

PROGRESS REPORT FOR MONTH OF JANUARY 1945

CONTRACT # W-7405-eng-48-A

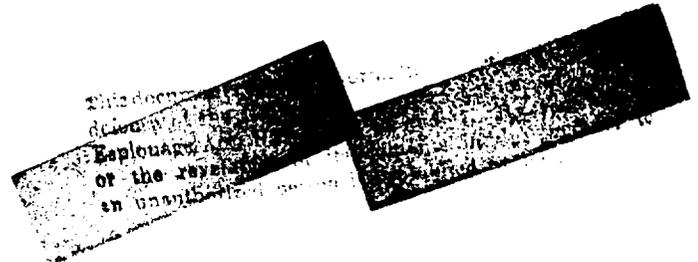
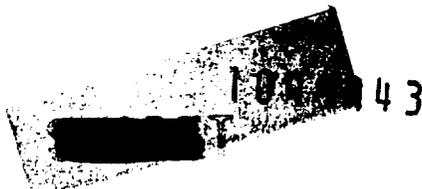
J. G. Hamilton

CLASSIFICATION CANCELLED
AUG 21 1962
DATE _____
For the Atomic Energy Commission

Chief, Classification Branch

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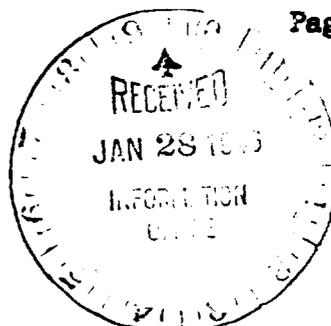
February 10, 1945





PART I

SUMMARY



The tracer and radio-autographic studies with U_3O_8 smoke containing fission products have been completed and a report is now being prepared. The long term tracer studies with animals which have been exposed to active gases from the fission product generator at the Clinton pile are now being completed. The soil studies with Hanford material are being continued.

On January 29, 1945 a 10^4 a beam, having a measured energy of approximately 20MEV, was obtained. The corresponding measured value before the shutdown was 12.8MEV. The remaining three days of January were spent in making numerous adjustments to both increase the cyclotron beam and to achieve greater stability to the apparatus. A thorium target was bombarded during this interval of adjustment and received a total of 10^4 a hrs. As soon as the above adjustments for obtaining steady operation are achieved, we plan to accelerate alpha particles to 40MEV for several very urgent bombardments required by the Metallurgical Laboratory. Most of the operating time for the next two months will be devoted to the alpha particle bombardments.

The expenditure for January, 1945 is estimated at \$5075.00, as compared to \$4650.00 for December, 1944. The personnel remained at nineteen.

hhbbbi



PART II

A. TECHNICAL PROGRESS REPORT ON METABOLIC STUDIES OF FISSION PRODUCTS

1. Radio-Autographic Studies

The radio-autographic studies have been completed on the experiments using U_3O_8 smokes containing fission products and a report is now in preparation.

2. Tracer Smoke Studies

The present series of tracer smoke studies have been completed and a report on this is now being prepared.

3. Fission Product Tracer Studies Performed at Clinton

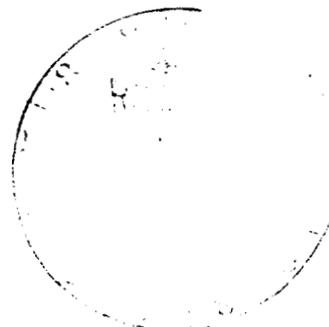
The 64 day animals which had been exposed to active gases produced by the emanation generator at the Clinton pile have been sacrificed and their tissues are to be assayed shortly.

4. Soil Studies

The experiments described last month using columns of typical W soils through which W-6 waste liquor have been allowed to percolate are being continued. Certain of the samples of soils have been freed from their clay content in an attempt to ascertain if the degree of fixation of fission products by these soils is a function of their clay content. A new series of samples from dry well at Hanford have been received and will be investigated as to their absorption properties towards fission products as soon as we receive information concerning how these samples were obtained at the site.

5. Projected Studies for the Next Two Months.

Radio-autographic, soil, and decontamination studies will be continued.



1099945



3. REPORT ON THE 60" BERKELEY CYCLOTRON FOR THE MONTH OF JANUARY 1945

During the first three weeks of January considerable time was consumed by the liquation of numerous problems which included the reinstallation of the large oscillator plate transformer. It will be recalled that last month the primary of this transformer burned out and had to be rewound. The deflector system developed several minor troubles notably excessive sparking in the region where the high voltage is introduced to the deflector stem. This difficulty was corrected by increasing the spacing of various components within the deflector cage. Considerable time had to be expended in baking in the deflector itself within the vacuum chamber until finally it would hold up to 130KV without undue sparking. During the same period a number of small leaks in the target chamber were observed and eventually fixed.

During this three week interval a great deal of time was expended for baking the vacuum chamber of the cyclotron and it was observed that once we had reached the point where voltages of the order of 100KV between dees were obtained any further increase in dee voltages was extremely slow. This situation was considerably aggravated by the fact that the existing system for firing the main oscillator had to be manually operated which very much retarded the baking procedure. To correct this difficulty a rapidly acting solenoid switch was installed which would momentarily feed power from the booster oscillator to the main oscillator whenever the latter dropped out of oscillation. This innovation represented a significant step forward in the right direction in as much as it enabled us to bake in the vacuum chamber much more rapidly at a considerably higher voltage which ranged up to 180KV between dees. At the end of several days with this type of accelerated baking it was observed that a great number of small particles, presumably tiny flakes of copper, appeared in the vacuum chamber and these became incandescent whenever power was applied to the dees. Presumably these small particles were detached as a result of very vigorous sparking within the vacuum chamber. In addition it was observed, when voltages between the dees of the order of 175KV was applied, that several areas about the dee stems became extremely warm due to the presence of very high radio frequency currents. To correct these two conditions the dees were removed from the vacuum chamber and carefully cleaned and more effective electrical contacts installed in regions where radio frequency currents appeared to be excessive. This general clean up required several days and very shortly after the dees were returned to their proper position and the cyclotron fired up we were able to obtain upwards to 150KV between dees. It was felt by this time that sufficient dee voltage had been obtained to make it at least possible to obtain an external beam.

This much desired possibility became a reality January 29, 1945, and a 10 μ beam, having a measured energy of approximately 20MEV, was obtained. The corresponding measured value before the shutdown was 12.8MEV. The theoretical energy value, as calculated from the known frequency of the oscillator and the magnetic field, was 21MEV. This calculated value for resonance was slightly lower than the one originally given due to the fact that the wave meter originally employed for measuring the frequency was in error. Our present values for frequency and magnetic field are 11.1 megacycles, 14,800 gauss respectively.

1099946



The remaining three days of January were spent in making numerous adjustments to both increase the cyclotron beam and to achieve greater stability to the apparatus. It might be noted in passing that this 10 μ a beam required an input of power to the main oscillator of from 90 to 110KW.

A thorium target was bombarded during this interval of adjustments and received a total of 10 μ a hrs. The purpose of the bombardment was for the production of U232 for use as a tracer by Dr. Spedding.

As soon as the adjustments for obtaining steady operation are achieved, which should give us a deuteron beam of from 10-25 μ a, we plan to then accelerate alpha particles to 40MEV for several very urgent bombardments required by the Metallurgical Laboratory. It is anticipated that most of the operating time during the next two months will be devoted to the alpha particle bombardments.

/s/ J. G. HAMILTON

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February 6, 1945

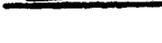
ESTIMATED STATE OF NDP-48A
ON JANUARY 31, 1945

PRIVACY ACT MATERIAL REMOVED

Payroll:

Appropriation		\$ 99,000.00
Payroll to December 31	\$ 69,500.00	
January payroll	<u>3,100.00</u>	
		<u>72,600.00</u>
Balance		\$ 26,400.00

Overhead:

Appropriation		24,750.00
Overhead to December 31		
January overhead		
Balance		

Expense and Equipment:

Appropriation		76,450.00
Expense to December 31	45,900.00	
January expense	<u>1,200.00</u>	
		<u>47,100.00</u>
Balance		<u>29,350.00</u>
TOTAL BALANCE		<u>\$ 62,350.00</u>

Total Appropriation	\$ 200,200.00
Total Expense	<u>137,850.00</u>
Total Balance	<u>\$ 62,350.00</u>

/s/ KENNETH PRIESTLEY
Kenneth Priestley
Business Manager
Radiation Laboratory

KP:ml
cc: Dr. J. C. Hamilton (2)

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Progress Report
Jan. '45, Pt. II


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October 28, 1944

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