND THE OWNERS ARE GIVEN UNTIL THE NEXT COLLECTION DAY TO REMEDY THE SITUATION. A RED TAG AND DOOR KNOB WARNING IS USED TO NOTIFY THE OWNER OF THE TYPE OF VIOLATION OF THE CITY CODE, PERTAINING TO REFUSE RECEPTACLES HE IS IN VIOLATION OF. IF THE VIOLATION IS NOT CORRECTED IN THE SPECIFIED TIME, THE COLLECTION CREW PICKS UP THE FAULTY CAN OR CANS AND REMOVES THEM FROM THE PREMISES.

03-04-01945 SOUTHERN CITY TURNS TO CONTAINERS FOR SAVINGS (COLLECTION-EQUIPMENT)
REFUSE REMOVAL JOURNAL 9(1), P. 22 (JANUARY 1966). CONTAINERIZATION HAS MADE AN ENORMOUS DIFFERENCE IN SPARTANBURG, S. C. FOR BOTH RESIDENTIAL AND INDUSTRIAL COLLECTION AND DISPOSAL. THE CITY OF 46,000 POPULATION HAS IMPROVED THE PICK UP SERVICE AND AT THE SAME TIME REALIZE SAVINGS IN MONEY, TIME, AND LABOR.

03-04-01947 IRISH CAPITAL GET CONTAINERS (COLLECTION)
REFUSE REMOVAL JOURNAL 8(11), P. 26 (NOVEMBER 1965). IN DUBLIN BAY, IRELAND DEMPSTER DUMPSTER CONTAINERS ARE USED TO COLLECT AND DISPOSE OF RESIDENTIAL AS WELL AS INDUSTRIAL REFUSE. SEVERAL ACRES OF LAND HAVE BEEN BUILT UP BY DUMPING REFUSE IN THE WATERS OF DUBLIN BAY. PARKS, SCHOOLS, PLAYGROUNDS, AND FACTORIES NOW STAND WHERE THERE WAS ONCE ONLY WATER AND SAND.

03-04-02023 DEVELOPMENTS IN CONTAINER SYSTEMS (COLLECTION)
BONSER, J. R.
71ST ANNUAL CONF OF THE INSTITUTE OF PUBLIC CLEANSING, HARROGATE, (JUNE 17-20, 1969). AS THE TYPES OF RESIDENTIAL AND INDUSTRIAL REFUSE CHANGE THERE IS A NEED FOR THE CLEANSING AND TRANSPORT DEPARTMENTS TO LOOK AT NEWER AND MORE ECONOMICAL MEANS OF COLLECTING THE REFUSE. A REVIEW OF THE MANY TYPES OF CONTAINERS THAT ARE ON THE MARKET AND THEIR ADAPTABILITY TO CERTAIN TYPES OF REFUSE COLLECTION ARE GIVEN.

03-04-02133 CLEANLINESS AND QUIETNESS IN THE STORAGE AND COLLECTION OF REFUSE
MCCARTHY, F. L.
THE PUBLIC WORKS AND MUNICIPAL SERVICES CONGRESS, (NOVEMBER 16, 1962). THE CLEANLINESS AND NOISE LEVELS ASSOCIATED WITH PRESENT COLLECTION METHODS ARE REVIEWED.

03-04-02164 SUBURBAN TOWN CONTAINERIZES HIGH VOLUME STOPS
REFUSE REMOVAL JOURNAL 9(2), P. 17, 46 (FEBRUARY 1966). ROCKVILLE CENTRE, NEW-YORK'S PUBLIC WORKS DEPARTMENT IS RESPONSIBLE FOR COLLECTING THE RESIDENTIAL, SCHOOLS, HOSPITALS, AND SOME OF THE COMMERCIAL REFUSE, WHILE SOME COMMERCIAL AND ALL INDUSTRIAL REFUSE IS HANDLED BY PRIVATE CONTRACTORS. OVER 50 1-1/2-YD CONTAINERS ARE IN USE AT HIGH DENSITY, HIGH VOLUME STOPS WHO PAY $8/TON FOR COMMERCIAL DISPOSAL. ROCKVILLE CENTRE'S INCINERATOR IS NO LONGER IN SERVICE SO THEY HAUL THEIR REFUSE TO HEMPSTEAD, LONG ISLAND'S INCINERATOR WHERE THEY PAY $4.25/TON FOR INCINERATION. HEMPSTEAD'S INCINERATOR USES THE HEAT TO DESALT SEA-WATER FOR WASHING THE FLY ASH AND THE STEAM TO GENERATE ITS OWN ELECTRICITY.

03 05 COMPACTION (STATIONARY)

03-05-00174 PACKAGED WASTE (QUANTITY HEAT-RECOVERY UNDERGROUND(TRACK-SYSTEM) DEVA-SYSTEM)
COMPRESSED AIR MAG 71(7), P. 21-23 (JULY 1966). IT IS SHOWN HOW COMPRESSION IS ONE SOLUTION TO HANDLING SOLID WASTES AT ALL-PNEUMATIC DEVA REFUSE COMPRESSION SYSTEM DEVELOPED BY HYDRAULIC ENGINEERING CO. OF ENGLAND AND JARTI AB OF SWEDEN. BASIC PRINCIPLE OF SYSTEM IS THAT IT WORKS ON SITE. AIR CONTROLLED AND OPERATED AUTOMATIC AND SEMIAUTOMATIC MACHINES USED ARE DESCRIBED. (EI)

03-05-00498 STATIONARY PACKER AIDS MICHIGAN PLANT DISPOSAL (COMPACTION)
REFUSE REMOVAL JOURNAL 5(10), P. 12 (OCTOBER 1962). GREAT SAVINGS IN REFUSE HANDLING COSTS HAVE BEEN REALIZED AT A PLANT IN JACKSON, MICHIGAN, THROUGH THE INSTALLATION OF A NEW AND REVOLUTIONARY REFUSE COMPACTOR. THE COMPACTING SYSTEM CONSISTS OF A STATIONARY COMPACTOR WHICH DEVELOPS 45 TONS OF PRESSURE, AN ENCLOSED CONTAINER, AND A NUMBER OF TILT CARTS WHICH ARE PLACED AT POINTS OF REFUSE ACCUMULATION. ALL REFUSE DUMPED INTO THE COMPACTOR HOPPER FROM TILT CARTS OR OTHER REFUSE STORAGE CONTAINERS IS AUTOMATICALLY CRUSHED AND COMPACTED INTO THE LARGE CARRY-AWAY, ROLLOFF CONTAINER. TRIPS TO THE DUMP HAVE THUS BEEN REDUCED FROM TWO AND THREE TIMES EACH DAY TO ONCE EVERY 4 DAYS. (PHS)

03-05-00640 MEETING THE CHALLENGE OF STATIONARY COMPACTION
RABINS, M.
SOLID WASTES MANAGEMENT/RRJ 11(8), P. 5, 7, 8, 26 (AUGUST 1968). ARTICLE DISCUSSES ADVANTAGES OF STATIONARY COMPACTION DEVICES TO THE REFUSE HAULER. USE OF THESE UNITS REDUCES THE NUMBER OF TRIPS REQUIRED TO SERVICE INDIVIDUAL CUSTOMERS. METHODS OF FINANCING SUCH OPERATIONS ARE ALSO DISCUSSED. ADVANTAGES TO BOTH THE CUSTOMER AND HAULER ARE EVALUATED.

03-05-00863 WHY NOT COMPACT YOUR INDUSTRIAL WASTE (TRANSFER-STATION ECONOMICS)
SZUKALSKI, C. J.
PLANT ENGRG 19(2), P. 120-122 (FEBRUARY 1965). TRANSFER STATION COMPACTOR COMPRESSES SCRAP FROM GLASS WOOL AND SHINGLE MANUFACTURING PLANT AND REDUCES TRAILER RUNS TO DUMP FROM 105/WK TO 10/WK. SCRAP DUMPING CREW HAS BEEN REDUCED BY ONE MAN SHIFT. INSTALLATION PAYOUT TIME IS 1.6 YR. (EI)

03-05-01197 AUXILIARY POWER UNITS FOR REFUSE PACKING (COMPACTION)
GENTILLON, M. B.
THE AMERICAN CITY 73(5), P. 190 (MAY 1958). THE INSTALLATION OF AUXILIARY POWER UNITS FOR REFUSE PACKING HAS MADE SANTA MONICA'S REFUSE COLLECTION SYSTEM MORE EFFICIENT AND MORE PRACTICAL. THE EXPERIMENTATION TO SOLVE THE SEVERAL PROBLEMS WHICH RESULTED FROM PACKING MOVING TRUCKS, WHICH HAD A CONVENTIONAL HYDRAULIC GEAR PUMP, IS DESCRIBED. (PHS)

03-05-01253 THE NEW EAGLE COMPRESSLOAD 3 (COMPACTION)
PUBLIC CLEANSING 58(3), P. 136 (1968). THE ARTICLE IS A DESCRIPTION OF A COMPRESSOR DESIGNED TO MEET THE NEED OF LARGE VOLUMES OF REFUSE AND COMPRESS IT INTO A COMPACT SIZE, HAVE AN ADEQUATE PAYLOAD AND EASILY HANDLED.

03-05-01774 PACKING MACHINE EXPANDS PHILADELPHIA HAULER'S BUSINESS (STATIONARY-COMPACTION COLLECTION(EQUIPMENT))
REFUSE REMOVAL JOURNAL 4(8), P. (AUGUST 1961). A PHILADELPHIA CONTRACTOR IS USING A NEW STATIONARY RIG FOR COMPACTION IN REFUSE CONTAINERS AT INDUSTRIAL FIRMS. ONE TRUCK INSTEAD OF THE USUAL TWO OR THREE, CAN NOW HANDLE THE SAME AMOUNT OF REFUSE, AND THE COMPACTORS WILL ENABLE THE FIRM TO OBTAIN NEW BUSINESS WHICH PREVIOUSLY HAD APPEARED TO INVOLVE TOO MUCH EXPENSE. (PHS)

03-05-01829 NEW CANADIAN TRASH BALING PLAN MAY SAVE CITY $100,000 YEARLY (COMPACTION SANITARY-LANDFILL COST(CAPITAL))
REFUSE REMOVAL JOURNAL 8(4), P. 39 (1965). COMPRESSING OR BALING REFUSE COULD SAVE $100,000 A YEAR AND ASSURE THE CITY OF HAMILTON, ONTARIO THAT ITS PRESENT DUMP AREA WILL LAST FOR 80 YEARS. THE REFUSE WILL BE COLLECTED BY TRUCKS, TRANSPORTED TO THE COMPRESSOR THEN TRANSFERRED TO THE LANDFILL. THE COMPRESSOR WOULD COST ABOUT $300,000 BUT SAVINGS IN TRANSPORTATION AND OTHER CAPITAL OUTLAY WOULD BE REALIZED.

03-05-01845 MANUFACTURER CUTS WASTE COST 42 PERCENT WITH STATIONARY COMPACTOR (TRANSFER-STATION)
REFUSE REMOVAL JOURNAL 8(8), P. 32 (1965). THE OWENS-CORNING FIBERGLAS CORP.'S PLANT AT SANTA-CLARA, CALIFORNIA, SPENT $7,279/MONTH OR $87,348/YEAR TO HAUL AND DISPOSE OF ITS REFUSE. BY PLACING INTO OPERATION A TRANSFER STATION COMPACTOR, THE COMPANY HAS REDUCED ITS MANPOWER BY FOUR MEN, REDUCED THE TRIP TO THE DUMP FROM 15/DAY SEVEN DAYS A WEEK TO 2/DAY FIVE DAYS PER WEEK. THERE IS A BREAKDOWN ON THE COST OF THE OPERATION. THE 42 PERCENT SAVING AMOUNTS TO $37,404 PER YEAR.

03-05-02158 ALERT BALTIMORE HAULER USES STATIONARY PACKER (COMPACTION)
REFUSE REMOVAL JOURNAL 6(2), P. 20, 26, 30 (FEBRUARY 1963). A BALTIMORE, MARYLAND REFUSE CONTRACTING FIRM HAS PUT INTO OPERATION A NEW STATIONARY PACKER REFUSE STORAGE AND HANDLING SYSTEM, A HYDRAULIC COMPACTION UNIT WHICH PUSHES THE MATERIAL INTO SPECIALLY DESIGNED CONTAINERS. WITH THE FIRST INSTALLATION, THE FIRM WAS ABLE TO REPLACE THREE 30 CU-YD CONTAINERS WITH THE NEW UNIT PLUS ONE CONTAINER, PRODUCING A SAVINGS IN SPACE, HANDLING, AND TRANSPORT OF THE MATERIAL. THE ARTICLE DESCRIBES THE OPERATION OF THE NEW COMPACTION UNIT. (PHS)

03-05-02160 PACK REFUSE INTO PAPER SACKS WITH AUTOMATIC UNITS (DEVA SACK(PAPER) COMPACTOR(STATIONARY))
REFUSE REMOVAL JOURNAL 9(7), P. 18, 33 (JULY 1966). AMONG THE METHODS FINDING APPLICATION FOR ON-SITE REFUSE HANDLING IS THE DEVA REFUSE COMPACTION SYSTEM WHERE THE REFUSE MAY BE RECEIVED FROM A REDUCTION SYSTEM, STATIONARY PACKER, PULPER, OR CONVEYOR AND COMPRESSED INTO PAPER SACKS FOR DISPOSAL. A 3.5 CU-FT REINFORCED SACK THAT CAN STAND 1.5 TONS OF PRESSURE IS USED. VARIOUS SIZE UNITS ARE AVAILABLE FOR DIFFERENT TYPES OF OPERATIONS.

03-05-02167 NEW-YORK'S ANSWER TO AIR-POLLUTION PROBLEM - ON-SITE WASTE COMPACTION
REFUSE REMOVAL JOURNAL 9(6), P. 12-13, 38 (JUNE 1966). HERE ARE THE MAJOR PROVISIONS OF NEW-YORK CITY'S NEW AIR POLLUTION LAW AS IT AFFECTS REFUSE COLLECTION AND DISPOSAL - (1) REQUIRES, AFTER TWO YEARS, EQUIPMENT CAPABLE OF REDUCING REFUSE VOLUME BY 2/3 BY MEANS OTHER THAN BURNING - COMPACTION, PULPING, ETC., - IN ALL NEW APARTMENTS OVER

THREE STORIES WITH 12 OR MORE FAMILIES. (2) PROHIBITS ON-SITE INCINERATORS AFTER TWO YEARS IN ALL NEW MULTIPLE DWELLING BUILDINGS OVER THREE STORIES AND WITH 12 OR MORE FAMILIES. (3) PERMITS MECHANICALLY OPERATED FOOD WASTE GRINDERS IN ALL DWELLINGS OR MULTIPLE DWELLINGS ERECTED AFTER TWO YEARS. (4) REQUIRES EXISTING ON-SITE INCINERATORS BE UPGRADED BY INSTALLING AIR POLLUTION CONTROL DEVICES. (5) FAILURE TO MEET NEW ON-SITE INCINERATION MEASURES WILL MEAN THE EQUIPMENT MAY BE SEALED AND THE OWNER BILLED FOR THE ADDITIONAL COLLECTION VOLUME. (6) REQUIRES MUNICIPAL REFUSE INCINERATORS BE UPGRADED TO INCLUDE THE LATEST ADVANCES IN AIR POLLUTION CONTROL WITHIN THREE YEARS. (7) PROHIBITS OPEN BURNING OF REFUSE OR SCRAP ON ANY FLOATING VESSEL THAT MAY EMIT CONTAMINATED AIR INTO THE OPEN AIR OF THE CITY. (8) SUSPENDS THE LICENSE OF AUTOMOBILE SALVAGERS IF MORE THAN TWO FIRES PER YEAR OCCUR ON HIS PROPERTY. (9) STRENGTHENS PENALTIES AGAINST VIOLATORS OF THE CITY'S OPEN BURNING LAW WHICH PROHIBITS OPEN FIRES.

03 06 COLLECTION FREQUENCY

03-06-01694 FREQUENCY OF COLLECTION IN MUNICIPALITY SERVICE
REFUSE REMOVAL JOURNAL 2(11), P. 28 (NOVEMBER 1959). A TABLE OF THE FREQUENCY OF PICK UPS OF VARIOUS TYPES OF WASTE IN 31 CITIES.

03 07 COLLECTION SCHEDULING

03-07-00079 HOW TO SOLVE THE HOLIDAY COLLECTION PROBLEM (FREQUENCY TRAIN(VEHICULAR))
THE AMERICAN CITY 80(104), P. 20 (MARCH 1965). TUCSON, ARIZONA COLLECTS REFUSE ON A FOUR DAY A WEEK SCHEDULE. THUS WHEN A HOLIDAY OCCURS THE SCHEDULE IS SHIFTED SO THAT THE HOLIDAY BECOME THE NORMAL DAY OFF. REFUSE TRAINS ARE USED AND ON THE AVERAGE 1500 STOPS ARE MADE PER TRAIN. EACH TRAIN IS COMPOSED OF A SCOUT TRUCK AND THREE FOUR-YARD TRAILERS.

03-07-00534 REVISED SCHEDULE STREAMLINES GARBAGE COLLECTION
NOE, T.
PUBLIC WORKS 90(11), P. 100 (JANUARY 1959). THE WINSTON-SALEM SANITATION DIVIDES ITS TERRITORY INTO THREE AREAS, LABELED A, B, AND C. BEFORE JULY 1958, COLLECTIONS WERE ON IDENTICAL DAYS EACH WEEK, WITH AREA A BEING COLLECTED ON MONDAY, AREA B ON TUESDAY, AREA C ON WEDNESDAY, AND A SECOND COLLECTION IN EACH AREA CROWDED INTO THURSDAY AND FRIDAY. THIS SHORT INTERVAL RESULTED IN LESS GARBAGE IN THE SECOND COLLECTION THAN IN THE FIRST. DATA ON THE AMOUNT COLLECTED EACH DAY IS PRESENTED. IT COST THE CITY $10 TO $11 PER TON TO COLLECT GARBAGE FROM MONDAY TO WEDNESDAY, BUT $16.41/TON ON FRIDAY DUE TO THE SMALL AMOUNT OF GARBAGE. (UC)

03-07-00553 REFUSE COLLECTION IN LOS ANGELES
HUME, N. B.
PUBLIC WORKS 93(1), P. 136 (JANUARY 1962). THE FIRST PUBLIC SERVICE RENDERED IN LOS ANGELES WAS GARBAGE COLLECTION (FOOD WASTES ONLY). THIS WAS FOLLOWED BY NONCOMBUSTIBLE REFUSE SERVICE, LATER BY THE SEPARATE COLLECTION OF COMBUSTIBLE REFUSE SERVICE IN 1957. WITHIN EACH OF THE CITY'S MAJOR OPERATING DISTRICTS, A DISPATCHER CONTROLS THE ACTIVITIES OF A NUMBER OF COLLECTION CREWS, AVERAGING ABOUT 55 PER DISPATCHER. EACH CREW HAS ON EACH DAY A REGULAR ASSIGNED ROUTE FOR WHICH IT IS RESPONSIBLE. GENERALLY, TWO SECTIONS ARE ALLOTTED PER ROUTE. THE FIRST SECTION IS THE MORE REMOTE OF THE TWO FROM DISPOSAL AREA. MOST COLLECTION CREWS MAKE AT LEAST TWO TRIPS/DAY, THE AVERAGE BEING 2.25 TRIPS/DAY. IN ESTABLISHING ROUTE BOUNDARIES, IT IS IMPORTANT THAT THE SIZE OF THE FIRST SECTION OF EACH ROUTE BE KEPT SUCH THAT IT IS UNLIKELY THAT A TRUCK WOULD BECOME LOADED TO CAPACITY PRIOR TO COMPLETING SERVICE IN THAT SECTION. THE SECOND SECTION GENERALLY IS ON THE WAY TO THE COLLECTION POINT. THUS, IF THE TRUCK IS NOT YET LOADED TO CAPACITY IT CAN COLLECT IN THE SECOND SECTION. THEREBY REDUCING THE PROBABILITY OF ENCOUNTERING A GREATER THAN CAPACITY LOAD WITHIN THE SECOND SECTION. WHENEVER A DRIVER FINISHES HIS REGULAR ROUTE BEFORE LOADING THE TRUCK TO CAPACITY, OR IF HIS VEHICLE IS LOADED TO CAPACITY BEFORE COMPLETING THE ROUTE, HE MUST TELEPHONE THE DISPATCHER AND REPORT. THE DISPATCHER CAN THEN MAKE APPROPRIATE ASSIGNMENTS OR REASSIGNMENTS TO EQUALIZE THE LOADS AND THE SERVICES RENDERED. AT LEAST ONE MOBILE-RADIO EQUIPPED VEHICLE IS USED IN EACH MAJOR OPERATING DISTRICT. THIS ALLOWS FOR THE IMMEDIATE ASSIGNMENT OF CREWS TO AREAS REQUIRING ADDITIONAL COLLECTION HELP, FOR THE PROMPT SERVICING OF COMPLAINTS, ETC. (UC)

03-07-01030 REVISED COLLECTION ROUTES MEET SUBURBAN GROWTH
SOMMERS, W. A.
PUBLIC WORKS 92(5), P. 108-110 (MAY 1961). IN 1958 THE PEOPLE OF FRANKLIN TOWNSHIP, NEW JERSEY, ADOPTED A COUNCIL-MANAGER FORM OF LOCAL GOVERNMENT. ONE OF THE FIRST PROBLEMS THAT THE COUNCIL DIRECTED THE MANAGER TO STUDY WAS A MORE EFFICIENT AND ECONOMICAL SYSTEM OF REFUSE DISPOSAL. A RUTGERS UNIVERSITY STUDENT WAS HIRED TO MAKE A FIELD STUDY OF PRESENT COLLECTION OPERATIONS. ARMED WITH STOP WATCH, MAPS, COUNTERS, ETC., HE FOLLOWED THE COLLECTION CREW IN A COMPLETE ROUND OF COLLECTIONS WHILE CHARTING THE ROUTE FOLLOWED, THE PICKUPS, THE STOPS, THE TIME INTERVALS AND GENERAL OPERATIONAL EFFECTIVENESS. A NUMBER OF RECOMMENDATIONS DEVELOPED AS FOLLOWS- (1) A LARGER CAPACITY TRUCK SHOULD BE OBTAINED TO PERMIT A REDUCTION IN THE NUMBER OF TRIPS TO THE DUMP FROM 3 TO 2 PER DAY, AND CONSEQUENTLY, TO INCREASE THE TIME AVAILABLE FOR COLLECTIONS. (2) ROUTE SPLINTERING MUST BE ELIMINATED AND CONTIGUOUS, FAIRLY COMPACT, ROUTE DISTRICTS SET UP. (3) A KEY TO THE FENCED-IN DUMP AREA SHOULD BE LEFT WITH THE DRIVER OF THE GARBAGE TRUCK TO TAKE CARE OF LATE ARRIVALS. (4) REGULATIONS GOVERNING THE TYPE OF GARBAGE ACCEPTED AND THE MANNER IN WHICH IT SHOULD BE SET OUT SHOULD BE DRAWN UP AND DISTRIBUTED TO ALL HOUSEHOLDERS. (5) A GENERAL SCHEDULE SHOULD BE ESTABLISHED SO THAT THE ADMINISTRATION WILL KNOW APPROXIMATELY WHERE THE TRUCK SHOULD BE AT A PARTICULAR TIME, AND SO THAT THE CREW WILL KNOW WHAT IS EXPECTED OF THEM. (6) ALL NEW HOUSING IN THE SERVICE AREA SHOULD BE RECORDED ON THE MAP AND PROVIDED FOR IN THE ROUTING AND PEGULAR RESTUDIES SHOULD BE MADE TO SEE IF THE EFFICIENCY OF THE OF THE ROUTE IS BEING MAINTAINED AND TO PREVENT QUALITY OF SERVICE FROM DROPPING. THE OBJECTIVES OF THE STUDY AND REROUTING OF THE COLLECTION ROUTES HAS BEEN ACHIEVED RESULTING IN EFFICIENT AND RELIABLE COLLECTION SERVICE FOR THE 20,000 PEOPLE OF FRANKLIN TOWNSHIP.

03-07-01073 TIME AND MOTION STUDIES AID SOLID WASTE COLLECTION
BRIGMAN, V. L.
PUBLIC WORKS 100(2), P. 84-85 (1969). THE TYPES OF GARBAGE AND REFUSE GREATLY AFFECT THE TYPE AND SIZE OF EQUIPMENT USED IN COLLECTION OF REFUSE, ALSO AN IMPORTANT PHASE IS THE MANNER THE MAN POWER IS USED TO COLLECT THIS RUBBISH. THE ARTICLE DEALS WITH THE METHOD THE CITY OF ATLANTA DID TIME AND MOTION STUDIES TO BEST UTILIZE THEIR MAN POWER AND EQUIPMENT FOR PRESENT ECONOMIC REASON AND FOR FUTURE PLANNING.

03-07-01235 OPERATIONAL RESEARCH IN MUNICIPAL ENGINEERING WITH REFERENCE TO WORK CARRIED OUT IN COVENTRY (COLLECTION SIMULATION)
RAYMAN, N. + WARD, R. A.
J INSTN MUN ENGRS 92(12), P. 428-435 (DECEMBER 1965). RESEARCH OF ACTIVITIES AND ROLE OF MUNICIPAL ENGINEER CONCERNED WITH DESIGN AND ADMINISTRATIVE PROCESS. USE OF MODELS AND COMPUTER IN PROCESS ANALYSIS. REFUSE COLLECTION AND DISPOSAL ORGANIZATION PROBLEM IS DISCUSSED AS EXAMPLE. USE OF GENERAL PURPOSE SIMULATION MODEL OF REFUSE COLLECTION PROCESS IS EXPLAINED. (EI)

03-07-01436 WE CUT 30 PERCENT FROM OUR REFUSE COLLECTION COSTS (INCINERATOR SANITARY-LANDFILL ROUTING ECONOMICS COLLECTION-EQUIPMENT)
FETROW, W. W.
THE AMERICAN CITY 71(9), P. 135 (SEPTEMBER 1956). THE NET EFFECT OF RE-ROUTING, JOINT PURCHASING USE OF A SANITARY LANDFILL INSTEAD OF AN INCINERATOR, AND PLACING IN SERVICE OF NEW COMPACTOR-TYPE VEHICLES IS OUTLINED (TAKOMA PARK, MARYLAND). (PHS)

03-07-01622 CITY REVISES ROUTES FOR GREATER EFFICIENCY (ROUTING SCHEDULING)
NEILSON, R. W.
REFUSE REMOVAL JOURNAL 1(12), P. 12 (DECEMBER 1958). AS THE RESULT OF A REVIEW OF THE REFUSE COLLECTION SYSTEM IT WAS DISCOVERED THAT A CHANGE IN COLLECTION SCHEDULES, AND ROUTES COULD RESULT IN A GREAT SAVING TO THE CITY OF WINSTON-SALEM. A TABLE OF DATA INDICATES SOME OF THEIR FINDINGS.

03-07-01728 EQUALIZATION OF REFUSE COLLECTION ROUTES (SCHEDULING)
ROBERTSON, G. B.
REFUSE REMOVAL JOURNAL 3(1), P. 20 (JANUARY 1960). CONSOLIDATED ROUTES, A 4-DAY (10 HOURS PER DAY) WORKWEEK, AND THE ADDITION OF TWO 28-CUBIC-YARD PACKER-TYPE TRUCKS FOR HAULING REFUSE TO THE DUMP HAVE MADE THE ALBUQUERQUE, NEW MEXICO REFUSE COLLECTION SYSTEM MORE EFFICIENT. FUTURE PLANS FOR IMPROVEMENT INCLUDE REORGANIZATION OF ROUTES AND A RADIO DISPATCH SYSTEM. (PHS)

03-08-00085 A VOTE FOR GOOD SERVICE (COST(COLLECTION))
THE AMERICAN CITY 80(5), P. 96-97 (MAY 1965). ALBUQUERQUE, NEW MEXICO, HAS INCREASED COLLECTION RATES FROM ONE DOLLAR AND SEVENTY-FIVE CENTS TO TWO DOLLARS AND TWENTY-FIVE CENTS A MONTH. THE INCREASE WAS REQUIRED TO PROVIDE BETTER SERVICE AND BETTER EQUIPMENT. IF THE FEE HAD NOT BEEN INCREASED COLLECTION AT THE CURB WOULD HAVE BEEN REQUIRED.

03 08 COLLECTION COSTS

03-08-00363 COLLECTIONS WERE MORE THAN DOUBLED (COLLECTION COST(OPERATING) SANITARY-LANDFILL)
MCGAHEN, C. A.
THE AMERICAN CITY 77(8), P. 31 (AUGUST 1962). AFTER ADOPTION OF AN ORDINANCE FOR FREE REFUSE COLLECTION AND PROHIBITING OPEN BURNING COLLECTIONS DOUBLED IN ZANESVILLE, OHIO. IN 1961 THE COST OF OPERATION WAS 8.21 DOLLARS PER TON FOR COLLECTION AND 2.26 COLLARS FOR DISPOSAL.

03-08-00397 COMMUNITY SHOWS SAVINGS BY USING CONTRACT METHOD (COLLECTION SANITARY-LANDFILL COST(OPERATING))
REFUSE REMOVAL JOURNAL 5(5), P. 10 (MAY 1962). OAK PARK, MICHIGAN, HAS SAVED ALMOST $53,000 IN ONE YEAR BY CHANGING FROM MUNICIPAL TO PRIVATE CONTRACT REFUSE COLLECTION. THE CONTRACTOR MADE A SUCCESSFUL BID IN APRIL 1960 AND SIGNED A 3-YEAR CONTRACT WITH THE CITY. THE HAULER PURCHASED THE CITY'S COLLECTION FLEET, BUT HE HAS SINCE REPLACED IT WITH UNITS OF GREATER CAPACITY. MOST OF THE REFUSE COLLECTED IN OAK PARK CONTAINS NO GARBAGE, BECAUSE A 1952 CITY ORDINANCE REQUIRED ALL NEW HOMES TO BE EQUIPPED WITH GARBAGE DISPOSAL UNITS. THE PRIVATE CONTRACTOR IS CURRENTLY COLLECTING FROM 9,200 RESIDENTIAL UNITS AT A COST TO THE CITY OF $0.14 PER UNIT PER WEEK, FROM 443 BUSINESS UNITS AT $0.20 AND FROM 647 MULTIPLE-DWELLING UNITS AT $0.15. OAK PARK IS A MEMBER OF THE SOUTHEASTERN OAKLAND COUNTY RUBBISH AND GARBAGE AUTHORITY, WHICH OPERATES AN INCINERATION PLANT AND AN 80-ACRE LANDFILL SITE. CITY OFFICIALS HAVE FOUND THAT REFUSE COLLECTION BY PRIVATE CONTRACTS NOT ONLY IS CHEAPER, BUT ALSO ALLOWS THE CITY'S PUBLIC WORKS DEPARTMENT TO DEVOTE FULL TIME TO SERVICES OTHER THAN REFUSE COLLECTION. (PHS)

03-08-00420 PHILADELPHIA FIRM GETS DISPUTED RATE INCREASE (COLLECTION COST(COLLECTION))
REFUSE REMOVAL JOURNAL 5(7), P. 20 (JULY 1962). BECAUSE OF SUBSTANTIAL LOSSES AND DELINQUENT ACCOUNTS, A PHILADELPHIA, PA., REFUSE CONTRACTOR RECENTLY ASKED FOR AN INCREASE IN REFUSE RATES FROM $600 TO $1,000 A WEEK FOR THE GROUP OF BUSINESSES HE WAS SERVICING AND THAT THE GROUP AS A WHOLE (INSTEAD OF EACH INDIVIDUAL FIRM) MAKE PAYMENTS TO HIM. THE BUSINESS ASSOCIATION AT FIRST REFUSED. REFUSE BEGAN TO ACCUMULATE WHEN THE HAULER STOPPED SERVING THE ASSOCIATION, AND THE CITY'S OTHER REFUSE HAULERS REFUSED TO TAKE OVER THE ROUTE. THE SITUATION SOON BECAME INTOLERABLE, AND THE ASSOCIATION FINALLY CONCEDED THE REFUSE RATE INCREASE WHEN FACED WITH PUNITIVE ACTION FROM THE CITY. (PHS)

03-08-00949 COST OF REFUSE COLLECTION AND DISPOSAL
PUBLIC WORKS 98(7), P. 150 (1967). IN FISCAL YEAR 1965-66, SCARSDALE, N.Y., COLLECTIONS OF COMBUSTIBLE WASTES AGGREGATED 9,315 TONS AND OF NON-COMBUSTIBLE WASTES 2,823 TONS. THE COST PER THOUSAND DOLLARS OF ASSESSED VALUATION AMOUNTED TO $3.10, ABOUT THE SAME AS FOR THE PRECEDING FOUR YEARS. (AUTH)

03-08-00951 REFUSE COLLECTION AND INCINERATION (COST QUANTITY)
PUBLIC WORKS 97(11), P. 142 (1966). WEEKLY REFUSE COLLECTION FROM 14,000 FAMILIES IN STRATFORD, CONNECTICUT, AND FROM SCHOOLS, BEACHES AND TRASH CANS IN BUSINESS AREAS COST $12.25 PER FAMILY. AVERAGE REFUSE VOLUME PER FAMILY PER WEEK WAS 37 POUNDS. THE INCINERATOR RECEIVED 13,883 TONS OF REFUSE DURING THE FISCAL YEAR ENDING IN 1966. IN VOLUME, 101,488 CU-YD WERE BURNED, WITH AN UNBURNABLE RESIDUE OF 17,620 CU-YD. THE YEARLY OPERATING COST OF BURNING COMBUSTIBLE REFUSE FROM HOMES AND BUSINESSES WAS $1.43 PER PERSON. (AUTH)

03-08-00986 TIME/CREW SIZE/COSTS (ECONOMICS COST(COLLECTION) COLLECTION)
DAIR, F. R.
REFUSE REMOVAL JOURNAL 10(8), P. 6-8, 10 (AUGUST 1967). THE ARTICLE IS SUBTITLED " HOW TO MAKE UP COLLECTION TEAMS FOR ANY TYPE OF EQUIPMENT ". IN IT IS DISCUSSED THE MATTER OF THE PROPER SIZE OF CREWS AND VEHICLES FOR REFUSE COLLECTION. TABLES ON LABOR AND VEHICLE COSTS AND GRAPHS SHOWING RELATION OF COSTS PER TON TO CREW SIZE, LOAD SIZE, AND TRAVEL TIME ARE PRESENTED. THE ARTICLE IS A GOOD ONE FOR USE IN STUDIES ON ECONOMICS, PLANNING, AND TRANSPORTATION. (UC)

03-08-01005 COSTS OF GARBAGE COLLECTION AND DISPOSAL (COST(OPERATING))
PUBLIC WORKS 91(2), P. 153 (1960). THE AVERAGE COST OF GARBAGE COLLECTION AND DISPOSAL IN RALEIGH, NORTH-CAROLINA, FOR THE FISCAL YEAR 1958-59 WAS $1.40/CU-YD OR $4.33/CAPITA. THE TOTAL HANDLED AMOUNTED TO 273,479 CU-YDS. NINETY-SEVEN MEN WERE EMPLOYED, INCLUDING 3 BULL-CLAM OPERATORS, ONE AT EACH OF THE THREE SANITARY LANDFILLS. THE COST FOR STREET CLEANING AND HAULING TRASH AND YARD TRIMMINGS WAS $1.15/CAPITA. DURING THE 1957-58 BUDGET YEAR, TIMING INSTRUMENTS WERE INSTALLED ON ALL STREET SWEEPERS. THESE SHOW THE TIME THE MOTOR IS STARTED AND THE TIME THE SWEEPER IS IN ACTUAL OPERATION. ALSO WHETHER OR NOT THE MOTOR IS RUNNING WHEN THE MACHINE IS STANDING STILL. IN STREET CLEANING WORK, 13.527 CURB MILES WERE SWEPT AND 14,037 STREET MILES WERE FLUSHED USING 27,147,240 GALLONS OF WATER. A TOTAL OF 7.075 LOADS OF TRASH, TREE TRIMMINGS, ETC. WERE HAULED.

03-08-01013 GARBAGE CLEANUP A STAGGERING TASK (COLLECTION COST(CLEANUP))
MEALEY, M.
OAKLAND TRIBUNE (CALIFORNIA), P. 13, 19, 31 (OCTOBER 1965). THE COSTS OF GARBAGE CLEANUP ARE MORE THAN MERELY MUNICIPAL REFUSE COLLECTION ONCE-A-WEEK. MANY PERSONS DO NOT SUBSCRIBE TO THIS SERVICE, AND DISPOSE OF THEIR GARBAGE THEMSELVES. OFTEN THEY SIMPLY THROW THEIR GARBAGE AWAY IN PARKS AND ALONG ROAD SIDES, OR THEY DISPOSE OF IT IN LITTER CANS PLACED ON SIDEWALKS FOR PURPOSES OTHER THAN RESIDENTIAL GARBAGE COLLECTION. THESE PEOPLE WILL NOT PAY THE COLLECTION COSTS, WHICH VARY FROM $1.35 TO $2.00 PER MONTH. AS A RESULT, THE COST TO THE CITY IS $1.80 PER PERSON ANNUALLY FOR THE DISPOSAL OF THE REFUSE ON THE STREETS. (UC)

03-08-01713 CHICAGO COSTS UP AS MUCH AS 456 PERCENT (COST(COLLECTION))
REFUSE REMOVAL JOURNAL 3(5), P. 8 (MAY 1960). A SURVEY OF PRIVATE CONTRACTORS IN THE CHICAGO AREA SHOWS THAT WAGES, EQUIPMENT, LICENSE FEES, AND INSURANCE COSTS HAVE TAKEN A STEEP RISE, AND THAT AN INCREASE IN THE AMOUNT OF REFUSE HAS NECESSITATED THE USE OF MORE EXPENSIVE EQUIPMENT. (PHS)

03-08-01763 MAMMOTH BUDGET IS A MUST FOR NEW YORK (COLLECTION)
REFUSE REMOVAL JOURNAL 6(4), P. 6 (1963). THE 4 MILLION TONS OF REFUSE COLLECTED IN NEW YORK CITY YEARLY DEMANDS A BUDGET OF ABOUT 126 MILLION DOLLARS, AND 14 THOUSAND EMPLOYEES. ALTHOUGH THE CITY OPERATES ITS OWN COLLECTION AND DISPOSAL SYSTEM, THESE ARE NUMEROUS CONTRACT HAULERS AND DISPOSAL FIRMS ALSO. THEY SERVE BOTH RESIDENTIAL AND COMMERCIAL CUSTOMERS.

03-08-01920 FILL UPKEEP COSTS TOWN $1.57 A TON (COST(COLLECTION) COST(OPERATING) COST(INCINERATION) COST(LANDFILL))
REFUSE REMOVAL JOURANL 8(9), P. 18 (1965). A BREAKDOWN OF REFUSE COLLECTION AND DISPOSAL COSTS IN KENOSHA, WISCONSIN, A CITY OF 68,000 ON LAKE MICHIGAN, REVEALED THAT HANDLING COMBUSTIBLE MATERIAL COST THE CITY NEARLY $5 PER TON MORE THAN NON-COMBUSTIBLES. DURING 1964, KENOSHA'S SANITATION DEPARTMENT PICKED UP 12,296 TONS OF BURNABLE MATERIAL. THE TOTAL COST FOR COLLECTION AND INCINERATION WAS $21.25 PER TON, WITH INCINERATION ALONE ACCOUNTING FOR $3.85 A TON. THE CITY BURNED A TOTAL OF 15,019 TONS OF REFUSE WITH A RESIDUE OF 3,185 TONS. BUT FOR NON-COMBUSTIBLE COLLECTION AND DISPOSAL, IT ONLY COST THE CITY $16.67 A TON FOR 13,098 TONS, OF WHICH $1.57 PER TON WENT FOR LANDFILL MAINTENANCE. INCLUDING NON-COMBUSTIBLE MATERIAL RECEIVED FROM OTHER SOURCES, TOTAL MATERIAL RECEIVED IN KENOSHA'S LANDFILL WAS 35,219 TONS DURING 1964.

03-08-02115 MANY BRITISH TOWNS CHARGE FOR BULKY REFUSE (COST(COLLECTION) BULKY-WASTE)
REFUSE REMOVAL JOURNAL 9(1), P. 28 (JANUARY 1966). IT TAKES ADDED LABOR AND TIME TO HAUL AWAY OLD FURNITURE, MATRESSES, RUGS, AND HEAVY APPLIANCES. HOWEVER, SANITATION EXECUTIVES ARE FINDING IT IS FAR BETTER TO ORGANIZE - AND EVEN CHARGE FOR - THIS SERVICE RATHER THAN HAVE PEOPLE CARRY IT TO VACANT LOTS SECRETLY AT NIGHT. THE QUESTION THAT FACES MANY IN THE INDUSTRY IS HOW BEST TO HANDLE THIS MATERIAL. SHOULD RESIDENTS BE CHARGED FOR THIS SERVICE? IF SO, HOW - BY ITEM, WEIGHT, OR TIME? OR SHOULD BULKY REFUSE COLLECTION BE INCLUDED IN THE OVERALL SERVICE. IN ADDITION, ONCE A POLICY IS SET UP, THE PUBLIC MUST BE MADE AWARE OF IT, OR ELSE OLD HABITS ARE LIKELY TO CONTINUE. IN GREAT BRITAIN, MANY CITIES CHARGE FOR COLLECTION OF BULKY WASTES.

03-08-02145 NATIONAL SURVEY OF REFUSE COLLECTION PRACTICES (COST(COLLECTION) FREQUENCY)
STONE, R. + STEARNS, R. P.
RALPH STONE AND COMPANY, INC., ENGINEERS (1969). A REFUSE COLLECTION QUESTIONNAIRE WAS DISTRIBUTED TO OVER 1000 CITIES WITH POPULATIONS EXCEEDING 10,000 PERSONS. A TOTAL OF 234 CITIES AND 42 STATES, WITH A COMBINED POPULATION OF 37,396,837 COOPERATED BY COMPLETING AND RETURNING THE QUESTIONNAIRE WITH DATA. THE DATA WERE ANALYZED AND THE RESULTS ARE SUMMARIZED UNDER THE FOLLOWING CATEGORIES, TYPE OF EQUIPMENT, CREW SIZE, PICK-UP LOCATION, FREQUENCY OF COLLECTION, LOST-TIME ACCIDENTS, AND COLLECTION COSTS.

03 09 USE OF SACKS

03-09-00060 SWEDISH REFUSE MACHINE SEEKS U.S. MANUFACTURER (SACK(PAPER))
REFUSE REMOVAL JOURNAL 2(8), P. 22 (AUGUST 1959). A NEW COLLECTION SYSTEM EMPLOYING PAPER BAGS, THAT IS PROPOSED TO BE ECONOMICAL AND EFFICIENT FOR MULTI-FAMILY HOUSING, HOSPITALS AND SIMILAR TYPE STRUCTURES IS DESCRIBED. THE SWEDISH COMPANY WHICH PATENTED THE SYSTEM IS LOOKING FOR A U.S. FIRM TO MANUFACTURE THE UNIT. (PHS)

03-09-00087 HALF OF SWEDEN USES PAPER SACKS (SACK COLLECTION-CONTAINER)
THE AMERICAN CITY 80(6), P. 61 (JUNE 1965). IN THE PAST THIRTEEN YEARS MORE THAN HALF OF SWEDEN'S 1,005 MUNICIPALITIES EITHER USE OR ARE TESTING THE USE OF PAPER-BAG REFUSE COLLECTION. FIRST AMERICAN CITIES TO USE PAPER-BAGS WERE COLLEGE PARK AND RIVERDALE, MARYLAND. BAGS OF 30 GALLON CAPACITY OR MORE COST ABOUT 9 CENTS APIECE.

03-09-00093 ONE-MAN REFUSE COLLECTION (COST(CAPITAL) SACK(PAPER))
MCDONALD, J. P.
THE AMERICAN CITY 80(9), P. 93 (SEPTEMBER 1965). COLLEGE PARK, MARYLAND, ADOPTED THE PAPERCAN BAG SYSTEM IN 1962. AS A RESULT ONE MAN CAN BE USED FOR COLLECTION. IT IS ESTIMATED THAT THE COST OF COLLECTION VEHICLES HAS DECREASED FROM $21,000 TO $15,000. THE WORK FORCE IS REDUCED RESULTING IN LABOR SAVINGS OF $19,000. THE ANNUAL SAVINGS ARE REPORTED AS $17,000/YR.

03-09-00107 COPOLYMER PLASTIC REFUSE - CAN LINERS (SACK(PLASTIC) COLLECTION)
THE AMERICAN CITY 81(6), P. 100-101 (JUNE 1966). LEBANON, OHIO, IS EXPERIMENTING WITH THE USE OF PLASTIC GARBAGE-CAN LINERS TO SEE IF IT WOULD REDUCE COLLECTION TIME AND COST. A 20 PERCENT REDUCTION IN COLLECTION TIME WAS OBSERVED (COLLECTION POINT WAS AT CURB).

03-09-00122 IN THE BAG FOR KEEPS (COLLECTION SACKS(PAPER) COST(OPERATING))
EDWARDS, R. A.
THE AMERICAN CITY 78(4), P. 89-92 (APRIL 1963). A DESCRIPTION OF THE PAPER SACK COLLECTION SYSTEM IN USE AT COLLEGE PARK, MARYLAND. SACKS ARE PRODUCED BY WEST VIRGINIA PULP AND PAPER CO. (WESTVACO SYSTEM). SACKS ARE MADE OF 100 LB. CLUPAK EXTENSIBLE KRAFT PAPER. UNDER THE SYSTEM IN COLLEGE PARK EACH RESIDENT RECEIVES 2 FREE SACKS PER WEEK (40 GALLON), EXTRA SACKS CAN BE PURCHASED AT 8 CENTS EACH. COST RANGES FROM 2.60 DOLLARS TO 4.16 DOLLARS MORE PER STOP PER YEAR.

03-09-00128 IT'S IN THE BAG FOR A SECOND CITY (SACKS(PAPER) COLLECTION)
FORD, W. + CARSWELL, J.
THE AMERICAN CITY 79(5), P. 22 (MAY 1964). PAPER SACKS HAVE REPLACED METAL CANS IN RIVERDALE, MARYLAND. THE WESTVACO SYSTEM IS USED. NINETY-TWO PERCENT OF THE USERS LIKED THE NEW SYSTEM. BAGS ARE FREE AND EACH HOUSEHOLD RECEIVED THE METAL HOLDER AND 25 FREE BAGS EVERY 12 WEEKS.

03-09-00139 REFUSE SACKS ARE IN (SACK(PAPER) COLLECTION)
THE AMERICAN CITY 80(12), P. 96-97 (DECEMBER 1965). MT. WOLF, PENNSYLVANIA, HAS STARTED TO USE THE ST. REGIS REFUSE SACK SYSTEM. THE CITY GAVE EACH HOUSEHOLD A METAL SACK HOLDER AND ONE YEARS SUPPLY OF SACKS. EXTRA BAGS CAN BE PURCHASED AT 10 CENTS EACH. IT IS ESTIMATED THAT IT WILL COST THE CITY 3000 DOLLARS PER YEAR FOR BAGS (ABOUT 36,000 NEEDED). IT IS ESTIMATED THAT COLLECTION CAN BE DONE IN HALF THE TIME WITH MUCH LESS LIFTING.

03-09-00146 REFUSE SACKS SLASH COLLECTION TIME
BROYLES, V.
THE AMERICAN CITY 84(1), P. 79-80 (1969). THE USE OF WET-STRENGTH KRAFT PAPER SACKS HALVED THE TIME TO COLLECT FROM APARTMENTS AND PRIVATE HOMES IN SMYRNA, GEORGIA.

03-09-00158 PAPER BAG COLLECTION ON REQUEST (SACK(PAPER) COST(OPERATING))
FOX, G. G.
THE AMERICAN CITY 79(10), P. 14 (OCTOBER 1964). IN CAMDEN, ARKANSAS RESIDENTS CAN REQUEST PAPER SACK COLLECTION AT AN ADDITIONAL COST OF 65 CENTS PER MONTH. NORMAL CHARGE IS 1 DOLLAR PER MONTH FOR CAN COLLECTION. SYSTEM USED IS DEVELOPED BY INTERNATIONAL PAPER COMPANY (GARBAX DISPOSAL SYSTEM). TWO BAGS PER WEEK ARE SUPPLIED, EXTRA BAGS ARE 8 CENTS.

03-09-00167 NINETY FOUR PERCENT VOTE AYE (SACK(PAPER) COLLECTION PROJECTION)
THE AMERICAN CITY 82(7), P. 78-79 (1967). BARRINGTON, RHODE ISLAND IS ENGAGED IN A STUDY ON THE USE OF PAPER SACKS FOR REFUSE COLLECTION AS A DEMONSTRATION GRANT FOR THE OFFICE OF SOLID WASTES, PHS.

03-09-00200 DISPOSABLE BAGS (SACK(PAPER) COLLECTION)
THE AMERICAN CITY 71(10), P. 32 (OCTOBER 1963). RESULTS OF A STUDY BY THE AMERICAN PUBLIC WORKS ASSOCIATION ON THE USE OF SACKS INSTEAD OF CAN FOR REFUSE COLLECTION. CITIES USED IN THE TEST WERE SARASOTA, FLORIDA, FORT WORTH, TEXAS, DUBUQUE, IOWA, AND BUFFALO, NEW YORK.

03-09-00652 GARBAGE CANS - WHO NEEDS THEM (SACKS(PAPER) COLLECTION)
SANBORN, K. F.
PUBLIC WORKS 93(3), P. 148, 150 (MARCH 1965). JUNCTION CITY, KANSAS HAS STARTED USING THE WESTVACO REFUSE SYSTEM (PAPER SACKS). AT PRESENT ABOUT 23 PERCENT OF THE CITY USES THIS SYSTEM. FOR A CHARGE OF ONE DOLLAR, SEVENTY-FIVE CENTS (50 CENTS MORE THAN FOR NORMAL COLLECTION) THE CUSTOMER RECEIVES 2 SACKS PER WEEK AND A SACK HOLDER.

03-09-00679 PAPER BAGS AT THE FOOT OF THE CHUTE (SACK(PAPER))
PUBLIC CLEANSING 50(12), P. 592 (DECEMBER 1960). A CIRCULAR REFUSE-COLLECTING MACHINE THAT CAN BE USED WITH ANY REFUSE CHUTE INSTALLATION HAS BEEN DEVELOPED IN SWEDEN. THE MACHINE CATCHES THE FALLING REFUSE IN 1 OF THE 12 PAPER BAGS WHICH IT CONTAINS, COMPRESSES IT, AND AUTOMATICALLY ROTATES A NEW PAPER BAG INTO POSITION WHEN THE OLD ONE IS FILLED. THE $1,420 MACHINE REDUCES REFUSE COLLECTION COSTS SUFFICIENTLY TO PAY FOR ITS OWN INSTALLATION IN A SHORT TIME. (PHS)

03-09-00831 BINS OR SACKS- ECONOMIC CONSIDERATIONS (SACK(PAPER) COST(COLLECTION) COLLECTION)
PUBLIC CLEANSING 53(8), P. 398 (AUGUST 1963). THE ONE SIGNIFICANT DISADVANTAGE OF THE PAPER SACK REFUSE STORAGE AND COLLECTION SYSTEM, OUTWEIGHING ALL OTHERS, IS THE ADDITIONAL EXPENSE OF THE SACKS THEMSELVES. THE ARTICLE GIVES SEVERAL ARGUMENTS AGAINST THIS ALLEGED DISADVANTAGE- (1) THE SACK IS NOW BEING MANUFACTURED FOR A LOWER PRICE THAN WHEN THE SYSTEM WAS FIRST BEING CONSIDERED, (2) EVEN IF COSTS RISE BY THE USE OF THE SACK, THE MERITS OF THIS SYSTEM OFFSET ANY COST INCREASE, AND (3) LABOR SAVINGS HELP TO OFFSET THE COST OF THE SACKS. DISCUSSES FACTORS WHICH SHOULD BE CONSIDERED WHEN ESTIMATING THE COST OF THE PAPER SACK SYSTEM. SHOWS THAT FOR UNITS OF 10,000 POPULATION (2,700 HOUSES) THE COST OF THE PAPER SACK SYSTEM AND THE DUSTBIN SYSTEM ARE THE SAME, USING AS A BASIS OF CALCULATION THE ANNUAL COSTING RETURNS OF THE MINISTRY OF HOUSING AND LOCAL GOVERNMENT. (PHS)

03-09-00845 PAPER BAGS FOR SPEEDY GARBAGE COLLECTION (COLLECTION SACK(PAPER) SANITARY-LANDFILL)
THE AMERICAN CITY 75(6), P. 33 (JUNE 1960). FREDERICKSBURG, VIRGINIA, HAS CONVERTED TO THE USE OF PAPER SACKS FOR REFUSE COLLECTION. SANITARY LANDFILL IS USED. YEARLY COST TO RESIDENTS IS 20 DOLLARS PER YEAR. COLLECTION IS TWICE A WEEK, WITH THREE PICKUPS PER WEEK IN THE SUMMER. SACKS COST 4 CENTS EACH OR 13,000 DOLLARS PER YEAR.

03-09-00910 PAPER SACKS ARE PUT THROUGH THE MILL (SALVAGE SACK(PAPER) SEGREGATION)
PUBLIC CLEANSING 52(2), P. 75 (FEBRUARY 1962). DESCRIBES A TEST RECENTLY CONDUCTED IN SALFORD, ENGLAND, TO DETERMINE WHAT WOULD HAPPEN TO PAPER SACKS CONTAINING REFUSE WHEN HANDLED BY A SEPARATION PLANT. IT WAS ASCERTAINED THAT- (1) THE ELEVATING BELTS WILL CARRY THE SACKS SMOOTHLY FOR DELIVERY TO THE SCREENS, (2) THE SACKS WILL BE THROWN ABOUT SOMEWHAT AS THEY ARE PASSED THROUGH THE SCREENS AND ARRIVING AT THE PICKING BELT THEY WILL RETAIN ONLY 50 PERCENT OF THEIR REFUSE, (3) IF A SLICING DEVICE IS INCORPORATED TO SLIT THE SACKS, THE SACKS WOULD NOT BE WHOLLY EMPTIED, AND (4) IF BAGS ARE TO BE USED, IT WILL BE NECESSARY TO PASS THEM FIRST THROUGH SOME FORM OF PULVERIZING MACHINE TO INSURE THAT ALL CONTENTS ARE SPILLED ON TO THE CONVEYOR BELTS. (PHS)

03-09-01039 USE OF PAPER GARBAGE CONTAINERS (SACK(PAPER) COST(OPERATING))
PUBLIC WORKS 93(11), P. 148 (NOVEMBER 1962). A COMPLETE DESCRIPTION OF THE PAPER BAG REFUSE COLLECTION SYSTEM. A STUDY HAS BEEN MADE BY A WEST VIRGINIA PAPER COMPANY GIVING DETAILS OF THE COLLECTION OF GARBAGE FROM 500 HOMES IN MONTCLAIR, NEW-JERSEY, FOLLOWING A SUCCESSFUL 90-DAY TEST OF THE SYSTEM. (WESTVACO). THE STUDY INDICATED THAT ASIDE FROM THE ADVANTAGES IT OFFERS IN CONVENIENCES, APPEARANCE, AND SANITATION, THE NEW BAG SYSTEM WILL COST $2 LESS A YEAR FOR EACH HOUSEHOLD THAN THE CONVENTIONAL REFUSE CAN SYSTEM. UNDER THE BAG SYSTEM, THE COLLECTOR HAS TO MAKE ONLY A ONE-WAY TRIP--FROM LOCATION OF THE REFUSE TO THE TRUCK--AND CAN CARRY MORE REFUSE PER TRIP BECAUSE OF THE MUCH LIGHTER WEIGHT OF THE BAG. THE BAGS ARE MADE OF THE STRONGEST SINGLE-PLY PAPER EVER CONSTRUCTED AND WILL HOLD WET GARBAGE, JAGGED TIN CANS, GLASS, ETC. IN ALL KINDS OF WEATHER. TWO TYPES OF BAG HOLDERS ARE OFFERED--PORTABLE OR STATIONARY. IN A SURVEY CONDUCTED AMONG HOUSEHOLDERS IN THE TRIAL AREA, 80 PERCENT PREFERRED THE PAPER BAG SYSTEM TO GARBAGE CANS. (PHS)

03-09-01067 SECOND COMMUNITY ADOPTS THE PAPER BAG REFUSE SYSTEM (SACK(PAPER))
PUBLIC WORKS 95(5), P. 117 (1964). A REVIEW OF THE DECISION AND RESULTS OF RIVERDALE, MARYLAND, CHANGING OVER FROM A GARBAGE CAN COLLECTION SYSTEM TO A PAPER BAG SYSTEM. THE RESPONSE OF THE HOUSEHOLD WAS ABOUT 90 PERCENT IN FAVOR OF THE CHANGE. DUE TO THE FACT THERE IS ONLY ONE TRIP FROM THE TRUCK TO THE HOUSE, THERE WAS A REDUCTION IN MANPOWER AND EQUIPMENT ENOUGH TO OFFSET THE COST OF THE CITY FURNISHING THE PAPER BAGS AND THE BAG HOLDERS AT EACH RESIDENCE.

03-09-01127 REFUSE COLLECTION--THE PAPER SACK SYSTEM (SACK(PAPER) COST(OPERATING) ,
MARRIOTT, J. + HOLT, A.
THE SANITARIAN 70(6), P. 289-309 (MARCH 1962). THE AUTHORS DESCRIBE A METHOD OF USING SINGLE-SERVICE PAPER BAGS FOR REFUSE STORAGE, COLLECTION, AND DISPOSAL IN ENGLAND. ADVANTAGES CLAIMED FOR THE SYSTEM HAVE BEEN - COLLECTION TIME REDUCED, DUSTLESS LOADING, IMPROVED HYGIENE OF STORAGE RECEPTACLES VEHICLES AND WORKMEN, NOISE ABATEMENT, LABOR PROBLEMS ERASED, COLLECTION DELAY PROBLEMS MINIMIZED, MULTI-STORY BUILDING REFUSE STORAGE AND DISPOSAL SIMPLIFIED, AND LESS WEAR AND TEAR ON VEHICLES. DISADVANTAGES HAVE BEEN STATED TO INCLUDE - COST, MISUSE, POTENTIAL RISK OF BAG FAILURE FROM MOISTURE, FIRE, ANIMALS, WIND, ETC., BULKY LOADS, DISPOSAL DIFFICULTIES, UNSIGHTLY APPEARANCE OF HOLDERS AND SACKS, IMPORTED COMMODITY (PAPER). THE CONCLUSIONS OF A PILOT TEST OF THE SYSTEM MADE IN THE WETHERBY RURAL DISTRICT ARE GIVEN. (PHEA)

03-09-01295 PAPER SACK SYSTEM PASSES THE TEST
PUBLIC CLEANSING 56(1), P. 35-36 (1966). THE PAPER SACK METHOD IN LANCHESTER IS PROVING TO BE A SATISFACTORY METHOD OF REFUSE COLLECTION. THE CITY FURNISHES THE RESIDENCE WITH THE NECESSARY SACKS AND HOLDERS AT NO COST. WITH THE EXCEPTION OF FEW MINOR INSTANCES WHERE SHARP OBJECTS PUNCTURE THE BAGS, FIRES FROM HOT ASHES, AND BIRDS SEEKING FOOD, THEY ARE PROVING TO BE SATISFACTORY. THE SYSTEM IS ALLOWING THE REFUSE COLLECTION CREWS TO COLLECT FROM LARGER AREAS WITHOUT INCREASING THE COLLECTION CREWS.

03-09-01471 GROSSE POINTE OFFERS ADVANCED REFUSE SERVICE (SACK(BURLAP) SALVAGE(PAPER))
BLONDELL, N.
THE AMERICAN CITY 72(11), P. 110 (JANUARY 1957). A DESCRIPTION OF THE GROSSE POINTE, MICHIGAN COLLECTION SYSTEM WHEREIN THE CITY USES BURLAP BAGS AT EACH RESIDENCE AND PROVIDES BASEMENT PICKUP SERVICE AT $5.93 PER CAPITA PER YEAR. SALVAGE AND DUMP OPERATING DIFFICULTIES ARE BRIEFLY DESCRIBED. (PHS)

03-09-01495 FLY AND ECONOMIC EVALUATION OF URBAN REFUSE SYSTEMS, PART II, AN EFFICIENCY ANALYSIS OF PAPER BAG CONTAINERS (SACK(PAPER) VECTOR COST(OPERATING))
ROGERS, P. A. + BELLENGER, G. J.
CALIFORNIA VECTOR VIEWS 14(5), (MAY 1967). THIS STUDY IS AN ECONOMIC EVALUATION OF ONCE-A-WEEK GARBAGE CAN SERVICE, TWICE-A-WEEK GARBAGE CAN SERVICE, ONCE-A-WEEK SERVICE FROM SUSPENDED PAPER BAG CONTAINERS, AND TWICE-A-WEEK SERVICE FROM SUSPENDED PAPER BAG CONTAINERS. FOUR COMPARABLE AREAS OF APPROXIMATELY 500 HOMES EACH WERE SELECTED IN THE CITY OF SANTA-CLARA, ONE FOR EACH OF THE FOUR SYSTEMS STUDIED. EVALUATION WAS BASED ON A TIME AND MOTION STUDY WHICH COMPARED THE VARIOUS ASPECTS OF PICKUP SERVICE BETWEEN EACH OF THE FOUR AREAS. UP TO 30 PERCENT SAVINGS IN MANPOWER WERE ACHIEVED BY SUBSTITUTING PAPER BAGS FOR METAL CANS, BUT UNLESS THE COLLECTION SYSTEM WAS ACTUALLY DESIGNED AROUND THE PAPER BAG CONCEPT, THE SAVINGS IN TIME WOULD PROBABLY NOT BE SUFFICIENT TO PAY FOR THE ADDITIONAL COST OF THE PAPER BAGS. (AUTH)

03-09-01536 REFUSE STORAGE IN PAPER SACKS (SACK(PAPER) COLLECTION)
BEVAN, R. E.
PUBLIC CLEANSING 52(5), P. 190 (MAY 1962). A DETAILED INTERIM REPORT ON THE PROGRESS OF AN EXPERIMENTAL PILOT SCHEME OF ABOUT 2,500 HOUSES IN THE WYTHENSHAWE, ENGLAND, AREA TO OBTAIN INFORMATION ON REFUSE STORAGE IN PAPER SACKS. DESCRIBES - (1) THE DISTRIBUTION OF THE PAPER SACKS AND HOLDERS TO THE RESIDENTS, INCLUDING PREPARATIONS MADE BEFOREHAND AND DIFFICULTIES INCURRED DURING DISTRIBUTION, (2) COLLECTION OPERATIONS, AND THE VEHICLE USED IN COLLECTION, (3) CONTROLLED TIPPING OF THE REFUSE SACKS, (4) THE THREE TYPES OF PAPER SACK HOLDERS USED, (5) COMPLAINTS MADE BY RESIDENTS ABOUT THE PAPER SACK SYSTEM AND ACTION TAKEN BY THE SUPERVISORY OFFICERS IN CORRECTING THEM, AND (6) ADVANTAGES AND DISADVANTAGES REALIZED BY USING THE SYSTEM. ALSO GIVES A COMPARISON OF COSTS OF THE DUSTBIN AND PAPER SACK SYSTEMS. (PHS)

03-09-01780 PAPER CONTAINERS TRIM MAINTENANCE COST 25 PERCENT (COLLECTION)
REFUSE REMOVAL JOURNAL 6(12), P. 14 (DECEMBER 1963). ONE OF NEW YORK CITY'S LARGEST BANKS, WITH 10 BRANCH OFFICES IN THE BOROUGH OF MANHATTAN, HAS REALIZED MANY IMPORTANT CAFETERIA IMPROVEMENTS BY CHANGING TO A NEW REFUSE DISPOSAL SYSTEM UTILIZING ENAMELED CABINETS LINED WITH LARGE, HEAVY-DUTY DISPOSABLE PAPER BAGS. AMONG THE IMPROVEMENTS ARE MAXIMUM SANITATION, A MORE ATTRACTIVE LUNCHING ENVIRONMENT, AND A BETTER THAN 25 PERCENT TIME REDUCTION IN MAINTENANCE OF DISPOSAL UNITS. (PHS)

03-09-01803 STORAGE IN PAPER SACKS AVOIDS RATS AND FLIES (VECTOR SACK(PAPER) CONTAINER(SIZE))
BLACK, R. J.
REFUSE REMOVAL JOURANL 7(12), P. 16 (1964). RECEPTACLE SPECIFICATIONS VARY WITH THE VARIETY OF REFUSE COLLECTION PRACTICES. SEVERAL STUDIES HAVE INDICATED THAT PAPER SACKS ARE A VERY CONVENIENT RECEPTACLE FOR DISPOSING GARBAGE AND REFUSE. IT HAS BEEN FOUND THAT BY PLACING GARBAGE IN PAPER BAGS IT REDUCES THE PROBLEM OF FLY AND RAT INFESTATION SINCE THE LARVAE IS CARRIED AWAY FROM THE HOUSEHOLD WITH THE GARBAGE AND ARE NOT LEFT IN THE CANS TO HATCH.

03-09-01824 SACKS QUIET APARTMENT PICKUPS (SACK(PAPER) COST RESIDUE INCINERATION)
REFUSE REMOVAL JOURNAL 8(5), P. 6 (1965). ALTHOUGH THE USE OF PAPER SACKS TO REMOVE REFUSE FROM MULTI-FAMILY APARTMENTS HAS REDUCED THE NOISE LEVEL, THE ECONOMICS ARE ALSO NOTICEABLE. THE CHANGE FROM METAL CANS TO PAPER SACKS SAVES THE COOPERATIVE OVER $5,000 PER YEAR. REFUSE HANDLING TIME WAS REDUCED FROM 31.5 MAN HOURS TO 5.25 MAN HOURS TO REMOVE AND ESTIMATED 4,200 LBS PER WEEK. ABOUT 50 BAGS PER WEEK ARE USED AT A COST OF 10 CENTS PER BAG FOR A 2-PLY 32 GALLON CAPACITY OR 7 CENTS FOR A 2-PLY 20 GALLON CAPACITY.

03-09-01838 PAPER SACK UNIT PACKS AND COMPRESSES AT SITE (DEVA COMPACTION SACK(PAPER))
REFUSE REMOVAL JOURANL 8(2), P. 22 (1965). DEVA REFUSE COMPRESSION SYSTEM AUTOMATICALLY COMPRESSES AND SACKS WASTE MATERIAL IN PAPER SACKS. TWO MODELS ACCEPT THE REFUSE EITHER MANUALLY OR FROM A CHUTE, COMPRESSES THE REFUSE AND MOVES TO ANOTHER EMPTY POSITION AUTOMATICALLY. THESE UNITS ARE DESIGNED FOR COMMERCIAL AND INDUSTRIAL USE.

03-09-01861 94 PERCENT " AYE " (SACK(PAPER))
THE AMERICAN CITY 82, P. 78-79 (JULY 1967). THE FEASIBILITY OF A DISPOSABLE REFUSE SACK FOR BOTH HOUSEHOLD REFUSE AND GARBAGE TO BE USED IN CONJUNCTION WITH THE OPERATION OF A YEAR-ROUND SANITARY LANDFILL IS BEING STUDIED. RECORDS ARE BEING KEPT TO DEVELOP WEIGHT-VOLUME-AREA CRITERIA TO MEASURE THE EFFECT OF THE SYSTEM ON LANDFILL OPERATION AND THE LANDFILL CAPACITIES OF THE COMMUNITY AND TO DETERMINE THE ECONOMICS OF THE SYSTEM. (PHEA)

03-09-01882 NEWBURN PUTS IT IN THE SACK (SACK(PAPER) ECONOMICS)
PUBLIC CLEANSING 54(11), P. 1272 (1964). UNDER THE GUIDANCE OF NEWBURN'S CHIEF PUBLIC HEALTH INSPECTOR, A SYSTEM OF PAPER SACK REFUSE STORAGE HAS BEEN PUT INTO USE. OTHER THAN A FEW INSTANCES OF ABNORMALLY WET WEATHER, SOME ANIMAL DAMAGE, AND A FEW MODIFICATIONS BY THE MANUFACTURER THE SYSTEM IS WORKING WELL. A COMPARISON IN THE COST OF DISPOSAL BY SACK AND BY DUSTBIN IS SHOWN IN A TABLE.

03-09-01886 PAPER SACKS PREPARED FOR DISPOSAL (SALVAGE SACK(PAPER) INCINERATOR)
PUBLIC CLEANSING 54(9), P. 1178 (1964). WITH THE CO-OPERATION OF THE BIRMINGHAM (ENGLAND) SALVAGE DEPARTMENT AND TWO SACK MANUFACTURERS, TESTS HAVE BEEN CONDUCTED TO CHECK THE RESULTS OF A SACK COLLECTION SYSTEM AND SOME OF THE PROBLEMS THAT MIGHT BE ASSOCIATED WITH THEM AT A DISPOSAL PLANT. THE BAGS WERE ALLOWED TO SIT IN WET CONDITION SIMILAR TO ACTUAL CONDITIONS, LOADED INTO COMPACTORS AND TRANSPORTED TO THE DISPOSAL PLANT. THE SACKS WERE CUT IN THE COMPACTION PROCESS AND AS THEY AND THEIR CONTENTS WERE UNLOADED THEY PASSED OVER THE NORMAL SEPARATION FOR SALVAGE THEN TO THE INCINERATOR WITHOUT ANY PROBLEMS.

03-09-01901 STUDY FINDS PAPER SACKS CUT FLY NUISANCE
ECKE, D. H.
REFUSE REMOVAL JOURNAL 8(12), P. 1965). WHEN PLANS ARE BEING MADE FOR REFUSE COLLECTION AND DISPOSAL IN URBAN AREAS, MAN POWER AND EQUIPMENT DEMANDS ARE GIVEN FIRST CONSIDERATION FOR ECONOMIC REASONS. ALTHOUGH IT IS GENERALLY THOUGHT THAT REFUSE COLLECTION AND DISPOSAL ARE CONDUCTED FOR PUBLIC HEALTH REASONS, VERY LITTLE THOUGHT IS GIVEN TO THE GREAT NUISANCE AND HEALTH PROBLEM RELATED TO REFUSE, THE FLY. IN AN EFFORT TO DETERMINE THE EFFECT OF PAPER SACKS ON THE MIGRATION OF LARVAE, A TEN-WEEK INVESTIGATION WAS CONDUCTED. THE DATA FROM THIS STUDY IS PRESENTED.

03-09-01908 REFUSE SERVICE IS GREATEST USER OF BAGS IN SWEDEN (SACK COMPACTION)
RASCH, S.
REFUSE REMOVAL JOURNAL 8(10), P. 20 (1965). REFUSE COLLECTION IN SACKS BEGAN IN 1952 IN MALMO, SWEDEN WHERE MANY SUMMER HOMES DID NOT HAVE REFUSE COLLECTION. PAPER BAGS WERE SOLD IN LOCAL STORES WHERE THEY WERE OBTAINED TO SACK THEIR REFUSE FOR DISPOSAL. NOW OVER 1,000 COMMUNITIES WITH ABOUT 38 PERCENT OF THEIR POPULATION ARE USING SACKS OR ARE CONVERTING OVER TO SACK DISPOSAL.

03-09-01911 STUDY FINDS SACKS DECOMPOSE AT SAME RATE AS CONTENTS
REFUSE REMOVAL JOURNAL 8(11), P. 42 (1965). AFTER BEING BURIED A YEAR IN A LANDFILL, TESTS IN ENGLAND REVEALED THAT REFUSE COLLECTED IN PAPER SACKS DECOMPOSED MUCH FASTER THAN IN POLYETHYLENE BAGS. THE EXPERIMENT WAS CARRIED OUT IN MANCHESTER, ENGLAND, A CITY OF 700,000 IN BRITAIN'S INDUSTRIAL HEART. SINCE IT WAS FOUND THAT PAPER SACKS HAVE A NORMAL DECOMPOSITION RATE UNDER SANITARY LANDFILL CONDITIONS, THE CITY IS EXTENDING THE USE OF THE SYSTEM FOR REFUSE COLLECTION AT THE RATE OF 15,000 HOMES PER YEAR. IN MARCH 1964, A HEAP OF FIVE TONS OF NORMAL HOUSEHOLD REFUSE CONTAINING 48 PAPER SACKS OF WASTE AND FIVE POLYETHYLENE BAGS, ALSO FILLED WITH THE SAME MATERIAL, WAS BUILT UP IN A LANDFILL. THIS WAS THEN COVERED WITH SOME 12 TONS OF INERT REFUSE TO ACT AS A SEAL. THE FILL WAS OPENED IN MARCH 1965, AND THE RESULTS WERE ANALYZED. MANCHESTER'S PUBLIC CLEANSING CHEMIST, WHO CONDUCTED THE TESTS, STATED THAT

REFUSE DUMPED IN THE PAPER SACKS WOULD FOLLOW THE PATTERN FOR DECOMPOSITION EXPECTED OF NORMAL HOUSEHOLD REFUSE, BUT POLYETHYLENE BAGS WOULD PRESERVE THE WASTE ALMOST INTACT, MAKING DECOMPOSITION EXCEEDINGLY SLOW.

03-09-01922 MORE PAPER SACKS IN MANCHESTER
BEVAN, R. E.
PUBLIC CLEANSING 54(1), P. 646 (1964). THE MANCHESTER, ENGLAND, CLEANSING COMMITTEE PROPOSES TO EXTEND THE PAPER SACK COLLECTION SYSTEM BY INTRODUCING A DEVELOPMENT PROGRAM OVER A THREE YEAR PERIOD WHICH WILL INVOLVE ABOUT 45,000 HOMES IN THE FIRST PHRASE. THEN AFTER EVALUATING THE RESULTS AN ADDITIONAL 15,000 HOMES WILL BE INCLUDED EACH YEAR UNTIL THE ENTIRE TOWN OF ABOUT 100,000 HOMES WILL BE USING PAPER SACKS. THERE ARE SOME COSTS DATA INCLUDED WITH SOME DISCUSSION OF ADVANTAGES AND DISADVANTAGES RELATED TO SUCH A SYSTEM.

03-09-01946 NEW YORK CITY APPROVES REFUSE SACKS (SACK(PAPER) COLLECTION)
THE AMERICAN CITY 85(1), P. 37 (JANUARY 1970). NEW YORK CITY HAS MODIFIED THE HEALTH CODE IN ORDER TO PERMIT THE LEGAL USE OF SACKS FOR REFUSE DISPOSAL. THE USE OF SACKS HAS BEEN TESTED FOR AN 8 WEEK PERIOD BY 17,000 HOUSEHOLDERS IN VARIOUS PARTS OF THE CITY, AND FOR A SHORTER TIME IN APARTMENT HOUSES. IT IS REPORTED THAT THE RESIDENTS LIKE THE SACKS, AND THE COLLECTION WORKERS WERE ABLE TO COMPLETE THEIR ROUTES FASTER, WITH FEWER INJURIES TO THEMSELVES OR THE COLLECTION VEHICLES.

03-09-01992 SOME EFFECTS OF DISPOSABLE PLASTIC LINERS ON REFUSE HANDLING EFFICIENCY (SACK(PLASTIC))
MCELWEE, W. C. + WILCOMB, M. J.
J ENVIRONMENTAL HEALTH 30(5), P. 501-509 (MARCH-APRIL 1968). HANDLING TIMES DURING WASTE COLLECTIONS WERE COMPARED USING PLASTIC DISPOSABLE REFUSE CAN LINERS AND CONVENTIONAL REFUSE CONTAINERS. THE STUDY WAS CONDUCTED IN LEBANON, OHIO, BETWEEN APRIL AND JUNE 1967. PICKUP TIMES FROM CURB TO TRUCK AVERAGED SIGNIFICANTLY LESS FOR THE PLASTIC LINERS, AS COMPARED TO THOSE FOR UNLINED REUSABLE METAL OR PLASTIC CONTAINERS. IN THE TWO PHASES OF THE STUDY, FOR WHICH THE DATA WERE COLLECTED SOMEWHAT DIFFERENTLY, THE MEAN DIFFERENCES WERE 13.7 SECONDS, PLUS OR MINUS 1.7 SECONDS, AND 14.1 SECONDS, PLUS OR MINUS 1.7 SECONDS AT THE 90 PERCENT CONFIDENCE LEVEL. SOME OF THE OBSERVED ADVANTAGES AND DISADVANTAGES OF THE PLASTIC LINERS ARE REPORTED FROM THE VIEWPOINTS OF PUBLIC HEALTH, AESTHETICS, ECONOMICS AND CONVENIENCE TO HOUSEHOLDERS AND COLLECTORS. (AUTH)

03-09-02127 SACKS IN A CITY (SACK(PAPER))
BEVAN, R. E.
70TH ANNUAL CONF OF THE INSTITUTE OF PUBLIC CLEANSING, BRIGHTON, (JUNE 11-14, 1968). THE USE OF THE PAPER SACK FOR THE STORAGE OF REFUSE UNTIL IT COULD BE PICKED UP AND DISPOSED OF HAS BEEN IN USE FOR MANY YEARS. ALTHOUGH THERE ARE MANY ADVANTAGES TO USING THIS SYSTEM THERE ARE ALSO MANY DISADVANTAGES. A RATHER EXTENSIVE REVIEW OF THE SYSTEM IS GIVEN WITH AN OUTLINE OF SOME OF THE IMPROVEMENTS BEING MADE, VOLUME DATA, AND COSTS ARE ALSO GIVEN.

03 10 USE OF COMPUTERS

03-10-00710 COMPUTERS CAN AID PLANNING OF CLEANSING SERVICES
PUBLIC CLEANSING 58(6), P. 258 (JUNE 1967). SEVERAL TECHNIQUES USING MATHEMATICAL MODELS TO STUDY REFUSE COLLECTION AND DISPOSAL PROBLEMS ARE DESCRIBED. ALTHOUGH THE SYSTEM DESCRIBED HERE IS FAR FROM PERFECTION AND HAS NOT YET BEEN APPLIED ON A WIDE ENOUGH SCALE TO BE ABLE TO ASSESS ITS COSTS, ADVANTAGES AND LIMITATIONS, THE MODELS DESCRIBED HERE HAVE PERFORMED WELL IN TEST STUDIES. THUS IT WAS CONCLUDED THERE IS EVERY REASON TO SUPPOSE THAT THEY WILL WORK IN LARGE SCALE PRACTICE, PROVIDING THEY ARE ACCORDED THE POSITIVE SUPPORT OF THE MANAGEMENTS THEY ARE INTENDED TO HELP.

03-10-00778 SIMULATION AND ANALYSES OF A REFUSE COLLECTION SYSTEM (COMPUTER)
QUON, J. E. + CHARNES, A. + WERSAN, S. J.
AM SOC CIVIL ENGRS J SANIT ENGRG DIV 91, P. 17 (1965). THE ARTICLE CONTAINS A DETAILED, COMPUTERIZED ANALYSIS OF A MUNICIPAL REFUSE COLLECTION SYSTEM. THE MAIN OBJECTIVE OF THE COMPUTATIONS WITH THE SIMULATION PROGRAM DEVELOPED BY THE RESEARCHERS WAS TO POINT OUT THE RELATIONSHIPS OF THE SEVERAL SIGNIFICANT VARIABLES INVOLVED IN THE FUNCTIONING OF A REFUSE COLLECTION SYSTEM. THE SIMULATION METHOD OF ANALYSIS ALLOWS AN ECONOMICAL MEANS OF INVESTIGATING CHANGES IN THE OPERATIONS OF A REFUSE COLLECTION SYSTEM WITHOUT RESORTING TO ACTUAL FIELD TRIALS. THE PARAMETERS TO BE CONSIDERED IN THE SIMULATION OF THE DAILY ROUTE OF REFUSE COLLECTION ARE- (1) NUMBER OF HOURS NEEDED TO COMPLETE ASSIGNED TASK, (2) FREQUENCY OF TRIPS TO THE DISPOSAL SITE, (3) OVERALL COLLECTION, PICKUP, AND HAUL EFFICIENCES, (4) TRUCK CAPACITY, (5) SERVICE DENSITY, (6) AVERAGE AND VARIABILITY IN THE QUANTITIES OF REFUSE PRODUCED DAILY, (7) HAUL DISTANCE, (8) FREQUENCY OF SERVICE, (9) NUMBER OF UNLOADING DOCKS AT THE DISPOSAL SITE. THE REPORT USED CHARTS, GRAPHS, EQUATION, DIAGRAMS AND A FLOW SHEET TO EXPLAIN THE PROCESS WHICH WAS USED. THE REPORT IS OF A TECHNICAL NATURE. (UC)

03-10-01404 AN AUTOMATIC EFFICIENCY EXPERT
MUCKELROY, E. F.
THE AMERICAN CITY 71(1), P. 156 (JANUARY 1956). AN ACCOUNT OF THE INCREASED EFFICIENCY ACHIEVED BY THE INSTALLATION OF AUTOMATIC VEHICLE MILEAGE RECORDERS ON REFUSE COLLECTION AND STREET CLEANING VEHICLES AT EL PASO, TEXAS. THE DATA COLLECTED WAS USED AS ONE BASIS FOR REWARDING EFFICIENCY. (PHS)

03-10-02159 SYSTEMS ANALYSIS OF REFUSE COLLECTION (PLANNING)
WERSAN, S. J. + QUON, J. E. + CHARNES, A.
REFUSE REMOVAL JOURNAL 6(1), P. 23-25 (JANUARY 1963). AN OUTLINE IS GIVEN OF A SYSTEM FOR ANALYZING A SOLID WASTE COLLECTION AND DISPOSAL SYSTEM. IT CONSISTS OF THE INTERRELATED SUBSYSTEMS OF COLLECTION, TRANSPORTATION, AND DISPOSAL METHODS, AND THE PROBLEMS OF EACH. TOPICS COVERED INCLUDE, THE NATURE OF THE REFUSE SYSTEM, THE COMPLEX INTERRELATION OF THE SUBSYSTEMS, ROUTE LAYOUTS, AND COSTS. REFERENCE IS MADE TO MATHEMATICAL FORMULATIONS RELATED TO SYSTEMS ANALYSIS WHICH ARE NOT GIVEN.

03 11 HEALTH ASPECTS

03-11-01018 THE MIGRATION OF FLY LARVAE FROM REFUSE CONTAINERS VS. FREQUENCY OF COLLECTION (INSECT VECTOR)
PUBLIC WORKS 92(4), P. 120-122 (1961). FLY NUISANCES IN THE CONCORD, CALIFORNIA, AREA PROMPTED THE RESIDENTS TO FORM A CITIZENS COMMITTEE TO INVESTIGATE THE VARIOUS WAYS OF CONTROLLING FLIES. IT WAS APPARENT THAT THE FLY PROBLEM WAS GENERAL THROUGHOUT THE AREA AND THE CITIZENS PETITIONED THE EXISTING CONTRA COSTA MOSQUITO ABATEMENT DISTRICT TO PROVIDE FLY CONTROL WORK ON AN AREA-WIDE BASIS. A SIMPLE METHOD OF INVESTIGATING THE PROBLEM OF LARVAL MIGRATION FROM THE GARBAGE CAN WAS DEVELOPED AND USED THROUGHOUT THE STUDIES. THE RESULTS SHOW THAT LARGE NUMBERS OF LARVAE MIGRATED FROM THE REFUSE CANS TO PUPATE BEFORE THE REFUSE WAS COLLECTED. AN AVERAGE OF 1,128 LARVAE PER CAN PER WEEK WERE FOUND DURING THE TWO YEARS OF STUDY, WHICH INCLUDED A TOTAL OF 583 WEEKLY OBSERVATIONS. BY COLLECTING TWO SPECIMENS EACH WEEK FROM EACH CAN, IT WAS FOUND THAT FROM 89.4 TO 98.6 PERCENT OF THE LARVAE LEFT THE GARBAGE CANS DURING THE LAST THREE DAYS OF THE WEEK. THE QUESTION OF HOW 1.4 TO 10.6 PERCENT OF THE LARVAE WERE ABLE TO DEVELOP AND MIGRATE DURING THE FIRST FOUR DAYS COULD BE ANSWERED BY THE FACT THAT OVIPOSITION COULD HAVE OCCURRED EITHER (A) ON THE FIRST DAY THE REFUSE WAS PLACED IN THE CAN, (B) BEFORE THE REFUSE WAS PLACED IN THE CAN, (C) THE LARVAE COULD HAVE BEEN LEFT IN THE BOTTOM SLUDGE OF THE GARBAGE CAN WHEN THE REFUSE WAS COLLECTED. A GOOD CORRELATION WAS FOUND WHEN THE AVERAGE LARVAE

AND PUPAE COUNTS WERE COMPARED WITH THE AVERAGE DAILY MAXIMUM TEMPERATURE BY WEEK. THE RESULTS INDICATE THAT WHEN THE AVERAGE DAILY MAXIMUM TEMPERATURE BY WEEK REACHES 75 DEGREES F, THE GARBAGE SHOULD BE COLLECTED TWICE WEEKLY. THIS SERVICE WOULD INCREASE COLLECTION COSTS BUT WOULD GIVE RESULTS QUICKLY WITHOUT SPECIAL EFFORT BY THE HOUSEHOLDER.

03-11-01490 THE PROBLEM OF MIGRATION OF MATURE FLY LARVAE FROM REFUSE CONTAINERS AND ITS IMPLICATION ON THE FREQUENCY OF REFUSE COLLECTION (VECTOR(CONTROL) CAN(GARBAGE))
CAMPBELL, E. + BLACK, R. J.
CALIFORNIA VECTOR VIEW 7(2), P. 9 (FEBRUARY 1960). THE PROBLEM OF THE MIGRATION OF FLY LARVAE FROM GARBAGE CANS IS A SERIOUS ONE. THE ARTICLE DEALS MAINLY WITH THE SOLUTION OF THE PROBLEM IN CONCORD, CALIFORNIA. THE CONTRA-COSTA MOSQUITO ABATEMENT DISTRICT DID THE RESEARCH - BECOMING THE FIRST PUBLIC AGENCY TO ENGAGE IN A SUSTAINED AND INTENSIVE FLY CONTROL PROGRAM. REGULAR GARBAGE CANS WERE ENCLOSED IN OPEN FIBER DRUMS, WHICH HAD A THREE INCH LAYER OF SAND AND SAWDUST IN THE BOTTOM. AFTER EACH COLLECTION, THE SAND AND SAWDUST, ALONG WITH ANY LARVAE WHICH HAD MIGRATED FROM THE GARBAGE CANS, WERE COLLECTED, AND THE NUMBER OF LARVAE COUNTED. IN 1957, 3.2 PERCENT OF THE LARVAE MIGRATED FROM THE CAN IN THE FIRST FOUR DAYS OF THE WEEK. THIS INDICATED THAT THE BEST WAY OF LESSENING THE NUMBER OF FLIES IN AN AREA WOULD BE TO COLLECT THE REFUSE TWICE PER WEEK AND THUS GREATLY REDUCING THE NUMBER OF LARVAE WHICH ESCAPE FROM THE CANS. THE 1958 STUDIES SHOWED SIMILAR RESULTS, WITH 10.6 PERCENT OF THE LARVAE LEAVING DURING THE FIRST FOUR DAYS OF THE WEEK, 89.4 PERCENT MIGRATING AT THE END OF THE WEEK. CHEMICAL STUDIES WERE ALSO MADE IN 1958. THE RESULTS OF THE CHEMICAL TESTS SHOWED THAT WHEN ATTACHED TO THE UNDERSIDE OF THE GARBAGE CAN LID, NEITHER PDB NOR NAPHTHALENE IS OF ANY VALUE IN REDUCING SUBSTANTIALLY THE NUMBER OF FLY LARVAE THAT MIGRATE FROM GARBAGE CANS. IN A WARM CLIMATE, THERE ARE THREE WAYS TO CONTROL THE FLY-MIGRATION PROBLEM - (1) ESTABLISH TWICE-A-WEEK COMMUNITY-WIDE COLLECTION OF MIXED REFUSE. (2) REQUIRE EACH HOUSEHOLDER TO DRAIN THE SECURELY WRAPPED GARBAGE. (3) REQUIRE EACH HOUSEHOLDER TO INSTALL AND USE A GARBAGE GRINDER. THE TWICE-A-WEEK COLLECTION IDEA IS THE MOST FEASIBLE. (UC)

03-11-01492 AN EVALUATION OF THE MIGRATION OF FLY LARVAE FROM GARBAGE CANS IN PASADENA, CALIFORNIA (VECTOR(CONTROL) CAN(GARBAGE))
MAGY, H. I. + BLACK, R. J.
CALIFORNIA VECTOR VIEWS 9(10), P. 55 (NOVEMBER 1962). THIS REPORT IS AN ACCOUNT OF A FIVE-WEEK STUDY IN PASADENA, WHERE GARBAGE CONTAINERS AT THIRTY HOUSEHOLDS WERE STUDIED. WHEN FLIES INFEST GARBAGE CANS, THE LARVAE PRODUCED ARE USUALLY CONCEALED IN THE GARBAGE. BECAUSE THE INSIDE OF THE CAN GENERALLY IS TOO MOIST, THE MATURE LARVAE CRAWL OUT OF THE CAN, EITHER THROUGH A HOLE OR UP THE SIDES OF THE CAN AND OUT FROM UNDER THE COVER. ONCE ON THE GROUND, THEY CRAWL TO A DRY PLACE AND BURROW INTO DRY GROUND TO PUPATE. EACH GARBAGE CAN WAS PLACED INSIDE A LARGER FIBER DRUM CONTAINING SEVERAL INCHES OF A MIXTURE OF SAWDUST AND SAND. THE CAN WAS USED IN THE USUAL MANNER, AND GARBAGE WAS COLLECTED EVERY WEEK. AFTER EACH COLLECTION, THE SAWDUST AND SAND AND ANY LARVAE THAT HAD MIGRATED FROM THE CAN WERE REMOVED FROM THE FIBER DRUM. THE LARVAE WERE THEN SEPARATED FROM THE SAND AND COUNTED. AVERAGES OF THE NUMBER OF LARVAE COLLECTED FROM EACH CAN EACH WEEK RANGED FROM 85 TO 767. THE CONTAINERS WERE CLASSIFIED AS EITHER SATISFACTORY OR UNSATISFACTORY. SATISFACTORY CANS WERE THOSE WITH TIGHT LIDS AND NO HOLES. THE UNSATISFACTORY CONTAINERS PRODUCED AN AVERAGE OF 877 LARVAE/CAN/WEEK, WHEREAS THE SATISFACTORY CONTAINERS PRODUCED AN AVERAGE OF 92 LARVAE/CAN/WEEK. OTHER FACTORS, BESIDES THE CONDITION OF THE CAN, WHICH AFFECTED THE THE FLY PRODUCTION INCLUDED - (1) HOW WELL THE GARBAGE WAS DRAINED AND WRAPPED, (2) WHAT KIND OF FOOD WAS PREPARED AND HOW MUCH WAS LEFT AS GARBAGE, (3) HOW LONG THE GARBAGE WAS LEFT EXPOSED TO OVIPOSITING FLIES BEFORE IT WAS WRAPPED, (4) WHETHER THE CAN WAS WASHED OUT AFTER EACH COLLECTION, AND (5) WHETHER OR NOT THE GARBAGE WAS PLACED IN THE CAN CAREFULLY. OTHER FACTORS CONSIDERED WERE THE SIZE OF THE FAMILY, SIZE OF THE CONTAINER, AND EXPOSURE OF THE CONTAINER TO THE SUN. ONLY 26 PERCENT OF THE SATISFACTORY CONTAINERS PRODUCED FLIES. WHEN A CAN IS NEW, ENTRY OF ADULT FLIES IS LESS FREQUENT. ON THE OTHER HAND, 46 PERCENT OF THE UNSATISFACTORY CANS PRODUCED FLIES, AND PRODUCED AN AVERAGE OF FOUR TIMES AS MANY FLIES PER WEEK AS DID THE SATISFACTORY CONTAINERS. THE DATA SUGGESTED THAT THERE WERE TWO PRIMARY VARIABLES WHICH AFFECT THE NUMBER OF FLY LARVAE MIGRATING FROM THE GARBAGE CANS UNDER STUDY - TEMPERATURE AND THE CONDITION OF THE CANS. (UC)

03-11-01500 MIGRATION OF GREEN BLOW FLY LARVAE FROM SIX REFUSE CONTAINER SYSTEMS
ECKE, D. E. + LINSDALE, D. D. + WHITE, K. E.
CALIFORNIA VECTOR VIEWS 12(8), P. 35 (AUGUST 1965). IN PREVIOUS STUDIES OF THE MIGRATION OF FLY LARVAE FROM GARBAGE CANS, IT WAS THEORIZED THAT TWICE-A-WEEK GARBAGE COLLECTION WOULD SOLVE THE MIGRATION PROBLEM. HOWEVER, NO ONE HAD EVER CONDUCTED TESTS TO LEARN IF THIS WERE TRUE. ECKE ET AL TRIED SIX DIFFERENT METHODS OF GARBAGE COLLECTION, AND MADE A COMPARISON AMONG THE SIX IN TERMS OF THEIR RELATIVE EFFICIENCY. THE SIX SYSTEMS WERE - 1. ONCE-A-WEEK COLLECTION FROM 30-GALLON METAL CAN (CONTROL SYSTEM). 2. TWICE-A-WEEK COLLECTION FROM A 30-GALLON METAL CAN. 3. ONCE-A-WEEK COLLECTION FROM A 30-GALLON CAN WITH A VAPONA (2,2-DICHLOROVINYL DIMETHYL PHOSPHATE) STRIP ATTACHED TO THE INSIDE OF THE LID. 4. ONCE-A-WEEK COLLECTION FROM AN EXPOSED, FREELY SUSPENDED PAPER BAG. 5. ONCE-A-WEEK COLLECTION FROM A SUSPENDED PAPER BAG ENCLOSED IN A RECTANGULAR METAL CONTAINER. 6. ONCE-A-WEEK COLLECTION FROM A SUPPORTED PAPER BAG LINER IN A RECTANGULAR METAL CONTAINER. IN ALL THREE PAPER BAG SYSTEMS HEAVY-DUTY WET STRENGTH BAGS WERE UTILIZED. THE BAGS WERE DISPOSED OF WITH THE GARBAGE. THE STUDY WAS CONDUCTED IN THREE DIFFERENT AREAS, AND THE SIX TYPES OF SYSTEMS USED FOR STORAGE WERE EVENLY DISTRIBUTED THROUGHOUT THE TEST AREAS. THE USE OF A GARBAGE GRINDER WAS NOTED. (IN GENERAL, THE FREQUENCY OF MIGRATION WAS GREATER AT HOUSEHOLDS WITHOUT GARBAGE GRINDERS THAN AT HOUSEHOLDS WITH GARBAGE GRINDERS.) THE SIX GARBAGE SYSTEMS FALL INTO TWO WELL DEFINED GROUPS SEPARATED ON THE BASIS OF COMPARISONS WITH RESPECT TO LARVAL MIGRATION. LARVAL MIGRATION WAS SUBSTANTIALLY LESS IN THE SYSTEMS WHICH INVOLVED TWICE-A-WEEK COLLECTIONS, THE USE OF A VAPONA STRIP, AND EXPOSED OR ENCLOSED BAGS, THAN IN THOSE INVOLVING ONCE-A-WEEK COLLECTION AND THE USE OF LINER BAGS. THE EXISTENCE OF ANY APPRECIABLE DIFFERENCE BETWEEN THE MORE EFFICIENT SYSTEMS COULD NOT BE DETERMINED IN THE TESTS. ONLY FROM 33-39 UNITS WERE STUDIED IN EACH SYSTEM. IN SUCH A SMALL STUDY NO REAL DIFFERENCES COULD BE NOTED. WHICH OF THE SYSTEMS WOULD BE THE MOST FEASIBLE FOR A COMMUNITY CANNOT BE DETERMINED UNTIL CAREFULLY OBSERVED, COMMUNITY-WIDE DEMONSTRATIONS ARE CONDUCTED. (UC)

03-11-01541 FLY AND ECONOMIC EVALUATION OF URBAN REFUSE SYSTEMS PART I - CONTROL OF GREEN BLOW FLIES, PHAENICIA, BY IMPROVED METHODS OF RESIDENTIAL REFUSE STORAGE AND COLLECTION (VECTOR INSECT COLLECTION CONTAINER)
ECKE, D. H. + LINSDALE, D. D.
CALIFORNIA VECTOR VIEWS 14(4), (APRIL 1967). THIS STUDY WAS CONCERNED WITH THE GREEN BLOW FLY PRODUCTION FROM HOUSEHOLD GARBAGE CONTAINERS, AND THE DENSITY OF ADULT GREEN BLOW FLIES IN FOUR COMPARABLE AREAS OF 500 HOMES EACH IN SANTA-CLARA, CALIFORNIA. TRAPS COLLECTED ALL FLY LARVAE MIGRATING FROM 40 REPRESENTATIVE GARBAGE CONTAINERS IN EACH AREA. ADULT FLY DENSITY WAS DETERMINED AT 20 STANDARDIZED ATTRACTION STATIONS. THE SYSTEMS STUDIED WERE - ONCE-A-WEEK CANS, ONCE-A-WEEK SUSPENDED PAPER CONTAINERS, TWICE-A-WEEK CANS, AND TWICE-A-WEEK PAPER. FREQUENCY OF REFUSE COLLECTION WAS AN IMPORTANT CONTROL FACTOR IN THAT NEITHER OF THE ONCE-A-WEEK SYSTEMS ACHIEVED SATISFACTORY CONTROL, BUT BOTH THE TWICE-A-WEEK SYSTEMS RESULTED IN GOOD TO EXCELLENT CONTROL. CONTROL MUST BE EVALUATED IN TERMS OF TOTAL FLY PRODUCTION AS WELL AS IN TERMS OF FREQUENCY OR DISTRIBUTION OF FLY SOURCES. USING THESE CRITERIA, THE SYSTEMS RANKED AS FOLLOWS - (1) ONCE-A-WEEK METAL CANS - EXTREMELY HIGH PRODUCTION FROM ABOUT 67 PERCENT OF CONTAINERS. (2) ONCE-A-WEEK PAPER BAGS - HIGH PRODUCTION FROM 20-25 PERCENT OF CONTAINERS. (3) TWICE-A- WEEK METAL CANS - HIGH PRODUCTION FROM ABOUT 10 PERCENT OF CONTAINERS. (4) TWICE-A-WEEK PAPER BAGS - NO CONTAINERS WITH CONSISTENTLY HIGH PRODUCTION. (5) MIXED REFUSE CONTAINERS ARE INDEPENDENT FLY SOURCES WITH LITTLE OR NO DEPENDENCE UPON NEARBY SOURCES AS TO THEIR PRODUCTIVITY. (UC)

03-11-01614 NEW DEODORANT SPRAY DISINFECTS, REPELS FLIES (CONTAINER ODOR(CONTROL))
REFUSE REMOVAL JOURNAL 1(11), P. 13 (NOVEMBER 1958). A NEW DEODORANT DEVELOPED FOR THE REFUSE INDUSTRY, AND FIRST USED BY A PRIVATE CONTRACTOR IN LONG ISLAND, NEW YORK, IS BEING USED TO DEODORIZE, DISINFECT AND, IN SOME APPLICATIONS, PERFUME GARBAGE CANS. (PHS)

03-11-01752 CALIFORNIA STUDY SHOWS FLY MIGRATION FROM CANS (FLY HEALTH VECTOR CONTAINER)
MAGY, H. I. + BLACK, R. J.
REFUSE REMOVAL JOURNAL 6(4), P. 11 (APRIL 1963). AN ACCOUNT OF A FIVE-WEEK STUDY CONDUCTED IN PASADENA, CALIFORNIA, TO EVALUATE THE PROBLEM OF MIGRATION OF FLY LARVAE FROM GARBAGE CANS. DESCRIBES THE OBJECTIVES, PROCEDURES, AND RESULTS. TWO SPECIES OF GREEN BOTTLE FLIES (PHACNICIA CUPRINA AND PHACNICIA SCRICATA) WERE THE PREDOMINANT FLIES RECOVERED. WRAPPED GARBAGE STORED SEPARATELY IN CANS THAT WERE EMPTIED ONCE A WEEK PRODUCED FLY LARVAE WHICH MIGRATED FROM THE CONTAINERS. AN AVERAGE OF 448 FLIES PER CAN MIGRATED EACH WEEK. TWO-THIRDS OF THE REFUSE CANS PRODUCED FLIES FOR AT LEAST ONE WEEK DURING THE 5-WEEK STUDY. AN AVERAGE OF 55.7 PERCENT OF THE CONTAINERS PRODUCED FLIES EACH WEEK. CANS WERE RATED AS TO WHETHER THEY WERE SATISFACTORY OR UNSATISFACTORY, AND ONLY 26 PERCENT OF THE SATISFACTORY CANS PRODUCED FLIES, WHILE 46 PERCENT OF THE UNSATISFACTORY CONTAINERS PRODUCED FLIES. (PHS)

03 12 CHUTES

03-12-00677 PROBLEMS OF HIGH LIVING AND BULK (CHARACTERISTICS QUANTITY COMPOSITION CHUTES COLLECTION)
SCOTT, J.
PUBLIC CLEANSING 51(8), P. 427-444 (AUGUST 1961). A DISCUSSION OF THE USE OF CHUTES FOR REFUSE COLLECTION IN MULTISTORY BUILDINGS. DESCRIBES HOPPER DESIGN, CONTAINERS AND COLLECTION VEHICLES USED, BEHAVIOR OF REFUSE IN THE CHUTE AND NOISE CREATED, CLEANING OF THE CHUTE, THE PROBLEM OF CHCKAGE, AND DISPOSAL OF BULK MATERIALS WHICH CANNOT BE DROPPED DOWN THE CHUTE. A STUDY IS CONDUCTED ON THE COMPOSITION OF REFUSE COLLECTED FROM THREE MULTISTORY DWELLINGS AND THE COLLECTION PROCEDURES USED. (PHS)

03-12-00911 THE GERMAN CHUTE SYSTEM OF DISPOSAL (COLLECTION)
PUBLIC CLEANSING 53(6), P. 286 (JUNE 1963). A TRANSLATION OF EXTRACTS FROM THE GUIDING PRINCIPLES FOR THE DESIGN OF DUSTBIN STANDS, DUSTBIN SHELTERS, AND RUBBISH CHUTES, ISSUED BY THE ASSOCIATION OF GERMAN ENGINEERS. DISCUSSES BRIEFLY THE THREE CLASSIFICATIONS OF REFUSE CHUTE UNITS. GIVES REQUIREMENTS FOR THE DESIGN OF REFUSE CHUTES, COVERING - (1) SOUNDPROOFING, (2) THE REFUSE DISCARD SHAFT - CONSTRUCTION, MATERIAL, SHAPE, AND CROSS SECTIONAL SIZE, (3) THE FITTINGS THROUGH WHICH REFUSE IS THROWN AND THE CONNECTION PIECES BETWEEN THESE AND THE SHAFT - CONSTRUCTION MATERIALS, SIZE, AND SLOPE, (4) A DOOR FOR CLEANING, AND (5) THE LOWER SHAFT END. (PHS)

03 13 OTHER GENERAL ARTICLES

03-13-00678 QUESTIONS AND ANSWERS ABOUT WASTE PAPER (COLLECTION COMPACTION SALVAGE(PAPER))
DUKE, RAYMOND Q.
MODERN SANIT AND BUILDING MAINTENANCE 12(1), P. 18 (JANUARY 1960). THE AUTHOR ANSWERS THE FOLLOWING QUESTIONS ON THE WASTEPAPER PROBLEM IN OFFICE BUILDINGS- (1) HOW DO YOU EDUCATE TENANTS REGARDING THE DEPOSIT OF COFFEE CUPS, LUNCH LEFTOVERS, ETC., IN WASTE BASKETS. (2) WHAT TYPE OF EQUIPMENT IS BEST SUITED FOR WASTEPAPER PICKUP. (3) IS IT MORE ECONOMICAL TO BALE YOUR OWN WASTEPAPER OR TO CONTRACT FOR ITS DISPOSAL (4) HOW IS THE PAPER TRANSFERRED FROM THE POINT OF ORIGIN TO THE BAILING ROOM OR PICKUP STATION. (PHS)

03-13-00721 HAULER RESUMED NEW JERSEY SERVICE AFTER REJECTION (COLLECTION)
REFUSE REMOVAL JOURNAL 5(1), P. 8 (JANUARY 1962). DESCRIBES THE DEVELOPMENT AND PRESENT-DAY OPERATION OF A NEW JERSEY REFUSE COLLECTION FIRM SERVING THE TOWNS OF BLOOMFIELD, VERONA, AND HARRISON. OWNED AND MANAGED BY THREE BROTHERS, THE FIRM IS MARKED BY A CLOSE RELATIONSHIP BETWEEN CUSTOMERS AND CREWS, AND CREW AND MANAGEMENT. IT OPERATES ITS OWN DISPOSAL SITE IN THE JERSEY MEADOWS. FROM 1942 TO 1946, BLOOMFIELD GAVE UP THE COMPANY SERVICE AND ATTEMPTED TO RUN ITS OWN MUNICIPAL REFUSE COLLECTION SERVICE. AFTER RUNNING INTO MANY PROBLEMS THE CITY SOON RETURNED TO COLLECTION BY PRIVATE CONTRACT. (PHS)

03-13-00950 GARBAGE COLLECTION FEE TO PAY FOR WATER TANK
PUBLIC WORKS 99(7), P. 146 (1968). A GARBAGE COLLECTION FEE OR CHARGE OF $1 PER MONTH HAS BEEN LEVIED BY DYER, TENN., TO PAY FOR A NEEDED HALF-MILLION GALLON WATER TANK. THE CHARGE OF $1 PER MONTH WILL PRODUCE ABOUT $8,400 PER YEAR. (AUTH)

03-13-01027 SUCCESS KEYED TO MAN ON TRUCK (COLLECTION CONTAINER)
VANDERVELD, J., JR.
REFUSE REMOVAL JOURNAL 10(4), P. 12, 32, 42 (APRIL 1967). A DISCUSSION OF THE MOTIVATION AND TRAINING REQUIREMENTS FOR THE MAN WHO CARRIES OUT THE REFUSE COLLECTION OPERATION. PUBLIC RELATIONS NEEDS ARE OUTLINED. USE OF CONTAINERS AND COMPACTION DEVICES FOR COLLECTION ARE DISCUSSED. NEED FOR BETTER CONSIDERATION OF REFUSE HANDLING AND DISPOSAL WHEN DESIGNING HIGH RISE AND INDUSTRIAL BUILDINGS IS ILLUSTRATED. RELATIONS BETWEEN DISPOSAL COMPANIES AND LOCAL GOVERNMENT IS ALSO EMPHASIZED.

03-13-01034 PLANNING A SUCCESSFUL LEAF REMOVAL PROGRAM (COLLECTION COST(OPERATION) EQUIPMENT(COLLECTION))
SEELEY, M. J.
PUBLIC WORKS 92(10), P. 127 (OCTOBER 1961). SUMMARIZES THE COMPLETE OPERATION AND EQUIPMENT USED IN AN INTENSIVE LEAF COLLECTION PROGRAM IN RIDGEWOOD, NEW-JERSEY. ONE CU-YD OF LEAVES PER CAPITA WAS REMOVED. THIS REDUCED CHANCES OF A FIRE HAZARD AND THE THICK SMOKE CAUSED BY PUBLIC BURNING.

03-13-01134 EQUIPMENT DEVELOPMENT (COLLECTION)
KUEHN, O.
PROC OF THE NATIONAL CONF ON SOLID WASTE RESEARCH, AM PUBLIC WORKS ASSOC, CHICAGO, ILLINOIS, P. 85-90 (DECEMBER 1963). ITEMS TO WHICH RESEARCH EFFORTS COULD BE APPLIED ARE - (1) STUDY OF EQUIPMENT USE - SEGREGATING REFUSE - WEIGHT - EQUIPMENT COST - MAN POWER - EJECTOR PLATE OR DUMP BODY - ALUMINUM BODIES AND FRAMES - PLASTIC MATERIAL - ALL RELATED TO REFUSE TRUCK USE. (2) ENGINE STUDY - SIZE - HP - TORQUE AND FORMULAS TO JUSTIFY AGREED ON SIZE OF ENGINE, ETC. - TWIN DISC CLUTCHES - DOUBLE REDUCTION REAR AXLES - LUBRICATION - MOTOR OILS, ETC. - TRANSISTORIZED IGNITION - REALISTIC PREVENTATIVE MAINTENANCE PROGRAM - WIDE TREAD AIRPLANE TYPE TIRES. WE FEEL THAT LARGE MUNICIPALITIES HAVE BEEN INSTRUMENTAL IN GETTING LOWER PRICES ON EQUIPMENT THEY PURCHASE, DUE TO WRITING SPECIFICATIONS WHICH ALLOW FOR COMPETITIVE BIDDING. ANYTHING THE LARGE MUNICIPALITIES COULD DO TO STANDARDIZE THEIR SPECIFICATIONS WOULD CERTAINLY HELP TO REDUCE THE PRICE OF EQUIPMENT WHICH IS PURCHASED BY COMPETITIVE BIDDING. IN THE PAST FEW YEARS, THE MAJOR IMPROVEMENT IN INCINERATION THAT HAS HAD A PRONOUNCED EFFECT ON EQUIPMENT, IS THE SEGREGATION OF THE RESIDUE. IN A NUMBER OF PLANTS, THE RESIDUES COMING FROM THE TROUGH UP INTO THE HOPPER, ARE DUMPED ON A VIBRATING SCREEN OR INTO A CYLINDER WHERE ALL PARTICLES 1-INCH OR LESS IN SIZE, GO INTO ONE HOPPER AND LARGER PIECES, WHICH ARE MOSTLY METAL, GO INTO ANOTHER HOPPER. HOWEVER, THE HAULING OF FINE RESIDUE IS QUITE A PROBLEM. THIS RESIDUE IS HEAVILY SATURATED WITH WATER AND WEIGHS APPROXIMATELY 2,000-2,500 LBS/CU-YD. SOME OF THIS WATER DRAINS OUT, HOWEVER, THE GREATER PERCENTAGE OF IT STAYS WITH THE RESIDUE, AND WHEN 35 CU-YD TRAILERS ARE USED, THIS MEANS THEY CANNOT BE FILLED TO CAPACITY, SINCE THEY WILL THEN BE OVERWEIGHT.

03-13-01148 SEVEN LOADS AT A TIME (BULKY-WASTE COLLECTION)
SEYMOUR, B.
THE AMERICAN CITY 68(10), P. 155 (1953). WITH THE COLLABORATION OF THE CITY OF OMAHA AND A LOCAL EQUIPMENT MANUFACTURER, THEY HAVE DEVELOPED A LEAF SWEEPER THAT HAS REDUCED THE UNITS OF EQUIPMENT AND MAN POWER USED TO REMOVE THE LEAVES FROM THE STREETS. THE EQUIVALENT OF SEVEN LOADS ARE NOW BEING HANDLED BY ONE DRIVER AND TWO CREW MEMBERS PER UNIT.

03-13-01292 RAISING PRODUCTIVITY IN THE REFUSE COLLECTION SERVICE
ROLFE, D. G.
PUBLIC CLEANSING 58(6), P. 293-306 (1968). MR. ROLFE, THE ASSISTANT DIRECTOR OF CLEANSING AT WESTMINSTER HAS REVIEWED VARIOUS SCHEMES WHEREBY THE INCREASED PRODUCTIVITY OF COLLECTION CAN BE IMPROVED. INCENTIVE BONUSES, WORK HABITS, LARGER CONTAINERS, COMPRESSION DEVICES, LARGER TRANSPORTATION VEHICLES ARE SOME OF THE AREAS HE THINKS SHOULD BE LOOKED INTO TO HELP ALLEVIATE SOME OF THE PROBLEMS.

03-13-01350 ABILENE CUTS COLLECTION COSTS (TRANSFER-STATION)
THE AMERICAN CITY 76(11), P. 27 (NOVEMBER 1961). ABILENE, KANSAS CUT COLLECTION COSTS BY REARRANGING SCHEDULES TO ALLOW ONLY TWO COFFEE BREAKS PER DAY AND REQUIRING THAT WORKERS WORK UNTIL QUITTING TIME, AND BY ELIMINATING LONG HAULS BY CONSTRUCTING A TRANSFER STATION. (UC)

03-13-01553 SANITARY ENGINEER'S SPEECH COVERS RANGE OF INDUSTRY (COLLECTION SCHEDULING)
REFUSE REMOVAL JOURNAL 1(4), P. 20 (APRIL 1958). EXCERPTS OF A SPEECH BY STAFFORD W. GRAYDON ON MUNICIPAL REFUSE COLLECTION IN ATLANTA, GEORGIA. (PHS)

03-13-01575 IT'S THE WORLD-WIDE LURE OF THE OLD GARBAGE CAN (CONTAINER)
REFUSE REMOVAL JOURNAL 1(4), P. 22 (APRIL 1958). THE EFFORTS OF A LONDON CONSTABLE AND MAGISTRATE TO PREVENT DRUNKS FROM ATTACKING DUSTBINS (TRASH CANS). (PHS)

03-13-01591 REPORTER FINDS REFUSE COLLECTION A TOUGH JOB
REFUSE REMOVAL JOURNAL 1(5), P. 12 (MAY 1958). A CLEVELAND REPORTER LEARNS THAT REFUSE COLLECTION IS A HARD AND HAZARDOUS JOB WHEN HE TRIES TO WORK ON A REGULAR COLLECTION CREW. (PHS)

03-13-01602 TWO CHICAGO SUBURBS AWARD PRIVATE CONTRACTS (COLLECTION)
REFUSE REMOVAL JOURNAL 1(10), P. 7 (OCTOBER 1958). CICERO AND PALATINE, ILLINOIS, AWARD CONTRACTS FOR REFUSE COLLECTION AND DISPOSAL. BOTH SUBURBS SWITCHED FROM MUNICIPAL COLLECTION SERVICE. (PHS)

03-13-01609 MODERN EQUIPMENT EASES HIGHWAY LITTER PROBLEM (COLLECTION)
REFUSE REMOVAL JOURNAL 1(10), P. 11 (OCTOBER 1958). JACKSON COUNTY, MISSOURI, USES A " PORTABLE DUMP " SYSTEM TO SOLVE A SEVERE HIGHWAY LITTER PROBLEM. THE COST FOR REMOVAL OF 5,000 TRUCKLOADS OF TRASH FROM ONE THREE-MILE STRETCH OF ROAD WAS $30,029. A SYSTEM OF MATERIALS HANDLING WAS SELECTED, USING TWO TRUCKS AND SEVERAL 20 AND 25 CU-YD DETACHABLE CONTAINERS PLACED AT CONVENIENT LOCATIONS. (PHS)

03-13-01613 SINGLE CONTRACTOR SERVES ALL SEATTLE (COLLECTION SANITARY-LANDFILL LAW CHARGE(COLLECTION))
REFUSE REMOVAL JOURNAL 1(11), P. 8 (NOVEMBER 1958). IN A TALK BEFORE THE A.P.W.A. MR. ANDERSEN DETAILS THE PROCESS OF LETTING REFUSE COLLECTION CONTRACTS AND METHODS OF COLLECTION.

03-13-01616 PUBLIC RELATIONS ARE A VITAL CONSIDERATION (COLLECTION)
REFUSE REMOVAL JOURNAL 1(11), P. 12 (NOVEMBER 1958). AN EXAMPLE OF COMPLETE, WELL-PRESENTED INFORMATION FROM GRAND PRAIRIE, TEXAS, CONCERNING THE REFUSE COLLECTION WORK OF THE DEPARTMENT OF SANITATION. (PHS)

03-13-01629 CANTON RECOMMENDATIONS (COLLECTION SURVEY)
REFUSE REMOVAL JOURNAL 2(1), P. 21 (JANUARY 1959). THE CITY OF CANTON, OHIO, RECENTLY MADE A STUDY OF REFUSE COLLECTION AND DISPOSAL PRACTICES. AS A PART OF THIS SURVEY, A QUESTIONNAIRE WAS ANSWERED BY OFFICIALS IN SEVERAL OTHER CITIES. THE RECOMMENDATIONS MADE ARE INCLUDED IN THIS ARTICLE. (PHS)

03-13-01633 WHAT'S THE BEST WAY TO RETIRE USED EQUIPMENT (COLLECTION-EQUIPMENT ECONOMICS)
REFUSE REMOVAL JOURNAL 2(2), P. 12 (FEBRUARY 1959). VARYING PROCEDURES FOR GETTING RID OF AGING TRUCKS ARE DISCUSSED. IT IS STRESSED THAT CONDITIONS LIKEWISE VARY IN DIFFERENT PARTS OF THE COUNTRY, THEREFORE, SEVERAL GENERAL POINTS ON THE SUBJECT ARE MADE. (PHS)

03-13-01641 PRIVATE COLLECTORS WIN A VOTE OF CONFIDENCE (COLLECTION)
REFUSE REMOVAL JOURNAL, 2(5), 6, (MAY 1959). A ONE-YEAR TRIAL OF PRIVATE SERVICE HAS DEMONSTRATED THE EFFICIENCY AND ECONOMY OF LOCAL CONTRACTORS IN SOUTHERN CALIFORNIA. THIS SERVICE IS BEING CONTINUED IN THE UNINCORPORATED AREAS OF THE LOS-ANGELES BASIN. (PHS)

03-13-01650 ROCHESTER FIRM MIXED PROFESSIONS FOR REFUSE (COLLECTION)
REFUSE REMOVAL JOURNAL 2(6), P. 22 (JUNE 1959). THE INTERESTING STORY OF THE DEVELOPMENT OF A DISPOSAL COMPANY IN ROCHESTER IS GIVEN. (PHS)

03-13-01658 STRONG TREND TO PRIVATE SERVICE CONTINUES GAINS (COLLECTION)
REFUSE REMOVAL JOURNAL 2(9), P. 10 (SEPTEMBER 1959). A SURVEY BY INFORMATION CONSULTANTS, A CHICAGO RESEARCH ORGANIZATION, INDICATED THAT MORE AND MORE CITIES ARE CHOOSING PRIVATE REFUSE COLLECTION SERVICES OVER THOSE OPERATED BY MUNICIPALITIES. THIS RESULTED, ACCORDING TO THE ARTICLE, FROM A GREATER ECONOMY AND EFFICIENCY. SPECIFIC EXEMPLARY CITIES ARE CITED, WITH DETAILS GIVEN. (PHS)

03-13-01667 ILLINOIS VILLAGE SWITCHES TO PRIVATE CONTRACT (COLLECTION COST(OPERATING))
REFUSE REMOVAL JOURNAL 2(11), P. 8 (NOVEMBER 1959). THIS BRIEF ARTICLE DISCUSSES THE CHANGEOVER IN NILES FROM PUBLIC REFUSE SERVICE TO PRIVATE CONTRACT OPERATION. (PHS)

03-13-01672 HOW BOSTON CHANGED TO PRIVATE SERVICE (COLLECTION)
REFUSE REMOVAL JOURNAL 2(11), P. 8 (NOVEMBER 1959). BOSTON HAS ADOPTED A SYSTEM OF CONTRACT REFUSE HAULING, LARGELY DUE TO SEVERE SNOW STORMS WHICH PREVENTED ADEQUATE COLLECTION OF REFUSE BY TRUCKS DOUBLING AS SNOW PLOWS. THE NEW SYSTEM SEEMS MORE SATISFACTORY, AND IS MORE ECONOMICAL. (PHS)

03-13-01682 RHODE ISLAND FIRM TAKES ON WARWICK COLLECTION (SANITARY-LANDFILL RECLAMATION(LAND) COLLECTION)
REFUSE REMOVAL JOURNAL 2(9), P. 12 (SEPTEMBER 1959). THE CITY OF WARWICK, RHODE ISLAND, IS NOW SERVED BY A COMMERCIAL CONTRACTOR, AFTER HAVING HAD MUNICIPAL SERVICE SINCE 1931. THIS CHANGE IS DETAILED. (PHS)

03-13-01693 NEWSPAPER DISCUSSION PRODUCES DOUBTFUL DATA (COLLECTION)
REFUSE REMOVAL JOURNAL 2(4), P. 7, 27-28 (APRIL 1959). THE ARTICLE DESCRIBES THE CONDITIONS WHICH PROMPTED THE FORMATION OF ORGANIZATIONS OF CLEANUP CAMPAIGNS IN NEW-YORK CITY. A SECTION ALSO DESCRIBES EFFORTS IN LOS-ANGELES TO CLEAN UP THE CITY AS WELL AS THEIR NAME.

03-13-01702 RECENT DEVELOPMENTS IN PUBLIC WORKS EQUIPMENT (COLLECTION-EQUIPMENT)
REFUSE REMOVAL JOURNAL 3(10), P. 10 (OCTOBER 1960). RECENT DEVELOPMENTS IN PUBLIC WORKS EQUIPMENT BY THE NEW YORK SANITATION DEPARTMENT INCLUDE AN ELECTROMECHANICAL TRUCK SCALE AND A LEAF COLLECTOR ASSEMBLY. STEEL CORD TIRES HAVE BEEN TESTED, AND PROVE TO BE THE BEST. LOCAL STUDY AND COST ANALYSIS WILL DETERMINE WHETHER THIS EQUIPMENT SHOULD BE LEASED OR OWNED BY THE CITY. OTHER PUBLIC WORKS EQUIPMENT STUDIED ARE DIESEL ENGINES, AUTOMOTIVE PLASTICS, STRUCTURAL ADHESIVES, AND TORQUE CONVERTERS. (PHS)

03-13-01708 CONTAINERS SOLVE BUTT PROBLEM FOR REPUBLIC
REFUSE REMOVAL JOURNAL 3(9), P. 12 (SEPTEMBER 1960). FIRE HAZARDS AND UNSIGHTLINESS ARE AVOIDED AT AN AVIATION PLANT BY THE USE OF SPECIAL RECEPTACLES FOR CIGARETTE ENDS. THE CONTAINERS ARE 5-GALLON, 26-GAGE STEEL, COVERED WITH A STRIKING RED, WHITE, AND BLACK SILK-SCREENED DESIGN. (PHS)

03-13-01744 CITY PROFITS FROM TEN-YEAR COLLECTION CONTRACT
REFUSE REMOVAL JOURNAL 6(6), P. 30 (JUNE 1963). DESCRIBES THE REFUSE COLLECTION SYSTEM IN PALO ALTO, CALIF. IN 1960 THE CITY CHANGED FROM MUNICIPAL TO CONTRACT COLLECTION BY SIGNING A 10-YEAR CONTRACT WITH A REFUSE HAULING COMPANY. THE AGREEMENT PROVIDES FOR ALL CITY REFUSE REMOVAL EQUIPMENT TURNED OVER TO THE FIRM, CONTINUING CITY SUPERVISION OF THE REFUSE SERVICE THROUGH A FULL-TIME SANITATION SUPERVISOR IN THE CITY ENGINEER'S OFFICE. TWENTY PERCENT OF ASSESSMENTS COLLECTED KEPT BY THE CITY FOR PROVIDING REFUSE DISPOSAL AND A BILLING SERVICE. BACKYARD COLLECTIONS ALONG ROUTES SPECIFIED BY THE CITY ENGINEER'S OFFICE, AND A MINIMUM SERVICE OF ONCE-A-WEEK COMBINED COLLECTION FROM TWO 32-GALLON CANS FOR HOUSEHOLDERS AND ONE 32-GALLON CAN FROM APARTMENT DWELLERS. THE PRIVATE OPERATOR WAS ALSO REQUIRED TO IMPROVE ON THE PREVIOUS MUNICIPAL COLLECTION SERVICE. (PHS)

03-13-01756 ADVERTISING IS A HELP TO NORTHWEST CONTRACTOR (COLLECTION)
REFUSE REMOVAL JOURNAL 6(3), P. 12 (MARCH 1963). A VANCOUVER, WASH., REFUSE COLLECTING FIRM, FACED WITH AN EXPANDING POPULATION AND SERVICE AREA, FOUND REFUSE CANS IN NEW SUBDIVISIONS CRAMMED WITH BACKBREAKING LOADS OF BUILDING MATERIALS. THE ANSWER TO THIS AND OTHER PUBLIC RELATIONS PROBLEMS WAS FOUND IN THE CREATION OF " SANITARY SAM ", AN IMAGINATIVE CARTOON CHARACTER, WHO IN A LIGHT GOOD-NATURED STYLE EXPLAINED THE COMPANY'S PROBLEMS TO ITS CUSTOMERS IN A SERIES OF NEWSPAPER ADS. (PHS)

03-13-01765 COMPANY SPECIALIZES IN SHOPPING CENTER UPKEEP (COLLECTION)
REFUSE REMOVAL JOURNAL 5(7), P. 6 (JULY 1962). DESCRIBES A COMPANY IN ENOLA, PA., WHICH SPECIALIZES IN THE ENTIRE EXTERIOR MAINTENANCE OF SHOPPING CENTERS. ALTHOUGH REFUSE COLLECTION IS ITS LARGEST JOB, IT ALSO PROVIDES OTHER SERVICES SUCH AS LANDSCAPING, MINOR REPAIRS, SNOW REMOVAL, LOT SWEEPING, REPLACEMENT OF BURNED-OUT BULBS, TRAFFIC PLANNING, AND THE STRIPPING OF PARKING LOTS. SPECIALIZATION HAS BEEN THE KEY TO THIS FIRM'S SUCCESS. IT HAS REFRAINED FROM SEEKING RESIDENTIAL BUSINESS PARTLY BECAUSE OF THE PLENTIFUL SUPPLY OF SMALL REFUSE OPERATORS IN THE AREA WHO ARE WILLING AND ABLE TO ACCEPT LOWER PRICES FOR COLLECTION JOBS. CONVERSELY, MAINTENANCE OF SHOPPING CENTERS CANNOT BE HANDLED BY THE SMALL OPERATORS, AND THEREFORE THERE IS LITTLE COMPETITION IN THIS FIELD. (PHS)

03-13-01769 FAST-GROWING OHIO FIRM AVOIDS OVER-EXTENSION (COLLECTION(CONTAINER) COLLECTION(VEHICLE))
REFUSE REMOVAL JOURNAL 5(3), P. 10 (MARCH 1962). THIS ARTICLE TELLS OF THE RAPID EXPANSION OF A REFUSE COLLECTION FIRM IN THE CINCINNATI, OHIO AREA. THE EXPANSION WAS THE RESULT OF A COMBINATION OF TWO BUSINESSES - AN OHIO FIRM WHICH WAS SUPPLYING A SWEEPING SERVICE FOR THE AREA, AND A NORTHERN KENTUCKY REFUSE HAULER. IT HAS BEEN A CAUTIOUS EXPANSION, HOWEVER, FOR THE FIRM HAS NOT TRIED TO OBTAIN MORE BUSINESS THAN IT WAS SURE IT COULD HANDLE. THE FIRM HAS MAINTAINED A CONSTANT THREE TO ONE RATIO OF COMMERCIAL TO RESIDENTIAL WORK SO THAT IF A RESIDENTIAL CONTRACT IS NOT RENEWED, THE COMMERCIAL BUSINESS CAN ABSORB THE IDLED EQUIPMENT AND EMPLOYEES. IN ADDITION TO REFUSE COLLECTION, THE OHIO FIRM ALSO OPERATES A SPRAY SERVICE. CONTAINERS, AT ESTABLISHMENTS WISHING THIS SERVICE, ARE REGULARLY CLEANED OUT WITH CHEMICALS. (PHS)

03-13-01795 IF REFUSE SERVICES STOP WHAT HAPPENS (VECTOR PEST COLLECTION BENEFIT(COLLECTION) COST(REFUSE))
REFUSE REMOVAL JOURNAL 6(7), P. 25 (JULY 1963). DESCRIBES A HYPOTHETICAL SITUATION IN WHICH A TOWN IS GREATLY AFFECTED BY A TEMPORARY CESSATION OF THE REFUSE COLLECTION SERVICES. CESSATION OCCURRED ON A SATURDAY BECAUSE THE CITY COUNCIL PUT OFF RENEWING ITS CONTRACT WITH THE REFUSE COLLECTORS. RESTAURANT PROPRIETORS, WHO COUNTED ON SPECIAL SATURDAY COLLECTIONS, WERE THE FIRST TO FEEL THE IMPACT. RESIDENTS DID NOT DISCOVER THE TROUBLE UNTIL THEY SET OUT THEIR REFUSE ON MONDAY WHERE IT STILL REMAINED BY NIGHTFALL. THEY SOON SAW AN INFLUX OF UNWELCOME PESTS WHOSE FAVORITE HAUNTS ARE PILES OF STAGNATING GARBAGE. THE COMMUNITY'S INDUSTRIAL ESTABLISHMENTS BEGAN TO SEE THEIR PRODUCTION FALTER ON TUESDAY AS THE GROWING ACCUMULATIONS OF TRASH HAMPERED OPERATIONS. THE COUNCIL QUICKLY REASSEMBLED AND WORKED OUT A TEMPORARY SOLUTION TO COMMENCE REFUSE COLLECTION ONCE AGAIN. (PHS)

03-13-01802 LEAVES ADD 100,000 YARDS TO LITTER LOAD (COLLECTION(LEAVES))
REFUSE REMOVAL JOURNAL 7(12), P. 27 (1964). MILWAUKEE RESIDENTS ARE PERMITTED TO PUSH THEIR LEAVES INTO THE STREETS UNTIL NOVEMBER 15, WHEN THE LEAVES MUST BE CLEARED FOR SNOW. THIS MEANS ABOUT 30,000 CU-YDS IN SUMMER AND 70,000 CU-YDS IN WINTER.

03-13-01810 HAULER ONCE COMPETED WITH FREE CITY SERVICE (COST(OPERATING) COLLECTION)
REFUSE REMOVAL JOURNAL 7(11), P. 12 (1964). A REFUSE COLLECTION HELPER TURNED CONTRACT HAULER DESCRIBES HOW HE MANAGED TO START HIS OWN CONTRACT OPERATION. ALTHOUGH HE WAS COMPETING WITH THE FREE SERVICE OF THE CITY HE HAS MANAGED TO EXPAND HIS FLEET AND SERVICE. THE CONTRACT HAULERS RATE ARE SET BY THE CITY ON A COST PER CU-YD OR COST PER CONTAINER RATE IN GALLONS. THE CITY PROVIDES FOR RESIDENTIAL DISPOSAL AT NO COST BUT THE COMMERCIAL CUSTOMERS MUST ARRANGE FOR THEIR OWN REFUSE DISPOSAL BY CONTRACTORS. SOME OF THE FEES ARE LISTED.

03-13-01815 EQUIPMENT BIDS MUST HAVE GUARANTEED MAINTENANCE (COLLECTION(VEHICLE))
REFUSE REMOVAL JOURNAL 8(1), P. 18 (1965). CAPITAL EQUIPMENT SUPPLIERS ARE REQUIRED TO SUBMIT MAINTENANCE CONTRACT BIDS ALONG WITH REGULAR EQUIPMENT BIDS TO THE CITY OF CHICAGO. A $1,035,555 EQUIPMENT BID FOR 100 NEW TRUCKS WAS ACCOMPANIED BY A $2,212,755 MAINTENANCE CONTRACT FOR A PERIOD OF SIX YEARS. THE SCOPE OF THE CONTRACTS, MAINTENANCE SCHEDULES AND PAYMENT SCHEDULES ARE DESCRIBED.

03-13-01820 NEW YORK TO ACCEPT UNWANTED JALOPIES (CAR(JUNK) BULKY-WASTE COLLECTION)
REFUSE REMOVAL JOURNAL 8(4), P. 28 (1968). IN ORDER TO REDUCE THE NUMBER OF ABANDONED VEHICLES ON THE CITY'S STREETS THE DEPARTMENT OF SANITATION IS OFFERING GARAGES, LANDFILLS, INCINERATORS TO MOTORISTS WHO WISH TO DISPOSE OF OLD UNWANTED VEHICLES LEGALLY.

03-13-01847 MILLION STOPS DAILY IN LOS ANGELES (COLLECTION SANITARY-LANDFILL)
HUME, N. B.
REFUSE REMOVAL JOURNAL 8(8), P. 38 (1965). THE LOS ANGELES REFUSE COLLECTION AND DISPOSAL DIVISION OF THE BUREAU OF SANITATION PICKS UP AND DISPOSES OF 1.1 MILLION TONS OF REFUSE ANNUALLY FROM ABOUT 1 MILLION RESIDENTIAL UNITS, 14,000 TONS PER YEAR OF COMMERCIAL FOOD WASTE AND ANIMAL CARCASSES. THE BUREAU OPERATES 3 SANITARY LANDFILLS. NO BURNING IS ALLOWED BECAUSE OF SMOG PROBLEMS. CURRENTLY THE TOTAL COST OF COLLECTION SERVICE PER RESIDENTIAL UNIT INCLUDING OVERHEAD, IS APPROXIMATELY $1.17/MONTH.

03-13-01919 FREE CITY COLLECTIONS NO BAR TO CONTRACTOR
REFUSE REMOVAL JOURNAL 8(9), P. 16 (1965). IN JANUARY 1964, A PRIVATE CONTRACTOR STARTED A ONE TRUCK REFUSE REMOVAL SERVICE IN CHARLESTON, SOUTH CAROLINA, COMPETING WITH FREE MUNICIPAL REFUSE REMOVAL SERVICE. BY CONCENTRATING ON THE COMMERCIAL AND INDUSTRIAL AREA HE WAS ABLE TO FURNISH THE TYPE OF REMOVAL SERVICE THE MUNICIPAL COLLECTION SYSTEM COULD NOT OFFER. THE CONTRACTOR NOW SERVICES A 60 MILE RADIUS OF CHARLESTON WITH FIVE PACKERS, ON A 24 HOUR BASIS. HIS ACCOUNTS NOW INCLUDE COMMERCIAL, INDUSTRIAL AND RESIDENTIAL.

03-13-01923 SPARE A THOUGHT FOR CLEANSING
PUBLIC CLEANSING 54(3), P. 785 (1964). ALTHOUGH IT IS APPRECIATED THAT THE PLANNERS AND DEVELOPERS MUST DESIGN THEIR PROJECTS IN A WAY THAT THE GREATEST USE OF LAND FOR HOUSING MAY BE REALIZED SOME THOUGHT SHOULD BE GIVEN TO THE MUNICIPAL SERVICES THAT MUST BE ASSOCIATED WITH THE HOUSING PROJECTS IN THE WAY OF REFUSE COLLECTION AND STREET CLEANING. SINCE THE TREND IS TO LARGER EQUIPMENT TO MEET THE DEMAND OF LARGER LOADS AND REDUCED TRIPS TO LANDFILLS OR INCINERATORS THE PUBLIC CLEANSING PEOPLE ARE MAKING A PLEA FOR THE PLANNERS AND DEVELOPERS TO KEEP THESE SUGGESTIONS IN MIND FOR FUTURE PROJECTS.

03-13-02000 WORK STUDY AS APPLIED TO PUBLIC CLEANSING (COLLECTION)
FLINTOFF, F.
66TH ANNUAL CONF OF THE INSTITUTE OF PUBLIC CLEANSING, MARGATE, (JUNE 8-12, 1964). A CASE HISTORY OF THE APPLICATION OF WORK STUDY IN THE CLEANSING AND TRANSPORT DEPARTMENT OF THE CITY OF WESTMINISTER.

03-13-02002 TECHNICAL ASPECTS OF THE REPORT OF THE WORKING PARTY ON REFUSE COLLECTION
MILLARD, R. F.
69TH ANNUAL CONF OF THE INSTITUTE OF PUBLIC CLEANSING, BLACKPOOL, (JUNE 6-9, 1967). THIS PAPER DEALS WITH SOME OF THE TECHNICAL ASPECTS OF THE WORKING PARTY REPORT ON REFUSE COLLECTION WHICH CONSISTS OF A 23 CHAPTER REPORT.

04 Salvage and Reclamation

04 01 POTENTIAL VALUES

04-01-00111 THE BUREAU OF MINES LOOKS AT REFUSE DISPOSAL AND RECOVERY POSSIBILITIES (ASH SURVEY SALVAGE(METAL) ECONOMIC(PENALTY) INCINERATOR PROCESS-DEVELOPMENT)
REYNOLDS, W. F.
PUBLIC WORKS 99(12), P. 85-86 (DECEMBER 1968). RESEARCH IS DESCRIBED ON THE RECOVERY OF METALS (GOLD AND SILVER) FROM FLY ASH PRODUCED BY MUNICIPAL INCINERATORS. A PROCESS HAS ALSO BEEN DEVELOPED TO RECLAIM FERROUS AND NON-FERROUS METALS FROM INCINERATORS ASH. THE WASTE MATERIAL IS SCREENED, MAGNETICALLY SEPARATED, SHREDDED, CRUSHED AND GROUND. FRACTIONS RICH IN METALS ARE THEN MELTED AND ANALYZED. BY LEACHING, COPPER AND TIN ARE SEPARATED FROM THE IRON FRACTIONS, PRODUCING IRON OF HIGH QUALITY FOR SCRAP METAL. PRELIMINARY FINDINGS SHOW THAT MUNICIPAL REFUSE CONTAINS ABOUT 550 POUNDS OF METALS PER TON OF RESIDUE. ABOUT 500 POUNDS OF THIS IS IRON. THE REMAINDER IS ALUMINUM, COPPER, TIN, AND ZINC. IT HAS ALSO BEEN LEARNED THAT NON-MAGNETIC TRACONITE CAN BE CONVERTED INTO USABLE IRON ORE BY MELTING WITH SCRAP IRON AND STEEL.

04-01-00119 CHANGE WASTE INTO REVENUE (SALVAGE)
FARRIS, W. W.
THE AMERICAN CITY 78(3), P. 27 (MARCH 1966). THE SALE OF WASTE PAPER AND OTHER SALVAGE ITEMS RETURNED APPROXIMATELY NINE THOUSAND DOLLARS TO THE CITY OF MEMPHIS, IN 1962. A CONTRACTOR PAID THIS AMOUNT FOR THE PRIVILEGE OF GATHERING THESE MATERIALS AT THE DISPOSAL AREAS. THE CITY MAKES NO GUARANTEE TO THE CONTRACTOR NOR DOES IT SEPARATE THE ITEMS FOR HIM. THE CONTRACTOR MAKES HIS OWN ARRANGEMENTS TO ACCUMULATE THEM AFTER THE COLLECTION TRUCKS HAVE COMPLETED THEIR DEPOSITS. WASTE PAPER COMPRISES AN ESTIMATED 80 PERCENT OF THE SALVAGEABLE MATERIALS. (AUTH)

04-01-00236 200 - 350 TONS OF TIN SALVAGED MONTHLY (SALVAGE(METAL))
REFUSE REMOVAL JOURNAL 10(11), P. 26 (NOVEMBER 1967). LOS ANGELES BYPRODUCT CO. SALVAGES TIN CANS AT FOUR SANITARY-LANDFILLS NEAR SACRAMENTO, CALIFORNIA. FROM 200 TO 350 TONS ARE RECOVERED FROM EACH OF THE FOUR SITES. SEPARATION IS BY MAGNETIC SEPARATOR. CANS ARE PROCESSED FOR COPPER RECOVERY.

04-01-00630 SANITARY-LANDFILL SALVAGE NETS $11,639 (INCOME(SALVAGE) SALVAGE)
MUCKELROY, E. F.
THE AMERICAN CITY 76(9), P. 31 (SEPTEMBER 1961). DISCUSSES THE SALE OF SALVAGE RECOVERED FROM A SANITARY LANDFILL IN EL PASO, TEXAS. INCLUDES A BREAKDOWN OF THE SALVAGE INTO THE DIFFERENT TYPES OF MATERIAL AND GIVES THE REVENUE MADE FROM THE SALE OF EACH TYPE. (PHS)

04-01-00730 THE SALVAGE POTENTIAL OF DOMESTIC REFUSE (COMPOSTITICN TRENDS SALVAGE(ALL-TYPES))
PUBLIC CLEANSING 51(2), P. 81 (FEBRUARY 1961). THE ARTICLE IS AN ANALYSIS OF THE REFUSE SITUATION IN ENGLAND WITH REGARD TO SALVAGE AND ITS POTENTIAL. IT CONTAINS AN EXTENSIVE CONSIDERATION OF THE SALVAGE POTENTIAL OF DOMESTIC REFUSE AND ON THE SORTING, HANDLING, MARKETING, AND UTILIZATION OF SALVAGE MATERIAL. IT CONTAINS A THORCUGH ANALYSIS OF REFUSE AND OF THE FACTORS WHICH WOULD HAVE AN EFFECT ON FUTURE CHANGES IN THE COMPOSITION OF REFUSE. ENGLISH REFUSE IS CHANGING CONTINUALLY IN COMPOSITION IN THAT IT HAS LESS WEIGHT AND MORE BULK. WASTE PAPER INCREASES BY 4 PERCENT PER YEAR. IN 20 YEARS, PAPER WILL CONSTITUTE 25 PERCENT BY WEIGHT AND 75 PERCENT BY VOLUME OF THE TOTAL REFUSE. FACTORS HAVING A BEARING ON THE CHANGE ARE THE INCREASING USE OF PAPER AND PACKAGING MATERIAL, CHANGE IN DWELLING HEATING METHODS, AND THE EXTENSIVE USE OF METAL CONTAINERS. (UC)

04-01-00731 WASTE OR WEALTH (SALVAGE(ALL-TYPES))
PUBLIC CLEANSING 51(4), P. 182 (APRIL 1961). IN THE ARTICLE IS DISCUSSED THE POSSIBLE UTILIZATION OF DISCARDED WASTE MATERIALS SUCH AS PLANTS, GRASS CUTTINGS, WASTE PAPER, BOTTLES, AND CANS. "PERNICIOUS" AND "CONTRARIES" ARE TERMS USED TO DESCRIBE SUBSTANCES WHICH CANNOT READILY BE DETECTED AND WHICH INTERFERE WITH THE REUSE OF WASTE PRODUCTS. ANY FOREIGN ELEMENT IS A "CONTRARY," E.G., GLASS AND METAL SCRAPS IN THE GARBAGE TO BE FED HOGS. IN PAPER REUSE, THE MOST "PERNICIOUS" OF THE "CONTRARIES" ARE THE RESINS ADDED TO GIVE PAPER "CUT STRENGTH." OTHER "CONTRARIES" ARE WAXED LAMINATES, PLASTICS, POLYETHYLENE, AND OTHER FILMS. THEY INTERFERE WITH REPULPING. (UC)

04-01-00862 DISPOSAL SYSTEM MAKES CASH FROM TRASH (VOLUME-REDUCTION SALVAGE COMPOSTING)
ENGRG NEWS-RECORD 172(13), P. 32 (MARCH 26, 1964). SALVAGE AND CONVERSION SYSTEMS, COMPLETELY ENCLOSED REFUSE DISPOSAL SYSTEM CONVERTS ALMOST 100 PERCENT OF ALL DOMESTIC REFUSE INTO SALABLE PRODUCTS. IMMEDIATELY AFTER SALVAGEABLE MATERIAL IS REMOVED BY HAND THROUGH SYSTEM OF CONVEYORS AT RECEIVING END OF PLANT, REMAINDER OF REFUSE UNDERGOES 6-DAY BACTERIAL DECOMPOSITION WHICH CONVERTS IT INTO COMPOST. FINAL COMPOST HAS LESS THAN 20 PERCENT OF THE VOLUME AND 80 PERCENT OF THE WEIGHT OF INCOMING REFUSE. (EI)

04-01-00873 FIELD OF REFUSE SALVAGE (QUANTITY COMPOSITION SALVAGE(POTENTIAL) RENDERING COMPOSTING RAIL-HAUL)
RANDLES, L. C., JR.
COMPOST SCIENCE 4(2), P. 5-10 (SUMMER 1963). DISPOSAL AND UTILIZATION OF VARIOUS TYPES OF WASTES AND POTENTIALS OF COMPOSTING AS POSSIBILITY IN RECOVERY OF MARGINAL WASTE. UTILIZATION OF HOUSEHOLD GARBAGE AND DEAD ANIMALS. SALVAGE OF PAPER, AND CLOTH, AND OF METALS AND OTHER NONCOMBUSTIBLE RUBBISH. USE OF SALVAGED TIN CANS IN COPPER MINING AND ADVANTAGES OF SEPARATE WASTE COLLECTION AS PRACTICED IN LOS ANGELES, CALIFORNIA. A TABLE SUMMARIZING THE QUANTITITES AND COMPOSITION OF REFUSE COLLECTED IN LOS ANGELES IS PRESENTED. (EI)

04-01-01042 THEY EVEN SELL THE ASHES (SALVAGE(METAL) INCINERATOR)
SANDERS, N. H.
PUBLIC WORKS 94(8), P. 99 (AUGUST 1963). DESCRIBES THE SALVAGE SHOP OF THE CITY OF MEMPHIS, TENNESSEE, LIGHT, GAS, AND WATER DIVISION, INCLUDING THE FOLLOWING EQUIPMENT IN THE SHOP- A LIGHT-BULB CRUSHER FOR SALVAGING THE BRASS ENDS OF STREET LIGHT BULBS, A GAS-FIRED INCINERATOR FOR SALVAGING COPPER FROM WIRES AND CABLES, AND WIRE STRIPPERS FOR RECLAIMING ALUMINUM WIRE. THE SALVAGE SHOP NETTED $105,525 FROM ITS SALVAGE OPERATIONS DURING THE FISCAL YEAR ENDING OCTOBER 31, 1962. (PHS)

04-01-01321 COMPOSITION AND CHARACTERISTICS OF MUNICIPAL INCINERATOR RESIDUES (SALVAGE(METALS) ANALYSIS(RESIDUE))
KENAHAN, C. B. + SULLIVAN, P. M. + RUPPERT, J. A. + SPANO, E. F.
U.S. BUREAU OF MINES, RI 7204 (DECEMBER 1968). THE BUREAU OF MINES IS DEVELOPING METHODS FOR RECLAIMING THE METAL AND MINERAL VALUES CONTAINED IN MUNICIPAL INCINERATOR RESIDUES. THIS REPORT DESCRIBES THE FIRST PHASE OF THE RESEARCH IN WHICH RELIABLE METHODS FOR SAMPLING AND ANALYZING MUNICIPAL RESIDUES WERE ESTABLISHED AND THE COMPOSITION AND CHARACTERISTICS OF THE RESIDUES WERE DETERMINED. SAMPLES WERE OBTAINED FROM A VARIETY OF GRATE-TYPE FURNACES AND ALSO FROM A ROTARY KILN FURNACE. THE SAMPLES WERE PROCESSED ON A BATCH BASIS AND SEPARATED INTO THEIR NATURAL CATEGORIES BY A VARIETY OF METHODS INCLUDING SCREENING, MAGNETIC SEPARATION, AIR SEPARATION TECHNIQUES, AND HANDPICKING. THE MAIN COMPONENTS OF THE RESIDUES WERE DETERMINED TO BE METAL AND METAL OXIDES, GLASS AND ASH. (AUTH)

04-01-01434 TIN-CAN SALVAGE IS GOOD BUSINESS (ASH)
THELIN, C. M.
THE AMERICAN CITY 71(9), P. 20 (SEPTEMBER 1956). A BRIEF DESCRIPTION OF ARRANGEMENTS AT FT. WORTH, TEXAS TO SALVAGE INCINERATOR ASH WHICH IS COMPRISED 75 PERCENT BY VOLUME OF TIN CANS. CANS ARE ROLLED AND SOLD UNDER CONTRACT FOR USE IN COPPER MINING. (PHS)

04-01-01439 SAWMILL MAKES TREE DISPOSAL PROFITABLE (BULKY-WASTE)
THE AMERICAN CITY 71(10), P. 105 (OCTOBER 1956). KANSAS CITY, MISSOURI (WELFARE DEPARTMENT) OPERATES A SAWMILL AND REPORTS TRANSFORMING WASTE LOGS INTO LUMBER AND BRANCHES INTO CORDWOOD WHICH ARE MUCH IN DEMAND THEREBY ELIMINATING BRUSH BURNING NUISANCE AND SAVING $20,000 ANNUALLY. (PHS)

04-01-01889 THE ECONOMICS OF THE WASTE PAPER INDUSTRY (QUANTITY SALVAGE(PAPER) PROJECTION)
TUCHMAN, S. G.
PH.D. THESIS, NEW YORK UNIVERSITY,(JUNE 1963). GROWTH IN THE WASTE PAPER INDUSTRY IN THE POSTWAR PERIOD HAS BEEN LAGGING FAR BEHIND GROWTH IN THE TOTAL ECONOMY AND THAT OF THE PAPER AND BOARD INDUSTRY. THIS REFLECTS A SHARP DECLINE IN WASTE PAPER'S SHARE OF FIBROUS MATERIALS CONSUMPTION IN PAPER AND BOARD MANUFACTURE, STEMMING PRINCIPALLY FROM THE DECLINING MARKET POSITION OF THE NONINTEGRATED SECTOR OF THE PAPERBOARD INDUSTRY. TOTAL WASTE PAPER CONSUMPTION HAS BEEN ON A PLATEAU IN THE POST- WAR PERIOD. PROJECTIONS OF WASTE PAPER CONSUMPTION THROUGH THE 1960'S MUST TAKE INTO ACCOUNT THE RATE OF GROWTH IN THE TOTAL ECONOMY, IN THE PAPER AND BOARD INDUSTRY, AND IN TOTAL FIBROUS MATERIALS CONSUMPTION, AND WASTE PAPER'S SHARE OF TOTAL FIBROUS MATERIALS CONSUMPTION. IN THIS STUDY THE TOTAL AMERICAN ECONOMY IS PROJECTED TO GROW IN THE 1960'S AT AN AVERAGE ANNUAL RATE, COMPOUNDED, OF 3.5 PERCENT. PAPER AND BOARD PRODUCTION IS PROJECTED TO EXPAND AT A COMPOUND ANNUAL RATE OF 4.0 PERCENT. TOTAL FIBROUS MATERIALS CONSUMPTION IS ALSO PROJECTED TO GROW AT A RATE OF ABOUT 4 PERCENT. WASTE PAPER'S SHARE OF TOTAL FIBROUS MATERIALS CONSUMPTION, WHICH HAS BEEN DECLINING THROUGH THE POSTWAR PERIOD, IS EXPECTED TO DECLINE ONLY SLIGHTLY THROUGH THE 1960'S. THIS REFLECTS ANTICIPATION OF A SLOWING DOWN IN THE LOSS OF MARKET POSITION OF THE NONINTEGRATED SECTOR OF THE PAPERBOARD INDUSTRY, AS THESE NONINTEGRATED MILLS GET DOWN TO THEIR HARD-CORE MARKETS. AT THE SAME TIME, TECHNOLOGICAL DEVELOPMENTS ARE EXPECTED TO OPEN UP TO SOME EXTENT NEW MARKETS FOR WASTE PAPER. WASTE PAPER CONSUMPTION IS PROJECTED TO RISE FROM ITS 1961 LEVEL OF 9,017,700 TONS TO 10,300,000 TONS IN 1965 AND 12,000,000 TONS IN 1970. THIS WOULD MEAN A GROWTH RATE FOR WASTE PAPER CONSUMPTION IN THE PERIOD 1961-1970 OF 3.2 PERCENT. THE WASTE PAPER INDUSTRY'S GROWTH IN THE POSTWAR PERIOD HAS BEEN IMPEDED BY FACTORS LARGELY BEYOND THE CONTROL OF THE INDUSTRY. THERE WAS LITTLE THE WASTE PAPER INDUSTRY COULD HAVE DONE TO FORESTALL THE EXPANSION OF THE INTEGRATED PULP, PAPER AND BOARD INDUSTRY IN THE SOUTH AND THE PACIFIC NORTHWEST, WHICH SO ADVERSELY AFFECTED WASTE PAPER INDUSTRY. IN THE COMING DECADE, HOWEVER, DEVELOPMENTS OF THIS MAGNITUDE ARE NOT LIKELY TO OCCUR. THE WASTE PAPER INDUSTRY WILL THEREFORE HAVE MORE INFLUENCE OVER ITS GROWTH THAN IN THE RECENT PAST. THERE ARE TWO IMPORTANT AREAS IN WHICH THE WASTE PAPER INDUSTRY MIGHT CONSIDER TAKING ACTION IN ORDER TO IMPROVE ITS LONG-TERM GROWTH PROSPECTS. THE FIRST INVOLVES THE MARKETING CHANNELS FOR WASTE PAPER. AT THE PRESENT TIME MOST WASTE PAPER IS SORTED AND GRADED BY WASTE PAPER DEALERS. IT IS RECOMMENDED THAT THIS FUNCTION BE UNDERTAKEN, WHEREVER POSSIBLE, BY THE INDUSTRIAL AND COMMERCIAL GENERATORS OF WASTE PAPER RATHER THAN BY THE DEALERS. THIS WOULD RESULT IN IMPROVING THE QUALITY OF WASTE PAPER AND ALSO IN LOWERING ITS COST, WHICH WOULD ENHANCE THE COMPETITIVE POSITION OF THE WASTE PAPER INDUSTRY AND OF THE NONINTEGRATED SECTOR OF THE PAPERBOARD INDUSTRY (THE PRINCIPAL USER OF WASTE PAPER). THE SECOND AREA FOR IMPROVEMENT INVOLVES THE WASTE PAPER INDUSTRY UNDERTAKING A BROAD-SCALED RESEARCH PROGRAM TO DEVELOP NEW USES FOR WASTE PAPER AND TO IMPROVE CURRENT METHODS OF UTILIZING THIS BASIC COMMODITY.

04-01-01912 TRAILERS HOOKED TO PACKERS SPEED WASTE PAPER COLLECTION (SALVAGE)
REFUSE REMOVAL JOURNAL 8(11), P. 28 (1965). SMALL TWO-WHEELED TRAILERS HOOKED TO REFUSE COLLECTION VEHICLES ARE BEING USED TO PICK UP WASTE PAPER AND CARDBOARD FOR SALVAGE. WHERE SALVAGE OPERATIONS ARE CARRIED ON THIS HAS INCREASED SALVAGE EFFICIENCY AND LOWERED OPERATING COSTS. SALVAGEABLE MATERIALS NEVER GET MIXED WITH UNSALVAGEABLE MATERIALS, SALVAGEABLE MATERIALS DO NOT TAKE UP SCARCE LANDFILL SPACE.

04-01-01918 PORTABLE CRUSHER SPEEDS AUTO SALVAGE (COMPACTION BULKY-WASTE)
REFUSE REMOVAL JOURNAL 8(9), P. 32 (1965). A CAR CRUSHER THAT MAY BE TRANSFERED FROM ONE AUTO SALVAGE YARD TO ANOTHER HAS ENABLED THE ATLER CO. OF DAVENPORT, IOWA, TO TURN JUNK CARS INTO USEFUL AND PROFITABLE STEEL. FIVE 150 HP. MOTORS DELIVER 1,000 TONS OF PRESSURE THAT WILL COMPRESS AS MANY AS 3 COMPLETE AUTOMOBILES INTO A 60" X 24" X 24" BALE IN 90 SECONDS.

04-01-02144 RETHINKING THE SOLID WASTE PROBLEM (SALVAGE SIZE-REDUCTION PNEUMATIC-COLLECTION)
WILSON, D. G.
SCIENCE J, P. 69-75 (SEPTEMBER 1969). THE AUTHOR REVIEWS THE REFUSE DISPOSAL PROGRAM, IN THE UNITED STATES IN PARTICULAR. AS TECHNOLOGY CHANGES NEW PRODUCTS ARE GENERATED WHICH IN TURN CHANGE THE CHARACTER OF OUR REFUSE DISPOSAL PROBLEMS. HE IS VERY CRITICAL OF SOME OF THE MUNICIPALITIES FOR NOT IMPROVING THEIR DISPOSAL PROGRAMS. IMPROVEMENTS IN COLLECTION METHODS, INCINERATION, TRANSPORTATION, RECLAMATION, AND PLANNING ARE DISCUSSED.

04-01-02153 DUMP SITE RECLAMATION PRACTICES VARY WIDELY
REFUSE REMOVAL JOURNAL 9(2), P. 38 (FEBRUARY 1966). IN ORDER FOR THE OHIO MUNICIPAL LEAGUE TO DETERMINE WHETHER OR NOT IT IS ECONOMICAL TO SALVAGE SCRAP METAL AT DUMPS OR LANDFILL OPERATIONS, THE LEAGUE MADE A SURVEY OF OHIO CITIES TO DETERMINE WHICH CITIES CONDUCTED SUCH AN OPERATION, AND WHETHER THEY FOUND IT TO BE ECONOMICAL. OF 146 MUNICIPALITIES RESPONDING, 124 DID NOT CONDUCT SUCH AN OPERATION. LISTED ARE 13 MUNICIPALITIES AND THE TYPES OF COLLECTION AND INCOME RECEIVED FROM THEIR SALVAGE OPERATIONS.

04 02 MARKETING OF SALVAGE

04-02-00562 REFUSE COLLECTION AND DISPOSAL IN WESTERN EUROPE PART III (COMPOSTING SALVAGE SANITARY-LANDFILL)
ROGUS, C. A.
PUBLIC WORKS 93(6), P. 139 (JUNE 1962). SALVAGING- ALTHOUGH EUROPEAN REFUSE USUALLY IS UNSEGREGATED AT THE PICKUP POINT, SALVAGEABLE MATERIALS GENERALLY ARE SEPARATED BEFORE THE REFUSE IS TREATED. ENGLAND AND SCOTLAND ARE THE ONLY EUROPEAN COUNTRIES IN WHICH SALVAGING IS PRACTICED EXTENSIVELY AS A MEANS OF REFUSE DISPOSAL. REASONS FOR THE DECLINE IN SALVAGE ARE- 1. MANUAL SORTING IS PROHIBITIVELY EXPENSIVE AND WORKING CONDITIONS ARE UNSANITARY. MANUAL WORK IS NECESSARY EVEN WITH A HIGHLY MECHANIZED PROCESS. 2. THE REUSE OF PAPER HAS DECLINED WITH THE WIDER USE OF SYNTHETICS. 3. BUILDUP OF PRINTING INKS MAKES REUSE OF PAPER FOR NEWSPRINT DIFFICULT WITHOUT AN INK REMOVAL PROCESS. 4. RECOVERY OF DIRTY, OILY TEXTILES IS NOW UNPROFITABLE. 5. ADMIXING OF SCRAP METALS HAS A CUMULATIVE ADVERSE EFFECT ON THE PHYSICAL PROPERTIES OF STEELS, AND IS PRACTICED LESS. DATA ON THE QUANTITIES AND REVENUES DERIVED FROM GARBAGE, SCRAP METAL, PAPER, AND OTHER MATERIALS SALVAGED IN ENGLAND ARE PRESENTED. COMPOSTING- DIRECT SPREADING OF DOMESTIC REFUSE ON FARM LAND WITHOUT ANY INTERMEDIATE PREPARATION NOW IS SELDOMLY USED, LARGELY BECAUSE OF ATTENDANT UNSANITARY CONDITIONS, NONUNIFORMITY AS TO SIZE AND COMPOSITION, AND OF THE PRESENCE OF METALS, GLASS AND OTHER HARMFUL ITEMS. COMPOSTING IS MOST COMMON IN THE LOW COUNTRIES. SANITARY LANDFILLING- IS THE DOMINANT METHOD OF REFUSE DISPOSAL USED BOTH FOR DIRECT DISPOSAL AND FOR THE FINAL DISPOSAL OF RESIDUES FROM OTHER PROCESSES. LONG HAUL DISTANCES ARE COMPENSATED FOR BY COMPRESSING THE MATERIAL TO TWO OR THREE TIMES THE ORIGINAL DENSITY. WHENEVER POSSIBLE, EUROPEANS RECLAIM NONUSABLE MARSHES, QUARRIES, AND PONDS BEFORE RESORTING TO TRENCHES AND CUT-AND-COVER OPERATIONS. UTILIZATION OF COMPLETE LANDFILLS IS LIMITED ALMOST EXCLUSIVELY TO PARKS AND PLAYGROUNDS, WITH SOME FARMING AND FORESTRY. USE OF LANDFILL SITES FOR CONSTRUCTION IS PRACTICALLY UNKNOWN. DATA ARE PRESENTED ON THE RELATIVE USE OF EACH METHOD IN VARIOUS EUROPEAN COUNTRIES AND IN THE U.S., AND ON THE OPERATION AND USE OF SANITARY LANDFILLS. (UC)

04-02-01152 PROBLEMS OF THE SALVAGE INDUSTRY AS THEY RELATE TO SOLID WASTE DISPOSAL (ON-SITE-PROCESSING)
STORY, W. S.
PROC OF THE NATIONAL CONF ON SOLID WASTE RESEARCH AM PUBLIC WORKS ASSOC, CHICAGO, ILLINOIS, P. 159-163 (DECEMBER 1963). AS THE PROBLEM OF SOLID WASTES ASSUMES COMMUNITY-WIDE PROPORTIONS, THE PROSPECT OF PROCESSING WASTES ON AN AREA-WIDE OR TOTAL-COMMUNITY BASIS OPENS UP NEW AVENUES FOR RESEARCH DIRECTED TO UTILIZATION AS AN EFFECTIVE MEASURE IN WASTES MANAGEMENT. SUCH A CONCEPT LIKEWISE GIVES NEW MEANING TO THE TYPE OF RESEARCH PROJECTS TO WHICH WE HAVE BEEN ACCUSTOMED. FOR EXAMPLE, FURTHER RESEARCH ALONG THE FOLLOWING LINES SUGGESTED BY APWA IN 1962 TAKES ON A NEW URGENCY - (1) DEVELOPMENT OF NEW PROCESSES FOR SALVAGE. (2) DETERMINING NEW USES FOR FRACTIONS OF EXISTING WASTES. (3) DEVELOPMENT OF ON-SITE PROCESSING OF VARIOUS WASTE MATERIALS. (4) POTENTIAL MARKET VALUE OF COMPOST WITH PARTICULAR REFERENCE TO ITS MERITS IN THE SOIL-WATER-CROP CYCLE, IN COMPARISON WITH OTHER NUTRIENT AND CONDITIONING MATERIALS. IF A COMMUNITY-WIDE APPROACH TO SOLID WASTES MANAGEMENT IS MADE AND UTILIZING CONVERTED WASTES IS TO PLAY AN IMPORTANT ROLE IN WASTES MANAGEMENT, THE MAJOR PROBLEMS YET TO BE OVERCOME LIE IN THE AREAS OF PUBLIC ATTITUDES, EQUIPMENT AND PROCESSING PLANT DEVELOPMENT, AND ECONOMICS OF SYSTEMS. THE STUDIES WHICH APPEAR MOST URGENT AT THE PRESENT TIME ARE THOSE WHICH DEAL WITH PEOPLE AND PUBLIC INSTITUTIONS. WASTES MANAGEMENT PROBLEMS SHOULD BE STUDIED ON A COMMUNITY-WIDE BASIS WITH REGARD TO THEIR OVERALL ENVIRONMENTAL EFFECT ON MAN'S PHYSICAL AND MENTAL HEALTH, AND WAYS SOUGHT TO BRING THE CO-ORDINATED EFFORTS OF ENGINEERS, HEALTH OFFICIALS, PLANNERS, PUBLIC ADMINISTRATORS, LEGISLATORS, ETC. TO BEAR UPON THE RESOLUTION OF WASTES PROBLEMS.

04-02-01665 RECLAMATION AND SALVAGE (SALVAGE(METALS) SALVAGE(GLASS) HEAT-RECOVERY INCINERATION SALVAGE(ECONOMICS))
XANTEN, W. A.
REFUSE REMOVAL JOURANL 2(12), P. 17 (DECEMBER 1959). THE PROS AND CONS OF RECLAMATION AND SALVAGE OPERATIONS ARE THOROUGHLY DISCUSSED BY MR. XANTEN. THE SALVAGING OF MATERIAL, AS A POSSIBLE SOLUTION TO THE PROBLEMS ENCOUNTERED DAILY IN MUNICIPALITIES, IS DETAILED IN TERMS OF SALVAGEABLE MATERIALS IN REFUSE METHODS OF " PARTIAL " SALVAGING, WASTES HEAT UTILIZATION, AND RESEARCH DEVELOPMENT. AN EXCELLENT ARTICLE FOR OFFICIALS CONSIDERING THIS PROBLEMATIC SUBJECT OF RECLAMATION AND SALVAGE OPERATIONS. (PHS)

04-02-01909 NEW MACHINES SPEED CORRUGATED COLLECTION AND SALVAGE
STEVENS, R. P.
REFUSE REMOVAL JOURNAL 8(10), P. 25 (1965). IN RECENT YEARS WASTE PAPER SALVAGING HAS ALMOST BEEN ELIMINATED BECAUSE OF THE TIME AND ADDED COST OF SEPARATING USABLE MATERIAL AT DISPOSAL SITES. NOW HOWEVER THERE IS A TREND TO DEVELOP TECHNOLOGY WHERE BY THIS MATERIAL MAY ECONOMICALLY BE RECOVERED AND RETURNED TO THE MILLS. PRESSES AND BALERS ARE BEING LOCATED AT THE SOURCE IN ORDER THAT THE PAPER AND CARDBOARD NEVER GET MIXED WITH OTHER REFUSE.

04-02-02104 THE WASTE TRADE DIRECTORY OF DEALERS AND CONSUMERS IN THE UNITED STATE AND CANADA (SALVAGE)
NEW YORK, ATLAS PUBLISHING CO (1967). THIS VOLUME IS A LIST OF DEALERS IN SECONDARY MATERIALS IN THE UNITED STATES AND CANADA.

04-02-02105 WORLD WASTE TRADE DIRECTORY OF IMPORTERS AND EXPORTERS (SALVAGE)
NEW YORK, ATLAS PUBLISHING CO (1965). THIS BOOK IS A LIST OF IMPORTERS AND EXPORTERS OF SECONDARY MATERIALS THROUGHOUT THE WORLD.

04 03 PROCESSES USED IN SALVAGE

04-03-02090 INDUSTRIAL WASTES AND SALVAGE, CONSERVATION AND UTILIZATION (PROCESSES(SALVAGE))
LIPSETT, C. H.
ATLAS PUBLISHING CO., NEW YORK, 406 PP. (1963), SECOND EDITION. THIS BOOK IS A COMPREHENSIVE SURVEY OF THE FIELD OF IMPORTANT INDUSTRIAL WASTES, AND INCLUDES THEIR ECONOMIC FUNCTION AND UTILIZATION IN THE INDUSTRIAL LIFE OF THE NATION. THE SALVAGE SECTION DESCRIBES PROGRAMS OF LEADING INDUSTRIAL PLANTS, WRECKING AND SALVAGE OF BUILDINGS, DEPARTMENT STORE WASTE COLLECTION, AUTOMOBILE WRECKING, MUNICIPAL SALVAGE, AND WASTE DISPOSITION PROGRAMS. THE SPECIFICATIONS SECTION DESCRIBES STANDARD GRADES FOR SECONDARY MATERIALS. (PHEA)

04-03-02124 BRITAIN'S FIRST FRAGMENTATION PLANT (GRINDING BULKY-WASTE INCINERATION SALVAGE)
BIRD, A. P.
70TH ANNUAL CONF OF THE INSTITUTE OF PUBLIC CLEANSING, BRIGHTON, (JUNE 11-14, 1968). WITH THE INCREASING NUMBER OF AUTOMOBILES BEING ABANDONED OR JUNKED, THE NEED FOR RECOVERING THE METAL FOR REUSE AND TO DIMINISH THE JUNKPILES, THE STEEL INDUSTRY HAS EMBARKED ON A PROGRAM OF FRAGMENTING, COMPACTION, AND INCINERATION FOR RECOVERING THE METALS FROM THE AUTOMOBILES. A LIST OF OPERATIONAL PLANTS AND THEIR CAPACITIES ARE GIVEN.

04 04 CLASSIFICATION AND STANDARDS

04-04-02116 PAPER STOCK STANDARDS AND PRACTICES (SALVAGE)
PAPER STOCK INSTITUTE OF AMERICA, CIRCULAR PS-69 (JANUARY 1, 1969). THE CIRCULAR DESCRIBES AND OUTLINES THE VARIOUS CLASSIFICATIONS OF USED PAPER STOCK THAT ARE TO BE CONSIDERED FOR REPULPING IN THE UNITED STATES.

05 Size Reduction and Separation

05 01 HAMMERMILLS

05-01-00095 REFUSE REDUCTION PLANT SAVES LANDFILL SPACE (GRINDING SALVAGE COST(CAPITAL) COST(OPERATING) VOLUME-REDUCTION)
THE AMERICAN CITY 80(4), P. 62 (NOVEMBER 1965). SANITARY REFUSE COLLECTORS, INC. (MONTREAL) PLACED INTO SERVICE A 650,000 DOLLAR REFUSE-REDUCTION AND TRANSFER PLANT. BULK IS REDUCED BY 65 PERCENT (INCLUDING SALVAGE) AND THEREBY A CHANGE IS BROUGHT ABOUT IN THE NATURE OF THE REFUSE. THE PROCESSED REFUSE CAN BE USED IN THE FIRST STAGE OF COMPOSTING. THE PLANT HAS A 500-TON PER DAY CAPACITY. THE FLOW CHART OF THE OPERATION IS AS FOLLOWS - HOPPER, PAN CONVEYOR, CONVEYOR BELTS, SORTING ROOM, SALVAGE (METAL, PAPER, RAGS, AND GLASS), CRUSHERS, TRANSFER TRUCKS. THE HAMMER MILL UNITS (GONDARD) CONSIST OF 4 ROWS OF SWING-HAMMERS WITH 12 HAMMERS PER ROW IN A UNIT. EACH HAMMER WEIGHS 15 LB AND REVOLVES AT 1,200 RPM. THE HAMMERS ARE REPOSITIONED AFTER EACH 500 TONS OF REFUSE AND ARE REPLACED AFTER EACH 1,000 TONS. MAINTENANCE OF THE HAMMER MILL COST (EUROPE) 57 CENTS PER TON OF REFUSE. THE EXPECTED OPERATING COSTS ARE 1.50 DOLLARS TO TWO DOLLARS PER TON. THE ADDITION OF CAPITAL COSTS BRINGS THE AMOUNT TO THREE DOLLARS PER TON. SALVAGE OPERATIONS REDUCE WEIGHT BY 25 PERCENT AND BULK BY 40 PERCENT. THE ESTIMATED COST OF REFUSE DISPOSAL IN THE MONTREAL AREA AVERAGES BETWEEN ONE DOLLAR AND 1.50 DOLLARS PER TON FOR LANDFILL AND 5 DOLLARS TO 7 DOLLARS PER TON FOR INCINERATION. (UC)

05-01-00117 CLIPPERS COUNTER CLEO DEBRIS
THE AMERICAN CITY 80(36), (FEBRUARY 1965). (SEE 07-04-00118.) IN MIAMI SHORES, FLORIDA, HURRICANE CLEO UPROOTED TREES AND SHRUBS AND WHIPPED THEM INTO THE STREETS. TWO NEW BRUSH CLIPPERS WERE ADDED TO REDUCE THE VOLUME OF MATERIAL TO BE DISPOSED OF. EACH MACHINE CAN REDUCE A TRUCKLOAD OF TREE BRANCHES INTO A SMALL PILE OF CHIPS IN A FRACTION OF THE TIME OTHERWISE NEEDED TO HAUL AND LOAD THE BRANCHES AWAY. THEY CAN SHOOT THE CHIPS DIRECTLY INTO TRUCK BOXES. (UC)

05-01-00349 COMMENTS ON THE CONSTRUCTION OF GRINDERS FOR URBAN REFUSE (VOLUME-REDUCTION)
PFEIFFER, E. F.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 6, (JANUARY 1959). HAMMER MILLS FOR GRINDING URBAN REFUSE ARE SEVERELY TESTED BY TWO FACTORS, VIZ., THE IRREGULAR SIZES AND SHAPES OF RAW REFUSE MATERIALS AND THE IRREGULARITY OF FEEDING RATE. THE MIXING OF ORGANIC AND INORGANIC COMPONENTS RESULTS IN A STICKY, YET ABRASIVE, MASS WHICH WEARS DOWN THE HAMMERS. THE WEAR IS INCREASED BY THE BUILDUP OF THE ABRASIVE MASS IN THE GRINDER. (UC)

05-01-00455 A NEW MACHINE FOR GRINDING BULKY REFUSE
KUMMER, F.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 20, (MAY 1964). THE SHREDDING MACHINE FOR BULKY-WASTES IS VERY SUITABLE FOR COMMUNITIES WHICH STILL DUMP THEIR REFUSE. IF THE BULKY GOODS, INCLUDING BULKY IRON OBJECTS SUCH AS BICYCLES, AUTO BODIES, BARRELS, REFRIGERATORS, WASHING MACHINES, ETC., ARE SHREDDED, IT NOT ONLY REDUCES THE DUMP VOLUME CONSIDERABLY BUT ALSO LEADS TO A GREATER AND FASTER COMPACTION OF THE REFUSE LAYER, THUS REDUCING THE FIRE HAZARD BECAUSE OF REDUCED AIR PASSAGES.

05-01-01250 PULVERIZATION (GRINDING)
REEVES, E. G.
PUBLIC CLEANSING 58(6), P. 283-292 (1968). THE SECOND OF THREE ARTICLES DEALING WITH REFUSE PULVERIZATION. THE REDUCTION OF BULK REFUSE PULVERIZATION MAY BE CLASSIFIED INTO THREE CLASSES, (1) FINE PULVERIZATION OF DOMESTIC REFUSE, (2) COARSE PULVERIZATION OF DOMESTIC REFUSE, AND (3) PULVERIZATION OF BULK REFUSE. A DESCRIPTION OF THE HAMMERMILL AND THE ROTARY DRUM TYPE PULVERIZERS ARE DISCUSSED AND HOW THEY ARE RELATED TO EACH OF THE ABOVE CLASSES OF REFUSE.

05-01-01252 REFUSE PULVERIZING PLANT FOR DUNDEE (SALVAGE(METAL) SANITARY-LANDFILL INCINERATION)
PUBLIC CLEANSING 58(3), P. 146-150 (1968). THE CITY OF DUNDEE LIKE MANY OTHER MUNICIPALITIES IS FACED WITH THE INCREASED VOLUME OF REFUSE AND THE DECREASING AREA TO DISPOSE OF IT. THE DECISION WAS MADE TO BUILD A PULVERIZER TO RELIEVE THE CITY OF SOME OF THE PROBLEM. THERE IS A DESCRIPTION OF THE REFUSE PULVERIZATION PLANT ALONG WITH THE TYPE OF EQUIPMENT USED IN THE PLANT.

05-01-01900 PULVERIZATION (INCINERATOR SANITARY-LANDFILL)
PUBLIC CLEANSING 54(7), P. 1006 (1964). IN A PAPER PRESENTED BEFORE A GROUP OF CLEANSING OFFICERS, A DESCRIPTION OF A PULVERIZER THAT IS OPERATING AT STAFFORD IN ENGLAND, WAS GIVEN. SOME OF THE ADVANTAGES OF THE PULVERIZER IN CONJUNCTION WITH INCINERATION AS WELL AS TIPPING ARE DISCUSSED. ALTHOUGH THERE ARE MANY GOOD FEATURES OF THE PULVERIZER THERE ARE STILL MANY PROBLEMS.

05 02 HAMMERMILLS WITH BALLISTIC SEPARATION

05-02-00513 PULVERIZATION FACILITY HAS CAPACITY OF 15 TONS AN HOUR (BALLISTIC-SEPARATION GRINDING)
SOLID WASTES MANAGEMENT/RRJ 10(33), (JULY 1967). TOLLEMACHE COMPOSTING SYSTEMS, LTD. MANUFACTURES THE PULVERIZER. THE COST IS $51,800 FOR THE PLANT AND $0.14 PER TON FOR OPERATION. IT IS USED IN PREPARING REFUSE FOR LANDFILL. (UC)

05-02-00561 GRINDING--AN AID IN REFUSE DISPOSAL (GONDARD)
MEYER, A. F.
PUBLIC WORKS 97(5), P. 156 (MAY 1966). THE HEIL-GONDARD PROCESS AUTOMATICALLY SELECTS OUT NONGRINDABLE REFUSE AND GRINDS THE REST. IT THUS MAKES POSSIBLE THE COMBINED COLLECTION OF ANY REFUSE- COMBUSTIBLE AND NONCOMBUSTIBLE. BY GRINDING AND MIXING THE REFUSE TO A UNIFORM COMPOSITION, IT FACILITATES LANDFILL, INCINERATION, AND COMPOSTING OPERATIONS. IT ALSO FACILITATES SALVAGING, AND MAKES POSSIBLE SHORTER HAUL DISTANCES THROUGH THE USE OF MILLED MATERIAL AT SMALL INCINERATORS AND LANDFILLS CLOSER TO POPULATION CENTERS, THAN IS FEASIBLE WITH THE LARGE OPERATIONS NEEDED FOR UNGROUND REFUSE. (UC)

05-02-00660 PULVERIZATION PLANT TO HANDLE 500 TONS DAILY (GONDARD COST(CAPITAL) COST(OPERATING))
SOLID WASTES MANAGEMENT/RRJ 11(6), P. 10 (JUNE 1968). A PULVERIZATION PLANT HAS BEEN BUILT IN WIESBADEN, WEST GERMANY HAVING A CAPACITY OF NEARLY 500 TONS PER DAY. EQUIPMENT WAS MANUFACTURED BY GONDARD. COST OF THE INSTALLATION WAS $720,000 WITH $150,000 USED FOR THE FOUR CRUSHERS. DETAILS OF THE INSTALLATION AND CRUSHERS ARE PRESENTED. DISPOSAL COSTS ARE CALCULATED AT $1.44 PER TON. TWO OTHER GERMAN INSTALLATIONS ARE ALSO DESCRIBED.

05-02-00693 WISCONSIN CRUSHER FOR 50 TONS DAILY (GONDARD)
SOLID WASTES MANAGEMENT/RRJ 11(1), P. 85 (JANUARY 1968). A HEIL-GONDARD GRINDER HAS BEEN INSTALLED IN MADISON, WISCONSIN AS A DEMONSTRATION PROJECT UNDER THE SOLID WASTES DISPOSAL ACT. CAPACITY OF THE UNIT IS 50 TONS PER DAY.

05-02-00694 NORTHERN IRELAND PULVERIZATION PLANT (GONDARD)
REFUSE REMOVAL JOURNAL 10(10), P. 10 (OCTOBER 1967). A GONDARD GRINDER HAVING A CAPACITY OF 40 TONS OF REFUSE PER DAY HAS BEEN INSTALLED AT PORTADOWN, NORTHERN IRELAND. END PRODUCT IS BEING USED AS COVER FOR AN EXISTING FILL. THE BOROUGH OF GREMSBY IS PLANNING INSTALLATION OF 2 GONDARD UNITS CAPABLE OF HANDLING 130 TONS PER DAY. PRODUCT TO BE USED FOR LANDSCAPING.

05-02-00907 CLEANER THAN MANY FOOD FACTORIES (GONDARD COST(CAPITAL) SALVAGE(METAL) GRINDING VOLUME-REDUCTION)
FULLARD, P. F.
PUBLIC CLEANSING 52(9), P. 391 (SEPTEMBER 1962). DESCRIBES THE GONDARD REFUSE REDUCER RECENTLY PUT INTO OPERATION AT ANNECY HAUTE SAVOIE FRANCE. REFUSE IS FIRST TIPPED INTO A RECEPTION PIT 100 FEET BY 40 FEET BY 30 FEET DEEP. OPPOSITE THE TIPPING GAP IS AN EXTRACTOR FAN WHICH DRAWS UP DUST AND SMELL FROM REFUSE IN THE PIT. A HYDRAULICALLY OPERATED GRAB TRANSFERS THE REFUSE TO A HOPPER ON A CONVEYOR BELT WHICH LEADS TO THE REDUCER. REJECT REFUSE IS DISCHARGED THROUGH THE REJECT CHUTE TO A RECEPTACLE AT THE END OF THE BUILDING. THE REMAINING REFUSE MOVES UP AN INCLINED CONVEYOR BELT AND OVER A MAGNETIC ROLLER WHICH SEPARATES THE METALLIC MATERIAL. THE METALLIC OBJECTS ARE AIR CLEANED, DROPPED INTO A HOPPER, AND EVENTUALLY SOLD AS CLEAN METAL SCRAP. PLANT STAFF CONSISTS OF A FOREMAN, A MECHANIC, AND A LABORER. THE WHOLE BUILDING AND SURROUNDINGS ARE REMARKABLY CLEAN, NO SMELL IS NOTICEABLE AND OPERATIONS ARE QUIET. SALE OF THE END PRODUCT AND SCRAP METAL IS EXPECTED TO MORE THAN COVER CAPITAL CHARGE INTEREST AND OPERATING COSTS. CITY OFFICIALS ENVISION THE DAILY MUNICIPAL REFUSE LOAD TO INCREASE TO 180 TONS WITHIN THE NEXT FEW YEARS, WITH WHICH THE PLANT SHOULD COPE WITH COMFORTABLY. (PHS)

05-02-00908 A VERSATILE SORTER-PULVERIZER (TOLLEMACHE COMPOSTING GRINDING)
PUBLIC CLEANSING 53(1), P. 457 (SEPTEMBER 1963). DESCRIBES A SORTING-PULVERIZING MACHINE IN USE NEAR EASTBOURNE, ENGLAND. THE MACHINE CONSISTS OF A HAMMERMILL AND BALLISTIC SEPARATOR. UNSORTED REFUSE IS FED INTO THE TOP OF A CONICAL RECEIVING HOPPER AND UNGRINDABLE ITEMS ARE THROWN OUT BY THE SEPARATOR LOCATED AT THE BOTTOM OF THE CONE. REJECTED MATERIALS INCLUDE METALS, POLYTHENE BOTTLES, RUBBER, AND SOME WOOD, CONSTITUTING APPROXIMATELY 4 PERCENT BY WEIGHT OF THE UNSORTED REFUSE. THE PRODUCT FROM THE PULVERIZER IS FINELY GROUND HOMOGENEOUS MATERIAL AND REPRESENTS LESS THAN HALF OF THE REFUSE'S ORIGINAL BULK. THE MACHINE CAN BE USED ADVANTAGEOUSLY AT TRANSFER STATIONS REDUCING THE BULK OF THE MATERIAL TO BE HAULED TO DISTANT LANDFILL SITES, OR IT MAY BE USED AT A COMPOSTING PLANT BEFORE OR AFTER THE COMPOSTING PROCESS. SUGGESTS THAT THE FINISHED PRODUCT MAY ALSO BE SOLD DIRECTLY TO FARMERS FOR SPREADING ON LEVEL GROUND WHERE IT WILL GRADUALLY MATURE TO COMPOST. (PHS)

05-02-00926 HAMMERING IT (GONDARD GRINDING)
PUBLIC CLEANSING 52(1), P. 9 (JANUARY 1962). DESCRIBES THE GONDARD SYSTEM OF REFUSE REDUCTION, WHICH REPRESENTS AN OUTSTANDING ADVANCEMENT IN THE APPLICATION OF A HAMMER CRUSHER TO THE PULVERIZATION OF MUNICIPAL REFUSE. THE PLANT CONSISTS OF A MODIFIED TYPE OF MULTIHAMMER IMPACT CRUSHER, WITH SUITABLE FEED ARRANGEMENTS. THIS MACHINE HAS THE USUAL DISCHARGE FOR THE REDUCED PRODUCT, AND THE TOP OF THE HOUSING IS OPEN FOR THE FREE EGRESS OF MATERIALS NOT READILY REDUCIBLE. THE REDUCED PRODUCT PASSES THROUGH A GRID BELOW THE ROTOR AND IS DISCHARGED DIRECTLY BELOW THE BREAKER. THE GONDARD BREAKER COMPRISES A CASING OF WELDED PLATE WELL STRENGTHENED WITH RAILS ON THE OUTSIDE. THE LOWER PORTION IS IN ONE PIECE, WITH HOUSINGS FOR THE TWO ROLLER BEARINGS CARRYING THE ROTOR SHAFT AND THE REMOVABLE GRIDS. THE UPPER PORTION IS IN TWO HALVES WITH VERTICAL BOLTED JOINT ON THE CENTER LINE, AND OPEN AT THE TOP WITH PROVISION FOR ATTACHING BREAKER PLATES AT THE REAR UPPER QUADRANT. THERE ARE FOUR ROWS OF STEEL HAMMERS OF THE FLAT BAR FREE-SWINGING TYPE, 12 HAMMERS PER ROW. THE REJECT TOWER IS ABOUT 9 METERS HIGH FROM THE ROTOR SHAFT TO THE TOP OF THE TOWER. IT IS DESIGNED TO ENSURE THAT THE REJECTED ITEMS HAVE LOST MOST OF THEIR VELOCITY ON APPROACHING THE TOP, WHERE THEY FALL INTO A HOPPER AND ARE DISCHARGED INTO A VEHICLE OR CONVEYOR. (PHS)

05-02-00990 WEST GERMAN PULVERIZATION DEVELOPMENTS (GRINDING)
SOLID WASTES MANAGEMENT/RRJ 11(6), P. 10 (JUNE 1968). A PULVERIZATION PLANT IN WIESBADEN, WEST GERMANY, IS THE LARGEST INSTALLATION OF ITS KIND IN EUROPE. THE COST OF THE PULVERIZATION PLANT WAS $720,000, WITH $150,000 BEING USED TO PURCHASE FOUR CRUSHERS INCLUSIVE OF HOPPERS AND ALL ELECTRICAL WORK. EACH UNIT CAN HANDLE 11.5 TONS PER HOUR. REFUSE IS DROPPED FROM HOPPERS INTO THE PULVERIZING MILLS BY WAY OF GRAVITY CHUTES. THE REFUSE IS SHREDDED AND ALL UNPULVERIZABLE MATERIAL IS REJECTED UP THE TOWER BY BALLISTIC SEPARATION. EACH CRUSHER IS, IN EFFECT, A 30-FT TOWER OF METAL PLATE CONSTRUCTION SET OVER A SWINGING HAMMER PULVERIZER. IN EACH MILL THERE ARE 48 HAMMERS SET IN FOUR ROWS OF 12 EACH, SWUNG FROM A ROTOR, WHICH IS BUILT UP WITH DISCS THAT ARE POSITIONED WITH DISTANCE PIECES BOTH ON THE MAIN SHAFT AND ON FOUR SUBSIDIARY SHAFTS. THE WHOLE UNIT IS BUILT TOGETHER WITH END-PLATES THREADED AND LOCKED ON THE MAIN SHAFT. MOTIVE DRIVE IS FROM A 140 HP ELECTRIC UNIT. THE LOWER SEMICIRCLE OF THE GRINDING CHAMBER IS FORMED BY A THREE-SECTION GRILL, THE CENTER SECTION BEING HINGED. A CHOICE OF GRINDING WIDTHS IS AVAILABLE TO ACCOMMODATE VARYING REQUIREMENTS. THE GRINDING CHAMBER IS DIVIDED LATERALLY, THE UPPER PART CONSISTING OF TWO BOLTED SECTIONS. THE SECTIONS ARE TO BE UNBOLTED AND SEPARATED BY UNDOING 24 BOLTS--A 20-MINUTE OPERATION. THE TOWER IS COMPOSED OF FIVE SECTIONS, WITH THE HEAD PART CONTAINING A TRAP FOR COLLECTING AND RETAINING REJECTS. (REJECTS - MAINLY RUBBER PRODUCTS, NYLONS, PLASTIC CONTAINERS, AND BOTTLE TOPS - CONSTITUTE ABOUT 3 PERCENT OF THE TOTAL REFUSE.) HAMMER REPLACEMENT IS NECESSARY EVERY 1400 TO 1600 TONS OF REFUSE PULVERIZED. HAMMERS COST ABOUT $175 PER SET, AND TWO MEN A TOTAL OF THREE MAN HOURS TO COMPLETE. DISPOSAL COSTS RUN ABOUT $1.44 PER TON, OF WHICH LABOR COSTS $0.30 PER TON, HAMMER REPLACEMENTS $0.25 PER TON, ELECTRICITY $0.05 PER TON, NORMAL MAINTENANCE $0.04 PER TON, AND LOAN CHARGE AND DEPRECIATION $0.80 PER TON. RUESSELSHEIM (GERMANY) HAS AN 80-TON PER DAY PLANT, AND WETZLAR , GERMANY, A 40-TON PER DAY PLANT. (UC)

05-02-01307 PULVERIZING THE TOLLEMACHE WAY (GRINDING)
PUBLIC CLEANSING 57(2), P. 68-70 (1967). THE TOLLEMACHE PULVERIZER IS A MACHINE SUCH THAT REFUSE MAY BE FED INTO IT WITHOUT SORTING WHATSOEVER. THE HEAVIER METAL OBJECTS THAT MAY DAMAGE THE MACHINE ARE AUTOMATICALLY DISCARDED. THE PLANT HAS A CAPACITY OF 15 TONS PER HR. THE COST OF SUCH A PLANT IS 25,000 POUNDS. THE REFUSE IS RUN THROUGH THE PULVERIZER INTO A LARGE TRANSFER COMPACTOR AND TRANSFERED TO THE TIP SITE. THIS MACHINE IS ALSO POPULAR IN THE COMPOST PLANT.

05-02-01858 SOLID WASTE REDUCTION/SALVAGE PLANT 3RD PROGRESS REPORT CITY OF MADISON PILOT PLANT (GRINDING SANITARY-LANDFILL COST(OPERATING) COST(CAPITAL) BALLISTIC-SEPARATOR SALVAGE LEACHING SETTLEMENT-RATE ODOR VECTOR)
CITY OF MADISON, WISCONSIN, AND THE UNIVERSITY OF WISCONSIN, (MARCH 16, 1969). THE CITY OF MADISON HAS SUCCESSFULLY DISPOSED OF MILLED REFUSE AS A LANDFILL OPERATION WITHOUT EARTH COVER SINCE JUNE 1967. THIS PILOT OPERATION HAS PRODUCED NO NUISANCE CONDITIONS AND IN OUR OPINION IS SUPERIOR TO A LANDFILL INCORPORATING DAILY EARTH COVER. THE COST PROJECTIONS FOR AN INTERMEDIATE SIZED PRODUCTION FACILITY (68,000 TONS PER YEAR) SHOW A COST SLIGHTLY HIGHER THAN THE CITY OF MADISON PRESENT LANDFILL DISPOSAL COSTS. HOWEVER, THE IMPROVED LEVEL OF LANDFILL OPERATIONS AND VOLUME SAVINGS IN THE FILL MAY WELL JUSTIFY THE INCREASED COST. RESIDENTIAL COMBINED REFUSE WAS MILLED EACH SEASON THROUGH GRATES OF DIFFERENT SIZES. SOME OF THE REFUSE WAS NOT MILLED, THUS, COMPARISONS CAN BE MADE BETWEEN MILLED AND NONMILLED REFUSE, IN ADDITION TO COMPARING REFUSE MILLED THROUGH DIFFERENT SIZED GRATES. CURRENTLY THE PLANT IS BEING OPERATED BY USING ONE SIZE OF GRATE IN THE MILL, AND BY CONSTRUCTING FEWER, BUT LARGER CELLS OF REFUSE IN THE LANDFILL. THE PRODUCTION RATE OF THE PLANT RANGED FROM 6.8 TO 7.7 TONS PER HOUR FOR THE 3-1/2 AND 6-1/4 INCH GRATES RESPECTIVELY. THE QUANTITY OF MATERIAL THAT CAN BE BALLISTICALLY REJECTED OUT OF THE MACHINE VARIES FROM 1 TO 7 PERCENT DEPENDING ON THE SIZE OF GRATE USED IN THE MILL. THE OPERATING COST OF THE SMALL SCALE, PILOT PLANT OPERATION WAS APPROXIMATELY $7.00/TON WHEN USING THE 5-IN GRATES. BASED ON EXPERIENCE GAINED WITH THE PILOT PLANT OPERATION, COST PROJECTIONS ARE MADE FOR A BETTER DESIGNED, EQUIPPED, AND OPERATED PLANT. LOCAL SCRAP DEALERS INDICATED NO INTEREST IN SALVAGING PAPER AFTER IT HAD BEEN IN A COLLECTION TRUCK. FURTHERMORE, THE COMMENT OF THE MOST INTERESTED SALVAGE DEALER WAS THAT THERE WERE TOO MANY TIN CANS IN THE REJECTED METALS TO PASS FOR NO. 2 GRADE SCRAP IRON, AND THAT THE REJECTS WERE TOO HETEROGENEOUS TO EXTRACT TIN FROM CANS. IN THE LANDFILL, THE DENSITY OF THE NONMILLED REFUSE

AND MILLED REFUSE AVERAGED 550 AND 930 LBS/CU-YD RESPECTIVELY. PRELIMINARY DATA FOR THE WATER ANALYSES OF THE LEACHATE FROM MILLED AND NONMILLED CELLS INDICATES THAT: THE DISSOLVED OXYGEN IN ALL LEACHATES IS VIRTUALLY ZERO, AND THE NONMILLED CELLS WHICH ARE COVERED WITH DIRT ARE PRODUCING LESS LEACHATE THAN THE MILLED CELLS WHICH ARE NOT COVERED. HOWEVER, ANY CONCLUSIONS TO BE DRAWN FROM THE AVAILABLE WATER ANALYSES DATA SHOULD BE REGARDED AS TENTATIVE. THE RESULTS OF THE GAS ANALYSES MADE TO DATE ARE ALSO TABULATED. PHYSICAL ANALYSES OF THE REFUSE, MADE BY THE FEDERAL SOLID WASTES PROGRAM, INDICATE THE REFUSE CONTAINS APPROXIMATELY 15 PERCENT FOOD WASTES, AND 40 PERCENT PAPER PRODUCTS. THE MOISTURE CONTENT VARIED FROM 30 TO 48 PERCENT. PLOTS OF SETTLEMENT VS. TIME INDICATE THAT AFTER ONE YEAR, THE SURFACE OF THE 6-FT DEEP CELLS HAS SETTLED ABOUT 0.25-FT IN THE MILLED CELLS, AND MORE THAN 0.50-FT FOR THE NONMILLED CELLS. BASED ON OBSERVATIONS TO DATE, USING MILLED REFUSE IN A LANDFILL RESULTS IN A SUBSTANTIAL INCREASE IN THE QUALITY OF OPERATION. WIND CARRIED LITTER, AND ODORS ARE LESS THAN FOR NONMILLED REFUSE LANDFILLS. ADDITIONAL BENEFITS OF USING MILLED REFUSE INCLUDE - (1) EASE OF SPREADING, WHICH MIGHT REDUCE THE AMOUNT OF FINAL COVER DIRT REQUIRED TO BRING AN AREA TO GRADE, (2) EASE OF FOLLOWING A GRADING PLAN AND PROVIDING DRAINAGE DURING THE LANDFILL CONSTRUCTION, (3) BUILDING ACCESS ROADS TO DESIRED DUMPING AREAS, AND (4) POSSIBLY NOT HAVING TO BE AS PROMPT IN PROVIDING COVER DIRT, IF ANY IS REQUIRED. IN ANY CASE, ONE SHOULD RECOGNIZE THE DIFFERENCE IN QUALITY BETWEEN MILLED AND CONVENTIONAL LANDFILLS WHEN COMPARING COSTS. ONE OF THE CONCLUSIONS OF A STUDY OF RATS AND FLIES WAS THAT MILLED REFUSE, WITHOUT COVER DIRT SHOWED LESS RAT ACTIVITY THAN DID NONMILLED, COVERED REFUSE. LITTLE DIFFERENCE WAS FOUND WITH RESPECT TO FLY NUMBERS BETWEEN MILLED, NONCOVERED CELLS, AND NONMILLED, COVERED CELLS. COST PROJECTIONS FOR THE EXISTING PLANT (ONE MILL OPERATED ONE SHIFT), AND AN EXPANSION OF THE EXISTING PLANT (TWO MILLS OPERATED TWO SHIFTS) INDICATE COSTS OF $6.60/TON AND $2.70/TON RESPECTIVELY, INCLUDING FINAL DISPOSAL. THE COST FOR NEW PLANTS, INCLUDING FINAL DISPOSAL, MIGHT RANGE FROM $5.15/TON TO $2.15/TON FOR ONE MILL OPERATING ONE SHIFT, AND FOUR MILLS OPERATING TWO SHIFTS RESPECTIVELY. ALL THE COSTS LISTED ABOVE COULD BE LOWER IF ALL REFUSE WERE ACCEPTED, AND THE MILLED REFUSE USED TO COVER THE NONMILLED REFUSE.

05-02-01963 THE RELATIVE ATTRACTIVENESS OF MILLED AND NONMILLED REFUSE TO RATS AND FLIES (GONDARD VECTOR SANITARY SANITARY-LANDFILL)
HAM, R. K.
PUBLIC WORKS 100(7), P. 74-75 (JULY 1969). A FULL-SCALE STUDY OF THE ADVANTAGES OF MILLING REFUSE PRIOR TO LAND-FILLING HAS BEEN UNDERTAKEN BY THE CITY OF MADISON WISCONSIN, UNDER THE HEIL GONDARD DEMONSTRATION PROJECT. ONE OF THE CRITERIA BY WHICH THE MILLING PROCESS WAS EVALUATED WAS THE EFFECT OF MILLED REFUSE, COMPARED TO NONMILLED, ON THE VECTOR POPULATION IN A LANDFILL. TO EVALUATE THIS HYPOTHESIS OVER TWENTY CELLS WERE CONSTRUCTED AND RATED FOR ACCEPTABILITY BY RATS AND FLIES. THE CELLS WERE PLACED THROUGHOUT THE TEST AREA AND CONTAINED MILLED COMBINED REFUSE, MILLED GARBAGE, NONMILLED COMBINED REFUSE, NONMILLED GARBAGE, MILLED RUBBISH, AND NONMILLED RUBBISH. THE CELLS VARIED IN AREA BUT WERE ALL ABOUT SIX FEET IN HEIGHT. CELLS CONSTRUCTED WITH MILLED MATERIAL WERE LEFT UNCOVERED WHILE THE NONMILLED CELLS WERE COVERED BOTH ON TOP AND SIDES WITH A MINIMUM OF SIX INCHES OF DIRT. FROM THIS STUDY THE FOLLOWING CONCLUSIONS ARE DRAWN - THE BAIT CONSUMPTION METHOD SUPPLEMENTED BY OBSERVATION, IS USEFUL FOR DETERMINING LOCATIONS AND PREFERENCES OF RAT POPULATIONS. BAIT STATIONS WILL DRAW ACTIVITY TO AREAS WHICH WOULD OTHERWISE BE OF LOW RAT ACTIVITY. GARBAGE IN LANDFILLS IS MORE ATTRACTIVE TO RATS THAN IS COMBINED REFUSE. MILLING GARBAGE PRIOR TO LAND FILLING REDUCES THE LIKELIHOOD OF RAT INFESTATION, NEVERTHELESS THE CELL SHOULD BE COVERED WITH DIRT. NONMILLED COVERED CELLS SEEMED TO HARBOR MORE RODENT ACTIVITY THAN DID MILLED UNCOVERED CELLS. THE DIFFERENCE IS THOUGHT TO BE DUE TO THE POOR DIGGING CHARACTERISTICS OF MILLED REFUSE AND THE DISPERSAL OF ATTRACTANT MATERIALS THROUGHOUT THE CELL. NOTE, HOWEVER, THAT THE PREFERENCE FOR THE PERIPHERAL AREA WAS STRONGER THAN THAT FOR EITHER CELL TYPE. TEST DRILLING, AND POSSIBLY BURROWS, ARE LIKELY ON EITHER CELL TYPE IF THE SURFACE IS BROKEN BY EROSION OR THE PRESENCE OF LARGE OBJECTS. LITTLE DIFFERENCES WERE FOUND WITH RESPECT TO FLY NUMBERS BETWEEN MILLED UNCOVERED AND NONMILLED COVERED CELLS.

05 03 CRUSHERS

05-03-00237 DISINTEGRATOR PROLONGS LIFE OF SANITARY LANDFILL (GRINDER CRUSHER DISINTEGRATOR)
ENGRG NEWS-RECORD, P. 63 (OCTOBER 12, 1967). A CRUSHER DISINTEGRATOR THAT IS CAPABLE OF REDUCING RUBBER TIRES, REFRIGERATOR, RAILROAD TIES, FURNITURE, ETC. TO 2 BY 2 INCH FRAGMENTS AT A RATE OF 100 TONS PER HOUR IS DESCRIBED. FOR LANDFILL THE CRUSHER CAN INCREASE COMPACTION BY 40 TO 100 PERCENT INCREASING THE LIFE OF THE LANDFILL.

05-03-00408 GRINDING HARBOR AND BULKY REFUSE IN AMSTERDAM
ANDREAS, E.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 18, P. 48 (AUGUST 1963). THE HAZEMAG IMPACT CRUSHER IS DESCRIBED. THE MODEL SAP 5/M HAS A CAPACITY OF 120 TO 160 CU-M/HR. ENERGY CONSUMED AMOUNTS TO 70 KW-HR/CU-M. IT CAN CRUSH REFUSE CONTAINING LARGE CRATES, FURNITURE, MATTRESSES, BARRELS, REFRIGERATORS, CARPETS, AND PIECES OF STONE AND CONCRETE. (UC)

05-03-00512 TWO EUROPEAN CITIES USE CRUSHERS OPERATING ON 10-HOUR SCHEDULE (GRINDING)
SOLID WASTES MANAGEMENT/RRJ 11(45), (FEBRUARY 1968). THE EMPLOYMENT OF AN IMPACT CRUSHER TO CRUSH ITS REFUSE HAS SAVED AMSTERDAM FROM THE NEED TO INSTALL AN ADDITIONAL INCINERATOR. IN 1961, AMSTERDAM INCINERATED 158,000 CU-YD OF BULK REFUSE IN TWO FURNACES. IT WAS THEN DECIDED TO CRUSH AND INCINERATE ANY ADDITIONAL BULK REFUSE IN DOMESTIC REFUSE FURNACES. THE NEXT YEAR IT HANDLED 162,000 CU-YD OF BULK REFUSE AND 324,000 CU-YD IN 1963. IF THE CRUSHER HAD NOT BEEN USED, THE SOLE ALTERNATIVE WOULD HAVE BEEN TO ERECT AN INCINERATOR. SO FAR NO SERIOUS BREAKDOWNS HAVE OCCURRED. THE CRUSHER IS OPERATED ABOUT 10 HOURS PER DAY. REPLACEMENT OF PARTS COSTS ABOUT 3 CENTS PER CU-YD OF REFUSE PROCESSED. HAGEN, GERMANY, HAS BEEN OPERATING ITS CRUSHER ON A TIPPING SITE. A VIBRATING CHUTE FEEDS IN BULKY ITEMS FROM THE TOP LEVEL. A HEAVY-DUTY BULLDOZER PUSHES OUT THE CRUSHED MATERIAL THAT IS ACCUMULATED BENEATH THE UNIT. THE EQUIPMENT IN BOTH THESE CITIES IS MANUFACTURED BY HAZEMUG OF MUENSTER, GERMANY. THE COMPANY REPORTS CAPACITIES AVAILABLE RANGING FROM 75 TO 780 CU-YD/HR WITH FEED OPENINGS RANGING FROM 3-FT 7-IN BY 4-FT 5-IN TO 5-FT 10-IN BY 13-FT. A HORIZONTALLY MOUNTED ROTOR IS HOUSED IN A STEEL CASING. THE ROTOR THROWS REFUSE ENTERING THE CRUSHER AGAINST TWO IMPACT BLADES. IMPACTING THE MATERIAL AGAINST THEM REDUCES THE BULK. IF THE MATERIAL IS NOT REDUCED BY INITIAL IMPACT, HEAVY REINFORCED RIBS ON THE ROTOR AND A SECOND IMPACT PLATE, WITH TEETH ON ITS LOWER EDGE, REDUCE THE REFUSE BY SHEARING. THE IMPACT BLADES ARE DESIGNED TO RETRACT WHEN UNCRUSHABLE MATERIAL ENTERS THE MACHINE. THE UNIT NEEDS ABOUT 0.8 KW/CU-YD OF THROUGHPUT. (UC)

05-03-01245 DESIGN AND OPERATION OF MS COMBUSTION CONE PLANT WITH REFUSE CRUSHING INSTALLATION (GRINDING INCINERATION)
MEYER, G.
AUFBAU UND WIRKUNGSWEISE EINER MS-BRENNKEGELANLAGE MIT MUELLZERKLEINERUNG AUFBEREITUNGS-TECHNIK 5(3), P. 135-138 (1964). UNSORTED REFUSE IS DUMPED BY TRUCK INTO REFUSE BIN WHERE IT IS DRIED. AT BOTTOM OF THIS BIN, COMBINED DISCHARGING AND CRUSHING INSTALLATION REDUCES REFUSE TO DESIRED SIZE, E.G. OF 40 CM EDGE LENGTH, AND DISCHARGES MATERIAL FROM BIN. BY MEANS OF STEEL PLATE CONVEYOR, MATERIAL IS FED INTO COMBUSTION CONE HOUSING AND THROWN ONTO COMBUSTION CONE GRATE. WITH PLANTS FOR THROUGHPUT OF 1500 KG/HR OF REFUSE COMBUSTION CONE HAS MAXIMUM DIAMETER OF 3.2 M AND ROTATES WITH SPEED OF 30-40 CM/MIN. (EI)

05 04 PULPERS AND SHREDDERS

05-04-00058 NEW AUTOMATIC PIPELINE DISPOSAL SYSTEM (GRINDER)
INCO 27(7), P. 38-39 (OCTOBER 1959). COMPACT, SANITARY, ODORLESS, MECHANIZED METHOD OF HANDLING WASTE DEVELOPED BY CONSERVOMATIC CORP., ORELAND, PA. CALLED CONSERVOMATIC SYSTEM, IT REDUCES ALL GARBAGE, PAPER, GLASS, CARDBOARD, WAX CONTAINERS, BOOKS, CELLOPHANE, CLASSIFIED MATERIAL AND OTHER WASTE TO ODORLESS PULP THAT IS SEMI-DRY, EASILY HANDLED, AND CAPABLE OF BEING EMPLOYED AS EFFECTIVE ORGANIC MULCH. PULPING UNITS EMPLOY ABRASION RESISTANT NI-HARD IMPELLERS TO DISPOSE OF 4000 LB OF GARBAGE PER HOUR. GARBAGE VOLUME REDUCED BY 80 PERCENT. (EI)

05-04-00114 COMMINUTORS CHEW UP BULKY ITEMS (SIZE-REDUCTION)
THE AMERICAN CITY 84(1), P. 24 (JANUARY 1969). THE VON ROLL COMMINUTOR IS DESCRIBED. NO PRESORTING IS REQUIRED. THROUGHPUT RANGES FROM 4,250 TO 7000 CU-FT/HR.

05-04-00497 NEW SYSTEM FOR DISPOSAL OF CLASSIFIED DOCUMENTS
REFUSE REMOVAL JOURNAL 5(10), P. 14 (OCTOBER 1962). A LOS-ANGELES, CALIFORNIA, DISPOSAL FIRM IS DOING SOME SUCCESSFUL PIONEERING IN THE DISPOSAL OF CLASSIFIED GOVERNMENT DOCUMENTS. IN THE PAST, GOVERNMENT REGULATIONS ON THE DISPOSAL OF SUCH MATERIAL HAVE FORCED DEFENSE PLANTS TO INSTALL THEIR OWN PULPING OR FURNACE FACILITIES FOR THIS PURPOSE. THE LOS-ANGELES DISPOSAL FIRM HAS RECENTLY DEVELOPED MOBILE DISINTEGRATOR EQUIPMENT WHICH MAY REPLACE THE INDIVIDUAL FURNACES AND PROVIDE SUBSTANTIAL SAVINGS TO DEFENSE COMPANIES AND THE GOVERNMENT IN THE FUTURE. THE EQUIPMENT IS ABLE TO DISINTEGRATE MATERIAL AT A RATE OF 3,000 LBS/HR WITHOUT BURNING. (PHS)

05-04-00699 SHREDDER REDUCES SOLID WASTE VOLUME (SALVAGE GRINDER)
PUBLIC WORKS, P. 168 (OCTOBER 1967). A DEVICE TO SHRED ALL REFUSE, INCLUDING AUTO HULKS, STOVES, TANKS AND OTHER METAL OBJECTS. USE OF THE UNIT SHOULD INCREASE THE ABILITY TO PERFORM METAL SALVAGE.

05-04-00729 NEW SHREDDING MACHINE FOR WASTE PROCESSING (CENTRIBLAST SIZE-REDUCTION)
PUBLIC CLEANSING 57(2), P. 106 (FEBRUARY 1967). A DESCRIPTION IS GIVEN OF THE NEW DESIGN OF A SHREDDING MACHINE FOR THE RAPID REDUCTION OF NONSORTED INDUSTRIAL OR MUNICIPAL WASTE TO A PREDETERMINED SIZE FOR CONTINUOUS FEEDING TO A PROCESS PLANT OR DISPOSAL SYSTEM. THE MACHINE IS MANUFACTURED BY THE CENTRIBLAST CORP., PITTSBURGH, PENNSYLVANIA. IN THE MACHINE, ROTARY IMPACT HAMMERS ARE ARRANGED IN A SPIRAL FORMATION AT INTERVALS ALONG A HIGH-SPEED REVOLVING SHAFT. THIS ARRANGEMENT ALLOWS THE FULL POWER OF THE DRIVE UNIT TO BE APPLIED TO A SINGLE HAMMER AT ANY ONE TIME. THE HAMMERS INTERSECT A SERIES OF STAR WHEELS WELDED TO ANOTHER SHAFT WHICH REVOLVES SLOWLY, PROVIDING THE FUNCTIONS OF IMPELLER AND ANVIL. SINCE IT IS NOT A FIXED ANVIL, WET OR GUMMY ITEMS WILL NOT CHOKE THE MECHANISM. IF A SPECIFIC SIZE OF PARTICLE IS NEEDED, A HEAVILY PERFORATED SCREEN IS FITTED AROUND THE ASSEMBLY. (UC)

05-04-00958 SHREDDER REDUCES SOLID WASTE VOLUME (GRINDING PEST VECTOR VOLUME-REDUCTION)
PUBLIC WORKS 98(8), P. 168 (1967). BULKINESS OF REFUSE MATERIAL DELIVERED IN PACKER TRUCKS MAY BE REDUCED TO AS LITTLE AS ONE-EIGHTH ITS ORIGINAL VOLUME BY PROCESSING IT IN A REFUSE SHREDDER AT THE SANITARY LANDFILL OR INCINERATOR SITE. IT IS CLAIMED THAT THE DEVICE WILL SHRED ALL REFUSE, INCLUDING AUTO HULKS, STOVES, TANKS AND OTHER METAL OBJECTS. IN ADDITION TO METAL SALVAGE, INCREASED LONGEVITY OF A LANDFILL SITE, OR BETTER COMBUSTION, OTHER ADVANTAGES CLAIMED FOR THE PROCESS INCLUDE REDUCTION OF VERMIN BREEDING AREAS AND A REDUCTION IN PERSONNEL AND EQUIPMENT REQUIREMENTS.

05-04-01561 MANY BENEFITS CLAIMED FOR GRINDING MACHINE (SOMAT LAND-SPREADING)
REFUSE REMOVAL JOURNAL 1(4), P. 8 (APRIL 1958). THE BENEFITS OF WET GRINDING OF REFUSE ARE DISCUSSED BRIEFLY. LARGE ITEMS ARE REMOVED BY HAND, WHILE SMALLER DEBRIS IS AUTOMATICALLY TAKEN OUT BY A "JUNKER" BEFORE THE REFUSE IS GROUND. THE PRODUCT IS REPORTED TO BE ODORLESS AND UNATTRACTIVE TO FLIES. THE COMPANY STATES THAT A LONG PERIOD OF TESTING HAS SHOWN THE PRODUCT TO BE EXTREMELY VALUABLE AS AN ORGANIC FERTILIZER.

05-04-01915 ANGELS BASEBALL PARK GETS AUTOMATED WASTE HANDLING (SOMAT GRINDING)
REFUSE REMOVAL JOURNAL 8(10), P. 28 (1965). NEXT YEAR WHEN THE LOS-ANGELES ANGELS AMERICAN LEAGUE BASEBALL TEAM MOVES INTO ITS NEW STADIUM IN ANAHEIM, CALIFORNIA, A MODERN WASTE HANDLING SYSTEM IS EXPECTED TO SIMPLIFY THE STRUCTURE'S CLEANUP OPERATION. THE METHOD, BASED ON GRINDING PULPING AND EXTRACTING, WILL BE INSTALLED IN THE DEEP LEFT FIELD AND RIGHT FIELD CORNER SECTIONS. THE PLAN IS TO SWEEP ALL SPECTATOR TRASH HORIZONTALLY ON THE DIFFERENT LEVELS, AROUND THE STADIUM, BEGINNING IN THE SECTION BEHIND HOME PLATE AND WORKING TOWARD LEFT AND RIGHT FIELDS. LARGE CHUTES PASSING FROM UPPER LEVELS WILL GUIDE RUBBISH DOWN TO A SOMAT WASTE HANDLING SYSTEM IN A TRASH ROOM NEAR THE GROUND. (EXPERIMENTS NOW UNDERWAY ARE TESTING THE FEASIBILITY OF USING PAPER SACKS TO HOLD WASTE BEFORE IT IS PUT IN THE CHUTE.)

05-04-02156 PULPING SYSTEM REDUCES WASTE TO 20 PERCENT OF VOLUME (SOMAT QUANTITY)
REFUSE REMOVAL JOURNAL 9(5), P. 32 (MAY 1966). A DESCRIPTION OF THE SOMAT PULPING SYSTEM IS GIVEN IN WHICH ABOUT 4,000 LBS OF OFFICE REFUSE IS SENT TO THE MACHINE EACH DAY WHERE IT IS SLURRIED, DEWATERED, AND TRANSFERED TO A CONTAINER FOR DISPOSAL. INSOLUBLE OBJECTS DO NOT AFFECT THE OPERATION OF THE UNIT; THEY CAN BE REMOVED FROM THE UNIT AFTER THE SLURRY HAS BEEN REMOVED. THE UNIT IS INSTALLED AT THE NEW ROHM AND HAAS BUILDING IN PHILADELPHIA.

05 05 GRINDERS OR PULVERIZERS

05-05-00193 REFUSE PULVERISING PLANT FOR WELSH AUTHORITY (GRINDING VOLUME-REDUCTION COMPOSITION SANITARY-LANDFILL)
GREENWAY, W. F. + FANRELL, J.
SURVEYOR 126(386), P. 19-20 (OCTOBER 2, 1965). CONTROLLED TIPPING OF REFUSE BEING NO LONGER CONSIDERED SAFE NOR HYGIENIC AND WITH INCINERATION UNFEASIBLE FOR BUDGETARY REASONS, MOUNTAIN ASH URBAN DISTRICT COUNCIL DECIDED ON PULVERIZATION PLANT. PULVERIZED WASTE IS USED AS LANDFILL OF SCARRED MINING AREA. PLANT IS DESIGNED FOR 10 TPH OF CRUDE REFUSE MEETING 70 TPD REQUIREMENTS. DETAILS OF PLANT DESIGN CONTROLLED CENTRALLY WITH INTERLOCKING SYSTEM FOR OPERATIONAL SAFETY AND GUARDING AGAINST OVERLOADING. (EI)

05-05-00195 REFUSE PREPARATION WITH GORATOR (GRINDING INCINERATION)
BRENNSTOFF-WAERME-KRAFT 16(8), P. 404-405 (AUGUST 1964). GORATOR IS SUITABLE FOR HANDLING, SIZE REDUCTION, KNEADING AND MIXING OF INHOMOGENEOUS MATERIAL OF VARIOUS KINDS, SUCH AS FIBROUS, PASTY OR VISCOUS MATERIALS, SLUDGES AND SOLID FUELS. IT IS PROPOSED ALSO FOR HOMOGENIZATION OF REFUSE BY ADMIXTURE OF SOLID FUELS SO THAT REFUSE BURNING PLANT CAN BE SUPPLIED WITH MORE CONSISTENT INPUT. (EI)

05-05-00286 MEANS OF RAKINGS DISPOSAL IN SEWAGE PUMPING STATION (GORATOR GRINDING SEWER)
NEIDL, G.
WEGE ZUR BEHERRSCHUNG INSBESONDERE DES RECHENGUTES BEI ABWASSERPUMPWERKEN, GESUNDHEITS-INGENIEUR 85(4), P. 118-125 (APRIL 1964). DESCRIPTION OF VARIOUS PNEUMATIC SYSTEMS FOR CONVEYING SOLID MATERIALS RETAINED ON TRASH RACK, AND OF "GORATOR" WASTE DISPOSAL UNIT, WHICH COMBINES HOMOGENIZER, COMMINUTOR, RIPPING MACHINE AND PUMP. (IN GERMAN) (EI)

05-05-01370 REFUSE PULVERIZATION - A THEORETICAL CASE AND PRACTICAL ANSWER (SANITARY-LANDFILL SIZE-REDUCTION COST(CAPITAL) CCST(OPERATING))
HETHERINGTON, W.
PUBLIC HEALTH INSPECTOR 75(1), P. 6-12 (OCTOBER 1966). THE AUTHOR DISCUSSES THE DESIGN AND OPERATION OF A SMALL PULVERIZATION PLANT FOR USE IN A SMALL COMMUNITY. WHEN REFUSE IS REDUCED TO A SIZE NO LARGER THAN 3 INCHES, DECOMPOSITION IN A SANITARY LANDFILL CAN PROCEED MORE RAPIDLY AND WITH FEWER ATTENDANT NUISANCES. (PHEA)

05-05-01817 PULVERIZATION MAKES GAINS AS BRITISH OPEN NEW UNITS (PULVERIZATION SALVAGE SANITARY-LANDFILL)
SOLID WASTES MANAGEMENT/RRJ 12(3), P. 32 (MARCH 1969). A DESCRIPTION OF A NEW REFUSE PULVERIZATION PLANTS CURRENTLY INSTALLED IN POOLE, ENGLAND. ALL SALVAGEABLE MATERIALS ARE SORTED OUT AND SOLD. FIVE "FERMASCREENS" ARE USED TO GRIND THE REMAINING REFUSE. THE FINAL PRODUCT IS USED IN LANDFILL OPERATIONS.

05-05-01885 REFUSE DISPOSAL - WHY PULVERIZATION (GRINDING SANITARY-LANDFILL)
OATES, E. T.
PUBLIC CLEANSING 54(10), P. 1201 (1964). DUE TO THE FACT THAT DISPOSAL SITES ARE MORE DIFFICULT TO FIND, BETTER METHODS OF DISPOSAL ARE BEING LOOKED FOR. ONE OF THE METHODS THOUGHT TO BE AN AID TO THE PROBLEM IS THE PRACTICE OF PULVERIZATION BEFORE DISPOSAL. THE COST OF PULVERIZING EQUIPMENT IS DISCUSSED ALONG WITH SOME RECOMMENDATIONS AS TO HOW A PULVERIZATION PLAN MAY HELP WITH YOUR DISPOSAL PROBLEMS.

05 06 RASPING MACHINES

05-06-01088 NEW REFUSE DISPOSAL SYSTEM FOR THE SMALLER AUTHORITY SEERDRUM (SIZE-REDUCTION LAND-SPREADING)
BUSFIELD, J. E.
SURVR MUNIC CTR ENGR 128(3887), P. 27-28 (DECEMBER 1966). A ROTATING REFUSE MACERATING PLANT (SEERDRUM) THAT REDUCES THE BULK OF REFUSE BY ABOUT HALF HAS PROVIDED AN ECONOMICAL, NUISANCE-FREE SOLUTION FOR REFUSE DISPOSAL FOR A SMALL DISTRICT. (EI)

05-06-01515 WALLINGFORD R.D.C. INSTALLS VICKERS SEERDRUM PULVERIZER (SANITARY-LANDFILL GRINDING)
PUBLIC CLEANSING 58(4), P. 185 (APRIL 1968). WALLINGFORD HAS INSTALLED A SINGLE UNIT MARK II SEERDRUM AT THEIR EXISTING LANDFILL. THE UNIT, LOCATED IN A SIMPLE, PREFABRICATED BUILDING, IS LOADED BY A TRACTOR SHOVEL OPERATING FROM THE RECEIVING SLAB. THE MARK II SEERDRUM IS A 29-FT CYLINDRICAL DRUM 8 FEET IN DIAMETER, AND IS ROTATED BY 13 RPM TWIN 35 HP ELECTRIC MOTORS. WATER IS ADDED TO THE CONTENTS TO ESTABLISH A 40 PERCENT TO 50 PERCENT MOISTURE CONTENT. THE DRUM HAS AN INPUT CAPACITY OF ABOUT 9 TONS PER HOUR. (UC)

05 07 HAND SORTING

05 08 MECHANICAL SORTING

05 09 OTHER GENERAL ARTICLES

05-09-00197 PROBLEMS OF REFUSE CRUSHING AND PULVERIZING (GRINDING)
WUHRMANN, K.
PROBLEME DER MUELLZERKLEINERUNG, AUFBEREITUNGS-TECHNIK 5(3), P. 104-109 (MARCH 1964). FOR CRUSHING AND PULVERIZING OF REFUSE FOLLOWING METHODS ARE AVAILABLE - HAMMERING OR DESTROYING BY IMPACT EFFECT, CUTTING OR SHEARING, TEARING AND GRINDING OR CRUSHING. WITH NEARLY ALL REFUSE PULVERIZING MACHINES, IMPACT EFFECT PREDOMINATES, PARTICULARLY IN CASE OF IMPACT MILLS. HAMMER MILLS WITH INTERLOCKING HAMMERS AT CIRCUMFERENTIAL SPEEDS BETWEEN 50 AND 100 M/SEC ARE WIDELY USED IN FIELD OF REFUSE PULVERIZATION. DETAILS OF NUMEROUS REFUSE PULVERIZING MACHINES. (EI)

05-09-00288 WASTE VOLUME REDUCED BY PULVERIZATION, CRUSHING AND SHEARING (GRINDING)
PATRICK, P. K.
PAPER PRESENTED AT 69TH ANNUAL CONF, THE INSTITUTE OF PUBLIC CLEANSING, BLACKPOOL, ENGLAND, (JUNE 5-9, 1967). BECAUSE OF THE CHANGING CIRCUMSTANCES IN WASTE COLLECTION, THE NEED TO HANDLE A WIDER VARIETY OF MATERIAL IN FUTURE, AND THE GROWING PROBLEMS OF DISPOSAL, IT IS NECESSARY TO INVESTIGATE METHODS OF TREATMENT AND VOLUME REDUCTION WHICH WILL GIVE GREATER FLEXIBILITY. THE WIDER ISSUES OF INCINERATION, CONTROLLED TIPPING, OR COMPOSTING AS THE MOST SUITABLE METHOD, DO NOT AFFECT THE PRINCIPLE OF PRE-TREATMENT, AS THIS IS LIKELY TO BECOME MORE NECESSARY WHATEVER THE SUBSEQUENT PROCESSING, PARTICULARLY WHERE BULKY MATERIAL IS CONCERNED. THERE ARE INDICATIONS THAT PLANNING AUTHORITIES ARE BECOMING RELUCTANT TO ALLOW THE DUMPING OF CRUDE WASTE, BECAUSE OF THE DIFFICULTIES OF ADEQUATE CONTROL. PULVERIZATION, THOUGH NOT WITHOUT ITS OWN PROBLEMS, IS LIKELY TO ENABLE TIPPING TO BE CARRIED OUT IN AREAS AND AT SITES WHICH WOULD OTHERWISE BE PROHIBITED. REFUSE PULVERIZATION IS A RELATIVELY COSTLY PROCESS, HOWEVER, AN EVALUATION OF THE DIFFERENT MACHINES AND PROCESSES NOW ON THE MARKET IS A COMPLEX BUSINESS. SELECTION WILL BE SIMPLIFIED IF THE FOLLOWING PRINCIPLES ARE ACCEPTED- (A) CAPITAL EXPENDITURE MUST BE RELATED TO MANPOWER REQUIRED IN ANY PROCESS, (B) IN PULVERIZING PROCESSES REFUSE SHOULD NOT BE REDUCED TO A GREATER DEGREE THAN IS NECESSARY FOR A PARTICULAR PURPOSE, AS COST RISES INVERSELY WITH THE PARTICLE SIZE OF THE PRODUCT, (C) WITH HAMMER MILLS, A LARGE MACHINE HAS AN INHERENTLY GREATER RIGIDITY AND RESERVE POWER THAN A SMALLER ONE, (D) A PULVERIZING PLANT WILL ONLY FUNCTION PROPERLY IF IT IS DESIGNED AND ENGINEERED AS AN INTEGRATED PROCESS, AND NOT SIMPLY AS A COLLECTION OF PROPRIETARY UNITS. THERE IS A NEED FOR FURTHER DEVELOPMENT OF MACHINES OR PROCESSES WHICH ARE NOT SELECTIVE. MUNICIPAL REFUSE CAN CONTAIN ALMOST ANY MATERIAL IN COMMON USE (AND SOME UNCOMMON) AND A REFUSE PROCESSING PLANT, IF IT IS TO MEET MODERN REQUIREMENTS OF EFFICIENCY, HYGIENE AND ECONOMY, MUST BE CAPABLE OF ACCEPTING, SEGREGATING AS REQUIRED, AND REDUCING ALL CLASSES OF WASTE NORMALLY COLLECTED, WITH A MINIMUM OF LABOR. THERE WILL CERTAINLY BE AN INCREASING NEED FOR BULK REDUCTION MACHINES, AND IN NEW AUTOMATIC GRATE INCINERATORS SOME TYPE OF MACHINE FOR THIS PURPOSE WILL PROBABLY BECOME A STANDARD REQUIREMENT. THE TECHNICAL PROBLEMS HERE ARE NOT AS SEVERE AS IN THE FIELD OF REFUSE PULVERIZATION, AS BY THEIR VERY NATURE, BULKY WASTE REDUCTION MACHINES MUST BE MASSIVELY BUILT AND PROVIDED WITH PLENTY OF POWER. THE PRESENT MACHINES ARE NOT NECESSARILY THE ONLY SOLUTIONS, HOWEVER, AND IT IS TO BE HOPED THAT BRITISH MANUFACTURERS WILL SHOW AN INTEREST IN THIS FIELD, IN WHICH AT PRESENT CONTINENTAL DESIGNERS HAVE A CLEAR LEAD.

05-09-00511 PULVERIZATION AT BRITISH SITE REDUCES MATTER BY 50 PERCENT (GRINDING)
SOLID WASTES MANAGEMENT/RRJ 11(16), (FEBRUARY 1968). SOME OF THE MAJOR ADVANTAGES INHERENT IN THE PULVERIZATION OF WASTES ARE AS FOLLOWS- 1. IT ACCELERATES DECOMPOSITION AND FERMENTATION. HENCE THE DEPOSITS ARE NOT INFESTED BY VERMIN OR INSECTS. FLIES, LARVAE, AND EGGS ARE KILLED BY THE MACHINERY. 2. RAPID CONSOLIDATION OF THE MATERIAL INCREASES THE EXCLUSION OF OXYGEN, THEREBY REDUCING THE DANGER OF SPONTANEOUS COMBUSTION. 3. SWIFT SETTLING IS ANOTHER FEATURE. 4. THE APPEARANCE OF THE GROUND MATERIAL IS NONOBJECTIONABLE. THE PARTICLE SIZE OF THE MATERIAL AT THE WORTHING LANDFILL IS 2 TO 3 INCHES. IT IS DEPOSITED IN LAYERS UP TO ABOUT 8 FEET IN DEPTH. NO COVERING MATERIAL IS

SAID TO BE REQUIRED. THE BULK CONTENT OF THE REFUSE IS REDUCED BY ABOUT 50 PERCENT. THE SMALLEST ECONOMIC PLANT SHOULD BE RELATED TO AN INPUT OF 10 TONS PER DAY. PREFERABLY THE INPUT SHOULD BE AUTOMATIC SINCE THE CAPACITY OF ONE MAN TO FEED A PULVERIZER IS ONLY 3 TONS PER HOUR. THE WORTHING PLANT SERVES SOME 43,000 PEOPLE AND OVER 17,000 DWELLINGS. PULVERIZATION OF REFUSE WAS BEGUN THERE IN 1947. (UC)

05-09-00692 PULVERIZATION CONTINUES TO SPREAD IN GREAT BRITAIN (SANITARY-LANDFILL PEST(CONTROL) VOLUME-REDUCTION COST(OPERATING))
REFUSE REMOVAL JOURNAL 10(2), P. 36 (FEBRUARY 1967). BULK REDUCTION EFFECTED BY VARIOUS BRITISH METHODS CURRENTLY IN USE IS - DIRECT INCINERATION 80 TO 85 PERCENT, SCREENING, SALVAGE, AND INCINERATION, 70 TO 75 PERCENT, SCREENING, SALVAGE, AND PULVERIZATION, 55 TO 60 PERCENT, PULVERIZATION ONLY 30 TO 35 PERCENT, SCREENING, SALVAGE AND COMPOSTING, 15 TO 20 PERCENT. COST OF INCINERATION IS BETWEEN $2.25 AND $4.27 A TON AND SANITARY LANDFILL BETWEEN 78 CENTS AND $2.27 PER TON. ADVANTAGES CITED FOR PULVERIZATION ARE - BULK REDUCED 33 TO 40 PERCENT, LANDFILL COVERING NOT NECESSARY, RODENTS NOT ATTRACTED, AND FLY NUISANCE REDUCED. COMPOSTING IS SUBJECT TO QUESTION UNLESS 50 PERCENT OF MATERIAL IS COMPOSTABLE.

05-09-01251 REFUSE DISPOSAL - PULVERIZATION (GRINDING COMPOSTING SANITARY-LANDFILL VOLUME-REDUCTION INCINERATION)
REEVES, E. G.
PUBLIC CLEANSING 58(4), P. 156-160 (1968). THIS ARTICLE IS THE FIRST OF A SERIES OF THREE ARTICLES. IT DISCUSSES IN GENERAL THE USE OF AND THE ADVANTAGE OF PULVERIZATION OF VARIOUS TYPES OF WASTES WHETHER IT BE LANDFILL, COMPOSTING, OR INCINERATION.

05-09-01273 WHY SCUNTHORPE CHOSE PULVERIZATION (GRINDING SANITARY-LANDFILL SALVAGE(COMPOSITION) COST(CAPITAL) COST(OPERATING))
ALLEN, G.
PUBLIC CLEANSING 56(10), P. 532-538 (1966). AT A MEETING OF PUBLIC CLEANSING OFFICERS MR. ALLEN DETAILED HIS INVESTIGATIONS LEADING TO THE DECISION OF CHANGING FROM LANDFILL DISPOSAL TO PULVERIZATION AND INCINERATION. THERE IS A TABLE COMPARING MAN POWER AND EQUIPMENT USED BY EACH METHOD OF DISPOSAL. THERE IS A QUESTION AND ANSWER SESSION RELATING TO PROBLEMS RELATED TO OTHER OPERATIONS AROUND THE COUNTRY.

05-09-01363 WOOD CHIPPER PAYS ITS WAY
THE AMERICAN CITY 72(12), P. 25 (DECEMBER 1957). WHEN THREE SEVERE WINDSTORMS HIT SPRINGFIELD, ILLINOIS, THEY BLEW DOWN HUNDREDS OF TREES AND THOUSANDS OF BRANCHES AND LIMBS, CLUTTERING THE STREETS WITH DEBRIS. DURING A 12-WEEK CLEANUP PERIOD, THE WOOD CHIPPER DISPOSED OF SIX TIMES AS MUCH DEBRIS IN TRUCKLOADS. THE CHIPPED BRUSH ALSO IS MUCH EASIER TO DISPOSE OF AND CAN BE USED AS MULCH. THE BLADES MUST BE KEPT SHARPENED. THIS HAS BEEN THE ONLY MAINTENANCE EXPENSE ENCOUNTERED THUS FAR. (UC)

05-09-02113 SIZE REDUCTION OF MUNICIPAL SOLID WASTE PRODUCTS (GRINDER)
KEYT, D. E.
DEPT OF MECHANICAL ENGINEERING, UNIVERSITY OF PENNSYLVANIA, (JUNE 1969). THE AUTHOR DESCRIBES THE NECESSARY CHARACTERISTICS OF THE MACHINERY AND WASTES THAT WILL BE COMPATIBLE WITH A SLURRY TRANSPORT SYSTEM FOR MUNICIPAL SOLID WASTES. A NUMBER OF DIFFERENT TYPES OF SIZE REDUCTION UNITS ARE INCLUDED.

06 Composting

06 01 RESEARCH RESULTS

06-01-00099 A THOROUGH LOOK AT COMPOSTING (TVA COST(CAPITAL))
THE AMERICAN CITY 81(5), P. 30 (MAY 1966). THREE PUBLIC AGENCIES RECENTLY SIGNED AN AGREEMENT TO CONDUCT FULL-SCALE STUDIES OF COMPOSTING. THE OFFICE OF SOLID WASTES, U.S. PUBLIC HEALTH SERVICE, TENNESSEE VALLEY AUTHORITY, AND JOHNSON CITY, TENNESSEE. TVA WILL DESIGN, CONSTRUCT, AND OPERATE A COMPOSTING PLANT WHICH WILL PROCESS JOHNSON CITY'S DAILY PRODUCTION OF REFUSE AND UNTREATED SEWAGE SLUDGE. THE PLANT WILL COST $750,000 TO CONSTRUCT AND $100,000/YR TO OPERATE. THE END PRODUCT WILL BE TESTED AS A SOIL CONDITIONER, AND PUBLIC HEALTH ASPECTS WILL BE STUDIED. THE PROGRAM WILL BE CARRIED OUT UNDER THE NEW SOLID WASTES PROGRAM OF THE U.S. PUBLIC HEALTH SERVICE. (UC)

06-01-00126 A PRELIMINARY STUDY OF HIGH RATE COMPOSTING
WILEY, J. S. PAPER 2895, ASCE TRANS 122, P. 1009-1034 (OCTOBER 1957). SIX 15-GAL LABORATORY, MECHANICAL COMPOSTERS (BATCH-TYPE) FOR DETERMINING THE CRITERIA FOR THE HIGH-RATE COMPOSTING OF ORGANIC WASTES ARE DESCRIBED HEREIN. PHYSICAL AND CHEMICAL TESTS FOR INDICATING THE DEGREE OF DECOMPOSITION DURING COMPOSTING ARE OUTLINED, AND TYPICAL RESULTS ARE PRESENTED. OPTIMUM STIRRING AND AERATION RATES, AS WELL AS THE PERCENTAGE OF MOISTURE IN THE INITIAL CHARGE, ARE PRESENTED FOR THE LABORATORY UNITS. THE CORRELATION OF CARBON DIOXIDE AND MOISTURE PRODUCTION WITH THE TEMPERATURE OF THE COMPOST IS SHOWN, TOGETHER WITH THE RESPIRATORY QUOTIENT FOR THE DECOMPOSITION. (AUTH)

06-01-00145 A COMPARATIVE STUDY OF THE BREAKDOWN OF CELLULOSE BY MICROORGANISMS (DECOMPOSITION(BIOLOGICAL))
REESE, ELWYN T. + LEVINSON, H. S.
PHYSIOLOGIA PLANTARUM 5, P. 345-366 (1952). A LARGE NUMBER OF MICROORGANISMS HAS BEEN EXAMINED WITH RESPECT TO CELLULOSE HYDROLYSIS. ALL THOSE WHICH REDUCE TENSILE STRENGTH OF COTTON DUCK PRODUCE THE HYDROLYTIC ENZYME, CX. SOME MICROORGANISMS WHICH DO NOT REDUCE THE TENSILE STRENGTH OF DUCK ALSO PRODUCE CX. A SCHEME FOR HYDROLYSIS BASED ON ATTACK OF CELLULOSE AND CELLULOSE DERIVATIVES BY MICROORGANISMS IS PRESENTED. IT HAS BEEN SHOWN THAT NEITHER PECTINASE NOR POLYPHENOL OXIDASE IS INVOLVED IN THE PRIMARY BREAKDOWN OF COTTON CELLULOSE.

06-01-00243 SIMULTANEOUS AEROBIC AND ANAEROBIC COMPOSTING PROCESS (SLUDGE(SEWAGE) GARBAGE)
JEFFREYS, G. A.
PATENT U.S. 2,867,521, (JANUARY 6, 1959). WASTE ORGANIC MATERIALS, SUCH AS GARBAGE, SAWDUST, RICE HULLS AND SEWAGE SLUDGE ARE COMPOSTED EITHER IN BATCHES OR IN CONTINUOUS PROCESS INTO A HIGH-GRADE HUMUS BY BACTERIAL ACTION. MATTER WHICH CONTAINS MUCH CELLULOSE OR LIGNIN IS FIRST SUBJECTED TO THE ACTION OF FUNGAL MOLDS, SUCH AS PENICILLIUM OR ASPERGILLUS, FOR WHICH THE OPTIMUM PH IS ABOUT 5 AND THE MOISTURE CONTENT ABOUT 30 PERCENT. AT THE START OF THE MOLD STAGE THE TEMPERATURE SHOULD BE 30-35 DEGREES. THEN THIS MASS OR A MIXTURE WITH OTHER WASTE ORGANIC MATERIALS IS SUBJECTED TO MESOPHYLLIC BACTERIAL ACTION AT 30-45 DEGREES. OPTIMUM CONDITIONS FOR THIS STAGE ARE PH OF 7.6, MOISTURE CONTENT OF 40-70 PERCENT, AND TEMPERATURE OF 60-75 DEGREES. A PERIOD OF THERMOPHYLLIC BACTERIAL ACTION THEN TAKES PLACE AND THE TEMPERATURE REMAINS AT 60-75 DEGREES UNTIL A DROP TO 45-50 DEGREES OCCURS, INDICATING COMPLETE CONVERSION. SOME BACTERIAL ORGANISMS MAY BE ADDED AT EITHER OF THESE STAGES. THE FINAL STAGE IS ONE IN WHICH ACTINOMYCETES EXERT A STABILIZING ACTION. THE TEMPERATURE AND OXIDATION RATE ARE CONTROLLED BY AERATION. N COMPOUNDS ARE PERIODICALLY ADDED. THE MATERIAL IS THEN DRIED AND GROUND. THE PERIOD REQUIRED IS ABOUT 1 TO 2 WEEKS. DESIGN CHARACTERISTICS AND OPERATIONAL INFORMATION OF THE UNIT ARE DISCUSSED IN DETAIL, E.G., MOISTURE CONTROL, PH, AERATION, TYPES OF WASTES TO BE TREATED, TYPES OF SPECIFIC ORGANISMS USED, ETC. (CA)

06-01-00244 FERMENTATION OF WASTE MATERIALS CONTAINING ORGANIC CONSTITUENTS (COMPOSTING SLUDGE(SEWAGE) GARBAGE)
CARLSSON, P. M. + PETERSON, K. F.
PATENT U.S. 2,954,285, (SEPTEMBER 17, 1960). AN APPLICATION AND PROCESS ARE DESCRIBED FOR MAKING GARBAGE, SEWAGE SLUDGE, SLAUGHTERHOUSE WASTE, ETC., INTO COMPOST. (CA)

06-01-00245 COMPOSTING MUNICIPAL REFUSE
GERAGHTY, C. H. + KENNEDY, R. R. + SEABROOK, C. S.
PATENT U.S. 2,798,800, (JULY 9, 1957), ASSIGNED TO MODOC PEAT MOSS CO. A HUMUS PRODUCT IS PRODUCED BY STACKING OF UNSEGREGATED MUNICIPAL REFUSE IN WINDROWS MAINTAINED AT A SUITABLE MOISTURE CONTENT (40-60 PERCENT), FOLLOWED BY TUMBLING EVERY FEW DAYS FOR 3-8 WEEKS. THE TEMPERATURE INSIDE THE WINDROWS IS 140-160 DEGREES F. THE MIXTURE IS THEN SCREENED. THE OVERSIZE FRACTION IS REJECTED AND THE UNDERSIZED FRACTION YIELDS A FINISHED HUMUS PRODUCT. IF THE C TO N RATIO IS TOO HIGH, IT CAN BE DECREASED BY ADDITION OF SUPERNATANT LIQUOR FROM ANAEROBIC DIGESTION OF SEWAGE SLUDGE AS A MEANS OF MAINTAINING THE MOISTURE CONTENT. THE HUMUS PRODUCT CONTAINS MOISTURE 15-25, N ABOUT 1, P AS PHOSPHORUS PENTOXIDE ABOUT 1, K AS POTASSIUM OXIDE ABOUT 0.8, AND C ABOUT 19 PERCENT OF THE DRY WEIGHT. THE WASTE-PAPER CONTENT OF THE REFUSE IS ALMOST COMPLETELY DECOMPOSED. FERROUS SCRAP IS RECOVERED BY THE SCREENING FOLLOWED BY MAGNETIC SEPARATOR. (CA)

06-01-00247 APPARATUS FOR FERMENTATION OF SOLID ORGANIC MATERIALS (COMPOSTING)
CARLSSON, P. M. + PETERSON, K. F.
PATENT U.S. 2,969,277, (JANUARY 24, 1961), ASSIGNED TO DANO INGENIORFORRETNING OG MASKINFABRIK, INGENIOR KAI PETERSEN'S FOND. THE APPLICATION IS ESPECIALLY APPLICABLE TO HOUSE REFUSE AND VEGETABLE WASTE TO MAKE COMPOST. (CA)

06-01-00253 NEW METHOD OF COMPOST PRODUCTION (COMPOSTING)
SURVEYOR 122(3716), P. 1053 (AUGUST 24, 1963). HARDY REFUSE REGENERATOR IS DESCRIBED, WHICH COMPRISES LARGE ROUND WEATHERPROOF DOME OR VAT CONTAINING AUTOMATIC MECHANICAL MEANS FOR AERATION AND MIXING DURING PROCESS OF DECOMPOSITION. PROCESS IS CONTINUOUS AND PRODUCES STERILIZED COMPOST IN 3 DAYS. OPERATION MAY BE ON 24 HR BASIS OR INTERMITTENT. (EI)

06-01-00254 ACCELERATED COMPOSTING
GRAY, K. R.
COMPOST SCIENCE 7(3), P. 29-32 (WINTER 1967). ARTICLE DESCRIBES RESEARCH PROJECT IN WHICH FUNDAMENTALS OF COMPOSTING ARE ASSESSED SO THAT ECONOMICAL, LARGE-SCALE PLANTS MAY BE DESIGNED IN WHICH MANY OF CARBONACEOUS WASTES CAN BE RAPIDLY TREATED AND RESULTING PRODUCTS USED IN AGRICULTURE. FOUR EXPERIMENTAL RUNS WERE MADE ON COMPOSTING OF MIXED CARBONACEOUS WASTES IN REACTOR WHICH IS INTERMITTENTLY AGITATED. REACTOR IS HORIZONTALLY MOUNTED DRUM OF HEXAGONAL CROSS SECTION. (EI)

06-01-00263 IMPORTANCE OF PRE-FERMENTATION IN COMPOSTING (PATHOGEN(SURVIVAL))
BANSE, H. J. + STRAUCH, D.
COMPOST SCIENCE 6(3), P. 17-23 (AUTUMN-WINTER 1966). INVESTIGATIONS ON OXYGEN AND CARBON DIOXIDE CONTENT OF DECOMPOSING MATERIAL, OPTIMUM MOISTURE CONDITIONS, AND WHAT HAPPENS TO PATHOGENIC ORGANISMS ADDED PRIOR TO COMPOSTING PROCESS ARE REPORTED. RESEARCH EQUIPMENT FEATURED CONTINUALLY ROTATING REVOLVING DRUM, 22 M IN LENGTH AND 3.5 M IN DIAMETER. CASING HAS OUTSIDE DEVICES CAPABLE OF ADJUSTING INFLOW OF AIR AND LIQUID IN VARIOUS PARTS OF DRUM. AT SUPPLY INLET FRESH GARBAGE, UNCRUSHED, FREED FROM FERROUS METALS MAGNETICALLY, IS FED INTO DRUM, AT OTHER END PROCESSED MATERIAL IS DISCHARGED THROUGH SLIDING DEVICE. (EI)

06-01-00264 COMPOSTING OF SOLID ORGANIC WASTE (COMPOSTING)
KNUTH, D. T.
BATTELLE TECH REV 17(3), P. 14-20 (MARCH 1968). LARGE-SCALE TREATMENT OF REFUSE, GARBAGE, AND OTHER SOLID ORGANIC WASTES BY COMPOSTING HOLDS PROMISE OF ATTAINING MARKETABLE PRODUCT THAT RETURNS VALUABLE NUTRIENTS TO SOIL. STUDIES SEEK TO DETERMINE BASIC MECHANISMS OF COMPOSTING, WITH AIM OF SPEEDING UP PROCESS AND REDUCING COSTS. COMPOSTABLE MUNICIPAL WASTES INCLUDE REFUSE, GARBAGE, AND DEWATERED SEWAGE SLUDGE. AGRICULTURAL WASTES INCLUDE CROP RESIDUES AND ANIMAL MANURES. INDUSTRIAL WASTES INCLUDE CERTAIN OF THOSE FROM MEAT PACKING PLANTS, STOCKYARDS, TANNERIES, PULP AND PAPER MILLS, SAWMILLS, CANNERIES, AND PHARMACEUTICAL HOUSES. (EI)

06-01-00265 COMPOSTING DOMESTIC REFUSE IN " HOME UNIT "
CLARK, J. W.
COMPOST SCIENCE 4(4), P. 16-17 (WINTER 1964). COMPOSTING UNIT WAS CONSTRUCTED FROM 55 GAL STEEL OIL DRUM AND EQUIPPED WITH SUPPORT AND CENTRAL ROTATING BAR WITH HAND CRANK ATTACHED. ROUND BAFFLE WITH HOLE IN CENTER WAS PLACED INSIDE DRUM SO THAT IT COULD BE MOVED TO EITHER END OF DRUM AS REQUIRED, SLIDING ON 3/4 IN. PIPE SUPPORT THAT DRUM ROTATES ABOUT. METHOD OF OPERATION.

06-01-00275 AUTOMATIC TEMPERATURE AND AIR CONTROL IN COMPOSTING (COMPOSITION(REFUSE))
SCHULZE, K. L.
COMPOST SCIENCE 2(4), P. 31-34 (WINTER 1962). EXPERIMENTS TO ASCERTAIN DEGREE OF TEMPERATURE CONTROL IN COOLING OF COMPOST PILES WHICH TEND TO OVERHEAT. ANALYZER FOR CONTROLLING TEMPERATURE AND AIR AND FOR REGULATION OF COMPOSTING PROCESS. EXPERIMENTS PROVED THAT ACCURATE AND RELIABLE AUTOMATIC TEMPERATURE AND AIR CONTROL IS OBTAINED BY USING COMBINATION OF THERMOSTAT AND SOLENOID VALVE. (EI)

06-01-00303 BIOCHEMICAL AND MICROBIOLOGICAL PROBLEMS OF URBAN REFUSE COMPOSTING.
HEINEN, W.
SCHWEIZ Z HYDROL 22, P. 793-817 (1960). THE FERMENTATION OF REFUSE OCCURS IN AT LEAST 2 PHASES. THE INITIAL BACTERIAL DECOMPOSITION LEADS TO SUBSTRATES WHICH ARE DEGRADABLE BY FUNGI (E.G. MUCOR). THE INFLUENCE OF HUMIDITY AND OXYGEN SUPPLY UPON THE RATE AND EXTENT OF THE BACTERIAL FERMENTATION IS INVESTIGATED. THE ENHANCEMENT OF THE N CONTENT OF THE COMPOST BY THE ADDITION OF SEWAGE SLUDGE CAN ONLY BE ACHIEVED IF THE CONDITIONS ARE CAREFULLY SELECTED. (CA)

06-01-00305 WOOD WASTES IN COMPOSTS (COMPOSTING QUANTITY(SAWDUST) COMPOST(CROP-YIELD))
DUNN, S. + EMERY, J. D.
COMPOST SCIENCE 1, P. 26 (WINTER 1961). A QUARTER TON OF SAWDUST IS PRODUCED FOR EVERY THOUSAND BOARD FEET OF LUMBER SAWED. FOUR METHODS OF OUTDOOR COMPOSTING OF WOOD WASTES WERE TESTED IN BINS, PILES, AND PITS. THE BEST METHOD WAS FOUND TO BE ONE INVOLVING THE USE OF COMPOSTING MIXTURES IN 1- CU YD WOODEN BINS. SECOND IN LINE WAS THE METHOD INVOLVING THE USE OF PITS TO WHICH NO WATER WAS ADDED BUT WHICH WERE OCCASIONALLY FLOODED AT CERTAIN TIMES OF THE YEAR. VARIOUS MANURES AND OTHER MATERIALS WERE TESTED AS AIDS IN COMPOSTING SAWDUST. THE COMPOSTING PROCESS GENERALLY REQUIRED 1 TO 2 YEARS TO COMPLETE THE BREAKDOWN OF THE WOOD. THE COMPOSTED WOOD-WASTE MIXTURE WAS ANALYZED. NUTRIENT DEFICIENCIES WERE COMPENSATED FOR THROUGH THE ADDITION OF FERTILIZERS TO THE END PRODUCT. THE TESTS WERE MADE BY GROWING VARIOUS TYPES OF PLANTS IN SUCCESSION IN THE COMPOST OR COMPOST-SOIL MIXTURES CONTAINED IN WOODEN BOXES OR IN GREENHOUSE POTS. YIELDS WERE DETERMINED AND COMPARED TO EACH OTHER AND TO A CONTROL (SOIL ONLY) FOR EACH CROP AND FOR THE ACCUMULATION OF ALL CROPS. BEST YIELDS WERE OBTAINED FROM SAWDUST-HEN MANURE CONTAINED IN WOODEN BOXES. THE SILAGE-SAWDUST MIXTURE WAS SECOND IN AMOUNT OF YIELD. POOREST RESULTS WERE OBTAINED WITH THE USE OF SEWAGE-SAWDUST COMBINATIONS. HEN MANURE OR CHOPPED GREEN VEGETATION ADDED TO SAWDUST RESULTED IN SATISFACTORY YIELDS. (UC)

06-01-00307 WHAT IS NECESSARY FOR COMPOSTING SUCCESS? (MARKETING SANITARY-LANDFILL)
COMPOST SCIENCE 2, (AUTUMN 1961). COMPOSTING OF MUNICIPAL WASTES CAN BE BOTH A MEANS OF WASTE DISPOSAL AND A MEANS OF PRODUCING USEFUL ORGANIC MANURE. IN MANY CASES, HOWEVER, THERE HAS BEEN NO COORDINATION BETWEEN THE DISPOSAL AND

THE AGRICULTURAL REQUIREMENTS. CITIES CANNOT AFFORD TO CONSIDER THE NATIONAL ASPECTS OF COMPOSTING, BUT MUST LOOK ONLY AT THE ECONOMICS AND CONVENIENCE OF MUNICIPAL COMPOSTING. THE AUTHOR THINKS THAT THE VALUE OF THE COMPOST HAS BEEN OVERSTATED IN THE U.S. AND THAT PLANTS WHICH HAVE SHUTDOWN HAVE DONE SO BECAUSE OF INABILITY TO SELL AN OVERPRICED MATERIAL. COMPOST IS SIMILAR TO GOOD FARMYARD MANURE AND SHOULD BE SOLD AT OR BELOW PRICES FOR SUCH. AS GARBAGE DISPOSAL IS A MUNICIPAL SERVICE AND RESPONSIBILITY, ECONOMICS SHOULD BE BASED ON A REASONABLY LOW SELLING PRICE TO INSURE SALES OF ALL COMPOST, NOT SELLING PART AT A HIGH PRICE. UNTIL THE MARKET IS ESTABLISHED, TOTAL OUTPUT MAY NOT BE SOLD FOR A YEAR OR TWO. FLEXIBLE OPERATION OF THE PLANT IS VERY IMPORTANT, AND IT MUST HAVE GOOD MANAGEMENT. (UC)

06-01-00330 LIQUID, PULPY SUSPENSIONS OF FERTILIZERS OR SOIL CONDITIONERS FROM ORGANIC WASTE MATERIALS
WANDEL, K.
PATENT GER. 1,005,534, (APRIL 4, 1957) (CL. 16) WILBRO CORP. THE WASTE MATERIALS, SUCH AS GARBAGE OR STABLE MANURE, ARE MECHANICALLY CRUSHED, AND LARGE AMOUNTS OF WATER ARE FED INTO THE MIXTURE TO PREPARE SUSPENSIONS WHICH ARE ALMOST ODORLESS. THEY SERVE AS PROTECTIVE LAYERS FOR THE CULTIVATED SOIL AND CONTINUALLY FEED NUTRIENTS TO IT WITH DECOMPOSITION OF THE FINELY CRUSHED ORGANIC SUBSTANCES. THE WATER-INSOLUBLE PORTION OF THE MATERIAL SHOULD BE LESS THAN OR EQUAL TO 5-8 PERCENT OF THE AMOUNT OF THE WATER PRESENT. (CA)

06-01-00331 THE ANAEROBIC MESOPHYLLIC CELLULOLYTIC BACTERIA
HUNGATE, R. C.
BACTERIAL REVIEW 14(1), (1950). AN EXTENSIVE STUDY WAS MADE OF THE ISOLATION OF PURE CULTURES OF ANAEROBIC, MESOPHYLLIC, CELLULOYTIC BACTERIA FROM SEWAGE SLUDGE. NO CELLULOSE-DIGESTING ORGANISMS WERE ISOLATED FROM THE RAW SLUDGE. HOWEVER, BACTERIAL COUNTS OF 880 PER ML AND 2600 PER ML WERE OBTAINED FROM THE FIRST- AND SECOND-STAGE DIGESTERS AT THE MOSCOW, IDAHO, SEWAGE TREATMENT PLANT. THERE APPEARS TO BE A MARKED PREVALENCE OF NONSPORE FORMING, OBLIGATELY ANAEROBIC BACTERIA AMONG THE CELLULOLYTIC STRAINS ISOLATED FROM DIGESTING SLUDGE. (UC)

06-01-00350 THE REFUSE TYPHOON, A MOBILE PROCESSING PLANT (COST(OPERATING) COMPOSTING)
REIDEL, E. O.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 6, (JANUARY 1959). THE MOBILE UNIT PROVIDES FOR A MAGNETIC SEPARATION, SIEVING TO REMOVE ASHES AND POWDERY WASTES, FOR GRINDING, AND FOR WINDROWING. NO PLANT BUILDING IS NEEDED FOR THE REFUSE TYPHOON. THE CAPACITY IS 12 TO 15 TONS (METRIC) PER HOUR. THE AUTHOR MAKES SOME CALCULATIONS CONCERNING ECONOMICS. HE SAYS THAT THE PLANT WOULD RECOVER ALL THE OPERATION COSTS AND 8.75 PERCENT OF THE CAPITAL COSTS PER YEAR. (UC)

06-01-00351 DEVELOPMENT AND SIGNIFICANCE OF COMPOST PREPARATION IN THE NETHERLANDS (COMPOSTING SLUDGE(SEWAGE) GRINDING)
VAN DE PASSCHE, A. W.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 7, (JULY 1959). AGRICULTURAL RESEARCH WAS HEAVILY EMPHASIZED BY THE AUTHORITIES AFTER WORLD WAR II. IN 1950 THE GOVERNMENT APPROPRIATED 10 MILLION GUILDERS ($2.67 MILLION) FOR THE CONSTRUCTION OF TWO COMPOSTING PLANTS, AND FOR MAKING 20-YEAR INTEREST-FREE LOANS TO MUNICIPALITIES FOR THE CONSTRUCTION AND OPERATION OF COMPOSTING PLANTS. IN 1959, ABOUT 350,000 METRIC TONS OR 25 PERCENT OF THE TOTAL URBAN REFUSE WAS PROCESSED INTO COMPOST. (UC)

06-01-00354 BIOLOGICAL PROCESSES IN THE COMPOSTING OF REFUSE (COMPOSITION(COMPOST))
GLATHE, H.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 7, (JULY 1959). A RESEARCH GROUP WAS ESTABLISHED AT THE GIESSEN UNIVERSITY TO STUDY THE SCIENTIFIC AND PRACTICAL FUNDAMENTALS OF THE COMPOSTING OF REFUSE AND SLUDGE FROM THE POINT OF VIEW OF AGRICULTURE, MICROBIOLOGY, AND HUMAN AND VETERINARY HYGIENE. RESEARCH HAS REVEALED THAT THE INOCULATION OF RAW GARBAGE WITH MICROORGANISMS ADDS NOTHING TO SPEED UP THE COMPOSTING PROCESS. RAW REFUSE-SLUDGE MIXTURES CONTAIN AN ENORMOUS PRIMARY FLORA, AND ANY ATTEMPT TO ENRICH THE MATERIAL WITH BACTERIA WOULD BE A SUPERFLUOUS GESTURE. HEAVY INOCULATIONS WITH AZOTOBACTER, OR NITROGEN-FIXING BACTERIA, WERE TRIED AT BADEN-BADEN. THE ORGANISMS DID NOT SURVIVE. THE THEORY THAT INOCULA HELP PREVENT THE FORMATION OF ANAEROBIC ZONES IN THE PILES IS ERRONEOUS. THE BLACK AREAS ARE DUE TO OXYGEN DEFICIENCY AND NOT TO A LACK OF CERTAIN ORGANISMS. (UC)

06-01-00364 STRUCTURAL ANALYSES OF COMPOST PILES (COMPOST(COMPOSITION))
TIETJEN, C. + BANSE, H. J.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 8, (MARCH 1960). A STRUCTURAL ANALYSIS MADE OF COMPOST PILES WITH THE COMPRESSED AIR PYCNOMETER (OF VON NITSCH) AND WITH A SPECIAL APPARATUS DEVELOPED BY W. SAUERLANDT SHOWED THE EXISTENCE OF DEFINITE DIFFERENCES BETWEEN SAMPLES OF STABLE MANURE COMPOSTED FOR TWO, FOUR, AND SIX MONTHS. ONLY SLIGHT DIFFERENCES COULD BE DETECTED IN THE STRUCTURE OF COMPOST CURED FOR SIX AND THAT FOR NINE MONTHS. HOWEVER, SIGNIFICANT STRUCTURAL DIFFERENCES WERE NOTED BETWEEN MATERIALS TAKEN FROM VARIOUS STRATA WITHIN A GIVEN PILE. (UC)

06-01-00367 THE EFFECT OF URBAN REFUSE ON ROOT GROWTH (COMPOST)
TEENSMA, B.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 9, (SEPTEMBER 1960). THE AUTHOR DESCRIBES EXPERIMENTS WITH ROOTING BOXES. A ROOT BOX CONSISTS OF A SMALL BOX, ABOUT 30 CM BY 20 CM BY 50 CM. THE WALLS ARE SLOPED TOWARD EACH OTHER SUCH THAT THEY ARE ONLY ONE CM APART AT THE BOTTOM. THE BOX MAY BE DIVIDED INTO TWO EQUAL PARTS BY A " LONGITUDINAL WALL " NOT REACHING THE TOP OF THE BOX. THE TWO SLOPING SIDEWALLS ARE MADE OF GLASS. THE BOX IS COVERED WITH A REMOVABLE WOODEN LID, SINCE THE ROOTS MUST SPROUT IN DARKNESS. (UC)

06-01-00368 COMPOSTING URBAN REFUSE WITH VARIOUS ADDITIVES
HORSTMANN, O. + SACHSSE, H.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULLETIN 9, (SEPTEMBER 1960). EXPERIMENTS WERE BEGUN IN 1957 AT THE HEIDELBERG COMPOSTING PLANT TO DETERMINE IF DECOMPOSITION OF URBAN REFUSE FROM THE DORR-OLIVER RASPING MACHINE COULD BE INFLUENCED BY THE ADMIXTURE OF PARTLY RIPE OR MATURE SUMMER OR WINTER COMPOST OR STABLE MANURE. (UC)

06-01-00372 DOES AERATION ACCELERATE THE COMPOSTING PROCESS?
HORSTMANN, O. + ENGLEHORN, E.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 11, (JUNE 1961). EXPERIMENTAL RESULTS WITH GROUND REFUSE FROM HEIDELBERG SHOWED THAT SUPPLEMENTAL AERATION IMPROVED WINDROW COMPOSTING. IN THE SMALLER (1.5-M HIGH) WINDROWS THE MATERIAL PACKED LESS, AERATION IN THE PILE INTERIORS WAS GREATER, THE TEMPERATURE INCREASED MORE SLOWLY, STAYED LONGER IN THE RANGE BELOW 55 DEGREES C (SUPPOSEDLY A RANGE FAVORABLE FOR DECOMPOSITION), AND DID NOT RISE AS HIGH AS IN THE LARGER (3.0-M HIGH) WINDROWS. PARTICLE SIZE, PORE VOLUME, DENSITY, AND NEUBAUER POT TRIALS INDICATED THAT MORE INTENSIVE DECOMPOSITION OCCURS IN THE SMALLER THAN IN THE LARGER WINDROWS. BECAUSE OF AREA LIMITATION, LARGE CITIES WITH HIGH REFUSE YIELD HAVE TO AVOID SMALL WINDROWS IN COMPOSTING. THE EXPERIMENTS SHOWED THE ADVANTAGES OF SMALL WINDROWS TO BE SLIGHT. WHILE DECOMPOSITION PROBABLY OCCURS SOMEWHAT FASTER IN 1.5-METER THAN IN 3.0-METER WINDROWS, THE INCREASED SPACE REQUIRED IS NOT OFFSET BY THE DECREASE IN TIME OF COMPOSTING. IF A PLANT MUST USE 3.0-M HIGH WINDROWS DUE TO LACK OF SPACE, PROVISION MUST BE MADE FOR SUPPLEMENTARY AERATION. AIR CHANNELS CANNOT SUBSTITUTE FOR TURNING. (UC)

06-01-00373 STUDIES OF THE EFFECT OF WINDROW HEIGHT ON COMPOSTING RATE
TEENSMA, B.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 11, (JUNE 1961). TWO WINDROWS OF WELL-MIXED, HOMOGENEOUS REFUSE WERE FORMED, ONE WAS 1.5 M HIGH, THE OTHER, 3.0 M. THE ANALYSES REVEALED A FEW INTERESTING POINTS. INSULATION IS BETTER IN THE LARGE WINDROW AND THEREFORE THE HEAT LOSS IS LESS. LESS ORGANIC MATTER WAS DECOMPOSED PRIOR TO TURNING IN THE LARGER WINDROW, AND THUS A GREATER SUPPLY OF NUTRIENTS WAS AVAILABLE TO THE BACTERIA. AN INCREASE IN ACTIVITY RESULTED. ANAEROBIOSIS WAS LESS INTENSIVE IN THE INTERIOR OF THE SMALLER WINDROW. MAXIMUM CARBON DIOXIDE CONTENT OF GASES WAS 38.3 PERCENT. THE REASON FOR THE CARBON DIOXIDE CONCENTRATION WAS THAT A GREATER PORTION OF THE ORGANIC MATTER HAD BEEN DECOMPOSED BEFORE TURNING. INCREASING THE HEIGHT OF PILES DID NOT RESULT IN ANY DIFFICULTIES. A HIGH PILE MAY BE DESIRABLE PROVIDED GOOD DRAINAGE IS DONE AND THE COMPOST IS NOT TOO WET AT THE BOTTOM. STRONG ANAEROBIC ACTION IS TO BE AVOIDED. (UC)

06-01-00377 CONTRIBUTION ON THE MICROBIOLOGY OF COMPOSTING
FARKASDI, G.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 13, (DECEMBER 1961). THE REPORT GIVES A CROSS SECTION OF STUDIES MADE ON THE MICROBIOLOGY OF COMPOSTING. WAKSMANN AND FEHER SHOWED THAT MOLDS PLAY AN IMPORTANT ROLE IN THE DECOMPOSITION OF ORGANIC MATTER. RHODE DEMONSTRATED THE INTENSIVE PROLIFERATION OF FUNGI THROUGHOUT PILES OF COMPOSTING MATERIAL SET UP AS WINDROWS. HE SHOWED THE EXISTENCE OF A CLOSE RELATIONSHIP BETWEEN THE AMOUNT OF OXYGEN AVAILABLE AND THE NUMBER OF MOLD FUNGI, AS WELL AS THE RELATION BETWEEN THE INCIDENCE OF FUNGI AND MOISTURE CONTENT AND TEMPERATURE LEVEL. IN HIS WORK WITH ANIMAL PATHOGENS, STRAUCH DEMONSTRATED THAT PARATYPHOID, HOG ERYSIPELAS, AND PSITTACOSIS AGENTS WERE COMPLETELY KILLED OFF UNDER PRACTICAL COMPOSTING CONDITIONS. BORNKESSEL IN HIS PARASITOLOGICAL STUDIES SHOWED THAT THE USE OF RAW SLUDGE IN VEGETABLE GARDENS AND ORCHARDS RESULTS IN A DIRECT HEALTH DANGER TO MAN. (UC)

06-01-00379 EFFECTS OF MOISTURE AND OXYGEN CONTENTS ON REFUSE COMPOSTING
POEPEL, F.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 13, (DECEMBER 1961). SUBJECTS COVERED IN THIS BULLETIN ARE THE INFLUENCE OF WETTING REFUSE ON RESPIRATION AND MULTIPLICATION OF MICROORGANISMS THE EFFECTS OF DIFFERENT MOISTURE CONTENTS, THE COMPARATIVE EFFECTS OF WATER AND SEWAGE AS REFUSE WETTING AGENTS, THE EFFECTS OF ADDING SEWAGE SLUDGE TO REFUSE, THE DEGREE OF ROTTING OF PREVIOUSLY COMPOSTED REFUSE, THE DEGREE OF ROTTING WITH AND WITHOUT SELF-HEATING OF THE REFUSE, THE EFFECT OF VARIATION IN OXYGEN SUPPLY, A COMPARISON OF METHODS FOR MEASURING TEMPERATURE IN DEWAR FLASKS FOR LABORATORY DETERMINATION, THE EFFECTS OF QUANTITY AND VENTILATION IN DEWAR FLASKS, THE EFFECT OF VARYING THE PROPORTIONS OF REFUSE AND SLUDGE IN MIXTURES, AND A COMPARISON OF ACTIVATED SLUDGE, SEWAGE, AND WATER AS MEANS FOR WETTING REFUSE. THE AUTHOR GIVES SOME RESULTS AND EMPHASIZES THAT THESE LABORATORY RESULTS SHOULD BE CHECKED ON A PILOT PLANT. (UC)

06-01-00382 PROCESSING TECHNIQUE - PRACTICAL CONCLUSIONS FROM SCIENTIFIC RESEARCH (SEWAGE COMPOSTING)
STRAUB, H.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 14, (APRIL 1962). CERTAIN ADVANTAGES RESULT FROM THE JOINT PROCESSING OF REFUSE AND SLUDGE. COMBINED REFUSE-SLUDGE PROCESSING SHOULD BE CONTEMPLATED ONLY WHEN EQUIVALENT AMOUNTS OF EACH PER CAPITA CAN BE TREATED. THE TECHNIQUES FOR DEWATERING SHOULD BE DEVELOPED WITH THE AIM OF ELIMINATING THE ATTENDANT HIGH COSTS. BOTH INCINERATION AND COMPOSTING ARE DISCUSSED. (UC)

06-01-00384 DEWATERING AND DRYING AS A PREREQUISITE TO COMPOSTING OF SEWAGE SLUDGE (COMPOSTING)
SCHROEDER, W.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 14, (APRIL 1962). THE FOLLOWING DEWATERING PROCESSES FOR ATTAINING THE RECOMMENDED FINAL MOISTURE CONTENT OF 70 PERCENT ARE DISCUSSED- SLUDGE SIEVES, SLUDGE CENTRIFUGES, SLUDGE FILTERS, VACUUM FILTERS, AND PRESSURE FILTERS. THE CONCLUSION IS THAT THE ONLY DEWATERING PROCEDURE TO BE RECOMMENDED FOR DEWATERING NORMAL SEWAGE SLUDGE IS VACUUM FILTRATION. IN SUBSEQUENT TREATMENT, THE MOISTURE CONTENT OF THE DEWATERED SLUDGE MAY BE REDUCED TO A FINAL MOISTURE CONTENT OF 30 PERCENT TO 40 PERCENT. THIS STEP CAN BE ACCOMPLISHED WITH THE USE OF A ROTARY DRUM DRYER, A HONEYCOMBED BAND DRYER, A SELECTIVE DRYER, OR A BELT DRYER. COSTS ARE GIVEN FOR THE DRYERS. (UC)

06-01-00390 NEW GUIDELINES FOR THE COMPOSTING OF RAW GROUND REFUSE IN THE NETHERLANDS
TEENSMA, B.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 16, (DECEMBER 1962). NEGATIVE RESULTS WERE OBTAINED AFTER THE APPLICATION OF COMPOST TO THE SOIL. THE CAUSES OF THE DAMAGE WERE DUE TO THE CHANGE IN THE CHARACTERISTICS OF THE PRODUCT. OLD COMPOSTING GUIDELINES, 1955 - THE HEIGHT OF THE WINDROWS SHOULD NOT BE MORE THAN TWO METERS. MOISTURE CONTENT OF THE MATERIALS DURING STACKING SHOULD NOT BE MORE THAN 50 PERCENT. DURATION OF DECOMPOSITION FOR WINTER REFUSE SHOULD BE AT LEAST 8 WEEKS, AND FOR SUMMER REFUSE, AT LEAST 12 WEEKS. DURING DECOMPOSITION THE WINDROW SHOULD BE TURNED ONCE, PREFERABLY AFTER ABOUT 4 WEEKS. NEW COMPOSTING GUIDELINES, 1961 - COMPOST WINDROWS SHOULD NOT BE HIGHER THAN 2 METERS. THE TOP OF THE WINDROWS SHOULD BE ROUNDED OR ROOF-SHAPED TO PERMIT THE RUNOFF OF RAIN. THE WINDROWS MUST BE SEPARATE. THE WINDROW AREA MUST BE WELL DRAINED. PUDDLE FORMATION AFTER RAINS MUST BE AVOIDED. THE MOISTURE CONTENT OF THE RAW REFUSE AT THE TIME OF STACKING MUST BE BETWEEN 50 PERCENT AND 55 PERCENT. THE INTERIOR OF ALL WINDROWS MUST BE CHECKED EVERY WEEK. WHEN ZONES HAVE BEEN FORMED, THE WINDROWS MUST BE TURNED--AS A RULE ABOUT 2 TO 3 WEEKS FOR THE FIRST TIME. CHECKS MUST BE CONTINUED AFTER TURNING. AS SOON AS NEW ZONES FORM, TURNING MUST BE CONTINUED UNTIL THEY DISAPPEAR. WHEN THIS STAGE IS ACHIEVED, THE COMPOST IS FINISHED AND MAY BE PILED IN LARGE STACKS. A BELT CONVEYOR AND A NAIL-COVERED CONCUSSION MILL AS A TURNING MACHINE ARE RECOMMENDED. THE ADDITION OF 10 PERCENT TO 20 PERCENT VOLUME OF RIPE COMPOST OR PEAT TO THE RAW REFUSE IS ADVISABLE. (UC)

06-01-00404 EXPERIMENTS TO DETERMINE THE DEGREE OF DECOMPOSITION OF REFUSE COMPOST BY ITS SELF-HEATING CAPABILITY
NIESE, G.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 17, (MAY 1963). THE FOLLOWING EXPERIMENTS WERE CONDUCTED - HEAT LOSS IN SELF-HEATING, SELF-HEATING CAPABILITY OF VARIOUS REFUSE AND REFUSE COMPOST SAMPLES, AND MICROBIAL COUNTS AND SELF-HEATING CAPABILITY. THE EXPERIMENTS DEMONSTRATED THE SELF-HEATING CAPACITY OF ORGANIC MATTER. (UC)

06-01-00450 MOLD FUNGI AND REFUSE
VON KLOPOTEK, A.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 19, (DECEMBER 1963). THE ACTION AND APPEARANCE OF MOLD FUNGI DURING THE COMPOSTING OF REFUSE AND REFUSE-SLUDGE MIXTURES WAS EXAMINED DURING THE LAST YEAR AT THE INSTITUT FER LANDWERTSCHAFTLICHE MIKROBIOLOGIE IN GIESSEN. THIS IS OF GENERAL INTEREST AND EXPRESSIONS SUCH AS " FUNGAL ZONES " OR " ACTINOMYCETES ZONES " IN THE PILE ARE COMMON AMONG PRACTITIONERS. THE EXPRESSION " WELL-MILDEWED " IS EVEN USED IN ADVERTISEMENTS TO EXPRESS THE QUALITY OF A MATERIAL. RESULTS OF THESE EXPERIMENTS HAVE BEEN REPORTED BY STRAUB AND GLATHE (1961), AND VON KLOPOTEK (1962). IN 1961 AND 1962 THE EXPERIMENTS WERE CONTINUED AND, AT THIS TIME, REPEATED AS TO THE EFFECT OF VARIOUS PROMOTING AGENTS IN THE REFUSE AND SLUDGE IN WINDROW COMPOSTING. THE RESULTS SHOW THAT THE APPEARANCE OF FUNGI IN COMPOST PILES IS HEAVILY DEPENDENT ON THE MATERIAL, THE MOISTURE CONTENT AND THE TEMPERATURE. THE FORMATION OF "FUNGAL ZONES " IS CAUSED BY THE LARGE INCREASE IN THERMOPHILIC FUNGI AND THE ZONES ARE MARKED BY INITIAL COOLING AND GOOD AERATION. IN DRY PILES THEY ALSO APPEAR THROUGHOUT THE ENTIRE PILE CROSS SECTION.

06-01-00452 EXPERIMENTS ON THE EFFECT OF ADDITIVES ON WINDROW COMPOSTING OF GROUND HOUSEHOLD REFUSE
OBRIST, W.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 19, (DECEMBER 1963). THE ADDITION OF MICROORGANISMS IN WINDROW COMPOSTING OF RESIDENTIAL REFUSE, WITH ITS RELATIVELY LONG DECOMPOSITION TIME, IS PRACTICALLY USELESS. ORGANIC AND, PARTICULARLY, INORGANIC NUTRIENTS FURTHER DECOMPOSITION IN A REFUSE OF ONE-SIDED COMPOSITION. IT IS THEREFORE CONCLUDED THAT THE NUTRIENT CONTENT OF REFUSE IS NOT ALWAYS OPTIMUM FOR DESIRABLE MICROBIOLOGICAL FERMENTATION. FURTHER EXPERIMENTS ARE DESIRED, PREFERABLY WITH STANDARDIZED REFUSE, TO DETERMINE WHICH NUTRIENTS AND CONCENTRATIONS ARE NEEDED FOR OPTIMAL MICROBIOLOGICAL REDUCTION OF THE REFUSE. IT WAS SHOWN THAT THE ADDITION OF THE TESTED STIMULATING AGENTS AND INOCULATION MATERIAL IS USELESS, OR AT LEAST UNECONOMICAL, FOR PRACTICAL REFUSE COMPOSTING. THIS IS DIFFERENT WHEN PLANTS WITH DIGESTERS ARE USED IN WHICH THE FASTEST POSSIBLE COMPOSTING IS WANTED. IN THIS CASE AN ADDITION OF NUTRIENTS COULD BE OF IMPORTANCE, BUT THERE ARE INSUFFICIENT DATA AVAILABLE ABOUT THIS.

06-01-00533 COMPOSTING MUNICIPAL REFUSE (COST(OPERATING) COST(CAPITAL) GRINDING SEPARATION BACTERIA(CULTURE))
NESBITT, J. B.
PUBLIC WORKS 90(2), P. 166 (FEBRUARY 1959). THE ARTICLE IS A SHORTENED FORM OF A REPORT ENGRG RES BULL B72, COLLEGE OF ENGINEERING AND ARCHITECTURE, PENNSYLVANIA STATE UNIVERSITY, BY MR. NESBITT. THE SEVERAL FACTORS FUNDAMENTAL TO THE SUCCESS OF THE COMPOSTING PROCESS, NAMELY, SEGREGATION, SHREDDING, C TO N RELATIONSHIPS, AERATION, USE OF INOCULA, AND TIME REQUIRED FOR COMPOSTING ARE DESCRIBED BRIEFLY. INVESTIGATIONS INCLUDED FIRST-HAND VISITS TO EUROPEAN INSTALLATIONS AT WHICH THE COMPOSTING PROCESS IS USED AS A METHOD OF MUNICIPAL REFUSE DISPOSAL. COST DATA ARE LISTED IN A CHART, BUT NO ALLOWANCE IS MADE FOR COSTS OF COLLECTION OR SALE AND DISPOSAL OF THE END PRODUCT. (UC)

06-01-00616 INVESTIGATION OF THE COMMON TREATMENT OF DIGESTED SLUDGE AND RUBBISH (SLUDGE(SEWAGE) COMPOSTING LAW(HEALTH))
ALLENSPACH, H.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE IRGR INFORMATION BULL 1, (NOVEMBER 1956). IN SWITZERLAND THE PROBLEM OF SIMULTANEOUS TREATMENT OF SLUDGE AND RUBBISH GAINS EVER GREATER INTEREST, PARTICULARLY BECAUSE A 1955 REGULATION REGARDING THE SALE OF MILK HAS PLACED CERTAIN RESTRICTIONS ON THE USE OF ACTIVATED SLUDGE AS A FERTILIZER. THE AUTHOR BRIEFLY DESCRIBES EXPERIMENTS IN THE CONCOMITANT COMPOSTING OF SLUDGE AND DOMESTIC WASTES, AS THEY HAVE BEEN CONDUCTED TO DATE AT THE COMPOSTING PLANT IN RUSCHKLON (DISTRICT OF ZUERICH). THE FOLLOWING IMPORTANT QUESTIONS MIGHT BE ANSWERED- (1) MAY SLUDGE BE ADDED IN THE CASE OF DECOMPOSITION OF DOMESTIC WASTES IN A CHAMBER AT THE PLANT SITE. IF SO, MAY WE AIR-DRY THE SLUDGE SO THAT IT IS POSSIBLE TO TREAT THE ENTIRE AMOUNT OF REFUSE AND SLUDGE FROM A GIVEN COMMUNITY. (2) HOW CAN THE PRODUCT OF THIS FERMENTATION CHAMBER BE ALTERED SO AS TO MAKE COMPOST USEFUL FOR VARIOUS PURPOSES. (3) WHAT ARE THE PROPERTIES OF THIS COMPOST FROM DIGESTED SLUDGE AND HOW DO THE CROPS REACT TO IT. BY THE CONCOMITANT TREATMENT OF THE TWO KINDS OF WASTE PRODUCTS, IT IS HOPED TO ACHIEVE NOT ONLY AN IMPROVEMENT IN THE QUALITY OF THE COMPOST OF DOMESTIC WASTES, BUT TO THEREBY ELIMINATE THE DISADVANTAGES OF USING ACTIVATED SLUDGE (DANGER OF SPREADING NOXIOUS WEEDS, PATHOGENIC MICROORGANISMS, ETC.). (UC)

06-01-00634 EXPERIMENTAL PROJECT OFFERS SOLUTION TO CHINA'S SANITARY NEEDS (COMPOSTING)
STONE, R.
CIVIL ENGRG, P. 166 (MARCH 1948). THE PROJECT WAS INTENDED TO SERVE AS A DEMONSTRATION NIGHT-SOIL FERTILIZER PLANT. THE AIM WAS TO ECONOMICALLY CONVERT NIGHT SOIL INTO A SANITARY ORGANIC FERTILIZER. NIGHT SOIL WAS DIGESTED WITH GARBAGE AND BONE MEAL AEROBICALLY AND ANAEROBICALLY. THE AEROBIC PROCESS PROVED TO BE THE MORE SATISFACTORY OF THE TWO PROCESSES. (UC)

06-01-00635 A CRITICAL EVALUATION OF INOCULUMS IN COMPOSTING (COMPOSTING BACTERIA(CULTURE))
GOLUEKE, C. G. + CARD, B. J. + MCGAUHEY, P. H.
APPLIED MICROBIOLOGY 2(1), P. 45 (JANUARY 1954). GARDEN SOIL, HORSE MANURE, PARTIALLY DECOMPOSED ORGANIC MATERIAL, AND A COMMERCIAL PREPARATION OF SPECIAL BACTERIAL CULTURES WERE TESTED TO STUDY THE EFFECTS OF ADDING THESE INOCULUMS TO COMPOSTING MATERIAL. THE INOCULUMS FAILED TO BENEFIT THE COMPOSTING PROCESS BECAUSE OF THE ADEQUACY OF THE MICROBIAL POPULATION INDIGENOUS TO THE MATERIAL, AND BECAUSE OF THE NATURE OF THE PROCESS ITSELF. THE COMPOSTING PROCESS PROCEEDED WITH EQUAL RAPIDITY ON INOCULATED OR UNINOCULATED MATERIAL - ADDING BACTERIA TO THE INOCULUMS DID NOTHING TO HASTEN THE ONSET OF DECOMPOSITION. THE ARTICLE DISCUSSES THE TYPES OF BACTERIA PRESENT. ACID-PRODUCING BACTERIA WERE THE FIRST TO APPEAR. THERMOPHILIC BACTERIA AND FUNGI WERE SECOND IN THE SUCCESSION. IN THE FINAL STAGES, AS THE TEMPERATURE BEGAN TO DROP, ACTINOMYCETES BECAME THE DOMINANT ORGANISMS. (UC)

06-01-00637 CELLULOSIC WASTES AS FERTILIZERS (COMPOSTING RAW-REFUSE)
BOLLEN, W. B. + LEE, K. C.
AGRIC FOOD CHEM 9(1), P. 9 (JANUARY 1961). AN ECONOMICAL METHOD HAS BEEN DEVELOPED FOR THE CONVERSION OF FINE SAWMILL AND OTHER CELLULOSIC WASTES INTO A USEFUL AGRICULTURAL PRODUCT. THE PROCESS CONSISTS OF TREATMENT WITH MINERAL ACIDS, ADDITION OF PLANT NUTRIENTS, HEATING, AND CONDITIONING. VERY THOROUGH AND COMPLETE STUDIES OF RAW AND REACTED SAWDUST, RAW AND REACTED BAGASSE, AND SPENT AND REACTED SPENT COFFEE GROUNDS WERE MADE TO EVALUATE THESE MATERIALS ON THE BASIS OF THEIR REACTIONS UNDER CONTROLLED CONDITIONS IN THE LABORATORY. THE BULK OF THE PAPER IS CONCERNED WITH EXPLANATIONS OF TESTS RUN ON THE RAW AND REACTED SAMPLES. TABLES ARE GIVEN OF THE PERTINENT INFORMATION. SAMPLES (100 LB EACH) OF RAW AND REACTED SAWDUST, BAGASSE, AND COFFEE GROUNDS WERE INDIVIDUALLY WELL MIXED. ONE-POUND SAMPLES OF EACH WERE GROUND THROUGH A NO. 800 SCREEN. THE FINE MATERIALS WERE REQUIRED TO ENSURE ADEQUATE MIXING WITH SMALL QUANTITIES OF SOIL. CONCLUSIONS REACHED IN THE PAPER ARE AS FOLLOWS- REACTED SAWDUST, BAGASSE, AND COFFEE GROUNDS ARE MORE RESISTANT TO GENERAL DECOMPOSITION IN THE SOIL THAN ARE THE RAW MATERIALS. THIS INCREASED RESISTANCE IS DESIRABLE, NOT ONLY DOES IT RESULT IN A DECREASE IN NITROGEN DEMAND DURING DECOMPOSITION, BUT IT ALSO ENHANCES ITS SOIL CONDITIONING EFFECTS. NITROGEN IN THE REACTED PRODUCTS WAS MORE THAN SUFFICIENT TO PROVIDE AN EXCESS OVER THAT REQUIRED FOR DECOMPOSITION, AND THE EXCESS SHOULD BECOME RAPIDLY AVAILABLE FOR PLANT GROWTH. (UC)

06-01-00686 RECENT DEVELOPMENTS IN THE COMPOSTING OF ORGANIC WASTES (BACTERIA(CULTURE) MARKETING)
MCCAULEY, R. F.
WATER AND SEWAGE WORKS 103(11), P. 522 (NOVEMBER 1956). BASED ON MICHIGAN STATE PILOT STUDIES WITH A COMPOST PLANT HAVING A CAPACITY OF 2 TONS PER DAY, IT APPEARS THAT COMPOSTING COULD BE AN ECONOMICALLY FEASIBLE METHOD FOR DISPOSING OF GARBAGE, REFUSE, AND SEWAGE SLUDGE. HOWEVER, TO DATE, A PROCESS OF COMPOSTING HAS NOT BEEN DEVELOPED WHICH IS ECONOMIC AND COMPLETELY FREE OF ODORS. NO BREEDING OF FLIES CAN TAKE PLACE IN PROPERLY TURNED WINDROW PILES OR IN PROPERLY AERATED DIGESTERS BECAUSE OF HIGH TEMPERATURES GENERATED IN THE MATERIAL. ALL OF THE NECESSARY ORGANISMS REQUIRED FOR COMPOSTING ARE INDIGENOUS TO BOTH SOIL AND GARBAGE, AND IT IS NECESSARY TO PROVIDE ONLY THE PROPER ENVIRONMENTAL CONDITIONS FOR THESE ORGANISMS TO GROW AND MULTIPLY. COMPOSTING WILL BE MORE AND MORE WIDELY USED AS A PROCESS FOR TREATING SOLID ORGANIC WASTES IN THE FUTURE. BECAUSE OF THE ABSENCE OF ADEQUATE MACHINERY AND TECHNICAL KNOW-HOW, COMPOSTING WILL NOT BE USED ON A WIDESPREAD COMMERCIAL BASIS AT ONCE. (UC)

06-01-00761 THE BORON AND MANGANESE CONTENT OF REFUSE AND REFUSE-SLUDGE COMPOST (TRACE-ELEMENTS(COMPOST))
KELLER, P. + HALTER, R.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 7, 8 (MARCH 1960). PLANT DAMAGE AFTER USE OF REFUSE OR REFUSE-SLUDGE DUE TO A DEFICIENCY OR EXCESS OF BORON OR MANGANESE IS NOT LIKELY. CAUTION IS ONLY NEEDFUL WHEN LARGE YEARLY COMPOST APPLICATIONS ARE MADE, SUCH AS IS DONE IN TREE NURSERIES OR IN CERTAIN GARDENING OPERATIONS. THE ASSIMILABLE BORON CONTENT OF COMPOST IS CONSIDERED TO BE A POSITIVE FACTOR SINCE IT CAN CONTRIBUTE TO THE ELIMINATION OF A BORON DEFICIENCY IN SOILS WHICH MAY BE BORON-POOR. COMPOSTING SLUDGE WITH REFUSE, PARTICULARLY WINTER REFUSE, ACTS NOT ONLY TO BALANCE THE CONTENTS OF THE USUAL NUTRIENTS AND OF HUMUS, BUT FAVORABLY INFLUENCES THE CONTENT OF TRACE ELEMENTS BY LEVELING-OUT THE EXTREMES. GLASS PULVERIZATION BY PROCESSING REFUSE IN HAMMER MILLS HAS PRACTICALLY NO EFFECT ON THE BORON CONTENT OF A COMPOST.

06-01-00764 RECLAMATION OF MUNICIPAL REFUSE BY COMPOSTING (GRINDING BACTERIA(CULTURE))
MCGAUHEY, P. H. + GELUEKE, C. G.
UNIVERSITY OF CALIFORNIA, SANITARY ENGRG RES LAB, TECH BULL 9, (JUNE 1953). DESCRIBES RESEARCH ON COMPOSTING EXTENDING FROM LABORATORY TO FIELD SCALE. THE LATTER INVOLVED COMPOSTING MUNICIPAL REFUSE FROM THE CITY OF BERKELEY AT ITS SANITARY LANDFILL SITE. AS A RESULT OF RESEARCH, MANY EMPIRICAL APPROACHES TO COMPOSTING COULD BE PLACED ON A RATIONAL BASIS, AND MANY MISCONCEPTIONS OF VARIOUS PHASES OF THE PROCESS COULD BE RECTIFIED. CONCLUSIONS INCLUDE- (1) SUCCESSFUL EUROPEAN METHODS ARE NOT DIRECTLY APPLICABLE TO THE U.S. BECAUSE OF DISSIMILARITY IN THE NATURE OF REFUSE. (2) THE PRACTICE OF COMPOSTING HAS BEEN LARGELY AN ART. IN THE U.S. FUNDAMENTAL STUDIES OF THE DECOMPOSITION OF ORGANIC MATTER HAD BEEN MADE BUT ENGINEERING APPLICATIONS TO COMPOSTING OF MUNICIPAL REFUSE WERE UNEXPLORED. (3) THE FACTORS FUNDAMENTAL TO COMPOSTING ARE THOSE FUNDAMENTAL TO ANY AEROBIC PROCESS- INITIAL POPULATION OF MICROORGANISMS, AVAILABLE NUTRIENTS TEMPERATURE, PH LEVEL, MOISTURE AND AERATION. (4) MICROORGANISMS ARE INDIGENOUS TO MUNICIPAL REFUSE IN SUCH GREAT NUMBERS AS TO MAKE INOCULATION SUPERFLUOUS. NEITHER OF TWO COMMERCIAL INOCULUMS IMPROVED THE PROCESS. (5) FACULTATIVE AND OBLIGATE AEROBIC BACTERIA, ACTINOMYCETES, AND FUNGI ARE MOST ACTIVE IN COMPOSTING. APPARENTLY THERMOPHILIC BACTERIA PLAY A MAJOR ROLE IN DECOMPOSING PROTEIN AND OTHER READILY BROKEN DOWN ORGANIC MATERIAL, ACTINOMYCETES IN DECOMPOSING CELLULOSE AND LIGNIN COMPOUNDS. FUNGI, BEING LIMITED BY TEMPERATURE, PLAY A LESSER ROLE. (6) NORMAL CITY REFUSE CONTAINS NUTRIENTS SUFFICIENT FOR RAPID AEROBIC COMPOSTING. (7) THE RATE OF DECOMPOSITION IS A FUNCTION OF THE C TO N RATIO. FOR RAPID COMPOSTING WITHOUT LOSS OF NITROGEN THROUGH VOLATILIZATION OF AMMONIA, A C TO N RATIO OF 30 TO 1 TO 35 TO 1 IS NEEDED. A C TO N RATIO ABOVE 50 TO 1 SLOWS THE PROCESS. AT C TO N RATIOS LESS THAN 30 TO 1, NITROGEN IS LOST. THE C TO N RATIO OF MIXED BERKELEY REFUSE AVERAGED 33 TO 1. (8) A MAXIMUM TEMPERATURE OF 73 TO 75 DEGREES C WAS ATTAINED DURING THE COMPOSTING PROCESS. (9) HYDROGEN ION CONCENTRATION IS NOT LIMITING IN COMPOSTING OF COMBINED REFUSE. (10) THE FUNDAMENTAL STEPS FOR RAPID COMPOSTING INCLUDE SEGREGATING, GRINDING, STACKING, TURNING (OR MECHANICAL AERATION), STACKING, TURNING, AND REGRINDING. (11) GRINDING IS NECESSARY FOR RAPID AEROBIC COMPOSTING. NO SPECIAL SIZE REQUIREMENTS NEED TO BE MET. HOWEVER, MATERIAL HAVING A HIGH GARBAGE CONTENT MUST NOT BE PULPED LEST IT BECOME TOO SOGGY TO COMPOST. (12) GROUND REFUSE MAY BE COMPOSTED IN WINDROWS. THE MAXIMUM HEIGHT OF A PILE SHOULD PROBABLY NOT EXCEED 5 OR 6 FEET TO AVOID COMPACTION. THE MINIMUM HEIGHT TO MAINTAIN GOOD INSULATING PROPERTIES IS ABOUT 4 FEET. THE MAXIMUM WIDTH OF A PILE SHOULD BE ABOUT 10 FT, ALTHOUGH IT IS NOT CRITICAL AND MAY DEPEND UPON THE METHOD OF TURNING. (13) TURNING COMPOST ACCOMPLISHES AERATION, INSURES UNIFORM DECOMPOSITION, AND EXPOSES ALL PATHOGENS AND INSECT LARVAE TO LETHAL TEMPERATURES. TURNING SHOULD BE DONE ON THE THIRD DAY AFTER GRINDING AND REPEATED THEREAFTER, DEPENDING ON THE MOISTURE CONTENT AND STRUCTURE OF THE MATERIAL. IF A COMPOST BECOMES ANAEROBIC, IT SHOULD BE TURNED DAILY UNTIL AEROBIC CONDITIONS ARE RESTORED. (14) THE MOISTURE CONTENT FOR GOOD COMPOSTING DEPENDS UPON THE NATURE OF THE MATERIAL. FOR MUNICIPAL REFUSE, IT IS 40 TO 65 PERCENT. MIXED BERKELEY REFUSE AFTER GRINDING AVERAGED 49 PERCENT. EXCESSIVE MOISTURE CONTENT MAY BE REDUCED BY DAILY TURNING OR BY THE ADDITION OF STRAW, SOIL, PAPER, ETC. (15) THE COURSE OF A NORMAL COMPOST IS CHARACTERIZED BY A RAPID RISE IN TEMPERATURE, FOLLOWED BY A LEVELING OFF AND SLOW DECLINE WITHOUT APPRECIABLE FLUCTUATIONS, AND A PROGRESSIVELY DARKENING IN COLOR. (16) A COMPOST IS NEARING COMPLETION WHEN ITS TEMPERATURE BEGINS A STEADY DECLINE. FINISHED COMPOST IS CHARACTERIZED BY- 1) A DARK GRAY OR DARK BROWN COLOR, 2) A NEUTRAL SLIGHTLY MUSTY OR EARTHY ODOR, AND 3) A C TO N RATIO OF 20 TO 1 OR LESS, OR MORE IF CARBON IS IN A DIFFICULTY AVAILABLE FORM. (17) THE TIME FOR COMPOSTING VARIED FROM ABOUT 12 DAYS FOR A C TO N RATIO OF 20 TO 1 TO ABOUT 21 DAYS FOR A C TO N RATIO OF 78 TO 1. (18) MUNICIPAL REFUSE COMPOSTS READILY WITH RAW AND DIGESTED SLUDGE AND WITH CANNERY WASTES. (19) ANY APPRECIABLE PRODUCTION OF COMPOST IN CALIFORNIA WOULD PRESUMABLY HAVE TO BE MARKETED TO LARGE-SCALE AGRICULTURALISTS AND THERE IS LITTLE EVIDENCE BY WHICH TO ESTIMATE THEIR REQUIREMENTS. AGRICULTURAL ACCEPTANCE OF COMPOST WILL DEPEND UPON THE ECONOMY WITH WHICH IT CAN BE PURCHASED AND APPLIED. (UC)

06-01-00836 ADDITIVES AND WINDROW COMPOSTING OF GROUND HOUSEHOLD REFUSE (BACTERIA(CULTURE))
OBRIST, W.
COMPOST SCIENCE 6(3), P. 27-29 (AUTUMN-WINTER 1966). IT IS SHOWN THAT ADDITION OF MICROORGANISMS IN WINDROW COMPOSTING OF RESIDENTIAL REFUSE, WITH ITS RELATIVELY LONG DECOMPOSITION TIME, IS PRACTICALLY USELESS. COMPOSTING EXPERIMENTS WERE CONDUCTED, ACCORDING TO METHOD DESCRIBED BY P. KELLER (1962), IN PLASTIC BAGS OF ABOUT 30 KG CONTENTS. TEMPERATURE, MOISTURE CONTENT, PH VALUE, GERM COUNT, AND CELLULASE (ENZYME) ACTIVITY WERE MEASURED. GERM COUNT DETERMINATION FOLLOWED KOCH PLATE METHOD WITH TRYPTOSE-GLUCOSE-BEEF EXTRACT AGAR. MEASUREMENT OF CELLULASE ACTIVITY WAS DONE WITH HELP OF VISCOSIMETRIC METHOD WITH CARBOXYMETHYL-CELLULOSE AS SUBSTRATE AND COMPOST EXTRACTS AS MEASURED BY ENZYME SOLUTION. (EI)

06-01-00839 COMPOSTING FRUIT AND VEGETABLE REFUSE (VOLUME-REDUCTION WINDROW AERATION)
ROSE, W. W. + CHAPMAN, J. E. + ROSEID, S., + KATSUYAMA, A. + PORTER, V. + MERCER, W. A.
COMPOST SCIENCE 6(2), P. 13-15, 17-25 (SUMMER 1965). STUDIES BY NATIONAL CANNERS ASSOCIATION SHOW POTENTIAL OF COMPOSTING AS EFFECTIVE WAY TO TREAT HIGH-MOISTURE FRUIT AND VEGETABLE WASTES, RESULTS OF INVESTIGATIONS OF AIR-COMPOSTING, WINDROW COMPOSTING OF FRUIT WASTE SOLIDS, AND OF FORCED AERATION COMPOST STUDY ARE DISCUSSED. CURRENT AND FUTURE RESEARCH. (EI)

06-01-00869 BERLIN STUDIES SHOW EFFICIENCY OF COMPOSTING (HEALTH PATHOGEN)
OESTERLE, P. + ROHDE, G. + RUDAT, K. D.
COMPOST SCIENCE 4(3), P. 19-22 (AUTUMN 1963). THE AEROBIC MICROBIAL DECOMPOSITION OF VARIOUS ORGANIC WASTES BY THE WINDROW AND SHEET, OR " NATURAL ", COMPOSTING PROCESSES ARE DISCUSSED. THE PROCEDURES FOR SPEEDING UP AIR DRYING OF SUCH WET MATERIALS AS SEWAGE SLUDGE AND PIG MANURE FOR SUBSEQUENT COMPOSTING ALONE OR WITH OTHER WASTES ARE DESCRIBED. WINDROW COMPOSTING IS MOST SATISFACTORY FOR THE ELIMINATION OF PUBLIC HEALTH AND NUISANCE HAZARDS AND FOR THE DESTRUCTION OF UNDESIRABLE SEEDS IF THE MOISTURE CONTENT IS 50 TO 70 PERCENT. WASTES COMPOSTED AND TESTED FOR PATHOGEN DESTRUCTION INCLUDED STABLE MANURE WITH SAWDUST, RUBBISH, STREET SWEEPINGS, GARBAGE, SEWAGE SLUDGE, PIG MANURE WITH STREET SWEEPINGS OR ASHES, SLAUGHTERHOUSE REFUSE, AND MARKET REFUSE. WHEN MOISTURE CONDITIONS ARE PROPER, WINDROWS ARE GENERALLY 3 M WIDE, 1.5 M HIGH AND AS LONG AS NEEDED. WETTER WASTES REQUIRE SMALLER WINDROWS OR PREDRYING WITH PLOWING AND HARROWING. MANY TYPES OF PATHOGENS INCLUDING BACILLI OF TUBERCULOSIS, PARATYPHOID, DYSENTERY, SWINE DYSENTERY, STAPHYLOCOCCUS, SHIGELLA, ANTHRAX GROUPS, ASCAROID EGGS, AND SPORE-FORMERS SUCH AS B. MYCOIDES AND B. SUBTILIS WERE INTRODUCED. IN MOST INSTANCES, THESE ORGANISMS WERE KILLED IN 2 TO 14 DAYS, DURING WHICH TIME TEMPERATURES OF 55 TO 70 DEGREES C DEVELOPED FOR LONG PERIODS. UNDER WINTER CONDITIONS, WITH DIGESTED SLUDGE HAVING EXCESSIVE MOISTURE, LESS FAVORABLE RESULTS WERE OBTAINED. LARGE-SCALE COMPOSTING OF VARIOUS WASTES CAN BE DONE IN WINDROWS WITH VERY LITTLE HAND LABOR. (PHEA)

06-01-00879 EXPERIMENTS IN SMALL-SCALE COMPOSTING (STERILIZATION)
RAO, S. N. + BLOCK, S. S.
COMPOST SCIENCE 3, P. 14-20 (WINTER 1963). COMPOSTING IS A PROCESS IN WHICH ORGANIC MATTER IS HEAPED TOGETHER TO EFFECT ITS DECOMPOSITION BY MICROBIAL ACTION AND BY PROVISION OF FAVORABLE CONDITIONS OF TEMPERATURE AND MOISTURE. OXYGEN, CARBON DIOXIDE, AND MIXING ARE OTHER VARIABLES IN COMPOSTING. TO REMOVE SOME OF THESE VARIABLES, A STUDY WAS MADE IN SMALL-SCALE COMPOSTING. SMALL AMOUNTS OF MATERIALS WERE USED TO PERMIT REPLICATION AND TO SAVE LABOR AND MATERIALS. IT WAS DESIRED TO PROVIDE CONDITIONS COMPARABLE WITH THOSE IN THE MOST ACTIVE PART OF THE PILE. COMPOSTERS OF FROM 2 TO 30 CU-FT WERE CONSTRUCTED AND TESTED, BOTH OUTDOORS AND IN A STEAM-FILLED ROOM. GARBAGE, SEWAGE, SLUDGE, SAWDUST, NEWSPAPER, STRAW, AND BAGASSE WERE SUCCESSFULLY COMPOSTED. RATE OF COMPOSTING WAS OBSERVED AND MEASUREMENTS WERE MADE OF TEMPERATURES, PH, AMMONIA, COLOR, ODOR, AND THE PRESENCE OF THERMOPHILIC MOLD AND ACTINOMYCETES. ABILITY OF THE COMPOST TO SUPPORT MUSHROOM MYCELIUM GROWTH WAS ALSO EVALUATED. THESE PROPERLY DESIGNED COMPOSTERS MARKEDLY SPEEDED THE COMPOSTING PROCESS. (PHEA)

06-01-00883 AEROBIC COMPOSTING OF VEGETABLE AND FRUIT WASTES (COMPOSITION COMPOSITION(COMPOST))
MERCER, W. A. + ROSE, W. W. + CHAPMAN, J. E. + KATSUYAMA, A. + DWINNEL, F., JR.
COMPOST SCIENCE 3(3), P. 9-19 (AUTUMN 1962). EXPERIMENTS AT RESEARCH LABORATORIES OF NATIONAL CANNERS ASSOC

DESIGNED TO DEVELOP AND EVALUATE METHODS OF HANDLING AND DISPOSING OF ORGANIC REFUSE, PARTICULARLY OF WASTE MATERIALS FROM CANNING AND ASSOCIATED AGRICULTURAL OPERATIONS. RESULTS OF INVESTIGATIONS SHOW THAT COMPOSTING OFFERS FEASIBLE AND ESTHETICALLY ACCEPTABLE METHOD FOR DISPOSAL OF HIGH MOISTURE WASTES. (EI)

06-01-00884 CONTINUOUS THERMOPHILIC COMPOSTING
SCHULZE, K. L.
COMPOST SCIENCE 3(1), P. 22-34 (SPRING 1962). TESTS WITH COMPOSTING UNIT BUILT FROM 55 GAL STEEL DRUM, EQUIPPED WITH SUPPORT, ROTATING MECHANISM, ELECTRIC TIMER, AIR COMPRESSOR, AIR FLOW RECORDER, TEMPERATURE RECORDER AND BECKMAN OXYGEN ANALYZER. OPERATION OF ROTATING DRUM PILOT PLANT HAS SHOWN THAT UNDER COMPLETE MIXING CONDITIONS, IT IS POSSIBLE TO MAINTAIN AEROBIC DECOMPOSITION OF ORGANIC WASTE MATERIALS AT TEMPERATURES BETWEEN 127 AND 158 F. BULKWEIGHT STUDY. (EI)

06-01-00888 METHANE FERMENTATION WITH COFFEE SHELLS (COMPOSTING SLUDGE(SEWAGE))
TIETJEN, C.
SPECIAL PRINT- LANDBAUFORSCHUNG BOLKENRODE MITTEILUNGSBLATT DER FORSCHUNGSANSTALT FUR LANDWIRTSCHAFT BRAUNSCHWEIG-VOLKENRODE, 8(1), (1958), METHANGAEORUNG MIT KAFFEESCHALEN. THE ARTICLE DEALS WITH THE DISPOSAL OF COFFEE SHELLS BY MEANS OF COMBINED DIGESTION WITH DOMESTIC SLUDGE. THE YIELD OF GAS AT 35 DEGREES C AFTER 21 DAYS WAS 313 LITERS PER KG OF ORGANIC MATTER FED TO THE DIGESTER. (UC)

06-01-00899 RATE OF OXYGEN CONSUMPTION AND RESPIRATORY QUOTIENTS DURING THE AEROBIC DECOMPOSITION OF A SYNTHETIC GARBAGE (COMPOSTING)
SCHULZE, K. L.
COMPOST SCIENCE 1, P. 36-40 (SPRING 1960). THE COMPOSTING UNIT CONSISTED OF A CLOSED LUCITE CYLINDER, 10 INCHES IN DIAMETER AND 19 INCHES LONG, WITH A CAPACITY OF 0.75 CU-FT. BOTH ENDS OF THE CYLINDER WERE FITTED WITH LUCITE PLATES AND EXPANDING RINGS SO THAT THE CYLINDER COULD BE ROTATED WHILE THE END PLATES REMAINED STATIONARY. AIR WAS SUPPLIED FROM A COMPRESSED AIR LINE. THE EXHAUST WAS ANALYZED FOR CARBON DIOXIDE WITH A BECKMAN D-2 MAGNETIC OXYGEN ANALYZER OR A PORTABLE CARBON DIOXIDE ANALYZER. THE RAW GARBAGE WAS MADE UP OF A GROUND MIXTURE OF 3 LBS BREAD, 5 LBS POTATOES, 5 LBS APPLES, 1 LB GROUND BEEF, 4 LBS ORANGES, 5 LBS OF CARROTS, LETTUCE AND CELERY, 0.5 LBS COFFEE GROUNDS AND 3 LBS OF NEWSPAPERS. AT THE BEGINNING OF EACH RUN, TOTAL WEIGHT, PERCENT MOISTURE, ASH, AND TOTAL NITROGEN WERE DETERMINED. THE DATA SHOW THAT MOISTURE INCREASED BY 12.5 PERCENT AND THE OXIDATION OF CARBONACEOUS MATERIAL YIELDS CARBON DIOXIDE AND WATER. THE C TO N RATIO DECREASED FROM 28.6 TO 19.9. THE LOSS OF WEIGHT AVERAGED 37.6 PERCENT FOR DRY WEIGHT. OXYGEN CONSUMPTION RATES WERE COMPUTED BY DETERMINING THE DIFFERENCE IN OXYGEN CONCENTRATION BETWEEN THE INCOMING AIR AND THAT OF THE EXHAUST AIR AT KNOWN RATES OF AIR SUPPLY. THE RESPIRATORY QUOTIENT--THE AMOUNT OF CARBON DIOXIDE PRODUCED DIVIDED BY THE AMOUNT OF OXYGEN CONSUMED--REMAINED AT ONE. CURVES SHOWING THE TEMPERATURE AND OXYGEN CONSUMPTION RATES OVER THE FULL RANGE OF TEMPERATURES REACHED IN THE EXPERIMENTS. THE OXYGEN CONSUMPTION RATES VARIED DIRECTLY WITH THE TEMPERATURE. THE AVERAGE TIME NEEDED FOR THE ACTIVE DECOMPOSITION WAS 14 DAYS, AND AN AVERAGE OF 40 PERCENT OF THE VOLATILE MATTER WAS OXIDIZED DURING THIS TIME. TO MAINTAIN AEROBIC CONDITIONS DURING PEAK OXYGEN DEMANDS, AN AIR SUPPLY OF 18,000 TO 20,000 CU-FT/TON INITIAL VOLATILE MATTER PER DAY WAS FOUND TO BE NECESSARY. (PHEA)

06-01-01024 RESEARCH ON COMPOSTING OF CITY REFUSE AND NIGHT SOIL
KAIBUCHI, Y.
AM SOC CIVIL ENGRS, PAPER 3002, 87(SA6), P. 101-139 (1961). STUDIES HAVE BEEN CARRIED OUT AT KOBE, JAPAN, WITH THE ASSISTANCE OF THE WORLD HEALTH ORGANIZATION, ON HIGH-RATE COMPOSTING OF GARBAGE. AFTER SORTING, THE GARBAGE IS GROUND AND DIGESTED IN A CONTINUOUS-FLOW UNIT DIVIDED INTO THREE DECKS, THE DIGESTING MATERIAL IS STIRRED AND MOVED CONTINUOUSLY WITH AGITATOR BLADES. THE COMPOST FROM THE DIGESTION UNIT RECEIVES FURTHER TREATMENT IN AERATED CURING BINS. ANAEROBICALLY-DIGESTED NIGHT SOIL CAN BE MIXED WITH THE GARBAGE BEFORE COMPOSTING. PRELIMINARY DIGESTION OF THE NIGHT SOIL INCREASES ITS FERTILIZING VALUE AND REDUCES THE MOISTURE CONTENT OF THE MIXTURE. RESULTS OF THE STUDIES ARE TABULATED AND DIAGRAMS OF THE PLANT ARE GIVEN. (WPA)

06-01-01058 RATE OF OXYGEN CONSUMPTION AND RESPIRATORY QUOTIENTS OF A SYNTHETIC GARBAGE (COMPOSTING)
SCHULZE, K. L.
PURDUE UNIVERSITY ENGRG EXPTL STA EGRG BULL 96, P. 541-554 (1958). IN COMPOSTING EXPERIMENTS WITH GARBAGE IN A LUCITE TUBE WITH EXCESS AIR FLOWING CONTINUALLY, THE RESPIRATORY QUOTIENT WAS FOUND TO BE 0.8 TO 0.9. OXYGEN IN THE EXHAUST GAS WAS MAINTAINED AT 5 PERCENT. TEMPERATURE ROSE TO 140 DEGREES F. IN 6-11 DAYS. OXYGEN UPTAKE RATE IS HIGHER AT TEMPERATURES ABOVE 113 DEGREES F. THAN AT LOWER TEMPERATURES. THE HYPOTHESIS THAT STABILIZATION OCCURS MORE RAPIDLY IN THE THERMOPHILIC RANGE IS CONSIDERED CORRECT. LOSSES IN DRY WEIGHT WERE 37.6 AND 40.1 PERCENT OF VOLATILE MATTER. LOSSES IN N WERE VARIABLE, AND MOISTURE INCREASED 4.3 PERCENT. DECOMPOSITION WAS COMPLETE IN 14 DAYS. (CA)

06-01-01098 THE UTILIZATION OF ORGANIC DOMESTIC WASTES (SLUDGE(SEWAGE) COMPOSTING ECONOMICS)
BURKE, C. E.
THE INSTITUTE OF PUBLIC CLEANSING AND THE INSTITUTE OF SEWAGE PURIFICATION, J AND PROC, INSTITUTE OF SEWAGE PURIFICATION, PART 4, (1949). THE PAPER IS CONCERNED WITH A PROPOSED SCHEME FOR COMPOSTING THE REFUSE AND SEWAGE SLUDGE FROM A TOWN HAVING A POPULATION OF ABOUT 500,000. IT WAS NOT THE INTENTION TO DISCUSS THE MANURIAL OR FERTILIZING VALUE OF THE ORGANIC WASTES IN SEWAGE OR HOUSEHOLD REFUSE OR OF COMPOSTS PREPARED FROM SUCH WASTE MATERIALS, BUT TO ACCEPT THE FACT THAT THEY HAVE A DEFINITE VALUE WHEN ADDED TO THE SOIL. THE PAPER DRAWS ATTENTION TO THE FACT THAT THE LAST WORD ON THE USE OF ORGANIC FERTILIZERS RESTS WITH THE FARMER, AND THAT IF HE WERE SATISFIED, HE WOULD CREATE THE MARKET. ALL THREE PRODUCTS VIZ., REFUSE, DRIED SLUDGE, AND A COMPOST OF BOTH WOULD SELL AS A FERTILIZER. THEREFORE IT DEPENDS ON CIRCUMSTANCES AND SITE CONDITIONS AS TO THE RIGHT DECISION REGARDING THE TIMELINESS OF THE INITIATION OF A COMPOSTING OPERATION. THE ARTICLE ALSO DETAILS PLANT OPERATIONS, MACHINERY, LABOR COSTS, PROFITS, AND DIFFICULTIES. (UC)

06-01-01124 MUNICIPAL GARBAGE COMPOSTING
OBUCHOWSKA, I. + CHMIUK, T. + MASISZEWSKA-SZOPLIK, M.
GAZ WODA I TECH SANITARNA 33, P. 214-216 (1959). VARIOUS MIXTURES OF GARBAGE STREET SWEEPINGS, WATER DILUTED FECES, SLAUGHTERHOUSE MANURE, AND AMMONIA WATER WERE COMPOSTED AND ANALYZED FOR WATER, C, LOSS ON IGNITION, TOTAL N, NITRATE N, AMMONIA N, B.O.D., AND VEGETATIVE BACTERIA COUNT. (CA)

06-01-01125 TECHNOLOGICAL STUDIES ON GARBAGE FERMENTATION IN WARSAW IN 1959 (COMPOSTING FERTILIZER-VALUE)
SKALMOWSKI, K. + LINOWSKI, Z. + OSTROWSKA, G.
GAZ WODA I TECH SANITARNA 34, P. 197-200 (1960). UNPROCESSED GARBAGE STACKED IN TWO (A AND B) 6 X 3 X 1.8-M PILES AND SPRINKLED IMMEDIATELY, AND AFTER 1 AND 2 MONTHS - A WITH 7, 2.2, AND 2.5 CU-M WATER, AND B WITH 7.75, 2.2, AND 2.5 CU-M OF FECES (CONTAINING PHOSPHATE 620, N 913, AND POTASH 33 MG/1, PH 7.8), RESPECTIVELY, WAS COMPOSTED FOR 100 DAYS AT AIR TEMPERATURE AND HUMIDITY OF 13-35 DEGREES AND 32-98 PERCENT RESPECTIVELY, AND RAINFALL 0.2-54-MM. CHEMICAL ANALYSES, ON A DRY BASIS, ON THE 1ST 3RD, AND 100TH DAY GAVE - C - A 28.6, 27.2, 16.8, B 28.5, 27.3, 17.9, N - A 0.88, 1.54, 0.82, B 0.49, 0.99, 0.87, PHOSPHATE - A 1.80, 1.74, 2.12, B 1.53, 1.23, 1.75, POTASH - A 0.21, 0.23, 0.47 B 0.23, 0.15, 0.43, AND CAO - A 2.81, 2.56, 3.30, B 2.00, 2.65, AND 3.70 PERCENT, ORIGINAL IGNITION LOSSES WERE - A 61.7 AND B 77.6 PERCENT. MAXIMUM TEMPERATURE DIFFERENCES AT DEPTHS OF 0.2, 0.5, AND 1-M WERE 54/60, 45/48, AND 43 DEGREES, RESPECTIVELY. RAINFALL, WIND ABOVE 3-M/SEC, OUTSIDE TEMPERATURE, AND AIR HUMIDITY ABOVE 40 PERCENT AFFECTED THE TEMPERATURE IN THE PILE. (CA)

06-01-01155 NEW DEVELOPMENTS IN WINDROW COMPOSTING (GRINDING)
LIVSHUTZ, A.
COMPOST SCIENCE 3(3), P. 26-28 (AUTUMN 1962). THE AUTHOR OFFERS SUGGESTIONS FOR IMPROVING WINDROW COMPOSTING METHODS BASED ON HIS EXPERIENCES IN ISRAEL. (PHEA)

06-01-01158 URBAN COMPOST AND SEWAGE DEVELOPMENT WORK IN INDIA (SLUDGE(SEWAGE) QUANTITY)
YADAVA, L. S.
COMPOST SCIENCE 3(4), P. 30-33 (WINTER 1963). THE AUTHOR DESCRIBES HIS COUNTRY'S EFFORTS TO UTILIZE MUNICIPAL WASTES. THE SUITABILITY OF MUNICIPAL WASTES AS A SOURCE OF ORGANIC MANURES WAS RECOGNIZED AS EARLY AS 1914. SEVERAL COMPOSTING METHODS WERE DEVELOPED, AND A SINGLE METHOD WAS ADOPTED IN 1942 FOR COMPOSTING GARBAGE, NIGHT SOIL, SLAUGHTER HOUSE WASTES, SLUDGE, AND STREET SWEEPINGS. GRANTS AND LOANS ARE GIVEN TO LOCAL GOVERNMENTS BY THE STATE GOVERNMENT. OPERATIONS ARE SUPERVISED BY LOCAL OFFICIALS, WITH TRAINING AND TECHNICAL ASSISTANCE SUPPLIED BY THE STATE. A HOT FERMENTATION METHOD IN TRENCHES IS USED. IN 4 TO 6 MONTHS THE DECOMPOSED MATERIAL IS READY FOR USE. IT IS FELT THAT THE PROCESS IS ECONOMICAL AND MEETS HYGIENIC REQUIREMENTS. THE YEAR-TO-YEAR PROGRESS OF COMPOST PRODUCTION AND DISTRIBUTION IS GIVEN. PROBLEMS ENCOUNTERED ARE - GETTING ADEQUATE COLLECTION AND REMOVAL OF WASTES IN MUNICIPALITIES TO COMPOST SITES, A LACK OF NIGHT SOIL STARTER FROM SEWERED TOWNS, A LACK OF DEMAND FOR COMPOST MATERIAL IN TOWNS NOT NEAR CULTIVATED AREAS, AND THE USE OF WASTE MATERIALS IN SOME TOWNS FOR THE PURPOSE OF LAND RECLAMATION. MECHANICAL COMPOSTING AS USED IN OTHER COUNTRIES HAS BEEN CONSIDERED, AND THE UTILIZATION OF SEWAGE BY SETTING UP SEWAGE FARMS HAS BEEN INSTITUTED. (PHEA)

06-01-01162 METHODS TO EVALUATE MATURITY OF COMPOST (CHARACTERISTICS(COMPOST))
KELLER, P.
COMPOST SCIENCE 2(3), P. 20-26 (AUTUMN 1961). SMALL- AND MEDIUM-SIZED COMMUNITIES MAY FIND COMPOSTING TO BE THE ONLY SATISFACTORY SOLUTION TO THEIR WASTE PROBLEM. COMPOST MUST BE PROPERLY PREPARED, CORRECTLY COMPOSTED, AND MATURED. COMPOST IS CONSIDERED TO BE MATURE WHEN AVAILABLE C HAS BEEN CONSUMED AND DECOMPOSITION PROCEEDS ONLY VERY SLOWLY. USE OF MATURE COMPOST GIVES GENERALLY BETTER RESULTS THAN IMMATURE COMPOST OR RAW WASTES. THE ULTIMATE AIM OF COMPOST APPLICATION, INCREASE IN SOIL HUMUS CONTENT, CAN IN MANY CASES ONLY BE ATTAINED USING MATURE COMPOSTS. BECAUSE OF HYGIENIC REASONS, MATURE COMPOST IS PREFERABLE TO RAW WASTES, PRINCIPALLY IF SLUDGE IS ADDED. DEGREE OF MATURITY CAN BE DETERMINED BY THE FOLLOWING METHODS - (A) BASED ON PHYSICAL CHARACTERISTICS (ODOR, COLOR, STRUCTURE, SPECIFIC GRAVITY). ERRONEOUS CONCLUSIONS ARE POSSIBLE. (B) BASED ON TEMPERATURE. COMPOST IS CONSIDERED MATURE, IF AFTER TURNING AND MOISTENING, IT NO LONGER SPONTANEOUSLY HEATS UP. THIS METHOD IS SIMPLE, PRACTICAL FOR COMPOST PLANTS, AND RELIABLE. (C) BASED ON CHEMICAL ANALYSES. THE C/N IS LIMITED IN THE CASE OF URBAN WASTE COMPOSTS BUT IS APPLICABLE TO HOMOGENEOUS MATERIALS. CELLULOSE CONTENT IS A GOOD INDEX AND BEST SUITED OF THE CHEMICAL TESTS. HUMUS CHEMISTRY IS NOT SUFFICIENTLY PROGRESSED FOR RELIABILITY. (D) BASED ON BIOLOGICAL STUDIES. PRESENCE OF EARTHWORMS MAY BE MISLEADING. MICROORGANISM COUNTS, CARBON DIOXIDE PRODUCTION AND OXYGEN CONSUMPTION MAY GIVE COMPREHENSIVE INDICATIONS, THE LATTER TWO BEING OF GREATEST IMPORTANCE. PLANT GROWTH TESTS ARE SUBJECT TO APPPECIABLE ERRORS AND SHOULD BE USED ONLY IN CONJUNCTION WITH OTHER TECHNIQUES. (PHEA)

06-01-01167 THE ROLE OF TEMPERATURE IN THE GARBAGE COMPOSTING PROCESS (PATHOGEN)
SNELL, J. R.
COMPOST SCIENCE 1(2), P. 28-30 (SUMMER 1960). A DISCUSSION OF WHAT TEMPERATURES ARE REACHED DURING THE COMPOSTING PROCESS, THE EFFECTS OF THESE RANGES, AND THE IMPORTANCE OF TEMPERATURE CONTROL. (PHEA)

06-01-01182 CAPILLARY DRYING OF MIXTURES OF CITY REFUSE AND SEWAGE SLUDGE (COMPOSTING SLUDGE(SEWAGE) BRIQUETTES(COMPOST))
CASPARI, F.
COMPOST SCIENCE 5(2), P. 21-23 (SUMMER 1964). A NEW METHOD OF MUNICIPAL WASTE UTILIZATION, DEVELOPED IN GERMANY, IS DESCRIBED BY ITS ORIGINATOR. (PHEA)

06-01-01222 THEORETICAL CONSIDERATIONS OF THE TREATMENT OF HOUSEHOLD REFUSE BY FERMENTATION (COMPOSTING VECTOR-CONTROL)
SENAULT, R. + FOLIGUET, J. M. + SEIGNEUR, J. P.
MAROC MED 40(436), P. 991-996 (SEPTEMBER 1961). THIS PAPER DESCRIBES THE TREATMENT OF HOUSEHOLD REFUSE BY AEROBIC COMPOSTING. THE PHYSICAL AND CHEMICAL FACTORS AIDING FERMENTATION AND THE BIOLOGICAL CHANGES RESULTING ARE DESCRIBED. THE TYPES OF THERMOGENIC BACTERIA AND MOULDS CONCERNED ARE SPECIFIED. REFERRING TO THE CONTROL OF FLIES AND RATS, THE AUTHORS STATE THAT FLY LARVAE ARE KILLED BY THE HIGH TEMPERATURES DEVELOPED DURING COMPOSTING AND RATS ARE REPELLED BY IT. THE MAIN RAT PROBLEM IS AT THE POINT WHERE RAW REFUSE IS DISCHARGED, AND IT MUST BE MET BY IMMEDIATE COMPOSTING AND BY RAT-PROOFING. (PHEA)

06-01-01233 TECHNICAL INVESTIGATION INTO REFUSE COMPOSTING (ECONOMICS)
MORRIS, S. S.
SURVEYOR 124(3769), P. 23-27 (AUGUST 29, 1964). RESULTS OF TECHNICAL INVESTIGATION AT CAPE TOWN, SOUTH AFRICA OF REFUSE COMPOSTING AND COST ANALYSIS FOR PILOT PLANT ARE PRESENTED. PROCESSES CONSIDERED INCLUDE STATIC FERMENTATION IN WINDROWS WITH OR WITHOUT PULVERIZING RAW REFUSE PRIOR TO FERMENTATION, AND MECHANICAL STABILIZATION WITH CONTINUOUS OR INTERMITTENT ACTIVATION IN ENCLOSED DRUMS, SILOS OR MULTIFLOOR STRUCTURES, WITH OR WITHOUT PULVERIZATION OF RAW REFUSE PRIOR TO STABILIZATION. (EI)

06-01-01240 CONTINUOUS THERMOPHILIC COMPOSTING (COMPOSITION)
SCHULZE, K. L.
APPL MICROBIOL, BALTIMORE, 10, P. 108-122 (1962). PREVIOUS STUDIES ON THE COMPOSTING OF SYNTHETIC GARBAGE IN A ROTATING DRUM LED TO CONSIDERATION OF A COMPOSTING PROCESS OPERATED CONTINUOUSLY IN THE THERMOPHILIC PHASE (THAT IS 120-160 DEGREES F), THUS ELIMINATING THE LAG PERIODS GENERALLY ASSOCIATED WITH THE INITIAL PHASES OF THE COMPOSTING PROCESS. EXPERIMENTS ARE REPORTED USING A 55-GAL ROTATING DRUM, THE RESULTS BEING GIVEN IN TABLES AND GRAPHS AND DISCUSSED. INITIAL EXPERIMENTS SHOWED THAT A CONTINUOUS PROCESS WAS IMPOSSIBLE USING GROUND GARBAGE ALONE OR MIXED WITH DEWATERED SEWAGE SLUDGE SINCE THE MATERIAL IN THE DRUM BECAME TOO DENSE AND THE AIR DID NOT HAVE SUFFICIENT ACCESS TO THE INDIVIDUAL PARTICLES OF MATERIAL. A SUCCESSFUL PROCESS WAS, HOWEVER, DEVELOPED USING A MIXTURE OF GARBAGE (OR GARBAGE AND DEWATERED SEWAGE SLUDGE) WITH A DRIER MATERIAL SUCH AS AIR-DRIED COMPOST PRODUCED IN PREVIOUS TESTS. AFTER THE INITIAL CHARGE OF WASTE MATERIAL HAD REACHED THE THERMOPHILIC PHASE, MATERIAL WAS ADDED AND REMOVED EVERY DAY OR EVERY SECOND DAY, THE DRUM BEING ROTATED FOR ONLY 5 MINUTES BEFORE AND AFTER EACH ADDITION OR REMOVAL, SUFFICIENT TO ENSURE COMPLETE MIXING, BUT PREVENTING THE FORMATION OF LARGE LUMPS. THE PROCESS COULD BE OPERATED CONTINUOUSLY FOR 176 DAYS, THE TEMPERATURE REMAINING AT 127-158 DEGREES F (53-70 DEGREES C) AND RAW MATERIAL COULD BE FED IN AMOUNTS UP TO 18 PERCENT OF THE DECOMPOSING MATERIAL WITHOUT ANY SIGNIFICANT EFFECT ON THE TEMPERATURE. THE LOSS OF VOLATILE MATTER RANGED FROM 37-45 PERCENT, AND THE AVERAGE DETENTION PERIOD WAS 7-18 DAYS, DEPENDING ON THE FEED RATE. IT IS CONSIDERED THAT MOST OF THE PATHOGENIC ORGANISMS IN THE RAW MATERIALS WILL BE DESTROYED UNDER THE CONDITIONS OF THIS PROCESS. (WPA)

06-01-01241 DETERMINATION OF THE COMPLETION OF COMPOSTING
HOWARD, D. H. + JANN, G. J. + SALLE, A. J.
APPL MICROBIOL 7, P. 271-275 (1959). EXPERIMENTAL STUDIES SHOWED THAT RAPID COMPOSTING WAS OBTAINED WHEN THE MATERIAL HAD AN ALKALINE PH, THE TEMPERATURE OF INCUBATION WAS MAINTAINED AT 55 DEGREES, AND THE MOISTURE CONTENT WAS ABOUT 65 PERCENT. THE STUDIES WERE CARRIED OUT WITH FRESH DRIED STOCK-YARD MANURE, COFFEE GROUNDS, PEAR WASTE, HOUSEHOLD GARBAGE, SPANISH MOSS, ALLIGATOR GRASS, AND WATER HYACINTH. CHANGES IN C, N, AND ORGANIC MATTER WERE DETECTED FULLY COMPOSTED MATERIAL WILL MAINTAIN AN ALKALINE PH FOR 24 HOURS AT 55 DEGREES WHEN INCUBATED UNDER ALKALINE CONDITIONS. (CA)

06-01-01264 METHOD OF PREPARING COMPOST FROM REFUSE, TAKING INTO ACCOUNT GERMAN CONDITIONS (COMPOSTING)
PETERS, W.
DIE VERFAHREN DER MUELLKOMPOSTIERUNG UNTER BESONDERER BERUECKSICHTIGUNG DER DEUTSCHEN VERHAELTNISSE.
AUFBEREITUNGS-TECHNIK 2(9), P. 375-386 (SEPTEMBER 1961). . SINCE THE PROMULGATION OF THE NEW WATER PROTECTION LAWS,

THE COUNTRY AND TOWN DISTRICTS AS WELL AS THE INDUSTRY ARE OBLIGED TO PROVIDE FOR THE REMOVAL OF THEIR SOLID AND LIQUID WASTE PRODUCTS IN SUCH A WAY THAT THEY ARE RENDERED HARMLESS. THE METHODS OF PROCESSING AND DRESSING WASTE PRODUCTS ARE OF GREAT INTEREST NOW, ESPECIALLY SINCE THE JURISDICTION HAS STATED THE LIABILITY OF WORKS MANAGERS AND OTHER RESPONSIBLE PERSONS FOR THE DAMAGE CAUSED, AND HAS ASSESSED INDEMNITY. THE METHODS OF WASTE-WATER PURIFYING HAVE BEEN IMPROVED IN THE LAST 60 YEARS ANC THEY ARE PRESUMED TO BE COMMONLY KNOWN. ON THE OTHER HAND, AS FAR AS THE PROCESSING OF GARBAGE IS CONCERNED, THE DEVELOPMENT IS NOT YET FINISHED. IN CERTAIN BRANCHES, IT HAS ONLY JUST BEGUN. IT IS THE PURPOSE OF THIS PAPER TO INFORM PLANNING STAFFS ABOUT THE METHODS USED IN GERMANY. THEREFORE, THE WELL-KNOWN METHODS OF GARBAGE DRESSING BY COMPOSTATION AND THE PLANTS PERFORMING THIS PROCEDURE ARE DESCRIBED. SEVERAL PROCEDURES PERFORMED IN NEIGHBORING COUNTRIES ARE STATED TOO IN SO FAR AS THEY ARE SIGNIFICANT FOR THE SITUATION IN GERMANY.

06-01-01278 COMPOSTS PREPARED FROM WASTE MATERIALS (COMPOSTING COMPOSITION(COMPOST-NITROGEN))
MATTINGLY, G. E. G.
J SCI FOOD AGRIC 5, P. 353-364 (1954). STRAW-SLUDGE, STRAW-SLUDGE-AMMONIUM SULPHATE, INCREASED DURING COMPOSTING, AND THE INCREASE WAS ACCOMPANIED BY A DECREASE IN THE AMOUNT OF INSOLUBLE ORGANIC N EXTRACTABLE BY CONCENTRATED AND DILUTED ACIDES. THESE RESULTS WERE FOUND REGARDLESS OF THE INITIAL N DISTRIBUTICN FOR COMPOSTS OLDER THAN 3 MONTHS. TOTAL N SOLUBLE IN 22 PERCENT (WEIGHT/VOLUME) HCL IN 16 HOURS AT 100 DEGREES WAS 83-88 PERCENT, AND THIS DID NOT INCREASE APPRECIABLY IN 48 HOURS. SOLUTION ALPHA-AMINO N REACHED A MAXIMUM IN 16 HOURS, THEN DECREASED. AMMONIA N INCREASED UP TO 48 HOURS. CHANGES IN THE PERCENTAGE OF TOTAL N PRESENT AS ALPHA-AMINO N AND AMIDE N WERE GREATEST DURING THE FIRST FEW WEEKS CF COMPOSTING. (CA)

06-01-01283 DECOMPOSITION OF ORGANIC WASTES (COMPOSTING)
KARIM, A. + CHOWDHURY, M. U.
SOIL SCI 85, P. 51-54 (1958). COMPOST OF STREET SWEEPINGS, FISH-MARKET AND SLAUGHTER-HOUSE GARBAGE, AND HOUSEHOLD REFUSE FROM THE DACCA CITY AREA SHOULD BE MADE UNDER AEROBIC CONDITIONS, WITH INOCULUM FOR A 90-DAY DECOMPOSITION PERIOD. THE PRODUCT IS EQUIVALENT TO HORSE MANURE IN RESPECT TO ENERGY-YIELDING MATERIALS, AND SUPERICR IN N CONTENT. CITY WASTES CONTAINED 10 TIMES AS MUCH N AND K AND 3 TIMES AS MUCH P AS COW MANURE. THE LOSSES ON DECOMPOSITION WERE GREATEST FOR THE FATS AND WAXES, INTERMEDIATE FOR CELLULOSE AND FURFURAL, AND SMALLEST FOR LIGNIN. (CA)

06-01-01286 CONCENTRATING AND COMPOSTING GARBAGE (COMPOST(FERTILIZER-VALUE))
MARX, T. + SALIM, U.
Z PFLANZENERNAEHR DUENG BODENK 62, P. 31-38 (1953). WEST BERLIN GARBAGE WAS COMPOSTED FOR PERIODS OF 3 TO 13 MONTHS. DECOMPOSITION WAS ACCOMPANIED BY AN INITIAL RISE IN TEMPERATURE TO 30-40 DEGREES, WHICH FELL SLOWLY TO 30 DEGREES, AND AFTER SEVERAL WEEKS SANK SLOWLY TO EQUILIBRIUM SOLUTION. PHOSPHATE CONTENT WAS INCREASED AFTER COMPOSTING. N, EXCEPT WHEN CALCIUM CYANIDE WAS ADDED, DECREASED, POTASSIUM OXIDE DECREASED AS DID CAO WHILE MGO AND MN WERE RELATIVELY UNAFFECTED. (CA)

06-01-01304 PRELIMINARY EXPERIMENTAL STUDIES ON TREATMENT FOR STABILIZATION OF LIQUID AND SOLID WASTES (SLUDGE(SEWER) COMPOSTING)
FRANGIPANE, E. D. F.
INGEGN SANIT 7(4), P. 112-133 (1959). DETAILS, INCLUDING TABULATED AND GRAPHICAL DATA, ARE GIVEN OF EXPERIMENTS CARRIED OUT AT THE SEWAGE WORKS OF SORRENTO, ITALY, SHOWING THAT IT IS POSSIBLE TO PREPARE COMPOSTS FROM ORGANIC WASTES OF HIGH MOISTURE CONTENT (UP TO 75 PERCENT) IF ADEQUATE AERATION IS PROVIDED. THIS IS IMPORTANT BECAUSE A LARGER PORTION OF SLUDGE CAN BE TREATED IN THE COMPOSTING OF SLUDGE WITH GARBAGE. A LARGER QUANTITY OF SLUDGE CAN ALSO BE USED IF A SUBSTANCE OF LOW MOISTURE CONTENT, SUCH AS EARTH OR STABILIZED COMPOST, IS ADDED. (WPA)

06-01-01390 THE POSSIBILITIES OF USING SOLID WASTES AND SEWAGE SLUDGE (INCINERATION COMPOSTING COMPOST(VALUE) RESEARCH-NEEDS SLUDGE(SEWAGE))
BRAUN, R.
EAU ASSAIN 16(185), P. 41-43 (1962). THE DISPOSAL OF DOMESTIC REFUSE AND SEWAGE SLUDGE BY INCINERATION AND BY COMPOSTING IS CONSIDERED, AND FACTORS AFFECTING THE CHOICE OF PROCESS ARE DISCUSSED. THE AUTHOR OUTLINES THE VALUE OF COMPOST TO SOILS ANC THE ADVANTAGES TO BE GAINED FROM ITS USE IN SWISS AGRICULTURE, BUT STRESSES THE NEED FOR RESEARCH REGARDING THE BEST USE OF THIS MATERIAL, AND FOR THE USER TO BE FULLY INFORMED. (WPA)

06-01-01446 DO ADDITIVES AFFECT WINDROW COMPOSTING OF REFUSE AND SLUDGE (CULTURE-BACTERIA PATHOGEN)
FARKASDI, G.
COMPOST SCIENCE 6(1), P. 11-13 (SPRING 1965). EXPERIMENTS WERE CONDUCTED BY RESEARCH GROUP AT GIESSEN UNIVERSITY INSTITUTE, WEST GERMANY TO TEST EFFECTIVENESS OF KNOWN MATERIALS FOR INOCULATION AND ACCELERATION. QUESTION REGARDING PREPARATION SPEEDING UP DECAY IN COMMERCIAL WINDROW COMPOSTING WAS EXAMINED. MATERIALS CONSIDERED AS ACCELERATING AGENTS USED IN TESTS INCLUDED INOCULANT "EDAFIL" MINERAL OIL DERIVATIVE " PROTEG OLEO ", PREPARATION, " ZUSATSE-FRANKFURT ", PREPARATION " MULTIBACTO " AND " B.D. STARTER ". EXPERIMENTAL WINDROWS WERE 1.5 M HIGH, 2.0 M WIDE, AND 5.0 M LONG. TWO PARALLEL WINDROWS WERE TREATED WITH SAME ADDITIVE, TABULATED DATA ON TEST RESULTS. (EI)

06-01-01473 EXPERIMENTS ON THE COMBINED COMPOSTING OF REFUSE AND SEWAGE SLUDGE (SLUDGE(SEWAGE) DANC)
BRAUN, R. + ALLENSPACH, H.
SCHWEIZ Z HYDROL 20, P. 59-134 (1958). AFTER A GENERAL ACCOUNT OF THE PROBLEMS OF GARBAGE DISPOSAL AND OPPORTUNITIES FOR THE USE OF COMPOSTED GARBAGE IN SWITZERLAND THE AUTHORS GIVE A DETAILED ACCOUNT OF EXPERIMENTS MADE AT THE DANO PLANT AT RUESCHLIKON. MIXTURES OF GARBAGE WITH DIFFERENT AMOUNTS ANC TYPES OF SEWAGE SLUDGE WERE TREATED IN A FERMENTATION DRUM AND DIGESTED IN HEAPS ON DIFFERENT TYPES OF DRAINED BASE. THE PLAN OF THE EXPERIMENTAL PLANT AND THE METHOD OF OPERATION OF THE PLANT AND OF CONTROL OF THE DIGESTION HEAPS ARE DESCRIBED AND ILLUSTRATED. RESULTS OF EXAMINATION OF THE PROCESSES OF DIGESTION IN THE HEAPS AND OF THE CHEMICAL EXAMINATION AND PRACTICAL TESTING OF THE COMPOSTS ARE GIVEN. FROM THE RESULTS, CONCLUSIONS ARE DRAWN AS TO THE BEST TYPE, CONDITION, AND QUANTITY OF SLUDGE AND THE METHODS OF BUILDING AND CONTROLLING THE HEAPS. AN ACCOUNT IS GIVEN OF SEASONAL VARIATIONS IN THE COMPOSITION OF GARBAGE ANC THE EFFECT OF THESE ON THE METHOD OF DISPOSAL IS DISCUSSED. (WPA)

06-01-01484 TEMPERATURE CONDITIONS IN COMPOSTING BY THE BADEN-BADEN PROCESS
FARKASDI, G.
STAEDTEHYGIENE 12, P. 138-142 (1961). AN INVESTIGATION IS DESCRIBED OF TEMPERATURE CONDITIONS AT DIFFERENT PLACES IN A NUMBER OF COMPOST HEAPS AT BADEN-BADEN. DATA ARE GIVEN OF THE MAXIMUM TEMPERATURES REACHED, THE TIME TAKEN TO REACH THE MAXIMUM, AND THE PERIODS FOR WHICH TEMPERATURES WITHIN DIFFERENT RANGES WERE MAINTAINED. THE EFFECTS OF THE COMPOSITION OF THE REFUSE, THE CONTENT OF MOISTURE, AND TURNING OVER OF THE HEAP ARE DISCUSSED. (UC)

06-01-01485 POSSIBILITIES OF CONTROLLING THE PROCESS OF COMPOSTING OF REFUSE (DANO)
BANSE, H. J.
STAEDTEHYGIENE 12, P. 142-144 (1961). THE AUTHOR DESCRIBES INFORMATION OBTAINED IN THE OPERATION OF THE DANO REFUSE COMPOSTING PLANT IN BAD KREUZNACH GIVING DATA ON THE EFFECTS AND RELATIONS OF TEMPERATURE, MOISTURE CONTENT, AND OXYGEN SUPPLY. AFTER THE FIRST PHASE OF DIGESTION, THE MATERIAL IS DEPOSITED IN HEAPS WHERE RE-HEATING TAKES PLACE. THE IMPORTANCE OF THE SHAPE AND HEIGHT OF THE HEAPS FOR SATISFACTORY DIGESTION IS DISCUSSED. (UC)

06-01-01486 PROCESSES IN COMPOSTING
BARDTKE, D.
STAEDTEHYGIENE 12, P. 135-137 (1961). APPARATUS HAS BEEN DEVELOPED AT THE TECHNISCHE HOCHSCHULE STUTTGART TO STUDY RESPIRATION PROCESSES DURING THE DIGESTION OF MATERIAL. GASES EVOLVED ARE PASSED THROUGH ABSORPTION TUBES WHERE WATER AND CARBON DIOXIDE ARE ABSORBED. THE REDUCTION IN PRESSURE IS MADE UP BY ADDITION OF PURE OXYGEN, THE AMOUNT REQUIRED

BEING A MEASURE OF THAT USED UP. EXPERIMENTS ON THE EFFECT OF MOISTURE CONTENT SHOWED THAT WITH INCREASING MOISTURE THE MAXIMUM TEMPERATURE REACHED DECREASED, BUT WAS MAINTAINED FOR A LONGER PERIOD. WITH A MOISTURE CONTENT OF 61 PERCENT THE MAXIMUM REACHED WAS ABOUT 32 DEGREES C, WHICH IS INSUFFICIENT TO DESTROY PATHOGENIC ORGANISMS. BOTH THE ABSOLUTE AMOUNTS AND THE RATIO OF OXYGEN DEMAND AND CARBON DIOXIDE ARE DEPENDENT ON THE INITIAL MOISTURE CONTENT. OTHER EXPERIMENTS SHOW THE IMPORTANCE OF MAINTENANCE OF HIGH TEMPERATURE AND OF A SUFFICIENT SUPPLY OF OXYGEN, WHICH HAS A STRONG EFFECT ON THE TEMPERATURE. (EI)

06-01-01841 SOUTH AFRICAN COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH (COMPOSTING ANALYSIS SLUDGE(SEWAGE) SALVAGE PATHOGEN)
NATIONAL INSTITUTE FOR WATER RESEARCH. REPORT OF THE DIRECTOR FOR 1962. C.S.I.R. SPEC. REP. NO. WAT. 27, 94 PP.
THIS REPORT ON THE WORK OF THE NATIONAL INSTITUTE FOR WATER RESEARCH, SOUTH AFRICA, INCLUDES SECTIONS ON THE HYDROBIOLOGY, BACTERIOLOGY, CHEMISTRY, AND BIOCHEMISTRY OF POLLUTED WATERS, WATER TREATMENT, PHYSICAL OCEANOGRAPHY, SEWERAGE AND SANITATION, UTILIZATION OF MUNICIPAL WASTES, AND SURVEYS OF ARID ZONES. IN INVESTIGATIONS ON THE COMPOSTING OF MUNICIPAL GARBAGE, IT WAS FOUND THAT WHILE THE GARBAGE COULD BE COMPOSTED ALONE, THERE WERE ADVANTAGES IN THE ADDITION OF CRUDE SEWAGE SLUDGE OR NIGHT SOIL, BUT OWING TO THEIR HIGH MOISTURE CONTENT THE VOLUME PERMISSIBLE WOULD BE LIMITED TO 11 GAL/CU-YD OF CRUDE ASH-FREE GARBAGE OF 17 GAL/CU-YD OF SORTED GARBAGE FREE OF INERT MATERIALS, UNLESS THE SLUDGE OR NIGHT SOIL IS PARTIALLY DEWATERED OR DRY DIGESTED SLUDGE FROM DRYING BEDS IS USED. AS REGARDS PUBLIC HEALTH ASPECTS, COMPOSTS AT PRESENT PREPARED IN SOUTH AFRICA ARE RELATIVELY SAFE, AS INDICATED BY A BACTERIOLOGICAL AND HELMINTHOLOGICAL SURVEY OF COMPOSTS AND SEWAGE SLUDGES. WITH THE MECHANIZED COMPOSTING PLANT OF THE C.S.I.R.O. AT PRETORIA, THE PRODUCT IS CONSISTENTLY FREE OF ASCARIS OVA AND INOCULATION TESTS SHOWED THAT TYPE 1 VIRULENT POLIOMYELITIS VIRUS IS COMPLETELY ELIMINATED. THE COMPOSTS PREPARED FROM GARBAGE WITH OR WITHOUT ASH SHOWED NO BACTERIOLOGICAL DIFFERENCES AND CHEMICAL DIFFERENCES WERE INSIGNIFICANT.

06-01-01895 RESEARCH WORK ON REFUSE DISPOSAL (INCINERATION COMPOSTING VALUE(COMPOST) RESEARCH-NEEDS)
PUBLIC CLEANSING 54(6), P. 936 (1964). A REPORT BEFORE THE INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL RELATES INFORMATION ON THE VARIOUS ASPECTS OF REFUSE DISPOSAL WHICH IS CURRENTLY OF GREAT IMPORTANCE. BOTH ANALYSIS AND EVALUATION OF REFUSE FOR DISPOSAL BY INCINERATION AND COMPOSTING AS WELL AS ANALYSIS AND EVALUATION OF THE FINAL PRODUCT WERE COVERED.

06-01-01984 HOUSEHOLD WASTE DISPOSAL - I. SOME MICROBIOLOGICAL ASPECTS OF ORGANIC WASTE DISPOSAL WITH SPECIAL EMPHASIS ON CELLULOSE DIGESTION (COMPOSTING)
GRAY, W. D.
RHODESIAN ENGINEER, P. 30-33 (SEPTEMBER 1959). DECOMPOSITION TRANSFORMS INSOLUBLE ORGANIC MATTER TO SOLUBLE FORMS READILY AVAILABLE TO A GREAT VARIETY OF MICROORGANISMS. VIRTUALLY ALL ORGANIC SUBSTANCES CAN BE DESTROYED BY ONE OR MORE MICROORGANISMS IN TIME. CELLULOSE COMPRISES ABOUT 50 PERCENT OF THE DRY WEIGHT OF PLANTS AND IS THE MOST ABUNDANT ORGANIC COMPOUND IN THE WORLD. THEREFORE, DECOMPOSITION OF ORGANIC MATTER IS MAINLY A MATTER OF DECOMPOSITION OF CELLULOSE. LIKE STARCH, CELLULOSE IS A HIGH MOLECULAR POLYSACCHARIDE BUILT UP OF GLUCOSE UNITS. AS A RESULT OF THE GREATER RESISTANCE OF THE GLUCOSE COMBINATIONS IN CELLULOSE TO ENZYME ATTACK, IT IS MORE DIFFICULT TO BREAK DOWN THAN STARCH. SOME FUNGI DIGEST CELLULOSE WELL BUT CELLULASE, THE CELLULOSE-DIGESTING ENZYME, IS NOT NEARLY AS WIDE-SPREAD AS AMYLASE, THE STARCH-DIGESTING ENZYME. IN THE COMPOSTING PROCESS CONDITIONS SHOULD BE ARRANGED TO FAVOR THE GROWTH OF CELLULOSE-DIGESTING FUNGI. MIXED WASTES DECOMPOSE IN STAGES, THE MORE READILY DECOMPOSABLE MATTER FIRST. THE FIRST STAGE SHOULD BE AEROBIC AND INVOLVE THERMOPHYLLIC BACTERIA TO DECOMPOSE SUGARS, STARCH, PROTEIN, AND HEMICELLULOSE, AND TO KILL INSECTS, WORM EGGS, AND PATHOGENS. AFTER THE FIRST STAGE THERE REMAINS LARGELY CELLULOSE AND LIGNIN WHICH FAVOR DEVELOPMENT OF FUNGI IF THE MOISTURE CONTENT IS MAINTAINED AT ABOUT 60 PERCENT AND GOOD AERATION IS PROVIDED. THE TEMPERATURE SHOULD NOT BE TOO HIGH BECAUSE AT THE MAXIMUM ATTAINABLE TEMPERATURE NO FUNGAL GROWTH OCCURS. (AUTH)

06-01-01986 EXPERIMENTS IN COMPOSTING REFUSE AND SLUDGE (DANO SLUDGE(SEWAGE))
BRAUN, R. + ALLENSPACH, H.
SCHWEIZ ZEITSCHRIFT FUR HYDROLOGIE 20, P. 1 (1958). INVESTIGATIONS INDICATE IT IS POSSIBLE TO ADD TO REFUSE EQUAL AMOUNTS OF SETTLED SLUDGE FROM A PRIMARY OR COMPLETE SEWAGE TREATMENT PLANT WHEN USING THE DANO BIOSTABILIZER COMPOSTER, PROVIDED THAT THE SLUDGE MOISTURE CONTENT IS REDUCED TO 70-75 PERCENT. THESE EXPERIMENTS WERE BASED ON USING SUMMER REFUSE. IT IS ASSUMED THAT, WITH THE DRIER WINTER REFUSE, THE AMOUNT OF SLUDGE ADDED COULD BE FURTHER INCREASED. TO WHAT EXTENT REFUSE-SLUDGE MIXTURES COULD BE COMPOSTED OTHER THAN IN IN THE BIOSTABILIZER MUST BE DETERMINED BY ADDITIONAL EXPERIMENTS. IT IS ALSO POSSIBLE TO MIX UNTHICKENED DIGESTED SLUDGE IN BIOSTABILIZERS, BUT IN AMOUNTS CONSIDERABLY LESS THAN FROM EQUIVALENT POPULATIONS. REFUSE-SLUDGE COMPOST CONTAINS TWICE AS MUCH ORGANIC MATERIAL AND 50 PERCENT MORE ALKALI-SOLUBLE HUMUS SUBSTANCES THAN THE USUAL REFUSE COMPOST. THE ADDITION OF SLUDGE ALSO IMPROVES THE NUTRITIONAL VALUE OF COMPOST. (AUTH)

06 02 PILOT PLANTS

06-02-00082 COMPOSTING GETS A TRYOUT (COMPOSTING COST(OPERATING) COST(PRODUCT))
THE AMERICAN CITY 80(4), P. 99 (APRIL 1965). A PILOT PLANT WAS BUILT IN SAN FERNANDO, CALIFORNIA, TO COMPOST DOMESTIC REFUSE. THE RATED CAPACITY OF THE PLANT IS 70 TONS PER DAY. OPERATING COSTS ARE PLACED AT 3.50 DOLLARS TO 4.50 DOLLARS PER TON OF REFUSE RECEIVED. THE PLANT LAYOUT IS DESCRIBED, AS ARE THE OPERATIONS. THE FINISHED COMPOST PRESENTLY IS SOLD AT TEN DOLLARS PER TON. THE PLANT IS OPERATED BY SACS, INC. SIX DAYS ARE REQUIRED TO COMPLETE THE TRANSFORMATION FROM A RAW MATERIAL TO A COMPOSTED SOIL CONDITIONER. THE EQUIPMENT USED IS SUPPLIED BY NATURIZER, INC. FINAL PRODUCT IS REPORTED TO BE LESS THAN 20 PERCENT OF THE VOLUME AND 80 PERCENT OF THE INCOMING REFUSE. (UC)

06-02-00241 COMPOSTING STUDIES I - COMPOSTING MUNICIPAL REFUSE BY THE AERATION BIN PROCESS (DESIGN)
MAIER, P. P. + WILLIAMS, E. R. + MALLISON, G. F.
PROC OF THE 12TH INDUSTRIAL WASTE CONF, SERIES 94, PURDUE UNIVERSITY ENGRG BULL, (MAY 13-15, 1957). COMPOSTING STUDIES WERE STARTED BY THE COMMUNICABLE DISEASE CENTER AT THE PHOENIX FIELD STATION IN DECEMBER 1953. THE PLAN WAS TO INVESTIGATE THE POTENTIALS OF THE WINDROW METHOD OF COMPOSTING AND TO PROCEED WITH SUCH MODIFICATIONS AS WERE INDICATED BY THE STUDIES. EFFORTS TO PROVIDE SUFFICIENT OXYGEN FOR BACTERIOLOGICAL ACTIVITY LED TO PLACEMENT OF GROUND REFUSE IN WINDROWS ON ELEVATED HARDWARE CLOTH RACKS SO THAT AIR COULD PERMEATE FROM BELOW THE MATERIAL AND CREATE A NATURAL DRAFT UPWARD. TEMPERATURE AND OXYGEN DETERMINATIONS PROVED THAT THIS METHOD WAS COMPLETELY SUCCESSFUL AND THAT THERMOPHILIC AEROBIC CONDITIONS WERE MAINTAINED IN ALL PARTS OF THE COMPOSTING MASS EXCEPT THE OUTER 2 INCHES AT THE SURFACE. THE PILOT PLANT NEEDED MUCH HAND LABOR, AND THEREFORE NO RELIABLE COST DATA COULD BE GIVEN. SINCE THE PROCESS NEEDED FURTHER STUDY, A DEMONSTRATION PLANT (CAPACITY 70 TONS PER WEEK) WAS DESIGNED FOR COMPOSTING REFUSE FROM CHANDLER, ARIZONA, SO THAT FURTHER REFINEMENTS ON THE PROCESS COULD BE MADE AND RELIABLE COST DATA BE GATHERED. THE PLANT WAS ABLE TO INCORPORATE SEWAGE SLUDGE FROM THE CITY INTO THE REFUSE FOR COMPOSTING, AND IN THE FIRST FEW WEEKS OF OPERATION RESULTS WERE SATISFACTORY. FURTHER TESTS AND EXPERIMENTS ARE PLANNED AT THE PLANT TO STUDY EFFECTS OF DIFFERENT FACTORS ON FINAL COMPOST. (UC)

06-02-00249 SAN FERNANDO PLANT USES "TOTAL SYSTEM CONCEPT" (COMPOSTING COST(CAPITAL))
GOLUEKE, C. G.
COMPOST SCIENCE 3(3), P. 5-8 (AUTUMN 1962). APPLICATION OF NATURIZER PROCESS IN PILOT PLANT OPERATED BY GENERAL CONVERSIONS SYSTEM CORP. AT SAN-FRANCISCO, CALIFORNIA, TO EVALUATE USE OF SALVAGE AND GENERAL CONVERSION SYSTEMS IN REFUSE DISPOSAL. PERFORMANCE OF PLANT. FLOW DIAGRAM OF COMPOSTING PHASE. (EI)

06-02-00255 COMPOSTING STUDIES II - PROGRESS REPORT ON HIGH-RATE COMPOSTING STUDIES
WILEY, J. S.
PROC OF THE 12TH INDUSTRIAL WASTE CONF, SERIES 94, PURDUE UNIVERSITY ENGRG BULL, P. 590-595 (MAY 13-15, 1957). RESULTS FROM RUNS MADE BY COOLING COMPOSTING MATTER DURING THE THERMOPHILIC PORTION OF THE DECOMPOSITION CYCLE INDICATE THAT THE BEST DECOMPOSITION MAY OCCUR AT TEMPERATURES LESS THAN THOSE ATTAINED IN NONCOOLED UNITS. A TEMPERATURE OF ABOUT 145 DEGREES F RESULTED IN BETTER DECOMPOSITION THAN WAS ATTAINED IN NONCOOLED UNITS IN WHICH THE MAXIMUM TEMPERATURE WAS 152 TO 162 DEGREES F. HEAT PRODUCTION IN A LABORATORY BATCH OF REFUSE COMPOSTING FOR 8 TO 10 DAYS AMOUNTS TO 3000 BTU PER LB OF VOLATILE SOLIDS. IT IS UNDESIRABLE TO HEAT THE MATERIAL TO BE COMPOSTED TO THE THERMOPHILIC LEVEL IN ORDER TO SPEED UP INITIAL DECOMPOSITION. MR. WILEY REPORTED IN 1955 THAT BETTER DECOMPOSITION MIGHT BE ATTAINED BY PREVENTING THE MAXIMUM TEMPERATURE FROM REACHING THE HIGH VALUES (150 DEGREES TO 168 DEGREES F) WHICH NORMALLY OCCUR IN INSULATED UNITS. A FEW RUNS WERE MADE IN WHICH A WATER JACKET WAS USED TO COOL COMPOST DURING THE THERMOPHILIC PORTION OF THE COMPOSTING PROCESS. RESULTS INDICATE THAT BEST DECOMPOSITION MAY OCCUR AT TEMPERATURES SOMEWHAT LESS THAN THOSE USUALLY ATTAINED IN UNCOOLED UNITS. IT APPEARS THAT A MUCH BETTER DECOMPOSITION RESULTS IF THE TEMPERATURE IS KEPT AT A MAXIMUM OF ABOUT 130 DEGREES TO 140 DEGREES F. RESULTS OBTAINED WITH THE MAXIMUM TEMPERATURE KEPT AT 145 DEGREES F WERE SOMEWHAT BETTER THAN THOSE BASED ON A DECOMPOSITION ATTAINED IN NONCOOLED UNITS AT MAXIMUM TEMPERATURES OF ABOUT 153 DEGREES TO 162 DEGREES F. COOLING BELOW 120 DEGREES F DOES NOT APPEAR TO BE DESIRABLE. THE ARTICLE DEALS WITH HEAT PRODUCTION FROM COMPOSTING AND ITS POSSIBLE USE, AND GIVES TABLES AND FIGURES FOR INFORMATION. HEAT PRODUCTION IN A LABORATORY BATCH COMPOSTING OF REFUSE FOR EIGHT DAYS AMOUNTED TO ROUGHLY 3000 BTU PER LB OF VOLATILE SOLIDS LOST OR DECOMPOSED. A STUDY WAS MADE TO DETERMINE THE EFFECT OF PREHEATING ON THE COMPOSTING PROCESS. TWO UNITS WERE FILLED WITH REFUSE, ONE WAS HEATED TO 128 DEGREES TO 132 DEGREES F THROUGHOUT AN EIGHT-DAY RUN. DECOMPOSITION IN THE HEATED DRUM WAS ONLY 1/9 THAT IN THE CONTROL DRUM AS JUDGED BY CO_2 PRODUCTION, AND ONLY 1/4 THAT OF THE CONTROL DRUM AS JUDGED BY DESTRUCTION OF VOLATILE SOLIDS. THESE RESULTS INDICATE THAT MATERIAL TO BE COMPOSTED SHOULD NOT BE PREHEATED TO THE THERMOPHILIC LEVEL IN ORDER TO SPEED UP DECOMPOSITION. (UC)

06-02-00273 HOME COMPOSTING UNITS (THERMOPHILIC)
SCHULZE, K. L.
COMPOST SCIENCE 3(4), P. 5-8 (WINTER 1963). FEATURES OF SMALL-SCALE PILOT PLANT DEVELOPED BY AUTHOR FOR USE IN COMPOSTING EXPERIMENTS AT MICHIGAN STATE UNIVERSITY. TYPE OF UNIT USED WAS 55 GAL INSULATED STEEL DRUM, I.E., CLOSE TO SMALLEST SIZE OF EQUIPMENT THAT CAN BE USED FOR THERMOPHILIC COMPOSTING PROCESS. EXPERIMENTS SHOWED THAT IT WAS POSSIBLE TO OPERATE SUCH UNIT CONTINUOUSLY AT TEMPERATURES BETWEEN 127 AND 158 F. (EI)

06-02-00674 POSSIBILITIES OF COMPOSTING MUNICIPAL REFUSE (COMPOST(CONDITION) FERTILIZER-VALUE COST(OPERATING))
MCGAUHEY, P. H. + GOLUEKE, C. G.
PUBLIC WORKS, (OCTOBER 1953). A FULL REPORT IS GIVEN OF THE COMPOSTING PROCESS. THE BERKELEY PILOT PLANT WAS USED TO ESTABLISH THE PRINCIPAL ECONOMIC AND DESIGN FACTORS INVOLVED IN COMPOSTING WASTE MATERIALS EITHER ALONE OR WITH DIGESTED SEWAGE SLUDGE OR CANNERY WASTES. TYPICAL COMPOSTING CYCLES ARE PRESENTED AND THE VALUE OF COMPOST AS FERTILIZER AND ASSOCIATED PRODUCTION COSTS ARE DISCUSSED.

06-02-00712 MODEL PLANT TO DEMONSTRATE COMPOSTING
PUBLIC WORKS 99(8), P. 64-66 (AUGUST 1968). A MODEL COMPOSTING DEMONSTRATION PLANT, DESIGNED TO EVALUATE THE FEASIBILITY FOR USE BY CITIES FOR REFUSE DISPOSAL, WAS RECENTLY DEDICATED IN JOHNSON CITY, TENN. THE PLANT IS A JOINT PROJECT OF THE SOLID WASTES PROGRAM OF THE PUBLIC HEALTH SERVICE'S NATIONAL CENTER FOR URBAN AND INDUSTRIAL HEALTH, THE TENNESSEE VALLEY AUTHORITY AND JOHNSON CITY. IT PROVIDES FOR DEMONSTRATION OF AN INTEGRATED MUNICIPAL WASTE DISPOSAL FACILITY WITH THE CAPACITY OF PROCESSING DAILY UP TO 70 TONS OF RESIDENTIAL AND COMMERCIAL REFUSE COMBINED WITH SEWAGE SLUDGE INTO A USEFUL COMPOST IN 7 TO 8 WEEKS. COMPOST, PRODUCED BY THE PARTIAL DECOMPOSITION OF ORGANIC MATTER, IS A SOIL CONDITIONER WITH CHARACTERISTICS SOMEWHAT SIMILAR TO THOSE OF PEAT MOSS. THE PUBLIC HEALTH SERVICE'S NATIONAL CENTER THROUGH ITS SOLID WASTES PROGRAM, IS FINANCING CONSTRUCTION AND OPERATION OF THE JOHNSON CITY PLANT AND PROVIDES TECHNICAL DIRECTION AND PROCESS CONTROL. CAPITAL COST OF BRINGING THE PLANT TO OPERATIONAL STATUS IS APPROXIMATELY $900,000. RESEARCH AND INVESTIGATIONS TO DATE COST ABOUT $400,000. AT THE JOHNSON CITY DEMONSTRATION PLANT, THE REFUSE COLLECTED FROM ITS 34,000 RESIDENTS IS DELIVERED TO THE PLANT CONVEYORS AT THE RATE OF ABOUT 60 TONS A DAY. NONCOMPOSTABLE MATERIALS, WHICH AVERAGE ABOUT 25 PERCENT BY WEIGHT, ARE SORTED OUT AND DISPOSED OF IN THE CITY LANDFILL. COMPOSTABLES ARE GROUND, MIXED WITH SEWAGE SLUDGE, AND THE MIXTURE SET OUT TO COMPOST IN LONG WINDROWS 5 FT HIGH ON A FIVE-ACRE FIELD. PROCESSING IN THE FIELD TAKES 5 OR 6 WEEKS, AND DURING THIS TIME THE MIXTURE IS TURNED 8 TO 12 TIMES AND MOISTURE IS KEPT AT BETWEEN 45 AND 60 PERCENT. AFTER THE DECOMPOSITION PROCESS, THE COMPOST IS CURED FOR APPROXIMATELY TWO WEEKS IN AN OPEN SHED. IT IS THEN REGROUND AND SCREENED FOR DISTRIBUTION. DAILY COMPOST PRODUCTION IS EXPECTED TO EXCEED 25 TONS.

06-02-00719 REFUSE-SLUDGE COMPOSTING IN WINDROWS AND BINS
WILEY, J. S. + SPILLANE, J. T.
PROC AM SOC CIVIL ENGRG J SANIT ENGRG DIV, P. 87. SUCCESSFUL COMPOSTING WAS ACHIEVED AT CHANDLER, ARIZONA, IN 2 RUNS INVOLVING 4 WINDROWS AND 25 AERATION BINS OF GROUND REFUSE AND REFUSE-SLUDGE MIXTURES. THE COMPOSTING MATERIALS WERE TURNED AN AVERAGE OF 5.1 TIMES BY REGRINDING AND WERE COMPOSTED FOR A MEAN OF 34.4 DAYS. THE 2 METHODS PRODUCED VERY SIMILAR RESULTS WITH AN AVERAGE DECOMPOSITION OF 38.8 PERCENT OF THE VOLATILE SOLIDS. THE RAW REFUSE WAS OF POOR QUALITY AND THE SLUDGE HAD A HIGH WATER CONTENT. PASTEURIZING TEMPERATURES WERE MAINTAINED FOR DAYS, AND THERE WERE LITTLE ODOR OR FLY PROBLEMS. THE WINDROW METHOD APPEARS TO BE PRACTICAL FOR PLANT-SCALE USE AND SHOULD ADEQUATELY DECOMPOSE REFUSE OR REFUSE-SLUDGE MIXTURES IN A TOTAL TIME OF ABOUT 5 WEEKS WITH 5 VIGOROUS TURNINGS DURING THE FIRST THREE WEEKS. (EI)

06-02-00835 CONCEPT AND DESIGN OF 3-WAY COMPOSTING PROJECT
WILEY, J. S. + GAPTRELL, F. E. + SMITH, H. G.
COMPOST SCIENCE 7(2), P. 11-14 (AUTUMN 1966). COORDINATED RESEARCH ACTIVITIES OF U.S. PUBLIC HEALTH SERVICE AND TVA CONCERNING MEANS OF CONVERTING COMPOSTS INTO FORMS SUITABLE FOR LARGE-SCALE DISPOSAL AND TO DETERMINE AGRONOMIC VALUES OF SUCH PRODUCTS. DESIGN OF COMPOSTING PLANT UNDER CONSTRUCTION AT JOHNSON CITY, TENN. ADJACENT TO ITS SEWAGE TREATMENT PLANT. PLANT WILL BE OF WINDROW TYPE CAPABLE OF TREATING ALL MIXED REFUSE AND RAW SEWAGE SLUDGE FROM CITY OF 33,000 POPULATION. (EI)

06-02-00881 HIGH RATE COMPOSTING
SNELL, J. R.
CONSULTING ENGR 4(8), P. 49-53 (AUGUST 1954). DESCRIPTION OF PLANT ON MICHIGAN STATE CAMPUS- GARBAGE IS GROUND AND TAKEN BY BUCKET CONVEYOR TO THE TOP OF A DIGESTER HAVING EIGHT LEVELS. A SLOWLY REVOLVING SHAFT TURNS PLOWS MOUNTED ON THE CROSSARM OF EACH OF THE EIGHT DECKS. THE ROTATING PLOWS AERATE AND MIX THE REFUSE AND GRADUALLY PUSH IT TO AN OPENING IN THE DECK THROUGH WHICH IT DROPS TO THE NEXT DECK. RETENTION PERIOD IN THE COMPOSTER VARIES FROM TWO TO FOUR DAYS. BASED ON A 3-1/2 DAY DETENTION PERIOD, THE DIGESTER'S CAPACITY IS 4500 LBS/DAY. (UC)

06-02-01164 REFUSE SEPARATION AND COMPOSTING IN EDINBURGH (DANO ECONOMICS MARKETING)
SCOTT, J.
COMPOST SCIENCE 2(3), P. 7-12 (AUTUMN 1961). THREE INCINERATORS, BUILT IN 1893, 1938 AND 1939, WERE USED TO TREAT THE REFUSE OF EDINBURGH, THE TWO LATTER INCLUDING SEPARATION AND SALVAGE PLANTS. IN 1953 A FOURTH PLANT WAS NEEDED, AND CONSIDERING COSTS, AIR POLLUTION, AGRICULTURAL NEEDS, AND SUBSEQUENT SLUDGE TREATMENT, THE CITY DECIDED ON COMPOSTING. A 20-TON/DAY PILOT PLANT, COMPLETED IN JULY 1955, EMPLOYED THE DANO BIOSTABILIZER SYSTEM. THE HIGH DUST AND CINDER CONTENT FROM ASHES NECESSITATED PRE-SCREENING SO THAT THE TAILINGS WERE COMPOSTED FOR 5 DAYS AND THEN FURTHER SCREENED TO REMOVE UNDECOMPOSABLE MATERIAL. TWO PERCENT AMMONIACAL LIQUOR (80 GAL./ TON) WAS USED, AS SLUDGE

WAS NOT AVAILABLE. A MARKET READILY DEVELOPED FOR COMPOST. CONTRACTS WERE THEN LET FOR A 140 T/DAY DANO PLANT TO REPLACE THE DEFUNCT INCINERATOR. THE FORMER HAS PRE-SCREENING, SALVAGE, 2 BIOSTABILIZERS, AND FINAL SCREENING. THE LATTER USES THE EXISTING SEPARATION PLANT. THE PLANT MET THE RATED CAPACITY AND SHOWS A SAVINGS OVER SEPARATION AND INCINERATION. BASED ON A NEW INCINERATOR PLANT DESIGN, THE SAVINGS WOULD BE GREATER. ONLY 42 TO 47 PERCENT OF EDINBURGH REFUSE REMAINS FOR COMPOSTING AFTER SEPARATION OF DUST, CINDERS, STONES, GLASS AND METALS. AFTER COMPOSTING, 22 PERCENT OF INITIAL WEIGHT IS REJECTED AND 24.7 PERCENT REMAINS. INCINERATION IS SIMILAR AS 21.1 PERCENT CLINKERS REMAIN. PATHOGENS ARE BELIEVED ENTIRELY DESTROYED EVEN THOUGH THE TEMPERATURES ARE ONLY 110-130 DEGREES F. GLASS, ESTIMATED AT 6.7 PERCENT, IS BEST SORTED OUT INITIALLY AND THEN SCREENED OUT AFTER COMPOSTING WITH VIBRATING SCREENS INSTEAD OF ROTARY SCREENS. THE AUTHOR, SATISFIED WITH THE COMPOSTING PROCESS AS A " SOUND, PRACTICABLE DISPOSAL PLANT, " STATES THAT " THE IDEAL ARRANGEMENT SHOULD COMBINE DOMESTIC WASTES AND SEWAGE. ANY AUTHORITY FACED WITH A REFUSE DISPOSAL OR SLUDGE DISPOSAL PROBLEM SHOULD, AT LEAST, INVESTIGATE THE POSSIBILITIES OF COMPOSTING. " (PHEA)

06-02-01177 PHS GRANTS $250,000 FOR FLORIDA COMPOST STUDY
COMPOST SCIENCE 7(2), P. 25 (AUTUMN 1966). A 130 TPD COMPOST PLANT COSTING $250,000 WILL BE BUILT IN GAINESVILLE, FLORIDA, AS DEMONSTRATION PLANT TO COMPOST GARBAGE, SEWAGE SOLIDS, AND OTHER SOLID WASTE.

06-02-01423 COOPERATION FOR COMPOSTING (COST(CAPITAL) COST(OPERATING))
AM SOC CIVIL ENGRG SANIT ENGRG DIV, NEWSLETTER, P. 6 (JULY 1966). THE TENNESSEE VALLEY AUTHORITY, JOHNSON CITY, TENNESSEE, AND THE PUBLIC HEALTH SERVICE WILL UNDERTAKE A FULL-SCALE COMPOSTING STUDY OF MUNICIPAL REFUSE AND RAW SEWAGE SLUDGE. THE TVA WILL DESIGN, CONSTRUCT, AND OPERATE A COMPOSTING PLANT AT JOHNSON CITY, DISPOSING OF THAT CITY'S WASTES OF ABOUT 60 TONS DAILY. ONE OF THE AIMS OF THE PROJECT IS TO FIND AN ECONOMIC USE FOR THE FINISHED PRODUCT, IN THE FORM OF SOIL CONDITIONERS AND FERTILIZERS, TO OFFSET DISPOSAL COSTS. THE INVESTIGATORS ALSO WISH TO DETERMINE WHETHER OR NOT COMPOSTING IS A SAFE MEANS OF DISPOSING OF REFUSE AND RAW SEWAGE SLUDGE WITHOUT CREATING HEALTH HAZARDS. THE PLANT WILL COST $750,000 TO CONSTRUCT AND ABOUT $100,000 ANNUALLY TO OPERATE. AS A PART OF THE PROCESS, METALS AND GLASS WILL BE REMOVED, AND THE REMAINING REFUSE WILL BE GROUND WITH SEWAGE SLUDGE. THE WASTES WILL BE STACKED IN LONG ROWS TO FACILITATE DECOMPOSITION. TESTS WILL BE MADE ON THE USE OF COMPOST ON "POOR SOIL", AND STUDIES WILL BE MADE TO DETERMINE ITS AGRICULTURAL VALUE. (UC)

06-02-01440 PILOT-PLANT GARBAGE COMPOSTER (COST(OPERATING) COMPOSITION PROPERTIES(COMPOST) SLUDGE(SEWAGE))
QUARTLY, E. V.
THE AMERICAN CITY 71(10), P. 109 (OCTOBER 1956). A DETAILED REPORT OF INVESTIGATIONS BY THE CITY OF SAN DIEGO, CALIFORNIA WITH THE CONCLUSION THAT THE PROCESS IS PROMISING BUT STILL ECONOMICALLY PROBLEMATIC. INCLUDED ARE DATA ON MOISTURE CONTENT OF REFUSE AND COMPOST, CHEMICAL ANALYSIS (NPK), COST OF PRODUCTION, AND RECOMMENDATIONS FOR FURTHER STUDY. (PHS)

06-02-01522 A FIELD STUDY ON THE DISPOSAL OF GARBAGE AND NIGHT SOIL BY COMPOSTING (PATHOGEN)
WANG, Y.
SCIENCE AND TECHNOL, CHINA 1, P. 80-82 (1948). PI-SHAN, SZECHUAN, WAS USED FOR AN 8-MONTH EXPT. IN WHICH 18 TONS OF NIGHT-SOIL WAS COMPOSTED WITH AN EQUAL WEIGHT OF GARBAGE (HOUSE WASTE) PRODUCING 20 TONS OF MANURE. THE COMPOST BRICKS CONTAINED AN AVERAGE OF 0.91 PERCENT N (KJELDAHL), 1.03 PERCENT P, AND 22.15 PERCENT VOLATILE MATTER (DRY BASIS). THE TEMPERATURE DEVELOPED (ABOVE 60 DEGREES) WAS SUFFICIENT TO DESTROY DISEASE GERMS AND FLY LARVAE. (CA)

06-02-01540 CAPITALIZING ON MUNICIPAL WASTES BY COMPOSTING (COST(CAPITAL) COST(OPERATING) ECONOMICS SALVAGE)
STOVOROFF, R. P.
PAPER PRESENTED AT THE ANNUAL MEETING OF AM SOC OF ENGRS, NEW YORK, (OCTOBER 20, 1953). IN OAKLAND, CALIFORNIA, AN EXPERIMENTAL COMPOSTING PLANT WAS CONSTRUCTED IN WHICH THE OPEN WINDROW COMPOSTING METHOD WAS USED. THE VALUES THAT FOLLOW ARE FOR OAKLAND ONLY, THEY ARE NOT AN AVERAGE. A PLANT WITH A CAPACITY OF HANDLING 265 TONS OF REFUSE 8 HOURS PER DAY, 5 DAYS PER WEEK WILL PRODUCE 125 TONS OF COMPOST AND 80 TONS OF MARKETABLE SCRAP MATERIALS PER DAY. THE CAPITAL INVESTMENT WOULD BE $715,000. THE FORECASTED YEARLY PROFIT, $235,000. LABOR COSTS PER TON WOULD BE $2.45. OTHER COSTS PER TON WOULD BE $0.45. COMPOSTING HAS NOT WORKED BEFORE IN THE UNITED STATES BECAUSE OF THE LACK OF SCIENTIFIC KNOW-HOW AND POOR TIMING. (UC)

06-02-02147 COMPOSTING OPERATIONS IN LOS ANGELES COUNTY
COMPTON, C. R. + BOWERMAN, F. R.
COMPOST SCIENCE 1(4), P. 5-8 (WINTER 1961). A DESCRIPTION IS GIVEN OF A PILOT PLANT WHERE THE SANITATION DISTRICT OF LOS ANGELES COUNTY HOPES TO PRODUCE A SALEABLE COMPOST BY UTILIZING THE SLUDGE FROM 270 MILLION GAL/DAY OF SEWAGE AND 3,000 TONS OF REFUSE TO PRODUCE ABOUT 5,000 TONS DAILY OF COMPOST.

06 03 FULL-SCALE OPERATIONS

06-03-00090 ELMIRA TO TRY COMPOSTING (COST(CAPITAL) COST(SUBSIDY))
SANFORD, C. F.
THE AMERICAN CITY 80(7), P. 93 (JULY 1965). ELMIRA, NEW YORK, FACED WITH A WASTE DISPOSAL PROBLEM THAT COULD NOT BE HANDLED BY ANY OTHER MEANS, TURNED TO COMPOSTING IN JULY 1964. NORCO OF ATLANTA, GEORGIA, CONTRACTED TO BUILD, FINANCE, AND OPERATE THE PLANT. UNDER A 20-YEAR AGREEMENT, THE CITY WILL PAY 4.35 DOLLARS PER TON OF REFUSE. THE COST OF THE PLANT WILL BE 650,000 DOLLARS. FROM 20,000 TO 40,000 TONS OF REFUSE WILL BE COMPOSTED EACH YEAR. (UC)

06-03-00096 THREE COMPOSTING PLANTS AND AN INCINERATOR
THE AMERICAN CITY 81(1), P. 20 (JANUARY 1966). HOUSTON, TEXAS, HAS SIGNED CONTRACTS FOR THREE COMPOSTING PLANTS AND AN INCINERATOR. EACH IS DESIGNED TO HANDLE 300 TONS OF RAW REFUSE PER DAY. HOUSTON WILL PAY 3.50 DOLLARS PER TON FOR DISPOSAL. THE CITY SUPPLIED THE PLANT SITES BUT WILL NOT INCUR OTHER CAPITAL COSTS. SELLING PRODUCT WILL BE CONTRACTORS RESPONSIBILITY. CITY CAN CLOSE ANY PLANT THAT IS A NUISANCE.

06-03-00102 NO COVER MATERIAL NEEDED FOR CONVERTED REFUSE (REDUCTION(VOLUME) SANITARY-LANDFILL)
THE AMERICAN CITY 81, P. 18 (FEBRUARY 1966). THE BULLINGDON RURAL DISTRICT COUNCIL AT WHEATLEY, OXFORDSHIRE, ENGLAND, RECENTLY INSTALLED A REFUSE CONVERSION PLANT WHICH SEPARATES REFUSE INTO A PEAT-LIKE PRODUCT AND REJECTS MATERIAL SUCH AS TIN CANS, RAGS, PLASTICS, AND RUBBLE. THE PRODUCT IS USED TO COVER REJECTS AT THE LANDFILL. IT HAS A DENSITY OF APPROXIMATELY 2-1/2 CU-YD/TON WHEN DISCHARGED FROM THE PLANT. BACTERIAL ACTIVITY AT THE FILL REDUCES THE VOLUME BY ABOUT 20 PERCENT. SETTLEMENT TAKES PLACE EVENLY. THE PLANT CONSISTS OF A 20-FT LONG BY 8-FT DIAMETER DRUM WHICH ROTATES AT 11.5 RPM. WATER IS ADDED TO THE REFUSE UNTIL IT ACQUIRES A MOISTURE CONTENT OF 40 PERCENT. WITH THE MOISTURE CONTENT AT THIS LEVEL, IT IS EASY TO BREAKUP THE FIBROUS MATERIAL BY THE TUMBLING ACTION. AFTER 45 MINUTES OF TUMBLING, THE BROKEN UP MATERIAL IS SCREENED AND SEPARATED. THE DRUM HAS A RATING OF 50 TO 60 TONS OF REFUSE PER DAY, AND IS OPERATED BY TWO MEN. (UC)

06-03-00149 COMPOSTING - ITS ROLE IN EUROPEAN REFUSE DISPOSAL (COST(OPERATING) COMPOSITION(COMPOST) INCINERATOR)
SPITZER, E. F.
THE AMERICAN CITY 79(10,11), P. 102-105 (OCTOBER 1964), P. 85-87 (NOVEMBER 1964). REVIEW OF DEVELOPMENTS ON COMPOSTING OF REFUSE IN VARIOUS CITIES OF EUROPEAN COUNTRIES. INCINERATION AND HOW PLANTS IN EUROPE DIFFER FROM THOSE IN UNITED STATES ARE ALSO DISCUSSED. DESIGN FEATURES OF INCINERATOR PLANTS IN PARIS, VIENNA, ROTTERDAM AND FRANKFURT. IT WAS NOTED THAT COMPOSTING MAY SERVE TWO OBJECTIVES - (1) TO REMOVE CITY REFUSE AND (2) TO MANUFACTURE A SOIL CONDITIONER OR A FERTILIZER BASE. THE PROBLEM OF COMPOST OVER-SUPPLY AND THE CONCEPT OF CONTROLLED OUTPUT ARE DISCUSSED. CURRENT COMPOSTING PRACTICES AND COSTS ARE PRESENTED. (EI)

06-03-00162 COMPOSTING WORKS IN HOUSTON (INCINERATION COMPOSTING COST(SUBSIDY) COST(OPERATING))
SPITZER, E. F.
THE AMERICAN CITY 82, P. 97 (OCTOBER 1967). AN ACCOUNT IS PRESENTED OF COMPOSTING IN HOUSTON. SINCE NOVEMBER OF 1966, METRO-WASTES CORP. HAS COMPOSTED OVER 65,000 TONS OF WASTES. ONLY 2 PERCENT TO 3 PERCENT BY WEIGHT OF THE RAW MATERIAL HAD TO BE DISPOSED OF BY LANDFILL. ANOTHER COMPANY IN HOUSTON, WHICH HAD COMPOSTED OVER 8000 TONS DURING THE FIRST FOUR MONTHS OF THIS YEAR, WAS CLOSED BECAUSE EXTREME PRESSURE BY IRATE CITIZENS FORCED THE CITY TO STOP DELIVERING REFUSE TO THE PLANT. THE MARKET FOR COMPOST IS SEASONAL, AND PROSPECTS FOR ITS DISPOSAL ARE NOT VERY BRIGHT AT PRESENT. IDEAS OF THE COMPANY DIRECTORS AS TO WAYS TO DEVELOP A MARKET ARE PRESENTED. FOR POTENTIAL MARKETS, THE COMPOST SHOULD BE BLENDED WITH FERTILIZERS TO FORM AN ENRICHED ORGANIC PRODUCT. THE PRODUCT COULD BE SOLD TO PAPER COMPANIES FOR USE IN REFORESTATION PROGRAMS. IT CAN BE USED IN RECLAMATION AND CONSERVATION PROJECTS. THE METRO PLANT IN HOUSTON HAS A CAPACITY OF 360 TONS PER DAY. IT COST $2 MILLION EXCLUSIVE OF LAND. THE COMPANY PAYS RENT ON THE LAND, AND TAXES ON THE BUILDINGS AND MACHINERY. IT HAS A WORKFORCE OF 29. (UC)

06-03-00169 ST. PETERSBURG SHUTS DOWN 'MODEL' COMPOST PLANT AS MALODOROUS 'PUBLIC NUISANCE' (COMPOSTING INCINERATION COST(SUBSIDY))
AIR/WATER POLLUTION REPORT 6(8), P. 59 (FEBRUARY 19, 1968). THE 2-MILLION DOLLAR ST. PETERSBURG COMPOST PLANT, OPENED IN 1966 AS A MODEL POLLUTION-FREE RECLAMATION FACILITY, HAS BEEN SHUTDOWN BY THE CITY COUNCIL AS A "PUBLIC NUISANCE." BECAUSE OF UNCONTROLLED ODORS. THE PLANT, LOCATED IN A RESORT AND RETIREMENT COMMUNITY, WAS BUILT AS A PILOT PROJECT FOR OTHERS AROUND THE COUNTRY BY INTERNATIONAL DISPOSAL CORP. THE LATTER IS ONE-THIRD OWNED BY WESTINGHOUSE ELECTRIC CORP., ONE-THIRD BY ALLSTATE INSURANCE CORP., AND ONE-THIRD BY SALVAGE AND CONVERSION SYSTEMS, INC. THE FACILITY TOOK 600 TONS OF GARBAGE WEEKLY AND PRODUCED "CURA" SOIL CONDITIONER, AND RECENTLY ADDED A 60,000 DOLLAR BLENDER TO MAKE "CURA-SOIL" FERTILIZER. IN UNANIMOUS ACTION, THE CITY COUNCIL TERMINATED IDC'S 20-YEAR CONTRACT. AN ARBITRATION SMELL-COMMITTEE, TOLD THE COUNCIL THAT "THIS PLANT IN ITS PRESENT STATE OF DESIGN AND OPERATION HAS CONSIDERABLE POTENTIAL FOR ODOR GENERATION AND IS IN FACT GENERATING ODORS TO THE POINT OF BEING A PUBLIC NUISANCE." THE SCENTS FROM THE FACILITY WERE DESCRIBED BY CITIZENRY AS VARYING FROM ROTTEN APPLES TO STALE BEER TO MUSK. AN IDC SPOKESMAN EXPLAINED THE STENCH AS ARISING WHEN BACTERIAL ACTION IS INTERRUPTED BY CHANGE IN TEMPERATURE, OR IN AMOUNT OF OXYGEN OR CARBON DIOXIDE, OR WHEN THERE IS A MECHANICAL BREAKDOWN. MEANWHILE, THE CITY IS SENDING ITS WEEKLY 600 TONS OF FORMERLY COMPOSTED REFUSE TO AN INCINERATOR WHICH ALREADY BURNS ABOUT 2,000 TONS OF CITY REFUSE WEEKLY. THE CITY HAD BEEN PAYING IDC $3.24/TON AND THE INCINERATOR OPERATOR $3.40/TON.

06-03-00201 QUESTIONS AND ANSWERS ON COMPOSTING (COMPOSTING COMPOST(QUANTITY) COST(SUBSIDY) MARKETING)
THE AMERICAN CITY 78(9), P. 119 (SEPTEMBER 1963). PHOENIX, ARIZONA HAS A 300 TON PER DAY COMPOSTING PLANT OPERATING UNDER CONTRACT WITH ARIZONA BIOCHEMICAL CO. QUESTIONS AND ANSWERS ABOUT COMPOST MARKETING, QUALITY OF THE COMPOST, APPEARANCE, REVENUE, ETC. ARE GIVEN.

06-03-00205 THE ARNHEM COMPOST PLANT - NOTES ON ITS OPERATION DURING 1961 (COMPOSTING COMPOSITION)
WILMES, L.
HET ARNHEMSE KOMPOSTBEDRIJF, ZIJN WERKING EN AFZET GEDURENDE HET JAAR 1961, TECH WETENSCH TIJDSCHR 32(3), P. 96-100 (MARCH 1963). IN 1958 IT WAS DECIDED TO BUILD A COMPOST PLANT AT ARNHEM AND THE CONSTRUCTION WAS STARTED IN OCTOBER OF THE SAME YEAR. THE OFFICIAL OPENING TOOK PLACE IN APRIL 1961. THE PRESENT ARTICLE GIVES A DESCRIPTION OF THE PLANT, AS WELL AS SOME PARTICULARS ON ITS FIRST YEAR OF OPERATION. (AUTH)

06-03-00206 WHY THE CITY OF GHENT CHOSE TO COMPOST HOUSE REFUSE (COMPOSTING)
VANHOEGAERDEN, F.
WAAROM DE STAD GENT DE KOMPOSTERING VAN HET HUISVUIL HEEFT VERKOZEN TECH WETENSCH TIJDSCHR 32(3), P. 113-117 (MARCH 1963). AFTER HAVING SUMMARILY DEALT WITH THE PROBLEM OF HOUSE REFUSE DISPOSAL AND WITH THE PROPERTIES OF THE GARBAGE, THE AUTHOR POINTS TO THE SIGNIFICANCE OF SUCH GARBAGE FOR AGRICULTURE. HE FURTHER DEALS WITH THE VARIOUS METHODS OF GARBAGE DISPOSAL AND THUS WITH THE SOLUTION WHICH HAS PREVAILED IN GHENT, I.E. WITH THE TRANSFORMATION INTO A COMPOST. HE FINALLY DESCRIBES THE PLANT WHICH WAS ERECTED THERE FOR THIS PURPOSE IN SEPTEMBER 1961 AND IS NOW NEARING COMPLETION. (AUTH)

06-03-00208 ORGANIZATION OF GARBAGE COLLECTION AND DISPOSAL AT MAASTRICHT (COMPOSTING COMPOSITION)
VAN DE VENNE, J.
DE ORGANIZATRE VAN HET VERWERKEN VAN HUISVUIL IN MAASTRICHT, TECH WETENSCH TIJDSCHR 32(3), P. 113-117 (MARCH 1963). IN 1955 A INVESTIGATION WAS MADE OF OTHER METHODS FOR HOUSE REFUSE DISPOSAL THAN THE CONVEYANCE THEREOF TO THE PUBLIC DUMPS, AS HAD BEEN CUSTOMARY BEFORE. THE CHOICE FELL UPON A DANO PLANT FOR COMPOST MAKING, BASED ON THE BIOSTABILIZER SYSTEM. THE PLANT WAS READY FOR OPERATION IN 1959. THIS ARTICLE GIVES A DESCRIPTION OF THE PLANT AND SUPPLIES DETAILS ABOUT THE PRODUCTION, COMPOSITION AND MARKETING OF THE COMPOST WHICH IS BEING PREPARED THERE. (AUTH)

06-03-00214 REFUSE COMPOSTING PLANT AT TURGI, SWITZERLAND (COMPOSTING CAPACITY)
LEUTELT, H.
AUFBEREITUNGS-TECHNIK 6(5), P. 284-288 (MARY 1965). REFUSE BIN WITH CAPACITY OF 20 TPH IS CHARGED BY SPECIAL VEHICLES. AFTER SEPARATION OF IRON PARTS COMMINUTION IS EFFECTED IN NOVOROTOR HAMMER MILL. AFTER SCREENING, REFUSE IS MIXED AND COMMINUTED IN FERMENTATION CELL (MULTIBACTOTURM) WITH 8 STAGES ARRANGED ONE ABOVE ANOTHER. ON WEEKLY AVERAGE 16 TPH OF CRUDE REFUSE WERE TREATED. THIS CORRESPONDS TO PEAK CAPACITY OF 20 TPH. (EI)

06-03-00216 COMPOSTING OF SOLIDS CITY WASTE (SALVAGE GLASS-REMOVAL)
FRANGIPANE, E. D. F.
COMPOST SCIENCE 3(2), P. 9-13 (SUMMER 1962). REVIEW OF MUNICIPAL COMPOSTING METHODS IN TERMS OF ACCEPTABILITY FROM SANITARY AND ECONOMICAL STANDPOINT. TECHNIQUES OF GARBAGE COMPOSTING, BIOLOGICAL TREATMENT, MECHANICAL TREATMENT IN CRUSHERS AND MECHANICAL TREATMENT BY MEANS OF RASP. DYNAMIC SYSTEM TO KEEP MATERIAL IN CONSTANT MOVEMENT, SUBMITTING IT SIMULTANEOUSLY TO HUMIDIFICATION AND AERATION IN OPTIMUM PROPORTIONS. (EI)

06-03-00239 FIRST AT EPSOM (COMPOSTING SALVAGE)
PUBLIC CLEANSING 57(9), P. 504-507 (SEPTEMBER 1967). A DESCRIPTION OF A NEW COMPOSTING PLANT PUT INTO OPERATION IN EPSOM. THE PLANT CONSISTS OF SIX FERMASCREEN UNITS (ROTATING DRUM-SCREEN). A METAL BALER IS PROVIDED FOR SALVAGED METALS. PAPER AND RAGS ARE ALSO SALVAGED. BULKY ITEMS ARE HANDLED IN A SEPARATE INCINERATOR UNIT.

06-03-00246 WESTINGHOUSE ENTERS COMPOSTING FIELD (COST(CAPITAL) COST(OPERATING) SALVAGE)
FURLOW, H. G. + ZOLLINGER, H. A.
COMPOST SCIENCE 4(4), P. 5-10 (WINTER 1964). REFUSE RECLAMATION PROCESS, DEVELOPED BY NATURIZER, SACS, AND WESTINGHOUSE APPLIED IN 150-TON SACS PLANT AT SAN-FERNANDO, CALIFORNIA, IS DESCRIBED. COLLECTION TRUCKS DUMP REFUSE INTO COMPLETELY ENCLOSED CONVEYOR HOPPER, WHICH MOVES REFUSE TO SALVAGE SECTION. PULVERATOR AND GRINDER REDUCE MATERIAL AND MIX IT WITH WATER OR LIQUID WASTE FOR EFFICIENT DECOMPOSITION. COMPOSTING IS DONE IN 6 DAYS IN ENCLOSED DIGESTER CELLS. (EI)

06-03-00250 PROCESSING OF REFUSE AND SLUDGE (COMPOSTING SLUDGE(SEWAGE) INCINERATION)
BRAUN, R.
COMPOST SCIENCE 2(2), P. 27-29 (SUMMER 1961). EXPERIENCES OF VARIOUS EUROPEAN CITIES INDICATE EFFECTIVENESS OF REFUSE AND SLUDGE COMPOSTING AT COMBINED INSTALLATION. ADVANTAGES INCLUDE BETTER DECOMPOSITION, DOUBLED WORKABLE ORGANIC CONTENT, AND 50 PERCENT MORE RELEASABLE HUMUS THAN USUAL WASTE COMPOST. (EI)

06-03-00251 COMPOSTING REFUSE AT SACRAMENTO, CALIFORNIA (COMPOST(ANALYSIS) COST(OPERATING))
GOLUEKE, C. G.
COMPOST SCIENCE 1(3), P. 12-15 (AUTUMN 1960). DETAILED REPORT ON DANO PROCESS PLANT IN FULL-SCALE OPERATION SINCE 1956. PROCESS COMBINES TECHNICAL AND ECONOMIC FEASIBILITY WITH RELIABILITY AND DURABILITY. EMPLOYS BOTH MECHANICAL AND BACTERIAL REDUCTION. COMPOST IS NON-ODOROUS, EASILY HANDLED, AND CAN HOLD OVER 100 PERCENT OF ITS WEIGHT IN WATER. (EI)

06-03-00256 COMPOSTING CITY REFUSE
CHEM AND PROCESS ENGR 46(1), P. 25-27 (JANUARY 1965). COMPOSTING PLANT WAS RECENTLY ESTABLISHED IN AUCKLAND IN WHICH REFUSE IS SUBJECTED TO AEROBIC FERMENTATION IN DANO BIOSTABILIZERS, PROCESS THAT IS ALREADY PRODUCING SALEABLE COMPOST. BESIDES ITS HORTICULTURAL VALUE, COMPOST IS SUITABLE FOR SERIAL SPREADING, AND FOR USE AS COUNTER TO SOIL EROSION. ITS FUNCTION HERE IS TO PROVIDE ERODED AREAS WITH PROTECTIVE BLANKET WHICH SLICKS OFF WATER FROM RAINFALL OR RIVULETS, THUS PREVENTING FURTHER LOSS OF SOIL. (EI)

06-03-00257 COMPOSTING DEVELOPMENTS IN UNITED STATES
WILEY, J. S. + KOCHTITZKY, O. W.
COMPOST SCIENCE 6(2), P. 5-9 (SUMMER 1965). REVIEW OF TRIALS AND TRIBULATIONS OF MUNICIPAL COMPOSTING, INCLUDING NEWS OF RESEARCH PROJECT TO BE UNDERTAKEN BY PUBLIC HEALTH SERVICE, DEPT OF HEALTH, EDUCATION, AND WELFARE, CHATTANOOGA, TENN, AND TENNESSEE VALLEY AUTHORITY. (EI)

06-03-00258 SED RESEARCH REPORT NO. 16 ON REFUSE COMPOSTING EXPERIENCE IN NETHERLANDS (COMPOST(ANALYSIS))
PROC AM SOC CIVIL ENGRG J SANIT ENGRG DIV 84(SA2), P. 1-3 (APRIL 1958). NETHERLANDS HAS SUCCESSFULLY DEVELOPED LARGE SCALE MUNICIPAL REFUSE COMPOSTING THROUGH " V.A.M. " CO., GOVERNMENT FINANCED AGENCY. ESSENTIAL RESEARCH TO REDUCE COST OF COMPOST PROCESSING AND TO IMPROVE QUALITY OF COMPOST PRODUCT, SUCCESSFULLY CARRIED ON FOR MANY YEARS. RESULTS OF PIONEERING WORK CRITICALLY REVIEWED. (EI)

06-03-00260 MUNICIPAL COMPOST PLANT FOR AUCKLAND (COMPOSTING)
NEW-ZEALAND ENGRG 19(2), P. 73-74 (FEBRUARY 15, 1964). NEW COMPOST PLANT AT AUCKLAND, NEW ZEALAND IS DESIGNED TO PROCESS 100 TONS OF MUNICIPAL WASTES/DAY BY NATURAL BACTERIAL ACTION, USING DANO BIO-STABILIZER EQUIPMENT WHICH PROVIDES FOR CONTINUOUS AGITATION OF FERMENTING REFUSE IN LARGE ROTATING DRUMS, PLANT OPERATION IS DESCRIBED. (EI)

06-03-00261 NEW DEVELOPMENTS IN COMPOSTING EQUIPMENT (GRINDING SLURRY-PUMPING)
COMPOST SCIENCE 4(2), P. 15-20 (SUMMER 1963). REVIEW OF DIGESTERS, SHREDDERS, PULVERIZERS AND OTHER EQUIPMENT USEFUL IN COMPOSTING REFUSE. TOLLEMACHE REFUSE PULVERIZER-SORTER. FERMASCREEN UNIT, REFUSE DISPOSAL PLANT BY SIMON-LAWDEN, MATTHEW HALL REFUSE-REDUCING PLANT, REMOVING FERROUS MATERIALS FROM CONVEYOR BELTS, MULCH SPREADER, MANURE DISPOSAL SYSTEM, PUMP FOR ORGANIC MATTER AND STRAW AND EQUIPMENT FOR SPRAY IRRIGATION DESCRIBED. (EI)

06-03-00266 COMPOSTING PLANT CONVERTS REFUSE INTO ORGANIC SOIL CONDITIONER (COMPOSITION SLUDGE(SEWAGE))
PRESCOTT, J. H.
CHEM ENGRG 74(23), P. 232-234 (NOVEMBER 6, 1967). COMPOSTING PLANT IN HOUSTON IS NOW TURNING 1/6 OF CITY'S REFUSE INTO ORGANIC SOIL CONDITIONER. ODOR-FREE UNIT HAS BEEN HANDLING 300 TPD OF GARBAGE AND REFUSE SINCE IT WAS PLACED IN OPERATION DURING SPRING (1967). AFTER MANUAL SORTING, GROUND REFUSE ENCOUNTERS MAGNETIC SEPARATOR THAT REMOVES ABOUT 50,000 LB/DAY OF TIN CANS. THICKENED SLUDGE FROM MUNICIPAL SEWAGE PLANT IS ADDED. AFTER DIGESTER IS HALF FILLED WITH DAY'S PRODUCTION, BLOWERS PROVIDE AIR TO PLENUM CHAMBER UNDER COMPOST BED. FROM DIGESTING TANK, COMPOST GOES THROUGH THREE GRINDERS IN PARALLEL. PROCESSED COMPOST IS GRAY AND HAS TEXTURE SIMILAR TO THAT OF PEAT MOSS. (EI)

06-03-00267 COMPOSTING AROUND WORLD (BACTERIA(CULTURE))
SNELL, J. R.
COMPOST SCIENCE 1(1), P. 30-35 (SPRING 1960). DESCRIPTION OF COMPOSTING PLANTS IN 12 CITIES, BY TYPE AND LOCATION. COMPOSTING PROVIDES POTENTIAL MEANS OF TREATING REFUSE SO THAT IT CAN BE SALVAGED AND UTILIZED, OFTEN RESULTING IN PROFIT. DISADVANTAGES OF CONVENTIONAL COMMONLY USED METHODS OF GARBAGE DISPOSAL ARE - LAND FILL AREAS ARE INCREASINGLY DIFFICULT TO FIND, INCINERATION IS EXPENSIVE, WASTEFUL, AND ADDS POLLUTANTS TO AIR. (EI)

06-03-00268 MOBILE, ALABAMA SCHEDULES COMPOST PLANT (COMPOSTING COMPOSITION QUANTITY)
MOULTON, G. L.
COMPOST SCIENCE 2(1), P. 15-17 (SPRING 1961). PROPOSED COMPOST PLANT WILL TREAT 360 TONS OF MUNICIPAL REFUSE DAILY WITH DORR-OLIVER EQUIPMENT. PROCESS IS COMPLETELY MECHANIZED EXCEPT FOR MANUAL SORTING OF NONCOMPOSTABLES ON CONVEYOR BELT. FINISHED COMPOST WILL WEIGH 35 LB/CU FT. WITH 30 PERCENT MOISTURE. FLOW DIAGRAM AND REFUSE CONTENT DATA. (EI)

06-03-00271 REFUSE RECLAMATION-SOLUTION TO GROWING URBAN PROBLEM (COMPOSTING SEPARATION COST(SUBSIDY))
REIMER, L. G.
WESTINGHOUSE ENGR 26(6), P. 175-177 (NOVEMBER 1966). OPERATION OF REFUSE RECLAMATION PLANT IN ST. PETERSBURG, FLA. MATERIALS WITH SALVAGE VALUE ARE REMOVED AND SOLD, AND REMAINDER OF REFUSE IS CONVERTED INTO SALEABLE ORGANIC COMPOST. (EI)

06-03-00274 FAIRFIELD-HARDY COMPOSTING PILOT PLANT AT ALTOONA, PA. (PATHOGENS THERMOPHILIC)
SCHULZE, K. L.
COMPOST SCIENCE 5(3), P. 5-10 (AUTUMN-WINTER 1965). OPERATION OF PLANT IS DESCRIBED, AND IT IS SHOWN THAT IT IS POSSIBLE TO OPERATE MECHANICAL COMPOSTING UNIT CONTINUOUSLY IN THERMOPHILIC PHASE, I.E. AT TEMPERATURE RANGE BETWEEN 130 AND 175 F AND TO PRODUCE SANITARY COMPOST WHICH IS FREE FROM OBNOXIOUS ODORS AND DOES NOT ATTRACT FLIES OR RODENTS.

06-03-00276 ECONOMICS OF COMPOSTING MUNICIPAL REFUSE IN EUROPE AND ISRAEL (COST(CAPITAL) COST(OPERATING) COST(SUBSIDY) COST(COMPOST) SALVAGE)
KUPCHIK, G. J.
PROC AM SOC CIVIL ENGRS J SANIT ENGRG DIV 92(SA6), P. 41-56 (DECEMBER 1966). ECONOMIC FEASIBILITY OF COMPOSTING MUNICIPAL REFUSE WAS EXPLORED ON BASIS OF DATA COLLECTED FROM FOURTEEN COMPOSTING PLANTS IN EUROPE AND ISRAEL. PLANTS USED EITHER DANO BIOSTABILIZER, DORR-OLIVER RASP, VENTILATED CELL, BUHLER-DANO COMBINATION, OR VAN MAANEN PROCESS. NONE OF PLANTS WAS ABLE TO COVER ITS CAPITAL SERVICE COSTS AND OPERATING EXPENSES THROUGH INCOME OBTAINED FROM SALVAGE AND SALE OF COMPOST. ECONOMIC CONSIDERATIONS DERIVED FROM THESE DATA WERE APPLIED TO CONDITIONS IN UNITED STATES, WHERE, BASED ON COMPARATIVE COST INDICES, CONSTRUCTION AND OPERATING COSTS WOULD BE CONSIDERABLY HIGHER. IT IS CONCLUDED THAT DETERMINATION BE MADE THAT CONTINUING DEMAND FOR COMPOST EXISTS BEFORE COMPOST PLANT IS CONSTRUCTED. (EI)

06-03-00279 HOUSTON FORCES COMPOST PLANT SHUTDOWN (COMPOSTING COST(SUBSIDY) INCINERATION)
REFUSE REMOVAL JOURNAL 10(7), P. 6, 36 (JULY 1967). THE COMPOST PLANT OPERATED BY UNITED COMPOST SERVICES, INC. IN HOUSTON WAS FORCED TO SHUT DOWN BY THE CITY BECAUSE OF ODORS. ONE OTHER PLANT IS STILL OPERATING, HOWEVER, THERE HAVE BEEN ODOR COMPLAINTS AGAINST IT. THE CITY OF HOUSTON PAYS $3.50 FOR EACH TON OF WASTE DELIVERED.

06-03-00281 MUNICIPAL COMPOSTING RESEARCH (COMPOSTING GARBAGE- DISPOSAL REFUSE-DISPOSAL SLUDGE GRINDING)
KOCHTITZKY, O. W.
ENVIRONMENTAL ENGINEERING CONF OF AM SOC OF CIVIL ENGRS, CHATTANOOGA, TENNESSEE (MAY 16, 1968). WITH THE INCREASE IN USE OF SINGLE-SERVICE PACKAGING MATERIALS, THE QUANTITIES OF REFUSE FOR DISPOSAL ARE CONTINUALLY INCREASING. CONCENTRATION OF POPULATIONS IN URBAN AREAS RESULTS IN A GROWING PROBLEM FOR SANITARY AND ECONOMICAL DISPOSAL. A JOINT RESEARCH PROJECT BY THE U.S. PUBLIC HEALTH SERVICE TENNESSEE VALLEY AUTHORITY, AND JOHNSON CITY, TENNESSEE, IS

REPORTED. THE MUNICIPAL REFUSE AND SLUDGE FROM THE WASTEWATER TREATMENT PLANT ARE BEING COMPOSTED BY THE WINDROW PROCESS. AN EVALUATION IS BEING MADE OF THE SUITABILITY OR ADAPTABILITY FOR PROCESSING REFUSE OF COMMERCIALLY AVAILABLE EQUIPMENT. THE CHEMICAL, PHYSICAL, AND MICROBIOLOGICAL CHANGES DURING COMPOSTING ARE BEING STUDIED. THE EFFECT OF VARIATIONS IN THE COMPOSTING PROCESS AND OF CHEMICAL ADDITIONS ARE BEING STUDIED WITH REGARD TO THE SPEED OF DECOMPOSITION AND THE QUALITY OF THE FINISHED COMPOST. THE DESTRUCTION OR SURVIVAL OF PATHOGENIC ORGANISMS THROUGH VARIOUS PHASES OF COMPOSTING IS BEING DETERMINED. (AUTH)

06-03-00291 HYGIENIC REFUSE COMPOSTING AND DISPOSAL PLANT (FERMASCREEN)
SURVEYOR 122(3726), P. 1381 (NOVEMBER 2, 1963). REFUSE REDUCTION AND PASTEURIZATION UNIT CONSISTS OF MULTI SIDED DRUM MOUNTED ON CIRCULAR TRACKS, SUPPORTED BY WHEELS, TO ALLOW DRUM TO BE ROTATED, WITH PIPE WORK FITTED TO ALLOW INGRESS OF WATER OR SEWAGE SLUDGE. OPERATION IS EFFECTED BY INJECTION OF CRUDE OR PULVERIZED REFUSE INTO DRUM, AND ADDITION OF WATER OR SEWAGE SLUDGE TO ADJUST MOISTURE CONTENT. ORGANIC WASTES MAY BE FERMENTED AND USED TO IMPROVE SOIL STRUCTURE. KITCHEN WASTES AND HOSPITAL GARBAGE ARE TRANSFORMED INTO COMPOST FOR USE ON HOSPITAL GROUNDS AND VEGETABLE GROWING AREAS. (EI)

06-03-00292 COMPOST-MAKING IN THE NETHERLANDS, ITS HISTORY, PLANNING AND POSSIBILITIES
WESTSTRATE, W. A. G.
DE KOMPOSTERING IN NEDERLAND, HISTORIEK, PLANNING EN MOGELIJKHEDEN TECH WETENSCH TIJDSCHR 32(3), P. 49-52 (MARCH 1963). THE AUTHOR FIRST GIVES A SHORT HISTORICAL SURVEY OF THE COMPOST PREPARATION AND MENTIONS THE FOUNDATION OF THE GARBAGE DISPOSAL COMPANY "V.A.M." BY THE GOVERNMENT IN 1929. THIS CONCERN PROCEEDED AT ONCE WITH THE ERECTION OF A COMPOST PLANT WIJSTER (DRENTE). SINCE THAT TIME, FURTHER PLANTS WERE ERECTED AT AT SCHIEDAM (1951) AND AT MIERLO (1954). THE AUTHOR DEALS EXTENSIVELY WITH THE PROPERTIES AND POSSIBILITIES OF APPLICATION OF THE COMPOST PRODUCED IN THESE PLANTS. (AUTH)

06-03-00294 THE COMPOST FACTORY OF BADEN-BRUGG (SWITZERLAND)
TENAILLE, M. G.
L'USINE DE COMPOST DE LA REGION DE BADEN-BRUGG (SUISSE) TECH. WETENSCH TIJDSCHR 32(3), P. 58-63 (MARCH 1963). IN THIS ARTICLE THE AUTHOR DEALS WITH A PROCESS FOR ACCELERATING THE FERMENTATION OF HOUSE REFUSE (MULTIBACTO) WHICH IS BEING APPLIED IN THE BADEN-BRUGG PLANT. HE GIVES A DESCRIPTION OF THE INSTALLATION AND MENTIONS THE SATISFACTORY RESULTS WHICH WERE OBTAINED, AS WELL AS THE EXCELLENT PROPERTIES OF THE COMPOST WHICH IS BEING MANUFACTURED THERE. (AUTH)

06-03-00295 THE DANO-COMPOSTING PLANT AT ANDERLECHT
DE ROEVER, J. G.
DE KOMPOSTERINGSINSTALLATIE TE ANDERLECHT TECH WETENSCH TIJDSCHR 32(3), P. 64-66 (MARCH 1963). THE DANO-COMPOSTING PLANT AT ANDERLECHT HAS JUST BEEN BROUGHT INTO SERVICE. IT IS THE PROPERTY OF THE "INTERCOMMUNALE POUR LE TRAITEMENT DES IMMONDICES DU SUD-QUEST DE L'AGGLOMERATION BRUXELLOISE" (INTRIMSO) AND TREATS 100 METRIC TONS OF REFUSE A DAY. THE PLANT HOWEVER HAS BEEN PLANNED IN SUCH A WAY THAT IT CAN BE DOUBLED ON A LATER DATE.

06-03-00300 PROBLEMS BESET COMPOSTING (COMPOSTING(FAILURES))
SOLID WASTES MANAGEMENT/RRJ 10(7), P. 12 (JULY 1967). THE MOBILE, ALABAMA, PLANT WAS CLOSED BUT HAS REOPENED AFTER A 5-MONTH SHUTDOWN. THE CONSULTING ENGINEER WAS RELEASED FROM HIS CONTRACT, AND IS NOW BEING SUED BY THE CITY. NO MARKET HAS BEEN FOUND FOR THE PRODUCT. AN EXPERIMENTAL PILOT PLANT WAS BUILT AT LARGO, FLORIDA, A MAJOR PLANT IS IN OPERATION AT ST. PETERSBURG, FLORIDA. ONE IS IN CONSTRUCTION AT GAINESVILLE, FLORIDA. ONE IS UNDER CONSIDERATION FOR JACKSONVILLE AND ANOTHER FOR MIAMI. COMPOSTING IS BESET BY FOUR MAJOR PROBLEMS, WHICH ARE- 1. THE RAPIDLY CHANGING COMPOSITION OF UNBURNED REFUSE, 2. A MISTAKEN BELIEF THAT SALVAGE WILL RECOUP INCOME, 3. THE NEED OF A GREAT DEAL OF LABOR AND MANY HANDLING STEPS (NEED FOR PARALLEL AND ADDITIONAL STEPS TO HANDLE NONCOMPOSTABLE REFUSE), AND 4. THE FACT THAT SUCCESS OR FAILURE DEPENDS UPON THE DEVELOPMENT OF AN EXPANDING MARKET FOR A HARD-TO-SELL PRODUCT. (UC)

06-03-00301 $1.5 MILLION COMPOSTING PLANT CLOSES (COMPOSTING(FAILURES))
SOLID WASTES MANAGEMENT/RRJ 11(5), P. 23, 64, 66, 80 (MAY 1968). ST. PETERBURG'S COMPOSTING PLANT WAS CLOSED DOWN AFTER A 3-MAN FACT-FINDING COMMITTEE FOR THE FLORIDA CITY DECLARED THE OPERATION A PUBLIC NUISANCE. THE GROUP FOUND THAT THERE WAS - 1. A LACK OF PREVENTATIVE MAINTENANCE CAUSING FREQUENT BREAKDOWNS OF ESSENTIAL EQUIPMENT. 2. THE BUILDING WAS POORLY DESIGNED, SINCE INCOMING TRUCKS HAD TO BE UNLOADED IN THE OPEN. 3. WINDS CARRIED ODORS TO A NEARBY RESIDENTIAL AREA AND A GOLF COURSE. 4. THE DRYER WHICH WAS INSTALLED TO ALLEVIATE ODOR HAS REPEATEDLY MALFUNCTIONED. THE 150-TON PER DAY PLANT WAS OPERATED BY THE INTERNATIONAL DISPOSAL CORP., A COMPANY JOINTLY OWNED BY WESTINGHOUSE ELECTRIC CORP., ALLSTATE INSURANCE, AND THE SHAREHOLDERS OF IDC'S PREDECESSOR, SALVAGE AND CONVERSION SYSTEMS, INC. (SACS). IT COST $1.5 MILLION TO ERECT. A 20-YEAR CONTRACT HAS BEEN NEGOTIATED WITH ST. PETERSBURG'S CITY MANAGER. IDC WAS TO DISPOSE OF 31,200 TONS OF REFUSE PER YEAR (100 PER DAY, 6 DAYS PER WEEK) IN A " NUISANCE-FREE " MANNER. THE CITY WAS TO PAY $3.24 PER DELIVERED TON WITH ALLOWANCES FOR SOME FLUCTUATION IN FUTURE YEARS. IDC ATTEMPTED TO SELL THE COMPOST FOR $9.00 PER TON TO COMMERCIAL AGRICULTURE AND FOR $1.98 PER BAG TO HOMEOWNERS. THE PLANT EMPLOYED 26 PEOPLE. NEARLY $500,000 WAS SPENT BY THE FIRM TO OPERATE ON A NUISANCE FREE BASIS. OF THIS $110,000 WAS SPENT ON A DRYER. OUTSIDE THE U.S. THE AVERAGE GROSS COST FOR COMPOSTING ONE TON OF RAW REFUSE IS ABOUT $4.45. AMORTIZATION, INTEREST, AND RENT ACCOUNT FOR AN AVERAGE OF $1.76, AND OPERATION ACCOUNTS FOR $2.79. THESE COSTS WOULD BE MUCH HIGHER IN THE U.S. OTHER FACILITIES WHICH HAVE CLOSED IN PAST YEARS ARE THE PLANTS IN SCARSDALE (NEW YORK), MCKEESPORT (PENNSYLVANIA), OAKLAND, SACRAMENTO, AND SAN FERNANDO (CALIFORNIA), MOBILE (ALABAMA), SPRINGFIELD (MASSACHUSETTS), NORMAN (OKLAHOMA), WILLIAMSTON (MICHIGAN), PHOENIX (ARIZONA), AND ONE IN HOUSTON (TEXAS). (UC)

06-03-00308 WASTE TREATMENT AT HAWAII'S OAHU PRISION (COMPOSTING MARKETING)
ERIKSSON, A.
COMPOST SCIENCE 1, P. 44 (WINTER 1961). A COMPOSTING PROJECT HAS BEEN IN OPERATION FOR EIGHT YEARS AT OAHU PRISON. AGRICULTURAL AND PROCESSING WASTES FROM THE PRISON AND FROM MANY COMPANIES ON OAHU ARE COMPOSTED. THE MATERIALS ARE GROUND IN A HAMMER MILL AND COMPOSTED IN WINDROWS 10 TO 12 FEET WIDE BY 5-1/2 TO 6 FEET HIGH. A HEAVY DUTY HAMMER MILL WITH AN ELEVATOR IS USED TO TURN THE PILES WEEKLY. COMPOST TIME IS FROM 3 TO 6 WEEKS, DEPENDING UPON THE RAW MATERIAL. COMPOST IS SOLD IN FOUR GRADES, A FINE LAWN DRESSING, A COARSE TREE-PLANT COMPOST, A GARDEN POTTING COMPOST, AND A LOOSELY SHREDDED MIXTURE FOR USE AS MULCH. THE COMPOST IS PACKAGED IN FOUR-PLY, USED PAPER BAGS OBTAINED FROM A SUGAR COMPANY. IT IS SOLD IN ONE- AND TWO-CUBIC FOOT BAGS.

06-03-00341 A NEW SWISS REFUSE DISPOSAL PROCEDURE (COMPOSTING COMPOST(PROPERTIES))
HURTER, H.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 4, (MARCH 1958). A NEW COMPOSTING PLANT IN UZWIL (SWITZERLAND) USING THE BUEHLER SYSTEM IS DESCRIBED. MECHANICAL - THE PLANT HAS A BIN WITH A STORAGE CAPACITY OF 23 CU-M. REFUSE IS NOT PRESORTED. ALL MATERIAL IS BROKEN UP INTO PIECES ABOUT 3-IN IN CROSS SECTION IN THE FIRST GRINDING MILL. FERROUS METALS ARE EXTRACTED AT THIS STAGE. A VIBRATING SCREEN THEN SEPARATES THE REFUSE INTO TWO FRACTIONS. THE SCREENED MATERIAL CONSISTS OF HEAVY MATERIALS WHICH ARE PULVERIZED IN A ROLLING MILL. THE SIEVE RESIDUES PASS A FINE GRINDER. THE MILLED AND GROUND MATERIALS ARE BROUGHT TOGETHER ON THE LAST CHAIN-CONVEYOR AND ARE DISCHARGED INTO A STORAGE BIN OUTSIDE THE PLANT. COMPOSTING - THE GROUND REFUSE IS STACKED IN PILES 4 TO 7 FEET HIGH. THE COMPOSTING REFUSE IS TURNED TWO OR THREE TIMES IN A PERIOD OF THREE TO FOUR MONTHS. RESULTS - IN THE FIRST YEAR, 2845 CU-M OF REFUSE FROM A POPULATION OF 8760 WERE TREATED. VOLUME REDUCTION WAS ON THE ORDER OF 4 TO 1. APPROXIMATELY 9.3 TONS OF IRON WERE SALVAGED POWER REQUIREMENTS WERE 7.4 KW-HR/CU-M OF RAW REFUSE. (UC)

06-03-00344 THE NEW COMPOST PLANT AT DUISBURG-HUCKINGEN IN OPERATION (QUANTITY COST(CAPITAL) COMPOSTING)
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 4, (MARCH 1958). THE PLANT WAS OFFICIALLY OPENED ON 16 DECEMBER 1957. REFUSE TRUCKS DUMP THEIR LOADS INTO RECEIVING BUNKERS. THE REFUSE IS TRANSPORTED TO THE COMPOST PLANT ON APRON AND BELT CONVEYORS. SCRAP IRON IS SORTED OUT BY MAGNETIC PULLEYS AND BALED. IN THE WINTER, SCREENS ARE USED TO SEPARATE OUT ASHES AND CLINKER. ON THE FINAL SORTING CONVEYOR, VALUABLE MATERIALS ARE PICKED OUT BY HAND. THE REFUSE IS THEN CONVEYED TO ROTATING DRUMS, AND THERE IS MIXED WITH SLUDGE. THE COMPOST LEAVES THE DRUMS AFTER FOUR DAYS RETENTION AND IS SCREENED AGAIN. THE PLANT SERVES A POPULATION OF 140,000 (ONE-THIRD THE TOTAL POPULATION OF THE CITY). IT HAS THE CAPACITY TO PROCESS 200 CU-M METERS OF REFUSE PER DAY (I.E., 80 TONS PER DAY), 10 TO 20 CUBIC OF SLUDGE PER DAY, AND 2 TONS OF IRON PER DAY. FROM THIS WOULD BE PRODUCED 50 TO 60 TONS OF COMPOST PER DAY. THE PLANT HAS TWO BIOSTABILIZERS, EACH 25-M LONG AND 3.5-M DIAMETER. THEY HAVE A CAPACITY OF 250 CU-M. THE INSTALLED POWER IS 200 KW. THE PLANT COST ABOUT 1,500,000 GERMAN MARKS TO BUILD.

06-03-00345 THE PREPARATION AND UTILIZATION OF MUNICIPAL WASTES IN HUNGARY (COMPOSTING COMPOST(APPLICATION))
FARKASDI, G.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 5, (AUGUST 1958). THE REPORT MENTIONS THE GENERAL TAKING OVER OF PRIVATE ENTERPRISES BY THE GOVERNMENT IN 1949. A NATIONAL ORGANIZATION DEALS WITH ALL WASTES. IN 1952 THE MANAGEMENT PROBLEMS CAUSED BY THE COMPLICATED BUREAUCRACY WERE TOO GREAT. FOUR BRANCH ORGANIZATIONS WERE FOUNDED. THE NEWLY FOUNDED INSTITUTE FOR PEAT AND FERTILIZER RESEARCH IS RESPONSIBLE FOR SOLVING SCIENTIFIC PROBLEMS, PLANNING NEW PLANTS, ETC. ALL PROPOSALS MUST BE SUBMITTED TO THE MINISTRY. THE INTERCONNECTED SYSTEM FOR COLLECTION, PROCESSING AND UTILIZATION OF ALL URBAN WASTES OF THE ENTIRE NATION HAS PROVED EXCEPTIONALLY GOOD FOR THE GENERAL AND AGRICULTURAL ECONOMY. FOLLOWING THE GOOD RESULTS ACHIEVED IN HUNGARY, THE DISPOSAL OF REFUSE SOON SHOULD BE SIMILARLY ORGANIZED IN CZECHOSLOVAKIA. (UC)

06-03-00346 INAUGURATION OF THE COMPOSTING PLANT AT DANTUMADEEL, NETHERLANDS (NIGHT-SOIL SLUDGE(SEWAGE))
WESTSTRATE, W. A. G.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 5, (AUGUST 1958). THE PLANT WAS DESIGNED TO SERVE A POPULATION OF 10,000. NO INFORMATION IS GIVEN ON THE SYSTEM OF COMPOSTING IN USE IN THE PLANT. SORTING IS DONE BY HAND, AND MILLING IS DONE WITH THE USE OF A HAMMER MILL. THE PULVERIZED REFUSE IS MIXED WITH SLUDGE IN A MIXING TROUGH. THE TIME REQUIRED FOR A GIVEN BATCH OF MATERIAL TO COMPOST IS FROM 3 TO 4 MONTHS. OPERATION OF THE PLANT WAS INAUGURATED DURING DECEMBER OF 1957. (UC)

06-03-00352 SPECIAL TECHNICAL PROBLEMS IN THE PROCESSING OF URBAN REFUSE (COMPOSTING COST(CAPITAL) COST(OPERATING))
GOTHARD, S. A.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 7, (JULY 1959). THE JERSEY (GREAT BRITAIN) PLANT MUST COMPLY WITH THE FOLLOWING REQUIREMENTS- IT MUST PRODUCE GOOD QUALITY, SANITARY COMPOST FOR EQUIVALENT AMOUNTS OF REFUSE AND SLUDGE. THE OPERATION MUST BE DONE WITH A MINIMUM OF LABOR AND A MAXIMUM DEGREE OF MECHANIZATION AND AUTOMATION WHEREVER POSSIBLE. ALL ODORS MUST BE AVOIDED. THE PLANT IS DESIGNED TO SERVE A POPULATION OF 100,000. IT HAS THE CAPACITY TO PROCESS 100 TONS OF REFUSE PER DAY. THE SYSTEM USED IS THE DORR-OLIVER (TOWER WITH SIX CHAMBERS). THE COMPOSTING PERIOD IS 6 DAYS IN THE TOWER AND 8 TO 12 MONTHS OUT-OF-DOORS FOR CURING. THE CAPITAL COST WAS $597,000. THE OPERATING COSTS WERE $50,400 PER YEAR. (UC)

06-03-00366 THE RECLAMATION OF REFUSE AT BUDAPEST (COMPOSITION COMPOSTING COMPOST(COMPOSITION))
DESZO, N. + JENO, T.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 9, (SEPTEMBER 1960). THE CITY OF BUDAPEST DECIDED AGAINST INCINERATION BECAUSE OF THE LOW CALORIFIC-VALUE (600 K-CAL/KG) OF ITS REFUSE, HIGH ASH CONTENT IN WINTER, AND THE HIGH CAPITAL COST. IT SELECTED COMPOSTING AS THE ALTERNATIVE METHOD OF DISPOSAL. THE AUTHOR DESCRIBES EXPERIMENTS WITH COMPOSTING, SUCH AS DECOMPOSITION FACTORS, THE REQUIRED MINIMUM ORGANIC CONTENT IN THE RAW MATERIALS, THE EFFECT OF MICROBIOLOGICAL INOCULATION, THE COURSE OF TEMPERATURE IN THE PILES, THE INFLUENCE OF PH, AND THE DEGREE OF AERATION NEEDED. ANAEROBIC DIGESTION WITH GAS PRODUCTION WAS ALSO CONSIDERED. PILOT PLANT EXPERIMENTS WERE CONDUCTED WITH THE USE OF SEALED IRON TANKS (900-LITER CAPACITY) PLACED IN A BECCARI CHAMBER FILLED WITH DECOMPOSTING REFUSE. A MIXTURE OF GARBAGE (300 KG) AND SLUDGE (100 KG) MAINTAINED AT 25 DEGREES C TO 30 DEGREES C PRODUCED 17 CU-M OF GAS PER MONTH WITH A METHANE CONTENT OF 45 PERCENT TO 50 PERCENT. THE TIMES REQUIRED FOR COMPLETE FERMENTATION WERE 4 TO 5 DAYS AT 42 DEGREES C TO 50 DEGREES C, 30 TO 40 DAYS AT 20 DEGREES C TO 30 DEGREES C AND 70 TO 80 DAYS AT 10 DEGREES C TO 15 DEGREES C. (UC)

06-03-00374 REPORT ON RECENT RESULTS AT THE REFUSE COMPOSTING PLANT AT KUESNACHT-ZUERICH (COST(CAPITAL) SAFETY-HAZARDS)
STAHEL, R.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 11, (JUNE 1961). THE PLANT HAS TWO HAMMER MILLS AND ONE DANO MIXING DRUM (WITHOUT A BIOSTABILIZER). SLUDGE IS ADDED TO THE REFUSE. THE PLANT SERVES A POPULATION OF 35,000. AFTER 200 HOURS OF OPERATION ONE-THIRD OF THE HAMMERS IN THE COARSE MILL WERE IN NEED OF REPLACEMENT. TWO MEN ARE SUFFICIENT FOR ALL OPERATIONS, INCLUDING WINDROWING AND LOADING THE COMPOST TRUCKS. THE EQUIPMENT COST WAS $84,000, OPERATING COSTS $8,380 PER YEAR. PLANT HAZARDS WERE MASSIVE DAMAGE TO THE HAMMERS BY LARGE PIECES OF METAL IN THE REFUSE, AND CLOGGING OF THE MILL BY RAGS. BRIDGING-OVER AT THE THROAT MUST BE PREVENTED BY SMOOTH FEEDING. (UC)

06-03-00375 THE REFUSE TREATMENT PLANT OF THE BADEN-BRUGG REGION (SWITZERLAND) (COMPOSTING COST(CAPITAL))
ZAMBETTI, T.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 11, (JUNE 1961). THE CITY DECIDED TO BUILD A COMPOSTING PLANT INCORPORATING THE SMG/MULTIBACTO PROCESS. THE PLANT CONSISTS OF A BUNKER, A CONVEYOR (IRON REMOVED BY A MAGNETIC PULLEY), MULTIROTOR GRINDER, FIRST SIEVE, DIGESTER, AND A SECOND SIEVE. THE FINES ARE DISCHARGED BENEATH THE SIEVE TO A BUNKER. AS THE FINE REFUSE LEAVES THE BUNKER IS IT INOCULATED WITH A SUSPENSION OF BACTERIA IN WATER, OR WITH SLUDGE. THE DIGESTER HAS THE APPEARANCE OF A NICHOLS FURNACE. AFTER 24 HOURS THE REFUSE IS SUPPOSEDLY READY FOR USE AS COMPOST. CHEMICAL FERTILIZERS (N, P, K) MAY BE ADDED BY A BATTERY OF MIXERS TO ENRICH THE COMPOST. THE PLANT SERVES A POPULATION OF 100,000. THE OPERATION BEGAN IN 1961 TO 1962. THE PLANT COST ABOUT $500,000. OPERATING COSTS ARE $3.50 PER TON.

06-03-00386 THE REFUSE COMPOSTING PLANT AT STUTTGART-MOHRINGEN
GLOCKNER, K.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULLETIN 15, (AUGUST 1962). THE COMPOST PLANT SERVES A POPULATION OF 100,000. THE COST OF CONSTRUCTION WAS 1,434,000 DM (ABOUT $335,000). THE DORR-OLIVER SYSTEM IS USED. A FLOW DIAGRAM OF THE PROCESS IS AS FOLLOWS - BUNKER TO MAGNETIC SEPARATOR TO HAND SEPARATION TO RASPING MACHINE TO BALLISTIC SEPARATOR TO WINDROW. THE PLANT HAS AN INCINERATOR FOR BURNING INDUSTRIAL AND NONCOMPOSTABLE WASTES. (UC)

06-03-00392 THE REFUSE UTILIZATION PLANT OF THE WERDENBERG- LIECHTENSTEIN REGION (SWITZERLAND) (INCINERATION)
GIGER, R.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 16, (DECEMBER 1962). THE COMPOST SYSTEM IN USE IS THE BUEHLER METHOD. THE PLANT INCLUDES A GRINDER, SLUDGE MIXER, AND AN INCINERATOR FOR BURNING SCREEN REJECTS AND ANIMAL CARCASSES. THE PLANT SERVES A POPULATION OF 40,000. SLUDGE IS ADDED TO THE REFUSE AS A PART OF THE COMPOSTING PROCESS. COMPOSTING BEGAN IN FEBRUARY OF 1962.

06-03-00518 REFUSE PLAYS KEY ROLE FOR SCOTTISH CITY (ECONOMICS COMPOSTING SALVAGE SANITARY-LANDFILL INCINERATION RECLAMATION(LAND) INCINERATION BULKY-WASTE COLLECTION)
REFUSE REMOVAL JOURNAL 10(1), P. 26-27, 46 (JANUARY 1967). A DESCRIPTION OF SOLID WASTE RECLAMATION AT FALKIRK, SCOTLAND. THE COLLECTION AND DISPOSAL SYSTEM CONSISTS OF SEPARATE PICKUPS, INCINERATION, NATURAL COMPOSTING, AND LANDFILL. FOOD WASTES ARE COLLECTED SEPARATELY AND SOLD TO PIG FARMERS. HOUSEHOLD REFUSE IS COLLECTED SEPARATELY. RESIDENTS ARE REQUESTED TO SEPARATE AND BUNDLE ALL WASTE PAPER AND CORRUGATED PAPER. GARDEN WASTES ARE ALSO COLLECTED SEPARATELY AND ALLOWED TO COMPOST. METALS, RAGS AND GLASS ARE HAND SORTED, CLINKERS ARE REMOVED AND CINDERS ARE SALVAGED. REMAINING MATERIAL IS BURNED IN AN INCINERATOR. TRADE WASTE AND UNBURNABLES ARE DISPOSED OF BY LANDFILL.

06-03-00546 PHOENIX WILL COMPOST ALL MUNICIPAL REFUSE (COMPOSTING COST(SUBSIDY))
SULLIVAN, R. H.
PUBLIC WORKS 94(3), P. 82 (MARCH 1963). THREE COMPOSTING PLANTS WILL BE INSTALLED, EACH WITH A 300- TON PER DAY CAPACITY. THE CITY WILL PAY THE OPERATOR $1.25 PER TON IN THE FIRST YEAR AND $1.10 PER TON THEREAFTER. DANO-TYPE PLANTS WILL BE CONSTRUCTED BY THE ARIZONA BIOCHEMICAL COMPANY. THE COMPANY AGREES TO PAY THE CITY A CERTAIN PERCENTAGE OF THE PROFITS FROM SALE OF THE COMPOST PRODUCT. OPERATION OF THE PLANT IS TYPICAL OF COMPOSTING SETUPS. (UC)

06-03-00631 REFUSE COMPOSTING IN PHOENIX (DANO COST(OPERATING))
THE AMERICAN CITY 76(4), P. 36 (APRIL 1961). A BRIEF DISCUSSION OF PLANS FOR THE UNITED STATES' FIRST FULL-SCALE COMMERCIAL COMPOSTING PLANT IN PHOENIX, ARIZONA. (PHS)

06-03-00645 SIX YEARS OF REFUSE COMPOSTING IN BRITAIN (COST(CAPITAL) DANO COMPOSITION(COMPOST))
GRINDROD, J.
PUBLIC WORKS 92(12), P. 110-111 (DECEMBER 1961). THE CITY OF EDINBURGH HAS BEEN COMPOSTING ITS DOMESTIC REFUSE SINCE 1955 BY MEANS OF AN EXPERIMENTAL DANO BIOSTABILIZER. THE ARTICLE DESCRIBES THE CONSTRUCTION OF THE DANO PLANT AND THE VARIOUS COMPONENT PARTS. DIFFERENT PROBLEMS ASSOCIATED WITH THE PROGRAM OF COMPOSTING DOMESTIC REFUSE SUCH AS DIFFICULTIES WITH BROKEN GLASS AND OTHER INORGANIC MATERIALS ARE DISCUSSED. FOLLOWING THE LEAD AT EDINBURGH, OTHER COMPOSTING PLANTS HAVE BEEN DEVELOPED WITH EQUAL SUCCESS. IT WAS FOUND THAT NO ENTERIC OR DYSENTERIC ORGANISMS WERE FOUND IN THE COMPOST. AS ADDITIONAL PLANTS HAVE BEEN DEVELOPED, THE TOTAL AMOUNT OF END PRODUCT IN THE SUM OF 10,000 TONS OF COMPOST A YEAR BECAME TOO LARGE TO HANDLE AND REQUIRED THE NEED FOR MARKETING TO BE PLACED IN THE HANDS OF A CONTRACTOR. (PHEA)

06-03-00697 MOSCOW TO TRY FRENCH COMPOSTING (SALVAGE)
ENGRG NEWS-RECORD, P. 56 (SEPTEMBER 8, 1966). MOSCOW GENERATES ABOUT 3000 TONS OF REFUSE EACH DAY. IN THE PAST THIS MATERIAL HAS BEEN PLACED IN DUMPS. WITH A LACK OF CLOSE-IN SITES, AND APPEARANCES, INTEREST IS BEING GIVEN TO OTHER METHODS OF DISPOSAL. A FIVE MILLION DOLLAR COMPOST PLANT IS CURRENTLY BEING DESIGNED BY THE FRENCH. CAPACITY WILL BE 600 TONS PER DAY.

06-03-00705 COMPOSTING OPERATION HANDLES REFUSE AND SLUDGE (SALVAGE)
PUBLIC WORKS 99(3), P. 84 (MARCH 1968). A DESCRIPTION OF THE LONE STAR ORGANICS COMPOSING PLANT IN HOUSTON, TEXAS. CAPACITY IS 400 TONS PER DAY OF REFUSE AND 120,000 GALLONS OF WASTE ACTIVATED SLUDGE.

06-03-00735 A LOOK AT EUROPEAN COMPOSTING (DANO COST(OPERATING) COST(CAPITAL) COST(SUBSIDY) SALVAGE SURVEY)
WILEY, J. S.
PUBLIC WORKS 92(2), P. 107-110, 158-159, 162, 164 (FEBRUARY 1961). REASONS FOR COMPOSTING IN EUROPE ARE SANITARY WASTE DISPOSAL, AGRICULTURE, AND ECONOMY. THREE GENERAL COMPOSTING PROCESS TYPES ARE- OPEN WINDROW WITH TURNING, VENTILATED CELL WITH INTERMITTENT DISTURBANCE, AND MECHANICAL WITH CONTINUOUS MIXING AND AERATION. THE TWO MOST NUMEROUS TYPES IN SIX COUNTRIES WERE THE RASPING AND DANO SYSTEMS. COSTS GENERALLY COMPARE FAVORABLY WITH REFUSE INCINERATION. (PHEA)

06-03-00760 THE REFUSE COMPOSTING PLANT IN EDINBURGH, ENGLAND (COMPOST(COMPOSITION) PRICE(COMPOST))
WILSON, N. G.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 5, P. 1 (AUGUST 1958). THE DANO BIOSTABILIZER SYSTEM IS USED. THE PLANT WAS OPENED IN JULY 1955. IT CAN HANDLE FROM 70 TO 75 TONS OF RAW REFUSE PER WEEK. FROM THIS AMOUNT, 35 TONS OF COMPOST ARE PRODUCED EACH WEEK. THE PLANT OPERATES 8 HOURS PER DAY, 5-1/2 DAYS PER WEEK. FROM 270 TO 360 LITERS OF SEWAGE SLUDGE ARE ADDED FOR EACH TON OF REFUSE INTRODUCED INTO THE BIOSTABILIZER. THE COMPOSTING MASS REACHES A MAXIMUM TEMPERATURE OF 60 DEGREES C. THE SELLING PRICE OF THE COMPOST IS $4.9 PER TON. THE ANALYSIS OF THE PRODUCT IS AS FOLLOWS- MOISTURE CONTENT 44.9 PERCENT, ORGANIC MATTER, 48.8 PERCENT, ASH 51.2 PERCENT, NITROGEN 1.1 PERCENT, NITROGEN IN THE ORGANIC MATTER, 2.3 PERCENT, PH LEVEL, 7.0, C TO N RATIO 25 TO 1. THE LAST SIX ITEMS (EXCLUSIVE OF PH) ARE ON A DRY WEIGHT BASIS. (UC)

06-03-00770 UTILIZATION OF URBAN REFUSE BY FERMENTATION (FERTILIZER-VALUE COMPOSTING)
DE LA RUBIA PACHECO, J.
LA MISE EN VALEUR DES DECHETS URBAINS PAR FERMENTATION. GENIE CIVIL 138(15-16), P. 334-338 (AUGUST 1-15, 1961). PAPER COMPARES VARIOUS METHODS OF DISPOSAL. DISADVANTAGES OF NATURAL FERMENTATION AND OF, EXPERIMENTALLY APPLIED, ANAEROBIC DIGESTION, FOR FERMENTATION. LIST OF LARGE PLANTS FOR AEROBIC FERMENTATION. DETAILED DESCRIPTION OF PLANT AT PAMPELUNE, FRANCE. PRODUCTING 50 TPD COMPOST, FREE OF PATHOGEN ORGANISMS BUT RICH IN USEFUL MICROORGANISMS. (EI)

06-03-00834 DISCUSSION OF COMPOSTING OF REFUSE WITH SEWAGE SLUDGE (COST(MILORGANITE) COST(DISPOSAL))
WILEY, J. S.
COMPOST SCIENCE 8(1), P. 22-27 (SPRING-SUMMER 1967). METHOD AND ADVANTAGES OF TREATING SEWAGE SLUDGE WITH REFUSE OR OTHER SOLID WASTES BY COMPOSTING AT NEW COMPOSTING PLANT OF JOHNSON CITY, TENN, ARE DISCUSSED. RAW PRIMARY SEWAGE SLUDGE IS COMPOSTED WITH REFUSE AFTER THICKENING IN EXISTING SLUDGE DIGESTER AND GRAVITY FILTERING IN PERMUTIT DGC SLUDGE CONCENTRATOR. MOISTURE AND NUTRIENT CONTENTS OF VARIOUS TYPES OF SEWAGE SLUDGE. (EI)

06-03-00837 MOBILE, ALABAMA BUILDS 300 TON PER DAY COMPOST PLANT (COMPOSTING)
COMPOST SCIENCE 6, P. 32 (1965). MOBILE, ALABAMA, HAS CONTINUED TO BUILD A 300 TPD COMPOSTING PLANT FOR ABOUT $1.1 MILLION AND IT IS SCHEDULED FOR COMPLETION IN AUGUST 1965. INCOMING TRUCKS WILL BE WEIGHED, DRIVEN UP A RAMP WHERE REFUSE WILL BE DUMPED INTO A RECEIVING HOPPER AND CONVEYOR. AS REFUSE MOVES, PAPER AND RAGS WILL BE SALVAGED. CANS AND FERROUS METALS WILL BE REMOVED MAGNETICALLY AND PROCESSED FOR SALE. GLASS WILL BE REMOVED AND GROUND TO A SAND GRADATION. THE PLANT WILL HAVE A PRIMARY AND SECONDARY GRINDER. AFTER SECONDARY GRINDING, MOISTURE WILL BE ADDED, AND THE COMPOST WILL BE BALED FOR INSIDE AND OUTSIDE STORAGE. A FINAL GRINDER IS PROVIDED FOR BULK SHIPMENTS. GRUENDLER CRUSHER AND PULVERIZER COMPANY OF ST. LOUIS, MISSOURI, IS SUPPLYING THE PROCESS MACHINERY, AS IS LOGEMANN BROTHERS OF MILWAUKEE, WISCONSIN. IT IS ESTIMATED IT WILL COST AROUND $2.60/TON OF INPUT TO OPERATE THE PLANT. ARRANGEMENTS HAVE BEEN MADE FOR MARKETING THE END PRODUCTS WHEREBY IT WILL NOT COST THE TAXPAYERS ONE CENT. IN FACT, THE CITY SHOULD MAKE A PROFIT ON THE OPERATION.

06-03-00842 LARGE-SCALE COMPOSTING IN THE SOVIET UNION (FERTILIZER-VALUE)
FRANZ, M.
COMPOST SCIENCE 5(2), P. 19-20 (SUMMER 1964). A REVIEW OF RUSSIAN AGRICULTURAL REPORTS SHOWS THE VALUE OF COMPOSTED WASTES IN BUILDING SOILS AND INCREASING CROP YIELDS. (PHEA)

06-03-00865 REPORT ON THREE MANURE COMPOSTING PLANTS
WILEY, J. S.
COMPOST SCIENCE 5(2), P. 15-16 (SUMMER 1964). WINDROW COMPOSTING PLANT THAT TREATS MIXTURE OF FEEDLOT MANURE FROM 5500 STEERS AND MEAT PACKING WASTES INCLUDING BLOOD, PLANT FOR COMPOSTING CHICKEN MANURE FROM 1 MILLION BIRD EGG RANCH IN CALIFORNIA, AND COMPOSTING DRUM 10 FEET DIAMETER AND 100 FEET LONG IN EGG RANCH WITH 1 MILLION LAYERS ARE DESCRIBED. (EI)

06-03-00872 DEVELOPMENT OF COMPOSTING IN ISRAEL (DANO COST(CAPITAL) SALVAGE COMPOSITION(COMPOST) SUBSIDY)
WATSON, L.
COMPOST SCIENCE 4(2), P. 11-12 (SUMMER 1963). " DANO " BIO-STABILIZER, DESIGNED TO HANDLE 50 TONS OF RAW REFUSE PER DAY IN HAIFA IS IN PROCESS OF HAVING ITS DESIGN CAPACITY DOUBLED TO 100 TPD. DORR-OLIVER SYSTEM OPERATING IN TEL-AVIV, COMPRISES 4 RECEPTION HOPPERS INTO WHICH RAW REFUSE IS TIPPED VIA 8 TIPPING BAYS. SALVAGEABLE MATERIAL AND BULKY ITEMS WHICH MIGHT INTERFERE WITH SMOOTH OPERATION OF GRINDING PROCESS, ARE REMOVED BY HAND FROM PICKING BELT AND POWERFUL MAGNETS REMOVE FERROUS METAL. THREE ADDITIONAL TOWNS ARE ACTIVELY PLANNING ERECTION OF MECHANIZED COMPOST PLANTS. (EI)

06-03-00876 THE PHOENIX PLANT - A PROGRESS REPORT
COMPOST SCIENCE 4(1), P. 17 (1963). APPARENTLY FROM THE INFORMATION PRESENTED, THE PLANT AT THIS STAGE HAS MANY " KINKS TO STRAIGHTEN OUT ". SOME OF THE ORIGINAL INSTALLATIONS WERE EXPERIMENTAL ONES, AND THERE HAVE BEEN MANY CHANGES. ADDITIONAL EQUIPMENT IS BEING INSTALLED TO INCREASE THE DAILY CAPACITY.

06-03-00878 WHY THIS NEW ZEALAND CITY CHOSE COMPOSTING (COMPOSITION ECONOMICS)
HUTCHINSON, G. A.
COMPOST SCIENCE 3(4), P. 24-29 (WINTER 1963). ACCOUNT OF EXPERIMENTS, PILOT PLANT, AND INVESTIGATIONS THAT LED TO DECISION TO BUILD AUCKLAND COMPOST PLANT, REPORTED FIRST OF ITS KIND IN AUSTRALIA OR NEW ZEALAND. PLANT DETAILS INCLUDING RECEPTION HOPPER, ELEVATED SILO, MATURING WINDROWS, TURNING MACHINE AND TRUCK FOR BAGGED ORDERS. (EI)

06-03-00880 ILLUSTRATED TOUR OF OVERSEAS COMPOST PLANT (COST(CAPITAL) GRINDING RASP BALLISTIC-SEPARATOR)
WILMES, L. W.
COMPOST SCIENCE 3(4), P. 12-13 (WINTER 1963). DESCRIPTION OF ARNHEM INSTALLATION TO SHOW HOW DUTCH AGRICULTURE BENEFITS FROM ITS DOMESTIC REFUSE. METHODS AND SPECIAL FACILITIES FOR COLLECTION OF HOUSEHOLD REFUSE. PLANT, WHICH PROCESSES REFUSE FOR 126,000 RESIDENTS, IS OPERATED BY 10 WORKERS. (EI)

06-03-00882 FULL-TIME SCHEDULE OF PHOENIX COMPOST PLANT (DANO)
VALIANOS, J. N.
COMPOST SCIENCE 3(4), P. 9-10 (WINTER 1963). THE TRADITIONAL LANDFILL AND GARBAGE DUMP DISPOSAL METHODS ARE BEING ELIMINATED IN THE RAPIDLY GROWING SOUTHWESTERN METROPOLIS OF PHOENIX, ARIZONA. NOW A CONTINUOUS AND FULLY MECHANIZED BIOLOGICAL PROCESS TRANSFORMS THE ORGANIC CONTENT OF REFUSE AND GARBAGE INTO USEFUL COMPOST UNDER HYGIENIC CONDITIONS. (AUTH)

06-03-00893 COMPOSTING CITY REFUSE IN THE NETHERLANDS (VAN-MAANEN SALVAGE DANO)
TEENSMA, B.
COMPOST SCIENCE 1(4), P. 11 (MARCH 1961). THE ARTICLE DESCRIBES THE NEED FOR REFUSE COMPOSTING IN THE NETHERLANDS, AND EXPLAINS HOW THE PROCESS PROGRESSED IN THAT COUNTRY. COMPOSTING ON A LARGE SCALE BEGAN WITH THE OPERATION OF THE VAN MAANEN PLANT AT WIJSTER IN 1929, A TIME WHEN COMPOST WAS NEEDED TO RESTORE THE PHYSICAL FERTILITY OF THE SOIL DEPLETED AFTER 30 YEARS OF SOLELY CHEMICAL FERTILIZATION. AT THE END OF 1960, 15 COMPOSTING PLANTS WERE IN OPERATION IN THE NETHERLANDS-- TWO VAN MAANEN PLANTS, EIGHT RASPING PLANTS, FOUR DANO PLANTS, AND ONE HAMMER MILL PLANT. THE LARGE WIJSTER PLANT WAS MODERNIZED IN 1962. THESE COMPOSTING SYSTEMS PROCESSED NEARLY 30 PERCENT OF THE TOTAL MUNICIPAL REFUSE OUTPUT IN THE NETHERLANDS. THE SYSTEMS ARE BRIEFLY DESCRIBED IN THE REPORT. THE PART PLAYED BY THE DUTCH GOVERNMENT IN MAKING POSSIBLE THE DEVELOPMENT AND INSTALLATION OF THE SYSTEMS ALSO IS TOLD. THE AUTHOR PREDICTS THE CONSTRUCTION OF MORE COMPOSTING PLANTS, BECAUSE HE FORECASTS A DEMAND FOR ADDITIONAL COMPOST. (UC)

06-03-00896 COMPOSTING SEWAGE SLUDGE WITH MUNICIPAL REFUSE
DAVIES, A. G.
COMPOST SCIENCE 1, P. 9 (AUTUMN 1960). THE ADDITION OF SEWAGE SLUDGE CAN BE OF HELP IN THE COMPOSTING OF MUNICIPAL WASTES. HOWEVER, LITTLE HAS BEEN DONE ALONG THESE LINES EXCEPT ON THE ISLAND OF JERSEY. THE ADDITION OF SEWAGE SLUDGE TO MUNICIPAL REFUSE INCREASES THE NUTRIENT VALUE OF THE COMPOSTED PRODUCT. PATHOGENS IN THE SLUDGE ARE KILLED BY THE HEAT PRODUCED IN A PROPERLY CONDUCTED AEROBIC, THERMOPHILIC COMPOSTING PROCESS. TO KEEP THE MOISTURE CONTENT AT THE PROPER LEVEL, THE SLUDGE SHOULD BE PARTIALLY DEWATERED BEFORE BEING ADDED TO THE REFUSE. IN THE OPERATION AT LEICESTER, ENGLAND, A VACUUM FILTER IS LINED WITH WOOD FLOUR PRIOR TO THE ADDITION OF DIGESTED SLUDGE. THE SLUDGE CAKE AND THIN LAYER OF THE FLOUR ARE CUT OFF BY A KNIFE AT EACH REVOLUTION OF THE FILTER. EXPERIMENTS ARE BEING CONDUCTED WITH THE AIM OF IMPROVING THE PROCESS. THE USE OF SLUDGE-REFUSE MIXTURES IN COMPOSTING ADDS LITTLE TO THE COST OF REFUSE COMPOSTING. IT DOES, HOWEVER, PROVIDE GOOD SAVINGS IN SEWAGE DISPOSAL. (UC)

06-03-00897 PHOENIX MAKES PROGRESS WITH COMPOST PLANT (DANO)
COMPOST SCIENCE 1(2), P. 47 (1960). THE COMPOST PROCESS WILL BE COMPLETELY ENCLOSED, WITH THE GARBAGE TRUCKS UNLOADING INSIDE THE BUILDING WHICH HOUSES THE COMPOST EQUIPMENT. PLANS HAVE ALSO BEEN MADE TO LANDSCAPE THE GROUNDS OUTSIDE THE PLANT. THE CITY WILL RECEIVE TEN PERCENT OF ALL PLANT GROSS SALES AFTER THE FIRST YEAR OF OPERATION, AND A GUARANTEED MINIMUM ANNUAL INCOME BETWEEN $45,000 AND $60,000 THEREAFTER. IN RETURN, THE DANO GROUP WILL BE PAID A DUMPING FEE FROM PHOENIX OF $1.25 PER TON THE FIRST YEAR AND $1.10 PER TON THEREAFTER. ACCORDING TO JOHN M. URIE, RESEARCH AND BUDGET OFFICER, THESE COSTS ARE JUST ABOUT THE SAME AS THE PRESENT LANDFILL METHOD COSTS. THE GROUP WHICH WILL FINANCE THE DANO PLANT PLANS TO SELL THE FINISHED COMPOST TO A FERTILIZER COMPANY WHO IN TURN WILL MARKET IT ON A RETAIL BASIS. TESTS ARE ALREADY UNDERWAY AT THE UNIVERSITY OF ARIZONA ON THE EFFECTIVENESS OF THIS COMPOST AS A SOIL CONDITIONER. TWO PRELIMINARY SURVEYS HAVE ALREADY INDICATED THAT THE LARGE NEARBY AGRICULTURAL AREAS MAKE A FINE MARKET FOR COMPOST.

06-03-00898 COMPOSTING MUNICIPAL GARBAGE IN ISRAEL (PRICE(COMPOST) GRINDING COST(CAPITAL) OPEN-DUMP)
SHUVAL, H. I.
COMPOST SCIENCE 1(1), P. 21 (SPRING 1960). INTEREST IN COMPOSTING MUNICIPAL GARBAGE HAS GROWN IN ISRAEL DURING THE PAST FIVE YEARS FOR A NUMBER OF REASONS. THE COMPOSTABLE FRACTION OF ISRAELI REFUSE IS ABOUT 84 PERCENT OF THE TOTAL, AS COMPARED TO THAT OF COUNTRIES SUCH AS ENGLAND WHERE THE REFUSE IS ONLY ABOUT 30 PERCENT COMPOSTABLE. ISRAEL NEEDS THE END PRODUCT AS FERTILIZER FOR ITS GROWING AGRICULTURAL ECONOMY. CONSEQUENTLY, THE GOVERNMENT HAS STARTED TO SUBSIDIZE TO SOME EXTENT COMPANIES WHICH WILL BUILD COMPOSTING PLANTS. THE PRESENT, DOMINANT METHOD OF WASTES DISPOSAL IS THE UNSANITARY OPEN DUMP. TREMENDOUS FLY PROBLEMS HAVE BEEN ENCOUNTERED. IN SOME CITIES, AN UNMECHANIZED WINDROW METHOD OF COMPOSTING HAS BEEN USED. THESE OPERATIONS ARE CHARACTERIZED BY THE ANAEROBIC DECOMPOSITION OF THE REFUSE. THEY GENERALLY HAVE FAILED BECAUSE THEY DID NOT ALLEVIATE THE FLY PROBLEM, AND BECAUSE OF THE HIGH LABOR COSTS. REFUSE WHICH HAD BEEN PARTIALLY STABILIZED IN OPEN DUMPS, IS BEING COMPOSTED. THE END PRODUCT OF SUCH OPERATIONS IS OF A FAIRLY GOOD QUALITY. THE CITY OF TEL AVIV CONTRACTED TO HAVE A 500-TON CAPACITY COMPOST PLANT BUILT. A PILOT PLANT WAS SET UP TO FIND THE MOST EFFICIENT TYPE OF OPERATION FOR THE CITY. THE PILOT PLANT IS FULLY MECHANIZED, AND HAS A DAILY CAPACITY OF 80-100 CU-M. SALVAGEABLE MATERIALS ARE SEGREGATED. THE COMPOSTABLE MATERIALS ARE GROUND AND PULVERIZED BEFORE BEING STACKED IN WINDROWS FOR DECOMPOSITION. THE COMPOSTING REFUSE IS TURNED BY TRACTORS AND IS LEFT IN THE PILES FOR FROM 3 TO 4 WEEKS. THE FINAL 500-TON PLANT WILL COST ABOUT $1 MILLION. THE CITY WILL PAY THE OPERATORS $0.75/TON FOR EACH TON OF RAW GARBAGE HANDLED. HAIFA HAS A 60-TON PILOT PLANT - A MODEL FOR A LARGER SETUP TO SERVE THE CITY'S 150,000 POPULATION. (UC)

06-03-00912 REFUSE COMPOSTING PLANT AT NORMAN, OKLAHOMA (SEGREGATION SALVAGE)
MCGAUHEY, P. H.
COMPOST SCIENCE 1, P. 5 (AUTUMN 1960). ONE OF THE MAJOR DRAWBACKS TO THE COMPOSTING PROCESS IN THE U.S. IS THE FACT THAT THERE HAS NOT BEEN ADECUATE EQUIPMENT TO MAKE A MECHANICAL PROCESS TECHNICALLY OR ECONOMICALLY FEASIBLE. THE NATURIZER COMPANY, NORMAN, OKLAHOMA, HAS DEVELOPED GOOD EQUIPMENT. IT HAD A DEMONSTRATION PLANT IN OPERATION AT TIME OF ARTICLE. THE BODY OF THE ARTICLE IS CONCERNED WITH A DESCRIPTION OF THE NATURIZER PLANT. THE MAJOR STEPS OF THE OPERATION INCLUDE RECEIVING, SORTING AND SALVAGE, GRINDING AND MIXING, DECOMPOSITION, SCREENING, BAGGING, AND STORAGE. THE REFUSE IS GROUND AND PULVERIZED AFTER THE SALVAGE OPERATIONS, AND IS CONVEYED TO A TRI-LEVEL DIGESTER FOR PARTIAL DECOMPOSITION. THE REFUSE IS REGROUND AND SENT TO ANOTHER DIGESTER, REGROUND AND THEN EITHER IS STCRED CR IS BAGGED FOR SALE. THE PLANT IS CAPABLE OF COMPOSTING 35 TONS OF REFUSE PER DAY. (UC)

06-03-00913 MUNICIPAL COMPOSTING IN UNITED KINGDOM (QUANTITY COMPOSITION ECONOMICS COMPOSITION(COMPOST) SALVAGE BALLISTIC-SEPARATOR RASP PRICE(COMPOST) COST(CAPITAL) COST(OPERATING))
GORDON, C. A.
AM SOC CIVIL ENGRG J SANIT ENGRG DIV 84(SA6), (NOVEMBER 1958). DESCRIPTION AND OPERATION OF KIRCKCONNEL AND JERSEY MUNICIPAL COMPOSTING PLANT IN GREAT BRITAIN. DISCUSSION OF METHODS FOR COMPOSTING OF REFUSE AND SEWAGE SLUDGE AND OF GENERAL TRENDS IN WASTE DISPOSAL. (EI)

06-03-00921 REFUSE DISPOSAL IN DUMFRIESSHIRE (COMPOSTING COST(OPERATING) COST(CAPITAL) DANO TRANSFER-STATION)
PUBLIC CLEANSING 53(5), P. 241 (MAY 1963). PRESENTS A PAPER, ENTITLED " DEVELOPMENTS IN REFUSE DISPCSAL IN DUMFRIESSHIRE, " BY JOHN W. FLETCHER. THE PAPER DISCUSSES THE NEW REFUSE DISPOSAL SCHEME INAUGURATED IN DUMFRIESSHIRE, IN WHICH THE TOWNS OF LANGHOLM, LOCHMABEN, SCOTLAND, AND LOCKERBIE ARE PARTICIPATING. DESCRIBES- (1) THE SEPARATION-COMPOSTING PLANT, WHICH WILL PROCESS BOTH REFUSE AND SLUDGE, (2) ALLOCATION OF COSTS OF THE SCHEME, (3) POPULATION DISTRIBUTION AND REFUSE QUANTITY IN THE AREA, (4) THE SELECTED SITE FOR THE DISPOSAL WORKS, AND (5) TRANSFER PROVISIONS AT LOCATIONS AROUND THE COUNTY FOR BULK TRANSPORT OF REFUSE AND SLUDGE TO THE DISPOSAL WORKS, INCLUDING LOCATIONS OF THE SIX TRANSFER DEPOTS, CONTAINERS AND VEHICLES USED IN THE SYSTEM AND OPERATION OF THE (PENMAN) TRANSFER SYSTEM. AN APPENDIX GIVES ESTIMATED CAPITAL OUTLAY AND ANNUAL COSTS. A DISCUSSION FOLLOWS THE PAPER. (PHS)

06-03-00939 REFUSE AND REFUSE-SLUDGE COMPOSTING (SLUDGE(SEWAGE) DANO RASP)
WILEY, J. S.
J BOSTON SOC CIVIL ENGRS, (JANUARY 1967). IN THE ARTICLE ARE DISCUSSED SOME OF THE RESULTS OBTAINED IN COMPOSTING STUDIES IN THE U.S., AND DESCRIPTIONS ARE GIVEN OF TWO PROCESSES OF COMPOSTING WIDELY USED IN EUROPE. RESULTS OBTAINED IN THE U.S. STUDIES SHOWED THAT COMPOSTING OF ORGANIC WASTES IS TECHNICALLY FEASIBLE EITHER IN MECHANICAL UNITS OR IN WINDROWS. THE ORGANIC WASTES HAVE MOISTURE CONTENTS RANGING FROM 40 PERCENT TO 70 PERCENT. IN THE PROCESSES, DECOMPOSITION GENERALLY TAKES PLACE IN THE THERMOPHILIC RANGE, I.E., 113 TO 140 DEGREES F. END PRODUCTS ARE HUMUS, OR HUMUS FORMING SUBSTANCES, CARBON DIOXIDE AND WATER. THE AUTHOR NOTES THAT 30 PERCENT TO 40 PERCENT OF THE DECOMPOSITION OF VOLATILE SOLIDS OCCURRED WITHIN 6 TO 11 DAYS IN THE LABORATORY, AND WITHIN 29 TO 43 DAYS IN OUTDOOR WINDROWS AND BINS. AT THE END OF THE COMPOSTING PROCESS, FIBERS CONSTITUTE ABOUT 50 PERCENT OF THE COMPOSTED MATERIAL. A GOOD CORRELATION EXISTED BETWEEN TEMPERATURE AND CARBON DIOXIDE PRODUCTION, WATER PRODUCED AND EVAPORATED, AND OXYGEN CONSUMED. CORRELATION COEFFICIENTS AVERAGED FROM 0.75 TO 0.85. THE RESPIRATORY QUOTIENT WAS ON THE ORDER OF 0.9. HEALTH AND NUISANCE HAZARDS ARE MINIMAL. PATHOGENS ARE KILLED. WEED SEEDS, FLY EGGS, AND LARVAE ARE DESTROYED. OF THE EUROPEAN COMPOSTING SYSTEMS, THE DANO METHOD PROVIDES REFUSE SORTING, COMPOSTING WITH CONTINUOUS TUMBLING AND AERATION FOR THREE TO FIVE DAYS (BIOSTABILIZER), REFINEMENT, AND CURING OF THE COMPOST. THE RASPING SYSTEM PROCESS INCLUDES REFUSE SORTING, GRINDING, AND REFINING, FOLLOWED BY WINDROW COMPOSTING FOR 3 TO 5 MONTHS. IN COMBINED REFUSE-SLUDGE COMPOSTING, RAW SLUDGE IS ADDED TO SORTED REFUSE. THE SLUDGE RAISES THE NITROGEN CONTENT OF THE MATERIAL TO BE COMPOSTED, AND SPEEDS DECOMPOSITION. THE FINAL COMPOST IS IMPROVED IN STRUCTURE AND NUTRIENT CONTENT. (UC)

06-03-00940 REFUSE PLANT IN CITY PARK (COMPOSTING BULKY-WASTE COST(CAPITAL))
PUBLIC CLEANSING 59(11), P. 570-575 (NOVEMBER 1967). THE INTERNATIONAL DISPOSAL CORPORATION'S NEW REFUSE RECLAMATION PLANT IN ST. PETERSBURG, FLORIDA, IS A SOPHISTICATED SOLUTION TO THE PROBLEM OF PROVIDING EFFICIENT AND NUISANCE-FREE DISPOSAL OF CITY REFUSE. APPLICATION OF MODERN MATERIAL HANDLING TECHNIQUES TO THE PLANT'S DECOMPOSITION PROCESSES, AND THE ABSENCE OF SMOKE, FUMES, NOISE OR UNPLEASANT ODORS HAVE RESULTED IN AN UNOBJECTIONABLE SYSTEM OF SOLID WASTE TREATMENT WHICH CAN BE SITED IN A RESIDENTIAL AREA.

06-03-00959 COMPOST PLANT BUILT FOR ST. PETERSBURG
PUBLIC WORKS 97(10), P. 152 (1966). APPLICATION OF MODERN MATERIAL HANDLING TECHNIQUES TO INTERNATICNAL DISPOSAL CORPORATION'S NEW $1.5 MILLION REFUSE RECLAMATION PLANT IN ST. PETERSBURG, FLORIDA, IS CLAIMED TO PROVIDE A COMPLETELY UNOBJECTIONABLE SYSTEM FOR SOLID WASTE DISPOSAL. BECAUSE IT DOES NOT PRODUCE SMCKE, FUMES, NOISE OR UNPLEASANT ODORS, THE PLANT HAS BEEN LOCATED IN THE MIDDLE OF THE RESIDENTIAL AREA IT SERVES. THIS CENTRAL LOCATION CFFERS A DISTINCT COMPETITIVE ADVANTAGE - HAULAGE COSTS WILL BE MINIMAL. BUILT UNDER A TURNKEY CONTRACT BY WESTINGHOUSE ELECTRIC CORP., THE PLANT IS DESIGNED TO PROCESS UP TO 105 TONS OF REFUSE DAILY. OPERATIONS ARE ENCLOSED IN CLEAN, MODERN, LIGHT INDUSTRIAL-TYPE BUILDINGS WITH LANDSCAPING THAT BLENDS THEM WITH THEIR PARKLIKE SETTING. UNDER A 20-YEAR RENEWABLE CONTRACT WITH THE SUNSHINE CITY, IDC MUST DISPOSE OF 100 TONS OF REFUSE PER DAY, SIX DAYS A WEEK. ST. PETERSBURG PAYS FOR THIS SERVICE CURRENTLY AT $3.24 PER DELIVERED TON, WITH ALLOWANCE FOR SOME FLUCTUATION IN FUTURE YEARS. OPERATION OF THE PLANT INVOLVES BOTH MANUAL AND AUTOMATIC REMOVAL OF SALVABLE ITEMS AND CONTROLLED BIOLOGICAL BREAKDOWN OF THE REMAINDER INTO AN ORGANIC COMPOST THROUGH A FIVE-DAY DECOMPOSITION PROCESS. BOTH COMPOST AND SALVAGED MATERIALS WILL BE MARKETED. (AUTH)

06-03-00985 FIRST PULVERIZATION PLANT FOR SCOTLAND (COMPOSTING VOLUME-REDUCTION DANO GRINDING)
SOLID WASTES MANAGEMENT/RRJ 10(4), P. 40 (APRIL 1967). A 96,000 ($268,000) PULVERIZATION PLANT, THE FIRST OF ITS KIND IN SCOTLAND, IS EXPECTED TO SERVE THE NEW TOWN OF GLENROTHES FOR THE NEXT 20 TO 30 YEARS. THE PLANT WILL OPERATE 8 HR PER DAY FOR A POPULATION PRESENTLY 40,000 AND EXPECTED TO INCREASE TO 75,000 TO 80,000. THE SYSTEM CONSISTS OF A HOPPER EQUIPPED WITH A MECHANICAL FEEDER-CONVEYOR, ELEVATOR WITH OVER-BAND MAGNETIC SEPARATOR, AND PULVERIZATION EQUIPMENT CONSISTING OF A DANO EGESTOR AND A HAMMER MILL. (UC)

06-03-00992 THE COMPOSTING GAME--MOBILE LOSES--HOUSTON TAKES CHANCE (COST(DISPOSAL) ECONOMICS COST(CAPITAL) COST(OPERATING))
SOLID WASTES MANAGEMENT/RRJ 9(8), P. 36 (AUGUST 1966). DESPITE THE HITHERTO POOR RECORD FOR COMPOSTING IN THE UNITED STATES, THE CITY OF HOUSTON, TEXAS, HAS CONTRACTED TO HAVE THREE 300-TON PER DAY CAPACITY COMPOSTING PLANTS BUILT AND OPERATED BY THREE DIFFERENT COMPANIES. THE SETUP IS NOT FINANCIALLY PERFECT. THE ESTIMATES CF COST PER TON TO THE CITY TO HAVE ITS REFUSE DISPOSED OF HAVE BEEN RAISED FROM $2.75 TO $3.51. THE CITY HAD TO PURCHASE THE PLANT SITES FOR THE COMPANIES, WHEREAS THE FRINGE BENEFITS PROMISED TO THE CITY ARE NOT FORTHCOMING. WHETHER OR NOT THE FINISHED PRODUCT WILL HAVE MUCH OF A MARKET VALUE IS AN UNANSWERED QUESTION. THE COST TO PROCESS REFUSE HAS BEEN ESTIMATED AT $6.80 PER TON, WITH $3.51 TO BE PAID BY THE CITY. THAT LEAVES $3.29 PER TON THAT MUST BE MADE ON COMPOST SALES AND SALVAGE OF TIN CANS, GLASS, ETC., MERELY FOR THE COMPANIES TO BREAK EVEN. WITH A PROJECTED PRODUCTION OF 100,000 TONS OF MATERIAL PER YEAR, A LARGE MARKET MUST BE SECURED FOR THE YEAR-ROUND. AFTER EIGHT MONTHS OF OPERATION, MOBILE, ALABAMA'S, $1.4 MILLION COMPOSTING PLANT HAS SHUTDOWN. VERY LITTLE OF THE END PRODUCT WAS SOLD, MUCH OF THE MACHINERY FAILED TO STAND THE RIGORS OF THE PROCESS, AND LABOR COSTS WERE DOUBLE THE ORIGINAL ESTIMATES. THE PLANT, AFTER ONLY EIGHT MONTHS OF OPERATION, HAS SUFFERED FROM FAILURE OF OVERWORKED MOTORS, THE NECESSITY OF REBUILDING CRUSHING MECHANISMS, AND THE ASSEMBLY LINE OF THE FACILITY NEEDS TC BE REDESIGNED. THE ESTIMATED BUILDING COSTS OF $980,000 TURNED OUT TO EXCEED $1.4 MILLION, AND THE ONLY PROFITS FROM SALE OF THE END PRODUCT WERE $1,000. AN ANNUAL PAYROLL OF $90,000 WAS ESTIMATED FOR A CREW OF 20 MEN, WHERE IN ACTUALITY THE WORKERS NUMBERED 53, WITH A SUM OF $182,000 ANNUALLY FOR SALARY COSTS. (UC)

06-03-00994 DUTCH COMPOST PILE SHRINKS (INCINERATOR ECONOMICS)
SOLID WASTES MANAGEMENT/RRJ 9(11), P. 20 (NOVEMBER 1966). GLASGOW, SCOTLAND, HAS ABANDONED COMPOSTING PLANS BECAUSE OF FAILURE TO FIND MARKET FOR COMPOST. IT IS BUILDING AN INCINERATOR INSTEAD. THE SUBSIDY FOR THE 500 TON PER DAY PLANT AT TEL-AVIV HAD TO BE INCREASED. JAPAN HAS CLOSED ALL SEVEN OF ITS PLANTS. PLANS TO REOPEN THE COMPOST PLANT IN KINGSTON, JAMAICA, HAVE BEEN ABANDONED. FIFTEEN COMPOST PLANTS ARE IN OPERATION IN HOLLAND, THREE ARE RUN BY V.A.M. AND THE REMAINDER BY THE MUNICIPALITIES IN WHICH THEY ARE LOCATED. TOTAL PRODUCTION UNTIL 1966 WAS 190,000 TONS PER YEAR, OF WHICH 100,000 TONS WERE PRODUCED BY V.A.M. MOST OF THE LATTER IS DEPENDENT ON REFUSE FROM THE HAGUE. WITH THE HAGUE SWITCHING TO INCINERATION, THIS PRODUCTION WILL BE REDUCED DRASTICALLY. HAARLEM HAS ABANDONED COMPOSTING. ROTTERDAM AND AMSTERDAM (TOTAL POPULATION 1.6 MILLION) ARE BUILDING INCINERATORS. COSTS OF COMPOSTING IN THE HAGUE ARE AS - FOLLOWS - RAIL TRANSPORT, $1.12/TON TO LOAD, AND $1.12 TO $1.26 TO TRANSPORT, $1.76 TO V.A.M. FOR PROCESSING. THE TOTAL COST PER TON, THEREFORE, IS $5.12. AT ROTTERDAM IT COSTS $2.83/TON TO INCINERATE REFUSE. THE MOISTURE CONTENT OF THE COMPOST IS 40 PERCENT, THE ORGANIC MATTER, 15 PERCENT, AND OTHER MATTER, 45 PERCENT. HIGH-GRADE COMPOST SELLS FOR $4.90/TON, AND THE LOWEST GRADE FOR $1.96. MARKET FARMERS BUY ABOUT 22.8 PERCENT OF THE TOTAL COMPOST, VEGETABLE, FRUIT, AND BULB GROWERS, 46.6 PERCENT, AND 35.6 PERCENT IS USED FOR LAWNS AND RECREATIONAL AREAS. DR. STOLP, DIRECTOR OF V.A.M., STATES THAT COMPOSTING IS TOO EXPENSIVE FOR CITIES HAVING A POPULATION GREATER THAN 300,000, I.E., TOO EXPENSIVE TO TRANSPORT AWAY FROM THE CITY. THE V.A.M. NOW IS TRYING TO INTEREST SMALLER COMMUNITIES IN COMPOSTING TO COMPENSATE FOR THE LOSS OF THE HAGUE. THE DUTCH ARE LOSING THEIR INTEREST IN COMPOSTING BECAUSE IT IS TOO EXPENSIVE, TOO SLOW, AND OFTEN A SOURCE OF NUISANCE. (UC)

06-03-01008 ASK BIDS FOR COMPOSTING PHOENIX REFUSE
THE AMERICAN CITY 75(3), P. 161 (MARCH 1960). PHOENIX, ARIZONA, HAS ASKED FOR PROPOSALS FROM PRIVATE INDIVIDUALS OR CORPORATIONS FOR THE COMPOSTING OF CITY REFUSE. THE CITY PLANS TO COLLECT AND TRANSPORT THE REFUSE TO THE COMPOSTING PLANT. (PHS)

06-03-01047 MUNICIPAL COMPOST PLANT (ECONOMICS COST(OPERATING) MARKETING DANO CHARACTERISTICS(COMPOST) DESIGN)
HUTCHINSON, G. A.
NEW-ZEALAND ENGRG 21(12), P. 509-517 (DECEMBER 1966). PILOT PLANT EXPERIMENTS FOR COMPOSTING MUNICIPAL REFUSE, FACTORS INVOLVED IN DETERMINING FUTURE REFUSE DISPOSAL POLICY FOR AUCKLAND CITY, AUSTRALIA, OVERSEAS INVESTIGATIONS OF CURRENT PRACTICE FOR MUNICIPAL COMPOSTING, DETAILS OF DESIGN, CONSTRUCTION AND OPERATION OF AUCKLAND'S FULL-SIZE MUNICIPAL COMPOST PLANT. SKETCH OF COMPOST PLANT. (EI)

06-03-01128 PROBLEMS IN THE DESTRUCTION AND USE OF HOUSEHOLD REFUSE IN MOROCCO (COMPOSTING COMPOSITION)
ECOFFARD, P. + KEHREN, L.
LES PROBLEMS POSES PAR LA DESTRUCTION ET L' UTILIZATION DES ORDURES MENAGERES. QUELQUES ASPECTS PARTICULARS AU MAROC. MAROC MED 40(436), P. 997-1014 (SEPTEMBER 1961). THIS PAPER DISCUSSES THE CONTENT OF HOUSEHOLD REFUSE IN EUROPE AND RABAT AND COMPARES THE VARIOUS WAYS OF DISPOSING OF IT. (PHEA)

06-03-01157 BRISTOL, ENGLAND, BUILDS COMPOST PLANT
COMPOST SCIENCE 3(3), P. 44 (AUTUMN 1962). PROCESS USED BY REFUSE DISPOSALS LTD. IS A 2-STAGE STATIC FERMENTATION WITH PROVISION FOR SALVAGING MATERIALS BETWEEN STAGES.

06-03-01165 BANGKOK PLANT COMPOSTS MUNICIPAL REFUSE (COMPOSTING)
GRINDROD, J.
COMPOST SCIENCE 2(4), P. 14-15 (WINTER 1962). BY UTILIZING THE CELL FERMENTATION PROCESS IN A 6-FLOOR FERMENTATION CHAMBER. BANGKOK'S NEW COMPOSTING PLANT IS CAPABLE OF HANDLING 38,000 CU-FT OF REFUSE DAILY, AND PRODUCING 60,000 TONS OF COMPOST YEARLY FOR THE FARMERS OF THAILAND. (PHEA)

06-03-01169 COMPOSTING METHODS AT KINGSTON, JAMAICA (COST(COMPOST) COMPOSTION)
SHATZEL, L. R.
COMPOST SCIENCE 4(4), P. 22-23 (WINTER 1964). THE AUTHOR DESCRIBES THE OPERATION OF A COMPOST PLANT IN JAMAICA WHICH HANDLED 100,000 TO 170,000 TONS OF UNSEGREGATED REFUSE PER YEAR. THE FLOW THROUGH THE GRINDING PLANT PROCEEDS AT THE RATE OF 30 TONS PER HOUR. GRINDING IS CARRIED OUT IN TWO STAGES. GLASS, CERAMIC, AND STONE ARE FREELY GROUND. METAL ITEMS ARE REDUCED TO APPROXIMATELY ONE-HALF IN. SIZE. THE COMPOST PROCESS TAKES PLACE OUT-OF-DOORS IN PILES 45 FEET LONG 6 FEET HIGH AND 12 FEET ACROSS. THESE PILES ARE INOCULATED WITH 1 OZ OF BACTERIA PER 1,000 LB OF REFUSE. THE TEMPERATURE, CAUSED BY BACTERIAL ACTION, IS MAINTAINED BY PERIODICAL TURNING AND WATERING EVERY 2 OR 3 DAYS. TEMPERATURE OF 140 DEGREES F IS REACHED IN 36 HOURS. WITHIN THREE WEEKS THE COMPOST PILE IS TRANSFORMED INTO A SOFT, DARK END-PRODUCT THAT HAS A MILD " WOODSY " AROMA. THE END-PRODUCT IS SCREENED, APPROXIMATELY 15 PERCENT IS RETURNED FOR ANOTHER PASS THROUGH THE ENTIRE COMPOSTING CYCLE. THE AUTHOR BELIEVES THAT THIS SYSTEM IS APPLICABLE TO REFUSE PROBLEM IN UNITED STATES CITIES AND THAT REFUSE CAN BE COMPOSTED FOR ABOUT $3.50 PER TON ALONG THE EASTERN SEABOARD OF THE UNITED STATES. (PHEA)

06-03-01170 REFUSE COMPOSTING IN ST. PETERSBURG, FLORIDA
MCCOLLAM, J. G.
COMPOST SCIENCE 7(2), P. 3-6 (AUTUMN 1966). A REFUSE COMPOSTING PLANT IS EVALUATED IN TERMS OF MOISTURE, SIZING, RETENTION, AGITATION, AERATION, AND HEAT. (PHEA)

06-03-01171 MANUFACTURING COMPOST FROM URBAN REFUSE IN SPAIN (COMPOSTING COST(OPERATING) COST(CAPITAL))
PACHECO, J.
COMPOST SCIENCE 7(2), P. 31-32 (AUTUMN 1966). COMPOSTING OPERATIONS AT FIVE SITES IN SPAIN ARE DESCRIBED. MOST OF THE PLANTS USE BIOCHEMICAL ACTIVATORS, AND GONDARD GRINDERS.

06-03-01172 GARBAGE PROCESSING IN JERSEY, BRITISH ISLES (SALVAGE COMPOSTING ECONOMICS)
GOTHARD, S. A.
COMPOST SCIENCE 2(1), P. 7-11 (SPRING 1961). THIS ARTICLE DEALS WITH SOME OF THE PROBLEMS WHICH ARISE IN MUNICIPAL COMPOSTING AND THE METHODS ADOPTED TO MEET THEM IN THE PLANT NOW IN OPERATION IN JERSEY. (PHEA)

06-03-01174 CONSERVATION AND FIELD TESTING OF COMPOST (METHODS(COMPOSTING) CROP-YIELD(COMPOST))
TIETJEN, C.
PROC OF THE NATIONAL CONF ON SOLID WASTE RESEARCH, AM PUBLIC WORKS ASSOC, CHICAGO, ILLINOIS, P. 175-186 (DECEMBER 1963). COMPOSTING RANKS WITH INCINERATION AND SANITARY LANDFILLING AS A METHOD OF REFUSE DISPOSAL IN MANY COUNTRIES, BUT IT MUST BE REALIZED THAT THREE GROUPS ORDINARILY PARTICIPATE IN COMPOSTING - (1) PRODUCERS OF SOLID WASTES AND THE OFFICIALS AND BOARDS RESPONSIBLE FOR PROVIDING SANITARY COLLECTION AND DISPOSAL FACILITIES. (2) THE INVENTORS AND BUILDERS OF COMPOST PROCESSING EQUIPMENT, AND THE COMPOST PRODUCERS (3) THE BUYERS OF COMPOST PRODUCTS. THE DIFFICULTY OF BALANCING THE ECONOMIC INTERESTS OF THESE GROUPS HAS BEEN CLEARLY DEMONSTRATED. THE NETHERLANDS IS WELL KNOWN AS AN OUTSTANDING EXAMPLE OF WHERE THE THREE GROUPS FOUND THE MODUS VIVENDI. IT MUST BE REMEMBERED, HOWEVER, THAT IN THE NETHERLANDS, PRODUCTION AND APPLICATION OF COMPOST FROM TOWN WASTES IS AN AGE OLD TRADITION. THE PRODUCERS OF MACHINERY AND COMPOST PRODUCTS CAN SCARCELY BE CONSIDERED COMPETENT TO ADDUCE CONVINCING PROOFS, BUT CERTAINLY THEY WILL SUPPORT COOPERATIVE WORK BY THE RESPONSIBLE OFFICIALS AND THE LANDOWNERS IN FINDING SOLUTIONS TO SANITARY WASTE DISPOSAL AND SOIL FERTILITY PROBLEMS THAT SATISFY BOTH PARTIES. THIS MAKES IT NECESSARY TO - (1) EXAMINE AND TEST COMPOSTING MACHINERY, PROCESSES, AND COMPOST PRODUCTS, (2) ESTABLISH SANITARY REQUIREMENTS, (3) DEMONSTRATE THE USE OF COMPOST UNDER CONTROLLED FIELD CONDITIONS (4) EVALUATE QUALITY CLAIMS.

06-03-01180 COMPOSTING REFUSE IN INDONESIA (COMPOSITION)
CARLYLE, P. E. + BROTONEGORO, S.
COMPOST SCIENCE 5(1), P. 22-25 (SPRING 1964). REFUSE COMPOSTING AS A MEANS OF CONVERTING WASTE ORGANIC MATERIALS INTO A USEABLE SOIL ADDITIVE IS DISCUSSED. DATA ARE PRESENTED FROM EXPERIMENTS IN WHICH COMPOST PILES WERE SHELTERED, COMMERCIAL FERTILIZERS CONTAINING NITROGEN AND PHOSPHORUS WERE ADDED, AND THE CONTROL HAD NEITHER SHELTER NOR ADDITIVES PROVIDED. TEMPERATURE, PH, AND CARBON-TO-NITROGEN RATIO CHANGES ARE RECORDED WEEKLY. THE RESULTS ARE ANALYZED AND DISCUSSED IN TERMS OF THE USEFULNESS OF THIS TYPE OF ORGANIC WASTE DISPOSAL FOR SMALLER CITIES. (PHEA)

06-03-01181 PROCESSING, CONVERTING AND UTILIZING SOLID WASTES (SALVAGE COMPOSTING AGRICULTURAL-WASTES RESEARCH-NEEDS

MCGAUHEY, P. H.
COMPOST SCIENCE 5(2), P. 8-14 (SUMMER 1964). A LEADER IN SANITARY ENGINEERING RESEARCH REVIEWS PAST DEVELOPMENTS, DISCUSSES THE PRESENT CRISIS, AND ANALYZES FUTURE WASTE TREATMENT NEEDS. (PHEA)

06-03-01200 WILLIAMSON, MICH. CONDUCTS SUCCESSFUL COMPOSTING OPERATION (COST(OPERATING) COST(COMPOST))
STEFFES, M. J.
THE AMERICAN CITY 73(8), P. 94-95 (AUGUST 1958). UNDIGESTED SEWAGE SOLIDS MIXED WITH GARBAGE AND OTHER ORGANIC WASTES FOR PRODUCTION OF COMPOST, FILTER DEWATERS TANK CONTENTS, TRANSFORMING IT FROM LIQUID TO FILTER CAKE CONTAINING ABOUT 65 PERCENT MOISTURE. CAKE IS ADDED TO GARBAGE, MIXTURE INOCULATED WITH AEROBIC BACTERIA CULTURE, AND GROUND THROUGH HAMMER MILL. CORN COBS ADDED TO INCREASE COMPOST VOLUME. AFTER 21 DAYS MATERIAL IS CONVEYED TO STORAGE BIN, REGROUND AND READY FOR SALE. (EI)

06-03-01206 TACOMA DISCONTINUES COMPOSTING OPERATIONS (FAILURE)
THE AMERICAN CITY 73(7), P. 35 (JULY 1958). THIS BRIEF ARTICLE EXPLAINS THE DISCONTINUANCE OF REFUSE COMPOSTING IN TACOMA, WASHINGTON. THE METHOD OF COMPOSTING WHICH HAD BEEN USED IS ALSO OUTLINED. (PHS)

06-03-01227 DISPOSAL OF REFUSE BY COMPOSTING (DANO COST(CAPITAL) COST(OPERATING))
KAY, T.
CHARTERED MUNIC ENGR 89(10), P. 361-365 (OCTOBER 1962). DANO PLANT AT RADCLIFF, ENGLAND, DESCRIBED. RECEIVING HOUSE, BIOSTABILIZER, CONTROL GEAR, DISCHARGE, SCREENING, CRUSHER, 3 MAIN FACTORS WHICH INSURE IDEAL CONDITIONS FOR ACCELERATION OF NATURAL PROCESS OF DECOMPOSITION IN DANO CYLINDER. OPERATION OF PLANT. (EI)

06-03-01231 THE COMPOST WORKS AT BADEN-BADEN (COMPOSTING)
STRAUB, H.
GAS U WASSERFACH 95, P. 382-386 (1954). AT THIS PLANT GARBAGE IS DUMPED INTO A SILO HAVING A CAPACITY OF ABOUT 1 DAY. THIS GARBAGE IS SIEVED INTO 3 FRACTIONS 0-8 MM, 8-40 MM, AND OVER 40 MM. THE TWO SMALLER FRACTIONS ARE DIRECTLY MIXED WITH SEWAGE SLUDGE, WHILE THAT OVER 40 MM IS SUBJECTED TO VISUAL INSPECTION TO REMOVE LUMPS, BONES, ETC., AND PASSED OVER A MAGNETIC SEPARATOR TO REMOVE IRON. THIS TREATED GARBAGE IS THEN MIXED WITH THE OTHER FRACTIONS AND SLUDGE. THE RESULTANT MIXTURE IS COMPOSTED IN 4-M HIGH PILES, 8-M WIDE AT THE BASE AND 4-M AT THE TOP, AND 100-M LONG. FERMENTATION BEGINS WITHIN 24 HOURS AND THE MAX. TEMP. OF 70 DEGREES IS REACHED IN 3-4 DAYS. IT IS COMPLETED IN 5-6 MONTHS. THE COMPOST IS AGAIN SCREENED, THE 8-40 MM FRACTION IS RESCREENED ON VIBRATING SCREENS. THE FRACTION 8-20 MM GOES DIRECTLY TO THE HAMMER MILL WHILE THE 20-40 MM FRACTION IS LARGELY INERT MATERIAL AND IS DISCARDED. DATA ARE GIVEN FOR THE COST OF THE PLANT AND THE COST OF OPERATION. THE PRODUCT IS FREE FROM PLANT AND ANIMAL DISEASES AND FINDS AGRICULTURAL USE AT THE RATE OF FROM 15 TO 125 METRIC TONS/HA. (1 TON COMPOST = APPROXIMATELY 1 CU-M). (CA)

06-03-01281 DISPOSAL OF WASTES--COMPOSTING (CHARACTERISTICS(COMPOST))
TRUMAN, H. A.
THE NEW ZEALAND INSTITUTION OF ENGINEERS, FERGUSON AND OSBORN, PRINTERS, LAMBTON QUAY (1949). MUNICIPAL COMPOSTING PROVIDES A SOUND AND HYGIENIC METHOD FOR THE DISPOSAL OF DIFFICULT ORGANIC WASTES. THE GENERAL POLICY OF BURYING AND BURNING HUGE QUANTITIES OF ECONOMICALLY AND AGRICULTURALLY USEFUL MATERIALS IS NOT SOUND. A SOURCE OF MOISTURE IS NECESSARY FOR A COMPOSTING SCHEME. COMPOSTING REFUSE WITH SEWAGE SLUDGE ASSISTS IN THE DISPOSAL OF THE SLUDGE AND AT THE SAME TIME PROVIDES THE NECESSARY MOISTURE. MUNICIPAL COMPOSTING MAKES IT POSSIBLE TO RETURN TO THE LAND CONVERTED TOWN REFUSE AND TOWN SEWAGE AS AN ORGANIC MANURE. MUNICIPAL COMPOSTING CAN EARN A RETURN FOR THE RATE-PAYERS BOTH IN CASH AND SOIL FERTILITY. IF TEMPERATURES OF 150 DEGREES TO 160 DEGREES F ARE MAINTAINED IN THE COMPOST FOR 2 TO 3 WEEKS THERE IS NO LIKELIHOOD OF MATURED COMPOST TO ACT AS A MEDIUM FOR THE DISSEMINATION OF INFECTIVE MATERIAL. (UC)

06-03-01285 COMPOSTING REFUSE IN A RESIDENTIAL AREA
SURVR MUNIC CTR ENGR 128(3886), P. 23-24 (NOVEMBER 26, 1966). A REFUSE DISPOSAL PLANT INSTALLED IN ST. PETERSBURG, FLA., CAN PROCESS UP TO 105 TONS OF REFUSE DAILY. KEY COMPONENTS OF THE RECLAMATION SYSTEM ARE A PATENTED GRINDER, WHICH REDUCES A HETEROGENEOUS MATERIAL TO PARTICLES OF UNIFORM SIZE, AND A PATENTED DIGESTER. THE DIGESTER GIVES MAXIMUM CONTROL OF THE ENVIRONMENTAL CONDITIONS REQUIRED FOR OPTIMUM DECOMPOSITION OF THE WASTES INTO AN ORGANIC COMPOST. (PHEA)

06-03-01303 A COMBINED SCHEME OF SEWAGE DISPOSAL AND REFUSE COMPOSTING IN LEICESTER (DANO COMPOSITION(COMPOST) COMPOSITION(SLUDGE) SLUDGE(SEWAGE) COST(CAPITAL) DESIGN)
BECKETT, J. L. + OAKLEY, H. R.
PROC INSTN CIVIL ENGRS 29(6756), P. 341-364 (1964). FURTHER DETAILS, ILLUSTRATIONS, AND FLOW DIAGRAMS ARE GIVEN OF THE NEW SEWAGE WORKS AT LEICESTER WITH SPECIAL REFERENCE TO THE DANO BIO-STABILIZER COMPOSTING PLANT AND THE ADVANTAGES OF INTEGRATED TREATMENT AND DISPOSAL OF SEWAGE AND GARBAGE. THE OPTIMAL MOISTURE CONTENT FOR COMPOSTING OF SEWAGE SLUDGE WITH GARBAGE IS BETWEEN 50 AND 60 PERCENT AND PARTIAL DEWATERING OF THE SLUDGE IS THEREFORE REQUIRED. EXPERIMENTS ARE REPORTED ON VARIOUS METHODS OF DEWATERING. IT WAS DECIDED THAT THE MOST SUITABLE PROCESS WAS THE KOMLINE-SANDERSON COIL VACUUM FILTER IN WHICH THE CONVENTIONAL CLOTH MEDIUM IS REPLACED BY STAINLESS STEEL COIL SPRINGS. AFTER DIGESTION IN HEATED TANKS, THE SLUDGE PASSES TO SECONDARY DIGESTION LAGOONS AND WILL BE CONDITIONED (PROBABLY WITH LIME AND ALUMINUM CHLOROHYDRATE) BEFORE VACUUM FILTRATION. ONLY A PORTION OF THE SLUDGE IS DEWATERED, SUFFICIENT TO GIVE THE REQUIRED MOISTURE CONTENT WHEN GARBAGE, DEWATERED SLUDGE, AND WET SLUDGE ARE MIXED. (WPA)

06-03-01323 SLUDGE DISPOSAL IN DUMFRIESSHIRE (COMPOSTING DANO COST(OPERATING) SLUDGE(SEWAGE))
FISHER, J. W.
J INST SEW PURIF, PT. 4, P. 322-331 (1961). THE AUTHOR DESCRIBES EXPERIENCE IN COMPOSTING SLUDGE AND GARBAGE IN DUMFRIESSHIRE, WITH PARTICULAR REFERENCE TO THE COMPOSTING PLANT BUILT AT KIRKCONNEL IN 1953. AT THIS PLANT GARBAGE IS TREATED TO SEPARATE INORGANIC MATERIALS, AND THE ORGANIC MATTER IS COMPOSTED WITH SLUDGE AND STRAW. THE MATURE COMPOST IS PULVERIZED, SCREENED, BAGGED, AND SOLD AS "ERADITE". A NEW COMPOSTING PLANT IS NOW BEING PLANNED TO SERVE OTHER PARTS OF THE COUNTY. IT WILL EMPLOY THE DANO PROCESS. IT IS EXPECTED THAT THE SLUDGE AT THIS PLANT WILL HAVE TO BE DEWATERED BY VACUUM FILTRATION BEFORE ADDITION TO THE GARBAGE, TO CONTROL THE MOISTURE CONTENT OF THE MIXTURE. THE FILTRATE FROM THE VACUUM FILTER WILL BE TREATED BY BIOLOGICAL FILTRATION TO REDUCE THE B.O.D. BEFORE DISCHARGE TO A STREAM. (WPA)

06-03-01324 OPERATION EXPERIENCES AT LEATHERHEAD SEWAGE AND REFUSE DISPOSAL WORKS (DANO COMPOSTING SLUDGE(SEWAGE) SALVAGE(METALS) SALVAGE(PAPER))
HARRISON, F.
J PROC INST SEW PURIF, P. 525-531 (1965). DETAILS ARE GIVEN OF THE DESIGN AND OPERATION OF THE SEWAGE WORKS AND GARBAGE COMPOSTING PLANT AT LEATHERHEAD, SURREY. THE LARGER OF THE TWO SEWAGE WORKS SERVING THE TOWN HAS RECENTLY BEEN EXTENDED. TREATMENT IS BY BIOLOGICAL FILTRATION AND SLUDGE IS PARTIALLY DIGESTED IN A LAGOON AND DRIED ON BEDS. SOME

OF THE DRIED SLUDGE IS COMPOSTED ALONG WITH GARBAGE IN THE DANO BIO-STABILIZER PLANT, THE COSTS OF OPERATION ARE TABULATED. (WPA)

06-03-01331 THE NETHERLANDS FINDS NO GOLD IN COMPOSTED REFUSE (COMPOSTING ECONOMICS)
THE AMERICAN CITY 68(3), P. 108-109 (1953). COMPOSTING IN THE NETHERLANDS IS A STATE SPONSORED ACTIVITY. AT THE PRESENT MUNICIPALITIES PAY THE NETHERLANDS REFUSE DISPOSAL CO. WHICH IS SELF SUPPORTING, ABOUT THE AMOUNT THAT THEY WOULD PAY FOR SOME OTHER DISPOSAL OPERATION. THE COMPANY COMPOSTS ABOUT 20 PERCENT OR BETTER OF ALL REFUSE AND SELLS IT TO THE FARMERS WHO NEED THE COMPOST TO IMPROVE THE TEXTURE OF THE SANDY SOIL. THE COMPOSITION OF THE COMPOST HAS MOST OF THE ELEMENTS NEEDED FOR NUTRIENTS FOR PLANT FOOD.

06-03-01378 EXPERIENCES ON THE COMPOSTING OF REFUSE IN BAD KREUZNACH (DANO)
BANSE, H. J.
BER ABWASSTECHN VEREIN 12, P. 403-408 (1960). THE AUTHOR DESCRIBES THE DESIGN AND OPERATION OF THE DANO COMPOSTING PLANT AT BAD KREUZNACH AND THE RESULTS OF TWO YEARS EXPERIENCE IN THE COMPOSTING OF GARBAGE. THE PLANT WAS DESIGNED TO INCLUDE SETTLED SLUDGE FROM THE SEWAGE WORKS BUT SO FAR THIS HAS NOT BEEN ADDED. THE CONTROL OF THE MOISTURE CONTENT OF THE MATERIAL AND THE POSSIBLE NECESSITY FOR DRYING SETTLED SLUDGE TO AVOID EXCESS MOISTURE ARE DISCUSSED. (WPA)

06-03-01394 CHEADLE AND GATLEY REFUSE DISPOSAL PLANT OPENED (COMPOSTING SALVAGE MARKETING(COMPOST) SEPARATION GRINDING ECONOMICS)
SURVEYOR 126(3830), P. 24-26, 29-30 (OCTOBER 30, 1965). ENGLISH URBAN DEVELOPMENT COUNCIL OPERATES COMPOSTING PLANT HOUSED IN PART OF HANGER-TYPE BUILDING. DEVELOPED ON LINES OF SEPARATION, PULVERIZATION, VERTICAL DIGESTION SCREENING PULVERIZING OF PRIMARY OVERSIZE WITH REJECTION OF SECONDARY OVERSIZE. LABORATORY MODEL WAS BUILT TO ESTABLISH AIR FLOW PATTERNS OF OXYGEN TRANSFER TO DIGESTER MATERIAL. FLOW DIAGRAM OF COMPOSTING PLANT, ANALYSIS OF COMPOST COMPOSITION, AND DESIGN AND OPERATING DETAILS. INSECT-O-CUTORS IS USED TO CONTROL INSECTS AND PRECAUTIONS FOR NOISE ATTENUATION ARE TO BE IMPROVED DURING OPERATION. (EI)

06-03-01397 COMPOSTING TREATMENT OF TOWN REFUSE AND SEWAGE SLUDGE (SLUDGE(SEWAGE) COMPOSITION GRINDING INCINERATION VOLUME-REDUCTION)
BRUNT, L. P.
SURVR MUNIC CTR ENGR 124(3781), P. 29-32 (1964). AFTER REVIEWING THE COMPOSITION OF DOMESTIC GARBAGE, THE AUTHOR DISCUSSES THE ADVANTAGES OF COMPOSTING GARBAGE, PARTICULARLY IN ADMIXTURE WITH SEWAGE SLUDGE. (WPA)

06-03-01424 SMALL COMPOSTING PLANT AT BLYTH IS PROVING SUCCESSFUL (SLUDGE(SEWAGE) PROPERTIES(COMPOST))
DAVIES, A. G.
MUNIC ENGRG 139, P. 577-578 (1962). A SMALL PLANT, DESIGNED TO PRODUCE 450 TONS OF COMPOST PER YEAR, HAS BEEN INSTALLED AT THE SEWAGE WORKS OF BLYTH, NORTHUMBERLAND, WHICH PROVIDES PARTIAL TREATMENT FOR DOMESTIC SEWAGE ONLY. LIQUID SLUDGE FROM THE SEDIMENTATION TANKS IS MIXED WITH WASTE STRAW, GRASS CUTTINGS AND ROADSIDE TRIMMINGS. THE COMPOSTING PROCESS AND THE MATURING PROCESS (IN WHICH PULVERIZED FUEL ASH WITH A LOW MOISTURE CONTENT IS ADDED) EACH TAKE ABOUT 6 WEEKS. SATISFACTORY RESULTS HAVE BEEN OBTAINED. (WPA)

06-03-01427 DANO PLANT AT MIDLOTHIAN SHOWS VALUE OF COMPOSTING
YOUNG, P. M.
MUNIC ENGRG 131, P. 1659-1660 (1961). IN A PAPER PRESENTED AT A MEETING OF THE INSTITUTE OF PUBLIC CLEANSING, MR. YOUNG REVIEWED THE CIRCUMSTANCES WHICH LED TO THE CONSTRUCTION OF THE DANO COMPOSTING PLANT AT MIDLOTHIAN, GAVE A DETAILED DESCRIPTION OF THE PLANT, AND DISCUSSED THE ECONOMICS OF COMPOSTING. (WPA)

06-03-01428 THE DEVELOPMENT OF MUNICIPAL COMPOSTING IN GREAT BRITAIN (DANO)
WYLIE, J. C.
J INSTN PUBLIC HEALTH ENGRS 60, P. 207-211 (1961). IN A PAPER PRESENTED TO THE EDINBURGH BRANCH OF THE INSTITUTION OF PUBLIC HEALTH ENGINEERS IN FEBRUARY 1961, THE AUTHOR DISCUSSED THE DEVELOPMENT OF MUNICIPAL COMPOSTING IN GREAT BRITAIN, WITH PARTICULAR REFERENCE TO THE INDORE AND DANO PROCESS. (WPA)

06-03-01444 MCKEESPORT PLANT TO TURN TRASH INTO FERTILIZER (COMPOSTING COST(CAPITAL))
THE AMERICAN CITY 71(12), P. 15 (DECEMBER 1956). ITEM REPORTING THE CONSTRUCTION OF A 140 TON PER DAY COMPOSTING PLANT AT MCKEESPORT, PENNSYLVANIA, BY THE ORGANIC CORP. OF AMERICA. CONSTRUCTION COST WAS $350,000. TWO TYPES OF PROPOSED LEASE - OPERATING AND CONSTRUCTION AGREEMENTS FOR SUCH PLANTS WITH INTERESTED CITIES ARE BRIEFLY DISCUSSED. (PHS)

06-03-01452 THE MCKEESPORT EXPERIMENT WITH REFUSE COMPOSTING
THE AMERICAN CITY 72(9), P. 15 (SEPTEMBER 1957). MCKEESPORT, PENNSYLVANIA HAS THE NATION'S ONLY PLANT WHICH COMPOSTS CITY REFUSE INTO A SOIL CONDITIONER AVAILABLE FOR SALE. ARTICLE REPORTS THE PROCESSING PROCEDURE, DISCUSSES THE RESULTANT INGREDIENTS OF THE PROCESS AND POSES QUESTIONS TO BE ANSWERED BEFORE ANOTHER CITY IS TO TAKE UP THIS DISPOSAL METHOD. (PHS)

06-03-01480 PROGRESS IN THE PREPARATION OF COMPOST - EXPERIENCES AT THE BALUBEUREN COMPOSTING WORKS
SPOHN, E.
STAEDTEHYGIENE 13, P. 86-92 (1962). THE AUTHOR DISCUSSES THE VALUE OF COMPOSTS, THE CHOICE OF RAW MATERIAL FOR COMPOSTING, AND THE PREPARATION OF THE MATERIAL. AN ILLUSTRATED ACCOUNT IS GIVEN OF THE CONSTRUCTION AND CONTROL OF COMPOST HEAPS, WITH METHODS FOR THE MEASUREMENT OF MOISTURE AND TEMPERATURE. THE FINAL MATURING, TESTING, AND METHOD OF APPLICATION OF COMPOST ARE DESCRIBED. (WPA)

06-03-01483 THE REFUSE COMPOSTING WORKS OF STUTTGART-MOEHRINGEN IN THE SERVICE OF MUNICIPAL HYGIENE (COST(CAPITAL))
GLOCKNER, K.
STAEDTEHYGIENE 13, P. 93-98 (1962). AFTER A GENERAL DISCUSSION OF THE THEORY AND PRACTICE OF GARBAGE COMPOSTING AND THE AGRICULTURAL AND HORTICULTURAL USES OF THE COMPOST, AN ILLUSTRATED ACCOUNT IS GIVEN OF THE COMPOSTING WORKS OF STUTTGART-MOEHRINGEN AND OF EARLY EXPERIENCES IN OPERATION. SEWAGE SLUDGE IS NOT AT PRESENT ADDED TO THE REFUSE. (WPA)

06-03-01487 SOIL IMPROVEMENT SOCIETY ORGANIZED TO PRODUCE AND TO UTILIZE COMPOST OF REFUSE (COMPOSTING)
TIETJEN, C. + BANSE, H. J.
CALIFORNIA VECTOR VIEWS 7(1), P. 1 (JANUARY 1960). A BRIEF ARTICLE DEMONSTRATING, BY EXAMPLE, HOW COOPERATION BETWEEN PEOPLE WHO PRODUCE WASTES AND THOSE WHO CAN USE THE WASTES LEADS TO INCREASED EFFICIENCY IN WASTE DISPOSAL. BY FORMING A UNION, THE GERMAN TOWN OF BAD KREUZNACH IS ABLE TO USE ITS MUNICIPAL WASTE TO MANUFACTURE A COMPOST WHICH THE LOCAL FARMERS CAN USE. IN THIS WAY, A MARKET IS GUARANTEED FOR ALL THE COMPOST THAT IS PRODUCED. THEY GO SO FAR AS TO MODIFY THE COMPOSTING PROCESS THROUGH THE YEARS TO MEET THE CHANGING NEEDS OF THE CROPS. THE COSTS OF THE COMPOSTING PROCESS ARE SHARED BY THE MEMBERS OF THE UNION. WASTE DISPOSAL HAS BECOME AN ASSET RATHER THAN A LIABILITY. (UC)

06-03-01509 SOLID WASTE MANAGEMENT/COMPOSTING, EUROPEAN ACTIVITY AND AMERICAN POTENTIAL (COMPOSTING MANAGEMENT DATA CONTRACT EQUIPMENT DANO COST(OPERATING) APPLICATION(COMPOST) SALES(COMPOST))
HART, S. A.
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE PUB 1826, (1968). THIS REPORT, THE RESULT OF A CONTRACT WITH THE SOLID WASTES PROGRAM, WAS INITIATED TO RELATE EUROPEAN COMPOSTING EXPERIENCE TO THE SOLID WASTE PROBLEM IN THE UNITED STATES. DURING THE INVESTIGATION, 14 EUROPEAN PLANTS WERE TOURED. COUNTRIES VISITED WERE GERMANY, HOLLAND, SWITZERLAND, AND FRANCE. DATA WAS COLLECTED ON THE PROCESSING OF SOLID WASTES INTO COMPOST, AND ON

COMPOST MARKETS, PLANT EQUIPMENT, FACILITIES, AND PROCEDURES. IN EUROPE, ONLY A LIMITED PERCENTAGE OF REFUSE IS COMPOSTED, BECAUSE PRODUCTION COSTS AND MARKETING PROBLEMS MAKE IT IMPRACTICAL TO PRODUCE MORE COMPOST THAN CAN BE SOLD. MOST EUROPEAN COMPOST PLANTS PROCESS ONLY DOMESTIC REFUSE AND HAVE ALTERNATE FACILITIES FOR MANAGEMENT OF NONCOMPOSTABLE ITEMS. COMPOST IS USED ALMOST EXCLUSIVELY FOR LUXURY AGRICULTURE - BULB AND FLOWER GROWING, GRAPES FOR WINE PRODUCTION, AND PARKS. THERE IS LITTLE MARKET FOR COMPOST IN BASIC AGRICULTURE. DATA IS GIVEN ON THE EFFECT OF COMPOST ON CROP YIELDS. THE REPORT INDICATES THAT THE POSSIBILITIES IN THE UNITED STATES FOR GROWTH OF COMPOSTING FOR SOLID WASTE DISPOSAL DO NOT DIFFER SIGNIFICANTLY FROM THOSE IN EUROPE. ROUGH QUALITY COMPOST HAS POTENTIAL FOR - (1) RECLAMATION OF SPOILED LANDS, (2) PREVENTION OF EROSION, (3) REDUCTION IN VOLUME OF LANDFILL MATERIAL, (4) COVER MATERIAL FOR ABOVE-GRADE LANDFILLS. A FAVORABLE AVENUE OF COMPOSTING PRACTICE SUGGESTED BY THE AUTHOR IS TO CONCEIVE OF THE LAND AS AN "ACCEPTOR OF COMPOST", RATHER THAN TO CONSIDER THE COMPOST AS A BENEFIT TO THE LAND, COMPOST APPLICATION WOULD NOT BE INTENDED TO INCREASE CROP PRODUCTION, NOR WOULD IT PREVENT RECOVERY OF THE LAND FOR AGRICULTURAL PURPOSES. (PHS)

06-03-01529 DESIGN FOR A COMBINED REFUSE AND SEWAGE PLANT
MUNIC ENGRG, LONDON, 142, P. 797 (1965). A PLANT FOR COMPOSTING GARBAGE WITH SEWAGE SLUDGE, DEVELOPED BY SIMON CARVES LTD. AND SIMON HANDLING ENGINEERS LTD. FOR A CITY OF 200,000 INHABITANTS, IS DESCRIBED AND ILLUSTRATED BY A FLOW DIAGRAM. AFTER SCREENING, THE GARBAGE IS MIXED WITH SEWAGE SLUDGE FROM CONVENTIONAL ACTIVATED-SLUDGE UNITS AND HELD IN TOWERS FOR ABOUT 5 DAYS, DURING WHICH PERIOD DECOMPOSITION TAKES PLACE WITH CONTROLLED ADDITION OF AIR AND SEWAGE EFFLUENT. FINES ORIGINALLY SEPARATED FROM THE GARBAGE ARE ADDED TO THE COMPOSTED MATERIAL. (EI)

06-03-01532 PROCESSING AND UTILIZATION OF REFUSE AND SLUDGE (SLUDGE(SEWAGE) INCINERATION COMPOSTING DANO APPLICATION(COMPOST) ECONOMICS)
BRAUN, R.
DIE VERARBEITUNG UND VERWERTUNG VON MUELL AND KLAERSCHLAMM. SCHWEIZ BAUZTG 77(7), P. 89-97 (FEBRUARY 12, 1959). INCINERATION OF MIXTURE, PRIOR TO BURNING, MIXTURE IS CENTRIFUGED AND DRIED, SAME MIXTURE USED FOR COMPOSTING BY VARIOUS METHODS INCLUDING BIO-STABILIZATION, SURVIVAL OF WEED SEEDS IN IMPERFECT COMPOST, USES OF COMPOST IN SWITZERLAND, ECONOMIC CONSIDERATIONS. (EI)

06-03-01552 COMPOST PLANT FOR BANGKOK (COMPOSTING SALVAGE SLUDGE(SEWAGE))
REFUSE REMOVAL JOURNAL 1(4), P. 21 (APRIL 1958). THE CITY OF BANGKOK, THAILAND, HAS ORDERED CONSTRUCTION OF A COMPOST PLANT AFTER PILOT STUDIES BY THE THAILAND DEPARTMENT OF AGRICULTURE. THE PLANT IS SCHEDULED TO PRODUCE 90,000 TONS OF COMPOST PER YEAR, WHICH IT IS ESTIMATED WILL INCREASE THE RICE YIELD BY AS MUCH AS 25 PERCENT. (PHS)

06-03-01578 COMPOSTING OF MUNICIPAL REFUSE AND SOME EUROPEAN COMPOSTING OPERATIONS (COST(OPERATING) DANO COST(CAPITAL) SURVEY FERTILIZER-VALUE SALVAGE)
NESBITT, J. B.
PENNSYLVANIA STATE UNIVERSITY, DEPT ENGRG RES, BULL B-72, (MAY 1958). IN EUROPE COMPOSTING IS PRACTICED ON LARGER SCALE THAN IN UNITED STATES, USE OF MECHANICALLY AERATED HORIZONTAL BIOSTABILIZER WITH DETENTION TIME FROM 5 DAYS TO 12 WEEKS. DANO PROCESS BIOSTABILIZER APPEARS MOST ECONOMICAL FOR APPLICATION IN UNITED STATES. USE OF COMPOSTING IS HAMPERED EVEN IN EUROPE BY DIFFICULTY OF MARKETING FINISHED COMPOST. (EI)

06-03-01607 MICHIGAN CITY COMPOSTS ITS REFUSE SUCCESSFULLY (SLUDGE(SEWAGE) COST(NET) COMPOSTING)
REFUSE REMOVAL JOURNAL 1(9), P. 14 (SEPTEMBER 1958). A COMPOSTING PLANT HAS BEEN OPERATING SUCCESSFULLY IN WILLIAMSTON, MICHIGAN, FOR OVER THREE YEARS. UNDIGESTED SEWAGE SOLIDS, GARBAGE, AND OTHER ORGANIC WASTES ARE MIXED, INOCULATED WITH AEROBIC BACTERIA CULTURE, AND GROUND THROUGH A HAMMERMILL, SMALL FERROUS PARTICLES ARE REMOVED WITH A MAGNETIC PULLEY. SOME OTHER MATERIALS ARE REMOVED BY HAND. COMPOSTING IS ACCOMPLISHED IN ENCLOSED STEEL BINS, EACH HOLDING FIVE TONS AND STACKED FOUR HIGH. FORCED AIR IS PIPED INTO THE BINS AND THROUGH THE MATERIAL. A 21-DAY DETENTION TIME IS USED. THE NET COST OF COMPLETED COMPOST IS $7/TON. (PHS)

06-03-01685 AUCKLAND'S MUNICIPAL COMPOST PLANT IN OPERATION (DANO COMPOSTING SALVAGE(FERROUS) MARKETING)
HUTCHINSON, G. A.
COMPOST SOCIETY JOURNAL 22(5), P. 19-22 (OCTOBER-NOVEMBER 1963). A 100-TON/DAY REFUSE-COMPOSTING PLANT OF THE DANO TYPE HAS BEEN COMPLETED AT AUCKLAND, NEW ZEALAND. THE PLANT CONSISTS OF TRUCK SCALES, DUAL RECEIVING HOPPERS WITH PLANT CONVEYORS, DUAL CONVEYOR BELTS WITH MAGNETIC HEAD PULLEYS, DUAL 310-CUBIC YARD DANO BIOSTABILIZERS, 2 DOUBLE-DECKED SCREENS, A DOUBLE-ROTOR HAMMERMILL FOR OVER-SIZE MATERIAL, A " DOUBLE-ROIL " DENSE PARTICLE SEPARATOR, AN OUTDOOR WINDROW MATURING AREA WITH TURNER, AND A MATURING SHED. THE UNGROUND UNSORTED REFUSE IS COMPOSTED FOR 5 DAYS IN THE BIOSTABILIZERS AND THEN FOR 4 TO 5 WEEKS IN WINDROWS WITH WEEKLY TURNING BY A FORCE-FEED HIGH LOADER. THREE GRADES OF COMPOST WILL BE SOLD UNDER THE NAME " ACCPOST " - THAT FROM THE BIOSTABILIZERS FOR DIRECT APPLICATION, THAT AFTER WINDROW COMPOSTING, AND THAT FULLY MATURED. ILLUSTRATIONS. (PHEA)

06-03-01699 FOUR YEARS OF COMPOST PROGRESS IN WILLIAMSTON (RIKER SLUDGE(SEWAGE))
RIKER, R. W.
REFUSE REMOVAL JOURNAL 3(10), P. 24-25 (1960). THE RIKER METHOD OF COMPOSTING UNDIGESTED SEWAGE SLUDGE MIXED WITH GARBAGE AND OTHER ORGANIC WASTES HAS PROVEN SATISFACTORY. THEY HAVE BEEN ABLE TO DISPOSE OF ALL THEIR COMPOST TO THE MARKET.

06-03-01753 PHOENIX COMPOST PLANT HAS STARTED OPERATION (COMPOSTING)
REFUSE REMOVAL JOURNAL 6(3), P. 8 (1963). A DESCRIPTION OF THE DANO PROCESS COMPOST PLANT OPERATED AT PHOENIX WHICH WILL EVENTUALLY DISPOSE OF THE CITY'S REFUSE.

06-03-01776 OPEN BIDS ON CITY DISPOSAL FACILITIES (COMPOSTING ECONOMICS)
REFUSE REMOVAL JOURNAL 6(11), P. 34 (NOVEMBER 1963). THE CITY OF ST. PETERSBURG, FLORIDA, WILL SHORTLY CALL FOR BIDS FOR A PRIVATE CONTRACTOR TO DESIGN, FINANCE, CONSTRUCT, AND OPERATE A SOLID WASTE DISPOSAL FACILITY UNDER A 20-YEAR CONTRACT WITH THE CITY. THE SPECIFICATIONS HAVE BEEN PREPARED TO ALLOW RESPONSIBLE BIDDERS TO OFFER ANY PROVEN PROCESS WHICH WILL DISPOSE OF THE CITY'S COLLECTED REFUSE. THREE DISPOSAL PLANTS WILL EVENTUALLY BE NEEDED. THE CITY WILL PAY A CONTRACT AMOUNT PER TON OF REFUSE DELIVERED TO THE DISPOSAL SITE. (PHS)

06-03-01868 WANLIP SLUDGE DIGESTION PLANT (COMPOSTING DANO SLUDGE(SEWAGE))
SHIRREFS, W. R. + ROBERTS, S. L.
EFFL AND WAT TREATM J 7, P. 23-28 (JANUARY 1967). A NEW SEWAGE PURIFICATION PLANT THAT WILL OPERATE IN CONJUNCTION WITH A REFUSE HANDLING PLANT IS DESCRIBED. THE BYPRODUCT OF THE REFUSE HANDLING PLANT, AFTER ITEMS OF SALVAGE HAVE BEEN REMOVED, WILL BE COMBINED WITH SEWAGE SLUDGE TO FORM A COMPOST SUITABLE FOR AGRICULTURAL AND HORTICULTURAL USE. (PHEA)

06-03-01928 COMPOSTING OPERATIONS BEGIN AT HOUSTON
HODGES, C. R.
COMPOST SCIENCE 7(3), P. 17-19 (WINTER 1967). A $1.75 MILLION COMPOST PLANT DESIGNED TO ACCEPT 300 TONS OF REFUSE A DAY, 6 DAYS A WEEK, HAS BEEN CONSTRUCTED AND IS OPERATED BY A SUBSIDIARY OF METROPOLITAN AND UNITED COMPOST SERVICES, INC., UNDER CONTRACT WITH THE CITY OF HOUSTON, TEXAS. THE HIGHLY AUTOMATED PLANT INCLUDES A PATENTED DIGESTER SYSTEM COMPRISED OF LONG TANKS INTO WHICH THE PREPARED MASS IS FED ON A LAYER BASIS. THE LAYER PROCESS OF FILLING THE DIGESTERS EFFECTIVELY INTERMIXES THE MATERIAL; SUBSEQUENT AGITATION, WHICH CUTS ACROSS THE HORIZONTAL LAYERS AND RESTACKS THE PILE IN THE DIGESTER TANK, PROVIDES ADDITIONAL MIXING. THE FINISHED COMPOST WHICH HAS BEEN EXPOSED TO TEMPERATURES UP TO 1,200 F, IS MARKETED IN THE SURROUNDING AGRICULTURAL AREA. (PHEA)

06-03-01950 TOWN REFUSE TREATMENT BY DEHYDRATION AND STERILIZATION (COMPOSTING(PRE))
TRAITEMENT DES RESIDUS URBAINS PAR DESHYDRATATION ET STERILISATION INDUSTRIES THERMIQUES ET AERAULIQUES 13(3), P. 141-171 (MARCH 1967). DETAILED STUDY OF NEW PROCESS UNDER DEVELOPMENT WHICH USES DRYING UNITS THAT ARE REPORTED TO MAKE POSSIBLE ECONOMIC STORAGE OF MATERIALS. INSTALLATION OF PRECOMPOSTING FACILITIES. (EI)

06-03-01961 THE UTILIZATION OF MUNICIPAL WASTES. REPORT ON THE PROCESSING OF URBAN WASTES IN A MECHANIZED COMPOSTING PLANT. (SALVAGE PATHOGEN COST(COMPOSTING))
KRIGE, P. R.
C.S.I.R. RES. REP. NO. 211, 82 PP (1964). THIS REPORT CONTAINS DATA OBTAINED IN AN INVESTIGATION OF THE CHARACTERISTICS OF MUNICIPAL WASTE IN SOUTH AFRICA, AND THEIR UTILIZATION BY COMPOSTING, INCLUDING A DETAILED DESCRIPTION OF THE MECHANIZED ROTATING-CYLINDER PLANT USED FOR PILOT-SCALE STUDIES IN PRETORIA. FURTHER DETAILS AND TABULATED AND GRAPHICAL RESULTS ON OPERATIONAL EXPERIENCES AT THIS PLANT, DISTINGUISHING BETWEEN THE STABILIZATION AND SECONDARY MATURATION PHASES OF THE COMPOSTING PROCESS; AND AN ANALYSIS OF THE FACTORS AFFECTING THE COSTS INVOLVED IN COMPOSTING. IT WAS CONCLUDED THAT COMPOSTING HAS ECONOMIC ADVANTAGES OVER DUMPING WHEN A LARGE-SCALE INSTALLATION CAN BE SET UP NEARER THE TOWN THAN A DUMPING SITE. THE BACTERIOLOGICAL AND HELMINTHOLOGICAL QUALITIES OF THE COMPOST WERE ALSO EXAMINED. (WPA)

06-03-01965 PROGRESS IN THE FIELD OF UTILIZATION OF GARBAGE (COMPOSTING SLUDGE(SEWAGE) ANALYSIS(COMPOST))
BRAUN, P. + KELLER, P.
PLAN SCHWEIZ Z. LANDES-, REGIONAL-, U. ORTSPLANUNG 5, 12P (1959). THE AUTHORS GIVE A REPORT ON THE 1ST INTERNATIONAL CONGRESS FOR THE DISPOSAL AND UTILIZATION OF TOWN GARBAGE HELD IN SCHEVENINGEN, HOLLAND, IN 1959. SUBJECTS DEALT WITH INCLUDE PLANT AND PROCESSES FOR THE COMPOSTING OF GARBAGE WITH AND WITHOUT SEWAGE SLUDGE, THE ADVANTAGES OF COMBINED COMPOSTING OF GARBAGE ADD SLUDGE, THE COMPOSTING PLANT IN JERSEY, BIOLOGICAL PROCESSES IN COMPOSTING, HYGIENIC CONSIDERATIONS, THE EFFECT OF THE COMPOSTS ON THE YIELD OF CROPS, ANALYSIS AND EXAMINATION OF COMPOSTS, AND METHODS OF USE.

06-03-01967 DAS NEUE KOMPOSTWERK IN DUISBURG-HUCKINGEN (THE NEW COMPOST STATION IN DUISBURG-HUCKINGEN) (COMPOSTING DANO SLUDGE(SEWAGE))
ROSSBERG, H.
STADT-UN-HAFEN (CITY AND PORT) 10, 2 PP. (1956). A COMPOSTING PLANT OF THE DANO TYPE, BEING BUILT IN THE HEART OF SOUTHERN DUISBURG, IS TO HAVE A DAILY CAPACITY OF ABOUT 200 CU-M OF RAW DOMESTIC WASTES, AND WILL COMPOST THE REFUSE OF A REGION HAVING 140,000 INHABITANTS. THE PLANT IS BEING BUILT ON THE GROUNDS OF THE SEWAGE TREATMENT PLANT WHICH FACILITATES THE ADDITION OF DIGESTED SLUDGE. THE SLUDGE IS PUMPED FROM A DIGESTER TO THE INLET OF A BIOSTABILIZER BY A SMALL PUMP. WHEN THE GAS PRODUCTION OF THE DIGESTER HAS INCREASED SUFFICIENTLY, THE EXCESS GAS IS USED TO GENERATE ELECTRICAL ENERGY, THEREBY REDUCING THE OPERATING COSTS OF THE COMPOSTING PLANT. THE PLANT WILL PROBABLY BE PUT INTO SERVICE BY THE SPRING OF 1957. (PHS)

06-03-01972 REFUSE COMPOST - A PRODUCT OF THE WERDENBERG LIECHTENSTEIN COOPERATIVE PLANT (COMPOSTING)
OSPELT, E.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 16, (DECEMBER 1962). CONSTRUCTION OF THE COOPERATIVE PLANT IN BUCHS WAS PLANNED, AMONG OTHER THINGS, WITH THE THOUGHT THAT REFUSE COULD BE CONVERTED INTO A PRODUCT WHICH CAN BE RETURNED TO NATURE AS HUMUS. THE ALTERNATE METHOD OF INCINERATION COULD HAVE BEEN SELECTED. THE QUESTION OF RESTORING IMPROVED CONDITIONS TO SOIL WHICH IS IN CONSTANT DEMAND FOR HUMUS APPEARS TO BE THE CORRECT APPROACH. AS SHOWN IN THE PAPER THE APPLICATION AREAS FOR COMPOST ARE VERY DIVERSE, PROVING THAT THE RIGHT PATH WAS TAKEN WITH THE CONSTRUCTION OF A COMPOST PLANT. MARKETS ARE ALSO AVAILABLE AS THERE ARE LARGE TRUCK FARMS AND A GREAT MANY HOME AND ORNAMENTAL GARDENS IN THE WERDENBERG AREA AND IN LEICHTENSTEIN. VINEYARDS CONTINUALLY TOTAL AROUND 30 HECTARES. THE PRICE OF COMPOST IS VERY FAVORABLE. COMPOST IS SUPERIOR TO STABLE MANURE WITH THE SAME CONTENT AND COMPARES FAVORABLY TO OTHER HUMUS FERTILIZERS. THE CONCLUSION TO RETURN ORGANIC MATTER TO THE SOIL INSTEAD OF DESTROYING IT WAS PROPER BECAUSE THERE IS STILL SUFFICIENT EXHAUSTION OF THE SOIL BEING CARRIED OUT. (AUTH)

06-03-01977 CONSTRUCTION ON PHOENIX COMPOST PLANT TO BEGIN FEBRUARY 1961 (COMPOSTING DANO)
COMPOST SCIENCE 1(4), P. 23 (WINTER 1961). FINAL PHASES OF DESIGN ARE IN PROCESS BY THE ARIZONA BIO-CHEMICAL CO. FOR THE 300 TON PER DAY DANO PLANT TO BE BUILT IN PHOENIX. EXTRA TIME WAS TAKEN TO INSPECT EUROPEAN COMPOST PLANTS IN ORDER TO IMPROVE THE DESIGN. CONSTRUCTION WILL START IN FEBRUARY AND IT IS ESTIMATED THAT THE PLANT WILL BE COMPLETED IN LATE SUMMER OR EARLY FALL. THE COMPANY WILL OPERATE THE PLANT AND SELL THE COMPOST TO A FERTILIZER FIRM WHICH IN TURN WILL MARKET IT ON A RETAIL BASIS. REFERENCE IS MADE TO GROWING TESTS BY THE UNIVERSITY OF ARIZONA AGRICULTURAL EXPERIMENT STATION WHICH DEMONSTRATED THE VALUE OF SUCH COMPOST FOR INCREASING PLANT YIELDS. (PHS)

06-03-01982 THE SEWAGE TREATMENT AND COMPOST PLANTS OF THE CITY OF BADEN-BADEN (COMPOSTING SLUDGE(SEWAGE) COST(OPERATING))
STRAUB, H.
DAS GAS-UND WASSERFACH 92(24), 10 PP. (1956). THE LOCATION OF THE SPA OF BADEN-BADEN AND ITS REQUIREMENTS WITH RESPECT TO THE SANITARY REMOVAL OF WASTES POSES PROBLEMS FOR THE CITY ADMINISTRATION REGARDING SEWAGE AND REFUSE DISPOSAL. THE TOWN CAN NO LONGER TOLERATE REFUSE DUMPS IN ITS VICINITY AS THESE THREATEN TO POLLUTE WATER, BREED RATS AND FLIES, AND CREATE OTHER VERY SERIOUS NUISANCES. AS THE INCINERATION OF REFUSE IN A CITY OF 60,000 WOULD BE ECONOMICALLY IMPRACTICAL, WE HAVE STUDIED THE PROCESS OF COMPOSTING REFUSE AND SEWAGE SLUDGE TOGETHER, AS WELL AS THE REQUIRED EQUIPMENT AND FACILITIES. THE CITY HAS STARTED CONSTRUCTION OF A SEWAGE TREATMENT COMPOSTING PLANT, INCLUDING CLARIFICATION OF SEWAGE, SLUDGE DIGESTION WITH GAS COLLECTION, AND COMPOSTING OF SCREENED REFUSE-SEWAGE SLUDGE. THIS PLANT WILL REMOVE AND CONVERT THE ENTIRE WASTE PRODUCTION FROM THE CITY INTO USEFUL SUBSTANCES - METHANE GAS AND COMPOST. THE AUTHOR DESCRIBES IN DETAIL THE INSTALLATION AT BADEN-BADEN AND SUPPLEMENTS HIS REPORT WITH DIAGRAMS AND PHOTOS. BY THE BADEN-BADEN EXAMPLE, HE SHOWS HOW SMALL AND MODERATELY SIZED TOWNS CAN TREAT REFUSE AND SEWAGE RATIONALLY. COST FIGURES INDICATED FOR CONSTRUCTION AND OPERATION OF THE SEWAGE TREATMENT PLANT ARE BASED ON EXPERIENCE, BUT THOSE FOR THE COMPOSTING PLANT ARE BASED ON CONSERVATIVE ESTIMATES. HOWEVER, THE AUTHOR CITES THE FIRST FIGURES FOR OPERATION COSTS OF THE COMPOSTING PLANT AND PROPOSES TO COMPLETE THEM AFTER THE PLANT HAS BEEN IN OPERATION FOR A LONGER TIME. (PHS)

06-03-01983 COMPOSTING OF COMMUNITY WASTES - A REPORT ON EXPERIENCES AT THE BADEN-BADEN PLANT (COST(OPERATING) COST(CAPITAL))
STRAUB, H.
GESUNDHEITS-INGENIEUR 77(19, 20), 10 PP. AFTER SOME GENERAL REMARKS ON THE DISPOSAL OF DOMESTIC WASTES, THE AUTHOR REVIEWS METHODS OF DISPOSAL, GIVING ATTENTION TO THE VARYING COMPOSITION OF SUCH WASTES. THE FIGURES ON THE YEARLY QUANTITIES AND COMPOSITION OF WASTES IN BADEN-BADEN ARE VERY VALUABLE FOR PURPOSES OF COMPARISON. A DETAILED DESCRIPTION OF THE PROCEDURE EMPLOYED AT BADEN-BADEN IS GIVEN. THE COSTS OF CONSTRUCTION AND OPERATION SHOULD BE OF INTEREST TO ENGINEERS. (PHS)

06-03-01998 REFUSE DISPOSAL PLANT (COMPOSTING COMPOSITION)
ROGERS, J. + BROADSTREET, D.
AUTUMN MEETING, INSTITUTE OF PUBLIC CLEANSING, CHEADLE AND GATLEY, (OCTOBER 15, 1965). A TWO PART PAPER DISCUSSING IN GENERAL THE PRELIMINARY INVESTIGATIONS LEADING TO THE SELECTION OF A REFUSE DISPOSAL PLANT. INCLUDED ARE SOME COSTS AND VOLUMES OF REFUSE. PART 1 COVERS THE REASONS FOR SELECTING COMPOSTING. PART 2 COVERS THE DEVELOPMENT, DESIGN, AND CONSTRUCTION OF THE PLANT AT CHEADLE AND GATLEY.

06-03-02004 REFUSE DISPOSAL WITH SPECIAL REFERENCE TO COMPOSTING AND INCINERATION
TURNER, W. A. + SOWERBY, A.
SPRING MEETING, INSTITUTE OF PUBLIC CLEANSING, MIDDLESBROUGH, (MARCH 20, 1964). IN A TWO PART PAPER THE AUTHORS DESCRIBE IN THE FIRST PART THE PRACTICE OF DISPOSAL BY TIPPING, INCINERATION, AND COMPOSTING. THE SECOND PART OF THE PAPER IS DEVOTED TO DESCRIBING EQUIPMENT DESIGN, WITH TEST DATA ON COMPOST PILOT PLANTS AND INCINERATORS.

06-03-02132 PROGRESS ON LEICESTER'S $11 MILLION SEWAGE AND COMPOSTING PLANT
SURVR MUNIC CTR ENGR, P. 1306 (OCTOBER 19, 1963). A REVIEW OF A TOUR OF INSPECTION OF A SEWAGE DISPOSAL WORKS AND A COMPOSTING PLANT IS PRESENTED. A DESCRIPTION OF THE PLANT, FLOW CAPACITIES, DIGESTION PROCESSES, AND COSTS ARE INCLUDED.

06-03-02171 AN AMERICAN IN BANGKOK (COMPOST PLANT) (COMPOSTING)
MCCONNELL, E. R.
COMPOST SCIENCE 9(2), P. 28-30 (SUMMER 1968). A DESCRIPTION OF THE COMPOSTING PLANT IN BANGKOK. THE COMPOSTING OPERATION TAKES PLACE IN A SIX STORY BUILDING, WITH THE FRESHLY GROUND MATERIAL BEING PLACED ON THE UPPER FLOOR. IN SIX DAYS THE MATERIAL HAS BEEN COMPOSTED, SPENDING ONE DAY ON EACH OF THE SIX FLOORS. THE COMPOST IS THEN WINDROWED FOR FROM 6 TO 8 WEEKS BEFORE BEING BAGGED FOR RESALE. PLASTIC SACKS ARE PRESENTING QUITE A PROBLEM IN THE COMPOST. A NUMBER OF GRADES OF COMPOST ARE PRODUCED.

06 04 PROCESSES AND SPECIAL EQUIPMENT

06-04-00131 FLORIDA DOCTOR URGES DISPOSAL BY COMPOSTING (COMPOSTING)
ANON.
REFUSE REMOVAL JOURNAL 4(7), P. 15, 18, 27 (1961). A DISCUSSION OF THE NEED FOR COMPOSTING AND THE PROBLEMS ASSOCIATED WITH THE PROCESS. A LISTING OF CURRENT AND PROPOSED COMPOST PLANTS IS PRESENTED.

06-04-00133 THEORY AND PRACTICE IN COMPOSTING PLANTS (EQUIPMENT)
SNELL, J. R.
REFUSE REMOVAL JOURNAL 4(1), P. 10, 12, 14, 24, 27-28 (1961). CURRENT THEORY AND PRACTICE (1961) IN COMPOSTING PLANTS IS REVIEWED IN DEPTH. NEW APPROACHES DEVELOPED DURING THE PREVIOUS DECADE ARE DESCRIBED. TYPES OF COMPOSTING EQUIPMENT INCLUDING PATENTED METHODS ARE DISCUSSED. GRINDING PROBLEMS AND MARKETING OF FINISHED COMPOST ARE BRIEFLY DISCUSSED.

06-04-00212 PUT YOUR LEAVES TO WORK (COMPOSTING)
BELL, C. W.
THE AMERICAN CITY 80(8), P. 112-113 (AUGUST 1965). FORMULA FOR COMPOSTING AT NEOSHO, MO, CONSISTS OF 170 TONS OF LEAVES, 28 TRUCK LOADS OF SAWDUST, 24 LOADS OF CHICKEN MANURE, 25 LOADS OF HORSE MANURE, EIGHT LOADS OF DIGESTED SLUDGE FROM CITY'S WATER-POLLUTION-CONTROL PLANT, SEVEN LOADS OF WOOD CHIPS (4-YR OLD), THREE TONS OF ROCK PHOSPHATE AND FOUR TONS OF GROUND DOLOMITE LIMESTONE. PROCESSING PROCEDURES ARE GIVEN. (EI)

06-04-00219 LESSER-KNOWN EUROPEAN COMPOST PROCESSES (COMPOSTING COST(CAPITAL) COST(OPERATING)
DAVIES, A. G.
COMPOST SCIENCE 2(1), P. 41-43 (SPRING 1961). DESCRIPTION OF STREIT PROCESS, SEMIACCELERATED FERMENTATION, SIMPLE AND OPEN FERMENTATION, BUHLER PROCESS, CAREL AND FOUCHE PROCESS, PRATT PROCESS. (EI)

06-04-00252 COMPOSTING WASTE SLUDGE FROM PHARMACEUTICAL MANUFACTURING (INDUSTRIAL)
GABACCIA, A. J.
COMPOST SCIENCE 1(2), P. 8-11 (SUMMER 1960). STUDY OF METHODS OF COMPOSTING ORGANIC SLUDGE ORIGINATING FROM FERMENTATION OF ANTIBIOTICS, PHARMACEUTICAL EXTRACTS, AND SEWAGE, UNDERTAKEN BY LEDERLE LABORATORIES AT PEARL RIVER, NEW-YORK. METHOD FINALLY ADOPTED IS COMPOSTING IN OPEN SANITARY LAND-FILL PROPERTY USING MODIFIED MULTI-STAGE PROCEDURES, END PRODUCT SOLD FOR LAWN-TREATMENT AND SOIL CONDITIONING. (EI)

06-04-00259 MATERIALS-HANDLING METHODS FOR CITY COMPOSTING (SALVAGE)
GOTAAS, H. B.
COMPOST SCIENCE 1(1), P. 5-9 (SPRING 1960). REFUSE COMPOSTING PLANTS MUST BE DESIGNED FOR NEEDS OF PARTICULAR AREA. EQUIPMENT REQUIREMENTS INCLUDE EFFICIENT COLLECTING OF REFUSE, MAINTAINING FLOW OF MATERIALS, MAXIMUM ECONOMIC RECOVERY OF ORGANIC AND INORGANIC MATERIALS, DISPOSAL OF NON-COMPOSTABLE MATERIAL, ADAPTABLE TO HANDLE OTHER WASTES, CONTROL FLY BREEDING AND ODORS, AND PROVIDE ECONOMIC LOADING AND SHIPPING OF END PRODUCT. (EI)

06-04-00262 EQUIPMENT FOR PROCESSING ORGANIC WASTES (GRINDING DRYING)
COMPOST SCIENCE 1(2,3), P. 20-23 (SUMMER 1960), P. 42-45 (AUTUMN). REPORT ON MACHINERY AVAILABLE FOR LARGE-SCALE COMPOSTING, AND EQUIPMENT FOR PROCESSING WASTES FOR RETURN TO SOIL, BRIEF DESCRIPTION AND ADDRESS OF MANUFACTURER GIVEN FOR GRINDERS, SHREDDERS, COMPOSTING UNITS, AND TRACTORS. (EI)

06-04-00270 PROPER GRINDING (COMPOSTING)
SNELL, J. R.
COMPOST SCIENCE 1(4), P. 9-10 (WINTER 1961). PREGRINDING ACCELERATES MOST COMPOSTING PROCESSES BY INCREASING AVAILABLE SURFACE AREA FOR BACTERIA AND PROVIDES UNIFORM PRODUCT. DISCUSSION INCLUDES TYPES OF GRINDERS AND SHREDDERS, ADVANTAGES OF SWING HAMMERS, AND ABRASION PROBLEM IN GRINDING ASH OR OTHER INORGANIC WASTES. (EI)

06-04-00277 SOME SPECIALIZED EQUIPMENT USED IN EUROPEAN COMPOST SYSTEMS (COMPOSTING SIZE-REDUCTION SCREENING SEPARATION(INERTIAL))
WILEY, J. S.
COMPOST SCIENCE 4(1), P. 7-10 (SPRING 1963). SEVERAL TYPES OF EQUIPMENT SPECIALLY DESIGNED FOR PROCESSING REFUSE AND FOR PREPARATION OF REFUSE FOR COMPOSTING, OR FOR REFINEMENT OF COMPOST. FEATURES OF RASPING MACHINES, SECATORS AND BALLISTIC SEPARATORS OF VARIOUS DESIGN ARE REVIEWED. (EI)

06-04-00278 ENGINEERING EQUIPMENT USED IN FULLY-MECHANIZED COMPOSTING (COST(CAPITAL) PLANTS(NUMBER))
COMPOST SCIENCE 7(3), P. 22-25 (WINTER 1967). DISCUSSION OF DIFFERENT COMPOSTING TYPES AND OPERATING DATA FOR EACH COVERS SLOW MOVING AND HIGH SPEED SHREDDERS, FERMENTATION IN LARGE CIRCULAR CONCRETE TANKS, MULTISTORIED FERMENTATION UNIT, THREE-FLOOR TOTALLY ENCLOSED DIGESTER, HORIZONTAL ROTATING DRUM, MACERATION OF REFUSE IN HEXAGONAL DRUM, AND TWO-DECK VIBRATING SCREEN. (EI)

06-04-00311 BACTERIOLOGICAL DIGESTER FOR TREATMENT OF MUNICIPAL REFUSE (COMPOSTING)
ABSON, J. W. + BROADHURST, D.
PATENT BRIT. 1,060,461 (CL. C02C), (MARCH 1, 1967), APPL. FEBRUARY 12 AND SEPTEMBER 3, 1963, ASSIGNED BY SIMON HANDLING ENGINEERS LTD A VERTICAL TOWER-TYPE BACTERIAL, DIGESTER IS DESCRIBED FOR THE COMPOSTING OF MUNICIPAL REFUSE. THIS DIGESTER IS SEPARATED INTERNALLY BY MEANS OF HORIZONTAL PLATES TO FORM A NUMBER OF DRUM-SHAPED COMPARTMENTS SO ARRANGED THAT THE REFUSE IS EMITTED AT THE TOP OF THE TOWER, AND FLOWS DOWN THROUGH THE COMPARTMENTS. AS IT FLOWS DOWN, IT IS BROUGHT INTO CONTACT WITH WATER AND AN UPFLOWING CURRENT OF AIR TO CAUSE BACTERIAL DECOMPOSITION. THIS BACTERIAL

DECOMPOSITION IS MAINTAINED BY RECIRCULATING SOME OF THE DECOMPOSING MATERIAL INTO THE TOP COMPARTMENT TO ACT AS A BACTERIAL SEED. THE WATER, WHICH FLOWS INTO EACH COMPARTMENT, IS CONTROLLED BY MEANS OF A TEMPERATURE CONTROLLER MEASURING THE TEMPERATURE OF THE STACK GASES. THE AIR FLOW ENTERING THE BOTTOM OF THE TANK IS CONTROLLED BY MEANS OF A CARBON DIOXIDE INDICATOR CONTROLLER, WHICH MEASURES THE CARBON DIOXIDE IN THE TANK GASES. AIR IS ADDED TO MAINTAIN A CERTAIN CARBON DIOXIDE CONTENT TO PROVIDE CONDITIONS OPTIMUM FOR DIGESTION. (CA)

06-04-00312 FERTILIZER FROM GARBAGE (COMPOSTING)
BOGGIANO-PICO, N.
PATENT ITAL. 537,793, (JANUARY 4, 1956). A PLANT IS DESCRIBED WHICH, BESIDES THE CONVENTIONAL MECHANICAL PROCESSING OF GARBAGE, INVOLVES USE OF AN OXIDIZING GAS, E.G. OZONIZED AIR, IN AN ELECTRIC FIELD. THIS IS SAID TO ACTIVATE AND ACCELERATE THE DEVELOPMENT OF THE BACTERIAL FLORA WHICH LEADS TO FERTILIZER FORMATION. (CA)

06-04-00313 ORGANIC COMPOSTS STARTING FROM ORGANIC WASTE AND THE RESULTING COMPOST (COMPOSTING)
BAILLOD, P. + BOSS, G.
PATENT SWISS 251,131, (JULY 16, 1948) (CL. 42). FERMENTATION OF NIGHT SOIL, GARBAGE, OR INDUSTRIAL ORGANIC WASTE BY A BACTERIAL CULTURE OF AZOTOBACTER, AMYLOBACTER, OR BACILLUS RADICOLA IS FAVORED BY ADDITION OF A MIXTURE OF INORGANIC SALTS WHICH ACT AS CATALYSTS. ONE LITER OF THE CATALYTIC MIXTURE IS ADDED TO A TON OF ORGANIC MATERIAL CONTAINING PREFERABLY 30 PERCENT MOISTURE AND ALLOWED TO FERMENT. BEST RESULTS ARE OBTAINED IF THE TEMPERATURE IS NOT ALLOWED TO RISE ABOVE 40 DEGREES. FERMENTATION PROCEEDS FOR 4-5 DAYS AFTER WHICH PERIOD LIME IS ADDED TO BRING THE PH OF THE FERMENTED MATERIAL TO ABOUT 7.5. MATERIAL PRODUCED IS A FERTILIZER. (CA)

06-04-00314 ORGANIC AND CHEMICAL FERTILIZER (COMPOSTING)
BELTRAMI, T. F.
PATENT ITAL. 426,240 (OCTOBER 28, 1947). THE PATENT COVERS A METHOD FOR THE PRODUCTION OF A FERTILIZER CONSISTING OF A MIXTURE OF RUBBISH AND ANIMAL REFUSE, RAPIDLY FERMENTED, DISINFECTED AND GRANULATED, AFTER WHICH CHEMICAL FERTILIZERS ARE ADDED AS FOLLOWS- AMMONIUM PHOSPHATE 10-20, MINERAL DIPHOSPHATES 5-15, CALCIUM NITRATE 2-7, AND POTASSIUM CHLORIDE 5-10 PERCENT. (CA)

06-04-00316 CONTINUOUS PROCESS FOR RAPID PREPARATION OF AN ORGANIC FERTILIZER FROM GARBAGE AND CITY WASTE (GRINDING COMPOSTING)
CASTOLA, L. G.
PATENT FR. 1,441,792 (CL. C05B), (JUNE 10, 1966), APPL. MAY 5, 1965. A DESCRIPTION IS GIVEN OF A PROCESS WHEREBY 4-10 TONS OF GARBAGE AND CITY WASTE COULD BE MOVED BY A SYSTEM OF BELTS THROUGH A MAGNETIC SEPARATOR (TO REMOVE FE-CONTAINING MATERIAL) TO A HAMMER MILL, THEN BY AIR PRESSURE TO A FERMENTATION VAT OF 20-60 TON CAPACITY. THE MASS IN THE VAT COULD BE STIRRED BY AIR FOR 36 HOURS AT 65 DEGREES IN THE PRESENCE OF AMMONIUM SULFATE AND CALCIUM CARBONATE TO CONTROL PH AND THE C TO N RATIO. (CA)

06-04-00317 EQUIPMENT FOR THE PRODUCTION OF GAS AND FERTILIZER BY FERMENTATION (THERMOPHILIC COMPOSTING)
JONNERET, F.
PATENT SWISS 232,378 (AUGUST 16, 1944). EQUIPMENT IS DESCRIBED FOR THE MANUFACTURE OF METHANE AND A FERTILIZER BY THE FERMENTATION OF WASTE ORGANIC MATTER. IT CONSISTS OF AN HERMETICALLY SEALED TANK WITH TWO ORIFICES. THE CHARGE CONSISTS OF TWO PARTS, SOLID ORGANIC WASTES, AND A LIQUID WHICH CONTAINS THERMOPHILIC BACTERIA DRAWN FROM A PREVIOUS BATCH. THE TEMPERATURE AND PH ARE CONTROLLED DURING FERMENTATION. THE GAS IS COLLECTED AND THE RESIDUE MAKES AN EXCELLENT FERTILIZER. TWO FIGURES ILLUSTRATE THE CONSTRUCTION AND A DETAILED DESCRIPTION OF THE VARIOUS PARTS OF THE UNIT IS GIVEN. (CA)

06-04-00318 MOISTENING CITY REFUSE FOR THE PRODUCTION OF FERTILIZERS (COMPOSTING)
LIVSHUTZ, A.
PATENT ISRAELI 13,033 (FEBRUARY 18, 1960). AEROBIC FERMENTATION OF GARBAGE IS ACCOMPLISHED DURING 2-4 WEEKS BY ALLOWING THE LATTER (BROKEN INTO PIECES OF LESS THAN 4 CM) TO REACT WITH AN OXIDIZING GAS, E.G., AIR, INJECTED INTO THE HEAP WHICH IS KEPT AT A RELATIVE HUMIDITY OF 40-60 PERCENT BY WEIGHT. A PLURALITY OF FINE, DISCRETE JETS, OBTAINED THROUGH AN ARRANGEMENT OF PIPES WITH PERFORATED HOLES OF LESS THAN 2 MM IN DIAMETER, IS INSTALLED IN THE BOTTOM OF THE HEAP AND SET ABOVE. (CA)

06-04-00319 AUTOMATIC INSTALLATION AND PROCESS FOR THE CONTINUOUS REMOVAL OF URBAN WASTES BY TRANSFORMING THE COMPONENTS OF ORGANIC ORIGIN INTO FERTILIZER AND INCINERATING THE NONTRANSFORMABLE SUBSTANCES (COMPOSTING INCINERATION)
MATTEINI, S.
PATENT FR. 1,454,019 (CL. C05) (SEPTEMBER 30, 1966), APPL. AUGUST 8, 1965. THE PROCESS IS CHARACTERIZED BY THE FACT THAT IT IS ENTIRELY CARRIED OUT IN A CLOSED SYSTEM. THE MATERIAL IS SEPARATED INTO LOW WEIGHT MOSTLY ORGANIC MATERIAL THAT CAN FERMENT EASILY, MEDIUM WEIGHT SUBSTANCES THAT CAN BE DECOMPOSED AFTER AN INITIAL FERMENTATION, AND NONPUTRESCIBLE MATERIAL WHICH IS INCINERATED AND THEN SEPARATED TO RECOVER THE FERROUS RESIDUES (WHICH ARE COMPRESSED), THE INERT MATERIAL, AND THE ASHES, WHICH CAN BE MIXED WITH THE FERMENTING MATERIAL. THE PROCESS HAS NUMEROUS ADVANTAGES SUCH AS THE REDUCED NUMBER OF MACHINES REQUIRED AND THEIR SIMPLIFIED CONSTRUCTION, LABOR REDUCTION, LOW INSTALLATION AND WORKING EXPENSES, AND THE FACT THAT TOXIC AND MALODOROUS VAPORS CANNOT ESCAPE INTO THE ATMOSPHERE. (CA)

06-04-00321 HUMUS-FORMING COMPOST (COMPOSTING)
PATENT BELG. 585,362 (JUNE 7, 1960). THE COMPOST CONTAINS (A) ORGANIC MATERIALS CONVERTIBLE INTO HUMUS BY THE ACTION OF MICROORGANISMS PREVIOUSLY NEUTRALIZED AND SUBJECTED TO CONTROLLED PRE-FERMENTATION, (B) N COMPOUNDS WHICH COUNTERBALANCE THE REMOVAL OF N BY THE MICROORGANISMS, (C) FERTILIZERS WHICH BALANCE THE EXCESS N PROVIDED BY (B) AND MINERALIZATION OF THE DEAD MICROORGANISMS, AND (D) SMALL AMOUNTS OF HORMONES AND PESTICIDES. THE TOTAL MINERAL SALT (PHOSPHATES, POTASSIUM AND MAGNESIUM SALTS) CONTENT IS SUCH THAT PRE-FERMENTATION OF THE ORGANIC MATERIAL IS STOPPED AND, UPON DILUTION OF THESE SALTS WHEN THE COMPOST IS ADDED TO THE SOIL, THE FERMENTATION IS AGAIN INITIATED. SUITABLE ORGANIC MATERIALS ARE COFFEE GROUNDS OR RESIDUES OF HYDROLYZED CELLULOSE MATERIALS. (CA)

06-04-00322 IMPROVEMENT OF FERTILIZERS FROM GARBAGE OR CLARIFYING SLUDGE.
MAYER-KRAPOLL, H.
PATENT GER. 1,013,299 (AUGUST 8, 1957) (CL. 16). TO OBTAIN A FERTILIZER SUITABLE FOR MANURING AND SOIL- IMPROVING PURPOSES, CRUDE GARBAGE OR CLARIFYING SLUDGE, OR THEIR MIXTURE IS TREATED WITH GASEOUS OR AQUEOUS AMMONIA BEFORE, DURING, OR AFTER THE FERMENTATION. THE AMOUNT OF AMMONIA IS 80-120 PERCENT OF THE AMOUNT OF NITROGEN IN THE CRUDE PRODUCT. (CA)

06-04-00323 METHANE FROM GARBAGE (COMPOSTING)
PATENT BRIT. 721,828 (JANUARY 12, 1955). TOWN GARBAGE, COMMINUTED AND HOMOGENIZED TO FORM A POROUS MASS CONTAINING LESS THAN 60 PERCENT MOISTURE, IS HEATED IN A SILO TO 30 DEGREES TO BEGIN METHANE FERMENTATION. EFFICIENCY IS INCREASED BY PASSING HYDROGEN OR CARBON DIOXIDE (OR BOTH) FROM COKE-OVEN GAS THROUGH THE MIXTURE. THE GAS PRODUCED HAS A CALORIFIC-VALUE TWICE THAT OF ILLUMINATING GAS, AND THE RESIDUE IS USEFUL AS AN AGRICULTURAL COMPOST. (CA)

06-04-00324 DECOMPOSING AND STABILIZING REFUSE FOR USE AS FERTILIZER (COMPOSTING)
PIERSON, N. A.
PATENT U.S. 2,969,279 (JANUARY 24, 1961) ASSIGNED TO NATURALIZER COMPANY. AN ODORLESS METHOD OF TREATING MUNICIPAL GARBAGE WITH THERMOPHYLLIC AEROBIC-TYPE BACTERIA AND ASPERGILLUS FUMIGATUS TYPE FUNGI IS DESCRIBED. A PREVIOUS PATENT

DISCLOSED A COMBINATION OF ANAEROBIC AND AEROBIC DIGESTION. THE REFUSE IS FIRST PULVERIZED, SCREENED THROUGH 6 X 6-IN. MESH, GROUND TO 2 IN. DOWN TO 1/8 INCH PARTICLE SIZE, AND THEN PASSED THROUGH A SERIES OF 6 CELLS. THE INITIAL TON OF REFUSE IS INOCULATED WITH THREE OUNCES OF A FILLER MATERIAL HAVING 1,300,000,000 BACTERIAL COUNT AND IMPREGNATED WITH A. FUMIGATUS UNTIL A BLUE-GRAY COLOR APPEARS. THE REFUSE REMAINS IN EACH CELL FOR ABOUT 24 HOURS. A TEMPERATURE BETWEEN 110 AND 148 DEGREES F IN THE FIRST CELL IS REACHED AFTER THREE DAYS. AFTER SIX DAYS, THE MATERIAL IS PILED IN WINDROWS. AFTER 12 DAYS, AND WHEN A TEMPERATURE OF 120 DEGREES IS REACHED, INDICATING THAT MOST BACTERIAL ACTION HAS CEASED, THE MATERIAL CAN BE USED AS A SOIL NUTRIENT. (CA)

06-04-00325 APPARATUS FOR COMPOSTING WASTE MATERIALS
REDMAN, L. E.
PATENT U. S. 3,276,845 (Cl. 23-259.3), (OCTOBER 4, 1966), APPL. NOVEMBER 30, 1962, ASSIGNED TO GARBAGE SERVICE CO., INC. AN EFFICIENT, ECONOMICAL METHOD AND APPLICATION CONTINUOUSLY PRODUCES SOIL NUTRIENT (HUMUS) FROM MUNICIPAL REFUSE AND WASTE PRODUCTS. ON A SLOW MOVING CONVEYOR, SALVAGEABLE ITEMS ARE REMOVED BY HAND AND METALLIC OBJECTS ARE REMOVED BY A ROTATING MAGNETIC DRUM. THE REFUSE IS THEN GROUND, WETTED WITH WARM WATER, AND MIXED IN AN INCLINED ROTATING DRUM HAVING INTERNAL BAFFLES. THEN, THE MATERIAL IS DELIVERED TO A DIGESTER VAT WHERE IT IS WETTED, STIRRED, AND AERATED FOR ABOUT 6 DAYS TO COMPLETE THE FERMENTATION PROCESS, AFTER WHICH THE MATERIAL IS GROUND, DRIED, AND COLLECTED, (CA)

06-04-00326 PHOSPHATE FERTILIZERS CONTAINING ORGANIC PRODUCTS (COMPOSTING SLUDGE(SEWAGE))
REPPERT, P. L.
PATENT GER. 960,464 (MARCH 21, 1957)(Cl. 16, 1). ADDN. TO GER. 940,707. DIGESTED SEWAGE SLUDGE AND (OR) PEAT AND (OR) REFUSE IS MIXED WITH RAW PHOSPHATE, TRACE ELEMENTS AND (OR) PLANT PESTICIDES . THIS MIXTURE IS TREATED WITH SULFURIC, NITRIC OR PHOSPHORIC ACID AND THEN WITH AMMONIA. SULFITE WASTE LIQUORS ARE THEN ADDED TO THE WARM PRODUCT. FOR EXAMPLE, 75 PARTS OF A MIXTURE OF COMPLETELY DIGESTED SEWAGE SLUDGE (CONTAINING 40 PERCENT WATER) AND GROUND REFUSE WAS MIXED WITH 9.3 GROUND RAW PHOSPHATE AND 6.4 OF A K SALT CONTAINING 60 PERCENT K. THIS MIXTURE WAS TREATED WITH 19 SULFURIC ACID (60 DEGREES BE.) IN A GRANULATOR. THE PRODUCT WAS ALLOWED TO REACT WITH TWO PARTS AMMONIA + SOLUTION CONTAINING 98 PERCENT AMMONIA IN A CONTINUOUS PROCESS AND THEN SPRAYED WITH SULFITE WASTE LIQUOR CONTAINING 5 PERCENT SOLIDS. THUS, A PRODUCT CONTAINING 35 PERCENT ORGANIC COMPOUNDS, 2.5 PERCENT N, 4 PERCENT PHOSPHORIC ACID, 4 PERCENT K, AND 20 PERCENT WATER WAS OBTAINED. (CA)

06-04-00327 CONTINUOUS SINGLE-ZONE THERMOPHYLLIC PHASE COMPOSTING PROCESS
SCHULZE, K. L.
PATENT U.S. 3,285,732 (Cl. 71-9), (NOVEMBER 15, 1966), APPL. JULY 18, 1960, AND DECEMBER 5, 1963. A COMPOSTING PROCESS IS DESCRIBED PERMITTING ACCELERATED CONTINUOUS, THERMOPHILIC AEROBIC COMPOSTING THROUGH THE ADDITION OF PREPARED AND CONTROLLED RAW MATERIALS AND MAINTAINING SUBSTANTIALLY UNIFORM HIGH TEMPERATURE WITHIN THE PROCESS VESSEL. ADMIXTURE OF RAW GARBAGE AND DEWATERED SEWAGE SLUDGE CAN BE USED WHILE MAINTAINING AEROBIC CONDITIONS.

06-04-00328 RECONSTITUTION OF HUMUS
SPINDLER, H. + USSE, J.
PATENT FR. 1,122,421, (SEPTEMBER 6, 1956) SOCIETE DE PRODUITS CHIMIQUES ET ENGRAIS D'AUBY. A HUMIFICATION-INDUCTING PRODUCT IS OBTAINED BY TREATING VEGETABLE MATTER, E.G., STRAW, WITH ALKALI METAL OR ALKALINE EARTH COMPOUNDS. THE AQUEOUS MIXTURE CONTAINS ALKALI METAL OR ALKALI EARTH IONS, CELLULOSE, MINERALS, AND LIGNIN-POTASSIUM COMPLEXES CONTAINING ORGANIC ACIDS. (CA)

06-04-00371 A NEW COMPOSTING PROCESS FOR REFUSE AND SLUDGE - THE TOLLEMACHE SYSTEM (TOLLEMACHE COMPOST(COMPOSITION))
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 10, (DECEMBER 1960). THE TOLLEMACHE SYSTEM, AS DEVELOPED AT THE REFUSE COMPOSTING PLANT AT MABELREIJN (SOUTHERN RHODESIA), IS AS FOLLOWS - REFUSE PREPARATION - REFUSE PASSES ON A CONVEYOR FROM THE BUNKER TO A SCREEN FOR ASH REMOVAL, THEN ON ANOTHER CONVEYOR WHERE THE FIRST MAGNETIC SEPARATION AND HAND SORTING TO REMOVE SALVAGE AND DISCARD ITEMS ARE ACCOMPLISHED. A BALLISTIC SEPARATOR REMOVES GLASS FRAGMENTS AND ROCKS. AFTER THE ADDITION OF WATER OR SLUDGE, THE COMPOSTABLE MATERIAL IS DISCHARGED INTO COMPOSTING CHAMBERS. COMPOSTING - THE FERMENTATION " SILOS " OR CHAMBERS HAVE MASONRY WALLS OPEN AT THE TOP AND A PERFORATED CONCRETE FLOOR WHICH PERMITS FORCED AERATION. FROM TIME TO TIME THE COMPOST IS MIXED AND SIMULTANEOUSLY PULVERIZED BY A TRAVELING TURNER MIXER (SIMILAR TO A ROTARY CULTIVATOR). THIS PROCEDURE IS REPEATED UNTIL THE COMPOST LEAVES THE CHAMBERS. AFTER TWO WEEKS IN A CHAMBER, REFUSE COMPOST HAS THE FOLLOWING TYPICAL ANALYSIS - ORGANIC MATTER 58 PERCENT, C TO N 20 PERCENT, MOISTURE 50 PERCENT, PHOSPHORUS 0.7 PERCENT, NITROGEN 1.4 PERCENT, AND POTASSIUM 1.1 PERCENT. THE CAPACITY OF THE PLANT IS 40 TONS OF COMPOST PER DAY. THE MANUFACTURER IS THE COMPOSTING COMPANY OF RHODESIA, LTD. (MEMBER OF THE JOHN LAING AND SON GROUP OF COMPANIES), SALISBURY, SOUTHERN RHODESIA. (UC)

06-04-00393 NEW COMPANY OFFERS TO PROVIDE REFUSE PACKAGE (COMPOSTING SALVAGE MARKETING)
REFUSE REMOVAL JOURNAL 5(6), P. 30 (JUNE 1962). THE SYSTEM ENVISIONS NOT ONLY A COMPOSTING PROCESS BUT ALSO AID IN MARKETING THE END PRODUCT AND CONSULTATION AND SPECIAL PRODUCTS FOR COLLECTION. THE SYSTEM IS IN SAN FERNANDO, CALIFORNIA, AND IS OPERATED BY THE GENERAL CONVERSION SYSTEMS CORP. COMPOSTING IS BY THE NATURIZER SYSTEM.

06-04-00549 SPECIALIZED EQUIPMENT USED IN EUROPEAN COMPOST SYSTEM (COMPOSTING DESIGN)
JACOBSON, A. R.
PUBLIC WORKS 94(10), P. 158 (OCTOBER 1963). SEVERAL TYPES OF REFUSE DISPOSAL EQUIPMENT HAVE BEEN DESIGNED FOR USE IN EUROPEAN COMPOSTING SYSTEMS, BUT AS YET NONE HAVE APPEARED IN THE U.S. THE PROCESSES INVOLVE FROM NONE TO ONE OR MORE OF THE FOLLOWING - SCREENING, HAND SORTING, MAGNETIC SEPARATION, AND INERTIAL SEPARATION. WHETHER OR NOT THESE OPERATIONS TAKE PLACE BEFORE OR AFTER THE REFUSE IS COMPOSTED, DEPENDS UPON WHICH PROCESS IS BEING USED. (UC)

06-04-00550 A NEW LOOK AT COMPOSTING (BACTERIA(CULTURE))
WICKER, W. J.
PUBLIC WORKS 95(10), P. 131 (OCTOBER 1964). IN 1964, M. W. KELLOGG COMPANY AGREED WITH NATIONAL ORGANIC CORP. TO DESIGN, ENGINEER, AND CONSTRUCT NORCO PLANTS THROUGHOUT THE WORLD. WESTINGHOUSE SIGNED AN AGREEMENT WITH THE NATURIZER CORP. THE AUTHOR INSPECTED THE KINGSTON, JAMAICA, OPERATION (NORCO). THE NORCO FLOW PATTERN IS AS FOLLOWS - TRUCK, HOPPER, CONVEYOR BELT, HOPPER, GRINDER I (PARTICLE-SIZE ABOUT 7-IN), GRINDER II (PARTICLE-SIZE, 3-IN) HOPPER, DUMP TRUCK, INOCULATION, COMPOSTING AREA, STACK IN WINDROWS 5 FT HIGH, 10 FT WIDE AND 50 FT IN LENGTH. THE COMPOSTING PERIOD LASTS 3 WEEKS. THE MOISTURE CONTENT IS 55 PERCENT. THE WINDROWS ARE " TURNED " APPROXIMATELY 10 TIMES DURING THE 3-WEEK PERIOD. THE FINAL MOISTURE CONTENT IS 5 PERCENT. AFTER 3 WEEKS, THE COMPOST IS TRANSFERRED TO THE PROCESSING YARD FOR STORAGE AND DISTRIBUTION. (UC)

06-04-00615 DIGESTER CONVERTS SAWDUST INTO HUMUS (BACTERIA(CULTURE) COMPOSTING COST(CAPITAL) COST(OPERATING))
CIVIL ENGRG 26(3), (APRIL 1956). THE OCEAN PACIFIC COMPANY OF OREGON HAS ESTABLISHED THE FACT THAT CERTAIN SELECTED BACTERIA CAN CONVERT SAWDUST INTO A FINE GRANULAR HUMUS. NUTRIENTS ARE ADDED TO ENRICH THE HUMUS. THE KEY TO THE PROCESS IS A CONTINUOUS-FLOW EIGHT-DECK DIGESTER. THE DIGESTER CAN ALSO PRODUCE AN ODORLESS GRANULAR HUMUS BY ADDING SEWAGE SLUDGE TO GARBAGE. THE COMPLETE ORGANIC FERTILIZER WILL BE UNIFORM IN QUALITY REGARDLESS OF THE BASIC ORGANIC WASTE USED. THE UNIFORMITY IS DUE TO THE PRODUCTION OF GROWTH FACTORS BY THE BACTERIA USED, SUCH AS ACTUMUS, AUXIN, AND KININ. (UC)

06-04-00727 COMPOSTING OF MUNICIPAL REFUSE (ECONOMICS HISTORY)
MCGAUHEY, P. H. + GOLUEKE, C. G.
UNIVERISTY OF CALIFORNIA, BERKELEY, SANITARY ENGINEERING RESEARCH LABORATORY, UNPUBLISHED PAPER, (1953). THE ARTICLE DEVOTES THREE PAGES TO THE HISTORICAL DEVELOPMENT OF THE ART OF COMPOSTING AND TO A DESCRIPTION OF THE DIFFERENT METHODS OF COMPOSTING PRACTICED THROUGHOUT THE WORLD. IT THEN EXPLAINS THE FUNDAMENTAL ASPECTS OF THE COMPOSTING PROCESS, WHICH ARE- (1) SEGREGATION- NONCOMPOSTABLE MATERIALS ARE SEPARATED FROM THE REFUSE. (2) GRINDING- REFUSE IS SHREDDED TO PIECES ABOUT 1-IN IN SIZE TO MAKE THE MATERIAL HOMOGENEOUS, MORE SUSCEPTIBLE TO BACTERIAL INVASION, AND TO GIVE IT A BENEFICIAL INITIAL AERATION. (3) STACKING- REFUSE IS STACKED IN WINDROWED PILES TRAPEZOIDAL IN CROSS SECTION, 8-10 FT AT THE BASE, 5-6 FT IN HEIGHT. (4) TURNING- AERATION IS PROVIDED BY TURNING TO BRING ABOUT UNIFORM DECOMPOSITION. (A RECOMMENDED TURNING SCHEDULE IS GIVEN IN THE ARTICLE.) (5) FINAL GRINDING- FOR SAKE OF APPEARANCE THE REFUSE IS GROUND TO A PARTICLE SIZE SMALL ENOUGH TO PASS THROUGH A 3/8-INCH SCREEN. THE BIOLOGICAL ASPECTS OF THE PROCESS ARE DESCRIBED, AS WELL AS ECONOMIC CONSIDERATIONS. IT IS DOUBTFUL THAT COMPOSTING WILL MAKE REFUSE DISPOSAL PROFITABLE. PRODUCTION COSTS OF COMPOSTING SELECTED GARBAGE WITH SEWAGE SLUDGE BY THE FRAZER PROCESS ARE REPORTED TO BE $15 TO $20 PER TON. ESTIMATES ON THE USE OF THE DANO GRINDER INDICATE A COST OF $9 TO $10 PER TON OF RAW REFUSE. THE PRESENT PRICE OF COMPOST SOLD TO SPECIALTY GARDENERS AND NURSERYMEN--REPORTEDLY $68 PER TON-- IS MORE THAN LARGE-SCALE FARMERS IN CALIFORNIA WOULD PAY. ESTIMATES OF WHAT FARMERS WOULD PAY RANGE FROM $10 TO $15 OR MORE PER TON. (PHEA)

06-04-00840 SIMPLE PROCESS FOR COMPOSTING SMALL QUANTITIES OF COMMUNITY WASTES (AEROBIC)
LINDSTROM, R.
COMPOST SCIENCE 6(1), P. 30-32 (SPRING 1965). EXPERIMENTALLY-TESTED PROCESS TO ACHIEVE AEROBIC BIOLOGICAL CHANGE IN ORGANIC WASTES WITHOUT MECHANIZATION IS DESCRIBED. WASTES ARE DEPOSITED INTO NATURALLY-VENTILATED CHAMBER. THEY MOVE BY GRAVITY FROM THIS CHAMBER INTO SECOND CHAMBER. SPEED OF MOVEMENT IS CHOSEN SO THAT WASTES ARE SUBSTANTIALLY DECOMPOSED AS THEY REACH SECOND CHAMBER. CHAMBERS ARE CONNECTED THROUGH VENTILATION HOLES IN PARTITIONS AND TO OUTSIDE AIR THROUGH AIR VENTS AND VENT PIPE WHICH EXTENDS ABOVE ROOF OF BUILDING. PARTITIONS DO NOT REACH BOTTOM OF TANK BUT LEAVE OPEN FLOW PASSAGES SO SIZED THAT, WITH SLOPE OF BOTTOM, SUITABLE DOWNWARD MOVEMENT OF WASTES OCCURS. (EI)

06-04-00868 HOW CASPARI COMPOST SYSTEM WORKS (SLUDGE(SEWAGE) GRINDER(RASP) RASP)
STICKELBERGER, D.
COMPOST SCIENCE 5(1), P. 15-17 (SPRING 1964). METHOD DEVELOPED FOR MAKING SOIL-IMPROVING BRIQUETTS OUT OF GARBAGE AND SLUDGE IS DESCRIBED. RASP MACHINE WAS SET UP AND AREA WAS RECULTIVATED WITH COMPOST MADE FROM CITY WASTE. OUTSTANDING GARDENING PRODUCTS ARE GROWN ON FORMER PLATE OF PURE LIMESTONE. (PHEA)

06-04-00924 REFUSE DISPOSAL ON CREDIT (COMPOSTING FINANCING)
PUBLIC CLEANSING 53(11), P. 579 (NOVEMBER 1963). DESCRIBES A NEW SYSTEM OF REFUSE DISPOSAL IN WHICH COMPOSTING PLANTS ARE ERECTED, OWNED, AND OPERATED BY PRIVATE COMPANIES TO WHOM LOCAL AUTHORITIES PAY AN AGREED PRICE PER TON OF MUNICIPAL REFUSE DELIVERED TO THE DISPOSAL PLANT. THE LOCAL AUTHORITY PROVIDES THE COMPANY WITH INFORMATION ABOUT QUANTITY OF MATERIAL HANDLED PER DAY, ITS POPULATION, AND ITS EXISTING REFUSE DISPOSAL COSTS. THE FIRM THEN CALCULATES THE QUANTITY OF COMPOST LIKELY TO RESULT, ASSESSES ITS MARKET VALUE, AND PREPARES AN ESTIMATE OF THE PRICE TO BE PAID FOR REFUSE DISPOSAL BY THE LOCAL AUTHORITY. ALSO DESCRIBES THE COMPOSTING METHOD THE COMPANY MIGHT USE TO PROCESS THE MUNICIPAL REFUSE. (PHS)

06-04-00988 SOLID WASTE PROBLEMS SOLVED
BROCHURE OF GENERAL PRODUCTS OF OHIO, CRESTLINE, OHIO, (1967). THE BROCHURE CONTAINS PICTURES OF THE COBEY COMPOSTING MACHINE IN ACTION. THE MACHINE IS A PORTABLE OR MOBILE COMBINATION SHREDDER AND WINDROW FORMING MACHINE. IN OPERATION, COLLECTION TRUCKS DISCHARGE THE REFUSE IN LONG WINDROWS. THE COBEY MACHINE BEGINS AT ONE END OF THE WINDROW AND PROCEEDS TO PROCESS IT. REFUSE ENTERS AT THE FRONT END OF THE MACHINE AND IS DISCHARGED AS A WINDROW OUT THE REAR END. THE WINDROWS ARE PROCESSED ONCE EVERY THREE DAYS. (UC)

06-04-01061 PROCESSING OF TOWN GARBAGE (COMPOSTING)
SPOHN, E.
AUFBEREITUNGS-TECHNIK 3(8), P. 366-368 (AUGUST 1962). TWO METHODS WHICH MAKE IT POSSIBLE TO TRANSFORM ACCUMULATED GARBAGE AND SEWAGE SLUDGE SIMULTANEOUSLY TO FERTILIZER. (EI)

06-04-01066 TURN-KEY COMPOSTING PLANTS (SALVAGE)
PUBLIC WORKS 95(5), P. 86-87 (1964). WESTINGHOUSE ELECTRIC CORP. IN CONJUNCTION WITH SALVAGE AND CONVERSION SYSTEMS ADVOCATE ON A TURN-KEY BASIS A PLANT KNOWN AS NATURIZER PROCESS, A COMPLETE SYSTEM FOR RECEIVING, SEPARATING, GRADING AND COMPOSTING OF REFUSE. COMPOSTING IS CARRIED OUT IN SIX DAYS, PASSING FROM ONE DIGESTER TO ANOTHER IN A SYSTEMATIC FASHION WITH THE PROPER TEMPERATURE AND MOISTURE CONTROLS. TEMPERATURE EXCEEDS THAT REQUIRED FOR THE DESTRUCTION OF PATHOGENS. AEROBIC DECOMPOSITION IS CARRIED TO COMPLETION TO PREVENT OFFENSIVE ODORS.

06-04-01091 METHODS OF GARBAGE PROCESSING (COMPOSTING INCINERATION)
JAEGER, B.
METHODEN DER MUELLAUFBEREITUNGSTECHNIK, GAS UND WASSERFACH 102(12), P. 297-302 (MARCH 1961). METHODS APPLIED TO GARBAGE COMPOSTING IN A NUMBER OF DIFFERENT COUNTRIES ARE DESCRIBED. THE FLOW CHARTS FOR A NUMBER OF THESE ARE DIAGRAMMED. FOUR PRINCIPAL TYPES ARE FOUND AMONG THE DIFFERENT SYSTEMS WHICH HAVE BEEN DESCRIBED AND FLOW CHARTS ARE GIVEN FOR EACH TYPE. (PHEA)

06-04-01092 REFUSE - SEWAGE COMPOSTING - ENGINEERING ASPECTS (SLUDGE(SEWAGE))
GUTTERIDGE, H.
THE ENGINEER 194, P. 498-500 (OCTOBER 10, 1952). A THOROUGH DESCRIPTION IS GIVEN OF EACH OF THE FOLLOWING ASPECTS OF OPERATION- RECEIVING REFUSE, SEPARATING OF SALVABLE MATERIALS, PULVERIZING, AERATING CELLS, MIXING OF REFUSE AND SEWAGE SLUDGE, AND USING MATURATIVE BEDS. HE DELINEATES PHYSICAL AND FINANCIAL CONSIDERATIONS TO BE CONSIDERED. PROCESSES SUCH AS THE VERDIER PROCESS, THE BECCARI PROCESS, THE FRASER PROCESS, AND THE DANO PROCESS ARE DESCRIBED IN SOME DETAIL.

06-04-01156 CONCRETE BUNKERS FOR COMPOSTING
COMPOST SCIENCE 3(3), P. 42-43 (AUTUMN 1962). A TILT-UP CONCRETE BUNKER SILO HAS DEMONSTRATED GREAT VERSATILITY IN SOLVING A KNOTTY STORAGE PROBLEM AT A SOUTHERN TOURIST ATTRACTION. (PHEA)

06-04-01159 COMBINED DISPOSAL OF SEWAGE SLUDGE AND REFUSE (COMPOSTING INCINERATION SANITARY-LANDFILL)
BLACK, R. J.
COMPOST SCIENCE 2, P. 16-17 (WINTER 1962). DISPOSAL OF SOLID WASTES BY COMBINING REFUSE AND SEWAGE SLUDGE IS DISCUSSED, WITH PARTICULAR ATTENTION PAID TO COSTS. THE CURRENT PRACTICES AND PROBLEMS OF DISPOSING SEPTIC TANK AND DIGESTED SEWAGE SLUDGES INTO SANITARY LANDFILLS ARE PRESENTED, ALONG WITH THE ADVANTAGES AND DISADVANTAGES OF COMBINED SEWAGE SLUDGE AND REFUSE DISPOSAL BY INCINERATION AND COMPOSTING. (PHEA)

06-04-01163 MUNICIPAL COMPOSTING
DAVIES, A. G.
COMPOST SCIENCE 2(3,6), (AUTUMN 1961). METHODS OF COMPOSTING THROUGHOUT THE WORLD ARE DESCRIBED. EUROPEAN COMPOSTING PLANTS ARE DISCUSSED. PHOTOGRAPHS AND FLOW CHARTS GIVE THE OPERATING PROCEDURES. SEVERAL TABLES SUMMARIZE THE ECONOMICS OF COMPOSTING. (PHEA)

06-04-01166 EQUIPMENT FOR PROCESSING ORGANIC WASTES (GRINDER SHREDDER COMPOSTING-UNITS MATERIALS-HANDLING DANO)
COMPOST SCIENCE 1(2), P. 20-23 (SUMMER 1960). A REPORT OF AVAILABLE MACHINERY WHICH CAN BE USED IN VARIOUS STAGES OF LARGE-SCALE COMPOSTING AS WELL AS EQUIPMENT FOR PROCESSING WASTES FOR DIRECT RETURN TO THE SOIL. (PHEA)

06-04-01179 CONSERVATION AND FIELD TESTING OF COMPOST (METHODS(COMPOSTING) CROP-YIELD(COMPOST))
TIETJEN, C.
COMPOST SCIENCE 5(1), P. 8-14 (SPRING 1964). REVIEW OF COMPOSTING PLANTS AND METHODS THAT ARE IN USE IN GERMANY IN WHICH DIFFERENT GRADATIONS ARE PRODUCED ACCORDING TO PARTICULAR PROCESSES OF COMPOSTING UTILIZED, COMPOST QUALITY TESTS. (EI)

06-04-01226 NEW INSTALLATIONS FOR HOUSEHOLD REFUSE TREATMENT IN VERSAILLES REGION (COMPOSTING EQUIPMENT(COMPOSTING) QUANTITY)
GREGOIRE, A.
LES NOUVELLES INSTALLATIONS DE TRAITEMENT DES ORDURES MENAGERES DE LA REGION DE VERSAILLES, TECHNIQUES DES TRAVAUX 43(9-10), P. 269-276 (SEPTEMBER-OCTOBER 1967). FULLY AUTOMATED COMPOSTING PLANT WITH MAXIMUM DAILY CAPACITY OF 160 TONS HAS FOUR REINFORCED CONCRETE FERMENTATION TOWERS HAVING FORM OF INVERTED HYPERBOLOID OF REVOLUTION WHICH REDUCES INTERNAL LATERAL PRESSURE AND FACILITATES AERATION OF COMMINUTED REFUSE. SYSTEM OF SCREW AND BAND CONVEYORS REMOVES PARTIALLY DIGESTED MATERIAL FROM TOWER BOTTOM AND RECIRCULATES IT SEVERAL TIMES. THIS PRODUCES HIGHLY ACCELERATED DIGESTION ACCOMPANIED BY TEMPERATURE RISE AND DESTRUCTION OF PATHOGENIC BACTERIA AND PARASITES. PLANT'S OPERATION IS DESCRIBED IN DETAIL. (EI)

06-04-01234 REFUSE DISPOSAL TRENDS AND COMPOSTING METHODS (CALORIFIC-VALUE COMPOSITION SLUDGE(SEWAGE) SALVAGE CULTURE DANO)
WYLIE, J. C.
SURVEYOR 117(3440), P. 277-280 (MARCH 29, 1958). DECOMPOSITION OF ORGANIC WASTES TO PRODUCE HUMUS. COMPOST MAY BE CONSIDERED MATURE IF IT HAS CARBON/NITROGEN RATIO OF AROUND 20 TO 1. COMPOSTABLE MATERIALS, PHYSICAL STRUCTURE OF REFUSE, DUST, BATCH COMPOSTING, USE OF MULTISTAGE VERTICAL SILOS, ROLE OF INOCULANTS, DANO PROCESS, MANURIAL VALUE ONLY SLIGHTLY LOWER THAN THAT OF FARM MANURE. (EI)

06-04-01302 TREATMENT OF SOLID TOWN WASTES. THEORETICAL AND TECHNOLOGICAL DISCUSSION OF TREATMENT BY NATURAL CONVERSION INTO ORGANIC HUMIC COMPOST. (COMPOSTING COMPOST(FERTILIZER-VALUE))
FRANGIPANE, E. D. F.
POLITEC MILAN, IST INGEGN SANIT REP 10, 16 PP., REPRINT FROM INGEGN SANIT 9(1), (1961). AFTER DISCUSSING THE VALUE OF ORGANIC MATERIAL IN IMPROVING THE FERTILITY OF SOIL, THE AUTHOR DESCRIBES THE VARIOUS STAGES OF THE COMPOSTING PROCESS, PARTICULARLY THE AEROBIC AND ANAEROBIC FERMENTATION, AND GIVES ILLUSTRATED DESCRIPTIONS OF VARIOUS COMPOSTING PLANTS AND EXAMPLES OF THE BENEFICIAL USE OF THE COMPOSTS PRODUCED. (WPA)

06-04-01478 A NEW PROCESS FOR THE CONVERSION OF SEWAGE SLUDGE AND GARBAGE INTO VALUABLE GRANULATED FERTILIZER (COMPOSTING SLUDGE(SEWAGE))
VEIHINGER, K.
STAEDTEHYGIENE 14, P. 112-113 (1963). THE AUTHOR REVIEWS EXISTING METHODS OF TREATMENT FOR THE UTILIZATION OF SEWAGE SLUDGE AS FERTILIZER AND GIVES A DETAILED ACCOUNT OF A NEW PATENTED PROCESS WHICH CAN CONVERT DRIED SEWAGE AND SLUDGE OR FINELY DIVIDED AND PURIFIED GARBAGE INTO A GRANULATED PRODUCT FOR USE AS FERTILIZER. THE FILTER CAKE IS BROKEN UP AND PASSED TO A ROTATING AIR-TIGHT CONTAINER, WHICH IS SLOWLY HEATED EXTERNALLY TO 100 DEGREES C, LEFT TO COOL TO 90 DEGREES C WHILE STILL ROTATING, THEN GRADUALLY REHEATED TO 100 DEGREES C AND FINALLY COOLED AGAIN FOR 30 MINUTES, GIVING A FINAL PRODUCT CONTAINING 60 PERCENT DRY SOLIDS. THIS NEW PROCESS IS SIMPLE AND TIME-SAVING AND CAN BE CARRIED OUT WITHOUT SPECIALLY CONSTRUCTED BUILDINGS. (WPA)

06-04-01481 CAPILLARY DRYING FOR REFUSE-SLUDGE MIXTURES (SLUDGE(SEWAGE) COMPOSTING SEPARATION GRINDING PATHOGEN)
CASPARI, F.
STAEDTEHYGIENE 13, P. 145-148 (1962). A PROCESS DEVELOPED AT SCHWEINFURT A. MAIN FOR THE COMBINED COMPOSTING OF GARBAGE AND SETTLED SLUDGE IS DESCRIBED. GARBAGE, WHICH HAS BEEN FREED FROM IRON AND OTHER UNDESIRABLE CONSTITUENTS AND GROUND, IS MIXED WITH SLUDGE WHICH HAS BEEN PARTIALLY DEWATERED BY FILTRATION AND THE MIXTURE IS PRESSED INTO FLAT CAKES. WHEN THESE ARE STACKED, A SPONTANEOUS FUNGUS DEVELOPMENT TAKES PLACE AND THE TEMPERATURE RISES TO A HEIGHT AT WHICH PATHOGENIC BACTERIA AND WORM EGGS ARE RENDERED HARMLESS AND THE WHOLE MASS IS DRIED WITHOUT PRODUCTION OF ODOR NUISANCE. (UC)

06-04-01482 FURTHER THOUGHTS ON THE PROBLEM OF REFUSE-COMPOST PREPARATION (COMPOSTING SLUDGE(SEWAGE) DRYING)
KEILER, E.
STAEDTEHYGIENE 13, P. 98-100 (1962). IN THE PREPARATION OF COMPOSTS FROM MIXTURES OF GARBAGE AND SEWAGE SLUDGE, THE SLUDGE MUST BE DEWATERED IN ORDER TO GET SATISFACTORY MIXING. VARIOUS METHODS OF DRYING ARE DISCUSSED. IN EXPERIMENTS ON SOIL IMPROVEMENT THE AUTHOR FOUND THAT SLUDGE DEPOSITED ON DUG-OUT BEDS AND COVERED WITH SOIL GAVE UP WATER UNDER PRESSURE AND THAT THE AMOUNT COULD BE CONTROLLED AND REGULATED BY THE PRESSURE. PLANT IS DESCRIBED IN WHICH THE SLUDGE IS PASSED THROUGH A VESSEL UNDER PRESSURE OF COMPRESSED AIR, AND THEN BETWEEN THE ROLLERS OF A TYPE OF MANGLE. IF NECESSARY THE MIXING CAN BE FURTHER FACILITATED BY FREEZING THIS PRESSED SHEET AND BREAKING IT UP. (PHEA)

06-04-01488 THE DANO METHOD OF REFUSE DISPOSAL (SALVAGE(METALS) COMPOSTING)
SCOVIL, R. E.
CALIFORNIA VECTOR VIEWS 5(2), P. 5 (FEBRUARY 1958). THE AUTHOR TELLS OF THE PROBLEMS ENCOUNTERED IN THE USE OF VARIOUS METHODS OF ACCOMPLISHING SOLID WASTE DISPOSAL, AND POINTS OUT THAT THE DANO METHOD OF COMPOSTING IS THE BEST MEANS OF DISPOSAL. SINCE OCTOBER 1957, A FULL-SCALE DANO BIOSTABILIZER COMPOSTING PLANT HAS BEEN IN OPERATION NEAR SACRAMENTO, CALIFORNIA. NO INOCULATION IS USED DURING THE PROCESS, WHICH INVOLVES THE USE OF A ROTATING DRUM (12 FEET IN DIAMETER, 150 FEET IN LENGTH) FOR AERATING AND MIXING THE REFUSE. RETENTION OF THE REFUSE FOR A PERIOD OF 10 DAYS RESULTS IN A COMPOST HAVING A LOW C TO N RATIO. (UC)

06-04-01566 NEW DISPOSAL METHOD CLAIMS BID ADVANTAGES (COLLECTION SALVAGE OBRON COMPOSTING SIZE-REDUCTION)
REFUSE REMOVAL JOURNAL 1(3), P. 10 (MARCH 1958). A COMMERCIAL GARBAGE AND REFUSE CONVERSION SYSTEM IS DESCRIBED. THE STEPS INCLUDE (1) PICKING TABLES, WHERE LARGE OR SALVAGEABLE ITEMS ARE REMOVED BY HAND, (2) PRIMARY MAGNETIC SEPARATION OF CANS AND FERROUS OBJECTS, (3) PRIMARY GRINDING TO REDUCE PARTICLE SIZE TO LESS THAN 4 INCHES, (4) SECONDARY MAGNETIC SEPARATION, (5) SECONDARY GRINDING TO REDUCE PARTICLE SIZE TO LESS THAN 3/4 INCH, (SEWAGE " WASTE " AND A DISPERSION OF CARBON BLACK ARE ALSO INTRODUCED), (6) DIGESTION PROCEEDS AS THE REFUSE PASSES THROUGH A SERIES OF TEN SPECIALLY DESIGNED BINS, AND (7) FINAL SCREENING, YIELDING THE END PRODUCT. THE VALUE OF CARBON BLACK LIES IN ITS HIGH ABSORPTION AND RETENTION OF THE HEAT OF THE SUN. (PHS)

06-04-01691 COMPOSTING (SLUDGE(SEWAGE) DANO)
WYLIE, J. C.
PREPRINT OF PAPER TO BE PRESENTED AT THE SYMPOSIUM ON TREATMENT OF WASTE WATERS TO BE HELD AT UNIVERSITY OF DURHAM, KINGS COLLEGE, UNITED KINGDOM, P. 14-19 (DECEMBER 1959). A DESCRIPTION IS GIVEN OF ALL PHASES OF THE COMPOSTING PROCESS, WITH EACH STEP BEING THOROUGHLY DISCUSSED. FERMENTATION, MASS COMPOSTING, SEGREGATION AND PREPARATION OF COMPOSTABLE MATERIALS, AND THE USE OF SEWAGE SLUDGE ARE ALL TREATED. THE AUTHOR PAYS PARTICULAR ATTENTION TO THE USE OF SEWAGE SLUDGE IN LOWERING C TO N RATIO. EXAMPLES ARE GIVEN OF THE USE OF MULTISTAGE SILOS IN COMPOSTING. RATHER THAN MAKING USE OF ROTATIONAL MOVEMENT OR OF TURNING OF WINDROWED COMPOST AFTER A A NUMBER OF WEEKS, IN SOME PLANTS THE

MIXED WASTES ARE HOISTED TO THE TOP OF A SILO AND DUMPED INTO THE FIRST OF A VERTICAL SERIES OF FERMENTATION CELLS. AFTER A FIXED INTERVAL, USUALLY TWENTY- FOUR HOURS, THE WASTES ARE DROPPED MECHANICALLY TO THE NEXT LOWER PLATFORM. THE NUMBER OF PLATFORMS USUALLY VARIES FROM FOUR TO EIGHT. THE WASTES ARE SUPPOSEDLY STABILIZED BY THE TIME THEY REACH THE BOTTOM OF THE SILO. THE "STABILIZED" WASTES ARE TRANSFERRED TO OPEN SHEDS, IN WHICH THE COMPOST IS "MATURED" WITHIN SIX TO EIGHT WEEKS. DROPPING THE MATERIAL FROM LEVEL TO LEVEL IS SUPPOSED TO PROVIDE SUFFICIENT AERATION. (UC)

06-04-01735 REPORT ON COMPOSTING EMPHASIZES EFFICIENCY (PATENT NEW-METHODS)
GERAGHTY, C. J.
REFUSE REMOVAL JOURNAL 3(1), P. 12 (1960). A REPORT ON THREE COMPOSTING PROCESSES THAT HAVE BEEN DEVELOPED AND ARE NOW IN USE IN A WIDE VARIETY OF DISPOSAL PROBLEMS USING GARBAGE, REFUSE, INDUSTRIAL ORGANIC WASTES AND SEWAGE SLUDGES.

06-04-01855 MAKE COMPOST IN 14 DAYS (COMPOSTING FERTILIZER-VALUE)
PAMPHLET BY ORGANIC GARDENING AND FARMING, RODALE PRESS, DEPARTMENT C, EMMAUS, PENNSYLVANIA. INSTRUCTIONS ARE GIVEN FOR MAKING COMPOST ON A " BACKYARD " SCALE. THE INSTRUCTIONS COVER TEN CATEGORIES, VIZ., LOCATION OF OPERATION, COLLECTION AND ASSEMBLAGE OF MATERIALS, USE OF POWER EQUIPMENT, OPERATION WITHOUT POWER EQUIPMENT, IMPROVEMENT OF THE VALUE OF COMPOST, THE WATERING AND TURNING PROCESSES, MISTAKES TO AVOID, HOW TO USE COMPOST, AND SHEET COMPOSTING. A LIST OF SOME COMMON MATERIALS THAT MAKE EXCELLENT ADDITIONS TO THE COMPOST HEAP IS GIVEN. IT CONTAINS INSTRUCTIONS ON HOW TO USE COMPOST. (UC)

06-04-01856 COMPOSTING OF MUNICIPAL REFUSE (VALUE(FERTILIZER) SALVAGE FINANCING)
SNELL, J. R.
CAN MUN UTILITIES MAG 95(11), P. 50-53, 54-56, 91-94 (NOVEMBER 1957). ATTEMPT MADE TO INTERPRET LABORATORY AND PILOT STUDIES CONDUCTED IN RESEARCH PROGRAMS AND TO APPLY THEM TO FULL SCALE SCIENTIFIC DESIGNS. THREE COMPOSTING PROCESSES EMPLOYING SCIENTIFIC PRINCIPLES DISCUSSED ARE - T. A. CRANE HIGH RATE DIGESTER WITH HOLDING CAPACITY OF 36 TONS, AMERICAN DROSS DISPOSAL CORP. AUTOMATIC TURNER AND SHREDDER, AND BIN COMPOSTING WITH FORCED AIR. RECOMMENDATIONS FOR DESIGN AND OPERATION OF PLANT. (EI)

06-04-01931 MECHANICAL COMPOSTING
SYNGHAL, K.N. + YADAV, L.S.
ENVIRONMENTAL HEALTH (INDIA) 5(3), P. 289-291 (JULY 1963). A BRIEF ACCOUNT IS GIVEN OF RECENT ATTEMPTS TO MECHANIZE THE COMPOSTING PROCESS. IT IS ARGUED THAT MECHANIZED COMPOSTING CAN SOLVE THE PROBLEM OF REFUSE DISPOSAL IN LARGE CITIES WHERE CONVENTIONAL COMPACTING OR LANDFILL IS NOT FEASIBLE BECAUSE OF POPULATION GROWTH. (PHEA)

06-04-01968 KOMPOSTIERUNG DER STADABFALLE (COMPOSTING OF URBAN DOMESTIC WASTES) (INDORE)
ROHDE, G.
WISSENSCHAFTLICHE ZEITSCHRIFT DER HUMBOLDT-UNIVERSITAT ZU BERLIN, MATHEMATICS AND SCIENCE SERIES 5, 4TH YEAR, 18 PP. (1954-1955). THE AUTHOR HAS TRIED TO DEVELOP THE " NATURAL COMPOSTING " METHOD AND EXPOUNDS ON ITS PRINCIPLES. HIS MAIN THEME IS THE FURTHER DEVELOPMENT OF THE FAMED INDORE METHOD AND CONSISTS OF NATURAL COMPOSTING IN WINDROWS 3-M WIDE BY 1.5-M HIGH, IN SEMI CIRCULAR PILES WITH AERATION CHANNELS. DURING 1954 THE AUTHOR PRODUCED 37,000 CU-M OF COMPOST FROM THE DOMESTIC WASTES OF GREATER BERLIN (DOMESTIC WASTES, STREET SWEEPINGS, PIG FECES, DIGESTED SLUDGE). (PHS)

06-04-01971 PROCESSING AND AGRICULTURAL UTILIZATION OF URBAN REFUSE IN FRANCE (COMPOSTING SLUDGE(SEWAGE))
NEVEUX, M.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 7, (JULY 1959). THE AMOUNT OF ORGANIC MATTER INCORPORATED INTO FRENCH SOILS YEARLY IS ABOUT 40 TO 50 MILLION TONS (METRIC). BY COMPARISON THE ANNUAL PRODUCTION OF STABLE MANURE IS ABOUT 100 MILLION TONS. IF EACH TOWN OF MORE THAN 20,000 INHABITANTS HAD A COMPOSTING PLANT AND A SEWAGE TREATMENT PLANT, AN ADDITIONAL 0.5-0.75 MILLION TONS OF ORGANIC MATTER WOULD COME FROM REFUSE AND 0.15 MILLION TONS FROM SEWAGE SLUDGE. LITTLE USE IS BEING MADE OF REFUSE AND SLUDGE FOR AGRICULTURAL PURPOSES AS COMPARED TO STABLE MANURE. SETTING ASIDE THE STATISTICS AND CONSIDERING THAT REFUSE COMPOST IS DESTINED FOR THOSE REGIONS OF FRANCE WHERE THE NEED IS GREATEST, IT IS SEEN THAT COMPOST WOULD PLAY AN IMPORTANT ROLE IN DEVELOPMENT AND MAINTENANCE OF SOIL FERTILITY. IN THE PARIS REGION, 200,000 TO 400,000 TONS OF RAW REFUSE ARE FREED FROM IRON AND GLASS FRAGMENTS, PULVERIZED, AND DISPENSED IMMEDIATELY TO FARMERS. THE FINELY GROUND PRODUCT IS HOMOGENEOUS, EASILY APPLIED, AND COMPARABLE TO STABLE MANURE IN FERTILIZING VALUE. THE RAW COMPOST IS PLOWED INTO THE SOIL IN AUTUMN. (AUTH)

06-04-01976 PROCESS COMPOSTS CARDBOARD AND OTHER CITY REFUSE (COMPOSTING)
COLEMAN, C. H.
COMPOST SCIENCE 1(4), P. 4 (WINTER 1961). ISRAELI PATENT 13,033 COVERS A PROCESS OF GRINDING AND WINDROW COMPOSTING OF REFUSE WITH FORCED AERATION AND WITH PROVISION FOR PH CONTROL AND THE ADDITION OF FERTILIZING MATERIALS. GRINDING REDUCES PARTICLE SIZE TO LESS THAN 4-CM IN DIAMETER. WINDROWS, LESS THAN 2-M HIGH, ARE PLACED OVER PIPES WITH AIR DISCHARGE HOLES LESS THAN 2 MM DIAMETER CONNECTED TO A BLOWER FROM WHICH AIR IS SUPPLIED AT 0.1-IN PRESSURE. ACIDS OR ALKALIS CAN BE ADDED TO CONTROL PH AND PHOSPHATES OR NITROGENOUS MATERIALS CAN BE ADDED TO IMPROVE THE FERTILIZER VALUE OF THE COMPOST. COMPOSTING TIME IS 3-4 WEEKS. (PHS)

06-04-01979 HOUSEHOLD WASTE DISPOSAL - II. MABELREIGN'S HOUSEHOLD WASTE DISPOSAL PROBLEM (COMPOSTING TOLLEMACHE)
KEEBLE, D. H. L.
RHODESIAN ENGINEER, P. 33-39 (SEPTEMBER 1959). AN INSANITARY OPEN, BURNING DUMP WAS USED BY THE TOWN OF MABELREIGN FOR REFUSE DISPOSAL. OTHER METHODS WERE CONSIDERED AND COMPOSTING WAS SELECTED BECAUSE OF THE LOW SOIL FERTILITY IN THE AREA AND FOR ECONOMIC REASONS. AN ANALYSIS OF THE REFUSE FOR A WEEK FROM THE TOWN (6,900 POPULATION) REVEALED - (1) TOTAL AMOUNT - 47,080 LB, (2) BOTTLES - 3.2 PERCENT, (3) METAL - 4.1 PERCENT, (4) RAGS - 1.0 PERCENT, (5) DENSITY - 11 LB/CU-FT, (6) BONES - 0.5 PERCENT, (7) PAPER AND CARDBOARD - 9.2 PERCENT AND (8) REMAINDER - 81.7 PERCENT. A NEW UNTRIED PROCESS, THE TOLLEMACHE SYSTEM, WAS TESTED IN A PILOT PLANT AND SELECTED AS THE PREFERRED COMPOSTING PROCESS. THE TOWN BOARD APPROVED A CONTRACT WITH PERFORMANCE GUARANTEES FOR CONSTRUCTION OF A 30 TON PER WEEK PLANT. PROCESS STAGES ARE - RECEIVING AND STORAGE (ONE DAY), SORTING, MAGNETIC SEPARATION, PAPER AND TIN BALING, ADDITION OF RAW SEWAGE, " SILO " COMPOSTING, AND COMPOST MATURING IN HEAPS. THE " SILO " CONSISTS OF A HORIZONTAL CONCRETE CHAMBER WITH A PERFORATED FLOOR, A RAIL-MOUNTED TURNER-AGITATOR, AND FORCED AERATION THROUGH THE FLOOR. TWO CHAMBERS WERE BUILT AT MABELREIGN AND ONE TURNER OPERATES IN BOTH OF THEM. THE PLANT WAS ACCEPTED IN MAY 1959 AND FUNCTIONS SATISFACTORILY EXCEPT THAT NON-COMPOSTABLE MATERIALS, SUCH AS POLYETHYLENE AND MILK BOTTLE CAPS, ARE OBJECTIONABLE. IT IS PLANNED TO ADD A " SILORATOR " WHICH WILL CUT UP SUCH MATERIAL AND BLOW THE COMPOST 40 TO 50 FEET TO A STOCKPILE. COMPOST SALES ARE GOOD AT 70 S/TON AT THE PLANT OR 1 D/LB IN BAGS. SALVAGE SALES HAVE NOT BEEN AS HIGH AS EXPECTED AND THERE IS NO MARKET FOR RAGS OR TINS. THE PLANT COST 5,600 POUNDS STERLING. OPERATING COSTS AND RECEIPTS ARE NOT YET STABILIZED. COMPOST TEMPERATURES REACH 150 DEGREES F. (AUTH)

06-04-01980 EXPERIENCES WITH COMPOSTING PLANTS USING THE RASPING (RASPEL) METHOD (COMPOSTING COST(OPERATING))
WURFBAIN, H.
STAEDTEHYGIENE 12, P. 273-275 (1956). ABOUT 50,000 TONS YEARLY OF DOMESTIC REFUSE ARE TREATED AT THE RASPEL PLANTS IN HOLLAND AT VLISSINGEN, DELFT, SCHIEDAM, SNEEK, AND ALMELO. ABOUT 45,000 TONS OF PULVERIZED REFUSE IS OBTAINED, YIELDING ABOUT 40,000 TONS OF COMPOST. THE CITIES OF ARNHEIM AND HENGELO HAVE LIKEWISE DECIDED TO BUILD RASPEL PLANTS. THE AUTHOR GIVES A SHORT DESCRIPTION OF THE RASPEL PLANT. THE PLANT TREATS 97 PERCENT OF ALL REFUSE, THE REMAINDER BEING LARGE COMBUSTIBLE ITEMS WHICH ARE INCINERATED. THE WORTHLESS RESIDUAL IS ABOUT 10 PERCENT, THUS 87 PERCENT OF THE TOTAL REFUSE IS COMPOSTED IN PILES IN THE OPEN OR DISTRIBUTED AS RAW MATERIAL FOR HOTBEDS. THE PAPER DESCRIBES THE VARIOUS MACHINES, GIVES AVERAGE CURRENT CONSUMPTION AT THE PLANT, AND PRESENTS GENERAL OPERATING COSTS. (PHS)

06-04-01981 DEVELOPMENT OF THE DANO (BIOSTABILIZER) METHOD FOR COMPOSTING REFUSE AND SLUDGE (EGSETER)
STAHLSCHMIDT, V.
STAEDTEHYGIENE 12, P. 275-277 (1956). THE DANO COMPANY AT COPENHAGEN HAS BUILT INSTALLATIONS FOR THE REMOVAL AND TREATMENT OF REFUSE SINCE 1930. THE WASTES WERE THEN MIXED IN A ROTATING SILO AND PULVERIZED IN AN " EGSETER " APPARATUS, THEN SCREENED AND COMPOSTED IN PILES IN THE OPEN. SUCH PLANTS EXIST AT LA CHAUX-DE-FONDS, SWITZERLAND, AND KUESNACHT, SWITZERLAND. THE BIOLOGICAL DECOMPOSITION OF REFUSE, HOWEVER, REQUIRED TOO MUCH SPACE, TIME, AND LABOR. WE THEREFORE SOUGHT TO ACCELERATE THE PROCESS AND THE DANO COMPANY INITIATED LABORATORY RESEARCH. THE RESULT OF THE STUDIES WAS THE DANO " BIOSTABILIZER ". IN SWITZERLAND THERE ARE DANO PLANTS AT RUESCHLIKON AND CHUR(COIRE). THIS PAPER DISCUSSES THE METHODS AND LABORATORY EXPERIMENTS, INCLUDING CONCLUSIONS FOR PRACTICAL APPLICATION. (PHS)

06-04-01987 COMPOSTING CITY REFUSE AND STANDARDS OF USE
SCHWEIZ LANDWIRTSCHAFTLICH MONATSHEFTE, (NOVEMBER 1958). VARIOUS SANITARY METHODS OF REFUSE DISPOSAL HAVE BEEN THOROUGHLY TESTED IN LARGE SCALE EXPERIMENTS IN RECENT YEARS. EMPHASIS HAS BEEN PLACED ON IMPROVED INCINERATORS AND THE MANUFACTURE AND USE OF COMPOST. DIFFICULTIES OF COMPOSTING HAVE BEEN ELIMINATED BY WELL CONCEIVED MECHANIZATION OF THE PROCESSING OF REFUSE BY THE INTRODUCTION OF VIBRATING SCREENS, ELECTROMAGNETS, AND HAMMERMILLS. FAVORABLE RESULTS HAVE BEEN OBTAINED IN COMPOSTING DIGESTED OR FRESH SLUDGE WITH REFUSE AND THE PROBLEMS OF COMPOSTING TODAY HAVE BEEN SOLVED. WHILE INCINERATION IS PURELY AN ECONOMIC PROBLEM, COMPOSTING TOUCHES UPON THE INTERESTS OF AGRICULTURE, VINICULTURE, AND FORESTRY. (AUTH)

06-04-02134 ORGANIC COMPOSTS STARTING FROM ORGANIC WASTE AND THE RESULTING COMPOST
BAILLOD, P. + BOSS, G.
PATENT SWISS 251,131 (CL 42), (JULY 16, 1948). FERMENTATION OF NIGHT SOIL, GARBAGE, OR INDUSTRIAL ORGANIC WASTE BY A BACTERIAL CULTURE OF AZOTOBACTER, AMYLOBACTER, OR BACILLUS RADICOLA IS FAVORED BY ADDITION OF A MIXTURE OF INORGANIC SALTS WHICH ACT AS CATALYSTS. ONE LITER OF THE CATALYTIC MIXTURE IS ADDED TO ONE TON OF ORGANIC MATERIAL CONTAINING PREFERABLY 30 PERCENT MOISTURE AND ALLOWED TO FERMENT. BEST RESULTS ARE OBTAINED IF THE TEMPERATURE IS NOT ALLOWED TO RISE ABOVE 40 DEGREES C. FERMENTATION PROCEEDS FOR 4 TO 5 DAYS AFTER WHICH PERIOD LIME IS ADDED TO BRING THE PH OF THE FERMENTED MATERIAL TO ABOUT 7.5. MATERIAL PRODUCED IS A FERTILIZER. (CA)

06 05 ECONOMICS

06-05-00218 ECONOMICS OF COMPOSTING MUNICIPAL REFUSE (COST(CAPITAL) COST(SUBSIDY) COST(OPERATING) INCINERATION)
SHUVAL, H. I.
PROC AM SOC CIVIL ENGRS J SANIT ENGRG DIV 88, P. 47-56 (JULY 1962). ECONOMIC ANALYSIS OF 2 COMPOSTING PLANTS IN ISRAEL IS PRESENTED IN ORDER TO ILLUSTRATE ECONOMIC FEASIBILITY OF REFUSE COMPOSTING UNDER CERTAIN FAVORABLE CONDITIONS. DATA, ALTHOUGH NOT DIRECTLY TRANSLATABLE INTO COSTS FOR SIMILAR PLANTS IN UNITED STATES, TEND TO POINT OUT THAT COMPOSTING PLANTS MAY BE IN SAME COST RANGE AS REFUSE DISPOSAL BY INCINERATORS. IF MARKET FOR SALE OF COMPOST EVEN AT NORMAL PRICE, COULD BE DEVELOPED, COMPOSTING MIGHT EVENTUALLY PROVE TO BE ECONOMICAL ALTERNATIVE TO INCINERATION IN CERTAIN AREAS OF UNITED STATES. (EI)

06-05-00309 MUNICIPAL COMPOSTING - SOME ECONOMIC CONSIDERATION (COST(OPERATING) COST(SUBSIDY) MARKETING COMPOSTING(FAILURES))
KOLB, L. P.
COMPOST SCIENCE 8(2), P. 9 (AUTUMN 1967-WINTER 1968). A BRIEF EXAMINATION OF A FEW SPECIFICS AND MANY GENERALITIES OF COMPOSTING ECONOMICS HAS LED TO ONE CONCLUSION. THE DEEPER ONE LOOKS INTO THE SUBJECT, THE MORE DISMAL SEEM THE PROSPECTS FOR ECONOMICAL COMPOSTING. WHAT CAN BE DONE? SINCE VIRTUALLY ALL STUDIES ON THE SUBJECT SEEM TO BE CONCLUDED WITH CALLS FOR MORE OF THE SAME, THE WRITER WOULD SUGGEST TWO PROMISING OBJECTIVES FOR FUTURE RESEARCH EFFORTS - 1. THE DEVELOPMENT OF A RATIONAL METHOD OF MARKET PREDICTION FOR COMPOST IN A GIVEN GEOGRAPHICAL AREA. 2. THE DEVELOPMENT OF TECHNIQUES FOR TAILORING THE PRODUCT TO FIT LOCAL NEEDS. FOR EXAMPLE, CAN COMPOST BE EFFICIENTLY PELLETIZED FOR EASIER HANDLING OR CAN SPREADING COSTS BE REDUCED BY COMBINING THE COMPOST WITH CHEMICAL FERTILIZERS. COMPOSTING IS STILL SEEN BY SOME BACKERS AS A " WAVE OF THE FUTURE " IN SOLID WASTE DISPOSAL. BUT UNTIL SOME FUNDAMENTAL ECONOMICAL PROBLEMS ARE SOLVED, THE " WAVE " IS LIKELY TO REMAIN A RIPPLE. (UC)

06-05-00402 ECONOMICS OF COMPOSTING MUNICIPAL REFUSE (COST(SUBSIDY) COST(OPERATING) COST(CAPITAL))
SHUVAL, H. I.
THE AMERICAN CITY 77(12), P. 132 (DECEMBER 1962). REPRINTED FROM MUNICIPAL SOLID WASTES DISPOSAL, PROCEEDINGS OF THE THIRD PITTSBURGH SANITARY ENGINEERING CONFERENCE, NOVEMBER 4, 1961. IT IS FELT THAT THE MAJOR OBSTACLES TO COMPOSTING IN THE UNITED STATES ARE ECONOMICAL ONES RATHER THAN TECHNICAL. THE ARTICLE GIVES AN ECONOMIC ANALYSIS OF TWO ISRAELI COMPOSTING PLANTS IN ORDER TO ILLUSTRATE THE ECONOMIC FEASIBILITY OF REFUSE COMPOSTING UNDER CERTAIN FAVORABLE ECONOMIC CONDITIONS. THE DATA PRESENTED TEND TO POINT OUT THAT THE COMPOSTING PLANTS MAY BE IN THE SAME COST RANGE AS REFUSE DISPOSAL BY INCINERATION. THE TWO PLANTS DISCUSSED INCLUDE THE 50-TON PER DAY DANO BIOSTABILIZER PLANT IN HAIFA AND THE 500-TON PER DAY DORR-OLIVER PLANT IN TEL-AVIV. THE ARTICLE EXAMINES THE EXISTING MARKET FOR COMPOST IN ISRAEL, GIVES AN ECONOMIC COMPARISON OF THE TWO PLANTS, INCLUDING GENERAL BACKGROUND DATA, PRODUCTION COSTS AND REVENUE, AND UNIT COSTS AND REVENUE, AND COMPARES COMPOSTING COSTS AND INCINERATION COSTS. (PHS)

06-05-00572 THE ECONOMICS OF COMPOSTING MUNICIPAL REFUSE (PULVERIZATION COST(OPERATING) COST(SUBSIDY) SALVAGE)
KUPCHICK, G.
PUBLIC WORKS 97(9), P. 127 (SEPTEMBER 1966). COST AND INCOME DATA WERE COLLECTED FROM 14 COMPOSTING PLANTS IN EUROPE AND ISRAEL. THESE PLANTS EMPLOYED EITHER THE DANO BIOSTABILIZER, THE DORR-OLIVER RASP, THE VENTILATED CELL, THE BUEHLER-DANO COMBINATION, OR THE VAN MAANEN PROCESS. THE AVERAGE COST TO PROCESS ONE TON OF RAW REFUSE WAS $4.55, OF WHICH CAPITAL COST (AMORTIZATION, INTEREST, AND RENT) AMOUNTED TO $1.76 AND OPERATING EXPENSES $2.79. BASED ON COMPARATIVE COST INDICES, IT IS EVIDENT THAT CONSTRUCTION AND OPERATING COST IN THE U.S. WOULD BE CONSIDERABLY HIGHER. THE WEIGHT OF COMPOST PRODUCED WAS 46 PERCENT OF THAT OF THE PROCESSED RAW REFUSE, AND THE AVERAGE INCOME SALES AMOUNTED TO $2.73 PER TON OF COMPOST, OR $0.90 PER TON OF RAW REFUSE. ADDITIONAL INCOME FROM SALVAGE MATERIALS AVERAGED ABOUT $0.20 PER TON OF RAW REFUSE. HOWEVER, ONLY IN GREAT BRITAIN WAS SALVAGE INCOME SUBSTANTIAL. NOT ONE OF THE PLANTS IS ABLE TO COVER ITS CAPITAL SERVICE COSTS AND OPERATING EXPENSES THROUGH INCOME OBTAINED FROM SALVAGE AND SALE OF COMPOST. DEFICITS RANGED FROM $0.32 TO $5.32 WITH AN AVERAGE NET COST OF $3.38 PER TON OF REFUSE PROCESSED. THE ONLY SUBSTANTIAL PRICES FOR COMPOST WERE OBTAINED IN ISRAEL. ON THE BASIS OF THE EXPERIENCES ENCOUNTERED, IT IS MOST IMPORTANT THAT A CONTINUING DEMAND FOR COMPOST SHOULD BE ESTABLISHED BEFORE A COMPOST PLANT IS CONSTRUCTED. PULVERIZATION APPEARS TO HOLD PROMISE AS A PRETREATMENT TO REDUCE SUBSTANTIALLY THE VOLUME AND ALTER THE CHARACTER OF REFUSE PRIOR TO LANDFILL, INCINERATION, OR COMPOSTING OPERATIONS. (UC)

06-05-00833 AN APPRAISAL OF COMPOSTING IN ENGLAND (COST(ANALYSIS) SALVAGE)
DAVIES, A. G.
COMPOST SCIENCE 5(2), P. 29 (1964). A DISCUSSION OF THE ECONOMICS OF COMPOSTING. WHEN MAKING AN ANALYSIS THE TYPE OF OPERATION, THE ORGANIC CONTENT OF THE REFUSE, AND THE DEGREE OF SEPARATION PRIOR TO COMPOSTING. INCOME FROM PRODUCT AND SALVAGED MATERIAL SALES IS ALSO A FACTOR. THE END USE OF THE COMPOST ALSO PRODUCES AN EFFECT ON THE COMPOSTING COST BECAUSE OF THE QUALITY CONTROL AND PRESORTING REQUIRED. IN SELLING, THE TWO ESSENTIAL FACTORS ARE A STABLE END PRODUCT OF KNOWN AND SUITABLE FORMULA, AND AN APPROPRIATE MARKETING SYSTEM.

06-05-00886 HOW DO YOU SELL COMPOST (MARKETING(COMPOST))
COMPOST SCIENCE 2(3), P. 3 (1961). IT IS PROPOSED TO SET UP A COMPOST INFORMATION GROUP THAT WILL BRING TOGETHER INDIVIDUALS AND COMPANIES INTERESTED IN DEVELOPING THIS MARKET.

06-05-00889 APPROACH TO MUNICIPAL COMPOSTING (COST(OPERATING) ECONOMICS HEALTH)
WILEY, J. S.
COMPOST SCIENCE 2(2), P. 6-7 (SUMMER 1961). ANALYSIS OF PRESENT AND FUTURE STATUS OF COMPOSTING AS MEANS OF PUBLIC REFUSE DISPOSAL. DISCUSSION INCLUDES COMPOST PLANT OPERATING COSTS, FEASIBILITY AND PUBLIC HEALTH ASPECTS. (EI)

06-05-00892 FINANCING A CITY COMPOST PLANT - FOUR VIEWS (COST(OPERATING) COST(SUBSIDY))
REES, D. + GOTAAS, H. B. + SNELL, J. R. + SHUVEL, H.
COMPOST SCIENCE 2(1), P. 12-14 (SPRING 1961). FOUR OF THE WORLD'S LEADING AUTHORITIES ON COMPOSTING GIVE THEIR VIEWS ON THE IMPORTANT ASPECT OF INCOME AND COSTS. (PHEA)

06-05-00996 COMPOSTING - IS IT ECONOMICALLY SOUND (ECONOMICS MARKETING)
SOLID WASTES MANAGEMENT/RRJ 9(7), P. 10 (JULY 1966). DESPITE CONSIDERABLE INVESTMENT AND TECHNICAL KNOW-HOW, NOT ONE LARGE-SCALE COMPOSTING PLANT HAS OPERATED ECONOMICALLY LONG ENOUGH IN THE UNITED STATES TO INDICATE THAT THE PROCESS IS FEASIBLE. AS OF JULY, 1966, THREE LIMITED INSTALLATIONS ARE IN OPERATION IN THE U.S., VIZ., ALTOONA, PENNSYLVANIA, LARGO, FLORIDA, AND BOULDER, COLORADO. ALTHOUGH THE PROCESS HAS A POOR RECORD IN THIS COUNTRY, COMPOSTING PLANTS ON A LARGE SCALE ARE UNDER CONSTRUCTION OR ARE IN THE PLANNING STAGE IN A NUMBER OF CITIES. COMPOSTING HAS FAILED IN THE U.S. FOR FOUR MAIN REASONS (1) NO STEADY MARKET FOR THE END PRODUCT HAS AS YET BEEN FOUND. (2) INITIAL INVESTMENT AND OPERATING COSTS ARE GENERALLY HIGH COMPARED TO OTHER DISPOSAL METHODS. (3) A HIGH QUALITY END PRODUCT USUALLY CANNOT BE DERIVED FROM REFUSE IN THE U.S. (4) THE SEPARATION OF NONCOMPOSTABLES REQUIRES EITHER A SANITARY LANDFILL SITE OR AN INCINERATOR TO DISPOSE OF THEM. MANY COMPOSTING PLANTS HAVE BEEN OPERATED BY PRIVATE CONTRACTORS. THE CITY IS CHARGED AN AMOUNT THAT WILL DEFRAY OPERATING COSTS. PROFITS FOR THE CONTRACTOR ARE HOPED TO BE REALIZED FROM THE SALE OF THE END PRODUCT. OPERATORS USUALLY CHARGE THE CITY FROM $1.00 TO $5.00/TON, WHILE THE COSTS FOR COMPOSTING REFUSE USUALLY RANGE FROM $5 TO $10/TON. THE OPERATORS MUST MAKE UP THE BALANCE OF THE COSTS AND ANY PROFITS FROM THE SALE OF THE COMPOST, AND SO FAR IT JUST HAS NOT BEEN POSSIBLE TO DO SO. THE HISTORY OF COMPOSTING IN THE PAST 15 YEARS IN THE U.S. IS ONE OF FAILURE. THERE ARE, HOWEVER, THREE NOTABLE EXCEPTIONS, AS MENTIONED ABOVE. ALTOONA, PENNSYLVANIA, COLLECTS ONLY TABLE GARBAGE, COMPOSTS IT, AND USES IT AS A SOIL CONDITIONER FERTILIZER. ALL OTHER REFUSE IS COLLECTED BY A PRIVATE CONTRACTOR AND TAKEN TO A PRIVATELY-OWNED LANDFILL SITE FOR DISPOSAL. BOULDER, COLORADO, OPENED ITS COMPOST PLANT LATE IN 1965, AND BAGS ITS PRODUCT FOR A LIMITED REGIONAL SALE. THE PLANT AT LARGO, FLORIDA, COMPOSTS MATERIALS FROM AGRICULTURE, STOCKYARDS CANNERIES, AND SEWAGE. A SMALL MARKET FOR THE PRODUCT INCLUDES GOLF COURSES AND AGRICULTURE. THE SELLING PRICE IS $16/TON. THERE IS LITTLE OBJECTION TO ODORS PRODUCED AT THESE PLANTS, WHICH WAS A VERY DEFINITE PROBLEM AT SOME OF THE PLANTS THAT WERE SHUTDOWN. MOBILE, ALABAMA, BUILT ITS OWN COMPOSTING PLANT AT A COST OF $1.5 MILLION, THE BUILDERS OF THE PLANT HAVE SETUP A CORPORATION TO BUY ALL THE CITY'S COMPOST AT $3/TON. (UC)

06-05-01385 THE UTILIZATION OF ORGANIC DOMESTIC WASTES (COMPOSTING SLUDGE(SEWAGE) QUANTITY COMPOSITION ECONOMICS)
BURKE, C. E.
SURVEYOR, LONDON, 108, P. 629-631 (OCTOBER 21, 1949). THE PAPER IS CONCERNED WITH A PROPOSED SCHEME FOR COMPOSTING THE REFUSE AND SEWAGE SLUDGE FROM A TOWN HAVING A POPULATION OF ABOUT 500,000. IT WAS NOT THE INTENTION TO DISCUSS THE MANURIAL OR FERTILIZING VALUE OF THE ORGANIC WASTES IN SEWAGE OR HOUSEHOLD REFUSE OR OF COMPOSTS PREPARED FROM SUCH WASTE MATERIALS, BUT TO ACCEPT THE FACT THAT THE LAST WORD ON THE USE OF ORGANIC FERTILIZERS RESTS WITH THE FARMER, AND THAT IF HE WERE SATISFIED HE WOULD CREATE THE MARKET. ALL THREE PRODUCTS, VIZ., REFUSE, DRIED SLUDGE, AND A COMPOST OF BOTH WOULD SELL AS A FERTILIZER. THEREFORE IT DEPENDS ON CIRCUMSTANCES AND SITE CONDITIONS AS TO THE RIGHT DECISION REGARDING THE TIMELINESS OF THE INITIATION OF A COMPOSTING OPERATION. THE ARTICLE ALSO DETAILS PLANT OPERATIONS, MACHINERY, LABOR COSTS, PROFITS, AND DIFFICULTIES. (UC)

06-05-01542 ECONOMICS OF COMPOSTING SEWAGE SLUDGE AND HOUSEHOLD REFUSE (SLUDGE(SEWAGE))
COMMONWEALTH ENGINEER, 2, 352-353, (APRIL 1951). TWO TYPES OF WASTES WERE CONSIDERED, ONE OF WHICH WAS A COMBINATION OF DIGESTED SLUDGE AND HOUSEHOLD REFUSE. USING THIS TYPE WOULD RESULT IN 1,000,000 TONS OF COMPOST A YEAR. THE SECOND TYPE WAS ONE OF SLUDGE SCREENINGS AND HOUSEHOLD REFUSE. THIS TYPE WOULD RESULT IN 5,000 TONS OF COMPOST A YEAR. THE COMPOSTING PROCESS WAS CONDUCTED IN CIRCULAR CELLS VENTILATED FROM BELOW, IN WHICH ALTERNATE LAYERS OF CRUSHED REFUSE AND SLUDGE OR SCREENINGS WERE DEPOSITED. STEPS IN COMPOSTING ARE - (1) THE ABSORPTION OF THE LIQUID OR SEMILIQUID SLUDGE BY THE REFUSE, (2) FERMENTATION, WHICH MAY BE AEROBIC OR ANAEROBIC, TAKES PLACE AT 170 DEGREES F, AND EVAPORATION OF WATER FROM THE SLUDGE, (3) RETENTION OF THE MIXTURE IN CELLS FOR ABOUT A WEEK, (4) REMOVAL OF THE COMPOSTING REFUSE FROM THE CELLS FOLLOWED BY STACKING FOR A PERIOD NOT LESS THAN 3 MONTHS TO MATURE THE COMPOST. IN PREPARING SLUDGE COMPOST, IT WAS NOT POSSIBLE TO FIND MEANS BY WHICH THE REFUSE COULD BE INDUCED TO ABSORB MORE THAN ITS OWN WEIGHT OF WET SLUDGE. CROPS BENEFIT FROM THE CONSTITUENT CHEMICAL ELEMENTS OF COMPOST, VIZ., NITROGEN, PHOSPHORUS, AND POTASSIUM - MODEST THOUGH THESE COMPONENTS BE IN PROPORTION TO THE TOTAL DRY MATTER. THE CHIEF BENEFIT IN THE USE OF COMPOST IS THE RESULTING IMPROVEMENT IN SOIL TEXTURE AND MOISTURE - HOLDING CAPACITY. THE FINAL DECISION OF THE LONDON COUNTY COUNCIL TO ABANDON THE PRODUCTION OF SLUDGE - REFUSE COMPOSTING WAS ARRIVED AT WITH A CONSIDERABLE DEGREE OF REGRET - IT HAVING BEEN MADE ON A PURELY FINANCIAL BASIS AS AFFECTING THE COUNTY OF LONDON ALONE. (UC)

06-05-01973 WHAT IS NECESSARY FOR COMPOSTING SUCCESS? (COMPOSTING MARKETING(COMPOST))
REES, D. F.
COMPOST SCIENCE 2(3), (AUTUMN 1961). COMPOSTING OF MUNICIPAL WASTES CAN BE BOTH A MEANS OF WASTE DISPOSAL AND A MEANS OF PRODUCING USEFUL ORGANIC MANURE. IN MANY CASES, HOWEVER, THERE HAS BEEN NO COORDINATION BETWEEN THE DISPOSAL AND THE AGRICULTURAL REQUIREMENTS. CITIES CANNOT AFFORD TO CONSIDER THE NATIONAL ASPECTS OF COMPOSTING BUT MUST LOOK ONLY AT THE ECONOMICS AND CONVENIENCE OF MUNICIPAL COMPOSTING. THE AUTHOR THINKS THAT THE VALUE OF COMPOST HAS BEEN OVER STATED IN THE U.S. AND THAT PLANTS THAT HAVE SHUT DOWN HAVE DONE SO BECAUSE OF INABILITY TO SELL AN OVERPRICED MATERIAL. COMPOST IS SIMILAR TO GOOD FARMYARD MANURE AND SHOULD BE SOLD AT OR BELOW COMPARATIVE PRICES. AS GARBAGE DISPOSAL IS A MUNICIPAL SERVICE AND RESPONSIBILITY, ECONOMICS SHOULD BE BASED ON A REASONABLY LOW SELLING PRICE TO INSURE SALES OF ALL COMPOST, NOT SELLING PART AT A HIGH PRICE. UNTIL THE MARKET IS ESTABLISHED, TOTAL OUTPUT MAY NOT BE SOLD FOR A YEAR OR TWO. FLEXIBLE OPERATION OF THE PLANT IS VERY IMPORTANT AND IT MUST HAVE GOOD MANAGEMENT. (PHS)

06-05-02131 MUNICIPAL COMPOSTING
TRUMAN, H. A.
MUNIC ENGR SANIT RECORD AND MUNIC MOTOR, P. 238, 246 (OCTOBER 31, 1947). A REPORT ON A NEW ZEALAND EXPERIMENT WHEREBY REFUSE AND SEWAGE ARE COMPOSTED AND CONVERTED INTO ORGANIC FERTILIZERS. SOME EXAMPLES OF VOLUMES AND COSTS ARE QUOTED IN THIS ARTICLE.

06-05-02135 IMPROVEMENTS IN BACTERIOLOGICAL DIGESTERS FOR CONVERSION OF ORGANIC WASTE (COMPOSTING)
ABSON, J. W. + BROADBURST, D.
PATENT BRIT. 1,060,461, (MARCH 1, 1967). THIS PATENT DESCRIBES A VERTICAL TOWER TYPE BACTERIOLOGICAL DIGESTER FOR COMPOSTING MUNICIPAL REFUSE IN A CONTINUOUS OPERATION.

06 06 VALUE IN AGRICULTURE

06-06-00306 SOIL IMPROVEMENT SOCIETY ORGANIZED TO PRODUCE AND UTILIZE COMPOST OF REFUSE (COMPOSTING MARKETING COMPOST(SPREADING))
TIETJEN, C. + BANSE, H. J.
COMPOST SCIENCE 1, P. 35 (SUMMER 1960). COMPOSTING INTERESTS TWO TYPES OF PEOPLE- THOSE WHO WANT TO GET RID OF THE WASTES, AND THOSE WHO REGULARLY OR PERIODICALLY BUY THE COMPOST. AT BAD KREUZNACH, GERMANY, THE FINANCIAL PROBLEMS INVOLVED IN COMPOSTING WERE SOLVED BY FORMING A SOIL IMPROVEMENT SOCIETY OR UNION WHICH GUARANTEES A MARKET FOR THE COMPOST AND APPORTIONS THE PROCESSING AND ADMINISTRATIVE COSTS BETWEEN ITS SHAREHOLDERS. THE MEMBERS OF THE SOCIETY SHARE THE COMPOST ACCORDING TO THE AMOUNT OF ACREAGE THEY OWN. IF A PERSON DOES NOT USE HIS SHARE OF THE COMPOST, OR IF HE USES ONLY A PART OF IT, THE REMAINDER IS LEFT TO THE DISPOSAL OF THE SOCIETY AS IT SEES FIT. THE COMPOSTING PLANT AT BAD KREUNZBACH IS SIMILAR TO THE DANO PLANT AT SACRAMENTO, CALIFORNIA. THIS GERMAN TOWN IS SURROUNDED BY MOUNTAINS WITH VERY STEEP SLOPES, GOOD ONLY FOR VINEYARDS. IT IS DIFFICULT TO APPLY COMPOST TO THE SOIL DUE TO THESE TERRAIN CONDITIONS. THE USUAL MANURE SPREADER IS NOT FEASIBLE. THE MOST COMMON METHOD OF APPLICATION IS THE USE OF WOODEN SLEDGES. A WINCH PLACED AT THE UPPER END OF A ROW PULLS THE SLEDGE WITH ITS LOAD OF MANURE, AND A MAN DOES THE SPREADING. A NEW METHOD OF SPREADING DEVELOPED BY THE SOCIETY IS THE USE OF A BLOWER TRUCK. THE COMPOST IS PLACED ON THE CONTOUR PATH IN A REGULARLY SHAPED PILE. THE BLOWER TRUCK FLINGS THE COMPOST DOWN THE HILL MUCH LIKE A SNOW PLOW CLEANS ROADS OF DRIFTS. THE COMPOST IS APPLIED AS NEEDED. (UC)

06-06-00332 USE OF COMPOST IN THE NETHERLANDS IN 1959
TEENSMA, B.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANSLATION BY U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE. IRGR INFORMATION BULLETIN 10, (DECEMBER 1960). THE TWELVE MUNICIPAL COMPOST PLANTS IN THE NETHERLANDS (OWIJSTER, MIERLO, DELFT, SCHIEDAM, ENSCHEDE, ALMELO, HENGELO, VENLO, SNEEK, VLISSINGEN, SOEST-BARN, AND DANTUMADEEL) DISPOSED OF 194,331 METRIC TONS OF REFUSE COMPOST IN 1959. THE FOLLOWING INDICATES THE USE OF COMPOST IN THE YEAR 1959- GRASSLAND PASTURE 4 PERCENT, CHICKEN LITTER 1.9 PERCENT, FIELD CROPLAND 35.3 PERCENT FOREST CULTURE 3.1 PERCENT, MIXED WITH MANURE 9.1 PERCENT, PARKS, GARDENS 22.3 PERCENT, HORTICULTURE 2.6 PERCENT, HOTBEDS 5.0 PERCENT, MARKET 12.9 PERCENT, FLOWER BULB-RAISING 3.8 PERCENT. (UC)

06-06-00337 THE USE OF REFUSE COMPOST IN VINICULTURE (COST(PRODUCT) APPLICATION(COMPOST))
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 2, (APRIL 1957). COMPOST IS AN ECONOMICAL SOURCE OF HUMUS. OF THE COSTS INVOLVED IN COMPOSTING, 8 PERCENT IS FOR TRANSPORTATION, 44 PERCENT FOR THE COMPOSTING PROCESS, 32 PERCENT FOR SCREENING, 5 PERCENT FOR REMOVAL OF DEBRIS, 7 PERCENT FOR MACHINERY, AND 3 PERCENT FOR INTEREST. THE USE OF COMPOST IN VINICULTURE RESULTS IN AN OPTIMUM REGULATION OF WATER CONTENT OF THE SOIL, IN AN INCREASE IN AMOUNT OF WATER ABSORPTION, AND IN AFFECTING THE SOIL SUCH THAT STEEP SLOPES (50 PERCENT INCLINATION) CAN BE CULTIVATED MECHANICALLY. IT REDUCES THE DANGER OF EXTENSIVE EROSION EVEN AT RAINS AS HEAVY AS 70 MM IN 20 MINUTES. THE QUANTITY AND THE QUALITY OF THE VINES ARE ENHANCED. (UC)

06-06-00338 COMPOSTING AND THE USE OF REFUSE COMPOST IN THE NETHERLANDS (APPLICATION(COMPOST))
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 2, (APRIL 1957). THE ARTICLE CONSISTS OF A BRIEF SUMMARY OF A BROCHURE PUBLISHED IN THE DUTCH LANGUAGE. IN 1957 MORE THAN 25 PERCENT OF ALL URBAN REFUSE WAS SUBJECTED TO COMPOSTING. (UC)

06-06-00340 THE REFORESTATION EXPERIMENT AT THE ZONSER HEATH (APPLICATION(COMPOST))
COSACK, J.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 3, (OCTOBER 1957). THE FALLOW SOIL (SAND DUNES) WAS TREATED WITH COMPOST, THE AMOUNT OF COMPOST RANGING FROM 0 (CONTROL) TO 75 TONS PER HECTARE (ONE HECTARE IS 2.47 ACRES). (UC)

06-06-00342 THE EFFECT OF REFUSE AND REFUSE SLUDGE COMPOST ON PLANTS AND SOILS (APPLICATION(COMPOST))
SPRINGER, U.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 4, (MARCH 1958). THE ADVANTAGEOUS EFFECTS OF COMPOST ON SOIL ARE DESCRIBED. THESE ARE PRIMARILY PHYSICAL IN NATURE, VIZ., IMPROVEMENT OF TEXTURE, INCREASING OF MOISTURE-HOLDING CAPACITY, AND INCREASING OF PORE VOLUME. NEGATIVE EFFECTS MAY BE A DANGEROUS RAISING OF THE PH LEVEL IN A NEUTRAL SOIL, CROP DAMAGE IF THE COMPOST IS RICH IN TRACE ELEMENTS, AND RELEASE OF TOXIC MATERIALS. (UC)

06-06-00343 REFUSE COMPOST IN POULTRY HUSBANDRY (APPLICATION(COMPOST))
TEENSMA, B.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 4, (MARCH 1958). UNTIL THE PRESENT, THE BEDDING LAYER IN POULTRY BUILDINGS (SAND OR PEAT BEDDING) WAS CHANGED EVERY 7 TO 14 DAYS. WITH THE NEW THICK LITTER METHOD, HENS AND CHICKS ARE KEPT IN PENS ON A 30 TO 50 CM LAYER OF ORGANIC MATTER SUCH AS STRAW, CORNCOBS, WOOD SHAVINGS, HORSE MANURE, PEAT BEDDING, OR COMPOSTED REFUSE. ADVANTAGES PROVIDED BY THIS METHOD ARE LABOR SAVING, THE BEDDING IS ALWAYS WARM, LOWER MORTALITY, CANNIBALISM SUBSIDES, BETTER GROWTH OF FOWLS, BETTER RESULTS IN BROODERS WITH EGGS FROM FOWLS RAISED ON DEEP LITTERS, AND SPACE SAVING. (UC)

06-06-00348 ON THE CONTENT AND VALUE OF TRACE ELEMENTS IN URBAN REFUSE COMPOST (APPLICATION(COMPOST))
GERRETSEN, F. C.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULLETIN 6, (JANUARY 1959). SOME TRACE ELEMENTS ARE INDISPENSABLE FOR PLANT GROWTH. EXAMPLES ARE MANGANESE, BORON, COPPER, MOLYBDENUM, AND ZINC. THE CONTENT OF TRACE ELEMENTS AND MAGNESIUM IN A DUTCH COMPOST WAS IN TERMS OF PERCENT DRY WEIGHT - CU, 0.01 TO 0.06 PERCENT, MN, 0.002 TO 0.03 PERCENT, ZN, 0.007 TO 0.023 PERCENT, B, 0.005 TO 0.007 PERCENT, MO, + 0.001, AND MG (AS MGO), 0.11 TO 0.34 PERCENT. (UC)

06-06-00357 THE INFLUENCE OF ORGANIC FERTILIZERS ON THE UPTAKE OF MINERAL NUTRIENTS BY PLANTS
SAUERLANDT, W.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 7, (JULY 1959). IT SHOULD BE POSSIBLE TO DETERMINE THE QUALITY OF DIFFERENT TYPES OF REFUSE BY LONG-TERM FIELD EXPERIMENTS. HOWEVER, IT APPEARS NECESSARY TO DETERMINE NOT ONLY THE YIELDS, BUT ALSO THE NUTRIENT UPTAKE AND THE ORGANIC SUBSTANCES CONTAINED IN THE CROPS. THEREFORE, A COMPREHENSIVE SOIL ANALYSIS IS IMPERATIVE. SOMETIMES, DIFFERENCES IN THE FIRST YEAR ARE SCARCELY NOTICEABLE, WHILE IN THE SECOND YEAR, THE ONSET OF A BRISK MINERALIZATION BRINGS ON FAVORABLE RESULTS. COMPOSTED REFUSE PRODUCES POSITIVE RESULTS DURING THE THIRD YEAR AS OPPOSED TO RAW REFUSE. (UC)

06-06-00360 LONG-TERM EFFECTS OF URBAN REFUSE COMPOST (SOIL-CONDITIONING)
KORTLEVEN, J.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 7, (JULY 1959). THE SHORT-TERM EFFECTS OF THE USE OF COMPOST ON SOIL ARE SIMILAR TO THOSE OF MINERAL FERTILIZERS. THE LONG-TERM EFFECTS ARE BASED ON AN INCREASE IN THE HUMUS CONTENT OF THE SOIL. (UC)

06-06-00362 PRODUCTION AND UTILIZATION OF COMPOST IN SUBTROPICAL COUNTRIES
LIVSHUTZ, A.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 7, (JULY 1959). THE APPLICATION OF COMPOST TO A SOIL BRINGS ABOUT A REDUCTION IN IRRIGATION REQUIREMENTS BY INCREASING THE MOISTURE-HOLDING CAPACITY OF THE SOIL. WITH THE USE OF COMPOST, THE NEED FOR IRRIGATION WATER CAN BE REDUCED BY 10 PERCENT, THUS PERMITTING A 10 PERCENT EXPANSION IN EXTENT OF AREAS UNDER IRRIGATION. MUCH COMPOST HAS BEEN USED IN CITRUS GROVES, VINEYARDS, AND IN GROWING BANANAS, POTATOES, AND STRAWBERRIES. IN 1958 A TOTAL OF 12,000 CU-M WERE USED IN CITRUS GROVES ALONE. TWO PLANTS WERE IN OPERATION IN ISRAEL IN 1958. IN ONE OF THE PLANTS REFUSE ACCUMULATED FOR MANY YEARS IS STACKED IN HEAPS ABOUT 4-M HIGH. COMPOST FROM THIS PLANT CONTAINS SOME GLASS AND CHINA, NAILS AND OTHER METAL PIECES. IT THEREFORE CANNOT BE USED IN GARDENS. HOWEVER, IT IS GOOD FOR USE IN VINEYARDS AND ORCHARDS. REFUSE IS PRESORTED IN THE SECOND PLANT. THE PRESORTED REFUSE IS PASSED THROUGH A DORR-OLIVER RASPING MACHINE AND IS COMPOSTED IN WINDROWS. THE WINDROWS ARE TURNED 4 TO 6 TIMES DURING THE COMPOST PERIOD. SLUDGE IS ADDED TO THE INCOMING REFUSE TO GIVE A MOISTURE CONTENT OF 50 PERCENT TO 60 PERCENT. BALLISTIC AND MAGNETIC SEPARATORS REFINE THE COMPLETED COMPOST. (UC)

06-06-00365 URBAN REFUSE FOR SOIL IMPROVEMENT IN ISRAEL (COMPOSTING COMPOST(QUALITY))
ADRITTI, E.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 8, (MARCH 1960). ISRAEL HAS NO AVAILABLE LAND FOR SANITARY LANDFILLS IN THE VICINITY OF ITS CITIES. INCINERATION IS TOO COSTLY. ON THE OTHER HAND, THE AGRICULTURAL NEED FOR FERTILIZERS MADE FROM COMMUNITY WASTES IS URGENT BECAUSE STABLE MANURE PROVIDES ONLY 60 PERCENT OF THE REQUIRED AMOUNT. ONLY A FEW COMPOST PLANTS ARE IN ISRAEL. THEY ARE IN TEL-AVIV, HAIFA, AND JERUSALEM (1960). THE DEMAND FOR COMPOST IS GREAT AND NEW PLANTS ARE PLANNED. THE NEED FOR COOPERATION AND COORDINATION BY VARIOUS GOVERNMENTAL AGENCIES IS APPARENT. THE "INTERDEPARTMENTAL COMMITTEE ON REFUSE PROBLEMS" HAS SUCH DUTIES AS EXAMINATION, TESTING NEW SYSTEMS, AND THE PROVISION OF INFORMATION. (UC)

06-06-00376 TEN YEARS OF SOIL IMPROVEMENT WITH PEAT, REFUSE, AND SLUDGE (COMPOSTING SOIL-CONDITIONING)
TRINEL, M.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 12, (SEPTEMBER 1961). THE TEN YEAR FIELD TEST SHOWED THAT- (1) SOIL PHYSICAL PROPERTIES (HUMUS CONTENT, HYGROSCOPIC MOISTURE, WATER-RETENTION CAPACITY, ABSORPTION CAPACITY) WERE PARTICULARLY IMPROVED BY THE PEAT. CHEMICAL PROPERTIES, ON THE OTHER HAND, WERE IMPROVED OVER LONG PERIODS PARTICULARLY BY THE REFUSE AND SLUDGE. (2) PEAT, MATURE REFUSE, AND SLUDGE WHEN APPLIED TO POOR SOIL APPRECIABLY INCREASED THE YIELDS OF WINTER AND SUMMER RYE, OATS, AND POTATOES, AND IMPROVED THE CERTAINTY OF YIELDS IN DRY YEARS. (3) SINCE THESE RESULTS WERE OBTAINED BY THE APPLICATION OF LARGE AMOUNTS OF COMPOST, AND CONSEQUENTLY AT A HIGH COST IN TERMS OF DISTRIBUTION, THE USE OF REFUSE COMPOST AND SLUDGE SHOULD BE GEARED MOSTLY TO SPECIALTY CROPS, SUCH AS THOSE RAISED IN GARDENING AND IN VINICULTURE. THE HIGH BORON AND COPPER CONTENTS OF REFUSE MUST ALWAYS BE KEPT IN MIND WHEN CONSIDERING THE USE OF COMPOST ON SOILS IN WHICH BORON-SENSITIVE PLANTS MAY BE CULTIVATED. (4) THE KNOWN UNFAVORABLE ACTION OF THE AMENDMENTS ON LUPINE AND SERRADELLA CANNOT BE EXPLAINED. IT MAY BE A FUNCTION OF THE HIGH BORON CONTENT. (5) THE EXPERIMENTS CONFIRMED THE WELL KNOWN FACT THAT ORGANIC MATTER IS RAPIDLY DECOMPOSED IN LIGHT SOILS. (UC)

06-06-00380 EVALUATION OF REFUSE COMPOST IN FIELD TRIALS
SAUERLANDT, W.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 13, (DECEMBER 1961). RESULTS OF FIELD TRIALS WITH AGRICULTURAL CROP PLANTS ARE REPORTED. ALTHOUGH MANY RESULTS ARE GIVEN, THE DATA CANNOT BE OF MUCH PRACTICAL VALUE, BECAUSE A UNIFORM MATERIAL WAS NOT USED IN THE TESTS. (UC)

06-06-00381 INFLUENCING PHYSICAL FERTILITY OF SOIL BY APPLICATION OF COMPOST
BANSE, H. J.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 13, (DECEMBER 1961). EXPERIMENTS IN VINEYARDS HAVE SHOWN THAT WITH COMPOST APPLICATIONS OF 50, 100, 200, AND 400 TONS PER HECTARE A CONSIDERABLE IMPROVEMENT OF SOIL CHARACTERISTICS OCCURRED. IN LIGHT SOILS THE MAINTENANCE OF SOIL MOISTURE DURING DROUGHT IS OF GREAT IMPORTANCE. THE INCREASE IN MOISTURE HOLDING CAPACITY IMPARTED BY THE COMPOST IS OF GREAT IMPORTANCE IN THIS RESPECT. IN HEAVY SOILS WHICH CAKE DURING DRY PERIODS, THE PORE VOLUME IS INCREASED THROUGH THE APPLICATION OF COMPOST, THUS IMPROVING THE STRUCTURE AND THE TILTH OF THE SOIL. IN TIMES OF HEAVY RAINFALL SILTING IS PREVENTED AND GOOD AERATION OF THE ROOT AREAS IS PROVIDED THROUGH THE APPLICATION OF COMPOST. (UC)

06-06-00385 AGRICULTURE AND COMPOST
ANDRES, O.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 15, (AUGUST 1962). THE AUTHOR DISCUSSES THE TERM COMPOSTING FROM THE VIEWPOINT OF AN AGRICULTURE ENGINEER. (UC)

06-06-00388 EROSION DAMAGE IN VINICULTURE AND PREVENTIVE MEASURES (COMPOST)
PEYER, E.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 15, (AUGUST 1962). EROSION IN VINEYARDS DUE TO PRECIPITATION IS DISCUSSED AND ITS EFFECT DEMONSTRATED BY ACTUAL MEASUREMENTS. WINEGROWERS HAVE A GREAT INTEREST IN ELIMINATING OR REDUCING SOIL EROSION. CONTROL POSSIBILITIES INCLUDE THE CONSTRUCTION OF ARTIFICIAL EROSION STOPS, THE PRACTICING OF GREEN MANURING, THE USE OF SODDING OR SOD STRIPS, THE TERRACING OF STEEP SLOPES, OR THE APPLICATION OF COARSE MATERIAL TO THE SOIL. SEVERAL WAYS OF INCREASING THE SOIL HUMUS CONTENT ARE MENTIONED. (UC)

06-06-00406 PLANT GROWING EXPERIMENTS WITH REFUSE COMPOST IN JAPAN
NAKAMURA, N.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 17, (MAY 1963). THE PLANT-GROWING EXPERIMENTS WERE CONDUCTED AT THE HYOGO AGRICULTURAL UNIVERSITY UNDER THE DIRECTION OF PROFESSOR N. NAKAMURA. THE FOLLOWING RESULTS WERE OBTAINED (1) THE REFUSE COMPOST PROVED TO BE EQUAL OR SUPERIOR TO STABLE MANURE. (2) THE ADDITION OF 7.5 TONS OF COMPOST PER HECTARE RESULTED IN A HIGHER YIELD THAN THAT OF 15 TONS PER HECTARE. THE OPTIMUM AMOUNT IS PROBABLY ABOUT 10 TONS PER HECTARE. (3) COMPOST NOT ONLY INCREASED THE YIELD AND SUGAR CONTENT OF SUGAR BEETS BUT ALSO REDUCED THE CONTENT OF NITROGEN. THE REDUCTION IS DESIRABLE IN SUGAR PROCESSING. (4) IN EXPERIMENTS WITH ONIONS, IT WAS FOUND THAT A CONCENTRATED APPLICATION OF COMPOST (DIRECTLY IN THE ROWS) RESULTS EASILY IN AN OVERDOSE. (5) DURING THE EXPERIENCE WITH CELERY, IT WAS NOTED THAT THE PH VALUE OF THE SOIL WAS NOT INCREASED, BUT THAT THE ACID EFFECT OF THE NECESSARILY HIGH MINERAL SALT ADDITIONS WAS NEUTRALIZED. (UC)

06-06-00885 RETURNING WASTES TO THE SOIL (COMPOSTING DANO)
PRESHUDA, H. J.
CHEMURGIC DIGEST 12(4), (APRIL 1953). A SUMMARY IS GIVEN OF THE PROBLEM OF SOIL DEPLETION AND THE PART HUMUS FROM THE COMPOSTING PROCESS PLAYS IN THE REBUILDING OF SOILS IS GIVEN. VARIOUS COMPOSTING METHODS ARE DESCRIBED. IT IS NOTED THAT THESE METHODS, WHILE SUCCESSFUL IN EUROPE FOR YEARS, ARE STILL IN THE DEVELOPMENTAL STAGE IN THE U.S. AND THAT MANY PROBLEMS HAVE TO BE WORKED OUT. WOOD WASTES AND STUBBLE MULCHING FOR USE IN DEVELOPING THE SOIL ARE DISCUSSED. THE ARTICLE POINTS OUT, HOWEVER, THAT THE EFFECTS OF ORGANIC RESIDUES ON THE SOIL ARE NOT COMPLETELY UNDERSTOOD, AND THAT MUCH MORE RESEARCH IS NEEDED. (UC)

06-06-00891 EFFECTS OF SAWDUST COMPOST ON SEEDLINGS GROWN IN PESTICIDE-TREATED SOILS
MATSUI, M.
COMPOST SCIENCE 2(1), P. 23-25 (SPRING 1961). REPORT ON STUDIES CONDUCTED AT UNIV WISCONSIN WHICH SHOW THAT FERMENTED SAWDUST COMPOST COUNTERACTS TOXIC SPRAY RESIDUES OF THIOSAN, CHLORDANE, AND ALLYL ALCOHOL IN SOIL. (EI)

06-06-01129 POT AND FIELD EXPERIMENTS ON THE EFFECT OF NITROGEN OF SOME FERTILIZERS PRODUCED FROM TOWN REFUSE
KICK, H.
Z PFLANZENERNAEHR DUENG BODENK 66, P. 132-142 (1954). IN A THREE-YEARS' TRIAL THE N UTILIZATION OF COM. HUMUS FERTILIZERS, AS " VITAHUM " AND " MUELLOHUM " AND OF REFUSE COMPOSTS WAS INVESTIGATED. DURING THE FIRST YEAR, OATS AND MUSTARD SHOWED GREATEST CROP INCREASES WITH MUELLOHUM. AMMONIUM NITRATE PRODUCED YIELDS FOUR TIMES THOSE ON PLOTS WITHOUT N. THE HIGHEST RATE OF NATURAL ORGANIC FERTILIZERS GAVE ONLY 1.3-1.4-FOLD YIELDS. DURING THE SECOND YEAR, ALL FERTILIZERS WITH RAPE AND SPRING WHEAT SHOWED THE SAME EFFECT. THE AFTER-EFFECT OF AMMONIUM NITRATE WAS EQUAL TO THE EFFECT OF HUMUS FERTILIZERS SUPPLYING TWICE AS MUCH N. IN THE THIRD YEAR ONLY A SLIGHT AFTER-EFFECT WAS OBSERVED. THE SOIL BECAME ALKALINE WITH ALL HUMUS FERTILIZERS. IN FIELD TRIALS DURING FIVE YEARS " MUELLOHUM " SHOWED NEARLY THE SAME N EFFECTS AS DID MANURE. (CA)

06-06-01218 EFFECT OF MINERALIZATION OF ORGANIC WASTES IN SOILS ON THEIR AVAILABLE NUTRIENTS AND EXCHANGEABLE BASE (COMPOSTING FERTILIZER-VALUE)
KARUN, A. + IAJUDDIN, A. M.
PAKISTAN J SCI RESEARCH 12, P. 29-38 (1960). CITY REFUSE CONTAINING N 6.33, P 1.47, AND POTASH 7.75 PERCENT AND PEAT CONTAINING N 3.04, P 0.03, AND POTASH 3.43 PERCENT WERE USED TO TREAT ALFERIC AND CALCAREOUS SOIL. THE CITY WASTE WAS SUPERIOR TO THE PEAT IN BUILDING UP THE AVAILABLE NUTRIENT. INCREASES RESULTING FROM CITY WASTE TREATMENT WERE FROM 1.96 TO 22.59 MG. PERCENT N AND INCREASES RESULTING FROM PEAT TREATMENT WERE FROM 2.17 TO 19.45 MG. PERCENT N. P CONTENT OF THE ALFERIC SOIL DECREASED SLIGHTLY FROM 5.24 TO 4.00 MG PERCENT FROM CITY WASTE TREATMENT AND FROM 1.32 TO 1.29 MG. PERCENT FROM PEAT TREATMENT. POTASH CONTENT OF THE ALFERIC SOIL INCREASED FROM 82.06 TO 92.04 MG. PERCENT FROM CITY WASTE TREATMENT AND FROM 61.40 TO 102.74 MG. PERCENT FROM PEAT TREATMENT. COMPARABLE RESULTS WERE OBTAINED WITH CALCAREOUS SOILS. AVAILABLE S INCREASED MORE WITH PEAT TREATMENT THAN WITH CITY REFUSE TREATMENT. THE EXCHANGEABLE METAL IONS, K AND CA, WERE INVESTIGATED, AND INCREASES WERE GREATER WITH PEAT- TREATED SOILS. (CA)

06-06-01287 FIRST EFFECT AND FIRST AFTEREFFECT OF WASTE COMPOST AFTER VARIOUS TREATMENTS WITH REGARD TO YIELD AND NUTRIENT UPTAKE (COMPOST(FERTILIZER-VALUE) COMPOSTING)
TIETJEN, C. + GIERKE, K. V.
Z PFLANZENERNAEHR DUENG BODENK 98, P. 109-125 (1961). FERTILIZATION EXPTS. WERE CARRIED OUT WITH VARIOUSLY TREATED TOWN WASTE, VARICUS AMOUNTS OF WASTE, AND WITH MINERAL-N ADDN. WASTE COMPOST FROM SETTLED SLUDGE HAD A VERY INTENSIVE FIRST EFFECT NO AFTEREFFECT. MECH. TREATED FRESH REFUSE WAS SUPERICR TO WASTE COMPOST, AND HAD A BETTER N AND K UPTAKE AND CONTENT IN THE CROP IN THE FIRST AFTEREFFECT YEAR. FE, MN, CU, AND CO CONTENTS IN THE GRAIN ANC STRAW WERE GENERALLY NOT AFFECTED, ONLY A MN DEFICIENCY IN THE PLANTS OCCURRED WHEN FRESH WASTE WAS USED. (CA)

06-06-01399 COMPOSTING OF CITY REFUSE (COMPOSITION)
FULLER, W. H.
J MILK FOOD TECH 24, P. 385-389 (DECEMBER 1961). AN AGRICULTURAL CHEMIST VIEWS " ONE OF THE MOST SERIOUS PROBLEMS OF COMMUNITY DEVELOPMENT " AND EMPHASIZES THE POTENTIAL AGRICULTURAL VALUE OF COMPOSTING OF CITY REFUSE. A NEW AND MORE EFFECTIVE METHCD OF DISPOSAL WHICH SUPPLIES ORGANIC MATTER FOR SOIL BUILDING AND PRESENTS THE POSSIBILITY OF RECLAIMING MATERIALS SUCH AS GLASS AND METALS ARE AMONG THE LISTED ADVANTAGES. COMPOSITION, AS WELL AS THE MICROBIOLOGICAL, CHEMICAL, AND PHYSICAL ASPECTS OF COMPOSTING ARE DISCUSSED. THE AIMS FOR A GOOD CCMPOST ARE DETAILED. REFERENCES INCLUDE ACTIVITY OF THE U.S.P.H.S., BOOKS, AND PERIODICALS. (PHEA)

06-06-01517 AVAILABILITY OF THE PLANT NUTRIENTS NITROGEN, PHOSPHORUS AND POTASSIUM IN TOWN REFUSE AND TOWN REFUSE-SEWAGE MUD COMPOSTS
KICK, H. + VOSS, N. + SAPPOK, B.
LANDWIRTSCH FORSCH 12, P. 97-110 (1959). THE EXPERIMENT WAS DESIGNED TO INVESTIGATE THRESHOLD VALUES AND MOST ECONOMIC VALUES OF K SUPPLY TO A REPRESENTATIVE ROTATION OF CROPS ON A MAN-MADE ORGANIC SOIL "PLAGGENBODEN" OF UP TO ONE FOOT DEPTH, OVERLYING A PODSOL. HAVING BEEN UNDER MARKET GARDEN CROPS, THE LAND WAS IN GOOD HEART, DURING THE EXPERIMENT ALL PLCTS RECEIVED ADEQUATE SUPPLIES OF N AND P AND CAREFUL CALCIUM CARBONATE TREATMENTS, AS WELL AS, FOR ROOT CROPS, FYM AT APPROX. TONS PER ACRE (EVEN CONTROL PLOTS). THE DIFFERENTIAL POTASSIUM CHLORIDE APPLICATIONS APART FROM THE CONTROL (K), SUPPLIED, APPROXIMATELY 80 AND 100, OR 120 AND 150 LBS/ACRE POTASSIUM TO CEREALS, 120 AND 180 LBS TO POTATOES AND 300 AND 400 LBS TO SUGAR AND FODDER BEET. THE DIFFERENCES IN RESPONSE TENDED TO BECOME MORE MARKED AS THE RESERVES FROM FERTILIZERS AND HUMUS SUPPLIED TO PREEXPERIMENTAL CROPS WORE OFF, AT THE SAME TIME THE INCREASING CONSOLIDATION OF THE SOIL MODIFIED THE EXPERIMENTAL RESULTS OVER THE YEARS. THE TOTAL POTASSIUM CONTENT OF THIS SOIL IN THE TOP 1 FOOT WAS NOT QUITE 10 T/ACRE AND THE ANNUAL TURNOVER, EXCLUDING LEACHING, WAS APPROXIMATELY 1/2 CWT POTASSIUM ACRE, A SUPRISINGLY HIGH VALUE. MEASURED BY LACTATE EXTRACTION, THE " AVAILABLE " POTASSIUM IN THE K PLOTS RAPIDLY DECREASED TO THE LOW VALUE OF 5 MG WHICH WAS SUBSEQUENTLY MAINTAINED. THIS IS INDEED REPRESENTATIVE FOR AVAILABILITY OF K TO LEGUMINOUS CROPS WHICH CONSISTENTLY FAILED AT THIS LOW K LEVEL, PRESUMABLY OWING TO CATION UNBALANCE AS WELL AS K-DEFICIENCY. THE CEREAL AND ROOT CROPS WERE, HOWEVER, MORE RESISTANT THAN THE LACTATE-VALUES SUGGEST, AND THEIR YIELDS WERE BETTER CORRELATED WITH THE HIGHER ASPERGILLUS VALUES. EFFECTS OF K WERE VARIABLE. A VERY SLIGHT INCREASE IN EASILY SOLUBLE POTASSIUM, BUT NO PERMANENT INCREASE IN TOTAL POTASSIUM OF THE SOIL RESULTED FROM THE K TREATMENT. THIS KIND OF SOIL APPEARS INCAPABLE OF BEING ENRICHED BEYOND A LACTATE VALUE OF 15-16 MG POTASSIUM (OR 30-35 MG IN HYDROGEN CHLORIDE). LOW SUPPLIES OF POTASSIUM ARE USED BY CROPS MUCH MORE ECONOMICALLY THAN HIGH ONES, WHICH CAUSE LUXURY CONSUMPTION. THE ECONOMICALLY SOUNDEST TREATMENT IS PROBABLY A NORMAL FYM DRESSING AUGMENTED BY APPROXIMATELY 1 1/2 CWT/ACRE (160 KG/HA) POTASSIUM ANNUALLY, THROUGHOUT THE ROTATICN, RESULTING IN "CEREAL EQUIVALENTS" OF 42 CWT/ACRE. (AUTH)

06-06-01521 UTILIZATION OF HOUSEHOLD REFUSE AND SEWAGE IN FORESTRY GERMAN AND DUTCH EXPERIMENTS (FERTILIZER-VALUE COMPOSTING)
COSACK, J.
SCHWEIZ Z HYDROL 17, P. 501-513 (1955). BENEFICIAL EFFECTS ARE DESCRIBED ON BOTH SOIL AND TREE GROWTH OF APPLYING (A) FRESH, ROUGHLY SCREENED, TOWN REFUSE IN LAYERS OF APPROXIMATELY 30 CM, COVERED WITH 10-15 CM OF SAND, ON SANDY SITES NEAR ARNHEM, (B) ROUGHLY SCREENED, DECOMPOSED MATERIAL FROM OLD GARBAGE DUMPS NEAR EINDHOVEN, AND (C) SPECIALLY PREPARED COMPOST IN THE AFFORESTATION IN THE 1930'S OF THE DUTCH HEATHS NEAR GROLLO AND SCHORNLO. EXPERIMENTS ARE IN PROGRESS WITH (A) ON MARSHY LAND AND WITH (B) ON SAND DUNES NEAR ZONS AND DORMAGEN (RHINE VALLEY), WHERE VARIOUS AMTS. UP TO 75 TONS/HA. WERE APPLIED BEFORE AND (OR) AFTER STRIP CULTIVATION. RESULTS OF THE FIRST GROWING SEASON IN SURVIVAL AND GROWTH WERE HIGHLY SATISFACTORY FOR ALL SPECIES TRIED, SCOTS PINE, LARCH, AND DOUGLAS FIR RESPONDING WELL TO INCREASED DOSAGES, THOUGH NOT BEECH AND ALDER. ANALYSIS OF (B) SHOWED A HIGH PH, A CA CONTENT OF APPROXIMATELY 5 PERCENT, ORGANIC MATTER APPROXIMATELY 7 PERCENT, AND A C/N RATIO OF 4 TO 1. WHERE LIGNITE IS USED EXTENSIVELY AS A DOMESTIC FUEL, B CONTENT IS A POTENTIAL LIMITING FACTOR FOR THE UTILIZATION OF SUCH REFUSE. (CA)

06-06-01686 FIRST EFFECT AND FIRST AFTEREFFECT OF WASTE COMPOST AFTER VARIOUS TREATMENTS WITH REGARD TO YIELD AND NUTRIENT UPTAKE (COMPOSTING FERTILIZER-VALUE)
TIETJEN, C. + GIERKE, K. V.
Z PFLANZENERNAEHR DUENG BODENK 93, P. 109-125 (1961). FERTILIZATION EXPERIMENTS WERE CARRIED OUT WITH VARIOUSLY TREATED TOWN WASTE, VARIOUS AMOUNTS OF WASTE, AND WITH MINERAL-N ADDITION. WASTE COMPOST FROM SETTLED SLUDGE HAD A VERY INTENSIVE FIRST EFFECT BUT NO AFTEREFFECT. MECHANICALLY TREATED FRESH REFUSE WAS SUPERIOR TO WASTE COMPOST, AND HAD A BETTER N AND K UPTAKE AND CONTENT IN THE CROP IN THE FIRST AFTEREFFECT YEAR. (CA)

06-06-01809 EFFECT OF NITROGEN SOURCES, WHEAT STRAW, AND SAWDUST ON NITROGEN TRANSFORMATIONS IN SUB-HUMID SOIL UNDER GREENHOUSE CONDITIONS (SOIL-CONDITIONER)
OREGON AGRICULTURE EXPERIMENT STATION, CORVALLIS, TECH PAPER 1228, (REPRINTED FROM J INDIAN SOC SOIL SCIENCE 7, P. 115 (MARCH 1959).) IN THE REGION AROUND OREGON, SOIL NITROGEN AND MOISTURE ARE THE TWO MAIN LIMITING FACTORS IN CROP PRODUCTION. MANY STUDIES HAVE BEEN MADE ON THE EFFECT OF ORGANIC RESIDUES SUCH AS STRAW AND SAWDUST ON NITROGEN TRANSFORMATIONS AND ON THE EXTENT OF NITROGEN LOSSES. RESULTS OF SUCH STUDIES MAY BE EQUALLY APPLICABLE IN INDIA WHERE DEFICIENCY OF NITROGEN IN SOIL IS A WELL-RECOGNIZED PROBLEM. ALTHOUGH SAWDUST AND STRAW HAVE LITTLE FERTILIZER VALUE AS SUCH, THEY MAY CONTRIBUTE TO NITROGEN CONSERVATION AS WELL AS IMPROVE THE PHYSICAL PROPERTIES OF SOIL. WHEN MIXED WITH THE SOIL THEY IMPROVE AERATION AND INCREASE THE SOIL'S WATER-HOLDING CAPACITY. THE INCORPORATION OF STRAW AND SAWDUST IN A SILT-LOAM SOIL CONSERVES ADDED NITROGEN. SINCE STRAW AND SAWDUST CAN CONTRIBUTE TO THE FORMATION OF HUMUS, IMPROVE AERATION, INCREASE THE WATER-HOLDING CAPACITY OF SOIL, AND AID IN THE CONSERVATION OF NITROGEN, THEY MAY BE USED FOR THE IMPROVEMENT OF SANDY AS WELL AS HEAVIER SOILS. (UC)

06-06-01872 THE EFFECT OF MANURING WITH COMPOSTED TOWN REFUSE ON THE YIELD AND ON SEVERAL IMPORTANT CHARACTERISTICS OF THE STATE OF THE SOIL (FERTILIZER-VALUE COMPOSTING)
SEIBERTH, W.
Z PFLANZENERNAEHR DUENG U BODENK 91, P. 53-62 (1960). THE EFFECT OF MANURING WITH COMPOSTED TOWN REFUSE WAS STUDIED FOR 10 YEARS. FOR COMPARISON, STABLE MANURE AND MINERAL FERTILIZER WERE USED. COMPOST WITH THE SAME C CONTENT WAS USED EVERY 2ND YEAR ON ROW PLANTS, AND THE FOLLOWING YEAR CEREALS WERE PLANTED TO DETERMINE POSTEFFECT. FIELDS WHERE THE COMPOSTED REFUSE WAS USED, GAVE A LOWER YIELD THAN THOSE WITH MANURE, OWING TO POOR N AVAILABILITY. THERE WAS ALSO NO POSITIVE POSTEFFECT ON CLOVER. THE DECOMPOSITION OF THE ORGANIC COMPOUNDS WAS PROBABLY DEPENDENT ON THE C TO N RATIO. ALTHOUGH THE COMPOST INCREASED THE LIME AND HUMIC ACID CONTENT OF THE SOIL, NO IMPROVEMENT IN THE ABSORPTION CAPACITY COULD BE DETECTED. OWING TO INSUFFICIENT AMOUNTS OF AVAILABLE N IN THE SOIL, WHEN THE COMPOSTED REFUSE WAS USED, NO INCREASED EFFECT OF THE EXISTING PHOSPHORUS PENTOXIDE, K, B, ZN, AND CU COULD BE DETECTED. (CA)

06-06-01927 THE RESURGENCE OF HUMUS. (COMPOST)
MARTIN-LEAKE, H.
COMPOST SCIENCE 7(3), P. 26-28 (WINTER 1967). THE SPECIALIZED AGRICULTURAL PROBLEMS OF INDIA AND AFRICA ARE TOO OFTEN OVERLOOKED, INTENTIONALLY AND OTHERWISE, BY "EXPERTS" INTENT ON USING MODERN METHODS. BASED ON HIS EXPERIENCES IN INDIA, DR. MARTIN-LEAKE STRESSES THE NEED FOR RETURNING COMPOST TO SOIL.

06-06-01970 REFUSE-SLUDGE COMPOST FOR SOIL IMPROVEMENT AND FERTILIZATION (FERTILIZER-VALUE COMPOSTING)
STIEGERWALD, E.
PRAKTISCHE BLATTER FUR PFLANZENBAU AND PFLANZENSCHUTZ 6, P. 210-217 (1956). BAVARIAN AGRICULTURAL PUB. THE BAVARIAN INSTITUTE FOR PLANT CULTURE AND PROTECTION AT MUNICH HAS CONDUCTED LONG-TERM TRIALS OF FERTILIZERS AT ITS EXPERIMENTAL PLANT AT PUCH SINCE 1950. FERTILIZERS INCLUDE - COMPLETE MINERAL FERTILIZERS, FRESH REFUSE, SEWAGE SLUDGE, AND REFUSE-SLUDGE COMPOST. IT HAS PROVED THAT REFUSE, PARTICULARLY REFUSE-SLUDGE COMPOST, BRINGS ABOUT CONSIDERABLE YIELD INCREASES AS COMPARED TO NON-FERTILIZED TRACTS. IN FOUR YEARS, DURING WHICH A COMPLETE MINERAL FERTILIZER WAS DIRECTLY APPLIED, THIS CHEMICAL FERTILIZER SHOWED A CLEAR SUPERIORITY OVER REFUSE. NITROGEN-PHOSPHOROUS-POTASH (NPK) FERTILIZER INCREASED THE YIELD BY 57 PERCENT, WITH REFUSE-SLUDGE COMPOST THE INCREASE WAS ABOUT 45 PERCENT. THE SAME RATE OF INCREASE WAS OBTAINED WITH ACTIVATED SLUDGE, WHILE FRESH REFUSE WAS CLEARLY INFERIOR IN THE YEARS WITH DIRECT APPLICATION. IN THE YEARS WITHOUT DIRECT APPLICATION, OR AFTER-EFFECT YEARS, THE URBAN REFUSE AND SLUDGE DEMONSTRATED THEIR NOTABLE AFTER-EFFECTS. THESE WASTES SHOULD THEREFORE NOT BE CONSIDERED AS FERTILIZERS IN THE NARROWER MEANING, BUT AS SOIL BUILDERS. THEIR EFFECT SHOULD NOT BE MEASURED ONLY DURING THE YEAR OF APPLICATION BUT AFTER THE PASSAGE OF A LONGER PERIOD OF OBSERVATION. IN TRIALS CONDUCTED IN PARALLEL ON TRACTS OF VERY DIFFERENT KINDS OF SOILS, THE 7-YEAR EXPERIMENTS AT PUCH ALSO SHOWED THAT THE REFUSE-SLUDGE COMPOST, CONSISTING OF 2 PARTS SUMMER DOMESTIC REFUSE AND 1 PART OF DRIED SLUDGE (MIXED AND COMPOSTED TOGETHER) FURNISHED AN EFFICACEOUS PRODUCT FOR SOIL IMPROVEMENT AND A GOOD FERTILIZER. THESE FACTS HAVE SO GREAT A SIGNIFICANCE FOR SUPPLYING HUMUS TO AGRICULTURE, AND, ABOVE ALL, TO HORTICULTURE THAT IT CANNOT BE FULLY GRASPED AT PRESENT BECAUSE THE PRESENT SOURCES OF HUMUS FOR HORTICULTURE IN THE VICINITY OF CITIES ARE BECOMING EVER LESSER WITH INCREASING MOTORIZATION. REFUSE-SLUDGE COMPOST, MADE IN A FORM SUITABLE FOR USE BY FARMERS AND GARDENERS AND SOLD AT A REASONABLE PRICE, CAN SERVE PERFECTLY TO FILL THE GAP IN THE HUMUS SUPPLY. COLLABORATION OF URBAN AND RURAL DISTRICTS IS REQUIRED TO SOLVE ALL THE MANY PROBLEMS. INTERESTED CIRCLES IN BAVARIA SHOULD NOW APPROACH AN AGREEMENT ON THE MANUFACTURE AND USE OF REFUSE-SLUDGE COMPOSTS. (AUTH)

06-06-01978 INDUSTRY, ORGANIC WASTES, AND AGRICULTURE (COMPOSTING)
TOTH, S. J.
COMPOST SCIENCE 1(4), P. 2 (WINTER 1961). PHYSICAL DETERIORATION OF U.S. SOILS SHOULD BE REMEDIED BY APPLICATION OF ORGANIC WASTES BEYOND THE AMOUNT AVAILABLE ON PRESENT-DAY FARMS. A WIDE RANGE OF ORGANIC WASTES FROM VARIOUS INDUSTRIES CAN PROVIDE SOIL IMPROVEMENT AND THE DETERMINATION OF N, PHOSPHOROUS PENTOXIDE, AND POTASSIUM OXIDE IS INSUFFICIENT IN ASSESSING THE VALUE OF SUCH WASTES. IT IS UP TO INDUSTRY TO EVALUATE THE AGRICULTURAL POTENTIALS OF THESE RESIDUES AND NOT ALL TYPES WILL IMPROVE THE PHYSICAL PROPERTIES OF SOIL. IN THE ABSENCE OF A CENTRALIZED INDUSTRY-SUPPORTED LABORATORY, THE AUTHOR SUGGESTS USE OF RESEARCH INSTITUTES AND AGRICULTURAL EXPERIMENT STATIONS. HE DEPLORES " THAT TREMENDOUS TONNAGES OF ORGANIC INDUSTRIAL WASTES, ARE BURNED OR DESTROYED AND NEVER DO GET BACK INTO THE SOIL FROM WHICH IT ORIGINATED ". (PHS)

06-06-01985 TRIALS IN EROSION PREVENTION IN VINEYARDS AND THEIR EVALUATION (COMPOST(SPREADING))
PEYER, E.
SCHWEIZ ZEITSCHRIFT FUR OBST-UND WEINBAU 67, P. 24 (1958). EXTENSIVE EXPERIMENTS HAVE BEEN CONDUCTED SINCE 1955 WITH THE COLLABORATION OF THE TWO RESEARCH INSTITUTES AT WADENSWIL AND ZURICH-OERLIKON AND THE EIDG ANSTALT FUR WASSERVERSORGUNG, ABWASSERREINIGUNG UND GEWASSERSCHUTZ (EAWAG). THESE SHOULD INDICATE THE POSSIBILITIES OF USE OF REFUSE COMPOSTS IN VINICULTURE. PREVENTION OF EROSION DAMAGE BY TREATMENT OF VINEYARD SOIL WITH COMPOST IS OF PRIMARY INTEREST. THE AUTHOR REPORTS ON THE FIRST YEARS OF THE TRIALS WHICH HAVE TURNED OUT EXTRAORDINARILY FAVORABLY. NOT ONLY WAS THE EROSION OF FINE SOIL REDUCED TO A MINIMUM BUT THE FRIABILITY OF THE VINEYARD SOIL WAS ALSO CONSIDERABLY IMPROVED BY COMPOST TREATMENT. (AUTH)

06-06-01988 SOME PRACTICAL RESULTS WITH REFUSE COMPOST IN VEGETABLE GARDENING (COMPOST(UTILIZATION))
MEYER, J. H.
SCHWEIZ GARTEN-BLATT 79, P. 46 (1958). IN 1956 THE AUTHOR RAISED TOMATOES, PUMPKINS, AND CUCUMBERS OUTDOORS DIRECTLY IN A REFUSE COMPOST PILE 30-40 CM HIGH WITHOUT ANY SOIL. TOMATO GROWTH WAS SATISFACTORY, BUT PUMPKINS, AND ESPECIALLY CUCUMBERS, SHOWED THE FOLLOWING INITIAL INJURIES - PLANTS BECAME YELLOWISH, FORMED ONLY SHORT INTERNODES AND VERY SMALL LEAVES, AND WILTED SLIGHTLY DURING HOT AFTERNOONS BUT WITHOUT BURNED LEAF EDGES. AFTER HEAVY RAINS, THE PLANTS AGAIN BECAME GREEN AND SHOWED SOMEWHAT BETTER GROWTH. FRUIT SET ON NORMALLY BUT SOON DROPPED OFF. THESE NEGATIVE PHENOMENA DISAPPEARED IN TIME. APPARENTLY THE DEGREE OF DECOMPOSITION (RIPENESS) OF THE COMPOST WAS INSUFFICIENT. RHUBARB WAS PARTICULARLY SUITED TO COMPOST TREATMENT, DEVELOPING OUTSTANDING HARVESTS EVEN WHEN PLANTED IN IMMATURE COMPOST. THE AUTHOR RECOMMENDS SIMULTANEOUS APPLICATION OF A COMPLETE ACIDIFYING COMMERCIAL FERTILIZER TO GUARD AGAINST ANY NITROGEN ROBBING BY IMMATURE COMPOST AND THE DANGER OF OVER ALKALIZING WITH PLAIN COMPOST. (AUTH)

06-06-01994 MUSHROOMS, MICROBES, AND MALNUTRITION (COMPOSTING UTILIZATION-WASTE)
HAYES, A.
NEW SCIENTIST 44, P. 450-452 (NOVEMBER 27, 1969). MASS CULTIVATION OF MUSHROOMS, A NEGLECTED SOURCE OF HIGH QUALITY PROTEIN, COULD HELP TO SOLVE PROBLEMS OF MALNUTRITION IN THE DEVELOPING COUNTRIES. RECENT RESEARCH HAS HIGHLIGHTED THE IMPORTANCE OF BACTERIA IN TRIGGERING THE FORMATION OF MUSHROOMS. ALSO, A FREELY AVAILABLE SUPPLY OF SUBSTRATES WOULD BE NECESSARY. LIGNIN, CELLULOSE, AND HEMI-CELLULOSE ARE THE MAIN NUTRIENTS REQUIRED FOR GROWTH - THESE ARE THE MAIN COMPONENTS OF MANY INDUSTRIAL, URBAN, AND AGRICULTURAL SOLID WASTES.

06 07 ANALYSIS OF COMPOST

06-07-00339 ANALYSIS AND EVALUATION OF THE QUALITY OF REFUSE COMPOST (COMPOST(PROPERTIES) ANALYSIS SAMPLING TESTING)
DE GROOTE, R.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 3, (OCTOBER 1957). ANALYSIS AND EVALUATION OF REFUSE COMPOST IS BROKEN DOWN INTO THE FOLLOWING CATEGORIES- SAMPLING, CHEMICAL ANALYSIS, PHYSICAL ANALYSIS, MICROBIOLOGICAL ANALYSIS, PHOTOPHYSIOLOGICAL TESTS, AND INTERPRETATION OF THE RESULTS. EACH ITEM IS DESCRIBED IN DETAIL. (UC)

06-07-00347 THE DETERMINATION OF DOMESTIC COAL IN REFUSE COMPOST
GERRETSEN, F. C.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 5, (AUGUST 1958). THE CONTENT OF MORE OR LESS BURNED HOUSEHOLD COAL IN REFUSE COMPOST VARIES FROM ABOUT 6 PERCENT TO 30 PERCENT, DEPENDING UPON THE TIME OF THE YEAR IN WHICH THE RAW MATERIAL WAS COLLECTED. SUCH COAL RESIDUES SHOULD NOT BE INCLUDED WITH ORGANIC SUBSTANCES USEFUL TO AGRICULTURE. TWO METHODS ARE GIVEN FOR DETERMINING THE COAL CONTENT - IN THE FIRST METHOD THE DECOMPOSABLE ORGANIC SUBSTANCES (PROTEIN, HUMUS, LIGNIN, HEMICELLULOSE) ARE SEPARATED BY BOILING THE COMPOST IN DILUTE SULFURIC ACID AND HYDROGEN PEROXIDE. THE RESIDUE IS EXTRACTED WITH DILUTE SODIUM HYDROXIDE OR AMMONIUM HYDROXIDE. THE REMAINING CELLULOSE IS DISSOLVED IN SCHWEITZER'S REAGENT (AMMONIACAL SOLUTION OF CUPRIC HYDROXIDE). DOMESTIC COAL AND ASHES ARE LEFT AS RESIDUE. THE CARBON CONTENT OF THIS RESIDUE IS DETERMINED BY COMBUSTION. IN THE SECOND METHOD, THE DECOMPOSABLE ORGANIC SUBSTANCES ARE SEPARATED WITH THE USE OF THE SCHARRER-KUERSCHNER REAGENT (A MIXTURE OF TRICHLORACETIC ACID, ACETIC ACID, AND NITRIC ACID). PROTEIN, LIGNIN, HUMUS, AND MOST OF THE HEMICELLULOSES DISSOLVE IN THIS REAGENT OR BY HYDROLYSIS WITH DILUTED SULFURIC ACID. THE RESIDUES ARE ASH AND COAL. (UC)

06-07-00369 SIMPLE CONTROL TEST WHICH CAN BE MADE BY COMPOST PLANT OPERATIONS
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 9, (SEPTEMBER 1960) THE ARTICLE LISTS SEVERAL CONTROL TESTS. AMONG THEM ARE- 1. DETERMINATION OF HARD PARTICLES - THE REFUSE IS PUT THROUGH A SIEVE HAVING ROUND HOLES AND MESH SIZE OF 6.8 MM. THE MAXIMUM PERCENT OF PARTICLES LARGER THAN 6.8 MM WHICH MAY BE PRESENT IN COMPOST DESTINED FOR GARDENING USE IS GLASS - 0.05 PERCENT, CERAMICS - 0.10 PERCENT, COAL AND SLAG - 0.30 PERCENT, AND IRON - 0.05 PERCENT. 2. DETERMINATION OF MOISTURE CONTENT - THE MATERIAL IS DRIED AT 105 DEGREES C. SPECIAL ATTENTION SHOULD BE GIVEN TO THE METHOD OF SAMPLING.

06-07-00370 THE SIGNIFICANCE AND METHODS OF EVALUATION OF THE MATURITY OF REFUSE AND REFUSE-SLUDGE COMPOSTS
KELLER, P.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 10, (DECEMBER 1960). COMPOST IS CONSIDERED TO BE MATURE WHEN THE AVAILABLE CARBON HAS BEEN LARGELY CONSUMED AND THE DECOMPOSITION PROCEEDS ONLY VERY SLOWLY. BETTER RESULTS ARE OBTAINED IN AGRICULTURAL APPLICATIONS WITH THE USE OF MATURE COMPOST RATHER THAN WITH IMMATURE COMPOSTS OR RAW WASTES. THE ULTIMATE AIM OF COMPOST APPLICATION, VIZ., TO INCREASE THE HUMUS CONTENT OF SOIL, CAN BE ATTAINED ONLY WITH THE USE OF MATURE COMPOSTS. THE DEGREE OF MATURITY CAN BE DETERMINED BY RELYING ON THE PHYSICAL CHARACTERISTICS OF THE COMPOSTING MATERIAL, I.E., EARTHY ODOR, DARK COLOR, FLUFFY STRUCTURE, LOW SPECIFIC GRAVITY. CONCLUSIONS DEPENDENT SOLELY ON THESE CRITERIA CAN BE QUITE ERRONEOUS. COMPOST MAY BE JUDGED TO BE MATURE IF AFTER TURNING AND MOISTENING, IT NO LONGER SPONTANEOUSLY HEATS UP. THIS METHOD IS SIMPLE, PRACTICAL FOR COMPOST PLANTS, AND IS RELIABLE. DEGREE OF MATURITY MAY BE BASED ON CHEMICAL ANALYSIS. THE USE OF THE C TO N RATIO HAS ITS LIMITATIONS IN OPERATIONS INVOLVING URBAN WASTES, BUT IT CAN BE USED TO EVALUATE COMPOSTING OF HOMOGENEOUS MATERIALS. RELYING UPON NITRITE AND NITRATE TESTS CAN LEAD TO UNRELIABLE CONCLUSIONS. CELLULOSE CONTENT IS A GOOD INDEX AND IS THE BEST SUITED OF THE CHEMICAL TESTS. HUMUS CHEMISTRY IS NOT SUFFICIENTLY ADVANCED TO PERMIT ITS USE IN THE DETERMINATION OF DEGREE OF MATURITY OF COMPOST. BIOLOGICAL TESTS BASED UPON THE PRESENCE OF EARTHWORMS MAY BE VERY MISLEADING. MICROORGANISM COUNTS, CARBON DIOXIDE PRODUCTION, AND OXYGEN CONSUMPTION MAY GIVE COMPREHENSIVE INDICATIONS - THE LATTER TWO BEING OF GREATEST IMPORTANCE. PLANT GROWTH TESTS ARE SUBJECT TO APPRECIABLE ERRORS, AND SHOULD BE USED ONLY IN CONJUNCTION WITH OTHER TECHNIQUES. (UC)

06-07-00378 DETERMINATION OF MATURITY OF COMPOST
HORSTMANN, O.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 13, (DECEMBER 1961). DETERMINATIONS OF THE DEGREE OF MATURITY OF A COMPOST MAY BE BASED ON THE EXTERNAL CHARACTERISTICS OF THE COMPOST (COLOR, ODOR, AND STRUCTURE), THE DECOMPOSITION STATUS, PHYSICAL ANALYSIS, CHEMICAL ANALYSIS, BIOLOGICAL ANALYSIS, AND CROP TESTS. FACTORS OF IMPORTANCE IN THE CHEMICAL ANALYSIS ARE WEIGHT, VOLUME, PORE VOLUME, AND PARTICLE SIZE. IN THE PHYSICAL ANALYSIS THEY ARE C TO N RATIO, NITROGEN FRACTIONS, CELLULOSE CONTENT, READILY DECOMPOSABLE ORGANIC SUBSTANCES, AND HUMUS MATERIALS. IN THE BIOLOGICAL ANALYSIS THEY ARE RATIO OF CONSUMPTION OF OXYGEN TO THE PRODUCTION OF CARBON DIOXIDE, SELF-HEATING CAPACITY, NUMBER OF THERMOPHYLLIC AND MESOPHYLLIC BACTERIA, SHIFTING OF PH, INHIBITORY ACTION ON AZOTOBACTER, AND COUNT OF MICROORGANISMS.

06-07-00874 METHODS FOR THE EVALUATION OF COMPOSTS (ANALYSIS(COMPOST))
LENHARD, G.
COMPOST SCIENCE 4(1), P. 20-25 (SPRING 1963). A SOIL SCIENTIST PRESENTS HIS OBSERVATIONS ON THE NEED FOR STANDARDIZING COMPOST ANALYSIS. THERE HAS BEEN MUCH CONTROVERSY OVER THE QUESTION OF WHETHER ORGANIC, DOMESTIC WASTES SHOULD BE UTILIZED BY COMPOSTING. USE OF COMPOST MATERIAL HAS TO BE ASSESSED FOR ITS DIRECT AND INDIRECT EFFECT ON CROP PRODUCTION, SOIL FERTILITY, AND PRESERVATION. THE DEVELOPMENT OF SUITABLE PHYSICAL, CHEMICAL, AND BIOCHEMICAL METHODS IS A PREREQUISITE FOR EVALUATION. THE BASE EXCHANGE CAPACITY, HUMIC-ACID DETERMINATION, ANIONIC-ABSORPTION CAPACITY, EXTRACTION METHODS, DEHYDROGENASE ACTIVITY METHOD, STANDARDIZATION FOR THE DETERMINATION OF BIOCHEMICAL ACTIVITIES, AND STANDARDIZATION OF THE DEHYDROGENASE METHOD FOR THE DETERMINATION OF MINERAL NUTRIENT DEFICIENCIES IN COMPOST MIXTURES ARE DISCUSSED. THE AUTHOR HOPES THAT A BETTER UNDERSTANDING OF THE VALUE OF COMPOSTS WILL RESULT FROM PERFORMANCE OF THE TESTS DISCUSSED. (EI)

06-07-01511 AVAILABILITY OF NITROGEN IN COMPOSTS PREPARED FROM WASTE MATERIALS (FERTILIZER-VALUE)
BOULD, C.
EMPIRE J EXPTL AGR 16, P. 103-110 (1648). FOUR METHODS OF ESTIMATING AVAILABLE N ARE DESCRIBED, AND RESULTS GIVEN FOR SOME REPRESENTATIVE REFUSE AND STRAW COMPOSTS. RESULTS OF 2 FIELD EXPERIMENTS INDICATING THE EFFECT OF ORGANIC MANURE AND INORGANIC N IN VARIOUS FORMS ON THE GROWTH, YIELD, AND N STATUS OF 2 DIFFERENT CROPS ARE GIVEN. RESULTS OF AN EXPERIMENT TO TEST THE EFFECT ON THE GROWTH AND RECOVERY OF N, OF DECOMPOSITION OF STRAW-SLUDGE MIXTURES OUTSIDE AND WITHIN THE SOIL ARE DESCRIBED. (CA)

06-07-01974 PROBLEMS IN ANALYSIS OF REFUSE, COMPOST, AND SEWAGE SLUDGE (ANALYSIS(COMPOST) SAMPLING)
ROLLE, G.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 20, (MAY 1964). THE AUTHOR DISCUSSES THE PROBLEMS IN ANALYSIS OF REFUSE AND COMPOST AND DESCRIBES PROBLEMS IN SAMPLING THE MATERIALS. HE DISCUSSES THE NEED FOR THE USE OF VERY ACCURATE METHODS OF ANALYSIS, BUT POINTS OUT THAT THIS IS EXPENSIVE AND TIME CONSUMING, AND THAT THERE IS A PLACE FOR RAPID, LESS ACCURATE METHODS FOR PROCESS OPERATING CONTROL. HE ALSO DEFINES THE NEED FOR STANDARD SAMPLING METHODS AND ANALYTICAL METHODS.

06 08 PROPERTIES OF COMPOST

06-08-00335 WHAT IS A GOOD REFUSE COMPOST (COMPOSTING COMPOST(PROPERTIES))
WESTSTRATE, W. A. G.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 1, (NOVEMBER 1956). A GOOD COMPOST SHOULD DIRECTLY INCREASE THE PRODUCTIVITY OF THE SOIL DURING THE FIRST TWO YEARS, MAINTAIN THE SOIL IN A GOOD CONDITION, AND INCREASE THE FERTILITY OF THE SOIL OVER A LONG PERIOD. THE BENEFICIAL EFFECT DEPENDS UPON THE NATURE OF THE SOIL, OF THE CLIMATE, AND OF THE METHODS OF CULTIVATION. THE COMPOST SHOULD BE FREE OF IMPURITIES. WHILE THE IMPURITIES DO NOT HAVE A DIRECT INFLUENCE ON THE COMPOST AS A FERTILIZER, THEY DO MAKE THE PRODUCT LESS ATTRACTIVE AND SOMETIMES UNUSABLE. A TON OF COMPOST INTENDED FOR HORTICULTURAL USE SHOULD NOT CONTAIN MORE THAN 0.5 KG OF GLASS FRAGMENTS, NOT MORE THAN 0.5 KG OF CERAMIC (POTTERY) FRAGMENTS, AND NOT MORE THAN 5 KG OF COAL AND SLAG, AND NO IRON. IF USED FOR AGRICULTURE COMPOST, THE AMOUNTS OF THESE MATERIALS CAN BE 10 TIMES AS HIGH WITHOUT RENDERING THE PRODUCT UNUSABLE. (UC)

06-08-00336 THE EVALUATION OF THE ORGANIC MATTER IN HUMUS FERTILIZERS
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE. IRGR INFORMATION BULL 1, (NOVEMBER 1956). A COMMERCIAL HUMUS FERTILIZER SHOULD BE REQUIRED TO HAVE AT LEAST 25 PERCENT ACTIVE ORGANIC SUBSTANCE. (ACTIVE ORGANIC SUBSTANCE IS THE DIFFERENCE BETWEEN THE TOTAL ORGANIC SUBSTANCE AND THE INACTIVE SUBSTANCE, I.E., THE HUMUS CARBON.) TOTAL ORGANIC SUBSTANCE IS BASED ON LOSS ON COMBUSTION. SALTS WHICH VOLATILIZE DURING COMBUSTION SHOULD BE ELIMINATED FIRST. THE CONCENTRATION OF PURE ORGANIC SUBSTANCE IS DEFINED AS THE DIFFERENCE BETWEEN THE TOTAL LOSS FROM COMBUSTION AND THE CALCULATED AMOUNT OF SALTS. A DETAILED DESCRIPTION IS GIVEN OF A METHOD FOR THE DETERMINATION OF THE PERCENTAGE OF INACTIVE MATERIAL. (UC)

06-08-00838 NITROGEN REQUIREMENT OF SOME MUNICIPAL COMPOSTS (COMPOSTING)
FULLER, W. H. + BOSMA, S.
COMPOST SCIENCE 6(2), P. 26-32 (SUMMER 1965). ADDING NITROGEN TO MUNICIPAL REFUSE COMPOSTS DID NOT SPEED UP DECOMPOSITION PROCESS ONCE INITIAL BIOLOGICAL ACTIVITY HAD SUBSIDED. RESEARCH AT ARIZONA AGRICULTURAL EXPERIMENT STATION IS DISCUSSED. THREE COMPOST MATERIALS WERE STUDIED FROM TWO SEPARATE PLANTS, ONE IN SACRAMENTO, CALIFORNIA AND OTHER IN PHOENIX, ARIZONA. BOTH PLANTS USE DANO-TYPE COMPOST DIGESTER. COMPOST MATERIALS WERE SELECTED ON BASIS OF THEIR EXTENT OF MATURITY. (UC)

06-08-00890 RELATIONSHIP BETWEEN MOISTURE CONTENT AND ACTIVITY OF FINISHED COMPOST (COMPOSTING)
SCHULZE, K. L.
COMPOST SCIENCE 2(2), P. 32-34 (SUMMER 1961). TO MEASURE THE SMALL OXYGEN UPTAKE RATES OF FINISHED COMPOSTS WITH VARIOUS MOISTURE CONTENTS, THE WARBURG TECHNIQUE WAS USED. THE SMALL AMOUNTS OF FINELY GROUND SAMPLES USED HAD TO BE ACCURATELY MEASURED IN BOTH WEIGHT AND VOLUME. SPECIFIC GRAVITY WAS OBTAINED BY MEASURING VOLUME DISPLACEMENT OF 1 GM IN BENZYL ETHER, AND THIS VOLUME WAS DIRECTLY RELATED TO THE COMPOST MOISTURE CONTENT. OXYGEN UPTAKE VARIED FROM " NO MEASURABLE RATE " AT 11.2 PERCENT MOISTURE TO A MAXIMUM OF 0.756 MG/G OF VOLATILE MATTER/HR AT 60.4 PERCENT MOISTURE. THE RATE AT 19.6 PERCENT WATER WAS VERY LOW--0.015 MG/G/HR, THAT AT 70.1 PERCENT WATER WAS 0.712 MG/G/HR. THE RATES FOR " FINISHED " COMPOST WERE FOUND TO BE ABOUT 1/7 OF THE MAXIMUM RATE DURING ACTIVE COMPOSTING. MOISTURE CONTENTS OF COMPOST BELOW 20 PERCENT SHOULD PERMIT STORAGE OR SHIPMENT WITH LITTLE OR NO OXYGEN UTILIZATION. (PHEA)

06-08-01220 PRACTICAL EVALUATION OF GARBAGE COMPOST AS A FERTILIZER (FERTILIZER-VALUE COST(COMPOST))
LUGO-LOPEZ, M. A. + LANDRAU, P., JR.
J AGRIC UNIV, PUERTO RICO, 40, P. 110-117 (1956). COMMERCIAL GARBAGE COMPOST CONTAINED 36.4 PERCENT ORGANIC MATTER, 2.28 PERCENT N, 2.87 PERCENT PHOSPHATE, AND 4.71 PERCENT WATER SOLUBLE POTASH, APPROXIMATELY THE SAME COMPOSITION AS SUGAR FILTER-PRESS CAKE. IT IS UNECONOMIC TO USE GARBAGE COMPOST AS COMPARED WITH INORGANIC FERTILIZERS AND PRESS-CAKE. THE LATTER COSTS NOTHING. (CA)

06 09 HEALTH ASPECTS

06-09-00356 COMPOSTING FROM THE HYGIENIC VIEWPOINT (PATHOGEN)
KNOLL, K. H.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 7, (JULY 1959). THE AUTHOR CONCLUDES THAT HYGIENIC REQUIREMENTS ARE LARGELY FULFILLED BY THE REGULATED COMPOSTING OF REFUSE AND SLUDGE. THE BIOLOGICAL SELF-PURIFICATION PROCESSES ARE CARRIED OUT BY COMPOSTING. THEY ELIMINATE THE HAZARDOUS CHARACTERISTICS OF WASTES. IT MAY BE POSSIBLE TO MEET SIMULTANEOUSLY THE REQUIREMENTS OF THE HYGIENISTS, TECHNICIANS, AND FARMERS BY REGULATING THE TEMPERATURE AND MOISTURE CONTENT OF THE WASTES TO BE TREATED. (UC)

06-09-00391 HYGIENIC CRITERIA OF THE EVALUATION OF REFUSE COMPOST
PARRAKOVA, E.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 16, (DECEMBER 1962). EMPHASIS IS PLACED ON THE COLI TITER. THE DESTRUCTION OF COLIFORM BACTERIA PERMITS THE ASSUMPTION THAT THE LESS RESISTANT PATHOGENIC BACTERIA ARE ALSO DESTROYED. IN ADDITION TO THE COLI TITER, A TITRATION FOR CLOSTRIDIUM PERFRINGENS, FOR MESOPHYLLIC BACTERIA, FOR MOLD FUNGI, AND FOR ACTINOMYCETES SHOULD BE MADE. AN UNOBJECTIONABLE PRODUCTION SHOULD HAVE AN AMMONIA CONTENT LESS THAN 1 PERCENT TO 2 PERCENT OF THE TOTAL CONTENT OF NITROGEN AND A CORRESPONDING COLI TITER OF LESS THAN 0.01. (UC)

06-09-00448 THE INFLUENCE OF VARIOUS COMPOSTING PROCESSES NON SPOREFORMING PATHOGENIC BACTERIA (PATHOGEN)
KNOLL, K. H.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEATH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 19, (DECEMBER 1963). THE REMOVAL OF RESIDENTIAL REFUSE IS PRIMARILY A HYGIENIC TASK AND OBLIGATION. THE TRAGIC SITUATION IN ZERMATT (TYPHOID EPIDEMIC IN WINTER OF 1962-63) HAS CONTRIBUTED GREATLY TO THE FACT THAT THIS TASK IS NOW TAKEN SERIOUSLY BY THOSE WHO, TILL NOW HAD LITTLE TO DO WITH THE MATTER. IT MAY SEEM IRONICAL THAT SUCH TRAGEDY, CAUSED BY INSANITARY REFUSE DISPOSAL, OCCURRED IN A COUNTRY WHICH HAS EARNED MUCH CREDIT IN REFUSE DISPOSAL AND HAS BEEN TO US IN GERMANY, THE EXAMPLE OF REGULATED REFUSE HANDLING PRACTICES. WE DO NOT WISH TO GLOSS OVER THE ZERMATT SITUATION, BUT WE CANNOT CLAIM THAT SUCH AN EXTENSIVE EPIDEMIC IS IMPOSSIBLE IN GERMANY. THESE SHORT-CUTS IN REFUSE DISPOSAL MAY OCCUR ANYWHERE AT ANY TIME TODAY, EVEN WHERE REFUSE DISPOSAL IS CONDUCTED WITH A SERIOUSNESS SUITABLE TO A BASIC SANITATION PROGRAM. A CLEAR CHALLENGE FOR THE DECONTAMINATION AND DISINFECTION OF WASTES FROM HUMAN HOUSEHOLDS RESULTED FROM THIS EPIDEMIC. IT MUST BE EMPHASIZED THAT IT IS NOT ONLY THE REFUSE THAT POSES A HYGIENIC PROBLEM. IF SUCH WERE TRUE, THEN WE COULD SOLVE THE CASE BY STERILIZATION AND VOLUME REDUCTION BY INCINERATION. HOWEVER, THE PROBLEM ALSO EXISTS WITH SEWAGE SLUDGE. IN SEWAGE, AND CONSEQUENTLY SEWAGE SLUDGE, WE FIND THOSE PATHOGENS WHICH CAN CAUSE A LARGE EPIDEMIC, AS CLEARLY SHOWN IN ZERMATT. SLUDGE MUST THEREFORE BE CLASSED AS A MOST IMPORTANT FACTOR, AND WE MUST BE CAREFUL IN OUR DISCUSSION TO SPEAK ONLY OF REFUSE ELIMINATION OR UTILIZATION. BUT REFUSE PROVIDES AN IDEAL WAY FOR US TO SOLVE THE SLUDGE DECONTAMINATION PROBLEM BY THE COMBINED COMPOSTING OF REFUSE AND SLUDGE. THIS METHOD NOT ONLY MEETS ALL HYGIENIC REQUIREMENTS, BUT ENABLES BROAD CONSIDERATION OF THE INDIVIDUAL INTERESTS OF ALL PARTICIPANTS. BY WHAT MANNER CAN THE PATHOGENIC BACTERIA, ENTERING IN SLUDGE WITH THE REFUSE AS RAW COMPOSTING MATERIAL, BE RENDERED AVIRULENT, WEAKER, OR BE ELIMINATED; AND WHEN ARE THE SANITARY REQUIREMENTS OF A COMPOSTED PRODUCT FULFILLED, IS DISCUSSED

06-09-00449 PLANT PATHOLOGY PROBLEMS IN REFUSE COMPOSTING (PATHOGEN(PLANT))
MARTIN, P.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 19, (DECEMBER 1963). DISEASE ORGANISMS OF CULTURED PLANTS CAN ENTER THE REFUSE WITH VEGETABLE AND POTATO WASTES FROM THE KITCHEN, OR WITH GARDEN WASTES. IN VIEW OF A POSSIBLE SPREAD OF SUCH GERMS BY REFUSE COMPOST, IT IS IMPORTANT TO STUDY THE INFLUENCE OF COMPOSTING ON THESE BACTERIA AND TO KNOW WHAT COMPOSTING PROCESSES ASSURE COMPLETE DESTRUCTION OF THE PATHOGENS. NOT ONLY IS SURVIVAL DURATION OF PLANT PATHOGENS OF IMPORTANCE, BUT ALSO THE EXTENT THAT REFUSE COMPOST ACTS TO HINDER OR TO HELP DISEASE GERMS IN THE SOIL. ONE MUST ALSO ASK IF THE DISEASE TENDENCY IN THE CROP PLANTS IS INFLUENCED BY THE APPLICATION OF REFUSE COMPOST. A SPECIAL DANGER IN THE USE OF REFUSE COMPOST IS FORMED BY THOSE DISEASE GERMS WHICH COULD PERMANENTLY CONTAMINATE THE SOIL. IN REPEATED PLANTINGS OF A SUSCEPTIBLE CROP, A HEAVY INCREASE OF THE PARTICULAR DISEASE ORGANISM COULD OCCUR. ONE SPEAKS IN THIS CASE, OF A SUCCESSIVE CROP DISEASE. IN RELATION TO SUCH DISEASES, SPECIAL ATTENTION MUST BE FOCUSED UPON ALL VEGETABLES AND POTATOES BECAUSE SCRAPS FROM THESE PLANTS ARE FREQUENTLY FOUND IN REFUSE. THE MOST IMPORTANT DISEASE ORGANISMS ARE LISTED AND THEIR POSSIBLE SIGNIFICANCE BRIEFLY DESCRIBED. IF EXPERIMENTAL RESULTS ARE AVAILABLE, THEY ARE LISTED.

06-09-00451 EXPERIMENTS ON THE EFFECT OF VARIOUS ADDITIVES ON WINDROW COMPOSTING OF REFUSE AND SLUDGE (PATHOGEN)
FARKASDI, G.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 19, (DECEMBER 1963). THE USE OF ADDITIVES DID NOT SHOW ANY HYGIENIC ADVANTAGES. THE DESTRUCTION OF PATHOGENIC ORGANISMS OCCURRED IN EQUAL TIME SPANS FOR TREATED AND UNTREATED PILES. THE INCREASED COSTS AND LABOR (OF THEIR USE) WOULD NOT BE JUSTIFIED. THIS CONCLUSION DOES NOT INCLUDE THE POSSIBLE USE OF NUTRIENTS OR ADDITIVES IN THE COMPOSTING OF SPECIALIZED COMMERCIAL AND INDUSTRIAL REFUSE THAT IS LOW IN MICROORGANISMS, OR THE INOCULATION OF RAW COMPOST WITH FINISHED COMPOST AS HAS BEEN DONE SUCCESSFULLY IN SEVERAL PLANTS.

06-09-00453 REQUIREMENTS OF VETERINARY HYGIENE IN THE REMOVAL OF URBAN REFUSE (PATHOGEN PATHOGEN(ANIMAL) PATHOGEN)
STRAUCH, D.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 20, (MAY 1964). COMPOSTING WILL BE INCREASINGLY USED IN THE FUTURE FOR PROCESSING URBAN REFUSE. SUCH REFUSE CONTAINS GERMS PATHOGENIC TO MAN AND ANIMALS WHICH ARE NOT DESTROYED THROUGH PHYSICAL TREATMENT. WHEN COMPOST FROM SUCH INFECTIOUS MATERIALS IS USED IN AGRICULTURE AND FORESTRY, THERE EXISTS A DANGER OF INFECTION FOR AGRICULTURAL WORKERS AND WILDLIFE. OUR OWN EXPERIMENTS SHOWED THAT IT IS POSSIBLE TO DECONTAMINATE URBAN REFUSE BY COMPOSTING THROUGH ADHERENCE TO CERTAIN REQUIREMENTS SO THAT SUCH COMPOST MAY BE USED WITHOUT DANGER IN AGRICULTURE AND FORESTRY. WITH THE INCREASING USE OF SUCH PRODUCTS FROM URBAN REFUSE IN AGRICULTURE, IT IS JUSTIFIABLE AND NECESSARY FOR VETERINARY AUTHORITIES TO EXAMINE THE COMPOST PLANTS WHENEVER DISEASE OUTBREAKS OF SUCH TYPE ARE SUSPECTED. IT WOULD ALSO BE ADVISABLE FOR THE AUTHORITIES TO MAKE THE LICENSING OF COMPOSTING PLANTS DEPENDENT ON AN EXAMINATION OF THE COMPOSTING OPERATION BY A VETERINARY HYGIENIST, SINCE ONLY SUCH AN EXAMINATION CAN DETERMINE THE HYGIENIC SAFETY OF A COMPOST. IT IS FURTHER SUGGESTED THAT SUITABLE GUIDELINES BE ESTABLISHED FOR THE HYGIENIC EXAMINATION OF COMPOSTS BY COORDINATION OF PUBLIC HEALTH AND VETERINARY AUTHORITIES.

06-09-00739 SANITARY ASPECTS OF COMPOSTED SEWAGE SLUDGE AND SAWDUST (COMPOSTING PATHOGEN SLUDGE(SEWAGE))
REEVES, J. B.
SEWAGE INDUS WASTES 31(5), P. 557-564 (MAY 1959). THE EASE WITH WHICH MEMBERS OF THE SALMONELLA AND SHIGELLA GENERA WERE ISOLATED IS PRESUMPTIVE EVIDENCE OF THE DANGERS INVOLVED IN THE POSSIBLE DISSEMINATION OF DISEASE THROUGH THE USE OF COMPOSTED SEWAGE SLUDGE AS A HUMUS. IN THIS STUDY, 61 STRAINS OF THE GENUS SHIGELLA WERE ISOLATED IN AIR DRIED SLUDGE AND HARDWOOD SAWDUST COMPOST. NO APPARENT EFFECTS OF MOISTURE CONTENT, AMBIENT TEMPERATURE, TOTAL PLATE COUNT, AND COLIFORM DENSITY WERE OBTAINABLE UNDER THE TIME LIMIT IMPOSED. HOWEVER, THESE PRELIMINARY STUDIES FORMED THE BASIS FOR CONTINUING MORE DETAILED WORK TO DETERMINE IF A PRACTICAL AND ECONOMICAL METHOD OF CONTROL CAN BE OBTAINED.

06-09-00747 PATHOGEN SURVIVAL IN COMPOSTING MUNICIPAL WASTES
WILEY, J. S.
J WATER POLLUTION CONT FED 24(1), P. 80-90 (JANUARY 1962). A REVIEW OF THE LITERATURE ON PATHOGEN SURVIVAL IN THE COMPOSTING OF VARIOUS MUNICIPAL WASTES. (AUTH)

06-09-01160 PUBLIC HEALTH AND REFUSE DISPOSAL (PATHOGEN COMPOSTING)
KNOLL, K. H.
COMPOST SCIENCE 2(1), P. 35-40 (SPRING 1961). A EUROPEAN SCIENTIST PRESENTS HIS FINDINGS ON RESEARCH INTO THE EFFECT OF COMPOSTING ON PATHOGENS COMMONLY OCCURING IN REFUSE AND SEWAGE SLUDGE. (PHEA)

06-09-01280 HYGIENIC ASSESSMENT OF WASTE DECONTAMINATION AT A BIO-ENERGETIC STATION (HEALTH PATHOGEN)
KHMALADZE, A. G. + CHILINGAROVA, S. V., + GABELAYA, M. I. + KANDELAKI, N. V.
HYG AND SANIT, MOSCOW, 28(8), P. 19-23 (1963). THE AUTHORS ASSESS THE HYGIENIC ASPECTS OF A METHOD OF TREATING ORGANIC WASTES, SUCH AS FARM WASTES AND REFUSE (LITTER STRAW, VARIOUS VEGETABLE RESIDUES, AND MANURE), TO PRODUCE A FERTILIZER BY MEANS OF METHANE FERMENTATION. RESULTS OF BACTERIOLOGICAL AND HELMINTHOLOGICAL ANALYSES SHOW THAT THERE IS A DEFINITE DECREASE IN THE NUMBER OF VIABLE HELMINTH EGGS AND AN INCREASE IN COLIFORM NUMBERS DURING METHANE FERMENTATION IN THE OPTIMUM MESOPHYLLIC TEMPERATURE RANGE OF 32-34 DEGREES C. HOWEVER, SINCE THIS METHOD DOES NOT PRODUCE A COMPLETELY DECONTAMINATED FERTILIZER, THE AUTHORS SUGGEST THAT A SERIES OF APPROPRIATE SANITARY MEASURES BE CARRIED OUT. (WPA)

06-09-01373 COMPOSTING AND THE SURVIVAL OF TYPHOID, PARATYPHOID, ENTERITIS AND DYSENTERY BACTERIA (PATHOGEN)
BAETGEN, D.
DIE KOMPOSIERUNG UND DAS ABSTERBEN PATHOGENER BAKTERIEN DER TPE-UND RUHRGRUPPE, STAEDTEHYGIENE 12(5), P. 81-85 (MAY 1962). BULL OF HYGIENE 37, P. 927 (SEPTEMBER 1962). THE REPORT IS INTRODUCED BY SOME ACCOUNT OF THE MODERN PROBLEMS OF RUBBISH AND REFUSE DISPOSAL AND OF SOME OF THE METHODS WHICH HAVE BEEN DEVISED FOR THIS PURPOSE. THE EXPERIMENTS CONSISTED IN THE STUDY OF THE SURVIVAL OF CULTIVATED TYPHOID, PARATYPHOID B, ENTERITIS (TPE), AND DYSENTERY ORGANISMS IN COMPOSTS OF DIFFERENT TYPES UNDER VARYING CONDITIONS. THE DATA OBTAINED ARE SET OUT IN A FEW TABLES. IT WAS FOUND THAT IN COMPOSTED RUBBISH CONTAINING 25 PERCENT OR MORE OF KITCHEN REFUSE, THE ADDED BACTERIA DIED OUT IN 1-3 DAYS IF THE TEMPERATURE HAD RISEN TO ABOVE 60 DEGREES C. THE COMPOSTING PROCESS IS, HOWEVER, ADVERSELY AFFECTED BY LOW ATMOSPHERIC TEMPERATURE, BY LONG PERIODS OF RAINFALL, AND BY MUCH ASH IN THE COMPOST HEAP. AT THE LOWER TEMPERATURES IN UNSATISFACTORY COMPOSTING, BACTERIA MAY SURVIVE FOR A MUCH LONGER PERIOD THAN A FEW DAYS. HENCE IT IS CONSIDERED THAT FERMENTATION IN A COMPOST SHOULD CONTINUE FOR A PERIOD OF 1 TO 3 MONTHS ACCORDING TO THE SEASON TO ENSURE THE DESTRUCTION OF ALL PATHOGENIC ORGANISMS. (PHEA)

06-09-01400 COMPOSTING CONTROLS FLIES (VECTORS PEST AGRICULTURAL WASTE)
HARTMAN, R. C.
PACIFIC POULTRYMAN, (FEBRUARY 1963). THE PROHOROFF RANCH AT SAN MARCOS, CALIFORNIA, IS ONE OF CALIFORNIA'S LARGEST EGG PRODUCING UNITS. IT HAS BEEN SITUATED IN ONE LOCATION FOR SOME YEARS. THE OPERATION HAS NO FLY PROBLEM DUE TO A PROGRAM OF COMPOSTING THE DROPPINGS. FROM 70 PERCENT TO 75 PERCENT OF THE COMPOSTING TAKES PLACE BENEATH THE CAGES. THE PROCESS BEGUN UNDER THE CAGES IS COMPLETED WITHIN FOUR TO FIVE WEEKS AFTER THE MANURE IS REMOVED AND STACKED OUTSIDE THE BIRD SHELTERS. REMOVAL OF THE MANURE FROM THE EGG ROOMS IS A TWICE A YEAR TASK. AT THESE TIMES THE MANURE IS CARTED TO A SELECTED AREA AND THERE IS STACKED INTO A MOUND 3 TO 4 FEET HIGH. NOT ALL OF THE MANURE IS REMOVED FROM THE SHELTERS, HOWEVER. THE LOWERMOST SIX-INCH LAYER OF MANURE IS LEFT IN THE SHELTER. IT IS LOOSENED AND LEVELED TO

FORM A PAD ABOUT SIX INCHES HIGH. LEAVING THIS LAYER IS CONSIDERED TO BE THE MORE IMPORTANT ASPECT OF THE PROGRAM. THE COMPOSTED MANURE PAD IS FAIRLY DRY, AND THEREFORE CAN ABSORB EXCESS MOISTURE FROM THE DROPPINGS. THE PAD IS SUFFICIENTLY BROKEN UP TO PERMIT AEROBIC CONDITIONS. THE DROPPINGS ARE DUMPED IN AN AREA TO FORM A MOUND ABOUT 3 TO 4 FEET HIGH. PRCHOROFF ESTIMATES THAT IF HE FOLLOWED A WEEKLY CLEANSING PROGRAM, HIS COSTS WOULD BE FROM $60,000 TO $70,000 A YEAR. AS A RESULT OF COMPOSTING, HE HAS AN EASY-TO-HANDLE ORGANIC FERTILIZER, THE SALE OF WHICH RETURNS ENOUGH MONEY TO COVER HIS COSTS, OVERHEAD, AND MAINTENANCE OF EQUIPMENT TO HANDLE THE MANURE. (UC)

06-09-01430 SURVIVAL OF BACTERIA OF THE TPE (TYPHOID-PARATYPHOID) AND DYSENTERY GROUPS IN COMPOSTED CITY AND ABATTOIR REFUSE (PATHOGEN)
BAETGEN, D.
ARCH HYG, BERLIN, 146, P. 292-320 (1962). BULL HYG, LONDON, 38, P. 11 (1963). THE RESULTS ARE GIVEN OF EXPERIMENTS ON THE EFFECT OF VARIOUS FACTORS ON THE DISTRIBUTION OF PATHOGENIC BACTERIA IN COMPOSTS. IT WAS FOUND THAT BACTERIA OF THE TYPHOID-PARATYPHOID GROUP ARE MOSTLY KILLED IN 1-3 DAYS IF THE TEMPERATURE IN THE COMPOST IS OVER 60 DEGREES C, AND THE COMPOST CAN BE CONSIDERED HYGIENICALLY SAFE AFTER 2-3 MONTHS. THE COMPOSTING PROCESS IS RETARDED BY LOW AIR TEMPERATURES DURING WINTER AND SPRING, TOO MUCH OR TOO LITTLE MOISTURE, TOO MUCH ASH IN THE GARBAGE, OR TOO LITTLE ORGANIC MATTER. (WPA)

06-09-01476 THE REQUIREMENTS OF HYGIENE IN THE DISPOSAL OF TOWN WASTES (PATHOGEN COMPOSTING ODOR INSECT VECTOR)
KNOLL, K. H.
STAEDTEHYGIENE 12, P. 95-99 (1961). THE AUTHOR DISCUSSES THE HYGIENIC PROBLEMS OF DISPOSAL OF THE VARIOUS KINDS OF TOWN WASTE MATERIALS AND CONCLUDES THAT THE MAIN PROBLEM IS THE DISPOSAL OF SOLID WASTES, ESPECIALLY REFUSE AND SETTLED SLUDGE. A TABLE IS GIVEN SHOWING THE VIABILITY OF VARIOUS PATHOGENIC BACTERIA IN SEWAGE, SOIL AND REFUSE. THE ADVANTAGES OF COMPOSTING REFUSE AND SLUDGE FOR AGRICULTURAL USE AND THE CONDITIONS IN WHICH THIS METHOD CAN BE USED ARE CONSIDERED. EXPERIMENTS ARE DESCRIBED IN WHICH THE EFFECT OF COMPOSTING ON THE CONTENT OF PATHOGENIC BACTERIA IN MIXED SEWAGE AND REFUSE WAS EXAMINED. PATHOGENIC BACTERIA WERE INTRODUCED INTO COMPOST HEAPS IN GLASS AMPOULES OR IN THE COMPOSTING MATERIAL. THE RESULTS SHOWED A DISAPPEARANCE OF THE BACTERIA AT ALL LEVELS IN THE HEAPS. THIS IS ASCRIBED NOT ONLY TO THE HEAT DEVELOPED BUT TO THE FORMATION OF ANTIBIOTICALLY-ACTIVE SUBSTANCES. EVEN SPORE-FORMERS WERE DESTROYED. NO NUISANCE FROM ODOR OR INSECTS WAS EXPERIENCED. (WPA)

06-09-01479 COMPOSTING OF HOUSEHOLD GARBAGE WITH SPECIAL REFERENCE TO HYGIENIC ASPECTS (HEALTH)
OESTERLE, P. + ROHDE, G. + RUDAT, K.
STAEDTEHYGIENE 14, P. 26-30 (1963). THE AUTHORS REVIEW THE PROCESS KNOWN AS " NATURAL COMPOSTING " WITH PARTICULAR REFERENCE TO ITS HYGIENIC ASPECTS. THIS PROCESS IS NOW WIDELY USED IN GERMANY. (WPA)

06-09-01687 A SURVEY OF THE PATHOGENIC ORGANISMS AND HELMINTHIC OVA IN COMPOSTS AND SEWAGE SLUDGE (HEALTH SLUDGE(SEWAGE))
KRIGE, P. R.
J PROC INST SEW PURIF, PART III, P. 215-220 (1964). TABULATED RESULTS ARE GIVEN SUMMARIZING RESEARCH CARRIED OUT BY THE SOUTH AFRICAN COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH ON THE SURVIVAL OF PATHOGENIC ORGANISMS AND HELMINTH OVA IN SEWAGE SLUDGE AND COMPOSTS. THE METHODS OF EXAMINATION USED ARE INDICATED. ANALYSIS OF MATURED COMPOST FROM VARIOUS MUNICIPALITIES IN SOUTH AFRICA SHOWED THAT THERE WAS NO DIRECT RELATION BETWEEN THE SURVIVAL OF ESCH. COLI AND THE SURVIVAL OF ASCARIS OVA. IN AEROBIC SYSTEMS, SUCH AS THE MECHANICAL COMPOSTING PLANT OPERATED EXPERIMENTALLY BY C.S.I.R., THE NUMBERS OF ESCH. COLI WERE HIGHER THAN IN ANAEROBIC SYSTEMS. WITH PROPER OPERATION AND THE CORRECT PERIOD OF MATURATION, THE C.S.I.R. MECHANICAL PLANT PRODUCED A COMPOST CONSISTENTLY FREE FROM ASCARIS OVA, AND POLIOMYELITIS VIRUS WAS ELIMINATED IN THE STABILIZATION PLANT WHILE THE MATERIALS WERE PASSING THROUGH THE DRUM. FROM THE RESULTS, IT IS CONCLUDED THAT COMPOST PRODUCED FROM SEWAGE SLUDGE UNDER CONTROLLED CONDITIONS DOES NOT CONSTITUTE A DANGER TO HEALTH. (WPA)

06-09-01865 THE ACTIVITIES OF THE STATE INSTITUTE OF HYGIENE IN THE YEAR 1961 (HEALTH COMPOSTING POLLUTION(WATER))
BUDAPEST (1962). THE WORK OF THE HUNGARIAN STATE INSTITUTE OF HYGIENE DURING 1961 IS REVIEWED, WITH LISTS OF THE RESEARCH PROJECTS OF THE VARIOUS GROUPS, NAMELY MICROBIOLOGY (INCLUDING THE SEROLOGICAL TYPING OF ENTERIC COLI BACTERIA FROM WATER AND STUDIES ON ENTERIC VIRUSES FROM WATER AND SEWAGE) IMMUNOLOGY AND SEROLOGY, EPIDEMIOLOGY (INCLUDING ENTERITIS EPIDEMICS CAUSED BY DRINKING WATER, EPIDEMIC HEPATITIS, AND THE EFFECT OF THE HIGH CONCENTRATION OF NITRATE IN DRINKING WATER ON INFANTILE DISEASES), COMMUNAL HYGIENE, PHYSIOLOGY, AND DRUG CONTROL. THE WORK OF THE GROUP ON COMMUNAL HYGIENE HAS INCLUDED STUDIES ON HYGIENIC PROBLEMS IN THE DEVELOPMENT OF WATER-SUPPLY AND GARBAGE-DISPOSAL (INCLUDING COMPOSTING) SYSTEMS FOR BUDAPEST; IMPROVEMENT OF HYGIENIC CONDITIONS IN VILLAGES; EXAMINATION OF WATER (INCLUDING CLASSIFICATION OF SURFACE WATERS FOR SEWAGE DISPOSAL, MINERAL AND MEDICINAL CHARACTERISTICS OF HUNGARIAN WATERS, BIOLOGICAL, CHEMICAL AND BACTERIOLOGICAL EXAMINATION OF WATER IN LAKE VELENCE, FACTORS AFFECTING THE QUALITY OF STORED WATER, TRACE ELEMENTS IN NATURAL WATERS, AND NEW METHODS FOR WATER ANALYSIS INCLUDING AN INDIRECT METHOD FOR THE DETERMINATION OF SULPHATE), STUDIES ON SEWAGE DISPOSAL (INCLUDING THE AREA OF CONTAMINATION ROUND DOMESTIC SUB-SOIL DISPOSAL SYSTEMS, REGULATIONS CONTROLLING IRRIGATION WITH SEWAGE, CHEMICAL, BACTERIOLOGICAL, AND BIOLOGICAL EXAMINATION OF ACTIVATED-SLUDGE PLANTS, TREATMENT OF SEWAGE AND TRADE WASTE WATERS WITH OZONE, AND THE USE OF ALGAL CULTURES IN SEWAGE TREATMENT) AND RADIOLOGICAL INVESTIGATIONS (INCLUDING STUDIES ON RADIOACTIVITY IN RAINFALL, SURFACE AND GROUND WATER, AND AQUATIC FLORA AND FAUNA, PREVENTION OF CONTAMINATION BY NUCLEAR REACTORS AND LABORATORIES USING RADIOACTIVE ISOTOPES, TREATMENT OF WASTE WATERS FROM THE PROCESSING OF URANIUM ORE, AND USE OF A HUNGARIAN PREPARATION OF ACTIVATED BENTONITE FOR THE REMOVAL OF RADIOACTIVITY FROM CONTAMINATED LIQUIDS). (WPA)

06 10 MULCHING

06-10-00867 AGRICULTURAL USES FOR HARDBOARD PLUGS (COMPOSTING MULCH)
TOTH, S. J.
COMPOST SCIENCE 5(2), P. 24-28 (SUMMER 1964). EFFECTIVENESS OF HARDBOARD INDUSTRY WASTES AS MULCHING MATERIAL FOR VARIOUS CROPS WAS STUDIED AT RUTGERS UNIVERSITY. ATTEMPTS WERE MADE TO PREPARE SATISFACTORY COMPOST FROM HARDBOARD PLUGS, WHEAT STRAW, PEAT MOSS, AND COMPOSTED HARDBOARD PLUGS TO DETERMINE VALUE OF PLUGS AS MULCH. RESULTS OF STUDY ARE DESCRIBED. (EI)

06 11 USE ON AGRICULTURAL WASTES

06-11-00329 HUMUS FERTILIZERS FROM VEGETABLE RAW MATERIALS (COMPOSTING)
SPINDLER, H.
PATENT GER. 1,071,103 (DECEMBER 17, 1969)(Cl. 16). STRAW IS TREATED WITH DILUTED NITRIC ACID, NEUTRALIZED AT 100 DEGREES, AND CONVERTED TO COMPOST WITH MICROORGANISMS. THUS, 100 KG. DRY STRAW WAS STEEPED IN 1000 KG. NITRIC ACID (112 G/L) FOR 24 HOURS. THE WET STRAW CONTAINED 45 PERCENT (BASED ON THE AMOUNT OF DRY WEIGHT) DILUTED NITRIC ACID. DRY STRAW (200 KG.) WAS BOILED WITH A SOLUTION OF 40 KG. POTASSIUM HYDROXIDE, AND THE PRODUCT WAS MIXED AT 100 DEGREES WITH THE NITRIC ACID-TREATED WET STRAW. FINALLY, 60 KG. ORTHO AMMONIUM PHOSPHATE WAS ADDED. THE PRODUCT WAS CONVERTED TO COMPOST IN A CONVENTIONAL WAY. (CA)

06-11-00875 WHEY AND WOOD BARK WASTES MAKE FERTILE COMPOST
MIDGLEY, A. R.
COMPOST SCIENCE 4(1), P. 29-31 (SPRING 1963). ADVANTAGES OF PUTTING THESE 2 BYPRODUCTS TOGETHER TO PRODUCE " GOOD PRODUCT " RATHER THAN PRODUCE 2 " BYPRODUCT PROBLEMS " ARE DISCUSSED. (EI)

06-11-00887 COFFEE WASTES ARE VALUABLE (COMPOSTING FERTILIZER-VALUE)
XABREGAS, J.
COMPOST SCIENCE 2(2), P. 44 (SUMMER 1961). ACCORDING TO TESTS IN ANGOLA, 80 TONS OF COFFEE HULLS, POTENTIALLY VALUABLE AS FERTILIZER WHEN COMPOSTED ARE PRODUCED WITH EACH 100 TONS OF COMMERCIAL COFFEE. COST COMPARISON OF COFFEE HULLS WITH NITROGEN, PHOSPHORUS AND POTASSIUM EQUIVALENT IN CHEMICAL FERTILIZERS. TRANSLATION FROM PORTUGUESE OF ORIGINAL ARTICLE APPEARING IN AGRICULTURAL J OF ANGOLA. (EI)

06-11-01090 FOOD PRODUCTION EFFLUENTS - CASE FOR COMPOSTING
DICKINSON, D.
COMPOST SCIENCE 4(3), P. 14-15 (AUTUMN 1963). THE AUTHOR GENERALIZES ABOUT THE DISPOSAL OF FOOD-PROCESSING WASTE SOLIDS, SLUDGES, AND HIGH BOD EFFLUENTS. HE PREFERS DISCHARGE OF LIQUID WASTES TO CENTRALIZED MUNICIPAL WASTEWATER TREATMENT PLANTS AFTER SCREENING WITH AS FINE A SCREEN AS PRACTICAL. SLUDGES FROM INDUSTRIAL SEDIMENTATION PLANTS MUST BE HANDLED RAPIDLY TO PREVENT EXCESSIVE ACID FORMATION, BUT THEY THEN PRESENT UNSOLVED DISPOSAL PROBLEMS. THEY ARE NOT USUALLY AMENABLE TO ORDINARY SLUDGE DIGESTION WITHOUT CHEMICAL TREATMENT TO PRODUCE A BALANCED COMPOSITION. THE AUTHOR FAVORS A CENTRALIZED DISPOSAL SYSTEM USING ONE OF THE MECHANICAL ACCELERATED COMPOSTING PROCESSES FOR SLUDGE TREATMENT. SOLIDS MAY POSSIBLY BE REMOVED BY OTHER THAN NORMAL SEDIMENTATION WITH VIBRATORY SCREENS OR WEDGE-WIRE FILTER BEDS. FOR FOOD-PROCESSING PLANTS IN RURAL AREAS, DISPOSAL BY SPRAY IRRIGATION APPEARS TO BE THE CHEAPEST SATISFACTORY METHOD. (PHS)

06-11-01489 COMPOSTING FARM AND GARDEN WASTES (DIGESTION(ANAEROBIC) COMPOSTING(TYPES))
GOLUEKE, C. G.
CALIFORNIA VECTOR VIEWS 2(12), P. 58 (DECEMBER 1955). VARIOUS ASPECTS OF COMPOSTING ARE TREATED, BOTH AEROBIC AND ANAEROBIC. FOUR MAIN TYPES OF PROCEDURES ARE DESCRIBED, VIZ., THE INDORE METHOD, A METHOD DEVELOPED BY THE UNIVERSITY OF CALIFORNIA, MECHANIZED DIGESTION, AND ANAEROBIC COMPOSTING OR DIGESTION. IT DESCRIBES THE USE OF ANAEROBIC MANURE DIGESTION IN THE TREATMENT OF ANIMAL WASTES ON FARMS IN EUROPE. GAS PRODUCTION PER TON OF MANURE RANGED FROM 5.3 CU-FT AT A DIGESTER TEMPERATURE OF 60 DEGREES F TO 7.6 CU-FT AT 93 DEGREES F. THE GAS CAN BE BURNED FOR HEATING THE DIGESTER AND FOR HOUSEHOLD USE. THIS PROCEDURE IS NOT FOLLOWED TO ANY EXTENT TODAY. (UC)

06 12 OTHER GENERAL ARTICLES

06-12-00248 UTILIZATION OF ORGANIC INDUSTRIAL WASTES BY COMPOSTING
BRAUN, R.
COMPOST SCIENCE 3(3), P. 34-41 (AUTUMN 1962). REPORT ON MATERIALS WHICH CAN BE TREATED BY COMPOSTING AND ANALYSIS OF PROBLEMS INVOLVED. EXAMPLES FOR UTILIZING ORGANIC INDUSTRIAL WASTES BY MEANS OF COMPOSTING. WASTES OF FOOD AND RELATED INDUSTRIES, INDUSTRIES ENGAGED IN EXPLOITATION OF VEGETABLE AND ANIMAL WASTES AND TEXTILE LEATHER, GLUE AND GELATINE, PHARMACEUTICAL, PETROLEUM AND WOOD AND PAPER INDUSTRIES ARE DISCUSSED. (EI)

06-12-00383 TECHNICAL AND PRACTICAL RESULTS AND DEVELOPMENTS IN REFUSE PROCESSING AND COMPOSTING
HORSTMANN, O.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 14, (APRIL 1962). SOME OF THE SUBJECTS OF THE ARTICLE ARE QUANTITIES OF DIFFERENT TYPES OF REFUSE, EFFECTS OF DISTRIBUTION AND SELLING PRICES, AND FINANCIAL PROBLEMS. GREAT SURPRISES CAN BE EXPECTED WHEN A PLANT IS DESIGNED ON THE BASIS OF AVERAGE FIGURES. THE SALE OF COMPOST RARELY DEVELOPS ACCORDING TO PLAN. IT IS DESIRABLE TO HAVE ALTERNATE OUTLETS FOR COMPOST SALES. MANUAL LABOR SHOULD BE REPLACED BY MACHINES. OF COURSE THIS INCREASES THE CAPITAL COSTS, INTEREST, AND AMORTIZATION. (UC)

06-12-00409 MUNICIPAL SOLID-WASTE DISPOSAL - PART V PLANNING MUNICIPAL COMPOSTING OPERATIONS (COMPOSTING SALVAGE COMPOST(ANALYSIS))
GOTAAS, H. B.
THE AMERICAN CITY 77(6), P. 160 (JUNE 1962). A DISCUSSION OF COMPOSTING AS A MEANS OF MUNICIPAL SOLID WASTE DISPOSAL. INCLUDES (1) TWO DETERRENTS TO COMPOSTING MUNICIPAL WASTE. (2) THE ADVANTAGES OF AEROBIC DECOMPOSITION. (3) THE QUANTITY AND QUALITY OF REFUSE AND THE QUALITY OF COMPOST, WITH TABLES GIVING THE AMOUNTS OF SALVABLE MATERIALS IN MUNICIPAL REFUSE AND THE CHEMICAL COMPOSITION OF COMPOST. (4) THE MARKETING OF COMPOST. (PHS)

06-12-00410 MUNICIPAL SOLID-WASTE DISPOSAL - PART VI - COMPOST PLANT DESIGN AND OPERATION (COMPOSTING MARKETING SLUDGE(SEWAGE))
GOTAAS, H. B.
THE AMERICAN CITY 77(7), P. 103 (JULY 1962). A CONTINUATION OF THE DISCUSSION OF COMPOSTING AS A MEANS OF MUNICIPAL SOLID WASTE DISPOSAL. DISCUSSES THE DESIGN AND OPERATION OF A COMPOST PLANT. INCLUDES A LIST OF THE FUNDAMENTAL FACTORS WHICH AFFECT PLANT DESIGN, AND GIVES THE FEATURES WHICH SHOULD BE INCLUDED IN THE SIX BASIC PROCESSES OF A PLANT - RECEIVING OF THE REFUSE. SEPARATION OF SALVABLE MATERIALS. REMOVAL OF NONCOMPOSTABLE MATERIALS. PREPARATION OF THE REMAINDER BY SCREENING, GRINDING, AND SHREDDING. BIOLOGICAL DECOMPOSITION AND STABILIZATION BY COMPOSTING. PREPARATION OF THE COMPOST FOR MARKETING BY SCREENING AND MILLING, FORTIFYING WITH ADDITIONAL NUTRIENTS WHEN DESIRED, AND BAGGING. TALKS BRIEFLY ABOUT COMPOSTING BOTH REFUSE AND SEWAGE SLUDGE. (PHS)

06-12-00415 MUNICIPAL SOLID-WASTE DISPOSAL - PART VII - COMBINED DISPOSAL OF SEWAGE SLUDGE AND REFUSE (SLUDGE(SEWAGE) INCINERATION COMPOSTING)
BLACK, P. J.
THE AMERICAN CITY 77(8E, P. 139 (AUGUST 1962). THE COMBINED DISPOSAL OF SEWAGE SLUDGE AND REFUSE IS AN EXAMPLE OF A POSSIBLE CHANGE IN THE PRACTICE OF SOLID WASTE DISPOSAL WHICH HAS RECEIVED LITTLE SERIOUS ATTENTION. DISCUSSES THE COMBINED DISPOSAL OF SEWAGE SLUDGE AND REFUSE BY SANITARY LANDFILLING, INCINERATION, AND COMPOSTING, AND GIVES REPORTS FROM A FEW CITIES THAT HAVE COMBINED THESE OPERATIONS. IN COMBINED DISPOSAL BY LANDFILLING, SEPARATE TRENCHES MAY BE EXCAVATED FOR SEPTIC TANK SLUDGE OR THE SLUDGE MAY BE SPREAD ON TOP OF A LAYER OF COMPACTED REFUSE. IN NEW YORK DIGESTED SEWAGE SLUDGE IS USED TO MAKE ARTIFICIAL TOPSOIL OVER COMPLETED SANITARY LANDFILLS. SEWAGE SOLIDS ARE BURIED ALONG WITH THE REFUSE AT SOME LANDFILLS. REFUSE INCINERATION PRODUCES EXCESS HEAT WHICH CAN BE USED TO DRY OR INCINERATE SEWAGE SOLIDS. HOWEVER, COMBINED DISPOSAL BY INCINERATION CAN ONLY BE USED WHERE THE INCINERATOR AND SEWAGE TREATMENT PLANTS ARE LOCATED WITHIN A REASONABLE DISTANCE FROM EACH OTHER. A NUMBER OF EUROPEAN COMPOSTING PLANTS ARE SUCCESSFULLY UTILIZING RAW OR DIGESTED SEWAGE SLUDGE, AND RESEARCH INDICATES THAT THIS PRACTICE COULD ALSO BE SUCCESSFUL UNDER CONDITIONS IN THE UNITED STATES.

06-12-00608 PUBLIC HEALTH ASPECTS OF WASTE DISPOSAL BY COMPOSTING
GOLUEKE, C. G. + GOTAAS, H. B.
AM J PUBLIC HEALTH 44(3), (MARCH 1954). COMPOSTING IS THE PRODUCTION OF A RELATIVELY STABLE HUMUS SUITABLE FOR AGRICULTURAL SOILS BY MEANS OF BIOLOGICAL DECOMPOSITION. IT IS USED MOST EXTENSIVELY IN ASIA, EUROPE, AND SOUTH AFRICA, LANDS IN WHICH THE POPULATION IS DENSE AND THE NEED FOR FOOD PRODUCTION IS MOST URGENT. KNOWN SINCE ANTIQUITY, COMPOSTING WAS FIRST SYSTEMATIZED BY LORD HOWARD IN THE INDORE PROCESS, WHICH HAS SINCE BECOME WIDELY ACCEPTED IN SOUTH

AFRICA. MECHANIZATION OF COMPOSTING LED TO THE APPEARANCE OF A NUMBER OF PATENTED DEVICES IN THE DECADE 1920-1930. COMPOSTING HAS NOT BEEN SUCCESSFUL IN THE U.S. IN COMPOSTING ORDINARY MUNICIPAL REFUSE THERE ARE FOUR IMPORTANT STEPS- GRINDING, STACKING, AERATION BY TURNING, AND REGRINDING. TURNING IS NOT NECESSARY UNTIL THE THIRD DAY IF THE INITIAL MOISTURE CONTENT IS BELOW 70 PERCENT. SUBSEQUENT FREQUENCY OF TURNING IS DETERMINED BY THE MOISTURE CONTENT. WITHIN 24 HOURS AFTER GRINDING AND STACKING THE INTERNAL TEMPERATURE OF THE PILE RISES TO ABOUT 60 DEGREES C AND SUBSEQUENTLY CONTINUES TO RISE LESS RAPIDLY UNTIL A MAXIMUM OF 70 DEGREES TO 75 DEGREES C IS REACHED. THIS MAY PERSIST FROM 3 TO 6 DAYS UNTIL THE SUPPLY OF READILY AVAILABLE NUTRIENTS DIMINISHES BECAUSE OF THE BREAKDOWN OF ORGANIC MATTER, AND THEN THE TEMPERATURE DECLINES. WHEN A TEMPERATURE OF 50 DEGREES TO 55 DEGREES C IS REACHED AGAIN, ACTIVE DECOMPOSITION IS OVER AND THE MATERIAL IS SUFFICIENTLY STABILIZED FOR AGRICULTURAL PURPOSES. WITH MIXED MUNICIPAL REFUSE THE ENTIRE PROCESS LASTS FROM 10 TO 21 DAYS, DEPENDING ON THE C TO N RATIO. THE HIGHEST TEMPERATURES DO NOT EXTEND TO THE SURFACE OF THE PILE, AND TURNING IS REQUIRED FOR COMPLETE DECOMPOSITION OF ALL THE REFUSE. SEWAGE SLUDGE MAY BE SAFELY TREATED BY COMPOSTING. THERMOPHYLLIC TEMPERATURES OBTAINED IN AEROBIC COMPOSTING ARE SUFFICIENT TO DESTROY PATHOGENS AND PARASITES, AS WELL AS FLY EGGS. SPECIAL CARE IS NECESSARY WHEN NIGHT SOIL AND SEWAGE SLUDGE ARE ADDED TO THE COMPOST IN ORDER TO SAFEGUARD THE HEALTH OF THE WORKERS. SUFFICIENT STANDBY EQUIPMENT SHOULD BE AVAILABLE TO PREVENT AN ACCUMULATION OF REFUSE IN CASE OF A BREAKDOWN. (UC)

06-12-00736 MILWAUKEE CONSIDERS COMPOSTING GARBAGE (COST(OPERATING))
HUBEL, J.
PUBLIC WORKS 83(10), P. 104-106 (OCTOBER 1952). IN 1950 MILWAUKEE CONTACTED THE FRAZER CORP. REGARDING COMPOSTING PLANTS AT THE CHICAGO STOCKYARDS. IT IS ESTIMATED THAT AN OUTDOOR PLANT WOULD COST $250,000 FOR 100 TONS PER DAY. IT IS ANTICIPATED THAT IT WOULD COST ABOUT $34 TO $35/TON TO PRODUCE MARKETABLE COMPOST.

06-12-01154 COMPOSTING OF CITY REFUSE (DANO RASPING VAN-MAANEN HAMMERMILL-SYSTEM APPLICATION(COMPOST))
WESTSTRATE, W. A. G.
PROC OF THE NATIONAL CONF ON SOLID WASTE RESEARCH, AM PUBLIC WORKS ASSOC, CHICAGO, ILLINOIS, P. 136-142 (DECEMBER 1963). THE MOST IMPORTANT POINTS WHICH SHOULD BE INVESTIGATED WITH REGARD TO THE PREPARATION AND THE USE OF MUNICIPAL COMPOST ARE - (1) FROM A TECHNICAL POINT OF VIEW - A HIGH YIELD COMBINED WITH A HIGH DEGREE OF PURITY. (2) WITH RESPECT TO FERMENTATION - (A) INVESTIGATION INTO THE ADVANTAGES AND DISADVANTAGES OF AEROBIC, SEMI-AEROBIC AND ANAEROBIC FERMENTATION, (B) JUDGING THE RIPENESS OF THE COMPOST. (3) WITH RESPECT TO THE USE OF COMPOST AS MANURE - TO BUILD ON THE KNOWLEDGE AND EXPERIENCE ALREADY GAINED. IT SHOULD BE BORNE IN MIND THAT THE QUESTION ON WHICH SOILS AND FOR WHAT PURPOSES THE USE OF COMPOST YIELDS GOOD RESULTS, HAS TO BE EXAMINED FOR EACH COUNTRY INDIVIDUALLY.

06-12-01219 REPORT ON THE CONSERVATION OF CITY WASTE (COMPOSTING COST(COMPOST) SLUDGE(SEWAGE))
J AUSTRALIAN INST AGRIC SCIENCE 21(3), (SEPTEMBER 1955). GARBAGE CAN BE COMPOSTED SUCCESSFULLY WITH OR WITHOUT THE ADDITION OF SEWAGE SLUDGE. PLANTS EQUIPPED TO DISPOSE OF GARBAGE BY COMPOSTING IT ARE IN OPERATION IN MANY PARTS OF THE WORLD. HOWEVER, MANY PLANTS HAVE BEEN CLOSED DOWN BECAUSE OF MECHANICAL DIFFICULTIES AND HIGH COSTS. THE COMMITTEE CANNOT RECOMMEND COMPOSTING AS AN ECONOMICAL METHOD OF GARBAGE DISPOSAL IN VICTORIA FOR THE FOLLOWING REASONS - (1) THE COMPOSTING PLANTS WHICH HAVE BEEN DEVELOPED THUS FAR REQUIRE A LARGE LABOR FORCE FOR HAND SORTING, AND GENERALLY GIVE RISE TO A DUST AND ODOR NUISANCE IN CLOSELY SETTLED AREAS. MOREOVER THE CAPITAL COST OF INSTALLATION IS VERY HIGH. (2) COMPOSTING WOULD BE AN ADDITIONAL CHARGE UPON THE COST OF GARBAGE DISPOSAL, WHILE FARMERS ARE NOT PREPARED TO PAY A SUFFICIENTLY HIGH PRICE FOR COMPOST TO COVER THIS EXTRA CHARGE. (3) MOREOVER THE METHOD USED AT PRESENT FOR TIPPING AND COVERING GARBAGE IS SATISFACTORY, AND THERE ARE SUFFICIENT TIPPING SITES WITHIN THE MELBOURNE METROPOLITAN AREA TO SATISFY THE DEMANDS OF MOST OF THE MUNICIPALITIES FOR YEARS TO COME. SEWAGE SLUDGE CONTAINS MUCH USEFUL ORGANIC MATTER AND FERTILIZER MATERIAL. HOWEVER, THE PRESENT METHODS OF DISPOSAL OF SEWAGE ARE ECONOMICAL, AND HEALTH REGULATIONS PREVENT THE SALE OR DISPOSAL OF SEWAGE PRODUCED IN VICTORIA AT THE PRESENT TIME. THE COMMISSION OF PUBLIC HEALTH WOULD NOT AGREE TO THE SALE OF COMPOST RESULTING IN THE COMBINED COMPOSTING OF REFUSE AND SLUDGE. THE REASON FOR THE RESTRICTION IS THE DIFFICULTY OF PROVIDING THE STRICT SUPERVISING OF THE PROCESS NEEDED TO INSURE THE EXPOSURE OF ALL OF THE TREATED MATERIALS TO TEMPERATURES LETHAL FOR PATHOGENIC ORGANISMS AND PARASITIC OVA. (UC)

06-12-01389 SALE OF COMPOST OBTAINED FROM TOWN REFUSE AND GARBAGE (COMPOSITION LAW MARKETING(COMPOST) SPECIFICATION

LA COMMERCIALISATION DES COMPOSTS DE RESIDUE MENAGERS OU RESIDUS URBAINS OBTENUS A PARTIR DES ORDURES, TECHNIQUES ET SCIENCES MUNICIPALES 61(8,9), P. 334-337 (AUGUST-SEPTEMBER 1966). THE WORK GROUP "TRAITEMENT DES ORDURES MENAGERES" OF AGHTM HAS ESTABLISHED CONTACT WITH THE MINISTRY OF AGRICULTURE AND THE SERVICE OF REPRESSION OF FRAUDS TO ESTABLISH A REGULATION OF THE SALE OF HUMUS AND COMPOST OF DOMESTIC REFUSE IN ORDER TO AVOID THE DIFFICULTIES ARISING FROM THE APPLICATION OF THESE COMPOSTS AND HUMUS TO A REGULATION CONCEIVED FOR MINERAL FERTILIZER. THE TEST OF THIS CIRCULAR SOLIDIFIES THE ACCORD TO WHICH THE THREE INTERESTED PARTIES HAVE ATTAINED. IT WILL PERMIT THE DESIRED DEVELOPMENT BY THE AGRONOMISTS AS BY THE MUNICIPALITIES OF THE COST OF COMPOST FROM DOMESTIC REFUSE WHICH HAS TAKEN A PROMISING START IN FRANCE.

06-12-01391 USE OF SLUDGES FOR COMPOST PRODUCTION FROM GARBAGE (SLUDGE(COMPOST) COMPOSITION(COMPOST))
ZAKPZEWSKI, J.
GAZ WODA I TECH SANIT 32, P. 240-243 (1958). REQUIREMENTS FOR ALKALINE COMPOUND, CN RATIO, AERATION, AND PROCESSING OF GARBAGE ARE GIVEN. (CA)

06-12-01573 WARNING ISSUED BY COMPOST SUPPORTER (COMPOSTING DANO SLUDGE(SEWAGE))
REFUSE REMOVAL JOURNAL 1(2), P. 10 (FEBRUARY 1958). THE PREDICTION OF MR. N. G. WILSON OF EDINBURGH, SCOTLAND, THAT THE VERY FUTURE OF OUR CIVILIZATION MAY DEPEND ON THE ADOPTION OF SOUND COMPOSTING SYSTEMS IS DISCUSSED IN REFERENCE TO THE TEN MILLION TONS OF ORGANIC WASTES PRODUCED PER YEAR IN U.S. CITIES. (PHS)

07 Sanitary Landfill (Tipping)

07 01 CURRENT PRACTICES

07-01-00075 REGIONAL REFUSE-DISPOSAL SOLUTION (SANITARY-LANDFILL INCINERATION)
BRAUN, P.
THE AMERICAN CITY 82(12), P. 96-97 (DECEMBER 1967). IT IS SHOWN HOW TOWNSHIP OF SPARTA, NJ, ON METROPOLITAN FRINGE STARTED AREA-WIDE SANITARY FILL WITH PLANS FOR INCINERATOR. METHOD PROVIDES LONG-TERM SOLUTION TO PROBLEM OF SOLID-WASTE DISPOSAL FOR SURROUNDING REGION. LANDFILL IS WELL ISOLATED FROM ANY URBAN GROWTH. (EI)

07-01-00112 HOW TO MAKE A LANDFILL ATTRACTIVE (SANITARY-LANDFILL RECLAMATION-LAND)
SEXTON, J.
THE AMERICAN CITY 81(11), P. 92-93 (NOVEMBER 1966). FOUR LARGE LANDFILL SITES NEAR CHICAGO ARE DESCRIBED. THE COST OF DISPOSAL IS $0.40/YD (ONE-THIRD EXTRA FOR PACKERS). ABOUT 25,000 TO 30,000 CU-YDS/DAY ARE HANDLED IN FOUR DISPOSAL SITES. NO FREE DUMPING IS ALLOWED. RECLAIMED LAND IS USED FOR GOLF COURSES, ETC. CONSIDERABLE EFFORT IS MADE IN PLANTING TREES, GRADING, ETC. TO MAKE THE SITE AS PRETTY AS POSSIBLE.

07-01-00143 OUR LANDFILL PLAYS FAVORITES (SANITARY-LANDFILL COST(OPERATING) COST(CHARGES) LAND-RECOVERY INCINERATION)
POUND, C. E.
THE AMERICAN CITY 79(1), P. 85-86 (JANUARY 1964). A DESCRIPTION OF LANDFILL OPERATIONS IN WESTCHESTER COUNTY, NEW-YORK. REFUSE IS HANDLED AT $2.25/TON AND INCINERATOR RESIDUE AT 1.75 DOLLARS PER TON. A TABLE INDICATES THAT A "SAVING" IS ACCOMPLISHED BY INCINERATOR WITH RESIDUE DISPOSED OF IN A LANDFILL. IT IS ESTIMATED THAT WITHOUT INCINERATION, AREA IN THE COUNTY FOR LANDFILL WILL BE USED UP IN LESS THAN 20 YEARS. (PHS)

07-01-00150 DEEP-HOLE METHOD EXTENDS LANDFILL USE (SANITARY-LANDFILL)
HERNANDEZ, G.
THE AMERICAN CITY 82, P. 17 (MARCH 1967). THE USE OF THE TRENCH METHOD OF DISPOSAL IN THE CITY OF LAFAYETTE, LOUISIANA, INVOLVES THE EXCAVATION OF A PIT 40 FT DEEP. A KOEHRING DRAGLINE IS USED TO EXCAVATE THE PIT. THE SPOIL IS CAST TO THE WINDWARD SIDE TO SERVE AS BARRICADE TO ODORS AND WINDSWEPT DEBRIS. A RUBBER TIRED HOUGH H-100A PROVED A MUCH BETTER COMPACTOR THAN THE CRAWLER TRACTOR. THE AREA REQUIREMENT HAS DROPPED FROM 1 ACRE/YR/1000 PEOPLE TO 1/4 ACRE/YR/10,000 PEOPLE. (UC)

07-01-00153 PLANNED LANDFILLS CUT COSTS AND COMPLAINTS (INCINERATOR COMPOSTING SANITARY-LANDFILL)
DAVIS, K.
THE AMERICAN CITY 83(12), P. 102-104 (1968). THE USE OF INCINERATORS AND OPEN DUMPS WAS TERMINATED AND SANITARY LANDFILLS ARE NOW USED TO DISPOSE OF REFUSE IN FORT WORTH, TEXAS. THE INCINERATORS WERE OBSOLETE AND HAD NO EMISSION CONTROL DEVICES.

07-01-00165 GET OUT OF THE DUMPS (SANITARY-LANDFILL COST(OPERATING))
HATTERY, G. S.
THE AMERICAN CITY 82(6), P. 100-101 (1967). LANDFILL OPERATIONS AT MEDINA, OHIO, ARE DESCRIBED. THERE ARE ABOUT 10,000 PEOPLE AND ABOUT 160 CU-YDS OF REFUSE ARE GENERATED PER DAY. CHARGES TO RESIDENTS ARE $1.30 A MONTH FOR ONE COLLECTION PER WEEK. RATE SCHEDULE FOR OTHER USERS IS PRESENTED.

07-01-00186 REVAMPED REFUSE DUMP DRAWS PRAISE (SANITARY-LANDFILL)
ALBERTSON, L. M.
PUBLIC WORKS 98(1(), P. 88-89 (JANUARY 1967). DESCRIPTION OF SANITARY LANDFILL IN TOWN OF SOUTHOLD, NEW-YORK. DUMP HAS TWO FENCES, ONE SURROUNDING LAND FILL AREA, AND SECOND FOR DIRECTING AND CONTROLLING TRAFFIC. HOUGH MODEL H-90 C PAYLOADER IS USED FOR DOZING AND LIFTING REFUSE. JUNK CARS ARE LIFTED AND STACKED WITH FURTHER REMOVAL BY JUNK DEALERS. (EI)

07-01-00187 OPERATION OF SANITARY LANDFILLS (SETTLEMENT-METHODS EQUIPMENT-LANDFILL)
PUBLIC WORKS 89(9), P. 115-117, 206-209 (SEPTEMBER 1958). FACTORS TO BE CONSIDERED IN ESTABLISHMENT AND PROPER OPERATION OF SANITARY LAND FILLS, INCLUDING CONVERSION OF OLD OPEN DUMPS. SELECTION OF SITE. PROPER SIZE OF AREA. POSSIBILITY OF OBJECTIONS BY NEARBY RESIDENTS. COST CONSIDERATIONS. TYPE OF LANDFILL DETERMINED BY KIND OF SOIL AND EQUIPMENT TO BE USED. USE OF TRENCH, RAMP, AND AREA METHODS. DRAINAGE AND TREATMENT OF RAVINES AND MARSHES. PROPER HANDLING OF SETTLEMENT. SLOPING OF SURFACE. SEEDING OF COMPLETE PORTIONS OF AREA. PROPER PLANNING IS ESSENTIAL. (EI)

07-01-00189 REFUSE FILLING OF SWAMP IN FRESH WATER LAKE (SANITARY-LANDFILL SETTLEMENT GAS-SEEPAGE POLLUTION(WATER) RECLAMATION(LAND))
DUNN, W. L.
CIVIL ENGRG (NEW YORK) 38(1), P. 60-62 (JANUARY 1968). FILLING SWAMP WITH HOUSEHOLD WASTE AND RUBBISH HAS RECLAIMED 166 ACRES ADJACENT TO UNIVERSITY OF WASHINGTON CAMPUS. LAND IS SUITABLE FOR PARKING, PLAYING FIELDS AND LIGHT STRUCTURES. SWAMP HAD CONSISTENCY OF SLUDGE FOR DEPTH AS GREAT AS 60 FT. STARTED IN 1933 AS OPEN DUMP WITH OPEN RUBBISH FIRES, FILL WAS UPGRADED TO CONTROLLED LANDFILL SITE. SMALL AREAS WERE DIKED WITH RUBBISH. DUMPED TIMBERS PROVIDED DRAINAGE CHANNELS. GARBAGE WAS COVERED WITH HAULED-IN DIRT. QUALITY OF LAKE WASHINGTON WATER WAS NOT SERIOUSLY AFFECTED BECAUSE FILL DRAINS SLOWLY AND IS NEAR LAKE OUTLET. (EI)

07-01-00227 HOW TO START A SANITARY LANDFILL (SANITARY-LANDFILL COST(CAPITAL) COST(OPERATING))
COPPA, R. B.
THE AMERICAN CITY 83(3), P. 85, 87 (MARCH 1968). DESCRIPTION OF SOLID WASTE PROBLEMS IN GASTONBURY, CONNECTICUT. AN OPEN DUMP WAS CONVERTED TO A MODIFIED SANITARY LANDFILL. IT HAS NOW BEEN REPLACED BY A SANITARY LANDFILL.

07-01-00228 ECONOMICS AND AESTHETICS OF NEW JERSEY LANDFILL REVIEWED (SANITARY-LANDFILL COST(OPERATING) RECLAMATION(LAND))
REFUSE REMOVAL JOURNAL 10(12), P. 22 (DECEMBER 1967). A DESCRIPTION OF SOME LANDFILL OPERATIONS IN NEW JERSEY. THERE ARE 417 LANDFILLS OPERATING. DISCUSSION OF USE OF RECLAIMED LAND IS PRESENTED ALONG WITH SOME EXAMPLES OF THEIR USE.

07-01-00230 PLANS FOR 8,150 TONS PER DAY AT LANDFILL
(SANITARY-LANDFILL COST(OPERATING)) REFUSE REMOVAL JOURNAL 10(8), P. 14 (AUGUST 1967). THE PLANNING AND EXPERIENCE OF THE ORANGE COUNTY, CALIFORNIA SANITARY LANDFILL OPERATIONS IS DESCRIBED. POLICIES GOVERNING CURRENT OPERATIONS AND SOME OPERATING COSTS ARE PRESENTED.

07-01-00235 A SANITARY FILL INSIDE THE CITY (SANITARY-LANDFILL)
SMITH, C. D.
THE AMERICAN CITY 83(4), P. 90-92 (APRIL 1968). A SANITARY LANDFILL IS LOCATED INSIDE THE CITY LIMITS OF CEDAR-RAPIDS, IOWA, NEAR GOOD RESIDENTIAL AREAS WITHOUT INDIGNANT CITIZENS DEMANDING THE DISPOSAL OPERATIONS MOVE SOMEWHERE ELSE. OPERATIONS ARE DESCRIBED.

07-01-00394 DISPOSAL COMMENTS, DUMPS VERSUS FILLS (SANITARY-LANDFILL OPEN DUMP COST(OPERATING) COST(COLLECTION))
BASKOUS, A. A.
REFUSE REMOVAL JOURNAL 5(5), P. 24 (MAY 1962). DISCUSSES THREE TOPICS- THE OPEN DUMP AS A METHOD OF REFUSE DISPOSAL IN NEW YORK STATE, THE SANITARY LANDFILL, AND WHAT THE STATE HEALTH DEPARTMENT CAN DO TO ASSIST IN SOLVING SOME OF THE PROBLEMS CAUSED BY UNSATISFACTORY REFUSE DISPOSAL. OUT OF 550 INCORPORATED VILLAGES, 932 TOWNS, AND 62 CITIES IN THE STATE, ONLY 54 COMMUNITIES HAVE REFUSE DISPOSAL INCINERATORS AND ONLY 31 OPERATE SANITARY LANDFILLS, INDICATING THAT A LARGE PROPORTION OF THE COMMUNITIES DEPOSIT REFUSE IN OPEN DUMPS. MANY OF THESE DUMPS CREATE NUISANCE PROBLEMS. OVER 150 SUCH DUMPS SERVING 3 MILLION PEOPLE ARE KNOWN TO EXIST IN THE STATE. THE ARTICLE LISTS SEVEN ESSENTIAL PRINCIPLES ON WHICH A SANITARY LANDFILL SHOULD BE OPERATED, AND CITES SEVERAL ADVANTAGES OF THE LANDFILL- RECLAMATION OF WASTELAND, MOBILITY, EASE OF OBTAINING NEW SITES, ELIMINATING NUISANCES, AND POSSIBILITY OF REDUCING THE HAUL DISTANCE. COST OF DISPOSAL BY LANDFILL IS ABOUT $1 PER TON WHERE THE HAUL IS LESS THAN 10 MILES, BUT IF IT EXCEEDS 10 MILES DISPOSAL BY INCINERATION SHOULD BE CONSIDERED. ALSO GIVES A SUMMARY OF RESULTS FROM A SURVEY BY THE AMERICAN SOCIETY OF CIVIL ENGINEERS OF THE OPERATION OF OVER 250 LANDFILLS. STATE HEALTH DEPARTMENTS SHOULD DEVELOP MINIMUM STANDARDS FOR REFUSE DISPOSAL TO PREVENT THE OCCURRENCE OF PUBLIC HEALTH NUISANCES. (PHS)

07-01-00412 MUNICIPAL SOLID-WASTE DISPOSAL - PART II - THE SANITARY LANDFILL (SANITARY-LANDFILL POLLUTICN(WATER))
MICHAELS, A.
THE AMERICAN CITY 77(3), P. 92 (MARCH 1962). A COMPLETE DISCUSSION OF SANITARY LANDFILLING PRACTICES. INCLUDES - (1) A BRIEF HISTORY OF SANITARY LANDFILLING. (2) SHORT DESCRIPTIONS OF THE AREA, TRENCH, AND RAMP LANDFILLING METHODS. (3) THE PUBLIC HEALTH CRITERIA TO BE MET IN A SANITARY LANDFILL. (4) IMPORTANT FACTORS TO CONSIDER IN FULFILLING THE CRITERIA SUCH AS TYPE AND FREQUENCY OF REFUSE COLLECTION, AVAILABILITY OF COVER MATERIAL, ACCESS, CLIMATE, DRAINAGE, FUTURE SITE USE, AND (5) REGULATIONS GOVERNING PRIVATE DUMP AND LANDFILLS IN THE PHILADELPHIA, PENNSYLVANIA, AREA. (PHS)

07-01-00499 MUSCATINE SUCCESSFULLY USES IN-TOWN LANDFILLS (SANITARY-LANDFILL)
PILGRAM, W.
REFUSE REMCVAL JOURNAL 5(10), P. 10 (OCTOBER 1962). DESCRIBES SANITARY LANDFILLING OPERATION WITHIN THE MUSCATINE IOWA CITY LIMITS. AFTER A THREE-WEEK TEST WITH AN EXPERIMENTAL IN-TOWN LANDFILL, RESIDENTS WERE CONVINCED THAT SUCH OPERATIONS WOULD NOT CREATE A PUBLIC NUISANCE, AND AT THE PRESENT THERE ARE ACTUALLY 43 REQUESTS TO START LANDFILLS IN THE CITY. THE LANDFILL OPERATIONS ARE VERY CAREFULLY HANDLED. THE GARBAGE AND RUBBISH IS ROLLED DOWN AND COMPACTED EVERY DAY AND THEN COVERED WITH A GOOD LAYER OF DIRT OR SAND. THRCUGH ITS IN-TOWN SANITARY LANDFILL OPERATIONS, THE CITY IS ELIMINATING LCW MOSQUITO INFESTED AREAS, CHANGING THEM INTO GOOD POTENTIAL BUILDING SITES, AND IS REDUCING HAULING COSTS. (PHS)

07-01-00523 SANITARY LANDFILL PROVEN UNDER FIRE
MCRAE, N.
THE AMERICAN CITY 76(5), P. 94 (MAY 1961). DESCRIBES THE WAY IN WHICH THE CITY OF BIRMINGHAM, ALABAMA, REOPENED TWO OLD DUMP SITES AS SANITARY LANDFILLS DESPITE PRELIMINARY OPPOSITION BY AREA RESIDENTS. GIVES TIPS ON PREPARING AND OPERATING A LANDFILL WHICH BIRMINGHAM CITY OFFICIALS FOUND TO BE VALUABLE. (PHS)

07-01-00525 A CLEANER CITY THROUGH TEAMWORK (COLLECTION SANITARY-LANDFILL PEST-CONTROL)
OLMSTEAD, R. O.
THE AMERICAN CITY 76(9), P. 113 (SEPTEMBER 1961). DISCUSSES IMPROVEMENTS MADE IN REFUSE STORAGE, COLLECTION, AND DISPOSAL PRACTICES AS PART OF A PROJECT FOR BETTER CITY-WIDE SANITATION IN ROCKY MOUNT, NORTH-CAROLINA. (PHS)

07-01-00527 ANNEXATION REQUIRES REFUSE CHANGES (COLLECTION SANITARY-LANDFILL)
GENTRY, R.
THE AMERICAN CITY 76(3), P. 29 (MARCH 1961). ANNEXATION OF NEW AREA BY THE CITY OF KNOXVILLE, TENNESSEE, WILL NECESSITATE A COMPLETE OVERHAUL OF REFUSE COLLECTION ROUTES AND THE OPENING OF A SECOND LANDFILL FOR DISPOSAL. (PHS)

07-01-00528 SANITARY LAND FILL BY CONTRACT (COST(OPERATING))
THE AMERICAN CITY 76(2), P. 104 (FEBRUARY 1961). DESCRIBES REFUSE COLLECTION AND DISPOSAL OPERATIONS IN PEORIA, ILLINOIS. A PRIVATE CONTRACTOR PROVIDES THE SERVICE AT AN ANNUAL PER CAPITA COST OF ONLY $3.06. (PHS)

07-01-00532 LANDFILL ENDS REFUSE DISPOSAL PROBLEMS (COST(OPERATING) RECLAMATION(LAND))
GIESER, F. E.
PUBLIC WORKS 90(3), P. 131 (MARCH 1959). SANITARY LANDFILL WAS INITIATED IN HIGHLAND PARK, ILLINOIS IN 1952. THE SYSTEM WAS RECOMMENDED AFTER INTENSIVE STUDY AND PERSONAL INVESTIGATION OF METHODS USED BY OTHER MUNICIPALITIES IN THE CHICAGO AREA. THE SITE PRESENTLY USED WAS PREVIOUSLY AN OPEN DUMP, AND THE SWITCH TO A SANITARY LANDFILL OPERATION HAS ELIMINATED THE ODOR, FLY AND RAT PROBLEMS THAT PLAGUED THE CITY UNDER THE OLD SYSTEM. FIVE NEIGHBORING COUNTIES USE THE SANITARY LANDFILL SITE, BUT EACH COLLECTS THEIR OWN REFUSE. AT THE SITE, TRENCHES ARE DUG 15 FT DEEP AND TWO LAYERS OF REFUSE ARE FILLED INTO THE PIT. WHEN THE REFUSE REACHES A HEIGHT OF 7 FT, A FOOT OF EARTH COVER IS PLACED OVER THE REFUSE. ANOTHER 7 FT OF REFUSE IS THEN PLACED UPON THE PILE. THIS LIKEWISE IS COVERED WITH A FOOT OF EARTH. A NUMBER OF SERVICE BUILDINGS HAVE BEEN BUILT ON COMPLETED FILL AREAS, INCLUDING A STORAGE SHED FOR REFUSE COLLECTION TRUCKS. THE COST OF DISPOSAL AVERAGES $0.08/CU YD OF GARBAGE, AND $0.15/CU-YD OF UNCOMPACTED REFUSE. (UC)

07-01-00544 SANITARY LANDFILL LIVES UP TO COUNTY'S EXPECTATIONS (COST(OPERATING) COST(COMPARISONS))
KOCH, A. S.
PUBLIC WORKS 96(7), P. 70 (JULY 1965). LIBERAL USE IS MADE OF CANYON BOTTOMS AS LANDFILL SITES. REFUSE PRODUCTION IN THE COUNTY IS 2,300 TONS PER DAY. THE EQUIPMENT CONSISTS OF 12 D7E CATERPILLAR TRACTORS, 2 CAT 619C TRACTOR-SCRAPERS, 1 WAGNER DOZER-COMPACTOR. FOUR OF D7E'S ARE STATIONED AT EACH OF THE THREE LANDFILL SITES, TWO NORTHERN SITES RECEIVE 90 PERCENT OF THE RUBBISH VOLUME. BECAUSE OF THIS, ONE 619C WORKS AT EACH LOCATION. PROCEDURE- THE FILL IS BEGUN AT THE LOWER END OF CANYON AND IS THEN ADVANCED UPHILL, WITH A BENCH FORMED ON AN AVERAGE OF EVERY 50 FEET. INDIVIDUAL CELLS ARE 50 TO 60 FT LONG, AND ARE FILLED TO A DEPTH OF 15 FEET. (UC)

07-01-00545 FUNDAMENTALS OF SANITARY LANDFILL OPERATIONS (SANITARY-LANDFILL COST(OPERATING))
SALES DEPARTMENT OF CATERPILLAR TRACTOR COMPANY PUBLIC WORKS 95(12), P. 88 (DECEMBER 1964). THE ARTICLE CONTAINS A DESCRIPTION OF METHODS OF LANDFILL. A LIST IS GIVEN OF THE REQUIRED EQUIPMENT AND ESTIMATES ARE MADE OF THE COSTS. (UC)

07-01-00547 COUNTY LANDFILL RECLAIMS MARSHLANDS (RECLAMATION(LAND) SANITARY-LANDFILL)
PUBLIC WORKS 94(3), P. 117 (MARCH 1963). THE BERGEN COUNTY, NEW JERSEY, SANITARY LANDFILL SERVES 52 OF THE COUNTY'S 71 COMMUNITIES, I.E., A POPULATION OF 600,000 AND A COLLECTION OF HIGHLY DEVELOPED COMMERCIAL AND INDUSTRIAL COMPLEXES. THROUGH THE DISPOSAL OF 400 TRUCKLOADS OF ALL TYPES OF REFUSE PER DAY, LOW-VALUE TIDAL MARSHLAND IS CONVERTED INTO POTENTIAL RECREATION SITES AT THE RATE OF 60 ACRES PER YEAR. OVER 14,000 CU YD OF COMPACTED MATERIAL ARE PLACED IN THE DUMP WEEKLY. SINCE A WIDE VARIETY OF TYPE AND SIZE OF MATERIAL IS HANDLED, A SINGLE LIFT UP TO 15 FEET THICK IS MORE FEASIBLE THAN MULTIPLE SHALLOWER LIFTS. A MODIFIED TRENCH AND COVER SYSTEM IS USED. THE TRENCHES ARE 35 FEET WIDE AND FROM 25 TO 30 FEET LONG. BECAUSE OF THE DEEP FILLS, A GIVEN WORK FACE REMAINS OPEN TWO TO THREE DAYS BEFORE BEING COVERED. THE TOTAL LANDFILL SITE COVERS NEARLY 800 ACRES OF COUNTY-OWNED MARSHLAND. IT IS BROKEN INTO A DOZEN INDIVIDUAL SITES BY A NETWORK OF LOCAL ROADS AND EXPRESSWAYS CRISSCROSSING THE SECTION. HAUL ROADS ARE MADE OF CRUSHED ROCK TO PREVENT MIRING. (UC)

07-01-00548 LANDFILL FROM EYESORE TO ASSET (SANITARY-LANDFILL COST(OPERATING) INCINERATION)
MAILEY, H. V.
PUBLIC WORKS 95(11), P. 95 (NOVEMBER 1964). THE SITE OF THE OPERATION WAS AT WILKES-BARRE, PENNSYLVANIA. SIX VILLAGES JOINED TO OPERATE THE LANDFILL. THE LOCALE OF THE FILL WAS AN ABANDONED COAL STRIPPING AREA. THE ANNUAL EXPENDITURE (5-DAY WEEK) IS ESTIMATED AT 39 CENTS PER CAPITA PER YEAR FOR A CONTRIBUTING POPULATICN CF 93,000. AN UNEXPECTEDLY LARGE REVENUE IS OBTAINED FROM COMMERCIAL HAULERS AND COMMERCIAL AND INDUSTRIAL ESTABLISHMENTS. FOR EXAMPLE, IN JUNE 1964, A TOTAL OF 3,745 VEHICLES (OF WHICH 687 WERE MUNICIPAL TRUCKS, 1,440 SMALL PICKUPS, 1,618 COMMERCIAL HAULERS) CAME TO THE SITE. COST OF PREPARING THE SITE WAS $2,000. THE PRESENT COST TO WILKES-BARRE IS $25,257 PER YEAR. (WHEN AN INCINERATOR WAS USED, THE COST WAS $60,798 PER YEAR.) (UC)

07-01-00556 A CITY DUMPS ITS DUMPSITE (SANITARY-LANDFILL)
RINEHART, J.
PUBLIC WORKS 93(3), P. 117 (MARCH 1962). UNTIL 1962, LOGANSPORT, INDIANA, HAD ITS REFUSE DISPOSED OF BY OPEN DUMP, OPEN BURNING, AND HOG FEEDING. BECAUSE OF THE MANY HEALTH HAZARDS ASSOCIATED WITH THESE METHODS, IT DECIDED TO SWITCH TO SANITARY LANDFILL. A DEAL WAS MADE IN WHICH THE CITY PURCHASED A 50-ACRE LANDFILL SITE IN A HILLY WASTELAND WITHIN A MILE OF THE CITY LIMITS. JURISDICTION OVER THE OPERATION OF THE SITE WITHIN THE SPECIFICATIONS OF A CONTRACT WITH THE CITY WAS LEFT TO THE WINNING CONTRACTOR. THE INTERESTING FEATURE IS THAT THE NEW CONTRACT (COLLECTION PLUS DISPOSAL) IS $29,000 PER YEAR LESS THAN IT HAD BEEN WITH THE OLD OBJECTIONABLE METHOD OF DISPOSAL. (UC)

07-01-00574 VILLAGE OF 16,000 SAVES $24,000/YR WITH SANITARY LANDFILL (COST(OPERATING))
KNUDSEN, E. J.
PUBLIC WORKS 86(2), P. 81 (FEBRUARY 1955). BY SWITCHING TO A SANITARY LANDFILL OPERATION, MELROSE PARK, ILLINOIS APPARENTLY SAVES UP TO $24,000 PER YEAR OVER OTHER MEANS OF DISPOSAL. THE CITY PURCHASED A 10-ACRE SITE BACK IN 1941, AND SINCE IT HAS A POPULATION OF ONLY 16,000, IT HOPES TO MAINTAIN THE SAME SITE UNTIL APPROXIMATELY 1975. COLLECTIONS ARE MADE ONCE EACH WEEK IN THE RESIDENTIAL SECTION OF TOWN, AND ONCE DAILY IN THE COMMERCIAL SECTION. COMPACTED SLAG COVER IS USED AT THE FILL. THIS USE HELPS ALLEVIATE THE PROBLEMS OF ODOR, RODENTS, AND VERMIN WHICH PLAGUED THE OLD OPEN DUMP OPERATION. ODORS ARE NOW ALMOST NONEXISTENT. RATS ARE NO PROBLEM BECAUSE THEY DO NOT LIKE TO BURROW THROUGH THE GRITTY SLAG, AND FLIES ARE A VERY RARE OCCURRENCE. (UC)

07-01-00600 ONE BULLDOZER IN A TRENCH (SANITARY-LANDFILL)
VERDEN, J.
THE AMERICAN CITY 74(11), P. 165 (NOVEMBER 1959). IN 1957 VICTORIA, TEXAS TURNED TO THE USE OF THE SANITARY LANDFILL. A DEEP TRENCH WITH DAILY COVER METHOD WAS SELECTED AS THE BEST SOLUTION TO THE CITY'S WASTE DISPOSAL PROBLEMS. GARBAGE IS PICKED UP TWICE A WEEK FROM RESIDENCES, AND TRASH ONCE A WEEK. A BULLDOZER DIGS TRENCHES 35 FT WIDE, 40 FT LONG, AND 15 TO 16 FT DEEP FOR THE REFUSE. THE SAME BULLDOZER COMPACTS THE REFUSE IN THE TRENCH AND COVERS IT EVERY NIGHT. THE LANDFILL SITE HAS 1,000 ACRES. IN SUMMER, THE TRENCHES ARE SPRAYED WITH INSECTICIDES TO PROTECT THE AREA AGAINST FLIES. (UC)

07-01-00604 INCOME DEFRAYS COSTS AT " SANITATION FARM "
ROBERTSON, A. M.
THE AMERICAN CITY 74(12), P. 76 (DECEMBER 1959). IN XENIA, OHIO, A SWITCH WAS MADE FROM AN OPEN DUMP TYPE OF OPERATION TO ONE OF THE SANITARY LANDFILL TYPE FOR THE DISPOSAL OF SOLID WASTES. WITH THE USE OF WARFARIN RAT POISON, ONE MILLION RATS WERE KILLED IN THE PROCESS OF CLEANING UP THE DUMP. THE CITY SERVES A POPULTION OF ABOUT 20,000 AND HAS 116 ACRES AT ITS DISPOSAL FOR LANDFILL. THE GARBAGE IS COMPACTED AND COVERED UNTIL A HEIGHT OF ABOUT 40 FEET IS REACHED. ABOUT 3/4 OF AN ACRE PER YEAR IS UTILIZED. THE CITY CHARGES $4.55 PER QUARTER PER RESIDENCE FOR COLLECTION AND DISPOSAL. IT CHARGES $0.35 AND UP FOR PRIVATE DUMPING. COSTS OF OPERATION ARE MET BY THIS INCOME. (UC)

07-01-00626 THE SANITARY FILL (COST(OPERATING) VOLUME-REDUCTION QUANTITY ECONOMICS)
THE AMERICAN CITY 76(2), P. 84 (FEBRUARY 1961). A DISCUSSION OF WHY THE SANITARY LANDFILL IS THE ONLY PRACTICAL ALTERNATIVE TO INCINERATION FOR REFUSE DISPOSAL IN THE UNITED STATES. PRESENTS A SUMMARY IN TABULAR FORM OF SIGNIFICANT OPERATING DETAILS AND OTHER PERTINENT DATA ON SOME OF THE ACTIVE SANITARY FILLS IN THE UNITED STATES (ARIZONA TO MAINE). (PHS)

07-01-00632 THE SANITARY FILL--HOW IT OPERATES PART II (SANITARY-LANDFILL ECONOMICS COST(OPERATING) VOLUME-REDUCTION)
THE AMERICAN CITY 76(3), P. 98 (MARCH 1961). A DISCUSSION OF THE PRINCIPLES INVOLVED IN ESTABLISHING AND OPERATING A SANITARY LANDFILL. INCLUDES SELECTION OF SITE, OPERATION OF THE LANDFILL, COSTS, INVOLVED, EQUIPMENT NEEDED, FUTURE USE OF THE RECLAIMED LAND, AND REFUSE DECOMPOSITION AT THE FILL. PRESENTS A SUMMARY OF OPERATIONS AT ADDITIONAL LANDFILL SITES FROM MAINE TO TENNESSEE. (PHS)

07-01-00633 THE SANITARY FILL--HOW IT OPERATES PART III (COST(OPERATING) ECONOMICS COST(OPERATING) VOLUME-REDUCTION)
THE AMERICAN CITY 76(4), P. 84 (APRIL 1961). DESCRIBES THE TRENCH, AREA, AND RAMP SANITARY LANDFILLING METHODS. SUMMARIZES OPERATIONS IN TABULAR FORM AT THE REMAINING ACTIVE LANDFILL SITES IN THE UNITED STATES FROM TENNESSEE TO WISCONSIN. (PHS)

07-01-00642 COUNTY PREPARES A MASTER PLAN FOR REFUSE DISPOSAL (SANITARY-LANDFILL)
PUBLIC WORKS 91(8), P. 87-88 (AUGUST 1960). THE ARTICLE PRESENTS THE PLAN FOR REFUSE DISPOSAL WHICH WAS PREPARED FOR CONSIDERATION BY ORANGE COUNTY, CALIFORNIA. THE USE OF ABANDONED SAND AND GRAVEL PITS AND THE PLANNED DISPOSAL PROGRAM WERE DEVELOPED TO PREVENT THE DUMPING OF REFUSE MATERIAL ALONG ROADSIDES IN THE RAPIDLY GROWING COMMUNITY. THIS REPORT IS ACTUALLY AN ABSTRACT OF THE COMPLETE REPORT SUBMITTED TO THE COUNTY FOR THEIR CONSIDERATION. THE FULL REPORT DISCUSSES IN CONSIDERABLE DETAIL DISPOSAL BY INCINERATION, COMPOSTING, OCEAN DUMPING, GRINDING AND DISCHARGE TO SEWERS, FEEDING TO SWINE AND OPERATION OF SANITARY LANDFILLS. (PHEA)

07-01-00643 STUDY OF HAZARDS IN DISPOSING OF INSECTICIDE CONTAINERS AT A CITY LANDFILL (SANITARY-LANDFILL HEALTH)
MAIL, G. A. + HARTWELL, W. V. + HAYES, G. R., JR., + FUNCKES, A. J.
PUBLIC WORKS 91(7), P. 110-111 (JULY 1960). THE PROBLEM OF DISPOSING OF CONTAINERS AND TOXIC WASTE MATERIALS RESULTING FROM THE MANUFACTURE, FORMULATION, AND USE OF PESTICIDES FACES MANY MUNICIPALITIES. PHOENIX, ARIZONA, TO REDUCE THE POSSIBLE HAZARD, HAD A STUDY MADE AND CRUSHED AT THE INSECTICIDE PLANT ALL FIBERED DRUMS DESIGNATED FOR DISPOSAL AT THE CITY LANDFILL WHICH HAD CARRIED INSECTICIDE TO ELIMINATE THE CLOUDS OF DUST WHICH MIGHT ARISE IF A LANDFILL BULLDOZER DID THE CRUSHING. METAL CONTAINERS WERE WASHED THREE TIMES WITH WATER AND RENDERED UNSERVICEABLE BY MULTIPLE PUNCTURES BEFORE BEING DISCARDED. OBSERVATIONS MADE ON THE BULLDOZER OPERATOR AFTER FOLLOWING THESE PRECAUTIONS INDICATED THAT CONTAINERS FOR ORGANIC PHOSPHORUS INSECTICIDES MAY BE DISPOSED OF WITH SAFETY TO LANDFILL PERSONNEL WHEN PROPER PRECAUTIONS ARE OBSERVED. FLOOR SWEEPINGS AND OTHER SPILLAGE OF HIGHLY TOXIC INSECTICIDES SHOULD BE DISPOSED OF BY TRAINED PLANT PERSONNEL AND NOT SENT TO THE PUBLIC LANDFILL. IT WAS FOUND THAT 85 PERCENT OF THE WASTE CONTAINERS FROM THE FORMULATING PLANTS CONSISTED OF MULTIWALLED PAPER BAGS THAT CONTAINED MATERIALS THAT WERE RELATIVELY INNOCUOUS AND WOULD NOT, UNDER EXISTING DISPOSAL PRACTICES, CONSTITUTE A HAZARD AT THE DISPOSAL SITE. (PHEA)

07-01-00644 KEEPING A SANITARY LANDFILL SANITARY
BJORNSON, B. F. + BOGUE, M. D.
PUBLIC WORKS 92(9), P. 112-114 (SEPTEMBER 1961). SANITARY LANDFILL IS STILL THE MOST SATISFACTORY AND ECONOMIC SANITARY METHOD OF GARBAGE AND RUBBISH DISPOSAL FOR MOST COMMUNITIES UNDER 100,000 POPULATION AND FOR MANY LARGER CITIES. ALTHOUGH THE OPERATION IS RELATIVELY SIMPLE, THE SANITARY LANDFILL SHOULD BE PLANNED AND OPERATED AS AN ENGINEERING PROJECT. THROUGH TIMELY EDUCATION AND CONTINUOUS HIGH STANDARDS OF OPERATION THE PUBLIC SHOULD LEARN THE MARKED DIFFERENCE BETWEEN AN " OPEN DUMP " AND A TRUE SANITARY LANDFILL. (PHEA)

07-01-00648 OPERATION OF SANITARY LANDFILLS BY COUNTIES
PUBLIC WORKS 90(2), P. 125 (FEBRUARY 1959). REPORT OF A QUESTIONNAIRE, NATIONWIDE SURVEY BY PUBLIC WORKS MAGAZINE GIVING DATA ON FINANCING, EQUIPMENT USED, CHARGES MADE, AND FUTURE PLANS FOR COUNTY OPERATED SANITARY LANDFILLS. (PHS)

07-01-00651 DETERMINING EFFECTS OF RECOMPACTION ON A LANDFILL (SANITARY-LANDFILL SETTLEMENT)
STONE, R. + ISRAEL, M.
PUBLIC WORKS 99(1), P. 72-73 (JANUARY 1968). A DESCRIPTION OF RESEARCH AT THE CITY OF SANTA CLARA'S SANITARY LANDFILL TO ESTABLISH IF EXCAVATION AND RECOMPACTION OF LANDFILL WOULD ACCELERATE STABILIZATION. A FILLED CELL WAS OPENED, AND THE MATERIAL WAS INSPECTED. ODOR WAS PRESENT, AND APPARENTLY THERE WAS LITTLE CHANGE IN THE CHARACTER OF THE LANDFILL MATERIAL. THE MATERIAL WAS RECOMPACTED AND SETTLEMENT MEASUREMENTS ARE BEING TAKEN.

07-01-00653 OPERATION OF SANITARY LANDFILLS (METHODS EQUIPMENT COMPACTION)
PUBLIC WORKS 89(9), P. 115 (SEPTEMBER 1958). FACTORS TO BE CONSIDERED IN THE ESTABLISHMENT OF SANITARY LANDFILLS, DISTANCE OF HAUL, AREA NEEDED, NEIGHBORS, COST OF LAND, TOPOGRAPHY, CONTROL OF DUMPING, COVER MATERIAL AVAILABILITY ARE REVIEWED. PREPARATION OF THE SITE AND THE TRENCH, RAMP, AND AREA METHODS OF OPERATION ARE DESCRIBED. (PHS)

07-01-00737 SELF-SUPPORTING LANDFILL HELPS ATTRACT INDUSTRY (SANITARY-LANDFILL)
PUBLIC WORKS 98(3), P. 98, 116 (MARCH 1967). IN SOLON, OHIO, AN OPEN DUMP WAS CONVERTED INTO A SANITARY LANDFILL. THE OPERATING COST IS PRESENTLY SUPPORTED BY DUMPING FEES FROM NONRESIDENT AND INDUSTRIAL USERS. (PHEA)

07-01-00738 LANDFILL OPERATIONS BY LOS ANGELES COUNTY (SANITARY-LANDFILL COST(OPERATING))
PUBLIC WORKS 91(9), P. 122-123 (SEPTEMBER 1960). THE BANNING OF BACKYARD INCINERATION OF REFUSE BY THE ENACTMENT OF AN " ANTI-SMOG " ORDINANCE IN OCTOBER 1957, IN LOS ANGELES COUNTY, CALIFORNIA, BROUGHT INTO FULL-TIME OPERATION TWO SANITARY LANDFILL AREAS AND THE CONSTRUCTION OF SOUTH GATE TRANSFER STATION. THE 19 SANITATION DISTRICTS RESPONSIBLE FOR THE OPERATIONS JOINTLY SERVE MORE THAN 3 MILLION PEOPLE IN 57 CITIES, AS WELL AS A NUMBER OF UNINCORPORATED COMMUNITIES. SITES ARE OPERATED AS RAMP TYPE LANDFILLS, WITH REFUSE DELIVERED TO THE BOTTOM OF THE WORKING FACE. IT IS PUSHED UP, PLACED, COMPACTED AND COVERED WITH EARTH BY TRACTORS EQUIPPED WITH BULLDOZER BLADES. A 12 INCH LAYER OF DIRT IS COMPACTED OVER THE FACE OF THE RAMP AT THE END OF EACH DAY'S OPERATION. THE PRIMARY COMPACTION OF THE REFUSE IS ACCOMPLISHED BY THE TRACK ROLLING OF THE DOZER TRACTORS, AND THE EARTH COVER COMPACTED BY THE APPLICATION OF WATER AND TRAVEL OF REFUSE VEHICLES AND EARTH-MOVING EQUIPMENT. COLLECTION OF THE REFUSE IS LEFT TO EACH LOCAL AGENCY TO HANDLE AS IT CHOOSES AND THE LANDFILL AREAS MAY BE UTILIZED BY BOTH PUBLIC AND PRIVATE HAULERS. ALL COSTS, INCLUDING THAT OF THE LAND, ARE BEING COVERED BY THE $1.00 PER TON CHARGE. DEPRECIATION OF EQUIPMENT IS 23 CENTS PER TON. COST OF OPERATION AND MAINTENANCE EXCLUSIVE OF EQUIPMENT IS 43 CENTS PER TON. BILLING AND ACCOUNTING COSTS ARE 11 CENTS PER TON. WHEN THE LANDFILLS ARE COMPLETED, THE SITES WILL BECOME COUNTY-OPERATED REGIONAL PARKS WITH GOLF COURSES AND OTHER RECREATIONAL AND CULTURAL FACILITIES.

07-01-00751 SANITARY LANDFILL OPERATIONS IN NEW YORK STATE (COST(OPERATING) SALVAGE FINANCING)
PAGANO, S.
PUBLIC HEALTH REPORTS 79(6), P. 543-548 (JUNE 1964). DATA ARE PRESENTED ON 24 LANDFILLS SERVING POPULATIONS RANGING FROM 3,000 TO 250,000. COST DATA SHOWED PER CAPITA OPERATING COSTS TENDED TO DECREASE AS THE SIZE OF THE POPULATION SERVED INCREASED, BUT MANY VARIABLE FACTORS SUCH AS LAND COSTS, HOURS OF OPERATION, AND TYPE OF EQUIPMENT USED MUST BE TAKEN INTO CONSIDERATION. NUISANCES WERE REPORTED FROM BURNING REFUSE, ODOR, SMOKE, FLIES, AND IN MANY CASES FROM TOO MUCH TRAFFIC ON THE FILL, WHICH INTERFERED WITH OPERATION. A SUMMARY IS INCLUDED OF THE TYPE OF OPERATION, EQUIPMENT USED, DEPTHS OF FILLS, AND ANNUAL COST OF OPERATION. PROPERLY OPERATED LANDFILLS APPARENTLY CREATED FEW PROBLEMS. (PHEA)

07-01-00757 GRAVEL PIT TO LANDFILL PARK WITH ROLLING HILLS (RECLAMATION(LAND))
TAYLOR, R. N.
PUBLIC WORKS 97(2), P. 105-106 (FEBRUARY 1966). THE COMBINATION OF GRAVEL MINING WITH SANITARY LANDFILL TO RECLAIM LAND NEAR PHOENIX, ARIZONA, IS DESCRIBED.

07-01-00792 A SURVEY OF SANITARY LANDFILL PRACTICES, THIRTIETH PROGRESS REPORT (PROHIBITED-ITEMS FINANCING EQUIPMENT PUBLIC-ACCEPTANCE RECLAMATION(LAND) QUANTITY GROUND-WATER COMPACTION SALVAGE OPEN-BURNING)
COMMITTEE ON SANITARY ENGINEERING RESEARCH PROC OF AM SOC CIVIL ENGRS J SANIT ENGRG DIV 87(SA4), PART 1, P. 65-84 (JULY 1961). IN THE UNITED STATES, SANITARY LANDFILLS ARE A COMMON LOW COST REFUSE DISPOSAL METHOD. THEY CAN PROVIDE SATISFACTORY, NUISANCE-FREE OPERATION. THE GENERAL POPULARITY OF SANITARY LANDFILLS IS ONLY PARALLELED BY THE LIMITED AVAILABLE TECHNICAL INFORMATION DESCRIBING PROVEN OPERATING AND LAND RECLAMATION EXPERIENCE. THE TECHNICAL DATA PRESENTED IN THIS REPORT WAS OBTAINED FROM A QUESTIONNAIRE SURVEY OF SOME 250 OPERATING AGENCIES AND MAY BE USED AS A GENERAL GUIDE TO CURRENT SANITARY LANDFILL PRACTICES.

07-01-00795 AN URBAN COUNTY ADOPTS A MASTER PLAN (SANITARY-LANDFILL)
THE AMERICAN CITY 75(5), P. 29 (MAY 1960). ORANGE COUNTY, CALIF., AN AREA LARGELY URBAN WITH SOME 700,000 POPULATION, RECENTLY ADOPTED A PLAN DESIGNED TO MEET ITS ULTIMATE REFUSE-DISPOSAL NEEDS. THE NEED FOR SUCH A PLAN BECOMES APPARENT WHEN ONE CONSIDERS ANTICIPATED GROWTH - BETWEEN 2 AND 2 1/2 MILLION PERSONS BY 1980 AND MAXIMUM GROWTH OF 3 MILLION BY THE YEAR 2000. THE REPORT SETS FORTH THE FOLLOWING CONCLUSIONS AND RECOMMENDATIONS - (1) THE COUNTY SHOULD RETAIN ITS PRESENT POLICY OF PROVIDING ADEQUATE AND EQUITABLE DISPOSAL FACILITIES FOR THE COUNTY AS A WHOLE. (2) COLLECTION AND SHORT-HAUL TRANSPORT OF REFUSE IS BEST ADMINISTERED ON THE LOCAL LEVEL AS IS BEING DONE AT PRESENT. (3) AN ORDINANCE ADOPTED IN 1946 WHEN GARBAGE WAS A MUCH LARGER COMPONENT OF DOMESTIC REFUSE THAN IT IS TODAY SHOULD BE AMENDED TO PERMIT THE DISPOSAL OF RESIDENTIAL GARBAGE AT THOSE SITES (SANITARY LANDFILL) WHERE THE PRESENCE OF THIS MATERIAL WILL NOT CAUSE POLLUTION OF SURFACE OR UNDERGROUND WATERS OR CREATE A PUBLIC NUISANCE. (4) BECAUSE OF THE IMMINENT CLOSURE OF TWO MAJOR DISPOSAL SITES, STEPS SHOULD BE TAKEN TOWARD THE ESTABLISHMENT OF A TRANSFER STATION IN THE AREA. BY 1965 THREE TRANSFER STATIONS WILL BE NEEDED. (5) NEW LONG-TERM FACILITIES SHOULD BE LOCATED IN ONE SECTION OF THE COUNTY AT THIS TIME TO AVOID A CRITICAL SITUATION AT THE TIME OF CLOSING TWO STATIONS, SET FOR THE NEAR FUTURE. (6) THE COUNTY SHOULD RECOGNIZE THAT IT IS DIFFICULT TO LOOK FAR INTO THE FUTURE, CONSEQUENTLY THE PLAN AS ADOPTED DOES NOT FIX THE FINAL SOLUTION TO THE PROBLEM BUT CAN BE ALTERED AS NEEDS AND EXPERIENCE DICTATE.

07-01-00798 SIZE NO DETERRENT TO GOOD REFUSE DISPOSAL (SANITARY-LANDFILL)
THE AMERICAN CITY 75(4), P. 47 (APRIL 1960). IN FARMVILLE, VIRGINIA (POPULATION 4,700) THE SANITARY- LANDFILL METHOD OF DISPOSAL IS USED. THE REFUSE IS COMPACTED AND IS COVERED EACH DAY TO A DEPTH OF 4 INCHES WITH EARTH. THE PERMANENT COVER IS FROM 2 TO 3 FEET DEEP. THE FINAL LEVEL OF THE AREA WILL BE RAISED FROM 15 FEET TO 18 FEET. (UC)

07-01-00944 FIVE-YEAR PROGRAM UPGRADES REFUSE SERVICE (COLLECTION SANITARY-LANDFILL SALVAGE)
ROSSI, R. M.
THE AMERICAN CITY 75(4), P. 108-109 (APRIL 1960). A DESCRIPTION OF CHANGES MADE TO IMPROVE REFUSE COLLECTION AND DISPOSAL IN RIVERSIDE, CALIFORNIA. OVER FIVE YEARS ALL VEHICLES WERE REPLACED WITH MODERN UNITS. THE METHOD OF LANDFILL WAS CHANGED TO INCREASE THE LIFE OF THE SITE. ABOUT 100 TONS OF REFUSE ARE HANDLED PER DAY. A SCAVENGER ALLOWED TO SALVAGE CARDBOARD FROM COMMERCIAL REFUSE AT NIGHT. COLLECTION FEES ARE EITHER $1.50 OR $2.00 PER MONTH DEPENDING ON TERRAIN AND DISTANCE FROM THE LANDFILL. COLLECTION IS TWICE PER WEEK.

07-01-00953 TEXANS CHOOSE SANITARY LANDFILL OVER BURNING DUMP
PUBLIC WORKS 97(7), P. 92 (1966). GEORGETOWN, TEXAS CONVERTED FROM OPEN DUMP AND BURN OPERATION TO SANITARY LANDFILL. VOTERS APPROVED $369,000 BOND ISSUE TO ACQUIRE 70 ACRE SITE AND 100 FWHP CRAWLER LOADER. RESIDENCES ARE CHARGED $1.50 AND APARTMENTS $1.00 PER MONTH. BUSINESSES $2-$35 PER MONTH.

07-01-01001 ONE-MAN LANDFILL SERVES 35,000 PEOPLE (SANITARY-LANDFILL COST(OPERATING))
PUBLIC WORKS 91(12), P. 99-100 (1960). JANESVILLE, WISCONSIN, EMPLOYS ONE MAN AND A SERIES OF ABANDONED GRAVEL PITS TO DISPOSE OF THEIR REFUSE. THE CITY MAKES THE REFUSE AND GARBAGE PICK-UPS SEPARATELY AT NO CHARGE TO THE CITIZENS. A DETAILED COST BREAKDOWN IS INCLUDED FOR THE YEARLY OPERATION.

07-01-01004 JOINT CITY-COUNTY SANITARY LANDFILL (COST(OPERATING))
PUBLIC WORKS 91(2), P. 154 (1960). A COOPERATIVE AGREEMENT BETWEEN GLENDALE, CALIFORNIA, AND LOS-ANGELES COUNTY PROVIDES FOR THE OPERATION OF A CITY-COUNTY LANDFILL, WHICH THE COUNTY WILL OPERATE. A CHARGE OF $1.25 PER TON WILL BE MADE TO THE CITY. OF THIS 75 CENTS WILL BE USED FOR OPERATION AND AMORTIZATION. THE REMAINING 50 CENTS WILL BE SPLIT BETWEEN THE TWO GOVERNMENTS AND WILL FORM THE BASIS FOR FINANCING ADDITIONAL NEEDED EQUIPMENT. THE PROJECT CONTEMPLATES FUTURE USE OF THE AREA FOR RECREATIONAL PURPOSES.

07-01-01006 ANOTHER COUNTY OPERATES A SANITARY LANDFILL (RODENT(CONTROL))
THOMPSON, P.
PUBLIC WORKS 91(3), P. 125 (MARCH 1960). DESCRIBES THE CONVERSION OF AN UNORGANIZED AND UNSANITARY REFUSE DISPOSAL SITE INTO A SANITARY LANDFILL IN DOUGLAS COUNTY, WASHINGTON. HOWEVER, DUE TO INADEQUATE REGULATIONS AND RESTRICTIONS, INDIVIDUALS ARE STILL BRINGING THEIR GARBAGE TO THE LANDFILL TO ESCAPE THE GARBAGE COLLECTORS FEES.

07-01-01009 SANITARY FILL RECLAIMS VALUABLE LAND (SANITARY-LANDFILL)
PUBLIC WORKS 91(4), P. 156 (APRIL 1960). WHEN THE STATE PASSED A LAW PROHIBITING OPEN DUMPS, BORDENTOWN, N.J., INITIATED A PROGRAM FOR CONVERTING ITS REFUSE DUMP INTO A SANITARY LANDFILL. THE NEW LANDFILL HAS NOW BEEN COMPLETED AND SERVES 16,000 PEOPLE IN THE IMMEDIATE VICINITY. (PHS)

07-01-01031 SANITARY LANDFILL OPERATIONS
ARMSTRONG, C. A.
PUBLIC WORKS 92(6), P. 152 (JUNE 1961). A DESCRIPTION OF REFUSE COLLECTION AND DISPOSAL PRACTICES IN ROCHESTER, MINN. EMPHASIZES THE SANITARY LANDFILL OPERATION AND EQUIPMENT USED, AND PRESENTS A BREAKDOWN OF COSTS INVOLVED. (PHS)

07-01-01037 COUNTY RUNS ECONOMICAL LANDFILLS (SANITARY-LANDFILL COST(OPERATING))
HILLER, J. R.
PUBLIC WORKS 92(8), P. 109 (AUGUST 1961). EXPLAINS REFUSE DISPOSAL OPERATIONS AT THE FOUR LANDFILLS AND 28 OPEN-BURNING DUMPS IN SAN BERNARDINO COUNTY, CALIF. ANNUAL REFUSE DISPOSAL COSTS IN THIS COUNTY AVERAGE $0.72 PER CAPITA. LOW DISPOSAL COSTS ARE ATTRIBUTED TO CONSOLIDATING CITY-COUNTY EFFORTS, PLACING THE DISPOSAL PROGRAM UNDER THE COUNTY HIGHWAY DEPARTMENT, LOCATING LANDFILL SITES TO ASSURE SUFFICIENT VOLUME, AND USING RELIABLE, HEAVY-DUTY TRACTORS TO HANDLE LARGE VOLUMES EFFICIENTLY. (PHS)

07-01-01044 REALISTIC APPROACH SOLVES REFUSE PROBLEMS (COST(OPERATING) SANITARY-LANDFILL)
WOOD, N.
PUBLIC WORKS 93(8), P. 94 (AUGUST 1962). DESCRIBES HOW A HIRED PROFESSIONAL REFUSE CONSULTANT SOLVED MANY OF THE REFUSE COLLECTION AND DISPOSAL PROBLEMS IN THE COUNTY OF SANTA-BARBARA, CALIFORNIA. THE CONSULTANT'S NEW REFUSE PROGRAM INCLUDED - (1) SECURING THE COOPERATION OF THE REFUSE HAULERS IN INVESTING IN BETTER EQUIPMENT AND ELIMINATING OVERLAPPING ROUTES, (2) INTRODUCING A RAMP METHOD AT THE COUNTY LANDFILL, THEREBY PROLONGING ITS LIFE 5 YEARS, (3) CLOSING THE WILDCAT DUMPS, (4) INITIATING A LITTER PROGRAM, (5) DRAFTING AN ORDINANCE FOR THE REGULATION AND DISPOSAL OF REFUSE, AND (6) ESTABLISHING A SCHEDULE OF FEES FOR THE USE OF LANDFILL SITES, A LICENSE FEE FOR REFUSE HAULERS, AND COLLECTION FEES FOR RESIDENCES. INCLUDES TWO DIAGRAMS OF THE COUNTY LANDFILL SITE. (PHS)

07-01-01071 THE RAMP-TYPE SANITARY FILL
THE AMERICAN CITY 69(1), P. 88 (JANUARY 1954). IN A STEP-BY-STEP DEMONSTRATION, THE ST. LOUIS COUNTY HEALTH DEPARTMENT AND THE U.S. PUBLIC HEALTH SERVICE ILLUSTRATED THE METHOD OF BUILDING A RAMP-TYPE FILL TO ABOUT 100 HEALTH AND SANITATION OFFICIALS FROM 65 NEARBY CITIES. THE DEMONSTRATION TOOK PLACE ON ROLLING GROUND TO SHOW THAT THE METHOD COULD BE OPERATED ON SUCH TERRAIN. BETWEEN 1952 AND 1954, TWO CITIES-- IOWA-CITY, IOWA, AND COLUMBIA, SOUTH-CAROLINA - TOOK THE INITIATIVE IN ADOPTING THE SANITARY FILL FOR REFUSE DISPOSAL AND THE RAMP METHOD FOR BUILDING IT. IOWA CITY CONVERTED AN OLD 13-ACRE "BURNING-DUMP" TO FILL-AND-COVER. THE OPERATION SERVES 30,000 PEOPLE. A TRACTOR TRANSVERSES A SHALLOW, VALLEY-LIKE TRENCH COMPACTING THE REFUSE AND COVERING IT. THIS ALLOWS A SUBSTANTIAL REDUCTION IN THE AMOUNT OF MANEUVERING THAT WOULD BE REQUIRED OF THE TRACTOR IN OTHER METHODS OF DISPOSAL. WHEN THE REPORT WAS MADE, IOWA CITY HAD USED THE RAMP-FILL FOR ONLY A YEAR, BUT THE RESULTS HAD BEEN SATISFACTORY. THE INSECT-RIDDEN RAT-RIDDLED OPEN " BURNING-DUMP " HAD BEEN REPLACED BY AN EFFICIENT SANITARY FILL THAT WAS NOT A NUISANCE PROBLEM AT ALL. ALONG WITH THIS EFFORT TO IMPROVE SANITATION, THE CITY ACQUIRED TWO NEW REFUSE COLLECTION TRUCKS. A RAMP-TYPE OPERATION IS USED AT COLUMBIA TO RECLAIM A PITLIKE AREA THAT ADJOINS RAILROAD PROPERTY. BECAUSE OF THE DENSE POPULATION CONCENTRATION, THE PROCESS MUST BE KEPT RUNNING IN A MANNER TO PREVENT NUISANCES OR OBJECTIONABLE ODORS. THE FILL RECEIVES REFUSE FROM A POPULATION OF ABOUT 87,000, AND EXTENDS OVER AN AREA OF APPROXIMATELY 3 ACRES. THE ENTIRE SITE WAS EXCAVATED TO A DEPTH OF 18 FEET. THE REFUSE IS COMPACTED INTO 3-FT LAYERS AND IS COVERED EACH NIGHT WITH 3 OR 4 INCHES OF EARTH. THE COMPLETED SECTIONS OF THE FILL ARE COVERED WITH 3-FT OF SOIL. (UC)

07-01-01075 CIVIC PRIDE (SANITARY-LANDFILL)
BASGALL, V. A.
THE AMERICAN CITY 69(2), P. 102 (FEBRUARY 1954). JUNCTION CITY, KANSAS, ABANDONED THE OPEN DUMP SYSTEM OF REFUSE DISPOSAL IN FAVOR OF THE SANITARY LANDFILL METHOD BECAUSE FIRSTLY, THE CITY WISHED TO RID ITSELF OF THE NUISANCE OF SMOKE AND ODOR, AND OF RATS AND INSECT BREEDING PLACES NEAR THE CITY. SECONDLY, THE STATE PASSED A LAW PROHIBITING THE USE OF RAW GARBAGE FOR HOG FEEDING. BECAUSE THE GARBAGE NOW HAD TO BE DISPOSED OF, AND SINCE IT IS HIGHLY PUTRESCIBLE, IT WAS NECESSARY TO BURY IT. THE CITY USES THE TRENCH TYPE OF LANDFILL. ALL TRENCHES ARE DUG TO A DEPTH OF 6 FEET AND TO A WIDTH OF 10-12 FEET. THE REFUSE IS COMPACTED OFTEN DURING THE DAY AND IS COVERED WITH 4-6 INCHES OF EARTH EACH NIGHT. THE FINAL COVER IS 2 FEET THICK. THERE HAVE BEEN NO COMPLAINTS OF THE SITE BEING A NUISANCE. THE CITY INTENDS TO CONVERT THE SITE INTO A CITY PARK WHEN FILLING HAS BEEN COMPLETED. THE REFUSE CREWS COLLECT GARBAGE TWICE EACH WEEK FROM ALL HOMES, AND RUBBISH ONCE EACH WEEK. TWELVE THOUSAND PEOPLE CONTRIBUTE 11,600 TONS OF MIXED REFUSE PER YEAR. IN SOUTH BOSTON, VIRGINIA, A COMMUNITY OF 7,000, THE AREA METHOD OF FILL IS USED TO CONVERT 23 ACRES OF WASTELAND TO PRODUCTIVE PURPOSES. SINCE THE FILL IS IN 5 FOOT LIFTS, LITTLE SETTLEMENT TAKES PLACE. THE SITE RECEIVES ABOUT 7,800 CU YD OF REFUSE ANNUALLY. IN MARINETTE, WISCONSIN, WASTELAND IS RECLAIMED BY THE AREA METHOD OF LANDFILL. THE REFUSE IS COMPACTED IN 6 FOOT LIFTS. NEARLY 100,000 CU YD OF REFUSE ARE BURIED ANNUALLY. THE REFUSE IS GENERATED BY A POPULATION OF 15,000. ONE-FOURTH OF THE WASTE COMES FROM MUNICIPAL COLLECTION. THE REMAINING 3/4 COMES FROM PRIVATE CONTRACTORS. THE RECLAIMED LAND IS USED FOR PARKS, PLAYGROUNDS, AND OTHER RECREATIONAL PURPOSES. (UC)

07-01-01076 ONE MAN, ONE MACHINE (SANITARY-LANDFILL)
JOHNSON, W. F.
THE AMERICAN CITY 69(2), P. 103 (FEBRUARY 1954). ONE MAN OPERATING BUT ONE CRAWLER TRACTOR CAN KEEP A SANITARY LANDFILL SITE RUNNING AT PEAK EFFICIENCY. WITH A POPULATION OF 15,800, THE CITY OF EMPORIA, KANSAS, IS RECLAIMING LAND WITH ITS REFUSE. THE CITY HAD BEEN USING THE SANITARY LANDFILL METHOD FOR EIGHT YEARS AT THE TIME THE ARTICLE WAS WRITTEN, UTILIZING THE TRENCH METHOD OF DISPOSAL. TRENCHES ARE DUG TO A DEPTH OF SIX FEET AND TO A WIDTH OF TEN FEET, GIVING THE TRACTOR PLENTY OF ROOM TO MANEUVER IN IT. THE REFUSE IS COVERED WITH 18 INCHES OF EARTH. THE TRACTOR, A CATERPILLAR D-4 WITH A TRAXCAVATOR FRONT-END SHOVEL, SPREADS AND COMPACTS THE REFUSE AND SPREADS THE FINAL COVER. IT HAULS 21,000 CU YD OF REFUSE ANNUALLY. THE AMOUNT OF SETTLEMENT ON THE FILL OVER THE EIGHT YEARS OF OPERATION HAS BEEN NEGLIGIBLE. COMPLETED AREAS HAVE BEEN USED FOR FARMLANDS, AT GREATLY IMPROVED LAND VALUES. (UC)

07-01-01077 COLD WEATHER IS NO OBSTACLE TO FILL-AND-COVER (SANITARY-LANDFILL COST(OPERATING))
BOOTH, E. J. + BARTHOLOMEW, N.
THE AMERICAN CITY 69(6), P. 114-116 (JUNE 1954). CITIES WHICH ARE SUBJECTED TO SEVERE COLD HAVE HESITATED TO ADOPT THE SANITARY LANDFILL METHOD OF WASTE DISPOSAL BECAUSE FROSTS OFTEN MAKE WINTER EXCAVATION VIRTUALLY IMPOSSIBLE. HOWEVER, BISMARK, NORTH-DAKOTA, AND EAU-CLAIRE, WISCONSIN, HAVE ADOPTED SANITARY LANDFILL WITHOUT ENCOUNTERING ANY SIGNIFICANT PROBLEMS. IN BISMARK, NORTH-DAKOTA (POPULATION 22,000), THE LANDFILL OPERATION WAS STARTED IN 1951. ABOUT 50,000 CU-YD OF REFUSE ARE DISPOSED OF ANNUALLY. OPERATING COSTS DO NOT EXCEED $25/DAY. THE RAMP METHOD IS USED. EACH ACTIVE RAMP AREA MEASURES 50 FT IN WIDTH AND 100 FT IN LENGTH. WHEN THE DESIRED ELEVATION OF REFUSE ON THE RAMP IS REACHED, A 12-18 INCH BLANKET OF EARTH IS SPREAD FOR COVER. SETTLEMENT HAS BEEN NEGLIGIBLE, AND THE SANDY SOIL OF THE VICINITY HAS PRESENTED NO SERIOUS PROBLEM TO WINTER OPERATIONS. DESPITE A COLD CLIMATE, A TRENCH-TYPE OF LANDFILL IS USED WITHOUT DIFFICULTY IN EAU CLAIRE, WISCONSIN (POPULATION 36,000). THE CITY PURCHASED A 160-ACRE SITE TO REPLACE AN OLD OPEN DUMP, BUT WINTER EXCAVATION PROVED TO BE A PROBLEM. CONSEQUENTLY, IN 1951, THE CITY AWARDED A CONTRACT TO AN EXCAVATOR FOR THE SANITARY LANDFILL TRENCH. THE TRENCH WAS TO BE KEPT OPEN AT LEAST 100 FT IN FRONT OF THE PRESENT LEVEL OF FILL AT ANY ONE TIME. GARBAGE AND RUBBISH ARE HAULED BY PRIVATE CONTRACTORS, AND MANY INDIVIDUALS HAUL THEIR OWN REFUSE. THE OPERATION REQUIRES THE EXCAVATION OF ABOUT 30,000 CU YD OF TRENCH PER YEAR--DUG ABOUT 15 FT DEEP. THE TRENCH IS 30 FT WIDE AT THE BASE AND 60 FT WIDE AT THE TOP. (UC)

07-01-01078 THE AREA METHOD OF LANDFILL (SANITARY-LANDFILL)
LEMON, T. J. + POSS, R. J.
THE AMERICAN CITY 69(4), P. 116 (APRIL 1954). IN THE AREA METHOD OF SOLID WASTE DISPOSAL, THE REFUSE IS SIMPLY PACKED IN PLACE WITH A TRACTOR OR BULLDOZER AND THEN COVERED WITH EARTH EACH DAY. IF THE LAYERS OF REFUSE ARE KEPT TO A MAXIMUM OF 6 FEET IN DEPTH, LESS DIFFICULTY WILL BE ENCOUNTERED IN COMPACTING THE REFUSE AND THEREFORE LESS SETTLEMENT WILL TAKE PLACE. IT IS ONLY FEASIBLE FOR SANFORD, FLORIDA, TO USE THE RAMP METHOD OF SANITARY FILL DUE TO MARSHY WASTELAND AND A GENERALLY HIGH WATER TABLE. THE REFUSE FILL IS BUILT IN 6 FEET LAYERS AND EACH DAY THE FILL IS COVERED WITH EARTH TO A DEPTH OF 12 INCHES. IT IS CLAIMED THAT THIS COVER IS THICK ENOUGH TO PREVENT RATS FROM BURROWING THROUGH TO THE REFUSE AND TO POSITIVELY KILL ANY FLY LARVAE THAT MIGHT DEVELOP. (UC)

07-01-01079 HOW TO BUILD A SANITARY FILL IN SWAMPLANDS (SANITARY-LANDFILL RECLAMATION(LAND))
PARKER, W. E.
THE AMERICAN CITY 69(5), P. 112-115 (MAY 1954). SWAMPLANDS AND OPEN DUMPS ARE PUBLIC NUISANCES AND POTENTIAL BREEDING PLACES FOR DISEASE, YET BOTH CAN BE CONVERTED TO USABLE LAND AREAS BY MEANS OF SANITARY LANDFILL. SUCCESSFUL ENDEAVORS OF THIS NATURE HAVE BEEN MADE IN ROCHESTER, NEW HAMPSHIRE AND IN SEATTLE, WASHINGTON. THE FACE OF THE FILL AT ROCHESTER IS NOT SEALED OFF EACH DAY, BECAUSE THE WORK HAS TO BE TAILORED SO THAT IT CAN BE DONE FROM THE TOP OF THE FILL. HOWEVER, ENOUGH COVER IS SPREAD TO EFFECTIVELY REDUCE THE DANGER OF RAT INFESTATION AND DEVELOPMENT OF NUISANCES. THE FILL IS OPERATED IN FINGERS THAT ARE ABOUT 75 FEET WIDE AND WHICH REACH OUT INTO MUCK THAT MAY BE AS DEEP AS 20 FEET AND HAVE WATER DEPTH OF MORE THAN 4 FEET. SANDY FILL MATERIAL IS STOCKPILED ON EACH SIDE OF A FINGER IN A WINDROW, SO THAT IT MAY BE EASILY ACCESSIBLE FOR USE AS COVER. FILL IS PLACED IN THE MUCK AND COMPRESSED WITH THE USE OF THE BUCKET OF THE TRACTOR AS THOROUGHLY AS POSSIBLE. AS THE MUCKY UNDERBURDEN CONSOLIDATES, THE COMPLETED FILL SETTLES INTO THE SWAMP, AT TIMES AS MUCH AS SEVERAL FEET. THIS SETTLING PROVIDES A SECOND OPPORTUNITY TO BUILD A FILL ON TOP OF THE SETTLED FILL, AND THUS FURTHER RECLAIM THE SWAMP AREA. IN THIS MANNER, ROCHESTER IS DISPOSING OF 36,000 CU YD OF REFUSE ANNUALLY. SEATTLE HAS BEEN RECLAIMING SWAMPLAND SINCE 1930. IN 2 TO 3 YEARS THE AMOUNT OF SETTLING HAS ONLY BEEN SLIGHT. THE CITY HAS CONVERTED THE RECLAIMED AREAS INTO PARKS, PLAYFIELDS, AND INTO INDUSTRIAL PROPERTY. IN THE OPERATION, GARBAGE IS SPREAD TO A DEPTH SUFFICIENT TO SUPPORT TRUCKS. IT IS THEN COVERED WITH EARTH. ADDITIONAL LOADS OF GARBAGE ARE SPREAD ON THIS BASE TO FORM AN 8-FT LIFT. THE CITY MAINTAINS FOUR SEPARATE FILLS, WHICH SERVE 500,000 PERSONS AND COVER A TOTAL OF 120 ACRES. THE REFUSE RECEIVED EXCEEDS 1,750,000 CU-YD PER YEAR. (UC)

07-01-01080 DO YOU REALIZE (SANITARY-LANDFILL COST(OPERATING))
SCHWALM, C. F.
THE AMERICAN CITY 69(2), P. 105 (FEBRUARY 1954). IN THE CITY OF HAMILTON, OHIO, AN OLD OPEN DUMP LOCATED ON LAND NEXT TO A RIVER HAS BEEN CONVERTED TO A SANITARY LANDFILL OPERATION. THE RECLAIMED LAND WILL BE USED AS A PLAYGROUND. THE CITY BOUGHT A FLEET OF NINE NEW COLLECTION VEHICLES OVER A THREE-YEAR PERIOD. DAILY WASTE COLLECTIONS ARE MADE IN THE DOWNTOWN AREA, AND TWICE WEEKLY IN RESIDENTIAL SECTIONS. THE COST OF COLLECTION AND DELIVERY TO THE DISPOSAL SITE AVERAGE $1.02/CU-YD. THE SITE RECEIVES 9,000 CU-YD OF REFUSE EACH MONTH. IT COSTS AN AVERAGE OF $0.17/CU-YD TO DISPOSE OF IT. TRENCHES 20 FEET WIDE AND 10 FEET DEEP ARE DUG. THE DOZER COMPACTS THE REFUSE AS IT IS RECEIVED. THE COMPACTED REFUSE IS COVERED WITH 3 FEET OF DIRT, THEREBY PROVIDING A RAMP FOR THE NEXT DAY'S OPERATION. (UC)

07-01-01083 MUNICIPAL REFUSE SANITATION PRACTICE IN TEXAS (SANITARY-LANDFILL)
THE AMERICAN CITY 69(5), P. 27 (1954). THERE ARE FOUR ARTICLES DEALING WITH THE REFUSE COLLECTION AND DISPOSAL IN THREE TEXAS CITIES, WACO, HUNTSVILLE AND LAKE JACKSON. THE FOURTH ARTICLE COVERS THE ATTITUDE THE TEXAS STATE DEPARTMENT OF HEALTH FEELS IT HAS IN KEEPING THE SMALLER CITIES AS WELL AS THE LARGER CITIES INFORMED IN MODERN SANITATION METHODS, PRACTICES AND ECONOMICS.

07-01-01097 A REPORT FROM TWO MIDWESTERN CITIES (SANITARY-LANDFILL)
THE AMERICAN CITY 69(9), P. 114-115 (SEPTEMBER 1954). HUTCHINSON, KANSAS, DEVELOPED AN INNOVATION IN THE RAMP METHOD OF SANITARY LANDFILL, WHILE LANSING, MICHIGAN, WAS FORCED BY PUBLIC PRESSURE TO BUILD A FILL. HUTCHINSON TOOK OUT THE WASTE MOTION IN ITS LANDFILL OPERATION BY BUILDING A RAMP-TYPE FILL THROUGH THE DEVELOPMENT OF A SPECIALLY BUILT BLADE. THE TRACTOR LEVELS THE REFUSE WHEN IN FORWARD MOTION AND PUSHES DIRT WHEN IN REVERSE. THE BLADE IS A STANDARD 18-INCH RIPPER INSTALLED ON THE REAR OF A TRACTOR. HUTCHINSON HAS BEEN USING THE SANITARY FILL METHOD AS A FEATURE OF ITS SERVICE SINCE 1944. ONE DOLLAR PER HOUSEHOLD PER MONTH DEFRAYS THE COSTS OF OPERATION. THE CITY HAS RECLAIMED MORE THAN 45 ACRES OF WASTELAND AND WAS WORKING ON A 50-ACRE SITE AT THE TIME OF THIS ARTICLE. THE FILL RECEIVES APPROXIMATELY 150 TONS OF REFUSE PER DAY AND WILL RAISE THE FINAL LEVEL OF THE LAND BY 13 FEET. LANSING WAS PRACTICALLY FORCED TO ADOPT THE SANITARY FILL METHOD OF DISPOSAL BECAUSE OF THE PUBLIC UPROAR AT THE OPEN DUMPS RUN BY THE CITY AND A FEW PRIVATE ENTREPRENEURS IN THE CITY. SINCE 1952 THE CITY HAS OPERATED THE FILL, AND BY 1954 HAD RECLAIMED 110 ACRES WITH THE REFUSE FROM 93,000 RESIDENTS. TRENCHES ARE USED WHICH ARE 100-FT LONG, 30 TO 40-FT WIDE AND 6-FT DEEP. REFUSE CONSISTS ONLY OF RUBBISH AND MANUFACTURERS' WASTES. GARBAGE IS COLLECTED BY THE CITY AND GROUND AND DISPOSED OF WITH THE SEWAGE SLUDGE. (UC)

07-01-01099 BADLANDS BECOME GOOD NEIGHBORS (RECLAMATION(LAND) SANITARY-LANDFILL)
THE AMERICAN CITY 69(13), (OCTOBER 1954). TWO CITIES IN THE CENTRAL UNITED STATES HAVE BEEN ABLE TO CONVERT NUISANCE LANDS INTO GOOD USABLE LAND. MADISON, WISCONSIN, BEGAN TO USE THE SANITARY LANDFILL AS A MEANS OF REFUSE DISPOSAL WHEN WISCONSIN PASSED A LAW PROHIBITING THE USE OF GARBAGE FOR FEEDING HOGS. THE CITY USES 57 ACRES OF TAX-DELINQUENT LAND ADJACENT TO AN EXISTING HIGH SCHOOL FOR ITS DISPOSAL SITE. AN ALLIS-CHALMERS HD-5G CRAWLER TRACTOR WITH A 1-YARD FRONT-END SHOVEL IS USED TO DO THE WORK. THE UNIT DIGS THE TRENCHES AND COMPACTS THE GARBAGE, COVERING IT WITH A TWO-FOOT LAYER OF GRAVEL PURCHASED AND DELIVERED TO THE SITE. SEMINOLE, OKLAHOMA USED LAND ON THE OUTSKIRTS OF THE CITY FOR A LAND-RECLAMATION SANITARY LANDFILL SITE. THE LAND WAS BADLY GULLIED AND WAS DECREASING IN VALUE PRIOR TO THE INITIATION OF THE REHABILITATION PROGRAM. REFUSE TRUCKS DELIVER THE TRASH TO CONVENIENT POINTS AT THE HEAD OF THE GULLY. A BULLDOZER IS USED IN COMPACTING THE REFUSE AND IN COVERING THE REFUSE WITH SOIL REMOVED IN EXCAVATING THE TRENCH FOR THE NEXT DAY'S FILL. THE CITY PLANS TO PUT THE COMPLETED LAND TO USE AS PASTURE IN ORDER TO PREVENT ANY FURTHER SOIL EROSION. (UC)

07-01-01104 A SANITARY FILL BUILT INTO AN OPEN DUMP (SANITARY-LANDFILL RECLAMATION(OPEN-DUMP))
THE AMERICAN CITY 59(12), P. 159 (DECEMBER 1954). A BRIEF REPORT OF HOW WARREN TOWNSHIP, MICHIGAN, SUCCESSFULLY UTILIZED A 10-YR OLD DUMP AS A SANITARY LANDFILL SITE. (PHS)

07-01-01107 ALMOST EVERYBODY WANTED BETTER REFUSE SANITATION (SANITARY-LANDFILL)
THE AMERICAN CITY 59(12), P. 71 (DECEMBER 1954). SALISAW, OKLA., GETS BACKING OF CIVIC LEADERS TO REPLACE OPEN DUMPS WITH A TRENCH-TYPE SANITARY FILL. (PHS)

07-01-01111 SANITARY FILL ROUNDUP (SANITARY-LANDFILL QUANTITY)
THE AMERICAN CITY 69(11), P. 94-95 (1954). AN EXTENSIVE TABULAR SUMMARY OF SIGNIFICANT OPERATING DETAILS IN 138 ACTIVE SANITARY FILLS THROUGHOUT THE COUNTRY. SOME DETAILS COVERED ARE THE POPULATION SERVED, VOLUME HANDLED, TYPE OF TRENCH, LAYER DEPTH, TYPE OF SOIL, EQUIPMENT USED, OPERATING CREWS, SOME REMARKS ABOUT LENGTH OF OPERATIONS.

07-01-01114 SANITARY LANDFILL (VECTOR PEST RECLAMATION(LAND) COST(OPERATING) COST(COLLECTION) SITE-SELECTION)
AM SOC CIVIL ENGRS, HEADQUARTERS OF THE SOC, NEW YORK, MANUAL OF ENGINEERING PRACTICE 39, (1959). A SUMMARY IS GIVEN OF THE PRINCIPLES OF THE SANITARY LANDFILL METHOD. A GUIDE TO PROPER PLANNING AND OPERATION IS INCLUDED. THE SUBJECTS TREATED IN THE MANUAL ARE PRELIMINARY CONSIDERATIONS IN SELECTING SITE, METHODS OF OPERATION, SPECIAL OPERATIONAL CONSIDERATION, EQUIPMENT, PUBLIC HEALTH AND NUISANCE CONSIDERATIONS, DISPOSITION AND USE OF FILLED SITE, COST DATA, AND ADMINISTRATION OF OPERATION. (UC)

07-01-01149 SANITARY LANDFILL (RESEARCH-NEEDS)
BLACK, R. J.
PROC OF THE NATIONAL CONF ON SOLID WASTE RESEARCH, AM PUBLIC WORKS ASSOC, CHICAGO, ILLINOIS, P. 120-127 (DECEMBER 1963). THE CURRENT STATE OF THE ART IS SUMMARIZED. CURRENT RESEARCH AND RESEARCH NEEDS ARE REFERENCED.

07-01-01184 SANITARY FILLS ARE THE ANSWER (SANITARY-LANDFILL COMPOSITION ANIMAL-FEED)
MARTIN, D.
THE AMERICAN CITY 68(11), P. 112-113, 179 (1953). OVER THE YEARS ST. LOUIS COUNTY, MO., HAS BEEN PLEASED TO DUMP THEIR REFUSE IN OPEN DUMPS, RAVINES, ROCK QUARRIES. ORDINANCES HAVE BEEN ENACTED TO CONTROL THE DISPOSAL OF REFUSE FOR HEALTH HAZARDS, NUISANCES AND FLY AND RODENT CONTROLS. A CONSULTING ENGINEERING GROUP HAS BEEN ENGAGED TO EVALUATE THE PRESENT AND FUTURE NEEDS OF THE COUNTY. PRESENT DISPOSAL RATES ARE 1,038 TONS PER DAY AND EXPECTS TO REACH 1,590 TONS PER DAY BY 1973. BASED ON PRESENT GROWTH RATE AND POTENTIAL GROWTH RATES IN THE FUTURE IT IS EXPECTED THAT 550 ACRES WILL BE NEEDED IN THE NEXT 20 YEARS. IT IS FURTHER ESTIMATED THE COST OF INITIATING A 20 YEAR PLAN FOR LANDFILL WILL BE $850,000. ON THE BASIS OF PRESENT LIVING COSTS FOR OPERATING A SANITARY LANDFILL, INCLUDING AMORTIZATION OF FIRST COSTS TO BE ABOUT $350,000 YEAR, AS COMPARED TO $650,000 FOR INCINERATION. IT IS RECOMMENDED THAT THE ENTIRE AMOUNT OF LAND TO SUPPORT A 20 YEAR LANDFILL OPERATION BE PURCHASED AT ONE TIME AND THAT THE EQUIPMENT BE PURCHASED TO COVER A FIVE YEAR PERIOD. THERE IS A TABLE GIVING THE CONTENTS OF THE WASTE AT THE TIME OF THE STUDY.

07-01-01185 GO HEAVY ON COMPACTION (SANITARY-LANDFILL)
THE AMERICAN CITY 68(12), P. 88 (DECEMBER 1953). IN DALLAS, TEXAS AND MEMPHIS, TENNESSEE THE SIZE OF THE EQUIPMENT HAS BEEN INCREASED. THE RESULT IS THAT THE SANITARY LANDFILL SITES NOW HAVE MUCH GREATER COMPACTION THAN THOSE IN OTHER SITES WHERE SMALLER EQUIPMENT IS USED. SEVEN SITES ARE OPERATED IN MEMPHIS, TENNESSEE FOR THE DISPOSAL OF THE REFUSE GENERATED BY ITS 450,000 PEOPLE. ALMOST 600,000 TONS OF MIXED REFUSE ARE DISPOSED OF EACH YEAR. THE AREA OF THE FILL MAY VARY FROM 5 TO 150 ACRES, DEPENDING ON THE SITE. THE LAYERS VARY FROM 20 TO 90 FEET IN DEPTH. EVERY FILL IS COVERED AT NIGHT. THE FINAL EARTH COVER IS AT LEAST 18 INCHES DEEP. THE SITES HAVE BEEN IN OPERATION FOR 15 YEARS. IT HAS BEEN FOUND THAT THE MOST IMPORTANT FACTOR IN BUILDING A GOOD FILL IS COMPACTION. EACH DAY THE REFUSE IS PACKED AND COVERED WITH HEAVY EQUIPMENT. SETTLEMENT HAS BEEN LESS THAN 6 INCHES IN TEN YEARS. THE COMPACTED FILLS HAVE BEEN USED FOR BALL FIELDS, PARKS, ROADWAYS, AND EVEN FOR HOMES. DALLAS HAS FOLLOWED A POLICY OF REPLACING SMALL EQUIPMENT WITH LARGER AND MORE MOBILE EARTH MOVING EQUIPMENT. THE REFUSE IS SEALED OFF EACH DAY WITH ABOUT 4 INCHES OF DIRT, AND TOPPED OFF WITH AN 18 INCH TO 24 INCH THICK LAYER WHEN THE FILL IS COMPLETED. THE LAND IS USED FOR PARKS, PLAYGROUNDS, HOUSING DEVELOPMENTS, AND COMMERCIAL PROJECTS. FIVE SITES ARE IN OPERATION SIMULTANEOUSLY. THE TRENCH, RAMP, OR AREA FILL IS USED AS NEEDED. THE INDIVIDUAL FILLS VARY FROM 4 TO 20 ACRES IN SIZE. REFUSE IS CONTRIBUTED BY 500,000 PERSONS. THE FILLS RECEIVE 250,000 TONS OF REFUSE FROM THE CITY AND 100,000 TONS OF COMMERCIAL REFUSE ANNUALLY. (UC)

07-01-01186 DAYTON BURIES NON-BURNABLES (SANITARY-LANDFILL)
THE AMERICAN CITY 73(4), P. 29 (APRIL 1958). DAYTON, OHIO, OPERATES THREE SANITARY LANDFILLS FOR THE DISPOSAL OF NONBURNABLE MATERIAL SUCH AS GLASS, CANS, AND ASH. SERVING A POPULATION OF 283,000, APPROXIMATELY 550 CU YD OF FILL PER DAY ARE REQUIRED FOR THE DISPOSAL OF THE NONBURNABLE OBJECTS. MATERIALS TO BE USED IN THE FILL ARE COLLECTED EVERY TWO WEEKS BY THE MUNICIPAL SANITATION DEPARTMENT. (UC)

07-01-01187 IT MADE A BIG DIFFERENCE (SANITARY-LANDFILL)
THE AMERICAN CITY 73(1), P. 107 (JANUARY 1958). PEOPLE IN MITCHELL, SOUTH DAKOTA, ARE GRADUALLY BECOMING ACCUSTOMED TO THE NEW SANITARY LANDFILL DISPOSAL SITE THAT REPLACED THE OLD OPEN DUMP. FIRES IN THE OLD, CANCEROUS DUMP HAVE BEEN SNUFFED OUT AND THE FORMERLY ABUNDANT POPULATION OF FLIES AND RATS HAS BEEN ELIMINATED. MITCHELL NOW HAS A HOUSING DEVELOPMENT WITHIN TWO BLOCKS OF THE LANDFILL SITE. THE LANDFILL SITE IS 35 ACRES IN EXTENT. THE CITY IS NOW DEPOSITING ITS SECOND LAYER OF FILL AT THE SITE. AS YET NO SETTLING PROBLEMS HAVE BEEN ENCOUNTERED. WITH DEPOSITION OF THE TWO LAYERS, THE LEVEL OF THE LAND HAS BEEN RAISED 35 FEET. (UC)

07-01-01199 BURY GARBAGE ACCORDING TO PLAN (SANITARY-LANDFILL RECLAMATION(LAND) COST(OPERATING))
CARPENTER, J. M. + DOVE, L. A.
THE AMERICAN CITY 73(6), P. 92 (JUNE 1958). AMES, IOWA, IS CONDUCTING SANITARY LANDFILL OPERATIONS ON A SITE BEING DEVELOPED FOR FUTURE INDUSTRIAL USE. THE DEVELOPMENT PLANS ARE OUTLINED, OPERATIONAL COSTS GIVEN, WITH THE POINT MADE THAT WHILE THE LANDFILL CANNOT BE NOTED FOR LOW COST IN OPERATION, THE FACT OF POSSIBLE LAND VALUE IN THE FUTURE, THE NEATNESS OF THE AREA, AND THE LACK OF RODENTS AND VERMIN JUSTIFY THE EXPENDITURES. (PHS)

07-01-01204 HOW TO GET GOOD COMPACTION IN A SANITARY FILL (SANITARY-LANDFILL COMPACTION)
THE AMERICAN CITY 73(12), P. 36 (DECEMBER 1958). THE MORE TIMES THAT REFUSE IN A LANDFILL IS PUSHED AND RUN OVER, THE GREATER THE DEGREE OF COMPACTION. THE THINNER THE LAYER MAINTAINS A CONSTANT PRESSURE. MOISTURE SOFTENS THE REFUSE AND DESTROYS ITS RESILIENCY, CONSEQUENTLY A FILL STARTED IN A DRY SEASON WILL SHRINK DURING A WET SEASON. (UC)

07-01-01208 SANITARY FILL WAS A CAMPAIGN PROMISE (SANITARY-LANDFILL)
MCBRIDE, J. H.
THE AMERICAN CITY 73(11), P. 38 (NOVEMBER 1958). IN BELZANI, MISSISSIPPI, A SANITARY LANDFILL REPLACED A RODENT-INFESTED DUMP AS A RESULT OF MCBRIDE'S CAMPAIGN PROMISE AND HIS LATER ELECTION. BRIEF SKETCH OF ITS OPERATION GIVEN. (PHS)

07-01-01209 JOINT PROGRAM SOLVES REFUSE DISPOSAL PROBLEM (SANITARY-LANDFILL VECTOR(CONTROL))
EDLEFSEN, R. E. + HUNT, J. W. + OLSON, R. P.
THE AMERICAN CITY 73(8), P. 161 (AUGUST 1958). A VECTOR CONTROL DEMONSTRATION PROJECT, AS A COOPERATIVE PROGRAM BETWEEN THE CITY-COUNTY HEALTH DEPARTMENT (BOISE-ADA COUNTY), IDAHO STATE BOARD OF HEALTH, AND THE U.S. PUBLIC HEALTH SERVICE, COMMUNICABLE DISEASE CENTER, WAS STARTED IN 1955. AS A RESULT OF THE NECESSITY FOR ABANDONMENT OF THE OPEN DUMP, A SANITARY LANDFILL OPERATION WAS ADOPTED AND HAS PROVED A SUCCESSFUL, COOPERATIVE UNDERTAKING. (PHS)

07-01-01214 SANITARY LANDFILL PROVES FINANCIALLY BEST
ANDEREGG, P. A.
THE AMERICAN CITY 73(7), P. 159 (JULY 1958). THE ESTABLISHMENT OF A SANITARY LANDFILL FOR GARBAGE DISPOSAL IN WYOMING, OHIO, HAS PROVED ECONOMICAL AND HAS ELIMINATED SMOKE AND RATS THERE. THE DETAILS OF THE HIGHLY SUCCESSFUL METHOD OF COLLECTION AND DISPOSAL ARE GIVEN. (PHS)

07-01-01216 MONTGOMERY'S MULTI-DUMP LANDFILL PROGRAM (SANITARY-LANDFILL COLLECTION VECTOR(CONTROL))
GREEN, L. B.
THE AMERICAN CITY 73(9), P. 118 (SEPTEMBER 1958). SEVERAL CLASSIFIED SITES IN MONTGOMERY ARE MAKING POSSIBLE AN ECONOMICAL AND CONVENIENT MEANS OF DISPOSAL FOR GARBAGE AND REFUSE AT NO DIRECT COST TO THE CITIZENS OR BUSINESS FIRMS. THE DETAILS OF THE CITY'S PROGRAM ARE OUTLINED. (PHS)

07-01-01232 NEW PROBLEMS AND TECHNIQUES IN CONTROLLED TIPPING
OATES, E. T.
SURVEYOR 121(3667), P. 1141-1143 (SEPTEMBER 15, 1962). CONTROLLED TIPPING AND COMPOSTING OF REFUSE DISCUSSED. EFFECT OF CHANGE IN NATURE OF REFUSE, MECHANIZATION AND SHORTAGE OF COVERING MATERIAL. TREATMENT OF EXPOSED TIP FACE. EXPERIENCES OF WORTHING RURAL DISTRICT IN SOLVING THESE PROBLEMS ARE REPORTED. BEFORE ANNUAL CONF OF ASSOC OF PUBLIC HEALTH INSPECTORS, SOUTHPORT, SEPTEMBER 1962. (EI)

07-01-01238 SPRINGFIELD, MO. TAKES OVER GARBAGE COLLECTION (SANITARY-LANDFILL)
HEDGES, B.
THE AMERICAN CITY 73(11), P. 189 (NOVEMBER 1958). THE CITY OF SPRINGFIELD FOUND IT NECESSARY TO ADOPT SANITARY LANDFILL METHOD OF GARBAGE DISPOSAL AS OBJECTIONS AROSE TO OPEN DUMP AND AS HOG FEEDING OF GARBAGE DECREASED. THE DETAILS OF THE SYSTEM, COSTING APPROXIMATELY $100,000 ANNUALLY, ARE GIVEN. (PHS)

07-01-01267 CHICAGO LANDFILL (COST(OPERATING) SANITARY-LANDFILL)
FRENCH, A. C.
PUBLIC CLEANSING 56(2), P. 623-624 (1966). ONE OF FOUR LANDFILL OPERATIONS OPERATED BY PRIVATE CONTRACTORS IS DESCRIBED. THE SITE IS 160 ACRES WHICH HAVE ABOUT A 20-YEAR LIFE. AN AREA 200 FT WIDE BY 6 TO 7 FT DEEP IS COVERED EACH DAY. WHEN THE LANDFILL IS COMPLETED IT IS TO BE USED AS A GOLF COURSE FOR ABOUT 50 YEARS THEN IT WILL BE DEVELOPED AS A CEMETERY. BELOW ARE SOME COSTS FOR DUMPING AT THE LANDFILL. (1) PRICE FOR DUMPING IS 40 CENTS PER CU-YD, (2) MINIMUM CHARGE IS $2.00 PER LOAD (ALLOWED TO DUMP UP TO FIVE CU-YDS).

07-01-01319 SANITARY LANDFILL HAS MANY BENEFITS (SITE-SELECTION POLLUTION(WATER))
CAN MUNICIPAL UTILITIES 99(9), P. 23-31, 44-46, 48, 50-51 (SEPTEMBER 1961). PAPER DEFINES TRUE SANITARY LANDFILL AS ONE WHERE REFUSE IS COMPACTED AND COVERED WITH MINIMUM OF 6 IN. OF COMPACTED EARTH DAILY. DISCUSSION OF ADVANTAGES SHOWING THAT CANADIAN MUNICIPALITIES CAN BENEFIT FROM SANITARY LANDFILL OPERATIONS. SITE SELECTION, EQUIPMENT NEEDED FOR PROPER SANITARY LANDFILL OPERATION, TRENCH, AREA, AND RAMP-METHODS OF MAKING FILLS, ASPECTS OF SURFACE WATER AND AQUIFER POLLUTION BY LANDFILLS, DATA ON FILLS WHICH CREATED NEW PARKS IN TORONTO. (EI)

07-01-01330 THE SANITARY FILL COMES FIRST (SANITARY-LANDFILL OPEN-DUMP)
ADAMS, B.
THE AMERICAN CITY 68(4), P. 83-84 (1953). CHEYENNE, WYOMING OPEN DUMP BECAME A NUISANCE FROM FIRES, RATS, SCATTERED TIN CANS, AND BLOWING PAPERS. THE POPULATION BECAME OUTRAGED WITH THE METHOD AND VOTED A NEW SLATE OF CITY OFFICIALS. THESE OFFICIALS WERE DEDICATED TO IMPROVE THE REFUSE DISPOSAL PROBLEM. WITH A MINIMUM OF EXPENSE, THE OPEN DUMP WAS CONVERTED INTO A CONTROLLED SANITARY LANDFILL.

07-01-01336 SANITARY FILL NEEDED - NOW
THE AMERICAN CITY 68(2), P. 92 (1953). AN UNCONTROLLED FIRE IN AN OPEN DUMP AT NEWBURGH, N.Y. CONVINCED THE CITY OFFICIALS THAT THERE MUST BE A BETTER WAY OF DISPOSING THEIR REFUSE. AS A RESULT THE CITY WENT TO CONTROLLED SANITARY LANDFILL.

07-01-01340 APPLIED MUNICIPAL GEOMETRY PAYS OFF (SANITARY-LANDFILL)
THE AMERICAN CITY 68(1), P. 5 (1953). UNTIL 1953 THE CITY OF TUCSON, ARIZONA, SHARED A LANDFILL OPERATION WITH THE COUNTY. IN A REVIEW OF THE REFUSE DISPOSAL SYSTEMS BY THE CITY MANAGER, IT WAS DECIDED CONSIDERABLE SAVINGS COULD BE MADE BY DEVELOPING A LANDFILL OPERATION WITHIN THE CITY. THEN BY OVERHAULING THE COLLECTION SYSTEM THERE WAS EVEN A MORE CONSIDERABLE SAVING. HAULING MILEAGE HAS BEEN REDUCED BY 17 PERCENT, COLLECTIONS HAVE BEEN REDUCED BY 14 PERCENT, WITH AN OVERALL SAVINGS OF $30,000/YEAR.

07-01-01349 SANITARY FILL REPAIRS FLOOD EROSION (SANITARY-LANDFILL RECLAMATION(LAND) COLLECTION)
POWERS, R. O.
THE AMERICAN CITY 68(6), P. 92-94 (1953). PRIOR TO THIS SAN BERNARDINO, CALIF., OPERATED AN OPEN DUMP REFUSE DISPOSAL OPERATION. AFTER THE SANTA ANA RIVER FLOODED AND CHANGED ITS COURSE THE SANITATION DEPARTMENT MOVED ITS DISPOSAL OPERATION INTO THE FLOODED AREA AND STARTED A CONTROLLED SANITARY LANDFILL OPERATION. THE WASTE LAND IS BEING RECLAIMED, THE FORMER PROBLEMS OF SMOKE, ODORS, BLOWING TRASH AND MOSQUITOES HAVE BEEN ELIMINATED.

07-01-01358 SANITARY FILL - HOW IT OPERATES - PART I (SANITARY-LANDFILL COST(OPERATION))
THE AMERICAN CITY 76(2), PART 1, P. 84-87 (FEBRUARY 1961). SUMMARY OF OPERATING DETAILS AND OTHER PERTINENT DATA ON ACTIVE SANITARY FILLS THROUGHOUT COUNTRY. PERFORMANCE OF REFUSE IN FILL. PROCESS OF DECOMPOSITION AND EQUIPMENT USED IN FILL OPERATIONS. TRENCH, AREA AND RAMP METHODS OF FILL EVALUATED. (EI)

07-01-01359 SANITARY FILL - HOW IT OPERATES (SANITARY-LANDFILL DECOMPOSITION(PRODUCTS) COST(OPERATING)
RECLAMATION(LAND)
THE AMERICAN CITY 76(3), P. 98-103, PART I, (MARCH 1961). SUMMARY OF OPERATING DETAILS AND OTHER PERTINENT DATA ON ACTIVE SANITARY FILLS THROUGHOUT COUNTRY. PERFORMANCE OF REFUSE IN FILL, PROCESS OF DECOMPOSITION AND EQUIPMENT USED IN FILL OPERATIONS, TRENCH, AREA, AND RAMP METHODS OF FILL EVALUATED. (EI)

07-01-01360 THE SANITARY LANDFILL - HOW IT OPERATES (SANITARY-LANDFILL COST(OPERATING))
THE AMERICAN CITY 76(4), P. 84-88, PART III, (APRIL 1961). SUMMARY OF OPERATING DETAILS AND OTHER PERTINENT DATA ON ACTIVE SANITARY FILLS THROUGHOUT COUNTRY, PERFORMANCE OF REFUSE IN FILL. PROCESS OF DECOMPOSITION AND EQUIPMENT USED IN FILL OPERATIONS, TRENCH, AREA, AND RAMP METHODS OF FILL EVALUATED. (EI)

07-01-01364 MOSES LAKE GETS RID OF ITS OPEN DUMP (SANITARY-LANDFILL)
RECTOR, R. C.
THE AMERICAN CITY 72(12), P. 94 (DECEMBER 1957). MOSES LAKE, WASHINGTON, HAD AN OPEN DUMP FOR TWENTY YEARS. THE DUMP WAS A CONSTANT SOURCE OF AIR POLLUTION, RAT INFESTATION, AND GENERAL NUISANCE. THE CITY COUNCIL DECIDED TO STUDY THE MATTER. AS A RESULT IT PURCHASED 40 ACRES OF LAND FOUR MILES FROM THE CENTER OF THE CITY. THIS LAND WAS USED FOR SANITARY LANDFILL PURPOSES ONLY. THE POPULATION OF 11,495 HAD 3,028 RESIDENCES WHICH REQUIRED WEEKLY GARBAGE COLLECTION, AND 303 COMMERCIAL ACCOUNTS WHICH NEEDED SIX COLLECTIONS PER WEEK. THE CONTRACTOR WHO RUNS THE DUMP MUST DISPOSE OF THE REFUSE BY SANITARY LANDFILL METHODS. FILL CELLS ARE NOT TO EXCEED 52 SQ FEET IN AREA AND 6 FT IN DEPTH. THE FINAL COVER MUST BE AT LEAST 2 FEET DEEP, AND ALL GARBAGE AND REFUSE MUST BE COVERED AT THE END OF THE DAY. THE CITY BILLS ALL CUSTOMERS AT THE END OF THE MONTH ALONG WITH THE WATER BILLS. THE CONTRACTOR COLLECTS ALL DUMPING FEES FROM REFUSE HAULED PRIVATELY BY CITIZENS TO THE DUMP. ALL CITIZENS IN THE CITY MUST SUBSCRIBE TO THE SERVICE, AND THOSE OUTSIDE THE CITY MAY DO SO, PROVIDING THEY PAY THE PRESCRIBED DUMPING FEES. (UC)

07-01-01365 SEATTLE'S REFUSE DISPOSAL REFORMATION (SANITARY-LANDFILL RECLAMATION(LAND))
DUNN, W. L.
THE AMERICAN CITY 72(3), P. 110 (MARCH 1957). SINCE JUNE 1956 THE CITY OF SEATTLE HAS COMPACTED ITS DOMESTIC REFUSE AND COMPLETELY COVERED IT AT THE END OF EACH DAY'S OPERATION AT THE UNION BAY SITE. THIS IS A 70-ACRE SWAMP AT THE NORTH END OF LAKE WASHINGTON, ADJACENT TO THE CAMPUS OF THE UNIVERSITY OF WASHINGTON. THE CITY DISPOSES ABOUT 1/3 OF ITS WASTES AT THIS SITE. ABOUT 25 COLLECTION TRUCKS DELIVER 125 LOADS OF DOMESTIC REFUSE MONDAY THROUGH FRIDAY. LOADS ARE DUMPED AT THE TOE OF THE SLOPE AND COVER DIRT IS DEPOSITED AT THE TOP. REFUSE DISPOSAL AT THE UNION BAY SITE IS MOST DESIRABLE BECAUSE IT PROVIDES A CONVENIENT AND ECONOMIC PLACE FOR THE DISPOSAL OF MUCH OF SEATTLE'S WASTES, AND BY IT IS RECLAIMED MUCH NEEDED LAND FOR USE BY THE UNIVERSITY OF WASHINGTON. (UC)

07-01-01374 OPERATION OF THE REFUSE TIP OF ANGOULEME (SANITARY-LANDFILL COST(OPERATING) COMPOSTING)
FONTALIRAND, P.
L'EXPLOITATION DE LA DECHARGE DES ORDURES D'ANGOULEME. TECHNIQUES ET SCIENCES MUNICIPALES 59(3), P. 95-96 (MARCH 1964). REFUSE IS TIPPED FOR 1 YEAR, THEN DUG OUT AND SCREENED TO PRODUCE A FERTILIZER. (PHEA)

07-01-01384 HIGHLAND PARK LANDFILL (SANITARY-LANDFILL)
GIESER, F. E.
MUNICIPAL CONSTRUCTION 3(6), P. 82 (JUNE 1958). THE LANDFILL METHOD OF REFUSE DISPOSAL WAS INITIATED IN HIGHLAND PARK IN 1952. IT WAS STARTED BY COMPLETELY OVERHAULING THE PREVIOUS OPEN DUMP. IN THE NEW OPERATION, TRENCHES ARE DUG, FILLED WITH WASTES IN 6-FT LIFTS, AND EARTH IS SPREAD OVER EACH LIFT. THE TRENCHES ARE 15-FT DEEP. MORE THAN 13,000 CU YD OF REFUSE ARE DISPOSED OF EACH MONTH. THE COST IS $0.08 PER CU YD OF GARBAGE AND $0.15 PER CU YD OF RUBBISH. THE FILL IS BEING USED TO RECLAIM LOW-VALUE LAND. IT ALSO SERVES AS A SOURCE OF INCOME, INASMUCH AS NEARBY CITIES ARE ALLOWED TO USE IT ON A COST BASIS. (UC)

07-01-01403 CEDAR RAPIDS, IOWA, EXPORTS GOOD SANITATION (SANITARY-LANDFILL)
THE AMERICAN CITY 71(1), P. 110 (JANUARY 1956). A BRIEF DESCRIPTION OF THE DEVELOPMENT OF THE USE OF THE SANITARY LANDFILL AT CEDAR RAPIDS, IOWA. THE LANDFILL WAS USED AS A DEMONSTRATION SITE TO SHOW TRACTOR COMPANIES' SALES ENGINEERS FROM 34 OVERSEAS COUNTRIES HOW A CITY COULD BENEFIT FROM A GOOD SANITARY LANDFILL PROGRAM. (PHS)

07-01-01407 AN OOLITE--COVERED SANITARY FILL (SANITARY-LANDFILL)
THE AMERICAN CITY 71(2), P. 119 (FEBRUARY 1956). KEY WEST, FLORIDA OPERATES A SANITARY FILL AND OBTAINS COVER MATERIAL BY DREDGING "MIAMI OOLITE" OR "MARL" FROM THE OCEAN BOTTOM. THE OOLITE IS A SOFT ROCK EASILY PULVERIZED THAT CAN BE WORKED LIKE CLAY BUT BECOMES HARD AND DENSE WHEN COMPACTED. (PHS)

07-01-01409 THE SANITARY LANDFILL (VECTOR BULKY-WASTE)
WEAVER, L.
THE AMERICAN CITY 71(3), PART I, P. 123 (MARCH 1956). FIRST PART OF A THREE-PART SERIES ENCOMPASSING A COMPREHENSIVE REVIEW OF DESIGN, OPERATIONAL, AND ECONOMIC CRITERIA OF THE SANITARY LANDFILL METHOD. (PHS)

07-01-01412 THE SANITARY LANDFILL (LAND-REQUIREMENTS POLLUTION(WATER))
WEAVER, L.
THE AMERICAN CITY 71(4), PART II, P. 132 (APRIL 1956). SECOND PART OF A THREE-PART SERIES ENCOMPASSING A COMPREHENSIVE REVIEW OF DESIGN, OPERATIONAL, AND ECONOMIC CRITERIA OF THE SANITARY LANDFILL METHOD. (PHS)

07-01-01416 WE BURIED OUR COMPLAINTS WITH REFUSE (SANITARY-LANDFILL COST(OPERATING))
BOWMAN, K. L.
THE AMERICAN CITY 71(6), P. 150 (JUNE 1956). THE DEVELOPMENT OF A MODERN REFUSE COLLECTION AND DISPOSAL SYSTEM AT SHELBYVILLE, INDIANA IS DESCRIBED. HIT AND MISS COLLECTION WITH AN OPEN DUMP AND UNSANITARY METHODS OF FEEDING GARBAGE TO HOGS ARE REPLACED BY A PLANNED COLLECTION SYSTEM AND THE SANITARY LANDFILL METHOD OF DISPOSAL. INCLUDED IS A DESCRIPTION OF REGULATIONS PROMULGATED, A PUBLIC RELATIONS PROGRAM USE OF THE INCENTIVE SYSTEM AND A BREAKDOWN OF COSTS FROM 1951 - 1954 INCLUSIVE. (PHS)

07-01-01419 THE SANITARY LANDFILL (COMPACTION-EQUIPMENT ECONOMICS)
THE AMERICAN CITY 71(5), PART III, P. 134 (MAY 1956). PART THREE OF A THREE-PART SERIES ENCOMPASSING A COMPREHENSIVE REVIEW OF DESIGN, OPERATIONAL, AND ECONOMIC CRITERIA OF THE SANITARY LANDFILL METHOD. (PHS)

07-01-01437 PEAK REFUSE LOADS ARE NO PROBLEM (SANITARY-LANDFILL)
RICE, C. M.
THE AMERICAN CITY 71(10), P. 24 (OCTOBER 1956). BELLAIRE, TEXAS REPORTS THE ADOPTION OF A FLEXIBLE SANITARY LANDFILL PROGRAM TO COPE WITH THE REFUSE FROM A FAST GROWING POPULATION (18,000 TO 24,000 IN TWO YEARS). (PHS)

07-01-01441 KEEP THAT SANITARY LANDFILL SANITARY (ECONOMICS)
THE AMERICAN CITY 71(11), P. 130 (NOVEMBER 1956). THE AUTHOR DISCUSSES THE PROBLEM OF THE DETERIORATION OF SANITARY LANDFILL OPERATING METHODS IN MANY CITIES. FUNDAMENTALS TO THE PERFORMANCE OF AN ADEQUATE JOB ARE REVIEWED INCLUDING COMPETENT AND INTERESTED SUPERVISION, AN INFORMED PUBLIC, AND ADEQUATE EQUIPMENT. THE IMPORTANCE OF COST ACCOUNTING METHODS IS EMPHASIZED AND A REPRESENTATIVE COST PER TON IS REPORTED TO BE $0.54.

07-01-01443 SANITARY LANDFILL RECLAMATION (RECLAMATION(LAND))
THE AMERICAN CITY 71(12), P. 15 (DECEMBER 1956). THE SUCCESSFUL USE FOR TEN YEARS OF THE SANITARY LANDFILL METHOD OF REFUSE DISPOSAL AT AUSTIN, TEXAS, IS DESCRIBED. (PHS)

07-01-01453 SANTA BARBARA AWARDS 10-YEAR REFUSE SERVICE CONTRACT (COST(COLLECTION) SANITARY-LANDFILL COLLECTION)
HOPKINS, W. T.
THE AMERICAN CITY 72(8), P. 107 (AUGUST 1957). AFTER CONDUCTING A PUBLIC OPINION SURVEY, A SPECIAL COMMITTEE RECOMMENDED REFUSE COLLECTION AND DISPOSAL BY A PRIVATE CONTRACTOR FOR SANTA BARBARA, CALIFORNIA. AFFIRMATIVE QUESTIONNAIRE RESULTS INCLUDED A DESIRE FOR PICKUP SERVICE, TWICE WEEKLY COLLECTION, AND BANNING OF BACKYARD BURNERS. IN A DESCRIPTION OF THE ORDINANCE, AND A CONTRACT, IT IS STATED THAT ALL PERSONS SHALL SUBSCRIBE TO REGULAR COLLECTION, THE CONTRACTOR IS CONTROLLED BY THE MUNICIPALITY (INCLUDING PERSONNEL). DISPOSAL IS BY SANITARY LANDFILL WHICH IS RESTRICTED BY THE CITY CONCERNING THE SITE AND SCAVENGING RIGHTS. A TABLE ON RATE STRUCTURE IS INCLUDED FOR RESIDENTIAL SPECIAL HAUL AND COMMERCIAL CUSTOMERS. MINIMUM RESIDENTIAL RATE IS $1.75 PER DWELLING UNIT PER MONTH. (PHS)

07-01-01460 BURBANK, CALIFORNIA, FILLS CANYON TO GAIN NEEDED LAND (RECLAMATION(LAND) SANITARY-LANDFILL QUANTITY COLLECTION-EQUIPMENT)
PAIGE, C. W.
THE AMERICAN CITY 72(5E, P. 144 (MAY 1957). A CANYON LOCATED LESS THAN 2 MILES FROM THE CENTER OF BURBANK, CALIFORNIA, AFFORDS A LARGE CONCEALED SITE FOR SANITARY LANDFILL OPERATIONS. THE LAND ADJACENT TO A PARK AND OPEN AIR THEATER IS BEING RECLAIMED FOR USE AS A VITALLY NEEDED PARKING AREA. (PHS)

07-01-01461 SANITARY LANDFILL EXTRA BENEFITS (RECLAMATION(LAND) SALVAGE COST(OPERATING))
FAGERLIND, C. C.
THE AMERICAN CITY 72(5), P. 122 (MAY 1957). WATERLOO, IOWA HAS COMBINED SANITARY LANDFILL OPERATIONS WITH FLOOD PROTECTION WORK, ISLAND REMOVAL, AND LAND RECLAMATION PROTECT THE CITY, RAISE PROPERTY VALUES, AND CREATE NEW INDUSTRIAL SITES. THE PROCEDURE AND EQUIPMENT USED ARE DESCRIBED. (PHS)

07-01-01467 SANITARY LANDFILL BY CONTRACT
GREENE, H. P.
THE AMERICAN CITY 72(3), P. 134 (MARCH 1957). BLOOMINGTON, ILLINOIS HAS CONVERTED A LARGE OPEN DUMP TO A SANITARY LANDFILL BECAUSE SEVERAL INJUNCTIONS WERE RECEIVED DUE TO THE RATS, SMOKE, FIRE, AND ODOR AT THE DUMP. FOR LACK OF LARGE EARTHMOVING EQUIPMENT, A CONTRACTOR WAS HIRED TO CLEAN UP THE DUMP AND TO OPERATE THE SANITARY LANDFILL AT A COST OF $17,500 FOR THE FIRST YEAR OF OPERATION. THE RAT POPULATION WAS DEPLETED BY USING POISON MIXED WITH CHOPPED FISH AND BREAD AND 4 KILLS OVER A 60-DAY PERIOD DID THE JOB. THE SOLUTION TO THE FILLING OF A GRAVEL PIT IS INCLUDED. (PHS)

07-01-01469 THE LAREDO STORY OF SANITATION PROGRESS (VECTOR PEST SANITARY-LANDFILL COLLECTION RECLAMATION(LAND))
MARTIN, J. C. + HAMMERSTROM, R. J. + WALDROP, R. H.
THE AMERICAN CITY 72(2), P. 116 (FEBRUARY 1957). THE STORY OF HOW LAREDO, TEXAS INITIATED A WELL PLANNED PROGRAM, EMPLOYED TRAINED PERSONNEL, AND USED STRONG PUBLIC SUPPORT TO OVERCOME MUNICIPAL VECTOR CONTROL PROBLEMS. THIS WAS A

DEMONSTRATION PROJECT WHICH INVOLVED FOUR PRINCIPAL STEPS. (1) ORGANIZATION AND SANITARY SURVEY, (2) REFUSE COLLECTION AND DISPOSAL, (3) IMPROVED SEWERAGE SERVICES AND (4) SUPPLEMENTARY RODENT CONTROL. THE PROJECT WAS A COOPERATIVE DEMONSTRATION WITH THE TEXAS STATE DEPARTMENT OF PUBLIC HEALTH AND THE U.S. PUBLIC HEALTH SERVICE. (PHS)

07-01-01474 THE SANITARY LANDFILL METHOD OF REFUSE DISPOSAL IN NORTHERN STATES (SITE-SELECTION COST(OPERATING) VECTOR PEST)
WEAVER, L. + KEAGY, D. M.
U.S. PUBLIC HEALTH SERVICE PUB 226, (1952). THIS IS A REPORT OF THE STUDIES UNDERTAKEN BY THE NORTH DAKOTA STATE HEALTH DEPARTMENT, IN COOPERATION WITH THE CITY OF MANDEN, NORTH-DAKOTA, AND THE U.S. PUBLIC HEALTH SERVICE. THE REPORT IS OF SPECIAL INTEREST TO NORTHERN COMMUNITIES EXPOSED TO SEVERE WINTERS, INASMUCH AS THE CITY OF MANDEN WAS ABLE TO CARRY ON ITS LANDFILL OPERATIONS AT TWO DIFFERENT SITES FOR TWO YEARS WITHOUT ENCOUNTERING ANY PROBLEMS, EVEN THOUGH THE TEMPERATURE DROPPED TO -44 DEGREES F AT TIMES. ONE OF THE SITES WAS ABOUT ONE MILE OUTSIDE THE CITY. THE TRENCH METHOD WAS USED. WINDBLOWN PAPER PROVED TO BE A NUISANCE. IT COULD HAVE BEEN ELIMINATED BY SURROUNDING THE DISPOSAL SITE WITH A STRONG WIRE FENCE FROM 10 TO 12 FEET HIGH. THE EXTENT OF COMPACTION OF THE REFUSE DEPOSITED DURING THE WINTER MONTHS WAS GREATER THAN THAT BURIED DURING THE REMAINDER OF THE YEAR. (UC)

07-01-01496 SANITARY LANDFILLS SERVING CALIFORNIA COMMUNITIES IN 1957 (COST(OPERATING) COST(CAPITAL) OPERATION)
BLACK, R. J.
CALIFORNIA VECTOR VIEWS 5(5), P. 27 (MAY 1958). THE REPORT CONCERNS 51 SANITARY LANDFILL SITES IN CALIFORNIA. IT CONTAINS FOUR PAGES OF CHARTS, LISTING 21 DIFFERENT ASPECTS OF EACH OF THE LANDFILL SITES. OF THE 51 SITES, 21 WERE AREA-FILLS, 19 WERE CUT-AND-FILLS, SEVEN WERE AREA-FILLS UTILIZING MOVING RAMPS, 1 WAS OF THE MOVING-RAMP FILL TYPE, AND 1 WAS A COMBINED OPERATION - USING THE AREA METHOD FOR RUBBISH DISPOSAL, AND THE CUT-AND-FILL METHOD FOR MIXED REFUSE. SOME OF THE SITES WERE RUN BY PUBLIC AGENCIES, SOME BY SANITATION DISTRICTS, AND SOME BY PRIVATE CONTRACTORS. CHARTS GIVE A VERY COMPLETE PICTURE OF EACH OF THE SANITARY LANDFILL SITES IN THE STATE. (UC)

07-01-01502 SANITARY LANDFILL EFFICIENCY (DECOMPOSITION(RATE) SANITARY-LANDFILL)
CHANIN, G.
REPORT - EAST BAY MUNICIPAL UTILITY DISTRICT, (SEPTEMBER 1955). THE DISTRICT HAS DISPOSED OF BAR SCREENINGS, GRIT, GRASS CLIPPINGS, RUBBISH, ETC., IN A CUT AND COVER SANITARY LANDFILL OPERATION EVER SINCE THE SEWAGE TREATMENT PLANT WENT INTO OPERATION. THIS STUDY WAS MADE TO DETERMINE THE EFFICIENCY OF THIS DISPOSAL PRACTICE. FOUR POST HOLES WERE DUG IN THE FILL, EACH TAPPING A PORTION OF THE FILL REPRESENTING A DIFFERENT TIME OR CONDITION, AND EACH RESULTING IN DIFFERENT SAMPLES. LABORATORY TESTS WERE PERFORMED ON THE SAMPLES TO DETERMINE THE DEGREE OF STABILIZATION THAT HAD OCCURRED. SOME GENERALIZATIONS WERE MADE FROM THE RESULTS - (1) AN EQUATION WAS SET UP TO ESTIMATE THE PERCENTAGE REDUCTION IN VOLATILE MATTER. ORDINARY MATERIALS, GRIT, SCREENINGS, ETC., DECOMPOSED ALMOST ENTIRELY AFTER ONE YEAR, ACCORDING TO THE EQUATION. (2) MATERIAL CONTAINING CANNING WASTES, ESPECIALLY TOMATO WASTES, DECOMPOSES MUCH MORE SLOWLY. THE AMOUNT WAS ONLY 53 PERCENT AFTER ONE YEAR. (3) FIELD OBSERVATIONS SUBSTANTIATED THESE RESULTS. CANNERY WASTES HAD A STRONG ODOR OF DECOMPOSITION AFTER A YEAR. OTHER SAMPLES HAD VERY LITTLE OR NO ODOR AT ALL. (4) ALTHOUGH CANNERY WASTES DECOMPOSE SLOWLY, GRIT BAR SCREENINGS, GRASS CLIPPINGS, RUBBISH, AND OTHER MATERIAL COLLECTED AT THE SEWAGE TREATMENT PLANT CAN BE SUCCESSFULLY DISPOSED OF AT A SANITARY FILL SITE. THE ARTICLE INCLUDES TABLES OF RESULTS OF SAMPLINGS MADE AT THE FILL. TOTAL SULFIDES, A 5-DAY BOD SAMPLE, PERCENT TOTAL SOLIDS AND PERCENT TOTAL VOLATILE SOLIDS OF THE SAMPLES WERE MEASURED AND REPORTED. (UC)

07-01-01512 AN ANALYSIS OF REFUSE COLLECTION AND SANITARY LANDFILL DISPOSAL (ANIMAL-FEED CONTAINERS QUANTITIES LABOR-REQUIREMENTS LAW MANAGEMENT ECONOMICS HEALTH VECTOR SALVAGE)
PEARSON, E. A.
UNIVERSITY OF CALIFORNIA, BERKELEY, SANITARY ENGINEERING RESEARCH LAB, TECH BULL 8, I.E.R. SERIES 37, ISSUE 8, (DECEMBER 1952). FIELD STUDIES OF REFUSE COLLECTION AND DISPOSAL OPERATIONS IN 13 CALIFORNIA CITIES WERE MADE DURING THE SUMMER OF 1950 AND 1951. AMONG THE SUBJECTS COVERED IN THE BULLETIN ARE - COLLECTION OPERATION - HAULING - ANALYSIS AND DESIGN OF REFUSE COLLECTION SYSTEMS - DISPOSAL OPERATION - PUBLIC HEALTH ASPECTS - ADMINISTRATION. THE BULLETIN DEFINES VARIOUS TERMS IN USE IN REFUSE MANAGEMENT. IT DISCUSSES ALL ASPECTS OF COLLECTION, INCLUDING FREQUENCY, POINT OF PICKUP, AND PRESENTS METHODS FOR MAKING SYSTEMS ANALYSES. VARIOUS METHODS OF LANDFILL ARE DEFINED AND DISCUSSED. DESIGN CRITERIA ARE PRESENTED. THE STATUS OF LANDFILL IS TREATED. (UC)

07-01-01514 REFUSE DISPOSAL (SALVAGE SANITARY-LANDFILL TRANSFER-STATION)
REPORT, SAN FRANCISCO BAY CONSERVATION AND DEVELOPMENT COMMISSION, SAN FRANCISCO, CALIFORNIA, (OCTOBER 1966). THE REPORT IS A REWORKING OF THE ABAG REPORT BROUGHT UP-TO-DATE, BUT WITH NO ORIGINAL DATA. A MAJOR CONCLUSION OF THE REPORT IS - RAPID INCREASES IN POPULATION MEAN INCREASING WASTE DISPOSAL REQUIREMENTS. OVERALL, PRESENT WASTE DISPOSAL RESOURCES IN THE BAY AREA ARE ADEQUATE FOR THE NEAR FUTURE. MEANWHILE, RESEARCH AND EXPERIMENTATION IS BEING UNDERTAKEN TO USE IMPROVED METHODS OF WASTE MANAGEMENT WITHIN RELATIVELY FEW YEARS. OTHER CONCLUSIONS ARE - SAN FRANCISCO BAY IS THE DOMINANT FEATURE OF THE BAY AREA. THERE NOW APPEARS TO BE NO PRESSING NEED TO PERMIT ANY FURTHER FILLING OF THE BAY FOR ADDITIONAL REFUSE DISPOSAL SITES. FUTURE REFUSE DISPOSAL SYSTEMS WOULD BE DESIGNED TO PROVIDE THE BEST POSSIBLE SERVICE FOR THE BAY AREA WITH NO FURTHER INFRINGEMENT UPON THE BAY. (UC)

07-01-01548 NEW LEASE ON LIFE FOR MOSES LAKE AS OPEN DUMPING ENDS, LANDFILL BEGINS (SANITARY-LANDFILL COST(OPERATING))
REFUSE REMOVAL JOURNAL 1(1), P. 25 (JANUARY 1958). THE REFUSE COLLECTION AND DISPOSAL SYSTEM OF MOSES LAKE, WASHINGTON, WAS OVERHAULED. A FIVE-YEAR CONTRACT WAS AWARDED AND A CITY-OWNED, CONTRACTOR-OPERATED SANITARY LANDFILL ESTABLISHED. (PHS)

07-01-01549 PEORIA'S EIGHT YEARS OF PRIVATE DISPOSAL AN EXAMPLE TO OTHERS (SANITARY-LANDFILL COLLECTION)
REFUSE REMOVAL JOURNAL 1(1), P. 20 (JANUARY 1958). PEORIA AND PEORIA HEIGHTS, ILLINOIS, ARE SERVED BY ONE CONTRACTOR. REFUSE IS COLLECTED ONCE A WEEK FROM 33,000 HOMES, AND MORE FREQUENTLY AT ABOUT 300 COMMERCIAL ESTABLISHMENTS. DISPOSAL IS BY SANITARY LANDFILL. (PHS)

07-01-01556 LANDFILL METHOD COMES TO CAPITAL OF MALAYA (SANITARY-LANDFILL VECTOR(CONTROL))
REFUSE REMOVAL JOURNAL 1(4), P. 17 (APRIL 1958). A DETAILED ACCOUNT OF THE 1950 INTRODUCTION OF SANITARY LANDFILL METHODS IN KUALA LUMPUR, THE CAPITAL OF THE FEDERATION OF MALAYA. THE INITIAL PROJECT WAS THE FILLING OF A WATERLOGGED POND. SPREADING OF THE REFUSE AND COVERING IT WITH SAND WERE DONE BY TWO GANGS OF 32 MEN WITH RAKES. (PHS)

07-01-01572 COMPANY GIVES HINTS FOR BETTER LANDFILLS (SANITARY-LANDFILL)
REFUSE REMOVAL JOURNAL 1(2), P. 12 (FEBRUARY 1958). A SUCCESSFUL SANITARY LANDFILL OPERATION USING CRAWLER TRACTORS EQUIPPED WITH SPECIALLY DESIGNED FRONT END LOADERS. (PHS)

07-01-01584 PLANNING IS THE KEY TO AMES' LANDFILL SUCCESS (SANITARY-LANDFILL COST(OPERATING) RECLAMATION(LAND))
REFUSE REMOVAL JOURNAL 1(7), P. 9 (JULY 1958). THE CITY OF AMES, IOWA, IS CURRENTLY OPERATING A SANITARY LANDFILL WHICH WILL BECOME A 350-ACRE INDUSTRIAL PARK UPON ITS COMPLETION. AN OVER-ALL STREET PLAN TO SERVE THE AREA HAS BEEN DEVELOPED. THE NECESSARY UTILITY SERVICE HAS BEEN DESIGNED AND PARTIALLY INSTALLED, A FINAL CONTOUR MAP ESTABLISHED, AND AN OVER-ALL SITE PLAN HAS BEEN DEVELOPED. PRESENT COSTS FOR REFUSE DISPOSAL ARE $1.62 PER TON. (PHS)

07-01-01594 CITY ENGINEER GIVES FULL STORY OF LANDFILL METHOD (SANITARY-LANDFILL COST(OPERATING) EQUIPMENT)
MOEHR, L. H.
REFUSE REMOVAL JOURNAL 1(5), P. 21 (MAY 1958). THE SANITARY LANDFILL METHOD IS DISCUSSED IN DETAIL ALONG WITH LOCAL EXPERIENCE IN WYANDOTTE, MICHIGAN. TRENCH AND FILL METHOD IS REPORTED TO COST $1.70 PER TON, INCLUDING 10 PERCENT FOR OVERHEAD. (PHS)

07-01-01595 BIG DRIVE FOR MODERN SANITATION GETS RESULTS (SANITARY-LANDFILL COLLECTION)
REFUSE REMOVAL JOURNAL 1(5), P. 19 (MAY 1958). A SURVEY, WHICH REVEALED THAT ONLY 59 PERCENT OF THE PRIVATE RESIDENCES WERE HANDLING REFUSE IN A SANITARY MANNER, LED TO IMPROVEMENTS IN REFUSE STORAGE AND DISPOSAL METHODS IN JOHNSON CITY, TENNESSEE. (PHS)

07-01-01627 PRIVATE LANDFILL SERVES LARGE INDIANAPOLIS AREA (SANITARY-LANDFILL)
REFUSE REMOVAL JOURNAL 2(1), P. 10 (JANUARY 1959). MARGINAL LAND IS BEING RECLAIMED NEAR INDIANAPOLIS THROUGH A SANITARY LANDFILL PROJECT. THE USE OF THIS SITE BY BOTH INDIVIDUALS AND PRIVATE CONTRACTORS IS DETAILED. (PHS)

07-01-01635 NEW YORK RUNS WORLD'S LARGEST SANITARY FILL (BARGE SANITARY-LANDFILL)
REFUSE REMOVAL JOURNAL 2(3), P. 7 (MARCH 1959). THE WORLD'S LARGEST SANITARY LANDFILL PROJECT AT FRESH KILLS, STATEN ISLAND, NEW YORK CITY, IS DESCRIBED. IN OPERATION NOW FOR TEN YEARS, THE FILL TAKES ONE-THIRD OF THE CITY'S TOTAL REFUSE VOLUME. (PHS)

07-01-01644 CITY-COUNTY COOPERATION ELIMINATES BOISE'S DUMP (SANITARY-LANDFILL)
REFUSE REMOVAL JOURNAL 1(1), P. 14, 15, 25 (1959). THE CITY OF BOISE IDAHO AND ADA COUNTY ARE WORKING TOGETHER TO INITIATE AND OPERATE A SUCCESSFUL SANITARY LANDFILL, RECLAIM LAND FOR USEFUL PURPOSES AND END THE NUISANCE OF AN UNSANITARY DUMP.

07-01-01660 CONTRACTOR AND VILLAGE STOP NUISANCE (SANITARY-LANDFILL)
REFUSE REMOVAL JOURNAL 2(8), P. 17 (AUGUST 1959). THE COMBINATION OF SCIENCE AND HARD WORK HAS ELIMINATED OBJECTIONS TO A GARBAGE DUMP NEAR ELK GROVE VILLAGE, ILLINOIS. PARTICULARS OF THIS OPERATION ARE REVIEWED BRIEFLY. (PHS)

07-01-01661 BERMUDA HAS IT EASY ON DISPOSAL PROBLEMS - NONE (SANITARY-LANDFILL)
REFUSE REMOVAL JOURNAL 2(8), P. 15 (AUGUST 1959). A 35-ACRE AREA, PEMBROKE MARSH, PROVIDES BERMUDA AN ALMOST INEXHAUSTIBLE SITE FOR REFUSE DISPOSAL. DETAILS OF THE FINE SANITATION SITUATION THERE ARE GIVEN. (PHS)

07-01-01778 SCIENTIFIC ANALYSIS OF SANITARY LANDFILLS (RESEARCH COMPOSITION SURVEY OPEN-DUMP COST(OPERATING) COMPACTION MOISTURE-CONTENT)
REFUSE REMOVAL JOURNAL 4(12), P. 15 (DECEMBER 1961). DESCRIBES TWO STUDIES--A POSTAL SURVEY OF SEVERAL HUNDRED LANDFILL OPERATIONS, AND AN ANALYSIS OF A TEST LANDFILL. THE RESULTS OF THE LANDFILL SURVEY ARE SUMMARIZED. IN THE TEST LANDFILL, SIX SEPARATE CELLS WERE CONSTRUCTED UNDER VARIED CONDITIONS OF MOISTURE CONTENT, COMPACTION, AND AERATION. THE AUTHORS CONCLUDE THAT A SCIENTIFICALLY PLANNED, ENGINEERED, AND OPERATED LANDFILL CAN RESULT IN SUBSTANTIAL SAVINGS OVER GOOD NORMAL PRACTICE. (PHS)

07-01-01779 SEVEN NEW JERSEY COMMUNITIES PLAN JOINT LANDFILL VENTURE (REGIONAL-APPROACH COST(DISPOSAL) SITE-SELECTION)
REFUSE REMOVAL JOURNAL 6(12), P. 28 (1963). A JOINT COMMITTEE ON SOLID WASTE DISPOSAL OF SEVEN COMMUNITIES HAVE ALLOCATED $600,000 TO PURCHASE AND DEVELOP A SANITARY LANDFILL. THE COMMUNITIES ARE BEING FORCED TO DEVELOP THEIR OWN DISPOSAL PROGRAM IN ORDER TO COMBAT THE UNUSUAL HIGH COST OF DISPOSAL BY PRIVATELY OWNED DISPOSAL SITES.

07-01-01786 LANDFILL BOOMING IN PENNSYLVANIA TOWN (SANITARY-LANDFILL COST(OPERATING) RECLAMATION(LAND)
REFUSE REMOVAL JOURNAL 6(10), P. 24 (1963). THE SUCCESS OF THE SANITARY LANDFILL OPERATION AT BETHLEHEM PA. IS DESCRIBED ALONG WITH SOME OF THE COSTS AND METHODS OF COLLECTING FEES.

07-01-01789 GOVERNMENT OFFERS NEW LANDFILL LEAFLET (SANITARY-LANDFILL)
REFUSE REMOVAL JOURNAL 6(9), P. 38 (1963). THE BULLETIN DESCRIBES HOW SMALL COMMUNITIES MAY TAKE ADVANTAGE OF THE SANITARY LANDFILL OVER THE OPEN DUMP METHOD. COST, CONSTRUCTION AND EQUIPMENT ARE DESCRIBED.

07-01-01804 SAN DIEGO DISPOSAL PLAN PROVIDES FOR A 20-YEAR POPULATION INCREASE (SANITARY-LANDFILL RECLAMATION(LAND))
GOODE, C. S.
REFUSE REMOVAL JOURNAL 7(12), P. 18 (1964). SINCE THE SITES FOR SANITARY LANDFILL ARE RAPIDLY DECREASING SAN DIEGO COUNTY HAS JUST COMPLETED A REFUSE DISPOSAL PLAN TO SPAN A TWENTY YEAR PERIOD. TWENTY-ONE DISPOSAL SITES ARE TO BE OPERATED TO HANDLE THE WASTE OF THE PRESENT 1.2 MILLION POPULATION AND ULTIMATELY PROVIDE FOR DISPOSAL SERVICE FOR TWICE THIS POPULATION.

07-01-01808 LANDFILLS THE BEST FOR MINNEAPOLIS-ST. PAUL (SANITARY-LANDFILL INCINERATION COST(OPERATING) COST(CAPITAL))
THE AMERICAN CITY 84(4), P. 117 (APRIL 1969). A STUDY OF REFUSE DISPOSAL IN THE MINNEAPOLIS-ST. PAUL AREA HAS SHOWN THAT SANITARY LANDFILL IS THE BEST METHOD TO USE. COST OF LANDFILL AND INCINERATION ARE GIVEN. SUITABLE SITES WERE FOUND TO LAST UNTIL 1988.

07-01-01818 COUNTY BATTLES FOR LANDFILL SITES (COST(OPERATING) SANITARY-LANDFILL PULVERIZATION SALVAGE)
SOLID WASTE MANAGEMENT/RRJ 12(3), P. 26 (MARCH 1969). FAIRFAX COUNTY, VIRGINIA, WHICH MUST DISPOSE OF 2600 CU-YDS OF REFUSE DAILY, IS LOOKING FOR ITS FIFTH LANDFILL SITE. A STUDY OF REFUSE DISPOSAL HAS RECENTLY BEEN COMPLETED COVERING POTENTIAL SALVAGE OF METALLICS AND PAPER, INCINERATION, AND PULVERIZATION.

07-01-01825 COUNTY IN OREGON OPENS LANDFILL TO CITIZENS (SANITARY-LANDFILL RECLAMATION(LAND))
ATTIG, G. K. + CLAY, J.
REFUSE REMOVAL JOURNAL 8(4), P. 16 (1965). THE RAPID CHANGE IN POPULATION AND INDUSTRIAL GROWTH PROMPTED THE CITY OF SPRINGFIELD, OREGON, TO PURCHASE A 60 ACRE SITE AND DEVELOP A SANITARY LANDFILL. ONE MAN DIRECTS FROM 500 TO 800 CARS AND TRUCKS DAILY TO THE PROPER DUMP SITE. THE LANDFILL AREA WILL EVENTUALLY BECOME A RECREATION AREA.

07-01-01833 TEXAS HAULER OPERATES FILL JOINTLY WITH MUNICIPALITY (SANITARY-LANDFILL COST(DISPOSAL) COLLECTION(CONTAINERS) COLLECTION(VEHICLE))
REFUSE REMOVAL JOURNAL 8(3), P. 18 (1965). A SANITARY LANDFILL NEAR FORT WORTH, TEXAS IN FARRANT COUNTY IS JOINTLY OPERATED BY A PRIVATE CONTRACTOR AND FARRANT COUNTY. THE LANDFILL OPERATION IS CARRIED OUT ON A 42 ACRE SITE WHICH IS OPEN TO ANYONE IN THE AREA ON A FEE BASIS, FEES ARE LISTED. THE CONTRACTOR SERVES 32 COMMUNITIES AS WELL AS FORT WORTH.

07-01-01835 DENVER'S NEW FILL TO LAST 40 YEARS (SANITARY-LANDFILL TRANSFER-STATION)
REFUSE REMOVAL JOURNAL 8(3), P. 14 (1965). THE MILE HIGH CITY IS SPENDING A TOTAL OF $370,000 FOR THE EXPANSION OF ITS REFUSE HANDLING FACILITIES. ON A 26-ACRE SITE THE CITY IS BUILDING A $295,000 EQUIPMENT SERVICE YARD AND A REFUSE TRANSFER STATION AND ANOTHER $75,000 FOR THE EQUIPMENT AND DEVELOPMENT OF A SANITARY LANDFILL. THE CITY OWNS A 2,680 ACRE PLOT WHICH THEY EXPECT TO LAST FOR THE NEXT 40 YEARS AS A DISPOSAL OPERATION.

07-01-01883 CONTROLLED TIPPING, PAST, PRESENT AND FUTURE (SANITARY-LANDFILL)
SHELDON, S. K.
PUBLIC CLEANSING 54(10), P. 1229 (1964). THE METHOD OF CONTROLLED TIPPING AS DESCRIBED IN THE PAST AND PRESENT ARE NOT TOO DIFFERENT IN THAT AT THE PRESENT IT IS MORE MECHANIZED AGAINST THE PAST MANUAL METHODS. NOW, AS IN THE PAST, TIPPING IS THE CHEAPEST METHOD OF DISPOSAL BUT WITH THE LACK OF NEW SITES CLEANSING OFFICERS FORESEE MANY DIFFICULTIES

SINCE COVERING MATERIALS ARE GETTING SHORTER AND SHORTER. PRESENTLY WASTES ARE RAPIDLY CHANGING IN TYPE AND VOLUMES. CONTROLLED TIPPING IN THE FUTURE IS SEEN TO BE AN OPERATION IN CONJUNCTION WITH MECHANICAL DISPOSAL WHEN THE NONCOMBUSTIBLE MATERIALS AND NON-SALVAGEABLE MATERIAL WILL BE DISPOSED OF. A TABLE ON WASTE COMPOSITION IS GIVEN.

07-01-01902 NEW JERSEY DRAFTS STRONG LANDFILL RULES (LAW SANITARY-LANDFILL)
REFUSE REMOVAL JOURNAL 8(11), P. 14 (1965). THE NEW JERSEY STATE HEALTH DEPARTMENT HAS COMMANDED THAT ALL MUNICIPALITIES IN THE STATE REQUIRE LICENSING AND BONDING FOR SANITARY LANDFILL OPERATORS. ALSO RECOMMENDED WAS ADVANCE APPROVAL OF PROPOSED LANDFILL SITES BY MUNICIPAL HEALTH OFFICERS IN CONSULTATION WITH STATE HEALTH REPRESENTATIVES. SOME OF THE KEY SECTIONS OF THE ORDINANCE ARE LISTED.

07-01-01906 1,200 ACRE LANDFILL CONTRACTOR BEGAN IN 1932 USING PICK AND SHOVEL (SANITARY-LANDFILL)
REFUSE REMOVAL JOURNAL 8(12), P. 8 (1965). A CONTRACTOR WHO STARTED REFUSE DISPOSAL CONTRACTING USING A PICK AND SHOVEL TO FILL IN BASEMENT OF DEMOLISHED BUILDING NOW HAS ONE OF THE MOST MODERN DISPOSAL OPERATIONS IN THE NATION. THROUGH AN EXTENSIVE ENGINEERING AND PUBLIC RELATIONS CAMPAIGN THE CONTRACTOR IS ABLE TO OPERATE 4 LANDFILL SITES WITHIN THE CHICAGO AREA. OVER A MILLION PEOPLE A DAY ARE SERVICED BY MORE THAN 600 HAULERS FROM 49 MUNICIPALITIES. EACH LANDFILL SITE IS STRATEGICALLY LOCATED TO SERVE ALL AREAS OF THE CITY AS WELL AS THE SURBURBAN AREAS. WHEN A SITE IS TO OPEN A COMPLETE ENGINEERING, SOIL SAMPLING, WATER SAMPLING, TRAFFIC CONTROL, RAT CONTROL, POLLUTION CONTROL STUDY IS DONE IN ORDER TO BECOME THE LEAST OBVIOUS TO THE RESIDENTIAL AREAS BY WHICH THEY ARE BOUNDED.

07-01-01907 QUARRIES BECOME LANDFILLS IN TEXAS (SITE-SELECTION SANITARY-LANDFILL)
REFUSE REMOVAL JOURNAL 8(10), P. 10 (1965). BY TURNING UNHEALTHY ABANDONED QUARRIES INTO SANITARY LANDFILL SITES, SAN ANTONIO, TEXAS, SOLVED TWO PRESSING NEEDS CREATED BY SOARING POPULATION AND RAPID INDUSTRIAL EXPANSION. THE CITY DESPERATELY REQUIRED BOTH AN EFFECTIVE WASTE DISPOSAL SYSTEM AND OPEN SPACE TO BUILD PUBLIC RECREATION AREAS. BY USING QUARRIES ON A NO-PURCHASE AGREEMENT THE CITY NOT ONLY FILLED THESE REQUIREMENTS, BUT CREATED ONE OF THE MOST EFFICIENT AND ECONOMICAL MUNICIPAL LANDFILL OPERATIONS IN THE UNITED STATES.

07-01-01933 SANITARY LANDFILL, BIG DECISION FOR SMALL TOWNS (VECTOR SITE-SELECTION)
NATION'S CITIES 5(1), P. 15-17 (JANUARY 1967). BECAUSE OPEN BURING DUMPS ARE BECOMING PUBLIC NUISANCES, SANITARY LANDFILLING HAS ADVANTAGES FOR THE SMALL CITY. A PUBLIC HEALTH SERVICE PROGRAM IS NOW UNDER WAY TO ASSIST LOCAL, STATE, AND PRIVATE AGENCIES IN REDUCING HEALTH HAZARDS THROUGH IMPROVEMENT OF DISPOSAL PRACTICES. (PHEA)

07-01-01949 DUMPING AND LANDFILL (SANITARY-LANDFILL)
ASCE COMMITTEE ON REFUSE COLLECTION AND DISPOSAL, REPORT OF TASK COMMITTEE 2, (JULY 31, 1953). THIS REPORT IS A COMPILATION OF INFORMATION FURNISHED BY THE INDIVIDUAL MEMBERS OF THE 1953 TASK COMMITTEE 2, AND BY OTHERS. MATERIAL ALREADY COVERED IN THE "TECHNICAL BULLETIN NO. 8 OF THE SANITARY ENGINEERING RESEARCH PROJECT OF THE UNIVERSITY OF CALIFORNIA" IS INCLUDED IN THIS REPORT. THE MAIN TOPICS ARE: MATERIALS DUMPED, BURNING IN OPEN DUMPS AND LANDFILLS, GENERAL OPERATION OF DUMPS, PUBLIC HEALTH ASPECTS OF DUMPING, COSTS, SANITARY LANDFILLS, COMPACTION OF LANDFILLS, AND SALVAGING ON FILLS. (UC)

07-01-02097 A NATIONAL SURVEY OF SANITARY LANDFILL PRACTICES (RECLAMATION(LAND) COST(OPERATING))
STONE, R. + FRIEDLAND, H.
PUBLIC WORKS 100(8), P. 88-89 (AUGUST 1969) AN ARTICLE TABULATED FROM DATA RECEIVED FROM A SURVEY OF 120 LANDFILL SITES AND 102 GOVERNMENTAL AGENCIES. TYPES OF LANDFILL, POPULATION DENSITIES, COST-PER-CAPITA LANDFILL COSTS ARE GIVEN. PROBLEMS ENCOUNTERED IN LANDFILL OPERATIONS ARE INCLUDED.

07-01-02141 WORLD'S LARGEST LANDFILL (SANITARY-LANDFILL VECTOR RECLAMATION(LAND))
REFUSE REMOVAL JOURNAL 9(2), P. 12, (FEBRUARY 1966). NEW-YORK CITY'S 3000 ACRE MARINE DISPOSAL SITE IS THE LARGEST LANDFILL IN THE WORLD. ABOUT TWO MILLION TONS OF REFUSE IS BURIED THERE EACH YEAR AND IT IS ESTIMATED THE LIFE OF THE FILL TO BE ABOUT 1977. BY A SYSTEM OF DRAINAGE DITCHES ABOUT 15 MILES LONG, THE WATER IS DRAINED THROUGH THE FRESH KILLS OUT INTO THE ATLANTIC OCEAN WHERE THE FORMATION OF MARSHES OF STAGNANT WATER DOES NOT DEVELOP. AN EXTENSIVE PROGRAM OF DISINFECTANTS, INSECTICIDES, AND PESTICIDES IS CONDUCTED TO PREVENT ODORS, INSECTS, AND RATS AT THE DISPOSAL SITE. AFTER THE SITE IS FILLED TO CAPACITY THE NEW-YORK CITY PARKS DEPARTMENT IS TO DEVELOP AN INDUSTRIAL PARK AND A RECREATIONAL PARK THERE.

07-01-02157 CITY ENGINEER GIVES FULL STORY OF LANDFILL METHOD (SANITARY-LANDFILL COST(OPERATING))
REFUSE REMOVAL JOURNAL 1(5), P. 21 (MAY 1958). THE SANITARY LANDFILL METHOD IS DISCUSSED IN DETAIL ALONG WITH LOCAL EXPERIENCE IN WYANDOTTE, MICHIGAN. TRENCH AND FILL METHOD IS REPORTED TO COST $1.70/TON, INCLUDING 10 PERCENT FOR OVERHEAD. (PHS)

07 02 SPECIAL EQUIPMENT

07-02-00078 PUT "TEETH" INTO COMPACTION (COST(OPERATING) SANITARY-LANDFILL)
ATTIG, G. K. + CLAY, J.
THE AMERICAN CITY 81(3), P. 88-90 (MARCH 1966). COUNTY-OPERATED LANDFILL SERVING EUGENE AND SPRINGFIELD, ORE., PUTS DOUBLE REFUSE INTO SAME SPACE WITH FWD WAGNER SF-17 AND HANCOCK SELF-LOADING SCRAPER. SF-17 IS COMPACTOR-DOZER WITH GEAR-TOOTH COMPACTION BLADES EXERTING 241 PSI PRESSURE AT 1-INCH PENETRATION. MACHINE IS EASILY MANEUVERABLE AND ITS LARGE U-BLADE WITH TRASH GUARD PERMITS MOVING AND SPREADING OF LARGE QUANTITIES OF REFUSE AND COVER SOIL.

07-02-00080 TIRE FAILURE NO LONGER A PROBLEM (SANITARY-LANDFILL TIRE(MAINTENANCE))
KANDRA, G. A.
THE AMERICAN CITY 80(3), P. 104 (MARCH 1965). BATAVIA, NEW YORK, A CITY OF 19,000 BEGAN A SANITARY LANDFILL IN 1962, SPENDING 7,500 DOLLARS FOR 16.2 ACRES OF ABANDONED GRAVEL PIT LAND, 21,788 DOLLARS FOR A 25,400 LB TRACK-TYPE TRACTOR, AND 1,674 DOLLARS FOR A CHAIN-LINK FENCE. THE CITY OPERATES THE LANDFILL FOR ALL SOLID WASTES EXCEPT GARBAGE WHICH IS HANDLED BY A PRIVATE CONTRACTOR WITH HIS OWN DISPOSAL FACILITIES. CUTS 25 TO 30 FEET DEEP ARE FILLED IN LAYERS, EACH ONE 2 TO 3 FEET DEEP. THESE ARE COVERED AT THE END OF EACH WORK PERIOD. THE TRACTOR WAS UNABLE TO WORK SUFFICIENTLY ON WINDY DAYS AND NEEDED A COMPLETE TRACK OVERHAUL AFTER 2,000 HOURS OF OPERATION. TO SOLVE THE EQUIPMENT PROBLEM, A RUBBER-TIRED LOADER WAS ADAPTED FOR LANDFILL USE AND TURNED OVER TO THE CITY FOR A PILOT PROGRAM BY THE YALE AND TOWNE COMPANY. IT WAS OPERATED FOR 1,300 HOURS BETWEEN DECEMBER 1963 AND JULY 1964. THE MACHINE HAD SEVEN TIRE FAILURES DUE TO PUNCTURES AND TWO DUE TO DEFECTIVE VALVES. FOUR OF THE PUNCTURES OCCURRED DURING THE LAST 300 HOURS OF OPERATION. FIVE TIRES WERE PURCHASED AT A COST OF 1,020.50 DOLLARS. TIRE REPAIRS COST A TOTAL OF 204.04 DOLLARS. TOTAL DOWNTIME DUE TO TIRE TROUBLE WAS 20 HOURS.

07-02-00098 FILL FIRST, THEN COMPACT (SANITARY-LANDFILL COST(OPERATING) EQUIPMENT(COMPACTION))
HANKILA, M.
THE AMERICAN CITY 81(5), P. 173 (MAY 1966). BUCHANAN, MICHIGAN, HAS A POPULATION OF 5,500. VERSATILITY IS IMPORTANT INASMUCH AS THE RUBBER-TIRED LOADER SPENDS ONLY ABOUT ONE-FOURTH OF TIME COVERING REFUSE AT THE LANDFILL. THE REFUSE, ALREADY COMPACTED IN THE COLLECTION VEHICLE, IS DUMPED IN THE LANDFILL TO A DEPTH OF FOUR FEET. THE LOADER DUMPS SAND OVER THE REFUSE BEFORE COMPACTING IT FURTHER. THIS PROTECTS THE HARD-ROCK LUG TREAD TIRES FROM DAMAGE. WHEN THE PREVIOUS COMPACTION VEHICLE, A CRAWLER TYPE, WAS IN USE, IT REQUIRED 45 MINUTES TO LOAD IT ONTO A TRAILER AND TRANSPORT IT TO A LANDFILL. THE RUBBER-TIRED LOADER CAN DRIVE TO THE LANDFILL FROM THE GARAGE IN 10 MINUTES. THE

LOADER ALSO IS USED IN BACKFILLING EXCAVATIONS, LOADING SEALCOATING AGGREGATE, AND FOR REMOVING SNOW. BUCHANAN SPENDS ABOUT $22,000/YEAR IN ADDITION TO EQUIPMENT DEPRECIATION TO OPERATE LANDFILL. OF THIS THE GREATER PART IS LABOR. ONLY ONE-FIFTH IS FOR FUEL AND OIL.

07-02-00100 A FIRM PRICE FOR SIX YEARS OF SERVICE (SANITARY-LANDFILL COST(EQUIPMENT) COST(OPERATION))
FAHY, V.
THE AMERICAN CITY 81(5), P. 106 (MAY 1966). A TRACK-TYPE LOADER PREVIOUSLY HAD BEEN USED IN THE SANITARY LANDFILL OPERATION AT MINOT, NORTH DAKOTA. THE DOWNTIME WITH THE MACHINE WAS EXTENSIVE. REPAIRS TO THE AMOUNT OF $20,000 HAD TO BE MADE OVER THE PAST 5 YEARS. THE CITY PROVIDES RESIDENTIAL PICKUPS TWICE A WEEK. THIS RESULTS IN THE DELIVERY OF AN AVERAGE OF 160 CU-YD OF MATERIAL TO THE FILL EACH DAY. EIGHT PRIVATE HAULING FIRMS SERVE THE COMMERCIAL AND INDUSTRIAL ESTABLISHMENTS ADDING APPROXIMATELY 150 CU-YD TO THE DAILY LOAD. THE CITY CHARGES $1.25/MONTH FOR EACH RESIDENCE. MULTIPLE-RESIDENCE UNITS ARE CHARGED AN ADDITIONAL DOLLAR FOR EACH ADDITIONAL KITCHEN UNIT IN USE. THE 1964-65 BUDGET ALLOCATED $111,000 FOR REFUSE COLLECTION AND DISPOSAL - $91,000 FOR HAULING AND $21,000 FOR OPERATING THE LANDFILL. THIS DOES NOT INCLUDE DEPRECIATION OF CAPITAL GOODS. AVERAGE YEARLY COST IS $4.26/TON, OR $1.17/YD FOR HAULING, AND $.94/TON OR $.26/YD FOR DISPOSAL. THE UNIT PRICE OF A NEW LOADER WAS $22,665 LESS A TRADE-IN OF $2,090 OR A NET OF $20,573. THE GUARANTEED REPAIR COST FOR SIX YEARS OR 10,000 HOURS WAS $6,100. THE GUARANTEED TRADE-IN VALUE AFTER SIX YEARS OR 10,000 HOURS IS $9,000. THE ACTUAL COST FOR SIX YEARS OF USAGE IS $17,675.

07-02-00156 EQUIPMENT NEEDED FOR SANITARY FILL (SANITARY-LANDFILL COMPACTION-EQUIPMENT)
CULHAM, W. B.
THE AMERICAN CITY 84(1), P. 100 (1969). MODIFICATIONS TO EARTH MOVING EQUIPMENT SUGGESTED BY THE SOLID WASTE PROGRAM OF THE OREGON STATE BOARD OF HEALTH TO PERMIT THEM TO WORK WELL ON SANITARY LANDFILLS ARE PRESENTED.

07-02-00358 LANDFILL LOGISTICS (SANITARY-LANDFILL COMPACTION)
MCSPADDEN, W.
THE AMERICAN CITY 77(1), P. 24 (JANUARY 1962). PHOENIX RUNS TWO SANITARY LANDFILL SITES, LOCATED ON OPPOSITE SIDES OF THE CITY. BEFORE, WHEN ONE SITE RECEIVED TOO MUCH RUBBISH, IT TOOK HALF A DAY TO TRANSPORT A BULLDOZER FROM THE OTHER SITE TO HELP WITH DISPOSAL. A BULLDOZER WITH LARGE RUBBER TIRES HAS BEEN PURCHASED. IT CAN TRAVEL THE 14 MILES BETWEEN SITES IN 45 MINUTES. THIS DOZER GREATLY COMPACTS THE RUBBISH DUE TO THE TIRES - COMPACTING 15 PERCENT MORE REFUSE INTO THE SAME SPACE. THIS IS ESPECIALLY IMPORTANT SINCE THE SITES COST 4,000 DOLLARS TO 6,000 DOLLARS/ACRE. THE CITY SERVES 106,000 PEOPLE. IN THE WINTER, WHEN MUD, SAND, AND SILT ACCUMULATE ON THE STREETS OF THE HILLY NORTHERN SECTION OF THE CITY, THE BULLDOZER IS SENT TO CLEAN UP THE DEBRIS, AND YET CAN BE BACK TO THE LANDFILL SITE IN A SHORT TIME.

07-02-00586 LIGHT EQUIPMENT FOR SMALL TOWN SANITARY LANDFILL OPERATIONS
WILLIAMS, E. R. + MALLISON, G. F. + MAIER, P. P.
PUBLIC WORKS 89(2), P. 89-91 (FEBRUARY 1958). INVESTIGATIONS COVER PRACTICABILITY OF SUSTAINED OPERATION OF LIGHT EQUIPMENT FOR CARRYING OUT ALL PHASES OF SANITARY LANDFILL OPERATIONS WITHOUT PRIOR EXCAVATION BY HEAVIER EQUIPMENT.

07-02-00592 ONE UNIT CLEARS LANDFILL SITE AND WORKS IT
THE AMERICAN CITY 74(8), P. 32 (AUGUST 1959). IN EAST PENNSBORO TOWNSHIP, PENNSYLVANIA (POPULATION 8,500), 2,000 CU YD OF GARBAGE ARE DISPOSED OF WEEKLY IN A 25-ACRE LANDFILL. AN INTERNATIONAL DROTT TD-15 4-IN-1 UNIT WAS USED FOR CLEARING THE TREES AND SHRUBS FROM THE SITE. IT IS USED TO RIP SHALE MATERIAL AND TO COVER THE FILL.

07-02-00594 HOW MANY TRACTORS ARE NEEDED FOR SANITARY FILL
THE AMERICAN CITY 74(3), P. 40 (MARCH 1959). DATA SUPPLIED BY THE ALLIS-CHALMERS MANUFACTURING COMPANY ARE AS FOLLOWS- A HD-6 CRAWLER WITH 1-1/2 YD BUCKET WILL BE SUITABLE FOR A POPULATION OF 30,000, A HD-11 TRACTOR WITH 2-1/4 YD BUCKET, FOR A POPULATION OF 30 TO 75,000, AND TWO HD-11 TRACTORS FOR A POPULATION OF 100,000. FOR MORE THAN 100,000 POPULATION, AN HD-16 WITH A 3-YD BUCKET OR AN HD-21 WITH A 4-YD BUCKET WOULD BE NEEDED.

07-02-00903 WHEELS OR TRACKS (SANITARY-LANDFILL-EQUIPMENT)
PUBLIC CLEANSING 53(8), P. 410 (AUGUST 1963). A DISCUSSION OF THE RELATIVE ADVANTAGES AND DISADVANTAGES OF THE RUBBER-TIRED TRACTOR AND THE CRAWLER TRACTOR AS USED IN THE REFUSE DISPOSAL SITE. ADVANTAGES OF THE RUBBER-TIRED TRACTOR INCLUDE SPEED OF MOVEMENT, LESS DAMAGE TO ROAD SURFACES LEADING TO AND FROM THE DISPOSAL SITE, MANEUVERABILITY, AND CHEAPER MAINTENANCE. THE MAIN DISADVANTAGE IS THE INCONVENIENCE CAUSED BY CONTINUAL PUNCTURING OF TIRES. THE CASE FOR THE CRAWLER IS EQUALLY STRONG SO AS TO NECESSITATE AN INDIVIDUAL DECISION BETWEEN THE TWO IN EVERY CASE. MANY AUTHORITIES, CONFINED BY EXPENSE CONSIDERATIONS TO THE USE OF A SINGLE PIECE OF MECHANICAL EQUIPMENT, HAVE TURNED TO THE USE OF A MECHANICAL SHOVEL IN PREFERENCE TO A CRAWLER TRACTOR SINCE THE MODERN SHOVEL MEETS ALL THE DEMANDS OF LOADING OPERATIONS.

07-02-01038 LANDFILL FOR A WHEEL LOADER (SANITARY-LANDFILL)
BURLESON, R. A.
PUBLIC WORKS 93(11), P. 113 (NOVEMBER 1962). DESCRIBES THE SANITARY LANDFILL OPERATIONS IN GRAND PRAIRIE, TEXAS. THE CITY LEASES ITS LANDFILL SITES FROM A LOCAL SAND AND GRAVEL COMPANY. THE FILLS HAVE PREDUG PITS AND NEARBY PILES OF RELATIVELY LOOSE COVER MATERIAL, ENABLING THE CITY TO USE A RUBBER-TIRED LOADER RATHER THAN A TRACK LOADER AND SAVE ON MAINTENANCE COSTS. THERE HAS BEEN NO TIRE DAMAGE FROM RUNNING OVER CANS AND BROKEN GLASS, BECAUSE THE OPERATOR SPREADS THE REFUSE IN SUCH A WAY THAT THE TIRES ARE ALWAYS ON DIRT.

07-02-01337 LIGHT TRACK-TYPE EQUIPMENT SHOWS USEFULNESS IN SANITARY-LANDFILL OPERATIONS (COST(CAPITAL))
BJORNSON, B. F.
THE AMERICAN CITY 68(1), P. 91-92 (1953). IN THE PAST EMPHASIS HAS BEEN PLACED ON LARGE TRACK-TYPE EQUIPMENT IN THE $6,000 TO $15,000 RANGE. BASED ON A RECENT SURVEY MOST CITIES ARE LESS THAN 10,000 POPULATION, AND DO NOT HAVE THE FUNDS TO PURCHASE SUCH EXPENSIVE EQUIPMENT. A DEMONSTRATION WAS MADE TO DETERMINE THE USEFULNESS OF SMALLER, LESS EXPENSIVE EQUIPMENT.

07-02-01410 A BIG MACHINE FOR A LITTLE TOWN (SANITARY-LANDFILL COMPACTION-EQUIPMENT)
THE AMERICAN CITY 71(3), P. 195 (MARCH 1956). A GRADER EQUIPPED WITH A LOADER IS USED ON A PART-TIME BASIS ON A RUBBISH FILL AT HILLSBORO, WISCONSIN (POPULATION 1,500).

07-02-01450 RUBBER-TIRED TRACTOR SUCCESSFULLY HANDLES SANITARY LANDFILL OPERATIONS (COMPACTION-EQUIPMENT COST(COLLECTION) COST(OPERATION) BULKY-WASTE)
KENNAUGH, J. H.
THE AMERICAN CITY 72(9), P. 110 (SEPTEMBER 1957). BUCHANAN, MICHIGAN REPORTS THAT AFTER SIX MONTHS OF EXPERIENCE WITH A RUBBER-TIRED TRACTOR, IT HAS SHOWN INCREASED SPEED AND MOBILITY AND USEFULNESS ON OTHER JOBS AS COMPARED WITH THE TRACK-TYPE TRACTOR PREVIOUSLY USED. TIME AT THE LANDFILL SITE HAS AVERAGED 1/5 OF THAT REQUIRED BY TRACK-TYPE EQUIPMENT. REFUSE IS COVERED WITH SAND BEFORE COMPACTION TO REDUCE TIRE WEAR. OPERATIONAL COSTS FOR COLLECTION FOR OVER 1,650 PICK-UP POINTS AVERAGES ABOUT $1,545 PER MONTH. DISPOSAL HAS AVERAGED ABOUT $220 PER MONTH. FOR FISCAL YEAR 56-57, REFUSE COLLECTION AND DISPOSAL COST EACH CUSTOMER $1.17 PER MONTH EXCLUDING INSURANCE AND DEPRECIATION.

07-02-01518 SANITARY LANDFILL (COMPACTION-EQUIPMENT)
ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE, WISCONSIN. THEORY AND PRACTICE OF SANITARY LANDFILL HOW IT CAN BE DONE WITH THE USE OF ALLIS-CHALMERS EQUIPMENT.

07-02-01604 BUCHANAN'S LANDFILL USES 4-WHEEL TRACTOR (SANITARY-LANDFILL COMPACTION-EQUIPMENT)
REFUSE REMOVAL JOURNAL 1(9), P. 24 (SEPTEMBER 1958). DETAILS ARE GIVEN FOR THE USE OF A RUBBER-TIRED, FOUR-WHEELED TRACTOR SHOVEL ON LANDFILL WORK AT BUCHANAN, MICHIGAN.

07-02-01634 REPORT FROM BUCHANAN (SANITARY-LANDFILL COMPACTION(EQUIPMENT) COST(EQUIPMENT)
KENNAUGH, J. H.
REFUSE REMOVAL JOURNAL 2(2), P. 18 (FEBRUARY 1959). MR. KENNAUGH COMMENTS ON BUCHANAN'S LANDFILL OPERATION, WHICH EMPLOYS A RUBBER-TIRED TRACTOR. THE METHOD USED AND EXPENSES ARE OUTLINED.

07-02-01732 HEAVY EQUIPMENT IS KEY TO LANDFILL COMPACTION (SANITARY-LANDFILL)
HUGHES, L. F.
REFUSE REMOVAL JOURNAL 6(1), P. 6 (JANUARY 1963). DESCRIBES THE OPERATIONS AT A RECENTLY OPENED SANITARY LANDFILL SITE IN FALL TOWNSHIP, PA. THE LANDFILL HANDLES ALL REFUSE DISPOSAL FOR THE CITIES OF TRENTON AND LAWRENCE TOWNSHIP, NEW JERSEY. OWNERS OF THE LANDFILL HAVE FOUND IT ADVANTAGEOUS TO USE HEAVY, RATHER THAN LIGHT, EQUIPMENT IN THEIR OPERATION. THE HEAVY EQUIPMENT IS ABLE TO COMPACT REFUSE MORE TIGHTLY, THEREBY INCREASING THE LIFE OF THE FILL. THE EQUIPMENT USED INCLUDES A 50,000-POUND RUBBER-TIRED TRACTOR SHOVEL AND A 46,000-POUND TRACK-LAYING TRACTOR, WHICH COMBINED TO GET A 90 PERCENT COMPACTION. (PHS)

07-02-02162 THE RESULTS OF PARTICLE SIZE REDUCTION OF REFUSE AT SANITARY LANDFILL OPERATIONS
TECH REPORT, ROTO-SHREDDER DIV, INTERNATIONAL MACHINE CO, INC, CRESTLINE, OHIO. THERE IS A GROWING WEIGHT OF EVIDENCE THAT THE REDUCTION OF PARTICLE SIZE OF REFUSE PRIOR TO PLACING THE MATERIAL IN A LANDFILL DOES INDEED HAVE OUTSTANDING BENEFITS. THE EVIDENCE HAS BEEN COMPILED BY PUBLIC AGENCIES AND BY MANUFACTURERS OF EQUIPMENT BOTH IN THE U.S. AND ABROAD. THE WEIGHT OF THIS EVIDENCE HAS IN EFFECT PROVEN THAT PARTICLE REDUCTION IN CONJUNCTION WITH PROPER LANDFILL DESIGN AND OPERATION CAN GAIN THE FOLLOWING ADVANTAGES. (1) EXTENDED LANDFILL LIFE - GENERALLY ABOUT DOUBLE THE NORMAL LIFE. (2) GREATER DENSITY OF COMPACTION. (3) ELIMINATION OF RODENT ACTIVITY. (4) ELIMINATION OF INSECT BREEDING. (5) ELIMINATION OF FIRE HAZARDS. (6) REDUCTION IN THE COST OF COVER SOIL. (7) REDUCED VEHICLE MAINTENANCE COSTS. (8) IMPROVED VALUE OF FILLED AREA FOR OTHER PURPOSES. (9) REDUCTION IN OVERALL COST OF OPERATION. (10) IMPROVED CONTROL OF POLLUTION FROM DRAINAGE. (AUTH)

07 03 SITE SELECTION

07-03-00134 INTERGOVERNMENT AGREEMENT TO SOLVE DISPOSAL PROBLEM (COLLECTION SANITARY-LANDFILL)
KERR, D.
REFUSE REMOVAL JOURNAL 4(5), P. 27-29 (1961). LAWS, REGULATIONS, ECONOMICS, AND PUBLIC OPINIONS EFFECTING LOCATION AND USE OF SANITARY LANDFILLS ARE BRIEFLY SUMMARIZED. PENNSYLVANIA LAW P.L. 340, AS AMENDED MAY 21, 1943 WHICH GAVE ADJOINING MUNICIPALITIES AUTHORITY TO JOIN TOGETHER FOR FUNCTIONS THEY CANNOT PERFORM ALONE ALLOWS THESE COMMUNITIES TO OPERATE THEIR DISPOSAL FACILITIES IN A JOINT MANNER TO REDUCE THE COST OF OPERATION. THE CASE OF SHENANGO VALLEY LANDFILL COMMISSION IS DESCRIBED.

07-03-00209 SELECTION OF REFUSE DISPOSAL SITES IN NORTHEASTERN ILLINOIS (SANITARY-LANDFILL)
HUGHES, G. M.
ILLINOIS STATE GEOLOGICAL SURVEY, NO. 17 (SEPTEMBER 1967). GEOLOGIC ENVIRONMENTS IN NORTHEASTERN ILLINOIS WERE EVALUATED IN TERMS OF RESULTS OF STUDIES ON REFUSE DISPOSAL AND GROUND-WATER CONTAMINATION THAT HAVE BEEN MADE ELSEWHERE. THE GEOLOGIC ENVIRONMENTS COMMONLY CONSIDERED AS SAFE FOR REFUSE DISPOSAL IN THIS AREA ARE THOSE WITH MATERIALS OF LOW PERMEABILITY AND THOSE THAT ARE RELATIVELY DRY. A THIRD TYPE OF ENVIRONMENT, ONE WHICH IS HYDROLOGICALLY PROTECTIVE, ALSO SHOULD BE CONSIDERED FOR DISPOSAL PURPOSES. (AUTH)

07-03-00566 ABANDONED STRIP MINES STUDIED FOR SOLID WASTE DISPOSAL
REYNOLDS, W. F.
PUBLIC WORKS 98(5), P. 74 (MAY 1967). THE STUDY IS EXPECTED TO DEMONSTRATE THE POTENTIAL IN THE USE OF ABANDONED STRIP MINE AREAS FOR WASTE DISPOSAL. THE LOCATION OF THE OPERATION IS IN ALLEGANY COUNTY (NEAR FROSTBURG, MARYLAND). A THREE-YEAR PROGRAM IS TO BE COMPLETED IN 1970. IT WILL INCLUDE A DETERMINATION OF UNIT COST AND MINE CAPACITY, OF GROUND AND SURFACE WATER QUALITY CHANGES, AND THE MAKING OF AN INVENTORY OF ALL ABANDONED MINES IN THE STATE. (UC)

07-03-00930 PLANNING THE FUTURE OF SAN FRANCISCO BAY (SANITARY-LANDFILL CONSERVATION)
FEIBUSCH, H. A.
CIVIL ENGRG, ASCE 38(1), P. 70-72 (JANUARY 1968). THE ARTICLE DESCRIBES THE WORK OF THE SAN FRANCISCO BAY CONSERVATION AND DEVELOPMENT COMMISSION.

07-03-01215 HOW TO PICK A SITE FOR A SANITARY LANDFILL (SITE-SELECTION)
THE AMERICAN CITY 73(10), P .15 (OCTOBER 1958). IN THIS BRIEF ARTICLE, THE FOLLOWING POINTS ARE EMPHASIZED FOR CONSIDERATION IN THE SELECTION OF A SITE - (1) THE AREA, (2) THE TRUCKING REQUIRED, (3) PROTECTION FROM WEATHER ELEMENTS, (4) THE SOIL CONDITIONS, AND (5) THE POSSIBLE ADVANTAGES OF A SMALL SITE. (PHS)

07-03-01773 STRIP PITS AND THE SANITARY LANDFILL (SITE-SELECTION LAND(RECLAMATION))
DEASY, G. F. + GRIESS, P. R.
REFUSE REMOVAL JOURNAL 4(6), P. 17 (JUNE 1961). ABANDONED BITUMINOUS COAL STRIP PITS IN WESTERN AND CENTRAL PENNSYLVANIA SHOULD BE USED AS SANITARY LANDFILL SITES FOR AREA REFUSE DISPOSAL. THE STRIP PITS ARE ACCESSIBLE TO HIGHLY POPULATED AREAS, AND IT HAS BEEN ESTIMATED THAT OVER A PERIOD OF 187 YEARS THEY COULD PROVIDE DISPOSAL FACILITIES FOR 4 MILLION PEOPLE. UTILIZATION OF THE ABANDONED PITS WOULD EASE THE FINANCIAL BURDEN OF WASTE DISPOSAL, INCREASE STANDARDS OF SANITATION, AND REMOVE UGLY BLEMISHES FROM THE EARTH. (PHS)

07-03-01784 VANISHING LANDFILL SITES WORRY MOST CANADIAN HAULERS (SANITARY-LANDFILL COST(DISPOSAL) SITE-SELECTION LAND-REQUIREMENTS)
REFUSE REMOVAL JOURNAL 6(11), P. 10 (NOVEMBER 1963). DESCRIBES THE REFUSE DISPOSAL PROBLEM WHICH CONFRONTS CANADIAN CITIES TODAY. ALTHOUGH IT IS NOT AS SEVERE AS IN MANY AREAS IN THE UNITED STATES, THE PROBLEM IS A FORMIDABLE ONE, NONETHELESS. THE MOST FAVORABLE DISPOSAL METHOD IS THE SANITARY LANDFILL, BUT AS PRESENT SITES ARE FILLED AND AS POPULATION INCREASES, ACCEPTABLE DISPOSAL SITES ARE BEING ESTABLISHED FURTHER AND FURTHER FROM THE URBAN CENTERS, AND CONSEQUENTLY THE COST OF HAULING THE REFUSE IS INCREASING. DISCUSSES BRIEFLY THE DISPOSAL SITUATIONS IN TORONTO, VANCOUVER, MONTREAL, OTTAWA, WINNIPEG, CALGARY, AND SASKATOON. ONE OF THE MAJOR FACTORS BEHIND CANADA'S REFUSE DISPOSAL PROBLEM IS THE LACK OF CONCERN FOR THE PROBLEM AND THE LACK OF ACCEPTANCE OF THE SANITARY LANDFILL ON THE PART OF THE PUBLIC.

07-03-01837 MILWAUKEE FACING SHAKE-UP DUE TO LACK OF DISPOSAL SITES (SANITARY-LANDFILL)
REFUSE REMOVAL JOURNAL 8(2), P. 24 (1965). FOR THE PAST FOUR YEARS, MILWAUKEE OFFICIALS HAVE BEEN UNABLE TO FIND SUITABLE DISPOSAL SITE WITHIN 30 MILES OF THE CITY. A REPORT FROM A CONSULTING FIRM SUGGESTS THAT A $2.3 MILLION SAVING COULD BE REALIZED BY REORGANIZING THE CITY GARBAGE COLLECTION BUREAU AND BUREAU OF STREET SANITATION AND REPLACING 3 SMALL INCINERATORS WITH ONE LARGE UNIT. WHERE AVAILABLE, LANDFILL METHODS COULD SERVE AS ALTERNATIVE.

07-03-01860 MAIN CONSERVATIONISTS AID SOLID WASTE DISPOSAL (SITE-SELECTION)
PUBLIC WORKS 98, P. 141-142 (JUNE 1967). THE SOIL CONSERVATION SERVICE PROVIDES, THROUGH SOIL AND WATER CONSERVATION DISTRICTS, AN INVENTORY OF LAND RESOURCES. THIS SERVICE INCLUDES AERIAL PHOTOGRAPHS ON WHICH SOIL SURVEY INFORMATION IS SUPERIMPOSED. ACCOMPANYING THE PHOTOGRAPHS ARE TECHNICAL INTERPRETATIONS THAT INDICATE THE SUITABILITY OF DIFFERENT LAND AREAS FOR ABOUT 30 DIFFERENT USES. COLORS ARE USED TO INDICATE WHICH AREAS ARE GOOD, FAIR, POOR, OR UNSUITED FOR VARIOUS USES, INCLUDING USE AS A DUMP. TOWN PLANNERS THEN MAKE ON-SITE INSPECTIONS OF THE DIFFERENT AREAS TO INSURE THAT FUTURE DUMPING WILL GUARD AGAINST UNSIGHTLINESS AND POLLUTION OF WATER SUPPLIES. (PHEA)

07-03-01952 SELECTION OF SANITARY LAND FILL SITES. (SITE-SELECTION POLLUTION(WATER))
NICKERSON, H. D.
SANITALK 9(2), P. 9-12 (1961). THE AUTHOR OUTLINES THE ADVANTAGES OF THE SANITARY LAND FILL METHOD OVER THE OPEN DUMP METHOD FOR DISPOSAL OF GARBAGE AND GIVES INDIVIDUAL CONSIDERATION TO THE VARIOUS FACTORS INVOLVED IN PLANNING A LAND FILL SITE, INCLUDING THE NEED FOR PRECAUTIONS TO AVOID POLLUTION OF GROUND OR SURFACE WATERS. IN PARTICULAR, A SANITARY LAND FILL SHOULD NOT BE OPERATED IN A SITE WHERE GROUND OF SURFACE WATER INTERCEPTS THE DEPOSITED REFUSE UNLESS SUFFICIENT EVIDENCE IS AVAILABLE TO SHOW THAT POLLUTION OF THE WATER WILL NOT CREATE A PUBLIC HEALTH HAZARD, OR ADEQUATE PROVISIONS ARE MADE TO PREVENT THIS POLLUTION. AN EXAMPLE IS GIVEN OF THE POLLUTION OF A SMALL STREAM BY LEACHING FROM A SANITARY LAND FILL OPERATION, INCLUDING THE REMEDIAL MEASURES TAKEN AND TABULATED DATA SHOWING THE SELF-PURIFICATION OF THE STREAM. (WPA)

07 04 LAND REQUIREMENTS

07-04-01913 LANDFILL SHORTAGES SPUR OFFICIAL ACTION (SANITARY-LANDFILL LAND(SHORTAGE))
REFUSE REMOVAL JOURNAL 8(10), P. 34 (1965). A CRITICAL SHORTAGE OF LANDFILL AREA HAS PROMPTED MILWAUKEE, WISCONSIN, COUNTY AND CITY OFFICIALS TO ATTEMPT TO UNITE ON PLANS FOR A CENTRAL INCINERATION SYSTEM. OFFICIALS HAVE AGREED THAT A COUNTY-WIDE PROGRAM THAT WILL SERVE SOME 1.2 MILLION WOULD BE PREFERABLE TO A MORE LIMITED CITY INCINERATION PLAN. HOWEVER, TWO OF MILWAUKEE'S LARGEST SUBURBS - WEST ALLIS AND WAUWATOSA - HAVE ALREADY INDICATED THAT THEY ARE NOT INTERESTED IN THE COUNTY-WIDE PLAN IF IT WILL RAISE TAXES. THE COUNTY'S PUBLIC WORKS DIRECTOR DECLARED THAT DUMP SITES IN THE COUNTY WERE FAST BEING EXHAUSTED AND THAT ONE WAY TO SAVE THEM WOULD BE TO INCINERATE EVERYTHING TO REDUCE OVERALL VOLUME. HE SAID THAT COMMUNITIES ON THE NORTH SHORE ALREADY HAD RUN OUT OF LANDFILL AREAS, AND THOSE SOUTH OF THE CITY, WITHOUT INCINERATION, WOULD EXHAUST THEIR FILL WITHIN FIVE YEARS.

07-04-01917 LOS ANGELES WARNED ABOUT SHRINKING DISPOSAL AREAS (LAND(SHORTAGE) SANITARY-LANDFILL)
REFUSE REMOVAL JOURNAL 8(9), P. 29 (1965). LOS-ANGELES COUNTY'S 7 MILLION POPULATION IS NOW DISPOSING OF 8.5 MILLION TONS OF REFUSE AT 32 PRIVATELY AND PUBLICLY OWNED OPERATIONS. IT HAS BEEN ESTIMATED THAT BY 1980 THE AREA'S POPULATION WILL INCREASE TO 9 MILLION AND 12 MILLION TONS OF REFUSE TO DISPOSE. AT LEAST SIX MORE LAND FILL SITES SHOULD BE ACQUIRED TO KEEP ABREAST OF THE GROWING POPULATION. THESE SITES SHOULD BE ACQUIRED AND PUT INTO OPERATION WHILE LAND PRICES ARE REASONABLE, AND WHILE THEY MAY STILL BE ACQUIRED IN AREAS OF NEED TO REDUCE HAUL TIME.

07 05 PEST CONTROL

07-05-00118 70,000 FLIES PER CU-FT OF GARBAGE (PEST-CONTROL SANITARY-LANDFILL)
THE AMERICAN CITY 80(2), P. 36 (FEBRUARY 1965). HIGHLIGHTS FROM THE SOLID WASTE SEMINAR HELD IN NIAGARA FALLS WAS REVIEWED. PERTINENT COMMENTS INCLUDE (1) A MAXIMUM OF 70,000 FLIES CAN BE EXPECTED TO PROPAGATE AND EMERGE FROM ONE CU-FT OF GARBAGE. (2) FLIES CANNOT PASS THROUGH 2.625-IN OR MORE OF SOIL. (3) IN NEW YORK STATE THERE ARE 60 SANITARY LANDFILLS, 60 INCINERATORS, AND 1600 UNSANITARY OPEN DUMPS.

07-05-00183 CONTROL OF RODENTS AND INSECTS ON DUMPS (OPEN-DUMPING)
FITZWATER, W. D.
PUBLIC WORKS 89(7), P. 90-92 (JULY 1958). DISCUSSION OF RODENTICIDES SUCH AS - ANTICOAGULANTS, COMPOUND 1080, RED SQUILL, THALLIUM SULPHATE, ZINC PHOSPHIDE - METHODS OF USING THEM IN BAITS - SUCCESSION OF USE OF POISONS - BAIT STATIONS - USE OF GAS TO SUPPLEMENT POISONING OPERATIONS.

07-05-00191 EFFECT OF EARTH COVER ON FLY EMERGENCE FROM SANITARY LANDFILLS (SANITARY-LANDFILL INSECT(CONTROL))
BLACK, R. J. + BARNES, A. M.
PUBLIC WORKS 89(2), P. 91-94 (FEBRUARY 1958). HOUSE FLIES WERE USED IN LABORATORY TESTS TO DETERMINE WHAT EFFECT EARTH COVER HAS ON FLY EMERGENCE. THREE TO SIX INCHES OF COMPACTED EARTH COVER PREVENT FLY EMERGENCE. NO REASONABLE AMOUNT OF UNCOMPACTED COVER WAS FOUND EFFECTIVE. CONDITIONS AT SEVERAL SANITARY FILLS ARE REVIEWED.

07-05-00537 EFFECT OF EARTH COVER ON HOUSEFLY EMERGENCE
BLACK, R. J. + BARNES, A. M.
PUBLIC WORKS 87(3), P. 109 (MARCH 1956). AN UNCOMPACTED LAYER OF SOIL AS DEEP AS 60 INCHES DID NOT SERVE AS AN EFFECTIVE DETERRENT TO THE EMERGENCE OF HOUSEFLIES. WHEN COMPACTED AT 8.5 PERCENT MOISTURE (DRY BASIS) THE SOIL COVER PREVENTED FLY EMERGENCE AT A DEPTH OF ONLY 1-1/8 INCHES. TWO PHASES OF FLY CONTROL ARE OF IMPORTANCE IN THE OPERATION OF SANITARY LANDFILLS- 1) THE PREVENTION OF OVIPOSITION BY THOROUGHLY COVERING ALL EXPOSED REFUSE EACH DAY, AND 2) THE PREVENTION OF FLY EMERGENCE BY COMPACTING THE COVER AT OR NEAR THE OPTIMUM MOISTURE CONTENT.

07-05-00577 APPLICATION OF INSECTICIDES AT DUMPS (SANITARY-LANDFILL PEST)
LABRECQUE, G. C.
PUBLIC WORKS 89(7), P. 92-93 (JULY 1958). USE OF BAITS OR SPRAYS CONTAINING ORGANOPHOSPHORUS INSECTICIDES SUCH AS MALATHION, DIPTEREX, OR DIAZINON. LIQUID AND DRY BAITS, CONTACT SPRAYS, CONTROL OF MOSQUITOES, USE OF HAND OPERATED SPRAYERS, HYDRAULIC OR PNEUMATIC POWER SPRAYERS AND THERMAL FOG GENERATORS.

07-05-01493 EFFECT OF EARTH COVER ON EMERGENCE OF THE VINEGAR FLY DROSOPHILA MELANOGASTER MEIGEN (VECTOR(CONTROL))
DOTY, R. E. + BARNES, A. M.
CALIFORNIA VECTOR VIEWS 8(2), P. 7 (FEBRUARY 1961). STUDIES OF THE EFFECT OF SOIL COVER ON INFESTED MEDIA FOR FLY BREEDING WERE MADE WITH THE VINEGAR FLY AS THE TEST ORGANISM. THE TESTS WERE DESIGNED TO EXPLORE THREE VARIABLES - SOIL MOISTURE, DEPTH, AND COMPACTION OF SOIL. THE ARTICLE DESCRIBES THE METHOD OF PLACING THE LARVAE IN TUBES BURIED IN SOIL. THE LARVAE EMERGED AND ATTEMPTED TO BURROW THROUGH THE SOIL. THE FIRST FOUR TRIALS INDICATED THAT THE VINEGAR FLY ADULTS DID NOT EMERGE THROUGH A 2-INCH UNCOMPACTED COVERING OF DRY SOIL (0.9 PERCENT MOISTURE). ONLY 0.5 PERCENT OF THE FLIES ACTUALLY SURVIVED TO EMERGE FROM THEIR PUPAL CASES. THIS WAS ATTRIBUTED TO THE DESICCATION OF THE BREEDING MEDIUM BY THE SOIL LAYER. IN THREE SETS AT 6 PERCENT SOIL MOISTURE, 32 PERCENT EMERGED FROM THE PUPAL CASES, AND 25 PERCENT EMERGED THROUGH THE 2-INCH SOIL LAYER. AT THE SAME MOISTURE LEVEL BUT WITH A 4-INCH SOIL LAYER, 26 PERCENT EMERGED FROM THE PUPAL CASES, BUT NONE EMERGED THROUGH THE SOIL. THE PERCENTAGE OF FLIES THAT WERE ABLE TO EMERGE FROM THE PUPAL CASES VARIED DIRECTLY WITH THE SOIL MOISTURE CONTENT. THE EMERGENCE OF THE VINEGAR FLY CAN BE PREVENTED BY AS LITTLE AS A 4-INCH UNCOMPACTED SOIL COVER.

07-05-01590 FLY EMERGENCY CONTROL IN SANITARY-LANDFILLS (VECTOR(CONTROL))
REFUSE REMOVAL JOURNAL 1(5), P. 13 (MAY 1958). A SERIES OF TESTS AT SEVERAL LANDFILL OPERATIONS IN CALIFORNIA INDICATES FLY EMERGENCE DEPENDS ON (1) SOIL COMPACTION (2) COMPACTION EQUIPMENT (3) SOIL MOISTURE (4) THICKNESS OF SOIL COVER.

07-05-01914 TRASH MADE ISLAND BURNED IN JAPAN (VECTOR FLY)
REFUSE REMOVAL JOURNAL 8(10), P. 36 (1965). A 172-ACRE MAN-MADE ISLAND OF REFUSE IN TOKYO BAY, JAPAN, PLANNED AS A FUTURE BEAUTY SPOT, WAS DRENCHED IN OIL AND SET AFIRE IN AN ATTEMPT TO ERADICATE A PLAGUE OF FLIES THAT MADE NEARBY AREAS OF TOKYO ALL BUT UNINHABITABLE. THE FLY PROBLEM WAS APPARENTLY UNFORESEEN WHEN MUNICIPAL AUTHORITIES BEGAN THE REFUSE DISPOSAL PROJECT WHICH THEY POETICALLY CALLED "DREAM ISLAND". THE PLAN WAS TO DUMP 6,000 TONS OF REFUSE A DAY, THE AMOUNT THE CITY'S INCINERATORS COULD NOT HANDLE, WITHIN THE ARTIFICIAL BOUNDARIES OF THE PROJECTED ISLAND. THE NEW LAND WAS OF REFUSE AND EARTH, WHICH WHEN COMPACTED WOULD BE MADE INTO A PARK. HOWEVER, RESIDENTS SAID THAT CLOUDS OF FLIES FROM THE RISING MOUND TURNED "DREAM ISLAND" INTO A NIGHTMARE. INSECTICIDES SPRAYED FROM HELICOPTERS HAD LITTLE EFFECT. WHETHER THE ISLAND BUILDING PROJECT WILL BE CONTINUED IS STILL BEING DEBATED. (AUTH)

07 06 GROUNDWATER POLLUTION

07-06-00185 INFLUENCE OF SANITARY-LANDFILL ON GROUND WATER QUALITY (POLLUTION(WATER))
ANDERSEN, J. R. + DORNBUSH, J. N.
J AM WATER WORKS ASSOC 59(4), P. 457-470 (APRIL 1967). STUDY OF GROUNDWATER QUALITY AS AFFECTED BY LAND FILL LOCATED IN GRAVEL PIT THAT PENETRATES HIGH WATER TABLE. METHOD OF CONTROLLED DISPOSAL WAS USED IN LAND FILL OPERATION AT BROOKINGS, S.D., REFUSE AREA. SAMPLING POINTS WERE INSTALLED TO AUGMENT EXISTING WELLS AND TO STUDY MOVEMENT OF GROUNDWATER, LEACHING OF REFUSE DUMP AND EFFECTS OF SMALL POND IN IMMEDIATE AREA OF FILL ON CHEMICAL QUALITY OF WATER. STUDY PROVIDED INFORMATION ON UTILIZATION OF INACTIVE GRAVEL MINING AREA FOR REFUSE DISPOSAL.

07-06-00659 SYSTEM FOR EVALUATION OF CONTAMINATION POTENTIAL OF SOME WASTE DISPOSAL SITES (SANITARY-LANDFILL POLLUTION(WATER))
LEGRAND, H. E.
J AM WATER WORKS ASSOC 56(8), P. 959-974 (AUGUST 1964). THE ARTICLE DESCRIBES A SYSTEM FOR EVALUATING THE CONTAMINATION POTENTIAL OF ANY SOURCE OF POLLUTION, INCLUDING REFUSE DISPOSAL. IT IS A POINT COUNT SYSTEM IN WHICH CERTAIN ENVIRONMENTAL FACTORS ARE GIVEN VALUES. THE SUITABILITY OF A GIVEN SITE DEPENDS UPON THE TOTAL VALUE OF THE POINTS. POINT VALUES ARE ASSIGNED TO- WATER TABLE, WATER TABLE GRADIENT, SORPTION, PERMEABILITY, AND DISTANCE TO POINT OF USE. THE ARTICLE PRESENTS CHARTS AND SCALES FOR GIVING POINT VALUES TO EACH OF THE FACTORS AS BASED ON ITS RELATIONSHIP TO THE OTHER FACTORS. EACH FACTOR TENDS TO HAVE A DIRECT OR INVERSE RELATION WITH EACH OF THE OTHER FACTORS. IT APPLIES TO NATURAL CONDITIONS. QUANTITATIVE STUDIES HAVE BEEN DRAWN UPON FOR PREPARATION OF THE SYSTEM. HOWEVER, THE SCHEME IS EMPIRICAL AND IS DESIGNED TO GIVE AN APPROXIMATE EVALUATION. IT WORKS BEST FOR A ONE-MEDIUM SITE (WELLS AND DISPOSAL SITES BOTH IN LOOSE GRANULAR MATERIALS) AND FAIR TO GOOD FOR TWO-MEDIA SITES.

07-06-00667 GROUND-WATER CONTAMINATION IN AN URBAN ENVIRONMENT (SANITARY-LANDFILL OPEN-DUMP POLLUTION(WATER))
HACKETT, J. E.
GROUND-WATER 3(3), P. 27-30 (MARCH 1965). THE MOST WIDESPREAD POTENTIAL SOURCES OF GROUND-WATER CONTAMINATION IN THE HIGHLY URBANIZED METROPOLITAN AREA OF NORTHEASTERN ILLINOIS ARE INDIVIDUAL SUB-SURFACE SEWAGE DISPOSAL SYSTEMS (APPROXIMATELY 162,000), DUMPS AND LANDFILLS THAT RECEIVE MILLIONS OF CU-YDS OF REFUSE ANNUALLY, AND SEWAGE EFFLUENT AND INDUSTRIAL WASTES DISCHARGED INTO STREAMS THAT ARE HYDROLOGICALLY CONNECTED WITH WIDELY USED SHALLOW AQUIFERS. CONTAMINATION ALSO MAY BE INTRODUCED FROM SURFACE AND SUBSURFACE STORAGE OF HYDROCARBON AND OTHER SOLUBLE OR MOBILE MATERIALS AND FROM WATER OF POOR QUALITY COMING FROM DEPTH. GROUND-WATER CONTAMINATION IS A PROBLEM OF REGIONAL SCOPE IN THE URBAN AREA OF NORTHEASTERN ILLINOIS. IT MUST BE CONSIDERED IN METROPOLITAN PLANNING NOT ONLY AS A HAZARD TO HEALTH AND SAFETY BUT AS A BASIC PART OF THE OVER-ALL PROGRAM OF DEVELOPMENT AND MANAGEMENT OF WATER RESOURCE POTENTIAL. THE RELATIONSHIPS THAT EXIST BETWEEN GROUND WATER CONTAMINATION AND LAND USE REQUIREMENTS OF THE AREA MUST BE RESOLVED IN ANY EFFECTIVE PROGRAM.

07-06-01388 FINDING MORE SITES FOR CONTROLLED TIPPING (SITE-SELECTION SANITARY-LANDFILL)
SURVR MUNIC CTR ENGR 121(3653), P. 763-764 (JUNE 9, 1962). RISK TO GROUND WATER FROM REFUSE TIPPING INTO WET AND DRY PITS IS DISCUSSED. (PHEA)

07-06-01689 LEACHING OF A SANITARY LANDFILL (POLLUTION(WATER))
MERZ, R. C.
CALIFORNIA STATE WATER POLLUTION CONTROL BOARD, PUB 10, (1954). DUMPS HANDLING GARBAGE, RUBBISH, AND MIXED REFUSE IN INTERMITTENT OR CONTINUOUS CONTACT WITH GROUND WATER WILL GROSSLY POLLUTE THE GROUND WATER IN THE IMMEDIATE VICINITY OF THE LANDFILL AND WILL MAKE IT UNFIT FOR DOMESTIC OR IRRIGATIONAL USE. LOCAL INCREASES OF MINERAL ELEMENTS TO CONCENTRATIONS VARYING FROM 20 TIMES THOSE FOUND IN THE UNPOLLUTED GROUND WATER IN THE CASE OF COMMON MINERALS UP TO 10,000 TIMES IN THE CASE OF AMMONIA N ARE POSSIBLE. IT MAY BE EXPECTED THAT CONTINUOUS LEACHING OF AN ACRE-FT OF SANITARY LANDFILL WILL RESULT IN A MINIMUM EXTRACTION OF 1.5 TONS OF NA PLUS K, 1.0 TONS OF CA PLUS MG, 0.91 TONS OF CHLORIDE, 0.23 TONS OF SULFATE, AND 3.9 TONS OF BICARBONATE IN LESS THAN ONE YEAR WITH DECREASED RATES IN SUBSEQUENT YEARS. RAINFALL ALONE IN THIS AREA WILL NOT PENETRATE A 7.5-FT LANDFILL SUFFICIENTLY TO CAUSE ENTRY OF LEACH INTO THE UNDERLYING GROUND WATER. ANAEROBIC CONDITIONS WITH PRODUCTION OF COMBUSTIBLE GAS WILL EXIST WITHIN A SANITARY LANDFILL IN APPROXIMATELY ONE MONTH FOLLOWING DEPOSITION OF THE FILL. THE COMPOSITION OF THIS GAS WILL BE APPROXIMATELY 70 PERCENT METHANE AND 30 PERCENT CARBON DIOXIDE.

07-06-01690 EFFECTS OF REFUSE DUMPS ON GROUND WATER QUALITY (POLLUTION(WATER) SANITARY-LANDFILL COMPOSITION DECOMPOSITION)
ENGINEERING-SCIENCE, INC. THE RESOURCES AGENCY OF CALIFORNIA, SACRAMENTO, CALIFORNIA, STATE WATER POLLUTION CONTROL BOARD, PUB 24, (1961). THE FLOW PATTERN OF POLLUTION IN GROUND WATER DEPENDS GREATLY ON LOCAL GEOLOGIC CONDITIONS. THE PRINCIPAL PROCESSES INVOLVED IN THE INTRODUCTION OF POLLUTANTS TO THE GROUND WATER THROUGH THE AGENCY OF REFUSE DUMPS ARE INFILTRATION AND PERCOLATION, REFUSE DECOMPOSITION, GAS PRODUCTION AND MOVEMENT, LEACHING, AND GROUND WATER TRAVEL. THE AMOUNT OF WATER WHICH ENTERS A REFUSE FILL WILL BE GOVERNED BY RATE OF WATER APPLICATION, NATURE OF THE REFUSE COVER, AND CLIMATIC CONDITIONS. IN SOUTHERN CALIFORNIA, REFUSE DUMPS HAVING UNIRRIGATED SOIL COVERS DO NOT SEEM TO TRANSMIT SURFACE-APPLIED MOISTURE IN QUANTITIES GREAT ENOUGH TO CAUSE NOTICEABLE POLLUTION. IN AREAS OF HIGHER PRECIPITATION, THE PERCOLATION OF RAINWATER THROUGH REFUSE HAS DEFINITELY BEEN OBSERVED, AND ESTIMATED WATER BALANCES INDICATE THAT HEAVY IRRIGATION AND OCCASIONAL YEARS OF HIGH PRECIPITATION MAY PRODUCE SUBSTANTIAL PERCOLATION THROUGH PERMEABLE DUMP COVERS EVEN IN SOUTHERN CALIFORNIA. THE APPEARANCE OF PERCOLATION EVEN UNDER SUCH ADVERSE CONDITIONS MAY BE DELAYED FOR YEARS BECAUSE OF THE HIGH MOISTURE-RETAINING CAPACITY OF COMBUSTIBLE RUBBISH, AND BECAUSE HEAT LIBERATED IN THE DECOMPOSITION OF THE REFUSE MAY ACCELERATE EVAPORATION. REFUSE CONTAINS MINERAL AND ORGANIC SUBSTANCES IN QUANTITIES CAPABLE OF SERIOUSLY DAMAGING UNDERGROUND WATER SUPPLIES. CARBON DIOXIDE PRODUCED IN THE BREAKDOWN OF ORGANIC MATTER CAN SERIOUSLY DEGRADE UNDERGROUND WATER BY DISSOLVING CA, MG, FE, AND OTHER SUBSTANCES WHICH ARE UNDESIRABLE AT HIGH CONCENTRATIONS.

07-06-01695 SPECIAL STUDIES OF A SANITARY LANDFILL - FINAL SUMMARY AND THIRD PROGRESS REPORT (POLLUTICN(WATER) SETTLEMENT-RATE DECOMPOSITION GAS-PRODUCTION)
U.S. PUBLIC HEALTH SERVICE, BUREAU OF SOLID WASTE MANAGEMENT, (MARCH 1969). THE PURPOSES OF THE FIELD INVESTIGATION, UTILIZING LANDFILL CELLS HAVING A DEPTH OF APPROXIMATELY 20 FEET AND AN EARTH COVER OF 2 FEET, WERE TO (1) STUDY THE PERCOLATION THROUGH THE LANDFILL AS A RESULT OF APPLICATION OF SUFFICIENT WATER TO MAINTAIN A GOLF COURSE TYPE TURF, (2) STUDY THE PERCOLATION THROUGH THE LANDFILL AS A RESULT OF APPLICATION OF SUFFICIENT WATER TO SIMULATE THE RAINFALL PATTERN OF A TEMPERATE CLIMATE (SEATTLE), (3) STUDY THE EFFECTS OF AERATING A LANDFILL, (4) MEASURE SETTLEMENT OF BOTH AEROBIC AND ANAEROBIC LANDFILLS, (5) STUDY THE QUALITY OF GAS PRODUCED IN THE LANDFILLS RECEIVING THE VARIOUS TREATMENTS, AND (6) DETERMINE THE VOLUME OF GAS PRODUCED BY A KNOWN QUANTITY OF REFUSE DECOMPOSING UNDER ANAEROBIC CONDITIONS. DATA WERE DEVELOPED AS A RESULT OF THE CONSTRUCTION OF MODEL LANDFILLS AND THEIR TREATMENT UNDER SELECTED ENVIRCNMENTAL CONDITIONS. PRACTICAL APPLICATION OF THE REPORTED DATA REQUIRES DETAILED KNOWLEDGE OF INDIVIDUAL LANDFILL CONDITIONS - EXISTING OR PROPOSED - BEST KNOWN TO THE RESPONSIBLE AUTHORITIES.

07-06-02007 POLLUTION OF WATER BY TIPPED REFUSE
SUMNER, J.
64TH ANNUAL CONF OF THE INSTITUTE OF PUBLIC CLEANSING, HASTINGS, (JUNE 5-8, 1962). AN INTRODUCTICN TO THE REPORT PUBLISHED BY THE MINISTRY OF HOUSING AND LOCAI GOVERNMENT, OF THE TECHNICAL COMMITTEE ON EXPERIMENTAL DISPOSAL OF REFUSE IN WET AND DRY PITS.

07 07 SETTLEMENT

07-07-00184 LANDFILL SETTLEMENT RATES (SANITARY-LANDFILL)
MERZ, R. C. + STONE, R.
PUBLIC WORKS 93(9), P. 103-106 (SEPTEMBER 1962). STUDY OF FACTORS CONTROLLING USE OF SANITARY LANDFILL SITE, BY DEPT. OF CIVIL ENGRG OF UNIVERSITY OF SOUTHERN CALIFORNIA TO DETERMINE OPTIMUM MEANS BY WHICH THE MOST WASTE CAN BE PUT INTO AN AVAILABLE VCLUME AND AT SAME TIME PERMIT SHRINKAGE PREDICTION. USE OF 6 CELLS, EACH 50 FEET SQUARE BY 20 FEET DEEP WITH VARIOUS CONDITIONS OF CONSTRUCTION IN TESTS. STUDY OF INFLUENCE OF CELLS ON BIOCHEMICAL DECOMPOSITION OF ORGANIC MATERIAL. (EI)

07-07-00280 REFUSE VOLUME REDUCTION IN A SANITARY-LANDFILL (BIOLOGICAL-ACTIVITY)
AM SOC CIVIL ENGRG J SANIT ENGRG DIV 85(SA6), P. 37 (1959). AN ENGINEERING INVESTIGATION WAS UNDERTAKEN TO ASCERTAIN THE EXTENT OF REFUSE VOLUME REDUCTION THAT CAN BE ACHIEVED INITIALLY AND AFTER A LONG PERIOD OF STORAGE IN A SANITARY LANDFILL. THE TESTS WERE CONDUCTED AT MONTEREY PARK, CALIFORNIA, WHERE THE SOIL CONSISTS OF FINE SANDY-SILT-CLAYS. THE TESTS WERE RUN IN NOV-DEC 1957. DURING THIS TIME, THE SKIES WERE OVERCAST DURING ONLY A FEW DAYS. ON THESE DAYS A MINOR AMOUNT OF RAINFALL OCCURRED. RESULTS OF THE TESTS, AND THE CONCLUSIONS TO BE DRAWN ARE AS FOLLOWS- 1. IN-PLACE VOLUME REDUCTION ACHIEVED AT THE SANITARY FILL SITE UNDER TEST-OPERATING CONDITIONS WAS 25 PERCENT OF THE ORIGINAL TRUCKED REFUSE VOLUME. 2. AFTER FIVE YEARS, AN ADDITIONAL 25 PERCENT IN-PLACE REDUCTION OF VOLUME OCCURRED. 3. SOIL TUBE INVESTIGATIONS INDICATED THAT THE INTENSITY OF THE BIOLOGICAL ACTIVITY IN THE FILL AFTER 1-1/2 YEARS WAS GREATER THAN THAT IN THE FIRST FEW WEEKS AFTER THE FILL WAS BEGUN. 4. IN A TYPICAL LANDFILL OPERATION HOMOGENEOUS MATERIALS ACTUALLY MAY EXPAND AS A RESULT OF FRACTURING AND MATTING, OR OF POOR COMPACTICN.

07-07-00902 SANITARY LAND FILL TESTS INVESTIGATING REFUSE VOLUME REDUCTION AND OTHER PHENOMENA (DECOMPOSITION-PRODUCTS COVER(AMOUNT))
AM SOC CIVIL ENGRS J SANIT ENGRG DIV 84(SA6), (NOVEMBER 1958). TESTS PERFORMED AT UNION BAY SANITARY LANDFILL DISPOSAL SITE, SEATTLE, WASH., TO ASCERTAIN COMPACTION, SETTLEMENT, FILL TEMPERATURE AND GAS PRODUCTION. CRITICAL REVIEW OF THESE DATA WITH REFERENCE TO OBTAINING OPTIMUM REFUSE DISPOSAL VOLUME INTO GIVEN LAND FILL AREA.

07-07-01623 COMPACTION, SETTLEMENT OF SANITARY LANDFILLS (RECLAMATION(LAND))
WINKLER, T. E.
REFUSE REMCVAL JOURNAL 1(12), P. 8 (DECEMBER 1958). VARIOUS METHODS OF OPERATING SANITARY LANDFILLS ARE DESCRIBED. THE IMPORTANCE OF KNOWING THE INTENDED USE OF THE LAND BEFORE FILLING IS BEGUN, IN ORDER TO REDUCE CONSTRUCTION AND UTILIZATION COSTS, IS STRESSED.

07 08 DECOMPOSITION PRODUCTS

07-08-00089 BURIED 25 YEARS AND STILL LEGIBLE (SANITARY-LANDFILL DECOMPOSITION)
BOOTH, E. J.
THE AMERICAN CITY 80(7), P. 26 (JULY 1965). IN THE PROCESS OF CONSTRUCTING A NEW HIGHWAY NEAR BISMARCK, SOUTH DAKOTA, AN OLD LANDFILL AREA WAS CUT THROUGH. INSPECTION OF THE EXPOSED MATERIAL SHOWED THAT LITTLE DECOMPOSITION OF PAPER HAD OCCURRED. THE PRINT WAS STILL LEGIBLE. METAL ITEMS ALSO WERE IN GOOD CONDITION. THERE WAS LITTLE EVIDENCE OF SETTLEMENT, AND NO EVIDENCE OF GAS PRODUCTION OR OF RODENTS.

07-08-00129 DECOMPOSITION OF LAND-FILLS (DECOMPOSITION SANITARY-LANDFILL)
ELIASSEN, R.
AM J PUBLIC HEALTH 32, P. 1023-1037 (SEPTEMBER 1942). DECOMPOSITION OF SANITARY LANDFILLS AT FIVE LOCATIONS WAS DESCRIBED. COMPOSITION OF RAW REFUSE BY WEIGHT IS PRESENTED IN FIGURES AND TABLES. THE PERCENTAGE OF OXIDIZABLE MATERIAL IN THE LANDFILL BY DEPTH AND AGE IS TABULATED. ORGANIC NITROGEN, ACIDITY, ORGANISM COUNTS, FUNGI COUNTS, MOISTURE, ARE SIMILARLY PRESENTED. TEMPERATURES AND DECOMPOSITION RATES ARE ALSO PRESENTED.

07-08-00188 GAS MOVEMENT IN LANDFILLED RUBBISH (SANITARY-LANDFILL POLLUTION(WATER))
BISHOP, W. D. + CARTER, R. C., + LUDWIG, H. F.
PUBLIC WORKS 96(11), P. 64-68 (NOVEMBER 1965). WITH ESTIMATED 4 LB/CAPITA REFUSE TO BE DISPOSED OF AND ITS USE AS LANDFILL IN AREA NOT PERMITTING INCINERATION, SUCH AS LOS ANGELES, DECOMPOSING GASES BECOME HEALTH HAZARD WHERE THEY POLLUTE GROUNDWATER RESOURCES. SINCE 1962 TESTS HAVE BEEN CONDUCTED WITH GAS COLLECTION PROBES INSTALLED IN SAMPLING WELLS AND TEMPERATURE-MOISTURE PROBES. METHOD, TEST EQUIPMENT AND GRAPHS. RESULTS HELP PREDICT AMOUNTS OF CARBON DIOXIDE ENTERING SOILS AND PROTECTIVE PROCEDURES TO BE ADOPTED.

07-08-00190 LANDFILL GAS BURNED FOR ODOR CONTROL (SANITARY-LANDFILL)
DUNN, W. L.
CIVIL ENGRG (NEW-YORK), 11, P. 60-61 (NOVEMBER 1957). METHANE GAS IN LANDFILL AT UNIVERSITY OF WASHINGTON GROUNDS IGNITED. INEXPENSIVE BURNER MADE FROM 1-INCH TUBING. SHORT PIECE OF ONE-FOURTH INCH WIRE MESH SCREEN WELDED ONTO ONE END OF PIPE. SCREENED END OF PIPE IS SET INTO REFUSE 6 TO 12 INCHES, THEN EARTH IS COMPACTED AROUND IT. LOW PRESSURE FLAME RETENTION GAS BURNER INSERTED ABOUT 2 INCHES BELOW TOP OF PIPE. PRINCIPLE INVOLVED IN BURNING REFUSE GAS IS TO MAINTAIN TIGHT EARTH SEAL.

07-08-00284 STORM DRAINAGE AND GAS BURNING AT REFUSE DISPOSAL SITE
DUNN, W. L.
CIVIL ENGRG (NEW-YORK) 30(8), P. 68-69 (AUGUST 1960). ON REFUSE DISPOSAL SITE, LOANED BY UNIVERSITY OF WASHINGTON TO CITY OF SEATTLE, FRENCH DRAINS ABOUT 20 FT. WIDE, 10 FT. DEEP, AND SEVERAL HUNDRED FEET LONG WERE CONSTRUCTED TO ABDUCT STORM WATERS AND COLLECT GASES. CONTROLLED BURNING, AT SPECIALLY CONSTRUCTED INLETS, OXIDIZES METHANE AND DESTROYS FOUL ODORS.

07-08-01023 GAS PRODUCTION IN SANITARY LANDFILL
MERZ, R. C. + STONE, R.
PUBLIC WORKS 95(2), P. 84-87, 174 (FEBRUARY 1964). THREE-YEAR STUDY OF FACTORS CONTROLLING USE OF SANITARY LANDFILL SITE HAS BEEN CONDUCTED BY UNIVERSITY OF SOUTHERN CALIFORNIA AND DESCRIBED IN ARTICLE INDEXED IN ENGINEERING INDEX 1962, P. 1159, PARALLEL STUDY INVOLVING QUALITY OF GAS PRODUCED BY DECOMPOSING REFUSE CONDUCTED DURING SAME PERIOD AND CONTINUED TO APRIL 30, 1963. GAS PRODUCTION DATA AND WARRANTED CONCLUSIONS ARE PRESENTED.

07-08-01059 MEASURING GAS ESCAPE FROM A LANDFILL (SANITARY-LANDFILL)
PUBLIC WORKS 95(9), P. 163 (1964). IN ORDER TO MEASURE THE CARBON DIOXIDE ESCAPE FROM LANDFILL COVER A DEVICE INCORPERATING COPPER WOOL SATURATED WITH (KOH) POTASSIUM HYDROXIDE TO ABSORB ANY CARBON DIOXIDE ESCAPING FROM THE FILL COVER. ADDITIONAL WEIGHT OF THE ABSORBER REPRESENTED CARBON DIOXIDE COLLECTED OVER A GIVEN TIME PERIOD. HOWEVER, THE AMOUNTS COLLECTED IN TEST RUNS DID NOT AGREE WITH THEORETICAL DIFFUSION EQUATIONS FOR CARBON DIOXIDE ESCAPING TO THE ATMOSPHERE. REFINEMENTS ARE BEING MADE TO THE DEVICE AND MEASUREMENTS WILL BE CONTINUED. THE DEVICE IS EXPECTED TO BE USEFUL IN DETERMINING THE NECESSARY THICKNESS OF LANDFILLS.

07-08-01082 TEMPERATURE IS A TEST OF DECOMPOSITION (SANITARY-LANDFILL RECLAMATICN(LAND))
NEDRY, D. E.
THE AMERICAN CITY 69(3), P. 29 (MARCH 1954). SANITARY LANDFILL HAS BEEN USED AT COEUR D'ALENE, IDAHO, NOT ONLY AS A MEANS OF REFUSE DISPOSAL BUT ALSO AS A METHOD OF RECLAIMING LAND IN AND AROUND THE CITY. AT THE TIME THE ARTICLE WAS WRITTEN, PROPERTY OWNED BY A LOCAL YACHT CLUB WAS BEING FILLED FOR USE AS A STORAGE SPACE FOR BOATS AND A PARKING LOT FOR CARS. EACH LAYER OF THE FILL IS 6 FEET DEEP AND IS COVERED BY 2 FEET OF EARTH. APPROXIMATELY 1/2 ACRE OF AREA PER YEAR IS USED IN THE OPERATION. BY TESTING THE TEMPERATURE OF THE GROUND, IT HAS BEEN POSSIBLE TO JUDGE THE EXTENT OF BACTERIAL ACTION IN THE REFUSE AND TO DETERMINE THE DEGREE OF DECOMPOSITION OF BURIED REFUSE. THREE MONTHS AFTER BURIAL, THE TEMPERATURE IN THE REFUSE IS AT LEAST 20 DEGREES WARMER THAN THAT IN THE SURROUNDING GRCUND. FROM 2 TO 3 YEARS USUALLY PASS BY BEFORE THE REFUSE TEMPERATURE DROPS TO THAT OF THE SURROUNDING SOIL. WHEN THIS STAGE HAS BEEN REACHED BACTERIAL ACTIVITY CEASES TO POSE A PROBLEM. THE RAMP SYSTEM IS USED. THE TRACTOR PUSHES THE REFUSE FORWARD, GRADING IT UPWARD. THE REFUSE IS COVERED EACH NIGHT.

07-08-01140 SANITARY FILL RE-USED SAFELY (SANITARY-LANDFILL RECLAMATION(LAND))
SCHNEIDER, C.
THE AMERICAN CITY 68(10), P. 83 (1953). CONTRARY TO WHAT NEW YORK AND CALIFORNIA FOUND, NEW ORLEANS FOUND THE FILL IN ITS LANDFILL OPERATION COULD BE USED FOR COVER AFTER ONLY THREE YEARS OF DECOMPOSITION. APPARENTLY, THE WARM CLIMATE AND HIGH RAINFALL HASTENS THE DECOMPOSITION. NEW ORLEANS USES BOTH LANDFILL AND INCINERATICN DISPOSAL OPERATIONS. THE LANDFILL COSTS ABOUT $.90/TON AND THE INCINERATOR COSTS ABOUT $2.80 PER TON.

07-08-01638 INSECT AND ODOR CONTROL IN SANITARY LANDFILLS
PAINO, B. + OLSEN, C. E.
REFUSE REMOVAL JOURNAL 2(4), P. 8 (APRIL 1959). THE ODORLESS AND NUISANCE-FREE LANDFILL AT DOBBS FERRY, NEW YORK, RESULTING FROM RESEARCH AND EXPERIMENTATION, IS DISCUSSED. COMPLAINTS OF NEIGHBORS WERE ENDED WITH THE USE OF CHEMICALS. (PHS)

07-08-01697 IN-SITU INVESTIGATION OF MOVEMENTS OF GASES PRODUCED FROM DECOMPOSING REFUSE
STATE WATER QUALITY CONTROL BOARD, SACRAMENTO, CALIFORNIA, PUB 31, (1965). BECAUSE OF CONCERN ABOUT POSSIBLE GROUND WATER POLLUTION FROM USE OF ABANDONED GRAVEL PITS FOR DISPOSAL OF SOLID WASTES, THIS STUDY WAS UNDERTAKEN TO EVALUATE THE MOVEMENT OF REFUSE DECOMPOSITION GASES, BOTH LATERALLY AND VERTICALLY THROUGH A REFUSE FILL AND ADJACENT STRATA. CARBON DIOXIDE WAS THE ONLY DECOMPOSITION GAS FOUND IN SIGNIFICANT QUANTITIES IN THE ADJACENT AND SURROUNDING SOIL. ABOUT 18 TIMES THE QUANTITY OF CARBON DIOXIDE PASSED THROUGH THE 1-FOOT SILT COVER INTO THE ATMOSPHERE AS PASSED INTO THE SOIL. IF IT IS DEEMED NECESSARY TO ISOLATE CARBON DIOXIDE FROM GROUND WATER, CONTROL METHODS MUST BE FORMULATED.

07-08-01793 EXPLOSION AND FIRE TRACED TO REFUSE GENERATED GASES (SANITARY-LANDFILL SAFETY)
REFUSE REMOVAL JOURNAL 6(8), P. 34 (1963). METHANE, HYDROGEN AND AMMONIA ARE DANGEROUS GASES FORMED BY THE BACTERIAL DECOMPOSITION OF ORGANIC MATERIAL. A RECENT REPORT FROM THE U.S. BUREAU OF MINES MAKES THIS POINT CLEAR AS A RESULT OF STUDYING THE CAUSES BEHIND SIX CASES OF FIRE AND EXPLOSION. AN EXPLOSION THAT DEMOLISHED A NEARBY HOUSE WAS TRACED TO GASES GENERATED BY SEWAGE DUMPED INTO AN ABANDONED MINE. GASES BUBBLING THROUGH POOLS OF WATER ON A SCHOOL CONSTRUCTION SITE WERE FOUND TO BE FLAMMABLE, AND THERE WAS A VEGETABLE DECAY ODOR IN THE AREA. THE INVESTIGATION, BY THE BUREAU'S EXPLOSIVES RESEARCH LABORATORY, FOUND THAT THE BUILDING'S FOUNDATIONS WERE LOCATED DIRECTLY OVER AN OLD GARBAGE DUMP. IN ANOTHER INVESTIGATION, IT WAS DISCOVERED THAT AN INFLAMMABLE GAS HAD BEEN ADMITTED TO A HOUSE THROUGH THE ACCIDENTAL CONNECTION OF A STORM SEWER TO A SANITARY DISPOSAL PIPE LINE.

07-08-02110 IN-SITU INVESTIGATION OF MOVEMENTS OF GASES PRODUCED FROM DECOMPOSING REFUSE (SANITARY-LANDFILL)
STATE WATER QUALITY CONTROL BOARD, STATE OF CALIFORNIA, PUB 35, 1967. A FINAL REPORT ON A FOLLCW-UP STUDY FROM A PREVIOUS INVESTIGATION TO DETERMINE THE RATE OF MOVEMENT AND MONITORING PROCEDURES FOR GASES MOVING IN THE SOIL AS A RESULT OF REFUSE DECOMPOSING IN A LANDFILL. LISTED ARE THE OBJECTIVES OF THE STUDY, DESCRIPTIONS OF EXPERIMENTS, DATA OBTAINED IN THE STUDY, AND CONCLUSIONS AND RECOMMENDATIONS.

07 09 COVER MATERIAL

07-09-00503 USE OF INCINERATOR ASH AS COVER FOR LANDFILLS (RESIDUE SANITARY-LANDFILL)
REQUARDT, G. J. + HARRINGTON, W. M., JR.
REFUSE REMOVAL JOURNAL 5(11), P. 25 (NOVEMBER 1962). A REPORT ON TESTS CONDUCTED IN BALTIMORE, MD., ON THE SUITABILITY OF INCINERATOR ASH AS COVER MATERIAL FOR A SANITARY LANDFILL. TESTS WERE MADE ON SANDY CLAY, WHICH HAS ALREADY BEEN ACCEPTED AS A SATISFACTORY COVER MATERIAL, INCINERATOR ASH FROM A 2-YEAR-OLD STOCKPILE, AND INCINERATOR ASH FROM A 10-YEAR-OLD ASH SPOIL AREA. THE TESTS INCLUDE- COMPACTION TEST (MOISTURE, DENSITY RELATIONS) BY THE STANDARD AASHO TEST DESIGNATION T99-57, METHOD D, SIEVE ANALYSIS FOR GRAIN SIZE DETERMINATION. FIELD MOISTURE CONTENT, PERMEABILITY OF A COMPACTED SAMPLE, SPECIAL SWELL, SHRINKAGE, AND MOISTURE-ABSORPTION TESTS USING MODIFICATIONS OF U.S. CORPS OF ENGINEERS PROCEDURE FOR ANALYSIS FOR COMPACTED FILLS, AND ORGANIC CONTENT BY LOSS ON IGNITION. A TABLE SUMMARIZES TEST RESULTS. THE PRIMARY ADVANTAGE OF ASH OVER ACCEPTABLE SANDY CLAY IS ITS COMPACTABILITY OVER A BROAD RANGE OF WEATHER CONDITIONS. OTHER ADVANTAGES OF THE ASH ARE ITS GREATER INTERNAL STRENGTH AFTER COMPACTION, ITS FREEDOM FROM SHRINKAGE UPON DRYING, THE GREATER SURFACE RIGIDITY IT AFFORDS AND THE LACK OF MUDDINESS DURING RAINY WEATHER WHEN IT IS USED. (PHS)

07 10 USE OF FILLED LAND

07-10-00091 HOW TO USE YOUR COMPLETED LANDFILLS (SANITARY-LANDFILL SETTLEMENT GAS-SEEPAGE UTILIZATION)
THE AMERICAN CITY 80(8), P. 91 (AUGUST 1965). A SURVEY OF COUNTIES THAT USED SANITARY LANDFILL FOR THEIR SOLID WASTE DISPOSAL SHOWED THAT 48 PERCENT OF THE 208 WHICH RESPONDED TO THE SURVEY DID NOT HAVE ANY STRUCTURES ON THE COMPLETED LANDFILL SITES, 21 PERCENT HAD BUILT ON ONE OR MORE SITES, AND 31 PERCENT HAD NOT AS YET COMPLETED ANY LANDFILLS. SETTLEMENT OR GAS PRODUCTION OR BOTH HAVE ADVERSELY AFFECTED MANY OF THE STRUCTURES CONSTRUCTED ON COMPLETED SANITARY LANDFILLS. THE ARTICLE DESCRIBES THE RESPONSES FROM MANY COUNTIES THROUGHOUT THE NATION. IN GENERAL, THE CONSENSUS WAS THAT BUILDINGS MUST HAVE ADEQUATE PROTECTION FROM SETTLING AND GAS SEEPAGE. ONE CITY INITIATED THE FOLLOWING REQUIREMENTS - A MONOLITHIC, SELF-SUPPORTING FOUNDATION SLAB, KEYED AND SEALED FOUNDATION WALLS, A PLASTIC SEAL UNDER THE INTERIOR FLOOR, AND A 24-INCH WIDE ROCK-FILLED TRENCH AROUND THE FOUNDATION TO COLLECT GAS. GOLF COURSES, PLAYGROUNDS, PARKS, AND PICNIC AREAS ARE SUITABLE USES FOR COMPLETED LANDFILLS, ALTHOUGH GASES PRODUCED BY THE DECOMPOSING REFUSE OFTEN MAKE IT DIFFICULT FOR GRASS AND OTHER FLORA TO GROW. (UC)

07-10-00177 WHY YOU SHOULD AVOID HOUSING CONSTRUCTION ON REFUSE LANDFILLS (RECLAMATION(LAND) SANITARY-LANDFILL ODOR(CONTROL) COMPOSITION SETTLEMENT)
ELIASSEN, R.
ENGRG NEWS-RECORD 138, P. 756 (1947). ERECTION OF VETERANS' EMERGENCY HOUSING UNITS IN NEW YORK CITY CALLED FOR THE USE OF A 130-ACRE SITE THAT HAD BEEN FILLED WITH RUBBISH AND GARBAGE SOME FIVE YEARS AGO. RE-GRADING OF THE SITE AND THE OPENING OF TRENCHES FOR UTILITIES EXPOSED DECOMPOSING GARBAGE WITH A RESULTING STENCH. SEEKING TO CONTROL THESE ODORS WITH VARIOUS CHEMICAL COMPOUNDS, IT WAS DISCOVERED THAT THIS COULD BE DONE SUCCESSFULLY USING A COMMERCIAL OXIDIZING AGENT SPRAYED ON THE EXPOSED REFUSE. TO COPE WITH THE PROBLEM OF COMBUSTIBLE-GAS GENERATION WITHIN THE FILL, ALL THE HOUSES WERE ELEVATED ABOVE THE GROUND AND AN ALUMINUM-FOIL MEMBRANE WAS SECURED UNDER THE WOOD FLOORING. ON THE BASIS OF THESE EXPERIENCES, THE CONCLUSION IS REACHED THAT LANDFILLS SHOULD NOT BE USED FOR PURPOSES REQUIRING EXCAVATION. (AUTH)

07-10-00192 SANITARY FILL PROVES OUT FOR PLANT SITES (SANITARY-LANDFILL SALVAGE SETTLEMENT FOUNDATIONS)
BOWERS, N. A.
ENGRG NEWS-RECORD 161(25), P. 44-46, 48 (DECEMBER 18, 1958). FILL-AND-COVER REFUSE DISPOSAL METHOD OF SAN FRANCISCO, SUCCEEDED BEYOND MOST OPTIMISTIC EXPECTATIONS. MORE THAN 75 MILLION CU-YDS OF REFUSE HAVE BEEN PLACED AT SAN FRANCISCO BAY TIDELAND. SALVAGE OF BOTTLES, PAPER, RAGS AND METALS. 1 TO 2 FT COVER MATERIAL SEALS OFF REFUSE. SETTLING PROCESS. INDUSTRIAL CONSTRUCTION ON FILL PROVIDES FOR SETTLEMENT, BY ADAPTING STOOPS, PIPE EXTENSION, AND ADJUSTABLE COLUMNS. (EI)

07-10-00194 SANITARY-LANDFILL BECOMES MAJOR LEAGUE TRAINING FIELD (RECLAMATION(LAND))
GOODROW, T. E.
PUBLIC WORKS 96(8), P. 124-126 (AUGUST 1965). LAND FILL METHOD OF DISPOSAL WAS USED AT ST. PETERSBURG, FLORIDA, TO RECLAIM SALT MARSH AND MANGROVE AREA IN NORTHEAST SECTION OF CITY. LARGE DIKE WAS THROWN UP AROUND AREA TO KEEP TIDAL WATER FROM INUNDATING LAND. CANAL WAS DUG AROUND 210 ACRES WITH DIRT CAST TO OUTSIDE TO FORM DIKE. TRENCH FILL METHOD WAS EMPLOYED. AFTER TRENCHING AND DIKING, PUMPS REMOVED EXCESS WATER. (EI)

07-10-00595 WE REWORK OUR SANITARY LANDFILL (RECLAMATION(LAND))
HALL, R. E.
THE AMERICAN CITY 74(9), P. 153 (SEPTEMBER 1959). HAVING ONLY 40.3 ACRES TO USE FOR SANITARY LANDFILL, CHARLOTTESVILLE, VIRGINIA, HAS DECIDED TO REWORK LAND, ALTHOUGH IT HAS ALREADY BEEN COMPLETELY UTILIZED FOR WASTE DISPOSAL. THE SITE WAS REUSED AFTER NO MORE THAN SIX YEARS, WITH NO FOUL ODORS NOTICED. EXCEPT FOR SOME PAPER AND RAGS, ALL OF THE MATTER HAD BEEN DECOMPOSED BY THE TIME THE FILL WAS REWORKED. COLLECTION BY THE CITY IS TWICE A WEEK. THE COLLECTION AND DISPOSAL OPERATIONS COST THE CITY $4.50 PER PERSON PER YEAR. THE EXPENSES ARE PAID BY THE CITY'S GENERAL FUND. (UC)

07-10-00596 SANITARY LANDFILL EXTENDS UNIVERSITY CAMPUS (RECLAMATION(LAND))
DUNN, W. J.
THE AMERICAN CITY 74(3), P. 97 (MARCH 1959). THE FILL IS LOCATED AT THE CAMPUS OF THE UNIVERSITY OF WASHINGTON IN SEATTLE. THE LANDFILL IS OPERATED AT THE UNION BAY SWAMP ON LAKE WASHINGTON. TO DATE, ABOUT 28 ACRES OF FILL HAVE BEEN CONVERTED INTO PARKING AREA AND A PLAYFIELD. OPERATION DURING WET WEATHER IS BESET WITH DIFFICULTIES, AND THE EXTENSIVE SETTLING IS A PROBLEM. NO OBJECTIONS TO THE OPERATION HAVE BEEN RAISED BY NEARBY RESIDENTS. (UC)

07-10-00601 DRAINED CANAL (SANITARY-LANDFILL)
POTTHOFF, E. H., JR.
THE AMERICAN CITY 74(4), P. 102 (APRIL 1959). THE SITE OF THE OPERATION IS NIAGARA FALLS, NEW YORK. AN ABANDONED HYDRAULIC POWER CANAL, 90 FT WIDE, 40 FT DEEP, AND 4,400 FT LONG EXTENDS THROUGH THE CITY'S BUSINESS DISTRICT. THE CANAL WAS DRAINED, AND A SANITARY LANDFILL WAS BEGUN IN IT. A 6-FT LAYER OF HEAVY BROKEN CONCRETE WAS PLACED ON THE BOTTOM OF THE DRAINED CANAL TO PROVIDE FOR DRAINAGE. COMPACTED 4-FT LAYERS OF RANDOM FILL WERE ALTERNATED WITH 1-FT LAYERS OF DIRT. THE TOP 6-FT LAYER CONSISTED OF HEAVY ROCK AND HIGH-QUALITY FILL. THE FILL INCLUDES INCINERATOR ASH AND NONCOMBUSTIBLE REFUSE. THE CANAL LAND BELONGS TO THE NIAGARA MOHAWK POWER CORP. THE CITY DOES THE FILLING. IT HOPES TO OBTAIN THE RECLAIMED LAND FOR USE IN A REDEVELOPMENT PROGRAM, PARK DEVELOPMENT, AND COMPLETION OF STREET PATTERN AND PARKING. (UC)

07-10-00606 SANITARY LANDFILL PUSHED BACK THE RIVER (RECLAMATION(LAND) COST(COLLECTION))
LUCE, R.
THE AMERICAN CITY 74(12), P. 92 (DECEMBER 1959). THE CITY OF TOPEKA HAS THREE SITES ALONG THE KANSAS RIVER WHERE FLOODLANDS ARE USED FOR SANITARY LANDFILL. JETTIES ARE CONSTRUCTED OUT INTO THE RIVER. THE SETTLING POOLS THUS CREATED QUICKLY FILL WITH SEDIMENT. THE AREA IS THEN AVAILABLE FOR FILL. ONLY ONE OF THE SITES IS USED FOR GARBAGE AND REFUSE FROM MUNICIPAL COLLECTION. THE CHARGE FOR COLLECTION IS $1.35 PER MONTH PER SINGLE RESIDENCE FOR TWICE WEEKLY COLLECTIONS. RESIDENCES EQUIPPED WITH A GARBAGE DISPOSAL RECEIVE AN EXEMPTION OF 60 CENTS PER MONTH. ALTHOUGH GARBAGE MUST BE SEPARATED FROM OTHER MATERIAL, IT IS PICKED UP IN THE SAME TRUCK AS IS THE RUBBISH. DAILY COLLECTIONS ARE MADE AT ALL COMMERCIAL STOPS. (UC)

07-10-00613 CONTROL OF TOXIC AND EXPLOSIVE HAZARDS IN BUILDINGS ERECTED IN LANDFILLS (SANITARY-LANDFILL LAND(RECLAMATION) SAFETY)
FIRST, M. W. + VILES, F. J., JR. + LEVIN, S.
PUBLIC HEALTH REPORTS 81(5), P. 419 (MAY 1966). THE PRINCIPAL HAZARD INVOLVED IN CONSTRUCTION ON REFUSE-FILLED LAND ARISES FROM THE ANAEROBIC PRODUCTION OF COMBUSTIBLE GASES. GAS-TIGHT CONSTRUCTION OVER LANDFILLS IS DIFFICULT IF NOT IMPOSSIBLE TO ACHIEVE BECAUSE OF THE GAS PRESSURES RESULTING FROM BIOLOGICAL GAS PRODUCTION. DURING INVESTIGATIONS OF GAS LEVELS IN A HOUSING DEVELOPMENT CONSTRUCTED ON SANITARY LANDFILLS, THE CONCENTRATION OF METHANE WAS FOUND TO BE AT AN UNSAFE LEVEL IN A HIGH PROPORTION OF THE BUILDINGS. A CONCRETE SLAB LAID ON TOP OF THE FILL DID NOT PREVENT GASES FROM PENETRATING INTO THE BUILDINGS. SEVERAL SEALANTS (FLINTKOTE C-13-A ASPHALT EMULSION, FLINTKOTE NO. 70 ASPHALT EMULSION, SODIUM SILICATE, WATER) WERE FOUND TO BE INADEQUATE FOR THE PURPOSE. RESULTS OF PERIODIC SAMPLING OVER SEVERAL YEARS IN THE SUB-BASEMENT SPACES OF A NUMBER OF BUILDINGS INDICATED THAT ORGANIC FILL LOCATED AROUND AND UNDER THE HEATED BUILDINGS BECAME COMPLETELY DEGRADED IN APPROXIMATELY FIVE YEARS, RELEASING METHANE AT A PROPORTIONATELY RAPID RATE. A SITUATION SUCH AS THIS CAN CONSTITUTE A SERIOUS EXPLOSION HAZARD UNLESS SUITABLE METHODS OF AERATING AND VENTILATION ARE EMPLOYED. CONTINUOUS MECHANICAL AERATION AT A RATE OF ONE OR TWO AIR CHANGES PER HOUR ADEQUATELY REDUCED THE METHANE CONCENTRATION.

07-10-00641 USE OF COMPLETED SANITARY LANDFILL SITES (COST SETTLEMENT RECLAMATION(LAND) ODOR)
ROGUS, C. A.
PUBLIC WORKS 71(1), P. 139-140 (JANUARY 1960). ABOUT 300 MILLION CU-YDS OF REFUSE HAVE BEEN PLACED IN FILLS OF FROM 1 TO 2700 ACRES AND 5 TO 30 FT IN DEPTH. TEN THOUSAND ACRES OF TIDAL AND MARSH LAND HAVE BEEN RECLAIMED AND HAVE AN ASSESSED VALUATION OF OVER $100 MILLION. CONSTRUCTION PRACTICES ON RECLAIMED LAND INCLUDE PROVISION FOR EXCLUSION OF GAS EMISSIONS FROM THE FILL. ALLOWANCE FOR ABOUT 10 PERCENT IN SETTLEMENT AFTER ABOUT FIVE YEARS, AND PARTICULAR ATTENTION TO FOUNDATIONS. CURRENT OPERATING PRACTICES FOR SANITARY FILLS PROVIDE PROTECTION AGAINST RODENT HARBORAGE, FLY EMERGENCE, FIRE HAZARDS, AND WATER POLLUTION. TOP SOIL FOR FINISHED FILLS IS BUILT UP WITH HYDRAULICALLY PUMPED SAND COVER, DIGESTED SEWAGE SLUDGE, AND CLAY. (PHEA)

07-10-00650 TREATMENT PLANT LOCATED ON FORMER LANDFILL SITE
GROFF, G. + TAYLOR, W. A.
PUBLIC WORKS 95(6), P. 105-107 (JUNE 1964). MISSOULA, MONTANA, HAS CONSTRUCTED ITS SEWAGE TREATMENT PLANT ON AN OLD SANITARY LANDFILL SITE. THIS SITE WAS USED BECAUSE GOING REGULATIONS WOULD NOT ALLOW ITS CONSTRUCTION ELSEWHERE.

07-10-00777 FOUNDATION PROBLEMS IN SANITARY LAND FILLS (BEARING-CAPACITY RECLAMATION(LAND))
SOWER, G. F.
AM SOC CIVIL ENGRS J ENGR DIV 94(SA1), P. 103-116, PROC PAPER 5811, (FEBRUARY 1968). IN THE PAST, MARGINAL OR OTHERWISE USELESS LANDS HAVE BEEN USED FOR SANITARY LANDFILL OPERATIONS. THE GROWING SCARCITY OF BUILDING SITES CLOSE TO CITIES AS WELL AS THE STEADY INCREASE IN THE VOLUME OF WASTES BEING GENERATED MAKE IT IMPERATIVE THAT COMPLETED SANITARY LANDFILLS BE USED AS SITES FOR FUTURE BUILDING. UNFORTUNATELY, THE FILLS ARE WEAK, COMPRESSIBLE, AND ARE CHARACTERIZED BY A CONTINUING PROCESS OF CHEMICAL AND BIOLOGICAL DETERIORATION. BUILDING FOUNDATIONS ARE WEAKENED BY BREAKTHROUGHS INTO THE FILL AND BY CONSTANT SETTLING. DECAY AND DECOMPOSITION RESULT IN THE FORMATION OF NOXIOUS AND EXPLOSIVE GASES. THE CONSTRUCTION OF FOUNDATIONS EXTENDING THROUGH THE FILL IS DIFFICULT AND EXPENSIVE. A MORE EFFECTIVE UTILIZATION OF COMPLETED FILLS WOULD BE POSSIBLE IF THEY WERE PLANNED AND OPERATED WITH THE POSSIBILITY OF FUTURE BUILDING KEPT IN MIND. IN LINE WITH SUCH AN APPROACH, MATERIAL OF THE HIGHEST DENSITY AND RESISTANCE TO BREAKDOWN SHOULD BE SEGREGATED FOR DISPOSAL IN FUTURE BUILDING SITES. THIS MATERIAL SHOULD BE HEAVILY COMPACTED AND POSSIBLY SURCHARGED TO INCREASE ITS STRUCTURAL STRENGTH AND DECREASE ITS COMPRESSIBILITY. BUILDING STRUCTURES MUST BE DESIGNED TO COMPENSATE FOR SETTLEMENT, OR TO BE SUPPORTED ON PILES OR ON PIERS. THEIR SUBSTRUCTURE MUST BE DESIGNED TO RESIST THE CORROSION AND CARE FOR THE GAS PRODUCTION CHARACTERISTIC OF FILLS. (UC)

07-10-01093 MORE CROPLAND FOR KEARNEY (SANITARY-LANDFILL RECLAMATION(LAND))
LANCASTER, R.
THE AMERICAN CITY 69(8), P. 99-100 (AUGUST 1954). KEARNEY HAS BEEN RECLAIMING OLD GRAVEL PITS FOR USE AS ALFALFA FIELDS BY MEANS OF SANITARY LANDFILL. SINCE 1946, THE RATE OF RECLAMATION HAS BEEN ABOUT TWO ACRES PER YEAR. FROM A POPULATION OF 12,000, 3,000 CU-YD OF REFUSE ARE DISPOSED OF ANNUALLY. AN ALLIS-CHALMERS HD-7 TRACTOR IS USED. ONLY ONE MAN IS REQUIRED FOR KEEPING THE FILL IN A GOOD AND SANITARY CONDITION. THE ABANDONED GRAVEL PITS MEASURE APPROXIMATELY 40 FEET IN DEPTH AND 300 FEET IN WIDTH. AS REFUSE IS PUSHED INTO THE WATER, SAND FROM ALONGSIDE THE PIT IS PUSHED IN ALSO. WHEN THE PIT IS FINALLY FILLED TO THE WATERLINE, THE AREA RESEMBLES AN INVERTED CONE THAT MEASURES 12 FEET IN DEPTH AT THE CENTER. AREA FILL IS USED FROM THEN ON, MIXING THE REFUSE WITH SAND AND DIRT FROM OUTSIDE THE DEPRESSION. THE CHARGE FOR SERVICES IS $1 PER MONTH FOR SINGLE RESIDENCES, $1.50 FOR DUPLEXES, AND AN ADDITIONAL 25 CENTS FOR EACH ADDITIONAL UNIT. WHEN A FILL IS COMPLETED IT IS LEVELED AND IS PLANTED WITH ALFALFA. THE CROP IS IRRIGATED BY A WELL LOCATED ON THE PROPERTY. (UC)

07-10-01096 REFUSE MAKES A RUNWAY (SANITARY-LANDFILL RECLAMATION(LAND))
GILES, J. H. L.
THE AMERICAN CITY 69(7), P. 87 (JULY 1954). IN 2 OR 3 MORE YEARS, MERIDEN, CONNECTICUTT, WILL HAVE AN AIRPLANE RUNWAY AT ITS DISPOSAL SITE. TO ACCOMPLISH THIS, THE GROUND ELEVATION MUST BE BROUGHT TO 30 FEET IN THE COURSE OF THE FILL OPERATION. SINCE THE REFUSE IS DEPOSITED ONLY IN 6 FT TO 8 FT LAYERS, SETTLING SHOULD NOT BE A PROBLEM. THE REFUSE IS SPREAD OVER AN AREA ROUGHLY 20 FT LONG BY 50 FT WIDE AND IS COMPACTED THOROUGHLY. THE COMPACTED REFUSE IS COVERED WITH A ONE-FOOT LAYER OF SAND AND GRAVEL. THE TOP LAYER OF REFUSE IS COVERED WITH A TWO-FOOT COVER. THE CITY HAS BEEN ABLE TO DISPOSE OF THE REFUSE AT A COST OF ONLY $0.10/CU-YD OF LOOSE REFUSE. THE CITY SERVES A POPULATION OF ABOUT 45,000 PEOPLE, AND ANNUALLY DISPOSES OF APPROXIMATELY 145,000 CU-YD OF REFUSE. (UC)

07-10-01100 SANITARY FILLS PROVIDE MORE PLAYGROUNDS FOR RICHMOND (SANITARY-LANDFILL RECLAMATION(LAND))
HOPSON, R. S.
THE AMERICAN CITY 69(8), P. 98-99 (AUGUST 1954). RICHMOND, VIRGINIA, SWITCHED TO A SANITARY LANDFILL OPERATION IN 1947, AND THEREBY TRANSFORMED A SMOKY, OPEN DUMP INTO A NEAT, INSECT-FREE, RAT-FREE DISPOSAL AREA. AS A RESULT OF THE CHANGEOVER, WASTELANDS HAVE BEEN MADE PRODUCTIVE, AREAS HAVE BEEN ACQUIRED FOR PARKS, SWAMP AREAS HAVE BEEN ELIMINATED, AND THE IMPORTANT PROBLEM OF DISPOSING OF THE REFUSE CONTRIBUTED BY NEARLY 250,000 PEOPLE HAS BEEN SOLVED. THE CITY RUNS AS MANY AS SIX FILLS AT A TIME. EACH YEAR, AN ADDITIONAL 25 ACRES OF LAND ARE REQUIRED FOR THE DISPOSAL OPERATION. THE FILLS SETTLE ABOUT 5 PERCENT TO 10 PERCENT IN FIVE YEARS. DECOMPOSITION IS ENTIRELY COMPLETE IN LESS THAN FIVE YEARS, WHEN THE FILL IS OPERATED ACCORDING TO THE PROCEDURE FOLLOWED BY THE CITY. WHEN NECESSARY, THE ALREADY DECOMPOSED REFUSE IS EXCAVATED AND USED FOR COVER MATERIAL. THE ENTIRE COST OF OPERATION IS ABOUT $0.14 PER CU YD OF REFUSE RECEIVED. (UC)

07-10-01101 MORE SHORELINE FOR BERKELEY (RECLAMATION(LAND) SANITARY-LANDFILL)
DWYER, O.
THE AMERICAN CITY 69(8), P. 98 (AUGUSTY 1954). BY CONSTRUCTING SANITARY LANDFILLS, BERKELEY HAS RECLAIMED WASTE SHORELINES FOR BUSINESS AND INDUSTRIAL USE. THE AREA TO BE FILLED IS ENCLOSED BY BULKHEADS BUILT IN THE BAY. THE AREA THUS ENCLOSED IS DEWATERED ACCORDING TO THE REQUIREMENTS OF THE CALIFORNIA STATE HEALTH DEPARTMENT. THE CITY MAINTAINS TWO SEPARATE FILLS, ONE FILL RECEIVES ONLY REFUSE COLLECTED BY CITY EQUIPMENT FROM THE CITY'S 115,000 PEOPLE, THE OTHER FILL RECEIVES REFUSE HAULED BY PRIVATE COLLECTORS. THE LATTER CONTAINS LITTLE ORGANIC GARBAGE. THE FILLS ARE CONSTRUCTED IN SECTIONS THAT ARE 100 FEET WIDE, 600 FEET LONG AND 14 FEET DEEP. TWO SIX-FOOT LAYERS OF REFUSE ARE COMPACTED IN EACH SECTION, THE FIRST COVERED WITH ONE-FOOT OF COVER, THE SECOND LAYER WITH TWO FEET OF COVER. APPROXIMATELY 57,000 TONS OF REFUSE ARE DUMPED IN THE TWO FILLS EACH YEAR. A SETTLEMENT OF 25 PERCENT IS EXPECTED BEFORE THE FILL BECOMES STABILIZED. AFTER SETTLING COMES TO AN END THE LAND IS USED FOR WHATEVER CONSTRUCTION THE CITY MAY REQUIRED. (UC)

07-10-01137 SWAMPS DISAPPEAR IN GARY, INDIANA (SANITARY-LANDFILL RECLAMATION(LAND))
SMITH, G.
THE AMERICAN CITY 68(8), P. 101 (1953). THE CITY OF GARY, INDIANA, HAS RID THEMSELVES OF APPROXIMATELY 125 ACRES OF MOSQUITO AND OTHER INSECT LADEN LAND. BY DUMPING THE REFUSE INTO THE SWAMP AND PACKING IT INTO THE MUD, THEN COVERING IT WITH A LAYER OF SANDY SILT AND ANOTHER LAYER OF TOP SOIL THE LAND IS NOW BEING USED AS A PLAYGROUND, FOOTBALL STADIUM AND TRACK.

07-10-01145 AN ABANDONED STRIP MINE IS TO FILL (RECLAMATION(LAND) SANITARY-LANDFILL)
ENVIRONMENTAL SCIENCE TECH 2(6), P. 402-405 (1968). ABANDONED STRIP MINES MAY BE THE ANSWER TO THE PROBLEM OF SOLID WASTE DISPOSAL. THE IDEA OF USING ABANDONED STRIP MINES COULD ACTUALLY SERVE THREE PURPOSES (1) PROVIDE A MEANS OF DISPOSING SOLID WASTES, (2) AND ALSO A MEANS OF RECOVERING USEFUL LAND AREAS, (3) STOP THE POLLUTION OF STREAMS FROM THE ACID WATER FROM MINE DRAINAGE. THERE ARE SEVERAL ADVANTAGES OF USING THE MINES ALSO, THEY ARE WELL REMOVED FROM THE NEIGHBORHOOD, THEY ARE EASILY ACCESSIBLE BECAUSE THE ROADS ARE ALREADY CONSTRUCTED, THERE IS PLENTY OF COVER MATERIAL FROM THE SPOILS OF THE STRIPPING OPERATION, THEY ARE ECONOMIC TO LEASE OR PURCHASE. FROSTBURG, MD. HAS A

PUBLIC HEALTH SERVICE GRANT OF $126,000 TO CONDUCT A THREE YEAR DEMONSTRATION ON THE FEASIBILITY OF USING ABANDONED MINES. THE LANDFILL IS RECEIVING ABOUT 250 TONS OF REFUSE PER WEEK FROM 18,000 INHABITANTS. ANOTHER USE OF THE LAND AFTER BEING RECLAIMED BY FILLING IS TO DEVELOP IT INTO A SKI RESORT, WHICH WILL BE WITHIN DRIVING DISTANCE OF WASHINGTON, D.C.

07-10-01198 A SANITARY FILL WITH A " MISSION " (RECLAMATION(LAND) SANITARY-LANDFILL)
THE AMERICAN CITY 73(2), P. 17 (FEBRUARY 1958). THE MISSION BAY SANITARY LANDFILL PROJECT IS DESCRIBED. IT IS HOPED THAT THIS POOR LAND MAY BE TRANSFORMED INTO A FINE BOAT HARBOR AND AN ATTRACTIVE AQUATIC RECREATIONAL AREA. (PHS)

07-10-01420 FROM GARBAGE TO GOLF COURSE (SANITARY-LANDFILL RECLAMATION(LAND))
THE AMERICAN CITY 71(4), P. 125 (APRIL 1956). A BRIEF REPORT OF HOW HOUSTON, TEXAS RECLAIMS 14 ACRES PER YEAR WITH THE SANITARY LANDFILL. (PHS)

07-10-01801 GOLF COURSE AND RECREATION AREA TO RISE FROM LANDFILL (COST(DISPOSAL) SANITARY-LANDFILL RECLAMATION(LAND))
REFUSE REMOVAL JOURNAL 6(6), P. 20 (1963). A 504-ACRE SWAMPY SITE ADJACENT TO THE HUDSON RIVER, AT CROTON, N.Y. IS BEING RECLAIMED FOR A RECREATIONAL AREA. THE AREA WAS ORIGINALLY BEING CONSIDERED FOR AN AIRFIELD BUT THE RECREATION SUPPORTERS WON OUT. THE RESIDENTS OF WESTCHESTER COUNTY DISPOSE OF THEIR REFUSE AT THE LANDFILL. A $2.25 FLAT FEE IS CHARGED FOR EACH LOAD DISPOSED AT THE FILL.

07-10-02091 LAND AND RECREATIONAL DEVELOPMENT THROUGH A ROCK AND SOLID WASTE DISPOSAL SYSTEM (RECLAMATION(LAND))
BAUER ENGRG, INC, CHICAGO, ILLINOIS, (SEPTEMBER 1967), REPORT TO METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO. A CONSULTING ENGINEERING FIRM OKS RECOMMENDATIONS FOR UTILIZING THE REFUSE FROM URBAN RENEWAL, GARBAGE, AND DREDGINGS TO CREATE RECREATION PARKS.

07 11 STANDARDS AND ORDINANCES

07-11-00141 SUGGESTED LANDFILL STANDARDS AND METHODS (SANITARY-LANDFILL(STANDARDS))
BLACK, R. J.
REFUSE REMOVAL JOURNAL 4(10), P. 10, 20-21, 25-29 (1961). THE LACK OF SATISFACTORY LANDFILL METHODS IS SUMMARIZED. SUGGESTED STANDARDS FOR SANITARY LANDFILLS AND METHODS ARE PRESENTED BY PUBLIC HEALTH SERVICE.

07-11-00756 ELEMENTS OF AN ORDINANCE FOR REFUSE DISPOSAL (LAW SANITARY-LANDFILL)
PUBLIC WORKS 97(2), P. 151 (FEBRUARY 1966). THE ARTICLE CONTAINS EXTRACTS FROM A MODEL ORDINANCE PROPOSED BY THE NEW JERSEY DEPARTMENT OF HEALTH COVERING THE DISPOSAL OF REFUSE BY SANITARY LANDFILL.

07-11-00991 COUNCIL TO PRESENT MODEL LANDFILL CONTRACT (SANITARY-LANDFILL)
GERSHOWITZ, H.
SOLID WASTE MANAGEMENT/RRJ 11(5), P. 54 (MAY 1968). THE NATIONAL SOLID WASTES MANAGEMENT ASSOCIATION WILL SOON PRESENT ITS MODEL "SANITARY LANDFILL CONTRACT" AND "MODEL INSTRUCTIONS" TO BIDDERS IN THE GOVERNMENT'S SOLID WASTES PROGRAM. IN PREPARING THE MODELS, THE AIM WAS TO PREPARE ONE WHEREBY A CITY WOULD BE SURE TO GET A TRUE SANITARY LANDFILL IF IT CONTRACTED FOR ONE. ONE SAFEGUARD IS A PROVISION THAT THE CONTRACTOR SHALL HAVE SOME DEGREE OF EXPERIENCE IN LANDFILLS. A SECOND REQUIREMENT IS THAT THE BIDDER HAVE ADEQUATE EQUIPMENT. LANDFILLS IN OPERATION SHOULD BE SUBJECT TO PERIODIC INSPECTION. NO CONTRACT SHALL BE AWARDED TO ANY BIDDER WHO HAS AN UNSATISFACTORY RECORD OF PERFORMANCE. CERTAIN SPECIFICATIONS OF PERFORMANCE ARE SPELLED OUT. AMONG THEM ARE A REQUIREMENT THAT THE COVER BE OF LOAM, CLAY, SAND, OR OTHER INERT MATTER, THAT A MINIMUM DEPTH OF 6 INCHES OF COMPACTED COVER AND FINAL SPREAD BE KEPT ON ALL INACTIVE FACES AT ALL TIMES, THAT THE FINAL COVER BE AT LEAST 24 INCHES DEEP AND OF COMPACTED MATERIAL, AND THAT THE MAXIMUM DEGREE OF SLOPE ON BANKS SHALL NOT EXCEED THE RATIO OF FOUR-TO-ONE OR TWO-TO-ONE TO BE DETERMINED BY THE TERRAIN OF THE SITE. ALL SALVAGE OPERATIONS ARE TO BE OPERATED IN A SANITARY MANNER REMOTE FROM THE OPERATING FACE OF THE FILL. (UC)

07-11-02154 ADVISORY BOARD HELPS DRAFT MODERN LANDFILL RULES (SANITARY-LANDFILL LAW STANDARDS)
REFUSE REMOVAL JOURNAL 9(4), P. 12-13, 53 (APRIL 1966). THE GOVERNOR OF ILLINOIS HAS CREATED A REFUSE DISPOSAL ADVISORY BOARD WHO ALONG WITH THE STATE HEALTH DEPARTMENT WILL BE RESPONSIBLE FOR SETTING UP THE MINIMUM RULES AND REGULATIONS UNDER WHICH MUNICIPALITIES AND PRIVATE CONTRACTORS MAY OPERATE REFUSE DISPOSAL OPERATIONS. UNDER THE NEW REGULATIONS ALL REFUSE DISPOSAL OPERATIONS MUST BE REGISTERED AND SUBJECT TO INSPECTION AND CONTROL BY THE REFUSE DISPOSAL ADVISORY BOARD. BEFORE AN OPERATION MAY BE REGISTERED SUCH ITEMS AS CONTOUR MAPS OF THE AREA, PHYSICAL SITE IMPROVEMENTS, DRAINAGE PLANS, FIRE PROTECTION, SALVAGE OPERATIONS, AND THE TRAFFIC PATTERNS MUST BE SUBMITTED.

07 12 ECONOMICS

07-12-00649 SANITARY LANDFILL COSTS 68 CENTS PER TON FOR DISPOSAL
PUBLIC WORKS 88(4), P. 177-178. THE CITY OF TUCSON, ARIZONA, HAS OPERATED A SANITARY LANDFILL FOR THE PAST FIVE YEARS. ALL REFUSE IS WEIGHED AND THE COST PER TON IS CALCULATED EACH MONTH. THE AVERAGE COST HAS BEEN 68 CENTS PER TON. THE TRENCH METHOD IS NORMALLY USED, BUT A PRESENT LANDFILLING OF AN OLD CLAY PIT IS BEING PRACTICED.

07-12-01333 SANITARY LANDFILL ECONOMICS (INCINERATION COST(COMPARISON))
FOSTER, W. S.
THE AMERICAN CITY 68(3), P. 96-97 (1953). ANY MUNICIPALITY MUST DISPOSE OF ITS REFUSE BY SOME METHOD, WHETHER IT BE LANDFILL, COMPOSTING, OR INCINERATION. SANITARY LANDFILL IS USUALLY MORE ECONOMIC IF SITES ARE AVAILABLE AT REASONABLE DISTANCES, AND IN SIZE TO LAST FOR LONG PERIODS OF TIME. SOME OF THE CRITERIA ARE DISCUSSED IN THIS ARTICLE. (PHS)

07-12-01692 HOW PRIVATE HAULERS PAY AT MUNICIPAL LANDFILLS (SANITARY-LANDFILL CHARGE(LANDFILL))
REFUSE REMOVAL JOURNAL 2(6), (OCTOBER 1959). CHARGES FOR DISPOSING REFUSE FROM PRIVATE HAULERS ARE LEVIED AT DIFFERENT RATES IN DIFFERENT CITIES. SOME OF THE METHODS OF LEVYING THESE FEES ARE DESCRIBED.

07-12-01720 HOW TO ESTIMATE HOURLY SANITARY-LANDFILL COSTS (COST(OPERATING))
REFUSE REMOVAL JOURNAL 3(3), P. 8 (MARCH 1960). GIVES DETAILS OF THE METHOD FOR ESTIMATING LANDFILL COSTS. VARIABLE INFLUENCES AT EACH INDIVIDUAL SITE MAKE IT IMPOSSIBLE TO ARRIVE AT GENERAL FIGURES APPLICABLE TO SEVERAL LOCATIONS. DISCUSSES COST OF LAND, EQUIPMENT AND OPERATING COSTS, AND MISCELLANEOUS EXPENDITURES. ESTIMATION OF OPERATING COSTS OF A $20,000 TRACTOR IS GIVEN AS AN ILLUSTRATION. (PHS)

07-12-01727 SANITARY LANDFILL COST AND EQUIPMENT FACTORS (COLLECTION)
REFUSE REMOVAL JOURNAL 3(2), P. 8 (FEBRUARY 1960). A STUDY OF REFUSE SERVICE IN CANTON, OHIO, REVEALS THAT THE BEST MEANS OF REFUSE DISPOSAL IS THE SANITARY LANDFILL. A SURVEY OF REFUSE OPERATIONS IN OTHER CITIES REVEALS INTERESTING FACTS ABOUT LANDFILL PRACTICES AND COLLECTION EQUIPMENT. (PHS)

07 13 LANDFILL MACHINES

07-13-00154 A NEW IDEA IN LANDFILL OPERATION (SANITARY-LANDFILL)
EVANS, H., JR.
THE AMERICAN CITY 82, P. 114 (MARCH 1967). THE NEW METHOD INVOLVES THE USE OF A "MOLE" TO PLACE PRESSURE-COMPACTED REFUSE. IT IS BEING TRIED IN KING COUNTY, WASHINGTON. BASICALLY THE METHOD CONSISTS OF HAULING THE REFUSE FROM TRANSFER STATIONS TO THE DISPOSAL SITE IN SPECIALLY CONSTRUCTED CONTAINERS, EMPTYING THE CONTAINERS INTO A NEW MACHINE CALLED A "MOLE", AND COMPRESSING THE REFUSE IN THE TRENCH BEFORE COVERING IT. THE MOLE - THE MACHINE OPERATES IN A TRENCH SOME 15 FT DEEP DUG BY A BACKHOE. ITS HOPPER RECEIVES THE CONTENTS FROM TWO CONTAINERS. A HYDRAULIC RAM COMPRESSES THE MATERIAL TO ONE-TENTH ITS ORIGINAL VOLUME, DISCHARGES IT FROM BACK OF THE MACHINE INTO THE TRENCH IN A CONTINUOUS EXTRUSION LINE 9 FT SQUARE. A STANDARD TRACTOR WITH A DOZER BLADE COVERS THE MATERIAL. THE FORCE OF THE HORIZONTAL RAM PUSHING THE REFUSE INTO THE TRENCH MOVES THE MOLE FORWARD.

07-13-00573 OPERATION " BIG SQUEEZE " TAKES ON REFUSE DISPOSAL (SANITARY-LANDFILL)
BILLINGS, C. H.
PUBLIC WORKS 97(1), P. 87 (JANUARY 1966). D AND J PRESS HAS CONSTRUCTED A MACHINE WHICH COMBINES THE VARIOUS EQUIPMENT NEEDED FOR SANITARY LANDFILL INTO A SINGLE MACHINE. THIS MACHINE WEIGHS 75 TONS, IS 23 FEET WIDE, 70 FEET LONG, 16 FEET 8 INCHES HIGH, AND ALL ON WHEELS. THE TYPICAL CYCLE OF OPERATION BEGINS WITH A TRUCK DUMPING ITS REFUSE LOAD ONTO A STEEL APRON WHICH LIFTS AND TRANSFERS THE LOAD TO A RECEIVING CAVITY. THE LOAD IS TUCKED AWAY BY A VERTICALLY SWINGING PLATE WHICH CLOSES THE " MOUTH " OF THE MACHINE. THE LOAD IS COMPRESSED AGAINST A SHEAR. AT A PREDETERMINED PRESSURE, THE SHEAR LOPS OFF A CHUNK, AT THE SAME TIME MANGLING LONG PIECES OF METAL AND WOOD. ABOUT THREE STROKES OF THE SHEAR OCCUR IN EACH CYCLE. ANOTHER PLATEN SHOVES THE CHUNKS DOWNWARD, COMPRESSING THEM FURTHER. THE LOAD IS DISCHARGED FROM A CHUTE LOCATED ON THE SIDE OF THE MACHINE OPPOSITE ITS " MOUTH ". COMPRESSION IS CONTINUED WITHIN THE CHUTE BY ANOTHER PLATEN. THE COMPRESSED LOAD IS EXTRUDED IN A CONTINUOUS MASS 36 INCHES SQUARE IN CROSS SECTION AND DUMPED INTO A TRENCH PREVIOUSLY DUG BY THE MACHINE. COMPRESSION IS MAINTAINED WHILE THE REFUSE IS COVERED WITH THE EARTH THAT WAS DUG OUT TO FORM THE TRENCH. THE COMPACTION RATIO VARIES WITH THE TYPE OF REFUSE AND IS BELIEVED TO RANGE FROM 10 TO 1 TO 20 TO 1. THE MACHINE CAN DISPOSE OF A 5 CU-YD LOAD OF REFUSE WITHIN AN AVERAGE OF 3 MINUTES TIME IN A MANNER THAT WOULD RESULT IN THE ELIMINATION OF FLY, RAT, AND ODOR PROBLEMS. THE OPERATION IS HIGHLY AUTOMATED. TWO MEN ARE REQUIRED, EACH TO SURVEY THE OPERATION FROM OPPOSITE SIDES OF THE CHASSIS.

07-13-02137 A NEW IDEA IN LANDFILL OPERATION (COMPACTION SANITARY-LANDFILL TRANSFER-STATION)
EVANS, H., JR.
THE AMERICAN CITY 82(3), P. 114-115 (MARCH 1967). AS LANDFILL SITES BECOME MORE DIFFICULT TO OBTAIN, NEWER TECHNIQUES ARE NEEDED TO EXTEND THE LIFE OF THE LANDFILL SITES. KING COUNTY, WASHINGTON'S SANITARY DISTRICT IS OPERATING A SYSTEM WHEREBY THE USE OF A TRANSFER STATION WHICH ACCOMMODATES 8 EACH 42 CU-YD CONTAINERS WHICH ARE IN TURN HAULED IN TWO CONTAINERS OF 84 CU-YD EACH TO THE LANDFILL. THESE CONTAINERS ARE DUMPED INTO A COMPACTION MACHINE WHICH COMPRESSES THE REFUSE INTO A 9 FT-SQ EXTRUSION WHICH REDUCES THE VOLUME TO ABOUT ONE TENTH ITS ORIGINAL SIZE. STUDIES ARE UNDERWAY TO INVESTIGATE THE ANAEROBIC CONDITIONS PRODUCED BY HIGH COMPACTION. HOPEFULLY THE AREA CAN BE USED FOR BUILDING SITES WITHOUT FEAR OF SETTLING OR GAS PRODUCTION.

07-13-02163 HIGH DENSITY LANDFILL RECOVERY
BROCHURE, JOHNSTON, CAMPANELLA, MURAKAMI, AND CO, RENTON, WASHINGTON. THE HIGH DENSITY LANDFILL RECOVERY PROGRAM IS A NEW IDEA IN SOLID WASTE DISPOSAL PRESENTLY UNDER DEVELOPMENT BY KING COUNTY AND THE PUBLIC HEALTH SERVICE NATIONAL CENTER FOR URBAN AND INDUSTRIAL HEALTH. KING COUNTY RECEIVED THE NINTH GRANT IN THE NATION PROVIDED BY THE PUBLIC HEALTH SERVICE, AND JOHNSTON-CAMPANELLA-MURAKAMI AND CO. ARE THE PLANNERS OF THIS METHOD. THIS PROGRAM UNLIKE OTHER SANITARY LANDFILL PROGRAMS, OPERATES ON THE PRINCIPLE THAT LAND CAN BE IMPROVED WITH THE DISPOSAL OF REFUSE. SOLID WASTE CAN BE ECONOMICALLY COMPRESSED UNDERGROUND TO 1/10TH OF ITS ORIGINAL VOLUME. DURING THIS COMPRESSION AND AT APPROXIMATELY 200 PSI, THE MIXTURE IS SO TIGHTLY CRUSHED THAT ANAEROBIC CONDITIONS BEGIN TO EXIST AND DECOMPOSITION IS SLOWED. A MACHINE DESIGNED TO PLACE THE REFUSE UNDER 15-FT OF ON-SITE EXCAVATION WILL RAISE THE SURFACE IN 6-FT LIFTS. OPERATING LIKE A MOLE, THE MACHINE MAINTAINS BUOYANCY AND SEEMS EMINENTLY DESTINED TO CONQUER SWAMPS AND LOW-LAND AREAS. THE TRIAL SITE IS NOT LOW-LAND, HOWEVER, AND WILL OFFER THE MOLE ITS GREATEST CHALLENGE, OPERATING IN GLACIAL TILL ON A MOUNTAIN TOP. WHETHER THE H.D.L.F. MACHINE ACCOMPLISHES ITS MAJOR OBJECTIVE OR NOT, KING COUNTY WILL HAVE GAINED ONE OF THE CLEANEST DISPOSAL METHODS IN THE COUNTRY AT LOW COST PER TON (ESTIMATED $.80 TO $1.00 LABOR AND MACHINE). DESIGNED TO HANDLE 200 TONS PER HOUR CLEARING KING COUNTY'S 2,000 TONS IN TEN HOURS OF OPERATION. EACH DUMP OF A CONTAINER IS DEPOSITED DIRECTLY INTO THE MACHINE AND CONVEYED 15-FT BELOW THE SURFACE. SURROUNDING THE MACHINE IS CLEAN EARTH OPERATION. THE OPERATION OF HEAVY EQUIPMENT WITH LITTLE SPREAD WILL NOT EVEN CREATE A DUST PROBLEM. WIND WILL BE CONTROLLED BY SCREENS PLACED DIRECTLY ON THE MACHINE WHEN THE UNIT IS OPERATIONAL. GARBAGE WILL BE UNSEEN BY THE PUBLIC. (AUTH)

07 14 OTHER GENERAL ARTICLES

07-14-00639 COMMITTEE ON SANITARY ENGINEERING RESEARCH (SETTLEMENT(RATE))
COMMITTEE ON SANITARY ENGINEERING RESEARCH PROC AM SOC CIVIL ENGRS J SANIT ENGRG DIV 85(SA6), (NOVEMBER 1959). AN INVESTIGATION OF REFUSE COMPACTION AND DISPOSAL IN SANITARY LANDFILL HAS RESULTED IN THE FOLLOWING CONCLUSIONS- SANITARY LANDFILL IS AN ECONOMICAL METHOD OF REFUSE DISPOSAL. VOLUME REDUCTION (IN-PLACE VOLUME REDUCTION) WAS 25 PERCENT OF THE ORIGINAL TRUCKED REFUSE VOLUME. AN ADDITIONAL REDUCTION OF 25 PERCENT IS EXPECTED TO TAKE PLACE IN FIVE YEARS. SOIL TUBE INVESTIGATIONS SHOWED THAT THE EXTENT OF BIOLOGICAL ACTIVITY WAS GREATER IN A ONE AND ONE-HALF YEARS OLD FILL THAN THAT IN TWO MORE YOUTHFUL FILLS WHICH WERE RESPECTIVELY ONE-HALF WEEK AND SIX WEEKS OLD. ALL THE FILL CORE SAMPLES INDICATED THAT MUCH ORGANIC REFUSE REMAINED FOR FUTURE DECOMPOSITION.

07-14-00664 SUBURB ATTEMPTS TO HALT SAN FRANCISCO LANDFILL PROJECT (SANITARY-LANDFILL)
REFUSE REMOVAL JOURNAL 10(1), P. 6-8 (JANUARY 1967). A DESCRIPTION OF THE LEGAL FIGHTING OVER A PROPOSED SANITARY LANDFILL SITE FOR SAN FRANCISCO, CALIFORNIA. THE SITE, AT BRISBANE HAS ALREADY BEEN PREPARED AND DUMPING HAS BEEN STOPPED BY INJUNCTION BY PEOPLE WHO FEEL THAT REFUSE SHOULD BE KEPT FROM THE SHORES OF SAN FRANCISCO BAY. ISSUE IS STILL IN DOUBT.

07-14-00708 HOW TO WIN FRIENDS AND GET A LANDFILL SITE APPROVED (SANITARY-LANDFILL LEGAL(PROBLEMS))
REFUSE REMOVAL JOURNAL 10(4), P. 10, 37 (APRIL 1967). A DESCRIPTION OF THE ACTIONS TAKEN BY PRIVATE CONTRACTORS IN SAGINAW, MICHIGAN TO OBTAIN PERMISSION TO OPERATE, A SANITARY LANDFILL.

07-14-01150 UTILIZATION OF SANITARY LANDFILL SITES (PLANNING RECLAMATION(LAND) SITE-SELECTION)
GOODE, C. S.
PROC OF THE NATIONAL CONF ON SOLID WASTE RESEARCH, AM PUBLIC WORKS ASSOC, CHICAGO, ILLINOIS, P. 128-131 (DECEMBER 1963). EVEN THOUGH THERE ARE EXAMPLES OF THE USE OF WASTE MATERIALS TO CREATE LAND FOR DESIRABLE IMPROVEMENTS, WE STILL ENCOUNTER OBJECTIONS FROM PROPERTY OWNERS AND REAL ESTATE OPERATORS TO THE LOCATION OF REFUSE DISPOSAL SITES IN AREAS WHICH THEY OWN OR CONTROL. TO OVERCOME THESE OBJECTIONS AND CONVINCE THE PLANNING COMMISSIONS AND OTHER LOCAL OFFICIALS OF THE NECESSITY FOR THE LOCATION OFTEN REQUIRES THE EFFORTS OF A SUPER SALESMAN. IT IS DIFFICULT TO SELL ANY SITE UNLESS YOU HAVE A THOUGHT OUT AND DOCUMENTED MASTER PLAN. THE CREATION OF A MASTER PLAN FOR A RAPIDLY GROWING COMMUNITY IS QUITE A PROBLEM.

07-14-01739 STUDY ADVOCATES ST. LOUIS USE NEARBY STRIP MINES (SANITARY-LANDFILL INCINERATION RECLAMATION(LAND) QUANTITY COST(OPERATING))
SOLID WASTES MANAGEMENT/RRJ 12(4), P. 47 (APRIL 1969). THE PROPOSAL IS RECOMMENDED AS A MEANS OF SHARPLY REDUCING THE COST OF SOLID WASTE DISPOSAL FOR THE CITY AND ELIMINATING INCINERATION. ANOTHER ADVANTAGE IS THAT LAND DESPOILED BY MINING OPERATIONS WILL BE RECLAIMED. APPROXIMATELY 10,000 ACRES ARE LOCATED A SHORT DISTANCE AWAY FROM THE CITY. MOST PITS ARE WITHIN A RADIUS OF 35 MILES, AND ACCORDING TO THE ILLINOIS GEOLOGICAL SOCIETY, THERE SHOULD BE NO OBJECTION TO THE USE OF THE SITES SINCE THE COMPACT NATURE OF THE UNDERLYING ROCK WOULD ADEQUATELY PREVENT CONTAMINATION OF THE GROUND WATER SUPPLY. IN THE PAST YEAR, ST. LOUIS HAS SPENT $1,821,178 TO COLLECT AND DISPOSE OF 207,803 TONS OF REFUSE, AN AVERAGE OF ABOUT $9 A TON. ABOUT $250,000 IS NEEDED ANNUALLY TO OPERATE ITS TWO MUNICIPAL INCINERATORS. BECAUSE THE VOLUME OF REFUSE HAS NEARLY TRIPLED IN THE LAST 20 YEARS, PLANS FOR EXPANDING ONE OF THE PLANTS ARE BEING CONSIDERED. THE COST WOULD BE IN EXCESS OF $1 MILLION.

07-14-01742 ESTIMATE RESIDENTIAL COST AT $9 PER TON, DISPOSAL UP TO $3 (COST(OPERATING) COST(COLLECTION))
SOLID WASTES MANAGEMENT/RRJ 12(4), P. 24, 44 (APRIL 1969). THE MAN-ON-THE-STREET AGREES THAT A DUMP OR LANDFILL IS NECESSARY, BUT IN THE NEXT TOWN OVER, NOT HIS, AS WE ALL HAVE HEARD INNUMERABLE TIMES. THE NEW YORK STATE DEPARTMENT OF HEALTH RECENTLY BEGAN A CAMPAIGN TO CHANGE THIS WIDESPREAD REACTION--AND IT STARTED RIGHT AT THE GRASS ROOTS LEVEL, A PUBLIC RELATIONS SYMPOSIUM ON SELLING LANDFILL AS A COMMUNITY ASSET. THE SESSION WAS ATTENDED BY 300 BUSINESS AND COMMUNITY LEADERS FROM THE FOUR COUNTIES AROUND ALBANY, N.Y., THAT BELONG TO THE CAPITAL DISTRICT REGIONAL PLANNING COMMISSION, CO-SPONSOR OF THE MEETING. CHARLES Y. HITCHCOCK STATED IT COST FROM $9 TO $14 A TON TO COLLECT REFUSE AND FROM ONE TO THREE DOLLARS FOR DISPOSAL AT A LANDFILL. THE COMBINATION REPRESENTS AN AVERAGE INVESTMENT OF $11 A TON. HE ALSO CONTENDED THAT IT COSTS THE AVERAGE FAMILY IN THE STATE FROM FIVE TO EIGHT CENTS A DAY FOR TWO TONS OF REFUSE PER YEAR. AT SIX CENTS PER DAY FOR 62,000 PEOPLE, THE EXPENSE WOULD BE $744,000 A YEAR. THE CITY OF TROY (POPULATION - 62,000) HAS A CONTRACT WITH A SOLID WASTES HAULER FOR ONLY $544,000 ANNUALLY. THE PANEL'S MODERATOR, DR. MEREDITH H. THOMPSON, ASSISTANT COMMISSIONER OF THE STATE HEALTH DEPARTMENT, POINTED OUT THAT EQUIPPING INCINERATORS WITH NECESSARY AIR POLLUTION CONTROL EQUIPMENT COSTS AS MUCH AS THE INCINERATOR ITSELF, YET STILL LEAVES A 30 PERCENT RESIDUE TO DISPOSE OF. THEREFORE, THE PROBLEM BOILS DOWN TO BASICALLY THIS - LANDFILL MUST BE SOLD TO THE PUBLIC AS BOTH MORE ECONOMICAL AND OF GREATER ADVANTAGE TO THE COMMUNITIES INVOLVED. HOWEVER, THE PICTURE IS NOT COMPLETELY BLACK. DURING THE SAME WEEK AS THE SYMPOSIUM, THE TOWN OF WATERFORD, N.Y., SIGNED A CONTRACT WITH HALFMOON, N.Y., TOWNSHIP TO USE A NEW LANDFILL AREA IN HALFMOON. RESIDENTS OF BOTH COMMUNITIES WILL GET A PERMIT, TO BE ATTACHED TO THEIR CAR WINDSHIELDS, ALLOWING THEM TO ENTER THE SITE AND DISPOSE OF REFUSE IN THE ABANDONED GRAVEL PIT. IT IS AT LEAST HEARTENING FOR LANDFILL ADVOCATES TO KNOW THERE ARE SOME COMMUNITIES AND POPULATIONS THAT SEE THINGS THEIR WAY.

07-14-01821 FILLED IN LAND IS RULED A DEDUCTION BY TAX COURT (LAW TAX RECLAMATION(LAND))
REFUSE REMOVAL JOURNAL 8(6), P. 10 (1965). AN ARTICLE DESCRIBING A 12-YR COURT PROCEEDING IN WHICH THE UNITED STATES TAX COURT HAS RULED A LANDFILL OWNER MAY MAKE TAX DEDUCTION IN THE FORM OF DEPRECIATION OF LAND PURCHASED FOR USE IN THE LANDFILL BUSINESS.

07-14-01875 EFFICIENCY BEFORE ECONOMY (FLY VECTOR PATHOGEN SANITARY-LANDFILL)
PUBLIC CLEANSING 53(12), P. 611 (1963). IN A LETTER TO THE CLEANSING COMMITTEE AT DUDLEY, THE QUESTION OF HOW TO OVERCOME THE INCREASING NUMBER OF DIFFICULTIES ARISING FROM WASTE COLLECTION AND DISPOSAL WAS ASKED. THE CHANGE IN WASTE VOLUMES AND TYPES HAVE OVER TAXED THE COLLECTION AND DISPOSAL METHODS. SUGGESTIONS ON HOW TO OVERCOME THESE PROBLEMS AND OTHERS THAT MIGHT ARISE ARE DISCUSSED.

07-14-02146 CONTROLLED TIPPING - HOW CAN IT CONTINUE? (SANITARY-LANDFILL COMPOSITION(TRENDS))
FEARENSIDE, W. H.
ANNUAL GENERAL MEETING, INSTITUTE OF PUBLIC CLEANSING, (MARCH 31, 1967). A PAPER DESCRIBING THE HISTORY OF "CONTROLLED TIPPING" AND THE IMPACT THAT THE CHANGE OF REFUSE ANALYSIS HAS HAD ON IT. CHANGES IN REFUSE ANALYSIS OVER A 32 YR PERIOD ARE LISTED. AS THE REFUSE TYPES CHANGE, DISPOSAL METHODS MUST CHANGE FOR OBVIOUS REASONS. THE USE OF COMPOSTING, INCINERATION, AND PULVERIZATION ARE DESCRIBED ALONG WITH SOME COSTS ON VARIOUS TYPES OF PULVERIZING PLANTS.

08 Incineration

08 01 APARTMENT HOUSE

08-01-00140 NO POLLUTING SMOKE AND NO ASH CANS (INCINERATION CHUTES(REFUSE))
THE AMERICAN CITY 79(9), P. 25 (SEPTEMBER 1954). A NEW APARTMENT BUILDING IN NEW YORK (852 UNIT PAVILION APARTMENT) USES CHUTES AND AN AUTOMATICALLY OPERATING INCINERATOR TO HANDLE ITS REFUSE. STAINLESS STEEL (TYPE 430) IS USED FOR THE CHUTES SO THEY CAN BE EASILY CLEANED.

08-01-00170 PERFORMANCE OF A FLUE-FED INCINERATOR (INCINERATOR(APARTMENT) COMPOSITION QUANTITY EMISSION)
KAISER, E. R. + HALITSKY, J. + JACOBS, M. B. + MCCABE, L. C.
J AIR POLLUTION CONTROL ASSOC 9(2), P. 85-91 (AUGUST 1959). THE FLUE-FED INCINERATOR IS A CONVENIENT MEANS FOR THE DISPOSAL AND REDUCTION OF DOMESTIC RUBBISH AND GARBAGE IN APARTMENT BUILDINGS. A SINGLE FLUE AND INCINERATOR CAN SERVE AN ENTIRE BUILDING. APPROXIMATELY 11,000 FLUE-FED INCINERATORS ARE IN USE IN NEW YORK CITY. THEY CONSUME AN ESTIMATED 600,000 TONS OF REFUSE ANNUALLY. THE MAIN DISADVANTAGE IN THEIR USE IS AIR POLLUTION. AN INVESTIGATION WAS MADE OF A SINGLE APARTMENT HOUSE INCINERATOR. THE APARTMENT HOUSE WAS A 128-UNIT BUILDING HOUSING 299 OCCUPANTS. THE DAILY REFUSE PRODUCTION AMOUNTED TO 430 LB PER DAY, I.E., AN AVERAGE OF 1.44 LB PER OCCUPANT. HAD NEWSPAPERS BEEN ADDED TO THE MATERIAL TO BE BURNED, THE INCINERATOR CHARGE PER PERSON PER DAY WOULD HAVE BEEN 1.7 LB. THE FLUE-FED INCINERATOR REDUCED THE APARTMENT REFUSE TO ABOUT 37 PERCENT OF ITS ORIGINAL WEIGHT AND TO 10 PERCENT OF ITS ORIGINAL VOLUME. THE BULK DENSITY OF THE REFUSE AVERAGED 4.1 LB PER CU FT IN THE INCINERATOR. THE RESIDUE HAD A BULK DENSITY OF 15.4 LB PER CU FT IN THE ASH CAN. THE RESIDUE AVERAGED 64 PERCENT METAL AND GLASS OVER 1/4 INCH IN SIZE, 12 PERCENT ASH, 16 PERCENT COMBUSTIBLE, AND 8 PERCENT MOISTURE, EXCLUDING QUENCH WATER. THE AIR SUPPLIED TO THE FURNACE WAS 10-20 TIMES THE THEOPETICAL REQUIREMENT NECESSARY FOR COMPLETE COMBUSTION. THIS RESULTED IN A REDUCTION OF FURNACE TEMPERATURES. THE PEAK FURNACE TEMPERATURES VARIED FROM 970-1200 DEGREES F DURING THE PERIOD OF RAPID BURNING. THE AVERAGE TEMPERATURES RANGED FROM 668-463 DEGREES F. THESE LATTER ARE LOWER THAN THE TEMPERATURE AT WHICH BURNING OF ORGANIC COMPOUNDS VOLATILIZED FROM THE REFUSE IS COMPLETE. THE EMISSIONS OF PARTICULATE MATTER TO THE ATMOSPHERE VIA THE FLUE GASES RANGED FROM 0.85 TO 1.55 PERCENT OF THE REFUSE WEIGHT. EMISSIONS OF EIGHT NOXIOUS GASES TOTALED 0.9 TO 3.0 LB PER 100 LB REFUSE.

08-01-00826 ROOF DAMPER OPERATION FOR APARTMENT-HOUSE INCINERATORS (SAFETY(FIRE) CHUTE)
SVED, J. R.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 153-156 (MAY 18-20, 1964). SYSTEM OF ROOF DAMPER OPERATION IN TWO-FLUE APARTMENT-HOUSE INCINERATORS IS ACCOMPLISHED BY STEP-BY-STEP ANALYSIS OF ALL POSSIBLE CONFIGURATIONS INCLUDING TYPE OF TWO-FLUE INSTALLATION, LOCATION OF ROOF DAMPER AND PROPER POSITION IN OPERATING CYCLE. POSSIBLE SOLUTION IS SUGGESTED TO UNSOLVED PROBLEM OF APARTMENT- HOUSE INCINERATOR, NAMELY FIRES IN REFUSE CHUTES.

08-01-00852 INSTALLATION OF SMALL GAS-FIRED INCINERATORS (DISPOSAL(IN-SITU))
WILLS, D. R. + BLENCH, G. T.
J INSTN HEATING VENT ENGRS 28(9), P. 189-196 (SEPTEMBER 1960). FLUE LENGTH, DOWN DRAFT DIVERTERS AND TREATED FLUE PIPE AS WELL AS DESIGN DATA FOR MECHANICAL EXTRACTION ARE EXAMINED RELATIVE TO ADEQUATE VENTILATION FOR INCINERATORS DISPOSING OF DOMESTIC REFUSE AND COMMERCIAL AND SANITARY WASTES FOR APARTMENT HOUSES AND OFFICE BUILDINGS. METHOD FOR CALCULATING FAN REQUIREMENTS, CONTROL EQUIPMENT. (EI)

08-01-00942 MODIFICATIONS TO REDUCE EMISSIONS FROM FLUE-FED INCINERATOR (GAS-FIRED)
KAISER, E. R. + HALITSKY, J. + JACOBS, M. B. + MCCABE, L. C.
J AIR POLLUTION CONTROL ASSOC 10(3), P. 183-197 (JUNE 1960). PROGRAM OF 38 TESTS CONDUCTED ON FLUE-FED SINGLE CHAMBER REFUSE INCINERATORS IN THREE 16-STORY APARTMENT BUILDINGS TO DETERMINE AMOUNT OF ATMOSPHERIC POLLUTION, AND EFFECTIVENESS OF SEVERAL APPLIANCES IN REDUCING EMISSION OF CONTAMINANTS. VARIOUS METHODS AND DEVICES DESCRIBED WHICH WERE FOUND EFFECTIVE. FACTORS TO BE CONSIDERED IN EVALUATING DEVICES FOR APPLICATION TO EXISTING INCINERATORS ARE GIVEN.

08-01-00971 UNSOLVED PROBLEMS WITH FLUE-FED INCINERATORS (EMISSION(CONTROL))
KAISER, E. R.
J AIR POLLUTION CONTROL ASSOC 11, P. 254 (MAY 1961). INCINERATORS IN THE BASEMENTS OF MULTI-STORY APARTMENT BUILDINGS GREATLY SIMPLIFY THE PROBLEM OF WASTE DISPOSAL BY REDUCING THE WEIGHT OF REFUSE TO 35 PERCENT OF ITS ORIGINAL WEIGHT AND VOLUME TO 10 PERCENT. ONE OPERATOR CAN TEND 10 INCINERATORS IN A GROUP OF AS MANY BUILDINGS HOUSING A TOTAL OF 3,000 PERSONS. SINCE THE INCINERATOR CHIMNEY OR FLUE ALSO SERVES AS THE REFUSE CHUTE, RESIDENTS CAN DEPOSIT REFUSE INTO THE CHARGING HOPPERS AT ANY TIME CONVENIENT TO THEM. GRAVITY TRANSPORTS THE REFUSE TO THE INCINERATOR. THE TYPICAL SINGLE-CHAMBER INCINERATOR FURNACE RECEIVES REFUSE FROM A FLUE THAT EXTENDS ABOVE ONE REAR CORNER OF THE FURNACE ROOF. THE REFUSE ACCUMULATES IN A SLOPING PILE WHOSE TOP OFTEN REACHES THE FLUE. WHEN THIS HAPPENS, THE FURNACE CAPACITY IS NOT PROPERLY UTILIZED. IN INSTALLING NEW UNITS, IT IS RECOMMENDED THAT THE FLUE BE CENTRALLY LOCATED. SINCE THE REFUSE CAN ROLL AWAY IN ALL DIRECTIONS FROM THE APEX OF THE PILE, THE FURNACE WOULD THEREBY BE MORE FULLY UTILIZED, AND THE CLEARANCE BETWEEN THE APEX AND THE FLUE WOULD BE INCREASED. IN COMPUTING FURNACE SIZE, IT IS ADVISABLE TO ALLOW FOR 1 LB OR 0.25 CU FT OF REFUSE PER OCCUPANT BETWEEN LATE AFTERNOON AND EARLY THE FOLLOWING MORNING. A BY-PASS FLUE ALLOWS THE USE OF A MULTIPLE-CHAMBER INCINERATOR WITH A SINGLE FLUE. AIR FROM BELOW HELPS BURN REFUSE HAVING A HIGH PERCENTAGE OF NONCOMBUSTIBLES. VARIOUS TECHNIQUES OF WHICH OUR KNOWLEDGE IS INCREASING ARE CONCERNED WITH HOPPER LOCKING, AUXILIARY GAS FIRING, OVERFIRE AIR JETS, AND THE USE OF FLUE-GAS SCRUBBERS. THE AMOUNT OF PARTICULATE MATTER TRAPPED IN THE CHAMBERS BEYOND THE BRIDGEWALL OF THE MULTIPLE CHAMBER INCINERATOR IS SIGNIFICANT BUT PROBABLY LOW IN PROPORTION TO THE TOTAL SOLIDS CARRIED BY THE GASES. A PAPER TRAP PROTECTS THE SPARK ARRESTOR. COMMERCIAL SCRUBBERS ARE EFFICIENT, BUT THE EXHAUSTING OF GAS IS A PROBLEM IN A BASEMENT INSTALLATION DUE TO COOLING AND CONDENSATION OF MOISTURE ONTO A FLUE THAT IS AT BUILDING TEMPERATURE. (EI)

08-01-01072 INCINERATION OF DOMESTIC REFUSE (EMISSION(CONTROL))
QUINN, P. D.
PUBLIC CLEANSING 57, P. 80-83 (1967). ON SITE INCINERATION MAY PROVE A SOLUTION TO SOME TO THE DOMESTIC REFUSE PROBLEMS AND THIS ARTICLE GIVES SOME DETAILS OF AN INSTALLATION OF A GAS FIRED INCINERATOR DESIGNED TO HANDLE HIGH DENSITY AREA DOMESTIC REFUSE. MUCH OF THE WORK DONE ON GAS FIRED INCINERATION HAS BEEN DONE IN THE U.S.A. BUT DOES NOT MEET THE STANDARDS OF THE BRITISH. THERE ARE STILL MANY REFINEMENTS TO BE MADE TO MEET THE REQUIREMENTS.

08-01-01258 THE HOW, WHY AND WHEREFOR OF CLEANSING IN NEW YORK (INCINERATION COLLECTION)
PUBLIC CLEANSING 56(4), P. 173-175 (1966). THE COMPLEXITY OF THE NEW YORK CITY DEPARTMENT OF SANITATION DOES NOT ARISE FROM ADMINISTRATIVE INTENTIONS BUT BECAUSE OF THE IMMENSE TASK OF REMOVING REFUSE FROM MORE THAN 8,000,000 RESIDENTS AND 2,500,000 DAILY VISITORS. THE DEPARTMENT IS RESPONSIBLE FOR DOMESTIC, PUBLIC INSTITUTIONS AND CHARITABLE ORGANIZATIONS, SEPARATE COLLECTION FACILITIES AND RATES PREVAIL FOR COMMERCIAL AND INDUSTRIAL REFUSE COLLECTION. MULTI-STORIED BUILDINGS HAVE CHUTE TO INCINERATOR REFUSE DISPOSAL WHERE REFUSE IS REDUCED BY 85 TO 95 PERCENT. TO CONSERVE LAND AREA, 16 1,000 TON/DAY INCINERATORS ARE BEING BUILT.

08-01-01265 NEW GAS-FIRED INCINERATOR HELPS FIGHT AIR POLLUTION (EMISSION(CONTROL))
GAS AGE 129(22), P. 28-29, 51 (DECEMBER 1962). FEATURES OF NEW YORK CITY HOUSING AUTHORITY DESIGN OF NEW TYPE OF INCINERATOR FOR APARTMENTS INCLUDE HIGH TEMPERATURE COMBUSTION CHAMBER, WHERE TEMPERATURES OF 1400-1500 F WILL COMPLETELY BURN MANY SOLIDS WHICH ARE ONLY PARTIALLY BURNED IN ORDINARY INCINERATORS. ELECTRONIC CONTROL CENTER PROVIDES FULLY-AUTOMATED OPERATION OF INCINERATOR. (EI)

08-01-01269 LONDON CENTRE DISCUSSES ON-SITE INCINERATION ION(CONTROL))
PUBLIC CLEANSING 56(11), P. 575-578 (1966). AT A MEETING OF THE LONDON CENTRE OF PUBLIC CLEANSING A REPRESENTATIVE OF A INCINERATOR MANUFACTURING COMPANY OUTLINED THE EFFORTS HE HAD GONE TO, TO TRY TO SELL THE CLEANSING OFFICIALS ON SITE " REFUMATIC " INCINERATION, ESPECIALLY IN MULTISTORIED APARTMENTS. THE FOLLOWING ARE A LIST OF IMPROVEMENTS THAT HAVE BEEN MADE AND HAS CONVINCED OTHER CITIES THAT THIS IS AN ECONOMIC MEANS OF DISPOSAL. IMPROVEMENTS WHICH HAVE TAKEN PLACE - (1) WHEELED ASH PIT TRAYS FOR STANDARD CONTAINERS INSTEAD OF SHOVELLING OUT OF ASHES. (2) MORE COMPACT ARRANGEMENT OF PLANT ALLOWING INSTALLATION IN SMALLER SPACE. (3) IMPROVEMENT IN FAN TO GIVE QUIETER RUNNING. (4) INCREASED VOLUME OF COMBUSTION CHAMBER TO TAKE GREATER QUANTITY OF RUBBISH WHICH MIGHT BE CHARGED OVER A SHORT PERIOD OF TIME. (5) GATE VALVE INCORPORATED AT BOTTOM OF DISCHARGE CHUTE. CLOSED ON SHUT DOWN AND IN ALL INSTALLATIONS 4 MINUTES BEFORE MAIN CHAMBER DOOR CAN BE OPENED FOR RAKING. (6) LOCK PROVIDED ON MAIN DOOR WHICH CANNOT BE OPENED UNTIL CONTROL PANEL KEY HAS BEEN REMOVED FROM PANEL. (7) IMPROVED HOPPER FITTED WITH STOPS HAVING INCREASED INTERNAL CAPACITY BUT NOT ALLOWING DIRECT CHARGING OF RUBBISH IN THE CHUTES. (8) PURGE CYCLE INTRODUCED AND ORIGINALLY USED ONCE PER DAY ON ALL CHUTES THROUGH MULTI-STOREY BUILDINGS BUT NOW AVAILABLE WITH ONE PURGE PER WEEK. (9) DEVELOPMENT OF INCINERATOR FOR LAMBETH WHICH ALLOWS DIRECT FALL OF RESIDUAL ASHES INTO LARGE PALADIN CONTAINER. (10) SOMEWHAT SIMILAR ARRANGEMENT FOR L.C.C. SINCE MODIFIED FOR A NUMBER OF LONDON BOROUGHS TO ALLOW INCINERATOR TO BE INSTALLED AT MEZZANINE FLOOR WITH WHEELED PALADIN IMMEDIATELY BELOW IT. (11) EXTRA AIR INLETS AT BACK OF ASH PIT AND AIR BOX AT BASE OF SLOPING HEARTH TO GIVE IMPROVED DESTRUCTION AND ELIMINATING THE NECESSITY OF RAKING.

08-01-01289 ON SITE INCINERATION
MARCHANT, A. J.
PUBLIC CLEANSING 56(2), P. 81-88 (1966). TO DATE TOO FEW PLANTS HAVE BEEN PROVIDED IN THIS COUNTRY FOR DEALING WITH REFUSE AT ITS SOURCE, IN CONSEQUENCE, THERE IS AT THE MOMENT INSUFFICIENT TECHNICAL DATA TO PRODUCE A COMPREHENSIVE REPORT. THE GAS COUNCIL HAVE BEEN CONDUCTING EXPERIMENTS WITH AN ON SITE INCINERATOR UNIT INSTALLED AT WOLVERTON AND WILL BE PUBLISHED. IT IS DIFFICULT TO ASSESS THE ADVANTAGES OF THESE TESTS AS NOTHING IS KNOWN AS TO THE EXTENT OF THE GAS COUNCIL'S EXPERIMENTS, BUT WHATEVER RESULTS MAY BE FORTHCOMING THEY WILL SURELY PROVIDE A BASIS UPON WHICH A COMPREHENSIVE STUDY CONCERNING ON SITE INCINERATION CAN BE MADE. THE IMPROVEMENTS MADE TO THE METHODS OF ON SITE INCINERATION ARE SUCH THAT THE SYSTEM REQUIRES VERY SERIOUS CONSIDERATION AS A MORE ADVANTAGEOUS METHOD OF REFUSE TREATMENT AND STORAGE THAN EXISTS AT THE PRESENT TIME.

08-01-01315 REFUSE DISPOSAL AT THE SOURCE (INCINERATION)
PUBLIC CLEANSING 55(1), P. 12-13 (1965). AN ARTICLE DISCUSSING SOME OF THE METHODS OF DISPOSING OF THE WASTES GENERATED ESPECIALLY IN MULTI-STORIED HOUSING PROJECTS. THE PROS AND CONS OF SEVERAL SMALL UNITS, OR FEWER LARGE UNITS INCORPORATING A CONTINUOUS TRANSPORTING SYSTEM, POSSIBLY A PNEUMATIC ONE.

08-01-01372 UNSOLVED PROBLEMS OF HYGIENE FOR WASTE REMOVAL IN INSTITUTIONS OF PUBLIC HEALTH (INCINERATION)
HARMSEN
UNGELOESTE HYGIENISCHE PROBLEME BEI DER ABFALLBESEITIGUNG IN EINRICHTUNGEN DES GESUNDHEITSDIENSTES, STAECTEHYGIENE 11(10), P. 205-207 (1960). AS THE COMBUSTIBLE MATERIAL IN WASTES IS INCREASING, THE REMOVAL OF DOMESTIC WASTES BY COMBUSTION IS AN ECONOMIC AND HYGIENIC POSSIBILITY. INSTITUTIONS FOR THIS PROCESS HAVE NOT ONLY BEEN ESTABLISHED FOR TOWNS, BUT FOR PRIVATE PURPOSES TOO. (TALL DWELLING HOUSES, OFFICES AND ADMINISTRATION BUILDINGS, LARGE SHOPS AND ESPECIALLY HOSPITALS AND SANITARY INSTITUTIONS.) WHILE THE CONSTRUCTIVE SYSTEMS OF SUCH FURNACES ARE DIFFERENT, IT IS NECESSARY TO MAKE SOME POSTULATES REGARDING THEIR HYGIENIC AND TECHNICAL MANAGEMENT, FOR INSTANCE THE HEIGHT OF TEMPERATURE, CHIMNEYS WITH FIREPROOF MATERIAL, STERILE ASHES, NO PERSONAL DANGER, ESTABLISHMENT IN ROOMS WITH FIREPROOF DOORS AND WALLS, POSSIBILITIES OF AN EASY CLEANING, NO POLLUTION OF AIR, THE AVOIDANCE OF HANDWORK, ETC. (PHEA)

08-01-01392 APARTMENT HOUSE INCINERATORS (POLLUTION(AIR))
NATIONAL RESEARCH COUNCIL, 38 PP. (1965). STUDY WAS CARRIED OUT TO DEVELOP PERFORMANCE REQUIREMENTS AND EVALUATIVE PROCEDURES FOR APARTMENT BUILDING INCINERATORS CONSISTENT WITH REDUCING AIR POLLUTION TO MINIMUM. REPORT IS INTENDED TO COVER NEW CONSTRUCTION AS WELL AS CONVERSION OF EXISTING UNITS, AND WAS PREPARED ON ASSUMPTION THAT APARTMENT BUILDING INCINERATORS RELEVANT TO AIR POLLUTION PROBLEM ARE, FOR PRACTICAL PURPOSES, FLUE-FED UNITS. (EI)

08-01-01539 SMOKELESS INCINERATOR - SEALED FLAME UNIT
MACHY MARKET 3388, P. 28 (OCTOBER 21, 1965). UNIVERSAL MACHINERY AND SERVICES, LTD. DEVISED SEALED FLAME DISPOSAL UNIT WHICH HAS NO THROUGH DRAFT, AS SMOKE IS GENERATED IT RETAINS ITS FULL HEAT AND MOST OF IT IS BURNED IN FURNACE, AFTERBURNER IN DOUBLE SLEEVE BOTTOM STACK STOPS SMOKE FROM REACHING ATMOSPHERE, UNIT WILL DESTROY RANDOM MIXTURE OF MATERIALS INCLUDING RUBBER, PLASTICS AND ANIMAL MATTER, WITHOUT EMISSION OF SMOKE, GRIT, OR FLY ASH, AND HAS ALSO BEEN OFFICIALLY ACCEPTED FOR DISPOSAL OF RADIOACTIVE MATERIALS, AND FOR SMOKELESS RECOVERY OF METAL FROM INSULATED CABLE. (EI)

08-01-01880 UNDER COVER AGENT - THE CASE OF THE SEALED FLAME AND CLEAN AIR (INCINERATOR)
PUBLIC CLEANSING 54(12), P. 1360 (1964). AN ARTICLE DESCRIBING FOUR MODELS OF SEALED FLAME DISPOSAL UNITS. THE UNITS ARE DESIGNED TO GIVE COMPLETELY SMOKELESS AND ODORLESS DISPOSAL OF ANY TYPE OF COMBUSTIBLE MATERIAL OF ANY SIZE.

08 02 COMMERCIAL

08-02-00012 INCINERATOR HELPS HEAT SHOPPING CENTER (SCRUBBER(WATER) HEAT-RECOVERY HEATING(SPACE))
MUNSON, J. S.
AIR ENGRG 5(2), P. 18, 52 (FEBRUARY 1963). INCINERATOR SYSTEM AT WOODWARDS OAKRIDGE SHOPPING CENTER IN VANCOUVER, BRITISH COLUMBIA, HAS BURNING CAPACITY OF 3000-LB OF REFUSE PER HOUR IN WHICH HOT GASES, UP TO 1600 F, GO THROUGH INGENIOUS HEAT EXCHANGER IN HOT WATER BOILER TO PROVIDE HEATING FOR CENTER. (EI)

08-02-00496 COMMERCIAL INCINERATOR DESIGN CRITERIA (DESIGN EMISSION(CONTROL) ECONOMICS PROJECTIONS PACKAGING(TRENDS))
ZINN, R. E. + NIESSEN, W. R.
PROC OF THE 1968 NATIONAL INCINERATOR CONF, ASME, P. 337-347 (MAY 5-8, 1968). UPGRADING CAPABILITIES OF COMMERCIAL AND INDUSTRIAL INCINERATORS IS NECESSARY IN VIEW OF PROJECTED TRENDS IN PACKAGING MATERIALS WHICH HERALD INCREASED AMOUNTS OF PLASTICS, METAL FOILS AND GLASS IN REFUSE. THESE MATERIALS CAN CAUSE MUCH MAINTENANCE AND EVEN FAILURE OF INCINERATOR GRATES, SUPPORTING STRUCTURES AND OPERATING MECHANISM. COMBUSTION AIR CONTROL WITH SUITABLE AGITATION OF RESIDUE TO ATTAIN GOOD BURNOUT IS SHOWN TO BE NECESSARY DESIGN PARAMETER. THUS, FUTURE DESIGNS OF INCINERATORS MUST AVOID USE OF GRATE SYSTEMS, YET MUST PROVIDE ADEQUATE STOKING OF BURNING MASS TO OBTAIN COMPLETE OXIDATION. (EI)

08-02-01700 ASH REMOVAL SYSTEM IS BUILT FOR SMALL PLANTS (INCINERATOR DESIGN)
REFUSE REMOVAL JOURNAL 3(10), P. 8 (OCTOBER 1960). DESCRIBES AND ILLUSTRATES A NEW ASH REMOVAL SYSTEM DESIGNED FOR INCINERATORS IN SMALL INDUSTRIAL PLANTS, HOSPITALS, HOTELS, MOTELS, SCHOOLS, AND INSTITUTIONS. (PHS)

08 03 MUNICIPAL

08-03-00005 OPERATION OF LOUISVILLE'S NEW INCINERATOR (SLUDGE(SEWAGE) KILN(ROTARY))
CATES, H. J.
PUBLIC WORKS 88(12), P. 110-111 (DECEMBER 1957). BUILDING AND ALL EQUIPMENT IS CONSTRUCTED FOR FOUR INCINERATOR UNITS OF 250 TONS CAPACITY PER 24 HOURS. UNITS PROVIDE CONTINUOUS FEED, CONTINUOUS ADVANCE AND TUMBLING OF REFUSE WITH CONTINUOUS DISCHARGE OF RESIDUE. EACH UNIT USES RECIPROCATING TYPE DRYING AND IGNITION GRATES, ROTARY KILN AND COMBUSTION CHAMBER. CAN HANDLE HEAVY TIMBERS AND LOGS UP TO THIRTY INCHES DIAMETER WITH SPECIAL GRINDING EQUIPMENT. (EI)

08-03-00006 INCINERATOR NEAR RESIDENTIAL AREA IS NUISANCE FREE (COST(CAPITAL))
PUBLIC WORKS 89(6), P. 60-61 (JUNE 1958). TWO HUNDRED TON INCINERATOR IN EAST HARTFORD, CONN, HAS DAILY LOAD OF 80 TO 100 TONS. TWO RECTANGULAR FURNACES HAVE HYDRAULIC STOKERS AND DUMPING GRATES. THREE FLOOR LEVELS USED FOR CHARGING, STOKING AND ASH HANDLING. AUTOMATIC PRINTED RECORDING OF INCOMING LOADS. EXPANSION CHAMBER AND REFRACTORY BAFFLE WALL SLOW FLUE GASES AND PERMIT PARTICLES TO DROP OUT. CHIMNEY EMISSIONS PROVED SATISFACTORY. (EI)

08-03-00008 HEAT RECOVERY FROM INCINERATORS (REFUSE FURNACES EMISSION(CONTROL) HEAT-BALANCE DESALINATION HEATING(PROCESS) HEATING(SPACE))
LIEBERG, O. S.
AIR CONDITIONING, HEATING AND VENT 62(6), P. 53-57 (JUNE 1965) AND P. 73-74 (JULY 1965). POSSIBILITIES OF REFUSE DISPOSAL AND ITS RELATION TO WASTE HEAT RECOVERY, GENERAL TYPE AND DESIGN OF EQUIPMENT REQUIRED, AND OTHER ASSOCIATED PROBLEMS ARE EXAMINED. DISCUSSION DEALS WITH REFUSE HANDLING, FURNACES, WASTE HEAT RECOVERY, FLY ASH CONTROL, AND HEAT BALANCE. GENERATION OF SERVICE HOT WATER AND LOW, MEDIUM AND HIGH TEMPERATURE WATER FOR SPACE AND PROCESS HEATING. (EI)

08-03-00010 NUISANCE FREE OPERATION FOR NEW INCINERATOR IN WASHINGTON, D.C. (LAW SEPARATION-REQUIREMENTS)
XANTEN, W. A.
CIVIL ENGRG 26(4), P. 50 (APRIL 1956). THE DESIGN OF THE DISTRICT'S NEW 500 TON RUBBISH INCINERATOR IS OUTLINED. SCHEMATIC DIAGRAMS, PICTURES AND A TABLE OF DESIGN AND EQUIPMENT DETAILS ARE INCLUDED. BASIC DESIGN IS SAID TO BE SIMILAR TO OTHER PIT AND CRANE TYPE PLANTS, EXCEPT THAT UNUSUALLY LARGE FLUES WERE CONSTRUCTED (209 CU-FT/TON) FOR BETTER FLY ASH CONTROL. ALSO INCLUDED IS A RESUME OF THE DISPOSAL PROBLEMS AND CHARACTERISTICS OF REFUSE PRODUCED. (1,100 LBS OF TRASH PER CAPITA IS NOW PRODUCED. THIS IS MORE THAN DOUBLE THAT OF 1945.) DENSITY OF RUBBISH VARIES FOR THE AVERAGE FROM 200 TO 230 LB/CU-YD. (PHS)

08-03-00011 SURVEY OF MUNICIPAL REFUSE INCINERATOR DESIGN PRACTICES (EMISSION(CONTROL))
SPEAS, I. G.
PAPER PRESENTED BEFORE THE ORO ENVIRONMENTAL POLLUTION TASK FORCE, OAK RIDGE, TENNESSEE, (JULY 13, 1967). CURRENT MUNICIPAL INCINERATOR PRACTICE WAS REVIEWED. IT WAS APPARENT THAT MODERN INCINERATOR DESIGNS WOULD BE REQUIRED TO MEET THE NEW FEDERAL AIR POLLUTION REGULATIONS. THE MAJOR ITEMS WHICH APPEARED TO BE ESSENTIAL FOR ACCEPTABLE FLY ASH CONTROL WERE 1. CONTINUOUS REFUSE CHARGING TO THE FURNACE. 2. MINIMAL EXCESS AIR WITH POSITIVE CONTROL. 3. MULTIPLE FURNACE CHAMBERS. 4. WATER SCRUBBER, BAG FILTER, OR ELECTROSTATIC PRECIPITATOR FLUE GAS CLEANING DEVICES. IN EUROPE THE ALL-REFRACTORY FURNACE-BOILER APPEARS TO BE OBSOLETE AND IS BEING REPLACED WITH A WATER-WALLED FURNACE BOILER. OBVIOUSLY ALL MUNICIPAL INSTALLATIONS CANNOT ECONOMICALLY JUSTIFY WASTE HEAT RECOVERY BOILERS, ESPECIALLY SMALLER PLANTS AND LARGER PLANTS NOT OPERATING 24 HOURS PER DAY. MANY PLANTS HAVE NO MARKET FOR SO MUCH STEAM. THE COST FOR A COMPLETE INCINERATOR-BOILER PLANT APPEARS TO BE NOT EXCESSIVELY GREATER THAN THE COST FOR AN INCINERATOR PLANT WITH A REFRACTORY FURNACE. WITH THE FEWER OUTAGES EXPECTED, LESS MAINTENANCE COST, AND LONGER LIFE SPAN PLUS THE VALUE OF THE STEAM GENERATED, AN INCINERATOR-BOILER PLANT SHOULD BE GIVEN CAREFUL CONSIDERATION. THE FIRST COST OF THE ELECTROSTATIC PRECIPITATOR IS HIGHER THAN FOR A WATER SCRUBBER AND LESS THAN FOR A BAG FILTER SYSTEM. HOWEVER, SINCE THE ELECTROSTATIC PRECIPITATOR OPERATING COSTS ARE ONLY ABOUT 60 PERCENT OF THOSE FOR THE WATER SCRUBBER AND BAG FILTER, THE PRECIPITATOR APPEARS TO BE THE MORE SUITABLE ASH COLLECTOR.

08-03-00014 HEAT FROM INCINERATION - AVAILABLE QUANTITIES AND UTILIZATION (CALORIFIC-VALUE COMPOSITION HEAT RECOVERY WATER-WALL EMISSION(CONTROL))
MEISSNER, H. G.
COMBUSTION 30(8), P. 57-63 (FEBRUARY 1959). HEATING VALUES OF INGREDIENTS USUALLY PRESENT IN MUNICIPAL REFUSE. DETERMINATION OF AVAILABLE HEAT. STRAIGHT INCINERATION. FLY ASH CONTROL BY MEANS OF MECHANICAL DUST COLLECTORS OR SCRUBBERS, WITH INDUCED DRAFT FANS AND SHORT STACKS. AVAILABLE ENERGY FROM VARIOUS REFUSE MATERIALS, AND POSSIBLE MEANS OF PUTTING HEAT ENERGY TO WORK. (EI)

08-03-00016 MODERN LOOK AT REFUSE INCINERATION (COMPOSITION EMISSION(CONTROL))
VAN KLEECK, L. W.
PUBLIC WORKS 90(9), P. 123-125, 184-186, 188 (SEPTEMBER 1959). PRESENT TRENDS IN DESIGN AND OPERATION. FORMER 65 PERCENT GARBAGE AND 35 PERCENT RUBBISH BY WEIGHT CHANGED TO ONLY 20 PERCENT GARBAGE IN TOTAL WEIGHT. EFFECTS OF CHANGE ON INCINERATOR DESIGN. STORAGE, HANDLING AND CHARGING OF REFUSE, IGNITION CHAMBERS, ASH HANDLING, AND IMPROVEMENTS IN SAFETY AND OPERATION PRACTICE. FACILITIES OF CHICAGO, ILLINOIS, PHILADELPHIA, PENNSYLVANIA, MARYLAND, AND HEMPSTEAD, NEW-YORK PLANTS. (EI)

08-03-00017 HEAT FROM REFUSE (HEAT RECOVERY COST(OPERATING))
GRINDROD, J.
HEATING AIR TREATM ENGR 22(1), P. 16-19 (JANUARY 1959). INCINERATION PLANT AT BERNE, SWITZERLAND BURNS GARBAGE TO PROVIDE HEAT IN FORM OF STEAM OR HOT WATER FOR SPACE HEATING OR INDUSTRIAL PURPOSES. GARBAGE BUNKER KEPT SUB-ATMOSPHERIC PRESSURE TO PREVENT ESCAPE OF DUST OR ODORS. UNLOADING AND CHARGING PROCEDURES. EACH FURNACE DESIGNED TO PRODUCE 4-9 TONS OF STEAM PER HOUR. 150 KW GENERATING SET UTILIZES STEAM FOR SPACE HEATING AND GENERATES ELECTRICITY AT PEAK LOADS IN WINTER. IN 1956, TWO INCINERATOR FURNACES DEALT WITH 29,200 TONS OF GARBAGE PRODUCING 38,000 TONS OF STEAM. 10,700 TONS OF STEAM WERE PRODUCED BY OIL-FIRED VELOX BOILER. ELECTRIC BOILER WAS NOT USED AT ALL. TOTAL HEAT PRODUCED AMOUNTED TO 48,700 TONS OR ABOUT 29,200 METRIC THERMAL UNITS. 20,800 METRIC THERMAL UNITS WERE SUPPLIED TO PAYING HEAT CONSUMERS. CLINKER AND FLY ASH EFFLUX MEASURE 25-30 PERCENT OF GARBAGE WEIGHT IN SUMMER AND ABOUT 70 PERCENT IN WINTER, WHEN A LARGE QUANTITY OF HEAVY DOMESTIC HEATING RESIDUE HAS TO BE DISPOSED OF. ON AN AVERAGE, THE QUANTITY OF CLINKER TO BE DISPOSED OF IS 52 PERCENT OF THE GARBAGE WEIGHT, DUE TO THE LARGE VOLUME OF WATER TO BE REMOVED WITH THE FLY ASH SLUDGE. IN 1956, OPERATING COSTS AMOUNTED TO SWISS FRANCS 634,000 AND INCOME TO SWISS FRANCS 594,000, OF WHICH SWISS FRANCS 545,000 CAME FROM HEAT SALES. THE PRICE OF HEAT IS COMPOSED OF A FIXED RATE BASED ON INSTALLATION COST THAT THE HEAT CONSUMER WOULD HAVE HAD TO LAY OUT ON A HEATING SYSTEM OF HIS OWN, PLUS A VARIABLE RATE DEPENDING ON CURRENT PRICES FOR COKE OR OIL. (EI)

08-03-00018 INCINERATION PLANT - PLUS (HEAT RECOVERY HEATING(SPACE) POWER CALORIFIC-VALUE)
BENDER, R. J.
POWER 111(1), P. 62-64 (JANUARY 1967). LARGEST PLANT IN WORLD FOR INCINERATION OF HOUSEHOLD REFUSE AT ISSY-LES-MOULINEAUX, SUBURB OF PARIS, OPERATES 24 HR/DAY AND ITS NOMINAL CAPACITY IS 400,000 TONS/YR. HEAT CREATED BY INCINERATION OF GARBAGE IS USED TO GENERATE STEAM. AT 928 PSI AND 770 F, STEAM IS PASSED THROUGH BACK-PRESSURE TURBINE (ABOUT 290 PSI) WHICH DRIVES 9000 KW GENERATOR. WINTER USAGE INCLUDES 285,000 LB/HR STEAM FOR DISTRICT HEATING. CONDENSING TURBINE PRODUCES 15,000 KW IN SUMMER. REFUSE RANGES FROM 1600 TO 4500 BTU/LB. (EI)

08-03-00019 INCINERATOR USES TRASH AS FUEL TO PRODUCE ELECTRICITY IN ROTTERDAM (HEAT-RECOVERY POWER COST(OPERATING) CAN(SALVAGE-VALUE) COST(CAPITAL) COMPOSTING COLLECTION)
REFUSE REMOVAL JOURNAL 10(11), P. 6, 7, 32 (NOVEMBER 1967). CONSTRUCTION AND OPERATION OF AN INCINERATOR TO BURN REFUSE IN ROTTERDAM IS DESCRIBED. COMPOSTING WAS CONSIDERED BUT RULED-OUT IN FAVOR OF INCINERATION. BY-PRODUCT POWER, CLINKERS, TIN CANS, AND OTHER METAL ITEMS ARE SOLD TO PARTIALLY DEFRAY OPERATING COSTS. PLANS FOR CONSTRUCTION OF A SECOND INCINERATOR TO BE COMPLETED IN 1970 ARE DESCRIBED.

08-03-00020 COMBUSTIBLE RUBBISH CONTENT FAVORS USING HEAT RECOVERY (HEAT-RECOVERY POWER COST(CAPITAL) EMISSION(CONTROL))
REFUSE REMOVAL JOURNAL 10(11), P. 32 (NOVEMBER 1967). CASIMIR A. ROGUS VOICED THE VIEW THAT REFUSE INCINERATORS SHOULD INCORPORATE EQUIPMENT TO USE THE HEAT FOR THE PRODUCTION OF ELECTRICITY. CALORIFIC-VALUE OF AMERICAN REFUSE ESTIMATED TO BE 3,500 TO 5,000 BTU/LB. INCORPORATION OF STEAM-ELECTRIC GENERATING FACILITIES WOULD INCREASE THE COST OF INCINERATORS BY ABOUT 25 PERCENT. IN A REPORT RECENTLY WRITTEN URGING HEAT RECOVERY FOR POWER PRODUCTION, MR. ROGUS INDICATES THAT MOST EUROPEAN INCINERATORS BUILT SINCE WORLD WAR II INCORPORATE POWER GENERATING FACILITIES.

08-03-00022 GARBAGE CAN BURN CLEAN WITH ENGINEERED INCINERATION (DESIGN)
MCGRATH, W. M.
CONSULTING ENGR (ST, JOSEPH, MICHIGAN) 17(2), P. 106-112 (AUGUST 1961). ITEMS IN REFUSE ACCUMULATION CAN BE EXPRESSED IN POUNDS OF EQUIVALENT PURE DRY ASH-FREE CELLULOSE/HR OF INCINERATOR OPERATION (PCH). HOUSEHOLD REFUSE PER CAPITA PER DAY, COMMERCIAL REFUSE PER DOLLAR OF AVERAGE GROSS BUSINESS PER DAY, INDUSTRIAL REFUSE IN SPECIFIC QUANTITY/WEEK AS DETERMINED BY SURVEY. REFUSE STORAGE AND HANDLING. IGNITION AND COMBUSTION. FACTORS AFFECTING LAYOUT AND EQUIPMENT. BELMONT, MASSACHUSETTS, INCINERATOR SYSTEM, DESIGNED ON BASIS OUTLINED. DISPOSAL OF RESIDUE. (EI)

08-03-00023 WASTE HEAT UTILIZATION (HEAT RECOVERY CALORIFIC-VALUE DESIGN POWER USAGE)
BLANKE, J. H. D.
POWER ENGRG 63(9), P. 96-99 (SEPTEMBER 1959). REVIEW OF SOLID WASTE INCINERATION PRACTICES IN AMERICAN COMMUNITIES AS SOURCE OF HEAT FOR STEAM GENERATION, USED FOR BUILDING HEATING AND PRODUCTION OF ELECTRIC POWER. VARIOUS INSTALLATIONS AND THEIR AUXILIARY EQUIPMENT DISCUSSED FROM POINT OF VIEW OF DESIGN AND APPLICATION. DIAGRAMS AND SKETCHES. (EI)

08-03-00025 CONTROLLED COMBUSTION FOR SOLID WASTES DISPOSAL (COMPOSITION QUANTITY DESIGN HISTORY EMISSION(CONTROL) COST(OPERATING) COST(CAPITAL) STATUS)
FIFE, J. A.
HEATING, PIPING AND AIR COND 40(3), P. 140-147 (MARCH 1968). DESCRIPTION OF STATUS OF AMERICAN INCINERATORS. FURNACE HEAT BALANCE, AIR POLLUTION POTENTIAL, PARTICULATE EMISSION CONTROL, AND ECONOMICS OF POLLUTION CONTROL ARE DISCUSSED. COMPARISON OF AIR POLLUTION CONTROL SYSTEMS FOR MUNICIPAL INCINERATION. (EI)

08-03-00026 ANOTHER LOOK AT EUROPEAN INCINERATION PRACTICES (CALORIFIC-VALUE HEAT-RECOVERY COMPOSITION EMISSION(CONTROL) RESIDUE POWER)
DVIRKA, M. + ZANFT, A. B.
PUBLIC WORKS 98(7), P. 99-100 (JULY 1967). DATA IS PRESENTED ON FOUR EUROPEAN CITIES USING INCINERATION THEY ARE DUESSELDORF, ROTTERDAM, PARIS, AND VIENNA. CAPACITIES OF UNITS AND DESIGN FEATURES ARE PRESENTED. ALL OF THE INCINERATORS ARE PROVIDED WITH STEAM GENERATION EQUIPMENT. ELECTRICITY IS PRODUCED OR, IN THE CASE OF VIENNA, THE STEAM IS SOLD. EMISSION CONTROL IS DISCUSSED ALONG WITH RESIDUE HANDLING. COMPOSITION AND HEAT VALUES ARE PRESENTED FOR THE FOUR CITIES.

08-03-00028 FUN CITY STRIKES AT POLLUTION (INCINERATION HEAT-RECOVERY EMISSION(CONTROL))
ENGRG NEWS-RECORD, P. 68 (NOVEMBER 9, 1967). NEW YORK CITY PROPOSES TO BUILD THE WORLD'S LARGEST INCINERATOR (5000 TONS/DAY) AS PART OF A COMBINED SEWAGE TREATMENT - REFUSE DISPOSAL PLANT. HEAT WOULD BE RECOVERED AND SOLD TO CONSOLIDATED EDISON FOR THEIR DISTRICT HEATING SYSTEM. AIR POLLUTION CONTROLS WILL BE PROVIDED FOR PARTICULATE, NITROGEN DIOXIDE AND SULFUR DIOXIDE CONTROL.

08-03-00030 DEMONSTRATION INCINERATOR TO HAVE ELECTROSTATIC PRECIPITATOR (EMISSION(CONTROL) DESIGN)
SETTEDUCATO, N. M.
PUBLIC WORKS 99(3), P. 99-100 (MARCH 1968). THE DEMONSTRATION PROJECT USING AN ELECTROSTATIC PRECIPITATOR AT THE NEW STAMFORD, CONNECTICUT INCINERATOR IS DESCRIBED. THE INCINERATOR IS DESIGNED TO HANDLE LARGE ITEMS WHICH BECAUSE OF SIZE CANNOT BE HANDLED IN THE EXISTING INCINERATOR. CAPACITY IS ABOUT 175 TONS OF OVERSIZE WASTE PER DAY.

08-03-00032 POWER IN GARBAGE (POWER)
ENGRG NEWS-RECORD, P. 27 (FEBRUARY 6, 1967). CONSOLIDATED EDISON COMPANY ASKED TO STUDY FEASIBILITY OF BURNING MUNICIPAL GARBAGE FOR POWER PRODUCTION.

08-03-00033 CITY SELECTS INCINERATION TO MEET ABOUT 60 PERCENT REFUSE RISE BY 1980 (COST(CAPITAL) COMPOSTING SANITARY LANDFILL DESIGN GRINDING)
SOLID WASTES MANAGEMENT/RRJ 11(7), P. 34, 39 (JULY 1968). DISTRICT OF BARROW-UPON-SOAR IN LEICESTERSHIRE, ENGLAND SELECTS INCINERATION OVER SANITARY LANDFILL, PULVERIZATION, AND COMPOSTING AS DISPOSAL METHOD. LANDFILL WITH PULVERIZATION WOULD STILL REQUIRE LARGE LAND AREAS. WITH COMPOSTING THE YIELD AND THE SALEABILITY OF THE PRODUCT WAS QUESTIONED.

08-03-00034 INCINERATORS SERVICE METROPOLITAN CHICAGO (DESIGN SALVAGE(METAL) COST(CAPITAL) COST(OPERATING) HEAT(PROCESS) HEAT(SPACE))
SOLID WASTES MANAGEMENT/RRJ 11(5), P. 12, 16, 26, 70, 77, 78 (MAY 1968). OPERATION OF THREE CONTRACTOR OWNED INCINERATORS SERVING THE CHICAGO METROPOLITAN AREA IS DESCRIBED. AT ONE PLANT REFUSE IS NOT CLASSIFIED PRIOR TO INCINERATION, BUT TIN-CANS AND OTHER METAL ITEMS ARE REMOVED FROM THE ASH AND SOLD. PROCESS AND HEATING STEAM IS PRODUCED AND SOLD. PLASTIC PACKAGING AND RELATED ITEMS ARE CURRENTLY A DIFFICULT PROBLEM.

08-03-00038 INCINERATION CAN BE CLEAN AND EFFICIENT (HEAT(SPACE) POWER DESIGN)
ROGUS, C. A.
POWER 111(11), P. 81-85 (DECEMBER 1967). COMPARISON OF EUROPEAN AND AMERICAN EQUIPMENT AND PRACTICE FOR INCINERATION OF DOMESTIC, COMMERCIAL AND MUNICIPAL WASTES. CHARACTERISTICS OF REFUSE. PERFORMANCE OF NEW INCINERATORS. WEIGHING SYSTEMS, HOPPERS, CRANES AND CHUTES. ELECTROSTATIC PRECIPITATORS AND AIR POLLUTION CONTROL. EXHAUST HEAT RECOVERY AND UTILIZATION AS STEAM OR ELECTRIC POWER. (EI)

08-03-00039 MONTREAL INCINERATOR IS TWOFOLD INNOVATOR (HEAT(SPACE) EMISSION(CONTROL) ELECTROSTATIC - PRECIPITATOR)
HOTTI, G.
POWER 112(1), P. 63-65 (JANUARY 1968). MUNICIPALITY IS TO BE EQUIPPED WITH INSTALLATION FOR SIMULTANEOUS INCINERATION OF DOMESTIC REFUSE, GENERATION OF STEAM FOR INDUSTRIAL PLANTS, AND FOR CLEANING FLUE GASES BY MEANS OF ELECTROSTATIC PRECIPITATION. FOUR UNITS WILL HAVE CAPACITY OF 300 TONS OF REFUSE PER DAY. EACH UNIT WILL SUPPLY 100,000 LB/HR OF SUPERHEATED STEAM AT 225 PSI, 500 F DEPENDING ON HEAT VALUE OF REFUSE. STEAM WILL BE USED BY INDUSTRIAL PLANTS ALL YEAR AROUND, AND FOR CITY HEATING DURING LONG MONTREAL WINTER. (EI)

08-03-00040 THE GREAT TRASH EXPLOSION (INCINERATION QUANTITY COLLECTION POLLUTION)
LATHAM, A. + PINCUS, W.
THE WASHINGTON POST (POTOMAC), P. 14 (SEPTEMBER 17, 1967). THE SOLID WASTE EXPLOSION IN WASHINGTON, D.C., IS REVIEWED. COLLECTION PRACTICES AND DISPOSAL BY INCINERATION ARE DESCRIBED.

08-03-00041 SQUEEZING HEAT FROM GARBAGE WITH MODERN MUNICIPAL INCINERATORS (HEAT-RECOVERY CALORIFIC-VALUE DESIGN STOKERS EMISSION(CONTROL))
POWER 108(3), P. 68-70 (MARCH 1964). VARIOUS TYPES OF STOKER DESIGN FOR GARBAGE INCINERATION ARE FEATURES. DESIGN OF BARREL GRATE TYPE NOW OPERATING FOR STEAM GENERATION IN FLINGERN, NEAR DUESSELDORF, WEST GERMANY, IS DESCRIBED. GARBAGE IS FIRST BURNED ON BARREL GRATES, THEN DELIVERED TO TRAVELING-GRATE STOKER. FEATURES OF MORE ELABORATE BOILER WITH SUPERHEATER AND ECONOMIZER PLANNED AS LATEST ADDITION TO DUESSELDORF INCINERATION PLANT. UNIT WILL BOAST LONGER BARREL GRATES BUT WILL BE BUILT WITHOUT TRAVELING GRATES. (GARBAGE IS ACTUALLY MUNICIPAL REFUSE.) (EI)

08-03-00042 REFUSE INCINERATION PLANT AT DEEPHAMS WORKS (HEAT-RECOVERY POWER DESIGN RESIDUE)
ENGINEER 223(5805), P. 641-642 (APRIL 28, 1967). PLANT, DESIGNED TO HANDLE UP TO 700 VEHICLE LOADS/DAY WILL USE CONTINUOUS TOTAL INCINERATION FOR GENERATING ELECTRIC CURRENT FOR SALE. IT WILL HAVE NORMAL CONTINUOUS THROUGHPUT OF 133 TONS OF CRUDE REFUSE EVERY 24 HR AND PEAK OF 1667 TONS. DEPENDING ON HEAT VALUE OF REFUSE, ELECTRICAL OUTPUT IS EXPECTED TO BE BETWEEN 27 AND 40 MW. SPECIFICATION CALLED FOR FIVE BOILERS, EACH CAPABLE OF COMPLETELY BURNING 14 TONS OF REFUSE/HR AND PRODUCING STEAM AT 625 PSI AND 850 F. PLANT LAYOUT IS SHOWN IN DRAWING. (EI)

08-03-00044 DESIGN AND OPERATION OF BIG INCINERATOR FURNACES (COST(CAPITAL) COST(OPERATING) WATER WALL HEAT-RECOVERY
BLANKE, J. H. D.
POWER ENGRG 63(11), P. 96-97 (NOVEMBER 1959). COMMUNITY SOLID WASTE INCINERATORS ARE SUBJECTED TO SEVERE OPERATING PRACTICE. WASTE RANGING FROM LOW TO HIGH COMBUSTIBILITY IN ONE DAY INTERMITTENT OPERATION, ADMITTANCE OF TOO MUCH EXCESS AIR, AND PERIODIC SHUTDOWN RESULTS IN HEAT SHOCK AND SPALLING OF FURNACE REFRACTORY. RECOMMENDATIONS FOR OPERATION INCLUDE CHANGES IN FURNACE DESIGN AND REFRACTORY, USE OF AUXILIARY BURNING EQUIPMENT, AND BLENDING OF REFUSE TO AVOID FLASH BURNING. COMPLETE WATER COOLED ENCLOSURE SEEN AS ULTIMATE FURNACE DESIGN. (EI)

08-03-00045 STOKERS FOR INCINERATORS - NEW TRENDS TO TRAVELING GRATES
BLANKE, J. H. D.
POWER ENGRG 64(2), P. 82-83 (FEBRUARY 1960). INSTALLATION CONSISTS ESSENTIALLY OF DRYING STOKER INCLINED 25 DEGREES WHICH DROPS REFUSE TWO AND ONE-HALF FEET TO HORIZONTAL BURNING STOKER. EACH STOKER IS CHAIN DRIVEN BY ELECTRIC MOTOR. STOKER SPEED IS CONTROLLED MANUALLY, AND BURNING STOKER IS TRAVELLED AT HIGHER SPEED TO OBTAIN THINNER LAYER OF REFUSE. CITY OF NEW YORK HAS INSTALLED FIRST LARGE SCALE TRAVELING GRATE STOKER IN INCINERATOR. ROCKING ARM CONE STOKER, AND ROTATING ARM TUYERE STOKER ARE DESCRIBED (EI)

08-03-00046 INCINERATOR TO UTILIZE WASTE HEAT FOR STEAM GENERATION (HEAT-RECOVERY HEAT(PROCESS) EMISSION(CONTROL))
GERHARDT, P.
PUBLIC WORKS 94(5), P. 100-101 (MAY 1963). FULL HOT GAS FLOW UTILIZATION IS ONE OF SEVERAL INNOVATIONS OFFERED IN DESIGN OF CHICAGO'S NEW SOUTHWEST INCINERATOR. USE OF "WETBOTTOM" THROUGHOUT COMBUSTION, SUBSIDENCE, SPRAY AND DRYING CHAMBER AREAS TO MINIMIZE AIR POLLUTION FROM FLY ASH. NEW PLANT HAS NUMBER OF AUTOMATIC FEATURES INCLUDING FULL ELECTRONIC CONTROLS ON TRAVELING CRANES WHICH LOAD CHARGING HOPPERS FROM RECEIVING PIT. PLANT HAS A CAPACITY OF 1200 TONS PER DAY, CONTINUOUS FEED. THE FOUR FURNACES HAVE STEAM GENERATION CAPACITY OF 50,000 LBS PER HOUR EACH. (EI)

08-03-00047 CHICAGO PLANS TWO INCINERATORS (GRINDING QUANTITY)
SOLID WASTES MANAGEMENT/RRJ 10(2), P. 32 (FEBRUARY 1967). CHICAGO HAS APPROVED A 15 MILLION DOLLAR BOND ISSUE TO BUILD 2 NEW INCINERATOR PLANTS. THE CITY IS ALSO GIVING CONSIDERATION TO SIZE REDUCTION BEFORE BURNING. MORE THAN 3 MILLION TONS OF REFUSE ARE PRODUCED PER YEAR IN CHICAGO OR ABOUT 4 AND ONE-HALF POUNDS PER CAPITA. IN 2000 IT IS ESTIMATED THAT 10 MILLION TONS OR FIVE AND ONE-HALF POUNDS PER PERSON WILL BE PRODUCED. (EI)

08-03-00048 ENERGY FROM REFUSE - IN PARTICULAR, CONSIDERATION OF ITS UTILIZATION FOR SLUDGE DRYING (SLUDGE(SEWAGE) HEAT(PROCESS) HEAT-RECOVERY FERTILIZER)
JOACHIM, H.
ENERGIE AUS MUELL UNTER BESONDERER BETRACHTUNG DER NUTZUNG ZUR KLAERSCHLAMMTROCKNUNG, AUFBEREITUNGS-TECHNIK 6(5), P. 279-284 (MAY 1965). ENERGY FROM REFUSE, WITH PARTICULAR CONSIDERATION OF ITS UTILIZATION FOR SLUDGE DRYING. PROCESS HAS BEEN DEVELOPED TO DRY SLUDGE BY MEANS OF FLUE GASES FROM REFUSE INCINERATION PLANT. DRIED MATERIAL CAN BE EITHER BURNT IN REFUSE INCINERATOR OR USED AS FERTILIZER. THIS PROCESS WAS FIRST APPLIED IN REFUSE INCINERATOR AT GLUECKSTADT, HOLSTEIN, WEST GERMANY. (EI)

08-03-00051 REFUSE BURNING PLANT AT VIENNA (OIL-CONTAINING HEAT-RECOVERY HEAT(SPACE))
FISCHER, F.
DIE WIENER MUELLVERBRENNUNGSANLAGE, BRENNSTOFF-WAERME-KRAFT 16(8), P. 392-396 (AUGUST 1964). DESCRIPTION IS PRESENTED OF PLANT DESIGNED TO BURN 600 TONS OF REFUSE/DAY AND WHICH CAN ALSO BURN WASTE OIL PRODUCTS. THREE STEAM GENERATORS SUPPLY 15 TPH MAXIMUM OF STEAM FOR DISTRICT HEATING AND POWER GENERATION. OPERATING EXPERIENCES OF FIRST YEAR ARE DESCRIBED. (EI)

08-03-00054 EMISSION REDUCTION OF SMALL REFUSE INCINERATORS BY USING CONSTRUCTIONAL AND CONTROL MEASURES (EMISSION(CONTROL) DESIGN)
ALBINUS, G.
EMISSIONSMINDERUNG BEI KLEINEREN ABFALLVERBRENNUNGSANLAGEN DURCH KONSTRUKTIVE UND REGELTECHNISCHE MASSNAHMEN, STAUB 25(11), P. 462-465 (NOVEMBER 1965). THE CAUSES OF DEFECTIVE REFUSE INCINERATIONS ARE GIVEN AND POSSIBILITY OF REACHING SATISFACTORY EMISSION REDUCTION IS SHOWN. IMPORTANCE OF SECONDARY INCINERATION AND RELIABLE MAINTENANCE OF INCINERATION PLANTS IS EMPHASIZED IN PARTICULAR. INFLUENCE OF COMBUSTION TEMPERATURE ON FURNACE DESIGN IS EXPLAINED FOR TEMPERATURE RANGE OF 800 TO 1000 C. DUST REMOVAL INSTALLATIONS ARE DISCUSSED AND SUCCESSFUL RESULTS ACHIEVED WITH WET SEPARATORS ARE REPORTED. IN GERMAN. (EI)

08-03-00056 NEW REFUSE DRESSING PLANT AT ST. GEORGEN (BLACK FOREST) (GRINDING INCINERATOR SLUDGE(SEWAGE))
FRANZ, W.
EINE NEUE MUELLVERWERTUNGSANLAGE IN ST. GEORGEN (SCHWARZWALD) , AUFBEREITUNGS-TECHNIK 5(3), P. 130-134 (MARCH 1964). A TOWN WITH 12,000 INHABITANTS, REFUSE DRESSING PLANT OF BUEHLER SYSTEM WAS SELECTED IN CONJUNCTION WITH REFUSE INCINERATOR. REFUSE IS FIRST PRECRUSHED IN HAMMER MILL AND IRON PARTS ARE SEPARATED BY DRUM MAGNET. HARD CONSTITUENTS OF REFUSE ARE PULVERIZED IN DOUBLE-ROTOR MILL AND SUBSEQUENTLY SCREENED OFF. SCREEN OVERSIZE IS SENT TO INCINERATOR, WHEREAS SCREEN THROUGHS ARE MIXED WITH READILY ROTTEN SEWAGE SLUDGE IN DOUBLE-SHAFT MIXER. HORIZONTAL CHAIN CONVEYOR TRANSPORTS CRUDE COMPOST INTO OPEN AIR. (EI)

08-03-00063 INCINERATION SHOULD BE ALLIED WITH LANDFILL TO PROLONG THE USE OF DISPOSAL SITES (HEAT-RECOVERY HEAT(PROCESS) SALVAGE(METAL))
DEBOER, J. G.
SOLID WASTES MANAGEMENT/RRJ 11(8), P. 16, 18, 20, 30 (AUGUST 1968) INCINERATOR, INC. IS AN ORGANIZATION IN CHICAGO WHICH OPERATES A PRIVATELY-OWNED INCINERATOR. HEAT RECOVERY IS PRACTICED AND THE STEAM PRODUCED IS SOLD TO AN ADJACENT CHEMICAL COMPANY. THE INCINERATOR IS OPERATED 24 HOURS A DAY, 365 DAYS A YEAR. OVER THE PAST 10 YEARS AN AVERAGE OF 156,133 TONS OF REFUSE HAVE BEEN BURNED EACH YEAR. TIN CANS ARE SALVAGED AND SOLD FOR USE IN THE COPPER INDUSTRY. (SEE ALSO ENTRY 08-03-00034)

08-03-00065 GARBAGE PROCESSING METHODS - ADVANTAGES OF REFUSE INCINERATION (COMPOSTING SANITARY-LANDFILL HEAT-RECOVERY)
BRAUN, R.
DIE TECHNIK DER MUELLAUFBEREITUNG, AUFBEREITUNGS-TECHNIK 1(4), P. 153-163 (APRIL 1960). IT IS ESSENTIAL TO OBTAIN A HYGIENICALLY SATISFACTORY AND UTILIZABLE FINISHED PRODUCT BY ADEQUATE TREATMENT OF THE HOUSEHOLD REFUSE. GARBAGE AND THE SLUDGE OF SEWAGE-TREATMENT PLANTS. INCINERATION IS ESPECIALLY SUITABLE FOR BIG TOWNS, WHILE THE DECOMPOSITION PROCESS IS THE MOST ECONOMIC SOLUTION OF THE GARBAGE PROBLEM FOR MEDIUM AND SMALL COMMUNITIES. REFUSE INCINERATION IS THE MOST HYGIENIC METHOD. THE HEAT PRODUCED CAN BE SOLD AND THUS, THE OPERATING COSTS CAN BE MAINTAINED ON A RATHER LOW LEVEL. FORTY TO FIFTY PERCENT BY WEIGHT OF THE RAW GARBAGE MUST BE DISPOSED OF IN FORM OF ASHES AND SLAG. AS A RULE, IT IS POSSIBLE TO BURN THE SEWAGE SLUDGE TOO, BUT THE PRECEDING DRYING OF THE SLUDGE WILL CONSIDERABLY INCREASE THE COSTS. MODERN DECOMPOSITION PROCESSES YIELD A HYGIENICALLY SATISFACTORY PRODUCT WHICH MAY BE USED FOR MELIORATING THE SOIL. TWO DIFFERENT PROCESSES ARE FEASIBLE - NATURAL DECOMPOSITION OF THE MECHANICALLY DISINTEGRATED OR NOT DISINTEGRATED GARBAGE IN THE OPEN-AIR AND ACCELERATED DECOMPOSITION IN CLOSED FERMENTATION CELLS. (AUTH)

08-03-00071 REFUSE DISPOSAL WORKS AT GLASGOW (INCINERATION SALVAGE(METALS) RESIDUE)
THE ENGINEER 206(5368), P. 935-936 (DECEMBER 12, 1958). A NEW REFUSE DISPOSAL WORKS HAS BEEN OPENED AT GLASGOW AT A COST OF ABOUT 1,668,000 POUNDS. THE REFUSE PLANT INCORPORATES 4 INCINERATORS EACH WITH A CAPACITY OF 100 TONS PER EIGHT-HOUR SHIFT. THERE IS ALSO A SEPARATE PLANT WITH A 3 TON PER HOUR CAPACITY WHICH CRUSHES, SCREENS, AND GRADES THE CLINKERS WHICH ARE PRODUCED. THREE PLANTS ARE NORMALLY IN OPERATION WITH ONE AS A STAND BY.

08-03-00077 HAMILTON, CANADA CONSIDERS RECOMMENDATIONS OF STUDY TO REVAMP SANITATION SYSTEM (SANITARY-LANDFILL COST(OPERATING) INCINERATION)
SOLID WASTES MANAGEMENT/RRJ 11(7), P. 24 (JULY 1968). DISPOSAL TECHNIQUES AT HAMILTON, CANADA HAVE BEEN REVIEWED. CONSTRUCTION OF INCINERATORS TO REDUCE LANDFILL REQUIREMENTS WERE RECOMMENDED. COSTS OF LANDFILL OPERATION ARE PRESENTED.

08-03-00094 LESS THAN 3,000 DOLLARS PER TON (INCINERATION COST(CAPITAL) COST(OPERATION) QUANTITY)
GRUENWALD, A. + REYNOLDS, J. A.
THE AMERICAN CITY 80(10), P. 99 (OCTOBER 1965). BY USING A SIMPLE DESIGN, A 250 TON PER DAY INCINERATOR COULD BE BUILT IN EWING TOWNSHIP, NEW JERSEY, FOR LESS THAN 3,000 DOLLARS PER TON OF CAPACITY. A LOW AIR VELOCITY IN THE COMBUSTION CHAMBER ALLOWS A LAZY FLAME, WHICH ACCORDING TO THE ARTICLE WOULD MINIMIZE AIR POLLUTION. OPERATING COSTS HAVE BEEN ABOUT 2.50 DOLLARS PER TON. THE INCINERATOR IS OPERATED ONLY ON ONE SHIFT PER DAY. ADDITIONAL SHIFTS AND PERHAPS EVEN AN EXTRA FURNACE WILL BE ADDED AS THE POPULATION INCREASES FROM ITS PRESENT 32,000 TO AN ULTIMATE OF 55,000 AND AFTER INDUSTRY MOVES IN. APPARENT PER CAPITA REFUSE PRODUCTION IS 5.2 TO 6.1 POUNDS PER DAY. (UC)

08-03-00101 " SMILE - YOUR INCINERATOR IS ON TV " (INCINERATOR-CONTROL COST(CAPITAL))
CERNIGLIA, V. J. + FRIEDLAND, A.
THE AMERICAN CITY 81(4), P. 110-112 (APRIL 1966). OYSTER BAY, NEW-YORK, NEW PLANT USES CLOSED-CIRCUIT TELEVISION UNITS TO MONITOR OPERATION FROM REFUSE-STORAGE BIN THROUGH TWO FURNACES. SYSTEM CONSISTS OF FOUR LIGHT WEIGHT CAMERAS, MONITORING CONSOLE WITH TWO SCREENS, CONTROL POWER UNITS AND MULTICONDUCTOR CONTROL CABLES. TWO CAMERAS COVER FINAL GRATE SECTION, PART OF PRECEDING GRATE SECTION, AND LARGE EXPANSE OF WALLS ON EACH SIDE. INDEPENDENT COMPRESSED AIR SYSTEM FOR COOLING OF CAMERAS. ALARM SYSTEM AND OPERATIONAL FEATURES OF PLANT. CAPACITY IS 1000 TONS/DAY. SERVES 350,000 PEOPLE. COST IS JUST UNDER $5000/TON. (EI)

08-03-00104 BIG INCINERATOR NEARS COMPLETION
THE AMERICAN CITY 80(4), P. 21 (APRIL 1965). THE MONTGOMERY COUNTY INCINERATOR IN ROCKVILLE, MARYLAND, WILL CONTAIN THREE FURNACES, EACH WITH A CAPACITY OF 350 TONS PER 24 HOURS. THE FURNACES ARE AMONG THE LARGEST IN THE COUNTRY AND WILL FEATURE THE LARGEST TRAVELING-GRATE STOKERS EVER INSTALLED IN A MUNICIPAL PLANT.

08-03-00106 SWISS ENGINEERS EXPLAIN INCINERATOR INCOME (WATER-WALL HEAT(PROCESS) POWER HEAT-RECOVERY EMISSION(CONTROL))
THE AMERICAN CITY 81(6), P. 24 (JUNE 1966). ALMOST ALL EUROPEAN INCINERATORS EMPLOY WATER-WALLS AND BOILERS FOR STEAM PRODUCTION. STEAM IS SOLD TO NEARBY INDUSTRIES OR CONVERTED INTO ELECTRICITY. MOST EUROPE INCINERATORS HAVE ELECTROSTATIC PRECIPITATORS FOR FLY-ASH CONTROL.

08-03-00113 NEW INCINERATOR TO FEATURE ELECTROSTATIC PRECIPITATOR (EMISSION(CONTROL) COST(CAPITAL))
THE AMERICAN CITY 81(12), P. 36 (DECEMBER 1966). A NEW INCINERATOR IS BEING BUILT FOR INDIANAPOLIS, INDIANA AT A COST OF ABOUT 5,500 DOLLARS PER TON OF CAPACITY. THE RATED CAPACITY WILL BE 1000 TONS, AND THE UNIT WILL FEATURE AN ELECTROSTATIC PRECIPITATOR FOR FLY ASH CONTROL.

08-03-00116 AN INCINERATOR CAN BE ATTRACTIVE (EMISSION(CONTROL) COST(CAPITAL))
KUCKUCK, F. D.
THE AMERICAN CITY 78(3), P. 96-98 (MARCH 1963). A DESCRIPTION OF A NEW INCINERATOR CONSTRUCTED FOR WAUWATOSA, WISCONSIN. COST WAS 881,500 DOLLARS AND INCINERATOR IS RATED AT 165 TONS/DAY (5400 DOLLARS PER TON).

08-03-00120 BUILT TO FIT THE SITE (INCINERATION COST(CAPITAL) EMISSION(CONTROL))
GEWECKE, G.
THE AMERICAN CITY 78(6), P. 120-121 (JUNE 1963). DESCRIPTION OF INCINERATOR FOR THE TOWN OF ISLIP, LONG ISLAND, N.Y. PLANT CAPACITY IS 300 TONS (2 FURNACES) AND THE COST WAS 1,200,000 DOLLARS (4000 DOLLARS PER TON).

08-03-00132 HOW TO SELECT INCINERATOR BUCKET
CHESAREK, R. F.
THE AMERICAN CITY 79(8), P. 80-82 (AUGUST 1964). SURVEY OF DEVELOPMENTS IN BUCKET AND GRAPPLE DESIGN INCLUDES CONSTRUCTION OF BUCKET, CORNER BARS, BUCKET HEAD AND SCOOPS USED IN INCINERATOR SERVICE. BUCKET SIZE AND WEIGHT. MATERIAL SPECIFICATIONS. (EI)

08-03-00137 HAULERS INCORPORATE TO CONSTRUCT TEPEE BURNER (INCINERATOR)
REFUSE REMOVAL JOURNAL 4(9), P. 14, 24, 28 (SEPTEMBER 1961). A GROUP OF MINNEAPOLIS REFUSE COLLECTORS COOPERATE TO CONSTRUCT PRIVATELY OWNED INCINERATOR.

08-03-00138 WASTE HEAT UTILIZATION FROM INCINERATOR PLANT (HEAT-RECOVERY HEAT(SPACE) HEAT(PROCESS))
GRAYDON, S. W.
REFUSE REMOVAL JOURNAL 4(10), P. 8, 22 (OCTOBER 1961). PLANS FOR THE ATLANTA INCINERATOR TO RECOVER WASTE HEAT AS STEAM ARE DESCRIBED. ONE POUND OF STEAM AT 175 PSIG CAN BE OBTAINED FOR EACH POUND OF GARBAGE BURNED. POTENTIAL APPLICATIONS INCLUDE POWER PRODUCTION, TURBINE DRIVEN PUMPS IN THE WATER WORKS, AND PROCESS AND HEATING STEAM FOR THE SEWAGE PLANT AND OTHER NEARBY USERS.

08-03-00144 INCINERATION DISPOSAL OF MUNICIPAL REFUSE (INCINERATOR EMISSION(CONTROL) HEAT-RECOVERY SALVAGE(METAL))
LEAKE, J. W.
REFUSE REMOVAL JOURNAL 4(2), P. 10, 12, 28 (FEBRUARY 1961). CURRENT PRACTICE AND RECENT CHANGES IN REFUSE AND ASSOCIATED DISPOSAL METHODS ARE SUMMARIZED. BECAUSE OF THE PROGRESSIVE DECREASE IN GARBAGE AND ASH CONTENT, THE CALORIFIC-VALUE HAS INCREASED TO ABOUT 6000 BTU/LB. THE ADVANTAGES OF INCINERATION OVER OTHER DISPOSAL METHODS ARE DISCUSSED.

08-03-00148 RAM-FED INCINERATOR (COMPOSTING COST(CAPITAL) COST(DISPOSAL) EMISSION(CONTROL))
THE AMERICAN CITY 76(12), P. 69-72 (DECEMBER 1964). FEATURES OF NEW INCINERATOR BUILT AT CLEARWATER, FLORIDA, INCLUDE RAM FEEDER THAT PLACES REFUSE IN FURNACE UNDER CONTROLLED CONDITIONS WITHOUT MAKING MAJOR DISRUPTIONS TO FIREBED AND BURNING, CHARGING HOOPERS, UNUSUAL COMBINATION OF PRIMARY AND SECONDARY SECTIONS OF COMBUSTION CHAMBER, QUENCH TANK AND DRAG CONVEYOR, USE OF EFFLUENT FROM ADJACENT SEWAGE TREATMENT PLANT AS PROCESS WATER FOR ENTIRE OPERATION, AND RETURN OF ALL WASTE WATER TO SEWAGE TREATMENT PLANT BEFORE ITS DISCHARGE INTO BAY. PLANT CAPACITY IS 300 TONS PER DAY (2 FURNACES) AND WAS CONSTRUCTED AT A COST OF 773,660 DOLLARS. COMPOSTING WAS CONSIDERED BUT ELIMINATED BECAUSE OF SOIL PLUGGING BY PLASTIC FRAGMENTS IN THE COMPOST. (EI)

08-03-00159 LONDON TO GENERATE POWER FROM REFUSE (POWER HEAT-RECOVERY INCINERATOR COST(CAPITAL))
THE AMERICAN CITY 82(5), P. 52 (MAY 1967). THE GREATER LONDON COUNCIL RECENTLY ORDERED CONSTRUCTION OF THE FIRST MAJOR PLANT IN THE UNITED KINGDOM TO GENERATE POWER FROM REFUSE INCINERATION. THE PLANT, SCHEDULED FOR COMPLETION IN 1970, WILL HAVE A CAPACITY OF 1,333 TONS OF REFUSE PER DAY. FOUR DIRECT-COUPLED TURBINE-GENERATORS EACH HAVING A CAPACITY OF 12,500 KW WILL SERVE AS THE BASELOAD GENERATING PLANT OPERATING THROUGHOUT THE WEEK. THE DEEPHAMS REFUSE DISPOSAL PLANT, TO BE BUILT IN NORTH LONDON, WILL COST AN ESTIMATED NINE MILLION POUNDS.

08-03-00164 THE WORLDWIDE RUSH TO INCINERATION (HEAT-RECOVERY SLUDGE(SEWAGE) HEAT(STEAM) POWER SALVAGE(METALS) RESIDUE)
SEBASTIAN, F.
THE AMERICAN CITY 82(40), P. 40 (DECEMBER 1967). THE AUTHOR CLAIMS THAT CLEAN INCINERATION IS THE ANSWER TO THE WORLD'S SEWAGE, SLUDGE, AND SOLID WASTE DISPOSAL PROBLEMS. HE GIVES EXAMPLES OF MODERN INCINERATORS 1. PARIS - THE PARIS PLANT HAS A CAPACITY OF 1400 TONS OF REFUSE PER DAY. TELEVISION CAMERAS MONITOR ALL IMPORTANT PLANT OPERATIONS. ELECTROSTATIC PRECIPITATORS ARE USED. 2. DUESSELDORF - THIS PLANT HAS A CAPACITY FOR HANDLING 960 TONS OF MUNICIPAL AND INDUSTRIAL REFUSE PER DAY. IT USES EXCESS HEAT TO GENERATE STEAM TO PRODUCE ELECTRICITY. IT IS EQUIPPED WITH ELECTROSTATIC PRECIPITATORS. ITS STACK GASES READ LESS THAN RINGLEMAN NO. 1 - NEVER MORE THAN NO. 2. METALLIC SCRAP IS MAGNETICALLY SEPARATED FROM BURNED RESIDUES, AND IS BALED FOR SALE AT 12.50 DOLLARS TO 25 DOLLARS PER TON. THE BALANCE OF RESIDUE IS SCREENED AND SOLD FOR FILL AT 10 TO 20 CENTS PER TON. THE CITY RECEIVES 3.45 DOLLARS PER TON OR 700,000 DOLLARS PER YEAR. 3. LEVERKUSEN - HERE, REFUSE IS BURNED IN A ROTARY KILN. STEAM IS PRODUCED AND IS TRANSPORTED 2 MILES FOR USE. 4. LONDON - A 1600-TON PER DAY PLANT IS BEING BUILT. IT WILL GENERATE STEAM WORTH 1,400,000 DOLLARS PER YEAR. RECLAIMED RESIDUE PER YEAR WILL BE WORTH 280,000 DOLLARS. 5. OSAKA, JAPAN - TWO NEW PLANTS ARE BEING BUILT BY THIS CITY. BOTH WILL PRODUCE STEAM. TOKYO HAS A 100-TON PER DAY SLUDGE INCINERATOR. 6. KYOTO, JAPAN - SEWAGE INCINERATORS ARE BURNING SLUDGE NEXT DOOR TO FARMERS WHO CAN'T BE BOTHERED WITH USING SLUDGE. THEY USE CHEMICAL FERTILIZERS INSTEAD. (UC)

08-03-00176 POWER FROM REFUSE (HEAT-RECOVERY INCINERATION CALORIFIC-VALUE ECONOMICS)
ENGDAHL, R. B. + HUMMELL, J. D.
THE AMERICAN CITY 83(9), P. 120-122, 124 (SEPTEMBER 1968). A DISCUSSION OF THE ECONOMICS OF POWER PRODUCTION FROM INCINERATORS. BECAUSE OF THE CHANGING COMPOSITION OF REFUSE IT HAS BECOME MORE ATTRACTIVE AS A FUEL. CALCULATIONS ARE PRESENTED TO ILLUSTRATE WHAT ALTERNATIVE FUEL COSTS OR POWER COSTS NEED TO BE TO MAKE HEAT RECOVERY ECONOMICAL.

08-03-00204 THE GARBAGE INCINERATION PLANT AT SAINT-OUEN
BALLIS, M. F.
L'USINE D'INCINERATION DE SAINT-OUEN8 TECH WETENSCH TIJDSCHR 32(3), P. 101-112 (MARCH 1963). MOST OF THE HOUSE REFUSE OF GREATER PARIS IS BEING DISPOSED OF BY BURNING IN FOUR PLANTS OF WHICH THE SAINT-OUEN ONE IS THE MOST IMPORTANT. THIS INSTALLATION IS EQUIPPED WITH FOUR VOLUND FURNACES WHICH ARE IN CONTINUOUS OPERATION ALL THE YEAR ROUND. THIS ARTICLE CONVEYS INFORMATION ON THESE FURNACES, THE OPERATION OF THE PLANT AND SOME OF THE RESULTS OBTAINED. (IN FRENCH). (AUTH)

08-03-00221 SAN FRANCISCO'S SOLID WASTES CRISIS (INCINERATION COMPOSTING SEWERS COST(CAPITAL) POWER)
SEBASTIAN, F. P.
CIVIL ENGRG (NEW-YORK) 37(10), P. 53-55 (OCTOBER 1967). REPORT OF THREE ENGINEERS SENT TO EUROPE BY SAN FRANCISCO CHAMBER OF COMMERCE SHOWS THAT EUROPEAN INCINERATORS, WITH THEIR ELECTROSTATIC PRECIPITATORS FOR CLEANING STACK GASES, ARE MEETING AND SURPASSING SAN FRANCISCO CLEAN AIR CODE. NEW PLANTS, ENTIRELY ENCLOSED, ARE ALSO SPOTLESSLY CLEAN AND ODOR-FREE. PRECIPITATORS ARE EXPENSIVE, BUT THIS COST IS LESSENED IN EUROPE BY COOLING STACK GASES, THUS HALVING GAS VOLUME, SMALLER GAS VOLUME MEANS SMALLER AND CHEAPER PRECIPITATOR. GASES ARE COOLED IN WHAT IS ESSENTIALLY WATER-WALLED BOILER. HEAT DRAWN OFF BY WATER IS REUSED AS STEAM, OR STEAM IS USED IN GENERATING ELECTRICITY. REVENUES FROM SALE OF STEAM OR ELECTRICITY AND RESIDUES REDUCE COST OF SOLID WASTE DISPOSAL. (EI)

08-03-00293 THE NEW GARBAGE INCINERATION PLANT OF ROTTERDAM
DUKSHOORN, R.
DE NIEUWE VUILVERBRANDINGSINRICHTING VAN ROTTERDAM TECH. WETENSCH TIJDSCHR 32(3), P. 53-57 (MARCH 1963). SINCE A FEW YEARS THE GARBAGE INCINERATION PLANT OF ROTTERDAM HAS BECOME INADEQUATE BECAUSE OF THE CONSTANT EXTENSION OF THE TOWN AND THE EVER INCREASING AMOUNT OF GARBAGE TO BE DISPOSED OF. THE WHOLE PROBLEM OF HOUSE REFUSE DISPOSAL WAS THEREFORE RECONSIDERED AND IT WAS DECIDED TO BUILD A NEW INCINERATION PLANT. WORK WAS STARTED THEREON AT THE END OF 1960 AND WILL BE FINISHED IN 1964. A REVIEW OF THE PROJECT AND A DESCRIPTION OF THE NEW PLANT ARE GIVEN IN THIS ARTICLE. (AUTH)

08-03-00333 HOW GREASE IS BURNED IN CANTON, OHIO (INCINERATOR GREASE(SEWAGE) SLUDGE(SEWAGE))
WALKENSHAW, G.
WATER AND WASTES ENGRG 3(9), P. 71-73 (SEPTEMBER 1966). INCINERATING FURNACE IS CYLINDER OF 5-FT ID AND EQUIVALENT HEIGHT, LINED WITH 4-1/2-IN OF 2800 F FIREBRICK PLUS 2-IN OF ROCKWOOL. ITS CONICAL ROOF CONTAINS CENTRAL FLUE OPENING AND 12 SURROUNDING AIR NOZZLES, PREVIOUSLY " FLUIDIZED " GREASE TO BE INCINERATED, CONTAINS WATER, ASH, AND FIBROUS TRASH, CALORIFIC-VALUE RANGES FROM 8000 TO 10,000 BTU/LB. WATER CONTENT IS GENERALLY 30-45 PERCENT BY WEIGHT, WATER BURSTS INTO STEAM AND ASSISTS IN INCINERATION BY PHYSICAL DISINTEGRATION AND BY DISSOCIATION AND CHEMICAL REACTION, 2-IN PUMP THAT SUPPLIES HOMOGENIZED FEED TO FURNACE IS OF POSITIVE-DISPLACEMENT ROTATING-WORM TYPE. THREE TAKEOFFS ARE BETWEEN IT AND GREASE BURNING INCINERATOR. (EI)

08-03-00389 THE REFUSE PROBLEM OF SWISS RESORT TOWNS (INCINERATION)
VOGEL, H. E.
INTERNATIONAL RESEARCH GROUP ON REFUSE DISPOSAL, ENGLISH TRANS BY U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, IRGR INFORMATION BULL 16, (DECEMBER 1966). THE REFUSE PROBLEM IN TOURIST CENTERS IS VERY URGENT. THE PROBLEM IS COMPLICATED SINCE A SMALL LOCAL POPULATION HAS TO CARRY THE COSTS OF REFUSE TREATMENT FOR MANY TOURISTS. A FEW CITIES HAVE INCINERATION PLANTS, IN OTHER COMMUNITIES THE REFUSE IS SIMPLY DUMPED. THE LATTER CANNOT BE TOLERATED ANY MORE. (UC)

08-03-00396 THE TOWN OF DARIEN, CONNECTICUT, ENLARGES ITS INCINERATOR
REFUSE REMOVAL JOURNAL 5(3), P. 28 (MARCH 1962). THE TOWN OF DARIEN, CONNECTICUT, RECENTLY AWARDED CONTRACTS FOR THE RENOVATION AND MODERNIZATION OF THE EXISTING MUNICIPAL INCINERATION PLANT. THE ENLARGEMENT AND IMPROVEMENT OF THE INCINERATOR, ORIGINALLY CONSTRUCTED IN 1941, WILL RESULT IN A RATED CAPACITY OF 130 TONS PER 24 HOURS OF OPERATION. THE CONTRACT FOR THE REHABILITATION OF THE TWO EXISTING INCINERATORS AND INSTALLATION OF A NEW UNIT WAS AWARDED TO MORSE-BOULGER, INC. OF NEW YORK CITY, A DIVISION OF HAGAN INDUSTRIES, CORONA 68, NEW YORK. THE CONTRACT WILL INCLUDE MECHANICALLY-OPERATED ASH CONVEYING EQUIPMENT AND A MONORAIL TYPE OF CRANE. COST OF THE ENTIRE PROJECT WILL BE $300,000. A BOND ISSUE WAS APPROVED AND PUBLIC BIDDING FOLLOWED. THE MODERNIZATION PROJECT, EXPECTED TO BE COMPLETED DURING 1962, WILL GIVE DARIEN ONE OF THE MOST MODERN INCINERATION FACILITIES IN THE EAST.

08-03-00398 A MODERN INCINERATOR FOR $2,280 A TON (INCINERATION COST(OPERATING) COST(CAPITAL))
SCHNEIDER, C.
THE AMERICAN CITY 77(9), P. 104 (SEPTEMBER 1962). DESCRIBES THE DESIGN AND PHYSICAL FEATURES OF THE NEW SEVENTH STREET INCINERATOR IN NEW ORLEANS, LA. THE CITY HAD ONLY $1 MILLION WITH WHICH TO CONSTRUCT THE INCINERATOR, AND ECONOMIES HAD TO BE REALIZED IN THE BUILDING PORTION OF THE PLANT. A BID OF $775,629 WAS ACCEPTED FOR THE PROJECT, AND AFTER THE PURCHASE OF THE EXTRA NEEDED ITEMS THE TOTAL COST CAME TO $912,058 OR APPROXIMATELY $2,280 PER TON. OPERATION OF THE NEW PLANT HAS BOTH BEEN SATISFACTORY AND ECONOMICAL. A TABLE GIVES PERFORMANCE AND COST DATA. (PHS) COMPLICATED SINCE A SMALL LOCAL POPULATION HAS TO CARRY THE COSTS OF REFUSE TREATMENT FOR MANY TOURISTS. A FEW CITIES HAVE INCINERATION PLANTS, IN OTHER COMMUNITIES THE REFUSE IS SIMPLY DUMPED. THE LATTER CANNOT BE TOLERATED ANY MORE. (UC)

08-03-00399 THERE'S NO UGLINESS HERE (INCINERATION)
RAISCH, W.
THE AMERICAN CITY 77(10), P. 155 (OCTOBER 1962). DESCRIBES THE NEW 200-TON INCINERATOR IN EASTCHESTER, N. Y. DESIGNERS TOOK SPECIAL CARE IN BLENDING THE INCINERATOR IN WITH THE RESIDENTIAL SURROUNDING. AESTHETIC CONSIDERATIONS INCLUDE CAREFUL LANDSCAPING, REFUSE DISCHARGE WITHIN THE BUILDING, A MIST CURTAIN AND VACUUM SYSTEM TO CONTROL DUST, AND A FLY-ASH REMOVAL SYSTEM. THE INCINERATOR CONTAINS TWO FURNACES, EACH OF WHICH HAS A NEW HYDRAULICALLY OPERATED ROCKER-TYPE STOKER. THE STOKERS FEATURE- (1) MINIMUM " DEAD " SPACE ALONG THE SIDES AND CENTER OF THE GRATE, (2) GREATER DEPTH OF GRATE SECTIONS TO PROVIDE LONG TRAVEL ARCS THAT ASSURE THE REFUSE WILL MOVE DOWN THE GRATES, AND (3) REMOVABLE GRATE TEETH WHICH PERMIT REPLACEMENT OF WORN OUT GRATE ELEMENTS WITHOUT REMOVAL OF THE ENTIRE GRATE BARS. (PHS)

08-03-00401 AN INCINERATOR WITHOUT FRILLS (INCINERATION COST(CAPITAL))
ESTEY, H. S.
THE AMERICAN CITY 77(12), P. 95 (DECEMBER 1962). DESCRIBES THE NEW 150-TON MUNICIPAL INCINERATOR IN WELLESLEY, MASS., EMPHASIZING THE MANNER IN WHICH IT WAS CONCEIVED, DESIGNED, AND CONSTRUCTED. A 51-ACRE SITE IN WELLESLEY NEAR THE NEEDHAM TOWN LINE WAS CHOSEN. EIGHTY-FIVE PERCENT OF THE LAND CAN BE CLEARED IF NEEDED FOR DISPOSAL OF INCINERATOR RESIDUE. WELLESLEY MAY NEGOTIATE FOR THE JOINT USE OF THE INCINERATOR WITH NEEDHAM UNTIL THE CITY REQUIRES USE OF THE FACILITY AT FULL CAPACITY. TO KEEP CONSTRUCTION COSTS MODERATE, EXPENSIVE GRINDING, WEIGHING, AND RECORD-KEEPING EQUIPMENT WERE NOT INCLUDED. RATHER THAN AWARDING A CONTRACT TO A SINGLE LOW BIDDER FOR CONSTRUCTION OF THE INCINERATOR, THE CITY AWARDED SIX SEPARATE CONTRACTS FOR KEY ITEMS. (PHS)

08-03-00413 MUNICIPAL SOLID-WASTE DISPOSAL - PART III - INCINERATOR DESIGN (INCINERATION COST(CAPITAL) COST(OPERATING) DESIGN RESIDUE)
ROGUS, C. A.
THE AMERICAN CITY 77(4), P. 104 (APRIL 1962). A DISCUSSION OF INCINERATION AS A MEANS OF REFUSE DISPOSAL. GIVES FOUR MAJOR DISADVANTAGES OF INCINERATING REFUSE, BRIEFLY REVIEWS THE BASIC ELEMENTS OF INCINERATION IN ITS PRESENT FORM, AND PINPOINTS FURTHER NEEDED ADVANCEMENTS. INCLUDES PLANT CAPACITY, REFUSE-STORAGE FACILITIES, REFUSE-HANDLING FACILITIES, FURNACES, RESIDUE-REMOVAL SYSTEM, FLY-ASH-REMOVAL SYSTEM, AND EXHAUST-GAS SYSTEM. A TABLE COMPARES THE COST OF CONSTRUCTION AND OPERATION OF CONTINUOUSLY FED AND BATCH-FED FURNACES. (PHS)

08-03-00414 MUNICIPAL SOLID-WASTE DISPOSAL - PART IV - INCINERATOR DESIGN (EMISSION(CONTROL) COST(CAPITAL))
ROGUS, C. A.
THE AMERICAN CITY 77(5), P. 106 (MAY 1962). A CONTINUATION OF THE DISCUSSION OF INCINERATION AS A MEANS OF REFUSE DISPOSAL. DISCUSSES THE CONTROL OF AIR POLLUTION FROM INCINERATORS, WASTE HEAT UTILIZATION, COST OF INCINERATOR CONSTRUCTION, AND INCINERATOR MAINTENANCE. EMPHASIZES THE FACT THAT COSTLIER DESIGN, MORE EXPENSIVE EQUIPMENT, AND HIGH-GRADE CONSTRUCTION MATERIALS, WHILE ADDING TO THE ORIGINAL COST, USUALLY GIVE THE PLANT LONGER USEFUL LIFE AND LOWER OPERATING AND MAINTENANCE COSTS, THAT BEST PERFORMANCE REQUIRES SKILLED OPERATION AND SUPERVISION BASED ON MEANINGFUL OPERATING DATA GATHERED WITH PROPER INSTRUMENTATION, AND THAT MAINTENANCE SHOULD BE BOTH PREVENTIVE AND ROUTINE. A TABLE GIVES THE DISTRIBUTION OF CONSTRUCTION COSTS. (PHS)

08-03-00429 PUBLIC RELATIONS CONSIDERATIONS IN INCINERATOR PLANT LOCATION
HARRINGTON, W. M., JR.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 105-106 (MAY 1-4, 1966). ENGINEERS ARE CHARGED WITH THE RESPONSIBILITY FOR LOCATING PUBLIC WORKS FACILITIES REQUIRED TO PROVIDE VITAL SERVICES NECESSARY TO THE HEALTH AND WELFARE OF THE PUBLIC. THEY ARE BECOMING AWARE OF THE NEED FOR A SPECIAL PUBLIC RELATIONS EFFORT IF PROPOSED PLANS ARE TO GAIN PUBLIC ACCEPTANCE. THIS PUBLIC RELATIONS EFFORT IS PARTICULARLY NECESSARY WHEN THE PROPOSED FACILITY IS AN INCINERATOR. PROBLEMS IN BALTIMORE, MARYLAND, ARE DISCUSSED. THIS PAPER DESCRIBES ONE APPROACH TO THE PROBLEM AND DESCRIBES SOME OF THE PITFALLS TO AVOID. (AUTH)

08-03-00430 AN APPRAISAL OF REFUSE INCINERATION IN WESTERN EUROPE (QUANTITY COMPOSITION INCINERATOR(TYPES) COST(OPERATING) COST(CAPITAL) RESIDUE EMISSION(CONTROL) CALORIFIC-VALUE)
ROGUS, C. A.
PROC OF THE 1966 NATIONAL INCINERATOR CONF, ASME, P. 114-123 (MAY 1-4, 1966). EUROPEAN INCINERATION OF COMMUNITY REFUSE HAS REACHED AN ADVANCED STATE OF THE ART. THE AUTHOR VISITED 13 LARGE MODERN INCINERATORS IN 7 COUNTRIES. THE THREE MOST NOTEWORTHY OPERATING PLANS ARE DESCRIBED, WITH EMPHASIS ON STEAM GENERATION, LOW DUST EMISSION FROM THE STACKS, AND PRINCIPAL FEATURES OF DESIGN. APPLICABILITY TO AMERICAN PRACTICE IS EVALUATED. (AUTH)

08-03-00431 EUROPEAN PRACTICE IN REFUSE AND SEWAGE SLUDGE DISPOSAL BY INCINERATION (COMPOSITION CALORIFIC-VALUE HEAT-RECOVERY COMPOSTING PLASTIC)
EBERHARDT, H.
PROC OF THE 1966 NATIONAL INCINERATOR CONF, ASME, P. 124-143 (MAY 1-4, 1966). AMERICAN AND EUROPEAN INCINERATION STARTS FROM TWO DIFFERENT PREREQUISITES. IN AMERICA, VOLUME REDUCTION OF THE REFUSE IS STRIVED FOR. IN EUROPE THE AIM IS TO COMPLETELY BURN OUT THE REFUSE, TO UTILIZE THE WASTE HEAT, AND TO MINIMIZE AIR POLLUTION AS FAR AS POSSIBLE THROUGH THE USE OF EXPENSIVE FLUE-GAS CLEANING EQUIPMENT. TODAY, VALUES THAT MUST BE ATTAINED ARE 3 PERCENT COMBUSTIBLE CONSTITUENTS IN THE RESIDUE, 0.1-0.2 PERCENT PUTREFYING SUBSTANCE, 0.04 GRAINS OF DUST PER STANDARD CU-FT OF FLUE GAS. THE COMBINATION OF REFUSE INCINERATION AND LARGE POWER-STATION BOILERS IS BECOMING MORE AND MORE FREQUENT. THIS CAN BE ATTRIBUTED TO THE FAVORABLE FINANCING POSSIBILITIES BY THE STATES FOR ELECTRIC COMPANIES WITH ADDITIONAL INCINERATION OF HOUSEHOLD AND INDUSTRIAL REFUSE. THIS EXPLAINS OUR DEVELOPMENT OF LARGE BOILER PLANTS WITH HIGH STEAM TEMPERATURES AND PRESSURES WHICH HAVE BEEN COMBINED WITH REFUSE INCINERATION. (AUTH)

08-03-00432 SURVEY OF EUROPEAN EXPERIENCE WITH HIGH PRESSURE BOILER OPERATION BURNING WASTES AND FUEL (INCINERATION WATER-WALL HEAT-RECOVERY EMISSION(CONTROL))
STABENOW, G.
PROC OF THE 1966 NATIONAL INCINERATOR CONF, ASME, P. 144-160 (MAY 1-4, 1966). A NUMBER OF LARGE INCINERATORS IN EUROPEAN MUNICIPAL SERVICE HAVE STOKER-FIRED WATER-WALLED FURNACES AND BOILERS FOR POWER GENERATION. THE PAPER DISCUSSES THE PRINCIPLES, STOKER DESIGN, BURNING RATES, BOILER DESIGN AND HIGH EFFICIENCY DUST COLLECTION. DATA ON NINE EUROPEAN AND TWO BRAZILIAN PLANTS OF EUROPEAN DESIGN ARE GIVEN. WATER-WALLED FURNACES ALLOW THE USE OF LOW EXCESS AIR, WHICH REDUCES THE VOLUME OF FLUE GAS TO BE CLEANED. (AUTH)

08-03-00434 THE MEASUREMENT OF AIR AND GAS FLOW AND PRESSURE AS APPLIED TO MODERN MUNICIPAL INCINERATORS
NORWARK, H. R.
PROC OF THE 1966 NATIONAL INCINERATOR CONF, ASME, P. 171-175 (MAY 1-4, 1966). THE PERFORMANCE OF AN INCINERATOR DEPENDS ON THE CONTROL OF THE AIR FLOW TO THE STOKER ZONES AND OVERFIRE NOZZLES, THE FURNACE DRAFT, AND THE PRESSURE DROP ACROSS AUXILIARIES. THE AUTHOR DESCRIBES SIMPLE, RUGGED PRESSURE TAPS FOR FANS, DUCTS AND CHAMBERS, WHICH PROVIDE THE INPUT TO INSTRUMENTATION. THE OBJECTIVE IS TO PROVIDE THE INCINERATOR OPERATOR WITH RELATIVE VALUES OF FLOW FOR GUIDANCE. AS 9 TO 10 LB OF AIR MAY BE SUPPLIED TO AN INCINERATOR FOR EACH LB OF REFUSE BURNED, AND THE AIR MUST BE PROPORTIONED DEPENDING ON FUEL CONDITION, FLOW INSTRUMENTATION IS NECESSARY TO GUIDE THE INCINERATOR OPERATOR. MOST INCINERATOR OPERATORS ARE NOT INTERESTED IN ABSOLUTE VALUES OF FLOW, BUT NEED RELATIVE VALUES, AS IN PERCENT OF MAXIMUM FLOW. THE MEASURING EQUIPMENT AND THE INSTALLATION IS THUS SIMPLIFIED, AND CAN BE MADE MORE RUGGED AND RELIABLE THAN PRECISE TEST EQUIPMENT. (AUTH)

08-03-00454 ALGIERS INCINERATOR HAS A MODERN STOKER SYSTEM (INCINERATION STOKER EMISSION(CONTROL))
REFUSE REMOVAL JOURNAL 5(9), P. 42 (SEPTEMBER 1962). A 70-TON STOKER SYSTEM, WHICH HAS 11,000 INDIVIDUAL ALLOY CAST-IRON GRATES AND IS CAPABLE OF HANDLING 200 TONS OF MUNICIPAL REFUSE DAILY, IS THE HEART OF THE RECENTLY BUILT ALGIERS INCINERATOR PLANT IN NEW ORLEANS, LA. THE STOKER CONSISTS OF TWO CONVEYORS--ONE WHICH IS 26 FEET LONG AND OPERATING HORIZONTALLY, AND THE OTHER 20 FEET LONG AND OPERATING ON A SLOPING PLANE. DESCRIBES THE OPERATION OF THE STOKER SYSTEM. THE INCINERATOR WILL REDUCE COMBUSTIBLE REFUSE TO ONE-TENTH OR LESS OF ITS ORIGINAL VOLUME, AND AIR POLLUTION CONTROL WILL BE VASTLY IMPROVED BECAUSE OF THE SUPERIOR BURNING EFFICIENCY AND SPECIAL DEVICES DESIGNED TO ELIMINATE FLY ASH AND SMOKE NUISANCE. (PHS)

08-03-00458 BIG TRAILERS HOLD THE KEY TO CITY'S PROBLEM (INCINERATOR COLLECTION)
REFUSE REMOVAL JOURNAL 5(9), P. 18, 26, 40 (SEPTEMBER 1962). COLLECTION BY COMPACTION TRAILERS AND DISPOSAL BY INCINERATION IN NEW ORLEANS ARE DESCRIBED. THREE INCINERATORS ARE IN OPERATION AND MORE ARE PLANNED.

08-03-00461 A SALVAGE FUEL BOILER PLANT FOR MAXIMUM STEAM PRODUCTION (INCINERATION HEAT-RECOVERY)
MOORE, H. C. + REARDON, F. X.
PROC OF THE 1966 NATIONAL INCINERATOR CONF, ASME, P. 252-258 (MAY 1-4, 1966). HEAT RECOVERY FROM INCINERATOR FURNACES IN THIS COUNTRY HAS IMPROVED AS THE ADVANCES IN THE INCINERATION PROCESS HAVE TAKEN PLACE. A DESIGN TO FURTHER IMPROVE THIS RECOVERY HAS RECENTLY BEEN MADE. FEATURES OF THE DESIGN, AND THE ANTICIPATED PERFORMANCE OF AN INSTALLATION FOR MAXIMUM STEAM PRODUCTION USING WATER WALLS IN THE INCINERATOR FURNACE INTEGRAL WITH A STEAM BOILER, ARE EXPLAINED AND DISCUSSED. THESE RELATE TO THE PROJECT NOW UNDER CONSTRUCTION FOR THE NAVY PUBLIC WORKS CENTER, NORFOLK, VIRGINIA. (AUTH)

08-03-00466 EFFECTS OF OPERATING VARIABLES AND REFUSE TYPES ON EMISSIONS FROM PILOT-SCALE TRENCH INCINERATOR (EMISSION(CONTROL))
BURCKLE, J. O. + DORSEY, J. A. + RILEY, B. T.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 34-31 (MAY 5-8, 1968). BASED ON THE DATA OBTAINED TO DATE FOR THE OPERATION OF A TRENCH INCINERATOR ON A BATCH BASIS, THESE CONCLUSIONS ARE DRAWN-(1) THE USE OF THE TRENCH INCINERATOR FOR THE DISPOSAL OF HIGH ASH CONTENT REFUSE OF EITHER HIGH OR LOW HEAT CONTENT RESULTED IN PARTICULATE EMISSIONS WHICH IN ALL CASES EXCEEDED 1.0 GRAIN PER STANDARD CU-FT AT 12 PERCENT CARBON DIOXIDE. (2) THE TRENCH INCINERATOR MAY BE APPLICABLE TO THE DISPOSAL OF LOW ASH, HIGH HEAT CONTENT REFUSE UNDER RIGIDLY CONTROLLED OPERATING CONDITIONS WHERE THE NATURE AND THE QUALITY OF THE REFUSE ARE CAREFULLY CONSIDERED. SINCE IT IS APPARENT THAT ACCEPTABLE LEVELS OF PARTICULATE EMISSIONS CAN EASILY BE EXCEEDED WITHOUT A NOTICEABLE CHANGE IN PLUME APPEARANCE, STANDARD METHODS AND CRITERIA TO OBTAIN GOOD OPERATING CONTROL OF PARTICULATE EMISSIONS MUST BE DEVELOPED. (3) FOR THE DISPOSAL OF MUNICIPAL REFUSE, THE TRENCH INCINERATOR IS SIGNIFICANTLY INFERIOR TO THE MULTIPLE-CHAMBER MUNICIPAL INCINERATOR, IN REGARD TO BOTH PARTICULATE EMISSIONS AND GASEOUS POLLUTANT EMISSIONS. (4) FEDERAL EXECUTIVE ORDER 11282 ESTABLISHES A RIGID EMISSION CODE FOR ALL FEDERAL FACILITIES. THE POINT OF INTEREST READS AS FOLLOWS- "---FOR INSTALLATIONS BURNING 200 POUNDS OF REFUSE OR MORE PER HOUR, EMISSIONS SHALL NOT EXCEED 0.2 GRAINS OF PARTICULATE MATTER PER STANDARD CUBIC FOOT OF DRY FLUE GAS CORRECTED TO 12 PERCENT CARBON DIOXIDE (WITHOUT THE CONTRIBUTION OF AUXILIARY FUEL)---". THIS DIRECTIVE PRECLUDES THE USE OF THE TRENCH INCINERATOR AT FEDERAL FACILITIES FOR ALL EXCEPT PERHAPS SPECIAL APPLICATIONS TO LOW ASH, HIGH HEAT CONTENT MATERIAL WHERE IT CAN BE DEMONSTRATED THAT EMISSION LEVELS WILL NOT EXCEED THIS FEDERAL STANDARD.

08-03-00467 CONSIDERATIONS IN INCINERATOR DESIGN WITH RESPECT TO COMMUNITY ACCEPTANCE (SITE-SELECTION)
CAMPBELL, H. J., JR. + FRIEDLAND, A. L.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 42-49 (MAY 5-8, 1968). SITES SHOULD BE SELECTED, IF POSSIBLE, IN RELATION TO CURRENT POPULATION DENSITIES, ANTICIPATED POPULATION EXPANSION PATTERNS, PROJECTED LAND USE IN AREA UNDER CONSIDERATION, HEALTH AND COMFORT OF THOSE PRESENTLY LIVING IN AREAS ADJACENT TO PLANT, AND PROJECTED TOTAL INCINERATION NEEDS OF COMMUNITY. SINCE AVERAGE LIFE OF PLANT IS ABOUT 20 YEARS, THOUGHT MUST BE GIVEN TO FUTURE USE OF SITE, WHEN IT MAY BE NO LONGER ECONOMICALLY FEASIBLE TO OPERATE BECAUSE OF OBSOLESCENCE, EXHAUSTION OF SURROUNDING AREAS REQUIRING LANDFILL, OR SHIFT IN POPULATION DENSITY. (EI)

08-03-00470 EXPERIENCES WITH REFUSE INCINERATORS IN EUROPE - PREVENTION OF AIR AND WATER POLLUTION, OPERATION OF REFUSE INCINERATION PLANTS COMBINED WITH STEAM BOILERS DESIGN AND PLANNING (DESIGN EMISSION(CONTROL) HEAT- RECOVERY CORROSION SALVAGE(METAL))
EBERHARDT, H. + MAYER, W.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 73-86 (MAY 5-8, 1968). EUROPEAN STEAM GENERATORS WITH REFUSE FIRING MUST MEET STRINGENT LEGAL REQUIREMENTS FOR ENVIRONMENTAL CONTROL, FLUE DUST COLLECTORS HAVE OVER 98 PERCENT EFFICIENCY. DIFFICULT PHYSICAL AND CHEMICAL PROBLEMS WITH FUEL AND WITH BOILER AVAILABILITY ARE MET BY ATTENTION TO ENGINEERING DETAILS. CORROSION OF BOILER AND SUPERHEATER TUBES IS LARGELY PREVENTED BY MAINTAINING OXIDIZING CONDITIONS IN CRITICAL AREAS. LEACHING TESTS OF RAW REFUSE, COMPOSTED REFUSE, AND INCINERATOR RESIDUE SHOW LESS GROUND WATER CONTAMINATION FROM RESIDUE. (EI)

08-03-00473 SERVICE REQUIREMENTS OF MODERN, LARGE REFUSE INCINERATION PLANT (VOLUME-REDUCTION DESIGN HEAT POWER SALVAGE(METAL) HEAT-RECOVERY ECONOMICS)
FICHTNER, W. + MARTIN, F.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 117-128, (MAY 5-8, 1968). TECHNIQUE OF GARBAGE AND WASTE INCINERATION HAS DEVELOPED IN DENSELY POPULATED COUNTRIES OF EUROPE. AVOIDANCE OF WATER AND AIR POLLUTION BY COMPLETE COMBUSTION OF REFUSE WITHOUT CAUSING NUISANCE BY DUST OR ODOR. LOW DISPOSAL COSTS BY ERECTING LARGE PLANTS WITH HEAT UTILIZATION. CONTINUAL IMPROVEMENT OF COMBUSTION TECHNIQUES BY MAKING USE OF EXPERIENCE GAINED. TWO IDEALIZED CASES OF STEAM GENERATION WITH REFUSE ARE INVESTIGATED. HOW HIGH COSTS OF CAPITAL, REPAIRS AND STAFF ARE OFFSET BY PROCEEDS, WITH ONLY SMALL PART OF COSTS NOT RECOVERED, WAS SHOWN FOR ELECTRIC POWER GENERATION AND HEAT SUPPLIED TO DISTRICT HEATING NETWORK, ELECTRIC POWER GENERATION AND SEAWATER DESALTING. (EI)

08-03-00479 PRACTICE OF REFUSE INCINERATION IN JAPAN - BURNING OF REFUSE WITH HIGH MOISTURE CONTENT AND LOW CALORIFIC-VALUE (COMPOSITION CORROSION)
MATSUMOTO, K. + ASUKATA, R. + KAWASHIMA T.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 180-197 (MAY 5-8, 1968). AS IN EUROPE AND UNITED STATES, STRENUOUS EFFORT HAS RECENTLY BEEN MADE TO IMPROVE AND EXPAND ENVIRONMENTAL SANITATION EQUIPMENT AND FACILITIES IN JAPAN. HISTORY AND DEVELOPMENT OF JAPANESE REFUSE INCINERATOR FACILITIES UP TO PRESENT DATE. ALSO DISCUSSED ARE INCINERATOR VARIATIONS TO DEAL WITH HIGHER MOISTURE CONTENT AND LOWER CALORIFIC-VALUE OF JAPANESE REFUSE, SEVERAL JAPANESE INCINERATOR PLANTS, AND OTHER RELATED TOPICS. (EI)

08-03-00483 SPECIAL FACTORS INVOLVED IN SPECIFYING INCINERATOR CRANES (DESIGN)
O'MALLEY, W. R.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 211-215 (MAY 5-8, 1968). IMPORTANT COMPONENTS ARE OVERHEAD BUCKET CRANES USED TO TRANSPORT REFUSE FROM STORAGE BINS THROUGH REHANDLING AND MIXING, THEN ON TO INCINERATOR FURNACE HOPPERS. MATERIAL-HANDLING DUTY CYCLE IS CONTINUOUS. DUTY CYCLE IS RELATED TO CRANE SPECIFICATIONS. (EI)

08-03-00485 LARGE PLANTS FOR INCINERATION OF DOMESTIC REFUSE IN PARIS METROPOLITAN AREA (HEAT-RECOVERY HEAT(SPACE) POWER QUANTITY COMPOSITION)
ROUSSEAU, H.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 225-231 (MAY 5-8, 1968). FOUR MAJOR INCINERATION PLANTS WHICH CONSUME 1.6 MILLION METRIC TONS ANNUALLY FROM 4.8 MILLION INHABITANTS ARE DESCRIBED. COMPOSITION OF REFUSE IS TABULATED. DAILY, WEEKLY, AND SEASONAL VARIATIONS IN QUANTITY AND COMPOSITION ARE ACCOUNTED FOR. STEAM RECOVERY, DUST COLLECTORS AND OPERATING METHODS ARE DISCUSSED. (EI)

08-03-00488 MECHANICAL DRAFT FANS FOR MODERN INCINERATOR (DESIGN)
SILVA, A.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 273-277 (MAY 5-8, 1968). PERFORMANCE CHARACTERISTICS OF FORCED AND INDUCED DRAFT FANS ARE PRESENTED WITH SPECIAL REFERENCE TO INCINERATOR APPLICATIONS. FORMULAS AND GUIDELINES WILL BE ESPECIALLY HELPFUL IN PLANT DESIGN AND MODIFICATION. SPECIAL BLADING AND FAN CONSTRUCTION FOR USE UNDER CORROSIVE CONDITIONS ARE DISCUSSED. (EI)

08-03-00494 EXPERIENCE IN CONDUCTING INCINERATOR TECHNOLOGY COURSE
WEBER, C. E.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 322-326 (MAY 5-8, 1968). MODERN MUNICIPAL AND INDUSTRIAL INCINERATORS REQUIRE QUALIFIED, TECHNICALLY TRAINED MEN FOR THEIR EFFICIENT OPERATION MAINTENANCE. INCINERATOR COMMITTEE OF AM SOC MECH ENGRS ORGANIZED AND SPONSORED 15 LECTURE COURSES IN 1966 AND 1967 FOR INCINERATOR OPERATORS AND OTHERS. PAPER OUTLINES COURSE AND DISCUSSES ENROLLMENT AND OTHER FACTORS.

08-03-00506 ADVICE ON INCINERATION DISPOSAL OF SOLID WASTE (EMISSION(CONTROL))
STENBURG, R. L.
REFUSE REMOVAL JOURNAL 5(12), P. 27 (DECEMBER 1962). DISCUSSES SOME OF THE PROBLEMS INVOLVED WITH INCINERATION, WHICH IS BECOMING MORE AND MORE WIDELY USED AS A MEANS OF REFUSE DISPOSAL. INCINERATION CAN REDUCE A COMMUNITY'S REFUSE BY 80 TO 90 PERCENT, BUT TO DO THE JOB PROPERLY WITHOUT CREATING AIR POLLUTION PROBLEMS, INCINERATORS MUST BE

PROPERLY OPERATED IN ACCORDANCE WITH THEIR DESIGN SPECIFICATIONS. PUBLIC OFFICIALS SHOULD RECOGNIZE AND REMEDY THE PROBLEMS CREATED THROUGH OVERLOADING AND OTHER IMPROPER OPERATING PRACTICES. GOOD MANAGEMENT, WITH COMPETENT SUPERVISORS AND QUALIFIED OPERATING PERSONNEL, WILL BE NECESSARY TO SATISFY THE OVERALL INTERESTS OF THE COMMUNITY. BETTER COMBUSTION PRACTICES AND BETTER HOUSEKEEPING AROUND THE PLANT WILL DO MUCH TO REMOVE THE OBJECTIONS TO INCINERATORS. IMPROVEMENT WILL PAY OFF IN LESS AIR POLLUTION, BETTER PUBLIC ACCEPTANCE OF INCINERATORS, AND GREATER REDUCTION OF REFUSE VOLUME. (PHS)

08-03-00507 THE CONSULTANT'S ROLE IN FURNACE DESIGN AND SELECTION (INCINERATOR)
CERNIGLIA, V. J.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 50-52 (MAY 5-8, 1968). THE AUTHOR EXPRESSES HIS OPINIONS ON THE PROBLEMS CURRENTLY FACING THE CONSULTING ENGINEER IN THE DESIGN AND CONSTRUCTION OF MUNICIPAL INCINERATOR PLANTS. SPECIFIC CONSIDERATION IS GIVEN TO THE ROLE OF THE ENGINEER IN THE DESIGN AND SELECTION OF THE VARIOUS ITEMS OF COMPONENT EQUIPMENT AND THE EXPECTATIONS ULTIMATELY TO BE DERIVED FROM AN OPERATING STANDPOINT. MUNICIPAL OFFICIALS ARE DEMANDING MORE COMPLETE PROGRAMMING OF THE PROJECT, STARTING WITH FEASIBILITY STUDIES, PUBLIC PRESENTATIONS, PLANNING FOR ITS CONSTRUCTION COSTS AND IN SOME INSTANCES, ADVISING IN THE ACTUAL FINANCING. THE CONSULTANT IS BEING PRESSURED NOT ONLY FOR INCREASED ACCURACY IN COST ESTIMATES, BUT IS EXPECTED TO ASSUME A GREATER RESPONSIBILITY IN REGARD TO THE CONTRACTORS' AND MANUFACTURERS' PERFORMANCE AS WELL AS THE SUPERVISION OF CONSTRUCTION AND THE ULTIMATE OPERATION OF THE ENTIRE FACILITY. THE AUTHOR REPORTS A TREMENDOUS NEED FOR A FREER EXCHANGE OF INFORMATION BETWEEN CONSULTANTS ON PAST EXPERIENCE WITH CONTRACTORS, SUPPLIERS, AND/OR MANUFACTURERS OF ITEMS OF RELATIVELY NEW CONCEPT AND DESIGN. LARGE SAVINGS WOULD RESULT. (AUTH)

08-03-00510 REGIONAL DISTRICTS FOR INCINERATION (ECONOMICS EMISSION(CONTROL) SITE-SELECTION IMPLEMENTATION)
HEANEY, F. L.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 123-128 (MAY 5-8, 1968). THERE ARE GREAT ADVANTAGES TO BE OBTAINED IN FORMING OF REGIONAL DISTRICTS FOR INCINERATION. COST DATA PREPARED FOR RECENT ENGINEERING STUDIES INDICATE SUBSTANTIAL SAVINGS FOR UTILIZING INCINERATORS UP TO 1200 TONS PER DAY CAPACITY AND SERVING POPULATIONS UP TO 425,000 PERSONS. THE MAXIMUM AREA OF AN EFFICIENT DISTRICT HAS BEEN ESTABLISHED AS THAT REQUIRING UP TO 45 MINUTES FOR THE COLLECTION TRUCKS TO MAKE A ROUND TRIP TO THE INCINERATOR. THE SIZE OF THE SERVICE AREA MAY BE EXTENDED THROUGH THE USE OF TRANSFER STATIONS. NEW AIR POLLUTION CONTROL CRITERIA, SUCH AS THOSE NOW APPLICABLE TO FEDERAL INSTALLATIONS, HAVE INCREASED CONSTRUCTION AND OPERATING COSTS OF INCINERATORS AND HAVE ACCENTUATED THE DIFFERENTIAL BETWEEN LOCAL AND REGIONAL INCINERATORS. SITE SELECTION REMAINS THE MOST DIFFICULT OBSTACLE TO BE OVERCOME. A WEIGHTED COMPARISON OF AVAILABLE SITES PRODUCES A METHOD OF RATIONALIZING AND SETTLING THIS DISPUTE.

08-03-00521 REVOLVING GRATES MAKE THE DIFFERENCE (INCINERATION)
BROKAW, A. T. + SLABY, S. M.
THE AMERICAN CITY 76(6), P. 109 (JUNE 1961). A DESCRIPTION OF THE ROTATING GRATES USED AT THE PRINCETON, NEW JERSEY, INCINERATOR. THE GRATES INCREASE THE BURNING RATE OF THE FURNACES BY AS MUCH AS 200 PERCENT AND REDUCE MANPOWER REQUIREMENTS. (PHS)

08-03-00535 INCINERATOR SOLVES BURNABLE WASTE PROBLEM (COST(OPERATING) COST(CAPITAL))
WALDSCHMIDT, M.
PUBLIC WORKS 88(2), P. 96 (FEBRUARY 1957). A 100-TON PER DAY REFUSE INCINERATOR WAS PLACED IN OPERATION IN SOUTH EUCLID, OHIO, IN 1955. IT IS LOCATED ADJACENT TO A RESIDENTIAL AND BUSINESS SECTION. THE COST WAS ABOUT $200,000. THE PLANT HAS TWO DIRECT-CHARGED FURNACES, MECHANICAL STOKING AND GRATES. DURING MAY 1956, 668.37 TONS OF WASTE REFUSE WERE INCINERATED AT A TOTAL COST OF $1.81 PER TON, EXCLUDING DEPRECIATION, ELECTRICITY, GAS, AND WATER COSTS. (UC)

08-03-00536 INCINERATOR WILL SOLVE MANY REFUSE PROBLEMS (COST(CAPITAL))
HIRSCH, P.
PUBLIC WORKS 88(4), P. 119 (APRIL 1957). A NEW REFUSE INCINERATOR WAS COMPLETED IN EVANSTON, ILLINOIS, IN 1957. ITS CAPACITY IS 180 TONS PER 24 HOURS. IT HAS TWO FURNACES, HYDRAULIC STOKER BARS, AND A LARGE CAPACITY TO PERMIT A LOW BURNING RATE AND LOW GAS SPEED, AS WELL AS SPACE FOR MAXIMUM FALLOUT IN THE COMBUSTION AND SUBSIDENCE CHAMBERS. THE SUBSIDENCE CHAMBER CAN BE OPERATED BOTH WET AND DRY-BOTTOMED. FLY ASH IS REMOVED BY A " VACUUM CLEANER " SYSTEM. A CENTRIFUGAL SEPARATOR REMOVES THE COLLECTED ASH. THE CHIMNEY IS 175 FT HIGH AND 8 FT IN INTERNAL DIAMETER. THE COST WAS $745,000. FROM A POPULATION OF 75,000, EVANSTON COLLECTED 9,820 TONS OF MIXED REFUSE AND 101,886 CU-YD OF NONCOMBUSTIBLE REFUSE. (UC)

08-03-00541 INCINERATOR MODEL CONVINCES PUBLIC
HAYDEN, J. L.
PUBLIC WORKS 95(7), P. 94 (JULY 1964). A 400 TON PER DAY INCINERATOR HAS BEEN CONSTRUCTED IN LOWELL, MASSACHUSETTS. IT IS A PIT AND CRANE INCINERATOR DESIGNED TO OPERATE IN TWO SHIFTS, FIVE DAYS PER WEEK. THE CAPACITY IS PREDICTED ON THE BASIS OF A PROJECTED 100,000 POPULATION OF LOWELL BY 1980. AFTER WEIGHING 500 TRUCKS LOADED WITH REFUSE, IT WAS CONCLUDED THAT REFUSE IS GENERATED AT THE RATE OF 2.84 LB PER CAPITA PER DAY. ONE-THIRD OF THE REFUSE IS COLLECTED PRIVATELY, AND THE REMAINING TWO-THIRDS BY CITY FORCES. DESIGN SPECIFICATIONS - THE RECEIVING PIT IS 26-FT WIDE, 81-FT LONG, AND 26-1/2-FT DEEP. THE INCINERATOR BRIDGE CRANE HAS A 4-TON CAPACITY AND IS EQUIPPED WITH A 2-1/2 CU YD BUCKET. THE PLANT HAS TWO DRYING GRATES (8 FT BY 20 FT), TWO BURNING GRATES (8 FT BY 25 FT). THE COMBUSTION CHAMBER IS DESIGNED TO OPERATE AT 1800 DEGREES F. THE GASES ARE COOLED TO 600 DEGREES F IN SPRAY WATER CHAMBERS. OTHER SPECIFICATIONS ALSO ARE GIVEN IN THE ARTICLE. COSTS - THE TOTAL COST OF LAND AND CONSTRUCTION WAS $1.5 MILLION. THE BID FOR CONSTRUCTION WAS $1,238,676. A SCALE MODEL OF THE INCINERATOR WAS USED TO IMPROVE PUBLIC RECEPTIVITY TO THE INCINERATOR. (UC)

08-03-00552 49 MUNICIPALITIES JOIN IN COUNTY-WIDE INCINERATION PLAN (COST(CAPITAL) COST(OPERATING) EMISSION(CONTROL)
FOX, E. B., JR.
PUBLIC WORKS 94(2), P. 100 (FEBRUARY 1963). DELAWARE COUNTY HAS 49 SEPARATE MUNICIPALITIES AND A POPULATION OF OVER HALF A MILLION. LAND AREA AVAILABLE FOR LANDFILL IS SCARCE. THE OUTPUT OF REFUSE IS 200,000 TONS ANNUALLY. THE DELAWARE COUNTY INCINERATOR AUTHORITY WAS FORMED IN 1954, AND WAS ABSORBED BY THE DELAWARE COUNTY COMMISSIONERS IN 1958. THREE INCINERATOR PLANTS HAVE BEEN CONSTRUCTED. THE FIRST WAS COMPLETED IN 1960. OPERATING COSTS ARE $2.26 PER TON, AND CAPITAL COSTS ARE $1.46 PER TON (25 YEARS AT 3.2 PERCENT INTEREST). DESCRIPTIONS OF ALL THREE INCINERATORS AS GIVEN IN THE ARTICLE INCLUDE GRATE DESIGN, FURNACE CONSTRUCTION, AIR SUPPLY, ASH HANDLING, AND INSTRUMENTATION. SEWAGE EFFLUENT IS USED FOR PROCESS WATER IN INCINERATOR PLANT NO. 2 IN DARBY TOWNSHIP. INCINERATORS NO. 1 AND NO. 2 HAVE FLY ASH CHAMBERS. THE CHAMBER HAS A DRY BOTTOM IN NO. 1, AND A WET BOTTOM IN NO. 2. INCINERATOR NO. 3 ALSO HAS A " WETSCRUB " FLY ASH ELIMINATING SYSTEM. IT USES EFFLUENT FROM THE RADNOR-HAVERFORD SEWAGE PLANT. (UC)

08-03-00568 INCINERATOR INSPECTION, WHAT TO LOOK FOR
WEBER, C. C.
PUBLIC WORKS 98(5), P. 133 (MAY 1967). GENERAL RULES OF THUMB ARE GIVEN DEVISING A PROGRAM OF INCINERATION INSPECTION. THE INSPECTION SHOULD INCLUDE A DETERMINATION OF COMPLIANCE WITH REGULATIONS, AN INVESTIGATION OF COMPLAINTS, A GATHERING OF INFORMATION, A DETERMINATION OF THE EXTENT OF THE COMPLIANCE OF THE CONSTRUCTION WITH APPROVED PLANS, A PLANT EFFICIENCY ESTIMATE, SUGGESTIONS FOR IMPROVING THE OPERATION, AND A DETERMINATION OF THE NEED FOR PLANT MODIFICATION OR EQUIPMENT. (UC)

08-03-00576 SUBURBAN COMMUNITIES JOIN TO PLAN REFUSE DISPOSAL (INCINERATOR COST(CAPITAL) REGIONAL-APPROACH)
WINKLER, T. E.
PUBLIC WORKS 96(2), P. 88 (FEBRUARY 1965). FIVE COMMUNITIES IN THE DETROIT AREA JOINED TO FORM THE CENTRAL WAYNE COUNTY SANITATION AUTHORITY. THE TOTAL POPULATION IN 1963 WAS 235,000, THE PROJECTED POPULATION FOR 1980 IS 330,000. THE AUTHORITY HAS CONSTRUCTED TWO 250-TON CONTINUOUS FEED INCINERATORS AND HAS PROVIDED FOR A THIRD. AFTER THE FIRST JULY FOLLOWING ONE FULL YEAR OF OPERATION OF THE INCINERATOR PLANT, EACH DIRECTOR (ONE DIRECTOR PLUS AN ALTERNATE PER COMMUNITY) IS ENTITLED TO ONE VOTE/3000 TONS REFUSE OR MAJOR FRACTION THEREOF DELIVERED TO THE PLANT DURING THE PRECEDING YEAR. SURPLUS CAPACITY WILL BE AVAILABLE TO NONMEMBERS. (UC)

08-03-00578 LOW-COST REFUSE BURNER ELIMINATES DUMP (INCINERATION TEPEE-BURNER)
QUILLEN, B. D.
PUBLIC WORKS 96(3), P. 96-97 (MARCH 1965). DESIGN FEATURES AND OPERATION OF " BURN-O-MATIC " REFUSE BURNER MANUFACTURED BY INDUSTRIAL BLOW PIPE CO. USED FOR REFUSE DISPOSAL AT DODGE CITY, KANSAS ARE DESCRIBED, INCINERATOR IS CONICAL SHAPED STEEL TYPE HAVING FORCED DRAFT SYSTEM. WALL CONSTRUCTION IS 16-GAGE ALUMINIZED STEEL WELDED TO FRAMEWORK OF STEEL ANGLES. CENTRIFUGAL BLOWERS SUPPLY UNDERFIRE AIR THROUGH UNDERGROUND PIPING, BRANCHING OUT AND UP THROUGH STATIONARY CAST IRON GRATES. (EI)

08-03-00581 MUNICIPAL INCINERATOR TRENDS (EMISSION(CONTROL))
STERNITZKE, R. F.
PUBLIC WORKS 89(9), P. 112-114 (SEPTEMBER 1958). TRENDS ILLUSTRATED BY DESCRIPTION OF NEW MUNICIPAL PLANT AT BINGHAMTON, N.Y. TWO CIRCULAR, MECHANICALLY STOKED INCINERATORS HAVE CAPACITY OF 300 TONS PER DAY. CRANE BUCKET DELIVERS REFUSE TO HOPPER ON CHARGING FLOOR. FACILITIES FOR SUPERVISION AND CONTROL, CHARGING GATE OPERATION, FLY ASH CONTROL. (EI)

08-03-00582 UNIQUE INCINERATOR DEVELOPS POWER AND PROVIDES SALT WATER CONVERSION (HEAT-RECOVERY DESIGN)
VELZY, C. R. + VELZY, C. O.
PUBLIC WORKS 95(4), P. 90-95 (APRIL 1964). NEW BIN AND CRANE TYPE 750 TPD REFUSE DISPOSAL PLANT BUILT FOR TOWN OF HEMPSTEAD AT OCEANSIDE, LONG ISLAND, N.Y., INCLUDES WASTE HEAT RECOVERY COMPLEX PROVIDING POWER GENERATION AND SALT WATER CONVERSION. EMPHASIS WAS PLACED ON ARCHITECTURAL TREATMENT AND LAYOUT OF PLANT DURING DESIGN DUE TO ITS LOCATION NEAR RESIDENTIAL AREAS. DESIGN AND OPERATION OF REFUSE BURNING FACILITIES ARE DESCRIBED IN DETAIL. (EI)

08-03-00583 NEW INCINERATOR DESIGNED TO REDUCE FLY ASH EMISSION (COST(CAPITAL) EMISSION(CONTROL))
WATSON, J. W.
PUBLIC WORKS 89(4), P. 97-98 (APRIL 1958). HOLLYWOOD, FLORIDA, PLANT CONSISTS OF SCALE HOUSE, CHARGING FLOOR, HIGH CAPACITY VIBRATING GRATE STOKER, ASH HANDLING FACILITIES, AND 75-TON COVERED STORAGE BIN. TWO FURNACES, EACH HAVING CAPACITY OF 225 TONS PER DAY, AND TWO STACKS, 65 FEET HIGH. (EI)

08-03-00585 INCINERATOR SERVES SUBURBAN COMMUNITIES (COST(CAPITAL) REGIONAL-APPROACH)
WINKLER, T. E.
PUBLIC WORKS 96(12), P. 74-77 (DECEMBER 1965). CENTRAL WAYNE COUNTY SANITATION AUTHORITY'S INCINERATOR, PLACED IN OPERATION IN 1964, OFFERS SOLUTION FOR REFUSE DISPOSAL IN SMALL COMMUNITIES. TWO FURNACES ARE RECTANGULAR IN SHAPE, EACH HAVING TOTAL EFFECTIVE VOLUME OF 4800 CU-FT. EFFECTIVE GRATE AREA IS 312 SQ-FT. REFRACTORY WALLS ARE OF INSULATED, SECTIONALLY SUPPORTED TYPE. FURNACE ROOFS ARE FLAT ARCH TYPE OF PREBURNED TILE. A 500-TON PER DAY INCINERATOR DESIGNED TO SERVE A POPULATION OF 366,000 COST, INCLUDING LANDSCAPING, $2,036,334. THE PLANT IS INTENDED TO SERVE FIVE COMMUNITIES NEAR DETROIT. THE ULTIMATE CAPACITY OF THE PLANT WILL BE 750-TONS PER DAY. PRESENTLY IT HAS TWO 250-TON PER DAY INCINERATORS. A STORAGE PIT HOLDS TWO DAYS' COLLECTION. A TRUCK-WEIGHING SCALE IS AT HAND.

08-03-00588 REFUSE INCINERATION--TRENDS AND DEVELOPMENTS (COST(CAPITAL) COST(OPERATING) HEAT-RECOVERY DESIGN RATING(INCINERATOR))
ROGUS, C. A.
THE AMERICAN CITY 74(7), P. 94 (JULY 1959). THE ASH AND GARBAGE CONTENT (NORTHERLY STATES) OF REFUSE HAS DROPPED BY ABOUT 40 PERCENT AND 70 PERCENT, RESPECTIVELY. THE QUANTITIES OF REFUSE ARE INCREASING, BUT THE AMOUNT COLLECTED IS ONLY 70-80 PERCENT OF THAT PRODUCED, SINCE SELF-DISPOSAL BY INDUSTRY, COMMERCIAL ESTABLISHMENTS, AND APARTMENTS IS ON THE INCREASE FOR REASONS OF ECONOMY AND CONVENIENCE. THE THERMAL CONTENT HAS INCREASED FROM 3,500 BTU PER LB A DECADE AGO TO A PRESENT LEVEL OF 4,500 BTU PER LB. MODERN FURNACES NO LONGER REQUIRE SEGREGATED REFUSE, SO THAT THE EXPENSE OF SEPARATE CONTAINERS AND COLLECTION IS NO LONGER NECESSARY. INCINERATION OF REFUSE USES UP 1/3 TO 2/3 OF ITS THERMAL VALUE. THE EXCESS COULD BE UTILIZED. TRUCK SCALES ARE VALUABLE FOR PLANNING OPERATIONS. CAPACITY RATINGS SHOULD BE IN TONS PER WEEK, SINCE DENSITY AND PATTERN OF OPERATIONS VARY WITH LOCATION. (UC)

08-03-00593 CUSTOM-DESIGNED INCINERATOR (EMISSION(CONTROL))
WATSON, J. W.
THE AMERICAN CITY 74(2), P. 102-104 (FEBRUARY 1959). INCINERATOR AT HOLLYWOOD, FLA., COMPRISES TWO FURNACES OF 450 TON DESIGN CAPACITY AND 576 TON ACTUAL CAPACITY, COST WAS ONLY $1,540 PER DESIGN-TON, STRUCTURE IS 2 STORIES HIGH AND HAS 11 FT WIDE, 65 FEET HIGH STACKS. DIRECT CHARGING SYSTEM SECURES COST SAVING. (EI)

08-03-00597 JERSEY CITY SOLVES ITS REFUSE DISPOSAL PROBLEM (INCINERATION COLLECTION(MUNICIPAL) HEAT-RECOVERY)
LYNCH, F. J.
THE AMERICAN CITY 74(9), P. 89 (SEPTEMBER 1959). JERSEY CITY, NEW JERSEY DECIDED AFTER AN ENGINEERING STUDY TO COLLECT REFUSE ITSELF RATHER THAN LEAVE IT TO PRIVATE CONTRACTORS. IN 1957 A 600-TON/DAY REFUSE INCINERATOR WAS COMPLETED. IT HAS FOUR 150-TON FURNACES. THE IGNITION CHAMBER HAS 1,650 CU-FT PER UNIT, THE COMBUSTION CHAMBER, 2,250 CU-FT PER UNIT, AND THE EXPANSION CHAMBER, 4,280 CU-FT FOR TWO UNITS. A HYDRAULIC DUMPING GRATE SYSTEM WAS INSTALLED IN 1958. FLY ASH IS CONTROLLED BY 125 PSI WATER SPRAYS AND TWO 127-FT STACKS. TWO WASTE-HEAT BOILERS SUPPLY STEAM AT 15 PSI TO 18 BLOWER-TYPE HEATERS IN THE MAIN BUILDING. (UC)

08-03-00599 400 TONS PER 8-HOUR SHIFT (COST(CAPITAL))
THE AMERICAN CITY 74(10), P. 98 (OCTOBER 1959). GLASGOW'S NEW REFUSE INCINERATOR, THE LARGEST IN GREAT BRITAIN, SERVES A CITY OF OVER 1,000,000 INHABITANTS WITH ITS 400-TON PER 8-HOUR SHIFT CAPACITY. THE PLANT IS DIVIDED INTO FOUR INDEPENDENT SECTIONS, EACH HAVING A CAPACITY OF 100 TONS PER 8-HOUR SHIFT. TRUCKS ENTER THE SECOND FLOOR, ARE WEIGHED, AND THEN DUMP THE REFUSE INTO HOPPERS. THE REFUSE PROCEEDS TO PRIMARY ROTATION SCREENS TO SEPARATE OUT SCREENINGS UNDER 1-1/2 INCHES IN SIZE. SALVAGEABLE MATERIALS ARE SEPARATED ON SORTING BELTS. BALING EQUIPMENT PREPARES TIN CANS AND OTHER SCRAP METAL, PAPER, AND TEXTILES FOR SALVAGE. THE REMAINDER, CALLED TAILINGS, ARE FED INTO INCINERATORS. MECHANICAL SUCTION UNITS PREVENT THE DISSEMINATION OF DUST AT THE RECEPTION HOPPERS. THE FURNACES EACH HAVE FIVE HYDRAULIC GRATES. AIR POLLUTION IS CONTROLLED BY GRIT COLLECTORS, INCORPORATING AN INDUCED DRAFT FAN, CENTRIFUGAL, PRIMARY, AND SECONDARY COLLECTORS, AND GRIT SETTLING TANKS. THE TWO CHIMNEYS ARE 220 FEET HIGH. THE COST WAS $5 MILLION. (UC)

08-03-00603 DIRECT-CHARGE INCINERATORS CAN DO A GOOD JOB
WHEELER, C. F.
THE AMERICAN CITY 74(5), P. 197 (MAY 1959). THE FOUR 150-TON FURNACE PLANT IN DURHAM, NORTH CAROLINA, HAS BEEN REBUILT AND TWO NEW 170-TON FURNACES HAVE BEEN ADDED TO IT, THEREBY INCREASING ITS CAPACITY FROM AN ORIGINAL OF 600 TONS PER DAY TO A NEW OF 880 TONS/DAY. THE TOTAL COST INVOLVED FIVE CONTRACTS AND AMOUNTED TO $363,133 ($386/TON OF TOTAL CAPACITY). ESTIMATED COST OF A COMPARABLE NEW PLANT IS $1,500/TON. THE FURNACES ARE OF THE BEEHIVE TYPE AND ARE DIRECTLY CHARGED THROUGH AN OPENING IN THE DOME. OPERATION COSTS ARE LESS THAN $1.00 PER CAPITA PER YEAR. BEEHIVE FURNACES REQUIRE LITTLE MECHANICAL EQUIPMENT. A TABLE OF DESIGN DATA IS GIVEN.

08-03-00607 BINGHAMTON'S INCINERATOR AFTER ONE YEAR (EMISSION(CONTROL) COST(CAPITAL) DESIGN)
WEGMAN, L. S.
CIVIL ENGRG, AM SOC CIVIL ENGRS, 28(6), P. 41 (JUNE 1958). BINGHAMTON, NEW YORK, HAS A 300-TON MUNICIPAL INCINERATOR. A LARGE SETTLING CHAMBER WAS ADEQUATE FOR CONTROLLING FLY ASH. THE SINGLE CHIMNEY IS 145 FT HIGH, AND HAS AN INSIDE DIAMETER OF 10 FT. DURING 1957, A TOTAL OF 28,474 TONS WERE HANDLED. THE TOTAL COST FOR WAGES AND PLANT SUPERINTENDENCE WAS $67,776, OR $2.37 PER TON. OTHER RECURRING COSTS TOTALED $6,300. REPAIRS CAME TO $2,700. THE COST OF LABOR IN 1958 WAS $2.08 PER TON. THE TOTAL CONSTRUCTION COST WAS $887,761. STACK EFFLUENT WAS GENERALLY LESS THAN RINGLEMAN NO. 1/2. NO AIR POLLUTION NUISANCE HAS BEEN REPORTED. (UC)

08-03-00610 MUNICIPAL INCINERATION OF REFUSE - FOREWORD AND INTRODUCTION (SANITARY-LANDFILL COST(CAPITAL) RESEARCH-NEEDS)
AM SOC CIVIL ENGRS J SANIT ENGRG DIV 90(SA3), P. 13 (JUNE 1964). THE USE OF INCINERATORS FOR THE DISPOSAL OF LARGE QUANTITIES OF MUNICIPAL REFUSE HAS LONG BEEN FAVORED, SINCE THE COSTS AND DIFFICULTY OF OBTAINING LAND FOR SANITARY LANDFILLS CONTINUE TO INCREASE. METHODS OF DISPOSAL OTHER THAN LANDFILL AND INCINERATION HAVE BEEN TRIED, INCLUDING DEPOSITING IN WATER, DUMPING ON LAND, REDUCTION, PIGGERIES, GRINDING, DOMESTIC INCINERATION, AND COMPOSTING, BUT SANITARY FILLS AND INCINERATION ARE THE ONLY TWO METHODS BY WHICH ALMOST ANY MUNICIPAL REFUSE CAN BE HANDLED WITH THE MAINTENANCE OF SATISFACTORY HEALTH STANDARDS. OF THE LATTER TWO, INCINERATION SEEMS TO BE THE BETTER ANSWER FOR THE FUTURE, AS WELL AS FOR THE PRESENT FOR WASTE DISPOSAL. SANITARY LANDFILL IS THE ONLY DISPOSAL METHOD BY WHICH ALL SOLID WASTE, IRRESPECTIVE OF SIZE, MOISTURE, OR OTHER CHARACTERISTICS, CAN BE DISPOSED OF. HOWEVER, AS CITIES GROW IN SIZE, AVAILABLE LAND BECOMES MORE AND MORE SCARCE AND COSTLY, AND HAULING COSTS TO AREAS OUTSIDE THE CITY NEGATE ANY SAVINGS OVER THE COSTS OF OPERATING A MUNICIPAL, CENTRALLY LOCATED INCINERATOR. " INCINERATION IS COMPLETE ", LEAVING ONLY 20 PERCENT TO 25 PERCENT BY WEIGHT TO BE DISPOSED OF AT SANITARY FILLS. THE MAJOR DISADVANTAGES OF INCINERATION ARE THE HIGHER INITIAL COSTS OF CONSTRUCTION, HIGH OPERATION AND MAINTENANCE COSTS, AND THE PROBLEM OF THE FINAL DISPOSAL OF RESIDUE. THE PAPER RELATES THE HISTORY OF INCINERATION IN THE UNITED STATES, AND POINTS OUT THE FACTORS TO BE CONSIDERED WHEN DECIDING UPON THE CAPACITY OF A PLANT. APPROXIMATE COSTS OF CONSTRUCTION AND OPERATION OF AN INCINERATOR ARE DISCUSSED, AND THE AREAS IN NEED OF RESEARCH IN THE FIELD OF INCINERATION ARE POINTED OUT. (UC)

08-03-00619 THREE INCINERATORS SOLVE REFUSE PROBLEM (COMPOSTING SANITARY-LANDFILL ADVANTAGES(INCINERATION) COST(CAPITAL) COST(OPERATING))
THE AMERICAN CITY 76(8), P. 102 (AUGUST 1961). DESCRIBES THE THREE INCINERATORS WHICH ARE BEING USED FOR THE DISPOSAL OF DELAWARE COUNTY, PA., REFUSE. COUNTY OFFICIALS EXAMINED VARIOUS METHODS OF REFUSE DISPOSAL AND CHOSE INCINERATION OVER SANITARY LANDFILLING AND COMPOSTING. THE THREE INCINERATORS COST IN EXCESS OF $5.6 MILLION. (PHS)

08-03-00621 REFUSE FIRED STEAM GENERATOR AT NAVY BASE, NORFOLK, VIRGINIA (INCINERATION HEAT-RECOVERY WATER-WALL EMISSION(CONTROL) COST(CAPITAL))
MOORE, H. C.
INCINERATION OF SOLID WASTES, PROC OF THE MECAR SYMPOSIUM, NEW-YORK, NEW-YORK, P. 10 (MARCH 21, 1967). THE NEW REFUSE INCINERATOR AT THE NORFOLK, VIRGINIA NAVAL BASE IS DESCRIBED. TWO FURNACES HAVING A CAPACITY OF 180 TONS EACH ARE PROVIDED. EACH FURNACE CAN BE OIL-FIRED IF NECESSARY. THE WATER-WALL FURNACES ARE CAPABLE OF PROVIDING 100,000 POUNDS OF STEAM PER HOUR. WATER-WALL FURNACES WERE SELECTED BECAUSE OF AN INCREASE IN STEAM PRODUCTION OVER REFRACTORY FURNACES WITH STEAM BOILERS. DESIGN OF THE FURNACES IS PRESENTED.

08-03-00622 NEW INCINERATOR AT MUNICH, WEST GERMANY (HEAT-RECOVERY POWER HEATING(SPACE) COST(OPERATING))
STABENOW, G.
INCINERATION OF SOLID WASTES, PROC OF THE MECAR SYMPOSIUM, NEW-YORK, NEW-YORK, P. 22 (MARCH 21, 1967). THE INCINERATOR AT MUNICH, WEST GERMANY IS DESCRIBED. REFUSE IS BURNED AND STEAM IS PRODUCED TO GENERATE ELECTRICITY. PULVERIZED COAL IS MIXED WITH THE REFUSE FOR FUEL. TWO BOILERS ARE PROVIDED, EACH ABLE TO GENERATE 220,000 LBS PER HOUR OF STEAM AT 2600 PSIG. RATIO OF REFUSE TO COAL IS 40 PERCENT REFUSE TO 60 PERCENT COAL. FURNACES ARE WATER-WALL TYPE WITH MARTIN GRATES. LATER AN ADDITION WAS MADE TO THE PLANT TO INCREASE ITS CAPACITY. REFUSE TO COAL RATIO WAS CHANGED TO 20 PERCENT REFUSE, 80 PERCENT COAL.

08-03-00623 AN INCINERATOR WITH REFRACTORY FURNACES AND ADVANCED STOCK GAS CLEANING SYSTEMS (EMISSION(CONTROL) CAPACITY INSTRUMENTATION)
WEGMAN, L. S.
INCINERATION OF SOLID WASTES, PROC OF THE MECAR SYMPOSIUM, NEW-YORK, NEW-YORK, P. 34 (MARCH 21, 1967). NEW INCINERATOR AT NORTH HEMPSTEAD, NEW YORK IS DESCRIBED. PLANT CONTAINS THREE FURNACES, EACH RATED AT 200 TONS PER DAY. DESIGN OF THE AIR POLLUTION CONTROL EQUIPMENT AND THE CONTROLS ARE GIVEN.

08-03-00669 DISPOSAL NEEDS NEW METHODS (INCINERATION SANITARY-LANDFILL)
HANSEN, N. B.
REFUSE REMOVAL JOURNAL 10(5), P. 34 (MAY 1967). THE PROBLEMS FACING SAN FRANCISCO AND SAN MATEO COUNTY, CALIFORNIA ARE OUTLINED. BASICALLY BECAUSE OF OBJECTIONS TO USE OF THE SHORE AREA AND OTHER AREAS FOR LANDFILL OPERATIONS, ALTERNATIVE DISPOSAL METHODS OR SITES MUST BE DEVELOPED. AFTER STUDY IT WAS RECOMMENDED THAT A SITE BE SELECTED AND AN INCINERATOR BE BUILT. IT IS RECOGNIZED THAT THIS SOLUTION WILL STILL REQUIRE LANDFILL FOR RESIDUE DISPOSAL.

08-03-00673 REFUSE COLLECTION AND DISPOSAL IN WESTERN EUROPE-- PART IV- REFUSE DISPOSAL BY INCINERATION (HEAT-RECOVERY SALVAGE COST(OPERATING) COST(CAPITAL) BRIQUETTE(FUEL) CALORIFIC-VALUE)
ROGUS, C. A.
PUBLIC WORKS 93(7), P. 71-76 (JULY 1962). HIGH-TEMPERATURE INCINERATION OF MUNICIPAL REFUSE WAS DEVELOPED NEARLY 100 YEARS AGO IN ENGLAND, AND BY 1920 OVER 200 PLANTS WERE IN OPERATION IN BRITAIN. INCINERATION LAGGED ON THE CONTINENT. HOWEVER, IN THE 1890'S, A LARGE 270-TON PER DAY PLANT WAS CONSTRUCTED IN HAMBURG. SUBSEQUENTLY, MANY OTHER PLANTS WERE CONSTRUCTED. MOST OF THEM WERE EQUIPPED WITH STEAM BOILERS AND ELECTRIC POWER GENERATORS. BY 1940, OVER 250 REFUSE INCINERATOR PLANTS HAD BEEN BUILT IN THE U.S. THE INDIVIDUAL CAPACITIES OF THE U.S. PLANTS RANGED UP TO 750 TONS PER DAY. FOLLOWING WORLD WAR I, RISING LABOR COSTS, EMPHASIS ON SALVAGING, CHEAPER SOURCES OF UTILITY POWER, AND NUISANCES CREATED BY THE STILL-NOT-PERFECTED DESIGN OF INCINERATORS LED TO A REVISED USE OF INCINERATORS. HOWEVER, THE NEARLY COMPLETE MECHANIZATION, HIGHER AND MORE EVEN BURNING TEMPERATURES, AND THE BULK AND HIGH CONTENT OF NONDECOMPOSABLE SYNTHETICS IN TODAY'S REFUSE ARE BRINGING ABOUT A RETURN IN THE POPULARITY OF THE INCINERATOR AS A DISPOSAL DEVICE. INCINERATION ACCOUNTS FOR ABOUT 35 PERCENT OF REFUSE DISPOSAL IN AMERICA AND FOR 12 PERCENT TO 85 PERCENT IN EUROPE, WITH A MEDIAN OF ABOUT 40 PERCENT IN WESTERN EUROPE. SEPARATION OF SALABLE COMPONENTS AND INCINERATION OF THE TAILINGS, OR REMAINDER, IS DONE MOST EXTENSIVELY IN ENGLAND AND SCOTLAND, BUT ONLY TO A NEGLIGIBLE EXTENT ELSEWHERE. RECOVERY OF WASTE HEAT FOR STEAM AND ELECTRIC POWER GENERATION IS PRACTICED EXTENSIVELY ON THE CONTINENT. THE USE OF INCINERATORS AS AN INTERMEDIATE DISPOSAL PROCESS TO REDUCE THE VOLUME OF REFUSE BEFORE FINAL DISPOSAL BY LANDFILLING OR OTHER METHODS IS NOT USED MUCH AS YET, BUT IT MAY BECOME MORE ATTRACTIVE DUE TO THE INCREASING BULKINESS, BURNABILITY, AND PLASTICS CONTENT OF MODERN REFUSE. COMPLETE INCINERATION, IN WHICH THE REFUSE IS BURNED SO THOROUGHLY THAT THE RESIDUE CONTAINS NO PUTRESCIBLES AND ITS VOLUME IS REDUCED TO 5 PERCENT OF THE ORIGINAL INPUT IS MOST POPULAR IN THE U.S., BUT SELDOM PRACTICED ABROAD. THROUGHPUT TIME IS NO LONGER THAN FOR INTERMEDIATE DISPOSAL. THE VOLUND AND THE DE ROLL SYSTEMS OF INCINERATION ARE DESCRIBED. COMPARATIVE COST DATA FOR INCINERATION IN EUROPE AND THE U.S. ARE PRESENTED. A TABLE OF DATA FOR STEAM AND POWER GENERATION IN PARIS, HAMBURG, AND ZURICH ALSO IS PROVIDED. A MEDIAN FIGURE FOR POUNDS OF STEAM PER POUND OF REFUSE SEEMS TO BE AROUND 1.40 FOR MODERN REFUSE AND RECENT PLANTS. FUEL BRIQUETTES CAN BE MANUFACTURED FROM REFUSE BY SORTING OUT NONCOMBUSTIBLES, GRINDING TO SECURE GREATER UNIFORMITY, DRYING, AND EXTRUDING THE BRIQUETTE UNDER PRESSURE. AN AVERAGE HEAT OUTPUT OF 7,500 BTU/LB CAN BE PRODUCED WITHOUT ANY NOTICEABLE SMOKE. SEVERAL SPECIAL FEATURES OF EUROPEAN INCINERATORS ARE NOTED- (1) EXHAUST STACKS SEEM TO BE HIGHER THAN THOSE IN THE U.S. (2) FIXED CRANE CABS WITH AIR CONDITIONING AND GLASS

ENCLOSURES, CENTRALLY LOCATED, GIVE GOOD VISIBILITY AND CONTROL OF CRANE AND PIT OPERATIONS. (3) THE PROVISION OF LARGE STORAGE PITS WITH UP TO 48 HR OF OPERATING CAPACITY IS THE USUAL PRACTICE. (4) ECCENTRICALLY-SHAPED METAL CHARGING HOPPERS REDUCE OR ELIMINATE CLOGGING AND BRIDGING OF REFUSE. (5) HYDRAULICALLY OPERATED HORIZONTAL SHEAR-GATES IN VERTICAL METAL FEEDING CHUTES INSURE CLOSURE AND GIVE POSITIVE PROTECTION AGAINST BACKDRAFTS AND BACKFIRES. (6) AIRTIGHT SHEET METAL CASINGS FOR FURNACES COUPLED WITH ELIMINATION OF STOKING DOORS AND ONLY NOMINAL USE OF INSPECTION DOORS GUARD AGAINST EMERGENCE OF FURNACE DUST AND THE INTAKE OF UNWANTED EXCESS AIR. (7) PULLING IN COMBUSTION AIR FROM TIPPING FLOOR AND STORAGE PITS SO AS TO PRODUCE A SLIGHT VACUUM IN THESE AREAS EFFECTIVELY REDUCES DUST. (8) THE SUCCESSFUL USE OF ORANGEPEEL TYPE CRANE BUCKETS IN HANDLING REFUSE DESTROYS THE MYTH THAT ONLY CLAM-SHELL BUCKETS WORK WELL. (UC)

08-03-00683 SALINE WATER CONVERSION AT NO COST FOR FUEL (HEAT-RECOVERY HEAT(PROCESS))
POPE, M. + DEMING, L. F.
PUBLIC WORKS 97(1), P. 62-63 (JANUARY 1966). A DISCUSSION OF THE POSSIBILITY OF USING REFUSE INCINERATORS FOR THE CONVERSION OF SALINE WATER TO FRESH WATER AND STEAM FOR ELECTRIC POWER GENERATION. THERE IS A TABLE AND FIGURE DETAILING THE COST AND DESIGN FEATURES OF MULTI-STAGE FLASH TYPE EVAPORATORS.

08-03-00687 NEW RESIDUE COMBUSTION INSTALLATION (INCINERATOR EMISSION(CONTROL))
FABIAN, H. + WEBER, H. O.
DIE NEUE RUECKSTANDVERBRENNUNGSANLAGE DER FARBENFABRIKEN BAYER AG, LEVERKUSEN, BRENNSTOFF-WAERME-KRAFT 19(10), P. 484-486 (OCTOBER 1967). COMBUSTION INSTALLATION FOR PRODUCTION RESIDUES WAS BUILT IN ACCORDANCE WITH MOST RECENT TECHNICAL DEVELOPMENTS. IT IS CAPABLE OF BURNING ABOUT 100 TPD OF REFUSE OF ALL TYPES. METHOD CHOSEN IS DESCRIBED AND MEASURES TO PROTECT NEIGHBORHOOD AGAINST NUISANCE AND DANGER ARE PRESENTED. (EI)

08-03-00689 REFUSE DISPOSAL IN THE CITY OF BIRMINGHAM (QUANTITY CHARACTERISTICS COMPOSITION CALORIFIC-VALUE VOLUME-REDUCTION SALVAGE INCINERATOR EMISSION(CONTROL) SLUDGE(INDUSTRIAL))
HARVEY, K.
PUBLIC CLEANSING 57(12), P. 622-644 (DECEMBER 1967). THE ORGANIZATION AND SOME OF THE METHODS UTILIZED BY THE CITY OF BIRMINGHAM SALVAGE DEPARTMENT TO CARRY OUT REFUSE DISPOSAL IN AN EFFICIENT AND NUISANCE FREE MANNER ARE OUTLINED. TO DISPOSE OF THE HUGE AMOUNT OF REFUSE PRODUCED IN THE CITY EACH YEAR, PRESENTS A TASK OF ENORMOUS MAGNITUDE AND IMPORTANCE, AN OPERATION MADE MORE DIFFICULT BY THE FACT THAT REFUSE IS A MATERIAL WHICH IS CONSTANTLY CHANGING IN COMPOSITION AND CHARACTER, AND WHICH IS POTENTIALLY CAPABLE OF GIVING RISE TO NUMEROUS LATENT NUISANCES AND HAZARDS TO PUBLIC HEALTH. IT MUST BE ACCEPTED THAT NO SINGLE SYSTEM HAS BEEN EVOLVED WHICH IS THE PANACEA TO ALL REFUSE DISPOSAL PROBLEMS. CONDITIONS PREVAILING IN A PARTICULAR LOCALITY MUST OBVIOUSLY HAVE CONSIDERABLE INFLUENCE IN DETERMINING THE POLICY AND METHODS TO BE ADOPTED. IT IS EASIER TO RECORD WHAT HAS BEEN DONE IN THE PAST RATHER THAN FORECAST FUTURE DEVELOPMENTS, BUT THERE SEEMS EVERY REASON TO BELIEVE THAT THE VERY GREAT BURDEN ALREADY PLACED ON THE REFUSE DISPOSAL FACILITY WILL CONTINUE TO INCREASE. INCINERATION IS LIKELY TO GROW IN IMPORTANCE AS AN EFFECTIVE METHOD OF DEALING WITH THE EVER-INCREASING VOLUME OF REFUSE PRODUCED BY THE POPULATION AND CHANGES IN REFUSE COMPOSITION AND THE DECLINE IN THE DEMAND FOR SALVAGING OPERATIONS ARE LIKELY TO RESULT IN RADICAL CHANGES IN THE TYPE OF INCINERATOR DESIGN CONSIDERED SUITABLE FOR THE FUTURE. A GREAT DEAL REMAINS TO BE DONE IN ADVANCING THE PRACTICE OF REFUSE DISPOSAL AND CERTAINLY AS TECHNOLOGY PROGRESSES, IT WILL BECOME A HIGHLY SPECIALIZED BRANCH OF ENGINEERING. MANY INTERESTING DEVELOPMENTS ARE PROMISED, AND I AM QUITE CERTAIN THAT AS IN THE PAST, THE SALVAGE COMMITTEE WILL CONTINUE TO BE IN THE FOREFRONT OF PROGRESS WHEN DETERMINING FUTURE POLICY IN ORDER THAT THE SALVAGE DEPARTMENT MAY MEET THE TREMENDOUS CHALLENGE SET BY THE TASK OF REFUSE DISPOSAL IN THE CITY OF BIRMINGHAM BY THE APPLICATION OF THE MOST ADVANCED METHODS AND EQUIPMENT AVAILABLE.

08-03-00691 BUILD INCINERATOR NEXT TO DISPOSAL SITE (INCINERATION SANITARY-LANDFILL EMISSION(CONTROL) CAPACITY)
HUMMELL, J. D.
REFUSE REMOVAL JOURNAL 10(1), P. 20, 30 (JANUARY 1967). MIAMI COUNTY, OHIO HAS APPROVED PLANS AND SPECIFICATIONS FOR A NEW INCINERATION FACILITY. THE SITE IS LARGE ENOUGH FOR BOTH THE INCINERATOR AND A LANDFILL FOR THE RESIDUE. QUANTITY OF REFUSE PER WEEK WAS ESTIMATED TO BE 550 TONS IN 1968, 1100 TONS IN 1980, AND 1600 TONS IN 1990. DESIGN OF BUILDINGS, ETC. WAS FOR EXPANSION TO TWO TIMES THE OUTPUT IN 1990. FIRST STAGE INCINERATOR HAS A CAPACITY OF 150 TONS PER DAY.

08-03-00704 A GOOD INCINERATOR SITE (COST(USER) DESIGN)
GARD, G. W.
THE AMERICAN CITY 74(5), P. 108 (MAY 1959). A 200-TON INCINERATOR HAS BEEN BUILT IN LEXINGTON, KENTUCKY, WITH FACILITIES SIZED FOR A 50 PERCENT INCREASE IN CAPACITY AT A COST OF APPROXIMATELY $705,000. THE ENTIRE OPERATIONAL PROCEDURE, EXPENDITURES, AND INCOME ARE REVIEWED. (PHS)

08-03-00709 NEW TYPE OF MUNICIPAL INCINERATOR (EMISSION(CONTROL) SLUDGE(SEWAGE) COST(CAPITAL) COST(OPERATING))
GLACE, I. M., JR.
THE AMERICAN CITY 74(11), P. 89 (NOVEMBER 1959). WHITEMARK TOWNSHIP, PENNSYLVANIA, HAS CONSTRUCTED THE NATION'S FIRST " HORIZONTAL FLOW-THROUGH " INCINERATOR, COMBINING IT WITH SEWAGE PURIFICATION. THUS, AN EFFICIENT AND ECONOMICAL SYSTEM FOR BOTH. THE IMPORTANT CONSTRUCTIONAL AND OPERATIONAL FEATURES ARE DESCRIBED, ALONG WITH THE FACTORS WHICH HAVE MADE IT A GOOD INVESTMENT FOR THE COMMUNITY. CAPACITY IS 300 TONS PER DAY. (PHS)

08-03-00744 CHOOSING THE RIGHT INCINERATOR (DESIGN SANITARY-LANDFILL COST(CAPITAL) SITE-SELECTION)
HEANEY, F. L.
CIVIL ENGRG, P. 651 (SEPTEMBER 1958). NO ONE FORMULA CAN BE APPLIED IN DETERMINING WHICH TYPE OF INCINERATOR INSTALLATION WOULD BE BEST FOR ALL COMMUNITIES. EACH TYPE MUST BE INVESTIGATED. STUDIES MUST BE SUFFICIENTLY THOROUGH TO DETERMINE THE PROPER OPERATING METHODS, TO DECIDE UPON THE BEST AVAILABLE SITE, AND TO DECIDE UPON THE MOST SATISFACTORY METHOD OF FINANCING. CONSTRUCTION COSTS ALONE MAKE IT EVIDENT THAT THE SELECTION SHOULD NOT BE MADE BY AMATEURS. IN THIS FIELD, AS IN MANY OTHERS, CAREFUL PLANNING IS THE FIRST REQUISITE TO ECONOMY, EFFICIENCY, AND A GOOD INSTALLATION. (UC)

08-03-00753 EXPERIENCE IN OPERATING STUTTGART GARBAGE INCINERATING PLANT (DESIGN INCINERATOR)
NOWAK, F.
ERFAHRUNGEN AN DER MUELLVERBRENNUNGSANLAGE STUTTGART. BRENNSTOFF-WAERME-KRAFT 19(2), P. 71-76 (FEBRUARY 1967). VARIED EXPERIENCE WAS GAINED DURING 18 MONTHS OF OPERATION. TROUBLES IN COMPARABLE PLANTS, AND POSSIBILITIES OF HOW TO COPE WITH THESE PROBLEMS BY IMPROVEMENT OF SEVERAL COMPONENTS OF PLANT ARE DEALT WITH. CONCLUSIONS ARE DRAWN FOR FUTURE PLANTS. (EI)

08-03-00759 STEAM GENERATION FROM INCINERATION (HEAT-RECOVERY)
SHEQUINE, E. R.
PUBLIC WORKS 95(6), P. 92-94 (AUGUST 1964). THE INSTALLATION OF A BOILER IN AN INCINERATOR PLANT NOT ONLY PROVIDES ENERGY AT A COMPARATIVELY LOW FUEL COST, BUT ALSO SIMPLIFIES PROBLEMS OF AIR POLLUTION CONTROL BY AUTOMATICALLY COOLING THE PRODUCTS OF COMBUSTION SO THAT A STANDARD COMMERCIAL DUST COLLECTOR MAY BE USED. A CONTINUOUS FEED PROCESS RESULTS IN FAR GREATER EFFICIENCY THAN A BATCH FEEDING PROCESS. IT IS BELIEVED THAT 450 PSI AND 725 DEGREES F ARE RESPECTIVELY THE MAXIMUM PRESSURE AND TEMPERATURE WHICH SHOULD BE CONSIDERED FOR THE FUEL UNDER DISCUSSION. INDUSTRIAL PLANTS OFTEN NEED STEAM, AND THEY GENERATE REFUSE WHICH MUST BE DISPOSED OF. IN THE PAST, MOST MUNICIPAL INCINERATORS HAVE BEEN LOCATED IN AREAS WHERE THERE WAS LITTLE POSSIBILITY OF USING STEAM. IT IS BELIEVED THAT IN THE FUTURE MORE INCINERATING PLANTS WILL BE LOCATED SO THAT THE STEAM-GENERATING POTENTIAL MAY BE UTILIZED, AS THIS POTENTIAL BECOMES MORE FAMILIAR. (UC)

08-03-00765 INSTALLATION OF CITY OF LAUSANNE FOR COMBUSTION OF SEWAGE SLUDGE USING FLUIDIZATION PROCESS (SLUDGE(SEWAGE) INCINERATION)
WEIAND, H. + KALMBACH, K.
DIE ANLAGE DER STADT LAUSANNE ZUR VERBRENNUNG VON ABWASSERSCHLAMM NACH DEM WIRBELSCHICHTVERFAHREN, BRENNSTOFF-WAERME-KRAFT 18(5), P. 231-235 (MAY 1966). COMBUSTION PLANT IN OPERATION SINCE 1965 CAN HANDLE SEWAGE SLUDGE FROM POPULATION OF 200,000 TO 250,000 IN ONE UNIT. FLUIDIZATION PROCESS, MODIFIED FOR THIS PURPOSE, HAS PROVED ITSELF. TO SUSTAIN CONTINUOUS COMBUSTION, AVAILABLE SLUDGE CAN BE MIXED WITH OTHER WASTE PRODUCTS WITH HIGHER CALORIFIC-VALUE. DETAILS OF OPERATIONAL EXPERIENCE ARE GIVEN. (IN GERMAN) (EI)

08-03-00767 IDEAS ON COMBINED COMBUSTION OF SLUDGE AND WASTE PRODUCTS IN GRATE FIRES (INCINERATION)
PALM, R.
BRENNSTOFF-WAERME-KRAFT 18(5), P. 223-236 (MAY 1966). SPECIAL DIFFICULTIES ENCOUNTERED FROM POINT WHERE CHARGE IS PREPARED, IGNITION AND COMBUSTION PROCESS THROUGH TO END PRODUCT. NUMBER OF TYPES OF SLUDGE ARE DISCUSSED FROM POINT OF VIEW OF COMPOSITION AND THEIR IGNITION AND COMBUSTION. FROM PRESENT KNOWLEDGE, CONCLUSIONS ARE DRAWN FOR DESIGN OF UNIVERSAL FURNACE. (IN GERMAN) (EI)

08-03-00771 INCINERATOR PROGRAM (SCRUBBER(WATER) DESIGN SEWAGE(EFFLUENT))
MITCHELL, R. J.
CIVIL ENGRG (NEW-YORK), 33(6), P. 64-66 (JUNE 1963). DESIGN FEATURES OF THREE INCINERATOR PLANTS IN DELAWARE COUNTY, PENNSYLVANIA, WITH CAPACITY OF 500 TPD EACH. ALL PLANTS ARE OF TRAVELING-GRATE TYPE, WITH SPECIAL FLY-ASH COLLECTION SYSTEMS TO MEET STRICTEST AIR POLLUTION STANDARDS. TWO PLANTS HAVE WET-BOTTOM SEDIMENTATION CHAMBERS, UTILIZING TREATED EFFLUENT FROM NEARBY SEWAGE TREATMENT PLANTS AT CONSIDERABLE SAVING IN WATER COST. PLANT NO. 3 IS DISCUSSED IN DETAIL, SPECIAL INTEREST CENTERING ON FLY-ASH HANDLING AND ELIMINATION EQUIPMENT. (EI)

08-03-00773 SLUDGE INCINERATION PLANT IN STUTTGART-MUEHLHAUSEN SEWAGE TREATMENT WORKS
VATER, W.
DIE SCHLAMMVERASCHUNGSANLAGE IM HAUPTKLAERWERK STUTTGART MUEHLHAUSEN, BRENNSTOFF-WAERME-KRAFT 18(5), P. 240-243 (MAY 1966). LURGI SLUDGE/ASH PROCESS WITH MULTI-STAGE ROTARY FURNACE HAS PROVED ITSELF, AFTER CERTAIN MODIFICATIONS, AS PIONEER PLANT. IN THIS PROCESS, ASH PRODUCED IS USED AS ADDITIONAL FILTER MEDIUM. CONSTRUCTION, OPERATION, CONTROL AND RUNNING OF PLANT ARE ILLUSTRATED. INITIAL DIFFICULTIES, AND WAY IN WHICH THEY WERE OVERCOME, ARE DISCUSSED AND SOME DETAILS ON COST OF OPERATION GIVEN. (IN GERMAN) (EI)

08-03-00775 SEWAGE DISPOSAL PROJECT OF CITY OF NUREMBERG
FREY, H.
DAS SCHLAMMENTWAESSERUNGSPROJEKT DER STADT NUERNBERG, BRENNSTOFF-WAERME-KRAFT 18(5), P. 249-251 (MAY 1966). SEWAGE DISPOSAL INSTALLATION FOR MAIN TREATMENT PLANT " FUCHASTRASSE " WILL HAVE INITIAL WEEKLY THROUGHPUT OF 2300 TONS OF DECOMPOSED SEWAGE. AUTOCLAVE PROCESS OF VON ROLL, WHICH HAS BEEN TESTED IN LARGE TRIAL INSTALLATION IS DESCRIBED WITH REFERENCE TO FLOW SHEET. LAYOUT AND METHOD OF OPERATION ARE DISCUSSED AND WEEKLY BALANCE SHEET GIVEN. (IN GERMAN) (EI)

08-03-00780 REFUSE INCINERATION IN HAMBURG AND ITS EXTENSION WITH VON-ROLL FURNACES (HEAT-RECOVERY POWER EMISSION EMISSION(CONTROL))
KAMPSCHULTE, J.
DIE MUELLVERBRENNUNG IN HAMBURG UND THRE ERWEITERUNG DURCH VON-ROLL-OEFEN, BRENNSTOFF-WAERME-KRAFT 14(5), P. 228-231 (MAY 1962). COMBUSTION 34(4), P. 54 (OCTOBER 1962). REFUSE INCINERATION COMBINED WITH STEAM AND POWER GENERATION HAS BEEN PRACTICED IN HAMBURG FOR 66 YEARS. THE FIRST EXTENSION WITH 2 VON-ROLL FURNACES AND WASTE-HEAT BOILERS WAS DECIDED UPON IN 1956, THE SECOND WITH 3 IDENTICAL UNITS IN 1961. THE VON-ROLL FURNACE (200 TONS REFUSE/24 HR) CONTAINS A DRYING AND A COMBUSTION GRATE FOLLOWED BY A SLAGGING GENERATOR SUPPLIED WITH A STEAM-AIR MIXTURE FOR THE COMPLETE BURNING OUT OF THE ASH. THE GRATES CAN BE SUPPLIED WITH RECIRCULATED FLUE GASES, COLD AIR OR PREHEATED AIR. EACH WASTE-HEAT BOILER GENERATES 34 KLB/HR OF STEAM AT 256 PSI AND 608 DEGREES F. THE ELECTROSTATIC PRECIPITATORS HAVE AN EFFICIENCY OF 98.8 PERCENT. STEAM IS GENERATED AT A RATE OF 1.5 TONS PER TON REFUSE IN SUMMER AND 1.32 TONS PER TON REFUSE IN WINTER. WHEN THE NEW PLANT IS IN OPERATION (PROBABLY LATE IN 1962) MORE THAN 1 MILLION CU-M/YR CAN BE BURNED AND 60-70 GIGA WATTS GENERATED. A NEW DESIGN OF COMBINED FURNACE AND BOILER WITH 3 GRATES (ONE REPLACING THE SLAGGING GENERATOR) IS BEING INSTALLED IN FRANKFURT (2 X 300 TONS REFUSE/24 HR). (PHEA)

08-03-00781 MUNICH REFUSE POWER STATION (HEAT-RECOVERY POWER HEAT(SPACE) INCINERATOR)
ANDRITZKY, M.
MUELLKRAFTWERK MUENCHEN, BRENNSTOFF-WAERME-KRAFT 14(5), P. 232-233 (MAY 1962). COMBUSTION 34(4), P. 54-55 (OCTOBER 1962). THE AMOUNT OF REFUSE COLLECTED IN MUNICH IS ABOUT 40 MILLION CU FT/YEAR AND IS EXPECTED TO INCREASE TO 64 MILLION CU FT IN 1971. ITS AVERAGE NET CV IS 2,700 BTU/LB. IT WILL BE BURNED IN 2 BENSON BOILERS (220 KLB/HR., 2,560 PSI, 1,005/1,005 DEGREES F.) EACH WITH 2 SEPARATE FURNACES, ONE EQUIPPED WITH A MARTIN STOKER (600 SQ. FT. GRATE AREA) BURNING 25 TONS/HR. OF REFUSE AND AUXILIARY OIL BURNER, THE OTHER WITH PULVERIZED COAL BURNERS. OF THE TOTAL STEAM OUTPUT, THE MARTIN STOKER PRODUCES 40 PERCENT AND THE PULVERIZED COAL 60 PERCENT. THE FLUE GASES ARE COMBINED AT A TEMPERATURE OF 1,200 DEGREES F. WHICH IS BELOW THE ASH SOFTENING POINT OF THE REFUSE ASH. THE EFFICIENCY OF THE BOILER IS 92 PERCENT WHEN COAL FIRED AND 85 PERCENT WHEN COMBINED FIRED. THE STEAM IS SUPPLIED TO A 68 MW TURBOGENERATOR WITH AN EXTRACTION STAGE FOR A DISTRICT HEATING SYSTEM. THE FIRST EXTENSION WITH A 100 MW UNIT IS PLANNED FOR OPERATION IN 1966/7 WHEN ALL REFUSE COLLECTED AT THAT TIME WILL BE BURNED. THE FINAL SIZE OF THE POWER STATION IS TO BE 368 MW. (PHEA)

08-03-00782 CALUMET INCINERATOR - CHICAGO'S SECOND, NATION'S LARGEST (EMISSION(CONTROL) COMPOSITION)
STELLWAGEN, R. H.
THE AMERICAN CITY 75(2), P. 96-98 (FEBRUARY 1960). CHICAGO'S CALUMET INCINERATOR IS CHICAGO'S SECOND IN A LONG-TERM INCINERATOR CONSTRUCTION PROGRAM AND IS THE LARGEST BUILT SO FAR IN THE UNITED STATES. IT CONTAINS SIX FURNACES, EACH RATED AT 200 TONS PER 24 HOURS, IS REQUIRED TO DISPOSE OF ALL RUBBISH AND MEET STRICT AIR POLLUTION CONTROL ORDINANCES. EACH OF THE SIX FURNACES IS DIVIDED INTO THREE CELLS WITH INDIVIDUAL CHARGING AND ASH REMOVAL. MATERIAL ENTERS THE FURNACE THROUGH PNEUMATIC-POWERED GATES. THE FURNACES ARE DESIGNED ON A BASIS OF MIXED REFUSE OF 46 PERCENT COMBUSTIBLE, 15 PERCENT MOISTURE AND 29 PERCENT NON-COMBUSTIBLE. REFUSE AVERAGES 400 TO 500 POUNDS PER CU-YD AND 4,000 BTU/LB. A SPRAY SYSTEM WITH FIVE WET-BAFFLE SURFACES AND A WET BOTTOM IS USED TO REMOVE FLY ASH. TESTS SHOW THAT NO SIGNIFICANT AMOUNT OF CARBON DIOXIDE IS REMOVED FROM THE EFFLUENT GAS STREAM BY THE USE OF THE WET COLLECTOR SYSTEM. (PHEA)

08-03-00783 VIEWPOINTS FOR THE DESIGN OF MODERN REFUSE COMBUSTION PLANTS (HEAT-RECOVERY EMISSION(CONTROL) INCINERATOR)
KERN, A.
GESICHTSPUNKTE FUER DIE AUSLEGUNG NEUZEITLICHER VERBRENNUNGSANLAGEN FUER STADTMUELL, BRENNSTOFF-WAERME-KRAFT 14(5), P. 226-227 (MAY 1962). COMBUSTION 34(4), P. 54 (OCTOBER 1962). SINCE REFUSE INCINERATION WITHOUT WASTE HEAT UTILIZATION REQUIRES LARGE FLUE GAS COOLING AND CLEANING PLANTS, IT IS MORE ECONOMICAL TO INSTALL BOILERS FOR THE GENERATION OF HOT WATER OR STEAM AND TURBOGENERATORS WHEREVER USE CAN BE FOUND FOR THE HOT WATER AND ELECTRICITY. THE PLANNING OF A STATION SHOULD BE PRECEDED BY A STUDY OF THE REFUSE PROPERTIES, I.E., CV IN WINTER AND SUMMER, ASH FUSION POINT, MOISTURE CONTENT, AND AMOUNTS COLLECTED. THE DESIGN OF THE PLANT MUST EXCLUDE THE POSSIBILITY OF ANY SMELL REACHING THE INSIDE OR OUTSIDE OF THE STATION. GAS VELOCITIES IN THE BOILER SHOULD BE LOW TO AVOID EROSION BY THE SAND CONTAINED IN THE REFUSE. HIGH-EFFICIENCY FLUE GAS CLEANING PLANTS AND HIGH CHIMNEYS ARE REQUIRED TO PREVENT AIR POLLUTION. THE MARTIN RECIPROCATING GRATE HAS PROVED SUCCESSFUL IN A REFUSE INCINERATION PLANT IN SAO PAULO WHICH IS

NOW BEING EXTENDED. THE ROTTERDAM REFUSE POWER STATION WILL CONTAIN 4 BOILERS WITH MARTIN STOKERS, AND, IN THE NEW MUNICH POWER STATION, 2 BENSON BOILERS (220 KLB/HR., 2,900 PSI, 1,005/1,005 DEGREES F.) ARE BEING EQUIPPED WITH SEPARATE FURNACES, ONE FOR BURNING PULVERIZED COAL, THE OTHER FOR 600 TONS/24 HOUR OF REFUSE ON MARTIN STOKERS. THE BOILERS SUPPLY STEAM TO 65 MW TURBOGENERATOR. (PHEA)

08-03-00784 THE CELL-GRATE REFUSE DISPOSAL PLANT (HEAT-RECOVERY INCINERATOR)
ZANKL, W.
DIE ZELLENROST-MUELLVERNICHTUNGSANLAGE, BRENNSTOFF-WAERME-KRAFT 14(5), P. 224-225 (MAY 1962). COMBUSTION 34(4), P. 54 (OCTOBER 1962). THE HEENAN-DIDIER SYSTEM IS MAINLY CONCERNED WITH BURNING THE REFUSE, WITH STEAM GENERATION PLAYING ONLY A SECONDARY ROLE. THE REFUSE IS TRANSPORTED TO THE HOPPERS FROM WHICH IT FALLS ONTO A FIRST GRATE ON WHICH IT IS DRIED AND IGNITED BY RADIATION FROM NEIGHBORING CELLS AND HOT FLUE GASES. THE GRATE IS THEN OPENED, AND THE IGNITED REFUSE FALLS ON A SECOND GRATE FOR COMPLETE BURNING OUT AND FROM THIS INTO A COLLECTING VESSEL. EACH CELL CAN BURN 1 TON/HR. OF REFUSE. THE FLUE GAS AT A TEMPERATURE OF ABOUT 1,470 DEGREES F. IS PASSED THROUGH CYCLONES, A WASTE HEAT BOILER, AND FINALLY THROUGH AN ELECTROSTATIC PRECIPITATOR. DUST IS DRAWN OFF AT VARIOUS POINTS AND HEATED TO 1,470-1,650 DEGREES F. TO MAKE IT GERM-FREE. A PLANT WITH A CAPACITY OF 175 TONS/24 HR. OPERATING ON THIS SYSTEM WAS BUILT AT TWICKENHAM IN 1952. ENGLISH PLANTS GENERALLY OPERATE WITHOUT, GERMAN PLANTS GENERALLY WITH, HEAT UTILIZATION. (PHEA)

08-03-00786 REFUSE INCINERATION BY THE VOLUND SYSTEM (VOLUND INCINERATION)
MUELLER, H. J.
MUELLVERBRENNUNG NACH DEM SYSTEM VOLUND. BRENNSTOFF-WAERME-KRAFT 14(5), P. 219-223 (MAY 1962). COMBUSTION 34(4), P. 54 (OCTOBER 1962). THE LARGEST EUROPEAN PLANT OPERATING ON THE VOLUND SYSTEM IS THAT AT ST. OUEN WHERE 323,000 TONS, A THIRD OF THE TOTAL REFUSE COLLECTED IN PARIS, WAS BURNED IN 1961. IT CONSISTS OF 4 FURNACES IN WHICH THE REFUSE IS DRIED ON THE FIRST GRATE, IGNITED AND PARTLY BURNED ON A SECOND GRATE, AND COMPLETELY BURNED OUT IN A ROTATING DRUM. PART OF THE COMBUSTION GASES SERVE AS DRYING MEDIUM. THE GASES FROM THE TWO GRATES AND THE DRUM ARE MIXED IN A CHAMBER AND THEIR TEMPERATURE REDUCED TO 1,830 DEGREES F. BEFORE THEY ENTER THE BOILER, RATED AT 33 KLB/HR. AT 375 PSI AND 662 DEGREES F. FROM 1 KG REFUSE, 1.35 KG STEAM CAN BE GENERATED. IT HAS NOT PROVED NECESSARY TO USE THE OIL BURNERS IN THE MIXING CHAMBER. NO CORROSION HAS OCCURRED DURING 45,000 HR. OF OPERATION. A SIMILAR PLANT IS UNDER CONSTRUCTION AT LYON. (PHEA)

08-03-00788 INCINERATION OF SEWAGE SLUDGE IN MULTISTAGE ROTARY FURNACE (SLUDGE(SEWAGE) COST(CAPITAL) COST(OPERATING))
GENERLICH, K.
VERASCHUNG VON ABWASSERSCHLAMM IM DREHETAGENOFEN, BRENNSTOFF-WAERME-KRAFT 18(5), P. 235-239 (MAY 1966). ALL EFFLUENTS (AT PRESENT ABOUT 400 CU M/HR) FROM RHINE OLEFIN WORKS AT WESSELING ARE COLLECTED IN CENTRAL TREATMENT PLANT. SEWAGE SLUDGE PRODUCED THERE--APPROXIMATELY 1 TPD, AVERAGE LOWER CALORIFIC VALUE APPROXIMATELY 1330 KCAL/KG, IS CONCENTRATED, FILTRATED AND INCINERATED IN 5-LAYER ROTARY FURNACE. RE-CYCLING OF ASH FOR USE AS ADDITIONAL FILTER MEDIUM IS NOT EMPLOYED. INDIVIDUAL SECTIONS OF PLANT ARE DESCRIBED AND DETAILS OF OPERATIONAL EXPERIENCE GIVEN. INVESTMENT AND OPERATIONAL EXPENDITURE ARE SUMMARIZED. (IN GERMAN) (EI)

08-03-00791 REFUSE INCINERATION PLANT COMBINED WITH DRYING AND COMBUSTION OF SEWAGE SLUDGE (HEAT-RECOVERY)
MUELLVERBRENNUNGSANLAGE KOMBINIERT MIT TROCKNUNG UND VERBRENNUNG VON KLUARSCHLAMM, BRENNSTOFF-WAERME-KRAFT 14, P. 231 (MAY 1962). COMBUSTION 34(4), P. 54 (OCTOBER 1962). THE TOWN OF GLUECKSTADT WITH 14,000 INHABITANTS IS INSTALLING A PLANT FOR THE PERIODIC BURNING OF REFUSE AND SEWAGE SLUDGE. THE REFUSE IS BURNED ON 2 COMPARTMENTED RAM-STOKER GRATES ASSISTED BY AUTOMATICALLY CONTROLLED OIL BURNERS, AND THE ASH FALLS INTO A WATER BATH FROM WHICH A SCRAPER CONVEYOR TRANSPORTS IT, VIA A MAGNETIC DRUM SEPARATOR, TO A BUNKER FOR FURTHER UTILIZATION. PART OF THE FLUE GAS IS USED TO DRY THE SEWAGE SLUDGE WHICH IS THEN MIXED WITH THE REFUSE. THE FLUE GASES ARE COMBINED AND CLEANED IN A MULTICYCLONE SEPARATOR. THE SMALL PLANT AND INTERMITTENT OPERATION DO NOT JUSTIFY THE EXPENSE OF A BOILER FOR STEAM GENERATION. (PHEA)

08-03-00793 WHEN TO BUILD AN INCINERATOR (SANITARY-LANDFILL DESIGN PEST VECTOR)
FOSTER, W. S.
THE AMERICAN CITY 75(3), P. 118 (MARCH 1960). OF 175 CITIES THAT HAVE BUILT INCINERATORS, 60 (34 PERCENT) HAVE ABANDONED THEM FOR OTHER METHODS OF DISPOSAL. ALTERNATIVES TO INCINERATION ARE THE OPEN DUMP AND THE SANITARY LANDFILL. (1) FLIES, RATS, AND DOGS ABOUND IN OPEN DUMPS. UNCONTROLLED FIRES ARE COMMON. SUCH DUMPS ARE BOTH UNSIGHTLY AND UNHEALTHFUL. (2) A PROPERLY OPERATED LANDFILL IS SANITARY AND CHEAPER THAN AN INCINERATOR, BUT ENOUGH LAND FOR THE NEXT 25 YEARS MUST BE AVAILABLE. IF NO STORAGE PIT IS AT HAND, AN INCINERATOR MUST HAVE THE CAPACITY TO BURN THE PEAK REFUSE LOAD WITHIN ABOUT SIX HOURS. IF COLD REFUSE IS TO BE DROPPED DIRECTLY ONTO THE FIRE BED, THE GRATE AREA SHOULD BE 0.8 SQ FT PER TON OF RATED CAPACITY, AND THE FURNACE AND COMBUSTION CHAMBER 30 CU FT PER TON OF RATED CAPACITY. AIR POLLUTION BECOMES A PROBLEM WHENEVER THE FURNACE IS OVERLOADED. AN INCINERATOR SHOULD BE BUILT WHEN SITES FOR LANDFILL ARE ABOUT TO BECOME NONEXISTENT, WHEN HAUL COSTS EXCEED $1.50 PER TON OF REFUSE, AND THE DISTANCE TO THE FILL IS 10 TO 15 MILES LONGER THAN TO AN INCINERATOR SITE. (UC)

08-03-00796 BOSTON'S INCINERATOR IS A STEAM PRODUCER (HEAT-RECOVERY HEAT(SPACE) ECONOMICS FLAME(DEODORIZING))
FLAHERTY, J. F.
THE AMERICAN CITY 75(6), P. 104 (JUNE 1960). BOSTON'S NEW 900-TON INCINERATOR SERVES 360,000 PERSONS, OR ABOUT 1/3 ITS AREA AND 1/2 ITS POPULATION. WASTE HEAT GENERATES STEAM FOR THE BOSTON CITY HOSPITAL, THEREBY REDUCING THE CITY'S FUEL AND POWER BILL BY $115,000 ANNUALLY. THE PLANT HAS SIX 150-TON FURNACES EQUIPPED WITH MECHANICAL STOKING GRATES. THE THREE BOILERS GENERATE 75,000 LB OF STEAM PER HOUR AT 250 PSI GAUGE. THE CHIMNEY IS 175-FT HIGH BY 10-1.2-FT INSIDE DIAMETER. FLY ASH IS CONTROLLED BY SIX CYCLONE FLY ASH ARRESTORS PLUS A SPRAY COOLING SYSTEM TO COOL THE GASES WHEN THE WASTE HEAT BOILERS ARE NOT IN USE. THE TOTAL COST WAS $5.5 MILLION. THE ESTIMATED OPERATING COST, INCLUDING AMORTIZATION, MAINTENANCE, AND DEDUCTING INCOME, IS $783,000 PER YEAR. COST OF DISPOSAL UNDER PREVIOUS METHODS PLUS THE COST OF OPERATING THE HOSPITAL STEAM GENERATING PLANT WAS $784,000/YR. (UC)

08-03-00797 ONLY ONE ANSWER - INCINERATION (SALVAGE GRINDING SANITARY-LANDFILL COST(OPERATING))
GOFF, C. D.
THE AMERICAN CITY 74(4), P. 94 (APRIL 1960). IN A STUDY ON THE SOLID WASTE DISPOSAL PROBLEM IN MILWAUKEE, IT WAS CONCLUDED THAT INCINERATION IS THE ONLY LONG-RANGE ANSWER. IT WAS NOTED THAT THE OPEN DUMP AND HOG FEEDING PRACTICES ARE BECOMING LESS COMMON. THE USE OF THE SANITARY LANDFILLS INVOLVES THE COSTS OF INCREASINGLY LONGER HAULS TO THE DISPOSAL SITE. THE USE OF GARBAGE GRINDERS--COMMERCIAL AND DOMESTIC--IS INCREASING. THE PRACTICE IS RESULTING IN A REDUCTION OF THE SIZE OF THE WET GARBAGE FRACTION FROM 65 PERCENT OF THE TOTAL REFUSE IN 1952 TO 10 PERCENT IN 1960. AT PRESENT, SALVAGE IS NOT BEING DONE AT INCINERATION PLANTS. EXPERIMENTAL ATTEMPTS ARE BEING MADE TO USE INCINERATOR HEAT TO GENERATE STEAM FOR CLEANING AND HEATING. THE ALTERNATIVES TO INCINERATION AVAILABLE TO THE CITY OF MILWAUKEE WOULD BE- (1) TO FILL IN THE SHALLOWS OF LAKE MICHIGAN, (2) TO HAUL THE REFUSE TO SOME FAR-OFF SITE BY WAY OF LARGE TRUCKS OR RAILROAD GONDOLAS, (3) TO BURN AND CRUSH REFUSE AT THE LANDFILL SITE TO EXTEND THE LIFE OF THE FILL. THE BEST SOLUTION IS TO RESORT TO INCINERATION, USING AN INCINERATOR EQUIPPED WITH A MECHANIZED FURNACE. THE USE OF SUCH A FURNACE RESULTS IN BETTER BURNING AND THE PRODUCTION OF LESS SMOKE AND OF A BETTER RESIDUE THAN COULD BE PRODUCED WITHOUT A MECHANIZED FURNACE. HEAT RECOVERY WOULD BE A POSSIBILITY. CONCLUSIONS REACHED IN THE STUDY WERE- (1) THE DISPOSAL COSTS PER TON OF REFUSE DECREASED WITH INCREASE IN PLANT SIZE AND LENGTH OF OPERATION TIME. (2) A GOOD DESIGN, PROPER OPERATION, AND CAREFUL MAINTENANCE ARE NECESSARY. (3) EVENTUALLY THE COUNTY WILL HAVE TO BUILD AND OPERATE A LARGE INCINERATOR TO HANDLE MUNICIPAL, COMMERCIAL, AND INDUSTRIAL COMBUSTIBLES ON A FEE BASIS. (UC)

08-03-00800 THE SWISS DON'T MISS INCINERATOR THRIFT (HEAT-RECOVERY HEAT(SPACE) ECONOMICS)
THE AMERICAN CITY 75(2), P. 32 (FEBRUARY 1960). RECENTLY IN BERNE, SWITZERLAND, AN INCINERATOR WAS CONSTRUCTED WHICH CONVERTS ITS WASTE HEAT INTO STEAM FOR USE BY TWO FACTORIES AND A 1,200-BED GENERAL HOSPITAL, A 120-BED CHILDREN'S HOSPITAL, A DENTAL INSTITUTE, AND A SCHOOL. THE PLANT BURNS 30,000 TONS OF REFUSE PER YEAR, AND FROM THIS PRODUCES 30,000 TONS OF STEAM, RESULTING IN AN ANNUAL COAL SAVING OF 5,000 TONS. ANNUAL OPERATING COSTS ARE 650,000 SWISS FRANCS, WAGES ARE 360,000 FRANCS, AND INCOME, MAINLY FROM THE SALE OF HEAT, IS ABOUT 560,000 FRANCS. (UC)

08-03-00804 PLANNING NEW INCINERATOR (QUANTITIES CHARACTERISTICS SITE-SELECTION)
WEGMAN, L. S.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 1-7 (MAY 18-20, 1964). CAPACITY IS FUNCTION OF AREA AND POPULATION TO BE SERVED, FUTURE YEAR FOR WHICH TO DESIGN, AND VOLUME OF WASTE, WITH DUE REGARD TO CHANGING CHARACTER OF WASTE MATERIAL. FACTORS TO CONSIDER IN SELECTING LOCATION INCLUDE LENGTH OF HAUL, TOPOGRAPHY OF PROPOSED SITE, AND UTILITIES AVAILABLE. OTHER CONSIDERATIONS ARE PREVENTION OF AIR AND WATER POLLUTION, SUBSOIL EXPLORATIONS, RESIDUE DISPOSAL, STORAGE BIN SIZE, AND COSTS. (EI)

08-03-00805 SPECIFICATIONS AND RESPONSIBILITY FOR INCINERATOR PLANT PERFORMANCE (DESIGN)
STEPHENSON, J. W.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 8-12 (MAY 18-20, 1964). PUBLIC HEALTH CONSIDERATIONS REQUIRE GREATER CONTROL OF REFUSE DISPOSAL BY PUBLIC AGENCIES. VIEWS OF RELATIVE RESPONSIBILITY OF STATE HEALTH DEPARTMENTS, DESIGNING ENGINEERS, AND CONTRACTORS FOR PROPER DESIGN AND OPERATION OF MUNICIPAL INCINERATORS. EXAMPLES OF PERFORMANCE-TYPE SPECIFICATION REQUIREMENTS IN USE WHICH ARE NOT CONSISTENT WITH BEST ENGINEERING PRACTICE. (EI)

08-03-00815 STEAM GENERATION FROM INCINERATION (HEAT-RECOVERY DESIGN)
SHEQUINE, E. R.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 90-94 (MAY 18-20, 1964). SEE ALSO PUBLIC WORKS 8(8), P. 92-94 (AUGUST 1964). INCREASED EVAPORATION RATES ARE POSSIBLE TO ATTAIN. REASONS FOR CURRENT LOW RATES ARE GIVEN. PRACTICAL FURNACE-BOILER COMBINATION IS ILLUSTRATED TO SHOW ONE MEANS OF GETTING USEFUL STEAM PRODUCTION FROM INCINERATION. POINTS OF DIFFERENCE IN FURNACE OPERATION BETWEEN REFUSE-FIRED UNIT AND NORMAL POWER BOILER ARE DISCUSSED. (EI)

08-03-00816 WASTE HEAT UTILIZATION AT HEMPSTEAD-MERRICK REFUSE DISPOSAL PLANT (HEAT-RECOVERY INCINERATOR)
LARKIN, J. F.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 95-98 (MAY 18-20, 1964). SUMMARY OF EXPERIENCE OBTAINED IN OPERATION OF MUNICIPAL REFUSE INCINERATOR WITH WASTE HEAT RECOVERY AND UTILIZATION, AS CASE STUDY. SOME OF ITEMS DISCUSSED ARE SPECIFICALLY RELATED TO THIS PLANT, WHILE OTHERS ARE RELATED TO PROCESS AND HAVE GENERAL APPLICATION. (EI)

08-03-00822 PROBLEMS ENCOUNTERED IN OPERATION OF LARGE INCINERATOR PLANT (STORAGE OVERHEAD-CRANES BULKY-WASTE ASH-REMOVAL EMISSION(CONTROL) MAINTENANCE)
LYNCH, F. J.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 132-134 (MAY 18-20, 1964). PROBLEMS ENCOUNTERED IN INCINERATOR OPERATION ARE DESCRIBED. WEIGH SCALE IS SOMETIMES TOO SMALL, DUST AND FIRES IN STORAGE BIN MAY BE PROBLEM, AND ATTENTION MUST BE GIVEN TO MAINTENANCE OF REFRACTORY IN IGNITION AND COMBUSTION CHAMBERS. IGNITION AND AIR SUPPLY PROBLEMS OCCUR IN FURNACE OPERATION. CRANES NEED CAREFUL MAINTENANCE. PROVISION FOR BURNING LARGE OBJECTS MAY BE REQUIRED. REMOVAL OF FLY ASH AND RESIDUE NEEDS FURTHER STUDY. (EI)

08-03-00824 INCINERATOR OPERATING PERSONNEL (COST(LABOR) LABOR(REQUIREMENTS))
FOX, E. B., JR.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 143-147 (MAY 18-20, 1964). DUTIES OF VARIOUS POSITIONS ON STAFF ARE DESCRIBED. EXAMPLES ARE GIVEN OF POSITIONS AND NUMBERS OF MEN EMPLOYED IN EACH POSITION FOR NUMBER OF CITIES. (EI)

08-03-00825 ESSENTIALS OF GOOD PLANNING (INCINERATOR)
VOELKER, E. M.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 148-152 (MAY 18-20, 1964). PLANNING OF FACILITIES FOR INCINERATION OF WASTE IS RESPONSIBILITY OF ARCHITECT OR ENGINEER, WHILE MANUFACTURER OF INCINERATOR MUST SUPPLY EQUIPMENT TO MEET REQUIREMENTS. AS AID TO THIS PLANNING INCINERATOR INSTITUTE OF AMERICA PRESCRIBES EIGHT POINTS TO BE CONSIDERED. THESE POINTS COVER QUESTIONS OF LOCATION, LAYOUT, AIR SUPPLY AND DRAFT, FEATURES OF ENVIRONMENT, AND ATTENTION TO LOCAL CODES AND ORDINANCES. REFERENCE IS MADE TO TYPES OF WASTE AND SOME OF PROBLEMS IN HANDLING AND BURNING SUCH WASTE. (EI)

08-03-00847 SOMERVILLE BUILDS AN INCINERATOR (COST(CAPITAL) EMISSION(CONTROL))
THE AMERICAN CITY 75(5), P. 219-221 (MAY 1960). SOMERVILLE, MASSACHUSETTS HAS RECENTLY CONSTRUCTED A NEW 450 TON PER DAY INCINERATION FACILITY. THERE ARE THREE FURNACES. SANITARY LANDFILL HAS BEEN USED BUT HAULAGE DISTANCE AND OTHER PROBLEMS LED TO A DECISION TO PROVIDE INCINERATION. THE COST IS SLIGHTLY OVER $3000/TON.

08-03-00854 NEW REFUSE INCINERATOR OF L. VON ROLL
TANNER, R.
J AIR POLLUTION CONTROL ASSOC 12(6), P. 285-290 (JUNE 1962). DESIGN AND DEVELOPMENT OF NEW TYPE FURNACE, PROVIDING SPECIAL PREDRYING BY APPLICATION OF COMPRESSED AIR INJECTORS THAT HAVE LESS SENSITIVITY TO DIRT AND CORROSION THAN FAN. SYSTEM IS FULLY AUTOMATIC AND OPERATES CONTINUOUSLY, HAVING HIGH GRATE LOADING CAPACITY. GAS IS DIRECTED IN ONLY ONE PASS. GRAPHICAL COMPARISON OF SYSTEM AND FURNACE DIMENSIONS WITH THOSE OF CELL TYPE AND CONTINUOUS FURNACES. (EI)

08-03-00864 AN EXAMINATION OF SEWAGE SOLIDS INCINERATION COSTS (COST(OPERATION) COST(CAPITAL) COMPOSITION MULTIPLE-HEARTH)
MICK, K. L. + LINSLEY, S. E.
WATER AND SEWAGE WORKS 104(11), P. 479 (NOVEMBER 1957). ADDITIONAL DEWATERING OF SLUDGE BEYOND THAT OF NORMAL CONCENTRATION IS NECESSARY FOR SUSTAINED COMBUSTION. THIS IS COMMONLY ACCOMPLISHED BY VACUUM FILTRATION. THE SEWAGE TREATMENT PLANTS AT BUFFALO, NEW YORK CITY, CLEVELAND, DETROIT, AND MINNEAPOLIS-ST. PAUL WERE SELECTED FOR COMPARISON OF COST DATA BECAUSE THEY ALL OPERATE INCINERATORS, PUBLISH EXTENSIVE ANNUAL DATA, AND ARE OF SIMILAR MAGNITUDE. IT IS NECESSARY TO COMPARE THE ENTIRE SYSTEMS, SINCE THE COMPONENTS ARE NOT THE SAME, AND IN FACT THE SYSTEMS THEMSELVES REVEAL DIFFERENCES. FOUR TABLES OF DATA AND REFERENCES ARE PRESENTED. (UC)

08-03-00906 EUROPE'S LATEST PLANT (INCINERATOR COST(CAPITAL) POWER HEAT-RECOVERY EMISSION(CONTROL) ELECTROSTATIC-PRECIPITATOR BULK-WASTE-GRINDING)
PUBLIC CLEANSING 52(2), P. 80 (FEBRUARY 1962). DESCRIBES THE NEW REFUSE INCINERATOR PLANT IN ROTTERDAM, NETHERLANDS. THE PLANT CONSISTS OF FOUR INCINERATORS, EACH WITH A MAXIMUM CAPACITY OF 16 TONS PER HOUR. EACH HALF OF THE PLANT IS INDEPENDENT OF THE OTHER SO THAT WHEN THE ANNUAL SUMMER OVERHAUL TAKES PLACE, THE PLANT CAN CONTINUE TO OPERATE. LISTS THE EQUIPMENT INSTALLED IN THE INCINERATOR, INCLUDING STEAM AND ELECTRIC GENERATING EQUIPMENT, WATER TUBE BOILERS, ELECTROSTATIC PRECIPITATORS, ASH REMOVAL EQUIPMENT, OVERHEAD CRANES, A PNEUMATIC DUST-CONVEYING SYSTEM, TURBO ALTERNATORS, A CARCASS INCINERATING CHAMBER, AND A GRINDER FOR REDUCING BULKY MATERIAL. (PHS)

08-03-00943 BELMONT, MASSACHUSETTS, INCINERATOR GIVES COMPLETE FLY-ASH CONTROL (COST(CAPITAL) EMISSION(CONTROL) SCRUBBER(WATER))
HAYDEN, J. L.
THE AMERICAN CITY 75(1), P. 76-78 (JANUARY 1960). A NEW INCINERATOR HAS BEEN BUILT IN BELMONT, MASSACHUSETTS. TWO 75 TON MORSE-BOULGER CYLINDRICAL FURNACES ARE INSTALLED. AN AUTOMATIC SPRAY SYSTEM IS USED TO COOL THE FURNACE GASES FOLLOWED BY A CENTRIFUGAL FLY ASH COLLECTOR WHICH REMOVES OVER 99 PERCENT BY WEIGHT OF ALL ENTRAINED MATTER. ALL OFF-GAS EQUIPMENT IS INSTALLED OUTSIDE THE INCINERATOR BUILDING. IN A TEST OF THE SYSTEM 35,100 POUNDS OF REFUSE WAS BURNED IN 244 MINUTES AND NO SMOKE OF DENSITY GREATER THAN NO. 1 RINGLEMAN WAS GIVEN OFF FOR A LONGER CONTINUOUS PERIOD THAN 30 SECONDS. TOTAL ASH AND NON- COMBUSTIBLES AT THE END OF THE PERIOD WAS 11,002 POUNDS.

08-03-00960 HISTORY OF EFFORTS AT INCINERATION IN THE LOS ANGELES AREA (SANITARY-LANDFILL COST(OPERATING) EMISSION(CONTROL))
J AIR POLLUTION CONTROL ASSOC 17(5), P. 308-309 (MAY 1967). THE HISTORY OF INCINERATION IN LOS ANGELES FROM 1943 TO THE PRESENT IS REVIEWED AS REPRESENTATIVE OF ALL SOUTHERN CALIFORNIA AREAS. PRIOR TO 1960 THERE WERE MORE THAN A DOZEN MUNICIPAL INCINERATORS IN OPERATION, AT THE TIME THE ARTICLE WAS WRITTEN THERE WAS ONLY ONE LEFT IN OPERATION. COST OF INCINERATION WAS $5.57/TON AT ONE INCINERATOR AND $3.60/TON AT ANOTHER. A STUDY OF LANDFILL OPERATIONS AT AN ESTIMATED COST OF $1.00/TON CONVINCED OFFICIALS THAT THIS METHOD OF DISPOSAL WOULD BE CHEAPER EVEN AT A ROUND TRIP ROAD HAUL OF 30 MILES, MORE THAN CURRENTLY NEEDED.

08-03-00982 COMBUSTIBLE RUBBISH CONTENTS FAVORS USING HEAT RECOVERY (EMISSION(CONTROL) ELECTROSTATIC-PRECIPITATORS SCRUBBER(WATER) POWER BULKY-WASTE COST(CAPITAL))
SOLID WASTES MANAGEMENT/RRJ 10(11), P. 32 (NOVEMBER 1967). ACCORDING TO C. ROGUS, AMERICAN REFUSE HAS 3500 TO 5000 BTU PER LB. IF BURNED, THIS COULD YIELD 1.4 LB STEAM - ENOUGH TO GENERATE 0.10 KW-HR OF ELECTRICITY. (COAL HAS 13,500 BTU PER LB, AND OIL, 18,000.) THE INCORPORATION OF STEAM AND ELECTRIC GENERATORS WOULD INCREASE THE CAPITAL COST OF AN INCINERATOR PLANT BY 25 PERCENT, OR FROM $10,000 PER TON CAPACITY TO $12,500 PER TON. IN NEW YORK, A 25 PERCENT TO 40 PERCENT SAVING COULD RESULT IN INCINERATION COST THROUGH THE SALE OF ELECTRICITY. ROGUS CRITICIZES THE PRACTICE OF DUMPING FURNITURE, MATTRESSES, CONSTRUCTION LUMBER, AND OTHER SUCH BULKY ITEMS IN LANDFILLS. (UC)

08-03-00987 $25 MILLION INCINERATOR WILL BE BRITAIN'S LARGEST (POWER HEAT-RECOVERY COST(CAPITAL) ELECTROSTATIC-PRECIPITATOR SALVAGE(METAL))
REFUSE REMOVAL JOURNAL 10(7), P. 16 (JULY 7, 1967). THE CAPACITY IS 700 TRUCKLOADS PER DAY, I.E., 2,880,000 TONS PER YEAR (1/5 LONDON'S OUTPUT). THE INCINERATOR WILL HANDLE DOMESTIC AND COMMERCIAL REFUSE. THE ARTICLE DESCRIBES THE DESIGN AND OPERATION OF THE PLANT. THE PLANT WILL HAVE A SINGLE HORIZONTAL GAS-FLOW PLATE ELECTROSTATIC PRECIPITATOR. ITS BOILER INCORPORATES A STEAM RISING UNIT OF THE SINGLE-DRUM WATER-TUBE TYPE WITH A PARTIALLY WATER-COOLED COMBUSTION CHAMBER. THE TEMPERATURE OF THE FLUE GASES WILL BE REDUCED BY A TANGENT TUBE-WALLED RADIATION SHAFT ABOVE THE COMBUSTION CHAMBER. THE OPTIMAL ROUTE FOR COLLECTION VEHICLES WAS FOUND TO BE 12 MILES. ANY ROUTE LESS THAN 8 MILES LONG WOULD BE UNPROFITABLE. (UC)

08-03-00989 EUROPEAN DEVELOPMENTS IN REFUSE INCINERATION
ROGUS, C. A.
PUBLIC WORKS 97(5), P. 113-117 (MAY 1966). REFUSE INCINERATION POSES A VARIETY OF PROBLEMS. HOWEVER, MANY OF THESE PROBLEMS HAVE BEEN SOLVED IN EUROPE'S NEWEST PLANTS, AND IT SEEMS THAT THESE EUROPEAN SOLUTIONS ARE LARGELY ADAPTABLE TO AMERICAN CONDITIONS. IN THIS ARTICLE THE AUTHOR REVIEWS AND DISCUSSES DESIGN FACTORS OF LARGER INCINERATOR UNITS ON THE CONTINENT. IN SUMMARY, THE MAJOR OVERALL TRENDS OBSERVED IN EUROPE'S INCINERATORS ARE THE FOLLOWING- (1) THERE ARE FEWER BUT LARGER CENTRAL INCINERATORS WITH PROGRESSIVELY LARGER FURNACES, UP TO 500 TPD EACH. (2) TYPICAL INSTALLATIONS USE RUGGED GRATES OF DESIGNS PROVIDING CONTINUOUS, MILD MIXING AND AGITATION OF BURNING REFUSE. (3) FURNACE CHAMBERS ARE HIGH-ROOFED. (4) USE OF WATER COOLED WALLS AND ARCHES IS WIDESPREAD. (5) MANY WASTE HEAT BOILERS WITH STEAM AND POWER GENERATION ARE INSTALLED. (6) RAW GAS CLEANSING IS PERFORMED BY ELECTROSTATIC PRECIPITATION. (7) THERE IS EVER INCREASING USE OF AUTOMATION AND MECHANIZATION, AND AN ATTENDANT DEPENDENCE ON MORE SOPHISTICATED INSTRUMENTATION. (8) FEWER (ONE OR TWO PER PLANT) BUT MUCH HIGHER EXHAUST STACKS ARE CUSTOMARY. (9) SHREDDING OF OVERSIZED WASTES PERMITS INCINERATION OF THESE PARTICLES WITH NORMAL REFUSE. COMPARISON OF CAPITAL AND OPERATING COSTS OF PLANTS BURNING MIXED, UNSEGREGATED REFUSE IN SEVERAL EUROPEAN AND U.S. PLANTS HAS BEEN MADE.

08-03-00998 INCINERATOR PROGRESS BEHIND THE IRON CURTAIN (HEAT-RECOVERY CALORIFIC-VALUE)
MILAN, D.
REFUSE REMOVAL JOURNAL 11(6), P. 15-16, 28 (1968). AN INCINERATOR INSTALLATION IN PRAGUE, CZECHOSLOVAKIA COMPLETED IN 1964 IS DESCRIBED. HEAT IS RECOVERED AS STEAM. THE SYSTEM HANDLES 480 TO 600 TONS OF REFUSE DAILY.

08-03-00999 BETTER MAINTENANCE FOR WASTE-HEAT BOILERS AT INCINERATOR
TRAUTWEIN, F. W.
PUBLIC WORKS 91(10), P. 207 (OCTOBER 1960). AIR-DRIVEN, LONG RETRACTABLE SOOT BLOWERS HAVE BEEN INSTALLED IN THE WASTE-HEAT BOILERS OF THE HEMPSTEAD, N. Y., INCINERATOR TO INCREASE LIFE OF THE BLOWERS AND TO PROVIDE BETTER CLEANING OF THE BOILERS. (PHS)

08-03-01007 INCINERATOR NEAR RESIDENTIAL AREA IS COMMUNITY SHOWPLACE (COST(CAPITAL) EMISSION(CONTROL) RESIDUE)
PUBLIC WORKS 91(2), P. 117 (FEBRUARY 1960). A DESCRIPTION OF THE CONSTRUCTION AND OPERATION OF A NEW MUNICIPAL INCINERATOR SERVING TWO SOUTHEASTERN PENNSYLVANIA COMMUNITIES. THE NEW INCINERATOR BURNS UP TO 12 1/2 TONS OF REFUSE PER HOUR AND IS OPERATED BY ONLY FOUR MEN. THE BUILDING HOUSING THE INCINERATOR AND THE LANDSCAPING HAVE BEEN DESIGNED TO BLEND WITH THE SURROUNDING RESIDENTIAL AREA. (PHS)

08-03-01021 REFUSE BURNER SUPPLEMENTS TOWN LANDFILL (INCINERATOR TEPEE)
WHITMAN, D., JR.
PUBLIC WORKS 92(3), P. 117 (MARCH 1961). A DESCRIPTION OF THE PHYSICAL FEATURES, OPERATION, AND COST OF A REFUSE BURNER RECENTLY INSTALLED AT THE NEWTON, NEW JERSEY, SANITARY LANDFILL TO BURN COMBUSTIBLE WASTES BEFORE BURIAL. THE CITY ALSO PASSED A NEW ORDINANCE REQUIRING THE SEPARATION OF COMBUSTIBLES AND NONCOMBUSTIBLES, AN ANNUAL $10 LICENSE FEE FOR REFUSE TRUCKS, THE COVERING OF ALL REFUSE VEHICLES, AND THE PROHIBITION OF THE DUMPING OF MATERIALS FROM OUT OF TOWN. (PHS)

08-03-01022 BACKHOE SOLVES INCINERATOR PROBLEM
PUBLIC WORKS 92(3), P. 123 (MARCH 1961). TWO NEW STORAGE BINS, HYDRAULICALLY OPERATED CHARGING GATES, AND A BACKHOE TO HANDLE ACCUMULATED REFUSE HAVE IMPROVED BURNING CHARACTERISTICS AND ELIMINATED TIME-WASTING TIEUPS OF LOADED REFUSE TRUCKS AT THE WALTHAM, MASSACHUSETTS, INCINERATOR. (PHS)

08-03-01025 NAVY TO INCINERATE RUBBISH FOR POWER (HEAT-RECOVERY CALORIFIC-VALUE COMPOSITION COST(CAPITAL) WATER-WALL EMISSION(CONTROL))
REFUSE REMOVAL JOURNAL 10(4), P. 18, 34 (APRIL 1967). ANOTHER DESCRIPTION OF THE STEAM GENERATING, WATER WALLED REFUSE INCINERATOR TO BE BUILT AT NORFOLK, VA., TWO FURNACE UNITS WILL BURN 180 TONS OF REFUSE PER DAY AND GENERATE 50,000 POUNDS OF 275 PSIG STEAM PER HOUR. COST IS ESTIMATED TO BE 2.2 MILLION DOLLARS. HEAT VALUE OF THE REFUSE IS ASSUMED TO BE 5000 BTU PER POUND. A DESCRIPTION OF PLANTS IN EUROPE AND THE U.S. HAVING HEAT RECOVERY SYSTEMS IS INCLUDED. A TABLE IS PRESENTED GIVING AN AVERAGE COMPOSITION OF MUNICIPAL REFUSE.

08-03-01029 DON'T ABANDON THAT OLD INCINERATOR--YET (DESIGN)
ABPLANALP, G. H. + STEPHENSON, J. W.
PUBLIC WORKS 92(10), P. 109-112 (OCTOBER 1961). MANY MUNICIPALITIES HAVE HAD TO REDESIGN THEIR INCINERATOR PLANTS BECAUSE OF THE GREAT CHANGE THAT HAS TAKEN PLACE IN THE COMPOSITION OF REFUSE. FORMERLY INCINERATORS WERE DESIGNED WITH SPECIAL HEARTHS OR OTHER PROVISIONS FOR DRYING THE REFUSE BECAUSE THE MUNICIPAL REFUSE CONTAINED 50 PERCENT OR MORE OF GARBAGE AND WAS WET, HEAVY AND COMPACT. PREHEATERS, AUXILIARY BURNERS, AND OTHER DEVICES WERE PROVIDED IN THE CONSTANT STRUGGLE TO MAINTAIN THE TEMPERATURES REQUIRED FOR SATISFACTORY, ODOR-FREE COMBUSTION. TODAY DRYING HEARTHS AND PREHEATERS ARE NO LONGER REQUIRED, THE PROBLEM IS ONE OF HOLDING TEMPERATURES DOWN BECAUSE THE MUNICIPAL REFUSE IS LIGHT AND BULKY, FREQUENTLY CONTAINING 85 TO 90 PERCENT OR MORE COMBUSTIBLE RUBBISH, AND 10 TO 15 PERCENT OR LESS GARBAGE. FOR SATISFACTORY OPERATION, TODAY'S INCINERATOR PLANT MUST BE CAPABLE OF HANDLING A GREATER VOLUME PER TON OF REFUSE AS RECEIVED AND AS CHARGED TO THE FURNACES, HIGHER COMBUSTION TEMPERATURES, AND GREATER VOLUMES OF GASES OF COMBUSTION AND COMBUSTION AIR. UNQUESTIONABLY, THE MOST FREQUENT MODIFICATION OF INCINERATORS IN RECENT YEARS HAS BEEN THE REPLACEMENT OF FIXED MANUALLY STOKED GRATES WITH MODERN MECHANICAL GRATES RESULTING IN AN INCREASE IN BURNING CAPACITY WITH A SUBSTANTIAL REDUCTION IN MANUAL STOKING. REFUSE STORAGE IS ANOTHER PROBLEM IN MANY PRESENT-DAY INCINERATORS. THE MOST ECONOMICAL SOLUTION IS CONSTRUCTION OF A REFUSE STORAGE PIT OF ADEQUATE SIZE, USUALLY WITH A CRANE AND BUCKET TO TRANSFER REFUSE FROM PIT TO CHARGING HOPPERS. THE AUTHORS HAVE CITED THREE EXAMPLES TO ILLUSTRATE THE VARYING EXTENT OF ALTERATIONS OR RECONSTRUCTION REQUIRED TO MODERNIZE DIFFERENT INCINERATOR PLANTS.

08-03-01033 INCINERATOR AND SEWAGE TREATMENT PLANT WORK TOGETHER (EMISSION(PARTICULATE))
REILLY, B. B.
PUBLIC WORKS 92(7), P. 109 (JULY 1961). DESCRIBES A NEW INCINERATOR AND SEWAGE TREATMENT PLANT RECENTLY CONSTRUCTED IN WHITEMARSH TOWNSHIP, PA. PRESENTS DATA ON ITS PERFORMANCE AND SOME OF THE PROBLEMS INCURRED WITH THE NEW OPERATION. (PHS)

08-03-01040 INCINERATOR TO UTILIZE WASTE HEAT FOR STEAM GENERATION (DESIGN HEAT-RECOVERY HEAT(PROCESS) SALVAGE(METAL))
GERHARDT, P., JR.
PUBLIC WORKS 94(5), P. 100 (MAY 1963). A DESCRIPTION OF SOUTHWEST INCINERATOR, THE THIRD INCINERATOR TO BE BUILT IN THE REFUSE DISPOSAL PROGRAM IN CHICAGO, ILL. THE PLANT CONTAINS FOUR 300-TON-PER-DAY FURNACES, EACH OF WHICH ARE SUPPLEMENTED BY A STEAM GENERATING BOILER OF 50,000-POUNDS-PER- HOUR CAPACITY. SALE OF STEAM TO NEIGHBORING INDUSTRIES IS EXPECTED TO NET $125,000 TO $150,000 ANNUALLY. STEAM PRODUCTION IS ONE OF SEVERAL INNOVATIONS IN THE DESIGN OF CHICAGO'S NEW SOUTHWEST INCINERATOR, THE LATEST OF THREE INCINERATOR PLANTS TO BE CONSTRUCTED BY THE CITY SINCE 1956. THE STEAM, PRODUCED FROM THE WASTE HEAT NORMALLY EMITTED IN THE GAS STREAM, IS BEING SOLD TO NEIGHBORING INDUSTRIES FOR APPROXIMATELY $125,000 TO $150,000 ANNUALLY. A FEATURE WHICH HELPS MINIMIZE AIR POLLUTION FROM FLY ASH IS THE USE OF A "WET-BOTTOM" THROUGHOUT THE COMBUSTION, SUBSIDENCE, SPRAY AND DRYING CHAMBER AREAS. TO MAINTAIN A "WET-BOTTOM" FLOOR THROUGHOUT THESE AREAS, SEVERAL INCHES OF WATER CONSTANTLY FLOW OVER THE FLOOR. THE MEASURE SUPPLEMENTS THE USE OF WATER SPRAYS AND A WET-IMPINGEMENT TYPE BAFFLE WALL. IN ADDITION THE NEW INCINERATOR HAS A NUMBER OF AUTOMATIC FEATURES INCLUDING FULL ELECTRONIC CONTROLS ON THE TRAVELING CRANES WHICH LOAD THE CHARGING HOPPERS FROM THE RECEIVING PIT. THE 1200-TON PER 24-HOUR-DAY PLANT CONSISTS OF FOUR 300-TON PER DAY FURNACES EACH OF WHICH IS SUPPLEMENTED BY A STEAM GENERATING BOILER OF 50,000 LBS. PER HOUR CAPACITY. COLLECTION TRUCKS ARE WEIGHED, THEN THE UNSEPARATED REFUSE IS RECEIVED IN A 256-FT. LONG STORAGE PIT WHICH IS 60 FT. WIDE AND 30 FT. DEEP, WITH ESTIMATED CAPACITY OF 1,800 TONS, WITH A TIPPING FLOOR AREA WITH SUFFICIENT BAYS TO ACCOMMODATE 24 TRUCKS AT A TIME. THREE 5-TON CRANES WITH AIR-CONDITIONED CABS WITH 3-CU. YD. GRAPPLING BUCKETS ARE USED TO FEED THE CHARGING HOPPERS. THE RESIDUE IS QUENCHED AND CONVEYED BY MEANS OF CHAIN DRAWN STEEL DRAG FLIGHTS TO PERFORATED STEEL CYLINDERS WHERE SCRAP METALS ARE SEPARATED FROM THE ASH FOR SALVAGE. THE ASH IS HAULED AWAY BY TRUCKS FOR INORGANIC FILL. PERFORMANCE TESTS HAVE REVEALED THAT THIS PLANT IS CAPABLE OF OPERATING WITH AIR POLLUTION DUST LOADING PERFORMANCES RANGING FROM 53.3 TO 82.2 PERCENT BELOW THE ADJUSTED LIMITATION ON PARTICULATE EMISSION PERMITTED BY THE CHICAGO AIR POLLUTION ORDINANCE.

08-03-01054 INCINERATING PLANT AT SAINT-OUEN (SEINE) (INCINERATOR HEAT-RECOVERY DESIGN ASH(COMPOSITION) VOLUND)
SULZER, P. + BALLIS, F.
L'USINE D'INCINERATION DES ORDURES MENAGERES DE SAINT-OUEN (SEINE), GENTE CIVIL 141(13-14, 15-16), P. 264-276, 284-295 (JULY 1-15, 1964, AUGUST 1-15, 1964). THIS MOST MODERN (1954) OF FOUR INCINERATING PLANTS SERVING PARIS CAN PROCESS 370,000 TONS OF REFUSE WITHOUT PRIOR SORTING AND IS EQUIPPED WITH FOUR UNITS, EACH CONSISTING OF ONE ROTARY VOLUND FURNACE OF 12 TO 15 TONS/HR CAPACITY AND ONE HEAT-RECUPERATING FORCED-DRAFT BOILER DELIVERING 22 TO 25 TONS/HR OF STEAM AT 26.4 BARS 265 C. DETAILED DESCRIPTION OF PLANT, AUTOMATIC CONTROLS, AND OPERATION. (EI)

08-03-01060 REFUSE INCINERATION METHODS WITH SPECIAL REFERENCE TO SITUATION IN GERMANY (HEAT-RECOVERY)
PETERS, W.
DIE VERFAHREN DER MUELLVERBRENNUNG UNTER BESONDERER BERUECKSICHTIGUNG DER DEUTSCHEN VERHAELTNISSE, AUFBEREITUNGS-TECHNIK 1(8), P. 329-339 (AUGUST 1960). HISTORICAL REVIEW OF GARBAGE BURNING IN GERMANY. RECONSTRUCTION OF PLANTS IN HAMBURG. PROJECT OF BURNING INSTALLATION FOR INDUSTRIAL GARBAGES. PROJECT IN RHINE WESTPHALIAN INDUSTRIAL AREA IS CITED. (EI)

08-03-01062 REFUSE INCINERATION ACCORDING TO DUESSELDORF SYSTEM (HEAT-RECOVERY)
NUBER, K.
DIE MUELLVERBRENNUNG NACH SYSTEM DUESSELDORF, AUFBEREITUNGS-TECHNIK 3(5), P. 199-202 (MAY 1962). DEVELOPMENT OF ROLLER GRATE FOR REFUSE INCINERATION. GRATE CONSISTS OF NUMBER OF SLOWLY REVOLVING ROLLERS ARRANGED IN SERIES. ROLLERS ARE FITTED WITH GRATE BARS. DIAMETER OF EACH ROLLER IS 1.5 M. AIR FOR COMBUSTION ENTERS ROLLERS AXIALLY THUS COOLING THEM. STREAM OF HOT GASES IS DIRECTED AGAINST FLOW OF GARBAGE. LAST ROLLER DISCHARGES RESIDUES ON TRAVELING GRATE. (EI)

08-03-01069 EXPERIENCE WITH PERFORMANCE OF TILTING STAGE REFUSE INCINERATOR AT PLANT OF STUTTGART-MOEHRINGEN
EBERHARDT, H. + WEIAND, H.
ERFAHRUNGEN UND BETRIEBSWEISE DER NEUEN KIPPSTUFEN-MUELLVERBRENNUNG IM KOMPOSTWERK STUTTGART-MOEHRINGEN, AUFBEREITUNGS-TECHNIK 3(11), P. 490-494 (NOVEMBER 1962). TILTING-STAGE GRATE CONSISTS OF 12 TO 20 TURNING, ARC-SHAPED ROWS OF GRATE RODS. BY SUCCESSIVE TILTING OF DIFFERENT ROWS OF GRATE RODS, GARBAGE IS PASSED DOWNWARD. BASE OF FURNACE IS 6.5 X 2.5 M, ITS HEIGHT IS 9.9 M. ACCORDING TO KIND OF GARBAGE TO BE PROCESSED, PLANT CAN HANDLE UP TO 220 KG/HR, WITH COMPLETE BURNING OUT OF GARBAGE SLAG. (EI)

08-03-01084 SOLID WASTE REDUCTION UNIT PROMISES TO BE A BETTER MOUSETRAP (INCINERATION SIZE-REDUCTION SALVAGE(METALS) HEAT-RECOVERY COST(CAPITAL) QUANTITY)
SUTIN, G. L.
PUBLIC WORKS 100(2), P. 72-74, 138 (1969). DISPOSAL OF SOLID WASTE CONTINUES TO GROW WITH THE INCREASE IN POPULATION. THE CITY OF HAMILTON, CANADA, HAS EMBARKED ON AN EXTENSIVE ENGINEERING STUDY ON WAYS AND MEANS OF REDUCING THE VOLUME OF REFUSE BEFORE DISPOSAL. PULVERIZATION AND INCINERATION SEEMS TO BE THE MOST LOGICAL METHOD. THERE IS A TABLE OF ALTERNATIVE PROPOSALS AND COSTS. THEY EXPECT TO HAVE AN OPERATIONAL UNIT BY 1971. SOME CONCLUSIONS OF THE INVESTIGATION ARE - (1) INCINERATORS OF THE FIXED GRATE TYPE (MONO HEARTHS) ARE RELATIVELY LOW CAPITAL COST, HAVE VERY HIGH LABOR COSTS. (2) INCINERATORS OF OSCILLATING GRATES HAVE HIGH CAPITAL COSTS AS WELL AS HIGH LABOR COSTS. (3) COMPLETE COMBUSTION AND ELECTROSTATIC PRECIPITATORS IS BEST SOLUTION TO AIR POLLUTION PROBLEMS RELATED TO INCINERATION. (4) THE 1700 DEGREES F. GASES MUST BE REDUCED TO ABOUT 500 DEGREES F BEFORE ENTERING PRECIPITATORS. (5) DUE TO DEPTH OF THE BURNING REFUSE BED, PROPER COMBUSTION AND COMPLETE BURN UP ARE DIFFICULT TO ACHIEVE IN CONVENTIONAL INCINERATORS. (6) OVERHEAD LOADING CRANES INCINERATORS ARE HIGH CAPITAL COSTS. (7) NO INCINERATOR PROCESSES DEMOLITION LUMBER OR BULKY WASTE WITHOUT SOME PREPARATION BY SHREDDING OR CRUSHING EQUIPMENT. (8) STEAM GENERATION IS NOT

ALTOGETHER ECONOMICAL BECAUSE OF THE DISTANCE OF THE FURNACE BED FROM THE BOILER TUBES AS WELL AS THE HIGH COST OF REFRACTORY MATERIAL. (9) CRUSHING AND PULVERIZATION OF REFUSE REDUCES VOLUME BY ABOUT 50 PERCENT AS WELL AS ENHANCING BACTERIAL ACTION TO REDUCE ODORS, RODENTS AND FLIES WHEN APPLIED TO COMPOSTING (10) REMOVAL OF FERROUS METALS, EITHER BEFORE OR AFTER BURNING IS EASILY ACCOMPLISHED.

08-03-01095 A REFUSE-SEWAGE TREATMENT WORKS (INCINERATOR SLUDGE(SEWAGE) COST(CAPITAL))
EDLIN, M.
THE AMERICAN CITY 75(8), P. 89 (AUGUST 1960). THE REFUSE INCINERATOR AND THE SEWAGE TREATMENT PLANT IN NEW ALBANY, INDIANA, ARE BOTH LOCATED ON THE SAME SITE TO ENABLE COMBINED PLANT FUNCTIONS WHEREVER POSSIBLE. THE SEWAGE SLUDGE IS DEHYDRATED TO ABOUT A 70-PERCENT MOISTURE CONTENT BY VACUUM FILTRATION AND THEN DRIED IN A FLASH-DRYING SYSTEM UTILIZING THE WASTE HEAT FROM THE INCINERATOR. IN ADDITION TO DISPOSING OF THE COMMUNITY'S REFUSE, THE TWO 80-TON/DAY TRAVELING-GRATE INCINERATORS ALSO BURN UNWANTED DRIED SLUDGE. (PHS)

08-03-01113 PHILADELPHIA DOUSES ITS DUMPS (INCINERATOR DESIGN)
BAILEY, J. A.
THE AMERICAN CITY 69(11), P. 69 (NOVEMBER 1954). REPORT OUTLINING PROGRESS ON THE CONSTRUCTION OF ONE NEW INCINERATOR AND THE RECONSTRUCTION OF TWO OLD ONES. (PHS)

08-03-01118 THE INCINERATOR--A MACHINE OF BEAUTY (SITE-LOCATION)
THE AMERICAN CITY 69(8), P. 85 (AUGUST 1954). REPORT ON BROOKLINE, MASS., MUNICIPAL INCINERATOR, WHICH WAS COMMENDED BY THE A.I.A. SPECIAL REFERENCE WAS MADE TO THE FACT THAT THIS PLANT IS EQUIPPED WITH BRUSH DISPOSAL FACILITIES WHICH " CHIPS " TREES AND BRANCHES TO FACILITATE FURNACE CHARGING. REFERENCE IS MADE TO 3 INCINERATOR PLANTS UTILIZING WASTE HEAT TO GENERATE STEAM (ROCHESTER, N.Y., MANCHESTER, N.H., AND ATLANTA, GEORGIA). (PHS)

08-03-01126 THE UTILIZATION OF WASTE MATERIALS FOR HEAT PRODUCTION (INCINERATION EMISSION(CONTROL) RESIDUE HEAT-RECOVERY)
SMELLIE, J. H.
THE SANITARIAN 70(9), P. 387-394 (JUNE 1962). ALL COMBUSTIBLE REFUSE HAS CALORIFIC VALUE, AND HENCE IT MAY BE USED AS FUEL. THIS ARTICLE DESCRIBES CURRENT PRACTICES IN ENGLAND IN THE DISPOSAL OF COMBUSTIBLE WASTE BY INCINERATION AND THE RECOVERY OF HEAT. PRACTICAL PROBLEMS IN THE DESIGN AND OPERATION OF BURNERS FOR WOOD WASTE ARE DISCUSSED IN DETAIL, AND SEVERAL TYPES OF INSTALLATIONS ARE DESCRIBED AND ILLUSTRATED. MUNICIPAL REFUSE, GENERAL INDUSTRIAL WASTES, PLASTICS, AND ALL MANNER OF SOLID ORGANIC RESIDUES MAY BE INCINERATED EITHER ALONE OR IN CONJUNCTION WITH SUPPLEMENTARY FUELS SUCH AS COKE, COAL, OR OIL. IT IS ESSENTIAL THAT TEMPERATURES OF COMBUSTION BE SUFFICIENTLY HIGH (1,200 DEGREES C) TO ASSURE COMPLETE DESTRUCTION OF ORGANIC MATTER AND MINIMUM ODORS. MECHANICAL PROBLEMS INVOLVED ARE - OVERHEATING AND DAMAGE TO GRATES, UNIFORM FEEDING, DISPOSAL OF " SANDER DUST ", ASHES, AND CINDERS, HEAT EXCHANGERS, STACK GASES, AND GRIT EMISSION. METHODS BY WHICH THESE PROBLEMS MAY BE HANDLED ARE DESCRIBED FOR VARIOUS PROPRIETARY BURNERS. (PHEA)

08-03-01133 AN INCINERATOR THAT INVITES INSPECTION (DESIGN)
THE AMERICAN CITY 68(9), P. 102 (1953). THE CITY OF LONG BEACH, N.Y., INCORPORATED THE HELP OF A CONSULTING ENGINEERING CO. AND AN ARCHITECT TO ASSIST IN THE DESIGNING AND BUILDING OF AN INCINERATOR THAT WOULD NOT BE A BLIGHT TO THE COMMUNITY WHICH DEPENDS LARGELY ON TOURISTS IN THE SUMMER TIME. THE INCINERATOR IS DESIGNED TO DISPOSE OF 72 TONS PER DAY WITH A 100-TON STORAGE CAPACITY WHICH WILL TAKE CARE OF THE POPULATION FLUCTUATION.

08-03-01188 A DUST-FREE INCINERATOR (COST(CAPITAL) EMISSION(CONTROL) HEAT-RECOVERY POWER)
THE AMERICAN CITY 73(1), P. 92-95 (JANUARY 1958). THE LOCATION OF THE INCINERATOR IS IN OYSTER BAY, LONG ISLAND, NEW YORK. ITS CAPACITY IS 500 TONS PER DAY. AIR POLLUTION EQUIPMENT - FLY ASH IS REMOVED IN TWO TROUGHED WATER BOTTOM EXPANSION CHAMBERS EQUIPPED WITH A DEFLECTING DAMPER AND A WATER-SPRAY ARRANGEMENT WITH LOW PRESSURE STEAM AT THE HEAD OF THE CHAMBER. FLY ASH IN THE STACK-DISCHARGE AVERAGES 0.296 LB PARTICULATE MATTER OF 1-MICRON SIZE AND LARGER PER 1,000 LB OF FLUE GAS DISCHARGED. THE COSTS AMOUNT TO $1,699,000 PLUS LEGAL FEES AND ADMINISTRATION. DESIGN FEATURES - THE STORAGE PIT DUST IS INTERCEPTED BY INLET PORTS ALONG THE TOP WHICH DRAW AIR ACROSS THE PIT AND CARRY AWAY THE DUST. RADIANT HEATING OF PART OF THE AIR CHARGE IS PROVIDED. THE INCINERATOR HAS A HYDRAULIC ASH COLLECTION AND REMOVAL SYSTEM. ABOUT 13,000 LB OF 250 PSI STEAM ARE PRODUCED EACH HOUR TO GENERATE 400 KW OF ELECTRICITY FOR THE PLANT AND OTHER TOWN BUILDINGS. WASTE HEAT ALSO IS USED IN OPERATING A 60 HP DEEP-WELL PUMP OF 500 GPM CAPACITY. THE PLANT HAS FOUR 125-TON FURNACES EQUIPPED WITH SEMI-AUTOMATIC STOKERS. (UC)

08-03-01195 WE INCINERATE OUR REFUSE NOW (HEAT-RECOVERY EMISSION(CONTROL))
BENDER, D. O.
THE AMERICAN CITY 73(4), P. 167 (APRIL 1658). THIS ARTICLE COVERS THE LATEST STAGE IN THE OVER-ALL, LONG RANGE MODERNIZATION PROGRAM OF COLLECTION AND DISPOSAL IN INDIANAPOLIS, INDIANA. ALSO DESCRIBED IS THE NEWEST INCINERATOR IN SERVICE THERE. (PHS)

08-03-01201 WEST HARTFORD, CONNECTICUT, MODERNIZES REFUSE SERVICE (INCINERATION COLLECTION)
KENNEDY, E. R.
THE AMERICAN CITY 73(9), P. 190-191 (SEPTEMBER 1958). NEW INCINERATOR CONSISTS OF TWO 175 TON NICHOLS MONOHEARTH UNITS. AREA UNDER TRUCK DUMPING PLATFORM IS UTILIZED AS A GARAGE. USE OF HYDRAULIC GRATE OPERATING MECHANISM. FOUR TRUCKS CAN UNLOAD SIMULTANEOUSLY ON DUMPING FLOOR. WEIGHING EQUIPMENT INCLUDES HOWE SCALE WITH MECHANOPRINT. FORCE OF 20 MEN HANDLES DISPOSAL OPERATIONS. COLLECTION EQUIPMENT DETAILED. (EI)

08-03-01223 LOADING PIER AND CITY REFUSE DISPOSAL PLANT IN GENEVA (INCINERATION TRANSPORTATION(BARGE) COMPOSITION(COMPOST) DESIGN)
PERRETEN, R. + JEHEBER, T. R. + GUEX, E.
QUAI DE CHARGEMENT ET USINE DE TRAITEMENT DES RESIDUE URBAINS, BUL TECHNIQUE DE LA SUISSE ROMANDE 91(15), P. 229-242 (JULY 24, 1965). DESCRIPTION OF FLUVIAL PORT AND ITS INSTALLATIONS FOR DUSTLESS UNLOADING OF SANITATION TRUCKS INTO BARGES FOR REFUSE TRANSPORTATION TO INCINERATING PLANT. CONSTRUCTION OF LATTER IS DESCRIBED. SPECIAL ATTENTION BEING GIVEN TO 105 M HIGH REINFORCED CONCRETE SMOKESTACK AND ITS DESIGN. (EI)

08-03-01224 PLANNING AND CONSTRUCTION OF REFUSE INCINERATION PLANT IN MANNHEIM, WEST GERMANY (HEAT-RECOVERY POWER INCINERATION HEAT(PROCESS) CALORIFIC-VALUE)
WINKENS, H. P. + GEIPEL, W.
PLANUNG UND BAU DER MUELLVERBRENNUNGSANLAGE IN MANNHEIM, VEREININGUNG DER GROSSKESSELBESITZER-MITTEILUNGEN 100(2), P. 14-22 (FEBRUARY 1966). PLANT WILL SUPPLY ADDITIONAL HEAT AND ELECTRICAL ENERGY TO NEIGHBORING OIL REFINERY AND MUNICIPAL GAS- AND WATER-WORKS. IN ITS FINAL DEVELOPMENT STAGE IT WILL HANDLE 220,000 TONS REFUSE/YR AND WILL BE EQUIPPED WITH THREE BOILERS WITH COMBINED REFUSE- AND OIL-FIRING, EACH DELIVERING 40 TPH STEAM AT 136 ATM 525 C. DETAILED DESCRIPTION OF INCINERATING BOILERS, STOKER, AND ANCILLARY EQUIPMENT. (EI)

08-03-01225 ELECTRICAL AND MECHANICAL EQUIPMENT OF REFUSE INCINERATING PLANT IN GENEVA (POLLUTION INCINERATION POWER HEAT-RECOVERY LUBRICANTS(INCINERATION) COMPOSITION)
WUETHRICH, F. + BOPP, R.
EQUIPEMENT ELECTROMECANIQUE DE L'USINE D'INCINERATION DES ORDURES MENAGERES DE LA VILLE DE GENEVE, BUL TECHNIQUE DE LA SUISSE ROMANDE 91(15), P. 243-250 (JULY 24, 1965). PLANT HAS TWO VON ROLL INCINERATORS OF 200 TPD CAPACITY. BRIEF DESCRIPTION OF PLANT IS FOLLOWED BY DISCUSSION OF SOME SPECIAL PROBLEMS SUCH AS DISPOSAL OF USED LUBRICANTS AND OTHER HYDROCARBONS, REFUSE COMMINUTORS, AND INCINERATION OF REFUSE WITH ADDITION OF RESIDUAL SLUDGE. (EI)

08-03-01229 CRANES FOR REFUSE INCINERATION PLANTS
FRITSCHE, R.
KRANE FUER MUELLVERBRENNUNGS-ANLAGEN, FOERDERN U HEBEN 17(5), P. 275-278 (APRIL 1967). SUITABILITY OF CLAM-SHELL AND MULTI-SHELL BUCKETS. LIFTING GEARS WITH EPICYCLIC GEARS ARE PREFERRED TO DIFFERENTIAL LIMIT SWITCHES FOR OPERATING REASONS ALTHOUGH CRANES EQUIPPED WITH THESE LIFTING GEARS ARE BOTH HEAVIER AND MORE EXPENSIVE. MOTORIZED BUCKETS ARE SOMETIMES USED FOR SMALL INCINERATION PLANTS. TRAVELING GEARS CAN BE CENTRALLY DRIVEN OR ON TWO CORNERS. CONTACTOR CONTROL SYSTEMS ARE EMPLOYED AND MAY BE SEMIAUTOMATIC WITH HOPPER PRESELECTION GEAR. (EI)

08-03-01236 CONSTRUCTION AND OPERATION OF REFUSE INCINERATION PLANT (EMISSION(CONTROL))
RIEDLINGER, R. A.
CONSTRUCTION ET EXPLOITATION D'UNE INSTALLATION D'INCINERATION D'ORDURES MENAGERES, INDUSTRIES THERMIQUES ET AERAULIQUES 13(3), P. 131-140 (MARCH 1967). STUDY OF OPERATION OF TOWN REFUSE INCINERATION PLANT BUILT IN CITY OF DUESSELDORF, WEST GERMANY, WHICH HAS 700,000 INHABITANTS. (EI)

08-03-01243 MODEL INVESTIGATION OF OPTIMUM LAYOUT OF REFUSE INCINERATION PLANTS FOR SMALL AND MEDIUM-SIZE TOWNS ON BASIS OF EXAMPLE OF REFUSE INCINERATION PLANT AT NEUSTADT IN HOLSTEIN (DESIGN HEAT-RECOVERY POWER ECONOMICS(POWER))
GERHARDT, R. + ERMER, H.
MODELLUNTERSUCHUNG DER OPTIMALEN AUSLEGUNG VON MUELLVERBRENNUNGSANLAGE NEUSTADT IN HOLSTEIN. AUFBEREITUNGS-TECHNIK 5(3), P. 110-119 (MRACH 1964). REFUSE INCINERATION PLANT AT NEUSTADT DOES NOT INCLUDE HEAT UTILIZATION. PLANNING AND CONSTRUCTION OF PLANT. COMPARATIVE COST STUDY IS MADE FOR PLANTS OF DIFFERENT DESIGNS. ON BASIS OF MODEL CALCULATION IT IS SHOWN THAT PLANT EQUIPPED WITH ITS OWN POWER STATION WITH AND WITHOUT SALE OF POWER AND HEAT CAN BE OPERATED MORE ECONOMICALLY THAN INCINERATION PLANT WITHOUT HEAT UTILIZATION. (EI)

08-03-01244 REFUSE INCINERATION PLANT OF MUNICIPALITY OF GLUECKSTADT IN HOLSTEIN (HEAT-RECOVERY SLUDGE(DRYING))
JOACHIM, H.
DIE MUELLVERBRENNUNGSANLAGE DER STADT GLUECKSTADT IN HOLSTEIN, AUFBEREITUNGS-TECHNIK 5(3), P. 126-129 (MARCH 1964). AS INCINERATING GRATE, CLAUDIUS PETERS MULTIPLE-ZONE PUSHING GRATE WITH AVERAGE CAPACITY OF 3 TPH AT AVERAGE VOLUMETRIC WEIGHT OF REFUSE OF 330 KG/CU METER WAS SELECTED. ASH AND SLAG DISCHARGE IS EFFECTED WITH AID OF WET-TYPE ASH REMOVAL PLANT. SCRAP IN RESIDUES IS SEPARATED BY DRUM MAGNET AND COMPACTED IN PRESS TO 1 TO 5 - 1 TO 13, FOR UTILIZATION OF WASTE HEAT, SEWAGE SLUDGE DRYING PLANT IS COORDINATED WITH INCINERATION PLANT. (EI)

08-03-01256 LULEA REFUSE INCINERATION AND SLUDGE DRYING PLANT (SLUDGE(SEWAGE) QUANTITY)
PUBLIC CLEANSING 58(4), P. 192-199 (1968). AS A RULE, SWEDISH REFUSE INCINERATION PLANTS HAVE NOT BEEN CONSTRUCTED IN COMBINATION WITH PLANTS INTENDED FOR OTHER REFUSE. HOWEVER, LULEA, IN NORTHERN SWEDEN, A REFUSE INCINERATION PLANT IS BEING BUILT AT THE SAME PLACE AS A SEWAGE TREATMENT PLANT, A NIGHT SOIL-TREATMENT PLANT AND A DESTRUCTION PLANT FOR WASTE OIL. THUS, IT WILL BE POSSIBLE TO COMBINE THE DIFFERENT OPERATIONS AND MAKE IT POSSIBLE TO USE THE HEAT OF COMBUSTION FOR DRYING THE SEWAGE SLUDGE IN ROTARY DRYERS AS WELL AS TO BURN WASTE OIL PRODUCTS IN THE REFUSE FURNACES AND IN THE SLUDGE-DRYING PLANT.

08-03-01257 HEENAN-NICHOLS CONTINUOUS GRATE INCINERATOR AT BIRMINGHAM (EMISSION(CONTROL))
PUBLIC CLEANSING 58(2), P. 76-84 (1968). THE BATCH FED TYPE OF INCINERATOR HAS BEEN SUCCESSFULLY OPERATED FOR MANY YEARS AT PRACTICALLY EVERY LARGE REFUSE DISPOSAL OPERATION, BUT THE CONTINUOUS TYPE FURNACE IS GAINING MORE POPULARITY AROUND THE COUNTRY. IT WAS FELT THAT IT WOULD BE UNDESIRABLE AS WELL AS DIFFICULT TO APPLY THE RESULTS OF ONE TYPE TO ANOTHER. IT HAS TAKEN MANY MONTHS OF RESEARCH TO ACHIEVE THE DESIRED RESULT. OBVIOUSLY MANY OF THE PROBLEMS PECULIAR TO TYSELEY WILL NOT ARISE ON NEW PLANTS, NEVERTHELESS THE DATA COLLECTED WILL BE INVALUABLE IN DESIGNING THE HEENAN-NICHOLS INCINERATORS FOR SUTTON COLDFIELD AND YORK, BASED AS IT IS ON FIRST-HAND INFORMATION. IMPORTANCE IS PLACED ON THE DUST BURDEN TESTS AT TYSELEY AS THERE IS A LACK OF SUCH PRACTICAL INFORMATION IN THIS COUNTRY. AT THE TIME OF THE TESTS THIS WAS ONLY CONTINUOUS INCINERATOR HERE DEALING WITH DOMESTIC REFUSE SO OBVIOUSLY THERE WAS A UNIQUE OPPORTUNITY TO OBTAIN FIELD FIGURES UNAVAILABLE ELSEWHERE IN GREAT BRITAIN. EVEN ON THE CONTINENT, THE MAJORITY OF CONTINUOUS INCINERATORS ARE FITTED WITH BOILERS AND THUS DO NOT PROVIDE AN EFFECTIVE COMPARISON. THE DUST BURDENS SHOWN IN THIS REPORT ARE, OF COURSE, LOW COMPARED WITH CERTAIN DESIGN PARAMETERS WHICH HAVE BEEN ADOPTED IN THE PAST.

08-03-01259 TAILOR-MADE FOR DEALING WITH TRADE WASTES (BULKY-WASTE INCINERATION EMISSION(CONTROL))
AMBROSE, J. A.
PUBLIC CLEANSING 56(6), P. 292-296 (1966). IN THIS ARTICLE THE AUTHOR DEFINES THE TERM "TRADE WASTE", IN RELATION TO DOMESTIC WASTES. HE GIVES A GENERAL DISCUSSION OF THE VARIOUS DESIGNS OF INCINERATORS USED FOR THE DIFFERENT TYPES OF WASTES AND WHY THE DESIGN MUST BE AS SUCH.

08-03-01263 REFUSE INCINERATION ACCORDING TO VOLUND SYSTEM (VOLUND)
BLOCK, H. + DUHME, A.
MUELLVERBRENNUNG NACH DEM SYSTEM VOLUND, AUFBEREITUNGS-TECHNIK 5(3), P. 120-125 (MARCH 1964). VOLUND REFUSE INCINERATION PLANT IS FULLY MECHANIZED FROM REFUSE FEEDING POINT TO SLAG DISCHARGE, THROUGHPUT RATE OF REFUSE BEING CONTROLLED IN INDIVIDUAL ZONES. DRYING OF REFUSE IS EFFECTED ON DRYING AND IGNITING GRATES DESIGNED AS PUSHING GRATES. FROM IGNITING GRATE REFUSE IS SENT INTO ROTARY DRUM WHICH, ACCORDING TO FURNACE OPERATION, IS ROTATED AT INFINITELY VARIABLE SPEED. SLAG FALLS FROM DRUM END INTO WET-TYPE SLAG REMOVAL INSTALLATION. OPERATION OF SOME EUROPEAN REFUSE INCINERATION PLANTS USING VOLUND SYSTEM. (EI)

08-03-01266 PROBLEMS OF INCINERATION PLANNING
HIGGINSON, A. E.
PUBLIC CLEANSING 56(12), P. 630-633 (1966). A SUMMARY OF A MEETING OF PUBLIC CLEANSING OFFICERS AND ENGINEERS ON THE PROBLEMS FACING THEM IN REFUSE DISPOSAL. OF PRIMARY IMPORTANCE WAS SITE SELECTION, ECONOMICS, AND HYGIENIC PROBLEMS.

08-03-01268 INCINERATOR INSTALLATION AT HONG KONG (ROTARY-KILN DESIGN)
PUBLIC CLEANSING 56(12), P. 611-614 (1966). HONG KONG'S POPULATION DENSITY HAS BROUGHT ON AN EVER INCREASING REFUSE DISPOSAL PROBLEM. HARBOR POLLUTION, ODOR AND DEMAND FOR INDUSTRIAL AND RESIDENTIAL LAND HAS REQUIRED THEM TO LOOK AT OTHER METHODS OF DISPOSAL. THE PUBLIC WORKS DEPARTMENT DECIDED TO GO TO LARGE INCINERATION PLANTS. FOUR UNITS OF 10.5 TONS/HR. ARE BEING BUILT. IT IS PLANNED TO USE THE HEAT TO POWER A 1.2 MW GENERATOR, DEVELOP PROCESS STEAM, DESALINATION. ALL OPERATIONS WILL TAKE PLACE INSIDE THE BUILDING TO REDUCE THE DUST AND RELATED ODOR PROBLEMS. THE FIRST TWO PLANTS SHOULD BE IN OPERATION IN 1967.

08-03-01270 NEW CONTINUOUS GRATE PLANT FOR DERBY (DESIGN INCINERATION)
PUBLIC CLEANSING 56(12), P. 603-607 (1966). THIS IS A DETAILED DESCRIPTION OF THE OPERATIONS AND EQUIPMENT OF AN "L" TYPE TRAVELING GRATE STOKER. THERE ARE TWO 7.5 TONS PER HOUR FURNACES EQUIPPED WITH TWO TANDEM TRAVELING GRATES. THE TANDEM GRATES ALLOW A DROP OF 7-FT BETWEEN THE PRIMARY AND SECONDARY BURNERS DRAUGHT BLOWERS ARE LOCATED BENEATH THE GRATES TO HELP MOVE THE HOT GASES AND TO ASSURE COMPLETE COMBUSTION. THE ASH CLINKERS AND NONCOMBUSTABLE MATERIAL ARE DISCHARGED TO A SUBMERGED CONVEYOR INTO 7-TON CAPACITY CONTAINERS AND TRANSPORTED TO DISPOSAL AREAS.

08-03-01279 EXPERIENCE WITH CENTRAL REFUSE DISPOSAL AT ESSEN-KARNAP (INCINERATION COLLECTION HEAT-RECOVERY COST(CAPITAL) SLUDGE(SEWAGE))
MOEGLING, E.
PRAXIS DER ZENTRALEN MUELLVERBRENNUNG AM BEISPIEL ESSEN-KARNAP, BRENNSTOFF-WAERME-KRAFT 17(8), P. 383-391 (AUGUST

1965). POWER STATION OF RHEINISCH-WESTFAELISCHES ELEKTRIZITAETSWERK AG (RWE) OPERATES LARGEST CENTRAL DISPOSAL PLANT FOR REFUSE AS WELL AS 2000 TONS OF SEWAGE SLUDGE ARE TRANSFORMED INTO ASH EVERY DAY. LAYOUT OF PLANT AND FLOW OF " REFUSE-FUEL " ARE DESCRIBED. OPERATING EXPERIENCES ARE GIVEN. (EI)

08-03-01284 ELECTROSTATIC PRECIPITATOR INCLUDED IN LATEST REFUSE DISPOSAL PLANT (INCINERATOR COST(CAPITAL) EMISSION(CONTROL))
SURVR MUNIC CTR ENGR 128(3877), P. 29-31 (SEPTEMBER 1966). BIRMINGHAM CORPORATION'S REFUSE DISPOSAL WORKS AT CASTLE BROMWICH, OPENED ON SEPTEMBER 9, 1966. IT INCLUDES THE FIRST ELECTROSTATIC PRECIPITATOR FOR FLUE GAS CLEANING TO BE INSTALLED IN A REFUSE INCINERATION PLANT IN BRITAIN. (PHEA)

08-03-01290 ROLLING ALONG TO DESTRUCTION (INCINERATION DESIGN(GRATE))
PUBLIC CLEANSING 56(3), P. 106-107 (1966). A NEW SYSTEM OF WASTE DISPOSAL WHICH OPERATES AT A VERY LOW COST. THE SYSTEM IS A ROLLING GRATE INCINERATOR WHICH REDUCES REFUSE TO CLINKER AND ASH, WHILE SUPPLYING HEAT FOR SUPER-HEATED OR SATURATED STEAM. IT HAS A CAPACITY OF 1,500 TONS PER DAY. THE MANUFACTURER CLAIMS THE OPERATING COSTS ARE SO LOW THAT A PROFIT MAY BE HAD FROM THE SALE OF SURPLUS HEAT.

08-03-01298 TIP " TOP CITY " GET NEW REFUSE DISPOSAL PLANT (SANITARY-LANDFILL INCINERATION COST(CAPITAL) SALVAGE)
PUBLIC CLEANSING 55(3), P. 151-154 (1965). THE CLEANSING COMMITTEE CHAIRMAN DETAILS THE SUCCESS BRADFORD HAS HAD IN THE PAST WITH TIPPING, BUT DUE TO THE LACK OF SPACE, ECONOMICS, LABOR PROBLEMS, NEW REGULATIONS AND ETC., THEY WERE FORCED TO SEEK A DIFFERENT TYPE OF DISPOSAL. IN SELECTING A NEW SYSTEM, THEY HAVE GONE TO A SEPARATION AND SALVAGE SYSTEM TEAMED WITH INCINERATION TO MEET THE DISPOSAL NEEDS.

08-03-01300 BUILT FOR GROWTH (INCINERATION)
PUBLIC CLEANSING 55(2), P. 81-84 (1965). AS KIDDERMINSTER'S POPULATION GREW SO DID THE PROBLEMS OF TIPPING. AFTER CONSIDERABLE EFFORT AND MUCH APPREHENSION ON THE PART OF COUNCIL MEMBERS AN INCINERATOR WAS BUILT. THE INCINERATOR DESIGN IS SUCH THAT IT MAY BE ENLARGED AT A LATER DATE AS DEMAND NECESSITATES, FROM A 34,000 POPULATION TO A 70,000 POPULATION. IT IS AN INCINERATION AND SALVAGE TYPE OPERATION WITH A HIGHLY EFFICIENT GAS CLEANING DEVICE.

08-03-01305 DEVELOPMENT OF VON ROLL INCINERATORS (HEAT-RECOVERY)
TANNER, R.
DIE ENTWICKLUNG DER VON ROLL-MUELLVERBRENNUNGSANLAGEN, SCHWEIZ BAUZTG 93(16), P. 251-260 (APRIL 22, 1965). VARIOUS DESIGNS OF RECENTLY BUILT SHAFT-TYPE VON ROLL INCINERATORS WITH WASTE HEAT BOILERS ARE ILLUSTRATED, AND THEIR OPERATION IS DISCUSSED. EXPERIENCE GAINED FROM VON ROLL INSTALLATIONS IN VARIOUS COUNTRIES (TOTAL OF 19 UNITS) INDICATES SUPERIORITY OF THIS SYSTEM OVER BATTERY-TYPE AND ROTARY DRUM INCINERATORS. (EI)

08-03-01306 PROBLEMS OF REFUSE DISPOSAL IN BASEL REGION (COMPOSTING INCINERATION ECONOMICS HEAT-RECOVERY)
KATZ, P.
PROBLEMS DER ABFALLBESEITIGUNG DER REGION BASEL, SCHWEIZ BAUZTG 83(25), P. 437-447 (JUNE 24, 1965). STORAGE, COMPOSTING AND INCINERATING PROBLEMS, AS WELL AS ECONOMIC ASPECTS OF COMPOSTING VS. INCINERATING ARE DISCUSSED. DESCRIPTION OF NEW INCINERATING PLANT DESIGNED FOR PROCESSING CAPACITY OF 145,000 TONS REFUSE/YEAR PER GROUP OF TWO FURNACES, AND FOR DELIVERY OF 75 TONS STEAM PER HOUR AT 40 ATM 350 C. (EI)

08-03-01310 AMERICA'S LARGEST INCINERATOR (COST(CAPITAL) ROTARY-KILN)
PUBLIC CLEANSING 56(1), P. 20-24 (1966). CHICAGO'S THIRD MODERN INCINERATOR WAS PUT INTO SERVICE IN 1962. THE PLANT HAS A CAPACITY OF 1,200 TONS. IT IS THE MOST MODERN PLANT IN THE U.S. THERE ARE FOUR 300 TON ROTARY KILN FURNACES WITH CALORIFIC-VALUES FROM 2,700 BTU/LB TO 3,600 BTU/LBS. IT HAS A STORAGE CAPACITY OF 1,880 TONS. THE PLANT WAS BUILT AT A COST OF $6,825,000.

08-03-01334 WATERBURY'S SEWAGE-REFUSE DISPOSAL PLANT (HEAT-RECOVERY INCINERATION)
MITCHELL, R. D.
THE AMERICAN CITY 68(3), P. 83-84 (1953). EXCESSIVE QUANTITIES OF METALLIC INDUSTRIAL WASTES THAT ARE EMPTIED INTO THE SEWAGE SYSTEM PREVENT COMPLETE DIGESTION. THIS PROMPTED THE CITY MANAGERS TO SEEK A MORE PRACTICAL SYSTEM. A SEWAGE TREATMENT PLANT WAS DESIGNED TO DEWATER THE SEWAGE TO LESS THAN 10 PERCENT MOISTURE, WHERE IT COULD BE BURNED IN THE INCINERATOR WHICH WAS AN INTEGRAL PART OF THE SYSTEM. IT HANDLES THE SOLID WASTES AS WELL AS THE SEWAGE WASTES. THERE IS A DESCRIPTION OF THE PLANT.

08-03-01341 HISTORY OF EFFORTS AT INCINERATION IN THE LOS ANGELES AREA (SANITARY-LANDFILL COST(OPERATING))
HUME, N. B.
PROC AIR POLLUTION CONTROL ASSOC 59, (JUNE 1966). A PAPER DESCRIBING THE EFFORTS AND EXPENSE THE LOS ANGELES CITY SANITATION BUREAU EXPERIENCED IN BUILDING INCINERATORS TO COPE WITH THE REFUSE DISPOSAL PROBLEM. THE TOPOGRAPHY AND CLIMATIC CONDITIONS PECULIAR TO THE LOS ANGELES AREA ARE NOT THE IDEAL SITUATION FOR AN INCINERATOR DISPOSAL SYSTEM. THERE ARE SOME COSTS OF THE INCINERATOR SYSTEM COMPARED TO THE LANDFILL SYSTEM.

08-03-01345 WE BORROWED FROM STEEL INDUSTRY TO REDUCE PROBLEMS OF INCINERATOR MAINTENANCE
CERNIGLIA, V. J. + CAMPBELL, H. J., JR.
THE AMERICAN CITY 79(5), P. 89-91 (MAY 1964). HOW RENOVATION OF OYSTER BAY, NY., 500 TPD INCINERATOR PLANT INCREASED FURNACE CAPACITY BY 20 PERCENT. INVESTIGATIONS INDICATED THAT THINNER, AIR-COOLED WALL SOLVES EXCESSIVE HEAT STORAGE PROBLEM AND FACILITATES CLEANING BY REDUCING SLAG BUILDUP AND TIME REQUIRED FOR CLEANING CHAMBERS. 3-1/2-IN AIR SPACE NOW SEPARATES INSULATING CEMENT AND 3/16-IN. STEEL PLATE CASING. (EI)

08-03-01346 COMPLETE COMBUSTION WITH MINIMUM EXCESS AIR (EMISSION(CONTROL) COST(CAPITAL))
EASTERLINE, J. D.
THE AMERICAN CITY 80(2), P. 99 (FEBRUARY 1965). SCRUBBER WASH WATER IS BEING SUCCESSFULLY RECYCLED IN THE NO. 1 INCINERATOR OF BROWARD COUNTY, FLORIDA. LARGE AMOUNTS OF QUITE MOIST YARD TRASH ARE BURNED AND A GOOD RESIDUE IS PRODUCED. THE INCINERATOR HAS A LOW STACK PARTICULATE EMISSION RATE. THE PLANT HAS TWO RAM-FED FURNACES, DETROIT STOKERS BUILT ON A TANDEM DESIGN, CHARGING HOPPERS THAT CAN BE LOADED BY CRANE OR TRUCK, AND STATIONARY CRANE CONTROLS. THE TOTAL CAPACITY IS 300 TONS PER DAY. IN NORMAL OPERATIONS, THE TEST VALUE FOR PARTICULATE EMISSION IS 0.96 GRAIN/CU FT. THE CONSTRUCTION COST WAS $1,309,000. A WATER SEAL CONTROLS UNDERFIRE AIR. A SECOND PLANT WAS BUILT IN 1964 AT A COST OF $1,194,000. (UC)

08-03-01347 CREMATORY FOR ANIMAL DISPOSAL
SPEER, R. D.
THE AMERICAN CITY 89(8), P. 121-122 (AUGUST 1965). QUICK AND SANITARY METHOD OF DISPOSAL BY CREMATING CORPSES OF SMALL ANIMALS IN SPECIAL, PATHOLOGICAL INCINERATOR AT ATLANTA, GA., BY INCORPORATING SMALL GAS-FIRED FURNACE AT INCINERATOR SITE IS DESCRIBED. CREMATORY HAS TOTAL CAPACITY OF 1000 LB/HR AFTER FURNACE REACHES BURNING TEMPERATURE. TRUCKS DUMP DIRECTLY ONTO TWO CHARGING CHUTES ON FLOOR DIRECTLY ABOVE FURNACE. NATURAL-GAS FUEL CONTAINS 1040 BTU/CU-FT AND ITS SPECIFIC GRAVITY IS 0.6. FIVE BURNERS OF BLAST TYPE WITH ELECTRIC IGNITION AND STARTERS EQUIPPED WITH AUTOMATIC FLAME- FAILURE CONTROLS OPERATE SYSTEM. (EI)

08-03-01348 A NEW IDEA IN INCINERATOR STOKING (COMBUSTION)
FANNON, W. P.
THE AMERICAN CITY 68(4), P. 114-115 (1953). DUE TO A STUDY AT A BALTIMORE, MD. INCINERATOR, WHICH WAS FORMERLY A HAND STOKED FURNACE, THE FURNACE HAS BEEN EQUIPPED WITH A SPECIALLY DESIGNED INCLINED GRATE AND HYDRAULICALLY POWERED STOKER BARS. THE RENOVATION HAS LOWERED THE MAN POWER REQUIRED, INCREASED THE CAPACITY OF THE INCINERATOR AS WELL AS DECREASED MAINTENANCE COSTS.

08-03-01353 THREE INCINERATORS SOLVE REFUSE PROBLEM (COST(OPERATING) COST(CAPITAL))
FOX, E. B., JR.
THE AMERICAN CITY 76(8), P. 102 (AUGUST 1961). IN DELAWARE COUNTY, PENNSYLVANIA, THREE SEPARATE INCINERATORS WERE BUILT, EACH WITH A CAPACITY OF 500 TONS PER 24 HOURS. INCINERATION WAS CHOSEN OVER LANDFILLING BECAUSE - (1) THE LARGEST AVAILABLE SITES WERE TOO FAR REMOVED FROM THE POPULATION CENTERS TO BE ECONOMICAL, (2) MANY OF THE SITES LAY IN WATERSHED AREAS OF RESERVOIRS SUPPLYING DRINKING WATER, (3) EXPENSIVE FLOOD CONTROL MEASURES WOULD BE NECESSARY PRIOR TO USE OF SWAMPY LOWLANDS ADJACENT TO THE DELAWARE RIVER, (4) LANDFILLS WOULD SOON CONSUME AVAILABLE LAND. THE POPULATION WAS 550,000 IN 1960. FORTY-NINE MUNICIPALITIES ARE CONCERNED. GARBAGE GRINDERS ARE NOT PERMITTED DUE TO INABILITY OF SEWERAGE FACILITIES TO HANDLE THE ADDITIONAL LOAD. (UC)

08-03-01354 WHAT GOOD INCINERATION MEANS (CALORIFIC-VALUE RESIDUE EMISSION(CONTROL))
MICHAELS, A.
THE AMERICAN CITY 83(5), P. 83 (MAY 1968). THIS IS THE FIRST OF A THREE-PART PAPER ON INCINERATION. THE FIRST INCINERATOR PLANT WAS BUILT IN 1885 FOR AN ARMY INSTALLATION. ALTHOUGH A FEW PLANTS WERE CONSTRUCTED DURING THE NEXT 15 YEARS, THE IDEA OF USING INCINERATION IN THE DISPOSAL OF MUNICIPAL REFUSE DID NOT GAIN ANY APPRECIABLE DEGREE OF ACCEPTANCE. EVEN IN THE 20TH CENTURY, THE ACCEPTANCE OF INCINERATION PROGRESSED QUITE SLOWLY. THUS, IN 1952, BOWERMAN AND LUDWIG (THE AMERICAN CITY 67, MARCH 1952) REPORTED THAT OF THE 175 CITIES THAT HAD OPERATED INCINERATORS, OVER ONE-THIRD (I.E. 60) HAD ABANDONED THEIR PLANTS. CHANGES IN AMERICAN LIVING HABITS WHICH TOOK PLACE AFTER WORLD WAR II BROUGHT ABOUT THE PRESSURES NEEDED TO IMPROVE INCINERATOR DESIGN TO A LEVEL AT WHICH INCINERATION COULD BE PRACTICED WITHOUT PLACING AN INTOLERABLE BURDEN UPON THE ENVIRONMENT. "PRIOR TO 1950, THE MANUFACTURERS ACTUALLY DESIGNED MOST INCINERATOR FURNACES AND THEIR APPURTENANCES TO MEET PERFORMANCE SPECIFICATIONS LOOSELY DEFINED BY THE TONNAGE OF THE REFUSE TO BE HANDLED. INVARIABLY THE INCINERATOR MANUFACTURER USED AN EXISTING FURNACE CONFIGURATION AS THE BASIS FOR DESIGN....AN ARCHITECT OR ENGINEER WOULD THEN DESIGN A STRUCTURE TO HOUSE THE INCINERATOR EQUIPMENT." TODAY'S ENGINEERING CONTRACT GENERALLY CONTAINS A LIST OF CRITERIA DESIGNATED BY THE MUNICIPALITY AS BEING ESSENTIAL IN THE DESIGNING OF THE PLANT. EXAMPLES OF THE CRITERIA ARE - (1) THE QUANTITY AND CHARACTERISTICS OF THE WASTE TO BE BURNED, (2) THE AIR POLLUTION REQUIREMENTS OF THE PLANT, (3) THE QUALITY OF THE RESIDUE, (4) THE TYPE OF MANPOWER TO BE USED FOR PLANT OPERATIONS, (5) THE PLANT SITE, (6) THE MONEY AVAILABLE FOR CONSTRUCTION. DETERMINATION OF THE HEAT VALUE OF REFUSE GENERALLY IS BASED UPON THE ASSUMPTION THAT COMBUSTIBLE REFUSE GENERALLY IS CELLULOSIC IN NATURE. HOWEVER, SINCE THE PERCENTAGE OF PLASTIC IS INCREASING, ITS HIGH HEAT VALUE (UP TO 19,000 BTU) SHOULD BE CONSIDERED IN NEW DESIGNS. (UC)

08-03-01355 YOU DON'T NEED A TALL STACK (INCINERATION EMISSION(CONTROL))
TAYLOR, M. G., JR.
THE AMERICAN CITY 76(12), P. 74-75 (DECEMBER 1960). THE LOCATION OF THE PLANT IS IN WINCHESTER, KENTUCKY. ITS CAPACITY IS 100 TONS/DAY. AIR POLLUTION EQUIPMENT - INCINERATOR GASES PASS THROUGH A BREACHING INTO A CHAMBER IN WHICH COOLING IS ACCOMPLISHED BY WATER SPRAY AND DILUTION WITH EXCESS AIR. THE STACK TEMPERATURE OF THE GASES IS 350 DEGREES F. DESIGN FEATURES - THE INCINERATOR PLANT CONSISTS OF TWO FURNACES, WHICH ARE RAM-SHAPED AND HAVE NEITHER STORAGE PIT NOR CRANE. THE DESIGN TEMPERATURE OF THE PRIMARY COMBUSTION FURNACE IS 1600 DEGREES F, AND THAT AT THE INCINERATOR EXIT, 1200 DEGREES F. THE PLANT HAS A TWO-MAN STAFF, BUT APPARENTLY ONE MAN WOULD SUFFICE. (UC)

08-03-01356 REFUSE INCINERATION - - TRENDS AND DEVELOPMENTS (QUANTITY CALORIFIC-VALUE COST(CAPITAL) HEAT-RECOVERY COST(OPERATING) FUEL(AUXILIARY))
ROGUS, C. A.
THE AMERICAN CITY 74(7), P. 94-98 (JULY 1959). THE ASH AND GARBAGE CONTENT (NORTHERLY STATES) OF REFUSE HAS DROPPED BY ABOUT 40 PERCENT AND 70 PERCENT, RESPECTIVELY. THE QUANTITIES OF REFUSE ARE INCREASING, BUT THE AMOUNT COLLECTED IS ONLY 70 PERCENT TO 80 PERCENT OF THAT PRODUCED, SINCE SELF-DISPOSAL BY INDUSTRY, COMMERCIAL ESTABLISHMENTS, AND APARTMENTS IS ON THE INCREASE FOR REASONS OF ECONOMY AND CONVENIENCE. THE THERMAL CONTENT HAS INCREASED FROM 3,500 BTU PER LB A DECADE AGO TO A PRESENT LEVEL OF 4,500 BTU PER LB. MODERN FURNACES NO LONGER REQUIRE SEGREGATED REFUSE, SO THAT THE EXPENSE OF SEPARATE CONTAINERS AND COLLECTION IS NO LONGER NECESSARY. INCINERATION OF REFUSE USES UP 1/3 TO 2/3 OF ITS THERMAL VALUE. THE EXCESS COULD BE UTILIZED. TRUCK SCALES ARE VALUABLE FOR PLANNING OPERATIONS. CAPACITY RATINGS SHOULD BE IN TONS PER WEEK, SINCE DENSITY AND PATTERN OF OPERATIONS VARY WITH LOCATION. (UC)

08-03-01361 LOUISVILLE INCINERATOR OPERATES ON PRODUCTION LINE BASIS (SALVAGE(METAL) EMISSION(CONTROL) BULKY-WASTES HEAT-RECOVERY COST(CAPITAL)
LEAKE, J. W.
THE AMERICAN CITY 72(11), P. 104-107 (NOVEMBER 1957). TWO 5-TON OVERHEAD CRANES TRANSFER REFUSE FROM BIN TO CHARGING HOPPERS, HOPPERS ARE OF CONSTANT FEED TYPE, DISCHARGING REFUSE DIRECTLY ONTO PAIR OF OSCILLATING DRYING GRATES. HOT GASES PASSING OVER MATERIAL REMOVE 50 PERCENT OF MOISTURE BEFORE IT DROPS ONTO SECOND SET OF OSCILLATING GRATES. METAL SALVAGE AND SLUDGE DRYING ARE SPECIAL FEATURES. (EI)

08-03-01366 BRIDGEPORT INCINERATOR UTILIZED SEWAGE PLANT EFFLUENT (COST(CAPITAL))
THE AMERICAN CITY 74(1), P. 82 (JANUARY 1959). THE BOSTWICK AVENUE INCINERATION PLANT IN BRIDGEPORT, CONNECTICUT, HAS OPERATED ON AN AVERAGE OF 90 PERCENT CAPACITY FIVE DAYS PER WEEK SINCE ITS OPENING IN 1958. NO BAD EFFECTS FROM A 29 PERCENT OVERLOAD WERE NOTED, EVEN THOUGH IT WAS DESIGNED TO HANDLE ONLY A 25-PERCENT OVERLOAD. THE RATED CAPACITY OF THE INCINERATOR IS 300 TONS. THE PLANT USES EFFLUENT FROM A SEWAGE TREATMENT PLANT FOR RESIDUE QUENCHING, FLY ASH CONTROL, AND OTHER PLANT USES NOT REQUIRING POTABLE WATER. IT HAS TWO 150-TON FURNACES, EACH WITH 150 SQ FT OF GRATE AREA. OPERATING TEMPERATURES ARE BETWEEN 1400 DEGREES F AND 1800 DEGREES F. TOTAL COST, INCLUDING ROADS, PAVING, FENCING, BUT EXCLUDING ENGINEERING AND LEGAL FEES, CAME TO $1,170,000. (UC)

08-03-01367 THE REFUSE INCINERATION PILOT PLANT IN DUESSELDORF (EMISSION(CONTROL))
WEIHE, A. V.
MITT VGB 77(4), P. 105-107 (APRIL 1962). COMBUSTION 34(4), P. 55 (OCTOBER 1962). THE PILOT PLANT WAS BUILT IN FRONT OF AN EXISTING BOILER WITH TRAVELING GRATE AND CONSISTS OF STORAGE SHAFT, A FEEDER AND 4 ROLLERS IN STEP-WISE FORMATION. THE FEEDER SUPPLIES THE FIRST ROLLER WITH A LAYER OF REFUSE OF 4 FEET THICKNESS FROM WHICH IT TURNS OVER IN FALLING ON THE NEXT ROLLER SO THAT ITS CONTENTS ARE DRIED AND THE COMBUSTIBLE MATTER IGNITED. FINAL BURNING OUT TAKES PLACE ON THE TRAVELING GRATE, WHICH HAS NOT PROVED SATISFACTORY AND WILL BE REPLACED BY 2 OR 3 ROLLERS IN THE PROJECTED LARGE SCALE PLANT. THE ROLLERS ARE COVERED BY GRATE BARS, AND HALF OF THESE ARE AT ANY ONE TIME IN THE FURNACE AND THE OTHER HALF IN THE WINDBOX FROM WHICH AN ADJUSTABLE AIR VOLUME IS ADMITTED AXIALLY TO THE ROLLERS. TESTS AFTER 3,000-HR OF OPERATION DURING WHICH OVER 4 MILLION CU-FT OF REFUSE WERE BURNT SHOWED THAT THE COMBUSTION EFFICIENCY WAS 83 PERCENT, THE BOILER EFFICIENCY 57 PERCENT, THE CARBON DIOXIDE CONTENT OF THE FLUE GAS 12-13 PERCENT, THE OXYGEN CONTENT 6-7 PERCENT, COMBUSTIBLES IN THE ASH 5-6 PERCENT, COMBUSTIBLES IN THE FLY ASH 5 PERCENT, THE ASH FREE OF GERMS, AND THE FLUE GAS FREE OF SMELL. THE PILOT PLANT PRESENTLY BURNS 35,000 CU-FT/DAY OF REFUSE. THE FULL SCALE PLANT IS DESIGNED FOR A YEARLY INCINERATION OF 200,000 TONS OF REFUSE. (PHEA)

08-03-01368 THE ROTTERDAM REFUSE POWER STATION (INCINERATION HEAT-RECOVERY POWER)
DIJKSHOORN, R..
MITT VGB 77(4), P. 108-111 (APRIL 1962). THE POWER STATION UNDER CONSTRUCTION CONTAINS FOUR BOILERS EACH RATED AT 60,000 LB/HR OF STEAM AT 400 PSI AND 680 F WITH A FEEDWATER TEMPERATURE OF 260 F EQUIPPED WITH MARTIN RECIPROCATING GRATES FOR FIRING 12.8 TONS/HR OF REFUSE, ECONOMIZER, SUPERHEATER, AIR PREHEATER AND ELECTROSTATIC PRECIPITATOR (EFFICIENCY 97.7-99.6 PERCENT). THE BOILER CONTAINS A LARGE, SUBDIVIDED RADIANT WATER COOLED FURNACE TO COOL THE FLUE GAS AND ASH PARTICLES OF LOW SOFTENING POINT BELOW 1650 F BEFORE THEIR ENTRY INTO THE CONVECTION SECTION, THE FLUE GAS VELOCITY IS KEPT BELOW 15 FT/SEC TO AVOID EROSION OF BOILER TUBES. ECONOMIZERS AND AIR PREHEATER ARE PROVIDED WITH STEEL SHOT CLEANERS. IT IS EXPECTED THAT THE ASSOCIATED TURBO-GENERATORS WILL GENERATE 55.5 MILLION KW-HR/YR NET. (COMB)

08-03-01369 A REFUSE INCINERATION PLANT FOR THE RUHR REGION (HEAT-RECOVERY)
VDI-NACHR (8), P. 8 (MAY 1962). SIX LARGE TOWNS IN THE RUHR WITH A POPULATION OF 18 MILLION AND AN ANNUAL PRODUCTION OF 360,000 TONS OF REFUSE ARE PLANNING IN COLLABORATION WITH THE RWE THE INSTALLATION OF A REFUSE INCINERATION PLANT IN FRONT OF 5 OUT OF A TOTAL OF 10 PULVERIZED COAL FIRED BOILERS OF THE ESSEN-KARNAP POWER STATION. THE REFUSE VEHICLES UNLOAD THE REFUSE FREE OF DUST AND SMELL VIA AN AIR LOCK INTO BUNKERS HELD UNDER VACUUM FROM WHICH CONVEYORS TRANSPORT IT VIA A MAGNETIC SEPARATOR TO A SYSTEM OF TRAVELING GRATES IN A FURNACE IN FRONT OF THE BOILER PROPER. IGNITION IS SUPPORTED BY AUXILIARY FUEL FIRING. THE TRAVELING GRATE PASSES ALSO THROUGH THE MAIN FURNACE TO ENSURE COMPLETE BURNING OUT OF THE ASH AND A TEMPERATURE OF 3300 F OF THE FLUE GASES TO MAKE THEM COMPLETELY FREE OF SMELL AND TO DESTROY ALL GERMS. IF THIS INSTALLATION IS SUCCESSFUL THE OTHER BOILERS WILL ALSO BE CONVERTED TO REFUSE INCINERATION AS DEMAND REQUIRES. (COMB)

08-03-01386 NEW ROTARY CONE REFUSE INCINERATOR
SURVEYOR 122(3720), P. 1183-1184 (SEPTEMBER 21, 1963). NEW COMBUSTION CONE AND AFTERBURNER CHAMBER IS DESIGNED SO THAT BULKY ITEMS PASS SLOWLY AND SMALL PIECES MORE QUICKLY THROUGH FLAME, SMALL BURNED PIECES AND ASH ARE REMOVED CONTINUOUSLY WHILE VOLATILE MATERIAL AND FINE DUST ARE EFFECTIVELY BURNED IN SPECIAL AFTERBURN CHAMBER, INCINERATOR DESIGN AND OPERATION DESCRIBED. (EI)

08-03-01387 FULHAM'S NEW REFUSE DESTRUCTOR ON SITE OF TWO PREVIOUS PLANTS (SALVAGE SEGREGATION INCINERATION HEAT-RECOVERY COMPACTION(BALERS))
SURVEYOR 123(3737), P. 24-25 (JANUARY 18, 1964). RECONSTRUCTION OF REFUSE DESTRUCTOR AT FULHAM, ENGLAND. NEW MECHANICAL PLANT PROVIDES SATISFACTORY TREATMENT OF REFUSE BY SEPARATION, SALVAGE AND INCINERATION. REFUSE COLLECTION VEHICLES DISCHARGE CONTENTS INTO 140-CU-YD HOPPER EQUIPPED WITH FEEDER CONVEYOR AND HYDRAULICALLY OPERATED REGULATING BEAM TO PRODUCE EVEN FLOW THROUGH PLANT. DESIGN CAPACITY IS 150 TONS OF REFUSE IN 8 HOUR PERIOD. (EI)

08-03-01402 AN INCINERATOR IS A GOOD INVESTMENT (COST(CAPITAL))
ULRICH, H. H.
THE AMERICAN CITY 71(1), P. 88 (JANUARY 1956). THE BACKGROUND OF THE FINANCING AND CONSTRUCTION OF A 375 TON RATED CAPACITY INCINERATOR AT OMAHA, NEBRASKA, BY A NON-PROFIT PRIVATE CORPORATION IS PRESENTED. INCLUDED ARE DESIGN, COST, AND OPERATING DETAILS. (PHS)

08-03-01405 SPRAY SYSTEM SUPPRESSES INCINERATOR ODORS
THE AMERICAN CITY 71(1), P. 13 (JANUARY 1956). AN ACCOUNT OF THE INSTALLATION IN THE STORAGE PIT OF THE BROOKLINE, MASSACHUSETTS MUNICIPAL INCINERATOR OF A CHEMICAL SPRAY SYSTEM TO CONTROL ODORS AND ALLAY DUST. (PHS)

08-03-01406 433 PERCENT LARGER (INCINERATOR)
THE AMERICAN CITY 71(2), P. 106 (FEBRUARY 1956). BABYLON, NEW YORK REBUILDS ITS TEN-YEAR OLD 90-TON INCINERATOR TO 390 TON CAPACITY. INCLUDED ARE DESIGN DATA ON PIT VOLUME, FURNACE APPURTENANCE, GRATE AREA, CRANE INSTALLATION, AND DEVELOPMENT OF AN INDIVIDUAL WATER SUPPLY. CAPITAL COST WAS $2,564/TON OF RATED CAPACITY. (PHS)

08-03-01411 INCINERATOR VACUUM CLEANER CUTS LABOR COSTS
THE AMERICAN CITY 71(3), P. 136 (MARCH 1956). A STATIONARY VACUUM CLEANING SYSTEM AT THE ROYAL OAK, MICHIGAN MUNICIPAL INCINERATOR PERMITS RAPID AND CONVENIENT CLEANING OF COMBUSTION CHAMBERS AND THE CHIMNEY BASE. (PHS)

08-03-01421 THE TOWN OF HUNTINGTON LOOKS AHEAD--WITH INCINERATION (COST(CAPITAL))
SCUDDER, G. H.
THE AMERICAN CITY 71(4), P. 106 (APRIL 1956). HUNTINGTON, NEW YORK, BUILDS AN INCINERATOR AFTER THE APPARENT COST AND RIGID SPECIFICATIONS SET UP BY THE CITY DISCOURAGED THE ADOPTION OF COMPOSTING AS THE METHOD OF DISPOSAL. INCLUDED ARE DETAILS OF THE INCINERATOR DESIGN CRITERIA USED IN THE CONSTRUCTION OF A 150-TON PLANT AT A COST OF $2,700 PER TON OF RATED CAPACITY (BUILDING AND EQUIPMENT). FURNACE GRATES WERE DESIGNED ON THE BASIS OF 56 LBS OF REFUSE BURNED PER SQ-FT OF GRATE AREA, COMBUSTION CHAMBER AND FURNACE VOLUME WERE 13.4 CU-FT AND 15.8 CU-FT/TON RESPECTIVELY AND THE SIZE OF THE STORAGE PIT WAS 32 BY 19 AND 34-FT DEEP. (PHS)

08-03-01429 INCINERATION OF REFUSE ON ROLLER GRATES
VON WEIHE, A.
MUELLVERBRENNUNG AUF WALZENROSTEN, ELEKTRIZITAETSWIRTSCHAFT 61(21), P. 809-810 (NOVEMBER 5, 1962). EXPERIENCE WITH PILOT PLANT PUT INTO OPERATION IN DUESSELDORF IN 1961. NEW LARGE INCINERATOR PLANT IS DESIGNED TO BURN 1440 TONS OF REFUSE DAILY TO GENERATE STEAM AT 500 C AND 106 ATM FOR DUESSELDORF STEAM POWER PLANT. (EI)

08-03-01431 ST. LOUIS TURNS TO INCINERATION
THE AMERICAN CITY 71(7), P. 124 (JULY 1956). THE AUTHOR TRACES THE BACKGROUND DEVELOPMENT OF THE NEED FOR AN INCINERATOR PROGRAM IN ST. LOUIS. INCLUDED ARE DESIGN DETAILS OF THE NEW SOUTHSIDE INCINERATOR. IT IS REPORTED THAT THE ORIGINAL 100 TON DESIGN CAPACITY WHICH WAS BASED ON 50 POUNDS OF REFUSE BURNED PER SQUARE FOOT OF GRATE AREA WITH A FURNACE VOLUME OF 14 CU-FT/TON HAVE BEEN EXCEEDED BY AS MUCH AS 70 PERCENT. THE SINGLE EXPANSION CHAMBER WHICH SERVES FOUR FURNACES IS DESIGNED TO REDUCE GAS VELOCITIES TO 7-1/2 FT PER SECOND. (PHS)

08-03-01432 TWO PLANTS FOR THE PRICE OF ONE (INCINERATOR SLUDGE(SEWAGE))
EVERS, H. J.
THE AMERICAN CITY 71(7), P. 101 (JULY 1956). MERRILL, WISCONSIN CONSTRUCTS A 35 TON PER DAY INCINERATOR IN CONJUNCTION WITH ITS SEWAGE TREATMENT WORKS. THE FURNACE IS DESIGNED TO INCINERATE DEWATERED SLUDGE CAKE HAVING 65 PERCENT TO 70 PERCENT MOISTURE ALONG WITH THE REFUSE. (PHS)

08-03-01435 TWO NEW INCINERATORS (COST(CAPITAL) COST(OPERATING) EMISSION(CONTROL) COLLECTION ASH-DISPOSAL RAIL-HAUL)
LEWIS, J. V. + NUSSBAUMER, N. L.
THE AMERICAN CITY 71(9), P. 105 (SEPTEMBER 1956). A REVAMPING PROGRAM TO IMPROVE REFUSE COLLECTION AND DISPOSAL METHODS AT ROCHESTER, NEW YORK IS DESCRIBED. COLLECTION ROUTES WERE REWORKED, MODERN EQUIPMENT OBTAINED, AND A SWITCH FROM " REDUCTION " AS A PRIMARY METHOD OF DISPOSAL TO INCINERATION IS REPORTED. THE CONSTRUCTION OF TWO NEW INCINERATOR PLANTS AND MODERNIZATION OF A THIRD IS DESCRIBED. THE NEW PLANTS (CONSTRUCTION HAS BEEN COMPLETED) WERE OF 450 AND 600 TON/24 HR. CAPACITY RESPECTIVELY. COST PER TON OF CAPACITY FOR CONSTRUCTION WAS $3,240. OPERATING COSTS ARE REPORTED AT $2.39 AND $2.84 PER TON FOR THE PLANTS. EQUIPMENT AND TESTS TO MEET LOCAL AIR POLLUTION REQUIREMENTS ARE ALSO DESCRIBED. (PHS)

08-03-01442 ALEXANDRIA'S INCINERATOR RETAINS THE COLONIAL TOUCH (COST(CAPITAL))
AHLL, P. B.
THE AMERICAN CITY 71(11), P. 109 (NOVEMBER 1956). A GENERALLY DESCRIPTIVE REPORT OF THE CONSTRUCTION OF A 200 TON PER 24 HOUR REFUSE INCINERATOR AT ALEXANDRIA, VIRGINIA. THE BIN AND CRANE TYPE PLANT WAS PLACED IN OPERATION IN 1956, AND WAS CONSTRUCTED AT A COST OF $3,730/TON OF RATED CAPACITY. (PHS)

08-03-01445 PROGRESS IS THE KEY (INCINERATION HISTORY COLLECTION)
GEISHEKER, B. J.
THE AMERICAN CITY 71(12), P. 82 (DECEMBER 1956). AN ACCOUNT OF THE 46 YEAR HISTORY OF THE DEVELOPMENT OF INCINERATION AND REFUSE COLLECTION METHODS AT MILWAUKEE, WISCONSIN. (PHS)

08-03-01447 OBSERVATIONS ABOUT MUNICIPAL INCINERATORS (EMISSION(CONTROL) DESIGN RESIDUE(DISPOSAL) COST(OPERATING))
THE AMERICAN CITY 72(11), P. 31 (NOVEMBER 1957). CONCLUSIONS OF A PANEL DISCUSSION BY THE SANITARY ENGINEERING SECTION OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS ARE SUMMARIZED. ITEMS COVERED INCLUDE INCINERATOR LOCATION, SIZE OF SITE, STORAGE PIT DESIGN, FURNACE DESIGN, FLY ASH CONTROL, INCINERATOR RESIDUE AND COSTS. (PHS)

08-03-01448 LOUISVILLE INCINERATOR OPERATES ON PRODUCTION LINE BASIS (ROTERY-KILN SALVAGE(FERROUS) COST(CAPITAL) COLLECTION)
LEAKE, J. W.
THE AMERICAN CITY 72(11), P. 104 (NOVEMBER 1957). LOUISVILLE, KENTUCKY'S NEW INCINERATOR, RATED AT 750 TONS PER 24 HOURS, IS SIMILAR TO THAT USED IN ATLANTA, GEORGIA. IT EMPLOYS METAL SALVAGE AND SLUDGE DRYING WHICH ARE REPORTED TO BE MONEY SAVERS. THE TOTAL COST OF THE HIGHLY MECHANICAL INCINERATOR WAS $3.7 MILLION. A CREW OF 53 OPERATES ON A 24-HR DAY, 7-DAY WEEK BASIS. EQUIPMENT TYPES AND SIZES ARE STANDARDIZED TO SIMPLIFY MAINTENANCE. ELABORATION IS MADE ON FLY-ASH CONTROL, WOOD HOGS, INCOME AND SAVINGS AND THE COLLECTION SYSTEM FOR THIS SITE. (PHS)

08-03-01449 INCINERATORS ARE CHEAPER (COST(CAPITAL) RESIDUE(DISPOSAL) CALORIFIC-VALUE)
SCHNEIDER, C.
THE AMERICAN CITY 72(11), P. 172 (NOVEMBER 1957). THE NEW NEW ORLEANS INCINERATOR WILL COST $750,000 AND IS RATED AT 400 TONS PER 24 HOURS. ECONOMICAL FEATURES, INCLUDING HOLLOW TILE BUILDING WALLS AND A GROUND FLOOR WITHOUT WALLS, ARE DESCRIBED. THE TOTAL VOLUME OF THE INCINERATOR WHICH IS TO BE IN OPERATION BY THE END OF THE YEAR, IS 9,444 CU-FT OR 23.4 CU-FT/TON OF RATED CAPACITY. (PHS)

08-03-01456 AN EXTRA-FEATURE INCINERATOR (COLLECTION)
HETTENBACH, C. F.
THE AMERICAN CITY 72(7), P. 119 (JULY 1957). ABINGTON, PENNSYLVANIA REPORTS ON OPERATION OF ITS NEW 200 TON PER DAY INCINERATOR. THE HIGHLY MECHANICAL PLANT FEATURES A FIRE JET SYSTEM FOR EXTINGUISHING STORAGE PIT FIRES. DATA ON ABINGTON'S INCENTIVE TYPE COLLECTION SYSTEM ARE ALSO INCLUDED. (PHS)

08-03-01459 THREE FLORIDA INCINERATORS (EMISSION(CONTROL) HEAT-RECOVERY HEAT(SPACE))
SLEEGER, W. H.
THE AMERICAN CITY 72(6), P. 138 (JUNE 1957). A COMPARISON OF INCINERATORS AT MIAMI, FT. LAUDERDALE, AND CORAL GABLES IS PRESENTED WITH AN ENGINEERING EXPLANATION OF WHY THEY DIFFER. MIAMI AND CORAL GABLES BECAUSE OF THEIR CENTRAL LOCATION, TAKE SPECIAL PRECAUTION TO INSURE CLEAN STACK GASES. IN ADDITION, MIAMI PRODUCES POWER FROM ITS INCINERATOR OPERATION. FORT LAUDERDALE HAS AN UNUSUAL MINIMUM DESIGN TAKING ADVANTAGE OF ITS FAIRLY REMOTE LOCATION. (PHS)

08-03-01470 TORONTO'S NEWEST INCINERATOR (DESIGN)
BRADLEY, H. D.
THE AMERICAN CITY 72(2), P. 107 (FEBRUARY 1957). REPORT ON THE COMPLETION OF A NEW 900 TON RATED CAPACITY REFUSE INCINERATOR IN TORONTO, CANADA. TOTAL COST OF THE PLANT WAS $2.2 MILLION. NOTE WAS MADE OF AN INCREASE IN THE AMOUNT OF GARBAGE AND COMBUSTIBLE RUBBISH TO BE INCINERATED FROM 1.4 LB/ CAPITA/DAY IN 1917 TO 1.65 LB/CAPITA/DAY IN 1956. (PHS)

08-03-01472 CHICAGO COMPLETES FIRST OF FOUR INCINERATORS (EMISSION(CONTROL) COST(CAPITAL))
GERHARDT, P.
THE AMERICAN CITY 72(1), P. 96 (JANUARY 1957). THE MEDILL INCINERATOR, THE FIRST OF FOUR INCINERATORS PLANNED FOR CHICAGO IS DESCRIBED. THE 720 TON PER DAY PLANT WAS BUILT AT A COST OF $2,507,000. REFUSE HANDLED DURING THE PLANTS ACCEPTANCE AVERAGE 400 LBS/CU-YD AND CONTAINED ONLY 3 PERCENT BY VOLUME OF GARBAGE. DESIGN SPECIFICATIONS INCLUDE STORAGE PIT 195' X 22' X 24' OR 4250 CU-YDS, 65 LBS/SQ-FT/HR BURNING RATE FOR THE GRATES, 70 CU-FT VOLUME PER TON PER DAY FOR COMBUSTION AND SUBSIDENCE CHAMBER AND 250 FEET IN HEIGHT AND 12' DIAMETER STACKS. HEAT VALUE OF THE REFUSE AVERAGED 4,000 BTU/LB AT 15 PERCENT MOISTURE. FLY ASH REMOVAL IS ACCOMPLISHED BY WATER SPRAYS. HOWEVER, DUST LOADINGS WERE REPORTEDLY HIGHER THAN 0.35 GRAINS PER CU-FT OF GAS MEASURED AT 60 DEGREES F. ADJUSTED TO 12 PERCENT CARBON DIOXIDE. (PHS)

08-03-01505 SPECIAL STUDIES FOR INCINERATORS FOR THE GOVERNMENT OF THE DISTRICT OF COLUMBIA (EMISSION(CONTROL) POLLUTION(AIR) COMPOSITION CORROSION INCINERATION LABORATORY(CONTROL) SIZE-REDUCTION BULKY-WASTE COST(CAPITAL) ECONOMICS COST(OPERATING) COMPACTION HEAT-RECOVERY SALVAGE(FERROUS))
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE REPORT 1748 (1968). THE SCOPE OF THIS STUDY INCLUDES AN ESTIMATION OF THE CHEMICAL CONSTITUENTS OF MUNICIPAL INCINERATOR EFFLUENT GASES, THE POTENTIAL AIR POLLUTION HAZARD OF SUCH CHEMICALS, AND THE EVALUATION OF VARIOUS ABATEMENT DEVICES APPLICABLE TO THE GAS STREAM LEAVING THE FURNACES OF A PROPOSED 800 TON PER DAY INCINERATOR PLANT. THE EFFLUENT STREAM WAS FOUND TO CONTAIN INORGANIC AND ORGANIC SUBSTANCES IN THE FORM OF BOTH GASES AND PARTICULATES. SOME OF THESE CONSTITUENTS IN THE EFFLUENT STREAM WERE FOUND TO BE BOTH TOXIC AND CORROSIVE WHEN PRESENT IN APPRECIABLE AMOUNTS. ELECTROSTATIC PRECIPITATORS AND HIGH ENERGY SCRUBBERS ARE TWO TYPES OF POLLUTION CONTROL EQUIPMENT APPLICABLE TO THIS PARTICULAR PLANT. ELECTROSTATIC PRECIPITATORS PRECEDED BY MECHANICAL COLLECTORS ARE RECOMMENDED FOR THE AIR POLLUTION CONTROL EQUIPMENT. THE USE OF HIGH ENERGY SCRUBBERS IS CONSIDERED ACCEPTABLE FROM A PERFORMANCE STANDPOINT, BUT ESTHETIC OBJECTIONS TO THE VAPOR PLUME AND PROBABLE THERMAL POLLUTION OF THE WATER SOURCE RULE OUT THIS APPLICATION AT THE DISTRICT OF COLUMBIA LOCATION. THIS REPORT DISCUSSES METHODS FOR MUNICIPAL DISPOSAL OF BULKY METAL OBJECTS. THE USE OF COMPRESSION PRESSES TO REDUCE THE VOLUME OF THESE OBJECTS WAS INVESTIGATED AND FOUND TO BE ACCEPTABLE UNDER CERTAIN CONDITIONS. CAPITAL INVESTMENT ESTIMATES AND EVALUATION OF OPERATING COSTS FOR METAL PRESSES INSTALLED AT TWO SEPARATE LOCATIONS ARE REPORTED. THE AMOUNT OF METAL TO BE HANDLED IN THE DISTRICT OF COLUMBIA IS NOT SUFFICIENT TO ACHIEVE A GOOD ECONOMY OF OPERATION. THE ALTERNATE USE OF OUTSIDE CONTRACTORS OR METAL SHREDDING AS A POTENTIALLY MORE ECONOMICAL SOLUTION IS RECOMMENDED. DISPOSAL OF OVERSIZE BURNABLE WASTE IN THE DISTRICT OF COLUMBIA IS PRESENTLY CONDUCTED BY DIRECT BURIAL OR BURNING OF THESE LARGE OBJECTS IN LANDFILL OPERATIONS. THE INCINERATION OF THESE OBJECTS DIRECTLY IN THE FURNACES WITH NORMAL MUNICIPAL REFUSE DOES NOT PRODUCE ACCEPTABLE BURNOUT. THE INVESTIGATION OF METHODS FOR SIZE REDUCTION OF THESE OBJECTS TO PIECES THAT WILL BURN COMPATIBLY WITH NORMAL MUNICIPAL REFUSE IS DESCRIBED. AN ALTERNATE METHOD OF DISPOSAL BY BURNING DENSE OBJECTS IN SPECIALLY DESIGNED INCINERATORS IS ALSO DESCRIBED. THE INSTALLATION OF A SHREDDER FOR SIZE REDUCTION IS RECOMMENDED. THIS REPORT PRESENTS ITEMIZED LISTS OF INSTRUMENTATION AND LABORATORY EQUIPMENT AND THEIR ESTIMATED INSTALLED COSTS. THIS EQUIPMENT WAS SELECTED TO PERMIT NORMAL MONITORING OF PLANT OPERATION AND TO AID IN THE PERFORMANCE OF TESTS FOR DEVELOPMENT OF INCINERATOR DESIGN AND OPERATING TECHNIQUES. REFERENCES TO EXISTING TEST PROCEDURES ARE PRESENTED TO AID IN THE PROPER APPLICATION OF THE EQUIPMENT ITEMS SUGGESTED. SEVERAL APPARENTLY SUCCESSFUL EUROPEAN APPLICATIONS OF STEAM BOILERS TO MUNICIPAL REFUSE INCINERATORS HAVE PROMPTED CONSIDERATION OF SIMILAR INSTALLATIONS FOR AMERICAN INCINERATORS. AMERICAN OPERATING EXPERIENCE WITH INCINERATOR HEAT RECOVERY BOILERS HAS BEEN LIMITED, AND NO OUTSTANDING PATTERN OF SUCCESSFUL OPERATION HAS BEEN ESTABLISHED. IN ORDER TO EVALUATE THIS DISPARITY BETWEEN EUROPEAN AND AMERICAN PRACTICE, THIS REPORT COMPARES THE TYPICAL REFUSE COMPOSITIONS, REFUSE HEATING VALUES, AND THE APPLICATIONS OF HEAT RECOVERY EQUIPMENT TO INCINERATOR FURNACES. CONSIDERATION IS GIVEN TO BOTH REFRACTORY AND WATER-COOLED FURNACES, THEIR EFFECT ON EXCESS AIR REQUIREMENTS, AND THE ECONOMICS OF THE SALE OF STEAM OR OTHER METHODS OF HEAT DISSIPATION. FOR THE PROPOSED WASHINGTON, D.C., INCINERATOR NO. 5, THE REPORT REVIEWS THE APPLICATION OF A BOILER PLANT CAPABLE OF BURNING 800 TONS OF REFUSE PER DAY WITH FOUR INCINERATOR FURNACES. THE ECONOMICS OF THE PROPOSED PLANT DO NOT JUSTIFY THE INSTALLATION OF HEAT RECOVERY EQUIPMENT.

08-03-01513 MUNICIPAL INCINERATION - A FIELD STUDY OF PERFORMANCE OF THREE MUNICIPAL INCINERATORS (CALORIFIC-VALUE HEAT-RECOVERY EMISSION FUEL(AUXILIARY) CRITERIA(ANALYSIS))
UNIVERSITY OF CALIFORNIA, BERKELEY, SANITARY ENGINEERING RESEARCH PROJECT, IER SERIES 37, TECH BULL 6 (NOVEMBER 1951). IN 1950, TESTS WERE MADE ON THREE CALIFORNIA INCINERATORS - SIGNAL HILL, BEVERLY HILLS, AND PASADENA. THE PURPOSE OF THE STUDY WAS TO DEVELOP METHODS FOR OBTAINING PERFORMANCE DATA ON MUNICIPAL INCINERATORS, TO EXAMINE EXISTING CRITERIA, AND TO SUGGEST NEW CRITERIA FOR INTERPRETING PERFORMANCE DATA ON MUNICIPAL INCINERATORS. FUEL VALUE OF REFUSE, MOISTURE, AND EXCESS AIR, TEMPERATURE, GAS ANALYSIS, HEAT AND MASS BALANCES, AND STACK DISCHARGES WERE STUDIED. ALSO OF CONCERN WERE UTILIZATION OF WASTE HEAT, AUXILIARY FUELS, STACK DISCHARGES AND OPERATION OF INCINERATORS. MEASURING TECHNIQUES AND ACTUAL PERFORMANCE OF EACH INCINERATOR ARE DISCUSSED. (UC)

08-03-01523 MUNICIPAL INCINERATOR SELECTION (DESIGN EMISSION COMBUSTION(CALCULATIONS))
MEISSNER, H. G.
PUBLIC WORKS 90(11), P. 99-105 (NOVEMBER 1959). PROS AND CONS OF VARIOUS DESIGNS - DETERMINATION OF AVERAGE AMOUNT OF REFUSE TO BE BURNED, AS WELL AS ITS GENERAL CHARACTERISTICS, AND VARIATIONS FROM DAY TO DAY AND BY SEASONS, ASPECTS OF REFUSE HANDLING, USE OF CRANES, REFUSE SORTING, AND SELECTION OF FURNACES - COMBUSTION CALCULATIONS CONSIDERING BTU VALUE OF REFUSE, BATCH FEED AND CONTINUOUS FLOW HOPPER HEAD FURNACES ARE COMPARED, SELECTION OF COMBUSTION CONTROL EQUIPMENT. (EI)

08-03-01524 DESIGN OF INCINERATOR FOR NUT ISLAND SEWAGE TREATMENT PLANT (SLUDGE(SEWAGE) MULTIPLE-HEARTH)
GINDER, C. J.
J BOSTON SOC CIVIL ENGRS 49(4), P. 297-311 (OCTOBER 1962). THIRTY-SIX TPD CAPACITY, MULTIPLE HEARTH, VERTICAL TYPE INCINERATOR INSTALLED IN EXISTING BUILDING IN QUINCY, MASS, NICHOLS HERRESHOF SLUDGE FURNACE FLOW DIAGRAM SHOWN, DETERMINATION OF DESIGN QUANTITIES, BASIS OF DESIGN, INCINERATOR DETAILS, INSTRUMENTATION AND CONTROLS, BREAKING-IN PERIOD, INITIAL OPERATION AND TESTS, PRESENT STATUS OF OPERATION. (EI)

08-03-01525 BOSTON SOUTH BAY INCINERATOR (COST(CAPITAL) ECONOMICS DESIGN)
EDDY, H. P., JR.
J BOSTON SOC CIVIL ENGRS 46(3), P. 246-263 (JULY 1959). DESIGN AND CONSTRUCTION OF PLANT FOR BURNING MIXED MUNICIPAL REFUSE, CONSISTING OF GARBAGE AND RUBBISH, THERE ARE SIX FURNACES, EACH OF RATED CAPACITY OF 150 TONS PER DAY AND THREE WASTE HEAT BOILERS, EACH HAVING A CAPACITY OF 75,000 LB OF STEAM PER HOUR. BUILDING IS 241-FT LONG BY 200-FT WIDE AND THERE ARE THREE LARGE CHIMNEYS. (EI)

08-03-01534 STUTTGART REFUSE INCINERATION PLANT - LAYOUT AND OPERATION EXPERIENCE (HEAT-RECOVERY OIL-REFUSE-FUEL HEAT(SPACE) DESIGN SALVAGE ECONOMICS COST(CAPITAL) COST(OPERATING))
FICHTNER, W. + MAURER, K. G. + MULLER, H.
ASME PAPER 66-WA/PID-10 FOR MEETING NOVEMBER 27-DECEMBER 1, 1966. PLANT WAS PLACED IN OPERATION JUNE 2, 1965 AND WAS INCORPORATED INTO EXISTING POWER PLANT MUNSTER. HEAT GENERATED BY INCINERATION OF REFUSE IS UTILIZED FOR STEAM PRODUCTION BY BOILERS HAVING 220,000/275,000 LB/HR CAPACITY WITH COMBINED OIL/REFUSE FIRING SYSTEM. SIZE OF BOILERS WAS GOVERNED BY REQUIREMENTS OF DISTRICT HEATING SYSTEM. REPORT OF OPERATING RESULTS EXPERIENCED, MECHANICAL DESIGN FEATURES OF PLANT. (EI)

08-03-01535 DEVELOPMENT OF CREWE'S REFUSE DISPOSAL PLANT (INCINERATOR DESIGN)
PUBLIC CLEANSING 53(10), P. 495 (OCTOBER 1963). A DESCRIPTION OF THE REFUSE INCINERATOR IN CREWE, ENGLAND. THE ORIGINAL PLANT WAS BUILT IN 1930 AND RECENTLY HAS UNDERGONE A MAJOR RECONSTRUCTION TO ACCOMMODATE THE INCREASING AMOUNT OF REFUSE GENERATED BY THE TOWN. DISCUSSION FOLLOWS THE REPORT. (PHS)

08-03-01543 CHICAGO HAULERS MAKE HISTORY BY BUILDING FIRST PRIVATE INCINERATOR (COST(CAPITAL) HEAT-RECOVERY SALVAGE(METALS))
REFUSE REMOVAL JOURNAL 1(1), P. 7 (JANUARY 1958). THE WAY IN WHICH FORTY-FIVE CHICAGO CONTRACTORS SOLVED THEIR GROWING DISPOSAL PROBLEM THROUGH THE CONSTRUCTION OF A PRIVATE INCINERATOR IS REVIEWED. AN INVESTIGATION OF U.S. INCINERATION PLANTS ENABLED THE PLAN FORMATION. FINANCIAL DIFFICULTIES AND THE SITE PROBLEM WERE WORKED OUT, CONSTRUCTION BEGAN. THE MANY ADVANTAGES OF THIS PRIVATE CONCERN ARE DESCRIBED. THE $2 MILLION PLANT WILL HAVE A CAPACITY OF 500 TONS PER 24 HOURS, AND IS COMPOSED OF TWO 250-TON UNITS. (PHS)

08-03-01569 HARTFORD AN EXAMPLE OF COOPERATION (COST(OPERATIONAL) SANITARY-LANDFILL INCINERATION)
REFUSE REMOVAL JOURNAL 1(2), P. 26 (FEBRUARY 1958). IN HARTFORD, CONNECTICUT, CITY FORCES COLLECT RESIDENTIAL REFUSE, AND PRIVATE COLLECTORS SERVE COMMERCIAL AND INDUSTRIAL ESTABLISHMENTS. DISPOSAL UNIT COSTS REPORTED AS $2.41 PER TON FOR 600-TON BIN AND CRANE INCINERATOR AND $0.35 PER TON FOR SANITARY LANDFILL. (PHS)

08-03-01619 SINGLE PRIVATE HAULER BUILDS OWN INCINERATOR (HEAT-RECOVERY)
REFUSE REMOVAL JOURNAL 1(12), P. 6 (DECEMBER 1958). A 400-TON-PER-DAY INCINERATOR IS BEING BUILT BY A CHICAGO, ILLINOIS, FIRM TO HANDLE THE DISPOSAL OF REFUSE FROM 54,000 HOMES SERVED BY THE COMPANY. (PHS)

08-03-01628 INCINERATION HISTORY TOOK FORM IN ENGLAND
REFUSE REMOVAL JOURANL 2(1), P. 18 (JANUARY 1959). A BRIEF HISTORY OF THE DEVELOPMENT OF MODERN INCINERATORS IS PRESENTED - " OF INTEREST TO ALL IN THE SANITATION FIELD ". (PHS)

08-03-01632 TOWN OF HEMPSTEAD RUNS A MODEL DISPOSAL PLANT (INCINERATION)
REFUSE REMOVAL JOURNAL 2(2), P. 14 (FEBRUARY 1959). THE EFFICIENT OPERATION OF HEMPSTEAD'S DISPOSAL PLANT IS DESCRIBED. AN INTERESTING FEATURE IS THE EXTERNAL " OFFICE BUILDING " APPEARANCE OF THE INCINERATION PLANT. ALSO NOTED IS THE USE OF BAY SALT WATER RATHER THAN TOWN WATER IN THE OPERATION. (PHS)

08-03-01639 RAILROAD, REFUSE HAULER COOPERATE ON DISPOSAL (HEAT-RECOVERY INCINERATION COMPOSITION)
REFUSE REMOVAL JOURNAL 2(5), P. 8 (MAY 1959). A UNIQUE ARRANGEMENT HAS BEEN MADE IN CHICAGO BETWEEN A DISPOSAL COMPANY AND A RAILROAD. THE RESULT - A MODERN AND EFFICIENT MEANS OF REFUSE DISPOSAL FOR THE SUBURBAN AREAS, A BETTER METHOD AND PERMANENT LOCATION FOR GARBAGE DISPOSAL FOR THE REFUSE COLLECTING COMPANY, AND STEAM AVAILABLE AS A BY-PRODUCT FOR USE BY THE RAILROAD. DETAILS OF THE OPERATION GIVEN. (PHS)

08-03-01656 BURNER NOW FEATURES ALUMINIZED STEEL SKIN (TEPEE BURNER INCINERATION)
REFUSE REMOVAL JOURNAL 2(7), P. 21 (JULY 1959). ALUMINIZED STEEL, MANUFACTURED BY A NEW AND EXCLUSIVE PROCESS, IS NOW BEING USED IN ONE TYPE OF BURNER. THE IMPORTANT FEATURES OF THIS BURNER, WITH ALUMINIZED SKIN, ARE DESCRIBED. (PHS)

08-03-01666 CLEVELAND INCINERATOR HAS NEW FLOOR TOPPING (DESIGN)
REFUSE REMOVAL JOURNAL 2(12), P. 10 (DECEMBER 1959). A COMPLETE DESCRIPTION OF THE CONSTRUCTION AND USE OF A NEW ALL-IRON AGGREGATE, CONCRETE TOPPING ON THE PIT FLOOR OF AN INCINERATOR PLANT IN CLEVELAND, OHIO. THIS NEW FLOOR TOPPING REPORTEDLY WILL ENABLE THE PIT BOTTOM TO WITHSTAND THE CONTINUOUS BRUTAL PUNISHMENT ASSOCIATED WITH NORMAL OPERATION OF THIS 500-TON INCINERATOR. (PHS)

08-03-01709 INCINERATION DISPOSAL IN MODERN COMMUNITIES (DESIGN HEAT-RECOVERY)
KURE, C. J.
REFUSE REMOVAL JOURNAL 3(9), P. 25 (SEPTEMBER 1960). A DISCUSSION OF THE HISTORY OF INCINERATION, INCINERATOR DESIGN, FOUR TYPES OF STOKERS, REFRACTORIES, AND WASTE HEAT UTILIZATION. COMPARES THE CALUMET INCINERATOR IN CHICAGO, ILL., WITH THE EUCLID INCINERATOR IN EUCLID, OHIO. (PHS)

08-03-01714 INCINERATOR DISPUTE ENLIVENS ROSYLN, LONG ISLAND (SITE-SELECTION)
REFUSE REMOVAL JOURNAL 3(6), P. 8 (JUNE 1960). THE ROSLYN, LONG ISLAND, DISPUTE OVER THE SELECTION OF A SITE FOR THE NEW INCINERATOR REMAINS UNSETTLED. THE NORTH HEMPSTEAD TOWN BOARD OF SUPERVISORS HAS OBTAINED A REFERENDUM VOTE TO BUILD THE PLANT ON A BLUFF OVERLOOKING THE HARBOR. CITIZENS WHO THINK THIS LOCATION WILL HINDER A NEARBY BEACH ARE CONTINUING THEIR STRUGGLE FOR RELOCATION. (PHS)

08-03-01724 TOWNSHIP HAS VARIETY OF COLLECTION SYSTEMS (HEAT-RECOVERY EMISSION(CONTROL) INCINERATION)
REFUSE REMOVAL JOURNAL 3(3), P. 6 (MARCH 1960). DESCRIBES THE ORGANIZATION OF REFUSE SERVICES IN HEMPSTEAD, NEW YORK. TODAY'S TENDENCY IS TOWARD COMMUNITY BREAKUP INTO REFUSE DISTRICTS SERVED BY PRIVATE CONTRACTORS. ALL HAULERS, HOWEVER, CAN USE THE NEWLY IMPROVED INCINERATOR PLANT OWNED BY THE TOWNSHIP. (PHS)

08-03-01812 FUTURISTIC INCINERATOR PLANNED FOR HAMILTON (GRINDING (EMISSION(CONTROL) INCINERATION BULKY-WASTE (COST(CAPITAL) COST(OPERATING) SALVAGE(METALS) HEAT-RECOVERY)
SOLID WASTES MANAGEMENT/RRJ 12(3), P. 14-16, 31 (MARCH 1969). A NEW INCINERATOR HAVING A CAPACITY OF 600 TONS PER DAY AND AN ULTIMATE CAPACITY OF 1500 TONS PER DAY IS BEING PLANNED FOR HAMILTON, ONTARIO. THE INCINERATOR IS NEEDED BECAUSE LANDFILL SITES ARE BECOMING SCARCE. REFUSE WILL BE CONTINUOUSLY CHARGED BY SEMI-AUTOMATIC EQUIPMENT. ALL REFUSE WILL BE GROUND TO PRODUCE A MORE HOMOGENEOUS MIXTURE. ELECTROSTATIC PRECIPITATORS WILL BE INSTALLED FOR PARTICULATE CONTROL. STEAM WILL BE PRODUCED BY THE WATER WALL FURNACE DESIGN AND WILL BE USED TO POWER THE GRINDERS AND FANS. MAGNETIC SEPARATION OF METALS WILL BE PRACTICAL PRIOR TO BURNING BUT AFTER GRINDING. COST OF THE INITIAL UNIT IS EXPECTED TO BE $6,250,000. OPERATING COST IS ESTIMATED AT $2.25 PER TON FOR THE 600-TON CAPACITY PLANT.

08-03-01826 DUTCH INCINERATOR TO BURN 1,000 TONS DAILY (POWER INCINERATION HEAT-RECOVERY)
REFUSE REMOVAL JOURNAL 8(4), P. 22 (APRIL 1965). THE HAGUE, NETHERLANDS, IS BUILDING AN INCINERATOR CAPABLE OF DESTROYING 1,000 TONS OF HOUSEHOLD REFUSE DAILY. THE PLANT WILL BE EQUIPPED WITH THREE FURNACES. THE STEAM PRODUCED WILL BE CONVERTED INTO ELECTRICITY THROUGH TWO GENERATORS WITH A CAPACITY OF 25,000 KW. (AUTH)

08-03-01831 TONAWANDA PLANNING 200 TON EXPANSION (INCINERATION COST(CAPITAL))
REFUSE REMOVAL JOURNAL 8(3), P. 29 (MARCH 1965). THE CITY OF TONAWANDA, NEW YORK, HAS RECEIVED A $58,400 PUBLIC WORKS PLANNING ADVANCE FROM THE COMMUNITY FACILITIES ADMINISTRATION OF THE U.S. HOUSING AND HOME FINANCE AGENCY FOR THE STUDY OF AN EXPANSION OF ITS INCINERATOR. THE EXPANDED INCINERATOR WILL INCLUDE A STORAGE AND CHARGING BIN, ONE OR TWO FURNACES WITH A CAPACITY OF 200 TONS, AIR POLLUTION CONTROL FACILITIES, A NEW CHIMNEY OR STACK, AND ASH REMOVAL FACILITIES. THE TOTAL PROJECT COST IS $1,284,800, AND CONSTRUCTION IS EXPECTED TO GET UNDERWAY IN 1967.

08-03-01832 INCINERATORS TO COST MILWAUKEE $10 MILLION (INCINERATION)
REFUSE REMOVAL JOURNAL 8(3), P. 26 (FEBRUARY 1965). THE CONSTRUCTION OF TWO $5 MILLION INCINERATORS TO HANDLE ALL REFUSE HAS BEEN RECOMMENDED TO THE CITY OF MILWAUKEE BY BLACK AND VEATCH, A KANSAS CITY, MISSOURI, CONSULTING FIRM. ACCORDING TO A CITY OFFICIAL, IF THE MUNICIPALITY ACCEPTS THE FINDINGS IT WOULD HAVE TO PURCHASE LAND FROM THE FEDERAL GOVERNMENT. THIS LATEST REPORT REVISED BLACK AND VEATCH'S 1960 RECOMMENDATION WHICH CALLED FOR ONE CENTRAL INCINERATOR. THE STUDY RULED OUT THE ACQUISITION OF DUMP SITES OUTSIDE THE CITY. IN 1960, THE CONSULTING FIRM PROPOSED SANITARY LANDFILL AS AN ALTERNATIVE TO INCINERATORS, BUT MILWAUKEE HAS NOT BEEN ABLE TO FIND DISPOSAL SITES WITHIN CONVENIENT TRUCKING DISTANCE. WITH THE NEW INCINERATORS, COMBINED GARBAGE AND NON-COMBUSTIBLE MATERIAL WOULD BE COLLECTED AND PLACED INTO THE OVENS TOGETHER. THE TWO INCINERATORS WOULD HAVE THREE UNITS EACH AND BE CAPABLE OF DISPOSING OF 1800 TONS OF REFUSE DAILY. THIS CAPACITY COULD TAKE CARE OF A PREDICTED POPULATION OF 1,021,000 BY 1985.

08-03-01866 INNOVATIONS IN REFUSE-INCINERATOR DESIGN
RAISCH, W.
ASME ANNUAL MEETING (ASME PAPER NO. 57-A-220), NEW YORK, NEW YORK, (DECEMBER 1957). THE 500-TON MUNICIPAL REFUSE INCINERATOR LOCATED IN OYSTER BAY, LONG ISLAND, NEW YORK, WAS DESIGNED BY THE AUTHOR TO DIRECT ALL COMPONENTS TO THE CENTRAL PURPOSE OF REFUSE INCINERATION. THIS PLANT CONTAINS FOUR FURNACES OF 125 TONS PER 24 HR CAPACITY, EACH EQUIPPED WITH SEMI-AUTOMATIC STOKERS. SEMI-AUTOMATIC OPERATION IS PREFERRED TO COMPLETE AUTOMATION, BECAUSE IT ENABLES THE CREW TO REGULATE THE RATE OF BURNING TO KEEP THE TEMPERATURE WITHIN A PREDETERMINED RANGE AND TO PROVIDE BETTER CONTROL OF THE ORGANIC CONTENT OF THE ASH. OPTIMUM TEMPERATURE FOR THE PLANT IS 1800 DEGREES F TO 2000 DEGREES F AT 200 PERCENT EXCESS AIR. ASHES FALL DIRECTLY FROM THE FURNACES INTO AN ENCLOSED HYDRAULIC SLUICEWAY, AND ARE CARRIED BY WATER TO A LARGE UNDERGROUND ASH TANK. WASTE HEAT SUPPLIES STEAM FOR THE GENERATION OF POWER FOR THE INCINERATOR AND OTHER TOWNSHIP BUILDINGS AT THE SAME SITE, AS WELL AS FOR PUMPING WATER FOR THE PLANT. FLY ASH IS REMOVED IN EXPANSION CHAMBERS WHICH HAVE TROUGHED WATER BOTTOMS, A DEFLECTING DAMPER, A WATER-SPRAY, AND LOW PRESSURE STEAM AT THE HEAD END OF THE CHAMBERS. RADIANT HEAT IN A PORTION OF THE CHARGING FLOOR INCREASES WORKER COMFORT. DUST IN THE STORAGE PIT IS CONTROLLED BY AIR INLET PORTS AT THE TOP OF THE PIT. FLY ASH IN THE STACK DISCHARGE AVERAGES 0.296 LB OF PARTICULATE MATTER OF 1-MICRON SIZE AND LARGER PER 1,000 LB OF FLUE GAS DISCHARGED. (UC)

08-03-01867 DERBY'S PLANT TO REDUCE RUBBISH TIPS (INCINERATION CALORIFIC-VALUE COMPOSITION EMISSION(CONTROL))
ENGINEERING 202(5245), P. 750-751 (OCTOBER 28, 1966). A CONTRACT HAS BEEN SIGNED TO CONSTRUCT A CONTINUOUS FEED AUTOMATIC INCINERATOR WITH A CAPACITY OF 210 TONS PER DAY OF REFUSE FOR DERBY CORP., ENGLAND. THE PRINCIPLE OF TOTAL COMBUSTION HAS BEEN USED IN THE DESIGN AND A PERFORMANCE GUARANTEE HAS BEEN REQUIRED. DESIGN OF THE PLANT IS DESCRIBED. AVERAGE HEAT VALUE OF THE REFUSE TO BE BURNED IS ABOUT 4,677 BTU PER POUND.

08-03-01869 HEAT-RECOVERY MAKES GARBAGE LESS A BURDEN (POWER INCINERATION STEAM(PROCESS) SALVAGE(METALS))
CHEM ENGRG 74(18), P. 17, 74 (AUGUST 25, 1967). THE CONCEPT OF DISPOSING OF GARBAGE, REFUSE, AND SIMILAR SOLID WASTES BY BURNING THEM UNDER CONTROLLED CONDITIONS, THEREBY PRODUCING USEFUL HEAT FOR STEAM GENERATION, HAS BEEN IN SUCCESSFUL USE IN EUROPE AND JAPAN FOR MANY YEARS. A NEWLY COMPLETED PLANT AT NORFOLK, VA., IS PRODUCING STEAM POWER BY BURNING GARBAGE. THE SAME IDEA IS UNDER STUDY FOR THE CITY OF SAN FRANCISCO, CALIFORNIA. (PHEA)

08-03-01871 EUROPEAN PRACTICE IN REFUSE AND SEWAGE SLUDGE DISPOSAL BY INCINERATION (COST(OPERATING) HEAT-RECOVERY HEAT(SPACE) POWER ECONOMICS EMISSION(CONTROL) POLLUTION(AIR) SLUDGE(SEWAGE) CALORIFIC-VALUE)
EBERHARDT, H.
COMBUSTION 38(4), P. 23-29 (OCTOBER 1966). INCINERATION PLANTS, WITH AND WITHOUT HEAT UTILIZATION, TO DISPOSE OF SEWAGE SLUDGE, AND COMPOSTING PRACTICES IN GERMANY ARE REVIEWED. (ALSO SEE 08-03-00431). (PHEA)

08-03-01874 SOME THOUGHTS ON THE FUTURE OF REFUSE DISPOSAL IN GREAT BRITAIN (INCINERATION COST(OPERATING) SANITARY-LANDFILL)
SHULTS, F.
PUBLIC CLEANSING 53(7), P. 335 (1963). AN APPRAISAL OF THE PUBLIC CLEANSING PROBLEMS IN BRITAIN OVER THE LAST 25 YEARS INDICATE THERE HAS BEEN A VAST CHANGE OF EMPHASIS FROM REFUSE COLLECTION TO REFUSE DISPOSAL. FOR MANY YEARS TIPPING HAS BEEN THE PRIMARY METHOD OF ECONOMICAL AND EFFICIENT DISPOSAL IN BRITAIN, BUT WITH THE LACK OF SUITABLE TYPING AREA THERE HAS BEEN A DRASTIC CHANGE IN ECONOMY AND DISPOSAL METHODS. NEW AND LARGER COLLECTION EQUIPMENT AS WELL AS WASTE TYPES HAS ALSO BROUGHT ABOUT CHANGES. A TABLE AND A GRAPH SHOW THE DIFFERENCE IN COST PER TON FOR DISPOSAL BY MECHANICAL AND NON-MECHANICAL METHODS.

08-03-01881 NEW REFUSE PLANT FOR LYTHAM ST. ANNES (INCINERATOR QUANTITY COST(CAPITAL))
PUBLIC CLEANSING 54(12), P. 1314 (1964). THE CHANGING PATTERN OF REFUSE DISPOSAL REQUIREMENTS IS ILLUSTRATED BY THE HISTORY OF THE BOROUGH OF LYTHAM ST. ANNES. IN 1938, 25,540 RESIDENTS YIELDED 1,800 LBS PER 1,000 POPULATION AND TODAY 36,300 RESIDENTS YIELD 2,050 LBS PER 1,000 POPULATION PER DAY. A MODERN INCINERATOR CONSISTING OF ONE FOUR CELL UNIT WITH MAGNETIC SEPARATORS AND A 65 TON PER DAY INTAKE CAPACITY IS NOW IN OPERATION. IT IS ANTICIPATED THAT BY 1981 THE EXISTING UNIT WILL BE EXPANDED TO THREE UNITS WITH FOUR CELLS PER UNIT.

08-03-01894 PRACTICAL EXPERIENCE IN INCINERATION (HEAT(PROCESS) HEAT-RECOVERY POWER HEAT(SPACE) MARINE BARGE)
DIJKSHOORN, R. + FISHER, F.
PUBLIC CLEANSING 54(6), P. 939 (1964). MR. R. DIJKSHOORN, ROTTERDAM, AND MR. FRANZ FISCHER, VIENNA, IN THEIR PAPERS ON THE USE OF REFUSE INCINERATION PLANTS PROVIDED EVIDENCE OF PRELIMINARY PLANNING AND PRACTICAL EXPERIENCE TO ACHIEVE THE SAME OBJECT WITH TWO END RESULTS, NAMELY THE DISPOSAL OF REFUSE, BUT IN THE FORMER INSTANCE ASSOCIATED WITH THE GENERATION OF ELECTRICITY AND IN THE LATTER WITH THE PROVISION OF HEAT FOR DISTRICT HEATING, AND PROVIDED A VERY CLEAR EXAMPLE OF THE NEED TO CONSIDER DISPOSAL IN RELATION TO LOCAL CONDITIONS.

08-03-01896 CEUD MILLE FAITE AT GOVAN (INCINERATION)
PUBLIC CLEANSING 54(6), P. 936 (1964). IN 1928, THE GOVAN WORKS OPENED ITS REFUSE INCINERATOR. AT THIS TIME SOME EXCLUSIVE OPERATIONS SUCH AS METAL SALVAGE WERE DONE AND THE COMBUSTIONABLE REFUSE WAS BURNED, SUPPLYING HEAT FOR GENERATING POWER AND HEATING BUILDINGS. PRIOR TO WORLD WAR II THE NATURE OF THE REFUSE CHANGED SO THAT THE POWER GENERATED COULD BE DONE CHEAPER BY OTHER METHODS. THE RAPID CHANGES MADE IT NECESSARY TO CONSIDER A NEW AND MORE EFFICIENT INCINERATOR.

08-03-01897 REFUSE INCINERATION - A MODERN APPROACH TO AN OLD PROBLEM
BALL, A.
PUBLIC CLEANSING 54(6), P. 963 (1964). IN SOME COUNTRIES TIPPING IS PROHIBITED BY LAW UNLESS IT HAS BEEN STERILIZED, AND THE SIMPLEST WAY TO ACHIEVE THIS IS BY INCINERATION. THE UNITED KINGDOM HAS NO LAW TO PROHIBIT TIPPING AND OTHER THAN THIS THEIR PROBLEMS ARE SIMILAR TO THE REST OF THE WORLD, INCREASED VOLUME AND FEWER TIPPING SITES. NEWER AND MORE ECONOMICAL METHODS OF DISPOSAL ARE BEING SOUGHT AND INCINERATION MAY BE THE SOLUTION. NEW INCINERATOR TECHNOLOGY IS BEING DEVELOPED AND SOME DAY JUST MIGHT BE ABLE TO OFFER THE SOLUTION TO REFUSE DISPOSAL.

08-03-01898 TEST ON INCINERATION IN GREAT BRITAIN (COMPOSITION STANDARD(REFUSE) TEST(INCINERATOR))
PUBLIC CLEANSING 54(6), P. 978 (1964). REFUSE DISPOSAL HAS BECOME A BIG BUSINESS AND MANY ENGINEERING COMPANIES HAVE BEGUN TO RECOGNIZE THE FACTS. VARIOUS COMPANIES HAVE DIFFERENT TYPES OF INCINERATORS AND EACH INCINERATOR MAY BE SUITED TO A PARTICULAR TYPE OF WASTE. SOME TEST RESULTS ARE LISTED FROM SOME EXPERIMENTAL RUNS MADE FROM VARIOUS TYPES OF WASTES.

08-03-01924 NEW DISPOSAL PLANT FOR FULHAM (INCINERATOR SALVAGE EMISSION(CONTROL))
PUBLIC CLEANSING 54(3), P. 776 (1964). CLEAN AIR ACTS REQUIREMENTS AT FULHAM, ENGLAND, HAVE REQUIRED THE TOWN TO REPLACE AN INCINERATOR THAT HAS BEEN OPERATING SINCE 1900. THE NEW INCINERATOR HAS A STORAGE CAPACITY OF 140 CU-YDS AND A DISPOSAL CAPACITY OF 150 TONS IN EIGHT HOURS. INCORPORATED INTO THE PLANT ARE MAGNETIC SEPARATORS, METAL BALERS, PAPER BALERS, WEIGHT BRIDGE, DUST COLLECTORS, ALONG WITH THE MOST RECENT TECHNIQUES IN SMOKE ABATEMENT.

08-03-01937 INCINERATOR WITH POWER AND OTHER UNUSUAL FEATURES (EMISSION(CONTROL) HEAT-RECOVERY PROCESS-HEAT DESIGN)
VELZY, C. R. + LANDMAN, W. J.
ASME PAPER 64-WA/PID-2 FOR MEETING NOVEMBER 25-DECEMBER 4, 1964. PLANT FOR HEMPSTEAD, NY IS DESIGNED TO BURN TOTAL OF 750 TPD OF REFUSE AND RUBBISH; THERE ARE TWO REFUSE FURNACES OF 300 TONS CAPACITY EACH, AND ONE RUBBISH FURNACE OF 150 TONS CAPACITY; SPECIALLY DESIGNED EQUIPMENT IS USED FOR FLY ASH REMOVAL TO PREVENT AIR POLLUTION; OTHER FEATURES INCLUDE USE OF WASTE HEAT FOR PRODUCTION OF POWER AND FOR SALT-WATER CONVERSION; COSTS ARE GIVEN TO SHOW PORTION OF CONSTRUCTION COST ALLOCATED TO INCINERATION, POWER, AND DESALINIZATION. (EI)

08-03-01939 INSTRUMENTATION MAINTENANCE - MAJOR PROBLEM (INCINERATION COST(MAINTENANCE))
STICKLEY, J. D.
ASME PAPER 66-WA/PID-9 FOR MEETING NOVEMBER 27-DECEMBER 1, 1966. INSTRUMENTATION SYSTEMS ESSENTIAL TO PROPER OPERATION OF MODERN INCINERATORS ARE REVIEWED; THIS PAPER EVALUATES THREE POSSIBLE SOLUTIONS TO PROBLEM OF INOPERATIVE INCINERATOR INSTRUMENTATION SYSTEMS; METHOD OF COST ANALYSIS FOR DETERMINING BEST SOLUTION. (EI)

08-03-01953 INCINERATION OF REFUSE IN THE WEST SUBURBS OF PARIS
L'INCINERATION DES ORDURES MENAGERES DANS LA BANLIEUE OUEST DE PARIS, TECHNIQUES ET SCIENCES MUNICIPALES, 61, P. 433-436 (DECEMBER 2966).

08-03-01954 A CONTINUOUS AUTOMATED INCINERATOR
SMOKELESS AIR 36(14C), P. 110-117 (WINTER 1966). THE DESCRIBED INCINERATOR, TO BE BUILT WITH A DAILY CAPACITY OF 210 TONS OF CRUDE REFUSE PER DAY, HAS BEEN DESIGNED TO MEET A PERFORMANCE GUARANTEE THAT THE RESIDUE WILL CONTAIN BY WEIGHT NO MORE THAN 3 PER CENT ORGANIC MATTER. (PHEA)

08-03-01956 THE DEVELOPMENT OF OPEN-PIT INCINERATORS FOR SOLID WASTE DISPOSAL
PESKIN, L. C.
PAPER - 59TH ANNUAL MEETING OF THE AIR POLLUTION CONTROL ASSOCIATION, SAN FRANCISCO, CALIFORNIA, (JUNE 1966). THE OPEN-PIT INCINERATOR WAS ORIGINALLY DEVELOPED AT DUPONT FOR THE SAFE DESTRUCTION OF CHEMICAL WASTES WHICH PRESENT AN EXPLOSIVE HAZARD IN A CONVENTIONAL TYPE OF CLOSED INCINERATOR. THE INCINERATOR DESCRIBED HAS AN OPEN TOP AND AN ARRAY OF CLOSELY SPACED NOZZLES WHICH ADMIT A SCREEN OF HIGH VELOCITY AIR OVER THE BURNING ZONE. VERY HIGH BURNING RATES, LONG RESIDUAL TIMES LEADING TO COMPLETE COMBUSTION, AND HIGH FLAME TEMPERATURES ARE ACHIEVED. VISIBLE SMOKE IS READILY ELIMINATED AND FLY ASH CAN BE CONTAINED BY SUITABLE SCREENING. IT IS ESTIMATED BY ELMER MONROE, SENIOR CONSULTANT FOR DUPONT, THAT FOR SPECIFIC INDUSTRIAL MATERIALS EMISSIONS OF LESS THAN 0.25 GRAIN OF DUST PER CU-FT HAVE BEEN ACHIEVED. OVERSIZED WASTES AND PLASTICS, WHICH GENERATE PROBLEMS IN THE CONVENTIONAL INCINERATOR, ARE READILY DESTROYED IN THE OPEN-PIT INCINERATOR. BOTH INSTALLATION AND MAINTENANCE COSTS ARE LOW. THE THERMAL RESEARCH AND ENGINEERING CORPORATION IS UNDERTAKING TO BUILD OPEN-PIT INCINERATORS. THE DESIGN FOR A MUNICIPAL PLANT TO BE CONSTRUCTED IN CANADA IS PRESENTED. (UC)

08-03-02085 REFUSE DISPOSAL IN THE CITY OF BIRMINGHAM (QUANTITIES CALORIFIC-VALUE COMPOSITION SANITARY-LANDFILL BULKY-WASTE COLLECTION INCINERATOR EMISSION(CONTROL))
HARVEY, K.
AUTUMN MEETING, INSTITUTE OF PUBLIC CLEANSING, BIRMINGHAM, (OCTOBER 20, 1967). A VERY BRIEF ATTEMPT IS MADE TO DESCRIBE THE ORGANIZATION AND SOME OF THE METHODS UTILIZED BY THE CITY OF BIRMINGHAM SALVAGE DEPARTMENT TO CARRY OUT REFUSE DISPOSAL IN AN EFFICIENT AND NUISANCE FREE MANNER. TO DISPOSE OF THE HUGE AMOUNT OF REFUSE PRODUCED IN THE CITY EACH YEAR, PRESENTS A TASK OF ENORMOUS MAGNITUDE AND IMPORTANCE, AN OPERATION MADE MORE DIFFICULT BY THE FACT THAT REFUSE IS A MATERIAL WHICH IS CONSTANTLY CHANGING IN COMPOSITION AND CHARACTER, AND WHICH IS POTENTIALLY CAPABLE OF GIVING RISE TO NUMEROUS LATENT NUISANCES AND HAZARDS TO PUBLIC HEALTH. IT MUST BE ACCEPTED, HOWEVER, THAT NO SINGLE SYSTEM HAS BEEN EVOLVED WHICH IS THE PANACEA TO ALL REFUSE DISPOSAL PROBLEMS, CONDITIONS PREVAILING IN A PARTICULAR LOCALITY MUST OBVIOUSLY HAVE CONSIDERABLE INFLUENCE IN DETERMINING THE POLICY AND METHODS TO BE ADOPTED. THE SALVAGE DEPARTMENT IS PROUD OF ITS ACHIEVEMENTS AND THE ADVANCES WHICH HAVE BEEN MADE OVER THE YEARS IN A CONSTANT ENDEAVOR TO IMPROVE THE STANDARD AND EFFICIENCY OF THE SERVICES FOR WHICH IT IS RESPONSIBLE. INCINERATION IS LIKELY TO GROW IN IMPORTANCE AS AN EFFECTIVE METHOD OF DEALING WITH THE EVER INCREASING VOLUME OF REFUSE PRODUCED BY THE POPULATION AND CHANGES IN REFUSE COMPOSITION AND THE DECLINE IN THE DEMAND FOR SALVAGING OPERATIONS ARE LIKELY TO RESULT IN RADICAL CHANGES IN THE TYPE OF INCINERATOR DESIGN CONSIDERED SUITABLE FOR THE FUTURE. (AUTH)

08-03-02095 FILM ON INCINERATION SHOWS FOREIGN ACCOMPLISHMENTS
ENVIRONMENTAL SCIENCE TECH 2(3), P. 230 (MARCH 1968). A PRIVATELY PRODUCED COLOR MOVIE HIGHLIGHTS INCINERATOR DEVELOPMENT IN SEVERAL PARTS OF THE WORLD. A 13 MINUTE, SUPER 8MM, COLOR FILM "SOLID WASTE WORLDWIDE - A BURNING

ISSUE," IS AVAILABLE TO CONSULTING ENGINEERS, MUNICIPALITIES, AND GOVERNMENT AGENCIES. AMONG THE PLANTS SHOWN IN THE FILM ARE THE CASTLE BROMWICH (BIRMINGHAM, ENGLAND), THE PLANT AT DUESSELDORF WHICH PRODUCES STEAM, ELECTRICITY, SALEABLE RESIDUAL ASH, AND MAGNETICALLY SEPARATED SCRAP, THE PLANT AT YAO CITY (OSAKA, JAPAN), THE MANNHEIM, ESSEN, AND FRANKFORT PLANTS IN GERMANY, AND THE ISSY LES MOULINEAUX PLANT IN PARIS, FRANCE. (UC)

08-03-02112 MUNICIPAL INCINERATION (SANITARY-LANDFILL EMISSION(CONTROL) HEAT-RECOVERY ECONOMICS)
BOUGE, M. D.
NEW YORK STATE HEALTH DEPARTMENT IN-SERVICE TRAINING COURSE - REFUSE DISPOSAL BY SANITARY LANDFILL AND INCINERATION, ALBANY, NEW YORK,(DECEMBER 1, 1965). THE PAPER DISCUSSES THE VARIOUS TYPES OF INCINERATORS IN USE THROUGHOUT THE COUNTRY, INCINERATION VERSUS SANITARY LANDFILL, DISADVANTAGES OF INCINERATION AND LANDFILL, HIGH COSTS OF INCINERATION VERSUS LANDFILL, HEAT UTILIZATION, AIR POLLUTION DEVICES, ETC.

08-03-02123 MECHANICAL REFUSE DISPOSAL (INCINERATION SALVAGE BULKY-WASTE RESIDUE)
ARCHER, G. A.
67TH ANNUAL CONF OF THE INSTITUTE OF PUBLIC CLEANSING, SCARBOROUGH, (JUNE 1-4, 1965). A GENERAL REVIEW OF THE METHODS OF MECHANICAL COLLECTION AND DISPOSAL. EMPHASIS IS GIVEN TO MAKING DETAILED STUDIES ON DISPOSAL NEEDS AND ON PROCURING THE TYPE AND SIZE OF EQUIPMENT BEST SUITED TO A CERTAIN AREA. TOPICS DISCUSSED INCLUDE UNLOADING AND STORAGE, SCREENING, ASH REMOVAL, MAGNETIC SEPARATION, SALVAGE, CONVEYING, TRANSFER LOADING STATIONS, HEAT RECOVERY, EMISSION CONTROL, AND CONSIDERATIONS FOR BULKY WASTES.

08-03-02136 U.S. CITIES BURN GARBAGE TO GENERATE ELECTRICITY (HEAT-RECOVERY INCINERATION)
THE CHRISTIAN SCIENCE MONITOR, P. 12 (OCTOBER 27, 1969). DR. A. R. KASSANDER, DIRECTOR OF THE UNIVERSITY OF ARIZONA'S INSTITUTE OF ATMOSPHERIC PHYSICS AND WATER RESOURCES RESEARCH CENTER, INDICATES WE ARE LACKING THE SUITABLE LANDFILL SITES NEEDED AND BURNING OF REFUSE AT RUBBLE HEAPS WILL NO LONGER BE TOLERATED BECAUSE OF AIR POLLUTION. HE THINKS WITH THE CALORIC-VALUE OF REFUSE AT 4,500 BTU/LB, AND RISING, THAT THIS SHOULD BE USED AS A MEANS FOR GENERATING ELECTRICITY OR DESALTING WATER. A FIGURE OF $0.73 PER THOUSAND GAL IS QUOTED FOR CONVERSION COSTS.

08 04 INDUSTRIAL

08-04-00004 DIRECT FLAME METHOD OF INCINERATION FOR COMBUSTIBLE SOLVENTS (DISPOSAL INDUSTRY GAS-FIRED)
AIR ENGINE 10(4), P. 32-33 (APRIL 1968). SUMMARY OF RESULTS OF OPERATION OF FULL SCALE DIRECT FLAME INCINERATOR INSTALLED IN MIDLAND-ROSS CORP. LABORATORY AT NEW BRUNSWICK, NEW JERSEY, (3000 SCFM) TO SIMULATE INDUSTRIAL APPLICATION - UNIT CONSISTS OF OVEN EXHAUST SIMULATOR AND INCINERATOR PROPER. BY SPRAYING SOLVENTS OF DIFFERENT TYPES AND QUANTITIES INTO AIR STREAM, THEY CAN DUPLICATE MOST EXHAUST CONDITIONS IN INCINERATOR. EXHAUST SIMULATOR IS CONTROLLED IN BOTH TEMPERATURE AND VOLUME AND CONTAMINANTS ARE INTRODUCED TO CONTROLLED CONCENTRATIONS. (EI)

08-04-00036 NAVY CONTEMPLATES STEAM GENERATING INCINERATOR (HEAT(PROCESS) SURVEY WATER-WALL COST(OPERATING) DESIGN)
DEMING, L. F.
PUBLIC WORKS 96(7), P. 92-94 (JULY 1965). FEASIBILITY STUDY OF MERGING TWO FACILITIES WITH OBJECTIVE OF UTILIZING HEAT RELEASED BY COMBUSTION OF REFUSE TO GENERATE STEAM FOR U.S. NAVAL BASE PIERS IN NORFOLK, VA. THREE WATER COOLED INCINERATOR FURNACES WERE STUDIED FOR PERTINENT INFORMATION. EVALUATION OF PROPOSED INCINERATOR DESIGNED FOR WASTE HEAT UTILIZATION AND ARRANGEMENT OF GRATE AND BOILER ARE FEATURED. (EI)

08-04-00049 INCINERATION PLANT FOR OIL-CONTAINING SLUDGES AND REFUSE WORKING ON PRINCIPAL OF ROTARY-KILN INCINERATOR.
(SLUDGE(SEWAGE))
KUCHTA, H. D.
VERASCHUNGSANLAGE FUER OELHALTIGE SCHLAEMME UND RECHENGUT NACH DEM DREHROHROFENPRINZIP, BRENNSTOFF-WAERME-KRAFT 18(5), P. 244-247 (MAY 1966). INCINERATION PLANT FOR OIL-CONTAINING SLUDGES AND REFUSE WORKING ON PRINCIPLE OF ROTARY TUBULAR FURNACE. PRACTICAL COMBUSTION TESTS WERE MADE IN MUNICIPAL SEWAGE TREATMENT PLANT OF CITY OF COLOGNE, PREDOMINANTLY ON OIL-CONTAINING SLUDGES AND REFUSE. DEVELOPMENT OF BOTH SECTIONS OF TUBULAR ROTARY FURNACE INCINERATION PLANTS FOR THROUGHPUT OF 3 TPH IS DESCRIBED. SPECIAL PROBLEMS ARE MENTIONED AND OPERATIONAL EXPERIENCE TO DATE DISCUSSED. COMMENTS ARE MADE ON COST OF OPERATION. (IN GERMAN) (EI)

08-04-00064 CHRYSLER ATTACKS POLLUTION PROBLEM (INCINERATION WASTE(LIQUID))
WATER AND WASTES ENGRG 3(10), P. 44-46 (OCTOBER 1966). LIQUID WASTE INCINERATION SYSTEM INSTALLED AT CHRYSLER PLANT AT TWINSBURG, OHIO, TO DISPOSE OF INDUSTRIAL EFFLUENT. PRENCO SYSTEM, DESIGNED AS INTEGRAL UNIT, CONSISTS OF VERTICAL UP-FIRED RETORT WITH COMBUSTION AND ATOMIZING AIR SYSTEM, HOLDING AND PUMPING SYSTEMS, 2400-FT NETWORK OF PIPING THAT EXTENDS THROUGHOUT PLANT, AND ELECTRICAL-MECHANICAL CONTROL SYSTEM. OPERATION IS DESCRIBED. (EI)

08-04-00067 CENTRAL COMBUSTION OF SEWAGE SLUDGE WITH ESSEN-KARNAP POWER PLANT AS EXAMPLE (INCINERATOR SLUDGE(SEWAGE)

MOEGLING, E. + HEITMUELLER, W. + DREWES, W.
PRAXIS DER ZENTRALEN KLAERSCHLAMMVERBRENNUNG AM BEISPIEL ESSEN-KARNAP, BRENNSTOFF-WAERME-KRAFT 18(5), P. 215-222 (MAY 1966). POWER PLANT OF RHINE/WESTPHALIA ELECTRICITY GENERATING STATION (RWE), IN ADDITION TO BURNING INDUSTRIAL REFUSE AND WASTE PRODUCTS, INCINERATES UP TO 2000 TPD OF SEWAGE SLUDGE FROM EMSCHERFLUSS SEWAGE PLANT. CONSTRUCTION OF INSTALLATION AND FLOW OF SEWAGE SLUDGE ARE ILLUSTRATED AND EXPERIENCE DISCUSSED. IN GERMAN. (EI)

08-04-00109 OUTDOOR INCINERATOR (TEPEE)
INDUSTRIAL EQUIPMENT NEWS 37(1), P. 31 (JANUARY 1969). THE ARTICLE DESCRIBES THE DESIGN AND OPERATION OF TWO SIZES OF TEPEE TYPE OUTDOOR INCINERATORS WITH A CAPACITY OF 2 1/2 TONS TO 11 TONS PER HOUR OF COMBUSTIONABLE REFUSE WITHOUT SMOKE OR FLY-ASH.

08-04-00130 NEW METHOD FOR DISPOSAL OF TOXIC CYANIDE WASTES (INCINERATION
INDUSTRIAL-WASTE) REFUSE REMOVAL JOURNAL 4(7), P. 12, 16 (1961). A NEW METHOD FOR DISPOSAL OF TOXIC COMPLEX CYANIDE WASTES BY INTRODUCING THE CYANIDE AS A SLURRY MIXED WITH SOLUBLE OIL INTO THE INCINERATOR. COMBUSTION RATE WAS 150 GPH.

08-04-00175 INDUSTRY TEAMS UP TO BUILD JOINT WASTE-DISPOSAL (INCINERATOR FURNACE WATER-WALL ROTARY-KILN)
THE AMERICAN CITY 83(1), P. 101 (JANAURY 1968). A NUMBER OF INDUSTRIES IN HOUSTON, TEXAS HAVE FORMED A COMPANY CALLED CONSOLIDATED OXIDATION PROCESS ENTERPRISES (COPE) TO BURN ALL TYPES OF INDUSTRIAL WASTES. A MULTIPLE-HEARTH, A WATER-WALL, AND A ROTARY KILN WILL BE INSTALLED. AN ELECTROSTATIC PRECIPITATOR WILL BE USED FOR FLY ASH CONTROL.

08-04-00320 BURNING RADIOACTIVE WASTES IN INSTITUTIONAL INCINERATORS
MACHIS, A. + GEYER, J. C.
AM IND HYG ASSOC - QUARTERLY 13, P. 199-205 (1952). ASSIGNED TO JOHNS HOPKINS UNIVERSITY, BALTIMORE, MARYLAND. A STUDY OF AN INCINERATOR IN AN INSTITUTION IN WHICH RADIOISOTOPES, SUCH AS PHOSPHORUS-32, ARE UTILIZED SHOWED THAT A MAJOR PART OF THE PHOSPHORUS-32 ADDED CAN BE EXPECTED TO REMAIN IN THE ASHES TO PRODUCE ACTIVITY AS HIGH AS 1.5 X 10.2 MC/G, WHICH WILL CONSTITUTE A DUST HAZARD IN ASH REMOVAL IF THE DUST CONCENTRATION REACHES 30 MG/CU-FT OF AIR. WHEN CHARGES CONTAIN MATERIAL CONTAMINATED WITH LESS THAN 2-MC OF PHOSPHORUS-32 RELATIVELY LITTLE OF THE RADIOISOTOPE APPEARS TO REACH THE FLUE. (CA)

08-04-00439 THREE INDUSTRIAL INCINERATION PROBLEMS
CHALLIS, J. A.
PROC OF THE 1966 NATIONAL INCINERATOR CONF, ASME, P. 208-218 (MAY 1-4, 1966). THE CASE HISTORIES ARE PRESENTED FOR THE DISPOSAL BY INCINERATION OF THREE TYPES OF CHEMICAL WASTES, WHICH REQUIRED AUXILIARY FUEL FOR THEIR COMBUSTION. THE WASTES INCLUDE A CARBON/WATER SLURRY, A HIGHLY COLORED LIQUID WASTE GENERATED DURING TNT MANUFACTURE, AND A GAS CONTAINING HYDROGEN SULFIDE. (AUTH)

08-04-00440 GENERAL OVERALL APPROACH TO INDUSTRIAL INCINERATION
WOODRUFF, P. H. + WENE, A. W.
PROC OF THE 1966 NATIONAL INCINERATOR CONF, ASME, P. 219-225 (MAY 1-4, 1966). A DETAILED OUTLINE HAS BEEN PREPARED TO GUIDE AND ADVISE INDUSTRY IN PLANNING A SAFE AND ECONOMICAL FACILITY FOR WASTE DISPOSAL. AMONG THE FACTORS TO CONSIDER ARE TYPES AND QUANTITIES OF GASEOUS, LIQUID AND SOLID WASTE, METHODS OF COLLECTION, TRANSPORTATION, STORAGE AND DISPOSAL. AS A METHOD OF DISPOSAL, INCINERATION IS DISCUSSED IN DETAIL. (AUTH)

08-04-00441 KODAK PARK WASTE DISPOSAL FACILITIES (INCINERATION SALVAGE)
MERLE, R. L.
PROC OF THE 1966 NATIONAL INCINERATOR CONF, ASME, P. 202-207 (MAY 1-4, 1966). A LARGE INDUSTRIAL COMPANY WITH VARIED PRODUCTS HAS A WIDE RANGE OF WASTES. THE PAPER DESCRIBES FACILITIES FOR BURNING SEPARATELY AND IN COMBINATION WASTE PAPER, CHEMICALS, SOLVENTS, FILTER CAKE, SLUDGES AND BULKY OBJECTS. THE USE OF INCINERATION IN METAL SALVAGE IS ALSO DISCUSSED. (AUTH)

08-04-00444 AUXILIARY GAS BURNERS FOR COMMERCIAL AND INDUSTRIAL INCINERATORS
HAEDIKE, E. W. + ZAVODNY, S. + MOWBRAY, K. D.
PROC OF THE 1966 NATIONAL INCINERATOR CONF, ASME, P. 235-240 (MAY 1-4, 1966). THE USE OF GAS BURNERS TO SUPPLY AUXILIARY HEAT TO COMMERCIAL AND INDUSTRIAL INCINERATORS IS HELPFUL IN CONTROL OF AIR POLLUTION AND GENERAL PERFORMANCE. THE PAPER DISCUSSES THE DESIGN AND APPLICATIONS OF GAS BURNERS IN THIS SERVICE. BURNER PILOTS AND SAFETY CONTROLS ARE DESCRIBED. (AUTH)

08-04-00446 NEW DEVELOPMENTS IN INDUSTRIAL INCINERATION
MONROE, E. S., JR.
PROC OF THE 1966 NATIONAL INCINERATOR CONF, ASME, P. 226-230 (MAY 1-4, 1966). THE PAPER IS A REVIEW OF IMPROVED CALCULATING AND DESIGN TECHNIQUES, PERFORMANCE RATING OF INCINERATORS, AND A DESCRIPTION OF THE NEW OPEN-PIT INCINERATOR. OF PARTICULAR INTEREST IS A CURVE OF NITROGEN OXIDE FORMATION WITH VARYING EXCESS AIR AND TEMPERATURE DEVELOPED FROM THERMODYNAMIC EQUILIBRIUM DATA THAT HAS BEEN VERIFIED BY FIELD TESTS. (AUTH)

08-04-00481 INCINERATION OF AQUEOUS WASTES (EVAPORATION)
MONROE, E. S., JR.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 204-210 (MAY 5-8, 1968). THREE BASIC METHODS OF TREATING AQUEOUS WASTE BY INCINERATION ARE COVERED. EXAMPLES OF EACH TYPE ARE GIVEN. REVIEW OF FLAMMABLE ZONES IS GIVEN. THESE ARE CRITICAL CONCEPT REQUIREMENT IN INCINERATING SUCH WASTES. CALCULATED DATA ARE PRESENTED FOR SIGNIFICANT VARIABLES THAT GOVERN TEMPERATURE AND HEAT INPUT. THESE CAN BE USED TO PREDICT PERFORMANCE. (EI)

08-04-00482 INCINERATION OF EPOXY GLASS LAMINATES TO RECOVER PRECIOUS METALS
MCLOUTH, B. F. + PAULUS, H. J. + ROBERTS, A. J.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 171-175 (MAY 5-8, 1968). INCINERATOR USED FOR COMBUSTION OF CERTAIN EPOXY RESINS TO RECOVER PRECIOUS METALS HAD BEEN CAUSING COMPLAINTS DUE TO EXCESSIVE SMOKE AND ODORS. LOCAL MANUFACTURER ACCEPTED CHALLENGE OF DESIGNING INCINERATOR CAPABLE OF COMBUSTING EPOXY MATERIAL UNDER CERTAIN TEMPERATURE LIMITATIONS AND ELIMINATING SMOKE AND ODORS BY COMPLETING COMBUSTION OF BURNABLE GASES IN AFTERBURNER. DETAILED DISCUSSION OF DEVELOPMENT, DESIGN CRITERIA, AND CONSTRUCTION TESTING OF PROTOTYPE INCINERATOR AT PLANT SITE IS INCLUDED. PERFORMANCE DATA ON OLD INCINERATOR AND NEWLY INSTALLED UNIT IS GIVEN. (EI)

08-04-00627 BURNING INDUSTRIAL WASTES (INCINERATION CALORIFIC-VALUE FURNACE(TYPES) HEAT-RECOVERY)
HESCHELES, C. A.
INCINERATION OF SOLID WASTES, PROC OF THE MECAR SYMPOSIUM, NEW-YORK, NEW-YORK, P. 60 (MARCH 21, 1967). TYPES OF FURNACES THAT CAN BE USED FOR BURNING INDUSTRIAL WASTES ARE OUTLINED AND DESCRIBED. ANALYSES NECESSARY BEFORE SELECTING AND DESIGNING AN INCINERATOR ARE OUTLINED. HEATING VALUES AND PROPERTIES OF VARIOUS INDUSTRIAL WASTES ARE TABULATED. HEAT RECOVERY IS DISCUSSED.

08-04-00661 OPEN-TOP INCINERATOR (EMISSION(CONTROL))
COMPRESSED AIR MAG 72(1), P. 13 (JANUARY 1967). IMPROVED COMBUSTION METHOD CONTRIBUTES TO REDUCED AIR POLLUTION. PRINCIPAL FEATURE OF OPEN TOP DESIGN IS THAT ALL AIR FOR BURNING IS ADMITTED THROUGH CLOSELY SPACED, HIGH- VELOCITY NOZZLES ALONG TOP OF INCINERATOR. NOVEL DESIGN OF INCINERATOR WAS USED BY DUPONT TO BURN WASTE NITROCELLULOSE. (EI)

08-04-00754 COMBUSTION OF SLUDGE WITH OIL GASIFICATION BURNERS (HEAT-RECOVERY)
WULF, H.
DIE VERBRENNUNG VON SCHLAEMMEN MIT OELVERGASUNGSBRENNERN. BRENNSTOFF-WAERME-KRAFT 16(8), P. 397-399 (AUGUST 1964). WATERY AND POISONOUS SEDIMENTS, SOLUTIONS CONTAINING PHENOLS, WASTE OILS AND LIKE CAN BE DESTROYED BY OIL GASIFICATION BURNER WITH SPECIAL INJECTOR EVEN IF MOISTURE CONTENT IS HIGH OR FLUCTUATING. FOR SMALL RATES OF FLOW AND FOR SLUDGE WITH FLUE GAS THAT CORRODES AFTER-HEATING SURFACES, FURNACES WITHOUT HEAT UTILIZATION SHOULD BE CONSIDERED. QUANTITIES OF SLUDGE CAN ALSO BE BURNED IN NORMAL STEAM GENERATORS OR AS ADDITIONAL CHARGE IN LARGE REFUSE-BURNING PLANTS. (EI)

08-04-00762 COMBUSTION OF SLUDGE FROM GALVANIZING PLANTS WITH COMBUSTION CONE (INCINERATION SLUDGE(GALVANIZING))
PEPPERL, H.
VERBRENNUNG VON GALVANISIERSCHLAEMMEN MIT DEM BRENNKEGEL. BRENNSTOFF-WAERME-KRAFT 16(8), P. 399-491 (AUGUST 1964). PROBLEM OF COMBUSTION OF SLUDGE FROM COMMERCIAL EFFLUENTS IS PRESENTED. PLANT FOR BURNING PREDRAINED SLUDGE (4 TO 5 TPD) FROM GALVANIZING PLANT OF AUTOMOBILE FACTORY IS DESCRIBED. MATERIAL IS BURNED ON COMBUSTION CONE TOGETHER WITH SOLID WASTE MATERIALS. (EI)

08-04-00763 COMBUSTION INSTALLATION FOR LIQUID AND GASEOUS WASTE PRODUCTS IN MEDIUM SIZE CHEMICAL PLANT (INCINERATION WASTE(GASEOUS) WASTE(LIQUID)
HAMMANN, W. G.
VERBRENNUNGSANLAGE FUER FLUESSIGE UND GASFOERMIGE ABFALLSTOFFE IN EINEM MITTLEREN CHEMIEBETRIEB, BRENNSTOFF-WAERME-KRAFT 19(10), P. 481-483 (OCTOBER 1967). COMBUSTION INSTALLATION FOR WASTE SOLVENTS AND GASES WAS INSTALLED IN MEDIUM SIZE PLANT FOR ORGANIC CHEMICAL PRODUCTS. DESCRIPTION OF INSTALLATION AND OF EXPERIENCE YIELD IMPORTANT HINTS ON BUILDING AND OPERATING OF SUCH INSTALLATIONS. (IN GERMAN) (EI)

08-04-00766 COMBUSTION OF HYDROCARBON-CONTAINING REFINERY SLUDGE (SLUDGE(REFINERY) INCINERATION)
GIESE, W. + SCHWARZ, P.
BRENNSTOFF-WAERME-KRAFT 18(5), P. 227-230 (MAY 1966). DESCRIPTION OF ROTARY ZONE FURNACE FOR COMBUSTION OF REFINERY SLUDGES. FACTORS WHICH ARE DECISIVE FOR OPTIMUM OPERATION ARE TEMPERATURE OF ROTARY BED, TEMPERATURE AT TOP OF FURNACE, WATER AND OIL CONTENT OF SLUDGE, AND AMOUNTS OF SAND AND AIR REQUIRED. OPTIMUM CHOICE OF THESE FACTORS GAVE MAXIMUM SLUDGE THROUGHPUT OF 700 KG/HR. EXPERIENCE IS DISCUSSED WITH PARTICULAR REFERENCE TO METHOD OF OPERATION, MATERIAL OF CONSTRUCTION AND CORROSION. (IN GERMAN) (EI)

08-04-00768 INSTALLATION FOR BURNING WASTE FROM PRODUCTION OF FOIL MATERIALS (INCINERATION)
MANNHARDT, H.
VERBRENNUNGSANLAGE FUER FABRIKATIONSRUECKSTAENDE AUS DER FOLIENHERSTELLUNG, BRENNSTOFF-WAERME-KRAFT 18(3), P. 130-133 (MARCH 1966). CHOICE OF COMBUSTION PROCESS AND DESIGN DETAILS OF INCINERATION PLANT, STARTING FROM CHARACTERISTICS OF WASTE TO BE INCINERATED AND OF STEAM AND WATER CONNECTIONS BETWEEN INCINERATION PLANT AND FACTORY POWER PLANT. RESULT CONFIRMS THAT CONSIDERATIONS UNDERLYING DESIGN ARE BASICALLY SOUND AND GIVES IMPORTANT INDICATIONS FOR CONSTRUCTION AND OPERATION OF SUCH PLANTS. (IN GERMAN) (EI)

08-04-00774 INCINERATION OF OIL-CONTAINING SLUDGES IN ROTARY DRUM FURNACE (INCINERATION SLUDGE(OIL))
ROGGE, W.
VERASCHUNG OELHALTIGER SCHLAEMME IN DREHTROMMELOFEN, BRENNSTOFF-WAERME-KRAFT 18(5),P . 247-248 (MAY 1966). WASTE PRODUCTS FROM FEDERAL RAILWAYS WORKS AT KASSEL ARE INCINERATED IN ROTARY DRUM. SIMPLE INSTALLATION HAS THROUGHPUT OF 100 KG/HR OF OIL-CONTAINING SLUDGE TOGETHER WITH FLUE RESIDUE AND SAND. ADDITIONAL HEAT SUPPLY FOR IGNITION, TO SUSTAIN COMBUSTION AND FOR AFTER-BURNING, IS ONLY OCCASIONALLY NECESSARY. COSTS OF OPERATION AND LABOR ARE, THEREFORE, LOW. (EI)

08-04-00790 DEVELOPMENT OF COMBUSTION CONE FOR BURNING REFUSE INTO ASH (INCINERATOR)
SCHOPPE, F.
DIE ENTWICKLUNG DES BRENNKEGELS ZUR ABFALLVERASCHUNG. BRENNSTOFF-WAERME-KRAFT 19(10), P. 469-476 (OCTOBER 1967). PROBLEM OF PRODUCING AUTOMATICALLY OPERATING UNIVERSALLY APPLICABLE AND CHEAP INSTALLATION FOR BURNING REFUSE INTO ASH FOR SMALL AND MEDIUM INDUSTRIAL ORGANIZATIONS AND COMMUNAL USE LED TO DESIGN OF COMBUSTION CONE. DESCRIPTION IS GIVEN OF DESIGN, PRINCIPLE OF OPERATION, CONTROL AND OPERATION. INFORMATION IS PRESENTED ON PRACTICAL RESULTS OBTAINED FROM INSTALLATIONS FOR VARIOUS OUTPUT RANGES AND TYPES OF REFUSE. (IN GERMAN) (EI)

08-04-00901 INCINERATOR BURNS LIQUID WASTE SAFELY (INCINERATION)
NOVOTNY, J. J.
PLANT ENGRG 18(2), P. 116-117 (DECEMBER 1964). MORE EFFICIENT WASTE TREATMENT FACILITY THAN CHEMICAL NEUTRALIZATION OF COMPLEX CYANIDE PLATING SOLUTIONS, FERRIC CHLORIDE, CALCIUM CARBONATE SLURRY AND SOLVENTS IS OIL-FIRED INCINERATOR. UNIT IS COMPLETE WITH SAFETY CONTROLS, STARTERS, PUSHBUTTONS, DISCONNECTS, IGNITION AND CONTROL TRANSFORMERS, AND TEMPERATURE CONTROLS FOR AUTOMATIC OPERATION. WASTES ARE COMPLETELY DESTROYED. (EI)

08-04-00905 VOLUND INCINERATOR INSTALLED BY FORDS
PUBLIC CLEANSING 52(10), P. 446 (OCTOBER 1962). DESCRIBES THE NEW VOLUND INCINERATOR INSTALLED AT A FACTORY IN DAGENHAM, ENGLAND. THE PLANT, WHICH IS DESIGNED TO CONSUME FOUR TONS OF REFUSE COMPOSED OF MAINLY CELLULOSIC MATERIAL, CONTAINS - A PLATE CONVEYOR MADE OF CONTINUOUS OVERLAPPING MILD STEEL PLATES AND DRAG BARS RUNNING THE WIDTH OF THE PLATES, A TROUGHED, RUBBER PICKING BELT WITH A SUITABLE SPEED VARIATION GEAR. AN ELEVATING CONVEYOR, AN ADJUSTABLE SCRAPER BELOW THE HEAD DRUM FOR BELT CLEANING, AN IGNITION GRATE CONSISTING OF A FIXED PERFORATED PLATE RECEIVING AIR FROM THE FORCED DRAUGHT FAN, THE MAIN BURNING GRATE CONSTRUCTED OF INTERMESHING HEAT-RESISTING FIRE BARS, ALTERNATE ONES OF WHICH ARE ARRANGED TO ROCK, DAMPERS TO CONTROL THE SUPPLY OF COMBUSTION AIR TO THE IGNITION AND BURNING GRATES, HOPPERS BENEATH THE GRATES TO RECEIVE FINE PARTICLES PASSING THROUGH, A CASING FORMED OF MILD STEEL WITH INSULATING FIREBRICKS, AN ELECTROMAGNETIC EXTRACTOR FOR METAL RECOVERY, AND A FORCED DRAUGHT FAN FOR COMBUSTION CONTROL. (PHS)

08-04-00993 NAVY TO INCINERATE RUBBISH FOR POWER (POWER- RECOVERY)
SOLID WASTES MANAGEMENT/RRJ 10(4), P. 19 (APRIL 1967). THE NAVY WILL BUILD AT NORFOLK, VIRGINIA, THE FIRST STEAM GENERATING, WATER-WALLED INCINERATOR TO BE BUILT IN THIS HEMISPHERE. THE COST WILL BE 2.2 MILLION DOLLARS. THE INCINERATOR WILL HAVE A CAPACITY OF 180 TONS MUNICIPAL REFUSE. THE HOPE IS TO SAVE $47,000 ANNUALLY IN TERMS OF STEAM. A RECIPROCATING GRATE STOKER WILL BE INSTALLED. ABOUT 50,000 LB OF STEAM WILL BE PRODUCED PER HOUR AT 275 PSIG. IN A YEAR'S TIME, THE AMOUNT OF STEAM PRODUCED AT THIS RATE WOULD BE EQUAL TO THAT GENERATED THROUGH THE BURNING OF 5,000,000 GALLONS OF FUEL OIL. THE FLUE GAS WILL BE COOLED TO 600 DEGREES F BEFORE BEING PASSED INTO A CYCLONE DUST COLLECTOR FOR REMOVAL OF FLY ASH. AN ELECTROSTATIC PRECIPITATOR ALSO WILL BE USED. PERTINENT FACTS ARE- (1) THE HEAT VALUE OF REFUSE IS 5000 BTU PER LB. (2) THE HEAT VALUE OF 2-1/4 LB OF REFUSE EQUALS THAT OF ONE POUND OF COAL. (3) THE COST OF CONSTRUCTING INCINERATORS FOR POWER PRODUCTION HAS INCREASED FROM $10,000 TO ABOUT $13,000 PER TON CAPACITY IN THE U.S. (4) FROM 85 TO 100 LB OF REFUSE CAN BE HANDLED PER SQ FT OF GRATE SURFACE PER HOUR. (5) FORTY-FIVE PERCENT OF THE LATENT HEAT OF REFUSE IS NEEDED TO SUPPORT BURNING PROCESS, 10 PERCENT LOST THROUGH EQUIPMENT, AND 45 PERCENT OUT OF THE STACK. (6) THE BURNING OF ONE POUND OF REFUSE CAN PRODUCE 1.8 LB OF STEAM. AMONG THE INSTALLATIONS ARE- (1) ATLANTA SELLS STEAM GENERATED AS PART OF INCINERATION AT $140,000 PER YEAR. PROCEEDS FROM THE SALE PAID FOR THE INCINERATOR IN 12 YEARS. (2) IN THREE YEARS' TIME, 150,000 LB OF STEAM PER HOUR WERE PRODUCED BY THE PLANT AT OCEANSIDE, LONG ISLAND, NEW YORK. HEAT GENERATED BY THE PLANT IS USED IN THE DISTILLATION OF THE SEA WATER TO PRODUCE THE WATER IT USES IN ITS OPERATION. (3) IN THE ISSY-LES-MOULINEAUX (PARIS) PLANT, 450,000 TONS OF REFUSE ARE BURNED IN THE PRODUCTION OF 90 MILLION KW-HR ELECTRICITY. SIMILAR PLANTS ARE LOCATED IN DUESSELDORF, MUNICH, FRANKFURT, AND HAMBURG IN GERMANY. (UC)

08-04-01785 USE INDUSTRIAL WASTE FOR FACTORY POWER (HEAT-RECOVERY GRINDING INCINERATION)
REFUSE REMOVAL JOURNAL 6(10), P. 26 (OCTOBER 1963). DISCUSSES THE IDEA OF INCINERATING INDUSTRIAL WASTE FOR PRODUCING FACTORY POWER. LARGE INDUSTRIAL PLANTS THAT MUST DISPOSE OF THEIR OWN REFUSE FIND INCINERATION ADVANTAGEOUS, SINCE STEAM AND HOT WATER CAN BE OBTAINED WITHOUT THE EXPENDITURE OF OTHER FUELS. BEFORE REFUSE IS INCINERATED, HOWEVER, IT SHOULD BE STORED FOR SORTING AND PULVERIZING. GIVES THREE REASONS WHY THIS PRACTICE IS NECESSARY. INCLUDED ALSO IN THE ARTICLE IS A SCHEMATIC ARRANGEMENT OF A COMPLETE PLANT FOR THE INCINERATION OF INDUSTRIAL REFUSE.

08-04-01857 SOLID-WASTE DISPOSAL IN CHEMICAL PLANTS (SURVEY INCINERATION HEAT-RECOVERY SANITARY-LANDFILL)
BENDER, R. J.
POWER 111, P. 65 (MARCH 1967). A SURVEY OF THE USE OF INCINERATORS BY CHEMICAL PLANTS (46 REPLIES FROM 195 QUESTIONNAIRES) INDICATED THAT ALTHOUGH VERY FEW COMPANIES USE INCINERATORS, 25 PERCENT ARE SEEKING A SOLUTION TO THEIR SOLID WASTE DISPOSAL PROBLEMS. (PHEA)

08 05 HOUSEHOLD

08-05-00001 NEW SMOKELESS ODORLESS INCINERATORS PROVIDE ANSWER TO POLLUTION PROBLEM (APPLIANCE GAS-FIRED PROTOTYPE COST HOUSEHOLD)
AM GAS J 185(4), P. 14-17 (APRIL 1958), AND GAS AGE 121(4), P. 16-17, 56 (FEBRUARY 21, 1958). CUTAWAY DRAWINGS SHOW INTERNAL FEATURES OF HOUSEHOLD GAS INCINERATORS CLAIMED TO BE SOLUTION TO AIR POLLUTION PROBLEM. THIRTY-SIX INCHES HIGH BY TWENTY-TWO INCHES WIDE UNITS DOUBLE BURN WASTE GASES AND SMOKE AFTER MIXTURE WITH AIR, FOLLOWING FIRST STAGE OF COMBUSTION. EVERYTHING EXCEPT CANS, BOTTLES, ETC., CAN BE BURNED. (EI)

08-05-00520 A RESIDENTIAL INCINERATION PROGRAM (COST(CAPITAL) COST(OPERATING))
MCASKILL, J. D.
THE AMERICAN CITY 76(7), P. 98 (JULY 1961). DESCRIBES THE PROGRAM INAUGURATED IN SASKATOON, SASKATCHEWAN, FOR THE INSTALLATION OF RESIDENTIAL INCINERATORS TO REDUCE GARBAGE COLLECTION AND DISPOSAL COSTS. (UC)

08 06 AIR POLLUTION AND EMISSION CONTROL

08-06-00002 USE OF ADHESIVE-COATED PAPER FOR ESTIMATING INCINERATOR PARTICULATE EMISSIONS (ANALYSIS LAW)
GRUBER, C. W. + SCHUMANN, C. E.
J AIR POLLUTION CONTROL ASSOC 12(8), P. 376-378 (AUGUST 1962). METHOD, USING ADHESIVE-COATED PAPER WRAPPED AROUND 8 OZ GLASS JAR, DEVELOPED IN SERIES OF STACK TESTS ON DIFFERENT TYPES OF INCINERATORS TO INVESTIGATE EFFECTIVENESS OF USING "NUMBER OF PARTICLES/MIN" CAUGHT ON WHITE ADHESIVE PAPER AS BASIS FOR ESTABLISHING LIMITS FOR INCINERATOR PARTICULATE EMISSIONS. METHOD HAS MERIT AS EFFECTIVE TOOL FOR REGULATING FLY ASH EMISSIONS. (EI)

08-06-00003 INEXPENSIVE METHOD SOLVES FLY ASH PROBLEMS (SCRUBBER(WATER))
DAHLMEYER, F.
PUBLIC WORKS 93(8), P. 105-106 (AUGUST 1962). FLY ASH CONTROL FROM REFUSE INCINERATOR STACKS ACHIEVED IN HOLLYWOOD, FLORIDA, BY FORCING GASES THROUGH WATER PATH - CHECK TESTS OF EFFICIENCY. (EI)

08-06-00007 ECONOMICS OF HEAT RECOVERY IN DIRECT-FLAME FUME INCINERATION (EMISSION(CONTROL))
BENFORADO, D. M. + PAULETTA, C. E. + HAZZARD, N. D.
AIR ENGINE 9(3), P. 29-32 (MARCH 1967). DIRECT-FLAME FUME INCINERATION AS EFFECTIVE AND ECONOMICAL AIR POLLUTION CONTROL PROCESS IS DISCUSSED. ITS ADVANTAGES OVER THERMAL INCINERATION WITHOUT FLAME, ITS USE IN CONJUNCTION WITH HEAT RECOVERY EQUIPMENT ARE TOPICS ALSO COVERED. DIRECT FLAME INCINERATION IS AIR POLLUTION CONTROL PROCESS IN WHICH OBJECTIONABLE ORGANIC VAPORS OR ORGANIC PARTICULATES ARE CONVERTED TO HARMLESS CARBON DIOXIDE AND WATER VAPOR. OBJECTIONABLE VAPORS ARE DESTROYED BY EXPOSURE UNDER PROPER CONDITIONS TO TEMPERATURES OF 1000 TO 1400 F IN PRESENCE OF FLAME. FEATURES OF UTILIZED INCINERATOR ARE DESCRIBED AND SHOWN. (EI)

08-06-00009 SLUDGE INCINERATOR FLY ASH CONTROLLED BY CYCLONIC SCRUBBER (SLUDGE(SEWAGE) EMISSION(CONTROL))
CALACETO, R. R.
PUBLIC WORKS 94(2), P. 113-114 (FEBRUARY 1963). USE OF CYCLONIC JET SCRUBBER WITH PRECOOLER AS MEANS OF HANDLING EXHAUST GASES FROM INCINERATORS. PERFORMANCE TESTS DEMONSTRATED FLY ASH COLLECTION EFFICIENCY OF 95.9 PERCENT. MATERIAL INCINERATED IS SEWAGE SLUDGE FROM THE CITY OF DETROIT MUNICIPAL SEWAGE TREATMENT PLANT. (EI)

08-06-00013 NEW WAY TO SCRUB INCINERATOR GASES (APARTMENT SCRUBBER(WATER) COST(CAPITAL) COST(OPERATING))
SMITH, S.
AIR ENGRG 2(5), P. 40-42 (MAY 1960). NEW GAS SCRUBBER HELPS COMMERCIAL AND INDUSTRIAL INCINERATORS MEET CLEAN AIR QUALITY STANDARDS REQUIRED BY CURRENT LEGISLATION. DESIGN AND CONSTRUCTION DETAILS, AND DESCRIPTION OF OPERATION AND PERFORMANCE. (EI)

08-06-00024 WASTE GASES CAN BE CLEANED AT LOW COST (INCINERATION(CATALYTIC) DESIGN EMISSION(CONTROL))
PRASS, H. J.
POWER 107(4), P. 74-77 (APRIL 1963). METHOD OF CATALYTIC INCINERATION IN WHICH LOW-TEMPERATURE OXIDATION OF COMBUSTIBLE GASES OR VAPORS IS OBTAINED WITHOUT ANY VISIBLE FLAME, IN PRESENCE OF CATALYST USING HEAT EXCHANGERS TO RECOVER INCINERATOR'S EXHAUST HEAT. RECOVERED HEAT WORKS IN PLANT PROCESS OR RAISES CYCLE EFFICIENCY AND ITS EXIT TEMPERATURE CONTROLS AUTOMATIC OPERATION OF SYSTEM. (EI)

08-06-00029 NEW BILL PROPOSED TO STOP ILLEGAL USE OF INCINERATOR (LAW EMISSION(CONTROL))
SOLID WASTES MANAGEMENT/RRJ 11(2), P. 11 (FEBRUARY 1968). IN THE FACE OF AN ANTI-POLLUTION LAW THAT APARTMENT-HOUSE OWNERS HAVE BEEN DISREGARDING, THE COMMITTEE ON BUILDINGS OF THE NEW YORK CITY COUNCIL HAS APPROVED A SIMILAR BILL THAT WOULD ALSO REQUIRE MOST LANDLORDS TO UPGRADE THEIR INCINERATORS OR COMPACT THEIR REFUSE. THE NEW MEASURE, HOWEVER, HAS ELIMINATED THE OPTION OF CLOSING INCINERATORS WHICH WOULD HAVE COMPELLED THE CITY TO COLLECT THE RESULTING RUBBISH. UNDER THE NEW BILL, OWNERS OF APARTMENT BUILDINGS SEVEN STORIES OR HIGHER WOULD BE REQUIRED TO COMPLETE ANTI-POLLUTION MEASURES BY SEPTEMBER 20, 1968. THE OWNERS WOULD ALSO BE REQUIRED TO FILE THEIR PLANS FOR INCINERATOR IMPROVEMENTS OR ON-SITE COMPACTION UNITS WITH THE DEPARTMENT OF AIR POLLUTION CONTROL BY FEBRUARY 20, 1968. THE NEW BILL WOULD PROVIDE AN EXEMPTION FOR LANDOWNERS WHOSE INCINERATORS SERVICE NO MORE THAN 20 APARTMENT UNITS.

08-06-00043 INCINERATOR SOLVES AIR POLLUTION PROBLEM (INCINERATOR(BATCH) EMISSION(CONTROL) BULKY-WASTE)
STEEL 145(6), P. 132 (AUGUST 10, 1959). BATCH LOADED, AFTERBURNER TYPE INCINERATOR, FIRED WITH FUEL OIL, DEVELOPED BY HARRIS FOUNDRY AND MACHINE CO., CORDELE, GEORGIA. COMPLETE COMBUSTION AT HIGH TEMPERATURES ENABLES DISPOSAL OF COMBUSTIBLE MATEPIALS IN AUTOMOBILES WITHOUT USUAL SMOKE CONSISTING OF UNBURNED PARTICLES, DUST, ASH AND FUMES. PROCESSES FOUR AUTOMOBILES AN HOUR. HAS BEEN APPROVED BY SEVERAL LARGE CITIES. (EI)

08-06-00052 STUDIES ON ANALYSIS OF HYDROCARBONS FROM INCINERATOR EFFLUENTS WITH FLAME IONIZATION DETECTOR (EMISSION(ANALYSIS))
FELDSTEIN, M.
J AIR POLLUTION CONTROL ASSOC 12(3), P. 139-141 (MARCH 1962). DETAILS OF ALTERNATE METHOD FOR ANALYSIS OF HYDROCARBONS, AND TO COMPARE RESULTS OBTAINED WITH STANDARD GAS CHROMATOGRAPHIC METHOD. USE OF CARAD FLAME IONIZATION DETECTOR AND GAS SAMPLING UNITS. FLAME IONIZATION METHOD PROVIDES MORE RAPID PROCEDURE FOR ANALYSIS. (EI)

08-06-00062 PROBLEMS IN CONNECTION WITH REFUSE INCINERATION IN SMALL PLANTS (EMISSION(CONTROL) INCINERATOR)
STEINBACH, W.
ZUM PROBLEM DER MUELLVERBRENNUNG IN KLEINANLAGEN, STAUB REINHALTUNG DER LUFT 27(7), P. 318-320 (JULY 1967). EMISSION MEASUREMENTS, OF CO AND HYDROCARBONS CONTENT OF SOLID MATTER, WERE CARRIED OUT IN REFUSE INCINERATION PLANT. CONCENTRATIONS OF CARBON MONOXIDE AND CARBON DIOXIDE WERE LOW, COMPARED WITH CONCENTRATIONS IN MEDIUM SIZED PLANTS. DUST MEASUREMENTS WERE AFFECTED BY UNBURNT, NOXIOUS GASES FROM LOW-TEMPERATURE CARBONIZATION THAT SETTLED ON FILTERS. (EI)

08-06-00081 INCINERATOR FLY-ASH METER UNDER DEVELOPMENT (EMISSION(CONTROL))
THE AMERICAN CITY 80(4), P. 21 (APRIL 1965). THE ILLINOIS INSTITUTE OF TECHNOLOGY RESEARCH INSTITUTE IS DEVELOPING A MONITORING DEVICE TO MEASURE PARTICULATE MATTER IN INCINERATOR STACK GASES. THE INSTRUMENT CONSISTS OF AN ISOKINETIC SAMPLER, A CYCLONE, AN INTERLOCKING FLOW SYSTEM, AND A TAPE RECORDER. (UC)

08-06-00151 ELECTROSTATIC PRECIPITATORS (INCINERATION EMISSION(CONTROL) COST(OPERATING) CAPACITY)
WALKER, A. B.
THE AMERICAN CITY 79(9), P. 148, 150 (1964). USE OF ELECTROSTATIC PRECIPITATORS FOR FLY-ASH CONTROL IS DESCRIBED. COSTS PER DAY ARE GIVEN AS A FUNCTION OF INCINERATOR CAPACITY. AT THE PRESENT TIME IT APPEARS THEY ARE ONLY PRACTICAL FOR INCINERATORS HAVING A CAPACITY OVER 50 TONS PER DAY. PROBLEMS IN OPERATION ARE DISCUSSED.

08-06-00304 AIR POLLUTION AND INCINERATION (COMPOSTING EMISSION(CONTROL) LAW POLLUTION(AIR))
POWELL, T.
COMPOST SCIENCE 1(3), P. 35 (AUTUMN 1960). AIR POLLUTION HAS BECOME AN URGENT PROBLEM IN METROPOLITAN AREAS AND INEFFICIENT INCINERATORS CONTRIBUTE GREATLY TO THIS PROBLEM. THE PRESENT TREND IN WASTE DISPOSAL IS TOWARD BURNING BECAUSE OF THE DISADVANTAGES FOUND IN OTHER METHODS OF WASTE DISPOSAL. SMOKE, DUST, AND GASES MAY BE DISCHARGED BY INCINERATORS. CONTAMINATION OF AIR IN THE U.S. IS ESTIMATED TO COST FROM $1.15 BILLION TO $4 BILLION PER YEAR. SINCE 1950, MORE THAN 20 STATES HAVE ADOPTED OR STRENGTHENED AIR POLLUTION LEGISLATION. SOME CITIES, NOTABLY DETROIT AND LOS

ANGELES, INCLUDE INCINERATOR CONTROL MEASURES IN THEIR CODES. THE AIR POLLUTION CONTROL ASSOCIATION IS ESTABLISHING MINIMUM REQUIREMENTS FOR THE DESIGN AND OPERATION OF ALL MAJOR TYPES OF INCINERATORS. COMPOSTING PROBABLY WILL GAIN MORE WIDESPREAD USE IN THE FUTURE AS MORE AND MORE PEOPLE REALIZE TWO IMPORTANT FACTS - VALUABLE ORGANIC MATTER SOON MUST BE RETURNED TO THE SOIL TO PRESERVE OUR RESOURCES, AND INCINERATORS CAN BE A CAUSE OF DANGER TO HEALTH. (UC)

08-06-00424 INCINERATION VS AIR POLLUTION - A NECESSARY DIVORCE (EMISSION(CONTROL))
KALKHOFF, A. W.
PROC OF THE 1966 NATIONAL INCINERATOR CONF, ASME, P. 60-63 (MAY 1-4, 1966). AIR POLLUTION CONTROL IS THE CONCERN OF EVERYONE. IN ORDER TO DIVORCE INCINERATION FROM AIR POLLUTION, EVERYONE, FROM THE MEMBERS OF THE PLANNING AND ZONING BOARDS, THE OWNERS (MUNICIPAL, GOVERNMENTAL, OR PRIVATE), THE ENGINEER, THE BUILDER, TO THE MEN OPERATING THE INCINERATOR, ALL MUST BAND TOGETHER. INDUSTRY MUST DEVELOP OR IMPROVE EXISTING EQUIPMENT ESPECIALLY FITTING FOR INCINERATORS. EACH UNIT MUST BE DESIGNED TO FIT THE SPECIFIC CONDITIONS OF ITS LOCALE, AND ALL DESIGNS MUST HAVE ABSOLUTE MINIMUM EMISSIONS, REGARDLESS OF LAX CODES. THERE IS NO CODE NOW IN EFFECT THAT GOOD DESIGN, ERECTION AND OPERATION CANNCT MEET ON SCHEDULED TESTS, AND ALSO DURING NORMAL OPERATION. (AUTH)

08-06-00425 CHARACTERISTICS OF FURNACE EMISSIONS FROM LARGE MECHANICALLY-STOKED MUNICIPAL INCINERATORS (EMISSION(CONTROL))
WALKER, A. B. + SCHMITZ, F. W.
PROC OF THE 1966 NATIONAL INCINERATOR CONF, ASME, P. 64-73 (MAY 1-4, 1966). A SUMMARY OF FIELD TEST AND LABORATORY ANALYTICAL DATA ON DUST EMISSION FROM SEVERAL LARGE, MECHANICALLY-STOKED MUNICIPAL INCINERATORS OF DIFFERENT GRATE CONFIGURATIONS IS PRESENTED. DATA ON DUST LOADING, AND PHYSICAL AND ELECTRICAL CHARACTERISTICS OF THE PARTICULATES ARE PRESENTED, AS WELL AS INFORMATION ON COMBUSTION CONDITIONS IN THE FURNACE. DESCRIPTION OF FIELD TEST EQUIPMENT AND TECHNIQUES, AND TECHNIQUES OF LABORATORY ANALYSIS ARE GIVEN. (AUTH)

08-06-00426 MUNICIPAL INCINERATION AND AIR POLLUTION CONTROL (EMISSION(CONTROL))
JENS, W. + REHM, F. R.
PROC OF THE 1966 NATIONAL INCINERATOR CONF, ASME, P. 74-83 (MAY 1-4, 1966). THE HISTORY AND DEVELOPMENT OF MUNICIPAL INCINERATOR AIR POLLUTION CONTROL IN MILWAUKEE, WISCONSIN, IS DISCUSSED. THIS COMMUNITY HAS PIONEERED IN THE DEVELOPMENT OF EFFECTIVE MUNICIPAL INCINERATOR AIR POLLUTION CONTROL SYSTEMS. COMPREHENSIVE PERFORMANCE TEST DATA OF A MUNICIPAL INCINERATOR INCORPORATING THREE NEW CONTROL CONCEPTS ARE PRESENTED. THE EFFECTS OF VARIABLE BURNING CAPACITY OPERATION ON AIR POLLUTION EMISSIONS FROM A MUNICIPAL INCINERATOR ARE DETAILED AND DISCUSSED. (AUTH)

08-06-00428 WHAT PRICE INCINERATION AIR POLLUTION CONTROL (COST(EMISSION) EMISSION(CONTROL) COST(CAPITAL) COST(OPERATING))
FIFE, J. A. + BOYER, R. H., JR.
PROC OF THE 1966 NATIONAL INCINERATOR CONF, ASME, P. 89-96 (MAY 1-4, 1966). THIS PAPER TAKES AN OBJECTIVE BUT STATISTICAL APPROACH TO SEVENTEEN POSSIBLE COMBINATIONS OF AIR POLLUTION CONTROL EQUIPMENT FOR MUNICIPAL INCINERATORS. BOTH REFRACTORY-LINED AND WATER-WALLED FURNACES OF IDENTICAL CAPACITIES ARE FOLLOWED BY GAS TEMPERING SYSTEMS, WHERE REQUIRED, AND THENCE TO MECHANICAL CYCLONES, ELECTROSTATIC PRECIPITATORS, OR BAG FILTERS. ADDITIONAL ALTERNATES INCLUDE THE INTRODUCTION OF FURNACE GASES DIRECTLY TO EITHER A REFRACTORY-LINED BAFFLED SPRAY CHAMBER OR TO A WET SCRUBBING SYSTEM. THUS, EACH FURNACE UNIT IS EQUIPPED WITH A SEPARATE AND INDEPENDENT AIR POLLUTION CONTROL SYSTEM. EMPIRICAL LATITUDE APPLIES IN CERTAIN DESIGN AREAS, BUT EXPERIENCE IS COMBINED TO DRAW CONCLUSIONS. THUS, ASSESSMENT OF CAPITAL AND OPERATING COSTS OF INCINERATOR AIR POLLUTION CONTROL EQUIPMENT INDICATES SEVERAL ENTIRELY POSSIBLE SOLUTIONS TO A UNIVERSALLY ACKNOWLEDGED PROBLEM. (AUTH)

08-06-00435 A NEW INCINERATOR CONTROL METER IS NEEDED (COMPOSITION(REFUSE) CALORIFIC-VALUE EMISSION(CONTROL) SMOKE)
KAISER, E. R.
PROC OF THE 1966 NATIONAL INCINERATOR CONF, ASME, P. 176-182 (MAY 1-4, 1966). THE PERFORMANCE OF AN INCINERATOR IS AFFECTED MARKEDLY BY THE MOISTURE CONTENT OF THE REFUSE. TO MAINTAIN A SATISFACTORY FIRE AND A HIGH RATE OF OPERATION UNDER CONDITIONS OF VARYING REFUSE MOISTURE IS DIFFICULT AT BEST. AS THE FLUE GAS REFLECTS THE REFUSE ANALYSIS, A METER IS PROPOSED THAT WOULD REPORT THE RATIO OF CARBON DIOXIDE AND WATER VAPOR IN THE FURNACE EXIT GAS. THE CARBON DIOXIDE TO WATER RATIO VARIES FROM 2.0 FOR REFUSE OF 10 PERCENT MOISTURE TO 193 FOR REFUSE OF 30 PERCENT MOISTURE. A GRAVIMETRIC APPARATUS IS DESCRIBED FOR TEST PURPOSES BUT A MONITOR FOR USE BY THE INCINERATOR OPERATOR IS NEEDED. THE EFFECTS ON THE METER READINGS OF FIRING RATE, ANALYSIS OF REFUSE, EXCESS AIR, AIR HUMIDITY AND VAPOR FROM ASH QUENCHING ARE EVALUATED. (AUTH)

08-06-00437 SMOKE DENSITY MEASUREMENT IN MUNICIPAL INCINERATORS (EMISSION(CONTROL) SMOKE)
EDWARDS, L. V.
PROC OF THE 1966 NATIONAL INCINERATOR CONF, ASME, P. 183-186 (MAY 1-4, 1966). THE OPACITY OR OPTICAL DENSITY OF SMOKE IN THE BREECHING OR STACK OF A MUNICIPAL INCINERATOR IS AN INDEX OF COMBUSTION. THE SMOKE METER IS A USEFUL OPERATING GUIDE, RAPID IN RESPONSE. THE PAPER DESCRIBES THE THEORY AND PRINCIPLES OF THE MODERN SMOKE METER AND TYPES OF READOUT. IT IS A GUIDE FOR THE SELECTION, SPECIFICATION AND INSTALLATION OF SMOKE METERS, SMOKE ALARMS, AND RECORDING SMOKE CHARTS. (AUTH)

08-06-00443 FLY ASH CONTROL EQUIPMENT FOR INDUSTRIAL INCINERATORS (EMISSION(CONTROL))
VICKERSON, G. L.
PROC OF THE 1966 NATIONAL INCINERATOR CONF, ASME, P. 241-245 (MAY 1-4, 1966). A DESCRIPTION IS GIVEN OF THE PROBLEM FACING THE ENGINEER WHEN DESIGNING AN INDUSTRIAL INCINERATOR, REFERRING ESPECIALLY TO THE TREATMENT OF PARTICULATE EMISSIONS FROM THE INCINERATOR BETWEEN 35 AND 200 MICRONS IN SIZE, AND TO THE CHOICE OF AVAILABLE COMMERCIAL EQUIPMENT WHICH CAN ATTAIN THE REQUIRED RESULTS. (AUTH)

08-06-00445 INCINERATOR TESTING PROGRAMS 1966 (INCINERATION TEST EMISSION(CONTROL))
GODER, R. + MARSHALLA, A.
PROC OF THE 1966 NATIONAL INCINERATOR CONF, ASME, P. 231-234 (MAY 1-4, 1966). THE PROGRESS ON INCINERATOR TESTING PROGRAMS SINCE THE 1964 ASME NATIONAL INCINERATOR CONFERENCE IS REPORTED FOR SEVERAL GROUPS. ACTIONS OF THE AIR POLLUTION CONTROL ASSOCIATION AND THE INCINERATOR INSTITUTE OF AMERICA ARE PRESENTED IN THIS PAPER TOGETHER WITH IMMEDIATE OBJECTIVES. THE INCINERATOR INSTITUTE OF AMERICA'S NEW TEST CHARGES, PROCEDURES AND INSTRUMENTATION ARE PRESENTED AGAINST A BACKGROUND OF TEST RESULTS ACCUMULATED AND STUDIED BY THE MEMBERS. FIELD STUDIES OF LARGE NUMBERS OF INSTALLATIONS ARE HAMPERED BY COMPLEX TESTING PROCEDURES AND THE INDUSTRY SUFFERS FROM A LACK OF SIGNIFICANT DATA FOR STUDY. A NEW PROCEDURE TO REDUCE THE COSTS OF STACK EMISSION TESTS IS OUTLINED. (AUTH)

08-06-00459 THE USE OF ELECTROSTATIC PRECIPITATORS FOR INCINERATOR GAS CLEANING IN EUROPE (EMISSION(CONTROL))
BUMP, R. L.
PROC OF THE 1966 NATIONAL INCINERATOR CONF, ASME, P. 161-166 (MAY 1-4, 1966). ELECTROSTATIC DUST PRECIPITATORS OF HIGH EFFICIENCY ARE WIDELY USED IN EUROPE TO CLEAN THE FLUE GAS FROM INCINERATORS. THE BASIC PRINCIPLES OF DESIGN AND THE FACTORS FOR SUCCESSFUL APPLICATION OF LURGI UNITS ARE EXPLAINED. A LIST OF INSTALLATIONS IS INCLUDED WHICH STATES THE EFFICIENCIES ATTAINED. ALL TYPES OF DUST COLLECTORS ARE COMPARED, BASED ON U.S. COSTS. (AUTH)

08-06-00472 INCINERATOR AIR POLLUTION CONTROL (EMISSION(CONTROL))
FERNANDES, J. H.
PROC OF THE 1968 NATIONAL INCINERATOR CONF, ASME, P. 101-116 (MAY 5-8, 1968). INCINERATORS OFFER SOLUTION TO SOLID WASTE DISPOSAL PROBLEMS IF PARTICULATE EMISSION IS CONTROLLED. EMISSION PROBLEM, VARIOUS METHODS OF INCINERATOR PARTICULATE EMISSION CONTROL, AND RELATIVE COST, PRELIMINARY COST VS. PERFORMANCE ESTIMATES MAY BE APPROXIMATED USING PARAMETERS PRESENTED. EXTENSIVE BIBLIOGRAPHY IS INCLUDED. (EI)

08-06-00478 INCINERATOR WASTE WATER (EMISSION(CONTROL) POLLUTION(INCINERATOR - WASTE-WATER))
MATUSKY, F. E. + HAMPTON, R. K.
PROC OF THE 1968 NATIONAL INCINERATOR CONF, ASME, P. 198-203 (MAY 5-8, 1968). EFFLUENT WATER FROM INCINERATOR PLANTS IS CONTAMINATED BY DISSOLVED AND SUSPENDED MATTER. TREATMENT IS REQUIRED TO PREVENT POLLUTION OF STREAMS AND UNDERGROUND WATER. WASTE WATER FROM FIVE PLANTS WAS INVESTIGATED TO ESTABLISH AMOUNT AND CHARACTERISTICS OF CONTAMINATION. REPORTS OF FINDINGS AND CORRECTIVE STEPS. (EI)

08-06-00480 CONVERSION FACTORS FOR SOURCE EMISSION MEASUREMENTS OF INCINERATOR FLUE GASES (EMISSION(CONTROL))
MARSHALLA, A. + CRAWFORD, G. + NOLAN, M.
PROC OF THE 1968 NATIONAL INCINERATOR CONF, ASME, P. 176-179 (MAY 5-8, 1968). TWO BASIC UNITS IN WHICH SOURCE EMISSION CONCENTRATION OF DUSTLOADING MAY BE EXPRESSED ARE PRESENTED FOR COMPARISON. TO STANDARDIZE PROCEDURES AND TO ELIMINATE SOME OF VARIABLES OF DUSTLOADING TESTS. CERTAIN STANDARDS OF CORRECTION HAVE BEEN AGREED UPON. FORMULAS ARE PRESENTED TO FACILITATE THESE CORRECTIONS. (EI)

08-06-00484 SUPPRESSION OF STEAM PLUME FROM INCINERATOR STACKS (EMISSION(CONTROL))
ROHR, F. W.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 216-224 (MAY 5-8, 1968). USE OF WATER SCRUBBER SYSTEM RESULTS IN GENERATION OF SUPER-SATURATED WATER VAPOR WHICH LEAVES STACK IN FORM OF VISIBLE WHITE PLUME. SCRUBBER SYSTEM IS DESIGNED TO REMOVE PARTICULATE MATTER FROM COMBUSTION GASES TO LEVEL AT WHICH OPTICALLY CLEAN APPEARANCE, OR APPROXIMATELY 0.10 GRAINS/SCFM CONVERTED TO 50 PERCENT EXCESS AIR, WOULD BE EXPECTED EXCEPT FOR STEAM PLUME. COSTS ARE EXPRESSED PER TON OF REFUSE BURNED AS OWNING AND OPERATING CHARGES IMPOSED BY EQUIPMENT REQUIREMENT TO SUPPRESS STEAM PLUME. (EI)

08-06-00501 CONDITIONING REFRACTORY FURNACE GASES FOR ELECTROSTATIC PRECIPITATOR APPLICATION (EMISSION(CONTROL))
BUMP, R. L.
PROC OF THE 1968 NATIONAL INCINERATOR CONF, ASME, P. 23-33 (MAY 5-8, 1968). 1) PROPER CONDITIONING OF HIGH TEMPERATURE GAS FROM A REFRACTORY FURNACE IS ESSENTIAL TO THE TROUBLE FREE OPERATION OF AN ELECTROSTATIC PRECIPITATOR. THE RESULTANT GAS MUST NOT HAVE ANY FREE MOISTURE IF A DRY PRECIPITATOR IS TO BE USED. 2) THERE ARE SEVERAL TRIED AND PROVEN METHODS OF ACCOMPLISHING THE REQUIRED GAS CONDITIONING. THESE HAVE BEEN DESCRIBED IN THIS PAPER. 3) TRADITIONAL METHODS OF COOLING AND SCRUBBING GASES FROM REFRACTORY FURNACES INVOLVING LOW PRESSURE WATER SPRAYS, LITTLE, IF ANY, CONTROL OF THE SPRAY SYSTEM AND INADEQUATE RESIDENCE TIME ARE NOT SATISFACTORY FOR USE WITH AN ELECTROSTATIC PRECIPITATOR. REFRACTORY INCINERATOR DESIGNERS, MANUFACTURERS AND PURCHASERS ARE URGED TO TAKE HEED IF MISAPPLICATION AND TROUBLESOME OPERATION OF ELECTROSTATIC PRECIPITATORS ON REFRACTORY FURNACES IS TO BE AVOIDED.

08-06-00567 BURN AWAY THE ODORS (EMISSION(CONTROL))
PUBLIC WORKS 97(3), P. 84 (MARCH 1966). FUME INCINERATION, A NEW APPROACH TO SEWAGE TREATMENT PLANT ODOR CONTROL, HAS BEEN INCORPORATED IN THE DESIGN OF SAN DIEGO'S NEW POINT LOMA PLANT. ODOR PROBLEMS ARE ABNORMAL, PRIMARILY BECAUSE OF SULFIDES GENERATED AT AN OUTFALL DROP STRUCTURE WHERE A 15-FT DROP OCCURS OVER A 120-FT WEIR. THE ESTIMATED CONCENTRATIONS OF HYDROGEN SULFIDE IN TRAPPED AIR AT THE VARIOUS SOURCES ARE UP TO 200 PPM. THE GASES ARE COLLECTED AT THE POINTS OF GENERATION AND PIPED TO THE INCINERATOR. (AUTH)

08-06-00598 INCINERATOR WILL HAVE SHORT STACK, DUST COLLECTOR (EMISSION(CONTROL))
THE AMERICAN CITY 74(3), P. 40 (MARCH 1959). IN BELMONT, MASSACHUSETTS, AN INCINERATOR WAS BUILT AND WAS EQUIPPED WITH A 144-TUBE HAGAN AEROSTATIC CENTRIFUGAL MECHANICAL COLLECTOR FOR AIR POLLUTION PREVENTION. ABOUT 95 PERCENT OF THE FLY ASH IS REMOVED. THE STACK IS ONLY 20 FT IN HEIGHT. (UC)

08-06-00629 AIR POLLUTION CONTROL EQUIPMENT FOR INCINERATORS (EMISSION(CONTROL))
WALKER, A. B.
INCINERATION OF SOLID WASTES, PROC OF THE MECAR SYMPOSIUM, NEW-YORK, NEW-YORK, P. 75 (MARCH 21, 1967). A DISCUSSION IS PRESENTED OF THE PROBLEMS IN CONTROL OF EMISSIONS FROM INCINERATORS. PARTICULATE, GASEOUS, AND ODOR PROBLEMS ARE ENUMERATED AND SOLUTIONS OUTLINED. CRITERIA FOR THE CHOICE OF EQUIPMENT OR PROCESS USED ARE LISTED.

08-06-00636 FRANK ANSWERS TO SOME HOT INCINERATOR QUESTIONS (EMISSION(CONTROL))
FLEMING, R. R.
THE AMERICAN CITY 83(5), P. 97 (MAY 1968). THE ARTICLE IS A SERIES OF QUESTIONS AND ANSWERS CONCERNED WITH PRACTICAL REASONS FOR THE SUCCESSES AND FAILURES IN INCINERATION OPERATION. THE SUBJECTS RANGE FROM REASONS FOR PREMATURE FAILURES TO OPINIONS ON PERFORMANCE TYPE SPECIFICATIONS FOR INCINERATOR CONSTRUCTION. A GRAPH OF EMISSION OF TYPICAL INCINERATORS IN NEW-YORK AREA IS PRESENTED. (UC)

08-06-00646 DESIGN AND EXPERIENCE GAINED WITH FLUE DUST REMOVAL INSTALLATION IN MUNICH REFUSE POWER PLANT NORD I (INCINERATION HEAT-RECOVERY EMISSION(CONTROL))
ANDRITZKY, M.
AUSLEGUNG UND BEWAEHRUNG DER RAUCHGASENTSTAUBUNGSANLAGE IM MUENCHENER MUELLKRAFTWERK NORD I, BRENNSTOFF-WAERME-KRAFT 19(9), P. 436-469 (SEPTEMBER 1967). DUST REMOVAL EQUIPMENT FOR FLUE GAS OF REFUSE POWER STATION MUST SATISFY REQUIREMENTS REGARDING AIR POLLUTION, WITH SAFETY MARGIN EVEN DURING INEVITABLE FLUCTUATIONS IN COMPOSITION OF REFUSE AND DUST. VALUES OF TESTS FOR STEAM GENERATOR AND ELECTRO FILTER AS WELL AS OPERATING DATA ARE GIVEN. (EI)

08-06-00681 NEW INSTRUMENTATION IN MUNICIPAL INCINERATION (EMISSION(CONTROL))
FISHER, M. A. + LANGER, G.
REFUSE REMOVAL JOURNAL 5(1), P. 10 (JANUARY 1962). EXPLAINS SOME OF THE NEW INSTRUMENTATION BEING DEVELOPED TO STUDY EMISSIONS FROM INCINERATOR STACKS FOR PURPOSES OF IMPROVING THE DESIGN AND CONTROL OF INCINERATORS. INCLUDES DESCRIPTIONS OF THE DYNAMIC DILUTER, THE ARF PARTICLE COUNTER, AND THE ACOUSTIC FLY ASH MONITOR. (PHS)

08-06-00746 HOW TO BURN WOOD WASTE WITHOUT SMOKE (TEPEE PROCESS-PARAMETERS INCINERATOR)
POPOVICH, M.
AIR ENGRG 4(10), P. 16-20, 43 (OCTOBER 1962). FIELD TESTS AND MODEL STUDY AT OREGON STATE COLLEGE OF EFFECTS OF VARIABLES IN BURNER OPERATION AND DESIGN UPON SMOKE AND CINDER DISCHARGE. TEPEE-TYPE STEEL INCINERATOR DESIGN WITH MINIMUM OF PARTICULATE EMISSION. TEST SHOWED THAT BY MAINTAINING EXCESS AIR BELOW 300 TO 400 PERCENT, SMOKE-FREE OPERATION IS ATTAINABLE. EXIT GAS TEMPERATURES ARE IN 600 TO 1000 F RANGE. (EI)

08-06-00789 MEASURING RESULTS ON EMISSION FROM COMBUSTION PLANTS FOR DOMESTIC GARBAGE (INCINERATOR)
SCHIEMANN, G.
ERGEBNISSE VON EMISSIONSMESSUNGEN AN VERBRENNUNGSANLAGEN FUER SIEDLUNGSABFAELLE, BRENNSTOFF-WAERME-KRAFT 19(9), P. 440-443 (SEPTEMBER 1967). REPORT OF INVESTIGATIONS ON 47 COMBUSTION PLANTS OF SMALL AND MEDIUM SIZE AND ONE LARGE PLANT. COMPARISON OF RESULTS DEMONSTRATES POSSIBILITIES FOR REDUCING EMISSION BY COMBUSTION IN LARGE PLANT. (IN GERMAN) (EI)

08-06-00806 ELECTROSTATIC FLY ASH PRECIPITATION FOR MUNICIPAL INCINERATORS - PILOT PLANT STUDY (EMISSION(CONTROL))
WALKER, A. B.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 13-19 (MAY 18-20, 1964). PILOT PLANT TESTS ON 220 TPD CONTINUOUS FEED MUNICIPAL INCINERATOR DEMONSTRATE TECHNICAL FEASIBILITY OF ELECTROSTATIC PRECIPITATION FOR CONTROL OF STACK EMISSION. DATA ON NATURE OF FURNACE STACK GASES AND PHYSICAL CHARACTERISTICS OF DUST AS WELL AS PERFORMANCE OF PILOT UNIT TREATING APPROXIMATELY 600 CFM ARE PRESENTED. (EI)

08-06-00820 FLYASH CONTROL EQUIPMENT FOR MUNICIPAL INCINERATORS (EMISSION(CONTROL) DESIGN SCRUBBER(WATER) CENTRIFUGAL-SEPARATORS BAG-FILTERS)
PASCUAL, S. J. + PIERATTI, A.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 118-125 (MAY 18-20, 1964). DESCRIPTION IS GIVEN OF SETTLING CHAMBERS WITH SPRAYS, CYCLONE TYPES AND ELECTROSTATIC PRECIPITATORS AS USED IN MUNICIPAL INCINERATORS. SPECIAL EMPHASIS IS PLACED ON SELECTION AND DUCT DESIGN IN PARTICULAR, TO INLETS OF COLLECTORS WHICH AFFECT EFFICIENCY. PREVENTION OF LEAKS AND OF OVERFILLING HOPPERS AND PROPER MAINTENANCE OF EQUIPMENT TO OBTAIN OPTIMUM EFFICIENCY ARE DISCUSSED. CONTROL OF AIR POLLUTION IS BEST ACCOMPLISHED BY THOROUGH BURNING IN COMBUSTION CHAMBER TO DECREASE LOAD TO FLY ASH EQUIPMENT. (EI)

08-06-00821 EFFECT OF FURNACE DESIGN AND OPERATION ON AIR POLLUTION FROM INCINERATORS (EMISSION(CONTROL))
MEISSNER, H. G.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 126-127 (MAY 18-20, 1964). CONTROL OF AIR POLLUTION FROM INCINERATION BEGINS IN FURNACE. SCIENTIFIC DESIGN AND CAREFUL OPERATION INSURE THAT GENERATION OF POLLUTION WILL BE MINIMIZED. EFFECTS OF VARIOUS CRITERIA OF DESIGN AND OPERATING PRACTICES ARE DISCUSSED. (EI)

08-06-00830 FLUE GAS COOLING (DESIGN EMISSION(CONTROL))
WESTERGAARD, V. + FIFE, J. A.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 170-180 (MAY 18-20, 1964). COOLING OF FLUE GASES IN SPECIAL COOLING CHAMBERS BECOMES NECESSARY IF DUST-COLLECTING AND ASSOCIATED EQUIPMENT IS CONSTRUCTED OF METAL. TWO MOST COMMON METHODS OF COOLING ARE BY DILUTION WITH AMBIENT AIR, AND BY EVAPORATION OF WATER IN GAS STREAM. USUALLY THEY ARE COMBINED. LOAD SHARING DEPENDS LARGELY ON ACCEPTABLE VISIBILITY OF STACK EFFLUVIA AND UPON ECONOMY. AUTOMATIC CONTROL OF COOLING SYSTEM APPEARS NECESSARY. EXPLANATION OF COMPUTATIONS WITH TABULATIONS AND GRAPHS PLUS DESCRIPTION OF EXISTING INSTALLATION ARE INCLUDED. (EI)

08-06-00844 HEALTH ASPECTS OF AIR POLLUTION FROM INCINERATORS
JACOBS, M. B.
PROC OF THE NATIONAL INCINERATOR CONF, P. 128-131 (1964). THE PUBLIC HEALTH ASPECTS OF INCINERATOR EXHAUST GASES ARE DISCUSSED FIRST IN THE LIGHT OF THE PHYSIOLOGICAL RESPONSE INDUCED BY SPECIFIC CONTAMINANTS SUCH AS SULFUR OXIDES, NITROGEN OXIDES, AND OTHER INORGANIC GASES AND ALDEHYDES, ORGANIC ACIDS, ESTERS, POLYNUCLEAR HYDROCARBONS, AND OTHER ORGANIC COMPOUNDS. SECOND, WITH RESPECT TO THEIR RELATION TO ILLNESS CAUSED BY AIR POLLUTION IN GENERAL SUCH AS EMPHYSEMA AND OTHER RESPIRATORY DISEASES, ALLERGENIC RESPONSES, AND CANCER. AND THIRD ON THE CHARACTER OF THE EFFLUENT GASES, NAMELY, DOMESTIC, MUNICIPAL, OR INDUSTRIAL. ONE ASPECT OF DOMESTIC INCINERATOR EFFLUENTS IS PARTICULARLY STRESSED, THAT IS, THE EFFECT ON NEARBY RESIDENTS. THE CONTRIBUTION THAT INCINERATOR EXHAUST GASES MAKE TO THE AIR POLLUTION OF ANY GIVEN COMMUNITY DEPENDS ON THE RATIO OF THE AMOUNT OF REFUSE AND GARBAGE BURNED TO THE TOTAL AMOUNT OF FUEL USED AND CONSUMED IN THAT REGION.

08-06-00853 FIELD EVALUATION OF COMBUSTION AIR EFFECTS ON ATMOSPHERIC EMISSIONS FROM MUNICIPAL INCINERATORS (EMISSION(CONTROL))
STENBURG, R. L. + HANGEBRAUCK, R. P. + VON LEHMDEN, D. J. + ROSE, A. H., JR.
J AIR POLLUTION CONTROL ASSOC 12(2), P. 83-89 (FEBRUARY 1962). FIELD TESTS ON 2 FULL SCALE MUNICIPAL INCINERATORS 50 TPD AND 250 TPD IN ORDER TO DETERMINE EXTENT TO WHICH RELATIONSHIP BETWEEN UNDERFIRE AIR AND PARTICULATE EMISSIONS APPLIES TO INCINERATORS OF DIFFERENT SIZES AND DESIGNS. EFFECT OF UNDERFIRE COMBUSTION AIR ON PRODUCTION OF PARTICULATE EMISSIONS. USE OF 50 PERCENT OVERFIRE AND 50 PERCENT UNDERFIRE AIR WAS FOUND TO PROVIDE BEST RESULTS IN FURNACE OPERATION. (EI)

08-06-00855 CONTROLLING FLUE-FED INCINERATOR (EMISSION(CONTROL))
MACKNIGHT, R. J. + WILLIAMSON, J. E. + SABLESKI, J. J., JR. + DEALY, J. O.
J AIR POLLUTION CONTROL ASSOC 10(2), P. 103-109, 125 (APRIL 1960). FLUE-FED INCINERATORS CONTRIBUTE TO AIR POLLUTION BY EMISSION OF LARGE QUANTITIES OF FLY ASH, COMBUSTIBLE GASES, OILS, TARS, AND FATS PRODUCED BY LOW TEMPERATURE COMBUSTION, SMOKE AND OTHER PARTICULATE MATTER. CONTROL DEVICES ARE REQUIRED TO OVERCOME PROBLEMS OF CHARGING OF REFUSE DURING BURNING PERIOD, OF INCOMPLETE COMBUSTION AND DESTRUCTIVE DISTILLATION, AND OF EXCESSIVE DRAFT, AS MEANS OF REDUCING CONTRIBUTION TO AIR POLLUTION. SKETCHES OF VARIOUS CONTROL DEVICES. (EI)

08-06-00856 EFFECTS OF DESIGN AND FUEL MOISTURE ON INCINERATOR EFFLUENTS (EMISSION(CONTROL))
STENBURG, R. L. + HORSLEY, R. R. + HERRICK, R. A. + ROSE, A. H., JR.
J AIR POLLUTION CONTROL ASSOC 10, P. 114-120 (1960). TESTS WERE PREVIOUSLY CARRIED OUT ON AIR DISTRIBUTION AND AMOUNTS, BURNING RATE, AMOUNT OF FUEL/CHARGE, INTERVAL BETWEEN STOKING, ETC. THIS ARTICLE DISCUSSES THE EFFECTS OF 25 PERCENT AND 50 PERCENT MOISTURE IN THE FUEL ON THE EFFLUENTS. THE DRY COMPONENT OF THE FUEL HAD EQUAL PARTS BY WEIGHT OF NEWSPAPER AND CORRUGATED CARDBOARD, MIXED IN A RATIO OF 3 TO 1 WITH WOOD CHIPS. CHOPPED POTATOES WERE SUBSTITUTED FOR LEAFY VEGETABLES AS THE WET COMPONENT. METHODS OF EFFLUENT ANALYSIS ARE GIVEN. FOR FUELS WITH 25 PERCENT AND 50 PERCENT MOISTURE CONTENT, THE FORMER GAVE THE HIGHEST PARTICULATE LOADING ON THE BASIS OF THE FUEL AS FIRED (2.1 TIMES THAT FROM THE FUEL WITH 50 PERCENT MOISTURE), BUT THIS RATIO FELL TO 1.4 WHEN THE FUELS WERE COMPARED ON DRY WEIGHT. INCREASING FUEL MOISTURE CONTENT DID NOT APPRECIABLY AFFECT THE TOTAL N-OXIDE EMISSION/LB OF FUEL AS FIRED, BUT DID CAUSE AN INCREASE ON A DRY-WEIGHT BASIS. THE PRACTICE OF INTRODUCING EXCESS AIR TO REDUCE FURNACE TEMPERATURES MAY RESULT IN INCREASED NITROGEN/LB. OF FUEL REQUIRED. LITTLE DIFFERENCE OCCURRED BETWEEN HYDROCARBONS AND CARBON MONOXIDE CONCENTRATIONS IN TESTS MADE WITH 25 PERCENT AND 50 PERCENT FUELS. LOW EXCESS AIR RESULTED IN INCREASE IN BOTH OF THESE - AVERAGE HYDROCARBON CONCENTRATIONS MEASURED WERE FROM 70-180 PERCENT HIGHER AT THE 50 PERCENT EXCESS-AIR LEVEL THAN AT 200 PERCENT EXCESS-AIR LEVEL. WITH 50 PERCENT MOISTURE FUEL, SMOKE DERIVATIVES WERE PRODUCED UP TO A NO. 2 RINGELMAN, ALTHOUGH THESE WERE INTERMITTENT AND FOR BRIEF PERIODS. WITH 25 PERCENT MOISTURE FUEL THE INTERMITTENT PEAKS OCCASIONALLY REACHED NO. 4 RINGELMAN. NO ODOR OF COMBUSTION GASES COULD BE DETECTED IN THE VICINITY OF THE STACK IN RANDOM OBSERVATIONS. (CA)

08-06-00857 ATTITUDES ON DESIGN OF FLUE-FED INCINERATORS (EMISSION(CONTROL))
STERLING, M.
J AIR POLLUTION CONTROL ASSOC 10(2), P. 110-113, 174 (APRIL 1960). IN DOMESTIC FIELD, USE OF FLUE-FED INCINERATORS AS ACCEPTABLE DISPOSAL TECHNIQUE IS CONTROVERSIAL FROM AIR POLLUTION VIEWPOINT. RESULTS OF QUESTIONNAIRE SUBMITTED TO 56 AIR POLLUTION CONTROL AGENCIES AND 14 INCINERATOR MANUFACTURES ON PREFERRED DESIGN OF NEW FLUE-FED INCINERATORS INDICATE MANY INNOVATIONS ARE POSSIBLE. CONSIDERABLE DEVELOPMENT WORK IS NECESSARY IF SUCH UNITS ARE TO ENJOY FUTURE ROLE AS WASTE DISPOSAL DEVICES IN MULTIPLE STORY USE. (EI)

08-06-00860 AIR POLLUTION CONTROL AND THE GAS INDUSTRY (INCINERATION EMISSION-CONTROL GAS-FIRED)
STERLING, M.
J AIR POLLUTION CONTROL ASSOC 11(8), P. 354-361 (AUGUST 1961). THE PERFORMANCE CHARACTERISTICS OF THE NEW INCINERATORS ARE SIGNIFICANTLY BETTER THAN THE DEHYDRATING (LOW INPUT) OR OLDER HIGH INPUT INCINERATORS FROM A SMOKE, ODOR, AND FLY ASH EMISSION STANDPOINT. THE ODOR PERFORMANCE CHARACTERISTICS FOLLOW THE SAME TREND AS THE SMOKE EMISSION CHARACTERISTICS. HOWEVER, THE SMOKE PERFORMANCE COULD NOT IN ITSELF ACCURATELY REPRESENT THE ODOR PERFORMANCE CHARACTERISTICS. THE AVERAGE NEW INCINERATOR REQUIRES APPROXIMATELY 35 PERCENT MORE HEAT INPUT PER POUND WASTE CONSUMED THAN THE LOW INPUT UNITS, AND 250 PERCENT MORE THAN THE OLDER HIGH INPUT UNITS. THE AVERAGE NEW INCINERATOR TAKES APPROXIMATELY TWICE AS LONG TO INCINERATE A UNIT TEST CHARGE AS DID THE OLDER HIGH INPUT UNIT. THE FLY ASH EMISSION PARTICULATE IS USUALLY GREATEST WHEN BURNING THE GARBAGE TEST CHARGE ("T") FOR ALL CLASSES OF DOMESTIC INCINERATORS. THE FLY ASH EMISSION FROM THE NEW INCINERATORS DOES NOT VARY TO THE SAME EXTENT AS THE LOW OR OLDER HIGH INPUT UNITS WHEN INCINERATING THE FOUR DIFFERENT TEST CHARGES. THE PERFORMANCE OF THE NEW UNITS IS MORE SENSITIVE TO

SLIGHT VARIATIONS IN DRAFT, OPERATING SKILL, AND INSTALLATION TECHNIQUES. ADDITIONAL DEVELOPMENTAL EFFORT WILL BE NECESSARY TO PERMIT REDUCTION IN THE RELATIVELY HIGH PERCENTAGE OF CARBON MONOXIDE EMISSIONS FROM THE NEW INCINERATORS. NO DATA WERE OBTAINED ON THE EXTENT OF EMISSIONS, SUCH AS ALDEHYDES, UNBURNED HYDROCARBONS, OXIDES OF NITROGEN, SULFUR DIOXIDES, ETC., FROM THE NEW DOMESTIC INCINERATORS. (PHEA)

08-06-00861 AIR POLLUTION CONTROL IN MUNICIPAL INCINERATION (EMISSION(CONTROL))
LENEHAM, J. W.
J AIR POLLUTION CONTROL ASSOC 12(9), P. 414-417 (SEPTEMBER 1962). VARIOUS METHODS OF CONTROLLING AIR POLLUTION OF MUNICIPAL INCINERATOR. COMPARATIVE DATA ON FLY ASH COLLECTORS FOR INCINERATORS, INCLUDING SETTLING CHAMBERS, SCRUBBERS, CYCLONE AND FABRIC COLLECTORS, AND ELECTROSTATIC PRECIPITATORS. (EI)

08-06-00941 SULFUR BALANCE OF INCINERATORS (CALORIFIC ULTIMATE-ANALYSIS(REFUSE))
KAISER, E. R.
J AIR POLLUTION CONTROL ASSOC 18(3), P. 171-174 (MARCH 1968). REPORT ON AVAILABLE DATA ON SULFUR CONTENT OF REFUSE COMPONENTS, INCINERATOR RESIDUES, AND FLUE GAS. SULFUR CONTENT OF REFUSE COMPONENTS WAS INVESTIGATED AT NEW YORK UNIVERSITY. BULK SAMPLES OF MUNICIPAL REFUSE WERE SEGREGATED BY HAND, DRIED, GROUND, AND PREPARED FOR LABORATORY ANALYSIS OF CHEMICAL ELEMENTS- STUDY SHOWED THAT MUNICIPAL REFUSE CONTAINS ONLY 0.10 TO 0.15 PERCENT SULFUR. DURING COMBUSTION MINOR FRACTION OF SULFUR IS RELEASED AS SULFUR DIOXIDE, WHILE MAJOR FRACTION IS FIXED IN ASH, WHICH CONTAINS ALKALINE OXIDES. CONTRASTED WITH COAL AND HEAVY FUEL OIL, MUNICIPAL REFUSE IS SHOWN TO BE MINOR TO NEGLIGIBLE SOURCE OF SULFUR DIOXIDE AIR POLLUTION. (EI)

08-06-00947 AIR POLLUTION RESULTING FROM INCINERATION--ITS REDUCTION AND CONTROL (EMISSION(CONTROL) HEALTH ECONOMICS
FLOOD, L. P.
J AIR POLLUTION CONTROL ASSOC 9(1), P. 63-65 (MAY 1959). CONSIDERATION OF POLLUTION BY SMOKE AND DUST RESULTING FROM INCINERATION, AND MEANS OF CONTROL. IT IS SHOWN THAT EFFECTIVE CONTROL DESIGNED INTO INCINERATION PLANT AND INCORPORATING THREE ELEMENTS OF PREVENTION, REMOVAL AND DISPERSAL, DECREASE CAPITAL INVESTMENT AND PROVIDE INCOME PRODUCING POTENTIAL. (EI)

08-06-00952 THE USE OF ELECTROSTATIC PRECIPITATORS ON MUNICIPAL INCINERATORS (EMISSION(CONTROL) COMPOSITION(REFUSE) COST(OPERATING) COST(CAPITAL))
BUMP, R. L.
J AIR POLLUTION CONTROL ASSOC 18(12), P. 803-809 (DECEMBER 1968). A DISCUSSION OF VARIOUS TYPES OF GAS CLEANING EQUIPMENT FOR INCINERATORS. TYPES DISCUSSED ARE THE BAFFLED SPRAY CHAMBERS, SPRAY COOLING CHAMBERS, WET SCRUBBERS, MECHANICAL COLLECTORS, AND ELECTROSTATIC PRECIPITATORS. TABLES ARE PRESENTED SHOWING THE EFFICIENCY AND VARIOUS COSTS OF EMISSION EQUIPMENT FOR BOTH REFRACTORY AND WATER COOLED FURNACES. A TABLE LISTING INCINERATORS WITH ELECTROSTATIC UNITS IS INCLUDED. A SUMMARY OF REFUSE COMPOSITION (BY PERCENT) IS ALSO PRESENTED.

08-06-00977 CONTROL OF AIR POLLUTION AND WASTE HEAT RECOVERY FROM INCINERATION (EMISSION(CONTROL) EMISSION(COMPOSITION) CENTRIFUGAL-COLLECTIONS ELECTROSTATIC-PRECIPITATORS)
ROGUS, C. A.
PUBLIC WORKS 97(6), P. 100-105 (1966). THIS IS THE CONCLUSION OF A SERIES OF FOUR ARTICLES IN WHICH THE AUTHOR EXAMINES THE SOLID WASTE PROBLEMS OF WESTERN EUROPE AND EVALUATES THEIR COLLECTION AND DISPOSAL PRACTICES IN TERMS OF SIMILAR OPERATIONS IN THE UNITED STATES. PREVIOUS ARTICLES HAVE COVERED REFUSE COLLECTION AND REFUSE CHARACTERISTICS, COLLECTION AND DISPOSAL OF OVERSIZE BURNABLE WASTES AND EUROPEAN DEVELOPMENTS IN REFUSE INCINERATION. THIS ARTICLE DESCRIBES THE CONTROL OF AIR POLLUTION AND WASTE HEAT RECOVERY FROM INCINERATION. IN AMERICA CONCERN WITH THIS PROBLEM HAS BEEN EXPRESSED IN SCIENTIFIC CIRCLES FOR OVER 25 YEARS, BUT ONLY WITHIN THE LAST FIVE YEARS HAS A REALISTIC ATTACK BEGUN. EUROPE, ON THE OTHER HAND, HAS HAD FOR SOME TIME RIGID GOVERNMENT STANDARDS CONTROLLING AIR POLLUTION WITH MANY LARGE SCALE AIR POLLUTION CONTROL INSTALLATIONS, PARTICULARLY OF REFUSE INCINERATION FACILITIES. SEVERAL METHODS HAVE BEEN USED IN AMERICA AND ABROAD FOR CLEANSING RAW GAS EFFLUENTS, NAMELY, SUBSIDENCE CHAMBERS, BAFFLED COLLECTORS, SCRUBBERS, CENTRIFUGAL COLLECTORS, CLOTH-TYPE FILTERS AND ELECTROSTATIC PRECIPITATORS. THE MAJOR CHARACTERISTICS AND COSTS OF THE SEVERAL COLLECTOR SYSTEMS ARE DISCUSSED AND SUMMARIZED IN TABULAR FORM. EACH OF THESE SYSTEMS, EXCEPT ELECTROSTATIC PRECIPITATION, HAS BEEN USED IN AMERICAN REFUSE INCINERATION, BUT ONLY WITH NOMINAL SUCCESS AND WITH NORMAL REMOVAL EFFICIENCIES UNDER 50 PERCENT. CONVERSELY THE MORE SOPHISTICATED APPLICATIONS IN EUROPE HAVE PRODUCED MUCH HIGHER EFFICIENCIES. THIS IS PARTICULARLY TRUE OF ELECTROSTATIC PRECIPITATORS WHICH THEY NOW USE, WITH FEW EXCEPTIONS, ON ALL LARGE MODERN INCINERATORS. THEIR DESIGNS OBEY THE BASIC CONCEPT THAT THE FUNDAMENTAL REQUIREMENT OF AIR POLLUTION CONTROL IS PROPER AND THOROUGH COMBUSTION. EUROPEAN SUCCESS IN CONTROLLING AIR POLLUTION FROM THE INCINERATION OF REFUSE IS ATTESTED TO BY THE FACT THAT IN MOST INSTANCES THEY MORE THAN MEET LOCAL RIGOROUS OFFICIAL STANDARDS. ONLY A SMALL FRACTION OF INCINERATORS IN THIS COUNTRY NOW RECOUP WASTE HEAT ENERGY. ON THE OTHER HAND, WITH THE EXCEPTION OF THOSE IN ENGLAND, MOST OF THE MODERN LARGE EUROPEAN INCINERATORS BUILT AND OPERATED SINCE WORLD WAR II, HAVE BEEN EQUIPPED TO UTILIZE THIS REMAINING AVAILABLE HEAT. THE AUTHOR DISCUSSES THE VARIOUS PROCESSES FOR AIR POLLUTION AND RECOVERY OF WASTE HEAT IN SOME DETAIL.

08-06-01026 ONLY FIFTEEN PERCENT OF ALL SOLID WASTES IS INCINERATED (INCINERATION EMISSION(CONTROL) QUANTITY)
MICHAELS, A.
REFUSE REMOVAL JOURNAL 10(2), P. 20, 22 (FEBRUARY 1967). STATISTICS ARE PRESENTED ON THE CURRENT STATUS OF INCINERATION IN THE U.S.A. AN ESTIMATE WAS MADE THAT 800,000 TPY OF PARTICULATE EMISSION WOULD CURRENTLY RESULT FROM PROPER INCINERATION OF ALL REFUSE. THIS WAS CONCLUDED TO BE AN ACCEPTABLE FIGURE AND NOT CAUSE MEANINGFUL AIR POLLUTION.

08-06-01036 MODIFICATION OF INCINERATOR PRECIPITATOR BAFFLE SAVES $15,000 PER UNIT (ELECTROSTATIC-PRECIPITATOR-BAFFLE DESIGN)
PUBLIC WORKS 92(7), P. 174 (JULY 1961). STAINLESS-STEEL INCINERATOR BAFFLES HAVE BEEN REPLACED WITH BAFFLES OF LOW POROSITY, LOW DENSITY FIREBRICK IN ROCHESTER, N.Y., INCINERATORS. THE REPLACEMENTS PRODUCED A $15,000 SAVING PER UNIT AND WERE LONGER LASTING. (PHS)

08-06-01105 WATER SPRAYS GIVE MILWAUKEE A FLY-ASH FREE INCINERATOR (COST(CAPITAL) EMISSION(CONTROL) HEAT-RECOVERY HEAT(SPACE))
SWIETLIK, W. M.
THE AMERICAN CITY 69(9), P. 90 (SEPTEMBER 1954). A REPORT ON THE GREEN BAY AVENUE PLANT, INCLUDING DIMENSIONS OF REFUSE STORAGE PIT, FURNACE VOLUMES, FLY ASH REMOVAL DATA AND COSTS ($3,000 PER TON OF ITS 300-TON RATED CAPACITY). (PHS)

08-06-01130 DUST AND WASTE GAS EMISSION OF DOMESTIC REFUSE INCINERATOR (EMISSION(CONTROL))
WEBER, E.
STAUB-UND ABGASANFALL BEI EINER HAUSMUELLVERBRENNUNGSANLAGE, STAUB 24(6), P. 210-216 (JUNE 1964). PRIVATELY-OPERATED DOMESTIC GARBAGE INCINERATION PLANTS ARE BEING EMPLOYED ON AN INCREASING SCALE. ONE OF THESE PLANTS HAS BEEN INVESTIGATED WITH RESPECT TO DUST EMISSION AND WASTE-GAS SMELLS. IT WAS FOUND THAT THE DUST EMISSION WAS ABOVE THE PERMITTED VALUES SO THAT SIMPLE, WET DUST-REMOVAL HAD TO BE BUILT IN TO CLEAN THE EFFLUENT GASES. AS A RESULT IT WAS POSSIBLE TO REDUCE THE DUST EMISSION TO 30 MG/N CU-M. WASTE GAS SMELLS WERE LARGELY AVOIDED IF THE RUBBISH INCINERATION WAS CARRIED OUT AT HIGH FURNACE TEMPERATURES AND THE FURNACE PROPERLY ATTENDED TO DURING INCINERATION. (EI)

08-06-01202 0.72 CU FEET OF FLY ASH PER TON OF REFUSE BURNED (EMISSION(CONTROL))
THE AMERICAN CITY 73(12), P. 36 (DECEMBER 1958). AN INCINERATOR HAVING A CAPACITY OF 500 TONS PER DAY HAS BEEN BUILT IN CINCINNATI, OHIO. FOR AIR POLLUTION EQUIPMENT IT HAS AN EXPANSION CHAMBER AND A BAFFLE OF " THINSULITE " CONSTRUCTION. APPROXIMATELY 0.72 CU FT OF FLY ASH PER TON OF REFUSE BURNED. (UC)

08-06-01217 SMOKELESS INCINERATION FOR A BETTER VIEW (EMISSION(CONTROL))
THE AMERICAN CITY 73(9), P. 18 (SEPTEMBER 1958). A BRIEF DESCRIPTION OF THE SPECIALLY DESIGNED, SMOKELESS, INCINERATION UNIT LOCATED NEAR THE STATUE OF LIBERTY. THIS UNIT, ENGINEERED AND MANUFACTURED BY THE SILENT GLOW OIL BURNER CORP. OF HARTFORD, CONNECTICUT, MEETS PERFORMANCE REQUIREMENTS OF NO OFFENSIVE SMOKE, ODOR, OR FLY ASH. (PHS)

08-06-01271 BIRMINGHAM'S ELECTRO PRECIPITATOR INSTALLATION (EMISSION(CONTROL) ELECTROSTATIC-PRECIPITATOR)
PUBLIC CLEANSING 56(11), P. 551-559 (1966). THE GAS CLEANING INSTALLATION IS THE FIRST OF ITS KIND TO BE ASSOCIATED WITH A REFUSE DISPOSAL PLANT. THE PLANT IS DESIGNED TO CLEAN THE FLUE GASES FROM INCINERATOR PROCESS. WHEN THE PRECIPITATOR IS IN OPERATION, A HIGH UNI-DIRECTIONAL VOLTAGE IS APPLIED TO THE DISCHARGE ELECTRODES AND SETS UP A CORONA DISCHARGE CAUSING A STREAM OF ELECTRONS AND NEGATIVE GAS IONS TO TRAVEL CONTINUOUSLY ACROSS THE STREAM TO THE COLLECTING PLATE ELECTRODES. THE GAS BORNE PARTICLES PASSING BETWEEN THE COLLECTING PLATES AND THE DISCHARGE ELECTRODES BECOME NEGATIVELY CHARGED AND MIGRATE TO THE SURFACE OF THE COLLECTING PLATE ELECTRODES ON WHICH THEY ARE DEPOSITED. THE GUARANTEED DUST COLLECTING EFFICIENCY OF THE PLANT IS 98.3 PERCENT AT 112,700 CFM, 482 DEGREES F.

08-06-01314 APPLICATION OF THE PRINCIPLES OF GAS CLEANING EQUIPMENT (EMISSION(CONTROL))
MCLEAN, N.
PUBLIC CLEANSING 58(6), P. 261-264 (1968). THE THIRD AND FINAL ARTICLE ON THE SUBJECT OF GAS CLEANING EQUIPMENT IN RELATION TO THE POLLUTION PROBLEM WITH REFUSE DISPOSAL. THREE METHODS MOST POPULAR AT THE PRESENT ARE - (1) FABRIC FILTERS (2) WET WASHERS (3) ELECTRO-PRECIPITATORS. OF THE THREE METHODS, THE ELECTRO-PRECIPITATORS, ALTHOUGH MORE EXPENSIVE IN CAPITAL COSTS ARE THE MOST EFFECTIVE.

08-06-01322 AIR POLLUTION ASPECTS OF TEPEE BURNERS USED FOR DISPOSAL OF MUNICIPAL REFUSE (EMISSION(CONTROL) COST(OPERATING))
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE PUB 999-AP-28 (SEPTEMBER 1966). THIS REPORT COVERS AN EVALUATION STUDY OF AIR POLLUTION EMISSIONS BASED UPON AN EXTENSIVE LITERATURE SEARCH AND ON FIELD TRIPS TO 15 TEPEE BURNERS IN SIX STATES. SMOKE AS A FUNCTION OF COMPOSITION AND RATE OF CHARGE WAS OBSERVED, AND THE EFFECT OF BURNER CHARGING METHODS, CONSTRUCTION, AND OPERATIONAL PROCEDURES ON SMOKE EMISSIONS WAS RECORDED. NONE OF THE TEPEE INCINERATORS OBSERVED IN OPERATION MEET THE NORMAL VISIBLE EMISSION LIMITATIONS OF AIR POLLUTION CONTROL ORDINANCES OF MOST MUNICIPALITIES. NUISANCE PROBLEMS FROM FLY ASH FALLOUT CAN BE EXPECTED WITHIN DISTANCES OF UP TO 1,290 FEET DOWNWIND FROM ON OPERATING TEPEE. BASED UPON THE RESULTS OF THE STUDY, THE PUBLIC HEALTH SERVICE DOES NOT CONSIDER THE USE OF TEPEE REFUSE BURNERS AS A SUITABLE METHOD FOR THE DISPOSAL OF MUNICIPAL REFUSE. (UC)

08-06-01338 TO IMPROVE APARTMENT-HOUSE INCINERATORS (EMISSION(CONTROL))
THE AMERICAN CITY 68(1), P. 5 (1953). A SMOKE REGULATION ENGINEER OF COLUMBUS, OHIO, SAYS THE NUISANCE OF THE ANTIQUATED INCINERATORS DESIGNED FOR APARTMENT HOUSES AND COMMERCIAL ESTABLISHMENTS THAT ARE OLDER THAN FIVE YEARS OLD, CAN ONLY BE COMBATED BY NEW REGULATIONS AND RIGID INSPECTIONS.

08-06-01377 AIR POLLUTION EFFECTS OF INCINERATOR FIRING PRACTICES AND COMBUSTION AIR DISTRIBUTION (POLLUTION(AIR) EMISSION(CONTROL))
ROSE, A. H., JR. + STENBURG, R. L. + CORN, M. + HORSLEY, R. R. + ALLEN, D. R. + KOLP, P. W.
J AIR POLLUTION CONTROL ASSOC 8(4), P. 297-309 (FEBRUARY 1959). TO DERIVE INCINERATOR DESIGN STANDARDS AND CRITERIA FOR MINIMIZING DISCHARGE OF ATMOSPHERIC POLLUTANTS, MULTIPLE-CHAMBER INCINERATOR STUDY WAS CONDUCTED TO OBTAIN INFORMATION ON EFFECT OF VARYING AMOUNT AND DISTRIBUTION OF COMBUSTION AIR, BURNING RATE, AMOUNT OF FUEL PER CHARGE, AND INTERVAL BETWEEN STOKING. MAJOR FINDINGS ARE TABULATED. (EI)

08-06-01475 TWO METHODS OF WET SCRUBBING OF GASES FOR REDUCTION OF ATMOSPHERIC POLLUTION (WATER-SCRUBBER EMISSION(CONTROL))
ANTHONY, A. W. JR.
PROC SMOKE PREVENTION ASSOC AM, 26 PP. (1948). THE WET CYCLONE P-A SCRUBBER FOR REMOVING FLY ASH, ETC., CONSISTS ESSENTIALLY OF A PLAIN, OPEN CYLINDER INTO WHICH THE DIRTY GAS ENTERS TANGENTIALLY AT THE BOTTOM AND PURSUES A SPIRAL BATH UPWARD, LEAVING AXIALLY AT THE TOP. SPRAY IS INTRODUCED INTO THE GAS FROM A SPRAY-NOZZLE MANIFOLD IN THE LOWER PART OF THE AXIS. THIS SCRUBBER IS EFFECTIVE ON MATERIALS DOWN TO ABOUT 1 MICRON, BUT EFFICIENCIES FALL OFF ON SMALLER PARTICLES. ON OLD UNITS IN A POWER PLANT, THE EFFICIENCY IS ABOUT 80 PERCENT AT FULL LOAD. MOST RECENT UNITS HAVE ABOUT 95 PERCENT EFFICIENCY, WITH MUCH HIGHER WATER RATES. THE RECIRCULATED WATER IS ACID AND VERY CORROSIVE, BUT THIS PROBLEM HAS BEEN SOLVED. WHERE ALKALI IS CHEAP, AN ALK. SOLN. CAN BE USED TO REMOVE S COMPDS. AS WELL AS FLY ASH. A C ELECTRODE PLANT USED A WET CYCLONE SCRUBBER TO ELIMINATE TAR FOG AND SIMILAR SCRUBBERS HAVE BEEN USED ON BLAST FURNACE GAS, TO REMOVE FUME AND ACROLEIN EVOLVED BY COOKING LINSEED OIL. ODORS FROM FERMENTING GARBAGE HAVE BEEN REMOVED BY USING A CYCLONE SCRUBBER SUPPLIED WITH NO. 3 DIESEL OIL TO SCRUB THE AIR. VERY HIGH SCRUBBING EFFICIENCES CAN BE SECURED BY THE VENTURI SCRUBBER IN WHICH LOW-VELOCITY SCRUBBING LIQUID IS INJECTED INTO A HIGH VELOCITY STREAM OF DIRTY GAS. THE GAS IMPINGES ON AND DISRUPTS THE RATHER LARGE LIQUID JETS AND ACCELERATES THE LIQUID DROPS WITH PROBABLE FURTHER DISRUPTION. THE MIXT. OF GAS AND SPRAY IS THEN DECELERATED AND SEPARATED IN AN ELIMINATOR, WITH THE LIQUID CONTG. MOST OF THE SOLIDS. THIS SCRUBBER WAS FIRST USED TO REMOVE SALT CAKE FUMES AT A KRAFT PULP MILL. IT WAS LATER SUCCESSFULLY USED TO REMOVE THE VERY FINE DUST PARTICLES RESULTING FROM THE USE OF O IN THE OPEN-HEARTH FURNACE. THE VENTURI SCRUBBER HAS ALSO BEEN USED TO REMOVE VAPORIZED FATTY ACID MATERIAL AND SULFURIC ACID FOG. INSTALLATION COSTS WILL BE MUCH LOWER THAN THAT OF AN EQUIV. ELECTROSTATIC PRECIPITATOR. HIGHER POWER COSTS WILL BE OFFSET BY LOWER FIXED CHARGES. ETC. (CA)

08-06-01516 GAS CLEANING EQUIPMENT (INCINERATION POLLUTION(AIR) EMISSION(CONTROL))
MCLEAN, N.
PUBLIC CLEANSING 58(4), P. 167 (APRIL 1968). THE MAJORITY OF GAS CLEANING EQUIPMENT (AIR POLLUTION CONTROL) INSTALLATIONS FALL INTO ONE OF THE FOLLOWING CATEGORIES- INERTIAL SEPARATORS, IMPINGEMENT SEPARATORS, AND ELECTRO-PRECIPITATORS. THE INERTIAL SEPARATORS CAN BE SUBDIVIDED INTO SETTLING CHAMBERS AND MECHANICAL COLLECTORS, AND THE IMPINGEMENT SEPARATORS, INTO GAS SCRUBBERS AND FABRIC FILTERS. THE SIMPLEST METHOD OF CONTROLLING POLLUTION IS THE GRAVITY SETTLING CHAMBER. IT IS ESSENTIALLY A LARGE CHAMBER BETWEEN THE SOURCE OF ASH AND THE STACK. IT IS DESIGNED TO REDUCE GAS VELOCITY AND ALLOW THE SETTLING OUT OF SOME OF THE SUSPENDED SOLIDS. THE CHAMBER MAY BE EQUIPPED WITH BAFFLES, AND THESE BAFFLES MAY BE WETTED. THE DIMENSIONS GENERALLY ARE LARGE, AND THE APPLICATION OF THE CHAMBERS GENERALLY IS LIMITED TO PARTICLES LARGER THAN 100 MICRONS. EFFICIENCIES IN FINE DUST REMOVAL GENERALLY ARE LESS THAN 50 PERCENT, AND MAY BE AS LOW AS 10 PERCENT. MECHANICAL COLLECTORS ARE THOSE IN WHICH REMOVAL OF DUST AND GRIT IS BROUGHT ABOUT BY UTILIZING FORCES RESULTING FROM CHANGES IN THE DIRECTION OF THE GAS FLOW. THE SEPARATING FORCE USUALLY EMPLOYED IS THE CENTRIFUGAL FORCE WHEN THE GASES ARE MADE TO SPIN IN A VORTICAL MOTION (CYCLONE COLLECTORS). CYCLONES ARE NOT GENERALLY CONSIDERED ECONOMICAL FOR PARTICLES BELOW ABOUT 5 MICRONS. THE PRINCIPLE INVOLVED IN THE DESIGN OF IMPINGEMENT SEPARATORS IS THAT WHEN DUST-LADEN GAS IMPINGES ON A SOLID OR LIQUID BODY, THE GAS WILL BE DEFLECTED AROUND THE BODY. THE DUST PARTICLES, DUE TO A GREATER INERTIA, TEND TO COLLIDE WITH THE BODY SURFACE AND BE SUBJECTED TO A RETAINING FORCE. EXAMPLES ARE SELF-INDUCED SPRAY SCRUBBERS, TOWER SCRUBBERS, VENTURI SCRUBBERS, FABRIC FILTERS, AND GRAVEL BED FILTERS. GAS SCRUBBERS OPERATE AT RELATIVELY HIGH EFFICIENCIES RANGING FROM 80 PERCENT FOR THE SELF-INDUCED SPRAY SCRUBBER WITH A PRESSURE DROP OF 4 TO 6 INCHES W.G. TO OVER 99 PERCENT FOR THE VENTURI SCRUBBER, WHICH REQUIRES A PRESSURE DROP OF SOME 40 TO 50 IN. W.G. THE GRAVEL BED FILTER WORKS IN CONTINUOUS OPERATION AT TEMPERATURES UP TO 600 DEGREES F AND AT EFFICIENCIES IN EXCESS OF 99 PERCENT. THESE FILTER BEDS CONSIST OF ONE OR MORE

LAYERS OF ABRASION RESISTANT MATERIAL, SUCH AS GRAVEL THROUGH WHICH THE DUSTY GAS IS PASSED. THE DUST CAUGHT IN THE FILTER BED IS REMOVED BY A VIBRATING SCREEN. IN AN ELECTRO- PRECIPITATOR, THE DUST-LADEN GAS IS PASSED BETWEEN CURTAINS OF EARTHED COLLECTING PLATES AND A SERIES OF HIGH VOLTAGE DISCHARGE OR IONIZING WIRES. ELECTRO-PRECIPITATORS CAN BE DESIGNED FOR ANY VOLUME, HAVE LOW MAINTENANCE COSTS, AND THE DRAFT LOSS USUALLY IS LESS THAN 0.5 IN. W.G. GASES NORMALLY MUST HAVE A TEMPERATURE LOWER THAN 600 DEGREES F. AND MUST BE HUMIDIFIED BEFORE ENTERING THE CHAMBER. THE VELOCITY OF THE GAS MUST BE REDUCED TO 3 TO 5 FT PER SECOND AND DISTRIBUTION MUST BE UNIFORM. THUS SPACE REQUIREMENTS ARE HIGH. COLLECTING EFFICIENCIES ARE IN THE RANGE OF 95 TO 99.7 PERCENT. (UC)

08-06-01772 AIR POLLUTION DETERRENTS (EMISSION(CONTROL)) POLLUTION(AIR) INCINERATOR(FLUE-FED))
WALSH, G. W.
REFUSE REMOVAL JOURNAL 4(3), P. 21 (MARCH 1961). A DISCUSSION OF THREE GENERAL TECHNIQUES USED TO CONTROL AIR CONTAMINANTS, WITH EMPHASIS ON THE CONTROL OF POLLUTANTS FROM WASTE INCINERATION AND ON PARTICULATE REMOVAL. (PHS)

08-06-01854 INCINERATOR CUTS AIR POLLUTION WITH NEW ENGINEERING DEVICES (POLLUTION(AIR) EMISSION(CONTROL))
MILTON, H. E.
REFUSE REMOVAL JOURNAL 8(6), P. 22 (1965). THE TOWN OF STRATFORD, CONN. DISPOSES OF APPROXIMATELY 1,800 TONS OF REFUSE PER MONTH IN ITS NEW INCINERATOR. THE MODERN REFUSE DISPOSAL SYSTEM HAS FEATURES INCORPORATED INTO IT WHICH GIVE THE MOST EFFICIENT COMBUSTION AND AIR POLLUTION CONTROL. IT CONSISTS OF TWO 120 TONS PER DAY CONTINUOUS FEED, TRAVELING GRATE-TYPE INCINERATOR UNITS WHICH ARE THE PIT AND CRANE TYPE. THERE ARE THREE TABLES COVERING COSTS OF COLLECTION AND INCINERATION, EQUIPMENT TYPES, AND SOME TEST DATA.

08-06-01859 INCINERATORS CAN MEET TOUGHER STANDARDS (DESIGN EMISSION(CONTROL))
MANDELBAUM, H.
THE AMERICAN CITY 82, P. 97-98 (AUGUST 1967). EMISSION TESTS DEMONSTRATE CONCLUSIVELY THAT AN INCINERATOR CONSISTING OF A SECONDARY COMBUSTION CHAMBER, A LOW-VELOCITY EXPANSION OR COOLING CHAMBER, 4 BANKS OF HIGH-PRESSURE WATER SPRAYS, A SECONDARY BAFFLE CHAMBER, AND CYCLONE COLLECTORS MEETS EXISTING AND PROPOSED AIR POLLUTION CONTROL REQUIREMENTS. (PHEA)

08-06-02126 TESTS ON EMISSIONS FROM REFUSE INCINERATION CHIMNEY STACKS (COMPOSITION(TRENDS) POLLUTION(AIR) EMISSION(CONTROL))
BARTON, A. E. + OSTLE, E. J.
PUBLIC WORKS AND MUNICIPAL SERVICES CONGRESS, (NOVEMBER 16, 1966). AS THE REQUIREMENTS FOR CLEANER AIR ARE INCREASED, AND THE TYPE OF WASTE IN CHANGING RAPIDLY, IT IS NECESSARY TO KEEP A BETTER CHECK ON THE TYPES OF EMISSIONS FROM INCINERATORS. EXTENSIVE TESTS ON NUMEROUS INCINERATORS HAVE BEEN MADE AND DATA HAS BEEN TABULATED IN THE PAPER.

08 07 BULKY WASTE

08-07-00031 CLAIM SEMI-MOBILE INCINERATOR WILL BURN AUTOS, TIMBER, BULK (BULKY-WASTE)
REFUSE REMOVAL JOURNAL 10(7), P. 18 (SEPTEMBER 1967). THE PERFECTAIRE INCINERATOR IS A SEMI-MOBILE UNIT DESIGNED TO HANDLE AUTOMOBILE BODIES, BUILDING DEMOLITION TIMBERS, REFRIGERATORS, AND OTHER BULKY REFUSE.

08-07-00037 PROTOTYPE LOG INCINERATOR OPERATES IN BALTIMORE PARK (GAS-FIRED)
DVIRKA, M.
PUBLIC WORKS, 97(11), 72-3 (NOVEMBER 1966). INCINERATOR DESIGN AND CONSTRUCTION IS DESCRIBED IN WHICH FURNACE CONSISTS OF LARGE PRIMARY COMBUSTION CHAMBER AND SETTLING CHAMBER EQUIPPED WITH HORIZONTAL FLY ASH SEPARATION BAFFLE. EMISSION TEST SHOWED THAT DESIGN, USING SPECIALLY DESIGNED OVERFIRE COMBUSTION AIR JETS, ADDED GREATLY TO EFFICIENCY OF FURNACE. SMOKE EMISSIONS DID NOT EXCEED NO. 0.5 ON RINGELMAN CHART. INCINERATOR HAS PROVED EFFECTIVE FOR DISPOSAL OF LOGS, AND MAY BE ADAPTED FOR INCINERATION OF OTHER BULKY REFUSE. COMBUSTION CHAMBER CAN ACCOMMODATE LOGS UP TO 14 FEET LONG. VOLUME IS 993 CU-FT. (EI)

08-07-00092 TEPEE REFUSE BURNER HAS EXTENTION DOME (INCINERATOR TEPEE-BURNER)
MOORE, W. M.
THE AMERICAN CITY 80(8), P. 165 (AUGUST 1965). LEXINGTON, KENTUCKY USES A TEPEE REFUSE BURNER FOR ITS BULKY-WASTES. BURNING RATE IS ABOUT 28 TO 30 LOADS PER DAY. A SPECIAL EXTENSION RAISES THE DOME TO PERMIT MORE THOROUGH BURNING BEFORE THE SMOKE ESCAPES. THE UNIT COST $12,700 PLUS A $15,500 COST OF INSTALLATION.

08-07-00289 CLEANEST INCINERATOR STACK GASES (EMISSION(CONTROL))
WEGMAN, L. S.
THE AMERICAN CITY 82(5), P. 89-91, 142, 144 (MAY 1967). FEATURES OF INCINERATOR IN NORTH HEMPSTEAD, N. Y. WITH THREE FURNACES RATED AT 200 TONS/24 HR. EACH. FURNACES HAVE SIX SEPARATE CONTROL LOOPS FOR UNDER GRATE AIR CONTROL, FOR FURNACE TEMPERATURE CONTROL, FOR FURNACE DRAFT CONTROL, FOR CYCLONE COLLECTOR CONTROL, FOR GAS TEMPERATURE CONTROL BY SPRAY WATER COOLING, AND BY AIR COOLING. CONTROL PANEL INSTRUMENTS SHOW ALL REQUIRED DATA. FEATURE THAT HAS ALREADY PROVEN ITS WORTH CONSISTS OF FAIL-SAFE DAMPER SYSTEM AND BYPASS FLUE IN EVENT OF POWER FAILURE. SLAGGING WAS REDUCED BY USE OF SILICON-CARBIDE AND AIR-COOLED WALLS IN FURNACE. (EI)

08-07-00423 THE INCINERATION OF BULKY REFUSE (ANALYSIS(PROXIMATE) ANALYSIS(ULTIMATE) RESIDUE)
KAISER, E. R.
PROC OF THE 1966 NATIONAL INCINERATOR CONF, ASME, P. 39-48 (MAY 1-4, 1966). BULKY REFUSE IS THE OVERSIZED SOLID COMBUSTIBLE WASTE THAT IS TOO LARGE OR OTHERWISE NOT PRACTICAL TO BURN IN CONVENTIONAL MUNICIPAL OR INDUSTRIAL INCINERATORS. THE WASTE EITHER IS TOO LARGE TO CHARGE, BURNS TOO SLOWLY, OR CONTAINS STEEL OF SHAPES THAT WOULD INTERFERE WITH THE BURNING OR THE RESIDUE DISCHARGE FROM CONTINUOUS INCINERATORS THAT WERE DESIGNED FOR SMALLER AND NORMAL REFUSE. SPECIAL FURNACES ARE NEEDED TO CONSUME THE BULKY REFUSE WITHOUT PRIOR SIZE REDUCTION OR SEGREGATION. THE DESIGN AND FIRST RESULTS OF TESTS OF A RELATIVELY SIMPLE AND PRACTICAL TYPE OF INCINERATOR ARE DESCRIBED. THE FURNACE CAN BE LOADED BY HAND FOR ONE BATCH PER DAY OPERATION, OR LOADED BY TRACTOR AND PUSHER BLADE FOR CONTINUOUS 8 HR/DAY OPERATION. (AUTH)

08-07-00476 INCINERATION OF BULKY REFUSE, PART 2 (EMISSION(CONTROL))
KAISER, E. R.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 129-135 (MAY 5-8, 1968). TESTS HAVE SHOWN PRACTICABILITY OF HEARTH-TYPE FURNACES FOR INCINERATION OF OVERSIZED BURNABLE WASTES. TRUCK LOADS CONTAINING LOGS, BRUSH, DEMOLITION LUMBER, FURNITURE, TIRES AND LIKE ARE TRACTOR CHARGED INTO FURNACE. BURNING RATES AVERAGE 18 LB/HR/SQ FT. OF REFRACTORY HEARTH AREA. SECONDARY COMBUSTION SPACE IS NECESSARY TO BURN SMOKE THAT IS GENERATED IN FURNACE. FLY ASH EMISSION IS LOW BECAUSE OF MINIMAL FLOW OF UNDERFIRE AIR. PROPOSED DESIGNS FOR INCINERATION OF 2 TO 20 TPH ARE SHOWN. (EI)

08-07-00580 SMOKELESS BRUSH DISPOSAL (INCINERATOR BULKY-WASTE)
PALMER, C. L.
PUBLIC WORKS 96(5), P. 60-92 (MAY 1965). PERFORMANCE OF TWO SMOKELESS BRUSH BURNING PLANTS OF DEPT. OF PUBLIC WORKS, DETROIT, MICH, THAT CONSUME ALL TREE TRIMMINGS, BRUSH AND LOGS COLLECTED BY DEPARTMENT. AND, ON TRIAL BASIS, SIMILAR WASTES FROM PRIVATE NURSERIES AND LANDSCAPERS. BRUSH AND LOGS ARE PUSHED INTO PLANTS BY FRONT END LOADER

EQUIPPED WITH PUSHPLATE ATTACHMENT. AVERAGE OF 1000 CU YD/8-HR SHIFT IS CONSUMED. ALL REQUIRED DRAFT IS PROVIDED BY STACK 150 FT HIGH AND 6 FT IN DIAMETER. SECOND PLANT IS DESIGNED TO SUSTAIN CONSTANT PRIMARY CHAMBER TEMPERATURE OF 2000 F AND OCCASIONAL FLARES UP TO 2400 F. FIRST PLANT WAS DESIGNED FOR CONSTANT TEMPERATURE OF 1800 F. (EI)

08-07-00628 HAMMERMILL GRINDS LUMBER FOR INCINERATION (GRINDING BULKY-WASTE)
THE AMERICAN CITY 76(10), P. 22 (OCTOBER 1961). A DESCRIPTION OF AN INCINERATOR EQUIPPED WITH A HAMMERMILL WHICH IS BEING TESTED AS A MEANS OF DISPOSAL FOR LARGE LUMBER. NEW YORK CITY EXPECTS SOON TO BAN ALL OPEN BURNING OF LUMBER AT DEMOLITION SITES IN ORDER TO REDUCE AIR POLLUTION. THIS SPECIAL INCINERATOR MAY SERVE AS AN ALTERNATIVE DISPOSAL METHOD. (PHS)

08-07-00734 HARBOR REFUSE DISPOSAL IN A LARGE PORT (INCINERATION GAS-FIRED EMISSION(CONTROL))
SYLVESTER, M. E.
PUBLIC WORKS 83(10), P. 80-81 (1952). APPROXIMATELY 500 TONS OF REFUSE, COLLECTED FROM LOS ANGELES, CALIFORNIA HARBOR, CONSISTING OF PAPER, TRASH, AND CREOSOTED LOGS AND TIMBERS ARE BURNED PER MONTH WITHOUT ATMOSPHERIC POLLUTION IN A GAS FIRED INCINERATOR FITTED WITH MECHANICAL LOADING EQUIPMENT. THE BURNER IS READILY CONVERTIBLE TO GAS AS A FUEL. (CA)

08-07-00859 BRUSH AND TRUNK BURNING PLANT IN CITY OF DETROIT (BULKY-WASTE EMISSION(CONTROL) INCINERATOR)
STERLING, M.
J AIR POLLUTION CONTROL ASSOC 15(12), P. 580-582 (DECEMBER 1965). DESIGN AND INSTALLATION OF SIX TPH INCINERATOR PLANT FOR BURNING DUTCH ELM DISEASED TREES, BRUSH AND TRUNKS. INFORMATION IS PROVIDED ON BASIC PLANT LAYOUT AND DESIGN, WET FLY-ASH COLLECTOR CONFIGURATION, OPERATING AND MAINTENANCE EXPERIENCE, AND RECOMMENDED CHANGES FOR ANY FUTURE SIMILAR INSTALLATIONS. STACK EMISSION TEST DATA ARE ALSO REPORTED. (EI)

08-07-00904 TEPEES BURN STOCKHOLM'S RUBBISH (INCINERATOR BULKY-WASTE)
BJORKMAN, A.
PUBLIC CLEANSING 52(12), P. 546 (DECEMBER 1962). AN UNEXPECTED AND PROLONGED INCREASE IN REFUSE QUANTITY COUPLED WITH THE FACT THAT NO SITE FOR A NEW INCINERATOR WILL BE AVAILABLE FOR SOME TIME, HAS LED THE CITY OF STOCKHOLM, SWEDEN, TO PURCHASE TWO AMERICAN-MADE CONICAL BURNERS. THE BURNERS, EACH OF WHICH HAS A DAILY CAPACITY OF 80 TONS, ARE NOT SUITABLE FOR DOMESTIC REFUSE BUT WILL BE USED TO DISPOSE OF THE LARGE QUANTITIES OF WRAPPING MATERIAL, CASINGS, OLD FURNITURE, DEMOLITION TIMBER, AND SIMILAR REFUSE. (PHS)

08-07-00967 SMOKELESS BURNING OF AUTOMOBILE BODIES (INCINERATION BULKY-WASTE EMISSION(CONTROL) HEAT-BALANCE)
KAISER, E. R. + TOLCISS, J.
J AIR POLLUTION CONTROL ASSOC 12(2), P. 64-73 (FEBRUARY 1962). OPEN BURNING OF AUTOMOBILE BODIES TO PREPARE THE STEEL FOR BALING HAS BEEN PRACTICED FOR YEARS BY AUTO-WRECKING YARDS. THE BLACK SMOKE RESULTING FROM THE PARTIAL COMBUSTION OF THE PAINT, SOUND DEADENING MATERIALS, RUBBER, UPHOLSTERY, WIRE, AND PLASTICS, HAS FREQUENTLY BEEN THE CAUSE OF COMPLAINT IN URBAN COMMUNITIES. IN RECENT YEARS LOCAL AND STATE LEGISLATION HAS OUTLAWED THE PRACTICE OF OPEN BURNING IN MANY AREAS, AND SIMILAR RESTRICTIONS CAN BE EXPECTED ELSEWHERE. BURNING IS A PRACTICAL WAY TO CLEAN AUTO STEEL, AND IS NECESSARY TO PRODUCE THE GRADE DESIRED FOR REMELTING. AN ECONOMICAL FURNACE FOR DOING THE JOB WITHOUT AIR POLLUTION HAS THEREFORE BEEN SOUGHT BY BOTH AUTO WRECKERS AND AIR POLLUTION CONTROL OFFICIALS. IT WAS RECOGNIZED AT THE OUTSET THAT THE COST OF SMOKELESS CLOSED BURNING WOULD BE HIGHER THAN THAT OF OPEN BURNING. THE COST OF CLOSED BURNING COULD BE OFFSET BY A SLIGHTLY LOWER PRICE PAID FOR SCRAPPED CARS. AS CLOSED BURNING OF AUTO BODIES CANNOT REASONABLY BE COMPETITIVE WITH OPEN BURNING IN THE SAME AREA, LEGISLATION TO OUTLAW OPEN BURNING IS NECESSARY TO ENCOURAGE THE USE OF CLOSED BURNERS. THE LACK OF PROVED AUTO BURNERS WITHIN THE FINANCIAL REACH OF AUTOWRECKERS HAS DELAYED THE ABATEMENT OF AIR POLLUTION FROM WRECKING YARDS. THE PURPOSE OF THIS REPORT TO PRESENT THE INFORMATION FOR THE CONSTRUCTION AND OPERATION OF TESTED DESIGNS. A DOUBLE-ENDED SHED-TYPE FURNACE WITH A SMOKELESS AFTERBURNER WAS DESIGNED BY THE AUTHORS FOR BURNING UP TO 28 AUTO BODIES A DAY IN AN AUTO-WRECKING OR SCRAP YARD. THE FURNACE MAY BE CONSTRUCTED FROM CONCRETE BLOCKS, FIREBRICK, AND USED OR NEW STEEL BY LOCAL CONTRACTORS. A SINGLE-ENDED PROTO-TYPE FURNACE WAS USED TO DEVELOP AND PROVE THE DESIGN. THE DOUBLE-ENDED FURNACE HAS AN ANNUAL CAPACITY OF 6048 BODIES WHEN OPERATED 216 FULL DAYS A YEAR. ON THE SAME BASIS, THE SINGLE-ENDED FURNACE HAS A CAPACITY OF ONLY 4320 BODIES. AT 1100 LB OF CLEAN STEEL PER BODY, THE RESPECTIVE TONNAGES WOULD BE 3326 AND 2376 A YEAR. THE CAPITAL AND OPERATING COST OF THE DOUBLE-ENDED FURNACE IS ESTIMATED AT $3.76 PER BODY OR $6.83 PER NET TON OF STEEL ABOVE THE COST OF OPEN BURNING. SIMILARLY, THE COST OF BURNING WOULD BE $5.13 PER BODY OR $9.32 PER NET TON WITH THE SINGLE-ENDED FURNACE.

08-07-01196 A PARTIAL ANSWER TO THE SCRAP-YARD BURNING PROBLEM (BULKY-WASTE INCINERATION)
THE AMERICAN CITY 73(5), P. 8 (MAY 1958). A DEMONSTRATION AT AN ATLANTA SCRAP YARD PROVED SCRAP-YARD BURNING CAN BE CONTROLLED AND NEED NOT CAUSE THE PROBLEM OF AIR POLLUTION. THE UNIT USED IS DESCRIBED. (PHS)

08-07-01597 PRIVATE INCINERATOR CO. BEATS OPEN BURNING LAW (TEPEE)
REFUSE REMOVAL JOURNAL 1(8), P. 8 (AUGUST 1958). A TEPEE INCINERATOR IS MODIFIED SO THAT REFUSE AND SUCH DIFFICULT ARTICLES AS TIRES CAN BE SUCCESSFULLY BURNED WHILE MEETING AIR POLLUTION CONTROL REQUIREMENTS AT NEWARK, NEW JERSEY. (PHS)

08-07-01696 WOOD RESIDUE INCINERATION IN TEPEE BURNERS (POLLUTION(AIR) COST(CAPITAL) COST(OPERATING) DESIGN BULKY-WASTE)
BOUBEL, R. W.
OREGON STATE UNIVERSITY ENGRG EXPERIMENT STATION, CIRC 34 (JULY 1965). INFORMATION CONCERNING COMBUSTION IN TEPEE WASTE BURNERS COVERS PROPERTIES OF WOOD AS FUEL AND DESIRABLE OPERATING RANGE FOR TEPEE BURNERS. DESIGN AND CONSTRUCTION OF WASTE BURNER, TEPEE BURNER OPERATION AND COSTS. IT IS CONCLUDED THAT TEPEE BURNER IS NOT DESIRABLE INCINERATOR FROM AIR POLLUTION STANDPOINT, BUT BY OPTIMIZING COMBUSTION CONDITIONS FOR EACH INDIVIDUAL BURNER POLLUTANTS CAN BE MINIMIZED. (EI)

08-07-01704 AUTO BODY AND BULK WASTE INCINERATION (POLLUTION(AIR) SURVEY COST(OPERATING) TEPEE)
KAISER, E. R. + TOLCISS, J.
REFUSE REMOVAL JOURNAL 3(11), P. 8 (NOVEMBER 1960). A STUDY OF THE INCINERATION OF BULK WASTES WHICH ARE NOT NORMALLY CONSUMED IN CONVENTIONAL MUNICIPAL INCINERATORS. GIVES RESULTS FROM A SURVEY OF U.S. CITIES ON BULK WASTE DISPOSAL. DISCUSSES CONICAL BURNERS, TUNNEL BURNERS, AIR POLLUTION, DISPOSAL COSTS, AND THE BURNING OF SCRAPPED AUTOMOBILE BODIES. (PHS)

08-07-01751 STOCKHOLM USES CONICAL BURNERS TO AID DISPOSAL (TEPEE INCINERATION BULKY-WASTE)
REFUSE REMOVAL JOURNAL 6(4), P. 16 (APRIL 1963). THE CITY OF STOCKHOLM, SWEDEN, IS USING TWO AMERICAN-MADE PREFABRICATED, CONICAL REFUSE BURNERS TO SUPPLEMENT THE OPERATION OF THE CITY'S LARGE REFRACTORY INCINERATOR. THE BURNERS ARE BEING USED TO CONSUME TREE LIMBS, DEMOLITION LUMBER, LARGE BOXES AND CRATES FROM FACTORIES, ALL OF WHICH ARE NOT ACCEPTABLE IN THE REFRACTORY INCINERATOR, AND SOME OF THE MORE HIGHLY COMBUSTIBLE HOUSEHOLD REFUSE WHICH IS COLLECTED. THE STOCKHOLM OPERATION IS AN EXCELLENT EXAMPLE OF THE KIND OF JOB THESE CONICAL BURNERS ARE DESIGNED TO DO. COMMUNITIES UNABLE TO BUILD LARGE INCINERATORS CAN DISPOSE OF THEIR REFUSE WITH ONE OF THESE LESS EXPENSIVE UNITS. THE RESIDUE FROM SUCH INSTALLATIONS MAKES EXCELLENT LANDFILL MATERIAL, AND IT IS BELIEVED THAT IF ONE OF THESE BURNERS IS USED IN CONJUNCTION WITH A LANDFILL, THE LIFE OF THE LANDFILL CAN BE INCREASED 10 TIMES. (PHS)

08-07-01836 SMOKELESS BRUSH BURNING PLANTS REDUCE AIR POLLUTION IN DETROIT (INCINERATION COST(CAPITAL) COST(OPERATING) EMISSION(CONTROL))
REFUSE REMOVAL JOURNAL 8(3), P. 8 (MARCH 1965). OPEN BURNING, LONG CONSIDERED A PRINCIPAL SOURCE OF AIR POLLUTION

WAS ELIMINATED BY THE CITY OF DETROIT WHEN ITS DEPARTMENT OF PUBLIC WORKS OPENED A SECOND SMOKELESS BRUSH BURNING PLANT. THE INCINERATORS ARE EQUIPPED TO HANDLE THE TRIMMING OF 50,000 TREES ANNUALLY AND 6 TO 7 THOUSAND TREE TRUNKS AS WELL AS 900,000 CU-YDS OF CITY REFUSE. THE PLANTS COST ABOUT $250,000 EACH TO BUILD AND $29,000 TO OPERATE AND MAINTAIN ANNUALLY.

08-07-01862 LOW COST PIT INCINERATOR EXTENDS LIFE OF SANITARY LANDFILL (INCINERATION BULKY-WASTE COST(CAPITAL) DESIGN)
PAGAN, A. R.
PUBLIC WORKS 98, P. 131-132 (AUGUST 1967). MATERIAL SUCH AS WOOD PALLETS, CARDBOARD CARTONS, AND FIBER BARRELS ARE BURNED IN A FIREBRICK-LINED PIT WITH CONTROLLED OVERFIRE AIR. (PHEA)

08-07-01995 DISMANTLING RAILROAD FREIGHT CARS (INCINERATION BULKY-WASTE)
BUTLER, D. M. + GRAHAM, W. M.
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE PUB 1850, WASHINGTON, D.C., (1969). IT IS RECOMMENDED THAT THE BUREAU OF SOLID WASTE MANAGEMENT UNDERTAKE TO SPONSOR A TWO-PART DEMONSTRATION PROGRAM AND TO CONSIDER THE DEVELOPMENT OF A FUNDAMENTAL RESEARCH PROGRAM IN A RELATED AREA. THE TWO-PART DEMONSTRATION PROGRAM WOULD BE DIRECTED TOWARD THE DEVELOPMENT AND TESTING OF SPECIFIC EQUIPMENT TO REMOVE WOOD FROM RETIRED FREIGHT CARS BY - (1) A SELF-CONTAINED INCINERATION TECHNIQUE USING A HOOD AND/OR STACK TO DELIVER EFFLUENT TO INSTALLED SMOKE CONTROL DEVICES OR, (2) HIGH-PRESSURE WATER JETS OF OPTIMAL DESIGN USING COMMERCIALLY AVAILABLE COMPONENTS AND ADAPTATIONS. THE DEMONSTRATION EQUIPMENT WOULD BE ASSEMBLED IN ESTABLISHED RAILROAD CAR DEMOLITION YARDS AND WOULD BE TESTED, UNDER SUITABLE SUPERVISION AND WITH INDUSTRY COOPERATION, ON FREIGHT CARS OF REPRESENTATIVE DESIGN. PHOTOGRAPHIC AND OTHER RECORDS OF RESULTS WOULD BE KEPT, AND A REPORT APPROPRIATE FOR USE AS AN INDUSTRY GUIDELINE WOULD BE PREPARED. THE DEVELOPMENT OF A FUNDAMENTAL RESEARCH PROGRAM WOULD HAVE A LONGER TERM OBJECTIVE AND SHOULD BE ADDRESSED NOT JUST TO THE FREIGHT CAR PROBLEM BUT TO THE STRUCTURAL DEMOLITION PROBLEMS OF INDUSTRY GENERALLY. IT WOULD BE SPECIFICALLY ADDRESSED TO THE ISSUES OF DEFINING THE SCOPE OF THE PROBLEM, TECHNIQUES FOR SEPARATING COMBUSTIBLES FROM STRUCTURES UNDERGOING DEMOLITION WITHOUT OPEN BURNING, AND MEANS FOR RENEWING THE ECONOMIC UTILITY OF USED WOOD AND OTHER COMBUSTIBLES FOUND IN DEMOLITION OF FIXED STRUCTURES AND CHATTELS SUCH AS FURNITURE AND APPLIANCES. (AUTH)

08 08 CORROSION AND METALLURGICAL ASPECTS

08-08-00061 BEHAVIOR OF BOILER TUBE MATERIALS IN HCL-CARRYING GASES (INCINERATOR CORROSION)
ANGENEND, F. J.
DAS VERHALTEN VON KESSELROHR-WERKSTOFFEN IN HCL-HALTIGEN GASEN, BRENNSTOFF-WAERME-KRAFT 18(2), P. 79-81 (FEBRUARY 1966). A REPORT OF LABORATORY INVESTIGATIONS IN WHICH EFFECT OF HCL CONTAINING FLUE GAS ON BOILER TUBE MATERIALS WAS EXAMINED. RESULTS ARE OF INTEREST FOR REFUSE INCINERATORS IN WHICH COMBUSTION OF CL-CONTAINING SYNTHETIC MATERIALS CAN LEAD TO DAMAGE. IN GERMAN. (EI)

08-08-00609 PLASTICS POSE A SOLID WASTE DISPOSAL PROBLEM (QUANTITY INCINERATION CORROSION SAFETY)
ENVIRONMENTAL SCIENCE TECH 2(2), P. 89 (FEBRUARY 1968). AT PRESENT THE DISPOSAL OF PLASTICS BY INCINERATION DOES NOT SERIOUSLY AFFECT THE OVERALL SOLID WASTE DISPOSAL PROBLEM ACCORDING TO A REPORT PREPARED BY THE BATTELLE MEMORIAL INSTITUTE FOR THE SOCIETY OF PLASTICS INDUSTRY, INC. ABOUT 1.5 PERCENT OF THE TOTAL WASTES IS IN THE FORM OF PLASTICS. THIS AMOUNTS TO 3.25 BILLION POUNDS. THE PERCENTAGE MAY DOUBLE IN THE NEXT DECADE. HOWEVER, IF THE AMOUNT OF PLASTICS SUBJECTED TO INCINERATION WERE INCREASED SIGNIFICANTLY, PLASTIC DISPOSAL COULD CREATE A PROBLEM, PARTICULARLY FROM HYDROGEN CHLORIDE AND OTHER HYDROGEN HALIDES. THE PROBLEM DERIVES FROM THE INCINERATION OF CHLORINE BEARING PLASTICS, SUCH AS POLYVINYL CHLORIDE WHICH ACCOUNTS FOR ONE-THIRD OF THE TOTAL PLASTICS, AND OTHER POLYMERS CONTAINING FLAME INHIBITORS. THE CONCENTRATION OF HCL IN INCINERATOR STACKS MAY APPROACH TOXICOLOGICAL LIMITS UNDER CERTAIN CONDITIONS. (UC)

08-08-00769 HYDROGEN CHLORIDE CORROSION IN REFUSE BURNING PLANTS
HUCH, R.
CHLORWASSERSTOFFKORROSIONEN IN MUELLVERBRENNUNGSANLAGEN. BRENNSTOFF-WAERME-KRAFT 18(2), P. 76-79 (FEBRUARY 1966). REFUSE BURNING PLANTS PRODUCE HYDROGEN CHLORIDE AND CHLORINE OUT OF CHLORIC FUELS. ESPECIALLY WITH HIGH FLUE GAS TEMPERATURES THESE PRODUCTS RESULT IN SEVERE FAILURE RATES IN CASES WHERE BOILER TUBE TEMPERATURES EXCEED 300 C, WITH TUBE SURFACE TEMPERATURES OF 300 TO 400 C CORROSION APPEARS SELECTIVELY OVER MECHANISM OF TRANSPORT FERRIC CHLORIDE. AT HIGHER TEMPERATURES FERRIC CHLORIDE IS APPARENTLY ALSO PRODUCED. IN GERMAN. (EI)

08-08-00817 SOME METALLURGICAL ASPECTS OF INCINERATOR CONSTRUCTION (DESIGN)
CAINE, J. B.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 99-104 (MAY 18-20, 1964). METALLURGICAL FACTORS INFLUENCING PERFORMANCE OF INCINERATOR COMPONENTS ARE REVIEWED. DATA ARE PRESENTED COVERING CREEP, GROWTH, ADHERENCE OF NONFERROUS METALS, SCALING AND DISTORTION DUE TO TEMPERATURE GRADIENTS OF COMMON FERROUS CONSTRUCTION METALS. (EI)

08-08-01053 CORROSION IN REFUSE-BURNING EQUIPMENT
STELLER, P.
VERSUCHE ZUR KLAERUNG DER KORROSIONSURSACHEN IN MUELLVERBRENNUNGSANLAGEN, ENERGIE 18(8), P. 355-357 (1966). THE COMBUSTION OF REFUSE PRODUCES FLUE GASES CONTAINING WATER AT 300 DEGREES-600 DEGREES IN THE PRESENCE OF NA, K, CL, S, AND O. SEVERE CORROSION OCCURS IN PIPES AND OTHER METAL PARTS IN CONTACT WITH MIXTURES OF HYDROCHLORIC ACID, SULFURIC ACID, AND WATER. (CA)

08 09 REFRACTORIES

08-09-00359 INCINERATOR REFRACTORY STUDIES
DAMIANO, D. J.
THE AMERICAN CITY 77(4), P. 84-87 (APRIL 1962). PHILADELPHIA'S NORTHWEST INCINERATOR REPRESENTS DEPARTURE FROM CONVENTIONAL DESIGN INSOFAR AS REFRACTORIES ARE CONCERNED. HEAT ENCLOSURE DESIGN IS BASED ON AMOUNT OF MATERIAL TO BE BURNED, KIND OF OPERATION, TYPE OF FURNACE AND RELATED FACTORS. EXHAUST TILE WAS REDESIGNED TO PREVENT PLUGGING OF AIR HOLES. SLAG DRIP LEDGE WAS BUILT IN TO PROTECT REFRACTORY BRICK. INSTALLATION HAS PROVED THAT CASTABLE MATERIAL HAS ABILITY TO SUPPORT ITSELF IN WALLS UP TO 40 FT HIGH IF PROPERLY CONSTRUCTED. RECOMMENDATIONS. (EI)

08-09-00460 SILICON CARBIDE REFRACTORIES IN INCINERATION
SCHRODER, C. H. + PROWSE, E. C.
PROC OF THE 1966 NATIONAL INCINERATOR CONF, ASME, P. 199-201 (MAY 1-4, 1966). SILICON CARBIDE REFRACTORIES HAVE UNIQUE PROPERTIES FOR PREVENTING SLAG AND CLINKER ADHERENCE ON THE LOWER WALLS OF INCINERATOR FURNACES. TO FULLY UTILIZE THESE PROPERTIES, THESE REFRACTORIES SHOULD BE INSTALLED WITH ARRANGEMENTS FOR AIR COOLING THE REAR SURFACE. THE PAPER DISCUSSES THE PERFORMANCE CHARACTERISTICS OF SILICON CARBIDE REFRACTORIES IN INCINERATOR SERVICE AND THE PRECAUTIONS TO BE OBSERVED IN THEIR INSTALLATION. (AUTH)

08-09-00468 THE CHEMISTRY OF INCINERATOR SLAGS AND THEIR COMPATIBILITY WITH FIRECLAY AND HIGH ALUMINA REFRACTORIES (RESIDUE)
CRISS, G. H. + OLSEN, A. R.
PROC OF THE 1968 NATIONAL INCINERATOR CONF, ASME, P. 53-60 (MAY 5-8, 1968). FUSED ASH ON INCINERATOR WALLS DAMAGES REFRACTORIES AND INTERFERES WITH INCINERATOR OPERATION. SLAG SAMPLES FROM WALLS OF NINE MUNICIPAL INCINERATORS WERE INVESTIGATED FOR CHEMICAL COMPOSITION AND FUSION CHARACTERISTICS. DIFFERENCES IN BEHAVIOR OF TWO SLAGS IN CONTACT WITH FOUR TYPES OF REFRACTORY ARE SHOWN. (EI)

08-09-00469 FURTHER INVESTIGATION OF REFRACTORY COMPATIBILITIES WITH SELECTED INCINERATOR SLAGS (RESIDUE)
CRISS, G. H. + OLSEN, A. R.
PROC OF THE 1968 NATIONAL INCINERATOR CONF, ASME, P. 61-68 (MAY 5-8, 1968). INCINERATOR SLAG ADHERENCE TO AND PENETRATION INTO REFRACTORIES WERE INVESTIGATED IN LABORATORY. REFRACTORY COMPOSITIONS INCLUDED BURNED SUPERDUTY FIRECLAY, HIGH ALUMINA, CHROME-MAGNESITE AND PLASTIC MATERIALS. TWO SLAGS OBTAINED FROM INCINERATOR WALLS WERE USED. PHOSPHATE-BONDED COMPOSITIONS APPEAR TO DO WELL IN RESISTING INCINERATOR SLAG ATTACK. (EI)

08-09-00752 MECHANISM OF CORROSION OF FIREBRICK BY ASH OF BORAX-IMPREGNATED TIMBER (INCINERATOR REFRACTORY(CORROSION) SLAG))
SEGNIT, E. R. + LIVERSIDGE, R. M. + GELB, T.
AUSTRALIAN J APPLIED SCIENCE 14(2), P. 155-167 (JUNE 1963). SEVERE CORROSION OF FIREBRICK LINING OF MCCASHNEY INCINERATORS INVESTIGATED. WORST DETERIORATION WAS CAUSED BY SILICEOUS ASHES FROM BORAX-IMPREGNATED WOOD WASTE. MINERALOGY OF CORROSION PRODUCTS IS DESCRIBED, AND MECHANISM OF REFRACTORY ATTACK DISCUSSED. (EI)

08-09-00808 MONOLITHIC REFRACTORIES IN MUNICIPAL INCINERATORS
KALKHOFF, A. W.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 32-34 (MAY 18-20, 1964). ADVANTAGES OF NEW INCINERATOR DESIGNS BASED ON MONOLITHIC REFRACTORY CONSTRUCTION. MODERN MONOLITHIC CONSTRUCTION WILL NOT ONLY SAFELY CONTAIN HEAT, BUT SUBSTANTIALLY ASSISTS IN PROMOTING EFFICIENT COMBUSTION, WITH ENCLOSURES THAT COMBINE VARIETY OF REFRACTORY TYPES TO MEET SPECIFIC SERVICE REQUIREMENTS OF PARTICULAR AREA. AS RESULT, DESIGNERS CAN EFFECTIVELY PREPLAN COMBUSTION EFFICIENCY AND ENCLOSURE SERVICE LIFE, AND CAN PLACE POSITIVE RESTRAINT ON MAINTENANCE COSTS. (EI)

08-09-00811 INCINERATOR REFRACTORY ENCLOSURES (EMISSION(CONTROL) SPRAY(WATER))
LINK, P. F.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 58-60 (MAY 18-20, 1964). COMPLEX STRUCTURE OF INCINERATOR FURNACE ENCLOSURES, CHARACTERISTICS OF SUSPENDED CONSTRUCTION, FLEXIBILITY IN DESIGN, MEANS OF CARRYING LOAD, ALLOWANCE FOR EXPANSION, EASE IN MAKING REPAIRS, AND OTHER FEATURES ARE DESCRIBED. IGNITION OCCURS IN PRIMARY CHAMBER AND COMBUSTION CONTINUES IN SECONDARY CHAMBER WHERE TEMPERATURES ARE STILL HIGH. IN EXPANSION CHAMBER VELOCITY AND TEMPERATURE OF GASES ARE REDUCED AND THINNER WALLS WITH INSULATION ARE SUITABLE. (EI)

08-09-01531 REFRACTORIES IN INCINERATOR CONSTRUCTION
COTTON, R. A.
ASME PAPER 62-WA-342 FOR MEETING (NOVEMBER 25-30, 1962). DIFFERENT FORMS OF REFRACTORIES AVAILABLE AND TYPES OF REFRACTORY MATERIALS USED IN THEIR MANUFACTURE ARE SHOWN. PHYSICAL PROPERTIES ARE USED AS MAIN CRITERION IN DETERMINING SUITABILITY OF REFRACTORY FOR USE IN DIFFERENT ZONES OF INCINERATORS, REFRACTORY ENCLOSURE IS SUBJECTED TO PHYSICAL ABRASION AND MECHANICAL ABUSE FROM REFUSE SLIDING OVER REFRACTORIES AND WORKING TOOLS USED TO CLEAN FURNACE, IN AREAS WHERE THESE CONDITIONS EXIST, REFRACTORIES SHOULD BE SELECTED WITH PROPER PHYSICAL PROPERTIES TO RESIST WEAR. (EI)

08 10 RESIDUE

08-10-00436 THE NATURE OF INCINERATOR SLAGS (RESIDUE(ANALYSIS)
HERBERT, D. B.
PROC OF THE 1966 NATIONAL INCINERATOR CONF, ASME, P. 191-194 (MAY 1-4, 1966). SLAG SAMPLES TAKEN FROM THREE INCINERATORS OPERATED BY THE CITY OF NEW YORK WERE INVESTIGATED. THE SLAGS SELECTED WERE TAKEN FROM THE POINT OF GREATEST BUILD-UP IMMEDIATELY ABOVE THE AIR-COOLED SILICON-CARBIDE WALL. INVESTIGATION INCLUDED- A) FUSION POINT AND FLUIDITY CHARACTERISTICS, B) PETROGRAPHIC EXAMINATION AND C) CHEMICAL ANALYSIS. RESULTS REPORTED SHOWED CONSIDERABLE VARIATION IN ALL PROPERTIES DETERMINED, UNDOUBTEDLY DUE TO THE NATURE OF THE REFUSE CHARGED IN EACH INCINERATOR. AT THE SAME TIME, IT IS FELT THAT THIS INFORMATION IS AN EXCELLENT BASIS FOR FUTURE INVESTIGATIONS AND WILL BE OF VALUE IN STUDYING SLAG-REFRACTORY REACTIONS. (AUTH)

08-10-00438 X-RAY SPECTROGRAPHIC ANALYSIS OF INCINERATOR SLAGS (RESIDUE(ANALYSIS))
REGIS, A. J.
PROC OF THE 1966 NATIONAL INCINERATOR CONF, ASME, P. 195-198 (MAY 1-4, 1966). A SERIES OF INCINERATOR SLAGS OF DIVERSE CHEMICAL COMPOSITIONS HAS BEEN ANALYZED ON A NORELCO-PHILIPS ALL VACUUM X-RAY SPECTROGRAPH. THE CALIBRATION CURVES FOR THE DESIRED ELEMENTS WERE PREPARED FROM THREE SLAG SAMPLES WHOSE COMPOSITIONS WERE KNOWN FROM WET CHEMICAL ANALYSIS. THE RESULTS SHOW THAT THE ANALYSIS OF SLAG TYPE MATERIALS BY INSTRUMENTAL METHODS TO HAVE NOT ONLY THE DESIRED ACCURACY BUT ALSO THE TIME IT TAKES FOR A COMPLETE ANALYSIS IS A FRACTION OF THE TIME REQUIRED FOR ANALYSIS BY THE WET CHEMICAL METHOD. (AUTH)

08-10-00465 INCINERATOR ASH-CRITERIA OF PERFORMANCE (ANALYSIS(CARBON-IN-ASH) RESIDUE)
BOWEN, I. G. + BREALEY, L.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 18-22 (MAY 5-8, 1968). CRITERIA WHICH APPLY TO DEGREE OF BURNOUT ON FURNACE BURNING MIXED HOUSEHOLD AND TRADE REFUSE. IN PARTICULAR, ASH DISCHARGED FROM END OF GRATE SINCE THIS REPRESENTS BULK OF ASH PRODUCED BY PLANT. CLASSICAL APPROACH TO BURNOUT IS TO EMPLOY " CARBON-IN-ASH " TECHNIQUES FAMILIAR TO COMBUSTION ENGINEERS DESIGNING GRATES FOR BOILER PLANTS. IN GERMANY ALTERNATIVE CHEMICAL TECHNIQUE HAS BEEN EVOLVED. BOTH TECHNIQUES HAVE BEEN EXAMINED AND HAVE BEEN USED ON ACTUAL SAMPLES OF ASH FROM CONTINENTAL AND BRITISH INCINERATORS. (EI)

08-10-00474 MUNICIPAL INCINERATOR REFUSE AND RESIDUE (ANALYSIS(RESIDUE))
KAISER, E. P. + ZEIT, G. D. + MCCAFFERY, J. B.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 142-153 (MAY 5-8, 1968). REPORT ON FIVE STUDIES OF MUNICIPAL REFUSE AND INCINERATOR RESIDUE. INFORMATION WILL BE OF INTEREST TO INCINERATOR PLANT CONSULTANTS AND OPERATORS, AS WELL AS TO THOSE WHO MAY CONDUCT SIMILAR INVESTIGATIONS. TESTS AT MUNICIPAL INCINERATORS SHOWED VARIATION RANGE OF REFUSE DENSITY IN STORAGE BUNKER, AVERAGE WEIGHT OF GRAPPLE LOADS, AND REFUSE ANALYSIS AND COMPOSITION. MOISTURE CONTENTS OF COMPOSITE SAMPLES RANGED FROM 19 TO 42 PERCENT. AVERAGE REFUSE ANALYSIS AND BTU CONTENT WAS DERIVED THAT IS USEFUL FOR PLANT DESIGN, PROVIDED THAT ALLOWANCE IS MADE FOR SEASONAL VARIATION IN REFUSE. (EI)

08-10-00475 PREVENTION OF FUSED DEPOSITS ON INCINERATOR LOWER SIDE WALLS
KAISER, E. R. + TRAUTWEIN, W. B.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 136-141 (MAY 5-8, 1968). WHERE FUSED ACCUMULATIONS OF GLASS, ASH, AND RESIDUE METAL OCCUR ON LOWER SIDE WALLS OF MUNICIPAL INCINERATORS, MOVEMENT OF GRATES AND BURNING REFUSE IS OBSTRUCTED. CHILLING OF WALL SURFACES NEAR BURNING REFUSE IS BASIC PRINCIPLE EMPLOYED FOR PREVENTING SUCH DEPOSITS. DISCUSSED ARE FUSION CHARACTERISTICS OF GLASS AND ASH FROM MAJOR REFUSE COMPONENTS. SUCCESSFUL METHOD OF FUSION

CONTROL THAT CAN BE INSTALLED IN EXISTING FURNACES, USE OF STEAM SPRAY NOZZLES, IS DESCRIBED IN DETAIL, TOGETHER WITH TEST DATA AND COSTS. (EI)

08-10-00486 CLASSIFICATION OF INCINERATOR RESIDUE (ANALYSIS(RESIDUE))
SCHCENBERGER, R. J. + PURDOM, P. W.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 237-241 (MAY 5-8, 1968). INCINERATOR RESIDUE CAN BE CLASSIFIED ACCORDING TO AMOUNT OF COMBUSTIBLE MATERIAL REMAINING AFTER BURNING PROCESS, AS WELL AS EFFECT ON AIR, WATER AND ANIMALS WHEN PLACED IN ENVIRONMENT. WATER POLLUTION IS VITAL CONCERN WHEN RESIDUE IS PLACED ON LAND WHERE NATURAL RAINFALL CAN LEACH CHEMICAL COMPOUNDS INTO SURFACE OR GROUNDWATERS. WATER SOLUBLE FRACTION OF RAW WASTE AND INCINERATED RESIDUE IS EXAMINED FOR NINE PARAMETERS. (EI)

08-10-00487 SPECIAL TECHNIQUES FOR ANALYZING SOLID WASTE OR INCINERATED RESIDUE (ANALYSIS(RESIDUE) CALORIFIC-VALUE)
SCHCENBERGER, R. J. + TRIEFF, N. M. + PURDOM, P. W.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 242-248 (MAY 5-8, 1968). ANALYSIS OF SOLID WASTE OR INCINERATED RESIDUE FOR INFORMATION REGARDING CHEMICAL CONSTITUENTS INVOLVED DEVELOPMENT AND ADOPTION OF ANALYTICAL METHODS. METHODS WERE DEVELOPED FOR DETERMINATION OF NITROGEN, CARBON, HYDROGEN, PROTEIN, CHEMICALLY DECOMPOSABLE ORGANIC AND CALORIFIC-VALUES. CHEMICAL COMPOSITION OF TWO TYPES OF RESIDUE AND UNBURNED SOLID WASTE WAS DETERMINED USING THESE METHODS. (EI)

08-10-00975 PNEUMATIC CONVEYOR SPEEDS FLY ASH REMOVAL (INCINERATION RESIDUE)
PUBLIC WORKS 96(4), P. 115 (1965). BY COMPARISON WITH FORMER MANUAL METHODS OF CLEANING AND REMOVING FLY ASH, THE MODERN PNEUMATIC CONVEYING SYSTEM GREATLY REDUCES THE TIME IN MAN HOURS REQUIRED TO COMPLETE THE CLEANING TASKS, ALLOWING AN INCREASE OF ABOUT 50 TONS PER WEEK OF INCINERATION.

08-10-01230 EFFECTS OF REFUSE DISPOSAL PLANT ASHES AND COMPOST DEPOSITS ON GROUNDWATERS (POLLUTION(WATER))
WOLFSKEHL, O. + BOYE, E.
EINWIRKUNG VON ABGELAGERTER MUELLASCHE UND VON MUELLKOMPOST AUF DAS GRUNDWASSER, GAS-U WASSERFACH 107(2), P. 36-38 (JANUARY 14, 1966). TEST AND CHEMICAL ANALYSIS SHOWED INCINERATOR ASHES TO BE FAR LESS DANGEROUS TO GROUNDWATER CONTAMINATION THAN COMPOST IN BULK DEPOSITS SINCE IN INCINERATION, SALTS OF ORGANIC SUBSTANCES ARE OXIDIZED INTO WATER INSOLUBLE OR NEAR-INSOLUBLE SLAGS. INCINERATORS WITH HIGH COMBUSTION RATES, REALIZING GLASSY ASHES, ARE RECOMMENDED. TABULATED DATA. (IN GERMAN) (EI)

08-10-01849 STUDY RESIDUE OF VALUE AS LANDFILL COVERING (ASH(INCINERATOR) SANITARY-LANDFILL)
REFUSE REMOVAL JOURNAL 8(7), P. 30 (JULY 1965). A STUDY IS UNDERWAY IN PHILADELPHIA TO DETERMINE WHETHER INCINERATOR RESIDUE IS SUITABLE FOR FILL PURPOSES OR AS A COVER MATERIAL FOR SANITARY LANDFILL. IN THE END, IT IS HOPED THAT INCINERATOR DESIGN AND OPERATIONS MAY BE RELATED TO RESIDUE CHARACTERISTICS. THE RESEARCH WAS MADE POSSIBLE BY A JOINT GRANT TO THE CITY OF PHILADELPHIA AND DREXEL INSTITUTE OF TECHNOLOGY OF NEARLY $60,000 TO COVER THE FIRST PERIOD OF WHAT IS PROJECTED AS A THREE-YEAR, $150,000 PROGRAM. THE MONEY CAME THROUGH THE RESEARCH BRANCH, DIVISION OF ENVIRONMENTAL ENGINEERING AND FOOD PROTECTION OF THE U.S. PUBLIC HEALTH SERVICE. (AUTH)

08-10-01935 INCINERATOR REFUSE-RESIDUE AND FLY-ASH MATERIALS HANDLING (DESIGN EMISSION(CONTROL) RESIDUE(HANDLING))
HAMPTON, R. K. + ROBERTS, J.
ASME PAPER 62-WA-343 FOR MEETING NOVEMBER 25-30, 1962. SUBJECTS CONSIDERED ARE REFUSE HANDLING INTO FURNACE, RESIDUE HANDLING FROM GRATES, AND FLY-ASH HANDLING FROM SETTLING CHAMBERS AND DUST COLLECTORS; LAYOUT OF TYPICAL MUNICIPAL INCINERATOR SHOWING POINTS REQUIRING MATERIALS HANDLING; PRESENT PRACTICE SHOWS THAT FOR LARGE PLANTS CRANE AND BIN ARE BEST; MEDIUM-SIZE PLANTS CAN BEST BE SERVED BY MODIFIED CRANE OR MONORAILS EQUIPPED WITH GRAB BUCKETS; INDUSTRIAL PLANTS, WHERE COLLECTION CAN BE CONTROLLED, WILL FIND CONVEYORS OR SKIP HOISTS USEFUL; OTHER RECOMMENDATIONS. (EI)

08 11 COMBUSTION

08-11-00471 BURNING RATES IN INCINERATORS (COMBUSTION)
ESSENHIGH, R. H.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 87-100 (MAY 5-8, 1968). EQUATION IS DERIVED RELATING FIRING RATES FOR COMBUSTION CHAMBERS OF VARIOUS TYPES AND FOR DIFFERENT WASTE FUELS. INFLUENCE OF MOISTURE IN REDUCING INCINERATOR CAPACITY IS ATTRIBUTED TO EXTRA THERMAL LOAD IT PROVIDES ON FLAME WHICH SO REDUCES AVERAGE FLAME TEMPERATURE THAT AVERAGE BURNING RATE OF WASTE IS SIGNIFICANTLY DECREASED. ACTUAL CHANGE IN FLAME TEMPERATURE IS QUITE SMALL BUT EFFECT IS GREATLY MAGNIFIED BY HIGH TEMPERATURE COEFFICIENT OF REACTION. (EI)

08-11-00495 COMBUSTION PROFILE OF GRATE-ROTARY KILN INCINERATOR (EMISSION(CONTROL))
WOODRUFF, P. H. + LARSON, G. P.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 327-336 (MAY 5-8, 1968). STUDY WAS MADE OF 300-TPD GRATE-ROTARY-KILN INCINERATOR. SAMPLING DATA WERE OBTAINED AT END OF ROTARY KILN, IN SECONDARY COMBUSTION CHAMBER, JUST AHEAD OF SPRAY CHAMBERS, AND IN STACK. SAMPLES WERE TAKEN AT SEVERAL ELEVATIONS AT EACH POINT IN COMBUSTION TRAIN. DATA WERE OBTAINED ON GAS TEMPERATURES, PARTICULATE LOADING, HYDROCARBON, OXYGEN, CARBON DIOXIDE, CARBON MONOXIDE. SAMPLING DATA HAVE BEEN CORRELATED WITH REFUSE LOADING AND GENERAL OPERATION OF INCINERATOR TO PRODUCE TYPICAL OPERATING PROFILES. PROFILES ILLUSTRATE GAS FLOW AND COMBUSTION CHARACTERISTICS OF MATERIALS AS THEY ARE BURNED IN THIS TYPE OF INCINERATOR. DATA FROM TESTS ARE PRESENTED AND DISCUSSED. (EI)

08-11-00722 EXPERIMENTAL STUDIES OF INCINERATION IN A CYLINDRICAL COMBUSTION CHAMBER
WEINTRAUB, M. + ORNING, A. A. + SCHWARTZ, C. H.
U.S. BUREAU OF MINES, RI 6908 (1967). IN AN INVESTIGATION OF THE INCINERATION OF COMBUSTIBLE WASTES, THE BUREAU OF MINES STUDIED THE EFFECT OF DIMENSIONAL PARAMETERS, PROCESS VARIABLES, AND FUEL PROPERTIES ON THE OPERATION OF AN INCINERATOR THAT CONSISTED OF A SINGLE CYLINDRICAL COMBUSTION CHAMBER IN WHICH ALL COMBUSTION AIR WAS SUPPLIED TANGENTIALLY ABOVE THE FUEL. CONSTRUCTION AND OPERATION OF THREE DESIGNS OF SUCH A DEVICE PROVED THAT THE TANGENTIAL OVERFIRE AIR DESIGN IS EFFECTIVE IN PROVIDING EFFICIENT COMBUSTION AND LOW CONCENTRATION OF PARTICULATE MATTER IN THE EFFLUENT GAS. A CORRELATION WAS FOUND THAT RELATED BURNING RATE WITH AIR RATE, CHAMBER DIAMETER, AND INLET PORT DIAMETER. IN ONE OF THE INCINERATOR MODELS, IGNITION WAS BY RADIATION FROM A PREHEATED SURFACE. THE TEMPERATURE OF THIS SURFACE WAS REQUIRED TO BE 1,400 DEGREES TO 1,600 DEGREES F TO INSURE IGNITION OF MOIST REFUSE. HOWEVER, THIS HAD LITTLE EFFECT ON COMBUSTION RATES. IN THE COMBUSTION OF MOIST REFUSE, EVAPORATION OF THE WATER PROCEEDED THROUGH THE FUEL BED AS A WAVE, WITH AN IGNITION WAVE FOLLOWING THE EVAPORATION. (AUTH)

08-11-00728 SCALE UP OF COMBUSTION POT BEHAVIOR BY DIMENSIONAL ANALYSIS
SATYANARAYANA, T. R. + GELERNTER, R. G. + ESSENHIGH, R. H.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 232-236 (MAY 5-8, 1968). NATURE OF DIMENSIONLESS GROUPS CHARACTERIZING COMBUSTION BEHAVIOR IN INCINERATOR, WHICH DETERMINE INFLUENCE OF SCALE IN TRANSPOSING RESULTS FROM COMBUSTION POT TO INCINERATOR, CAN BE EXPRESSED AS FUNCTION OF MINIMUM OF FOUR GROUPS INVOLVING NINE PARAMETERS. FROM INSPECTION OF THESE GROUPS IT WOULD SEEM THAT THEIR VALUES MAY WELL BE SAME IN BOTH SYSTEMS FOR SAME RANGE OF DIMENSIONAL PARAMETERS IN TWO SYSTEMS. (EI)

08-11-00755 UNIVERSAL REFUSE DISPOSAL AND ITS ACCOMPLISHMENT THROUGH FLAME-CHAMBER-SLAGGING METHOD (INCINERATOR)
WOTSCHKE, J.
UNIVERSALE ABFALLBESEITIGUNG UND IHRE VERWIRKLICHUNG DURCH DAS FLAMMENKAMMER-EINSCHMELZVERFAHREN, BRENNSTOFF-WAERME-KRAFT 16(8), P. 383-391 (AUGUST 1964). SLAGGING METHOD DESCRIBED OVERCOMES KNOWN DIFFICULTIES OF REFUSE COMBUSTION, ESPECIALLY THOSE RESULTING FROM FLUCTUATING CALORIFIC-VALUE AND CONTENT OF COMBUSTIBLE. GREATLY INCREASED COMBUSTION TEMPERATURES ARE ACHIEVED. IN THIS METHOD REFUSE DEPOSITS LINING COMBUSTION CHAMBER PROPER ARE CONVERTED INTO HOT DUSTLESS FLUE GAS AND SLAG OF NONCOMBUSTIBLES. (EI)

08-11-00787 REFUSE INCINERATION, FUNDAMENTAL CONSIDERATIONS OF REFUSE DISPOSAL BY COMBUSTION (COMPOSITION)
ALBINUS, G.
MUELLVERBRENNUNG, BRENNSTOFF-WAERME-KRAFT 14(5), P. 215-218 (MAY 1962). COMBUSTION 34(4), P. 54 (OCTOBER 1962). RECENT GERMAN LAWS AGAINST WATER AND AIR POLLUTION HAVE FOCUSED ATTENTION ON REFUSE DISPOSAL BY COMBUSTION. THE CALORIFIC VALUE OF REFUSE VARIES FROM COUNTRY TO COUNTRY, TOWN TO TOWN, AND SEASON TO SEASON, ALSO ITS MOISTURE AND ASH CONTENT. THE COMBUSTION TEMPERATURE SHOULD EXCEED 1,400 DEGREES F. TO DESTROY ALL OBNOXIOUS SMELLS AND GERMS. DETERMINATION OF REFUSE PROPERTIES, ESPECIALLY ITS CV, COMBUSTION BEHAVIOR, DESIGN OF FURNACES, COMBUSTION WITH AND WITHOUT ADDITIONAL FUELS, DUST PROBLEMS, AND HEAT UTILIZATION ARE DISCUSSED. (PHEA)

08-11-00814 COMBUSTION AND HEAT CALCULATIONS FOR INCINERATORS (DESIGN EMISSION(CONTROL) SCRUBBER(WATER))
KAISER, E. R.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 81-89 (MAY 18-20, 1964). DESIGN OF INDUSTRIAL AND MUNICIPAL INCINERATORS IS BASED ON COMBUSTION AND HEAT CONSIDERATIONS. PROCEDURES ARE GIVEN FOR CALCULATING QUANTITIES OF AIR, FLUE GAS, WATER AND HEAT, AS WELL AS GAS TEMPERATURES. MUNICIPAL INCINERATOR IS USED AS EXAMPLE. RELATION BETWEEN REFUSE ANALYSIS AND FLUE GAS ANALYSIS IS EXPLAINED. SECTIONS ON DRY AND WET DUST COLLECTION ARE INCLUDED. (EI)

08-11-00823 INVESTIGATION OF COMBUSTION AIR FOR REFUSE BURNING (INCINERATION COMPOSITION)
COHAM, L. J. + SHERRILL, R. C.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 135-142 (MAY 18-20, 1964). OPERATING TESTS RUN ON 250 TPD INCINERATOR TO DETERMINE EFFECTS OF OVERFIRE AIR ON BURNING RATES, FURNACE TEMPERATURES, AND OTHER CRITERIA. ALL TESTS FOR VARIOUS OVERFIRE AND UNDERGRATE AIR PROPORTIONS WERE COMPARED AGAINST CONCURRENT, NORMAL-OPERATION TEST AND COVERED SEVERAL CLASSIFICATIONS OF MOISTURE CONTENT. TESTS INDICATED THAT PROPER COMBINATION OF LOW- AND HIGH-PRESSURE OVERFIRE AIR HAD DIRECT BEARING ON INCREASED CAPACITY AND RESULTS IN GREATER BULK REDUCTION OF AVERAGE REFUSE. (EI)

08-11-00829 INCINERATOR TEMPERATURE MEASUREMENT HOW, WHAT AND WHERE (DESIGN)
LAUER, J. L.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 165-169 (MAY 18-20, 1964). VARIOUS METHODS CURRENTLY AVAILABLE FOR TEMPERATURE MEASUREMENT WITH PARTICULAR EMPHASIS ON THOSE APPLICABLE TO INCINERATORS. VARIOUS SPECIAL CONDITIONS, COMMONLY FOUND IN INCINERATORS, WHICH INSTRUMENTS MUST MEET ARE DESCRIBED. TEMPERATURE SENSORS, THEIR CHARACTERISTICS AND APPLICATION REQUIREMENTS, SUCH AS LOCATION AND PROTECTION. (EI)

08-11-00851 EFFECTS OF HIGH VOLATILE FUEL ON INCINERATOR EFFLUENTS (POLLUTION COMBUSTION EMISSION(CONTROL))
STENBURG, R. L. + HANGEBRAUCK, R. P. + VON LEHMDEN, D. J. + ROSE, A. H., JR.
J AIR POLLUTION CONTROL ASSOC 11(8), P. 376-383 (AUGUST 1961). THESE TESTS DEMONSTRATE THE DIFFICULTY OF BURNING A HIGH VOLATILE SOLID WASTE MATERIAL WITHOUT MAKING APPRECIABLE CONTRIBUTIONS TO ATMOSPHERIC POLLUTION. THE EXTENT TO WHICH OPERATIONAL FACTORS AFFECT EMISSIONS OF DIFFERENT POLLUTANTS IS EMPHASIZED BY THE WIDE RANGE OF RESULTS OBTAINED. FROM THIS IT IS ONLY LOGICAL TO CONCLUDE THAT MINIMIZATION OF POLLUTANTS CANNOT BE AFFECTED BY PROPER INCINERATOR DESIGN ALONE BUT MUST DEPEND ON A COMBINATION OF GOOD DESIGN AND PROPER OPERATIONAL PROCEDURES. BECAUSE OF THE BASIC PHYSICAL AND CHEMICAL LAWS INVOLVED, FACTORS SHOWN TO AFFECT THE INCREASE OR DECREASE OF AIR POLLUTANTS IN THIS STUDY WOULD BE EXPECTED TO APPLY WHEN THIS OR A SIMILAR MATERIAL IS BURNED IN OTHER INCINERATORS OF DIFFERENT SIZES AND DESIGNS. SINCE MODIFYING INFLUENCES CAN RESULT FROM MANY CONDITIONS OF DESIGN, CONSTRUCTION, AND OPERATION, CAUSATIVE FACTORS BROUGHT OUT BY THESE TESTS WILL REQUIRE INDIVIDUAL CONSIDERATION AND TREATMENT. REDUCTION OF OVER-ALL EMISSIONS TO A MINIMUM WILL REQUIRE THAT OPTIMUM COMBUSTION CONDITIONS BE MAINTAINED BY CONTROLLING ALL OPERATIONAL FACTORS WITHIN FAIRLY CLOSE LIMITS. OPTIMUM COMBUSTION CONDITIONS WOULD IMPLY A TEMPERATURE RANGE OF 1,800 DEGREES TO 2,000 DEGREES F. IN THE SECONDARY CHAMBER, THE USE OF A RELATIVELY LOW PROPORTION (15 PERCENT TO 20 PERCENT) OF UNDERFIRE AIR (THE REMAINDER BEING OVERFIRE), AND THE CHARGING OF FUEL CONTINUOUSLY OR IN SMALL BATCHES AS OPPOSED TO LARGE BATCH CHARGES. (PHEA)

08-11-00964 INCINERATOR FURNACE TEMPERATURE--HOW TO CALCULATE AND CONTROL IT (EMISSION(CONTROL) COMBUSTION CALORIFIC-VALUE HEAT-BALANCE)
MEISSNER, H. G.
J AIR POLLUTION CONTROL ASSOC 11(10), P. 479-482 (OCTOBER 1961). THIS PAPER COVERS THE RECOMMENDED PROCEDURE AND FACTORS OF PRIMARY IMPORTANCE IN THE DESIGN AND OPERATION OF A REFUSE INCINERATOR, SO AS TO BE ABLE TO CALCULATE AND MAINTAIN THE OPTIMUM FURNACE TEMPERATURE. THE PROCEDURE HAS BEEN SIMPLIFIED AS FAR AS POSSIBLE. THE THREE " T'S " OF COMBUSTION, NAMELY, " TIME, " " TEMPERATURE ", AND " TURBULENCE " ARE SO CLOSELY RELATED THAT THEY MUST BE CONSIDERED TOGETHER IN DETERMINING THE PERFORMANCE OF THE INCINERATOR. WITHOUT TIME ENOUGH FOR THE COMBUSTIBLE MATTER TO BURN, THE DESIRED TEMPERATURE WILL NOT BE OBTAINED, AND WITHOUT ADEQUATE TURBULENCE NEITHER THE TIME OR TEMPERATURE REQUIREMENTS WILL BE MET. FOR ANY GIVEN FURNACE AND FUEL THERE IS A FAIRLY DEFINITE AND RATHER EASILY DETERMINED OPTIMUM FURNACE TEMPERATURE WHICH CAN BE CALCULATED, WHEN CERTAIN CONTROLLING FACTORS ARE KNOWN OR ASSUMED. SUCH CALCULATIONS HAVE BEEN USED FOR MANY YEARS IN THE DESIGN OF BOILER FURNACES BUT ARE NOT SO WELL KNOWN OR UNDERSTOOD IN THE CASE OF INCINERATOR DESIGN. THESE FACTORS INCLUDE THE FUEL CHARACTERISTICS SUCH AS ASH FUSION TEMPERATURE AND MOISTURE CONTENT FOR SOLID FUELS. ALSO UNIT HEAT VALUE, AS WELL AS THE FURNACE SIZE AND DESIGN, WATER COOLING, OR REFRACTORY WALL CONSTRUCTION, INCLUDING BOILER OR OTHER HEAT ABSORBING OR " BLACK " SURFACES. THE S/V RATIO OR HEAT ABSORBING SURFACE VS FURNACE VOLUME IS SOMETIMES USED TO EXPRESS THE LATTER FACTOR.

08-11-01142 INCINERATION - A PRACTICAL AND SCIENTIFIC APPROACH (COMPOSITION COMBUSTION)
ESSENHIGH, R. H.
ENVIRONMENTAL SCIENCE TECH 2(7), P. 524-534 (1968). THE AUTHOR DEALS WITH THE NEED TO REALLY UNDERSTAND THE COMPLEX PROCESS TAKING PART IN AN INCINERATOR. HE DEFINES THE DIFFERENCE IN RUBBISH AND GARBAGE AND WHY EACH MUST BE TAKEN INTO CONSIDERATION WHEN PLANNING INCINERATION. HE DESCRIBES AREAS THAT MORE RESEARCH SHOULD BE DONE TO REFINE THE PROCESS OF INCINERATION A PROGRAM TO REALLY ANALYZE THE PROCESS , AND NOT ONE JUST TO COLLECT DATA. THERE ARE TWO TABLES (1) POSSIBLE REACTION MODES IN AN INCINERATOR, (2) CLASSIFICATION OF WASTES TO BE INCINERATED.

08 12 STANDARDS

08-12-00750 DESIGN STANDARDS FOR MULTIPLE CHAMBER INCINERATORS PART I
WILLIAMSON, J. E. + MACKNIGHT, R. J. + CHASS, R. L.
IND WATER WASTES 6(3), P. 61-65 (MAY-JUNE1961). THIS IS THE FIRST OF A THREE PART SERIES ON THE STANDARDS DEVELOPED FOR THE DESIGN OF INCINERATORS BY THE LOS ANGELES AIR POLLUTION CONTROL DISTRICT. IT IS DEVOTED TO DEVELOPING BASIC CONSIDERATIONS REGARDING INCINERATOR OPERATION AND DESIGN AND PRESENTING IN TABULAR FORM THE STANDARDS THEMSELVES. THE BASIC CONSIDERATIONS DEVELOPED ARE - CLASSIFICATION OF REFUSE, THE PROCESS OF INCINERATION, THE PRINCIPLES OF COMBUSTION FOR THE TYPE OF EQUIPMENT, AND FINALLY THE DESIGN. (PHEA)

08-12-00827 INCINERATOR TESTING PROGRAMS (EMISSION(CONTROL) SAFETY COMBUSTION-EFFICIENCY DESIGN)
GODER, R.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 157-160 (MAY 18-20, 1964). DISCUSSION OF WIDELY VARIED AND UNCOORDINATED EFFORTS TO STUDY AND EVALUATE INCINERATOR DESIGN THROUGH FIELD AND LABORATORY TESTS AND TEST PROGRAMS. AIR POLLUTION, FIRE HAZARD AND COMBUSTION EFFICIENCY ARE ALL ELEMENTS REQUIRING SPECIALISTS IN EACH FIELD TO COOPERATE TO PRODUCE FIELD STANDARD ACCEPTANCE TEST AND UNIFORM TERMS AND NOMENCLATURE FOR EACH ASSIMILATION OF LABORATORY TEST DATA AND REPORTS. (EI)

08-12-00968 INCINERATOR STANDARDS
VOELKER, E. M.
J AIR POLLUTION CONTROL ASSOC 12(10), P. 487-491 (OCTOBER 1962). A DISCUSSION OF THE FORMATION OF THE INCINERATOR INSTITUTE OF AMERICA AND THEIR ROLE IN DEVELOPING STANDARDS FOR INCINERATOR DESIGN. SAMPLE CALCULATIONS OF COMBUSTION PRODUCTS AND FURNACE VOLUME ARE INCLUDED. IT IS SUGGESTED THAT THE INCINERATOR STANDARDS PROPOSED BE ACCEPTED BY THE AIR POLLUTION CONTROL ASSOCIATION.

08-12-01049 IIA INCINERATOR STANDARDS
INCINERATOR INSTITUTE OF AMERICA (NOVEMBER 1968). CLASSIFICATION AND STANDARDS FOR INCINERATORS ARE DETAILED.

08-12-01050 INCINERATOR TESTING
INCINERATOR INSTITUTE OF AMERICA, BULLETIN T-6 (AUGUST 1968). A TEST PROCEDURE DEVELOPED BY IIA FOR INCINERATOR EMISSION IS DETAILED.

08-12-01938 NEED FOR TEST CODE FOR LARGE INCINERATORS
KAISER, E. R.
ASME PAPER 67-WA/PTC-4 FOR MEETING NOVEMBER 12-17, 1967. COMMITTEE HAS BEEN NAMED BY AMERICAN SOCIETY OF MECHANICAL ENGINEERS TO DRAFT PERFORMANCE TEST CODE FOR INCINERATORS THAT BURN OVER 2000 LB OF REFUSE/HR; CONSIDERATIONS WHICH LED THIS ACTION, AND OUTLINE OF SCOPE, AND TECHNICAL FEATURES THAT WILL ENGAGE COMMITTEE'S ATTENTION. (EI)

08 13 DESIGN

08-13-00035 GUIDE TO INCINERATOR INSTALLATIONS (CALORIFIC-VALUE DESIGN SELECTION QUANTITY SCRUBBER(WATER) EMISSION(CONTROL))
SCHLOERKE, K. W.
AIR CONDITIONING, HEATING AND VENT 64(5), P. 627-632 (MAY 1967). BASIC CRITERIA GUIDES FOR CHOOSING TYPE AND SIZE OF INCINERATOR AND ITS AUXILIARY INSTALLATIONS INCLUDING GAS BURNERS, DRAFT CONTROLS, BREECHINGS, CHIMNEYS AND COMBUSTION AIR SUPPLY. (EI)

08-13-00050 FURNACE DESIGNS FOR REFUSE BURNING (DESIGN INCINERATOR HEAT RECOVER ASH(UTILIZATION)
RASCH, P.
OFENSYSTEME FUER DIE MUELLVERBRENNUNG, BRENNSTOFF-WAERME-KRAFT 16(8), P. 376-382 (AUGUST 1964). TYPES OF SYSTEMS ARE SHOWN AND VARIOUS DESIGNS DESCRIBED ACCORDING TO PECULIARITIES OF EACH FURNACE. DETAILS OF COMBUSTION CHAMBER LININGS AND FLUE GAS RECIRCULATION ARE DEALT WITH. ECONOMIC VALUE OF HEAT RECOVERY IS TOUCHED UPON. POSSIBILITIES AND PROBLEMS OF USING ASH FROM REFUSE FOR MAKING BUILDING MATERIAL ARE DISCUSSED. (EI)

08-13-00421 MUNICIPAL INCINERATOR DESIGN PRACTICES AND TRENDS (HEAT-RECOVERY SALVAGE)
STEPHENSON, J. W. + CAFIERO, A. S.
PROC OF THE 1966 NATIONAL INCINERATOR CONF, ASME P. 1-38 (MAY 1-4, 1966). IMPROVEMENTS AND CHANGES IN REFUSE INCINERATOR TECHNOLOGY DURING THE PAST TWENTY YEARS HAVE BEEN GREATER THAN IN ANY OTHER PERIOD. THIS PAPER REPORTS THE FINDINGS OF A SURVEY OF DESIGN PRACTICES COVERING PLANTS BUILT OR DESIGNED SINCE 1945. DATA ARE PRESENTED ON 205 PLANTS FOR WHICH QUESTIONNAIRES WERE RETURNED, WITH NOTE MADE OF INDICATED TRENDS IN DESIGN PRACTICES AND TYPES OF EQUIPMENT. EIGHTY-FOUR PLANTS, FOR WHICH QUESTIONNAIRES WERE NOT RETURNED, ARE LISTED. (AUTH)

08-13-00433 INSTRUMENTATION SPECIFICATIONS - THE KEY TO A GOOD SYSTEM (EMISSION(CONTROL))
STICKLEY, J. D.
PROC OF THE 1966 NATIONAL INCINERATOR CONF, ASME, P. 167-170 (MAY 1-4, 1966). ONE OF THE KEYS TO EFFICIENT INCINERATOR OPERATION IS A WELL DESIGNED AND PROPERLY FUNCTIONING INSTRUMENTATION SYSTEM. THE KEY TO A GOOD INSTRUMENTATION SYSTEM IS A GOOD SET OF SPECIFICATIONS, WHICH ASSURES HIGH QUALITY EQUIPMENT, PROPER INSTALLATION, AND THOROUGH TESTING. THIS PAPER EXAMINES THE PROBLEM OF SPECIFICATION WRITING AND SUGGESTS SPECIFICATIONS WHICH WILL ASSURE A GOOD SYSTEM IN TERMS OF RESULTS. WHEN A MUNICIPALITY BUILDS A NEW INCINERATOR FACILITY, AN IMPORTANT PART OF THIS FACILITY IS THE INSTRUMENTATION SYSTEM. THE INSTRUMENTATION SYSTEM ENABLES THE OPERATOR TO OPERATE THE INCINERATOR AT MAXIMUM EFFICIENCY WHILE PRODUCING A MINIMUM OF AIR POLLUTION. IT FOLLOWS THEN THAT THE EFFECTIVE OPERATION OF AN INCINERATOR DEPENDS VERY MUCH ON THE PROPER INSTALLATION OF THE INITIAL INSTRUMENTATION SYSTEM. THE SELECTION OF THE RIGHT EQUIPMENT, THE PROPER INSTALLATION OF THIS EQUIPMENT AND THE CAREFUL TESTING OF THE ENTIRE SYSTEM ARE FACTORS WHICH INFLUENCE THE PROPER OPERATION OF AN INSTRUMENTATION SYSTEM. HOW CAREFULLY THESE THREE FUNCTIONS ARE PERFORMED DEPENDS VERY MUCH ON THE MANNER IN WHICH THE SPECIFICATIONS OF A JOB ARE WRITTEN. THE PURPOSE OF THIS PAPER IS TO ASSIST THE CONSULTING ENGINEER TO DEVELOP SPECIFICATIONS WHICH WILL ASSURE THE ENGINEER AND THE MUNICIPALITY OF A PROPERLY OPERATING INSTRUMENTATION SYSTEM. (AUTH)

08-13-00442 PROGRESS IN MUNICIPAL INCINERATION THROUGH PROCESS ENGINEERING (EMISSION(CONTROL))
ZINN, R. E.
PROC OF THE 1966 NATIONAL INCINERATOR CONF, ASME, P. 259-266 (MAY 1-4, 1966). PROCESS ENGINEERING IS APPLIED TO THE DESIGN OF A NEW CONCEPT OF A MUNICIPAL INCINERATOR. EACH OF SEVEN INCINERATION PROCESS AREAS IS ANALYZED SEPARATELY AND THE EQUIVALENT PROCESS IN THE CHEMICAL AND METALLURGICAL INDUSTRIES EXAMINED FOR PROVEN DESIGN FEATURES APPLICABLE TO INCINERATION. EXAMPLES OF INTEGRATION OF DESIGNS FOR PROCESS AREAS ARE GIVEN. ADVANTAGES OF THIS NEW INCINERATOR CONCEPT INCLUDE LOWER COST, LESS CONSTRUCTION TIME AND ADAPTATION TO PREFABRICATION AND MASS PRODUCTION. (AUTH)

08-13-00463 USE OF MATHEMATICAL PLANNING MODELS TO PREDICT INCINERATION REQUIREMENTS (REGRESSION PROJECTION)
BACHER, J. H. + RANARD, E. D.
PROC OF THE 1966 NATIONAL INCINERATOR CONF, ASME, P. 1-11 (MAY 5-8, 1968). MATHEMATICAL MODELS (EQUATIONS) TO PREDICT INCINERATOR REQUIREMENTS IN CONNECTICUT. TECHNIQUE OF STEPWISE CURVILINEAR REGRESSION ANALYSIS WAS USED TO GENERATE THESE MATHEMATICAL MODELS. INPUT INFORMATION NECESSARY TO EXECUTE MODELS WAS TAKEN FROM " TRANSPORTATION " STUDY CONDUCTED BY STATE OF CONNECTICUT. TRANSPORTATION STUDY INVESTIGATES EFFECTS OF LAND USE, POPULATION, AND MANUFACTURING INTENSITIES ON HIGHWAY REQUIREMENTS. SINCE SIMILAR TRANSPORTATION STUDIES ARE BEING, OR HAVE BEEN, CONDUCTED IN MANY STATES, CONCEPTS PRESENTED IN THIS REPORT CAN BE USED BY OTHER STATES TO DEVELOP THEIR OWN MODELS TO PREDICT INCINERATOR REQUIREMENTS. (EI)

08-13-00477 INFLUENCE COEFFICIENTS TO RELATE MUNICIPAL REFUSE VARIATIONS TO INCINERATOR DESIGN (DESIGN COMPOSITION)
KALIKA, P. W.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 154-170 (MAY 5-8, 1968). VARIABILITY OF MUNICIPAL REFUSE IS DIFFICULT TO PREDICT OR TO COMPENSATE FOR IN INCINERATOR DESIGN. COMPUTER PROGRAM HAS BEEN DEVELOPED WHICH PROVIDES INFLUENCE COEFFICIENTS WHICH RELATE REFUSE VARIATION TO INCINERATOR DESIGN PARAMETERS. COEFFICIENTS WERE FOUND TO BE RELATIVELY INDEPENDENT OF MOST OPERATING CONDITIONS AND WERE REDUCED TO BRIEF TABLES. THESE AND SELECTED GRAPHS ARE PRESENTED AND DISCUSSED. COEFFICIENTS INDICATE THAT MODEST INCREASES IN REFUSE HEAT CONTENT COULD SERIOUSLY LIMIT INCINERATOR DESIGN CAPACITY, BUT THAT HEAT ABSORPTION EQUIPMENT COULD POTENTIALLY BE USED TO COMPENSATE FOR FUTURE CHANGES IN REFUSE CHARACTERISTICS. (EI)

08-13-00489 PERFORMANCE AND DESIGN DATA FOR LARGE EUROPEAN REFUSE INCINERATORS WITH HEAT-RECOVERY (COMPOSTION EMISSION(CONTROL))
STABENOW, G.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 278-286 (MAY 5-8, 1968). VARIETY OF DESIGNS FOR MUNICIPAL INCINERATORS WHICH HAVE OPERATED SUCCESSFULLY IN EUROPE OVER LONG PERIODS. HEAT RECOVERED THROUGH GENERATION OF STEAM PERMITS THOROUGH EVALUATION OF INCINERATOR PERFORMANCE TESTS. PERFORMANCE SPECIFICATIONS AND GUARANTEES FOR HIGH GRADE INCINERATOR EQUIPMENT. RIGID ENFORCEMENT OF SUCH SPECIFICATIONS WILL PERMIT MUNICIPALITIES TO SELECT INCINERATORS THAT WILL ASSURE LONG LIFE AND SATISFACTORY OPERATION. (EI)

08-13-00490 INCINERATOR DESIGN WITH OPERATOR IN MIND (HEAT-RECOVERY)
STEPHENSON, J. W.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 287-294 (MAY 5-8, 1968). EASE, SIMPLICITY, AND ECONOMY OF OPERATION AND MAINTENANCE ARE IMPORTANT CONSIDERATIONS IN INCINERATOR PLANT DESIGN, BUT AVERAGE DESIGNING ENGINEER CANNOT ACQUIRE SUFFICIENT OPERATING EXPERIENCE TO BECOME FAMILIAR WITH DAY TO DAY PROBLEMS FACED BY PLANT PERSONNEL. DETAILS CONSIDERED MINOR BY DESIGNER MAY, IF NOT PROPERLY TREATED, BECOME MAJOR PROBLEMS OR INCONVENIENCES IN PLANT OPERATION OR MAINTENANCE. SUGGESTIONS BY LEADING MUNICIPAL INCINERATOR PLANT OPERATORS, BASED ON MANY YEARS' EXPERIENCE, ARE PRESENTED FOR CONSIDERATION BY DESIGNERS. (EI)

08-13-00491 TEMPERATURE AND AIR DISTRIBUTIONS IN LARGE RECTANGULAR INCINERATOR FURNACES (DESIGN)
STERNITZKE, R. F. + DVIRKA, M.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 295-302 (MAY 5-8, 1968). SOME BASIC THEORIES OF FURNACE DESIGN AND THEIR APPLICATION IN MODERN REFUSE BURNING FURNACES. PRELIMINARY AND PARTIAL TEST DATA. OBSERVATIONS BASED ON EXPERIENCE IN OPERATION OF VARIOUS TYPES OF MUNICIPAL INCINERATORS, SOME RECOMMENDATIONS FOR DESIGN OF COMBUSTION-AIR SYSTEMS. COMBUSTION AND EXCESS AIR DELIVERED IN CORRECT QUANTITIES, AT RIGHT PLACE AND AT RIGHT TIME WILL RESULT IN CONTROLLED OPTIMUM OPERATING FURNACE TEMPERATURES, REDUCED REFRACTORY MAINTENANCE COST BY VIRTUE OF LIMITED SLAGGING ON REFRACTORY WALLS, REDUCED STOKER MAINTENANCE COST, CONSIDERABLE REDUCTION IN PARTICULATE EMISSIONS. (EI)

08-13-00492 INSTRUMENTATION SYSTEMS FOR MUNICIPAL REFUSE INCINERATORS (DESIGN)
STICKLEY, J. D.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 303-308 (MAY 5-8, 1968). OPERATIONAL REQUIREMENTS OF TODAY'S MODERN REFUSE INCINERATORS MAKE USE OF MODERN INSTRUMENTATION TECHNIQUES NECESSARY. BASIC CONTROL SYSTEMS USED IN MODERN INCINERATORS ARE OUTLINED. UTILIZATION OF MORE SOPHISTICATED TECHNIQUES OF RATIO AND CASCADE CONTROL OF INTERRELATED VARIABLES ARE EXAMINED AS TOOLS FOR MORE EFFECTIVE OPERATION OF INCINERATORS. (EI)

08-13-00509 FACTORS INVOLVED IN THE DESIGN OF HIGH RISE CHIMNEY AND CHUTE SYSTEMS (INCINERATION)
SCHULZ, J. F.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 249-265 (MAY 5-8, 1968). THIS PAPER PRESENTS THE NATURAL BUILDING PRESSURES CREATED BY THE TEMPERATURE DIFFERENCE BETWEEN THE CHIMNEY AND THE OUTSIDE ATMOSPHERES. IT ALSO REVIEWS THE EFFECT OF WIND UPON BUILDING PRESSURES AND CHIMNEY TERMINATIONS. THESE FACTORS ARE CONSIDERED FOR EFFECTIVE CHIMNEY DESIGN. POINTERS ON CHIMNEY CONSTRUCTION TO SOLVE WET AND LEAKY CHIMNEYS ARE PRESENTED TOGETHER WITH SIMPLE FORMULAS FOR THE CALCULATION OF THE VARIOUS DATA FOR CHIMNEY DESIGN PURPOSES.

08-13-00558 FACTORS IN INCINERATOR DESIGN
NICKELSPRN, H. B.
PUBLIC WORKS 93(3), P. 123 (MARCH 1962). THE DENSITY OF REFUSE VARIES FROM 250 TO 750 LB PER CU YD - DEPENDING UPON THE AMOUNT OF COMPACTION. COMPUTATIONS AND RATINGS FOR PLANT DESIGN SHOULD BE BASED ON WEIGHT, NOT VOLUME. ACCORDING TO THE PAPER, THERE ARE FOUR ESSENTIALS TO COMPLETE COMBUSTION- (1) SUFFICIENT AIR TO PERMIT COMPLETE INCINERATION - AN INSUFFICIENT AMOUNT OF AIR RESULTS IN HIGH TEMPERATURES, WHICH, IN TURN, REDUCE THE LIFE OF THE REFRACTORY. (2) MIXING AIR WITH REFUSE TO START OXIDATION. (3) SUFFICIENTLY HIGH TEMPERATURE SO THAT THE REFUSE CAN BE HEATED TO ITS IGNITION POINT AND IGNITION BE SUSTAINED. FURNACE TEMPERATURES RANGE FROM 1200-1800 DEGREES F., AND SHOULD BE KEPT AROUND 1500 DEGREES F. (4) SUFFICIENT TIME TO COMPLETE COMBUSTION. THE TIME REQUIREMENT CAN BE REDUCED BY PROVIDING SUFFICIENT FURNACE DRAFT. THE DRAFT SHOULD BE GREAT ENOUGH TO RESULT IN A NEGATIVE PRESSURE WHEN THE FURNACE DOOR IS OPENED (0.25-INCH WATER COLUMN). THE LATTER REQUIREMENT IS A FUNCTION OF SAFETY IN WORKING CONDITIONS. THE FOLLOWING ARE THE RECOMMENDED RATINGS IN POUNDS OF REFUSE BURNED PER SQ FT OF GRATE SURFACE PER HOUR- HERRINGBONE STATIONARY GRATES (HAND STOKED), 40, INCLINED TILTING GRATES (MECHANICALLY STOKED), 60, ROUND GRATES (MECHANICALLY STOKED), 70. TRAVELING GRATES ARE RATED ON THE BASIS OF 300,000 BTU PER HOUR PER SQ FT. THE NORMAL HEAT RELEASE IN FURNACES OPERATING UNDER DRAFT CONDITIONS IS 20,000 TO 35,000 BTU PER CU FT VOLUME. AN ACCEPTED FIGURE OF 25 CU-FT PER TON OF RATED CAPACITY HAS BEEN USED FOR THE COMBINED VOLUMES OF FURNACE AND COMBUSTION CHAMBER. MOST MUNICIPAL REFUSE HAS A COMBUSTIBLE CONTENT SIMILAR TO THAT OF CELLULOSE. THE THEORETICAL AIR REQUIREMENT IS 5 LB AIR PER LB OF COMBUSTIBLE MATERIAL FIRED. IN PRACTICE IT IS DESIRABLE AND PRACTICAL TO PROVIDE 100 PERCENT EXCESS AIR. MOIST GARBAGE NEEDS LESS AIR PER LB. IN GENERAL, THE GREATER THE FURNACE HEIGHT, THE BETTER THE DESIGN. SAMPLE DESIGN CALCULATIONS ARE PROVIDED. (UC)

08-13-00620 HOW HOT IS " TOO HOT " IN AN INCINERATOR (DESIGN(TEMPERATURE))
CAINE, J. B.
THE AMERICAN CITY 76(11), P. 104 (NOVEMBER 1961). PRESENTS SOME SOLUTIONS TO THE PROBLEMS OF METAL EXPANSION, GROWTH, AND BREAKAGE IN MUNICIPAL INCINERATORS. (PHS)

08-13-00676 HOW CAN WE GET INCINERATION (CAPACITY COMPOSITION)
CADMUS, T. W.
PUBLIC WORKS 84(10), P. 82, 83, 157 (OCTOBER 1953). A GENERAL ARTICLE OUTLINING THE GENERAL PRINCIPLES NEEDED TO SPECIFY AN INCINERATOR FOR MUNICIPAL REFUSE DISPOSAL.

08-13-00714 WHAT GOOD INCINERATION MEANS - PART II DESIGN PARAMETERS (HEAT-RECOVERY EMISSION(CONTROL) MATERIALS-HANDLING COST(HEAT-RECOVERY))
MICHAELS, A.
THE AMERICAN CITY 83(6), P. 88-90, 156-157 (JUNE 1968). RECENT DEVELOPMENTS IN INCINERATOR DESIGN ARE REVIEWED. NEW METHODS FOR CONTINUOUSLY FEEDING FUEL TO THE INCINERATOR ARE DESCRIBED. RESIDUE REMOVAL, EXCESS AIR AND EMISSION CONTROL, AND HEAT RECOVERY TRENDS ARE DISCUSSED. COST DATA FROM AN ENGINEERING STUDY TO RECOVER WASTE HEAT AS STEAM FOR DISTRICT HEATING IN PHILADELPHIA IS SUMMARIZED.

08-13-00745 NEW TRENDS IN HOSPITAL INCINERATION DESIGN (PATHOGEN)
LARKIN, M. C.
AIR ENGRG 3(4), P. 33-36 (APRIL 1961). CHANGING PATTERN OF HOSPITAL WASTES, I.E. INCREASED USE OF PAPER PRODUCTS AND DECREASED WET WASTE, RESULTED IN INCREASE OF WASTE THERMAL VALUE FROM 2500 TO 6500 BTU/LB. OLD, HORIZONTAL HEARTH WET TYPE INCINERATORS ARE NOT ABLE TO HANDLE NEW DRY WASTE AND RESULT IN GREATER FLYASH AND SMOKE CARRYOVER DUE TO HIGHER GAS VELOCITIES. NEW INCINERATOR DESIGNS ARE PRESENTED. (EI)

08-13-00748 DESIGN STANDARDS FOR MULTIPLE CHAMBER INCINERATION PART III (REFRACTORY GRATES HEARTHS AIR-INLETS STACK DRAFT OPERATION)
WILLIAMSON, J. E. + MACKNIGHT, R. J. + CHASS, R. L.
IND WATER WASTES 6(5), P. 134-137 (SEPTEMBER-OCTOBER 1961). ORDINANCES AND STATUTES NOW BEING ENACTED CONSIDER MECHANICAL DESIGN AND MATERIALS OF CONSTRUCTION FOR INCINERATORS. PORTABLE PREFABRICATED UNITS ARE AVAILABLE AND NEED ONLY PLACEMENT ON A FOUNDATION AND CONNECTION TO AN AUXILIARY FUEL SUPPLY. DISCUSSION CENTERS ON REFRACTORY, GRATES AND HEARTHS, AIR INLETS, STACK CONSTRUCTION, INDUCED DRAFT AND OPERATION. THE ARTICLE ENDS WITH BRIEF SUMMARY OF THE THREE PARTS OF THE ARTICLE. (PHEA)

08-13-00749 DESIGN STANDARDS FOR MULTIPLE CHAMBER INCINERATORS PART II
WILLIAMSON, J. E. + MACKNIGHT, R. J. + CHASS, R. L.
IND WATER WASTES 6(4), P. 97-101 (JULY-AUGUST 1961). THE DESIGN OF A MULTIPLE CHAMBER INCINERATOR IN ACCORDANCE WITH THE STANDARDS OF THE LOS ANGELES AIR POLLUTION CONTROL DISTRICT IS DISCUSSED WITH A COVERAGE OF THE LIMITATIONS OF THE TWO BASIC DESIGN TYPES, THE DESIGN CALCULATIONS AND THE SOLVING OF A SAMPLE DESIGN PROBLEM. THE WORK WHICH THE LOS ANGELES GROUP DID IN DEVELOPING THEIR STANDARDS HAS ESTABLISHED THAT RETORT TYPE INCINERATORS HAVE DEFINITE ADVANTAGES IN THE RANGE OF CAPACITIES FROM 50 TO 750 TONS PER HOUR. IT WAS ALSO FOUND THAT IN-LINE UNITS WERE MOST EFFICIENT BETWEEN 750 LBS/HR, AND SOME CASES IN EXCESS OF ABOUT 4 TONS PER HOUR. THE UPPER UNIT IS NOT CLEARLY DEFINED SINCE LITTLE IF ANY WORK HAS BEEN DONE IN THIS RANGE. AS A SAMPLE PROBLEM, THE CALCULATIONS FOR THE DESIGN OF AN INCINERATOR TO BURN 100 POUNDS OF PAPER PER HOUR ARE WORKED OUT. TWO DIAGRAMS ARE ALSO PRESENTED WHICH SHOW THE DESIGN FOR IN-LINE UNITS FROM 750 TO 2,000 LBS/HR AND RETORT TYPE UNITS OF CAPACITY FROM 50 TO 1500 LBS/HR. (PHEA)

08-13-00807 LEXICON OF INCINERATOR TERMINOLOGY
SCHWARTZ, D.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 20-31 (MAY 18-20, 1964). INCINERATION IS EVERLASTING FIELD OF ACTIVITY BY DIVERSE GROUP OF CONSULTING ENGINEERS, MANUFACTURERS, SUPPLIERS, BUILDERS AND USERS. THIS LEXICON HAS BEEN COMPILED BY DEVELOPING COMMON AND CLEAR LANGUAGE FROM MANY SOURCES IN HOPE THAT IT WILL LEAD TO UNIFORM LEXICON, WHICH WILL BE ADOPTED BY ALL INTERESTED GROUPS. (EI)

08-13-00810 FURNACE CONFIGURATION (DESIGN HEAT-RECOVERY INCINERATOR)
HEANEY, F. L.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 52-57 (MAY 18-20, 1964). CONFIGURATION OF INCINERATOR FURNACE IS INFLUENCED BY TYPE OF GRATES AND SIZE OF UNIT TO BE INSTALLED. FOR SMALL CAPACITY CIRCULAR OR RECTANGULAR BATCH FEED FURNACE MAY BE USED. FOR CAPACITIES OF 50 TPD AND OVER, TENDENCY IS TOWARD USE OF CONTINUOUS FEED GRATES WITH RECTANGULAR FURNACE. FACTORS DETERMINING SIZE OF FURNACE INCLUDE BURNING RATE PER UNIT OF GRATE AREA, HEAT CONTENT OF FUEL, OPERATING TEMPERATURES, AND GAS VELOCITIES. CHARACTER OF FUEL CALLS FOR ATTENTION TO FACILITIES FOR CHARGING AND MOVING MATERIAL. COARSE MATERIAL OR RUBBISH PRESENTS PROBLEMS IN CHARGING. SEVERAL TYPES OF FURNACE DESIGN ARE DESCRIBED AND SHOWN. (EI)

08-13-00812 TRENDS IN CHARGING REFUSE INTO AND CONVEYING RESIDUE FROM FURNACE (MATERIAL-HANDLING INCINERATOR DESIGN
HAMPTON, R. K.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 69-75 (MAY 18-20, 1964). LATEST TRENDS IN INCINERATOR MATERIALS HANDLING AND WAYS IN WHICH RESIDUE CONVEYORS CAN BE ADAPTED TO NEWER CONTINUOUS BURNING FURNACE DESIGNS, AS WELL AS IMPROVEMENTS IN MATERIALS USED IN CONVEYOR COMPONENTS ARE DESCRIBED. CHANGES IN LOCATION OF CHARGING GATES AND NEWER GATE DESIGNS FOR USE WITH CONTINUOUS BURNING FURNACES ARE REVIEWED. (EI)

08-13-00813 INCINERATOR BUCKETS AND GRAPPLES (MATERIAL-HANDLING DESIGN)
CHESAREK, R. F.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 76-80 (MAY 18-20, 1964). TWO TYPES OF BUCKETS USED IN INCINERATOR SERVICE TODAY ARE CLOSED SCOOP TYPE AND TINE TYPE. EACH HAS INHERENT ADVANTAGES AND DISADVANTAGES. SUGGESTIONS ON CHOICE OF PROPER TYPE AND MODEL OF BUCKET FOR PARTICULAR APPLICATION. (EI)

08-13-00818 EUROPEAN PRACTICE IN REFUSE BURNING (INCINERATION DESIGN)
STABENOW, G.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 105-113 (MAY 18-20, 1964). PRACTICE AND TYPE OF DESIGN IN EUROPEAN MUNICIPAL INCINERATORS ARE DESCRIBED. SPECIAL ATTENTION IS GIVEN TO DESIGN OF GRATES. DATA IS GIVEN ON AMOUNT OF REFUSE PER CAPITA, ANALYSIS OF REFUSE AND HEAT RECOVERY. (EI)

08-13-00819 MODERN INCINERATION OF COMMUNITY WASTES (POLLUTION OPERATING-PRACTICES EMISSION(CONTROL) DESIGN)
STENBURG, R. L.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 114-117 (MAY 18-20, 1964). KNOWLEDGE OF TECHNOLOGY OF DESIGN AND OPERATION ARE NECESSARY FOR GOOD RESULTS WITH FUEL HAVING WIDE RANGE OF CHARACTERISTICS. HELPFUL PRESENT TRENDS IN DESIGN AND OPERATION INCLUDE ADOPTING OF CONTINUOUS CHARGING, USE OF MULTIPLE COMBUSTION CHAMBERS, MAINTAINING FURNACE TEMPERATURE, AND CONTROL OF PARTICULATE MATTER. AIR POLLUTION PROBLEM IS DISCUSSED. (EI)

08-13-00828 INSTRUMENTATION OF INCINERATOR - TWO CASE STUDIES (DESIGN)
STICKLEY, J. D. + ORTHUS, H. B.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 161-164 (MAY 18-20, 1964). STUDY OF INSTRUMENTATION SYSTEM OF TWO INCINERATORS TO DETERMINE WHAT PROGRESS IS BEING MADE IN UTILIZATION OF INSTRUMENTATION IN INCINERATORS, AND TO DETERMINE WHAT DEFICIENCIES, IF ANY, EXIST IN INCINERATOR INSTRUMENTATION AS FURNISHED ON INCINERATORS BEING CONSTRUCTED TODAY. (EI)

08-13-00846 THE INCINERATOR CRANE (DESIGN)
BRICKLE, F. J.
PROC OF THE NATIONAL INCINERATOR CONF, P. 61-68 (MAY 18-20, 1964). THE PAPER DISCUSSES THE DIFFERENT OPERATIONAL REQUIREMENTS OF THE INCINERATOR CRANE AND DESCRIBES A LOGICAL METHOD FOR DETERMINATION OF THE PROPER SIZE CRANE TO BE USED. A REVIEW OF CRANE COMPONENTS, WITH SOME DETAILS ON THE MORE CRITICAL ITEMS, IS INCLUDED.

08-13-00858 THE PROBLEMS OF APPLYING INCINERATOR CRITERIA (EMISSION(CONTROL) DESIGN-CRITERIA)
VOELKER, E. M.
J AIR POLLUTION CONTROL ASSOC 14(9), P. 363-365 (SEPTEMBER 1964). INCINERATOR DESIGN CRITERIA ARE DISCUSSED FROM THE STANDPOINT OF THE INCINERATOR DESIGNER. NONUNIFORM, WIDELY VARYING, AND OVERLY RIGID DESIGN CRITERIA ADOPTED BY STATES, COUNTIES, AND COMMUNITIES ARE CITED AS PROBLEMS STANDING IN THE WAY OF EFFECTIVE INCINERATOR DESIGN. IT IS REASONED THAT RIGID CRITERIA, AMONG OTHER THINGS, REMOVE RESPONSIBILITY FOR PERFORMANCE FROM THE DESIGNING ENGINEER AND ELIMINATE THE POSSIBILITY OF MERITORIOUS IMPROVEMENTS. THE MERITS OF FLEXIBLE INCINERATOR CRITERIA ARE DISCUSSED, AND THE INCINERATOR STANDARDS (APRIL 1963) PUBLISHED BY THE INCINERATOR INSTITUTE OF AMERICA ARE RECOMMENDED AS A BASIS FOR GOOD INCINERATOR DESIGN. (PHEA)

08-13-00900 DESIGNING MODERN INCINERATOR (DESIGN)
MEISSNER, H. G.
POWER 102(4), P. 80-83 (APRIL 1958). BASIC FACTORS INVOLVED AND DESIGN DATA; TRAVELING GRATE STOKER APPLICATION TO INCINERATORS GREATLY INCREASES THEIR UNIT SIZE AND CAPACITY. USE OF MECHANIZED HANDLING OF BOTH REFUSE AND RESIDUE, WET OR DRY TYPE DUST COLLECTION SYSTEMS OF WASTE HEAT BOILER, AND AIR PREHEATERS FOR WATER COOLED FURNACES. FUEL VALUE OF REFUSE, CALCULATIONS INVOLVED IN SELECTING EQUIPMENT, AND SIZING OF FURNACES, FLUES, DUST COLLECTORS, FANS AND STACKS. DETERMINATION OF FURNACE TEMPERATURE. (EI)

08-13-00923 WHAT KIND OF PLANT--AND AT WHAT PRICE (INCINERATOR SANITARY-LANDFILL COST(CAPITAL))
PUBLIC CLEANSING 52(1), P. 21 (JANUARY 1962). A BRIEF DISCUSSION OF WHEN TO CONSIDER THE CONSTRUCTION OF A DISPOSAL PLANT AS OPPOSED TO LAND DISPOSAL OF REFUSE, WHAT KIND OF PLANT TO BUILD, AND AT WHAT PRICE. THERE IS NO NEED TO CONSTRUCT AN INCINERATOR PLANT IF THERE IS LAND AVAILABLE FOR DISPOSAL, BUT IT SHOULD BE REMEMBERED THAT USE OF AN INCINERATOR WILL EXTEND THE USEFUL LIFE OF THE REFUSE TIP BY FOUR- OR FIVE-FOLD. LOCAL CONDITIONS MAY DICTATE THE TYPE OF DISPOSAL PLANT ADOPTED. IN THE LAST 10 YEARS MANY REFUSE-TREATMENT PLANTS HAVE BEEN BUILT THROUGHOUT THE WORLD AT VARYING COSTS RANGING FROM 1,000 TO 5,000 POUNDS PER TON PER 8-HR DAY. (PHS)

08-13-00957 DEFINITIONS OF TERMS USED IN INCINERATOR TECHNOLOGY
COREY, R. C.
J AIR POLLUTION CONTROL ASSOC, INFORMATION REPORT 1, 15(3), P. 125-126, 135 (MARCH 1965). THE DEFINITIONS GIVEN APPLY TO CONVENTIONAL COMMERCIAL, INDUSTRIAL, AND MUNICIPAL WASTE-INCINERATION PRACTICES, AND DO NOT COVER SPECIAL APPLICATIONS OF INCINERATION, NOR DO THEY COVER SPECIAL FEATURES OF CERTAIN TYPES OF INCINERATORS, FOR EXAMPLE, CATALYTIC DEVICES.

08-13-00974 TRENDS AND PRACTICES IN MUNICIPAL INCINERATOR DESIGN (CHARACTERISTICS COMPOSITION EMISSION(CONTROL) WATER(WASTE))
PUBLIC WORKS 97(6), P. 84-86 (1966). FINDING OF A SURVEY OF DESIGN PRACTICES COVERING MUNICIPAL INCINERATORS BUILT OR DESIGNED SINCE 1945 (298 PLANTS). TOPICS COVERED ARE (1) PLANT AND FURNACE CAPACITY, (2) REFUSE CHARACTERISTICS, (3) FURNACES AND COMBUSTION CHAMBERS, (4) DRAFT AND COMBUSTION AIR, AND (5) WATER TREATMENT. IT WAS RECOMMENDED THAT FURTHER STUDY BE CONDUCTED IN THE FOLLOWING AREAS - UNIT WEIGHT OF REFUSE, ITS HEAT CONTENT AS FIRED, A HEAT RELEASE BASIS FOR FURNACE DESIGN, COMBUSTION VOLUME REQUIREMENTS, DISTRIBUTION OF COMBUSTION AIR, ECONOMIC UTILIZATION OF WASTE HEAT, PARTICULARLY FOR PLANTS OPERATING ONE OR TWO SHIFTS PER DAY, AND INCINERATOR WASTE WATER CHARACTERISTICS AND TREATMENT REQUIREMENTS.

08-13-01051 IIA INCINERATOR OPERATORS MANUAL
INCINERATOR INSTITUTE OF AMERICA (MARCH 1968). OPERATING INSTRUCTIONS FOR SMALL INCINERATORS ARE OUTLINED.

08-13-01085 INCINERATOR DESIGN (QUANTITY OPERATION)
FOSTER, W. S.
THE AMERICAN CITY 69(2), P. 126-127 (1954). IN DISCUSSING THE SITE AND PLANT DESIGN A FEW COMMENTS ARE MADE TO KEEP IN MIND WHEN PLANNING AN INCINERATOR OPERATION. SEVERAL EXAMPLES OF PROPERTY OPERATED INCINERATORS ARE LISTED. PROBLEMS SUCH AS OFF-STREET DUMPING, AMPLE STORAGE FOR REFUSE THAT MAY EXCEED THE CAPACITY OF THE PLANT AND A PLANT DESIGNED TO HANDLE LARGE VOLUMES OF WET ORGANIC WASTES AND STILL OBTAIN COMPLETE COMBUSTION. ANOTHER THING TO KEEP IN MIND IS THE TYPE OF FEEDING SYSTEM AND AUTOMATIC BOTTOM FEEDER OR A MORE EXPENSIVE OVERHEAD CRANE FEEDER.

08-13-01144 INCINERATOR DESIGN (PART 2) (EMISSION(CONTROL) FURNACE(TYPE))
THE AMERICAN CITY 69(3), P. 120-123 (MARCH 1954). A DESCRIPTION OF THE FURNACES USED IN REFUSE INCINERATION. METHODS OF STOKING AND DESIGN FEATURES OF THE FURNACE AND EMISSION CONTROL EQUIPMENT ARE INCLUDED.

08-13-01203 INCINERATOR DESIGN CRITERIA (DESIGN CALORIFIC-VALUE)
THE AMERICAN CITY 73(12), (DECEMBER 1958). SAMUEL M. CLARKE OF GREELEY AND HANSEN SUGGESTS THAT INCINERATORS SHOULD BE RATED ON TONS OF REFUSE PER WEEK INSTEAD OF PER DAY, SINCE PLANTS ARE SHUTDOWN WEEKLY FOR CLEANING, AND THEREFORE CAPACITY DEPENDS ON STORAGE FACILITIES AS WELL AS ON RATE OF FURNACE OPERATION. BTU'S PER POUND OF REFUSE VARIES FROM 2,500 TO 6,000 DEPENDING ON ASH AND MOISTURE CONTENT. (UC)

08-13-01272 INCINERATOR DESIGN - HEAT ENCLOSURES
HIGGINSON, A. E.
PUBLIC CLEANSING 56(11), P. 547-550 (1966). WITH THE RENEWED INTEREST IN DIRECT INCINERATION AND THE RISING CALORIFIC-VALUES OF WASTES, ATTENTION IS BEING FOCUSED ON THE DESIGN AND PERFORMANCES OF HEAT ENCLOSURES. THERE ARE A NUMBER OF MECHANICAL GRATES AVAILABLE, EACH WITH ITS OWN FEATURES. THE DESIGN USUALLY INCORPORATES A NUMBER OF CHAMBERS WITH A DISTINCT FUNCTION APPLICABLE TO SPECIFIC ZONES. THE CHOICE OF DESIGN, AND PLACEMENT OF REFRACTORY IS VERY IMPORTANT TO THE IGNITION ZONE. SPRAY CHAMBERS AND WATER TRAPS ARE OTHER AREAS REFRACTORY MATERIAL MUST BE CAREFULLY SELECTED. THE REFRACTORY MATERIAL USED IN THE WALLS AND ROOF MUST BE CAREFULLY SELECTED ALSO. WITH DIRECT FEEDING OF CRUDE REFUSE AND HIGHER TEMPERATURES IN THE NEWER TYPES OF INCINERATORS SILICON CARBIDE IS BEING USED AS A REFRACTORY MATERIAL FOR THE INTENSELY HEATED AREAS.

08-13-01288 REFUSE DISPOSAL AND THE MECHANICAL ENGINEER (INCINERATION EMISSION(CONTROL) HEAT-RECOVERY)
FIFE, J. A.
HEATING, PIPING, AND AIR CONDITIONING 38, P. 93-100 (NOVEMBER 1966). THE ROLE OF THE MECHANICAL ENGINEER IN THE FIELD OF REFUSE DISPOSAL IS DISCUSSED, PARTICULARLY IN RELATION TO THE TREND TO CONTINUOUS FEED FURNACES AS A MEANS OF DISPOSAL. DEFINITIONS, DISPOSAL METHODS, AND COMPARISON WITH EUROPEAN PROGRESS ARE ALSO DISCUSSED. (PHEA)

08-13-01297 REFUSE INCINERATION PLANT (DESIGN(GRATE) GRATE-INCINERATOR)
PUBLIC CLEANSING 56(2), P. 62-64 (1966). SINCE THERE IS A GROWING INTEREST IN THE CONTINUOUS FEED AUTOMATIC GRATES, AN ATTEMPT IS MADE TO SUMMARIZE THE TYPES OF INCINERATOR GRATES BEING USED IN BRITAIN. EACH SYSTEM HAS A BRIEF DESCRIPTION OF HOW IT FUNCTIONS.

08-13-01320 INCINERATOR DESIGN
WILLETT, G. H., JR.
NATIONAL FIRE PROTECTION ASSOC - QUARTERLY 55(2), P. 166-168 (OCTOBER 1961). PRESENT-DAY DESIGNS DESCRIBED AND ILLUSTRATED INCLUDE DIRECT-FED, PATHOLOGICAL AND FLUE-BED INCINERATORS. (EI)

08-13-01351 NEW INCINERATOR DESIGN GROUP
THE AMERICAN CITY 76(11), P. 27 (NOVEMBER 1961). A NEW ASME COMMITTEE HAS BEEN FORMED TO STUDY INCINERATOR DESIGN AND AIR POLLUTION. THE ASME TEAM BELIEVES THAT AN ANSWER TO AIR POLLUTION FROM STACK GASES LIES IN THE DESIGN OF NEW PLANTS WHICH CAPITALIZE ON A MORE THOROUGHLY UNDERSTOOD KNOWLEDGE OF THE COMBUSTION PROCESS IN AN INCINERATOR. (UC)

08-13-01362 A SIMPLIFIED METHOD OF INCINERATOR DESIGN (DESIGN CALORIFIC-VALUE EMISSION(CONTROL))
MEISSNER, H. G.
THE AMERICAN CITY 72(9), P. 135 (SEPTEMBER 1957). PAPER, CARTONS, AND CRATES ARE WOOD OR WOOD PRODUCTS. THE HEAT VALUE OF WOOD IS KNOWN. MOISTURE CONTENT CAN ALSO BE DETERMINED. WITH THIS INFORMATION, INCINERATOR DESIGN CAN BE BASED ON HEAT TRANSFER CALCULATIONS. FURNACE GRATES MUST BE LARGE ENOUGH TO RELEASE HEAT AT THE RATE OF 20,000 BTU/CU-FT/HR. FURNACE VOLUMES MUST BE GREAT ENOUGH TO RELEASE HEAT AT THE RATE OF 20,000 BTU/CU-FT/HR. AN EXAMPLE OF THE CALCULATION OF AIR AND GAS WEIGHT IS GIVEN IN THE ARTICLE. THESE ARE THE BASES FOR A SIZE CALCULATION. TOTAL HEAT PRODUCED IS USED IN CALCULATING THE AMOUNT OF WATER NEEDED FOR FLY ASH CONTROL. (UC)

08-13-01381 ENGINEERING DESIGN OF REFUSE INCINERATORS
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, MANUAL FOR NATIONAL PARK SERVICE, (JUNE 1958). THIS MANUAL IS A GUIDE FOR NATIONAL PARK SERVICE PERSONNEL TO ASSIST THEM IN PREPARING SPECIFICATIONS AND IN DESIGNING REFUSE INCINERATORS. HOWEVER, IT IS USEFUL FOR OTHER AGENCIES. FACTORS INFLUENCING THE DESIGN OF A REFUSE INCINERATOR, INCLUDING SITE SELECTION, EQUIPMENT, DESIGN, AND OPERATIONS, ARE DISCUSSED IN PART I. ENGINEERING DESIGN IS DISCUSSED AND EXAMPLES OF CALCULATIONS ARE GIVEN IN PART II OF THE MANUAL. (UC)

08-13-01451 A SIMPLIFIED METHOD OF INCINERATOR DESIGN (COMBUSTION CALORIFIC-VALUE)
MEISSNER, H. G.
THE AMERICAN CITY 72(9), P. 135 (SEPTEMBER 1957). REPORT STATES THAT RULE-OF-THUMB UNCERTAINTIES CAN BE ELIMINATED FROM MUNICIPAL INCINERATOR DESIGN WHEN CALCULATIONS ARE BASED ON HEAT TRANSFER WHICH PERMITS DIRECT APPLICATION OF ENGINEERING PRINCIPLES. A NUMBER OF TABLES AND GRAPHS ARE INCLUDED TO QUICKLY DETERMINE DESIGN FACTORS. THE USE OF A LARGE FURNACE WITHOUT A SECONDARY CHAMBER IS ADVOCATED. (PHS)

08-13-01455 INCINERATOR STYLES ARE CHANGING (DESIGN(COMPARISON) EMISSION(CONTROL))
BROWN, W. D. + FOYLE, L. E.
THE AMERICAN CITY 72(7), P. 103 (JULY 1957). A COMPARISON OF 28 MUNICIPAL INCINERATORS SHOWS A GREAT VARIETY IN STYLE. ARTICLE GIVES BROAD COMPARISON OF THESE PLANTS INCLUDING AVAILABLE FURNACE DESIGN DATA, SIZE OF PLANTS, COMBUSTION CHAMBERS, FLY-ASH ARRESTORS, ASH HANDLING, BUILDING CONSTRUCTION AND WASTE HEAT RECOVERY. INCLUDED ARE TABLES SUMMARIZING THE DESIGN DATA. (PHS)

08-13-01637 MUNICIPAL INCINERATOR DESIGN AND OPERATION
SCHNEIDER, C.
REFUSE REMOVAL JOURNAL 2(3), P. 21 (MARCH 1959). WITH THE CHANGES IN WASTE TYPES, VOLUMES, POLLUTION, COMPETITION AND DESIGN IT HAS BEEN NECESSARY TO UP DATE METHODS OF PREPARING AND SUBMITTING BIDS FOR INCINERATORS.

08-13-01891 REGULATIONS OF REFUSE INCINERATOR DESIGN BY PUBLIC AGENCIES (LAW)
ABPLANALP, G. H. + STEPHENSON, J. W.
AM J PUBLIC HEALTH AND THE NATION'S HEALTH 50, P. 1155-1162 (AUGUST 1960). DISPOSAL OF GARBAGE AND RUBBISH IN THE FORM OF MIXED REFUSE IS A COMMUNITY PROBLEM COMMANDING MORE AND MORE ATTENTION THROUGHOUT THE UNITED STATES. THE FACT THAT SUITABLE AREAS FOR DUMPING OR LANDFILL OPERATIONS ARE BECOMING INCREASINGLY MORE DIFFICULT TO FIND, ESPECIALLY IN CROWDED METROPOLITAN AREAS, IS FORCING MUNICIPAL AUTHORITIES TO INVESTIGATE ALTERNATE MEANS OF REFUSE DISPOSAL. PROBABLY THE FOREMOST OF THESE ALTERNATE MEANS IS HIGH TEMPERATURE INCINERATION. BECAUSE OF THE UNCERTAIN AND OFTEN UNSATISFACTORY RESULTS OF INCINERATION IN THE PAST, IT IS THE LACK OF INCINERATOR DESIGN REGULATION BY QUALIFIED PUBLIC AGENCIES AND TO PRESENT RECOMMENDATIONS FOR SUCH REGULATIONS. (PHEA)

08-13-01934 TYPES OF MECHANICAL GRATES FOR INCINERATORS
WESTERGAARD, V. T. + MEISSNER, H. G. + CLARK, W. T.
ASME PAPER 62-WA-259 FOR MEETING NOVEMBER 25-30, 1962. MECHANICAL GRATE TYPES COVERED ARE CIRCULAR GRATES WITH ROTATING STOKING ARMS, ROCKING, RECIPROCATING, IMPACT, AND TRAVELING GRATES; PROJECTED NEW DESIGNS SHOW INCLINATION TOWARDS MORE SOPHISTICATED INSTRUMENTATION, AUTOMATION AND CONTROL OF BURNING PROCESS WHICH WILL HAVE MAJOR EFFECT ON DESIGN OF MECHANICAL GRATE. (EI)

08-13-01936 POTENTIALS IN INCINERATION (RESEARCH-POTENTIAL EMISSION(CONTROL) HEAT-RECOVERY RESIDUE DESIGN GRATES AUXILLARY-FUEL)
VELZY, C. R.
ASME PAPER 65-WA/PID-10 FOR MEETING NOVEMBER 7-11, 1965. POTENTIALS FOR IMPROVEMENT IN DESIGN OF REFUSE INCINERATORS ARE COMMENTED UPON UNDER PRINCIPLE HEADINGS OF INCINERATION AND HEAT RECOVERY; THERE APPEARS TO BE POSSIBILITY OF DEVELOPMENTS IN TYPE OF GRATES, METHODS OF FEEDING FURNACES, RESIDUE HANDLING, AND OTHER ELEMENTS OF PLANT, AND PARTICULARLY ON FACILITIES FOR AIR-POLLUTION CONTROL; NUMBER OF SPECIFIC PROBLEMS ARE DISCUSSED POINTING OUT WHERE AND IN WHAT DIRECTION STUDY MIGHT BE PURSUED. (EI)

08-13-01940 EFFECTS OF VARIATIONS IN MUNICIPAL REFUSE ON SOME INCINERATOR DESIGN PARAMETERS. (HEATING-VALUE)
KALIKA, P. W.
ASME PAPER 67-WA/PTC-2 FOR MEETING NOVEMBER 12-17, 1967. VARIABILITY OF MUNICIPAL REFUSE CAN HAVE MARKED EFFECT ON PERFORMANCE OF INCINERATOR DURING TEST, AS COMPARED TO DESIGN EXPECTATIONS; COMPUTER PROGRAM HAS BEEN DEVELOPED WHICH CAN ASSESS THIS VARIABILITY IN TERMS OF ITS EFFECT ON INCINERATOR DESIGN PARAMETERS, SUCH AS GAS, AIR, AND QUENCH WATER FLOWS AND TEMPERATURES; RESULTS OF CALCULATIONS FOR SEVERAL REFUSE COMPOSITIONS IN RANGE OF 4,000 TO 8,000 BTU/ LB ARE PRESENTED IN FORM OF TABLES AND GRAPHS AND THEIR SIGNIFICANCE WITH RESPECT TO INCINERATOR DESIGN AND TESTING IS DISCUSSED; TENTATIVE PLANS FOR FURTHER WORK INVOLVING INFLUENCE COEFFICIENTS AND CORRECTION FACTORS ARE OUTLINED. (EI)

08-13-02024 SOME CONSIDERATIONS AFFECTING THE DESIGN OF REFUSE INCINERATION PLANTS (EMISSION(CONTROL) COST(CAPITAL)
WATSON, R. H. + KNOWLES, P.
71ST ANNUAL CONF OF THE INSTITUTE OF PUBLIC CLEANSING, HARROGATE, (JUNE 17-20, 1969). AS THE NUMBER OF TIPPING OPERATIONS DECREASE BECAUSE OF LACK OF SPACE OR FOR ECONOMIC REASONS, THE NUMBER OF INCINERATORS BEING PUT INTO OPERATION HAVE INCREASED. A POPULATION OF 300,000 CAN EXPECT TO PRODUCE ABOUT 1,500 TONS/WEEK AND COST FROM 1-2 MILLION POUNDS DEPENDING ON DESIGN, AND SIZE OF THE PLANT.

08-13-02025 HEAT RECOVERY FROM INCINERATION PLANTS (CALORIFIC VALUE)
SHORT, W.
71ST ANNUAL CONF OF THE INSTITUTE OF PUBLIC CLEANSING, HARROGATE, (JUNE 17-20, 1969). TYPICAL ANALYSES OF REFUSE IN VARIOUS TOWNS SUGGEST THTA PRESENT-DAY CALORIFIC VALUE IS IN THE REGION OF 4,100 TO 4,300 BTU/LB VARYING WITH HOUSING TYPE AND SEASON OF THE YEAR. WITH THE INCREASE OF PAPER AND PACKAGING MATERIALS AND WITH THE REDUCTION OF ASH VOLUME THE CALORIFIC VALUE WILL CONTINUE TO INCREASE. OF FIFTY NEW INCINERATOR UNITS DESIGNED TO HANDLE 300 TONS/DAY FOR 300 DAYS PER YEAR THE HEAT RELEASE WILL BE EQUIVALENT TO 1,550,000 TONS PER YEAR OF COAL OR ABOUT ONE PERCENT OF THE NATIONAL COAL BOARDS ANNUAL PRODUCTION. DESIGN CRITERIA AND COSTS ARE ALSO LISTED.

08-13-02138 INCINERATOR PLANNING - RESIDUE LANDFILL CONSIDERATION IS IMPORTANT LOCATION FACTOR (DESIGN)
WEGMAN, L. S.
REFUSE REMOVAL JOURNAL 9(2), P. 24, 36-37 (FEBRUARY 1966). WHEN THE DECISION HAS BEEN MADE TO BUILD AN INCINERATOR SOME OF THE POINTS TO BE CONSIDERED ARE, PROPER CAPACITY, SITE COSTS, LIFE OF INCINERATOR, PREVENTION OF AIR POLLUTION, WATER POLLUTION, RESIDUE DISPOSAL, STORAGE AND COSTS. A FORMULA FOR CALCULATING HAULING COSTS IS GIVEN.

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08-14-00565 INCINERATING PLANT COSTS (COST(CAPITAL) INCINERATION)
CLARK, S. M.
PUBLIC WORKS 93(9), P. 122 (SEPTEMBER 1962). THE PER TON COST OF INCINERATOR CONSTRUCTION VARIES WITH LOCATION, TIME, FOUNDATION, AND SITE PREPARATION, CONSTRUCTION MATERIALS, ENCLOSURE OF THE TIPPING FLOOR, AND UNUSUAL STRUCTURES OR EQUIPMENT. DATA ARE PRESENTED FOR SIX MEDIUM-SIZED INCINERATORS. THE PER TON COST VARIES FROM $3,152 TO $5,500. (UC)

08-14-00602 INCINERATION COSTS AT LOUISVILLE, KENTUCKY (SALVAGE(METALS))
LEAKE, J. W.
THE AMERICAN CITY 74(4), P. 157 (APRIL 1959). FOR THE CALENDAR YEAR 1958, THE GROSS OPERATING COST AT 24- HOURS PER DAY, SEVEN DAYS PER WEEK, WAS $1.80 PER TON. INCOME FROM SALVAGED CANS REDUCED THE NET OPERATING COST TO $1.33 PER TON. FURTHER GAINS ARE EXPECTED FROM THE DRYING AND SALE OF SEWAGE SLUDGE FROM THE LOUISVILLE JEFFERSON COUNTY SEWAGE TREATMENT PLANT. PREVENTIVE MAINTENANCE AND REPLACEMENT OF EQUIPMENT ARE CAREFULLY PLANNED. THE INCINERATOR PRESENTLY HAS A 750-TON CAPACITY, BUT IS DESIGNED FOR EXPANSION TO 1,000 TONS. THE BUILDINGS, STACKS, CAN-RECLAMATION SYSTEM, AND REFUSE STORAGE BINS ARE DESIGNED FOR A 1,000-TON PER DAY OPERATION. THE TOTAL COST WAS $3,815,000. BURNING IS COMPLETE AND NO AIR POLLUTION PROBLEM HAS BEEN DETECTED. (UC)

08-14-00625 ECONOMICS OF SOLID WASTE INCINERATION (HEAT-RECOVERY COST(OPERATING) COST(CAPITAL))
BISHOP, J. W. + DEMING, L. F.
INCINERATION OF SOLID WASTES, PROC OF THE MECAR SYMPOSIUM, NEW-YORK, NEW-YORK, P. 51 (MARCH 21, 1967). AN EXAMPLE IS PRESENTED ILLUSTRATING A TYPICAL ECONOMIC COMPARISON MADE FOR A 160 TON PER DAY INCINERATOR FACILITY WITH WASTE HEAT RECOVERY. ECONOMIC FACTORS AFFECTING FUTURE INCINERATION OF REFUSE ARE DIFFERENT AT EACH LOCATION. A COMPLETE TABULATION OF PLAUSIBLE ALTERNATE SCHEMES FOR EACH FACILITY SHOULD BE MADE AND ECONOMICALLY EVALUATED PRIOR TO SELECTION.

08-14-00772 COST PROBLEMS IN COMBUSTION OF REFUSE, BASED ON DATA OF POWER PLANT NORD OF MUNICIPAL ELECTRICITY WORKS, MUNICH (INCINERATION COST(OPERATING))
PRESUHN, A.
KOSTENPROBLEME BEI MUELLVERBRENNUNGSANLAGEN, DARGESTELLT ANHAND DES KRAFTWERKS NORD DER STADTWERKE MUENCHEN--ELEKTRIZITAETSWERKE. BRENNSTOFF-WAERME-KRAFT 19(10), P. 489-492 (OCTOBER 1967). IT IS SHOWN HOW TO CALCULATE, SEPARATELY, ADDITIONAL COST CAUSED BY BURNING OF REFUSE IN COMBINED PLANT FOR BURNING REFUSE AND COAL. SPECIFIC COSTS OF REFUSE BURNING FOR VARIOUS LONG PERIOD BOILER OUTPUT ARE DETERMINED, WHICH ARE LOWERED DUE TO CALORIFIC-VALUE OF REFUSE. (IN GERMAN) (EI)

08-14-01247 REFUSE DISPOSAL IN MEDIUM SIZE INCINERATION FURNACES (ECONOMICS DESIGN)
WUHRMANN, K.
ABFALLBESEITIGUNG IN MITTELGROSSEN VERBRENNUNGSOEFEN, AUFBEREITUNGS-TECHNIK 6(5). P. 262-270 (MAY 1965). MINIMUM SIZE OF INCINERATORS IS CONSIDERED FROM ECONOMIC VIEWPOINT. AFTER DEALING WITH MOST COMMON FURNACE SYSTEMS, IMPORTANCE OF CHARGING DEVICE, CLINKER-REMOVAL AS WELL AS COOLING AND CLEANING OF FLUE GAS IS EMPHASIZED. (EI)

08-14-01418 INCINERATORS WIN IN NEW ORLEANS (ECONOMICS SANITARY-LANDFILL)
THE AMERICAN CITY 71(5), P. 129 (MAY 1956). A SHORT REPORT ON THE ECONOMIC COMPARISON OF THE USE OF LANDFILLS AND/OR INCINERATORS IN NEW ORLEANS. A TABLE OF COMPARATIVE COSTS IS INCLUDED. (PHS)

08-14-01422 SWISS ENGINEERS EXPLAIN INCINERATOR INCOME (EMISSION(CONTROL) HEAT-RECOVERY HEAT(PROCESS) WATER-WALL)
AM SOC CIVIL ENGRS SANIT ENGRG DIV, NEWSLETTER, P. 5 (JULY 1966). IN SWITZERLAND, AS WELL AS IN THE GREATER PART OF EUROPE, WATER WALLS AND BOILERS ARE EMPLOYED IN INCINERATORS TO TRANSFORM COMBUSTION CHAMBER HEAT TO STEAM. THE STEAM THUS GENERATED, IS SUPPLIED TO NEARBY INDUSTRY, WHICH PAYS FOR THE STEAM AT A COST COMPARABLE TO THAT FROM OTHER SOURCES OF HEAT AND POWER. OFFICIALS DELIBERATELY CHOOSE THE SITES FOR INCINERATORS WITH RESPECT TO THE PROXIMITY OF INDUSTRY, SO THAT A MARKET FOR THE STEAM WILL BE ASSURED. THE WATER WALLS WERE PREVIOUSLY PLACED ABOVE THE COMBUSTION CHAMBERS. HOWEVER, EXPERIENCE HAS SHOWN THAT THE BEST RESULTS COME FROM PLACING THE WATER AROUND THE CHAMBERS, NEARER THE SOURCE OF HEAT. ELECTROSTATIC PRECIPITATORS ARE COMMONLY USED IN EUROPE, DESPITE THE DEARTH OF AIR POLLUTION LAWS. ALTHOUGH EXPENSIVE, THE PRECIPITATORS REMOVE OVER 90 PERCENT OF THE PARTICULATE MATTER, A FAR GREATER REMOVAL THAN CAN BE ENCOUNTERED IN ANY OPERATION IN THE UNITED STATES. TEN SWISS ENGINEERS, VISITING THE U.S. TO STUDY REFUSE DISPOSAL AND WATER POLLUTION CONTROL, EXPLAINED THE EUROPEAN SYSTEM AT A CONFERENCE IN NEW-YORK CITY. (UC)

08-14-01587 ENGINEER DISCUSSES INCINERATION COSTS (COST(CAPITAL) COST(OPERATING))
MICHAELS, A.
REFUSE REMOVAL JOURNAL 1(7), P. 22 (JULY 1958). FACTORS TO BE CONSIDERED IN STANDARDIZING INCINERATION COSTS ARE EXPLAINED. (PHS)

08-14-01678 WHAT HAULERS PAY AT MUNICIPAL INCINERATORS (COST(OPERATING) COLLECTION)
REFUSE REMOVAL JOURNAL, 2(9), 26, (SEPTEMBER 1959). A SURVEY HAS FOUND CONSIDERABLE VARIATION IN CHARGES FOR PRIVATE USE OF CITY FACILITIES AND MANY DIFFERENCES IN ADMINISTRATION. THE CHARGES MADE IN FORTY CITIES ARE SHOWN. (PHS)

09 Other Processes and Operations

09 01 DISPOSAL IN SEWAGE TREATMENT PLANT

09-01-00272 DUAL DISPOSAL OF GARBAGE AND SEWAGE (SEWERS DIGESTION)
GOLUEKE, C. G.
COMPOST SCIENCE 2(2), P. 8-12 (SUMMER 1961). WHEN ALL GARBAGE IS COMBINED WITH SEWAGE, EITHER BY WAY OF HOME GRINDER OR AT SEWAGE TREATMENT PLANT, DAILY LOADING OF SOLIDS IS INCREASED BY ONLY 0.5 LB PER CAPITA. BOD LOADING IS INCREASED BY 15-30 PERCENT. GAS COMPOSITION IS NOT AFFECTED ALTHOUGH TOTAL AMOUNT IS INCREASED. SLUDGE QUALITY IS UNCHANGED. ECONOMIC ADVANTAGES IN REDUCED HAULING. (EI)

09-01-00400 GARBAGE GRINDERS ADD ONLY 30 PERCENT (GRINDER(GARBAGE) SEWER)
CLARK, C. M. + WATSON, K. S.
THE AMERICAN CITY 77(6), P. 102 (JUNE 1962). DESCRIBES A TEST CONDUCTED IN HOFFMAN HEIGHTS, A SUBDIVISION OF AURORA, COLORADO, ON THE EFFECTS OF FOOD WASTE DISPOSERS ON THE SEWAGE SYSTEM. THE PERCENTAGE OF RESIDENCES USING DISPOSERS WAS INCREASED FROM 65 TO 88 PERCENT WITH THE INSTALLATION OF 338 PORTABLE UNITS, AND SEWER CONDITIONS WERE OBSERVED AND ANALYZED. BASED ON THE RESULTS, THESE CONCLUSIONS WERE REACHED- (1) DISPOSERS INCREASE THE PER CAPITA BOD AND SUSPENDED-SOLIDS LOADING BY ABOUT 30 PERCENT, (2) THE GREASE CONCENTRATION AND THE QUALITY OF SEWAGE DISCHARGED IS NOT APPRECIABLY INCREASED, (3) THERE IS A DEFINITE DIFFERENCE IN BOD AND SUSPENDED-SOLIDS LOADINGS DURING THE MID-MORNING AND EARLY EVENING HOURS, AND (4) A 30-PERCENT INCREASE IN LOAD IS AN AMPLE DESIGN FIGURE FOR RENOVATING SEWAGE-TREATMENT PLANTS OR DESIGNING NEW ONES THAT WILL RECEIVE GROUND GARBAGE FROM PRIVATE DWELLINGS. (PHS)

09-01-00539 GARBAGE GRINDING PAYS ITS WAY (COST(OPERATING))
ROSS, W. E. + TOLMAN, S. F.
PUBLIC WORKS 84(5), P. 70 (MAY 1953). IN RICHMOND, INDIANA, GARBAGE IS GROUND AT THE SEWAGE TREATMENT PLANT AND IS ADDED TO THE DIGESTERS ALONG WITH SEWAGE SLUDGE. THE RESULTS HAVE BEEN GOOD. THE PLANT WAS BUILT IN 1948 AND WAS IN OPERATION IN 1951. PRIOR TO THE UNDERTAKING OF THE GARBAGE GRINDING OPERATION, SEPARATE COLLECTION HAD BEEN THE PRACTICE. THE GARBAGE IS REDUCED TO A SLURRY BY MEANS OF A JEFFREY GRINDER. APPROXIMATELY 207 TONS OF GARBAGE ARE DIGESTED EACH MONTH (0.35 LB PER CAPITA PER DAY). VERY LITTLE SEASONAL VARIATION IS NOTED IN THE AMOUNT OF GARBAGE

PRODUCTION. IN SEPTEMBER IT WAS 0.42 LB PER CAPITA PER DAY, AND IN FEBRUARY, 0.26 LB. ABOUT 95 PERCENT OF THE GARBAGE SOLIDS ARE VOLATILE. A FINANCIAL BALANCE OF THE OPERATION IS GIVEN. (UC)

09-01-00560 HOW FOOD WASTE DISPOSERS AFFECT PLANT DESIGN CRITERIA (GRINDER(GARBAGE) SLUDGE(SEWAGE))
WATSON, K. S. + CLARK, C. M.
PUBLIC WORKS 93(6), P. 105 (JUNE 1962). THE COMMUNITY UNDER STUDY WAS AURORA, COLORADO. SIXTY-FIVE PERCENT OF ITS POPULATION IS SERVED BY GARBAGE DISPOSAL UNITS. THE POPULATION OF THE TOWN IS 53,000. IT IS A " BEDROOM " COMMUNITY AND HAS NO INDUSTRIES. THE AVERAGE PER CAPITA DISCHARGE IS 50 GAL PER DAY. THE DISPOSAL UNITS CONTRIBUTE 0.052 LB BOD AND 0.064 LB SUSPENDED SOLIDS PER CAPITA PER DAY. THE GROUND GARBAGE CONSTITUTES A 30 PERCENT INCREASE IN LOADING TO THE DIGESTERS. (UC)

09-01-00718 GARBAGE GRINDING AT GOSHEN
TAYLOR, H. W.
ENGRG NEWS-RECORD 127(9), P. 441-443 (SEPTEMBER 25, 1941). THIS IS A REPORT ON OPERATING EXPERIENCES AT A DUAL DISPOSAL PLANT SERVING THE CITY OF GOSHEN, N.Y., A VILLAGE OF ABOUT 3,000 POPULATION. THE REPORT COVERS SIZE OF GRINDING EQUIPMENT AND SCREENS, SLUDGE TANK DESIGN, MOISTURE IN-OFF GAS, FLOTATION OF GARBAGE AND GAS PRODUCTION. THERE IS A TABLE COMPARING THE PRODUCTION OF GAS WITH AND WITHOUT THE ADDITION OF GARBAGE.

09-01-00866 DIGESTION OF GARBAGE WITH SEWAGE SLUDGE (DISPOSAL(SEWER))
BLOODGOOD, D. E.
SEWAGE WORKS JOURNAL 8, P. 3-12 (1936). THE WORK WAS DONE WITH THE USE OF FIVE-GALLON CREAM CANS. DAILY CHARGES OF PRIMARY SLUDGE, ACTIVATED SLUDGE, AND GARBAGE (OF WHICH THE VOLATILE CONTENT OF GARBAGE SOLIDS WAS 33 PERCENT OF THE TOTAL VOLATILE SOLIDS) WERE ADDED TO THE DIGESTERS. THE MATERIAL WAS DIGESTED FOR NINE DAYS AT 85 DEGREES F. FOR EACH GRAM OF VOLATILE SOLIDS ADDED TO THE DIGESTERS, AN AVERAGE OF 562 CC OF GAS (CARBON DIOXIDE, 32.7 PERCENT) WAS PRODUCED. REDUCTION IN VOLATILE SOLIDS AMOUNTED TO 59.9 PERCENT. DIGESTION TOOK PLACE MORE RAPIDLY WHEN GARBAGE WAS PRESENT IN THE SLUDGE MIXTURE THAN WHEN SLUDGE ALONE WAS USED. (UC)

09-01-00870 EFFECT OF FOOD WASTES ON SEWERS AND SEWAGE TREATMENT (GRINDER(HOME) QUANTITY)
COHN, M. M.
SEWAGE WORKS JOURNAL 18, P. 477-483 (1946). THE PER CAPITA PRODUCTION OF GARBAGE IS APPROXIMATELY 1/2 POUND GARBAGE PER DAY. THE GARBAGE IS ABOUT 70 PERCENT MOISTURE. THEREFORE, AMOUNTS TO ABOUT 0.15 LBS OF SOLIDS PER CAPITA PER DAY. THE AUTHOR ESTIMATES THAT THE TOTAL SEWAGE FLOW WOULD BE INCREASED BY 1 PERCENT TO 2 PERCENT, SUSPENDED SOLIDS APPROXIMATELY DOUBLED AND BOD INCREASED BY 15 PERCENT TO 30 PERCENT. (UC)

09-01-00877 THE DISPOSAL OF GARBAGE IN THE SEWERAGE SYSTEM (DISPOSAL(SEWER))
CARPENTER, L. + ROGEL, A. C. + GRABOIS, B.
SEWAGE WORKS JOURNAL 8(5), P. 728-741 (1936). GARBAGE GROUND BY THE KITCHEN WASTES DISPOSAL UNITS CAN BE DIGESTED SATISFACTORILY IN SEPARATE SLUDGE DIGESTION TANKS. THE GAS PRODUCTION PER GRAM OF FRESH VOLATILE SOLIDS WAS ESSENTIALLY THE SAME WITH THE ADDITION OF GROUND GARBAGE. NO MARKED DIFFERENCE WAS NOTED BETWEEN THE COMPOSITION OF THE GASES EVOLVED BY THE SEEDED SLUDGE ALONE AND THAT BY THE MIXTURE OF GARBAGE AND SEWAGE. GARBAGE MIXED WITH SEWAGE SETTLES READILY BUT THE CONCENTRATION OF TOTAL SOLIDS IN THE SUPERNATANT WILL BE THAT OF SETTLED SEWAGE. THE INCREASE IN BOD OF THE SUPERNATANT IS PROPORTIONAL TO THE INCREASED VOLATILE SOLIDS ADDED. (UC)

09-01-00927 DIGESTION STUDIES OF PURE VEGETABLES (DISPOSAL(SEWER))
STRAUB, C. P.
SEWAGE WORKS JOURNAL 15, P. 658 (1943). POTATO SKINS DO NOT DIGEST AS READILY AS POTATO PULP. DIGESTION OF CABBAGE WAS ACCOMPANIED BY THE PRODUCTION OF STRONG ODORS. THESE WERE CONTROLLED BY THE ADDITION OF ACTIVATED CARBON OR ORTHO-DICHLOROBENZENE. (UC)

09-01-00928 DUAL DISPOSAL OF GARBAGE AND SEWAGE AT RICHMOND, INDIANA (DISPOSAL(SEWER))
ROSS, W. E.
SEWAGE AND IND WASTES 26(2), P. 140 (FEBRUARY 1954). EXCELLENT RESULTS WERE OBTAINED WITH THE USE OF A SEWAGE DISPOSAL SYSTEM ADAPTED TO THE INCREASED LOAD. AN EXCELLENT TABLE OF VOLATILE AND TOTAL SOLIDS CONTENT AS WELL AS DIGESTER PERFORMANCE IS GIVEN IN THE ARTICLE. (UC)

09-01-00929 EFFECTS OF GROUND GARBAGE ON SEWERS AND SEWAGE TREATMENT (DISPOSAL(SEWER))
SIMPSON, R. W.
WASTES ENGRG 23, P. 33 (1952). THE AUTHOR DISCUSSES THE EFFECT OF GROUND GARBAGE ON CONVENTIONAL DIGESTER PERFORMANCE. AN ADDITION OF APPROXIMATELY 0.5 LB OF SOLIDS AND AN INCREASE IN FLOW OF 3 GAL PER CAPITA PER DAY WOULD BE A CONSEQUENCE OF UNIVERSAL HOME GARBAGE GRINDING. A 56.5 PERCENT INCREASE IN RAW SLUDGE NECESSITATES A 50 PERCENT GREATER DIGESTER CAPACITY. GARBAGE DECOMPOSES MORE RAPIDLY THAN SEWAGE AND IS ACCOMPANIED BY AN INCREASE IN GAS PRODUCTION AND IN STRENGTH OF THE SUPERNATANT. IT ALSO BRINGS ABOUT A MAGNIFICATION OF THE PROBLEMS OF SCUM AND GREASE. FREQUENT PUMPING OF RAW SLUDGE AND TWO-STAGE DIGESTION ARE RECOMMENDED. (UC)

09-01-00933 EFFECT OF ADDITION OF NITROGEN ON DIGESTION OF PAPER PULP (DISPOSAL(SEWER))
STRAUB, C. P.
SEWAGE WORKS JOURNAL 16, P. 30 (1944). THE AUTHOR STUDIES THE EFFECT OF ADDING SALTS CONTAINING NITROGEN ON GAS PRODUCTION. HE NOTED THAT THE PH DROPPED WITH THE USE OF AMMONIUM SULFATE. THE ADDITION OF AMMONIUM SULFATE RESULTED IN THE PRODUCTION OF HYDROGEN SULFATE. HYDROGEN SULFATE WAS NOT PRESENT WHEN SODIUM NITRATE WAS USED. ADDING NITRATE TO DIGESTING PAPER PULP CAUSED AN INCREASE IN THE NITROGEN CONTENT OF THE GAS, A DECREASE IN METHANE CONTENT, AND A MORE COMPLETE DESTRUCTION OF VOLATILE SOLIDS. (UC)

09-01-00934 A YEAR'S EXPERIENCE IN DIGESTION OF SEWAGE AND GARBAGE SOLIDS (DISPOSAL(SEWER))
WYLIE, G. F.
SEWAGE WORKS JOURNAL 12, P. 760 (1940). IN THE EXPERIMENTS GARBAGE WAS GROUND WITH A JEFFREY MANUFACTURING COMPANY HAMMER MILL. AFTER THE REMOVAL OF BONES AND EGG SHELLS, THE GROUND GARBAGE WAS PLACED IN DIGESTERS. THE ADDITION OF THE GARBAGE RESULTED IN AN INCREASE IN GAS PRODUCTION OVER THAT COMING FROM THE DIGESTION OF SLUDGE ALONE. THE PROPORTION OF CARBON DIOXIDE TO METHANE ALSO WAS HIGHER. STAGE DIGESTION WAS INDICATED AS BEING NECESSARY FOR OBTAINING A SUPERNATANT LOW ENOUGH IN SOLIDS TO PERMIT ITS RETURN TO THE TREATMENT PLANT. (UC)

09-01-00935 DISPOSAL OF GARBAGE WITH SEWAGE SLUDGE (DISPOSAL(SEWAGE))
BABBIT, H. E.
SEWAGE WORKS JOURNAL 6, P. 1103 (1934). ACCORDING TO THE ARTICLE, MIXED DIGESTION WAS PRACTICED IN SOUTHAMPTON, ENGLAND AS LONG AGO AS 1885. A LONG LIST OF FACTORS TO BE STUDIED IN RESEARCH ON DIGESTING SEWAGE WITH GARBAGE IS GIVEN. EQUIPMENT USED IN THE RESEARCH AT THE UNIVERSITY OF ILLINOIS INCLUDED ONE-GALLON BOTTLES, 50-GALLON CASKS, TWO IMHOFF TANKS CAPABLE OF HOLDING 80,000 GALLONS, AND A SEPARATE TANK HOLDING 25,000 GALLONS OF SEWAGE. (UC)

09-01-00936 DIGESTION OF GARBAGE (DISPOSAL(SEWER))
FAIR, G. M.
SEWAGE WORKS JOURANL 6, P. 259 (1934). THE ARTICLE REFERS TO A STUDY IN WHICH THE PROPORTION OF SEWAGE SLUDGE TO GARBAGE WAS INADEQUATE. THE RESULT WAS AN ABSENCE OF GAS PRODUCTION. THE AUTHOR BELIEVES THAT NORMALLY THE QUANTITY OF SEWAGE SLUDGE WOULD NOT BE SUFFICIENT TO SATISFY THE DEMANDS FOR READY DIGESTION OF ALL OF THE MUNICIPAL GARBAGE. HE ADVOCATES RECIRCULATING A DIGESTED MIXTURE OF GARBAGE AND SLUDGE. (UC)

09-01-00937 THE QUANTITY OF GARBAGE THAT CAN BE DIGESTED WITH SEWAGE SLUDGE (DISPOSAL(SEWER))
KEEFER, C. E. + DRATZ, H.
SEWAGE WORKS JOURNAL 6, P. 250 (1934). THE ARTICLE CONTAINS A GOOD DISCUSSION OF THE TECHNIQUE USED IN THE STUDY. ACCORDING TO THE AUTHORS' RESULTS, A MIXTURE OF EQUAL QUANTITIES OF GARBAGE AND RAW SLUDGE DIGESTS RAPIDLY IN TERMS OF VOLATILE SOLIDS REDUCTION, WHEN SEEDED WITH THE PROPER AMOUNT OF DIGESTED SEWAGE SLUDGE. A MAXIMUM DAILY ADDITION EQUAL TO 5 PERCENT OF THE INITIAL VOLATILE SOLIDS, CONSISTING OF EQUAL PERCENTAGES OF GARBAGE AND RAW SLUDGE CAN BE SATISFACTORILY DIGESTED. (UC)

09-01-00938 GARBAGE DISPOSAL AS A SEWAGE PROBLEM (DISPOSAL(SEWER))
BABBIT, H. E.
SEWAGE WORKS JOURNAL 16, P. 861 (1944). DIGESTION OF GARBAGE WITH SEWAGE HAS OUTSTANDING ADVANTAGES, EVEN THOUGH IT INVOLVES MORE WORK. INFORMATION IS GIVEN ON VARIOUS FACTORS TO BE CONSIDERED. (UC)

09-01-01123 TRANSFER OPERATIONS (SEWER-DISPOSAL GRINDER(HOME))
BOWERMAN, F. R.
PROC OF THE NATIONAL CONF CN SOLID WASTES RESEARCH, AM PUBLIC WORKS ASSOC, CHICAGO, ILLINOIS, P. 75-79 (DECEMBER 1963). FUTURE TRENDS IN TRANSFER - MOST SOLID WASTE TRANSPORTATION SYSTEMS UTILIZE AUTOMOTIVE VEHICLES EXCLUSIVELY. THE ONE MAJOR CHANGE IN SOLID WASTE COLLECTION IN THE LAST 100 YEARS HAS BEEN THE CONVERSICN FROM HORSE-DRAWN WAGONS TO GASOLINE-POWERED TRUCKS. THE PRESENT DAY USAGE OF GARBAGE DISPOSERS OFFER SOME HOPE FOR RIDDING THE SOLID WASTE COLLECTION SYSTEM OF THE MOST LIKELY SOURCE OF NUISANCE. IT IS ENTIRELY POSSIBLE THAT AN EXTENSION OF THE CONCEPT OF FOOD WASTE GRINDERS TO INCLUDE OTHER SOLID WASTES WILL PROVE PRACTICAL. OUR PRESENT TECHNOLOGY SUGGESTS THAT GRINDING AT EACH INDIVIDUAL HOME MAY NOT BE PRACTICAL BECAUSE OF THE INHERENT PROBLEMS IN PROVIDING A GRINDER CAPABLE OF HANDLING THE MANY TYPES OF SOLID WASTE WHICH COULD BE CARRIED IN THE SEWER. NON-COMBUSTIBLE RUBBISH SUCH AS CANS AND BOTTLES, AND LARGE, AWKWARD OBJECTS SUCH AS TREE LIMBS, WOULD OF NECESSITY HAVE TO BE COLLECTED THROUGH USUAL PROCEDURES. THE GRINDING OF ONLY A PORTION OF THE COMBUSTIBLE RUBBISH TO THE SEWER AT HOMES WOULD NOT BE JUSTIFIABLE, SINCE, IF THE COLLECTION VEHICLE MAKES A PERIODIC STOP AT THE HOME, IT COSTS VERY LITTLE MORE TO PICK UP ALL OF THE RUBBISH THAN IT DOES TO PICK UP ONLY A PORTION OF IT. SOME MERIT EXISTS IN GRINDING RUBBISH TO THE SEWERS AT TRANSFER STATIONS WHERE THE SOLID WASTE UNSUITED FOR CARRIAGE IN THE SEWER WOULD BE HAULED AWAY FOR DISPOSAL ELSEWHERE. THE SEWER SERVES AS AN " ENDLESS BELT " TYPE OF CONVEYOR TO DELIVER THE GROUND REFUSE AT NOMINAL COST TO SEWAGE TREATMENT PLANTS WHERE IT WILL BE EXTRACTED FOR DISPOSAL ALONG WITH SEWAGE SLUDGE. MANY UNSOLVED PROBLEMS LIE ALONG THIS PATH, BUT WITH THE USE OF CENTRIFUGES FOR ECONOMICAL DEWATERING OF SLUDGES AND THE COMPOSTING OF THE SEWAGE-REFUSE MIXTURES, SUCH SYSTEMS MAY PROVE TO BE AN ECONOMICAL MEANS OF TRANSPORTING CERTAIN PORTIONS OF SOLID WASTES AT LESS COST THAN BY TRUCK. THE LOS-ANGELES COUNTY SANITATION DISTRICTS HAVE RUN FEASIBILITY TESTS ON THE ANAEROBIC DIGESTION OF SEWAGE-REFUSE MIXTURES AS WELL AS ON THE AEROBIC COMPOSTING OF SUCH MIXTURES AND THE RESULTS APPEAR PROMISING. THE SANITATION DISTRICTS FED SOME 7 TONS OF GROUND COMBUSTIBLE REFUSE TO A TRUNK SEWER DURING A PERIOD OF ABOUT 30 MINUTES. OBSERVATIONS AT MANHOLES DOWNSTREAM AND AT THE SEWAGE TREATMENT PLANT SHOWED THAT THE GROUND REFUSE WAS READILY TRANSPORTED THROUGH THE SEWER, INCLUDING INVERTED SEWER SIPHONS, AND CAUSED NO DIFFICULTY UNTIL IT REACHED THE BAR SCREENS AT THE SEWAGE TREATMENT PLANT. IT WAS CONCLUDED THAT A SOMEWHAT FINER GRIND THAN THE 2-IN TO 4-IN SIZE AS WAS USED IN THE TEST WOULD HAVE READILY PASSED BETWEEN THE BAR SCREEN OPENINGS FOR REMOVAL IN THE SEDIMENTATION TANKS. HOWEVER, THE LARGER PARTICLES OVERLOADED THE SCREENINGS GRINDER WHICH NORMALLY HANDLES A VERY MUCH SMALLER LOADING FROM SEWAGE. IT IS PROBABLE THAT EITHER A MODIFICATION IN THE INLET WORKS SCREENING OR THE GRINDING OF REFUSE TO A MAXIMUM SIZE OF ABOUT 1-INCH OR LESS WOULD BE NECESSARY.

09-01-01328 JASPER, IND., MEASURES ITS GARBAGE-GRINDER SANITATION PROGRESS (GRINDER(HOME))
THE AMERICAN CITY 68(2), P. 108-109 (1953). IN A JOINT STUDY BY INDIANA STATE BOARD OF HEALTH AND THE U.S. PUBLIC HEALTH SERVICE, OVER 75 PERCENT OF THE TOWN (900) HAVE GARBAGE GRINDERS, TO DISPOSE OF THEIR GARBAGE. THE DESIGN OF THE CITY SEWAGE DISPOSAL SYSTEM HAD TO BE ENLARGED BY ABOUT 60 PERCENT. DATA ON THE OPERATION OF THE SEWAGE DISPOSAL PLANT IS GIVEN.

09-01-01393 THE DOSING OF SEWAGE TANKS WITH GROUND GARBAGE
BABBIT, H. E.
SEWAGE WORKS JOURNAL 7, P. 16 (1935). IMHOFF TANKS WERE USED IN THE STUDY. IT WAS FOUND THAT CNE OF THE DIGESTERS COULD HANDLE THE EQUIVALENT OF ONE TON OF GARBAGE PER MILLION GALLONS OF SEWAGE. (UC)

09-01-01414 GROUND GARBAGE BRINGS CLEANER SEWERS
THE AMERICAN CITY 71(6), P. 29 (JUNE 1956). BRIEF REPORT THAT ROUGHAGE IN FOOD WASTES GROUND AND DISPOSED INTO THE SEWERAGE SYSTEM AT JASPER, INDIANA HAS TENDED TO " SCRUB OUT " THE SEWERS. DATA ON AIR REQUIREMENTS AND SLUDGE AND GAS PRODUCTION AT THE ACTIVATED SLUDGE PLANT ARE INCLUDED. (PHS)

09-01-01528 EFFECTS OF GARBAGE GRINDING ON SEWAGE SYSTEMS AND ENVIRONMENTAL SANITATION (HOME-GRINDER VECTOR)
DAVIS, P. L. + BLACK, R. J.
AM PUBLIC WORKS ASSOC REPORTER, P. 26 (DECEMBER 1962). ALTHOUGH A SMALL PORTION OF TOTAL REFUSE CAN BE DISPOSED OF BY GARBAGE GRINDERS, 26 PERCENT OF TOTAL REFUSE BY WEIGHT, 7 PERCENT BY VOLUME (DON E. BLOODGOOD, "DIGESTION OF GARBAGE WITH SEWAGE SLUDGE", SEWAGE WORKS JOURNAL, 8(1), 3, (JANUARY 1936), THIS PORTION IS THE MOST TROUBLESCME PART. THE GARBAGE-CAN FLY PROBLEM IS REDUCED THROUGH THE USE OF GARBAGE GRINDERS. BY REDUCING THE QUANTITY OF FOOD THAT IS AVAILABLE TO RATS, THE USE OF GARBAGE GRINDERS HELPS TO CURB AN URBAN COMMUNITY'S RAT PROBLEM. ALTHOUGH GARBAGE GRINDING INCREASES THE SEWAGE FLCW BY ONLY 1 OF 2 GAL PER CAPITA PER DAY, I.E., BY 1 PERCENT TO 2 PERCENT, BOD SUSPENDED SOLIDS, AND GREASE WILL INCREASE MARKEDLY. IN AURORA, THE BOD WAS INCREASED BY 18 PERCENT, AND THE SUSPENDED SOLIDS BY 25 PERCENT. (K. S. WATSON AND CURTIS CLARK, " HOW FOOD WASTE DISPOSERS AFFECT PLANT DESIGN CRITERIA", PUBLIC WORKS, 93(6), 105, (JUNE 1962).) GROUND GARBAGE HAS ESSENTIALLY THE SAME SPECIFIC GRAVITY AS THE CONSTITUENTS IN ORDINARY SEWAGE, AND FEW NEW MATERIALS ARE INTRODUCED BY GRINDING FOOD WASTES. LITTLE OR NO INCREASE IN CAPACITY IS REQUIRED IN PRIMARY SEWAGE TREATMENT DEVICES, SINCE THEY ARE DESIGNED ON THE BASIS OF SEWAGE FLOW, WHICH IS INCREASED ONLY SLIGHTLY. HOWEVER, GRIT MAY INCREASE BY AS MUCH AS 40 PERCENT, AND THE AMOUNT OF SCUM FORMED ON THE TOP OF PRIMARY SETTLING TANKS IS MAGNIFIED. AN INCREASED SECONDARY TREATMENT CAPACITY IS NEEDED TO HANDLE THE ADDITIONAL BOD AND PRIMARY EFFLUENT. A GREATER DIGESTER CAPACITY IS NEEDED TO HANDLE THE ADDITIONAL SOLIDS (70 PERCENT TO 100 PERCENT INCREASE IN SLUDGE). THE QUANTITY OF GAS PRODUCED WHEN ALL OF A COMMUNITY'S GARBAGE IS GROUND IS LIKELY TO BE AMPLIFIED BY 100 PERCENT. SEPTIC TANKS MUST BE EXPANDED UP TO 50 PERCENT IN SIZE. (WPA)

09-01-01537 EFFECT OF KITCHEN REFUSE GRINDING ON SEWAGE (GRINDER(HOME))
BUCKSTEEG, W. + IMHOFF, K. R.
UEBER DIE AUSWIRKUNGEN DER KUECHENABFALLZERKLEINERUNG AUF KANALISATION, KLAERANLAGE UND VORFLUTER, GAS-U WASSERFACH 135(44), P. 1226-1228 (OCTOBER 30, 1964). TECHNICAL AND ECONOMIC EFFECT OF REFUSE GRINDING WERE STUDIED AND IT IS CONCLUDED THAT CONCENTRATION OF SLUDGE AND DIRT INCREASES BY 50 PERCENT WHILE COST OF SEWAGE WATER TREATMENT INCREASES BY 30 PERCENT. (EI)

09-01-01596 CENTRAL GARBAGE GRINDING PLANT AT RICHMOND, INDIANA (COST(CAPITAL) DIGESTION)
ROSS, W. E.
REFUSE REMOVAL JOURNAL 1(5), P. 18 (MAY 1958). GROUND GARBAGE, AFTER HAVING GRIT REMOVED, IS PUMPED DIRECTLY INTO SEWAGE TREATMENT PLANT DIGESTERS WITH SEWAGE SLUDGE TO GET MAXIMUM GAS PRODUCTION. THE VALUE OF THE GAS IS HIGH ENOUGH SO THAT THE COST OF GARBAGE DISPOSAL EQUIPMENT WILL BE PAID FOR IN FIVE YEARS. (PHS)

09-01-01955 CONTROLLED GARBAGE DIGESTION (SEWER-DISPOSAL GRINDING)
SCHLENZ, H. E.
J WESTERN SOC OF ENGRS 49(3), P. 273-278 (MARCH 1944). A DESCRIPTION IS GIVEN OF A SYSTEM FOR PROVIDING THE CONTROLLED DIGESTION OF GARBAGE SOLIDS IN A SPECIAL GARBAGE DIGESTION TANK. GARBAGE IS GROUND IN DIGESTER SUPERNATANT AND IS PLACED IN PERFORATED CONTAINERS WHICH REMAIN SUBMERGED IN THE GARBAGE DIGESTER FOR 10 DAYS. THE TANK IS SEEDED BY SUPERNATANT FROM SEWAGE SLUDGE DIGESTION TANKS, WHICH ALSO RECEIVE THE LIQUID FROM THE GARBAGE DIGESTER. (UC)

09 02 LAND APPLICATION

09-02-00871 DISPOSAL OF HIGH ORGANIC CONTENT WASTES ON LAND
SCOTT, R. H.
COMPOST SCIENCE 4(3), P. 9-13 (AUTUMN 1963). DISPOSAL OF HIGH ORGANIC WASTES, INCLUDING LIQUID DIGESTED SLUDGE, CHEESE WHEY AND SPENT SULFITE LIQUOR IN WISCONSIN. SLUDGE HAULING, SPRAY IRRIGATION AND GENERAL LAND APPLICATION PRACTICES ARE DESCRIBED. (EI)

09-02-00894 SLUDGE DISPOSAL BY USE IN AGRICULTURE
TIETJEN, C.
ZUR UNTERBRINGUNG VON ABWASSERSCHLAMM IN DER LANDWIRTSCHAFT, LANDBAUFORSCHUNG VOLKENRODE, MITTEILUNGSBLATT DER FORSCHUNGSANSTALT FUR LANDWIRTSCHAFT BRAUNSCHWEIG-VOLKENRODE, 10(2), P. 43 (1960). THE PROBLEM OF SLUDGE DISPOSAL IS BECOMING MORE IMPORTANT WITH THE INCREASE IN NUMBER OF SEWAGE TREATMENT PLANTS. ONE OF THE CHEAPEST SOLUTIONS IS DISPOSAL ON AGRICULTURAL LAND. THIS MAY CAUSE SEVERE DAMAGE IF THE SLUDGE ORIGINATES FROM A PLANT WHERE DOMESTIC AND INDUSTRIAL WASTES ARE TREATED TOGETHER. THE " SOIL NUTRIENTS " IN SEWAGE, AND IN RAW AND DIGESTED SLUDGE, ARE DISCUSSED AND COMPARED WITH THOSE IN STABLE MANURE. CONCENTRATIONS OF TRACE ELEMENTS (BORON, COPPER, MAGANESE, MOLYBDENUM, ZINC) ARE MENTIONED. A SUMMARY IS GIVEN OF METHODS FOR DISPOSING OF SLUDGE AT DIFFERENT LEVELS OF MOISTURE CONTENT. (UC)

09-02-01003 SPRAY IRRIGATION OF WOOD DISTILLATION WASTES
HICKERSON, R. C. + MCMAHON, E. K.
J WATER POLLUTION CONT FED 32(1), P. 55-94 (JANUARY 1960). THE WRIGLEY PLANT OF THE TENNESSEE PRODUCTS AND CHEMICAL CORP. NEAR NASHVILLE, TENN., PRODUCES CHARCOAL, ACETIC ACID, WOOD ALCOHOL, AND VARIOUS WOOD OILS AND TARS. WOOD IS CONVERTED TO CHARCOAL AND VOLATILE MATERIALS ARE CONDENSED AND LATER DISTILLED TO PRODUCE THE OTHER PRODUCTS. REFINING OF ALCOHOL PRODUCES " LIME LEE WASTES " AND " ALCOHOLIC POT RESIDUES. " REFINING ACETIC ACID RESULTS IN " WATER COLUMN WASTES " AND " DECANTER OVERFLOWS." THE LIME LEE AND WATER COLUMN WASTES ACCOUNT FOR MOST OF THE VOLUME, AND THE DECANTER OVERFLOW WASTES ARE HIGH IN PHENOL AND TURN BLACK IN THE PRESENCE OF DISSOLVED IRON. LAGOONING WITH CHEMICAL TREATMENT RESULTS IN VARYING DEGREES OF IMPROVEMENT OF ALL WASTES EXCEPT THE WATER COLUMN WASTES WITH RESPECT TO BOD. SPRAY IRRIGATION DISPOSAL METHODS WERE INVESTIGATED BY THE USE OF A PILOT GREENHOUSE IN WHICH DIFFERENT GRASSES WERE SUBJECTED TO VARYING DOSES OF THE WASTE. IT WAS FOUND THAT DISPOSAL OF LIME LEE AND WATER COLUMN WASTES HAD LITTLE EFFECT ON FESCUE. THIS PROMPTED THE USE OF A QUARTER-ACRE TEST PLOT AND EVENTUALLY FULL SCALE OPERATION OF A 40-ACRE AREA. THE WASTES ARE FED TO A NEUTRALIZING SUMP FROM WHICH THEY ARE PUMPED TO A ONE-HALF ACRE LAGOON, ADJOINING THE IRRIGATION FIELD. PORTABLE ALUMINUM PIPE IS USED FOR DISTRIBUTION IN THE IRRIGATION AREA. THE FIELD IS COVERED BY A 4-IN. DISTRIBUTION HEADER SPLITTING THE AREA INTO EAST AND WEST PORTIONS. AT 60-FT. INTERVALS THE HEADER IS EQUIPPED WITH QUICK-COUPLING FITTINGS. FOUR MOVABLE LATERAL SPRAY LINES ARE CONNECTED TO THE HEADER AT LOCATIONS CHOSEN BY THE OPERATOR TO PERMIT SPRAYING SECTIONS OF THE FIELD IN PLANNED SEQUENCE. THE LATERALS ARE 3-IN. ALUMINUM PIPE FITTED WITH NOZZLES EVERY 25 FEET. THE SYSTEM HANDLES 300 GPM AND WAS INSTALLED AT A COST OF $15,000.

09-02-01103 WASTE DISPOSAL BY RIDGE AND FURROW IRRIGATION
SCHRAUFNAGEL, F. H.
WISCONSIN UNIVERSITY, ENG EXPERIMENT STATION, RESEARCH REPORT 20, (1963). EVALUATION OF RIDGE AND FURROW IRRIGATION METHOD OF WASTE DISPOSAL. METHOD CONSISTS OF CONFINING WASTES TO FURROWS WITH LIQUID SURFACE AT LEAST SEVERAL INCHES BELOW RIDGES TO BE CARRIED BY CAPILLARY ACTION ABOVE LINE OF SATURATION. METHOD IS DISCUSSED AND ITS LIMITATIONS AND POTENTIAL INDICATED. LIST OF RIDGE AND FURROW IRRIGATION DISPOSAL SYSTEMS IN WISCONSIN IS GIVEN. (EI)

09-02-01168 DISPOSAL OF PULP AND PAPERMILL WASTE BY LAND APPLICATION
GELLMAN, I. + BLOSSER, R. O.
COMPOST SCIENCE 1(4), P. 18-23 (WINTER 1961). A SURVEY WAS MADE IN 1958 OF 18 PULP AND PAPER MILLS EMPLOYING LAND APPLICATION FOR WASTE DISPOSAL IN PILOT OR FULL- SCALE OPERATIONS. TWO GENERAL METHODS WERE USED - APPLICATION FOR FILTRATION THROUGH SOIL AND APPLICATION FOR CROP IRRIGATION. METHODS OF APPLICATION INCLUDED SPRAYING, CONTOUR DITCHES AND, TO A LESSER EXTENT, SEEPAGE PONDS. TYPES OF MILLS INCLUDED THOSE PRODUCING SULFITE, KRAFT, SEMICHEMICAL, STRAWBOARD, GROUND WOOD, HARDBOARD AND BOXBOARD PRODUCTS. THE AUTHORS RECOMMEND PRESCREENING AND STORAGE OF EFFLUENTS PRIOR TO LAND APPLICATION. THE MEDIAN LAND REQUIREMENT WAS AROUND 1.0-1.5 ACRES PER TON OF DAILY PULP PRODUCTION. MANY FACTORS REQUIRE STUDY IN A LAND APPLICATION PROGRAM. (PHEA)

09-02-01975 CANNERY WASTE DISPOSAL BY GERBER PRODUCTS (IRRIGATION(SPRAY))
DIETZ, M. R. + FRODEY, R. C.
COMPOST SCIENCE 1(3), P. 22-25 (AUTUMN 1960). THE GERBER PRODUCTS CO., FREEMONT, MICHIGAN, CONSERVES FRUIT AND VEGETABLE CANNERY WASTES BY SPRAY IRRIGATION ON 140 ACRES LOCATED 3-1/2 MILES FROM THE PLANT. THE WASTES CONTAIN UP TO 3000 PPM OF 5-DAY BOD AND THE PH VARIES FROM 4.3 TO 11.5. THE SPRINKLER SYSTEM APPLIES ONE INCH OF IRRIGATION IN 4-1/2 HOURS AND 2-4 INCHES ARE APPLIED PER WEEK. THE SOIL CONSISTS LARGELY OF FINE SAND. DIFFERENT CROPS HAVE BEEN TESTED ON THE IRRIGATED FIELDS, THE YIELD OF SUCH COVER CROPS AS ALFALFA WAS MUCH GREATER ON THE IRRIGATED SOIL. SEVERAL TYPES OF TREES THRIVED WITH MODERATE APPLICATION RATES OF IRRIGATION AND THE DANISH WILLOW WITHSTOOD HEAVY SPRAY IRRIGATION. IRRIGATION CAN BE CONTINUED IN WINTER BY CONTROLLED SPRAYING OVER A SMALL AREA SO THAT LAGOONING IS UNNECESSARY IN COLD WEATHER. THE OPERATING COST IS RELATIVELY LOW IN COMPARISON TO OTHER METHODS OF DISPOSAL. (PHS)

09-02-02100 LAND RECLAMATION PROJECT - AN INTERIM REPORT (SLUDGE(SEWAGE))
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE, CINCINNATI, OHIO, (1968). A PROPOSAL BY THE HARZA ENGINEERING CO. ON THE USE OF DIGESTED SEWAGE SLUDGE FOR LAND RECLAMATION IN THE CHICAGO, ILLINOIS, AREA. A PROGRAM IS RECOMMENDED FOR LAND RECLAMATION USING SEWAGE SLUDGE AS A FERTILIZER. THE SLUDGE MAY BE TRANSPORTED BY RAIL, BARGE, OR PIPELINE.

09 03 OPEN DUMPS

09-03-00514 DISPOSAL OF HOUSEHOLD REFUSE IN WET GRAVEL PITS (OPEN-DUMPING)
FURNESS, J. F.
PUBLIC CLEANSING 57, P. 235 (MAY 1967). THE AUTHOR DESCRIBES TIPPING INTO WATER AS A NEW BUT NOT YET FULLY ACCEPTED METHOD OF DISPOSAL. WET PITS ARE A SERIOUS PROBLEM IN SOME DISTRICTS, AND AT THE SAME TIME, DRY SITES ARE BECOMING VERY SCARCE. EXPERIMENTS ARE DESCRIBED IN WHICH CRUDE REFUSE (100,000 TONS PER YEAR) WAS TIPPED IN A 36-ACRE PIT FROM 12 TO 15 FT DEEP. A RAPID INCREASE OF SULFIDE CONCENTRATION UP TO 30 MG/1 WAS OBSERVED, AND THE DEVELOPMENT

OF VERY BAD ODORS BECAME NOTICEABLE. THE WRITER CLAIMS THAT THE ODOR NUISANCE CAN BE ELIMATED THROUGH INOCULATION WITH SULFUR BACTERIA, PROVIDING AERATION, CHLORINATION, AND THE ADDITION OF SODIUM DICHROMATE. THE INOCULATION PROVED UNSUCCESSFUL. AERATION WAS SUCCESSFUL ONLY AT TEMPERATURES BELOW 10 DEGREES C. CHLORINATION WAS SUCCESSFUL BUT EXPENSIVE. THE DOSAGE WAS 9,000 LB FOR 3 ACRES IN WHICH 2,000 TONS PER WEEK WERE DUMPED. THE ADDITION OF SODIUM DICHROMATE WAS SUCCESSFUL, BUT IT GAVE RISE TO LEACHING PROBLEMS. BACTERIA AND ORGANIC MATTER DID NOT PERSIST IN THE UNDERFLOW GROUND WATER FOR MORE THAN 50 YARDS. NO SIGNIFICANT INCREASE OF SULFATES OR HARDNESS WAS NOTICED. AN APPRECIABLE INCREASE WAS NOTED IN THE AMOUNT OF FREE AMMONIA. THE AUTHOR RECOMMENDS THAT A PIT BE FILLED TO WATER LEVEL WITHIN A SEVEN-MONTH PERIOD. (UC)

09-03-01491 CONTROLLED BURNING ON REFUSE DUMPS (OPEN-DUMP)
BLACK, R. J. + NEAR, L. B.
CALIFORNIA VECTOR VIEWS 6(9), P. 55 (SEPTEMBER 1959). ACCORDING TO THE ARTICLE, THERE ARE THREE TYPES OF CONTROLLED BURNING DUMPS - (1) SINGLE LIFT FILL - THIS WOULD BE USED WHERE LOW LEVEL GROUND COULD BE IMPROVED BY FILLING. ROADWAYS AND BANK WITH SAFETY BERM ARE CONSTRUCTED SO THAT COMPLETED FILL FITS THE CONTOURS OF THE SURROUNDING LAND. (2) TRENCH FILL - A TRENCH IS EXCAVATED IN LEVEL GROUND. THE EXCAVATED MATERIAL IS USED FOR FILL. COSTS OF EXCAVATION MAKE IT THE MOST COSTLY OF THE THREE METHODS. (3) CANYON SITE - TWO SHELVES ARE CUT ALONG THE SIDE OF A CANYON. THE UPPER LEVEL IS USED FOR BURNING. ASHES ARE BULLDOZED TO THE LOWER LEVEL FOR PERMANENT LANDFILL. THE LOWER LEVEL LIMITS THE DUMPING AREA AND FACILITATES SALVAGE. THE OPERATION MUST MEET FIVE REQUIREMENTS - (1) IT MUST BE SUFFICIENTLY ISOLATED, (2) IT MUST PROVIDE A CARETAKER TO SUPERVISE DUMPING AND POLICE THE OPERATION, (3) A CLEAN, LEVEL ROADWAY AND SAFETY BERM MUST BE PROVIDED, (4) A BANK APPROXIMATELY 15 FEET HIGH WITH A 45 DEGREE SLOPE MUST BE ERECTED, (5) THE DUMP FACE MUST BE OF A LENGTH SUITABLE TO PERMIT A PROPER SEGREGATION OF MATERIALS. THE REFUSE IS SEGREGATED INTO FIVE TYPES OF MATERIALS. THE FIRST CLASS CONSISTS OF HOUSEHOLD RUBBISH, MIXED REFUSE, PAPER PRODUCTS, CANS, BOTTLES, TOYS, AND SIMILAR MATERIALS. AFTER METALS ARE SALVAGED, THE REST CAN BE BURNED WITH THE PRODUCTION OF VERY LITTLE SMOKE. THE SECOND CLASS OF REFUSE IS COMPOSED OF STOVES, REFRIGERATORS, WASHERS, DRUMS, BEDS, AND OTHER LARGE ITEMS. THESE ITEMS ARE ALMOST TOTALLY SALVAGEABLE. IN THE THIRD CLASS BELONG TIRES, GROUND RUBBER, ROOFING PAPER, LINOLEUM, OTHER HEAVY SMOKE- PRODUCING MATERIALS, CONCRETE, BRICK, AND OTHER RUBBLE. SALVAGEABLE ITEMS ARE REMOVED AND THE REMAINDER ARE BURIED. THE FOURTH CLASS CONSISTS OF LAWN CLIPPINGS, AND BRUSH AND TREE TRIMMINGS. THESE ITEMS MUST BE THOROUGHLY DRIED BEFORE BEING BURNED. DIRT AND ASHES MAKE UP THE FIFTH CLASS. BY PROVIDING A SEPARATE STORING AREA, THESE MATERIALS CAN BE USED FOR COVER MATERIAL. WHERE LOCAL SOIL CONDITIONS ARE NOT SUITABLE FOR SANITARY LANDFILL, OR VOLUMES OF REFUSE ARE TOO SMALL, THE CONTROLLED BURNING METHOD MAY BE A SATISFACTORY TEMPORARY SOLUTION. (UC)

09-03-01743 TOWN RESCUES CITIZEN FROM RANDOM DUMPING (OPEN-DUMP)
REFUSE REMOVAL JOURNAL 6(6), P. 19 (JUNE 1963). AN IRATE CITIZEN AND HIS NEIGHBORS IN ROSEVILLE, MINN., GOT THEIR TOWN COUNCIL TO MOVE AGAINST WANTON USE OF THE CITIZEN'S PROPERTY AS A DUMP. THE ACTION THE COUNCIL TOOK WAS TO ADOPT REGULATIONS REQUIRING A LICENSE FOR PUTTING FILL ON ANY PROPERTY, THE CONTROL OF DUST, AND REGULAR COVERINGS OF DIRT OVER ANY FILL PERMITTED, LIMITING THE TOTAL AMOUNT OF FILL IN ANY ONE PLACE, AND BANNING AN UNREASONABLE AMOUNT OF ORGANIC MATERIAL. THE TOWN ALSO ERECTED SIGNS ON THE CITIZEN'S PROPERTY WARNING TRASH DISPOSERS OF THE NEW REGULATIONS. (PHS)

09-03-01926 BURNLEY'S SOLUTION TO THE RUBBISH DUMP
PUBLIC CLEANSING 54(3), P. 801 (1964). THROUGH THE COMBINED EFFORTS OF THE TOWN CLERK, MEDICAL OFFICER OF HEALTH, BOROUGH SURVEYOR, AND CLEANSING SUPERINTENDENT BURNLEY, ENGLAND REMOVED REFUSE THAT HAD BEEN DUMPED ON VACANT LOTS AND EMPTY HOUSES. OWNERS WERE CONTACTED IN CERTAIN AREAS AND CHARGES WERE MADE WHERE CERTAIN VIOLATIONS WERE MADE AND WHERE CERTAIN TYPES OF REFUSE SUCH AS ABANDONED CARS, BULKY MATERIAL HAD TO BE LIFTED BY MECHANICAL MEANS.

09 04 OCEAN DISPOSAL

09-04-00059 WILL BALE RUBBISH FOR OCEAN BURIAL (COMPACTING BALING)
REFUSE REMOVAL JOURNAL 10(9), (SEPTEMBER 1967) A PATENTED PROCESS FOR COMPOSTING AND BALING REFUSE TO A DENSITY THAT WILL BE GREATER THAN WATER SO IT WILL SINK. OUTSIDE OF BALES IS WRAPPED IN PLASTIC OR COATED WITH ASPHALT.

09-04-00135 FLORIDA OCEAN DUMPING TEST NOT A TOTAL SUCCESS (OCEAN-DISPOSAL)
REFUSE REMOVAL JOURNAL 4(8), P. 11, 28 (1961). FIRST EXPERIMENT TO DUMP REFUSE IN GULF STREAM SHOWED THAT MATERIAL MUST BE LOADED DRY, OTHERWISE, IT WILL STICK TOGETHER LIKE GLUE.

09-04-01274 WASTE DISPERSAL INTO THE SEAS
FOXWORTHY, J. E. + TIBBY, R. B. + BARSON, G. M.
PUBLIC WORKS 97(10), P. 152 (1966). A RECENT SURVEY SHOWED THAT IN CALIFORNIA SOME 125 COASTAL COMMUNITIES, INCLUDING 11 OF THE 13 LARGEST CITIES, DISCHARGE THEIR WASTES INTO THE OCEAN BY USE OF SUBMARINE OUTFALLS. MUCH THEORETICAL AND EMPIRICAL WORK HAS BEEN ACCOMPLISHED IN RECENT YEARS, ESPECIALLY WITH REGARD TO THE PROBLEM OF HORIZONTAL TURBULENT DIFFUSION IN THE SEA, HOWEVER, VERY LITTLE INFORMATION IS AVAILABLE ON THE EFFECT, IF ANY, OF THE VERTICAL COMPONENT OF DIFFUSION ON THE NET DISPERSAL OF A WASTE SUBSTANCE. BETWEEN 1963 AND 1965, A SERIES OF EXPERIMENTS PERFORMED AT THE ORANGE COUNTY, CALIF., OCEAN OUTFALL SHOWED THAT A TWO-DIMENSIONAL POINT- SOURCE MATHEMATICAL MODEL COULD DESCRIBES THE RESULTS OF POINT- RELEASE EXPERIMENTS. WHEN HIGH WINDS AND LOW STABILITY PREVAILED, VERTICAL DIFFUSION WAS SIGNIFICANT. WHEN VERTICAL DIFFUSION WAS NOT SIGNIFICANT, A ONE-DIMENSIONAL MODEL COULD BE USED. WHEN THE ENTIRE WASTE SOURCE WAS TAGGED, A MODEL DESCRIBING DIFFUSION FROM A CONTINUOUS VOLUME SOURCE, BASED ON A GAUSSIAN DISTRIBUTION OF MATERIAL IN A HOMOGENEOUS, STATIONARY, AND INFINITE FIELD, GAVE A REALISTIC REPRESENTATION OF THE OBSERVATIONS. LATERAL VARIANCE OF CONCENTRATION DISTRIBUTION WAS A FUNCTION OF DISTANCE.

09-04-01533 SEA GOING GARBAGE (HEALTH LAW)
BARFIELD, S.
J ENVIRONMENTAL HEALTH 26(5), P. 325-327 (MARCH-APRIL 1964). THE AUTHOR DISCUSSES FEDERAL RESTRICTIONS RELATING TO MEAT, FOOD STORES, AND GARBAGE IN U.S. PORTS, REFUSE DISPOSAL METHODS IN THE PORT OF LOS ANGELES, AND THE SAN PEDRO, CALIF., FIRM THAT SPECIALIZES IN DISPOSAL AT SEA. (PHEA)

09-04-01585 REFUSE DISPOSAL AT SEA AND IN PORTS
REFUSE REMOVAL JOURNAL 1(7), P. 19 (JULY 1958). GARBAGE GRINDERS, INCINERATORS, AND REFUSE CHUTES ARE EXAMPLES OF REFUSE HANDLING AT THE DOCKS IN SOME PORTS. (PHS)

09-04-01767 COUNTY USES DYNAMITE ON DEAD OCEAN MAMMALS
REFUSE REMOVAL JOURNAL 5(1), P. 27 (JANUARY 1962). HEALTH OFFICIALS IN DEL NORTE COUNTY, CALIF., HAVE FOUND DYNAMITING TO BE THE QUICKEST, EASIEST, AND MOST SANITARY METHOD OF DISPOSING OF DEAD OCEAN MAMMALS. ONLY WHEN A CARCASS IS IN A LOCATION WHERE DYNAMITING WOULD BE EXTREMELY HAZARDOUS IS AN ALTERNATIVE DISPOSAL METHOD USED - USUALLY APPLICATION OF HOT LIME OR CHLORIDE OF LIME TO THE CARCASS. THE PRINCIPAL IDEA BEHIND THE DYNAMITE METHOD IS TO PLACE THE DYNAMITE AROUND THE CARCASS IN SUCH A WAY THAT IT IS BLOWN OUT TO SEA, WHERE THE RESULTING DEBRIS IS CLEANED UP BY TIDES AND SCAVENGER BIRDS. FOR THE ACTUAL BLASTING THE COUNTY HEALTH DEPARTMENT HIRES A POWDER EXPERT, AND COSTS ARE GENERALLY $10 OR $15 PER CARCASS DEPENDING UPON THE NUMBER TO BE DISPOSED. (PHS)

09-04-01839 STRICT SANITATION STANDARDS OBSERVED BY SHIPS AT SEA (OCEAN-DISPOSAL CONTAINER)
REFUSE REMOVAL JOURNAL 8(2), P. 6 (1965). ALL LUXURY LINERS BOTH DOMESTIC AND FOREIGN MUST MEET A STRICT SET OF STANDARDS SET UP BY THE U.S.P.H.S. THE LINERS ARE MET OUTSIDE THE 3-MILE LIMIT AND ARE INSPECTED PRIOR TO REACHING DOCK. SHIPS MEETING THE STANDARDS ARE ALLOWED TO DOCK. THOSE NOT MEETING THE STANDARDS ARE QUARANTINED UNTIL REQUIRED STANDARDS ARE MET.

09-04-01840 CARS DROWNED BY SWEDISH SKIPPER (BULKY-WASTE OCEAN-DISPOSAL)
REFUSE REMOVAL JOURNAL 8(4), P. 38 (1965). A THRIVING BUSINESS, DISPOSING OF UNWANTED CARS AT SEA, HAS BEEN BUILT UP BY CAPTAIN OTTO MAGNUSSON, SKIPPER OF THE SWEDISH SHIP, OSTKUST. HE WENT INTO THIS VENTURE BECAUSE WEALTHY SWEDEN IS PRODUCING AND IMPORTING AUTOMOBILES AT SO FAST A RATE THAT ANY CAR OVER FIVE YEARS OLD IS BEING JUNKED SINCE IT HAS NO RESALE VALUE. AT PRESENT, THE COUNTRY, WITH A POPULATION OF CLOSE TO 8 MILLION, HAS ONE CAR FOR EVERY FIVE INHABITANTS. THE ENTERPRISING CAPTAIN CHARGES $22 TO $32 A CAR, DEPENDING ON SIZE, AND THE PRICE INCLUDES A PICK UP SERVICE. HE LOADS THE UNWANTED JALOPIES ON BOARD HIS VESSEL AND HAULS THEM TO THE DEEPEST PART OF THE BALTIC SEA, WHERE THEY ARE UNCEREMONIOUSLY SHOVED OVERBOARD. (AUTH)

09-04-01910 $197,500 GRANTED HARVARD UNIVERSITY FOR INCINERATION AT SEA STUDY (OCEAN-DISPOSAL)
REFUSE REMOVAL JOURNAL 8(10), P. 38 (1965). A GRANT WAS AWARDED RESEARCHERS AT HARVARD'S SCHOOL OF PUBLIC HEALTH FOR A TWO YEAR STUDY OF INCINERATION AT SEA. A STUDY OF THE IMPACT ON THE SEA AND OFF SHORE ATMOSPHERE OF REFUSE DISPOSED AND BURNED BY VESSELS EQUIPPED WITH HIGH-TEMPERATURE INCINERATORS.

09 05 ANIMAL FEEDING

09-05-00315 CATTLE FEED
BIJMA, J.
PATENT DUTCH 63,778 (JULY 15, 1949). GARBAGE IS GRANULATED PREFERABLY BY MILLING AND THEN HEATED AT 50 DEGREES C. WHILE MIXING, TILL A STICKY MASS IS OBTAINED WHICH IS KNEADED, FORMED, IF DESIRED, AND FINALLY BAKED. THE BAKED PRODUCT OBTAINED MAY BE EMPLOYED DIRECTLY AS CATTLE FEET OR PRESERVED BY DRYING IN FINELY DIVIDED FORM. THE GARBAGE MAY BE MIXED WITH OTHER FOODSTUFFS, SUCH AS HAY, STRAW, CHAFF, BRANS. IN AN EXAMPLE, GARBAGE, COMPOSED OF POTATO SKINS 50, VEGETABLE REFUSE 25, BREAD 10, GRAIN WASTE, HAY, OR STRAW 15 PERCENT, IS MILLED AND THEN HEATED IN A STEAM-JACKETED VESSEL AT 50 DEGREES C., WHILE MIXING DURING 1 HOUR OR MORE TILL A STICKY MASS IS FORMED. THIS MASS IS KNEADED DURING 1/4 HOUR UNTIL A DOUGH IS OBTAINED, WHICH IS MOLDED AND THEN BAKED DURING 1 1/2 TO 2 HOURS AT 100-200 DEGREES C. THE PRODUCT MAY BE EMPLOYED DIRECTLY OR DRIED AT 80 DEGREES C. (CA)

09-05-01132 FORTY STATES PROHIBIT UNCOOKED GARBAGE DIET FOR HOGS (LAW ANIMAL-FOOD))
THE AMERICAN CITY 68(9), P. 15 (1953). FORTY STATES HAVE PASSED LEGISLATION THAT PROHIBITS THE FEEDING OF UNCOOKED GARBAGE TO HOGS. THE LEGISLATION WAS NECESSARY TO STOP THE SPREAD OF VESICULAR EXANTHEMA, WHICH WAS ATTRIBUTED TO UNCOOKED GARBAGE.

09-05-01136 COOKING RIG PREPARES GARBAGE FOR HOG FEEDING
THE AMERICAN CITY 69(9), P. 97 (1953). THE ARTICLE DESCRIBES TWO METHODS OF HEAT TREATING GARBAGE PRIOR TO FEED TO HOGS, TO PREVENT THE SPREAD OF VESICULAR EXANTHEMA, TRICHINA PARASITE.

09-05-01141 A NUISANCE-FREE GARBAGE COOKER (ANIMAL-FOOD)
THE AMERICAN CITY 68(10), P. 118 (1953). MANY STATES AND MUNICIPALITIES HAVE LEGISLATION REQUIRING GARBAGE BE COOKED 30 MINUTES OR LONGER AT 212 DEGREES F. PRIOR TO FEEDING TO HOGS. ONE COMPANY HAS DESIGNED TWO SYSTEMS FOR MEETING THIS DEMAND. ONE UNIT PROCESSES 4 TONS PER HOUR AND THE OTHER 1 TON PER HOUR COOKING CAPACITY. ONE CITY CHARGES $40 PER TON.

09-05-01242 THE GARBAGE HOG FEEDING BUSINESS IN CALIFORNIA (ANIMAL(FEED))
SULLIVAN, W. + MAHARG, E. + HUGHES, E. H.
UNIVERSITY OF CALIFORNIA, BERKELEY, COLLEGE OF AGRICULTURE, CALIFORNIA AGRICULTURE EXTENSION SERVICE, CIRC 166, (APRIL 1950). POINTS COVERED IN THE CIRCULAR ARE AS FOLLOWS - (1) LAYING OUT THE FEEDING LOT SO THAT A MINIMUM OF TIME AND MOTION IS USED IN PERFORMING THE NECESSARY CHORES, (2) THE ELEMENTS OF GOOD BREEDING MANAGEMENT - KEEPING THE BREEDING AND FEEDING HERDS IN BALANCE WITH THE AMOUNT OF FEED AVAILABLE, (3) KEEPING COSTS IN LINE BY BALANCING LABOR AND FEED WITH THE SIZE OF THE HERD, (4) MAINTAINING ACCURATE RECORDS THAT WILL POINT OUT MANAGEMENT ERRORS AND SHOW WHERE THE MONEY IS GOING. THE FOLLOWING ARE SOME OF THE FACTS GIVEN IN THE CIRCULAR - ONE TON OF GARBAGE WILL PRODUCE APPROXIMATELY 50 LB OF PORK. THE NUMBER OF GARBAGE FEEDING OPERATIONS INCREASED FROM 355 TO 417 DURING 1947-1948. MOST OF THE FEEDING LOTS WERE LOCATED IN THE VICINITIES OF LOS ANGELES AND SAN FRANCISCO. IN SOUTHERN CALIFORNIA, 5.5 MILLION LB OF PORK WERE PRODUCED IN THE PERIOD 1945-1948. A 100-SOW UNIT REQUIRES 9.5 TONS GARBAGE PER DAY AND A MINIMUM OF 2 ACRES OF LAND. (UC)

09-05-01520 THE TREATMENT AND UTILIZATION OF DOMESTIC ORGANIC WASTE (ANIMAL-FEED QUANTITY)
GURNEY, H.
MUNIC ENGR SANIT RECORD 123, P. 330-333 (1949). DISCUSSION INCLUDES - COLLECTION OF RAW MATERIAL, PURPOSE OF PROCESSING PLANTS, ECONOMIC PRICE OF RAW KITCHEN WASTE, FEEDING VALUE OF KITCHEN WASTE, DRYING PROCESS, CONCENTRATED KITCHEN WASTE, PULVERIZING AND METAL EXTRACTION, AND COST OF PLANT. (CA)

09 06 BARGING

09-06-00715 SANITATION NAVY CARRIES NEW YORK DAILY REFUSE ACROSS WIDE BAY TO LANDFILL SITE (SANITARY-LANDFILL TRANSFER-STATION QUANTITY COMPOSITION)
REFUSE REMOVAL JOURNAL 10(6), P. 6, 7, 39 (JUNE 1967). NEW-YORK CITY MAINTAINS A FLEET OF FOUR TUGS AND FORTY BARGES THAT OPERATE BETWEEN NINE MARINE TRANSFER STATIONS TO A 3,000 ACRE LANDFILL OPERATION AT FRESH KILLS ON STATEN ISLAND. MIXED REFUSE OF COMMERCIAL AND MUNICIPAL COLLECTIONS IS TRANSFERRED AT THESE STATIONS AT THE RATE OF 7,200 TONS PER DAY. THE INDUSTRIAL AND COMMERCIAL REFUSE IS DELIVERED BY PRIVATE CONTRACTORS TO THESE TRANSFER STATIONS. THEY PAY $1.00/CU-YD FOR COMPACTED AND $0.80/CU-YD FOR LOOSE MATERIAL. THERE IS A TABLE ON THE TOTAL ANNUAL MIXTURE OF REFUSE RECEIVED AT THE MARINE TRANSFER STATIONS. THIS MARINE OPERATION COSTS NEW-YORK CITY ABOUT $8 MILLION PER YEAR TO OPERATE.

09-06-00919 WALBROOK WHARF (SANITARY-LANDFILL TRANSPORT(BARGE))
PUBLIC CLEANSING 53(3), P. 115 (MARCH 1963). A DETAILED DESCRIPTION OF REFUSE DISPOSAL IN THE CITY OF LONDON, ENGLAND. FIRST, BRIEFLY DISCUSSES THE VARIOUS REFUSE DISPOSAL ALTERNATIVES OPEN TO THE CITY. AFTER WEIGHING ALL EVIDENCE, OFFICIALS ADOPTED RIVER TRANSPORT AND CONTROLLED TIPPING AS THE MOST APPROPRIATE DISPOSAL METHOD FOR THE CITY. THEN DESCRIBES- (1) THE SITE OF THE WALBROOK WHARF, WHERE THE REFUSE IS TRANSFERRED FROM COLLECTION TRUCKS TO BARGES, (2) THE FINAL DISPOSAL SITE, A 209-ACRE TRACT OF LAND AT STANFORD-LE- HOPE, (3) THE CAPACITY OF THE WALBROOK WHARF DEPOT, INCLUDING BARGE ACCOMMODATIONS, AND (4) SERVICES AND FACILITIES PROVIDED AT THE DEPOT--THE TIPPING FACILITY, FACILITIES FOR VEHICLES, THE SALT AND SAND STORE, THE GENERAL STORES, PERSONNEL FACILITIES, ADMINISTRATIVE ACCOMMODATIONS AND DOMESTIC ACCOMMODATIONS.

09-06-01683 THIS MARINER NEVER LEAVES THE HARBOR (BARGE TRANSFER)
REFUSE REMOVAL JOURNAL 2(10), P. 17 (OCTOBER 1959). THE ARTICLE DESCRIBES ONE OF SIX TUG BOAT OPERATIONS OF THE N.Y. SANITATION DEPARTMENT. THE SIX TUGS AND FORTY-TWO BARGES DELIVER ABOUT 1,800,000 TONS OF REFUSE TO RICHMOND'S LANDFILL ON STATEN ISLAND.

09-06-01870 COMPACTING REFUSE IN BARGES SAVES COSTS (COMPACTION SANITARY-LANDFILL TRANSPORTATION(BARGE))
ENGINEERING 196(5076), P. 138-139 (AUGUST 2, 1963). DEVICES TO COMPACT RUBBISH IN REFUSE VEHICLES TC INCREASE THE VEHICLE'S CAPACITY ARE NOW COMMON. THIS ARTICLE DESCRIBES 2 SPECIAL MACHINES FOR BARGE LOADED REFUSE, WHICH RESULT IN IMPORTANT TRANSPORT ECONOMIES. (PHEA)

09-06-01904 BARGES IN HOLLAND HAUL REFUSE TO INCINERATORS (TRANSFER)
JORGENSEN, P. J.
REFUSE REMOVAL JOURNAL 8(12), P. 10 (1965). IN AMSTERDAM AND ROTTERDAM, HOLLAND REFUSE COLLECTION VEHICLES COLLECT REFUSE AND TRANSPORT IT TO TRANSFER STATIONS WHERE IT IS LOADED ON BARGES AND DELIVERED TO INCINERATORS. AMSTERDAM RECEIVES ABOUT 800 TONS DAILY WHILE ROTTERDAM RECEIVES ABOUT 1,550 TONS DAILY. ALTHOUGH INCINERATIONS IS THE PRIMARY DISPOSAL METHOD IN HOLLAND THERE ARE 15 COMPOSTING PLANTS IN OPERATION THROUGH OUT HOLLAND.

09 07 HOME GARBAGE GRINDERS

09-07-00125 YOU MUST HAVE A GARBAGE DISPOSAL UNIT (GRINDER(GARBAGE) COLLECTION)
BRETZKE, D. J.
THE AMERICAN CITY 79(6), P. 177 (JUNE 1964). IN 1959 THORNTON, COLORADO PASSED TWO ORDINANCES THAT REQUIRED ALL RESIDENTIAL BUILDINGS TO HAVE GARBAGE DISPOSAL UNITS. EFFECTIVE IN 1963 A RESIDENCE MUST EITHER HAVE A SINK-TYPE UNIT OR A GAS FIRED FOOD-WASTE INCINERATOR. ALL NEW CONSTRUCTION WAS TO HAVE SINK UNITS. NO PROBLEMS HAVE RESULTED AT THE SEWAGE TREATMENT PLANT, IN FACT THE CITY FEELS THEY HAVE SAVED A CONSIDERABLE AMOUNT OF MONEY. TRASH IS STILL COLLECTED IN THE USUAL FASHION.

09-07-00199 GARBAGE DISPOSAL WITH GARBAGE GRINDER (SEWER GRINDER(GARBAGE))
YAGOME, K.
SOC HEATING, AIR-CONDITIONING AND SANITARY ENGRS, JAPAN TRANS. 3, P. 48-53 (1965). REFUSE DISPOSAL IN UNITS OF HOUSING DEVELOPMENT BUILT IN JAPAN AND QUANTITY OF GARBAGE COLLECTED AND ITS CHARACTERISTICS ARE DISCUSSED. STATE OF DISPOSAL OF GROUND GARBAGE INTO SEWER SYSTEM AND COMBINED TREATMENT WITH SEWAGE IN JAPAN. (EI)

09-07-00741 A STUDY OF THE USE OF HOME FOOD WASTE DISPOSERS (GRINDER(USE) VOLUME-REDUCTION)
PUBLIC WORKS 91(11), P. 82-85 (NOVEMBER 1960). A NATION-WIDE SURVEY WAS MADE TO DETERMINE TO WHAT EXTENT MUNICIPALITIES PERMITTED THE USE OF DISPOSERS IN CITIES HAVING A POPULATION OF 10,000 OR MORE, PERCENT OF HOMES SERVED, REDUCTION IN REFUSE VOLUME, CLOGGING OF SEWERS AND EFFECT ON SEWAGE TREATMENT. QUESTIONNAIRES WERE RECEIVED FROM CITIES AND STATE HEALTH DEPARTMENTS. WHILE THE INFORMATION FURNISHED DID NOT PERMIT THE REACHING OF ANY POSITIVE CONCLUSIONS, IT DID INDICATE, WHERE DISPOSERS ARE WIDELY USED, CLOGGING OF SEWERS AND POSSIBLE SEWAGE TREATMENT COMPLICATIONS COULD BE EXPECTED. OPINIONS PERTAINING TO REDUCTION IN REFUSE VOLUME AND COLLECTION COSTS VARIED. SOME CITIES PROHIBITED THE USE OF DISPOSERS WHILE A FEW MADE THEIR USE COMPULSORY. IN MOST CASES THEIR USE WAS ON A VOLUNTARY BASIS. (PHEA)

09-07-00849 SIXTH YEAR WITH GARBAGE GRINDERS (ANIMAL-FEED SANITARY-LANDFILL GRINDER(HOME) DISPOSAL(SEWER))
ROTH, H. S.
THE AMERICAN CITY 75(4), P. 162 (APRIL 1960). GRINDER OPERATION, AS A METHOD OF DISPOSAL OF GARBAGE, HAS BEEN A SUCCESS IN THE VILLAGE. IN 1953, 415 GRINDERS, CHIEFLY GENERAL ELECTRIC WERE INSTALLED FOR $52,293 AND WITH THE PURCHASE OF GRINDERS FROM OWNERS AND PAYMENTS TO THEM FOR BYPASSING GREASE TRAPS, THE TOTAL INSTALLATION COST WAS ABOUT $61,459. IN FOUR YEARS, WITH THE INSTALLATION OF ADDITIONAL GRINDERS TO THE 50 NEW HOMES AND INCLUDING THE COST OF OWNERS' GRINDERS, THE TOTAL COSTS OF THE PROJECT ARE ABOUT $73,945. THE ORIGINAL WARRANTY OF THE GRINDERS CARRIED FOR FIVE YEARS AND WITH THIS NOW RUNNING OUT WE FEEL THAT MAINTENANCE COSTS MAY INCREASE UP TO 1963 OR 10 YEARS FROM INSTALLATION. THIS, IT IS BELIEVED, IS THE SERVICEABLE LIFE OF THE AVERAGE GRINDER. BY 1963, THE VILLAGE EXPECTS TO HAVE THE ENTIRE COST OF THE PROJECT AMORTIZED AND WILL BE ABLE TO MEET EXPENSES WITH AN ANNUAL APPROPRIATION SLIGHTLY IN EXCESS OF THE PRESENT $9,000. OPERATING COST IS $5.50 PER CAPITA OR ABOUT $22 PER FAMILY. SEWER MAINTENANCE COSTS HAVE NOT BEEN ADVERSELY AFFECTED BY DISPOSAL OPERATIONS DUE PRIMARILY TO THE FACT THAT THE MAJORITY OF VILLAGE SEWERS HAVE STEEP GRADES AND HIGH SCOURING VELOCITIES. MUNICIPAL OFFICIALS SHOULD CONSIDER EXISTING SEWER GRADES AND THE EFFECT OF INCREASED TREATMENT PLANT LOADS FROM DISPOSALS IF THEY WISH TO USE THIS METHOD.

09-07-00920 DISPOSING OF REFUSE AT THE SOURCE (QUANTITY IN-SITU GRINDER(HOME))
PUBLIC CLEANSING 52(5), P. 222 (MAY 1962). DISCUSSES, IN GENERAL, THE PERPETUAL INCREASE IN THE AMOUNT OF REFUSE, THE CHANGING NATURE OF REFUSE, AND THEIR IMPACT UPON DISPOSAL. TAKES THE POSITION THAT EFFORTS SHOULD FIRST BE MADE TO DISPOSE OF REFUSE AT THE SOURCE, AND IF THIS PROVES TO BE INAPPLICABLE IN CERTAIN INSTANCES, THEN OTHER METHODS, SUCH AS COLLECTION AND DISPOSAL, SHOULD BE EMPLOYED. ADVOCATES THE USE OF GARBAGE GRINDERS AND DOMESTIC INCINERATOR UNITS FOR THE REDUCTION OF REFUSE BULK AT THE SOURCE. GIVES ADVANTAGES AND DISADVANTAGES OF HOME INCINERATION. (PHS)

09-07-00970 THE CONTRIBUTION FROM THE INDIVIDUAL HOME TO THE SEWER SYSTEM (GRINDER(GARBAGE))
WATSON, K. S. + FARRELL, R. P. + ANDERSON, J. S.
J WATER POLLUTION CONTROL FED 39, P. 2039 (DECEMBER 1967). IN AN EVALUATION OF THE LOAD CONTRIBUTED TO THE SEWER SYSTEM BY THREE HOMES USING DISPOSERS IN WHICH THE HOMES WERE MAINTAINED AT LEAST ONE MONTH WITH AND ANOTHER WITHOUT THE DISPOSERS IN USE, THE FOLLOWING RESULTS WERE OBTAINED- (1) NO SIGNIFICANT INCREASE IN USE OF WATER TOOK PLACE BECAUSE OF THE USE OF A DISPOSER. (2) THE AVERAGE PER CAPITA LOAD INCREASE WAS 26 PERCENT FOR SUSPENDED SOLIDS, 17 PERCENT FOR BOD, AND 35 PERCENT FOR GREASE. DATA IS PRESENTED TO INDICATE THE EFFECT OF GARBAGE DISPOSAL BY SEWER ON SEWAGE. (UC)

09-07-01086 KITCHEN GARBAGE GRINDERS MEAN A CLEANER CITY (GRINDER(GARBAGE) INCINERATOR(HOUSEHOLD))
HOXIE, H. A.
THE AMERICAN CITY 69(5), P. 150-151 (1954). THROUGH THE EFFORTS OF DEARBORN FEDERATION OF CIVIC ASSOCIATIONS A PILOT PLAN WAS PLANNED FOR ABOUT 500 HOMES TO INSTALL HOUSEHOLD FOOD GRINDERS. THE CITY OF JASPER, INDIANA WAS PICKED FOR THE TRIAL. AS A RESULT AN ORDINANCE WAS PASSED THAT ALL NEW HOMES AND RESTAURANTS INSTALL GARBAGE GRINDERS. ALTHOUGH THE HOME GARBAGE GRINDERS HAVE DECREASED THE VOLUME OF WASTE IT HAS INCREASED THE LOAD ON THE SEWAGE DISPOSAL PLANT AND A FEW CLOGGED DRAIN TRAPS. SINCE THE GRINDERS COULD NOT HANDLE ALL REFUSE, IT WAS SUGGESTED HOUSEHOLD INCINERATORS BE INSTALLED. AFTER A FEW RUNS IT WAS DECIDED TO PASS AN ORDINANCE FOR ALL HOMES AND RESTUAURANTS TO BE REQUIRED TO INSTALL AN INCINERATOR AND A GRINDER.

09-07-01106 GROSSE POINT WOODS, MICH., PRESENTS THE FACTS (GRINDER(HOME))
THE AMERICAN CITY 69(3), P. 130 (MARCH 1954). A MUNICIPAL SUPPLEMENT TO THE LOCAL NEWSPAPER IS PUBLISHED TO OBTAIN SUPPORT FOR REPLACING THE CITY GARBAGE COLLECTION SYSTEM BY CITY-WIDE INSTALLATION OF GARBAGE GRINDERS. (PHS)

09-07-01108 GARBAGE DISPOSER SALES (GRINDER(HOME) LAW)
BROWNELL, C. D., JR.
THE AMERICAN CITY 69(8), P. 127 (AUGUST 1954). PROGRAMS TO ENCOURAGE "UNIVERSAL" INSTALLATION OF HOUSEHOLD GRINDERS ARE REPORTED IN JASPER, INDIANA, HERRIN, ILLIONIS, MT.-DORA, FLORIDA, SOUTH EUCLID, OHIO, SHOREWOOD HILLS, WISCONSIN, DEARBORN, ALLEN PARK, AND ROYAL OAK, MICHIGAN, AURORA, COLORADO, ST. PAUL, MINNESOTA, SOUTH PASADENA, POMONA, ANC BEVERLY HILLS, CALIFORNIA. IT IS ESTIMATED THAT THERE ARE MORE THAN 1,500,000 FOOD WASTE DISPOSERS IN DAILY USE. (PHS)

09-07-01138 HOUSEHOLD GARBAGE GRINDERS USE 1.14 GALLONS OF WATER PER PERSON DAILY (GRINDER(HOME))
COSENS, K. W.
THE AMERICAN CITY 68(9), P. 103 (1953). MUNICIPALITIES AND ENGINEERS ARE CONSTANTLY FACED WITH ADDED WATER DUE TO GARBAGE GRINDERS. A TABLE SHOWS THE AMOUNTS OF WATER USED BY DIFFERENT TYPES OF GRINDERS IN A SERIES OF TESTS.

09-07-01329 ONE FAMILY IN EIGHT MAKES THE DIFFERENCE (GRINDER(HOME) COMPOSITION)
THE AMERICAN CITY 68(4), P. 120-121 (1953). KITCHEN FOOD WASTE DISPOSERS HAVE NO MEASUREABLE EFFECT ON REFUSE COLLECTION OR SEWAGE UNTIL ONE FAMILY IN EIGHT DISPOSES OF ITS KITCHEN FOOD WASTES IN A GARBAGE GRINDER. AFTER AN EIGHT-CITY SURVEY, IT WAS NOTICED THERE WAS A DEFINITE CHANGE IN THE CHARACTER AND VOLUME OF WASTE.

09-07-01335 ALL HOMES IN SHOREWOOD HILLS VILLAGE WILL GRIND THEIR GARBAGE (GRINDER(HOME))
TOOLEY, L. J.
THE AMERICAN CITY 68(2), P. 129-130 (1953). ON INVESTIGATING THE VARIOUS METHODS OF GARBAGE DISPOSAL THE VILLAGE OF SHOREWOOD, WISCONSIN, BECAUSE OF ITS SMALL POPULATION (1,700) DECIDED IT WAS CHEAPER FOR THE CITY TO INSTALL GARBAGE GRINDERS IN ALL HOMES RATHER THAN USE OTHER TYPES OF DISPOSAL.

09-07-01554 COLUMBUS, OHIO AIMS AT GARBAGE FREE STATUS THROUGH GRINDERS (GRINDER(GARBAGE))
REFUSE REMOVAL JOURNAL 1(4), P. 33 (APRIL 1958). A REVIEW OF LOCAL CONDITIONS IN COLUMBUS, OHIO, LEADING TO THE PASSAGE OF LEGISLATION WHICH REQUIRES THE INSTALLATION OF GARBAGE DISPOSERS IN ALL NEW DWELLINGS, RESTAURANTS AND EATING PLACES HAVING KITCHENS.

09 08 GARCHY SYSTEM

09-08-00060 EVERYTHING GOES DOWN DRAIN (GARCHEY-SYSTEM COST(CAPITAL))
ENGRG NEWS-RECORD 175(21), P. 107-108 (NOVEMBER 18, 1965). PUBLIC HOUSING UNITS INSTALLED KITCHEN SINK GARBAGE DISPOSAL, BASED ON GARCHEY BOWL COLLECTING WASTE SYSTEM, TO WASH WASTES THROUGH VERTICAL PIPES INTO UNDERGROUND COLLECTION CHAMBER. WITH MATHEW HALL GARCHEY SYSTEM, HANDLING NORMAL GARBAGE IS LESS VULNERABLE THAN GRINDER DISPOSAL UNIT AND NEEDS NO ELECTRICITY. COLLECTION TANK TRUCK PUMPS OUT COLLECTION TANK AT REGULAR INTERVALS, COMPACTS SEMI-SOLIDS AND DRAINS WATER INTO SEWER. (EI)

09-08-00732 REFUSE STORAGE AND REMOVAL IN CITY CENTRES (GARCHEY COMPACTION)
PUBLIC CLEANSING 57(2), P. 85 (FEBRUARY 1967). A DESCRIPTION IS GIVEN OF THE APPLICATION OF THE GARCHEY SYSTEM OF WASTE HANDLING. APPARENTLY THE SYSTEM IS SUITABLE PRINCIPALLY FOR HIGHLY CONCENTRATED WASTE OUTPUT, I.E., APARTMENT COMPLEXES, ETC. JUDGING FROM THE SKETCHY DESCRIPTION IT CONSISTS OF AN INTERCONNECTED SYSTEM OF PIPING THROUGH WHICH REFUSE FROM INDIVIDUAL BUILDINGS IS HYDRAULICALLY TRANSPORTED TO A CENTRAL RECEIVING CHAMBER. THE CONTENTS OF THE CHAMBER ARE PUMPED INTO A TANKER TRUCK. HERE, THE WATER CONTENT IS REDUCED BY PRESSING THE REFUSE WITHIN THE VEHICLE AND DRAINING OFF THE EXCESS WATER. WHEN THE TANKER IS FILLED WITH COMPRESSED REFUSE, THE LOAD IS TAKEN TO THE TIP AND IS DISPOSED OF. THE TANKER, EQUIPPED WITH PUMP, ETC., WEIGHS 17,900 LB - WHICH DOES NOT LEAVE MUCH FOR THE REFUSE. BULKY ARTICLES (ANY ARTICLE ABOVE 10 IN. IN LENGTH AND 4 IN. IN DIAMETER) MUST BE HANDLED SEPARATELY. APPARENTLY THIS WASTE HANDLING SYSTEM IS INTENDED TO CONSTITUTE THE "ANSWER" TO ON-SITE INCINERATION AT APARTMENT HOUSES. (UC)

09-08-00799 GARCHEY SYSTEM GETS STREAMLINING (TRANSPORTATION COLLECTION)
PUBLIC CLEANSING 53(1), P. 9 (JANUARY 1963). BRIEFLY EXPLAINS THE GARCHEY SYSTEM OF REFUSE COLLECTION. HOUSEHOLDERS DISCHARGE THEIR REFUSE CONSISTING OF ANYTHING FROM FOOD REMNANTS TO BOTTLES AND CANS--DOWN THE SINK INTO A SPECIAL RECEIVER UNIT CONNECTED UNDERNEATH. BY MANUALLY OPERATING A WASTE-TUBE ALL UNWANTED WASTE IS WASHED THROUGH TO A MAIN COLLECTION CHAMBER. EACH CHAMBER IS NORMALLY DESIGNED TO HOLD 7 DAYS' REFUSE. FROM HERE, THE REFUSE CAN EITHER BE TAKEN DIRECTLY TO THE TIP OR TO A CENTRAL DESTRUCTION WORKS BY COLLECTION TANKER, OR IT CAN BE DIRECTED TO A CENTRAL POINT OF OPERATION. A REFUSE COLLECTION TANKER HAS RECENTLY BEEN DEVELOPED WHICH VACUUM SUCKS THE REFUSE FROM THE COLLECTION CHAMBER AND COMPRESSES IT INTO A SEMISOLID STATE, THE WHOLE OPERATION BEING ACCOMPLISHED WITHOUT ANY HUMAN HAND COMING INTO CONTACT WITH THE REFUSE. (PHS)

10 New Process Applications

10 01 WET OXIDATION

10-01-00015 NEW WASTE DISPOSAL PROCESS (WET-OXIDATION HEAT RECOVERY SLUDGE(SEWAGE))
ZIMMERMANN, F. J.
CHEM ENGRG 65(17), P. 117-120 (AUGUST 25, 1958). METHOD OF COMBUSTION WITH AIR AT HIGH PRESSURE WHICH OXIDIZES ORGANIC MATTER DISSOLVED OR SUSPENDED IN WATER, FOR DISPOSAL OF INDUSTRIAL WASTES. WET OXIDATION PROCESS OUTLINED. PROCESS FEATURES POWER, CHEMICAL OR ENERGY RECOVERY FROM CHEAP FUEL SOURCES WHICH IS USED TO GENERATE UNITS' OPERATING POWER AND STEAM. UNIT CONSUMES AQUEOUS CHEMICAL, PAPER MILL AND SEWAGE WASTE LIQUORS AND DISCHARGES ODORLESS, LOW OXYGEN DEMAND EFFLUENT. (EI)

10-01-00231 WET COMBUSTION OF SEWAGE SLUDGE SOLVES DISPOSAL PROBLEMS (WET-OXIDATION SLUDGE(SEWAGE))
GUCCIONE, E.
CHEM ENGRG 71(11), P. 118-120 (MAY 25, 1964). THE WET-AIR OXIDATION PROCESS AS USED AT THE SOUTHEAST WORKS IN CHICAGO, ILL. TO BURN SEWAGE SLUDGE IS DESCRIBED. CAPITAL AND OPERATING COSTS ARE PRESENTED.

10-01-00353 RECENT DEVELOPMENTS IN CHICAGO SANITARY DISTRICT (WET-OXIDATION SLUDGE(SEWAGE) INCINERATION)
ANDERSON, N. E.
THE AMERICAN CITY 77(10), P. 98-100 (OCTOBER 1962). DESIGN OF SCUM INCINERATOR FOR CALUMET, CHICAGO SEWAGE TREATMENT PLANT, NOVEL FEATURE OF UNIT IS THAT BURNING TAKES PLACE ON LIQUID SURFACE, THEREBY SIMPLIFYING HANDLING AND CONTROL, OPERATION CONSISTS OF FEEDING LIQUID SCUM FROM CONCENTRATION TANK INTO INCINERATOR TANK BELOW LIQUID SURFACE, OVERFLOW PIPE CONNECTED TO BOTTOM OF INCINERATOR TANK AUTOMATICALLY REMOVES SETTLING MATERIAL AND WATER AND MAINTAINS SURFACE LEVEL. (EI)

10-01-00740 WET OXIDATION OF SLUDGE (WET-OXIDATION SLUDGE(SEWAGE) COST(CAPITAL) COST(OPERATING) PROCESS-PARAMETERS DESIGN)
ANGENEND, F. J.
DIE NAAS-LUFT-OXYDATION VON SCHLAMM, BRENNSTOFF-WAERME-KRAFT 18(5), P. 252-256 (MAY 1966). ARTICLE DESCRIBES AMERICAN PROCESS OF WET OXIDATION, ACCORDING TO ZIMMERMANN, IN WHICH SLUDGES ARE CONVERTED INTO BIOLOGICALLY STABLE FORM (ZIMPRO-PROCESS). AS EXAMPLE, LARGEST INSTALLATION SO FAR BUILT, THAT IN CITY OF CHICAGO, CAN HANDLE APPROXIMATELY 200 TPD OF SEWAGE SLUDGE (DRY WEIGHT) IN FOUR UNITS. (IN GERMAN) (EI)

10-01-00832 WET-OXIDATION - A FRESH IDEA IN SEWAGE TREATMENT (COST(CAPITAL) DESIGN)
THE AMERICAN CITY 75(5), P. 99-101 (MAY 1960). A DESCRIPTION OF THE ZIMMERMAN PROCESS (ZIMPRO). INSTALLATIONS AT CHICAGO AND WHEELING, WEST VIRGINIA, ARE DESCRIBED. FOR UNITS OF FOUR OR FIVE TONS PER DAY OF DRY SOLIDS OR LARGER, THE ORIGINAL EQUIPMENT COST WILL BE IN THE RANGE OF 30,000 TO 60,000 DOLLARS PER TON OF DAILY CAPACITY.

10-01-01028 FIRST ZIMMERMAN PROCESS PLANT NEARING COMPLETION (WET-OXIDATION SLUDGE(SEWAGE))
PUBLIC WORKS 92(1), P. 105 (1961). THE ARTICLE GIVES A REVIEW OF THE ZIMMERMAN PROCESS WHICH IS A CHEMICAL OXIDATION PROCESS, UNDER PRESSURE, OF COMBUSTIBLE MATERIALS IN A WATER SOLUTION. IT DESCRIBES THE FEATURES AND AN ANALYSIS OF SOME PILOT PLANT RUNS. THE METROPOLITAN SANITARY DISTRICT OF CHICAGO IS BUILDING THE PLANT BEING DESCRIBED.

10-01-01043 ZIMMERMAN PROCESS INSTALLATION (WET-OXIDATION SLUDGE(SEWAGE))
PUBLIC WORKS 93(2), P. 140 (1962). A 45-FOOT A. O. SMITH REACTOR WEIGHING 13 TONS, FABRICATED BY THE COMPANY'S PROCESS EQUIPMENT DIVISION, IS THE PRINCIPAL COMPONENT OF THE NEW ZIMMERMANN WET OXIDATION PROCESS RECENTLY INSTALLED AT SOUTH MILWAUKEE, WISCONSIN. THE SOUTH MILWAUKEE INSTALLATION IS DESIGNED TO PROCESS A CAPACITY OF ONE TON (DRY WEIGHT) OF SEWAGE SLUDGE PER DAY, THE POPULATION EQUIVALENT OF 20,000 PERSONS. OPERATING TEMPERATURE OF THE SYSTEM IS ABOUT 435 DEGREES F. WITH AN OPERATING PRESSURE IN THE ORDER OF 500 PSIG.

10-01-01056 WET SLUDGE BURNER NOW MADE FOR SMALL CITIES (WET-OXIDATION SLUDGE(SEWAGE))
ENGRG NEWS-RECORD 167(22), P. 40-41 (1961). THE ARTICLE IS AN INTRODUCTION TO A NEW SERIES OF ZIMMERMAN PROCESS PLANTS THAT MAY BE DESIGNED TO MEET THE NEED FOR THE SMALLER CITIES AND THE CAPACITY FOR MEETING THE NEED FOR DIFFERENT TYPES OF WASTES. THERE IS A DESCRIPTION OF THE EQUIPMENT AND OPERATING CONDITIONS FOR SOME OF THE DIFFERENT SIZES WITH DIFFERENT WASTES. SOME DATA IS GIVEN ON BY-PRODUCTS BY TYPE AND THE COST RELATED TO SOUTH MILWAUKEE, WIS. PLANT.

10-01-01276 SLUDGE DISPOSAL BY WET AIR OXIDATION AT FIVE MGD PLANT (WET-OXIDATION)
HARDING, J. C. + GRIFFIN, G. E.
J WATER POLLUTION CONTROL FED 37(8), P. 1134-1141 (1965). FROM THE ANALYSIS OF THE PRELIMINARY DESIGN AND ESTIMATES FOR ALTERNATE PROJECTS FOR HANDLING SLUDGE AND THE RESULTS OF OPERATION FOR OVER ONE YEAR, WESTCHESTER COUNTY, IN MODERNIZING ITS 5-MGD (18.9-MIL LITERS/DAY) BLIND BROOK TREATMENT PLANT, HAS CONCLUDED THAT THE WET AIR OXIDATION PROCESS, AS ADAPTED FOR SMALL PLANTS, COULD BE AN ECONOMICAL AND APPEALING SOLUTION OF THE SLUDGE-HANDLING PROBLEM. THE INSTALLATION HAS READILY MET THE SPECIFICATION FOR CAPACITY AND EFFICIENCY. SAVINGS IN CAPITAL EXPENDITURES ARE APPROXIMATELY $500,000. OPERATING COSTS FOR FULL DESIGNED CAPACITY APPEAR TO BE REASONABLE. POWER AND LABOR CONSTITUTE NEARLY THREE-QUARTERS OF THE UNIT COST. IT IS DIFFICULT TO DECIDE HOW MUCH LABOR SHOULD BE CHARGED WHEN IT IS PRIMARILY FOR OBSERVATION, SAMPLE TAKING, AND RECORD KEEPING, BUT IT IS BELIEVED THAT THE LABOR ALLOWANCE HAS BEEN FAIR. THESE COST FIGURES AND DATA SHOULD BE USED WITH CAUTION SINCE THEY APPLY TO A SINGLE, RELATIVELY SMALL INSTALLATION AND NECESSARILY HAVE SOME INDIVIDUAL SIGNIFICANCE. THEREFORE, A DESIGN ENGINEER WOULD DO WELL TO MAKE COMPARATIVE STUDIES AND COST ESTIMATES FOR EACH PARTICULAR PROBLEM. BASED ON SPECIFIC EXPERIENCE, THE AUTHORS BELIEVE THAT THE WET AIR OXIDATION PROCESS HAS MERIT AND IS WELL WORTH CONSIDERING IN SEEKING SOLUTIONS FOR THE PROBLEMS OF SLUDGE TREATMENT AND DISPOSAL.

10-01-01376 COMPOSTING AND WET OXIDATION
SIMPSON, J. R.
EFFL AND WAT TREATM J 2, P. 393-397 (1962). THE AUTHOR REVIEWS THE PRINCIPLES OF 2 METHODS FOR DISPOSAL OF SLUDGE, NAMELY, COMBINED COMPOSTING WITH MUNICIPAL REFUSE AND THE ZIMMERMANN WET OXIDATION PROCESS, OUTLINING THE DIFFERENT METHODS OF HEAP AND MECHANICAL COMPOSTING AND DISCUSSING COSTS FOR 3 EXISTING ZIMMERMANN INSTALLATIONS IN THE U.S.A. BASIC FLOW DIAGRAMS FOR COMPOSTING AND ZIMMERMANN PROCESSES ARE INCLUDED. (WPA)

10-01-02026 WET AIR OXIDATION PROCEDURE AND ITS UTILIZATION FOR INDUSTRIAL WASTE REMOVAL (WET-OXIDATION)
SCHOEFFEL, E. W. + SEEGERT, N.
WASSER LUFT BETRIEB 10(8), P. 541-545 (1966). WET AIR OXIDATION OF WASTE LYES, EFFLUENTS, AND SLUDGES WITH A HIGH WATER CONTENT ARE TECHNICALLY POSSIBLE AT TEMPERATURES 100-372 DEGREES AND AT PRESSURES 1-300 ATMOSPHERES, AND ECONOMICALLY FEASIBLE. THIS IS SHOWN BY RESULTS OBTAINED WITH MUNICIPAL AND INDUSTRIAL SEWAGE-TREATMENT PLANTS IN THE U.S.A. AND THE FEDERAL REPUBLIC OF GERMANY. (CA)

10-01-02027 WET-OXIDATION OF SEWAGE SLUDGE
HURWITZ, E. + DUNDAS, W. A.
J WATER POLLUTION CONT FED 32, P. 918-929 (1960). A DESCRIPTION OF THE WET AIR OXIDATION PROCESS AND OF A PLANT ARE GIVEN. CRITERIA FOR SIZES OF DIFFERENT COMPONENTS OF THE UNIT ARE DISCUSSED. A SCHEMATIC FLOW DIAGRAM FOR A 2 TON/DAY PLANT ILLUSTRATES THE PROCESS. OPERATING DATA ARE GIVEN FOR A PILOT PLANT WHICH INDICATES THE POTENTIAL OF THE METHOD. INCIDENTAL DATA ARE INCLUDED FOR CHEMICAL CHARACTERISTICS OF A REACTOR EFFLUENT, A TYPICAL SPECTROMETRIC ANALYSIS OF AN ASH, A MASS SPECTROMETER ANALYSIS OF AN EXHAUST GAS, AND PERFORMANCE OF THE WET OXIDATION PROCESS AT HIGH PRESSURES. (CA)

10-01-02028 PRESSURE OXIDATION OF SEWAGE SLUDGE (WET-OXIDATION)
EARLE, J. S. + SCHOEFFEL, E. W. + ZIMMERMANN, F. J.
BELG. PATENT 667,038, (NOVEMBER 16, 1965), U.S. APPLIED FOR NOVEMBER 13, 1964, 27 PP., ASSIGNED TO STERLING DRUG, INC. A PROCESS IS DESCRIBED FOR THE CONVERSION OF SEWAGE SLUDGE TO STABLE ODOR-FREE MATERIAL SUITABLE FOR FILL. THUS THE PRE-HEATED SLUDGE WAS CHARGED INTO A PRESSURE REACTOR, THE TEMPERATURE WAS RAISED BY THE INTRODUCTION OF STEAM AT 100-225 DEGREES. COMPRESSED AIR WAS INTRODUCED UNTIL OXIDATION WAS COMPLETE, VENT GASES WERE USED TO PREHEAT THE NEXT CHARGE AND WERE VENTED INTO A WATER SCRUBBER. SLUDGE THUS TREATED IS CLAIMED TO GIVE A MUCH FASTER SETTLING RATE IN A STANDARD POND OR WITH A ROTARY FILTER. AUTOMATIC CONTROLS GAVE MINIMUM MAN POWER DEMANDS. EXAMPLES ARE GIVEN IN WHICH THE REACTOR IS MAINTAINED FOR 6-26-1/2 HOURS AT MAXIMUM TEMPERATURES OF 198-232 DEGREES, AND FINAL TEMPERATURES 167-221 DEGREES. REDUCTION OF CHEMICAL OXYGEN DEMAND RANGED FROM 16 TO 82 PERCENT. (CA)

10-01-02029 WET AIR OXIDATION (WET-OXIDATION)
TELETZKE, G. H.
CHEM ENGRG PROGRESS 60(1), P. 33-38 (1964). THE PROCESS IS UNIQUELY SUITED TO THE OXIDATION OF WASTE LIQUORS, SLURRIES, AND SLUDGES WHERE THE O-DEMANDING ORGANIC MATTER IS BUT A FEW PERCENT OF THE WATER STREAM. (CA)

10-01-02030 WET AIR COMBUSTION (WET-OXIDATION)
ZIMMERMANN, F. J.
IND WATER WASTES 6, P. 102-106 (1961). THE THEORY OF WET AIR COMBUSTION OF SLUDGE IS REVIEWED AND EQUIPMENT IS DESCRIBED. DATA FROM PILOT PLANT RUNS ON SEWAGE SLUDGE ARE PRESENTED. IN ONE PLANT, SLUDGE CONTAINED TOTAL SOLIDS 3.10-3.57, VOLATILE SOLIDS 1.91-2.49 PERCENT, AND CHEMICAL OXYGEN DEMAND (C.O.D.) 40.2-53.9 G/1. THE AVERAGE REDUCTION IN VOLATILE SOLIDS AT 1500 AND 1800 LB/SQ-IN GAGE, RESPECTIVELY, WAS 88.6 AND 92.4 AND IN C.O.D. WAS 79.3 AND 85.1 PERCENT. A TYPICAL MASS SPECTROMETER ANALYSIS OF EXHAUST GAS SHOWED HYDROCARBONS LESS THAN 0.02, H 0.4, N 82.8, O 2.0, AR 0.9, AND CARBON DIOXIDE 13.9 PERCENT BY VOLUME. (CA)

10-01-02031 SCOPING STUDY OF THE WET AIR OXIDATION OF TRASH (WET-OXIDATION)
HAMMOND, O. H. + DESAI, V. J.
ORNL-MIT-75, (MARCH 6, 1969). A SCOPING STUDY WAS MADE OF WET AIR OXIDATION OF MUNICIPAL TRASH. BECAUSE PAPER IS THE MAJOR CONSTITUENT IN SUCH TRASH, ALL RUNS WERE MADE WITH PAPER ALONE. IT WAS DISCOVERED THAT AQUEOUS PAPER SLURRIES COULD BE NEARLY COMPLETELY OXIDIZED AT TEMPERATURES ABOVE 220 DEGREES C AND IN THE PRESENCE OF AS LITTLE AS 50 PERCENT EXCESS OXYGEN. WHEN THE REACTION WAS CARRIED OUT IN THE ABSENCE OF OXYGEN, MANY UNIDENTIFIED ORGANICS WERE FORMED. IT IS SPECULATED THAT THESE ORGANICS RESULT FROM THE HYDROLYSIS OF CELLULOSE. FURTHER STUDY TO OPTIMIZE THE VALUE OF BYPRODUCT ORGANICS IS DEEMED NECESSARY. (AUTH)

10-01-02032 VANILLIN FROM SULFITE WASTE LIQUOR (WET-OXIDATION)
SCHOEFFEL, E. W.
U.S. PATENT 2,598,311, MAY 27, 1952. SULFITE WASTE LIQUOR (FROM A PULPING PROCESS) CONTAINING 3.5 PERCENT LIGNIN AND 10 PERCENT NAOH IS TREATED WITH O (COMPRESSED AIR) AT ABOUT 200 DEGREES AND ABOUT 1500 LB/SQ-IN TO CONVERT ABOUT 21 PERCENT OF THE LIGNIN TO VANILLIN, OF WHICH ABOUT 80 PERCENT IS RECOVERED. (CA)

10-01-02033 WHAT MAY BECOME OF WET COMBUSTION (WET-OXIDATION)
BRUNES, B. + JARNBERG, T. + JONSSON, S. E.
SVENSK PAPERSTIDN 58, P. 332-345 (1955). THE AUTHORS DISCUSS PRINCIPLES OF WET COMBUSTION, DIFFERENT WAYS TO INSTALL PLANTS FOR SPENT LIQUORS FROM PULPING PROCESSES, AND THE SPECIAL EQUIPMENT WHICH IS REQUIRED. WET COMBUSTION IS COMPARED WITH CONVENTIONAL EVAPORATION, AND BURNING FOR SULFITE AND SULFATE MILLS. POSSIBILITIES OF RECOVERING CHEMICALS AND SOME OPERATIONAL CHARACTERISTICS ARE EXAMINED. THE COST OF CONSTRUCTION FOR WET COMBUSTION IS CONSIDERED TO BE ABOUT THE SAME AS FOR EVAPORATION AND BURNING, DEPENDING ON ALREADY EXISTING BURNING FACILITIES. WET COMBUSTION SEEMS TO HAVE CONSIDERABLE ADVANTAGES AS REGARDS HEAT ECONOMY, WHILE ITS OWN CONSUMPTION OF GENERATED POWER IS A WEAKNESS. (CA)

10-01-02034 ZIMMERMANN PROCESS FOR THE PULPING INDUSTRY (WET-OXIDATION)
BLIKSTAD, F.
NORSK SKOGIND 10, P. 172-180 (1956). AFTER A DESCRIPTION OF THE PRINCIPLE OF WET COMBUSTION AND A REVIEW OF ITS DEVELOPMENT BY ZIMMERMANN AND CEDERQUIST, THE ECONOMY OF WET OXIDATION WITH RESPECT TO HEAT, POWER, AND INVESTMENT AND ITS OPERATIONAL CHARACTERISTICS ARE COMPARED WITH CONVENTIONAL EVAPORATION AND BURNING OF THE SPENT LIQUOR. FINALLY THE POSSIBILITIES FOR RECOVERY OF CHEMICALS ARE DISCUSSED. (CA)

10-01-02035 WET AIR COMBUSTION OF SLUDGE AND INDUSTRIAL WASTE (WET-OXIDATION)
ISHII, R. + ITO, H. + HONDA, A.
HAKKO KOGAKU ZASSHI 42(2), P. 62-69 (1964). THE ADVANTAGES OF WET COMBUSTION METHOD OF TREATING SLUDGE AND THICK ORGANIC INDUSTRIAL WASTES ARE DISCUSSED. IN SOME CASES THE HEAT THAT IS GENERATED DURING THE TREATMENT CAN BE FED BACK TO THE MAIN PRODUCTION PROCESSES. THE METHOD IS FREE FROM GENERATION OF SMOKE AND ODOR.

10-01-02036 WET AIR OXIDATION PROCESS (WET-OXIDATION)
MCKINLEY, J. B.
WATER WORKS WASTES ENGRG 2(9), P. 97-99 (1965). SEWAGE SLUDGE FROM A GRINDER (TOTAL SOLIDS - 7.14 PERCENT AVERAGE) IS HEATED TO 100-140 DEGREES F, MIXED WITH COMPRESSED AIR, FURTHER HEATED TO 400 DEGREES F (REACTOR INLET), AND OXIDIZED AT 500 DEGREES F. THE OXIDATION PRODUCTS (N, CARBON-DIOXIDE, STEAM, LIQUID, AND ASH) ARE SEPARATED AND THE MIXTURE OF LIQUID AND ASH IS REMOVED AT 100-140 DEGREES F. (CA)

10-01-02037 WET COMBUSTION (WET-OXIDATION)
CEDERQUIST, K. N.
SVENSK PAPPERSTIDN 58, P. 154-164 (1955). IN ORDER TO OBTAIN DATA FOR FAIRLY CHEAP PROCESSES WITH A MINIMUM OF EQUIPMENT TROUBLES, THE INVESTIGATIONS WERE CONCENTRATED ON THE LOWEST TEMPERATURE RANGES WHICH GAVE TECHNICALLY USEFUL RATES OF COMPLETE COMBUSTION. OXIDATIONS WERE PERFORMED WITH AIR IN A 3-LITER ROTATING PRESSURE VESSEL OF STAINLESS STEEL. WITH SPENT SULFITE LIQUOR 225 DEGREES WAS THE LOWEST POSSIBLE TEMPERATURE. FERMENTED NA- AND CA- BASE LIQUORS WERE USED. IN AN EARLY STAGE OF THE COMBUSTION A CARBONACEOUS PRECIPITATE WAS FORMED. ORGANIC MATTER IN CARBONACEOUS PRECIPITATE VARIED WITH THE DEGREE OF COMBUSTION FROM ZERO TO 58-60 PERCENT OF THE AMOUNT IN THE CHARGED LIQUOR. DISTRIBUTIONS OF SOLIDS AND THERMOCHEMICAL DATA ARE GIVEN IN TABLES AND DIAGRAMS (VARIABLES VS. OXYGEN CONSUMPTION). THE OPTIMAL VALUES OF AMOUNT OF CARBONACEOUS PRECIPITATE AND ITS HEAT OF COMBUSTION COINCIDE AT 160 LITERS. OXYGEN CONSUMED/KG CHARGED SOLIDS, BEING 65 AND 68 PERCENT OF CHARGED QUANTITIES. THE LOSS OF HEAT OF COMBUSTION IN DISSOLVED MATTERS AFTER COMBUSTION OF ALL CARBONACEOUS PRECIPITATE WAS 8-9 PERCENT OF THE CHARGED HEAT. WITH CA-BASE LIQUORS CALCIUM-SULFATE AND SULFURIC-ACID WERE FORMED. CALCIUM-SULFATE BECAME A PART OF CARBONACEOUS PRECIPITATE WHICH HAD 27 PERCENT ASH AT AN OXYGEN CONSUMPTION OF 200 LITERS. THE ASH CONTENT OF CARBONACEOUS PRECIPITATE COULD BE REDUCED CONSIDERABLY BY A PREOXIDATION AT LOWER TEMPERATURE, MAXIMUM 162 AND 190 DEGREES FOR CRUDE AND FERMENTED SULFITE LIQUOR, RESPECTIVELY. CARBONACEOUS PRECIPITATE FROM CA-BASE LIQUORS WAS EASILY FILTERED TO 40 OR CENTRIFUGED TO 70 PERCENT SOLIDS CONTENT. PRECIPITATE CONTAINED A HIGH ASH CONTENT ALSO FOR NA-BASE LIQUORS, BECAUSE THEY WERE DIFFICULT TO FILTER AND WASH. AT PARTIAL COMBUSTION OF AMMONIA BASE LIQUORS A LARGE AMOUNT OF N WAS FOUND IN THE PRECIPITATE, WHEREAS ALMOST ALL N WAS FOUND IN THE SOLUTION AFTER COMPLETE COMBUSTION. DILUTION OF SPENT SULFITE LIQUORS GAVE VERY SMALL CHANGES IN THE MATERIAL AND HEAT BALANCES. OXYGEN WAS CONSUMED ALMOST COMPLETELY IN ALL EXPERIMENTS EXCEPT FOR PREOXIDATIONS. WITH PEAT, SPONTANEOUS COMBUSTION WAS OBTAINED AT 190-225 DEGREES WITH ALMOST TOTAL CONSUMPTION OF OXYGEN. TEN MINUTES WAS USUALLY SUFFICIENT FOR COMPLETE COMBUSTION. ON PARTIAL COMBUSTION AT 195 DEGREES, 336 LITERS/KG SOLIDS (97.5 PERCENT OF CHARGED AMOUNT) WAS CONSUMED AFTER ONE MINUTE. SEVERAL EXPERIMENTS WERE ALSO MADE WITH CITY-SEWAGE SLUDGE, WHICH GAVE AN ALMOST COMPLETE OXYGEN CONSUMPTION DURING 10 MINUTES AT 225 DEGREES WITH PARTIAL COMBUSTION TO 40 PERCENT. FURTHER COMBUSTION WOULD REQUIRE HIGHER TEMPERATURE AND LONGER TIME. PRECIPITATE FROM SEWAGE WAS EASILY FILTERED AND DEWATERED. THE CONTINUOUS PROCESS FOR WET COMBUSTION IS DISCUSSED AND DEMONSTRATED BY EXPERIMENTS WITH SULFITE LIQUOR WHICH, ON THE WHOLE, VERIFIED THE BATCH EXPERIMENTS. THE LOSS OF HEAT OF COMBUSTION WITH DISSOLVED MATTERS WAS SOMEWHAT HIGHER, 13-14 PERCENT. DRY COMBUSTION GASES CONTAINED USUALLY LESS THAN 0.2 PERCENT OXYGEN. IT IS CONCLUDED THAT WET COMBUSTION OF VARIOUS SOLUTIONS AND SUSPENSIONS CAN BE PERFORMED AT REASONABLE TEMPERATURE AND PRESSURE CONDITIONS, AND THE METHOD IS SUGGESTED AS AN ALTERNATIVE TO EVAPORATION AND BURNING. (CA)

10-01-02038 RECOVERY OF THE HEAT CONTENT OF THE ORGANIC SUBSTANCES IN SULFITE WASTE LIQUORS (WET-OXIDATION)
CEDERQUIST, K. N.
PATENT SWED 143,765 (JANUARY 19, 1954), ASSIGNED TO STORA KOPPARBERGS BERGSLAGS AKTIEBOLAG. SULFITE WASTE LYES AT ABOUT 200 DEGREES ARE OXIDIZED WITH AIR OR OXYGEN UNDER ABOUT 25 ATMOSPHERES, PREFERABLY IN THE PRESENCE OF AN OXIDATION CATALYST SUCH AS CU, FE, V OR ONE OF THEIR DERIVATIVES, AND ALSO, IF DESIRED, AN ALKALI OR ALKALINE EARTH OXIDE OR CARBONATE. THE HEAT GENERATED IS RECOVERED BY BLOWING OUT THE HOT GASES. TEMPERATURES UP TO 300 DEGREES AND PRESSURES UP TO 200 ATMOSPHERES MAY BE USED. (CA)

10-01-02039 WET COMBUSTION OF WATER-SOLUBLE MATERIALS IN WASTE LIQUORS (WET-OXIDATION)
CEDERQUIST, K. N.
PATENT SWED. 172,223, (JULY 26, 1960), STORA KOPPARBERGS BERSLAGS AKTIEBOLAG. THE AMOUNT OF UNBURNED WATER SOLUBLE ORGANIC PRODUCTS IN SULFITE WASTE LIQUORS AND SIMILAR AQUEOUS WASTES CAN BE DECREASED BY CARRYING OUT THE COMBUSTION AT 180 - 360 DEGREES C UNDER PRESSURE IN TWO STEPS. THE LIQUOR IS FIRST TREATED WITH OXYGEN OR AN OXYGEN CONTAINING GAS TO CONVERT THE SULFIDE AND THE SULFITE TO THE SULFATE, THEN CATALYST (OXIDES, HYDROXIDES, OR SALTS OF COPPER, IRON, MANGANESE, COBALT, VANADIUM, OR CHROMIUM) IS ADDED, AND THE COMBUSTION COMPLETED. (CA)

10-01-02040 SELF-SUSTAINING FLAMELESS OXIDATION OF COMBUSTIBLE LIQUID WASTES (WET-OXIDATION)
ZIMMERMANN, F. J.
PATENT U.S. 2,824,058 (FEBRUARY 18, 1958), ASSIGNED TO STERLING DRUG, INC. COMBUSTIBLE MATERIALS ARE DISPERSED IN WATER INTO A COMBUSTION ZONE ALONG WITH OTHER COMBUSTIBLE MATTER HAVING A HEAT VALUE GREATER THAN THE COMBUSTIBLE MATERIALS, AND AT THE SAME TIME AN OXYGEN CONTAINING GAS CONTAINING SUFFICIENT OXYGEN TO REACT STOICHIOMETRICALLY WITH THE COMBUSTIBLE MATERIALS PRESENT. THE COMBUSTION ZONE IS THEN PRESSURIZED TO LEAVE SOME OF THE WATER IN LIQUID FORM. GASES AND WATER VAPOR ARE WITHDRAWN AT A RATE SUFFICIENT TO BALANCE THE RATE OF INTRODUCTION OF THE COMBUSTIBLE MATERIALS AND OXYGEN CONTAINING GAS. HEAT IS SUPPLIED EXTERNALLY TO ESTABLISH A FLAMELESS AUTOXIDATION REACTION UNTIL THE REACTION PROCEEDS AT THE SAME RATE AS THE COMBUSTIBLE MATERIALS ARE INTRODUCED. THE REACTION IS ALSO REGULATED BY KEEPING THE FUEL VALUE OF THE CHARGE INVERSELY PROPORTIONAL TO THE COMBUSTIBLE MATERIAL TO WATER RATIO IN THE REACTION ZONE. THE HEAT VALUE OF THE REACTION ZONE IS KEPT INVERSELY PROPORTIONAL TO THE HEAT VALUE CONCENTRATION OF THE FEED AND SUBSTANTIALLY PROPORTIONAL TO THE VOLUME OF THE FEED. PART OF THE HEAT ENERGY IN THE GASES WITHDRAWN IS CONVERTED TO MECHANICAL ENERGY, AND PART IS RECYCLED TO PREHEAT THE INCOMING DISPERSION. THIS PROCESS HAS THE FOLLOWING ADVANTAGES - NO CONCENTRATION OF THE COMBUSTIBLE MATERIAL IS NECESSARY, NO FLY ASH OR WATER TREATMENT PROBLEMS OCCUR, AND THE CONVENTIONAL BOILER AND ASSOCIATED ENERGY LOSSES ARE ELIMINATED. THUS, 10 G FINELY DIVIDED CHARCOAL, 1 LITER WATER AND THE STOICHIOMETRIC AMOUNT OF OXYGEN WERE FED INTO AN AUTOCLAVE. AT 250 DEGREES C AND 800 LB/SQ-IN, THE DEGREE OF OXIDATION AFTER 30 MINUTES WAS 56 PERCENT. A SEMICHEMICAL PULP (8.90 LB) CONTAINING 1.11 LB SOLIDS AND 7.79 LB WATER WAS PLACED IN AN AUTOCLAVE WITH 355 LB AIR AT 250 DEGREES AND 800 LB/SQ-IN. NO OXIDATION TOOK PLACE IN 1 MINUTE, AND ONLY SLIGHT OXIDATION IN 20 MINUTES, CONCENTRATING THE LIQUID 4 TIMES TO 4.44 LB OF SOLIDS/GAL OF SOLUTION. USE OF AIR GAVE SIMILAR RESULTS. AFTER 20 MINUTES THE OXYGEN DEMAND OF THE MATERIAL HAD DECREASED BY 1/4. THE PRODUCTS WERE N 2.73, CARBON DIOXIDE 1.04, OXYGEN 0.07, STEAM 6.16, ASH 0.45 AND WATER 2.00 LB/GAL OF FEED. THE PROCESS HAS ALSO BEEN APPLIED TO MASONITE WOOD WASTE LIQUOR, WHEY FROM CHEESE PLANTS, FUEL OIL (0.556 LB/GAL WATER) AND AQUEOUS COAL DISPERSIONS. (CA)

10-01-02041 DESTRUCTIVE OXIDATION OF ORGANIC MATTER IN WASTE WATER DISPOSAL (WET-OXIDATION)
ZIMMERMANN, F. J.
PATENT U.S. 2,665,249 (JANUARY 5, 1954), ASSIGNED TO STERLING DRUG, INC. IN AN OIL-JACKETED TOWER REACTOR CONNECTED TO A FLASH CHAMBER TO RECEIVE THE REACTION PRODUCT FROM THE REACTOR, WASTE LIQUORS, SUCH AS SULFITE LIQUORS FROM PAPER MILLS AND OTHER AQUEOUS CARBONACEOUS DISPERSIONS, ARE HEATED FAR BEYOND THE BOILING POINT OF WATER UNDER HIGH PRESSURE WHILE AIR IS INJECTED FOR OXIDIZING ALL ORGANIC MATTER. CONCURRENTLY, LIME IS ADDED TO CONVERT THE S IN THE SULFITE LIQUOR TO CALCIUM SULFATE. THE LIQUOR PRIOR TO TREATMENT HAS THE FOLLOWING ANALYSIS - SOLIDS 0.720, C 0.268, S 0.040, CA 0.080, AND ASH 0.190 LB/GAL. THE LIQUOR HAD AN OXYGEN DEMAND (IODATE VALUE) OF 0.865, PH OF 9.4 AND A SPECIFIC GRAVITY OF 1.042. AT A PRESSURE OF 1500 LB/SQ-IN, AIR AT 86 DEGREES F IS CONTINUOUSLY SUPPLIED TO THE SULFITE WASTE LIQUOR WHICH IS HEATED FROM THE OIL JACKET TO 518 DEGREES F. THE RATE OF AIR SUPPLY IS 400 LB/HR WHICH IS SAID TO BE EQUIVALENT TO 92.6 LB OXYGEN/HR. WASTE LIQUOR OF 65 DEGREES F IS PUMPED INTO THE REACTOR UNDER 1500 LB/SQ-IN AT THE RATE OF 78 GAL/HR. THE CALCIUM SULFATE PRECIPITATE FORMED IS PERIODICALLY REMOVED, AND THE LIQUOR LEAVING THE REACTOR IS PASSED INTO THE FLASH CHAMBER WHERE THE GASES N, CARBON DIOXIDE, AND EXCESS AIR ARE RELEASED. THE EFFLUENT AFTER TREATMENT HAS AN OXYGEN DEMAND WHICH IS LESS THAN 2 PERCENT OF THE OXYGEN DEMAND OF THE UNTREATED SULFITE LIQUOR. THE PROCESS REQUIRES NO CATALYSTS AND NEED NOT BE OPERATED WITH PURE OXYGEN. ITS NOVEL FEATURE RESIDES IN THE FACT THAT NO ORDINARY LOW PRESSURE AND LOW TEMPERATURE OXIDATION IS EMPLOYED. ON THE OTHER HAND, THERE IS NO EVAPORATION OR COMBUSTION PROCESS INVOLVED. NO HARMFUL CHEMICALS ARE INTRODUCED INTO THE WASTE-WATER EFFLUENT AS THE REACTION PRODUCTS ARE EITHER INNOCUOUS GASES OR SOLIDS, BOTH READILY REMOVABLE FROM THE SYSTEM. (CA)

10-01-02042 THE ZIMMERMANN PROCESS AND ITS APPLICATION IN THE PULP AND PAPER INDUSTRY (WET-OXIDATION)
ZIMMERMANN, F. J. + DIDDAMS, D. G.
TAPPI 43, P. 710-715 (1960). WET AIR OXIDATION OF SPENT LIQUORS FROM PULPING MILLS HAS BEEN DONE IN STAINLESS-STEEL REACTORS AT TEMPERATURES IN THE RANGE OF 200-300 DEGREES AND AT 800-3000 LB/SQ-IN. THE OXIDATION OF COMBUSTIBLES HAS BEEN AS HIGH AS 95 PERCENT COMPLETE. AT THE SAME TIME, THE ENERGY FROM THE OXIDATION HAS BEEN CONVERTED TO MOTIVATING POWER, AND CHEMICALS HAVE BEEN RECOVERED FOR RECYCLING TO THE PULPING PROCESS. (CA)

10-01-02043 WET COMBUSTION OF CELLULOSIC WASTE LIQUORS (WET-OXIDATION CATALYST)
CEDERQUIST, K. N.
SVENSK PAPPERSTIDN 61, P. 38-41 (1958). A CERTAIN DEGREE OF COMBUSTION WAS REACHED AT A LOWER TEMPERATURE WITH (ACID) SPENT SULFITE LIQUOR COMPARED TO BLACK LIQUOR UP TO ABOUT 280 DEGREES. AT 290 DEGREES BLACK LIQUOR WAS OXIDIZED ALMOST COMPLETELY WHILE SULFITE LIQUOR LEFT ABOUT 10 PERCENT (IN TERMS OF CALORIES) ON THE ORIGINAL MATERIAL UNBURNT, MOSTLY AS ACETIC ACID. THE VARIATION OF THE RATE OF COMBUSTION WITH PH AND THE SLOW OXIDATION OF ACETIC ACID IN ACID SOLUTION WERE DEMONSTRATED IN SEPARATE EXPERIMENTS. THE USE OF A CATALYST, CU-MN-CHROMITE INCREASED THE RATE CONSIDERABLY AND GAVE COMPLETE COMBUSTION ALSO AT LOW PH. AT THE CONDITIONS OF WET COMBUSTION THE CONCENTRATION OF LOW MOLECULAR WEIGHT ACIDS IN THE LIQUID AND STEAM PHASES ARE OF THE SAME MAGNITUDE. THE ACIDS LEAVING WITH EVAPORATED WATER COULD BE OXIDIZED TO CARBON-DIOXIDE AND WATER BY PASSING THE MIXTURE TOGETHER WITH AN ADEQUATE AMOUNT OF OXYGEN OVER THE CU-MN-CHROMITE CATALYST AT ABOUT 300 DEGREES. (CA)

10-01-02044 WET AIR OXIDATION OF SEWAGE SLUDGE (WET-OXIDATION)
NICHOLSON, R. W. + PEDO, D. J. + MARTINEK, J.
THE AMERICAN CITY 81(4), P. 97-99,170 (APRIL 1966). IN WET AIR OXIDATION PROCESS, COMPRESSED AIR OXIDIZES COMBUSTIBLE MATTER IN WATER SOLUTION OR SUSPENSION, THIS OXIDATION OF SLUDGE SOLIDS TAKES PLACE AT TEMPERATURES OF ABOUT 400 F AND AT RELATIVELY HIGH PRESSURES, END PRODUCT CONSISTS OF SMALL VOLUME OF STERILE, INERT, SOLID RESIDUE AND SUPERNATANT LIQUOR, FLOW DIAGRAM OF SOUTH MILWAUKEE UNIT AND TABULATED PERFORMANCE DATA. (EI)

10-01-02046 HOW HAMMERMILL SOLVED ITS EFFLUENT PROBLEM (WET-OXIDATION)
PULP AND PAPER 30(5), P. 98-99 (MAY 1956). A DESCRIPTION OF THE ZIMMERMANN NEUTRACEL PROCESS IS PRESENTED.

10-01-02047 OXIDATION OF SPENT SEMICHEMICAL PULPING LIQUORS BY THE ZIMMERMANN PROCESS (WET-OXIDATION)
PULP AND PAPER 32(2), P. 69-72 (FEBRUARY 1958). EXPERIENCE WITH HAMMERMILL'S NEUTRACEL (SEMICHEMICAL) PULPING PLANT INDICATED THAT - (1) OXIDATION HAS BEEN " VERY SATISFACTORY ", (2) CORROSION IS VIRTUALLY NON-EXISTENT, (3) 92 PERCENT OF THE ORIGINAL OXYGEN DEMAND IS REMOVED, (4) 90 PERCENT OF SODIUM-SULFATE CAN BE CONVERTED TO SODIUM-SULFITE, (5) OXIDATION EQUIPMENT IS SIMPLE, EASY TO OPERATE, (6) THERE IS A MINIMUM OF MAINTENANCE AND LABOR, (7) AN ECONOMIC PLANT CAN BE BUILT FOR CHEMICAL RECOVERY, (8) NEUTRACEL (LAB) COOKS WITH RECOVERED LIQUOR ARE OKAY, (9) REACTIONS RECOVERING SODIUM ARE SIMPLE, NO SULFIDE OR THIOSULFATE IS FORMED DURING THE PROCESS, AND (10) ECONOMIC RETURN FOR STEAMPOWER REGENERATION IS INDICATED. UNSOLVED PROBLEMS WERE - (1) RECOVERY OF SULFUR, (2) RECOVERY OF RELEASED ENERGY. (AUTH)

10-01-02048 CHICAGO PILOT STUDIES OF SLUDGE DISPOSAL BY WET COMBUSTION (WET-OXIDATION)
WASTES ENGRG 30, P. 35-44 (JANUARY 1959). A PILOT PLANT STUDY OF A NEW TECHNIQUE FOR DISPOSING OF SEWAGE SLUDGE WAS RECENTLY COMPLETED BY THE METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO. THE METHOD INVESTIGATED IS THE ZIMMERMANN PROCESS WHICH REDUCES SLUDGE TO GASES, WATER AND ASH BY WET COMBUSTION OF ORGANIC MATTER. THE BASIC EQUIPMENT INVOLVED IN THE PROCESS IS A REACTOR, AN AIR COMPRESSOR, HEAT EXCHANGERS, AND A PUMP. THE PROCESS IS CONTINUOUS AND IS BASED ON THE FACT THAT ORGANIC MATTER, EITHER DISSOLVED OR SUSPENDED IN WATER CAN BE OXIDIZED IN A REACTOR BY WET COMBUSTION AT TEMPERATURES OF ABOUT 500 DEGREES F AND PRESSURES OF 1200 PSI. (AUTH)

10-01-02049 WET AIR OXIDATION OF SEWAGE SLUDGE (WET-OXIDATION)
TELETZKE, G. H.
TRANS OF THE 16TH ANNUAL CONF ON SANITARY ENGINEERING, BULL OF ENGRG AND ARCHITECTURE NO. 56, UNIVERSITY OF KANSAS. THE ZIMPRO WET OXIDATION PROCESS FOR THE DISPOSAL OF SEWAGE SLUDGE IS DISCUSSED. RELATIVE COSTS VERSUS C.O.D. REDUCTION AND OTHER DESIGN PARAMETERS ARE PRESENTED.

10-01-02050 PROCESS CONSUMES SLUDGE BY FLAMELESS COMBUSTION (WET-OXIDATION)
CHEM ENGRG 67(24), P. 80-82 (NOVEMBER 28, 1960). A SURVEY OF THE APPLICATION OF THE ZIMMERMANN PROCESS FOR SEWAGE SLUDGE DISPOSAL IS PRESENTED.

10-01-02051 SEMI-CHEMICAL RECOVERY PROCESSES AND POLLUTION ABATEMENT (WET-OXIDATION)
BROWN, R. W. + JACKSON, D. T. + TONGREN, J. C.
PAPER TRADE JOURNAL 143(25), P. 28-33 (NOVEMBER 1959). THE AUTHORS DESCRIBE SIX OF SEVEN RECOVERY SYSTEMS FOR SODIUM AND SULPHUR FROM THE VARIOUS SULPHITE PULPING PROCESSES INCLUDING THE ZIMMERMANN PROCESS. NO EFFORT HAS BEEN MADE TO COMPARE THEM SINCE IT IS OBVIOUS THE MOST ADVANTAGEOUS ONE WILL DEPEND ON LOCAL CONDITIONS. THE AUTHORS OVER LOOKED ONE RECOVERY METHOD WHICH HAS BEEN IN COMMERCIAL USE FOR FIVE YEARS, NAMELY THAT OF STORA KOPPARBERG IN SKUTSKAR, SWEDEN. (AUTH)

10-01-02052 COMPONENTS OF SLUDGE AND ITS WET AIR OXIDATION PRODUCTS (WET-OXIDATION)
TELETZKE, G. H. + GITCHEL, W. B. + DIDDAMS, D. G. + HOFFMAN, C. A.
J WATER POLLUTION CONT FED 39(6), P. 994-1005 (JUNE 1967). BASIC CLASSES OF ORGANIC MATTER SUCH AS PROTEINS, LIPIDS, TOTAL SUGARS, STARCH, AND CRUDE FIBER ARE FOUND IN RAW SLUDGE AND SLUDGE PARTIALLY OXIDIZED BY THE WET AIR METHOD. AS THE DEGREE OF OXIDATION IS INCREASED, THE BASIC CLASSES DISAPPEAR RAPIDLY. EVEN AT LOW DEGREES OF OXIDATION THE LARGER MOLECULES ARE BROKEN DOWN, PRODUCING COMPOUNDS SUCH AS FREE AMINO ACIDS, FREE FATTY ACIDS, AND SIMPLE SUGARS. THE HYDROLYTIC EFFECT AT LOW DEGREES OF OXIDATION CAUSES THE RESULTING PRODUCT TO BE EASILY DEWATERABLE. THE FILTRATES FROM SUCH DEWATERING MAY BE TREATED READILY BY BIOLOGICAL SYSTEMS. (AUTH)

10-01-02053 PURIFYING METALLIC SALT SOLUTIONS SUCH AS ZINC CHLORIDE SOLUTIONS USED IN VULCANIZING OR PARCHMENTIZING CELLULOSE (WET-OXIDATION)
HENGLEIN, F. A. + STAUF, F. W.
PATENT U.S. 1,839,220 (JANUARY 5), ASSIGNED TO I. G. FARBENIND A.-G. FOR THE PURIFICATION OF METALLIC SALT SOLUTIONS CONTAMINATED BY CELLULOSE-LIKE SUBSTANCES, THE SOLUTIONS ARE TREATED WITH OXYGEN AT SUPER ATMOSPHERIC PRESSURE AT TEMPERATURES ABOVE 130 DEGREES. (CA)

10-01-02054 AIR OXIDATION OF WASTE SULFITE LIQUORS (WET-OXIDATION CATALYSIS)
HURWITZ, E. + CIABETTARRI, E. + WOLFF, R. A. + BERNSTEIN, I.
IND ENGR CHEM 51, P. 1301-1304 (1959). LABORATORY AND PILOT PLANT STUDIES INDICATE THAT COBALT CHLORIDE IS AN EFFECTIVE CATALYST FOR ACCELERATING OXIDATION OF SPENT SULFITE LIQUORS. DISSOLVED SALTS DEPRESS OXIDATION, THIS CAN BE COUNTERACTED BY DILUTION. SURFACTANTS ACCELERATE OXIDATION. THE POSITIVE EFFECTS OF CATALYST, DILUTION, AND SURFACTANTS ARE ROUGHLY ADDITIVE. (CA)

10-01-02055 ULTIMATE DISPOSAL OF SEWAGE SLUDGE BY WET-OXIDATION
HURWITZ, E. + DUNDAS, W. A.
PURDUE UNIVERSITY, ENGRG BULL EXT SER, P. 211-226 (1959). THE SLUDGE IS HEATED AND MIXED WITH AIR UNDER PRESSURE AT 1200 LB/SQ-IN GAGE AND 515 DEGREES F, COOLED, VENTED, AND THE LIQUID EFFLUENT RETURNED TO THE SLUDGE PLANT BY PROPORTIONING WITH RAW SEWAGE. THE PLANT CONSISTS OF PREHEATERS, REACTOR, COOLER, AND SEPARATOR, AND IS DESIGNED TO CIRCULATE THE HOT REACTOR EFFLUENT THROUGH THE PREHEATERS PRIOR TO THE COOLING STAGE. THE PROCESS EFFECTS A 79-80 PERCENT REDUCTION IN CHEMICAL OXYGEN DEMAND AND A REDUCTION OF ABOUT 60 PERCENT IN B.O.D. IN SLUDGES OF 3-6 PERCENT SOLIDS. HIGHER OPERATING TEMPERATURES GIVE GREATER REDUCTIONS. THE EFFLUENT IS HIGH IN AMMONIA AND VOLATILE ACIDS, AND THE VENTED EXHAUST GAS CONSISTS MAINLY OF N, CARBON DIOXIDE, AND OXYGEN. MINOR CONSTITUENTS ARE AR 0.9, H 0.4, AND HYDROCARBONS LESS THAN 0.02 PERCENT. (CA)

10-01-02056 WET AIR OXIDATION OF SEWAGE SLUDGE (WET-OXIDATION)
HURWITZ, E. + TELETZKE, G. H. + GITCHEL, W. B.
WATER SEWAGE WORKS 112(8), P. 298-305 (AUGUST 1965). SEWAGE SLUDGE CAN BE OXIDIZED BY HEATING IN A CLOSED CONTAINER IN PRESENCE OF AIR AT TEMPERATURES ABOVE 150 DEGREES. DEGREE OF OXIDATION INCREASES WITH TEMPERATURE, REACHING 80 PERCENT IN 1 HOUR AT 260 DEGREES. INSOLUBLE ORGANIC MATTER IS CONVERTED TO SOLUBLE SUBSTANCES AND EVENTUALLY TO WATER AND CARBON-DIOXIDE, AMINES TO AMMONIA, AND S TO SULFATE. ACETATE IS THE MOST RESISTANT TO OXIDATION. SETTLING AND DRAINING CHARACTERISTICS OF SLUDGE ARE IMPROVED EVEN AT 15-20 PERCENT CHEMICAL OXYGEN DEMAND (C.O.D.) REDUCTION. THE DRAINED SOLIDS HAVE NO OBJECTIONABLE ODOR EVEN WHEN MOIST. THE 5-DAY B.O.D. OF THE SOLIDS AFTER 30 PERCENT C.O.D. REDUCTION IS ABOUT 10 PERCENT OF THE VOLATILE SOLIDS IN CONTRAST TO 70 PERCENT OF VOLATILE SOLIDS IN RAW PRIMARY SLUDGE. C.O.D. OF THE OXIDIZED LIQUOR REACHES A MAXIMUM AT 20-50 PERCENT TOTAL C.O.D. REDUCTION, THEN DECREASES WITH FURTHER OXIDATION. VOLATILE ACID INCREASES UP TO 80 PERCENT C.O.D. REDUCTION AND CONSISTS ALMOST ENTIRELY OF ACETIC-ACID. THE LIQUOR IS READILY TREATED BY BIOLOGICAL PROCESSES FOR FURTHER C.O.D. REDUCTION. (CA)

10-01-02057 DEGRADATION OF ORGANIC WASTES BY THE WET AIR OXIDATION PROCESS (WET-OXIDATION)
HURWITZ, E.
PROC RESEARCH CONF ADVISORY COUNCIL RESEARCH AM MEAT INST FOUND, UNIVERSITY OF CHICAGO, 15, P. 31-44 (1963). THE OPERATION OF THE WET AIR OXIDATION PROCESS FOR THE DISPOSAL OF ORGANIC SEWAGE IS DESCRIBED. (CA)

10-01-02059 WET AIR OXIDATION OF COMBUSTIBLE MATERIALS ADSORBED ON CARBONACEOUS ADSORBENT (WET-OXIDATION)
SCHOEFFEL, E. W. + ZIMMERMANN, F. J.
PATENT U.S. 3,386,922 (JUNE 4, 1968), APPLIED FOR NOVEMBER 23, 1959, NOVEMBER 1962, ASSIGNED TO STERLING DRUG, INC. SELECTIVE REMOVAL OF OXIDIZABLE ADSORBATE FROM THE SURFACE OF A SPENT CARBONACEOUS ADSORBENT WAS ACCOMPLISHED BY OXYGENATING AN AQUEOUS SUSPENSION OF CARBONACEOUS ADSORBENT UNDER PRESSURE AT 125-300 DEGREES. THUS, 50 G OF SPENT CHARCOAL USED TO CLARIFY AQUEOUS PHENOLIC INDUSTRIAL WASTE WAS MIXED WITH 1000 ML WATER AND CHARGED INTO A REACTION VESSEL WITH OXYGEN. AFTER HEATING TO 200 DEGREES FOR ONE HOUR, THE RECOVERED CHARCOAL (90 PERCENT OF ORIGINAL) WAS FULLY ACTIVE. AT LESS THAN 185 DEGREES, THE LOSS OF CHARCOAL WAS QUITE LOW (LESS THAN 1 PERCENT AT 150 DEGREES). (CA)

10-01-02060 WET AIR OXIDATION OF SEWAGE SLUDGE (WET-OXIDATION)
TELETZKE, G. H.
PROCESS BIOCHEM 1(6), P. 329-333 (1966). THE DISPOSAL OF SLUDGE, WHETHER FROM INDUSTRIAL PROCESSES OR DOMESTIC SEWAGE, IS AN EVER-INCREASING PROBLEM. THE OBJECT OF THE ZIMPRO PROCESS IS TO PRODUCE A STERILE, NONPUTRESCIBLE SOLID RESIDUE BY HEATING ORGANIC WASTE WITH AIR TO OXIDIZE IT. THIS METHOD AND SEVERAL OTHERS NOW BEING DEVELOPED HAVE CERTAIN ADVANTAGES OVER ESTABLISHED BRITISH PRACTICE AS THEY ARE INDEPENDENT OF WEATHER CONDITIONS, REQUIRE ONLY A SMALL AREA FOR OPERATION, AND ARE READILY ADAPTABLE TO FULLY AUTOMATIC CONTROL. THE PROCESS DESCRIBED HERE WAS ORIGINALLY ADOPTED AS A METHOD FOR DEALING WITH INDUSTRIAL SLUDGES AND SLURRIES, BUT HAS BEEN APPLIED IN THE UNITED STATES TO DEAL WITH SLUDGE FROM SMALL COMMUNITIES. (CA)

10-01-02061 SELF-SUSTAINING FLAMELESS OXIDATION OF COMBUSTIBLE MATERIAL (WET-OXIDATION)
ZIMMERMANN, F. J.
BRIT PATENT 812,832, MAY 6, 1959, ASSIGNED TO STERLING DRUG, INC. CONTINUOUS, FLAMELESS OXIDATION OF COMBUSTIBLE

MATERIAL DISPERSED IN WATER IS CARRIED OUT AT LESS THAN 1000 LB/SQ-IN. THE DISPERSION IS PASSED ALONG WITH AN OXYGEN-CONTAINING GAS INTO A REACTION ZONE, THE CONCENTRATION OF COMBUSTIBLE MATERIAL BEING KEPT SUFFICIENT FOR COMPLETE OXIDATION AT THE FEED RATE. NONCONDENSABLE GASES (EITHER REACTION PRODUCTS OR INJECTED GASES) ARE USED IN AN AMOUNT SUFFICIENT TO CARRY OFF THE ENERGY LOADED WATER VAPOR. SUBSTANTIALLY COMPLETELY OXIDIZED MATERIAL AND AN ENERGY ENRICHED GAS MIXTURE ARE RECOVERED. HEAT EXCHANGE AND RECOVERY ARE ACCOMPLISHED WITHOUT USE OF A CONVENTIONAL SOLID BARRIER, AND MUCH HIGHER EFFICIENCIES OF HEAT RECOVERY ARE ACHIEVED. THE PROCESS IS APPLICABLE TO VARIOUS INDUSTRIAL WASTES AND IS DESCRIBED IN DETAIL IN ITS APPLICATION TO PULP-MILL WASTES. (CA)

10-01-02062 OXIDATION REGULATION IN COMBUSTION OF INDUSTRIAL WASTES (WET-OXIDATION)
ZIMMERMANN, F. J.
U.S. PATENT 2,903,425, SEPTEMBER 8, 1959. CONTINUATION IN PART OF U.S. 2,824,058. THE CONCENTRATION OF COMBUSTIBLE MATERIALS IN INDUSTRIAL WASTES FED TO AN OXIDATION REACTOR IS ADJUSTED BY EVAPORATION OR DILUTION TO MAINTAIN A UNIFORM BTU/GAL OF INPUT. SEE ALSO U.S. 2,665,249. (CA)

10-01-02063 SEWAGE SLUDGE TREATMENT BY WET AIR OXIDATION (WET-OXIDATION)
ZIMMERMANN, F. J.
PURDUE UNIVERSITY, ENGRG EXPTL STATION ENGRG BULL 96, P. 409-417 (1958). A SLUDGE DISPOSAL PLANT USING THE ZIMMERMANN WET OXIDATION PROCESS HAS BEEN INSTALLED IN CHICAGO. THE CAPACITY IS 2 TONS DAILY DRY WEIGHT. SLUDGE PASSES FROM A GRINDER TO STORAGE TANKS WHERE IT IS HEATED TO 180 DEGREES F. FROM THERE IT IS PUMPED UNDER HIGH PRESSURE THROUGH HEAT EXCHANGERS TO THE REACTOR WHERE IT MIXES WITH AIR. OXIDATION PROCEEDS AT 150-370 DEGREES F. PRESENCE OF LIQUID WATER IS ESSENTIAL. WITH SLUDGE OF 6-7 PERCENT SOLIDS CONTENT, ADDITION OF OUTSIDE HEAT IS UNNECESSARY. HEAT FROM THE REACTION IS RECOVERED BY HEAT EXCHANGERS AND THE GASEOUS PHASE IS EXPANDED IN AN ENGINE FOR POWER RECOVERY. DESTRUCTION OF ORGANIC MATTER IS 80 PERCENT COMPLETE. THE RESIDUAL SOLIDS SETTLE READILY. (CA)

10-01-02064 WET COMBUSTION, A PROCESS FOR THE UTILIZATION OF PEAT (WET-OXIDATION)
CEDERQUIST, K. N. + BERING, P.
ACTA POLYTECH, CHEM MET SER 3(1), P. 5-34 (1952). A PROCESS IS DESCRIBED WHICH ENABLES THE WATER CONTENT OF PEAT TO BE REDUCED BY FILTRATION TO SUCH A VALUE AS TO TO PERMIT ITS USE AS FUEL OR FOR GASIFICATION. THE CRUDE PEAT CONTAINING 85-95 PERCENT WATER, IS HEATED BY OXIDATION OF 10-20 PERCENT OF THE SOLID MATERIAL WITH OXYGEN OR AIR UNDER A PRESSURE OF 15-30 KG/SQ-CM TO A TEMPERATURE OF 170-200 DEGREES. AT THIS TEMPERATURE THE COLLOIDAL FORM OF THE PEAT IS BROKEN DOWN AND THE MATERIAL BECOMES A FREE FLOWING SUSPENSION. FILTRATION AND PRESSING REDUCE THE WATER CONTENT TO ABOUT 50 PERCENT. THE OXIDATION TAKES PLACE IN A REACTOR EQUIPPED WITH AN AGITATOR SO THAT THE ENTIRE MASS IS HEATED DIRECTLY. LABORATORY AND PILOT PLANT DATA ARE GIVEN ON YIELDS, HEAT BALANCES, OXYGEN CONSUMPTION, OXIDATION RATES, AND FILTRATION AND PRESSING TIMES. (CA)

10-01-02065 PARTIAL WET AIR OXIDATION OF SLUDGE (WET-OXIDATION)
GITCHEL, W. B. + HOFFMAN, C. A. + SCHOEFFEL, E. W.
U.S. PATENT 3,359,200, DECEMBER 19, 1967, APPLIED FOR FEBRUARY 24, 1966, ASSIGNED TO STERLING DRUG, INC. SEWAGE SLUDGE CHEMICAL OXYGEN DEMAND IS REDUCED 10-40 PERCENT BY PREHEATING A MIXTURE OF SLUDGE AND AIR BY INDIRECT HEAT EXCHANGE TO APPROXIMATELY 150 DEGREES, HEATING THE PREHEATED MIXTURE TO 160-185 DEGREES BY INJECTING LIVE STEAM, MAINTAINING THE SLUDGE AT THE 160-185 DEGREES REACTION TEMPERATURE BY VARYING THE AMOUNT OF STEAM INJECTED. (CA)

10-01-02066 DECOMPOSTING SULFITE CELLULOSE WASTE LYE (WET-OXIDATION)
STREHLENERT, R. W.
PATENT SWED. 43,860, (APRIL 3, 1918). THE LYE IS HEATED IN AN AUTOCLAVE UNDER HIGH PRESSURE PRODUCED BY THE INTRODUCTION OF SULFUR DIOXIDE IN SUCH AMOUNT THAT ITS PARTIAL PRESSURE IS GREATER THAN THAT OF THE STEAM PRESSURE AT THE PREVAILING TEMPERATURE, WHEREBY SULFURIC ACID REQUIRED FOR THE REACTION IS FORMED BY THE OXIDATION OF THE SULFUROUS ACID. (CA)

10-01-02067 TREATING WASTE LIQUOR FROM SULFITE-CELLULOSE FACTORIES (WET-OXIDATION)
STREHLENERT, R. W.
PATENT CAN. 190,864, (JUNE 10, 1919). THE LIQUOR IS SUBJECTED TO CONCENTRATION BY EVAPORATION, THEN HEATED UNDER PRESSURE TO DECOMPOSE THE LIGNO-SULFITES AND LIGNO-SULFATES. THE EXCESS HEAT OF DECOMPOSITION IS USED TO EFFECT THE EVAPORATION WHICH MAY BE CONDUCTED UNDER VACUUM. (CA)

10-01-02068 PRODUCTION OF VALUABLE ORGANIC SUBSTANCES FROM SULFITE WASTE LIQUOR (WET-OXIDATION)
STREHLENERT, R. W.
PATENT CAN. 191,432, (JULY 8, 1919). ACID GASES ARE INTRODUCED INTO AN AUTOCLAVE CONTAINING THE WASTE LIQUOR IN QUANTITY SUFFICIENT TO CREATE A PRESSURE WHICH IS CONSIDERABLY HIGHER THAN THE STEAM PRESSURE CORRESPONDING TO THE TEMPERATURE IN THE AUTOCLAVE, THE TEMPERATURE AND PRESSURE BEING SUFFICIENT TO CAUSE THE SELF OXIDATION OF THE SULFUR DIOXIDE. THE GASES USED ARE PREFERABLY THOSE FROM THE SULFITE DIGESTER AT THE TIME OF BLOWING OFF FOR LOWERING PRESSURE. THE PREFERRED TEMPERATURE IS ABOUT 190 DEGREES C AND PRESSURE ABOUT 20 ATMOSPHERES. (CA)

10-01-02069 PURIFICATION OF METAL SALT SOLUTIONS (WET-OXIDATION)
HENGLEIN, F. A. + STAUF, F. W.
PATENT GER. 500,813, (JULY 22, 1927), ASSIGNED TO I. G. FARBENIND. SOLUTIONS OF METAL SALTS CONTAINING ORGANIC IMPURITIES SUCH AS CARBOHYDRATES, ESPECIALLY CELLULOSE AND ITS INCRUSTATIONS, ARE PURIFIED BY TREATING THEM WITH OXYGEN AT ABOVE ONE ATMOSPHERE PRESSURE AND AT TEMPERATURES ABOVE 130 DEGREES C. IN AN EXAMPLE, A SOLUTION OF ZINC CHLORIDE CONTAINING GLUCOSE IS HEATED TO 200 DEGREES C IN AN AUTOCLAVE WITH OXYGEN AT 20 ATMOSPHERES. (CA)

10-01-02070 TREATING CELLULOSE WASTE LYES (WET-OXIDATION)
BERGSTROM, H. O. V. + CEDERQUIST, K. N.
PATENT SWED. 90,896, (NOVEMBER 23, 1937). TO REMOVE ORGANIC SUBSTANCES, THE LYES PRESSED OUT FROM SODA CELLULOSE ARE TREATED WITH OXIDIZING AGENTS, E. G., AIR OR OXYGEN CONTAINING GASES. THE CONTENT OF RESIN ACIDS CAN BE DECREASED FROM 375 TO 100 MG./LITER. (CA)

10-01-02071 VANILLIN (WET-OXIDATION)
SALVESEN, J. R. + BRINK, D. L. + DIDDAMS, D. G. + OWZARSKI, P.
PATENT U.S. 2,434,626 (JANUARY 13, 1948), ASSIGNED TO SALVO CHEMICAL CORP. VANILLIN IS PRODUCED IN IMPROVED YIELD BY COOKING AN AQUEOUS SOLUTION OF BASIC CA LIGNOSULFONATE CONTAINING 40-200 G LIGNIN PER LITER AND 80-200 G SODIUM-HYDROXIDE PER LITER UNDER AUTOGENOUS PRESSURE TO 140-170 DEGREES AND INTRODUCING OXYGEN INTO THE LIQUOR FOR 60-110 MINUTES AT SUCH A RATE THAT 25-35 G OF OXYGEN ARE CONSUMED PER 100 G LIGNIN ORIGINALLY PRESENT. THE ADDITION OF OXYGEN DURING THE COOKING INCREASES THE VANILLIN YIELD BY 60-80 PERCENT OVER THAT OBTAINED WITHOUT OXYGEN ADDITION. EXAMPLES AND AN APPARATUS FOR CARRYING OUT THE PROCESS ARE GIVEN. (CA)

10-01-02072 PURIFICATION OF WASTE WATER (WET-OXIDATION)
SCHMALENBACH, A. + KARL, A. + SCHULZ, M.
PATENT GERMAN 1,051,210 (FEBRUARY 19, 1959), ASSIGNED TO HEINRICH KOPPERS G. M. B. H. AND WM. J. BOULIN. THE PURIFICATION, ESPECIALLY OF WASTE WATERS FROM AMMONIA PRODUCING PLANTS OF COKE OR GAS WORKS IS ACCOMPLISHED BY WET BURNING OF THE IMPURITIES AT AN ELEVATED PRESSURE AND TEMPERATURE IN THE LIQUID PHASE WITH EXCESS OXYGEN, 2-3 TIMES THE STOICHIOMETRIC AMOUNT BEING USED. THE UNUSED PART OF THE OXYGEN FROM THE TREATED WASTE WATER IS LARGELY RECYCLED TO TREAT FURTHER AMOUNTS OF WASTE WATER. THE OXYGEN CAN BE ADDED TO THE WASTE WATER AT THE PRESSURE REQUIRED FOR OXIDATION OF THE IMPURITIES BEFORE HEATING TO THE REACTION TEMPERATURE. INSOLUBLE IMPURITIES, ESPECIALLY TARRY

CONSTITUENTS, ARE SEPARATED BEFORE TREATMENT WITH OXYGEN BY DEPOSITION AT AN ELEVATED PRESSURE AND TEMPERATURE. THE WASTE WATER CAN ALSO BE PRESSURIZED BEFORE MIXING WITH OXYGEN AT APPROXIMATELY ROOM TEMPERATURE, THE PARTS WHICH SETTLE BEING THUS SEPARATED. (CA)

10-01-02073 REMOVAL OF DISSOLVED OR DISPERSED ORGANIC MATERIAL FROM AQUEOUS SOLUTIONS AND SUSPENSIONS (WET-OXIDATION)
CEDERQUIST, K. N.
PATENT U.S. 2,773,026 (DECEMBER 4, 1956), ASSIGNED TO STORA KOPPARBERGS BERGSLAGS AKTIEBOLAG. WASTE PULPING LIQUORS ARE TREATED WITH OXYGEN CONTAINING GASES AT ELEVATED TEMPERATURES AND PRESSURES TO EFFECT COMBUSTION WITHIN THE LIQUOR, AND THE LIBERATED HEAT IS USED TO MAINTAIN THE NECESSARY TEMPERATURE AND PRESSURE. IF THE COMBUSTION IS INTERRUPTED WHEN 20-25 PERCENT OF THE ORGANIC MATTER HAS BEEN COMPLETELY OXIDIZED TO WATER AND CARBON-DIOXIDE, THE REST OF THE ORGANIC MATTER PRECIPITATES AS A CARBONOUS MATERIAL WHICH CAN BE REMOVED BY FILTERING OR CENTRIFUGING AND USED DIRECTLY AS A FUEL. THE PROCESS CAN BE USED TO TREAT WASTE LIQUORS FROM PULPING, MASONITE PROCESSING, SUGAR REFINING, AND SPENT WASH FROM DISTILLERIES AND YEAST FACTORIES. (CA)

10-01-02074 SEPARATING ORGANIC AND INORGANIC CONSTITUENTS OF WASTE SULFITE LIQUOR (WET-OXIDATION)
STREHLENERT, R. W.
PATENT U.S. 1,149,420, (AUGUST 10, 1915). THE FREE AND COMBINED SULFUR DIOXIDE IS OXIDIZED INTO SULFURIC ACID BY THE ACTION OF AIR OR OXYGEN UNDER HEAT AND PRESSURE, AND THE SULFURIC ACID AS FAST AS FORMED IS ALLOWED TO ACT ON THE OTHER CONSTITUENTS, IN THE PRESENCE OF SODIUM BISULFATE WHICH IS ADDED TO RETARD THE REACTION, TO CAUSE PRECIPITATION. (CA)

10-01-02075 SLUDGE TREATMENT AND DISPOSAL BY THE ZIMMERMANN PROCESS (WET-OXIDATION)
23RD PROGRESS REPORT OF COMM ON SANIT ENGRG RES OF SANIT ENGRG DIV, PROC OF AM SOC CIVIL ENGRG J SANIT ENGRG DIV 85(SA4), P. 13-23 (JULY 1959). TREATMENT AND DISPOSAL OF SEWAGE SLUDGE AS PRACTICED TODAY GENERALLY IS DEPENDENT UPON ANAEROBIC BIOLOGICAL CONVERSION AND MODIFICATION OF RAW SLUDGE SOLIDS PREPARATORY TO FINAL DISPOSAL. ENGINEERS LONG HAVE BEEN INTERESTED IN WAYS AND MEANS OF IMPROVING ON OR EVEN CIRCUMVENTING THE TIME CONSUMING AND EXPENSIVE BIOLOGICAL PHASE OF SLUDGE TREATMENT. A NEW WET COMBUSTION PROCESS FOR DESTROYING ORGANIC SLUDGE WAS RECENTLY REPORTED ON. KNOWN AS THE ZIMMERMANN PROCESS IT WAS STUDIED ON A PILOT PLANT SCALE AT THE SOUTHWEST WORKS OF THE METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO. RESULTS OBTAINED TO DATE SUGGEST THAT DESIGN ENGINEERS COULD GIVE SERIOUS CONSIDERATION TO THE USE OF THE ZIMMERMANN PROCESS IN TREATING SEWAGE SLUDGE. (AUTH)

10-01-02076 ZIMMERMANN PROCESS FOR THE CHEMICAL PULP INDUSTRY (WET-OXIDATION)
BLIKSTAD, F.
ZIMMERMANNPROSESSEN FOR CELLULOSEINDUSTRIEN, NORSK SKOGINDUSTRI 10, P. 172-179 (MAY 1956). THE PRINCIPLE OF WET COMBUSTION IS DESCRIBED WITH THE AID OF A SIMPLE EXAMPLE. THE HISTORY OF THE DEVELOPMENT IS TREATED BRIEFLY AND THE DIFFERENCE BETWEEN THE WORK OF CEDERQUIST AND ZIMMERMANN IS FINALLY DISCUSSED. THE FORMER WORKED PRIMARILY WITH THE PROBLEM OF PARTIAL OXIDATION, WHILE THE LATTER CONCENTRATED ON COMPLETE OXIDATION. IT IS FURTHERMORE EXPLAINED WHY A. S. BORREGAARD IN SARPSBORG HAS CHOSEN TO BUILD A PLANT BASED ON THE ZIMMERMANN PROCESS INSTEAD OF AN EVAPORATION UNIT AND WASTE LIQUOR BOILERS. THE OVERALL EFFICIENCY IS FIRST OF ALL 50-60 PERCENT BETTER AND THE WET STEAM PRODUCTION WILL BE 100 TONS OF STEAM PER HOUR CORRESPONDING TO 6.2 TONS OF STEAM PER TON OF PULP. THE PLANT WILL COST APPROXIMATELY 18 MILLION N.KR., WHILE A PLANT COMPRISING EVAPORATION AND COMBUSTION IN A SUITABLE BOILERHOUSE WOULD HAVE AMOUNTED TO 27 MILLIONS N.KR. WET COMBUSTION REQUIRES LARGE QUANTITIES OF POWER, WHICH, HOWEVER, WILL BE DEVELOPED IN BACK PRESSURE TURBINES BY THE STEAM PRODUCED AND BY THE HIGH PRESSURE WASTE GASES. THE POWER WHICH IN GENERAL COULD HAVE BEEN GAINED IN BY BACK PRESSURE TURBINES, WITH STEAM FROM A CONVENTIONAL BOILERHOUSE IS THUS LOST. IF THE POWER IS EXPENSIVE IT WOULD PAY TO PRODUCE POWER FROM THE NET AMOUNT OF STEAM PRODUCED BY THE ZIMMERMANN PLANT. A ZIMMERMANN PLANT IS ADVANTAGEOUS WITH RESPECT TO INCRUSTATION AND POLLUTION DUE TO ASHES AND SULFUR-DIOXIDE, BUT IS NOT ADAPTABLE TO QUICK LOAD CHANGES. WET COMBUSTION IS NOT ONLY ADVANTAGEOUS FROM THE POINT OF VIEW OF HEAT ECONOMY, BUT OPENS THE WAY TO QUITE NEW METHODS FOR THE RECOVERY OF THE CHEMICALS USED IN THE DIGESTION OF WOOD. (AUTH)

10-01-02077 LITT OM VATFORBRENNING AV AVLUT FRA CELLULOSEFABRIKASJONEN (WET-OXIDATION)
HANSSEN, L. J.
NORSK SKOGINDUSTRI 8, P. 454-465 (DECEMBER 1954). FIRST, A HISTORICAL REVIEW IS GIVEN OF VARIOUS METHODS OF UTILIZING THE HEAT VALUE OF WASTE LIQUORS FROM PULP PLANTS, EXPLAINING HOW THE PROBLEM HAS BEEN SOLVED WITH ACCEPTABLE EFFICIENCY FIRST IN SULPHATE AND LATER IN SULPHITE PULP MILLS THROUGH MULTISTAGE EVAPORATION AND COMBUSTION IN STEAM BOILERS. OTHER SOLUTIONS HAVE ALSO BEEN TRIED, AND THE PAPER MENTIONS ROBERT STREHLENERTS PROCESS, PATENTED IN 1912 AND TESTED IN FACTORY SCALE IN 1918, AND IT IS SHOWN THAT THIS PROCESS CAN BE REGARDED AS A FORERUNNER FOR THE LATER PATENTS ON WET COMBUSTION OF WASTE LIQUOR BY K. N. CEDERQUIST AND H. G. BERGSTROM IN SWEDEN, AND F. J. ZIMMERMANN IN THE U.S.A. THESE PROCESSES ARE EXPLAINED IN DETAIL REGARDING TEMPERATURE AND PRESSURE IN THE REACTOR, AND THE POSSIBLE HEAT RECOVERY FROM THE REACTOR IS COMPARED WITH HEAT RECOVERY FROM THE USUAL METHOD OF EVAPORATION AND COMBUSTION. IT IS SHOWN THAT IT IS OF OUTMOST INTEREST TO FOLLOW FURTHER DEVELOPMENTS IN THIS FIELD, AS WET COMBUSTION IN CERTAIN CASES SEEM TO OFFER ADVANTAGES SUCH AS HIGHER HEAT ECONOMY, SAFE OPERATION AND SMALLER INVESTMENTS COMPARED WITH EVAPORATION AND COMBUSTION. (AUTH)

10-01-02099 RECOVERING VALUES FROM WASTE SULFITE LIQUOR (WET-OXIDATION)
STREHLENERT, R. W.
PATENT U.S. 1,384,219, (JULY 12, 1921). WASTE SULFITE LIQUOR IS CONCENTRATED AND DECOMPOSED BY HEATING UNDER PRESSURE IN ORDER TO DECOMPOSE LIGNO SULFATES AND LIGNO SULFITES. (CA)

10-01-02106 WET-OXIDATION (COST(OPERATING) COST(CAPITAL))
LOHMANN, U. + TILLY, A.
NASSVERBRENNUNG, CHEMING-TECH 37(9), P. 913-916 (1965). THE COMBUSTION PRODUCTS WHICH REMAIN IN THE WATER AFTER THE WET OXIDATION OF ORGANIC SUBSTANCES ARE HARMLESS, STERILE, NON-TOXIC, AND SETTLE OUT WELL. THE ASH VOLUME IS SMALL. THE PROCESS IS SUITABLE FOR THE DISPOSAL OF ORGANIC WASTE. IT IS A FLAMELESS, SELF-SUSTAINING OXIDATION. CAPITAL AND OPERATING COSTS FOR THE ZIMPRO PLANT IN CHICAGO ARE PRESENTED. PLANNING FOR A LARGE ZIMPRO PLANT IN GERMANY HAS BEEN STARTED.

10 02 PYROLYSIS

10-02-00155 BURNS REFUSE WITHOUT FLAME (PYROLYSIS)
HOFFMAN, D. A.
THE AMERICAN CITY 82(2), P. 102-104 (1967). PYROLYSIS OF SOLID WASTE APPEARS PROMISING BECAUSE - (1) VOLUME REDUCTION, (2) PROCESS SHOULD BE SELF-SUSTAINING, AND (3) LIQUID AND TARRY BY-PRODUCTS MAY HAVE COMMERCIAL VALUE. RESEARCH IS TO BE CONDUCTED BY CITY OF SAN-DIEGO, CALIFORNIA. PILOT PLANT IS PROPOSED TO FURNISH DEFINITIVE INFORMATION ON PYROLYSIS AS DISPOSAL METHOD. (UC)

10-02-00713 PYROLYTIC DECOMPOSITION OF SOLID WASTES (PYROLYSIS SALVAGE HEAT-RECOVERY LANTZ-CONVERTER)
PUBLIC WORKS 99(8), P. 82-83, 106 (AUGUST 1968). PYROLYSIS IS DEFINED AS CHEMICAL DECOMPOSITION BY THE ACTION OF HEAT IN THE ABSENCE OF OXYGEN. A PLANT IS BEING INSTALLED AT FORD MOTOR COMPANY IN SAN JOSE, CALIFORNIA TO HANDLE 40 TO 50 TONS OF INDUSTRIAL WASTE PER DAY. A 300 TON/DAY PLANT IS PROPOSED FOR SAN FRANCISCO, CALIF. AND A PLANT FOR

HOUSTON, TEXAS. BASICALLY THE PROCESS PRODUCES GAS WHICH CAN BE USED FOR POWER GENERATION, CHARCOAL, AND A LIQUID CONDENSATE WHICH IS A POTENTIALLY VALUABLE SOURCE OF ORGANIC COMPOUNDS. THE MATERIAL IS SORTED, GROUND AND PUT IN THE LANTZ CONVERTER WHERE THE MATERIAL IS HEATED TO 1200 DEGREES F IN AN OXYGEN-FREE ATMOSPHERE. STEAM, CARBON DIOXIDE, AND CARBON MONOXIDE ARE THE FIRST GASES PRODUCED. AS THE TEMPERATURE RISES, VOLATILE GASES (HYDROGEN, METHANE, ETHYLENE, AND ETHANE) ARE PRODUCED. ABOUT 25 CU-FT OF GASES ARE RECOVERED FROM EACH POUND OF WASTE. ENERGY VALUE OF THE GAS IS BETWEEN 400 AND 500 BTU. IF THE GAS IS COOLED, A CONDENSATE IS FORMED. FINALLY ABOUT 30 TO 35 PERCENT OF THE FURNACE INPUT (BY WEIGHT) IS PRODUCED IN THE FORM OF CHARCOAL. THE HEAT VALUE OF THE CHARCOAL IS ABOUT 12,000 BTU. AVERAGE TIME IN THE CONVERTER IS FROM 12 TO 15 MINUTES. IT IS ANTICIPATED THAT SALE OF BY-PRODUCTS WILL PAY FOR MOST OF THE OPERATING COST OF THE PROCESS.

10-02-01057 DESTRUCTIVE DISTILLATION - LANTZ CONVERTERS--BASIC CONSERVATION MACHINERY (PYROLYSIS SALVAGE)
BROCHURE ISSUED BY PAN AMERICAN RESOURCES, INC., LANTZ CONVERTER DIVISION. THE LANTZ CONVERTER ORIGINALLY WAS DEVELOPED FOR USE IN THE DISPOSAL OF WASTES FROM RANCH OPERATIONS. FROM ONE POUND OF A TYPICAL COMBUSTIBLE WASTE CAN BE OBTAINED 1/3 POUND OF CARBONACEOUS FUEL WHICH MAY BE COMPRESSED FOR INDUSTRIAL CHARCOAL FUEL OR BRIQUETTED FOR COMMERCIAL CHARCOAL, 1/2 POUND OF CRESOTAR (A VARIABLE OF LIQUID CREOSOTE AND TAR), AND 4 CU FT OF COMBUSTIBLE GAS. THE THREE TYPES OF LANTZ CONVERTER UNITS ARE THE BATCH TYPE, THE INTERVAL-FEED RAM TYPE, AND THE CONTINUOUS FLOW MULTIPLE SCREW TYPE, OF WHICH THERE ARE THE DUAL CYLINDER UTILITY TYPES AND THE COMPLETELY AUTOMATIC TYPES. THE LATTER DO NOT REQUIRE A FULL-TIME OPERATION. A DESCRIPTION OF THE CONVERTER IS PRESENTED. (UC)

10-02-01207 STABLE PYROLYSIS PRODUCTS OF CELLULOSE EXPOSED TO INTENSE THERMAL RADIATION
MARTIN, S. B. + RAMSTAD, R. W.
U.S. NAVAL RADIOLOGICAL DEFENSE LABORATORY, (JANUARY 1965). THE VOLATILE PRODUCTS OF PYROLYSIS GENERATED FROM CELLULOSE AS A FUNCTION OF TIME BEFORE, DURING, AND AFTER IGNITION IN AIR ARE ESTIMATED FROM GAS CHROMATOGRAPHY ANALYSES OF VAPORS EVOLVED DURING EXPOSURES OF CELLULOSE TO INTENSE RADIANT ENERGY IN A HELIUM ATMOSPHERE. IN ALL, 24 COMPONENTS WERE RESOLVED, AND 18 WERE IDENTIFIED. THE CHROMATOGRAPHICALLY MEASURED COMPONENTS COMPROMISE 20 PERCENT TO 50 PERCENT OF THE EXPOSURE WEIGHT LOSS. THE REMAINDER IS BELIEVED TO BE MOSTLY LEVOGLUCOSAN. (UC)

10-02-01282 THE PORTEUS PROCESS (SLUDGE(SEWAGE) DEWATERING(SLUDGE))
BROCHURE BY THE BSP CORP, SAN FRANCISCO, CALIFORNIA, BULLETIN NO. S 114, (1967). RAW SLUDGE (PRIMARY OR SECONDARY) IS PUMPED FROM SEDIMENTATION TANK OR DIGESTER TO STORAGE TANK. FROM THE TANK, THE SLUDGE IS PUMPED THROUGH A HEAT EXCHANGER TO THE REACTION VESSEL. WITHIN THE REACTION VESSEL, TEMPERATURES ARE MAINTAINED AT 350 TO 390 DEGREES F. PRESSURES AT 180 TO 210 PSI, AND THE USE OF A SPECIALLY DESIGNED STEAM-JET CIRCULATOR ASSURE AN INTIMATE MIXTURE OF SLUDGE AND STEAM. AFTER A CYCLE OF APPROXIMATELY THIRTY MINUTES, THE CONDITIONED SLUDGE IS PASSED BACK THROUGH THE HEAT EXCHANGER, GIVES UP ITS HEAT TO INCOMING RAW SLUDGE, AND ENTERS THE DECANTING VESSEL. WHEN THE TREATED SLUDGE LEAVES THE HEAT EXCHANGER, THE TEMPERATURE HAS BEEN REDUCED TO ABOUT 90 DEGREES F. THE DECANTING VESSEL ACTS AS A SEDIMENTATION TANK. THE SOLID MATERIAL SETTLES RAPIDLY WHILE SUPERNATANT WATER RISES TO THE TOP WHERE IT IS DRAWN OFF. AT THIS POINT, THE TREATED SLUDGE HAS BEEN REDUCED TO ABOUT ONE-THIRD ITS ORIGINAL VOLUME. THIS DENSE PRODUCT IS PASSED FOR FINAL DEWATERING TO VACUUM-FILTERS, FILTER-PRESSES, OR OTHER MECHANICAL DEWATERING EQUIPMENT. SELECTION OF THIS FINAL DEWATERING STEP DEPENDS UPON INDIVIDUAL PLANT REQUIREMENTS. VACUUM-FILTERED CAKES WITH 55 PERCENT MOISTURE HAVE BEEN PRODUCED IN ONE SWISS INSTALLATION. FILTER-PRESSED CAKES ARE MORE COMMONLY USED IN GREAT BRITAIN. THESE CAKES CONTAIN AS LITTLE AS 35 PERCENT MOISTURE. WITH EITHER TECHNIQUE, THE FINAL PRODUCT IS AN EASILY HANDLED STERILE CAKE. DEWATERED CAKES ARE IDEALLY SUITED FOR FUEL-FREE AUTOGENOUS COMBUSTION IN A BSP MULTIPLE-HEARTH FURNACE. WHERE LOCAL CODES PERMIT, THE CAKE CAN BE USED FOR COMPOST OR LANDFILL. (UC)

10-02-01375 BATCH RETORT PYROLYSIS OF SOLID MUNICIPAL WASTES (COMPOSITION SALVAGE)
HOFFMAN, D. A. + FITZ, R. A.
ENVIRONMENTAL SCIENCE TECH 2, P. 1023-1026 (NOVEMBER 1968). DATA COLLECTED FROM THE PYROLYSIS OF THE COMBUSTIBLE PORTION OF A TYPICAL SAN DIEGO REFUSE DEMONSTRATE THAT, ONCE STARTED, THE PROCESS CAN BE SUSTAINED BY THE INCINERATION OF ONE OR MORE OF ITS PRODUCTS. THIS ELIMINATES THE PURCHASE OF ADDITIONAL FUEL TO MAINTAIN THE PROCESS ON A CONTINUOUS BASIS. SHOULD A SALVAGE MARKET EXIST FOR ANY OF THE GASES, LIQUIDS, OR SOLID RESULTING FROM PYROLYSIS, THE PRODUCT(S) INCINERATED TO SUSTAIN THE PROCESS MAY BE MANIPULATED TO PROVIDE SOME FINANCIAL RETURN TO OFFSET THE COST OF THE OPERATIONS. THE RESIDUAL CHAR IS COMPARABLE TO A SEMIANTHRACITE COAL AND THUS CONSTITUTES AN EASILY TRANSPORTABLE FUEL. IF THE SEPARATION PROBLEM CAN BE OVERCOME, THE PYROLIGNEOUS ACIDS AND TAR FRACTION FROM THE PROCESS MAY CONSTITUTE A SOURCE OF ORGANIC COMPOUNDS. THE INERT SOLID(S) FROM THE PROCESS ARE STERILE AND REPRESENT A SATISFACTORY FILL MATERIAL. VOLUME REDUCTION BY PYROLYSIS OF THE COMBUSTIBLE PORTION OF TYPICAL SAN DIEGO REFUSE IS IN EXCESS OF 50 PERCENT. BASED ON PRESENT INCOMPLETE KNOWLEDGE OF CAPITAL COSTS INVOLVED, IT WOULD SEEM JUSTIFIED TO PUT CAPITAL EQUIPMENT COSTS OF PYROLYSIS TENTATIVELY AT ABOUT TWO-THIRD THOSE OF INCINERATION. THE EXACT FIGURES WILL NEVER BE DEVELOPED UNTIL A LARGE CAPACITY CONTINUOUS PYROLYZING INSTALLATION IS ERECTED.

10-02-01526 RUBBISH, GOOD TO THE LAST SCRAP (PYROLYSIS SALVAGE COMPOSTING)
ENGRG NEWS-RECORD 169, P. 18, 49 (1962). THE 'SALVAGE AND CONVERSION' REFUSE DISPOSAL AND RECLAMATION SYSTEM, COMPRISING SALVAGING, COMPOSTING AND DISTILLATION PROCESSES, DEVELOPED BY LOCKHEED-CALIFORNIA CO., IS DESCRIBED. ALL REFUSE PASSES THROUGH THE SALVAGE OPERATION ON CONVEYOR BELTS AND IS SPRAYED WITH DISINFECTANT DEODORANT. CARDBOARD, RAGS, METAL AND GLASS ARE THEN SORTED OUT AND REMOVED WHILE THE REMAINDER CONTINUES ALONG THE CONVEYOR TO BE DIVERTED TO EITHER THE COMPOSTING OR DISTILLING PLANT. IN THE PATENTED COMPOSTING PROCESS, REFUSE IS FED INTO HEAT CHAMBERS WHERE CRUDE SEWAGE SOLIDS, DIGESTED SEWAGE SLUDGE AND/OR WET GARBAGE ARE USED AS A MOISTENING AGENT FOR THE DRY REFUSE, THUS INCREASING THE RATE OF COMPOSTING AND IMPROVING THE QUALITY OF THE END-PRODUCT. THE REFUSE IS THEN TRANSFERRED TO DIGESTION TANKS WHERE BACTERIAL REDUCTION OCCURS AND AFTER 6 DAYS IT IS PASSED TO A SECONDARY GRINDER, SCREENED, BAGGED, AND SOLD. THE DISTILLATION PROCESS UTILIZES SELECTED GRADED MATERIAL FED INTO A CONVERTOR RETORT WHERE IT IS CARBONIZED BY INDIRECT APPLICATION OF HEAT, COOLED CLASSIFIED AND STORED FOR FURTHER PROCESSING. GAS GENERATED DURING THE PROCESS IS RECIRCULATED AS FUEL FOR THE CONVERTER. IT IS CLAIMED THAT THIS SYSTEM, THE END-PRODUCTS OF WHICH ARE CHARCOAL, METHANE GAS AND CRESOTARS, WILL EVENTUALLY ELIMINATE THE CUT-AND-FILL, AND INCINERATION METHODS OF DISPOSAL PROVIDING A SMOG- AND ODOR-FREE OPERATION.

10 03 COMPACTION INTO BUILDING MATERIAL

10-03-00073 CHICAGO WILL COMPACT ITS REFUSE (COMPACTION RAIL-HAUL)
THE AMERICAN CITY 83(6), 58 (JUNE 1968). A PILOT-MODEL REFUSE COMPACTOR WILL BE USED TO COMPRESS REFUSE IN CHICAGO INTO DENSE CUBES. THESE CUBES MAY BE USED TO FILL LAKE SHORE PROPERTY.

10-03-00794 IS BALED REFUSE THE ANSWER (SANITARY-LANDFILL COMPACTION BALING)
VINCEZ, J. J.
THE AMERICAN CITY 77(2), P. 149 (FEBRUARY 1960). THE ARTICLE SUGGESTS A NEW APPROACH TO THE SOLUTION OF THE SOLID WASTE DISPOSAL PROBLEM - BALING THE REFUSE AND DISPOSING OF IT AT SANITARY LANDFILL SITES. THE METHOD INVOLVES THREE PHASES, VIZ., (1) INSTALLATION OF A BALER AT THE REFUSE TRANSFER STATION TO COMPRESS AND BALE REFUSE, (2) THE USE OF A SUITABLE TRUCKING CONVEYANCE FOR HAULING A LARGE PAYLOAD TO THE DISPOSAL SITE, AND (3) STACKING THE BALES SIDE BY SIDE AND ON TOP OF EACH OTHER, USING EARTH COVER TO PROVIDE A SANITARY LANDFILL. THE REFUSE MUST BE GREATLY COMPACTED, OR THE BENEFITS WILL NOT BE WORTH THE TROUBLE. THE BALING OR BINDING MATERIAL MUST BE STRONG ENOUGH TO RETAIN THE REFUSE IN A COMPRESSED CONDITION LONG ENOUGH TO PREVENT ANY CONSIDERABLE LOSS DURING THE HANDLING PROCESS. ADVANTAGES OF THE PROCESS OBVIOUSLY INCLUDE REDUCED HAULING COSTS, LONGER TERM USE OF THE DISPOSAL SITE, LESS BLOWING OF PAPER AT THE SITE AND A NEATER APPEARANCE. THE MAIN DRAWBACK TO THE PROCESS IS THE FACT THAT NO COMPRESSORS HAVE AS YET BEEN DESIGNED, AND WHEN THEY ARE, THE COSTS WILL BE HIGH UNLESS A LARGE NUMBER OF FACILITIES ADOPT THIS MEANS OF DISPOSAL. (UC)

10 04 BRIQUETTING INTO FUEL

10-04-00217 PROSPECTS OF RECOVERING FUEL FROM REFUSE (BRIQUETTING(FUEL) SEPARATION GRINDING DRYING CAPACITY COST(OPERATING) COMPOSTING COST(CAPITAL))
STIRRUP, F. L.
SURVEYOR 118(3492), P. 289-291 (MARCH 28, 1959). DESCRIPTION OF EXPERIMENTAL PLANT AT MUTTENZ, SWITZERLAND FOR PRODUCTION OF BRIQUETTED FUEL AND FERTILIZERS FROM REFUSE. MAGNETIC SEPARATION, GRINDING, DRYING, BRIQUETTING, AND COMPOSTING ARE DETAILED. PLANT DISPOSES OF 200 TONS REFUSE PER DAY AND PRODUCES ABOUT 60 TONS OF FUEL. (EI)

10 05 FUEL CELLS

10-05-01161 ORGANIC WASTES OFFER NEW SOURCE OF ELECTRICAL ENERGY (FUEL-CELL(BIOLOGICAL))
COMPOST SCIENCE 2(2), P. 45-46 (SUMMER 1961). LABORATORY STUDIES OF THE U.S. GEOLOGICAL SURVEY SHOW THAT THE DECOMPOSITION OF ORGANIC WASTES CAN BE CONTROLLED TO PRODUCE ELECTRICITY INSTEAD OF HEAT. BACTERIA AND SEA WATER WERE PLACED IN THE ANODE SECTION WHILE THE CATHODE SECTION CONTAINED SEA WATER AND OXYGEN. THE SLOW FEEDING OF OXYGEN FOR BIOCHEMICAL OXIDATION ACROSS THE BRIDGE PRODUCES ELECTRONS. THE METHOD MAY BE APPLICABLE TO REFUSE, SLUDGE AND OTHER ORGANIC WASTE TREATMENT. (PHEA)

10 06 FLUIDIZED-BED INCINERATORS

10-06-00355 COVERED PLANT TO BURN SLUDGE (INCINERATION(FLUID BED) SLUDGE(SEWAGE))
THE AMERICAN CITY 77(9), P. 8 (SEPTEMBER 1962). LYNWOOD, WASHINGTON, WILL BE THE FIRST COMMUNITY TO HAVE INSTALLED THE DORR-OLIVER FS SLUDGE DISPOSAL SYSTEM. THE PLANT IS PART OF A 1,892,000 DOLLARS PROJECT WHICH INCLUDES CONSTRUCTION OF SEWERS AND PUMP STATIONS. THE FS UNIT IS CAPABLE OF DISPOSING OF THE ENTIRE OUTPUT OF A PLANT INTENDED TO SERVE A POPULATION OF 60,000 IN 1975. THE FS SYSTEM BURNS THE SLUDGE TO A FINE ASH IN A CLOSED SYSTEM WITH WHICH IS ELIMINATED NUISANCES, AIR AND WATER POLLUTION ACCOMPANYING THE BURNING OF SLUDGE. (UC)

10-06-00464 POTENTIAL ADVANTAGES OF INCINERATION IN FLUIDIZED BEDS
BAILIE, R. C. + DONNER, D. M. + GALLI, A. F.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 12-17 (MAY 5-8, 1968). POTENTIAL ADVANTAGES OFFERED BY FLUIDIZED BED FURNACE FOR COMBUSTION OF WIDE VARIETY OF SOLID WASTES ARE PRESENTED ALONG WITH DESCRIPTION OF FLUIDIZED BED. SMALL PILOT PLANT FOR INVESTIGATION OF SOLID WASTE COMBUSTION IS DESCRIBED. SOME PRELIMINARY RESULTS OBTAINED FROM THIS PLANT ARE PRESENTED ALONG WITH DISCUSSION OF SOME PROBLEMS ENCOUNTERED IN FEEDING UNIT. (EI)

10-06-01055 FLUIDIZED-BED COMBUSTION
REH, L.
VERBRENNUNG IN DER WIRBELSCHICHT, CHEM ING-TECH 40(11), P. 500-515 (1968). A DISCUSSION IS GIVEN OF FLUIDIZED-BED COMBUSTION APPLICATIONS. EXAMPLES DESCRIBED IN DETAIL ARE- IRON PYRITE ROASTING AS AN EXOTHERMIC REACTION OF A SOLID FEED, HYDROLYSIS- OXIDES OF FERROUS CHLORIDE TO FERRIC OXIDE AND HCL AS AN ENDOTHERMIC REACTION OF A FLUID FEED, AND BURNING OF WET WASTE PRODUCTS IN PETROLEUM REFINERIES AS A MIXED PROCESS. (CA)

10-06-01143 FLUID BED INCINERATORS STUDIED FOR SOLID WASTE DISPOSAL (COMBUSTION EMISSION(CONTROL) DEMONSTRATION-GRANT)
ENVIRONMENTAL SCIENCE TECH 2(7), P. 495-497 (JULY 1968). ARTICLE DESCRIBES WORK UNDERWAY TO DETERMINE THE FEASIBILITY OF USING FLUIDIZED BED TECHNIQUES FOR REFUSE BURNING. ADVANTAGES OF THIS PROCESS ARE THE REDUCED EXCESS AIR REQUIREMENTS (PERHAPS AS LOW AS 5 PERCENT) AND RESULTING DECREASE IN OFF-GAS CLEANING EQUIPMENT AND LOWER COST. PROBLEMS NEEDING SOLUTION ARE THE FEEDING OF THE UNIT AND ASH REMOVAL. A TYPICAL FLUID BED REACTOR CONSISTS OF, A LOWER CHAMBER FOR DISTRIBUTING THE FLUIDIZING GAS, A MIDDLE SECTION WHERE THE BED MATERIAL (SUCH AS SILICA SAND) IS KEPT IN SUSPENSION BY THE FLUIDIZING GAS AND WHERE THE DESIRED REACTION TAKES PLACE, AND AN UPPER CHAMBER WHERE THE GAS PASSES OUT OF THE BED. A PILOT PLANT DEMONSTRATION IS CURRENTLY UNDER CONSTRUCTION.

10-06-01325 THE DISPOSAL OF SEWAGE SLUDGE BY COMBUSTION, WITH SPECIAL REFERENCE TO FLUIDIZATION METHODS (INCINERATION WET-OXIDATION)
MARSON, H. W.
J PROC INST SEW PURIF, P. 320-331 (1965). THE AMOUNT OF SEWAGE SLUDGE BEING PRODUCED HAS INCREASED CONSIDERABLY IN RECENT YEARS, AND DISPOSAL IS OFTEN DIFFICULT. SOME METHODS OF DISPOSAL ARE EXPENSIVE, DISPOSAL AT SEA MAY BE UNHYGIENIC, AND USE AS FERTILIZER MAY BE A HEALTH HAZARD (OWING TO THE PRESENCE OF RESISTANT INTESTINAL PARASITES IN THE SLUDGE) OR BE IMPOSSIBLE IF THE SLUDGE CONTAINS TOXIC METALS FROM TRADE WASTES WATERS. THE AUTHOR CONSIDERS THAT THE MOST SATISFACTORY METHOD OF DISPOSAL IS BY COMBUSTION AND HE DESCRIBES, WITH DIAGRAMS, VARIOUS PROCESSES FOR THIS PURPOSE, INCLUDING THE ZIMMERMANN AND CEDERQUIST WET COMBUSTION PROCESSES, THE ATOMIZED SUSPENSION TECHNIQUE, COMBUSTION IN ADMIXTURE WITH GARBAGE, COMBUSTION IN STAGE FURNACES AND DRUM FURNACES, AND FLUIDIZED COMBUSTION BY THE DORR-OLIVER PROCESS AND THE ESSLINGEN PROCESS, WHICH IS NOW IN USE AT LAUSANNE, SWITZERLAND. THE ADVANTAGES OF FLUDIZED COMBUSTION ARE INDICATED. (WPA)

10-06-02094 SMOKELESS FLUID-BED INCINERATOR IS ON STREAM
EWING, R. C.
OIL AND GAS JOURNAL 67(50), P. 68-69 (DECEMBER 15, 1969). A NEW FLUID INCINERATOR WHICH DISPOSES OF WASTES WITHOUT EMITTING SMOKE OR ODOR INTO THE ATMOSPHERE IS ON STREAM AT AMERICAN OIL CO., MANDON, N.D. REFINERY. THE UNIT IS DESIGNED TO DISPOSE OF OIL SLUDGES, EMULSIONS, AND ODOROUS CHEMICALS WITHOUT POLLUTING THE ATMOSPHERE. THE WASTE MATERIALS ARE CONVERTED INTO CARBON DIOXIDE, WATER, AND ASH, WHICH IS SUITABLE FOR LANDFILL DISPOSAL. THE ESTIMATED TOTAL COST OF THE PLANT WAS ABOUT $354,000. DESIGN DATA AND OPERATIONAL EXPERIENCE ARE GIVEN.

10-06-02174 COMBUSTION POWER UNIT - 400 (CPU-400 - A TECHNICAL ABSTRACT (FLUIDIZED-BED HEAT-RECOVERY TURBINE(GAS))
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE, ROCKVILLE, MARYLAND (1969). A REPORT BY COMBUSTION POWER CO. THAT DESCRIBES A TURBOELECTRIC GENERATOR PLANT THAT USES MUNICIPAL SOLID WASTE AS A FUEL. THE BASELINE CONFIGURATION IS A MODULAR UNIT THAT IS DESIGNED TO UTILIZE 400 TONS/DAY OF REFUSE (THE AMOUNT OF SOLID WASTE GENERATED BY A COMMUNITY OF 100,000 TO 200,000 POPULATION). THE 400 TONS OF REFUSE WILL PRODUCE UP TO 15,000 KW OF ELECTRIC POWER. THE HEART OF THE PROPOSED UNIT IS A FLUIDIZED BED REACTOR. VACUUM COLLECTION SYSTEMS AND DESIGNS TO PRODUCE DESALTED WATER OR STEAM ARE ALSO MENTIONED. NO MENTION IS MADE OF THE METHOD OF RESIDUE HANDLING OR DISPOSAL.

10 07 CERAMIC-METAL PRODUCTS

10 08 RAIL HAUL

10-08-00053 ENVISION TRAIN LOADS OF 1,500 - 2,000 TONS TO DELIVER BALES IN A SEALED RAILCAR CONTAINER (SANITARY-LANDFILL COMPACTION BALING RAIL-HAUL TRANSFER-STATION)
SOLID WASTES MANAGEMENT/RRJ 11(3), P. 12-13, 16, 30 (MARCH 1968). A PROPOSED OPERATION INCLUDING COMPACTION, BALING, RAIL HAUL AND LANDFILL IS OUTLINED. INITIALLY OPERATION WOULD BE IN CONJUNCTION WITH REGULAR RAILROAD SCHEDULES, BUT AS VOLUME INCREASES UNIT TRAINS ARE PROPOSED. DETAILS OF THE TRANSFER STATION AND LAND FILL OPERATION ARE GIVEN.

10-08-00055 REFUSE DISPOSAL BY RAILROAD (SHREDDING BALING RAIL-HAUL COMPACTION SANITARY-LANDFILL TRANSFER-STATION)
PUBLIC WORKS 99(7), P. 92 (JULY 1968). A PROPOSED RAIL-HAUL, STRIP MINE RECLAMATION SCHEME FOR THE CITY OF PHILADELPHIA IS DESCRIBED. WASTE WOULD BE COLLECTED AND DELIVERED TO TRANSFER STATIONS BY THE CITY. AT THE TRANSFER STATION THE WASTE WOULD BE SHREDDED AND BALED TO A DENSITY OF 70 TO 72 LBS/CU-FT. BALES WOULD BE LOADED ON RAIL CARS AND MOVED TO THE DISPOSAL SITE. DISPOSAL WILL BE IN ABANDONED STRIP MINING SITES IN UPSTATE PENNSYLVANIA. COST IS ESTIMATED TO BE $5.39/TON.

10-08-00057 RAILROAD WILL HAUL WASTE TO ABANDONED STRIP MINES (RAIL-HAUL SANITARY-LANDFILL ASH-DISPOSAL)
REFUSE REMOVAL JOURNAL 10(10), P. 14 (OCTOBER 1967). A DESCRIPTION OF THE PROPOSED RAIL HAUL SYSTEM FOR THE CITY OF PHILADELPHIA. IN ADDITION TO HOUSEHOLD REFUSE IT IS PROPOSED TO DISPOSE OF INCINERATOR ASH FROM THE PHILADELPHIA INCINERATORS. (SEE ALSO ENTRY 10-08-00055)

10-08-00171 RAIL-HAUL REFUSE DISPOSAL (TRANSFER-STATION COMPACTION COST(FREIGHT) REFUSE COLLECTION)
BUGHER, R. D. + WOLF, C.
THE AMERICAN CITY 83(8), P. 79-80 (AUGUST 1968). THE THREE MAJOR ELEMENTS OF THE APWA RAIL-HAUL STUDY ARE - (1) TRANSFER STATIONS, (2) RAIL HAUL LINK, AND (3) THE ULTIMATE DISPOSAL METHODS. MAJOR BENEFITS ARE - (1) RAIL-HAUL MIGHT BE ABLE TC DISPOSE OF REFUSE AT ABOUT 4.00 DOLLARS PER TON. (2) RAIL-HAUL MIGHT ENABLE COMMUNITIES TO CHANGE FROM METHODS OF DISPOSAL THAT ARE NOW INADEQUATE. (3) RAIL-HAUL ESTABLISHES A CAPABILITY FOR LAND RECLAMATION AND THE CONVERSION OF WORTHLESS MINING AND OTHER LAND TO ACTIVE RESOURCES. (4) THE RAIL-HAUL SYSTEM PROVIDES AN EFFECTIVE AND RELIABLE METHOD OF DISPOSING CF SOLID WASTES. (5) RAIL-HAUL IS BROADLY APPLICABLE TO LARGE AND SMALL COMMUNITIES. (6) IN TERMS OF ORGANIZATION, RAIL-HAUL IS CAPABLE OF ACCOMMODATING ALL KINDS OF ARRANGEMENTS.

10-08-00297 RAIL-HAUL PROJECT FOR PHILADELPHIA IS DEAD (TRANSPORTATION COST(CAPITAL) TRANSFER-STATION SANITARY-LANDFILL RECLAMATION(LAND))
SOLID WASTES MANAGEMENT/RRJ 11(2), P. 34 (FEBRUARY 1968). PHILADELPHIA'S CITY COUNCIL HAS KILLED THE PLAN FOR THE READING RAILROAD TO HAUL THE MUNICIPALITY'S REFUSE TO ABANDONED STRIP MINES IN SCHUYLKILL COUNTY. THE COST OF THE PROJECT WAS PUT AT $7 MILLION. PHILADELPHIA AND EASTERN LAND RECLAMATION COMPANY, A SUBSIDARY OF THE READING COMPANY, HAD REACHED AGREEMENT ON THE FOUR-YEAR EXPERIMENTAL PLAN. REFUSE WAS TO BE TREATED AT TWO TRANSFER STATIONS, WHICH THE CITY WOULD HAVE BUILT AT A COST OF ABOUT $5 MILLION, AND HAULED IN SEALED RAILCARS TO STRIP MINES NEAR POTTSVILLE, PENNSYLVANIA. AN ARTICLE ON THIS NOW-REJECTED PLAN WAS CARRIED IN THE OCTOBER, 1967, ISSUE OF SOLID WASTES MANAGEMENT/RRJ.

10-08-00706 WESTERN PACIFIC RAILROAD PLANNING A REFUSE EXPRESS (RAIL-HAUL)
REFUSE REMOVAL JOURNAL 10(9), P. 18 (SEPTEMBER 1967). A PROPOSAL IS BEING DEVELOPED TO RAIL-HAUL REFUSE FROM SAN FRANCISCO TO THE NEVADA DESERT. SEALED 70 CAR TRAINS ARE VISUALIZED.

10-08-00717 DENVER EYES RAIL TRANSFER STATIONS (QUANTITY RAIL HAUL COST(COLLECTION) COST(OPERATING)
SOLID WASTES MANAGEMENT/RRJ 11(1), P. 8 (JANUARY 1968). A PROPOSAL RECENTLY SUBMITTED TO THE CITY OF DENVER BY THE DENVER AND RIO GRANDE RAILROAD OFFERS TO DISPOSE OF HOUSEHOLD WASTES VIA RAIL LINES AND EQUIPMENT. CONTRACT TERMS CALL FOR DENVER TO CONTINUE COLLECTING FROM HOMES. MUNICIPAL TRUCKS WOULD HAUL THE REFUSE TO A PAIR OF IN-CITY TRUCK-RAIL TRANSFER STATIONS TO BE BUILT BY THE RAILROAD. THE RAILROAD WOULD THEN ASSUME COMPLETE RESPONSIBILITY FOR DISPOSAL. LANDFILL, INC., A DENVER FIRM WILL OPERATE THE DISPOSAL SITE AS A SUBCONTRACTOR. THE COMPANY HAS ENOUGH PROPERTY FOR 40 YEARS OF OPERATION. THE RIO GRANDE WOULD CHARGE DENVER $4.50/TON FOR A GUARANTEED MINIMUM OF 875 TONS/DAY WITH THE OPERATION IN SERVICE 5 DAYS/WEEK. REFUSE BURIAL, EXCLUSIVE OF TRANSPORTATION, NOW COSTS THE CITY $1/TON. VEHICLE COST IS $4.18/HR, LABOR COST (3 MEN/TRUCK) PER VEHICLE IS $13.13/HR. THE TOTAL COST PER VEHICLE IS $17.17/HR. USE OF THE RAILROAD SYSTEM WOULD RESULT IN A SAVING OF $81/HR/VEHICLE/WEEK OR A TOTAL OF $1,394/WEEK. (DETAILS OF THE CALCULATIONS ARE GIVEN IN THE ARTICLE.) A BREAKDOWN OF REFUSE COLLECTION VEHICLE AND LABOR COSTS IS TABULATED. ADVANTAGES - (1) ACCESSIBILITY OF THE TRANSFER STATIONS (CENTRALLY LOCATED AND ADJACENT TO THROUGH STREETS). (2) LOCATED IN COMMERCIAL ZONES. (3) FLEXIBILITY. (4) REDUCTION IN CAPITAL EXPENSES. OPERATION- THE TRUCK DRIVES UP AN ELEVATED RAMP AND DUMPS ITS CONTENTS INTO A SURGE BIN. A ROTARY PLOW MOVES THE TRASH ONTO A CONVEYOR BELT WHICH CARRIES IT TO THE SHREDDERS. THE SHREDDERS REDUCE ALL TYPES OF REFUSE, INCLUDING METALS, TO ONE-TENTH ITS ORIGINAL BULK. THE SHREDDERS ACCEPT TRASH AT 370 LB/CU-YD AND GRIND IT AT 175 CU-YD/HR. THE SHREDDED REFUSE IS DUMPED INTO RAILCARS, EACH HAVING A CAPACITY OF 50 TO 70 TONS. THREE TOP-LOCKING COMPARTMENTS ARE SECURED DURING TRANSIT. AT THE DISPOSAL SITE, THE TRAIN PULLS OFF ONTO A SIDING. THE CARS ARE DESIGNED TO TILT. OPENING THE SIDE DOORS CAUSES THE SHREDDED REFUSE TO FALL INTO THE CONCRETE RECEIVING BIN. A COVERED CONVEYOR BELT CARRIES THE REFUSE TO LANDFILL TRENCHES FOR BURIAL. (UC)

10-08-00980 GIANT RAILHAUL LANDFILL PLAN (COMPACTION SANITARY-LANDFILL RAIL-HAUL TRANSFER-STATION VOLUME-REDUCTION)
SOLID WASTES MANAGEMENT/RRJ 11(3), P. 12 (MARCH 1968). CONSTRUCTION OF A GOLF COURSE ATOP OF A LANDFILL, A $1 MILLION OUTRIGHT PAYMENT, AND 10 CENTS A TON ROYALTIES TO THE COMMUNITIES INVOLVED WERE SOME OF THE PROPOSALS OFFERED BY ASSOCIATED DEVELOPMENT CORP. TO SEVERAL UPSTATE NEW YORK MUNICIPALITIES IN AN EFFORT TO OBTAIN A LANDFILL SITE. THE LOCATION WOULD BE USED AS THE END-POINT FOR DEPOSITING BALED REFUSE RAILHAULED BY THE NEW YORK CENTRAL RAILROAD. THE SYSTEM AS PROPOSED BY ASSOCIATED DEVELOPMENT AND THE NEW YORK CENTRAL ENVISAGES THE CONSTRUCTION OF A TRANSFER COMPACTION STATION, REMOVAL OF THE COMPACTED REFUSE ON RAILCARS TO LANDFILL, AND PROCEDURES FOR ULTIMATE DISPOSAL AND RECLAMATION OF THE SITE. TRANSFER STATION - THE PROCESS CONSISTS OF LOADING REFUSE INTO CONTINUOUS-ACTING, EXTRUSION UNITS. REFUSE WOULD BE COMPACTED BY THE MACHINES INTO BALES HAVING A WEIGHT OF APPROXIMATELY 3,000-LB AND 18-IN X 96-IN IN SIZE. AFTER THE RAILROAD CARS ARE LOADED, THEY ARE CLOSED TO FACILITATE SHIPPING, ELIMINATE ODORS, AND PROMOTE SANITATION. AT FIRST, THE CARS WOULD BE A PART OF REGULARLY SCHEDULED FREIGHT RUNS. ONCE TONNAGE GROWS TO 1,500 TO 2,000 TONS, THE CARS WOULD RUN AS A UNIT TRAIN. PRESENT PLANS CALL FOR RAILCARS 50-FT LONG AND HAVING A CARRYING CAPACITY OF 240,000 POUNDS OR 120 TONS. THE CAR WILL BE CLOSED ON THREE SIDES WITH ONLY ONE SIDE EQUIPPED WITH OVERHEAD-TYPE DOORS. MATERIAL NOT SUBJECT TO COMPACTION WILL BE CARRIED IN OPEN GONDOLAS. THE ARTICLE LISTS SAFEGUARDS TO BE PROVIDED AGAINST STRIKES AND THE REQUIREMENTS FOR THE LANDFILL OPERATIONS. (UC)

10-08-01262 PROPOSE TRAIN HAUL TO DESERT LANDFILL (RAIL-HAUL TRANSFER-STATION SANITARY-LANDFILL COMPACTION VOLUME-REDUCTION ECONOMICS)
HAMLIN, G. H.
REFUSE REMOVAL JOURNAL 10(3), P. 10 (MARCH 1967). A SYSTEM OF TRANSPORTING SAN FRANCISCO BAY AREA REFUSE BY TRAIN IS DESCRIBED. TRANSFER STATIONS WOULD BE OPERATED BY A DISTRICT AT 10-MILE INTERVALS ALONG EXISTING RAILROADS ON EITHER SIDE OF THE BAY. TWO "UNIT TRAINS" WILL BE USED, EACH COMPOSED OF 70 TO 90 HIGH-VOLUME CARS OF 70 TONS OR MORE CAPACITY AND FOUR 3000 HP DIESEL LOCOMOTIVES. A DISTRICT- MANAGED LANDFILL WOULD BE OPERATED IN DESERT LANDS ALONG THE EASTERN BORDER OF CALIFORNIA AND ADJACENT TO EXISTING RAILROADS FOR EASY ACCESS BY A RAILWAY BRANCH. THE LANDFILL OPERATION WOULD INCLUDE THE USE OF MODERN CAR DUMPERS AND CONVEYOR BELT SYSTEMS. IT IS ESTIMATED THAT WITH THE USE OF A FILL DEPTH OF 18 FEET, AN AREA OF 9,125 ACRES WOULD SERVE FOR 50 YEARS. EXISTING AGENCIES WOULD DO THE LOCAL COLLECTING AND TRANSPORTING TO THE TRANSFER STATION. TRANSPORT AND DISPOSAL WOULD BE CARRIED ON BY THE SPECIALLY CREATED DISTRICT. (UC)

10-08-01560 A NEW USE FOR NEW JERSEY RAILROADS (RAIL-HAUL)
REFUSE REMOVAL JOURNAL 1(4), P. 12 (APRIL 1958). A GROUP OF 21 NORTHERN NEW JERSEY COMMUNITIES ARE INVESTIGATING A PROPOSED PLAN TO USE RAILROADS FOR LONG-DISTANCE HAULING OF REFUSE. UNDER THE PLAN, PROMPTED BY IMPENDING LEGISLATION AGAINST OPEN DUMPING, REFUSE WOULD BE COLLECTED BY TRUCK AND TAKEN TO SIDINGS CLOSE TO THE COLLECTION POINTS IN THE VARIOUS COMMUNITIES. THE REFUSE WOULD BE SHIPPED TO SOUTHERN NEW JERSEY FOR DISPOSAL BY SANITARY LANDFILL IN AREAS SELECTED BY THE STATE FOR RECLAMATION. (PHS)

10-08-01664 CHICAGO SANITARY DISTRICT BUYS RAILROAD CARS
REFUSE REMOVAL JOURNAL 2(9), P. 14 (SEPTEMBER 1959). THE METROPOLITAN SANITARY DISTRICT OF GREATER CHICAGO HAS PURCHASED 12 NEW AIR-DUMP, DUAL DROP-DOOR DUMP CARS. THESE WILL BE PUT INTO SERVICE DURING THE SUMMER OF 1960. (PHS)

10-08-01740 MILWAUKEE PICKS RAILHAUL INSTEAD OF INCINERATION (COST(OPERATING) COMPACTION(STATIONARY) SANITARY-LANDFILL TRANSFER-STATION RAIL-HAUL)
SOLID WASTES MANAGEMENT/RRJ 12(4), P. 10-11, 46 (1969). THE CITY OF MILWAUKEE, WISCONSIN, AND MILWAUKEE COUNTY HAVE TENTATIVELY SIGNED A 20-YEAR CONTRACT WITH THE CHICAGO, MILWAUKEE, ST. PAUL AND PACIFIC RAILROAD AND ACME DISPOSAL CORP. FOR RAILHAUL OF REFUSE TO REMOTE LANDFILL SITES. CHARGES WOULD BE $6.23/TON FOR UP TO 480,000 TONS PER YEAR AND WOULD BE DECREASED IN STEPS TO $5.45/TON AFTER 960,000 TONS PER YEAR. A MINIMUM VOLUME OF 360,000 TONS PER YEAR IS REQUIRED. THREE LARGE 1000 TON PER DAY TRANSFER STATIONS WOULD BE BUILT. CAPITAL CHARGES FOR THIS WOULD INCREASE COSTS TO FROM $5.66 TO $6.75/TON. THE TRANSFER STATIONS WOULD CONSIST OF 10 STATIONARY COMPACTION UNITS LOADING INTO SPECIAL 107 CU-YD, 30-TON CAPACITY CONTAINERS. WHEN FULL THE CONTAINERS WOULD BE PLACED ON RAIL CARS. EACH EVENING A TRAIN WOULD PICK UP 16 CARS AT EACH STATION (32 CONTAINERS) AND HAUL THEM TO THE LANDFILL SITE IN KENOSHA COUNTY. THE CONTAINERS WOULD BE REMOVED FROM THE CARS, DUMPED, CLEANED AND RETURNED TO THE TRANSFER STATIONS. EACH DAY'S SOLID WASTE WOULD BE LANDFILLED, COMPACTED, AND COVERED EACH DAY.

10-08-01816 $4.61 A TON ASKED TO RAILHAUL DENVER'S PICKUP OUT-OF-TOWN (COST(OPERATING) TRANSFER-STATION QUANTITY(WASTE))
SOLID WASTES MANAGEMENT/RRJ 12(3), P. 43 (MARCH 1969). A NEW BID BY THE DENVER AND RIO GRANDE RAILROAD TO HAUL AWAY DENVER'S REFUSE HAS BEEN MADE. BASED ON A MINIMUM OF 875 TONS OF REFUSE PER DAY THE COST WOULD BE $4.61. TWO CITY OWNED TRANSFER STATIONS WOULD BE REQUIRED. IT IS ESTIMATED THAT WASTE PRODUCTION IN DENVER IN 1968 WAS 5.9 POUNDS PER PERSON PER DAY. THE BID IS NOW BEING REVIEWED.

10-08-02079 REFUSE DISPOSAL VIA RAILROAD (RAIL-HAUL COMPACTION COST(OPERATING) LAW)
PUBLIC WORKS 97(11), P. 92 (JULY 1968). THE CITY OF PHILADELPHIA, PENNSYLVANIA, HAS PASSED AN ORDINANCE AUTHORIZING THE STREET DEPARTMENT TO SIGN A FOUR YEAR CONTRACT WITH EASTERN LAND RECLAMATION CO. FOR A RAIL-HAUL SYSTEM FOLLOWED BY DISPOSAL IN ABANDONED STRIP MINES IN UPSTATE PENNSYLVANIA. THE CONTRACT GUARANTEES THAT 260,000 TONS/YR WILL BE HANDLED AT A COST OF $5.39/TON. TWO TRANSFER STATIONS WILL BE BUILT WHICH WILL PRODUCE HIGH DENSITY BALES (70 TO 72 LBS/CU-FT) FOR LOADING IN THE SEALED RAIL CARS. DETAILS OF THE OPERATION ARE GIVEN.

10-08-02080 SOLID WASTE TRAIN IDEA DERAILS (RAIL-HAUL COST(OPERATING) INCINERATION HEAT-RECOVERY)
ENGRG NEWS-RECORD 183(7), P. 9 (AUGUST 14, 1969). A PROPOSED RAIL-HAUL CONTRACT BETWEEN SAN-FRANCISCO, CALIFORNIA, AND THE WESTERN PACIFIC RAILROAD HAS BEEN DROPPED. THE CITY INSISTS ON A 20-YR CONTRACT AND A PERFORMANCE BOND, NEITHER OF WHICH THE RAILROAD WANTS TO GIVE. COST ESTIMATES WERE $6.93, $6.98, AND $7.39/TON FOR 20, 15, AND 10 YEAR CONTRACTS. A NUMBER OF ALTERNATE SCHEMES HAVE BEEN PROPOSED INCLUDING MARINE DISPOSAL, COMPACTION FOLLOWED BY LANDFILL, AND INCINERATION WITH HEAT-RECOVERY.

10-08-02083 RAIL TRANSPORT OF SOLID WASTES - A FEASIBILITY STUDY - AN INTERIM REPORT
WOLF, K. W. + SOSNOVSKY, C. H.
APWA RESEARCH FOUNDATION, 130 PP. (OCTOBER 1968). THE CONCLUSIONS DRAWN FROM THE INFORMATION PRESENTED IN THIS REPORT SUGGEST THAT SOME OF THE BENEFITS, AS INDICATED IN THE ORIGINAL PROJECT APPLICATION, APPEAR TO BE ATTAINABLE. AT PRESENT, THE BENEFITS POTENTIALLY ACHIEVABLE THROUGH A SOLID WASTE RAIL HAUL SYSTEM, APPEAR TO BE AS FOLLOWS - 1. A STRONG POSSIBILITY OF REDUCING DIRECT WASTE DISPOSAL COST - CURRENTLY, IT IS CALCULATED, THAT SOLID WASTE RAIL HAUL WILL COST ABOUT $4-$4.50/TON, FOB TRANSFER STATION, (I.E., NOT INCLUDING THE COST OF LOCAL COLLECTION.). THESE COSTS, INCLUDING INVESTMENT AND OPERATIONS, BREAKDOWN AS FOLLOWS - TRANSFER STATION, ABOUT $1-$1.50/TON, RAIL HAUL, ABOUT $2.00/TON, AND DISPOSAL, ABOUT $1.00/TON. IN ADDITION, SOME COMMUNITIES MIGHT REALIZE CONSIDERABLE SAVINGS IN THEIR SOLID WASTE COLLECTION COST THROUGH A STRATEGIC LOCATION OF THE TRANSFER STATIONS THUS CUTTING DOWN ON LOCAL HAULING DISTANCES AND TIME. 2. A CHANGE FROM METHODS OF DISPOSAL THAT ARE INADEQUATE TO DESIRABLE METHODS AND A REDUCTION OF AIR AND WATER POLLUTION AS WELL AS OTHER ENVIRONMENTAL HEALTH HAZARDS - SOLID WASTE RAIL HAUL DOES NOT CONTRIBUTE TO AIR POLLUTION IN ANY SIGNIFICANT DEGREE. THE EXTREME FLEXIBILITY IN THE LOCATION OF THE DISPOSAL SITE ALLOWS A WIDE CHOICE AMONG SITES ACCORDING TO THEIR GEOLOGICAL SUITABILITY. 3. A BETTER UTILIZATION OF EXISTING RAIL INSTALLATIONS IN URBAN, AS WELL AS, RURAL AREAS. 4. A CAPABILITY FOR LAND RECLAMATION AND THE CONVERSION OF WORTHLESS MINING OR OTHER LAND INTO AN ACTIVE RESOURCE. 5. THE ESTABLISHMENT OF AN EFFECTIVE AND RELIABLE SOLID WASTE DISPOSAL SYSTEM. 6. A POTENTIAL FOR WIDESPREAD APPLICATION. 7. A HIGH DEGREE OF FLEXIBILITY WITH RESPECT TO THE WORKLOAD - SOLID WASTE RAIL HAUL CAN ACCOMMODATE GRADUAL AS WELL AS SUDDEN INCREASES IN THE TOTAL, AS WELL AS IN THE LOCAL, WORKLOAD, WHILE REQUIRING ONLY RELATIVELY SMALL ADAPTATIONS IN THE CAPACITY OF THE SYSTEM INSTALLATION. CONVERSELY, SYSTEM COSTS CAN BE CUT BACK DRASTICALLY IF THE WORKLOAD DECREASES. 8. ATTRACTIVE IMPLEMENTATION OPPORTUNITITIES - CONCERNING THE INDIVIDUAL SYSTEM ELEMENTS, THE EXPERIENCE IN OTHER FIELDS OF INDUSTRIAL-COMMERCIAL ENDEAVOR INDICATES THAT THE SYSTEM (A) IS SAFE TO OPERATE, (B) CAN BE IMPLEMENTED RATHER RAPIDLY, I.E., WITHIN TWELVE MONTHS, AND (C) OFFERS POTENTIAL USERS MANY OPTIONS FOR THE ORGANIZATION OF THE EFFORT. (AUTH)

10 09 SLURRY PUMPING AND PNEUMATIC TRANSPORT

10-09-00285 CONVEY REFUSE BY VACUUM (CENTRALZUG COLLECTION VACUUM)
REFUSE REMOVAL JOURNAL 10(34), (FEBRUARY 1967). A LONDON HIGH HOUSING DEVELOPMENT WILL ADOPT A SWEDISH SYSTEM OF PIPED REFUSE DISPOSAL TO SERVE A 1700-APARTMENT COMPLEX, ACCORDING TO MUNICIPAL ENGINEERING, A BRITISH PUBLIC WORKS MAGAZINE. THE SYSTEM, CALLED "CENTRAZUG" IS VACUUM SEALED AND REFUSE IS CONVEYED BY SUCTION. IN PLACE OF THE USUAL STORAGE CHAMBER OR INCINERATOR ON THE GROUND FLOOR OF THE APARTMENT, THE REFUSE WHICH HAS ACCUMULATED IN THE VERTICAL CHUTE IS DRAWN BY AIR PRESSURE THROUGH A HORIZONTAL PIPE TO A CENTRAL COLLECTING POINT. TURBO-EXTRACTORS ARE USED TO CREATE THE VACUUM IN THE HORIZONTAL PIPES. A PROGRAM IS ARRANGED SO THAT THE VALVE OF EACH CHUTE IS OPENED IN TURN AND THE CONTENTS DRAWN QUICKLY THROUGH THE TRANSPORTER PIPES TO THE CENTRAL COLLECTING POINTS FOR DISPOSAL. TO OFFSET HIGH CAPITAL INSTALLATION COSTS, SAVINGS ARE POSSIBLE BY ELIMINATING THE NEED FOR REFUSE STORAGE CONTAINERS AND CHAMBERS AND MULTIPLE PICK-UPS. (UC)

10-09-00508 PNEUMATIC CONVEYING FOR INCINERATION OF PAPER TRIM (SALVAGE(PAPER) SHREDDER DESIGN)
TANZER, E. K.
PROC OF THE NATIONAL INCINERATOR CONF, ASME, P. 309 (MAY 5-8, 1968). THE DESIGN PARAMETERS WERE DEVELOPED FOR A SYSTEM OF PNEUMATIC CONVEYING OF PAPER TRIMMINGS AND SHREDDED RESINS FROM MULTIPLE SOURCES TO BOILER FIRING 1400 FEET AWAY. THE NECESSARY AIR VELOCITY IN THE PIPING, BLOWER SIZES AND HORSEPOWER, AIR-TO-PAPER RATIO AND OTHER PRACTICAL DATA WERE DETERMINED. THE SYSTEM HAS BEEN IN USE THREE YEARS. A SYSTEM OF SCRAP PAPER TRANSPORT TO BALERS IS ALSO DESCRIBED.

10-09-00698 INSTALL VACUUM COLLECTION FOR $750,000 (COLLECTION)
REFUSE REMOVAL JOURNAL 10(8), P. 12, 45 (AUGUST 1967). A $750,000 VACUUM SYSTEM IS BEING INSTALLED IN THE ST. MARYLEBONE GOODS YARD HOUSING DEVELOPMENT IN LONDON. SOME 4,575 PEOPLE WILL LIVE THERE. A SIMILAR SYSTEM HAS BEEN INSTALLED IN STOCKHOLM, SWEDEN TO SERVE SOME 9000 PEOPLE IN 2700 FAMILY UNITS. A DESCRIPTION OF THE SYSTEM IS GIVEN.

10-09-00707 TRANSPORTING SOLIDS - SLURRIES BASIC PRINCIPLES AND POWER REQUIREMENTS (DESIGN)
ELLIS, H. S.
IND ENGR CHEM 55(8), P. 19-26 (AUGUST 1963). THE PIPE-LINE TRANSPORT OF SLURRIES IS SURVEYED. THE FOLLOWING TOPICS ARE COVERED - (1) FUTURE PROSPECTS, (2) BASIC PRINCIPLES, (3) NON-SETTLING MIXTURES, (4) SETTLING MIXTURES, (5) MINIMUM POWER FOR TRANSPORT, (6) EFFECT OF PARTICLE DENSITY, (7) EFFECT OF SOLID THROUGHPUT.

10-09-00716 RESEARCH SPARKS INTEREST IN NEW SOLIDS PIPELINES (SLURRY-PUMPING CAPSULE-FLOW)
ENGRG NEWS-RECORD 36, P. 37 (JANUARY 18, 1968). A SHELL CANADA LTD. SUBSIDIARY, COMMERCIAL SOLIDS PIPELINE CO. (CSP), HOPES TO BUILD A 750-MILE PIPELINE FROM CALGARY TO VANCOUVER TO CARRY SULFUR SLURRIED IN CRUDE PETROLEUM. THE RESEARCH COUNCIL OF ALBERTA IS RUNNING A $500,000 PILOT STUDY TO SEE IF IT IS POSSIBLE AND ECONOMICAL TO RUN CAPSULES CONTAINING PRODUCTS THROUGH PIPELINES. THE COUNCIL SET UP A 3,500-FT LOOP OF 4-IN PIPE IN EDMONTON AND IS RUNNING TRAINS OF HOLLOW STEEL CYLINDERS, 3-1/2-IN IN DIAMETER BY 15-IN LONG, THROUGH IT IN WATER. IT WILL USE ANTIFREEZE AND THEN OIL AS THE CARRYING FLUID LATER. THE CAPSULES RUNNING THROUGH THE LINE NOW ARE EMPTY, BUT RESEARCHERS WILL FILL THEM WITH VARIOUS TYPES OF MATERIAL LATER TO SEE IF THE LOADED CYLINDERS TRAVEL ALONG THE LINE AS WELL AS THEY DO EMPTY. THE COUNCIL THINKS THE CAPSULE IDEA WILL ELIMINATE SEVERAL PROBLEMS USUALLY FOUND IN SLURRY PIPELINES WHERE MATERIALS FLOW ALONG IN A FLUID CARRIER. SLURRIES OF ABRASIVE MATERIALS WEAR OUT PIPE WALLS, MANY CARGOES (SUCH AS GRAIN) WOULD BE DESTROYED BY THE LINE FLUID AND SOME CARGOES CAN BE RUINED BY MECHANICAL STRESSES ALONG THE LINE. A BIG EXPENSE OF SLURRY LINES IS DRYING THE CARGO AT THE END OF THE LINE. PUTTING THE CARGO IN A CAPSULE WOULD, ACCORDING TO THE COUNCIL, ELIMINATE ALL OF THESE PROBLEMS. AT ITS TEST SITE, THE COUNCIL FOUND THAT THE CAPSULES TEND TO CENTER THEMSELVES IN THE PIPELINE AND MOVE AS MUCH AS 10 PERCENT FASTER THAN THE AVERAGE LIQUID SPEED. IT FOUND THAT STABLE FLOW OCCURS AT MUCH LOWER VELOCITIES THAN ARE POSSIBLE WITH SLURRY LINES AND THAT SPHERICAL CAPSULES THAT TRAVEL WITH A ROLLING MOTION APPEAR TO PERFORM BEST. COUNCIL RESEARCHERS H. S. ELLIS AND R. T. LIDDLE HAVE ALREADY PATENTED A DEVICE THAT INJECTS HIGH PRESSURE LIQUID FROM PUMPS INTO THE LINE TO PUSH THE CAPSULE TRAIN ALONG. A SECOND PATENT APPLICATION, NOW BEING PROCESSED, COVERS A REVOLVER DEVICE THAT LETS THE CAPSULES PASS AUTOMATICALLY FROM THE LOW TO THE HIGH PRESSURE SIDE OF THE PUMP THROUGH SLOTS IN A REVOLVING PLATE. ELLIS AND LIDDLE SAY THAT REMOVING THE CAPSULES AT THE END OF THE LINE CAN BE DONE BY RUNNING THEM OVER ROLLERS WHILE THE LINE'S LIQUID FALLS INTO A TANK UNDER THE ROLLERS. THE COUNCIL IS ALSO LOOKING INTO THE POSSIBILITY OF PIPING COAL IN SLUGS. SEVERAL U.S. FIRMS HAD PROVED, BEFORE THE RAILROADS LOWERED PRICES, THAT COAL SLURRIED IN WATER CAN RUN ECONOMICALLY THROUGH PIPELINES. NOW THE COUNCIL WANTS TO TRY MAKING A PILL OF COAL PASTE HELD TOGETHER WITH WATER. IF THE CONVEYING LIQUID WERE OIL, THE LINE COULD BE A DUAL-USE ONE CARRYING THE COAL IN THE OIL STREAM. SULFUR PASTE HELD TOGETHER WITH OIL MIGHT BE PIPED IN WATER. POTASH AND CEREAL GRAINS ARE ALSO BEING CONSIDERED FOR PIPE-LINE TRANSPORT.

10-09-01052 1984 IN 1967 - USE OF AIR FOR CONVEYING REFUSE OVER VARYING DISTANCES (CENTRALZUG PNEUMATIC-TRANSPORT COLLECTION)
MARCHANT, A. J.
PUBLIC CLEANSING 57, P. 189 (APRIL 1967). PNEUMATIC SYSTEMS FOR CONVEYING REFUSE OVER VARYING DISTANCES HAVE IN A LIMITED WAY BEEN WITH US FOR A NUMBER OF YEARS. SUCH SYSTEMS HAVE BEEN INSTALLED IN HOSPITALS AND PRIVATE DWELLINGS PRIMARILY FOR THE REMOVAL OF DUST AND FLOOR SWEEPINGS. A DESCRIPTION IS GIVEN OF A PNEUMATIC SYSTEM INSTALLED IN A NEW HOSPITAL AT SOLLEFTEA, SWEDEN. LIMITATIONS OF THE SYSTEM ARE DISCUSSED. THE SYSTEM IS ALSO BEING INSTALLED IN A HOUSING DEVELOPMENT IN SUNDEBERG, SWEDEN, AND IS BEING PROPOSED FOR A DEVELOPMENT IN ENGLAND.

10-09-01191 COLLECTION OF MUNICIPAL SOLID WASTES IN PIPELINES (COST(CAPITAL) COST(OPERATING) GRINDING HYDRAULIC-TRANSPORT PNEUMATIC-TRANSPORT)
ZANDI, I. + HAYDEN, J. A.
PAPER PRESENTED BEFORE THE TRANSPORTATION CONF, AM SOC CIVIL ENGRS, SAN DIEGO, CALIFORNIA, (MEETING PREPRINT NO. 640). (FEBRUARY 1967). IN THE PAPER AN EXAMINATION IS MADE OF THE FEASIBILITY OF THE APPLICATION OF SOLID TRANSPORT IN PIPELINES TO THE COLLECTION AND REMOVAL OF SOLID WASTES. "WHETHER THE PIPELINE TRANSPORT OF SOLID WASTE MAY BE CONSIDERED AS A SERIOUS ALTERNATIVE TO TRUCK COLLECTION, DEPENDS UPON THE ANSWERS TO TWO FUNDAMENTAL QUESTIONS- (1) IS PIPELINE TRANSPORT OF SOLID WASTE TECHNOLOGICALLY FEASIBLE? (2) HOW DOES SOLID WASTE PIPELINE COMPARE ECONOMICALLY WITH THE TRUCK COLLECTION?" ACCORDING TO THE PAPER, UNDER THE CONDITIONS PREVAILING IN PHILADELPHIA, PENNSYLVANIA, THE COLLECTION AND REMOVAL OF SOLID WASTE IN A COMBINED PNEUMATIC AND SLURRY SYSTEM WOULD BE TECHNOLOGICALLY AND ECONOMICALLY FEASIBLE. THE LONGER THE HAULAGE TO THE DISPOSAL SITE, THE MORE ATTRACTIVE THE PIPELINE SYSTEM BECOMES. THE MORE WASTE TO BE HANDLED, THE LESS EXPENSIVE THE PIPELINE WOULD BE FOR A UNIT OF WASTE, ON THE OTHER HAND, THE COSTS OF TRUCK COLLECTION WOULD INCREASE PROPORTIONATELY. THE PROBLEMS INVOLVED ARE OVERWHELMING AND THE INITIAL CAPITAL REQUIRED IS HUGE, BUT THE GAINS ARE ATTRACTIVE.

10-09-01261 VACUUM NETWORK SERVES 3,000 APARTMENTS (COLLECTION PNEUMATIC-TRANSPORT)
BJORKMAN, A. A.
REFUSE REMOVAL JOURNAL 10(3), P. 12 (MARCH 1967). IN THE ARTICLE IS DESCRIBED A SYSTEM OF REFUSE TRANSPORT BY UNDERGROUND PIPELINE BETWEEN APARTMENT DWELLINGS AND A CENTRAL COLLECTING STATION. THE INSTALLATION IS LOCATED IN STOCKHOLM, SWEDEN. THE SCHEME WILL EMBODY 3,000 APARTMENT UNITS AND HAVE A MAXIMUM DISTANCE OF 1-1/2 MILES. THE MAIN PIPE WILL BE 24 IN. IN DIAMETER. AT THE BOTTOM OF EACH REFUSE CHUTE IS A VALVE ROOM. ROOMS ARE CONNECTED BY PIPES TO A CENTRAL REFUSE BUNKER EQUIPPED WITH A TURBINE EXHAUSTER, DUST FILTER, ETC. VALVES UNDER THE DIFFERENT REFUSE CHUTES ARE OPENED FOR A FEW MOMENTS CONSECUTIVELY AND PERIODICALLY BY AN AUTOMATIC REMOTE CONTROL DEVICE. THE POWER CONSUMPTION IS 90 KW. (UC)

10-09-01996 ARE PIPELINES THE ANSWER TO WASTE COLLECTION DILEMMA? (COLLECTION SLURRY-PUMPING COST(OPERATING) COST(CAPITAL) SIZE-REDUCTION)
ZANDI, I.
ENVIRONMENTAL SCIENCE TECH 3(9), P. 812-819 (SEPTEMBER 1969). EVEN WITH PRESENT TECHNOLOGY, PIPING SOLID WASTE TO DISPOSAL POINTS APPEARS ATTRACTIVE. A POTENTIALLY SIGNIFICANT ADVANTAGE OF THE SOLID WASTE PIPELINE IS THE POSSIBILITY OF ATTAINING HIGH EFFICIENCY DUE TO ECONOMIES OF SCALE.

10-09-02128 AN INVESTIGATION INTO THE VACUUM SYSTEM OF REFUSE COLLECTION (CENTRALZUG PNEUMATIC-COLLECTION)
CRELLIN, A. D.
70TH ANNUAL CONF OF THE INSTITUTE OF PUBLIC CLEANSING, BRIGHTON, (JUNE 11-14, 1968). A DESCRIPTION OF TRANSPORTING REFUSE IN PIPES WITH THE USE OF AIR (VACUUM). A PHYSICAL DESCRIPTION OF THE PLANT AND SOME OPERATING EXPERIENCE IS GIVEN.

10-09-02170 COLLECTION AND REMOVAL OF MUNICIPAL SOLID WASTES BY PNEUMO-SLURRY SYSTEM (COLLECTION GRINDING SLURRY-TRANSPORT ECONOMICS)
ZANDI, I.
COMPOST SCIENCE 9(2), P. 7-11 (SUMMER 1968). A DETAILED DESCRIPTION OF THE USE OF A SLURRY TRANSPORT SYSTEM FOR THE TRANSPORT OF SOLID WASTES IN UNDERGROUND PIPELINES. THE CITY OF PHILADELPHIA IS USED FOR THE DESIGN AND COST ESTIMATES. THE SYSTEM CONSISTS OF A PRELIMINARY VACUUM COLLECTION STEP, SIZE REDUCTION, AND THEN SLURRY TRANSPORT. EXPERIMENTAL DATA AND COST ESTIMATES ARE PRESENTED. A DISCUSSION IS ALSO PRESENTED OF POSSIBLE DISPOSAL OPERATIONS THAT COULD BE PERFORMED ON THE SLURRY, SUCH AS WET-OXIDATION, AND THE POSSIBILITY OF USING THE PIPELINE AS A BIOLOGICAL REACTOR.

10 10 AEROBIC LANDFILLS

10-10-00571 SANITARY LANDFILL BEHAVIOR IN AN AEROBIC ENVIRONMENT
MERZ, R. C. + STONE, R.
PUBLIC WORKS 97(1), P. 67 (JANUARY 1966). AN AEROBIC LANDFILL CELL WAS CONSTRUCTED AND WAS PROVIDED WITH AN ACCESS WELL IN WHICH COULD BE LOCATED OUTLETS FOR GAS COLLECTION LINES, LEACH COLLECTION LINES, AND ELECTRICAL LEADS. IT ALSO SERVED AS A MEANS FOR HUMAN ACCESS IN THE PLACING OF EQUIPMENT AND TAKING OF DATA. A SYSTEM OF PIPING TO ADMIT AIR ALSO WAS INSTALLED. TO PREVENT THE AIR FROM BEING FORCED THROUGH THE EARTH COVER AND INTO THE ATMOSPHERE, AN IMPERVIOUS POLYETHYLENE MEMBRANE WAS STRETCHED ONE FOOT BELOW THE SURFACE THE TOTAL RATE OF SETTLEMENT OVER 344 DAYS WAS 1.66 FT, A SHRINKAGE 4 TO 6 TIMES GREATER THAN THAT OCCURRING UNDER ANAEROBIC CONDITIONS. THE CHIEF COMPONENTS OF THE GAS TAKEN AT THE TOP AND BOTTOM LEVELS WERE NITROGEN, METHANE, OXYGEN, AND CARBON DIOXIDE. AT TIMES HYDROGEN WAS DETECTED. THE TEMPERATURE WAS HIGHER AND HAD A GREATER RANGE IN THE AEROBIC CELLS THAN IN THE ANAEROBIC CELLS. IN THE FORMER, IT RANGED FROM 113 DEGREES TO 193 DEGREES F AT THE 10-FT LEVEL. GASES DISCHARGED FROM BOTH AEROBIC AND ANAEROBIC CELLS HAD AN OBJECTIONABLE ODOR.

10-10-00966 LAND CONSERVATION BY AEROBIC LANDFILL STABILIZATION (SANITARY-LANDFILL COST(OPERATING))
STONE, R. + CONRAD, E. T. + MELVILLE, C.
PUBLIC WORKS 99(12), P. 95-97, 138, 140 (1968). THE MAJOR PURPOSE OF THE THREE-YEAR PROGRAM SPONSORED BY THE CITY OF SANTA-CLARA, CALIFORNIA, UNDER A U.S. PUBLIC HEALTH SERVICE DEMONSTRATION GRNAT HAS BEEN TO DEMONSTRATE ACCELERATION OF THE STABILIZATION PROCEDURE IN WHICH COMPACTED REFUSE IS AEROBICALLY DECOMPOSED BEFORE FINAL DISPOSAL. IN A NORMAL ANAEROBIC LANDFILL, METHANE, CARBON DIOXIDE AND AMMONIA ARE PRODUCED AS BYPRODUCTS OF DECOMPOSITION. IN CONTRAST, THE ADDITION OF OXYGEN GENERALLY RESULTS IN A CHEMICAL REACTION WITHIN THE LANDFILL IN WHICH WATER IS PRODUCED IN PLACE OF METHANE. IN THIS PROCESS, THE REFUSE IS FIRST DUMPED AND COMPACTED WITHIN A LARGE CELL WHICH HAS BEEN UNDERLAIN WITH A SERIES OF GRAVEL-COVERED PERFORATED PIPES THROUGH WHICH AIR MAY BE FORCED. AFTER THE REFUSE HAS BEEN AERATED FOR A SPECIFIC LENGTH OF TIME, THE RELATIVELY STABLE RESIDUE IS TRANSFERRED FROM THE AERATION PIT TO A FINAL RESIDUE CELL WHERE IT RECEIVES RECOMPACTION AND A SOIL COVER IN THE STANDARD MANNER. THE CELL IS THEN ALLOWED TO REVERT TO AN ANAEROBIC STATE. AS EXPECTED THE AEROBIC BIOLOGICAL DECOMPOSITION WAS FAR MORE RAPID THAN ANAEROBIC DECOMPOSITION. THERMISTORS WERE IMBEDDED IN THE COMPACTED MATERIAL, AND THE INTERNAL TEMPERATURES OF THE AERATED REFUSE WERE RECORDED. THE TEMPERATURES IN THE CELL ROSE RAPIDLY TO APPROXIMATELY 190 DEGREES F. WHICH IS SUBSTANTIALLY HIGHER THAN NORMAL FOR MOST THERMOPHILIC PROCESSES. TEMPERATURES REMAINED AT OR NEAR THIS LEVEL UNTIL AERATION WAS TERMINATED. THE CYCLE OF REFUSE FILLING, AERATION, AND TRANSFER FOR FINAL DISPOSAL CAN BE REPEATED SEVERAL TIMES, REUSING THE AERATION UNDERDRAIN AND BLOWER. ON A WEIGHT BASIS, THE UNIT COSTS FOR THIS PROCESS WERE CALCULATED (PRELIMINARY) TO BE ABOUT $0.50 TO $0.95/TON DELIVERED.

10 11 TEZUKA BALER

10-11-00157 EDITORIAL (BUILDING-MATERIAL)
SOLID WASTES MANAGEMENT/RRJ 11, P. 14 (MARCH 1968). A PORTION OF THE EDITORIAL IS DEVOTED TO COMMENTS ABOUT TEZUKA KOSAN REFUSE BALING PROCESS. A "WORKING" MODEL, SIX STORIES HIGH, COSTING THE EQUIVALENT OF 1.5 MILLION DOLLARS HAS BEEN ERECTED IN TOKYO TO DEMONSTRATE THE PROCEDURE. THE MANUFACTURERS CLAIM THAT THE PRESS CAN REDUCE A TON OF REFUSE INTO A "HARD" BALE, ONE CU-YD IN SIZE. THE BLOCKS CAN BE TRANSPORTED BY RAIL OR ROAD TO A LANDFILL OR TIPPED INTO THE SEA. THE MANUFACTURER CLAIMS THAT THE BALES CAN BE COATED WITH AN INCH OF CONCRETE OR ASPHALT AND USED AS BUILDING BLOCKS. NO METHANE WOULD BE FORMED BECAUSE THE BACTERIA WOULD BE KILLED BY THE PRESSURE. ONE MACHINE CAN BALE 750 TONS OF REFUSE A DAY AND PROVIDE A LIKE NUMBER OF COMPRESSED BLOCKS EVERY 24 HOURS. "THE JAPANESE BALING PROCESS HAS NEVER BEEN PUT INTO USE. IN FACT, THE PRESENT DEMONSTRATIONS SHOW IT TO BE FAR FROM LIVING UP TO THE CLAIMS OF ITS BACKERS. MANY FAILINGS MUST BE ELIMINATED, BEFORE A FULL-SCALE EXPERIMENTAL TRIAL CAN EVER BE MADE."

10-11-00161 NEAT LITTLE BALES OF GARBAGE
THE AMERICAN CITY 82(9), P. 32 (SEPTEMBER 1967). A MACHINE TO COMPRESS REFUSE INTO SMALL BALES WRAPPED IN WIRE MESH VINYL FILM IS DESCRIBED. FINAL DENSITY IS ABOUT 75 LBS/CU-FT WHICH WILL ALLOW THE BALES TO SINK, EVEN IN SEA WATER. SIZES AVAILABLE ARE FROM 50 TO 500 TONS PER DAY. MACHINE IS MADE BY TEZUKA KOSAN CO., LTD., JAPAN.

10-11-00226 LETTER TO THE EDITOR (BALING)
SOLID WASTES MANAGEMENT/RRJ 11(5), P. 62 (MAY 1968). A QUESTION IS RAISED AS TO THE ABILITY TO COMPRESS REFUSE TO DENSITIES REPORTED BY MANUFACTURERS AND PROMOTERS OF SPECIALIZED PROCESSES. ALSO A QUESTION IS RAISED ON RAIL HAUL AS FAR AS ITS APPLICABILITY TO THE SOLID WASTE PROBLEM.

10-11-02078 HIGH COMPRESSION BALING OF SOLID WASTES (TEZUKA-KOSAN COST(CAPITAL) COST(OPERATING))
ROGUS, C. A.
PUBLIC WORKS 100(6), P. 85-90 (JUNE 1969). A DETAILED DESCRIPTION OF THE TEZUKA-KOSAN HIGH PRESSURE COMPRESSION AND BALING MACHINE IS GIVEN. SKETCHES SHOWING THE OPERATING SEQUENCES ARE GIVEN. BALES PRODUCED CAN BE ENCASED IN ASPHALT, PLASTIC, CONCRETE, OR STEEL. AN ECONOMIC ANALYSIS IS MADE BETWEEN THIS SYSTEM, AND ONE OF LOWER COMPACTION PRESSURES. THE HIGH PRESSURE BALER WAS FOUND TO BE MORE ECONOMICAL.

10-11-02121 THE TEZUKA REFUSE COMPRESSION SYSTEM (COST(CAPITAL) COST(OPERATING))
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE, CINCINNATI, OHIO, 1969. THE MAIN COMPRESSION PROCESS USES AN INGENIOUS APPROACH IN UTILIZING A LIMITED AMOUNT OF PRESSURE FORCE BY CONCENTRATING ONTO SMALL AREAS. THIS INGENIOUS PROCESS ALSO CAN PRODUCE ZONES OF HIGHER COMPACTION INSIDE THE BALE BY APPLYING COMPRESSION FORCES BELOW THE ORIGINAL PRESSURE CONTACT SURFACE. BY THIS APPROACH TEZUKA AVOIDS EXPENSIVE HYDRAULICS NEEDED TO PRODUCE HIGHER FORCES ON THE RAM. IF ONE ASSUMES THAT THE SAME RESULTS COULD BE OBTAINED WITHOUT THE CYLINDER APPROACH BY INCREASING THE PRESSURE TO 3000 PSI OVER THE TOTAL PRESSURE FACE, THEN THE FORCE ON THE RAM WOULD HAVE TO BE INCREASED BY APPROXIMATELY 4.5 TIMES. THE SPECIFIC COST/PERFORMANCE VALUES OF THE TEZUKA PROCESS AND ITS INDIVIDUAL SYSTEM ELEMENTS CAN NOT BE DETERMINED FROM THE DATA PRESENTLY AVAILABLE. IN THE OVER-ALL, THE TEZUKA SYSTEM APPEARS TO BE COMPLICATED AND, IN PART, VERY CUMBERSOME. AS THE SIZE OF THE BALE INCREASES, THE PRODUCTIVITY OF THE PRESS, IN TERMS OF TONS OF PRODUCT PER DAY PER DOLLAR OF INVESTMENT, WILL DECREASE RATHER THAN INCREASE. IT IS PROBABLE THAT THE TEZUKA PROCESS CAN BE APPRECIABLY IMPROVED THROUGH ADDITIONAL PROCESS ENGINEERING.

10 12 CONVEYOR BELT TRANSPORT

10-12-01848 WASTE FROM COAL MINE CONVEYED THROUGH MOUNTAIN
REFUSE REMOVAL JOURNAL 8(8), P. 42 (1965). THOUSANDS OF TONS DAILY COME FROM THE COAL MINES AS UNUSUABLE REFUSE, THAT IS COSTLY AND OFTEN PHYSICALLY DIFFICULT TO DISPOSE OF. AT THE KOPPERSTON, W.VA. MINE THE REFUSE IS REMOVED FROM THE COAL PREPARATION PLANT UP THE MOUNTAIN, THROUGH A MOUNTAIN INTO THE NEXT VALLEY WHERE IT IS HAULED TO A LANDFILL FOR COMPACTION.

10-12-02092 SECOND AVENUE " SUBWAY " FOR GARBAGE URGED (CONVEYOR-BELT)
THE WASHINGTON POST, P. A9 (SEPTEMBER 23, 1969). A PLAN WHEREBY GARBAGE WOULD BE TRANSPORTED BY A HIGH-SPEED CONVEYOR BELT PARALLEL TO THE SUBWAY TRAINS HAS BEEN PROPOSED.

10 13 CHEMICAL AND BIOLOGICAL METHODS

10-13-00779 THERMAL DECOMPOSITION OF HUMAN WASTE (INCINERATION)
QUON, J. E. + PIPES, W. O.
PROC OF AM SOC CIVIL ENGRS J SANIT ENGRG DIV 89(SA1), PAPER 3382, P. 1-16 (JANUARY 1963). STUDY TO PROVIDE INFORMATION FOR DESIGN OF INCINERATORS FOR HUMAN WASTE. EQUATION IS PROPOSED TO DESCRIBE VOLATILIZATION PROCESS. DETERMINATION OF DEPENDENCE OF CONSTANTS IN VOLATILITY EQUATION ON TEMPERATURE AND ON RATE OF AIR SUPPLY TO VOLATILIZATION CHAMBER. VOLATILIZATION TEMPERATURES AS LOW AS 300 C MAY BE FEASIBLE FOR INCINERATOR DESIGNS THAT PROVIDE REACTOR FOR OXIDATION OF MATERIAL VOLATILIZED. (EI)

10-13-02045 METAL-CATALYZED OXIDATION OF POLYETHYLENE (SALVAGE)
ALTER, H.
IND ENGR CHEM 52(2), P. 121-124 (FEBRUARY 1960). THE RESULTS REPORTED FOR THE METAL-CATALYZED OXIDATION OF POLYETHYLENE ARE CONSISTENT WITH THE MECHANISMS PREVIOUSLY REPORTED FOR MODEL COMPOUNDS; NO SINGLE MECHANISM IS PROPOSED. THE MECHANISMS DESCRIBED AND EXPERIMENTAL RESULTS INDICATE THAT HIGHLY BRANCHED AND UNSATURATED POLYETHYLENE WILL BE MOST SUSCEPTIBLE TO METAL-CATALYZED OXIDATION. IT MAY BE POSSIBLE TO PREDICT PRODUCTS BY STARTING WITH A POLYETHYLENE OF PRESELECTED STRUCTURE AND EMPLOY METAL-CATALYZED OZONE OXIDATION OF OFF-GRADE POLYETHYLENE IN CHEMICAL MANUFACTURING. MECHANISTIC DESCRIPTIONS OF THE REACTION INDICATE THAT CONVENTIONAL ANTIOXIDANTS MAY PROTECT BRANCHED POLYETHYLENES FROM PIGMENT-CATALYZED DEGRADATION. (AUTH)

10-13-02107 CONVERSION OF ORGANIC SOLID WASTES INTO YEAST (SALVAGE HYDROLYSIS ECONOMICS FERMENTATION)
MELEE, F. H.
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE PUB 1909, WASHINGTON, D.C., (1969). THE FEASIBILITY OF CONVERTING URBAN AND AGRICULTURAL ORGANIC SOLID WASTES SUCH AS WASTE PAPER, BAGASSE, ETC., INTO EDIBLE PROTEIN IN A TWO STAGE PROCESS OF HYDROLYSIS AND FERMENTATION IS CONSIDERED. BASED ON THE PROCESS AND ECONOMIC EVALUATION INCLUDED IN THE REPORT, THE PROCESS APPEARS TO HAVE SOME POTENTIAL.

10-13-02166 NOVEL PROCESS COULD AID IN WASTE DISPOSAL (SALVAGE)
CHEM AND ENGRG NEWS 47(48), P. 43 (NOVEMBER 17, 1969). AS A RESULT OF THE U.S. BUREAU OF MINES RESEARCH IN EXPERIMENTING WITH WAYS OF PRODUCING OIL FROM LIGNITE, SUB-BITUMINOUS, AND BITUMINOUS COAL, THEY HAVE DISCOVERED A PROCESS WHEREBY CELLULOSE MAY BE CONVERTED TO OIL. SINCE REFUSE IS MADE UP OF A HIGH PERCENT OF CELLULOSE MATERIALS THERE IS A POSSIBILITY THE REFUSE MIGHT BE USED IN SUCH A PROCESS. BASED ON DATA ALREADY DEVELOPED, ONE TON OF CELLULOSE REFUSE COULD YIELD ONE BARREL OF OIL. IT IS POINTED OUT THAT NOT ONLY ARE THEY HELPING THE REFUSE DISPOSAL PROBLEM, BUT THE OIL PRODUCED IS LOW IN SULFUR WHICH WILL REDUCE THE AIR POLLUTION PROBLEM.

10-13-02169 METHOD OF DEGRADING POLYSACCHARIDES USING LIGHT RADIATION AND A WATER-SOLUBLE METAL OR NITROGEN BASE SALT OF NITROUS OR HYPONITRIC ACID (SALVAGE)
SCHWARTZ, A. M. + RADER, C. A.
PATENT U.S. 3,352,773 (NOVEMBER 14, 1967). POLYSACCHARIDES SUCH AS STARCH AND CELLULOSIC MATERIALS ARE CONVERTED TO SACCHARIDES OF LOWER MOLECULAR WEIGHT BY IRRADIATION WITH LIGHT RICH IN FREQUENCIES IN THE NEIGHBORHOOD OF 355 MILLIMICRONS IN THE PRESENCE OF A WATER-SOLUBLE METAL OR NITROGEN BASE SALT OF NITROUS OR HYPONITRIC ACID. (AUTH)

10 14 HIGH-TEMPERATURE INCINERATION (SLAGGING)

10-14-00776 UNIVERSAL REFUSE DISPOSAL, THE FLAME CHAMBER MELT-DOWN
WOTSCHKE, J.
AUF DEM WEGE ZUR UNIVERSALEN ABFALLBESEITIGUNG. BRENNSTOFF-WAERME-KRAFT 16(8), P. 383-391 (AUGUST 1964). THE METHOD DESCRIBED OPERATES AT HIGH COMBUSTION TEMPERATURES. THE REFUSE DEPOSITS WHICH LINE THE FLAME CHAMBER ARE COMPLETELY CONVERTED INTO HOT DUST-FREE FLUE GAS (COMBUSTIBLE MATTER) AND SLAG (INCOMBUSTIBLE MATTER). (PHEA)

10 15 OTHER GENERAL ARTICLES

10-15-00695 COMBINES SLUDGE AND SOLID WASTES (SLUDGE(SEWAGE) COST(OPERATING) INCINERATION)
REFUSE REMOVAL JOURANL 10(8), P. 42 (AUGUST 1967). SUGGESTS COMBINING SEWAGE SLUDGE AND SOLID WASTE DISPOSAL OPERATIONS. ANY OF THE THREE COMMON METHODS OF SOLID WASTE DISPOSAL, INCINERATION, SANITARY LANDFILL, AND COMPOSTING, ARE CAPABLE OF HANDLING COMBINED SLUDGE-REFUSE COMBINATIONS.

10-15-01501 FEASIBILITY STUDY OF A NEW SOLID WASTE SYSTEM (BULKY-WASTE SALVAGE RESEARCH-NEEDS COLLECTION SHREDDER GRINDING POWER MARKETING ECONOMICS BUILDING-MATERIAL INCINERATION)
EGGEN, A. + POWELL, O. A., JR.
UNIVERSITY OF HARTFORD, HARTFORD, CONNECTICUT, SCHOOL OF ENGRG, DIV OF URBAN SCIENCE AND TECH, DUST/TR-6701, (NOVEMBER 1967). THE "BEST GUESS" SYSTEM IS COMPOSED OF 3 SEPARATE SUBSYSTEMS - THE AUTO SHREDDER, THE POWER PRODUCTION SYSTEM, AND THE MATERIAL PRODUCTION SYSTEM. THE AUTO SHREDDERS WOULD BE CONSTRUCTED ACCORDING TO EXISTING TECHNOLOGY, AND WOULD BE OPERATED BY THE EXISTING SCRAP INDUSTRY. THE POWER PRODUCTION SYSTEM ESSENTIALLY WOULD CONSIST OF A SHREDDED REFUSE BURNING GAS TURBINE. THE POWER PRODUCTION SYSTEMS WOULD BE OPERATED EITHER BY UTILITIES OR BY LARGE POWER USERS. TECHNOLOGY DEVELOPMENT WOULD BE REQUIRED IN 3 AREAS - THE DEVELOPMENT OF A HIGH-PRESSURE REFUSE "PUMP", OF A HIGH-INTENSITY, HIGH-TEMPERATURE SHREDDED REFUSE BURNER, AND OF A HIGH-EFFICIENCY, LOW-PRESSURE-LOSS SEPARATOR. THE MOST ATTRACTIVE SPECIFIC SYSTEM AT THIS TIME IS BASED ON A MODIFIED PRATT AND WHITNEY AIRCRAFT FT 4 GAS TURBINE (I.E., EXISTING BURNERS REPLACED BY GAS COLLECTOR AND DISTRIBUTION MANIFOLDS), ON COMBUSTION IN A SEPARATE BURNER (SEPARATOR) OF A NEW CONCEPT, AND ON TWO HAMMERMILLS, INC. 6060 SHREDDERS, THE RANGE IN POWER GENERATING COSTS WOULD BE FROM 0.4 TO 3.3 MILLS/KW-HR. MATERIAL PRODUCTION WILL INCLUDE THE MANUFACTURE OF SHREDDED SCRAP CERAMIC COMPOSITES. ONE-HALF OF THE SCRAP SHOULD BE EFFECTIVE IN CARRYING TENSILE LOADS. ESTIMATES OF THE TOTAL COSTS OF PRODUCING SUCH MATERIALS ARE GIVEN, AS WELL AS THE USES TO WHICH THEY CAN BE APPLIED. (UC)

10-15-01850 ATOMIC BLAST MIGHT HELP DISPOSAL, GRADUATES HEAR (NUCLEAR-EXPLOSION PLOWSHARE)
REFUSE REMOVAL JOURNAL 8(7), P. 18 (1965). THE ASSISTANT DIRECTOR, DIVISION OF PEACEFUL USES OF NUCLEAR ENERGY, ADDRESSED A GROUP OF SOLID WASTE TECHNICIANS AT THEIR GRADUATION EXERCISES. IN HIS TALK IT WAS POINTED OUT THAT SOME TIME IN THE NEAR FUTURE IT MIGHT BE POSSIBLE TO USE CONTROLLED NUCLEAR EXPLOSIONS A THOUSAND FEET OR SO UNDERGROUND FOR A CAVITY IN WHICH TO DISPOSE OF SOLID WASTES.

11 Alternative Packaging Materials

11 01 RESEARCH

11-01-00072 25 BILLION BOTTLES, 48 BILLION CANS DISCARDED BY U.S. EACH YEAR (BOTTLES TIN-CANS PLASTIC)
REFUSE REMOVAL JOURNAL 10(9), (SEPTEMBER 1967) THE PRESIDENT'S SCIENCE ADVISORY COMMITTEE REPORTS THAT 25 BILLION BOTTLES AND 48 BILLION CANS ARE USED PER YEAR IN THE UNITED STATES. THE USE OF ALTERNATE MATERIALS OR DEGRADABLE, CONTAINERS IS SUGGESTED.

11-01-00983 GLASS GROUP STUDIES DISPOSAL OF ITS PACKAGING MATERIALS (COMPOSITION(GLASS))
SOLID WASTES MANAGEMENT/RRJ 10(11), P. 28 (NOVEMBER 1967). THE ESTIMATE IS MADE THAT GLASS ACCOUNTS FOR 6 PERCENT OF THE TOTAL 4.5 MILLION LB WASTE/YEAR. A STUDY OF THE PROBLEM WILL BE MADE BY THE GLASS CONTAINER MANUFACTURING INSTITUTE. (UC)

11 02 FUTURE NEEDS AND TRENDS

11-02-00172 STUDY TO ANALYZE PACKAGING PROBLEM (COMPOSITION)
REFUSE REMOVAL JOURNAL 10(8), P. 42 (AUGUST 1967). THE PHS HAS AWARDED A 53,975 DOLLAR CONTRACT TO MIDWEST RESEARCH INSTITUTE TO STUDY SOLID WASTES DISPOSAL PROBLEMS ASSOCIATED WITH PACKAGING AND TO FIND WAYS TO MINIMIZE THEM. PACKAGING MATERIALS REPRESENT AN ESTIMATED 40 PERCENT OR MORE OF THE TOTAL WEIGHT OF MUNICIPAL REFUSE TODAY.

11-02-01930 ON THE DISPOSAL OF DISPOSABLES (PLASTIC(DISPOSAL-PROBLEMS))
RAYNER, H. M.
CANADIAN J OF PUBLIC HEALTH 58, P. 177-179 (APRIL 1967). THE SPECIAL CHARACTERISTICS THAT MAKE THE DISPOSAL OF PLASTICS DIFFICULT ARE OUTLINED. OF THE HUNDREDS OF RESINS NOW AVAILABLE, ONLY THOSE IN USE OR LIKELY TO BE USED IN A MEDICAL CONTEXT ARE DISCUSSED. (PHEA)

11-02-01964 THROWAWAY PACKAGES - A MIXED BLESSING (PACKAGING VOLUME QUANTITY)
DARNAH, A. J., JR.
ENVIRONMENTAL SCIENCE TECH 3(4), P. 328-333 (APRIL 1969). IN 1967 AND 1968, MIDWEST RESEARCH INSTITUTE (MRI) ECONOMISTS SPENT NINE MONTHS ATTEMPTING TO DISCOVER THE ROLE THAT PACKAGING MATERIALS PLAY IN SOLID WASTE DISPOSAL IN A STUDY UNDERTAKEN FOR THE SOLID WASTES PROGRAM, U.S. DEPT. OF HEALTH, EDUCATION AND WELFARE. NINETY CENTS OF EACH DOLLAR SPENT ON SOLID WASTE DISPOSAL IS PICKING UP AND TRANSPORTING WASTES TO DISPOSAL SITES. OF THE $2.8 BILLION SPENT ON COLLECTION IN 1966, ABOUT 80(WAS FOR LABOR. IN THAT YEAR, 46.5 MILLION TONS OF PACKAGING MATERIALS WERE DISCARDED, AND SUBSEQUENTLY COLLECTED AT A COST OF AT LEAST $373 MILLION. IN 1966, EACH PERSON THREW AWAY 121 POUNDS MORE OF SUCH MATERIALS THAN IN 1958; BY 1976, WE SHALL BE DISCARDING 136 POUNDS MORE PER PERSON THAN WE DID IN 1966. THIS INCREASE WILL NECESSITATE NEARLY 4.76 MILLION MORE COLLECTION TRIPS THAN WERE REQUIRED IN 1966, AND SOME 9,500 MORE COLLECTION VEHICLES (COSTING ABOUT $265 MILLION CURRENTLY) WOULD HAVE TO BE ADDED TO THE PRESENT FLEET OF ABOUT 150,000 TRUCKS. TOTAL RESIDENTIAL WASTE TONNAGE WILL INCREASE BY 34(IN THE 1966-1976 PERIOD, WHILE THE PACKAGING MATERIALS THROWN AWAY BY RESIDENTIAL SOURCES WILL INCREASE BY 42(. ONCE COLLECTED, WASTES USUALLY ARE TAKEN TO ONE OF FOUR BASIC TYPES OF DISPOSAL OPERATIONS - OPEN DUMPS, LANDFILLS, MUNICIPAL INCINERATORS, OR COMPOSTING PLANTS. ROUGHLY 75(OF ALL WASTES END UP IN OPEN DUMPS. THE ONE CHARACTERISTIC MARKING ALL THESE DISPOSAL PROCESSES IS THE LACK OF SOPHISTICATED EQUIPMENT AND TECHNIQUES. SOIL, AIR, AND GROUNDWATER POLLUTION CAN BE CAUSED BY SOLID WASTES. IN 1966, MATERIALS VALUED AT $16.2 BILLION ENTERED THE PACKAGING MATERIAL AND OF THIS TOTAL, PROBABLY 90(WAS THROWN AWAY. LARGE INPUTS OF PACKAGING MATERIALS INTO THE SOLID WASTE SYSTEM CANNOT BE BLAMED FOR ALL THE DISTRESS SIGNALS WHICH ARE PERCEPTIBLE. RATHER, THE PROBLEMS ILLUSTRATE THAT THE ENTIRE FIELD OF SOLID WASTE HANDLING IS A NEGLECTED AREA AND SHOULD NOW BE OVERHAULED.

11-02-02152 THE ROLE OF PACKAGING IN SOLID WASTE MANAGEMENT 1966 TO 1976 (TRENDS)
DARNAY, A. + FRANKLIN, W. E.
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, PUBLIC HEALTH SERVICE PUB 1855, WASHINGTON, D.C., (1969). THIS DOCUMENT PRESENTS THE FINDINGS OF A RESEARCH EFFORT TO DEFINE THE ROLE OF PACKAGING IN WASTE DISPOSAL IN THE 1966 TO 1976 PERIOD. THE REPORT IS DIVIDED INTO THREE PARTS. PART 1 PRESENTS HISTORICAL PACKAGING MATERIAL CONSUMPTION DATA FOR THE 1958 TO 1966 PERIOD, A FORECAST OF PACKAGING MATERIAL CONSUMPTION TO 1976, AND A DISCUSSION OF THE ECONOMIC, TECHNOLOGICAL, MARKETING, AND DEMOGRAPHIC TRENDS AND FORCES UNDERLYING THE FORECAST. PART 2 ANALYZES THE DISPOSABILITY OF PACKAGING MATERIALS IN 1966 AND IN 1976. THE QUANTITATIVE SOLID WASTE BURDEN IMPOSED BY PACKAGING IN THE TWO YEARS IS DISCUSSED, AS WELL AS COLLECTION PROBLEMS ENGENDERED BY PACKAGING, AND PACKAGING MATERIAL RESISTANCE TO DISPOSAL PROCESSING. PART 3 IS AN EXPLORATORY ANALYSIS OF THE VARIOUS MECHANISMS THAT MIGHT BE EMPLOYED FOR MITIGATING THE PROBLEMS CAUSED BY PACKAGING MATERIALS IN WASTE DISPOSAL. THESE SECTIONS ARE FOLLOWED BY TWO APPENDICIES. APPENDIX 1 PRESENTS TABULAR MATERIALS THAT WILL PERMIT INTERESTED PERSONS TO FOLLOW THE ROUTE BY WHICH WE ARRIVED AT OUR DISPOSAL RESISTANCE INDEX FIGURES. APPENDIX 2 IS A BIBLIOGRAPHY OF LITERATURE USED AS BACKGROUND FOR THIS ANALYSIS. (AUTH)

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ONE-MAN LANDFILL SERVES 35,000
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ATED BY NATIONAL SURVEY (QUANTITY COLLECTION)/
)/ 70,000 FLIES
PLANS FOR 8,150 TONS
MOBILE, ALABAMA BUILDS 300 TON
HOUSEHOLD GARBAGE GRINDERS USE 1.14 GALLONS OF WATER
QUANTITY)/ LESS THAN 3,000 DOLLARS
GOLD, SILVER CONTENT SEEN AT FOURTEEN DOLLARS
SANITARY LANDFILL COSTS 68 CENTS
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CONTAINERIZATION OF COMMERCIAL REFUSE SAVES $1000
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PHILADELPHIA YOUTH'S
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ASK BIDS FOR COMPOSTING
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)/
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CANADIAN CITY
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