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# Radioisotope Distribution Program Progress Report for May 1975

J. H. Gillette



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ISOTOPES DEVELOPMENT CENTER

RADIOISOTOPE DISTRIBUTION PROGRAM  
PROGRESS REPORT FOR MAY 1975

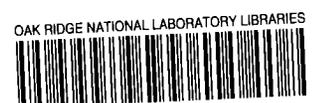
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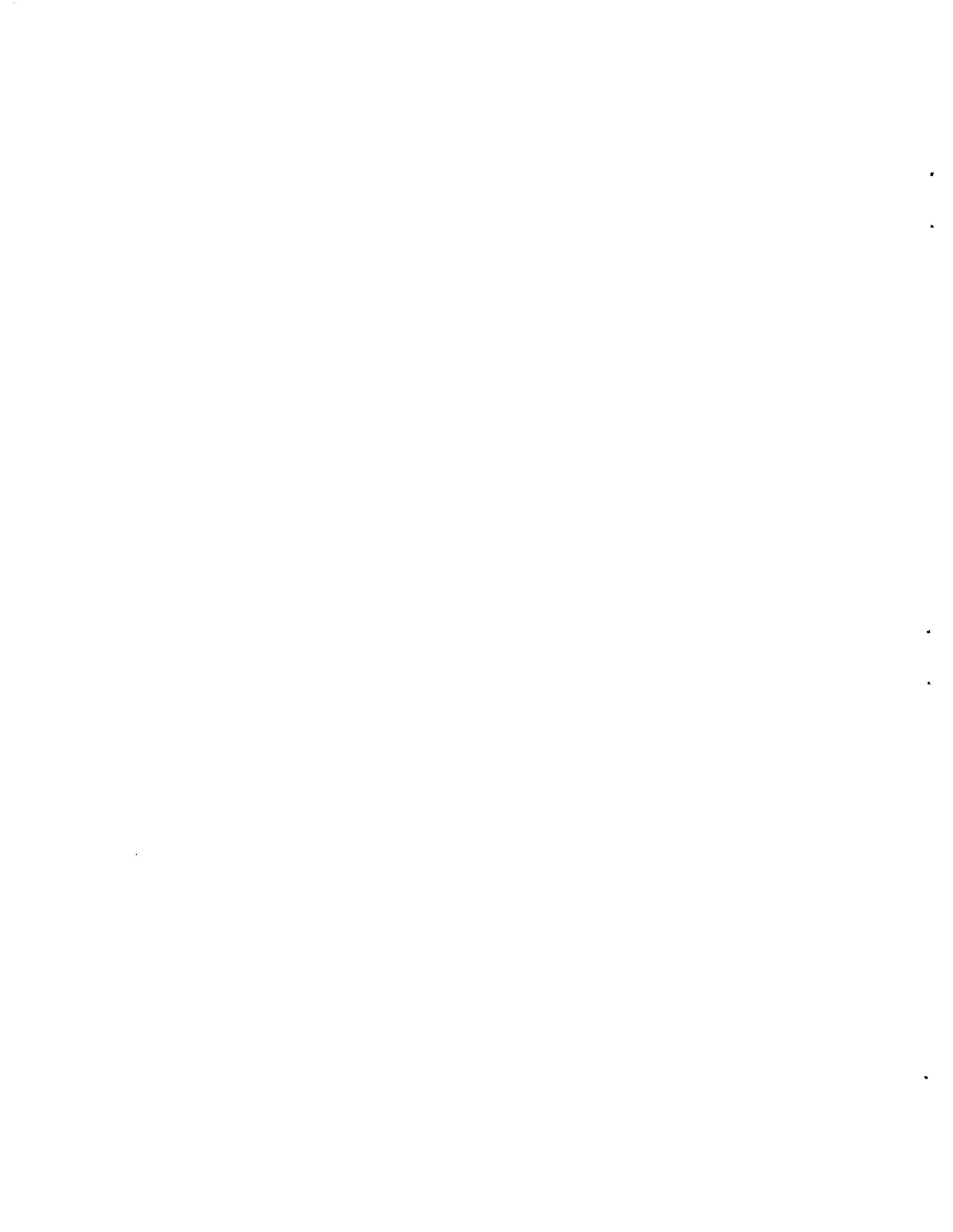
JULY 1975

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RADIOISOTOPE DISTRIBUTION PROGRAM  
PROGRESS REPORT FOR MAY 1975

*J. H. Gillette*

RADIOISOTOPE PRODUCTION AND MATERIALS DEVELOPMENT

REACTOR-PRODUCED RADIOISOTOPES

Reactor Products Pilot Production (*R. W. Schaich*)  
(Production and Inventory Accounts)

<u>Processed Units</u>	
<u>Radioisotope</u>	<u>Amount (mCi)</u>
Copper-67	12
Calcium-47	18

ACCELERATOR-PRODUCED ISOTOPES

Cyclotron Products Pilot Production (*M. R. Skidmore*)  
(Production and Inventory Accounts)

May 1975 ORNL 86-Inch Cyclotron runs for ORNL and non-ORNL programs are given in Table 1.

Table 1. Cyclotron Irradiations and Runs for May 1975

<u>Date</u>	<u>Customer</u>	<u>Product</u>	<u>Target</u>	<u>Total Time (hr:min)</u>	<u>Total Charges</u>
<u>ORNL Programs</u>					
5-6-75	Isotopes Div.	Thallium-201	Thallium	3:20	\$ 319
5-13-75	ORAU	Carbon-11	Boron Oxide	5:20	514
5-14-75	ORAU	Carbon-11	Boron Oxide	2:35	252
5-15-75	ORAU	Carbon-11	Boron Oxide	2:45	268
5-16-75	Cyclotron	Beam Location & <sup>67</sup> Ga	Zinc	5:55	-
5-19-75	ORAU	Carbon-11	Boron Oxide	1:15	127
5-21-75	ORAU	Carbon-11	Boron Oxide	4:50	466
5-22-75	ORAU	Carbon-11	Boron Oxide	<u>3:50</u>	<u>363</u>
				29:50	\$ 2,309
<u>Non-ORNL Programs</u>					
4-22-75	New England Nuclear Corporation	Germanium-68	Gallium	9:15	\$ 1,533
5-27-75	New England Nuclear Corporation	Gallium-67	Zinc-68	<u>5:15</u>	<u>875</u>
				14:30	\$ 2,408

### Cyclotron Operations

Usually irradiations for beam locations are for ~15 min; however, it is felt that this is insufficient for temperature equilibrium of the cyclotron. This month a copper flat plate with ~0.3-mil nickel undercoat and ~4.5-mil natural zinc plated over the nickel was irradiated for 4 hr and 50 min with an average beam current of 521  $\mu$ A. After an autoradiograph was made for the beam location, the Medical Radioisotopes Group stripped the target, an aliquot was analyzed, and the EOB yield was calculated at 1.32 Ci  $^{67}\text{Ga}$  total. If an enriched  $^{68}\text{Zn}$  target had been used, the production rate of  $^{67}\text{Ga}$  should have been 1447 mCi/hr or 2800 mCi/mA-hr.

An enriched  $^{68}\text{Zn}$  target was irradiated for a customer for 4 hr at an average beam current of 484  $\mu$ A/hr and has a reported yield of 1355 mCi/hr or 2800 mCi/mA-hr, in complete agreement with our extrapolated yield from the natural zinc target. Both targets showed no signs of damage and could easily have stood a longer irradiation and probably higher beam current.

### FISSION PRODUCTS

Krypton-85 Enrichment (*S. E. Gheesling*)

#### Krypton-85 Columns

The installation and leak testing of these columns are complete. The columns are charged and in operation except for one column which indicates blocked valves or lines in the original system. This correction will be made as a part of routine maintenance.

Cesium-137 Pilot Production (*R. W. Schaich*)  
(Production and Inventory Accounts)

#### 1. Process Status

The  $^{137}\text{Cs}$  process equipment is in standby condition.

#### 2. Operational Summary

##### Product Inventory

(Decay calculated through April 30, 1975)

<u>Inventory Material</u>	<u>Amount (Ci)</u>
Cesium-137 chloride powder	0
Special form cans	<u>5,100</u>
<u>Total Inventory Material</u>	<u>5,100</u>

Non-Inventory Material

Material returned or stored for customer	
Puerto Rico sources	8,400
Lockheed	27,600
AECL powder	92,000
Radiation Resources	35,900
Minn. Mining & Mfg. Company	13,700
Gamma Industries	8,800
J. L. Shepherd	<u>27,800</u>
<u>Total Non-Inventory Material</u>	<u>214,200</u>
TOTAL INVENTORY AND NON-INVENTORY MATERIAL	219,300

Fabrication Summary

	<u>May 1975</u>		<u>CY 1975</u>		<u>FY 1975</u>	
	<u>No.</u>	<u>Ci</u>	<u>No.</u>	<u>Ci</u>	<u>No.</u>	<u>Ci</u>
Sources						
Fabricated	0	0	13	371	38	32,463
Shipped	0	0	13	371	38	32,463
Special Form Cans						
Fabricated	0	0	0	0	23	37,710
Shipped	0	0	4	2,049	10	4,169

## 3. Current Orders

All orders on hand have been completed and the material placed into storage awaiting receipt of release for the material.

Strontium-90 Pilot Production (*R. W. Schaich*)  
(Production and Inventory Accounts)

## 1. Process Status

The <sup>90</sup>Sr process and manipulator cells are being decontaminated under the DWMT Decommission Program. The <sup>90</sup>Sr powder was removed from the FPDL, encapsulated, and stored for future orders.

Product Inventory

(Decay calculated through April 30, 1975)

<u>Inventory Material</u>	<u>Amount (Ci)</u>
<sup>90</sup> Sr titanate powder (±5%)	491,800
Sources in fabrication	0
RCA source	59,200
<sup>90</sup> Sr silicate powder	28,900
Stock powder cans	<u>4,700</u>
<u>Total Inventory Material</u>	<u>584,600</u>

<u>Non-Inventory Material</u>	<u>Amount (Ci)</u>
FPDL recovery material	18,700
Quehanna recovery material	45,500
Weather Bureau source	12,100
SNAP-7B	165,600
SNAP-7C	26,000
SNAP-7D	151,500
SNAP material purchase <sup>a</sup>	<u>263,000</u>
<u>Total Non-Inventory Material</u>	<u>682,400</u>
<u>TOTAL INVENTORY AND NON-INVENTORY MATERIAL</u>	<u>1,267,000</u>

<sup>a</sup>Strontium-90 purchased under DRRD program.

#### Fabrication Summary

	<u>May 1975</u>		<u>CY 1975</u>		<u>FY 1975</u>	
	<u>No.</u>	<u>Ci</u>	<u>No.</u>	<u>Ci</u>	<u>No.</u>	<u>Ci</u>
Sources						
Fabricated	0	0	0	0	0	0
Shipped	0	0	0	0	0	0
Special Form Cans						
Fabricated	0	0	0	0	0	0
Shipped	0	0	0	0	3	540

Short-Lived Fission Production (*R. W. Schleich*)  
(Production and Inventory Accounts)

<u>Isotope</u>	<u>Number of Batches</u>	<u>Amount (Ci)</u>
Xenon-133	2	700
Iodine-131	1	50

#### RADIOISOTOPE SALES

*J. E. Ratledge*

A request for quotation was received from EG&G for a 30-kilocurie <sup>60</sup>Co source having specific activity of >600 Ci/g.

Shipments made during the month that may be of interest are listed below:

<u>Customer</u>	<u>Isotope</u>	<u>Amount</u>
<u>Large Quantities</u>		
New England Nuclear Corporation	Tritium	4,000 Ci
<u>Withdrawn Items</u>		
University of California, Los Alamos	Iodine-131	25 mCi
Mine Safety Appliance	Iodine-131	100 mCi
<u>Unusual Items</u>		
Rutgers University	Carbon-14 Targets	5.8 mCi
<u>Items Used in Cooperative Programs</u>		
University of Maryland Hospital	Potassium-43	25.9 mCi
Temple University	Potassium-43	26.0 mCi
University of Mississippi Medical Center	Potassium-43	97.7 mCi
University of Texas Medical Branch	Potassium-43	98.5 mCi
Yale-New Haven Medical Center	Potassium-43	97.3 mCi
Johns Hopkins Medical Institutions	Potassium-43	100.7 mCi
ORAU	Erbium-171	220 mCi
ORAU	Dysprosium-157	110 mCi

The radioisotopes sales proceeds and shipments for the first eleven months of FY 1974 and FY 1975 are given in Table 2.

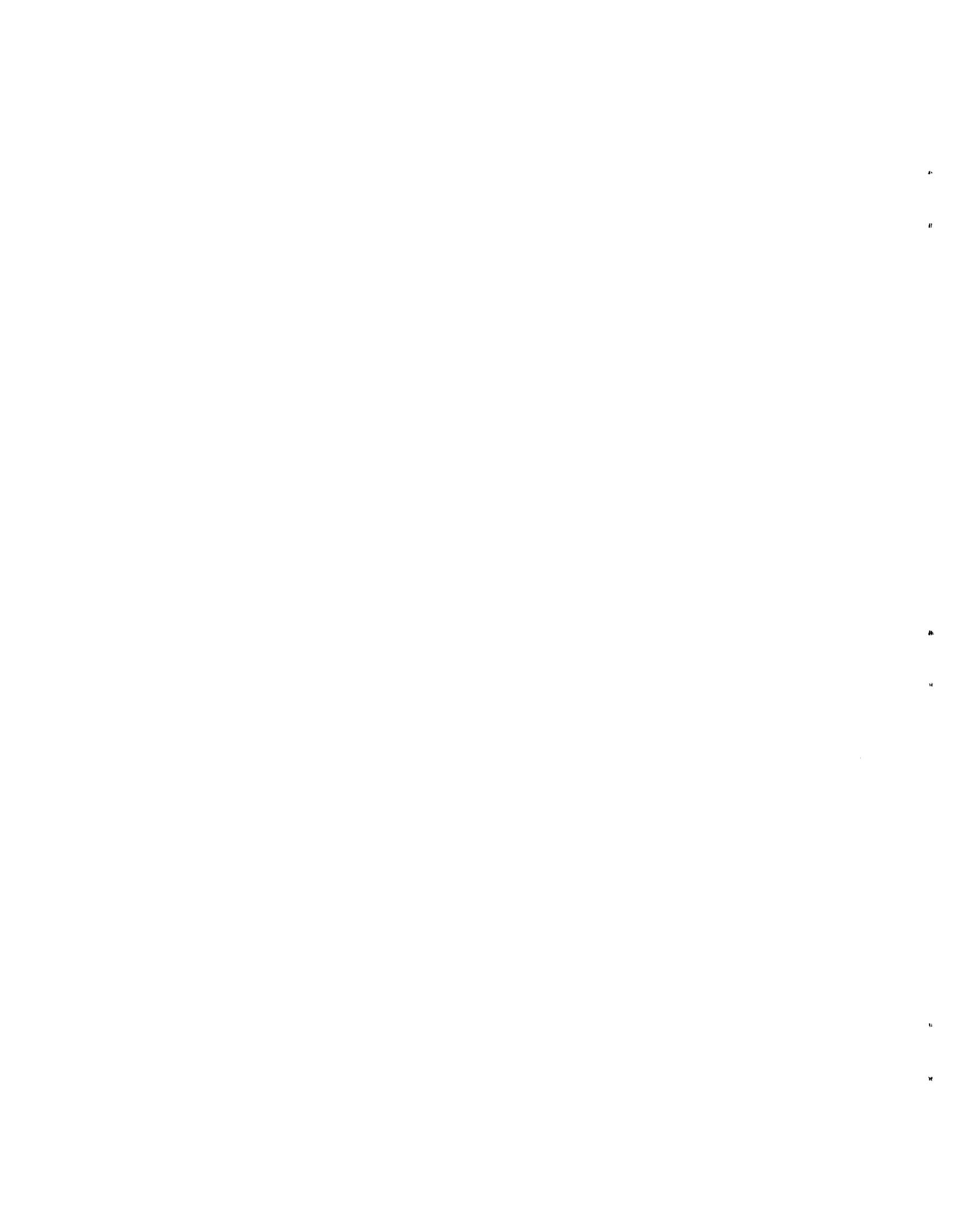
Table 2. Radioisotope Sales and Shipments

Item	7-1-73 thru 5-30-74	7-1-74 thru 5-30-75
Inventory items	\$ 399,361	\$ 342,635
Major products	62,075	92,390
Radioisotope services	225,825	81,199
Cyclotron irradiations	92,856	90,689
Miscellaneous processed materials	67,491	130,701
Packing and Shipping	67,262	69,015
Total	\$ 914,870	\$ 806,629
Number of shipments	1,661	1,457

## PUBLICATIONS

### REPORTS

J. H. Gillette, *Radioisotope Distribution Program Progress Report for April 1975*, ORNL-TM-4964, Oak Ridge National Laboratory (May 1975).



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