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THE USE OF GEOCHEMICAL SECTIONS AND RELATED TECHNIQUES FOR THE INTERPRETATION OF MULTIELEMENT SOIL GEOCHEMICAL MAPS OF THE ZAP CLAIMS AREA NEAR WATSON LAKE, Y.T.

Report on a three day test project
August 20th, 21st and 25th 1981

John A.C.Fortescue
Consulting Geochemist
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Vancouver, B.C.

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August 25th 1981.

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Geochemical topography/distance/abundance plots were made for four elements at 200m intervals orientated at right angles to the 100m line spacing geochemical map in order to examine the possible effects of topography and glaciation on the geochemical signatures in detail.

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First set of Geochemical Sections

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Conclusion A logical explanation for the 3 line geochemical signature GS-I is the presence of a geochemical linear in bedrock at an oblique angle to the orientation of the lines.

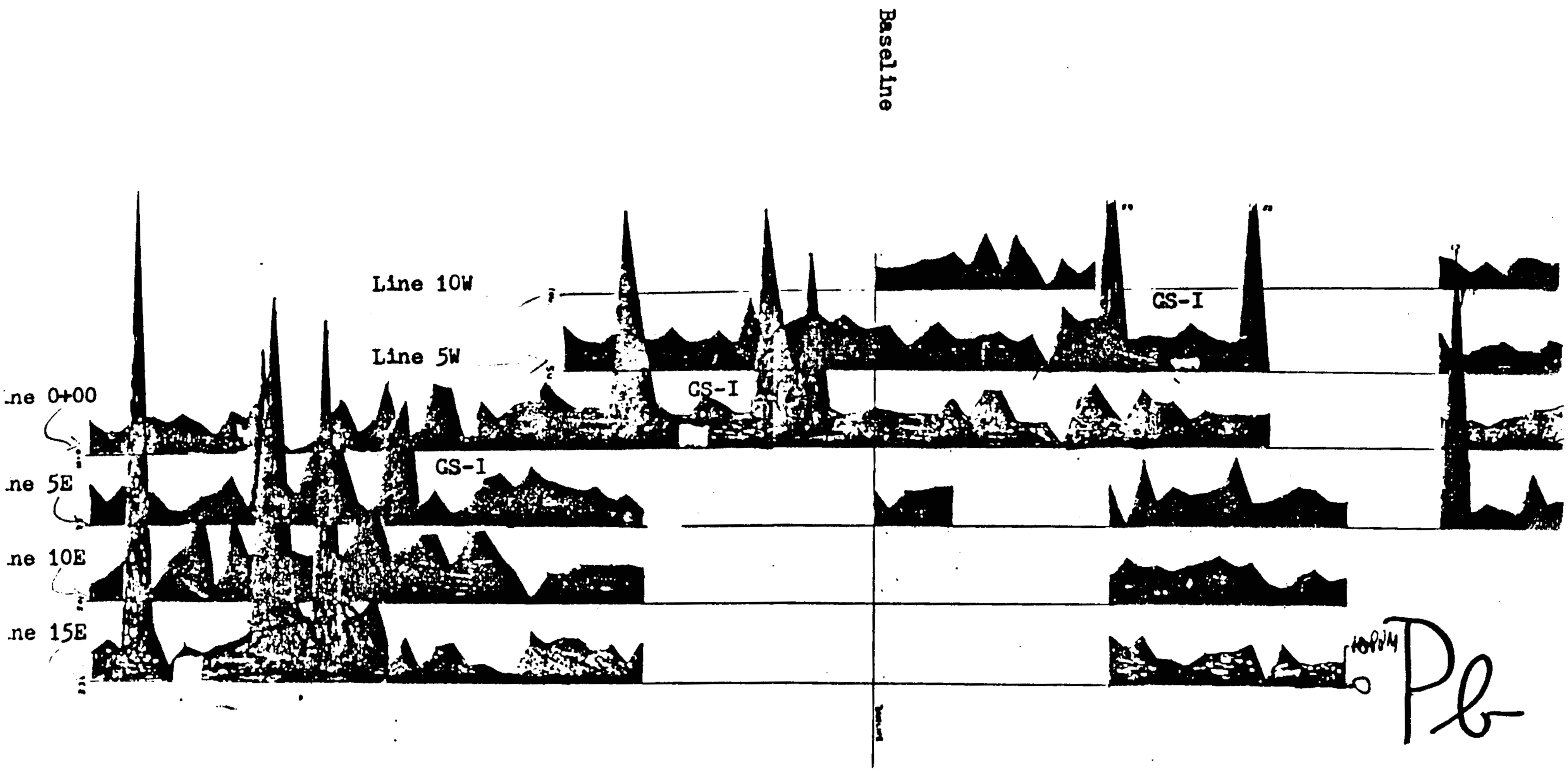


Figure 1A Simple geochemical sections from line spacing soil geochemical map of Zap Claims :LEAD

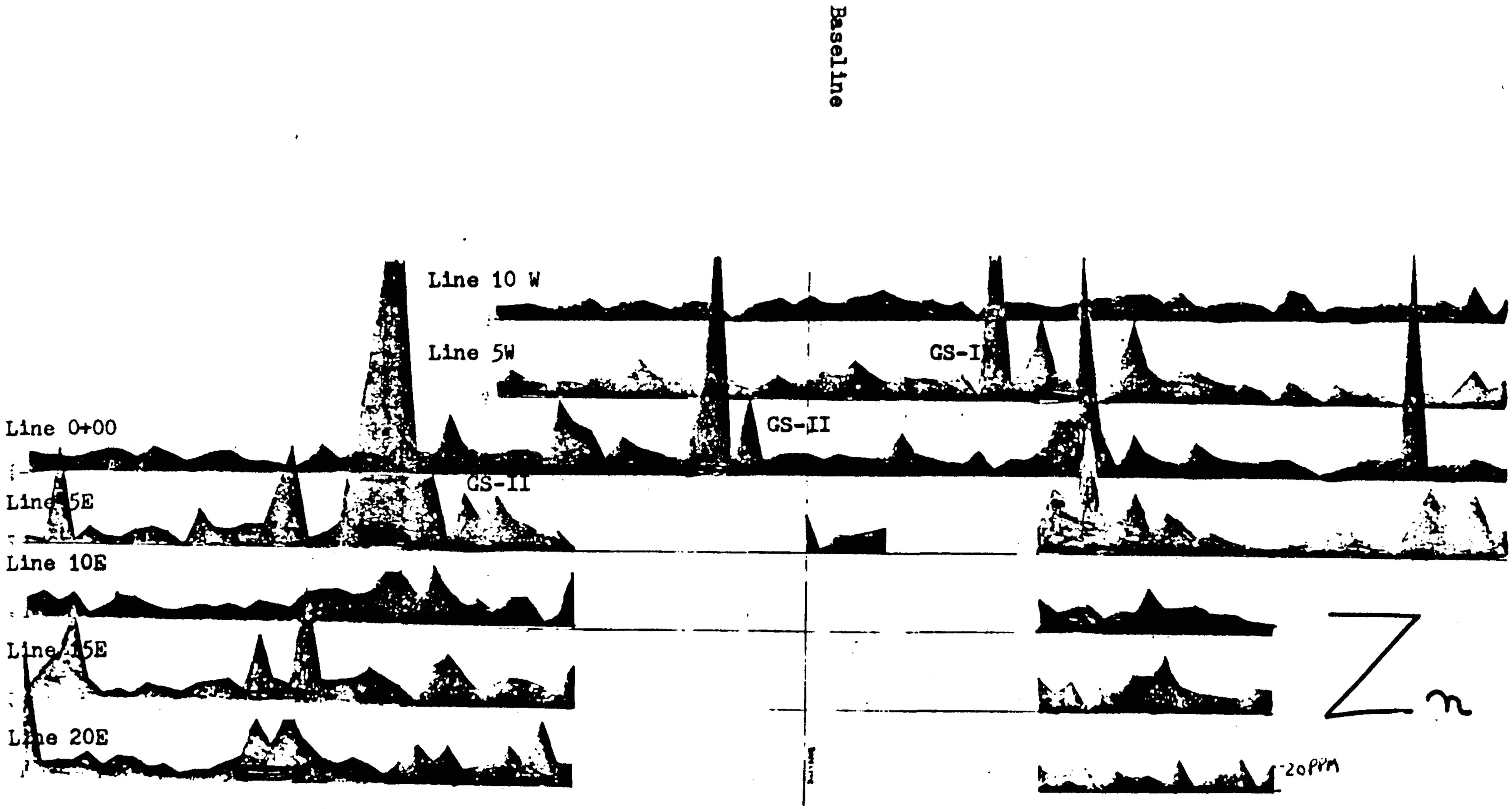
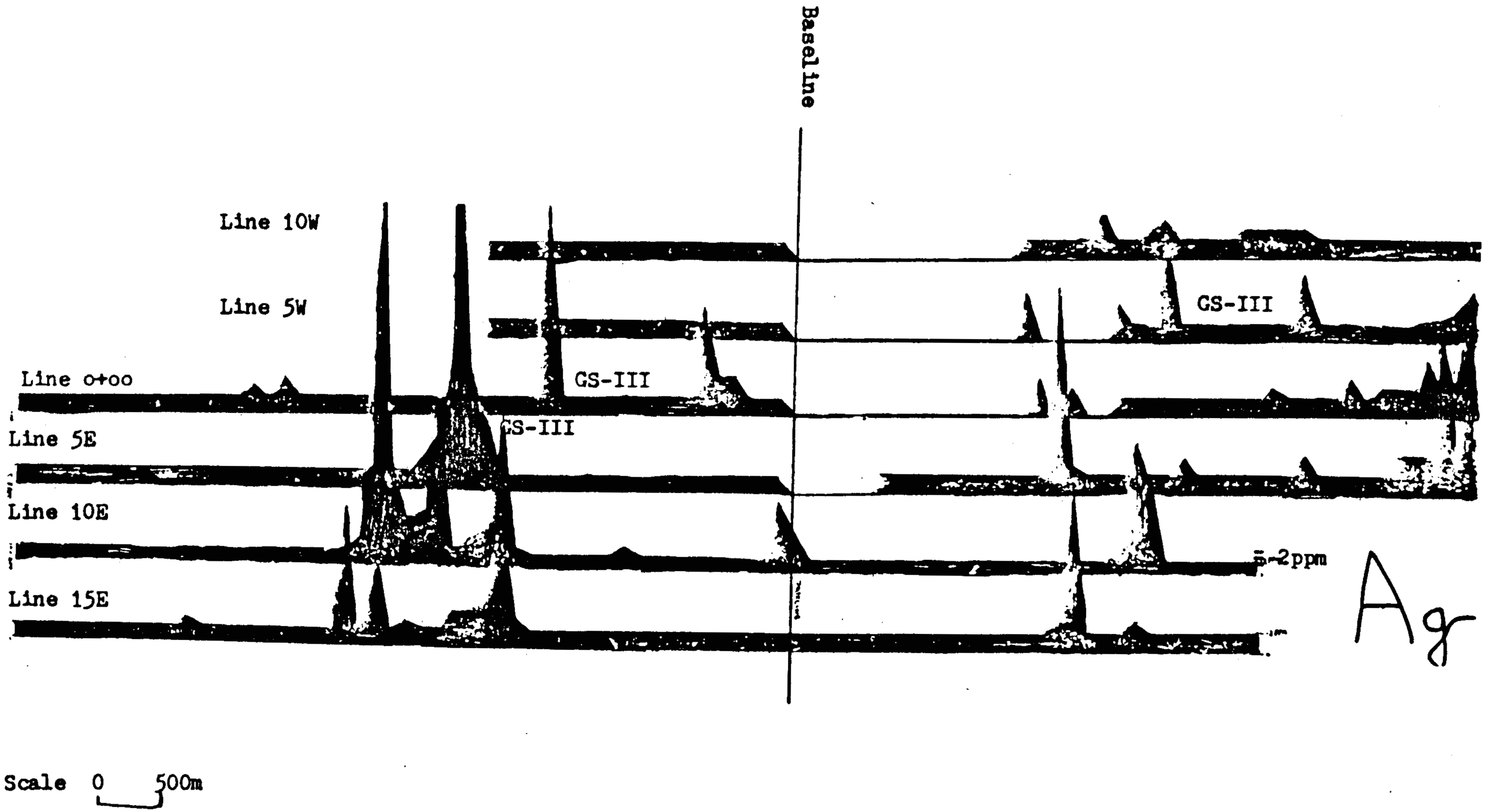


Figure 1B Simple Geochemical Sections from 500m line spacing soil geochemical map Zap Claims : ZINC



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<u>Conclusion</u> The zinc patterns are similar to the lead(Figure 1A) except that the zinc is offset north from the lead pattern.

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Another way of showing the "geochemical signature linear" described above is by means of a map overlay to a composite air photograph. In Figure 2 this has been attempted as a mockup. Figure 2A is a Xerox reduction of the air protograph of the area if interest for geochemical sections discussed above. In general it indicates the grain of the glacial movement in relation to the geochemical signature linear. Figure 2 B (which was originally a coloured sketch map to fit over the air photo) shows the location of the geochemical linear(fault line(??) and the position of the geochemical high values for the four elements which lie upon it as full dots. Values to the left(east) of the line are considered glacial smear and to the west to be due to movement of ions downhill subsequent to glaciation.

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The combined evidence obtained from the geochemical sections for lead zinc and silver and the study of the projection of the geochemical signatures on the air photograph suggests that the most favourable area lies on line 5E to the south of the baseline. This should be studied further as well as the line of the supposed geochemical linear which cuts across the valley in the vicinity of the <u>M.guttatus</u> hot springs.

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Line 8W Topographic/geochemical sections for lead silver cadmium and zinc on Line 8W north of the baseline are reproduced on Figure 3A. The north facing slope at the left of the figure evidences a small geochemical high four all four elements which is interpreted as seepage from the hillside. Cadmium and zinc anomalies to the right of the figure are interpreted as seepage from the geochemical linear which lies further east downice (i.e . above the page surface.

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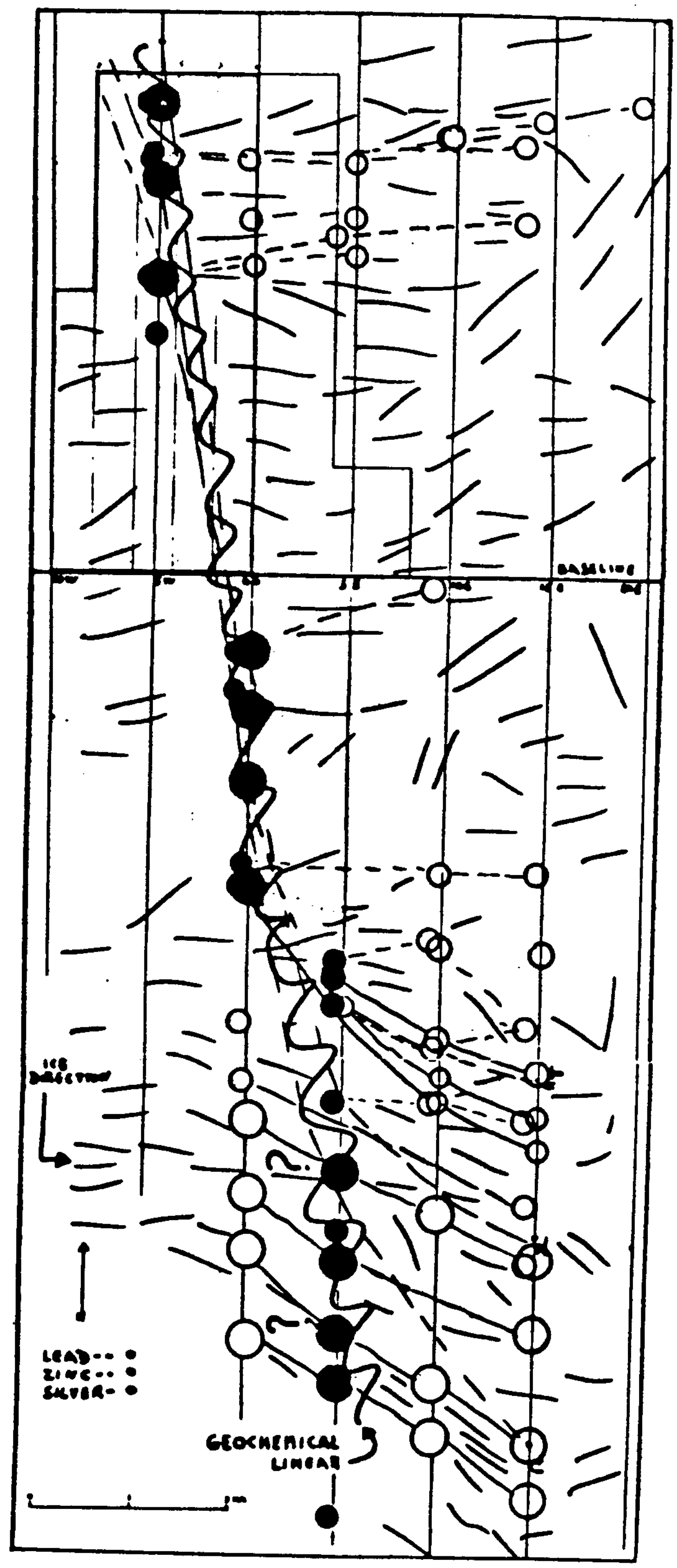
(A)



(B)

Figure 2 Reduced Xerox of air photograph composite of part of Zap Claims area(A)
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Although the cadmium pattern Figure 4B was somewhat dissapointing when it was combined with that for lead Figure 4A a pattern emerges. Signature GS-IV for lead occurs on lines 8N 16N and 22N(Figure 4A) as expected and it appears that the high values for cadmium lie on either side of it especially on line 16N Figure 4B. Further study is required to investigate the significance of this observation.

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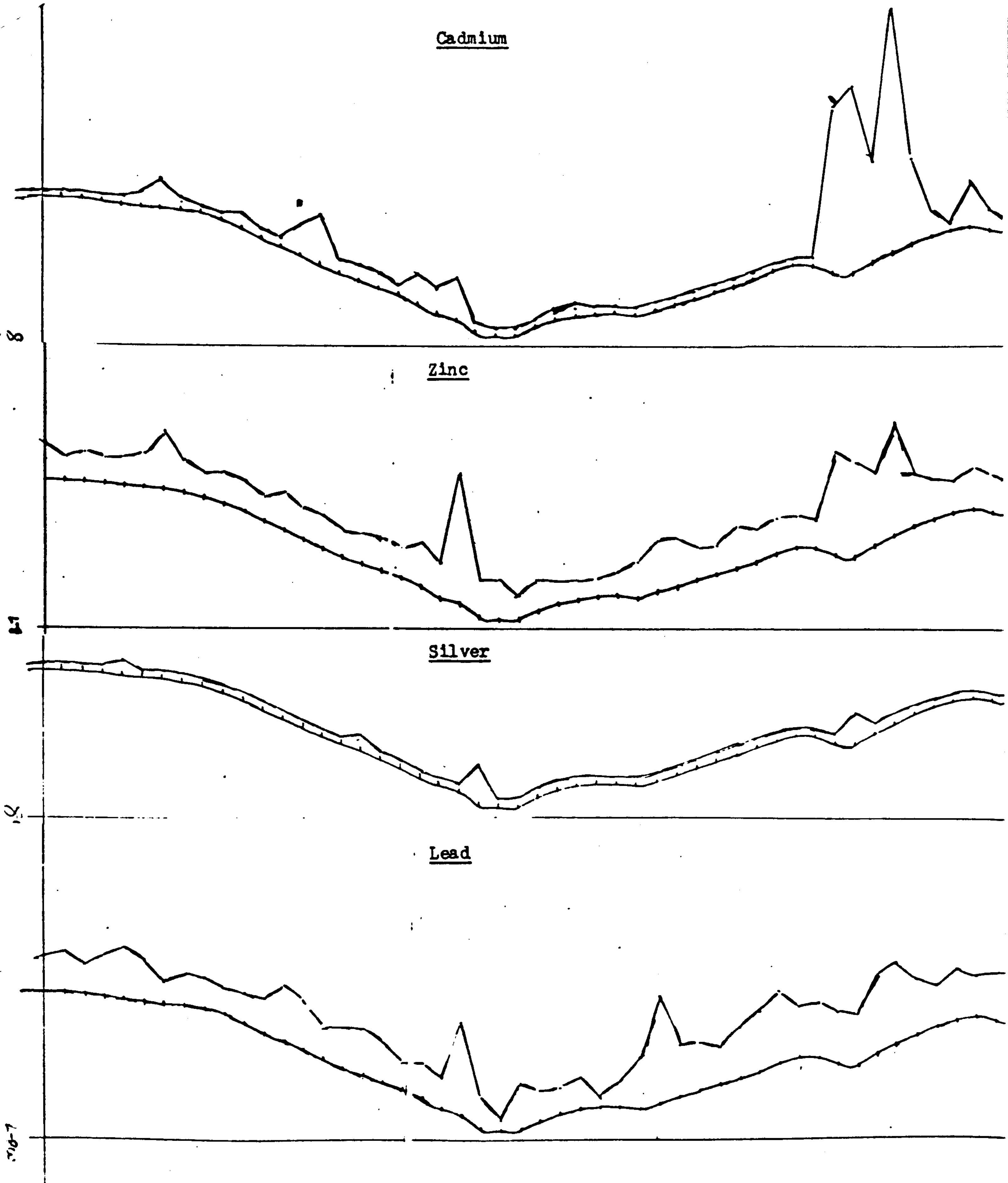


Figure 3A Topographic/Geochemical profiles along Line 3W north of the baseline at Zap claims

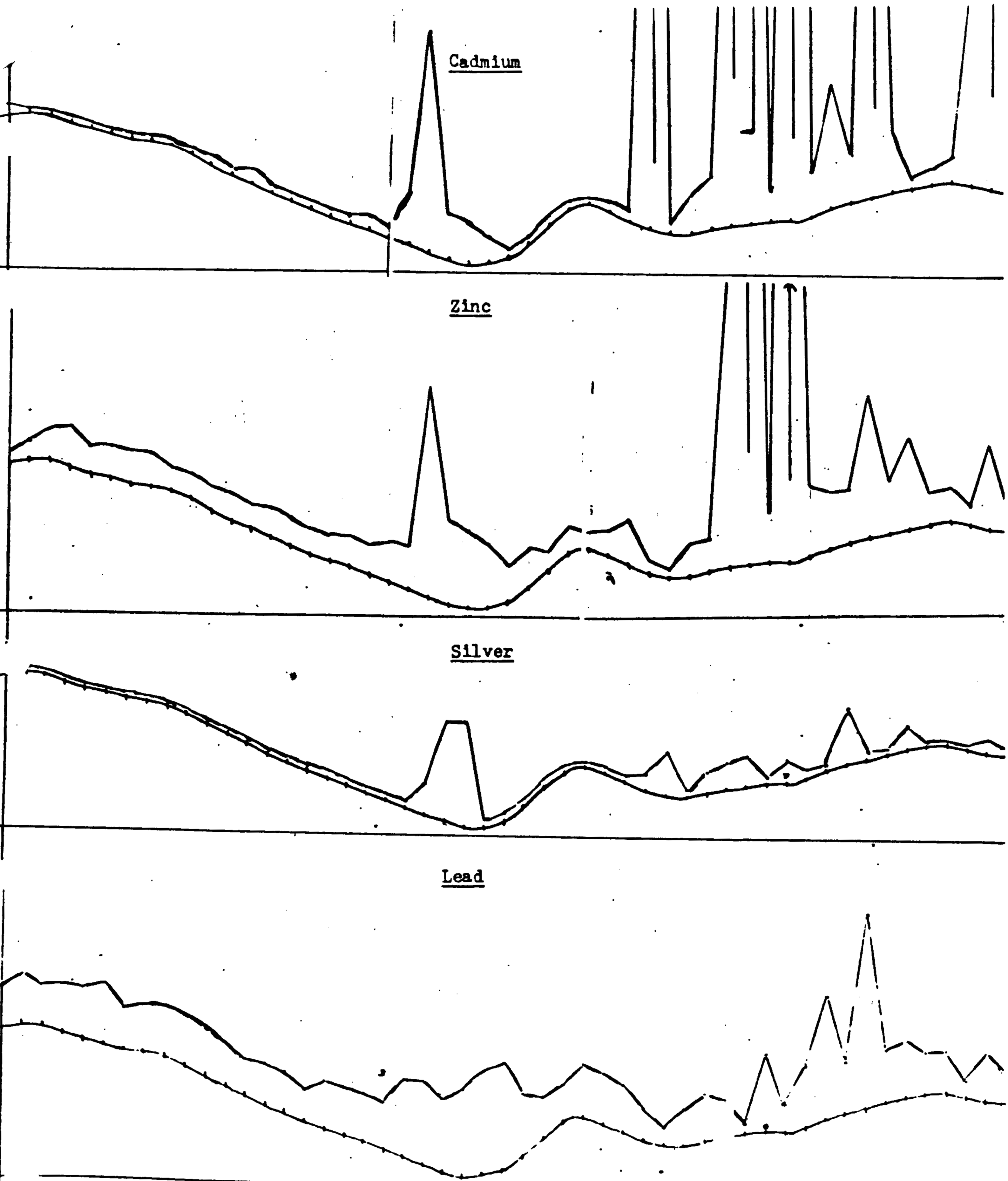
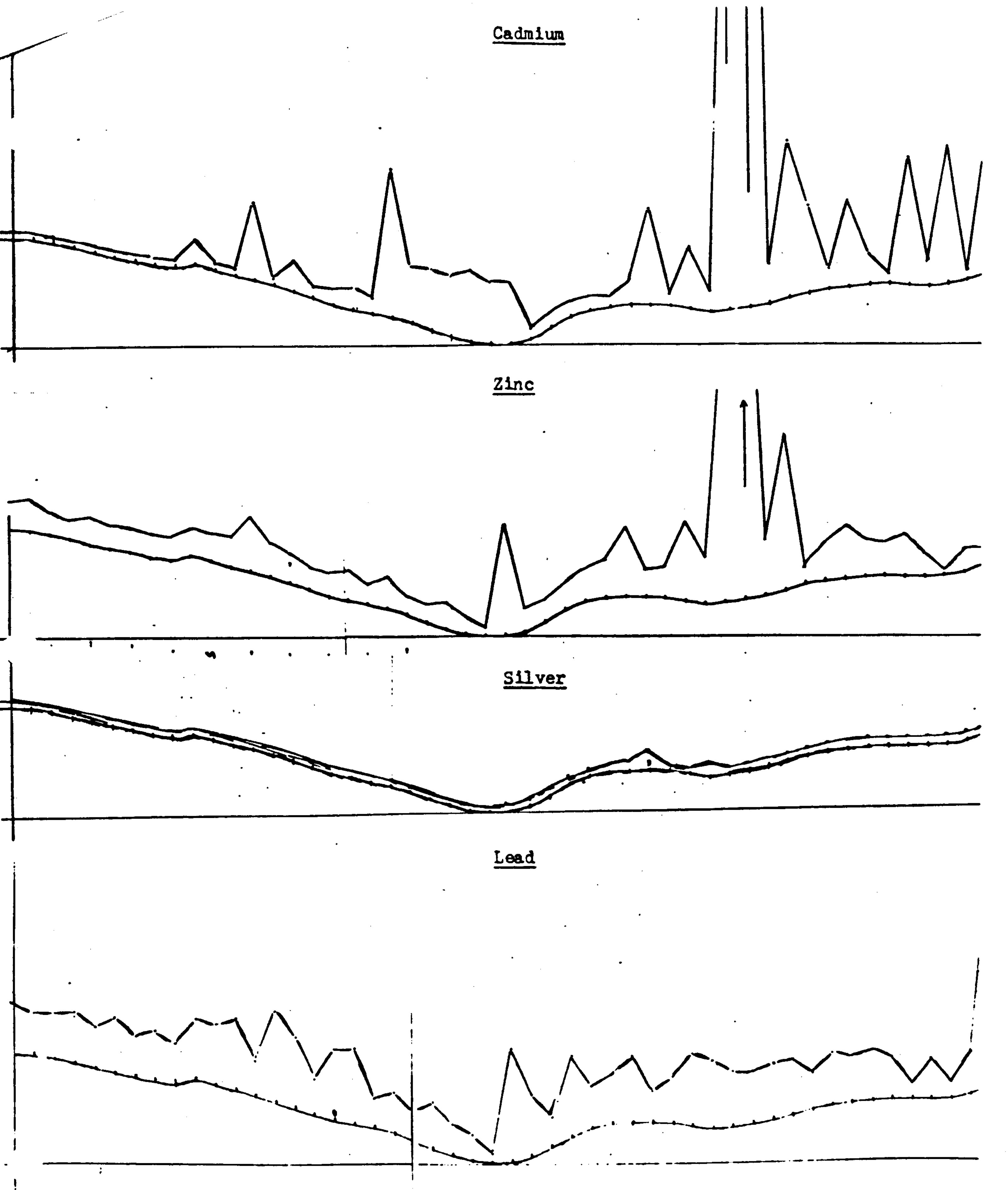


Figure 3B Topographic/Geochemical profiles along line north of the baseline at Zap Claims



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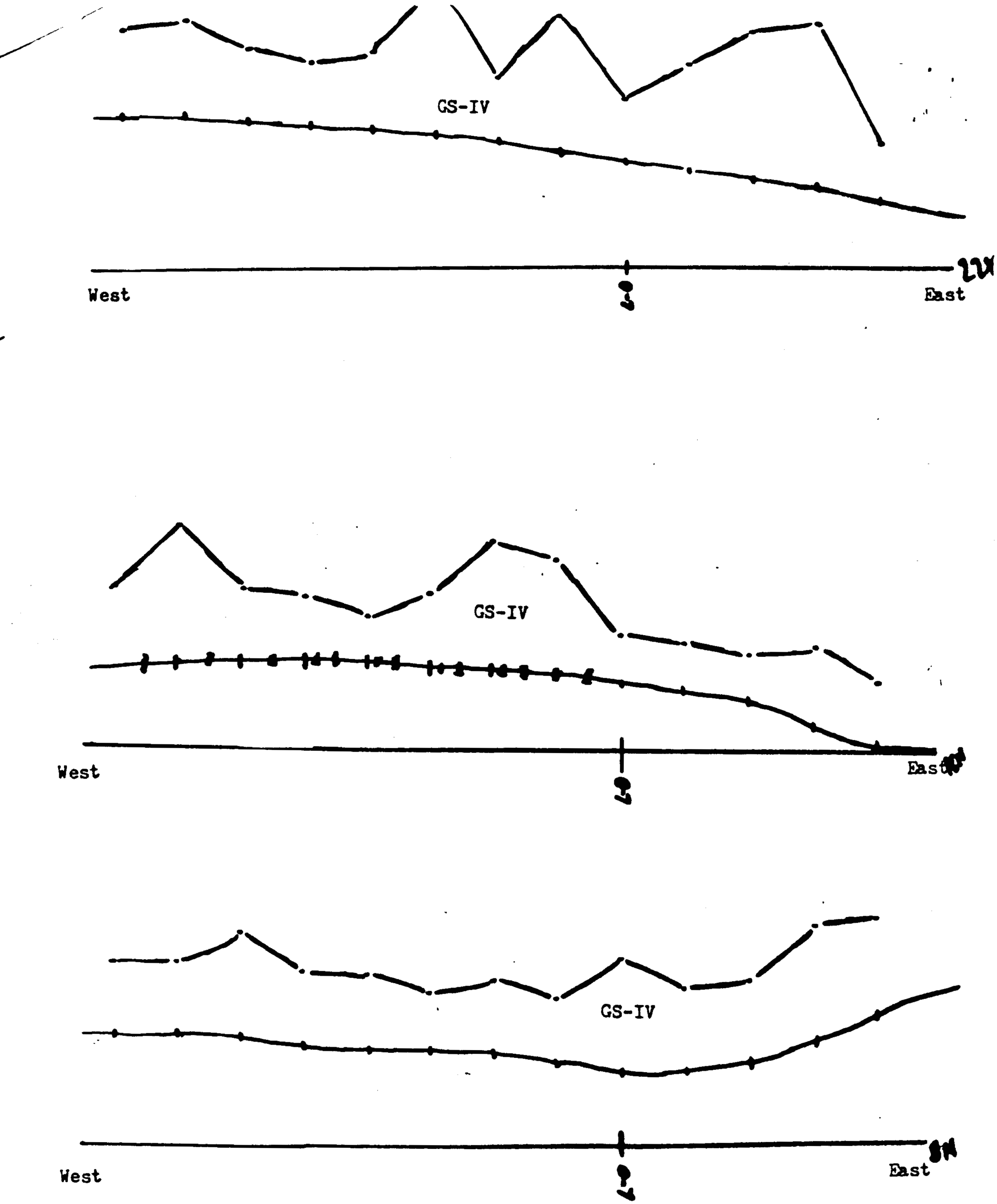

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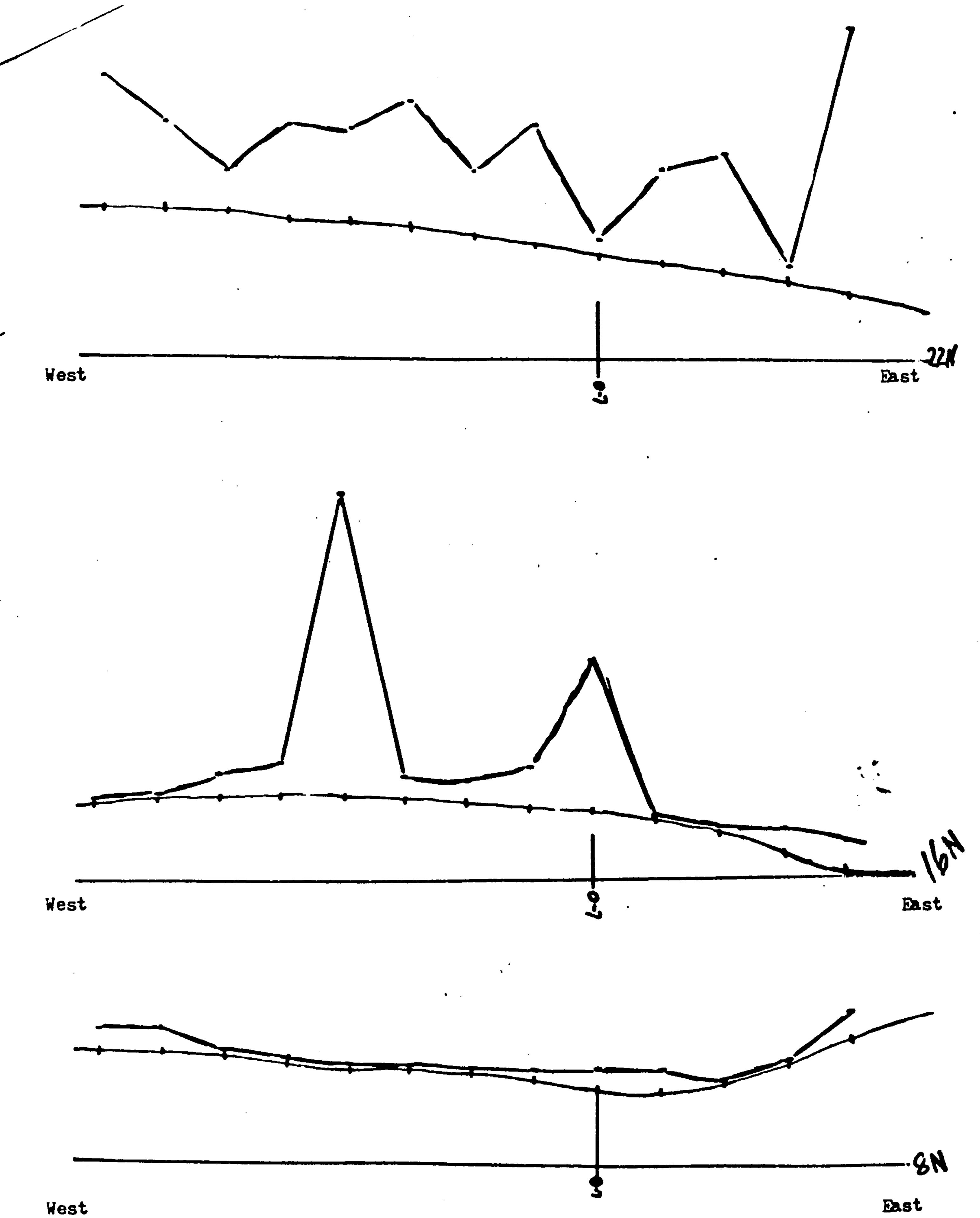

Figure 43 Patterns for cadmium along lines included in figure 3 but orientated in an west/ east(i.e. downdip) direction

CONCLUSIONS

1)A test has demonstrated that the geochemical section/signature technique provides a logical interpretation of geochemical patterns for four elements in a part of the Zap claim group which includes the hot springs where geochemical anomalies are known.

2)Although the results of the test are logically related other explanations of the geochemical patterns should not be ruled out at this stage. For example the geochemical anomalies might occur only where the drift was thin.

3)It is suggested that only after a careful examination of all known geochemical anomalies and geological and geophysical evidence that the existance of the geochemical linear should be proven by trenching or drilling operations.

Suggestions for further work

1) Geochemistry

A full and complete geochemical section/signature analysis be completed using all currently available soil information

Selected lines should be subjected to further detailed examination using a multielement approach(eg ICP scan analysis of samples for 20-30 elements)

A detailed stream sediment survey of the region enclosed within the claims based on the four elements studied(or preferably ICP analysis) should be completed prior to more soil investigations at this stage.

2) Other

Overburden drilling to obtain samples for geochemistry at the interface of bedrock and surficial material might be preferable to soil sampling as a next step to the investigation of supposed geochemical linears.

Shallow seismic investigations might be used to estimate the depth to bedrock along selected lines as an aid to interpretation of the geochemical linear and related patterns.

Detailed glacial geology of the area might suggest further targets for geochemical followup.

A survey of the temperature of springs in the area should be completed.

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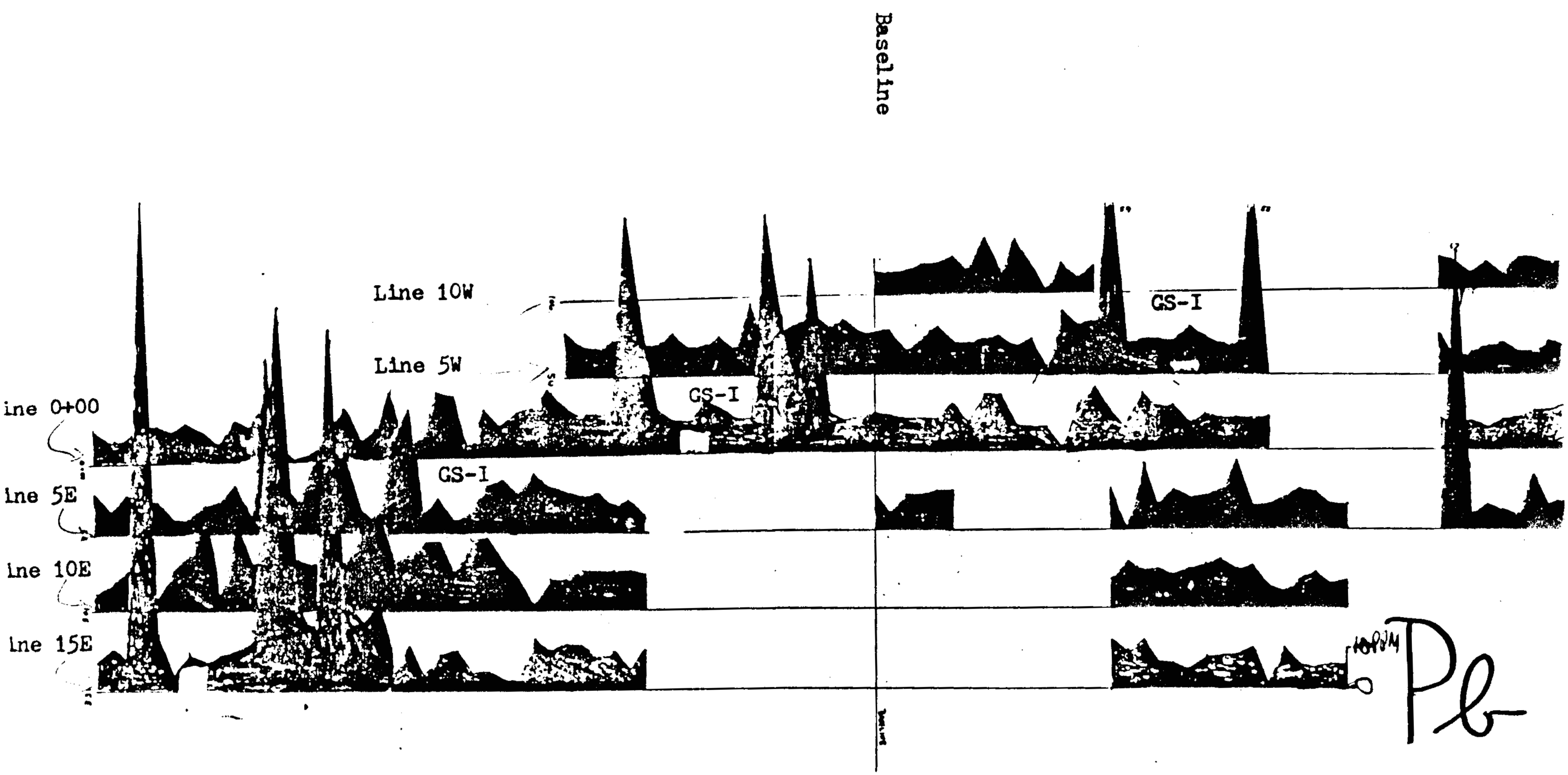

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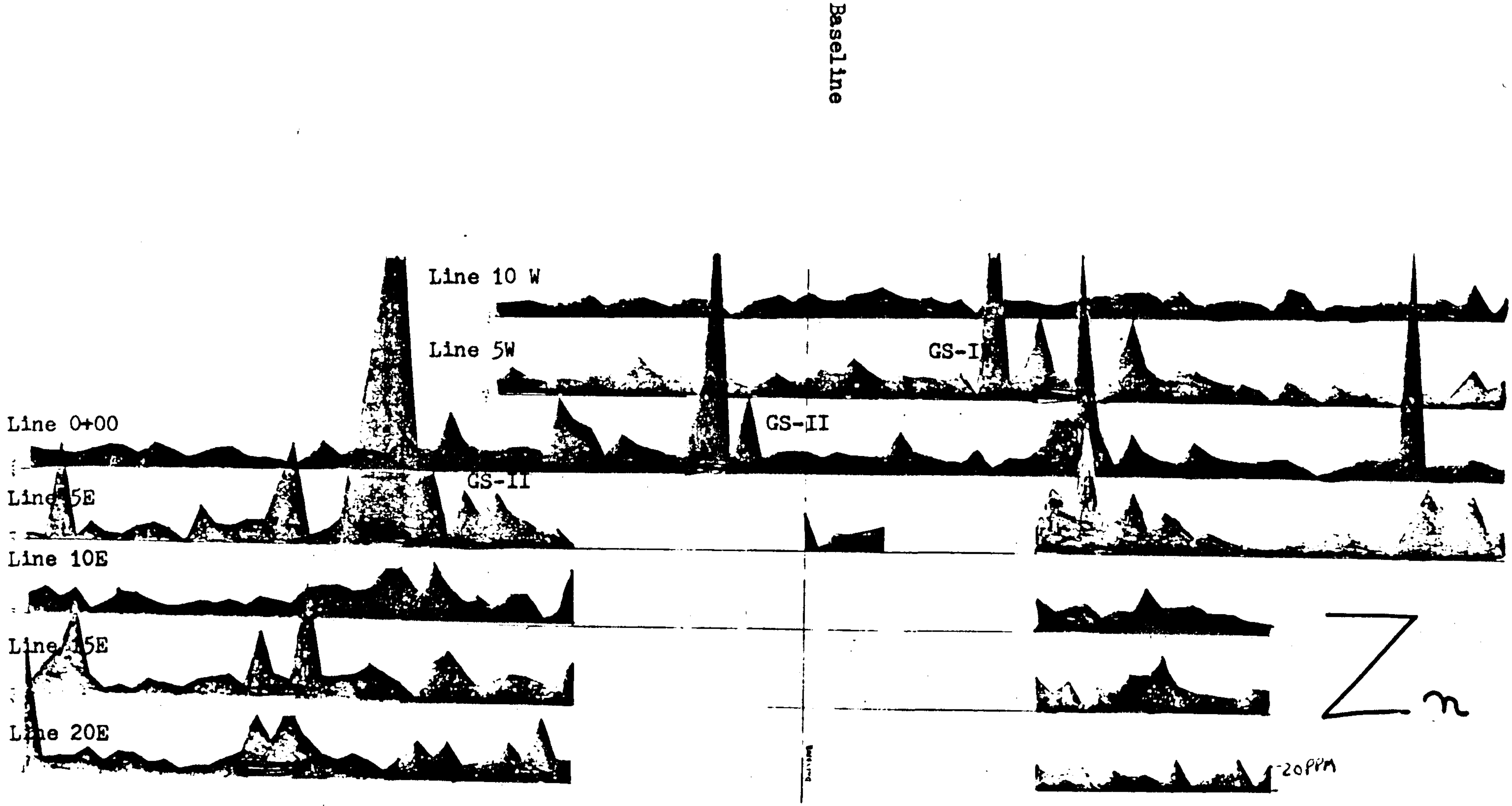

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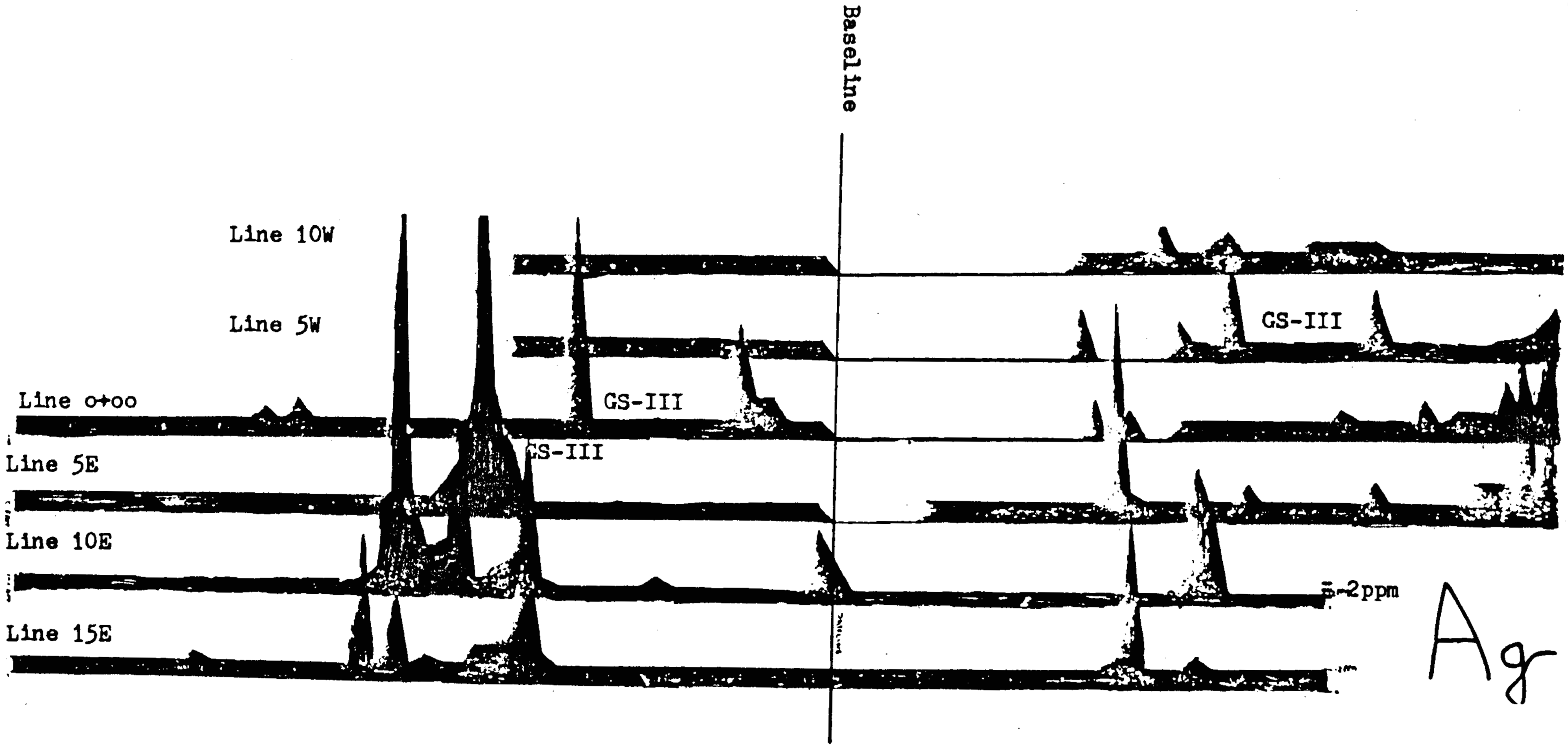

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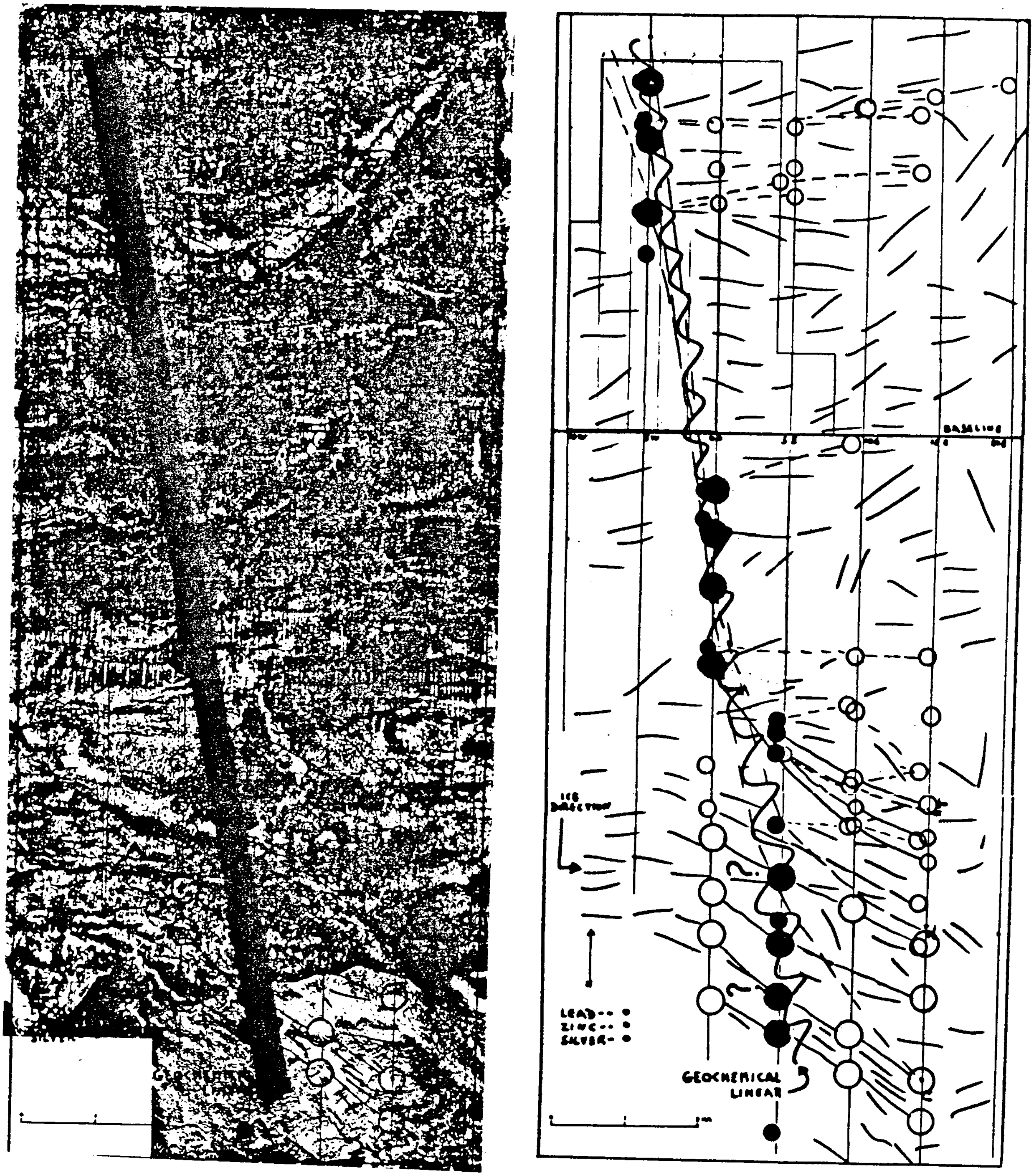

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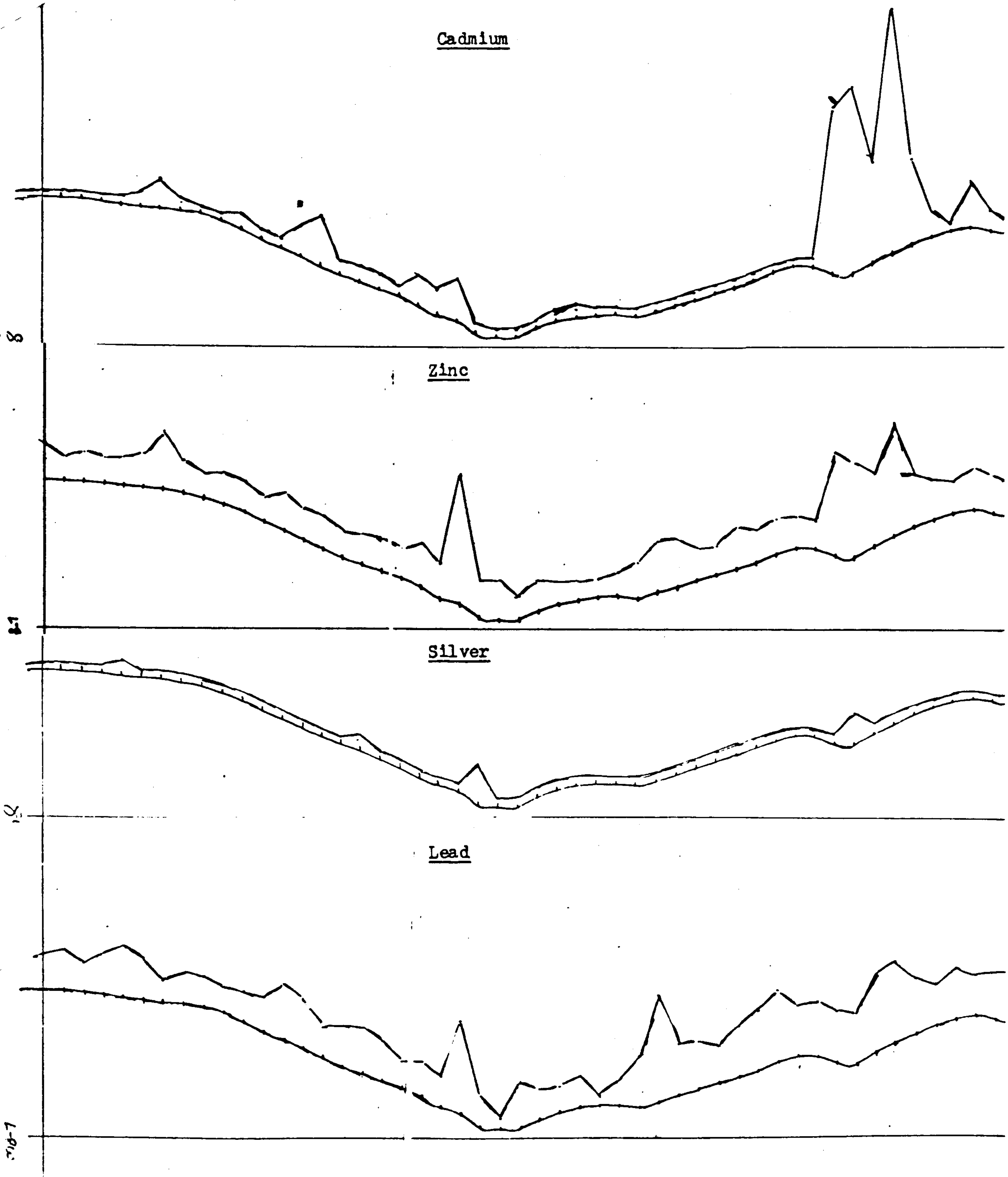

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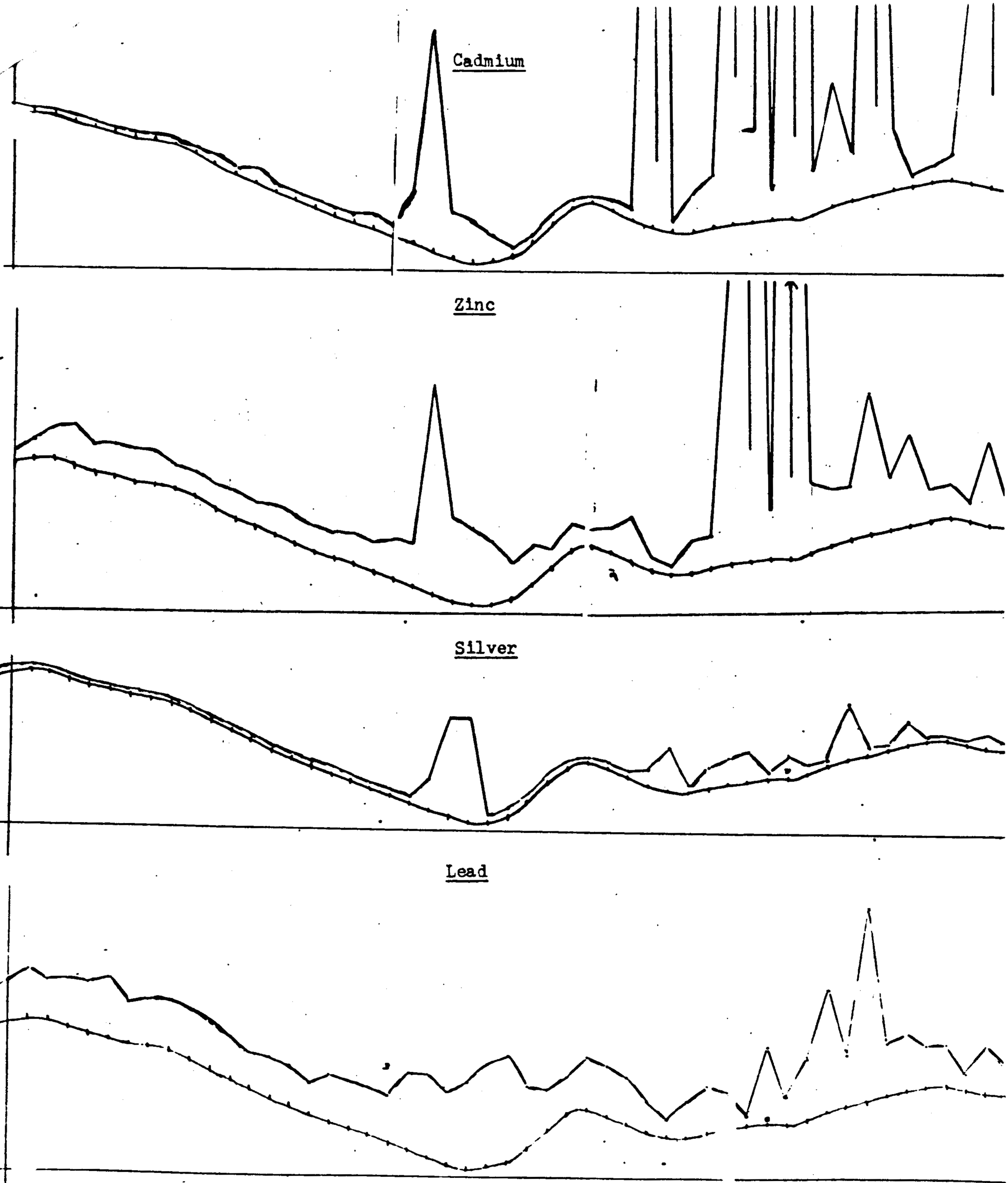

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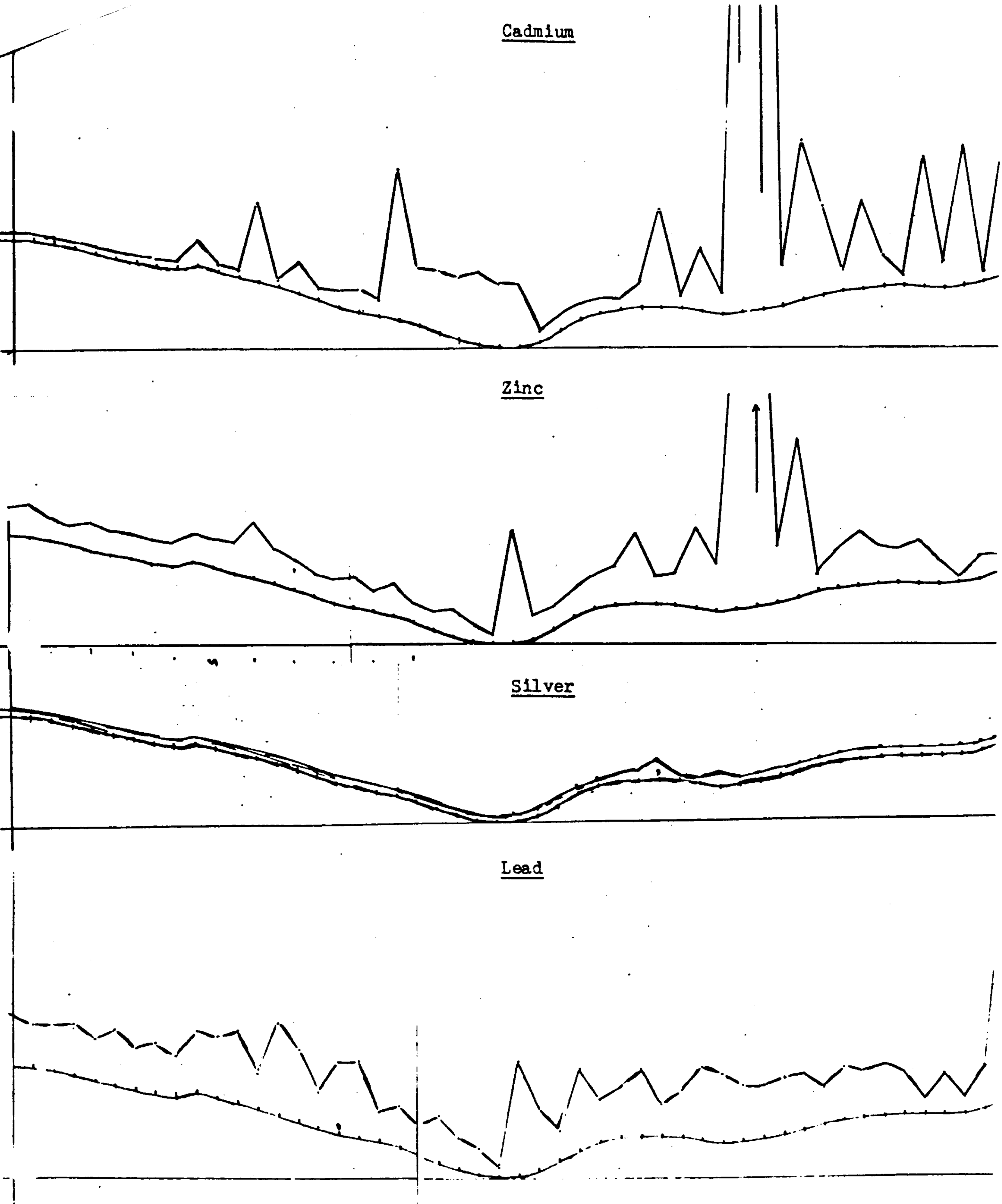

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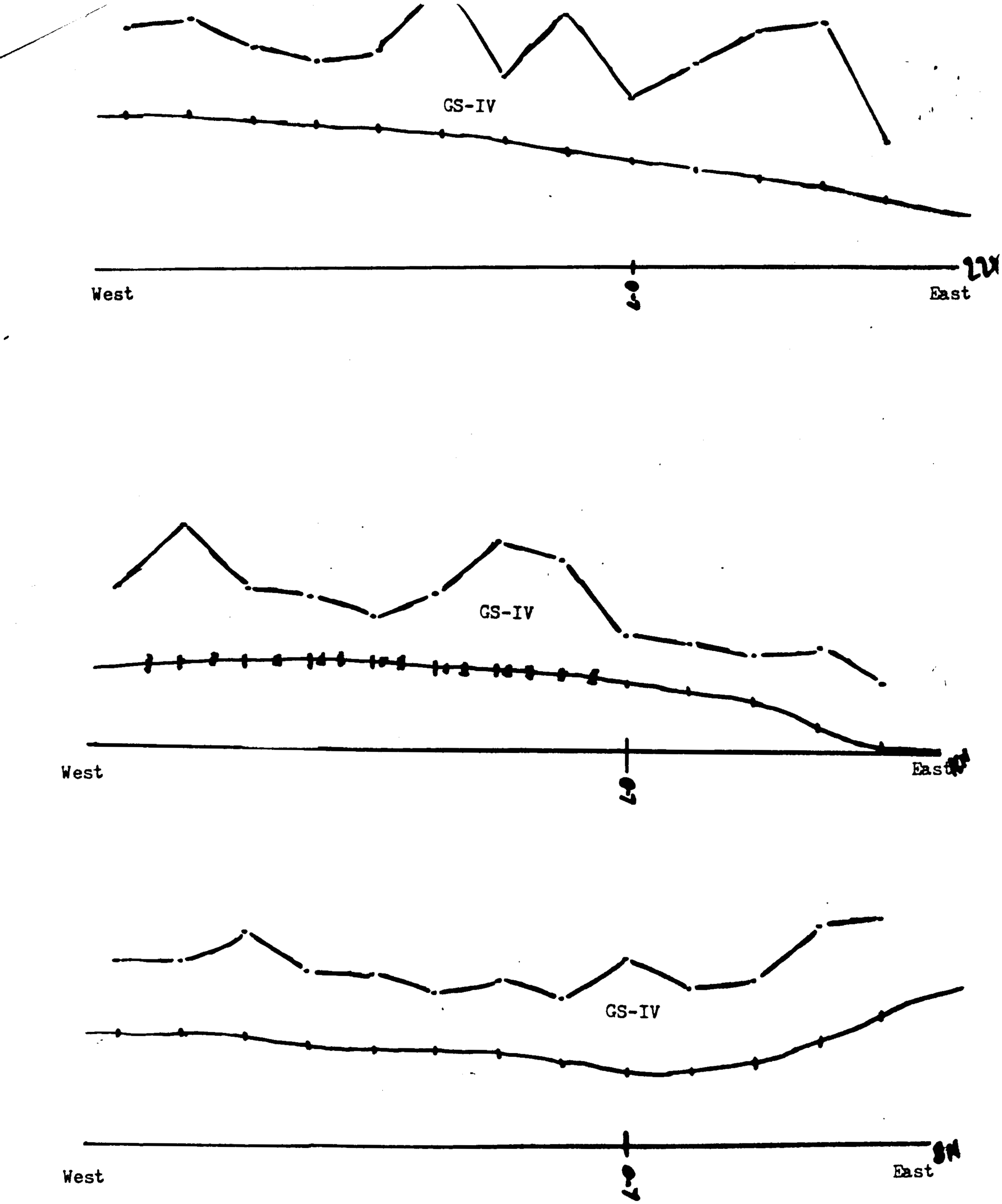

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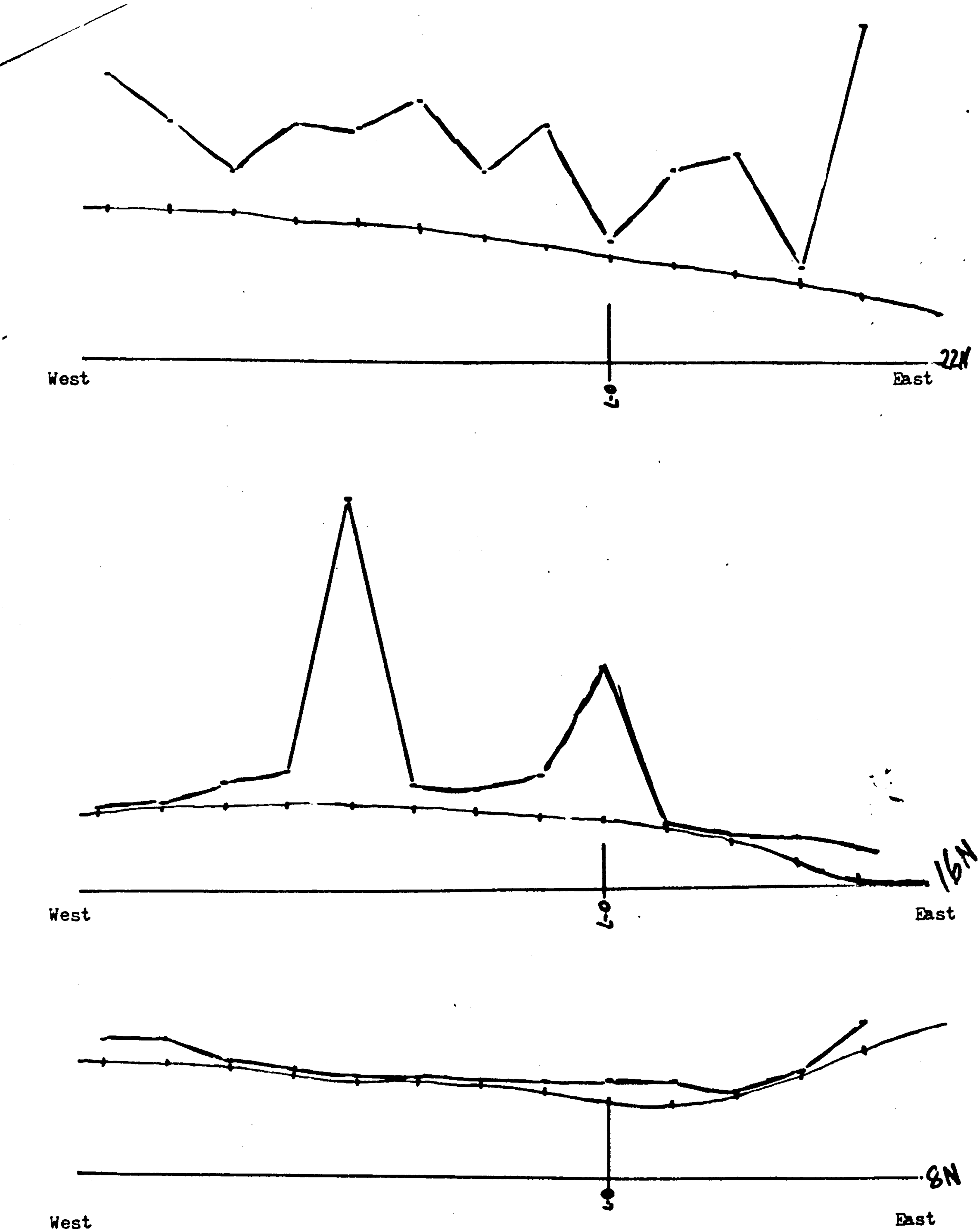

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2) Other

Overburden drilling to obtain samples for geochemistry at the interface of bedrock and surficial material might be preferable to soil sampling as a next step to the investigation of supposed geochemical linears.

Shallow seismic investigations might be used to estimate the depth to bedrock along selected lines as an aid to interpretation of the geochemical linear and related patterns.

Detailed glacial geology of the area might suggest further targets for geochemical followup.

A survey of the temperature of springs in the area should be completed.