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GRAVITY INTERPRETATION
+ Profiles
HILL-RUST CLAIM GROUP

ROSE CREEK AREA, YUKON TERRITORY
105K5 - 105K6

ANVIL'S COPY July 1969

GRAVITY INTERPRETATION

of the

HILL-RUST CLAIM GROUP
ROSS CREEK AREA, YUKON TERRITORY

for

HECLA MINING COMPANY
OF
CANADA LTD.

by

OVERLAND EXPLORATION
SERVICES LTD.

INDEX

INTRODUCTION

A gravity survey was conducted on the Hill, Fust, etc., Claim Groups by Overland Exploration Services Ltd., in June and July, 1969. Overland contracted to cut the lines, conduct the gravity survey and interpret the results on the Claim Group for the account of Hecla Mining Company Of Canada Ltd. Hecla Mining Company provided the helicopter support necessary to transport the crew to the location and carry out camp moves in and camp moves out. A total of 28.5 miles of gravity line were run on the Hill-Fust Group with stations every 100 feet along lines spaced at 800 feet intervals. The grid lines were connected by a base line which also was metered with 100-foot station spacing. The metering was carried out with a Wordan Master meter.

SURVEY & FIELD PROCEDURE

The horizontal and vertical survey was conducted with a Ti-A theodolite. The Base Line was located as to its relationship to north by a series of sun shots, the average of which was used for north. Elevations were run down the Base Line with three individual surveys. The extreme divergence of these surveys was 2.5 feet and an averaged mean elevation was then used for stations along this line. All cross lines were double surveyed.

The gravity readings were taken with a Worden Master meter and stations were metered on two and one-half hour runs from base stations. The base station plots were used for graphing the diurnal gravity drift which in turn was applied to all station readings. Each gravity station run had several repeat stations from preceding runs in order to prove and maintain repeatability of the gravity meter. The repeats were all within a 0.00 to 0.05 milligal range.

All gravity readings are corrected for :

- Diurnal Tidal Drift
- Bouguer Free-Air-Correction
- Latitude Correction
- Terrain Correction

A density factor of 0,050 for a surface density of 2,55 has been used in this interpretation.

low ?

INTERPRETATION

The main body of this interpretation is derived from gravity profiles of the surveyed lines. From these profiles a regional gradient has been determined which forms the basis for defining local positive and negative anomalies. These gravity anomalies show as density highs and lows relative to the regional gradient and are mapped on the Residual Gravity Map. All modal studies of the positive anomalies which could relate to sulphide bodies together with (depth and magnitude calculations) have assumed a density contrast of 0.9 to exist between native rock and the anomaly source. This contrast supports the majority of our calculations and it is to be construed that the source of the major anomalies are either dense sulphides or extremely dense basic rock intrusions. A third possibility could be an escarpment of native rock adjoining a deep layer of unconsolidated surface till. However, from both the pattern present and repeatability necessary to reproduce

such effects as shown on the Residual Map, we doubt that this latter possibility exists.

[illegible]

The Bouguer Map displays the total gravity field. The intensity of the gravity field over the surveyed area ranges from 785.0 milligals to 800.0 milligals, a total difference of 15.0 milligals.

The Bouguer Map in itself does not disclose any significant trends which may be valuable in the search for mineralized areas. There is a low gravity trend that strikes north-south through the map in the area of Line 164 + 00. We feel this trend reflects a fault zone with the upthrust side lying west of Line 164 + 00. Other minor faulting is related to areas of gradient steepening. However, these areas are discussed and described more thoroughly in both the Residual and Profile Discussion later in this report.

RESIDUAL MAP

Residual gravity highs and lows have been extracted from the total gravitational field by constructing a regional gravity datum from the Bouguer profiles. The relationship of the total field to the regional datum results in residual gravity data. The gravity highs are what we primarily investigated in this report because the areas of suspected base metal content will have a positive gravitational relationship to the surrounding native rocks.

We have lettered the positive anomalies on the Residual Map and the following is a discussion of them.

ANOMALY "A"

- The "A" anomaly appears north of the base line between lines 116 and 164. The maximum amplitude is 1.40 milligals. We have used a 3.5 density

as an assumed model study density for sulphide bodies in this area. With this differential the "A" anomaly is a large massive dense pod having its shallowest cover on Line 132. Depth to surface at this point should be less than 200 feet. The main body of the anomalous mass dips to the north along its entire strike. We feel the entire bedding plane is north dipping in this area and the causative mass is possibly involved with faulting which parallels strike. If this entire anomaly is due to a sulphide mass then, the volume is in excess of 30,000,000 tons. However, some portion of the anomaly may be accentuated by the faulted bedding.

ANOMALY "B"

- This anomaly is possibly the most interesting in this area. It certainly has the largest mass and has the possibility of containing

huge reserves. The "B" and "BB" anomalies appear to be associated with a change in rock type, or a fault. Possibly both events take place in this area paralleling the anomaly itself. However, the "B" anomaly appears on the gravity section as a localized high density mass which is superimposed on the larger gradient change. The depth to top of the "B" anomaly is very shallow where the profiles cross it, we estimate a depth of less than 100' and possibly very near surface on Line 124. On the Residual Map we have represented the "B" anomaly as continuous. This, of course, may not be correct and further gravity work may prove the anomaly to be several separated pods. This fact along with a lack of information on the north flank prevents us from estimating actual tonnages involved.

ANOMALY "C"

- Anomaly "C" is a well defined linear feature which extends for 1,200 feet parallel to the base line from Lines 172 to 196. There is a second pod of dense material lying to the south of the main body on Line 172 + 00 which is also referred to as anomaly "C". The original "C" anomaly is closest to the surface and best defined on the 160 +00 Line-the depth to top of anomaly is probably 100 - 150 feet and the dense mass is dipping to the north. The density or the size of the mass diminished rapidly to the west from the No. 172 Line.

ANOMALY "D"

- The "D" anomaly is on the same trend as the "A" anomaly and may well be an extension of the former feature. The

main difference is that "D", in general, is considerably deeper and the main body of the mass lies 600 feet below surface. An exception to this depth is on Line 196 at 13 + 00 South where there is a segment of dense material extending to within 200 feet of the surface.

ANOMALY "E"

- "E" is a trend that may or may not be continuous between Line 100 and Line 143. We have separated the anomalies where they cross the individual lines because of the lack of data. "E" could be a continuous stringer of sulphide paralleling the "B" trend and associated with the suspected fault extending through this portion of the surveyed area.

ANOMALY "F"

- The "F" anomaly is a small partially defined residual gravity high in the southeast corner of the prospect. It has enough magnitude and is well enough defined, especially on the south flank, to warrent mention. Further work should be done on this feature to the east of Line 100.

ANOMALY "G"

- "G" is a large amplitude anomaly which is hard to completely sort out because of a mass deficiency area present to the south of the anomaly. This mass deficiency area is probably a pronounced thickening in the surface till, but despite this the "G" anomaly stands as a target which must be investigated further.

ANOMALY "H"

- "H" is an area of low relief density highs that could be intermittant sulphide stringers. This will have to be detailed before much more can be said about this area. We hold the "H" anomaly in the lowest priority in the mapped area.

ANOMALY I

- The I anomaly is similar to "H", this is an inferred anomaly on the extremities of the surveyed area (Line 190 + 00 North end). More work will be necessary before any evaluation can be made of the "I" feature.

AMOMALY "J"

- The "J" anomaly is a well defined density high having a causative mass 200 to 250 feet deep. It is probably associated with the "L" anomaly which lies to the west.

If the "J" and "L" anomalies are continuous we are looking at a probable source of 15,000,000 M.M tons of 3.5 density material. If they are separated by a the tonnage will be smaller but still worth investigating.

ANOMALY "K"

- This well defined anomaly has an amplitude of 1.00 milligals and indicates a possible medium size tonnage concentration. A northeast-southwest fault appears to cut across the area on the east side of the "K" anomaly and may be associated with this anomaly.

ANOMALY "L"

- "L" is discussed in the "J" anomaly discussion.

ANOMALIES "M", "N" & "P"

- These three anomalies fall on the west extremity of the Hill-Fust Group Claims and appear to be inter-connected and if so they could represent a 20,000,000 M.T. ton causative mass. There is also a possible fault trending northeast-southwest through this anomalous area causing the mass deficiency exhibited on the Residual Map.

CONCLUSIONS

This survey covers a large area which appears to be almost continuously covered by massive, high density, gravity anomalies. Within the survey boundaries there are several faults and/or rock facies changes which could be the reason for the gravity anomalies (suspected sulphide bodies) existing as they do. The lines in general are far to widely spaced to do any accurate tonnage estimations, because, with closer line spacing the anomalies that appear to be continuous can well prove to be a series of disconnected highs. Also, the flanks of most of the edge anomalies are poorly defined.

We feel that this prospect has the highest order of potential that can be found on a heavy ore gravity exploration program. We strongly advise you to continue the survey to the northeast beyond the "B" anomaly. Cut all of the lines from 100 to 172 North to Station 90 + 00 North. Continue the exploration

of the "F" anomaly and continue the 108, 116, 132, 140, 156 and 164 Lines to 75 + 00 South. Cut 204 and 212 Lines to 65 + 00 North and continue the 228 and 212 Lines south to 79 + 00 South.

Respectfully submitted by:

OVERLAND EXPLORATION SERVICES LTD.

W.T. Galt
Geoph.

WTS/jb

William G. Crook
P. Geol.

Assisted by
David K.Y. Chen, P. Geoph.

CERTIFICATE OF PROFESSIONAL QUALIFICATIONS

1. I, William G. Crook, reside at 3404-8A Street, S.W., Calgary 6, Alberta.

2. I have a B.Sc. in Geology from the University of Alberta, Edmonton (1955).

3. I am a Professional Geologist registered with the Alberta Association of Professional Engineers.

4. I possess experience in the following fields of Geology: Surface Geology, Sub-Surface Geology, Geomorphology, Mineralogy, Structural and Stratigraphic Geology, Photogeology, Geophysics, Engineering Geology and Investigations, Economic Geology, Sub-Surface Mining and Petroleum Exploration.

5. I have worked on a great variety of exploration projects in the plains and mountainous regions of western and northern Canada, and South America.

6. I belong to the following professional societies: Alberta Association of Professional Engineers, Alberta Society of Professional Geologists.

7. I have not, directly or indirectly received, nor do I expect to receive any interest, direct or indirect, in the property of the Company (Hecla Mining Company of Canada Ltd.) or any affiliate, nor do I beneficially own, directly or indirectly, any securities of the Company or any affiliate.

Respectfully submitted:

William G. Crook

William G. Crook, P. Geol.

DATED: September, 1969.

CERTIFICATE OF QUALIFICATIONS

I, DAVID K.Y. CHEN, Geophysicist, of 6405 Center Street North, Calgary 47, Alberta, Canada, hereby certify that:

1. I am a professional geophysicist associated with Overland Exploration Services Ltd., 1347 - 12th Avenue S.W., Calgary, 3, Alberta, Canada.

2. I have no direct or indirect interest in, nor do I expect to receive any direct or indirect interest in any properties or securities of New North Minerals Ltd.

3. I have attended the National Hunan University of Changsha Hunan, China, 1947, receiving a Bachelor of Science Degree in Mining Engineering; that I hold a Master's Degree in Earth Sciences (geophysics major) from New Mexico Institute of Mining Technology, at Socorro, New Mexico, U.S.A. During the period of 1964-67 I undertook part-time graduate studies in geophysics at Washington University, St. Louis, Missouri, U.S.A. I have completed all requirements of the graduate courses for my Ph. Degree work in geophysics except the thesis.

4. Since 1957, I have been intensively engaged in seismic, gravity and magnetic surveys and interpretations for oil/ore exploration in the U.S.A. and Far East with several Chinese, U.S. and Canadian oil and geophysical companies. In 1947, I was engaged

.....(Cont'd).....

as a Petroleum Engineer supervising oil well drilling and production. In 1957 I became involved in the geophysical oil/ore exploration field. I have held the following positions;

- Geophysicist
- Research Geophysicist
- Assistant Professor in Geophysics.

5. I am a member of the following academic and professional societies;

- Society of Exploration Geophysicists
- American Geophysical Union
- European Association of Exploration Geophysicists
- Association of Professional Engineers of Alberta
- Geological Society of Republic of China
- Chinese Petroleum Institute
- Chinese Institution of Mining and Metallurgical Engineers

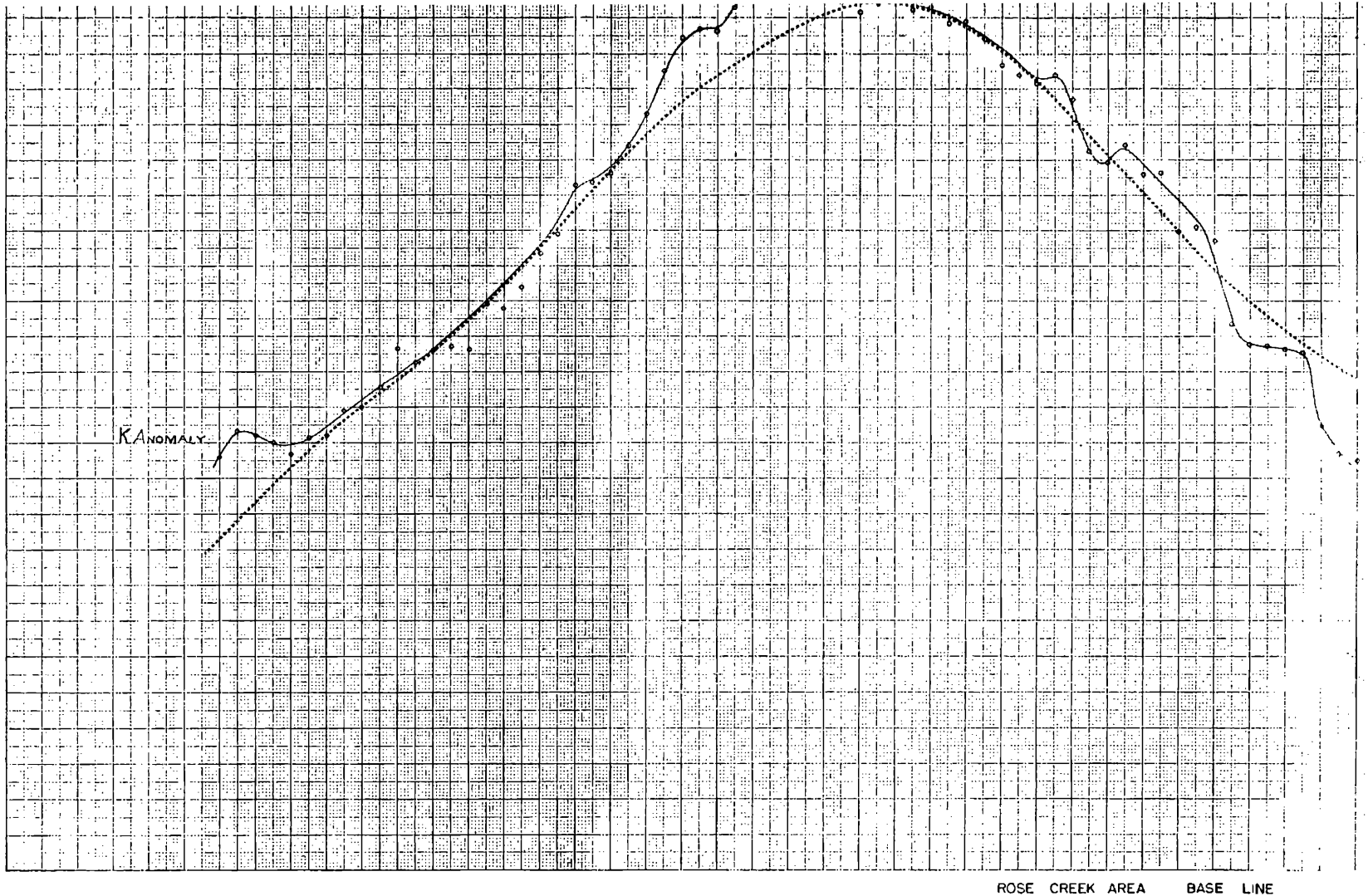
6. I have published several papers (in both China and the United States, together with periodicals.

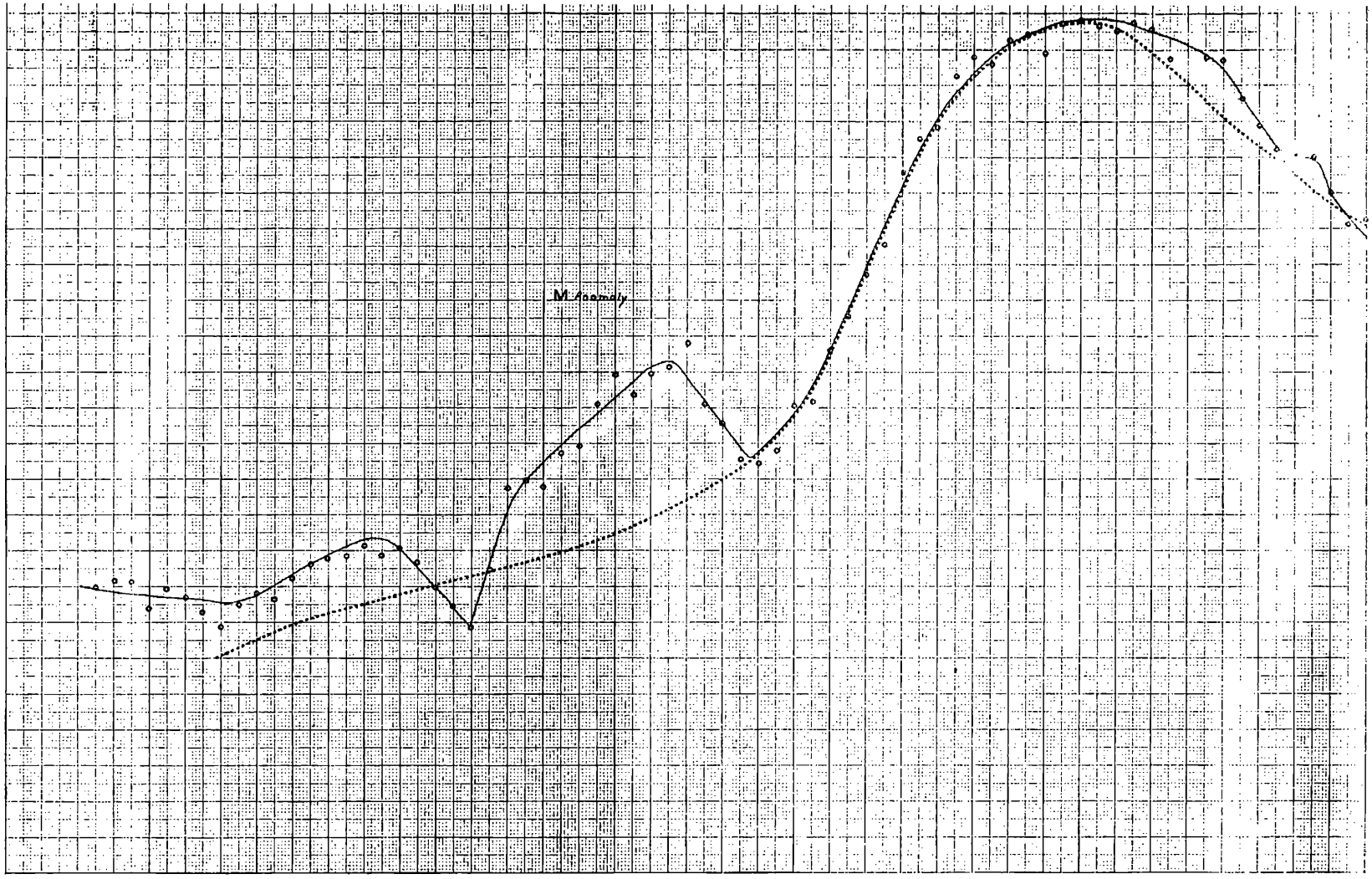
David K.Y. Chen

DAVID K.Y. CHEN
Professional Geophysicist

DKYC/jp

FAULT
ROSE CREEK AREA
BASE LINE


K ANOMALY
ROSE CREEK AREA BASE LINE



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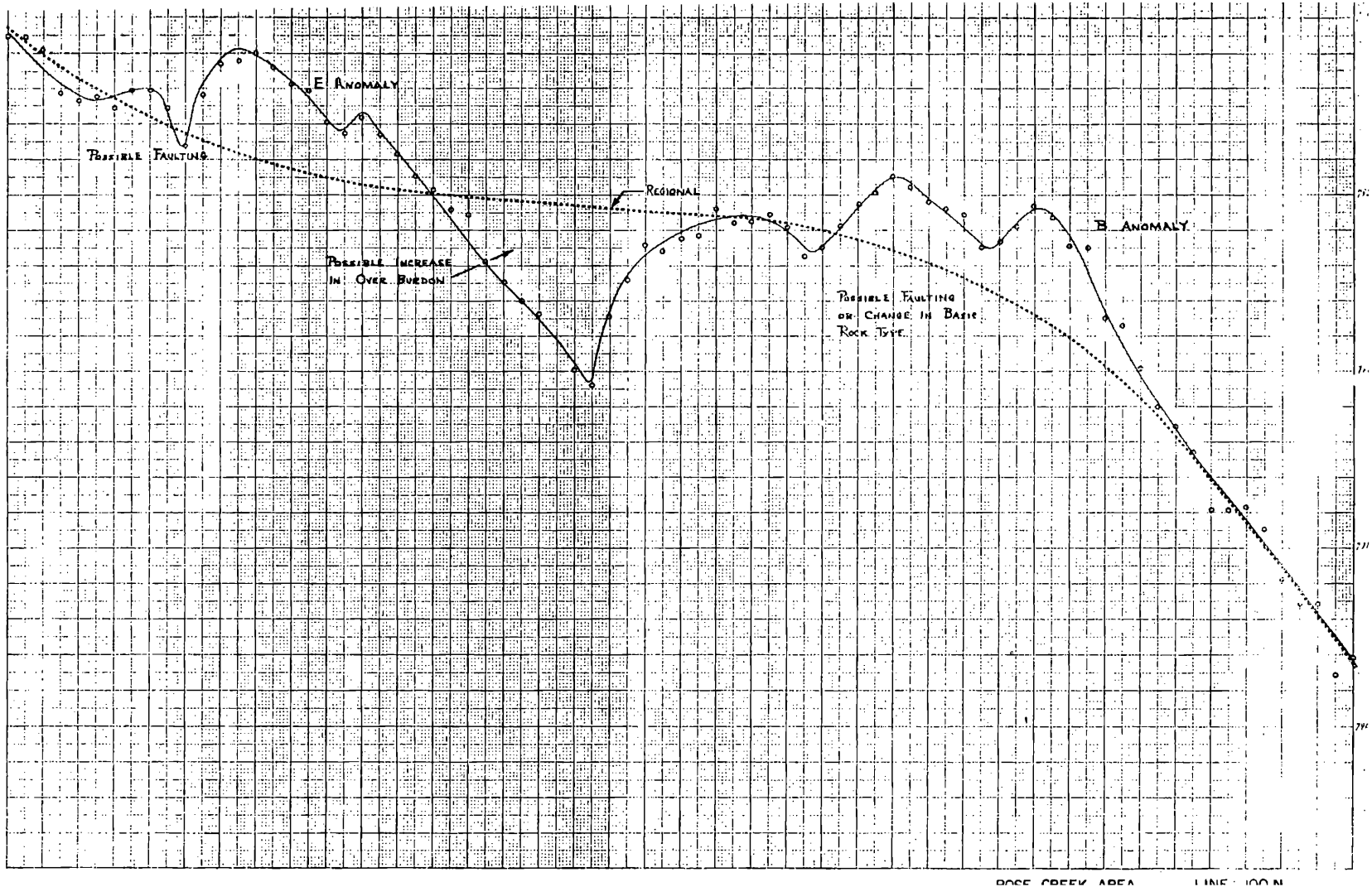

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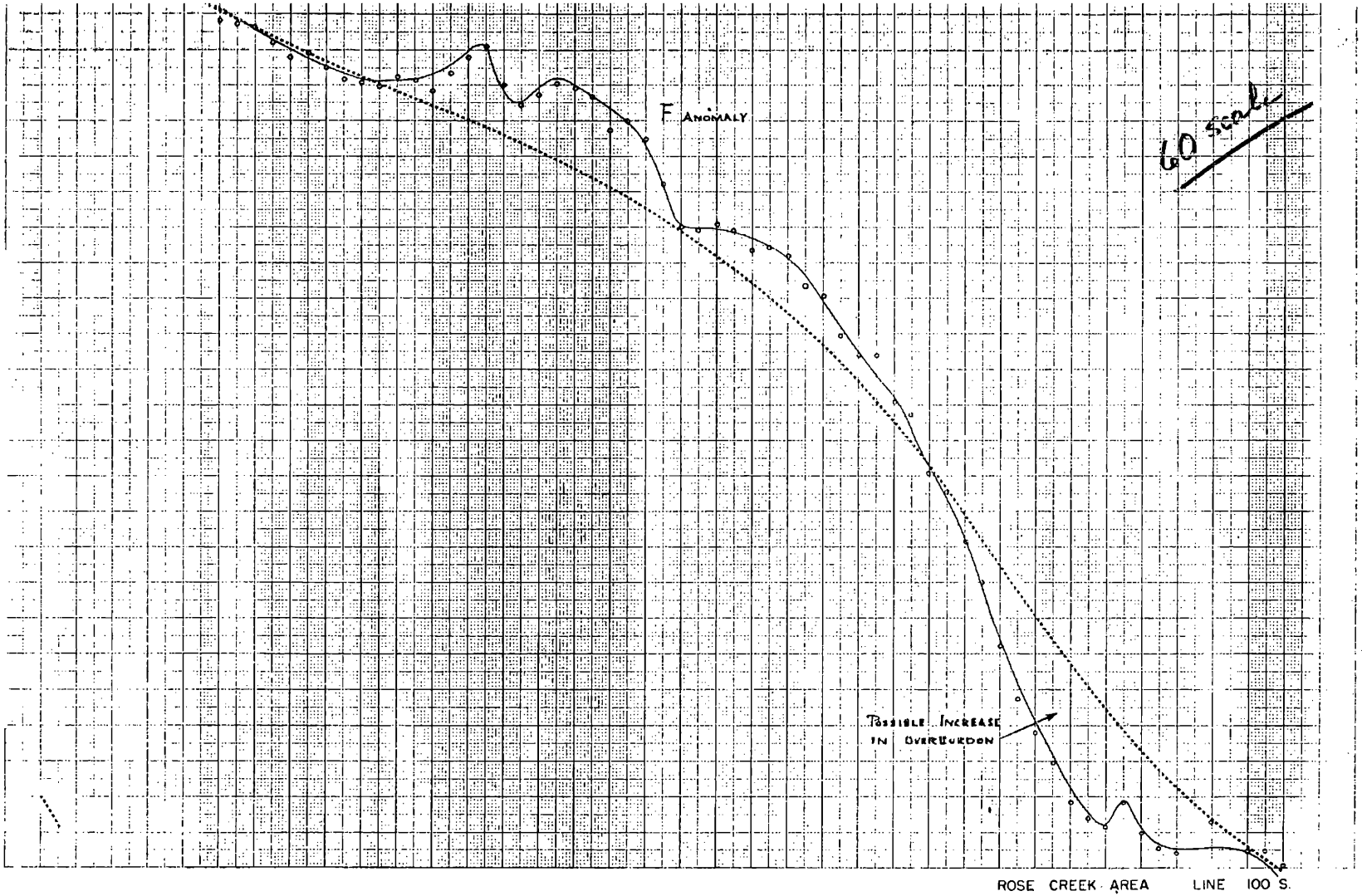
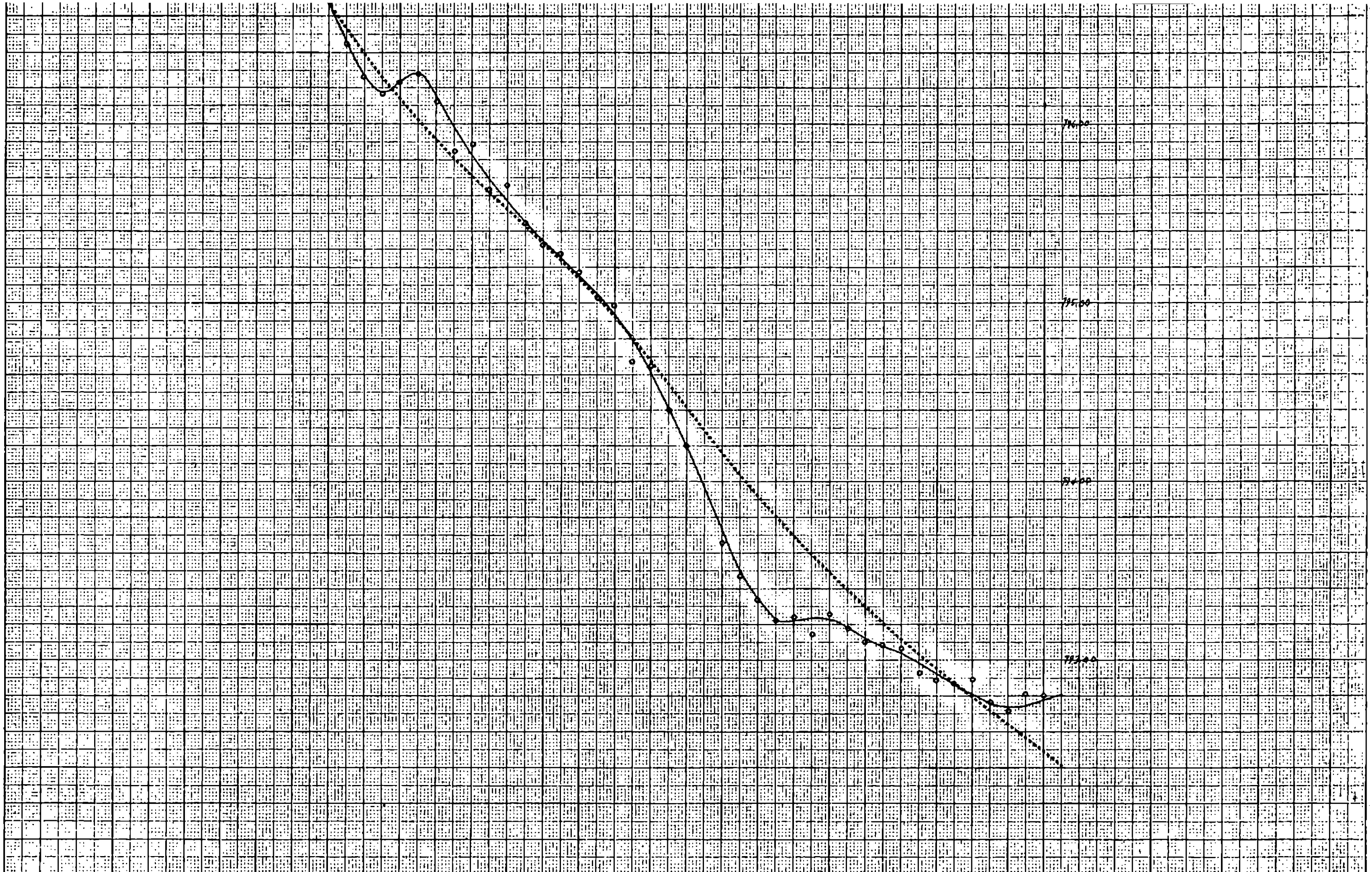

F ANOMALY
60 scale
POSSIBLE INCREASE
IN OVERBURDEN
ROSE CREEK AREA LINE 100 S.

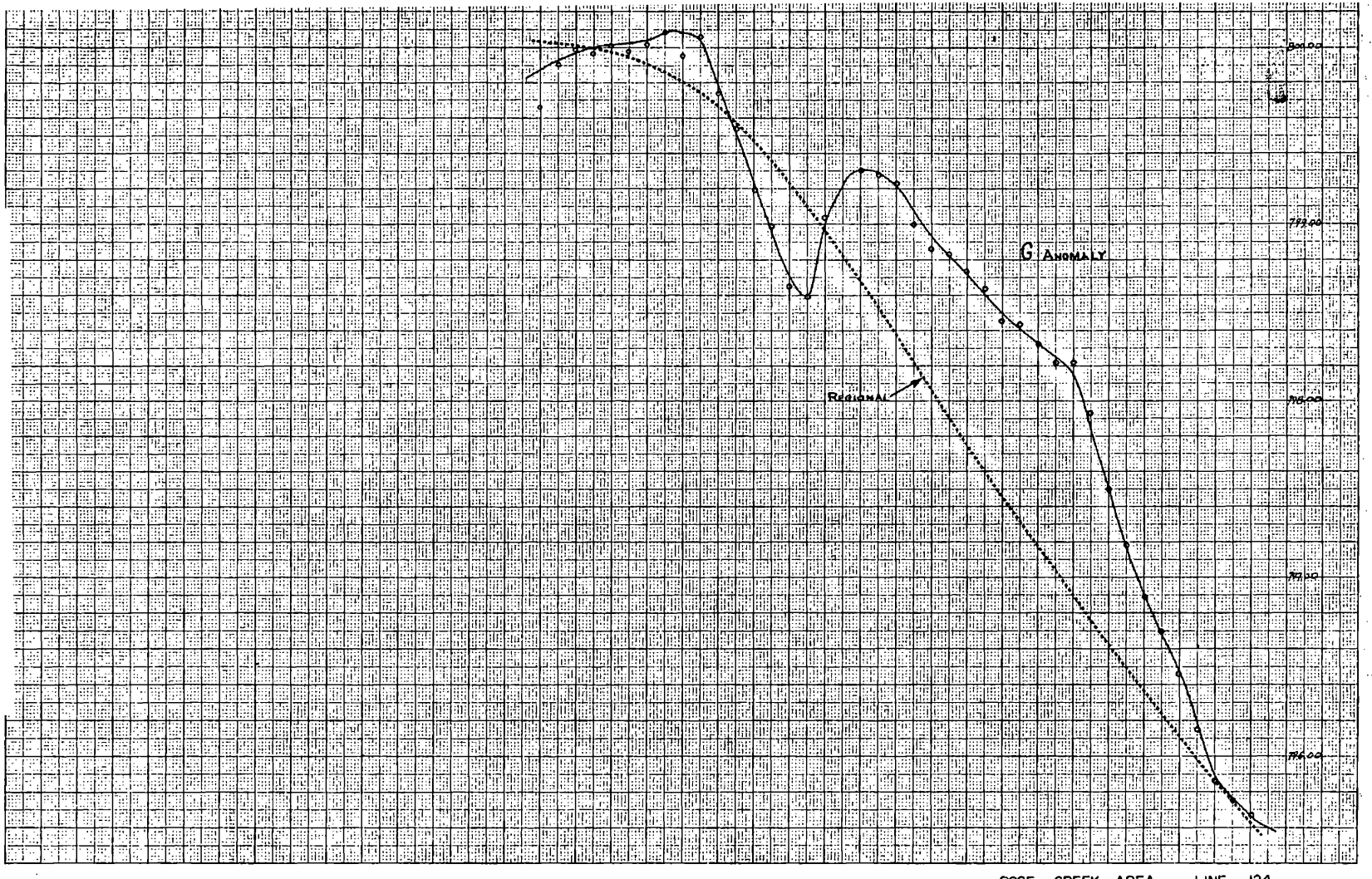


ROSE CREEK AREA LINE 108

ANOMALY G
ANOMALY A
ROSE CREEK AREA LINE 116

ROSE CREEK AREA LINE 124 N

A ANOMALY
ROSE CREEK AREA LINE 124 N&S.



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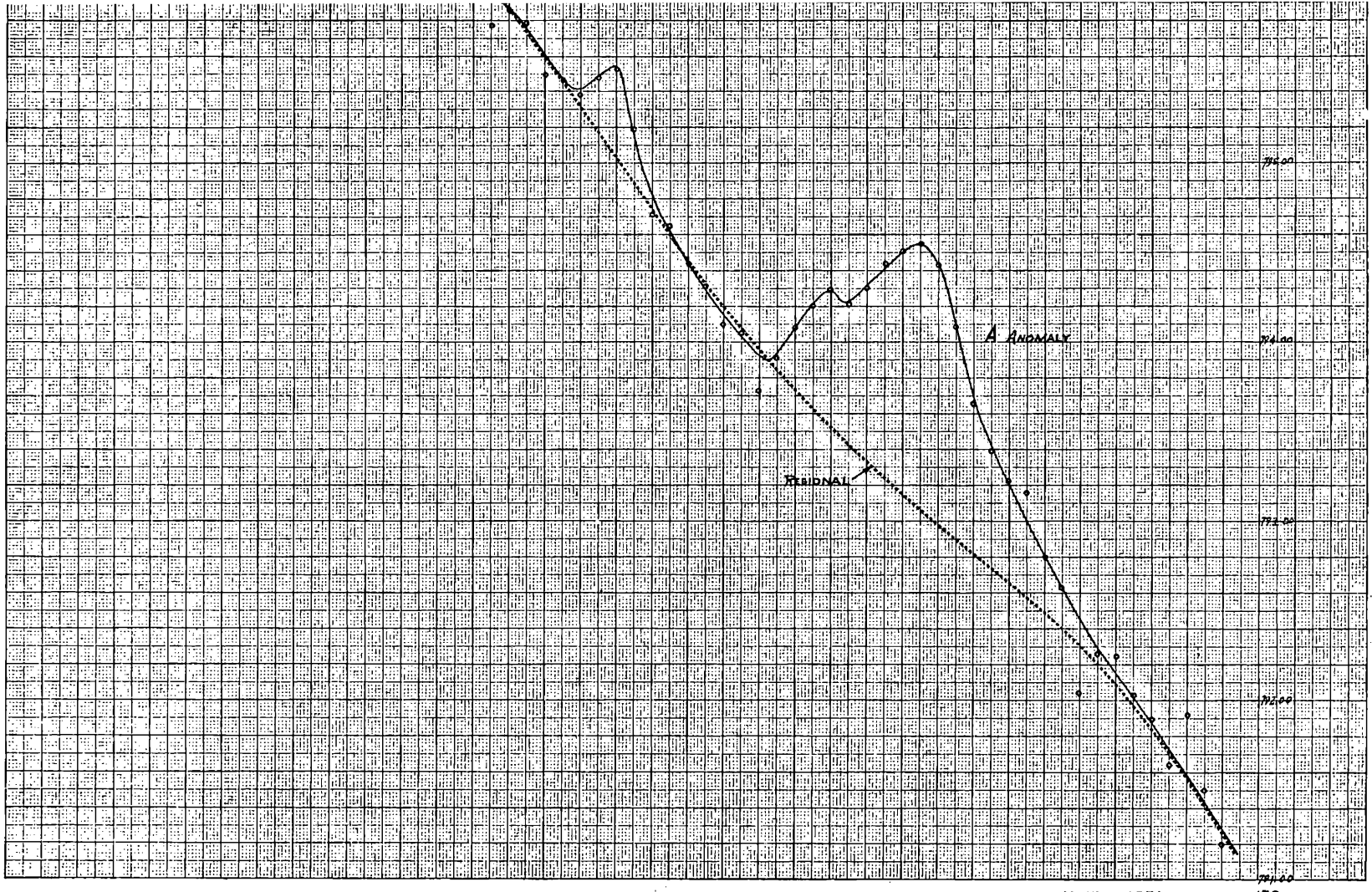

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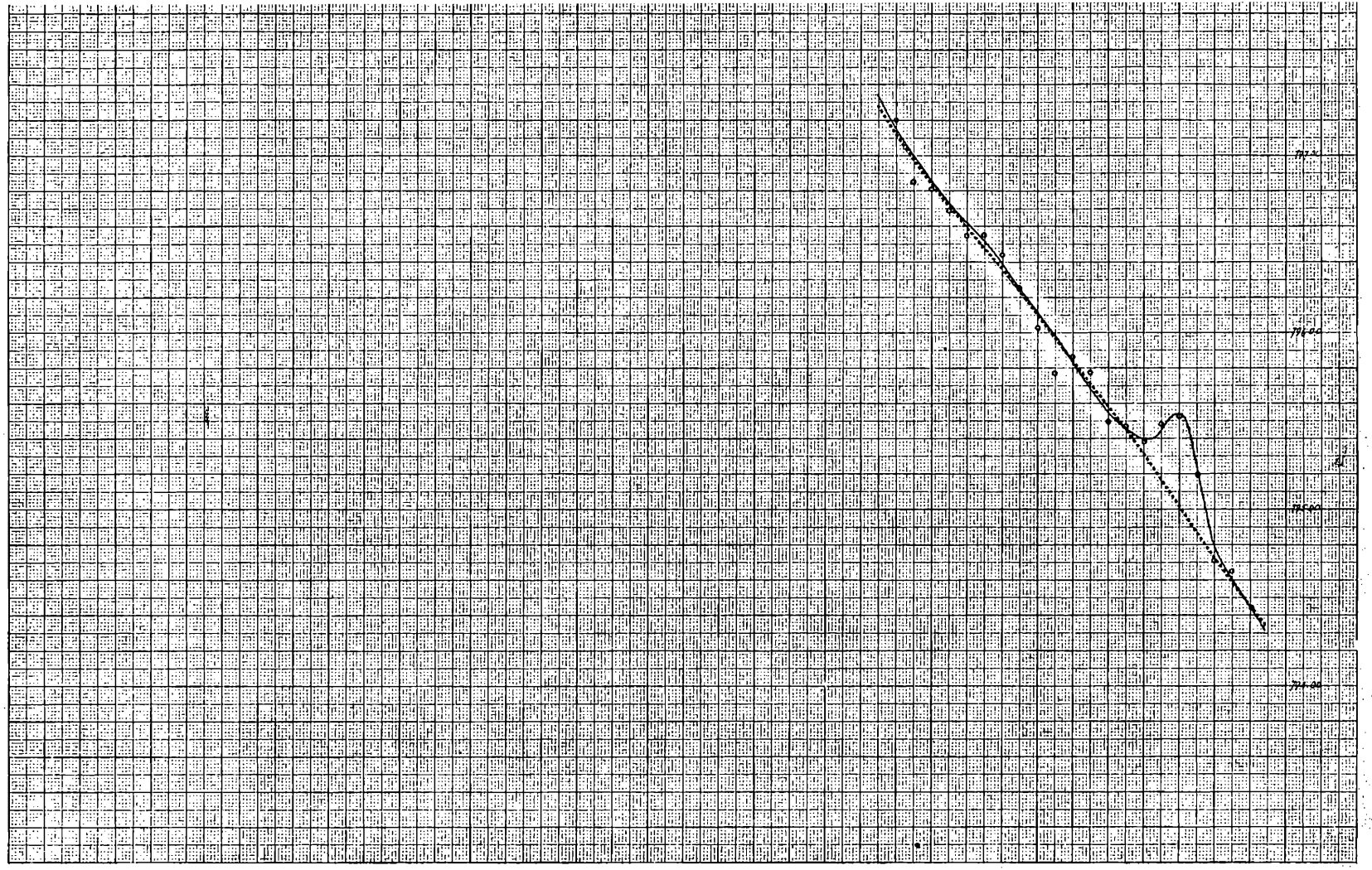
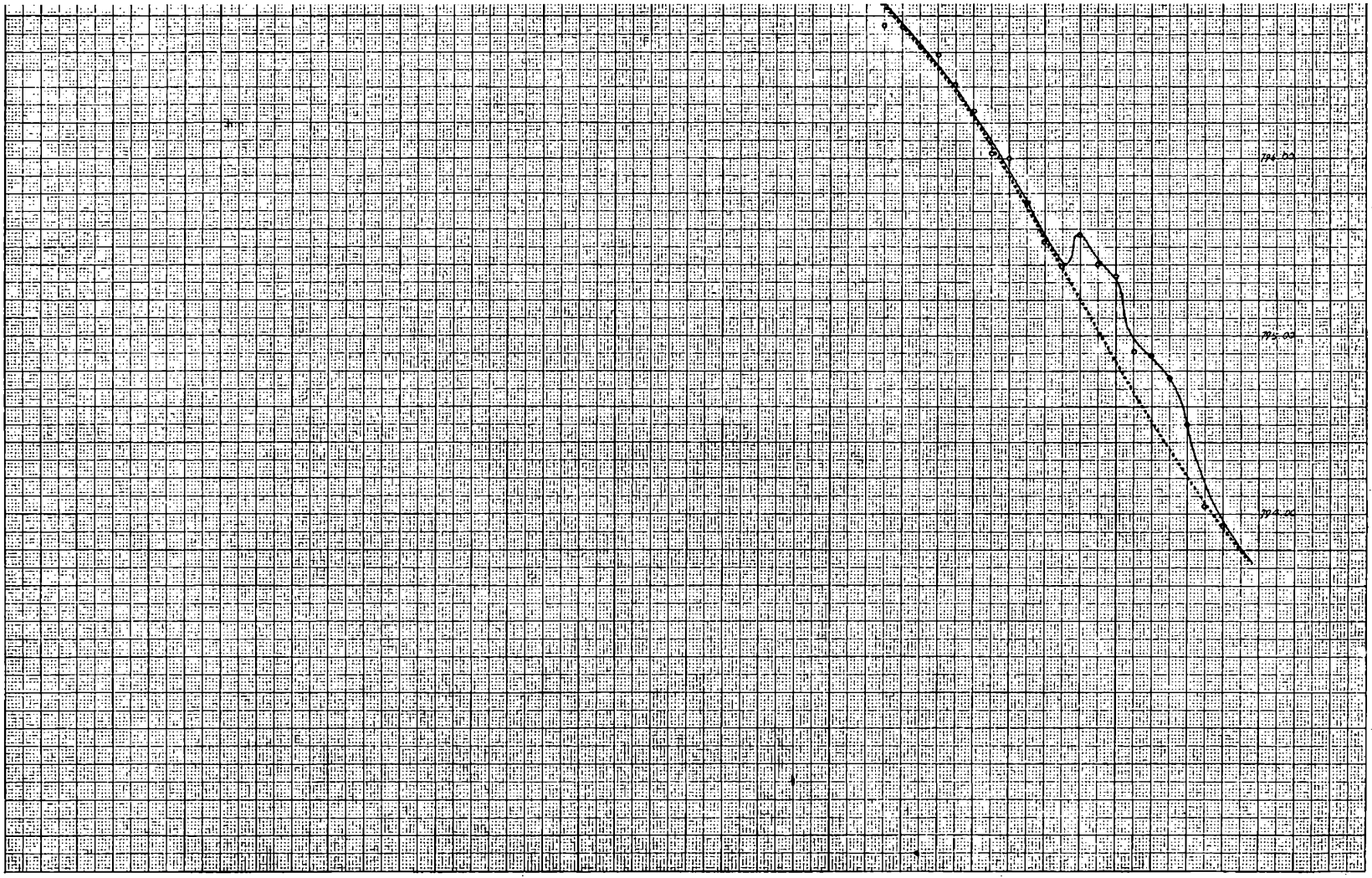


ROSE CREEK AREA LINE 132 S

ROSE CREEK AREA LINE 140



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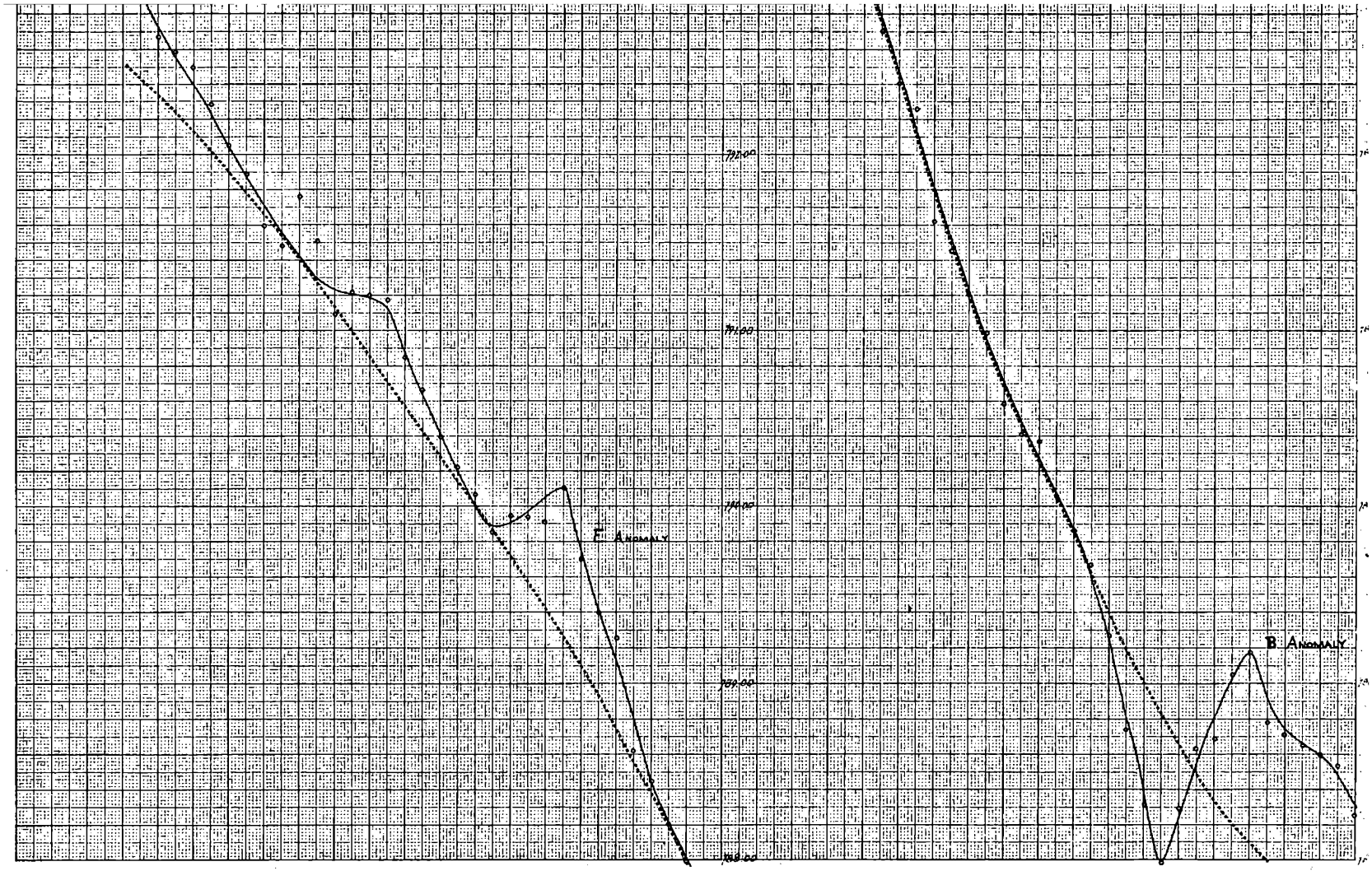
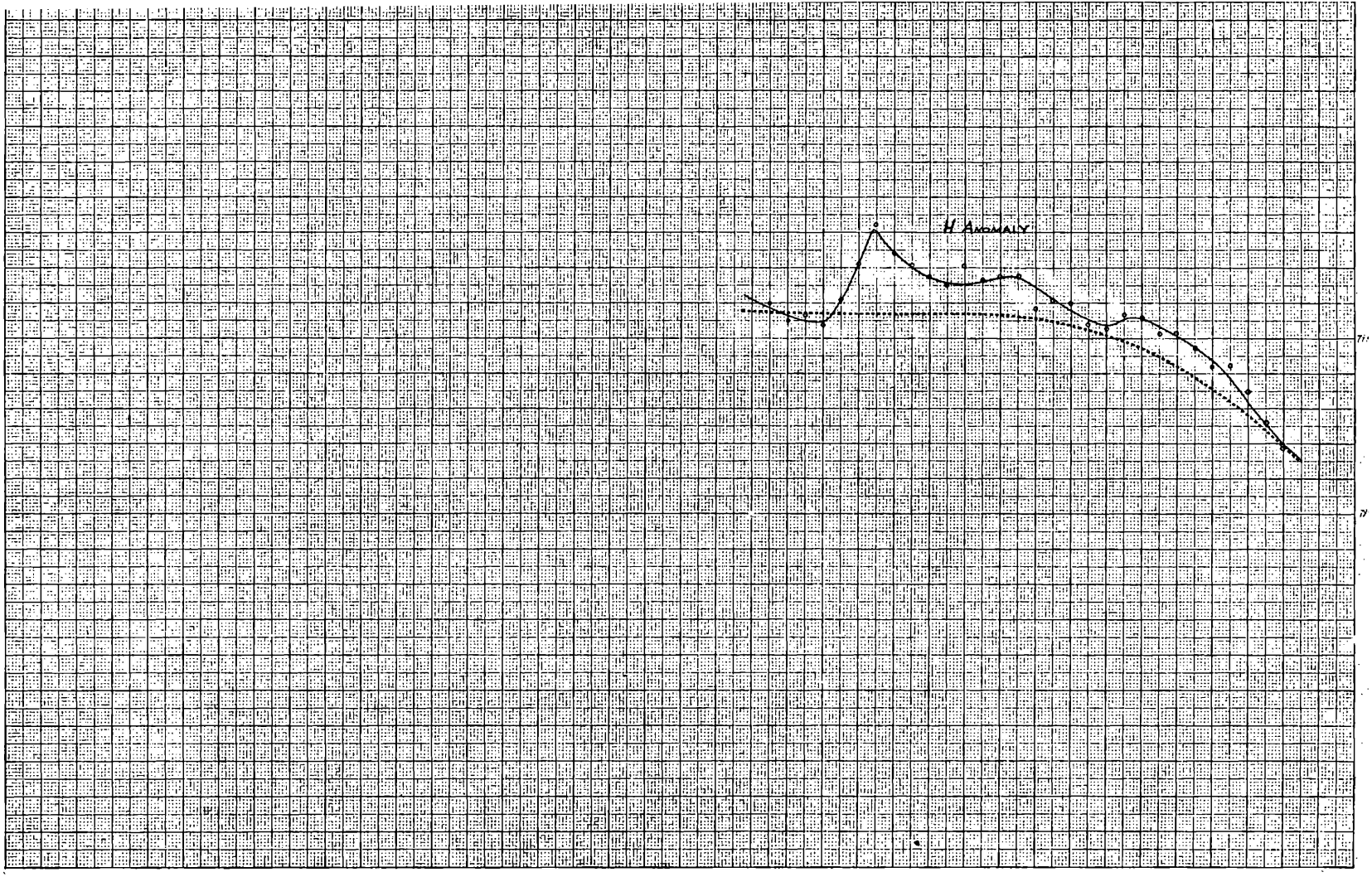

720.00
710.00
700.00
690.00
680.00
E ANOMALY
B ANOMALY
ROSE CREEK AREA LINE 148

A ANOMALY
ROSE CREEK AREA LINE 148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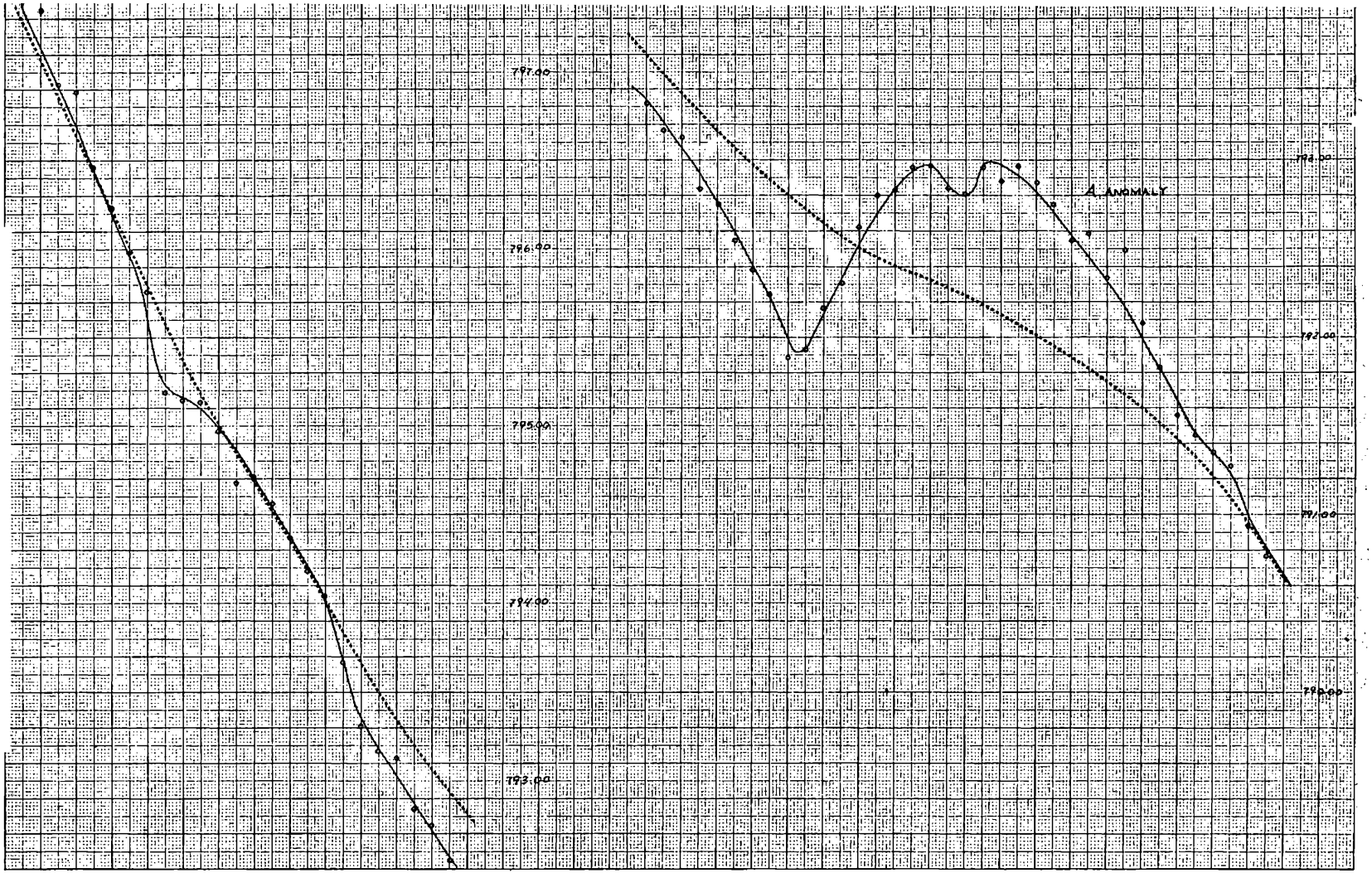
ROSE · CREEK AREA LINE 148



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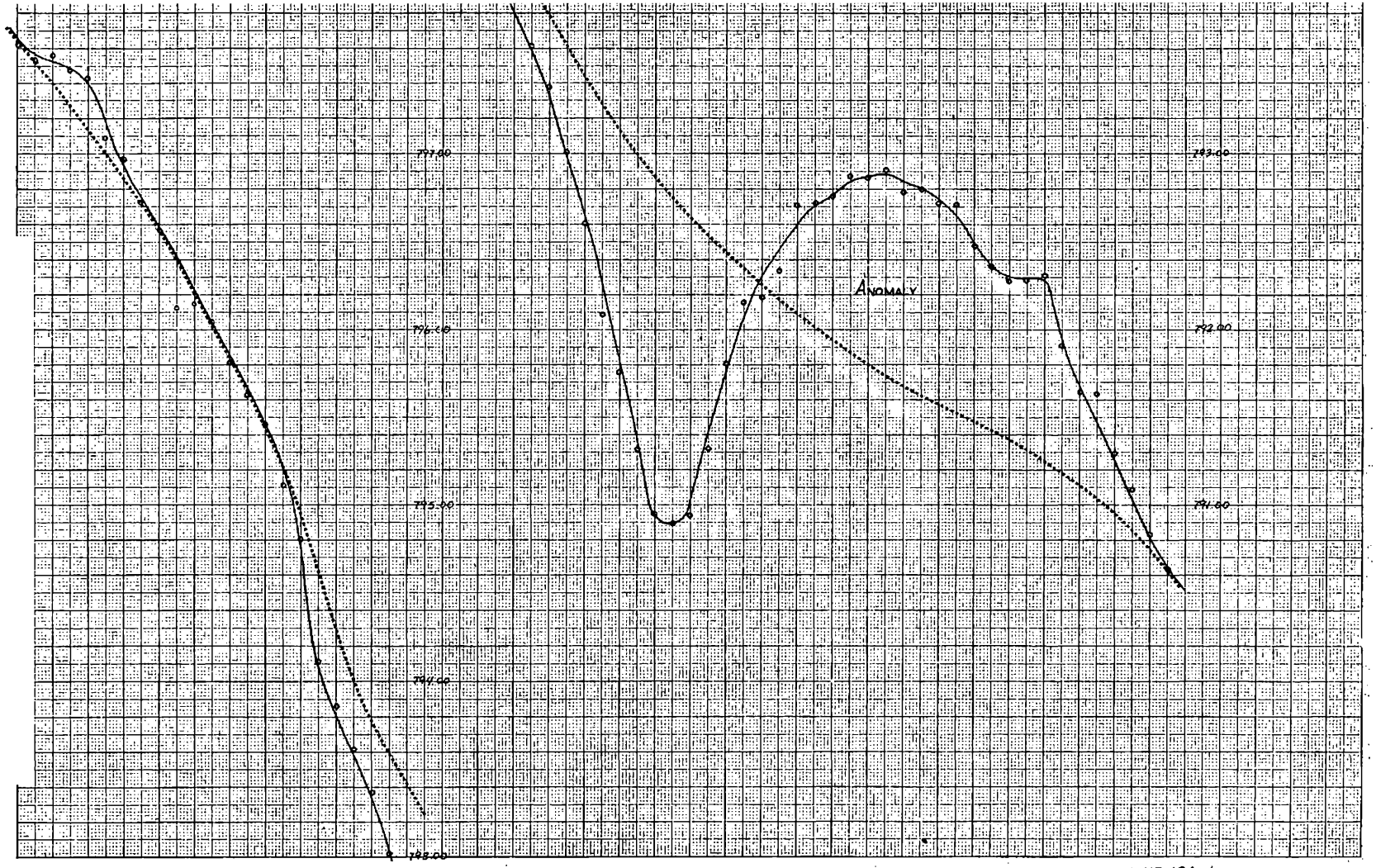

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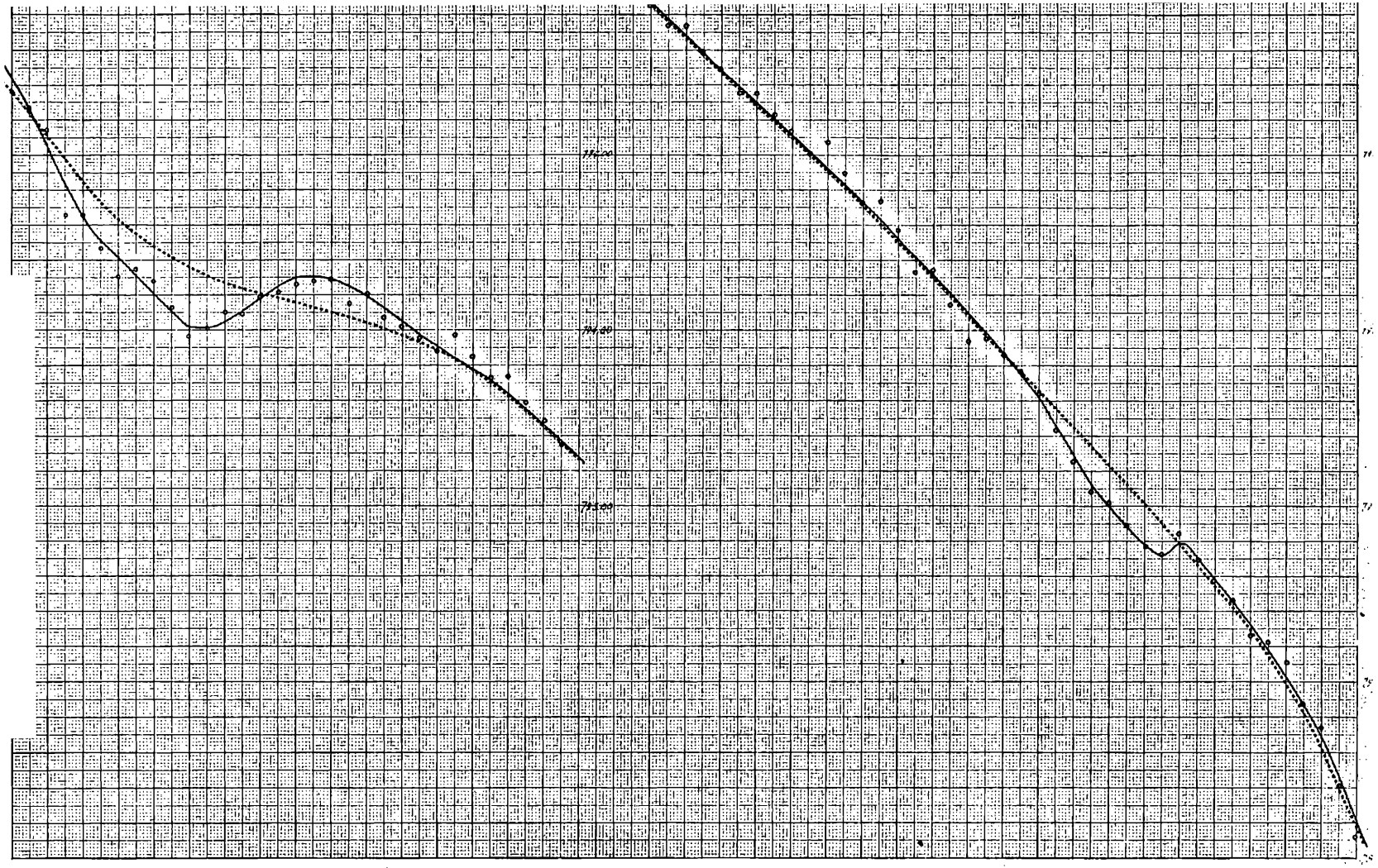
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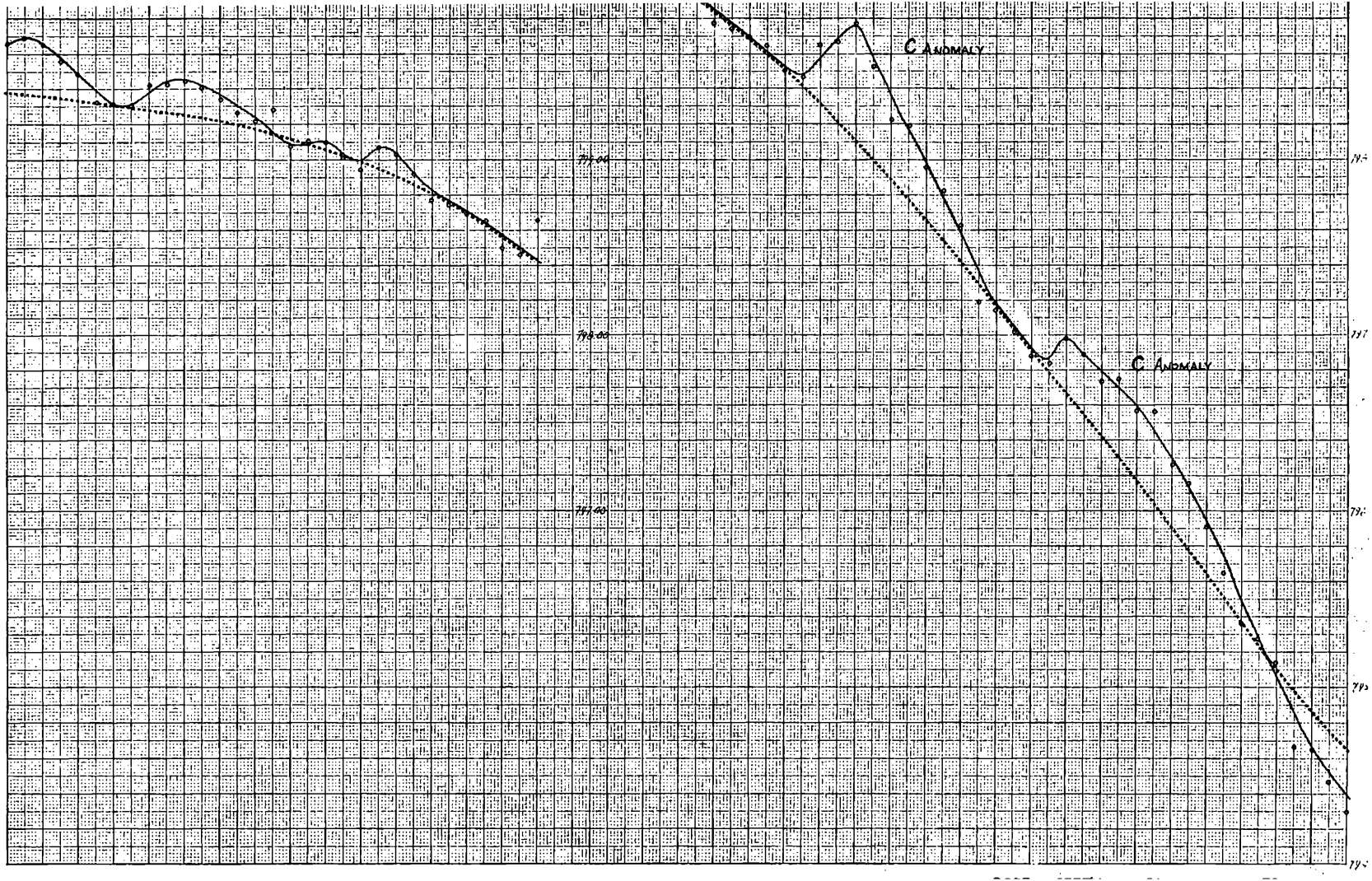
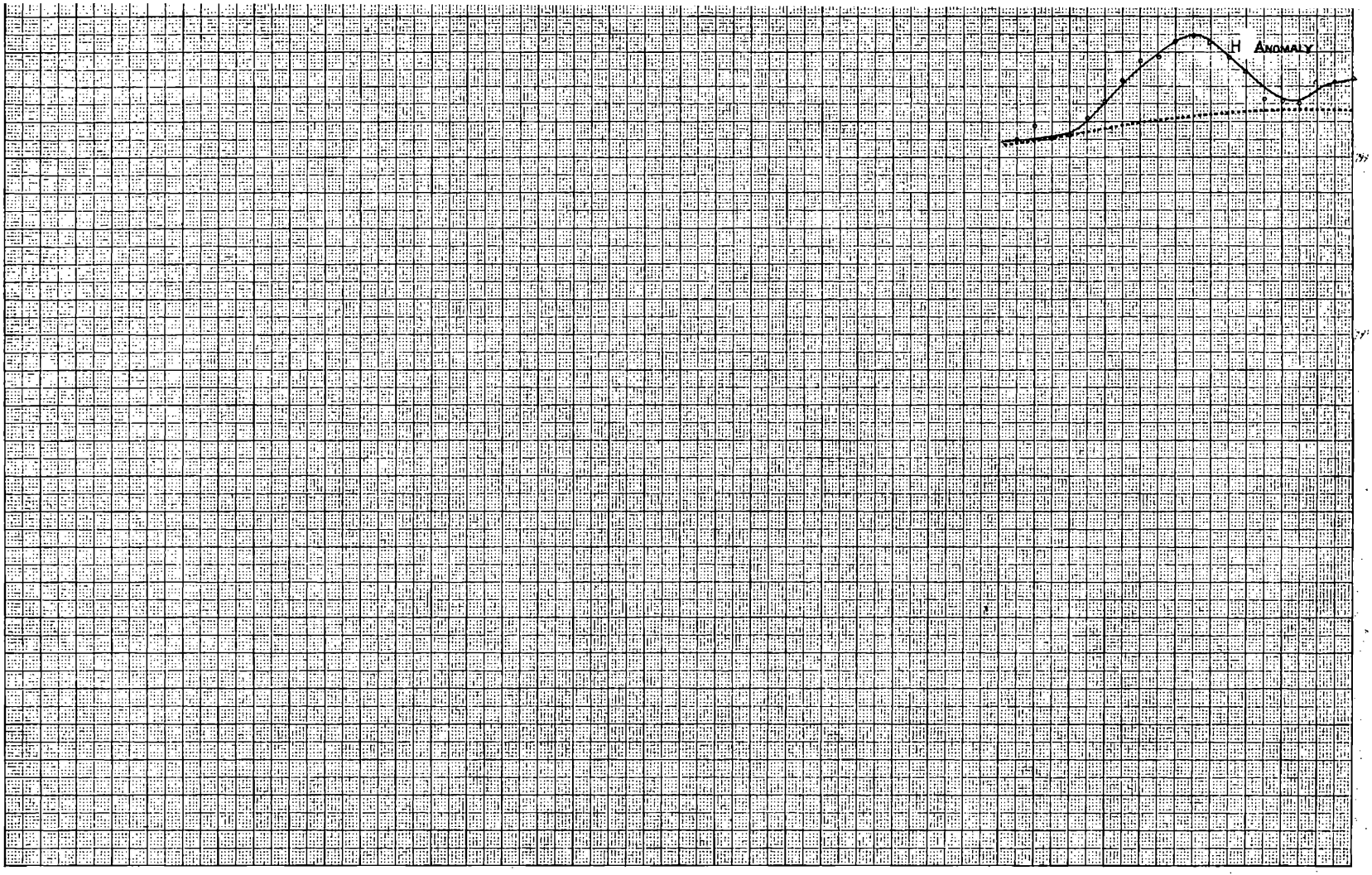

C ANOMALY
C ANOMALY



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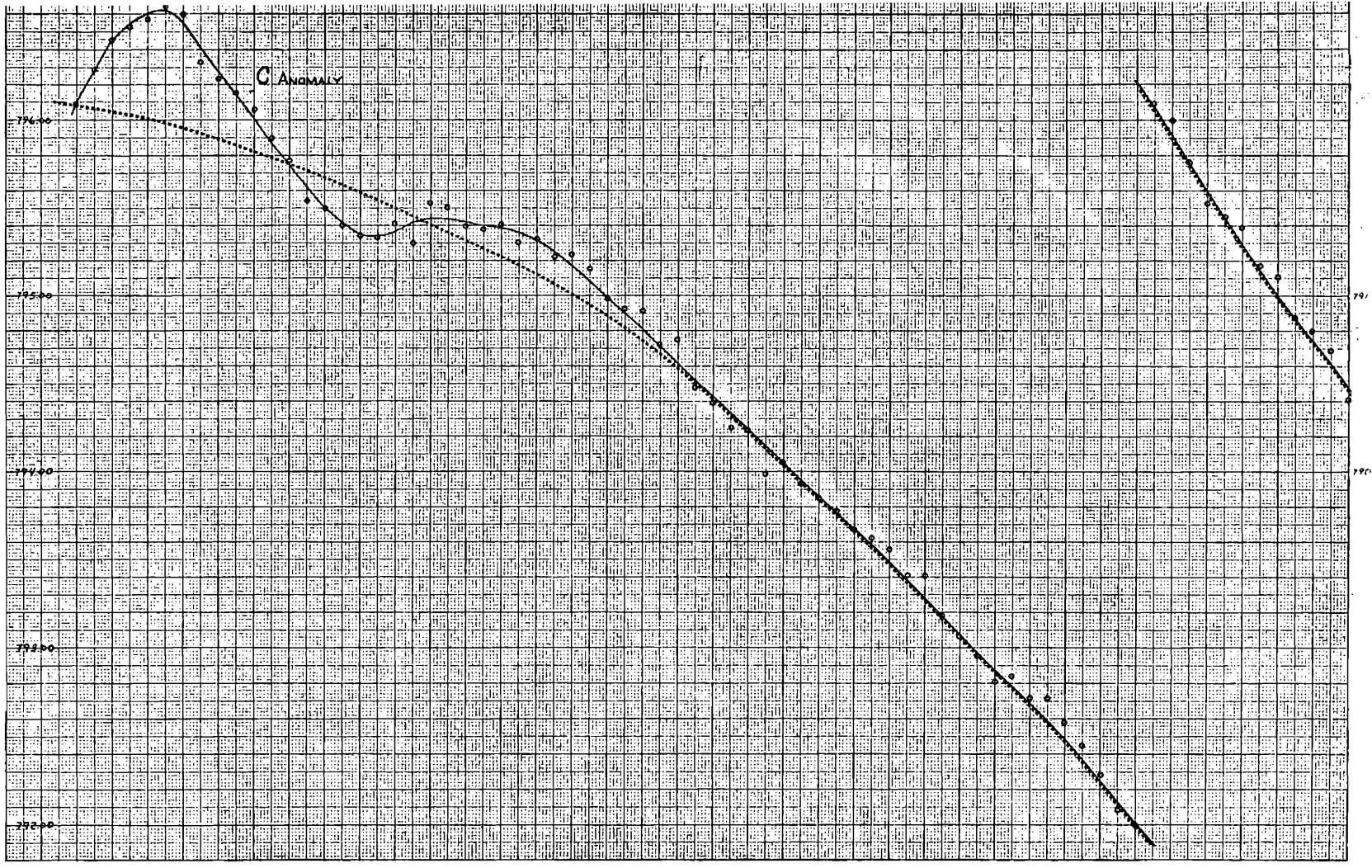

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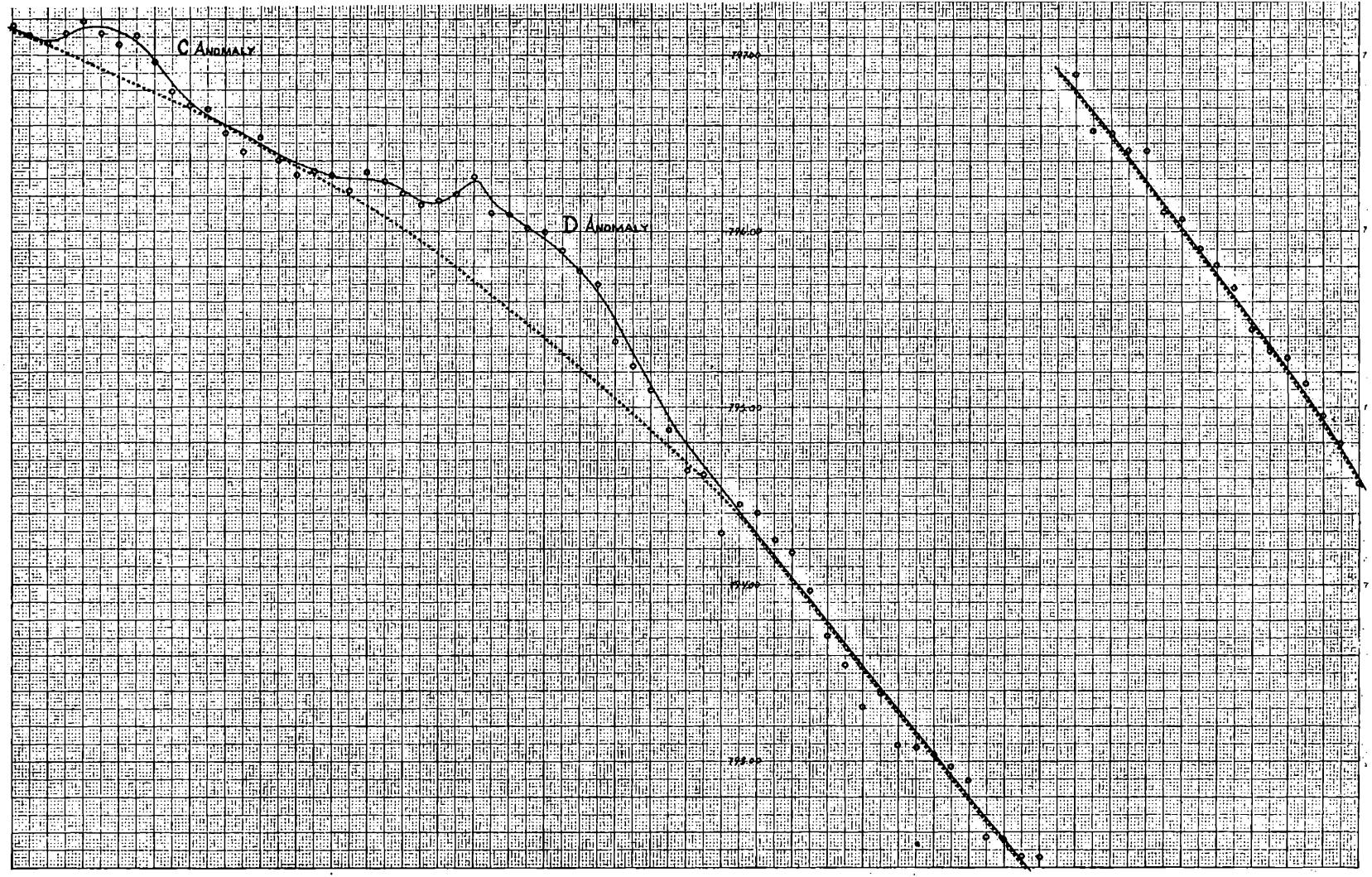

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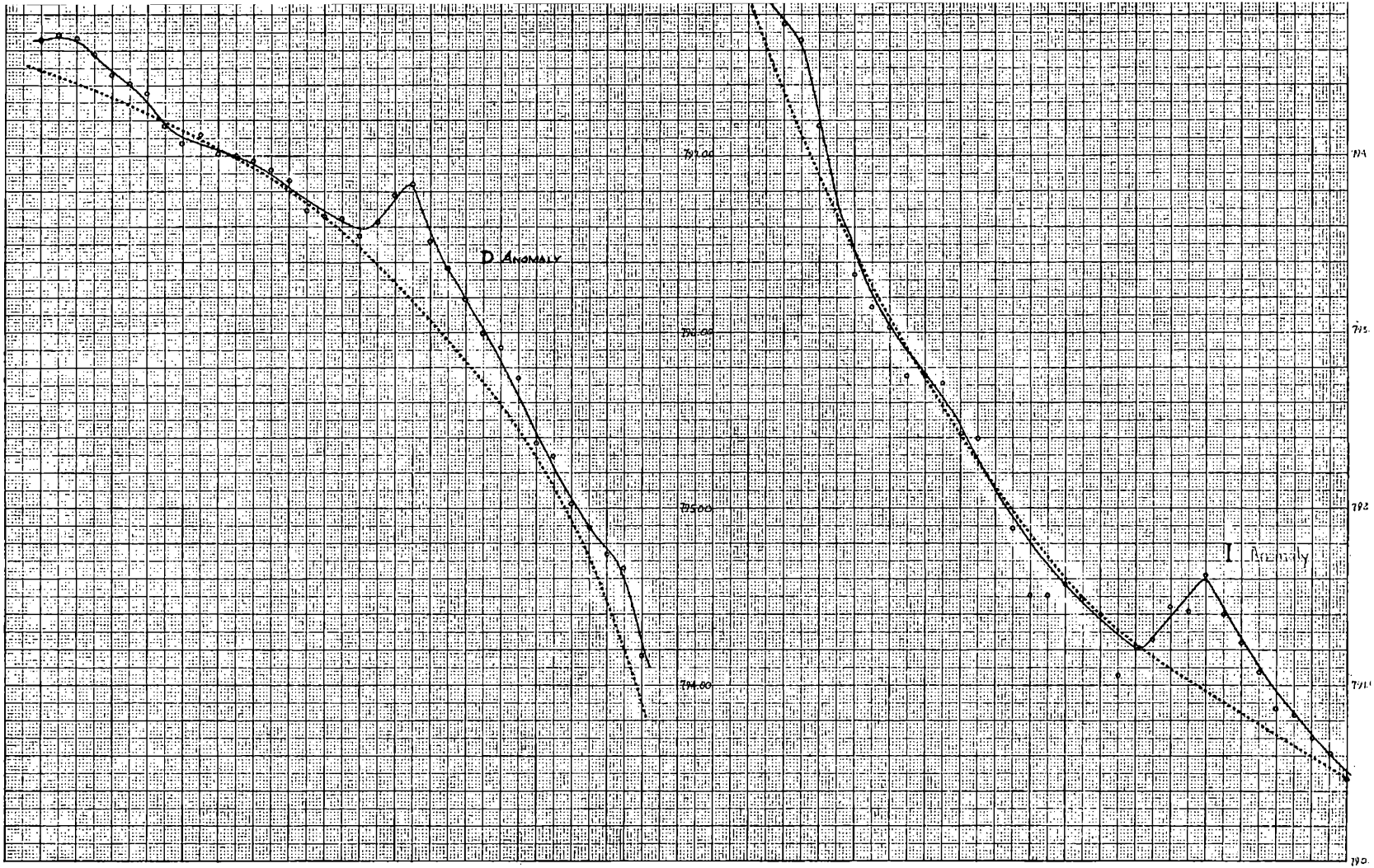

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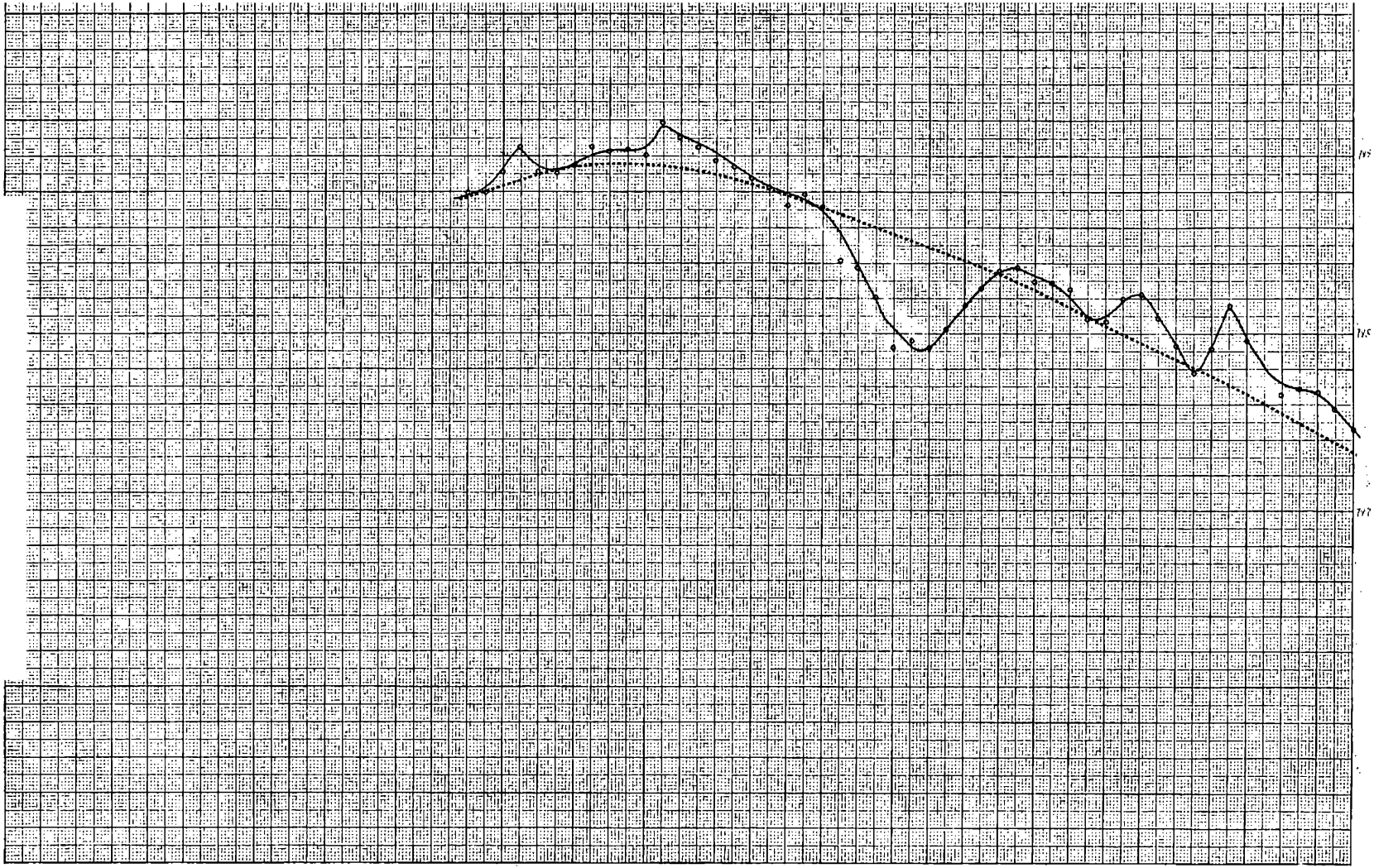

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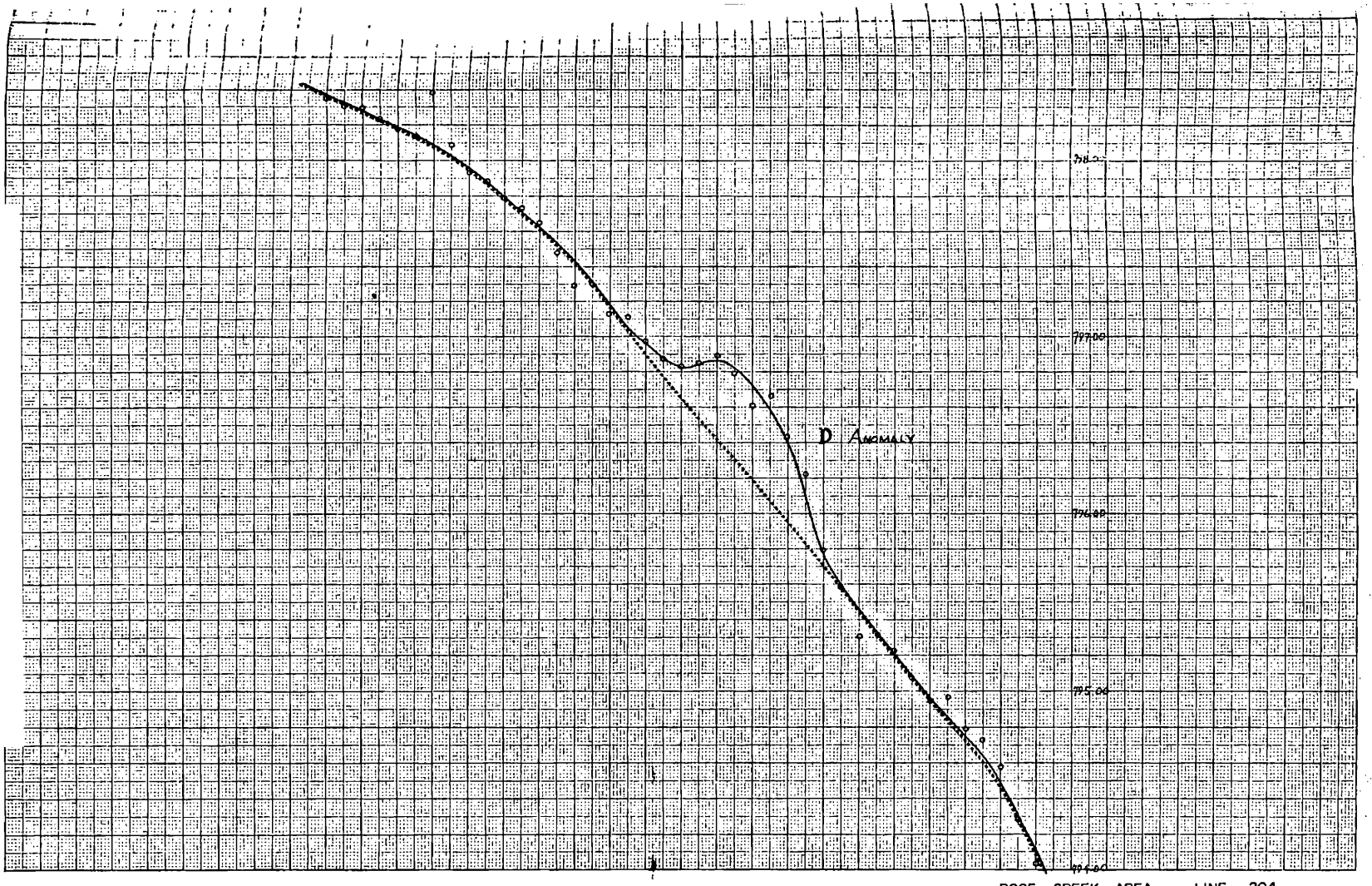

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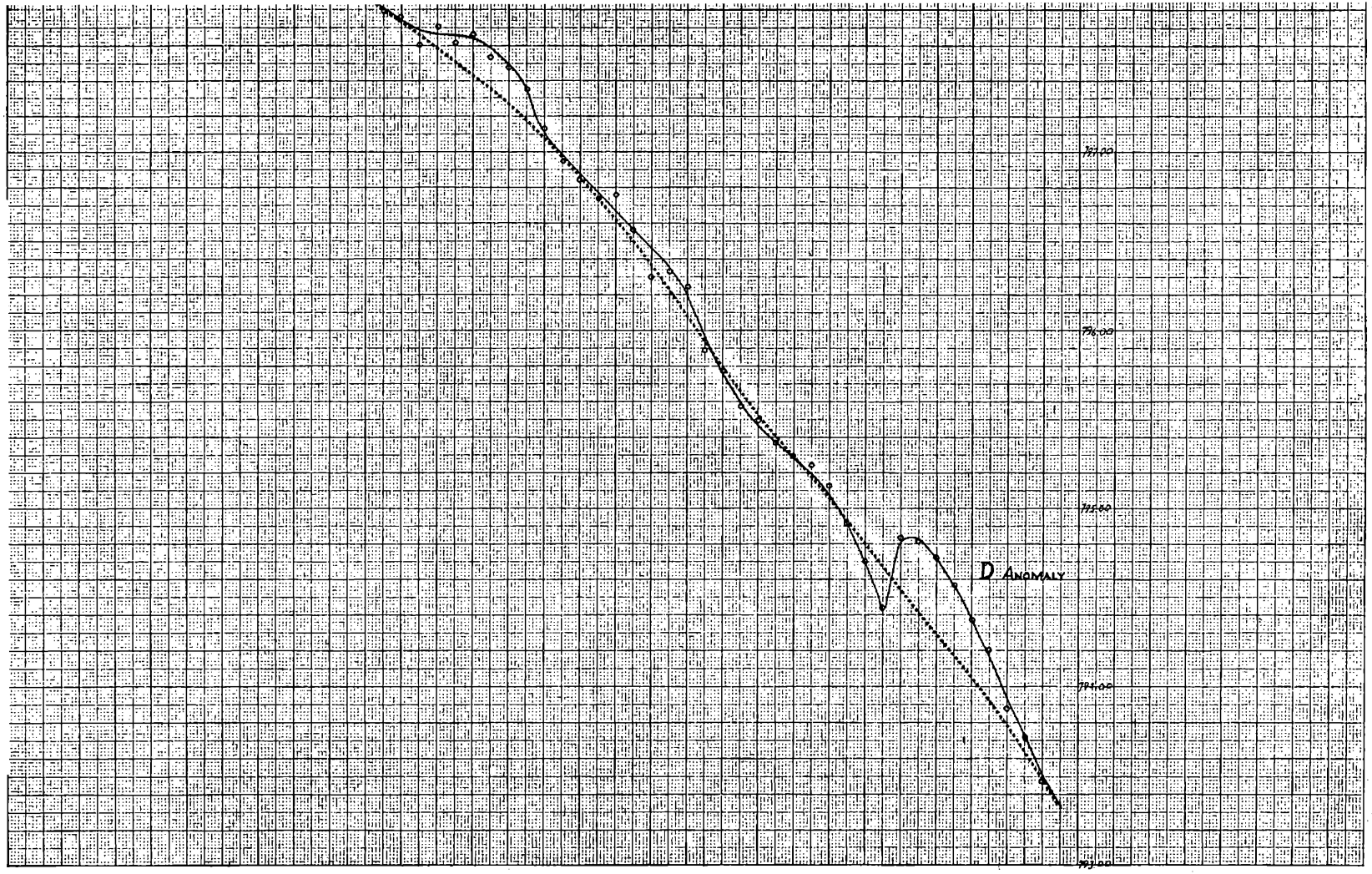

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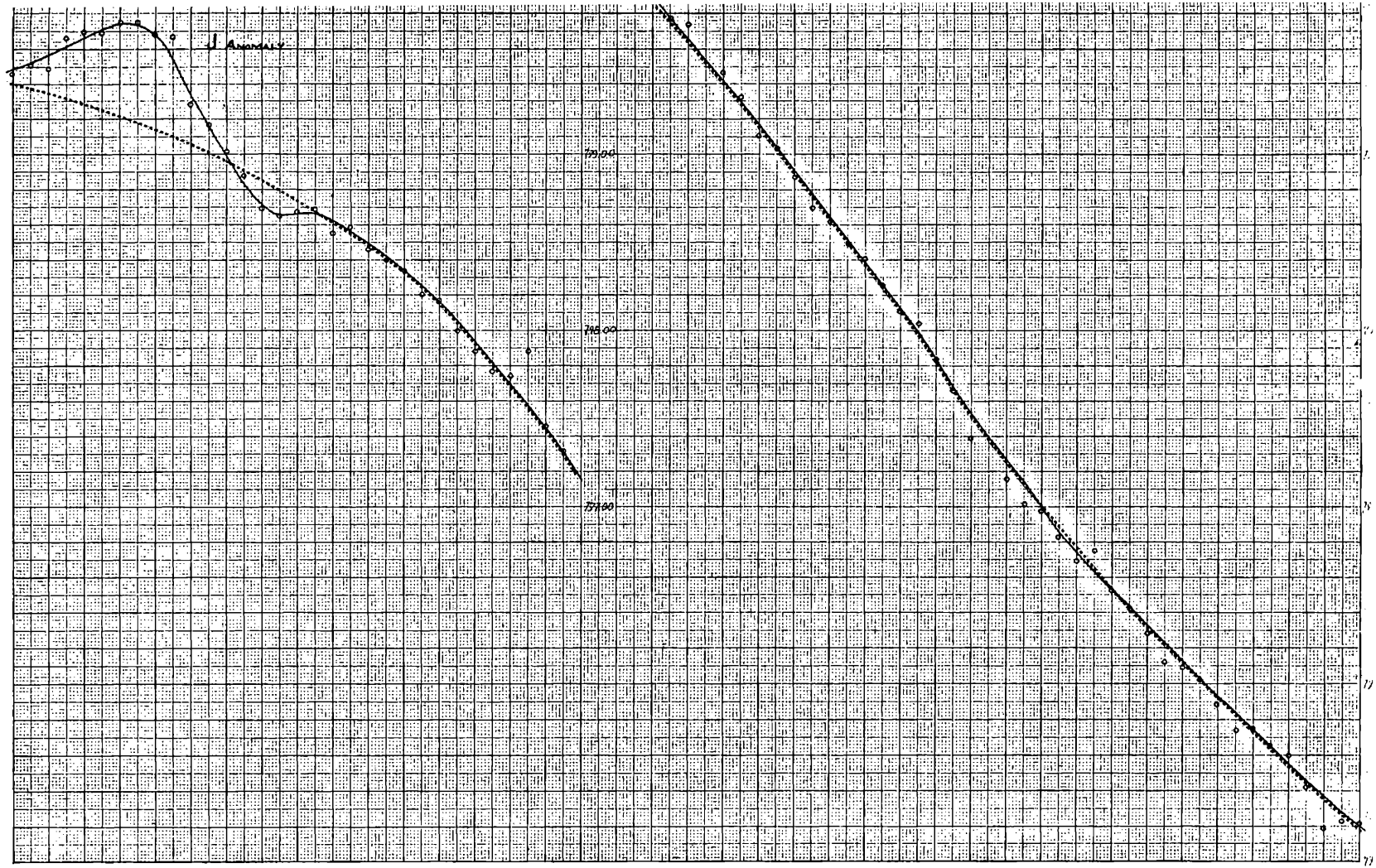

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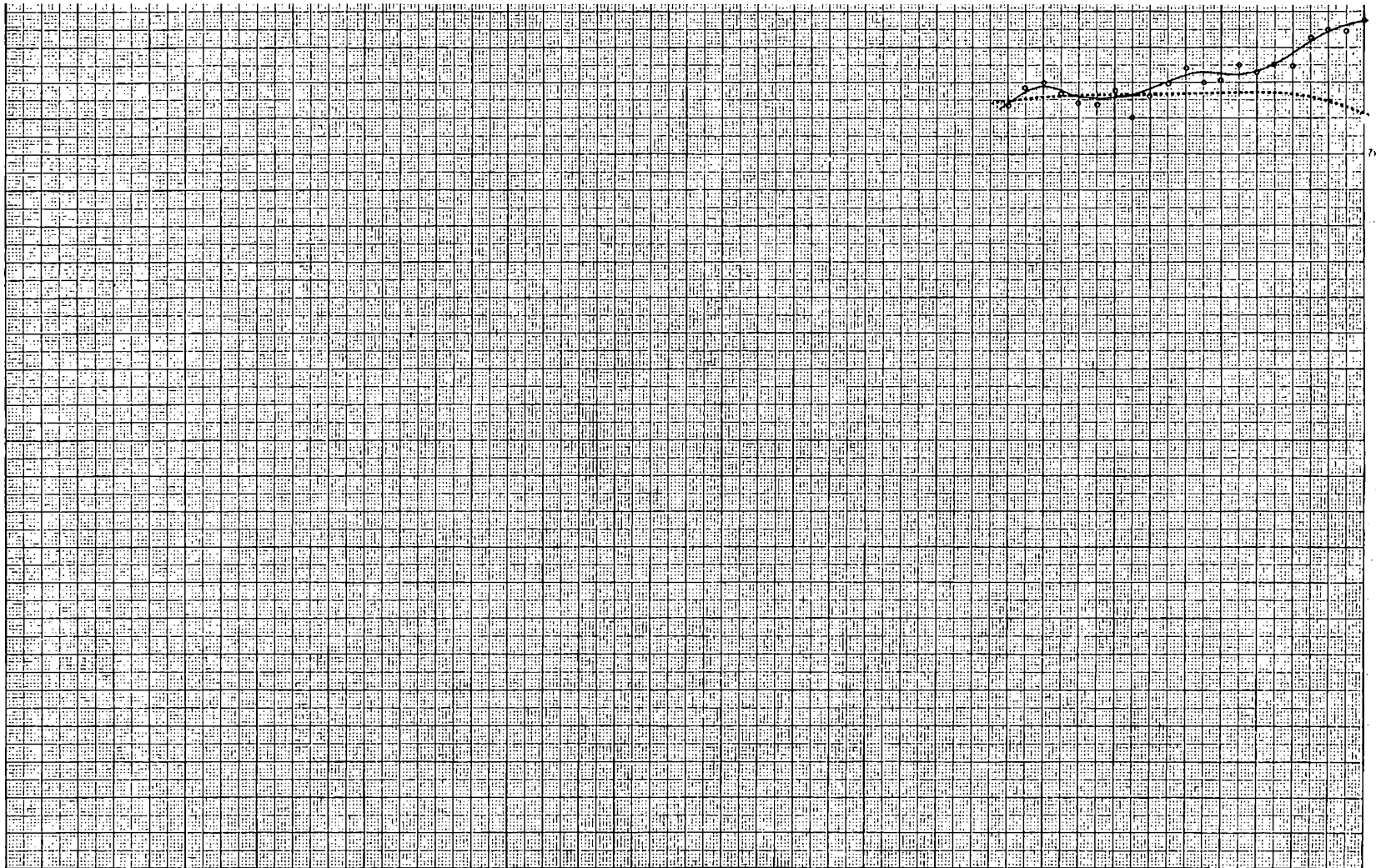

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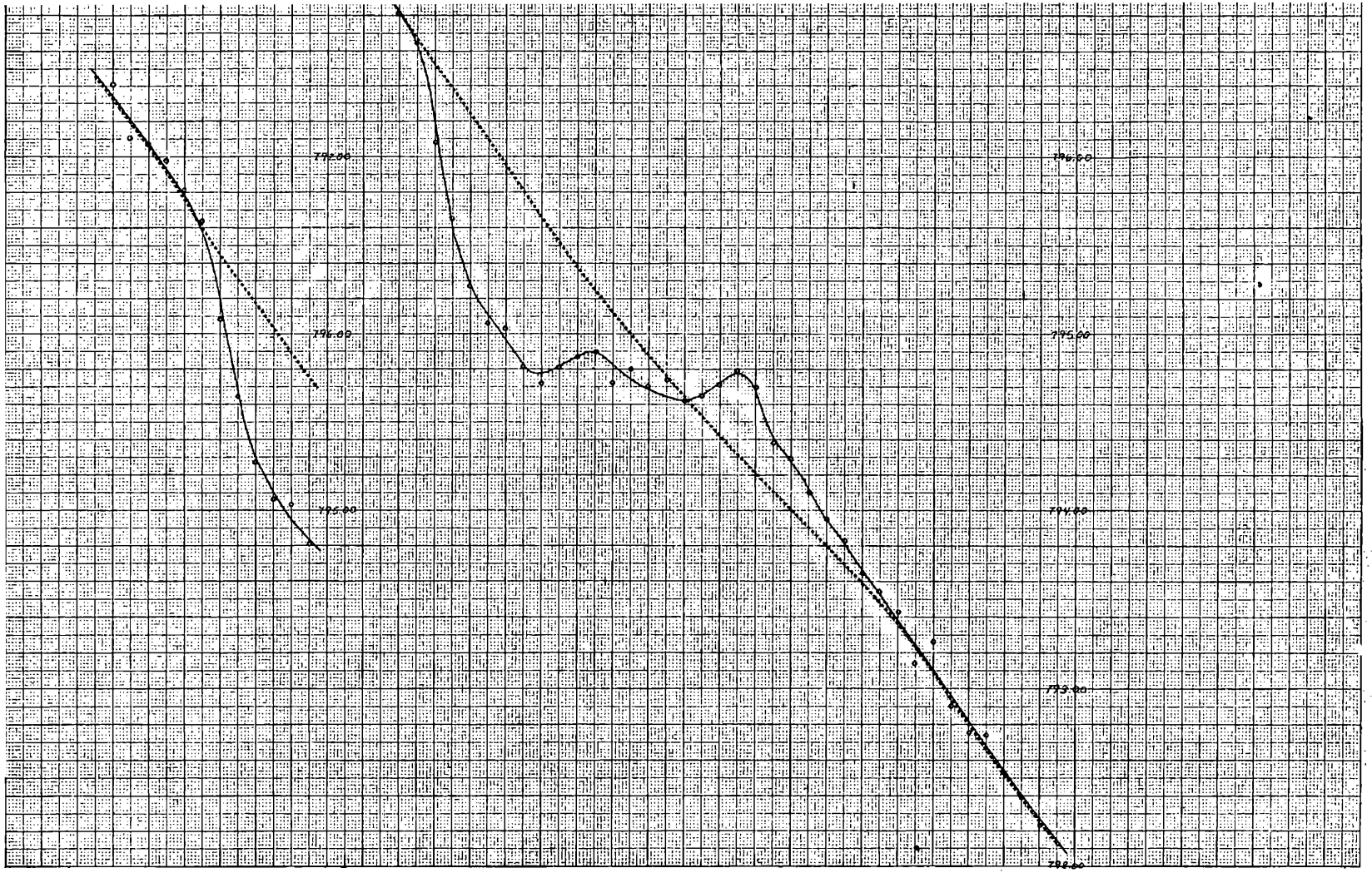

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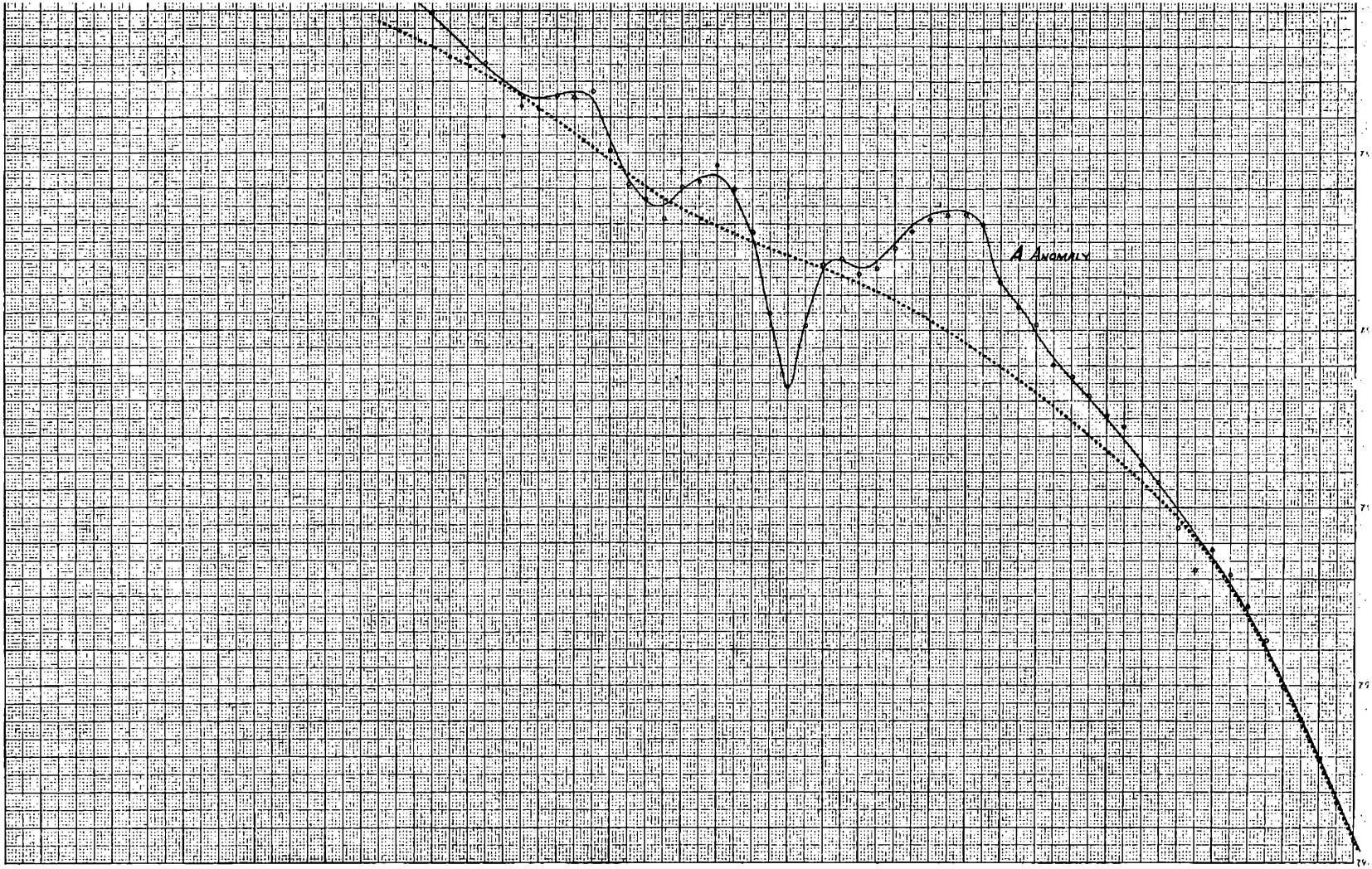

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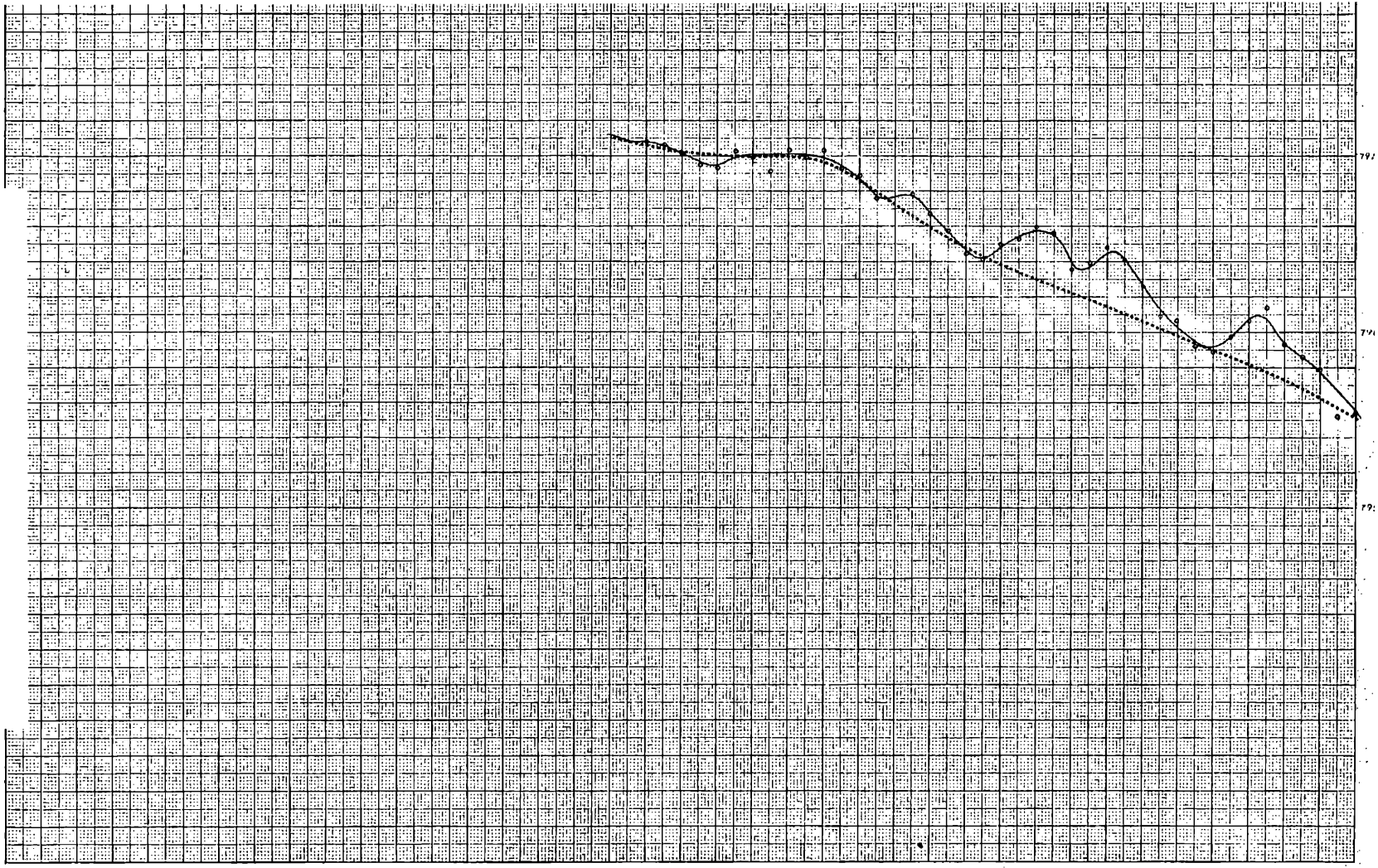

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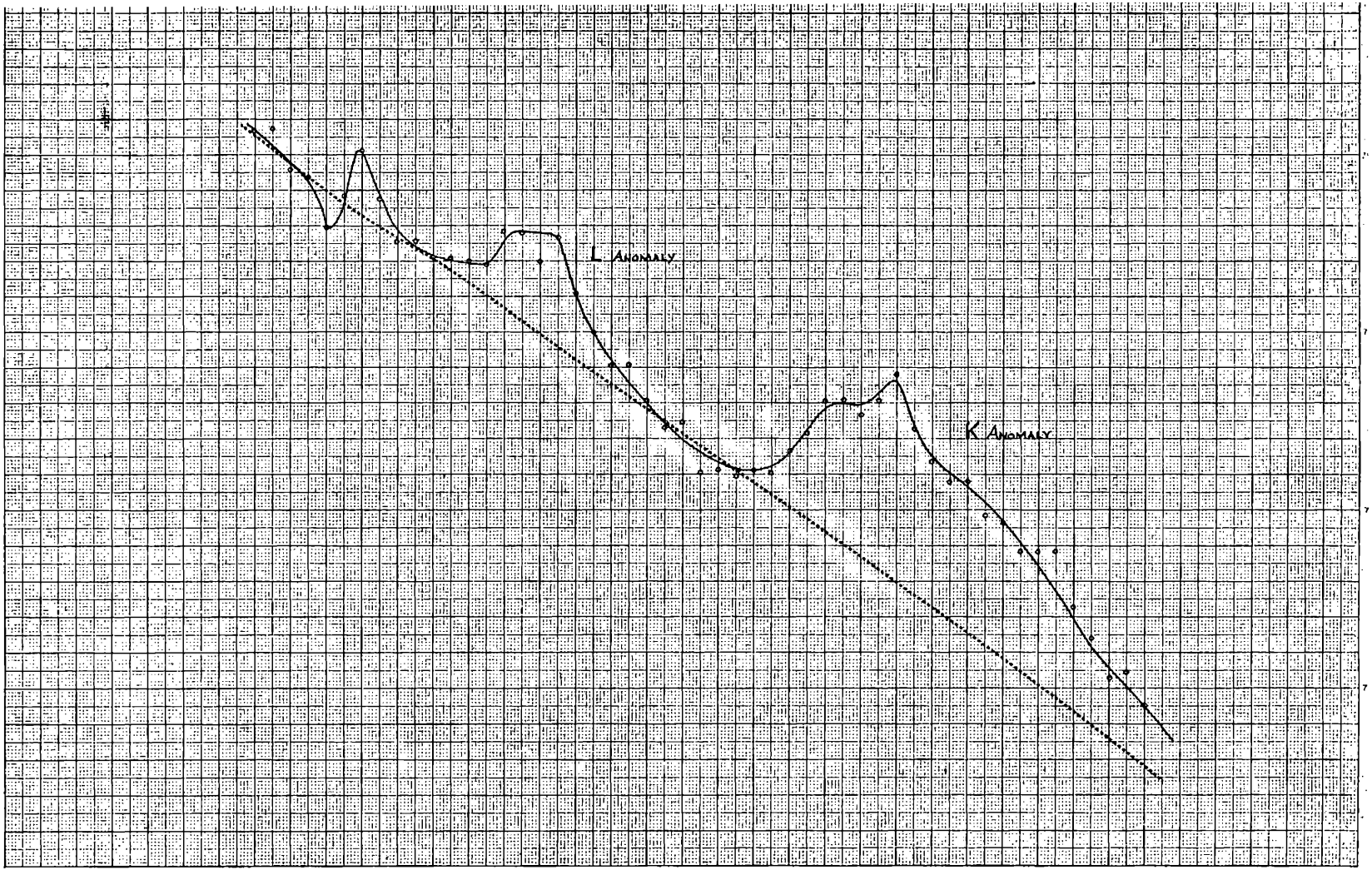


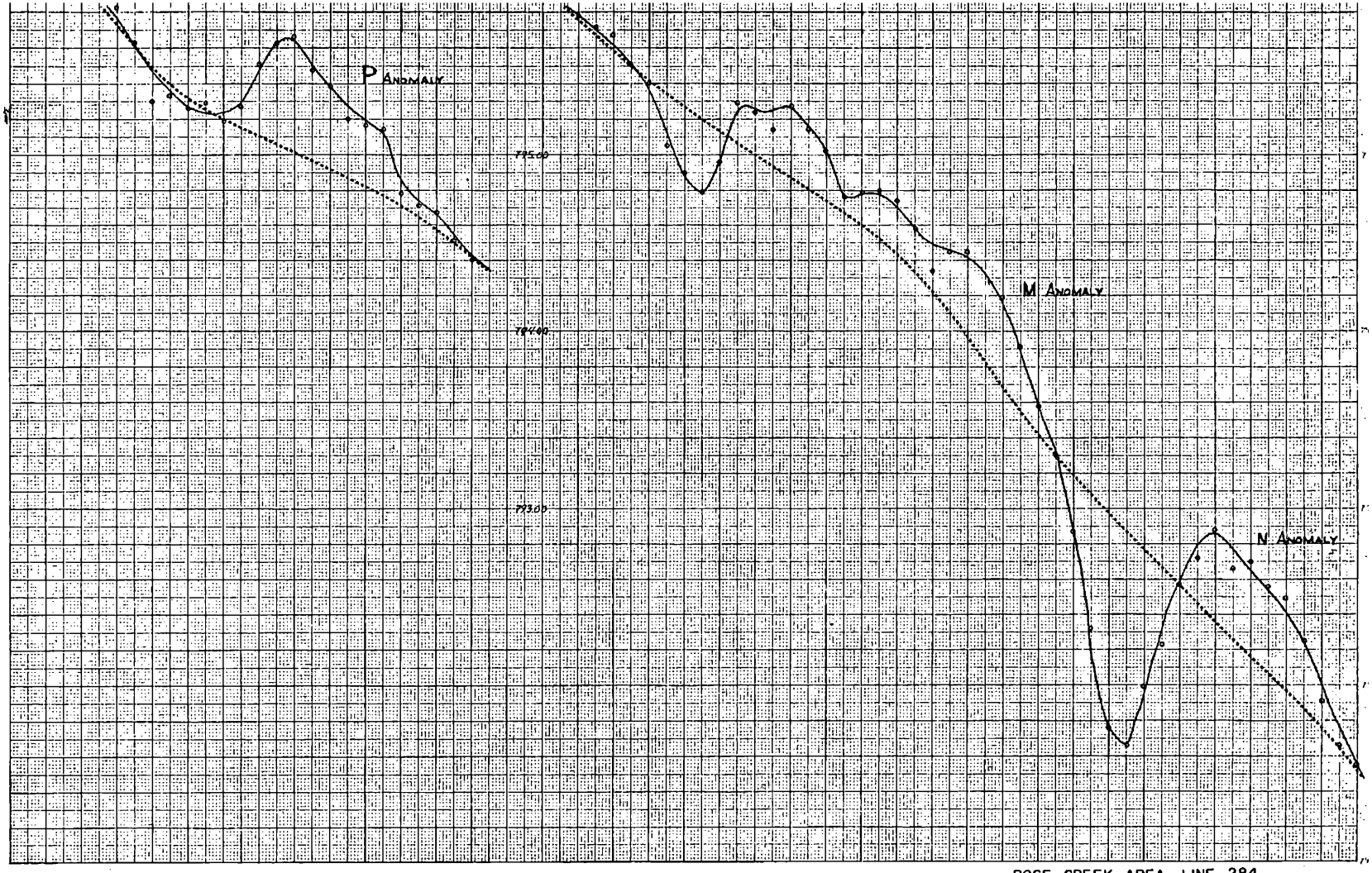
ROSE CREEK, YUKON LINE 244

ROSE CREEK, YUKON, LINE 252

POSSIBLE FAULT
776.00
775.00
774.00
773.00
772.00

ROSE CREEK, YUKON, LINE 269

ROSE CREEK, YUKON LINE 276



ROSE CREEK AREA LINE 284