

OAK RIDGE NATIONAL LABORATORY

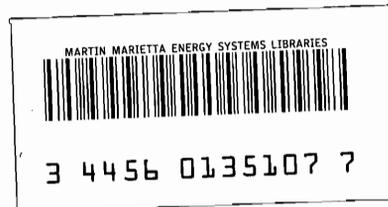
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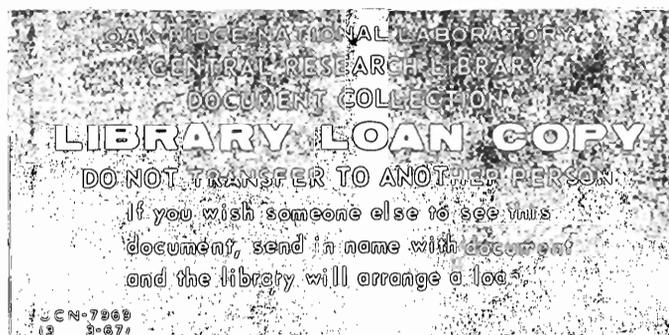
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PROPOSED NEW INFORMATION CENTERS

by Francois Kertesz

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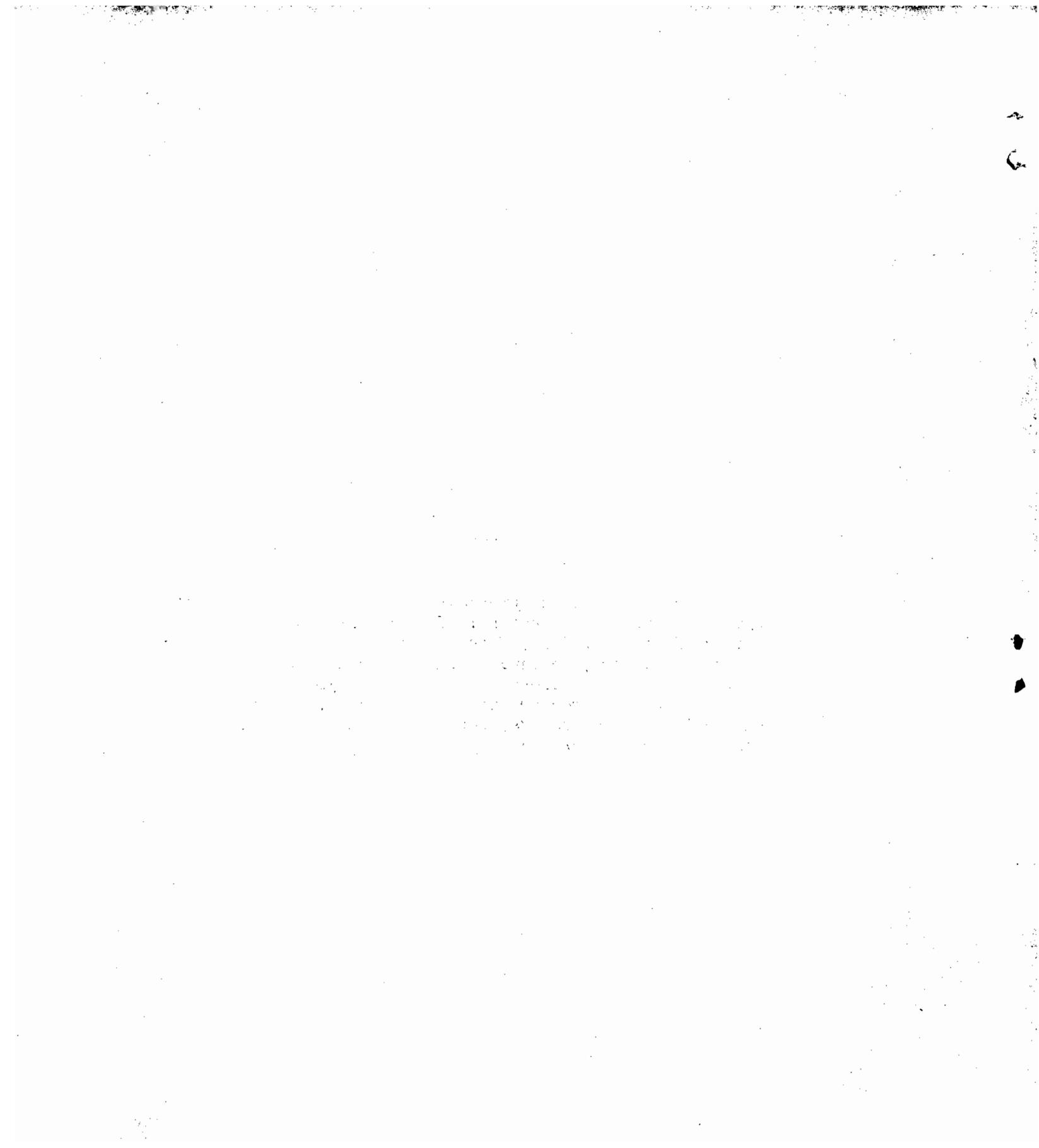
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The report contains recent proposals concerning the establishment of new information centers: *Information Center for Industrial Instrumentation, Matrix Information Center, Information Center for Dosimetry, Research and Development Hazard Control Information Center, Environmental Mutagens Information Center, Molten Salt Breeder Reactor Information Center, Information Center on Fluorine Compounds, Information Center on Analytical Methods for the Nuclear Industry.*



PROPOSED NEW INFORMATION CENTERS AT THE OAK RIDGE NATIONAL LABORATORY

The successful operation of the ORNL information centers has attracted the attention of three distinct groups of people:

a) The technical information community is very much aware of our activities, --as a matter of fact, members of COSATI Panel No. 6 on Information Analysis Centers met recently in Oak Ridge, visited some of the centers and expressed satisfaction with what they saw.

b) The centers also became well known in their own technical community and several of them have established themselves as authoritative, active focal points of information handling. They have made considerable contributions toward the creation of a basically new source of scientific information, which supplements the services of primary journals, abstracting services and personal contact with experts at society meetings. It is quite possible that some of the functions of the traditional organizations will be taken over by this vigorous, new agency.

c) The third group, which "discovered" only recently the existence of the centers and their service potential, is the Laboratory's own scientific staff. During the last few years, I had many conversations with colleagues at ORNL about the possible application of the information center concept to their special field of interest. Even though some of these discussions have not been followed up any further steps have been taken in several areas to establish centers. I would like to review briefly the active projects.

1. C. S. Lisser (Instrumentation and Controls Division) is examining the possibility of establishing an *Information Center For Industrial Instrumentation*. It would cover the whole gammut of the instrumentation field, including nuclear, pneumatic, electronic, hydraulic, etc. devices. The input activity of the center will be based on the published literature, commercially available hardware, and the associated documentation, such as operating manuals. Peripheral areas, such as training and rating of instrument technicians will also be covered.

The Instrument Society of America would act as the chief sponsor of the proposed center which at the start would not be a true "analytic" agency. After the special library on instrumentation has been established and subject experts have been located, the center would assume responsibilities beyond those

member of the Instrumentation and Controls Division is connected with the scoping study primarily in his capacity of Director of the Publications Department of the Society.

2. V. P. R. Uppuluri (Mathematics Division) has proposed that a special *Matrices Information Center* be established under the supervision of the Mathematics Division. He invited attention to the great interest that matrices present to many branches of science: nonnegative matrices are useful in reactor criticality studies, as are continuants in physics and chemistry. Since the theory of Markov chains has been applied successfully to biological and other phenomena, the properties of special stochastic matrices which arise with specific models, are of great potential interest. The design of physical experiments could profit greatly from matrices with zeros and units as elements; they are also of interest for the network theory. It is proposed to create a center to examine critically properties, such as eigenvalues, eigenvectors, spectral resolution, invertibility, higher powers, and decomposability of matrices. Such a center would be very helpful to eliminate duplication of effort, because it would make available widely scattered information at a single location. In view of the available expertise in this field, the Mathematics Division is considered a natural home for the proposed center.

3. Two years ago J. A. Auxier and K. Becker (Health Physics Division) proposed the establishment of an *Information Center for Dosimetry* but shortage of funds forced postponement of the project. In the meantime, the need for a coordinated effort in this area became acute. The number of publications keeps increasing; more than ten large, national and international meetings dealing with dosimetry, are organized yearly. Members of the Dosimetry Research Section of the Health Physics Division are attempting to cover informally this ever-growing activity by attending meetings, scanning the widely-scattered scientific literature and maintaining personal contact with leading scientists. Actually, the staff members of the section are already performing many of the functions of an information center without formal recognition. During the last few years, the state of the art in the field of neutron interactions and penetration in tissue, photographic film dosimetry, radiophotoluminescence dosimetry, nuclear accident dosimetry, nuclear track registration in solids, neutron monitoring and fast-

members of the section; in addition, work is in progress on a book covering personnel radiation dosimetry, and on thermally stimulated exoelectron emission. Staff members have also helped to edit the Proceedings of the Second International Symposium on Luminescence Dosimetry and a series of dosimetry bibliographies published by the German Federal Nuclear Documentation Center in Frankfurt. One comprehensive bibliography on radiophotoluminescence dosimetry has already been published in the journal "Health Physics"; another one is in progress.

About ten to twenty inquiries per month on dosimetric subjects are currently received at the Section as the result of the reputation of staff members in this field.

The proposed Dosimetry Information Center will have an interdisciplinary character covering primarily the field related to health physics. Topics such as the measurement of extremely high dose levels (reactor in-core dosimetry, dosimetry for food irradiation and sterilization), therapeutic dosimetry (photon depth-dose data for restricted field sizes and source-skin distances) would also be included.

The proposed center would fill a void between several ORNL centers, supplementing the activities of the Isotopes, Nuclear Safety, Radiation Shielding and Internal Dose Information Centers. The subject is of great international interest; dissemination of information to less developed countries in this unclassified field is highly desirable.

4. Establishment of a *Research and Development Hazard Control Information Center* at ORNL has been proposed by H. C. Hoy of the Y-12 Plant. The concept has been presented at a meeting held at the National Research Council-National Academy of Sciences in which representatives of interested agencies, such as the National Library of Medicine, National Institutes of Health, the Coast Guard, Federal Fire Council, Federal Safety Council, Advisory Center on Toxicology, Underwriters Laboratories and Science Information Exchange participated.

This partial list of groups involved in various aspects of safety illustrates that the field of safety is very dispersed; working scientists and engineers are unable to conveniently retrieve the material of interest to them from a single authoritative source. The usually urgent nature of queries requires an answer within the shortest possible time. Safety features are of great importance

are inherently dangerous if safety problems are neglected; on the other hand, overdesign could present a financial burden on the project.

The Science Information Exchange which covers about 100,000 research projects annually, answers 40,000 to 50,000 requests per year, without emphasizing the safety information. The Research and Development Section of the National Safety Council also emphasized the need for a central safety information source.

There is a general consensus that it is highly desirable to centralize the widely scattered portions of the safety field. Although certain specialized areas are in good order - the Materials Hazard Information System provides data on bulk and packaged materials transported by water, the Nuclear Safety Information Center of the Laboratory covers very well its well-defined field - a central agency is greatly needed. Therefore, it is proposed to incorporate the research and development safety information activity into the NSIC, providing the necessary backup by experts. The Y-12 Plant, in which NSIC is located, is a large production facility, provided with extensive research and development facilities. This staff, together with the ORNL engineering groups, would supply the experts for the center; NSIC would provide guidance in information handling.

The organizers tried to find outside financial support for the proposed center; an attempt to interest the Ford Foundation was not successful.

5. H. V. Malling and J. S. Wassom (Biology Division) examined the possibility of creating a central registry for mutagenic compounds. They reviewed the scientific activity in this important but until now somewhat neglected area, visited the ORNL information centers to study how they solved their information-handling problems and examined the programs developed by the Computing Technology Center. On the basis of this extensive preliminary study, they started the organization of the *Environmental Mutagens Information Center*. EMIC will store and analyze information on compounds known to have been tested for mutagenicity and those suspected to possess mutagenic properties.

It is planned to screen the current technical literature through MEDLARS (Medical Literature Analysis and Retrieval System) and the searching tools provided by the Institute for Scientific Information. The latter organization covers a large number of scientific publications on a interdisciplinary basis, thus

abstracting and microfilming program will supplement the computer storage of selected data. For the future, it is planned to carry out remote custom searches; browsing with a terminal computer console will also be possible. The tools developed by Chemical Abstracts will be used to correlate molecular formula and structure with the chemical or biological activity of the compound. A monthly list of compounds tested for mutagenicity will be made available to interested scientists.

Preliminary discussions were held concerning the potential use of this information for preparing a similar registry of carcinogenic agents at a later date; however, this would require a much larger effort. Interested individuals at NIH and other related organizations were kept informed about these plans.

6. The Molten Salt Breeder Reactor project is one of the most important activities of the Laboratory. The project already supports a specialized information center, the Molten Salt Information Center which collects phase diagrams of multicomponent fluoride-based salt mixtures and information on techniques related to their study. The work of the center is still in its initial states; the input is critically evaluated and indexed. During the temporary absence of H. F. McDuffie, the planned expansion is kept in abeyance and the state-of-the-art review series has not yet been started. S. Cantor of the Reactor Chemistry Division is currently examining the possible revitalization of the activity of the center, which serves primarily the local staff. However, the problem exceeds the boundaries of chemistry. In view of the complexity of the molten-salt breeder-reactor studies and the wide scattering of the material, the project director, M. W. Rosenthal is exploring the possibility of organizing an internal information center to assist the management and the technical staff of the Molten Salt Reactor project in the preparation of engineering studies and to locate papers in their areas of interest.

The proposed *Molten Salt Breeder Reactor Information Center* would first develop a subject-matter file index based on the functions of the molten salt breeder reactor e.g., materials for system components, instrumentation and control for nuclear analysis, cost studies, etc. The present Molten Salt Information Center, oriented toward chemistry, would be a separate unit of the new system under the direct scientific supervision of the Reactor Chemistry Division.

used. It is proposed to adapt the technique originally developed by D. W. Cardwell and A. F. Goldenson for the CHORD-S project.

Because of its very nature, the center would serve primarily the local technical staff. Its existence could greatly facilitate the development work and would be of great help to the staff called to supply information to management and to the engineering staff on this important project. If the concept receives acceptance, as it is hoped, the services of the center would be of great demand by engineers and scientists outside of the Laboratory.

8. Several other proposals have been advanced to establish new information analysis centers; however, at present they have reached only the preliminary discussion stage. The desirability of these centers is obvious to the technical man in the field but many pertinent problems, such as source financial support, staffing, etc. have not yet been considered.

a. * *Information Center on Fluorine Compounds.* The scope of this center would be limited to the chemistry and physical properties of fluorine compounds of potential interest for nuclear and space industries. The Oak Ridge Gaseous Diffusion Plant has a staff with special expertise in the field of fluorine compounds used in isotope separation processes; reactor-fuel reprocessing techniques based on fluorine volatility have been developed at ORNL. Fluorine and its compounds are also of great interest for use as rocket fuel.

Other areas of fluorine chemistry, such as aluminum production based on cryolite, propellants, manufacture of heat exchangers (Freon, spray cans), fabrication of fluorinated plastics for use at elevated temperatures and under corrosive conditions, etc. could be covered by satellite centers located institutions where active work is going on, rather than at ORNL.

b. * *Information Center on Analytical Methods for the Nuclear Industry.* The ORNL Analytical Chemistry Division is one of the largest nuclear analytical-chemistry groups in the country; it is in excellent position to obtain additional experts from neighboring institutions, ORGDP, Y-12, ORAU and the University of Tennessee. The Division is

also widely known as the organizer and host of the annual Gatlinburg Conference on Nuclear Applications of Analytical Chemistry. Many "hot" analytical techniques have been developed at ORNL; thus the Laboratory could easily provide the staff and the needed technical backing. The proposed center would supplement the activities of already operating centers, such as the Research Materials, Isotope, Radiation Shielding and Actinide Research Information Center which make use of analytical techniques but do not cover analytical chemistry explicitly.

These examples illustrate the dynamic character of the information center activity at the Laboratory: As the concept becomes better known among technical men, it attracts increasingly the attention of many scientists who might be willing to forgo the pleasure of increasing the flood of literature and instead would use their talent to keep the tide of papers within manageable boundaries. As a matter of fact, it is worth noting that most of the proposals have been made by working scientists and engineers who were frustrated by their inability to read every important document in their own field.

In view of the current budget restrictions, it is improbable that all of the proposed centers will be actually established in the near future. Discussions are in progress between the different divisional managements and potential sponsors and I am hopeful that the important management problems, such as staffing, training and financial support will be solved. Every effort must be made to explain to program directors at AEC Headquarters level the benefits derived from the operation of information centers. To quote from the Weinberg Report:

"It is no wonder that the scientific administrator, especially at the highest level in government, so often fails to be impressed with the urgency of the communication problem or with the necessity of spending more to improve the situation. He is importuned on every hand by professional specialists to each of whom the situation in his speciality appears to be in a state of crisis that can be eased only by more spending.... In the meantime, we have only common sense to tell us that considerable effort-in most cases more than is now expended-

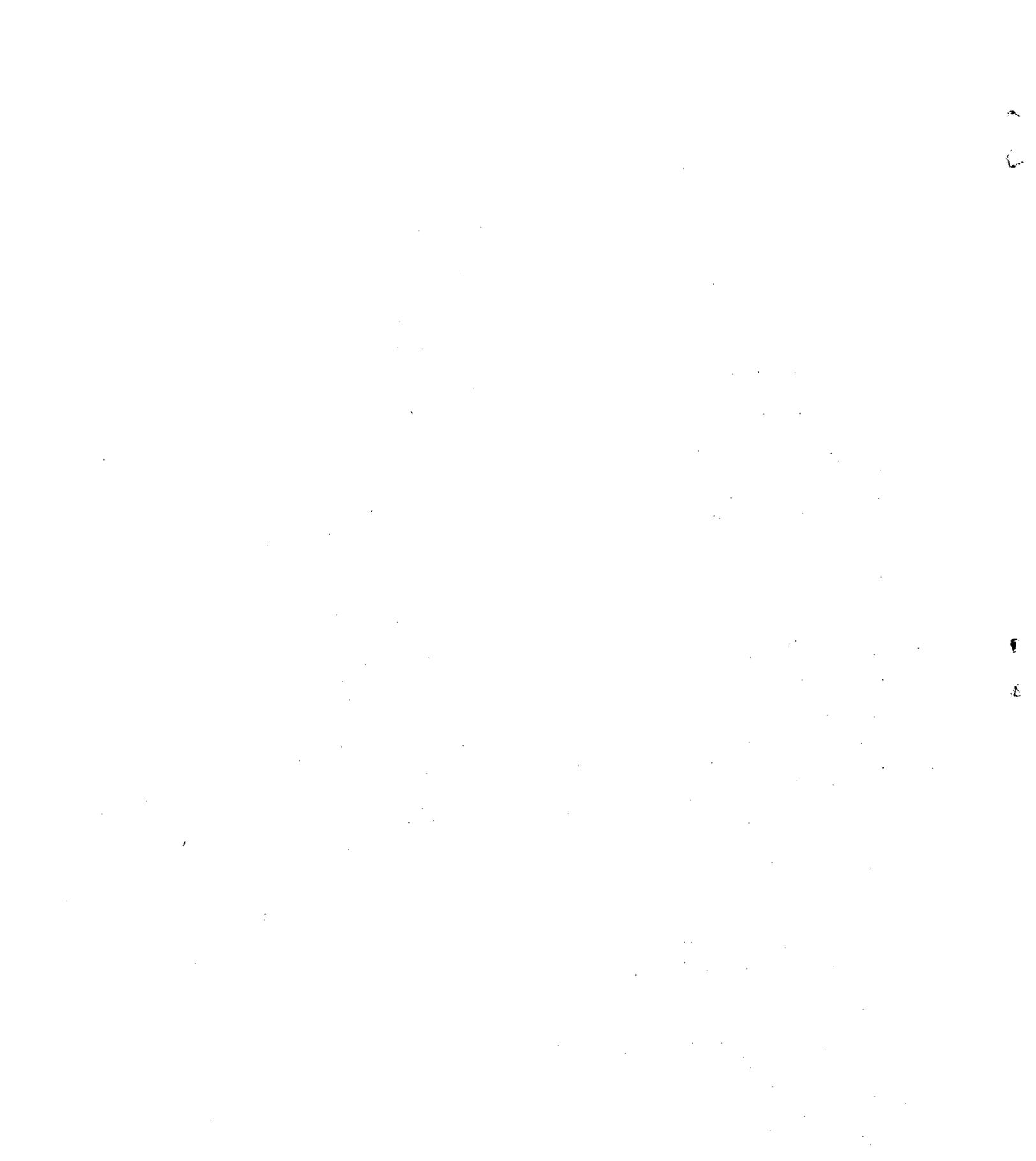
must go into scientific communication, and that the effort required will grow." *

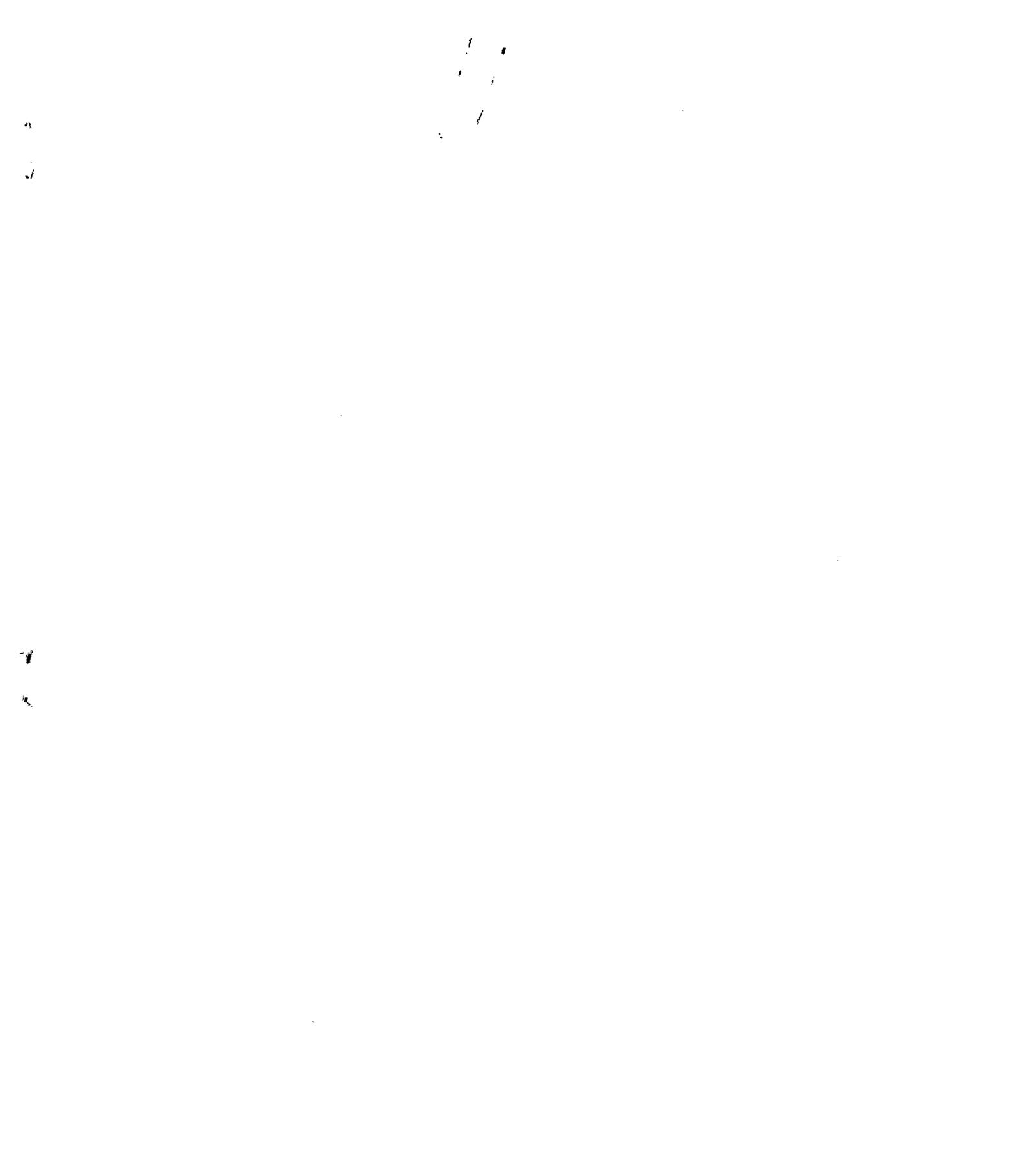
Depending how active a given technical field is, information centers will be established to cover it. These centers may prosper, but if the activity shifts, the center must adjust its own program, otherwise it will wither and die. The fact that capable technical men are willing to devote their time and talent to the operation of new centers is a proof of the vitality of this new tool of scientific information and the interest it generates. Hopefully, we are approaching the time predicted by the prophets of scientific information, when instead of a few hundred, we will have tens of thousands of analytical centers encompassing the whole range of science and technology.

* Science, Government, and Information, A Report of the President's Science Advisory

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