

**THE IMPACT OF ICELANDIC VOLCANIC ERUPTIONS
UPON THE ANCIENT SETTLEMENT AND ENVIRONMENT OF NORTHERN BRITAIN.**

**VOLUME 2.
FIGURES.**

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This work is submitted in fulfilment of the requirements for a Doctor of Philosophy in the Faculty of
Pure Science at the University of Sheffield.



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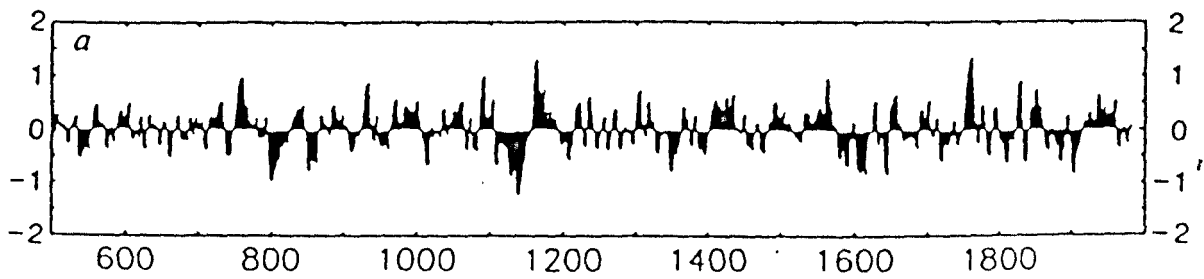


Figure 1.1. Ten year cycles in reconstructed northern Fennoscandian summer temperature anomalies relative to 1951-1970 mean. From Briffa *et al.* 1990.

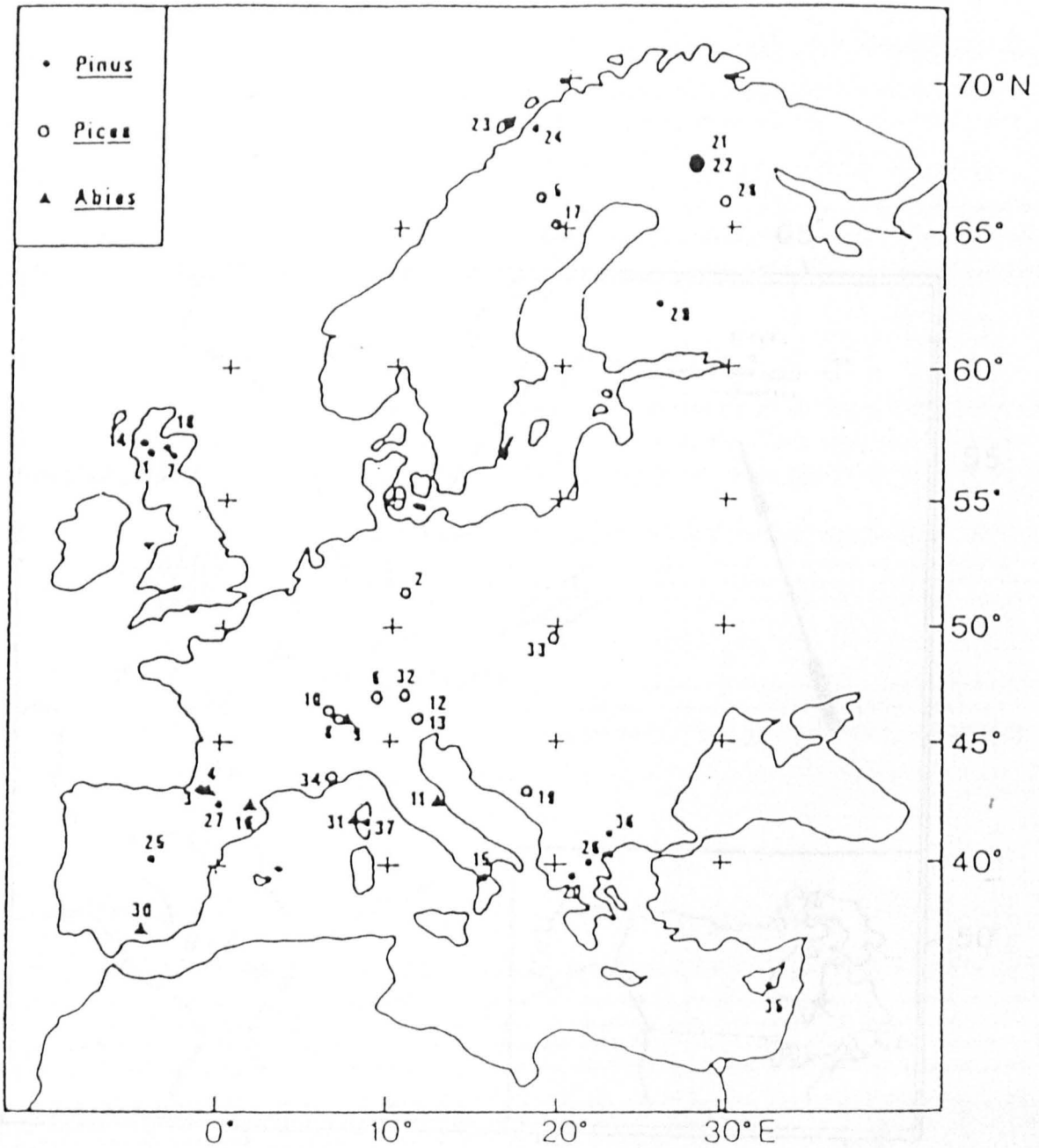


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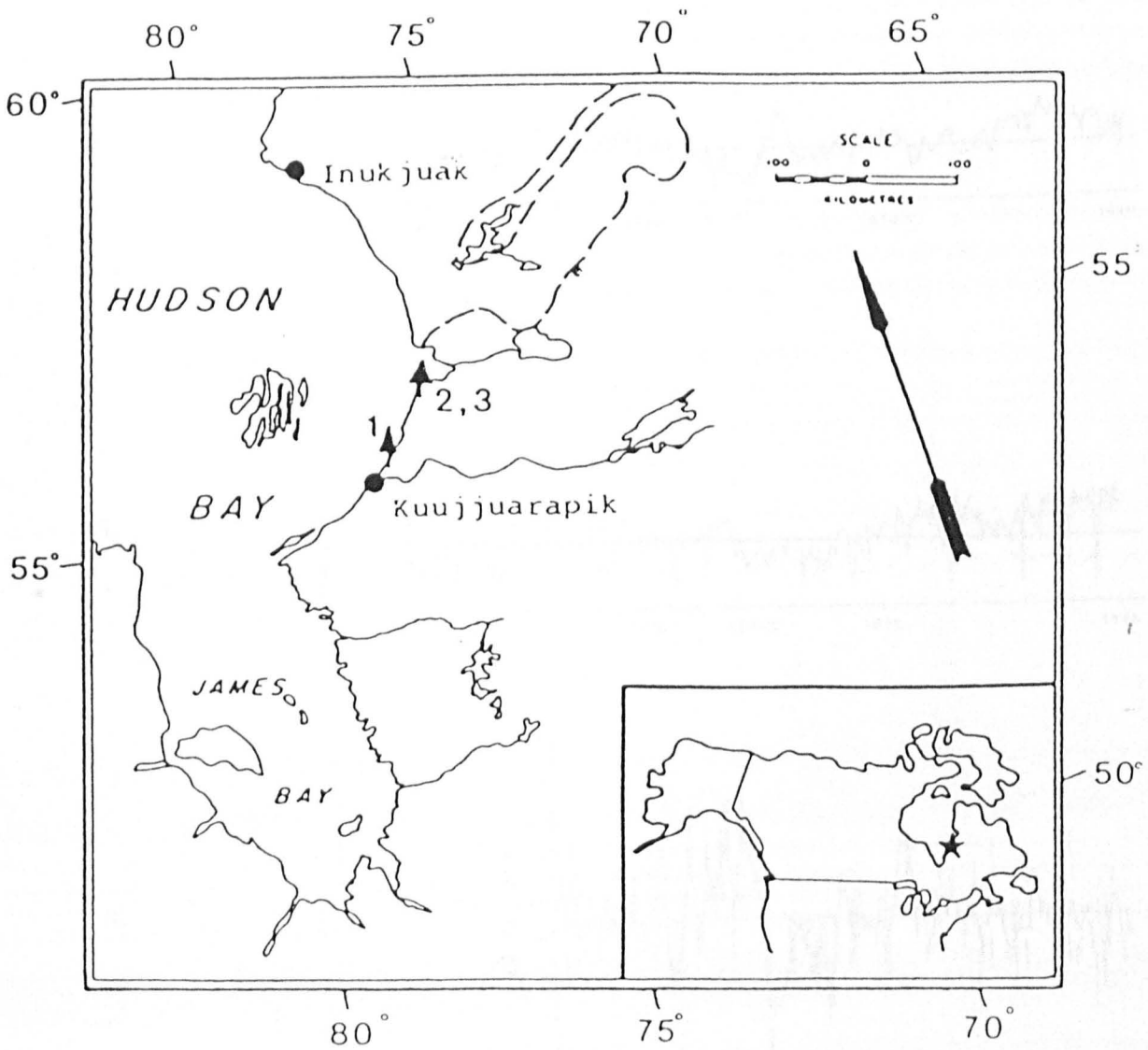
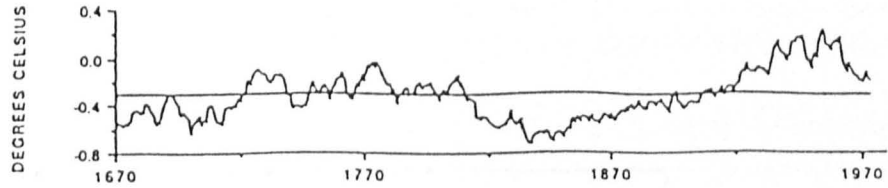
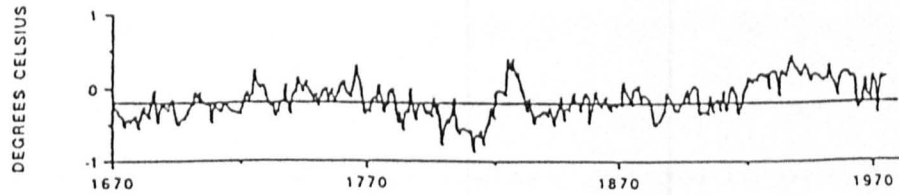


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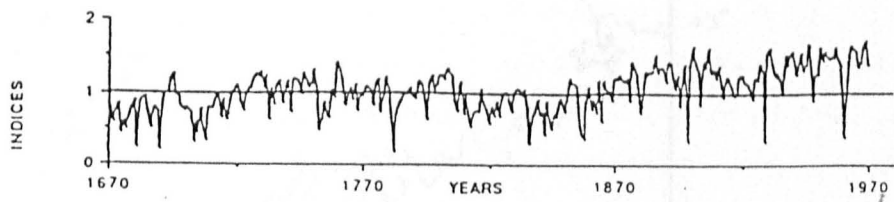
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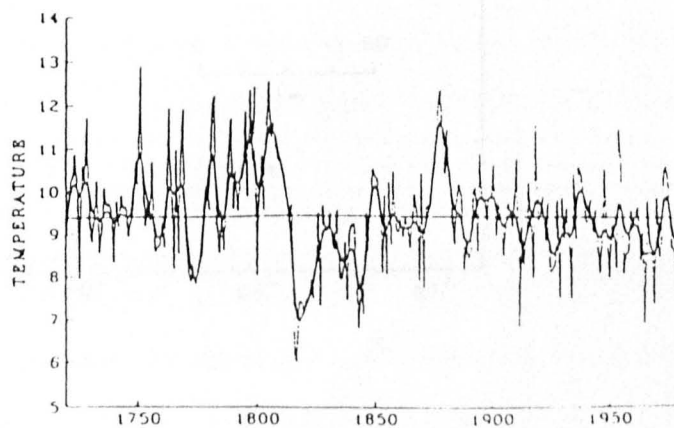


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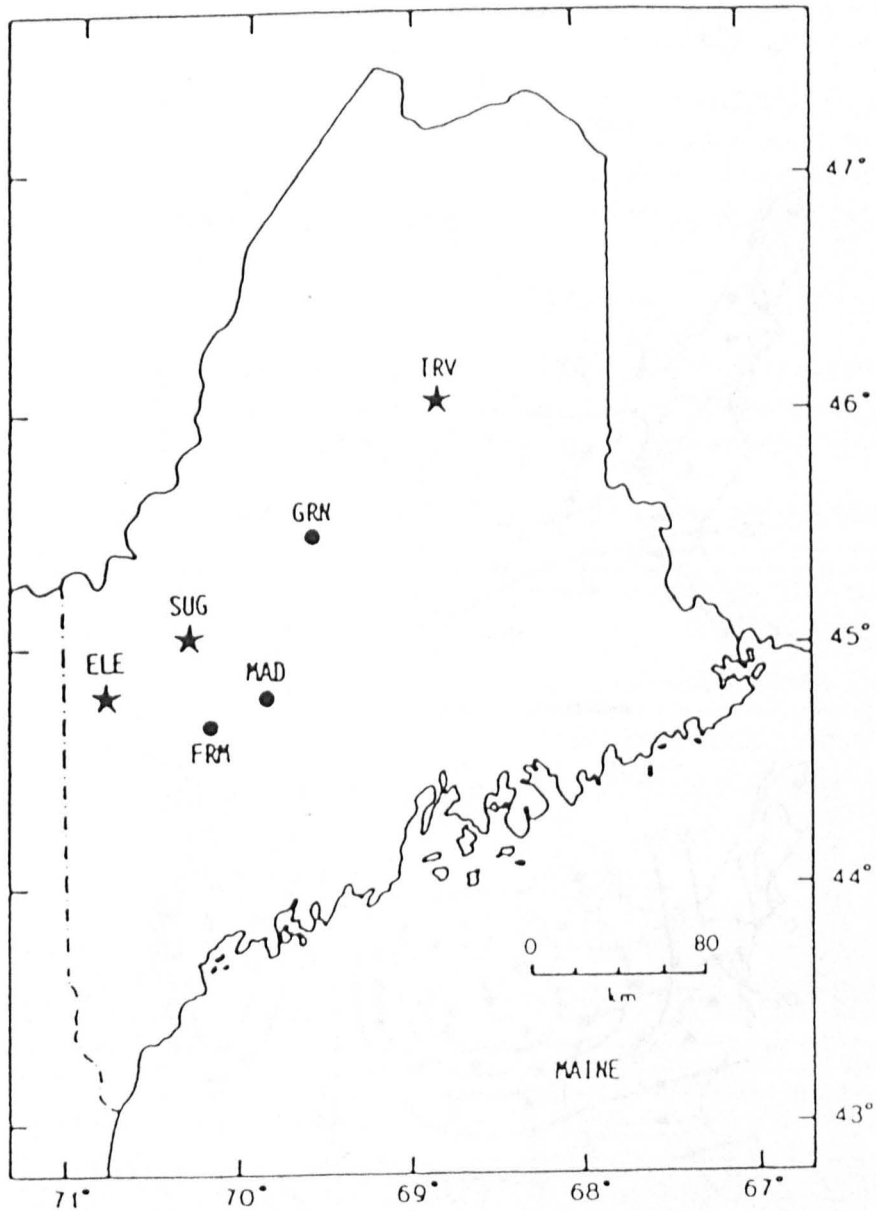


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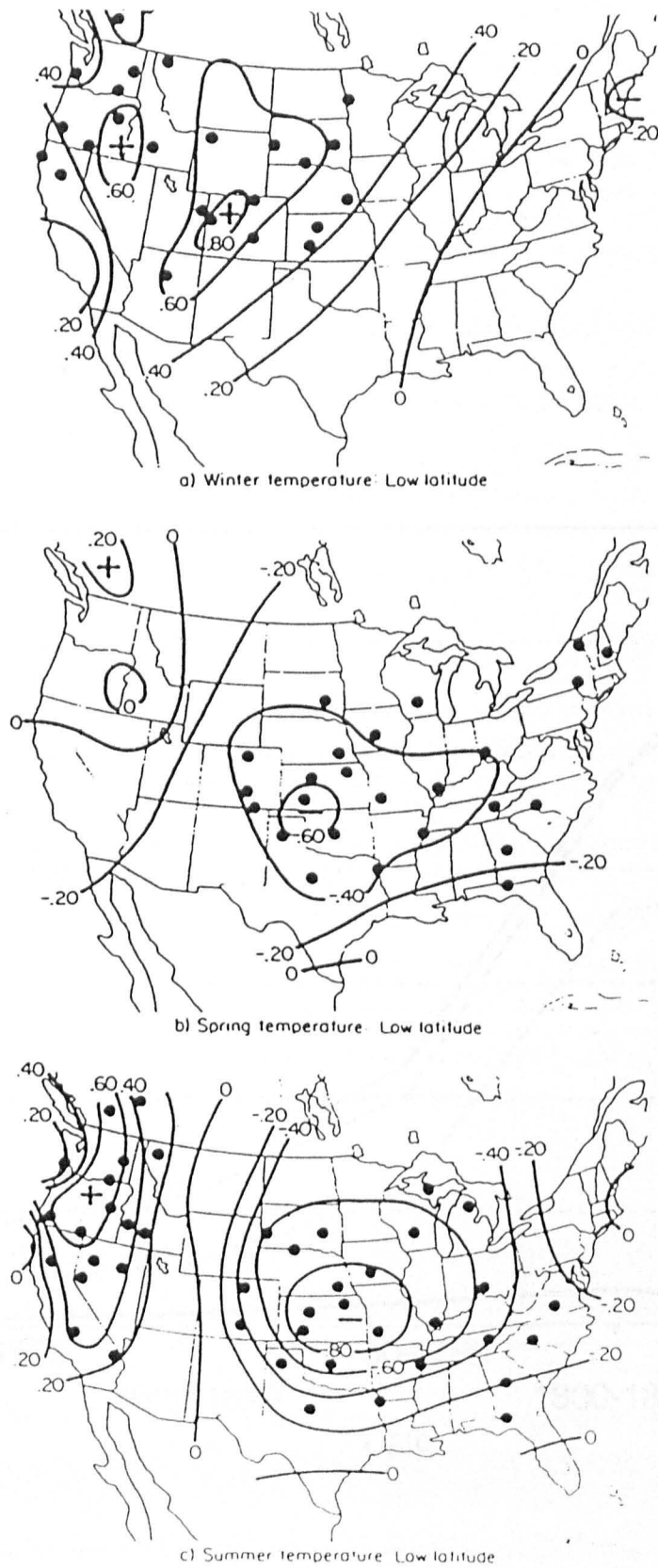


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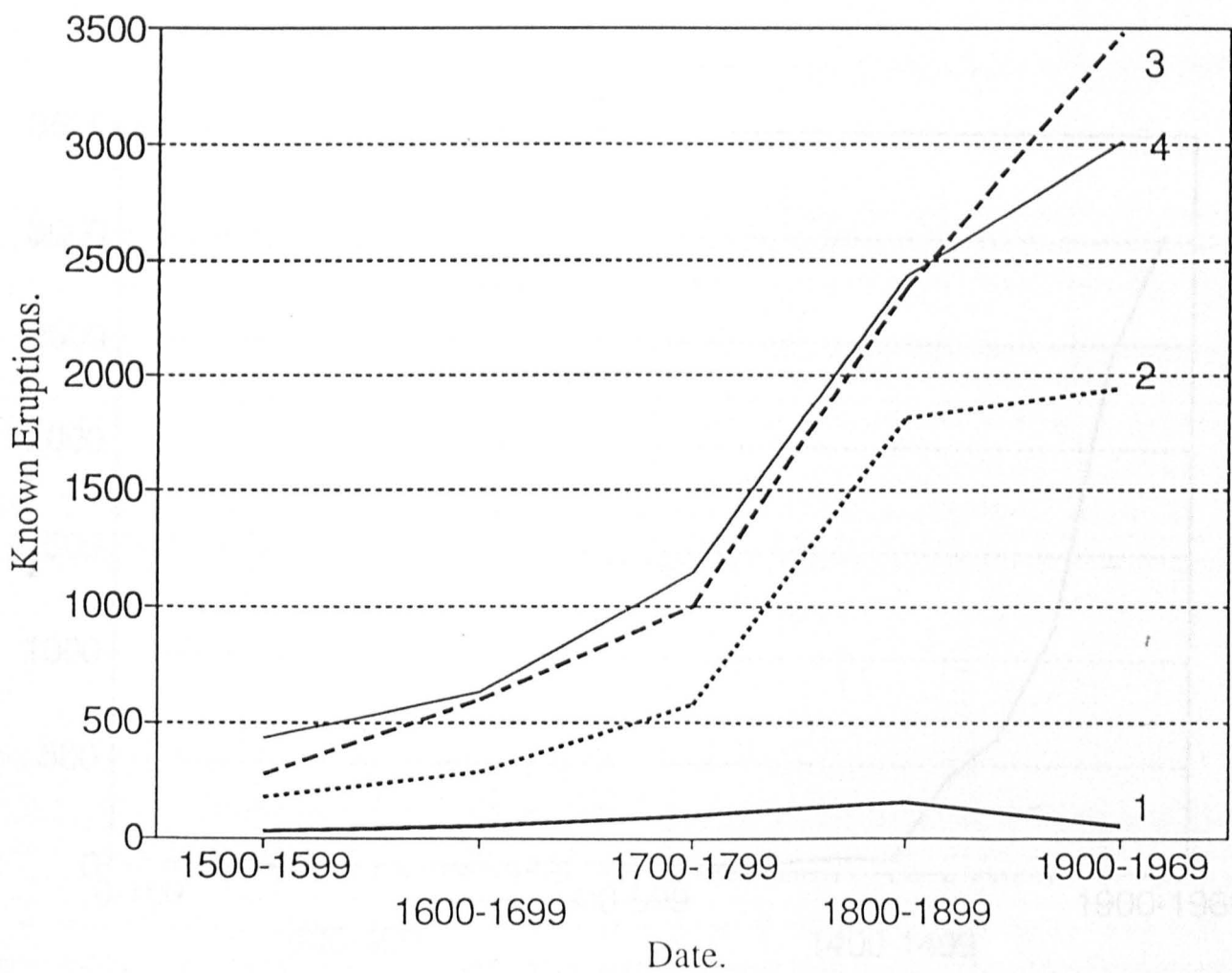


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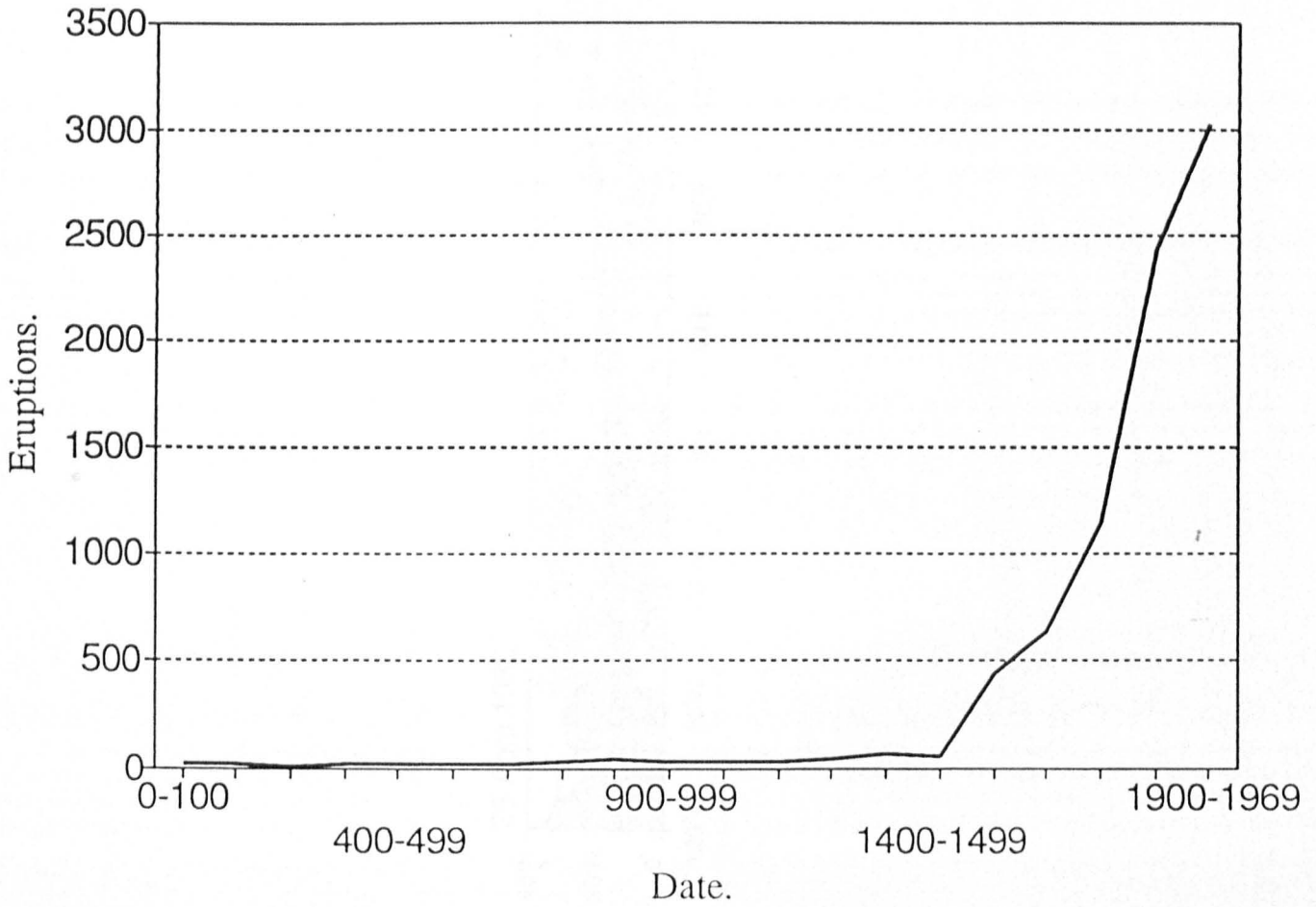


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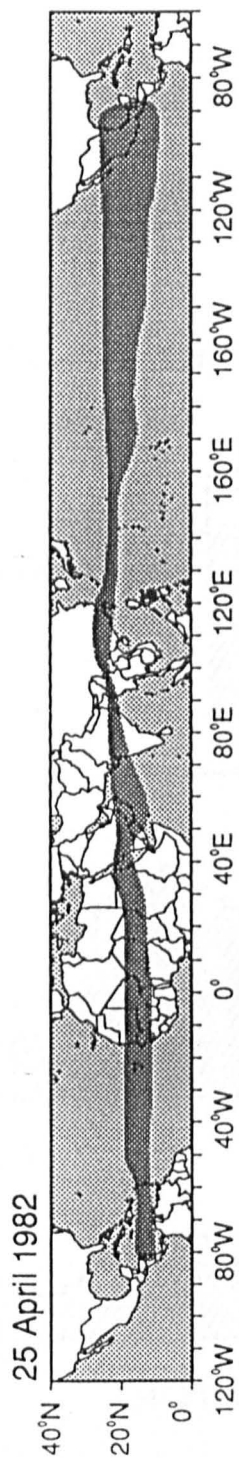


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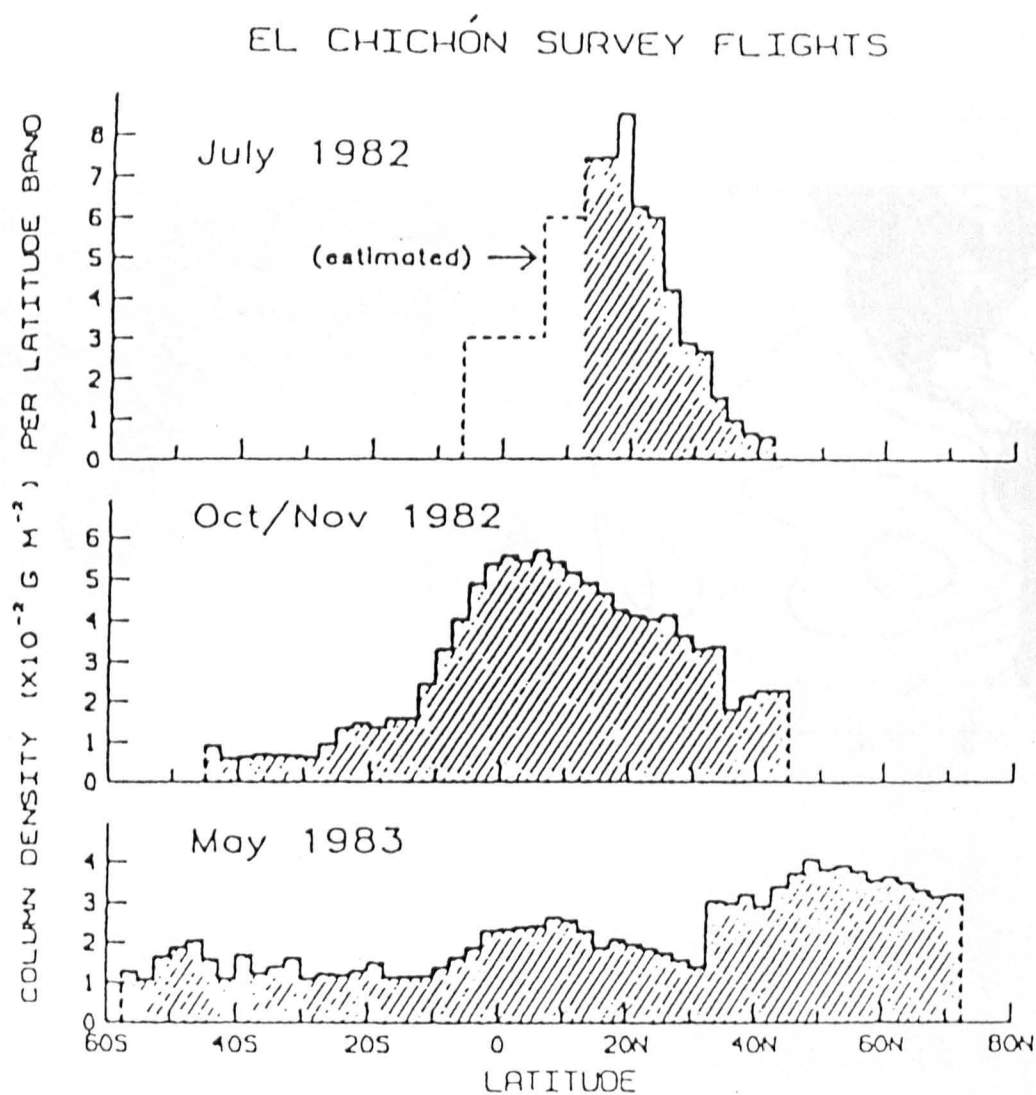


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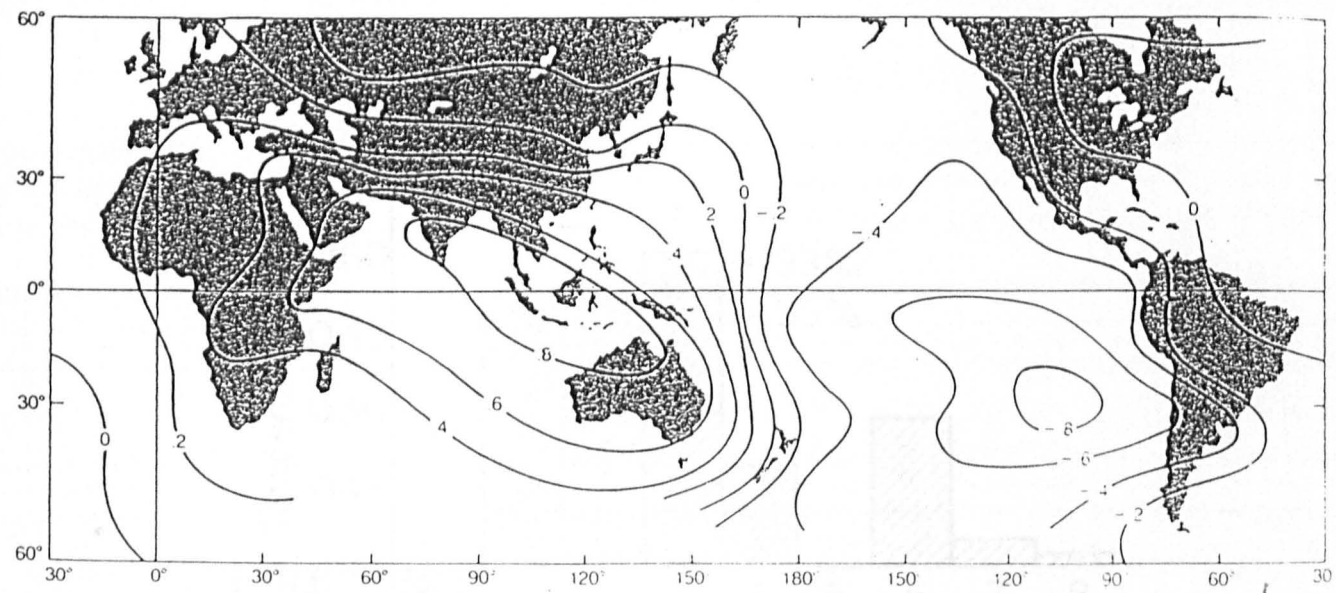


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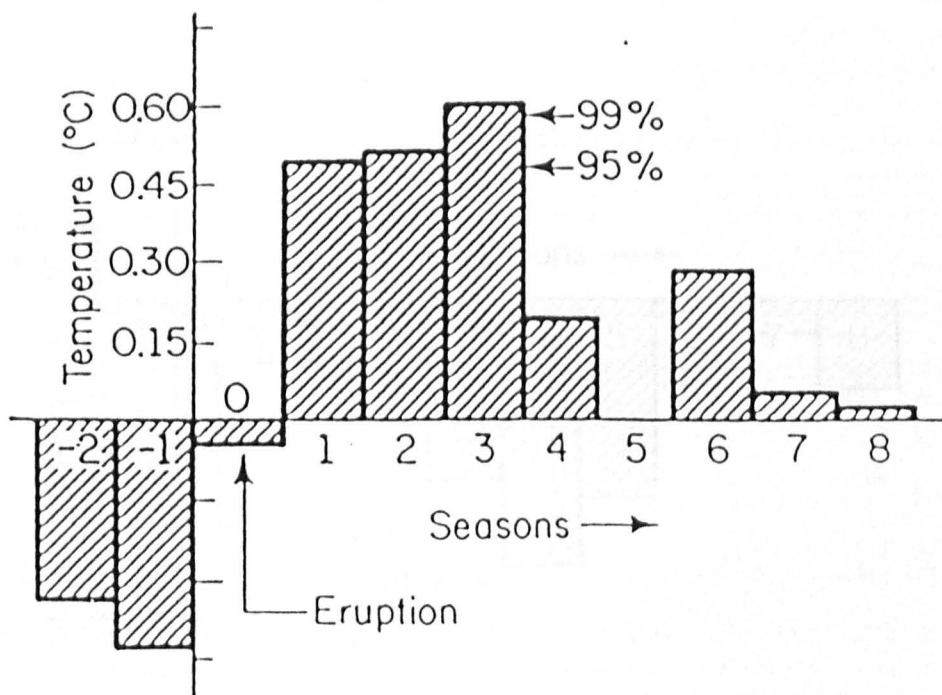


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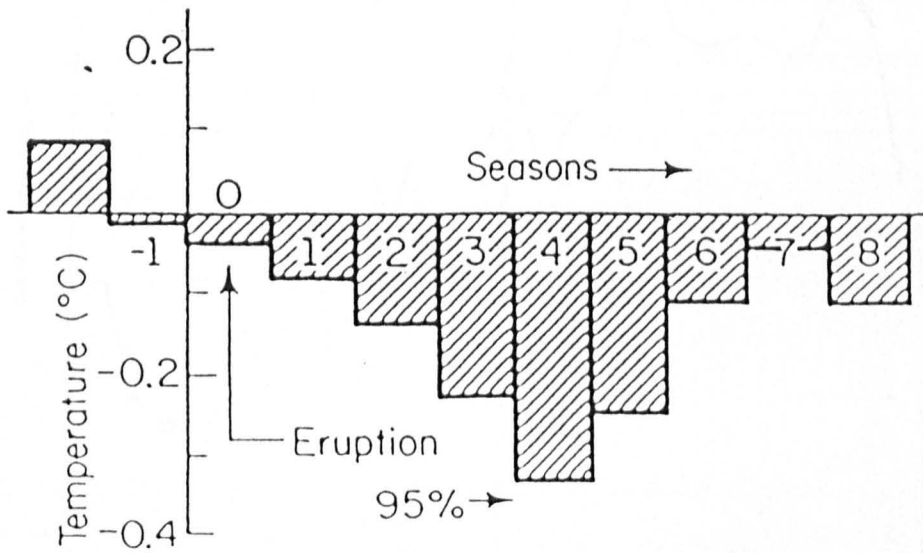


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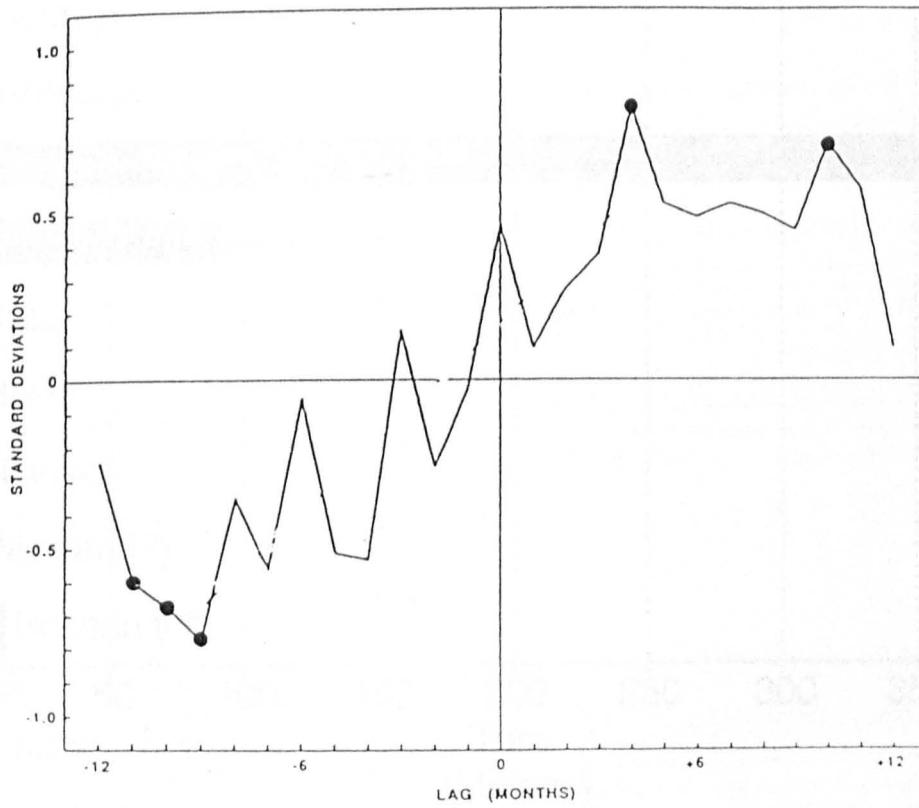


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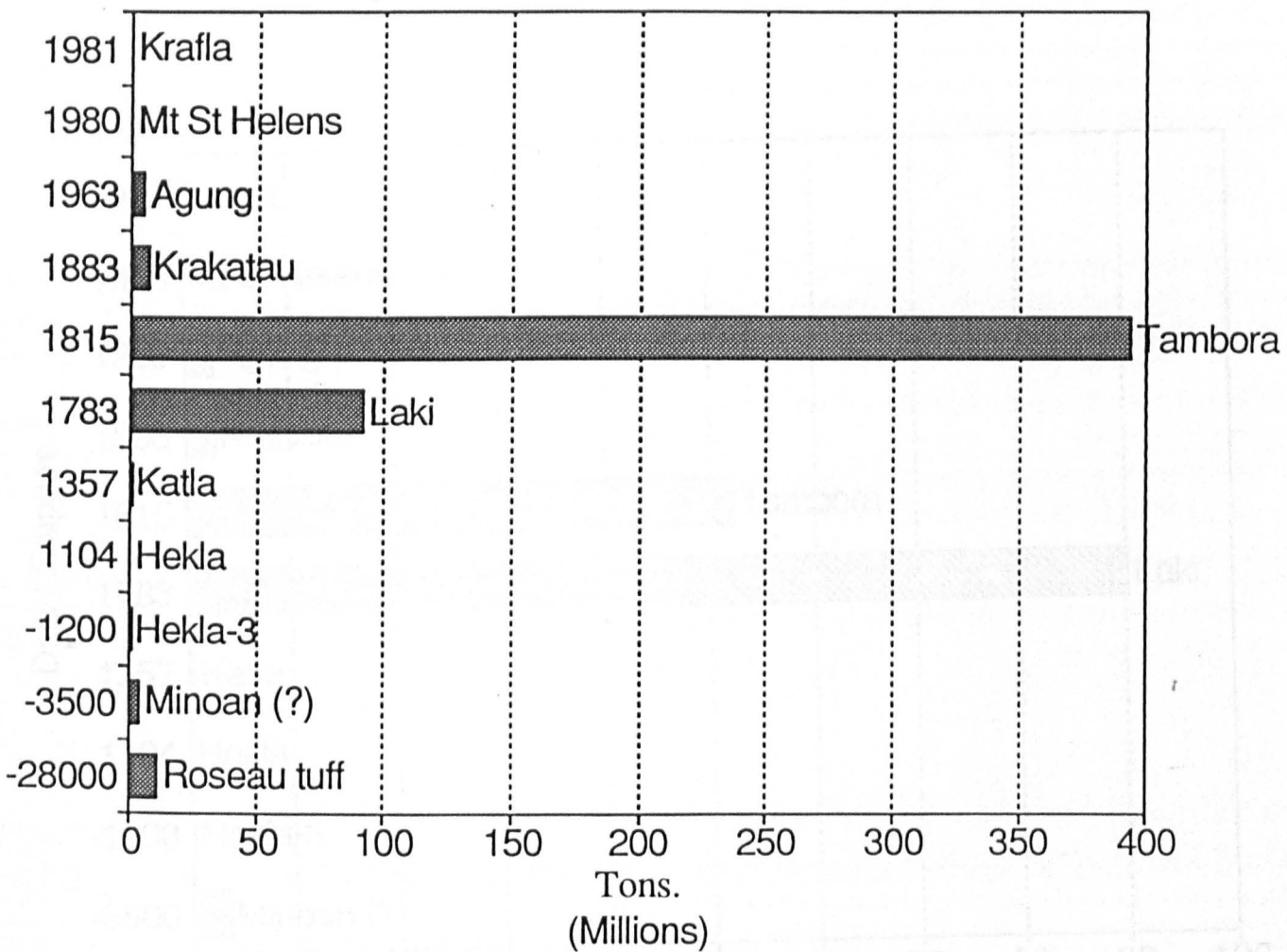


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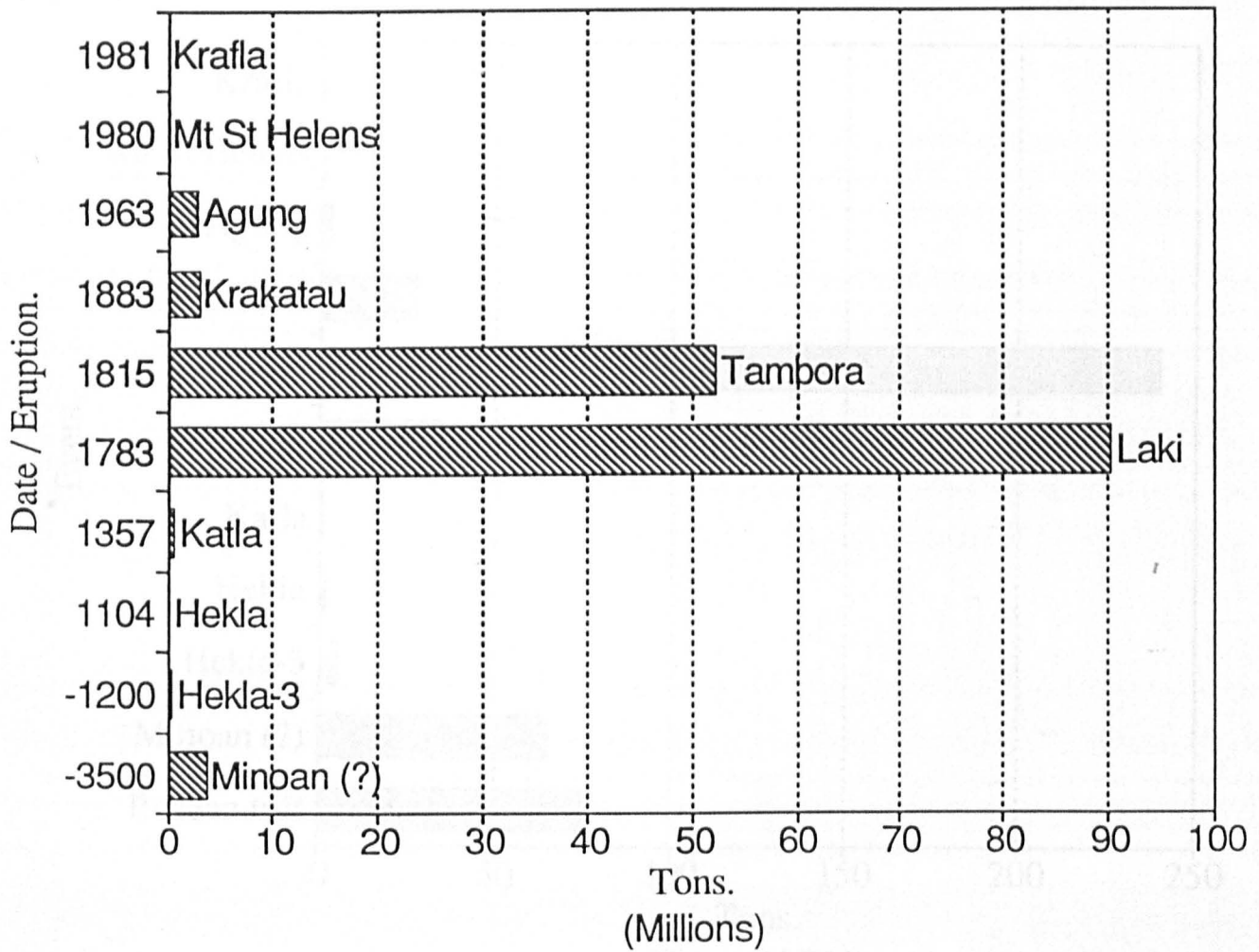


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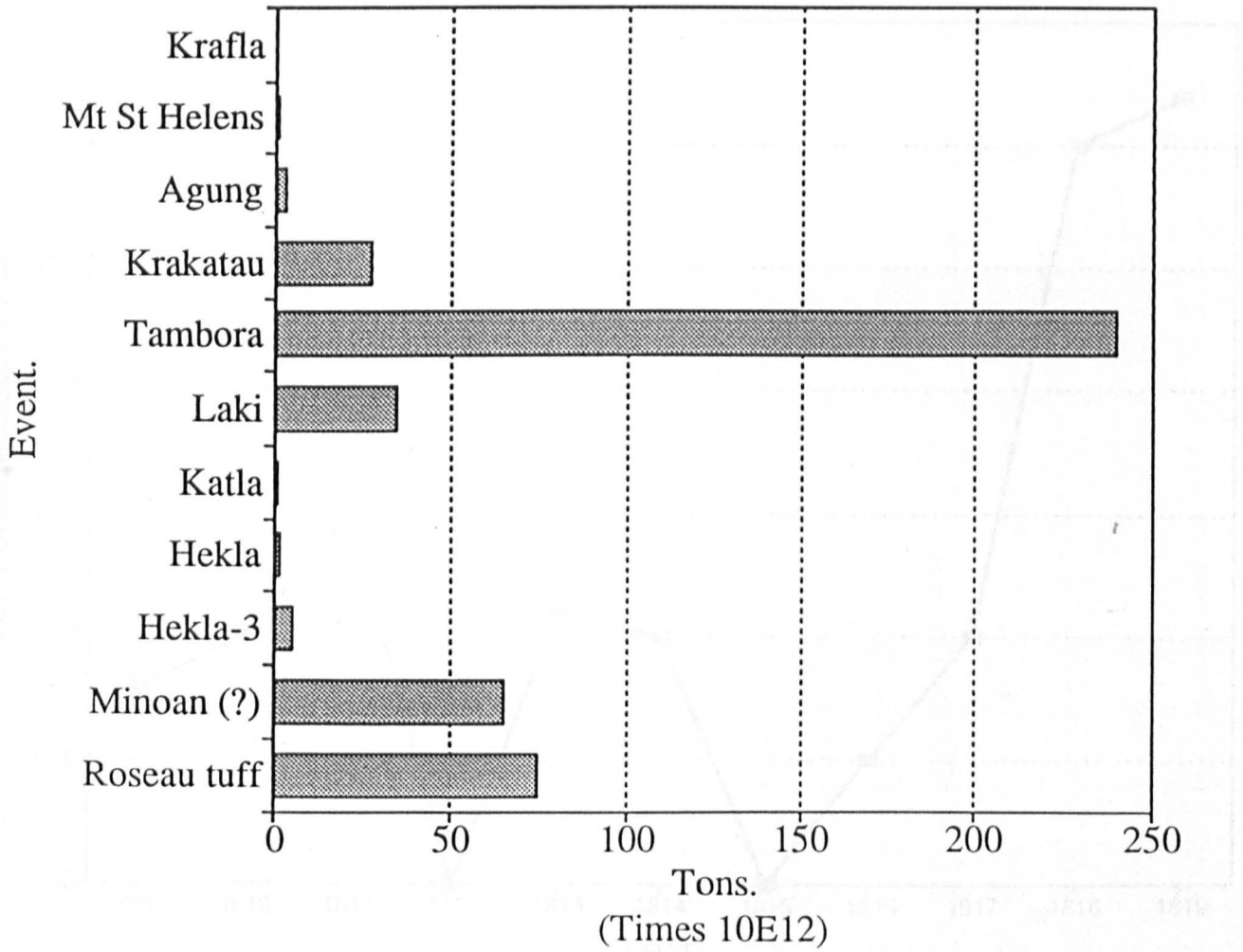


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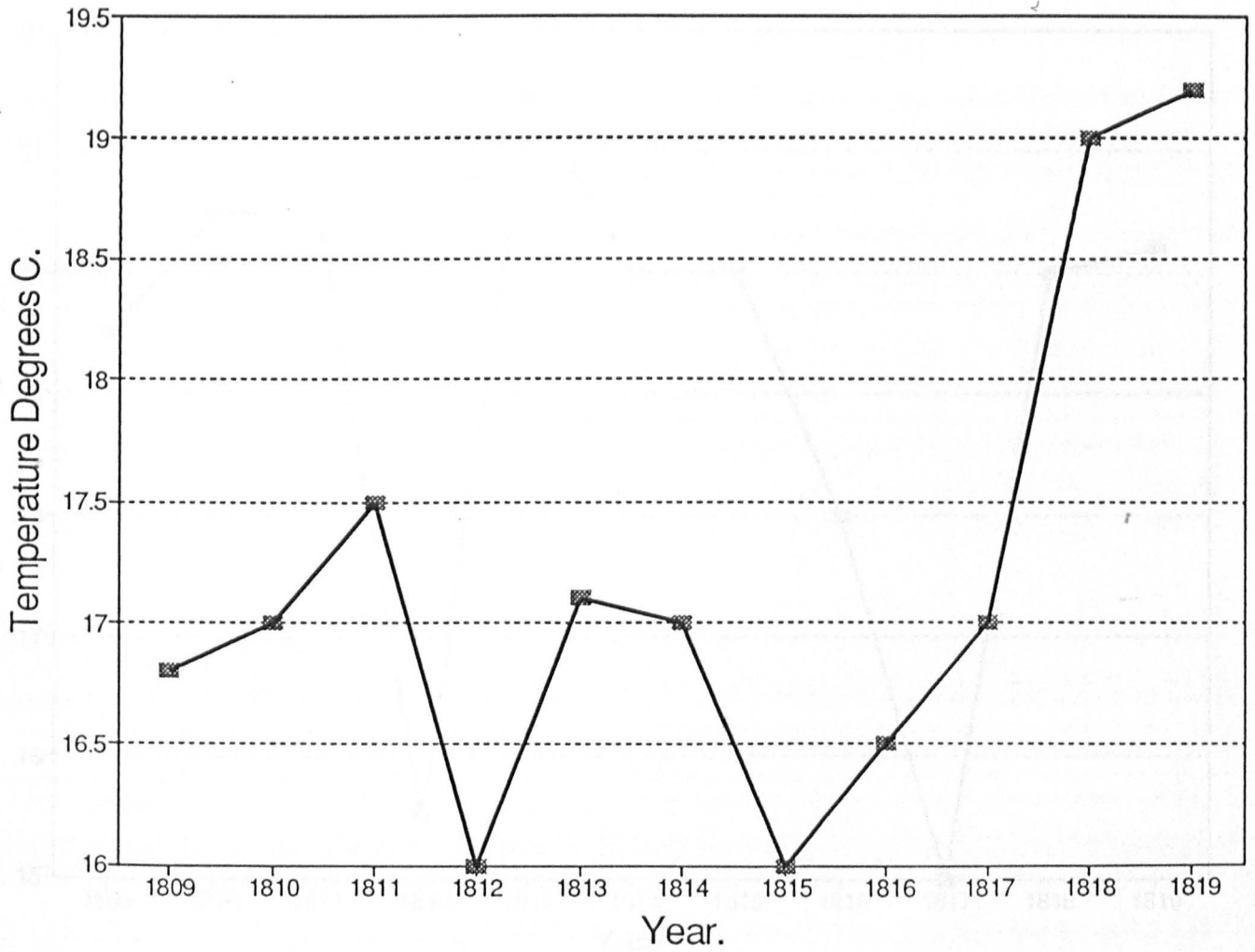


Figure 4.4. Summer mean temperatures at Brunswick, New Jersey. Data from Baron [1992].

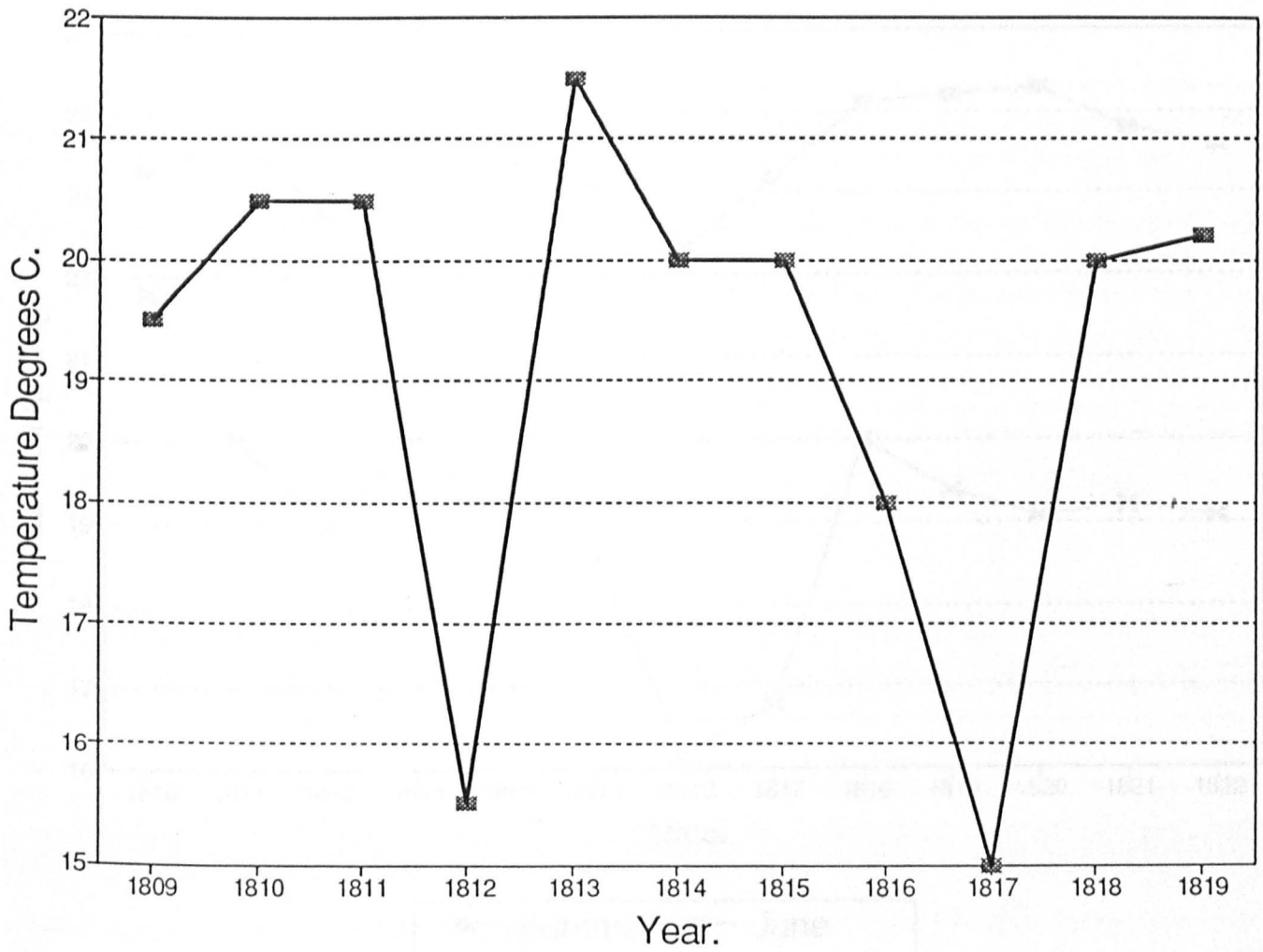


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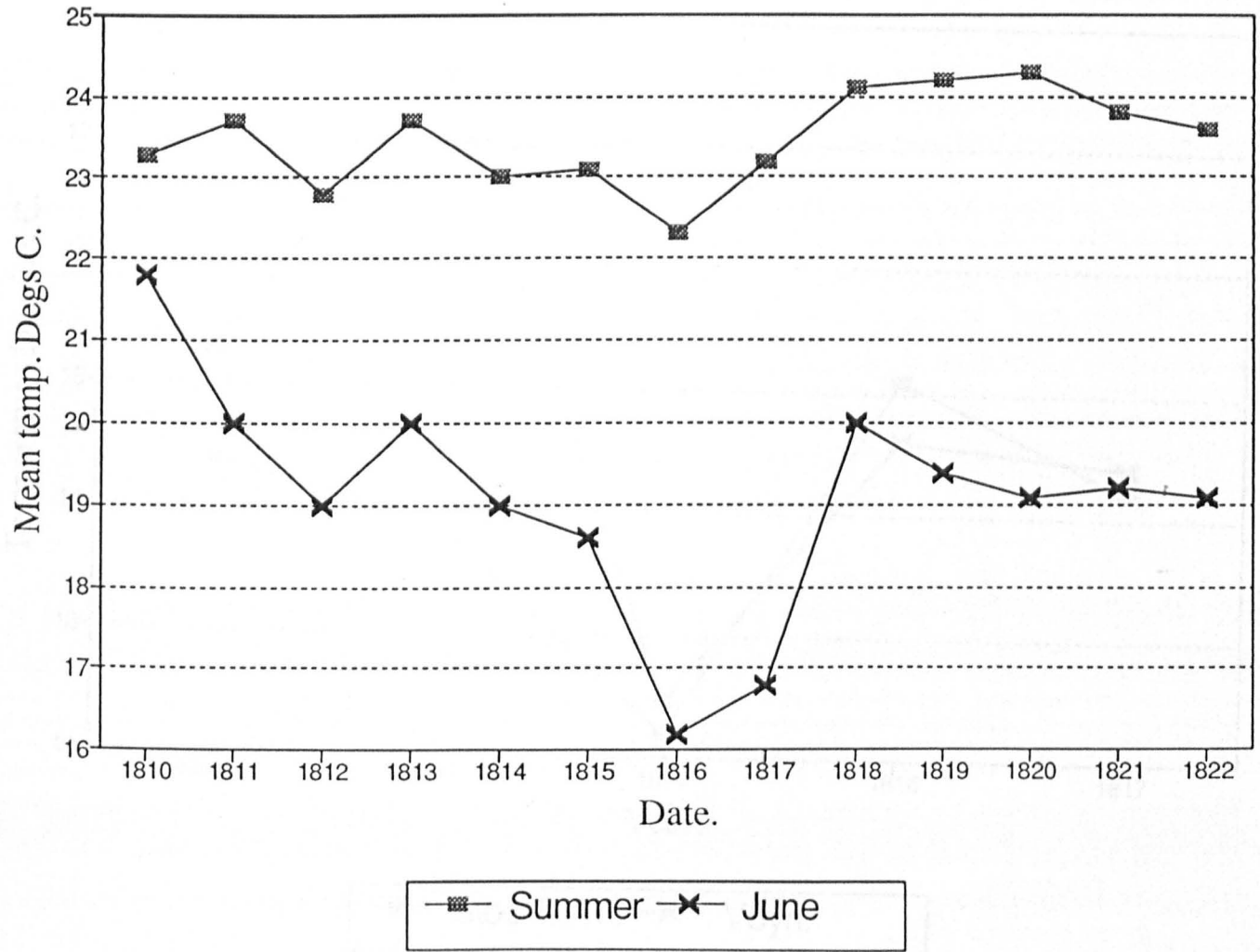


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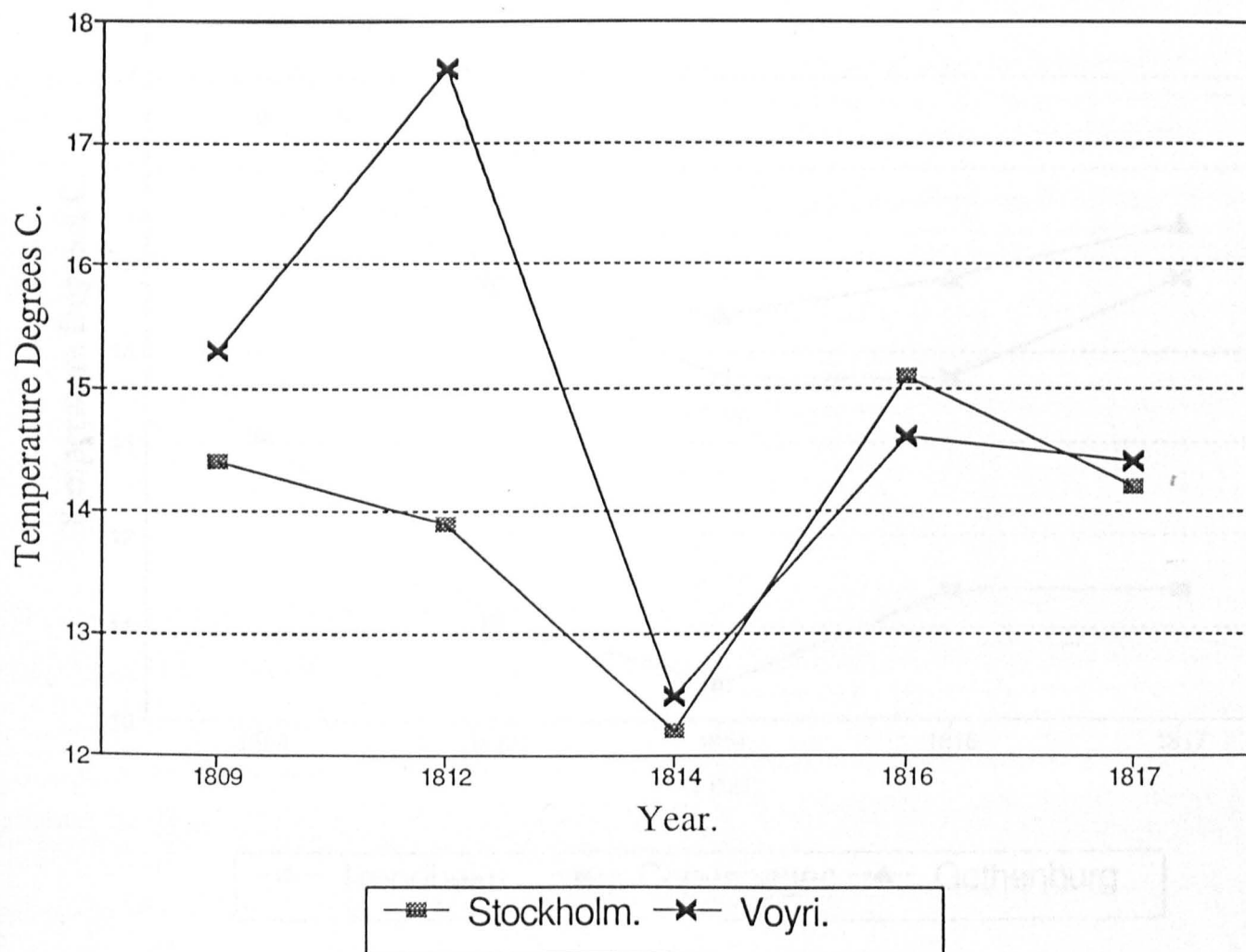


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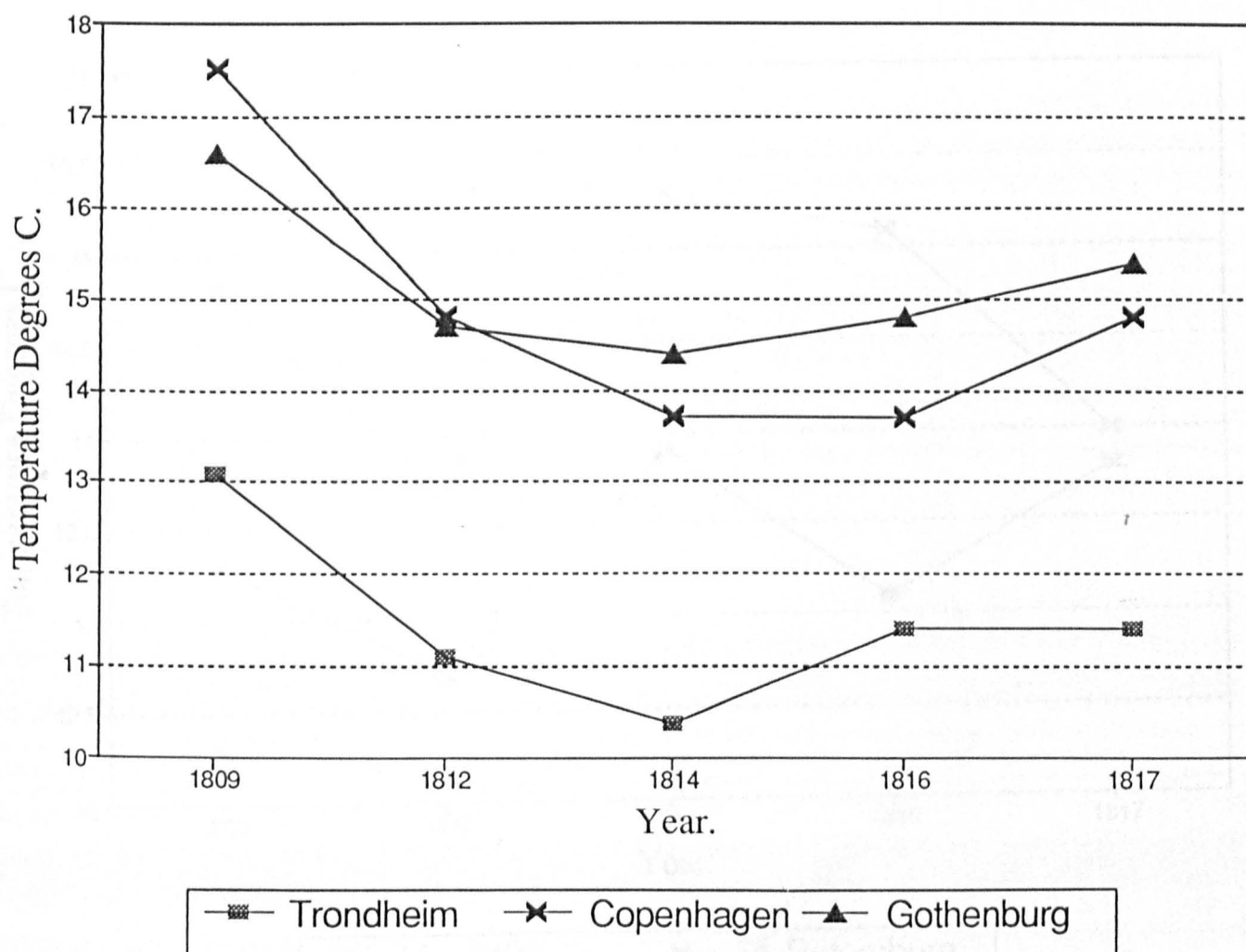


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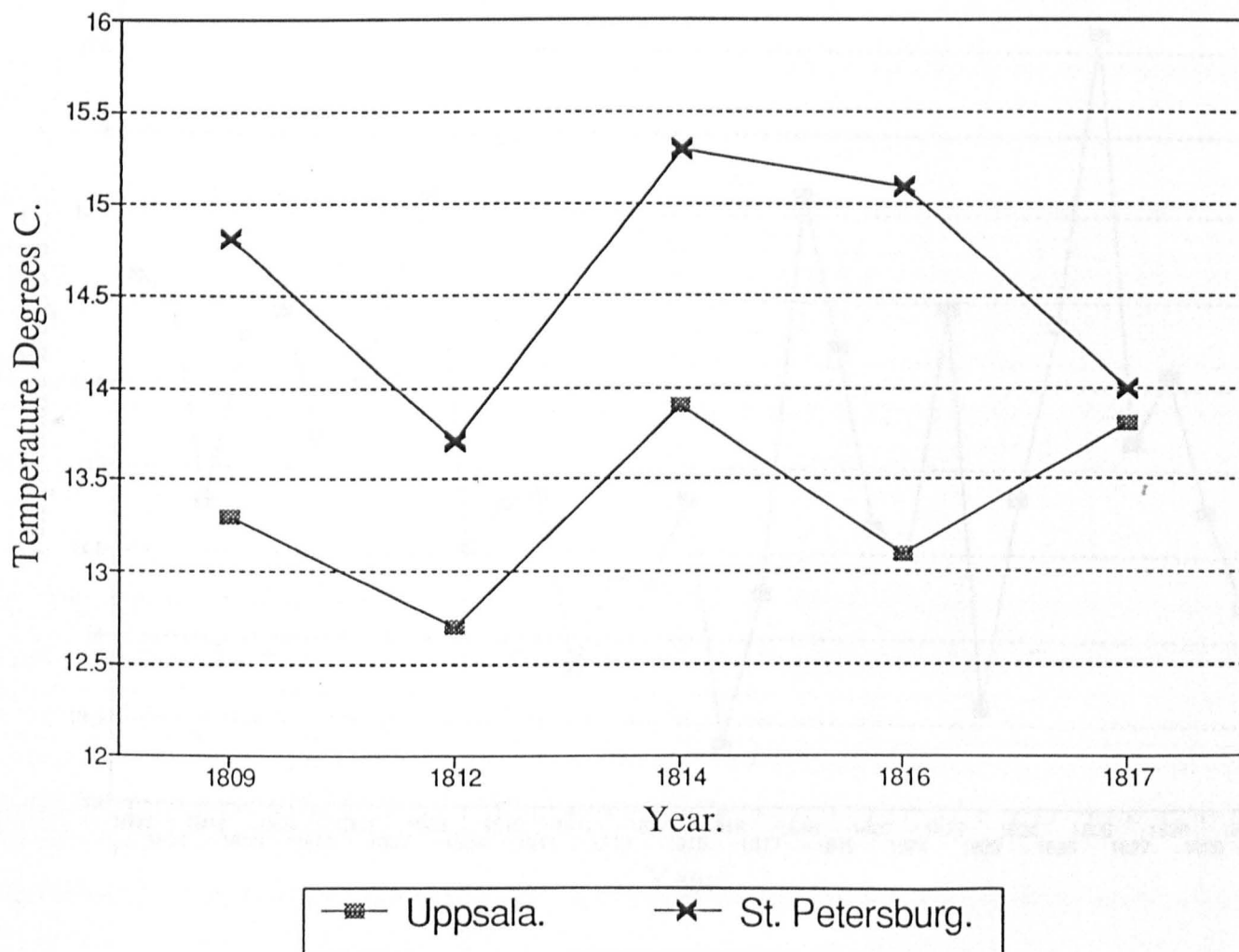


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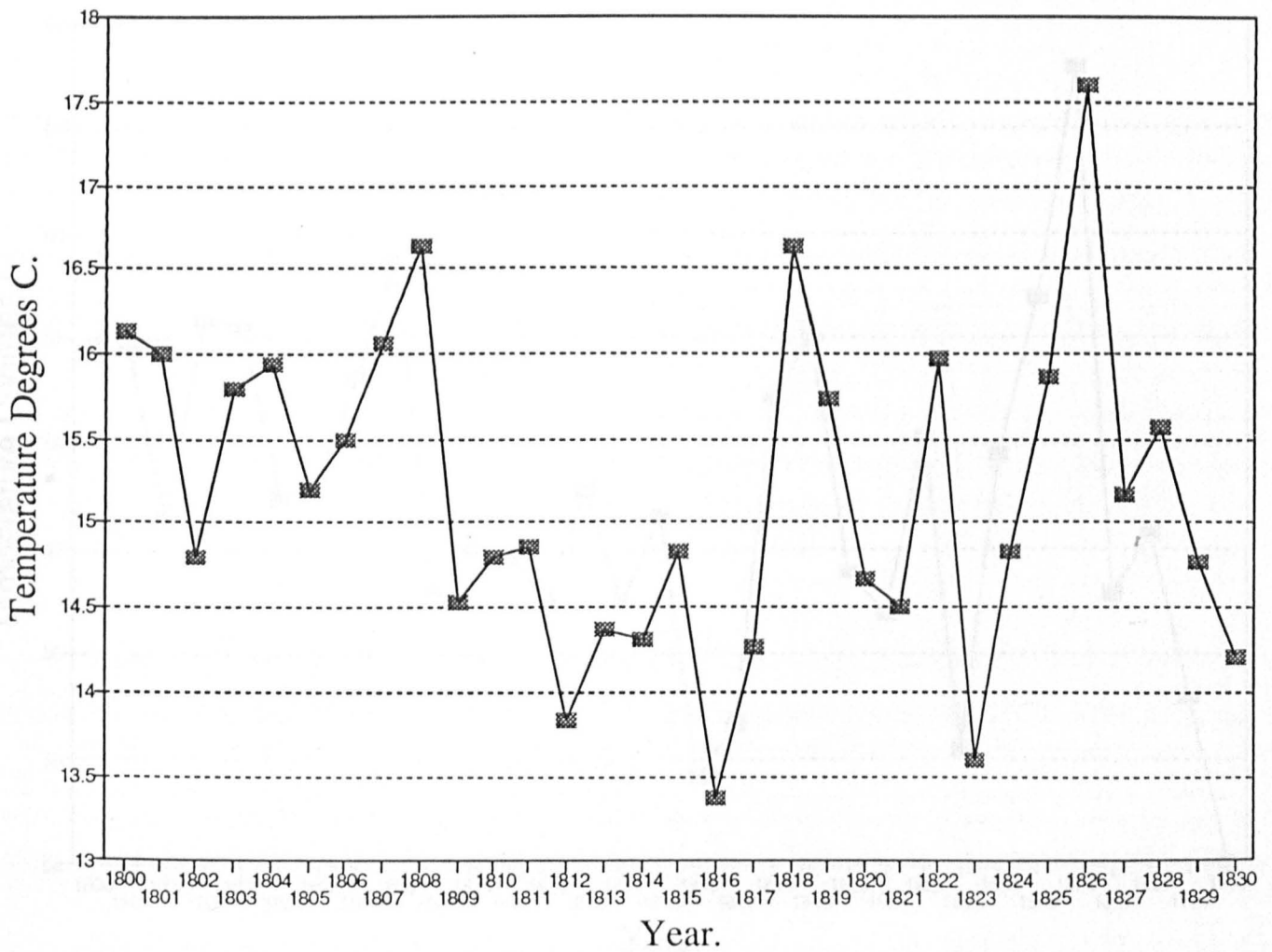


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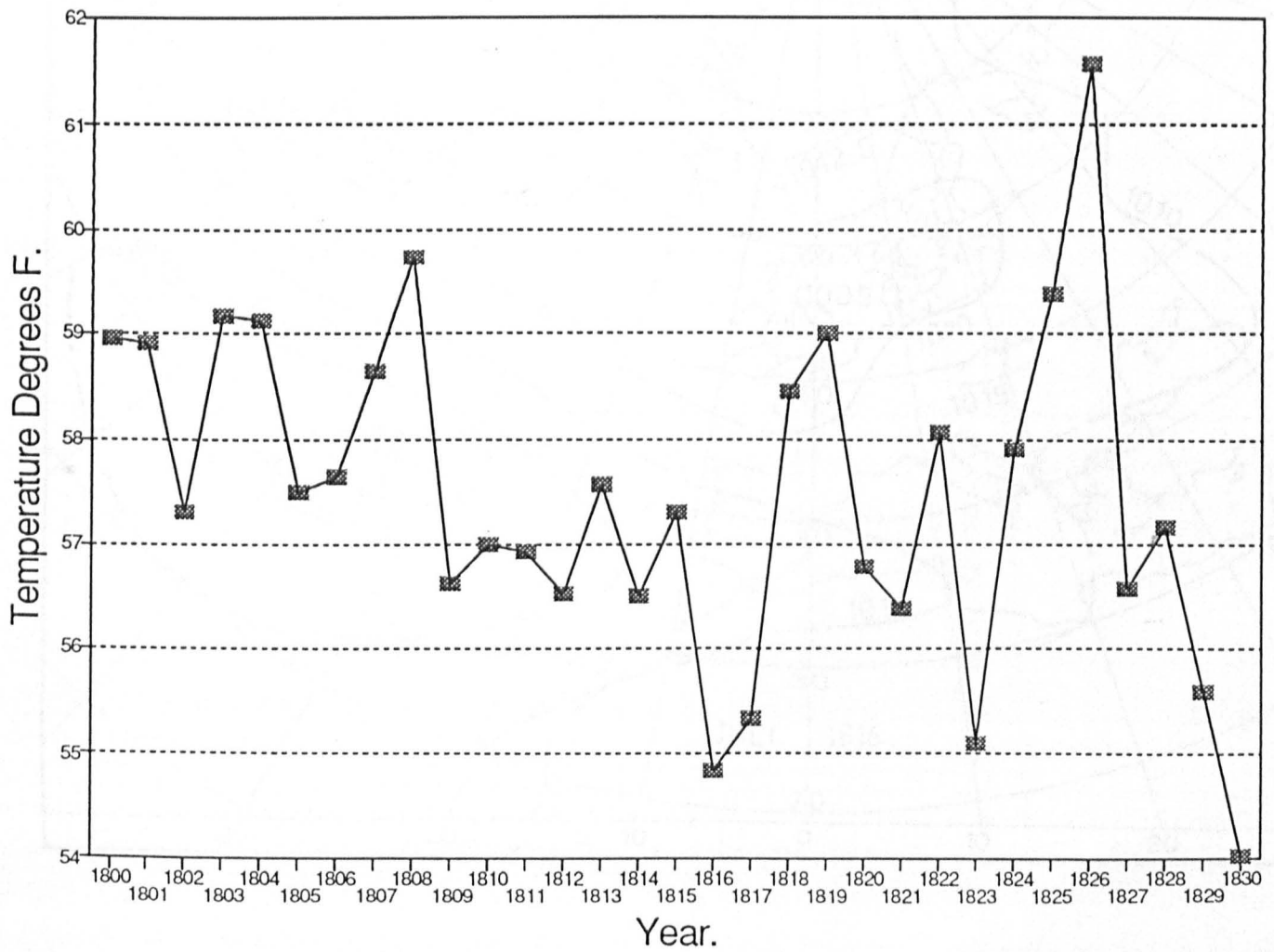


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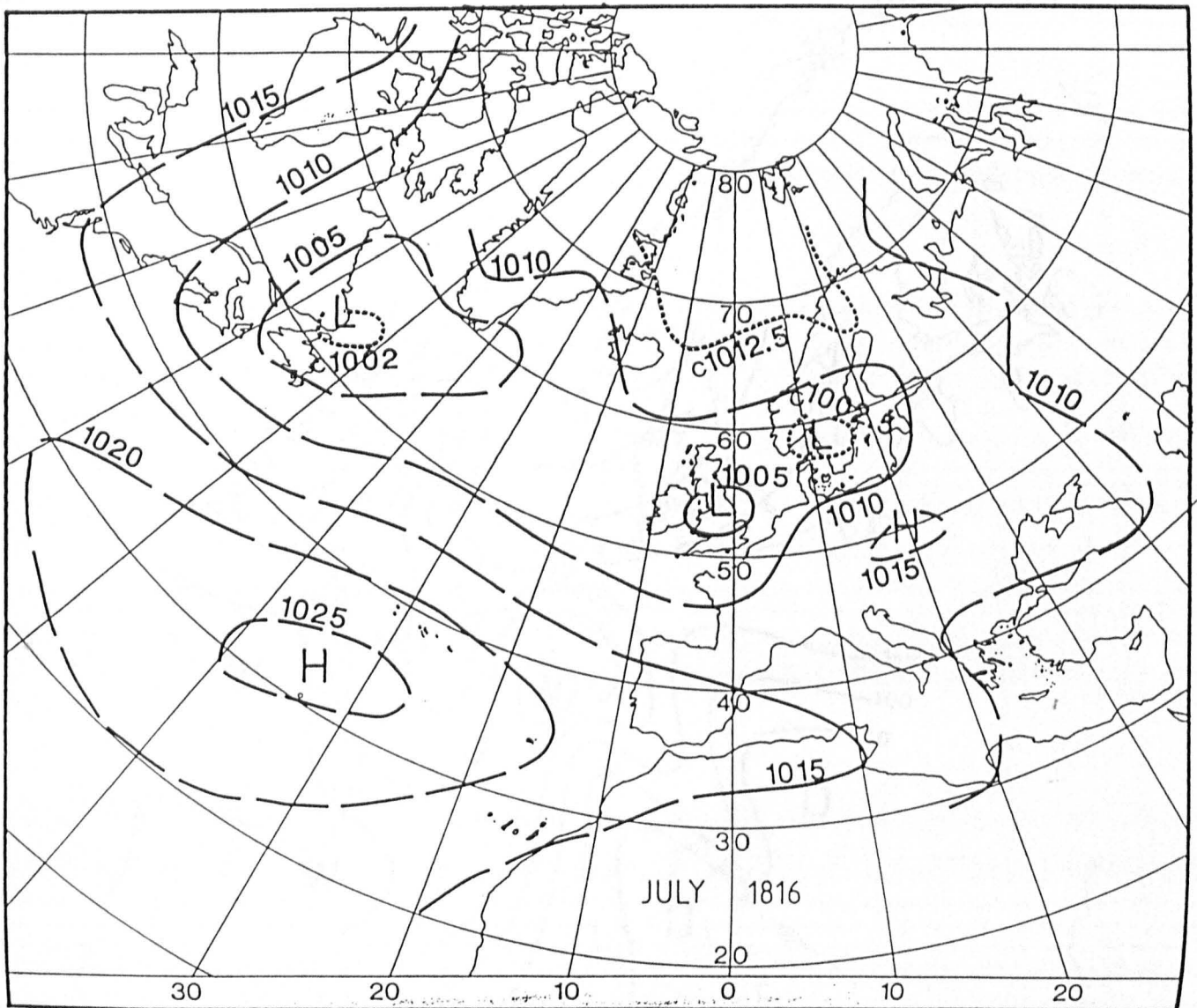


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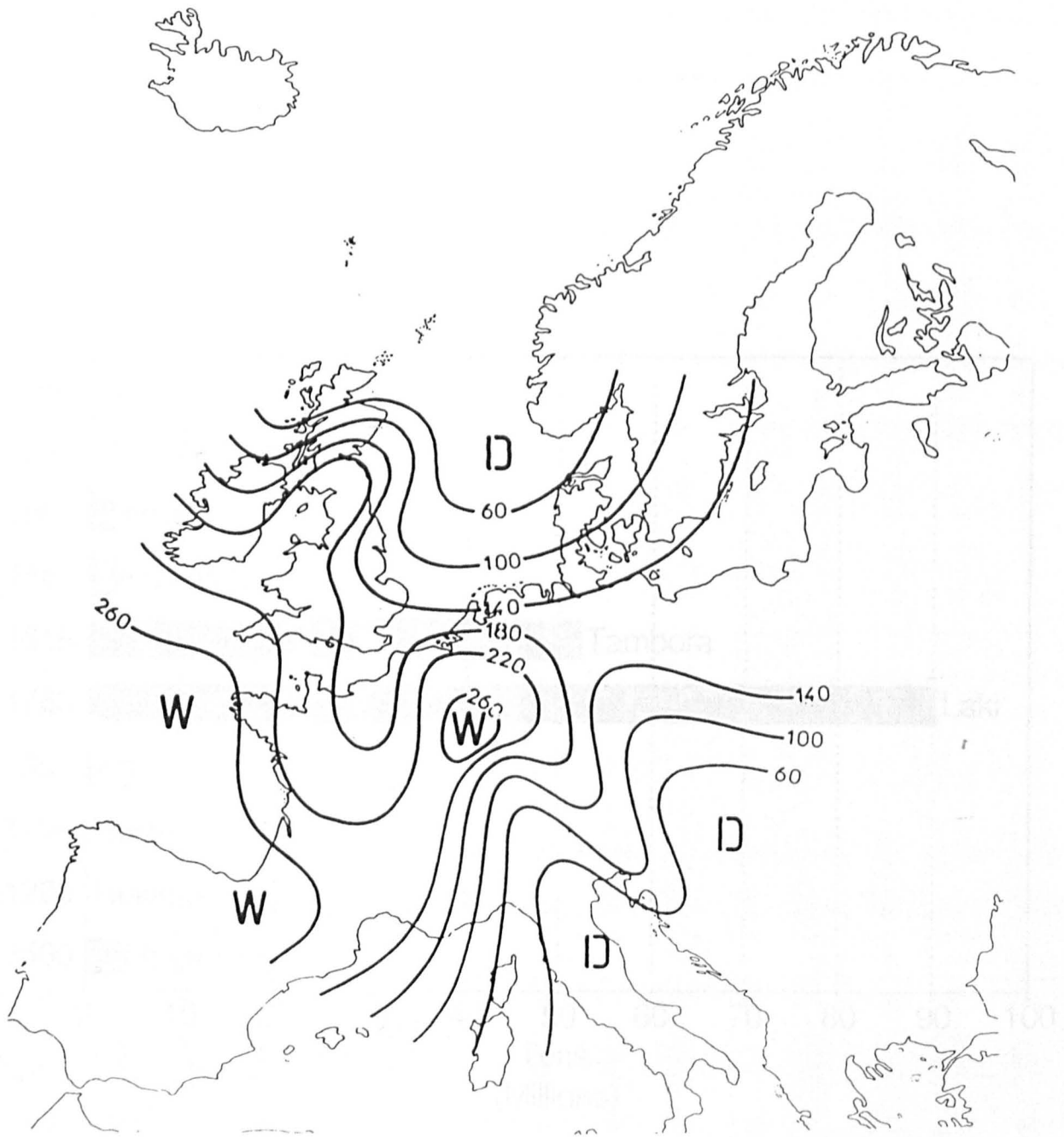


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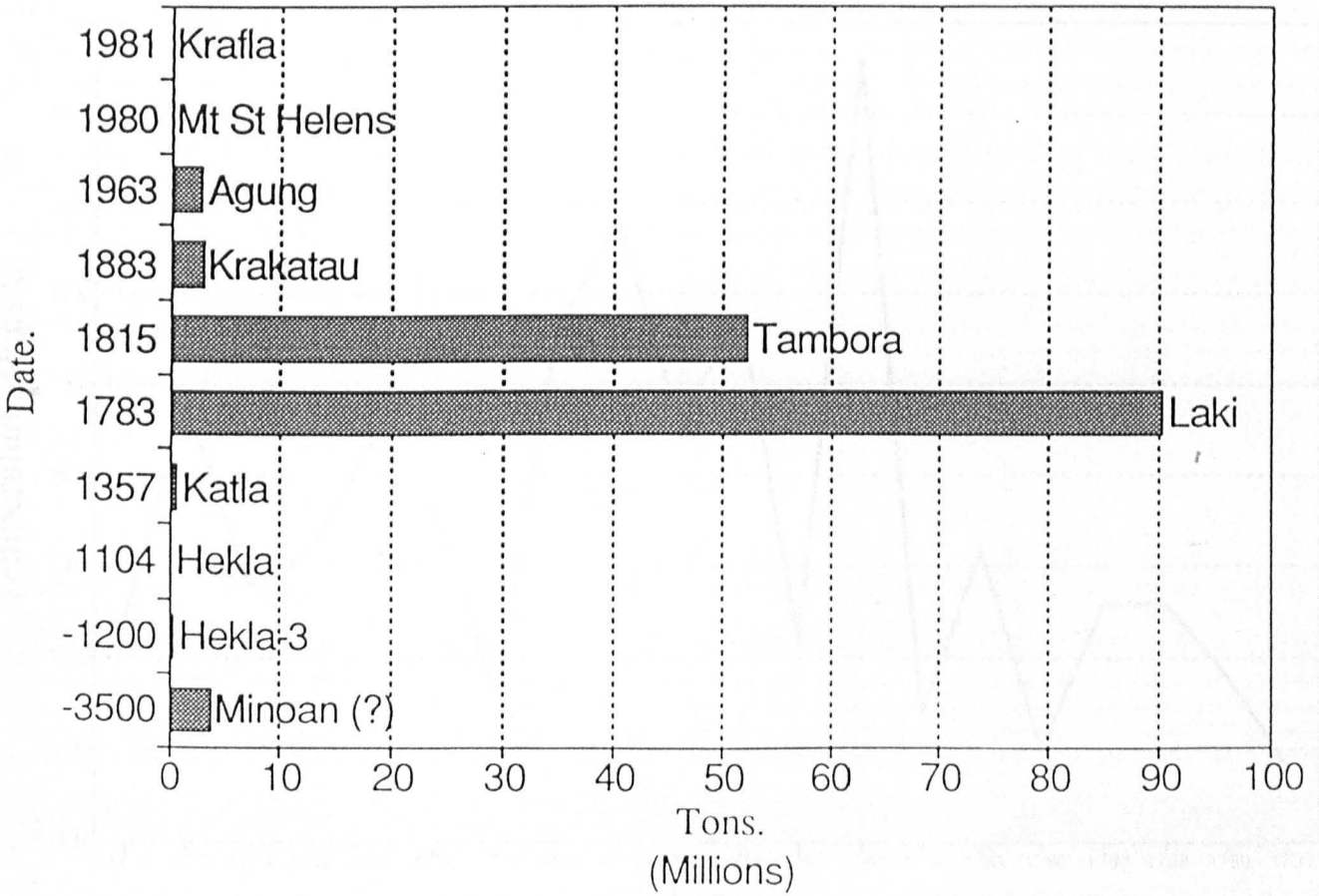


Figure 5.1. Acid volatile emission of selected volcanoes. [Data from Devine *et al.* 1984; & Sigurdsson *et al.* 1985].

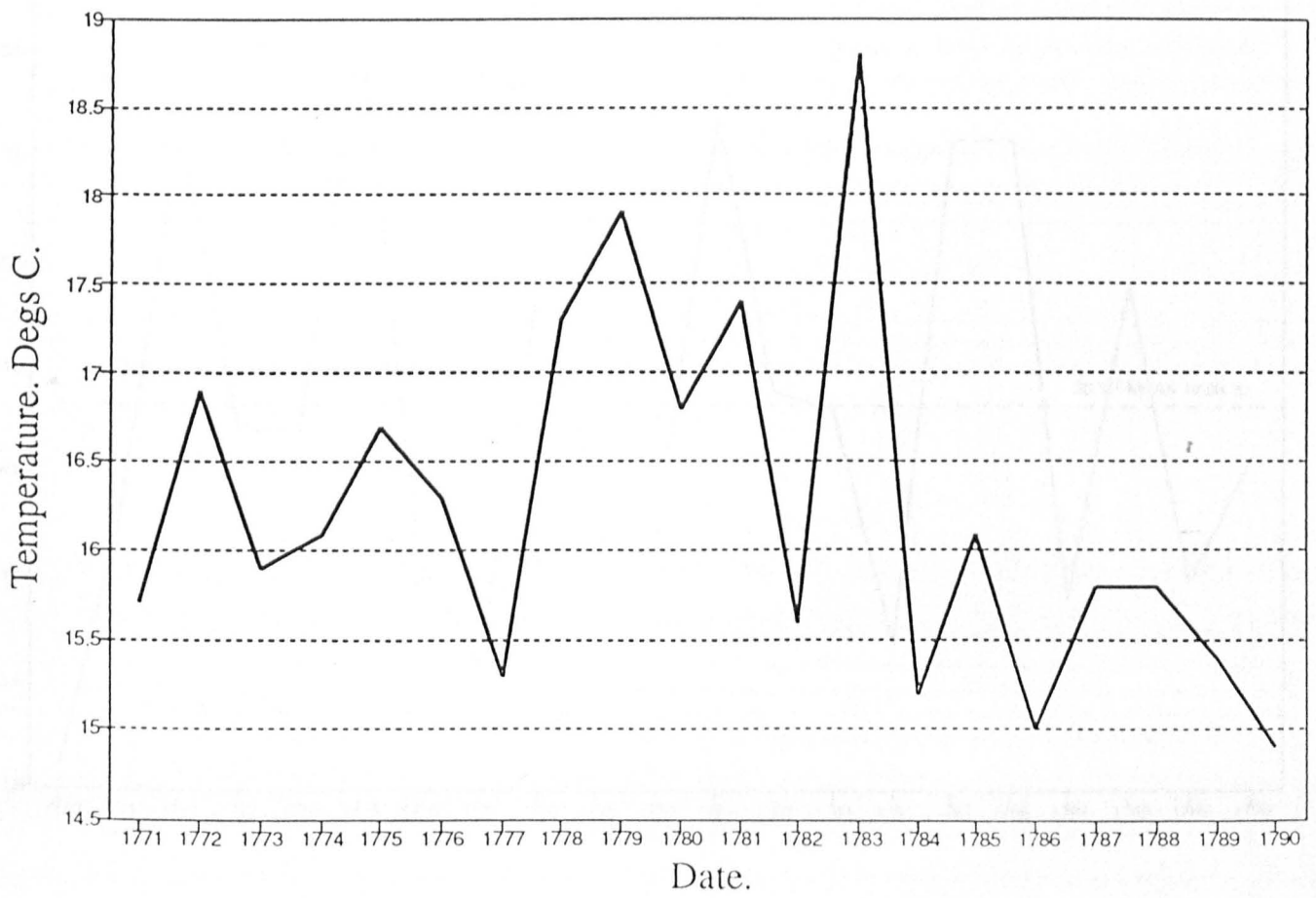


Figure 5.2. July temperatures in Central England 1770-1790.

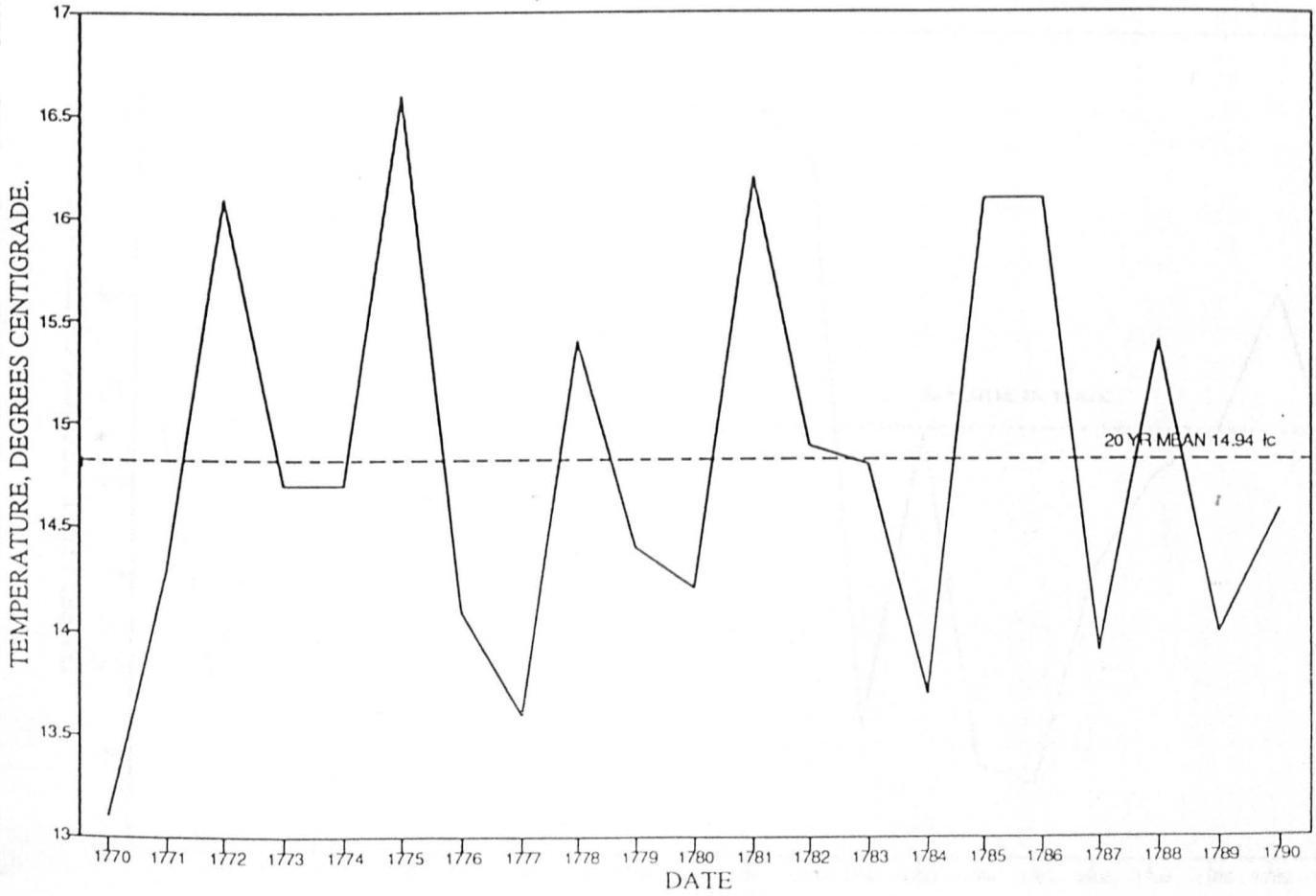


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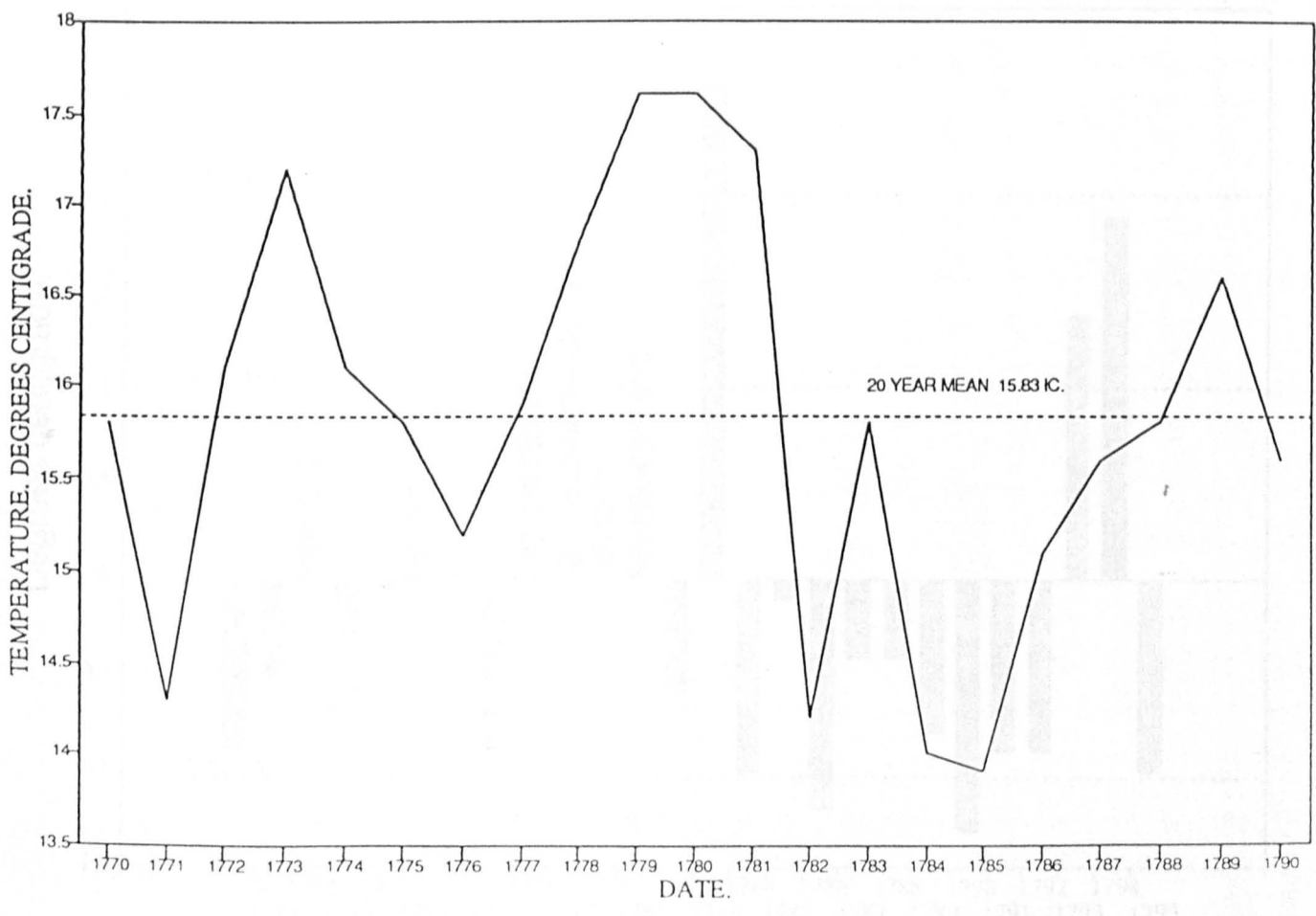


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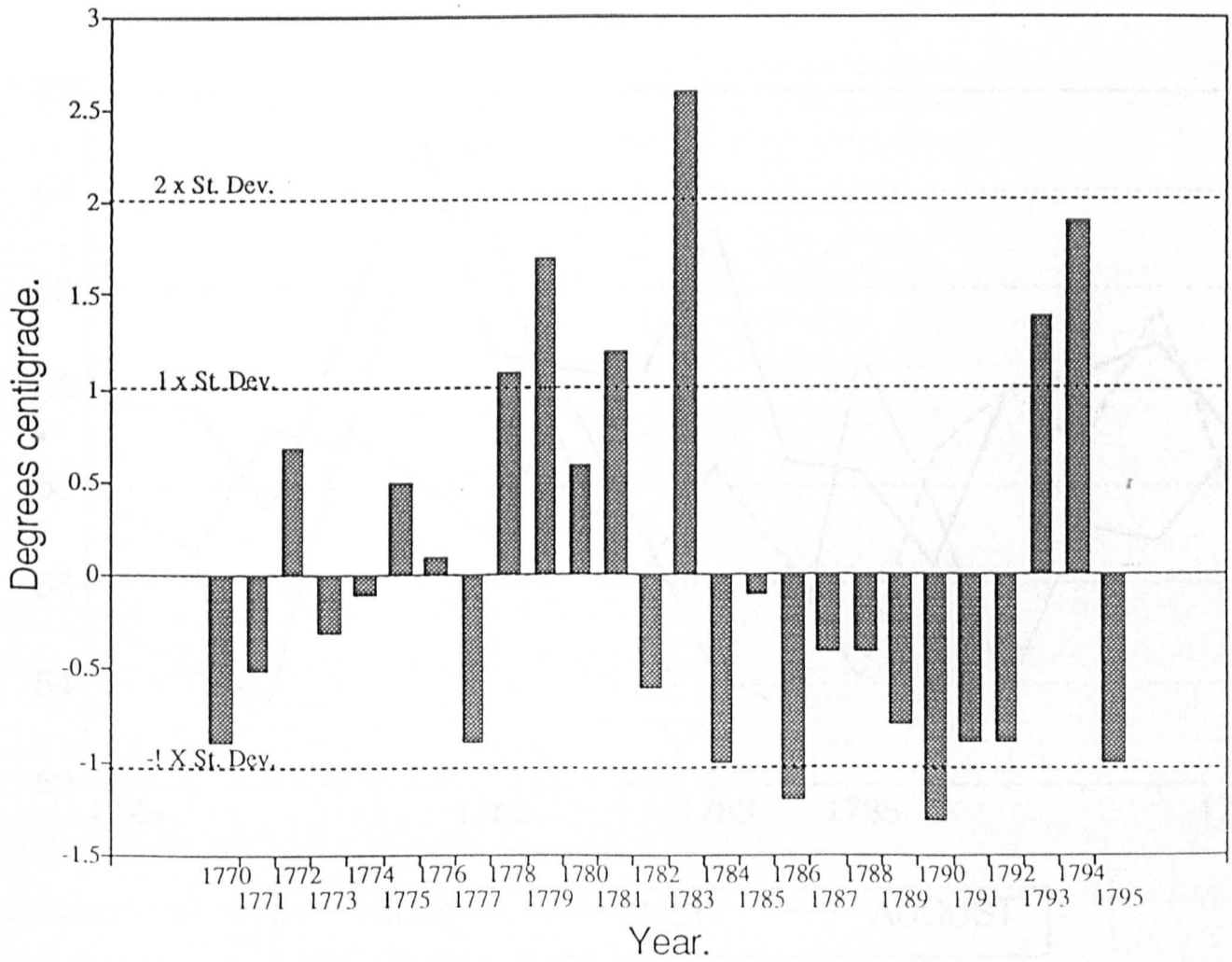


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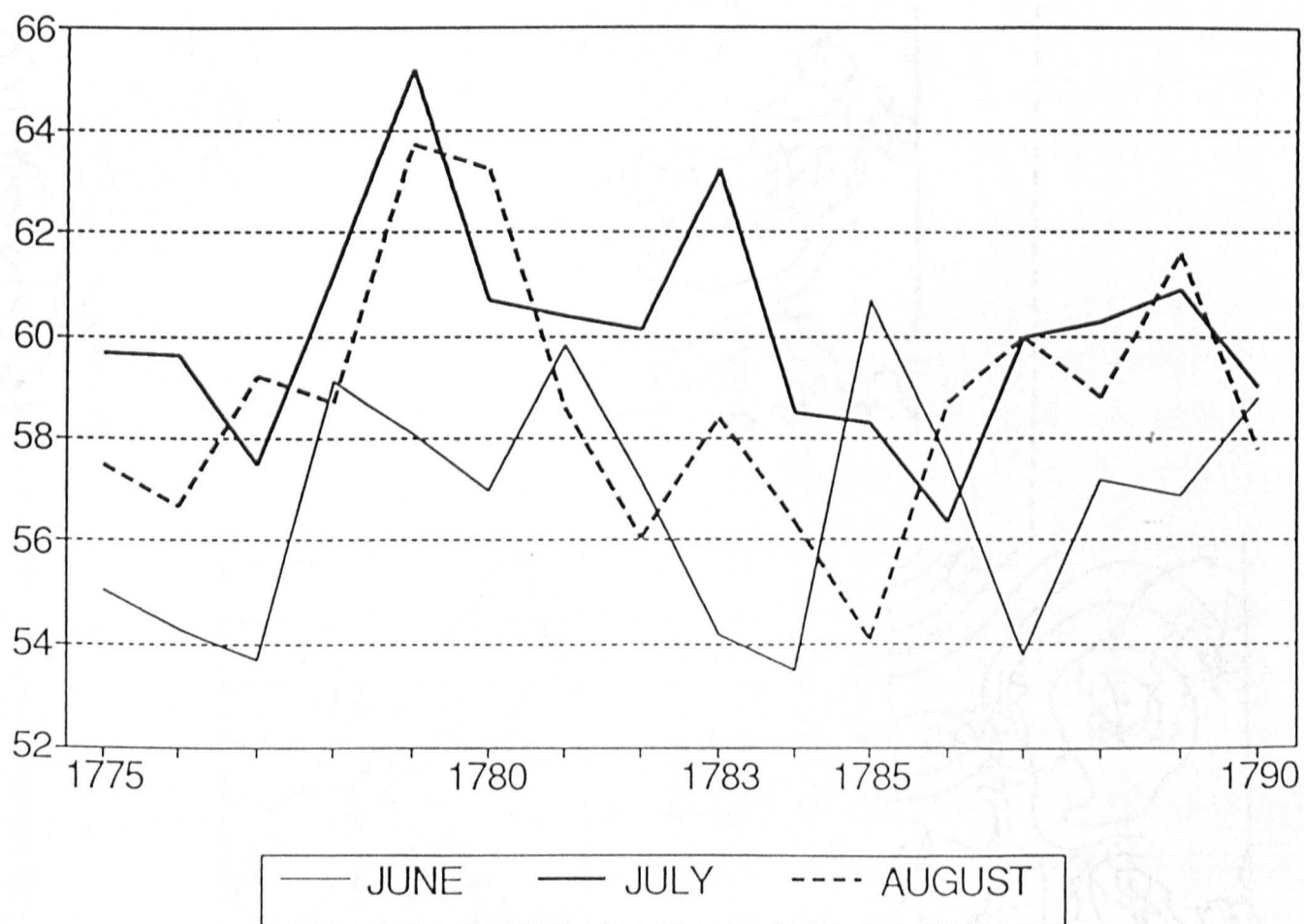


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Mean Temperature 13 June to 5 July 1783

Lydon Hall Meteorological Register

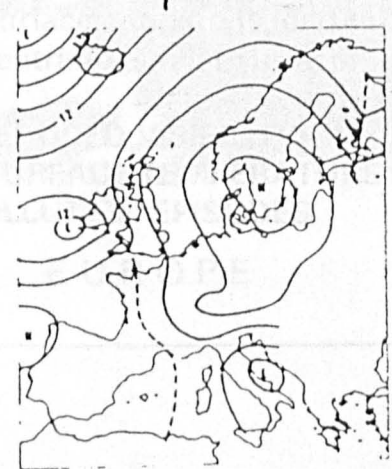
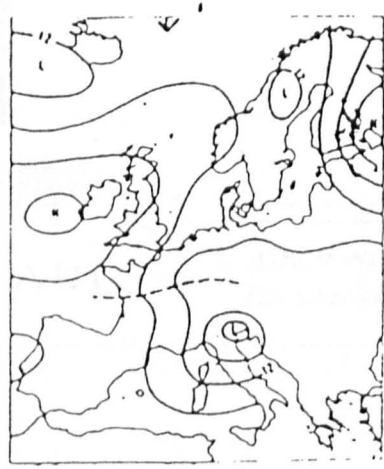
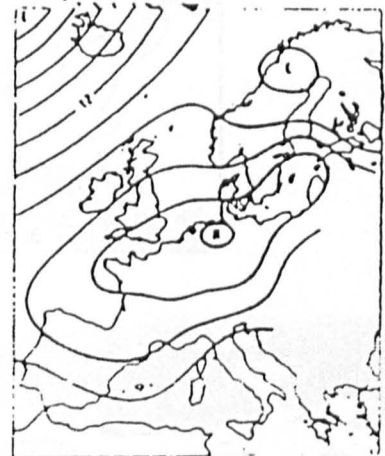
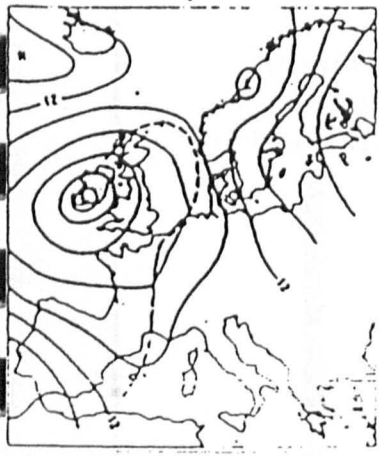
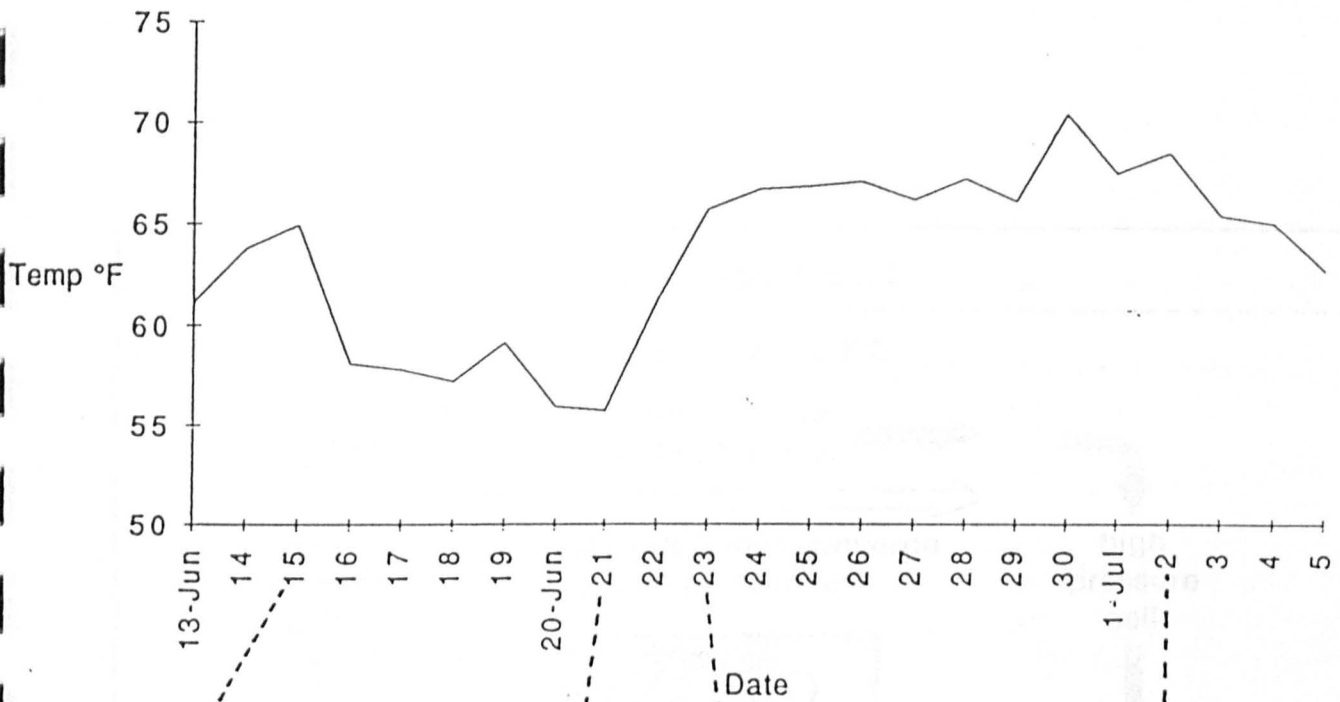


Figure 5.7. Synoptic maps and temperature records: June and July 1783.

Synoptic maps from Kington 1988; temperature from Barker 1783.

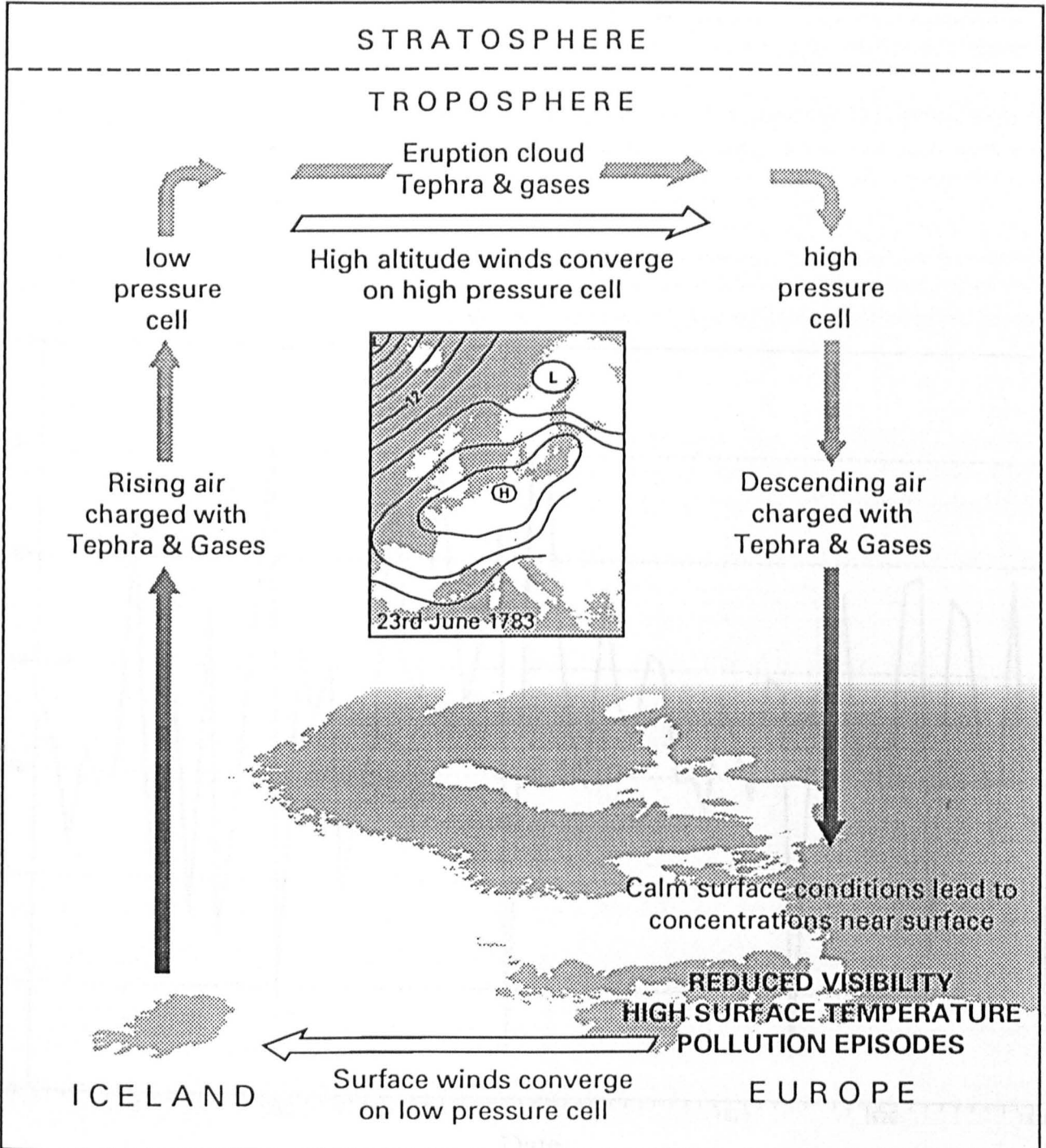


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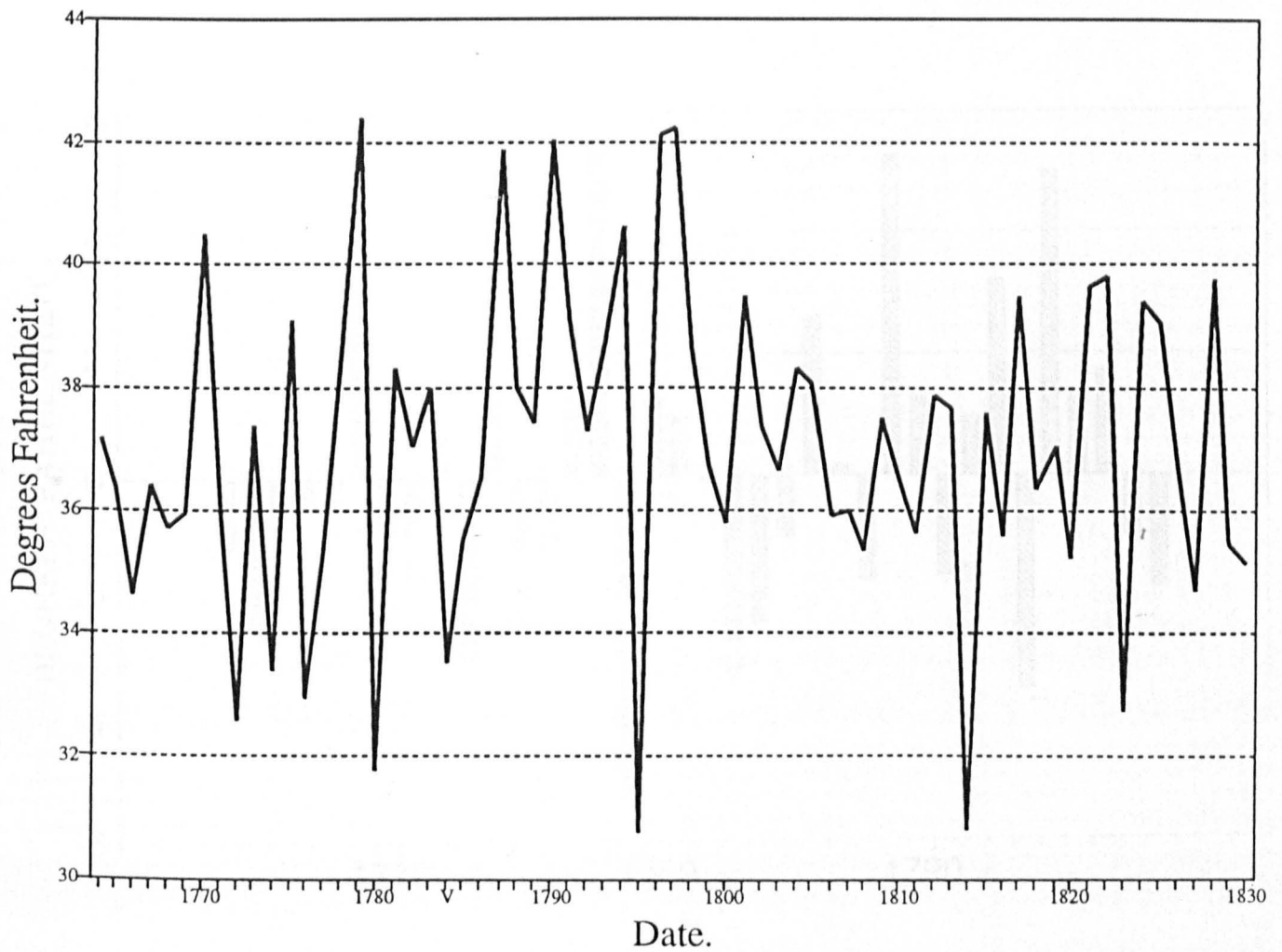


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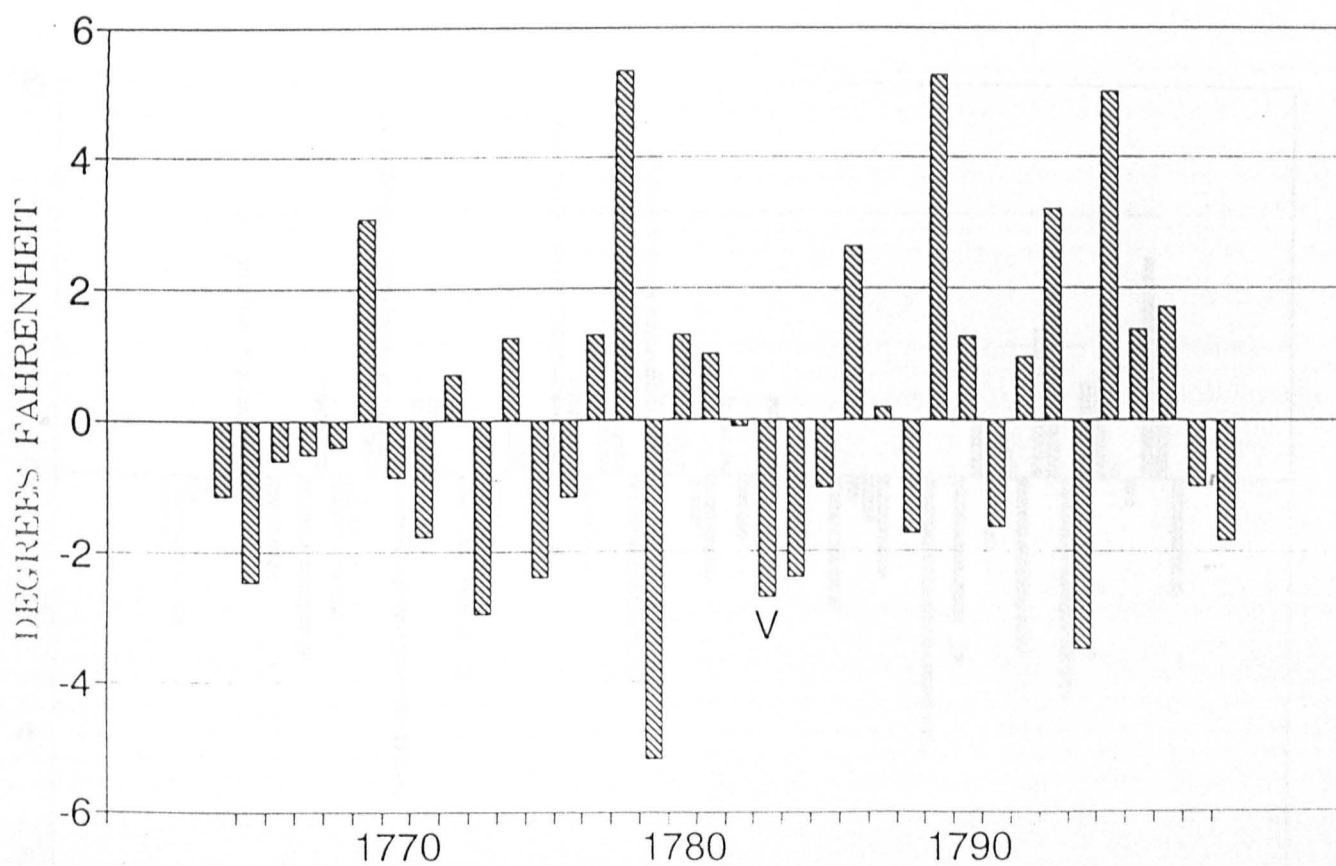


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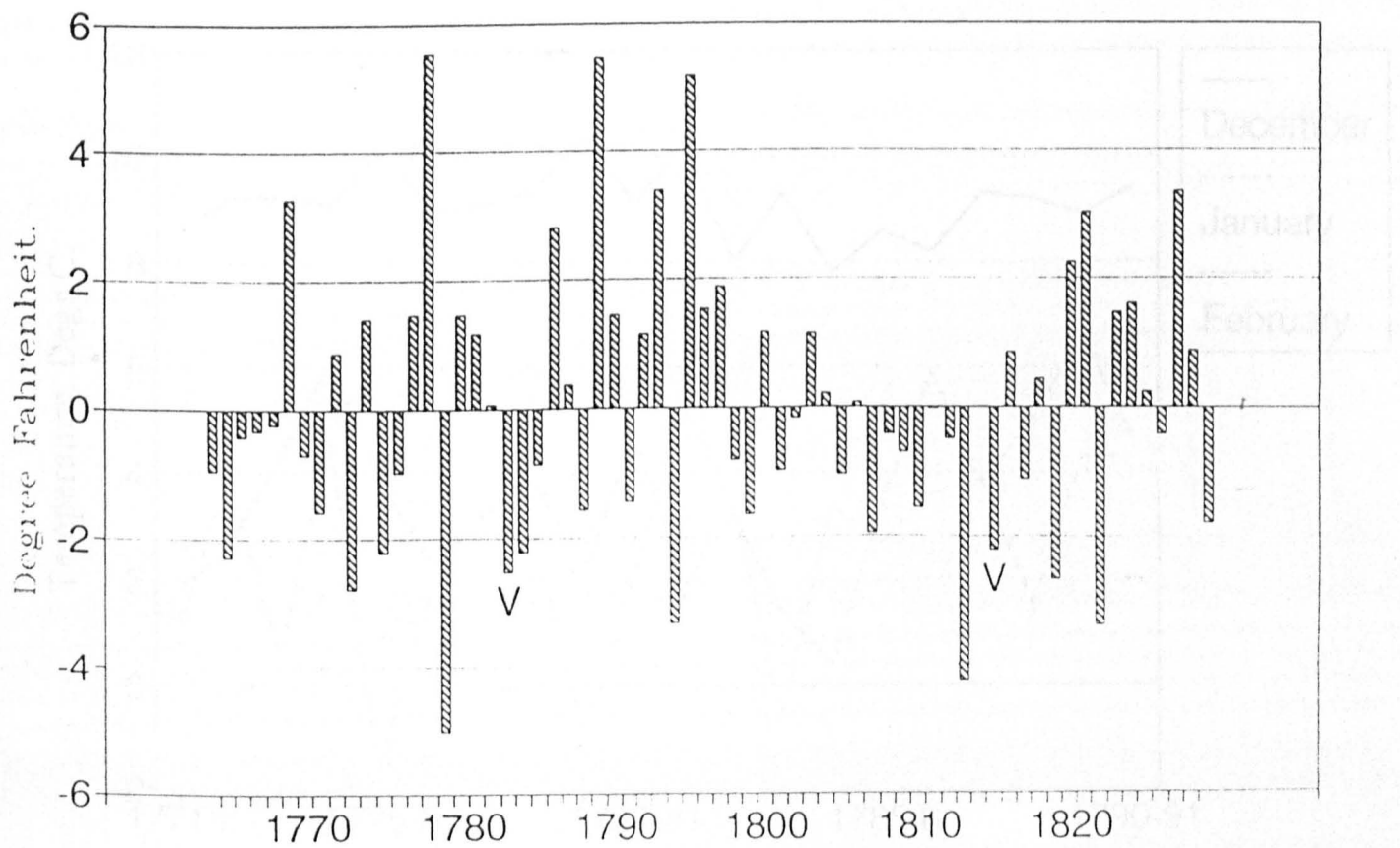


Figure 5.11. Variation of Edinburgh winter temperatures from the Sixty-six year mean,

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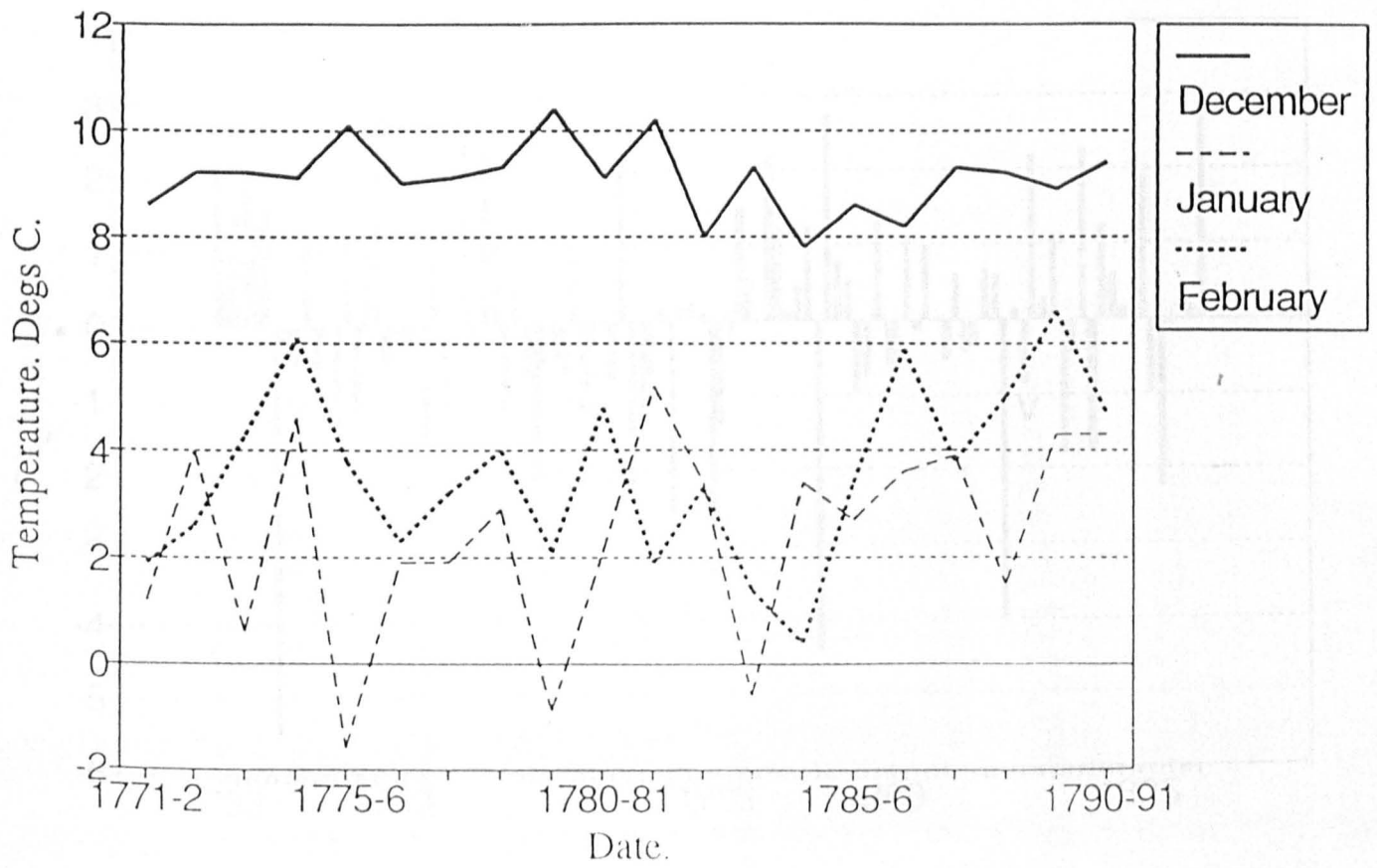


Figure 5.12. Winter temperatures in Central England, 1771-1791.

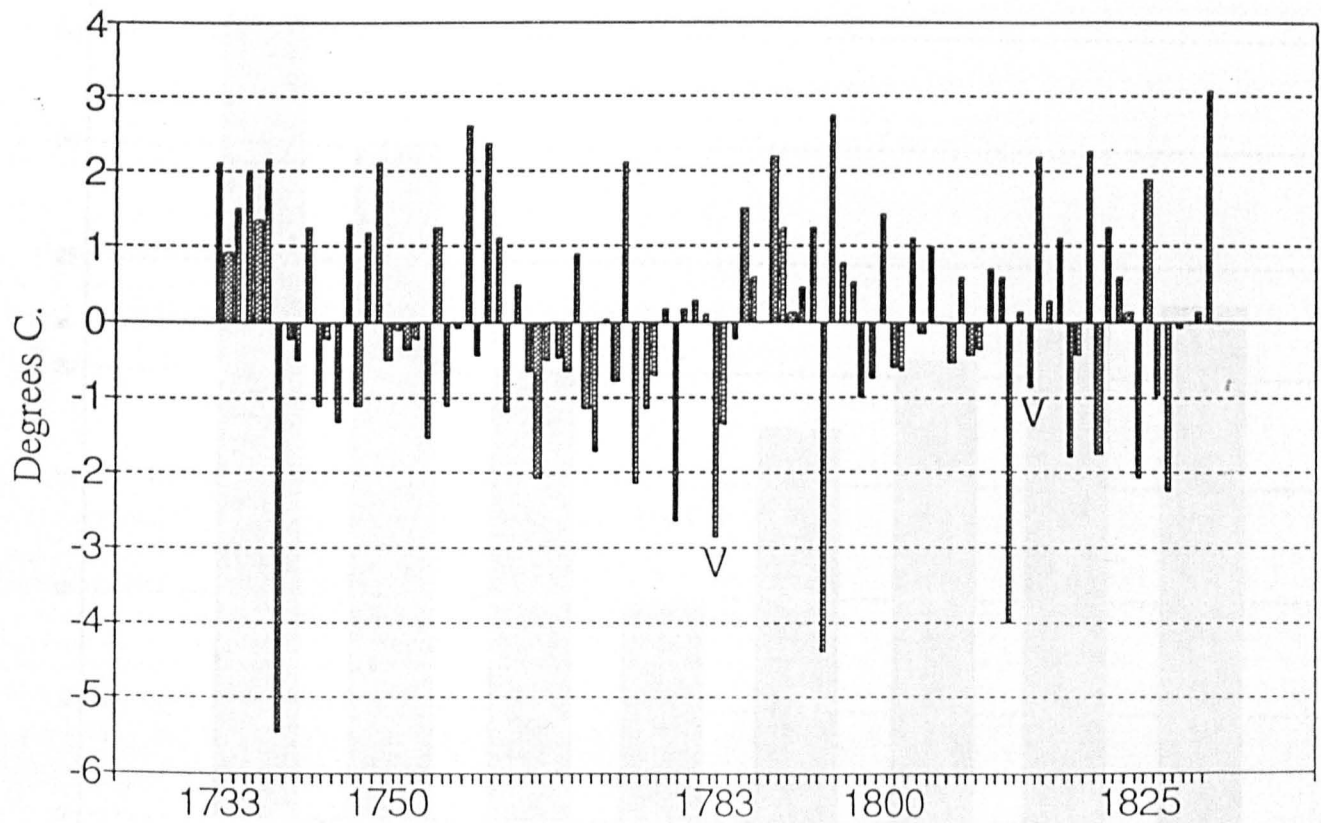


Figure 5.13. Variation of winter temperatures from the (1733-1833) 100 year mean.

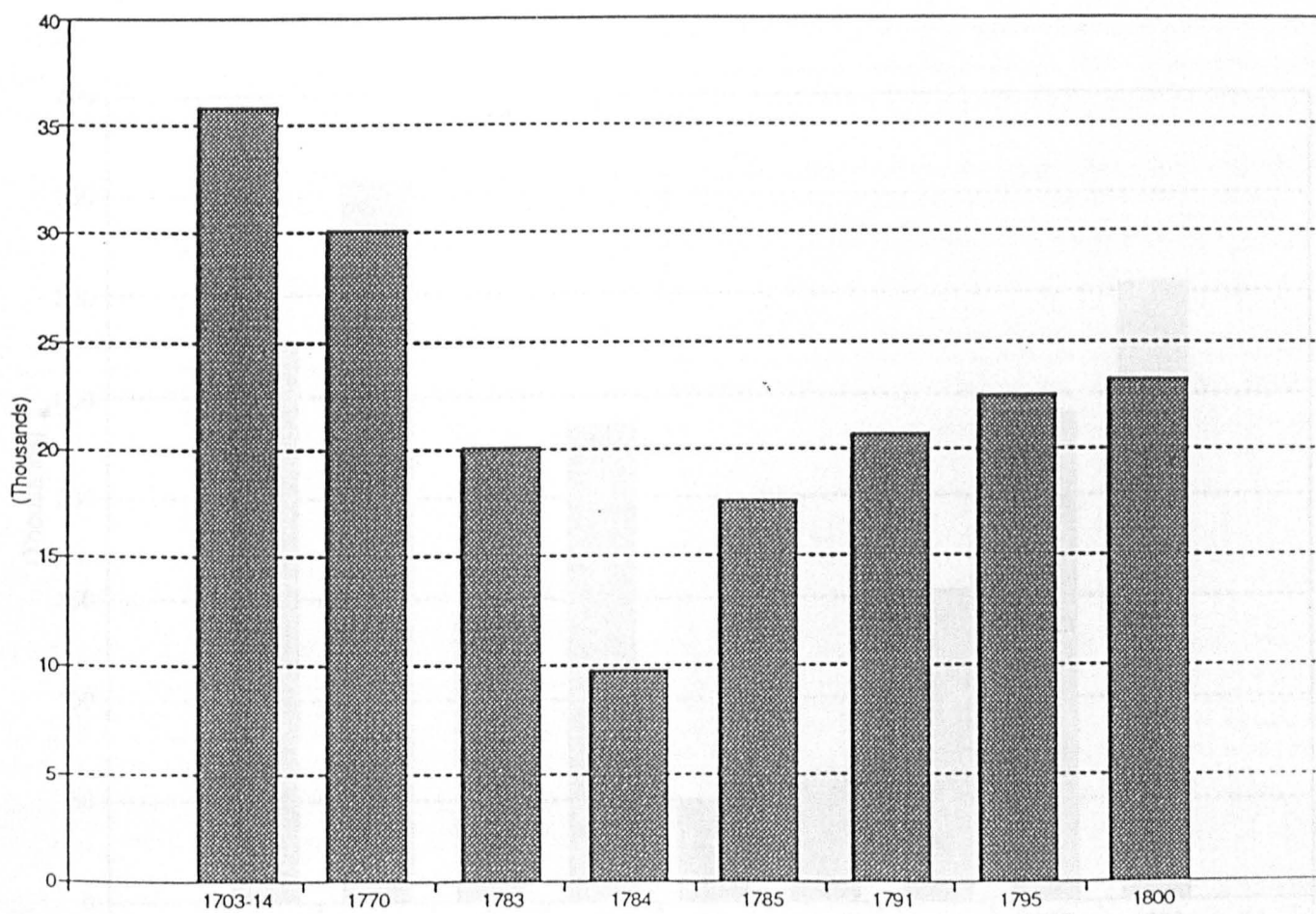


Figure 6.1. Cattle mortality in Iceland. Data from Gerrard [1991]

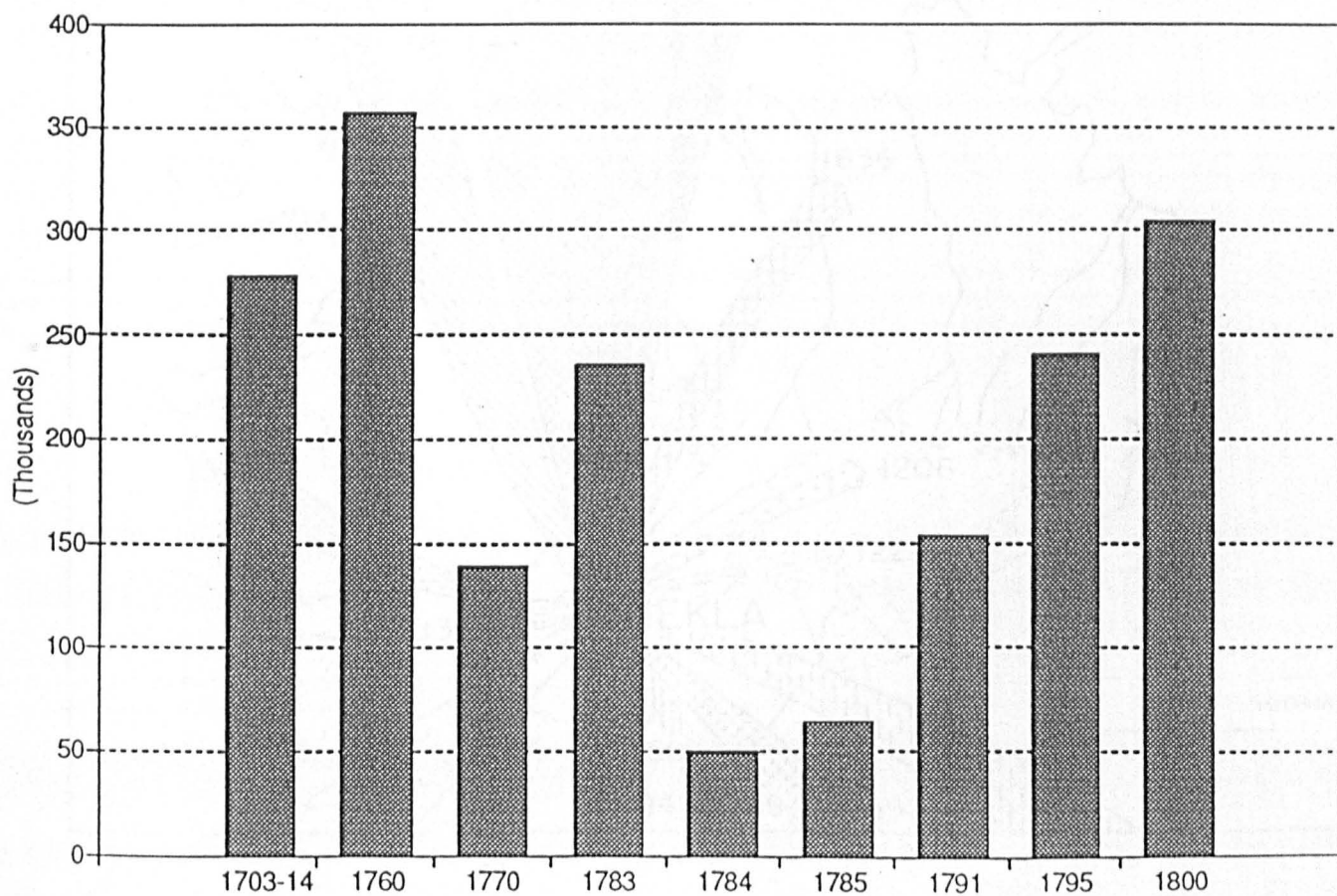


Figure 6.2. Sheep mortality in Iceland. Data from Gerrard [1991]

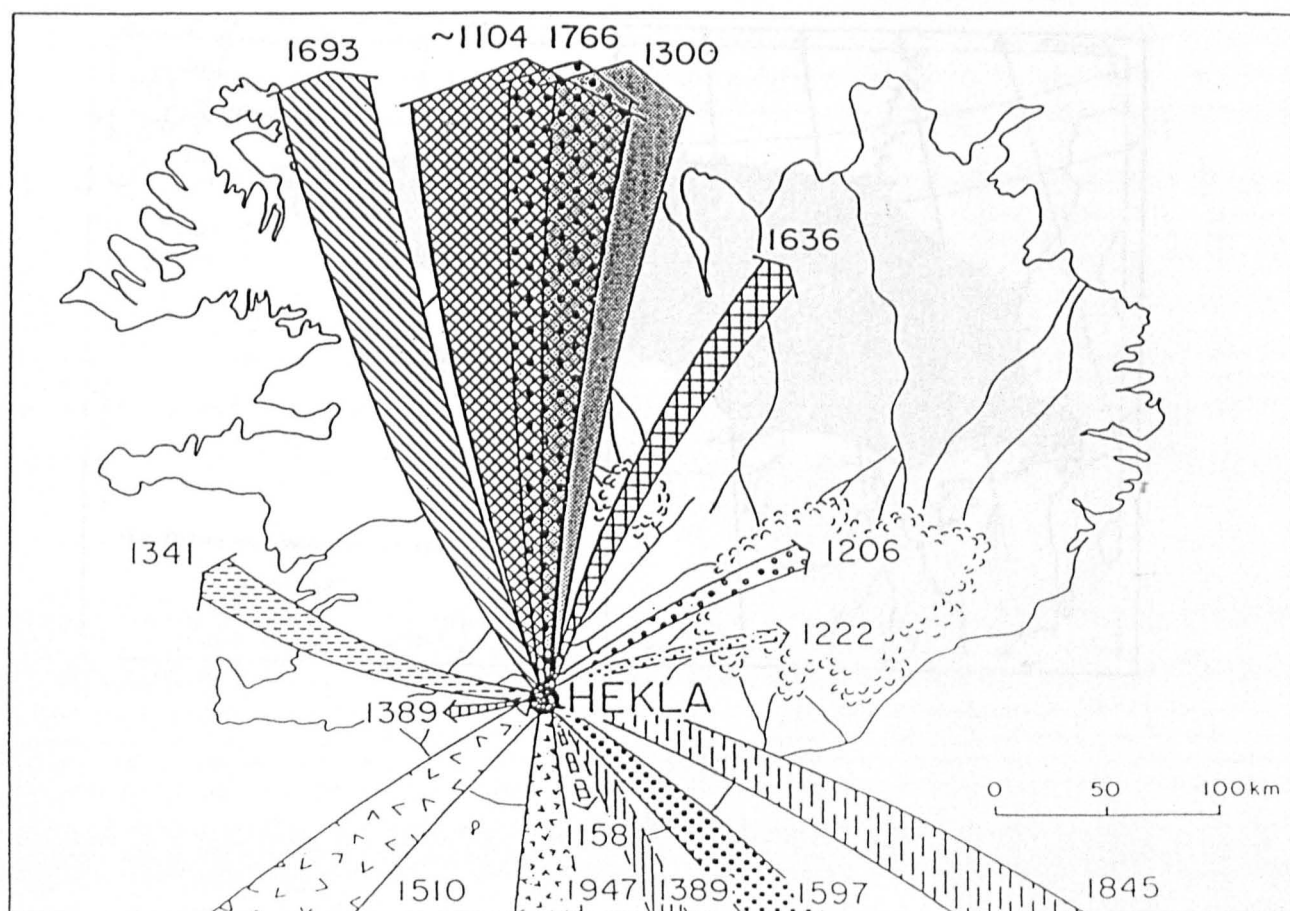


Figure 6.3. Transport of volcanic material from Iceland. From Thórarinnsson [1967].



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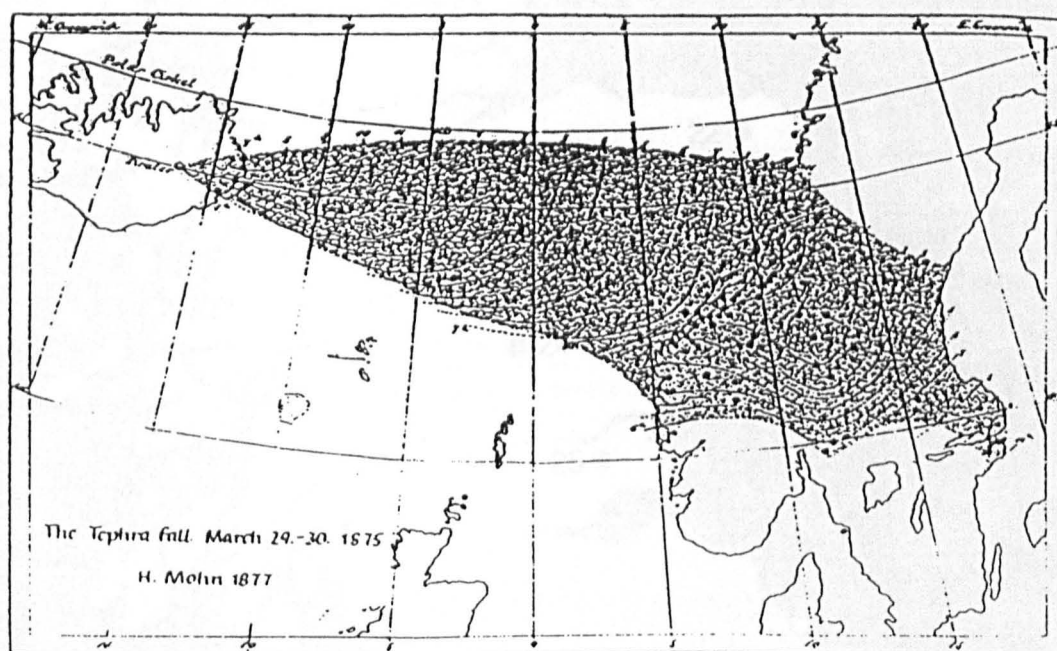


Figure 6.4b. Ash fall from the Askja eruption 1875. From Persson [1971].

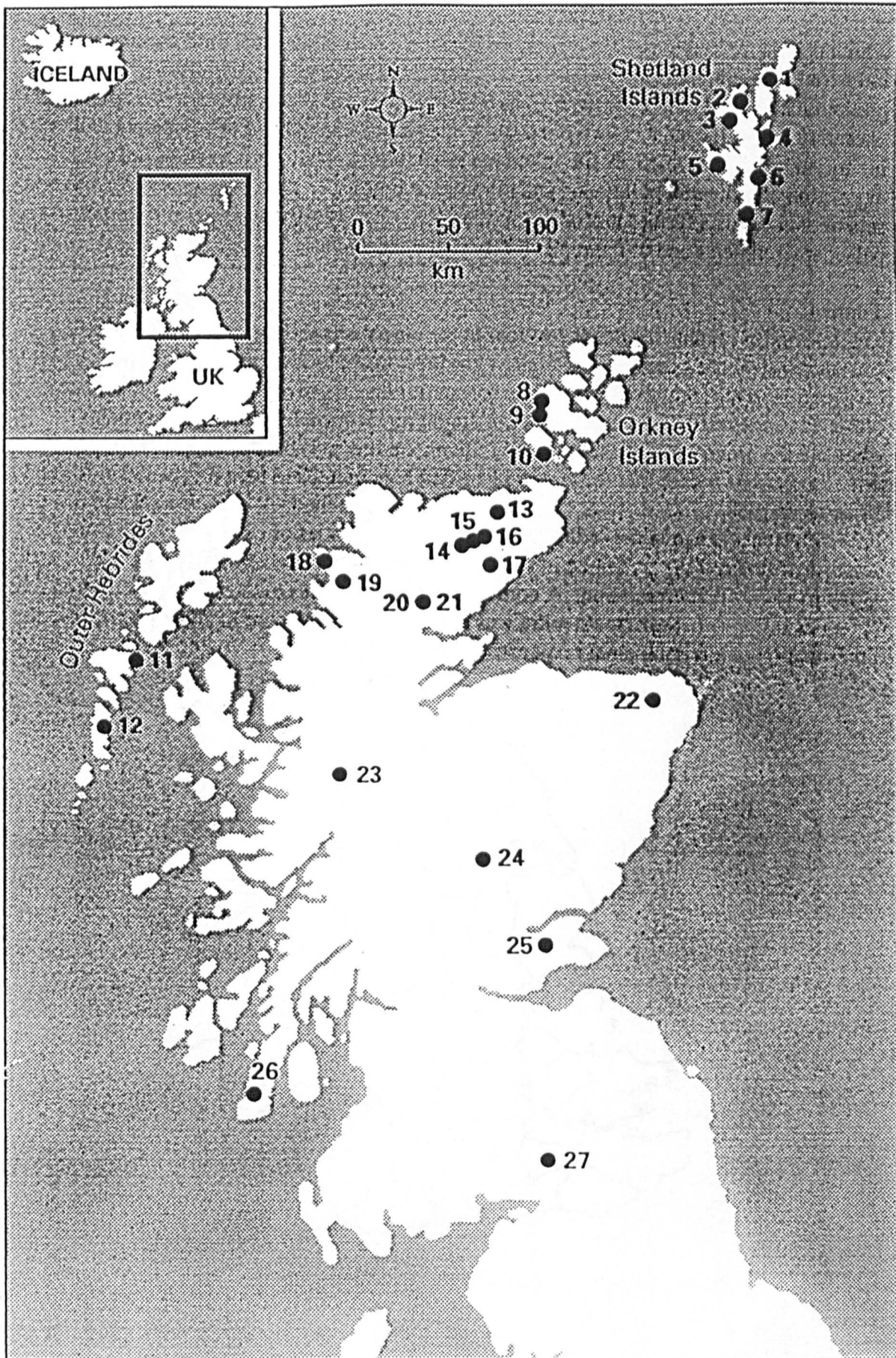


Figure 6.5. Tephra fall locations in Britain. Various sources.



Figure 6.6. Locations Mentioned in the text.

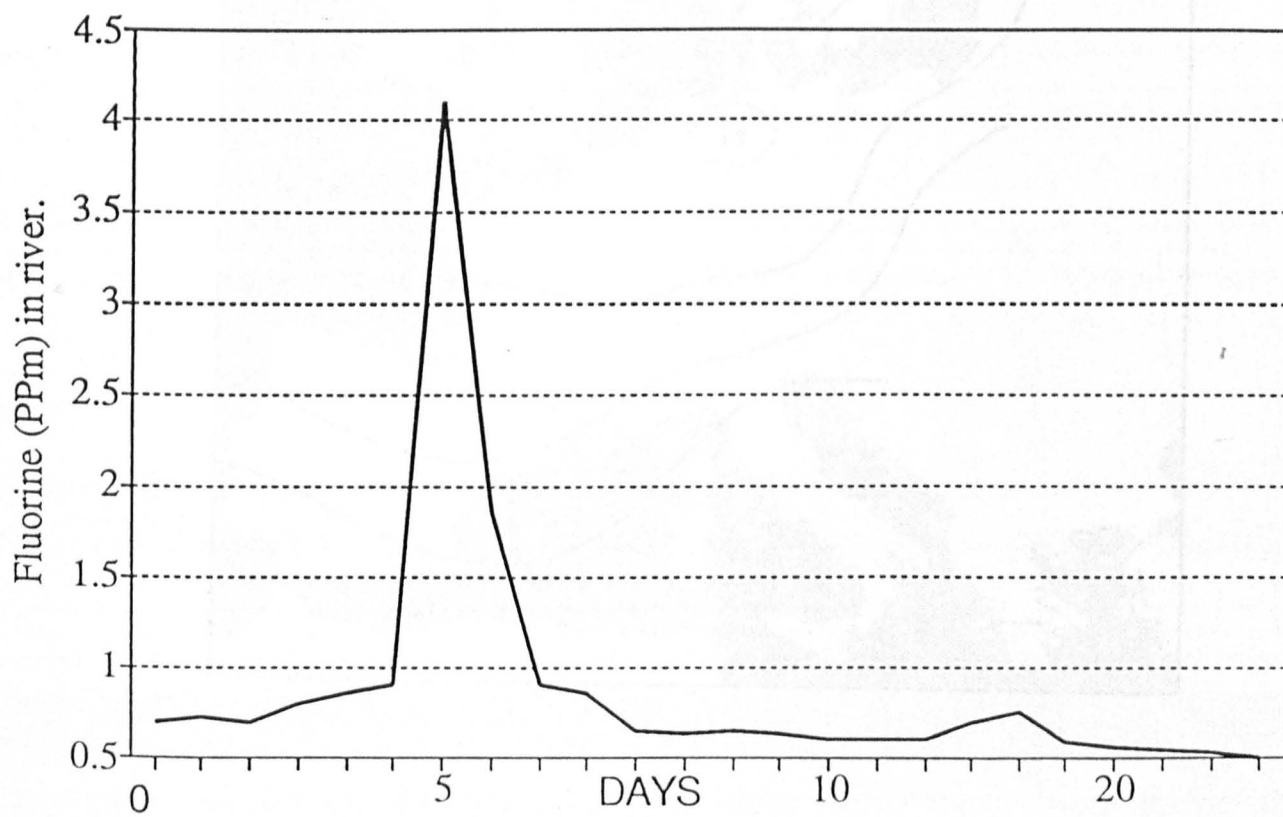


Figure 6.7 Fluorine concentrations in the River Ytri-Raga following the 1991 eruption of Hekla.

Data from Gudmundsson *et al.* [1992].

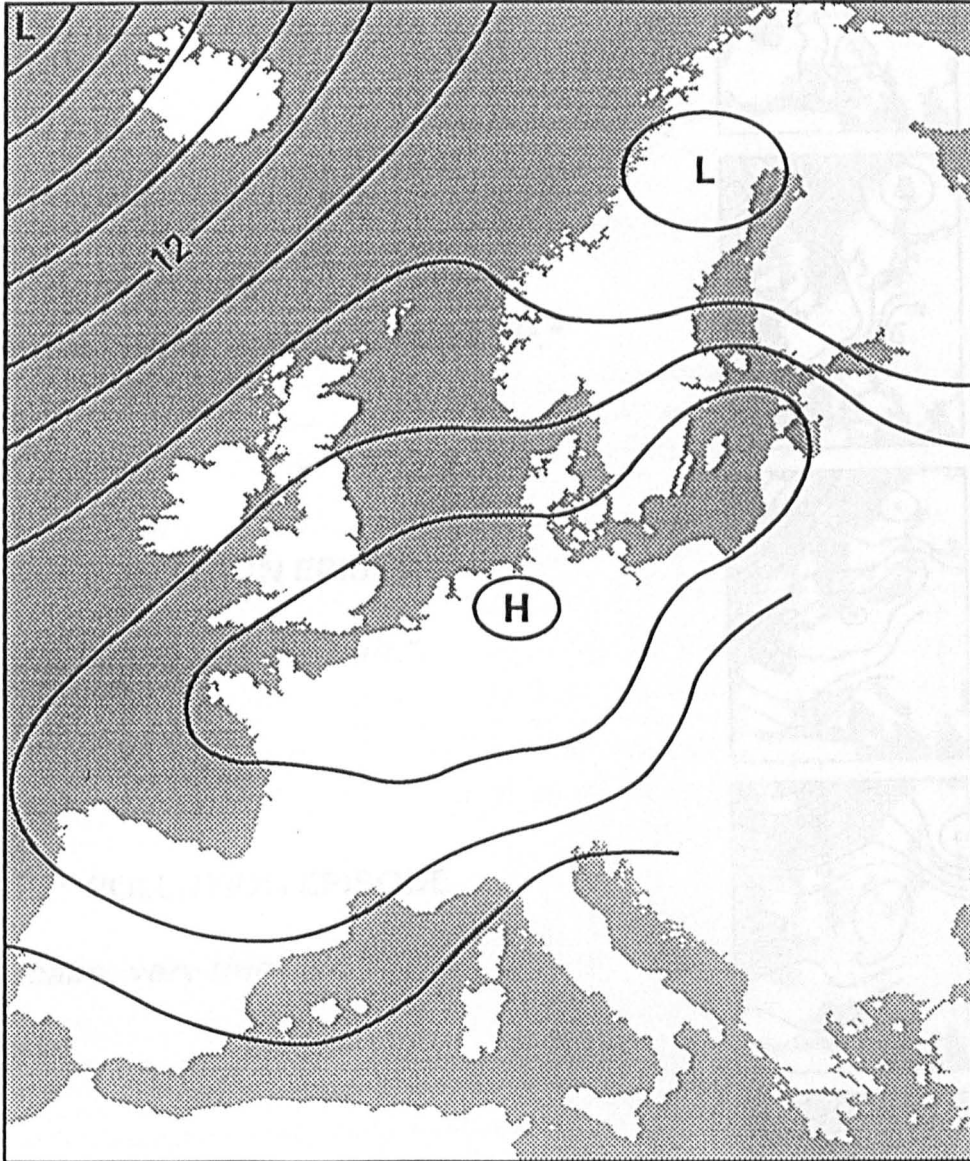


Figure 6.8. Synoptic map June 23rd 1783. From Kington [1988].

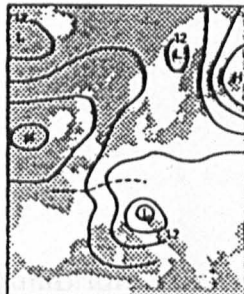
June 20th :

"Chiefly cloudy, calm and sometimes wetting."



June 21st :

"Cloudy and calm, thick moist air."



June 22nd :

"Hot, some sunshine, calm and thick air."



June 23rd : **POLLUTION EPISODE**

"Hot, calm. Sunny and thick air."



June 24th : **POLLUTION EPISODE**

"Sunny, calm, very thick air."



June 25th : **POLLUTION EPISODE**

"Hot, calm, very thick smokey air."

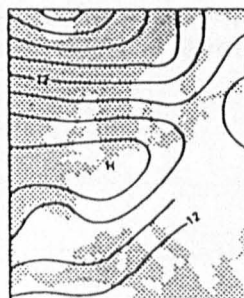


Figure 6.9. The association between atmospheric circulation and volcanic pollution.

Weather Observations From Barker 1783. Synoptic maps from Kington 1988.

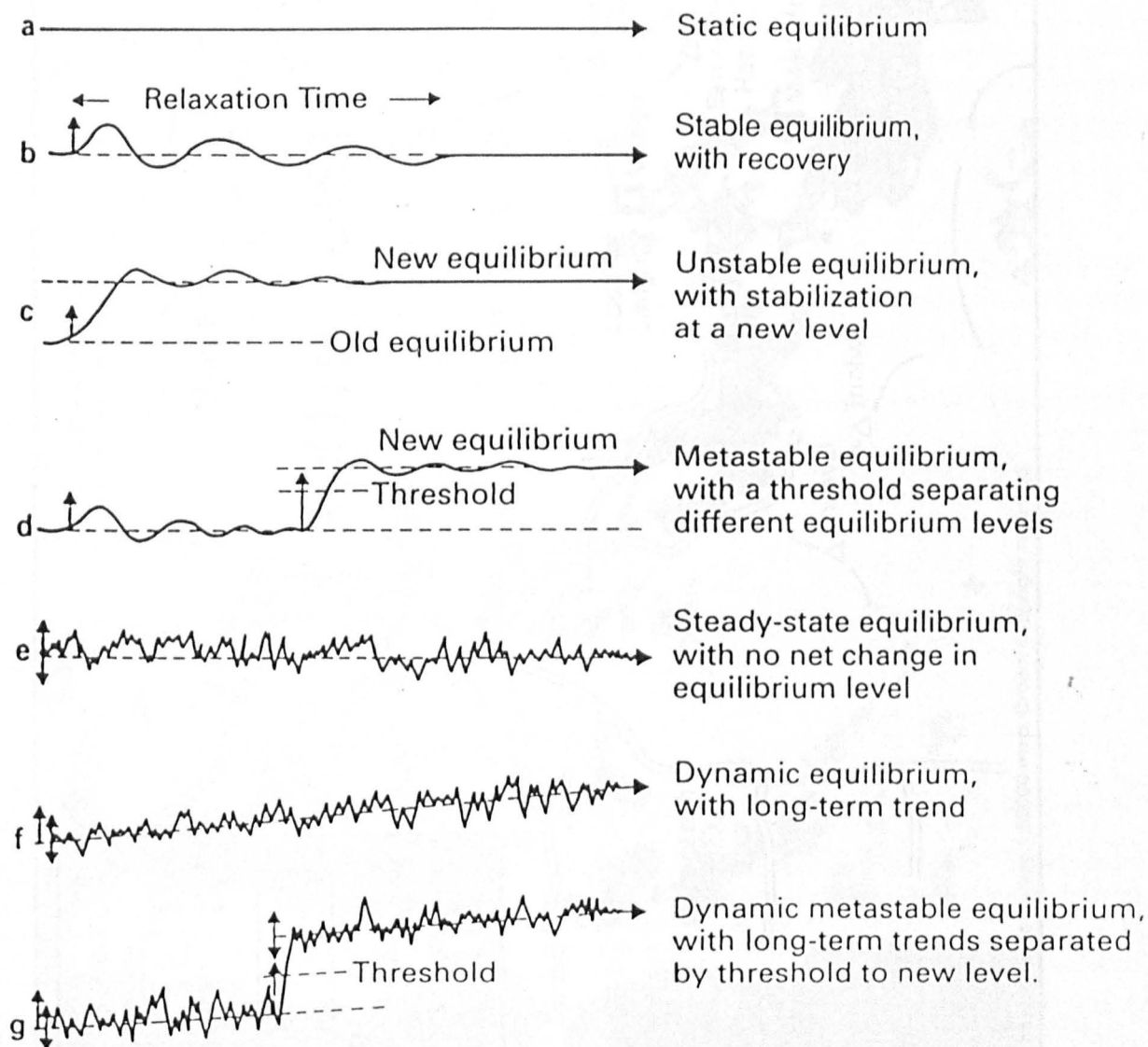
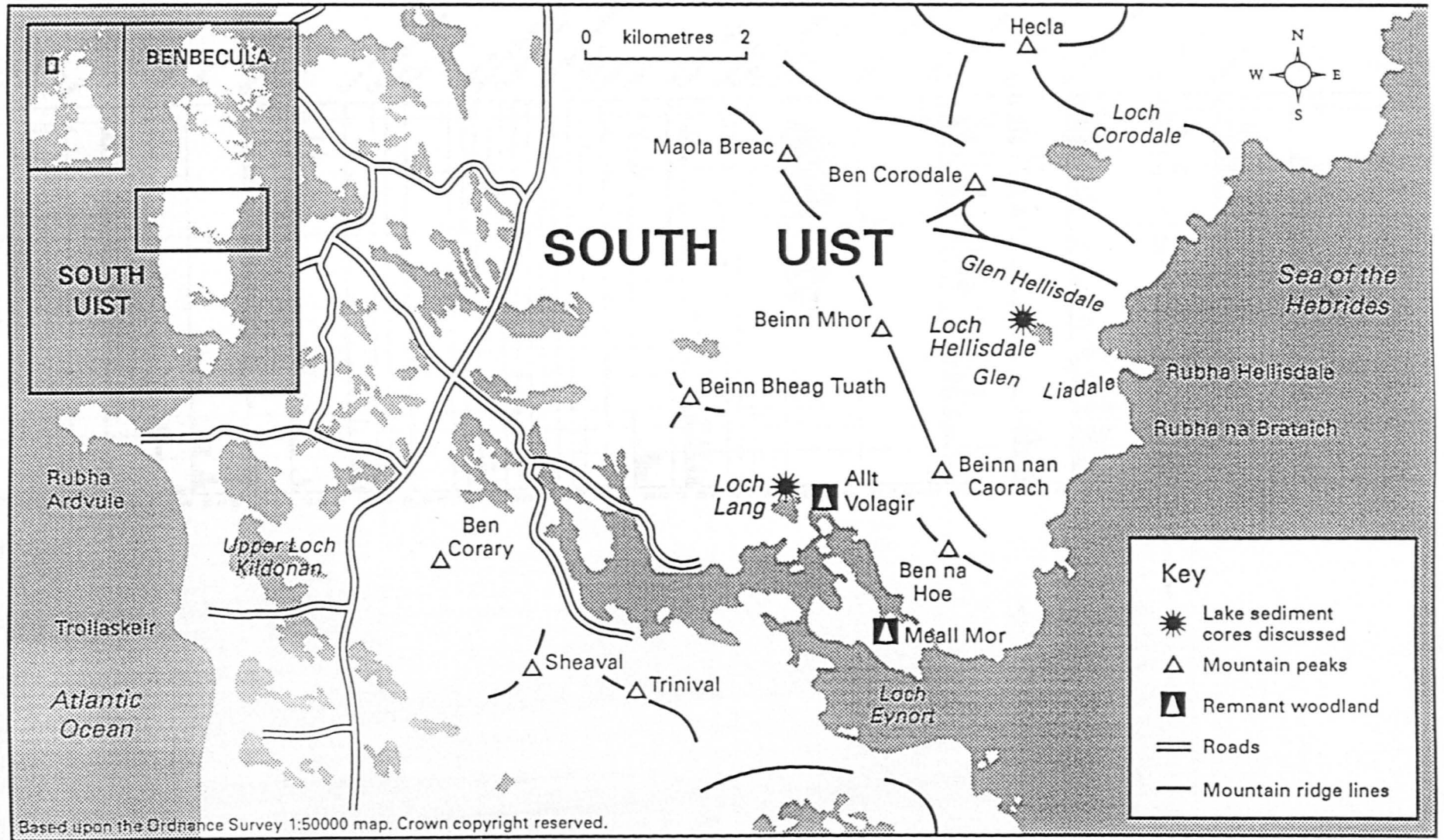
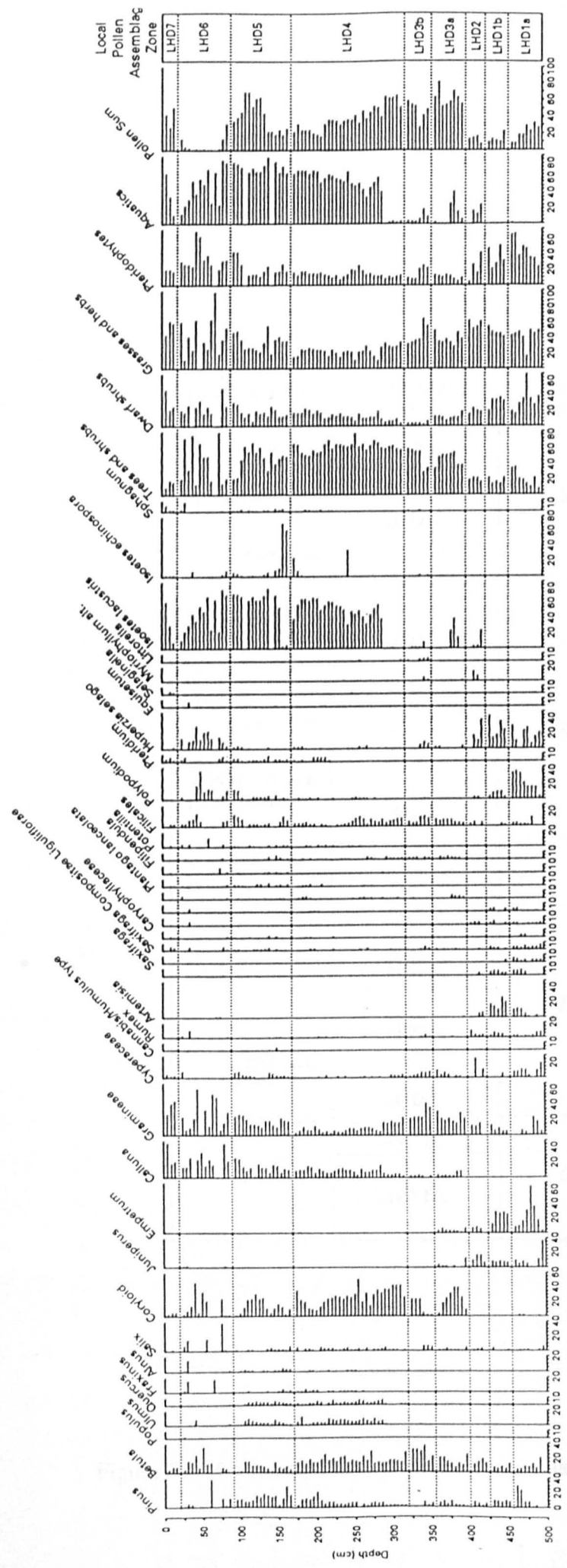


Figure 7.1. Theoretical framework for the interpretation of EDMA results. After Butzer [1982].

Figure 7.2. Location map. Loch Hellisdale.





Loch Hellisdale

Figure 7.3. Palynology of the Loch Hellisdale. After Brayshay [1992] and Kent *et al.* [in press].

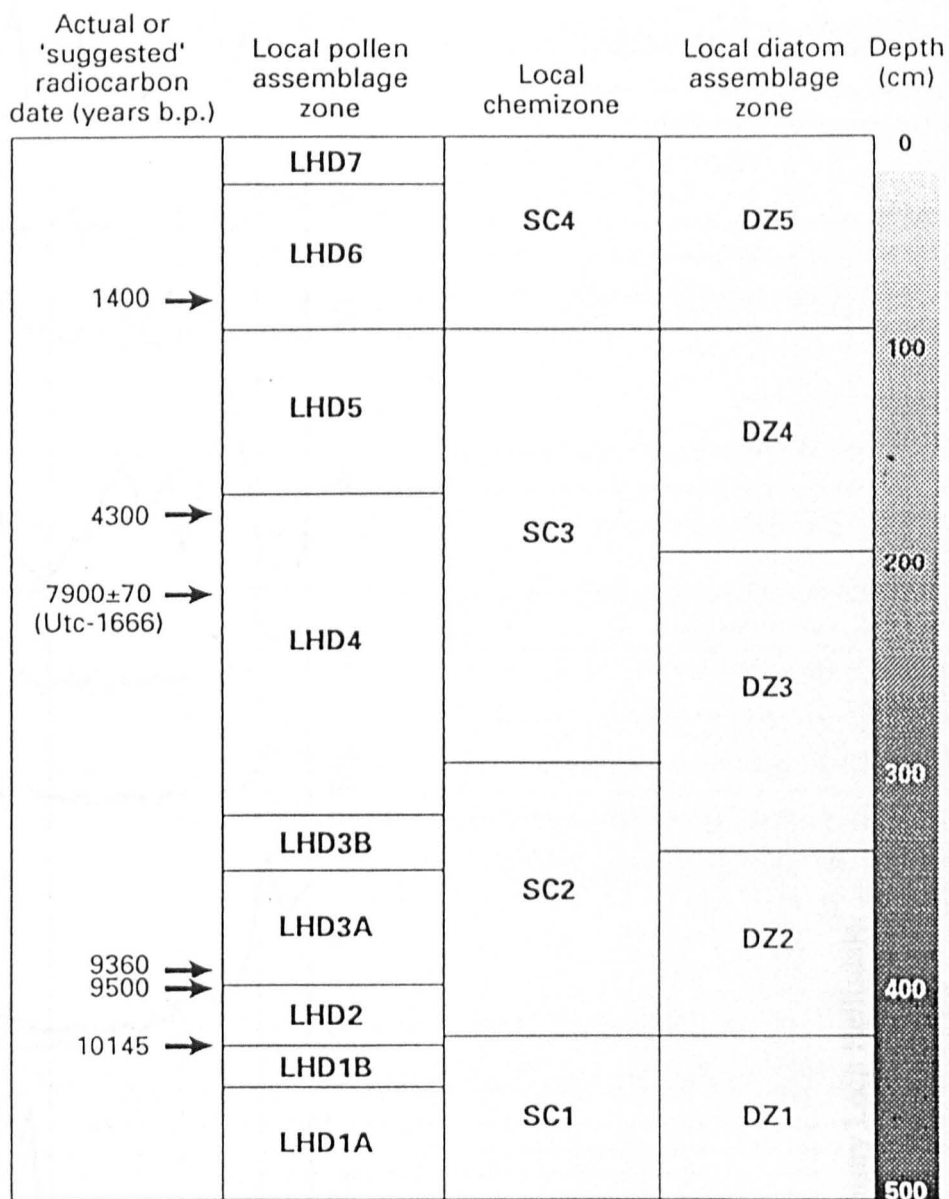
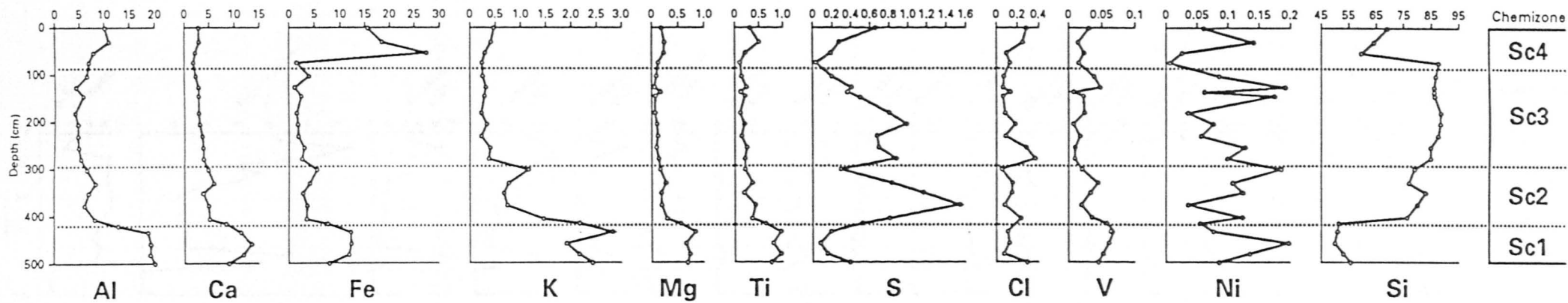
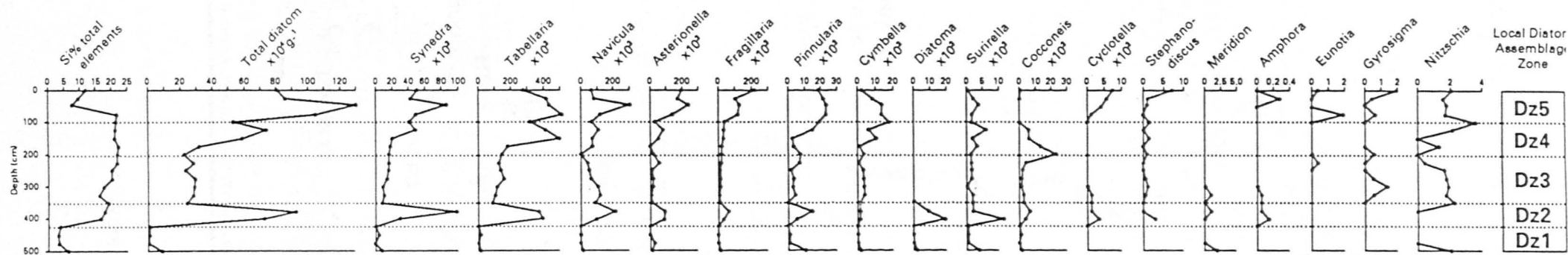


Figure 7.4. Correlation between radiocarbon dates and palaeoenvironmental zones.



Loch Hellisdale

Figure 7.5. Sediment geochemistry Loch Hellisdale.



Loch Hellisdale

Figure 7.6. Diatom assemblage and Silicon in Loch Hellisdale.

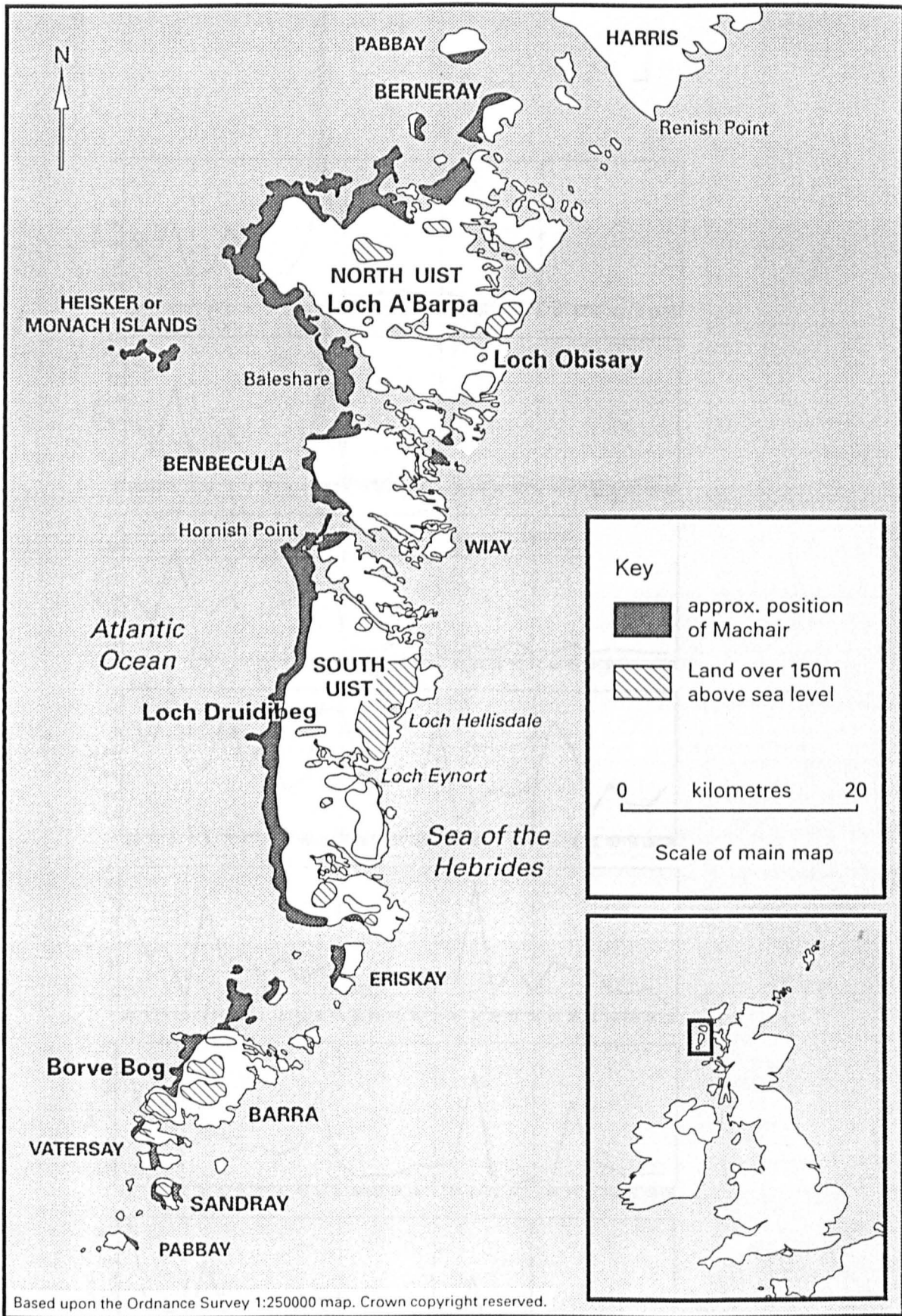


Figure 8.1. Sample locations

Chemizone.

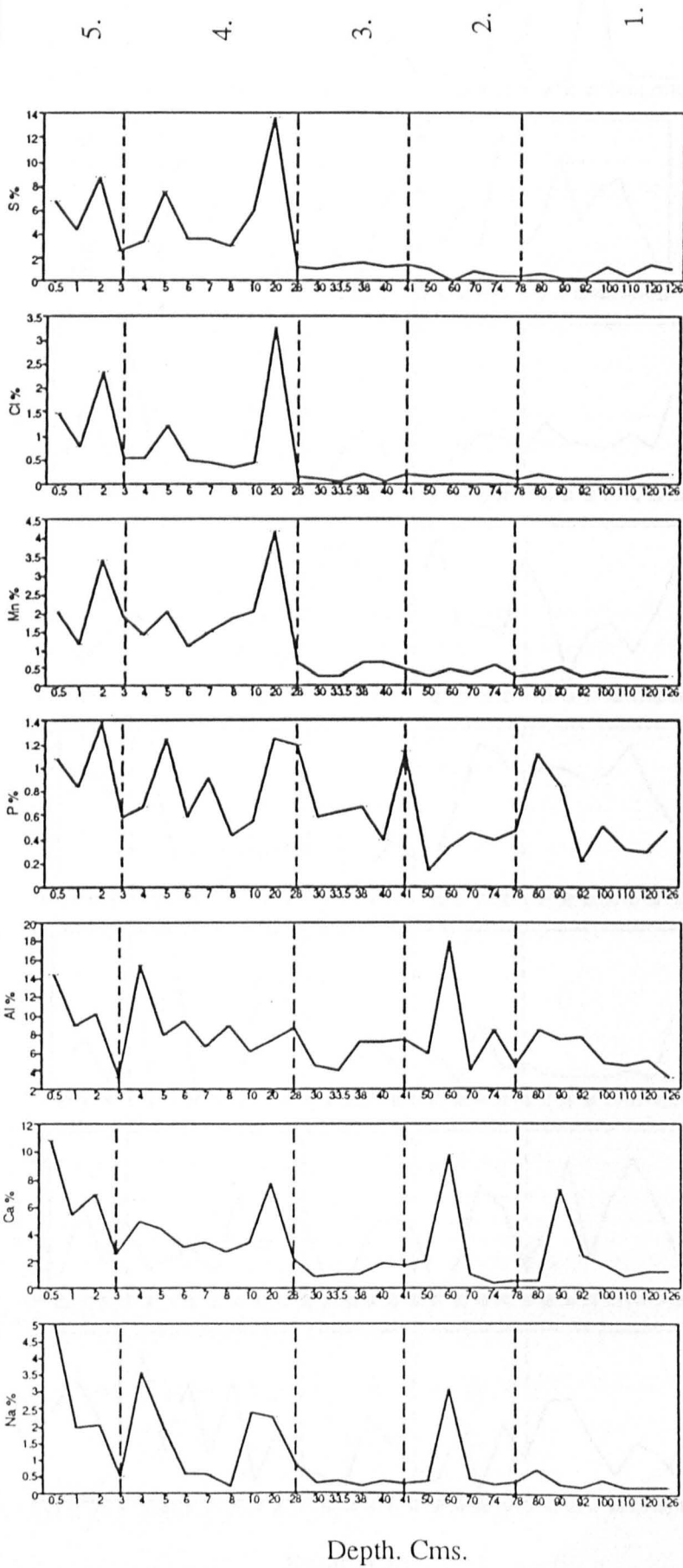


Figure 8.2a. Sediment geochemistry Loch A'Barpa.

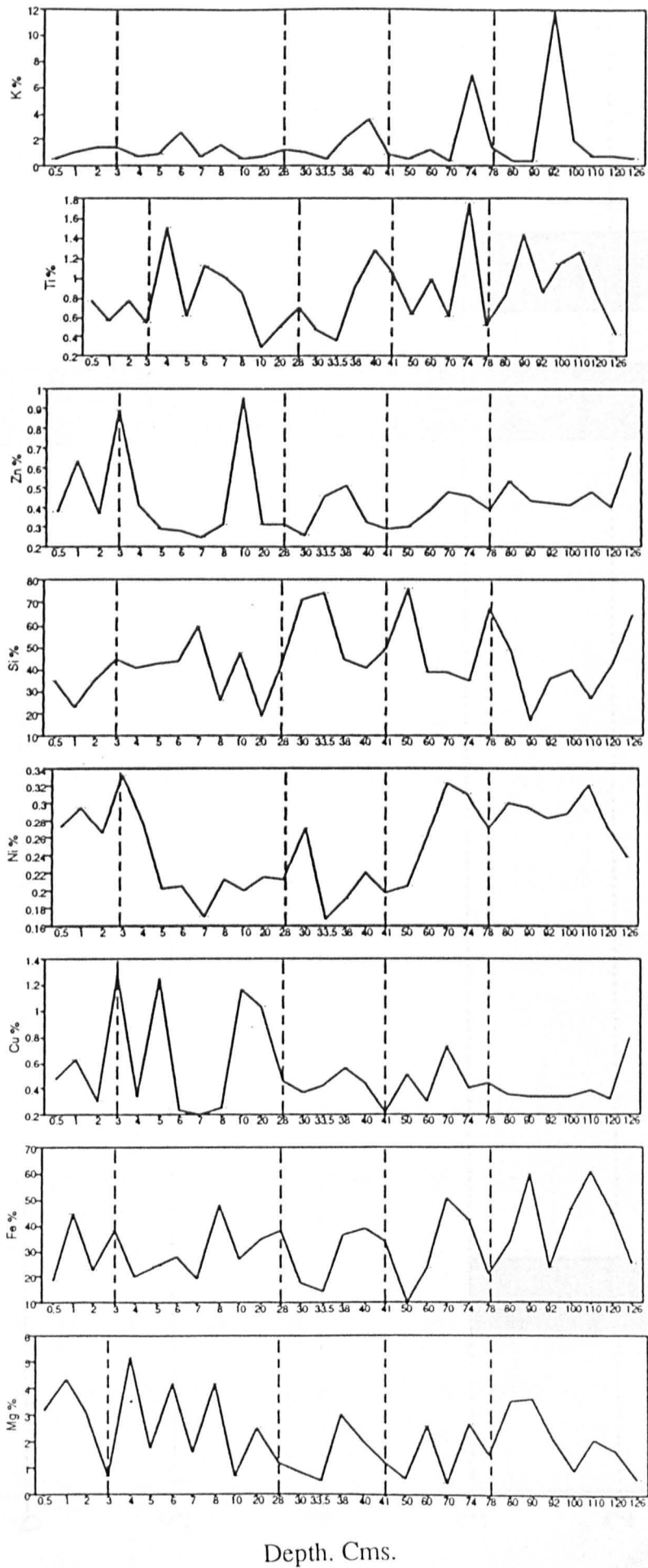


Figure 8.2b. Sediment geochemistry Loch A'Barpa.

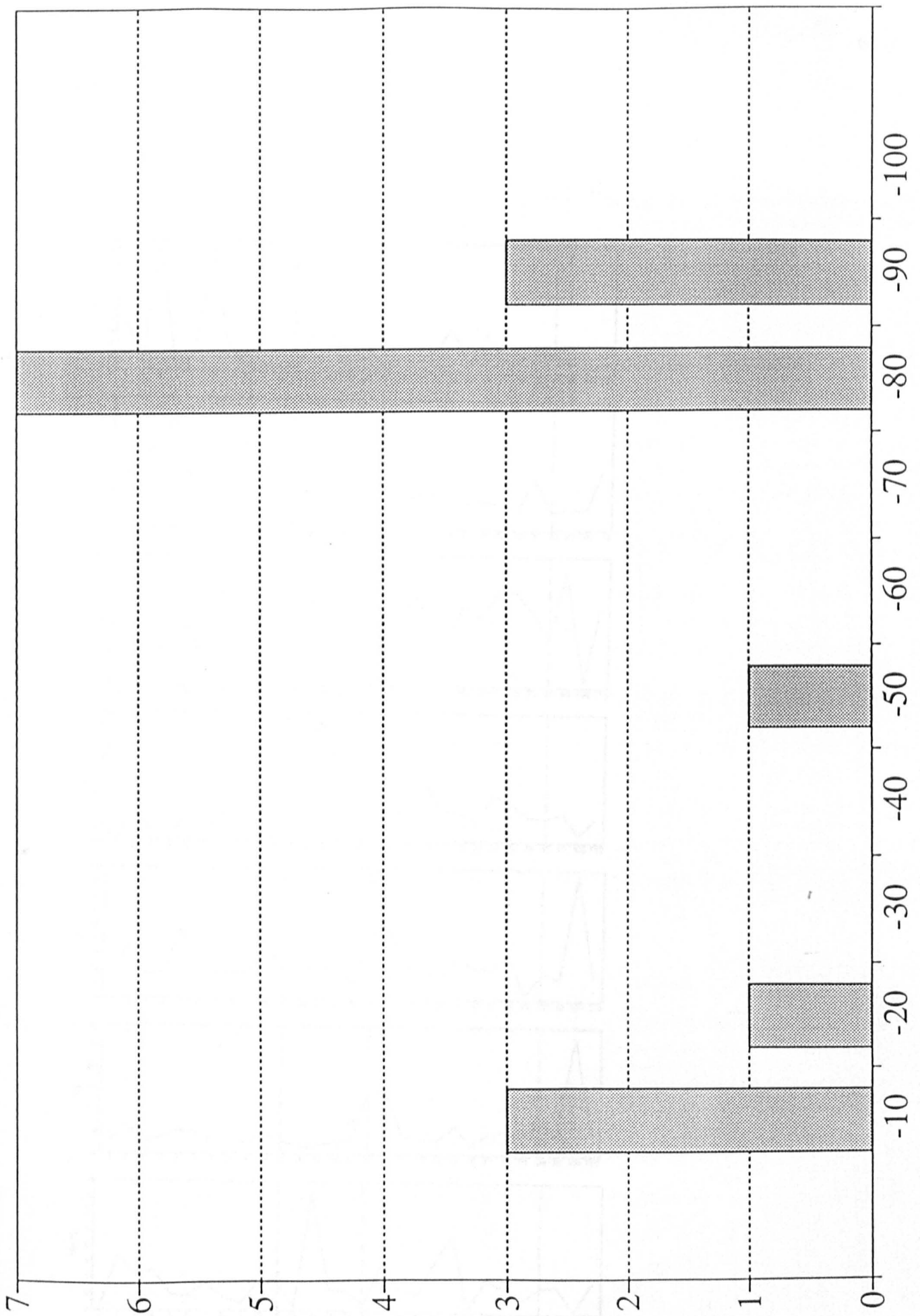


Figure 8.3. Tephra distribution, Loch Obisary.

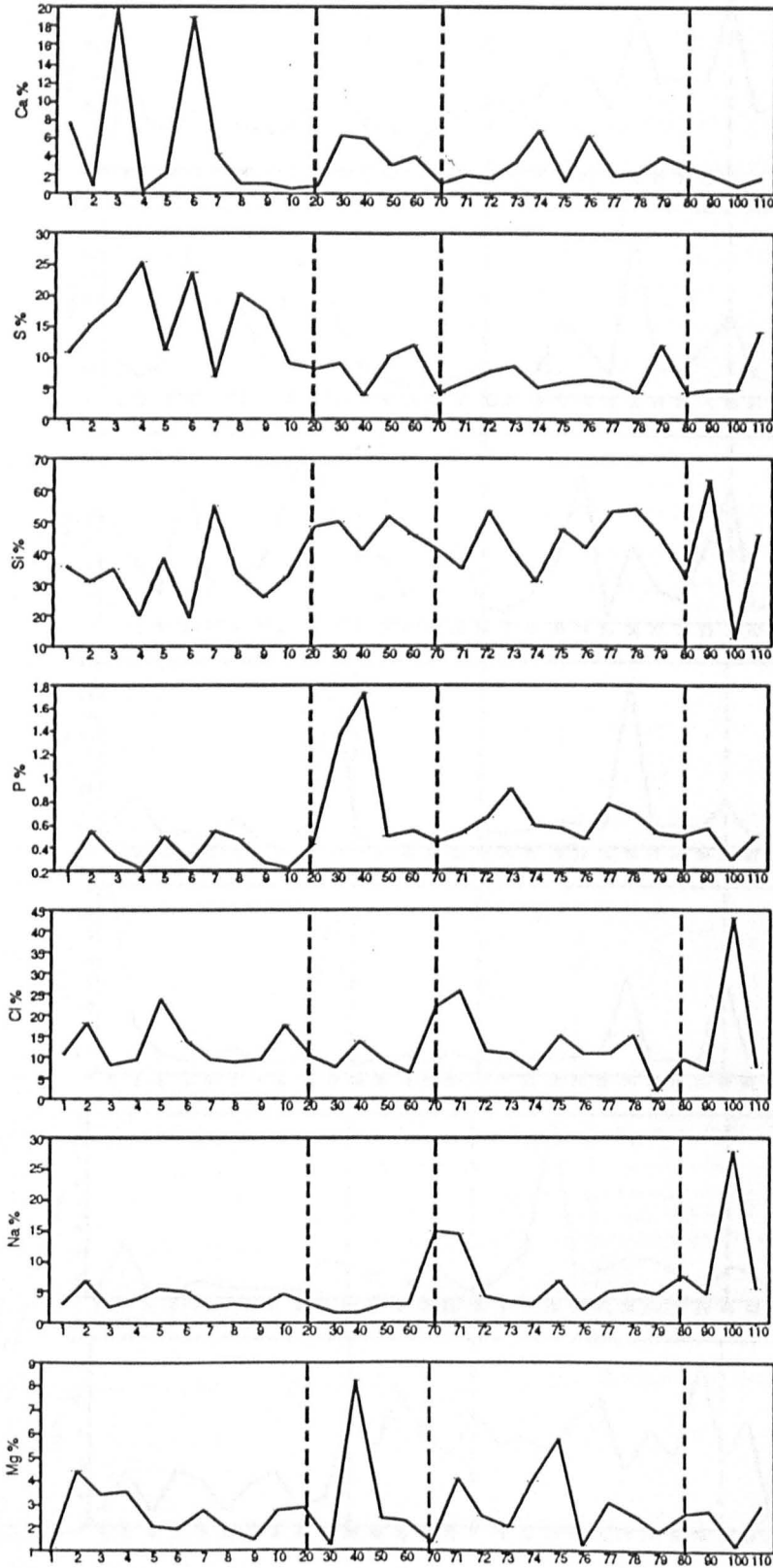
Chemizone.

4.

3.

2.

1.



Depth. Cms.

Figure 8.4a. Sediment geochemistry Loch Obisary.

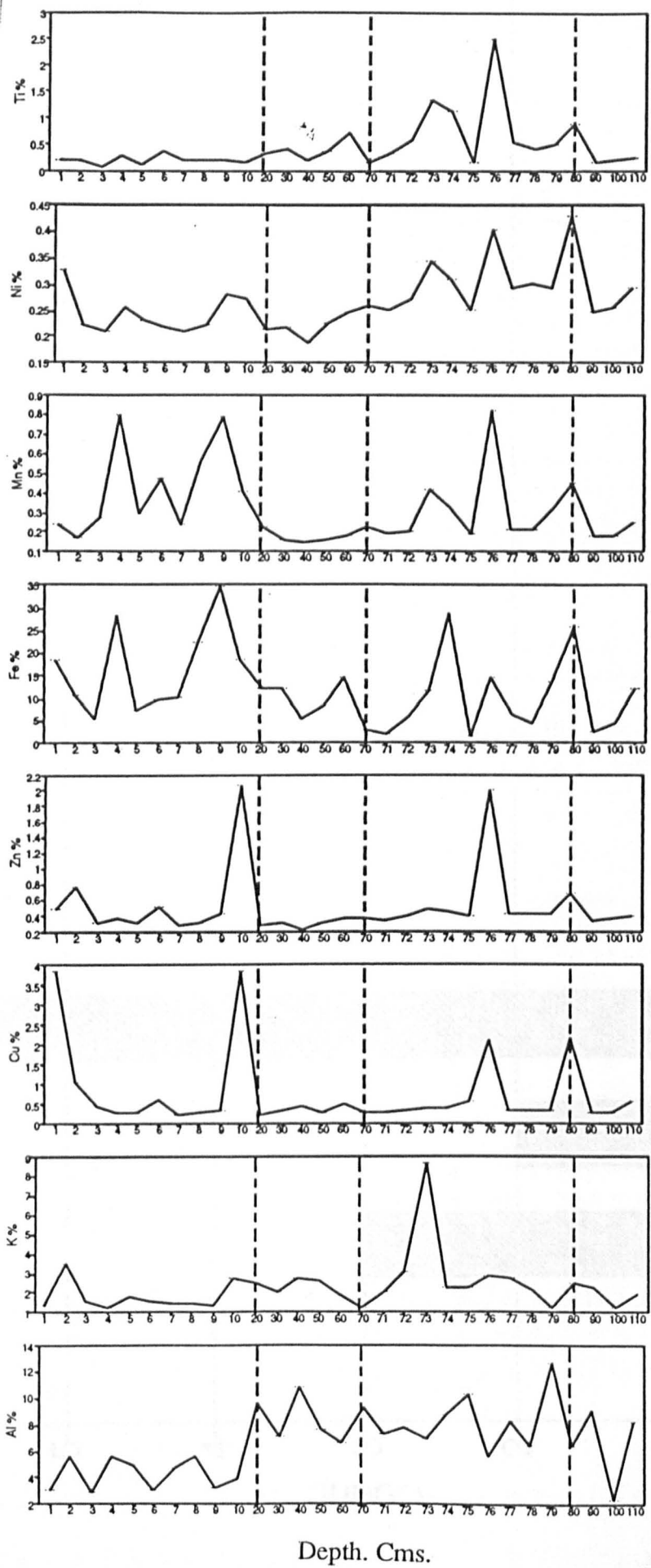


Figure 8.4b. Sediment geochemistry Loch Obisary.

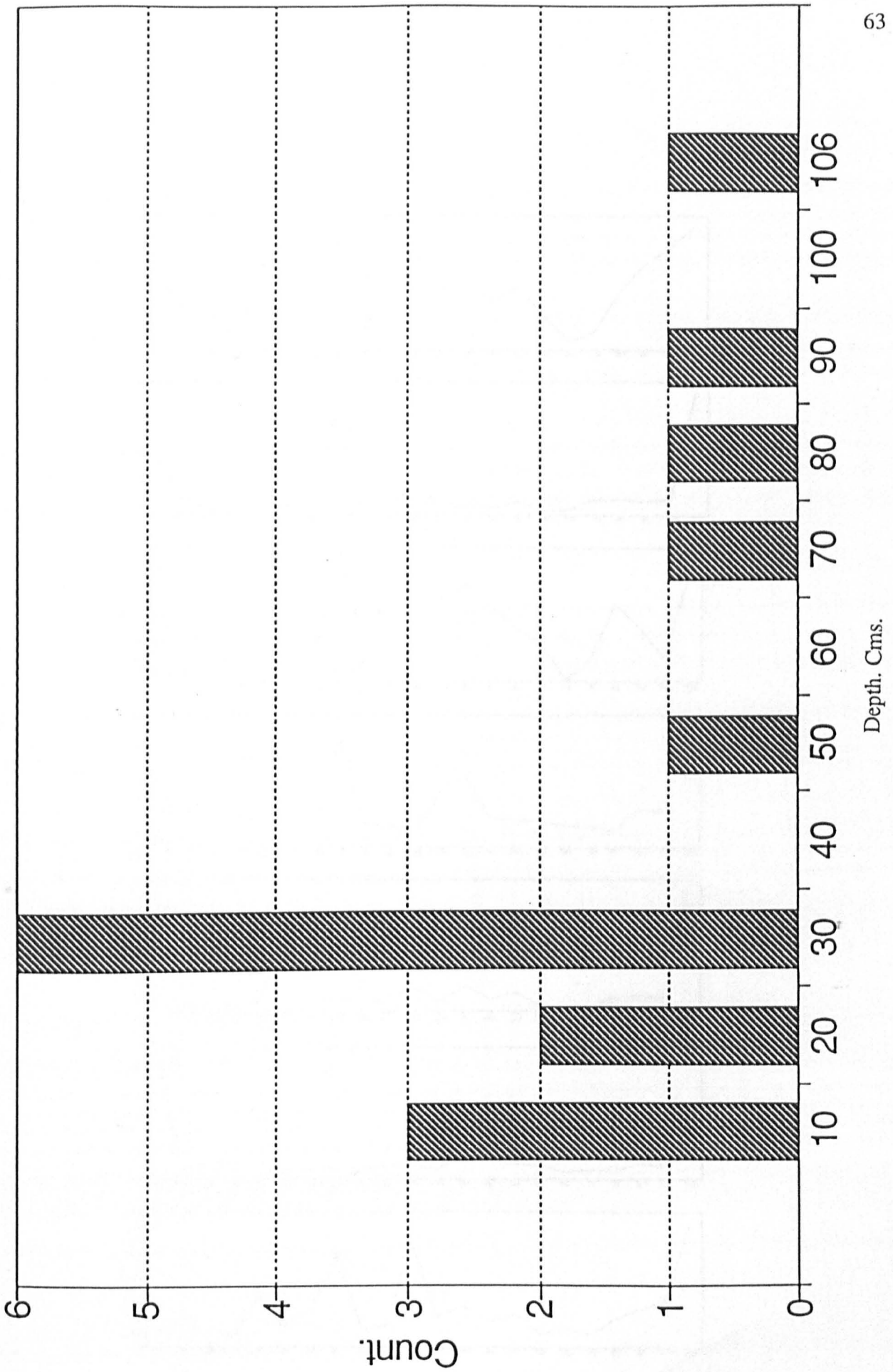


Figure 8.5. Tephra distribution, Loch Druidibeg.

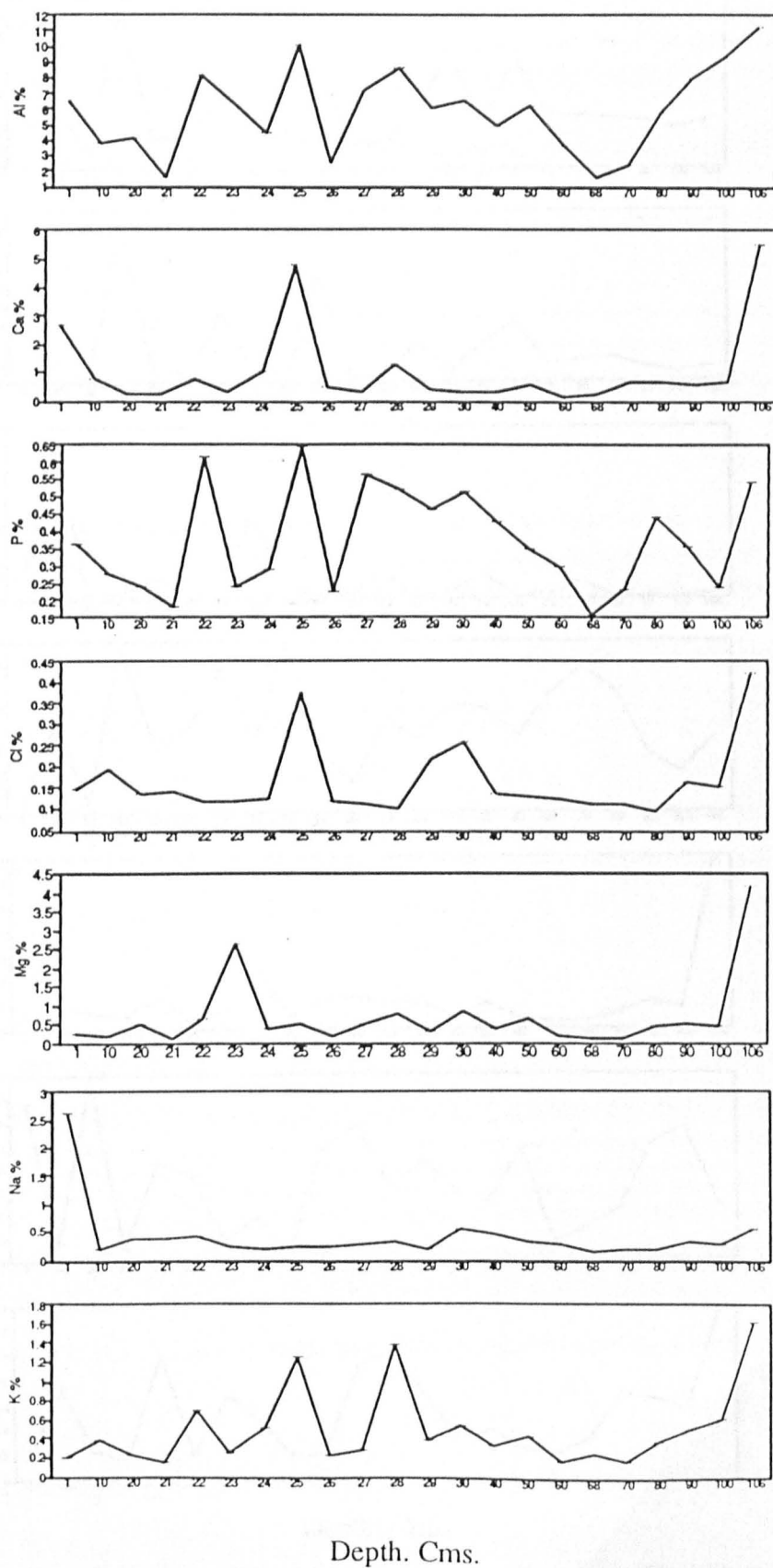


Figure 8.6a. Sediment geochemistry Loch Druidibeg.

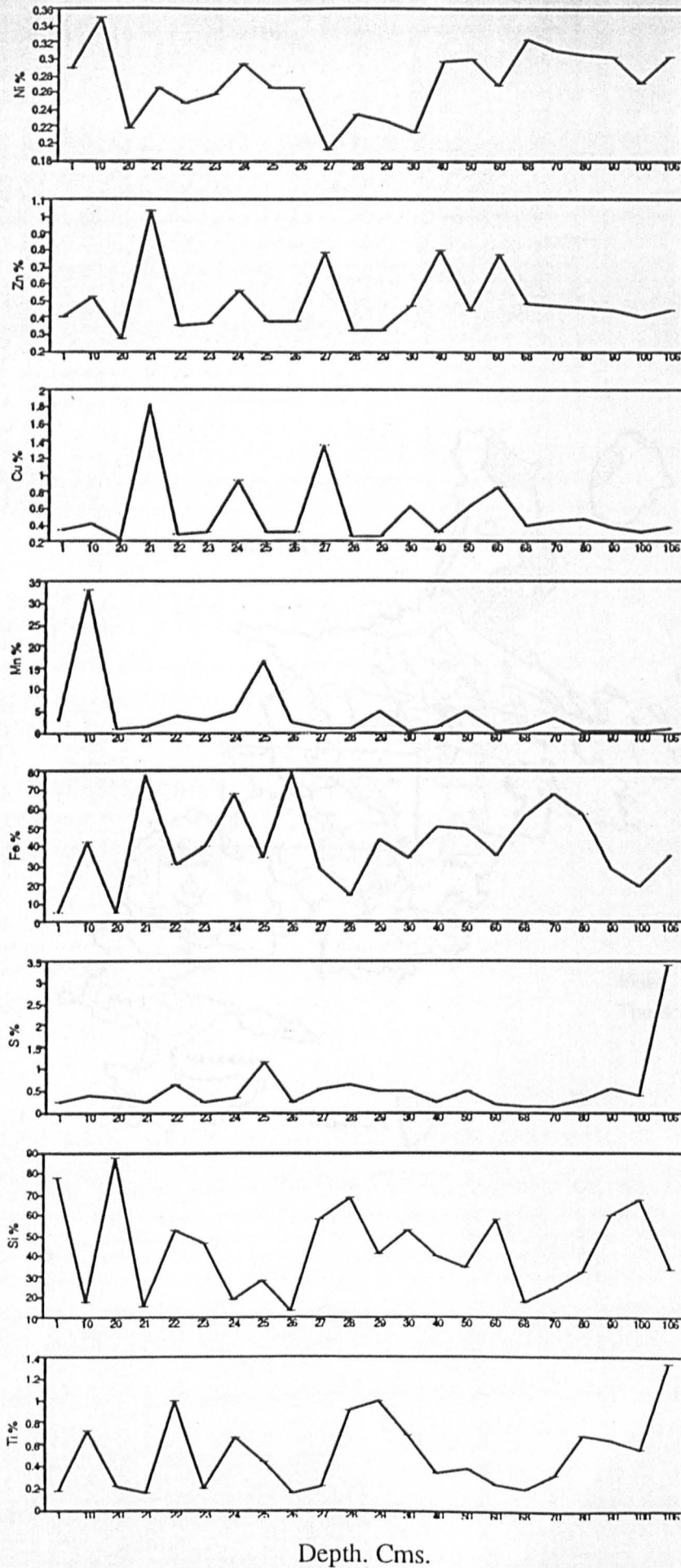


Figure 8.6b. Sediment geochemistry Loch Druidibeg.

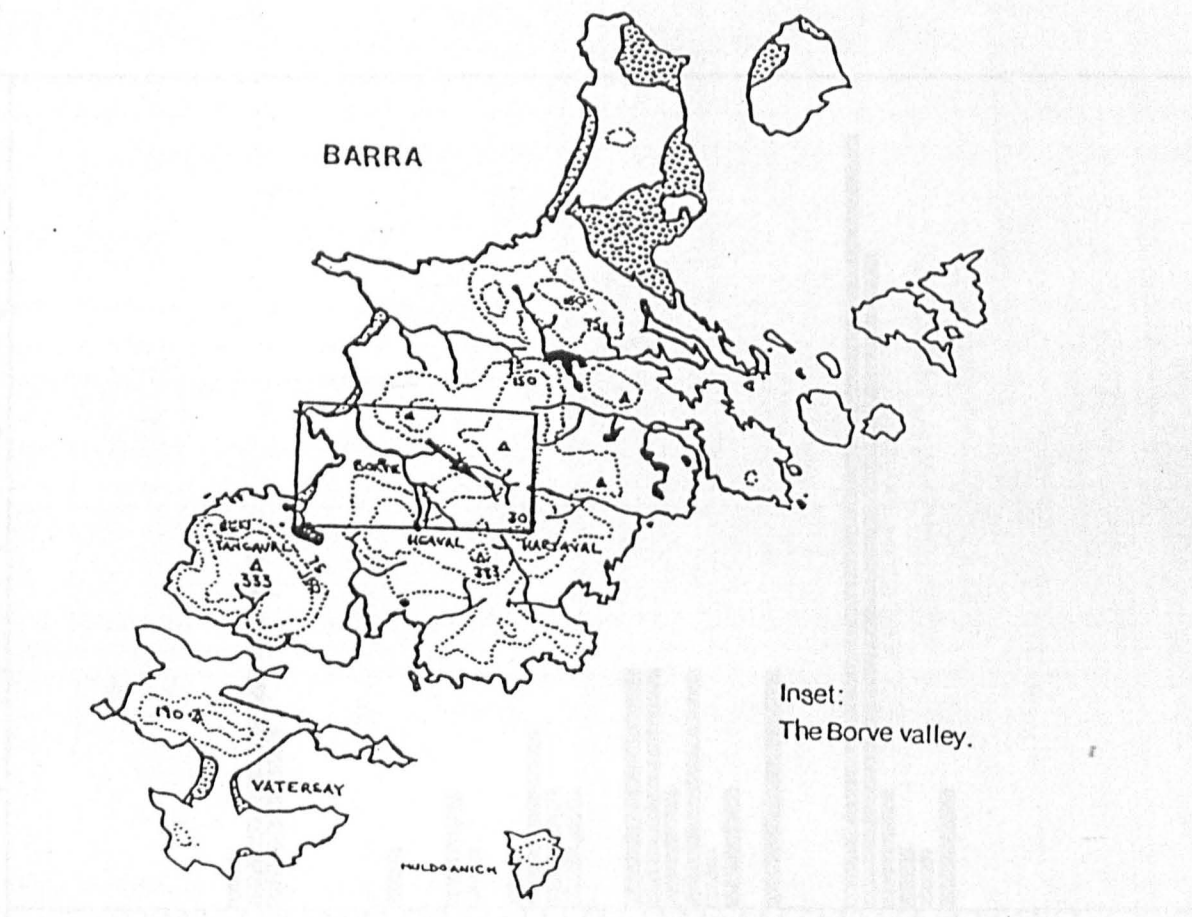


Figure 9.1. Location map, Borve bog. [From Pratt 1992].

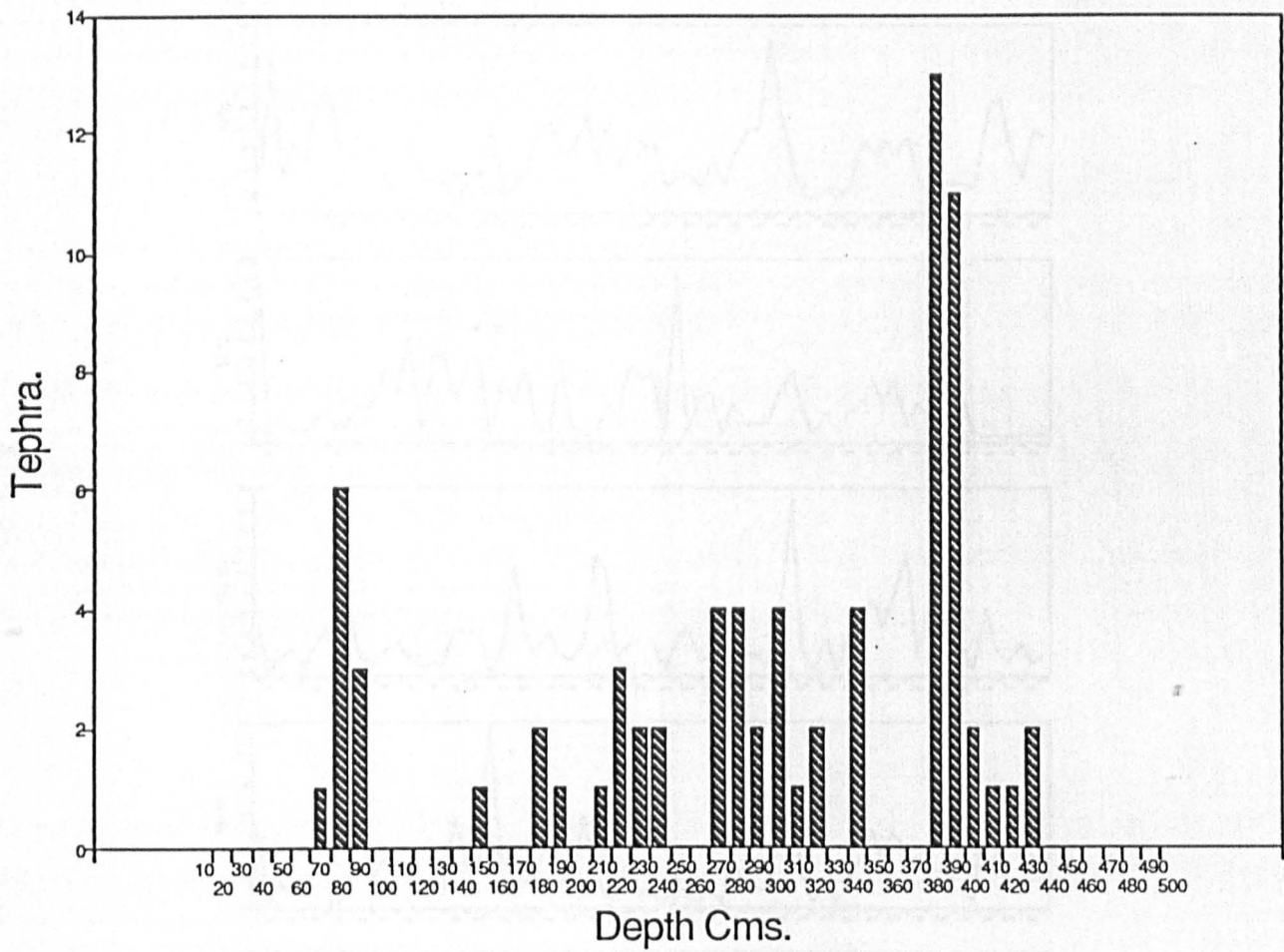


Figure 9.2. Tephra distribution in Borve Bog.

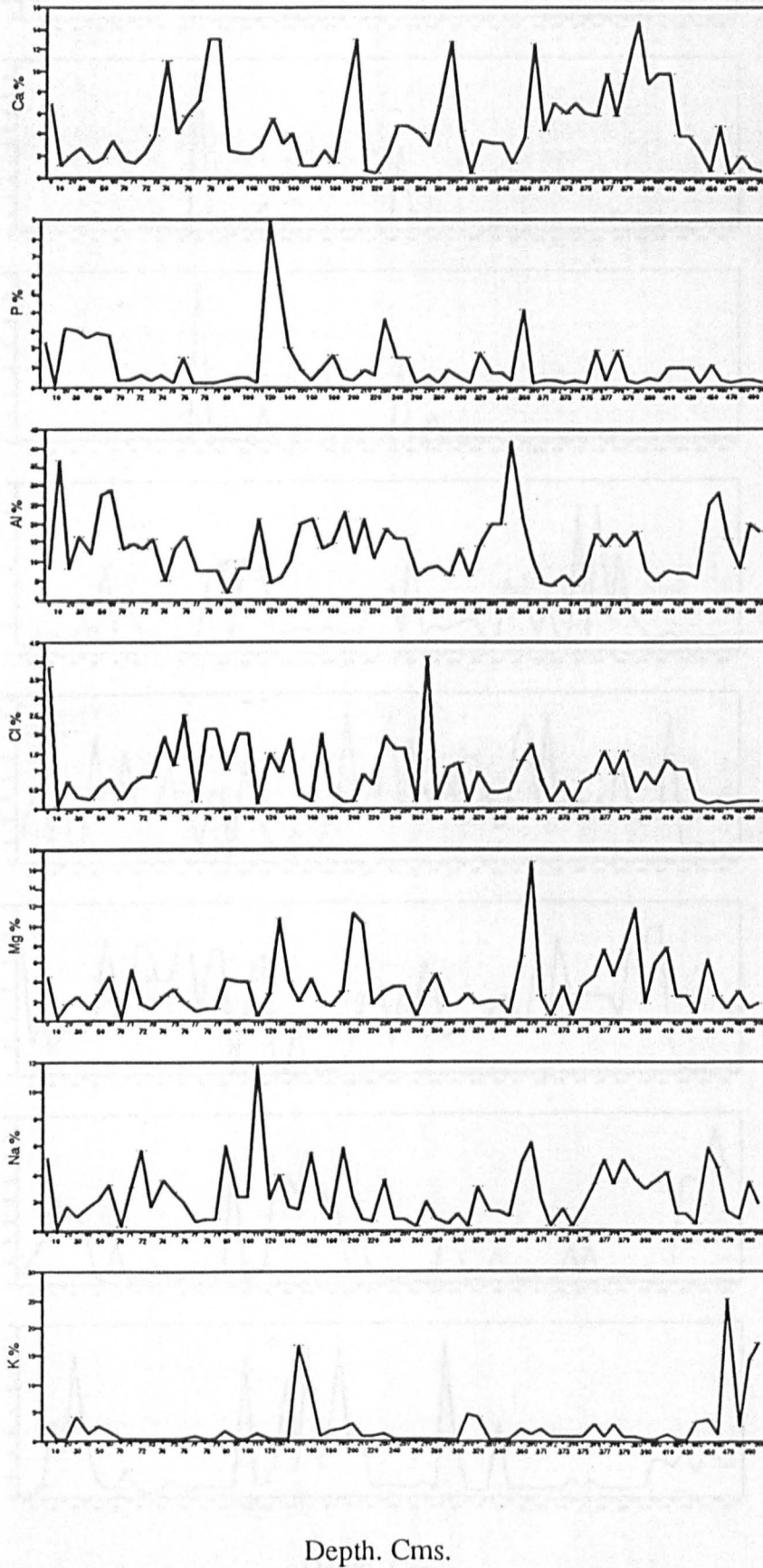
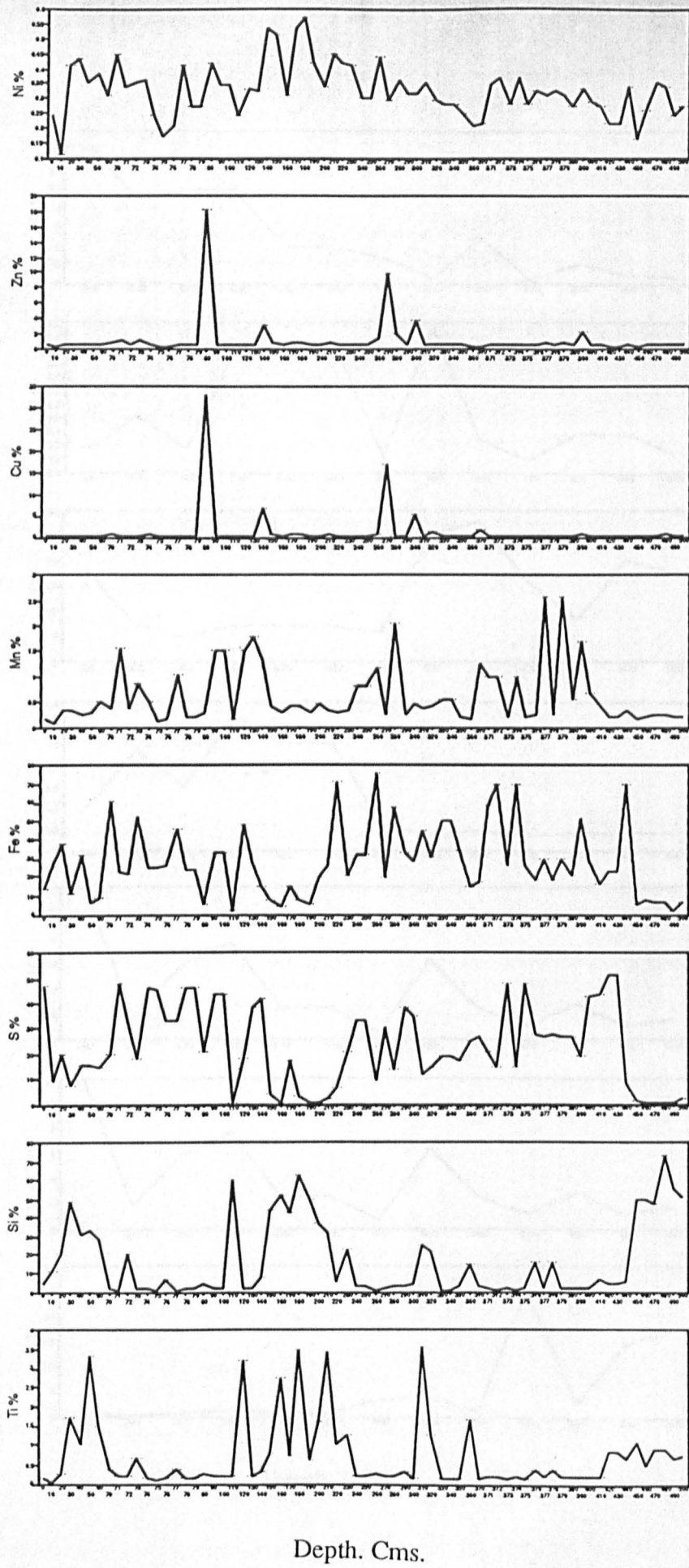


Figure 9.3a. Sediment geochemistry Borve Bog.



Depth. Cms.

Figure 9.3b. Sediment geochemistry Borve Bog.

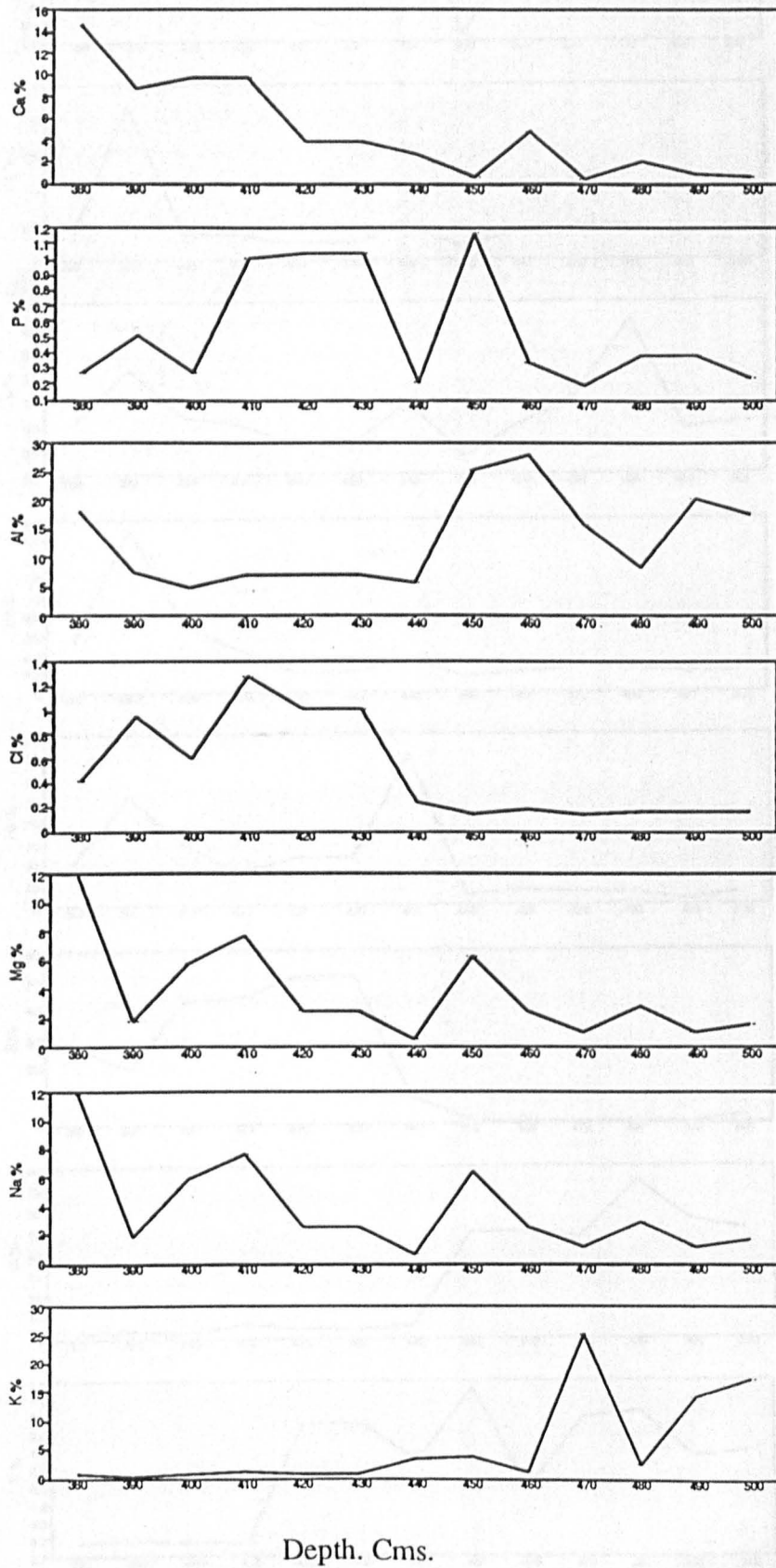


Figure 9.4a. Sediment geochemistry Borve Bog. Chemizone BV1.

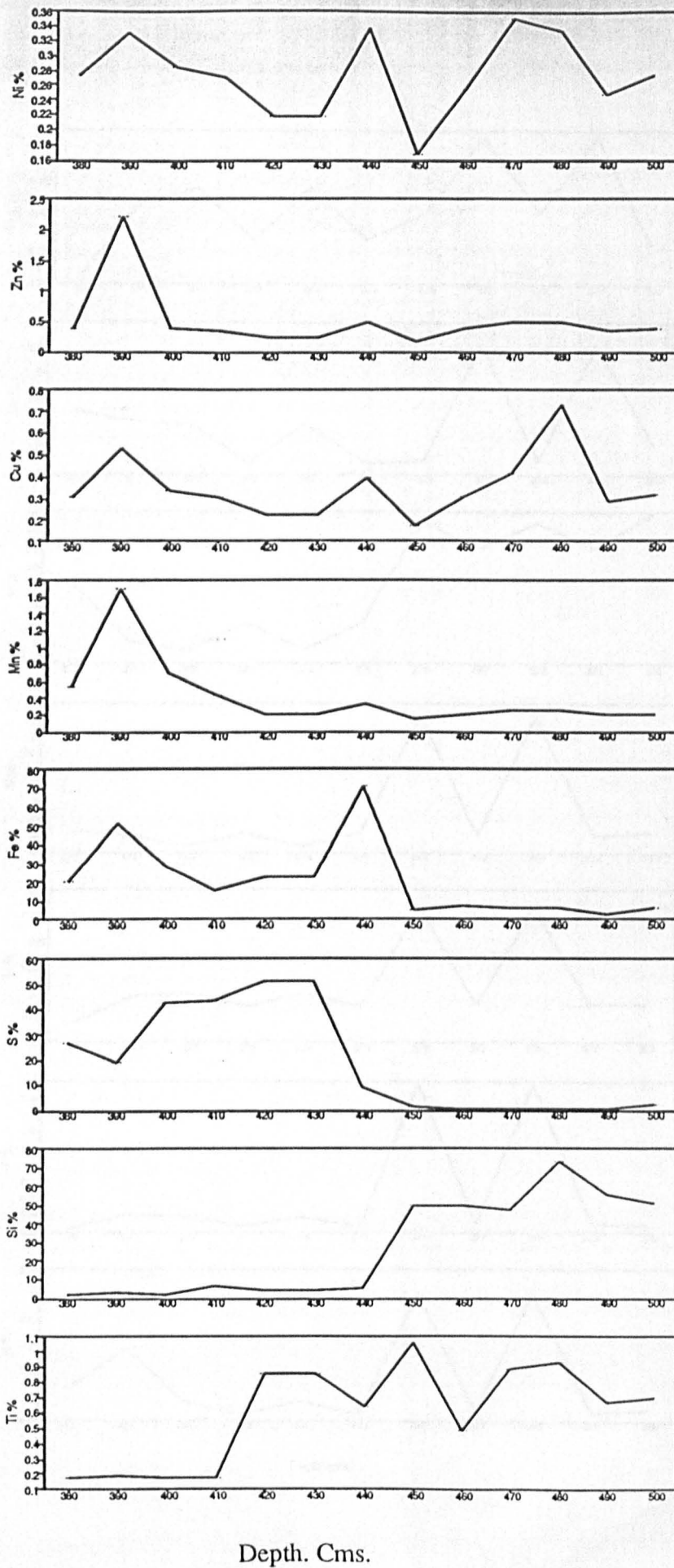


Figure 9.4b. Sediment geochemistry Borve Bog. Chemizone BV1.

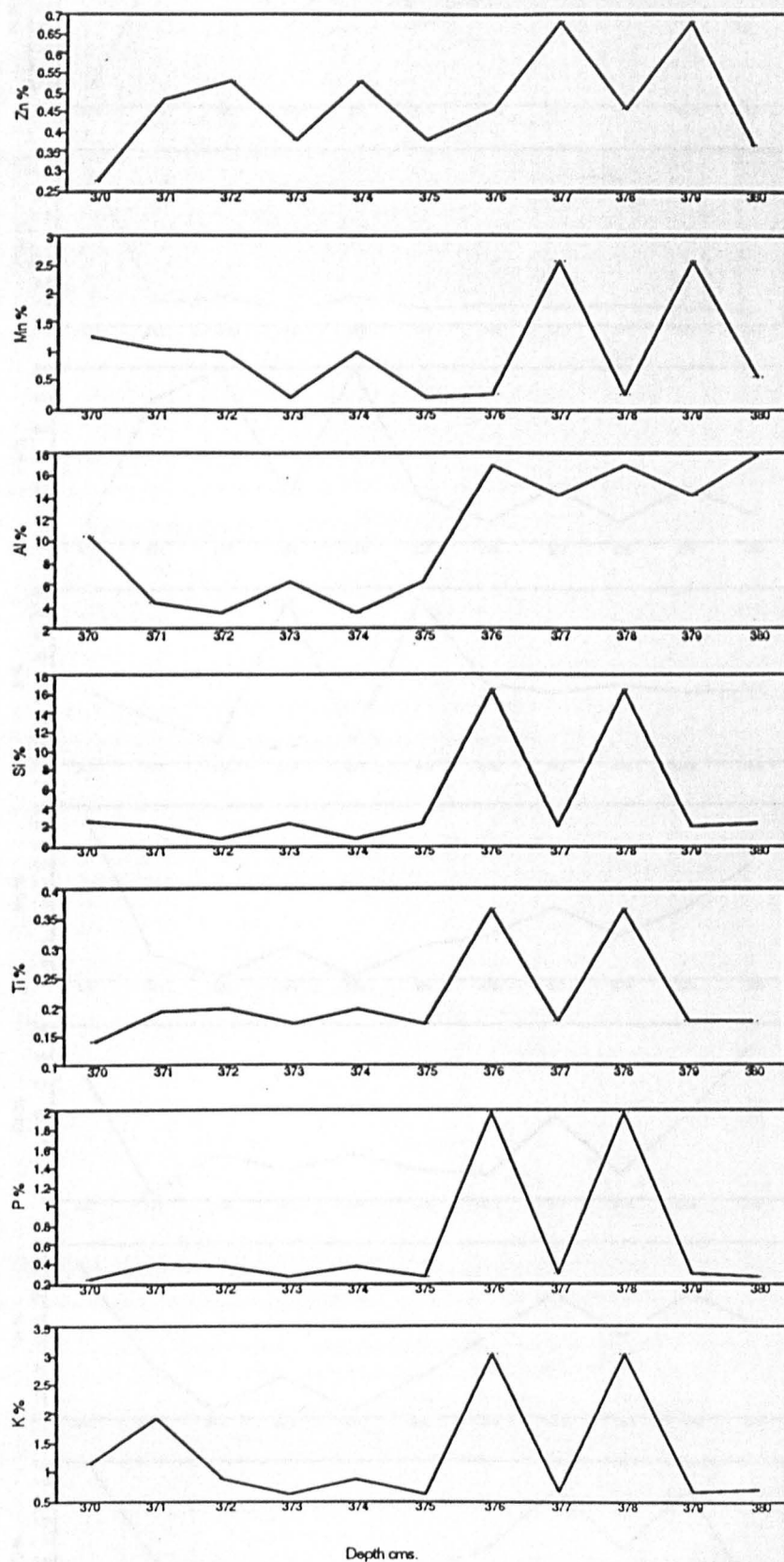


Figure 9.5a. Sediment geochemistry Borve Bog. Chemizone BV2.

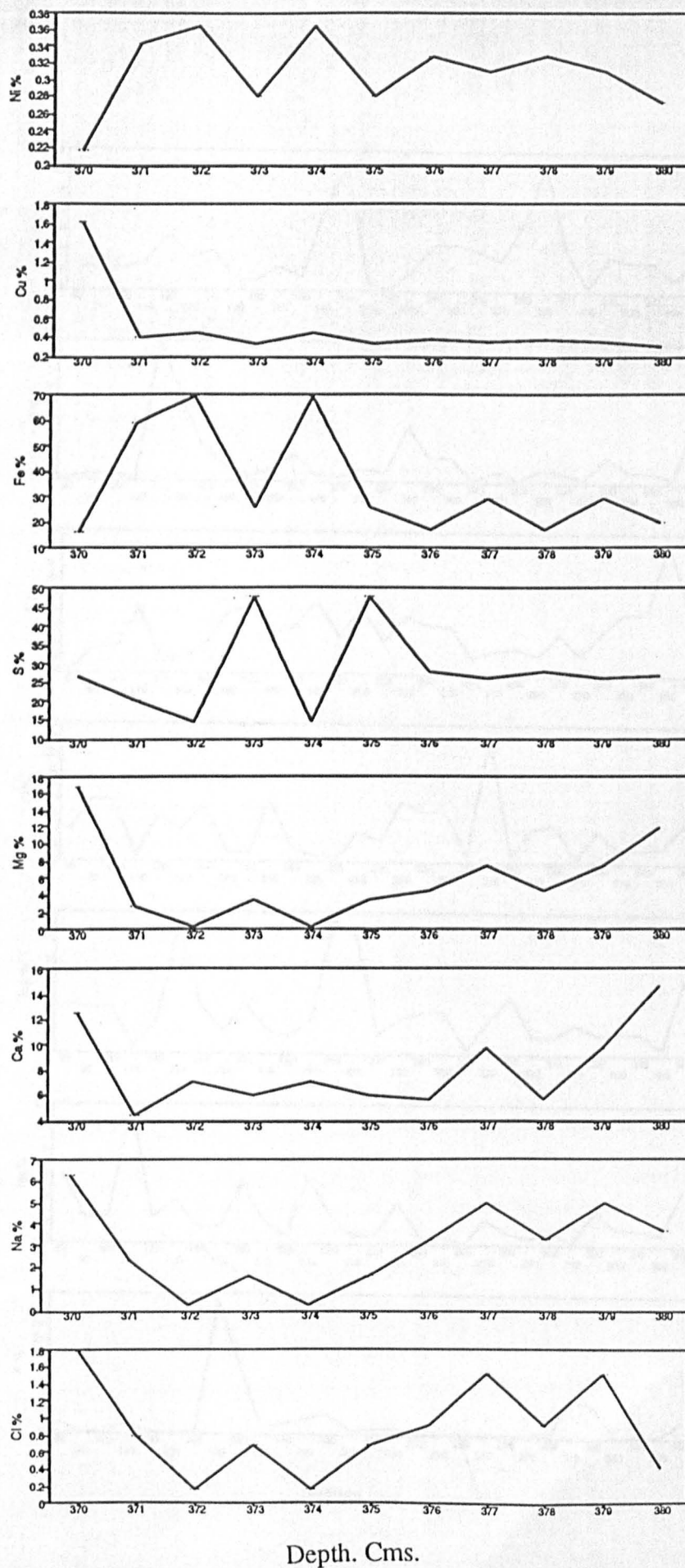


Figure 9.5b. Sediment geochemistry Borve Bog. Chemizone BV2.

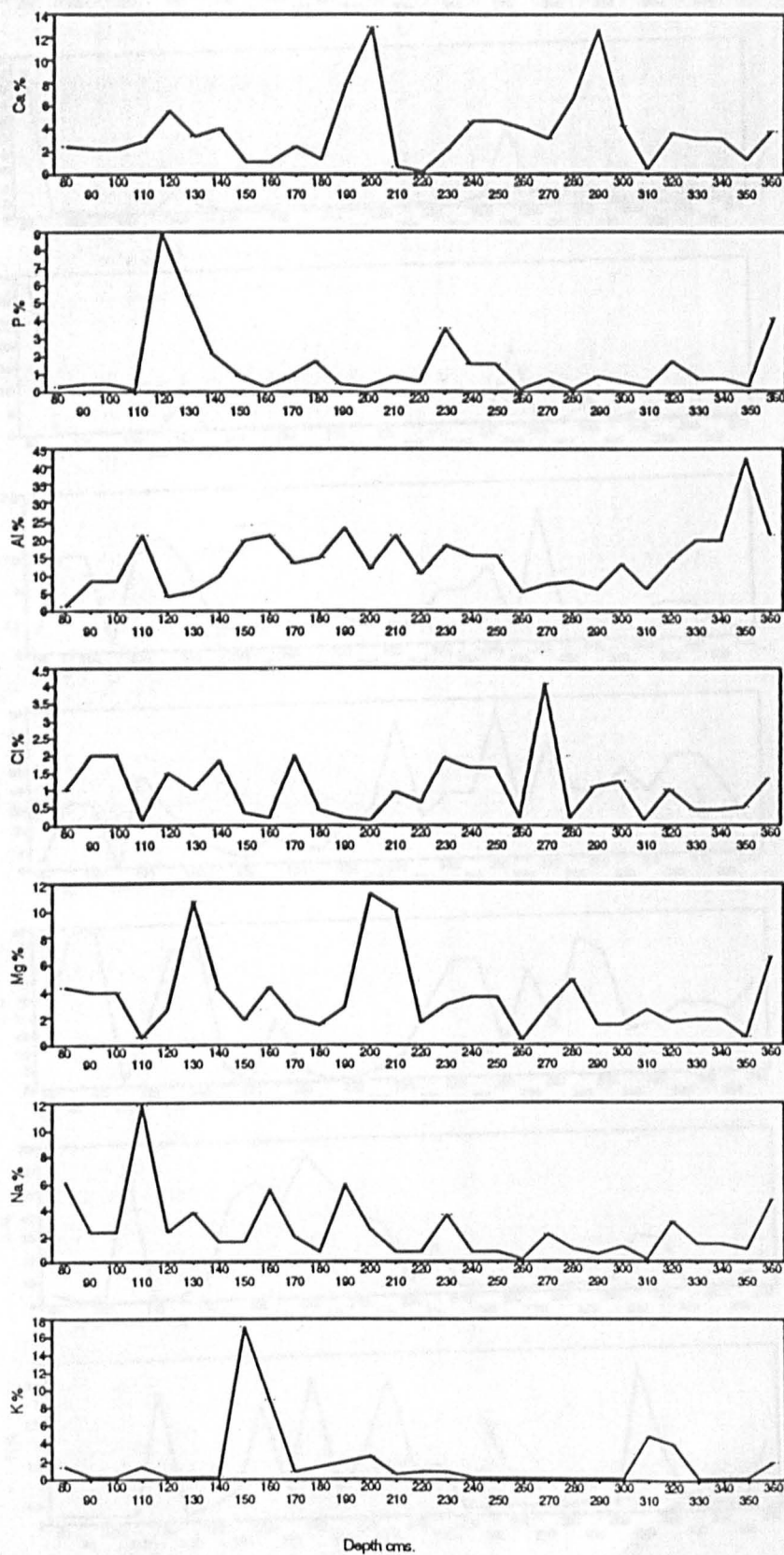


Figure 9.6a. Sediment geochemistry Borve Bog. Chemizone BV3.

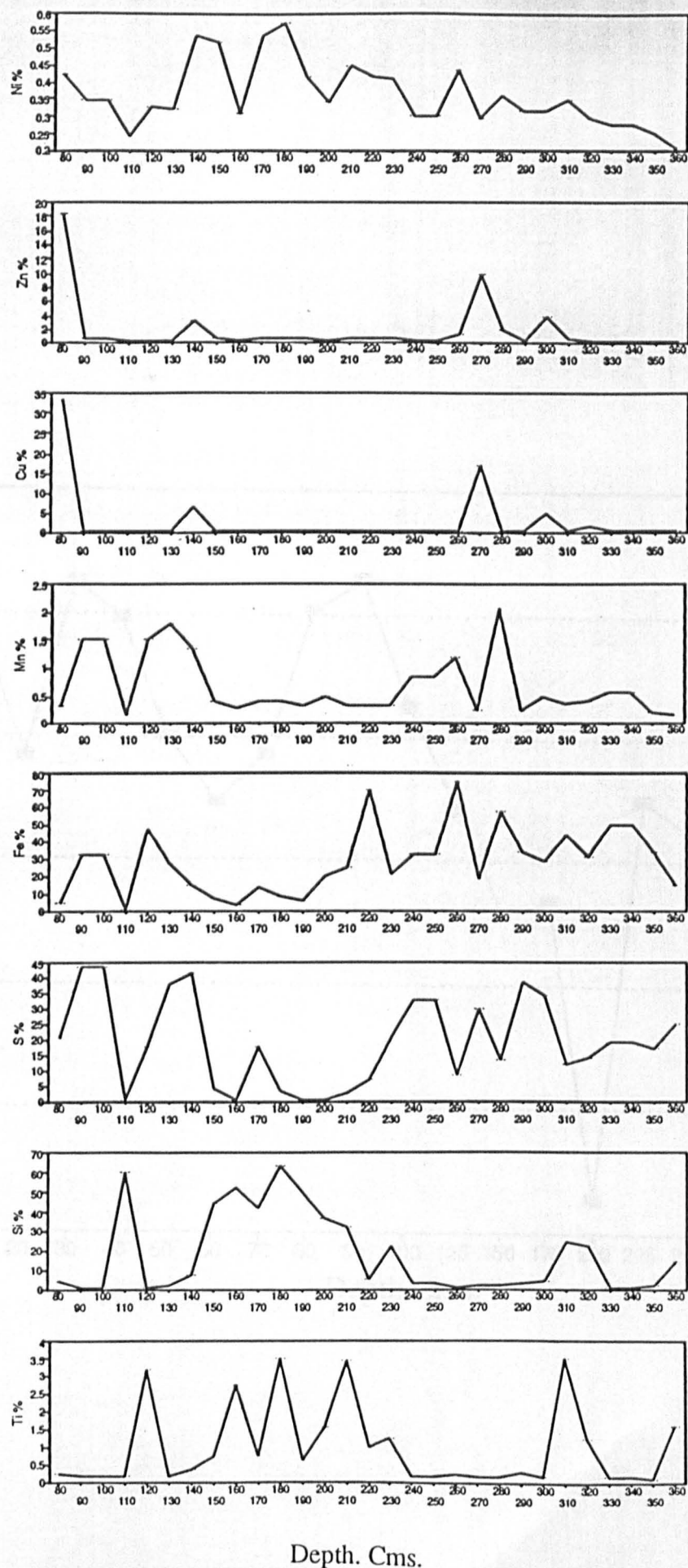


Figure 9.6b. Sediment geochemistry Borve Bog, Chemizone BV3.



Figure 9.7. Organic content Borve Bog.

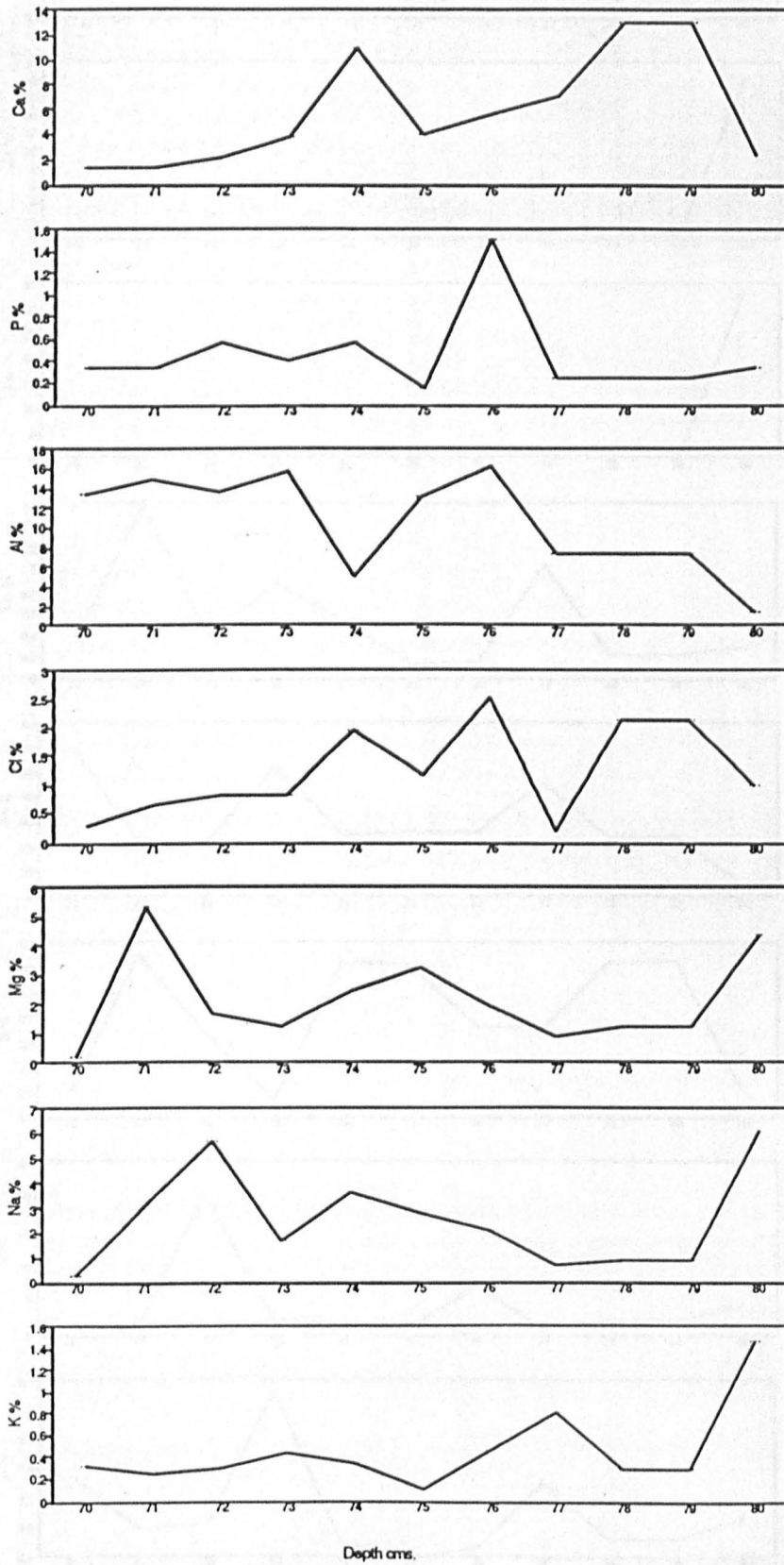


Figure 9.8a. Sediment geochemistry Borve Bog. Chemizone BV4.

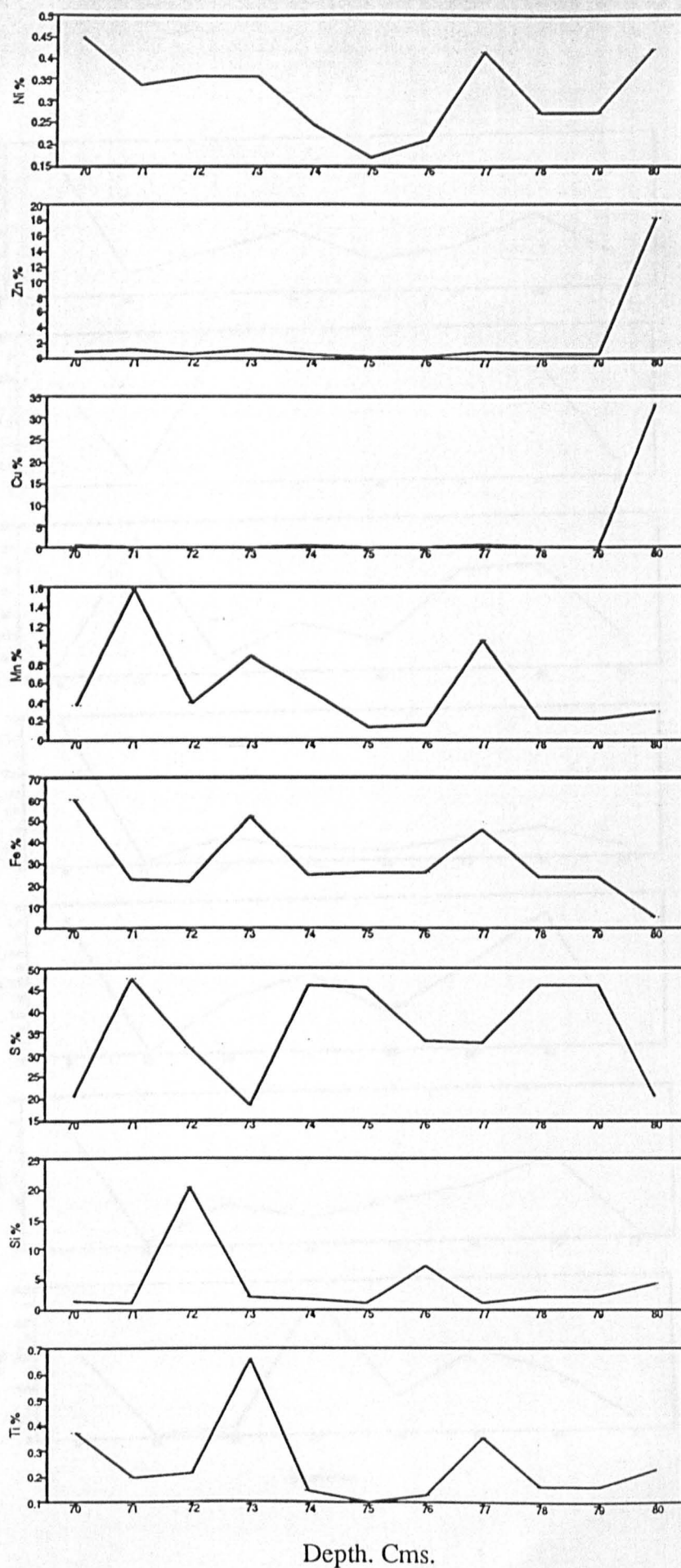


Figure 9.8b. Sediment geochemistry Borve Bog. Chemizone BV4.

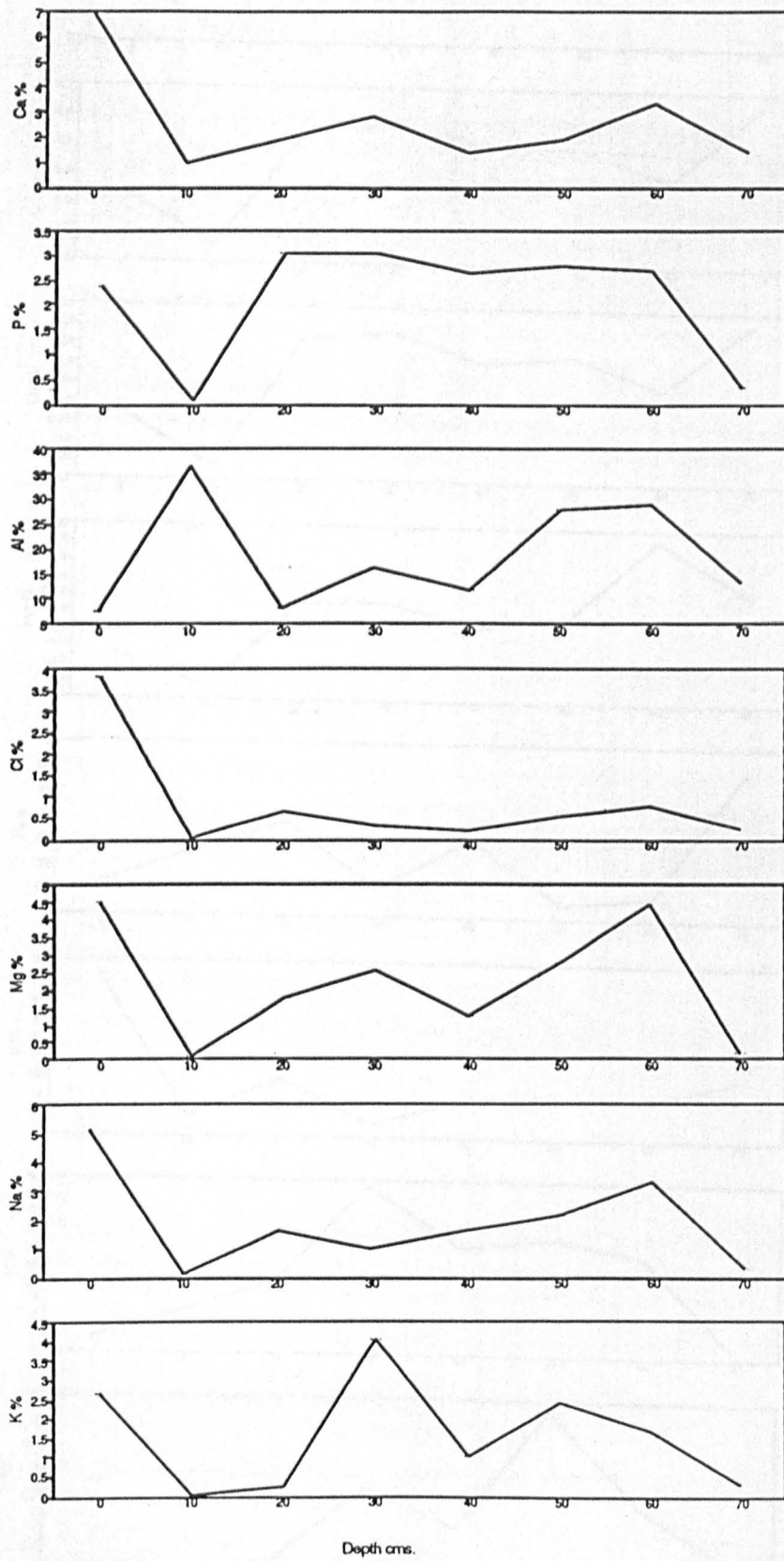


Figure 9.9a. Sediment geochemistry Borve Bog. Chemizone BV5.

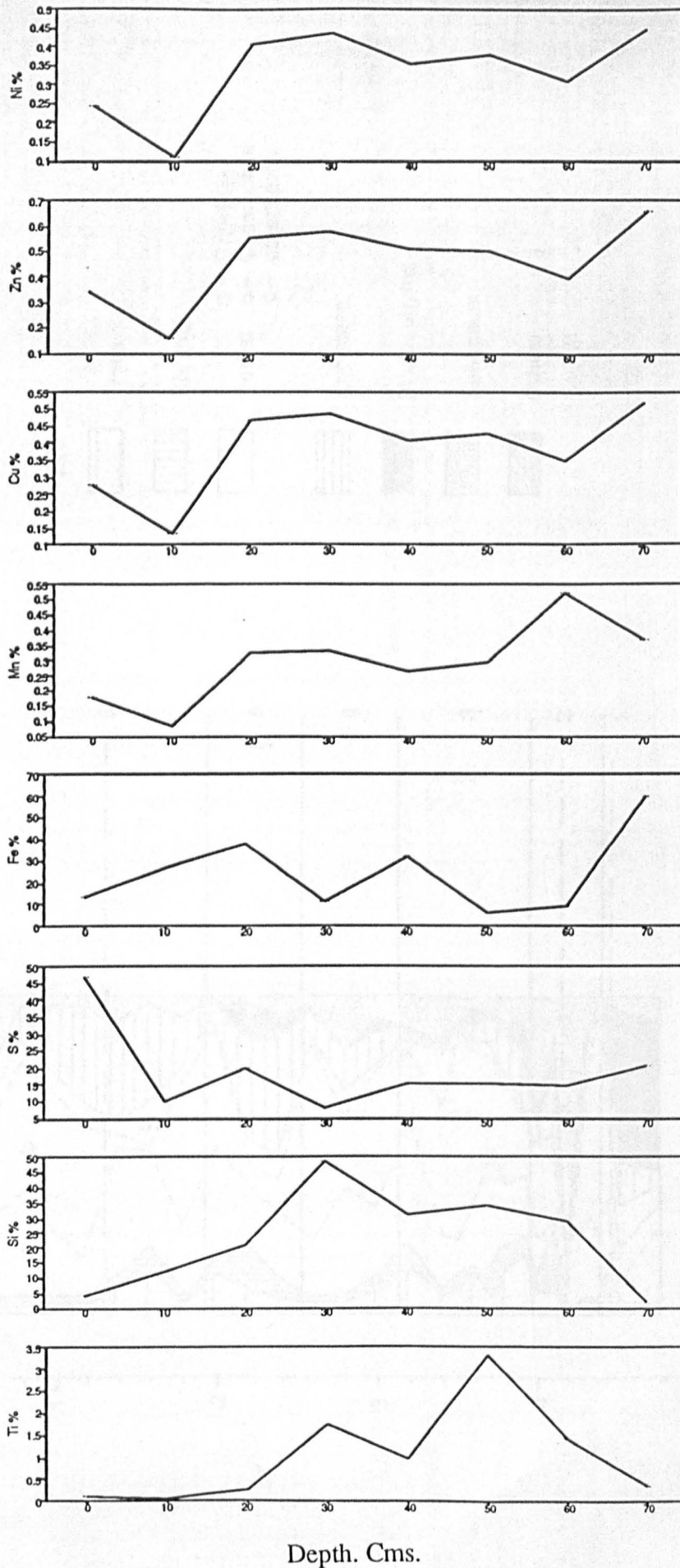


Figure 9.9b. Sediment geochemistry Borve Bog. Chemizone BV5.

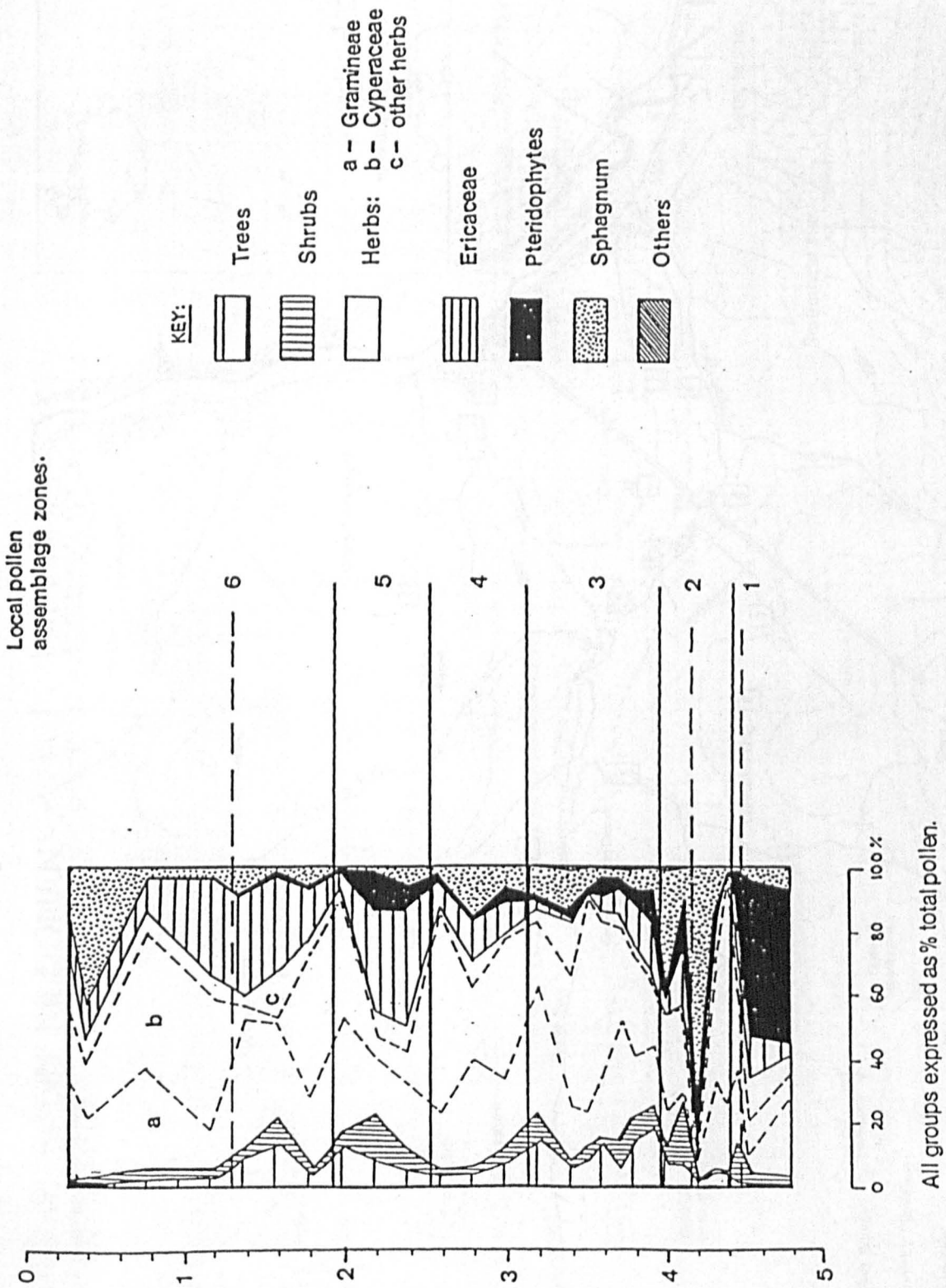


Figure 9.10. Summary pollen diagram Borve Bog. [From Pratt 1992].

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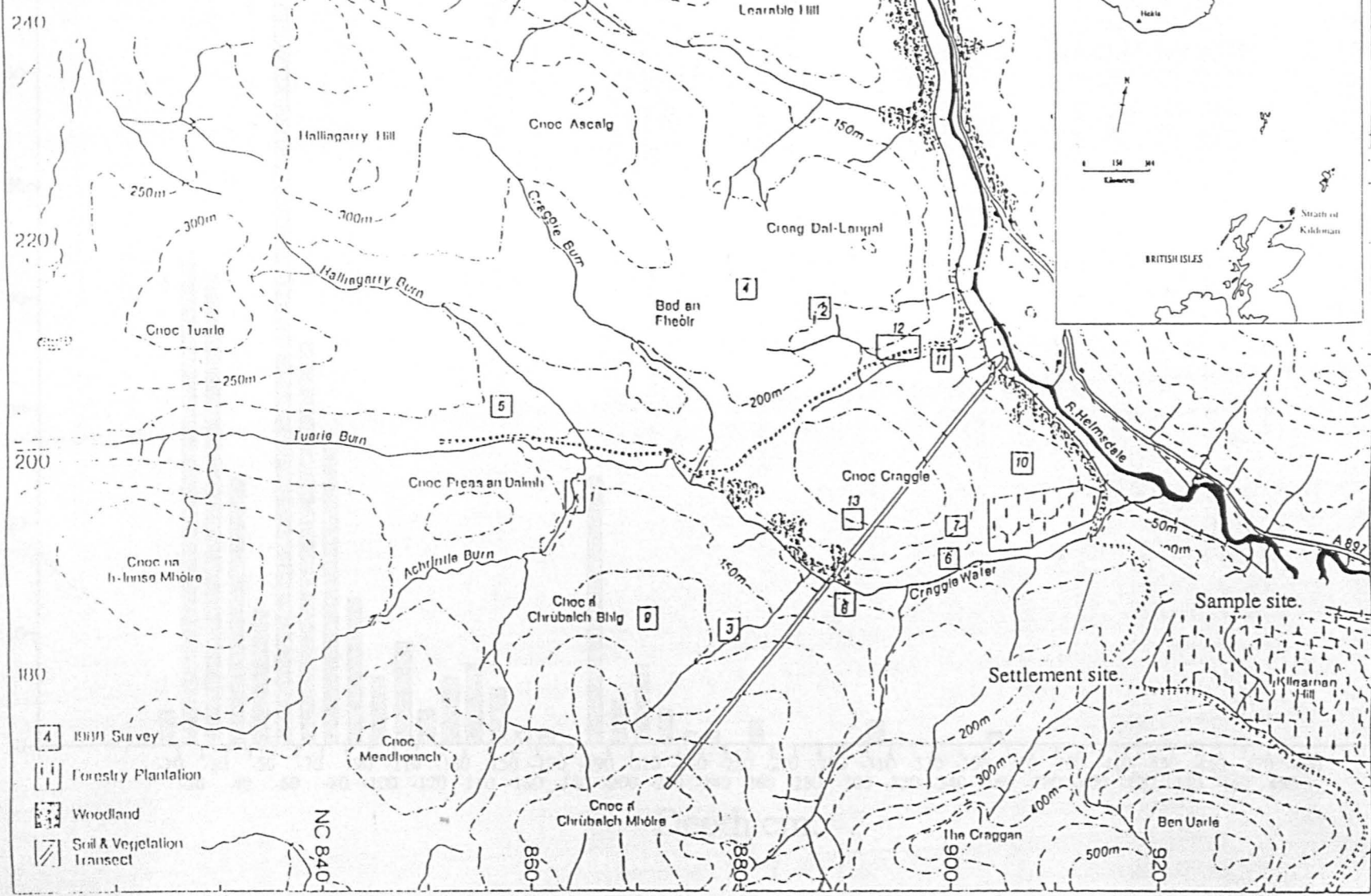


Figure 10.1. Site location Strath of Kildonan.

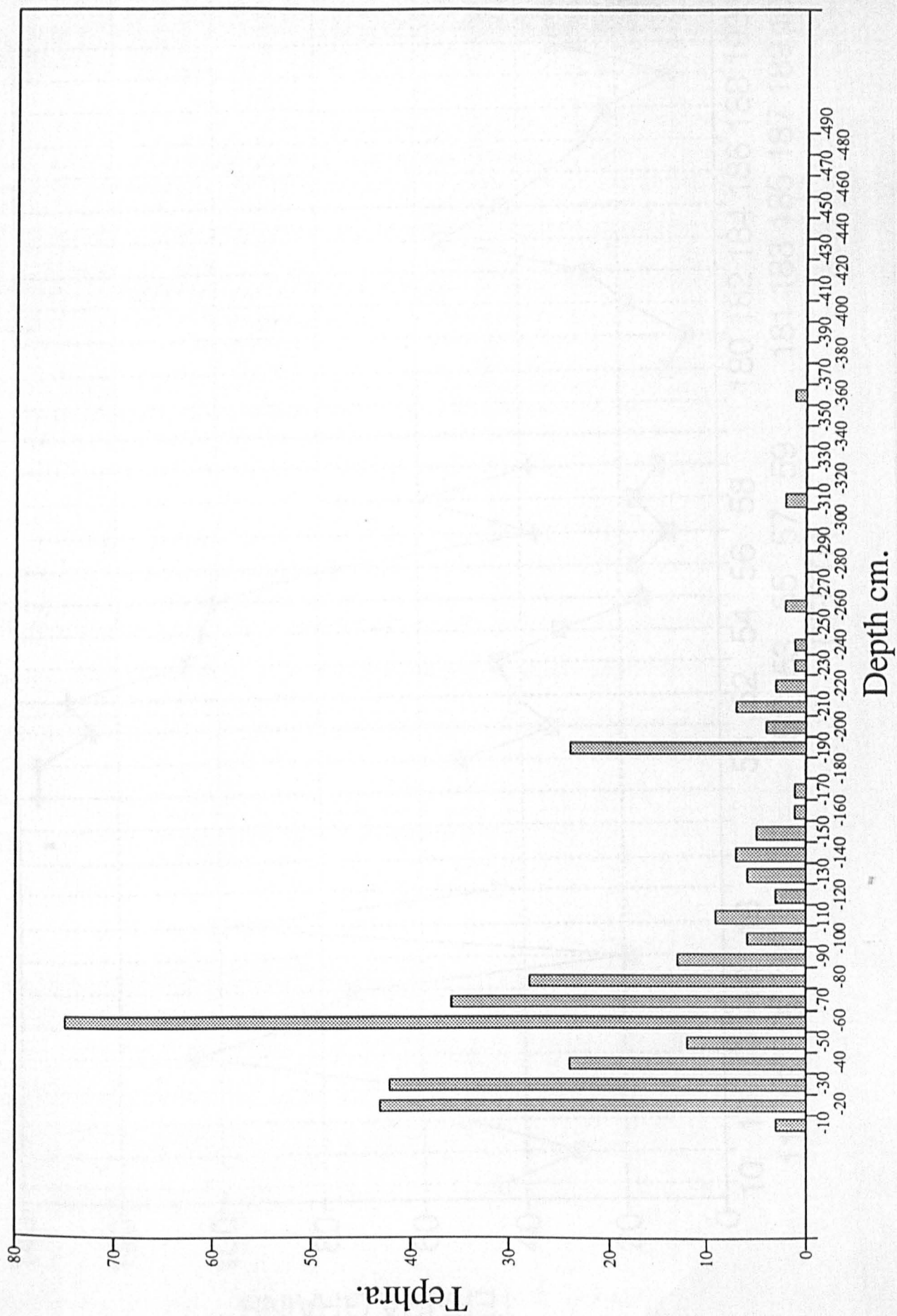


Figure 10.2. General tephra distribution, Strath of Kildonan.

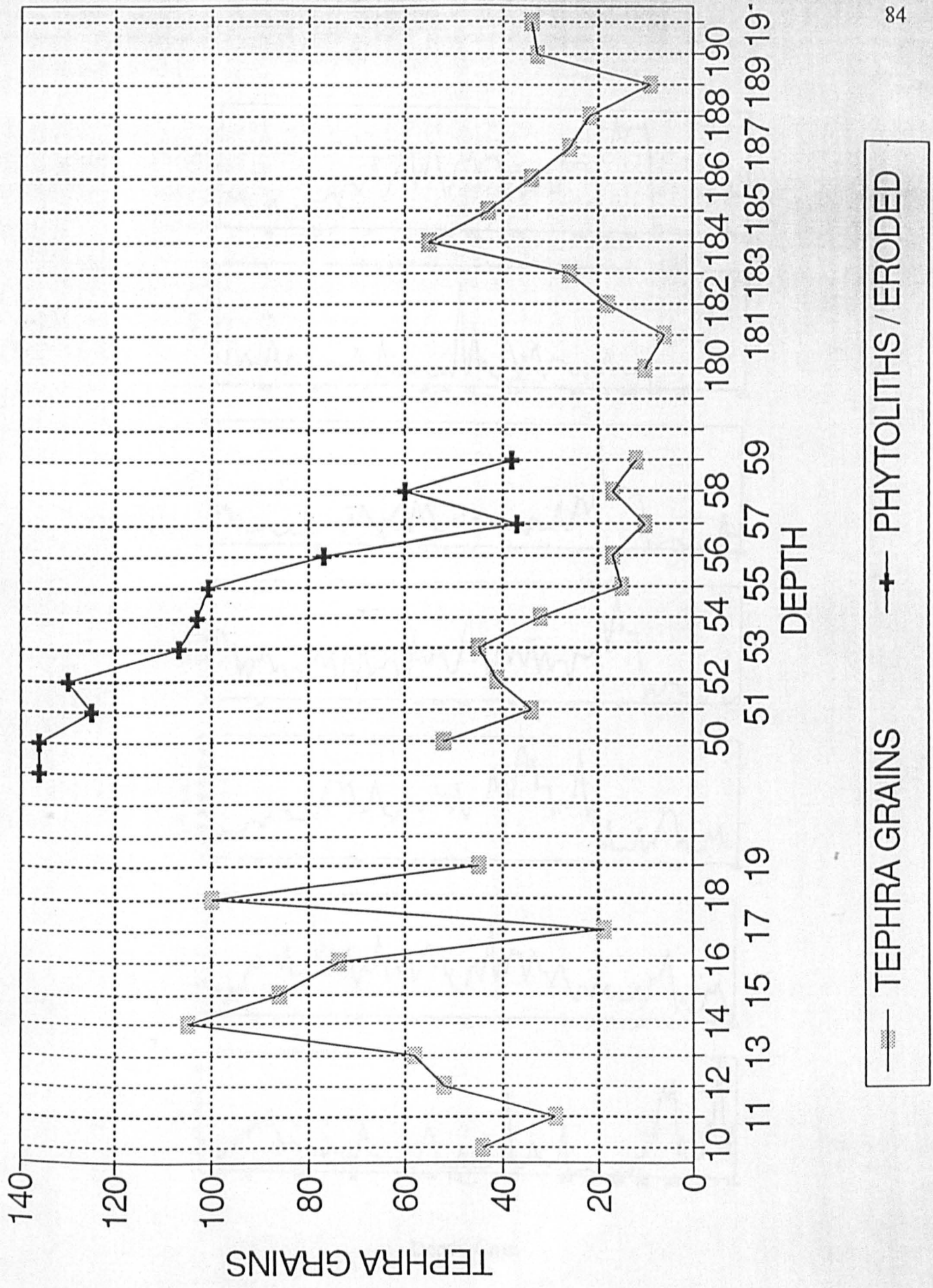


Figure 10.3. Detailed tephra distribution, Strath of Kildonan.

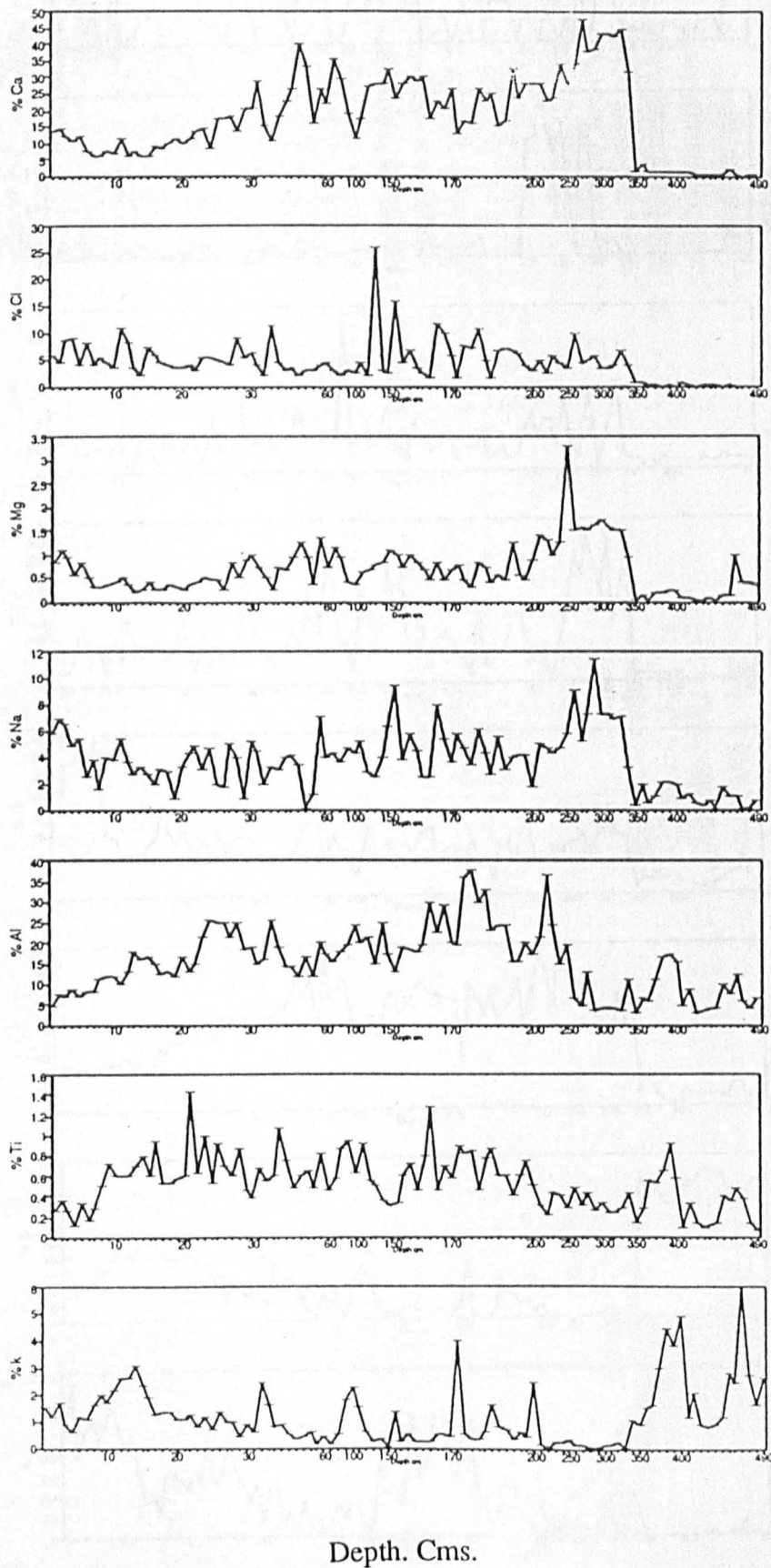


Figure 10.4a. Sediment Geochemistry, Strath of Kildonan.

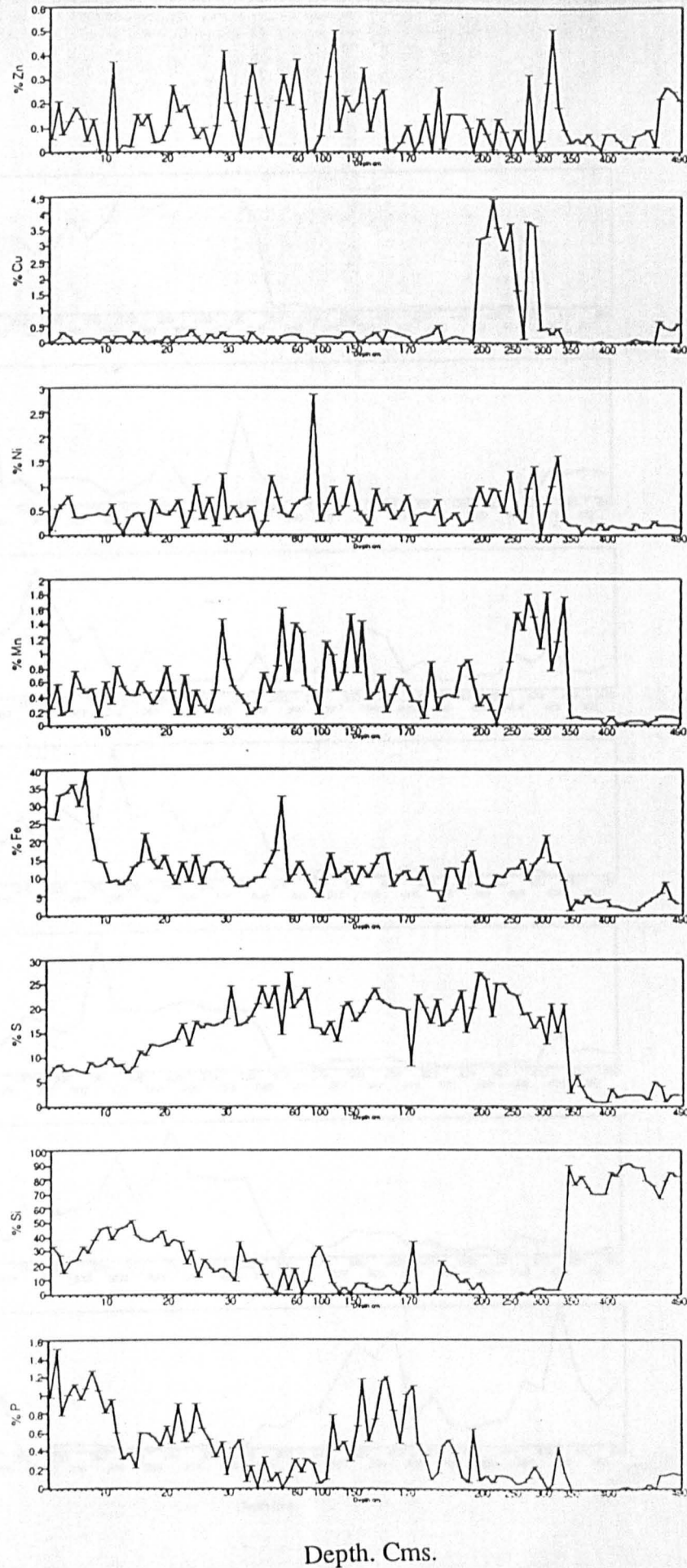


Figure 10.4b. Sediment Geochemistry, Strath of Kildonan.

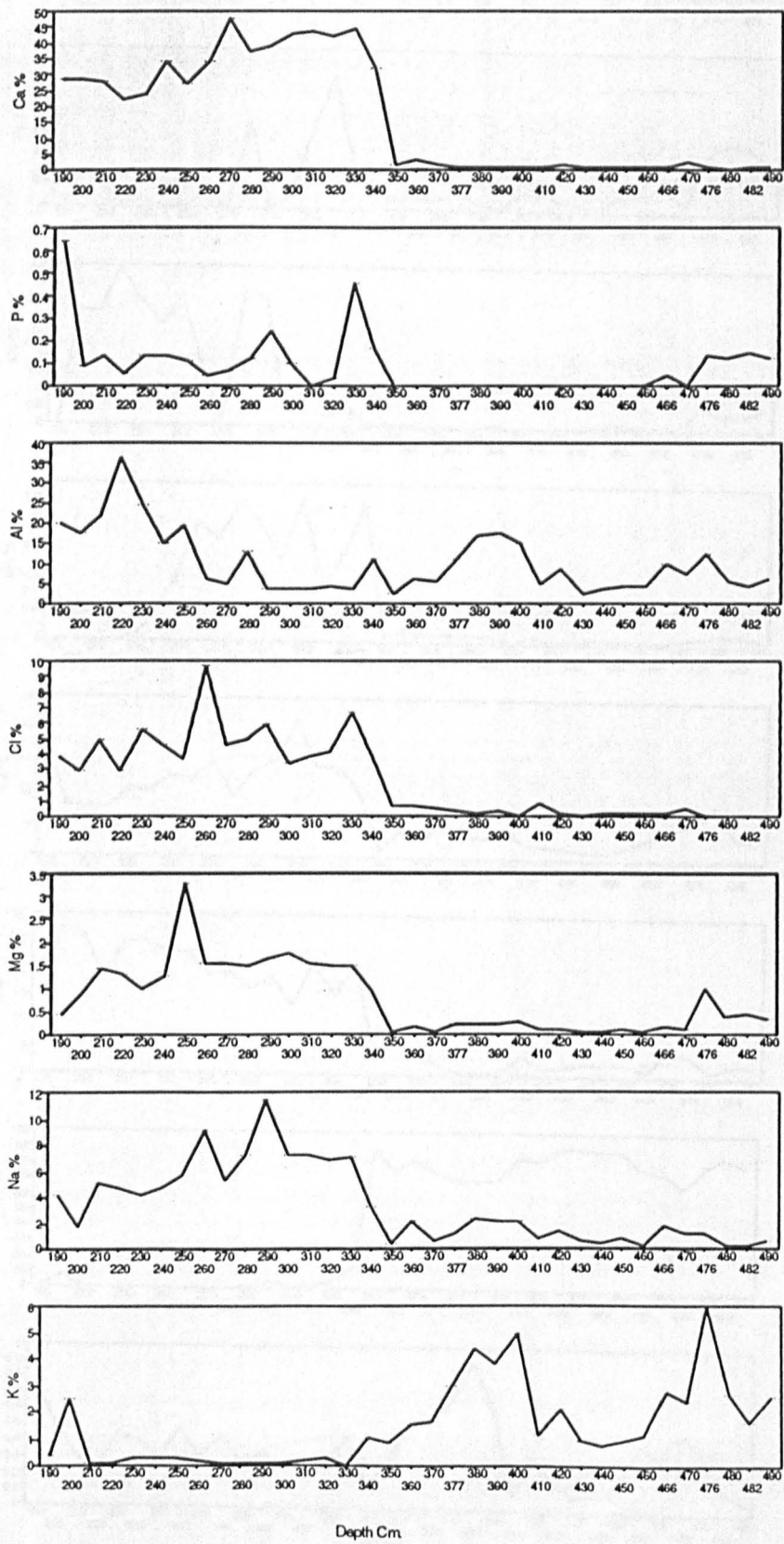
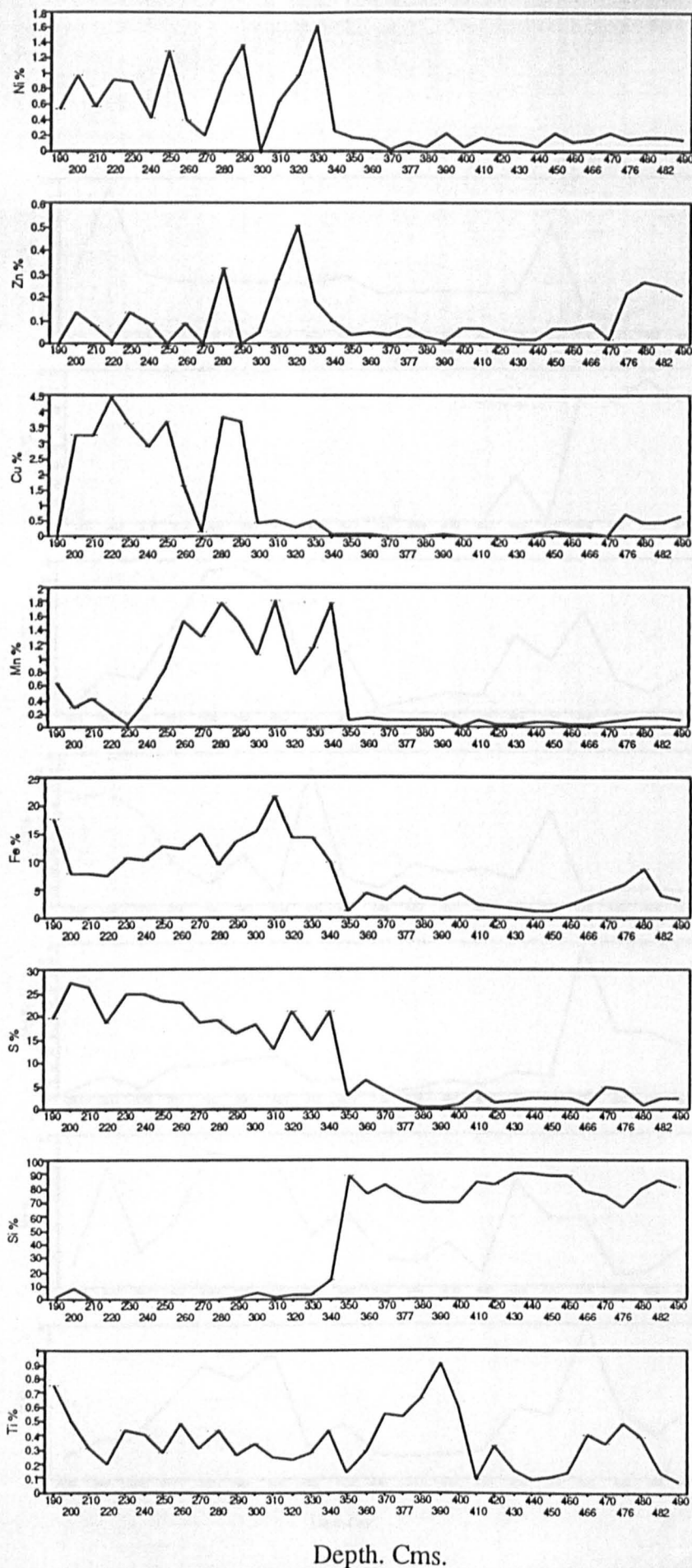


Figure 10.5a. Sediment Geochemistry. Chemizone KL1, Strath of Kildonan.



Depth. Cms.

Figure 10.5b. Sediment Geochemistry Chemizone KL1, Strath of Kildonan.

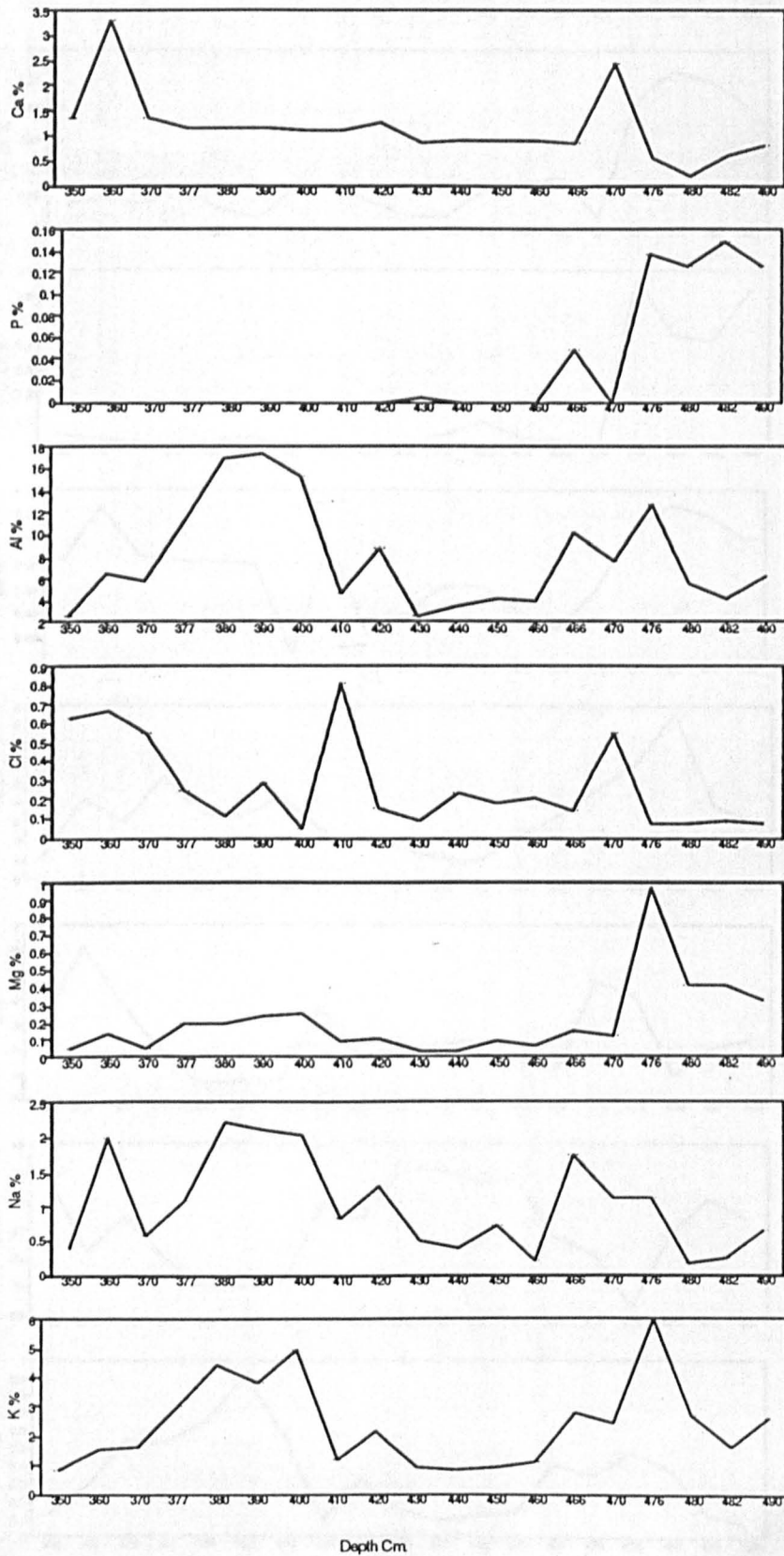


Figure 10.6a. Sediment Geochemistry Chemizone KL1a, Strath of Kildonan.

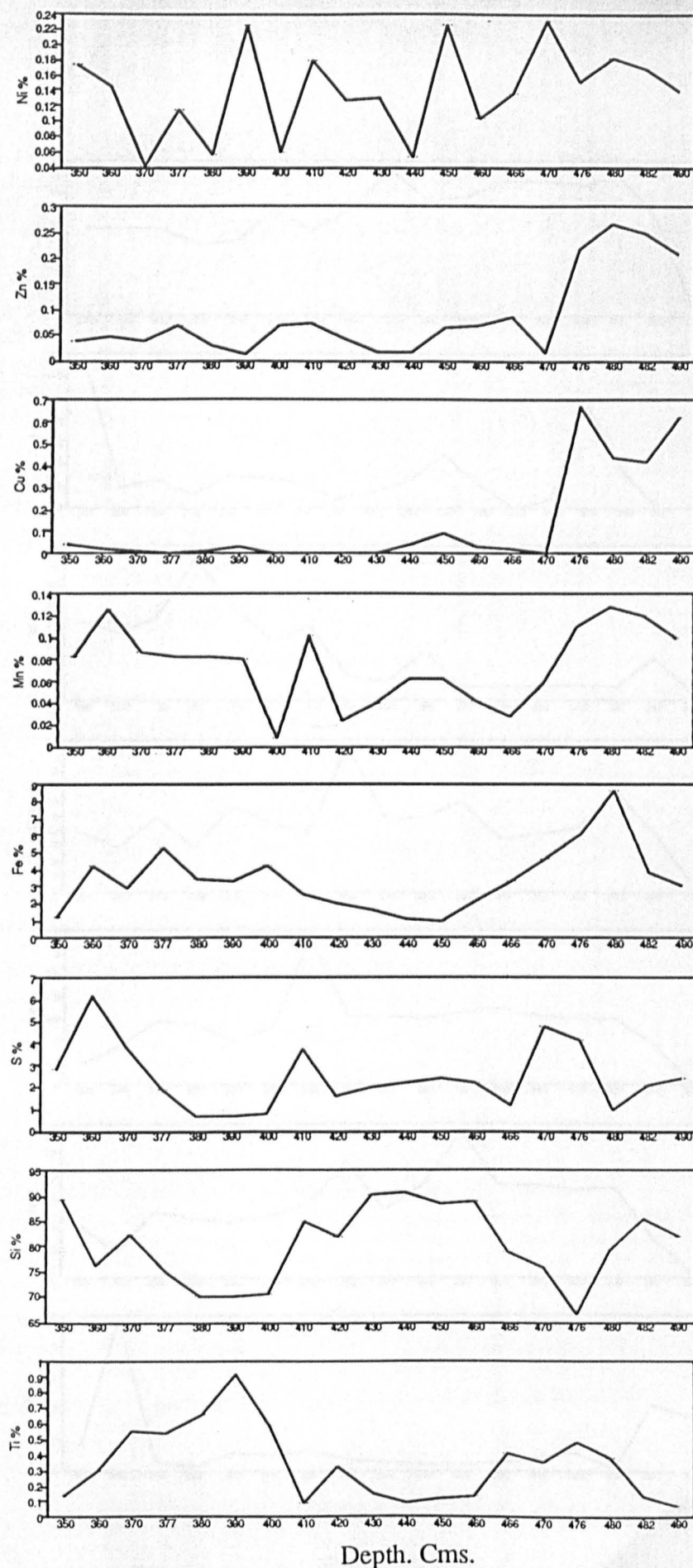


Figure 10.6b. Sediment Geochemistry Chemizone KL1a, Strath of Kildonan.

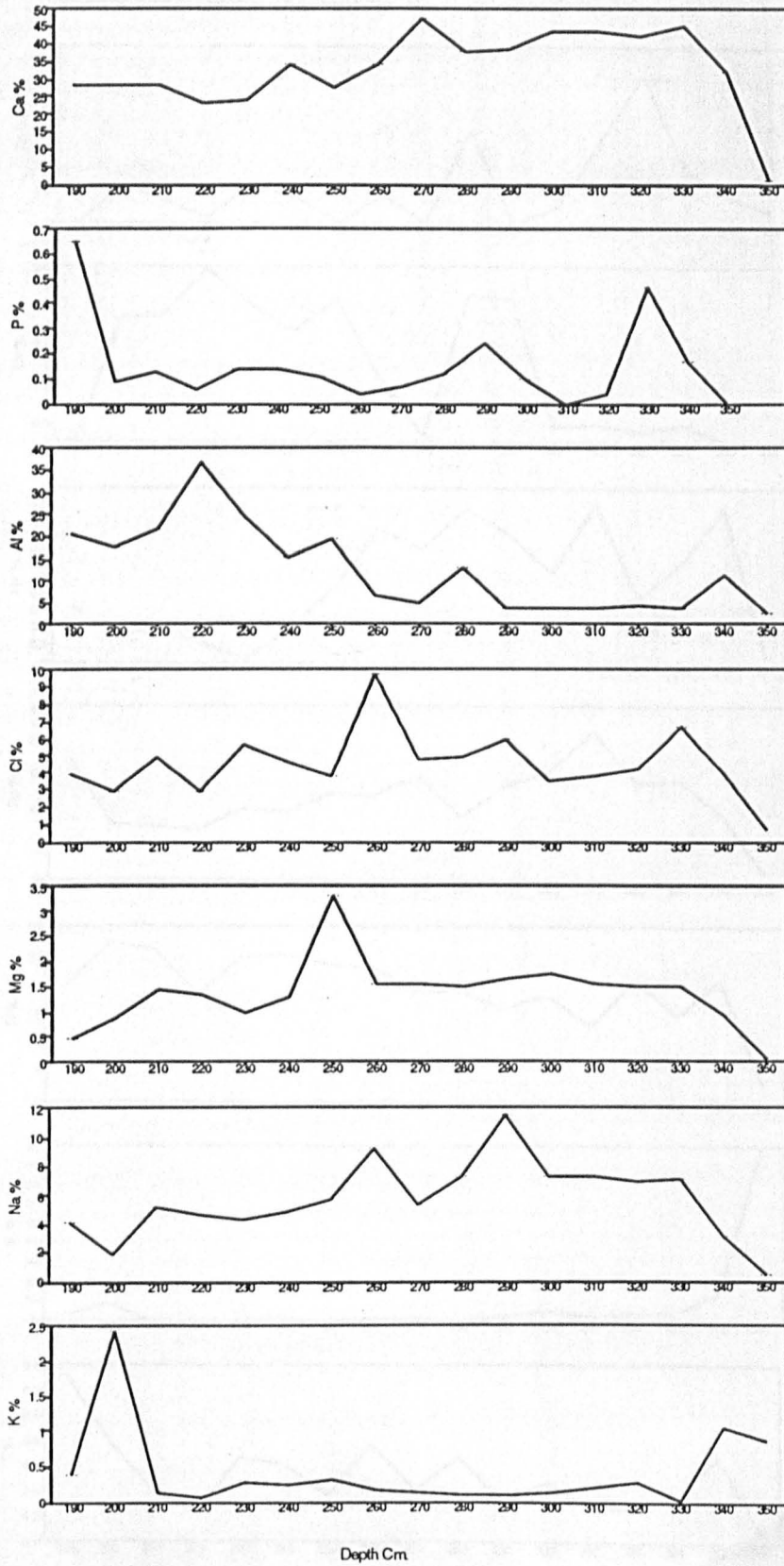


Figure 10.7a. Sediment Geochemistry Chemizone KL1b, Strath of Kildonan.

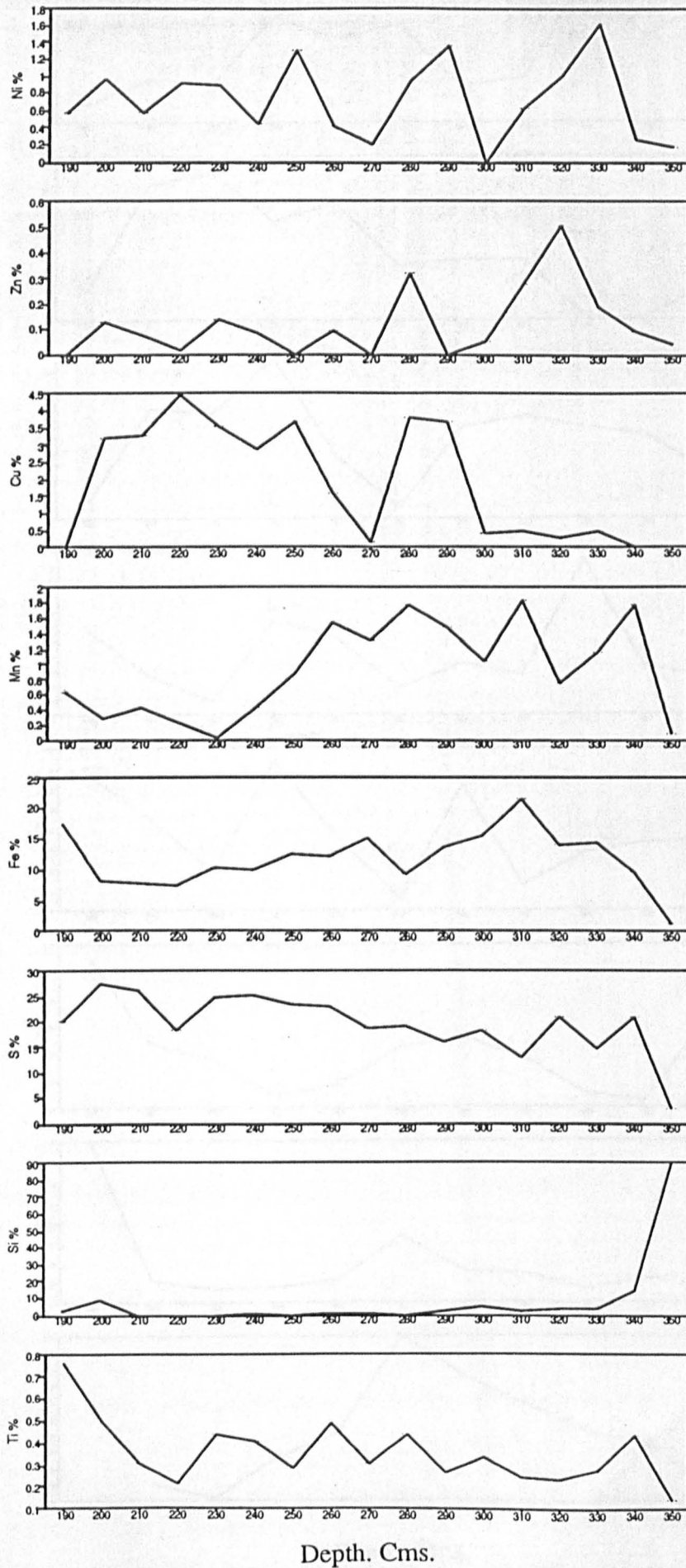


Figure 10.7b. Sediment Geochemistry Chemizone KL1b, Strath of Kildonan.

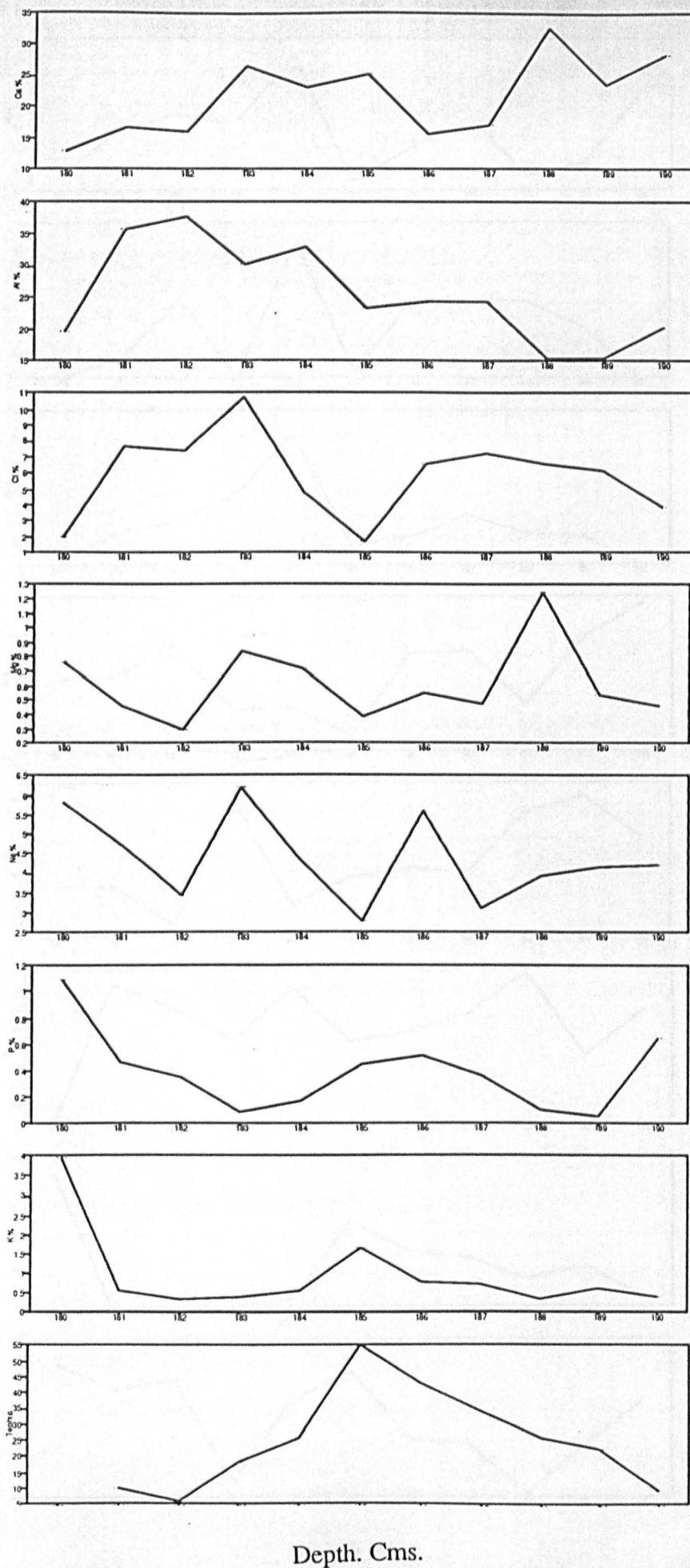


Figure 10.8a. Sediment Geochemistry Chemizone KL2, Strath of Kildonan.

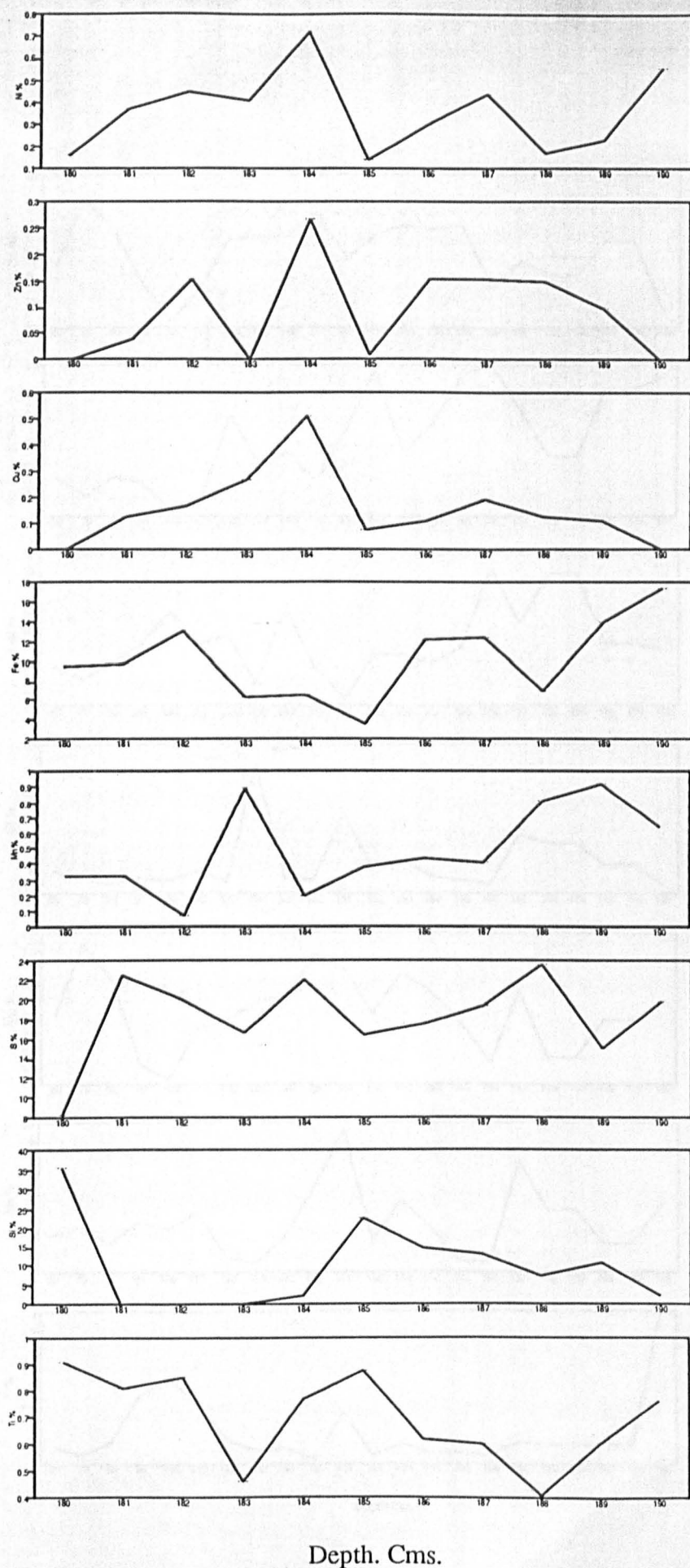


Figure 10.8b. Sediment Geochemistry Chemizone KL2, Strath of Kildonan.

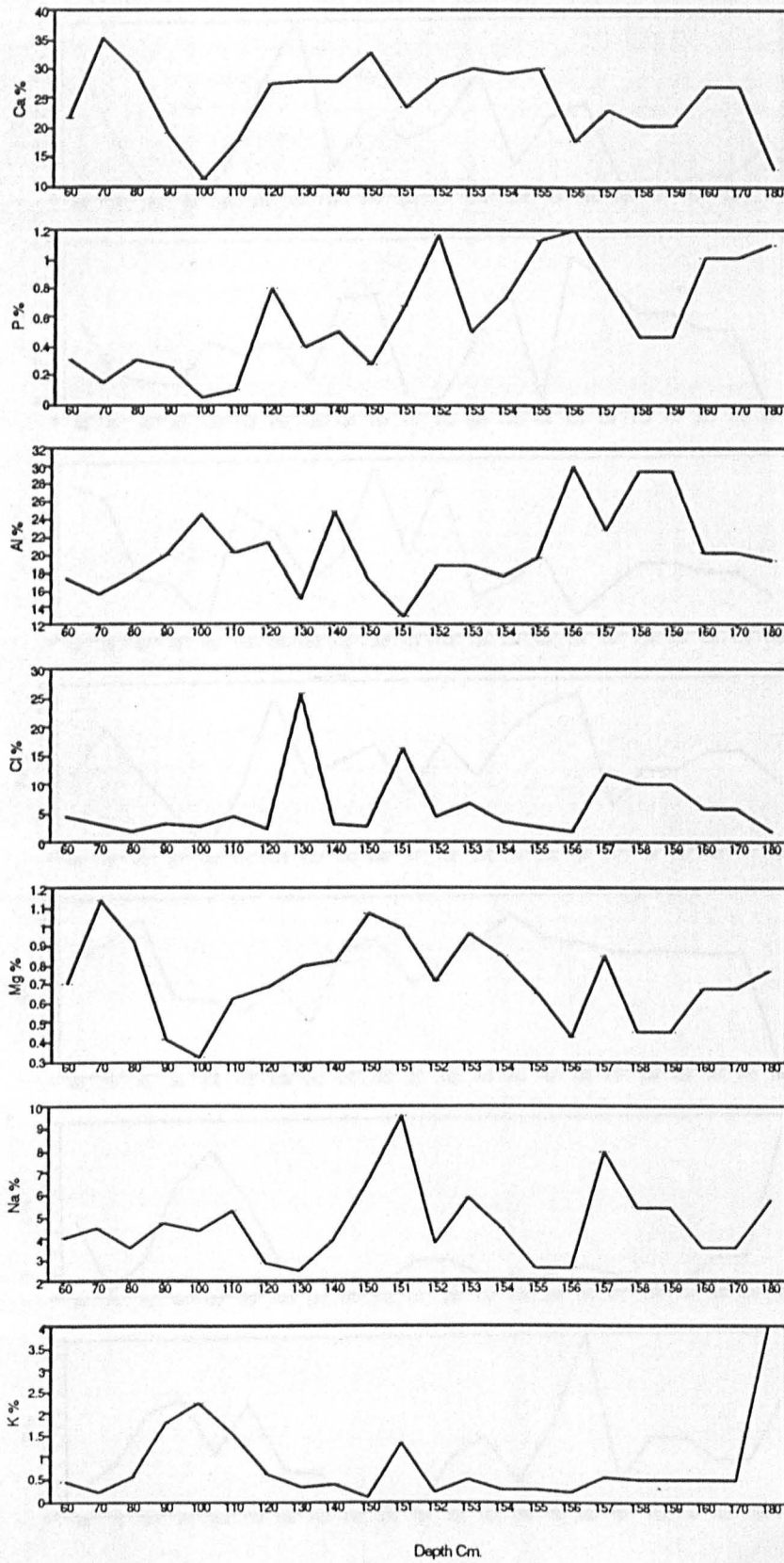


Figure 10.9a. Sediment Geochemistry Chemizone KL3, Strath of Kildonan.

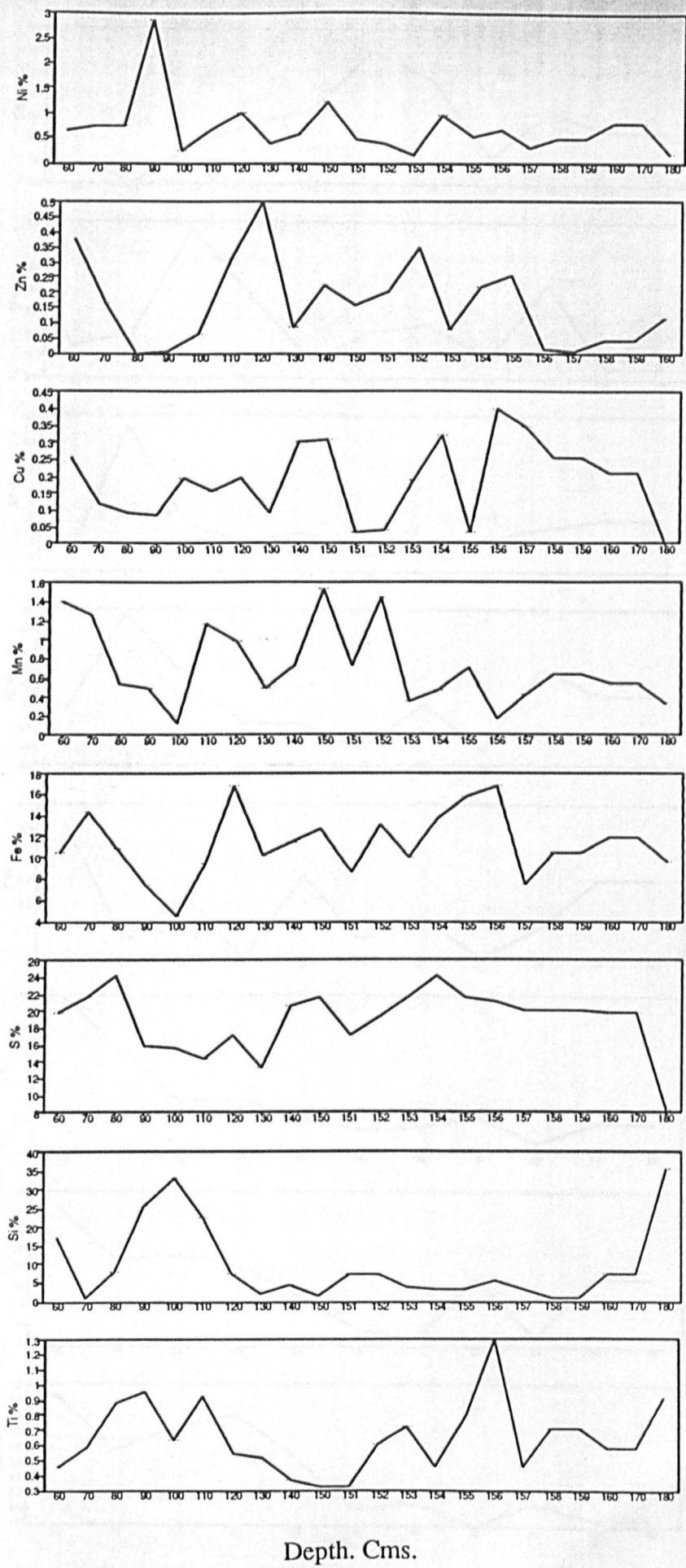


Figure 10.9b. Sediment Geochemistry Chemizone KL3 Strath of Kildonan.

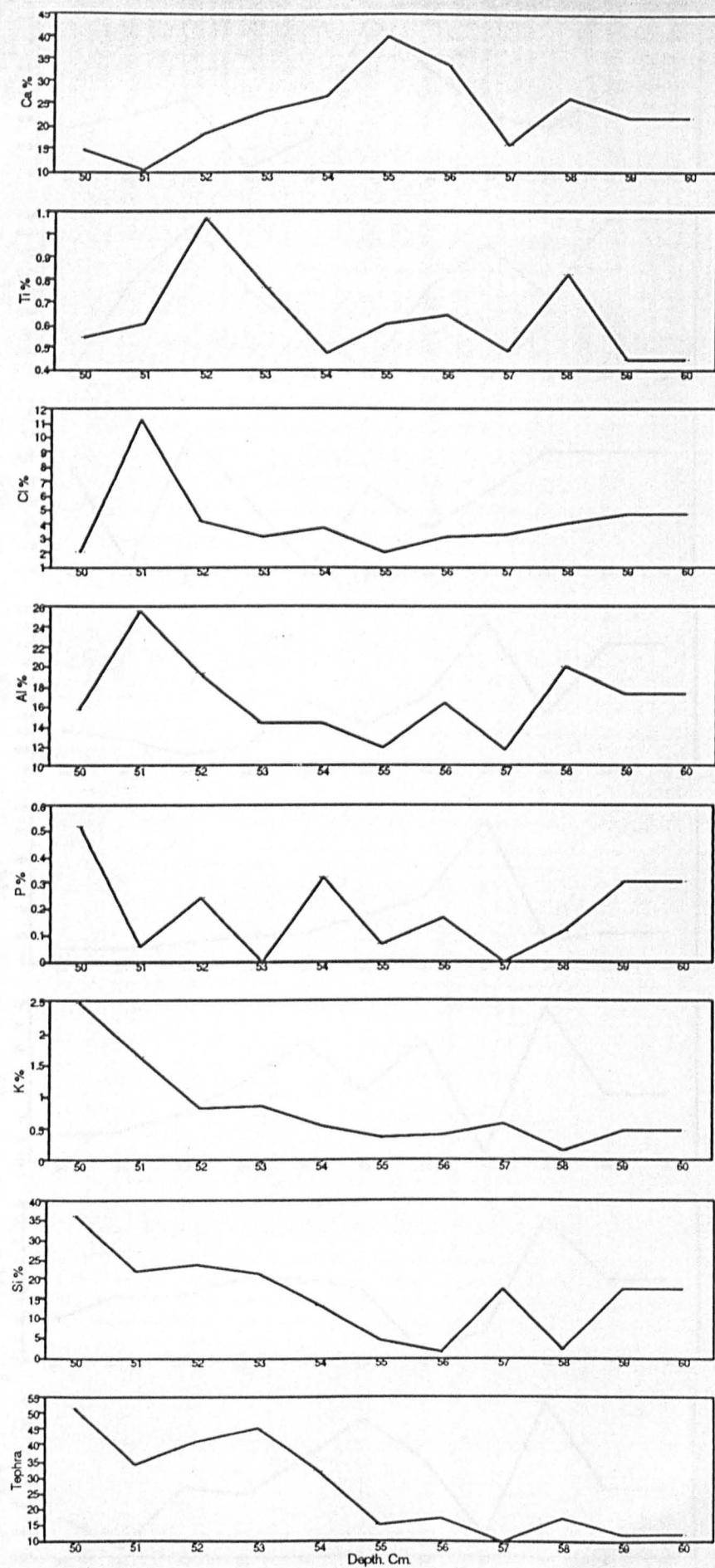


Figure 10.10a. Sediment Geochemistry Chemizone KL4, Strath of Kildonan.

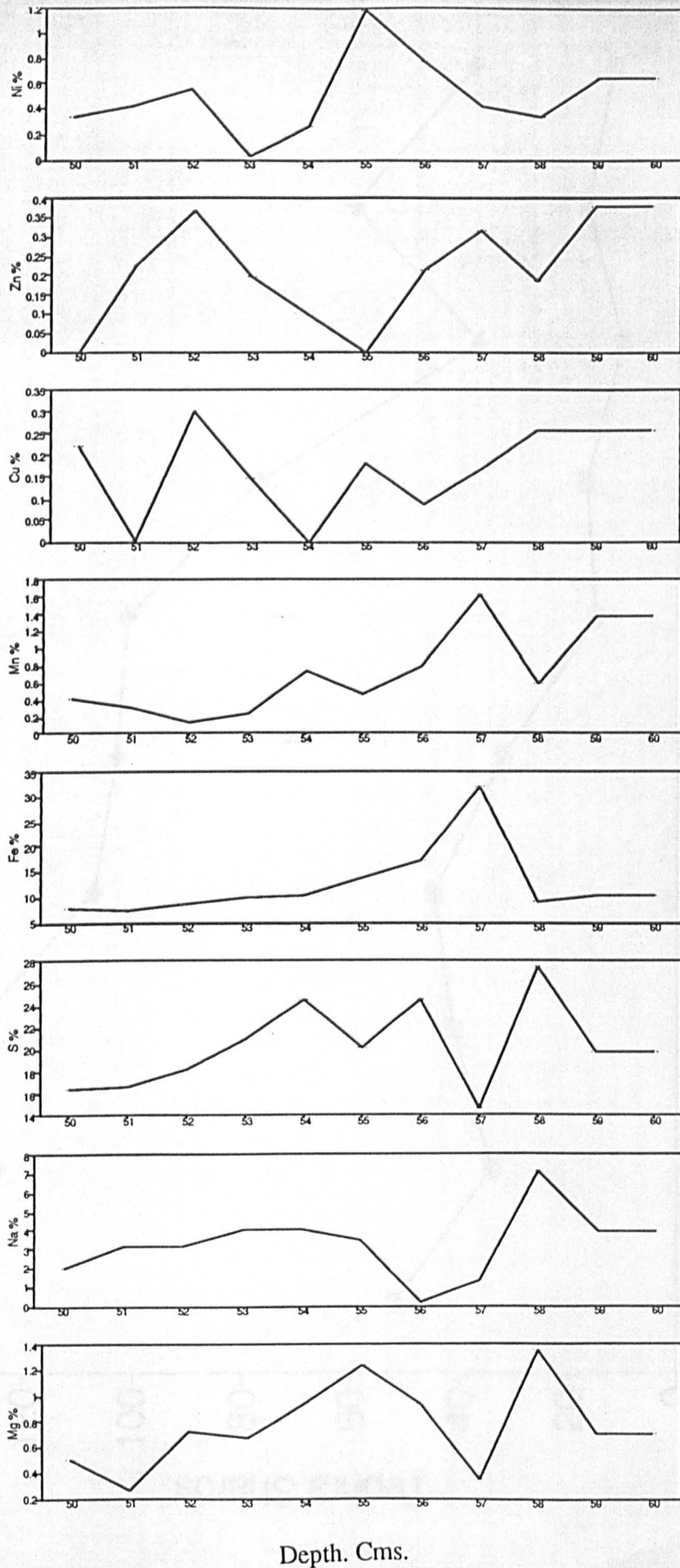


Figure 10.10b. Sediment Geochemistry Chemizone KL4, Strath of Kildonan.

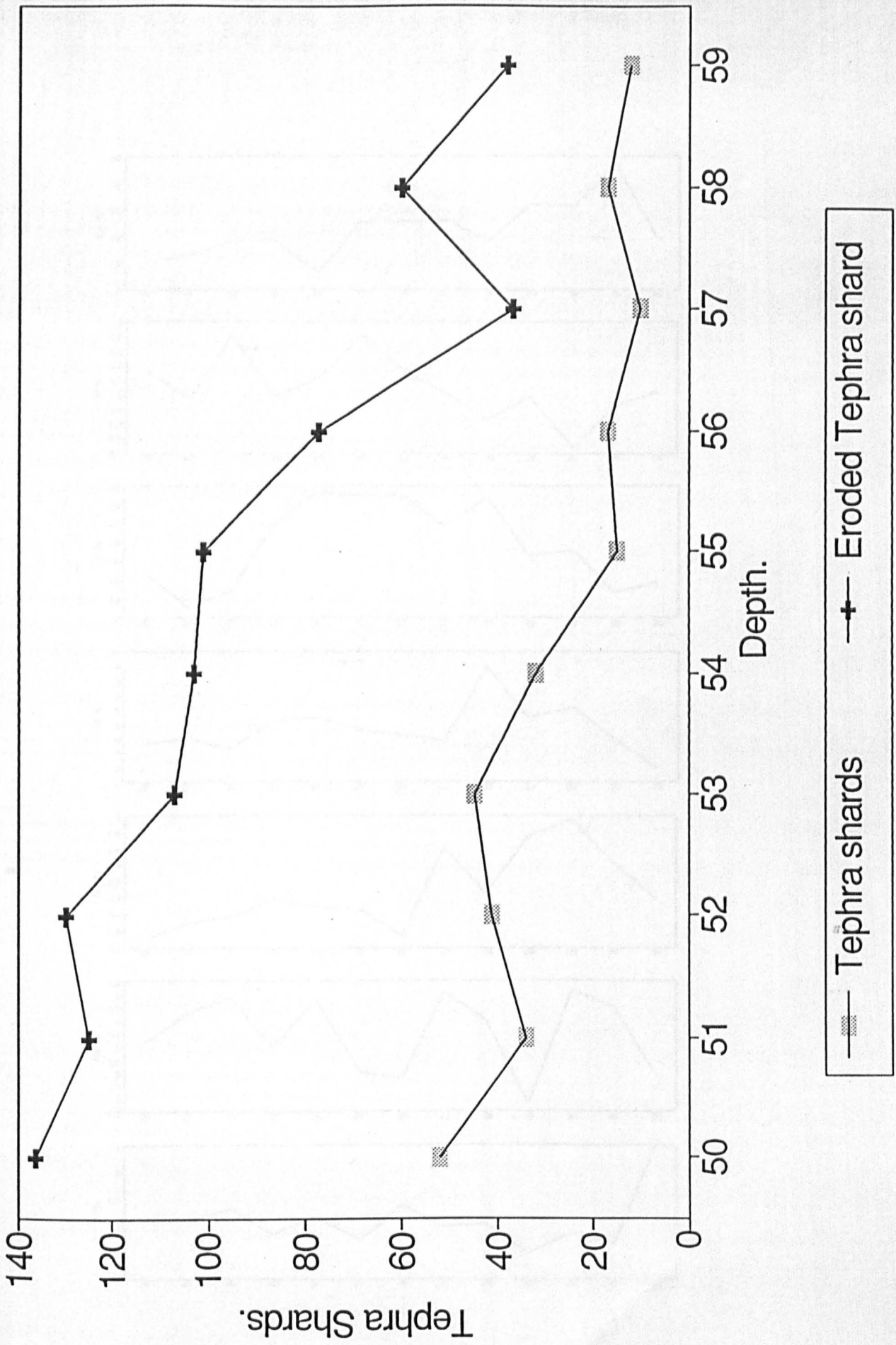


Figure 10.11. Tephra distribution in Chemizone KL4.

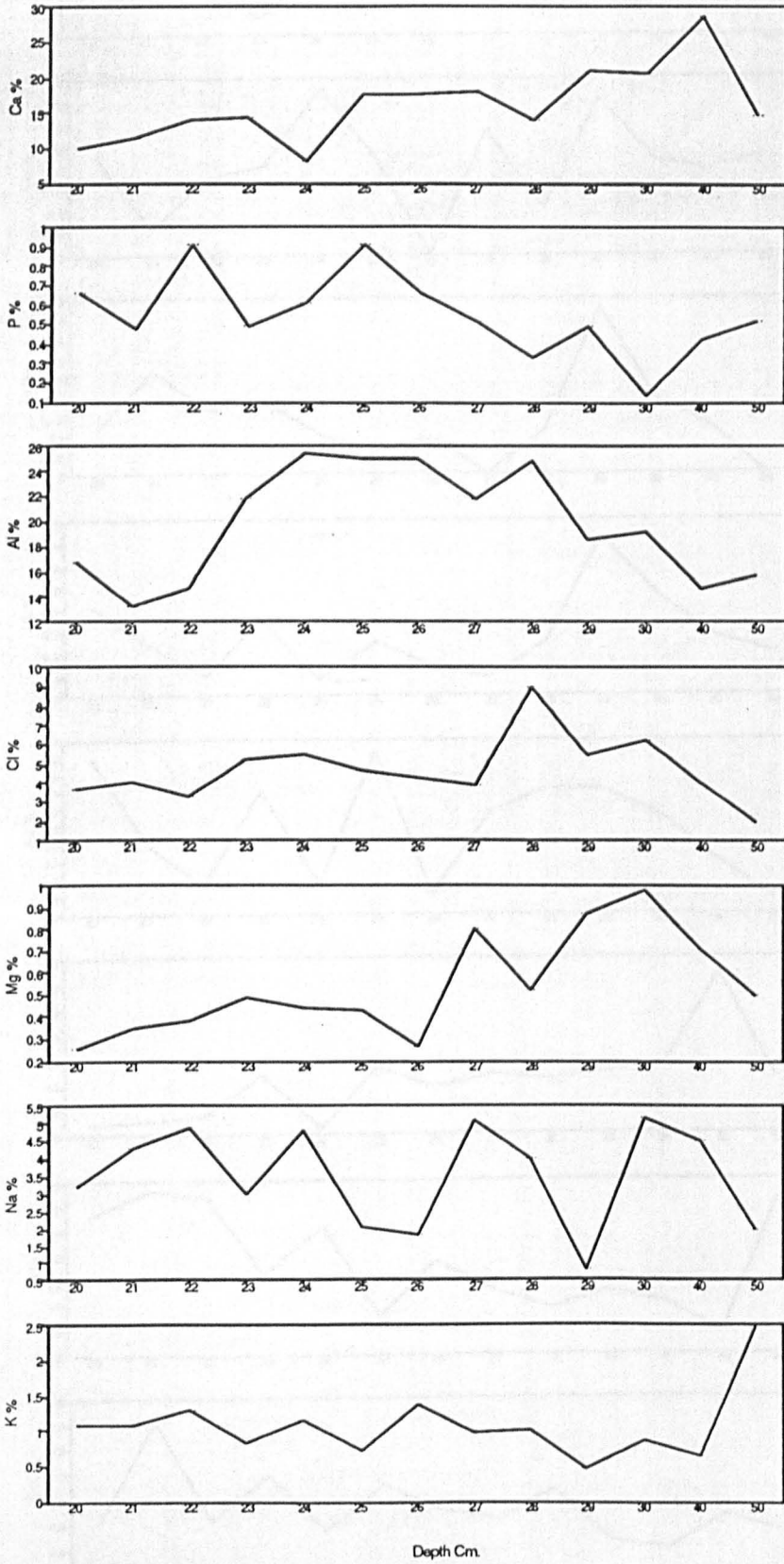


Figure 10.12a. Sediment Geochemistry Chemizone KL5, Strath of Kildonan.

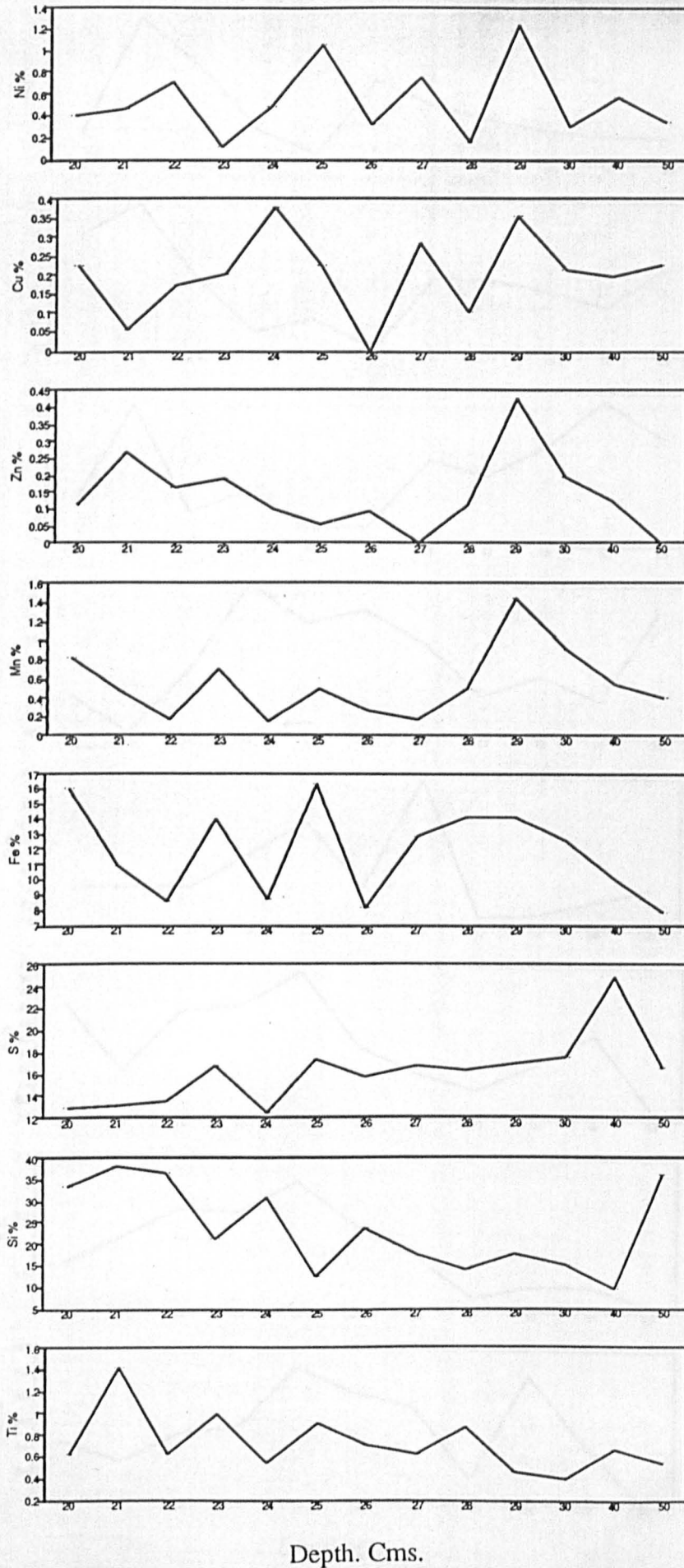


Figure 10.12b. Sediment Geochemistry Chemizone KL5, Strath of Kildonan.

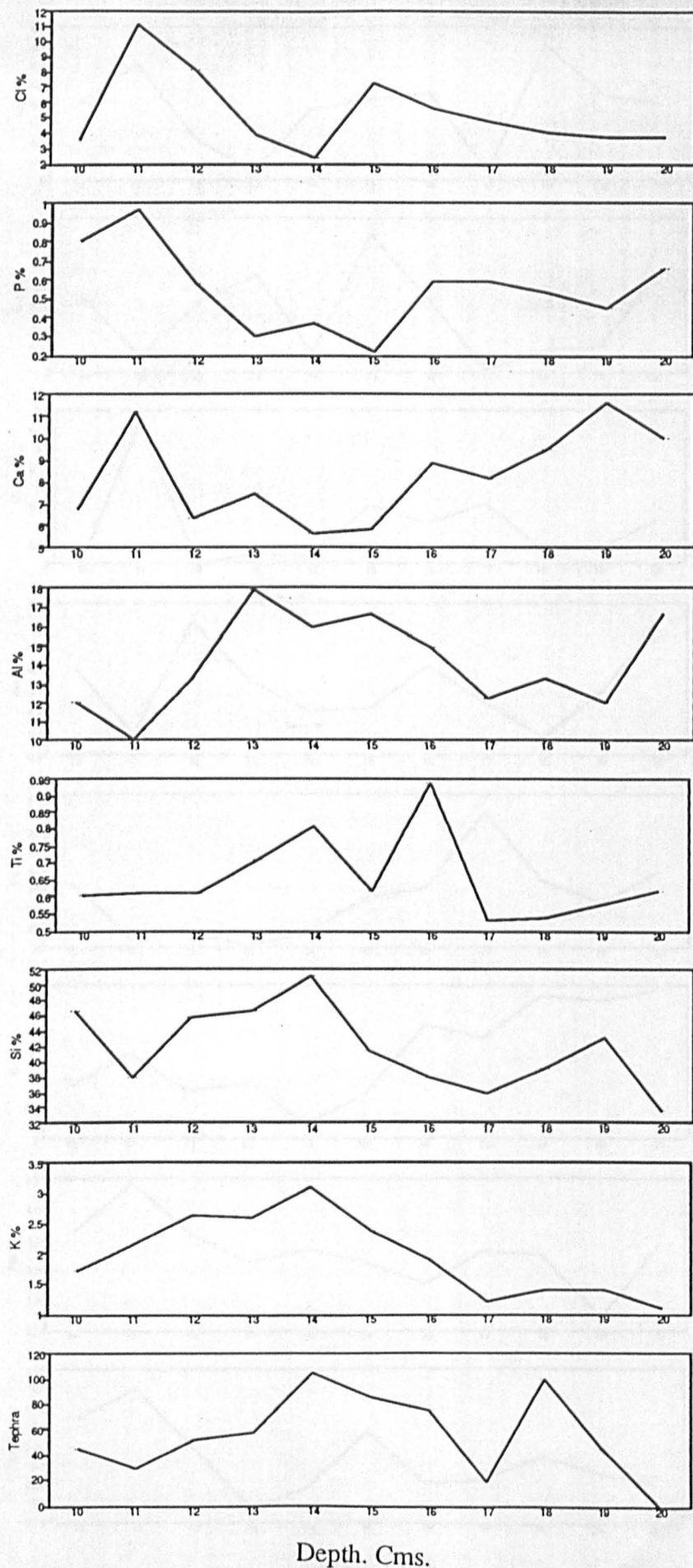


Figure 10.13a. Sediment Geochemistry Chemizone KL6, Strath of Kildonan.

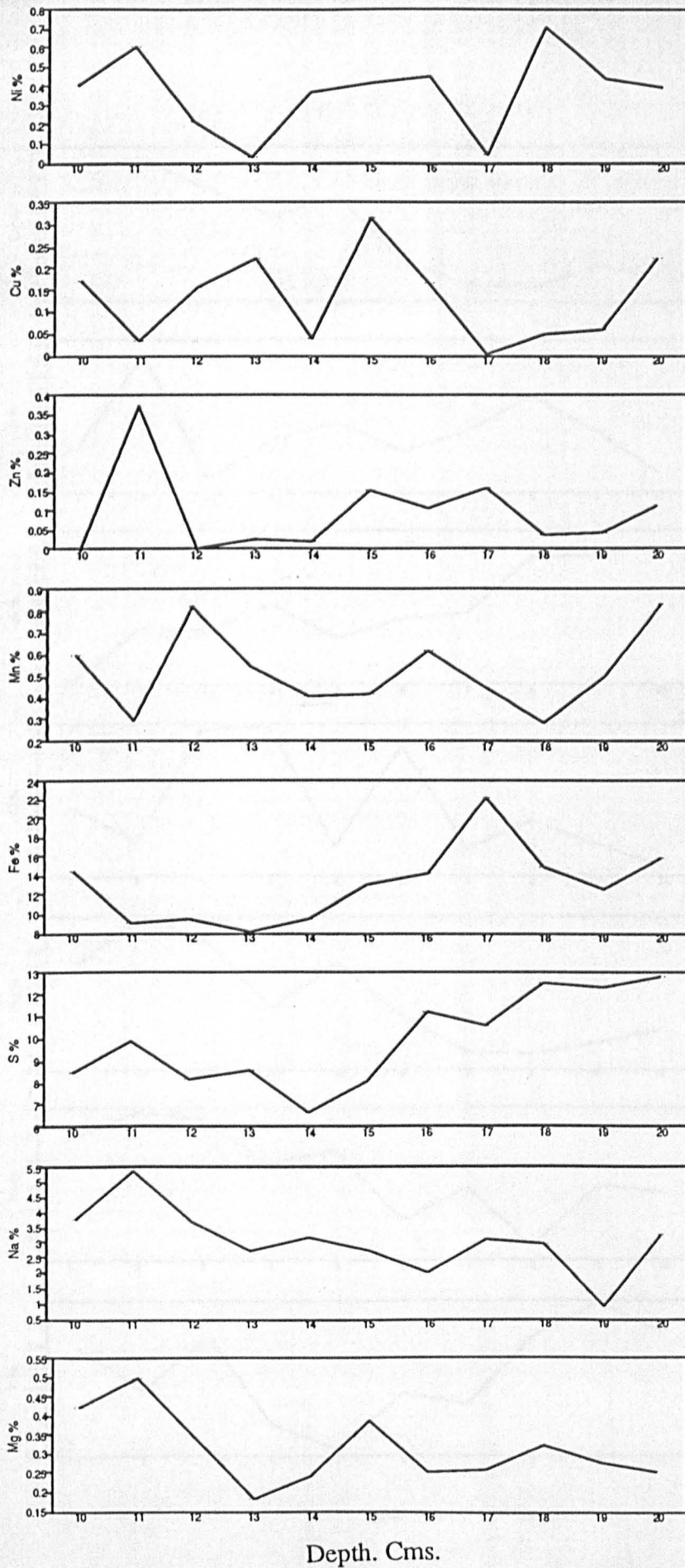


Figure 10.13b. Sediment Geochemistry Chemizone KL6, Strath of Kildonan.

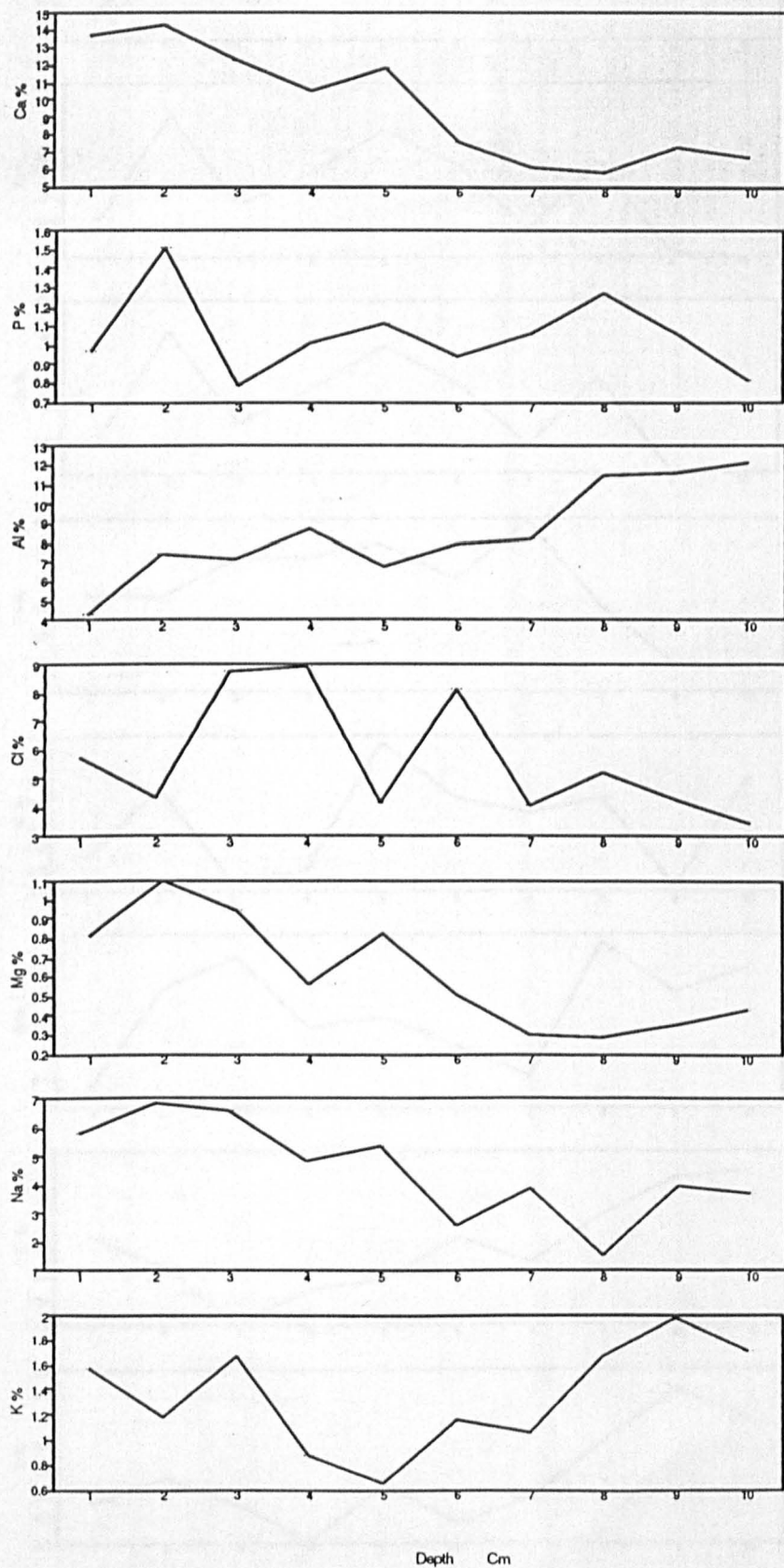


Figure 10.14a. Sediment Geochemistry Chemizone KL7, Strath of Kildonan.

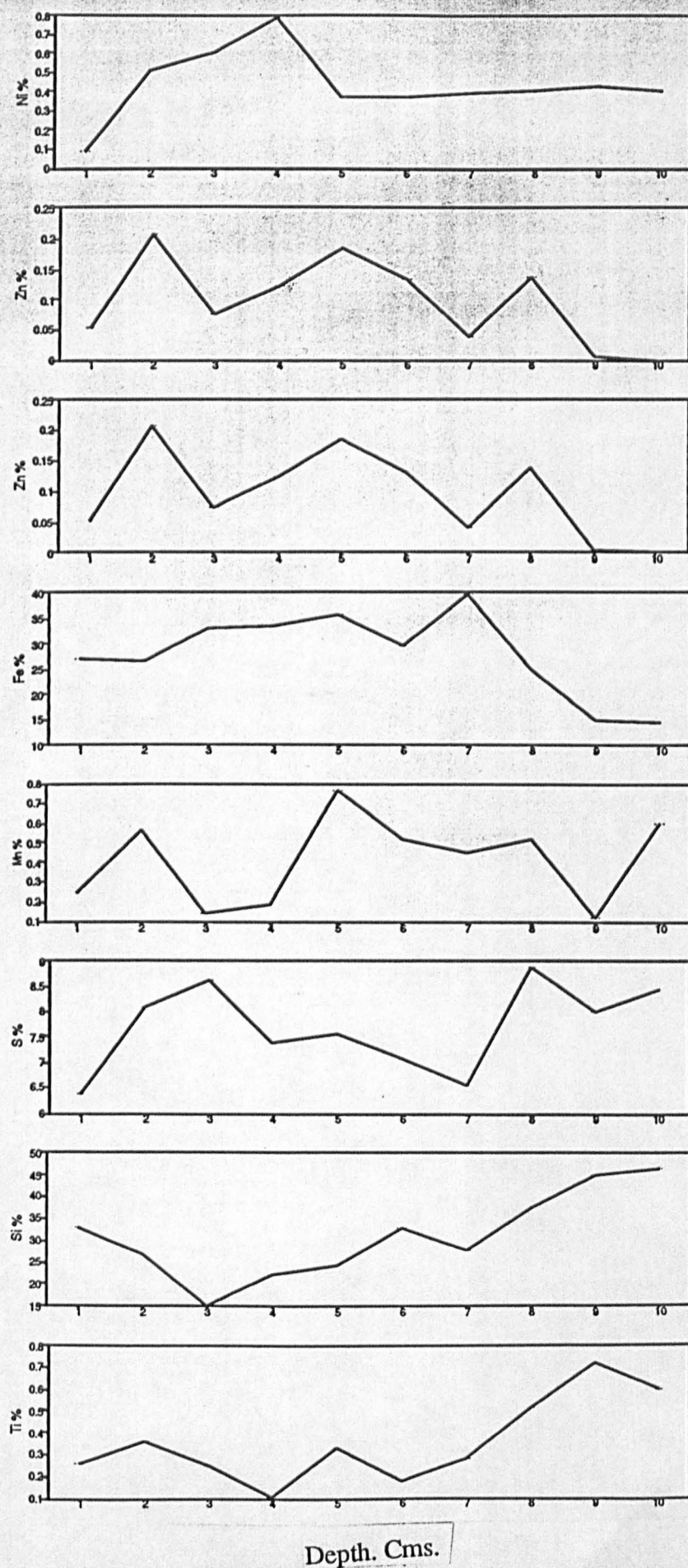


Figure 10.14b. Sediment Geochemistry Chemizone KL7, Strath of Kildonan.