

*Long Waste Dump* 1547

8/30/44  
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CLAYTON LABORATORIES

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Health-Physics

C. M. Patterson

Health-Physics

CELLEMITE BLOWN OUT THE 115 STACK

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P  
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On the morning of August 1, 1944 a quantity of light, fluffy pieces of cellemite were found around the base of the 115 stack. Several of these pieces were gathered and placed in a thin paper container. It was of interest to learn something of the activity present; if any, and the half life of the activity from the health hazard standpoint.

A decoy curve was run (grapy#1) of a sample mounted around the chamber of an electroscope (HP32) and another curve (graph #2) was obtained by suing counter #59. It was noted that a 1/3 inch brass shield eliminated almost all of the radiation.

Good correlation is found on a 16 hour half-life. Graph #1 indicates a shorter lived component. The counter readings were not started until August 2nd which may account for the absence of the shorter lived component.

Absorption data is presented in graph #3. Sheets of aluminum foil 1/1000 inch thick were employed in an effort to obtain the energy of the rays but this evidence is inconclusive. No range was found if they were  $\alpha$  and if  $\beta$  the energy is extremely weak.

A spectrochemical analysis was made of the cellamite and with the elements found as a guide the Seaborg tables were searched.

$Si^{31}$  produced by  $Si^{30} + n$  has a 2.8 hour half-life, a 1.8 MEV  $\beta$  and no  $\gamma$ .

$Cu^{64}$  produced by  $Cu^{63} + n$  has a 12.8 hour half-life, a .58 a .66  $\beta^+$  and no  $\gamma$ .

Copper and Silicon were the only elements found whose half lives were at all close to experimental findings and did not emit  $\gamma$  rays.

Calcium, Manganese and Nickel were suspected as well as Silicon but all are emitters.

From the Health Hazard angle it is fortunate that the half lives found are relatively short.

C. M. Patterson

CMP/mab

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This document has been approved for release to the public by:

*David R. Hamlin* 4/24/95  
Technical Information Officer Date  
ORNL Site

ChemRisk Document No. 1582

H. P. 32

30

20

Collinite Sample Decay

10

*MY/hY*

9

8

7

6

5

4

3

Subtraction of straight portion  
from above

2

Graph #1

Hours

1

5

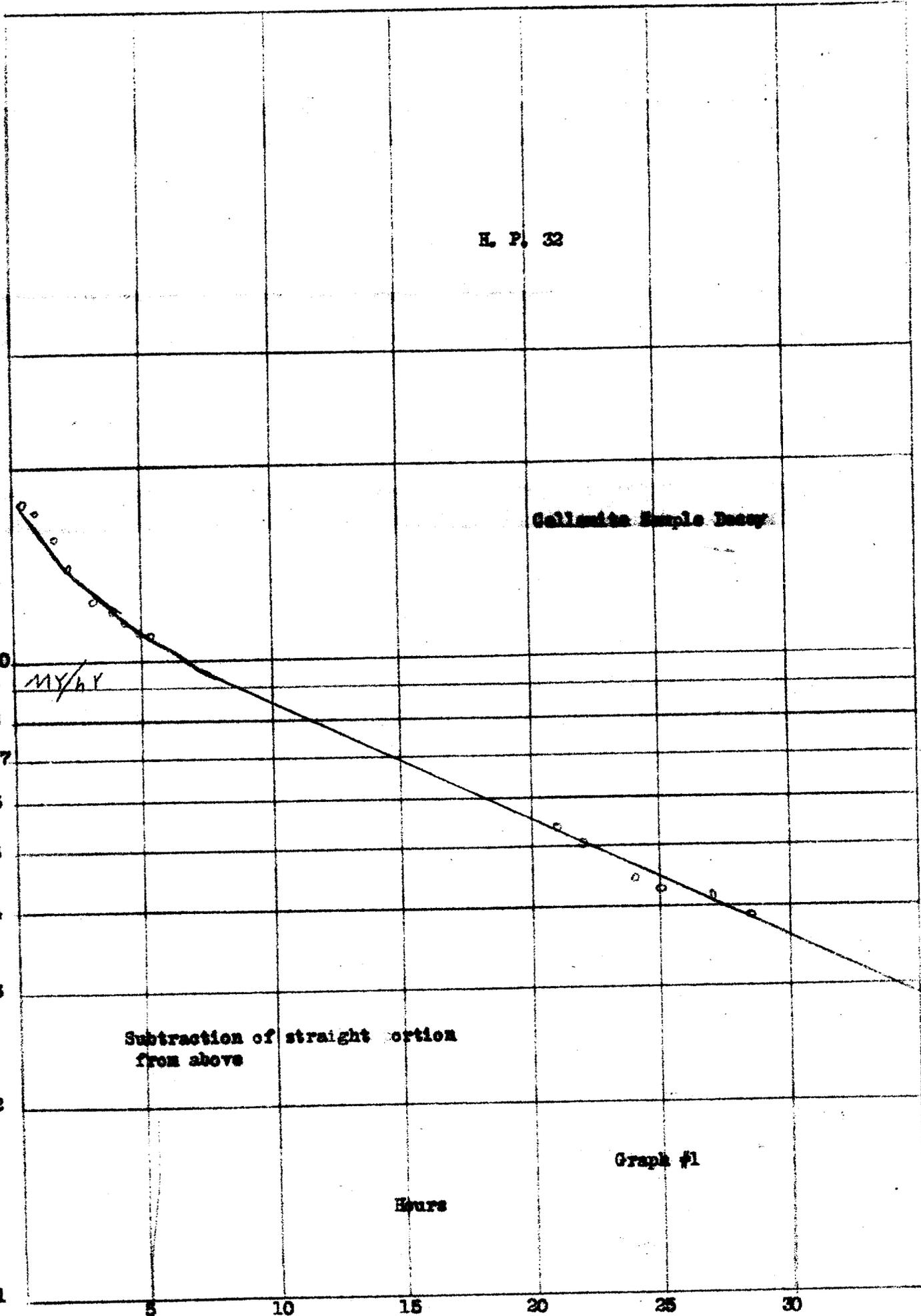
10

15

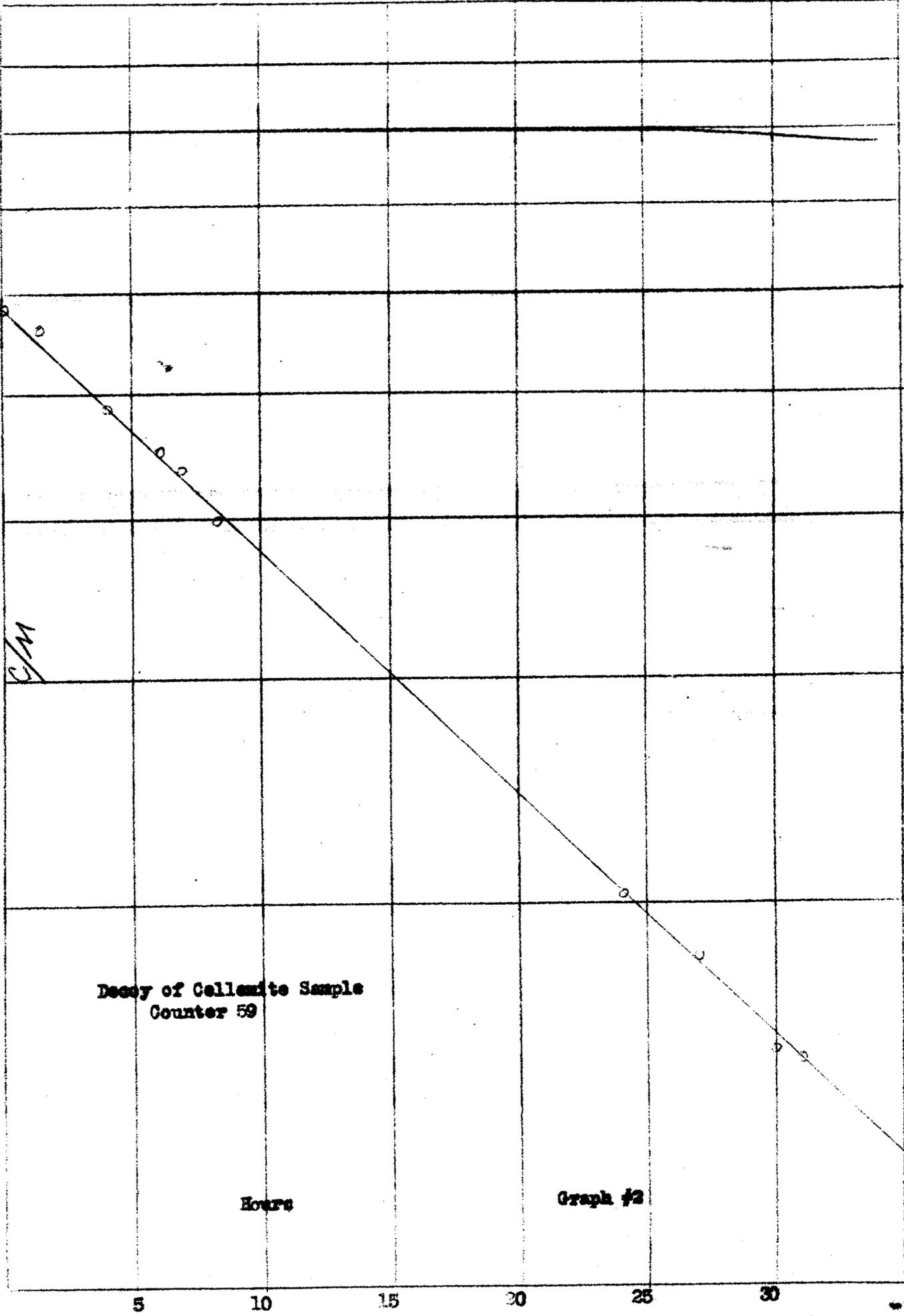
20

25

30



9000  
8000  
7000  
6000  
5000  
4000  
3000  
2000  
1000

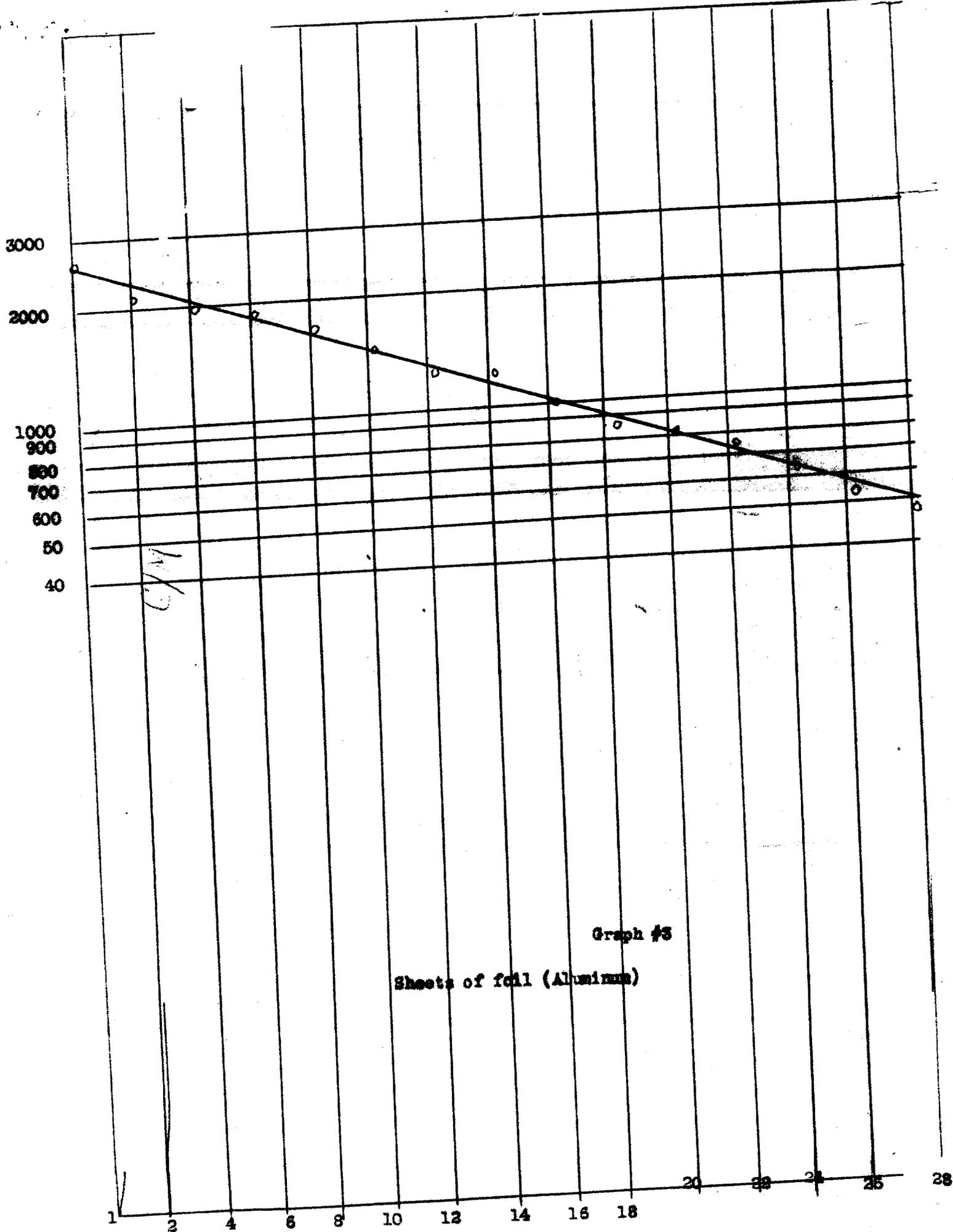


Decay of Collexite Sample  
Counter 59

Hours

Graph #2

C/M



Graph #3

Sheets of foil (Aluminum)