Sedimentology of Arctic Fjords Experiment: HU 82-031 Data Report, Volume 1

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September 1983

Canadian Data Report of Hydrography and Ocean Sciences No. 12

Fisheries and Oceans
Pêches et Océans

Canada

Canadian Data Report Of Hydrography and Ocean Sciences

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Generally, the reports will contain raw and/or analyzed data but will not contain interpretations of the data. Such compilations will commonly have been prepared in support of work related to the programs and interests of the Ocean Science and Surveys (OSS) sector of the Department of Fisheries and Oceans.

Data Reports are produced regionally but are numbered and indexed nationally. Requests for individual reports will be fulfilled by the issuing establishment listed on the front cover and title page. Out of stock reports will be supplied for a fee by commercial agents.

Regional and headquarters establishments of Ocean Science and Surveys ceased publication of their various report series as of December 1981. A complete listing of these publications and the last number issued under each title are published in the *Canadian Journal of Fisheries and Aquatic Sciences,* Volume 38: Index to Publications 1981. The current series began with Report Number 1 in January 1982.

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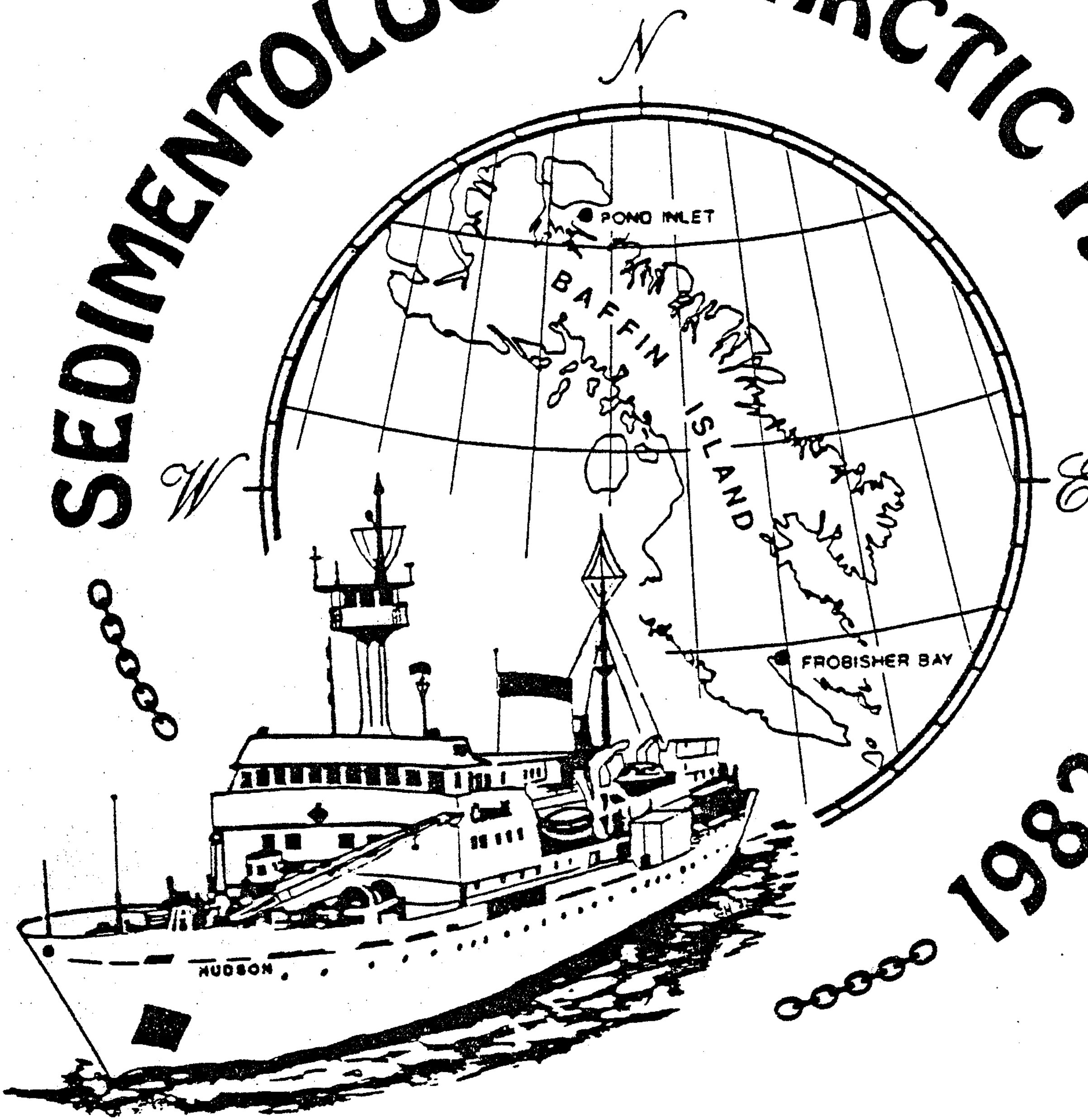
Ces rapports servent de véhicule pour la compilation et la diffusion des données sous une forme directement utilisable par les scientifiques et les techniciens.

En général, les rapports contiennent des données brutes ou analysées mais ne fournissent pas d'interprétations des données. Ces compilations sont préparées le plus souvent à l'appui de travaux reliés aux programmes et intérêts du service des Sciences et Levés océaniques (SLO) du ministère des Pêches et des Océans.

Les rapports statistiques sont produits à l'échelon régional mais sont numérotés et placés dans l'index à l'échelon national. Les demandes de rapports seront satisfaites par l'établissement auteur dont le nom figure sur la couverture et la page de titre. Les rapports épuisés seront fournis contre rétribution par des agents commerciaux.

Les établissements des Sciences et Levés océaniques dans les régions et à l'administration centrale ont cessé de publier leurs diverses séries de rapports depuis décembre 1981. Vous trouverez dans l'index des publications du volume 38 du *Journal canadien des sciences halieutiques et aquatiques,* la liste de ces publications ainsi que le dernier numéro paru dans chaque catégorie. La nouvelle série a commencé avec la publication du Rapport n^{o} 1 en janvier 1982.

SEDIMENTOLOGY OF ARCTIC FJORDS



1982

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compiled by

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Also issued as Geological Survey of

Canada Open File No. 960.

ACKNOWLEDGEMENTS

The scientific collection, analyses and publication of data contained in this report is credited to support from the following organizations: The Department of Energy Mines and Resources (GSC/AGC), the Department of Fisheries and Oceans, the Department of Environment , the Natural Science and Engineering Council of Canada, the U.S. National Science Foundation, the Association of Canadian Universities for Northern Studies, Newfoundland Institute for Cold Ocean Sciences, the Institute of Arctic and Alpine Research and the U.S. National Oceanographic and Atmospheric Administration.

Cat. No. Fs 97-16/12E ISSN 0711 - 6721

Correct citation for this publication:

Syvitski, J.P.M. and Blakeney, C.P. (Compilers) 1983. Sedimentology of Arctic Fjords Experiment: HU 82-031 data report, Volume 1. Can. Data Rep. Hydrogr. Ocean Sci. No. 12 : 935 p.

ABSTRACT

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This is the first report in a series on the Sedimentology of Arctic Fjords Experiment (Geological Survey of Canada project 810042). The data are reported in 20 chapters: 35 scientists participated in the project.

SUMMAIRE

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Le rapport est le premier d'une série au sujet de l'Expérience sur la Sédimentologie des Fjords de l'Arctique (Commission Géologique du Canada, projet 810042). On rapporte les donneés dans 20 chapitres: 35 hommes de science ont participés dans le projet.

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PREFACE

The enclosed 900 page volume is the first data output of the Sedimentology of Arctic Fjords Experiment (SAFE), or Geological Survey of Canada project 810042. SAFE is a comprehensive study on the climatology, hydrography, physical oceanography, sediment dynamics, stratigraphy and animal-sediment relationship in arctic fjords. The data is based on information and samples collected during the first of three sister cruises to Baffin Island fjords. The cruise took place between September 9 and September 24, 1982, during the narrow weather window of ice-melt and ice-freeze (for cruise details see Cruise Report: C.S.S. HUDSON 82-031 by J.P.M. Syvitski; GSC Open file report 897). The enclosed data report was completed 10 months after the cruise: a timeframe that boasts of participant enthusiasm as well as the need to compensate for the geographical scatter of the 35 contributing scientists (Universities of Memorial, Glasgow, Queens, Lakehead, Alberta, Simon Fraser, British Columbia, Washington, Institute of Arctic and Alpine Research and the Canadian Federal Departments of Environment Canada (NHRI), Fisheries and Oceans(HSC, MEL, AOL) and Energy, Mines and Resources (GSC)).

All chapters/reports indicate that more data is still to come and other Universities and Institutes will also be contributing to future SAFE volumes. Still, this report is thorough in its indication of the participants' specific objectives, methods and initial results. As C.T. Schafer has ably pointed out in his introduction, Arctic fjords are a fascinating scientific frontier.

We wish to express our appreciation to the many unnamed draftsmen, photographers and support staff who more than adequately met their responsibilities. We are indebted to Captain F. Mauger and his officers and crew for their professional support on the cruise. Finally, C.T. Schafer, cruise chief scientist, deserves special praise for his effort at bringing together the scientists and HUDSON crew into an enjoyable working unit.

J.P.M. Syvitski, Project Leader

C.P. Blakeney, Project Co-ordinator

INTRODUCTION

Fjords are both an interface and a buffer between continents and oceans. They represent environments in which the impact of seasonal and long term climatic variations on the rates of geological processes, and on the development of local marine plant and animal populations, can be expected to be relatively pronounced. These characteristics enhance their potential as field laboratories for investigating problems in sedimentology, and as a source of highly resolvable stratigraphic records for earth scientists investigating the interrelationships between atmosphere, continent and ocean. The Baffin Island fjords are of special interest because their climatological setting modulates analogs of postglacial sedimentary processes and ecological systems that have long ceased to be dominant in the more southerly parts of the Canadian landmass.

The participants in project SAFE (Sedimentology Arctic Fjords Experiment) include representatives from university departments and government agencies that have an interest in elucidating our understanding of the relationship between Arctic climates, landscapes and marine ecosystems. The data set included in this report represents the initial output of their first multidisciplinary cruise to a suite of ten Baffin Island fjords that took place during the autumn of 1982 (Hudson 82-031). The suite included fjords with a range of drainage basin size, glacier development, tidal conditions, delta morphologies, sediment inputs, maximum water depth, and number and depth of sills. Together, they reflect a spectrum of contrasting conditions that have the potential to yield new scientific understandings that should result in a more accurate and complete interpretation of the significance of older glacial deposits that have been recognized at many locations along Canada's east coast and adjacent continental margin.

The Hudson departed from the Bedford Institute during the summer of 1982 filled to the brim with geological and oceanographic hardware that was ultimately deployed and recovered successfully with the aid of the ship's crew and officers. Although the original operational plan called for a survey of Pangnirtung Fiord, this inlet had to be cancelled because of impassible ice conditions; Sunneshine Fiord was substituted as an example of an Arctic inlet with a comparatively large tidal range (4m). Other survey target fjords included Coronation, Maktak, Tingin, Iterbilung, Mcbeth, Inugsuin, Clark, and Cambridge; these were visited between the 10th and 22nd of September. Nedlukseak was originally part of this suite but had to be replaced by North Pangnirtung because of a medivac problem that required a change in the cruise track.

The investigative strategy in each fjord usually involved an up-fiord axial survey of fjord basins and their sediment deposits using side scan sonar and Huntec and air gun reflection seismic methodologies. The station work carried out on the down-fiord transect involved CTD/SPM profiling, grab sampling, plankton sampling, piston/LeHeigh coring, and bottom photography operations at predesignated stations to aid in characterizing watermasses, sediments and benthic invertebrate populations including foraminifera. Surveys at fiord heads utilized scientific parties that were landed by small boat. These operations were augmented by concurrent scientific launch (Grebe and Gull) activities of an oceanographic, geologic and hydrographic nature; launch operations supplimented the data being acquired by the Hudson in the deeper offshore environments. In total, more than 100 grabs/cores were raised and 59 CTD casts, 22 camera stations, 20 plankton tows, 17 radiochemical (water) casts, and six nephelometer profiles were completed on the Hudson itself. The particulars of these samples are documented in the Hudson 82-031 cruise report (Syvitski, 1982, GSC Open File) and in Appendix I.

One of the more specialized activities involved an investigation of a polyna at the head of Cambridge fjord. The polyna is maintained during the winter months by a submarine fresh groundwater discharge that is channeled through a fjord head delta deposit aquifer which is believed to extend to a nearby lake. A Polar Continental Shelf Project heliocopter was used to install a time-lapse camera system on the side of an adjacent mountain to monitor the size of the polyna during the winter of 82/83. CTD profiling acoustic/monitoring techniques were employed at the submarine freshwater discharge site by anchoring the Grebe over this position.

The success of the 1982 SAFE effort was in no small part related directly to the interdisciplinary character of the scientific team and to the unrelenting enthusiasm of technical and ship's support personnel. Drs. J. Syvitski (GSC), R. Gilbert (Queens Univ.), C. Schafer (GSC), and F. Hein (Univ. Alberta) focused their efforts on the sedimentological, geophysical, geomorphological, geotechnical, geochemical, and ecological aspects of the program.Their collaborators included B. Maclean (GSC), G. Winters (GSC), J. Stravers (INSTAAR), G. Rodgers (CHS), G. Hodge (Univ. B.C.). Technical support was provided by R. Murphy (GSC), C. Powell-Blakeney (GSC), L. Johnson (GSC), A. Boyce (GSC), R. Fitzgerald (GSC), K. Robertson (GSC), G. Bika (Huntec), and K. Asprey (GSC). Oceanographic and hydrogeologic objectives were accomplished under the guidance of Drs. R. Trites (Dept. Fish and Oceans), A. Hay (Memorial Univ.), and U. Weyer (NHRI). Their technical support staff included B. DeYoung (Memorial Univ.), L. Petrie (Dept. Fish. and Oceans) and J. Banner (NHRI). Specialized water sampling programs for marine bacteria and radioisotopes were carried out by D. Stroh

(SF Univ.) and K. Ellis (Dept. Fish and Oceans) for their respective supervisors.

Except for a 1.5 hour delay in McBeth fjord, when winds in excess of 40 m sec^{-1} forced a cessation of sampling operations, most activities on both the Hudson and on its auxilliary scientific launches proceeded as planned. The analytical work completed in the laboratory to date indicates that SAFE participants have lost little of the enthusiasm that was reflected throughout the cruise, and bodes well for some interesting reading as these results begin to appear in the international scientific literature.

As a participating scientist on this cruise, I can say with no hesitation that the operation was as exciting as some of the "frontier" cruises to the Mid-Atlantic Ridge in which I had the priviledge to participate in the late sixties. During these earlier sojourns, I found that I was usually able to persuade the then First Mate (F. Mauger) that at least 50% of my methodologies were possible if he would only stand the ship on its end. Throughout the fjord cruise, the enthusiasm of Captain Mauger and his staff for tasks that were often beyond the call of duty could not be faulted, a tradition which I salute, and which I feel represents something that goes beyond the working relationship that I have come to enjoy with many colleagues as a member of the Bedford Institute of Oceanography scientific team.

Charles T. Schafer

Appendix I-1

Claudia Blakeney
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Dartmouth, Nova Scotia B2Y 4A2

Table I-1

Station	AST Time/Day	Latitude(N)	Longitude(W)	Depth(m)
SU-1	2038/254	66°36.9'	61°53.8'	215
SU-5	2337/254	66°33.3'	61°42.6'	155
SU-6	0200/255	66°30.7'	61°39.2'	117
SU-7	0334/255	66°29.3'	61°31.0'	67
SU-8	1040/255	66°33.1'	61°11.8'	160
CO-1	1400/256	67°12.5'	64°46.5'	98
CO-2	1522/256	67°14.1'	64°38.0'	248
CO-3	1943/256	67°14.5'	64°30.0'	269
CO-4	2130/256	67°15.2'	64°18.2'	356
CO-5	0228/257	67°17.8'	64°09,0'	497
MA-1	1028/257	67°21.3'	64°46.5'	90
MA-2	1143/257	67°19.7'	64°33.6'	257
MA-4	1617/257	67°18.9'	64°17.0'	333
MA-5	0340/257	67°17.5'	64°01.0'	585
MA-5A	0640/258	67°16.8'	63°55.0'	575
MA-6A	1042/258	67°27.4'	63°35.4'	658
MA-7	1240/258	67°34.8'	63°34.6'	585
NP-1	0022/258	67°03.5'	64°40.0'	80
NP-2	0127/258	67°09.5'	64°25.0'	347
NP-3	0250/258	67°11.6'	64°05.0'	333
TI-1	1650/259	68°59.4'	68°57.6'	98
TI-1A	1740/259	69°05.4'	68°54.0'	302
TI-2	2143/259	69°07.0'	68°50.5'	347
TI-3	2355/259	69°11.5'	68°23.5'	487
TI-4	1155/259	69°05.8'	67°54.5'	298
TI-5	1010/259	68°54.3'	67°17.2'	575
TI-6	0745/259	68°48.9'	66°05.4'	800
IT-1	1015/260	69°18.5'	69°10.0'	167
IT-2	1510/260	69°20.5'	68°53.0'	320
IT-3	1645/260	69°16.9'	68°22.0'	417
IT-4	2024/260	69°10.0'	67°45.0'	303

Appendix I-1 Con'd

Table I-1

Station	AST Time/Day	Latitude(N)	Longitude(W)	Depth(m)
MC-1	1815/261	69°31.9'	69°47.5'	329
MC-3	0022/262	69°31.4'	69°16.0'	440
MC-4	0205/262	69°34.7'	68°57.0'	530
MC-5	0400/262	69°36.8'	68°35.0'	572
MC-6	0816/261	69°31.7'	68°09.4'	415
MC-7	0835/262	69°37.5'	68°16.0'	497
MC-8	1350/262	69°44.0'	67°44.0'	290
MC-9	0645/261	69°30.0'	67°51.0'	326
MC-11	0405/261	69°29.5'	66°39.0'	250
IN-1	0822/263	69°40.8'	69°43.5'	160
IN-2	1227/263	69°42.9'	69°54.0'	280
IN-3	1500/263	69°48.8'	69°33.0'	557
IN-4	2000/263	69°53.0'	69°17.3'	585
IN-5	2121/263	69°58.5'	69°02.0'	503
IN-6	0128/263	70°03.8'	68°41.4'	267
IN-7	2208/262	70°19.1'	68°19.2'	338
IN-8	2049/262	70°23.1'	68°03.6'	391
CL-1	1507/264	70°49.6'	72°37.0'	192
CL-2	1902/264	70°50.0'	72°27.0'	234
CL-3	1955/264	70°52.8'	72°15.7'	256
CL-4	2205/264	70°58.5'	72°07.3'	530
CL-5	2345/264	71°05.5'	71°53.0'	683
CL-6	0405/265	71°02.7'	71°31.0'	552
CL-7	0550/265	71°02.6'	71°13.7'	685
CL-8	0745/265	71°10.9'	70°49.2'	755
CA-1	0540/266	71°12.5'	75°00.0'	196
CA-2	0905/266	71°16.2'	74°52.0'	316
CA-3	1610/266	71°23.6'	74°40.0'	366
CA-4	1720/266	71°26.5'	74°43.7'	476
CA-5	1915/266	71°33.0'	74°45.7	575
CA-6	2114/265	71°34.9'	74°40.0'	640
CA-7	1920/265	71°41.3'	74°25.2'	398
CA-8	1715/265	71°46.9'	74°12.3'	681
CA-9	1440/265	71°48.8'	73°31.0'	610

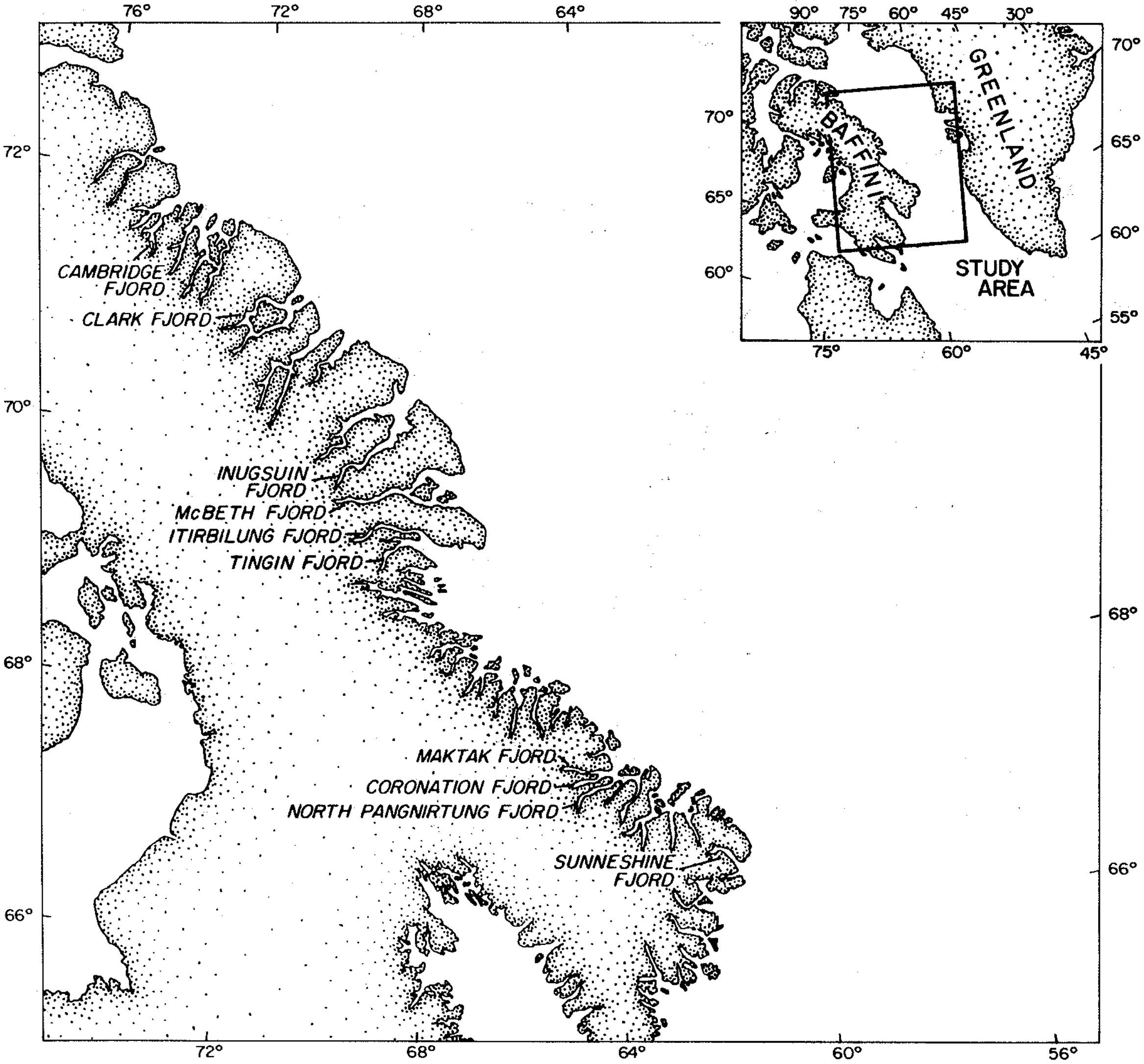
76°
72°
68°
64°
72°
70°
68°
66°
CAMBRIDGE FJORD
CLARK FJORD
INUGSUIN FJORD
McBETH FJORD
ITIRBILUNG FJORD
TINGIN FJORD
MAKTAK FJORD
CORONATION FJORD
NORTH PANGNIRTUNG FJORD
SUNNESHINE FJORD
72°
68°
64°
60°
56°
68°
66°
90°
75°
60°
45°
30°
70°
65°
60°
55°
70°
65°
60°
BAFFIN
GREENLAND
STUDY AREA
75°
60°
45°

FIG. 1-1

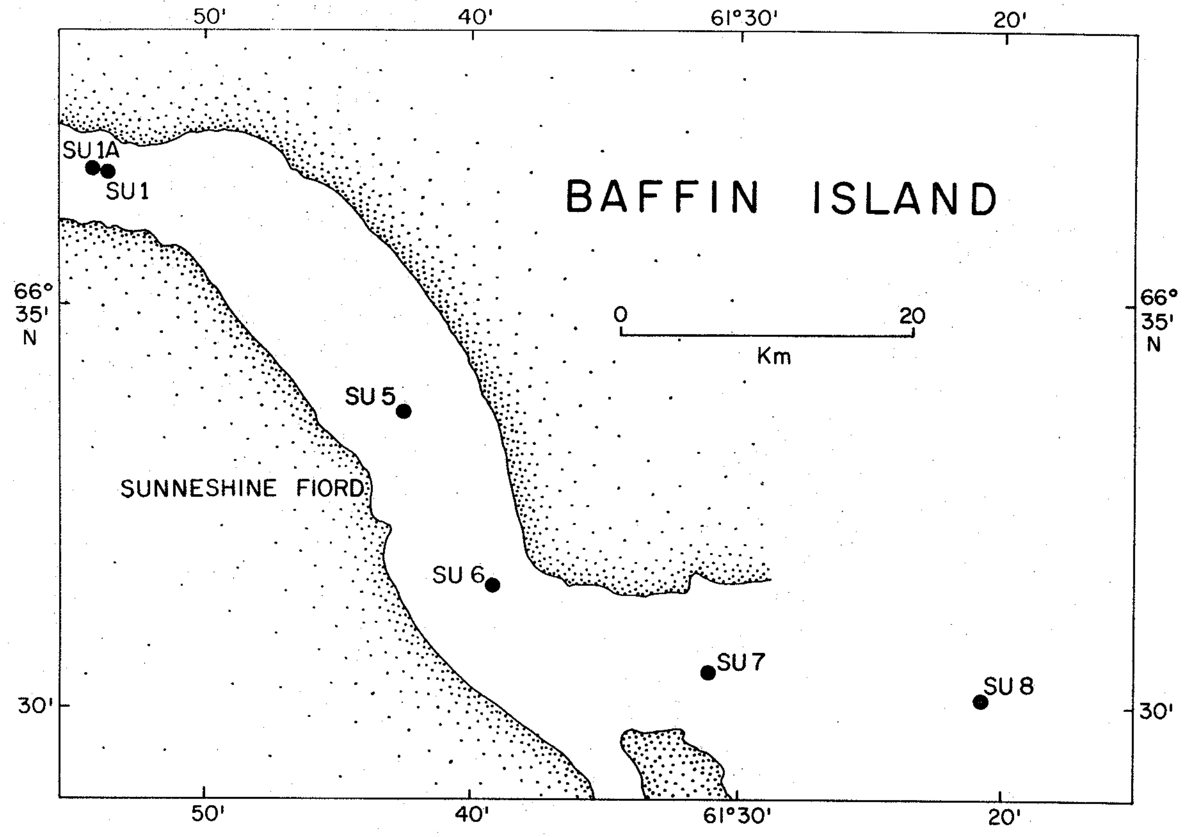
50'
40'
61°30'
20'
BAFFIN ISLAND
SU 1A
SU 1
66° 35' N
0
20
Km
SU 5
SUNNESHINE FIORD
SU 6
SU 7
SU 8
30'
50'
40'
61°30'
20'

FIG. 1-2

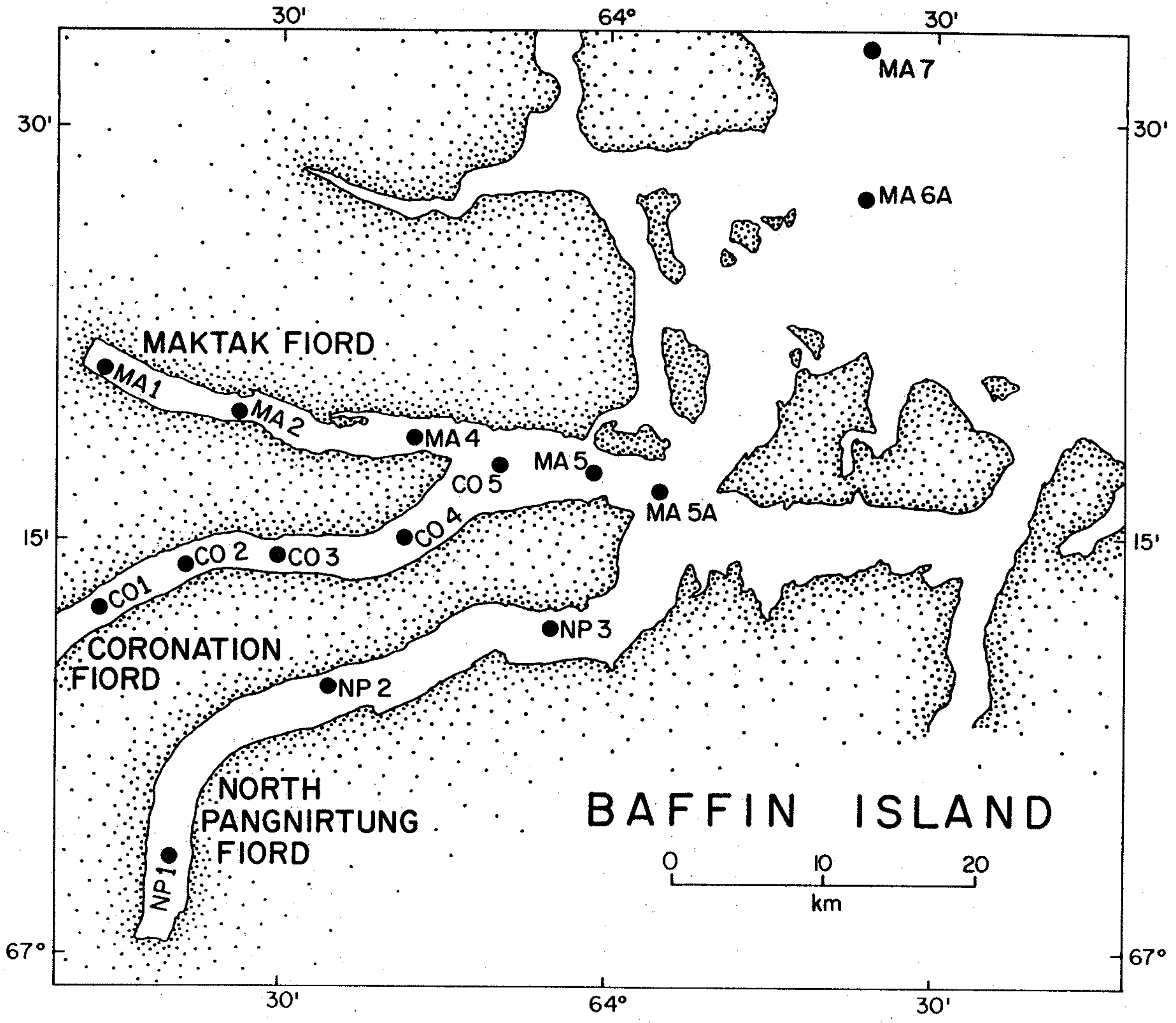
30'
64°
30'
30'
30'
15'
15'
67°
67°
30'
64°
30'
MA 7
MA 6A
MAKTAK FIORD
MA 1
MA 2
MA 4
CO 5
MA 5
MA 5A
CO 1
CO 2
CO 3
CO 4
NP 3
CORONATION FIORD
NP 2
NORTH PANGNIRTUNG FIORD
NP 1
BAFFIN ISLAND
0
10
20
km

FIG. 1-3

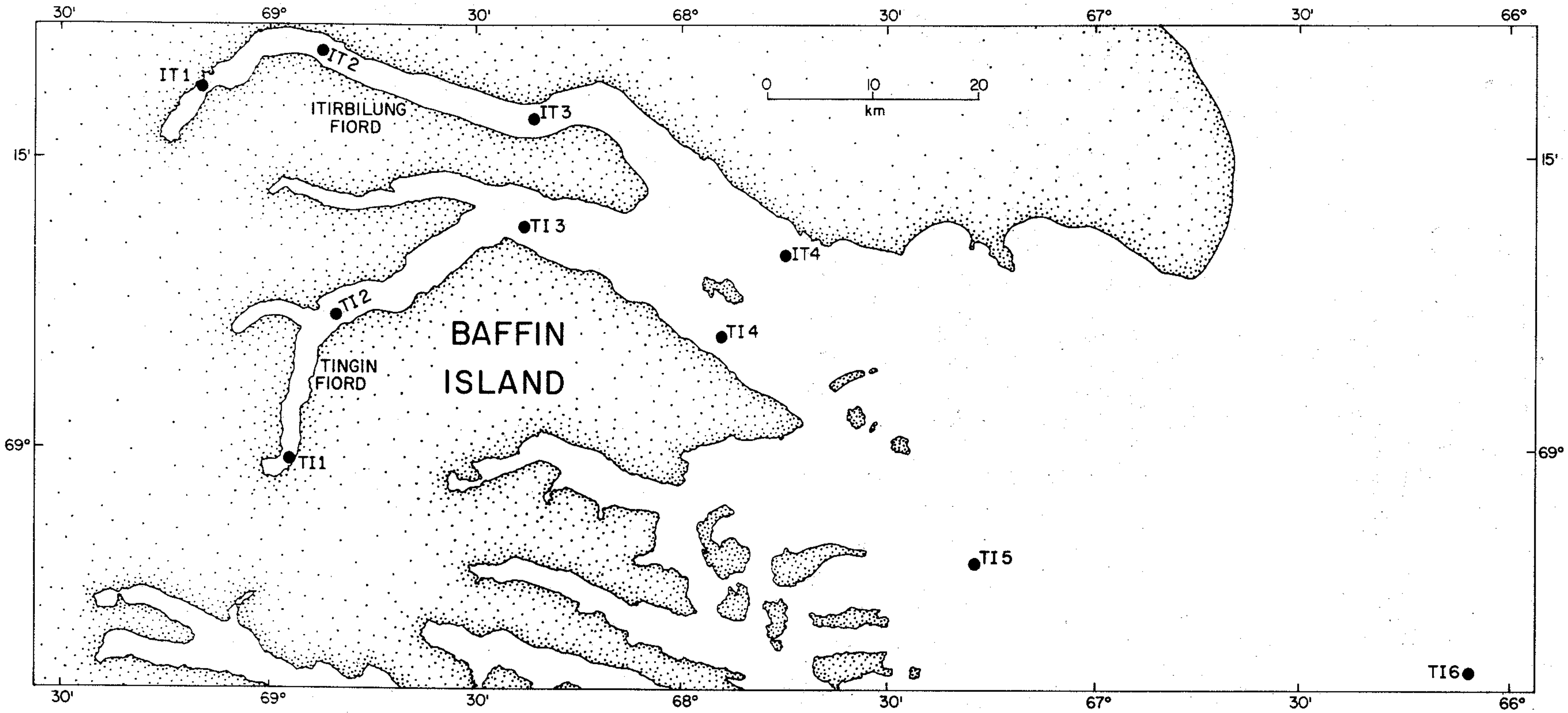
30'
69°
30'
68°
30'
67°
30'
66°
15'
69°
IT1
IT2
IT3
IT4
ITIRBILUNG FIORD
TI1
TI2
TI3
TI4
TI5
TI6
TINGIN FIORD
BAFFIN ISLAND
0
10
20
km

FIG. 1-4

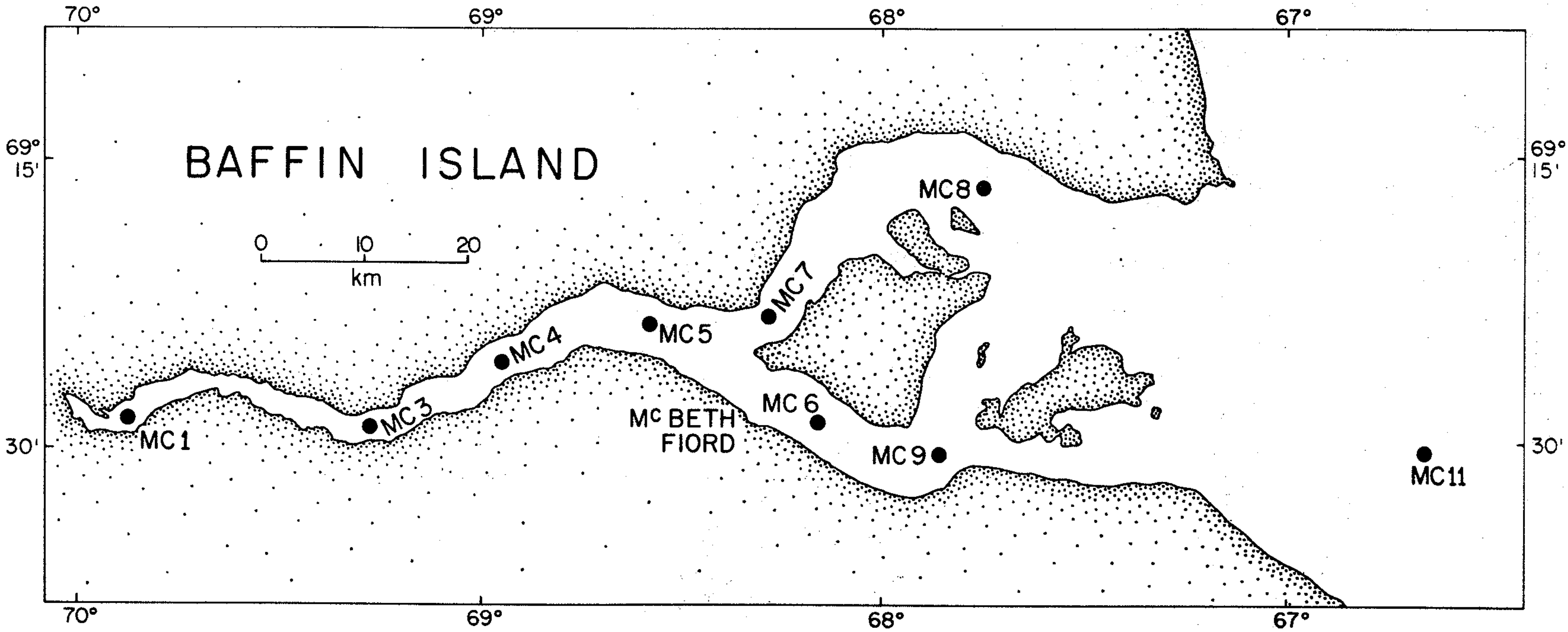
70°
69°
68°
67°
69° 15'
30'
BAFFIN ISLAND
0
10
20
km
MC1
MC3
MC4
MC5
MC7
MC8
MC 6
MC9
MC11
Mc BETH FIORD

FIG. 1-5

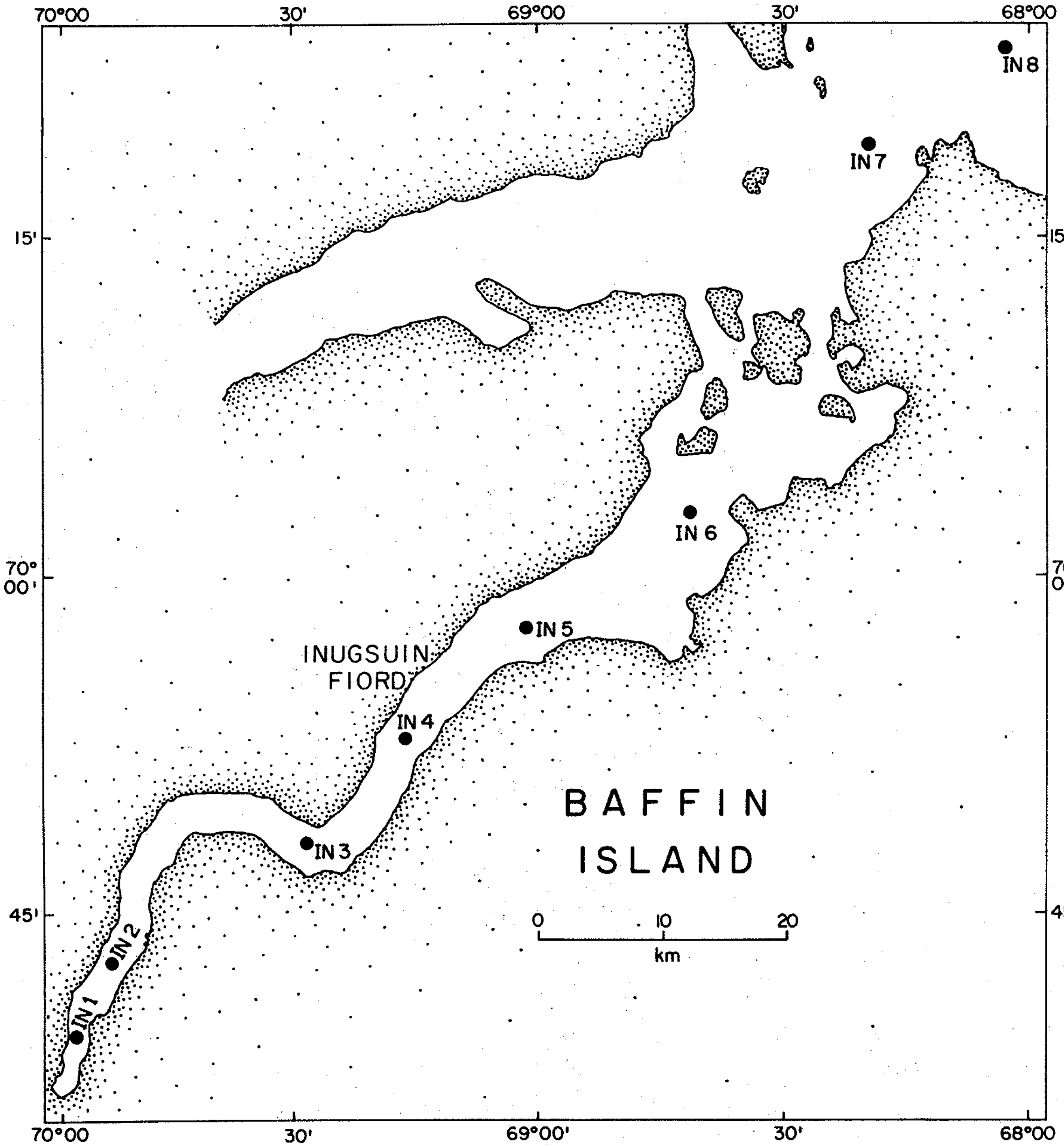
70°00
30'
69°00
30'
68°00
15'
70°
00'
45'
IN 1
IN 2
IN 3
IN 4
IN 5
IN 6
IN 7
IN 8
INUGSUIN
FIORD
BAFFIN
ISLAND
0
10
20
km
70°00
30'
69°00'
30'
68°00

FIG. 1-6

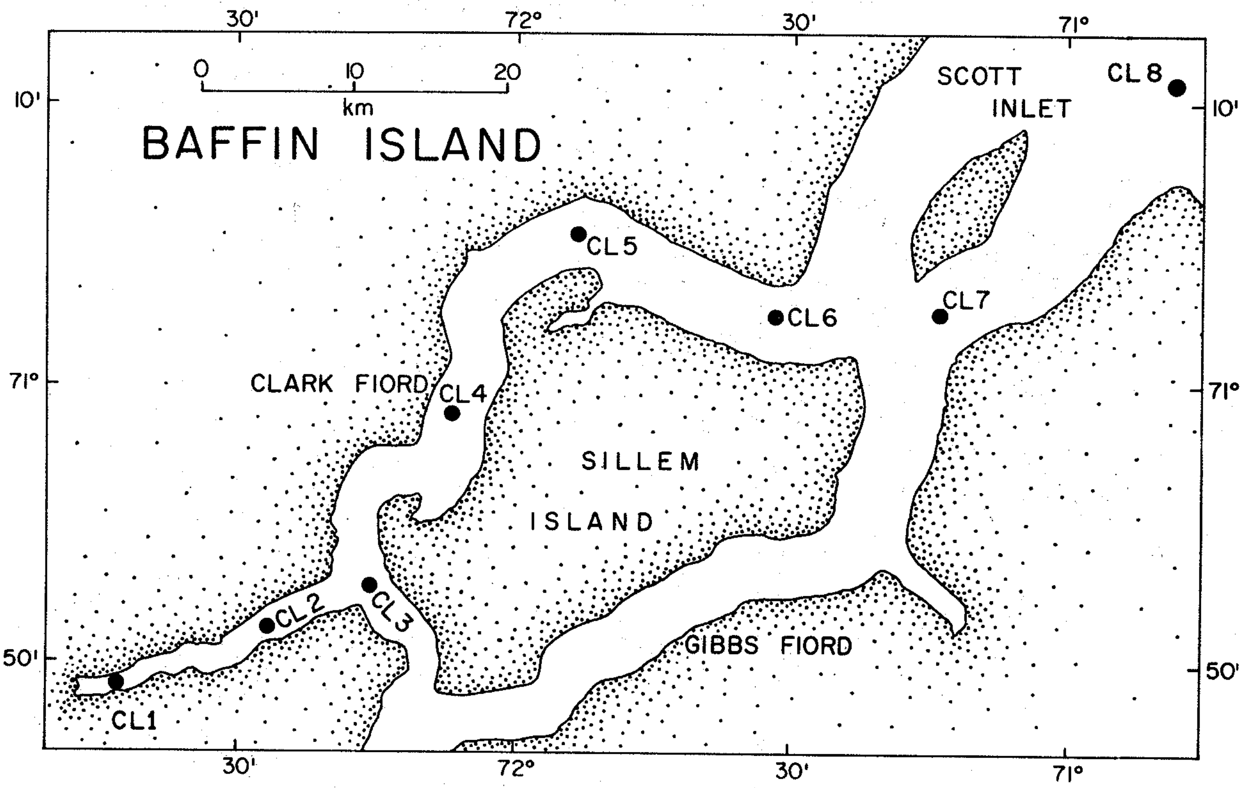
30'
72°
30'
71°
10'
10'
71°
71°
50'
50'
30'
72°
30'
71°
0
10
20
km
BAFFIN ISLAND
SCOTT
INLET
CL 8
CL5
CL6
CL7
CLARK FIORD
CL4
SILLEM
ISLAND
CL2
CL3
CL1
GIBBS FIORD

FIG. 1-7

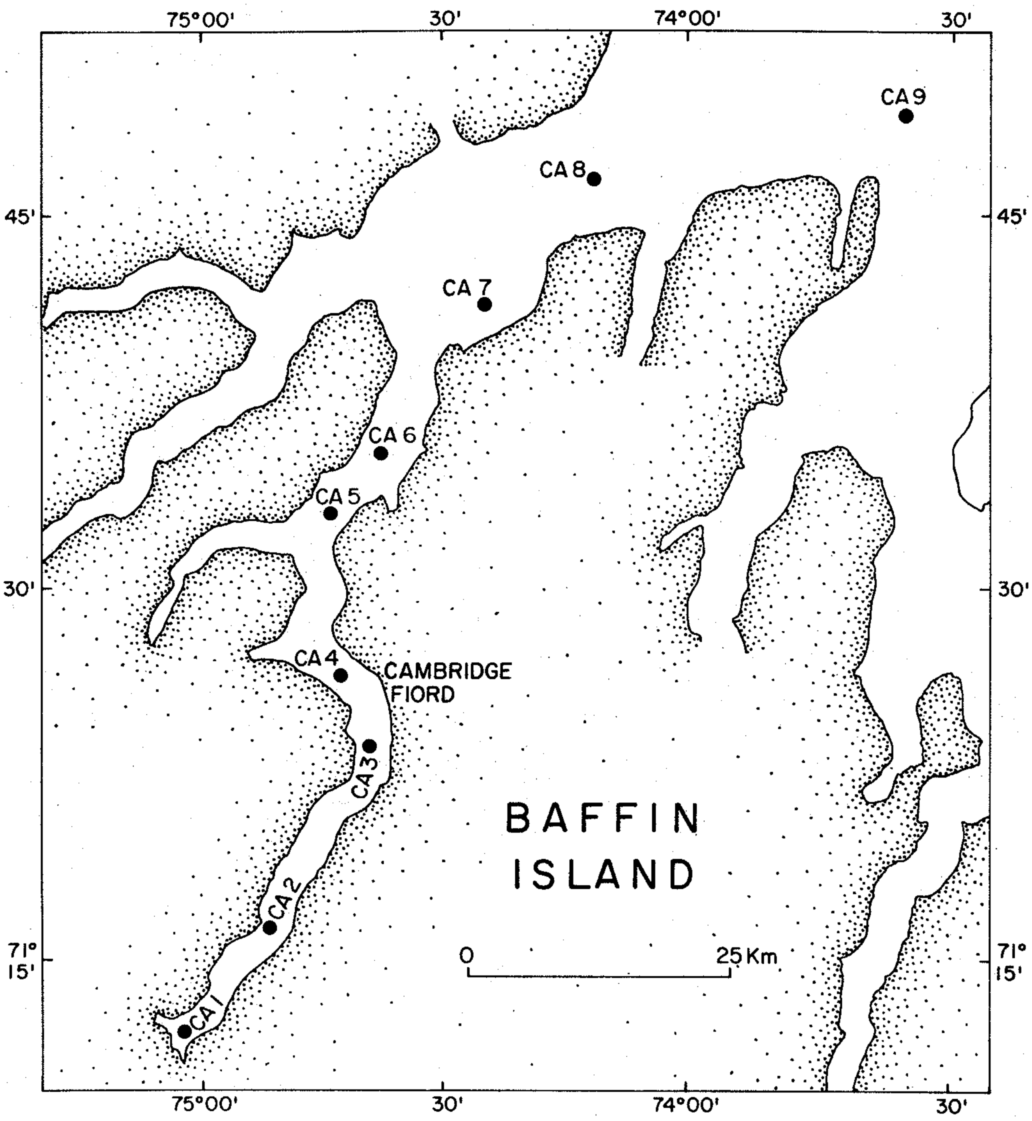
75°00'
30'
74°00'
30'
45'
30'
71°
15'
CA 9
CA 8
CA 7
CA 6
CA 5
CA 4
CA 3
CA 2
CA 1
CAMBRIDGE
FIORD
BAFFIN
ISLAND
0
25 Km

FIG. 1-8

SECTION 2

SYNOPTIC OCEANOGRAPHY

Baffin Island Fjords, Cruise 82-031

by

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I. INTRODUCTION

The objective of the synoptic oceanography program is to provide a broad general description of the physical oceanographic properties of selected Baffin Island Fjords, by measuring temperature, salinity, density, dissolved oxygen and nutrients at a series of stations extending from near the head of the fjord to a point seaward of the mouth.

This section summarizes the temperature, salinity, dissolved oxygen and nutrient data collected during September 1982 on BIO cruise 82-031. While the bulk of the data were taken directly from the CSS Hudson, measurements were also taken from the Scientific Launch, which operated near the head of most of the fjords surveyed during the cruise.

II. SAMPLING AND ANALYTICAL METHODS

A. Temperature and Salinity

The temperature and salinity measurements aboard CSS Hudson were taken using a continuous profiling digital Guildline CTD (Model 8705) and recorded on 9-track magnetic tape. A portable continuous profiling Guildline CTD (Model 8770) was used aboard the Scientific Launch. Data were recorded on cassette tape. Salinities are reported as parts per thousand (ppt). Potential densities were calculated from the temperature and salinity measurements using the UNESCO 1980 formulation and are expressed in sigma- θ units.

On the CSS Hudson a rosette sampler was coupled with the CTD. The unit was fitted with 10, 5-litre Niskin bottles. At nearly all stations, water samples were taken at 10 depths during the up-cast. Salinity samples were drawn from all casts, and returned to BIO for subsequent analyses in the laboratory using a Guildline Autosal Model 8400 salinometer. These laboratory determined salinities were used to adjust the salinities measured by the Guildline profiling unit. "In situ" temperatures were measured at selected sampling depths using reversing thermometers as a check on the temperature calibration of the Guildline CTD.

B. Dissolved Oxygen and Nutrients

Samples were drawn from all Niskin bottles and dissolved oxygen determined using a modification of the classical Winkler procedure (Levy, et al., 1977) and are reported in millilitres per litre (ml/ℓ).

Samples for nutrient analyses (phosphate, nitrate, and silicate) were taken in triplicate, and frozen quickly in small polyethlene vials (approx. 5 ml) and stored in a deep freeze at approximately -20°C. Samples were analyzed several months later at BIO using standard methods (Strickland and Parsons, 1968) with an Auto Analyzer II. In reporting nutrient concentrations the values of the three samples were averaged in most cases. In instances where one of the three values was appreciably different from the other two, it was discarded from the average. Values are reported in µg-at./ℓ.

III. RESULTS

After editing the magnetic tapes and applying any corrections, a vertical profile of temperature, salinity and density, and a T-S diagram, were plotted for each station using both the down and up trace from the CTD (Pages 2-4 - 2-64 for unit aboard CSS Hudson). For the portable CTD (Pages 2-65 to 2-99) an as-yet-uncorrected small error appears on some of the up-traces (e.g. MA2S, MA3S). This error was generated on the temperature channel, as a sudden decrease in temperature of about 0.1°C, which typically persisted for a few meters to a few tens of meters before returning suddenly to the correct value. Since temperature is used to compute salinity and density the error also shows on these traces as well.

Temperature, salinity, density, dissolved oxygen, silicate, phosphate and nitrate as taken from CSS Hudson at serial depths are reported in tabular form

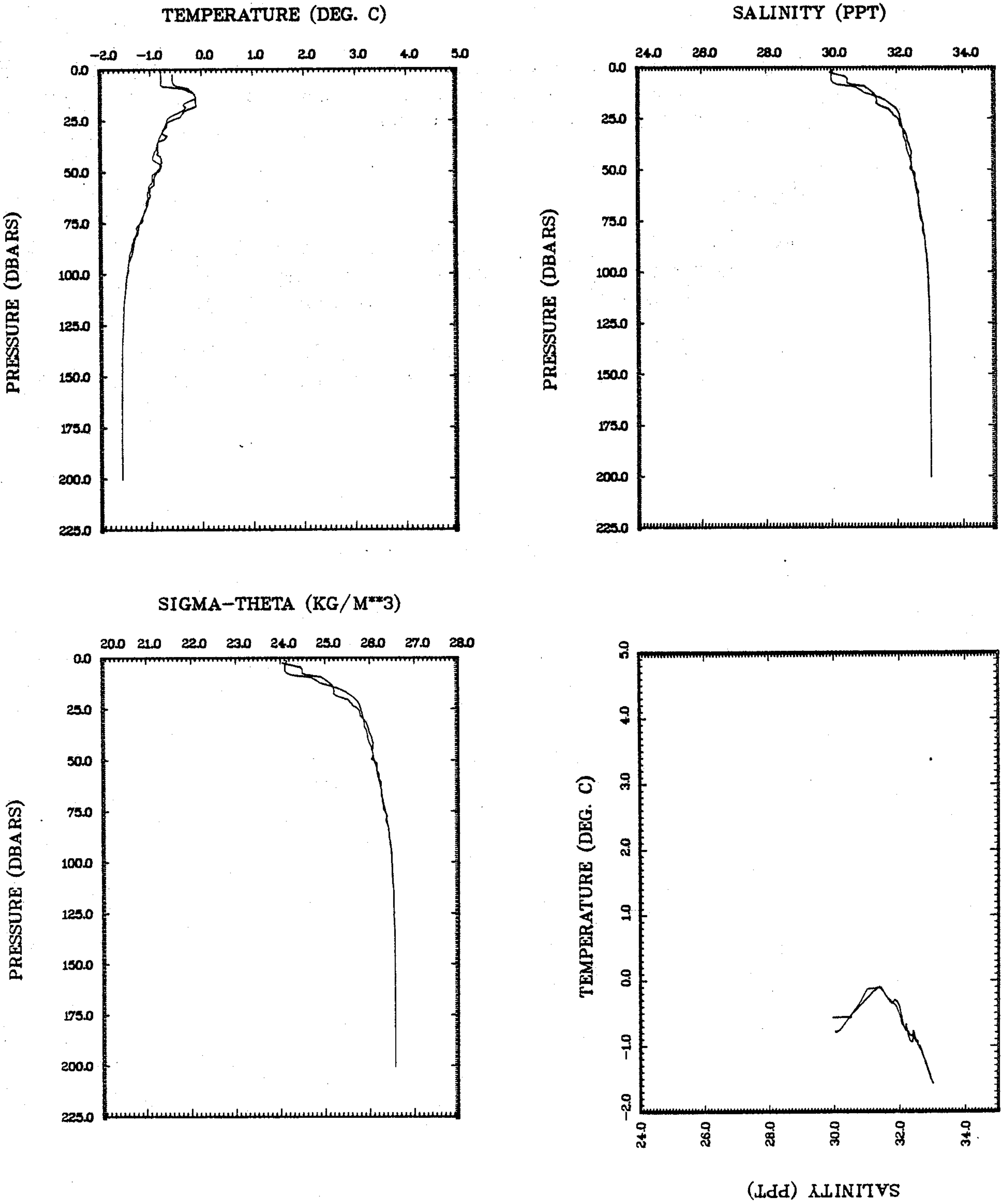
(Pages 2-100 to 2-119). Since the rosette sampler was operated during the up-cast, values of temperature, salinity, and density were taken from the up-trace unless otherwise noted.

Temperature, salinity and density as taken from the portable CTD aboard the Scientific launch are reported at serial depths and in tabular form (Pages 2-120 to 2-129). Values were taken from the down trace.

IV. REFERENCES

Levy, E.M., C.C. Cunningham, C.D.W. Conrad, and J.D. Moffatt. 1977. The Determination of dissolved oxygen in sea water. Bedford Institute of Oceanography Report Series/BI-R-77-9/August.

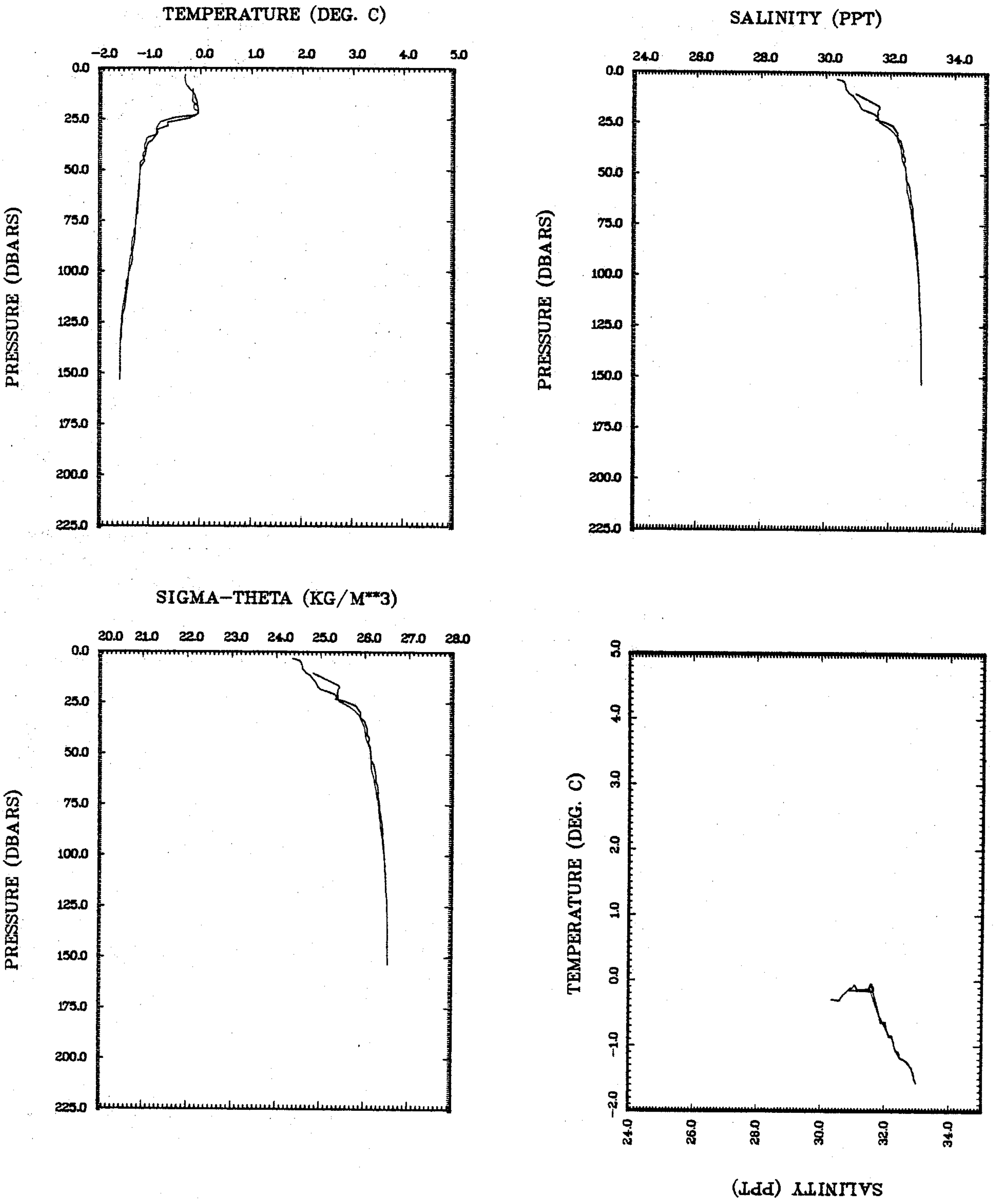
Strickland, J.D.H., and T.R. Parsons. 1968. A Practical Handbook of Seawater Analysis. Fisheries Research Board of Canada. Bulletin 167.


TEMPERATURE (DEG. C)

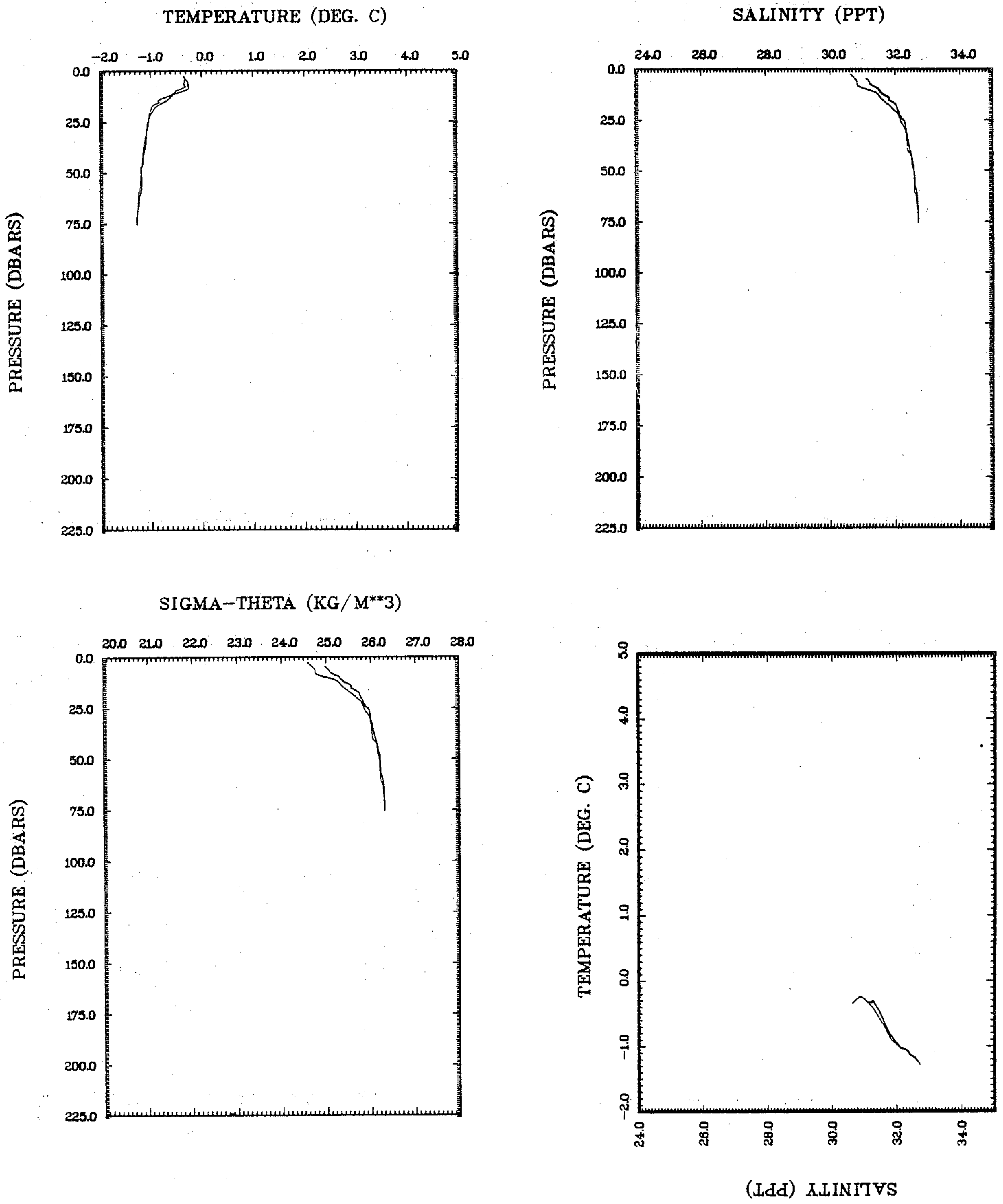
SALINITY (PPT)

SIGMA-THETA (KG/M**3)

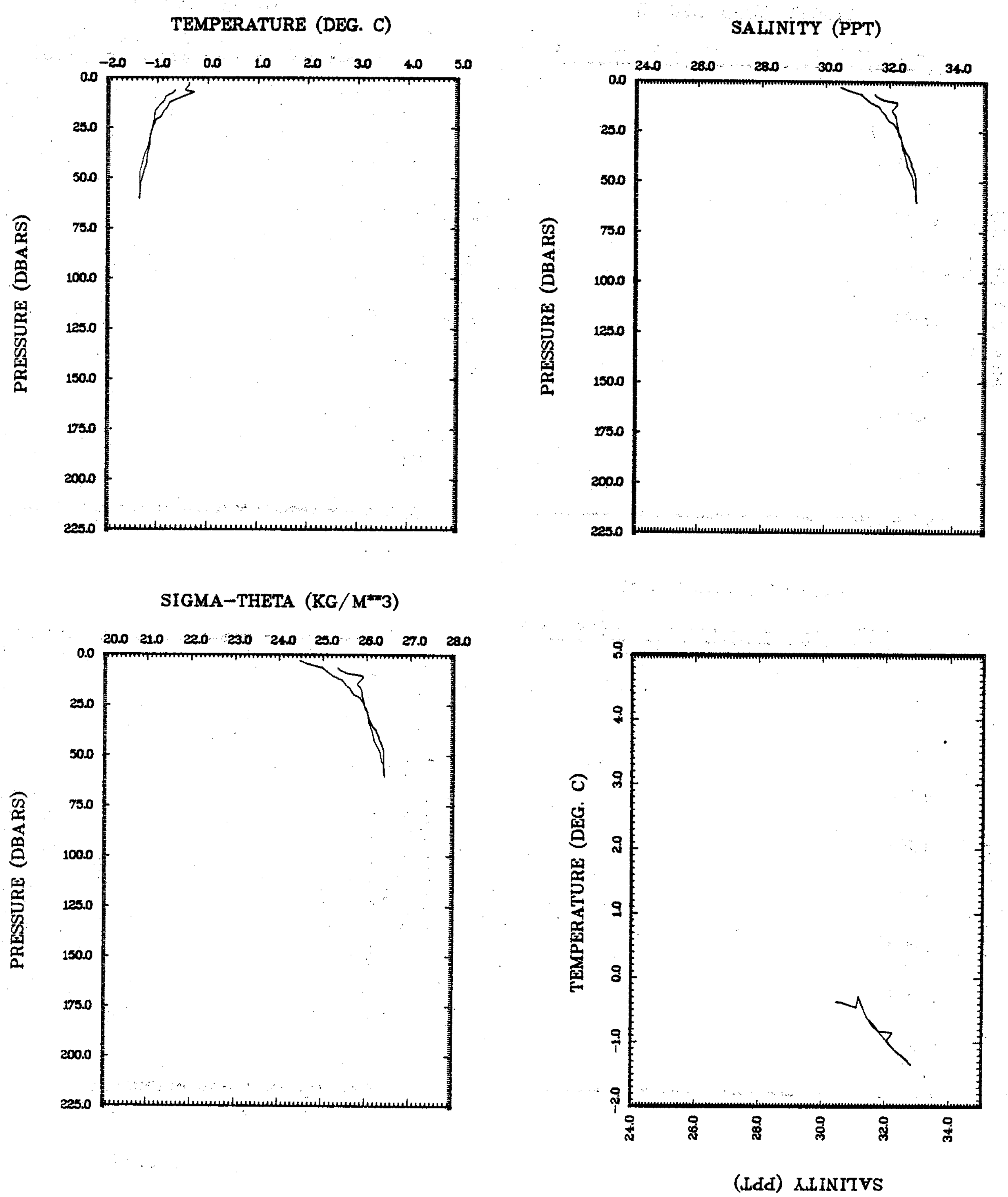
Sunneshine Fjord (SU1, CTD1, 82.09.11)



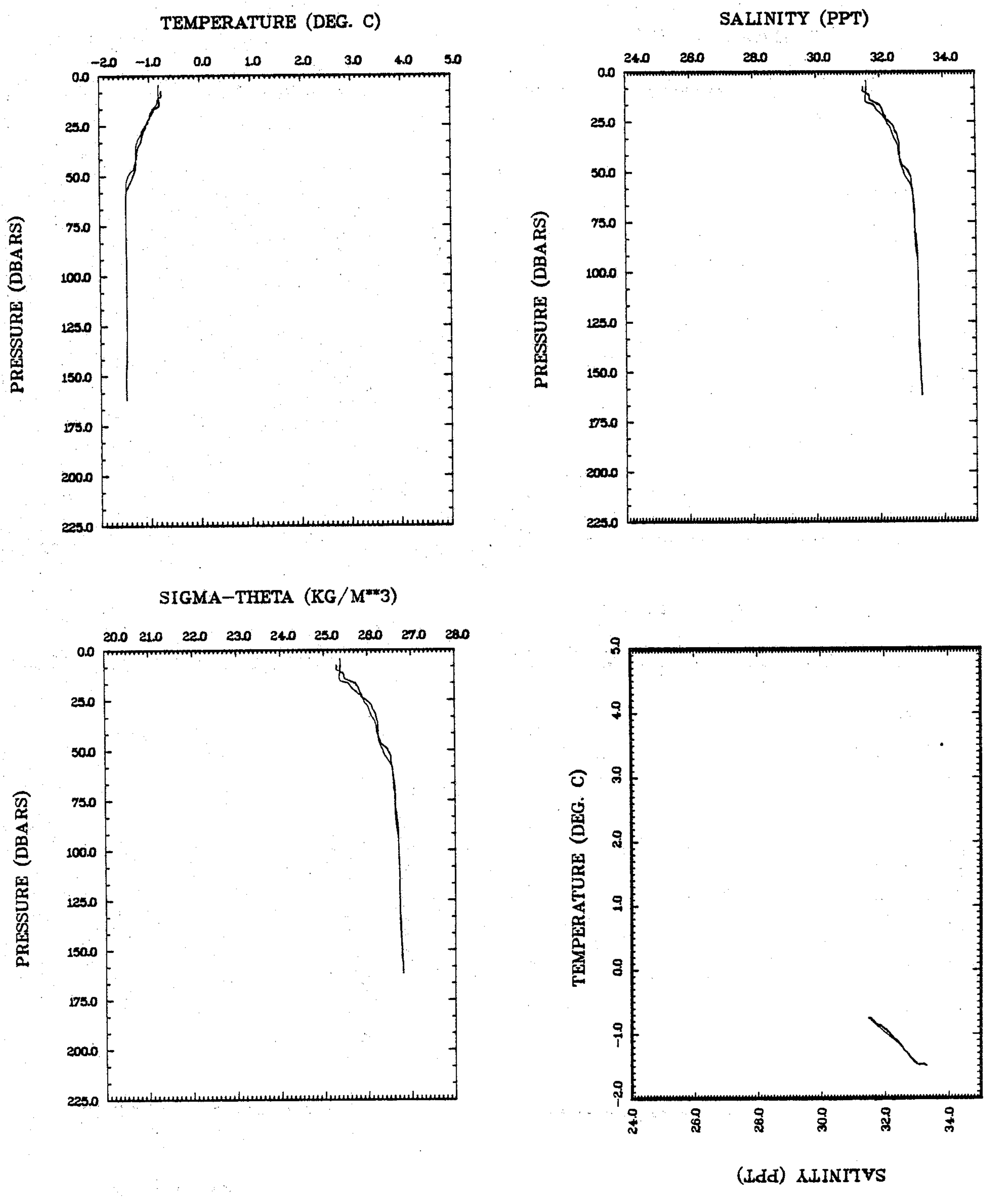
Sunneshine Fjord (SU5, CTD2, 82.09.11)



Sunneshine Fjord (SU6, CTD3, 82.09.12)



Sunneshine Fjord (SU7, CTD5, 82.09.12)



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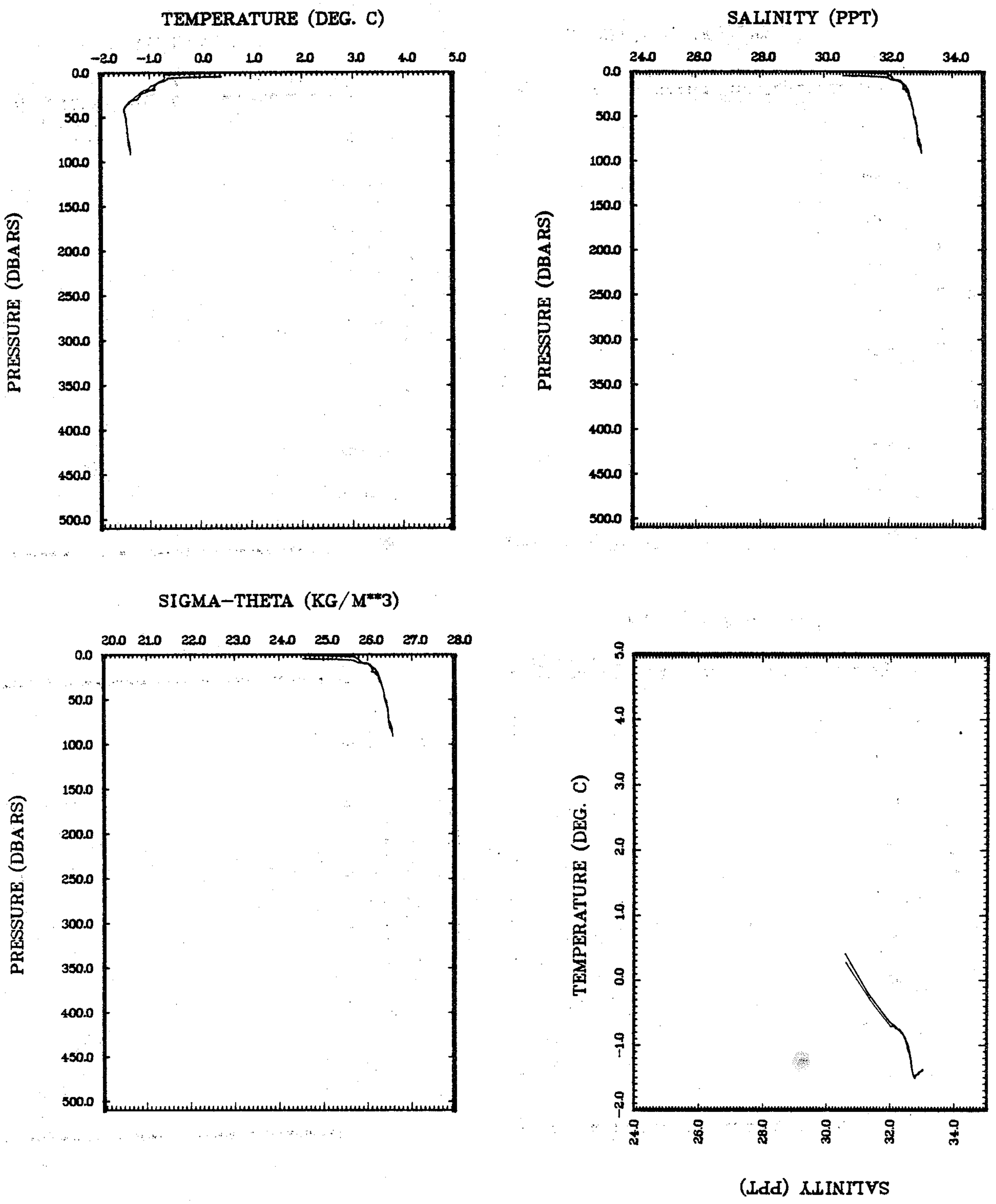
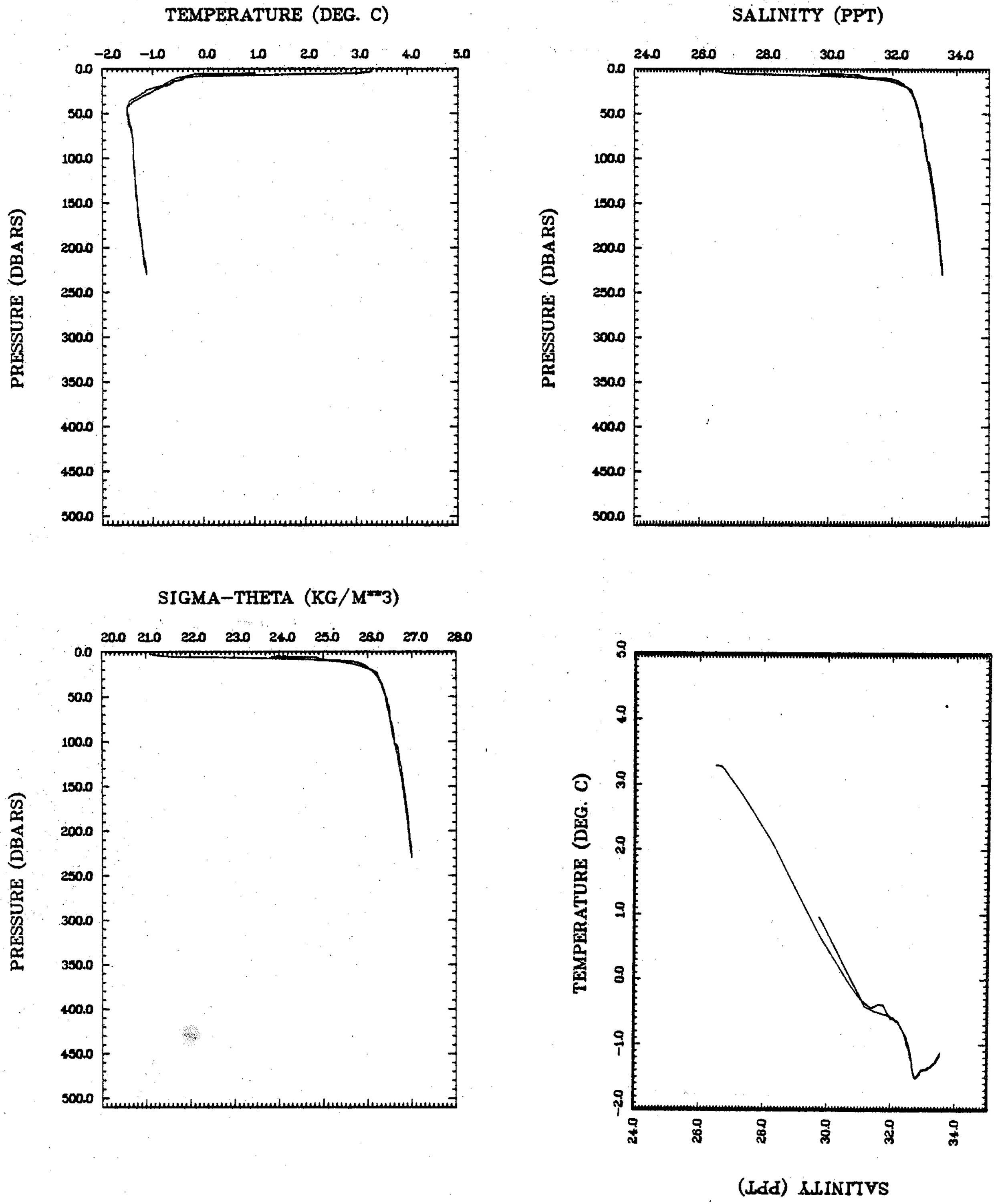
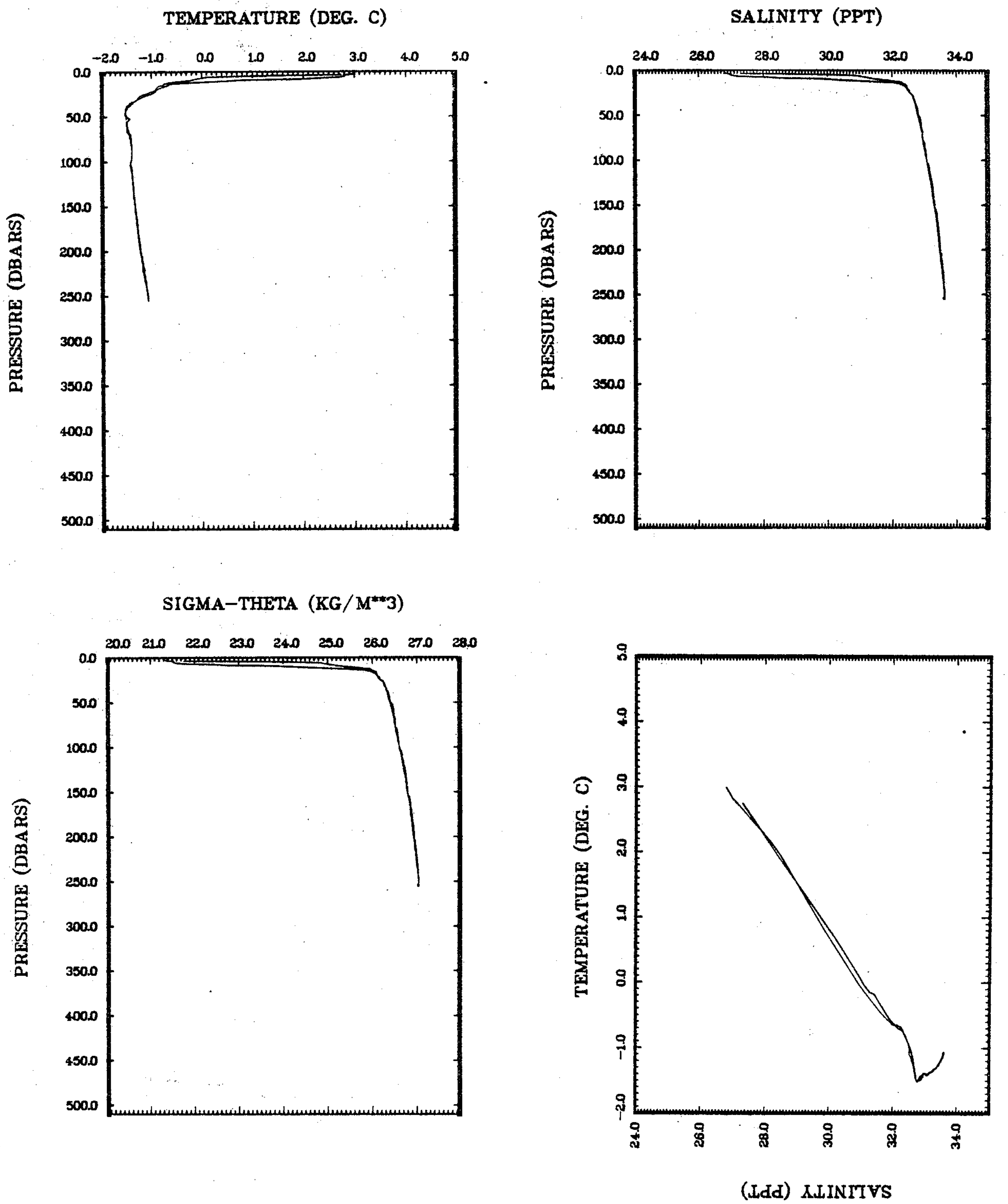


Coronation Fjord (C01, CTD8, 82.09.13)



Coronation Fjord (CO2, CTD9, 82.09.13)



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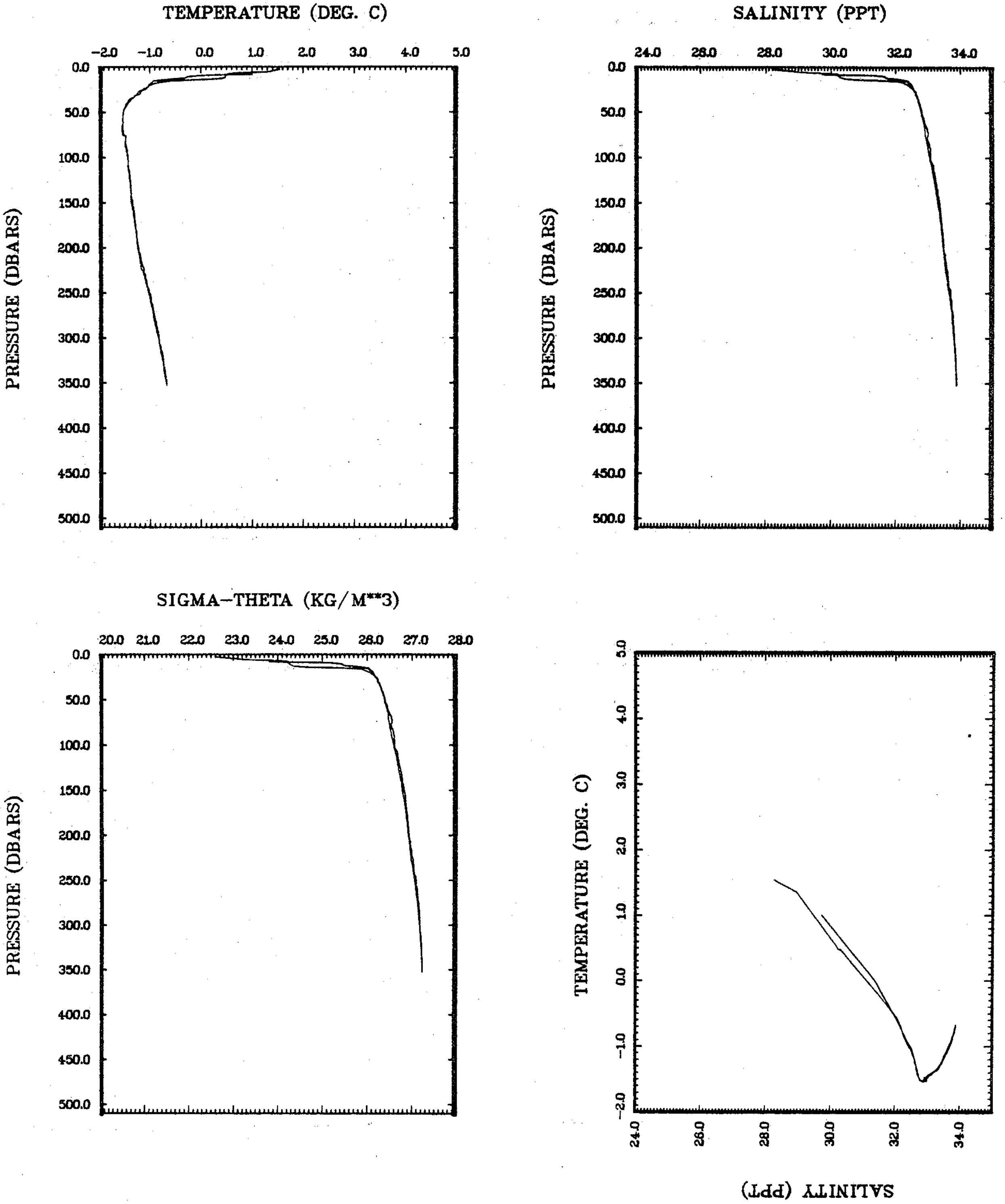

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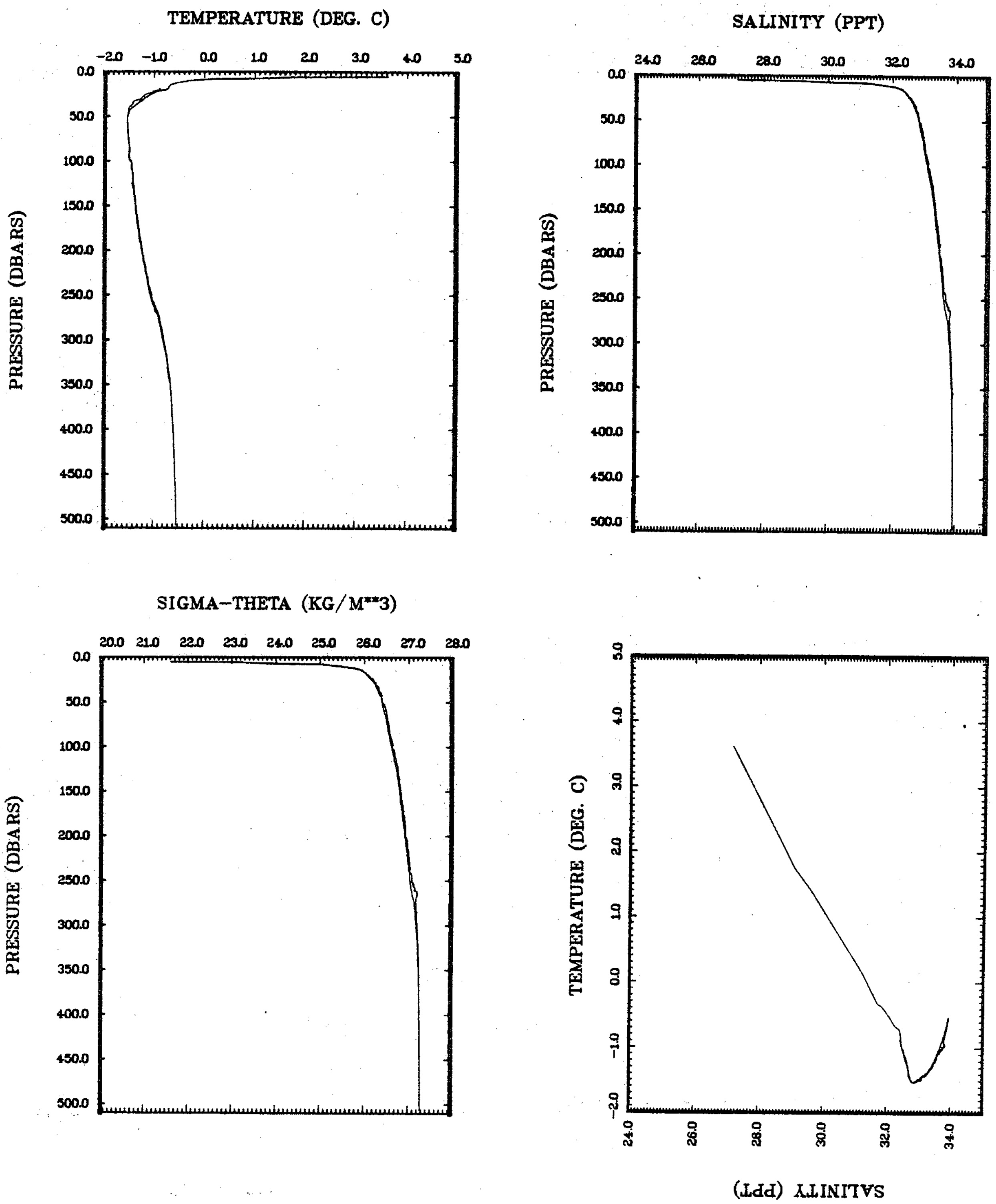

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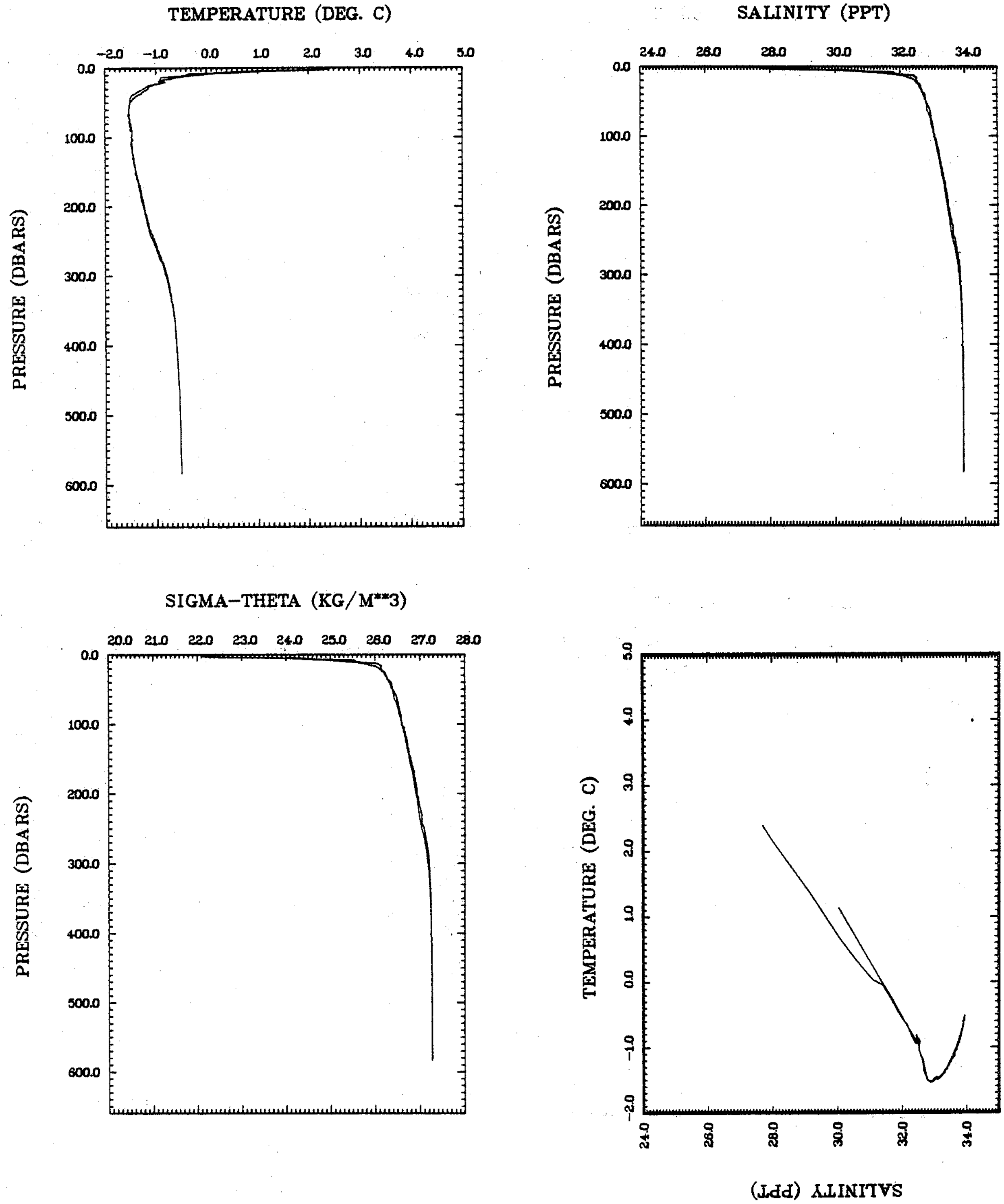

TEMPERATURE (DEG. C)

SALINITY (PPT)

SIGMA-THETA (KG/M**3)

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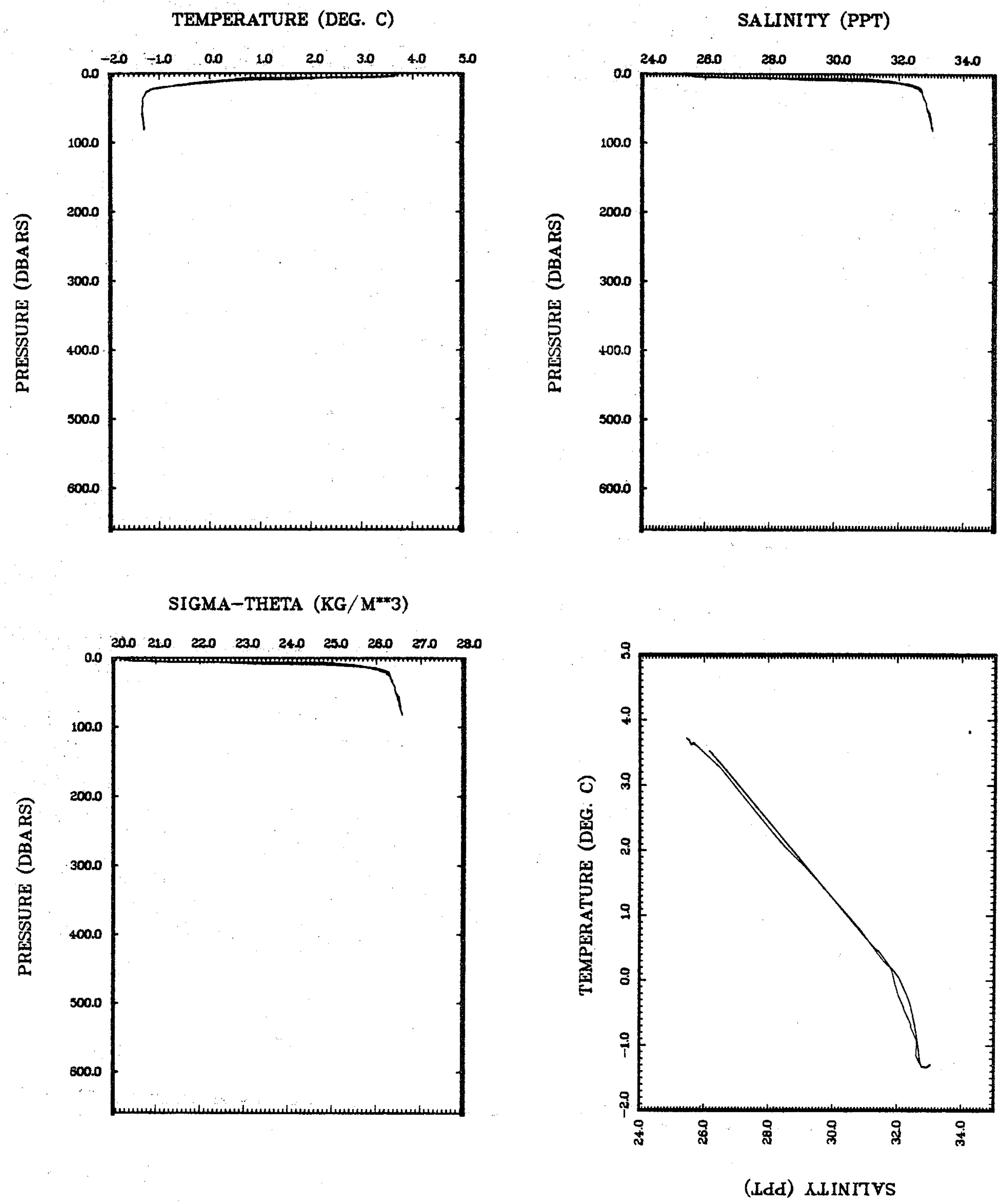

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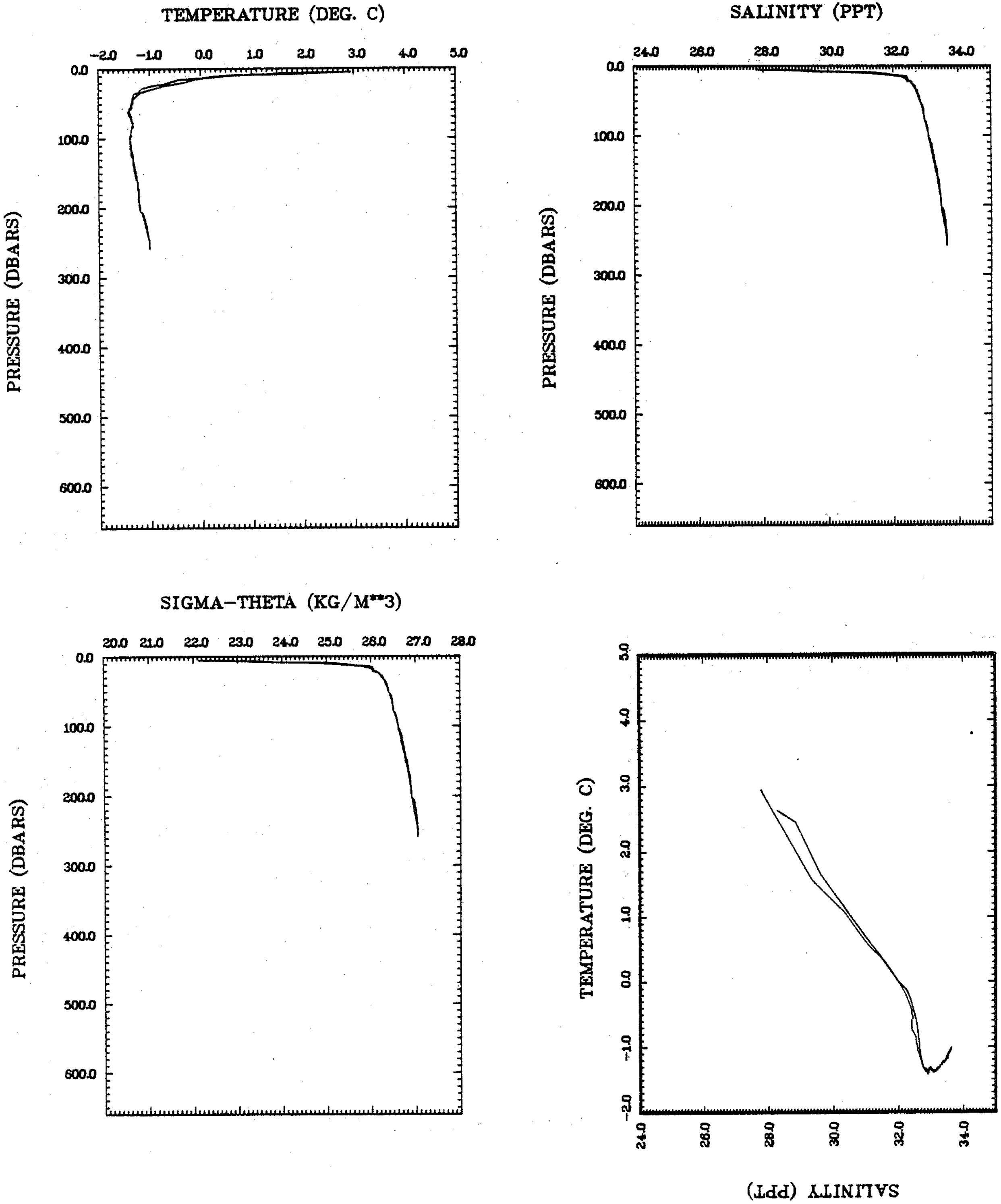

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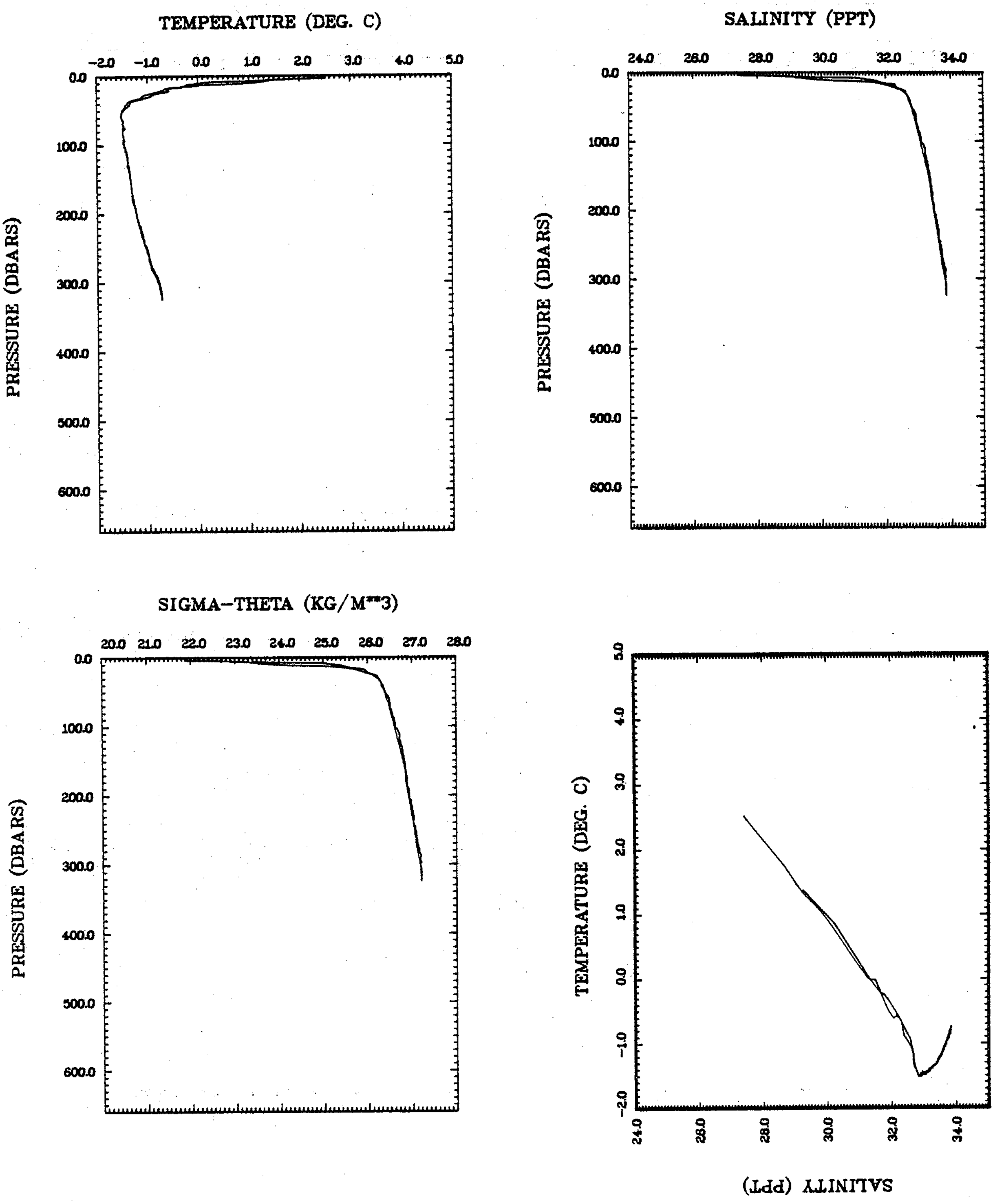

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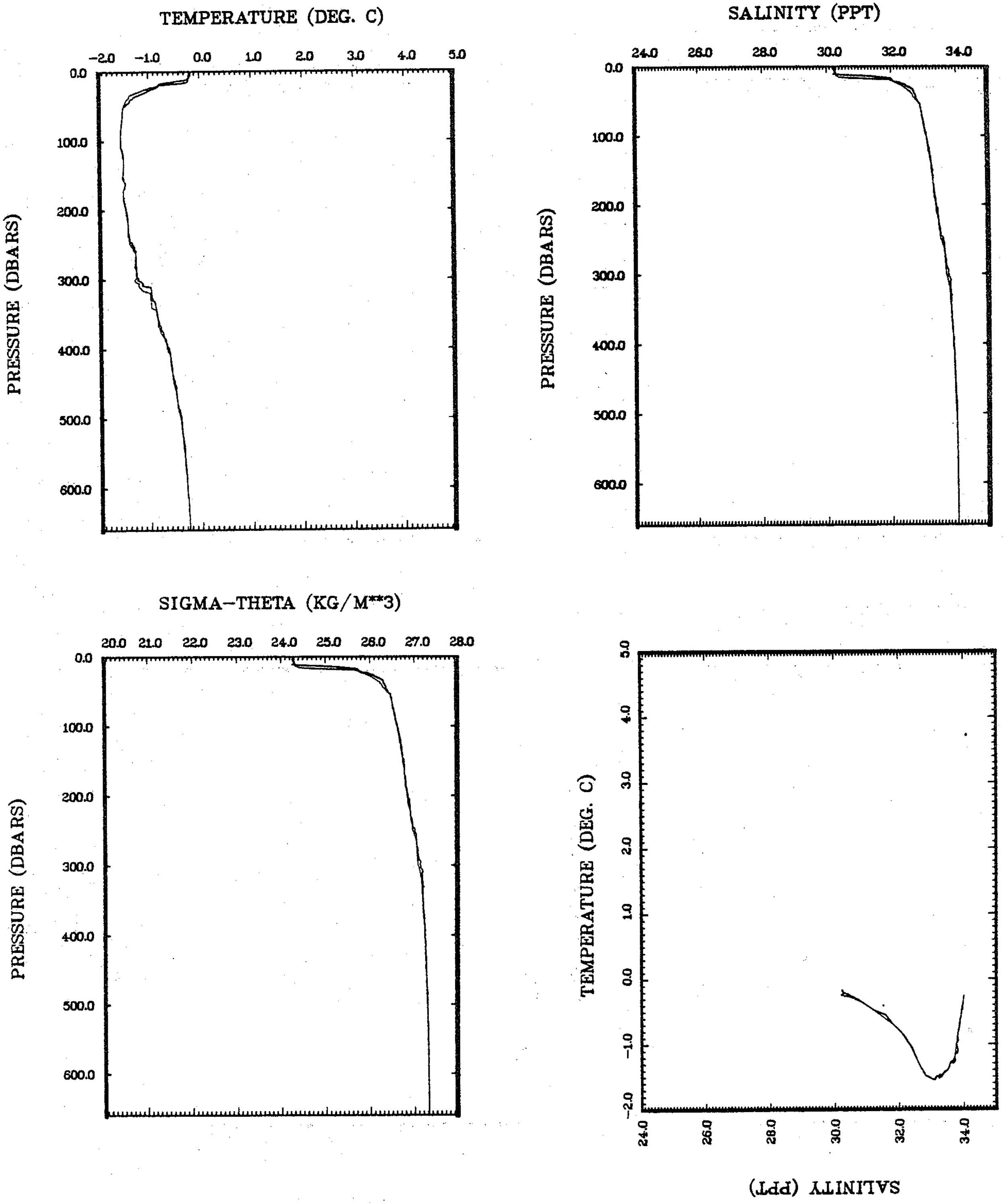

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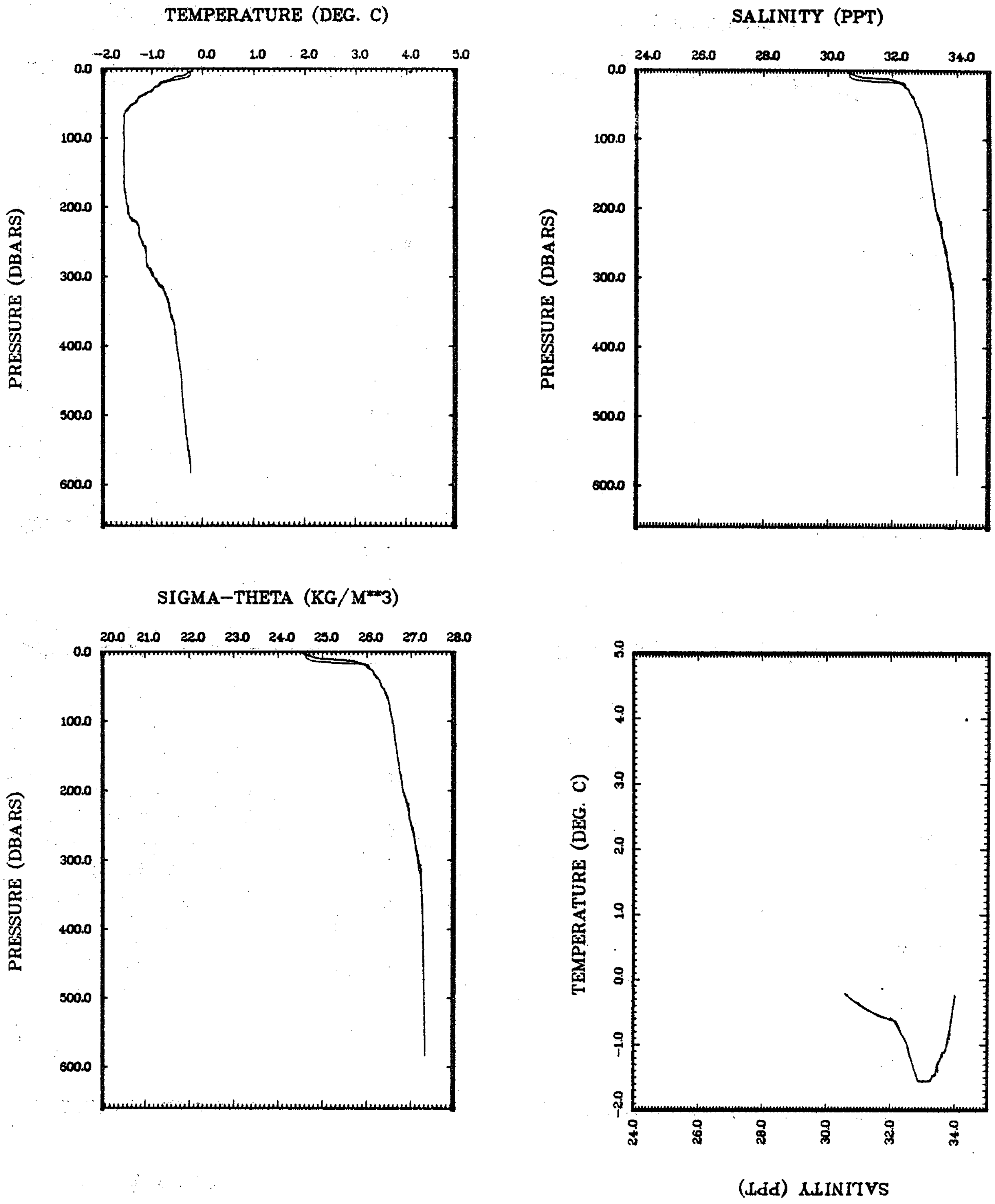
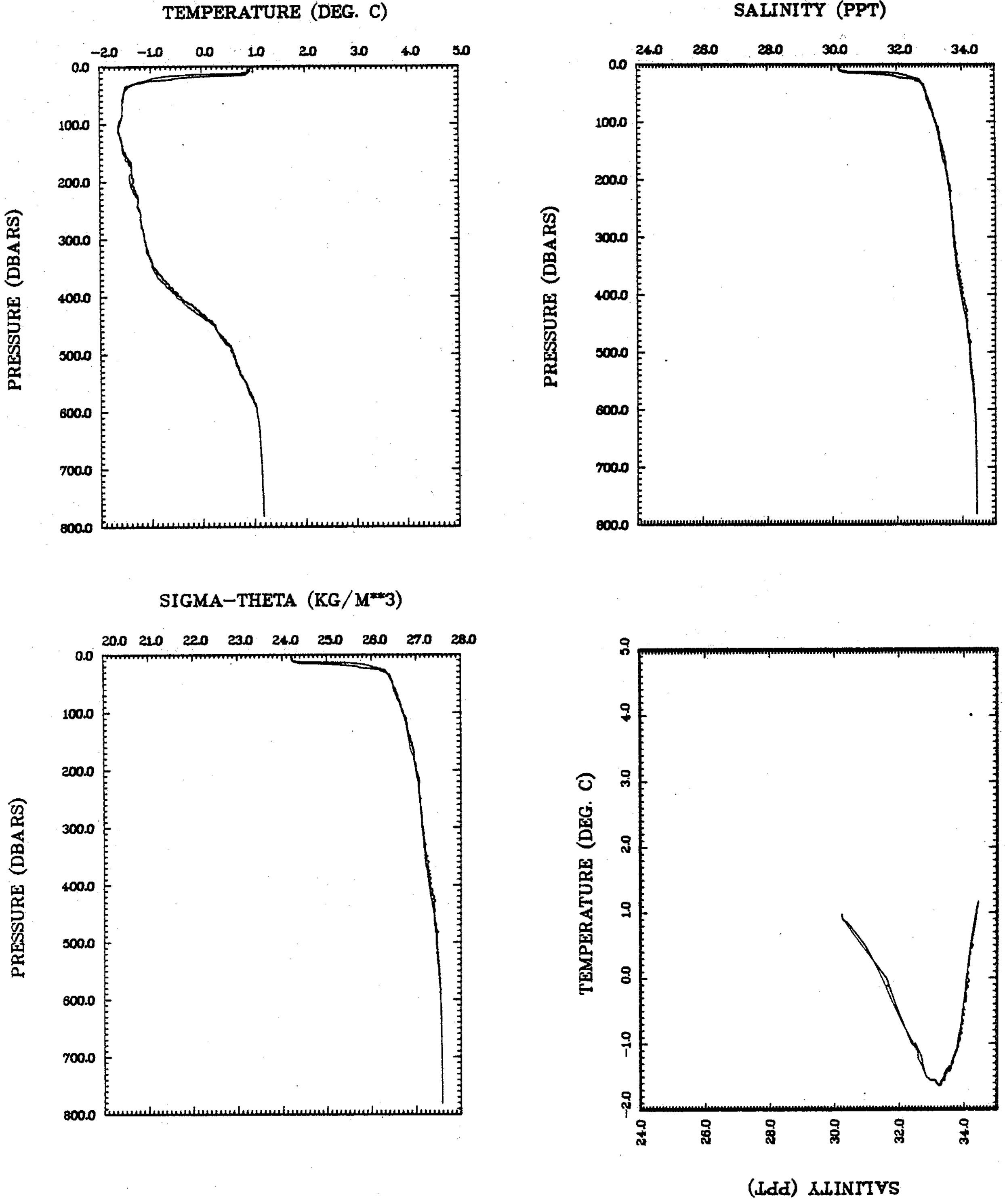


MAKTAK Fjord (MA7, CTD18, 82.09.15)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SALINITY (PPT)

SIGMA-THETA (KG/M**3)

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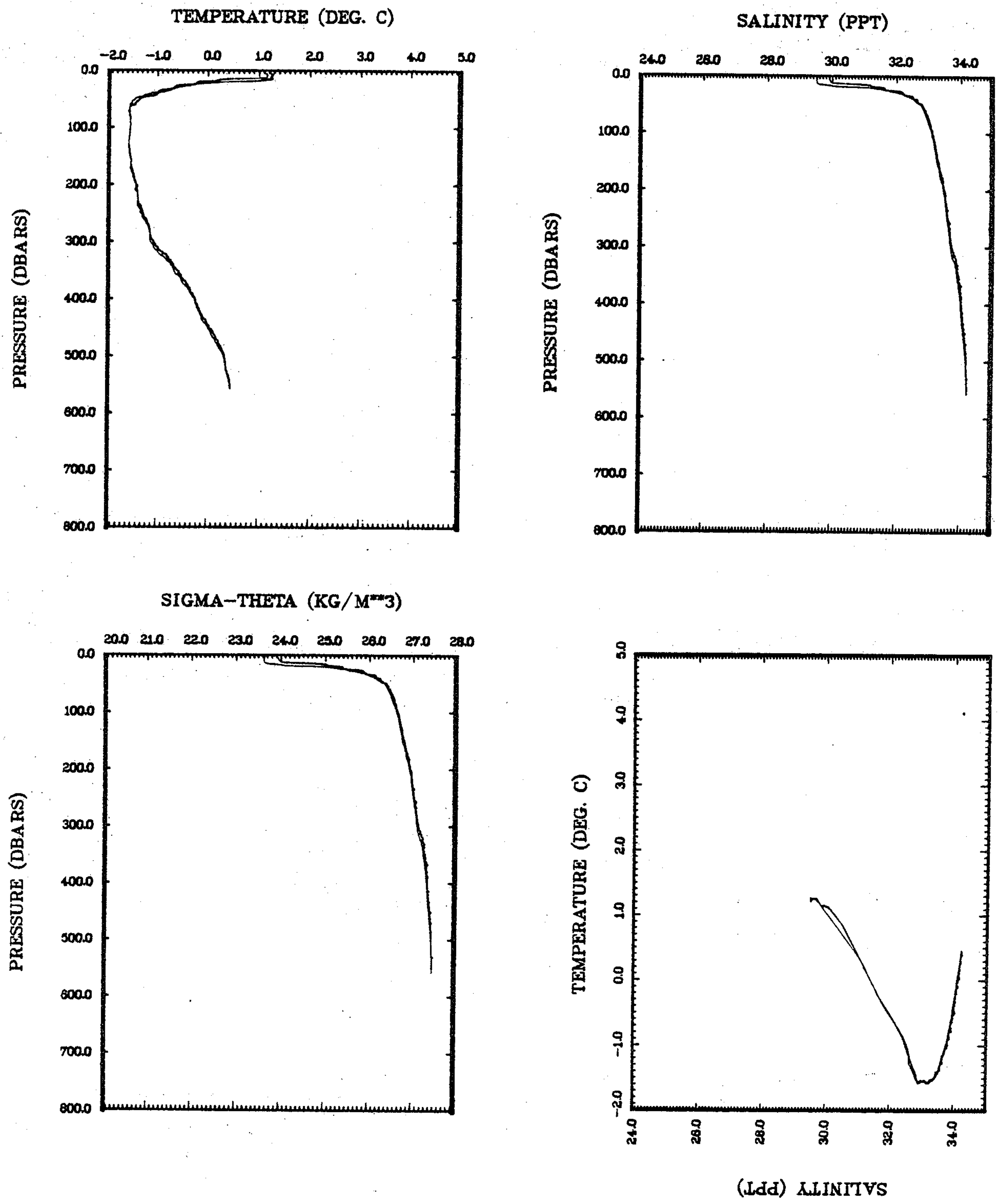

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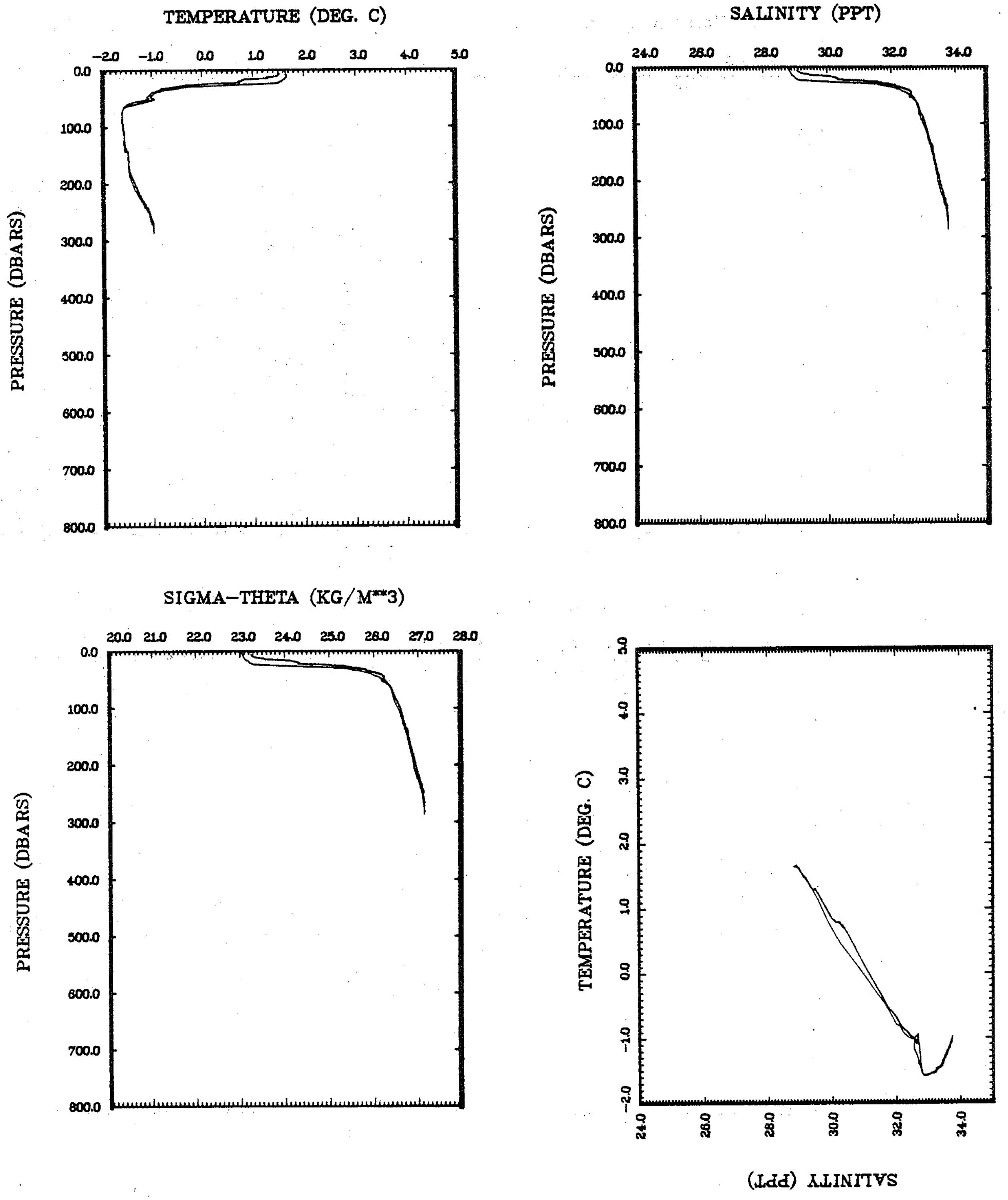

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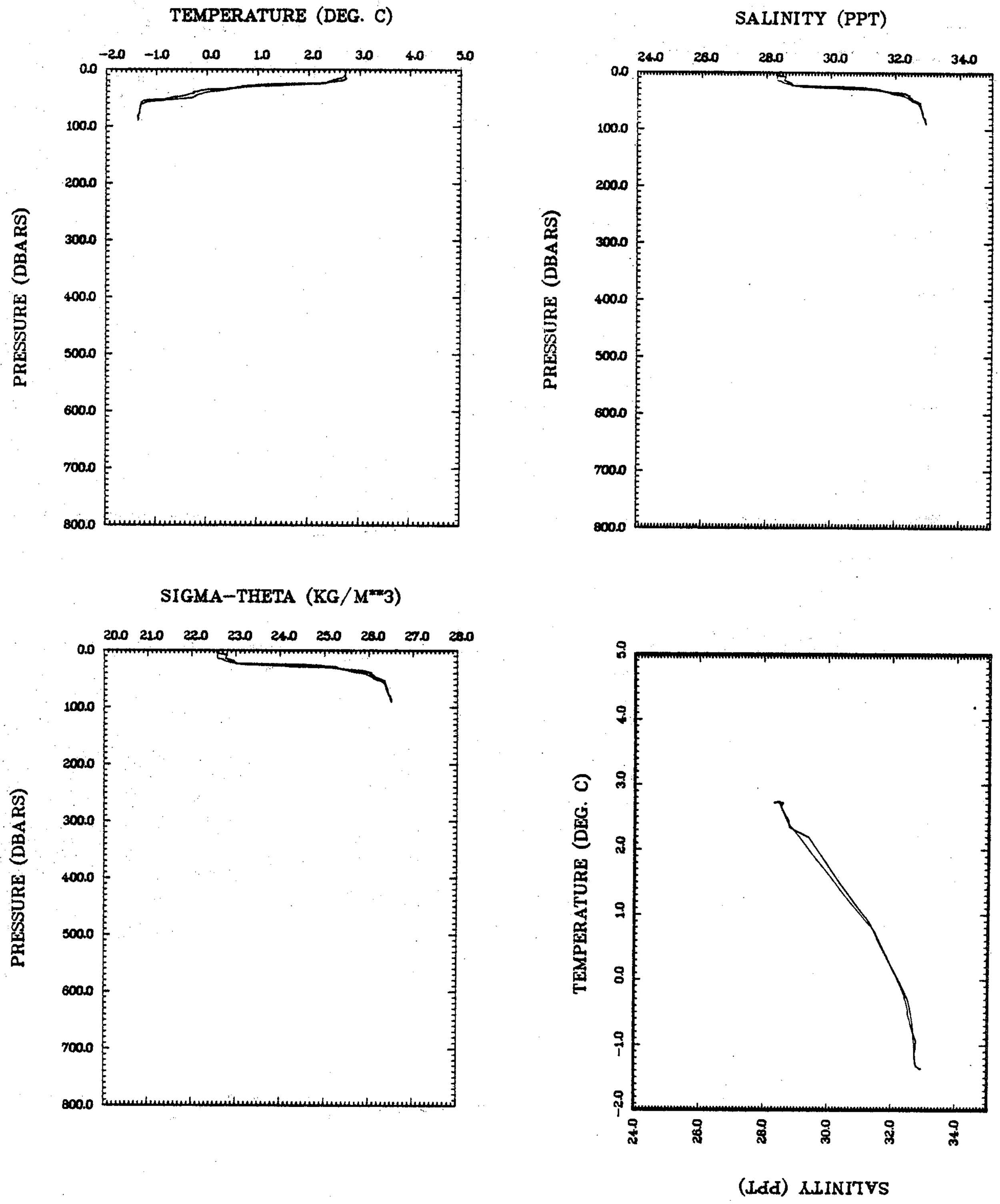

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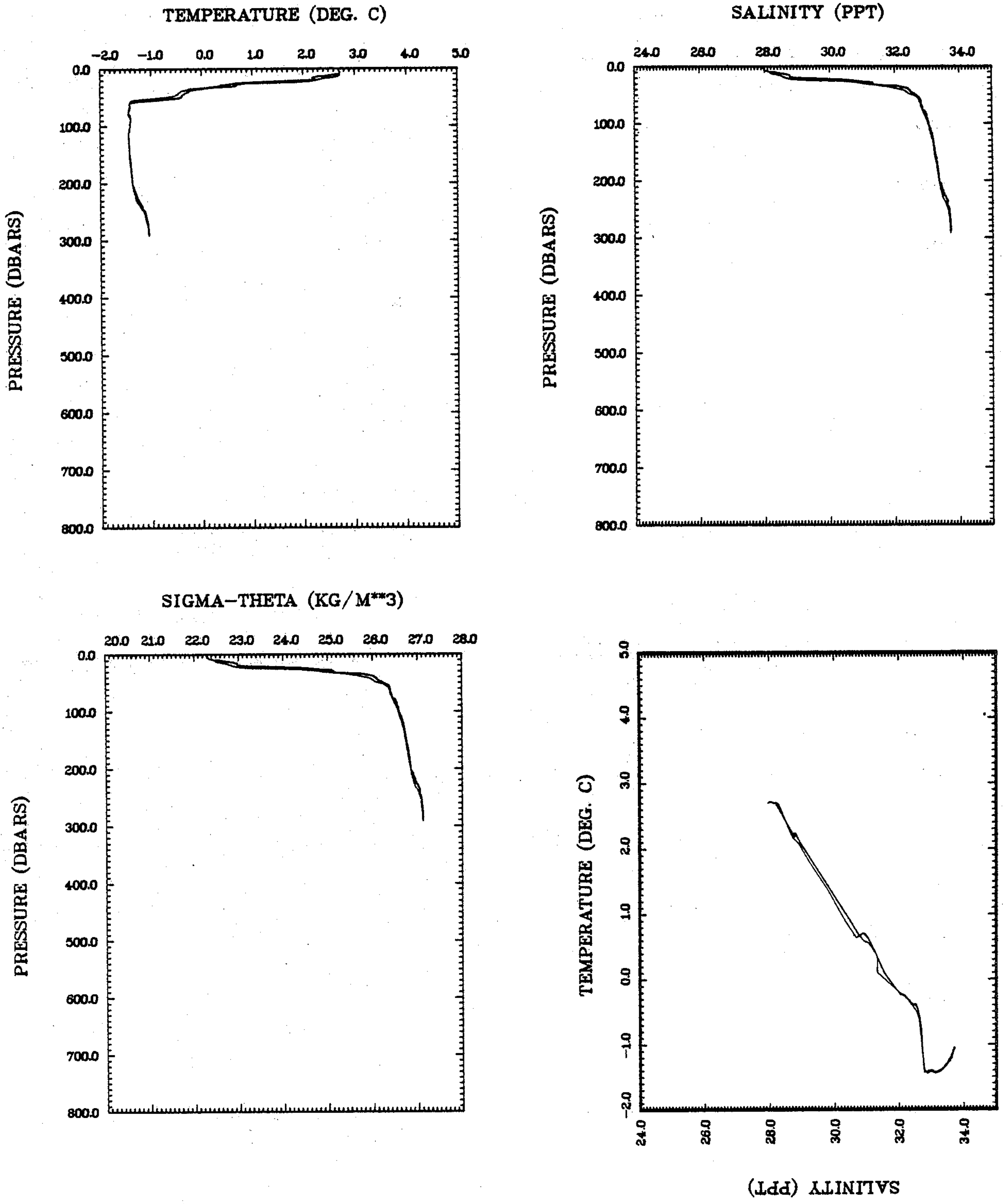

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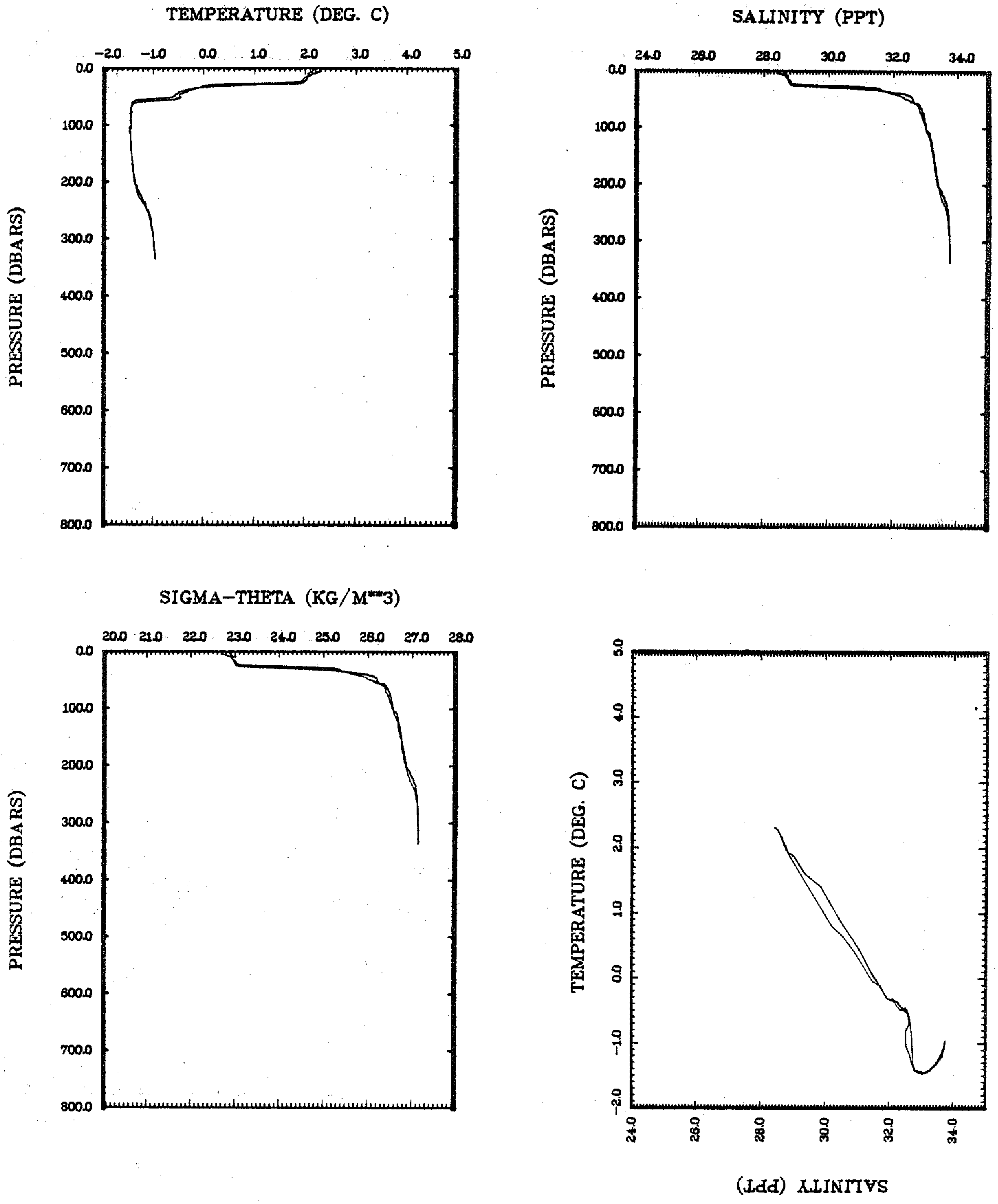

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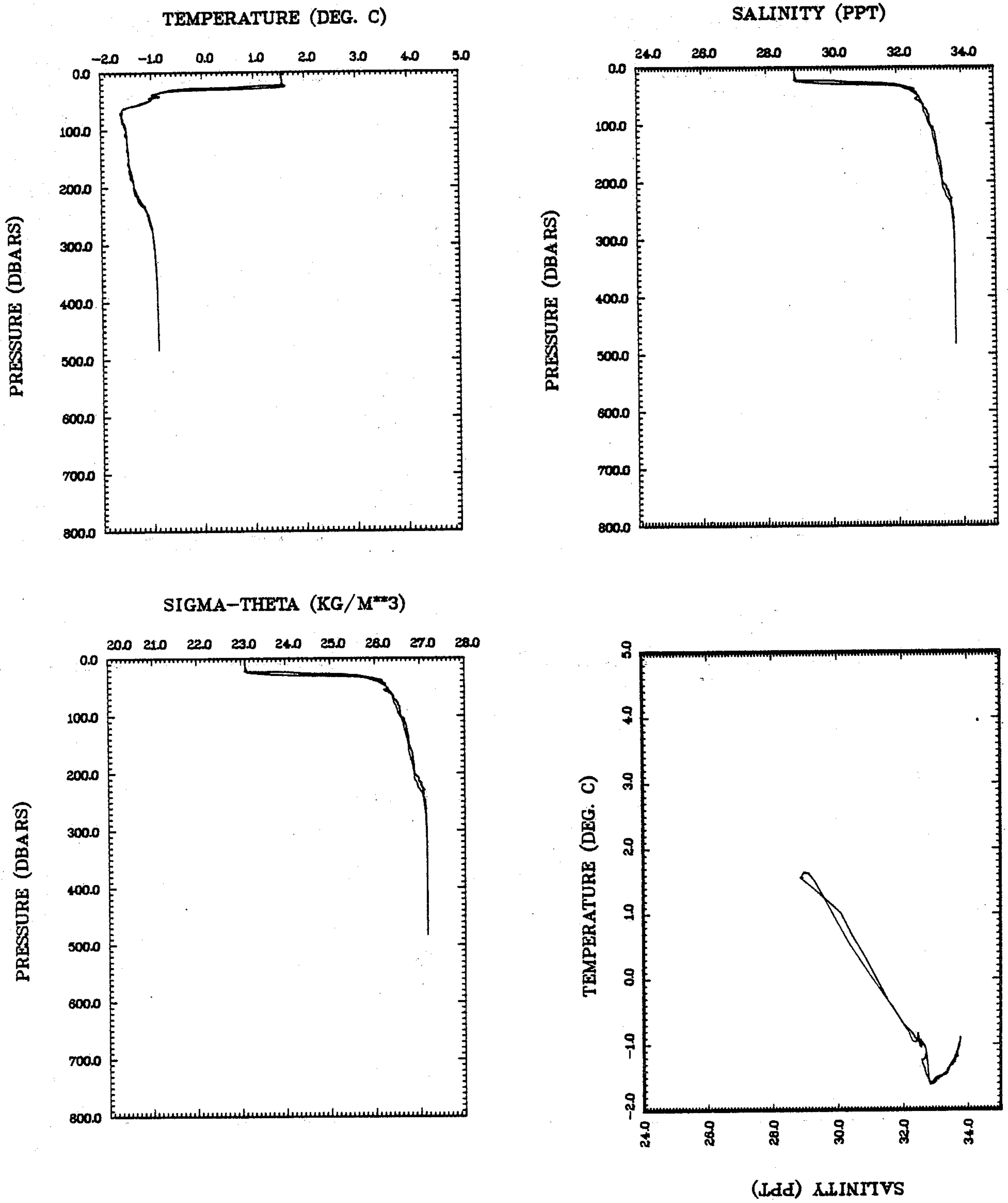

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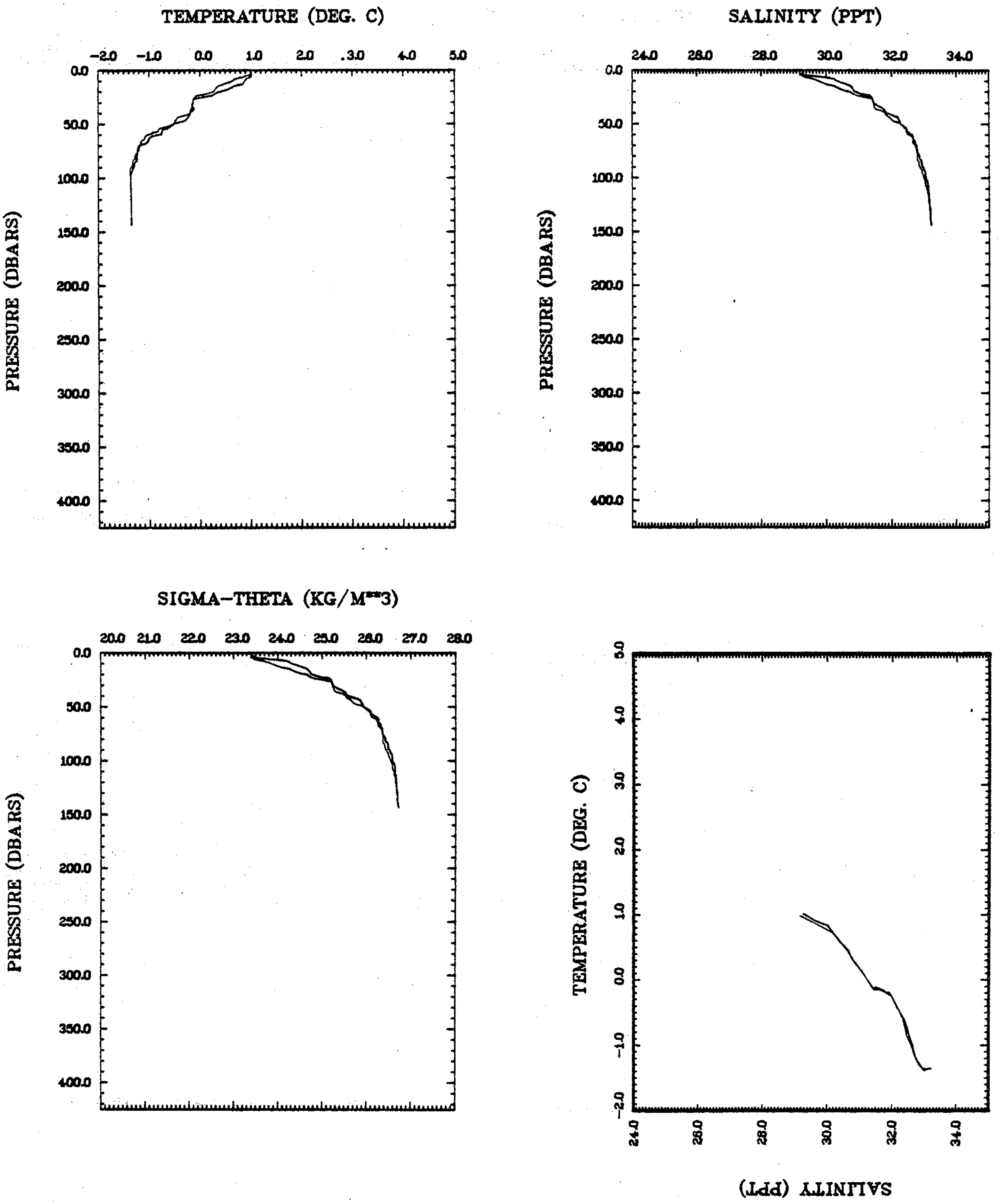

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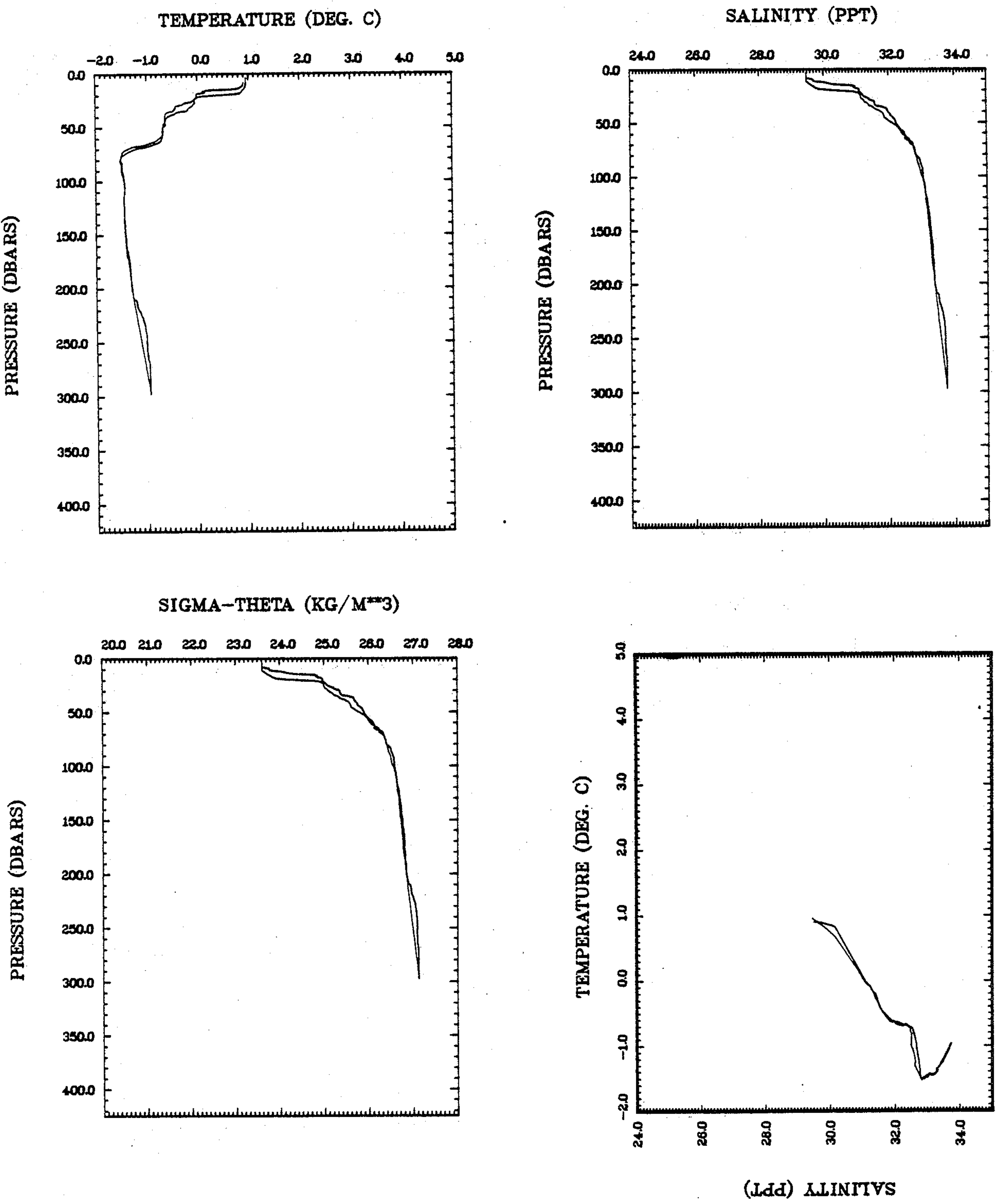

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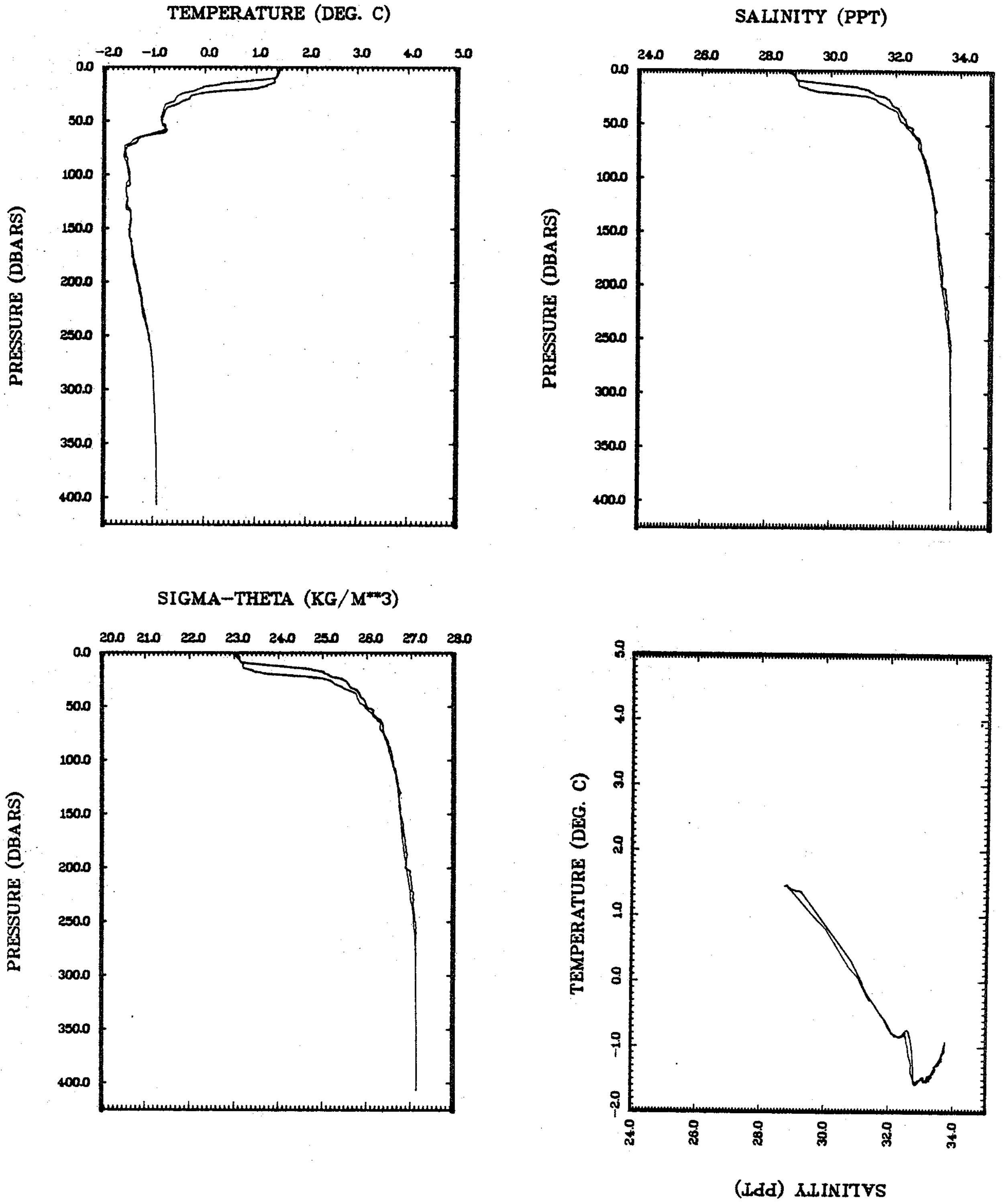

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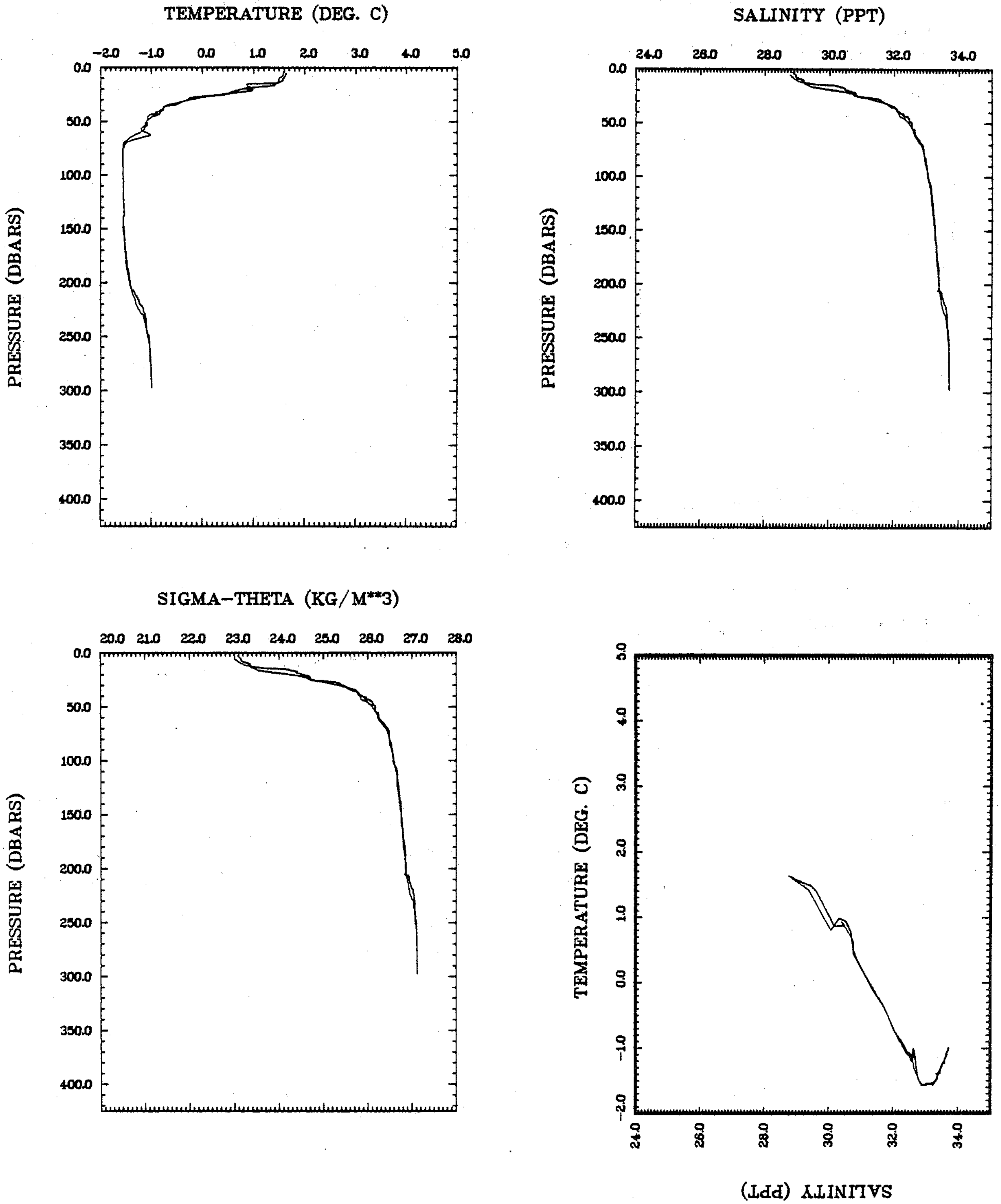

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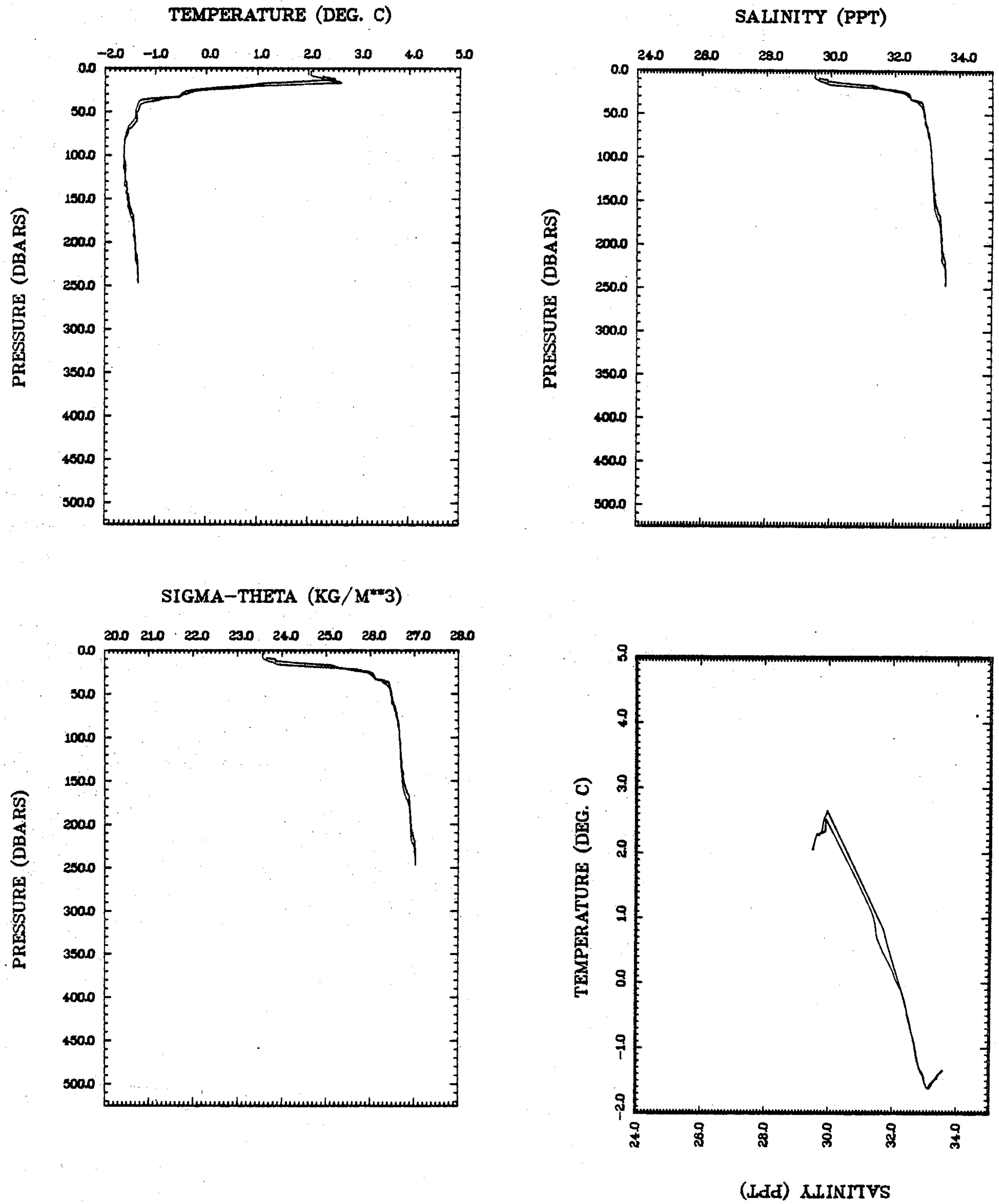

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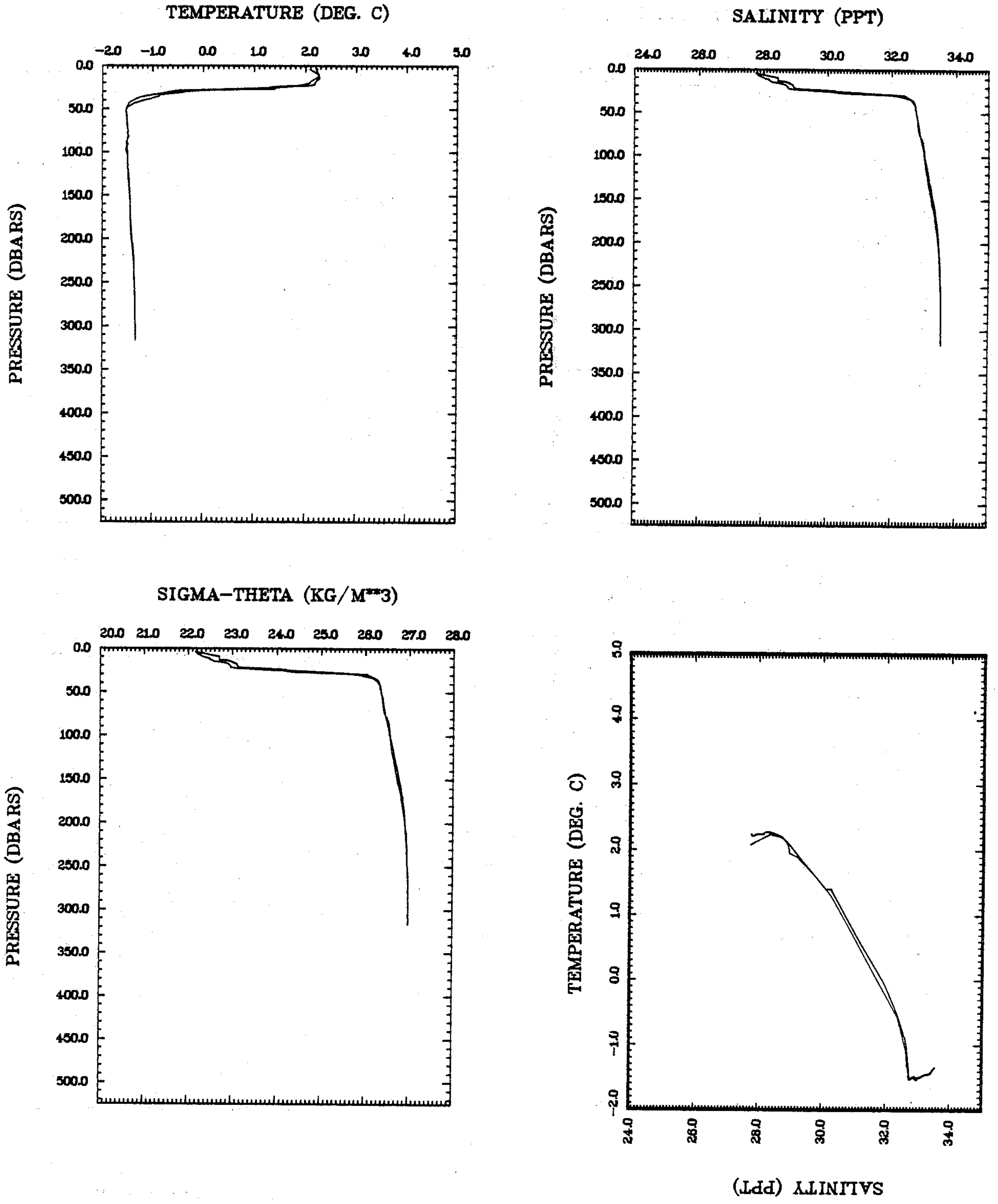

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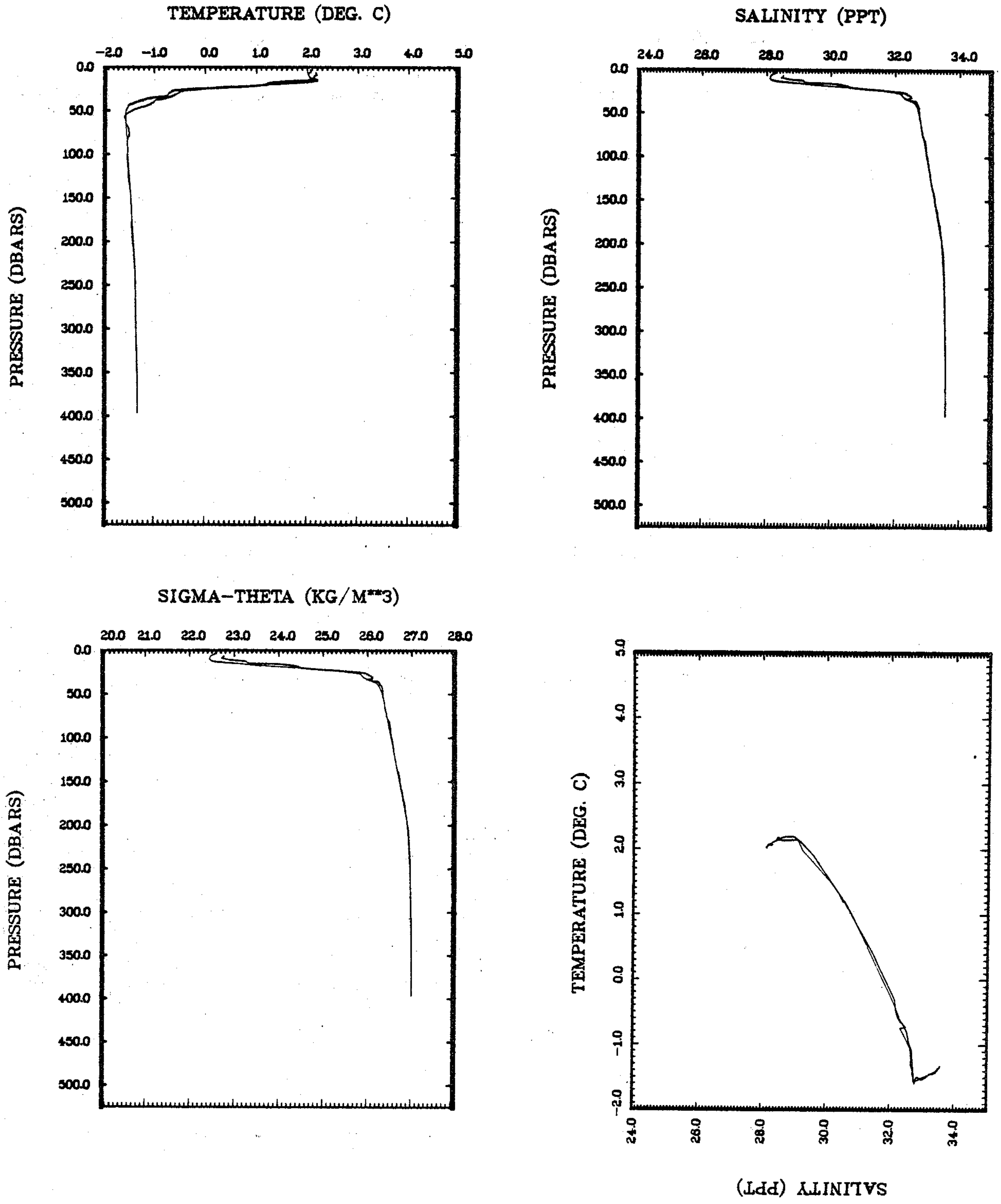

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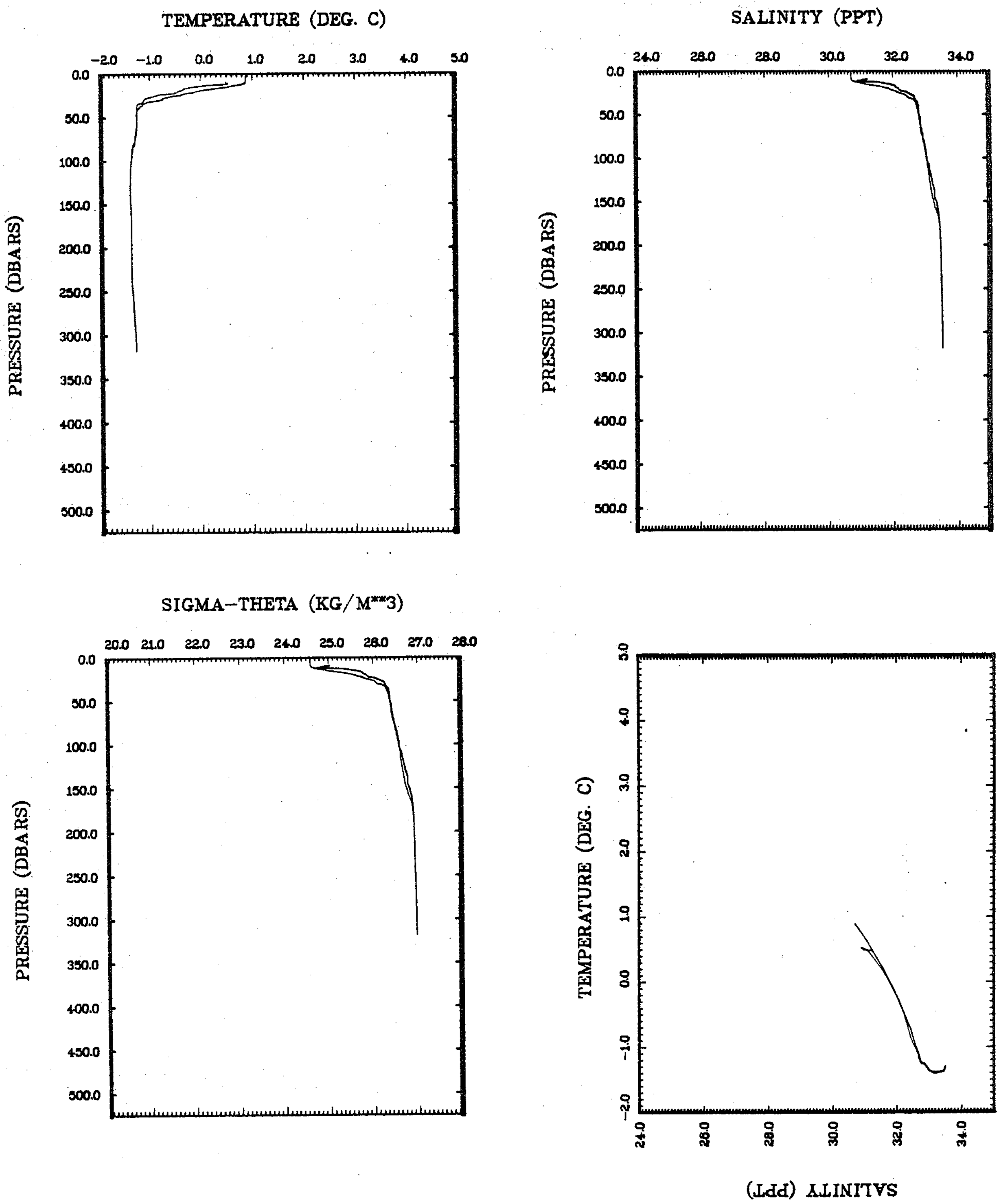

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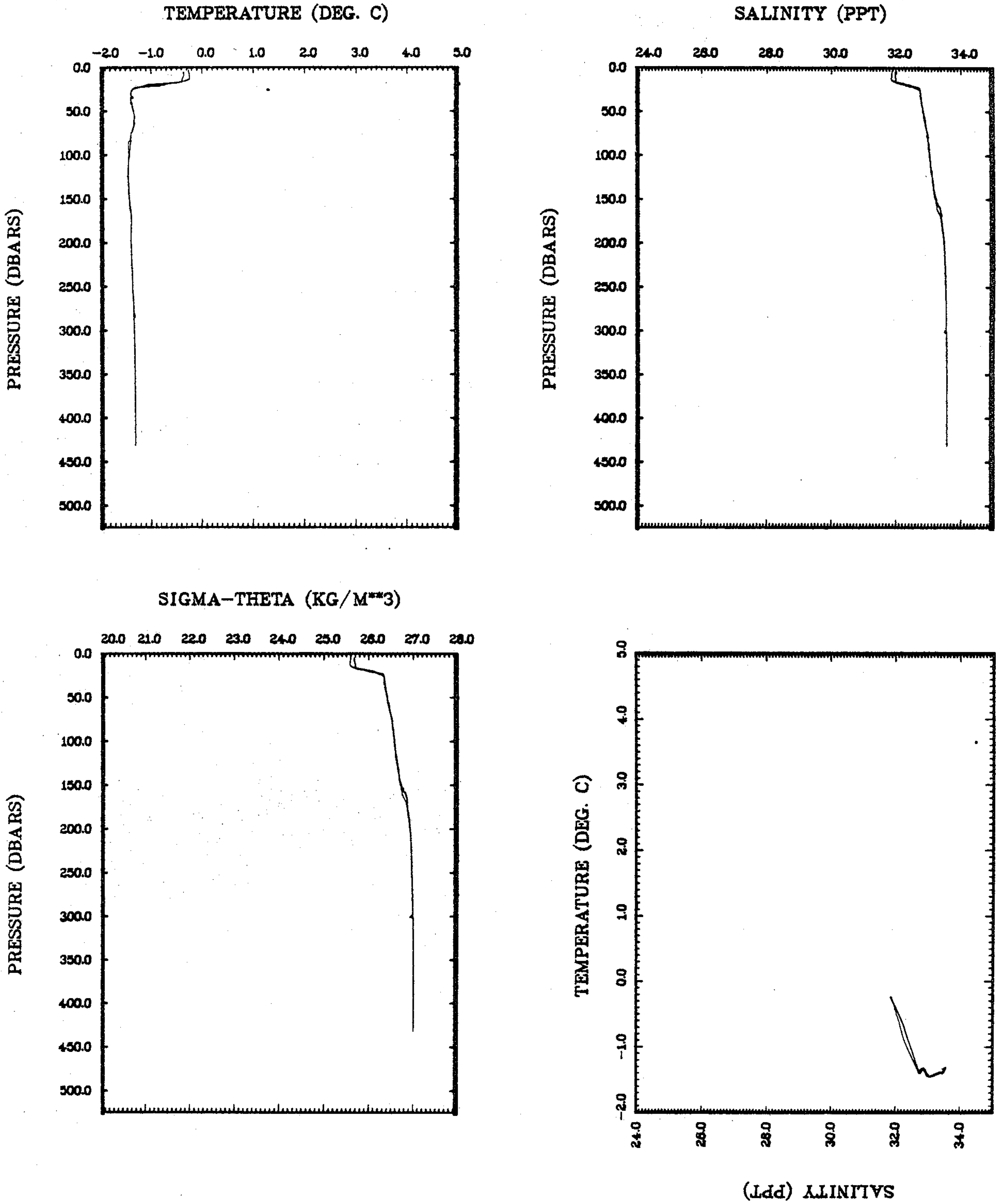

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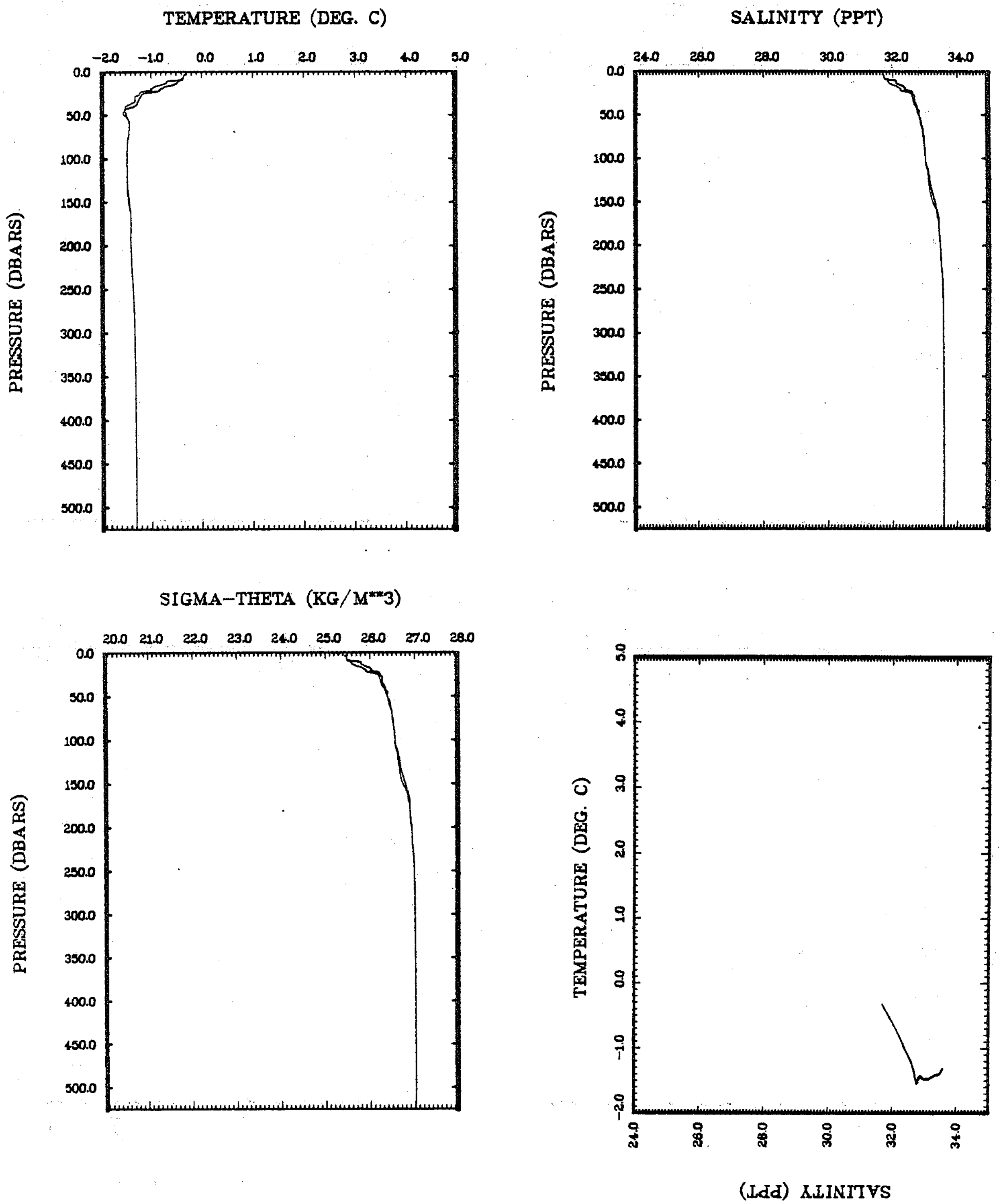

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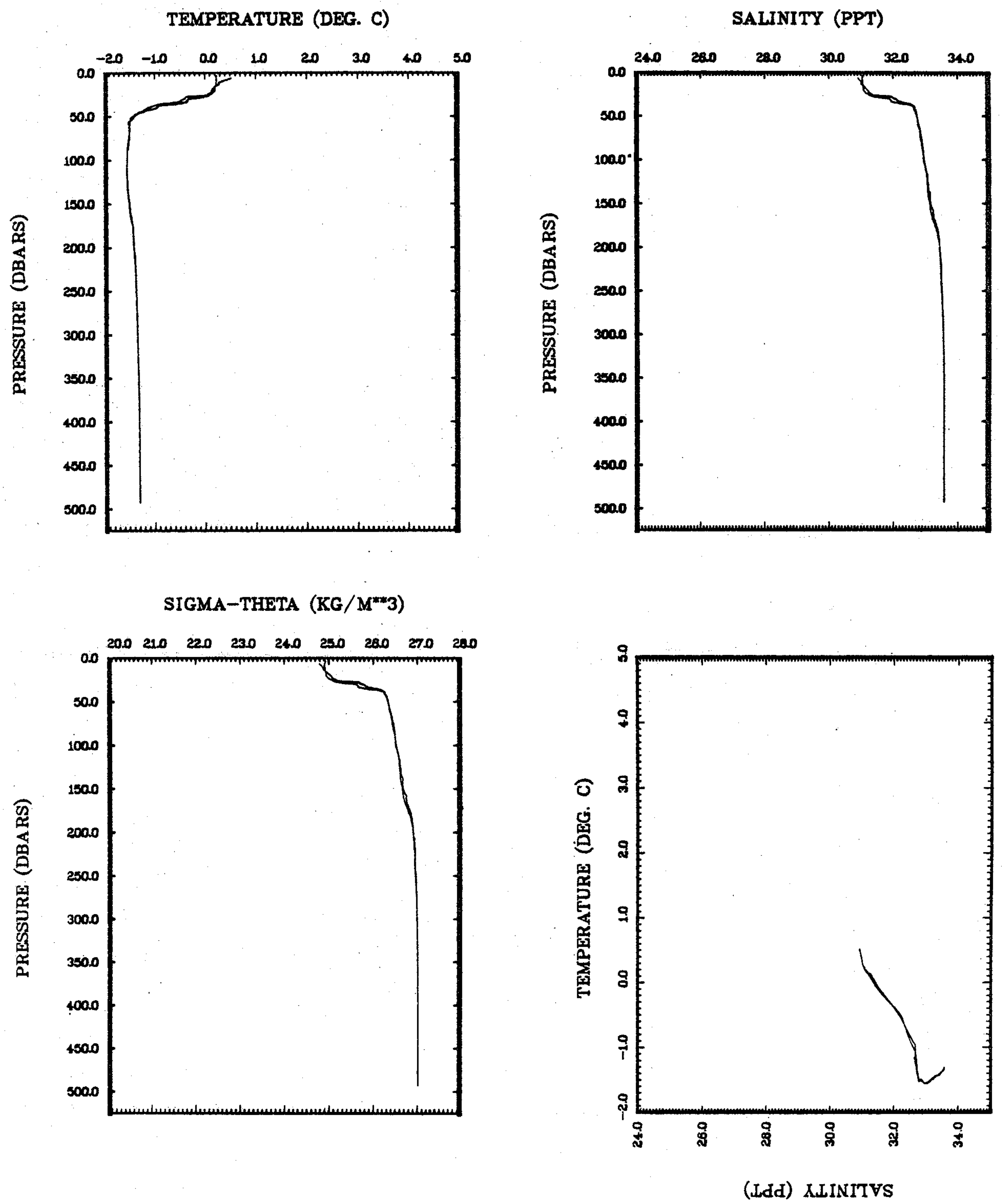
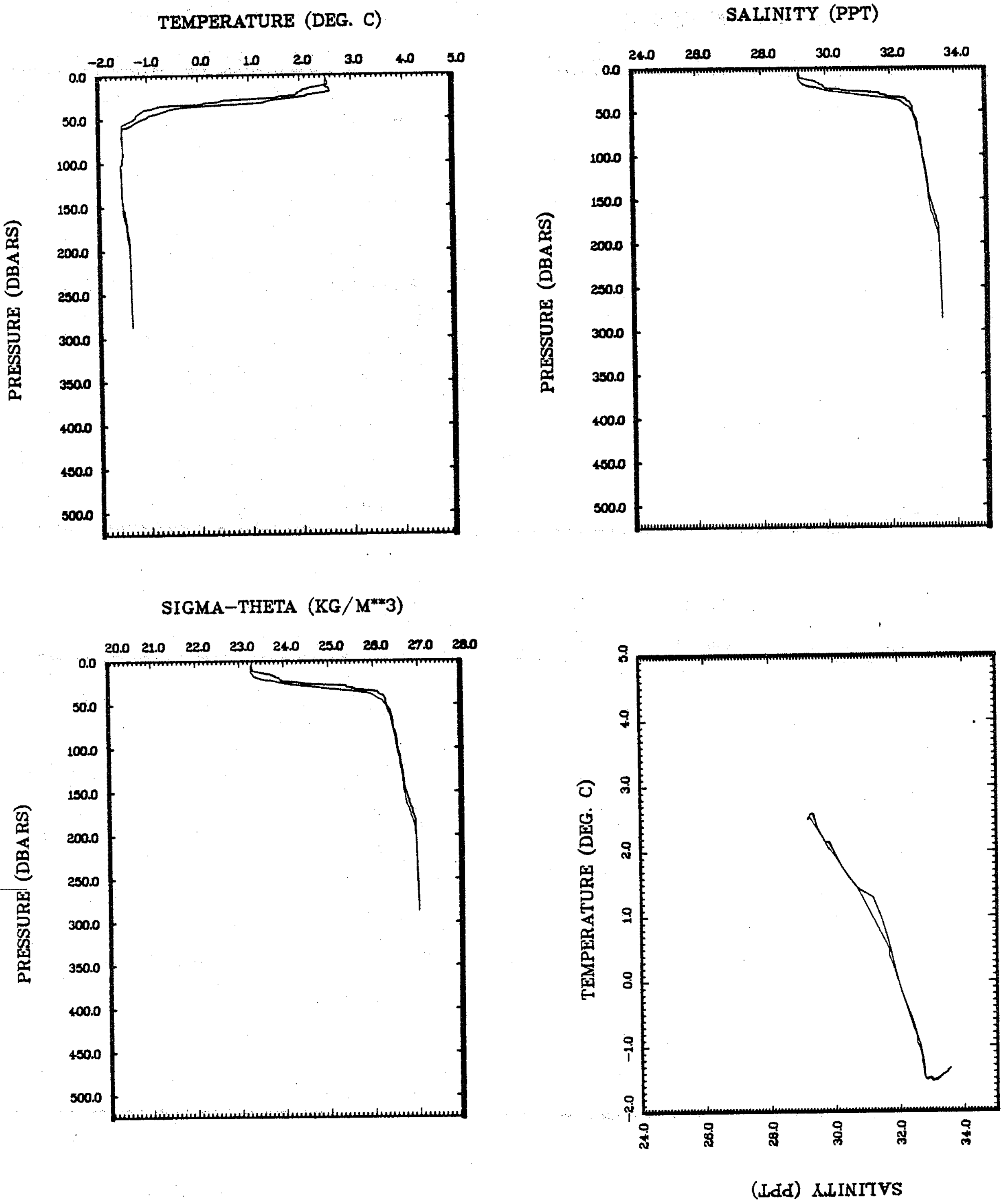
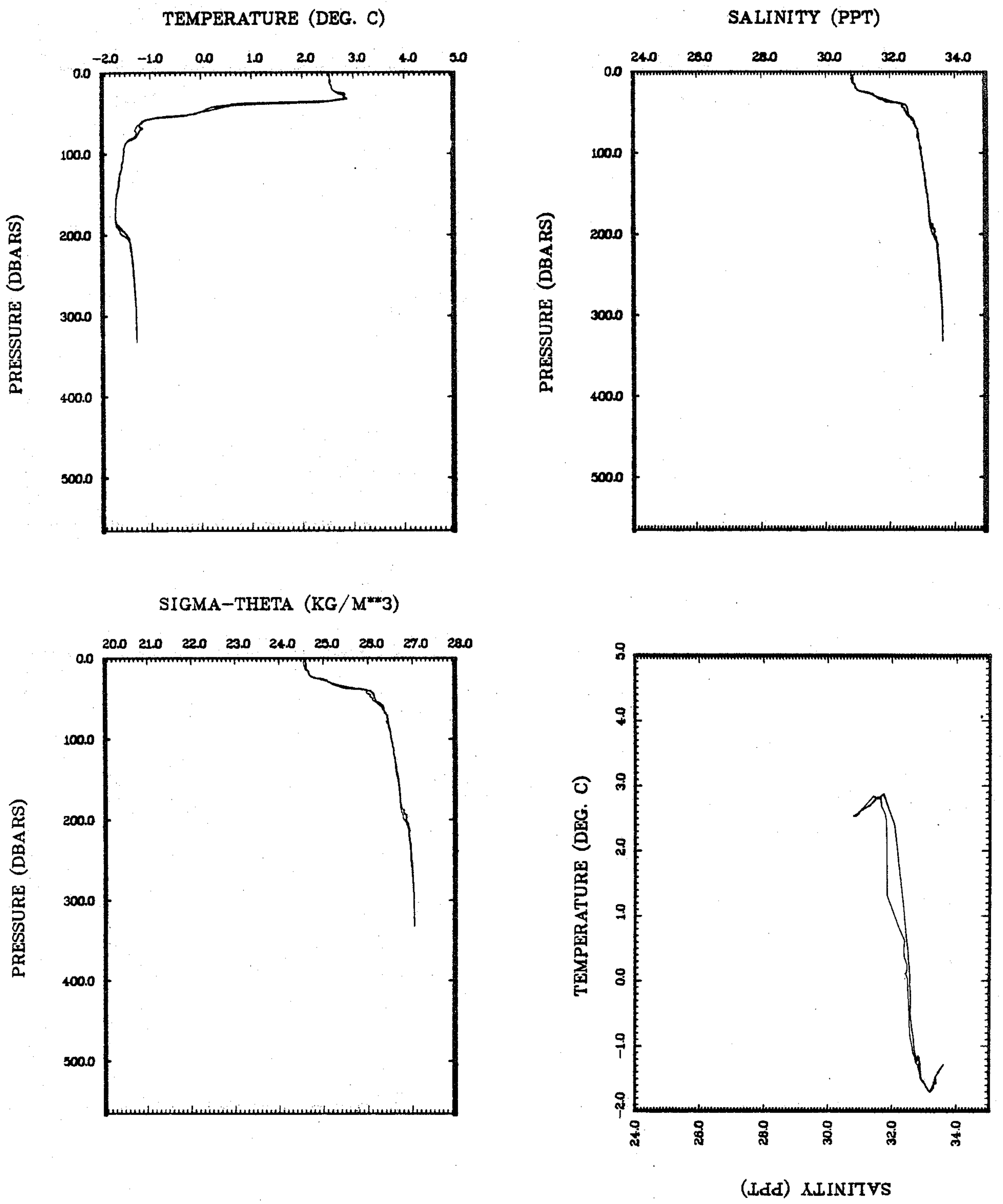


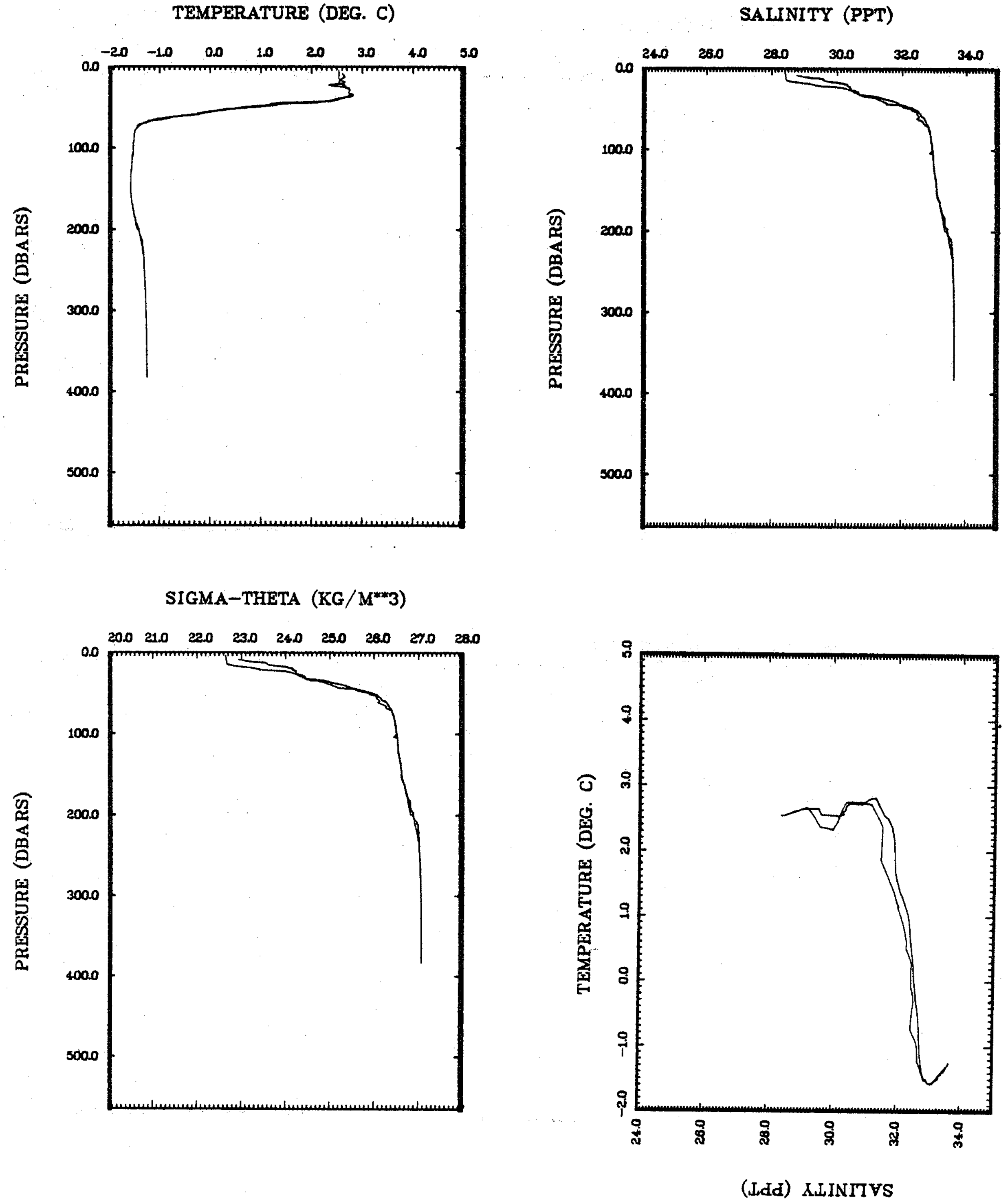
McBeth Fjord (MC7, CTD40, 82.09.19)



McBeth Fjord (MC8, CTD41, 82.09.19)



Inugsuin Fjord (IN8, CTD42, 82.09.19)



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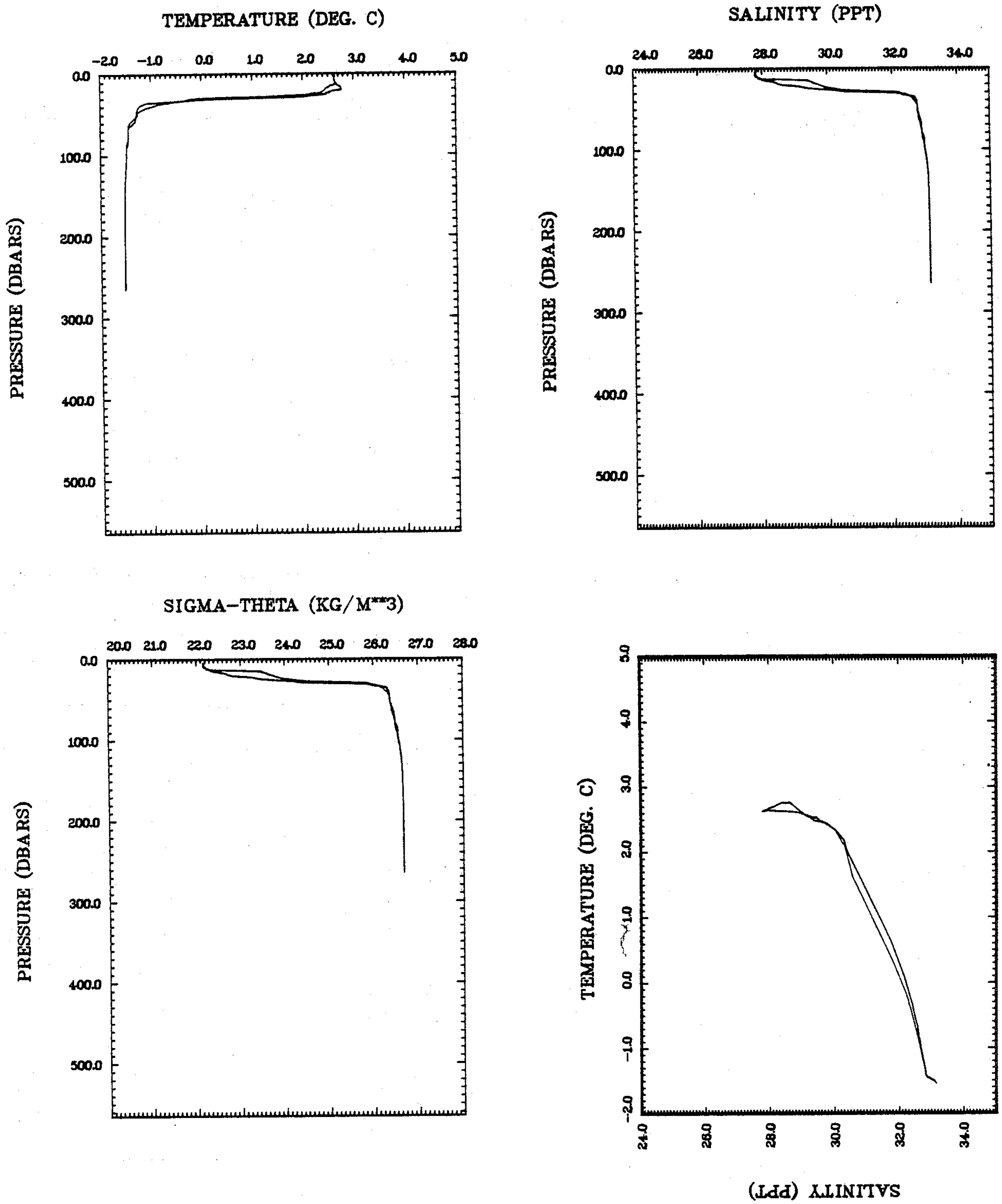

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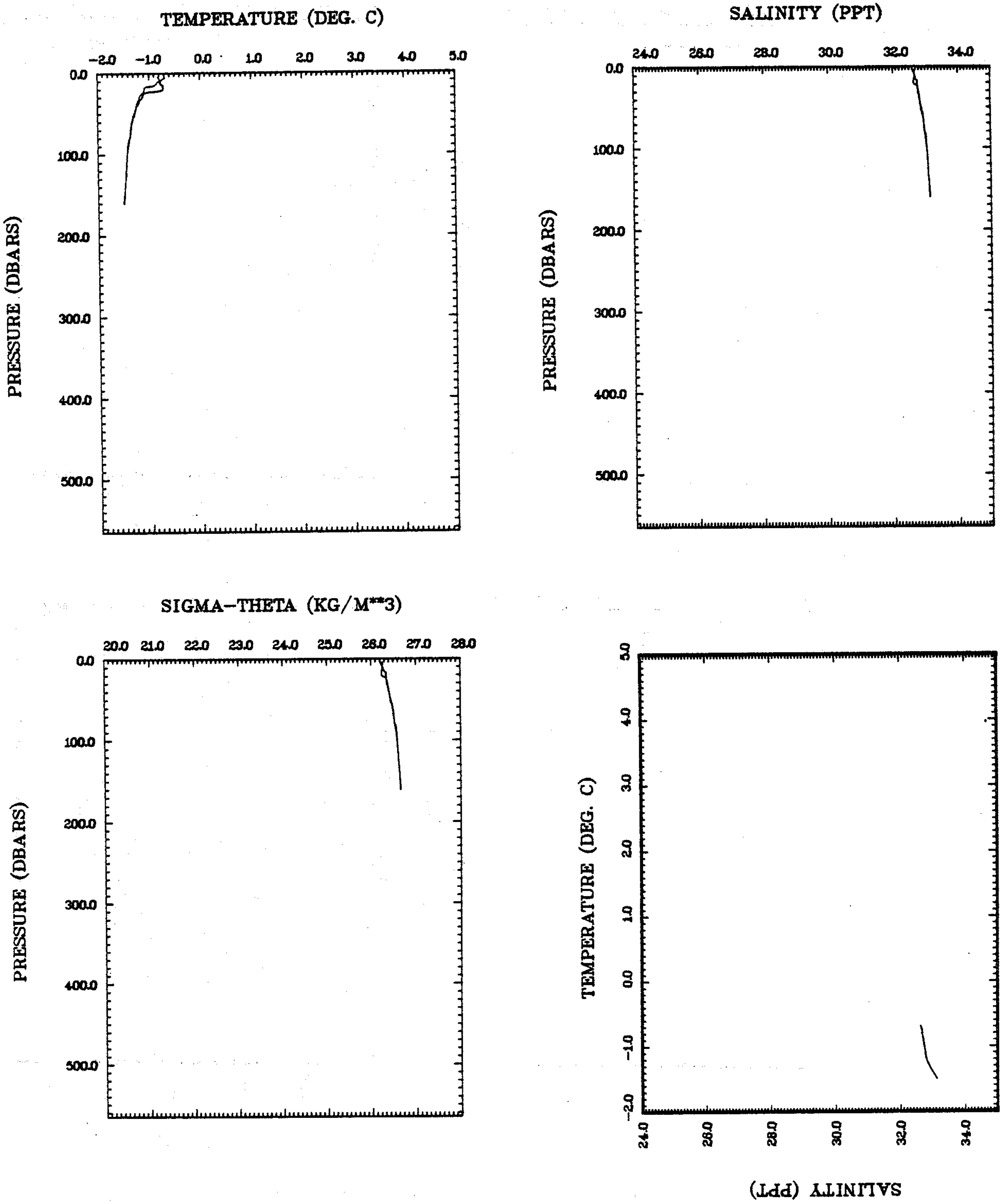

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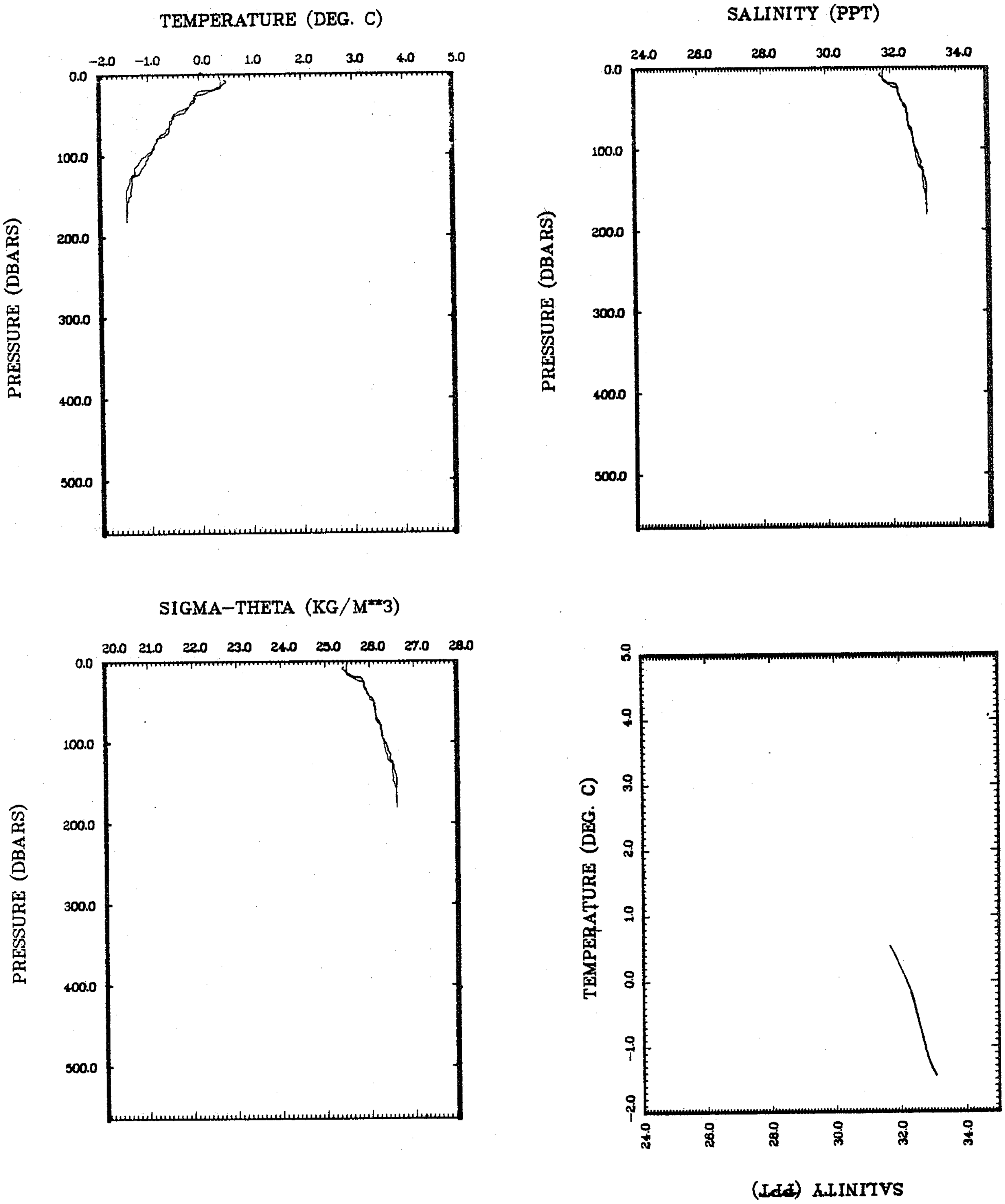

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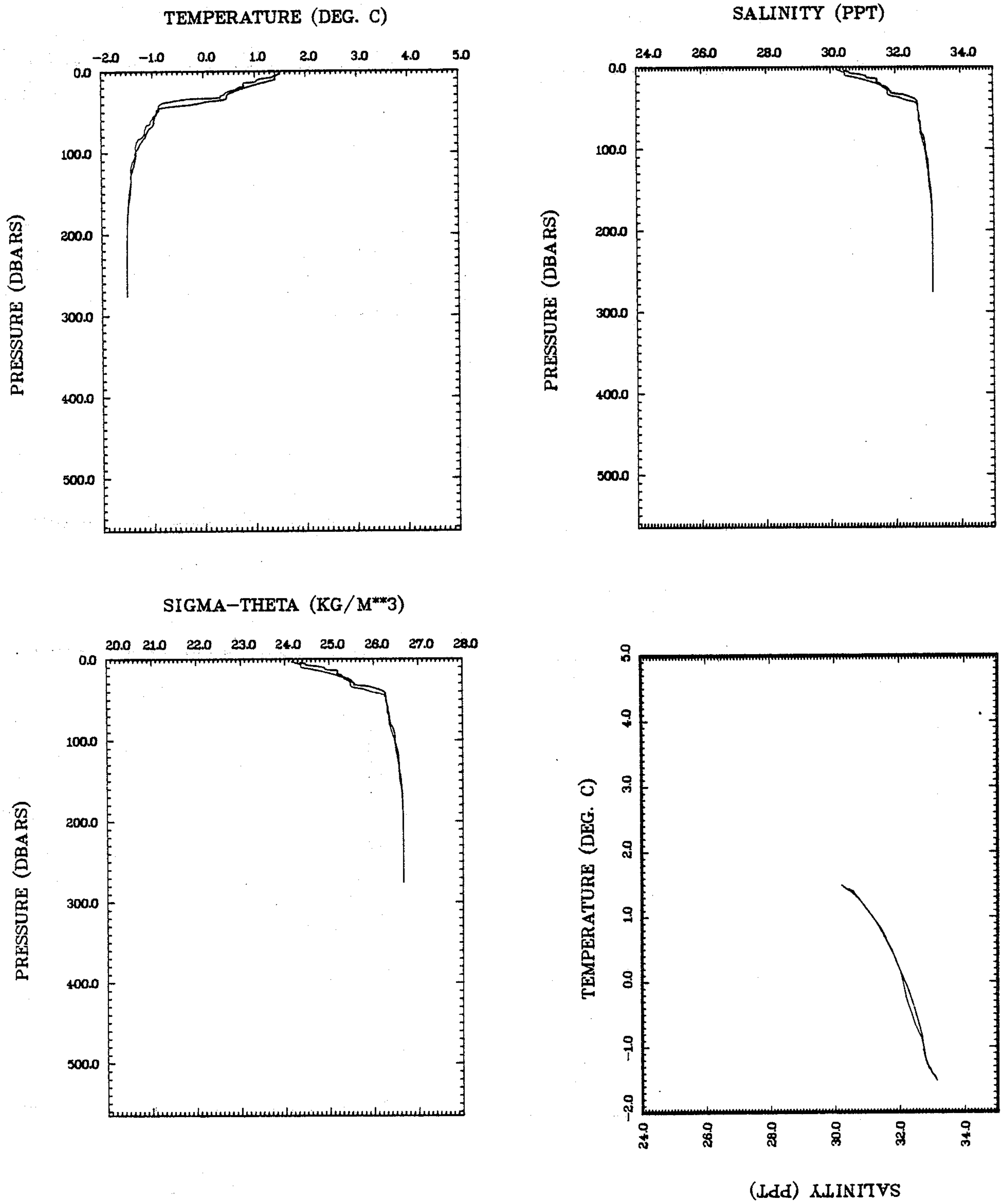

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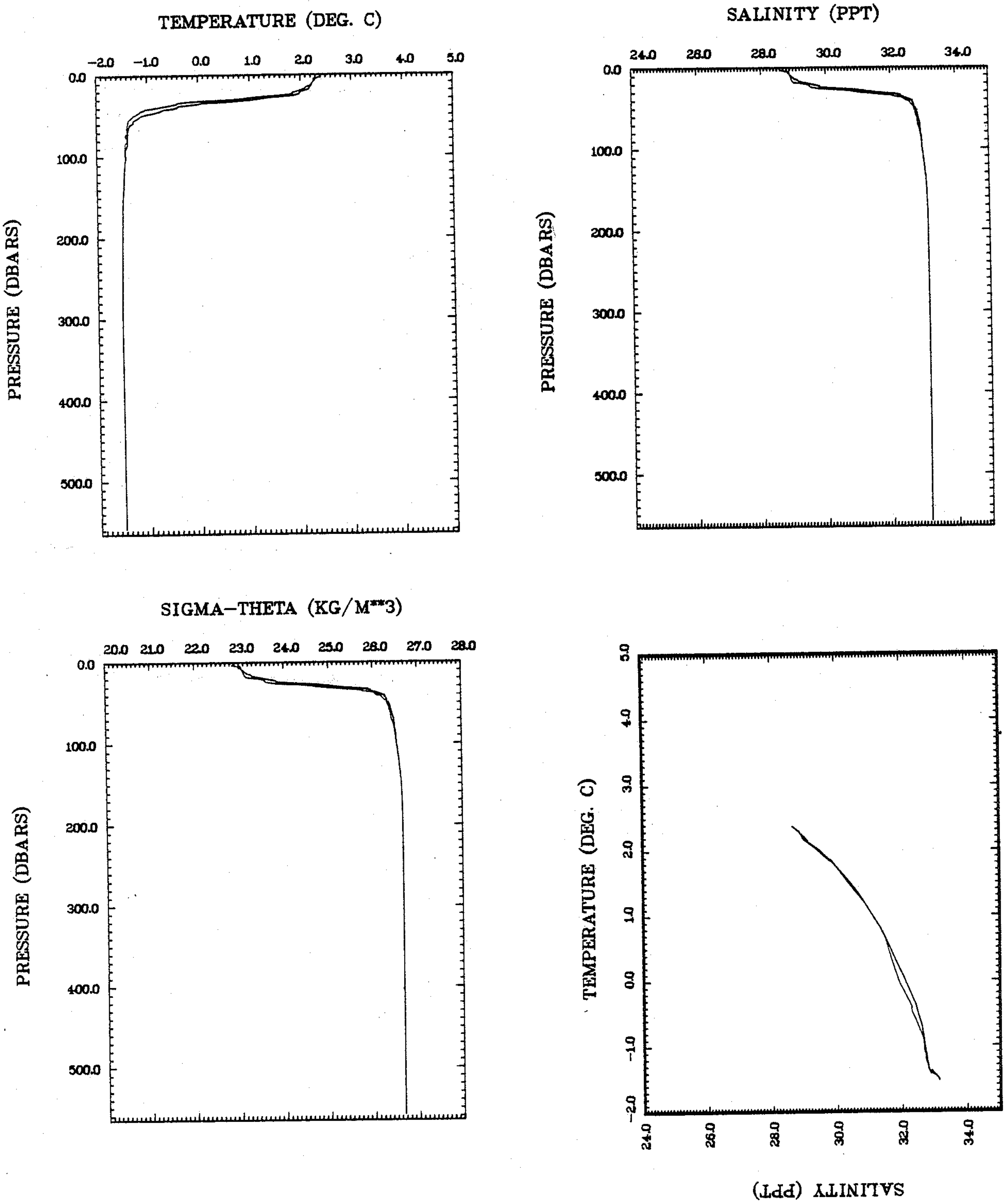

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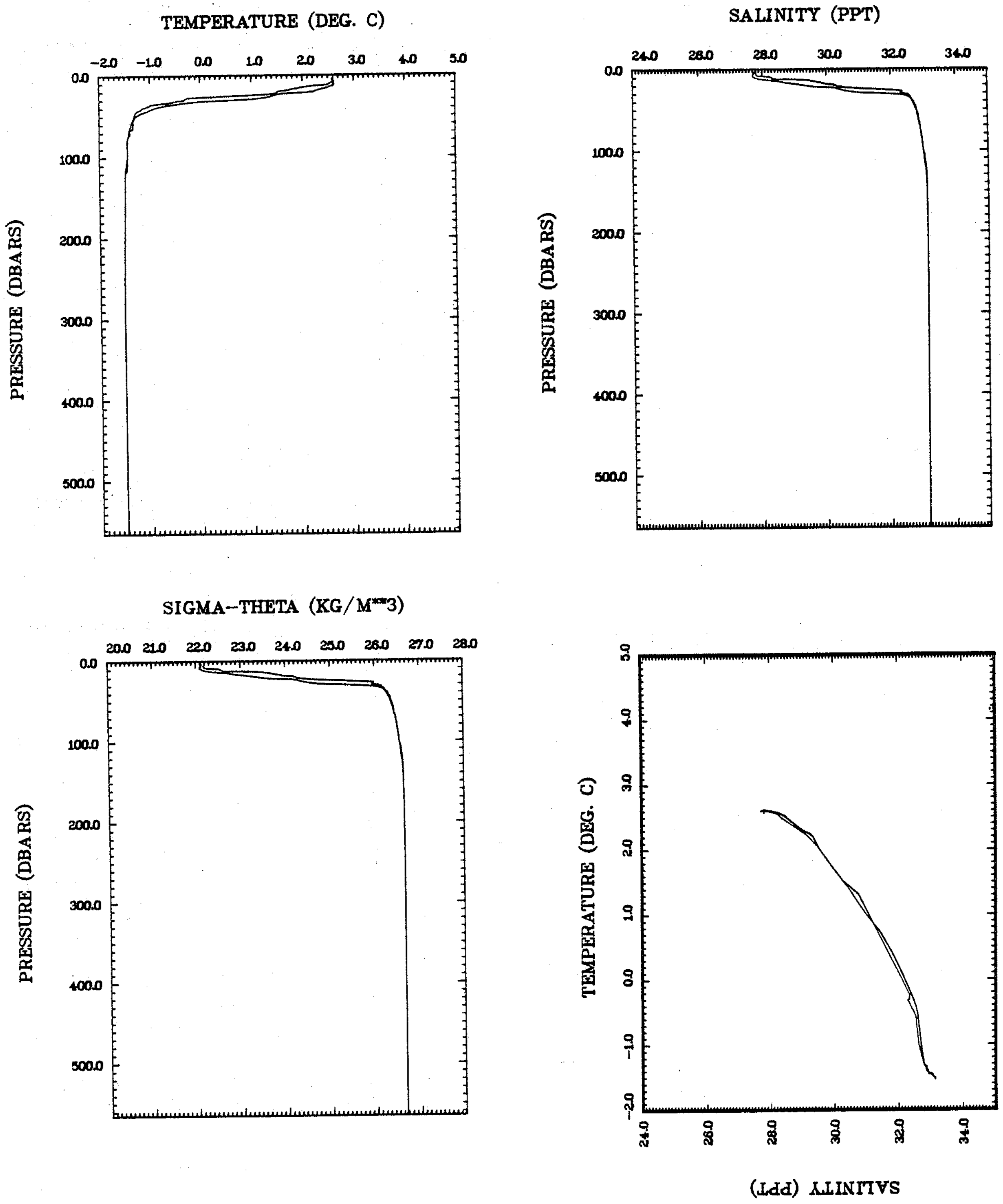

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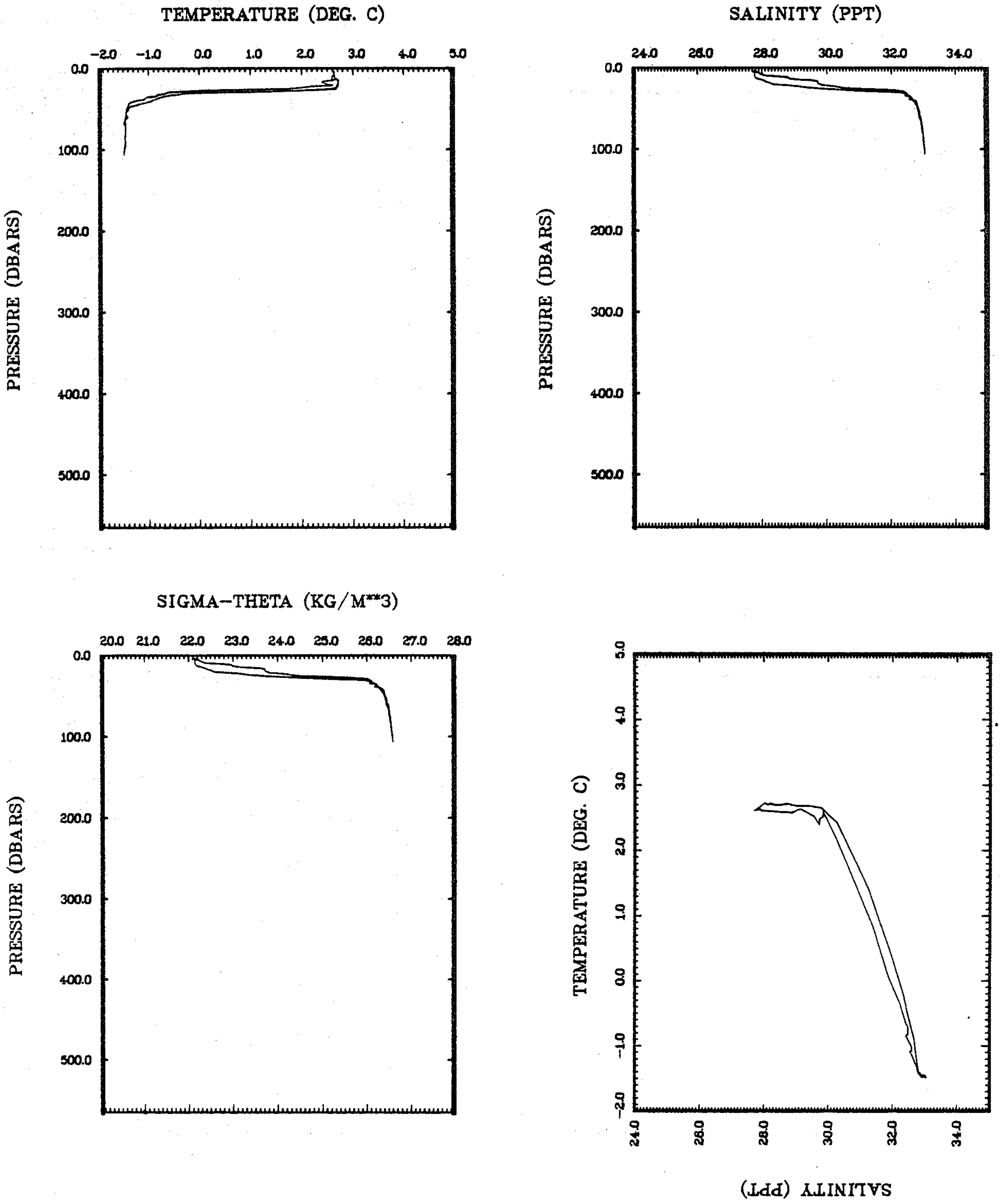

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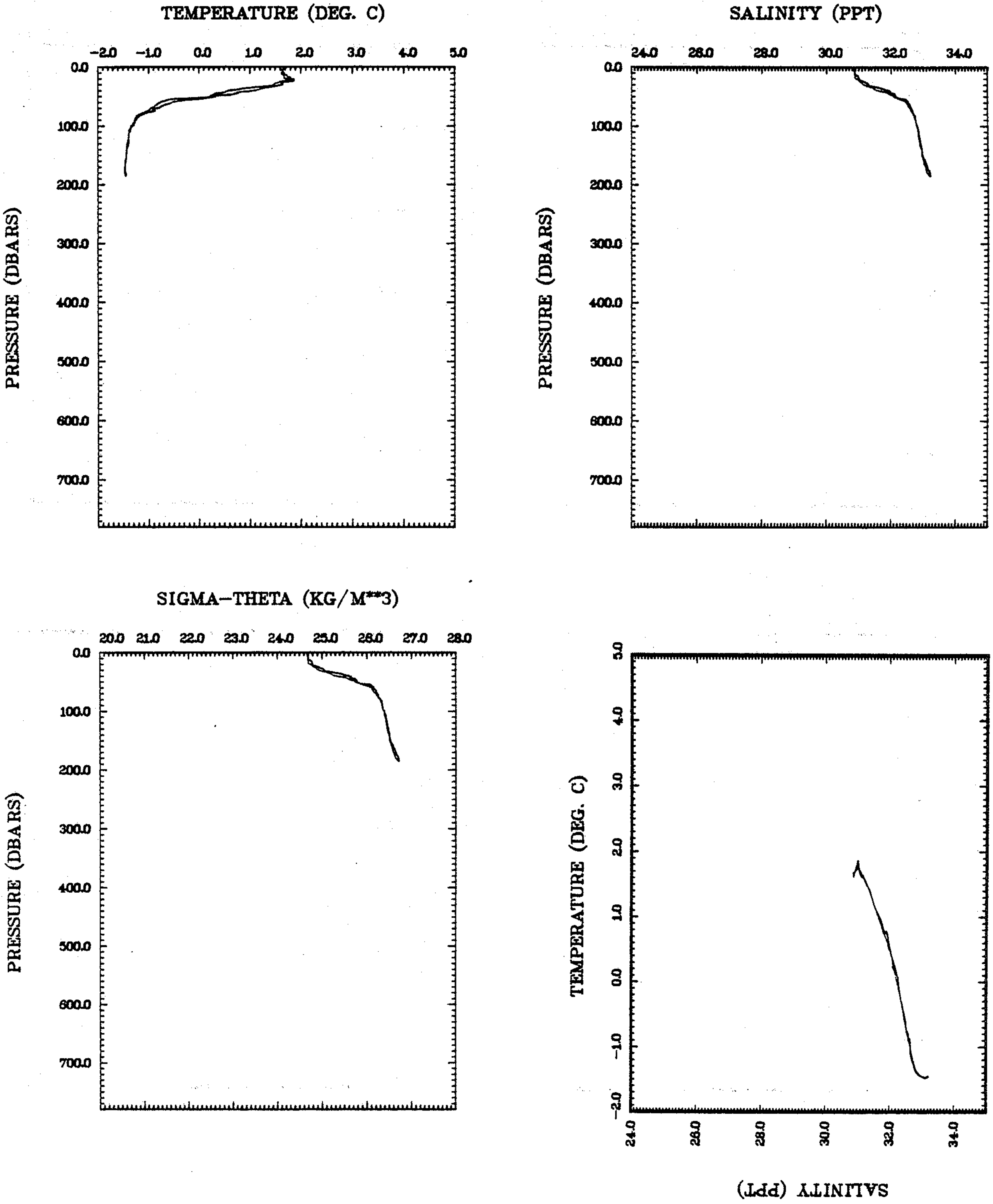

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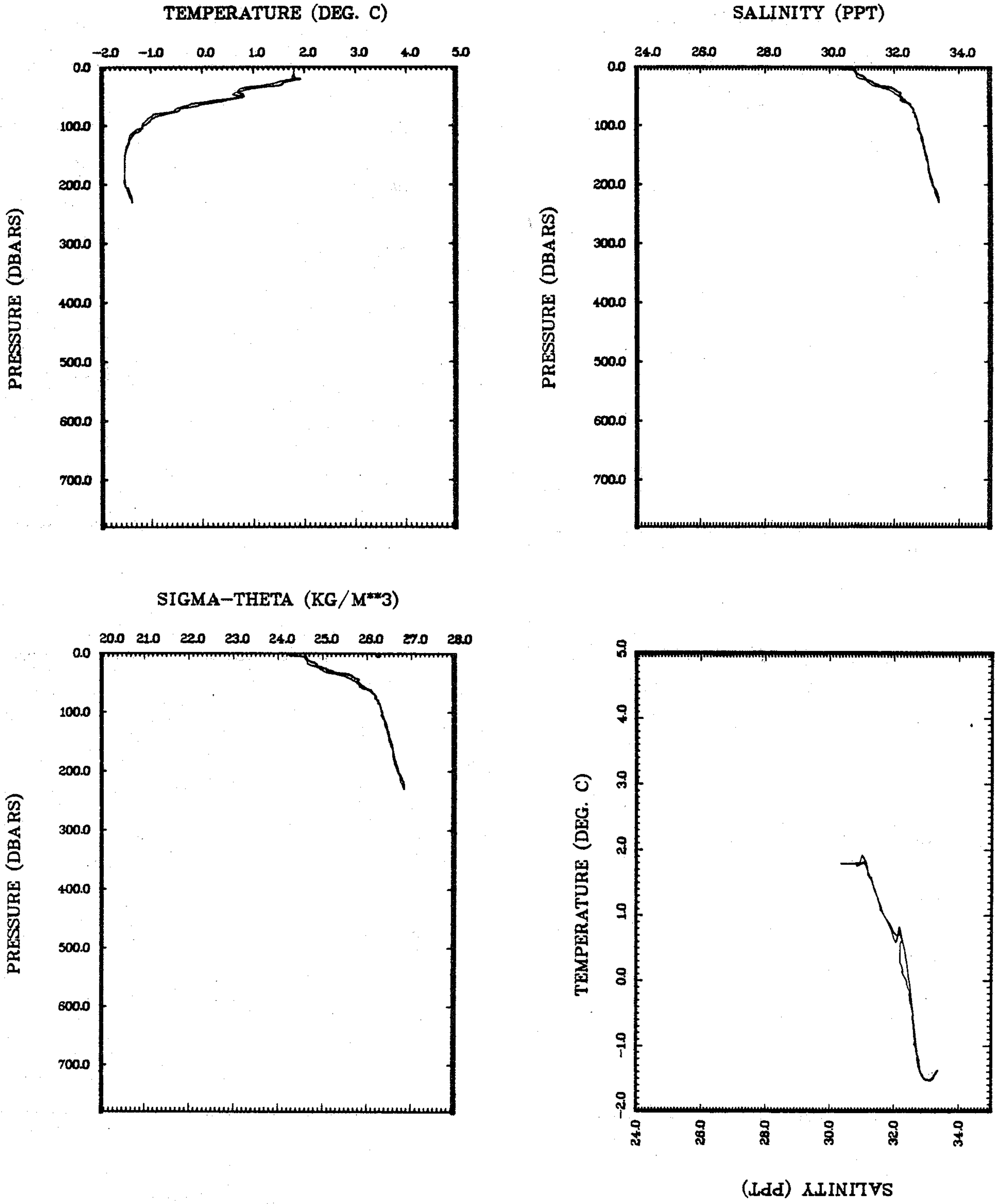

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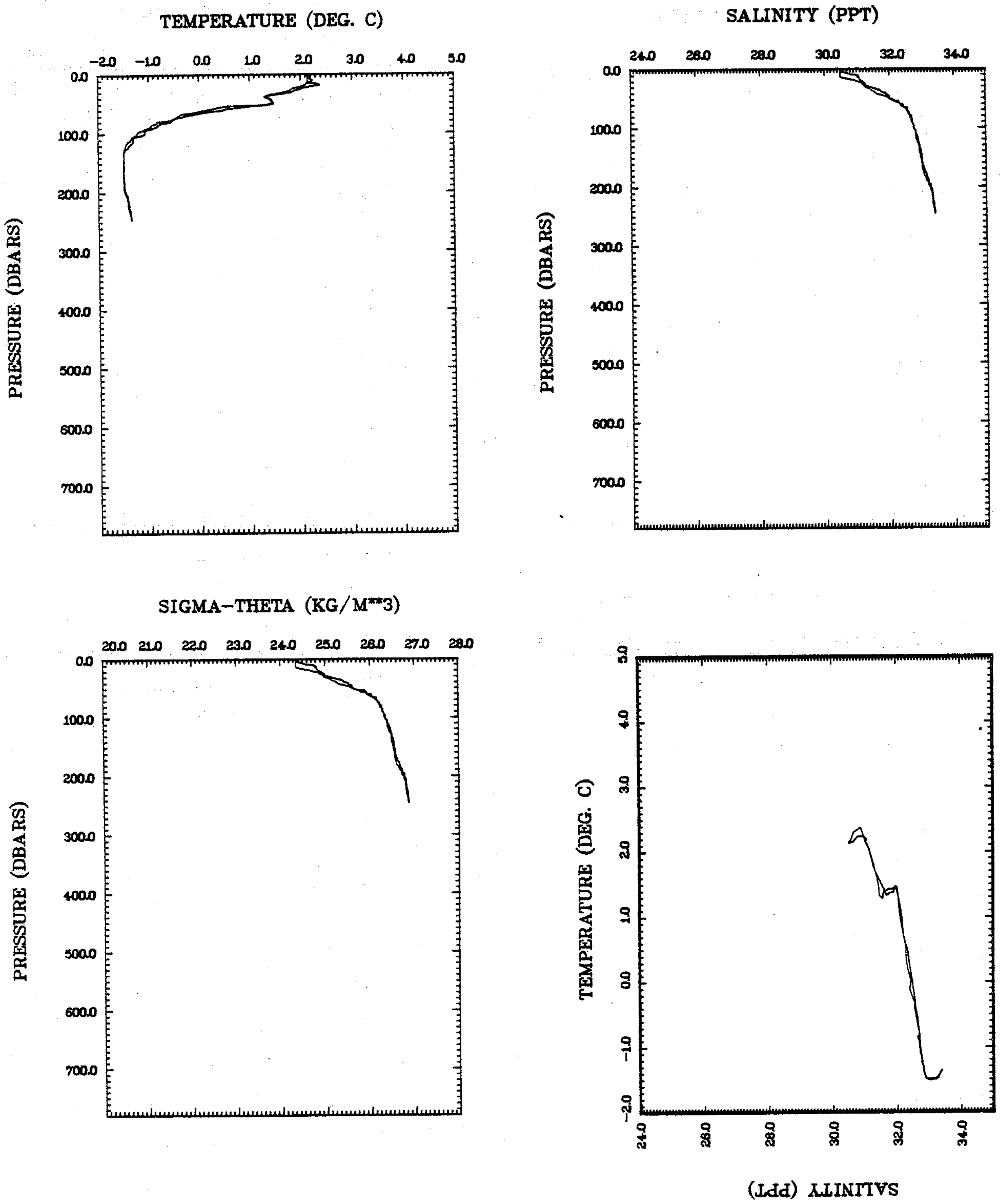

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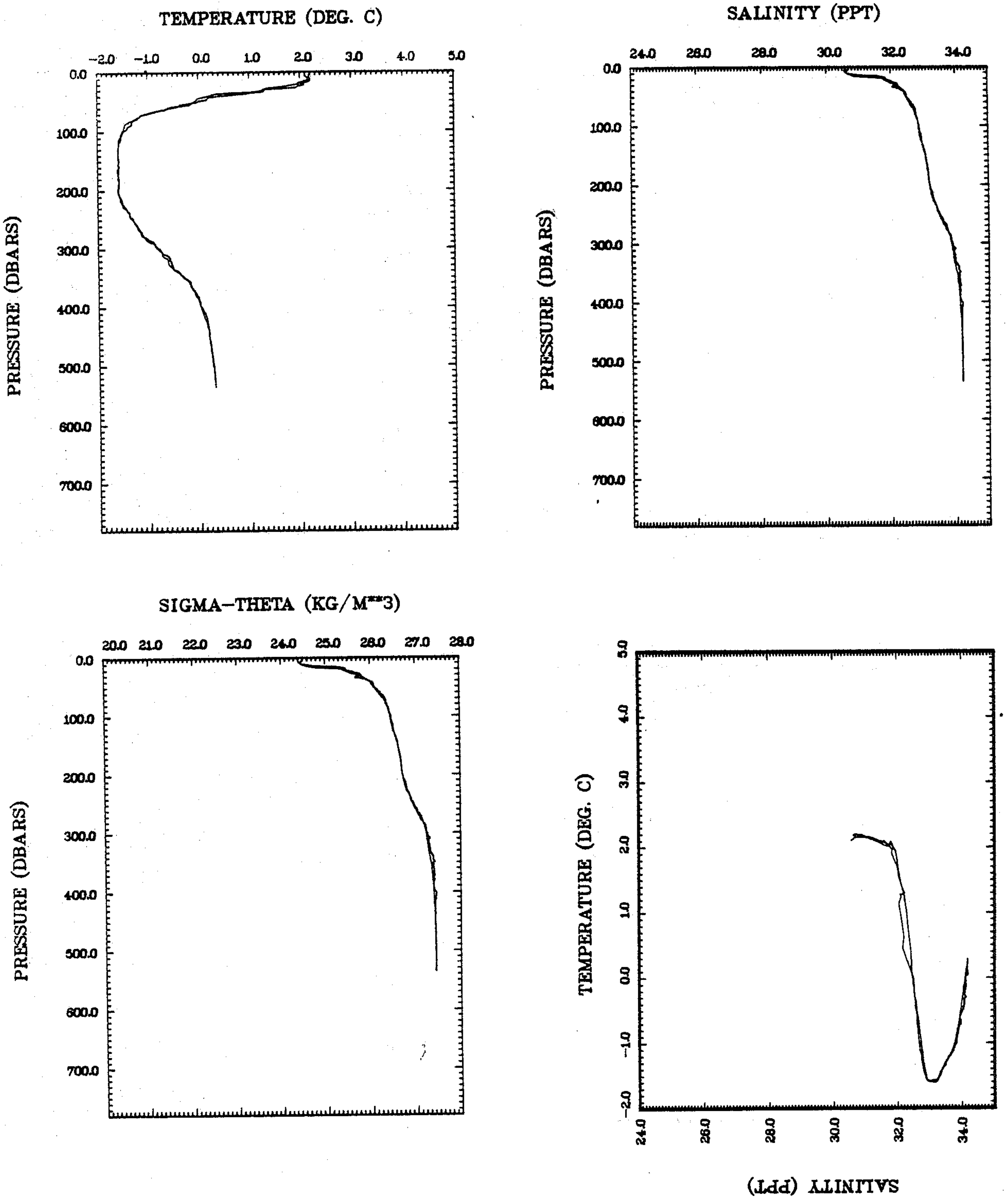

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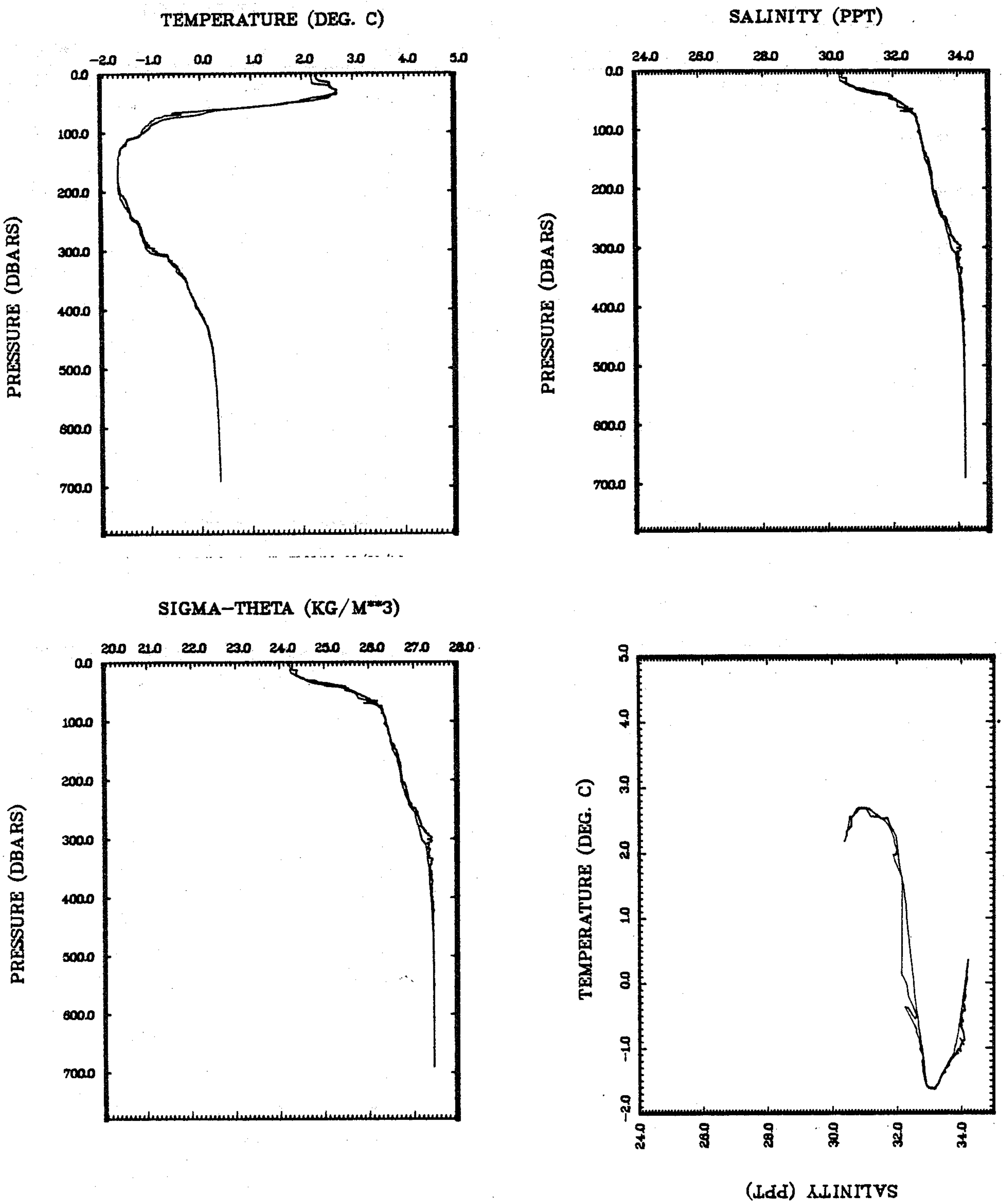

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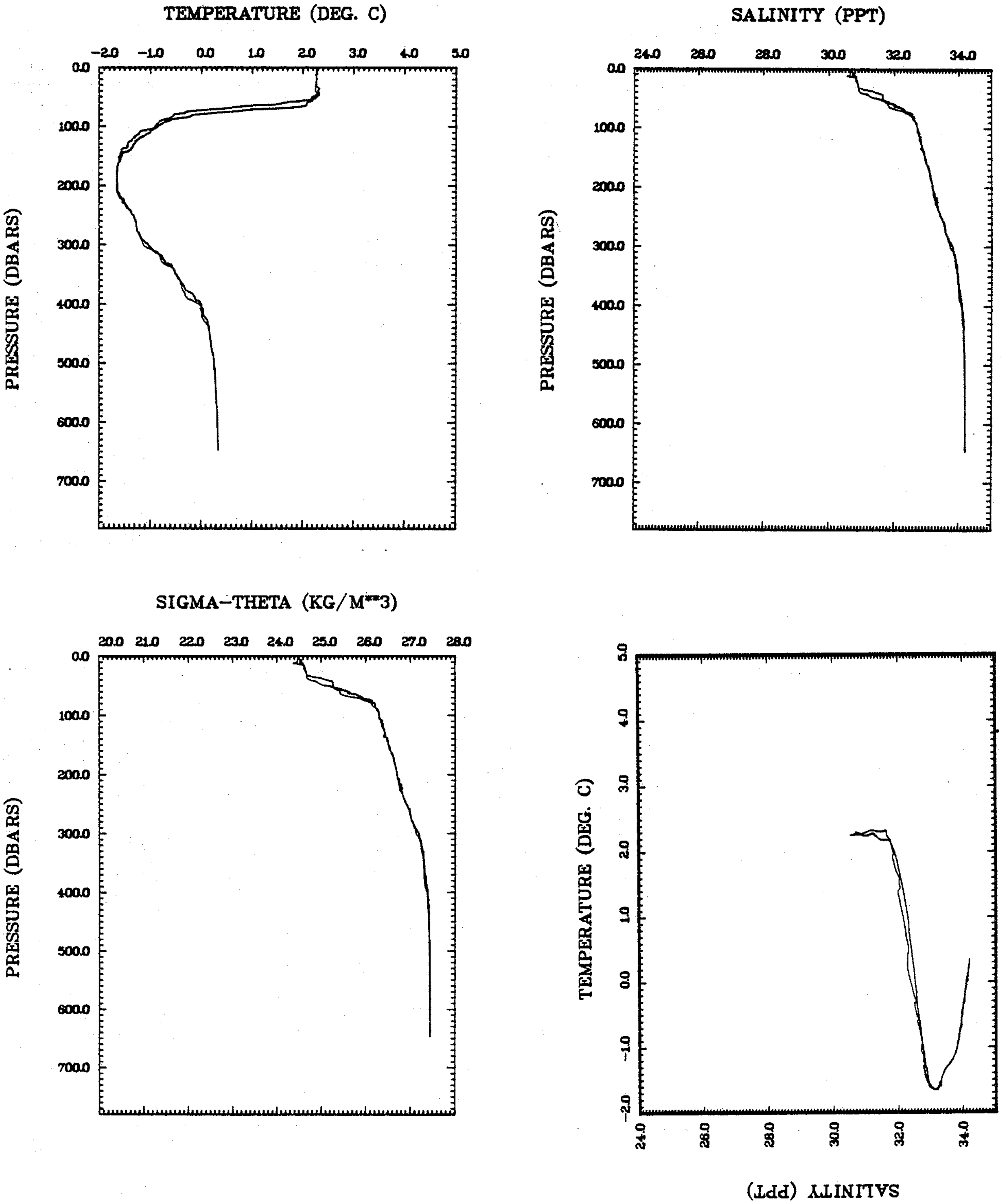

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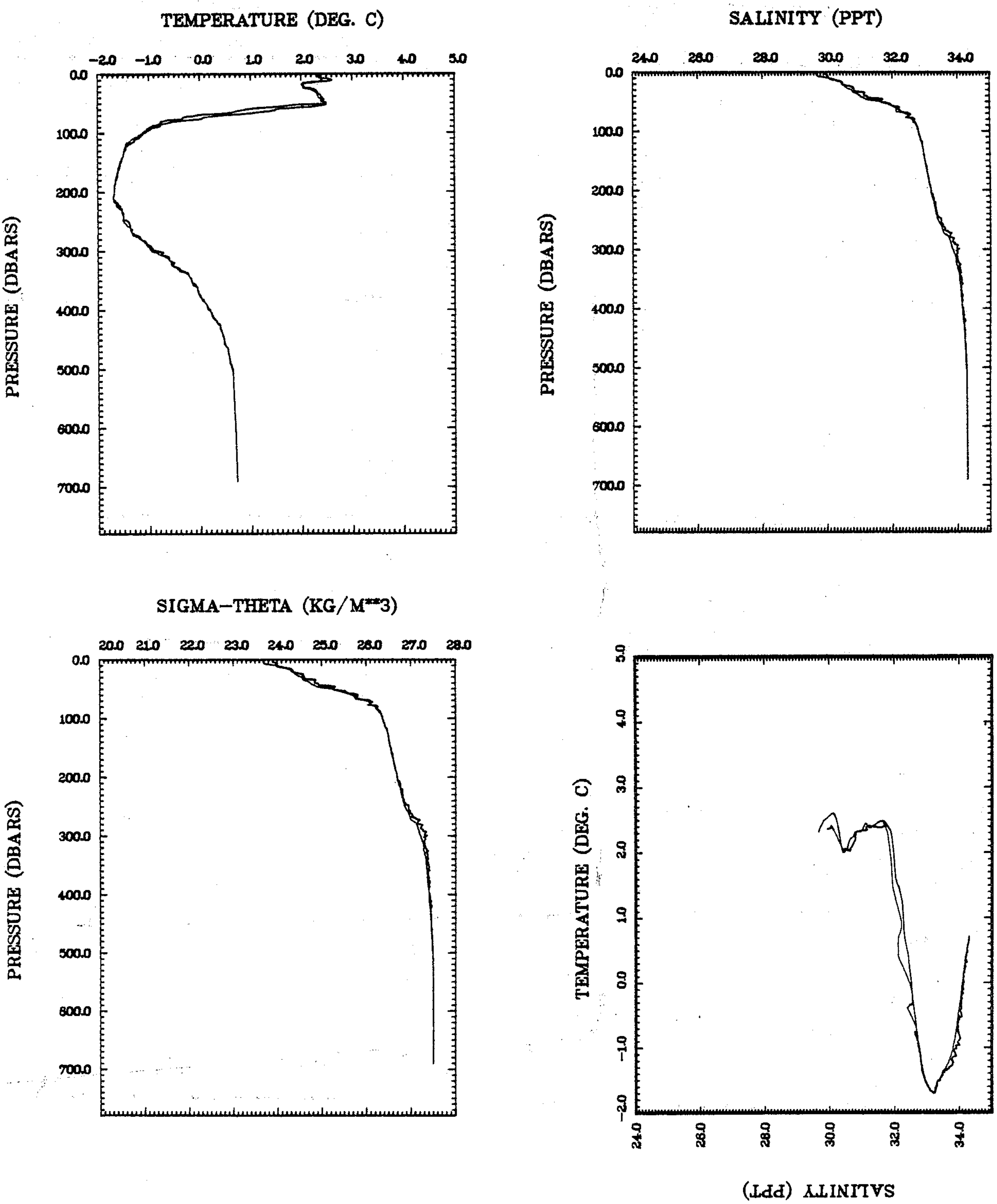

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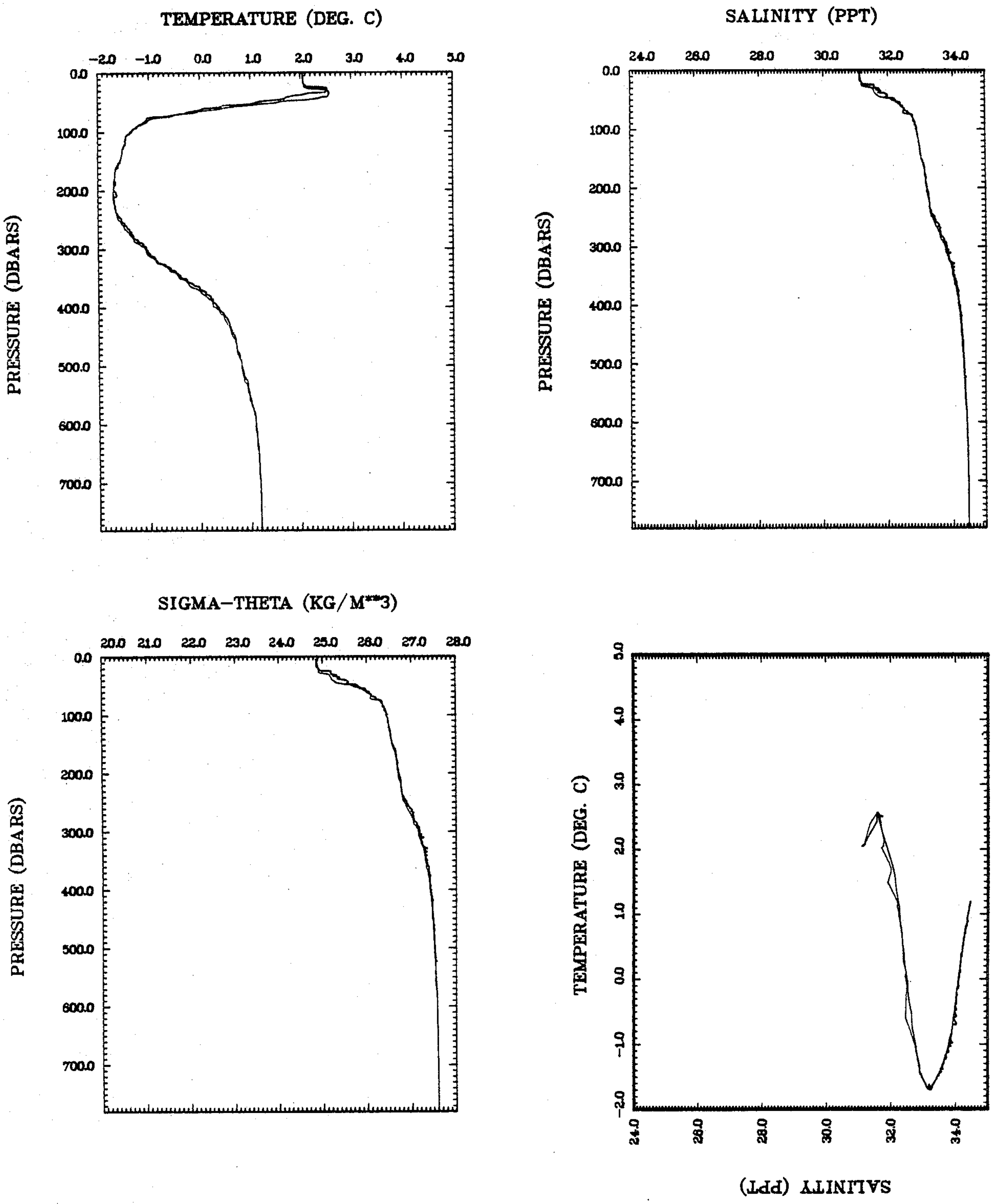

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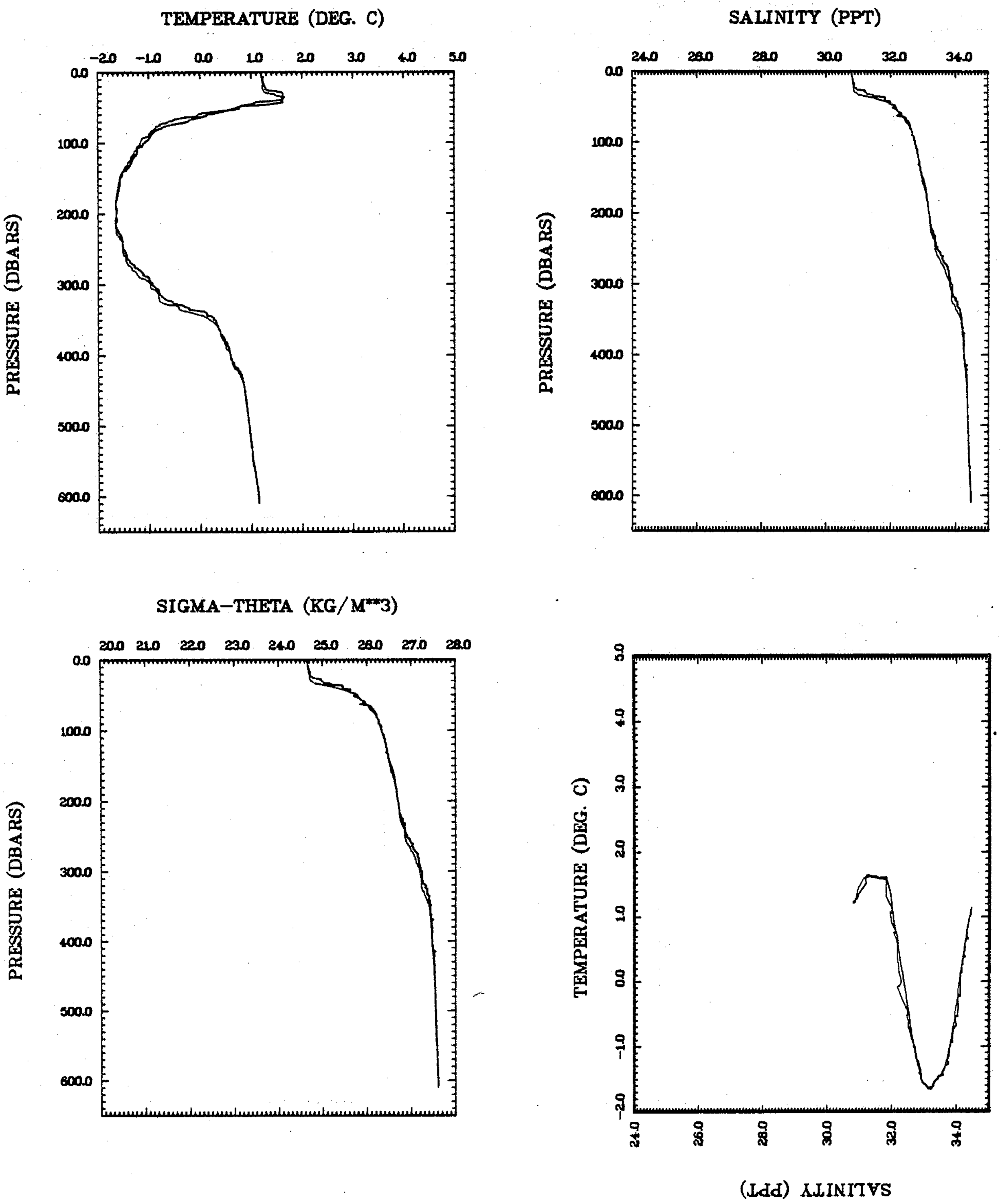
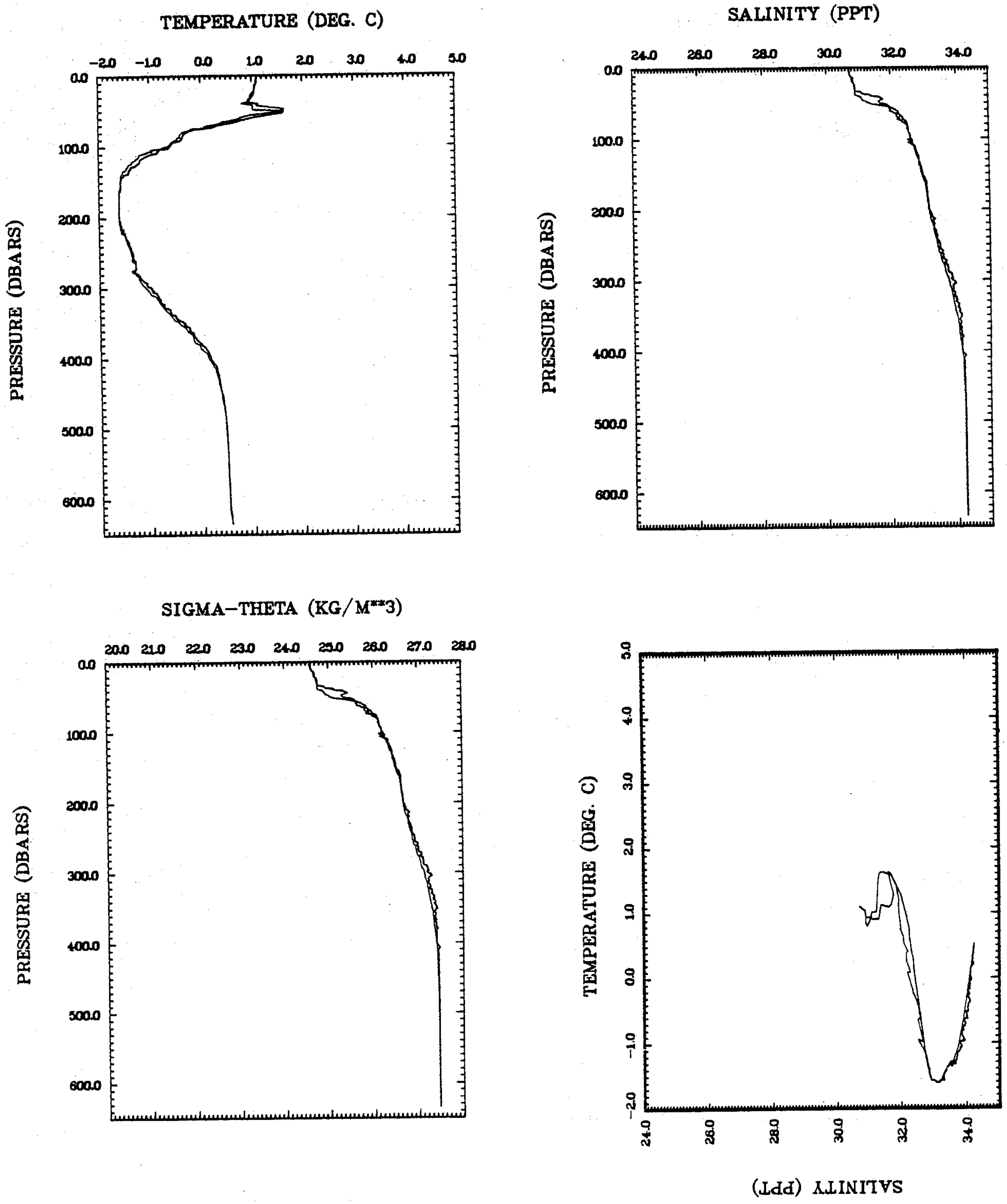


Cambridge Fjord (CA9, CTD62, 82.09.22)



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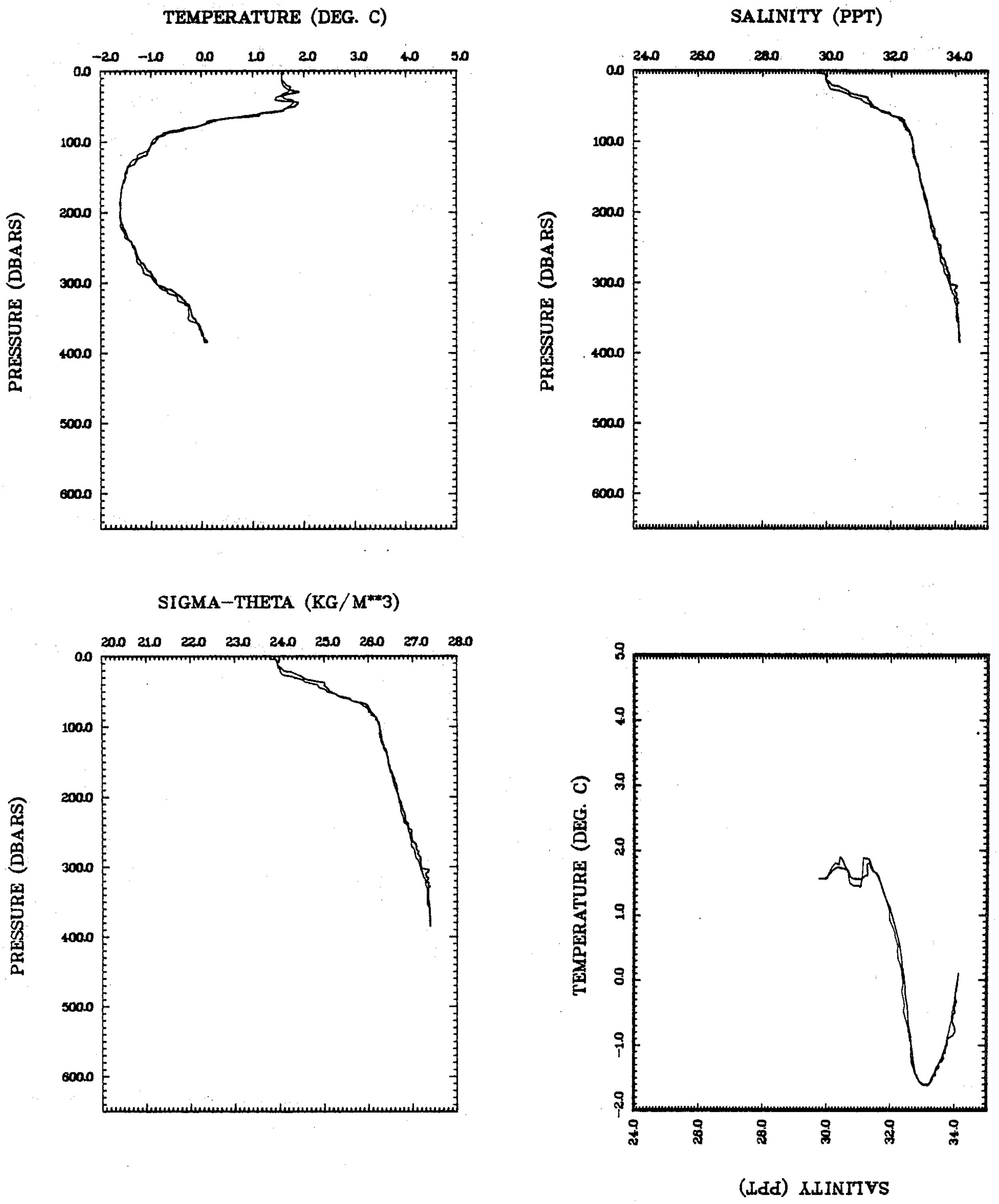
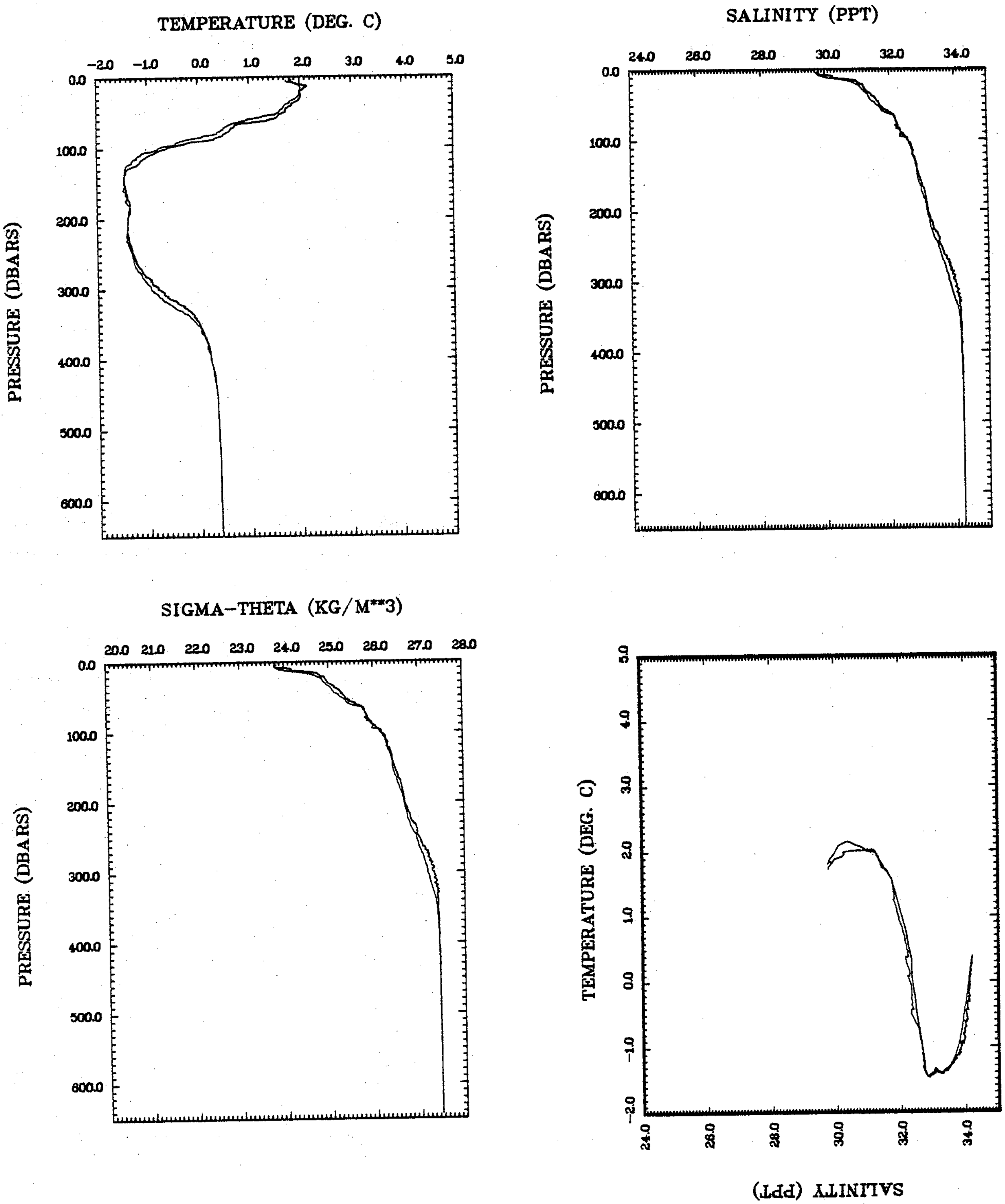


Cambridge Fjord (CA7, CTD64, 82.09.22)



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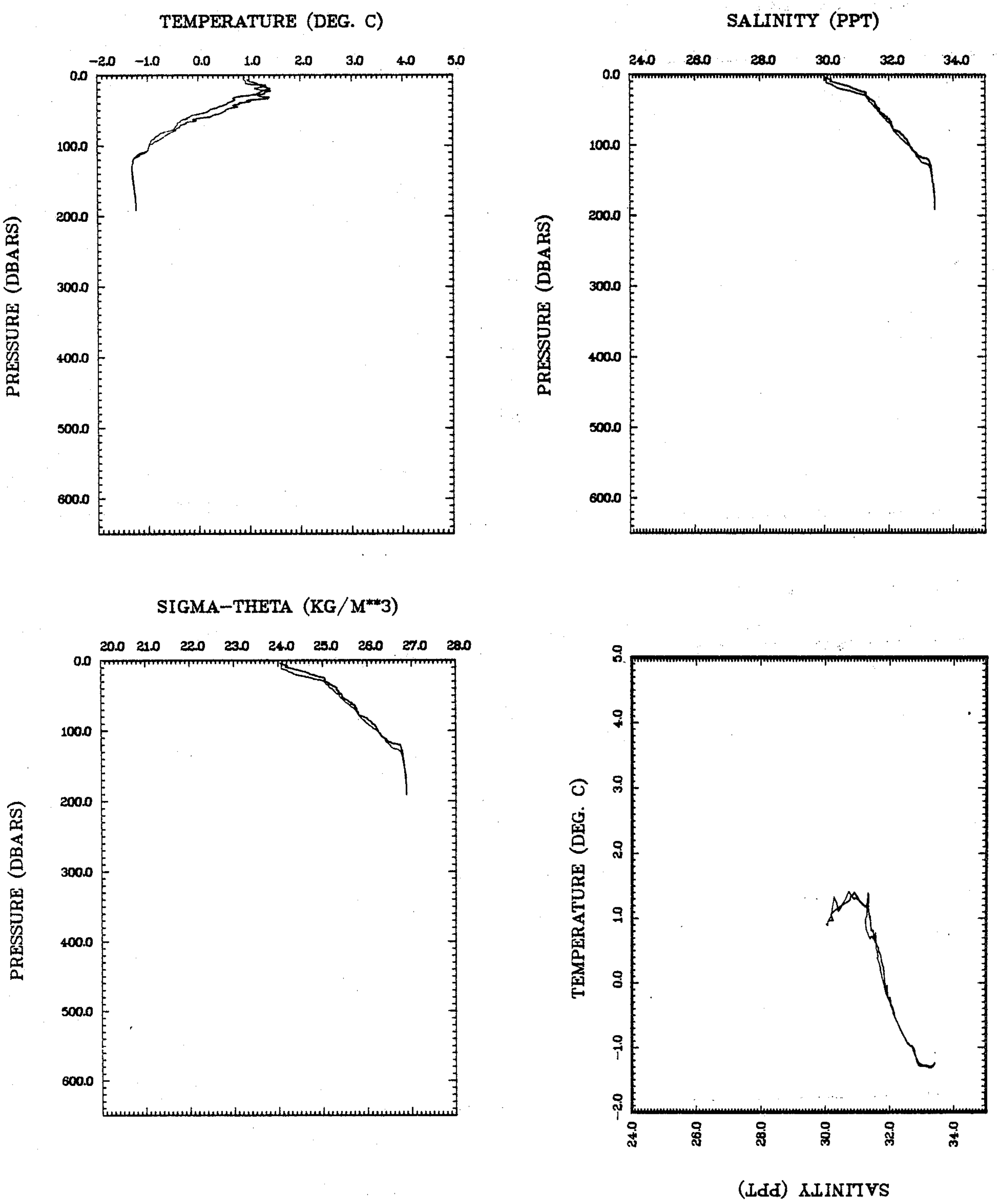

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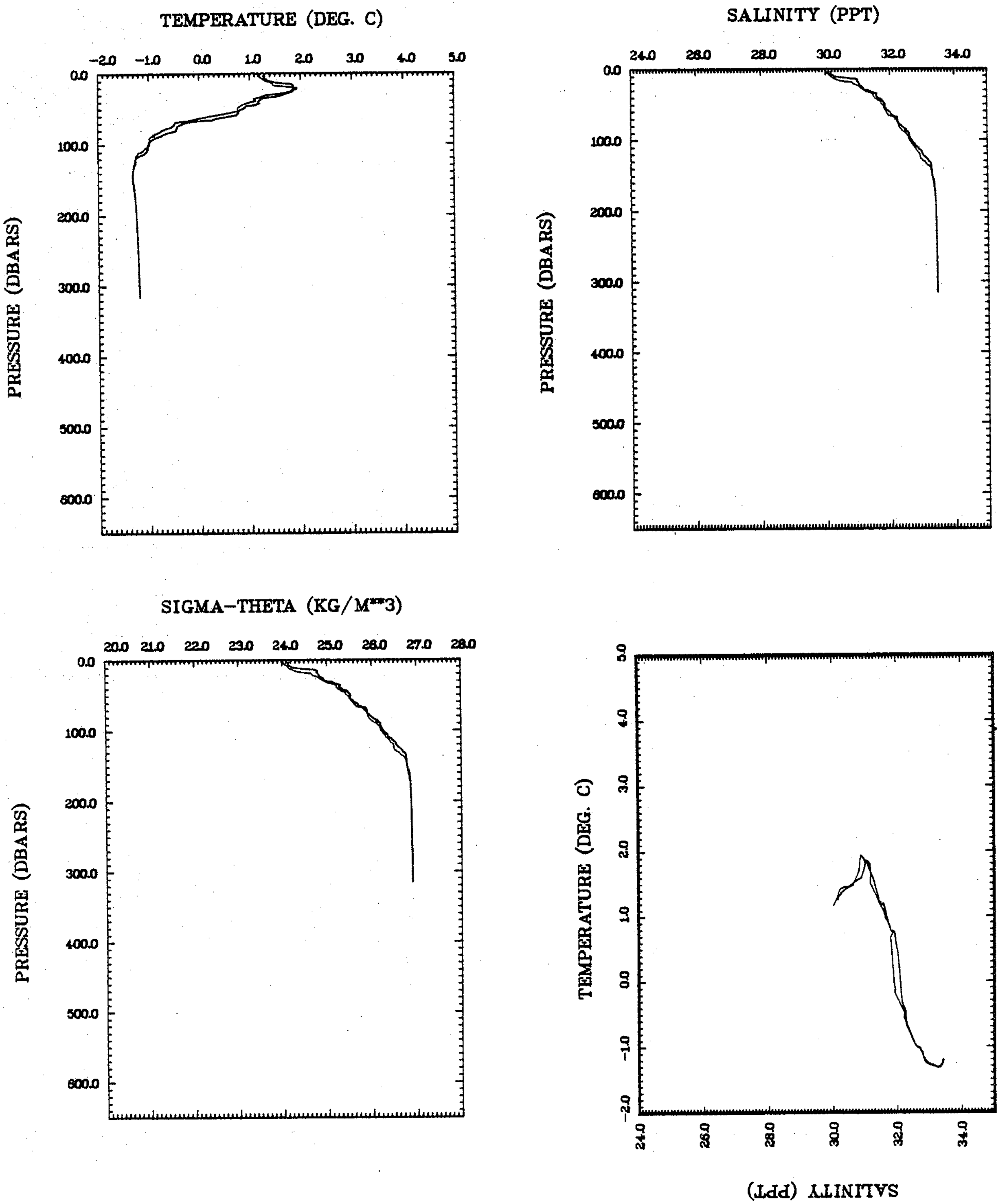
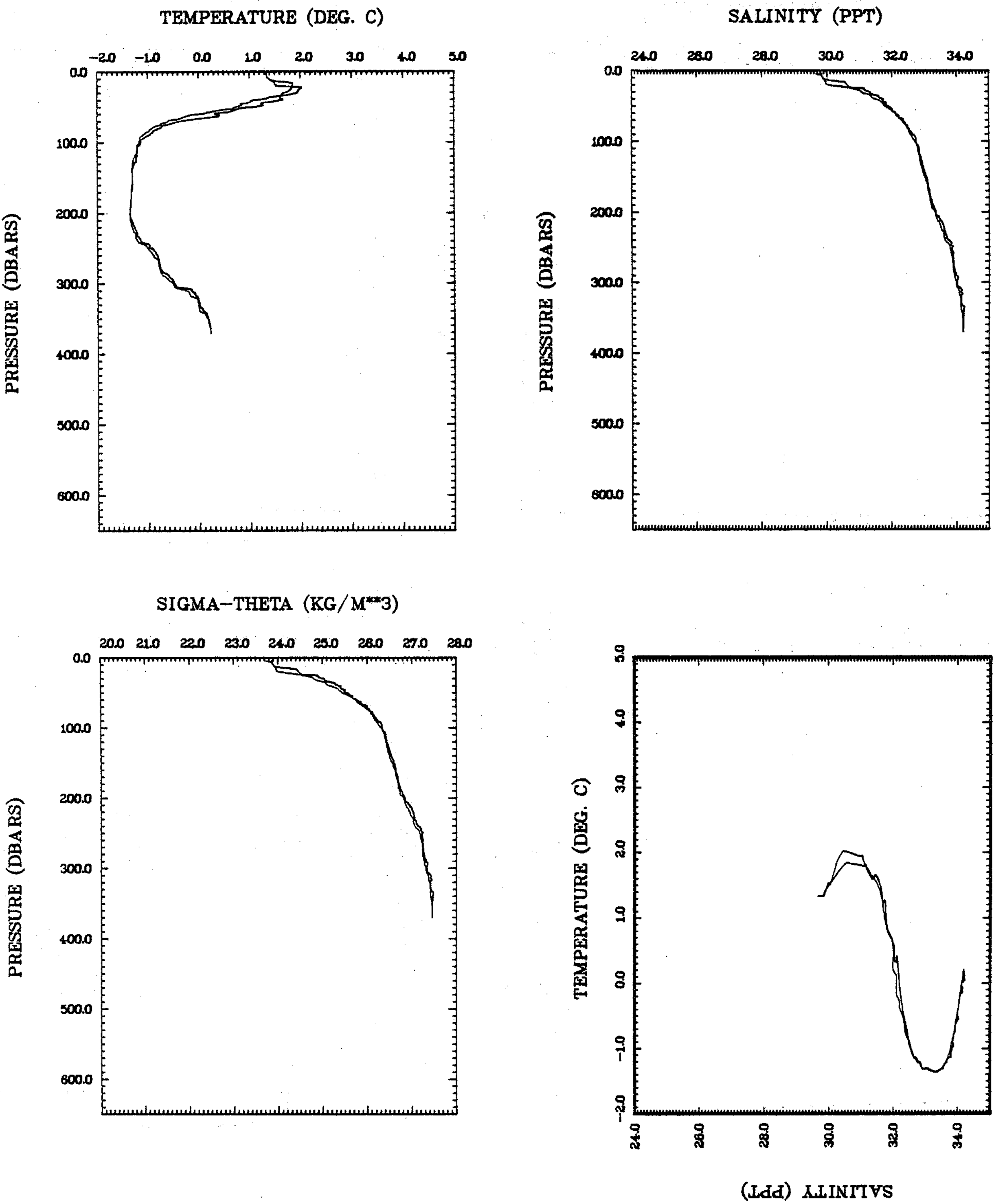
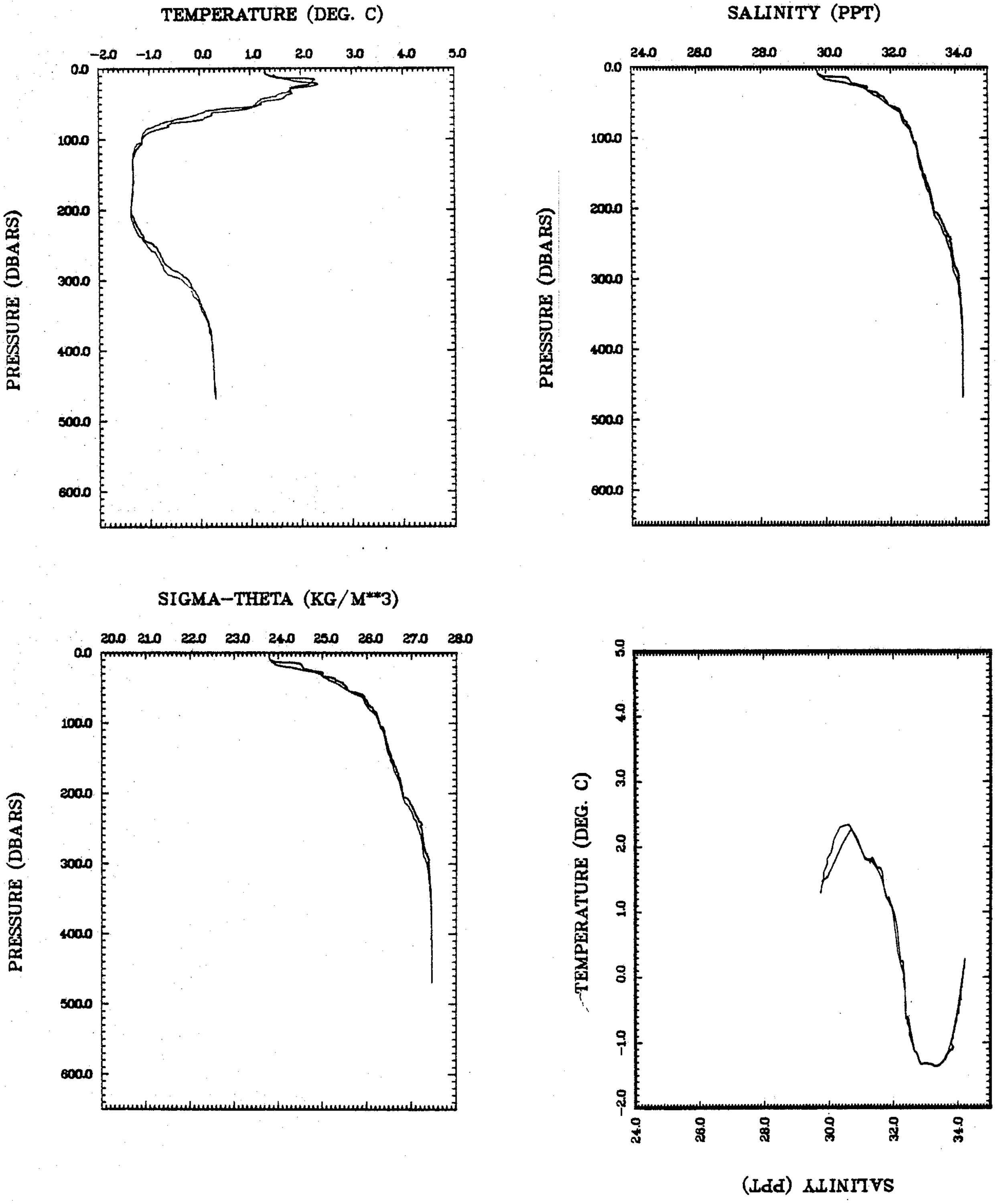


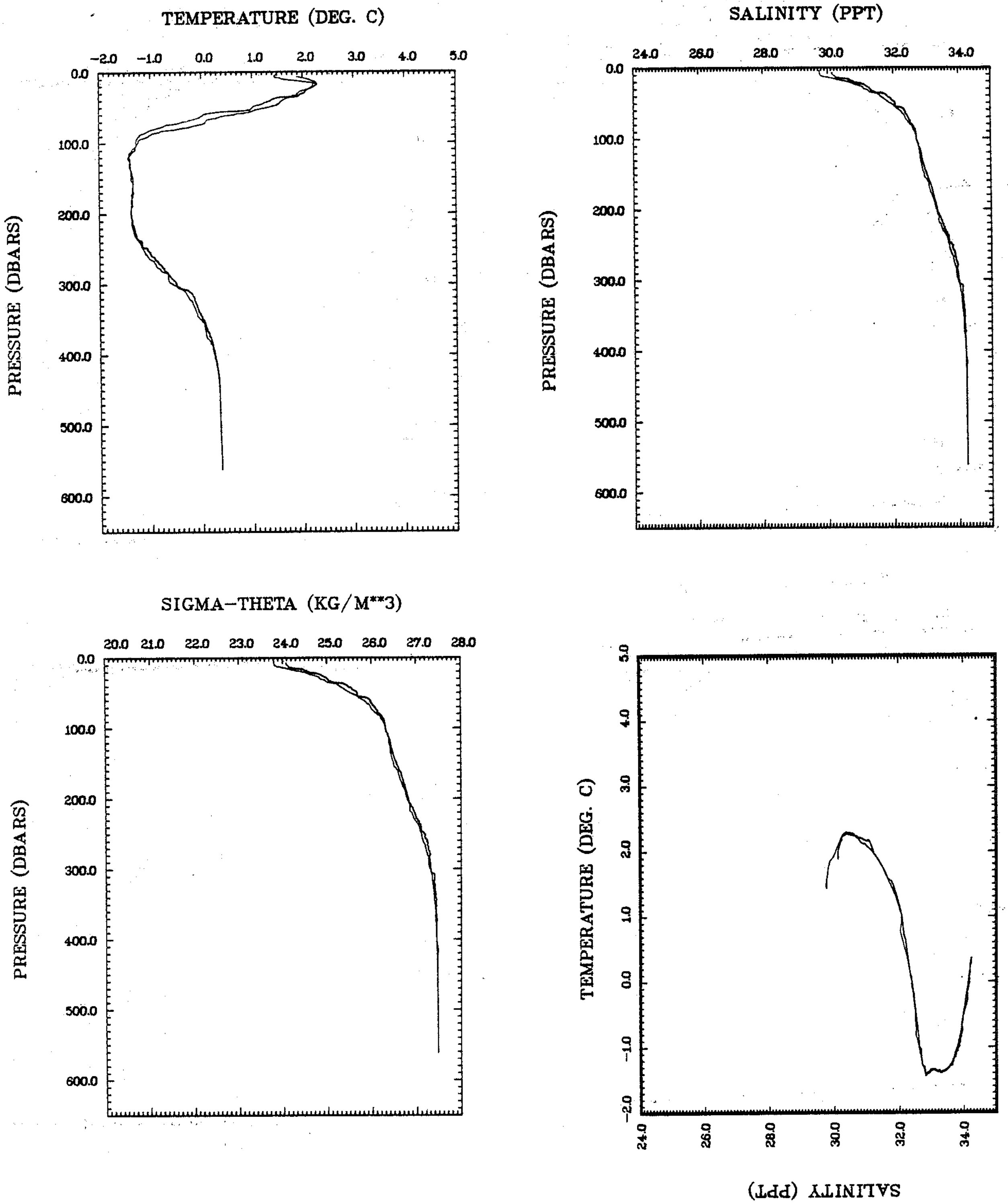
Cambridge Fjord (CA2, CTD67, 82.09.23)



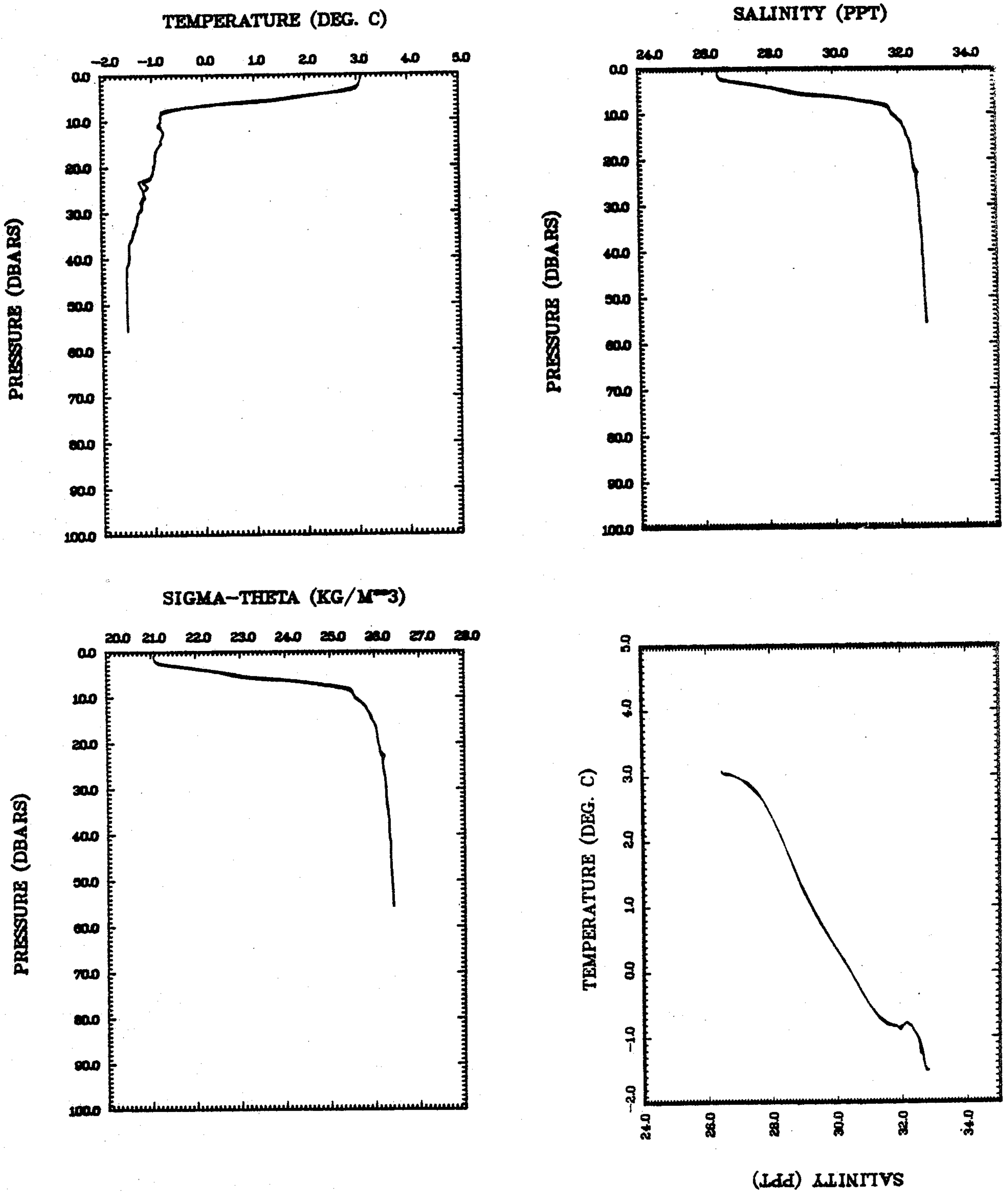
Cambridge Fjord (CA3, CTD68, 82.09.23)



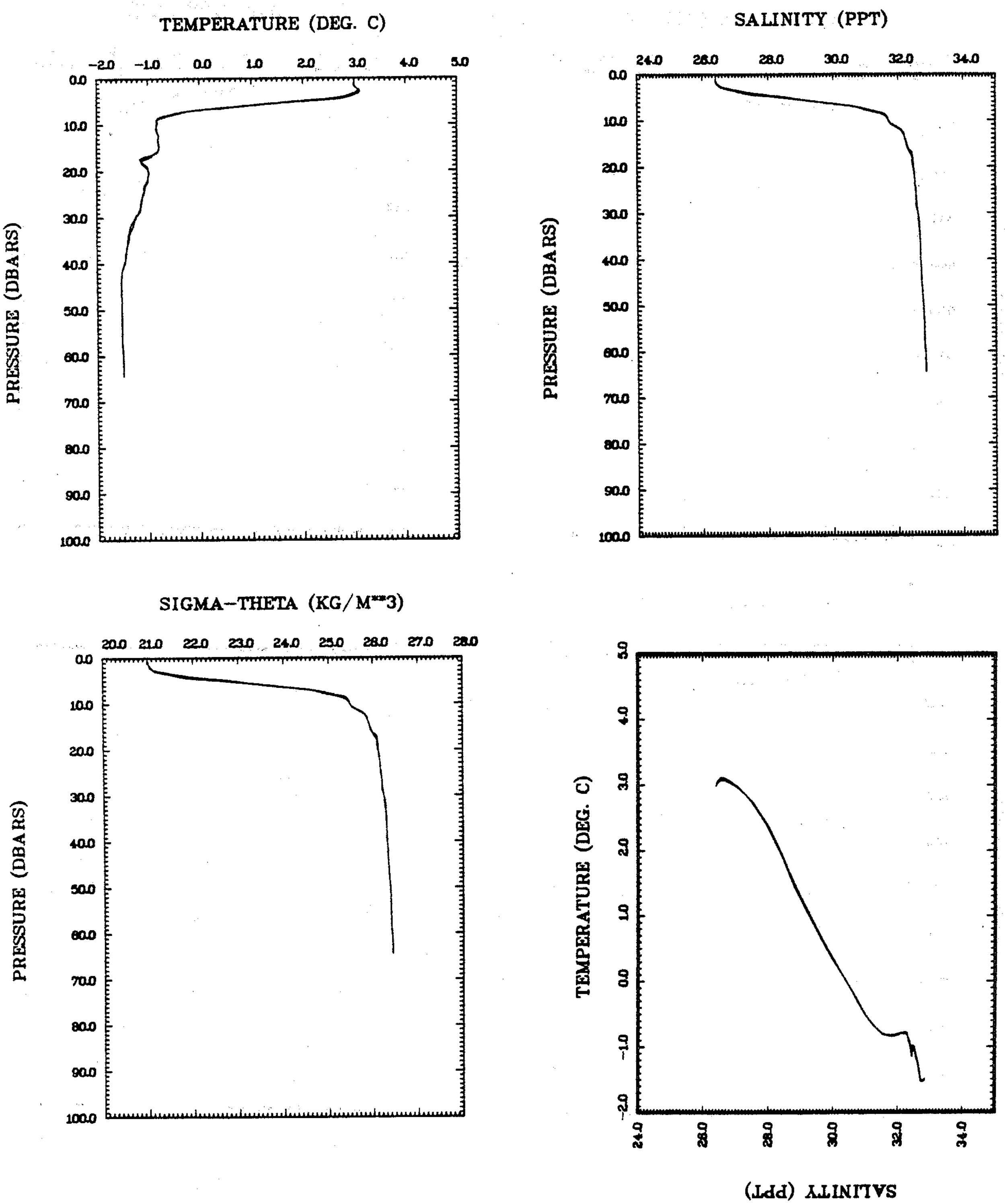
Cambridge Fjord (CA5, CTD69, 82.09.23)



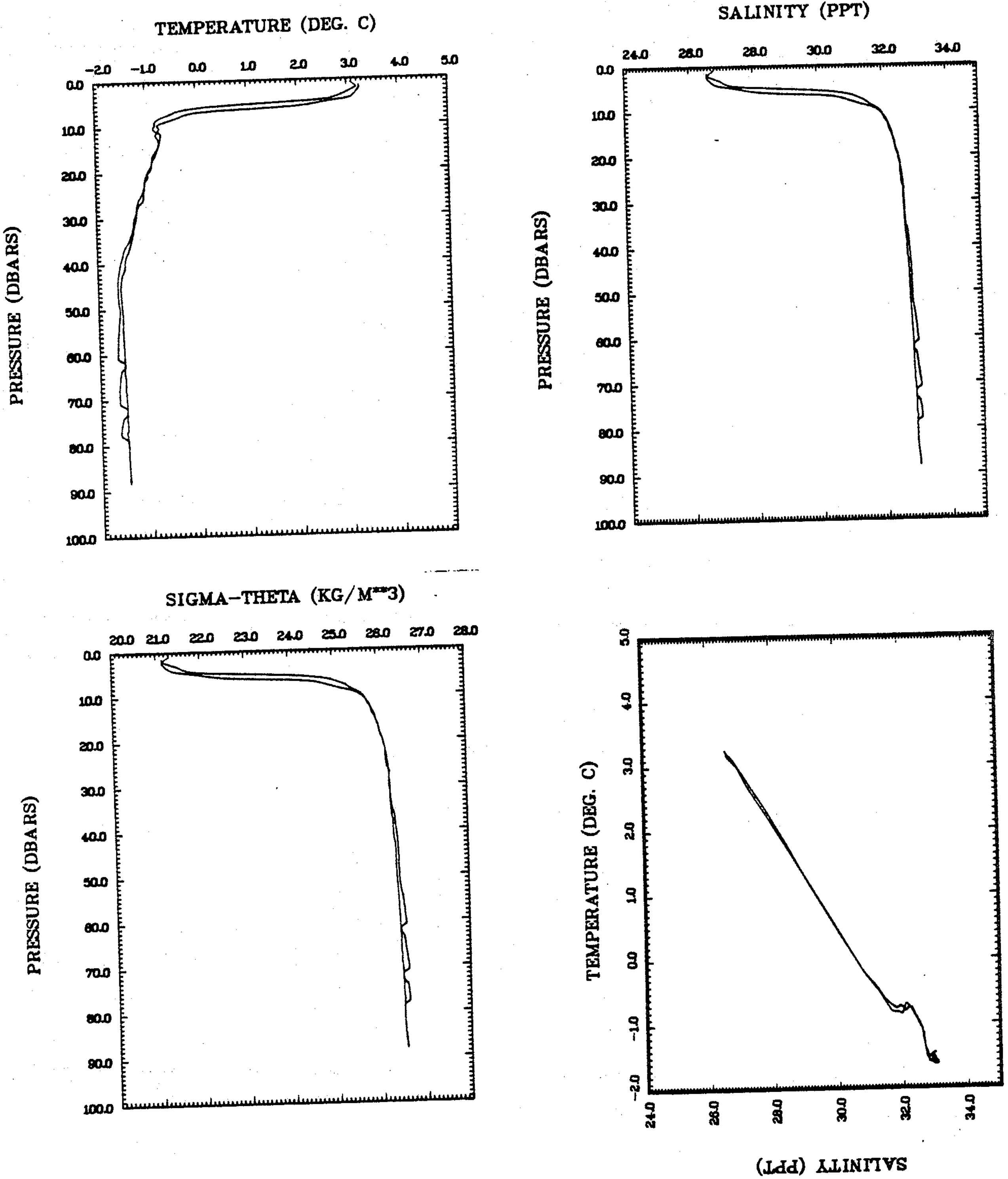
Cambridge Fjord (CA5, CTD70, 82.09.23)



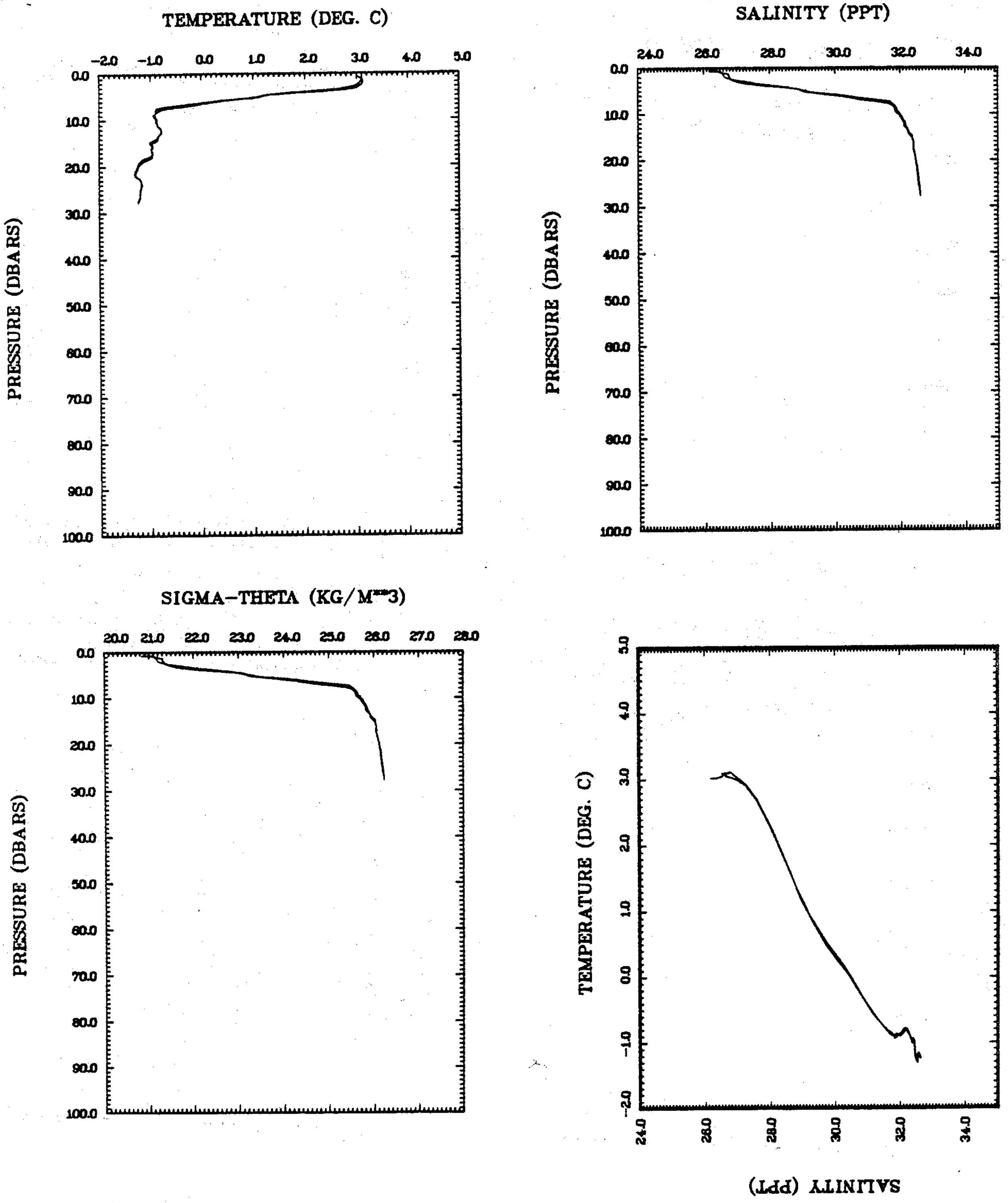
Coronation Fjord (C01S, CTD1, 82.09.13)



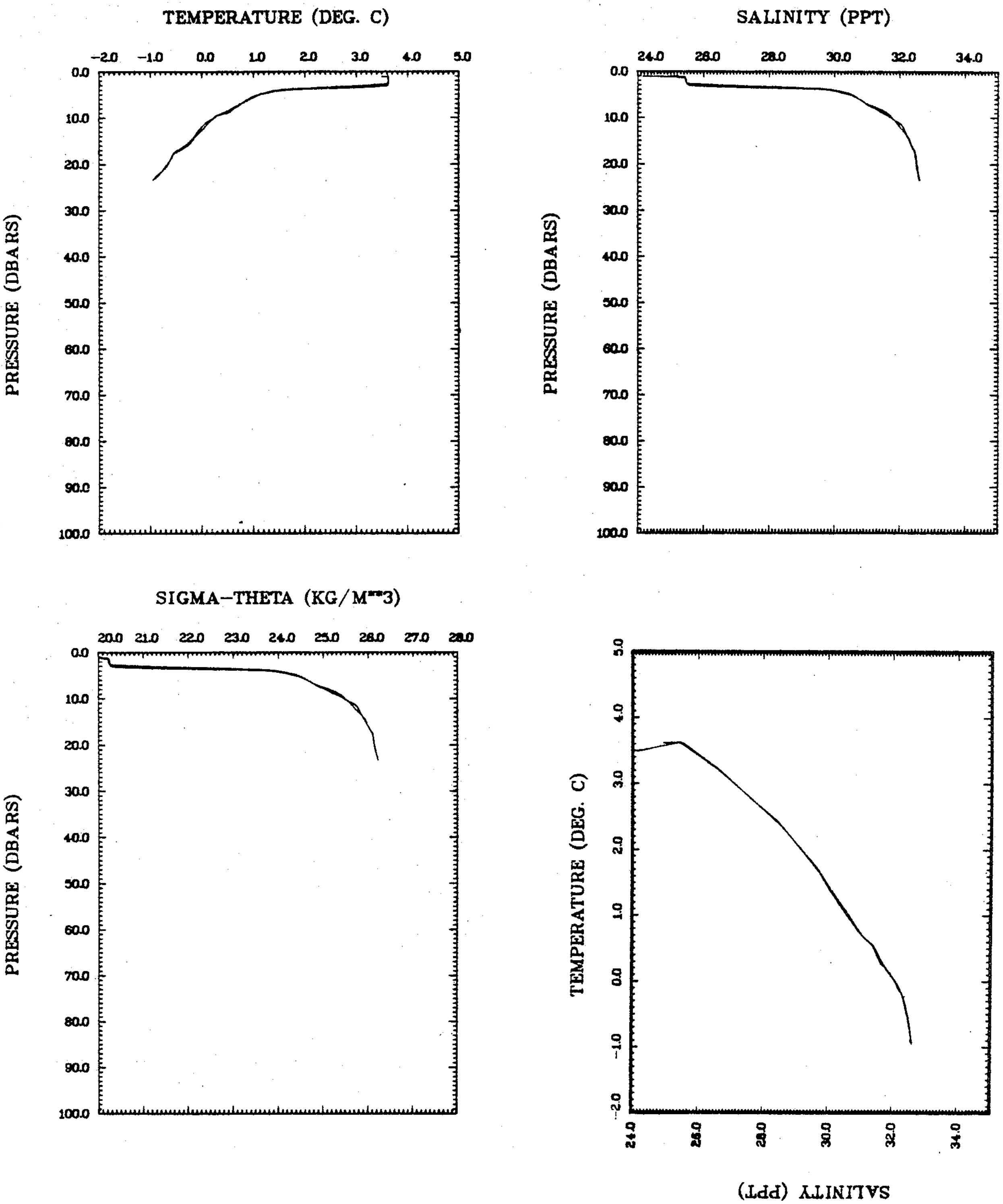
Coronation Fjord (CO2S, CTD2, 82.09.13)



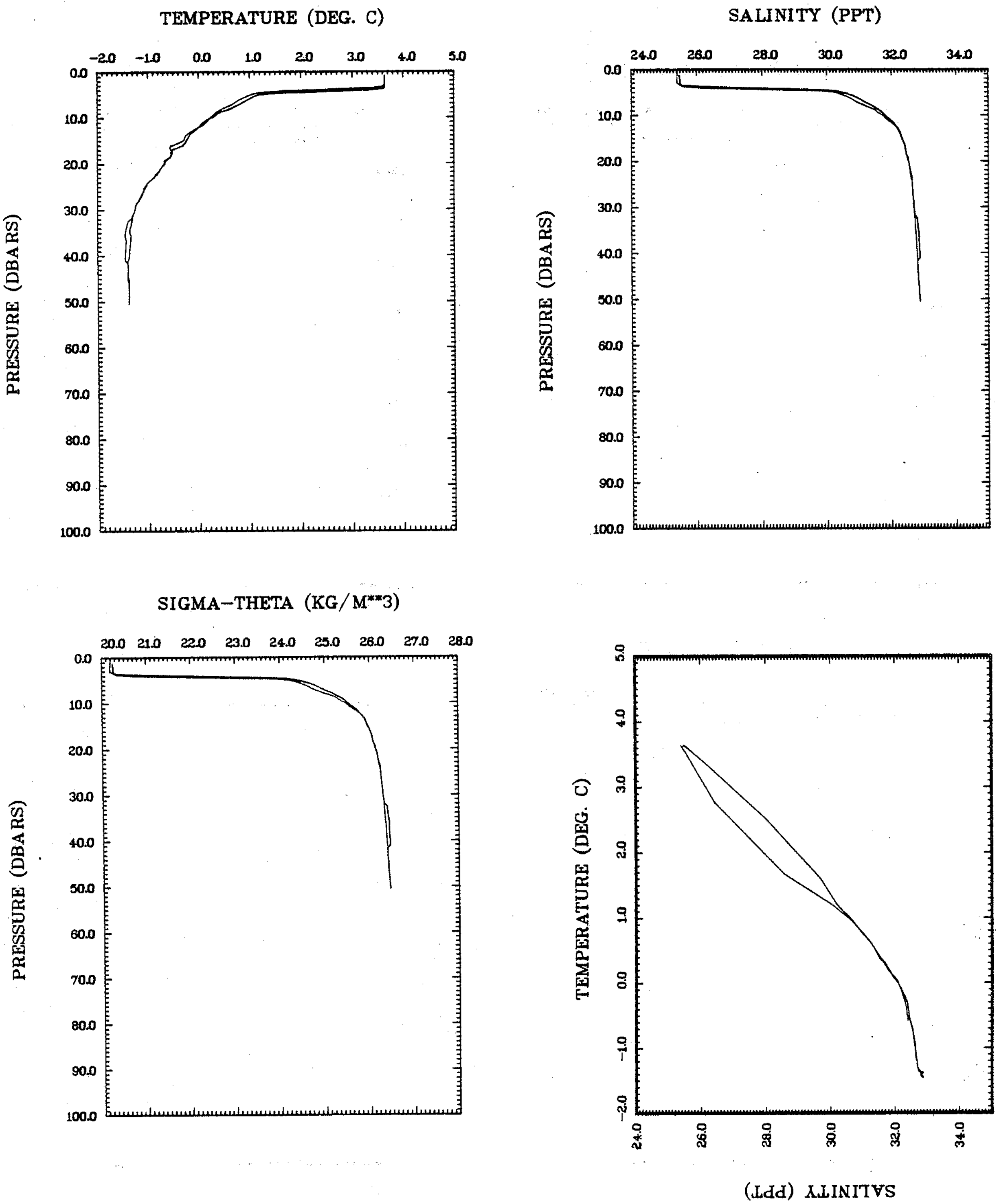
Coronation Fjord (CO3S, CTD3, 82.09.13)



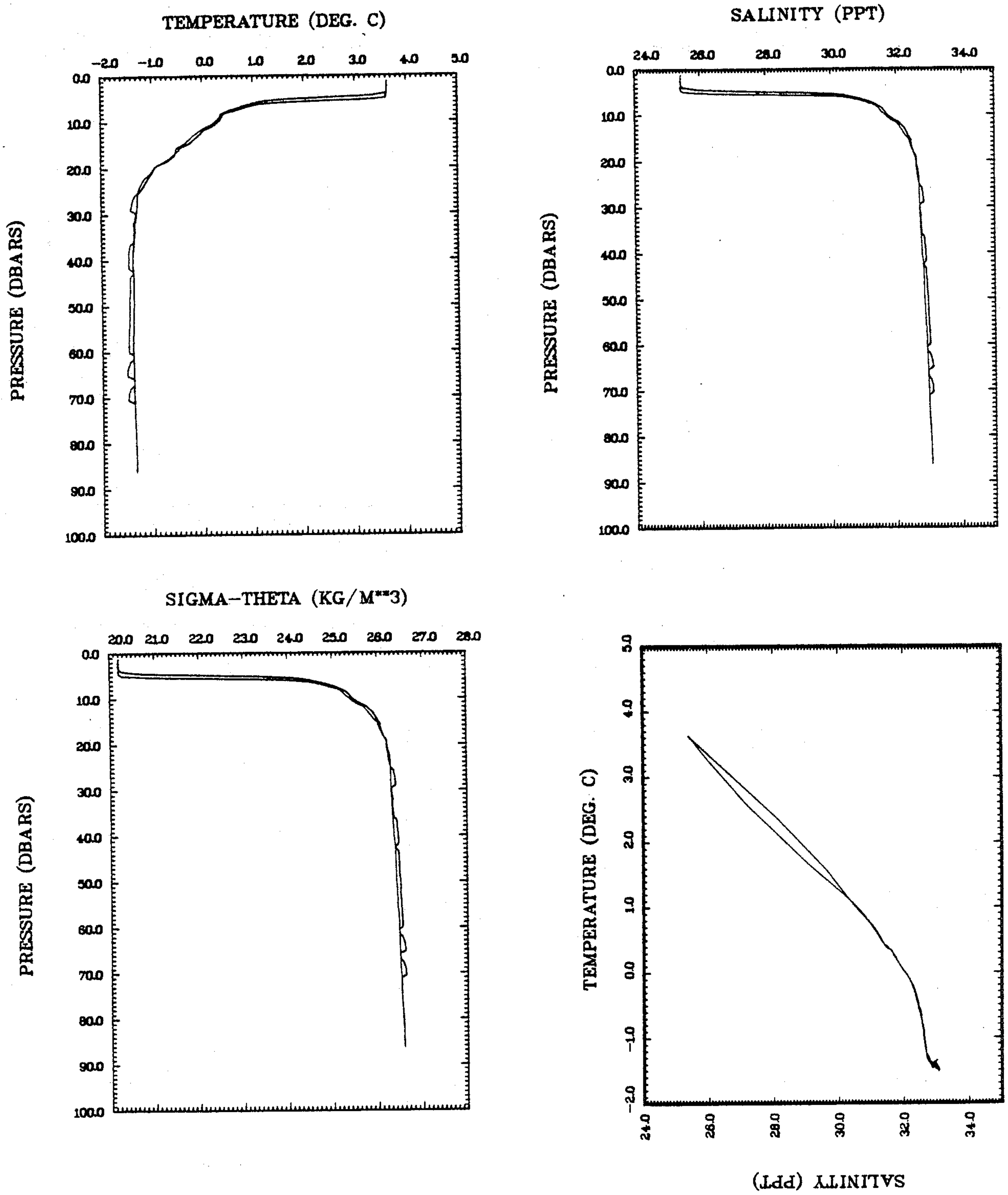
Coronation Fjord (CO4S, CTD4, 82.09.13)



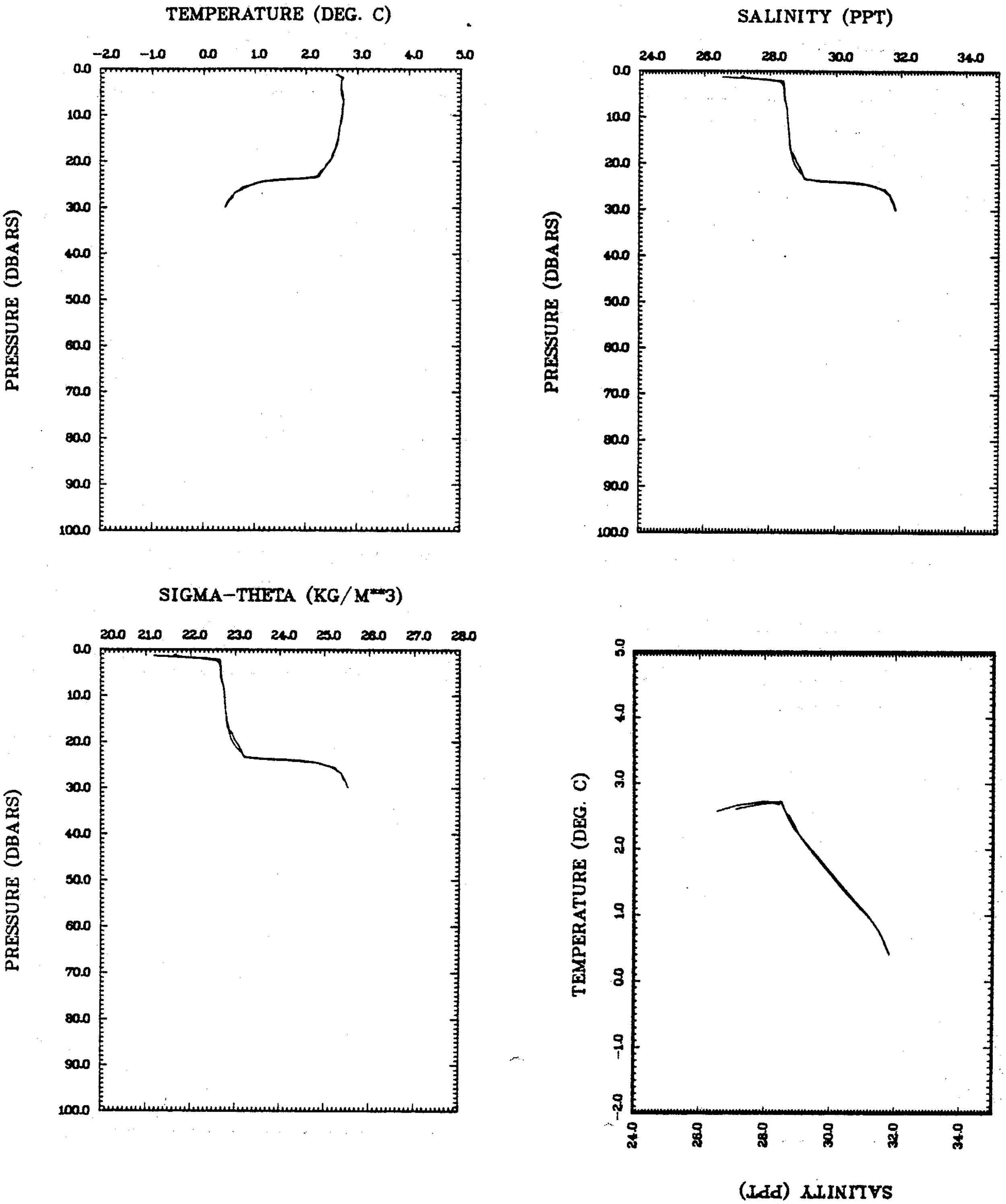
MAKTAK Fjord (MA1S, CTD7, 82.09.14)



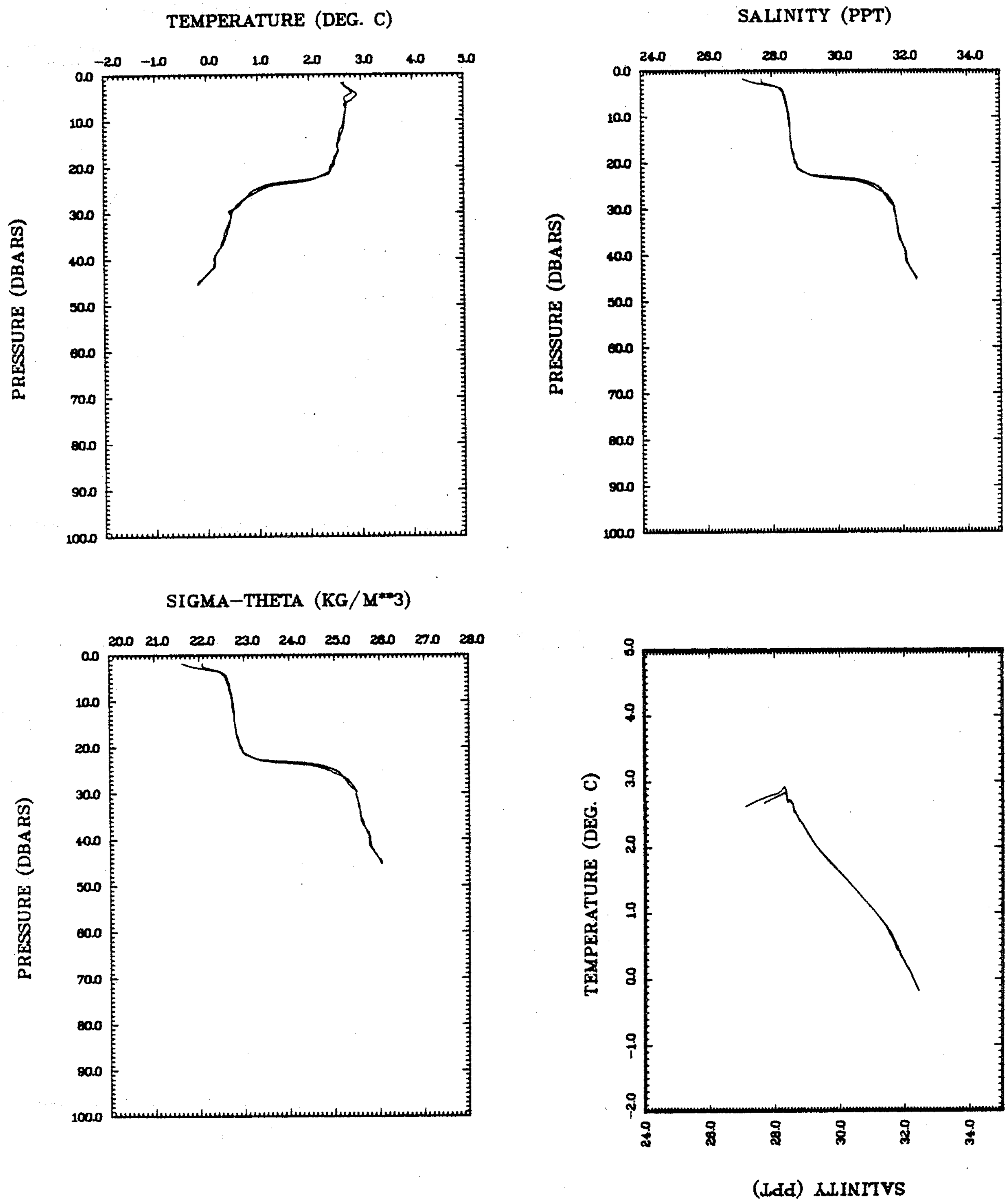
MAKTAK Fjord (MA2S, CTD5, 82.09.14)



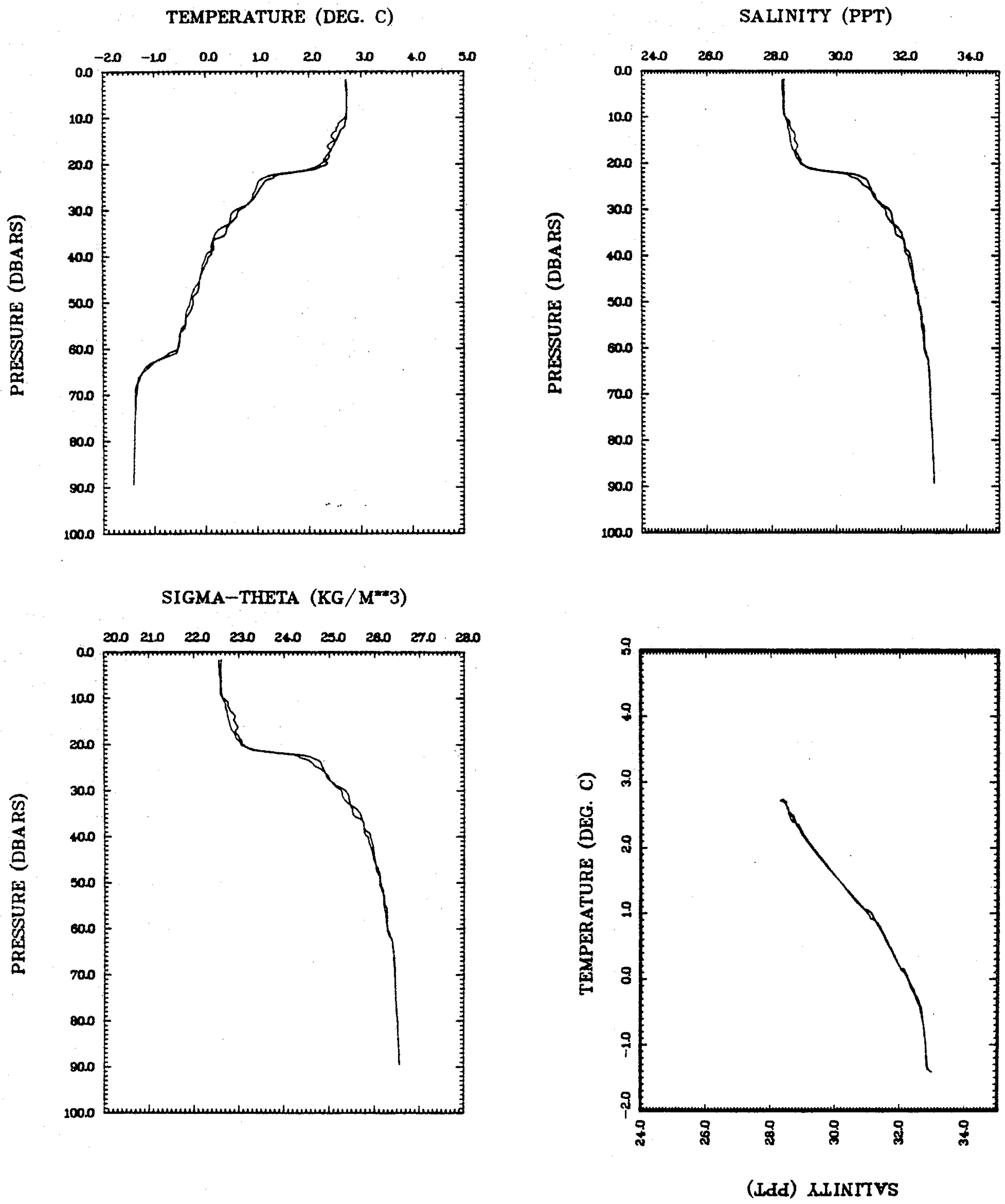
MAKTAK Fjord (MA3S, CTD6, 82.09.14)



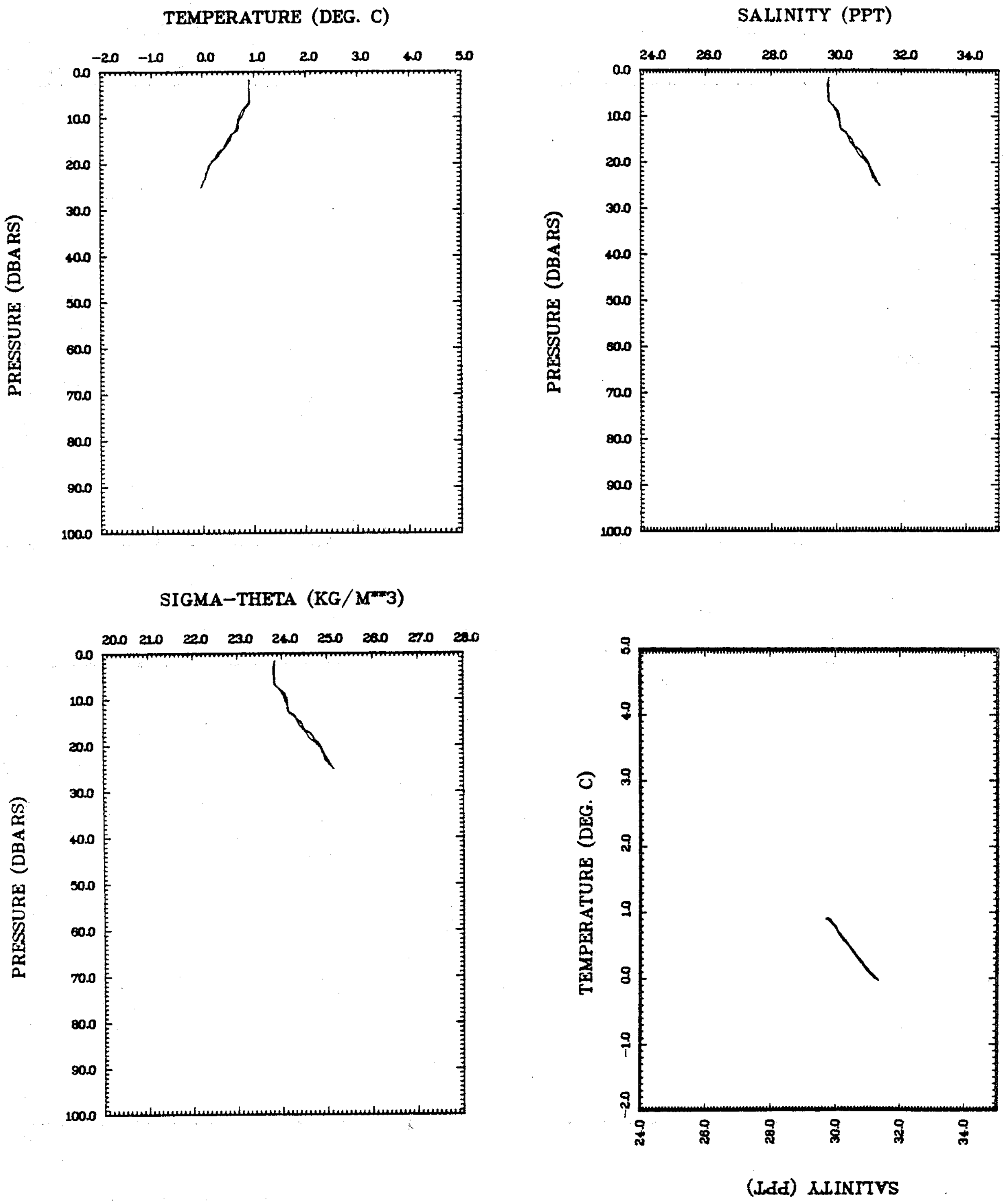
Tingin Fjord (TilS, CTD8, 82.09.16)



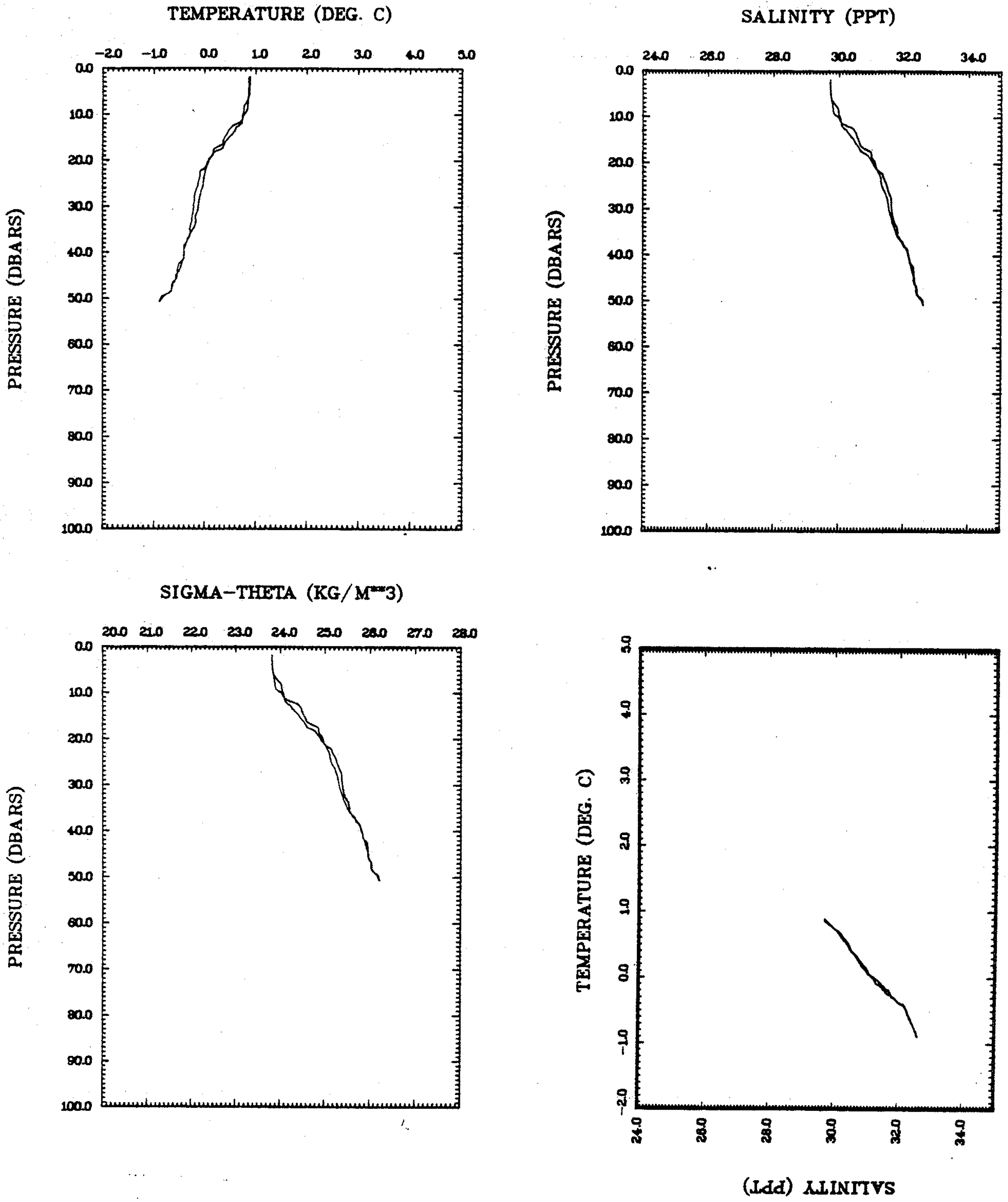
Tingin Fjord (Ti2S, CTD9, 82.09.16)



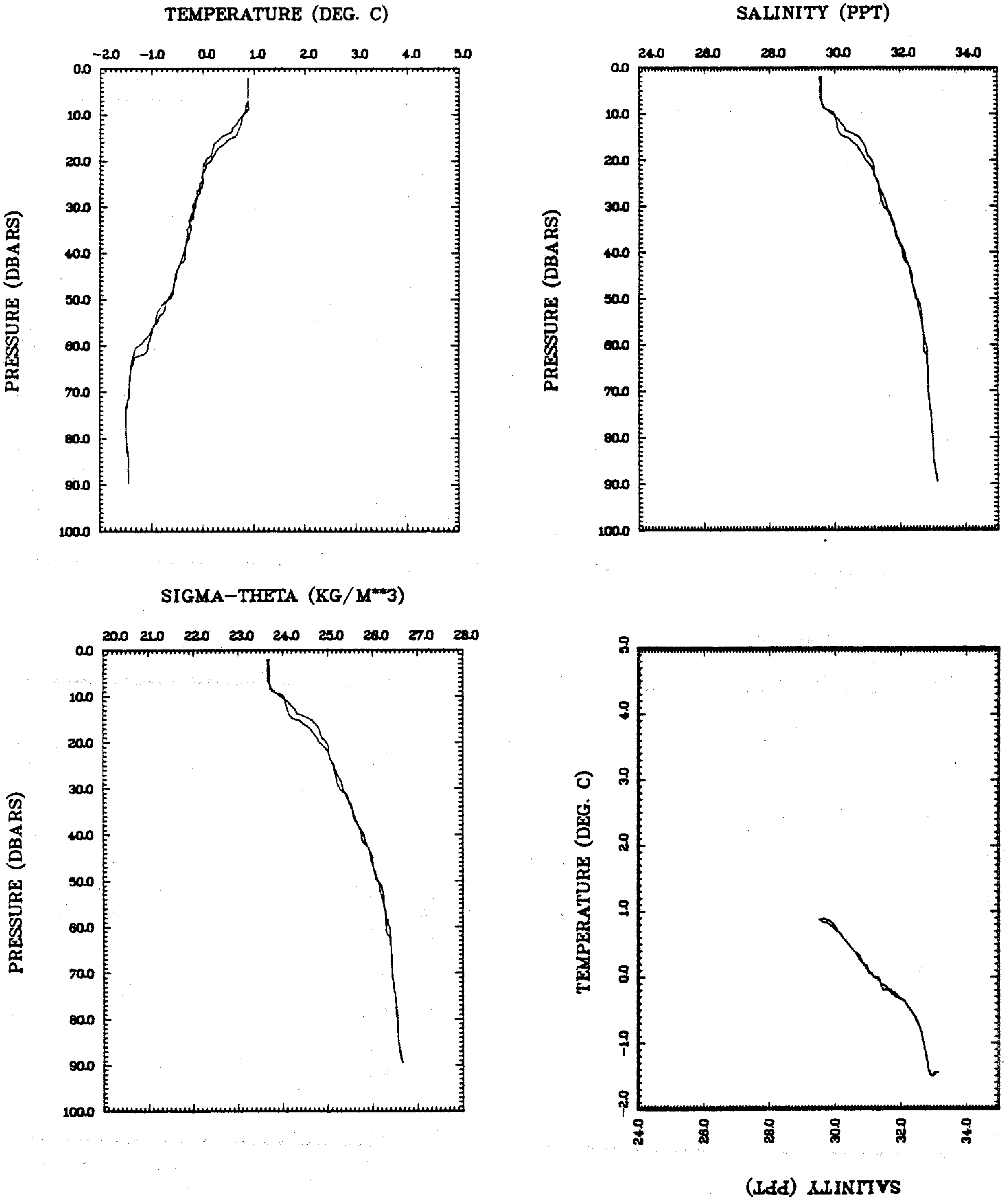
Tingin Fjord (Ti3S, CTD10, 82.09.16)



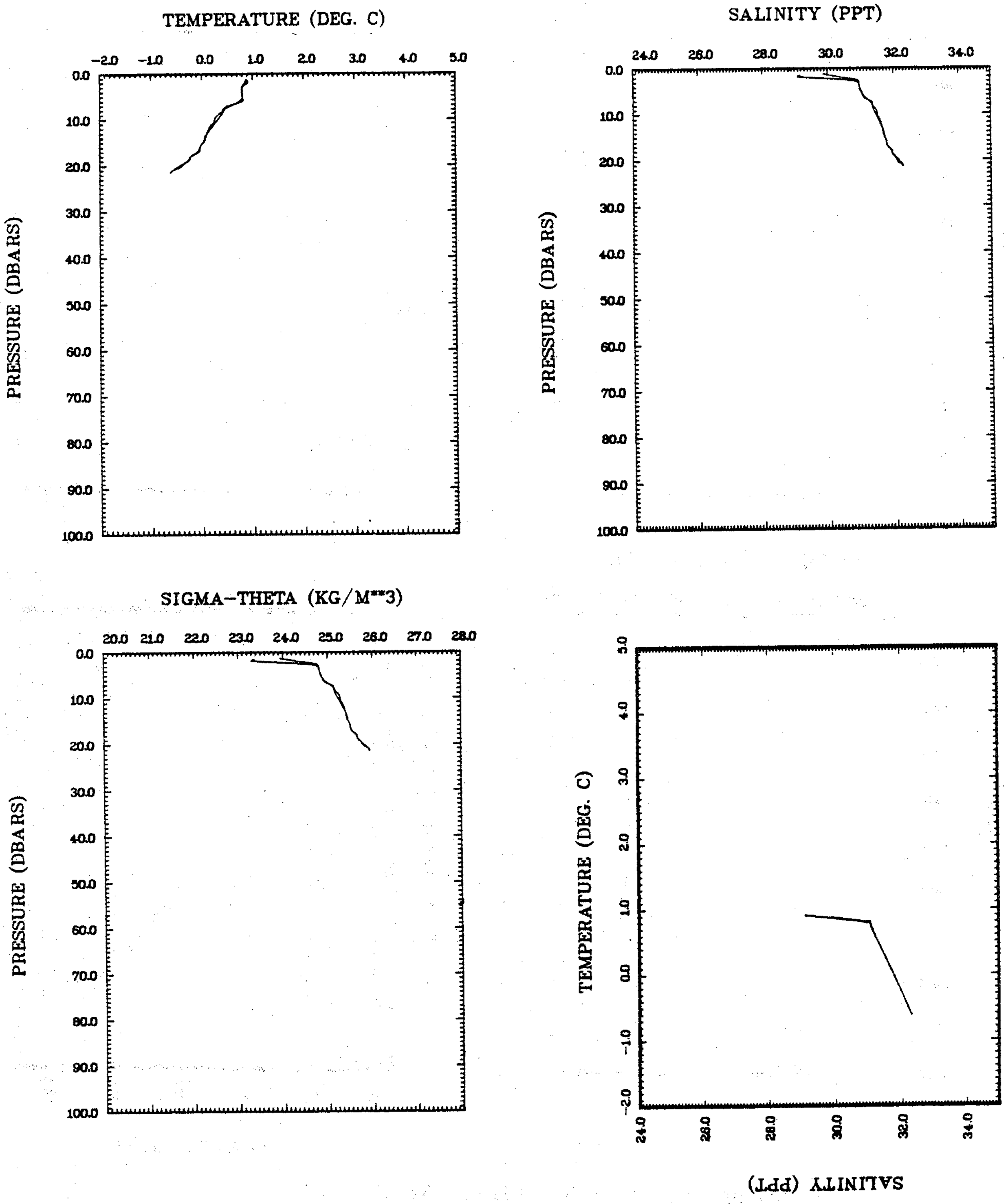
Iterbilung Fjord (ItlS, CTD11, 82.09.17)



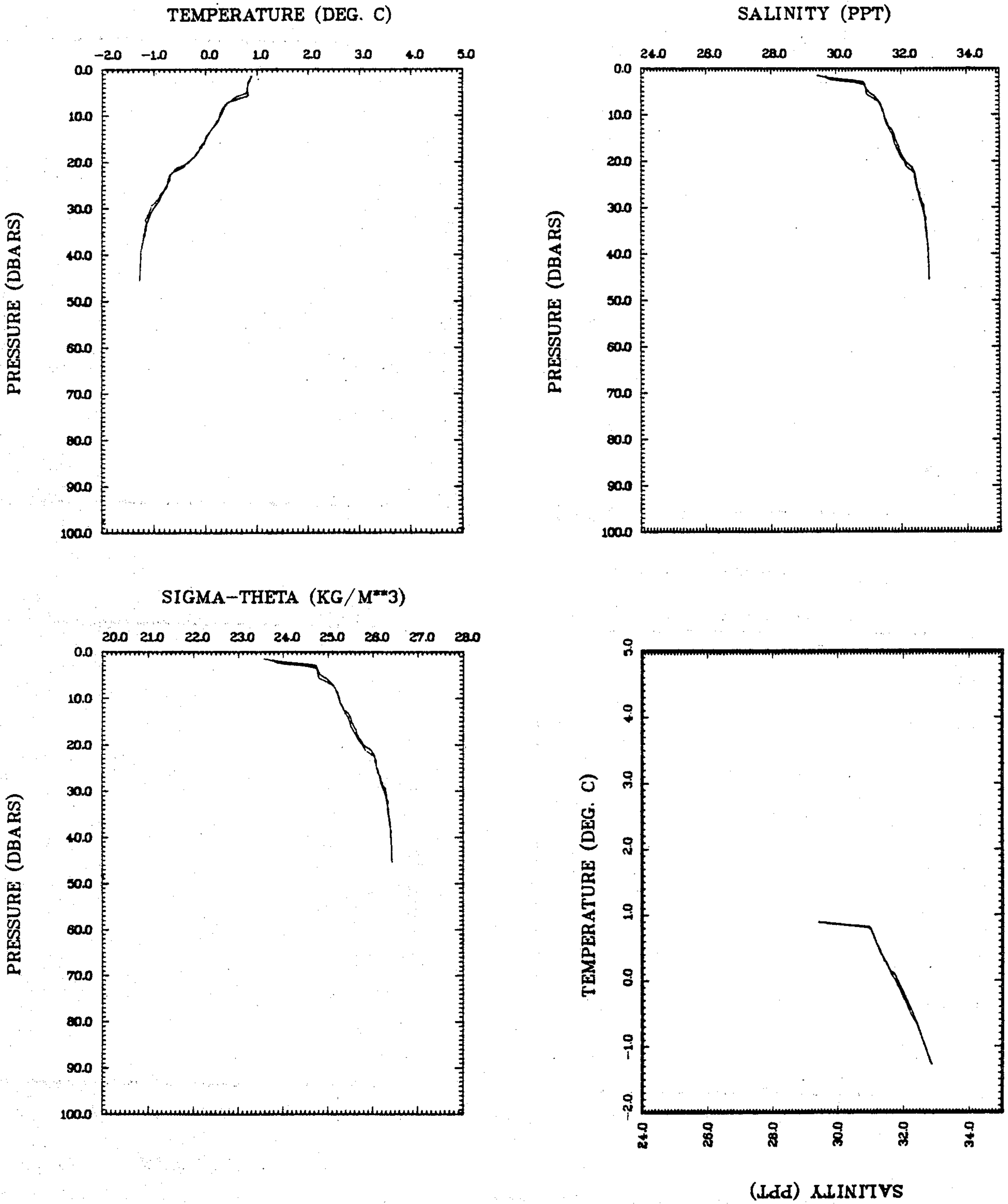
Iterbilung Fjord (It2S, CTD12, 82.09.17)



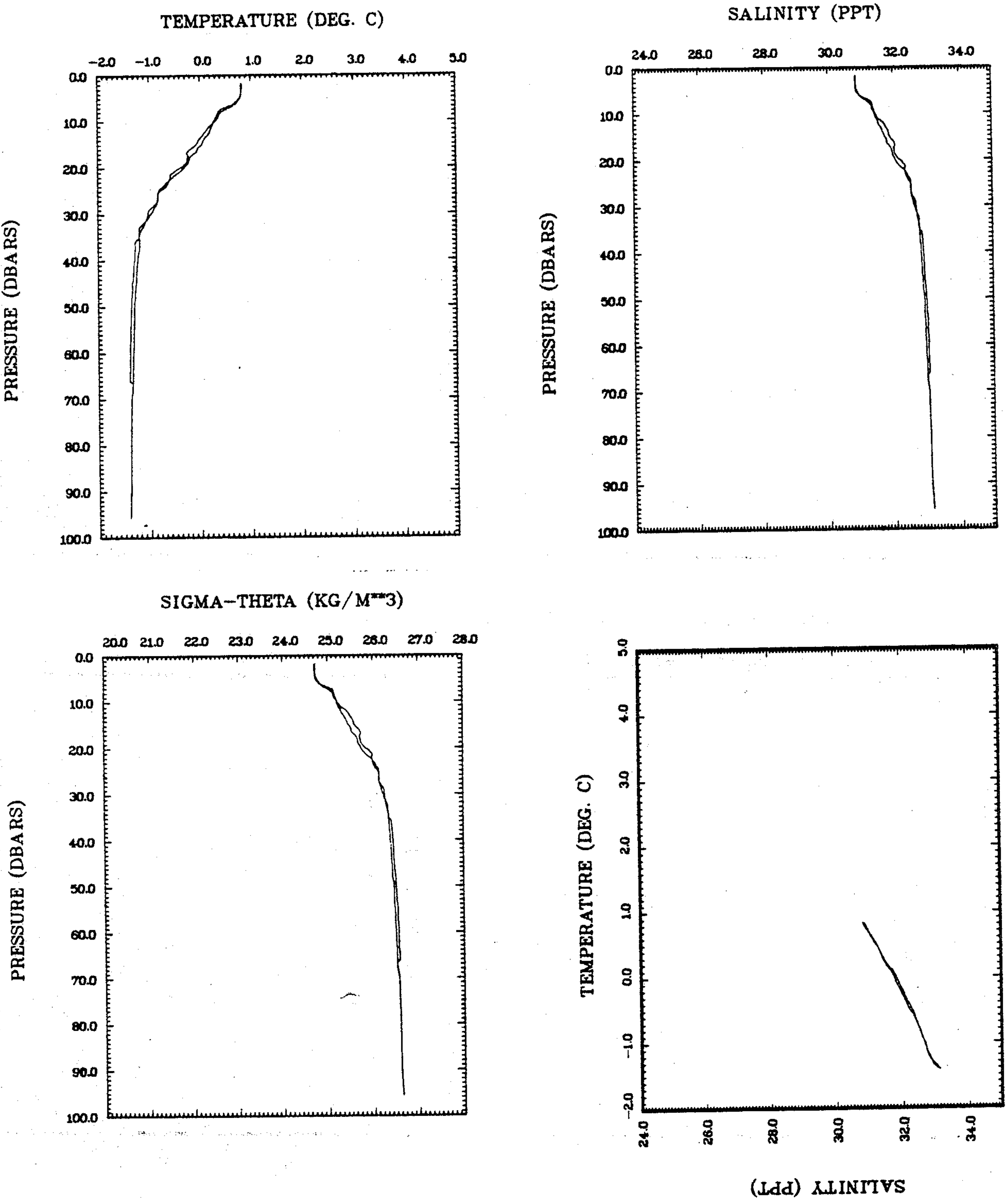
Iterbilung Fjord (It3S, CTD13, 82.09.17)



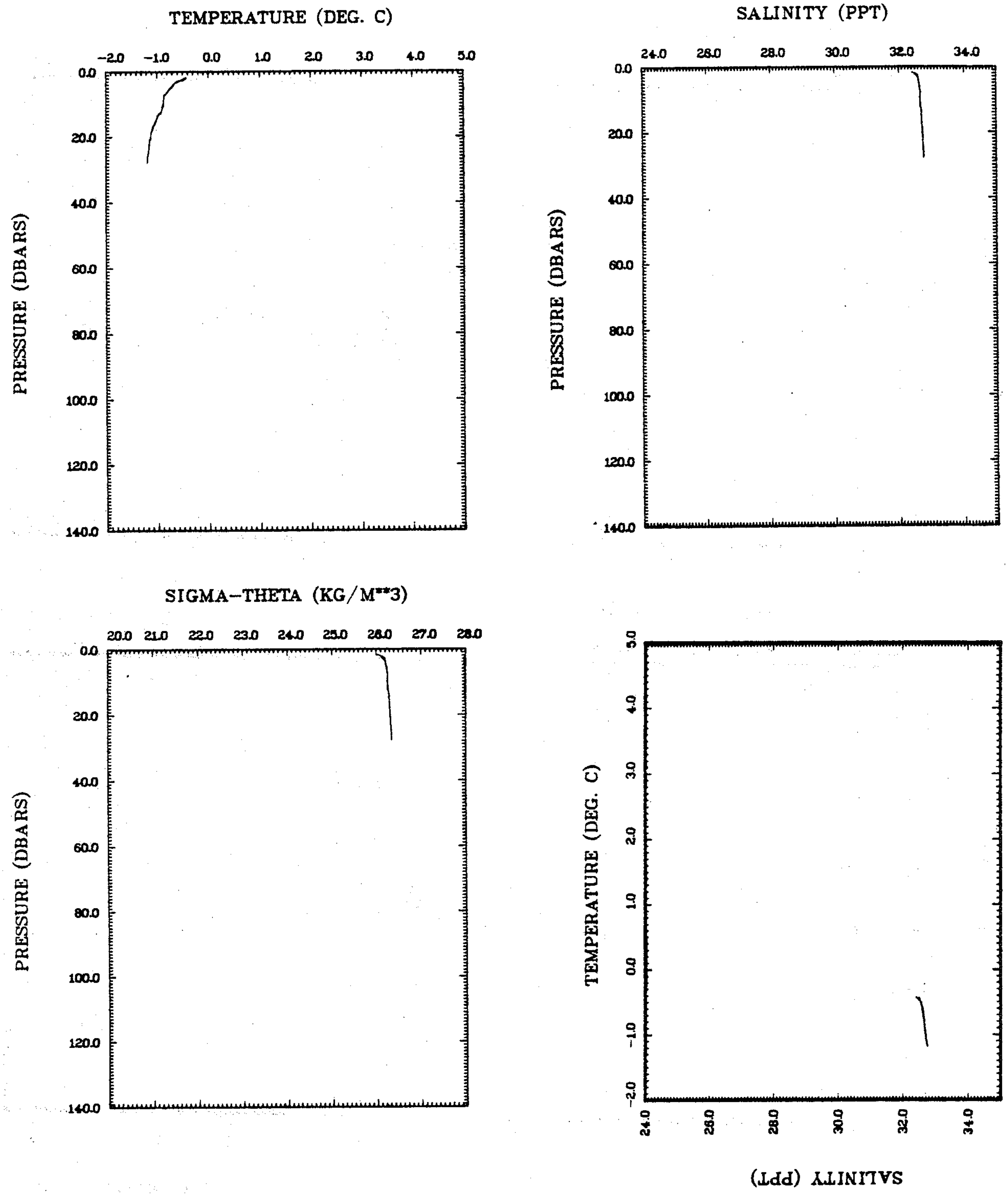
McBeth Fjord (MC1S, CTD14, 82.09.18)



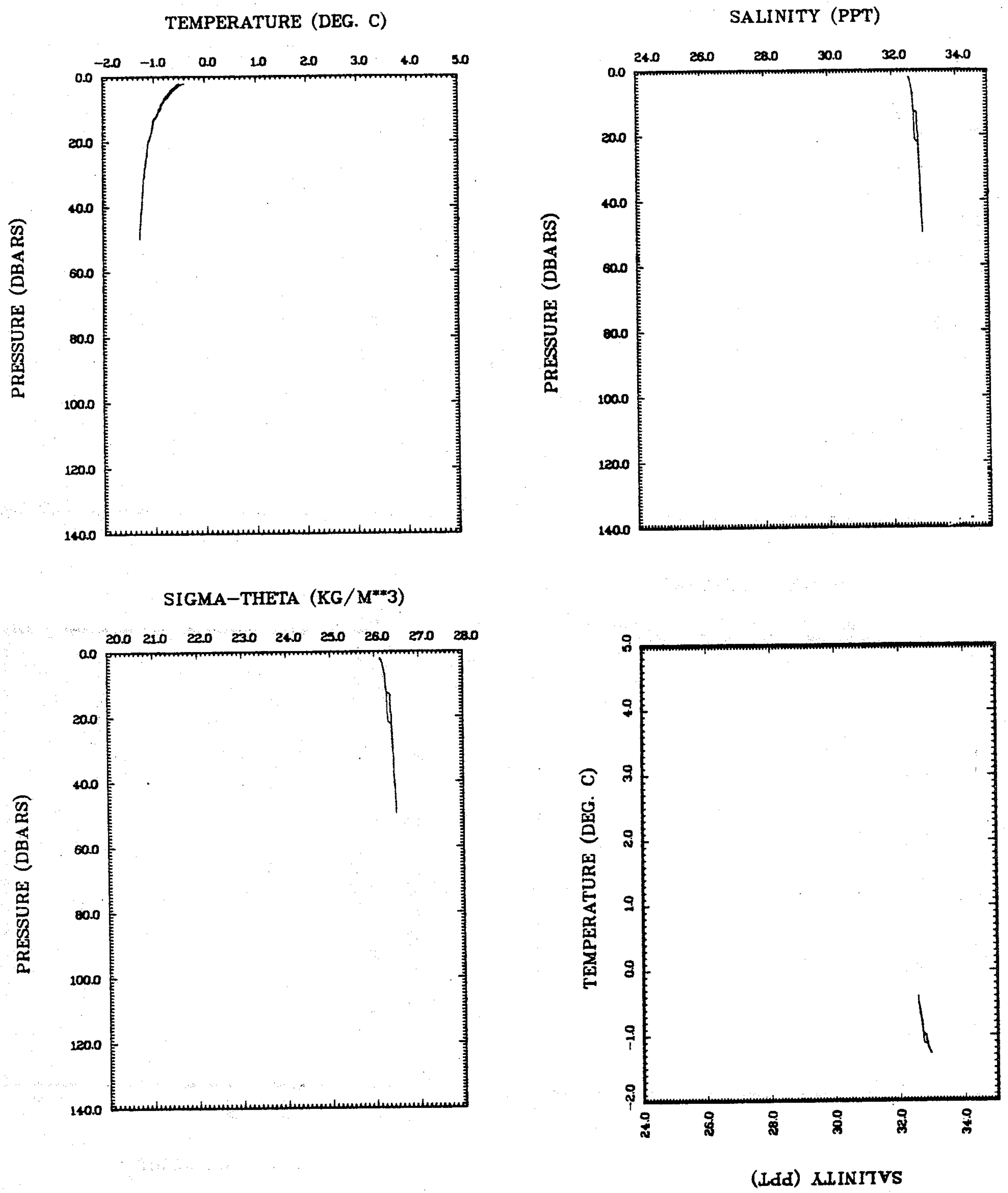
McBeth Fjord (MC2S, CTD15, 82.09.18)



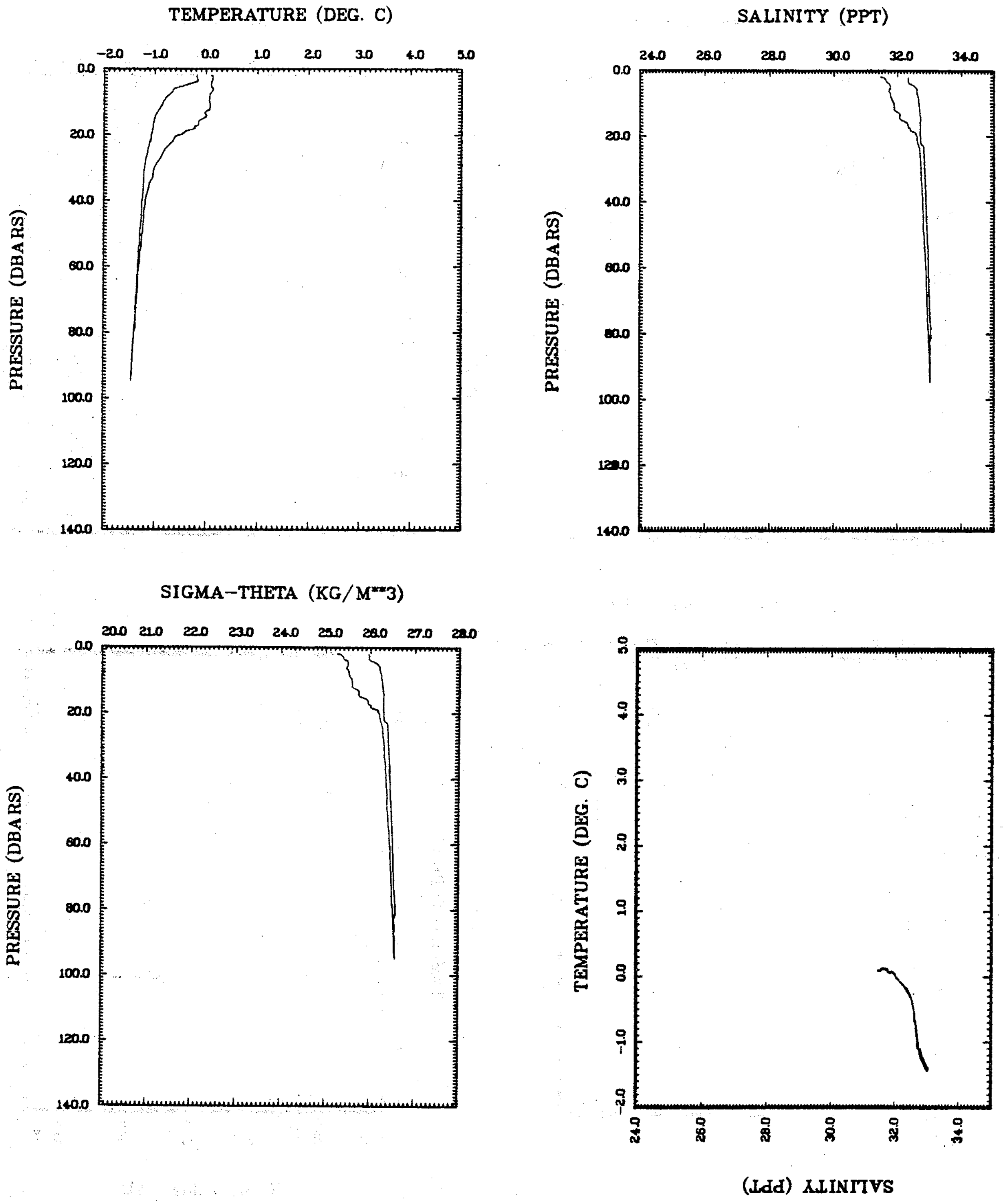
McBeth Fjord (MC3S, CTD16, 82.09.18)



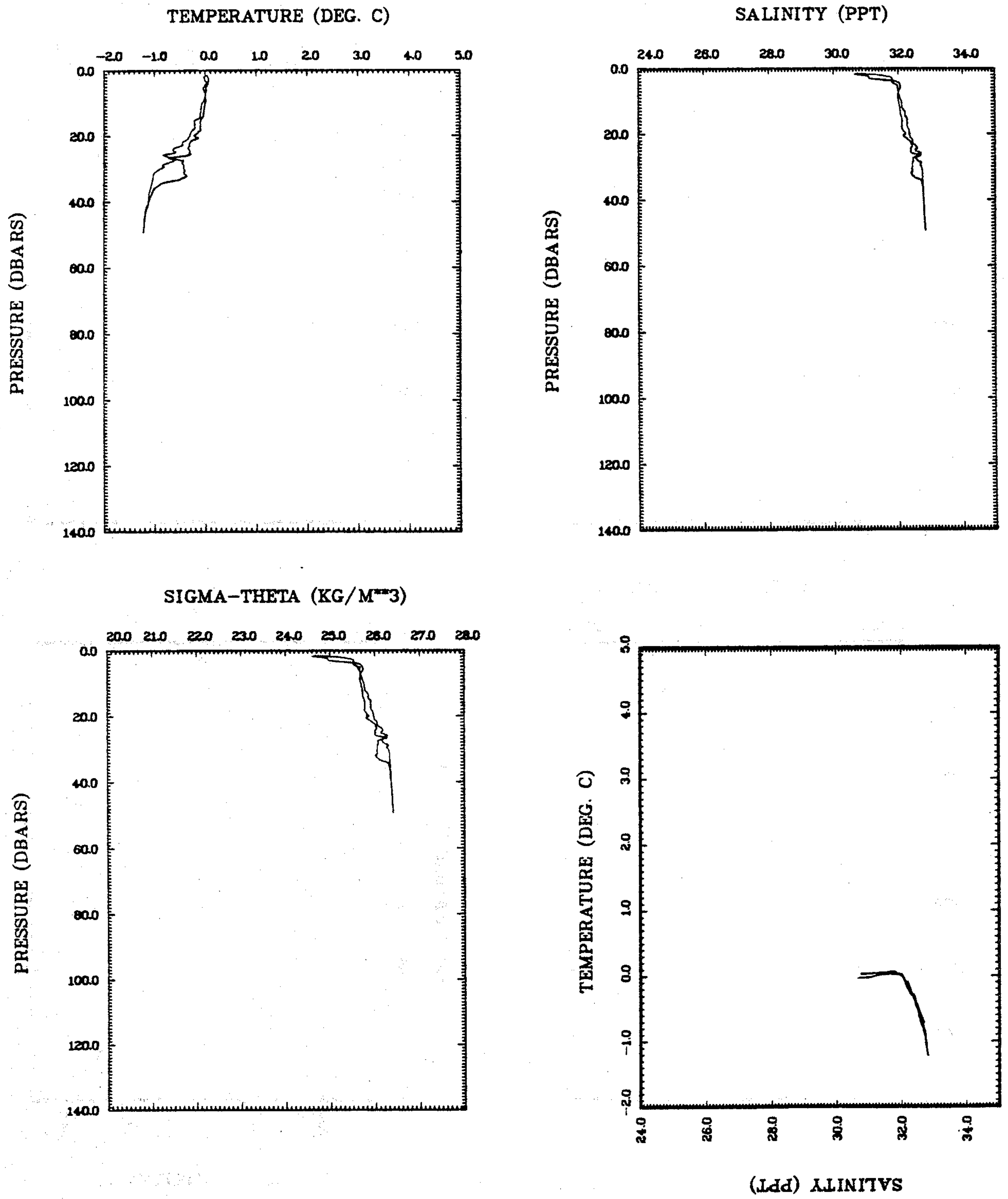
Inugsuin Fjord (IN1S, CTD17, 82.09.20)



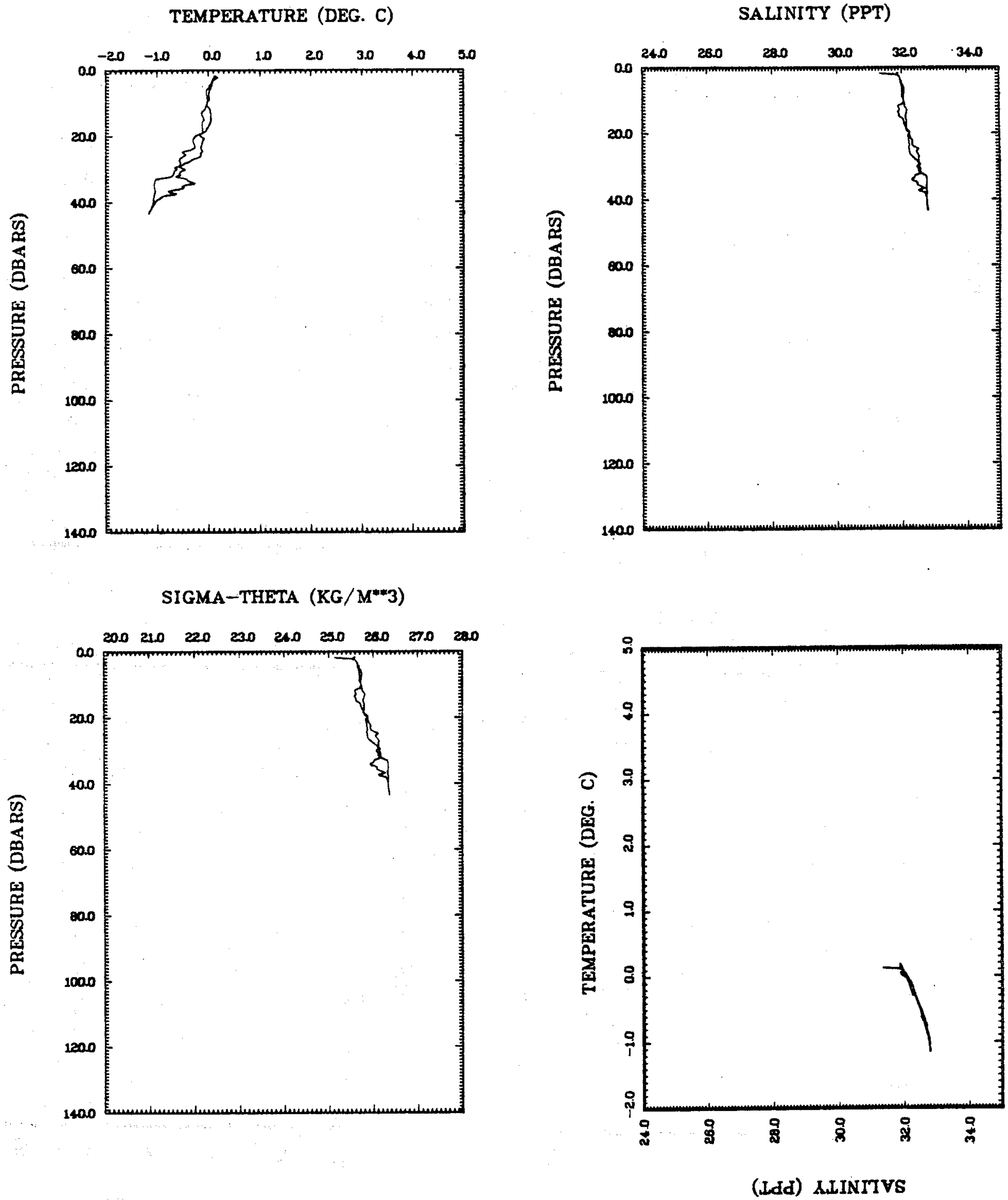
Inugsuin Fjord (IN2S, CTD18, 82.09.20)



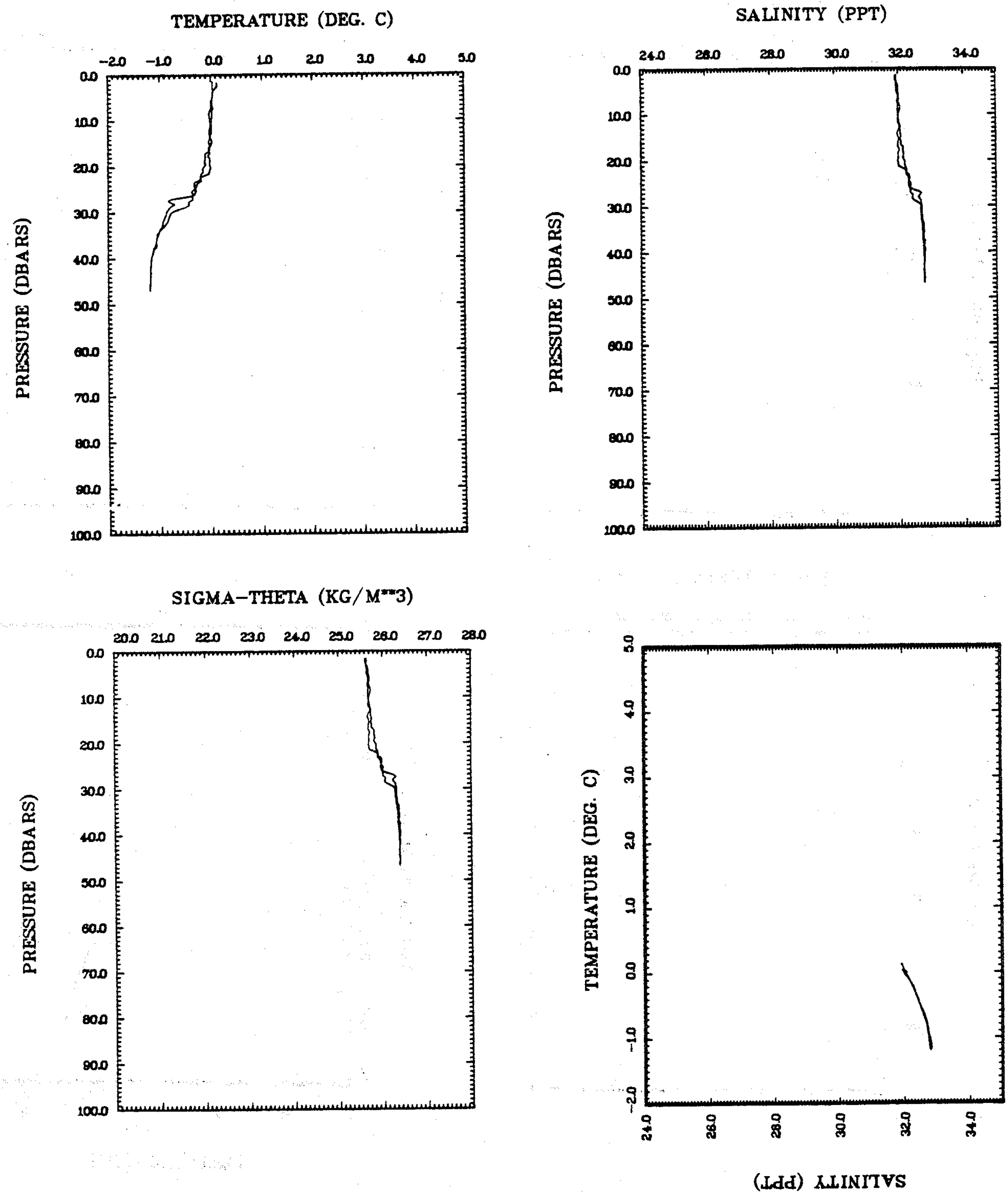
Inugsuin Fjord (IN3S, CTD19, 82.09.20)



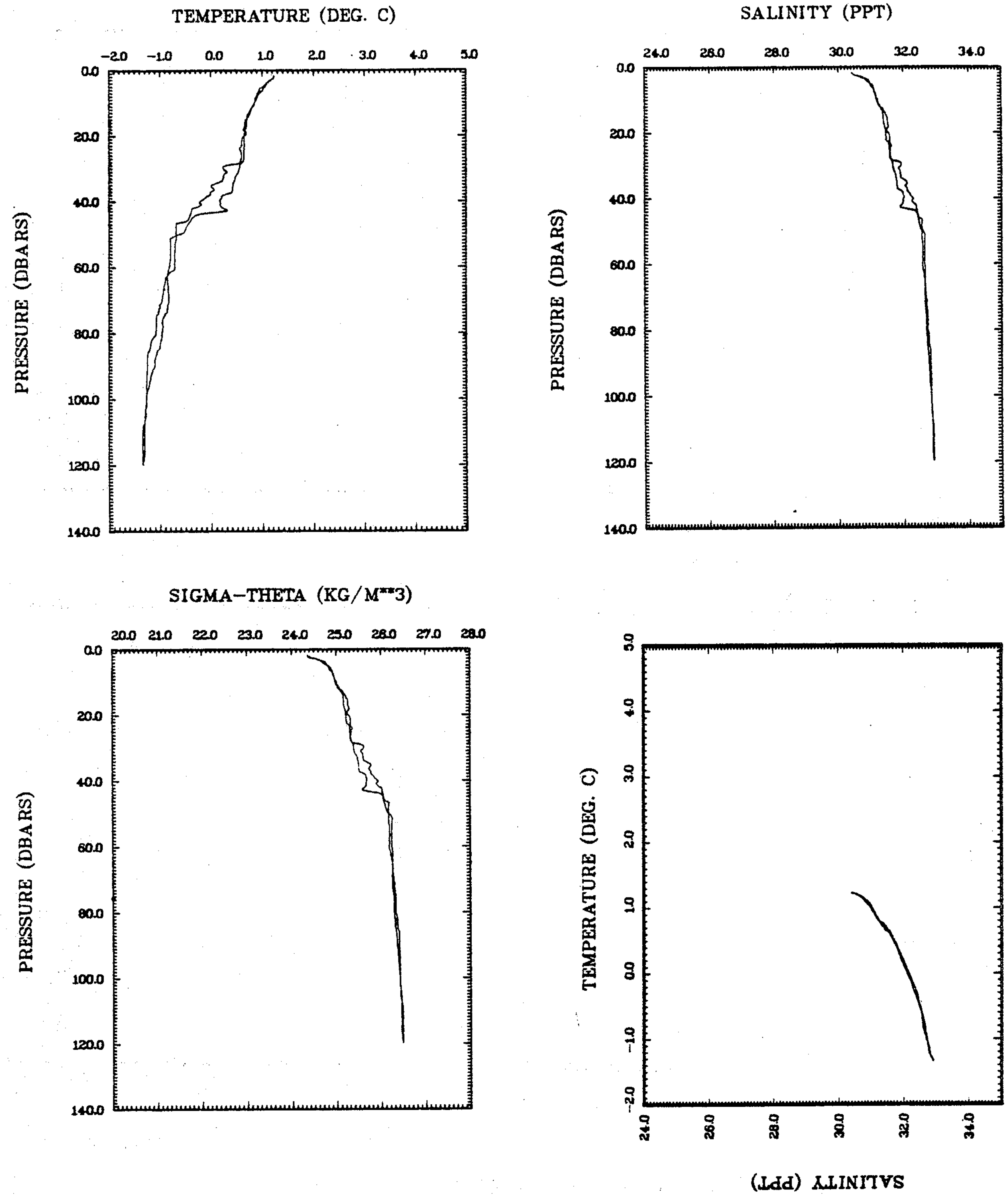
Inugsuin Fjord (IN4SA, CTD20, 82.09.20)



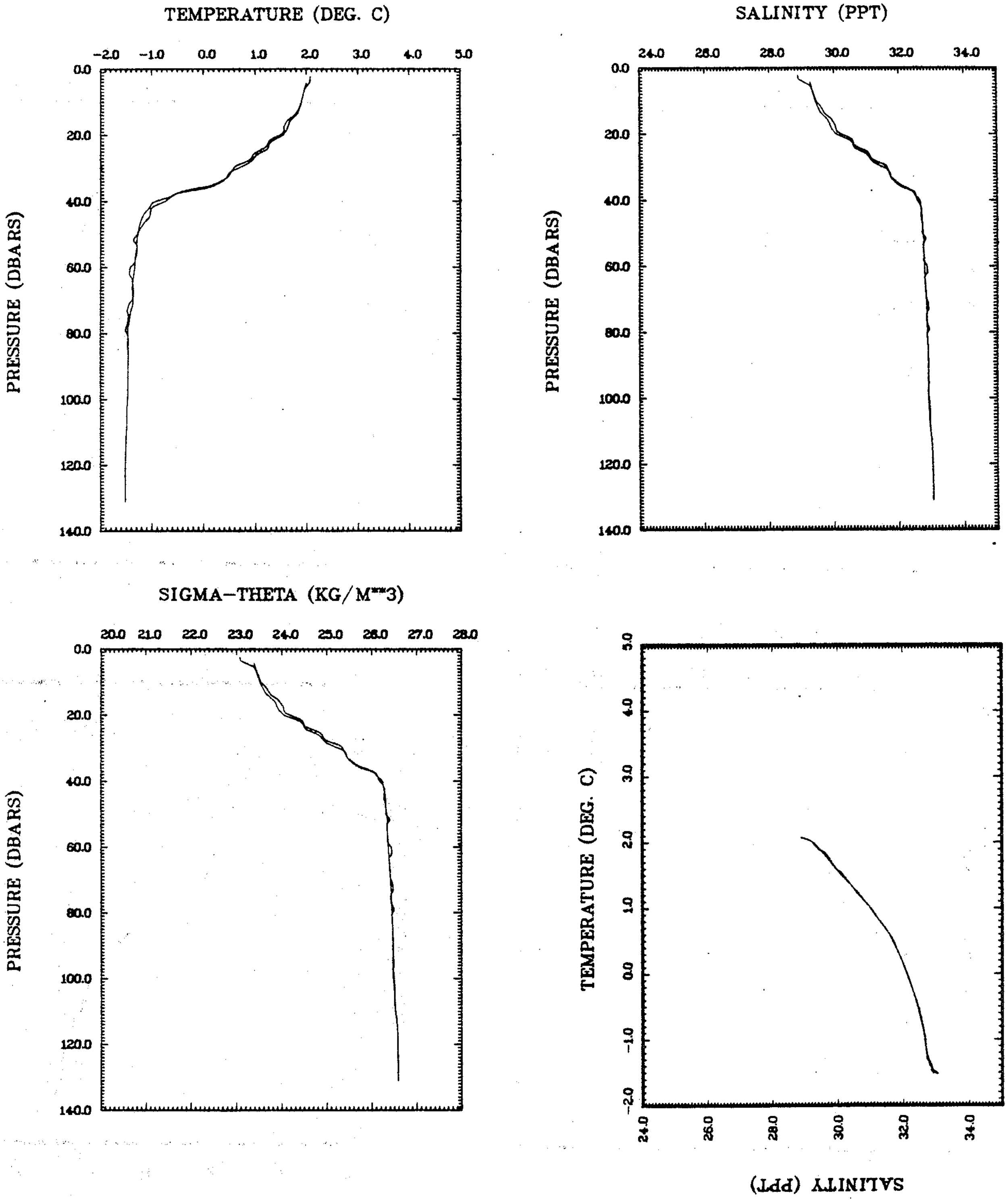
Inugsuin Fjord (IN4SB1, CTD21, 82.09.20)



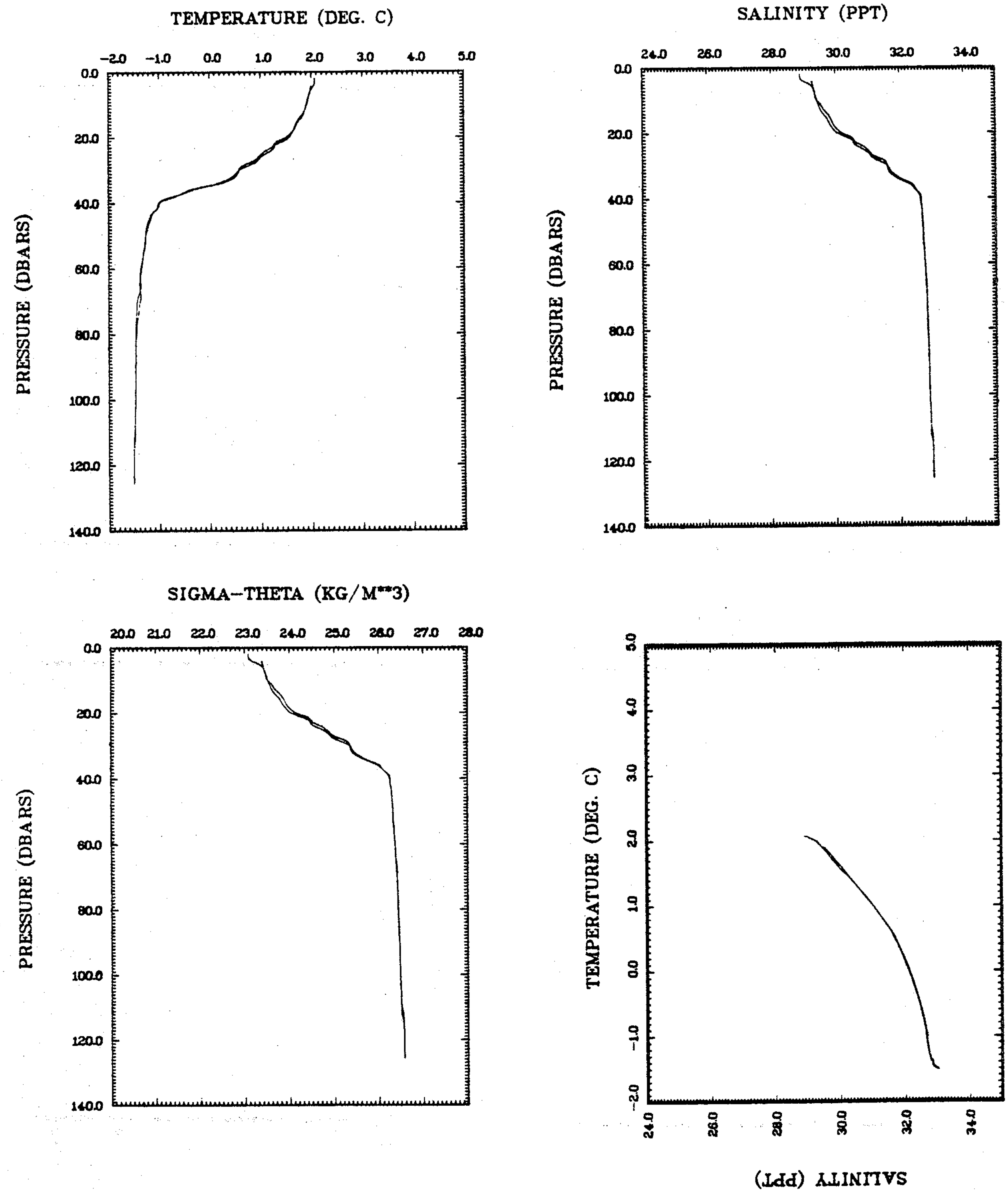
Inugsuin Fjord (IN4SB2, CTD21, 82.09.20)



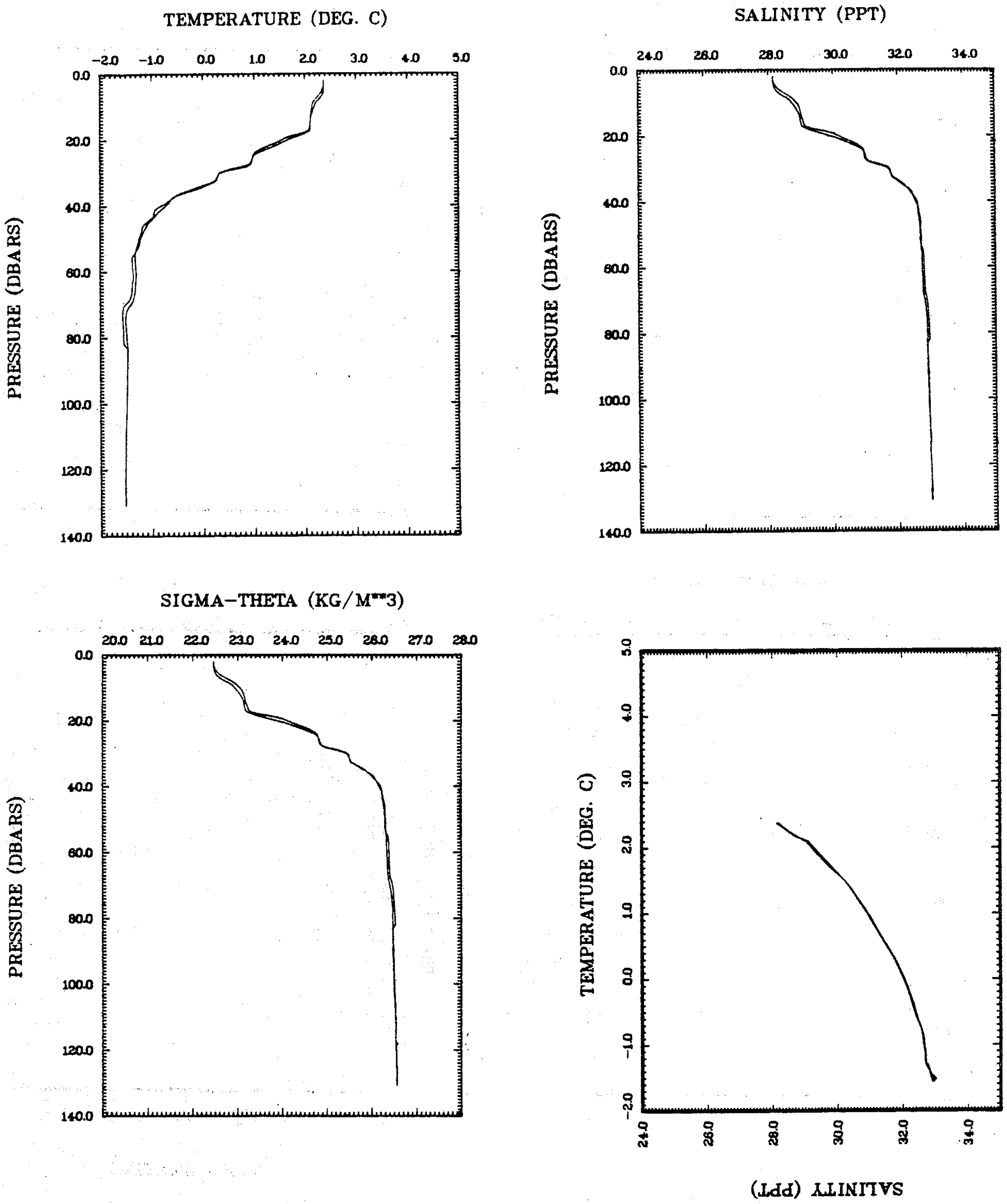
Inugsuin Fjord (IN5S, CTD22, 82.09.20)



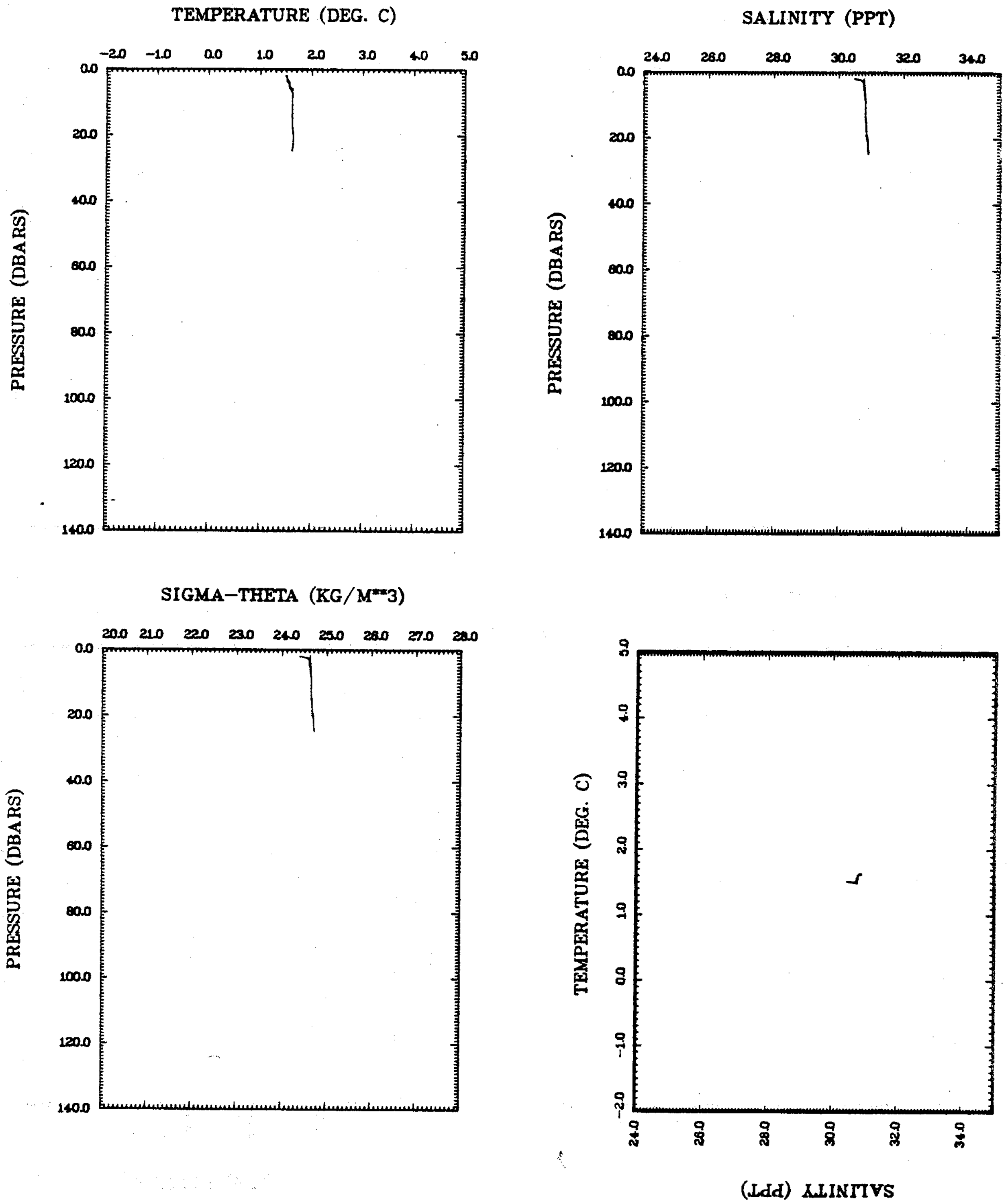
Inugsuin Fjord (IN6S1, CTD23, 82.09.20)



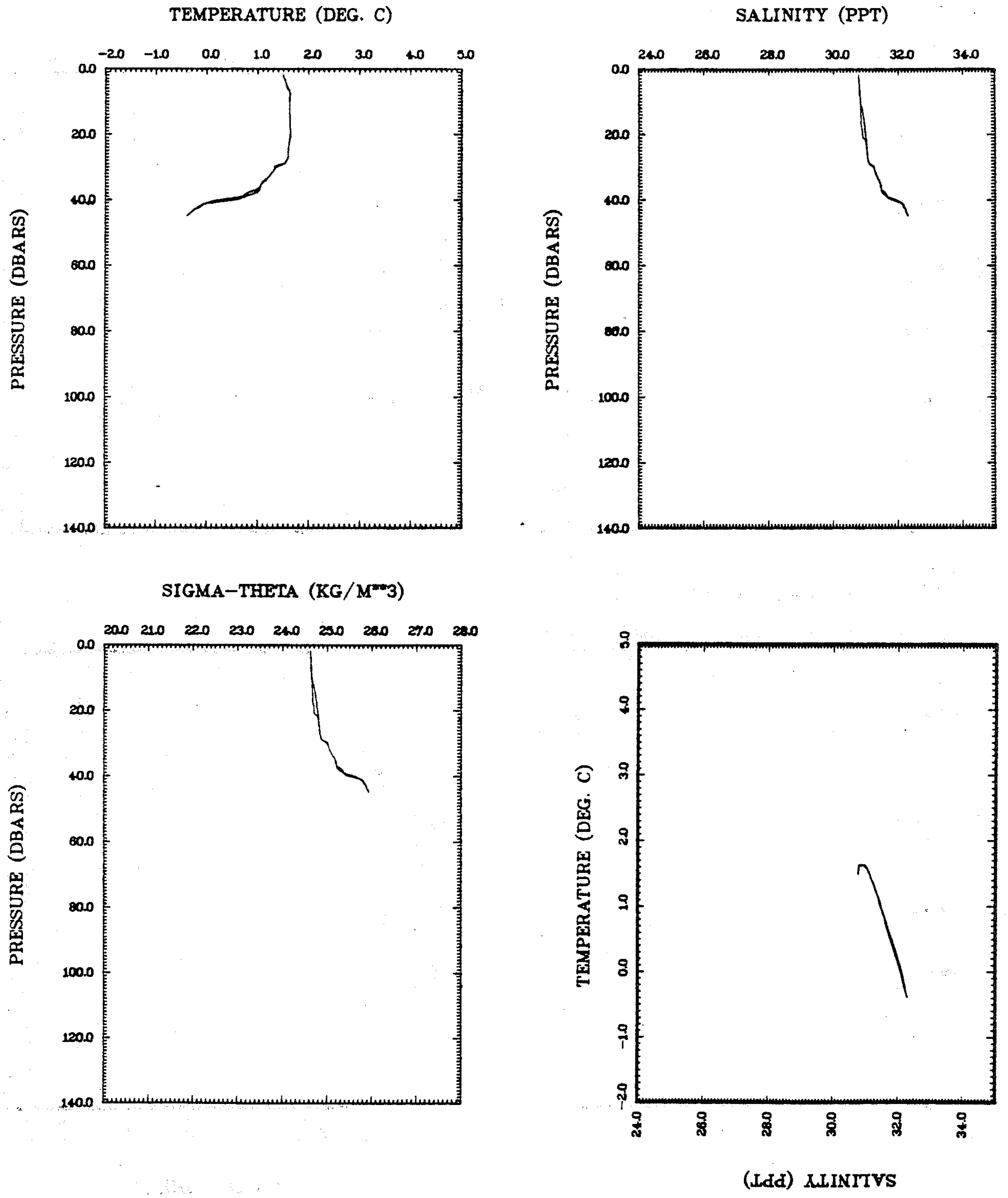
Inugsuin Fjord (IN6S2, CTD23, 82.09.20)



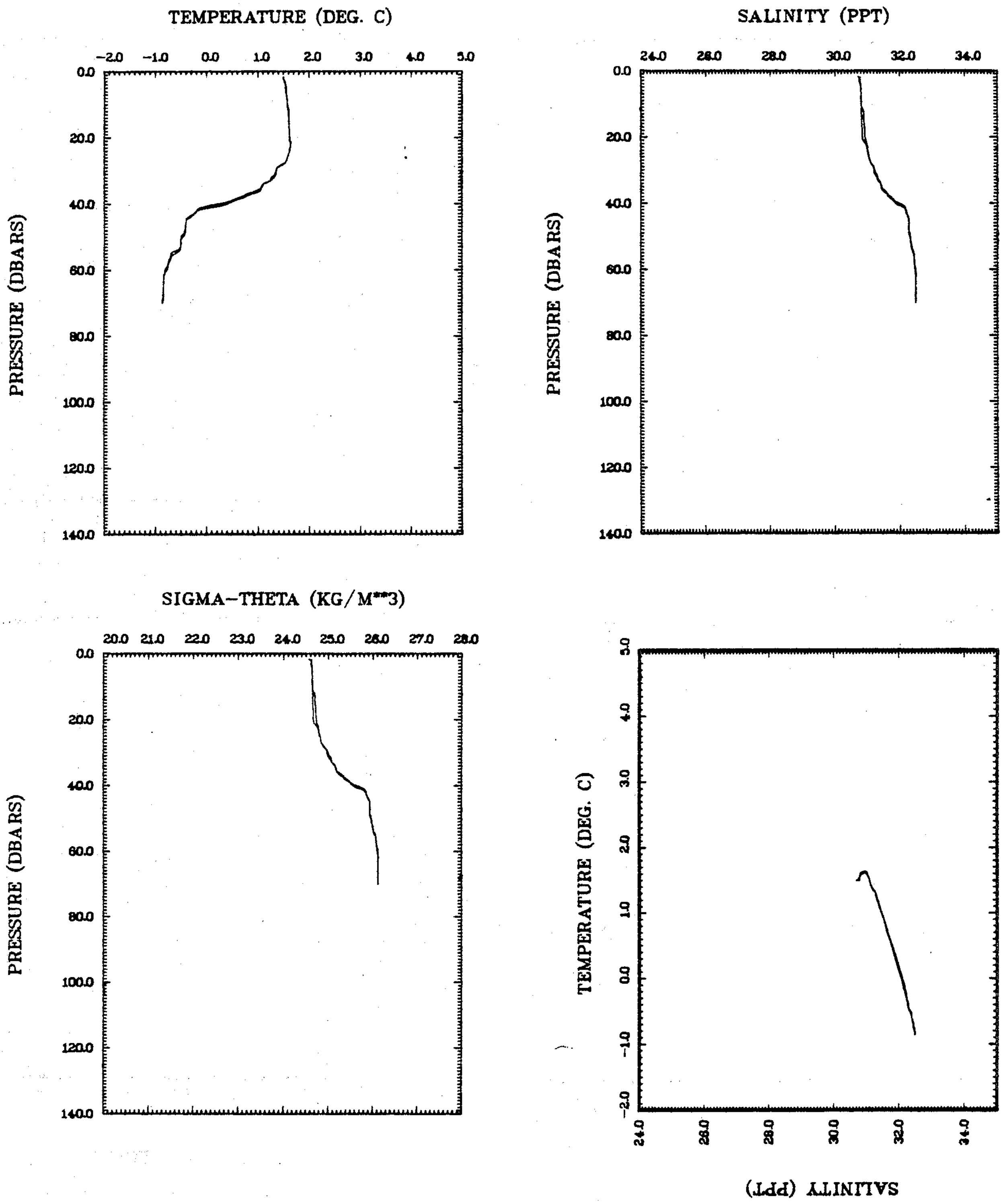
Inugsuin Fjord (IN7S, CTD24, 82.09.20)



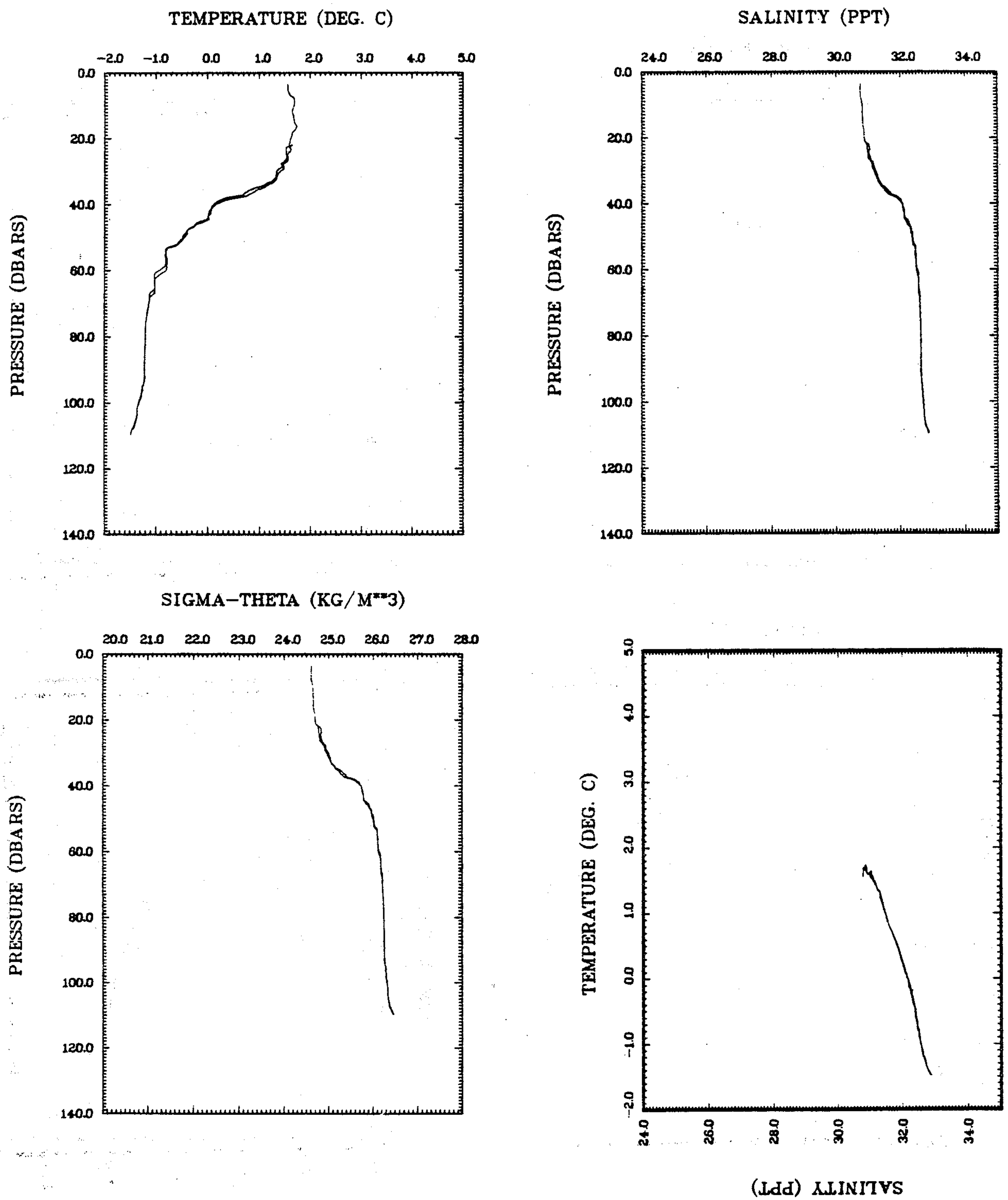
Clark Fjord (CL1S, CTD25, 82.09.21)



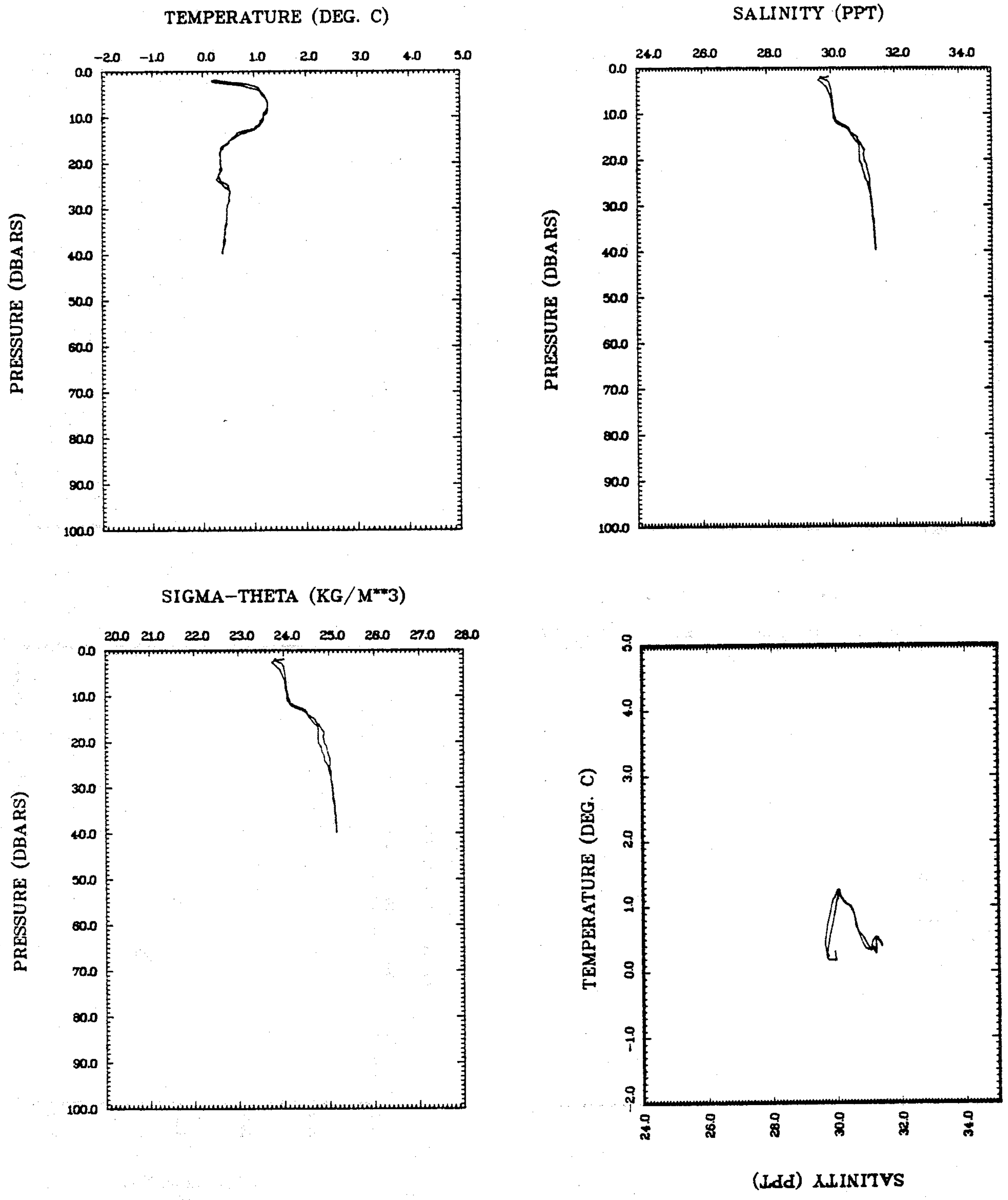
Clark Fjord (CL2S, CTD26, 82.09.21)



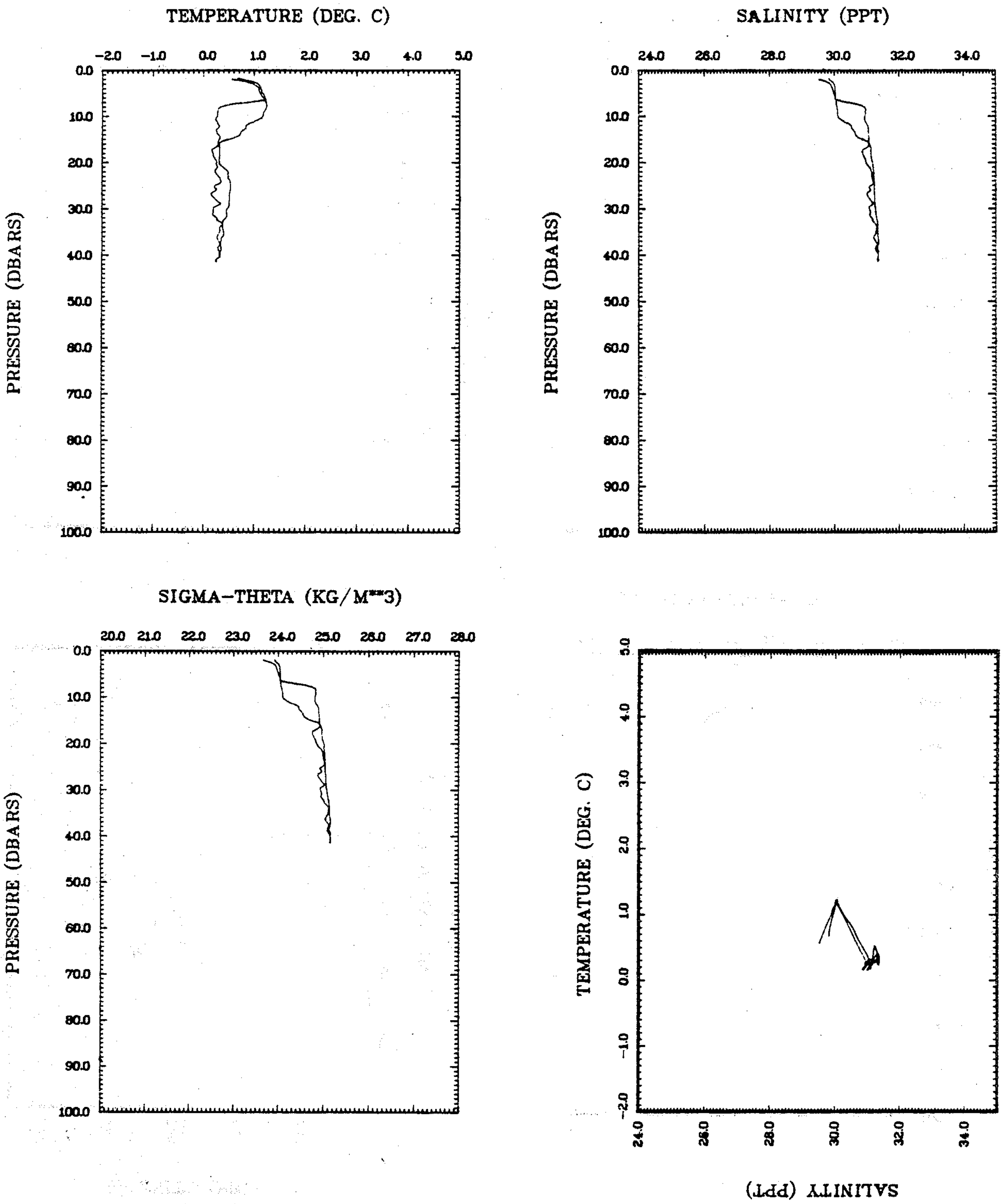
Clark Fjord (CL3S, CTD27, 82.09.21)



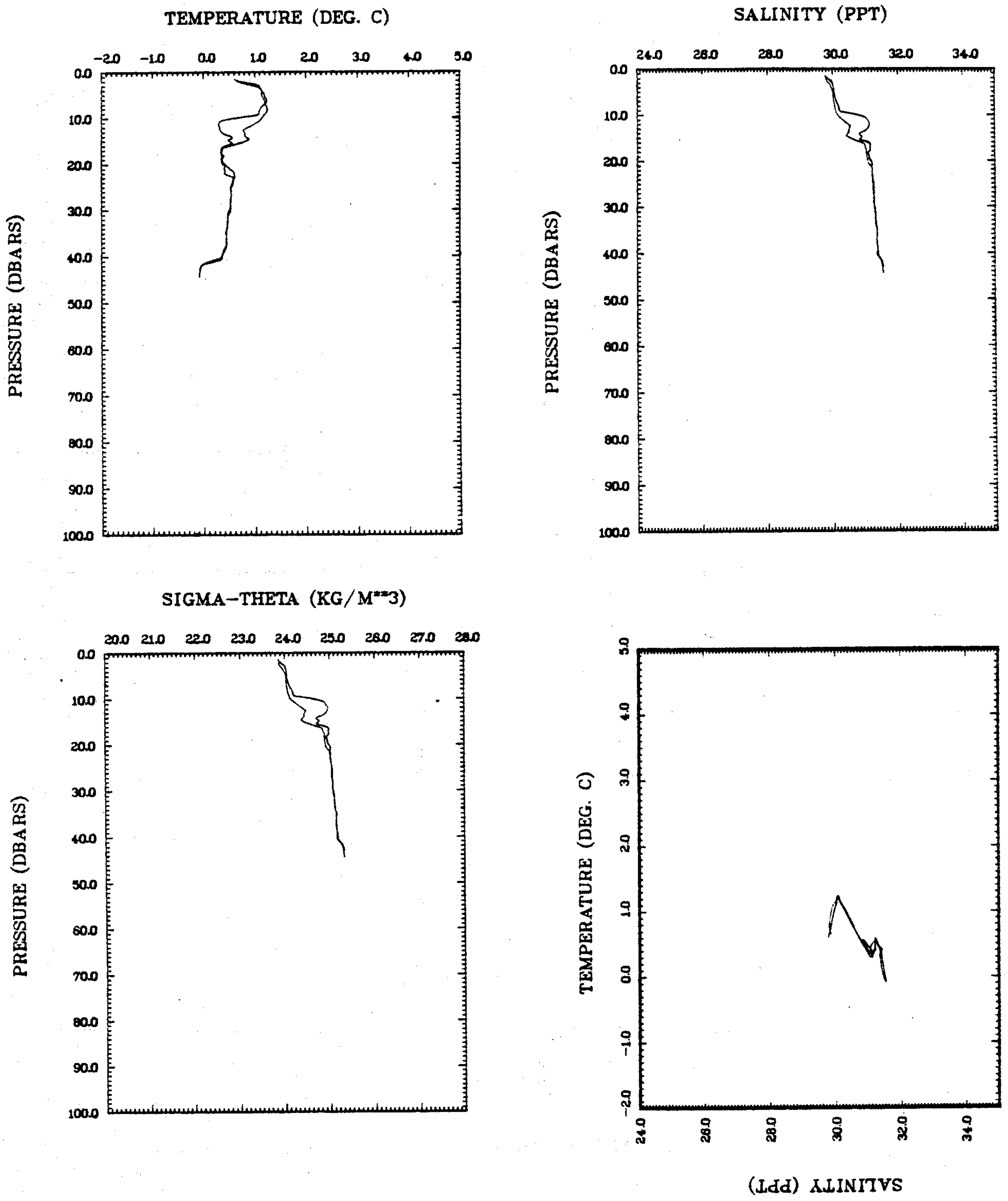
Clark Fjord (CL4S, CTD28, 82.09.21)



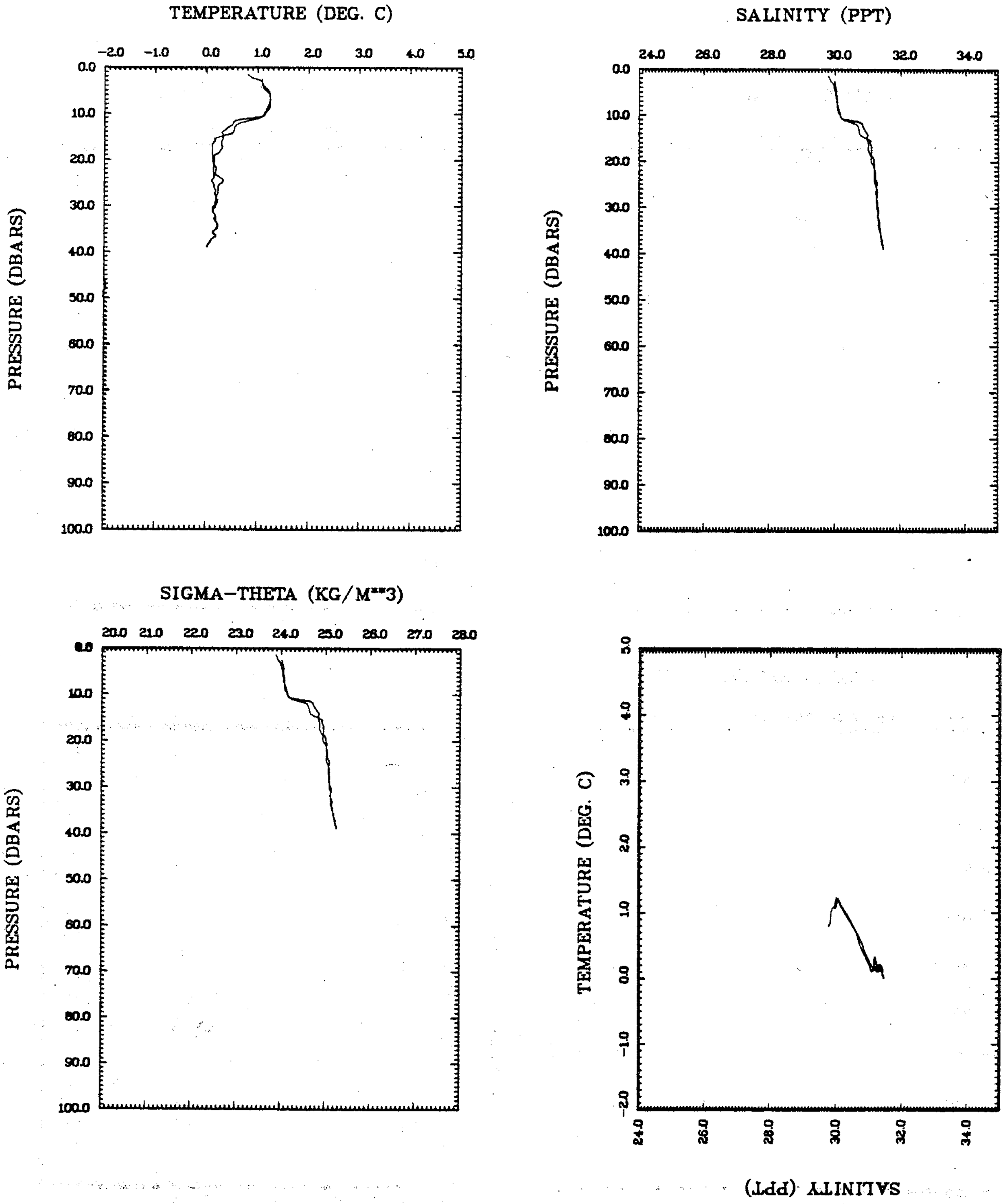
Cambridge Fjord (CA1SA, CTD29, 82.09.23)



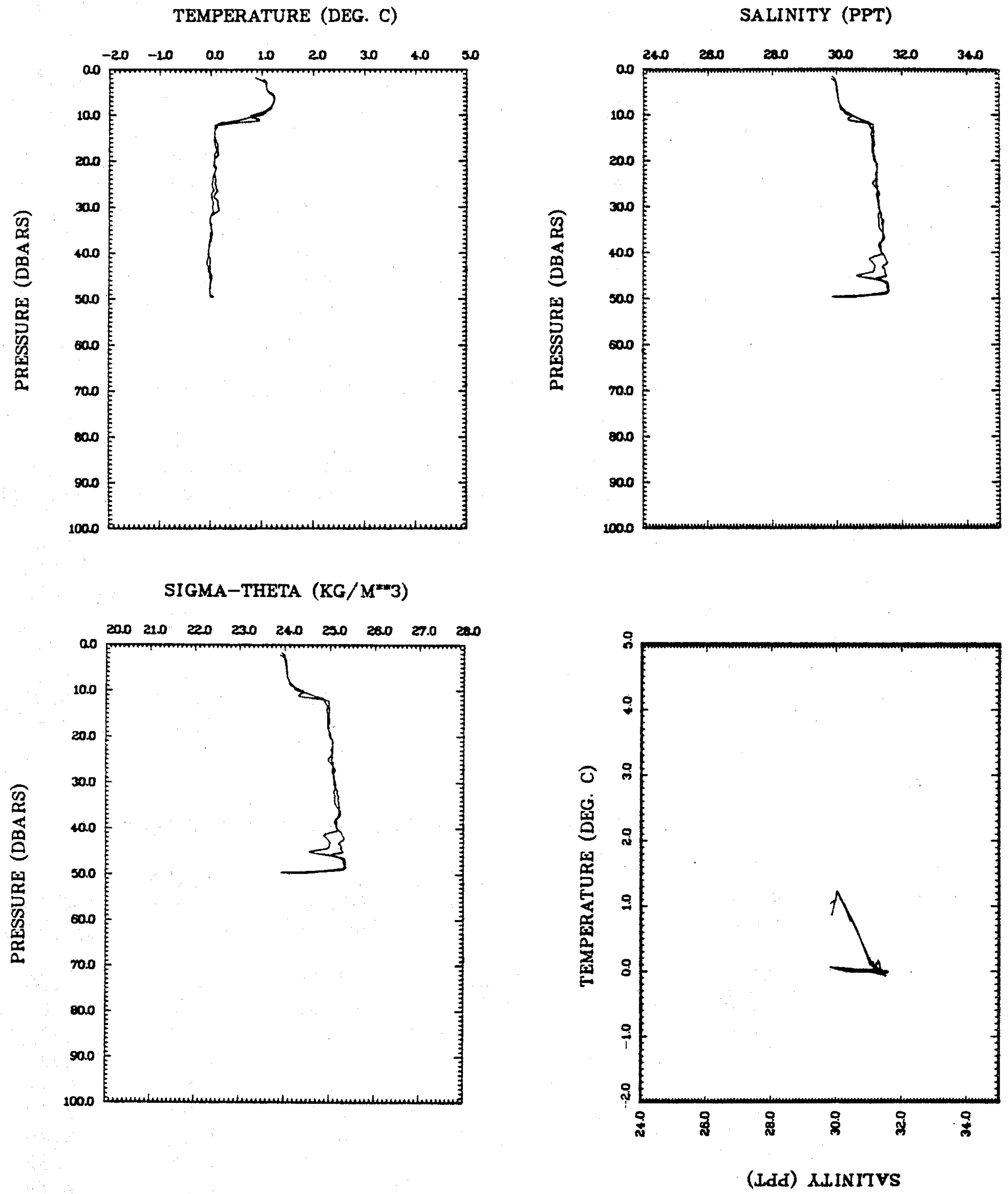
Cambridge Fjord (CA1SB, CTD30, 82.09.23)



Cambridge Fjord (CA1SC, CTD31, 82.09.23)



Cambridge Fjord (CA1SD, CTD32, 82.09.23)



Cambridge Fjord (CAISE, CTD33, 82.09.23)

Station: CO1 Date: 82.09.13 LATITUDE: 67°12.5' LONGITUDE: 64°46.5' DEPTH: 98 M

					NUTRIENTS		
Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Dissolved Oxygen (ml/ℓ)	Silicate (μg-at/ℓ)	Phosphate (μg-at/ℓ)	Nitrate (μg-at/ℓ)
*1	-0.35	31.47	25.27	8.03	4.18	1.32	.78
5	-0.22	31.37	25.18	8.54	4.73	1.50	1.44
10	-0.80	32.34	25.99	9.15	2.60	.25	.81
20	-0.88	32.45	26.08	9.12	2.39	1.60	.77
30	-1.27	32.65	26.26	8.64	4.15	2.02	2.16
50	-1.46	32.80	26.38	7.69	9.06	2.20	6.58
75	-1.41	32.93	26.49	7.46	10.97	2.41	8.13
92	-1.38	33.02	26.56	7.22	12.01	1.35	8.73

Station: CO2 Date: 82.09.13 LATITUDE: 67°14.1' LONGITUDE: 64°38.0' DEPTH: 230 M

					NUTRIENTS		
Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Dissolved Oxygen (ml/ℓ)	Silicate (μg-at/ℓ)	Phosphate (μg-at/ℓ)	Nitrate (μg-at/ℓ)
*1	3.28	26.52	21.10	7.70	3.68	.49	.23
5	.97	29.75	23.83	8.15	4.48	.66	1.04
10	-0.46	31.35	25.18	9.00	3.01	.73	1.04
20	-0.79	32.38	26.02	9.06	2.04	.83	.76
30	-1.23	32.64	26.25	8.07	4.36	.94	2.70
50	-1.50	32.82	26.40	7.09	10.71	1.18	7.74
75	-1.40	32.95	26.50	6.90	11.79	1.21	8.71
100	-1.39	33.07	26.60	6.69	12.96	1.14	9.70
200	-1.21	33.48	26.93	5.93	17.12	1.31	12.82
225	-1.13	33.55	26.98	5.62	18.14	1.40	13.39

Station: CO3 Date: 82.09.13 LATITUDE: 67°14.5' LONGITUDE: 64°30.0' DEPTH: 269 M

					NUTRIENTS		
Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Dissolved Oxygen (ml/ℓ)	Silicate (μg-at/ℓ)	Phosphate (μg-at/ℓ)	Nitrate (μg-at/ℓ)
1	2.98	26.79	21.34	8.19	3.56	.52	.44
10	-0.33	31.62	25.39	8.15	2.29	.72	.85
20	-0.92	32.48	26.11	9.00	2.21	.80	.78
30	-1.26	32.65	26.26	7.98	4.64	.98	3.07
50	-1.49	32.82	26.40	7.17	10.29	1.15	7.64
75	-1.40	32.96	26.51	6.95	10.55	1.12	7.64
100	-1.40	33.06	26.60	6.92	7.92	1.01	5.82
150	-1.32	33.31	26.79	6.37	15.30	1.33	11.19
200	-1.22	33.48	26.93	6.00	15.06	1.13	11.45
250	-1.08	33.62	27.04	5.77	15.02	1.25	12.92

Station: CO4 Date: 82.09.13 LATITUDE: 67°15.2' LONGITUDE: 64°18.2' DEPTH: 358 M

						NUTRIENTS	
Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Dissolved Oxygen (ml/ℓ)	Silicate (µg-at/ℓ)	Phosphate (µg-at/ℓ)	Nitrate (µg-at/ℓ)
*1	1.54	28.27	22.61	8.11	4.01	1.13	.08
*5	1.36	28.95	23.16	9.43	4.03	1.76	.44
10	-0.02	31.40	25.20	9.30	1.85	1.52	.22
20	-1.02	32.50	26.13	8.69	3.16	.94	1.04
30	-1.24	32.61	26.23	7.93	5.39	.88	3.54
50	-1.51	32.81	26.39	7.27	10.32	1.12	7.12
100	-1.42	33.07	26.60	6.43	12.96	1.16	9.29
200	-1.22	33.48	26.92	6.09	16.59	1.32	12.22
300	-0.83	33.80	27.18	5.73	20.63	1.37	13.62
352	-0.68	33.88	27.23	6.28	21.35	1.30	14.20

Station: CO5 Date: 82.09.14 LATITUDE: 67°17.8' LONGITUDE: 64°9.0' DEPTH: 497 M

						NUTRIENTS	
Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Dissolved Oxygen (ml/ℓ)	Silicate (µg-at/ℓ)	Phosphate (µg-at/ℓ)	Nitrate (µg-at/ℓ)
1	3.61	27.18	21.60	8.17	3.00	.47	.16
5	3.62	27.18	21.60	8.84	1.83	.55	.16
10	-0.33	31.72	25.47	9.34	1.34	.62	.35
20	-0.73	32.41	26.05	9.05	2.07	.83	.40
30	-1.24	32.64	26.25	8.00	5.69	2.27	3.52
50	-1.52	32.82	26.40	7.28	10.01	2.28	7.14
100	-1.45	33.10	26.63	6.93	12.97	2.31	9.18
200	-1.23	33.48	26.93	6.34	15.72	.29	11.48
400	-0.60	33.92	27.26	5.86	19.78	2.39	13.93
497	-0.53	33.94	27.27	-	20.24	.91	13.88

Station: MA5 Date: 82.09.14 LATITUDE: 67°17.5' LONGITUDE: 64°01.0' DEPTH: 576 M

						NUTRIENTS	
Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Dissolved Oxygen (ml/ℓ)	Silicate (µg-at/ℓ)	Phosphate (µg-at/ℓ)	Nitrate (µg-at/ℓ)
*1	2.38	27.71	22.11	8.47	2.17	.48	.14
5	1.14	30.05	24.06	8.93	1.43	.52	.34
10	-0.41	31.86	25.59	9.22	.99	.59	.18
20	-0.86	32.50	26.13	8.77	2.30	.75	.70
30	-1.22	32.64	26.25	8.00	5.06	.90	3.08
50	-1.51	32.80	26.38	7.28	9.35	1.11	6.50
100	-1.48	33.05	26.59	6.91	13.04	1.35	9.26
200	-1.24	33.47	26.92	6.22	15.85	1.34	11.71
400	-0.61	33.89	27.24	5.83	19.83	1.25	13.87
576	-0.52	33.94	27.28	5.68	20.19	1.19	13.85

Station: Ti5 Date: 82.09.16 LATITUDE: 68°54.25' LONGITUDE: 67°17.2' DEPTH: 570 M

				Dissolved		NUTRIENTS	
Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Oxygen (ml/ℓ)	Silicate (μg-at/ℓ)	Phosphate (μg-at/ℓ)	Nitrate (μg-at/ℓ)
*1	1.22	29.52	23.63	7.72	.84	.55	.41
558	.46	34.22	27.46	5.12	30.76	1.42	16.32

Station: Ti4 Date: 82.09.16 LATITUDE: 69°05.8' LONGITUDE: 67°54.5' DEPTH: 298 M

				Dissolved		NUTRIENTS	
Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Oxygen (ml/ℓ)	Silicate (μg-at/ℓ)	Phosphate (μg-at/ℓ)	Nitrate (μg-at/ℓ)
*1	1.65	28.81	23.04	8.28	.62	.46	.40
284	-0.97	33.74	27.13	5.93	21.80	1.32	12.90

Station: Ti1 Date: 82.09.16 LATITUDE: 68°59.4' LONGITUDE: 68°57.6' DEPTH: 96 M

				Dissolved		NUTRIENTS	
Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Oxygen (ml/ℓ)	Silicate (μg-at/ℓ)	Phosphate (μg-at/ℓ)	Nitrate (μg-at/ℓ)
*1	2.72	28.32	22.57	8.00	2.19	.44	.17
5	2.72	28.32	22.58	-	2.16	.45	.17
10	2.72	28.60	22.80	8.16	1.94	.47	.18
20	2.43	28.77	22.96	9.13	1.77	.56	.36
30	0.68	31.52	25.26	9.85	2.03	.68	.34
50	-0.74	32.65	26.24	7.95	6.69	1.02	5.58
75	-1.34	32.86	26.43	7.41	9.84	1.15	8.10
85	-1.35	32.94	26.49	-	10.24	1.17	8.44

Station: Ti1A Date: 82.09.16 LATITUDE: 69°05.4' LONGITUDE: 68°54.0' DEPTH: 302 M

				Dissolved		NUTRIENTS	
Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Oxygen (ml/ℓ)	Silicate (μg-at/ℓ)	Phosphate (μg-at/ℓ)	Nitrate (μg-at/ℓ)
*1	2.70	27.96	22.29	7.93	2.43	.44	.20
*5	2.72	28.00	22.32	7.96	2.29	.44	.19
10	2.68	28.22	22.50	8.12	1.98	.45	.19
20	2.07	28.99	23.16	9.16	1.61	.54	.20
30	.32	31.34	25.14	9.81	1.81	.67	.40
50	-0.69	32.64	26.23	8.18	5.15	.93	3.81
75	-1.44	32.86	26.43	7.29	10.53	1.16	7.98
100	-1.41	33.05	26.58	7.08	9.44	1.03	7.44
200	-1.36	33.37	26.84	6.45	15.99	1.23	11.41
290	-1.05	33.71	27.11	5.79	21.82	1.29	13.78

Station: Ti2 Date: 82.09.16 LATITUDE: 69°7' LONGITUDE: 68°50.5' DEPTH: 347 M

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Dissolved Oxygen (ml/ℓ)	Silicate (µg-at/ℓ)	NUTRIENTS Phosphate (µg-at/ℓ)	Nitrate (µg-at/ℓ)
*1	2.15	28.66	22.88	7.97	2.06	.43	.15
5	2.32	28.42	22.68	8.01	1.90	.45	.12
10	2.14	28.66	22.89	8.05	1.84	.47	.12
20	1.95	28.82	23.02	8.24	1.61	.51	.33
30	0.07	31.46	25.25	9.75	1.91	.69	.27
50	-0.59	32.61	26.20	8.08	5.80	1.00	3.91
100	-1.43	33.01	26.55	7.12	12.83	1.26	8.99
200	-1.35	33.40	26.87	6.44	15.27	1.27	11.25
300	-0.99	33.74	27.13	5.74	18.13	1.38	11.64
330	-0.96	33.76	27.15	5.62	23.48	1.32	14.11

Station: Ti3 Date: 82.09.16 LATITUDE: 69°11.5' LONGITUDE: 68°23.5' DEPTH: 487 M

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Dissolved Oxygen (ml/ℓ)	Silicate (µg-at/ℓ)	NUTRIENTS Phosphate (µg-at/ℓ)	Nitrate (µg-at/ℓ)
1	1.56	28.88	23.10	8.16	1.04	.69	.12
5	1.56	28.88	23.10	8.16	1.12	.65	.11
10	1.57	28.88	23.10	8.21	1.23	.62	.11
20	1.56	28.94	23.14	8.57	1.08	.67	.37
30	-0.56	31.83	25.57	9.23	1.62	.88	.40
50	-1.05	32.67	26.27	8.20	5.63	1.10	3.58
100	-1.50	33.04	26.58	7.11	13.65	1.30	9.12
200	-1.36	33.40	26.87	6.46	16.65	1.32	11.50
400	-0.91	33.76	27.15	5.84	22.77	1.36	13.54
475	-0.90	33.77	27.15	5.82	23.08	1.36	13.57

Station: It1 Date: 82.09.17 LATITUDE: 69°18.5' LONGITUDE: 69°10.0' DEPTH: 167 M

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Dissolved Oxygen (ml/ℓ)	Silicate (µg-at/ℓ)	NUTRIENTS Phosphate (µg-at/ℓ)	Nitrate (µg-at/ℓ)
*1	1.01	29.26	23.43	8.61	1.76	.55	.16
*5	1.01	29.28	23.45	8.82	1.86	.57	.11
10	0.67	30.28	24.27	8.90	1.56	.66	.15
20	0.28	30.86	24.75	8.79	1.48	.68	.37
30	-0.14	31.45	25.24	9.29	1.58	.75	.21
40	-0.20	31.87	25.59	9.36	2.43	.84	.53
50	-0.50	32.26	25.92	9.23	3.39	.93	1.35
75	-1.20	32.76	26.34	7.91	8.82	1.23	6.16
100	-1.37	33.05	26.59	7.13	12.35	1.34	8.95
145	-1.35	33.22	26.72	6.88	14.48	1.44	10.32

Station: It2 Date: 82.09.17 LATITUDE: 69°20.5' LONGITUDE: 68°53' DEPTH: 320 M

				Dissolved		NUTRIENTS	
Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Oxygen (ml/ℓ)	Silicate (µg-at/ℓ)	Phosphate (µg-at/ℓ)	Nitrate (µg-at/ℓ)
*1	.96	29.47	23.61	8.66	1.54	.55	0.00
*5	.96	29.48	23.61	8.70	1.49	.55	.09
10	.89	29.69	23.77	9.17	1.33	.57	.01
20	-0.02	31.11	24.97	9.41	1.18	.62	0.00
30	-0.42	31.57	25.35	9.47	.93	.69	.01
50	-0.67	32.24	25.90	9.35	3.28	.81	.95
75	-1.48	32.78	26.37	7.50	10.05	1.12	7.22
100	-1.44	33.04	26.58	7.04	13.41	1.22	9.34
200	-1.31	33.37	26.84	6.58	16.31	1.28	11.26
305	-0.96	33.73	27.12	5.91	22.66	1.34	13.83

Station: It3 Date: 82.09.17 LATITUDE: 69°16.9' LONGITUDE: 68°22' DEPTH: 417 M

				Dissolved		NUTRIENTS	
Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Oxygen (ml/ℓ)	Silicate (µg-at/ℓ)	Phosphate (µg-at/ℓ)	Nitrate (µg-at/ℓ)
1	1.46	28.74	22.99	8.26	1.69	.47	0.00
5	1.46	28.83	23.07	8.25	1.00	.37	0.00
10	1.37	29.27	23.42	8.71	1.05	.51	0.00
20	-0.09	31.18	25.03	9.46	.73	.61	.10
30	-0.58	31.86	25.60	9.11	1.06	.77	.23
50	-0.86	32.34	25.99	9.23	1.73	.77	.29
100	-1.47	33.05	26.59	7.10	13.13	1.19	9.10
200	-1.30	33.43	26.89	6.50	16.66	1.29	11.69
300	-0.99	33.73	27.12	6.00	21.10	1.34	12.19
405	-0.92	33.75	27.14	5.79	26.71	1.45	13.86

Station: It4 Date: 82.09.17 LATITUDE: 69°10.0' LONGITUDE: 67°45.0' DEPTH: 303 M

				Dissolved		NUTRIENTS	
Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Oxygen (ml/ℓ)	Silicate (µg-at/ℓ)	Phosphate (µg-at/ℓ)	Nitrate (µg-at/ℓ)
*1	1.60	28.86	23.08	8.21	1.38	.46	.11
5	1.64	28.76	22.99	8.21	1.39	.46	.11
10	1.59	28.96	23.16	8.83	.81	.59	.12
20	0.78	30.66	24.53	8.73	1.66	.67	.35
30	-0.29	31.65	25.42	8.72	2.49	.99	1.49
50	-1.09	32.55	26.17	8.65	2.61	.92	1.61
75	-1.56	32.91	26.47	7.43	10.98	1.22	7.73
100	-1.56	33.05	26.59	7.22	13.50	1.21	8.94
200	-1.42	33.39	26.86	6.81	15.20	1.26	10.55
290	-1.00	33.72	27.12	5.91	23.36	1.35	13.39

Station: MC11 Date: 82.09.18 LATITUDE: 69°29.5' LONGITUDE: 66°39.0' DEPTH: 250 M

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Dissolved Oxygen (ml/ℓ)	Silicate (µg-at/ℓ)	NUTRIENTS Phosphate (µg-at/ℓ)	Nitrate (µg-at/ℓ)
*1	2.06	29.51	23.57	7.95	2.22	.57	.15
*5	2.05	29.51	23.57	7.89	2.54	.61	.19
10	2.33	29.89	23.86	8.34	2.26	.61	.10
20	0.70	31.52	25.26	9.91	.84	.70	.18
30	-0.49	32.47	26.09	8.92	4.73	.92	2.53
50	-1.39	32.92	26.48	8.06	12.45	1.08	6.47
75	-1.58	33.06	26.60	7.63	10.91	1.11	6.80
100	-1.62	33.13	26.66	7.43	12.96	1.18	8.41
200	-1.40	33.46	26.92	6.34	20.04	1.32	10.93
241	-1.34	33.59	27.02	6.39	21.75	1.28	11.93

Station: MC9 Date: 82.09.18 LATITUDE: 69°30' LONGITUDE: 67°51.0' DEPTH: 326 M

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Dissolved Oxygen (ml/ℓ)	Silicate (µg-at/ℓ)	NUTRIENTS Phosphate (µg-at/ℓ)	Nitrate (µg-at/ℓ)
*1	2.24	27.77	22.17	8.18	1.45	.69	.21
5	2.08	27.75	22.16	8.07	1.92	.52	.16
10	2.25	28.44	22.70	8.24	1.82	.56	.16
20	2.09	28.92	23.10	8.91	1.25	.57	.15
30	-0.58	32.39	26.02	9.27	1.30	.75	.55
50	-1.52	32.76	26.35	7.66	8.05	1.07	5.47
75	-1.49	32.87	26.44	7.28	10.05	1.14	6.92
100	-1.50	33.01	26.56	6.94	12.08	1.20	8.00
200	-1.41	33.45	26.91	6.08	21.91	1.43	12.79
305	-1.34	33.55	26.99	5.38	29.60	1.60	14.26

Station: MC6 Date: 82.09.18 LATITUDE: 69°31.7' LONGITUDE: 68°09.4' DEPTH: 415 M

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Dissolved Oxygen (ml/ℓ)	Silicate (µg-at/ℓ)	NUTRIENTS Phosphate (µg-at/ℓ)	Nitrate (µg-at/ℓ)
*1	2.07	28.28	22.59	8.11	1.65	.57	.07
*5	2.07	28.22	22.55	8.12	1.65	.57	.18
10	2.14	28.62	22.85	8.49	1.45	.56	.11
20	1.21	30.58	24.48	9.66	.84	.64	.08
30	-0.72	32.49	26.11	9.18	1.43	.80	.52
50	-1.55	32.76	26.35	7.65	8.44	1.15	6.25
*100	-1.52	33.00	26.55	7.10	14.73	1.26	9.57
*200	-1.42	33.44	26.90	6.06	22.16	1.38	12.91
300	-1.35	33.55	26.99	5.45	28.61	1.52	14.40
380	-1.32	33.58	27.01	5.15	32.20	1.59	14.57

Station: MC1 Date: 82.09.18 LATITUDE: 69°31.9' LONGITUDE: 69°47.5' DEPTH: 329 M

					NUTRIENTS		
Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Dissolved Oxygen (ml/ℓ)	Silicate (μg-at/ℓ)	Phosphate (μg-at/ℓ)	Nitrate (μg-at/ℓ)
*1	0.88	30.70	24.59	9.01	2.01	.57	.28
*5	0.88	30.69	24.58	9.03	1.98	.58	.30
10	0.49	30.98	24.84	8.20	2.69	.61	.47
20	-0.44	32.18	25.85	7.51	6.59	.89	3.66
30	-1.11	32.66	26.26	7.25	10.15	1.16	7.29
50	-1.25	32.80	26.38	-	11.14	1.16	8.48
75	-1.29	32.91	26.47	7.23	12.55	1.24	9.23
100	-1.37	33.03	26.57	7.23	13.60	1.29	10.07
200	-1.37	33.44	26.90	5.84	21.90	1.52	13.86
318	-1.29	33.50	26.95	4.59	29.42	1.65	16.04

Station: MC3 Date: 82.09.19 LATITUDE: 69°31.4' LONGITUDE: 69°16' DEPTH: 440 M

					NUTRIENTS		
Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Dissolved Oxygen (ml/ℓ)	Silicate (μg-at/ℓ)	Phosphate (μg-at/ℓ)	Nitrate (μg-at/ℓ)
*1	-0.26	31.88	25.60	8.69	4.18	.86	2.11
5	-0.36	31.98	25.68	8.78	3.73	.80	1.95
10	-0.36	31.98	25.68	8.54	4.75	.86	2.67
20	-1.00	32.38	26.03	7.56	9.98	1.17	7.06
30	-1.40	32.76	26.35	7.39	10.78	1.20	7.76
50	-1.34	32.83	26.40	7.24	11.82	1.24	8.41
100	-1.44	33.03	26.57	7.03	14.27	1.27	9.53
200	-1.40	33.47	26.93	6.00	21.54	1.41	13.18
300	-1.33	33.47	26.93	5.45	25.19	1.43	14.20
435	-1.31	33.58	27.01	5.25	30.08	1.53	14.66

Station: MC4 Date: 82.09.19 LATITUDE: 69°34.7' LONGITUDE: 68°57' DEPTH: 530 M

					NUTRIENTS		
Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Dissolved Oxygen (ml/ℓ)	Silicate (μg-at/ℓ)	Phosphate (μg-at/ℓ)	Nitrate (μg-at/ℓ)
*1	-0.32	31.70	25.45	8.59	3.90	.76	1.82
*5	-0.35	31.72	25.48	8.54	4.61	.81	2.22
10	-0.52	31.90	25.63	8.52	4.78	.87	2.72
20	-0.99	32.38	26.03	-	5.96	.99	3.98
30	-1.31	32.68	26.28	6.86	5.56	.96	4.02
50	-1.49	32.81	26.39	7.36	7.65	1.01	5.33
100	-1.47	33.01	26.55	7.12	13.45	1.21	8.85
200	-1.40	33.46	26.92	5.96	19.82	1.27	12.77
400	-1.32	33.58	27.01	5.32	27.82	1.52	14.63
520	-1.31	33.58	27.01	5.10	31.74	1.53	14.98

Station: MC7 Date: 82.09.19 LATITUDE: 69°37.5' LONGITUDE: 68°16.0' DEPTH: 497 M

					NUTRIENTS		
Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Dissolved Oxygen (ml/ℓ)	Silicate (µg-at/ℓ)	Phosphate (µg-at/ℓ)	Nitrate (µg-at/ℓ)
*1	0.23	31.06	24.92	8.64	2.39	1.24	.47
*5	0.22	31.07	24.92	8.73	2.12	1.21	.52
*10	0.23	31.05	24.91	8.63	2.39	1.26	.60
20	0.14	31.20	25.03	8.77	2.58	.17	.71
30	-0.41	32.06	25.75	9.20	2.35	.76	.65
50	-1.40	32.73	26.33	7.88	5.77	1.07	4.28
100	-1.54	32.94	26.50	7.21	12.78	1.20	8.30
200	-1.41	33.44	26.90	6.08	20.81	1.38	12.81
400	-1.32	33.58	27.01	5.17	32.38	1.49	14.69
490	-1.31	33.58	27.01	5.02	35.79	1.65	14.82

Station: MC8 Date: 82.09.19 LATITUDE: 69°44.0' LONGITUDE: 67°44.0' DEPTH: 290 M

					NUTRIENTS		
Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Dissolved Oxygen (ml/ℓ)	Silicate (µg-at/ℓ)	Phosphate (µg-at/ℓ)	Nitrate (µg-at/ℓ)
*1	2.52	29.18	23.28	7.96	1.97	.52	0.00
5	2.50	29.17	23.27	7.98	2.09	.56	0.00
10	2.54	29.21	23.30	8.22	1.77	.54	0.00
20	1.98	29.93	23.92	9.14	1.32	1.49	.01
30	0.40	31.68	25.41	-	2.57	1.85	1.04
50	-1.27	32.71	26.30	8.25	6.41	.20	4.13
75	-1.50	32.88	26.45	7.38	10.08	2.18	6.92
100	-1.50	32.97	26.52	7.18	13.50	2.38	8.73
200	-1.37	33.48	26.94	6.29	21.89	2.58	12.66
287	-1.34	33.56	27.00	5.29	29.93	2.66	14.02

Station: IN8 Date: 82.09.19 LATITUDE: 70°23.13' LONGITUDE: 68°03.64' DEPTH: 338 M

					NUTRIENTS		
Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Dissolved Oxygen (ml/ℓ)	Silicate (µg-at/ℓ)	Phosphate (µg-at/ℓ)	Nitrate (µg-at/ℓ)
*1	2.54	30.79	24.56	7.80	1.04	.66	.12
5	2.54	30.84	24.60	7.80	.89	.61	.10
10	2.54	30.85	24.60	7.83	.99	.60	.15
20	2.57	30.94	24.68	7.81	.95	.67	.10
30	2.81	31.56	25.16	8.02	1.01	.72	.15
50	-0.08	32.50	26.09	8.60	6.52	1.00	3.08
100	-1.53	32.95	26.51	7.34	9.49	1.16	7.79
200	-1.47	33.37	26.85	6.91	16.69	1.24	11.04
300	-1.30	33.59	27.02	10.72	20.35	1.39	12.73
325	-1.29	33.61	27.03	6.20	20.17	1.39	12.79

Station: IN7 Date: 82.09.19 LATITUDE: 70°19.1' LONGITUDE: 68°19.2' DEPTH: 391 M

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Dissolved Oxygen (ml/ℓ)	Silicate (μg-at/ℓ)	NUTRIENTS Phosphate (μg-at/ℓ)	Nitrate (μg-at/ℓ)
*1	2.54	28.39	22.64	7.91	1.92	.62	.11
*5	2.54	28.39	22.65	7.89	1.98	.61	.08
10	2.62	28.95	23.09	7.89	1.87	.62	.08
20	2.56	30.30	24.16	7.74	1.60	.66	.09
30	2.75	30.65	24.43	8.19	1.84	.69	.17
50	0.58	32.31	25.91	8.61	6.22	.95	2.21
100	-1.51	32.94	26.50	7.16	11.53	1.16	8.72
200	-1.41	33.41	26.88	6.56	17.28	1.28	10.82
300	-1.27	33.63	27.05	5.96	16.20	1.25	11.39
380	-1.25	33.65	27.07	5.91	22.22	1.36	12.81

Station: IN6 Date: 82.09.20 LATITUDE: 70°03.8' LONGITUDE: 68°41.4' DEPTH: 267 M

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Dissolved Oxygen (ml/ℓ)	Silicate (μg-at/ℓ)	NUTRIENTS Phosphate (μg-at/ℓ)	Nitrate (μg-at/ℓ)
*1	2.64	27.84	22.20	7.99	.87	.46	.07
5	2.62	27.78	22.15	7.96	1.03	.51	.07
10	2.63	27.85	22.21	7.96	1.01	.52	.06
20	2.44	29.74	23.73	8.38	1.50	.64	.10
30	-0.14	32.19	25.84	9.04	2.84	.83	1.20
50	-1.29	32.79	26.37	7.65	8.75	1.16	6.07
75	-1.45	32.92	26.48	6.89	15.09	1.30	9.51
100	-1.49	33.02	26.56	6.58	17.22	1.34	10.27
200	-1.53	33.13	26.65	5.98	22.82	1.45	11.24
260	-1.54	33.13	26.65	6.04	23.39	1.56	11.07

Station: IN1 Date: 82.09.20 LATITUDE: 69°42.8' LONGITUDE: 69°43.5' DEPTH: 160 M

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Dissolved Oxygen (ml/ℓ)	Silicate (μg-at/ℓ)	NUTRIENTS Phosphate (μg-at/ℓ)	Nitrate (μg-at/ℓ)
*1	-0.81	32.64	26.24	9.02	1.06	.77	0.00
5	-0.68	32.61	26.21	8.63	1.97	.90	.18
10	-0.91	32.68	26.26	7.88	4.82	1.08	2.14
20	-1.09	32.76	26.34	7.08	7.44	1.21	7.72
30	-1.18	32.79	26.37	6.73	13.05	1.38	9.77
50	-1.28	32.86	26.43	6.67	14.97	1.33	9.64
75	-1.36	32.96	26.51	6.27	17.35	1.42	10.75
*100	-1.43	33.03	26.57	5.77	22.82	1.48	11.71
*125	-1.45	33.07	26.60	5.54	25.04	1.49	11.80
155	-1.49	33.11	26.64	5.42	27.83	1.47	11.93

Station: IN2 Date: 82.09.20 LATITUDE: 69°42.9' LONGITUDE: 69°54.0' DEPTH: 280 M

				Dissolved		NUTRIENTS	
Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Oxygen (ml/ℓ)	Silicate (µg-at/ℓ)	Phosphate (µg-at/ℓ)	Nitrate (µg-at/ℓ)
*1	1.48	30.20	24.16	8.82	1.02	.62	0.00
5	1.41	30.50	24.40	9.00	.89	.64	0.00
10	1.10	31.02	24.84	9.17	1.02	.68	0.00
20	0.70	31.52	25.26	9.11	1.29	.70	.07
30	0.36	31.86	25.56	9.09	2.11	.77	.24
50	-0.92	32.70	26.28	8.20	4.26	1.02	1.89
75	-1.15	32.78	26.36	6.88	11.52	1.54	9.30
100	-1.32	32.92	26.48	6.59	15.88	1.40	9.72
200	-1.50	33.13	26.65	5.56	26.75	1.49	11.20
270	-1.51	33.13	26.65	5.53	26.98	1.57	11.42

Station: IN3 Date: 82.09.20 LATITUDE: 69°48.8' LONGITUDE: 69°33.0' DEPTH: 557 M

				Dissolved		NUTRIENTS	
Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Oxygen (ml/ℓ)	Silicate (µg-at/ℓ)	Phosphate (µg-at/ℓ)	Nitrate (µg-at/ℓ)
*1	2.37	28.65	22.87	8.31	1.14	.60	.25
5	2.28	28.87	23.05	8.37	.92	.52	.23
*10	2.24	28.92	23.09	8.60	1.23	.52	.24
*20	2.06	29.34	23.44	8.66	.92	.59	.23
30	0.65	31.50	25.25	9.33	1.46	.73	.48
50	-1.26	32.78	26.36	7.49	-	-	-
100	-1.44	32.98	26.53	6.51	17.37	1.41	10.37
200	-1.51	33.13	26.65	5.79	25.59	1.54	11.69
400	-1.52	33.13	26.66	5.90	25.03	1.42	10.80
550	-1.52	33.14	26.66	6.18	28.89	1.43	10.85

Station: IN4 Date: 82.09.20 LATITUDE: 69°53.0' LONGITUDE: 69°17.3' DEPTH: 585 M

				Dissolved		NUTRIENTS	
Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Oxygen (ml/ℓ)	Silicate (µg-at/ℓ)	Phosphate (µg-at/ℓ)	Nitrate (µg-at/ℓ)
*1	2.61	27.74	22.13	8.07	1.09	.57	.23
5	2.57	27.81	22.18	8.06	1.11	.60	.14
10	2.57	28.23	22.52	8.74	1.07	.66	.16
20	1.52	30.28	24.23	8.76	1.04	.75	.40
30	-0.32	32.32	25.95	9.68	1.28	.89	.50
50	-1.31	32.80	26.38	6.93	13.56	1.50	9.09
100	-1.45	33.01	26.55	6.33	13.37	1.44	9.08
200	-1.51	33.13	26.65	5.68	17.07	1.41	8.42
400	-1.53	33.13	26.66	6.07	16.90	1.24	8.04
565	-1.52	33.14	26.67	5.85	28.60	1.40	10.67

Station: IN5 Date: 82.09.20 LATITUDE: 69°58.5' LONGITUDE: 69°02.0' DEPTH: 503 M

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m³)	Dissolved Oxygen (ml/ℓ)	Silicate (µg-at/ℓ)	NUTRIENTS Phosphate (µg-at/ℓ)	Nitrate (µg-at/ℓ)
*1	2.64	27.77	22.14	8.23	1.62	.59	.28
100	-1.48	33.03	26.57	6.70	12.71	1.28	7.85

Station: CL1 Date: 82.09.21 LATITUDE: 70°49.6' LONGITUDE: 72°37' DEPTH: 192 M

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m³)	Dissolved Oxygen (ml/ℓ)	Silicate (µg-at/ℓ)	NUTRIENTS Phosphate (µg-at/ℓ)	Nitrate (µg-at/ℓ)
*1	1.68	30.86	24.67	8.22	2.81	.74	.49
5	1.63	30.86	24.68	8.25	2.60	.75	.39
10	1.67	30.89	24.70	8.38	2.99	.77	.53
20	1.79	31.01	24.79	8.57	3.66	.83	.82
30	1.47	31.31	25.05	8.52	3.81	.82	.85
50	0.24	32.10	25.76	8.69	6.93	1.02	2.65
75	-1.05	32.65	26.25	8.38	9.46	1.11	4.85
100	-1.35	32.81	26.39	7.86	10.58	1.15	6.64
150	-1.44	32.97	26.52	7.45	11.03	1.14	7.47
180	-1.45	33.19	26.70	7.14	16.61	1.21	10.41

Station: CL2 Date: 82.09.21 LATITUDE: 70°50.0' LONGITUDE: 72°27.0' DEPTH: 234 M

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m³)	Dissolved Oxygen (ml/ℓ)	Silicate (µg-at/ℓ)	NUTRIENTS Phosphate (µg-at/ℓ)	Nitrate (µg-at/ℓ)
*1	1.79	30.33	24.25	8.19	2.35	.71	.30
5	1.80	30.80	24.62	8.20	2.55	.71	.40
10	1.79	30.83	24.65	8.44	2.56	.74	.36
20	1.79	31.11	24.87	8.36	3.38	.80	.60
30	1.29	31.48	25.21	8.51	4.42	.85	1.15
50	0.72	32.21	25.82	8.37	5.23	.93	2.21
75	-0.54	32.60	26.19	8.36	7.61	1.01	3.69
100	-1.17	32.76	26.35	7.99	10.47	1.13	5.77
200	-1.50	33.19	26.70	6.95	16.58	1.28	10.86
225	-1.38	33.36	26.83	6.66	18.03	1.30	11.40

Station: CL3 Date: 82.09.21 LATITUDE: 70°52.8' LONGITUDE: 72°15.7' DEPTH: 256 M

						NUTRIENTS	
Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Dissolved Oxygen (ml/ℓ)	Silicate (μg-at/ℓ)	Phosphate (μg-at/ℓ)	Nitrate (μg-at/ℓ)
*1	2.14	30.50	24.36	8.04	1.89	.65	.27
5	2.15	30.57	24.41	8.07	2.07	.67	.28
10	2.24	30.89	24.67	8.16	2.10	.69	.35
20	2.06	31.11	24.86	8.28	2.88	.74	.51
30	1.72	31.31	25.04	8.42	2.83	.72	.66
50	1.42	32.01	25.62	8.35	3.84	.82	1.49
75	-0.50	32.60	26.19	7.91	7.70	1.02	3.88
100	-1.23	32.75	26.34	7.99	11.38	1.09	6.15
200	-1.45	33.27	26.76	6.91	17.03	1.22	10.83
240	-1.36	33.39	26.86	6.65	14.20	1.18	9.20

Station: CL4 Date: 82.09.21 LATITUDE: 70°58.5' LONGITUDE: 72°07.3' DEPTH: 540 M

						NUTRIENTS	
Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Dissolved Oxygen (ml/ℓ)	Silicate (μg-at/ℓ)	Phosphate (μg-at/ℓ)	Nitrate (μg-at/ℓ)
*1	2.18	30.64	24.47	8.05	2.24	.66	0.00
5	2.10	30.57	24.41	8.07	2.22	.65	.22
10	2.15	30.67	24.49	8.19	2.41	.72	.40
20	1.97	31.85	25.45	8.31	2.21	.81	.84
30	1.30	32.21	25.79	8.46	3.47	.87	1.45
50	-0.07	32.48	26.08	8.33	7.96	1.05	3.56
100	-1.48	32.86	26.44	5.04	12.48	1.10	7.28
200	-1.59	33.19	26.71	4.85	15.60	1.22	9.93
400	.03	34.15	27.42	4.42	15.88	1.13	11.80
535	.29	34.17	27.42	5.35	23.08	1.20	15.84

Station: CL5 Date: 82.09.21 LATITUDE: 71°05.5' LONGITUDE: 71°53.0' DEPTH: 690 M

						NUTRIENTS	
Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)	Dissolved Oxygen (ml/ℓ)	Silicate (μg-at/ℓ)	Phosphate (μg-at/ℓ)	Nitrate (μg-at/ℓ)
*1	2.18	30.35	24.24	7.99	1.66	.66	.16
10	2.31	30.42	24.29	7.95	1.46	.63	0.00
20	2.55	30.58	24.39	7.93	1.32	.63	0.00
30	2.68	30.85	24.60	7.97	1.30	.64	0.00
50	1.73	32.04	25.62	8.40	2.72	.86	.86
100	-1.15	32.80	26.38	7.85	12.31	1.17	6.40
200	-1.58	33.22	26.73	7.14	15.60	1.20	10.12
400	-0.05	34.12	27.40	5.56	20.14	1.29	15.15
600	0.33	34.20	27.44	5.30	23.32	1.32	15.93
690	0.36	34.20	27.44	5.36	24.63	1.26	15.86

Station: Ti2S Date: 82.09.16 DEPTH: 52 M

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)
1	2.63	27.12	21.62
5	2.89	28.33	22.57
10	2.68	28.50	22.73
20	2.45	28.71	22.91
30	0.49	31.75	25.46
45	-0.18	32.43	26.04

Station: Ti3S Date: 82.09.16 DEPTH:

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)
1	2.71	28.36	22.61
5	2.73	28.36	22.61
10	2.72	28.41	22.65
20	2.25	28.91	23.08
30	0.66	31.51	25.26
50	-0.30	32.53	26.13
75	-1.38	32.90	26.47
89	-1.41	33.00	26.54

Station: It1S Date: 82.09.17 DEPTH: 30 M

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)
1	0.91	29.75	23.83
5	0.92	29.76	23.84
10	0.75	30.04	24.07
20	0.16	30.91	24.80
25	-0.02	31.31	25.13

Station: It2S Date: 82.09.17 DEPTH: 55 M

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)
1	0.89	29.72	23.81
5	0.88	29.74	23.82
10	0.75	30.03	24.06
20	0.08	31.02	24.89
30	-0.12	31.53	25.31
50	-0.87	32.59	26.19

Station: It3S Date: 82.09.17 DEPTH: 106 M

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)
1	0.88	29.59	23.70
5	0.89	29.60	23.71
10	0.79	29.97	24.02
20	0.15	30.93	24.81
30	-0.16	31.58	25.35
50	-0.69	32.52	26.13
75	-1.49	32.95	26.50
89	-1.44	33.12	26.64

Station: MC1S Date: 82.09.18 DEPTH: 25 M

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)
1	0.88	29.88	23.94
5	0.82	31.02	24.86
10	0.32	31.47	25.24
20	-0.39	32.10	25.78
21	-0.59	32.28	25.93

Station: MC2S Date: 82.09.18 DEPTH: 50 M

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)
1	0.89	29.43	23.57
5	0.79	31.01	24.85
10	0.28	31.46	25.24
20	-0.35	32.08	25.76
30	-1.01	32.66	26.25
45	-1.27	32.86	26.42

Station: MC3S Date: 82.09.18 DEPTH: 100 M

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)
1	0.81	30.87	24.73
5	0.80	30.89	24.75
10	0.27	31.43	25.21
20	-0.33	32.05	25.74
30	-1.03	32.66	26.26
50	-1.30	32.89	26.45
75	-1.38	33.03	26.57
95	-1.41	33.09	26.62

Station: IN1S Date: 82.09.20 DEPTH: 32 M

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)
1	-0.43	32.41	26.03
5	-0.73	32.63	26.22
10	-0.87	32.66	26.26
20	-1.12	32.73	26.31
28	-1.18	32.75	26.34

Station: IN2S Date: 82.09.20 DEPTH: 57 M

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)
1	-0.50	32.53	26.14
5	-0.66	32.62	26.21
10	-0.86	32.67	26.26
20	-1.10	32.72	26.31
30	-1.18	32.85	26.42
50	-1.28	32.93	26.49

Station: IN3S Date: 82.09.20 DEPTH: 101 M

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)
1	-0.19	32.32	25.95
5	-0.37	32.54	26.14
10	-0.83	32.67	26.26
20	-1.07	32.71	26.30
30	-1.20	32.84	26.41
50	-1.29	32.93	26.48
75	-1.38	33.02	26.56
95	-1.44	33.02	26.57

Station: IN4SA Date: 82.09.20 DEPTH: 55 M

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)
1	0.03	30.74	24.66
5	0.02	31.93	25.63
10	0.00	32.01	25.70
20	-0.23	32.23	25.88
30	-0.43	32.44	26.06
49	-1.22	32.83	26.40

Station: IN4SB1 Date: 82.09.20 DEPTH: 47 M

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)
1	0.12	31.34	25.15
5	0.03	32.00	25.69
10	-0.03	32.06	25.73
20	-0.25	32.22	25.88
30	-0.44	32.44	26.06
43	-1.15	32.79	26.37

Station: IN4SB2 Date: 82.09.20 DEPTH: 47 M

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)
1	0.12	31.91	25.60
5	0.03	32.00	25.68
10	-0.01	32.01	25.70
20	-0.01	32.00	25.68
30	-0.87	32.73	26.31
46	-1.19	32.80	26.38

Station: IN5S Date: 82.09.20 DEPTH: 140 M

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)
1	1.22	30.42	24.35
5	1.05	30.98	24.81
10	0.85	31.21	25.01
20	0.65	31.46	25.22
30	0.55	31.67	25.39
50	-0.62	32.58	26.18
75	-0.92	32.69	26.28
100	-1.26	32.84	26.41
120	-1.33	32.91	26.47

Station: IN6S1 Date: 82.09.20 DEPTH: 380 M

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)
1	2.08	28.89	23.08
5	2.01	29.23	23.35
10	1.91	29.44	23.52
20	1.52	30.09	24.07
30	0.61	31.58	25.31
50	-1.27	32.75	26.34
75	-1.43	32.86	26.43
100	-1.47	32.93	26.49
131	-1.52	33.04	26.58

Station: IN6S2 Date: 82.09.20 DEPTH: 380 M

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)
1	2.06	28.91	23.09
5	1.98	29.31	23.42
10	1.90	29.44	23.53
20	1.55	30.04	24.03
30	0.57	31.63	25.36
50	-1.26	32.73	26.33
75	-1.42	32.85	26.42
100	-1.47	32.92	26.48
125	-1.51	33.02	26.56

Station: IN7S Date: 82.09.20 DEPTH: 560 M

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)
1	2.37	28.15	22.47
5	2.38	28.19	22.50
10	2.19	28.72	22.93
20	1.71	29.77	23.80
30	0.31	31.77	25.48
50	-1.25	32.71	26.31
75	-1.50	32.88	26.45
100	-1.49	32.95	26.51
130	-1.52	33.00	26.55

Station: CL1S Date: 82.09.21 DEPTH: 31 M

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)
1	1.51	30.47	24.38
5	1.57	30.77	24.61
10	1.62	30.81	24.64
20	1.64	30.86	24.68
25	1.62	30.90	24.72

Station: CL2S Date: 82.09.21 DEPTH: 50 M

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)
1	1.50	30.76	24.61
5	1.56	30.79	24.63
10	1.62	30.82	24.65
20	1.64	30.89	24.70
30	1.33	31.25	25.01
45	-0.39	32.30	25.95

Station: CL3S Date: 82.09.21 DEPTH: 76 M

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)
1	1.50	30.69	24.56
5	1.55	30.80	24.63
10	1.57	30.81	24.64
20	1.62	30.84	24.67
30	1.35	31.21	24.98
50	-0.47	32.31	25.96
70	-0.87	32.49	26.12

Station: CL4S Date: 82.09.21 DEPTH: 115 M

Depth (m)	Temperature (°C)	Salinity (ppt)	Sigma-θ (kg/m^3)
1	1.56	30.77	24.61
5	1.56	30.77	24.61
10	1.69	30.81	24.64
20	1.62	30.88	24.70
30	1.41	31.19	24.96
50	-0.47	32.38	26.01
75	-1.18	32.63	26.24
100	-1.32	32.72	26.32
110	-1.48	32.88	26.45

Here, I report on the zooplankton data from the first phase of SAFE. The zooplankton sampling programme was designed primarily to obtain data on the large-scale distribution and abundance of zooplankton within the Baffin Island fjords. Samples were collected from all fjords visited and, in particular, an attempt was made to sample any basins isolated by shallow sills. Samples were taken with a standard ring net hauled vertically from near bottom to surface. They were preserved in buffered formalin, and were pre-processed by screening through a 63 μm sieve. Material passing through this seive was analysed for diatoms (P. Mudie), retained material was re-suspended and analysed for zooplankton.

All samples have been examined, but not exhaustively sorted, for dominant zooplankton species, gross differences in community composition, and general diversity. Smaller species have not yet been adequately sorted and will be considered more fully in a later report. Data have been obtained for 23 taxa, including 12 species (Table 1). Data for selected taxa are summarized in Table 2. Since these data are not quantitative, care should be taken in comparing fjords. A further data report will include information on all taxa, particularly those smaller copepods which have not been examined in detail at this date.

Table 1: Taxa identified in the preliminary examination of zooplankton samples collected on Hudson 82-031.

COPEPODS:

Calanus hyperboreus Krøyer, 1838
Chiridius gracilis Farran, 1908
Heterorhabdus norvegicus (Boeck, 1872)
Euchaeta sp.
Oithona sp.

CHAETOGNATHS:

Sagitta elegans Verrill, 1873
S. maxima (Conant, 1896)
Eukrohnia hamata (Möbius, 1875)

AMPHIPODS:

Parathemisto libellula (Lichtenstein, 1822)
P. abyssorum Boeck, 1870
Unidentified species 'A'
Unidentified species 'B'

EUPHAUSIIDS:

Thysanöessa inermis (Krøyer, 1846)

MEDUSAE:

Aeginopsis sp.
Aglantha digitale (O.F. Müller, 1776)
Eumedusa sp.

PTEROPODS:

Clione limacina (Phipps, 1773)
Limacina helicina (Phipps, 1774)

OTHERS:
Larvaceans
Mysids
Polychaete larvae (Syllidae)
Siphonophores (including *Dimophyes arctica* (Chun, 1897) as the dominant)
Ostracods

Table 2: Distribution and index of abundance for selected species collected from Baffin Island fjords in September 1982. Abundance indices refer to abundance within the sample, and are only a very rough indication of abundance in the field. [x = not recorded; r = rare (0-10); c = common (11-25); a = abundant (25+)].

Fjord Species	Sunneshine	Coronation	Maktak	North Pang.	Tingin	Iterbilung	McBeth	Inugsuin	Clark	Cambridge
Calanus hyperboreus	c	r	a	c	r	c	a	x	a	a
Chiridius gracilis	x	x	x	r	r	x	r	r	r	x
Euchaeta sp.	r	r	r	r	r	r	r	x	c	r
Sagitta elegans	r	r	c	c	r	c	a	c	c	r
Eukrohnia hamata	r	r	r	c	x	r	c	r	a	a
Parathemisto libellula	r	x	x	x	r	r	r	a	r	a
P. abyssorum	r	c	r	r	x	r	r	r	x	x
Thysanöessa inermis	r	x	x	x	x	r	r	x	x	x

Cs-137 and Sr-90 in the Water of the Baffin Island Fjords

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OBJECTIVES:

To determine Cs-137 and Sr-90 levels in the Arctic fjords for comparison with levels in Baffin Bay and with levels in the Saguenay Fjord, where nuclear fallout deposition and anthropogenic inputs are greater.

To determine the suitability of any of the fjords sampled to identify and study processes which control Cs-137 behavior in water column in the absence of large anthropogenic and organic matter influences. Important parameters include the size and morphology of the drainage basins and such processes as desorption and adsorption of Cs-137 from suspended particulate matter and sediment.

To relate the distribution of Cs-137 in the water column and the suspended particulate matter to the Cs-137 distribution in the sediment.

FIELD AND LABORATORY METHODS:

Water samples were collected for radionuclide analysis at the head of seven of the ten fjords visited (Sunneshine, Coronation, Maktak, Iterbilung, McBeth, Inugsuin and Cambridge Fjords). In addition, surface water samples were collected from three lakes at Cambridge Fjord in order to characterize the freshwater input to Cambridge Fjord.

Sixty litre water samples were collected using a rosette sampler for subsurface samples and the ship's pumping system for surface samples. Subsamples were taken for salinity analysis. Water samples were pumped through a Whatman-in-line filter (0.3 µm pore size), to collect suspended particulate matter (SPM) and a column containing 5 g of potassium cobalt ferrocyanide (KCFC), resin to collect Cs-137. Twenty litres of the filtrate were retained for later analysis of Sr-90.

In the laboratory, the filter samples were dried and weighed, and the SPM concentrations calculated. The KCFC resin was analysed for Cs-137 using a 5 inch x 5 inch NaI gamma detector for a counting period of 48 hours. For the given counting conditions, the Cs-137 counting efficiency was 26% and the detection limit was 0.8 mBq/l. The procedure used for the Sr-90 analysis is described in Bishop *et al.* (1981).

Filters will be analysed for gamma-emitting radionuclides (in particular for Cs-137) using a hyperpure germanium detector, which is interfaced with a PDP-11-04 computer for automatic spectrum analysis.

RESULTS:

The results for salinity, suspended particulate matter and soluble Cs-137 are activities listed in Table 1. Results for Cs-137 in suspended matter and Sr-90 activities will be reported later.

Soluble Cs-137 activities measured in the fjords exhibit a wide range of values (1.58 to 6.90 mBq/l) with an average value of 3.64 mBq/l. Highest activities were measured in McBeth and Iterbilung Fjords. The highest value was measured in surface water at Station Mc2, located at the mouth of McBeth Fjord. Profiles at the heads of the fjords are generally characterized by low activities in low salinity surface water and higher activities in deeper water. Inugsuin Fjord is the exception to this pattern, where Cs-137 activities are generally constant with depth. This may be explained by the high surface salinity suggesting minimum fresh water input at IN2 at the time of sampling. Samples collected in the lakes at Cambridge Fjord have levels of Cs-137 below the detection limit.

Although the average value of Cs-137 activity measured in the Baffin Island Fjords is virtually the same as that measured in the Saguenay Fjord (3.67 mBq/l) in 1981, there are major differences in the water column distributions. In the Saguenay Fjord, activities in the surface, low salinity water are generally higher than the subsurface water, whereas in the Baffin Island Fjords, the surface water activities are generally lower. A positive correlation (r=.7) between salinity and Cs-137 in surface water of the fjords suggests that, in all the fjords, the fresh water is not a major source of Cs-137 in the water column. The low activities of Cs-137 (<0.1 mBq/1) in the lakes at Cambridge Fjord further substantiate this.

The main source of Cs-137 in the water column appears to be Baffin Bay. Activities of Cs-137 measured in subsurface samples agree well with those measured in the surface water (0 to 400 m) of Baffin Bay (Bowen *et al.*, 1974). Bowen measured a range of up to 6.4 mBq/1 at surface down to 2.3 mBq/1 at 370 m. The profile measured at Mc2 agrees well with Baffin Bay profiles, while at the head of the fjords, the subsurface levels are typical of levels found at 200 m in Baffin Bay. Decreased levels of Cs-137 in surface samples of the fjords are presumably a result of mixing of fresh water, low in Cs-137, with Baffin Bay water.

There was no correlation found between suspended particulate matter concentration and Cs-137. Thus, the Baffin Island Fjords are not a suitable area to study the processes of Cs-137 desorption from particles.

FUTURE RESULTS:

Over the next few months, the Sr-90 analyses will be performed and Cs-137/Sr-90 ratios determined in water samples. This ratio will be compared with the fallout ratio (1.45) to determine whether Cs-137 is removed from the water column relative to Sr-90. Suspended particulate matter analysis of Cs-137 will be completed and the Cs-137 distribution between soluble and particulate phases will be determined. No further sampling of the water column will be undertaken in the Baffin Island Fjords as the results from the initial survey do not clearly point to any areas of active Cs-137 desorption from suspended particulate matter or sediment or indicate that the fresh water is a major source of Cs-137 in the fjords.

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TABLE 1 BAFFIN FJORD SAMPLES - SALINITY, Cs-137, SPM

STATION #	SAMPLE #	DEPTH (m)	SALINITY (ppt)	Cs-137(sol) (mBq/l ± 2sigma)	SPM (mg/l)
Su-1	82-04814	180	33.743	3.58 ± 0.27	7.15
	82-04815	100	32.872	4.12 ±0.32	0.728
	82-04816	50	32.370	3.53 ± 0.47	0.869
	82-04817	1	29.879	-	0.863
Co-2	82-03159	224	33.557	2.23 ±0.20	1.40
	82-03160	100	33.056	3.05 ± 0.27	1.24
	82-03161	50	32.831	3.68 ± 0.32	0.901
	82-03162	1	27.621	2.25 ± 0.28	0.969
Ma-2	82-03230	225	33.624	2.47 ± 0.30	1.16
	82-03231	100	33.099	3.40 ± 0.30	0.598
	82-03232	50	32.831	3.03 ± 0.30	0.783
	82-03233	1	26.992	1.58 ± 0.37	0.622
It-1	82-04907	150	33.229	4.20 ± 0.52	1.10
	82-04908	100	32.995	4.60 ± 0.48	0.588
	82-04909	50	32.256	4.55 ± 0.55	5.32
	82-04910	1	29.272	3.78 ± 0.38	1.01
Mc-1	82-04412	313	33.517	4.05 ± 0.50	0.875
	82-04413	100	33.023	4.06 ± 0.45	0.698
	82-04414	50	32.808	4.70 ± 0.47	1.74
	82-04415	1	31.004	4.23 ± 0.40	0.696
Mc-2	82-04416	420	33.573	4.18 ± 0.28	1.08
	82-04417	1	31.341	6.90 ± 0.32	0.615
In-2	82-04429	148	33.092	3.25 ± 0.33	0.601
	82-04430	100	32.820	3.78 ± 0.28	0.785
	82-04431	50	32.620	3.40 ± 0.33	0.470
	82-04432	1	32.186	3.53 ± 0.43	0.681
Ca-1	82-04469	190	33.377	3.32 ± 0.35	0.780
	82-04487	100	32.695	3.58 ± 0.40	0.467
	82-04488	50	31.772	4.10 ± 0.48	0.580
	82-04489	1	30.063	2.53 ± 0.36	0.676
Ca (WEY 615)	82-04714	1		<1.02	
Ca (WEY 616)	82-04715	1		<0.83	
Ca (WEY 617)	82-04716	1		<0.80	

SAFE: 1982 SUSPENDED PARTICULATE MATTER DATA

by

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CRUISE OBJECTIVE

To determine the primary properties of suspended sediment found during the Autumn season of Baffin Island Fjords, so as to aid in the interpretation of water movement and particle dynamics.

METHOD

Water was collected with 5-L Niskin^{R} water samples triggered closed at depth with a B.I.O. CTD-rossette configuration. Two 1-L samples were subsampled from the sampler bottom using a funnel into Nalgene^{R} bottles (Note: the spigot was not used). The first one litre sample of a given water depth was suction filtered through preweighed Nucleopore^{R} 47mm diameter 0.45 μm nominal pore diameter filters. The second one litre sample (when taken) was similarily suction filtered through Selas Flotronic^{R} Ag-filters of 47mm diameter and 0.45 μm nominal pore diameter. Only 250 or 1/3 of the water samples were filtered onto the expensive Ag-filters. In all cases, distilled water was washed through the final filtration stage to remove any sea-salt precipitation onto the filters. Filters were oven dried in individual petri dishes on the ship at temperatures of 40°C for 12 to 15 hours.

In addition to the water samples, a multiparameter CTD was used with its attached 'Larsen meter' light attenuance meter (Larsen, 1974). The meter was used with a wavelength of 680mm (red) during descent and 475mm (bl-gr) during instrument ascent. An Oregan Red^{R} beam attenuance meter (=660mm) was hand lowered from the side of the ship to a depth of 30 metres. All attenuance measurements are corrected for light attenuance by water.

In the lab, the Nucleopore filters were reweighed (± 0.005mg) and the total suspended concentration determined. Half of each Nucleopore filter is sonified in a sodium hexametaphosphate solution (40g.L^{-1}) and analyzed on a computerized Coulter Counter model TAII^{R} with two aperatures (30 μm and 200 μm) and subsequently overlapped. This gives a particle resolution of 0.63 μm to 80 μm nominal volume diameters. Appropriate moment measure statistics of the size frequency distribution are produced from an Apple IIe^{R} microcomputer. The remaining Nucleopore filter halves are stored as an archive specimen to be used only for non-destructive observation of filtrate optical microscopic properties (for diatom work see chapter 14, for dinoflagellate work see chapter 20) such as plankton abundance, presence of fecal pellets, floccules, clumps and discription of the mineral fraction.

The Ag-filters were divided into a 50% fraction for CHN elemental analysis, a 25% fraction for Energy-dispersive X-ray Elemental Analysis and Scanning Electron Miscoscopic observation, and the remaining 25% fraction is used in the X-ray Diffraction (XRD) analysis of the mineral composition.

CHN sample filters were analyzed on a Perkin-Elmer model 240B elemental analyzer equipped with a Perkin-Elmer AD-27 autobalance interfaced with a Tektronix model 31 programmable calculator. Detector sensitivites are as follows: 1) for carbon, 20±5μV/μg; 2) for hydrogen, 60±16μV/μg; and 3) for nitrogen, 7±2μV/μg. Filters were cut in half with a scalpel and folded with forceps for insertion in the sample ladle before before combustion. Results were determined as total weight (in micrograms) of N, C, and H, for each sample. A sample calculation:

$$\text{element signal } (\mu V) - \text{blank value}(\mu V) - \text{instrument zero}(\mu V)$$

$$= \text{Total signal of element in } \mu V$$

$$\text{Element sample weight} = \frac{\text{Total signal } (\mu V)}{\text{Sensitivity } K(\mu V/\mu g)}$$

where the Sensitivity K(μV/μg) is determined for each element using a reference standard (usually acetanilide). The maximum deviation from average of sensitivity factors for an accuracy of ±0.3% absolute is ±0.20μV/μg for N; ±0.085 μV/μg for C and ±2.70 μV/μg for H. These results can therefore be related directly to the volume of seawater filtered. It can be seen from Table 5-1 that some values of Nitrogen fall close to the detection limits.

The XRD filter piece was mounted with nail polish for semi-quantitative mineral analysis of majors according to the procedures outlined in Syvitski and Bayliss (1980). The peak area of identifying mineral "marker" reflections were digitized and normalized to the total peak area of other marker reflections. Unfortunately no Lorentz polarization correction was yet undertaken. The category "other" given in Table 5-4 is usually composed of unidentified peaks or traces of tourmaline, pyroxeue, siderite, magnetite and other heavy minerals. Many of the filters had too little material for peak area analysis and are indicated as NES (not enough sample).

No EDEX-SEM work was undertaken at the time of writing this report.

Suspended sediment concentrations were derived from light attenuance data use gravimetric calibration (for details see Winters & Buckley, 1980).

TO FOLLOW

Many samples remained to be analyzed in terms of mineralogy (XRD) and grain size distribution (Coulter Counter). We will complete the EDEX-SEM work within the next year.

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TABLE 5-1 Concentration and Elemental Composition of Suspended Particulate Matter

Station-Depth	(m)	Concentration (mg L^{-1})	N	C (ug L^{-1})	H	atomic C/N
SU-1	1	0.740	36.08	177.36	22.68	5.7
	5	0.803	42.16	259.66	34.12	7.2
	10	0.808	24.68	139.92	18.20	6.7
	20	0.668	36.84	190.10	25.20	6.0
	30	1.611	33.80	229.86	30.86	7.9
	50	0.485	42.16	188.32	24.66	5.2
	75	0.431	32.02	131.02	16.98	4.1
	100	0.596	30.00	0.0	19.34	-
	150	0.742	25.44	182.10	24.06	8.3
	200	1.286	47.48	232.74	30.74	5.7
SU-5	1	1.872	55.86	165.76	23.54	3.4
	5	1.424	55.10	236.08	30.96	5.0
	10	1.169	48.00	171.32	24.84	4.2
	20	0.521	56.86	251.78	38.70	5.2
	30	1.115	18.06	134.12	14.04	8.7
	50	0.728	5.90	94.74	11.22	18.7
	75	0.791	6.40	112.74	13.98	20.5
	100	1.609	7.92	114.48	14.12	16.8
	150	2.372	5.90	163.32	24.16	32.2
SU-6	1	1.573	7.42	166.08	29.34	26.1
	5	1.578	34.76	337.52	55.52	11.3
	10	1.664	17.04	178.02	25.76	12.2
	20	0.731	24.14	226.42	30.32	10.9
	30	0.421	55.78	516.40	71.24	10.7
	50	0.705	0.0	83.26	11.34	-
	75	0.609	8.94	167.92	24.16	21.8
	100	2.851	1.60	135.22	22.86	98.2
	150	1.589	48.24	65.06	10.20	1.6
SU-7	1	1.002	30.06	161.10	22.14	6.2
	5	0.726	22.08	146.34	19.84	7.7
	10	0.853	27.22	164.00	22.38	7.1
	20	0.821	37.28	280.20	39.28	8.7
	30	0.549	61.24	361.10	48.20	6.9
	50	0.966	21.86	204.28	25.76	10.9
	57	0.814	1.60	80.78	14.20	58.7
SU-8	1	1.277	36.76	218.08	30.30	6.9
	5	1.068	26.98	168.20	24.22	7.2
	10	1.113	40.14	209.18	27.48	6.1
	20	0.584	23.66	174.70	23.32	8.6
	30	0.440	18.34	113.52	14.62	7.2
	50	0.662	17.30	233.48	36.52	15.7
	75	0.244	13.82	107.94	14.52	9.1
	100	0.608	29.30	164.28	23.72	6.5
	150	0.793	36.00	208.36	28.38	6.8
	155	0.611	16.92	127.20	17.30	8.7

TABLE 5-1 Con'd

Station-Depth (m)		Concentration (mg L^{-1})	N	C (ug L^{-1})	H	atomic C/N
CO-1	1	1.874	83.34	334.56	48.78	4.6
	5	2.862	96.56	160.16	28.40	1.9
	10	1.427	48.90	221.38	37.22	5.3
	20	1.907	25.42	154.84	21.82	7.1
	30	0.977	16.40	120.94	17.90	8.6
	50	1.179	5.58	56.48	8.24	11.8
	75	1.472	3.78	46.38	7.02	14.2
	92	1.557	32.90	202.68	31.42	7.2
CO-2	1	0.560	86.94	104.30	16.48	1.4
	5	1.840	82.64	116.54	19.20	1.6
	10	1.587	76.08	128.96	23.70	2.0
	20	1.007	10.24	88.12	11.30	10.0
	30	0.996	13.54	107.46	12.88	9.2
	50	0.839	13.80	75.00	9.56	6.4
	75	0.766	16.58	150.48	19.78	10.6
	100	0.877	25.22	124.30	16.64	5.7
	200	1.349	30.80	107.28	18.26	4.1
	225	1.669	41.98	186.56	28.64	5.2
CO-3	1	0.716	88.80	126.12	18.60	1.6
	5	1.228	82.84	58.12	11.80	0.8
	20	0.796	109.26	91.34	14.92	1.0
	30	0.678	83.88	101.38	18.42	1.4
	50	0.488	112.62	99.38	16.94	1.1
	75	0.516	83.10	63.90	15.02	1.0
	100	0.380	24.02	119.70	21.94	5.8
	150	0.654	69.88	127.92	25.32	2.2
	200	0.354	62.18	43.10	10.32	0.8
	250	0.642	79.36	36.40	11.62	0.5
CO-4	1	0.826	90.72	159.32	18.70	2.0
	5	1.414	103.36	155.88	21.34	1.8
	10	1.590	72.04	164.04	24.16	2.7
	20	2.304	29.98	142.46	34.96	5.6
	30	0.503	71.96	161.78	24.92	2.6
	50	0.494	66.26	104.18	17.20	1.8
	100	0.570	41.90	118.26	19.30	3.3
	200	0.630	35.16	95.50	16.96	3.1
	300	0.529	63.14	121.42	20.00	2.2
	352	0.529	73.00	72.56	11.46	1.2
CO-5	1	0.834	25.64	163.70	22.08	7.5
	5	0.914	21.86	120.84	17.86	6.4
	10	1.631	37.30	209.92	28.50	6.5
	20	1.060	41.52	251.40	34.64	7.1
	30	2.504	62.94	170.38	23.30	3.1
	50	4.802	84.66	46.64	7.08	0.7
	100	0.690	23.18	56.36	6.60	2.9
	200	2.489	22.40	103.62	13.90	5.4
	400	1.318	10.78	73.24	10.26	7.9
	497	1.688	20.86	144.88	19.24	8.1

TABLE 5-1 Con'd

Station-Depth	(m)	Concentration (mg L^{-1})	N	C (ug L^{-1})	H	atomic C/N
MA-5	1	1.546	72.04	124.60	19.70	2.0
	5	2.053	71.28	92.96	11.68	1.5
	10	1.258	86.44	123.52	16.46	1.6
	20	0.844	61.18	101.76	14.98	1.9
	30	0.579	76.08	101.40	16.46	1.5
	50	0.732	75.06	61.32	10.32	1.0
	100	1.689	36.44	116.08	17.64	3.7
	200	0.532	60.16	131.58	20.56	2.6
	400	1.646	17.74	90.16	16.58	6.0
	576	0.784	86.18	147.08	21.72	2.0
MC-1	1	1.392	11.06	96.02	12.16	10.0
	5	0.879	15.66	106.98	12.72	8.0
	10	0.935	23.98	103.16	24.98	5.0
	20	0.942	-	131.68	21.72	-
	30	0.650	21.94	107.08	19.06	5.7
	50	0.514	14.64	41.08	6.48	3.3
	75	0.757	14.64	54.86	7.92	4.3
	100	0.727	16.72	54.58	8.48	3.8
	200	1.244	18.00	94.52	16.32	6.1
	312	1.558	19.82	90.58	14.22	5.3
MC-3	1	1.220	19.98	61.48	7.14	35.5
	5	0.396	30.68	182.66	23.14	6.9
	10	1.141	25.84	106.42	15.08	4.8
	20	4.027	23.24	86.88	11.56	4.3
	30	0.516	33.88	142.14	22.28	4.9
	50	0.894	15.70	90.04	11.70	6.7
	100	1.220	13.68	43.52	7.08	3.7
	200	0.656	17.46	60.52	12.04	4.1
	300	0.929	8.26	85.44	12.76	12.1
	435	2.988	1.12	39.86	4.72	41.1
MC-4	1	0.561	26.40	52.24	4.82	2.3
	5	1.419	19.82	43.16	6.02	2.6
	10	0.835	13.36	61.86	8.46	5.4
	20	0.763	15.14	80.28	11.34	6.1
	30	1.263	12.84	95.10	12.64	8.6
	50	0.705	7.76	109.26	10.02	16.4
	100	0.685	6.98	59.10	7.38	9.9
	200	0.420	6.74	56.70	7.20	9.8
	400	0.422	3.42	49.80	5.34	17.0
	520	1.077	6.48	74.20	9.46	13.3

TABLE 5-1 Con'd

Station-Depth (m)		Concentration (mg L^{-1})	N	C (ug L^{-1})	H	atomic C/N
MC-6	1	0.734	33.52	184.36	24.00	6.4
	5	1.352	22.40	99.86	16.78	5.2
	10	0.632	36.46	214.70	27.58	6.8
	20	0.541	27.14	136.96	16.98	5.8
	30	0.741	21.44	88.38	11.02	4.8
	50	0.417	21.18	93.18	11.58	5.2
	100	0.384	22.62	117.58	13.30	6.1
	200	0.428	92.74	117.16	20.30	1.5
	300	1.780	67.20	122.54	18.84	2.2
	380	0.989	40.54	74.40	13.64	2.2
MC-7	1	0.905	80.70	101.28	13.06	1.5
	5	0.948	57.62	76.30	9.26	1.5
	10	1.324	68.02	95.52	13.14	1.6
	20	1.206	62.20	178.38	29.16	3.4
	30	1.404	43.68	136.86	19.76	3.7
	50	0.637	9.46	81.04	10.10	9.9
	100	0.502	50.28	60.32	6.54	1.4
	200	0.620	10.48	44.72	5.26	5.0
	400	0.519	5.16	42.02	5.70	9.5
	490	0.783	12.00	59.94	8.08	5.8
MC-8	1	1.167	31.82	106.80	14.12	3.9
	5	0.614	16.12	101.00	14.18	7.3
	10	0.953	31.56	128.34	20.16	4.8
	20	0.719	77.64	211.30	29.96	3.1
	30	0.910	53.18	189.12	26.86	4.1
	50	0.954	6.60	54.50	8.26	9.6
	75	0.550	39.28	60.30	10.20	1.8
	100	1.381	96.94	29.72	5.84	0.4
	200	0.315	101.84	95.92	18.92	1.1
	287	1.090	80.18	108.06	13.78	1.6
IN-1	1	1.753	160.44	163.72	24.28	1.2
	5	1.261	36.40	169.38	25.92	5.4
	10	1.126	37.88	254.32	39.88	7.9
	20	1.364	58.68	354.10	53.46	7.1
	30	0.777	23.00	140.18	24.72	7.1
	50	0.454	21.10	66.34	10.98	3.7
	75	0.659	13.18	76.06	12.48	6.7
	100	0.800	-	47.32	9.50	-
	125	0.411	-	63.06	11.82	-
	155	0.534	-	28.70	9.96	-

TABLE 5-1 Con'd

Station-Depth (m)		Concentration (mg L^{-1})	N	C (ug L^{-1})	H	atomic C/N
IN-2	1	1.156	17.44	161.10	25.46	10.7
	5	0.917	32.00	171.80	26.16	6.2
	10	0.767	39.14	304.92	45.10	9.1
	20	1.449	22.06	180.54	27.26	9.5
	30	0.813	53.68	88.79	30.94	1.9
	50	1.081	85.76	227.68	31.70	3.1
	75	0.876	237.68	212.72	26.24	1.1
	100	0.538	141.02	49.14	6.14	0.4
	200	0.313	38.20	42.02	4.76	1.2
	270	0.408	6.58	147.70	17.86	26.1
IN-3	1	0.629	26.84	132.34	21.28	5.7
	5	0.638	73.46	141.38	18.00	2.2
	10	0.797	135.40	559.52	82.38	4.8
	20	0.930	39.86	154.96	27.28	4.5
	30	1.012	42.92	207.20	32.02	5.6
	50	0.811	46.22	135.12	20.98	3.4
	100	0.230	33.24	76.10	12.40	2.7
	200	0.188	13.86	29.36	3.72	2.4
	400	0.345	18.20	30.48	5.94	1.9
	550	0.579	-	68.08	13.58	-
IN-4	1	0.422	10.68	116.82	18.96	12.8
	5	0.493	9.40	116.92	18.98	14.5
	10	0.904	9.90	117.94	25.48	13.8
	20	1.000	24.68	127.48	18.40	6.0
	30	0.741	42.42	196.52	25.16	5.4
	50	0.420	10.68	58.82	10.72	6.4
	100	0.203	4.00	56.38	10.94	16.4
	200	0.408	0.66	60.58	11.16	106.8
	400	0.046	9.90	53.30	10.46	6.2
	560	1.076	10.68	87.22	17.60	9.5
IN-5	1	0.508	37.06	124.10	20.44	3.9
	100	0.776	2.72	44.14	8.42	18.9
IN-6	1	0.867	34.08	100.70	17.68	3.4
	5	2.062	56.08	109.80	17.26	2.3
	10	1.021	59.70	139.64	22.64	2.7
	20	1.089	48.06	147.26	24.20	3.5
	30	1.002	46.24	226.82	38.46	5.7
	50	0.637	50.30	104.00	15.86	2.4
	75	0.535	27.82	54.84	10.48	2.3
	100	0.233	37.38	85.68	13.80	2.7
	200	0.739	50.06	72.70	11.96	1.8
	260	0.370	57.02	125.50	18.60	2.6

TABLE 5-1 Con'd

Station-Depth		Concentration	N	C	H	atomic C/N
	(m)	(mg L^{-1})		(ug L^{-1})		
IN-7	1	8.440	98.12	263.54	37.18	3.1
	5	3.586	101.22	174.38	22.24	2.0
	10	6.089	44.10	97.18	16.66	2.6
	20	2.181	52.12	73.72	10.88	1.6
	30	1.154	60.64	102.78	13.86	1.9
	50	0.708	92.42	122.88	16.66	1.5
	100	0.619	61.94	88.30	14.46	1.6
	200	0.501	122.92	86.34	17.90	0.8
	300	0.781	62.54	149.70	24.66	2.7
	378	1.123	42.40	129.60	22.82	3.5
IN-8	1	0.842	111.24	199.00	34.60	2.0
	5	0.960	13.34	141.40	27.70	12.6
	10	0.925	76.86	238.92	38.94	3.5
	20	1.287	38.52	198.50	31.20	6.1
	30	0.677	99.78	155.78	20.76	1.8
	50	0.563	56.78	181.74	27.34	3.7
	100	0.315	58.84	76.50	12.96	1.5
	200	0.509	74.54	112.60	22.16	1.8
	300	0.781	63.48	315.08	62.64	5.8
	325	0.822	34.14	207.80	37.66	7.1
CA-1	1	0.433	24.82	112.22	14.16	5.3
	5	0.740	21.52	111.40	14.20	6.0
	10	0.961	28.40	136.36	17.02	5.6
	20	0.653	32.72	138.84	15.96	4.9
	30	0.709	29.92	112.88	14.66	4.3
	50	0.846	37.56	143.44	19.94	4.5
	75	0.597	42.40	175.86	20.88	4.9
	100	0.596	4.96	76.68	9.46	18.0
	150	0.476	26.60	69.86	9.98	3.1
	185	0.684	21.52	55.50	9.64	3.0

TABLE 5-2 Suspended Sediment Concentration for Remainder of Stations not given in Table 5-1

MA-1

Depth (m)	Concentration (mg L^{-1})
1	1.711
5	0.711
10	1.065
20	0.821
30	0.824
50	1.212
75	1.378

MA-2

Depth (m)	Concentration (mg L^{-1})
1	0.930
5	0.754
10	1.970
20	0.839
30	0.941
50	0.856
75	0.728
100	0.392
200	0.710
254	1.704

MA-4

Depth (m)	Concentration (mg L^{-1})
1	1.151
5	0.670
10	1.353
20	0.298
30	0.452
50	0.314
100	0.893
200	0.672
300	0.627
320	0.908

MA-6A

Depth (m)	Concentration (mg L^{-1})
1	1.801
10	1.714
20	0.713
30	2.207
50	2.402
100	0.690
200	1.020
400	1.087
600	0.969
640	0.617

MA-7

Depth (m)	Concentration (mg L^{-1})
1	1.167
5	1.070
10	1.123
20	0.866
30	0.834
50	0.820
100	1.598
200	2.379
400	6.284
575	1.552

TI-1A

Depth (m)	Concentration (mg L^{-1})
1	0.875
5	1.156
10	0.681
20	0.661
30	0.693
50	0.350
75	0.416
100	0.338
200	1.000
285	1.067

TABLE 5-2 (Con'd)

TI-1

Depth (m)	Concentration (mg L^{-1})
1	1.322
5	0.931
10	0.488
20	0.405
30	0.710
50	0.564
75	1.000
85	1.174

TI-2

Depth (m)	Concentration (mg L^{-1})
1	2.682
5	1.830
10	1.111
20	0.456
30	1.394
50	0.831
100	1.101
200	1.562
300	2.360
330	1.109

TI-3

Depth (m)	Concentration (mg L^{-1})
1	1.347
5	1.338
10	0.875
20	0.785
30	0.443
50	0.321
100	0.269
200	0.658
400	0.683
475	0.522

IT-1

Depth (m)	Concentration (mg L^{-1})
1	0.956
5	1.472
10	1.039
20	1.173
30	2.155
40	4.140
50	0.967
75	1.426
100	1.891
145	2.049

IT-2

Depth (m)	Concentration (mg L^{-1})
1	0.906
5	0.609
10	0.858
20	0.514
30	1.531
50	0.435
75	0.407
100	0.504
200	0.638
305	1.059

IT-3

Depth (m)	Concentration (mg L^{-1})
1	0.885
5	0.591
10	0.519
20	0.947
30	0.319
50	0.288
100	0.321
200	0.399
300	0.631
405	1.418

TABLE 5-2 (Con'd)

TI-4

Depth (m)	Concentration (mg L^{-1})
1	1.043
5	0.997
10	0.760
20	1.172
30	1.217
50	0.877
75	1.206
100	2.009
200	3.033
290	2.264

MC-9

Depth (m)	Concentration (mg L^{-1})
1	1.567
5	0.409
10	0.711
20	0.450
30	0.551
50	0.319
75	0.836
100	0.704
200	1.846
305	0.801

MC-11

Depth (m)	Concentration (mg L^{-1})
1	0.657
5	0.589
10	1.546
20	2.006
30	5.423
50	8.080
75	0.632
100	0.381
200	1.393
241	3.824

CL-1

Depth (m)	Concentration (mg L^{-1})
1	1.226
5	0.848
10	0.747
20	0.941
30	0.580
50	0.617
75	0.642
100	0.537
150	1.234
180	1.285

CL-2

Depth (m)	Concentration (mg L^{-1})
1	1.814
5	1.136
10	1.098
20	1.791
30	0.767
50	0.607
75	1.270
100	0.466
200	0.888
225	1.464

CL-3

Depth (m)	Concentration (mg L^{-1})
1	0.860
5	0.886
10	1.641
20	1.375
30	0.672
50	0.764
75	0.778
100	0.793
200	1.026
240	1.075

TABLE 5-2 (Con'd)

CL-4

Depth (m)	Concentration (mg L^{-1})
1	2.388
5	2.501
10	1.438
20	0.999
30	1.374
50	0.619
100	0.480
200	0.401
400	0.577
525	0.492

CL-5

Depth (m)	Concentration (mg L^{-1})
5	1.028
10	0.891
20	0.670
30	0.563
50	0.708
100	0.462
200	0.348
400	0.631
600	0.315
685	0.618

CL-6

Depth (m)	Concentration (mg L^{-1})
1	1.299
10	0.954
20	0.993
30	0.603
50	0.578
100	0.375
200	0.458
400	0.209
600	0.547
655	0.421

CL-7

Depth (m)	Concentration (mg L^{-1})
1	0.728
10	0.994
20	0.863
30	1.151
50	0.979
100	0.240
200	0.660
400	0.694
600	0.886
680	0.580

CL-8

Depth (m)	Concentration (mg L^{-1})
1	0.628
10	0.550
20	0.682
30	0.930
50	0.528
100	0.538
200	0.332
400	0.388
600	0.337
765	0.398

CA-2

Depth (m)	Concentration (mg L^{-1})
1	0.541
5	0.493
10	0.750
20	0.472
30	0.612
50	0.573
100	0.427
150	0.418
200	0.418
309	4.962

TABLE 5-2 (Con'd)

CA-3

Depth (m)	Concentration (mg L^{-1})
1	0.974
5	0.732
10	1.311
20	1.055
30	0.791
50	0.615
100	0.652
200	0.391
300	0.791
362	0.768

CA-4

Depth (m)	Concentration (mg L^{-1})
1	0.710
5	0.499
10	0.773
20	0.788
30	0.480
50	0.549
100	0.493
200	0.424
400	0.589
460	1.061

CA-6

Depth (m)	Concentration (mg L^{-1})
1	0.548
5	0.487
10	0.680
20	0.521
30	0.376
50	0.341
100	0.406
200	0.382
400	0.457
636	0.852

CA-7

Depth (m)	Concentration (mg L^{-1})
1	0.977
5	0.569
10	0.802
20	0.554
30	0.738
50	0.736
100	0.473
200	0.413
300	0.530
380	0.532

CA-8

Depth (m)	Concentration (mg L^{-1})
1	2.280
10	1.612
20	2.201
30	1.600
50	0.517
100	0.513
150	0.417
200	0.504
400	0.500
630	0.461

CA-9

Depth (m)	Concentration (mg L^{-1})
1	0.729
5	0.499
10	0.763
20	0.619
30	0.465
50	0.730
100	0.468
200	0.727
400	0.923
600	0.467

TABLE 5-3 GRAIN SIZE STATISTICS (moment measures)

Sample ID	(m)	Mean µm	Mode µm	St. Dev. µm	Skew	Kurt
CA-1	1	21.2	28.9	2.3	-0.34	34.0
	5	16.8	22.5	2.3	-0.66	7.3
	10	18.5	32.6	2.3	-0.53	10.7
	20	25.2	45.8	2.6	-0.23	118.7
	50	20.4	37.6	2.5	-0.48	16.0
	75	17.8	18.8	2.4	-0.62	8.2
	100	31.9	46.3	2.2	-0.35	23.7
	150	27.5	44.5	2.2	-0.4	13.0
	185	19.7	49.5	2.6	-0.6	7.8
CA-2	1	12.1	21.1	2.5	-0.6	9.8
	5	15.4	27.9	2.4	-0.78	6.0
	10	14.8	22.7	2.2	-0.74	4.4
	20	16.4	33.8	2.4	-0.73	5.7
	30	13.3	15.9	2.1	-0.76	3.7
	50	15.5	35.2	2.3	-0.78	4.1
	100	16.5	18.5	2.2	-0.69	4.6
	150	16.8	29.3	2.3	-0.63	6.4
	200	17.0	40.7	2.5	-0.6	9.9
CA-3	1	14.3	34.9	2.4	-0.67	8.5
	5	11.4	8.9	2.2	-0.84	4.6
	10	12.8	8.2	2.5	+0.7	9.8
	20	15.5	9.1	2.5	+0.65	11.4
	30	13.8	14.1	2.1	-0.85	3.6
	50	15.0	11.0	2.2	+0.87	4.3
	100	14.1	16.5	2.1	-0.8	3.1
	200	13.0	15.0	2.2	-0.8	3.8
	300	14.7	15.1	2.3	-0.73	5.0
	362	12.5	14.6	2.1	-0.77	3.2
CA-4	1	11.7	6.9	2.5	+0.81	9.3
	5	13.1	8.9	2.4	+0.69	7.7
	10	11.7	13.8	2.2	-0.87	3.5
	20	11.6	8.9	2.3	+0.84	5.3
	50	12.5	10.3	2.1	+0.98	3
	100	13.2	15.3	2.2	-0.81	4.4
	200	14.0	14.9	2.2	-0.81	4.4
	400	16.6	21.2	2.2	-0.68	4.9
	460	17.9	23.0	2.2	-0.54	9.2

TABLE 5-3 Con'd

Sample ID	(m)	Mean µm	Mode µm	St. Dev. µm	Skew	Kurt
CA-6	1	39.2	45.5	2.2	-0.17	421.0
	5	18.2	41.9	2.4	-0.6	7.3
	20	16.6	40.4	2.4	-0.68	6.1
	30	24.0	38.5	2.2	-0.82	11.8
	200	14.1	15.5	2.2	-0.82	3.9
	400	14.1	17.9	2.4	-0.71	6.6
	639	13.3	14.8	2.2	-0.76	4.7
CA-7	1	14.7	14.7	2.2	-0.77	4.8
	5	18.0	21.5	2.3	-0.61	7.3
	10	16.6	15.5	2.3	+0.74	5.4
	20	13.6	15.2	2.1	-0.83	3.5
	30	51.6	47.4	1.3	+0.84	1.9
	50	15.3	14.8	2.1	+0.74	4
	100	19.7	43.2	2.4	-0.62	6.1
	300	18.0	26.7	2.3	-0.55	9.1
CA-8	10	13.4	14.2	2.1	-0.85	3.6
	20	22.5	42.2	2.4	-0.41	17.3
	30	52.4	47.7	1.3	+0.87	1.7
	50	15.5	16.8	2.0	-0.77	3.4
	100	14.1	12.2	2.2	+0.88	3.5
	150	18.7	35.5	2.4	-0.56	10.2
	200	18.5	35.8	2.3	-0.62	6.7
	400	17.2	16.5	2.2	+0.68	6.0
	630	15.6	15.9	2.3	-0.72	6.0
CA-9	1	52.1	47.7	1.3	+0.83	2.0
	5	13.3	11.2	2.2	+0.85	3.7
	10	10.7	10.4	2.1	+0.88	3.8
	20	12.4	10.9	2.2	+0.96	4.0
	30	13.4	11.6	2.1	+0.88	3.5
	100	14.7	13.1	2.3	-0.82	5.3
	200	13.4	14.1	2.3	-0.8	4
	400	15.4	15.8	2.2	-0.7	5.4
	600	12.9	14.6	2.2	-0.83	4.2

TABLE 5-4 RELATIVE MINERAL ABUNDANCE
(Peak Area %)

Sample ID	Mica	Chlorite	Quartz	Feldspar	Ilmenite	Other
MC-1-1(m)	100					
MC-1-5	100					
MC-1-10	70			20	10	
MC-1-20	100					
MC-2-30	100					
MC-1-50	68			17	15	
MC-1-75	100					
MC-1-100	80			10	10	
MC-1-200	95			5		
MC-1-312	80				20	
MC-3-1	100					
MC-3-5	75			25		
MC-3-10	100					
MC-3-20	76			24		
MC-3-30	100					
MC-3-50	100					
MC-3-100	100					
MC-3-200	84			16		
MC-3-300	100					
MC-3-435	88	12				
MC-4-1	90				10	
MC-4-5	56	31			13	
MC-4-10						NES
MC-4-20	70			10	10	10
MC-4-30	70					30
MC-4-50	80	10		10		
MC-4-100	26			27		46
MC-4-200	100					
MC-4-400	76			24		
MC-4-520	90					10
MC-6-1	23			30	47	
MC-6-5	40	20		15	25	
MC-6-10	60			20	20	
MC-6-20	32			25	43	
MC-6-30	14			15	56	15
MC-6-50	16			12	43	29
MC-6-100	19			12	45	24

TABLE 5-4 Con'd
(Peak Area %)

Sample ID	Mica	Chlorite	Quartz	Feldspar	Ilmenite	Other
MC-7-1(m)	100					
MC-7-5	100					
MC-7-10	100					
MC-7-20	63			37		
MC-7-30						NES
MC-7-50						NES
MC-7-100						NES
MC-7-200						NES
MC-7-400	60					40
MC-7-490	100					
	Samples MC-8-1m,5m,10m,20m,30m,50m,75m,100m,200m =					NES
MC-8-287	100					
CO-1-5	100					
CO-1-10	68	13		19		
CO-1-20	80			10	10	
CO-1-30	100					
CO-1-50	100					
CO-1-75	69	5		3		23
CO-1-92	46	6		6	12	31
CO-5-1	65			35		
CO-5-5						
CO-5-10	100					
CO-5-20	55	45				
CO-5-100	37			63		
CO-5-200	100					
CO-5-400	85			15		
CO-5-497	66			34		
IT-2 delta	84	6	1	2	6	
IT-3 delta	63			17	20	
TI-1c-delta	81		5	5	8	
TI-1-delta	58			8	33	
SU-1-1(m)					40	60
SU-1-5	35			13	52	
SU-1-10	25			37	38	
SU-1-20	18					82
SU-1-30	100					
SU-1-50				44	56	
SU-1-75	29			8	14	49
SU-1-150	100					
SU-1-200	88			12		

TABLE 5-4 Con'd
(Peak Area %)

Sample ID	Mica	Chlorite	Quartz	Feldspar	Ilmenite	Other
SU-5-1(m)	17			18	46	19
SU-5-5	23			18	24	35
SU-5-10	24				27	49
SU-5-20	35		9		20	36
SU-5-30	50				20	30
SU-5-50	100					
SU-5-75	40			11	21	26
SU-5-100	62				38	
SU-5-150	36			7	25	32
SU-6-1	36			7	32	25
SU-6-5	43			16	17	23
SU-6-10	37			11	29	25
SU-6-20	43			13	44	
SU-6-30	68			13	20	
SU-6-50	13			10	16	61
SU-6-75	27			18	44	11
SU-6-100	68				5	28
SU-6-150	93			3	2	2
SU-7-1	47				53	
SU-7-5	27					73
SU-7-10	16			24	60	
SU-7-20	63				8	29
SU-7-30	24			17	49	10
SU-7-50	59			41		
SU-7-57	27				31	42
SU-8-1	80			5		15
SU-8-5	26			14	60	
SU-8-10	47			22	31	
SU-8-20	50			18	32	
SU-8-30	55	20		5	20	
SU-8-50	64	2	15	11	8	
SU-8-75	51			23	26	
SU-8-100	43			12	32	13
SU-8-150	40				34	26
SU-8-155	67			12	20	

TABLE 5-5: BINOCULAR MICROSCOPIC DESCRIPTION OF SOME OF THE WATER SAMPLE FILTRATES

Sample ID	ZOO	PHYT	PEL	FLOC	CLUMP	C sd	F sd	C st	F st	Clay
IN-1-1(m)	M	H	M	M	N	N	R	M	H	H
-5	M	M	M	M	N	N	N	M	H	H
-10	R	M	M	M	R	N	N	M	H	H
-20	R	M	M	M	N	R	R	M	H	H
-30	R	M	M	M	N	R	R	M	H	H
-50	N	M	M	M	R	N	R	M	M	M
-75	N	R	M	M	N	N	R	M	M	M
-100	N	R	M	R	N	N	R	M	M	M
-125	N	R	R	R	R	N	R	M	M	M
-155	N	R	R	R	R	R	F	M	M	M
IN-2-1	R	H	M	M	N	N	R	M	H	H
-5	R	H	M	M	N	N	R	M	H	H
-10	R	H	M	M	N	N	R	M	H	H
-20	H	H	M	M	N	N	R	M	H	H
-30	M	H	M	M	N	N	R	M	H	H
-50	M	H	M	M	N	N	R	M	H	H
-75	M	M	M	M	N	N	R	M	H	H
-100	R	R	M	M	N	N	N	M	M	M
-200	N	R	R	R	R	R	F	M	M	M
-270	N	R	R	R	R	R	F	M	M	M
IN-3-1	R	H	M	M	N	N	R	M	H	H
-5	R	H	M	M	N	N	R	M	H	H
10	R	H	M	M	N	N	R	M	H	H
20	R	H	M	M	N	N	R	M	H	H
30	R	H	M	M	N	N	R	M	H	H
50	R	H	M	M	N	N	R	M	H	H
100	R	M	M	M	N	N	N	M	M	M
200	N	R	M	M	N	N	N	M	M	M
400	N	R	R	R	R	R	F	M	M	M
550	N	R	R	R	R	R	F	M	M	M
IN-4-1	M	H	M	M	H	H	H	H	H	H
-5	R	H	M	M	N	N	H	H	H	H
-10	R	M	M	M	M	R	M	H	H	H
-20	R	H	M	M	N	N	M	H	H	H
-30	R	H	H	M	N	N	M	H	H	H
-50	N	M	M	M	N	N	N	R	M	M
-100	R	M	M	M	N	N	R	R	M	M
-200	R	M	M	M	N	N	R	M	M	M
-400	R	H	M	M	N	N	R	M	M	M
-560	R	M	M	M	N	N	R	H	H	H
IN-5-1	R	M	M	M	N	N	R	M	M	M
-100	R	H	M	M	N	N	R	M	M	M

TABLE 5-5 Con'd

Sample ID	ZOO	PHYT	PEL	FLOC	CLUMP	C sd	F sd	C st	F st	Clay
CA-1-1(m)	R	H	M	N	N	N	F	F	M	M
-5	R	H	F	N	N	N	M	M	M	M
-10	R	H	F	R	N	N	M	M	M	M
-20	F	H	H	R	N	N	F	F	M	M
-30	F	H	H	R	N	N	F	F	M	M
-50	M	H	H	R	N	N	F	F	M	M
-75	R	H	H	N	N	N	R	F	M	M
-100	R	H	H	N	N	N	M	M	M	M
-150	R	M	M	N	N	N	M	M	M	M
-185	R	M	M	N	N	N	M	M	M	M
CA-2-1	R	H	R	N	N	N	F	M	M	M
-5	R	H	R	N	N	N	R	F	M	M
-10	M	H	F	N	N	N	R	F	M	M
-20	M	H	M	N	N	N	R	F	M	M
-30	M	H	H	R	N	N	R	F	M	M
-50	F	H	H	R	N	N	R	M	M	M
-100	N	M	H	N	N	N	R	M	M	M
-150	R	R	R	R	N	N	F	M	M	M
-200	R	M	R	R	R	N	M	M	M	M
-309	R	M	R	N	N	N	M	M	M	M
CA-3-1	R	H	F	N	N	N	N	F	M	M
-5	R	H	R	N	N	N	N	F	M	M
-10	R	H	R	N	N	N	N	F	M	M
-20	R	H	F	N	N	N	N	M	M	M
-30	R	H	F	N	N	N	N	M	M	M
-50	R	H	F	N	N	N	N	M	M	M
-100	R	F	R	N	N	N	N	M	M	M
-200	R	F	R	N	N	N	N	R	M	M
-300	R	M	R	N	F	N	M	M	M	M
-360	R	F	R	N	M	N	M	M	M	M
CA-4-1	R	H	R	N	N	N	N	M	M	M
-5	R	H	R	N	N	N	N	M	M	M
-10	R	H	R	N	N	N	N	M	M	M
-20	R	H	M	R	N	N	N	M	M	M
-30	R	H	M	R	N	N	N	M	M	M
-50	R	H	H	N	N	N	N	M	M	M
-100	R	H	F	R	N	N	N	M	M	M
-200	R	F	F	N	N	N	N	M	M	M
-400	R	F	F	N	N	N	F	M	M	M
-460	R	F	F	N	F	R	M	M	M	M

TABLE 5-5 Con'd

Sample ID	ZOO	PHYT	PEL	FLOC	CLUMP	C sd	F sd	C st	F st	Clay
CA-6-1(m)	F	H	F	N	N	N	F	M	M	M
-5	F	H	H	N	N	N	M	M	M	M
-10	H	H	H	R	N	R	M	M	M	M
-20	H	H	H	N	N	N	N	M	M	M
-30	H	H	H	N	N	N	N	M	M	M
-50	H	H	H	N	N	N	N	M	M	M
-100	R	R	F	R	N	N	N	M	M	M
-200	R	R	F	R	N	N	N	M	M	M
-400	R	R	R	R	R	N	R	M	M	M
-642	N	N	R	N	F	N	M	M	M	M
CA-7-1	F	H	R	R	N	N	R	M	M	M
-5	F	H	R	R	N	N	N	M	M	M
-10	F	H	M	R	N	N	N	M	M	M
-20	R	H	R	R	N	N	N	M	M	M
-30	R	H	F	R	N	N	N	M	M	M
-50	R	H	M	R	N	N	N	M	M	M
-100	R	M	H	R	N	N	N	M	M	M
-200	R	M	F	R	N	N	N	M	M	M
-300	R	F	F	F	N	N	N	M	M	M
-380	R	F	F	F	R	N	R	M	M	M
CA-8-1	M	H	M	R	N	N	F	M	M	M
-10	M	H	M	R	N	N	F	M	M	M
-20	M	H	M	R	N	N	F	M	M	M
-30	F	H	H	R	N	N	F	M	M	M
-50	F	H	H	F	N	N	N	M	M	M
-100	F	H	M	F	N	N	N	M	M	M
-150	F	F	R	N	N	N	R	M	M	M
-200	N	F	R	N	N	N	R	M	M	M
-400	N	R	R	R	R	N	R	M	M	M
-630	N	R	R	R	R	N	N	M	M	M
CA-9-1	M	H	F	R	F	N	F	M	M	M
-5	M	H	M	R	F	N	F	M	M	M
-10	M	H	R	N	R	N	F	M	M	M
-20	R	H	F	N	N	N	N	M	M	M
-30	F	H	M	R	N	N	N	M	M	M
-50	M	H	M	R	N	N	N	M	M	M
-100	M	H	F	N	N	N	N	M	M	M
-200	M	H	M	N	N	N	N	M	M	M
-400	F	M	R	N	N	N	N	M	M	M
-600	R	R	R	N	R	N	F	M	M	M

TABLE 5-5 Con'd

Identifiers:
ZOO = zooplankton
PHYT = Phytoplankton
PEL = fecal pellets
CLUM = mud clumps or clasts
CSCL = coarse sand
F cd = fine sand
C st = coarse silt
F st = fine silt

for ZOO, PHYT, PEL, FLOC, CLUM 8:
N = none,
R = rare (1 to 5 particles)
F = few (5 to 10 particles)
M = moderate (10 - 20 particles)
H= high (>20)

for Sediment Particles:
N = none
R = rare (1 to 5 particles)
F = few (5 to 20 particles)
M = moderate (even distribution)
H = dense mat of particles

TINGIN FIORD
STATION TI-1A

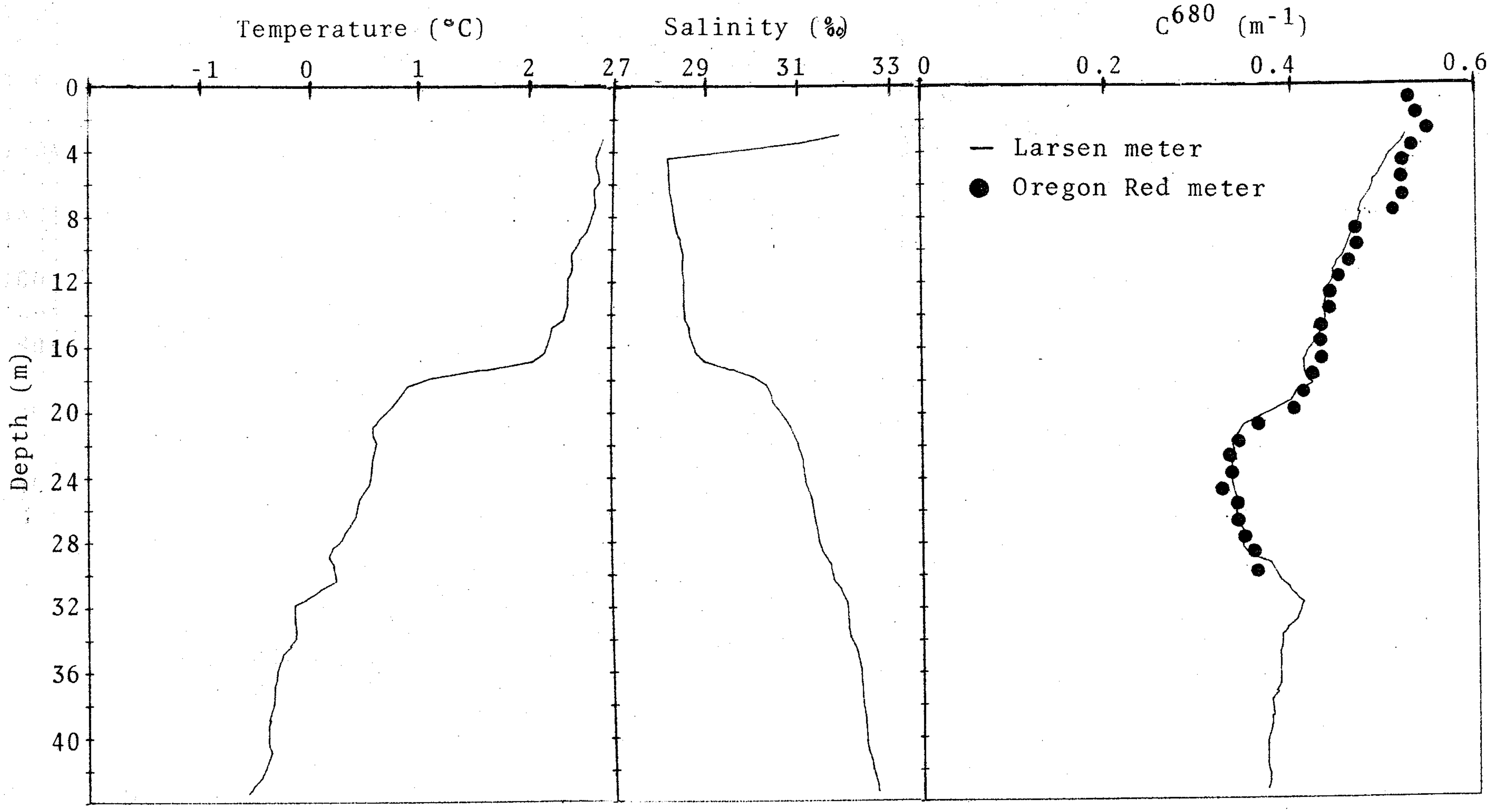

Fig. 5-1

TINGIN FIORD
STATION TI-1A

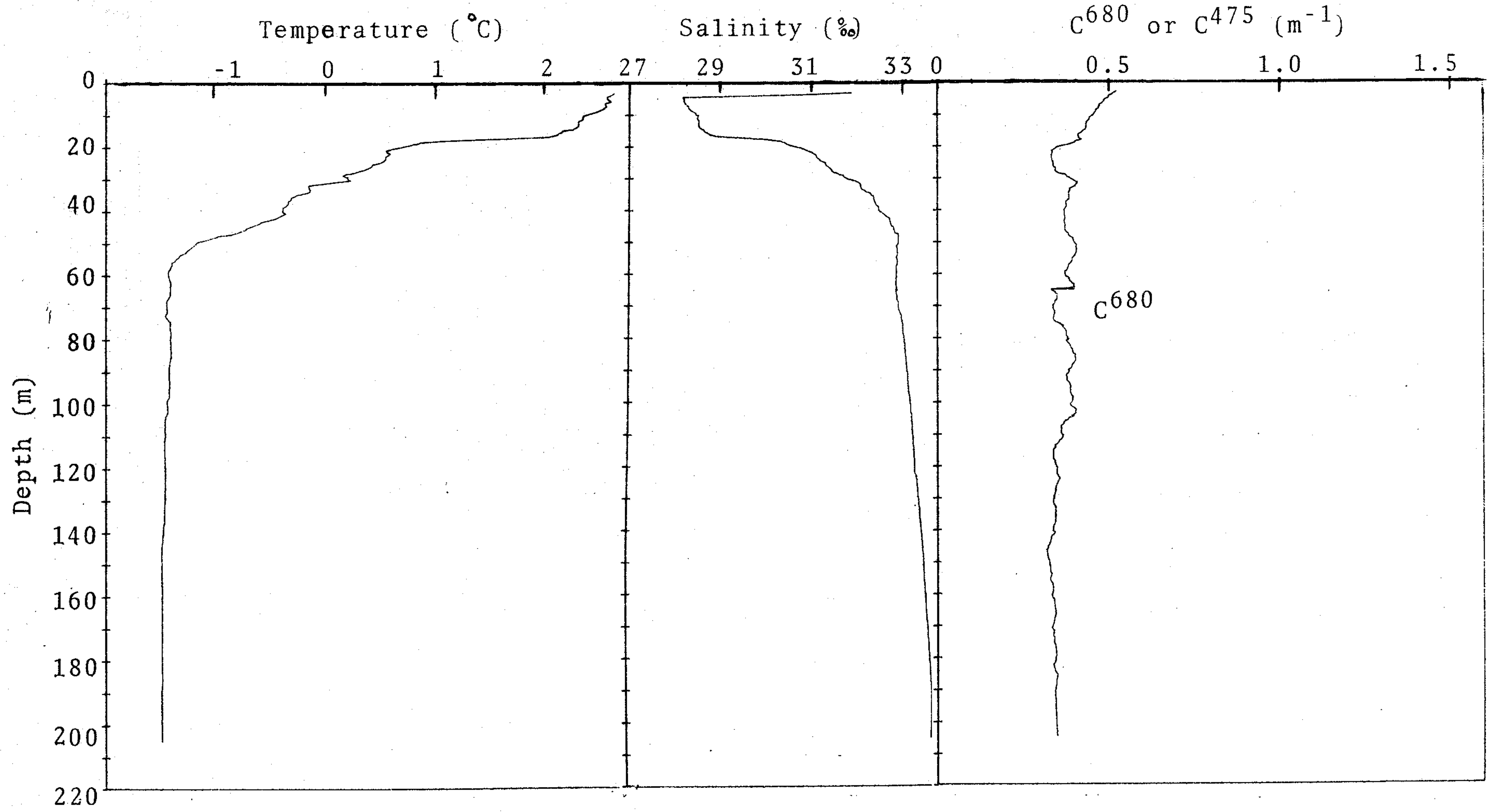

Fig. 5-2

INUGSUIN FIORD
STATION IN-1

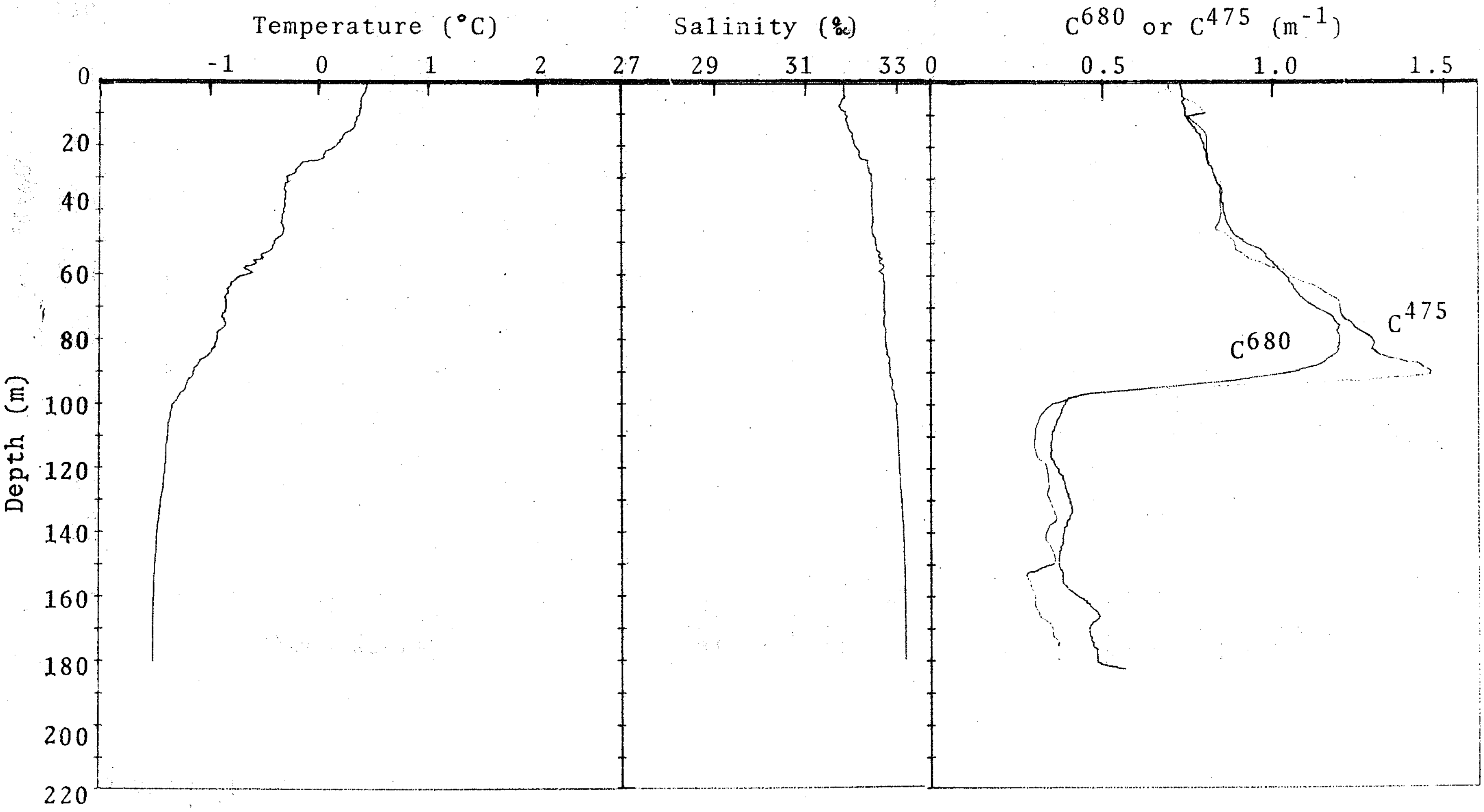

Fig. 5-3

INUGSUIN FIORD
STATION IN-3

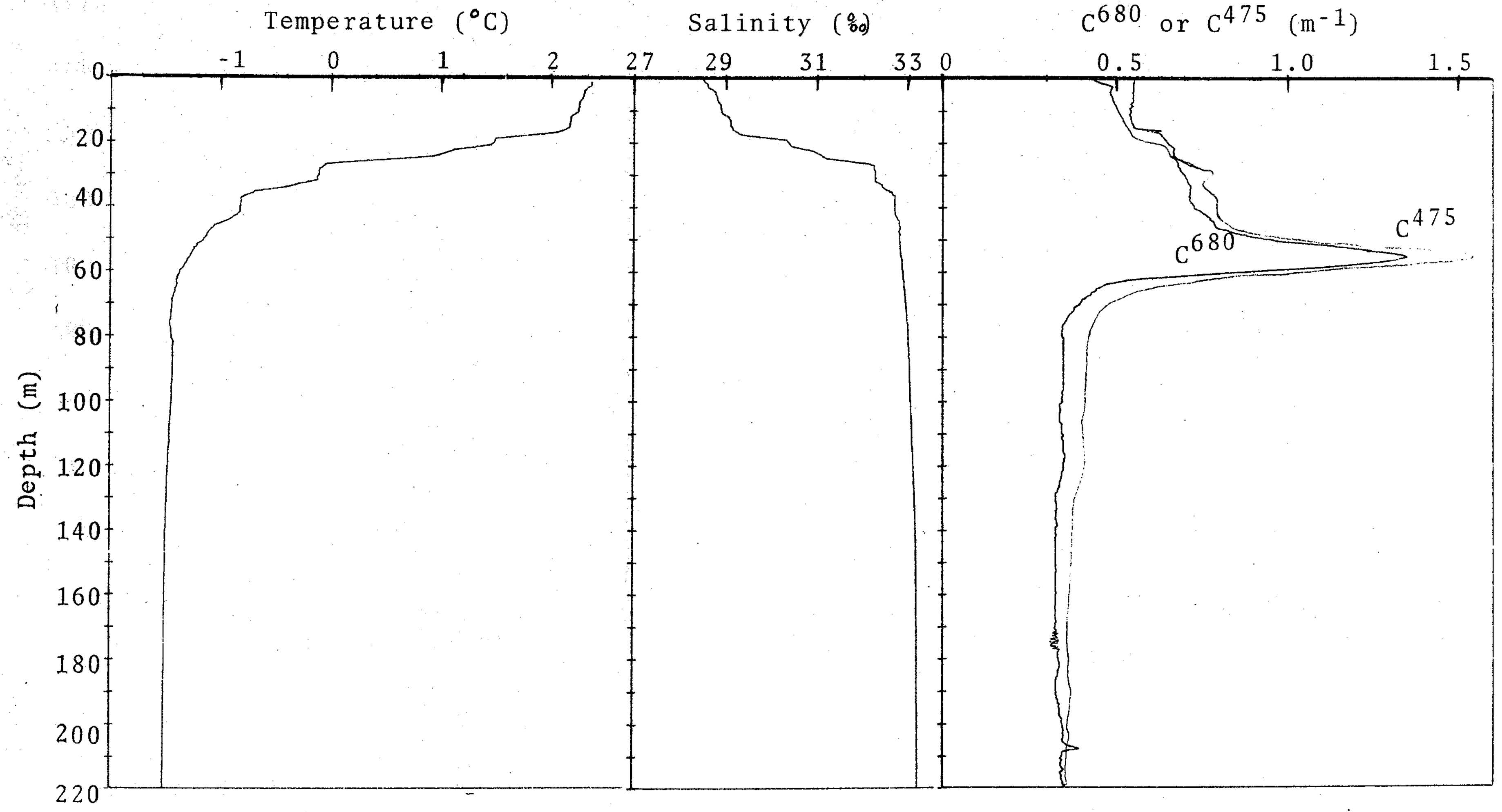

Fig. 5-4

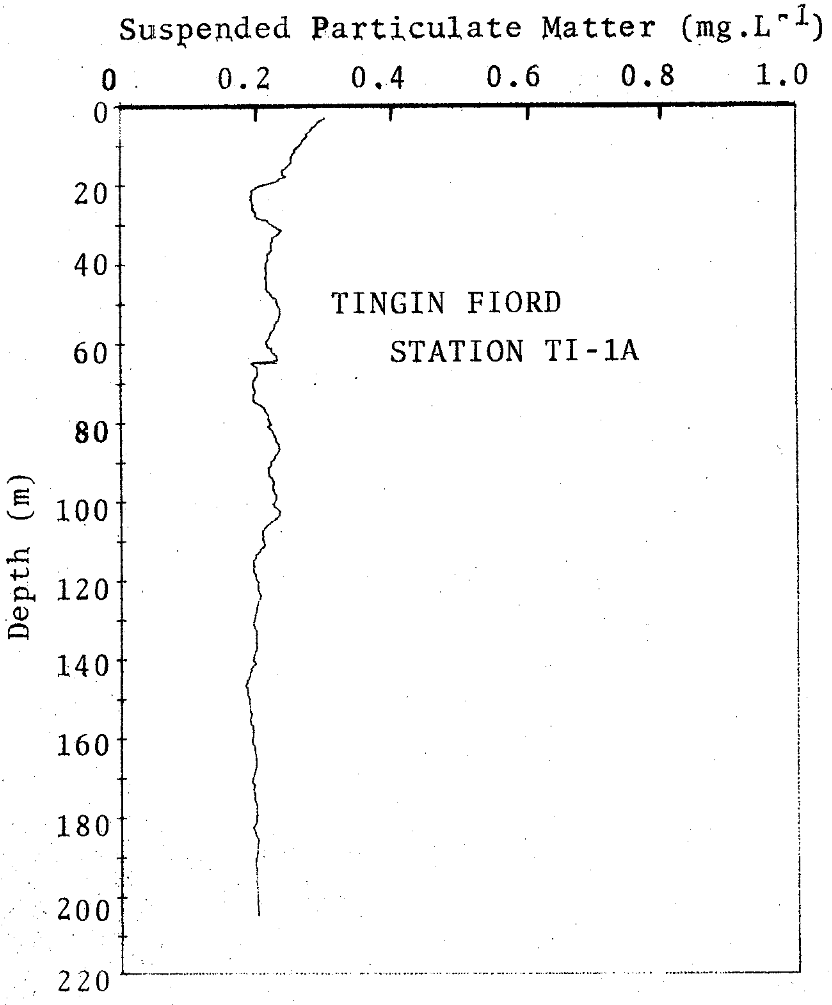
Suspended Particulate Matter (mg.L^{-1})
0
0.2
0.4
0.6
0.8
1.0
Depth (m)
0
20
40
60
80
100
120
140
160
180
200
220
TINGIN FIORD
STATION TI-1A

Fig. 5-5

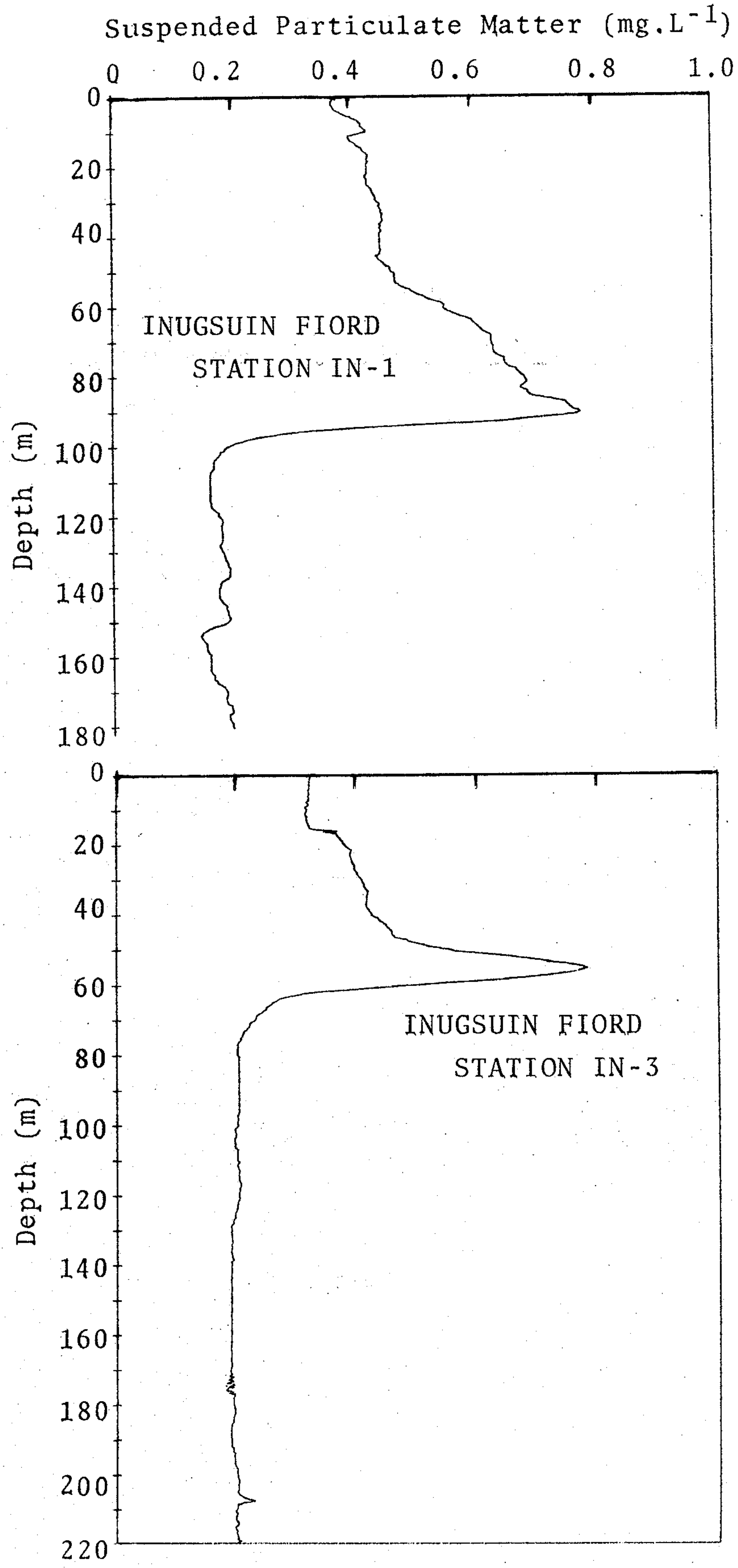
Suspended Particulate Matter (mg.L⁻¹)
0
0.2
0.4
0.6
0.8
1.0
Depth (m)
0
20
40
60
80
100
120
140
160
180
INUGSUIN FIORD
STATION IN-1
0
20
40
60
80
100
120
140
160
180
200
220
INUGSUIN FIORD
STATION IN-3

Fig. 5-6

HETEROTROPHIC BACTERIAL DYNAMICS WITHIN WATERS AND SURFICIAL SEDIMENTS OF SEVERAL CANADIAN EASTERN ARCTIC FIORDS

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OBJECTIVES

At present a paucity of data exists upon standing stocks and activities of bacteria of the water column and surficial sediments of Canadian Arctic waters. The objective of this study was therefore to obtain baseline data on bacterial numbers, biomasses and productivities and to compare these with phytoplankton biomasses within the waters and surficial sediments of several fiords of Baffin Island.

METHODS

Collection of water and sediment samples.

Surface waters were collected with a clean washed bucket whereas sediments were collected using a prewashed grab sampler (see chapter 8 for details).

Determination of bacterial numbers and biomasses.

Duplicate 10 mL samples of each water sampled were treated with formaldehyde to a final concentration of 3.7% and stored at room temperature until assayed. At the time of assay each preserved sample was then treated with 0.001 M (final concentration) $Na_4P_2O_7$ for 15 min followed by insonation for 2 1/2 s at an intensity of 63 watts cm^{-1} using a Bronwill II sonicator. This procedure serves to deflocculate and evenly disperse bacteria (Velji and Albright, 1983). Bacterial numbers were then estimated by epifluorescent microscopy using the DAPI technique of Porter and Feig (1980).

Duplicate one g portions of each sediment sampled were each suspended in 10 mL of sterile isotonic preserved with formaldehyde

(3.7% final concentration) and stored at room temperature. Each sample was then assayed for bacterial numbers as described above.

The mean bacterial dimensions (length and width) were determined whilst the cells were being counted by epifluorescent microscopy. Since most cells appeared to be rods their volumes were calculated as cylinders. Bacterial biomasses were then calculated assuming a cell density of 1.07 g cm^{-3} (Lamanna *et al.* [1973]), a dry weight to wet weight ratio of 0.22 (Luria [1960] and Lamanna and Mallete [1965]), and a carbon to dry weight ratio of 0.50 (Luria [1960]).

Determination of phytoplankton chlorophyll a concentrations and biomasses.

Duplicate 2 or 3 L portions of each water sampled were filtered through 0.8 μm nominal pore size cellulose nitrate membrane filters (Millipore). The material retained on each filter was then treated with a suspension of $MgCO_3$; the filters were wrapped in aluminum foil and frozen at -20 C till assayed for Chl *a*. Chl *a* was determined spectrophotometrically after acetone extraction, using the procedure described by Strickland and Parsons (1972). A factor of 30 was used to convert Chl *a* values to phytoplankton carbon.

Duplicate 10 g samples of each sediment were frozen at -20 C till being assayed for Chl *a* by the spectrophotometric procedure described above. The conversion factor 60 was used to convert Chl *a* to microalgal carbon values.

Determinations of bacterial glucose heterotrophic activities and bacterial productivities.

Heterotrophic activity was determined by the method described by Azam and Holm-Hansen (1973). Tritiated glucose (D[16-^{3}H] glucose, specific activity 30 Ci mmol^{-1}, New England Nuclear) was diluted with sterile distilled water to give a working concentration of 10 µCi mL^{-1}. Volumes of this solution, in the range 10 to 150 µL, were added to 10 mL of water sample in a plastic disposable syringe (Dietz et al., 1976). The samples were then incubated in the dark for 1 h at in situ temperature. At the end of this period the water was filtered through 0.22 µm nominal pore size Millipore filters, rinsed with 10 mL sterile isotonic water and the filters then placed in 10 mL PCS II scintillation fluor (Amersham Corp.). After the filters had clarified and partially dissolved the samples were counted on a Beckmann LS 8000 scintillation counter. Quenching was corrected for by the external standards ratio method.

Determinations of primary productivities and total inorganic carbon concentrations.

Primary production was determined by the light and dark bottle technique. Sodium bicarbonate, [^{14}C]-(specific activity 8.4 m Ci mmol^{-1}, New England Nuclear), packaged as 5 µCi in 1 mL sealed glass ampuoles was used. The contents of one ampuole was added to 240 mL of water sample contained in each of two light and two dark (control) bottles. Incubation was for the period of 4 h between 1000 and 1500 h each day. At the end of the incubation period all the bottles were treated with 2% v/v formaldehyde filtered through 0.45 µm nominal pore size Millipore filters rinsed with 20 mL of sterile isotonic water. Each filter was then placed in a scintillation vial containing PCS II fluor and the contained ^{14}C determined using a Beckmann LS 8000 scintillation counter as described above.

Total inorganic carbon (TIC) values of the water samples were determined by the gas stripping technique of Stainton (1973).

ACKNOWLEDGEMENTS

This research was supported in part by NSERC Operating and Northern Supplement grants to L.J.A.

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Table 1. Bacterial and algae biomasses of fiord surface waters.

Fiord		Coordinates	Bacteria/m^3	Bacterial Biomass (mgC/m^3)	Chl *a* (mg/m^3)	Algal Biomass (mgC/m^3)	% Bacterial Biomass
SUNNESHINE	1	66°37.0'N,61°54.2'W	8.1×10^{10}	0.58	0.339	10.17	5
	5	66°33.3'N,61°42.6'W	11.0×10^{10}	0.77	0.208	6.24	11
	6	66°30.7'N,61°39.2'W	11.0×10^{10}	0.76	0.621	18.63	4
	8	66°30.1'N,61°11.8'W	9.3×10^{10}	0.67	0.231	6.93	9
CORONATION	1	67°12.7'N,64°46.0'W	10.0×10^{10}	0.73	0.405	12.15	6
	2	67°13.9'N,64°41.1'W	9.7×10^{10}	0.70	0.127	3.81	16
	3	67°14.6'N,64°36.2'W	1.0×10^{11}	0.73	0.831	24.93	3
	4	67°14.6'N,64°21.7'W	1.0×10^{11}	0.74	0.250	7.50	9
	5	67°17.6'N,64°08.6'W	1.0×10^{11}	0.74	0.415	12.45	6
MAKTAK	1	67°21.0'N,64°44.5'W	1.0×10^{10}	0.76	0.793	23.79	3
	2	67°20.3'N,64°42.1'W	9.4×10^{10}	0.68	0.426	12.78	5
	4	67°18.9'N,64°26.0'W	10.0×10^{10}	0.73	0.616	18.48	4
	5	67°17.2'N,63°57.0'W	8.2×10^{10}	0.59	0.246	7.38	7
	6	67°16.8'N,63°22.7'W	9.8×10^{10}	0.70	0.824	24.72	3
TINGIN	1	68°57.8'N,68°52.3'W	9.2×10^{10}	0.66	0.197	5.91	10
	1a		9.4×10^{10}	0.67	0.239	7.17	9
	2	69°06.1'N,68°52.3'W	9.0×10^{10}	0.64	0.250	7.50	8
	3	69°10.7'N,68°13.8'W	8.7×10^{10}	0.62	1.011	30.33	2
	4	69°04.8'N,67°48.5'W	8.2×10^{10}	0.59	0.382	11.46	5
	5	68°53.7'N,67°09.5'W	7.8×10^{10}	0.56	0.721	21.63	3
ITIRBILUING	1	69°15.1'N,69°06.8'W	8.8×10^{10}	0.63	0.669	20.07	3
	2	69°19.6'N,68°50.7'W	8.2×10^{10}	0.59	0.503	15.09	4
	3	69°15.8'N,68°15.0'W	6.3×10^{10}	0.45	0.115	3.45	12
	4	69°10.4'N,67°48.5'W	7.8×10^{10}	0.56	0.975	29.25	2

Table 1 continued.

Table 1 continued

Fiord		Coordinates	Bacteria/m^3	Bacterial Biomass (mgC/m^3)	Chl a (mg/m^3)	Algal Biomass (mgC/m^3)	% Bacterial Biomass
McBETH	1	69°31.9'N,69°47.5'W	8.4×10^{10}	0.61	0.802	24.06	3
	3	69°29.7'N,69°11.0'W	6.0×10^{10}	0.43	0.930	28.05	2
	4	69°32.6'N,68°53.0'W	7.2×10^{10}	0.52	0.691	20.73	2
	5	69°35.7'N,68°29.0'W	7.5×10^{10}	0.54	0.345	10.35	5
	6	69°31.3'N,68°04.5'W	9.1×10^{10}	0.65	0.516	15.48	4
	9	69°30.0'N,67.51.0'W	7.7×10^{10}	0.55	0.238	7.14	7
	11	69°29.6'N,66°31.0'W	7.2×10^{10}	0.52	0.607	18.21	3
INUGSUIN	1	69°36.0'N,69°53.8'W	9.4×10^{10}	0.67	0.246	7.38	8
	2	69°41.9'N,69°47.0'W	8.3×10^{10}	0.59	0.117	3.51	15
	3	69°16.9'N,68°22.0'W	7.5×10^{10}	0.54	0.222	6.66	8
	4	69°56.8'N,68°58.5'W	1.2×10^{11}	0.86	0.307	9.21	9
	5	70°02.4'N,68°39.0'W	5.6×10^{10}	0.40	0.305	9.15	4
	6	70°13.5'N,68°36.5'W	9.4×10^{10}	0.68	0.822	24.66	3
	7	70°19.5'N,68.21.0'W	9.7×10^{10}	0.70	0.438	13.14	5
	8	70°25.0'N,68°02.5'W	9.4×10^{10}	0.67	0.248	7.44	8
CLARK	1	70°48.8'N,72°43.5'W	9.4×10^{10}	0.68	0.526	15.78	4
	2	70°51.2'N,72°28.0'W	8.4×10^{10}	0.60	0.135	4.04	13
	3	70.52.7'N,72°18.0'W	8.3×10^{10}	0.60	0.230	6.90	8
	4	70.59.5'N,72°07.0'W	8.4×10^{10}	0.60	0.743	22.29	3
	5	71°05.4'N,71°55.5'W	7.4×10^{10}	0.53	0.106	3.18	14
	6	71°02.6'N,71°33.0'W	7.3×10^{10}	0.52	0.501	15.03	3
	7	71°02.4'N,71°13.5'W	7.4×10^{10}	0.52	0.165	4.95	10
	8	71°11.1'N,70°49.7'W	7.2×10^{10}	0.52	0.982	29.46	2

Table 2. Bacterial and algal biomasses of fiord surface sediments.

Fiord		Bacteria/m^3	Bacterial Biomass (mgC/m^3)	Chl $\underline{a}$ (mg/m^3)	Algal Biomass (mg/Cm^3)	% Bacterial Biomass
SUNNESHINE	1	1.2×10^{12}	14.30	0.451	27.06	35
	5	2.1×10^{12}	25.00	0.112	6.72	79
	6	2.2×10^{12}	26.11	0.596	35.76	42
	8	1.3×10^{12}	14.82	1.012	60.72	20
CORONATION	1	3.9×10^{12}	45.52	0.361	21.66	68
	2	1.8×10^{12}	21.82	0.311	18.66	54
	3	2.0×10^{12}	24.01	0.508	30.48	44
	4	2.0×10^{12}	23.82	1.119	67.14	26
	5	2.8×10^{12}	32.64	1.231	73.86	31
MAKTAK	1	2.9×10^{12}	34.13	1.116	66.96	34
	2	2.3×10^{12}	27.47	0.711	42.66	39
	4	2.4×10^{12}	28.82	1.139	68.34	30
	5	3.7×10^{12}	43.61	0.628	37.68	54
	6	2.7×10^{12}	32.29	1.128	67.68	32
TINGIN	1	2.5×10^{12}	29.83	0.232	13.92	68
	1a	2.6×10^{12}	30.55	0.728	43.68	41
	2	3.3×10^{12}	38.34	0.736	44.16	47
	3	2.5×10^{12}	29.30	0.727	43.62	40
	4	2.4×10^{12}	28.12	0.536	32.16	47
	5	2.4×10^{12}	28.63	0.846	50.76	36
ITERBILUNG	1	2.9×10^{12}	34.39	0.567	34.02	50
	2	3.3×10^{12}	38.80	0.461	27.66	58
	3	3.2×10^{12}	37.93	1.078	64.68	37
	4	3.3×10^{12}	38.90	0.510	30.60	56
McBETH	1	3.3×10^{12}	39.60	0.133	7.98	83
	3	2.9×10^{12}	33.40	0.559	33.54	50
	4	3.0×10^{12}	35.60	0.776	46.56	43
	5	3.3×10^{12}	38.43	0.659	39.54	49
	6	2.9×10^{12}	33.74	0.683	40.98	45
	9	3.1×10^{12}	36.02	0.725	43.50	45
	11	3.1×10^{12}	36.95	0.138	8.28	82
INUGSUIN	1	3.3×10^{12}	39.09	0.139	8.34	83
	2	2.6×10^{12}	30.94	0.108	6.48	83
	3	3.8×10^{12}	44.85	0.244	14.64	75
	4	3.9×10^{12}	46.28	0.206	12.36	79
	5	2.3×10^{12}	26.95	0.221	13.26	67
	6	2.5×10^{12}	29.95	0.117	7.02	81
	7	3.2×10^{12}	37.19	0.994	59.64	38
	8	3.1×10^{12}	35.99	0.877	52.62	42

Table 2 continued.

Table 2. continued.

Fiord		Bacteria/m^3	Bacterial Biomass (mgC/m^3)	Chl a (mg/m^3)	Algal Biomass (mgC/m^3)	% Bacterial Biomass
CLARK	1	2.7×10^{12}	31.96	0.436	26.16	55
	2	2.8×10^{12}	32.77	0.502	30.12	51
	3	3.9×10^{12}	45.28	0.867	52.02	47
	4	2.6×10^{12}	30.75	0.264	15.84	66
	5	3.1×10^{12}	36.80	0.772	46.32	44
	6	2.5×10^{12}	28.88	0.267	16.02	58
	7	2.3×10^{12}	26.99	0.932	55.92	17
	8	2.9×10^{12}	34.62	0.662	39.72	47

Table 3. Bacterial and algal production, total inorganic carbon concentrations of fiord surface waters and thymidine uptake rates by the microorganisms of surface sediment.

Fiord		Water				Sediment
		Bacterial Production ($mgC/m^3/d$)	Bacterial Production ($cells/m^3/d$)	Primary Production ($mgC/m^3/d$)	Total Inorganic carbon (mgC/m^3)	Moles Thymidine Uptake ($M/m^3/d$)
SUNNESHINE	1	0.278	3.86×10^{10}	45.22	22.4×10^3	15.27
	5	0.220	3.06×10^{10}	———	———	7.16
	6	0.581	8.10×10^{10}	———	———	5.37
	8	1.009	14.0×10^{10}	———	———	12.56
CORONATION	1	0.243	3.38×10^{10}	70.43	24.8×10^3	9.83
	2	0.840	11.7×10^{10}	———	———	6.47
	3	0.890	12.4×10^{10}	———	———	3.66
	4	0.206	2.87×10^{10}			9.64
	5	1.237	1.73×10^{10}	151.09	24.9×10^3	8.74
MAKTAK	1	0.322	44.8×10^{10}	91.37	25.5×10^3	10.63
	2	0.348	48.5×10^{10}	———	———	10.16
	4	0.379	5.28×10^{10}			6.44
	5	0.207	2.89×10^{10}	71.36	24.5×10^3	3.53
	6	0.828	11.5×10^{10}	80.57	26.5×10^3	3.82
TINGIN	1	0.512	7.13×10^{10}	76.60	25.4×10^3	4.41
	1a	0.161	2.24×10^{10}	82.07	25.1×10^3	4.71
	2	0.156	2.17×10^{10}	95.95	26.4×10^3	7.08
	3	0.437	6.08×10^{10}	134.92	25.8×10^3	7.43
	4	0.266	3.71×10^{10}	69.56	22.4×10^3	6.41
	5	0.298	4.15×10^{10}	90.32	25.1×10^3	14.85
ITIRBILUING	1	0.336	4.68×10^{10}	118.26	24.6×10^3	4.10
	2	0.585	8.15×10^{10}	95.69	25×10^3	4.34
	3	0.889	12.4×10^{10}	70.09	24×10^3	3.96
	4	0.970	13.5×10^{10}	79.71	24×10^3	3.24

Table 3 continued.

Table 3 continued.

Fiord		Water				Sediment
		Bacterial Production ($mgC/m^3/d$)	Bacterial Production ($cells/m^3/d$)	Primary Production ($mgC/m^3/d$)	Total Inorganic carbon (mgC/m^3)	Thymidine Uptake ($M/m^3/d$)
McBETH	1	0.686	9.56×10^{10}	120.07	21.7×10^3	4.12
	3	0.743	10.4×10^{10}	166.16	24.2×10^3	4.93
	4	0.688	9.58×10^{10}	145.82	24.1×10^3	4.66
	5	0.924	12.9×10^{10}	69.90	25.6×10^3	8.20
	6	0.406	5.66×10^{10}	127.28	23.1×10^3	8.74
	9	1.047	14.6×10^{10}	94.93	23.4×10^3	4.68
	11	0.346	4.83×10^{10}	128.96	23.3×10^3	5.01
INUGSUIN	1	0.587	8.18×10^{10}	55.93	25.2×10^3	6.75
	2	0.314	4.37×10^{10}			9.19
	3	0.336	4.68×10^{10}	—	—	8.13
	4	0.623	8.67×10^{10}	164.59	24.7×10^3	8.23
	5	0.579	8.07×10^{10}			6.91
	6	1.009	14.1×10^{10}	—	—	7.28
	7	0.575	8.01×10^{10}	210.38	24.5×10^3	11.36
	8	0.817	11.4×10^{10}	210.83	25.5×10^3	9.79
CLARK	1	0.410	5.70×10^{10}	—	—	4.95
	2	0.989	13.8×10^{10}	—	—	7.11
	3	0.928	12.9×10^{10}	—	—	5.97
	4	0.903	11.2×10^{10}	—	—	5.27
	5	0.564	7.85×10^{10}	—	—	5.74
	6	0.682	9.50×10^{10}	—	—	5.15
	7	0.487	6.79×10^{10}	—	—	5.45
	8	0.363	5.05×10^{10}	—	—	5.07

Table 4. Glucose heterotrophic activities of the surface water bacterioplankton within the stream plumes which enter the following fiords.

Fiord	Salinity (°/oo)	V_{max} (µg glucose/L/h)	$K_t + S_n$ (µg glucose/L)	T_t (h)
SUNNESHINE	25	9.26×10^{-4}	90.8×10^{-1}	98
TINGIN	0	8.62×10^{-4}	1.59×10^{-1}	184
	5	13.70×10^{-4}	4.02×10^{-1}	293
	15	11.30×10^{-4}	4.39×10^{-1}	387
	25	6.44×10^{-4}	91.3×10^{-1}	142
INUGSUIN	0	2.07×10^{-3}	21.4×10^{-2}	10
	5	1.13×10^{-3}	3.01×10^{-1}	267
	10	1.27×10^{-3}	3.12×10^{-1}	257
	15	1.02×10^{-3}	1.40×10^{-1}	138
	20	1.12×10^{-3}	4.20×10^{-1}	376
	25	2.00×10^{-3}	3.50×10^{-1}	175

7. CAMBRIDGE FJORD POLYNYA EXPERIMENT: THE BUOYANT JET

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PURPOSE

The primary goal of the experiment was to demonstrate that it is possible to obtain acoustic images of the buoyant jet rising from the submarine freshwater spring in Cambridge Fjord. The acoustic images and CTD profiles were to be used to draw inferences as to the nature and dynamics of the jet itself, and the mechanism principally responsible for the backscattered acoustic signal.

EQUIPMENT AND METHODS

The measurements were made from the fore-and-aft moored scientific launch GREBE with a Ross Laboratories 192 kHz acoustic sounder (see Chapter 17) and a Guildline portable CTD (see Chapter 2).

SUMMARY OF RESULTS

The CTD profiles are summarized in Chapter 2. Typical images of the buoyant jet are presented in Figs. 7B-1 and 7B-2. The images in Fig. 7B-1 were taken on successive transects across the vent, and indicate that the diameter of the jet increases with increasing distance from the bottom, presumably the result of entrainment of ambient sea-water. The jet appears to reach a level of neutral buoyancy at a depth of 10-15 m, from which the brackish water spreads laterally outward. The temporally coherent scattering structures in the image in Fig. 7B-2 indicate a vertical velocity of about 15 cm/s within the plume.

FUTURE WORK

The objectives of future experiments will be to: (1) define the lateral dimensions of the jet as a function of distance from the bottom using side-looking acoustic sounders; (2) to obtain lateral profiles of vertical velocity and temperature, salinity and density through the jet as a function of distance above the bottom; and (3) to obtain quantitative measures of the backscattered acoustic signal in order to determine the principal scattering mechanism.

FIGURE CAPTIONS

Fig. 7-1. Two acoustic images at 192 kHz of the buoyant jet on successive transects over the vent. The vent is at 45 m depth.

Fig. 7-2. Echogram obtained while fore-and-aft moored over the vent showing discrete and temporally coherent scattering structures rising from the bottom.

Fig. 7-1

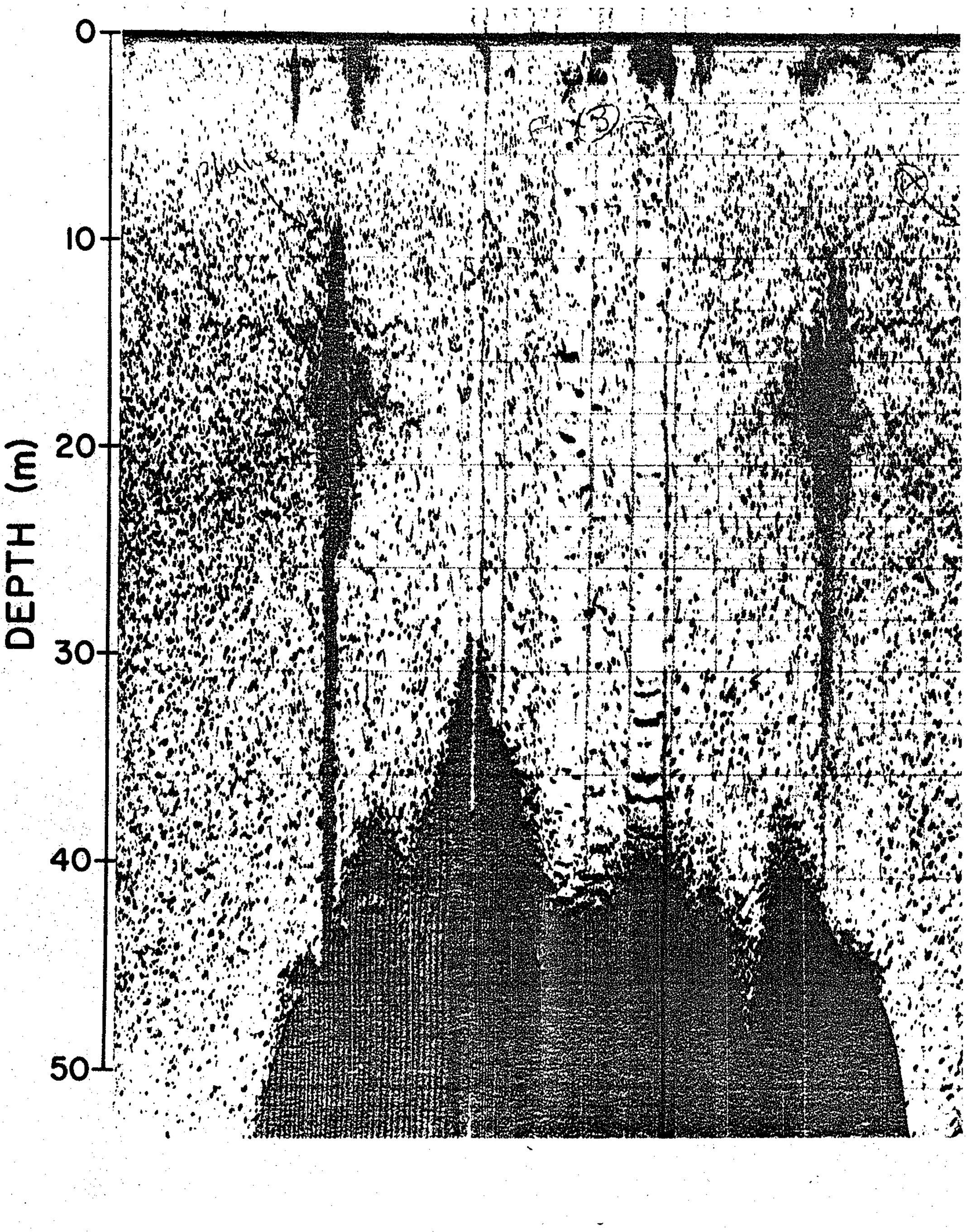
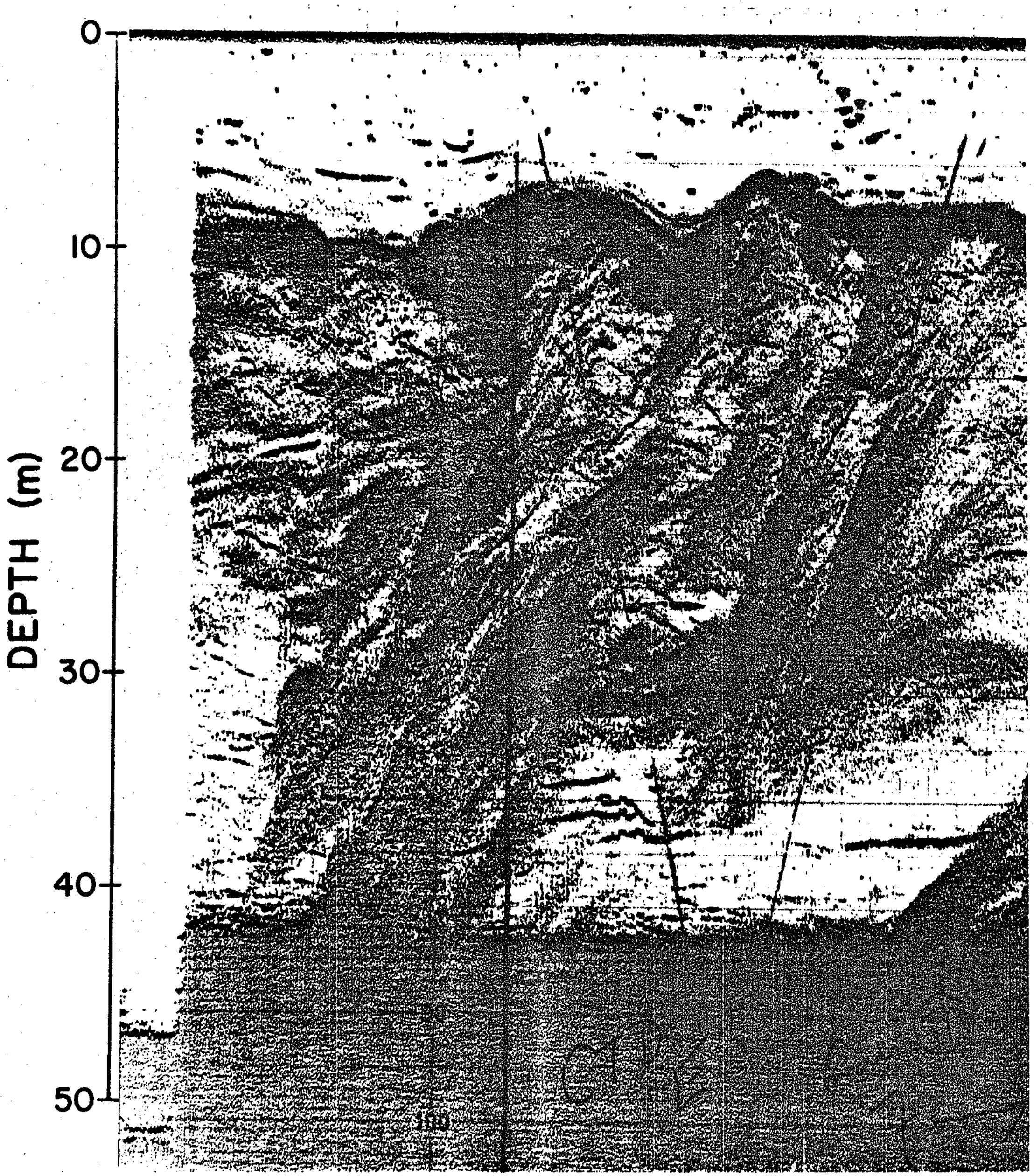


Fig. 7-2



SAFE: 1982 BOTTOM GRAB SAMPLES

by

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CRUISE OBJECTIVES

A) To ground truth geophysic data (sidescan sonar, high resolution Huntec^R).

B) To ground truth bottom photographs.

C) To qualify and quantify macro and micro benthic communities.

D) To ascertain the primary properties (grain size and composition) and associate organic parameters (inorganic and organic carbon).

METHOD

Grab samples were collected at most stations using a 40 X 40cm Van Veen^R or Shipek^R sampler. Three subsamples were taken from the surface layer (i.e. upper two to three cm of sediment) and one from the subsurface layer if the sample was not homogeneous. The surface subsamples were designated for foram, sedimentology and bacterial research. The subsurface sample was used strictly for sediment property analysis. Macrofauna samples were separated out of the grab and with the foram subsample treated with formalin (pH=8.3). The remainder of the sample was used to fill a 4-L plastic bag/ bucket. Sediment colour and sediment texture were described within minutes of the sample retrieval.

Size frequency distributions were obtained from all samples. The gravel fraction was separated from the finer fraction using a standard 2mm sieve. The sand fraction was separated from the mud using a 53 μm wet sieve. The sand fraction when greater than 4% by weight was analyzed for its equivalent spherical sedimentation diameter at 1/5 interval using the computerized Atlantic Geoscience Centre settling tube. The mud fraction was analyzed on a computerized sedigraph^R 5000D for the particles equivalent spherical sedimentation diameters at 1/50 interval over the range of 0.5μm to 63μm.

All bottom grab samples were subsampled for carbon determinations. Approximately 1-2 grams of sample were oven-dried and ground to a fine powder prior to weighing. This was to allow for replicate determinations. Samples of 250mg were accurately weighed into sample crucibles. For determinations of total carbon, samples were moistened with a few drops of deionized water and dried. This procedure "cakes" the sample to the bottom of the crucible and eliminates loss during combustion due to the high flow of oxygen in the combustion cylinder. For analyses of organic carbon, samples were digested with 1N hydrochloric acid to remove carbonates and other inorganic carbon. The residual HCl was removed from the samples with successive washings using deionized water. Samples were then analyzed on a Leco model/ WR-12 Carbon Determinator equipped with a Leco induction furnace. The percentage of carbon is displayed on a direct reading digital display. Detection limits of the WR-12 in the high range (0.010 to 5.000% C) is 0.002 or 1% of the reading, whichever is greater; and in the low range (0.0050 to 0.200% C) 0.005 or 1% of the reading, whichever is greater. The instrument is calibrated using a 1 gram iron ring reference standard. Since all samples are 1/4 the weight of a standard, the digital display readings for all samples are multiplied by a factor of 4.

Total nitrogen determinations of the grab samples were contracted to the Nova Scotia Research Foundation Corporation in Dartmouth, N.S. Analyses were performed by the "Kieldahl" method.

Washed subsamples were size fractionated by wet sieving (53 μm and 25 μm screens) and settling into 4 fractions >53 μm, 25-53 μm, 2-25 μm, and <2 μm). The fractions were mounted onto 10mm Ag-filters (Syvitski and Bayliss, 1980) and run at 40KV and 20 MA at 1° per minute on a X-ray diffractogram. Peak areas were digitized and the relative percentage calculated. This data report has not massaged the peak area percentages in terms of the intensities of identifier peaks or the Lorentz polarization factors.

In the laboratory, the wet volume of each foram subsample was measured by displacement and the material was then stained using a heated, saturated solution of Sudan Black B (Waker _et al_., 1974). After 30 minutes of staining, the sample was washed through a 63 um sieve with alcohol and dried. The dried residue was floated in a 10:4 mixture of bromoform and acetone to separate the foraminifera (Gibson and Walker, 1967).

RESULTS

Benthonic foraminifera were observed in 63 grab samples. Their relative abundance per species compared to the total population count is given in terms of ranges where R is 0.1 to 10.0% to 30.0% and a is 30.1% (Table 8.2). The total assemblage includes 81 arenaceous taxa, 39 calcareous taxa and 6 thecameobian species. Arenaceous species are the dominant types especially in Cambridge Fiord where they may exceed 85% of the total population. The mean percentage of arenaceous species for the ten fjords visited is 74%. In all fjords, total populations are dominated by either _Textularia earlandi_, _Spiroplectammina biformis_ or _Reophax arctica_.

Cassidulina reniforme can be considered dominant for the calcareous population in Coronation and Tingin Fiords. In general, the proportion of calcareous species in the total population is highest in Sunneshine, Inugsuin and Coronation Fiords. The total number of benthonic foraminifera tests per cc of wet sediment is highest in Sunneshine and in Iterbilung.

There is a general inverse trend among the foraminifera populations observed in the 10 fjords between the average total number of foraminifer per cc of wet sediment per fjord (TN/cc) and the relative % of living specimens per fjord (Fig. 8.1). If a relatively constant value is assumed for living population test production for all of the fjords, the higher TN/cc's are suggestive of comparatively low sedimentation rates. The relatively high average percentages of living specimens in several fjords should be related to one or more of the following factors: availability of food, absence of predators, and/or high sedimentation rates. All factors are present in these fjords. Preliminary observations suggest that there appears to be a scarcity of predators in terms of molluscs or other bottom-feeding macroinvertebrates (except worms). This observation is not surprising in light of the comparatively low total organic carbon concentrations in the bottom sediments which average $\gtrsim$1%. A relatively high sedimentation rate is probably among the key fractors controlling macroinvertebrate distributions and, indirectly, living foraminiferal population densities, since many organisms cannot cope with burial by sediments. The foraminifera observed in the fjords are primarily species that appear to be able to live successfully in such an environment.

The majority of the arenaceous species live in the surface "sludge" material which often tends to "float" above the sediment. Conversely, the calcareous species include species that tend to be active movers that are probably capable of digging out after burial by fine sediments. Other less active species may be able to recolonize the high sedimentation environments between peak influxes of sediment. Their distribution would therefore be much more irregular than that of the year-round indigenous assemblages.

Thecamoebians are present in the fjord samples, but total numbers of specimens per cc of wet sediment are very low compared to other temperate fjord environments, such as the Saguenay in Quebec. This may reflect the fact that the fresh water influx in the Baffin Island fjords is derived mostly from glacial and stream environments that art short-lived summer phenomena, or that the thecameobian species observed are approaching the limit of their environmental range.

References:

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Walker, D., Linton, A.E. and Schafer, C.T. 1974. Sudan Black B: A superior stain to Rose Bengal for distinguishing living from non-living foraminifera. Jour. Foram. Research 4:205-215.

RESULTS TO FOLLOW

Over the next several months we shall be writing up the findings of our statistical analysis (Q-mode cluster analysis) of the calcareous and arenaceous assemblages identified in the 1982 suite of grabs and will compare these results with similar data for the Bassin Island Shelf that has been provided by I.A. Hardy (AGC). This exercise will be followed by a factor analysis that will examine assemblage-environment relationships using the 1982 data base. A similar sequence of analysis will be used to evaluate the comparatively dense pattern of grab samples that we shall be collecting in Cambridge and Iterbilung Fiords during the 1983 field season. An initial evaluation of core 82031-IN3 is presently underway with a view to determining assemblage variations over the past 2500 years.

The Size Analyses of the remaining grab samples will be completed within the next month. Similar XRD analysis, as presented here for Cambridge, will be completed for selected other fiords with survey-type scans on the remaining fjords. The data will be presented more quantified in future reports.

ACKNOWLEDGEMENT

We wish to express our thanks to the many shipboard helpers of the grab sampling program.

TABLE 8-1 Carbon and Nitrogen Values of Some Grab Samples

SAMPLE ID	Total Carbon (%)	Organic Carbon (%)	Nitrogen (%)	Atomic C/N
SU-1-surf	0.86	ND	0.101	9.2
SU-1-sub	0.72	ND		
SU-5-surf	0.90	ND	ND	
SU-5-sub	0.89	ND		
SU-6-surf	0.45	ND	0.054	10.1
SU-6-sub	0.49	ND		
SU-7-surf	ND	ND	0.060	
SU-8-surf	0.18	ND	ND	
NP-1-surf	0.28	ND	0.032	9.0
NP-1-sub	0.22	ND		
NP-2-surf	0.54	ND	0.063	9.5
NP-2-sub	0.48	ND		
NP-3-surf	0.63	ND	ND	
NP-3-sub	0.67	ND		
CO-1-surf	0.07	ND	0.001	62
CO-1-sub	0.08	ND		
CO-2-surf	0.12	ND	0.012	13.1
CO-2-sub	0.14	ND		
CO-3-surf	0.24	ND	0.09	3.0
CO-4-surf	0.40	ND	ND	
MA-1-surf	0.09	ND	0.018	5.7
MA-2-surf	0.37	ND	ND	
MA-2-sub	0.20	ND	ND	
MA-5-surf	0.64	ND	0.068	8.9
MA-5-sub	0.40	ND		
MA-5A-surf	0.68	ND	0.080	8.9
MA-5A-sub	0.55	ND		
MA-6A-surf	1.90	1.70	ND	
MA-6A-sub	1.82	1.63	ND	
MA-7-surf	1.76	1.47	ND	
MA-7-sub	1.76	1.47	ND	
TI-1A-surf	0.41	ND	0.020	21.7
TI-1A-sub	0.32	ND		
TI-2-surf	0.61	ND	0.037	19.4
TI-2-sub	0.63	ND		
TI-3-surf	1.35	1.31	ND	
TI-3-sub	1.13	1.13	ND	
TI-6-surf	1.88	1.30	ND	
TI-6-sub	1.85	1.26		

TABLE 8-1 Con'd

SAMPLE ID	Total Carbon (%)	Organic Carbon (%)	Nitrogen (%)	Atomic C/N
IT-1-surf	0.54	ND	0.022	25.4
IT-1-sub	0.43	ND		
IT-2-surf	0.30	ND	ND	
IT-2-sub	0.32	ND		
IT-3-surf	1.21	1.18	0.145	9.0
IT-3-sub	1.04	1.00		
IT-4-surf	0.88	ND	ND	
IT-4-sub	0.88	ND		
IT-8-surf	1.33	1.14	ND	
MC-1-surf	0.80	ND	0.079	11.0
MC-1-sub	0.69	ND		
MC-3-surf	0.41	ND	ND	
MC-3-sub	0.40	ND		
MC-4-surf	0.41	ND	0.044	9.7
MC-4 sub	0.33	ND		
MC-5-surf	0.75	ND	0.068	10.9
MC-5-sub	0.53	ND		
MC-6-surf	1.06	0.96	ND	
MC-6-sub	0.95	ND		
MC-7-surf	1.18	1.08	ND	
MC-8-surf	1.82	1.70	ND	
MC-8-sub	1.77	1.64	ND	
MC-9-surf	1.34	1.27	ND	
MC-9-sub	1.22	1.17	ND	
MC-11-surf	1.99	1.65	ND	
MC-11-sub	1.95	1.61	ND	
IN-1-surf	0.31	ND	0.075	4.8
IN-2-surf	0.46	ND	0.016	25.1
IN-2-sub	0.24	ND		
IN-3-surf	0.56	ND		
IN-3-sub	0.31	ND		
IN-4-surf	0.52	ND		
IN-4-sub	0.39	ND		
IN-5-surf	0.47	ND		
IN-5-sub	0.45	ND		
IN-6-surf	1.34	1.34		
IN-6-sub	1.17	1.16		
IN-7-surf	0.94	ND		
IN-7-sub	0.72	ND		
IN-8-sub	1.13	0.90		

TABLE 8-1 Con'd

SAMPLE ID	Total Carbon (%)	Organic Carbon (%)	Nitrogen (%)	Atomic C/N
CL-1-surf	0.26	ND	0.037	9.5
CL-1-sub	0.34	ND		
CL-2-surf	0.26	ND	0.021	14.5
CL-2-sub	0.26	ND		
CL-3-surf	0.44	ND		
CL-3-sub	0.38	ND		
CL-4-surf	0.06	ND		
CL-4-sub	0.23	ND		
CL-5-surf	0.43	ND		
CL-5-sub	0.08	ND		
CL-6-surf	0.44	ND		
CL-6-sub	0.24	ND		
CL-7-surf	0.60	ND		
CL-7-sub	0.56	ND		
CL-8-surf	1.40	0.84		
CL-8-sub	1.40	0.73		
CA-1-surf	0.71	ND	0.064	11.9
CA-1-sub	0.60	ND		
CA-2-surf	0.86	ND	0.093	9.9
CA-2-sub	0.72	ND		
CA-3-surf	0.50	ND	0.052	10.1
CA-3 sub	0.40	ND		
CA-4-surf	0.51	ND	0.041	12.8
CA-4-sub	0.40	ND		
CA-5-surf	0.32	ND	0.038	10.0
CA-5-sub	0.34	ND		
CA-6-surf	0.34	ND	0.024	14.6
CA-6-sub	0.26	ND		
CA-7-surf	0.49	ND	0.025	21.7
CA-7-sub	0.42	ND		
CA-8-surf	0.59	ND	0.048	15.8
CA-8-sub	0.72	WD		
CA-9-surf	1.70	0.88	0.083	24.1
CA-9-sub	1.70	0.75		

ND = No Data

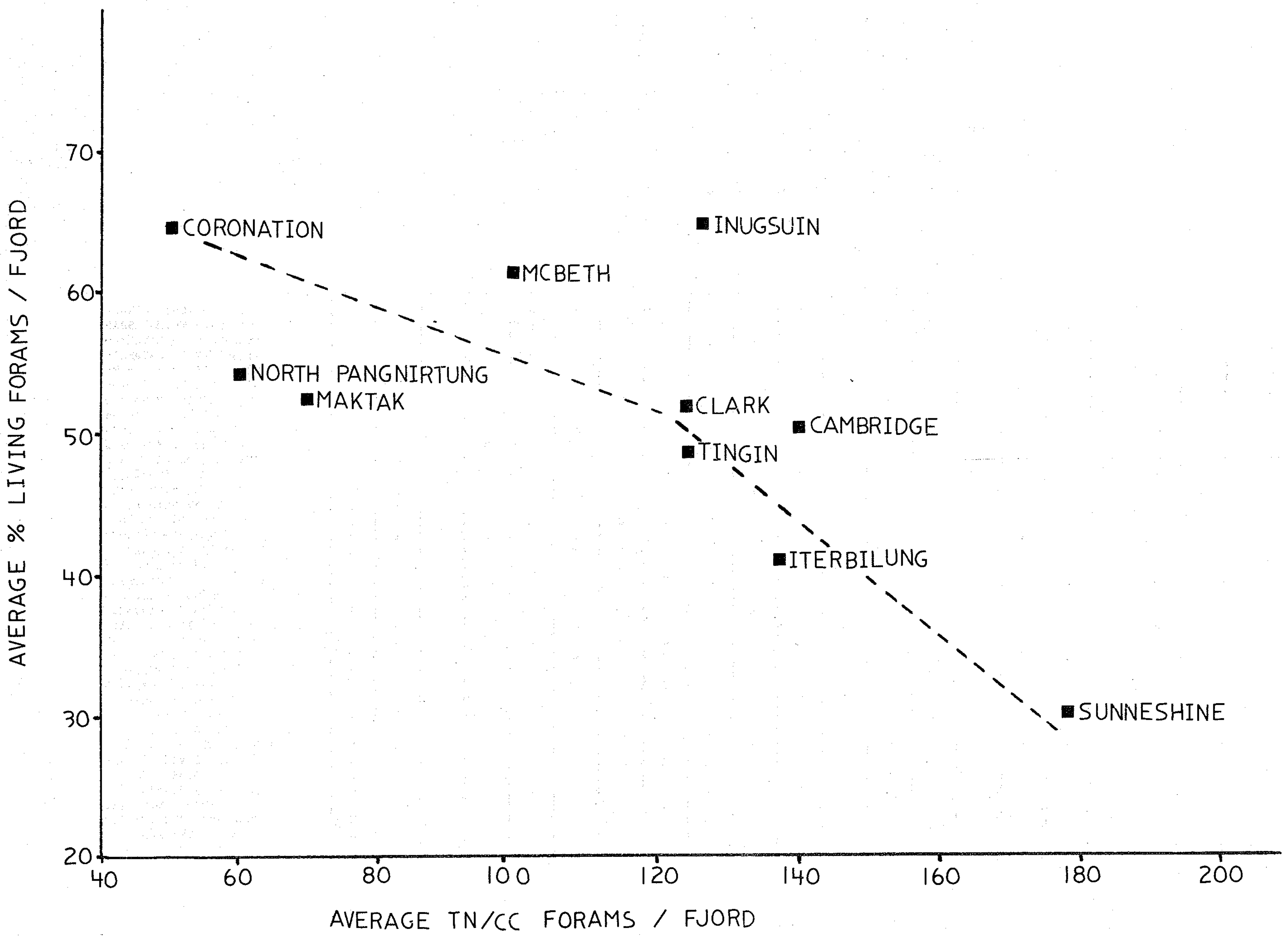

CORONATION
INUGSUIN
MCBETH
NORTH PANGNIRTUNG
MAKTAK
CLARK
CAMBRIDGE
TINGIN
ITERBILUNG
SUNNESHINE
70
60
50
40
30
20
40
60
80
100
120
140
160
180
200
AVERAGE % LIVING FORAMS / FJORD
AVERAGE TN/CC FORAMS / FJORD

FIG. 8-1

82031 BAFFIN FJORD SAMPLES (TOTAL REL. %)

STATION	SU-7	NP-1	CO-1	MA-1	SU-6	SU-5	IN-1	SU-8	IT-1	IN-2	CL-1	SU-1	CL-2	CO-2	CO-2A	MC-11	MA-2	CL-3	IN-6	CO-3	MC-8	TI-1A
DEPTH (m)	67	80	90	90	117	155	160	160	167	183	192	215	234	248	248	250	252	256	267	269	290	302
SPECIES TN/CC	222.4	29.8	0.14	4.3	143.5	49.8	40.4	378.7	61.0	106.0	116.3	92.9	86.3	3.8	4.9	129.6	81.5	225.7	52.9	89.9	74.0	160.6
HIPPOCREPINA INDIVISA	R																					
EOEPONIDELLA PULCHELLA	R							R			R					R		R				
TRIFARINA FLUENS	R							R														
SPIROPLECTAMMINA TYPICA	R				R			R	R		R											
BUCCELLA FRIGIDA	R							R		R								R				
BULIMINELLA ELEGANTISSIMA	R								R									R				
HEMISPHAERAMMINA BRADYI	R	R				R			R	R			R			R	R	R	R	R	R	R
ASTRONONION GALLOWAYI	R							R	R		R											
CASSIDULINA RENIFORME	R	C		C				R	C	R		R		R	C		R	R		R		R
CRIBROSTOMOIDES JEFFRESYI	R				R	R		R	R		R	R			R				R	R		R
CIBICIDES LOBATULUS	R							A												R		
GLOMOSPIRA GORDIALIS	R				R		R												R	R	R	
TROCHAMMINA OCHRACEA GP.	R				R	R		R								R		R			R	R
SPIROPLECTAMMINA BIFORMIS	R	R	C	A	C	C	A	R	R	C	C	C	C	C	R	R	C	C	C	C	C	R
CRIBROSTOMOIDES CRASSIMARGO	R	C			R	R					R	R	R			R	R	R	R	R	R	R
ADERCOTRYMA GLOMERATA	R	R			R	R	R	R		R	R	C	R			C	R	C	R	R	R	R
EGGERELLA ADVENA	A				C	R		R				R				R					R	
ELPHIDIUM EXCAVATUM GP.	R						R	R	R		R			R			R	R		R		R
ISLANDIELLA HELENAE	R						R	R	R		R						R			R		
RECURVOIDES TURBINATUS	R				R	R	R	R		R	R	R	R			R	R	R	R	R	R	R
REOPHAX ARCTICA	C	R		R	C	C	C	R	R	C	R	C	C			C	C	C	R	R	C	R
REOPHAX FUSIFORMIS	R	R			R	R	R	R	R	R	R	R	R	R		R	R	R	C	R	R	R
SACCAMMINA ATLANTICA	R	R			R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
TEXTULARIA TORQUATA	R	R			C	C	C	R	R	R	R	C	R		C	C	R	R	R	R	C	R
TROCHAMMINA NANA	R	R				R		R	R	R	C		C		R	R	C	C	R	C	R	C
VIRGULINA FUSIFORMIS	R	R	C				R			C	R	R					R	R	R	R		R
TEXTULARIA EARLANDI		C	C	C	R	R	C	R	A	R	A		C	A	A	R	A	C	R	A	R	C
THURAMMINA FAERLEENSIS		C	C	C		R			R	R			R				R	R	R	R		R
BATHYSIPHON OBLONGA				R																		
SILICOSIGMOILINA GROENLANDICA				R	R	R	R		R	R	R	R	R	R		R	R	R	R		R	R
AMMOTIUM CASSIS					R																	
BATHYSIPHON HIRUDINEA					R				R	R					R							
HYPERAMMINA CYLINDRICA					R																	
HYPERAMMINA SUBNODOSA					R		R			R		R							R			
HYPERAMMINA FRAGILIS		R			R												R			R		R
VERNEUILINOIDES EUROPEUM					R	R	R		R	R	R	R	R			R	R	R	R		R	R

TABLE 8-2

	STATION	IT-4	CA-2	IT-2	MC-1	MC-9	NP-3	MA-4	IN-8	TI-2	NP-2	CO-4	CA-3	CA-7	IN-7	IT-3	MC-6	MC-3	CA-1	CA-4	TI-3	CO-5	MC-7
	DEPTH (m)	303	316	320	322	326	333	333	338	347	347	356	366	398	417	417	425	432	476	476	487	495	497
SPECIES	TN/CC	217.9	319.7	114.7	106.6	73.6	94.6	86.2	68.9	166.5	54.5	126.7	105.1	238.0	96.0	155.6	93.8	127.6	96.5	174.7	145.4	74.4	91.3
HIPPOCREPINA INDIVISA																							
EOEPONIDELLA PULCHELLA		R								R													
TRIFARINA FLUENS																R							
SPIROPLECTAMMINA TYPICA														R									
BUCCELLA FRIGIDA		R		R								R									R		R
BULIMINELLA ELEGANTISSIMA			R	R						R					R	R					R		R
HEMISPHAERAMMINA BRADYI		R		R	R	R		R	R		R	R	R	R	R	R	R		R				R
ASTRONONION GALLOWAYI										R				R		R							
CASSIDULINA RENIFORME			R	R						R		R			R	R					R		R
CRIBROSTOMOIDES JEFFRESYI		R	R				R		R				R	R			R		R	R	R	R	
CIBICIDES LOBATULUS				R								R											
GLOMOSPIRA GORDIALIS		R	R	R					R				R	R			R			R		R	
TROCHAMMINA OCHRACEA GP.		R							R				R		R				R			R	
SPIROPLECTAMMINA BIFORMIS		C	C	C	R	R	R	R	R	R	R	R	R	R	R	C	R	R	R	R	R	R	R
CRIBROSTOMOIDES CRASSIMARGO		R	R			R	R	R		R		R	R	R	R			R	R	C	R	R	R
ADERCOTRYMA GLOMERATA		C	C	R		C	C	R	C	C	R	R	R	R	C	C	C	R	C	R	C	C	C
EGGERELLA ADVENA		R	R						R						R		R						
ELPHIDIUM EXCAVATUM GP.				R					R	R		R			R	R	R				R		
ISLANDIELLA HELENAE		R	R	R						R		R				R							R
RECURVOIDES TURBINATUS			C	R	R	R	R	R	R	R	R	R	R	R	R		R	C	R	R	R	R	R
REOPHAX ARCTICA		C	R	R	C	R	R	R	C	R	R	R	R	R	C	C	R	R	C	R	C	R	R
REOPHAX FUSIFORMIS		R	R	C	R	C	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
SACCAMMINA ATLANTICA		R	R	R	C	C	R	R	C	R	C	R	R	R	R	R	C	R	R	R	R	R	R
TEXTULARIA TORQUATA		C	R	R	R	R	C	R	C	R	R	R	R	R	R	R	R	R	C	R	R	R	R
TROCHAMMINA NANA		R	R	R	C	R	C	C	R	C	C	C	C	C	R	C	C	R	R	C	C	C	C
VIRGULINA FUSIFORMIS		R	R	R						R		R	R	R	R	R	R			R			R
TEXTULARIA EARLANDI		C	C	C	A	R	R	C	R	A	C	C	C	C	R	C	C	A	R	C	C	C	C
THURAMMINA FAERLEENSIS		R	R	R	R	R	R	R	R	R	R	R		R	R	R	R	R		R	R		R
BATHYSIPHON OBLONGA																							
SILICOSIGMOILINA GROENLANDICA		R	R	R	R	R	R	R	R	R		R		R	R	R		R	R	R	R	R	R
AMMOTIUM CASSIS																							
BATHYSIPHON HIRUDINEA															R			R					
HYPERAMMINA CYLINDRICA													R	R									
HYPERAMMINA SUBNODOSA		R		R		R	R		R						R	R	R				R	R	R
HYPERAMMINA FRAGILIS		R			R	R		R	R		R	R	R	R	R	R	R	R				R	
VERNEUILINOIDES EUROPEUM		R	R	R	R	R		R	R	R	R			R		R		R	R		R	R	R

TABLE 8-2 Con'd

	STATION	IN-5	MC-4	CL-4	CL-6	IN-3	IN-4	MC-5	MA-5A	CA-5	MA-5	MA-7	CA-9	CA-6	MA-6A	CA-8	CA-5	CL-7	CL-8	TI-6
	DEPTH (m)	503	530	530	552	557	570	572	575	575	585	585	610	640	670	681	683	685	755	800
SPECIES	TN/CC	143.7	146.7	43.2	106.1	138.2	344.3	48.1	56.6	81.7	96.1	146.0	43.9	81.6	53.0	120.9	1.1	210.6	200.2	
HIPPOCREPINA INDIVISA																				
EOEPONIDELLA PULCHELLA																				
TRIFARINA FLUENS																				
SPIROPLECTAMMINA TYPICA																				
BUCCELLA FRIGIDA		R						R												
BULIMINELLA ELEGANTISSIMA													R							
HEMISPHAERAMMINA BRADYI		R		R	R	R		R	R	R		R				R				
ASTRONONION GALLOWAYI											R									
CASSIDULINA RENIFORME											R									
CRIBROSTOMOIDES JEFFRESYI		R		R		R			R	R	R	R	R	R	R	R				
CIBICIDES LOBATULUS											R						R		R	
GLOMOSPIRA GORDIALIS			R					R		R	R	R	R	R		R			R	
TROCHAMMINA OCHRACEA GP.					R					R	R	R			R			R		R
SPIROPLECTAMMINA BIFORMIS		A	C	C	R	C	A	R	R	R	R	R		R	R	R		R		R
CRIBROSTOMOIDES CRASSIMARGO		A	R	R	R	R	R			R	R	R		R	R	R		R		R
ADERCOTRYMA GLOMERATA		A	R	C	C	R	R	R	C	R	R	C	R	R	A	R	R	R		R
EGGERELLA ADVENA			R		R						R	R			R					R
ELPHIDIUM EXCAVATUM GP.					R			R			R							R		R
ISLANDIELLA HELENAE								R							R					R
RECURVOIDES TURBINATUS		R	R	R	R	C	R	R	R	R	R	R	R	R		R		R	R	R
REOPHAX ARCTICA		C	R	R	R	C	C	R	C	R	C	R	R	R	R	R	R	R	R	R
REOPHAX FUSIFORMIS		R	R	R	C	R	R	R	R	R	R	R	R	R	R	C	R	R	R	R
SACCAMMINA ATLANTICA		R	R	R	R	R	R	C	R	R	R	R	R	R	R	C	R	R	R	R
TEXTULARIA TORQUATA		C	R	R	R	C	R	R	R	R	R	R	R	R	C	R	R	R	R	C
TROCHAMMINA NANA		R	C	R	C	R	R	R	C	C	C	C	C	C	R	R	R	R	R	R
VIRGULINA FUSIFORMIS								R			R		R	R	R		R			R
TEXTULARIA EARLANDI		R	A	A	C	C	R	A	C	A	C	R	R	A	R	C	C	C	R	R
THURAMMINA FAERLEENSIS		R	R	R	R	R	R		R	R	R	R	R	R		R		R	R	R
BATHYSIPHON OBLONGA																				
SILICOSIGMOILINA GROENLANDICA		R	R	R	R	R	R		R	R	R	R		R	R	R	R	R	R	R
AMMOTIUM CASSIS																				
BATHYSIPHON HIRUDINEA		R					R						R							
HYPERAMMINA CYLINDRICA					R							R		R		R				
HYPERAMMINA SUBNODOSA		R				R	R	R	R		R	R		R	R				R	
HYPERAMMINA FRAGILIS					R	R		R	R		R	R	R			R		R	R	R
VERNEUILINOIDES EUROPEUM		R	R	R	R	R	R		R		R	R		R	R		R			R

TABLE 8-2 Con'd

STATION	SU-7	NP-1	CO-1	MA-1	SU-6	SU-5	IN-1	SU-8	IT-1	IN-2	CL-1	SU-1	CL-2	CO-2	CO-2A	MC-11	MA-2	CL-3	IN-6	CO-3	MC-8	TI-1A
DEPTH (m)																						
TN/CC																						
SPECIES																						
RECURVOIDES CONTORTUS						R																
TROCHAMMINA GLOBIGERINIFORMIS PYGMAEA						R																
REOPHAX GRACILIS							R															
REOPHAX CATENATA							R		R	R			R	C	R	R	R		R		R	R
BOTELLINA LABYRINTHICA							R															
PSAMMOSPHAERA FUSCA							R	R														
FISSURINA LUCIDA								R														
GLABRATELLA WRIGHTII								R														
HYPERAMMINA ELONGATA								R														
LAGENA SEMILINEATA								R														
NONIONELLA AURICULA								R														
PROTELPHIDIUM ORBICULARE								R		R												
PROTELPHIDIUM NANUM								R		R												
TRILOCULINA TRIHEDRA								R														
MARSIPELLA ELONGATA								R														
ISLANDIELLA NORCROSSI								R	R	R							R			R		
BOLIVINA PSEUDOPUNCTATA								R	R													
MELONIS ZAANDAMAE								R										R				R
PLANKTONICS								R			R											
MARSIPELLA CYLINDRICA									R													
TRILOCULINA OBLONGA		R							R													
VIRGULINA CONCAVA		R							R	R				R					R			
DENDROPHRYA ARBORESCENS									R		R					R	R					
PYRGO SUBSPHAERICA											R						R					
DENTALINA FROBISHERENSIS										R												
PSEUDONODOSARIA ROTUNDATA										R												
ROSERTINOIDES CHARLOTTENSIS										R												
GUTTULINA LACTEA										R												
TEXTULARIA GRACILLIMA										R	R		R	R				R		R	R	R
URNULINA DIFFLUGIFORMIS		C				R						R		R			R		R	R		
DENTALINA PAUPERATA																	R					
STETSONIA HORVATHI																	R					
TROCHAMMINA INFLATA						R											R	R		R		
SACCORHIZA RAMOSA										R							R		R			
TROCHAMMINA BULLATA																	R					

TABLE 8-3 Con'd

STATION	IT-4	CA-2	IT-2	MC-1	MC-9	NP-3	MA-4	IN-8	TI-2	NP-2	CO-4	CA-3	CA-7	IN-7	IT-3	MC-6	MC-3	CA-1	CA-4	TI-3	CO-5	MC-7
DEPTH (m)																						
TN/CC																						
SPECIES																						
RECURVOIDES CONTORTUS													R									
TROCHAMMINA GLOBIGERINIFORMIS PYGMAEA								R											R	R		
REOPHAX GRACILIS																						
REOPHAX CATENATA		R	R	R	R		R	R		R				R	R					R	R	R
BOTELLINA LABYRINTHICA												R									R	
PSAMMOSPHAERA FUSCA			R									R	R						R			
FISSURINA LUCIDA																						
GLABRATELLA WRIGHTII																						
HYPERAMMINA ELONGATA													R									
LAGENA SEMILINEATA																						
NONIONELLA AURICULA																						
PROTELPHIDIUM ORBICULARE														R						R		
PROTELPHIDIUM NANUM																						
TRILOCULINA TRIHEDRA																						
MARSIPELLA ELONGATA	R																					
ISLANDIELLA NORCROSSI														R								
BOLIVINA PSEUDOPUNCTATA	R	R												R	R	R				R		
MELONIS ZAANDAMAE									R		R		R	R		R			R	R		R
PLANKTONICS	R								R		R				R							
MARSIPELLA CYLINDRICA																						
TRILOCULINA OBLONGA										R												
VIRGULINA CONCAVA		R	R							R										R		R
DENDROPHRYA ARBORESCENS	R		R															R				
PYRGO SUBSPHAERICA																						
DENTALINA FROBISHERENSIS																						
PSEUDONODOSARIA ROTUNDATA																						
ROSERTINOIDES CHARLOTTENSIS																						
GUTTULINA LACTEA																						
TEXTULARIA GRACILLIMA		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R			R	R	R	R
URNULINA DIFFLUGIFORMIS				R			R			C	R								R			
DENTALINA PAUPERATA																						
STETSONIA HORVATHI			R						R		R				R							
TROCHAMMINA INFLATA						R	R			R	R	R	R					R	R		R	
SACCORHIZA RAMOSA																						
TROCHAMMINA BULLATA						R													R			

TABLE 8-3 Con'd

STATION	IN-5	MC-4	CL-4	CL-6	IN-3	IN-4	MC-5	MA-5A	CA-5	MA-5	MA-7	CA-9	CA-6	MA-6A	CA-8	CL-5	CL-7	CL-8	TI-6
DEPTH (m)																			
SPECIES TN/CC																			
RECURVOIDES CONTORTUS												R							
TROCHAMMINA GLOBIGERINIFORMIS PYGMAEA				R					R								R		
REOPHAX GRACILIS																			
REOPHAX CATENATA	R	R		R	R	R	R	R	R	R	R				R				
BOTELLINA LABYRINTHICA											R	R		R			R	R	
PSAMMOSPHAERA FUSCA				R													R		
FISSURINA LUCIDA																			
GLABRATELLA WRIGHTII																			
HYPERAMMINA ELONGATA				R															
LAGENA SEMILINEATA																			
NONIONELLA AURICULA																			
PROTELPHIDIUM ORBICULARE																			
PROTELPHIDIUM NANUM																			
TRILOCULINA TRIHEDRA																			
MARSIPELLA ELONGATA													R						
ISLANDIELLA NORCROSSI																			
BOLIVINA PSEUDOPUNCTATA							R							R		R			R
MELONIS ZAANDAMAE									R	R		R	R	R	R		R	R	R
PLANKTONICS													R	R				R	R
MARSIPELLA CYLINDRICA																			
TRILOCULINA OBLONGA																			
VIRGULINA CONCAVA																			R
DENDROPHRYA ARBORESCENS							R			R			R		R			R	R
PYRGO SUBSPHAERICA																			
DENTALINA FROBISHERENSIS							R												
PSEUDONODOSARIA ROTUNDATA																			
ROSERTINOIDES CHARLOTTENSIS																			
GUTTULINA LACTEA																			
TEXTULARIA GRACILLIMA		R	R	R			R	R	R	R	R	R	R	R	R	R	R	R	R
URNULINA DIFFLUGIFORMIS								R		R	R								
DENTALINA PAUPERATA																			
STETSONIA HORVATHI										R						R			
TROCHAMMINA INFLATA								R	R	R			R	R		R	R	R	
SACCORHIZA RAMOSA				R							R	R	R		R		R	R	R
TROCHAMMINA BULLATA							R							R					R

TABLE 8-3 Con'd

STATION	SU-7	NP-1	CO-1	MA-1	SU-6	SU-5	IN-1	SU-8	IT-1	IN-2	CL-1	SU-1	CL-2	CO-2	CO-2A	MC-11	MA-2	CL-3	IN-6	CO-3	MC-8	TI-1A
DEPTH (m)																						
SPECIES TN/CC																						
PYRGO WILLIAMSONI														R	R					R		
REOPHAX SCOTTI						R														R		
SACCAMMINA SPHAERICA						R				R										R		R
AMMODISCUS PLANUS		R				R				R			R					R	R			
REOPHAX DIFFLUGIFORMIS																						
GLOBOBULIMINA AURICULATA																						
QUINQUELOCULINA SEMINULUM		R																				
TROCHAMMINA GLOBIGERINIFORMIS													R	R		R		R	R			
TROCHAMMINA NITIDA																						
BRACHYSIPHON SP. NOV.																						
LARYNGOSIGMA HYALASCIDIA																						
CENTROPYXIS ARENATUS														R								
BATHYSIPHON FILIFORMIS										R												
TROCHAMMINA QUADRILOBA													R									
BATHYSIPHON ALBA																						
ELPHIDIUM SUBARCTICUM																						
ASTRORHIZA ARENARIA																						
NONIONELLA ATLANTICA																						
RHABDAMMINA ABYSSORUM																						
CRITHIONINA GOESI																			R			
PELOSINA DIDERA																						
ASTRORHIZA LIMICOLA																						
TOLYPAMMINA VAGANS																						
HORMOSINA OVICULA MEXICANA																						
CRIBROSTOMOIDES WIESNERI																						
CRITHIONINA PISUM HISPIDA																R						
REOPHAX PILULIFERA																						
NONIONELLINA LABRADORICA																						
CENTROPYXIS EXCENTRICUS																						R
DIFFLUGIA CAPREOLATA																						
REOPHAX NODULOSA																						
THURAMMINA PAPILLATA																						
TROCHAMMINA COMPACTA																						
CRIBROSTOMOIDES SUBGLOBOSUM																						
REOPHAX ROSTRATA																						

TABLE 8-3 Con'd

SPECIES STATION	IT-4	CA-2	IT-2	MC-1	MC-9	NP-3	MA-4	IN-8	TI-2	NP-2	CO-4	CA-3	CA-7	IN-7	IT-3A	MC-6	MC-3	CA-1	CA-4	TI-3	CO-5	MC-7
DEPTH (m)																						
TN/CC																						
PYRGO WILLIAMSONI																						
REOPHAX SCOTTI																				R		
SACCAMMINA SPAHERICA											R			R							R	
AMMODISCUS PLANUS	R	R				R		R		R			R	R		R			R			R
REOPHAX DIFFLUGIFORMIS	R																					
GLOBOBULIMINA AURICULATA		R																				
QUINQUELOCULINA SEMINULUM		R																				
TROCHAMMINA GLOBIGERINIFORMIS		R	R	R		R	R			R		R	R	R		R	R		R		R	R
TROCHAMMINA NITIDA		R																				
BRACHYSIPHON SP. NOV.			R															R				
LARYNGOSIGMA HYALASCIDIA			R																			
CENTROPYXIS ARENATUS			R	R								R										R
BATHYSIPHON FILIFORMIS			R																R	R		
TROCHAMMINA QUADRILOBA									R										R			
BATHYSIPHON ALBA								R			R	R										
ELPHIDIUM SUBARCTICUM											R											
ASTRORHIZA ARENARIA						R				R	R	R	R						R		R	
NONIONELLA ATLANTICA											R											
RHABDAMMINA ABYSSORUM								R			R								R			
CRITHIONINA GOESI													R		R			R				
PELOSINA DIDERA															R							
ASTRORHIZA LIMICOLA							R					R	R						R		R	
TOLYPAMMINA VAGANS													R									
HORMOSINA OVICULA MEXICANA																						
CRIBROSTOMOIDES WIESNERI																		R				
CRITHIONINA PISUM HISPIDA													R									
REOPHAX PILULIFERA																						
NONIONELLINA LABRADORICA																						
CENTROPYXIS EXCENTRICUS																				R		
DIFFLUGIA CAPREOLATA																						
REOPHAX NODULOSA																						
THURAMMINA PAPILLATA																						
TROCHAMMINA COMPACTA																						
CRIBROSTOMOIDES SUBGLOBOSUM																						
REOPHAX ROSTRATA																						

TABLE 8-3 Con'd

SPECIES	STATION	IN-5	MC-4	CL-4	CL-6	IN-3	IN-4	MC-5	MA-5A	CA-5	MA-5	MA-7	CA-9	CA-6	MA-6A	CA-8	CL-5	CL-7	CL-8	TI-6
	DEPTH (m)																			
	TN/CC																			
PYRGO WILLIAMSONI													R							
REOPHAX SCOTTI																				
SACCAMMINA SPHAERICA		R				R			R		R	R		R		R				
AMMODISCUS PLANUS					R	R	R		R	R		R	R		R			R	R	R
REOPHAX DIFFLUGIFORMIS																R		R	R	R
GLOBOBULIMINA AURICULATA																				
QUINQUELOCULINA SEMINULUM																				
TROCHAMMINA GLOBIGERINIFORMIS			R		R		R		R	C	R	R	C	R	R			R	R	R
TROCHAMMINA NITIDA														R					R	R
BRACHYSIPHON SP. NOV.																				
LARYNGOSIGMA HYALASCIDIA																				
CENTROPYXIS ARENATUS		R	R	R																
BATHYSIPHON FILIFORMIS		R				R							R	R		R		R	R	C
TROCHAMMINA QUADRILOBA												R		R				R	R	R
BATHYSIPHON ALBA					R	R							R							
ELPHIDIUM SUBARCTICUM																				
ASTRORHIZA ARENARIA					R				R				R	R		R		R	R	R
NONIONELLA ATLANTICA		R									R						R		R	R
RHABDAMMINA ABYSSORUM														R		R		R	R	R
CRITHIONINA GOESI					R															
PELOSINA DIDERA																				R
ASTRORHIZA LIMICOLA					R				R	R	R		R			R		R		
TOLYPAMMINA VAGANS														R						
HORMOSINA OVICULA MEXICANA														R					R	
CRIBROSTOMOIDES WIESNERI													R	R				R	R	R
CRITHIONINA PISUM HISPIDA															R					
REOPHAX PILULIFERA															R	R				
NONIONELLINA LABRADORICA															R					R
CENTROPYXIS EXCENTRICUS				R													R			
DIFFLUGIA CAPREOLATA																	R			
REOPHAX NODULOSA																			R	
THURAMMINA PAPILLATA																			R	
TROCHAMMINA COMPACTA																			R	
CRIBROSTOMOIDES SUBGLOBOSUM																			R	R
REOPHAX ROSTRATA																			R	R

TABLE 8-3 Con'd

SPECIES	STATION	SU-7	NP-1	CO-1	MA-1	SU-6	SU-5	IN-1	SU-8	IT-1	IN-2	CL-1	SU-1	CL-2	CO-2	CO-2A	MC-11	MA-2	CL-3	IN-6	CO-3	MC-8	TI-1A
	DEPTH (m)																						
	N/CC																						
REOPHAX GUTTIFER																							
NONION GRATELOUPI																							
PONTIGULASIA COMPRESSA			R				R									R							
THOLOSINA BULLA			R																				
ASTRORHIZA ANGULARIS																							
SACCAMMINA SOCIALIS											R									R			
TROCHAMMINA MACRESCENS																							R
AMMODISCUS CATINUS																							
TURRITELLELLA SHONEANA																	R						
CRITHIONINA PISUM																	R			R			
QUINQUELOCULINA AGGLUTINATA																							
CASSIDULINA LAEVIGATA																			R				
AMMOBACULITES SP.																							
SACCAMMINA SP.																							
SACCAMMINA SPHAERICA CATENULA																							
CRIBROSTOMOIDES SCITULUS																							
HORMOSINA GLOBULIFERA																							
THOLOSINA SP.																							
MILIAMMINA FUSCA																							
THOLOSINA VESCICULARIS																							
GLOMOSPIRA CHAROIDES																							

TABLE 8-3 Con'd

STATION	IT-4	CA-2	IT-2	MC-1	MC-9	NP-3	MA-4	IN-8	TI-2	NP-2	CO-4	CA-3	CA-7	IN-7	IT-3	MC-6	MC-3	CA-1	CA-4	TI-3	CO-5	MC-7
DEPTH (m)																						
SPECIES N/CC																						
REOPHAX GUTTIFER													R						R			
NONION GRATELOUPI																						
PONTIGULASIA COMPRESSA										R												
THOLOSINA BULLA								R					R						R			
ASTRORHIZA ANGULARIS										R												
SACCAMMINA SOCIALIS							R						R									
TROCHAMMINA MACRESCENS																						
AMMODISCUS CATINUS																	R					
TURRITELLELLA SHONEANA																						
CRITHIONINA PISUM													R	R					R			
QUINQUELOCULINA AGGLUTINATA																						
CASSIDULINA LAEVIGATA													R									
AMMOBACULITES SP.																						
SACCAMMINA SP.																						
SACCAMMINA SPHAERICA CATENULA												R						R				
CRIBROSTOMOIDES SCITULUS																						
HORMOSINA GLOBULIFERA												R										
THOLOSINA SP.													R									
MILIAMMINA FUSCA																						
THOLOSINA VESCICULARIS																						
GLOMOSPIRA CHAROIDES																						

TABLE 8-3 Con'd

SPECIES	STATION	IN-5	MC-4	CL-4	CL-6	IN-3	IN-4	MC-5	MA-5A	CA-5	MA-5	MA-7	CA-9	CA-6	MA-6A	CA-8	CL-5	CL-7	CL-8	TI-6
	DEPTH (m)																			
	N/CC																			
REOPHAX GUTTIFER					R								R			R		C	C	C
NONION GRATELOUPI																				R
PONTIGULASIA COMPRESSA													R							
THOLOSINA BULLA					R													R		
ASTRORHIZA ANGULARIS																				
SACCAMMINA SOCIALIS												R								
TROCHAMMINA MACRESCENS																				
AMMODISCUS CATINUS																R				
TURRITELLELLA SHONEANA																				
CRITHIONINA PISUM																				
QUINQUELOCULINA AGGLUTINATA						R														
CASSIDULINA LAEVIGATA					R															
AMMOBACULITES SP.					R															
SACCAMMINA SP.					R															
SACCAMMINA SPHAERICA CATENULA					R								R					R		
CRIBROSTOMOIDES SCITULUS																		R		
HORMOSINA GLOBULIFERA																				
THOLOSINA SP.																				
MILIAMMINA FUSCA																R				
THOLOSINA VESCICULARIS																R				
GLOMOSPIRA CHAROIDES													R							

TABLE 8-3 Con'd

TABLE 8-4: GRAIN SIZE DATA

	SIZE FRACTIONS (%)					MOMENT STATISTICS (ϕ)				STATION NOTES
Sample ID	Gravel	Sand	Mud	Silt	Clay	$\bar{X}$	σ	Sk	Kurt	
SU-1-surf	1.8	8.8	89.4							silty clay
SU-1-sub	0.0	8.3	91.7							silty clay
SU-5-surf	0.0	14.9	85.1	57.0	28.1	6.49	2.23	-0.16	2.68	sandy clayey silt
SU-5-sub	0.0	13.7	86.3	58.4	27.9	6.59	2.07	0.22	2.09	sandy clayey silt
SU-6-surf	0.0	51.9	48.1	40.7	7.4	4.70	1.78	1.38	4.46	greenish grey muddy sand
SU-6-sub	0.0	52.0	48.0	40.7	7.3	4.69	1.75	1.36	4.39	no surf/subsurf distinction
SU-7										similar to SU-6 only coarser
SU-8	35.2	61.6	3.2							gravelly sand, gravel lag
NP-1-surf	0.0	1.6	98.4	37.0	61.4	8.04	1.56	-0.50	3.00	soupy brown mud
NP-1-sub	0.0	1.6	98.4	35.0	63.4	8.08	1.55	-0.53	3.20	compacted grey mud
NP-2-surf	0.0	1.9	98.1	24.5	73.6	8.38	1.42	-0.87	4.49	soupy brown mud
NP-2-sub	0.0	1.3	98.7	30.0	68.7	8.16	1.37	-0.73	3.95	firm mud with large worm tubes
NP-3-surf	0.0	2.5	97.5	27.5	70.0	8.29	1.43	-0.64	3.36	soupy brown mud
NP-3-sub	0.0	1.0	99.0	26.9	72.1	8.28	1.53	-0.87	3.77	firm grey layer
CO-1-surf	0.0	5.1	95.9	66.0	28.9	6.85	1.96	0.31	2.08	grey soupy clayey silt
CO-1-sub	0.0	5.3	94.7	59.4	35.3	7.04	1.77	0.39	2.24	no subsurf distinction
CO-2-surf	1.6	2.5	95.9	45.4	50.5	7.73	1.61	-0.07	2.45	greenish grey mud
CO-2-sub	0.0	1.8	98.2	46.2	52.0	7.77	1.67	-0.12	2.37	no subsurf distinction
CO-3	0.0	9.4	90.6	40.5	50.1	8.10	1.65	-0.53	3.00	no subsurf distinction
CO-4	0.9	5.0	94.1	43.6	49.5	7.89	1.74	-0.43	2.61	no subsurf distinction
CO-5										soupy top, compacted bottom

TABLE 8-4: Con'd

	SIZE FRACTIONS (%)					MOMENT STATISTICS (Ø)				STATION NOTES
Sample ID	Gravel	Sand	Mud	Silt	Clay	$\bar{X}$	σ	Sk	Kurt	
MA-1	0.0	9.0	91.0	57.3	33.7	6.86	2.19	-0.14	2.32	grey, clayey silt, homogeneous
MA-2-surf	0.0	3.0	97.0.	29.6	67.4	8.22	1.63	-0.73	3.18	soupy surface
MA-2-sub	0.2	2.0	97.8	44.0	53.8	7.70	1.67	-0.17	2.36	compacted bottom
MA-4										upper: soupy brown clayey silt lower: firm grey clayey silt
MA-5-surf	0.1	1.2	98.7	36.8	61.9	8.11	1.64	-0.53	2.81	soupey brown silty clay
MA-5-sub	0.2	2.6	97.2	43.5	53.7	7.69	1.78	-0.19	2.21	firm grey silty clay
MA-5A-surf	0.5	1.8	97.7	41.7	56.0	7.86	1.75	-0.34	2.38	soupy brown silty clay
MA-5A-sub	0.0	3.7	96.3	38.5	57.8	7.88	1.71	-0.37	2.46	firm grey silty clay
MA-6A-surf	0.2	7.4	92.4							silty clay
MA-6A-sub	0.2	7.4	92.4							silty clay
MA-7-surf	0.0	9.5	90.5							soupy brown mud
MA-7-sub	0.0	6.9	93.1							greenish grey mud
TI-1A-surf	0.0	44.9	55.1							soupy brown sandy mud
TI-1A-sub	0.0	51.4	48.6							greenish grey muddy sand
TI-2-surf	0.0	27.4	72.6							brown silty clay
TI-2-sub	2.7	12.4	84.9							grey silty clay
TI-3-surf	0.0	4.3	95.7							
TI-3-sub	0.0	3.5	96.5							
TI-6-surf	0.1	3.3	96.6							
TI-6-sub	0.0	3.6	96.4							
IT-1-surf	1.7	10.8	87.5	48.6	38.9	6.94	2.38	-0.55	2.70	soupy brown mud
IT-1-sub	9.3	30.3	60.4	45.4	15.0	5.61	2.39	0.46	2.15	grey mud with isolated sand
IT-2-surf	0.0	69.7	30.3	19.5	10.8	4.07	2.33	1.38	3.77	
IT-2-sub	0.2	66.8	33.0	20.7	12.3	4.19	2.42	1.24	3.29	
IT-3-surf	0.2	6.0	93.8	46.0	47.8	7.56	2.10	-0.57	2.72	soupy brown mud
IT-3-sub	13.4	8.8	77.8	41.0	36.8	7.26	2.24	-0.37	2.29	firm greenish grey mud
IT-4-surf	0.9	39.8	59.3	36.8	22.4	5.47	2.62	0.41	2.00	greenish homogeneous mud
IT-4-sub	0.4	35.4	64.2	39.6	24.6	5.73	2.57	0.37	1.92	
IT-8 surf	0.0	8.4	91.6	60.0	31.6	6.92	2.17	-0.31	2.68	

TABLE 8-4: Con'd

Sample ID	SIZE FRACTIONS (%)					MOMENT STATISTICS (Ø)				STATION NOTES
	Gravel	Sand	Mud	Silt	Clay	$\bar{X}$	σ	Sk	Kurt	
MC-1-surf	0.6	4.6	94.8	43.2	51.6	7.75	2.20	-1.23	5.02	first attempt was one boulder
MC-1-sub	0.3	3.9	95.8	46.9	48.9	7.68	2.05	-0.75	3.50	second attempt this sample
MC-3-surf	0.0	21.2	78.8	51.4	27.4	6.37	2.29	0.04	2.08	greenish grey mud
MC-3-sub	0.7	19.7	79.6	52.8	26.8	6.40	2.20	0.20	2.02	more compacted than surface
MC-4-surf	0.0	14.3	85.7	50.7	35.0	6.82	2.32	-0.19	2.17	top layer soupy
MC-4-sub	0.3	12.3	87.4	53.7	33.7	6.77	2.29	-0.13	2.13	one dropstone boulder
MC-5-surf	0.0	5.7	94.3	46.3	48.0	7.62	2.03	-0.58	2.74	soupy mud
MC-5-sub	0.0	6.0	94.0	49.8	44.2	7.41	2.16	-0.43	2.44	firmer below
MC-6-surf	0.0	7.1	92.9	44.4	48.5	7.56	2.14	-0.69	2.95	brown soupey mud
MC-6-sub	0.0	8.4	91.6	42.6	49.0	7.55	2.22	-0.61	2.68	firmer greenish grey mud
MC-7-surf	0.0	8.3	91.7	41.7	50.0	7.58	2.14	-0.67	2.67	grey homogeneous mud
MC-8-surf	0.5	10.5	89.0	49.8	39.2	7.09	2.08	-0.36	2.38	brown soupy mud
MC-8-sub	0.0	9.9	90.1	54.3	35.8	7.03	2.01	-0.22	2.25	grey compacted mud
MC-9-surf	0.0	3.3	96.7	46.6	50.1	7.68	2.02	-0.70	3.21	
MC-9-sub	2.9	5.8	91.3	41.9	49.4	7.71	2.06	-0.68	3.03	
MC-11-surf	0.0	12.6	87.4	54.7	32.7	6.70	2.18	-0.16	2.16	
MC-11-sub	0.0	14.1	85.9	51.4	34.4	6.80	2.19	-0.14	2.14	

TABLE 8-4: Con'd

Sample ID	SIZE FRACTIONS (%) Gravel	Sand	Mud	Silt	Clay	MOMENT STATISTICS (ϕ) $\bar{X}$	σ	Sk	Kurt	STATION NOTES
CL-1-surf	0.3	16.6	83.1	56.4	26.7	6.37	2.32	-0.13	2.43	thin veneer
CL-1-sub	2.1	11.3	86.6	55.3	31.3	6.72	2.23	-0.20	2.41	firm
CL-2-surf	0.1	25.0	73.9	50.6	23.2	5.96	2.44	0.16	2.03	homogeneous
CL-2-sub	0.7	28.0	72.0	49.9	22.1	5.85	2.46	0.18	2.05	homogeneous
CL-3-surf	0.7	4.4	94.9	52.1	42.8	7.50	1.68	0.05	2.22	one cobble
CL-3-sub	1.0	6.6	92.4	50.1	42.3					
CL-4-surf	0.0	81.8	18.2	17.0	1.2	3.64	1.00	2.51	15.2	sand with a thin cover of mud
CL-4-sub	0.0	27.5	72.5	58.4	14.1	5.44	2.01	0.93	3.01	
CL-5-surf	0.0	2.6	97.4	52.3	45.1	7.63	1.77	0.08	2.02	large silty clay
CL-5-sub	0.0	34.7	65.3	63.3	2.0	4.53	0.02	2.5	9.45	firm grey mud with sand
CL-6-surf	0.1	25.8	74.1	49.4	23.7	6.00	2.41	0.21	2.01	1 to 2 cm of brown sandy mud
CL-6-sub	0.0	38.3	61.7	46.9	14.8	5.2	2.23	0.84	2.79	poorly sorted green sandy mud
CL-7-surf	1.0	5.8	93.2	50.2	43.0	7.41	2.19	-0.62	3.12	medium brown mud
CL-7-sub	0.4	9.5	90.1							green mud
CL-8-surf	0.0	10.0	90.0	43.2	46.8	7.26	2.42	-0.65	2.68	brown silty clay
CL-8-sub	0.0	7.3	92.7	42.0	50.7	7.54	2.28	-0.65	2.71	greenish mud

TABLE 8-4: Con'd

	SIZE FRACTIONS (%)					MOMENT STATISTICS (Ø)				STATION NOTES
Sample ID	Gravel	Sand	Mud	Silt	Clay	$\bar{X}$	σ	Sk	Kurt	
IN-1-surf	0.0	13.6	86.4							homogeneous silty clay
IN-2-surf	0.0	33.8	66.2							thin light brown mud
IN-2-sub	0.0	48.6	51.4							light grey medium sand
IN-3-surf	0.0	20.0	80.0							
IN-3-sub	0.0	38.6	61.4							
IN-4-surf	0.0	28.1	71.9							
IN-4-sub	0.0	29.3	70.7							muddy sand with mafics
IN-5-surf	0.0	51.6	48.4							silty mud rich in mafics
IN-5-sub	0.0	43.0	57.0							
IN-6-surf	0.0	3.8	96.2							silty clay
IN-6-sub	0.6	8.6	90.8							sandy mud
IN-7-surf	0.0	26.0	74.0							homogeneous mud
IN-7-sub	0.0	30.4	69.6							
IN-8-sub	0.0	11.7	88.3							brown mud
										greenish grey compacted mud.

TABLE 8-4: Con'd

	SIZE FRACTIONS (%)					MOMENT STATISTICS (ϕ)				STATION NOTES
Sample ID	Gravel	Sand	Mud	Silt	Clay	$\overline{X}$	σ	Sk	Kurt	
CA-1-surf	2.7	15.4	81.9	48.7	33.2	6.45	2.92	-0.66	2.61	medium brown mud
CA-1-sub	0.2	7.2	92.6	57.0	35.6	7.05	2.26	-0.50	2.96	olive green mud
CA-1-NG	0.0	3.8	96.2	67.8	28.4	7.02	1.81	-0.03	2.84	1 KU grab sampler
CA-2-surf	8.4	18.4	73.2	38.0	35.2	6.22	3.36	-0.62	2.15	sandy mud
CA-2-sub	11.0	9.2	79.8	43.0	36.8	7.10	2.71	-0.91	3.17	
CA-3-surf	5.4	19.1	75.5	48.9	26.6	6.01	3.07	-0.45	2.24	laden ice-rafted material
CA-3-sub	2.6	18.8	78.6	48.1	30.5	6.39	2.84	-0.40	2.34	
CA-4-surf	1.3	19.7	79.0	59.8	19.2	5.85	2.92	-0.23	2.10	oxidized, contains dropstones
CA-4-sub	25.1	16.3	58.6	32.4	26.2	5.82	3.46	-0.57	2.12	
CA-5-surf	4.5	26.1	69.4	48.8	20.6	5.81	2.74	-0.03	2.10	ice-rafted debris
CA-5-sub	0.7	16.0	83.3	60.1	23.2	6.33	2.50	-0.16	2.44	olive green mud
CA-6-surf	7.1	19.9	73.0	44.5	28.5	6.08	2.96	-0.46	2.44	3mm of brown mud
CA-6-sub	0.6	21.2	78.2	60.5	17.7	6.06	2.51	0.02	2.10	
CA-7-surf	0.9	16.2	82.9	54.2	28.7	6.39	2.73	-0.38	2.38	thin brown surface layer
CA-7-sub	2.9	14.6	82.5	59.3	23.2	6.39	2.62	-0.34	2.47	green mud, pebbles
CA-8-surf	0.0	19.4	80.6	49.6	31.0	6.42	2.36	0.13	1.75	medium brown mud
CA-8-sub	1.9	5.2	92.9	53.4	39.5	7.28	2.18	-0.61	3.20	green mud
CA-9-surf	0.0	3.8	96.2							
CA-9-sub	0.0	4.0	96.0	55.0	41.0	7.32	2.09	-0.29	2.37	

Note 1. $\overline{X}$ = mean, σ = standard deviation, SK = skewness, Kurt = Kurtosis, ϕ = phi units = $\log_2$ dmm
Note 2. moment statistics do not include gravel fraction
Note 3. surf = surface veneer of grab, sub = subsurface subsample
Note 4. missing values usually indicates sample analysis incomplete

TABLE 8-5 MINERALOGY

RELATIVE PEAK AREA ABUNDANCE (%)

Sample ID	Size Fraction (um)	Mica (1.0mm)	Amphibole (0.84mm)	Chlorite (0.71mm)	Quartz (0.426mm)	Feldspan (3.2mm)	Ilmenite	Garnet	Other
CA-1- surf	25-53	14.8	4.4	13.5	24.9	35.1	7.4	-	-
	2-25	10.1	7.3	21.1	10.1	28.9	17.5	4.6	-
	2	25.9	-	-	-	38.7	35.4	-	-
CA-1-sub	25-53	-	-	-	7.0	86.3	6.7	-	-
	2-25	-	7.5	11.5	15.4	37.3	12.5	15.7	-
	2	16.5	-	13.8	6.1	34.4	29.2	-	-
CA-1-NG	25-53	-	-	-	24.0	76.0	-	-	-
	2-25	6.5	9.6	11.7	11.1	37.6	5.7	17.7	-
	2	35.0	-	28.3	-	16.8	7.8	-	12.1
CA-2-surf	25-53	-	-	-	18.7	50.5	-	18.6	12.2
	2-25	4.2	-	-	19.3	46.4	12.8	17.1	-
	2	30.0	1.8	18.4	4.1	25.4	20.3	-	-
CA-2-sub	25-53	-	-	-	10.5	85.5	-	-	4.0
	2-25	9.7	2.8	4.9	10.2	45.6	10.4	16.4	-
	2	26.3	-	-	-	41.9	31.8	-	-
CA-3-surf	25-53	-	-	-	38.1	29.0	-	32.9	-
	2-25	35.0	-	10.7	5.4	17.6	24.1	7.2	-
	2	25.7	-	17.3	-	33.2	23.8	-	-
CA-3-sub	25-53	-	-	-	14.2	69.7	-	11.8	4.3
	2-25	18.0	11.1	8.9	9.2	38.5	7.7	6.6	-
	2	34.5	-	10.8	-	33.8	20.9	-	-
CA-4-surf	25-53	-	-	-	24.9	69.8	-	-	5.3
	2-25	29.7	6.8	14.8	15.0	33.7	-	-	-
	2	22.1	-	14.0	-	25.8	38.1	-	-
CA-4-sub	25-53	13.6	5.9	-	10.8	50.5	-	-	19.2
	2-25	19.6	7.4	9.3	12.3	35.9	4.7	10.8	-
	2	41.9	-	18.2	-	18.0	21.9	-	-
CA-5-surf	25-53	-	10.1	-	24.6	55.7	-	-	9.6
	2-25	-	-	-	22.4	77.6	-	-	-
	2	31.4	-	20.4	-	22.2	26.0	-	-
CA-5-sub	25-53	14.3	6.5	11.2	8.5	59.5	-	-	-
	2-25	36.0	15.9	19.8	4.0	17.3	7.0	-	-
	2	43.0	-	27.4	-	12.9	16.7	-	-

TABLE 8-5 MINERALOGY

RELATIVE PEAK AREA ABUNDANCE (%)

Sample ID	Size Fraction (um)	Mica (1.0mm)	Amphibole (0.84mm)	Chlorite (0.71mm)	Quartz (0.426mm)	Feldspan (3.2mm)	Ilmenite	Garnet	Other
CA-6- surf	25-53	-	8.4	-	11.7	35.6	-	-	44.2
	2-25	29.3	16.8	13.3	9.7	24.6	6.3	-	-
	2	55.3	27.5	13.3	-	3.9	-	-	-
CA-6-sub	25-53	-	-	-	21.8	67.5	-	-	10.7
	2-25	24.2	3.0	13.1	5.7	42.3	11.7	-	-
	2	28.8	-	21.9	-	27.0	22.9	-	-
CA-7-surf	25-53	2.9	-	-	15.1	42.4	-	-	19.3
	2-25	17.3	-	10.3	16.1	33.6	22.2	-	-
	2	47.8	-	12.4	-	12.1	27.6	-	-
CA-7-sub	25-53	36.9	-	-	-	63.1	-	-	-
	2-25	34.9	7.5	16.6	4.5	27.8	8.8	-	-
	2	58.1	-	-	-	41.9	-	-	-
CA-8-surf	25-53	11.4	-	-	12.9	63.5	-	-	7.2
	2-25	19.5	10.6	25.2	11.9	32.8	-	-	-
	2	60.1	-	-	-	39.9	-	-	-
CA-8-sub	25-53	15.9	4.5	-	30.3	25.6	-	-	17.6
	2-25	23.2	2.5	25.1	15.4	27.3	6.5	-	-
	2	54.0	4.2	17.2	-	24.6	-	-	-
CA-9-surf	25-53	6.8	-	-	17.2	49.4	-	10.3	16.3
	2-25	24.9	-	20.4	5.8	35.3	13.5	-	-
	2	22.5	-	-	-	28.3	49.2	-	-
CA-9-sub	25-53	3.8	-	15.9	17.9	47.0	-	15.4	-
	2-25	15.6	5.8	31.0	10.0	32.0	5.5	-	-
	2	54.2	-	-	-	45.8	-	-	-

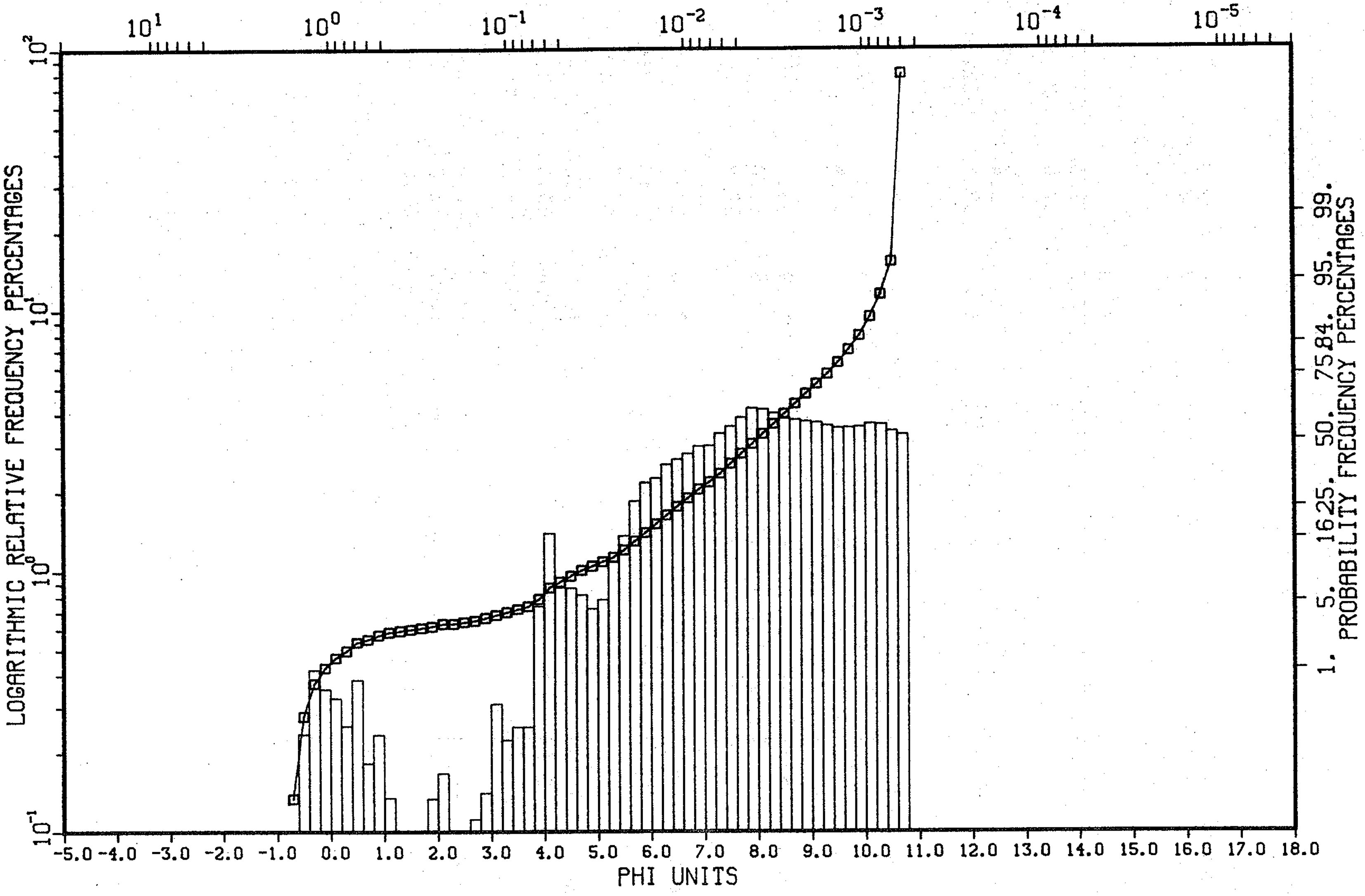
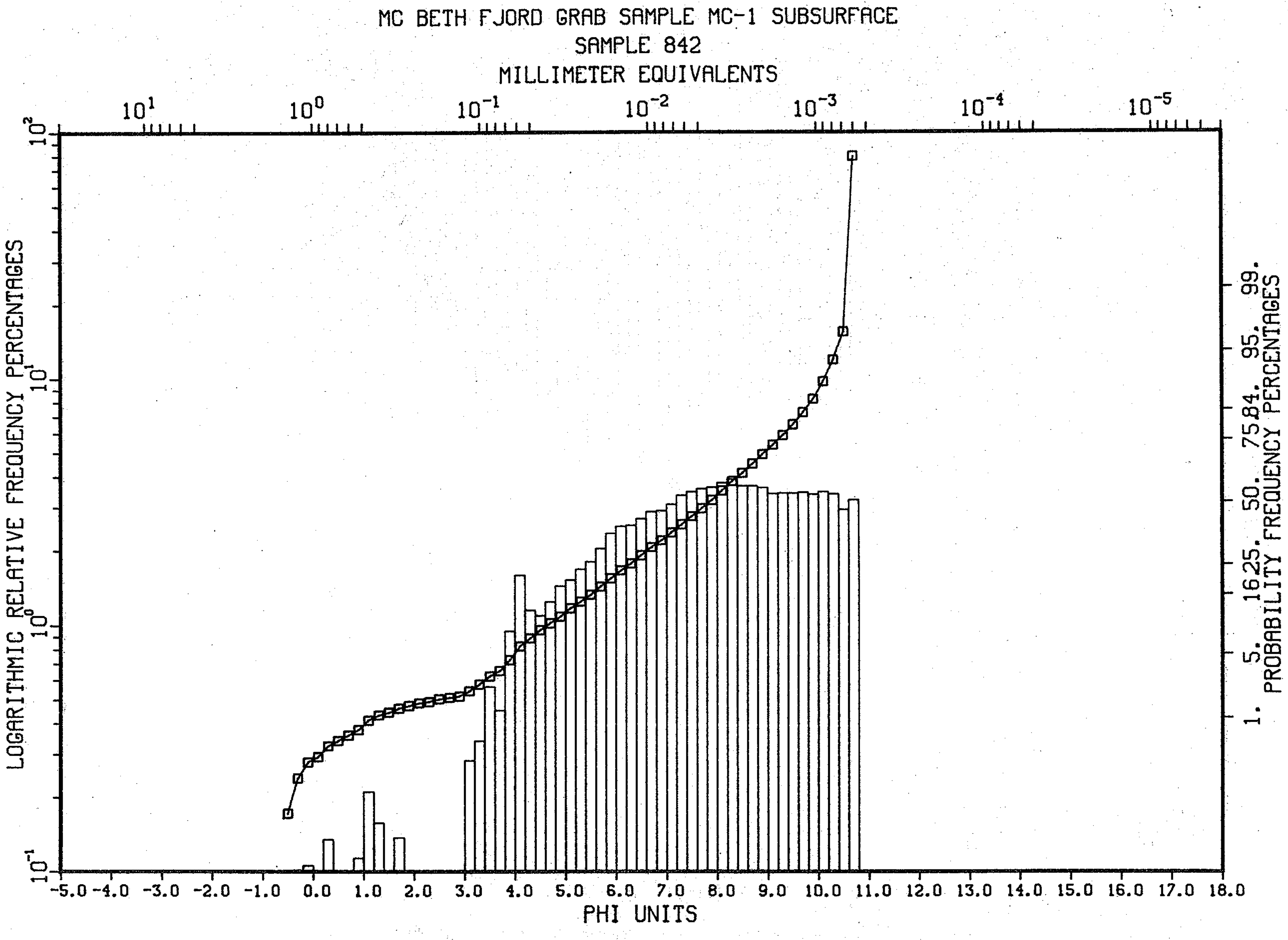

MC BETH FJORD GRAB SAMPLE MC-1 SURFACE
SAMPLE 841

Fig. 8-2

PLOT 9 14.27.25 THUR 30 JUN, 1983 JOB-FMDI::: , BEDFORD INSTITUTE DISSPLA VER 8.2



MC BETH FJORD GRAB SAMPLE MC-1 SUBSURFACE
SAMPLE 842

Fig. 8-3

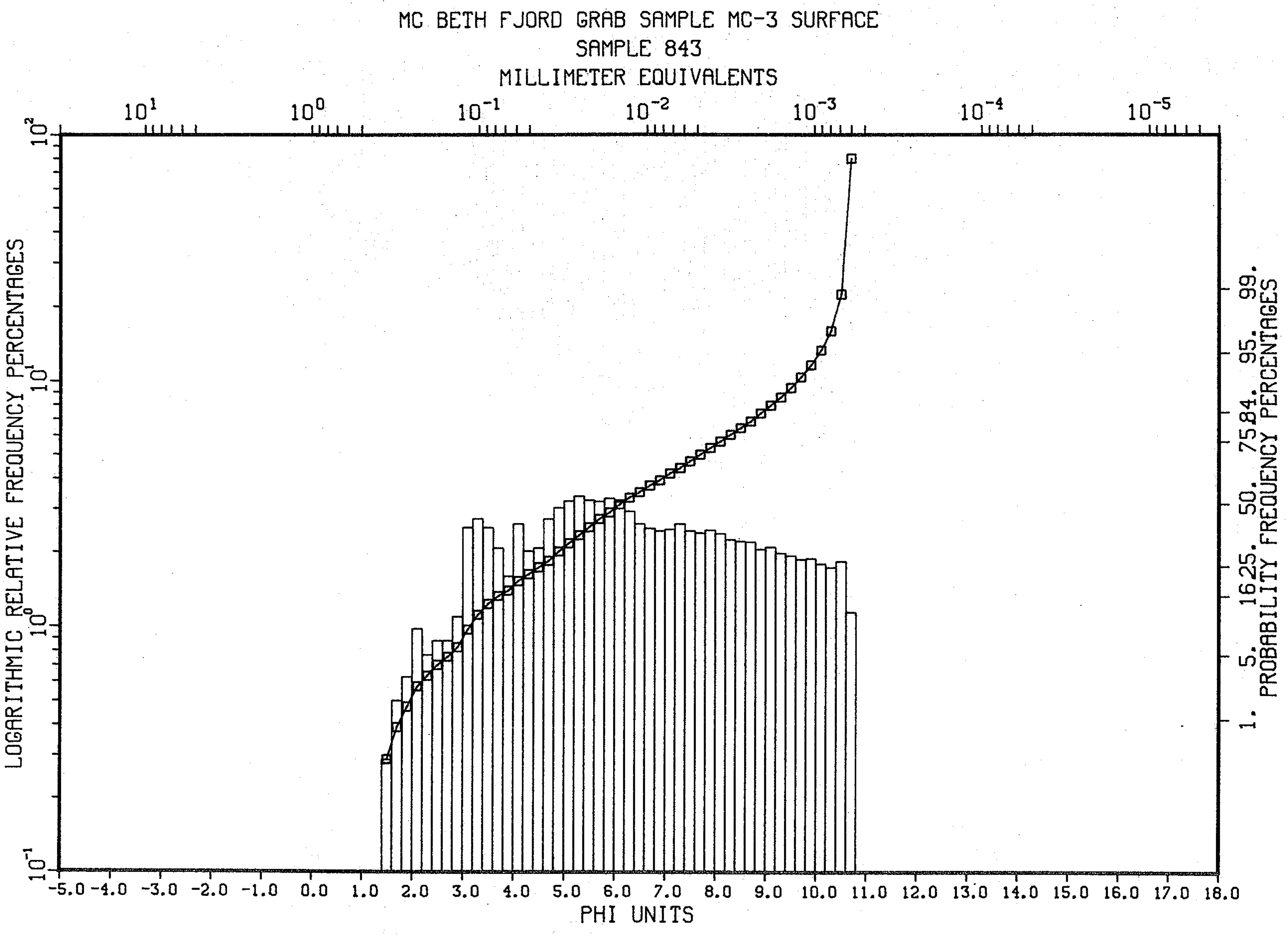


Fig. 8-4

PLOT 6 14.26.38 THUR 30 JUN, 1983 JOB-FWOI::: , BEDFORD INSTITUTE DISSPLA VER 8.2

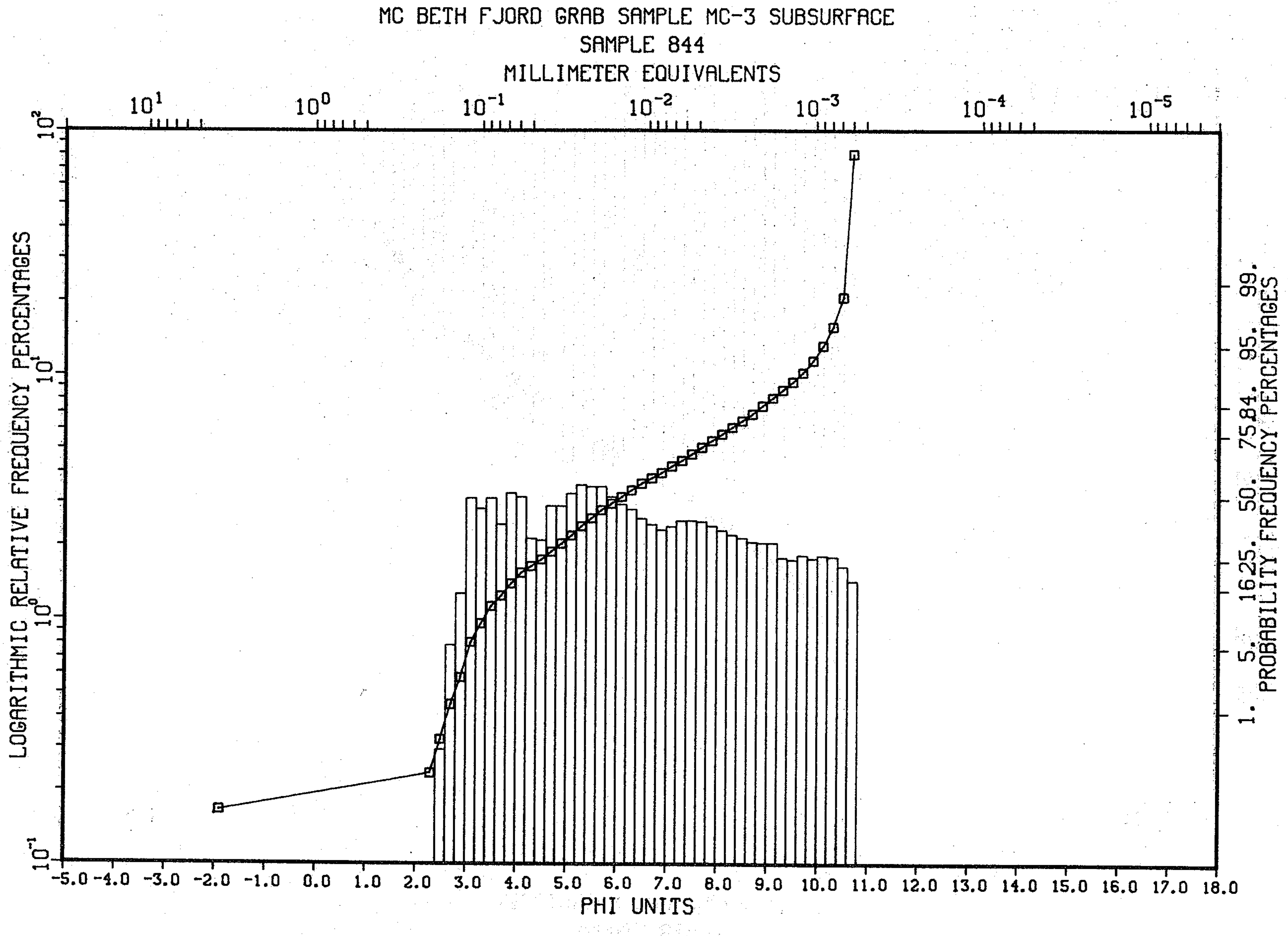

MC BETH FJORD GRAB SAMPLE MC-3 SUBSURFACE
SAMPLE 844
MILLIMETER EQUIVALENTS
10^1
10^0
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
LOGARITHMIC RELATIVE FREQUENCY PERCENTAGES
10^2
10^1
10^0
10^{-1}
PROBABILITY FREQUENCY PERCENTAGES
1.
5.
16.
25.
50.
75.
84.
95.
99.
-5.0
-4.0
-3.0
-2.0
-1.0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
PHI UNITS

Fig. 8-5

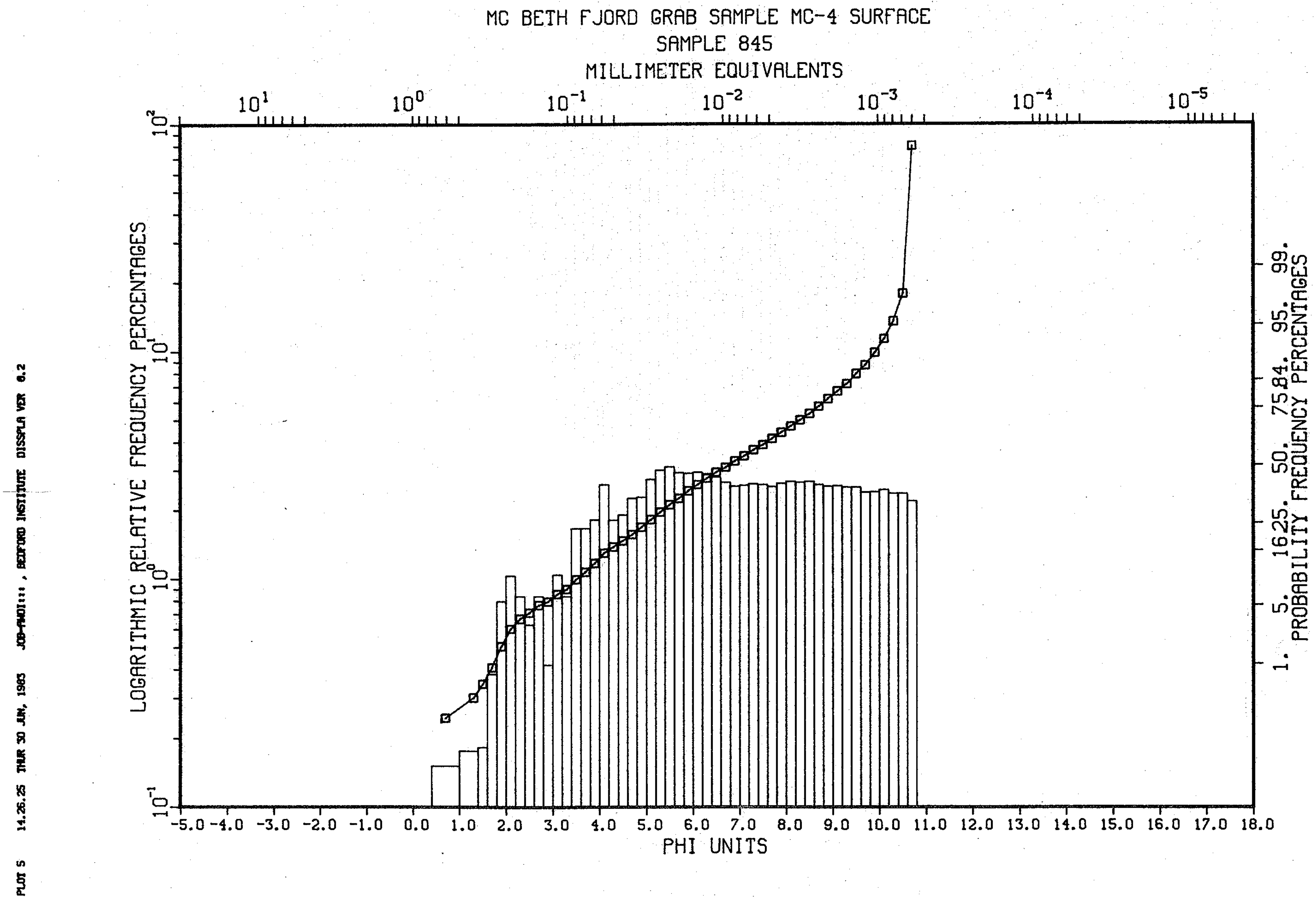

MC BETH FJORD GRAB SAMPLE MC-4 SURFACE
SAMPLE 845
MILLIMETER EQUIVALENTS
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
LOGARITHMIC RELATIVE FREQUENCY PERCENTAGES
10^2
10^1
10^0
10^-1
PROBABILITY FREQUENCY PERCENTAGES
1.
5.
16
25.
50.
75
84.
95.
99.
-5.0
-4.0
-3.0
-2.0
-1.0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
PHI UNITS
PLOT 5 14.26.25 THUR 30 JUN, 1983 JOB-RMDI::: , BEDFORD INSTITUTE DISSPLA VER 6.2

Fig. 8-6

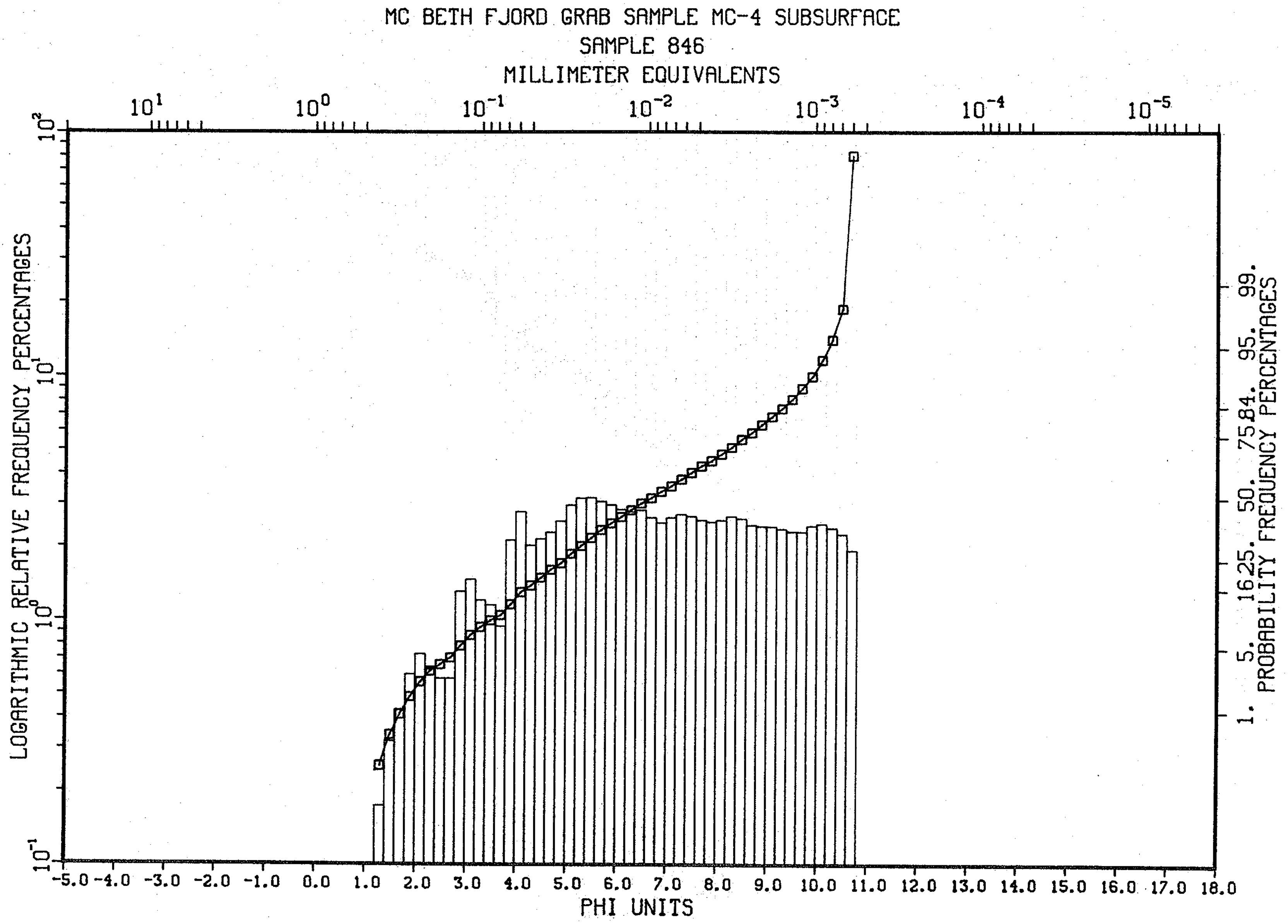


Fig. 8-7

PLOT 3 14.26.00 THUR 30 JUN, 1983 JOB-FMOI!!! , BEDFORD INSTITUTE DISSPLA VER 8.2

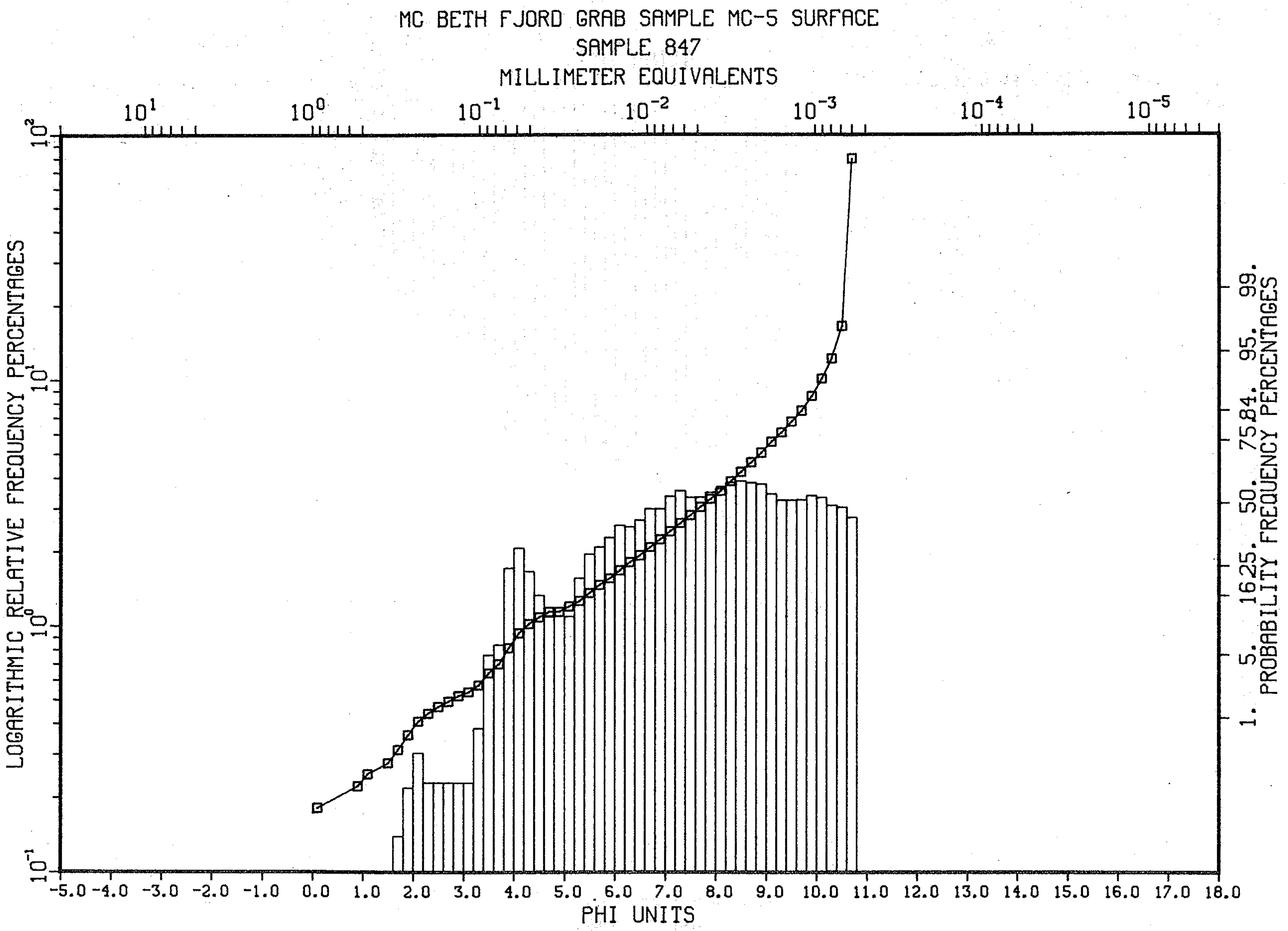


Fig. 8-8

PLOT 4 14.26.13 THUR 30 JUN, 1983 JOB-AMOI::: , BEDFORD INSTITUTE DISSPLA VER 8.2

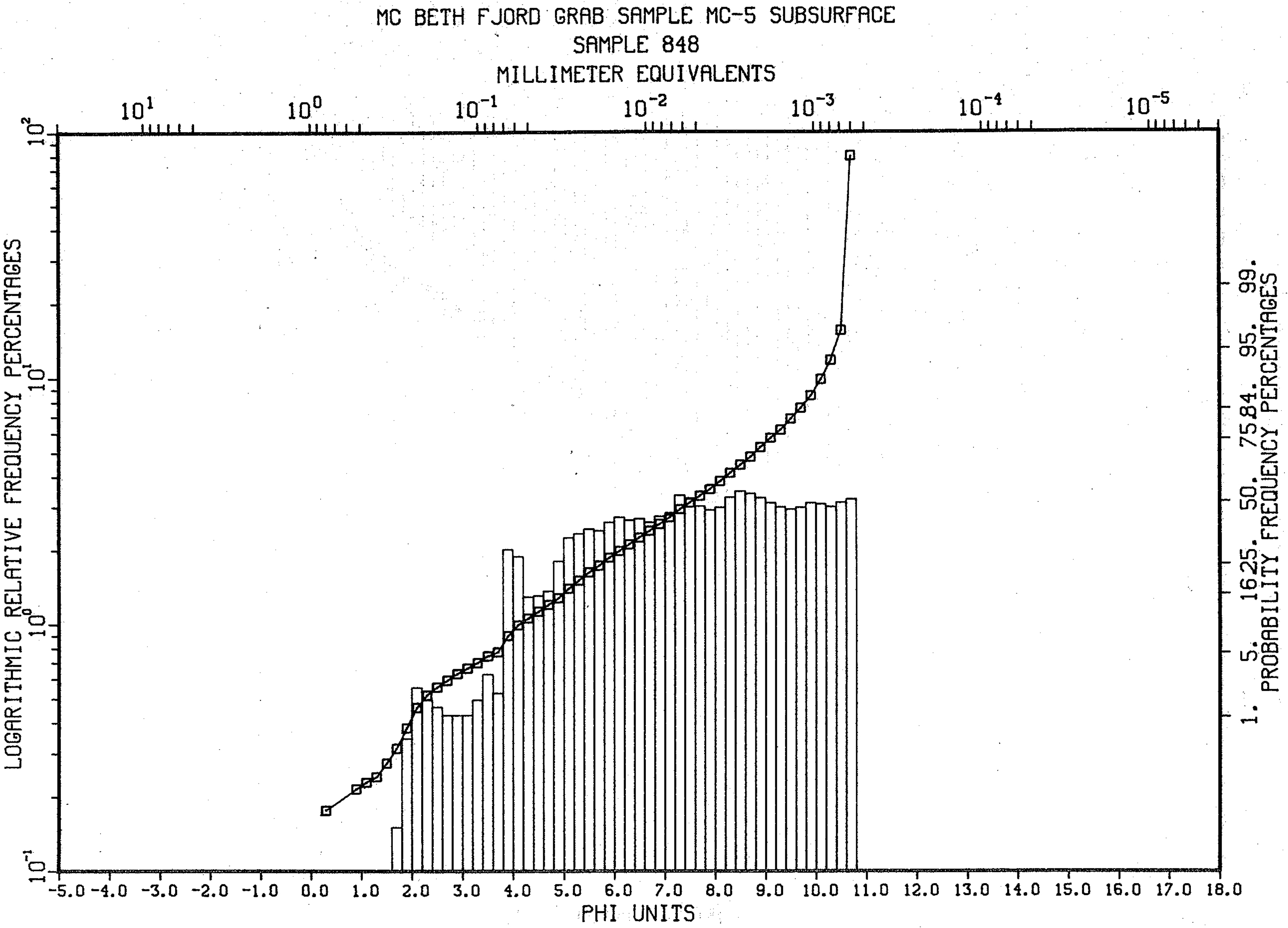


Fig. 8-9

PLOT 2 14.25.44 THUR 30 JUN, 1983 JOB-AMOI::: , BEDFORD INSTITUTE DISSPLA VER 8.2

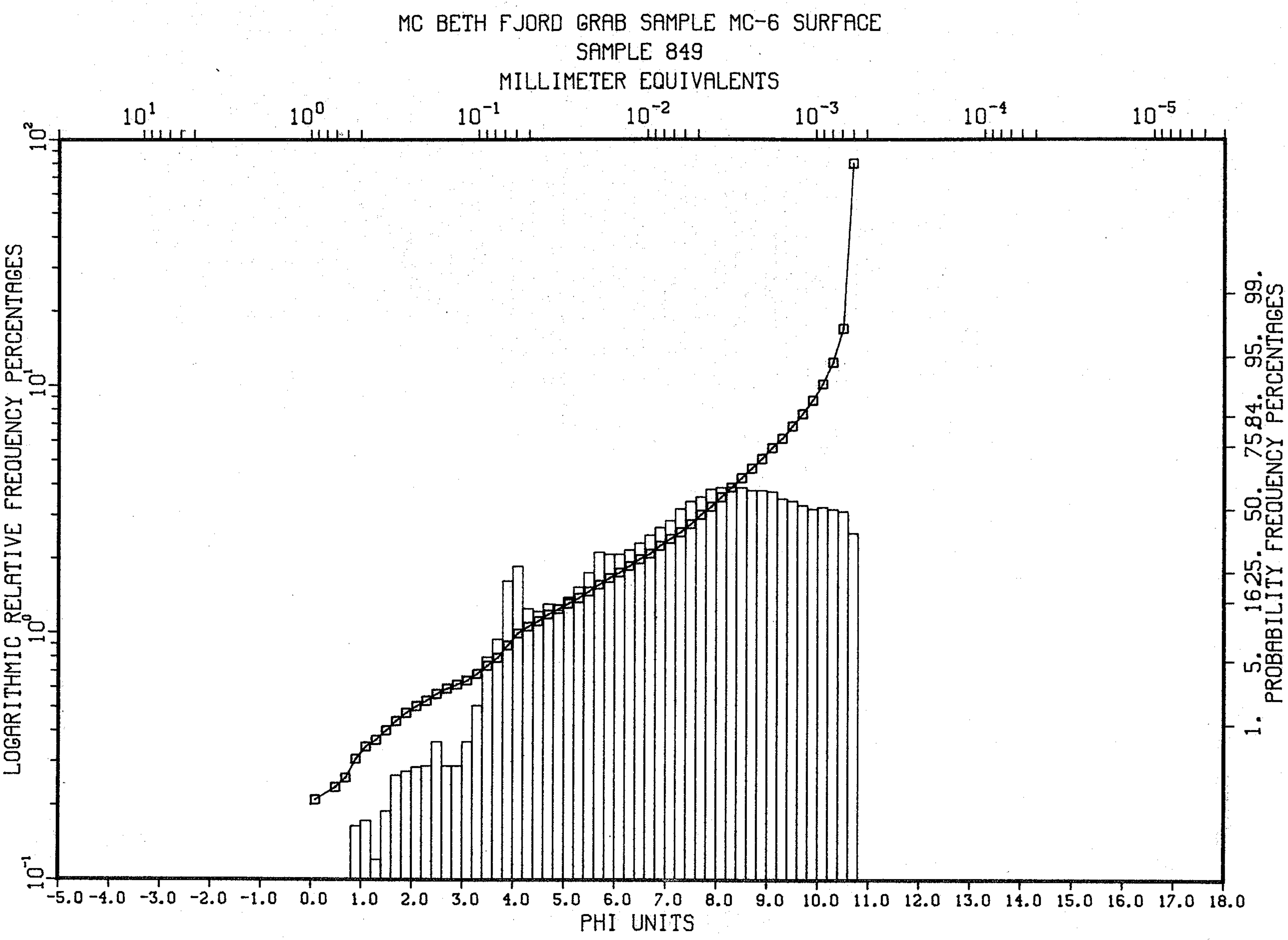


Fig. 8-10

PLOT 1 14.25.33 THUR 30 JUN, 1985 JOB-AWOI::: , BEDFORD INSTITUTE DISSPLA VER 8.2

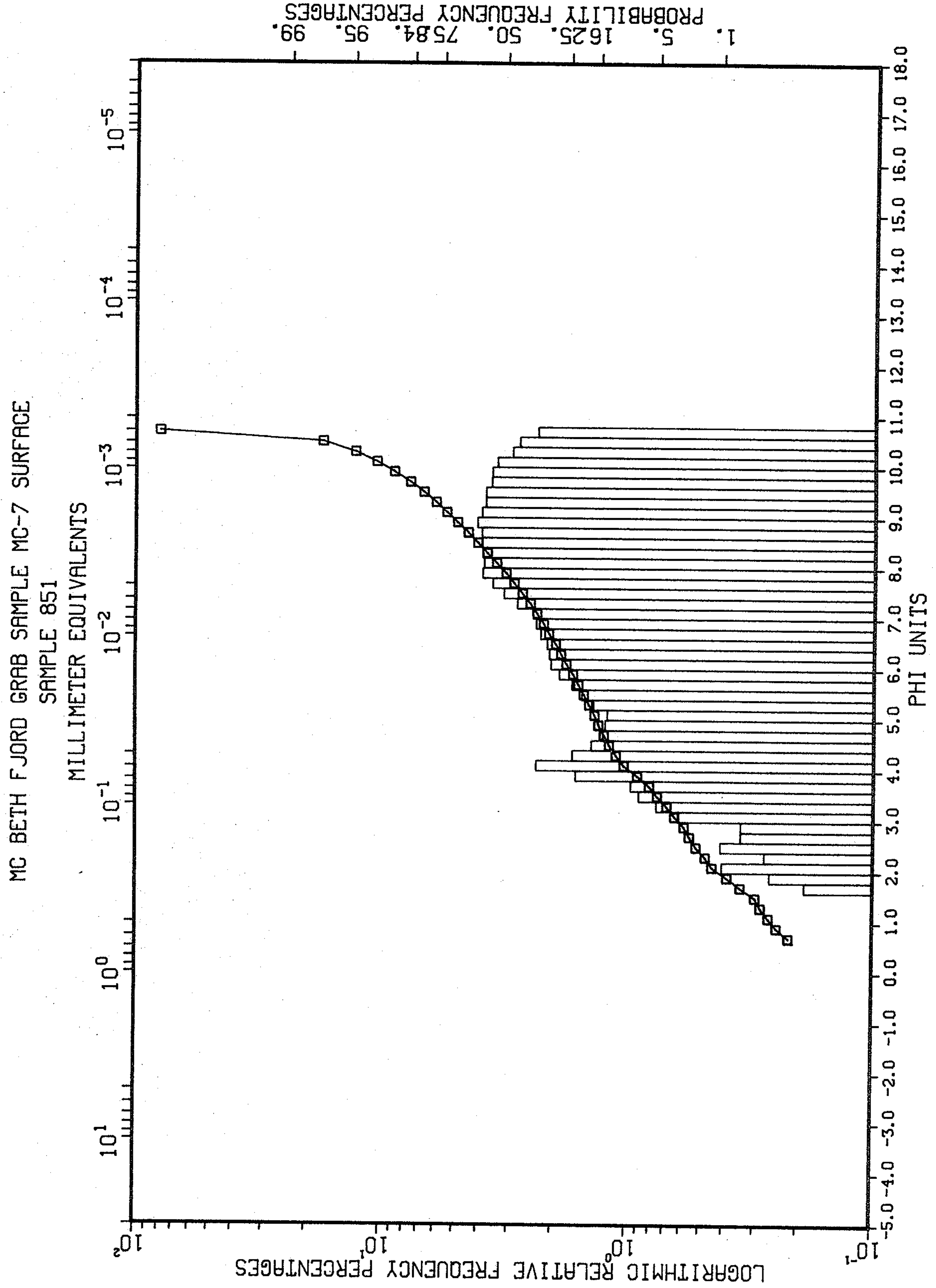


Fig. 8-12

PLOT 4 08.36.28 MON 4 JUL, 1983 JOB-AACH::: , BEDFORD INSTITUTE DISSPLA VER 8.2

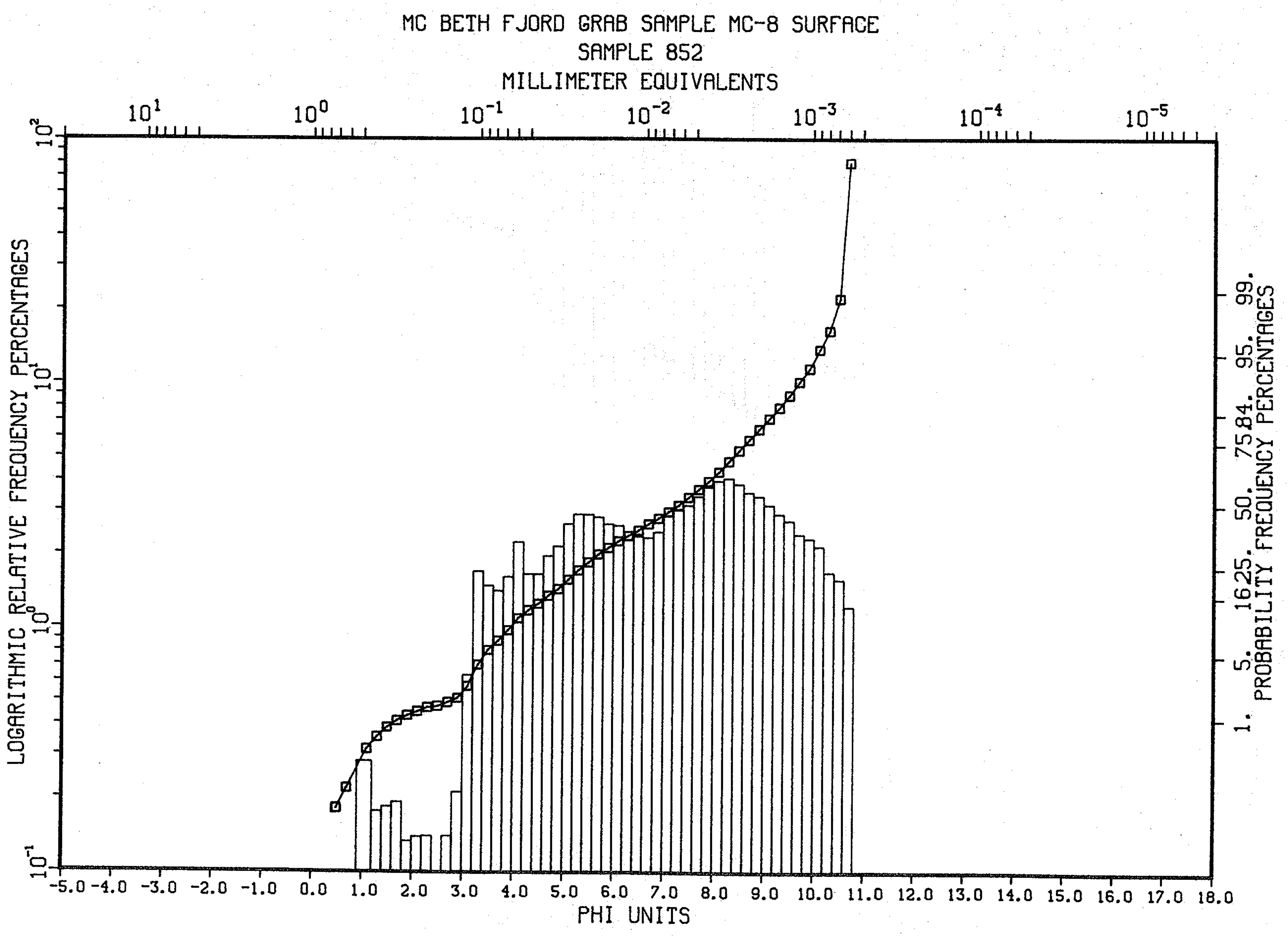


Fig. 8-13

PLOT 5 08.36.40 MON 4 JUL, 1983 JOB-ARCH!!! , BEDFORD INSTITUTE DISSPLA VER 8.2

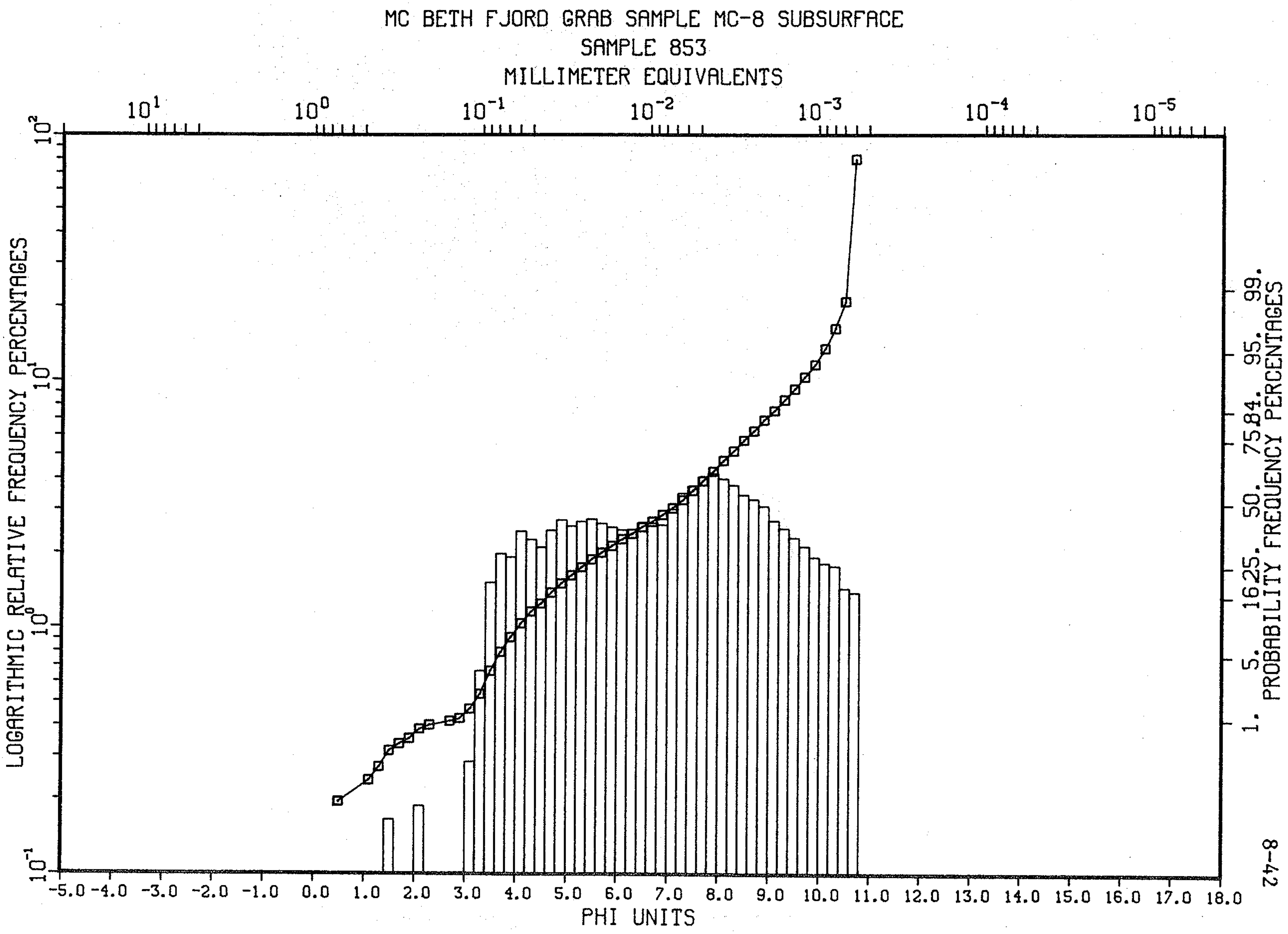


Fig. 8-14

PLOT 6 08.36.50 MON 4 JUL, 1985 JOB-ARCH::: , BEDFORD INSTITUTE DISSPLA VER 8.2

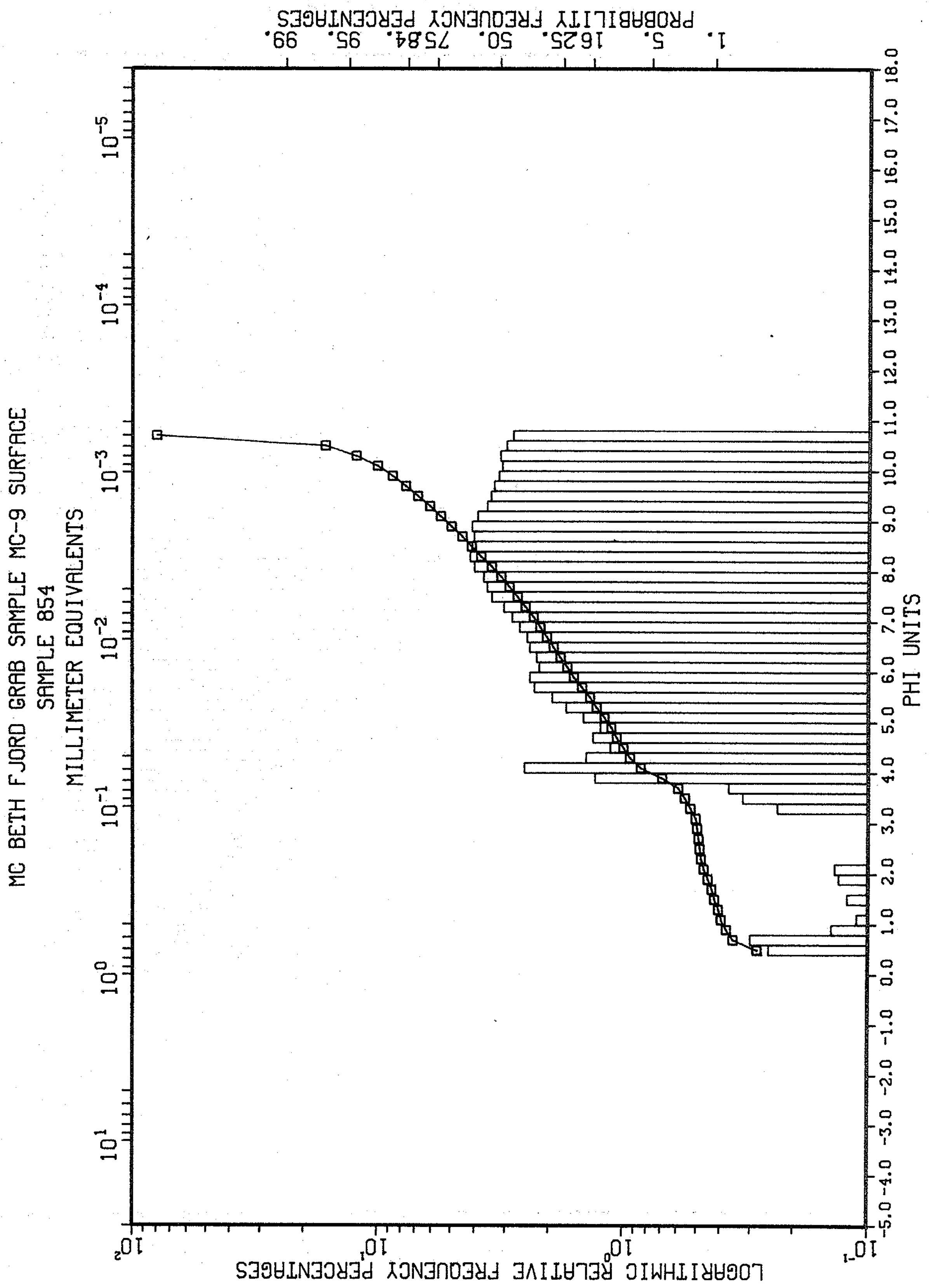


Fig. 8-15

PLOT 7 08.37.10 MON 4 JUL, 1983 JOB-ARCH:::, BEDFORD INSTITUTE DISSPLA VER 8.2

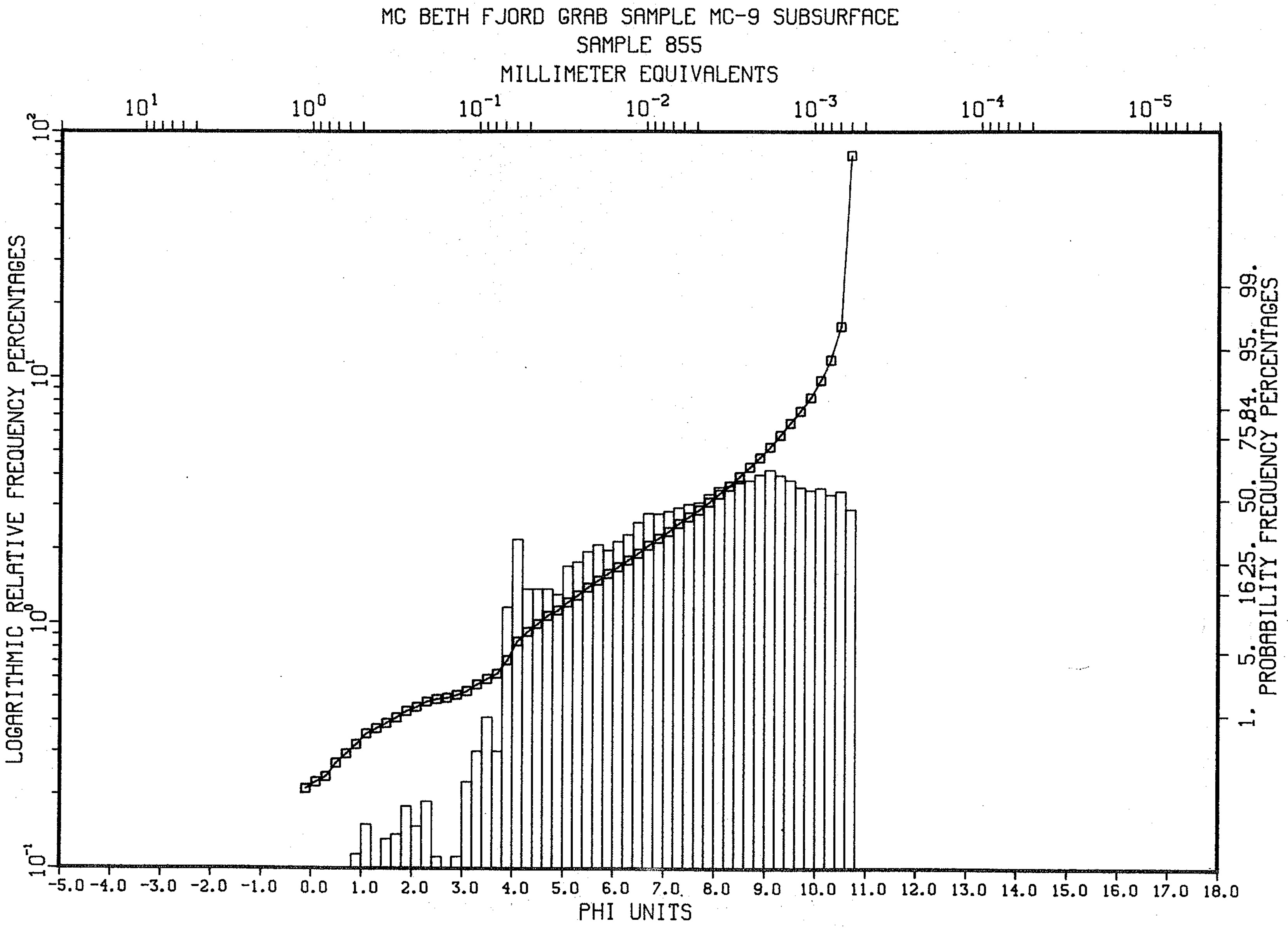


Fig. 8-16

PLOT 2 08.35.48 MON 4 JUL, 1983 JOB-ARCH::: , BEDFORD INSTITUTE DISSPLA VER 8.2

MC BETH FJORD GRAB SAMPLE MC-11 SURFACE
SAMPLE 856

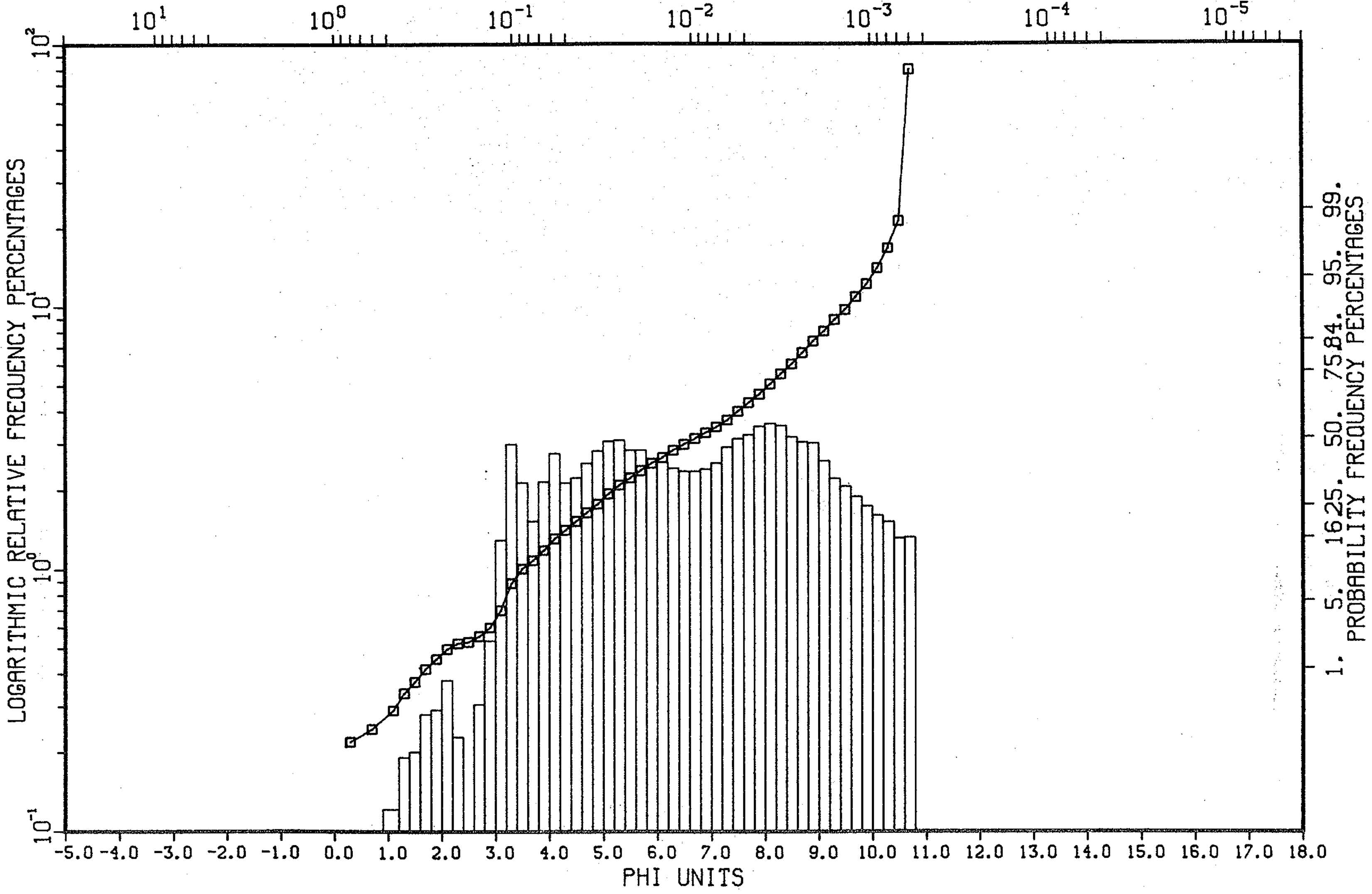


Fig. 8-17

PLOT 1 08.35.31 MON 4 JUL, 1983 JOB-RACH::: , BEDFORD INSTITUTE DISSPLA VER 8.2

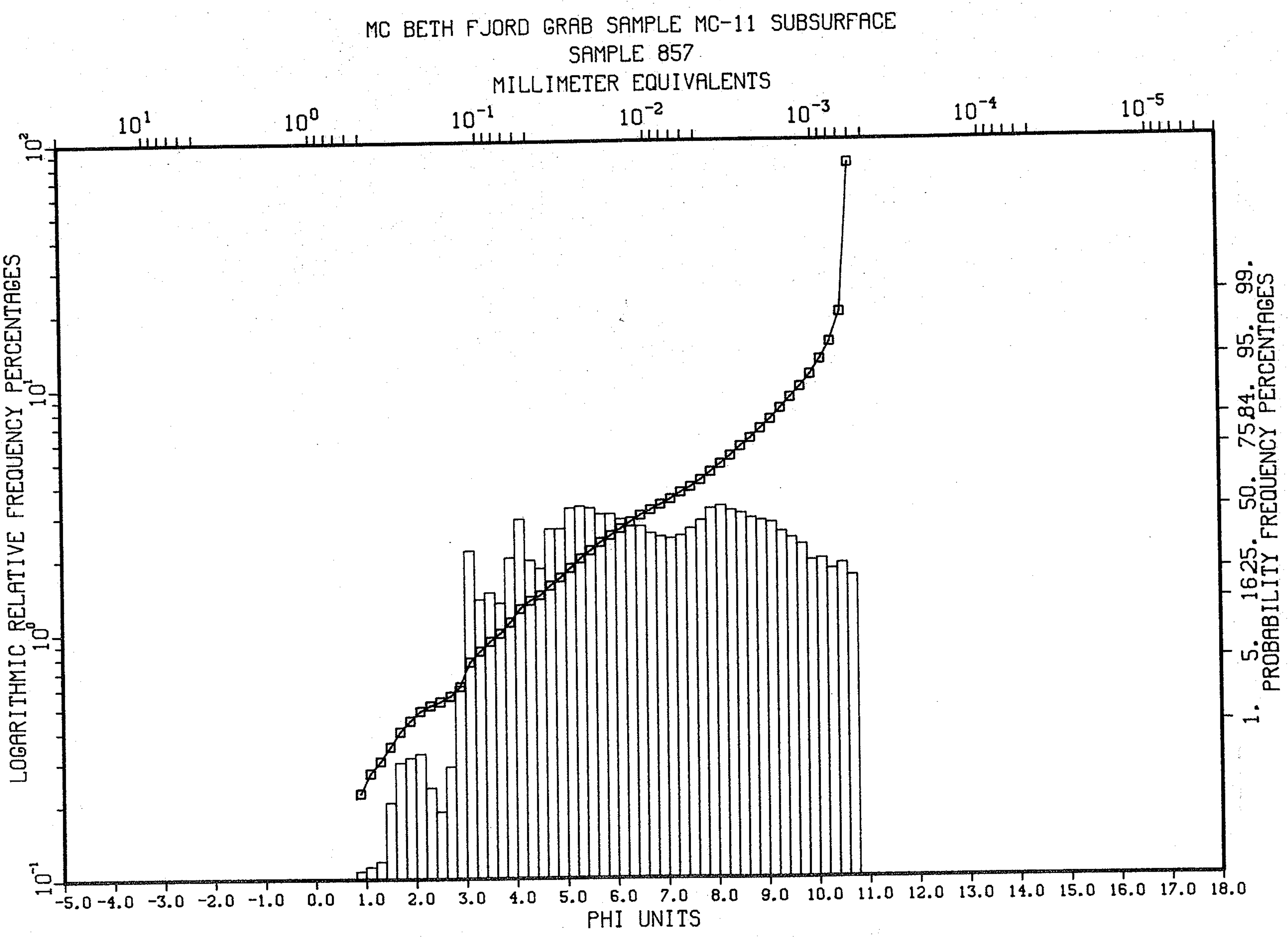


Fig. 8-18

PLOT 10 08.33.47 MON 4 JUL, 1983 JOB-AACL::: , BEDFORD INSTITUTE DISSPLA VER 8.2

CAMBRIDGE FJORD GRAB SAMPLE CA-1 SURFACE
SAMPLE 800

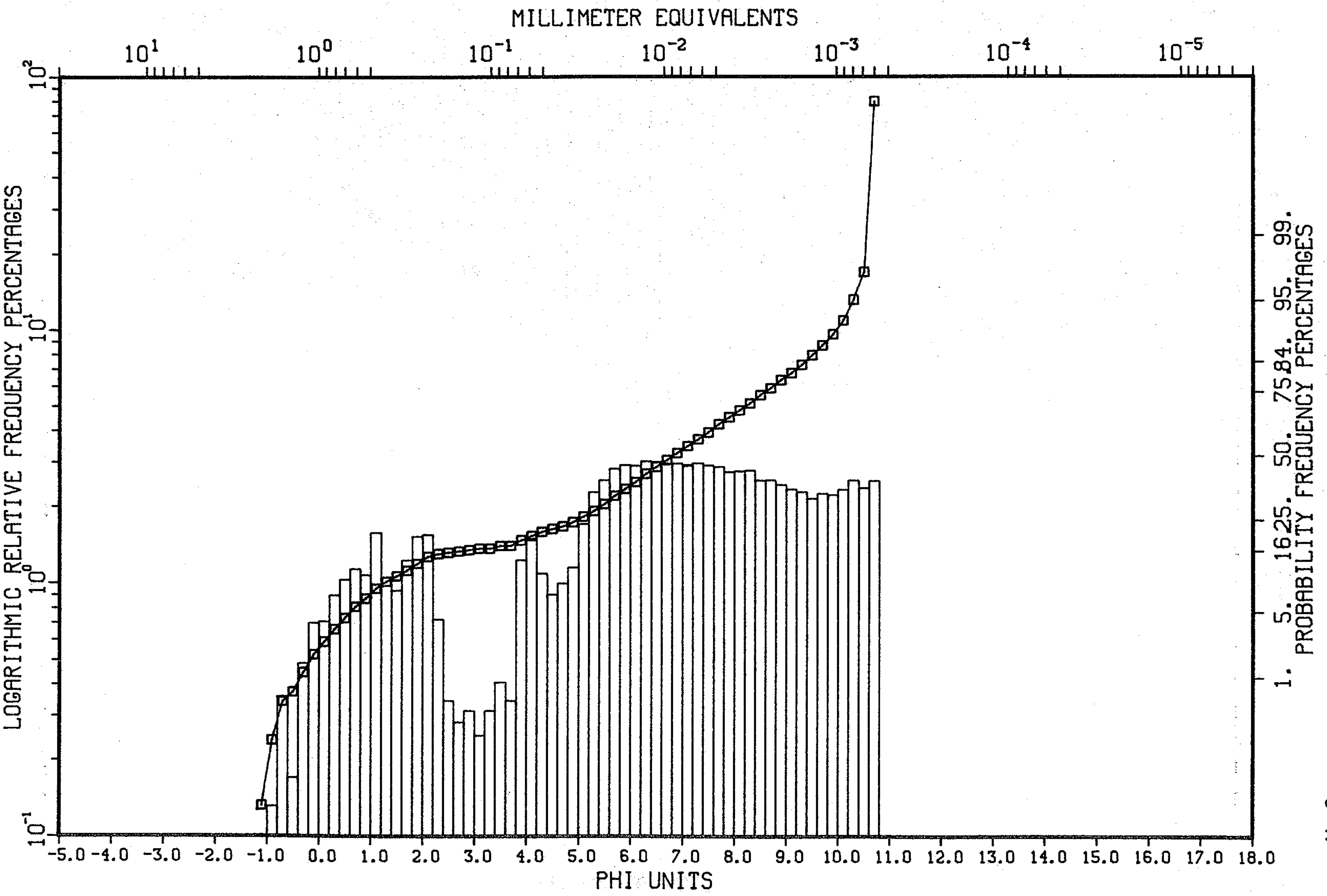


Fig. 8-19

CAMBRIDGE FJORD GRAB SAMPLE CA-1 SUBSURFACE
SAMPLE 801

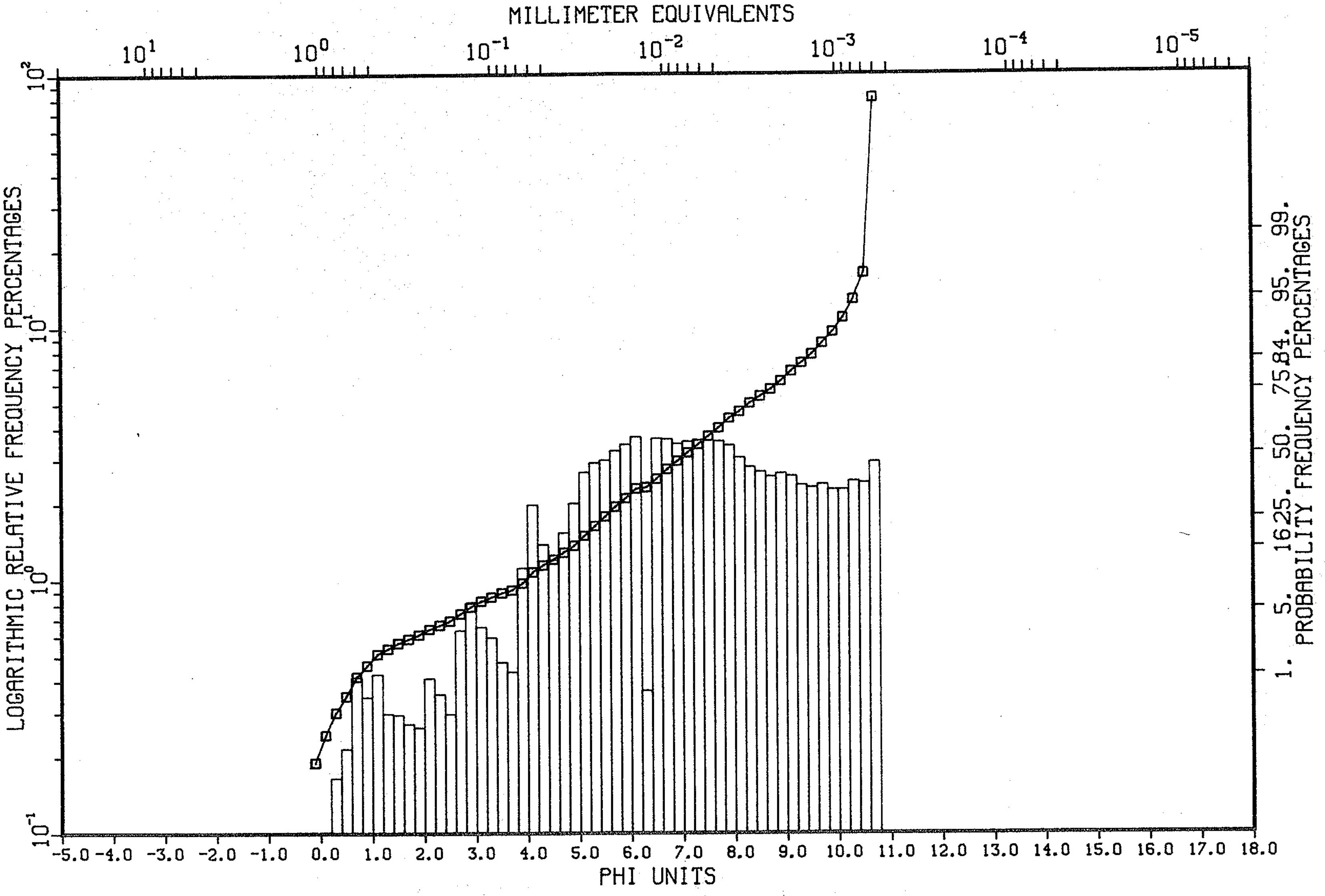


Fig. 8-20

PLOT 10 08.38.06 MON 4 JUL, 1983 JOB-ARCH::: , BEDFORD INSTITUTE DISSPLA VER 8.2

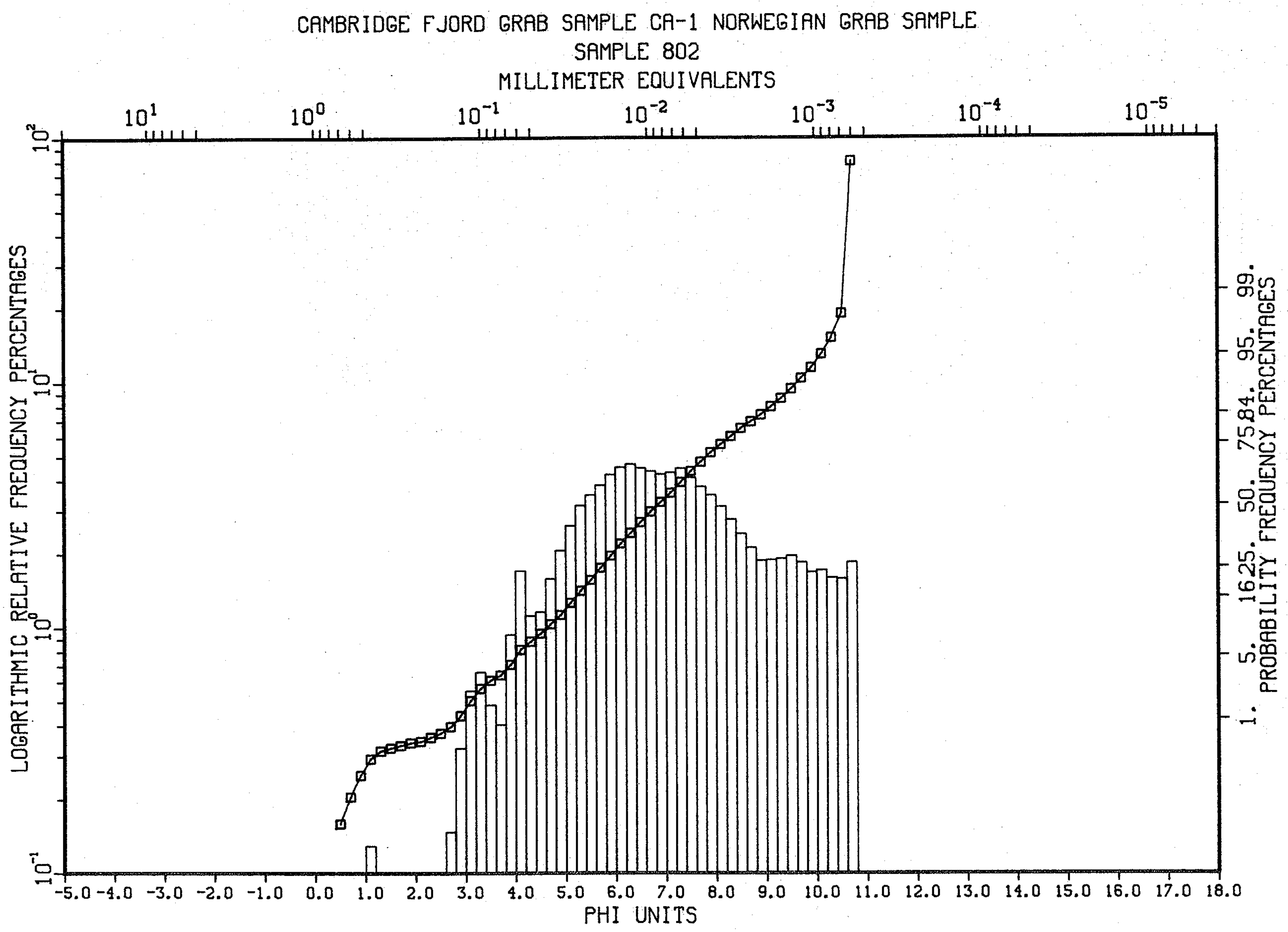


Fig. 8-21

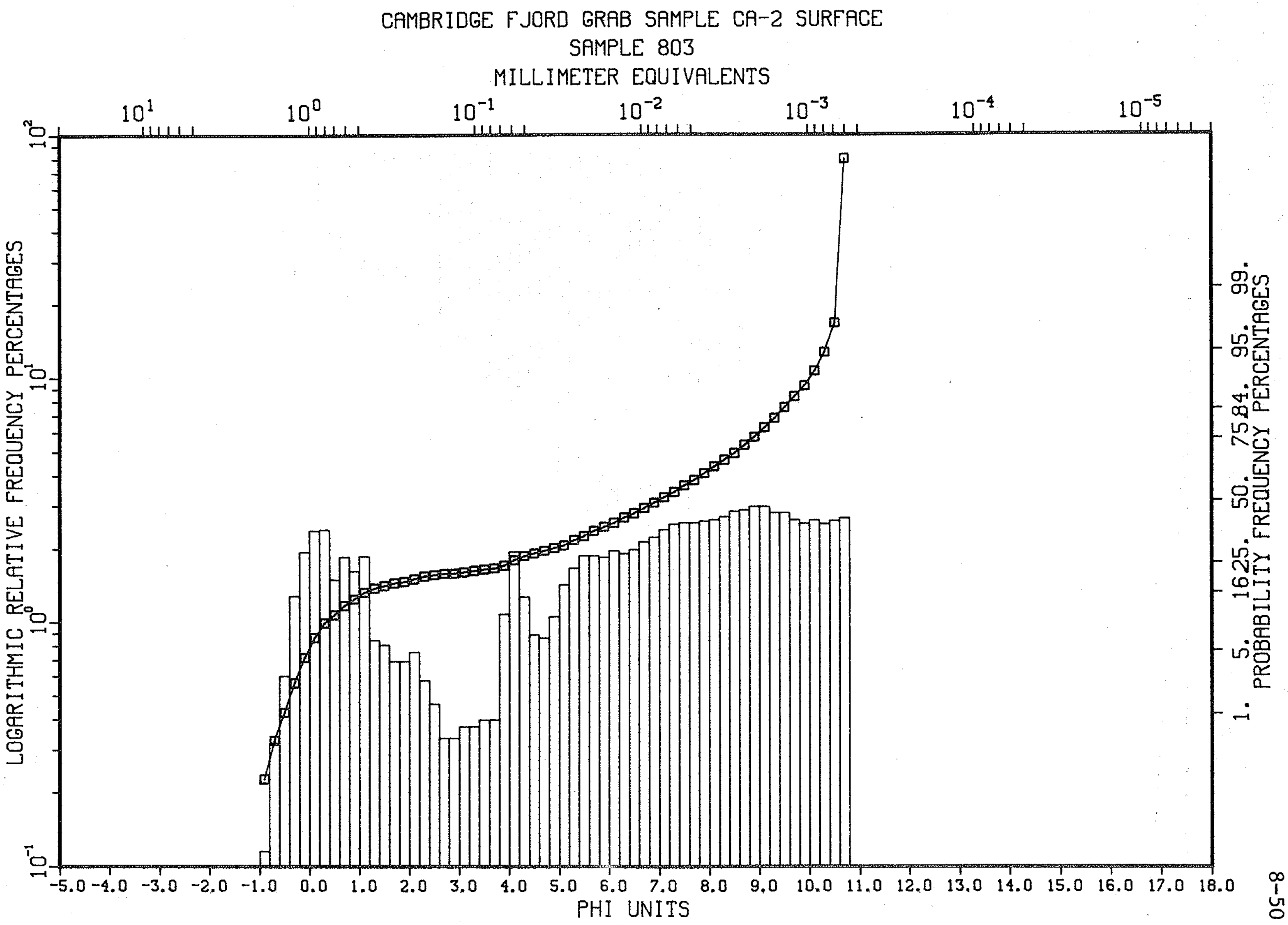


Fig. 8-22

PLOT 11 08.38.29 MON 4 JUL, 1983 JOB-AACM::: , BEDFORD INSTITUTE DISSPLA VER 8.2

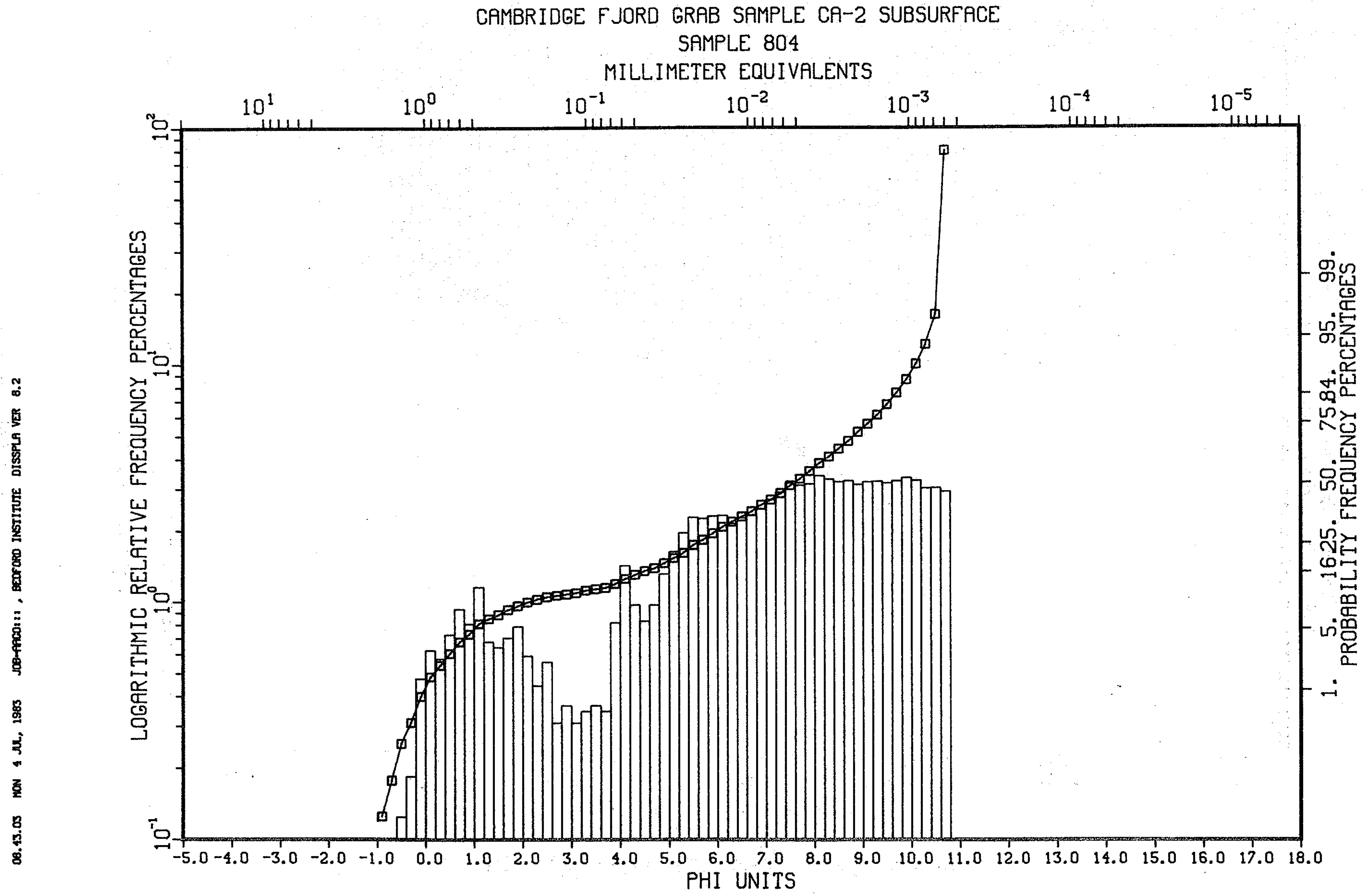

CAMBRIDGE FJORD GRAB SAMPLE CA-2 SUBSURFACE
SAMPLE 804
MILLIMETER EQUIVALENTS
10^1
10^0
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
LOGARITHMIC RELATIVE FREQUENCY PERCENTAGES
10^2
10^1
10^0
10^{-1}
PROBABILITY FREQUENCY PERCENTAGES
1.
5.
16.
25.
50.
75.
84.
95.
99.
-5.0 -4.0 -3.0 -2.0 -1.0 0.0 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0 16.0 17.0 18.0
PHI UNITS
PLOT 1 08.43.03 MON 4 JUL, 1983 JOB-AACO::, BEDFORD INSTITUTE DISSPLA VER 8.2

Fig. 8-23

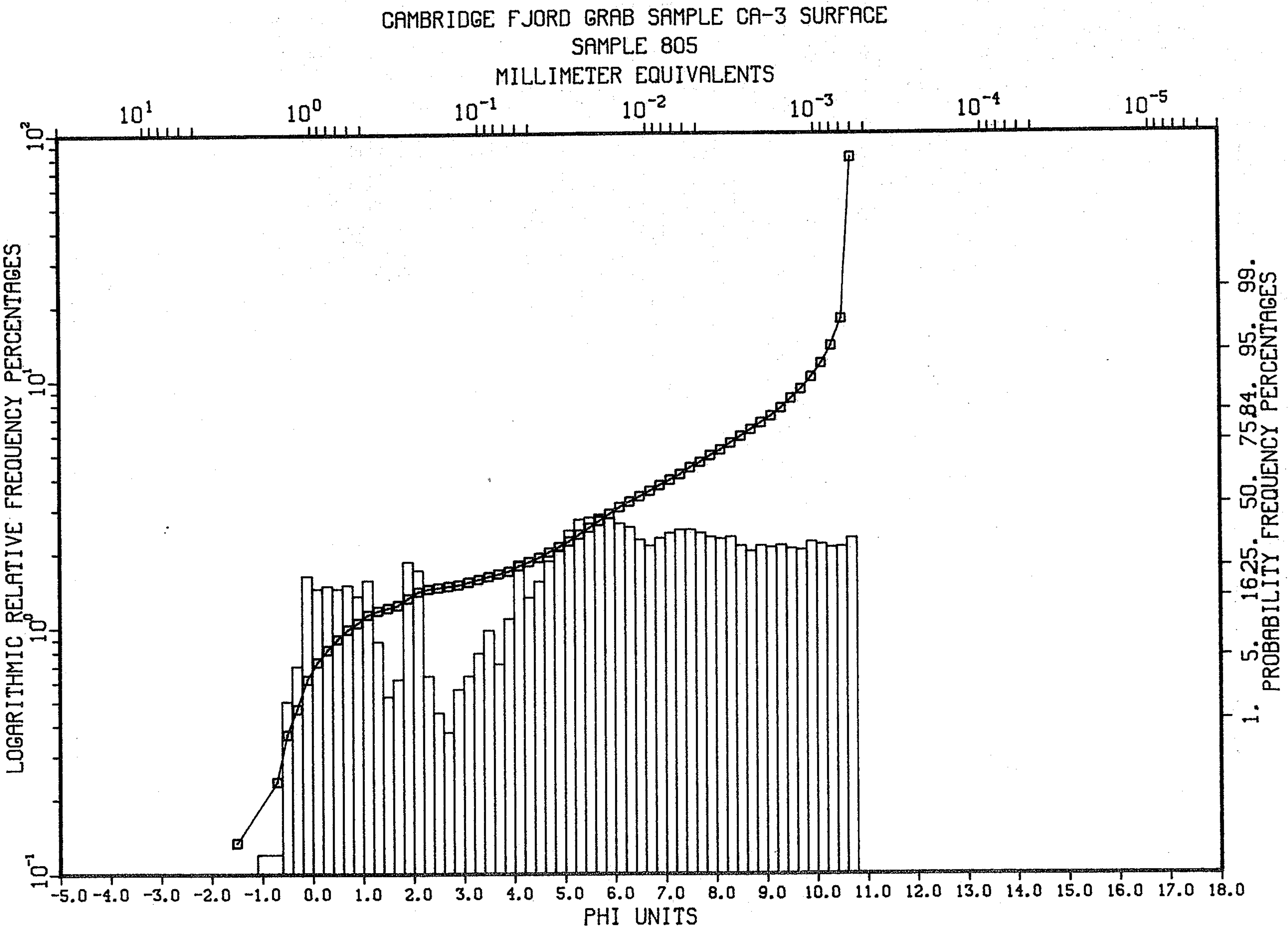


Fig. 8-24

PLOT 2 08.43.13 MON 4 JUL, 1983 JOB-ARCO::: , BEDFORD INSTITUTE DISSPLA VER 8.2

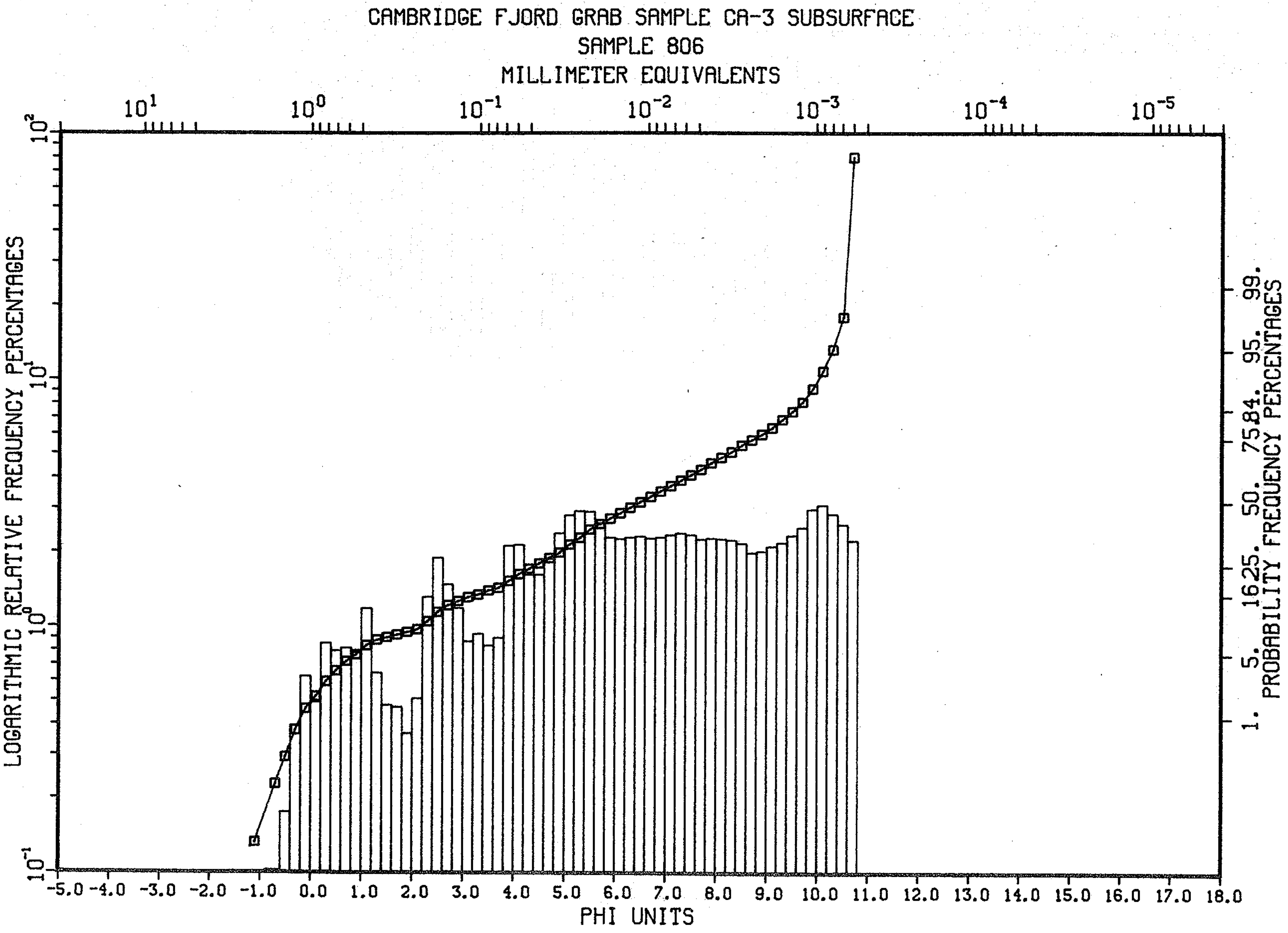


Fig. 8-25

PLOT 3 08.43.23 MON 4 JUL, 1983 JOB-ARGO::: , BEDFORD INSTITUTE DISSPLA VER 8.2

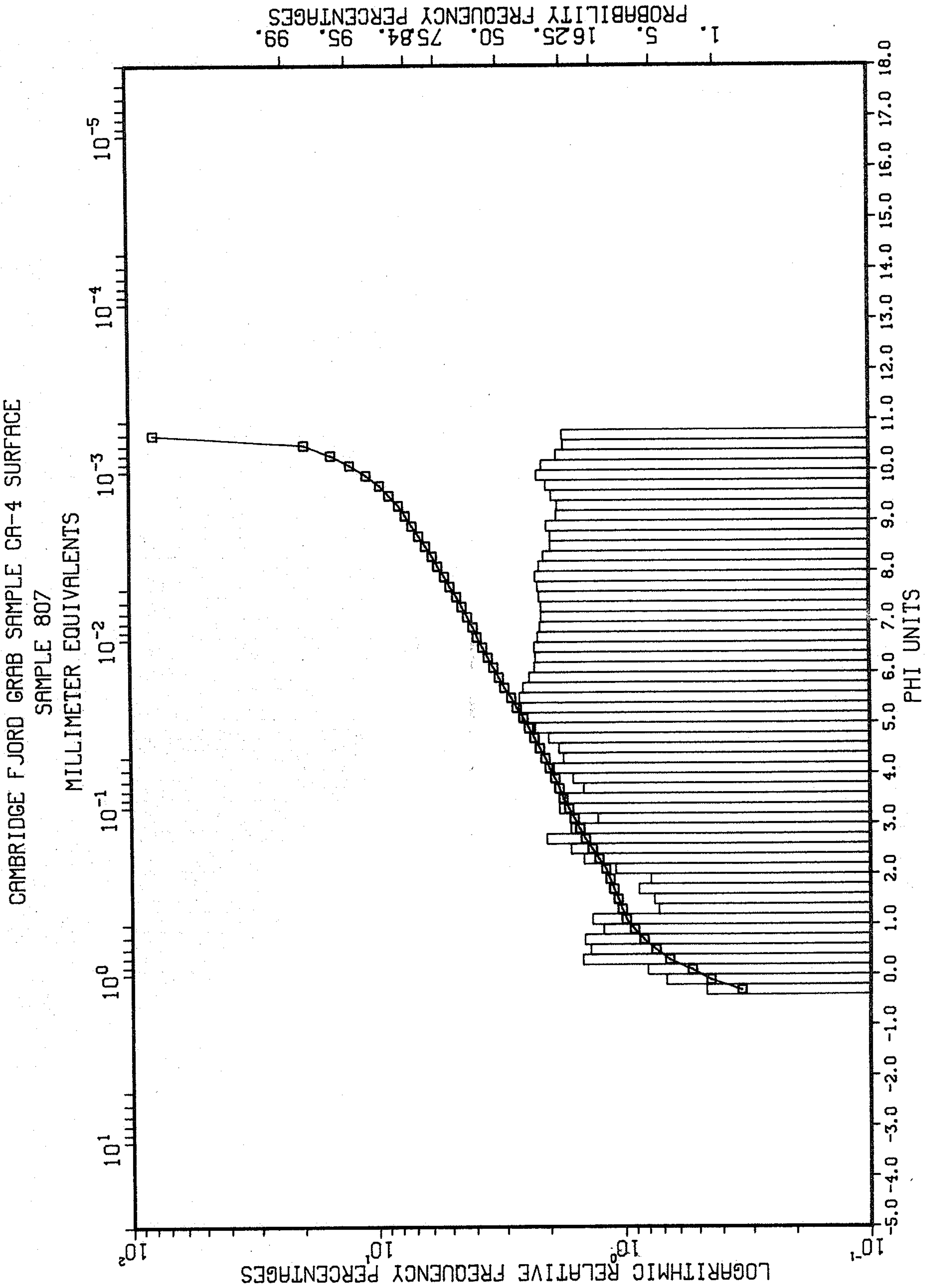


Fig. 8-26

PLOT 4 08.43.34 MON 4 JUL, 1983 JOB-ARCO::: , BEDFORD INSTITUTE DISSPLA VER 8.2

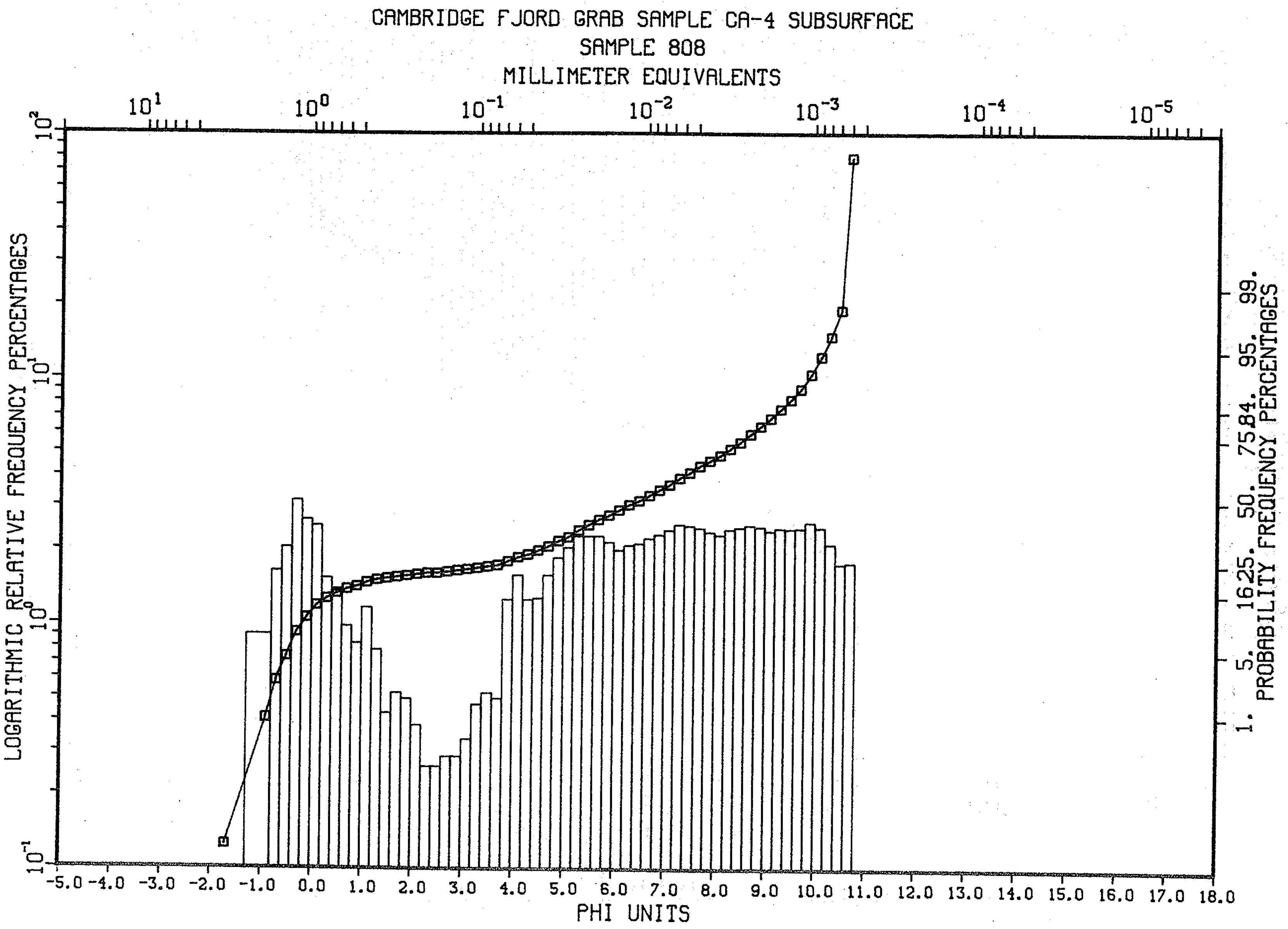


Fig. 8-27

PLOT 5 08.43.47 MON 4 JUL, 1983 JOB-ARCO::: , BEDFORD INSTITUTE DISSPLA VER 8.2

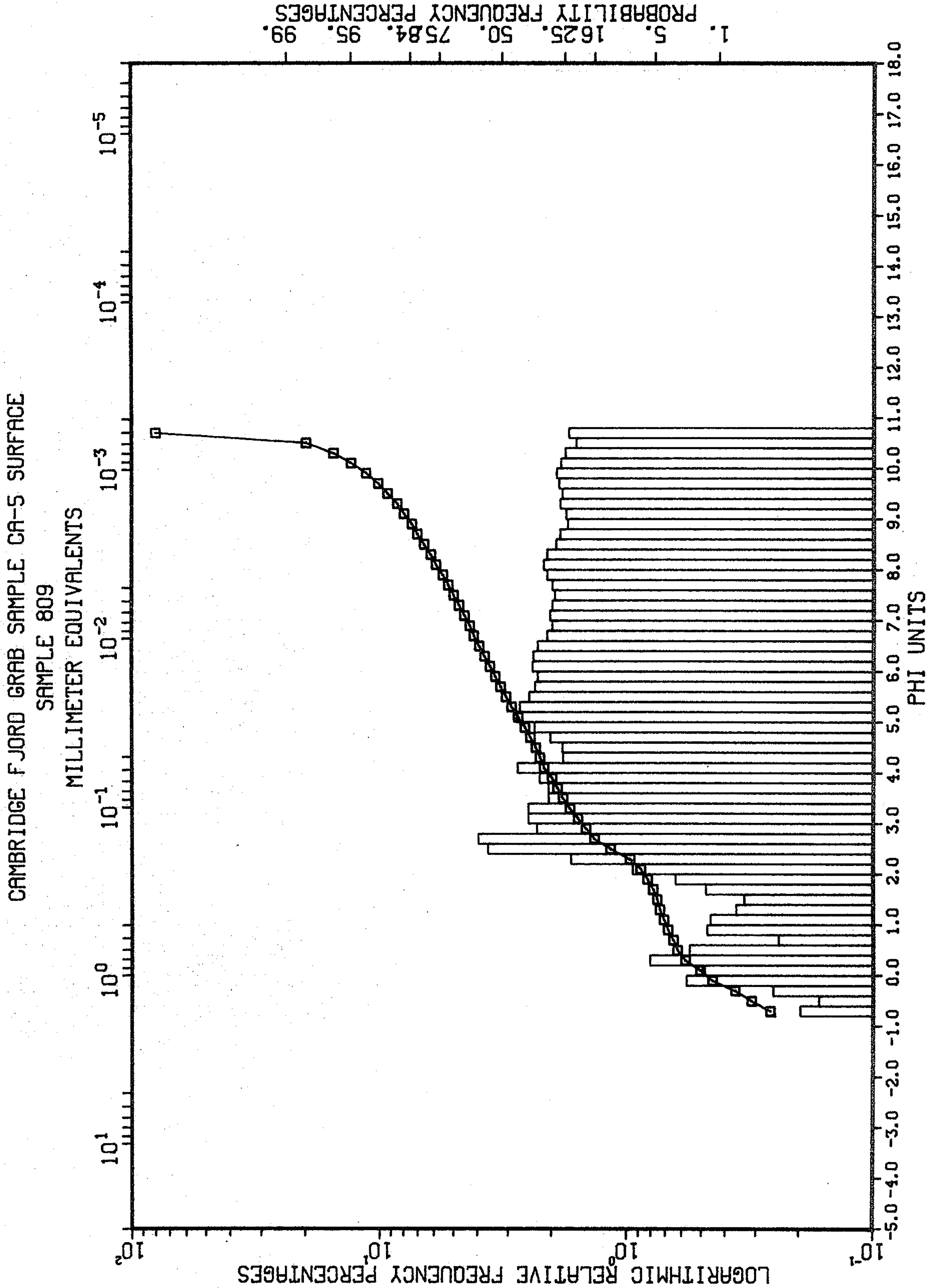


Fig. 8-28

PLOT 6   08.44.05   MON 4 JUL, 1983   JOB=ARCO:::, BEDFORD INSTITUTE DISSPLA VER 8.2

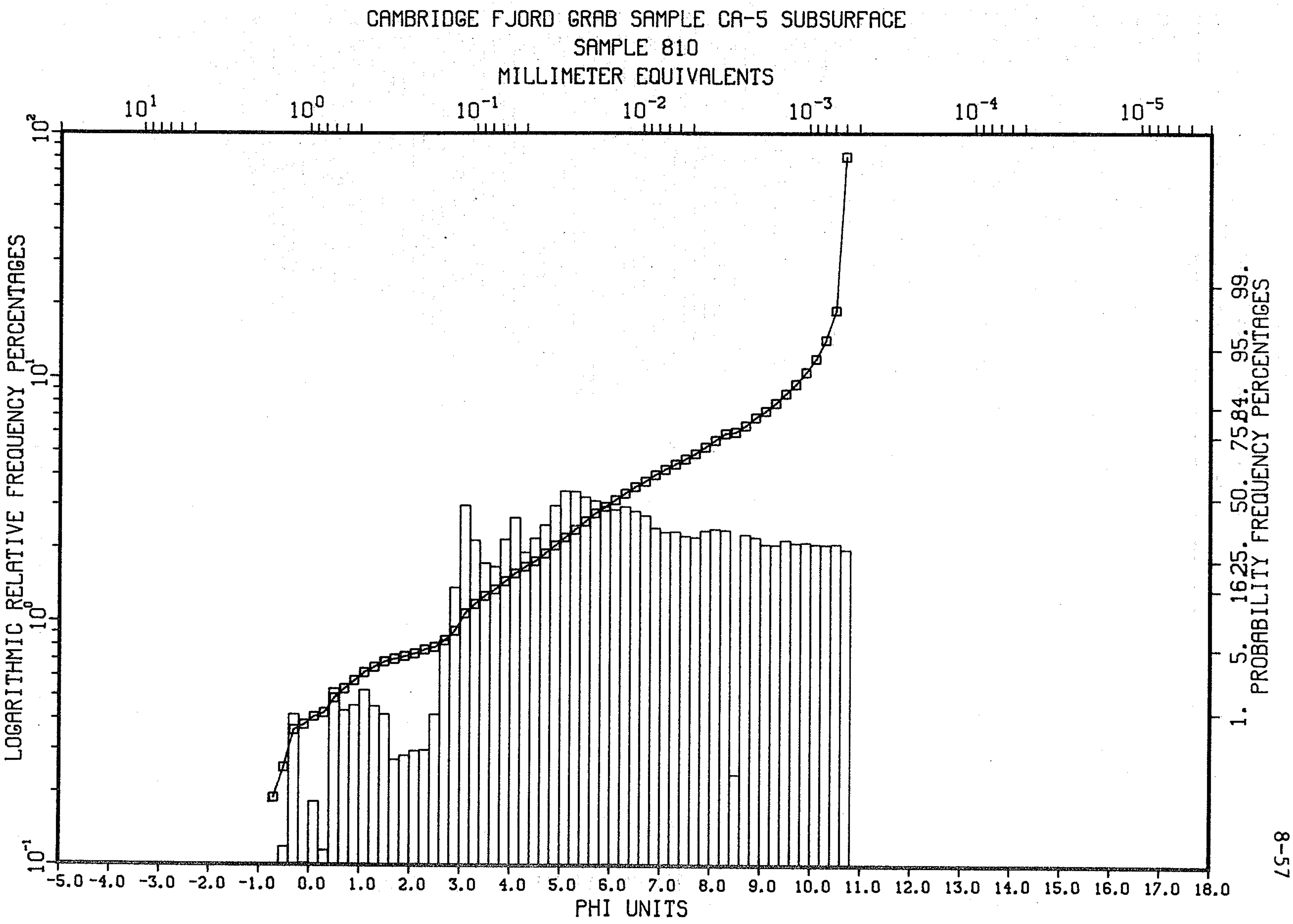


Fig. 8-29

PLOT 7 08.44.21 MON 4 JUL, 1983 JOB=AACO!!! , BEDFORD INSTITUTE DISSPLA VER 8.2

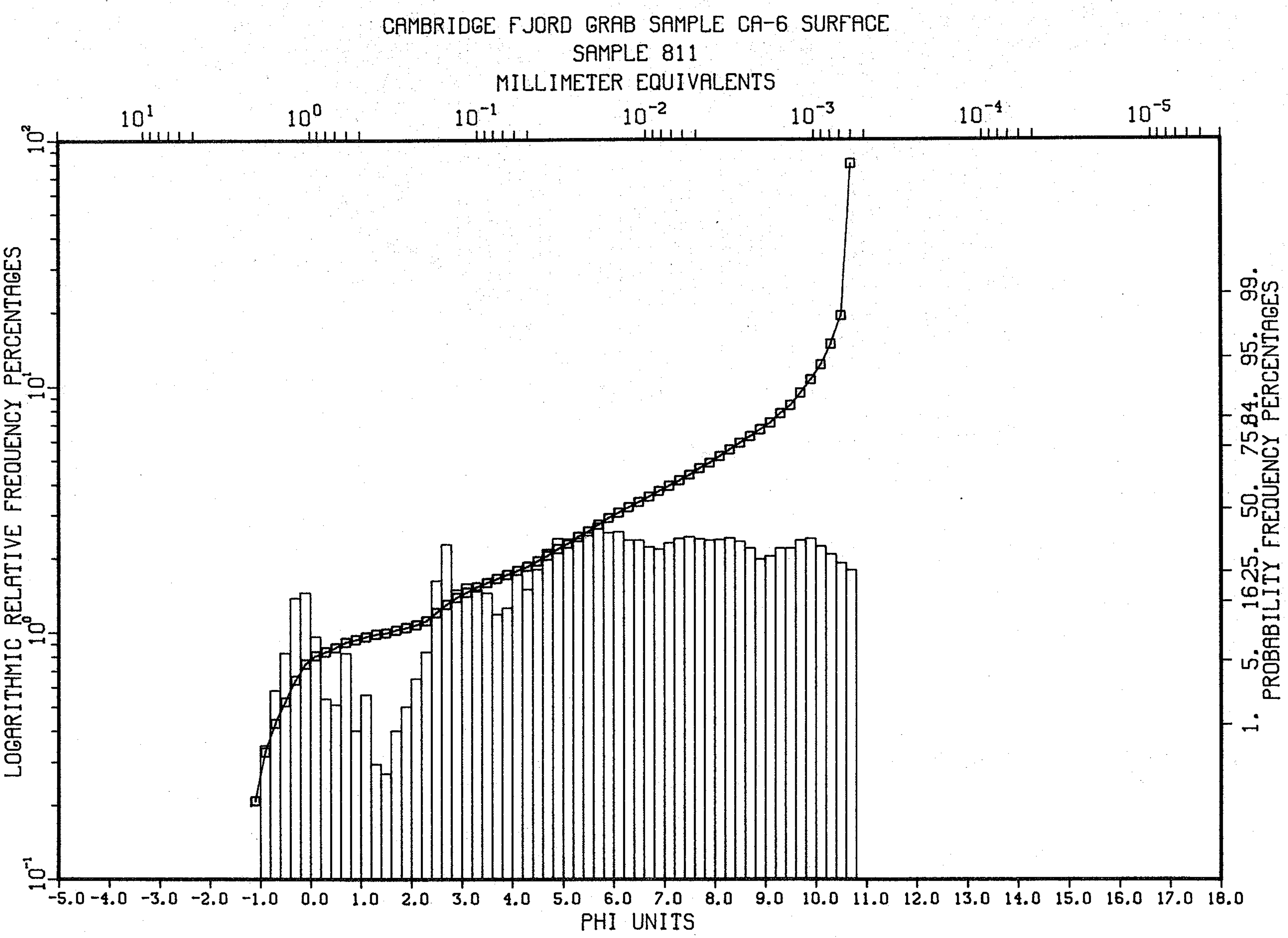


Fig. 8-30

PLOT 8 08.44.35 MON 4 JUL, 1983 JOB-ARCO::: , BEDFORD INSTITUTE DISSPLA VER 8.2

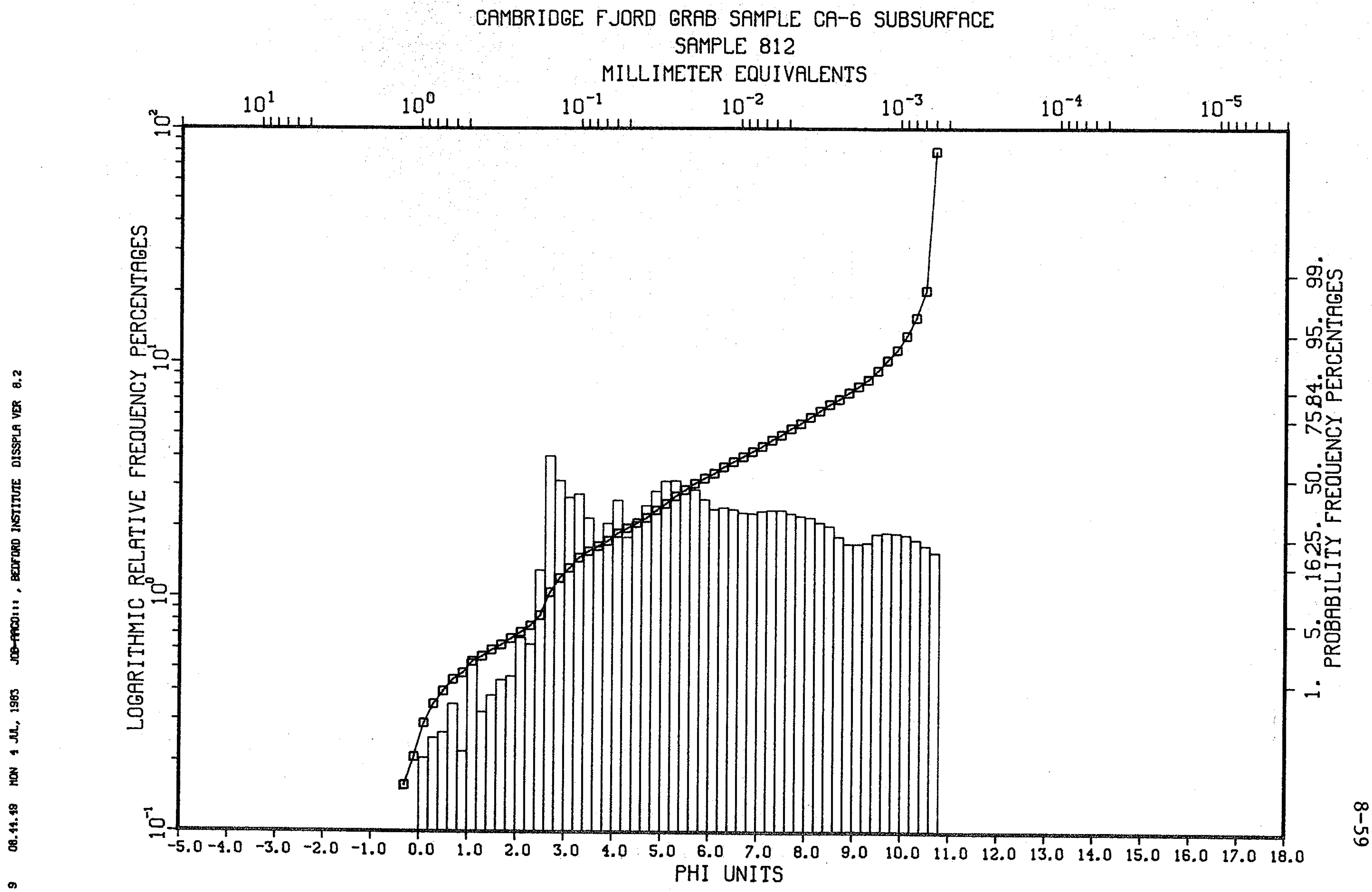

CAMBRIDGE FJORD GRAB SAMPLE CA-6 SUBSURFACE
SAMPLE 812
MILLIMETER EQUIVALENTS
10^1
10^0
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
LOGARITHMIC RELATIVE FREQUENCY PERCENTAGES
10^2
10^1
10^0
10^{-1}
PROBABILITY FREQUENCY PERCENTAGES
1. 5. 16 25. 50. 75 84. 95. 99.
-5.0 -4.0 -3.0 -2.0 -1.0 0.0 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0 16.0 17.0 18.0
PHI UNITS
PLOT 9 08.44.49 MON 4 JUL, 1983 JOB-ARCO::: , BEDFORD INSTITUTE DISSPLA VER 8.2

Fig. 8-31

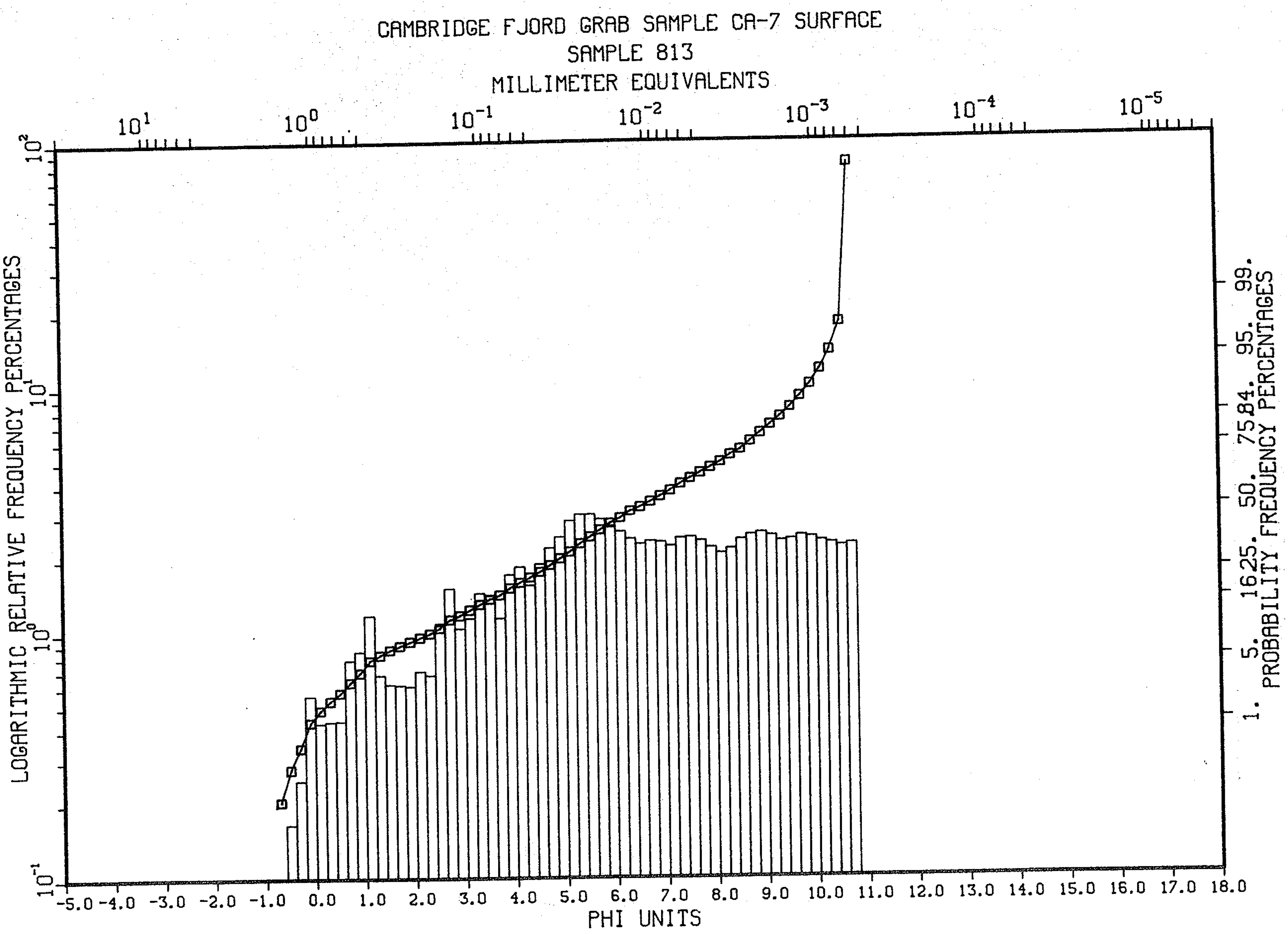


Fig. 8-32

PLOT 10 08.45.00 MON 4 JUL, 1983 JOB-AACO::: , BEDFORD INSTITUTE DISSPLA VER 8.2

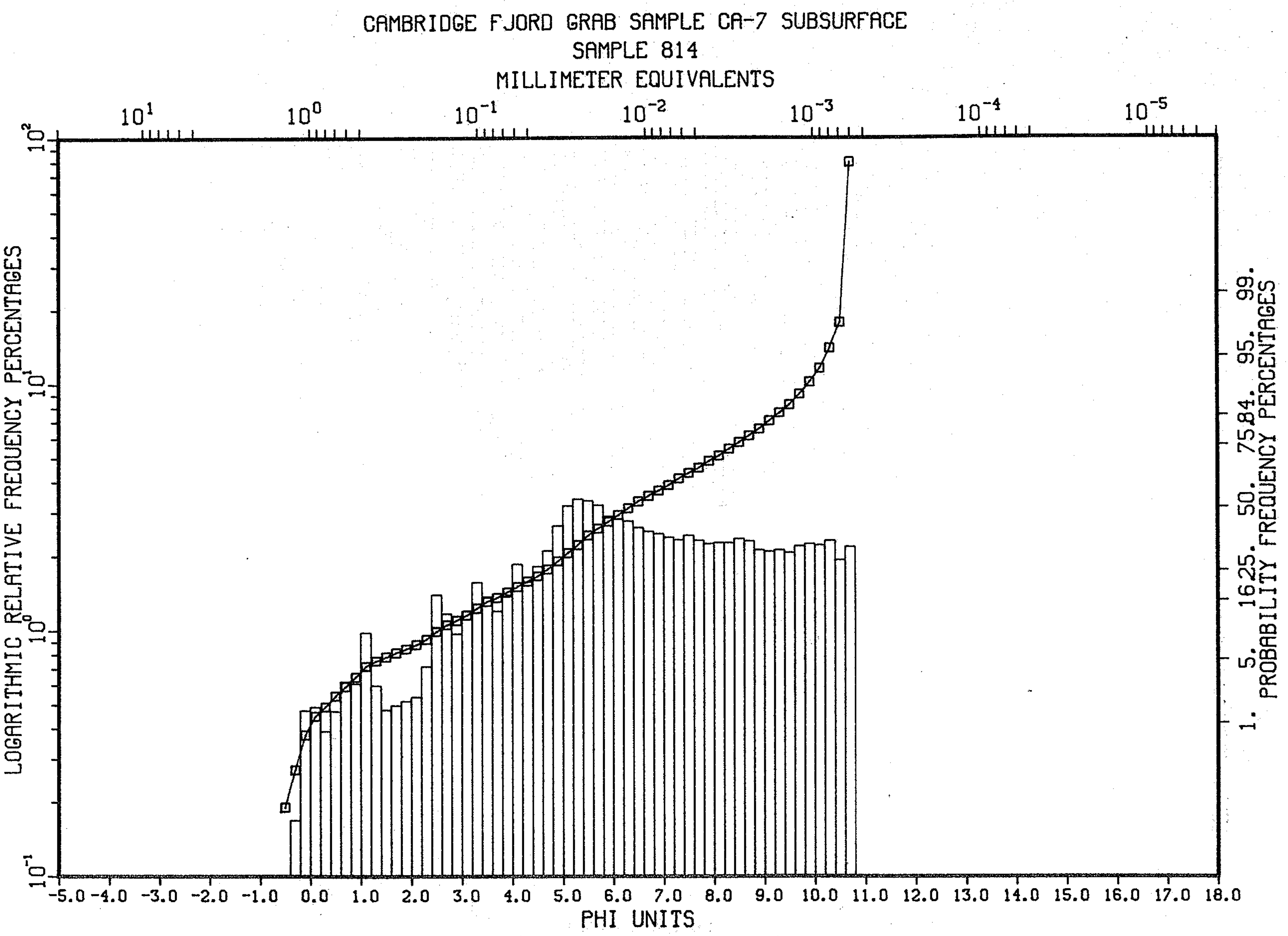
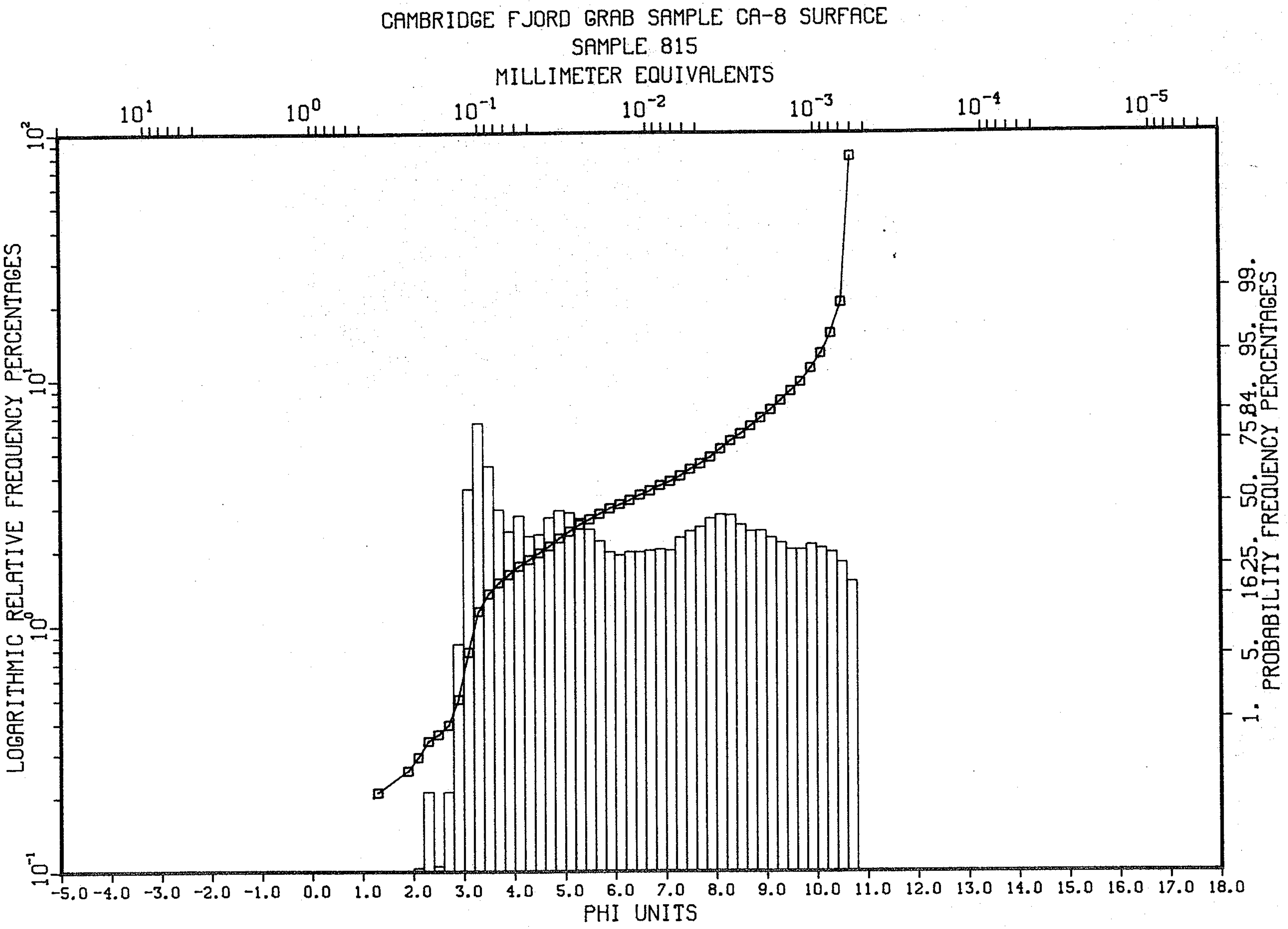

CAMBRIDGE FJORD GRAB SAMPLE CA-7 SUBSURFACE
SAMPLE 814
MILLIMETER EQUIVALENTS
10^1
10^0
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
LOGARITHMIC RELATIVE FREQUENCY PERCENTAGES
10^2
10^1
10^0
10^{-1}
PROBABILITY FREQUENCY PERCENTAGES
1.
5.
16
25.
50.
75
84.
95.
99.
-5.0
-4.0
-3.0
-2.0
-1.0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
PHI UNITS

Fig. 8-33



CAMBRIDGE FJORD GRAB SAMPLE CA-8 SURFACE
SAMPLE 815

Fig. 8-34

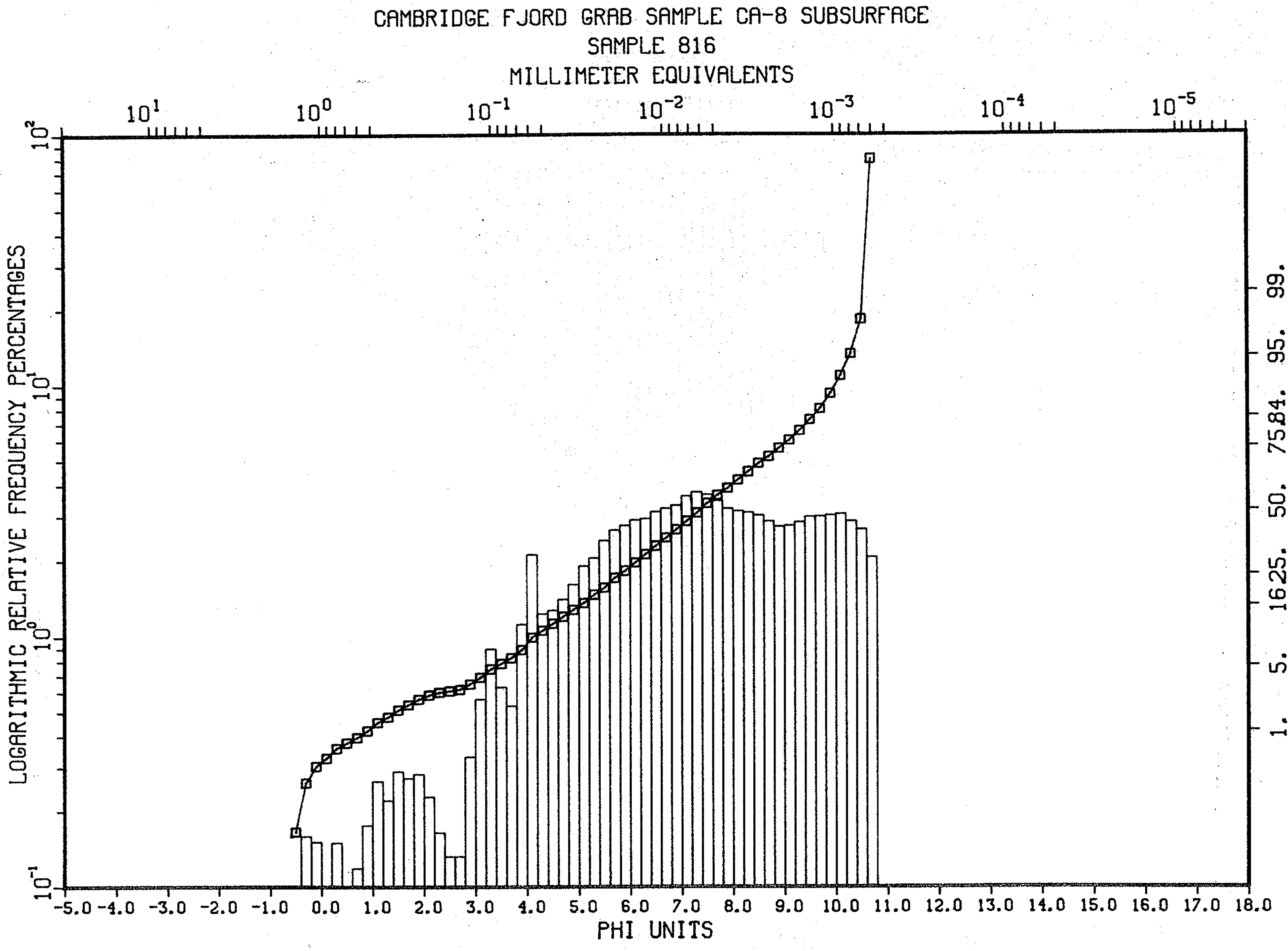

CAMBRIDGE FJORD GRAB SAMPLE CA-8 SUBSURFACE
SAMPLE 816
MILLIMETER EQUIVALENTS
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
LOGARITHMIC RELATIVE FREQUENCY PERCENTAGES
10^2
10^1
10^0
10^-1
PROBABILITY FREQUENCY PERCENTAGES
1.
5.
16
25.
50.
75
84.
95.
99.
-5.0 -4.0 -3.0 -2.0 -1.0 0.0 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0 16.0 17.0 18.0
PHI UNITS

Fig. 8-35

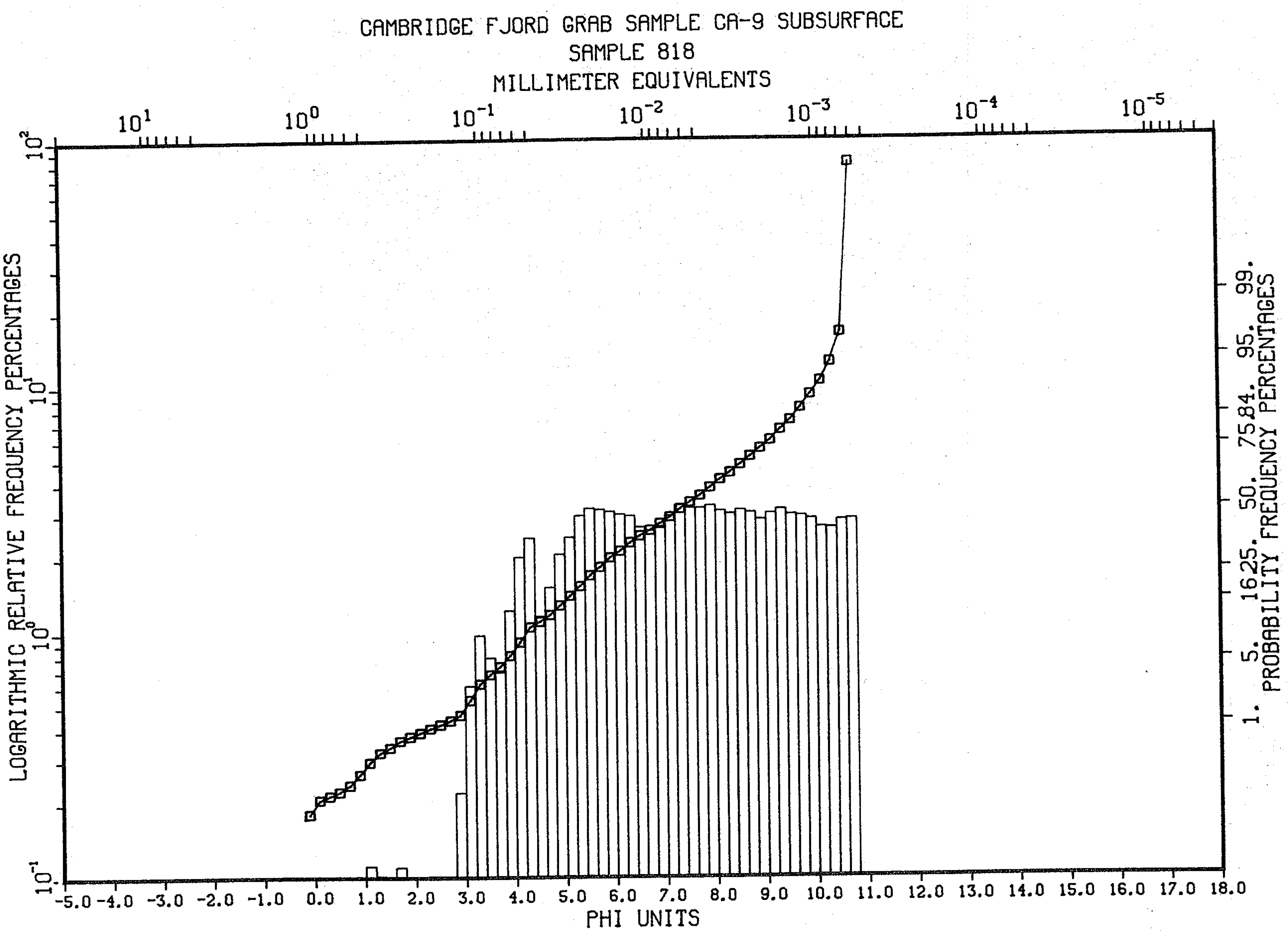

CAMBRIDGE FJORD GRAB SAMPLE CA-9 SUBSURFACE
SAMPLE 818
MILLIMETER EQUIVALENTS
10^1
10^0
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
LOGARITHMIC RELATIVE FREQUENCY PERCENTAGES
10^2
10^1
10^0
10^{-1}
PROBABILITY FREQUENCY PERCENTAGES
1.
5.
16
25.
50.
75
84.
95.
99.
-5.0
-4.0
-3.0
-2.0
-1.0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
PHI UNITS

Fig. 8-36

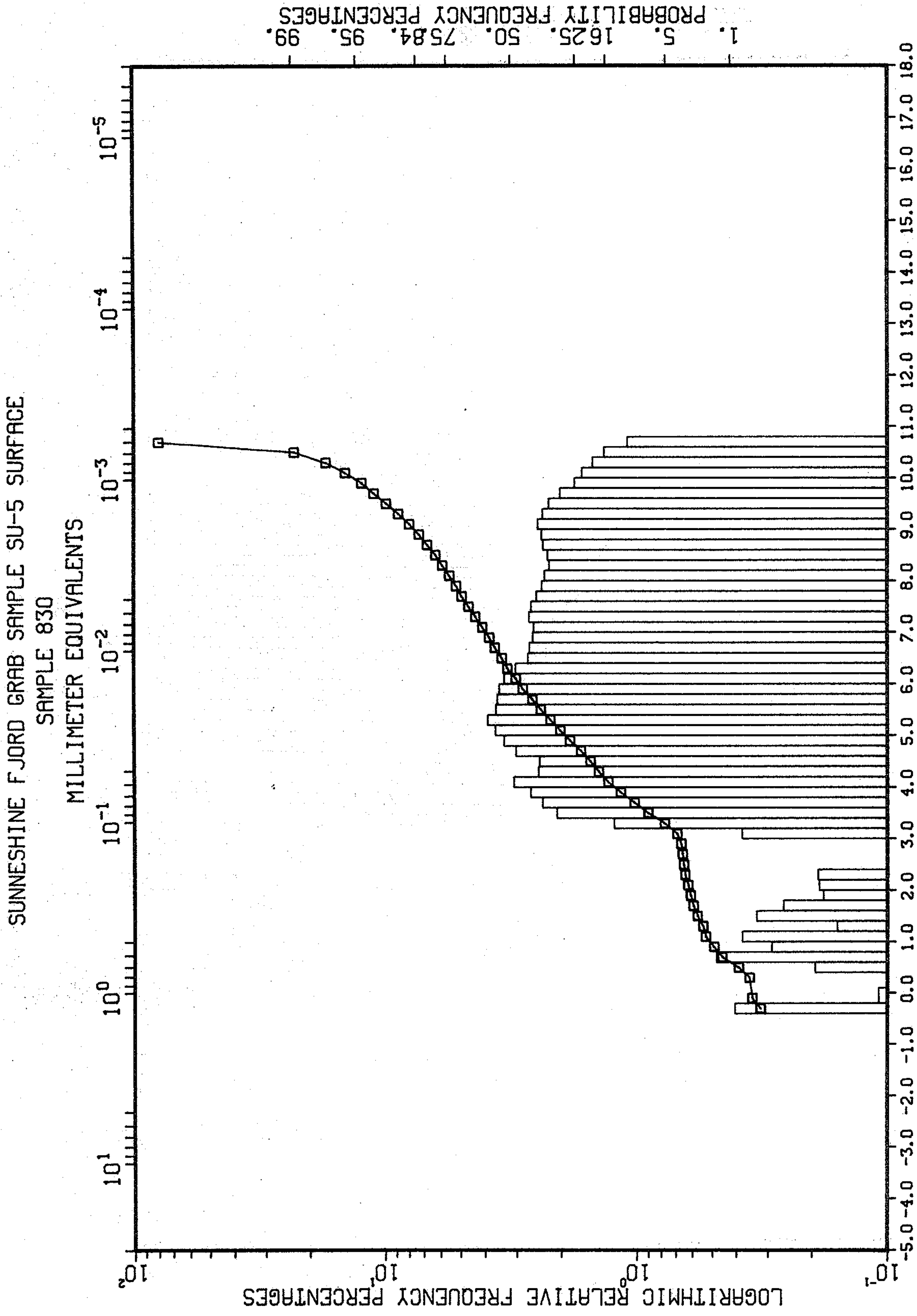

SUNNESHINE FJORD GRAB SAMPLE SU-5 SURFACE
SAMPLE 830
MILLIMETER EQUIVALENTS
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
PROBABILITY FREQUENCY PERCENTAGES
1.
5.
16
25.
50.
75
84.
95.
99.
LOGARITHMIC RELATIVE FREQUENCY PERCENTAGES
10^{2}
10^{1}
10^{0}
10^{-1}
PHI UNITS
-5.0
-4.0
-3.0
-2.0
-1.0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0

Fig. 8-37

SUNNESHINE FJORD GRAB SAMPLE SU-5 SUBSURFACE
SAMPLE 831

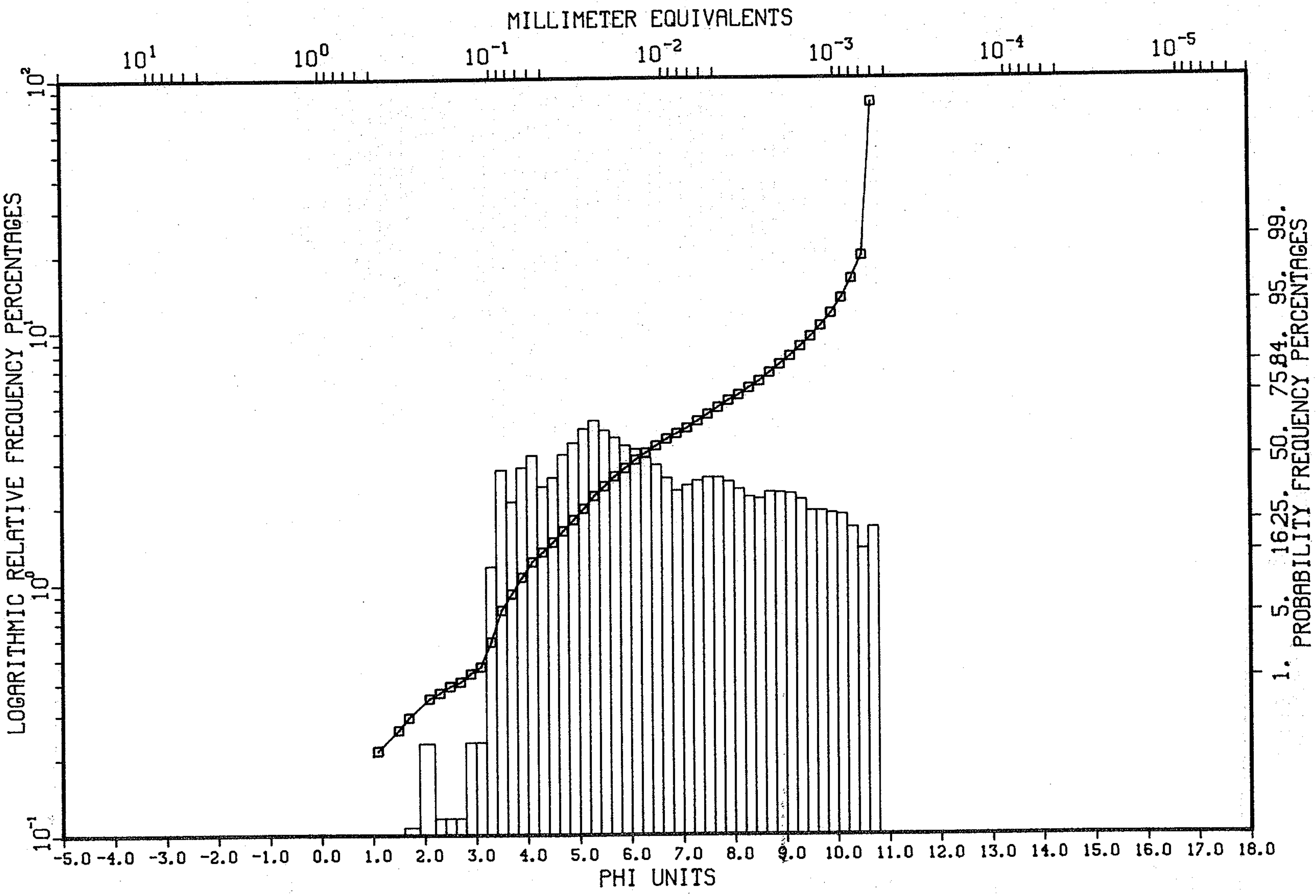


Fig. 8-38

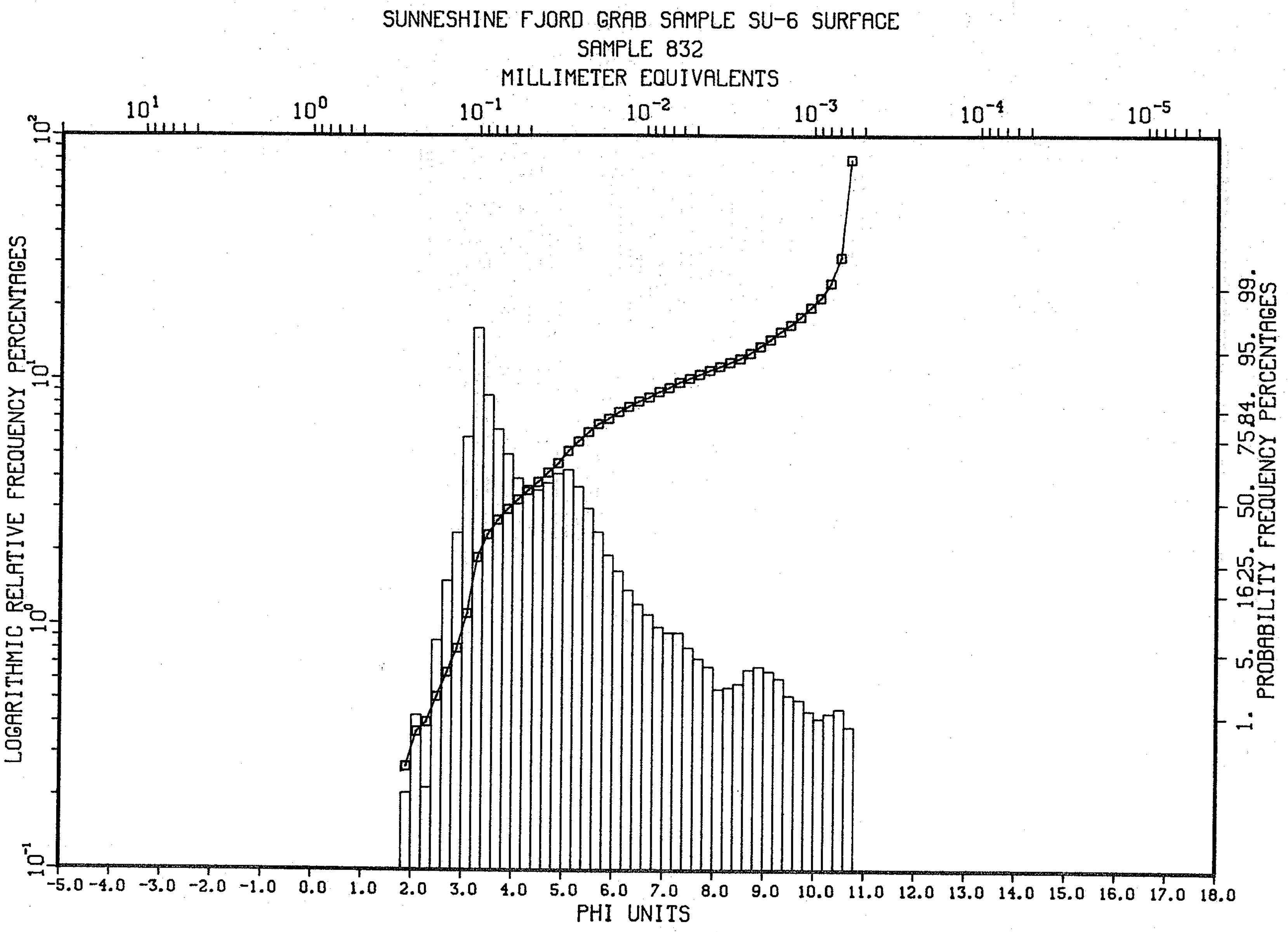

SUNNESHINE FJORD GRAB SAMPLE SU-6 SURFACE
SAMPLE 832
MILLIMETER EQUIVALENTS
10^1
10^0
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
LOGARITHMIC RELATIVE FREQUENCY PERCENTAGES
10^2
10^1
10^0
10^{-1}
PROBABILITY FREQUENCY PERCENTAGES
1.
5.
16
25.
50.
75
84.
95.
99.
-5.0
-4.0
-3.0
-2.0
-1.0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
PHI UNITS

Fig. 8-39

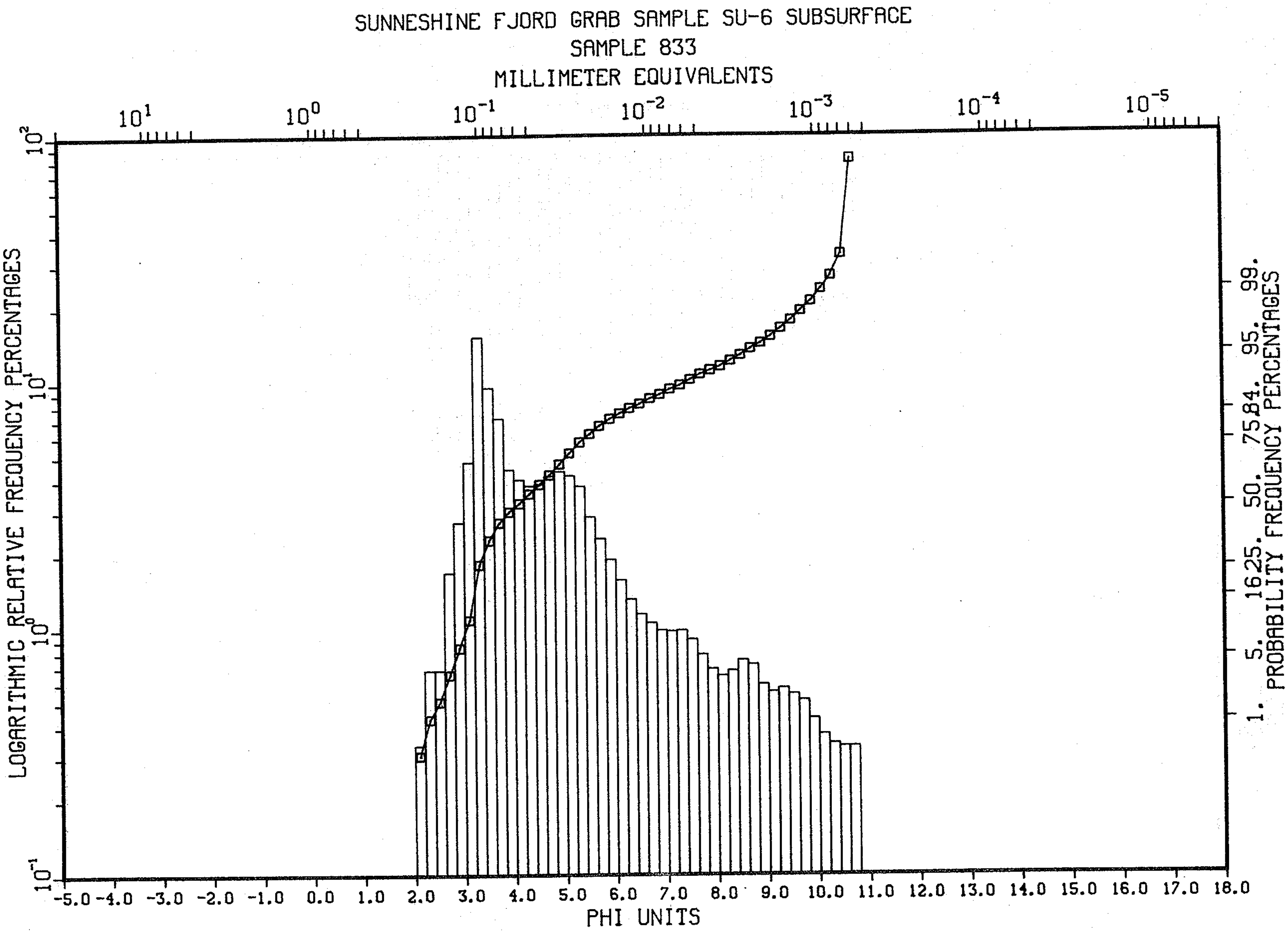
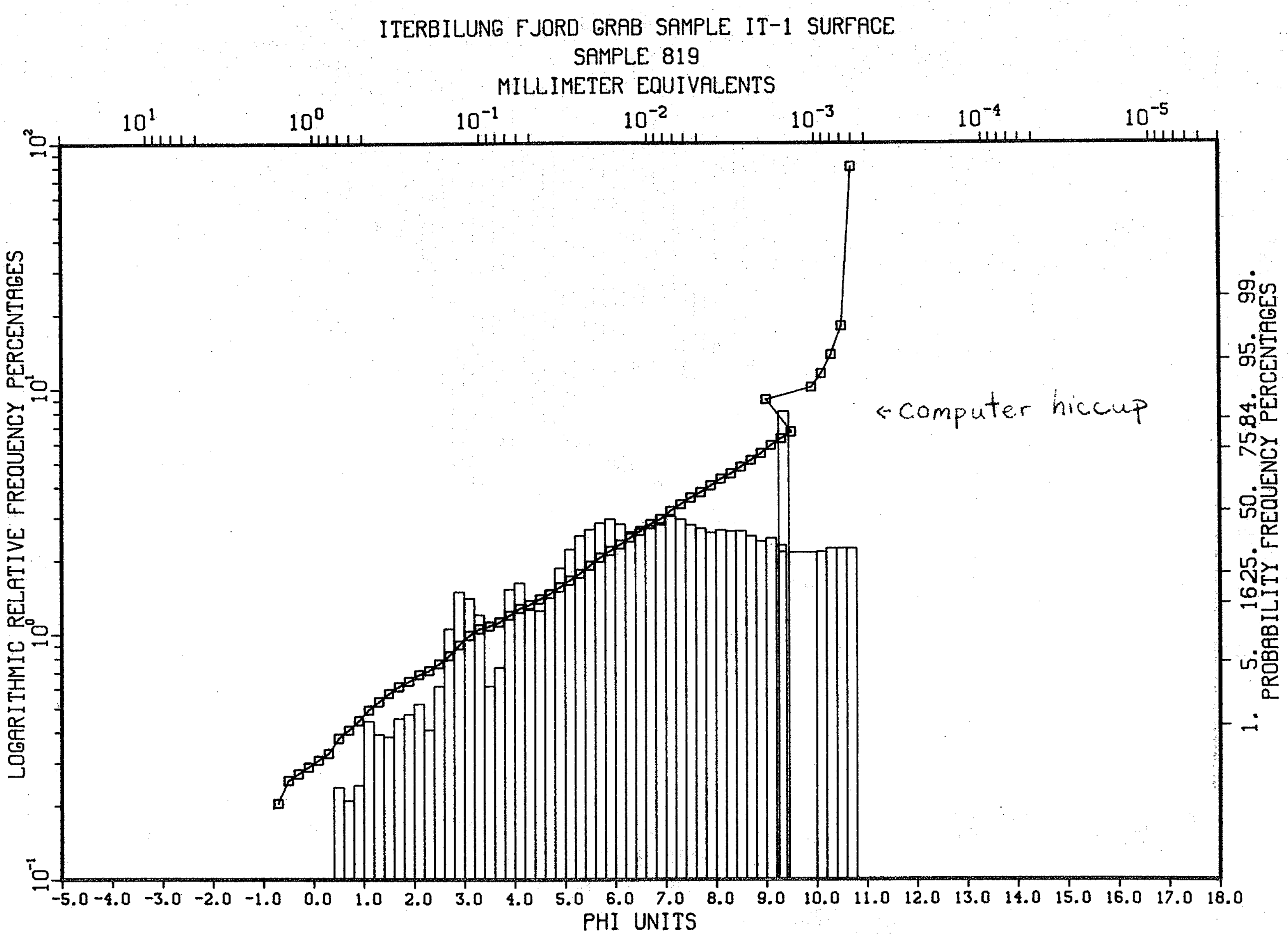

SUNNESHINE FJORD GRAB SAMPLE SU-6 SUBSURFACE
SAMPLE 833
MILLIMETER EQUIVALENTS
10^1
10^0
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
LOGARITHMIC RELATIVE FREQUENCY PERCENTAGES
10^2
10^1
10^0
10^{-1}
PROBABILITY FREQUENCY PERCENTAGES
1.
5.
16
25.
50.
75
84.
95.
99.
-5.0 -4.0 -3.0 -2.0 -1.0 0.0 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0 16.0 17.0 18.0
PHI UNITS

Fig. 8-40



← computer hiccup

Fig. 8-41

PLOT 1 08.46.16 MON 4 JUL, 1985 JOB-AACR::: , BEDFORD INSTITUTE DISSPLA VER 8.2

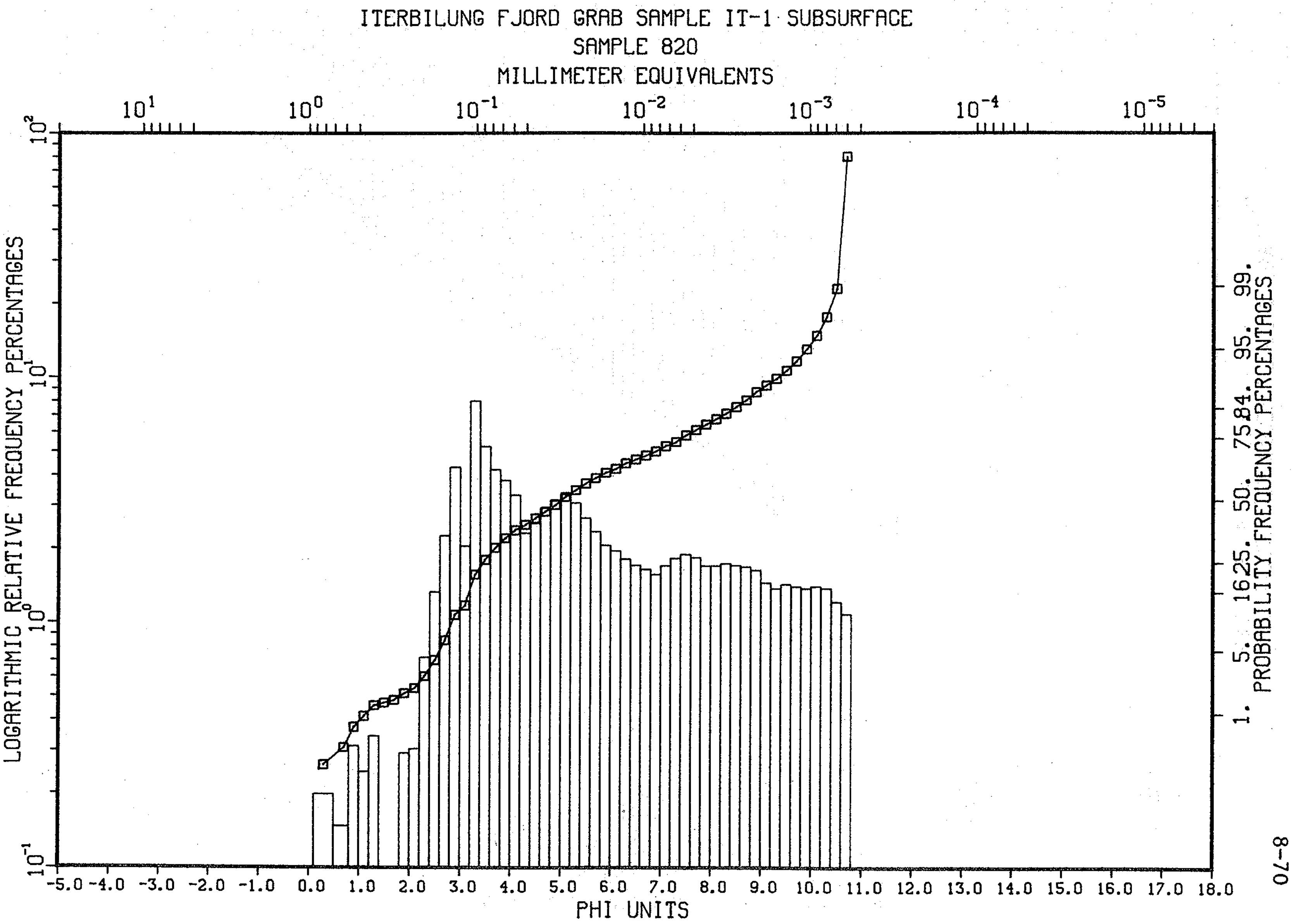


Fig. 8-42

PLOT 2 08.46.30 MON 4 JUL, 1983 JOB-AACR::: , BEDFORD INSTITUTE DISSPLA VER 8.2

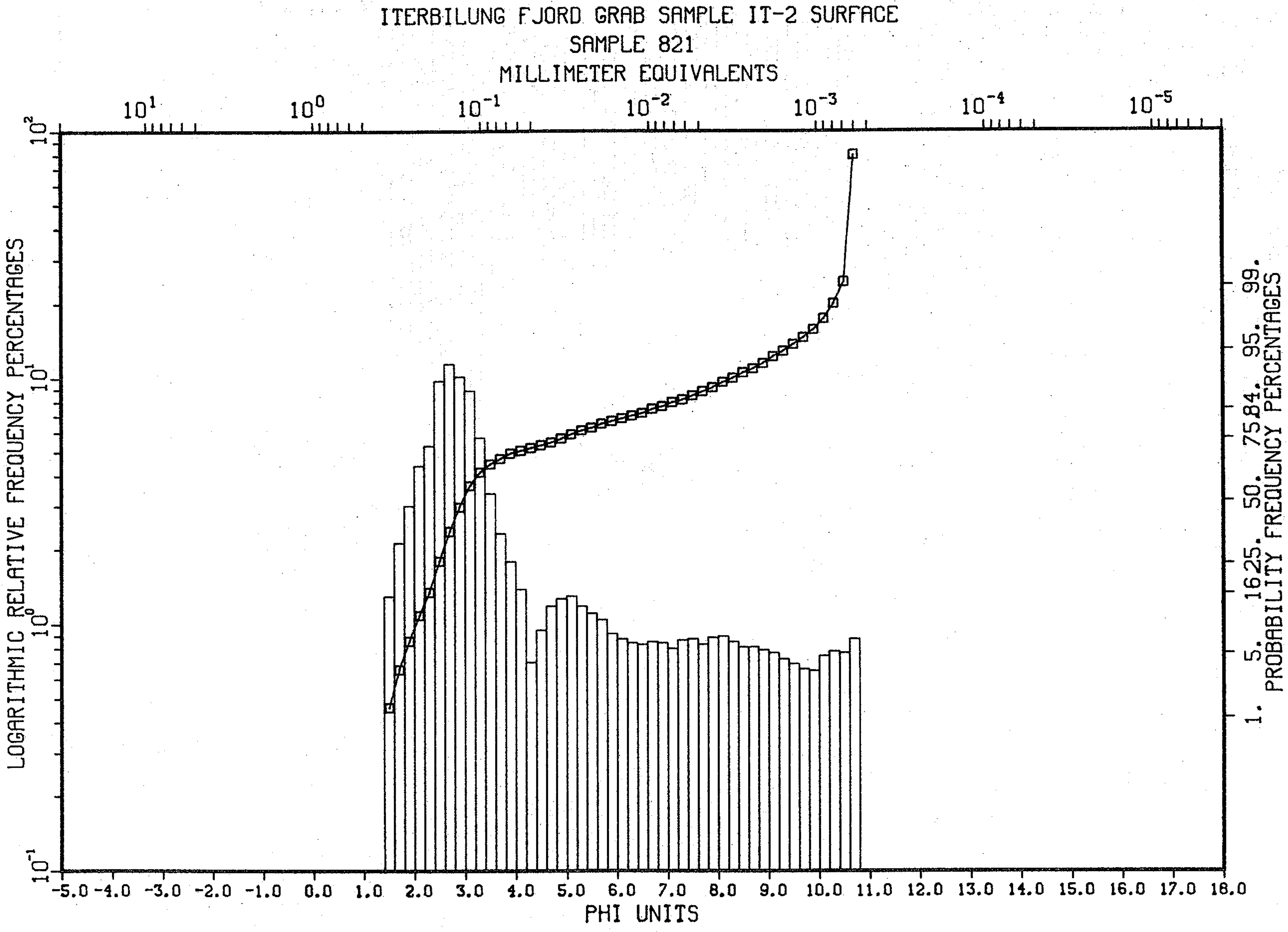


Fig. 8-43

PLOT 3 08.46.45 MON 4 JUL, 1985 JOB-AACR::: , BEDFORD INSTITUTE DISSPLA VER 8.2

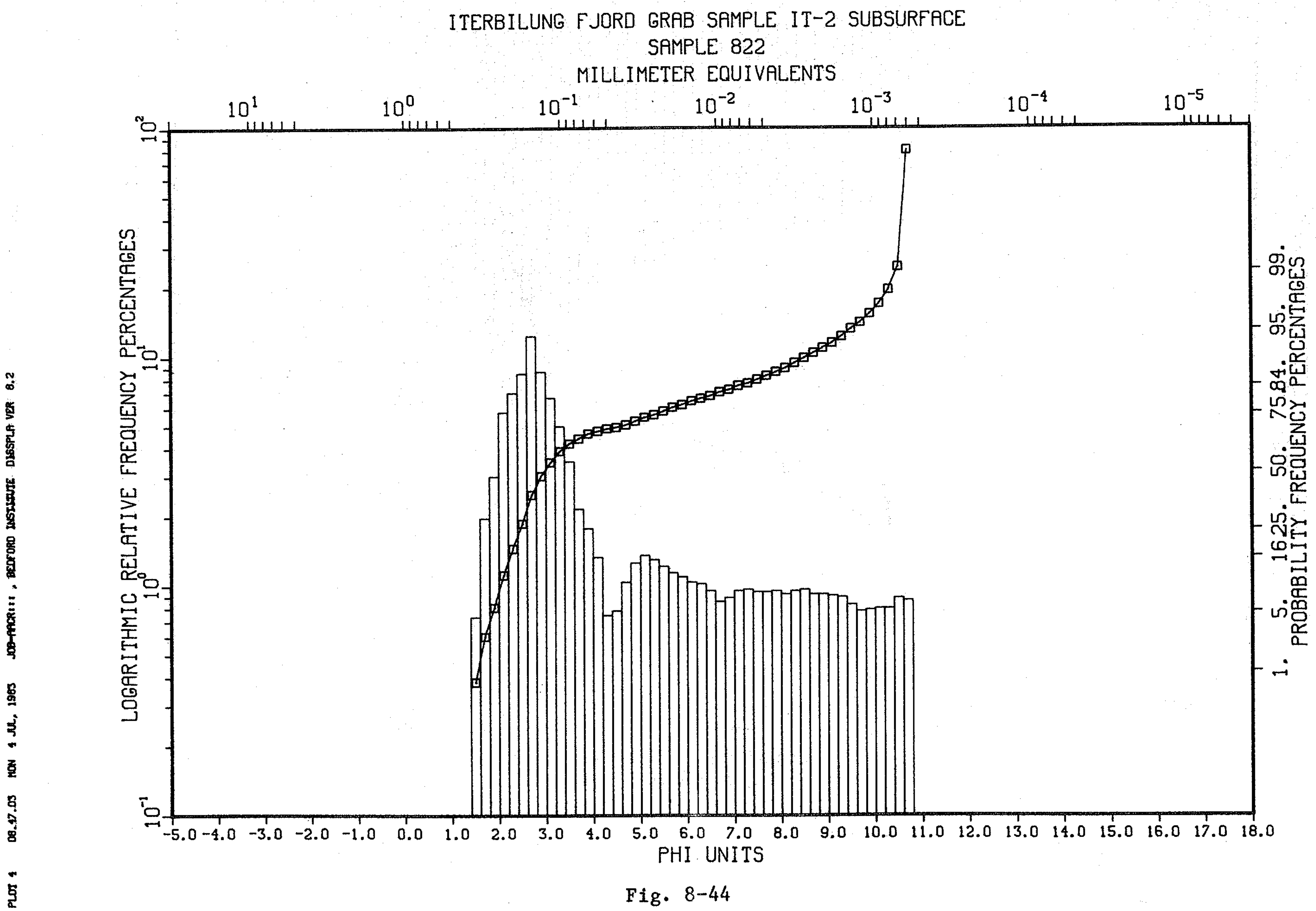

ITERBILUNG FJORD GRAB SAMPLE IT-2 SUBSURFACE
SAMPLE 822
MILLIMETER EQUIVALENTS
10^1
10^0
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
LOGARITHMIC RELATIVE FREQUENCY PERCENTAGES
10^2
10^1
10^0
10^{-1}
PROBABILITY FREQUENCY PERCENTAGES
1.
5.
16.
25.
50.
75.
84.
95.
99.
-5.0
-4.0
-3.0
-2.0
-1.0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
PHI UNITS
PLOT 4 08.47.03 MON 4 JUL, 1983 JOB-AACR::: , BEDFORD INSTITUTE DISSPLA VER 8.2

Fig. 8-44

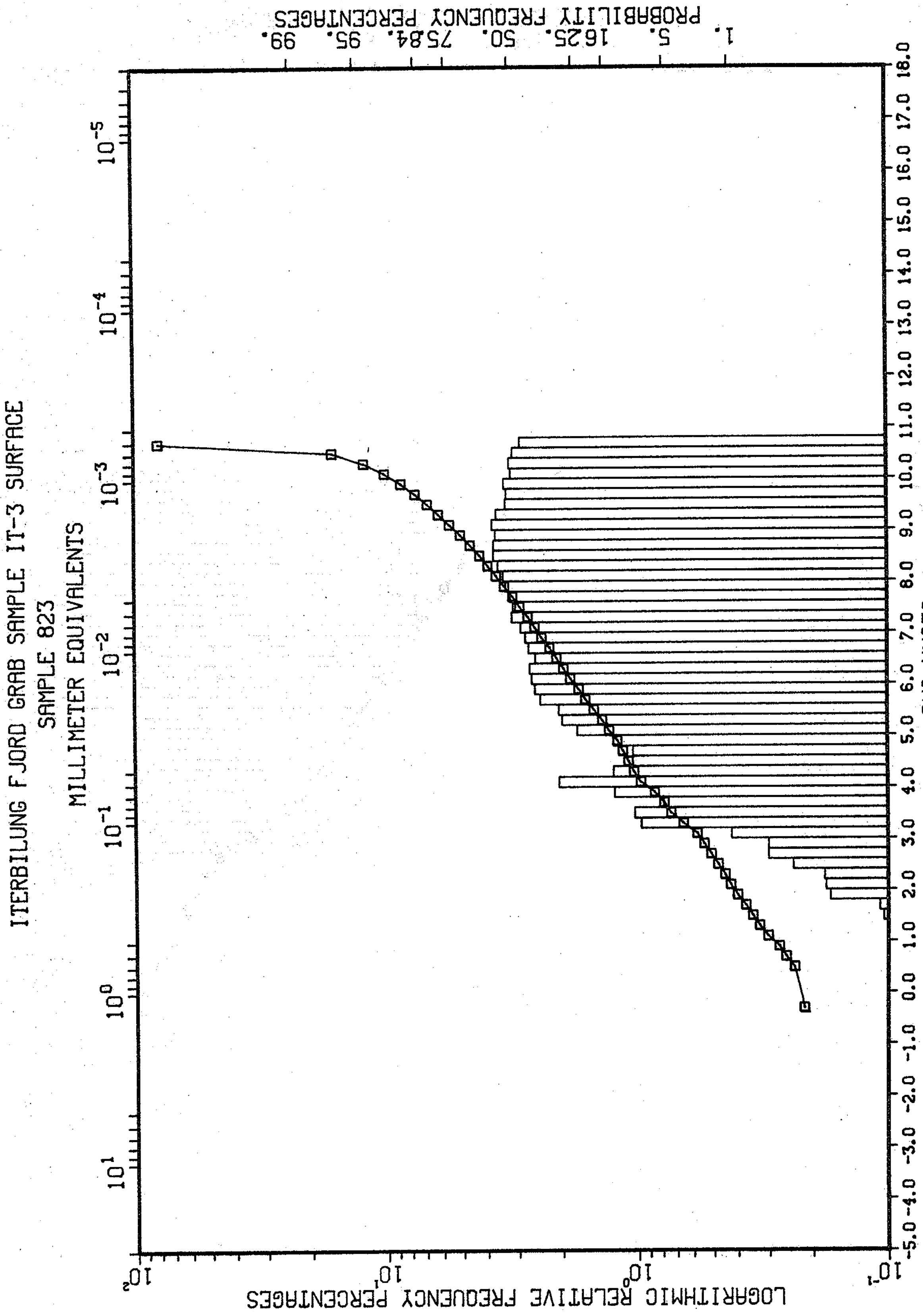


Fig. 8-45

PLOT 6 08.48.04 MON 4 JUL, 1983 JOB-RRCR!!! , BEDFORD INSTITUTE DISSPLA VER 8.2

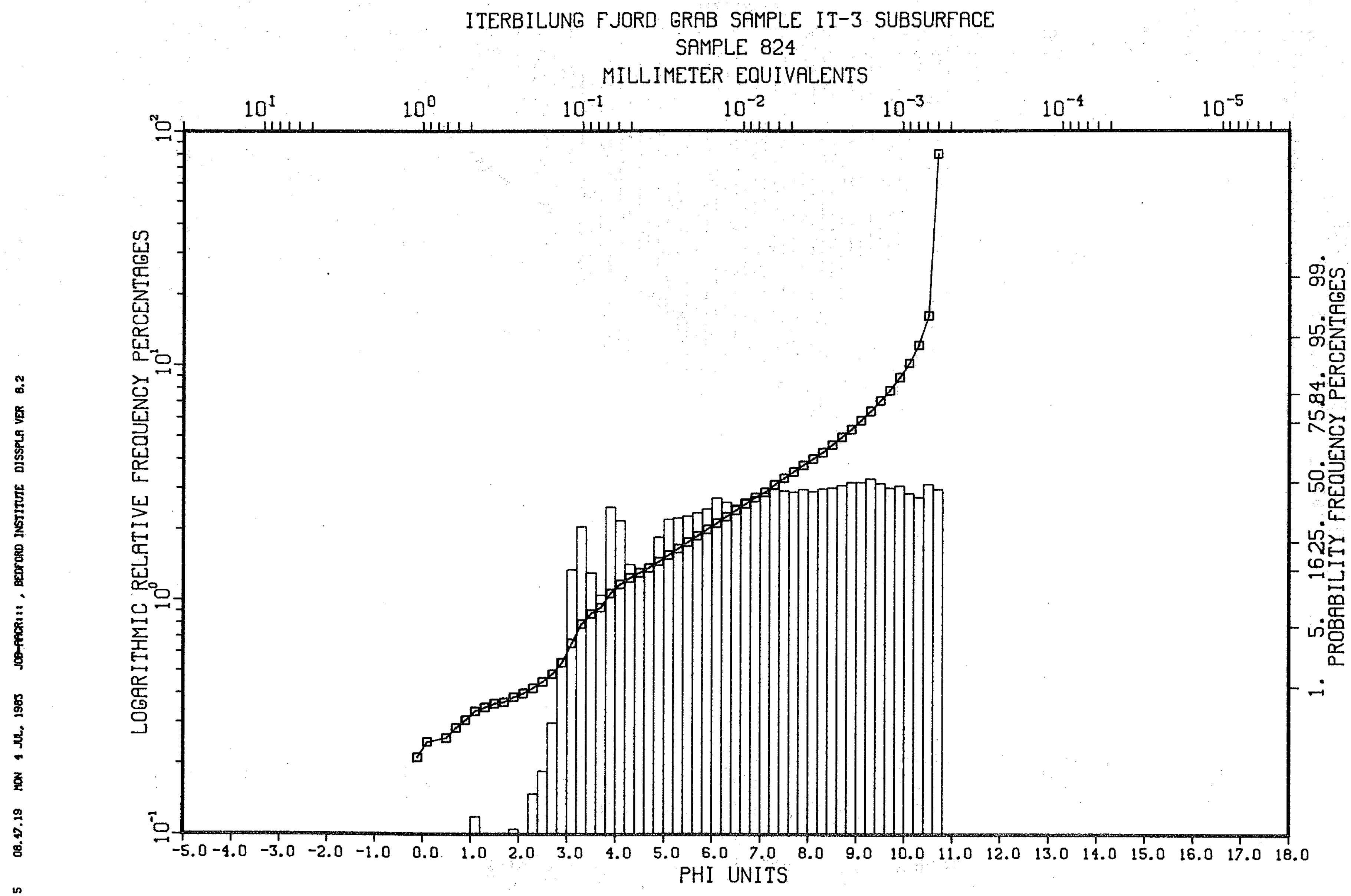

ITERBILUNG FJORD GRAB SAMPLE IT-3 SUBSURFACE
SAMPLE 824
MILLIMETER EQUIVALENTS
10^1
10^0
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
LOGARITHMIC RELATIVE FREQUENCY PERCENTAGES
10^2
10^1
10^0
10^{-1}
PROBABILITY FREQUENCY PERCENTAGES
1.
5.
16.25.
50.
75.84.
95.
99.
-5.0
-4.0
-3.0
-2.0
-1.0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
PHI UNITS
PLOT 5 08.47.19 MON 4 JUL, 1983 JOB-AACR::: , BEDFORD INSTITUTE DISSPLA VER 8.2

Fig. 8-46

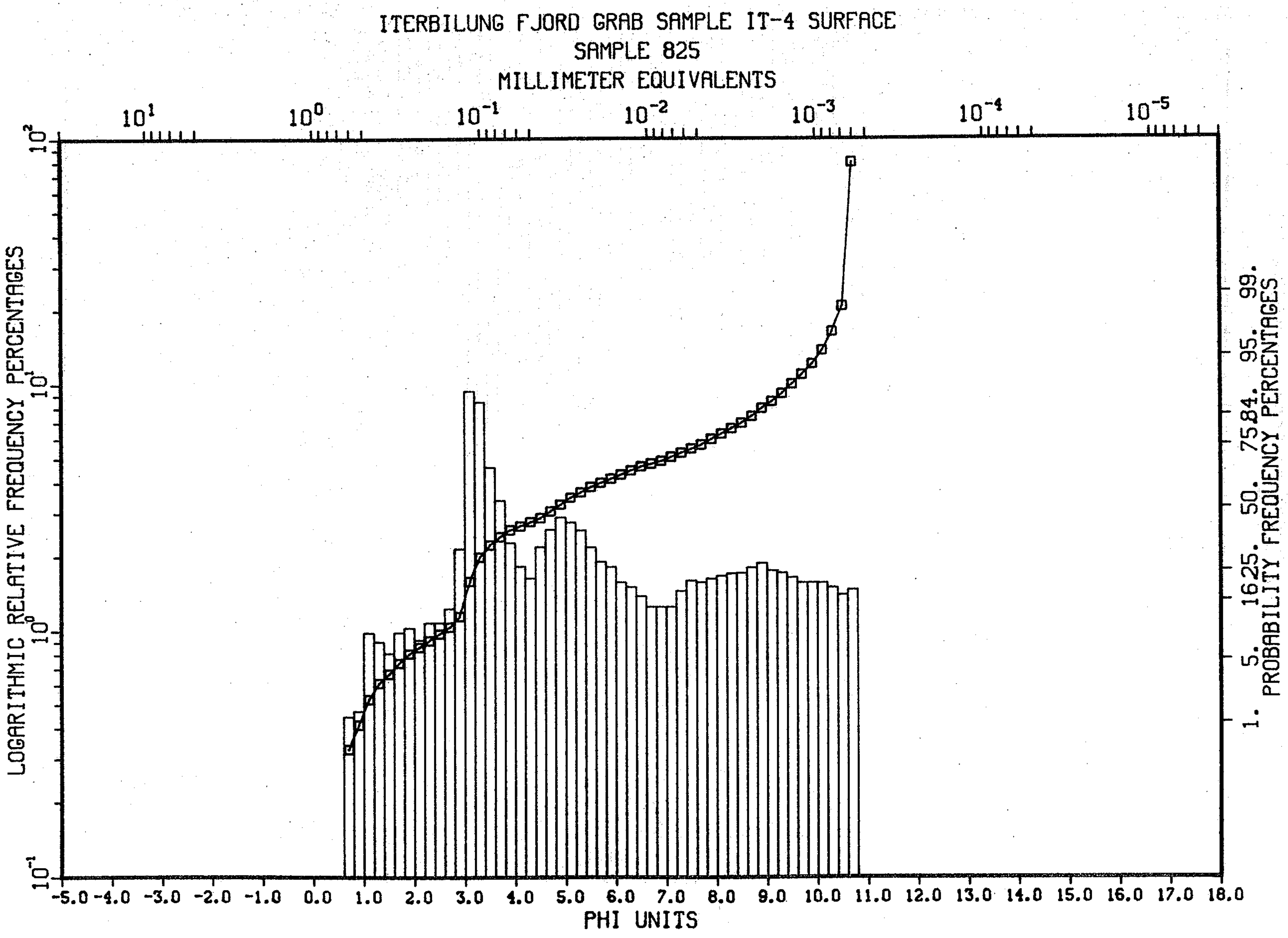


Fig. 8-47

PLOT 7 09.22.33 MON 4 JUL, 1983 JOB-AAGR::: , BEDFORD INSTITUTE DISSPLA VER 8.2

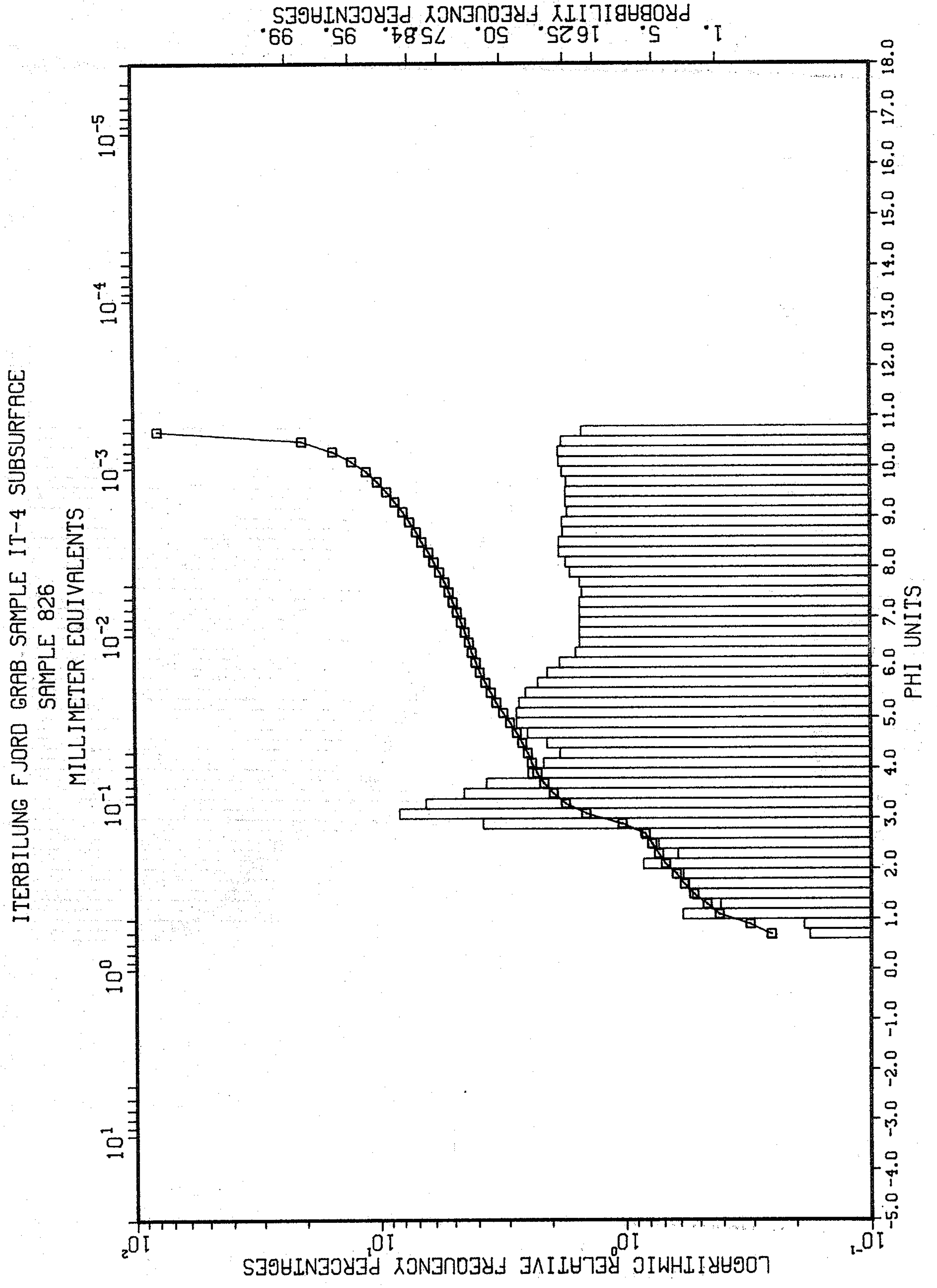
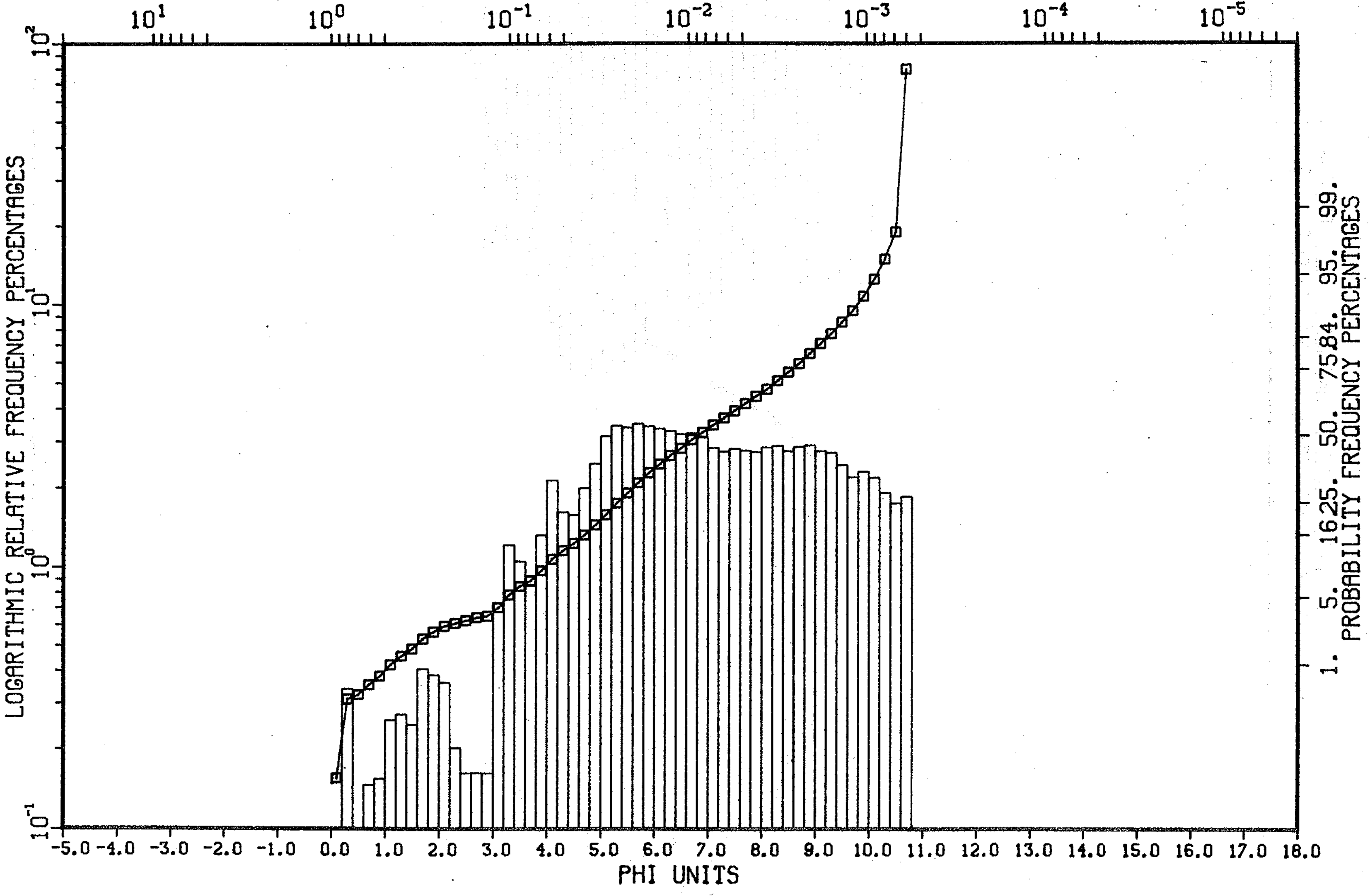


Fig. 8-48

PLOT 8 09.23.07 MON 4 JUL, 1983 JOB-AAGR!!! , BEDFORD INSTITUTE DISSPLA VER 8.2



ITERBILUNG FJORD GRAB SAMPLE IT-8 SURFACE
SAMPLE 827
MILLIMETER EQUIVALENTS

Fig. 8-49

PLOT 9 09.23.50 MON 4 JUL, 1983 JOB-AACR::: , BEDFORD INSTITUTE DISSPLA VER 8.2

CORONATION FJORD GRAB SAMPLE CO-1 SAMPLE
SAMPLE 875
MILLIMETER EQUIVALENTS

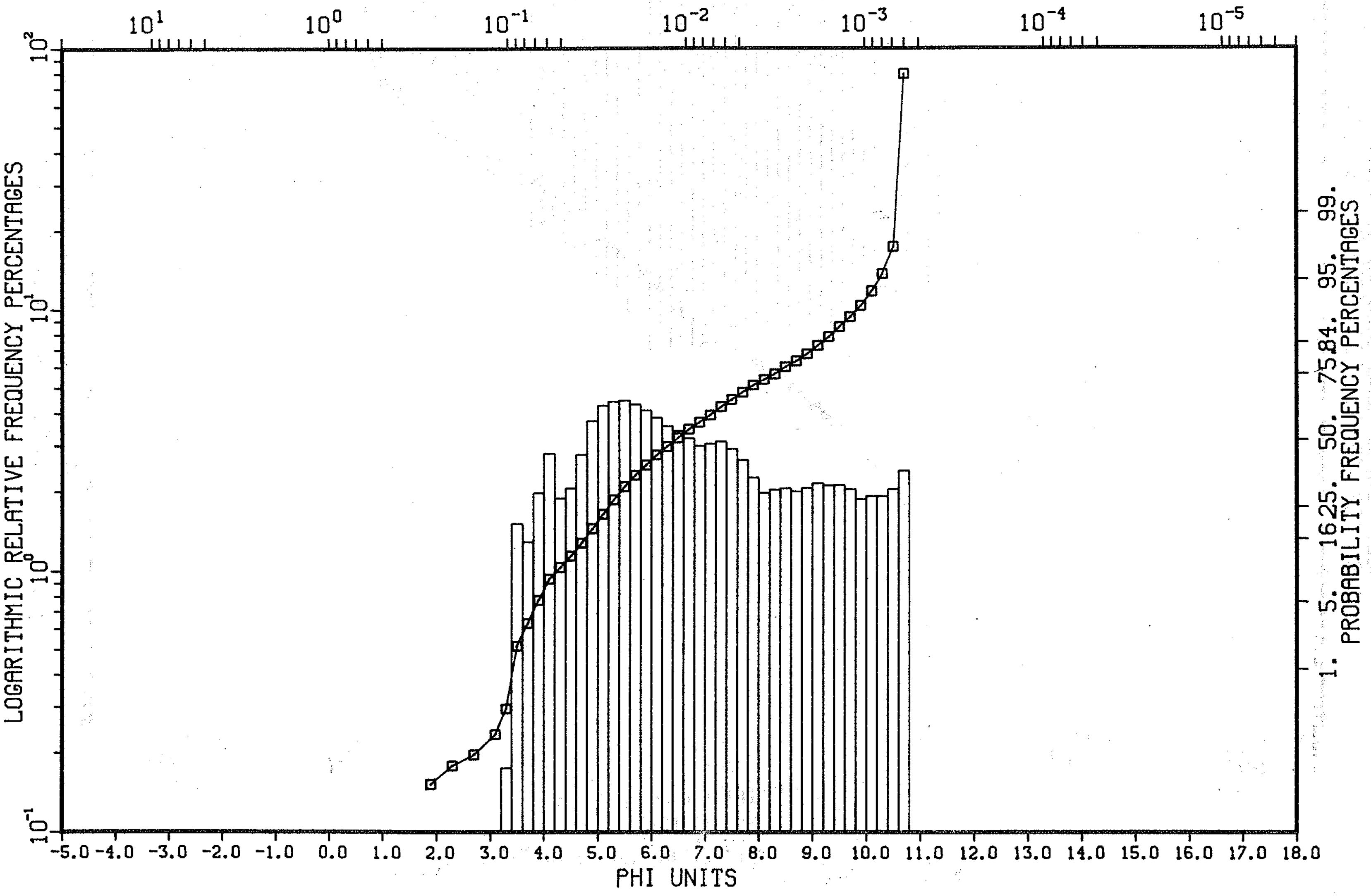


Fig. 8-50

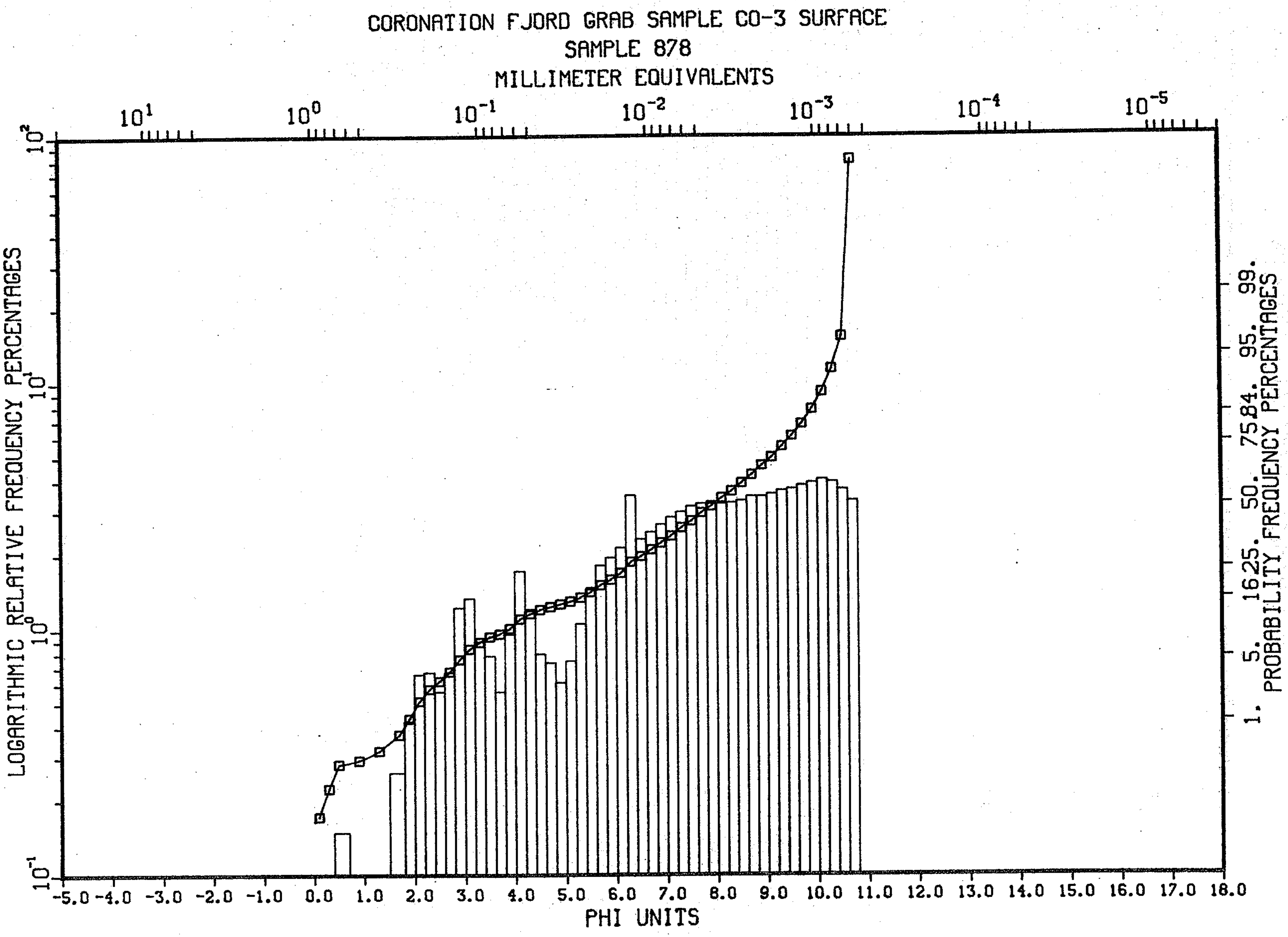

CORONATION FJORD GRAB SAMPLE CO-3 SURFACE
SAMPLE 878
MILLIMETER EQUIVALENTS
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
LOGARITHMIC RELATIVE FREQUENCY PERCENTAGES
10^{2}
10^{1}
10^{0}
10^{-1}
PROBABILITY FREQUENCY PERCENTAGES
1.
5.
16
25.
50.
75
84.
95.
99.
-5.0
-4.0
-3.0
-2.0
-1.0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
PHI UNITS

Fig. 8-51

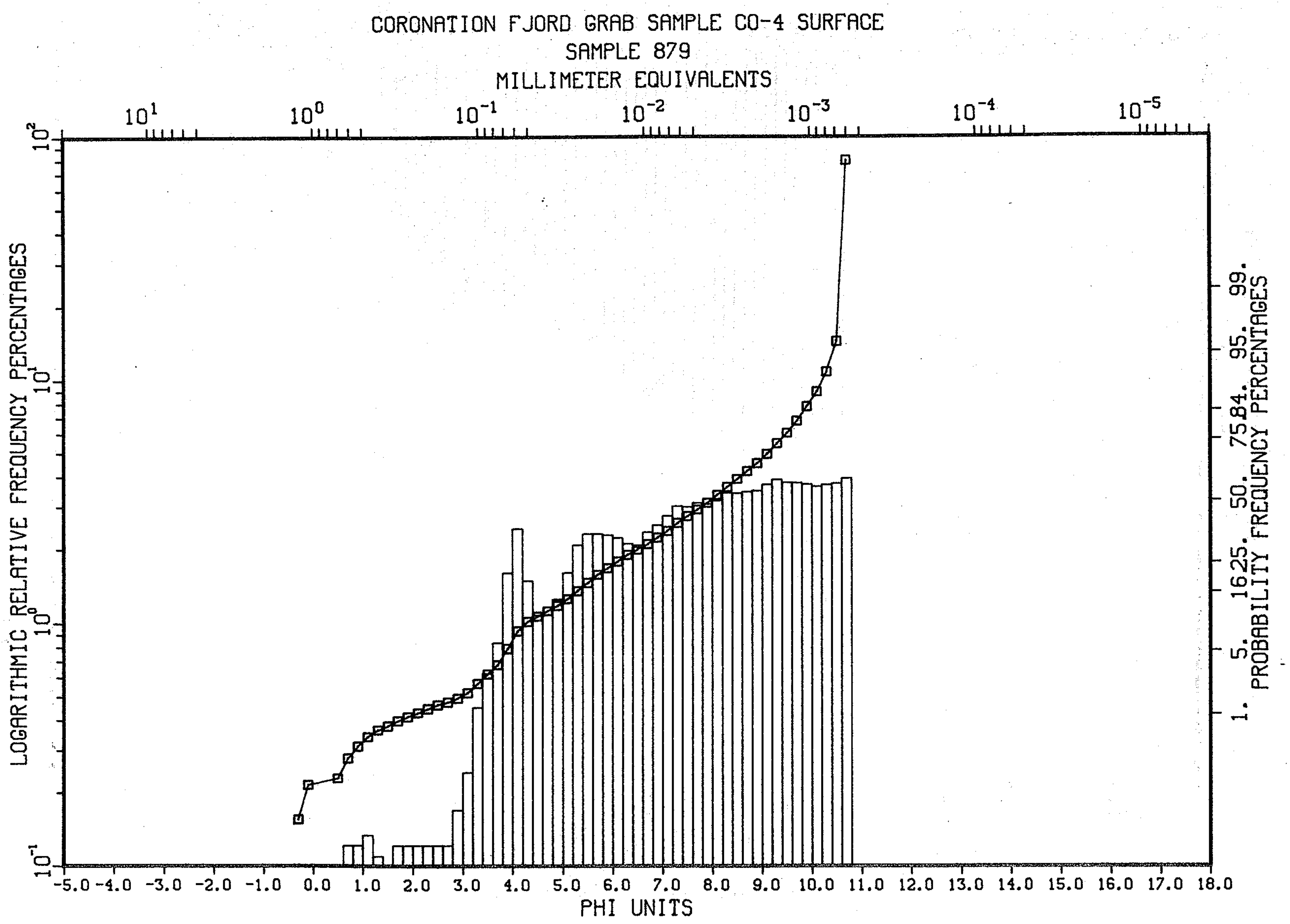

CORONATION FJORD GRAB SAMPLE CO-4 SURFACE
SAMPLE 879
MILLIMETER EQUIVALENTS
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
LOGARITHMIC RELATIVE FREQUENCY PERCENTAGES
10^2
10^1
10^0
10^-1
PROBABILITY FREQUENCY PERCENTAGES
1.
5.
16
25.
50.
75
84.
95.
99.
-5.0
-4.0
-3.0
-2.0
-1.0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
PHI UNITS

Fig. 8-52

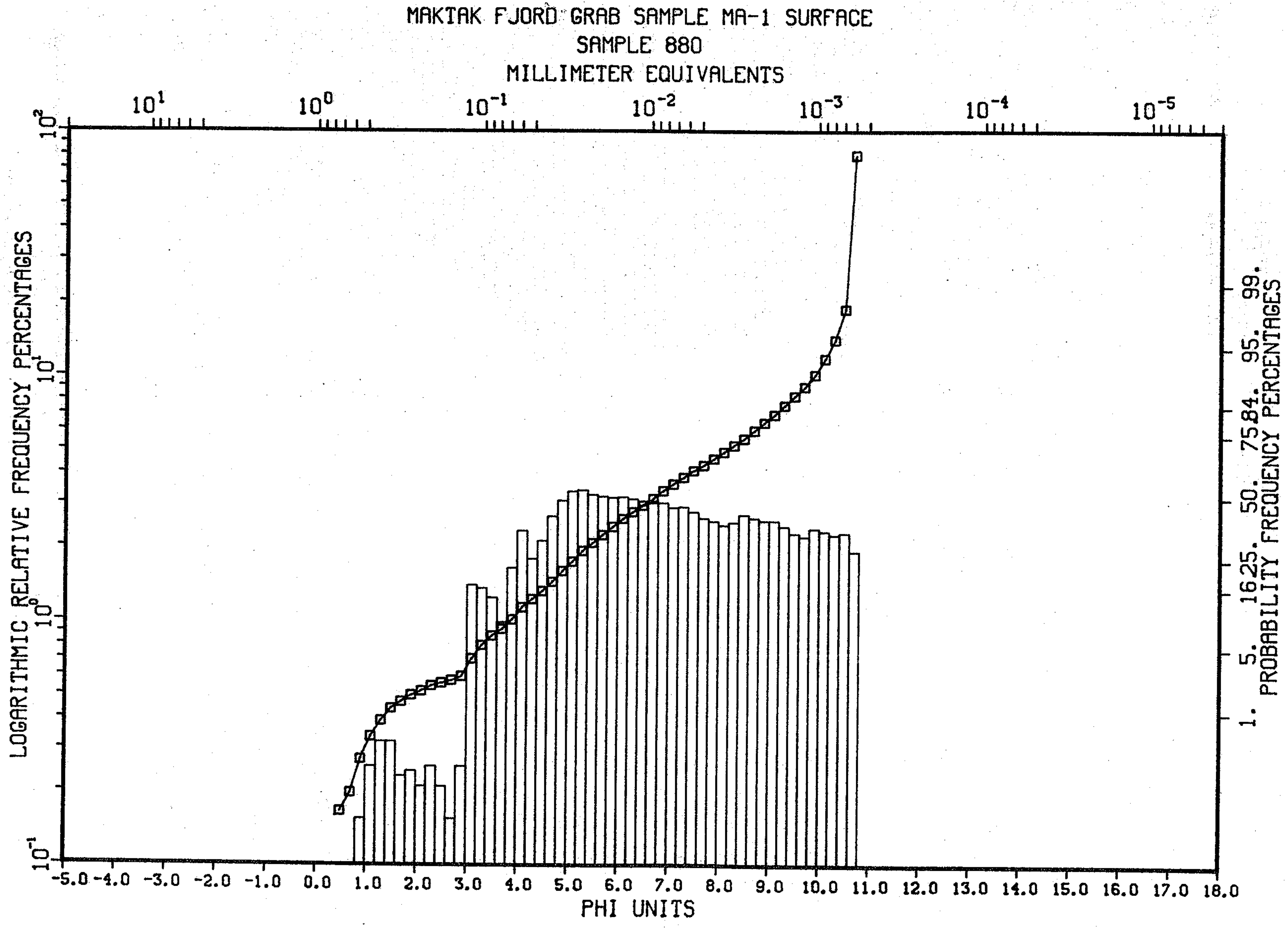

MAKTAK FJORD GRAB SAMPLE MA-1 SURFACE
SAMPLE 880
MILLIMETER EQUIVALENTS
10^1
10^0
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
LOGARITHMIC RELATIVE FREQUENCY PERCENTAGES
10^2
10^1
10^0
10^{-1}
PROBABILITY FREQUENCY PERCENTAGES
1.
5.
16
25.
50.
75
84.
95.
99.
-5.0
-4.0
-3.0
-2.0
-1.0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
PHI UNITS

Fig. 8-53

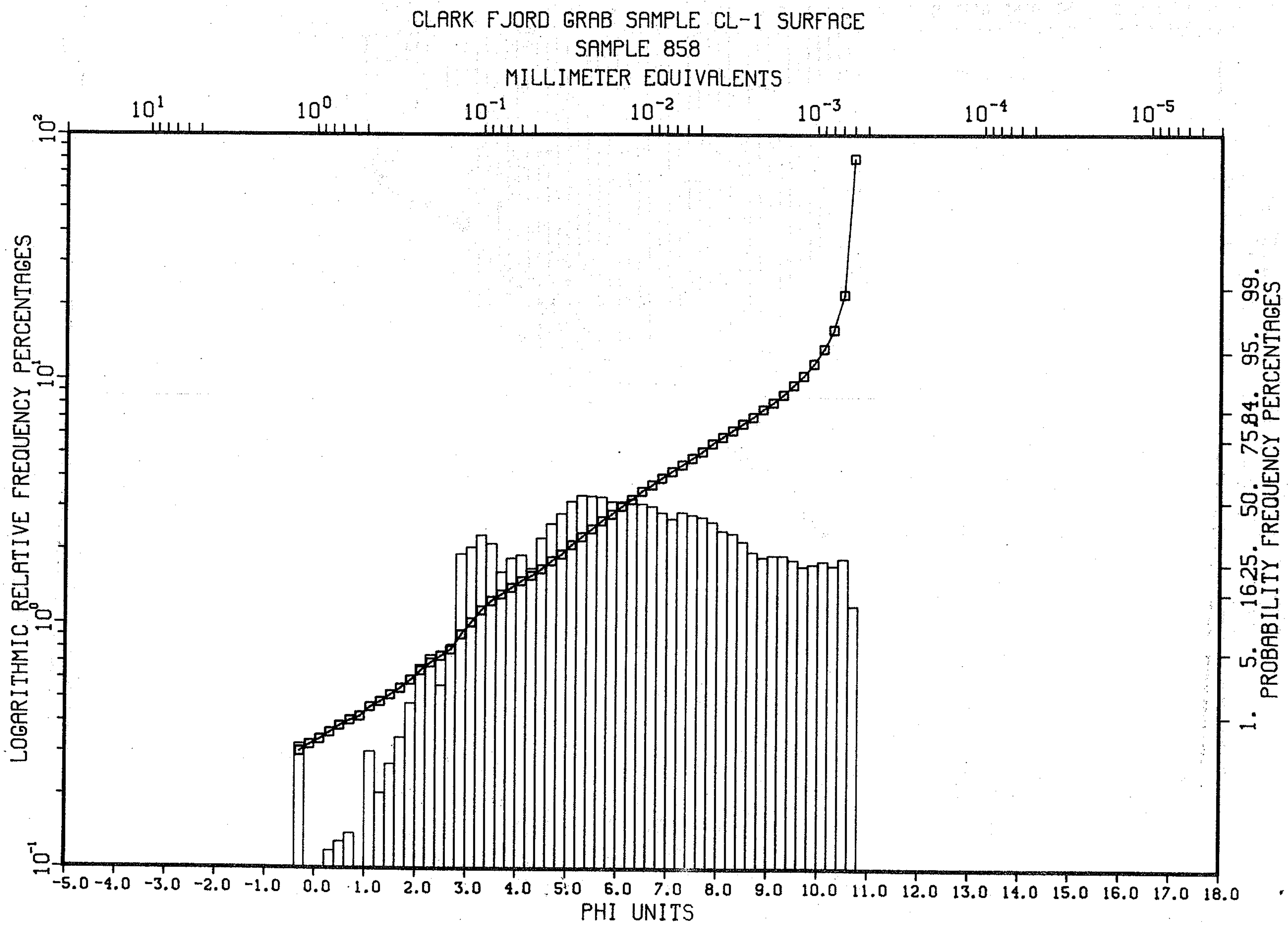

CLARK FJORD GRAB SAMPLE CL-1 SURFACE
SAMPLE 858
MILLIMETER EQUIVALENTS
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
LOGARITHMIC RELATIVE FREQUENCY PERCENTAGES
10^{2}
10^{1}
10^{0}
10^{-1}
PROBABILITY FREQUENCY PERCENTAGES
1.
5.
16.25.
50.
75.84.
95.
99.
PHI UNITS
-5.0 -4.0 -3.0 -2.0 -1.0 0.0 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0 16.0 17.0 18.0

Fig. 8-54

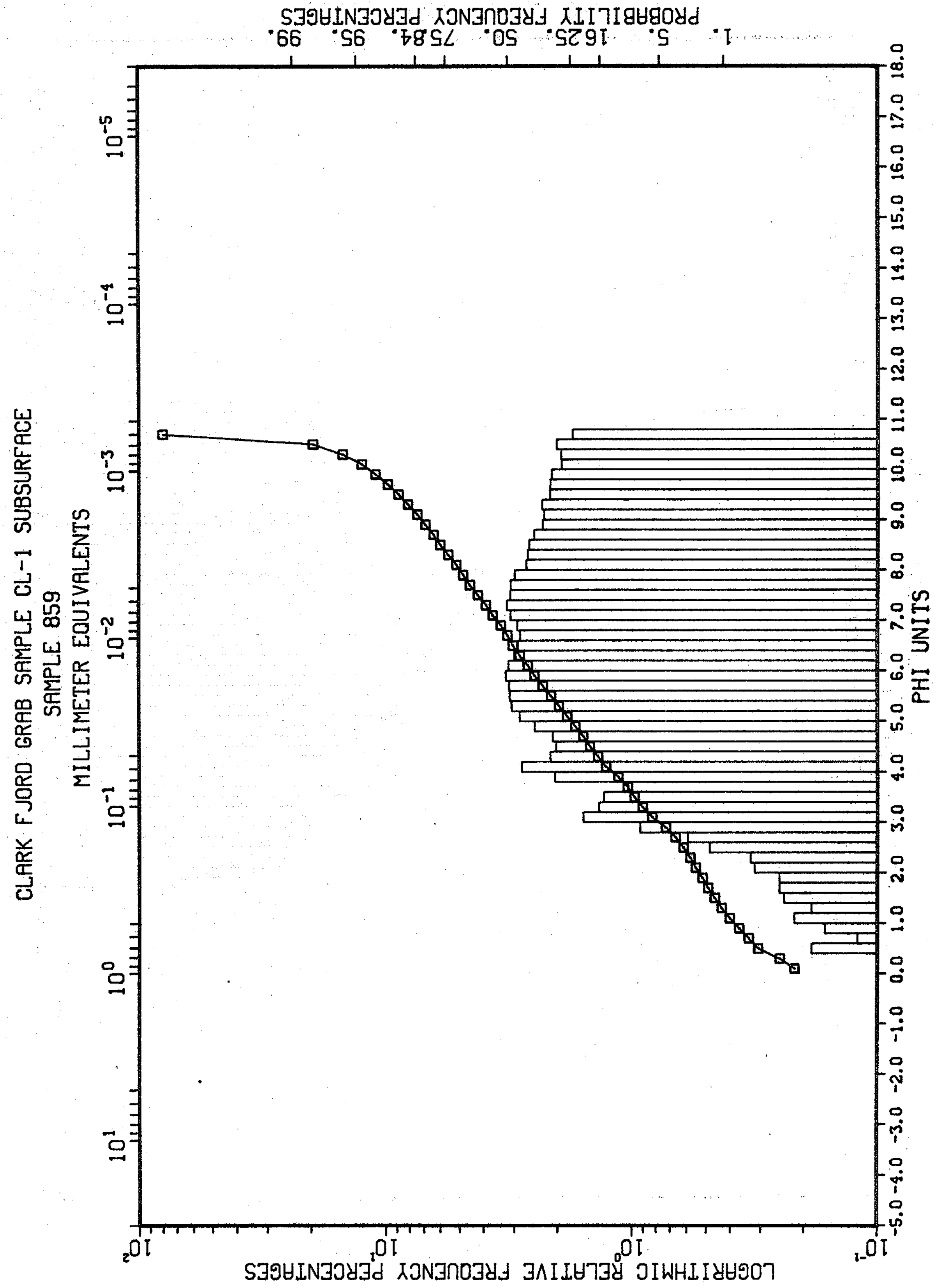

CLARK FJORD GRAB SAMPLE CL-1 SUBSURFACE
SAMPLE 859
MILLIMETER EQUIVALENTS
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
PROBABILITY FREQUENCY PERCENTAGES
1.
5.
16
25.
50.
75
84.
95.
99.
LOGARITHMIC RELATIVE FREQUENCY PERCENTAGES
10^2
10^1
10^0
10^-1
PHI UNITS
-5.0
-4.0
-3.0
-2.0
-1.0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0

Fig. 8-55

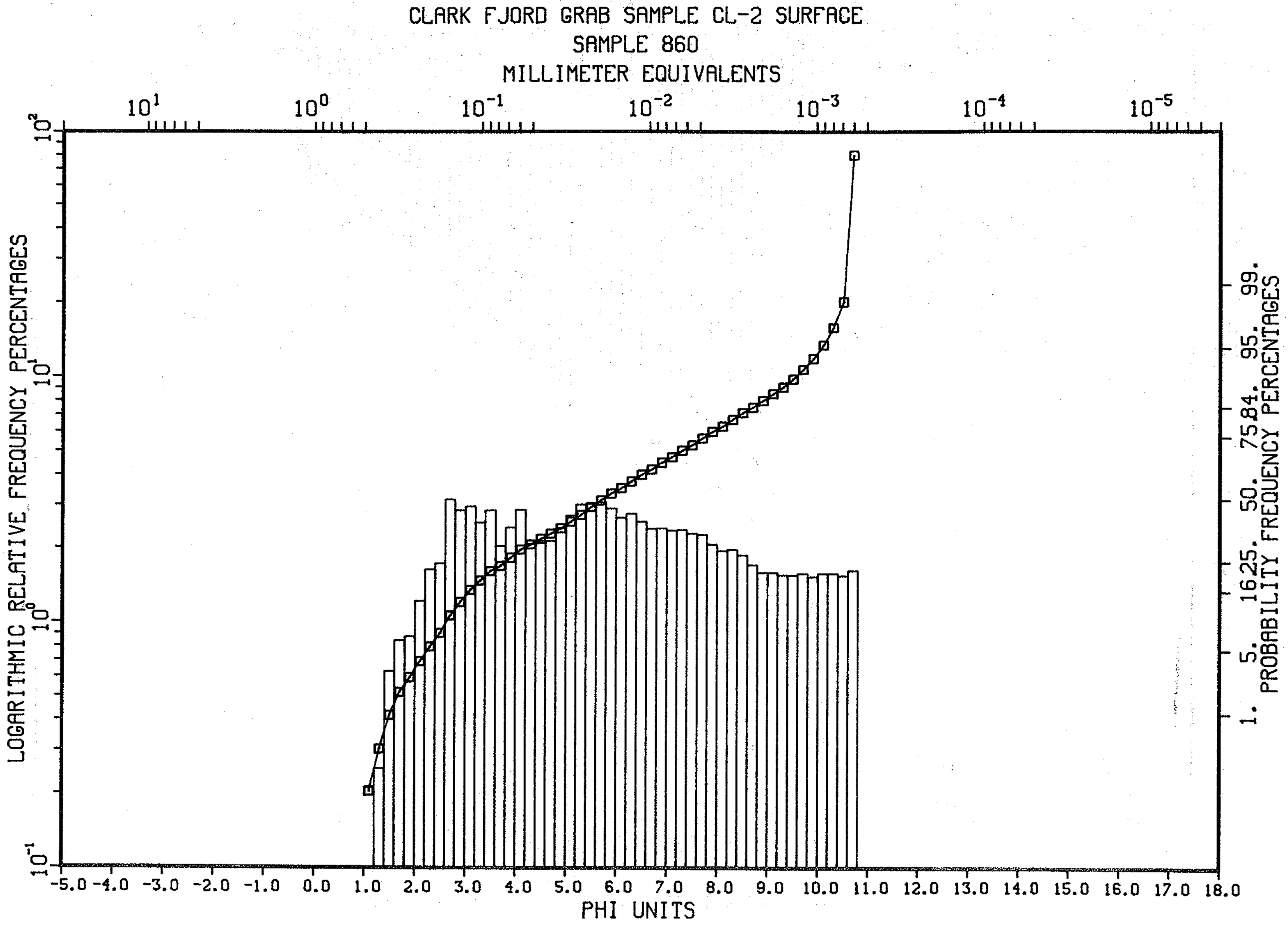

CLARK FJORD GRAB SAMPLE CL-2 SURFACE
SAMPLE 860
MILLIMETER EQUIVALENTS
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
LOGARITHMIC RELATIVE FREQUENCY PERCENTAGES
10^{2}
10^{1}
10^{0}
10^{-1}
PROBABILITY FREQUENCY PERCENTAGES
1.
5.
16.
25.
50.
75.
84.
95.
99.
-5.0
-4.0
-3.0
-2.0
-1.0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
PHI UNITS

Fig. 8-56

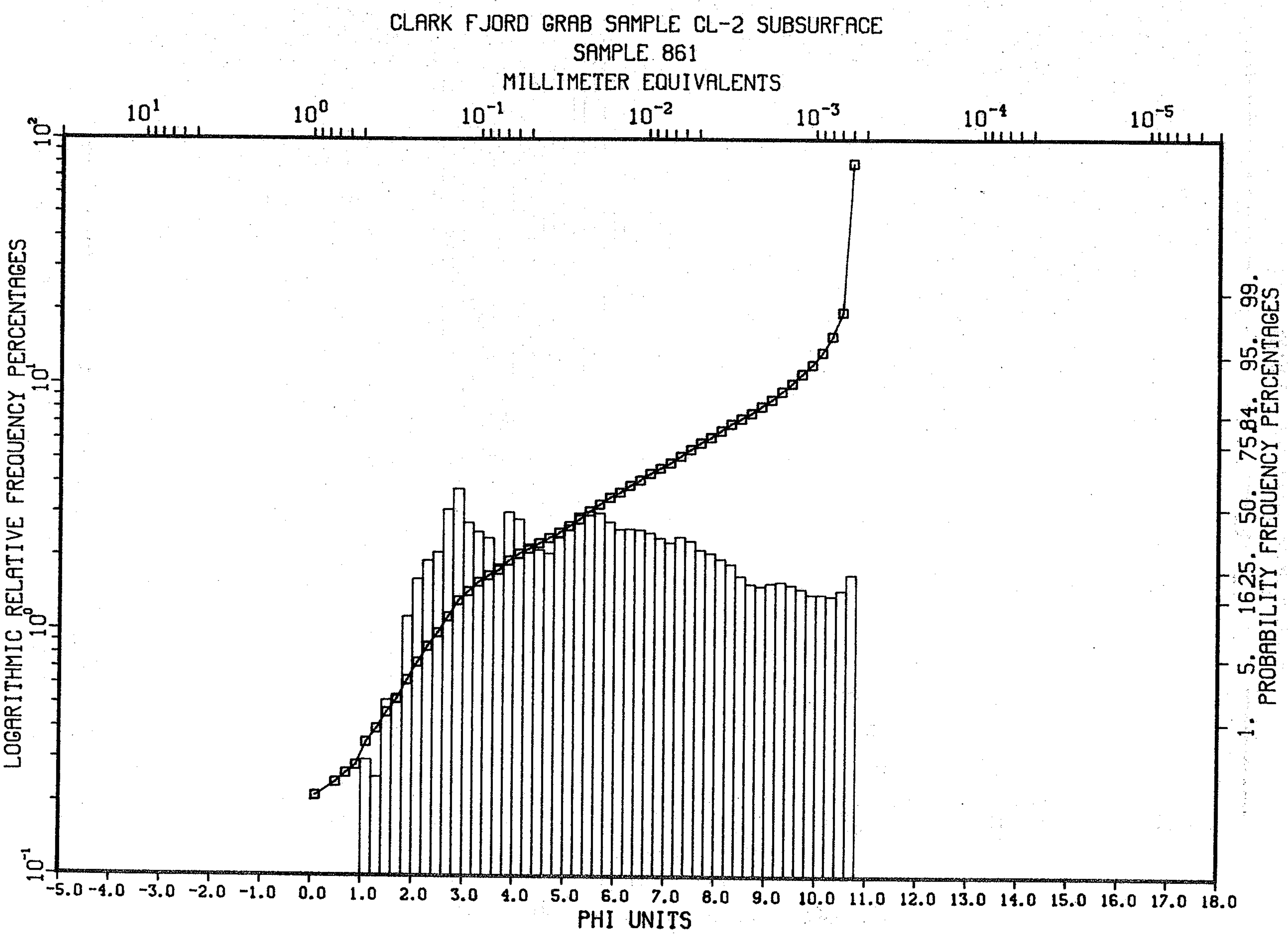
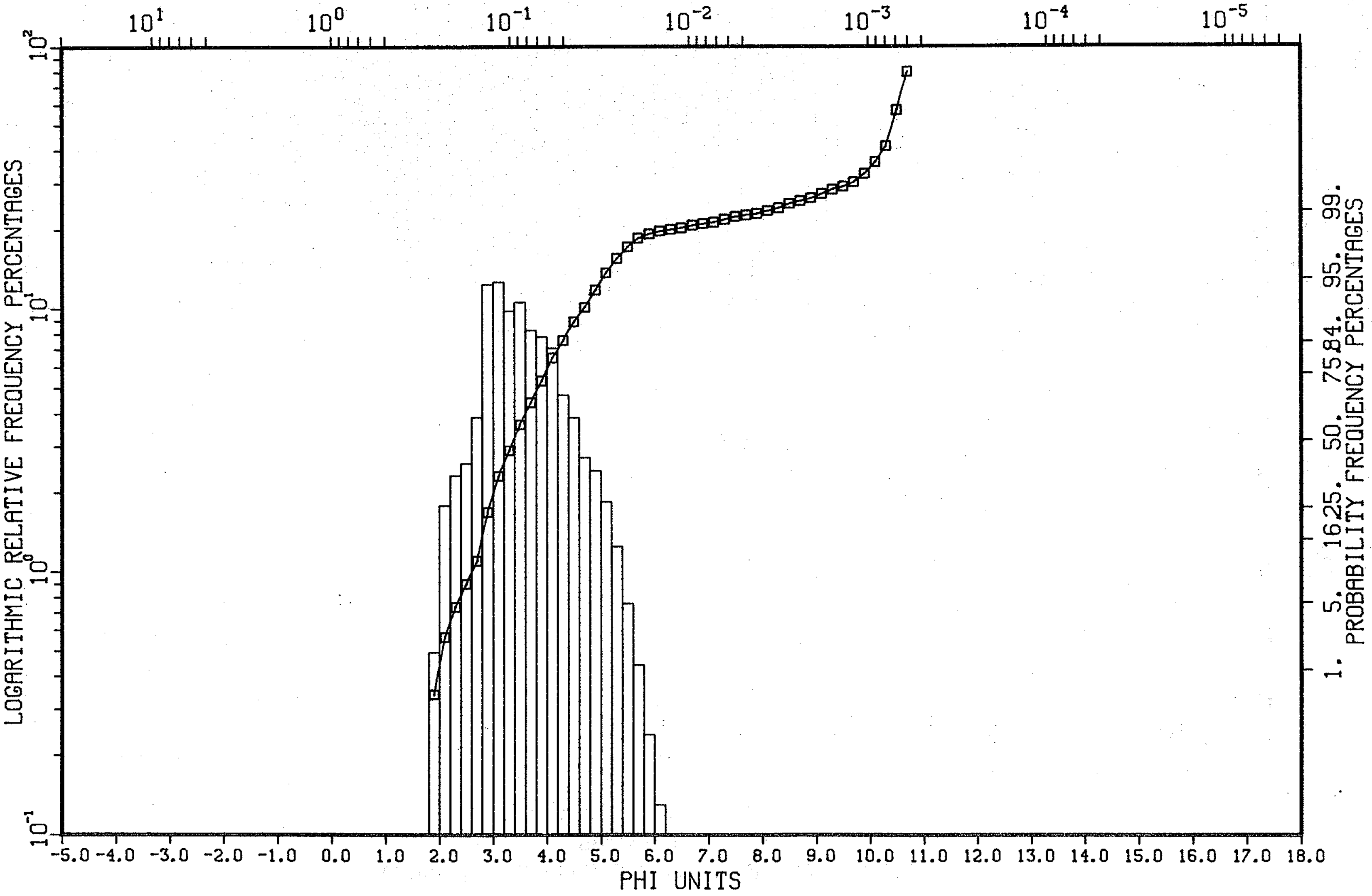
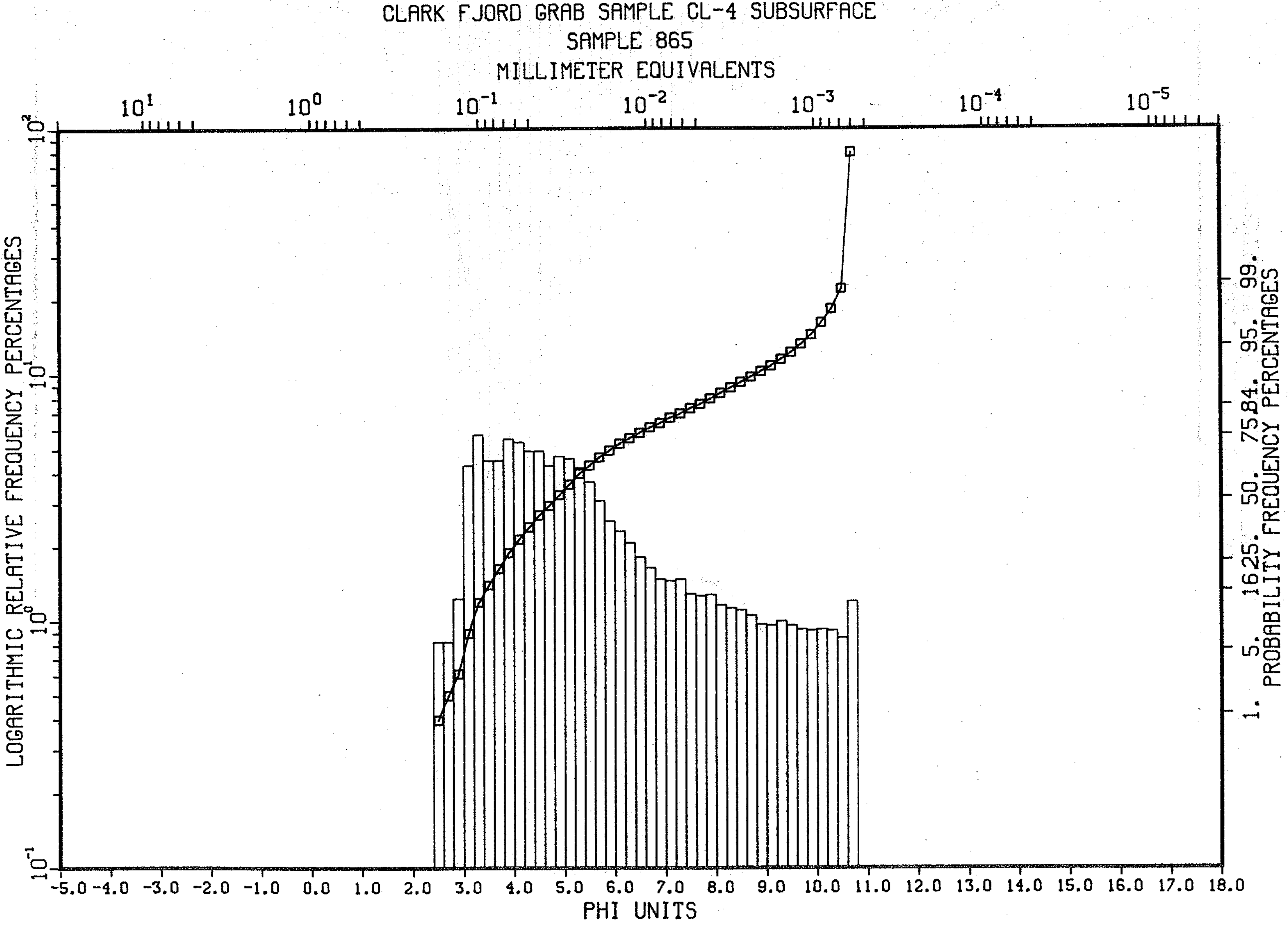

CLARK FJORD GRAB SAMPLE CL-2 SUBSURFACE
SAMPLE 861
MILLIMETER EQUIVALENTS
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
LOGARITHMIC RELATIVE FREQUENCY PERCENTAGES
10^2
10^1
10^0
10^-1
PROBABILITY FREQUENCY PERCENTAGES
1.
5.
16
25.
50.
75
84.
95.
99.
-5.0
-4.0
-3.0
-2.0
-1.0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
PHI UNITS

Fig. 8-57



CLARK FJORD GRAB SAMPLE CL-4 SURFACE
SAMPLE 864
MILLIMETER EQUIVALENTS

Fig. 8-58


CLARK FJORD GRAB SAMPLE CL-4 SUBSURFACE
SAMPLE 865
MILLIMETER EQUIVALENTS
10^1
10^0
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
LOGARITHMIC RELATIVE FREQUENCY PERCENTAGES
10^2
10^1
10^0
10^{-1}
PROBABILITY FREQUENCY PERCENTAGES
1.
5.
16
25.
50.
75
84.
95.
99.
-5.0
-4.0
-3.0
-2.0
-1.0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
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14.0
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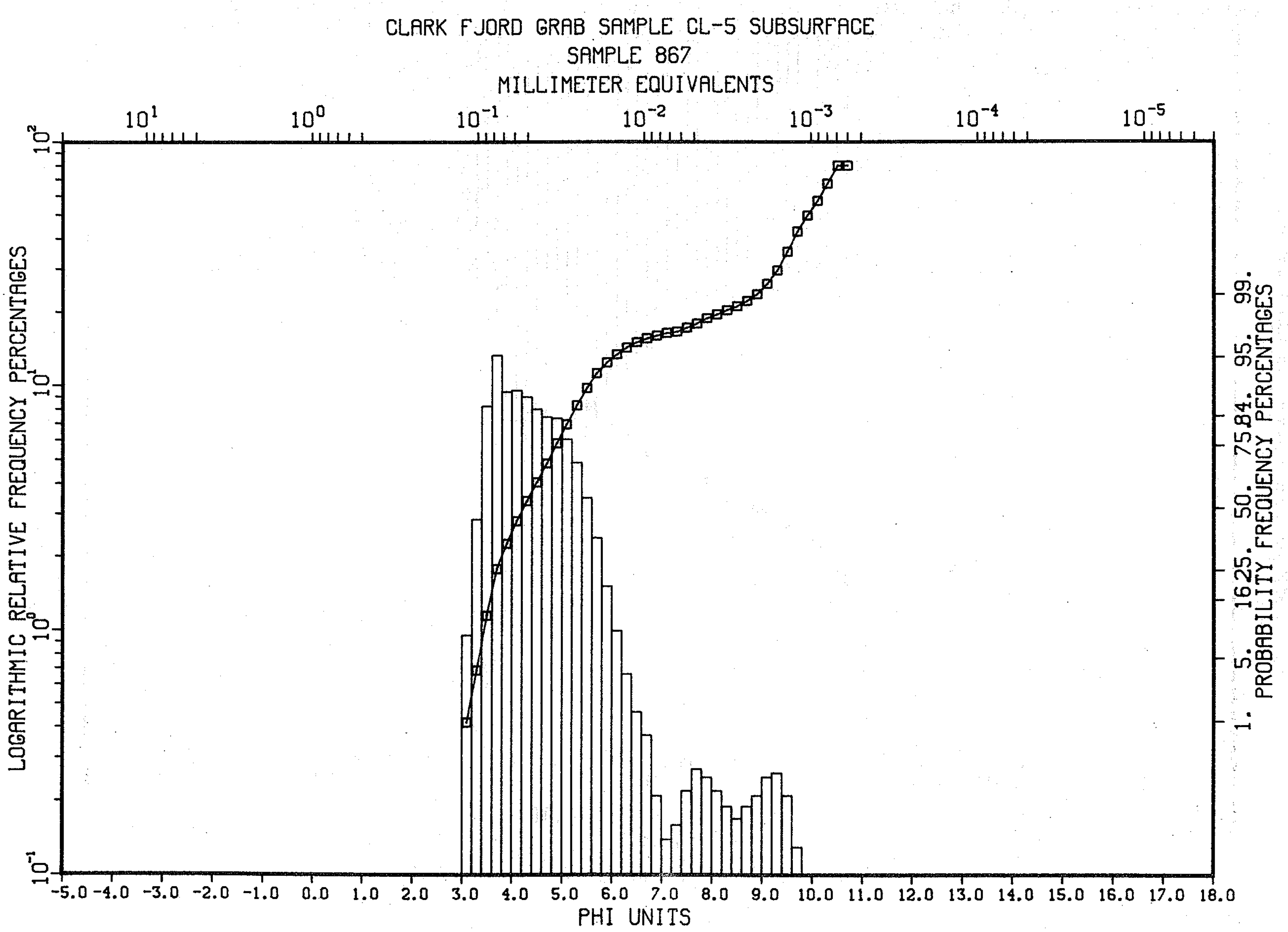
16.0
17.0
18.0
PHI UNITS

Fig. 8-59


CLARK FJORD GRAB SAMPLE CL-5 SUBSURFACE
SAMPLE 867
MILLIMETER EQUIVALENTS
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10^0
10^-1
10^-2
10^-3
10^-4
10^-5
LOGARITHMIC RELATIVE FREQUENCY PERCENTAGES
10^2
10^1
10^0
10^-1
PROBABILITY FREQUENCY PERCENTAGES
1.
5.
16
25.
50.
75
84.
95.
99.
-5.0
-4.0
-3.0
-2.0
-1.0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
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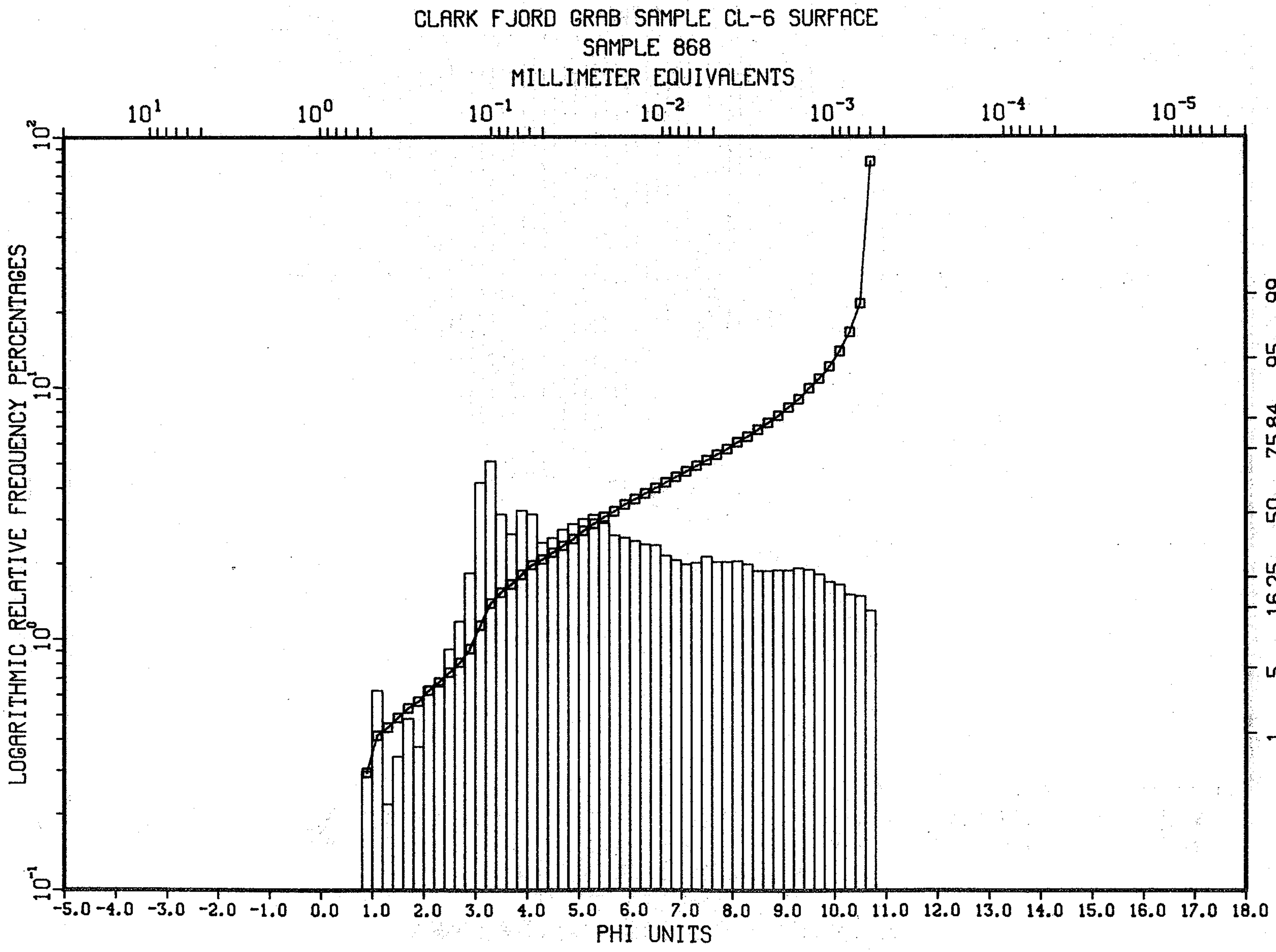
17.0
18.0
PHI UNITS

Fig. 8-60


CLARK FJORD GRAB SAMPLE CL-6 SURFACE
SAMPLE 868
MILLIMETER EQUIVALENTS
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10^0
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
LOGARITHMIC RELATIVE FREQUENCY PERCENTAGES
10^2
10^1
10^0
10^{-1}
PROBABILITY FREQUENCY PERCENTAGES
1.
5.
16
25.
50.
75
84.
95.
99.
-5.0
-4.0
-3.0
-2.0
-1.0
0.0
1.0
2.0
3.0
4.0
5.0
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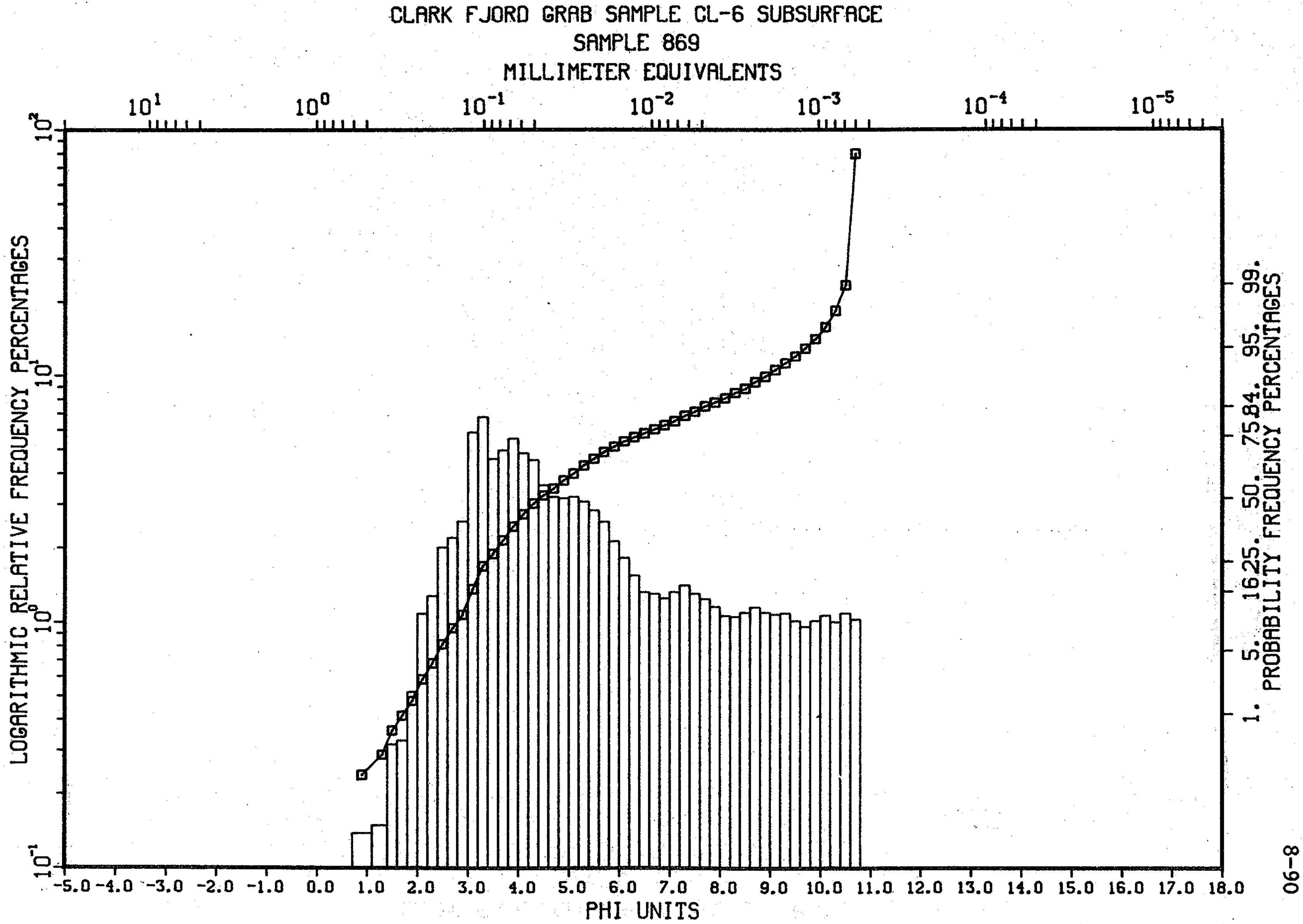
PHI UNITS

Fig. 8-61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SAMPLE 869
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10^{-5}
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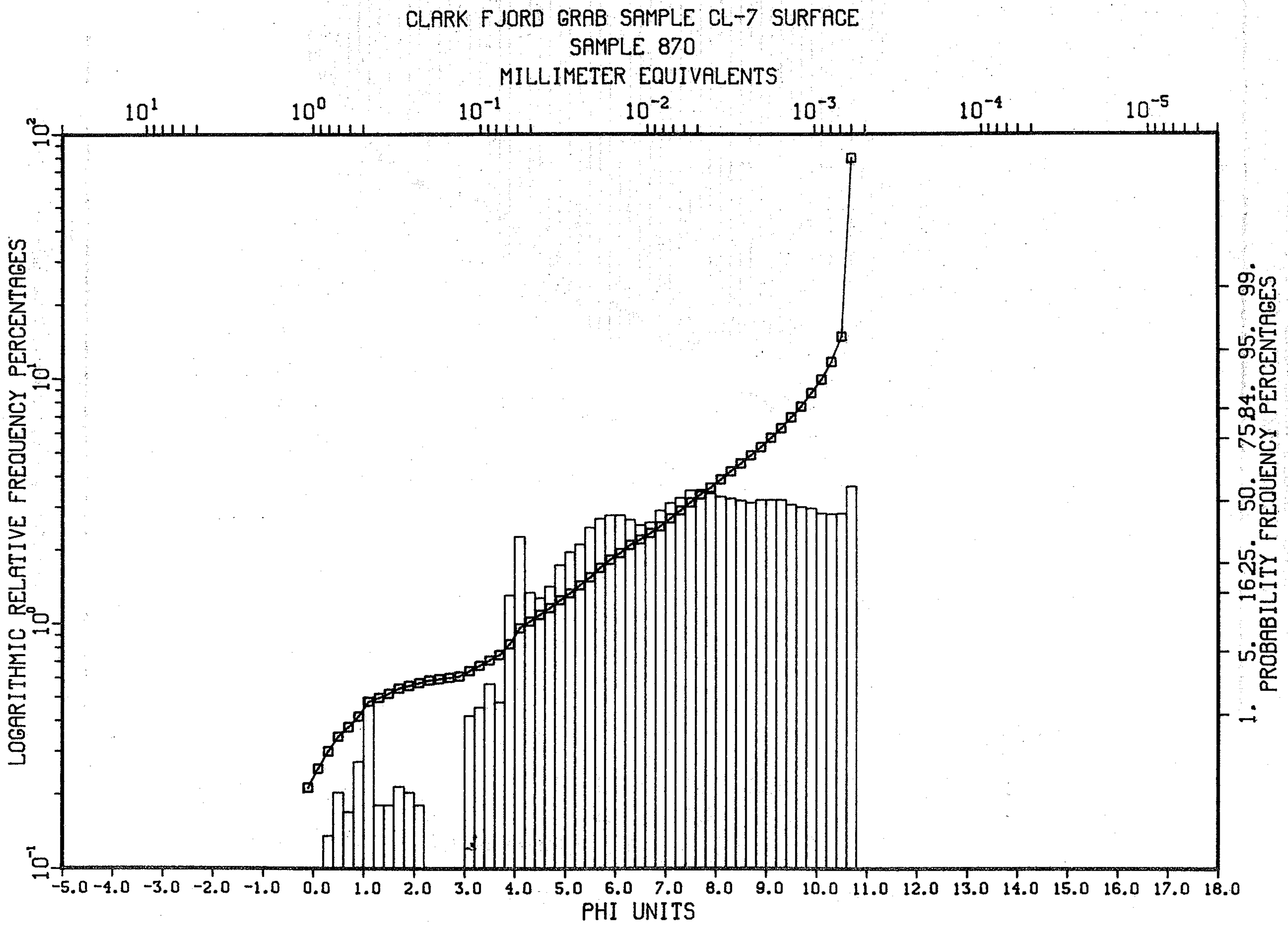
10^1
10^0
10^{-1}
PROBABILITY FREQUENCY PERCENTAGES
1.
5.
16.
25.
50.
75.
84.
95.
99.
-5.0 -4.0 -3.0 -2.0 -1.0 0.0 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0 16.0 17.0 18.0
PHI UNITS

Fig. 8-62


CLARK FJORD GRAB SAMPLE CL-7 SURFACE
SAMPLE 870
MILLIMETER EQUIVALENTS
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10^0
10^-1
10^-2
10^-3
10^-4
10^-5
LOGARITHMIC RELATIVE FREQUENCY PERCENTAGES
10^2
10^1
10^0
10^-1
PROBABILITY FREQUENCY PERCENTAGES
1.
5.
16
25.
50.
75
84.
95.
99.
-5.0
-4.0
-3.0
-2.0
-1.0
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1.0
2.0
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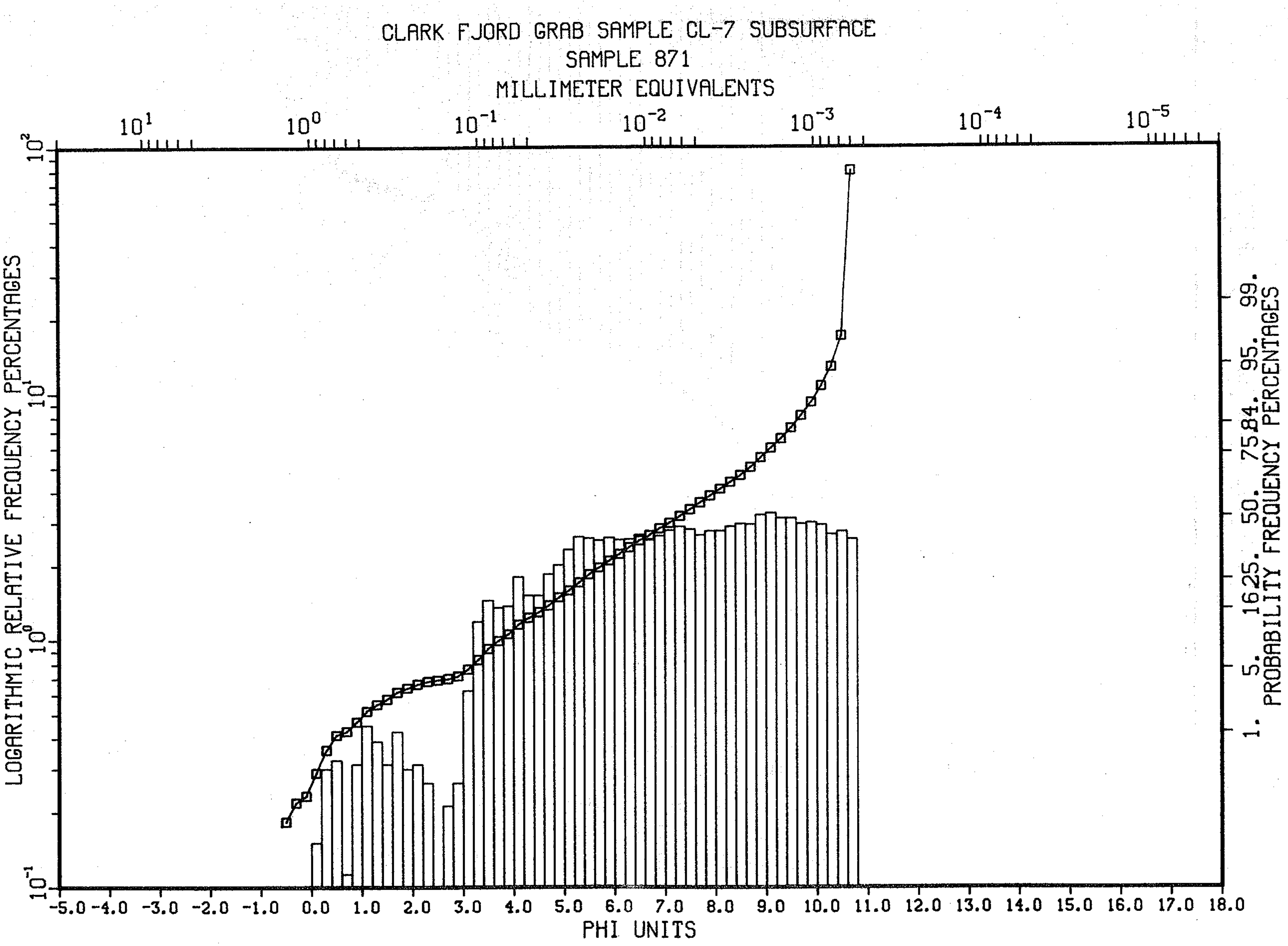
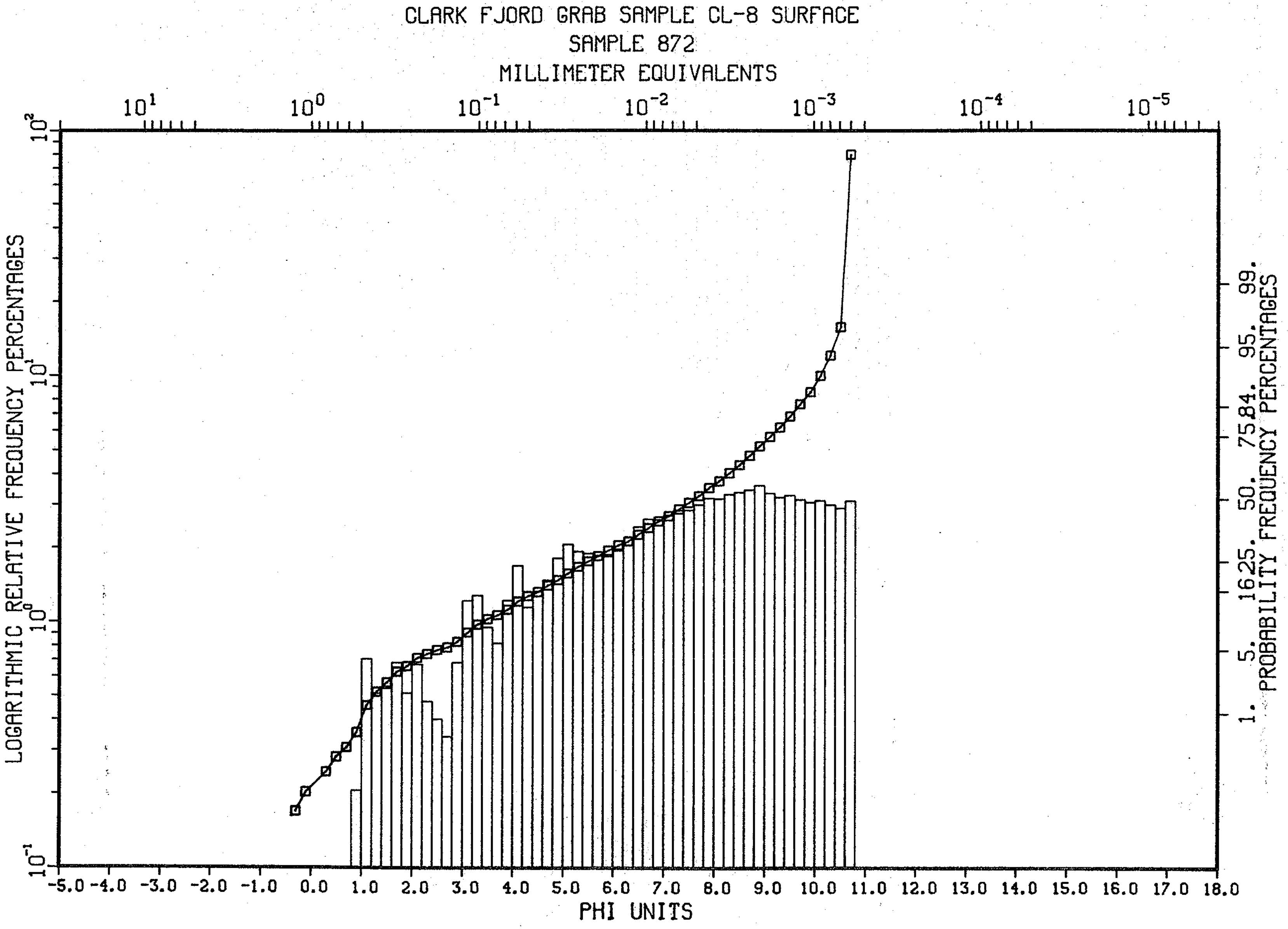
PHI UNITS

Fig. 8-63



CLARK FJORD GRAB SAMPLE CL-7 SUBSURFACE
SAMPLE 871

Fig. 8-64



CLARK FJORD GRAB SAMPLE CL-8 SURFACE
SAMPLE 872

Fig. 8-65

CLARK FJORD GRAB SAMPLE CL-8 SUBSURFACE
SAMPLE 873

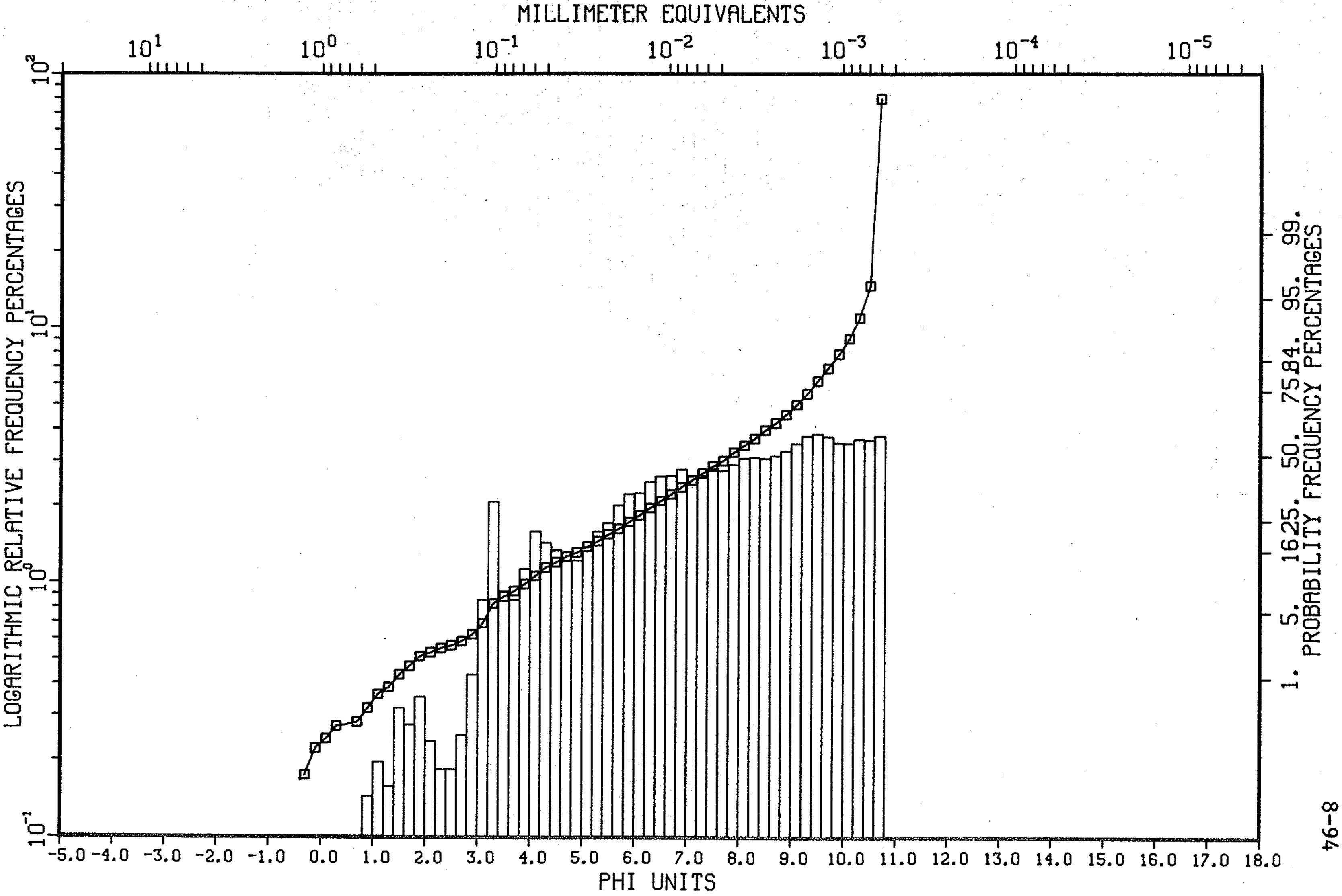


Fig. 8-66

9. BOTTOM FAUNA AND BIOTURBATION

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9.1 INTRODUCTION AND OUTLINE

This account is based on 36 grab samples, 36 photographic stations and two sets of X-ray radiographs of piston cores. The material was sent to Glasgow. I was not a member of the cruise.

Samples and photographs were available from all the fjords visited. Faunal differences between fjords and between stations at different depths are evaluated. A combination of bottom photographs and interpretation of radiographsis used to describe the nature and consistency of the fjord bottom. Traces of animal activity are illustrated.

Most stations were in rather deep water and this has prevented detailed comparison with many of the Arctic communities classically described by Bertelsen (1937), Sparck (1933) and Thorson (1934, 1957). These dealt mainly with shallow water biota and, moreover, referred to East Greenland fjords. The most helpful comparisons are with Vibe (1939) who deals with Northwest Greenland.

9.2 NATURE OF THE BOTTOM FAUNA AS DEDUCED FROM SAMPLES AND PHOTOGRAPHS

Table 1 summarizes the different elements of the bottom fauna. A greater variety of epifauna would be anticipated from a study of the photographs, whereas infauna should have been better sampled by the grab. This is not entirely how things turned out!

Brittle stars are most obvious in the photographs whereas the grabs reveal that agglutinated polychaetes dominated the infauna: this is much as expected. However, burrowing anemones were recorded from nearly half the camera stations though none was obtained in any grab, nor were pennatulaceans (sea pens). Although cumaceans were found by both methods, the distinctive idotheid isopods (Pl. 3) were not present in the grab. The importance of drifted kelp debris would not have emerged without the camera survey, which also picked up a far greater density of fused siphons of infaunal suspension feeding bivalves than grab samples showed.

So, rather unexpectedly, the high-quality bottom photographs not only increased the diversity evident amongst the epifauna but also increased that of the infauna. This is an important point to be borne in mind when comparing our faunal lists with those of earlier surveys which did not have the benefit of a benthic camera.

Summary of the fauna

The fauna is characterized by epifaunal ophiuroids and elasipod holothurians and by infaunal anemones and polychaetes. Molluscs seem to be of subordinate importance, especially compared with shallower Greenland communities. Spider crabs, squat lobsters and callianassids, conspicuous in B.C. fjords, are absent.

The sixteen epifaunal groups identified are less widely distributed than the nine infaunal groups.

Variation with depth of water

Many species range over a considerable depth. The bivalve *Serripes groenlandicum*, for instance (Pl. 1) was photographed from 60 m (SU 7) and 570 m (CA 5). Cumaceans were sampled from 60 m (SU 7), 200 m (CA 1) and 355 m (IT 2). Generalizing grossly, however, it may be stated that brittle stars were more abundant in stations from 60 - 200 m (e.g. Pl. 2) and polychaetes most abundant below 300 m. Below 500 m maldanid and capitellid polychaetes and the sipunculids *Leptosynapta inhaerens* and *Golfingia elongata* demonstrate a dominance of deposit feeders.

Astacillid isopods were encountered in shallower stations down to 100 m, often in association with kelp debris (Pl. 2). The bivalve Modiolaria laevigata, sampled from 100 m (SU 6), is normally found epifaunistically on vegetation. The highly distinctive idotheid isopod cf. Mesidotea sp. was only recorded from one shallow station in Sunneshine Fjord (SU 7; Pl. 3). Elasipod holothurians were often abundant in deep water , e.g. MA 5 at 610 m (Pl. 4).

Variation between fjords

Any comments here must be regarded as even more speculative than those in the previous section, especially since not all fjords were adequately sampled at shallow depths as was Sunneshine Fjord. This fjord produced several unique records. Brachiopods, for example, were recorded both in a sample (SU 8), where a juvenile terebratulid was attached to the protrudung tube of a terebellid worm, and in an X-rayed core (SU 5) where large shells occur at several levels (Fig. 1, Pl. 5): they were not recorded from any other fjord. Likewise, the idotheid isopods and Modiolaria were confined to Sunneshine Fjord.

The majority of organisms, however, were recorded from several fjords. Ophiura sarsi, O. robusta and O. albida were widespread, as were the elasipod holothurians and pycnogonids. Scavenging buccinid gastropods were obvious in Cambridge (Pl. 6), Tingin and Maktak Fjords.

Table 1. Comparative summary of bottom faunal groups as determined by grab sampling and photography.

– = absent
x = present in 0-9% of stations
xx = present in 10-19% of stations
xxx = present in 20-29% of stations
xxxx = present in more than 30% of stations

FAUNAL GROUP	MODE OF LIFE	GRAB	PHOTO
Anemones	Epifaunal (rock)	–	x
Anemones	Infaunal suspension	–	xxxx
Sea Pens	Infaunal suspension	–	xx
Starfish	Epifaunal predator	–	x
Sea Urchins, regular	Epifaunal omnivore	–	x
Sea Urchins, irregular	Infaunal omnivore	–	x
Holothurians, elasipod	Epifaunal omnivore	–	xxxx
Holothurians	Infaunal omnivore	x	x
Brittle Stars	Epi-Infaunal omnivore	xxx	xxxx
Polychaetes	Infaunal suspension/deposit	xxx	xx
Cumaceans	Epifaunal	x	x
Isopods	Epifaunal	–	xx
Ostracods	Infaunal	x	–
Pandalid Shrimps	Epifaunal	–	x
Pycnogonids	Epifaunal	–	xxxx
Bivalves	Infaunal suspension	–	xx
Bivalves	Epifaunal suspension	x	–
Bivalves	Infaunal deposit	x	x
Gastropods	Infaunal predator	–	x
Gastropods	Epifaunal scavenger	x	xxx
Brachiopods	Epifaunal suspension	x	–
Foraminifera	Infaunal	x	–
Sipunculids	Infaunal deposit	x	–
Tunicata	Epifaunal filter	x	–
Fish	Epifaunal predator	–	xx

9.3 NATURE AND CONSISTENCY OF FJORD BOTTOM SEDIMENTS

It is clear from studying only a limited number of core radiographs that periodic changes in bottom characteristics occurred. These changes are best revealed by the pattern of bioturbation. The top part of core TI 1A shows that comparatively fluid mud overlies more compact mud at -188 cm (Fig. 2), the firmer mud containing poly-phase burrowing with the structures clearly defined. Lower in the core three earlier periods of firmer consistency may be recognised at -380, -410 and -530 cm. In contrast, the evidence from SU 5 (Fig. 1) suggests that the bottom remained of similar consistency for longer periods and was fairly well burrowed throughout.

One fascinating problem to have in mind when looking at the bottom photographs is this. How to imagine any lamination or bedding being preserved without becoming obliterated by benthonic animal activity. In describing the photographs I shall grade examples in increasing order of disturbance by both epifaunal and infaunal organisms and by bottom currents. It is to be expected that some lamination will be preserved in cores taken through the first examples, but in the last a clear-cut erosion surface would be present. The series of plates (Pl. 7-14) may thus be viewed as arranged in increasing energy level. Sedimentary structures are tabulated on Table 2.

Structures seen in cores but without equivalent bottom photographs

Core sequences give a more dynamic impression of conditions of sedimentation than photographs alone. Slumped intervals occur in both TI 1A (Fig. 2) and SU 5 (Fig. 1, Pl. 5), the former being a spectacular 130 cm-thick unit with floating clasts, upwardly terminating in a thin laminated unit dipping at 36° (unit C, fig. 2). The basal 2 m of the core is homogeneous but without the associated dropstone fabric of SU 5 (unit A, fig. 1). Pulses of current-rippled sand were introduced at similar levels in both cores (-490-500 cm in TI 1 cf. -570-590 cm in SU 5).

It may be significant that the pulse is slightly deeper (?earlier) in the more southerly Sunneshine sequence. This may be related to earlier release of fluvio-glacial sands than in Tingin Fjord. Both sets overlie the dropstone unit. A symmetrically rippled sand at -570 cm in TI 1A is worthy of note.

No ripples or slump features were observed on any of the bottom photographs. Stones present in CA 5 and CA 6 may have a dropstone origin.

Table 2. Sedimentary structures on the fjord bottom, graded according to increasing energy level from high sedimentation, soft bottom (7) to resuspension (13) and erosion (14).

PLATE NUMBER	STATION NUMBER	DEPTH (m)	CLOTTED-PELLETED TEXTURE	WORM TUBES	BRITTLE STAR TRAILS	BURROW OPENING	ANEMONE RHEOTAXIS	CURRENT LINEATION
7	MC 7-3		xx	-	-	-	-	-
8	CA 5	570	x	x	-	-	-	-
9	TI 3-2	520	-	-	x	-	-	-
10	SU 2		-	x	x	x	-	-
11	CA 1	200	-	xx	xx	-	-	-
12	TI 1A-3	90	-	-	x	x	-	-
13	IN 1-2	130	-	-	-	x	x	-
14	IT 1-6	175	-	-	-	-	x	x

9.4 TRACES OF ANIMAL ACTIVITY

The following summary integrates data from cores and bottom photographs. It should be noted that many epifaunal organisms that might have been expected to prduce traces did not seem to do so at many stations! (Table 3). The diversity of traces is lower than was recorded by Farrow et al. (1983, p.280) from Knight Inlet, British Columbia: the relative frequency of traces is compared on Table 4. The trace record would seem to point to zoogeographic differences between the two fjord systems. Although neither holothurian traces nor irregular echinoid furrows occurred in Knight Inlet, both traces are common on the slopes of Rockall Bank (Scoffin et al. 1980, p. 338. fig. 4 b,c).

Table 3. Traces of Animal Activity.

Pits made by fish (very rare)	Pl. 1
Horizontal, slightly sinuous trails of worm-tubes	Pl. 3, 11
Elasipod holothurian tracks and faecal strings	Pl. 4, 6
Asteriacites resting traces of ophiuroids	Pl. 12
Horizontal trails of moving ophiuroids	Pl. 9
Pseudo-U burrows of buried ophiuroids	Pl. 5, fig. 1
Single burrow openings (?retracted anemones)	Pl. 12
Paired openings (?siphons of cf. *Macoma*)	Pl. 12
Stellate traces associated with paired openings (cf. *Macoma*)	Pl. 13
Broad furrow, probably of irregular echinoid (very rare)	Pl. 9

Table 4. Comparison of types of traces left by animal activity in the fjords of British Columbia and Baffin Island.

TYPE OF TRACE	KNIGHT INLET	BAFFIN ISLAND
Burrows and pits of fish	xxxx	x
Pectoral fin impressions	xxx	-
Gastropod trails	xx	-
Worm-tube trails	-	xx
Ophiuroid trails	xxx	xxx
Spider crab traces	xx	-
Pandalid shrimp pockmarks	xxx	-
Callianassid volcanoes	xx	-
Agglutinated tubes	xxx	xxx
Burrowing anemones	xx	xx
Bivalve siphon openings	?not resolved	xx
Holothurian tracks	-	xx
Irregular echinoid furrows	-	x

9.5 CONCLUSIONS AND FURTHER WORK

Most of the fjord stations sampled or photographed would fall into Schafer's vital-pantostrate biofacies. Radiographs of piston cores from TI 1A are of particular palaeontological interest because they show that the ophiuroids so commonly seen in bottom photographs do indeed get preserved in situ (Fig. 2 cf. Schafer 1972, fig. 265, p. 480). In the two cores studied so far there are no indications of prolonged anoxia.

The diversity of both infauna and epifauna would have been inadequately assessed if the benthic camera had not been deployed. Four groups of organisms were characteristic and widespread:- epifaunal elasipod holothurians and ophiuroids; infaunal polychaetes and anemones. Suspension feeding bivalves were under-represented in grab samples according to the photographic evidence.

No traces of the activity of spider crabs or callianassids were recorded, in striking contrast to observations in British Columbian fjords.

Sunneshine Fjord was the most interesting faunistically, with brachiopods occurring at several levels in piston core samples (Fig. 1). Adjacent rocky slopes may have flourishing populations. The distinctive idotheid isopod cf. Mesidotea (Pl. 3) was recorded only from Sunneshine Fjord at a depth of 60 m. Since such isopods are characterizing members of an Arctic community from 23 m described by Vibe (1939, pl. 4) from Thule it would be desirable to ensure adequate coverage of similarly shallow sites in other Baffin Island fjords. The associated fauna at Thule contains cumaceans, Ophiura sarsi and the Greenland cockle Serripes groenlandicum, all of which have been recorded from several Baffin Island stations, chiefly in Cambridge, Iterbilung and Sunneshine Fjords.

Agglutinated tube-worms dominate the infauna, and it is of interest to note that Vibe (1939, pp. 13-16) has pointed out that Owenia fusiformis takes over as characterizing species of the Macoma calcaria community wherever a sandy bottom occurs close to a river entering the fjord. The tube-worm occurred down to the deepest station worked (64 m). Pectinaria was common at 10 m (cf. Pl. 11). In the majority of Baffin Island stations agglutinated polychaete tubes are more common than bivalves, as they are in Northwest Greenland -- the reverse of the situation in East Greenland (Vibe 1939, p. 31).

A subsequent report will list full faunal identifications and will present additional interpretations of further piston core radiographs.

Acknowledgments

Dr R. J. A. Atkinson and Dr P. G. Moore kindly assisted in identification of organisms on the photographs.

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FIGURE 1 SEDIMENTARY STRUCTURES REVEALED BY X-RADIOGRAPHS OF SUNNESHINE FJORD CORE SU5

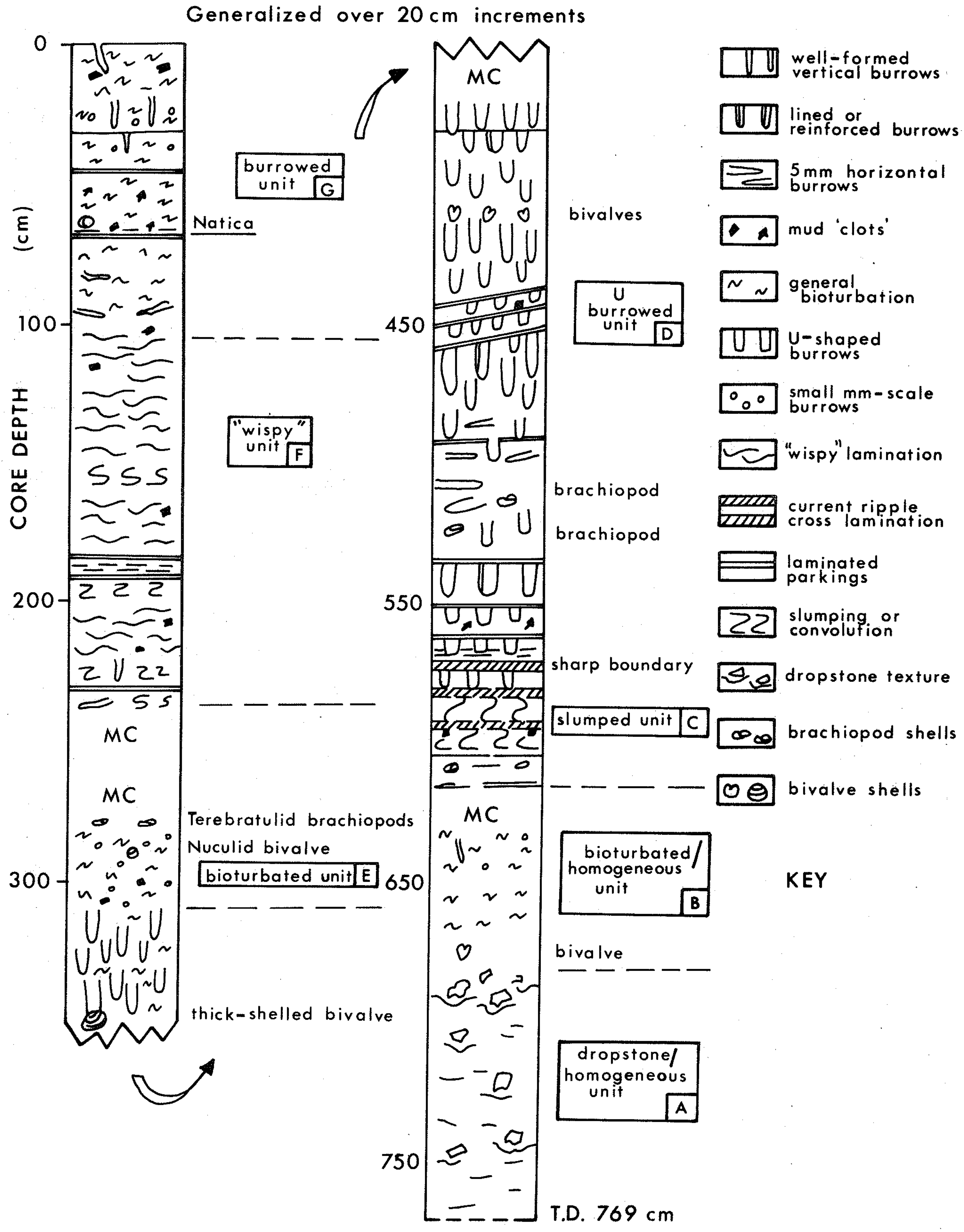

FIGURE 2 SEDIMENTARY STRUCTURES REVEALED BY X-RADIOGRAPHS OF TINGIN FJORD CORE TI 1A

Generalized over 20 cm increments

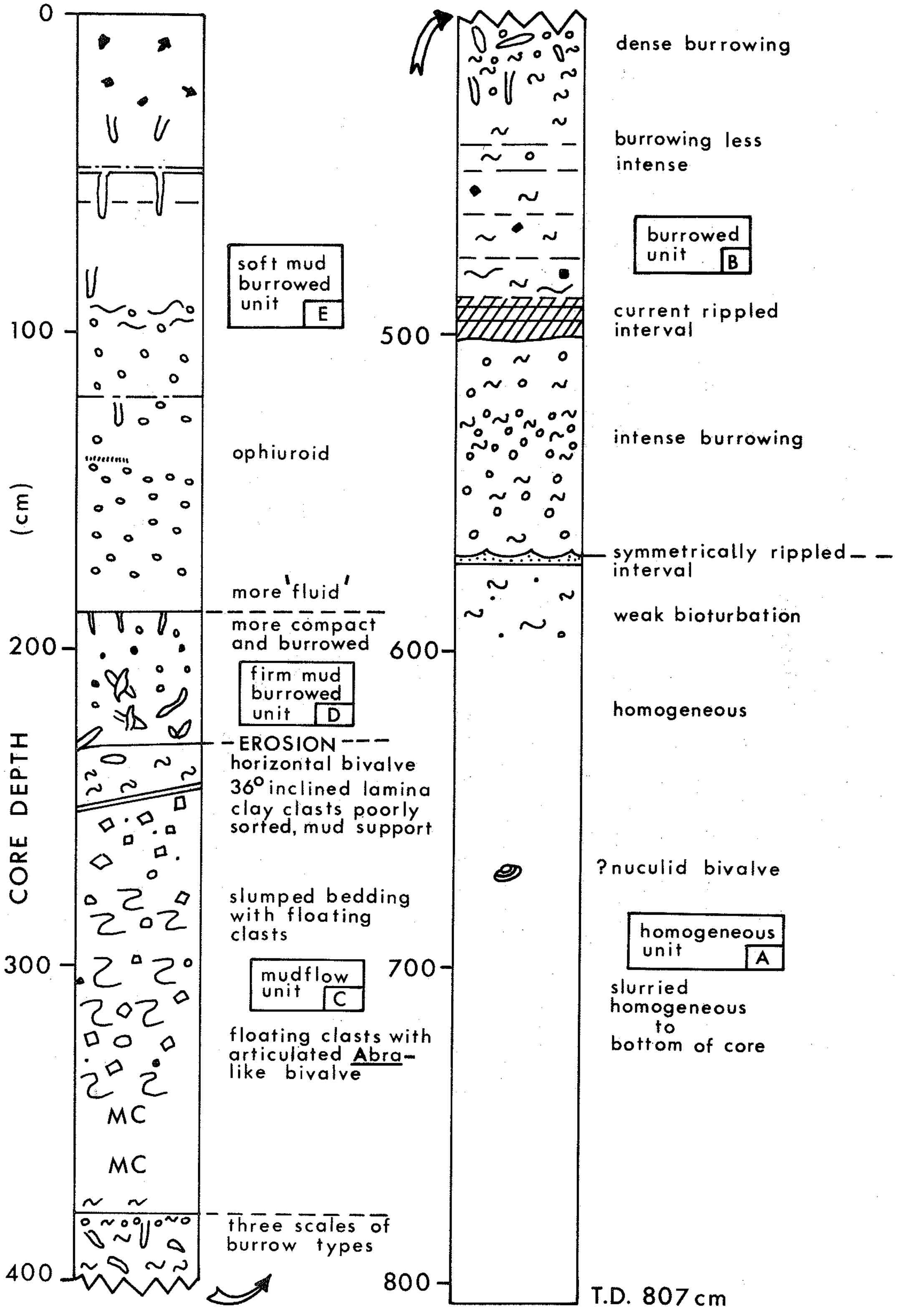

PLATE ONE

SUNNESHINE FJORD 7 - 2 Depth = 60 m

Large ophiuroids (*Ophiura ?sarsi*) Small ophiuroids (*Ophiura robusta*)
Asteroid (below weight) Buccinid gastropod (upper right)
Large fused siphons of suspension feeding bivalve (left of vane)
Dead, united valves of bivalve *Serripes groenlandicum* (left)
Small fish in depression (bottom left), possibly gobiid
Astacillid isopod (right of compass)

(Other photographs from this station show the following additional features:-
  regular echinoid, e.g. *Strongylocentrotus* sp.
  concave-up bivalve shell partly filled with sediment
  asteroid hunched over (?feeding on) ophiuroid)

Note that the sediment appears to be rich in comminuted shell debris

Scale x$\frac{1}{3}$

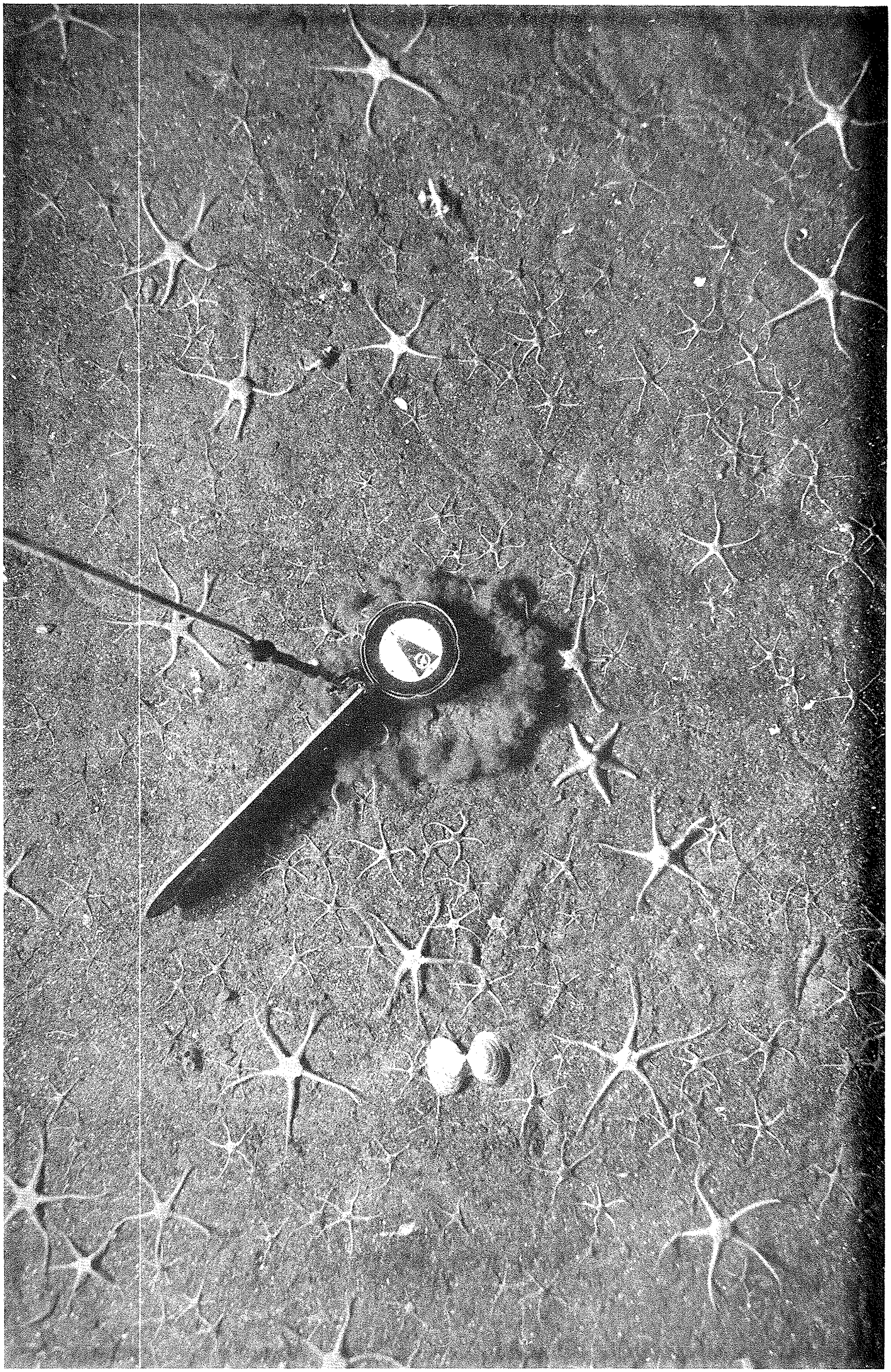

PLATE TWO

SUNNESHINE FJORD 6 - 3 Depth = 100 m

Kelp debris with two astacillid isopods (top right) has drifted over ophiuroids (mostly *Ophiura robusta*)

Several horizontal worm-tubes of agglutinated sediment are present (e.g. left of compass); tube above left-hand piece of kelp has incorporated shell debris, or has encrusting epifauna.

Scale x$\frac{1}{3}$

PLATE THREE

SUNNESHINE FJORD 7 - 1 Depth = 60 m

Two large idotheid isopods (cf. *Mesidotea* sp.) do not seem to be leaving traces of their movement over the sediment surface.

Abundant ophiuroids.

Two asteroids, one in hunched up feeding position (bottom, centre-left).

Two sets of fused bivalve siphons protruding from sediment (e.g. upper left).

Five sets of small bivalve siphons (e.g. lower right of centre shadow).

Small burrowing anemone (left of weight).

Fusiform gastropod (top left)

Pycnogonid (lower left)

Horizontal, slightly sinuous trails of ?worm-tube (below left-hand isopod).

Again, note the widespread shell debris in the sediment.

Scale x$\frac{1}{3}$

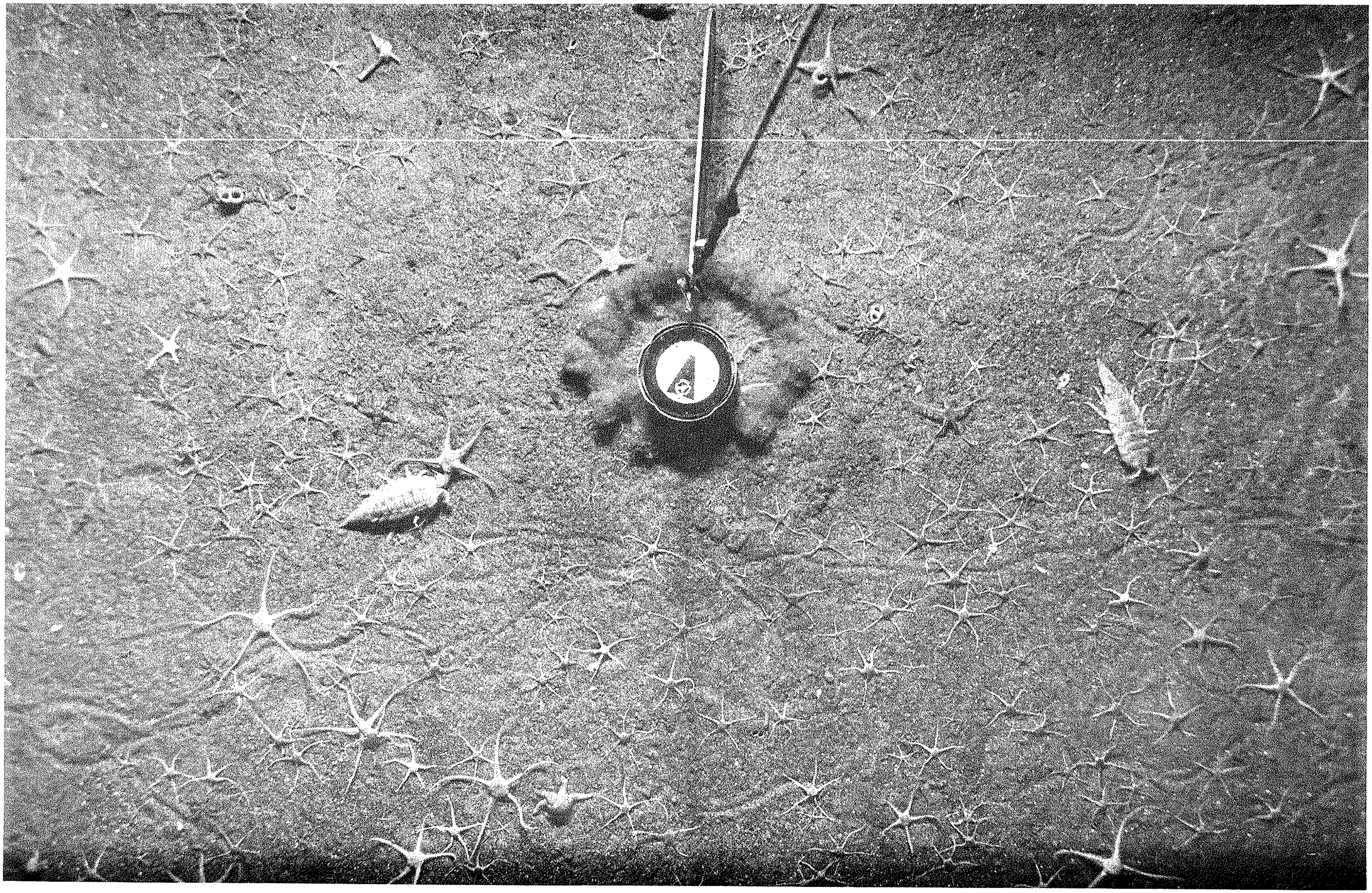

PLATE FOUR

MAKTAK FJORD 5 - 1 Depth = 610 m

Three thin-armed ophiuroids
Abundant elasipod (spiky) holothurians, with tracks and faeces
Shrimp or mysid (white)
Pycnogonid (centre, near bottom)
Burrowing anemone (left of shrimp)
Large burrow opening below compass weight

(Other photographs show clustered burrow openings and live and dead buccinid gastropods)

Scale $x\frac{1}{3}$

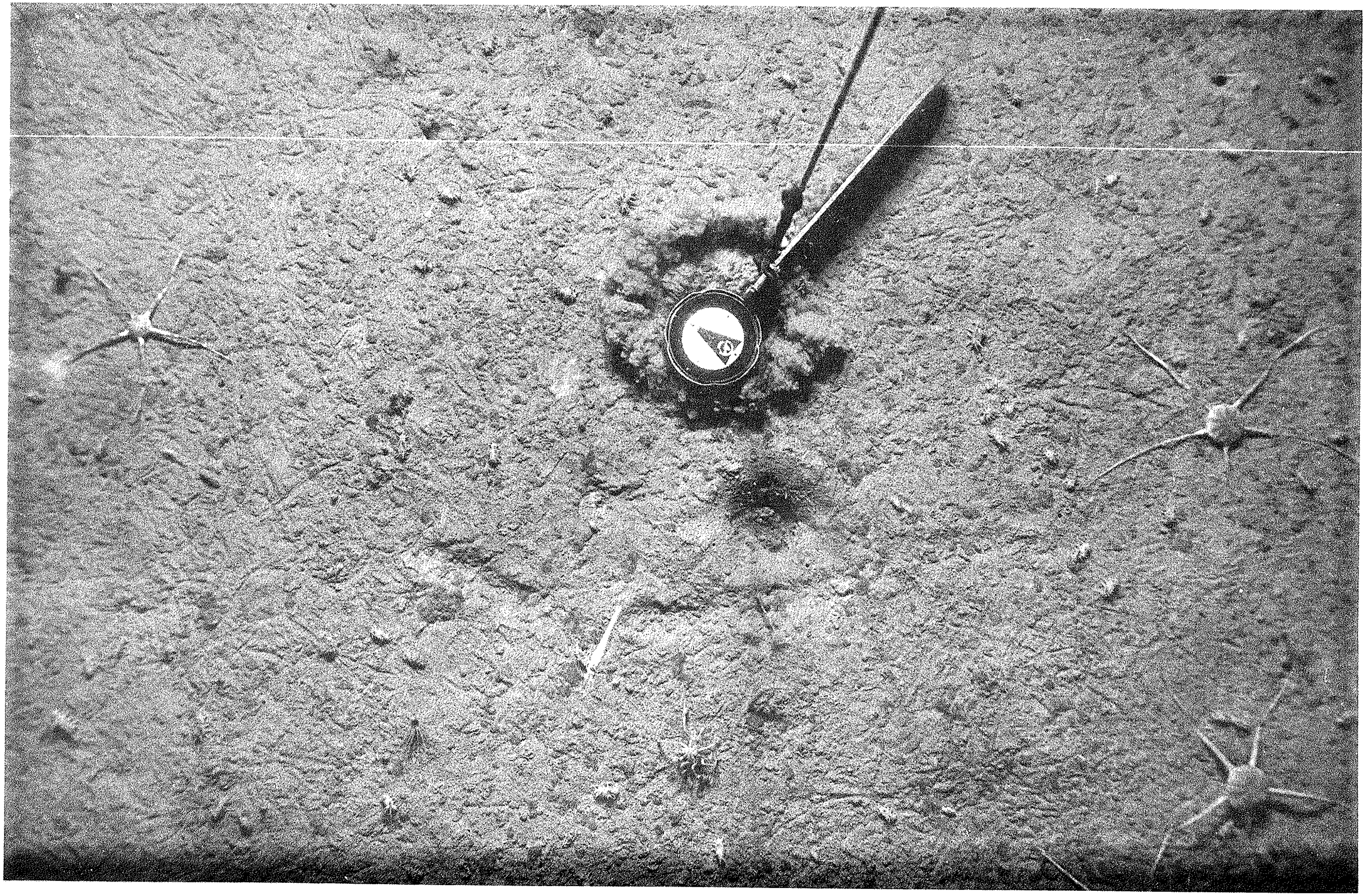

PLATE FIVE

X-Ray Radiographs of piston cores from Sunneshine Fjord SU 5
100 KV 3.5 ma

a) 431-453 cm depth:
showing several vertically burrowed sedimentary units, with
burrows truncated at the base of units (!)
bivalve at 445 cm
original stratification is inclined

b) 502-524 cm depth:
showing downward transition from vertical to horizontal
burrows at top of core
large articulate brachiopods at 512 and 522 cm
return to vertical burrows at base

c) 559-581 cm depth:
showing very long vertical burrow at top (possibly U-shaped)
passing through three graded sedimentary units
graded unit in centre has erosive current-rippled base sharply
truncating burrowed top of thick lower unit
original stratification appears horizontal

d) 582-604 cm depth:
showing lithic clasts at bases of two graded units, and slumped
mass of current-rippled sand at base of central unit

True Scale

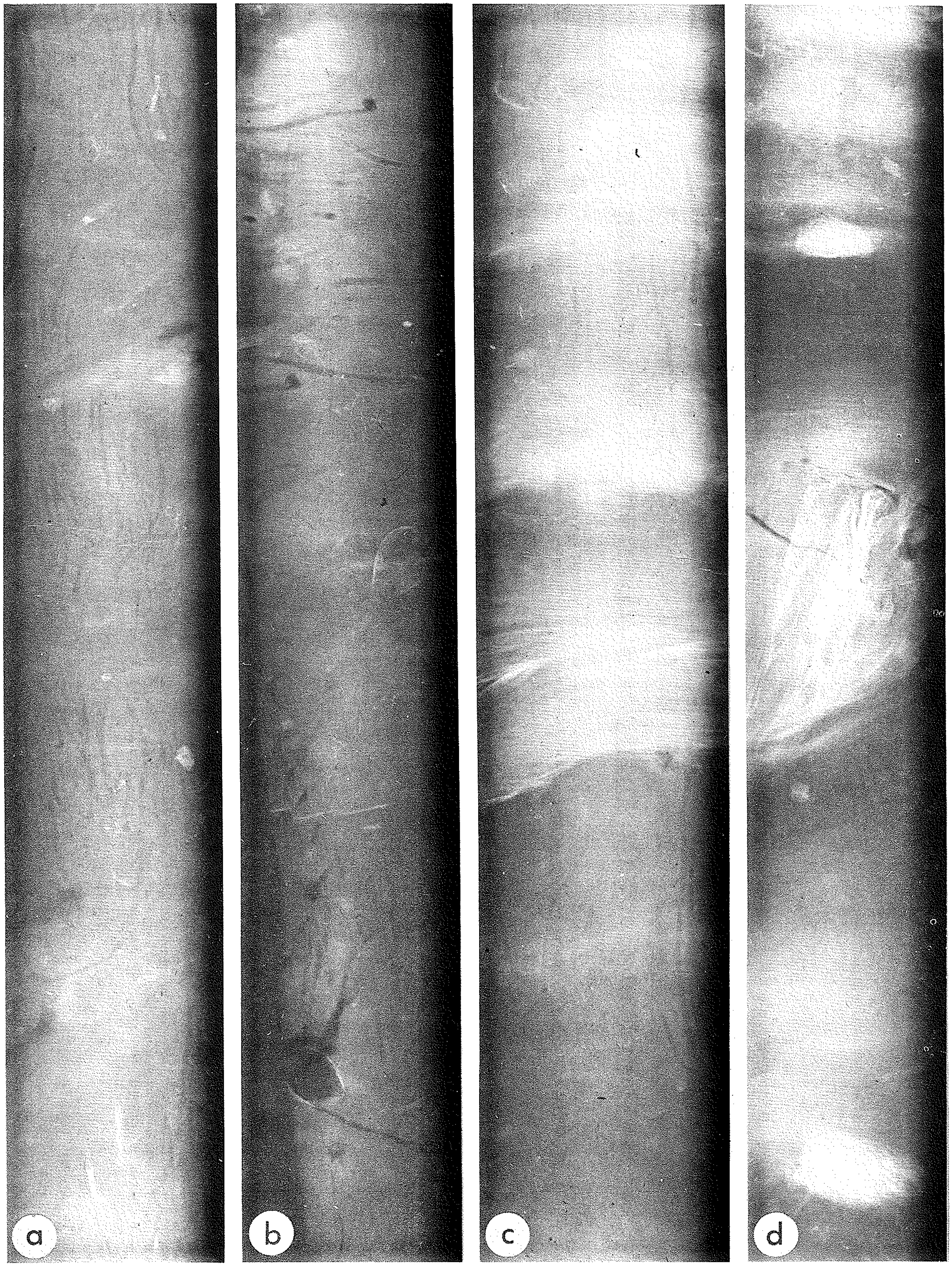
a
b
c
d

PLATE SIX

CAMBRIDGE FJORD CA 6 Depth = 580 m

Four dead _Buccinum_ sp.
One elasipod holothurian (cf. _Elpidia_) below compass, with associated faecal strings

Scattered shell debris is evident

(Other photographs show no burrow openings and few trails, except for a big hole excavated beneath a dropstone. This had a shrimp "on gaurd")

Scale x$\frac{1}{3}$

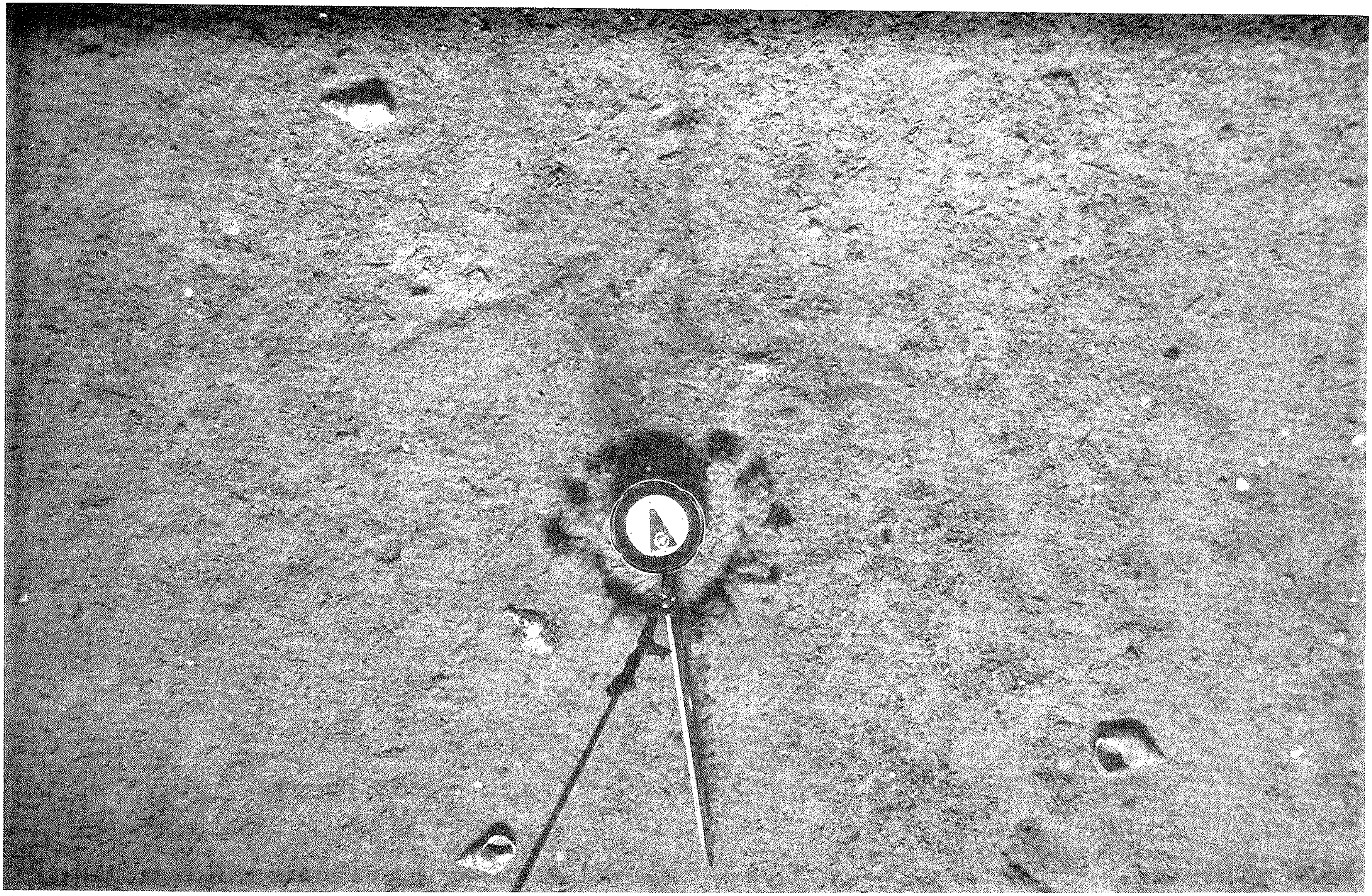

PLATE SEVEN

McBETH FJORD MC 7 - 3 Depth =

Bottom strikingly devoid of surface trails or burrows and has a somewhat "clotted" texture which seems to submerge some small ophiuroids (e.g. bottom left), possibly implying a high rate of sedimentation.

Scale $x\frac{1}{3}$

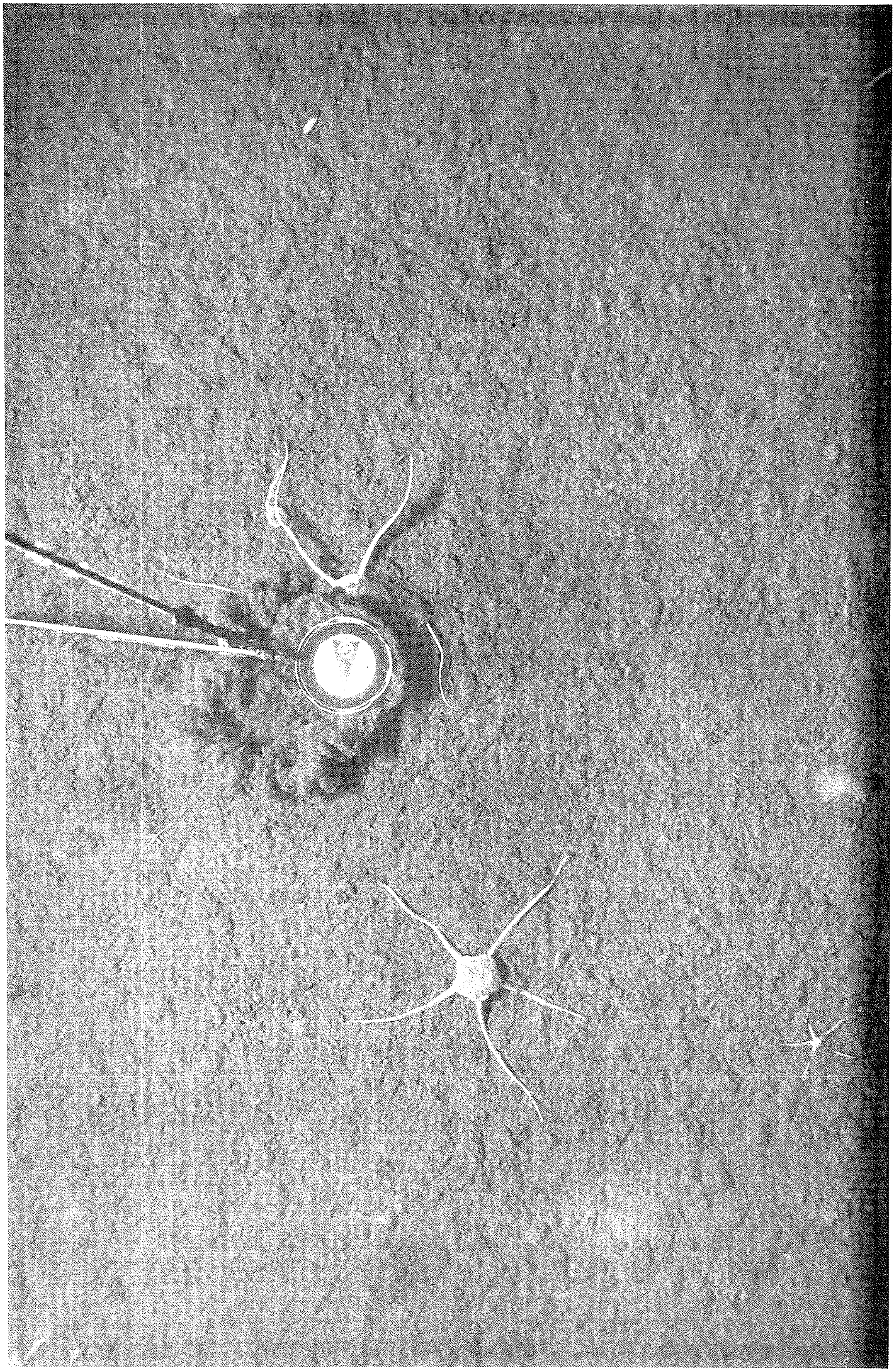

PLATE EIGHT

CAMBRIDGE FJORD CA 5 - 8A Depth = 570 m

Two large stiff-armed ophiuroids (cf. *Ophiura sarsi*)
Six sabellid polychaete tubes (e.g. left)
Two tentacle rosettes of burrowing holothurians (left of weight)
Calcareous serpulid tubes lying directly on the bottom imply a firm substratum

Trails are not present, thought the bottom appears pelleted

Scale x$\frac{1}{2}$

PLATE NINE

TINGIN FJORD TI 3 - 2 Depth = 520 m

Surface trails abundant and chiefly made by the movement of five large ophiuroids rather than the smaller elasipod holothurians (even though the latter are more abundant).

The curious orientation of the thin-armed ophiuroids, with discs raised, is also seen to occur at several other stations.

Furrow in lower centre was probably caused by irregular echinoid.

Trochiform gastropod left of centre.

(Buccinid gastropods occur in other photographs)

Scale $x\frac{1}{3}$

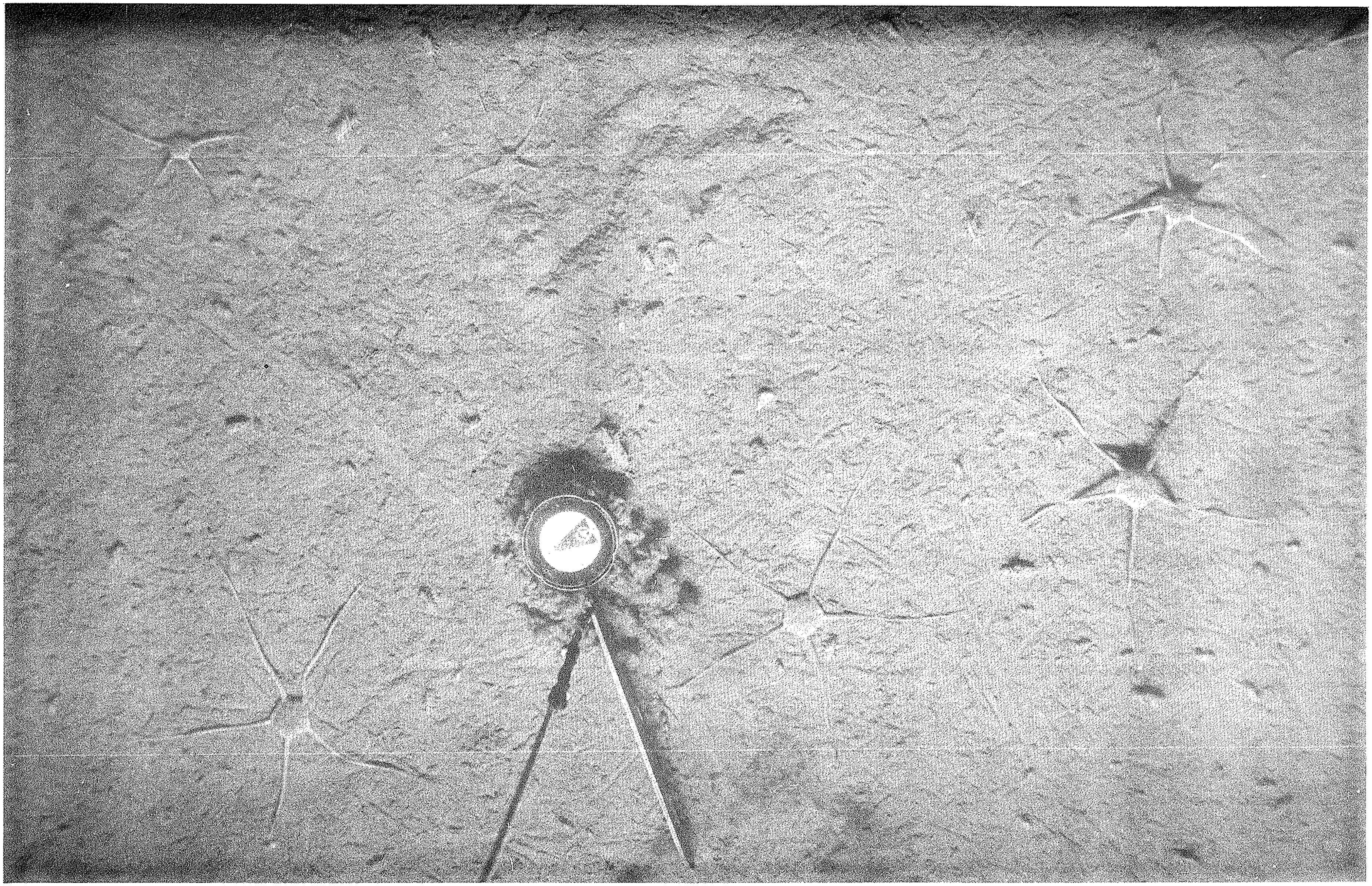

PLATE TEN

SUNNESHINE FJORD SU 2 Depth =

Adundant ophiuroids, some with raised discs, many moving (in different directions) without leaving obvious traces, some burrowed with whip-like arm tips visible (these individuals could be responsible for the pseudo-U shaped burrows seen on radiographs of core SU 5; Fig. 1 and Pl. 5).
Four pycnogonids, occasional 'fuzzy' pennatulids and sabellid tubes.

Scattered shell debris is present (cf. other Sunneshine localities, e.g. Pl. 1, 3; SU 7)

(Other photographs show minor drifted kelp, occasional burrow openings, with one fish).

Scale $x\frac{1}{3}$

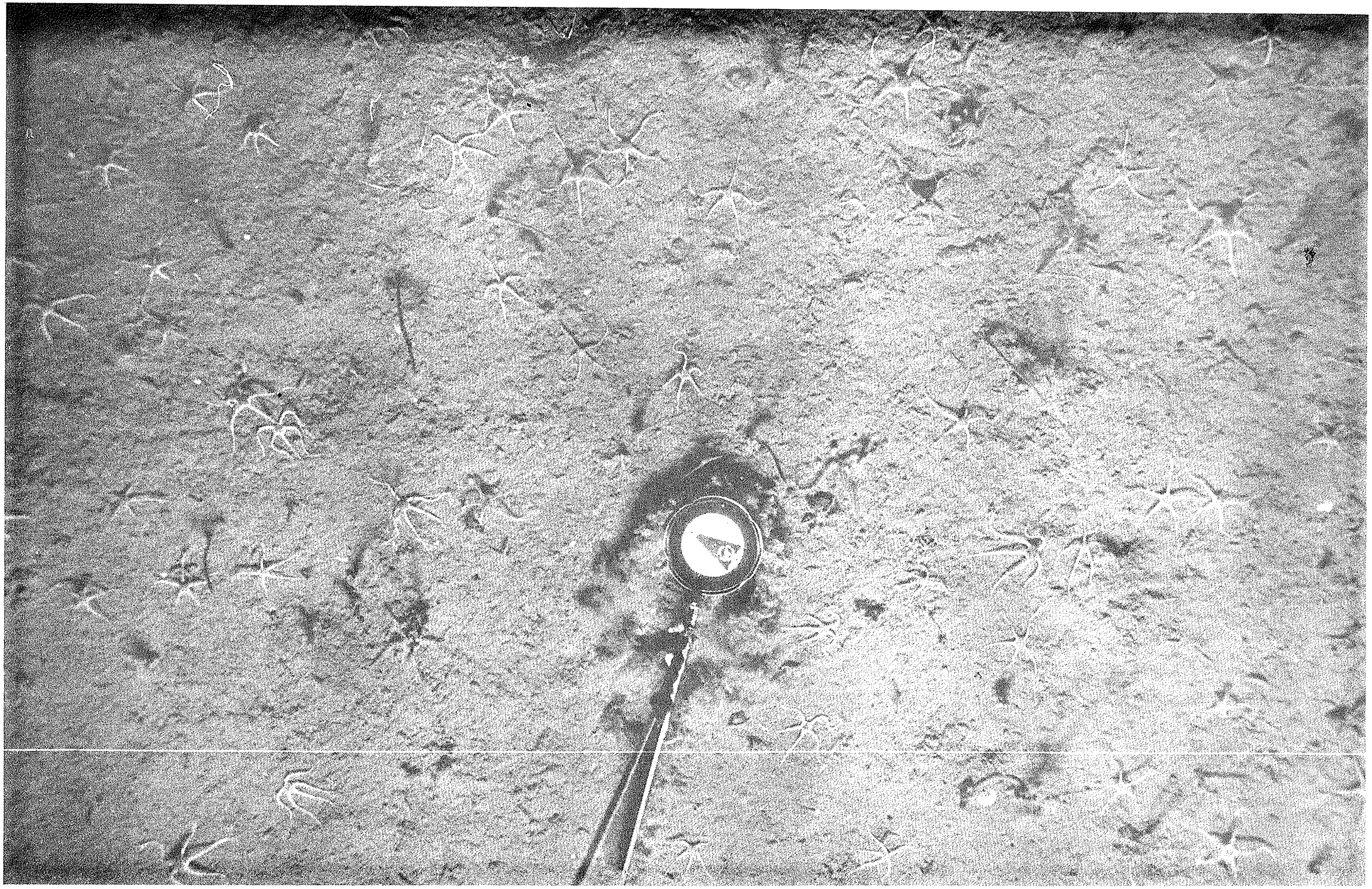

PLATE ELEVEN

CAMBRIDGE FJORD CA 1 Depth = 200 m

Interfering horizontal trails made by <u>Pectinaria</u>-like worm-tubes moving over surface.
Whip-like arms are of buried ophiuroids.
Eroded cross section of naticid (predatory) gastropod, bottom left.

Scale xl

PLATE TWELVE

TINGIN FJORD   TI 1A - 3   Depth = 90 m

Conspicuous burrow openings, often paired, are similar to those made by the siphons of large deposit-feeding bivalves such as *Macoma*.
Larger single burrow holes made be occupied by retracted anemones.
Good *Asteriacites* trace on right but less clear traces top left, though still proabably made by ophiuroids.
Burrowing anemone at left.
Pycnogonid right of compass.
Worm casts (lower left) from deposit feeding polychaete.
Small fused bivalve siphons of suspension feeder (left and below compass)

This station must contain a relatively dense infauna and should appear well burrowed in cores. However, Fig. 2 shows only isolated burrows, with a dense 'clotted' texture.

Scale $x\frac{1}{3}$

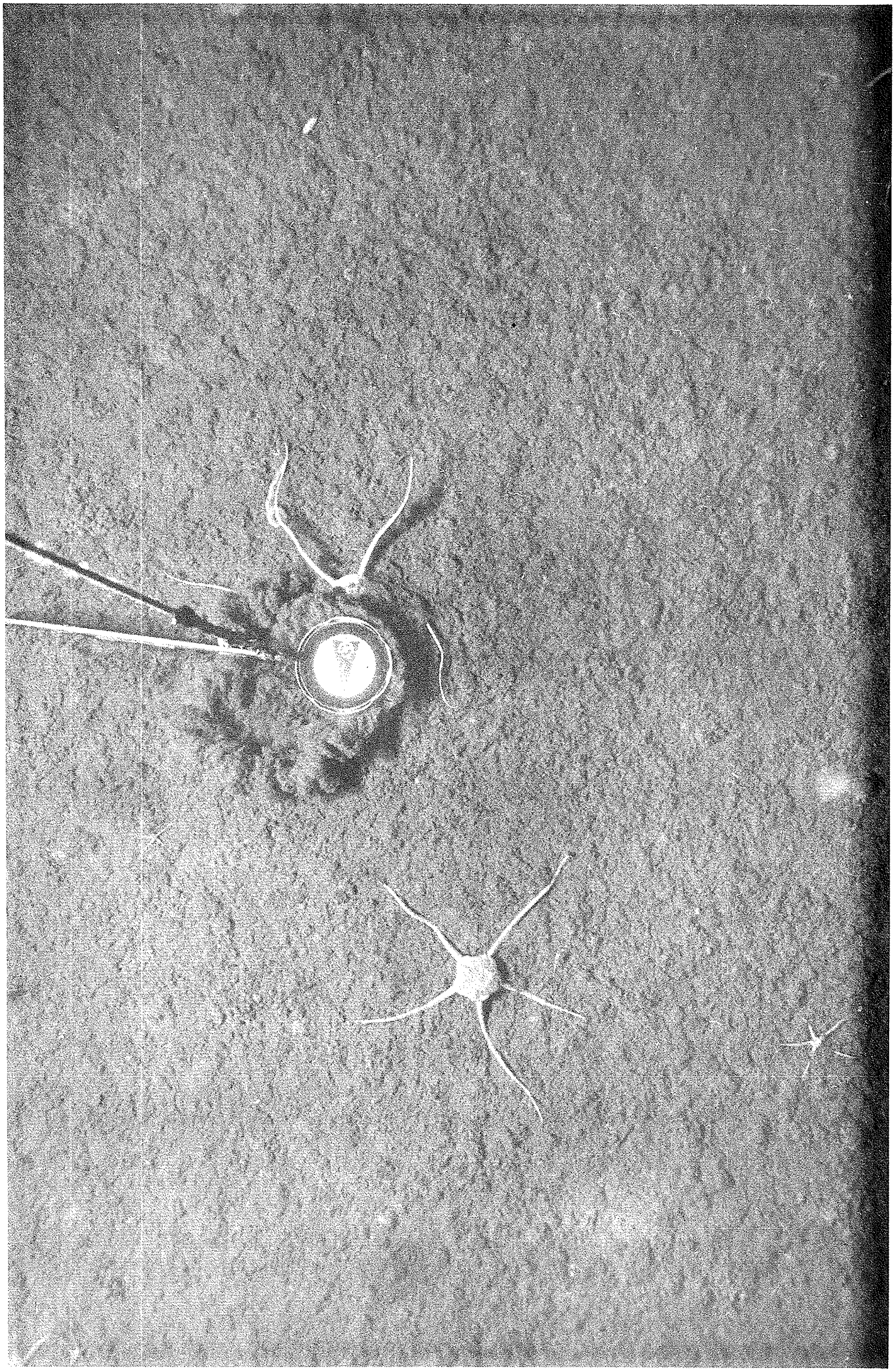

PLATE EIGHT

CAMBRIDGE FJORD CA 5 - 8A Depth = 570 m

Two large stiff-armed ophiuroids (cf. *Ophiura sarsi*)
Six sabellid polychaete tubes (e.g. left)
Two tentacle rosettes of burrowing holothurians (left of weight)
Calcareous serpulid tubes lying directly on the bottom imply a firm substratum

Trails are not present, thought the bottom appears pelleted

Scale x$\frac{1}{2}$

PLATE NINE

TINGIN FJORD TI 3 - 2 Depth = 520 m

Surface trails abundant and chiefly made by the movement of five large ophiuroids rather than the smaller elasipod holothurians (even though the latter are more abundant).

The curious orientation of the thin-armed ophiuroids, with discs raised, is also seen to occur at several other stations.

Furrow in lower centre was probably caused by irregular echinoid.

Trochiform gastropod left of centre.

(Buccinid gastropods occur in other photographs)

Scale $x\frac{1}{3}$

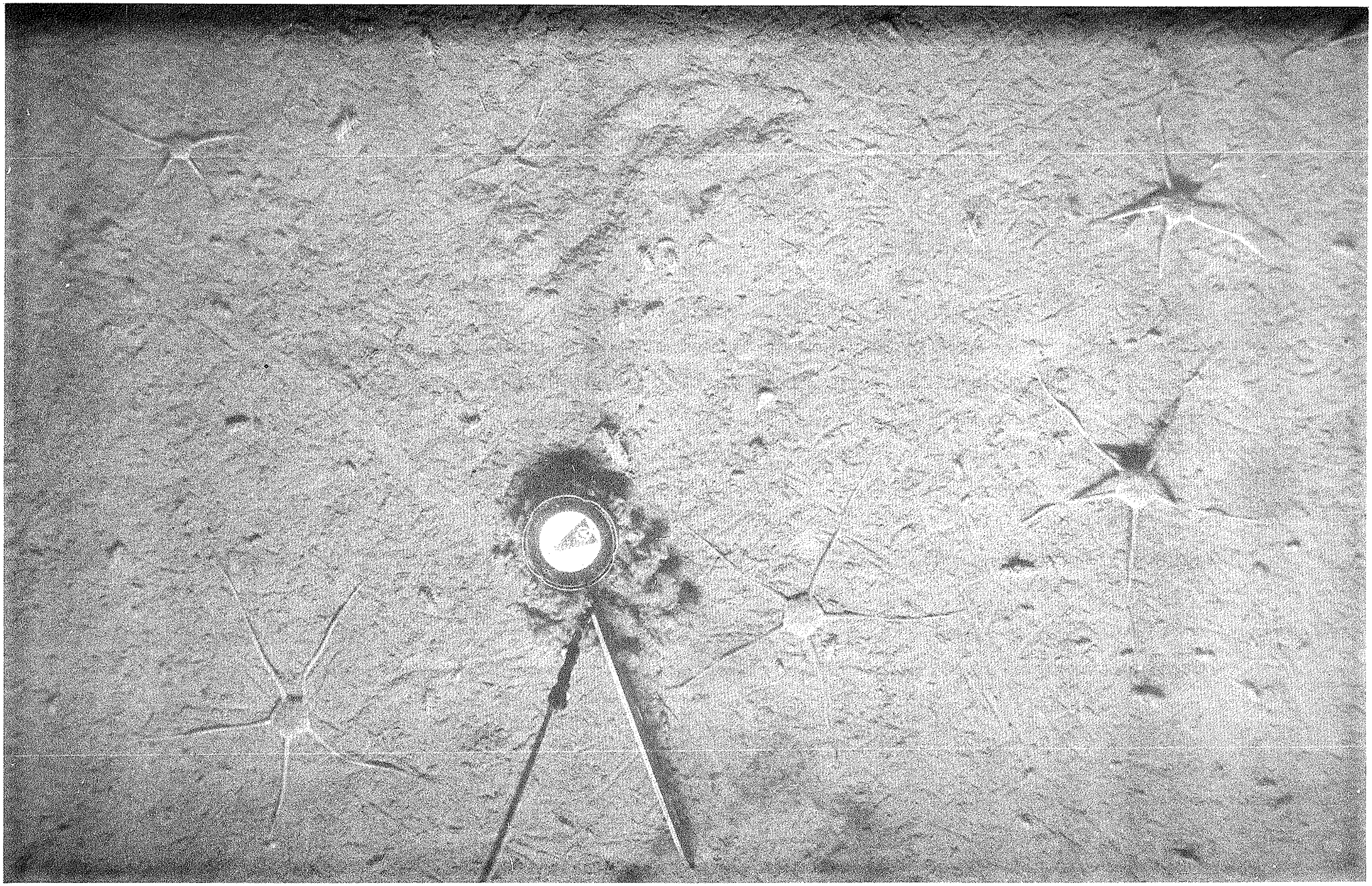

PLATE TEN

SUNNESHINE FJORD SU 2 Depth =

Adundant ophiuroids, some with raised discs, many moving (in different directions) without leaving obvious traces, some burrowed with whip-like arm tips visible (these individuals could be responsible for the pseudo-U shaped burrows seen on radiographs of core SU 5; Fig. 1 and Pl. 5).
Four pycnogonids, occasional 'fuzzy' pennatulids and sabellid tubes.

Scattered shell debris is present (cf. other Sunneshine localities, e.g. Pl. 1, 3; SU 7)

(Other photographs show minor drifted kelp, occasional burrow openings, with one fish).

Scale x$\frac{1}{3}$

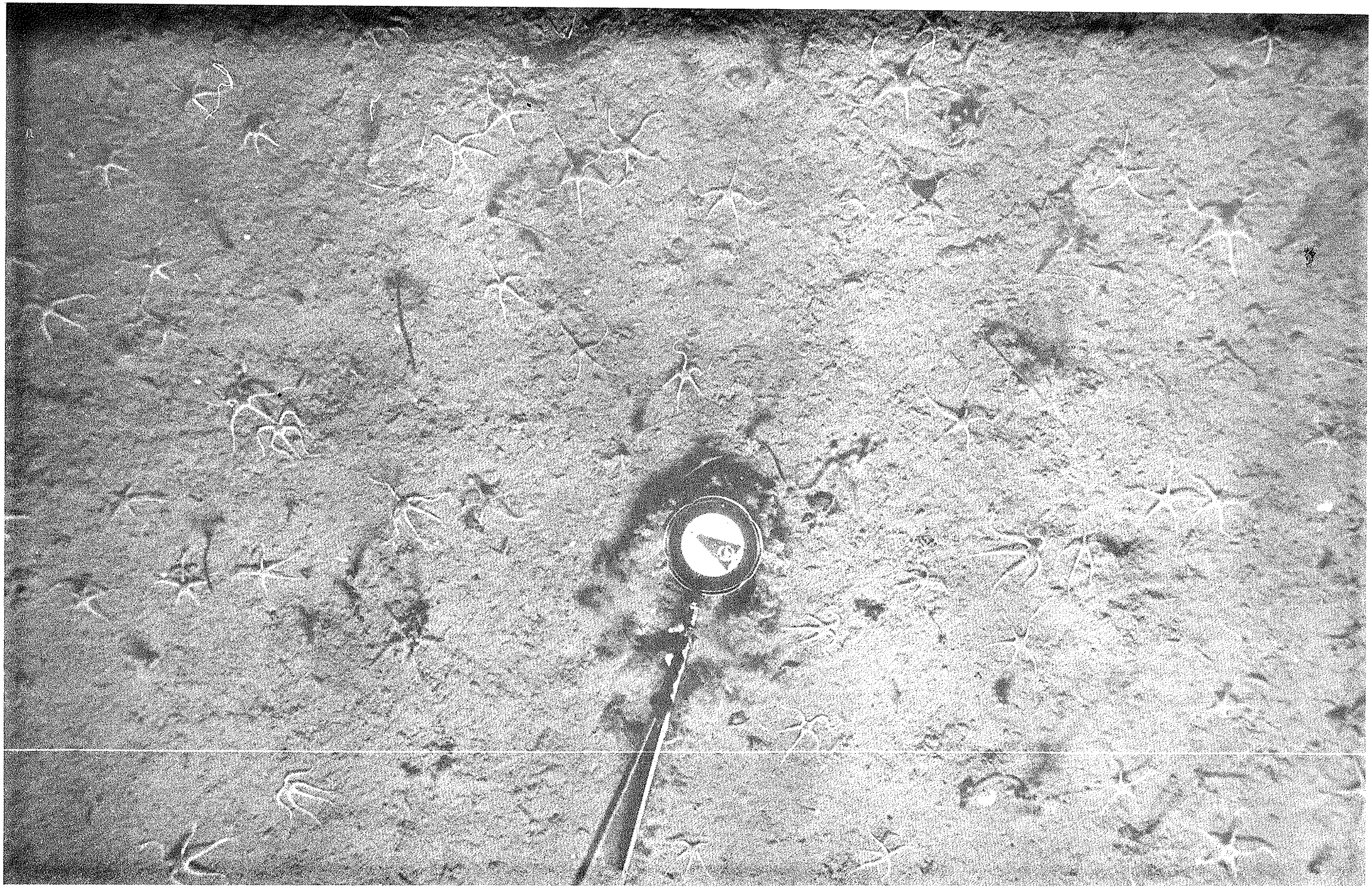

PLATE ELEVEN

CAMBRIDGE FJORD   CA   1   Depth = 200 m

Interfering horizontal trails made by Pectinaria-like worm-tubes moving over surface.
Whip-like arms are of buried ophiuroids.
Eroded cross section of naticid (predatory) gastropod, bottom left.

Scale   x1

PLATE TWELVE

TINGIN FJORD TI 1A - 3 Depth = 90 m

Conspicuous burrow openings, often paired, are similar to those made by the siphons of large deposit-feeding bivalves such as <u>Macoma</u>.
Larger single burrow holes made be occupied by retracted anemones.
Good <u>Asteriacites</u> trace on right but less clear traces top left, though still proabably made by ophiuroids.
Burrowing anemone at left.
Pycnogonid right of compass.
Worm casts (lower left) from deposit feeding polychaete.
Small fused bivalve siphons of suspension feeder (left and below compass)

This station must contain a relatively dense infauna and should appear well burrowed in cores. However, Fig. 2 shows only isolated burrows, with a dense 'clotted' texture.

Scale x$\frac{1}{3}$

TABLE 10-2D

SAMPLE	STATION	INTERVAL CM	FEHA PPM	MNHA PPM	ZNHA PPM	CUHA PPM	NIHA PPM
8215681	MC7	25- 30	3340.	216.0	10.9	8.6	4.5
8215682	MC7	30- 35	3410.	199.0	10.5	10.3	6.6
8215683	MC7	35- 40	2970.	142.0	9.4	8.3	5.0
8215684	MC7	40- 45	2590.	162.0	9.6	9.6	6.0
8215685	MC7	45- 50	2660.	173.0	9.6	9.1	4.8
8215686	MC7	50- 55	2822.	176.0	10.3	8.3	5.5
8215687	MC7	55- 60	3860.	175.0	14.4	10.1	5.6
8215688	MC7	60- 65	3720.	146.0	13.5	8.3	5.6
8215689	MC7	65- 70	4310.	152.0	12.7	10.4	6.0
8215690	MC7	70- 75	3970.	149.0	12.7	9.4	5.5
8215691	MC7	75- 80	4290.	173.0	14.2	11.2	7.4
8215692	MC7	80- 85	4000.	161.0	13.9	10.3	6.3
8215693	MC7	85- 90	3690.	140.0	13.0	9.8	5.5
8215694	MC7	90- 95	4300.	191.0	12.6	7.9	5.1
8215695	MC7	95-100	3700.	131.0	13.1	7.9	5.6
8215696	MC7	100-110	4706.	160.0	17.9	11.0	5.8
8215697	MC7	110-120	4190.	136.0	14.9	8.8	4.3
8215698	MC7	120-130	3410.	152.0	15.8	10.2	4.4
8215699	MC7	130-140	3360.	163.0	17.8	10.4	5.1
8215700	MC7	140-150	3380.	180.0	17.8	10.5	5.5
8215701	MC7	150-160	4390.	205.0	18.4	11.1	5.6
8215702	MC7	160-170	3870.	166.0	19.7	11.6	6.3
8215703	MC7	170-180	3040.	186.0	17.9	10.5	4.6
8215704	MC7	180-190	3290.	196.0	19.1	10.9	6.4
8215705	MC7	190-200	2640.	192.0	17.0	10.6	5.9
8215706	MC7	200-210	2730.	185.0	15.8	10.0	5.1
8215707	MC7	210-220	3020.	177.0	17.7	12.2	6.5
8215708	MC7	220-230	3530.	174.0	16.1	12.3	6.4
8215709	MC7	230-240	2600.	181.0	16.8	11.7	6.4
8215710	IN3	0- 5	1000.	15.0	3.0	5.1	0.7
8215711	IN3	5- 10	2760.	45.0	6.7	7.6	1.5
8215712	IN3	10- 15	2160.	42.0	6.9	9.6	1.8
8215713	IN3	15- 20	2560.	50.0	8.7	8.4	2.9
8215714	IN3	20- 25	2340.	49.0	7.3	8.4	2.4
8215715	IN3	25- 30	1500.	34.0	5.7	9.3	2.8
8215716	IN3	30- 35	2730.	32.0	6.6	5.5	3.0
8215717	IN3	35- 40	1730.	34.0	7.9	14.7	3.1
8215718	IN3	40- 45	2100.	42.0	8.9	11.9	3.1
8215719	IN3	45- 50	1920.	43.0	6.8	8.8	2.7
8215720	IN3	50- 55	1980.	29.0	6.8	10.8	2.5
8215721	IN3	55- 60	1670.	30.0	6.7	10.6	4.1
8215722	IN3	60- 65	2050.	43.0	9.2	9.9	3.4
8215723	IN3	65- 70	1670.	37.0	7.2	12.2	2.6
8215724	IN3	70- 75	2180.	55.0	11.5	9.1	2.8
8215725	IN3	75- 80	463.	10.0	1.6	3.0	0.5
8215726	IN3	80- 85	1620.	38.0	6.9	11.0	1.1
8215727	IN3	85- 90	1910.	42.0	7.8	12.7	2.4
8215728	IN3	90-100	1300.	31.0	5.9	8.9	1.3
8215729	IN3	95-110	1760.	46.0	7.6	8.6	1.3
8215730	IN3	100-120	1950.	44.0	11.6	10.4	3.6
8215731	IN3	110-130	1450.	33.0	5.5	8.8	1.8
8215732	IN3	120-140	1860.	43.0	8.8	12.6	3.6
8215733	IN3	130-150	1240.	27.0	5.1	8.4	1.8
8215734	IN3	140-150	2000.	46.0	9.7	10.9	4.1
8215735	CA2	0- 5	3300.	79.0	11.6	11.2	2.2
8215736	CA2	5- 10	2710.	57.0	12.9	12.0	3.2
8215737	CA2	10- 15	2790.	66.0	12.5	13.4	3.7
8215738	CA2	15- 20	3129.	70.0	12.0	12.7	3.1
8215739	CA2	20- 25	2910.	75.0	12.7	11.6	3.2
8215740	CA2	25- 30	3000.	82.0	12.3	14.1	3.5

TABLE 10-2E

SAMPLE	STATION	INTERVAL CM	FEHA PPM	MNHA PPM	ZNHA PPM	CUHA PPM	NIHA PPM
8215741	CA2	30- 35	2600.	92.0	12.0	14.5	3.1
8215742	CA2	35- 40	2280.	81.0	12.0	14.3	2.8
8215743	CA2	40- 45	2310.	79.0	11.6	13.0	2.5
8215744	CA2	45- 50	2540.	93.0	12.5	13.1	2.9
8215745	CA2	50- 55	2720.	112.0	11.8	12.7	3.1
8215746	CA2	55- 60	2290.	93.0	12.1	14.4	2.9
8215747	CA2	60- 65	2600.	96.0	11.6	17.2	4.2
8215748	CA2	65- 70	2460.	98.0	11.7	16.4	5.1
8215749	CA2	70- 75	2630.	97.0	12.6	15.8	4.2
8215750	CA2	75- 80	2710.	100.0	13.5	15.6	5.8
8215751	CA2	80- 85	2770.	103.0	12.0	19.8	3.6
8215752	CA2	85- 90	2240.	71.0	8.8	17.7	3.9
8215753	CA2	90- 95	2640.	101.0	11.7	16.8	4.1
8215754	CA2	95-100	2750.	103.0	12.7	16.4	5.4
8215755	CA2	100-110	2920.	101.0	13.8	14.8	5.0
8215756	CA2	110-120	2800.	110.0	12.8	17.7	5.3
8215757	CA2	120-130	3020.	108.0	13.2	18.8	5.6
8215758	CA2	130-140	3150.	103.0	13.1	20.1	4.5
8215759	CA2	140-150	2861.	99.0	13.2	19.9	4.1

TABLE 10-3A

SAMPLE	STATION	INTERVAL CM	FEWA PPM	MNWA PPM	ZNWA PPM	CUWA PPM	NIWA PPM
8215501	SU5	0- 5	4090.	13.1	8.0	9.3	2.6
8215502	SU5	5- 10	2590.	10.0	5.8	10.2	7.1
8215503	SU5	10- 15	2790.	9.6	5.4	10.0	7.6
8215504	SU5	15- 20	2460.	9.5	5.1	9.5	6.6
8215505	SU5	20- 25	2590.	9.3	5.2	9.6	7.7
8215506	SU5	25- 30	2150.	9.5	5.0	9.1	6.8
8215507	SU5	30- 35	2680.	9.9	4.9	9.7	8.2
8215508	SU5	35- 40	2290.	10.1	4.9	9.3	9.1
8215509	SU5	40- 45	2030.	13.3	5.3	9.4	7.8
8215510	SU5	45- 50	1880.	10.0	5.5	9.1	9.0
8215511	SU5	50- 55	1370.	10.2	4.9	7.2	7.7
8215512	SU5	55- 60	1470.	10.5	5.0	8.8	9.0
8215513	SU5	60- 65	1610.	10.5	5.2	10.1	9.4
8215514	SU5	65- 70	1390.	10.4	5.1	9.0	8.9
8215515	SU5	70- 75	1560.	11.2	5.5	8.9	10.3
8215516	SU5	75- 80	1660.	10.7	5.7	10.1	10.5
8215517	SU5	80- 85	1670.	10.8	5.3	10.1	9.4
8215518	SU5	85- 90	1180.	8.3	3.8	7.5	6.8
8215519	SU5	90- 95	1560.	10.5	5.1	9.7	9.8
8215520	SU5	95-100	1490.	10.1	5.5	8.8	9.4
8215521	SU5	100-110	1740.	10.7	5.6	9.7	10.2
8215522	SU5	110-120	1970.	10.5	4.9	8.7	9.9
8215523	SU5	120-130	1850.	11.4	5.6	10.3	8.9
8215524	SU5	130-140	2770.	10.8	5.5	10.4	8.2
8215525	SU5	140-150	1530.	11.0	5.0	9.4	9.0
8215526	SU5	150-160	1910.	10.6	5.3	9.1	9.2
8215527	SU5	160-170	1210.	29.1	7.1	5.2	2.4
8215528	SU5	170-180	1770.	12.3	5.4	10.2	10.1
8215529	SU5	180-190	2090.	11.4	5.5	10.4	10.2
8215530	SU5	190-200	2020.	12.4	5.9	12.0	10.1
8215531	SU5	200-210	1900.	11.4	5.8	10.7	10.8
8215532	SU5	210-220	2370.	11.4	4.8	10.0	8.9
8215533	C04	0- 5	2030.	28.3	7.5	4.3	1.7
8215534	C04	5- 10	1920.	22.6	9.0	5.0	1.8
8215535	C04	10- 15	1660.	21.6	9.0	4.5	2.5
8215536	C04	15- 20	1600.	19.9	8.7	5.2	1.6
8215537	C04	20- 25	1420.	18.6	8.4	4.4	2.1
8215538	C04	25- 30	1170.	17.4	7.3	4.0	2.7
8215539	C04	30- 35	1310.	19.7	7.5	3.7	1.9
8215540	C04	35- 40	1130.	17.7	7.4	4.3	1.9
8215541	C04	40- 45	1240.	19.3	7.1	3.6	1.6
8215542	C04	45- 50	1390.	23.9	8.7	4.6	3.0
8215543	C04	50- 55	1020.	19.1	5.9	4.0	3.2
8215544	C04	55- 60	1480.	27.5	8.7	5.6	2.4
8215545	C04	60- 65	1340.	26.1	8.0	5.1	3.5
8215546	C04	65- 70	1450.	28.6	8.3	4.9	4.1
8215547	C04	70- 75	1280.	28.0	8.2	5.0	2.9
8215548	C04	75- 80	1270.	25.7	7.5	5.2	3.3
8215549	C04	80- 85	1540.	29.2	8.5	5.2	3.7
8215550	C04	85- 90	1420.	31.0	7.9	5.3	2.2
8215551	C04	90- 95	2450.	11.5	5.0	10.4	8.8
8215552	C04	95-100	1270.	32.2	7.7	5.8	2.0
8215553	C04	100-110	1340.	41.3	8.1	6.1	3.4
8215554	C04	110-120	1300.	32.2	7.3	4.6	2.7
8215555	C04	120-130	1430.	35.9	7.3	5.9	3.5
8215556	C04	130-140	1150.	29.1	6.1	4.7	2.9
8215557	C04	140-150	1250.	34.9	6.6	5.7	3.8
8215558	C04	150-160	1240.	31.7	6.7	6.2	2.9
8215559	C04	160-170	1470.	40.5	7.2	6.4	3.5
8215560	C04	170-180	1280.	36.3	7.7	6.2	3.1

TABLE 10-38

SAMPLE	STATION	INTERVAL CM	FEWA PPM	MNWA PPM	ZNWA PPM	CUWA PPM	NIWA PPM
8215561	C04	180-190	1110.	33.8	7.3	6.1	3.3
8215562	C04	190-200	1300.	36.3	8.1	6.3	3.2
8215563	C04	200-210	1570.	47.8	8.3	6.4	4.2
8215564	C04	210-220	1650.	45.2	8.2	7.0	4.2
8215565	C04	220-230	1620.	41.8	7.7	7.4	3.7
8215566	C04	230-240	1920.	50.5	7.8	7.5	4.5
8215567	MA2	0- 5	2840.	24.0	9.7	5.2	1.7
8215568	MA2	5- 10	2690.	27.0	11.7	6.0	1.9
8215569	MA2	10- 15	2410.	24.0	10.2	3.6	2.0
8215570	MA2	15- 20	2230.	22.0	9.4	3.7	2.4
8215571	MA2	20- 25	2230.	23.0	10.5	4.4	2.6
8215572	MA2	25- 30	2050.	25.0	9.3	4.5	2.6
8215573	MA2	30- 35	1950.	24.0	9.8	3.9	3.3
8215574	MA2	35- 40	2070.	24.0	9.0	3.8	2.3
8215575	MA2	40- 45	1790.	23.0	8.4	2.9	2.3
8215576	MA2	45- 50	2340.	27.0	9.2	3.8	1.8
8215577	MA2	50- 55	2240.	27.0	10.0	5.6	1.5
8215578	MA2	55- 60	1930.	25.0	9.5	4.6	1.1
8215579	MA2	60- 65	1980.	26.0	9.1	4.4	1.5
8215580	MA2	65- 70	2210.	24.0	8.6	3.9	1.1
8215581	MA2	70- 75	2160.	27.0	9.7	4.5	1.7
8215582	MA2	75- 80	1840.	24.0	9.4	5.0	1.0
8215583	MA2	80- 85	2160.	26.0	8.5	4.9	1.5
8215584	MA2	85- 90	1890.	26.0	8.7	5.2	1.2
8215585	MA2	90- 95	1780.	23.0	8.3	4.2	1.7
8215586	MA2	95-100	1740.	22.0	8.6	5.2	1.9
8215587	MA2	100-110	1710.	25.0	8.6	4.9	2.1
8215588	MA2	110-120	1350.	16.0	5.9	3.2	2.4
8215589	MA2	120-130	2590.	31.0	9.2	5.2	2.6
8215590	MA2	130-140	1990.	28.0	9.4	5.6	2.9
8215591	MA2	140-150	1740.	26.0	7.9	5.4	1.8
8215592	MA2	150-160	2720.	33.0	7.5	4.0	1.9
8215593	MA2	160-170	2120.	29.0	8.8	4.6	1.7
8215594	MA2	170-180	2020.	29.0	8.2	4.7	1.4
8215595	MA2	180-190	2160.	29.0	8.4	5.5	1.0
8215596	MA2	190-200	1580.	26.0	7.8	3.8	.9
8215597	MA2	200-210	1540.	27.0	8.1	4.7	1.7
8215598	MA2	210-220	1550.	28.0	8.1	4.6	1.5
8215599	MA2	220-230	1622.	38.0	8.1	4.9	2.1
8215600	MA2	230-240	1650.	29.0	7.9	5.4	1.5
8215601	MA2	240-250	1520.	29.0	7.6	4.3	1.7
8215602	NP2	0- 5	3370.	192.0	12.6	6.8	3.7
8215603	NP2	5- 10	2820.	129.0	12.7	5.8	2.9
8215604	NP2	10- 15	2950.	141.0	12.0	5.9	4.9
8215605	NP2	15- 20	2580.	109.0	11.7	6.3	4.2
8215606	NP2	20- 25	2480.	109.0	12.9	6.1	3.8
8215607	NP2	25- 30	3090.	116.0	10.7	5.7	4.1
8215608	NP2	30- 35	3210.	108.0	12.4	6.1	2.9
8215609	NP2	35- 40	2180.	81.0	10.2	5.1	2.4
8215610	NP2	40- 45	2920.	124.0	10.0	5.9	2.3
8215611	NP2	45- 50	3170.	102.0	12.9	6.3	3.5
8215612	NP2	50- 55	3120.	110.0	13.0	6.8	2.8
8215613	NP2	55- 60	4710.	167.0	12.0	6.5	4.0
8215614	NP2	60- 65	3550.	97.0	11.9	5.7	5.3
8215615	NP2	65- 70	3520.	112.0	12.7	6.8	4.6
8215616	NP2	70- 75	2150.	82.0	11.8	5.7	3.9
8215617	NP2	75- 80	3050.	99.0	11.4	5.6	3.3
8215618	NP2	80- 85	2706.	89.0	11.3	6.5	3.4
8215619	NP2	85- 90	3755.	117.0	12.9	6.2	5.7
8215620	NP2	90- 95	3010.	91.0	11.1	5.7	3.2

TABLE 10-3C

SAMPLE	STATION	INTERVAL CM	FEWA PPM	MNWA PPM	ZNWA PPM	CUWA PPM	NIWA PPM
8215621	NP2	95-100	2850.	89.0	12.1	6.5	4.3
8215622	NP2	100-110	2690.	92.0	11.5	5.8	3.3
8215623	NP2	110-120	3750.	106.0	12.3	6.0	5.2
8215624	NP2	120-130	3180.	92.0	11.3	5.7	3.9
8215625	NP2	130-140	3300.	100.0	10.7	5.0	4.5
8215626	NP2	140-150	2880.	96.0	12.1	7.8	4.9
8215627	NP2	150-160	2730.	87.0	11.4	5.4	4.2
8215628	NP2	160-170	2570.	86.0	10.7	6.2	4.5
8215629	NP2	170-180	2490.	84.0	11.3	7.0	4.6
8215630	NP2	180-190	3160.	94.0	10.2	5.8	4.2
8215631	NP2	190-200	3330.	101.0	11.3	4.6	4.9
8215632	NP2	200-210	3470.	103.0	11.2	6.3	6.2
8215633	NP2	210-220	2620.	89.0	11.1	5.3	4.4
8215634	NP2	220-230	2370.	92.0	10.6	4.7	4.6
8215635	NP2	230-240	2840.	96.0	10.7	4.7	5.0
8215636	NP2	240-250	2990.	100.0	11.8	4.8	4.3
8215637	NP2	250-260	3290.	92.0	11.8	5.1	5.1
8215638	NP2	260-270	3650.	99.0	11.7	7.2	4.8
8215639	NP2	270-280	3010.	85.0	11.2	7.1	4.2
8215640	TI3	0- 5	4260.	15.0	10.7	10.7	3.7
8215641	TI3	5- 10	3720.	12.0	10.4	11.7	4.3
8215642	TI3	10- 15	3660.	13.0	10.1	11.3	4.3
8215643	TI3	15- 20	2920.	13.0	8.9	9.0	3.8
8215644	TI3	20- 25	3210.	12.0	9.9	10.7	3.5
8215645	TI3	25- 30	3530.	12.0	9.2	10.6	3.8
8215646	TI3	30- 35	3540.	12.0	10.1	9.5	4.3
8215647	TI3	35- 40	3850.	13.0	10.3	12.2	5.3
8215648	TI3	40- 45	3950.	13.0	9.8	11.2	4.9
8215649	TI3	45- 50	3250.	13.0	10.3	12.6	3.6
8215650	TI3	50- 55	3350.	13.0	9.6	11.0	5.3
8215651	TI3	55- 60	4280.	15.0	11.4	10.8	4.8
8215652	TI3	60- 65	4220.	15.0	11.2	10.8	4.2
8215653	TI3	65- 70	3540.	15.0	9.1	8.9	4.9
8215654	TI3	70- 75	3370.	16.0	11.0	9.9	3.3
8215655	TI3	75- 80	4030.	16.0	11.6	12.1	3.7
8215656	TI3	80- 85	4170.	22.0	11.1	10.2	3.7
8215657	TI3	85- 90	3730.	18.0	12.0	11.2	3.7
8215658	TI3	90- 95	2780.	18.0	10.7	10.1	4.5
8215659	TI3	95-100	3190.	19.0	9.2	9.4	4.1
8215660	TI3	100-110	2550.	18.0	9.4	10.3	3.9
8215661	TI3	110-120	2990.	19.0	9.5	11.1	3.7
8215662	TI3	120-130	3040.	22.0	9.8	10.3	2.9
8215663	TI3	130-140	2960.	21.0	9.4	10.3	3.3
8215664	TI3	140-150	3610.	24.0	9.5	10.8	3.8
8215665	TI3	150-160	2810.	24.0	8.6	11.1	4.3
8215666	TI3	160-170	3060.	23.0	6.9	8.7	2.5
8215667	TI3	170-180	2640.	26.0	8.3	9.5	3.7
8215668	TI3	180-190	3160.	30.0	9.7	10.9	5.6
8215669	TI3	190-200	3700.	31.0	9.6	8.9	3.5
8215670	TI3	200-210	3790.	35.0	9.1	9.3	4.6
8215671	TI3	210-220	4400.	38.0	9.9	10.5	4.3
8215672	TI3	220-230	4530.	43.0	9.3	9.1	4.2
8215673	TI3	230-240	5340.	47.0	10.7	8.8	4.6
8215674	TI3	240-250	5360.	47.0	9.9	9.5	3.1
8215675	TI3	250-260	4010.	48.0	8.9	11.7	4.5
8215676	MC7	0- 5	2700.	136.0	9.2	7.0	3.4
8215677	MC7	5- 10	2500.	151.0	8.5	6.1	2.9
8215678	MC7	10- 15	1450.	476.0	3.8	3.3	2.0
8215679	MC7	15- 20	2420.	999.0	5.0	3.4	3.5
8215680	MC7	20- 25	3950.	440.0	10.3	9.2	6.3

TABLE 10-3D

SAMPLE	STATION	INTERVAL CM	FEWA PPM	MNWA PPM	ZNWA PPM	CUWA PPM	NIWA PPM
8215681	MC7	25- 30	3110.	212.0	10.5	8.7	5.7
8215682	MC7	30- 35	3470.	198.0	10.2	9.2	6.1
8215683	MC7	35- 40	2910.	166.0	9.6	8.5	4.7
8215684	MC7	40- 45	2234.	156.0	9.8	9.6	4.8
8215685	MC7	45- 50	2390.	167.0	10.0	8.6	5.7
8215686	MC7	50- 55	2590.	173.0	10.5	8.9	5.2
8215687	MC7	55- 60	2820.	173.0		.2	
8215688	MC7	60- 65	3010.	155.0	11.3	7.8	6.6
8215689	MC7	65- 70	3690.	166.0	10.4	8.4	6.6
8215690	MC7	70- 75	3270.	154.0	10.5	8.5	6.3
8215691	MC7	75- 80	3560.	187.0	11.6	8.5	6.4
8215692	MC7	80- 85	3540.	172.0	11.7	8.2	6.5
8215693	MC7	85- 90	3130.	148.0	10.7	8.2	5.9
8215694	MC7	90- 95	3940.	222.0	10.9	7.8	5.6
8215695	MC7	95-100	3230.	136.0	11.1	7.6	6.2
8215696	MC7	100-110	3780.	162.0	15.1	9.1	6.3
8215697	MC7	110-120	3570.	146.0	13.0	8.7	5.8
8215698	MC7	120-130	2440.	158.0	13.1	8.8	5.3
8215699	MC7	130-140	2430.	168.0	14.5	8.2	6.7
8215700	MC7	140-150	2770.	188.0	13.6	8.7	6.5
8215701	MC7	150-160	3260.	216.0	13.5	8.4	6.8
8215702	MC7	160-170	3030.	177.0	14.5	8.9	7.3
8215703	MC7	170-180	2120.	197.0	12.7	8.5	5.5
8215704	MC7	180-190	2580.	201.0	13.6	8.0	6.6
8215705	MC7	190-200	1800.	192.0	13.6	8.1	8.1
8215706	MC7	200-210	2000.	184.0	11.9	6.7	7.4
8215707	MC7	210-220	2410.	172.0	14.0	8.3	8.2
8215708	MC7	220-230	2760.	169.0	12.6	8.9	9.1
8215709	MC7	230-240	1710.	177.0	12.3	7.9	6.5
8215710	IN3	0- 5	1230.	20.0	3.6	3.6	1.5
8215711	IN3	5- 10	2670.	47.0	6.4	6.9	1.7
8215712	IN3	10- 15	1940.	39.0	6.0	8.1	1.6
8215713	IN3	15- 20	2270.	46.0	7.3	5.9	3.4
8215714	IN3	20- 25	2150.	48.0	6.5	6.9	2.5
8215715	IN3	25- 30	1350.	37.0	4.9	7.8	2.4
8215716	IN3	30- 35	2530.	39.0	5.8	5.8	2.8
8215717	IN3	35- 40	1420.	40.0	6.0	12.5	3.3
8215718	IN3	40- 45	1760.	49.0	8.0	10.3	2.9
8215719	IN3	45- 50	1670.	46.0	5.8	7.1	2.5
8215720	IN3	50- 55	1700.	36.0	5.8	9.0	2.5
8215721	IN3	55- 60	1460.	33.0	6.0	8.7	2.7
8215722	IN3	60- 65	1620.	42.0	8.2	8.8	2.9
8215723	IN3	65- 70	1340.	38.0	6.3	11.4	2.2
8215724	IN3	70- 75	2060.	48.0	9.9	8.3	2.8
8215725	IN3	75- 80	569.	12.0	1.8	2.4	.9
8215726	IN3	80- 85	1390.	33.0	5.3	9.4	1.9
8215727	IN3	85- 90	1550.	38.0	6.7	11.9	2.2
8215728	IN3	90-100	1080.	27.0	4.8	6.4	1.2
8215729	IN3	95-110	1550.	46.0	6.7	7.9	1.8
8215730	IN3	100-120	1620.	42.0	9.6	9.9	3.7
8215731	IN3	110-130	1320.	31.0	4.6	7.3	1.2
8215732	IN3	120-140	1530.	32.0	7.1	11.1	3.4
8215733	IN3	130-150	1200.	26.0	4.6	7.2	2.6
8215734	IN3	140-150	1780.	36.0	8.3	11.5	3.2
8215735	CA2	0- 5	2410.	69.0	9.3	10.2	1.9
8215736	CA2	5- 10	2310.	47.0	11.0	11.5	4.1
8215737	CA2	10- 15	1980.	57.0	10.6	12.3	4.1
8215738	CA2	15- 20	2480.	58.0	10.3	11.8	4.2
8215739	CA2	20- 25	2280.	59.0	10.5	10.9	4.9
8215740	CA2	25- 30	2150.	68.0	10.0	11.7	4.1

TABLE 10-3E

SAMPLE	STATION	INTERVAL CM	FEWA PPM	MNWA PPM	ZNWA PPM	CUWA PPM	NIWA PPM
8215741	CA2	30- 35	1950.	63.0	9.5	12.3	3.0
8215742	CA2	35- 40	1620.	69.0	9.3	12.7	2.9
8215743	CA2	40- 45	1900.	78.0	9.5	12.6	3.5
8215744	CA2	45- 50	1710.	79.0	21.6	11.5	3.2
8215745	CA2	50- 55	2150.	95.0	9.6	11.3	3.6
8215746	CA2	55- 60	1530.	76.0	9.1	12.3	2.3
8215747	CA2	60- 65	1790.	71.0	8.4	13.8	4.2
8215748	CA2	65- 70	1660.	75.0	8.2	13.8	3.1
8215749	CA2	70- 75	1780.	78.0	9.1	12.7	4.5
8215750	CA2	75- 80	1950.	76.0	9.5	12.4	3.7
8215751	CA2	80- 85	1930.	79.0	8.1	16.6	3.2
8215752	CA2	85- 90	1610.	54.0	6.1	14.4	2.6
8215753	CA2	90- 95	1830.	81.0	8.4	14.9	2.2
8215754	CA2	95-100	1770.	80.0	8.6	12.8	4.1
8215755	CA2	100-110	1920.	76.0	9.5	11.9	3.4
8215756	CA2	110-120	1660.	85.0	8.8	13.1	3.8
8215757	CA2	120-130	1872.	83.0	9.2	14.7	4.3
8215758	CA2	130-140	1908.	77.0	8.9	16.3	3.9
8215759	CA2	140-150	1692.	73.0	8.9	16.2	3.4

GEOTECHNICAL, SEDIMENTOLOGICAL AND MINERALOGICAL INVESTIGATIONS IN ARCTIC FJORDS

June 30, 1983

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I. INTRODUCTION

Little is known about the mechanisms of deposition, sedimentary structures, facies and geotechnical properties of predominantly fine-grained submarine mass-transport deposits, which are presently being deposited in slope-dominated areas. The major problem in the application of existing facies models to fine-grained, slope-dominated systems is that most models were developed for the submarine canyon - fan geomorphologic system (Gorsline,1978). Deposits from canyon - fan systems tend to be sandy or pebbly whereas slope-dominated systems tend to have more silts and clays. Depositional models for clay-rich sediment-water mixtures may differ from those for coarser, cohesionless sediments.

The purpose of this project is to describe the sedimentary and engineering index properties of surficial (upper 2 meters) of submarine sediments from slopes and slope-aprons of Baffin Island fjords. Specific objectives include: 1) to establish correlations between sediment character and structures and geotechnical properties of surficial bottom sediments, Baffin Island fjords; 2) to determine the influence of sedimentary facies, organic carbon content, clay mineralogy and grain size distributions on the geotechnical properties of fine-grained mass-transport deposits; 3) to develop a facies model for submarine mass-transport deposits from slope-dominated regions in a glacial setting.

Expected benefits include: 1) description and understanding of submarine mass-transport deposits, Baffin Island fjords; 2) delineation of sites in Baffin Island fjords particularly susceptible to possible mass-movement; 3) development of a facies model for these deposits which will be invaluable for studies dealing with basin-analysis in slope-dominated areas. Such a model would be useful in modern studies for the evaluation of offshore development, and in ancient studies for reconstruction of paleoenvironments, especially in non-fossiliferous submarine slope sequences.

II. ANALYTICAL TECHNIQUES

Shipboard Methods: Core Recovery and Handling

A modified Leheigh Gravity Corer (hydroplastic) (Richards and Keller,1961) was slowly lowered into the fjord bottom to obtain an approximately 8 cm diameter core of the upper 2 metres of sediment. Only a core catcher was used which limited penetration in sandy zones, a problem which can be eliminated in the future by using an additional core cutter. Some of the Leheigh cores were undisturbed with flat upper surfaces and no apparent downdrag along sides of the core barrel; others have the upper 0.1 m of sediment disturbed mainly by "water washing." Water washing is rarely a problem in disturbance of sediment along the sides of the cores. After recovery the cores were immediately split onboard for core description, vane shear tests, and subsampling for sedimentological, geotechnical and mineralogical analyses. Core lengths were measured from the top of the core downsection, with lengths marked on the core barrel after the core was split.

Shipboard Methods: Core Descriptions

Cores were described with careful notation of sediment color (using the Munsell Color Charts), grain size, sedimentary and biogenic structures, and nature of all lithologic contacts as discernable in split cores. Sketches were made of representative sedimentary structures and contacts. Preliminary facies were defined using grain size and sedimentary and biogenic structures (see Results).

Shipboard Methods: Subsampling

Subsampling for the purpose of sedimentological, geotechnical and mineralogical analyses was done during core logging. Cores were initially subsampled for water content using a thin-walled mini-corer. Water content subsamples were taken to correspond to dominant lithologic changes downcore. If the core was apparently homogeneous, the water content subsamples were taken at fixed downcore intervals. Mini-corers were emplaced at appropriate horizons and the tops were capped immediately. The core was then covered with PVC plastic wrap to minimize water loss during core logging. After core logging and vane shear tests were completed, the mini-corers were removed from the core, sealed with waterproof electric tape and packed in sealed PVC bags with a small amount of salt water. Samples were stored at 0°C prior to laboratory analyses.

Bulk samples were taken at core depths corresponding to water content samples and vane shear tests. These samples were sealed in PVC bags and stored at 0°C prior to laboratory analyses.

Shipboard Methods: Vane Shear Tests

Vane shear tests were measured at facies changes downcore. If the cores were apparently homogeneous, the vane shear tests were done at fixed downcore intervals. Measurements were conducted with a Wykeham-Farrance Miniature Vane Shear Apparatus with the blades inserted at the center of the split core. These vane shear tests were done on "undisturbed" and "remolded" samples. For remolded states, the samples were homogenized by stirring after the undisturbed vane shear tests were done. Sensitivities were calculated as the ratio of the undisturbed to remolded shear stress at failure.

Specifications for the vane shear tests are as follows: Gear Speed = 1/4 RPM, Vane Size = 3/4 x 3/4 inches, Spring Size = 1, Calibration = 30 degrees rotation = 0.25 kg-cm. Calculations to obtain the shear strength at failure are as follows:

T = (load twist angle) (.0083) (from calibration curve)

$S = T / (\pi D^2 (H/2 + D/6))$ (Dunn et al., 1980)

$S = T/ (14.479)$ (using specifications listed above)

where T = maximum torque , D = diameter of vane, H = height of vane, S = shear strength, load twist angle = maximum degrees of rotation measured on inner dial of vane shear apparatus.

Laboratory Methods: Geotechnical Analyses

Water content (dry basis) was measured using the ASTM D2216-71 procedure (Bowles, 1970) (ASTM, 1981). This refers to the ratio, given as a percent, of the weight of water to the weight of oven-dried solids of a given sediment mass. Corrections for salt content have been made in the data presented.

Atterberg Limits define the water content (given in percent weight of oven-dried sediment) at which the sediment consistency changes from semi-solid to plastic to liquid states (Lambe and Whitman, 1969). Samples were not dried or sieved before these limits were measured;

results were corrected for salt content. The Liquid Limit (WL) was measured using the ASTM D423-66 procedure (Bowles,1970) (ASTM,1981). The Plastic Limit (WP) was measured using the ASTM D424-59 procedure (Bowles,1970) (ASTM,1981).

Laboratory Methods: Grain Size Analyses

Approximate grain-size distributions were determined by the hydrometer method (Bowles,1970). Samples were not dried before analysis. Salt water and organic matter was removed from the samples by washing. Those samples with significant sand-size fractions (> 20 % by weight) were then dry sieved to obtain the grain size distribution of the coarse fraction. Grain size statistics were calculated via the method of moments. Frequency distributions are given in Figures 11.1 to 11.90 (see Results). Statistics were calculated for the silt and clay-size fractions (< 75 µm).

Laboratory Methods: Clay Mineralogy Procedures

The samples to be analyzed were dispersed in distilled water (by ultrasonic probe) and allowed to settle in a column for the appropriate period of time required to obtain the < 2 µm size-fraction. This procedure was repeated three times to ensure effective separation of the required material. Once separated, the clay-sized material was treated with a 3 % sodium hypochlorite solution for 48 hours at 65° C and then thoroughly washed with distilled water, using high-speed centrifugation.

The < 2 µm size-fraction was then split into two portions; one portion was saturated with a 2 molar solution of Ca^{2+} and the other with a 2 molar solution of K^{+}. Once saturated. the clays were thoroughly washed in distilled water and freeze-dried. About 50 mg of clay was then dispersed in distilled water and deposited by suction onto a ceramic disc. This procedure produces a preferred basal orientation of platy minerals. The Ca- and K-saturated samples were then analyzed using a Philips X-ray diffractometer under the following conditions:

1. Co K-alpha radiation filtered by a graphite monochromator;
2. 1 degree divergent slit; time constant = 2;
3. 1 degree two theta/minute at 600 mm/h;
4. 50 kV, 20 mA.

The following X-ray patterns were obtained (Ignasiak et al., 1983):

1. Ca-disc at 54% relative humidity, 2 - 35 degrees two theta;
2. Ca-disc glycolated, 2 - 80 degrees two theta;
3. K-disc at 0% relative humidity, 2 - 25 degrees two theta;
4. K-disc at 54 % relative humidity, 2 - 25 degrees two theta;
5. K-disc at 300° C, 2 - 25 degrees two theta;
6. K-disc at 550° C, 2 - 25 degrees two theta.

For X-ray patterns 1 and 4, samples were equilibrated to 54 % relative humidity over a magnesium nitrate solution for a minimum of 12 hours prior to analysis. For X-ray pattern 2, samples were vapour-solvated with ethylene glycol for 18 hours at 65° C and then for a minimum of 24 hours at 22° C. Samples analyzed at 0 % relative humidity were heated to 105° C for a minimum of 2 hours and analyzed while still hot. Samples treated at 300° and 550° C were heated for 3 and 2 hours respectively prior to analysis.

In all cases, humidity conditions were strictly controlled both during sample equilibration and during the analysis of the sample on the diffractometer. These steps allow unambiguous identification of common clay mineral families.

To compute the relative percentages of individual clay minerals within a sample, a technique modified after Biscaye (1965) was employed. Net peak areas for the smectite (001), illite (001) and kaolinite (001) X-ray reflections were obtained by planimetry from Ca-saturated, ethylene-glycol solvated samples. The net peak area for chlorite was obtained using the chlorite (001) reflection for the K-saturated sample, following heating to 550° C. These peak areas were then multiplied using the following form factors (after Biscaye, 1965):

1. smectite: X 1
2. chlorite: X 1
3. illite: X 4
4. kaolinite: X 2

To account for the overlap between the kaolinite (001) and chlorite (002) reflections, the chlorite (001) weighted area was then subtracted from the kaolinite (001) weighted area to give the net kaolinite weighted area. All net weighted areas were then summed and the weighted areas for each clay mineral divided by this sum to provide the relative percentage of each clay in the mixture. This procedure gives comparable results to other methods of estimating the relative abundances of clay minerals in sediments (e.g., Biscaye, 1964, 1965; Boyd and Piper, 1976; Kravitz, 1982). Nevertheless, the results reported in Tables 11.3, 11.6, 11.9, 11.12, 11.15, 11.18, 11.21, 11.24 and 11.27 are semiquantitative estimates only. In particular, this procedure does not allow appropriate accounting for interstratified clay minerals, which are of importance here at least for the samples from the Clark and Cambridge Fjords. Tables containing the unmodified areas of the clay mineral 001 reflections are available upon request (FJL).

Only very minor abundances of other phases were noted in the <2 μm size-fraction. Their abundances have not been quantified; they are reported as minor (m), minor to trace (mt), trace (t) or not detected (nd).

III. RESULTS

Grain Size and Geotechnical Data

The grain size statistics of 90 samples from the eleven Leheigh gravity cores are given in Figures-11.1 to 11.90. These statistics were computed using a moments method on the distributions defined by the histograms of individual weight percentages versus grain size in mm. To calculate the statistics the original data were transformed to a "weighted grain size" parameter. This weighted grain size parameter is defined as the product of the midpoint of a grain size class interval (in mm) and the individual weight percent. The transformed data were then run in the SPSS CONDESCRIPTIVE program to obtain the statistics. Cumulative frequency curves of the original hydrometer data are given in Figures 11.1 to 11.90.

Atterberg Limits and water contents for 93 samples from the eleven Leheigh gravity cores are listed in Tables 11.1, 11.4, 11.7, 11.10, 11.13, 11.16, 11.19, 11.22 and 25. Results of the vane shear tests done onboard are given in Tables 11.2, 11.5, 11.8, 11.11, 11.14, 11.17, 11.20, 11.23, and 11.26.

Mineralogical Data

The mineralogical data for the < 2 μm size-fraction of sixty-three (63) samples from nine Baffin Island fjords are given in Tables 11.3, 11.6, 11.9, 11.12, 11.15, 11.18, 11.21, 11.24 and 11.27. Where appropriate, comments concerning the presence of interstratified clay minerals or other phases have been appended to the Tables. All clay mineral abundances are given as weighted area percentages. These areas have been calculated assumming that clay minerals constitute 100 % of the <2 μm size-fraction. Such data can be considered only as semi-quantitative estimates of true abundances.

Errata: In the Miniature Vare Shear Test Results the dimensions for the Undisturbed and Remolded Shear Stress should be kg/cm^2.

Core Descriptions

CORE SU-1, 82-04832, SUNNESHINE FJORD, LENGTH=2.4m

0-2.4m: 5y 3/2 with 5y 2/0 zones; greenish black mud with oxidized tan portions, especially along burrow margins. Bioturbated and mottled throughout. Few scattered shell debris clasts. Shell lag, openwork clast-supported zone of abraded shells, 2 cm below top of core (sample Mf-1), average shell-size 1-2 mm diameter. Worm burrows in core are a maximum of 0.5 cm in diameter, some of which appear lined.

Disturbance: Top 15 cm during sampling.

Figure 11.1. Grain Size Data: Sunneshine Fjord GT-1

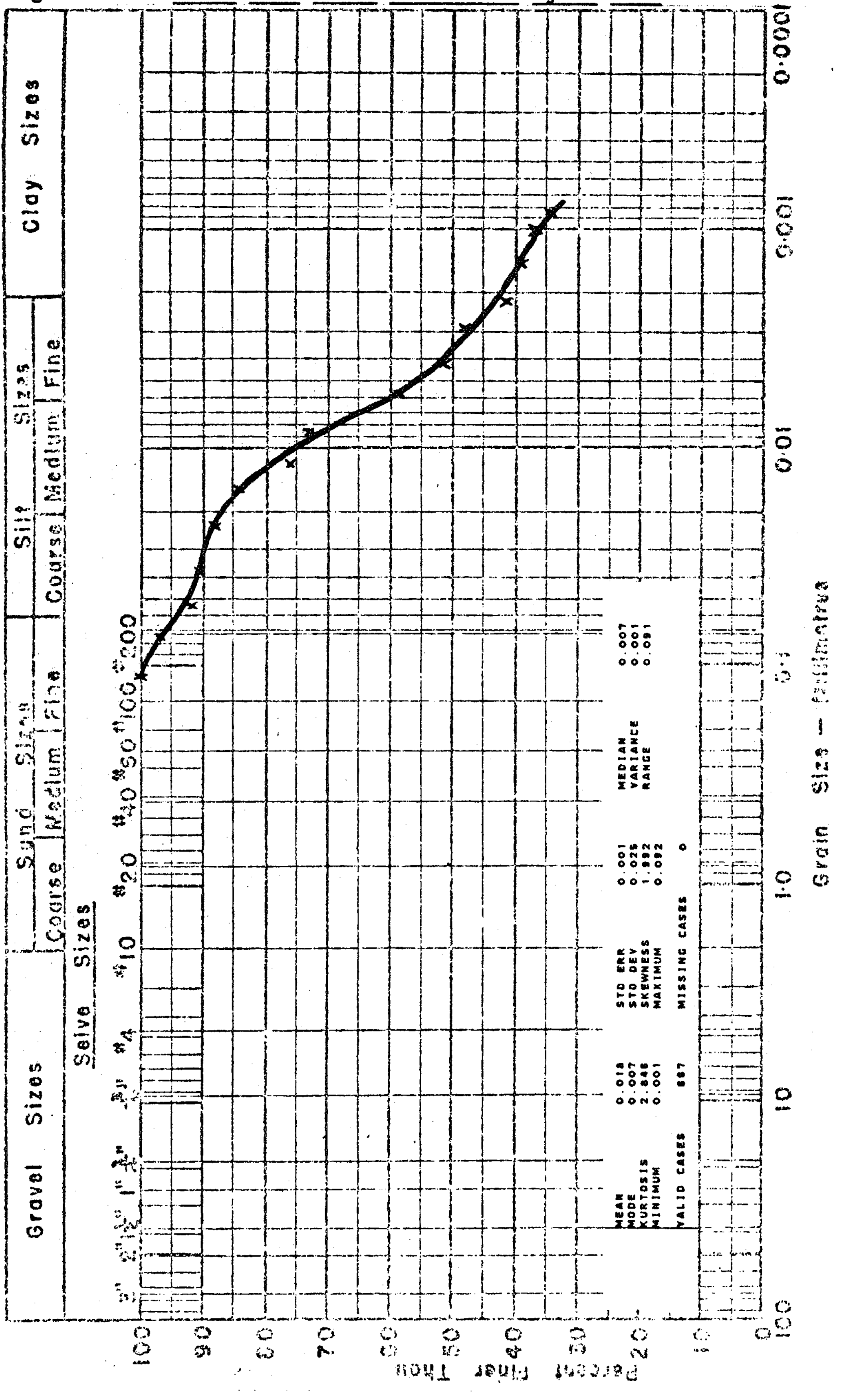
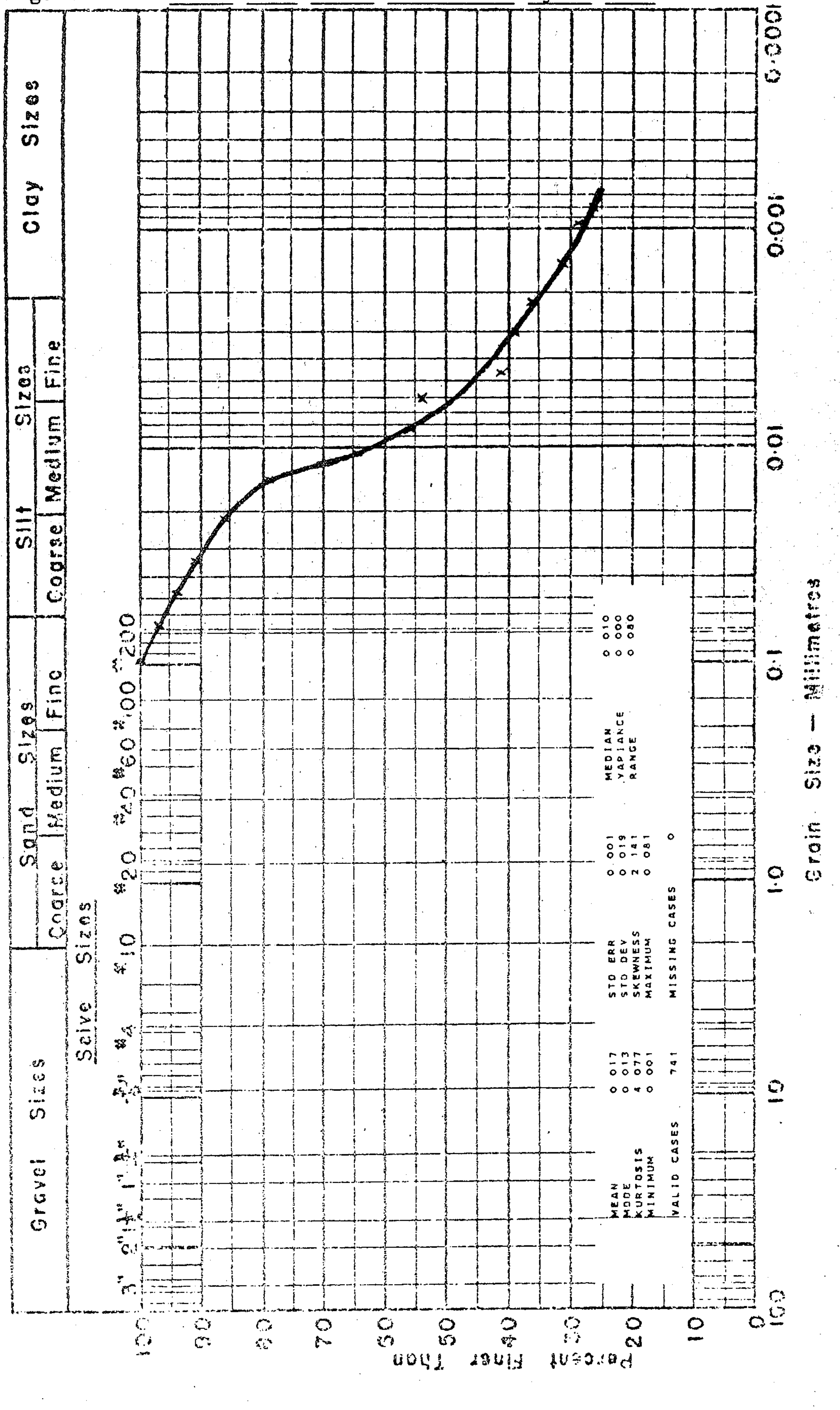
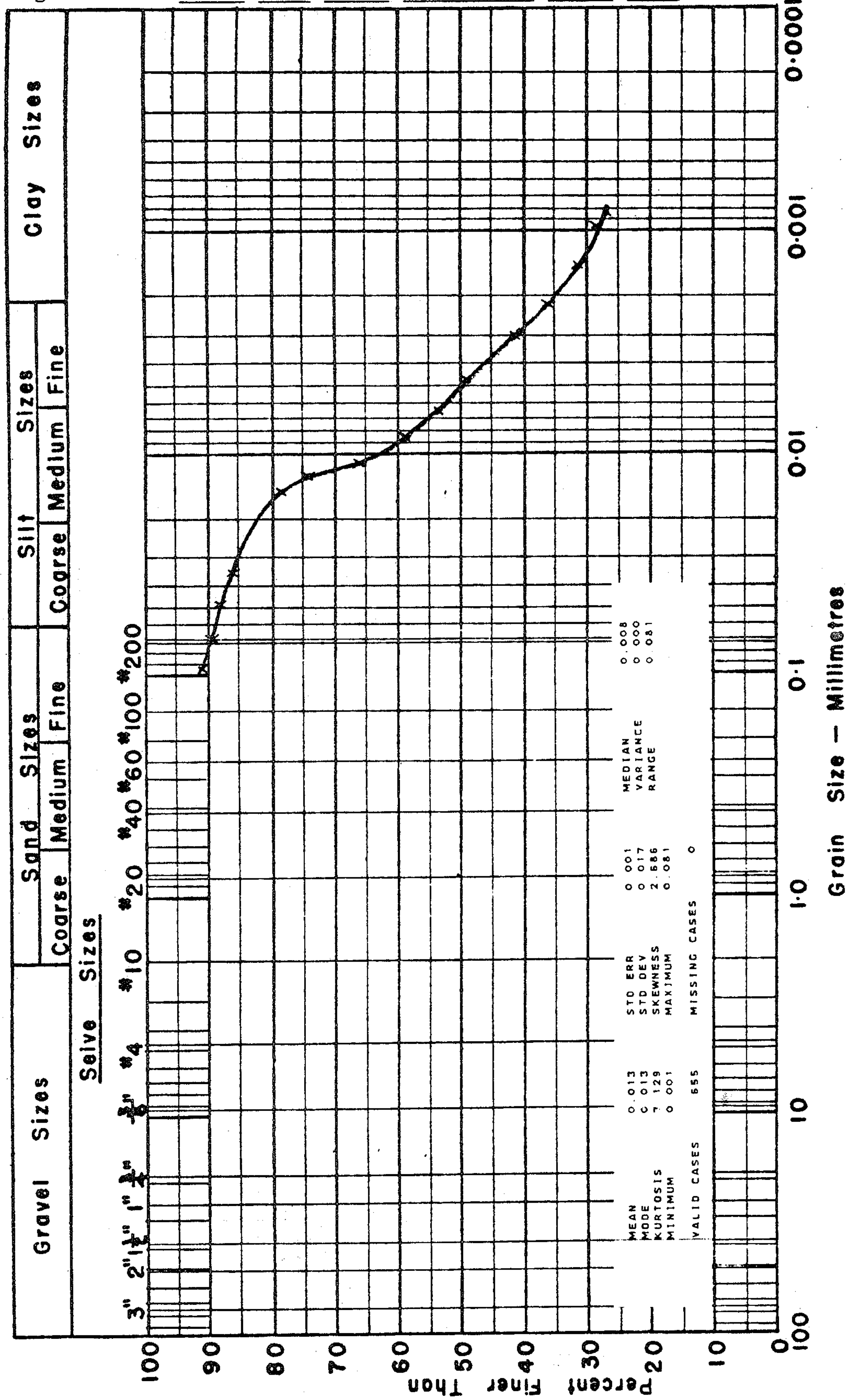


Figure 11.2. Grain Size Data: Sunneshine Fjord GT-2



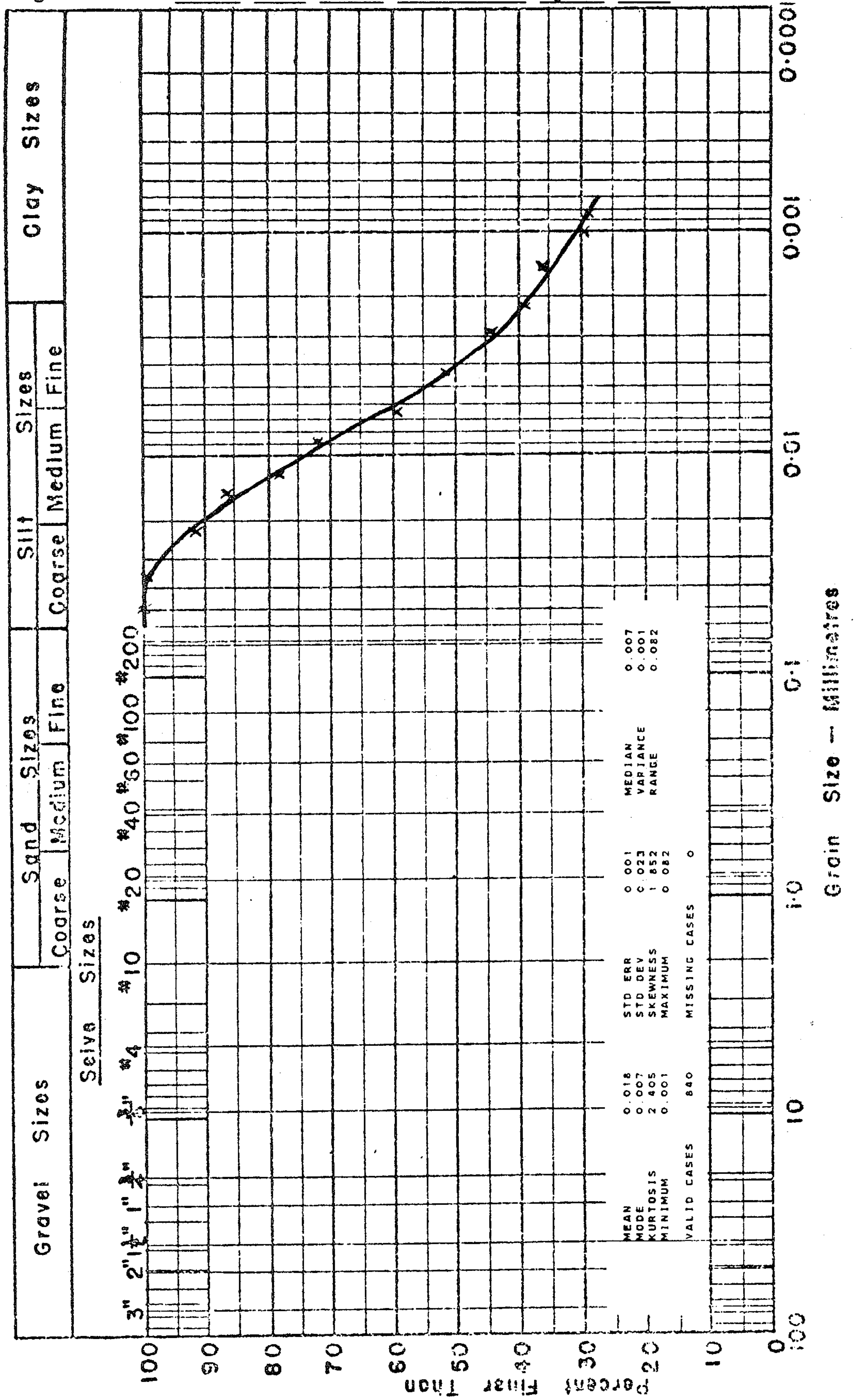
```
MEAN          0 017     STD ERR      0.001     MEDIAN     0 010
MODE          0 013     STD DEV      0 019     VARIANCE   0 000
KURTOSIS      4 077     SKEWNESS     2 141     RANGE      0 080
MINIMUM       0 001     MAXIMUM      0 081

VALID CASES     741     MISSING CASES    0
```

Figure 11.3. Grain Size Data: Sunneshine Fjord GT-3



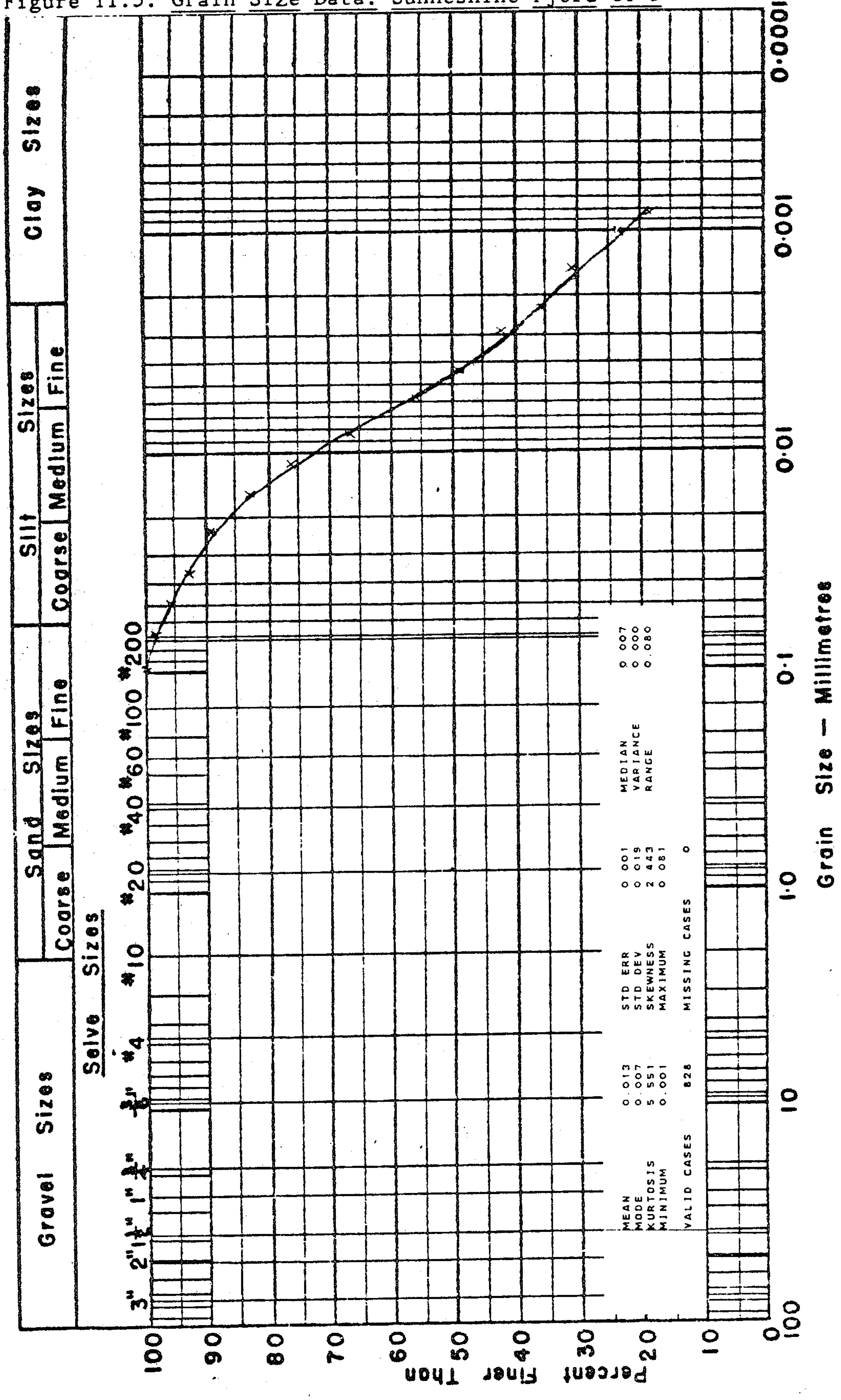
```
MEAN        0.013   STD ERR       0.001   MEDIAN      0.008
MODE        0.013   STD DEV       0.017   VARIANCE    0.000
KURTOSIS    7.129   SKEWNESS      2.686   RANGE       0.081
MINIMUM     0.001   MAXIMUM       0.081

VALID CASES   655   MISSING CASES    0
```

Figure 11.4. Grain Size Data: Sunneshine Fjord GT-4



```
MEAN        0.018    STD ERR        0.001    MEDIAN      0.007
MODE        0.007    STD DEV        0.023    VARIANCE    0.001
KURTOSIS    2.405    SKEWNESS       1.852    RANGE       0.082
MINIMUM     0.001    MAXIMUM        0.082

VALID CASES   840    MISSING CASES    0
```

Figure 11.5. Grain Size Data: Sunneshine Fjord GT-5



MEAN 0.013 STD ERR 0.001 MEDIAN 0.007
MODE 0.007 STD DEV 0.019 VARIANCE 0.000
KURTOSIS 5.551 SKEWNESS 2.443 RANGE 0.080
MINIMUM 0.001 MAXIMUM 0.081

VALID CASES 828 MISSING CASES 0

Table 11.1 Geotechnical Data: Sunneshine Fjord

Sample #	Depth (m±2.5cm)	Water Content (Dry Basis) w(%)	Natural Water Content w(%)	Atterberg Limits WL(%)	WP(%)	IP
Core: SU-1 82-04832						
GT-1	0-0.05	107.80	51.88	Disturbed		
GT-2	0.50	110.11	52.41	78.5	48.2	30.3
GT-3	1.00	120.33	54.58	82.3	48.3	34.1
GT-4	1.50	117.96	45.88	83.6	52.4	31.2
GT-5	2.00	100.55	50.14	77.5	50.5	27.0

w= water content

WL= liquid limit

WP= plastic limit

IP= plasticity index

Table 11.2 <u>Geotechnical Data: Sunneshine Fjord</u>

<u>Miniature Vane Shear Test Results</u>

Sample #	Depth (m±2.5cm)	Undisturbed Shear Stress (Kg-cm)	Remolded Shear Stress (Kg-cm)	Sensitivity
Core: SU-1 82-04832				
GT-2	0.5	.0564	.0242	2.33
GT-3	1.0	.0662	.0150	4.42
GT-4	1.5	.0840	.0213	3.95
GT-5	2.0	.0691	.0190	3.64

Table 11.3 Mineralogy of <2 μm Material: Sunneshine Fjord

Sample	Depth	Relative % Clays[1]				Other Phases[2]			
#	(m±2.5cm)	K	I	CHL	SW	Q	PL	KF	AMP
Core: SU-1 82-04832									
GT-1	0-0.05	6	86	3	5[3]	t	mt	mt	t
GT-2	0.50	5	87[5]	2	6[3]	t	m	t	t
GT-3	1.00	5	87[5]	3	5[3]	t	mt	nd	t
GT-4	1.50	2	85[5]	5	8[3]	t	mt	nd	t
GT-5	2.00	4	90	2	4[3]	t	mt	nd	t

K= kaolinite I= illite CHL= chlorite SW= swelling clay

Q= quartz PL= plagioclase KF= potassium feldspar

AMP= amphibole

[1] The relative amounts of clay minerals reported are weighted percentages, normalized to 100 %, using the procedures described in the text.

[2] m = minor phase, mt = minor to trace phase, t = trace phase, nd = not detected.

[3] The swelling clay material is mostly smectite.

[5] A small amount of randomly interstratified illite/smectite or degraded illite is also indicated.

Core Descriptions

CORE NP-3, 82-04972, NORTH PANGNIRTUNG FJORD, LENGTH= 2.20m

0-0.07m: 2.5y 5/2; Grey tan mud, structureless, disturbed.

0.70-0.14m: 2.5y 5/2; Grey tan mud, structureless, medium bioturbation (mainly polychaetes). No reduced zones around burrows.

0.14-0.45m: 2.5y 5/2; Grey tan mud, structureless, more extensive bioturbation (mainly polychaetes), no reduced zones around burrows.

0.14-0.45m: 2.5y 5/2; Grey tan mud, structureless, more extensive bioturbation (mainly polychaetes), no reduced zones around burrows.

0.45-0.77m: 2.5y 5/2; Grey tan mud, structureless, medium bioturbation, no reduced zones around burrows.

0.77-0.80m: 2.5y 5/2; Grey tan mud, vague horizontal lamination, slight bioturbation.

0.80-0.90m: 2.5y 5/2; Grey tan mud, structureless, medium bioturbation, no reduced zones.

0.90-1.46m: 2.5y 5/2 (2.54 4/2); Grey tan mud, structureless, medium bioturbation, dark reduced zones in burrows and as irregular streaks.

1.46-1.60m: 2.5y 5/2 (2.5y 4/2); Grey tan mud, vague lamination, dark layers 1-2cm wide alternate with lighter tan layers 2-3cm wide, medium to slight burrowing, few grey streaks (? reduced zones).

1.60-1.90m: 2.5y 5/2; Grey tan mud, faint lamination, slight burrowing.

1.90-1.95m: 2.5y 5/2; Grey tan mud, structureless, few scattered burrows, clayey silt has gradational basal contact with lower bed.

1.95-2.05m: 2.5y 4/0; Dark graded sand, medium-coarse sand in basal 5 cm, overlain by medium-fine sand, which is graded into overlying clayey silt; sharp, knife-edge (? scoured) base. (turbidite)

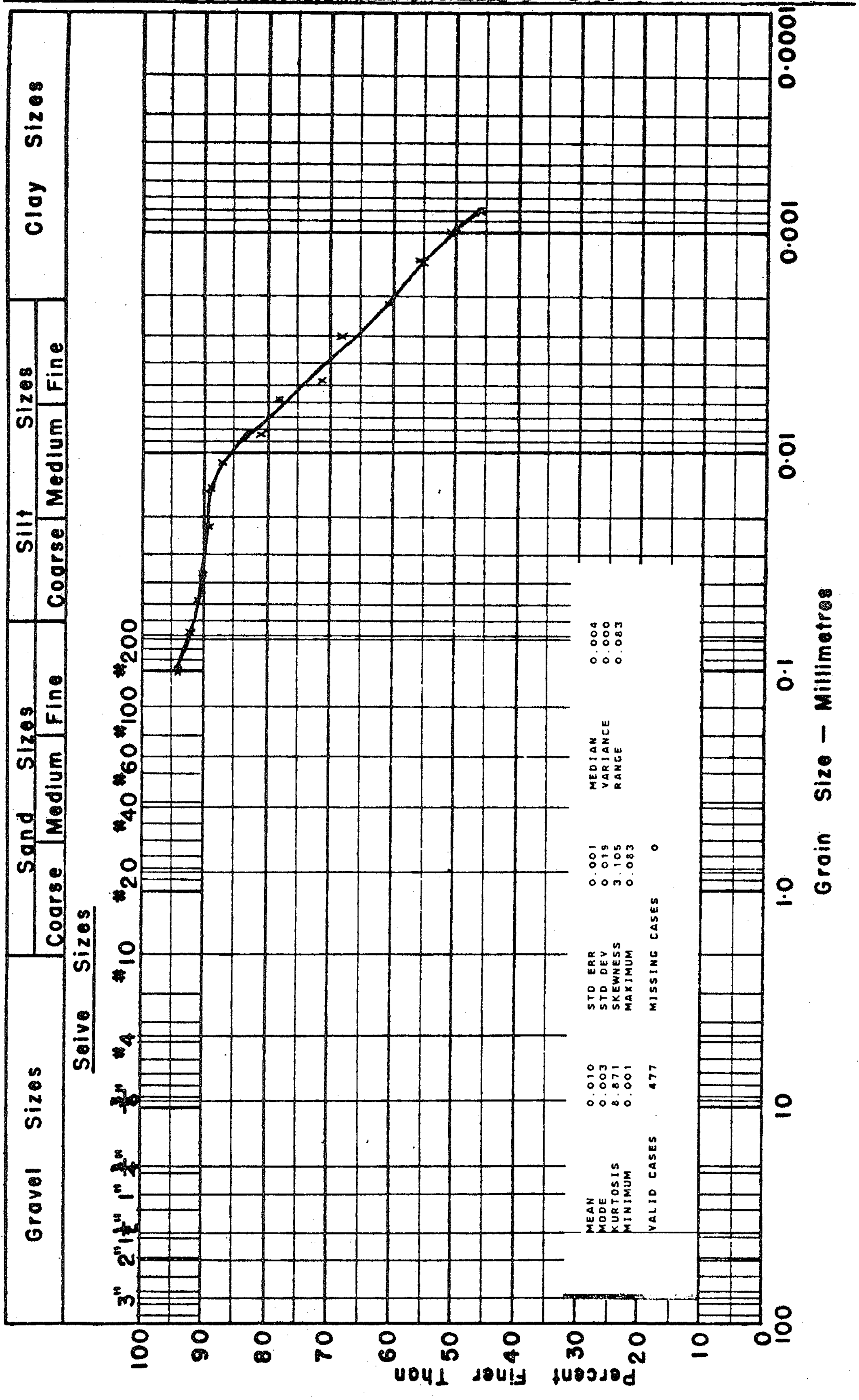
2.05-2.16m: 2.5y 4/0; Dark graded sand to mud; medium to fine sand at base to fine sandy mud at top, sharp (? scoured) base. (turbidite)

2.16-2.20m: 2.5y 5/2; Grey tan mud, structureless.

Core catcher: 2.5y 4/0; Grey sandy mud.

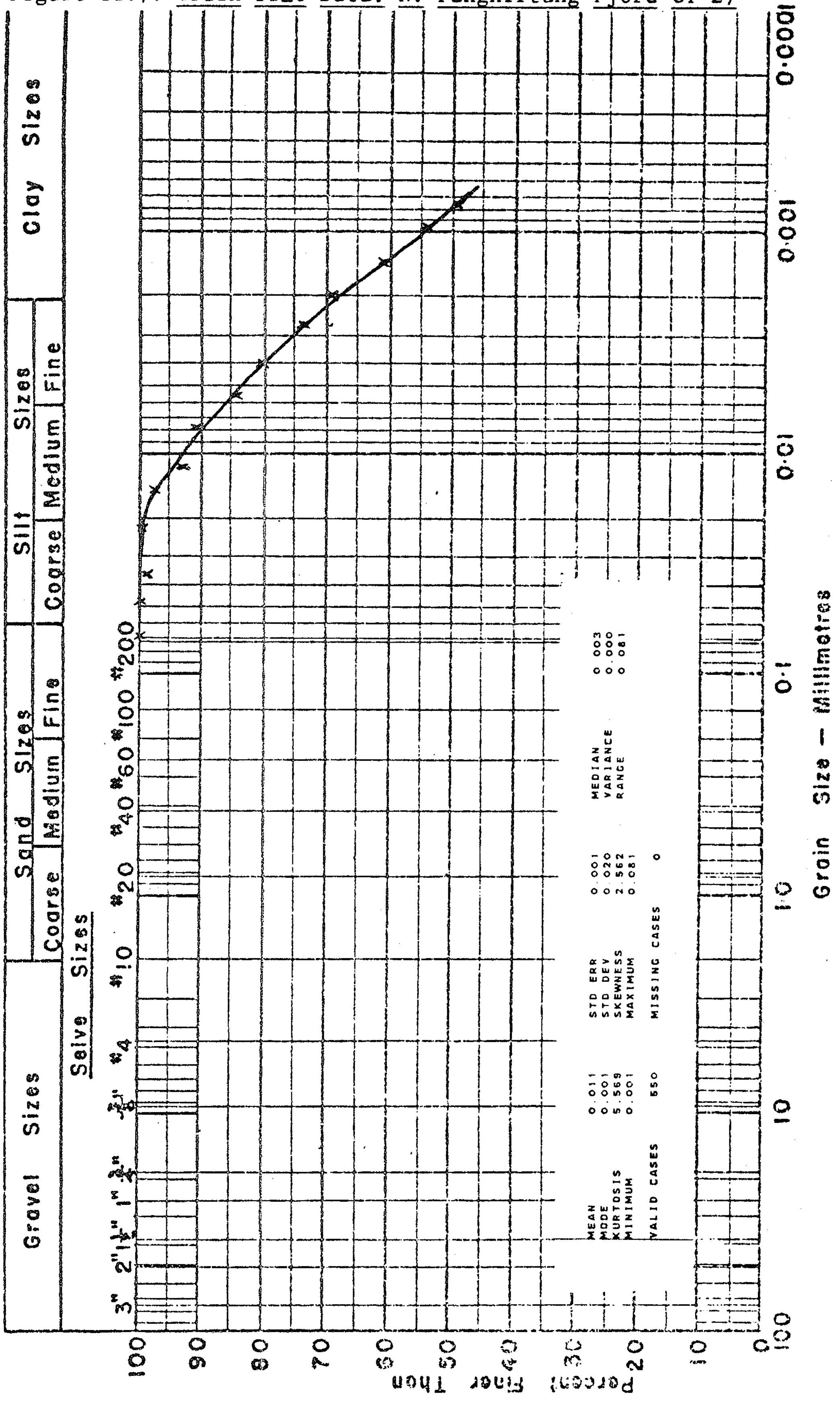
Disturbance: Top 0.07m disturbed, ? water washed, very soupy and leaked out of core during splitting.

Figure 11.6. Grain Size Data: N. Pangnirtung Fjord GT-26



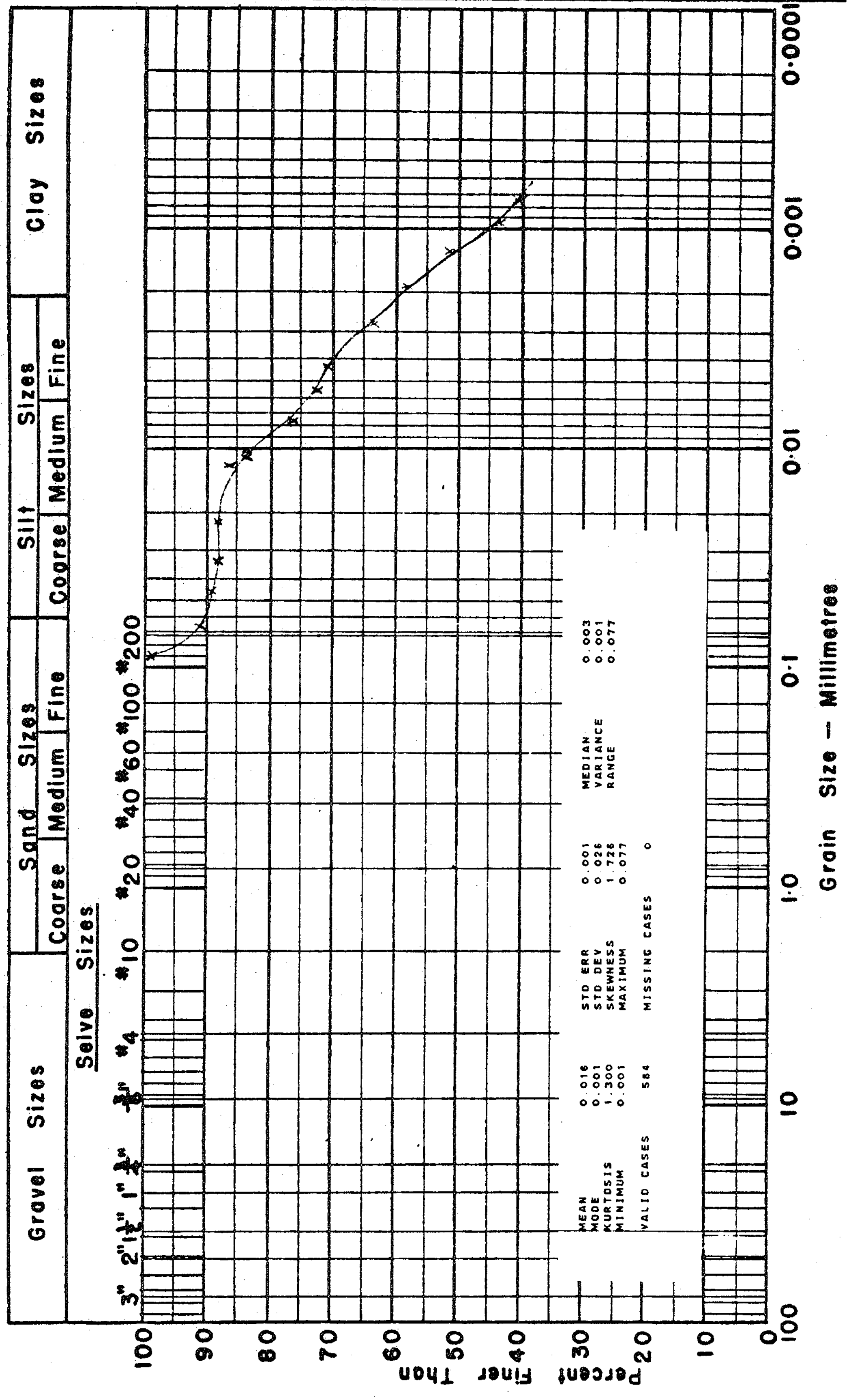
```
MEAN          0.010    STD ERR        0.001    MEDIAN       0.004
MODE          0.003    STD DEV        0.019    VARIANCE     0.000
KURTOSIS      8.871    SKEWNESS       3.105    RANGE        0.083
MINIMUM       0.001    MAXIMUM        0.083

VALID CASES     477    MISSING CASES      0
```

Figure 11.7. Grain Size Data: N. Pangnirtung Fjord GT-27



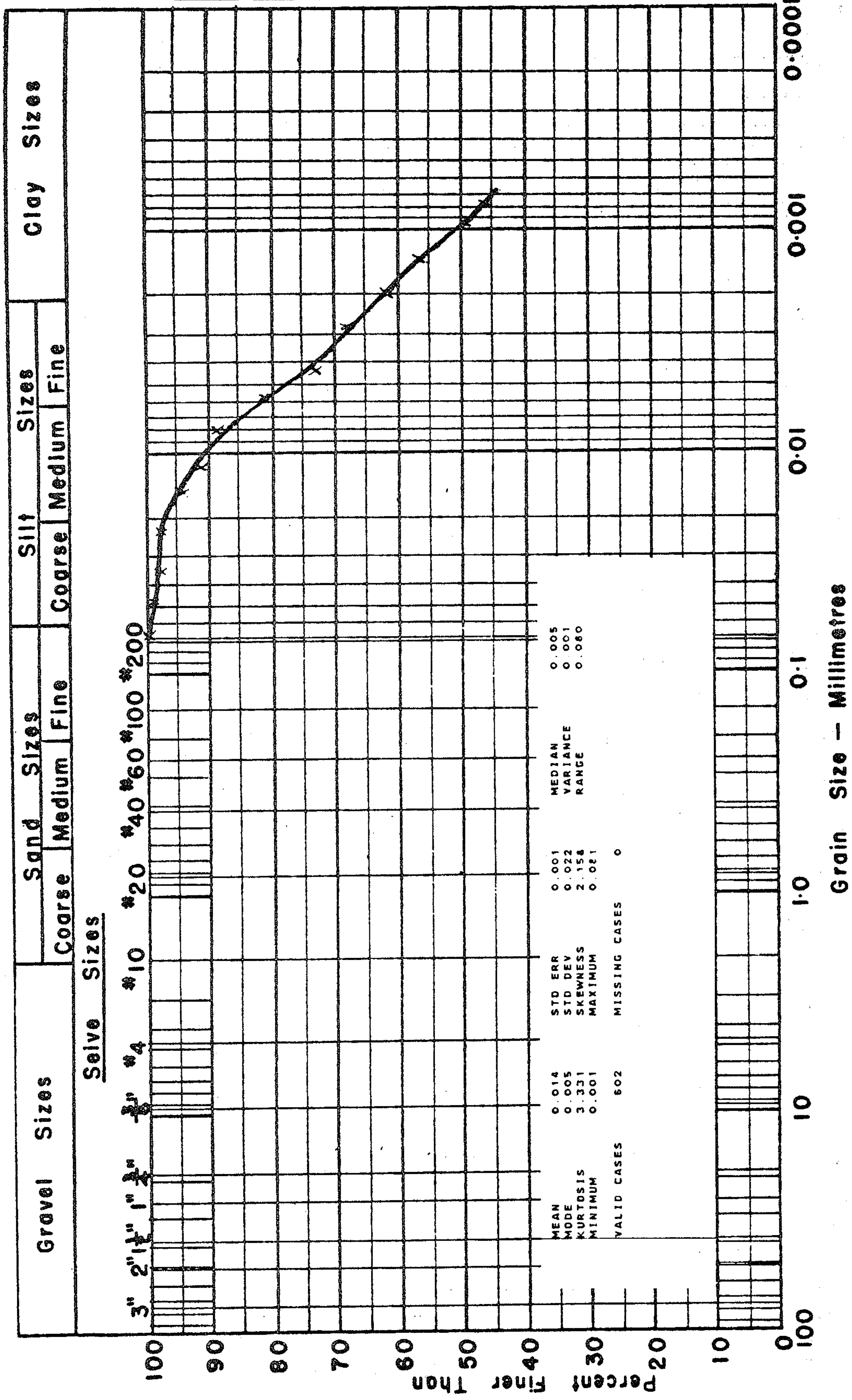
MEAN	0.011	STD ERR	0.001	MEDIAN	0.003
MODE	0.001	STD DEV	0.020	VARIANCE	0.000
KURTOSIS	5.569	SKEWNESS	2.562	RANGE	0.081
MINIMUM	0.001	MAXIMUM	0.081		
VALID CASES	550	MISSING CASES	0		

Figure 11.8. Grain Size Data: N. Pangnirtung Fjord GT-28



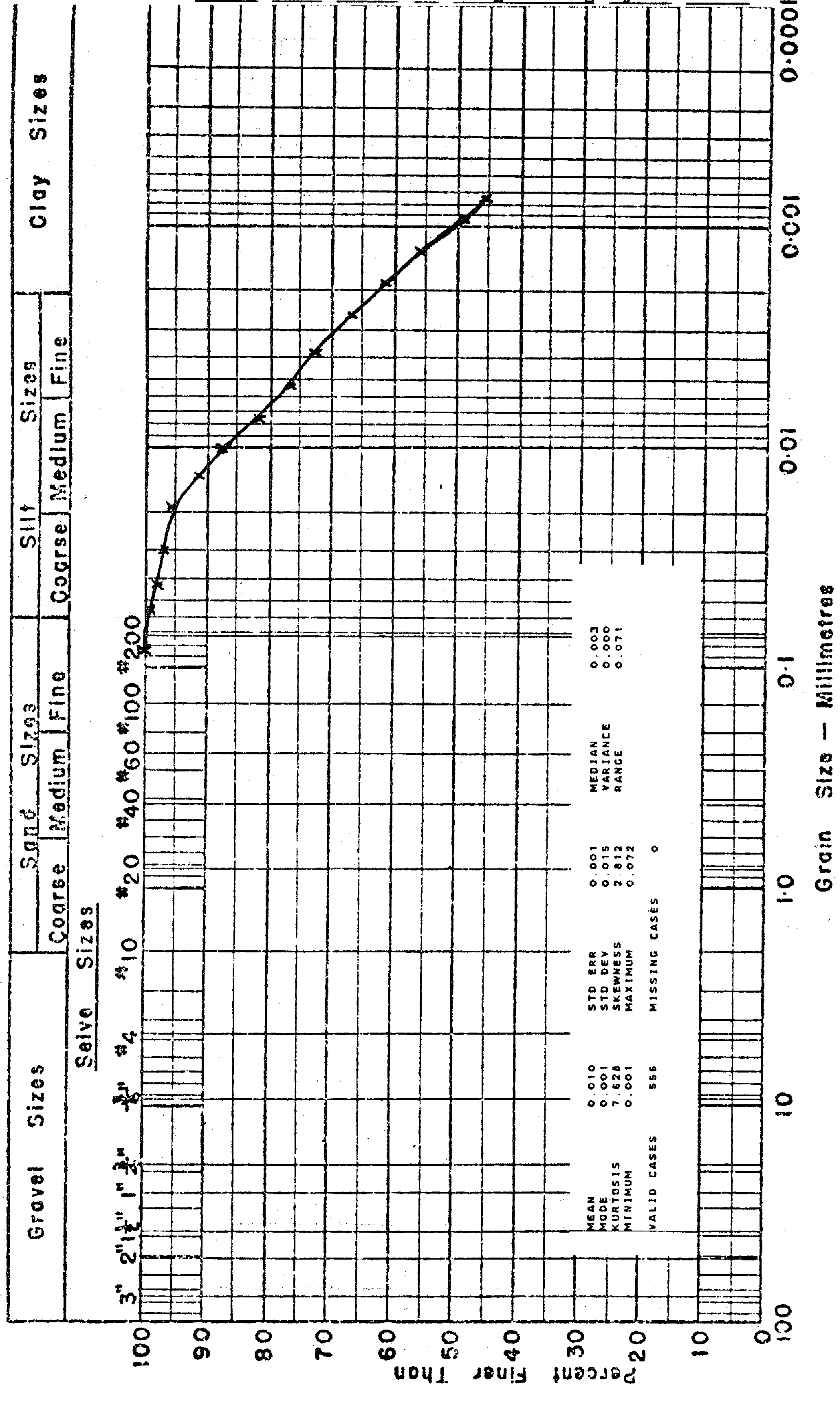
```
MEAN          0.016     STD ERR         0.001     MEDIAN      0.003
MODE          0.001     STD DEV         0.026     VARIANCE    0.001
KURTOSIS      1.300     SKEWNESS        1.726     RANGE       0.077
MINIMUM       0.001     MAXIMUM         0.077

VALID CASES   584       MISSING CASES   0
```

Figure 11.9. Grain Size Data: N. Pangnirtung Fjord GT-29



```
MEAN          0.014    STD ERR         0.001    MEDIAN      0.005
MODE          0.005    STD DEV         0.022    VARIANCE    0.001
KURTOSIS      3.331    SKEWNESS        2.158    RANGE       0.080
MINIMUM       0.001    MAXIMUM         0.081

VALID CASES     602    MISSING CASES       0
```

Figure 11.10. Grain Size Data: N. Pangnirtung Fjord GT-30



```
MEAN          0.010    STD ERR        0.001    MEDIAN     0.003
MODE          0.001    STD DEV        0.015    VARIANCE   0.000
KURTOSIS      7.628    SKEWNESS       2.812    RANGE      0.071
MINIMUM       0.001    MAXIMUM        0.072

VALID CASES     556    MISSING CASES      0
```

Figure 11.11. Grain Size Data: N. Pangnirtung Fjord GT-31

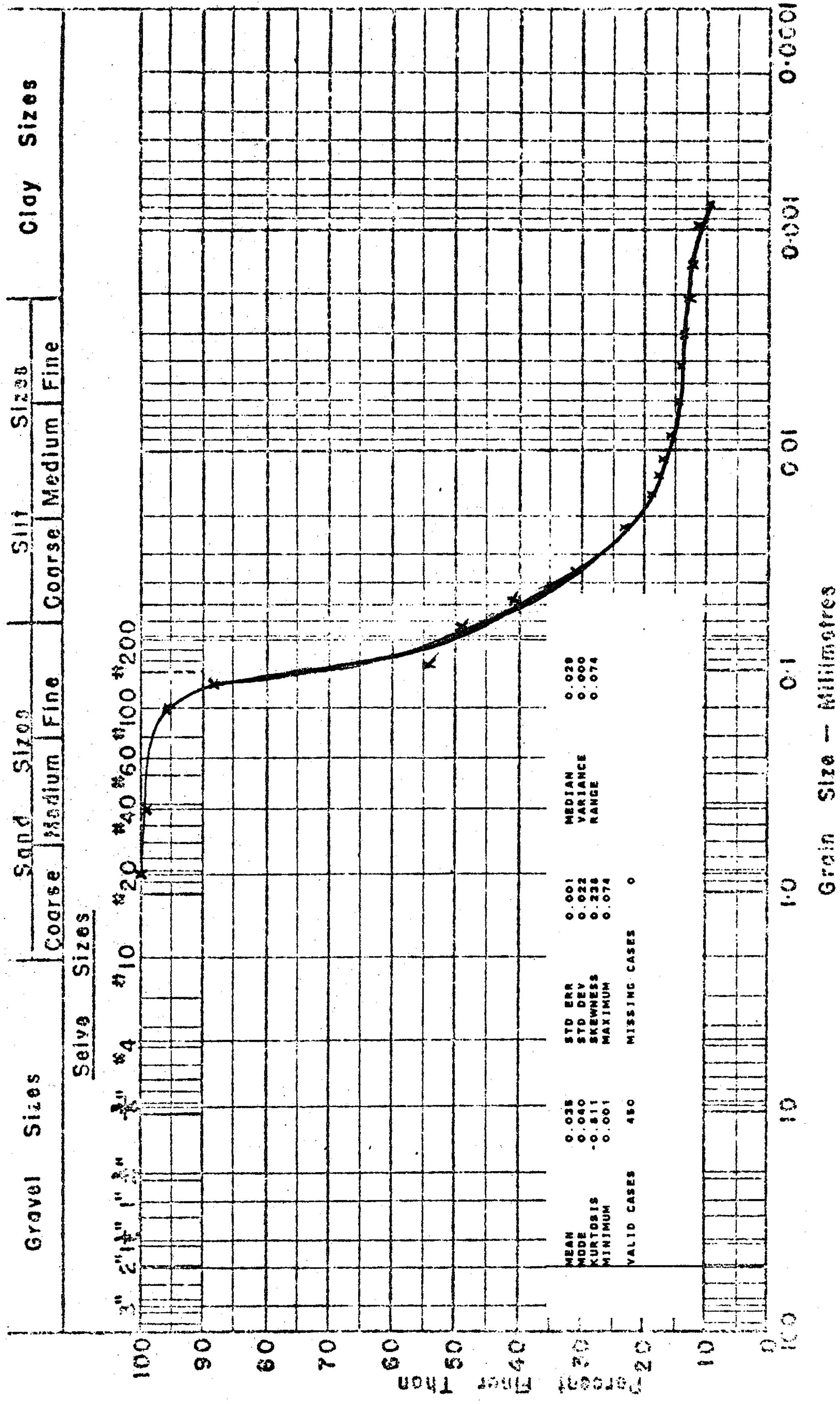


Table 11.4 Geotechnical Data: North Pangnirtung Fjord

Sample #	Depth (m±2.5cm)	Water Content (Dry Basis) w(%)	Natural Water Content w(%)	Atterberg Limits WL(%)	 WP(%)	 IP
Core: NP-3 82-04972						
GT-26	0-0.05	118.85	54.31	82.2	39.9	42.3
GT-27	0.10	111.92	52.81	80.7	34.7	46.0
GT-28	0.46	98.45	49.61	71.8	33.7	38.1
GT-29	1.00	89.92	47.35	69.0	32.4	36.6
GT-30	1.50	107.21	51.74	67.3	31.0	36.3
GT-31	2.25	22.06	18.08	N.P.	N.P.	N.P.

w= water content

WL= liquid limit

WP= plastic limit

IP= plasticity index

Table 11.5 Geotechnical Data: North Pangnirtung Fjord

Miniature Vane Shear Test Results

Sample #	Depth (m±2.5cm)	Undisturbed Shear Stress (Kg-cm)	Remolded Shear Stress (Kg-cm)	Sensitivity
Core: NP-3 82-04972				
GT-27	0.1	.0322	.0127	2.55
GT-28	0.46	.0483	.0155	3.11
GT-29	1.0	.0898	.0173	5.20
GT-30	1.5	.0489	.0086	5.67
GT-31	2.25	.0455	.0092	4.94

Table 11.6 Mineralogy of <2μm Material:

North Pangnirtung Fjord

Sample	Depth	Relative % Clays[1]				Other Phases[2]			
#	(m±2.5cm)	K	I	CHL	SW	Q	PL	KF	AMP
Core: NP-3	82-04972								
GT-26	0-0.05	5	77	10	8[3]	mt	m	m	m
GT-27	0.10	4	75	11	10[3]	mt	m	m	t
GT-28	0.46	5	73	10	12[3]	mt	m	m	t
GT-29	1.00	6	72	12	10[3]	mt	m	m	t
GT-30[6]	1.50	5	85	6	4[3]	mt	m	m	t
GT-31	2.25	7	86	6	1	t	m	m	t

K= kaolinite I= illite CHL= chlorite SW= swelling clay

Q= quartz PL= plagioclase KF= potassium feldspar

AMP= amphibole

[1] The relative amounts of clay minerals reported are weighted percentages, normalized to 100 %, using the procedures described in the text.

[2] m = minor phase, mt = minor to trace phase, t = trace phase, nd = not detected.

[3] The swelling clay material is mostly smectite.

[6] Traces of a 9 Å mineral are also detected, perhaps pyrophyllite or talc.

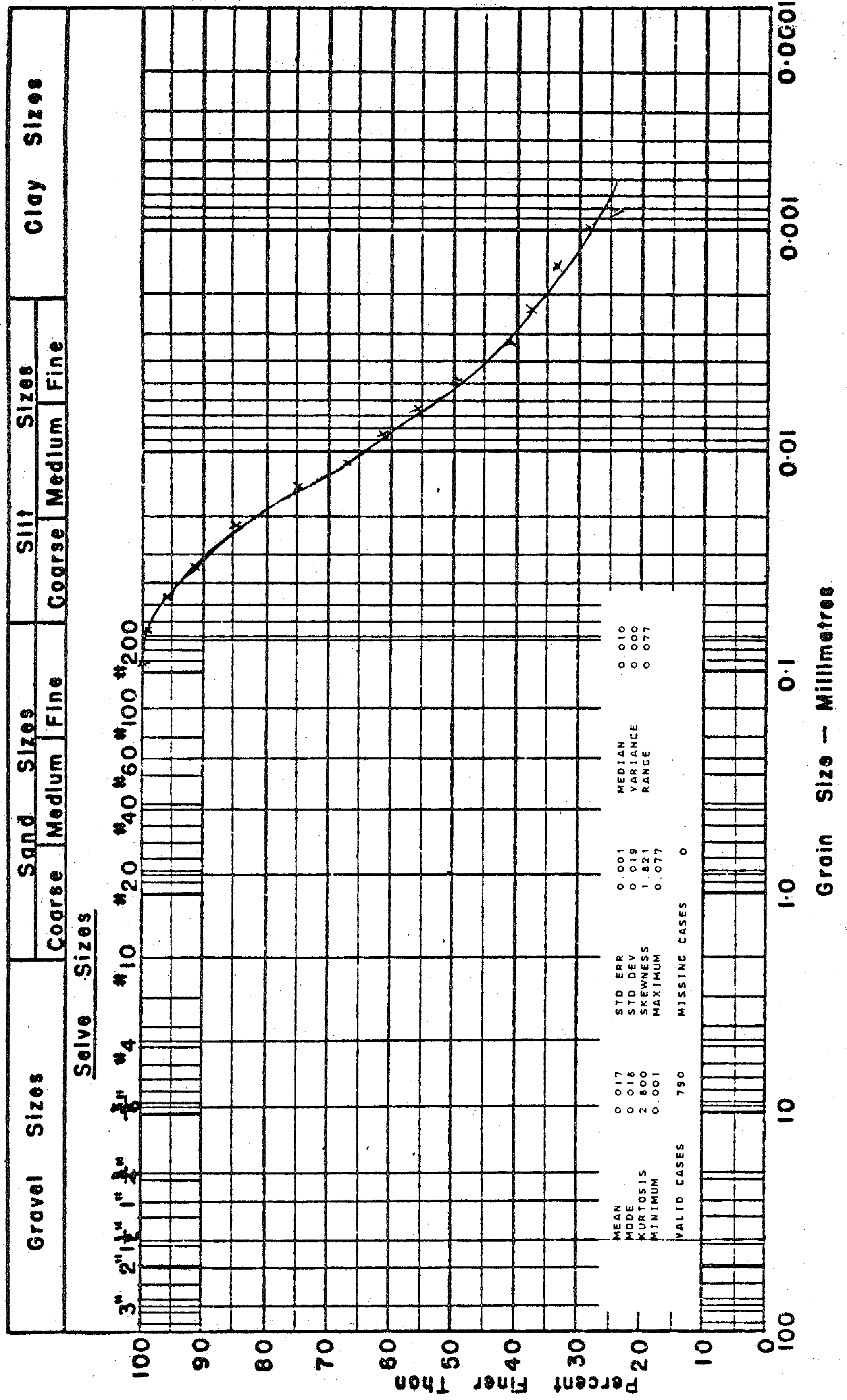
Core Descriptions

CORE CO-2, 82-04887, CORONATION FJORD, LENGTH= 2.56m

0-2.56m: 5y 4/1; Greenish black mud. Upper 1.25m surface of split core was streaked - difficult to discern sedimentary structures. Lower 0.40m of core, well laminated sediments, dark fine sand layers alternating with tan silty layers (2-3cm).

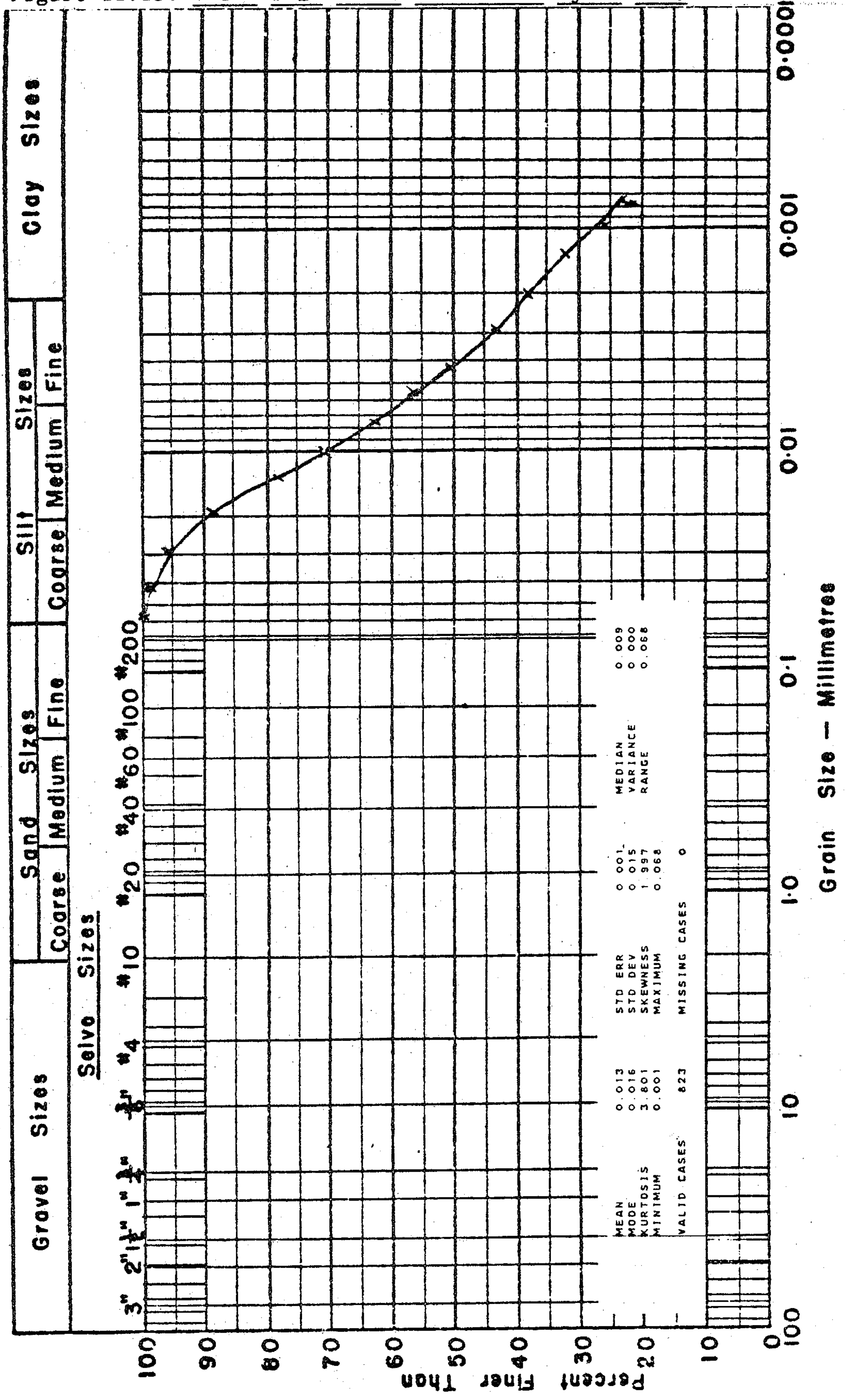
Disturbance: Excessive with splitting, due to high water content of core. Core sample oozed out of sides of core when split. Water-washing along sides of core from 0.3m to 0.9m above base. Zone of disturbance seems to extend to center of core, although core center was still stiff to touch.

Figure 11.12. Grain Size Data: Coronation Fjord GT-6



MEAN	0.017	STD ERR	0.001	MEDIAN	0.010
MODE	0.018	STD DEV	0.019	VARIANCE	0.000
KURTOSIS	2.800	SKEWNESS	1.821	RANGE	0.077
MINIMUM	0.001	MAXIMUM	0.077		
VALID CASES	790	MISSING CASES	0		

Figure 11.13. Grain Size Data: Coronation Fjord GT-7



```
MEAN          0.013     STD ERR        0.001     MEDIAN      0.009
MODE          0.016     STD DEV        0.015     VARIANCE    0.000
KURTOSIS      3.801     SKEWNESS       1.997     RANGE       0.068
MINIMUM       0.001     MAXIMUM        0.068

VALID CASES     823     MISSING CASES    0
```

Figure 11.14. Grain Size Data: Coronation Fjord GT-8

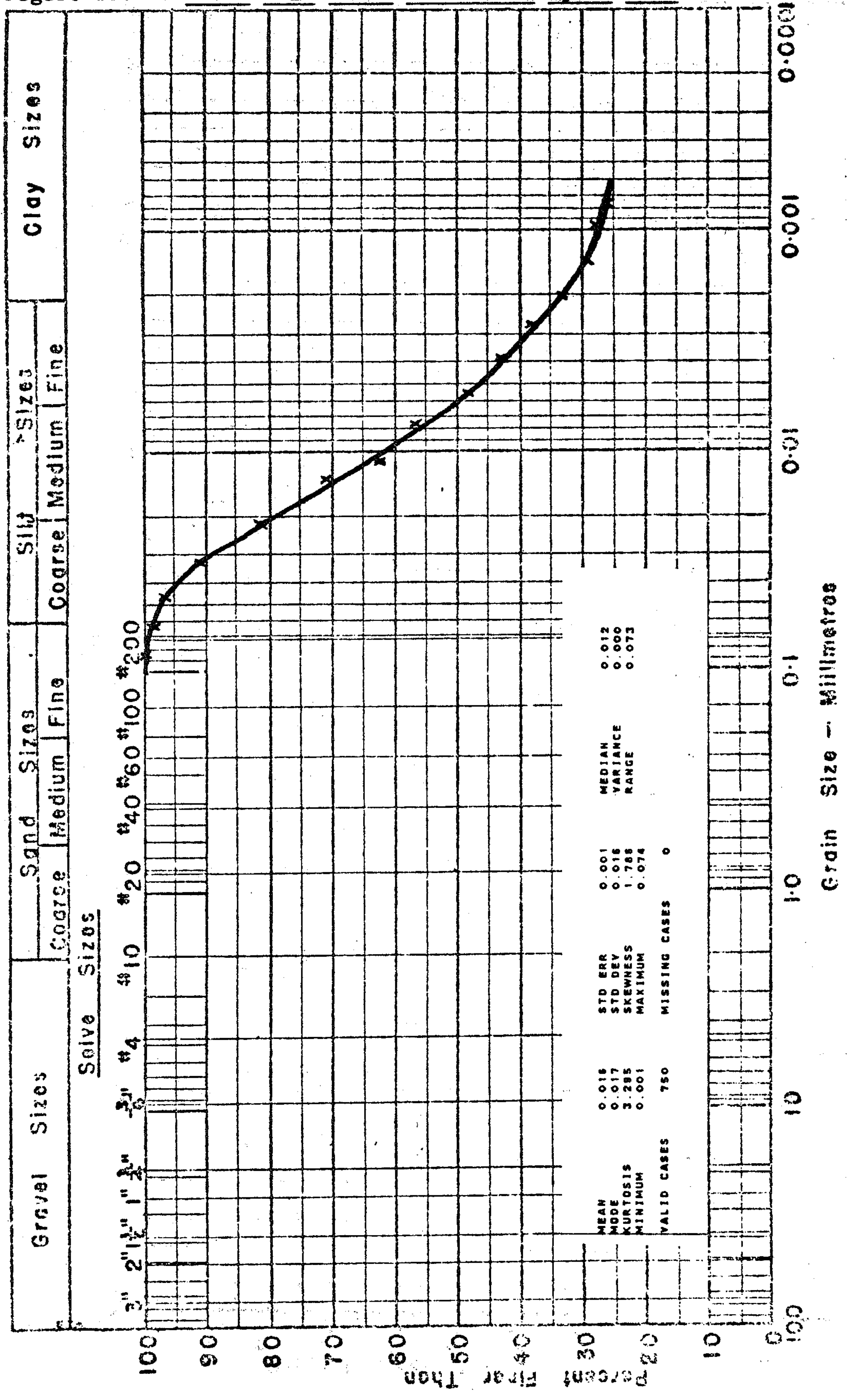
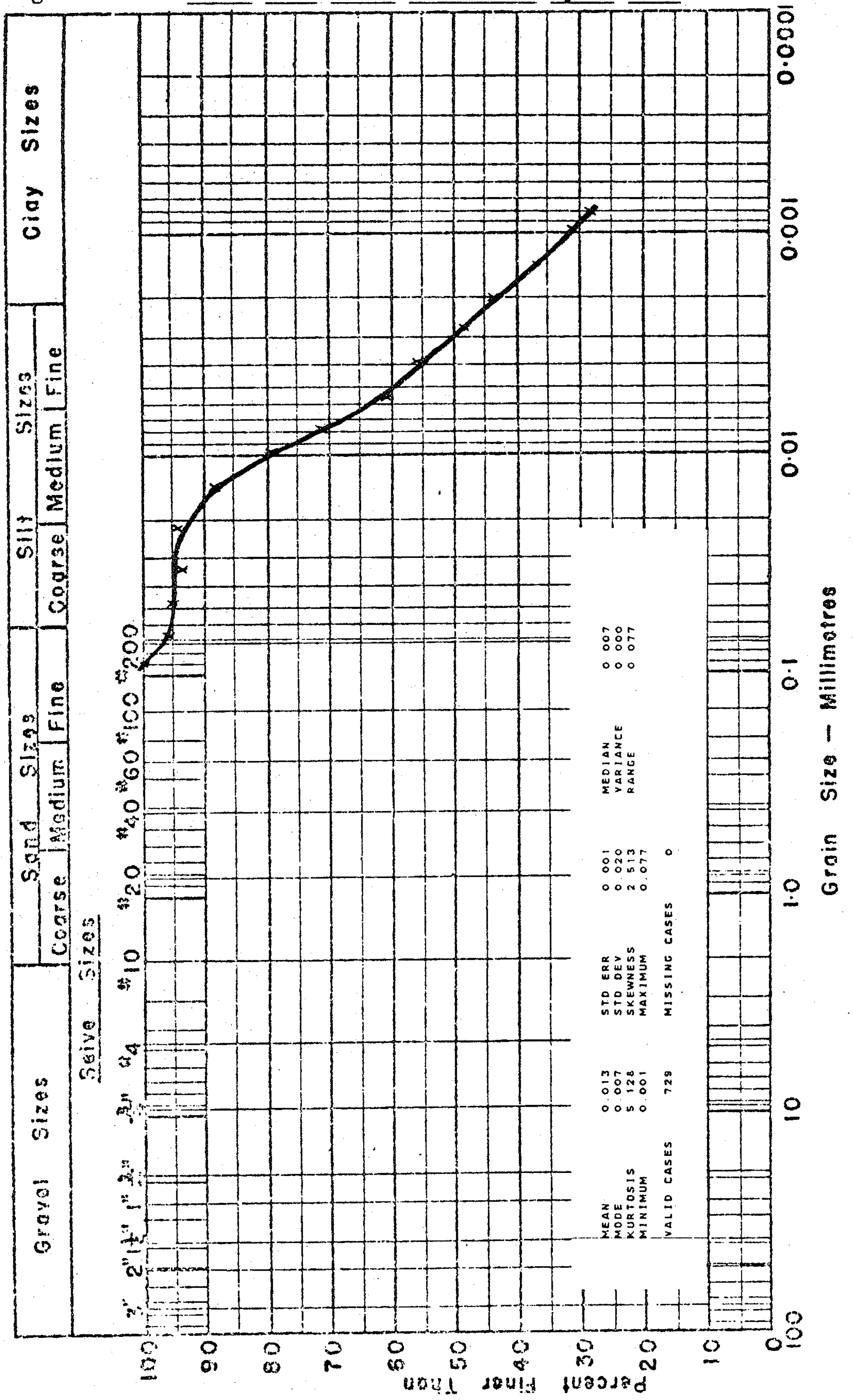
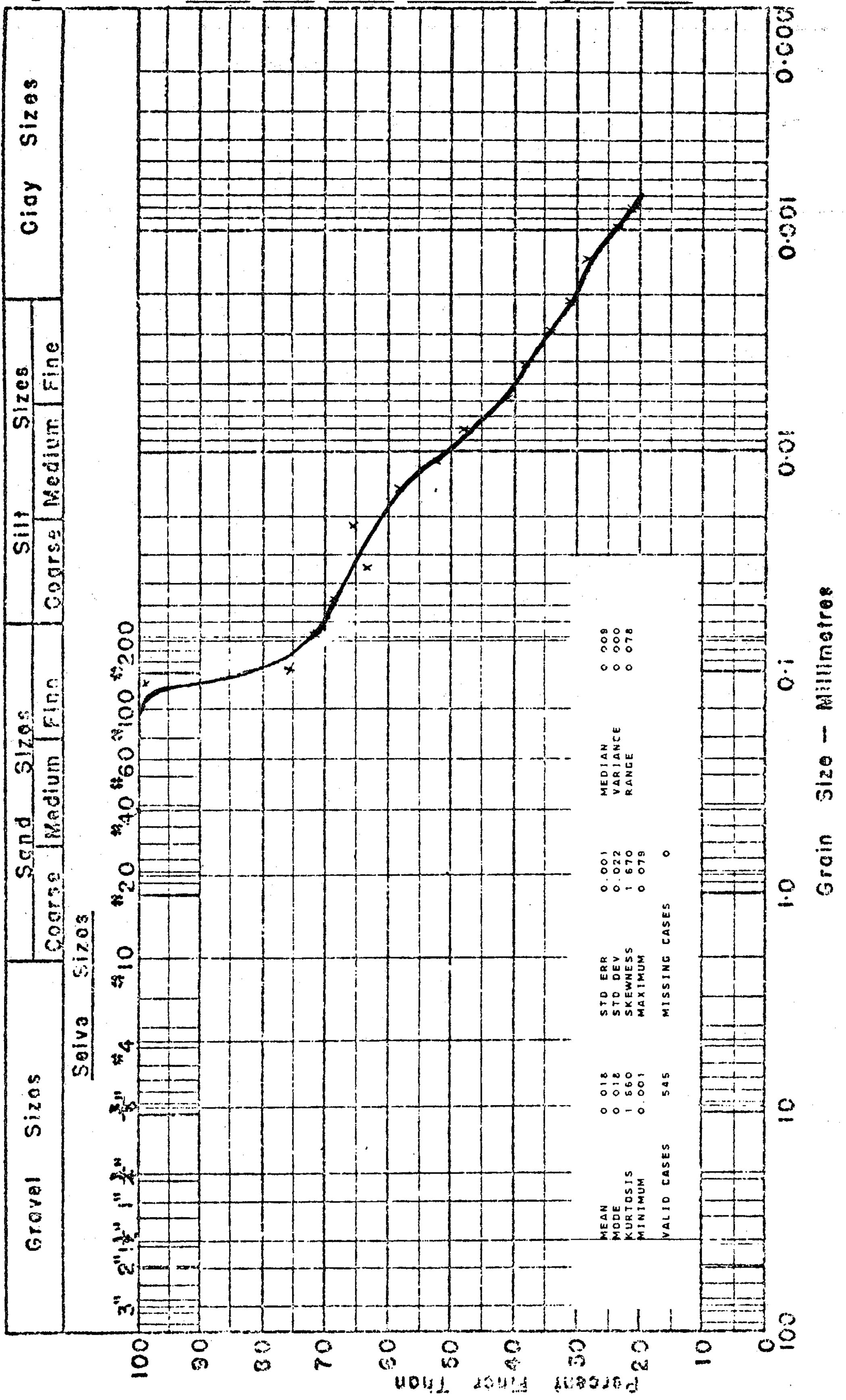


Figure 11.15. Grain Size Data: Coronation Fjord GT-9



```
MEAN          0.013     STD ERR        0 001     MEDIAN      0 007
MODE          0.007     STD DEV        0.020     VARIANCE    0 000
KURTOSIS      5 128     SKEWNESS       2 513     RANGE       0 077
MINIMUM       0.001     MAXIMUM        0.077

VALID CASES     729     MISSING CASES      0
```

Figure 11.16. Grain Size Data: Coronation Fjord GT-10



```
MEAN        0 018    STD ERR        0.001    MEDIAN      0 009
MODE        0 018    STD DEV        0.022    VARIANCE    0 000
KURTOSIS    1 660    SKEWNESS       1 670    RANGE       0 078
MINIMUM     0.001    MAXIMUM        0 079

VALID CASES   545    MISSING CASES    0
```

Table 11.7 Geotechnical Data: Coronation Fjord

Sample #	Depth (m±2.5cm)	Water Content (Dry Basis) w(%)	Natural Water Content w(%)	Atterberg Limits WL(%)	WP(%)	IP
Core: CO-2 82-04887						
GT-6	0.10	42.58	29.86	29.9	21.0	8.9
GT-7	0.60	43.94	30.53	31.2	22.5	8.7
GT-8	0.95	38.58	27.84	25.8	20.0	5.8
GT-9	1.50	42.41	29.78	31.6	23.2	8.4
GT-10	1.90	35.04	25.95	24.0	17.7	6.3
GT-11	2.30	30.55	23.40	27.0	19.6	7.4

w= water content WL= liquid limit

WP= plastic limit IP= plasticity index

Table 11.8 Geotechnical Data: Coronation Fjord

Miniature Vane Shear Test Results

Sample #	Depth (m±2.5cm)	Undisturbed Shear Stress (Kg-cm)	Remolded Shear Stress (Kg-cm)	Sensitivity
Core: CO-2 82-04887				
GT-6	0.1	.0374	.0276	1.35
GT-7	0.5	.0351	.0184	1.91
GT-8	0.95	.0144	.0075	1.92
GT-9	1.50	.0391	.0224	1.74
GT-10	1.90	.0322	.0132	2.43
GT-11	2.30	.0619	.0247	2.50

Table 11.9 Mineralogy of <2 μm Material: Coronation Fjord

Sample #	Depth (m±2.5cm)	Relative % Clays[1] K	I	CHL	SW	Other Phases[2] Q	PL	KF	AMP
Core: CO-2 82-04887									
GT-6	0.10	7	83	8	2[3]	t	m	m	t
GT-7	0.60	2	84	11	3[3]	mt	m	m	t
GT-8	0.95	3	82	12	3[3]	mt	m	m	t
GT-9	1.50	7	80	10	3[3]	mt	m	m	t
GT-10	1.90	1	84	13	2[3]	mt	m	m	t
GT-11	2.30	7	85	7	1[3]	mt	m	m	t

K= kaolinite I= illite CHL= chlorite SW= swelling clay

Q= quartz PL= plagioclase KF= potassium feldspar

AMP= amphibole

[1] The relative amounts of clay minerals reported are weighted percentages, normalized to 100 %, using the procedures described in the text.

[2] m = minor phase, mt = minor to trace phase, t = trace phase, nd = not detected.

[3] The swelling clay material is mostly smectite.

Core Descriptions

CORE MA-4, 82-04996, MAKTAK FJORD, LENGTH=2.99m

0-0.3-m: 10yr 5/3; Tan structureless mud, few polychaete burrows, disturbed.

0.30-0.40m: 10yr 5/3 (10yr 3/1); Tan mud with dark reduced zones in burrows, slighty burrowed.

0.4-0.8m: 10yr 5/3; Tan mud, structureless, blocky fractured surface, extensively burrowed, although burrows do not show dark reduced zones.

0.80-0.85m: 10yr 5/3 (10yr 3/1); Tan mud, structureless,extensively burrowed with burrows showing dark reduced zones.

0.85-1.80m: 10yr 5/3 (10yr 3/1); Tan mud, structureless, burrowing less intense, scattered dark reduced zones.

1.80-2.99m: 10yr 4/2 (10yr 5/2); Structureless, slightly darker brown mud, extensively burrowed with dark reduced zones.

Disturbance: Top 0.30m disturbed by water-washing.

CORE MA-5, 82-04865, MAKTAK FJORD, LENGTH= 1.98m

0-0.04m: 10yr 4/6 and 10yr 5/2; Tannish/grey mud, structureless.

0.04-0.20m: 10yr 5/2; Tannish/grey mud, dominantly massive and structureless, some bioturbation, mainly polychaetes.

0.20-0.31m: 10yr 5/2; Faintly laminated tannish/grey mud, laminated of scale of 0.5-1cm, consisting of slightly darker grey laminae alternating with tannish grey bands. Slight bioturbation.

0.31-0.38m: 10yr 5/2; Tannish/grey mud, massive structureless band. Some bioturbation.

0.38-0.395m: 10yr 4/1; Darker laminae, medium-fine sand, fairly well sorted.

0.395-0.57m: 10yr 5/2 (10yr 3/1); Massive, stiff tannish clay with dark irregular streaks and patches (? bioturbated).

0.57-0.60m: 10yr 4/1; Darker band, medium to fine sand, fairly well sorted.

0.60-1.00m: 10yr 5/2 (10yr 3/1); Tannish/grey mud, massive, extensive bioturbation, mainly worm burrows, the fillings of which are reduced. Some of the burrows have a thin wall lining. Very broken (fractured) surface from split.

1.0-1.4m: 10yr 4/2 (10yr 3/1); Thick, massive, Tannish/grey mud with dark, iregular streaks and blobs. Slight recognizable burrowing.

1.4-1.98m: 10yr 4/2; Thick, massive, structureless tannish/grey mud.

Disturbance: sample split with spatulas without wire running down the core, resulting in an irregularly broken (fractured) surface on the split core.

CORE MA-5A, 82-04868, MAKTAK FJORD, LENGTH= 1.50m

0.0-0.10m: Accidently cut before split, sediment not seen before subsampling.

0.1-0.20m: 10yr 5/2; Silty mud, structureless, few scattered burrows.

0.20-0.23m: 10yr 4/2 (10yr 5/2); Graded sand to sandy silt, medium-fine dark sand at base; fine sandy tan silt at top. ? Gradational top with overlying silty mud. (turbidite)

0.23-0.32m: 10yr 4/2; Graded sand, medium-fine sand at base, fine silty sand at top. (turbidite)

0.32-0.90m: 10yr 5/2 (10yr 2/1); Tan silty mud with dark (almost black) reduced fillings of some burrows. Bioturbation increases markedly from scattered burrows at the top to medium-extensive bioturbation in the lower half of interval.

0.90-1.05m: 10yr 6/2, 10yr 5/2 (2.5y 4/2); Faintly laminated mud, lighter zones have medium-slight burrowing; dark 3-cm thick bands at

0.90 and 1.0m, with no apparent grain size change.

1.05-1.30m: 2.4y 4/2 (10yr 2/1); Tan silty mud, bioturbation with a few scattered reduced fillings and streaks of darker mud, burrowing slight, except at 1.1m where it has medium density; burrows 2mm wide at base, 1mm wide in upper parts, sharp base.

1.30-1.45m: 2.5y 4/2, 10yr 4/3; Well laminated silty mud. Basal grey/tan layers (0.3-3.5cm thick) graded into somewhat finer-grained tan silty muds (0.30-3.5cm thick). (turbidites/hemipelagic fall-out)

1.45-1.50m: 2.5y 4/2; Mud, grey, structureless.

Disturbance: Top 0.1m of core accidently cut prior to core-splitting. This top plug was tested for shear strength and subsampled for water content and Atterberg limits.

Figure 11.17. Grain Size Data: Maktak Fjord GT-20

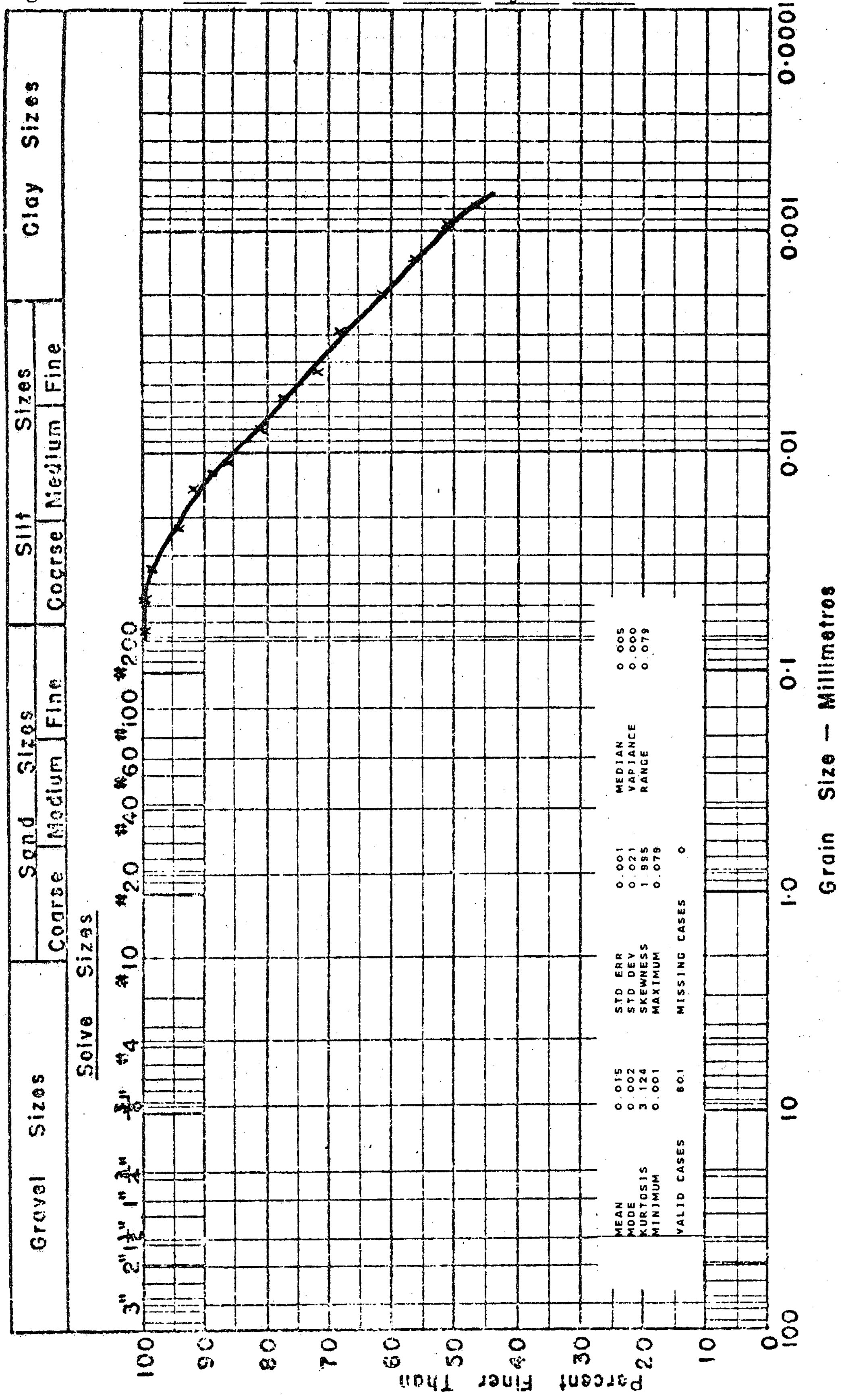


Figure 11.18. Grain Size Data: Maktak Fjord GT-21

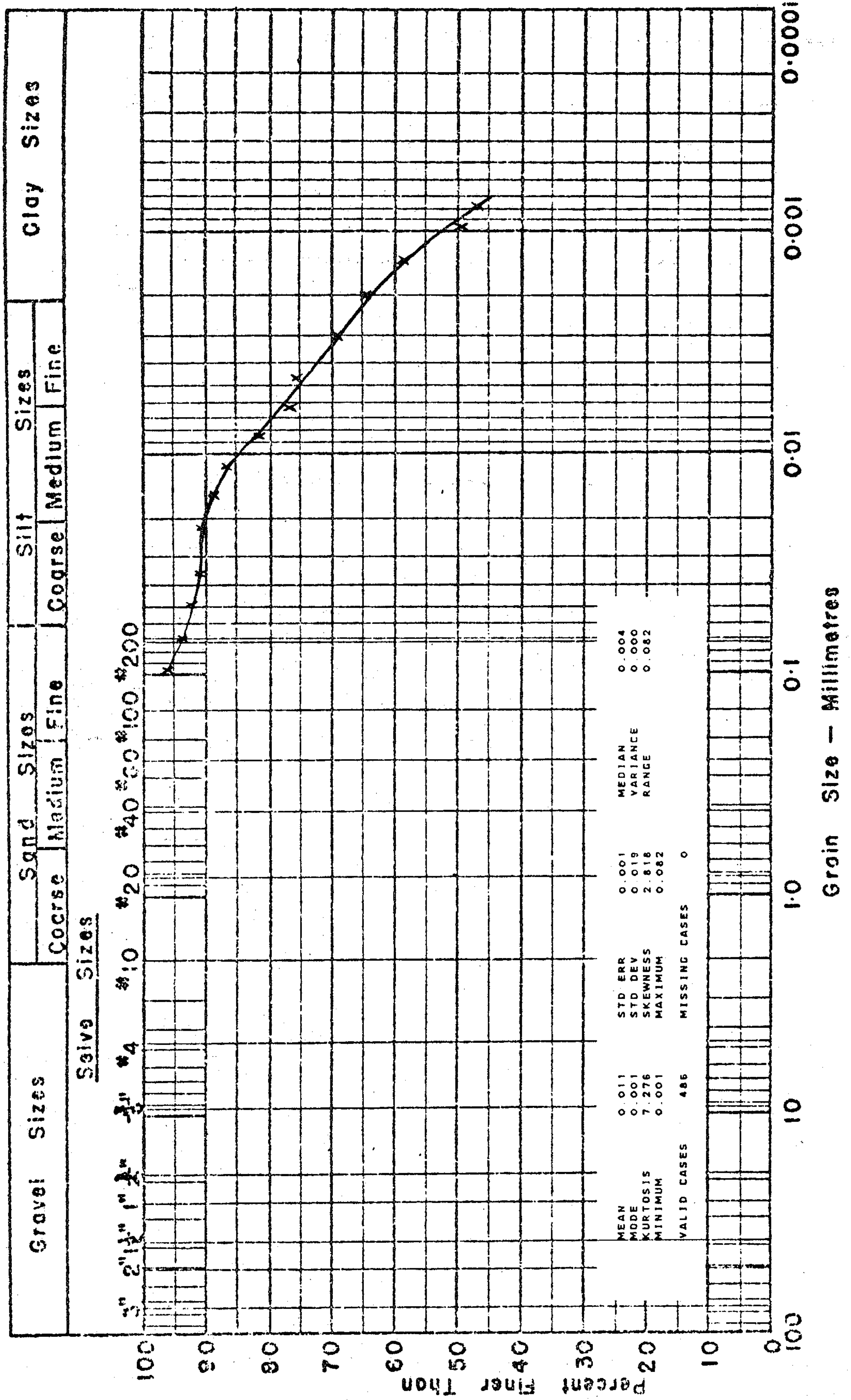
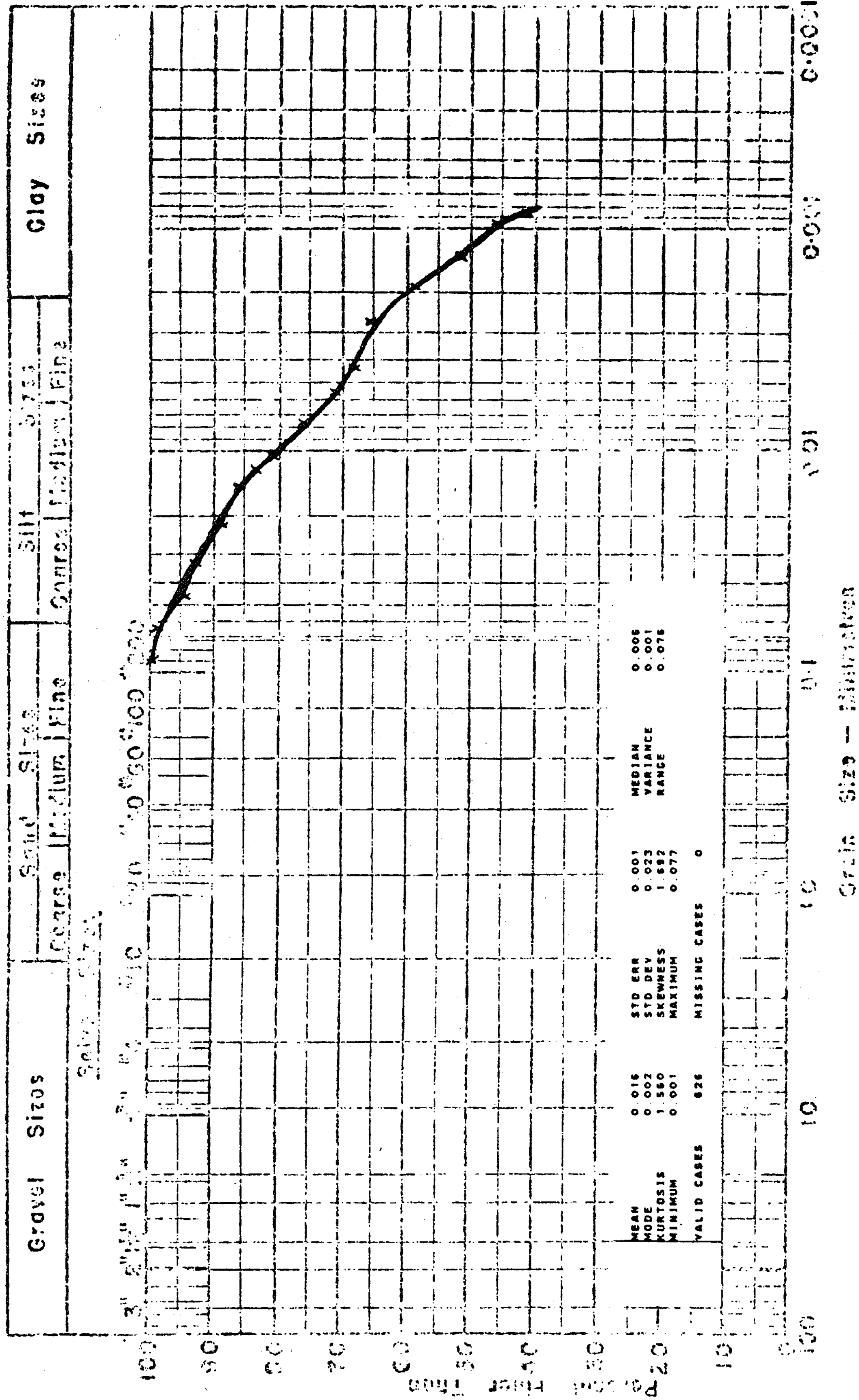
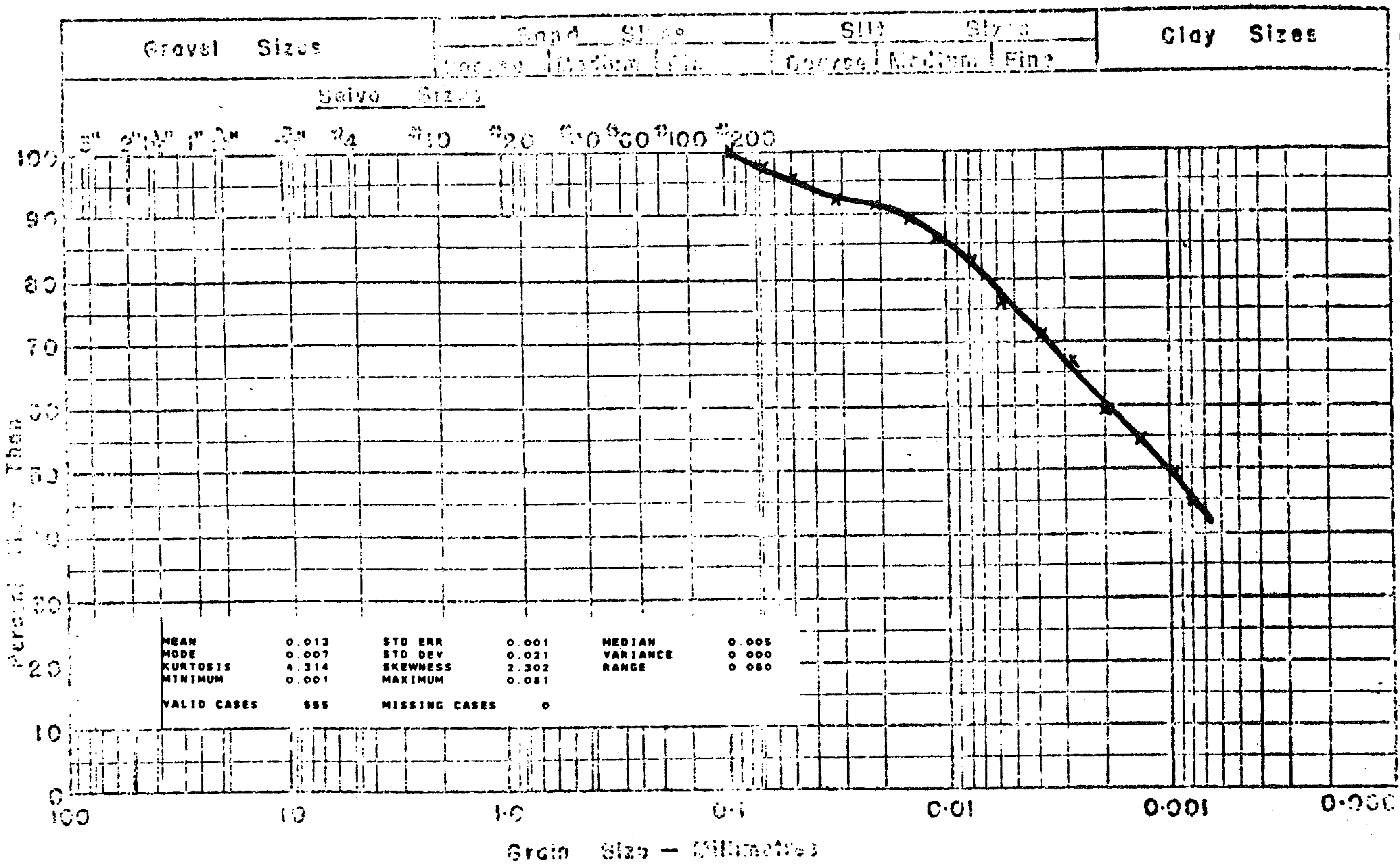


Figure 11.19. Grain Size Data: Maktak Fjord GT-22



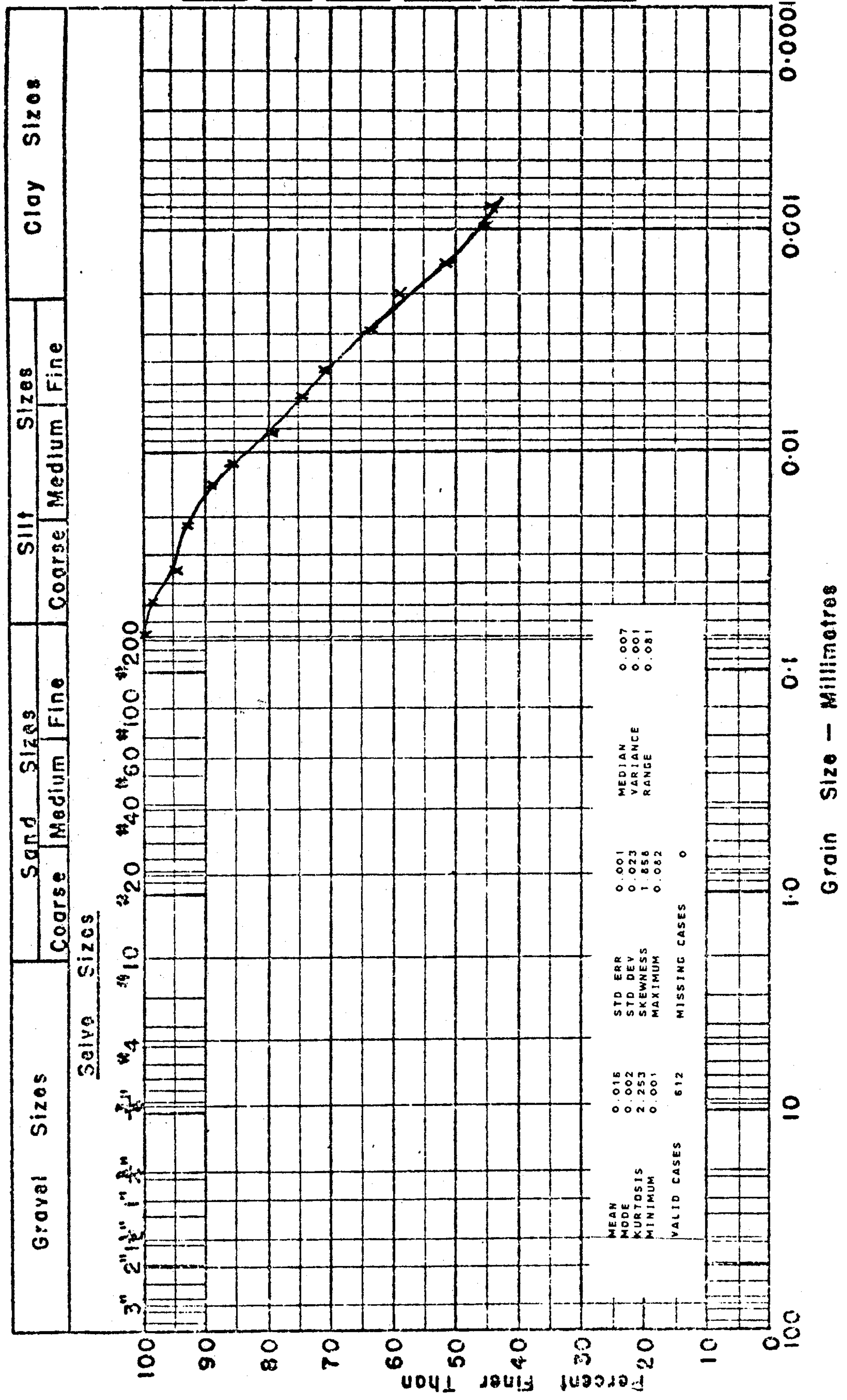
```
MEAN        0.016   STD ERR        0.001   MEDIAN     0.006
MODE        0.002   STD DEV        0.023   VARIANCE   0.001
KURTOSIS    1.560   SKEWNESS       1.692   RANGE      0.076
MINIMUM     0.001   MAXIMUM        0.077

VALID CASES   826   MISSING CASES      0
```

Figure 11.20. Grain Size Data: Maktak Fjord GT-23



```
MEAN          0.013    STD ERR        0.001    MEDIAN      0.005
MODE          0.007    STD DEV        0.021    VARIANCE    0 000
KURTOSIS      4.314    SKEWNESS       2.302    RANGE       0 080
MINIMUM       0.001    MAXIMUM        0.081

VALID CASES     555    MISSING CASES      0
```

Figure 11.21. Grain Size Data: Maktak Fjord GT-24



```
MEAN        0.016   STD ERR         0.001   MEDIAN      0.007
MODE        0.002   STD DEV         0.023   VARIANCE    0.001
KURTOSIS    2.253   SKEWNESS        1.858   RANGE       0.081
MINIMUM     0.001   MAXIMUM         0.082

VALID CASES   612   MISSING CASES       0
```

Figure 11.22. Grain Size Data: Maktak Fjord GT-25

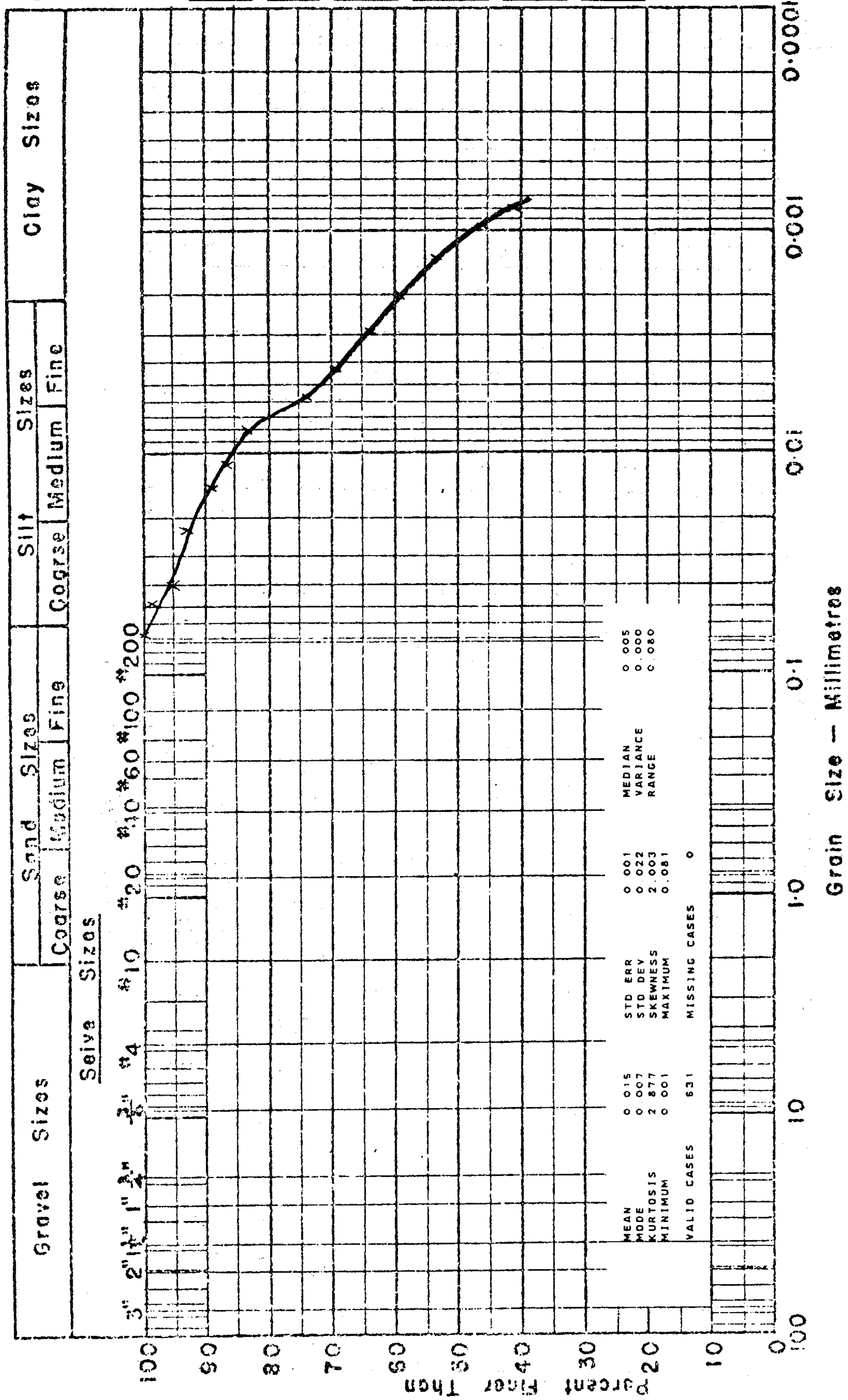
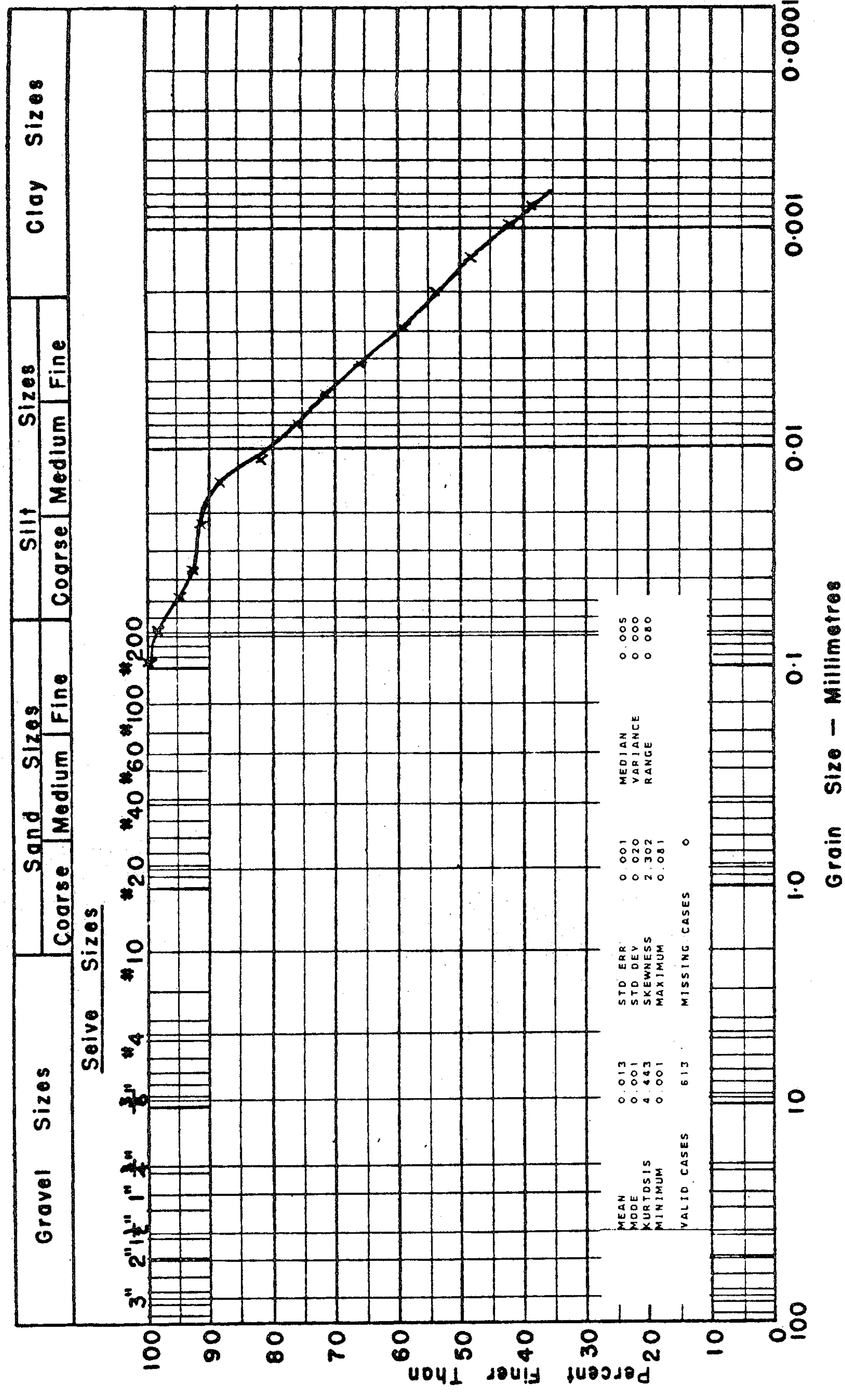
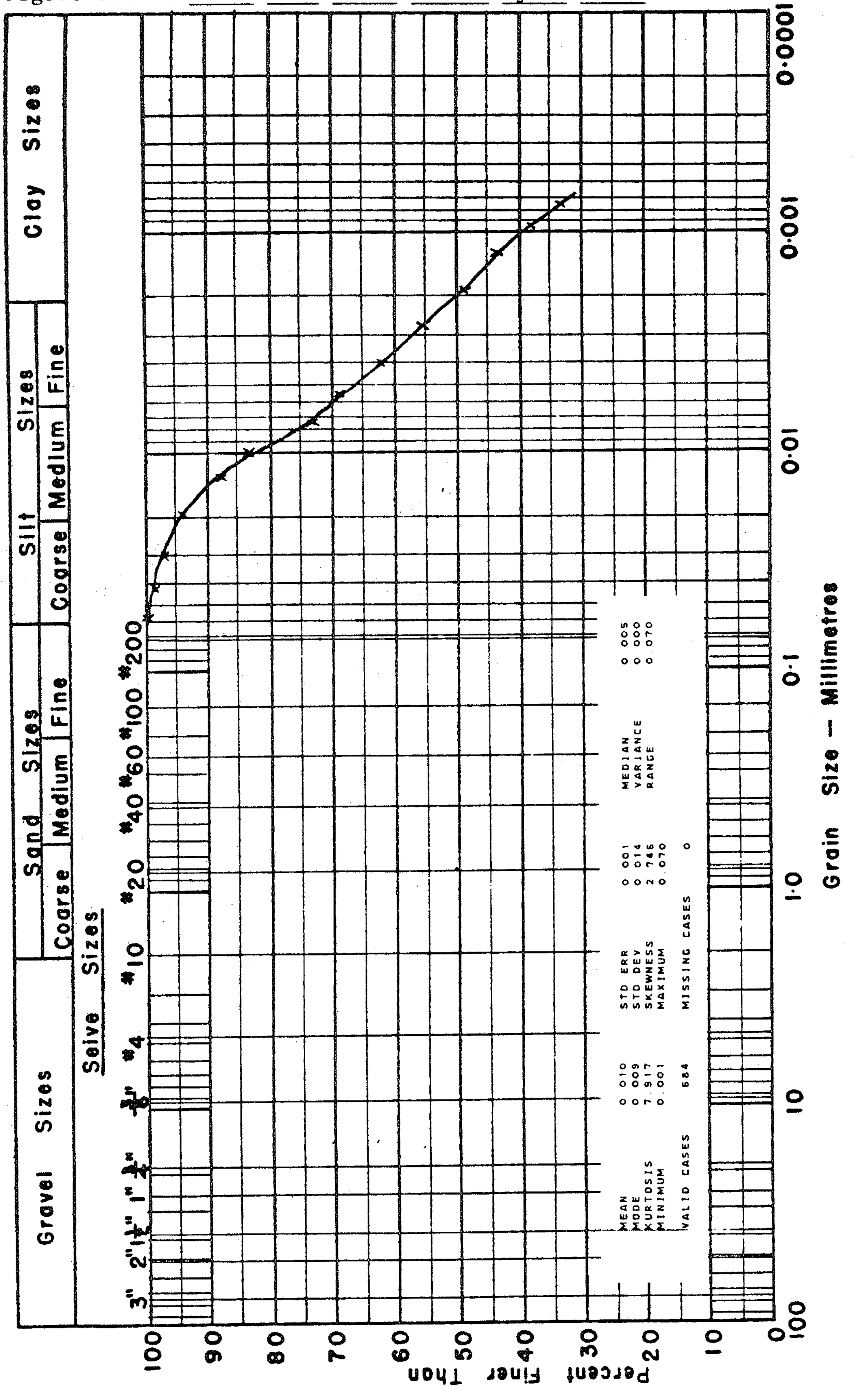


Figure 11.23. Grain Size Data: Maktak Fjord GT-13



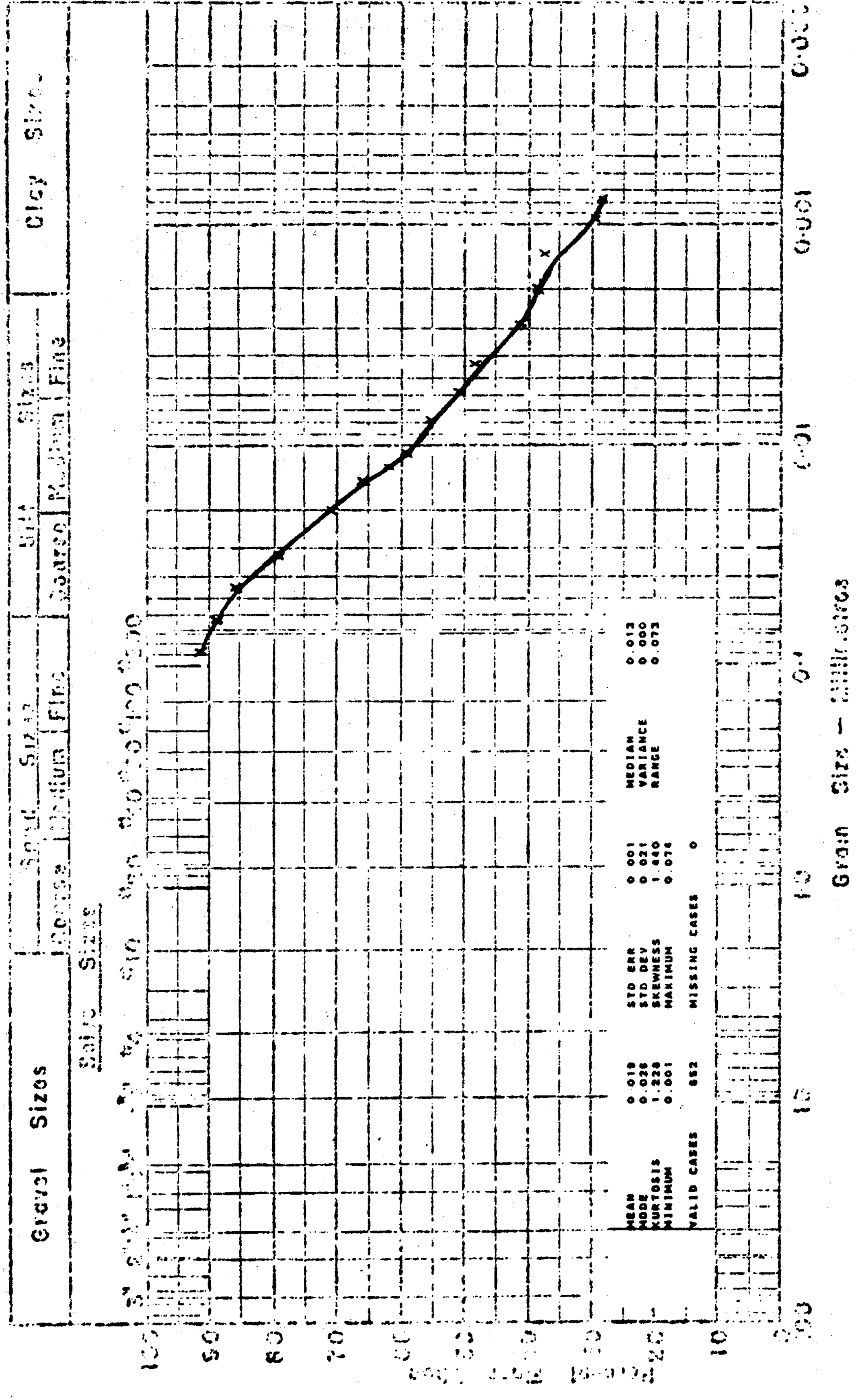
```
MEAN         0.013   STD ERR        0.001   MEDIAN      0.005
MODE         0.001   STD DEV        0.020   VARIANCE    0.000
KURTOSIS     4.443   SKEWNESS       2.302   RANGE       0.080
MINIMUM      0.001   MAXIMUM        0.081

VALID CASES    613   MISSING CASES      0
```

Figure 11.24. Grain Size Data: Maktak Fjord GT-14



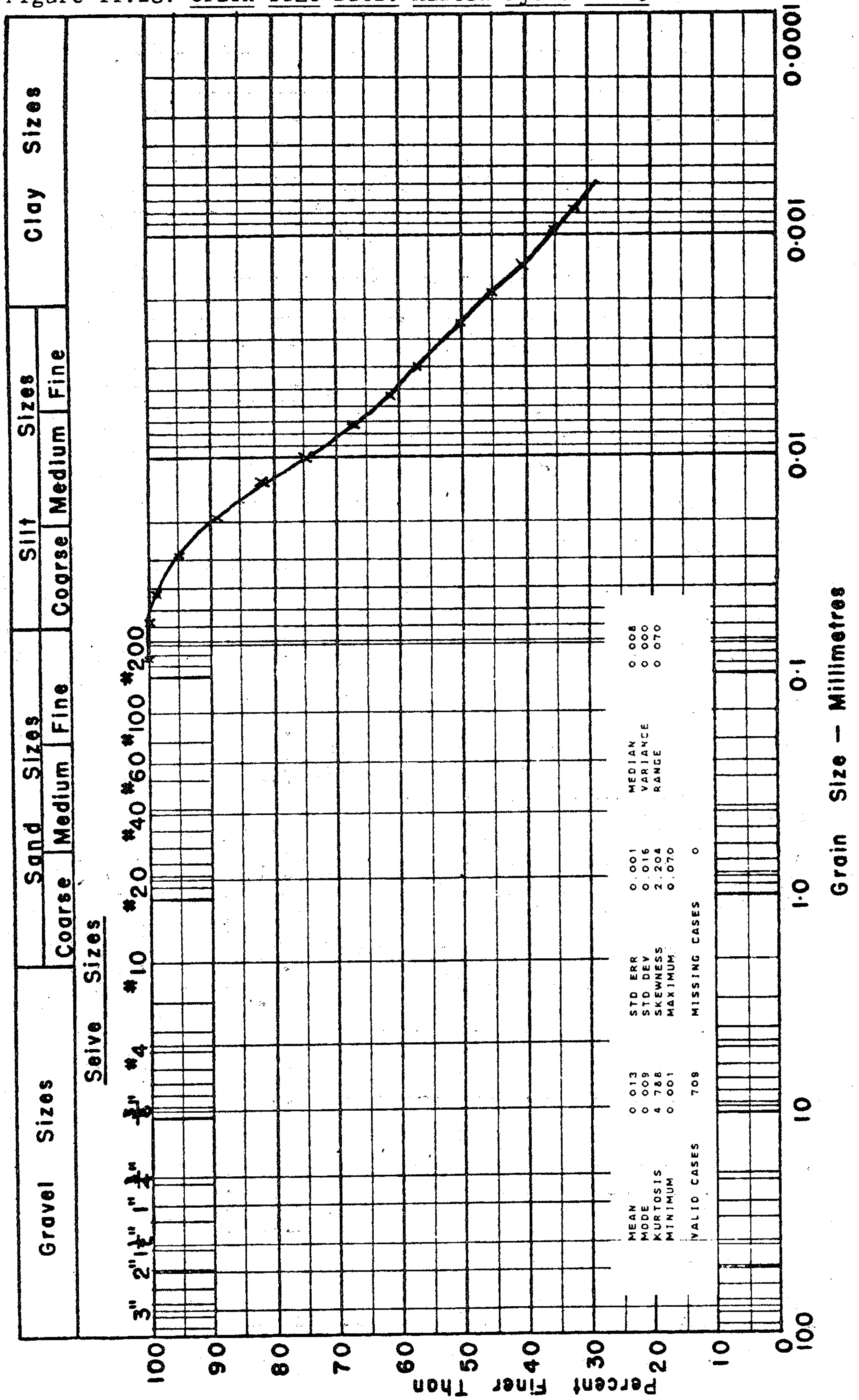
```
MEAN       0 010     STD ERR     0 001     MEDIAN     0 005
MODE       0 009     STD DEV     0 014     VARIANCE   0 000
KURTOSIS   7.917     SKEWNESS    2 746     RANGE      0.070
MINIMUM    0.001     MAXIMUM     0.070

VALID CASES    684   MISSING CASES     0
```

Figure 11.25. Grain Size Data: Maktak Fjord GT-15



```
MEAN         0.019   STD ERR        0.001   MEDIAN     0.013
MODE         0.026   STD DEV        0.021   VARIANCE   0.000
KURTOSIS     1.220   SKEWNESS       1.440   RANGE      0.073
MINIMUM      0.001   MAXIMUM        0.074

VALID CASES    852   MISSING CASES      0
```

Figure 11.26. Grain Size Data: Maktak Fjord GT-16



```
MEAN         0.013    STD ERR       0.001    MEDIAN      0.008
MODE         0.009    STD DEV       0.016    VARIANCE    0.000
KURTOSIS     4.788    SKEWNESS      2.204    RANGE       0.070
MINIMUM      0.001    MAXIMUM       0.070

VALID CASES    708    MISSING CASES     0
```

Figure 11.27. Grain Size Data: Maktak Fjord GT-17

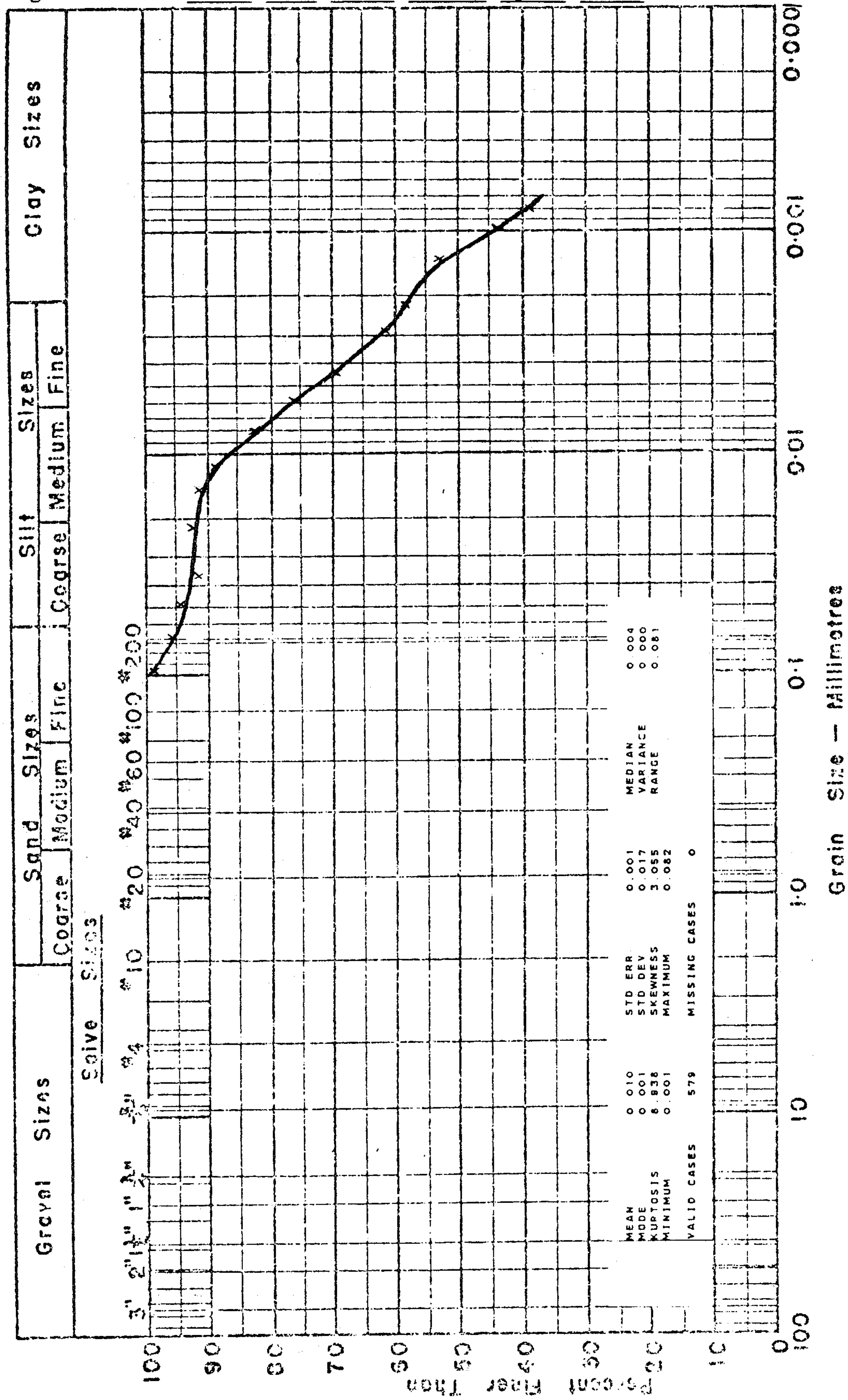
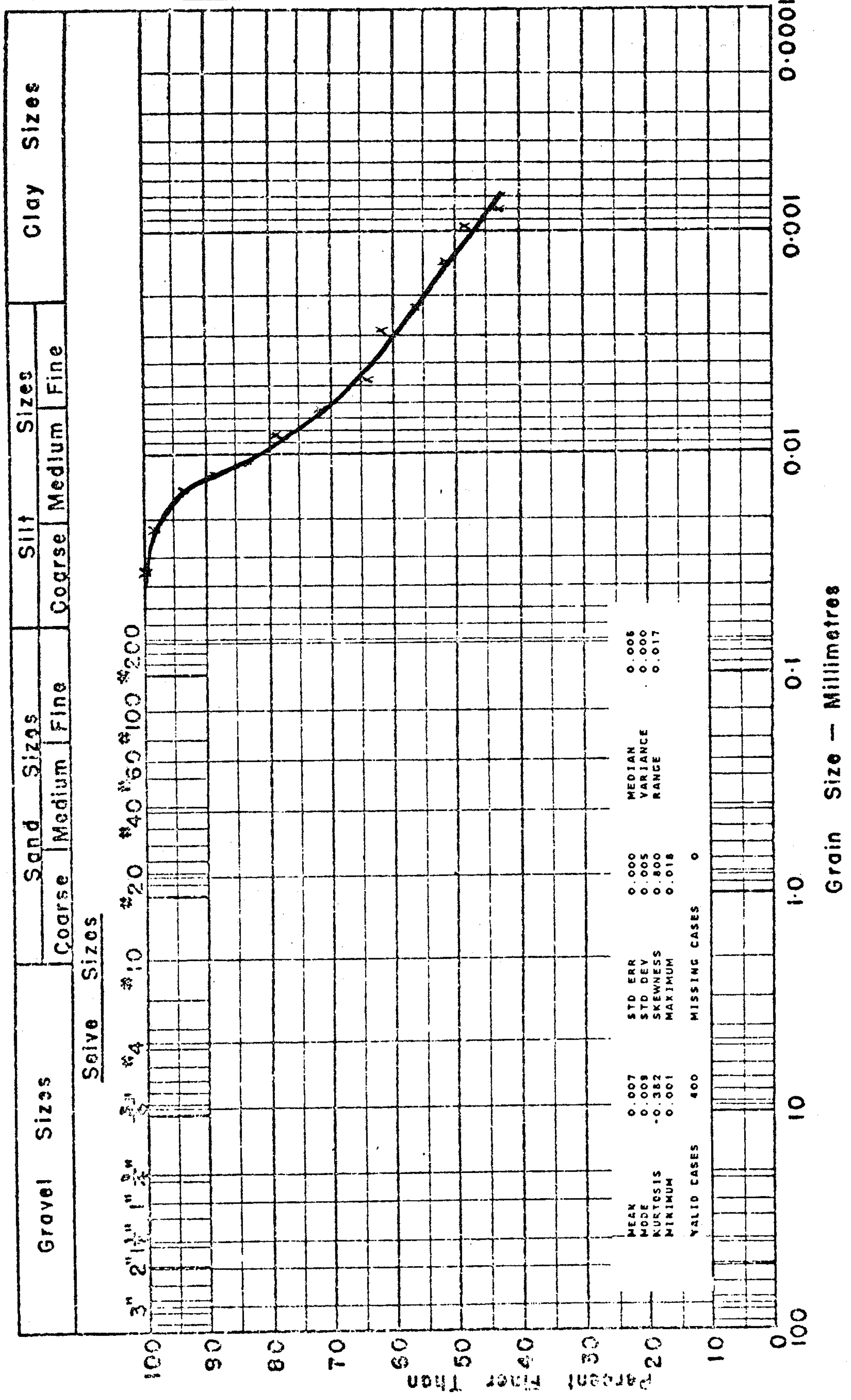
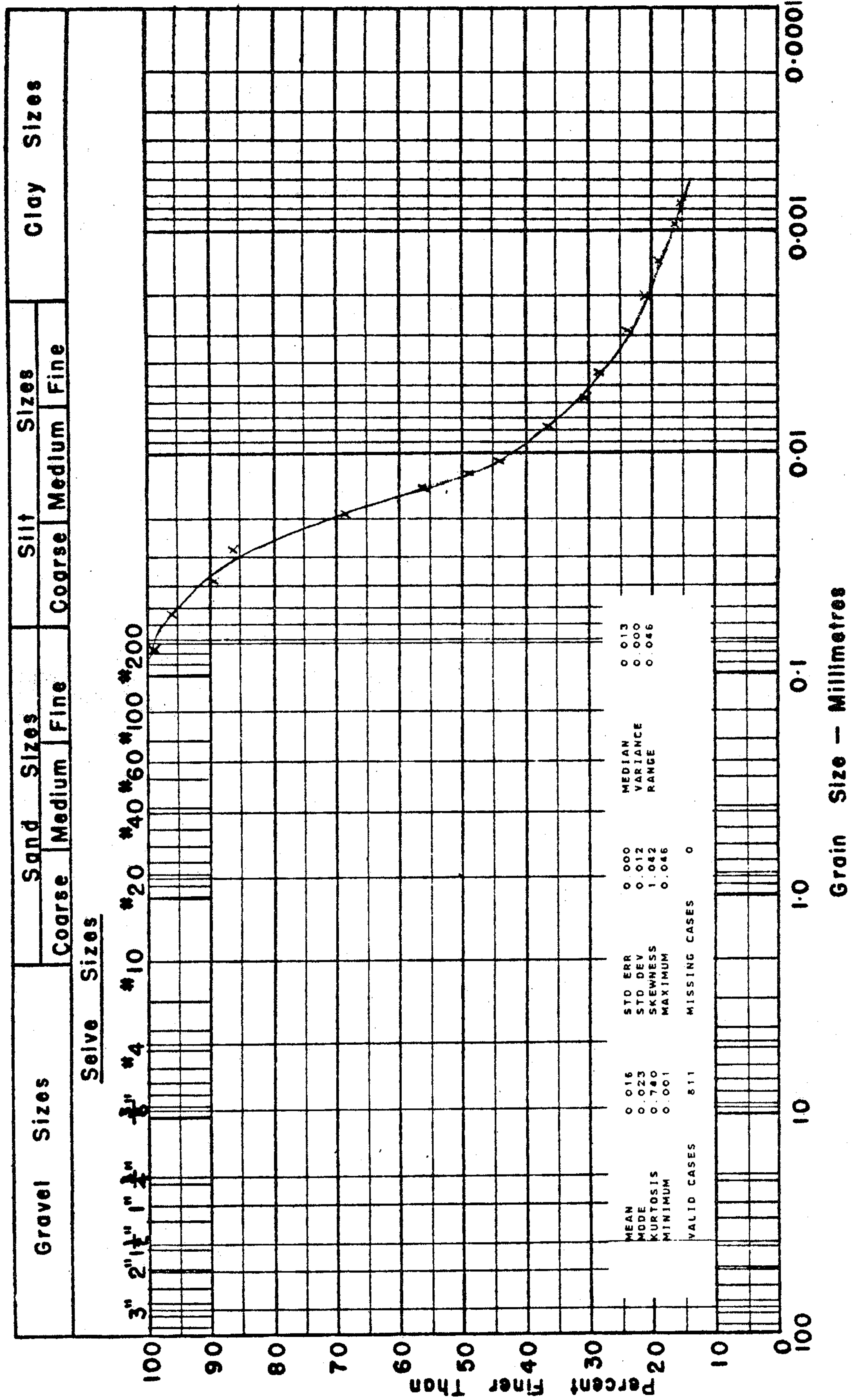


Figure 11.28. Grain Size Data: Maktak Fjord GT-18



```
MEAN          0.007    STD ERR        0.000    MEDIAN      0.006
MODE          0.008    STD DEV        0.005    VARIANCE    0.000
KURTOSIS     -0.382    SKEWNESS       0.800    RANGE       0.017
MINIMUM       0.001    MAXIMUM        0.018

VALID CASES     400    MISSING CASES      0
```

Figure 11.29. Grain Size Data: Maktak Fjord GT-19



```
MEAN          0.016    STD ERR        0.000    MEDIAN      0.013
MODE          0.023    STD DEV        0.012    VARIANCE    0.000
KURTOSIS      0.740    SKEWNESS       1.042    RANGE       0.046
MINIMUM       0.001    MAXIMUM        0.046

VALID CASES     811    MISSING CASES      0
```

Figure 11.30. Grain Size Data: Maktak Fjord GT-32

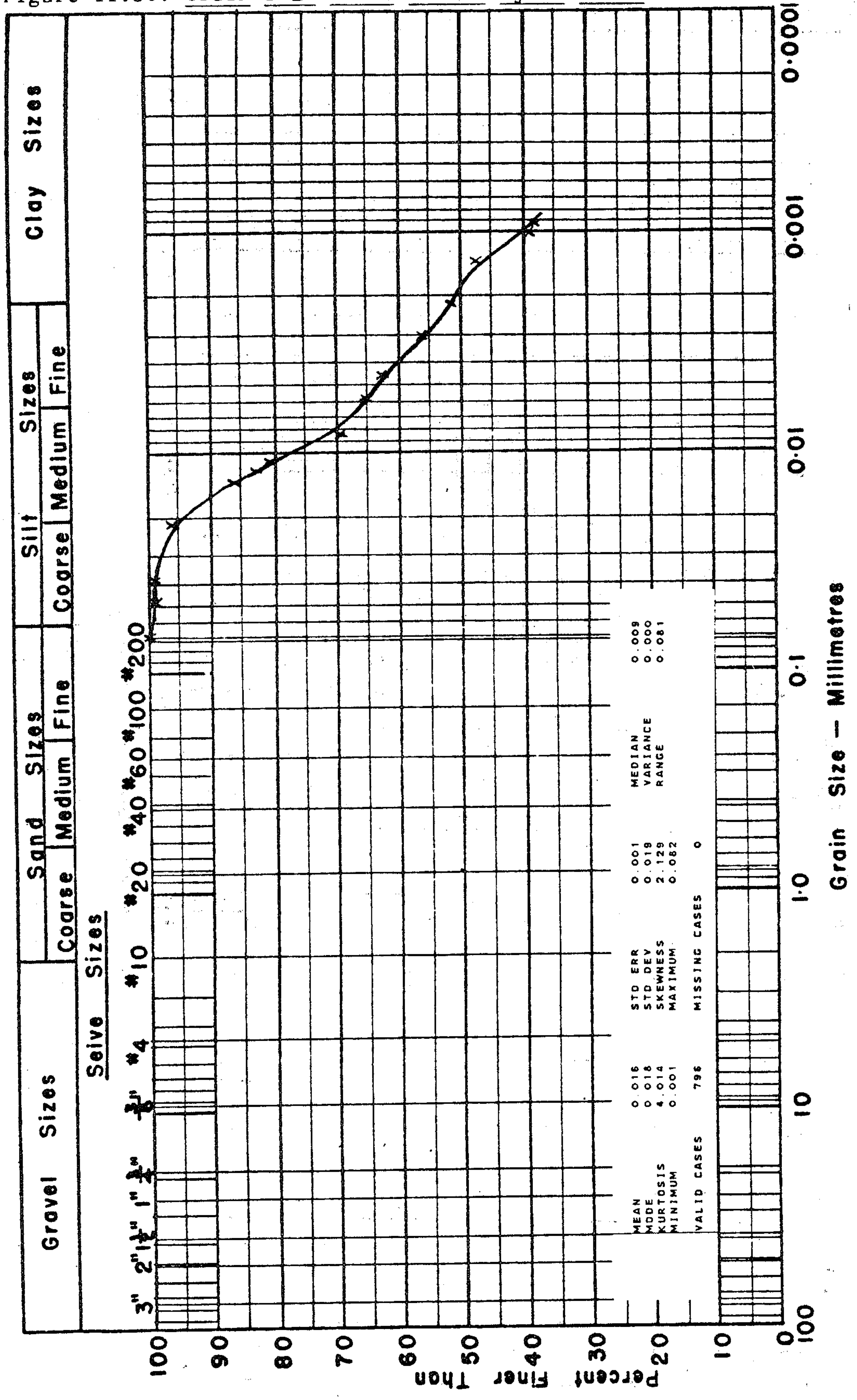
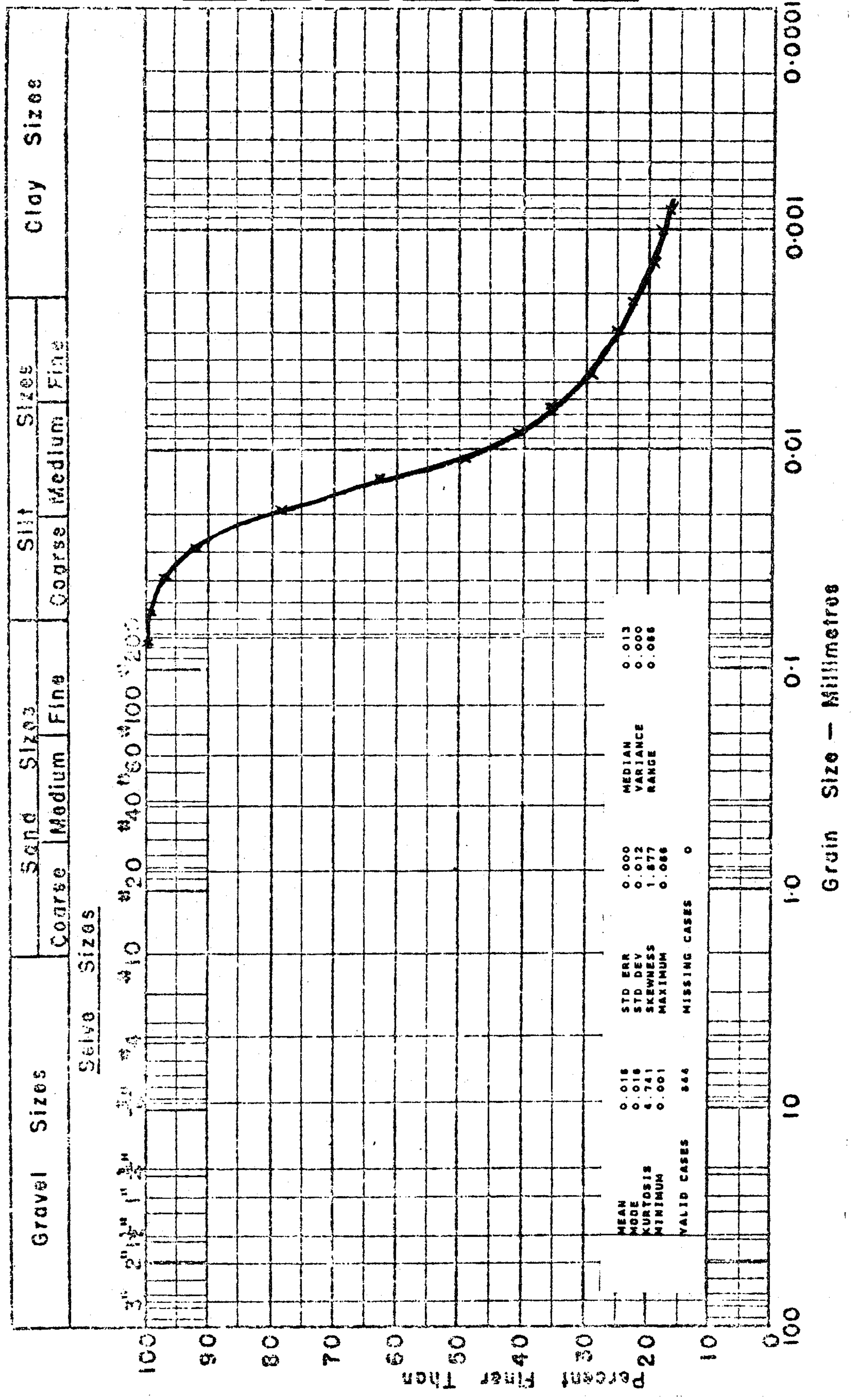
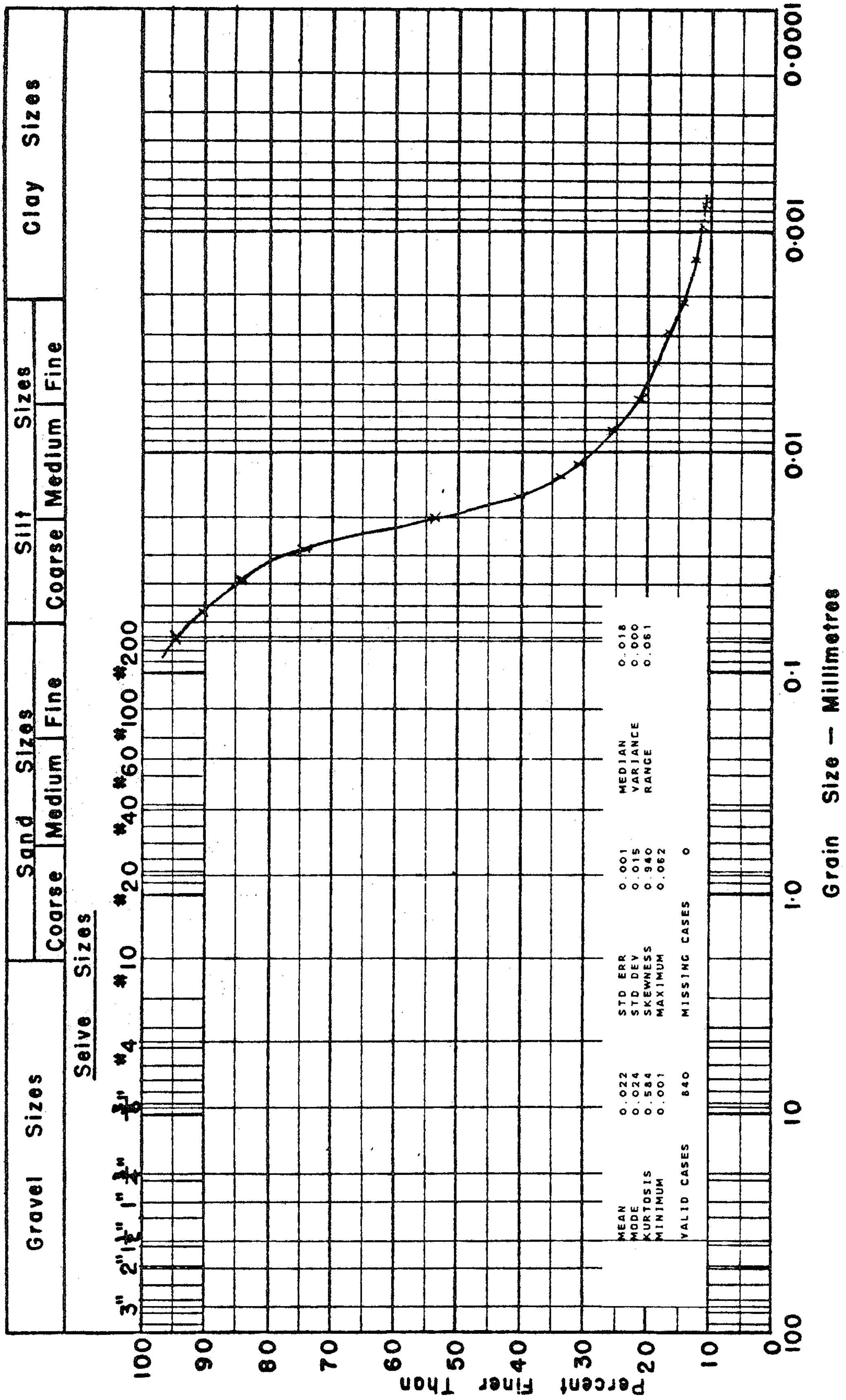


Figure 11.31. Grain Size Data: Maktak Fjord GT-33



MEAN	0.018	STD ERR	0.000	MEDIAN	0.013
MODE	0.018	STD DEV	0.012	VARIANCE	0.000
KURTOSIS	4.741	SKEWNESS	1.877	RANGE	0.086
MINIMUM	0.001	MAXIMUM	0.086		
VALID CASES	844	MISSING CASES	0		

Figure 11.32. Grain Size Data: Maktak Fjord GT-34



```
MEAN        0.022   STD ERR     0.001   MEDIAN     0.018
MODE        0.024   STD DEV     0.015   VARIANCE   0.000
KURTOSIS    0.584   SKEWNESS    0.940   RANGE      0.061
MINIMUM     0.001   MAXIMUM     0.062

VALID CASES   840   MISSING CASES   0
```

Figure 11.33. Grain Size Data: Maktak Fjord GT-35

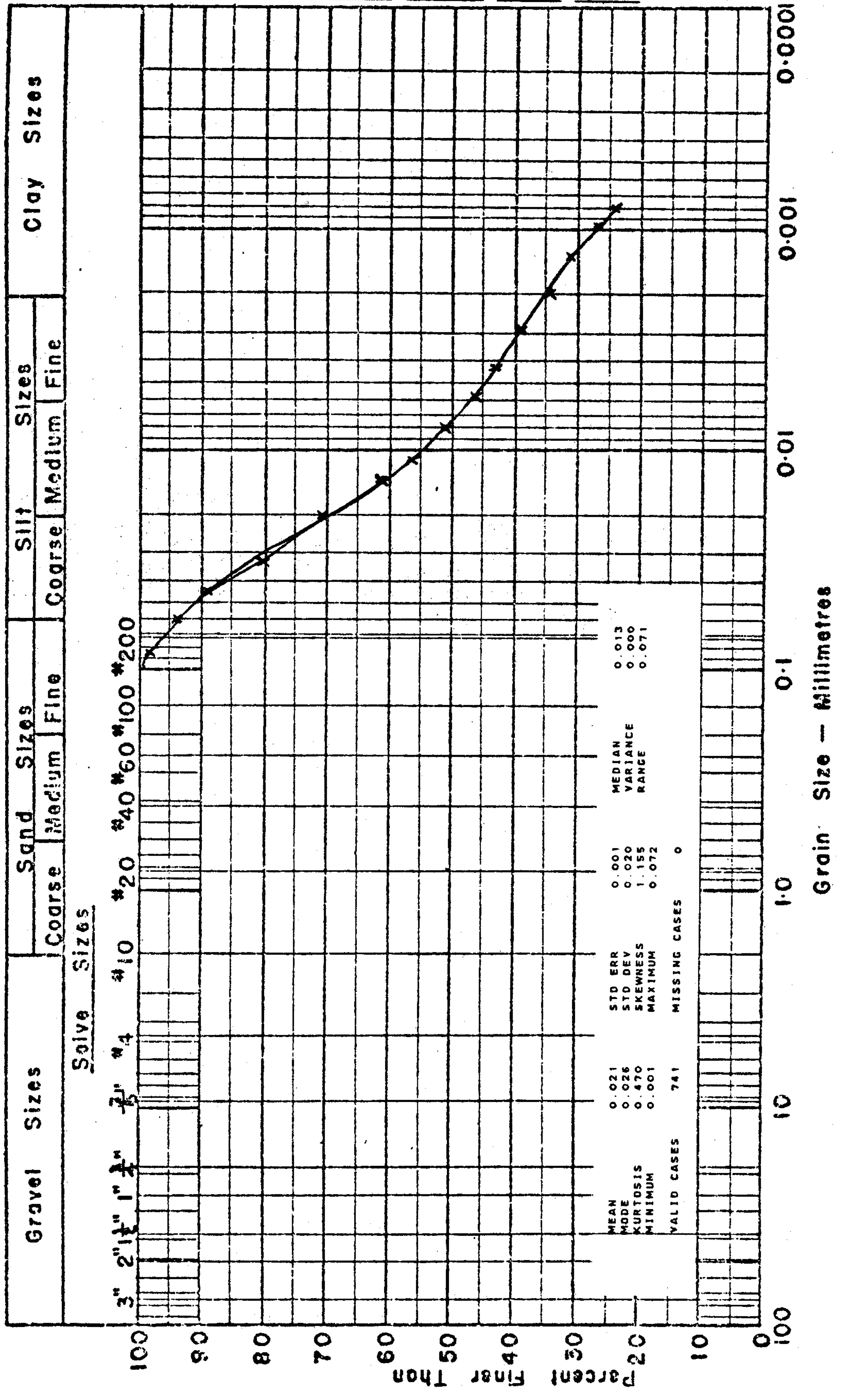


Figure 11.34. Grain Size Data: Maktak Fjord GT-36

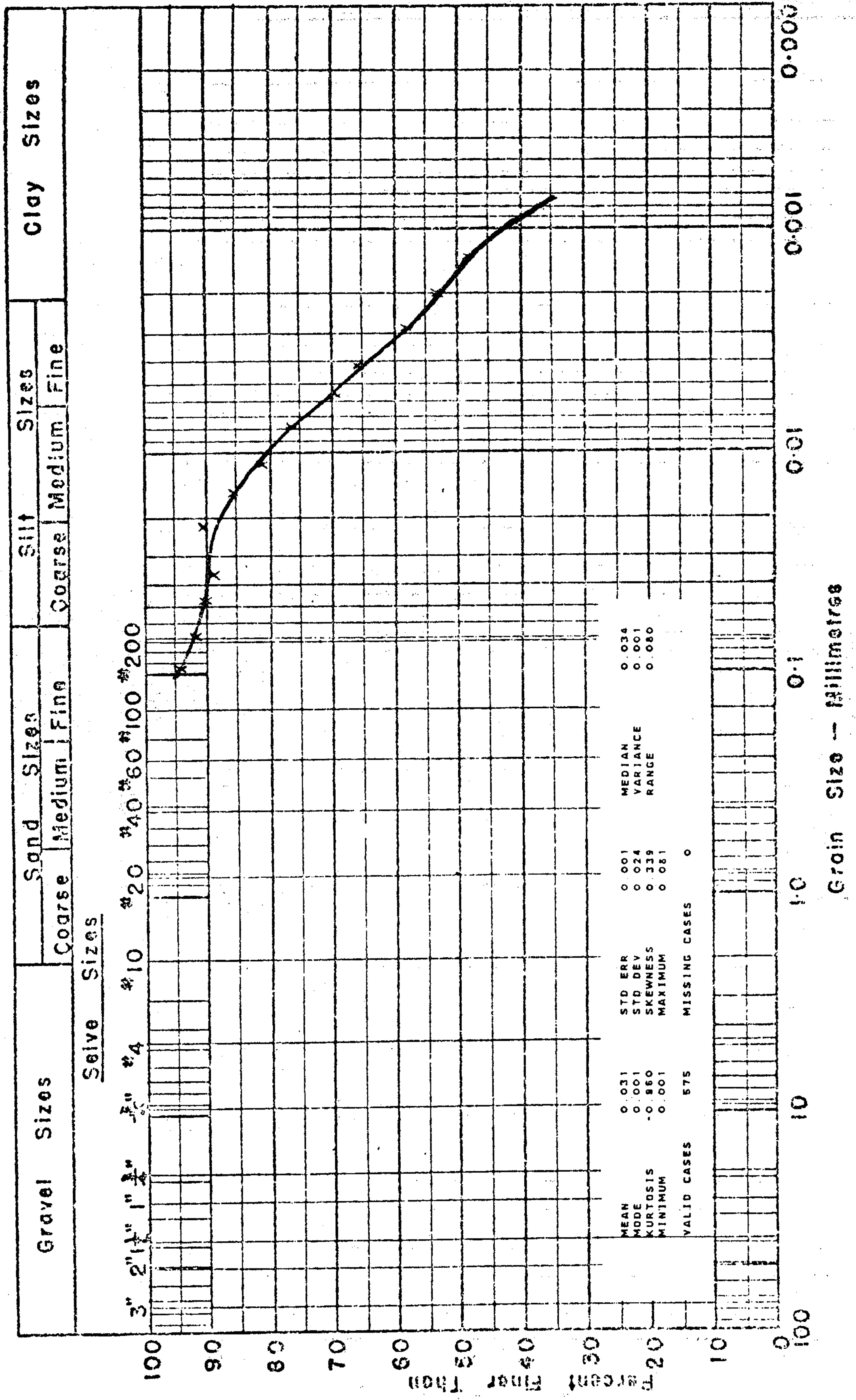
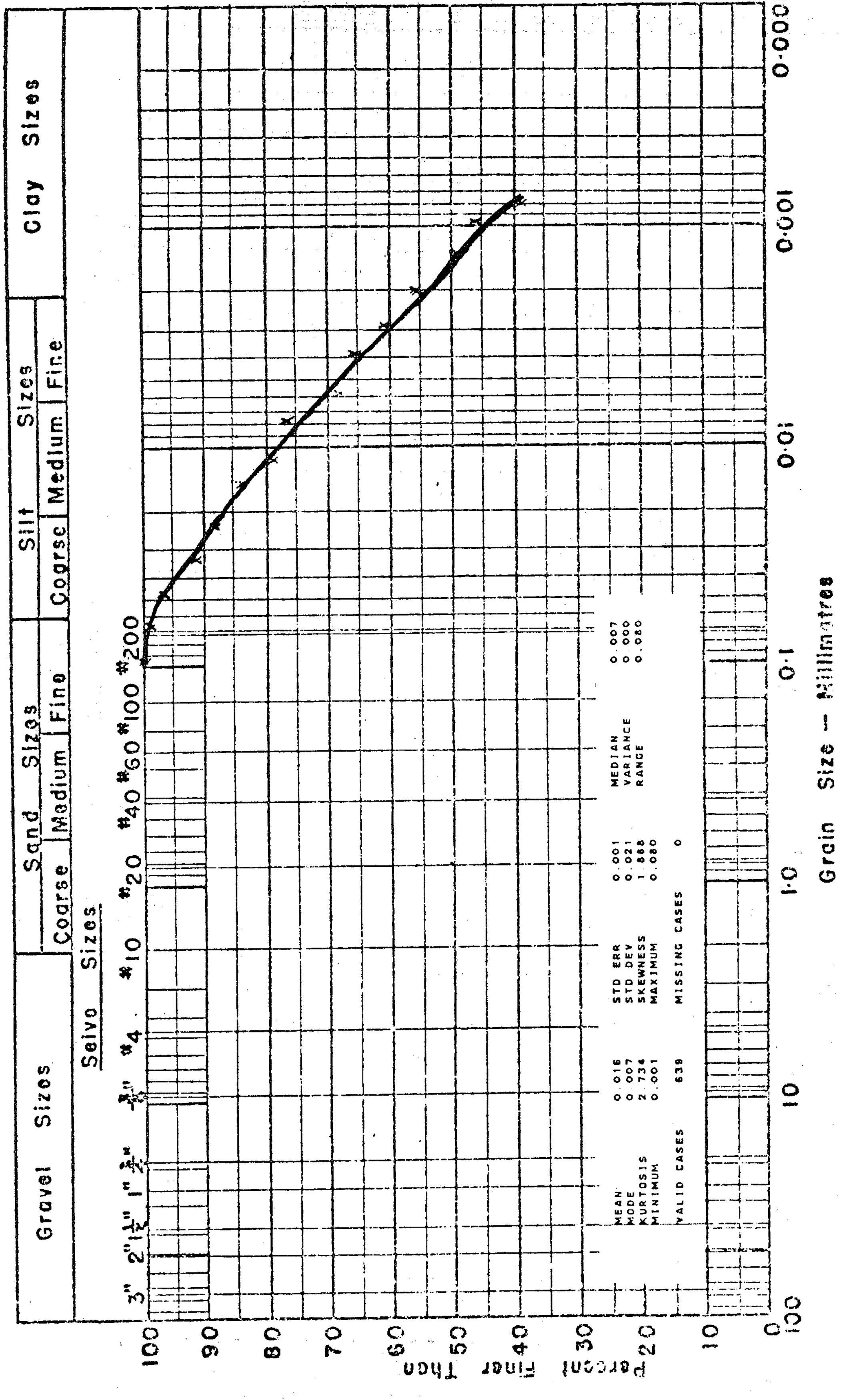


Figure 11.35. Grain Size Data: Maktak Fjord GT-37



MEAN	0.016	STD ERR	0.001	MEDIAN	0.007
MODE	0.007	STD DEV	0.021	VARIANCE	0.000
KURTOSIS	2.734	SKEWNESS	1.888	RANGE	0.080
MINIMUM	0.001	MAXIMUM	0.080		
VALID CASES	638	MISSING CASES	0		

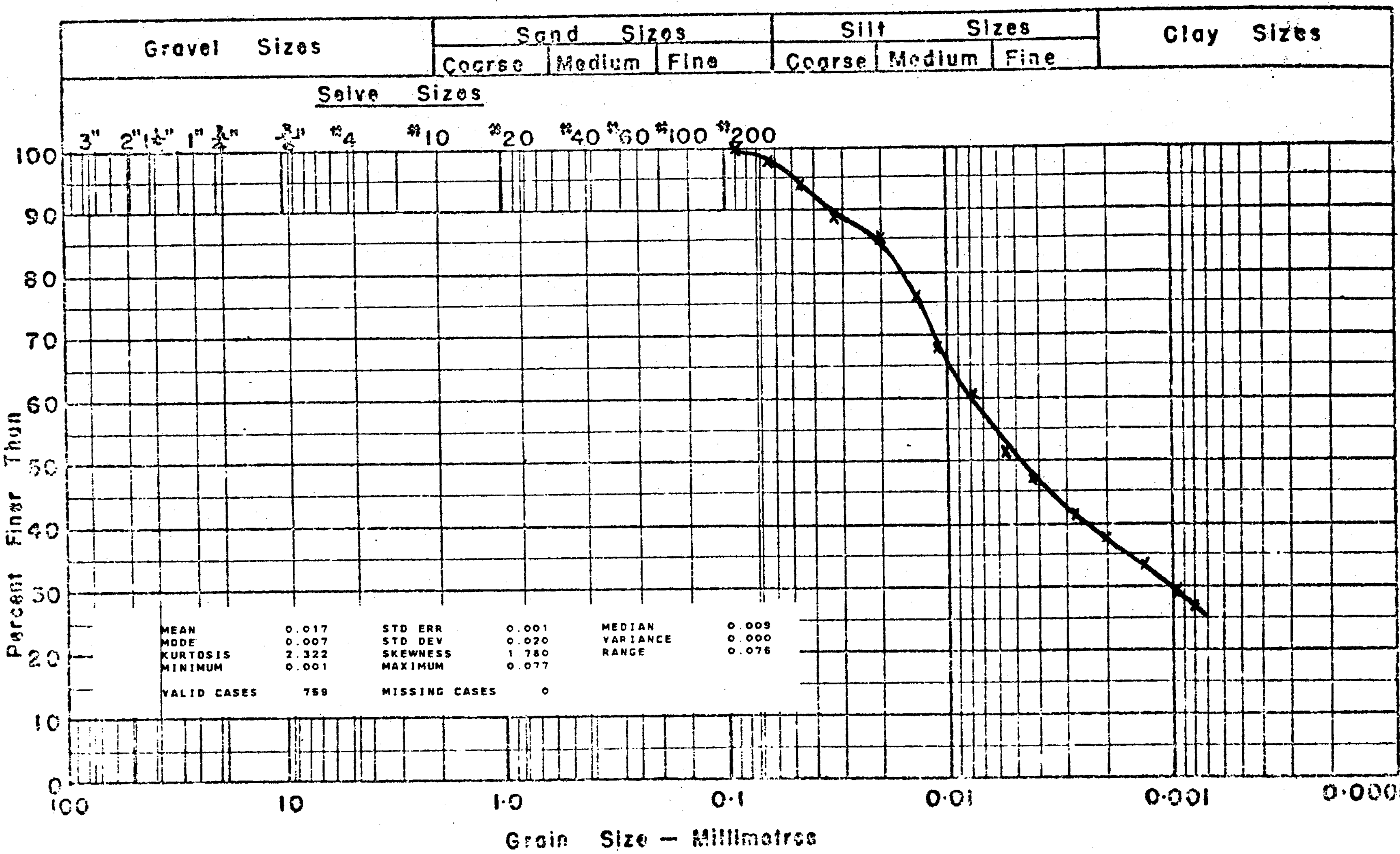


Figure 11.36. Grain Size Data: Maktak Fjord GT-38

Table 11.10 Geotechnical Data: Maktak Fjord

Sample #	Depth (m±2.5cm)	Water Content (Dry Basis) w(%)	Natural Water Content w(%)	Atterberg Limits WL(%)	WP(%)	IP
Core: MA-4 82-04996						
GT-20	0-0.025	96.03	48.99	80.0	38.9	41.1
GT-21	0.55	109.08	52.17	71.9	36.5	35.4
GT-22	1.00	85.71	46.15	57.8	33.4	24.4
GT-23	1.50	91.22	47.70	67.5	35.6	31.9
GT-24	2.00	85.13	45.98	63.0	32.6	30.4
GT-25	2.60	85.83	46.19	58.2	35.3	22.9
Core: MA-5 82-04865						
GT-12	0-0.05	102.39	50.59	48.0	28.0	20.0
GT-13	0.10	83.28	45.44	68.7	33.7	35.0
GT-14	0.30	60.35	37.64	40.7	25.7	15.0
GT-15	0.39	27.33	21.47	29.8	20.9	8.9
GT-16	0.50	59.81	37.43	38.5	24.6	13.9
GT-17	0.70	83.71	45.57	56.8	31.3	25.5
GT-18	1.05	98.28	49.57	78.7	33.9	44.8
GT-19	1.50	40.14	28.64	23.7	20.6	3.1

w= water content

WL= liquid limit

WP= plastic limit

IP= plasticity index

Table 11.10 (cont'd) Geotechnical Data: Maktak Fjord

Sample #	Depth (m±2.5cm)	Water Content (Dry Basis) w(%)	Natural Water Content w(%)	Atterberg Limits WL(%)	WP(%)	IP
Core: MA-5a 82-04868						
GT-32	0-0.10	78.80	44.07	52.7	31.1	21.6
GT-33	0.15	32.64	24.61	21.7	20.7	1.0
GT-34	0.23	29.63	22.86	21.5	20.7	0.8
GT-35	0.30	37.31	27.17	33.0	23.7	9.3
GT-36	0.50	89.44	47.21	65.5	31.8	33.7
GT-37	1.00	93.18	48.23	56.3	27.0	29.3
GT-38	1.35	45.42	31.24	28.5	18.7	9.8
GT-39	1.40	48.55	32.68	29.9	19.9	10.0

w= water content WL= liquid limit

WP= plastic limit IP= plasticity index

Table 11.11 <u>Geotechnical Data: Maktak Fjord</u>

<u>Miniature Vane Shear Test Results</u>

Sample #	Depth (m±2.5cm)	Undisturbed Shear Stress (Kg-cm)	Remolded Shear Stress (Kg-cm)	Sensitivity
Core: MA-4 82-04996				
GT-21	0.55	.0317	.0115	2.75
GT-22	1.0	.0725	.0167	4.35
GT-23	1.5	.0950	.0317	3.00
GT-24	2.0	.0777	.0305	2.55
GT-25	2.6	.1030	.0207	4.97
Core: MA-5 82-04865				
GT-13	0.1	.0443	.0196	2.27
GT-14	0.3	.0627	.0104	6.06
GT-15	.039	.0604	.0086	7.00
GT-16	0.5	.0530	.0075	7.08
GT-17	0.7	.0737	.0150	4.92
GT-18	1.05	.0702	.0144	4.88
GT-19	1.50	.0213	.0069	3.08

Table 11.11 (cont'd) Geotechnical Data: Maktak Fjord

Miniature Vane Shear Test Results

Sample #	Depth (m±2.5cm)	Undisturbed Shear Stress (Kg-cm)	Remolded Shear Stress (Kg-cm)	Sensitivity
Core: MA-5A 82-04868				
GT-32	0.05	.0495	.0155	3.19
GT-33	0.15	.0800	.0236	3.39
GT-34	0.20	.0489	.0138	3.54
GT-35	0.30	.0535	.0138	3.87
GT-36	0.50	.0673	.0161	4.18
GT-37	1.0	.0478	.0744	6.39
GT-38	1.35	.0927	.0178	5.19
GT-39	1.40	.1019	.0092	11.06

Table 11.12 Mineralogy of <2 μm Material: Maktak Fjord

Sample	Depth	Relative % Clays[1]				Other Phases[2]			
#	(m±2.5cm)	K	I	CHL	SW	Q	PL	KF	AMP
Core: MA-4 82-04996									
GT-20	0-0.025	7	78	10	5[3]	t	m	m	t
GT-21	0.55	3	77	14	6[3]	mt	m	m	t
GT-22[7]	1.00	8	71	11	10[3]	mt	m	m	t
GT-23	1.50	7	70	14	9[3]	mt	m	m	t
GT-24	2.00	8	72	10	10[3]	mt	m	m	t
GT-25[7]	2.60	7	75	10	8[3]	mt	m	m	t
Core: MA-5 82-04865									
GT-12[7]	0-0.05	7	80	10	3[3]	mt	m	m	t
Gt-13[7]	0.10	7	80	9	4[3]	mt	m	m	t
GT-14[7]	0.30	4	83	10	3[3]	mt	m	m	t
GT-15	0.39	6	81	10	3[3]	mt	m	m	t
GT-16[7]	0.50	6	82	8	4[3]	mt	m	m	t
GT-17	0.70	6	79	10	5[3]	mt	m	m	t
GT-18[7]	1.05	5	76	11	8[3]	m	m	m	t
GT-19	1.50	6	82	9	3[3]	mt	m	m	t

Table 11.12 (cont'd.) Maktak Fjord

Sample #	Depth (m±2.5cm)	K	I	CHL	SW	Q	PL	KF	AMP
Core: MA-5A 82-04868									
GT-32	0-0.10	6	79	10	5[3]	t	m	m	t
GT-33	0.15	8	80	9	3[3]	mt	m	m	t
GT-34	0.23	5	81	10	4[3]	mt	m	m	t
GT-35	0.30	8	79	10	3[3]	mt	m	m	t
GT-36	0.50	7	76	9	8[3]	mt	m	m	t
GT-37	1.00	6	80	8[4]	6[3]	t	m	m	t
GT-38	1.35	5	87	6	2[3]	mt	m	m	t
GT-39	1.40	11	83	4	2[3]	mt	m	m	t

Column groups: Relative % Clays[1] (K, I, CHL, SW); Other Phases[2] (Q, PL, KF, AMP).

K= kaolinite I= illite CHL= chlorite SW= swelling clay

Q= quartz PL= plagioclase KF= potassium feldspar

AMP= amphibole

[1] The relative amounts of clay minerals reported are weighted percentages, normalized to 100 %, using the procedures described in the text.

[2] m = minor phase, mt = minor to trace phase, t = trace phase, nd = not detected.

[3] The swelling clay material is mostly smectite.

[4] A regularly interstratified clay mineral, probably corrensite, is also present in trace amounts.

[7] A trace of non-clay mineral at d=12 Å is indicated.

Core Descriptions

CORE IT-3, 82-0441, ITIRBILUNG FJORD, LENGTH=2.4m

0-0.19m: 5y 4/4; Greenish sandy silty mud, structureless, scattered dark streaks, sand-size is commonly as mica flakes (? wind blown) dispersed in silty mud.

0.19m: Large angular dropstone (9cm x 6cm x 4cm).

0.19-0.215m: 5y 2.5/1 (5y 4/4); Loaded, escape burrow with deformed spriten consisting of alternating dark and lighter green laminae; loaded escape burrow is 2cm high x 4cm wide.

0.215-0.27m: 5y 4/3 (5y 2.5/1); Green mud, structureless with scattered dark reduced streaks, scattered mica flakes (sand-size) in mud.

0.27-0.46m: 5y 4/3; Green silty mud with scattered mica flakes (sand-size), extensively bioturbated, burrows heavily filled with very dark reduced sediment.

0.46-0.67m: 5y 4/3; Green silty mud with scattered mica flakes, medium burrowing, structureless.

0.67-0.90m: 5y 4/3; Silty mud with sand-size mica flakes, few scattered burrows and reduced zones.

0.90-0.98m: 5y 4/2; Slightly darker green silty mud, medium burrowing with reduced zones, structureless.

0.98-1.37m: 5y 4/3; Silty mud, slight to medium burrowing structureless.

1.37-1.43m: 5y 4/2; Silty mud with sand-size mica flakes; extensively bioturbated with heavily reduced zones.

1.43-1.60m: 5y 4/3; Fine sandy, silty mud, structureless, medium burrowing with reduced zones.

1.60-1.70m: 5y 4/2; Silty mud with sand-size mica flakes; extensively bioturbated, burrows heavily reduced.

1.70-1.83m: 5y 4/3; Medium-fine sandy, silty mud, medium-slight burrowing, structureless.

1.83-2.13m: 5y 5/2; Tannish green sandy mud, slight burrowing with a few scattered dark reduced streaks.

2.13-2.20m: 5y 4/3; Silty mud with scattered sand-size mica flakes, structureless.

2.20-2.40m: 5y 4/2; Silty mud with scattered sand-size mica flakes, a few dark reduced streaks.

Disturbance: none.

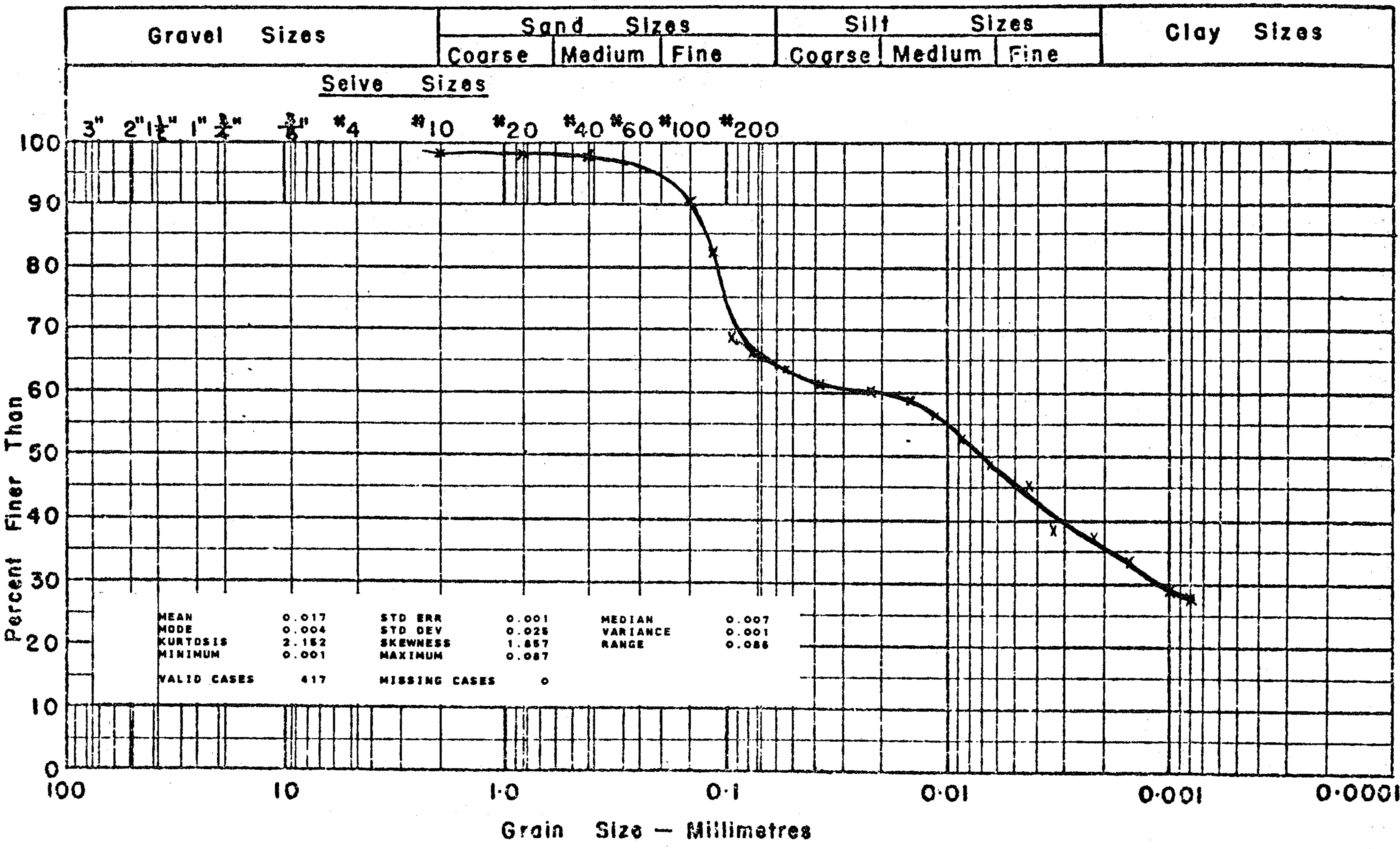
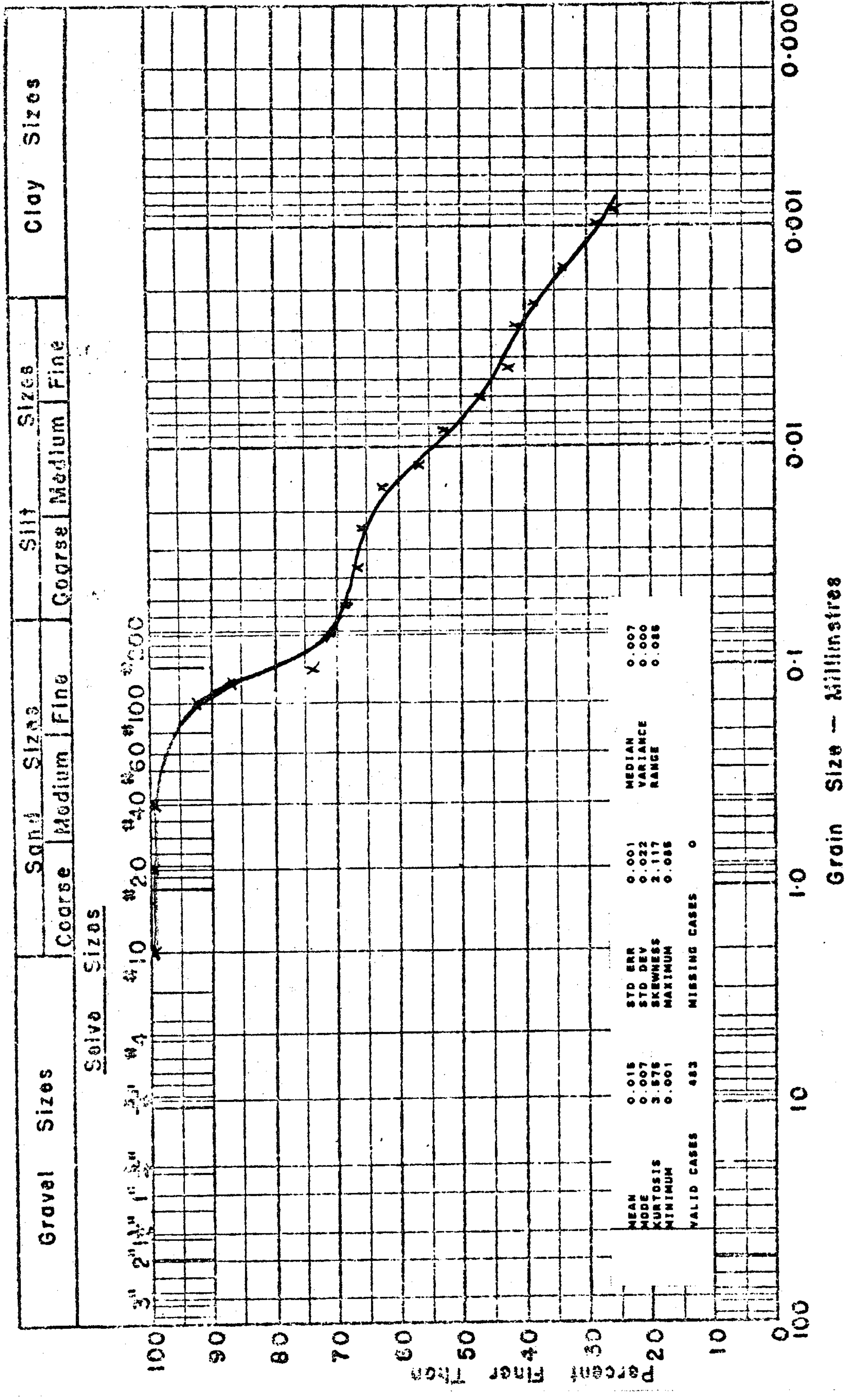


Figure 11.37. Grain Size Data: Itirbilung Fjord GT-40

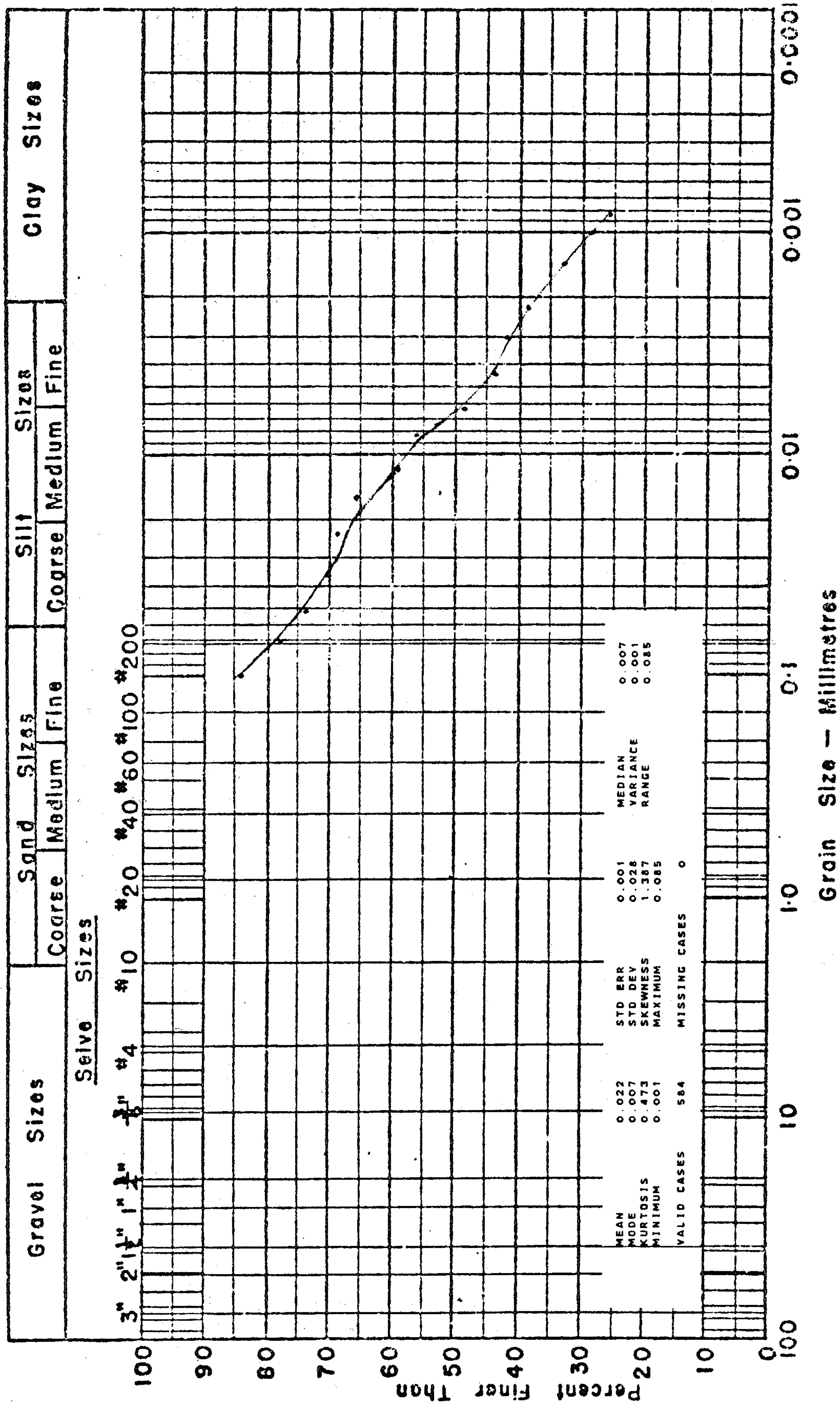
```
MEAN          0.017      STD ERR         0.001      MEDIAN       0.007
MODE          0.004      STD DEV         0.025      VARIANCE     0.001
KURTOSIS      2.152      SKEWNESS        1.857      RANGE        0.086
MINIMUM       0.001      MAXIMUM         0.087

VALID CASES     417      MISSING CASES       0
```

Figure 11.38. Grain Size Data: Itirbilung Fjord GT-41



```
MEAN         0.015   STD ERR        0.001   MEDIAN     0.007
MODE         0.007   STD DEV        0.022   VARIANCE   0.000
KURTOSIS     3.576   SKEWNESS       2.117   RANGE      0.085
MINIMUM      0.001   MAXIMUM        0.085

VALID CASES    483   MISSING CASES      0
```

Figure 11.39. Grain Size Data: Itirbilung Fjord GT-42



```
MEAN          0.022     STD ERR         0.001     MEDIAN        0.007
MODE          0.007     STD DEV         0.028     VARIANCE      0.001
KURTOSIS      0.473     SKEWNESS        1.387     RANGE         0.085
MINIMUM       0.001     MAXIMUM         0.085

VALID CASES     584     MISSING CASES       0
```

Figure 11.40. Grain Size Data: Itirbilung Fjord GT-43

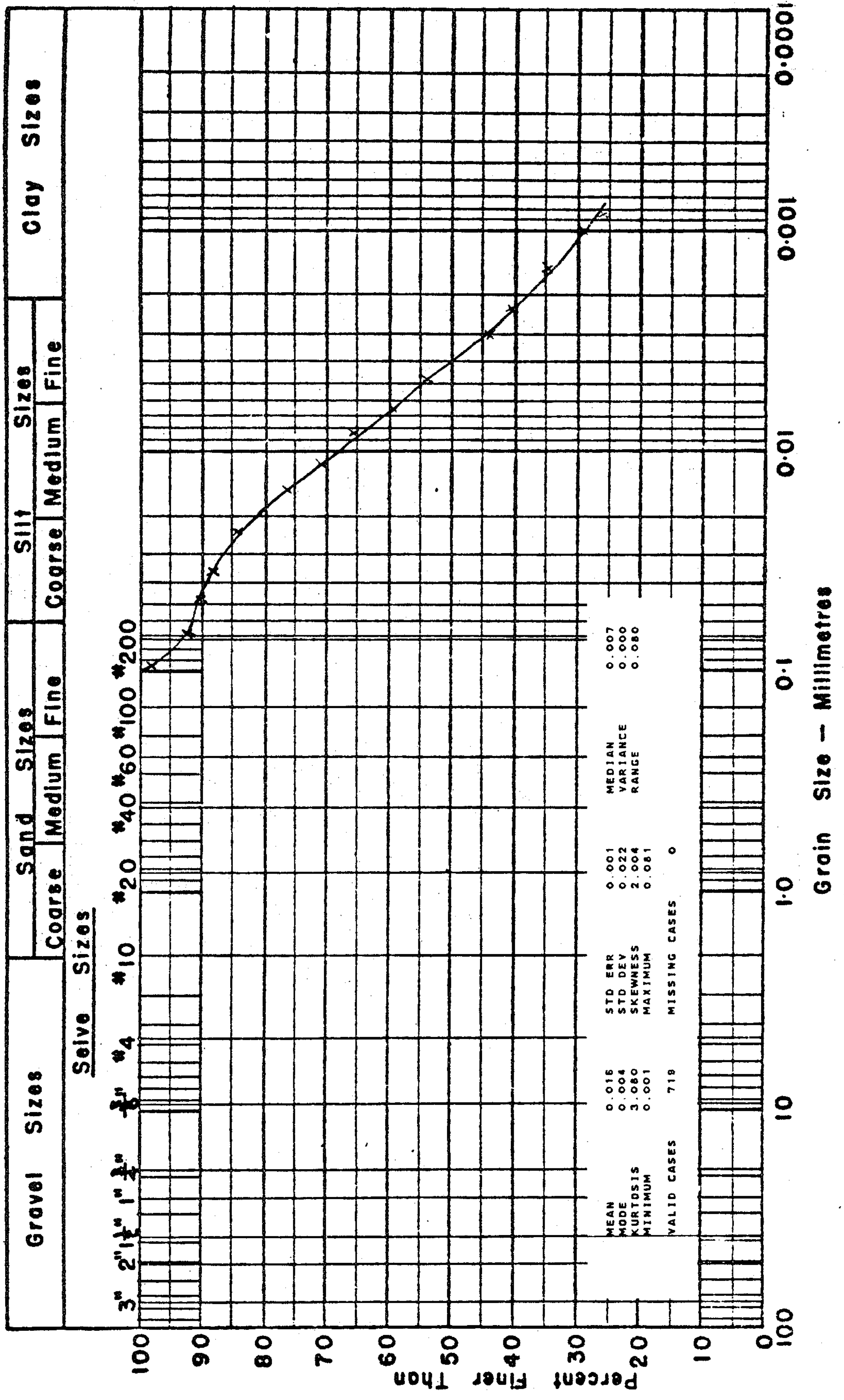
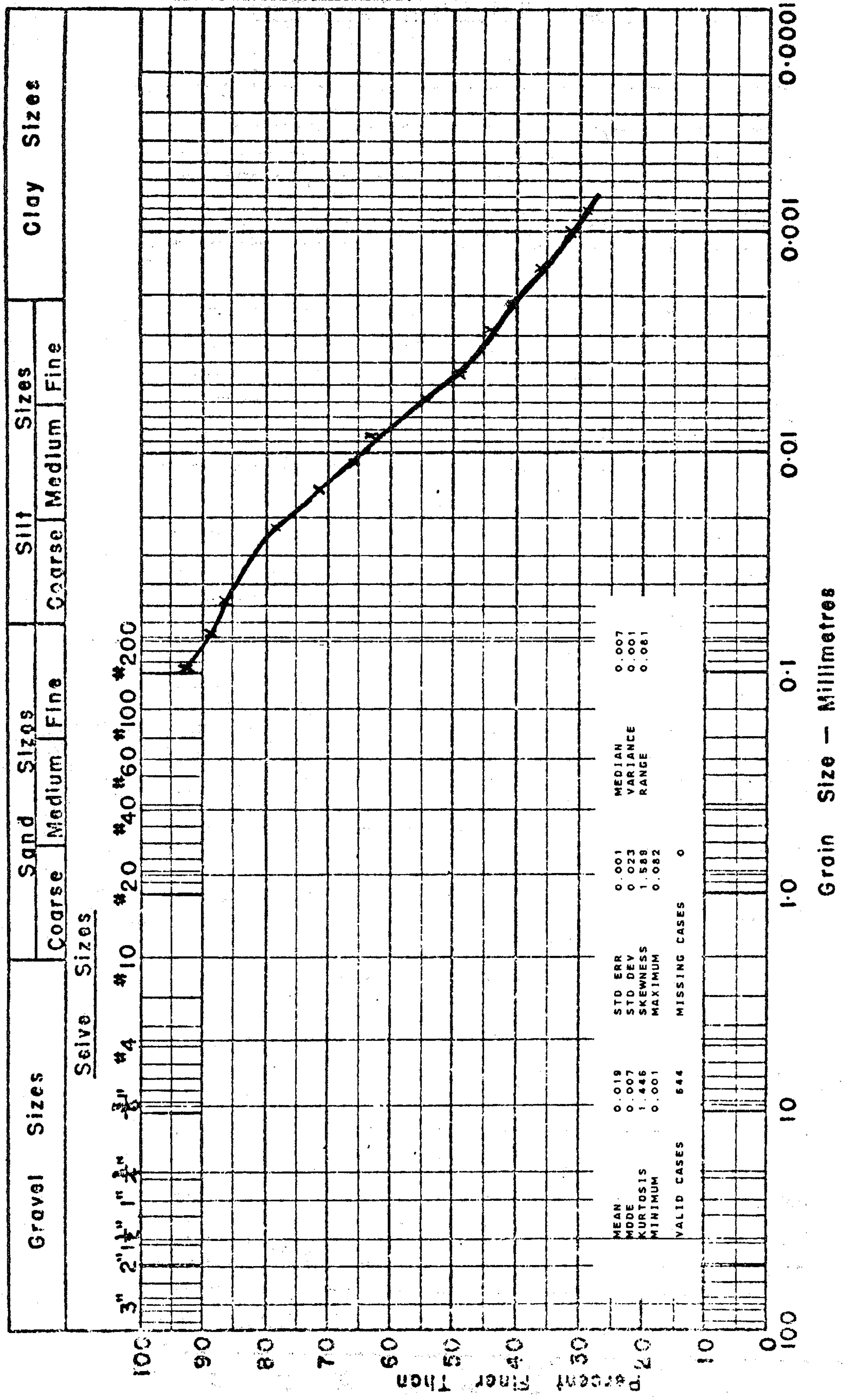
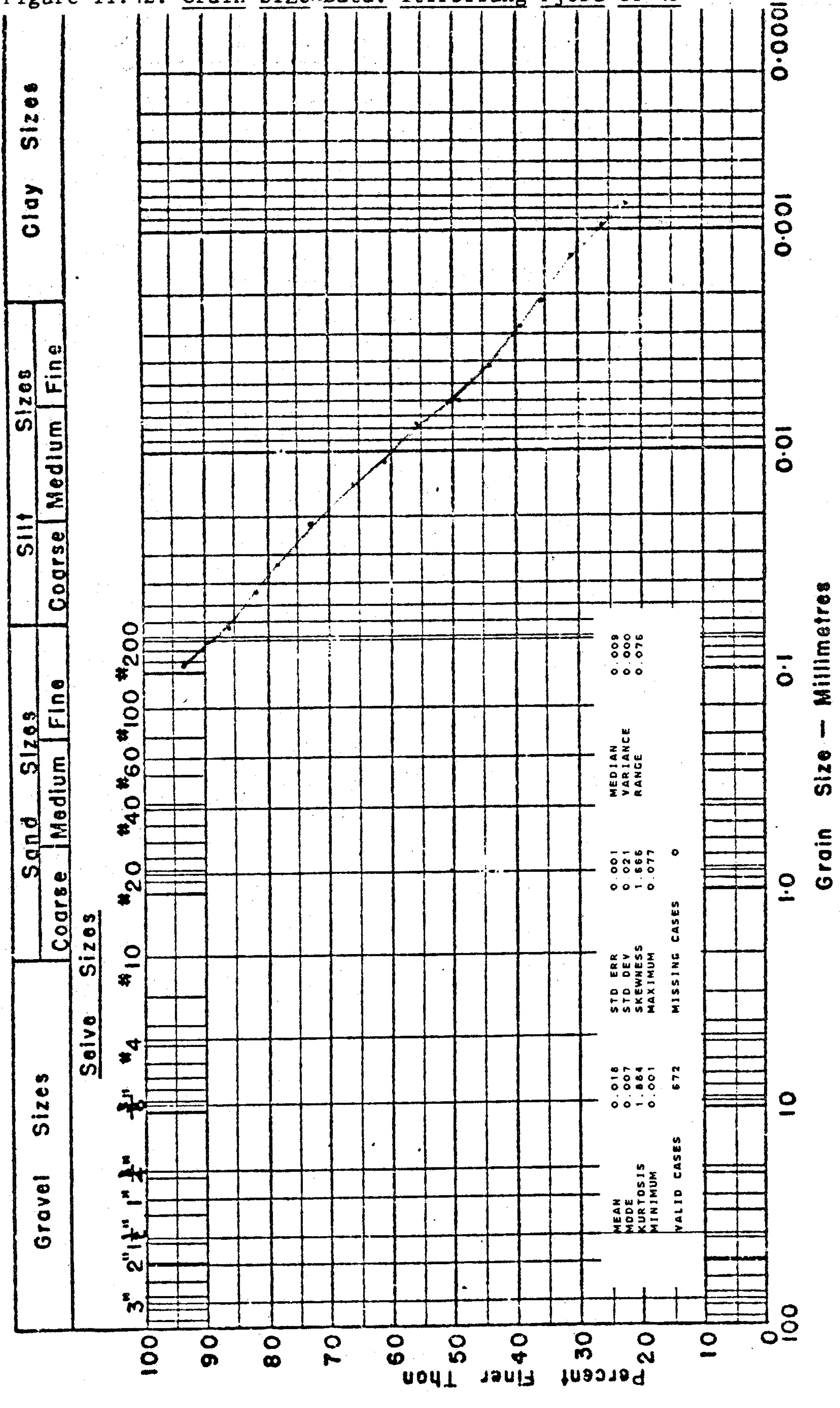


Figure 11.41. Grain Size Data: Itirbilung Fjord GT-44



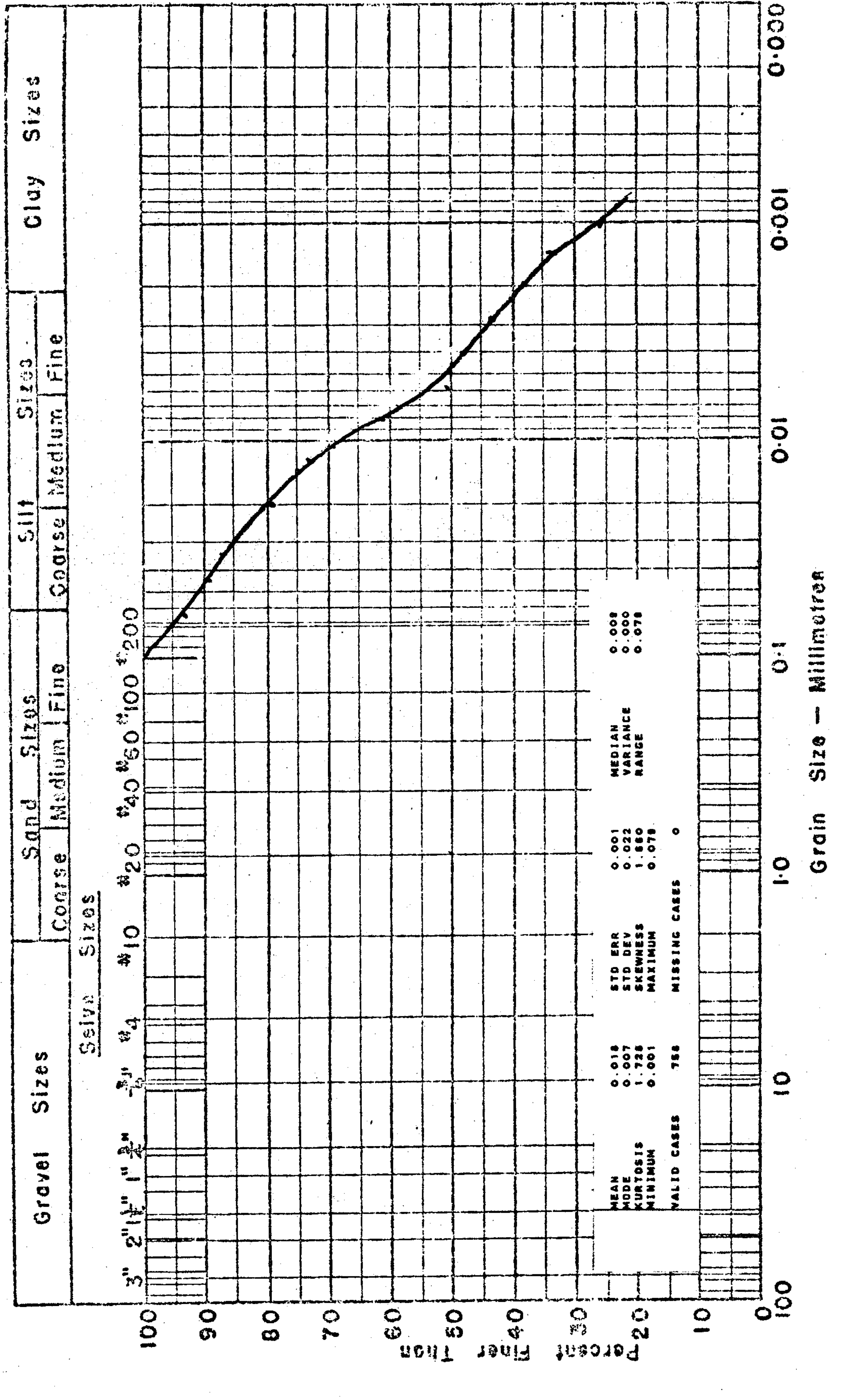
```
MEAN        0.019   STD ERR       0.001   MEDIAN     0.007
MODE        0.007   STD DEV       0.023   VARIANCE   0.001
KURTOSIS    1.446   SKEWNESS      1.588   RANGE      0.081
MINIMUM     0.001   MAXIMUM       0.082

VALID CASES   644   MISSING CASES     0
```

Figure 11.42. Grain Size Data: Itirbilung Fjord GT-45



```
MEAN        0.018    STD ERR        0.001    MEDIAN      0.009
MODE        0.007    STD DEV        0.021    VARIANCE    0.000
KURTOSIS    1.884    SKEWNESS       1.666    RANGE       0.076
MINIMUM     0.001    MAXIMUM        0.077

VALID CASES   672    MISSING CASES      0
```

Figure 11.43. Grain Size Data: Itirbilung Fjord GT-46



MEAN	0.018	STD ERR	0.001	MEDIAN	0.008
MODE	0.007	STD DEV	0.022	VARIANCE	0.000
KURTOSIS	1.728	SKEWNESS	1.880	RANGE	0.078
MINIMUM	0.001	MAXIMUM	0.078		
VALID CASES	758	MISSING CASES	0		

Figure 11.44. Grain Size Data: Itirbilung Fjord GT-47

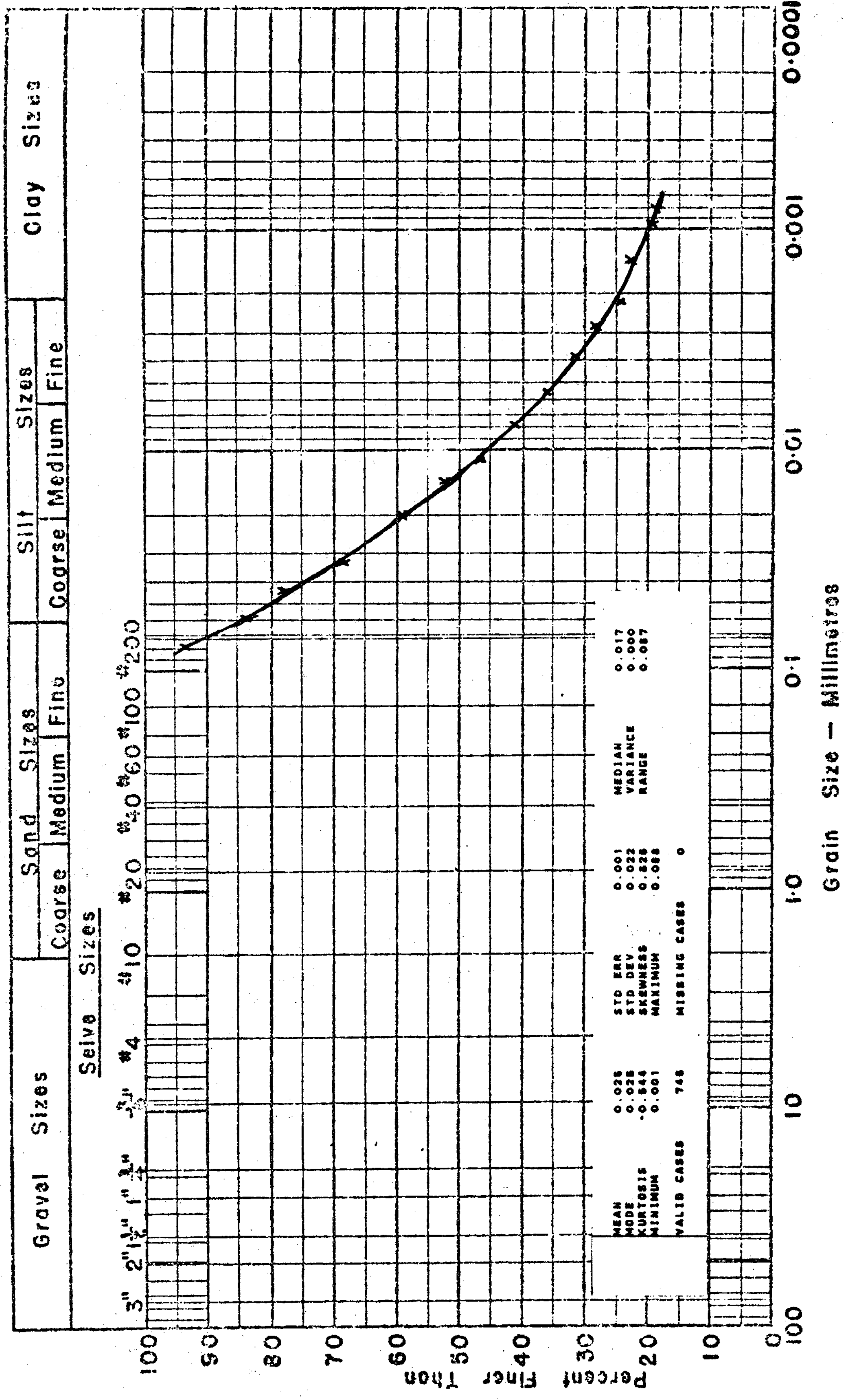
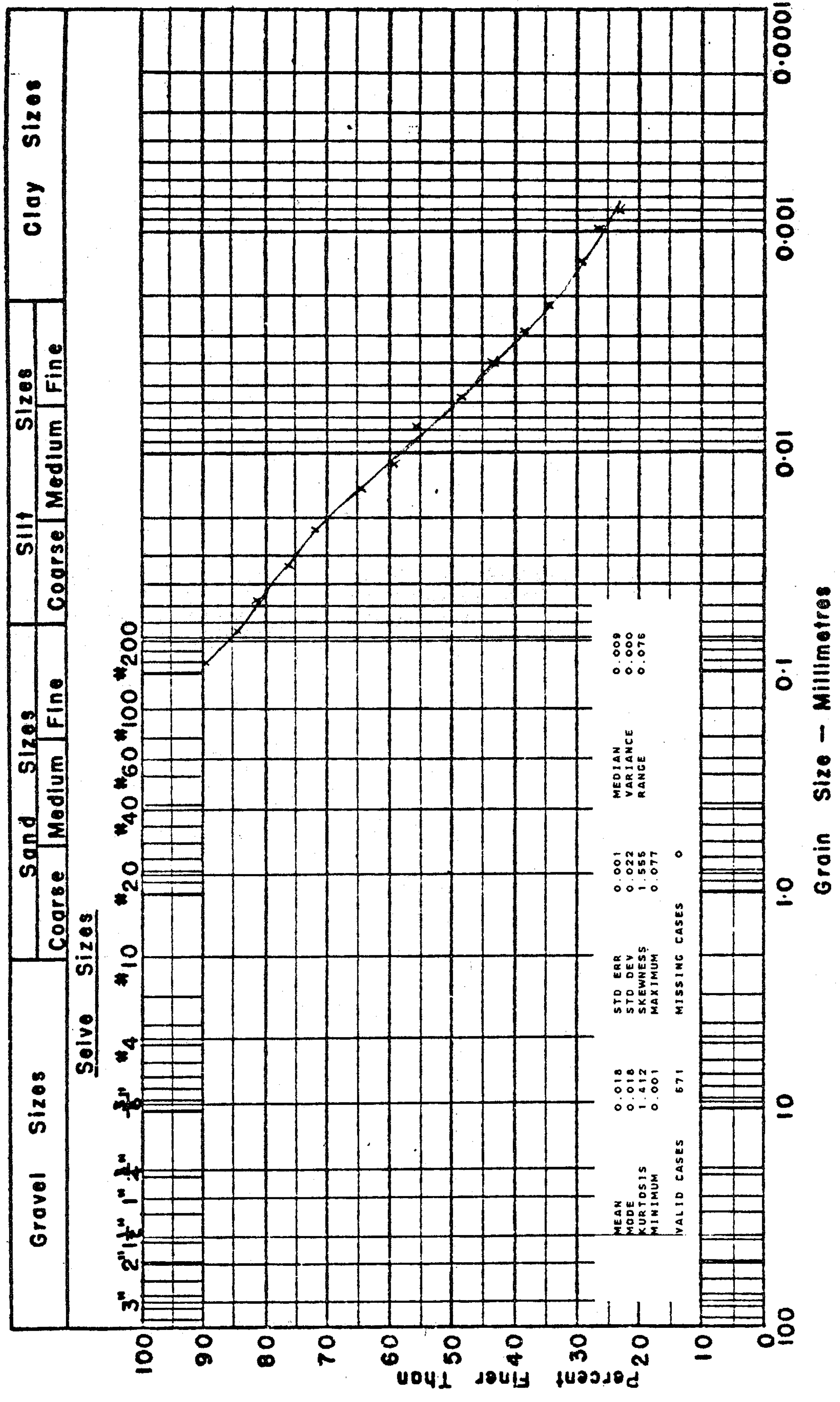


Figure 11.45. Grain Size Data: Itirbilung Fjord GT-48



MEAN	0.018	STD ERR	0.001	MEDIAN	0.009
MODE	0.018	STD DEV	0.022	VARIANCE	0.000
KURTOSIS	1.412	SKEWNESS	1.555	RANGE	0.076
MINIMUM	0.001	MAXIMUM	0.077		
VALID CASES	671	MISSING CASES	0		

Figure 11.46. Grain Size Data: Itirbilung Fjord GT-49

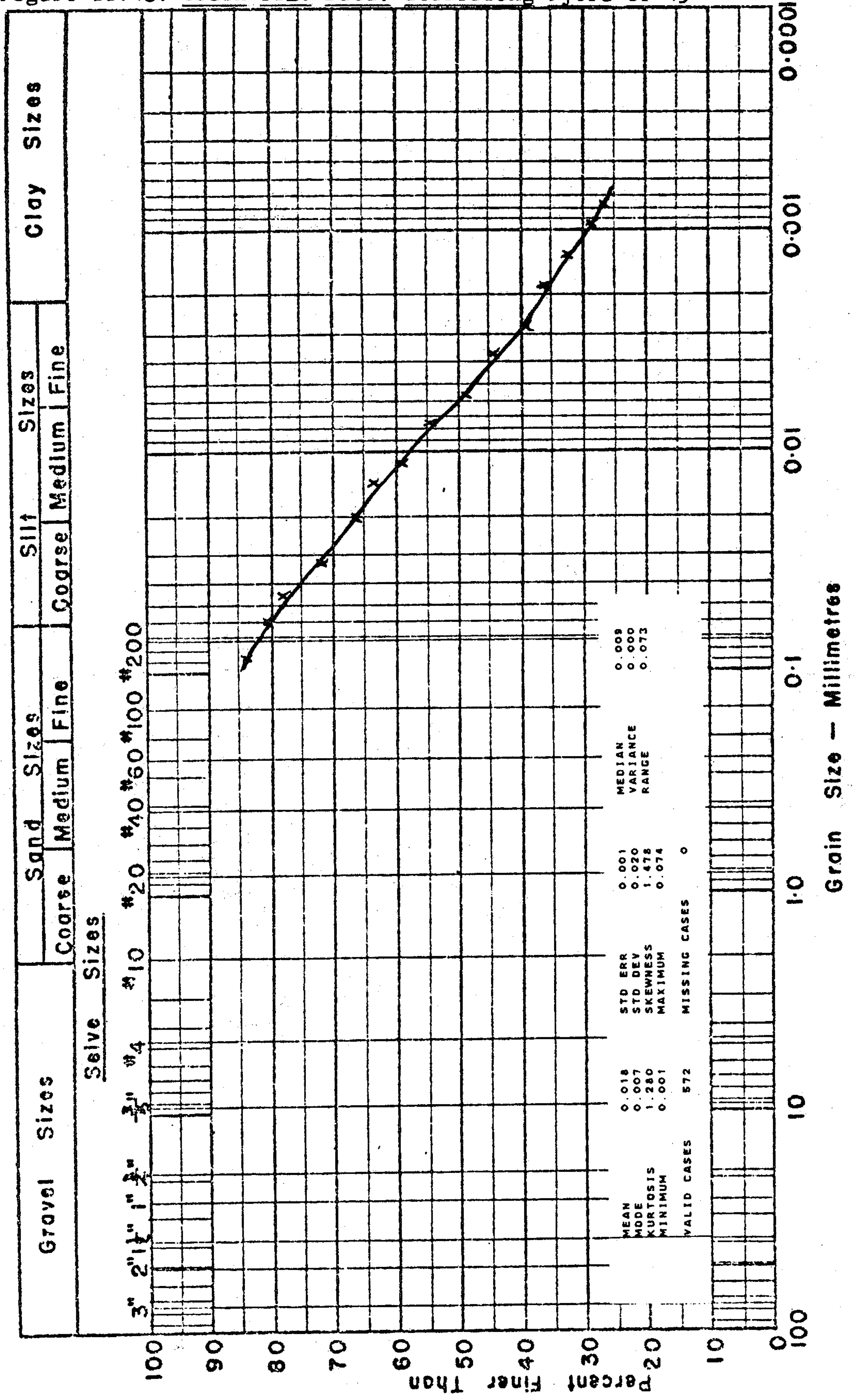


Figure 11.47. Grain Size Data: Itirbilung Fjord GT-50

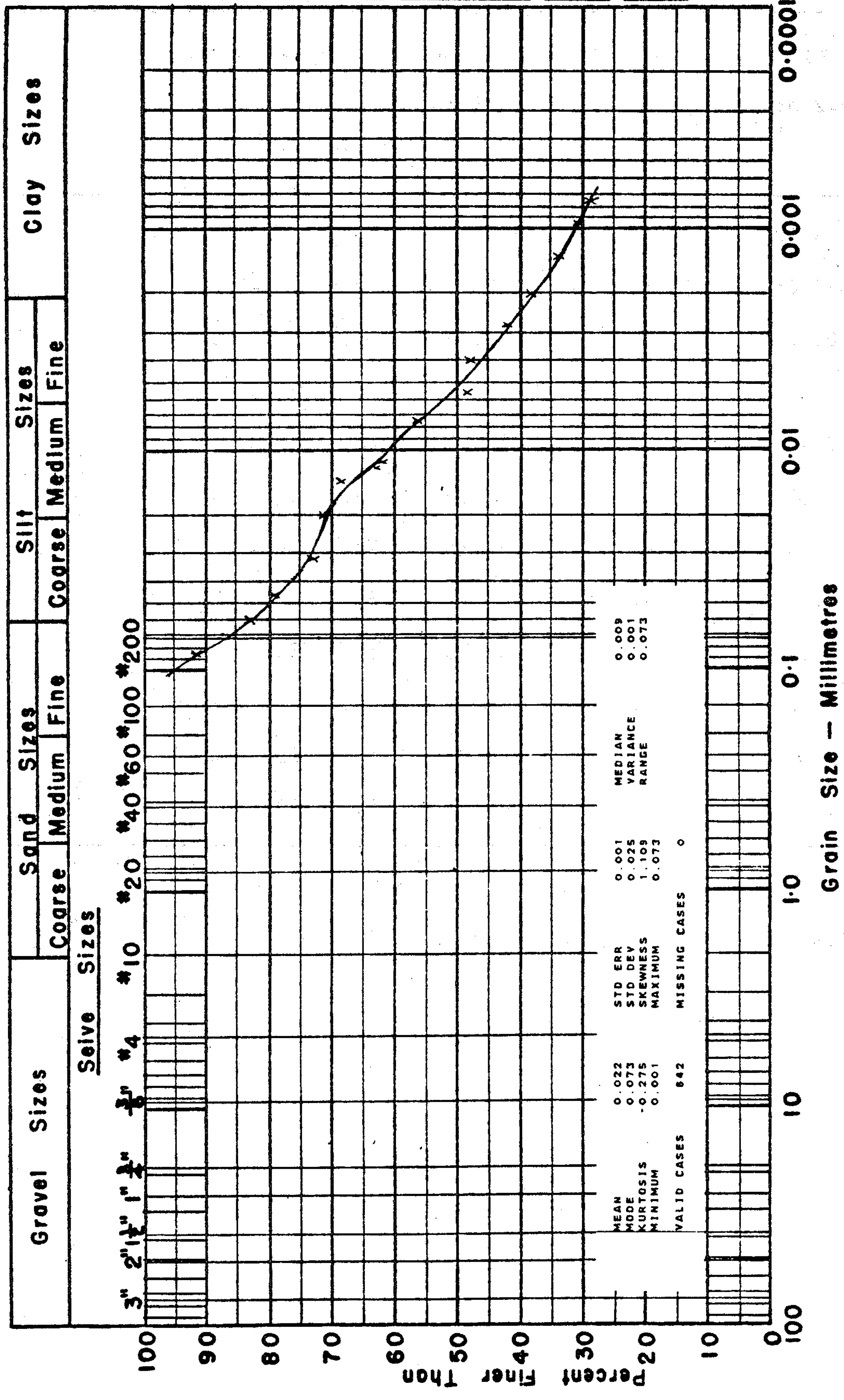


Table 11.13 Geotechnical Data: Itirbilung Fjord

Sample #	Depth (m±2.5cm)	Water Content (Dry Basis) w(%)	Natural Water Content w(%)	Atterberg Limits WL(%)	WP(%)	IP
Core: IT-3 82-04401						
GT-40	0-0.05	89.46	47.22	58.5	34.4	24.1
GT-41	0.10	78.28	43.89	64.4	33.1	31.3
GT-42	0.20	99.34	49.84	69.6	36.0	33.6
GT-43	0.40	95.70	48.90	73.5	36.6	36.9
GT-44	0.60	83.83	45.60	69.5	38.7	30.8
GT-45	1.00	81.69	44.85	70.8	36.5	34.3
GT-46	1.40	75.20	42.92	60.5	35.4	25.1
GT-47	1.65	75.92	43.16	63.0	32.7	30.3
GT-48	1.75	71.08	41.55	52.2	31.2	21.0
GT-49	2.00	65.44	39.56	49.3	28.9	20.4
GT-50	2.30	71.09	41.55	50.2	30.6	19.6

w= water content WL= liquid limit

WP= plastic limit IP= plasticity index

Table 11.14 Geotechnical Data: Itirbilung Fjord

Miniature Vane Shear Test Results

Sample #	Depth (m±2.5cm)	Undisturbed Shear Stress (Kg-cm)	Remolded Shear Stress (Kg-cm)	Sensitivity
Core: IT-3 82-04401				
GT-41	0.1	.0622	.0466	1.33
GT-42	0.2	.0409	.0685	0.60
GT-43	0.4	.0909	.0236	3.85
GT-44	0.6	.0800	.0207	3.86
GT-45	1.0	.1111	.0299	3.71
GT-46	1.4	.1070	.0247	4.33
GT-47	1.65	.1007	.0207	4.86
GT-48	1.75	.0886	.0242	3.67
GT-49	2.00	.0719	.0190	3.79
GT-50	2.20	.0782	.0173	4.53

Table 11.15 Mineralogy of <2μm Material: Itirbilung Fjord

Sample #	Depth (m±2.5cm)	Relative % Clays[1] K	I	CHL	SW	Other Phases[2] Q	PL	KF	AMP
Core: IT-3 82-04401									
GT-40	0-0.05	4	88[5]	6	2[3]	mt	m	m	t
GT-44	0.60	3	89[5]	5	3[3]	mt	m	m	t
GT-46	1.40	3	90[5]	5	2[3]	mt	m	m	t
GT-48	1.75	4	88[5]	4	4[3]	mt	m	m	t
GT-50	2.30	6	88[5]	4	2[3]	mt	m	m	t

K= kaolinite I= illite CHL= chlorite SW= swelling clay

Q= quartz PL= plagioclase KF= potassium feldspar

AMP= amphibole

[1] The relative amounts of clay minerals reported are weighted percentages, normalized to 100 %, using the procedures described in the text.

[2] m = minor phase, mt = minor to trace phase, t = trace phase, nd = not detected.

[3] The swelling clay material is mostly smectite.

[5] A small amount of randomly interstratified illite/smectite or degraded illite is also indicated. Chloritic hydroxy-interlayer material may also be present in some of the illite.

Core Descriptions

CORE IN-1, 82-04425, INUGSUIN FJORD, LENGTH=2.45m

0-0.27m: 5yr 4/2; Olive grey, very well-graded fine conglomerate to silty mud, dispersed pebbles (? dropstones) at 0.03m (2.5cm x 2.3cm x 2.0cm); 0.09m and 0.16m. (turbidite, ? AE)

0.27-0.38m: 5y 4/1; grey fine sandy mud, mainly structureless, some light-colored, scattered burrows.

0.38-0.60m: 5y 3/1; Dark grey silty mud with dispersed sand, massive, structureless, few scattered burrows, some with reduced zones, others not.

0.60-0.77m: 5y 4/2; Olive grey pebbly muds, faint laminations (0.5-1cm thick).

0.77-0.85m: 2.5y 5/2 (5y 4/2); Golden tan alternating with olive grey muds. Well-laminated, tan layers 1-2cm thick, grey layers 0.5cm thick, tan layers seem more plastic, grey layers are more compact.

0.85-1.23m: 5y 4/1 (5y 4/2); Lower 0.1m tan mud topped by thick massive grey mud. Faint laminations 0.1m above base, scattered burrows.

1.23-1.25m: 2.5y 4/0 (2.5y 4/2); Sandy to silty mud, fine sand dispersed in lower half, resulting in a more tannish color.

1.25-1.28m: 5y 4/2; Olive green silty mud, some dispersed fine sand.

1.28-1.31m: 5y 4/2; Olive green sandy, silty mud, graded with more dispersed sand towards base and silty mud towards top.

1.31-1.325m: 5y 4/2 (5y 4/1); Olive green sandy mud graded into grey silty mud, lower 0.5cm has dispersed fine sand in mud.

1.325-1.365m: 5y 4/2 (5y 4/1); Olive green sandy mud graded into grey silty mud, lower 0.8cm has dispersed fine sand in mud.

1.365-1.385m: 5y 4/2 (5y 4/1); Olive green sandy mud graded into grey silty mud, lower 1.3cm has dispersed fine sand in mud.

1.385-1.41m: 5y 3/2; Grey silty mud, ungraded, slight amount of very fine sand dispersed in mud.

1.41-1.46m: 5y 4/2 (5y 4/1); Grey silty mud, ungraded, seems lighter colored at base and at top (5y 4/2).

1.46-1.48m: 5y 4/2; Olive grey silty mud with dispersed fine sand, ungraded.

1.48-1.59m: 5y 4/1 (5y 4/2); Graded grey sandy, silty muds to lighter colored grey silty mud, well laminated couplets, darker sandy intervals average 1cm thick, upper silty muds average 2-3cm thick.

1.59-1.84m: 5y 4/2 (5y 5/2); Graded olive grey sandy muds to grey muds with less dispersed fine sand, well laminated couplets, olive grey layers average 2cm thick, light grey layers average 1cm thick.

1.84-2.1m: 5y 4/2 (5y 5/2); Graded olive grey sandy and granule muds to grey muds with less dispersed fine sand, well laminated couplets, olive grey layers average 1-2cm thick, light grey layers average 1-1.5cm thick.

2.1-2.22m: 5y 4/2 (5y 5/2); Graded olive grey sandy muds to grey muds, well laminated couplets, olive grey layers average 2-2.5cm thick, light grey layers average 0.5-1cm thick.

2.22-2.29m: 5y 4/2; Tannish olive grey fine sand to fine sandy mud, graded, sand concentrated at base, more dispersed in mud above base.

2.29-2.295m: 5y 3/2; Grey silty mud, structureless.

2.295-2.33m: 5y 4/2; Tannish fine sand, slightly coarser at 2.305m; laminated at a high angular discordance to bedding, ? crossbedded or a syn-depositional fold.

2.33-2.45m: 5y 3/1; Sandy mud capped by more massive dark olive silty grey mud with dispersed fine sand.

Disturbance: Top surface flowed out during split, flow-out at 2.3m, some downflow of sand along sides of core at 0.15m.

Figure 11.48. Grain Size Data: Inugsuin Fjord GT-59

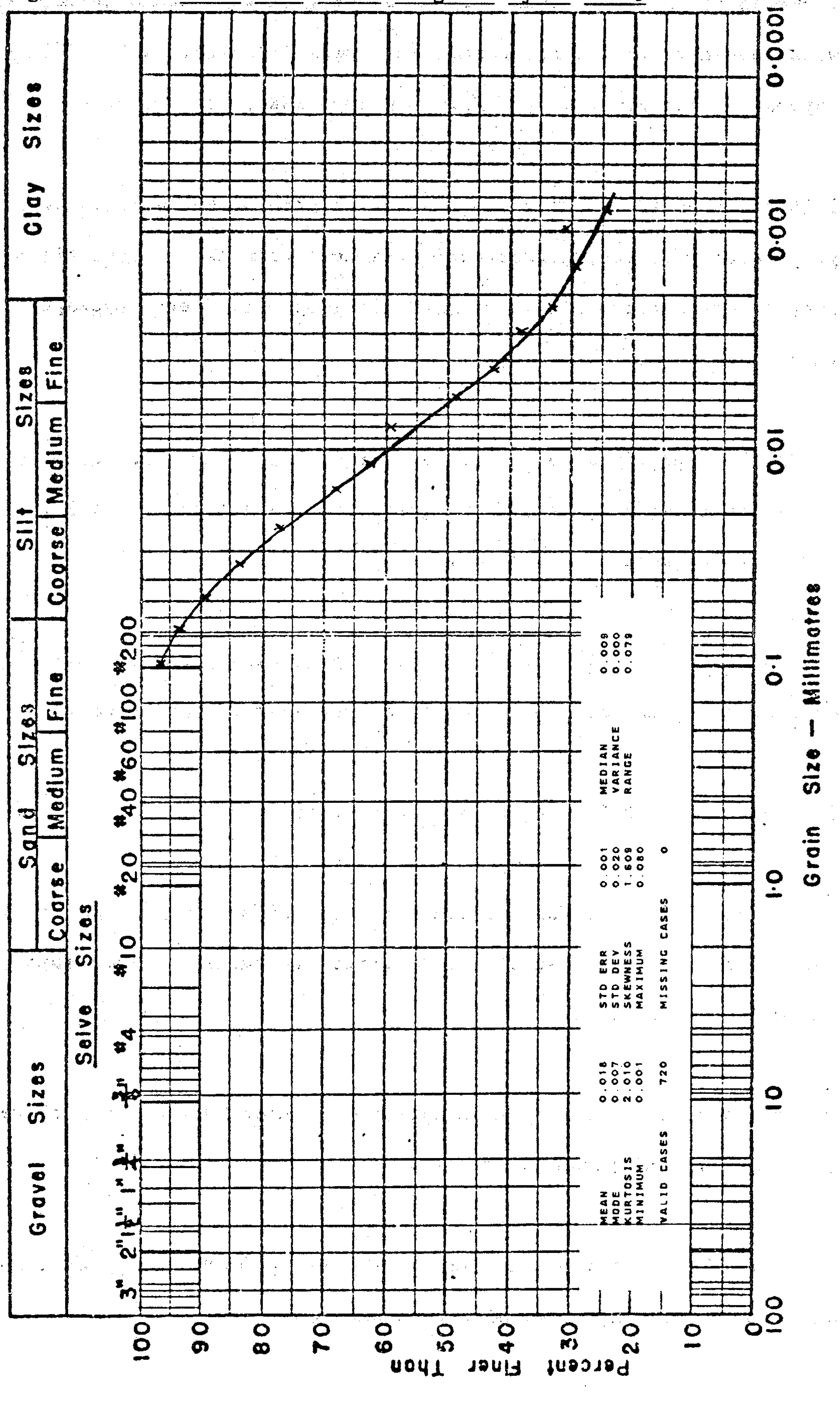
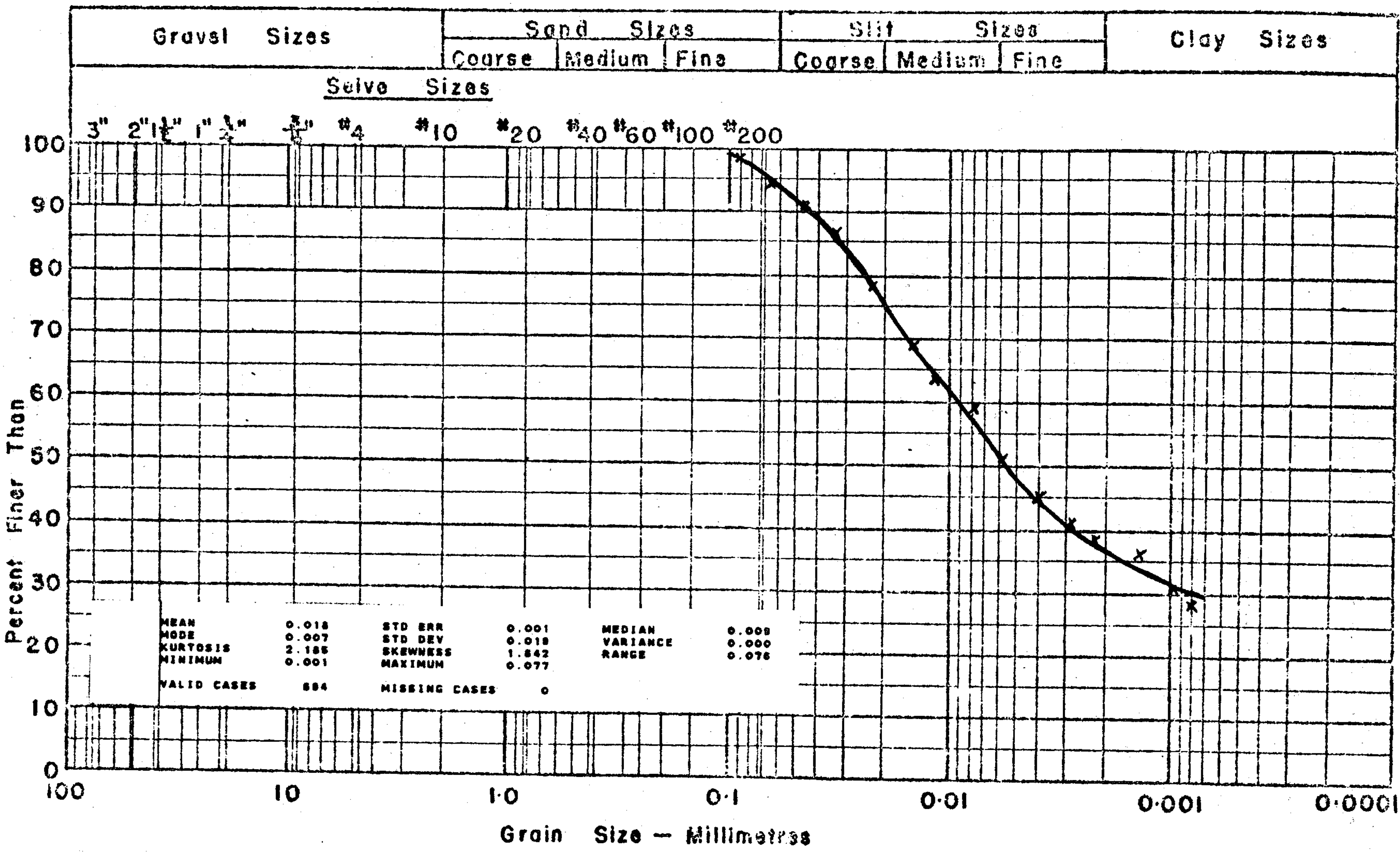


Figure 11.49. Grain Size Data: Inugsuin Fjord GT-60



```
MEAN          0.018     STD ERR         0.001     MEDIAN       0.008
MODE          0.007     STD DEV         0.018     VARIANCE     0.000
KURTOSIS      2.185     SKEWNESS        1.842     RANGE        0.076
MINIMUM       0.001     MAXIMUM         0.077

VALID CASES     884     MISSING CASES       0
```

Figure 11.50. Grain Size Data: Inugsuin Fjord GT-61

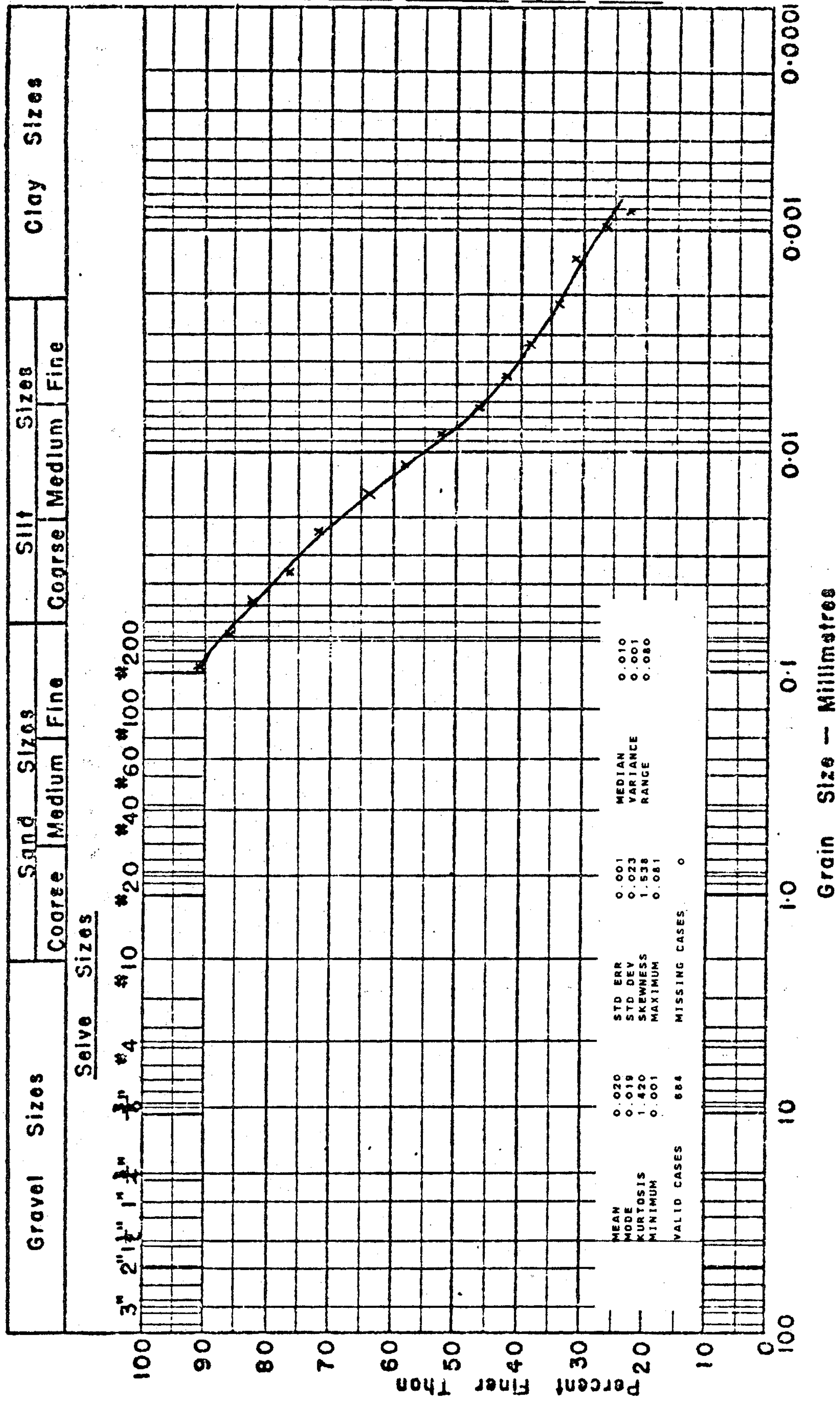
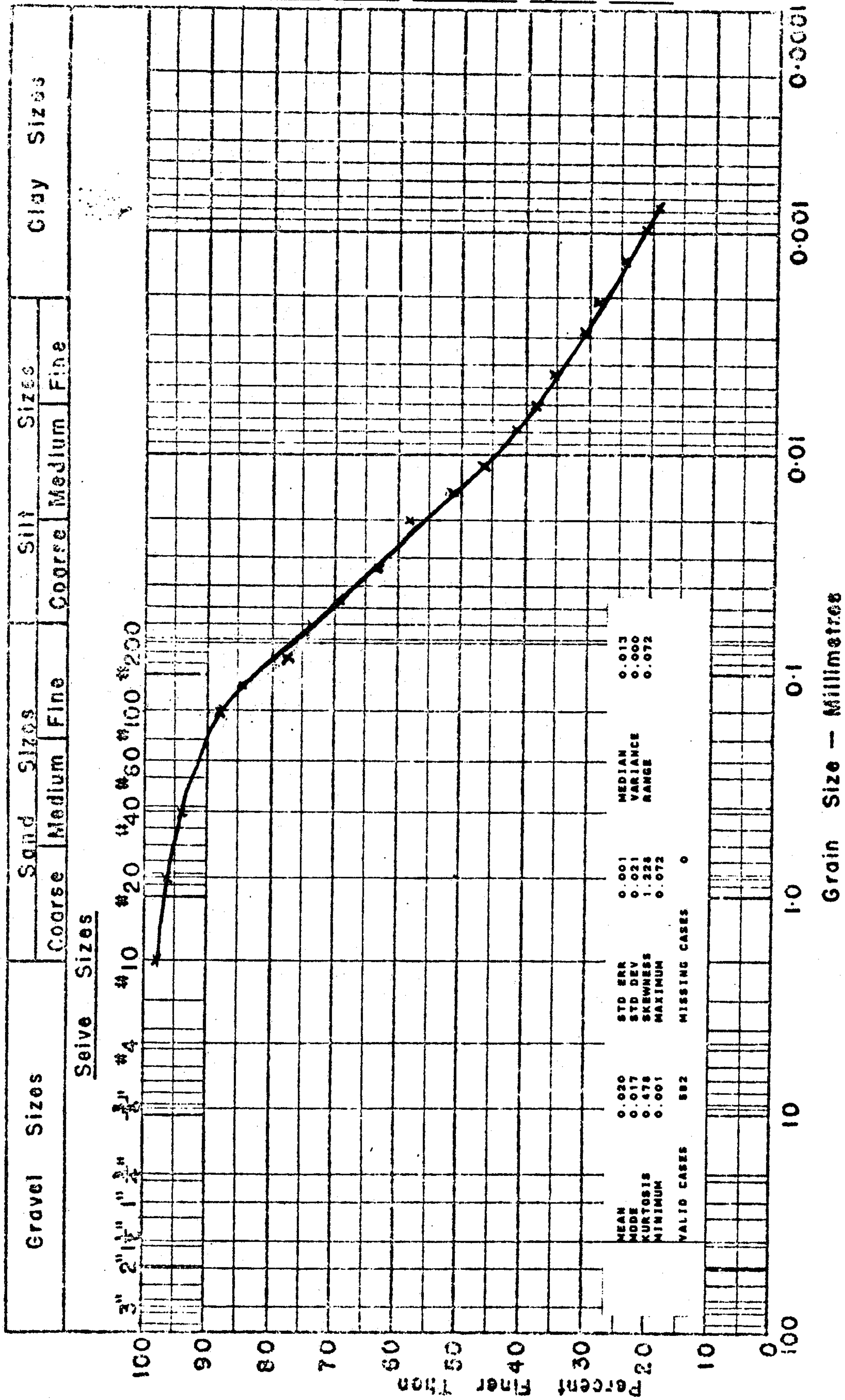
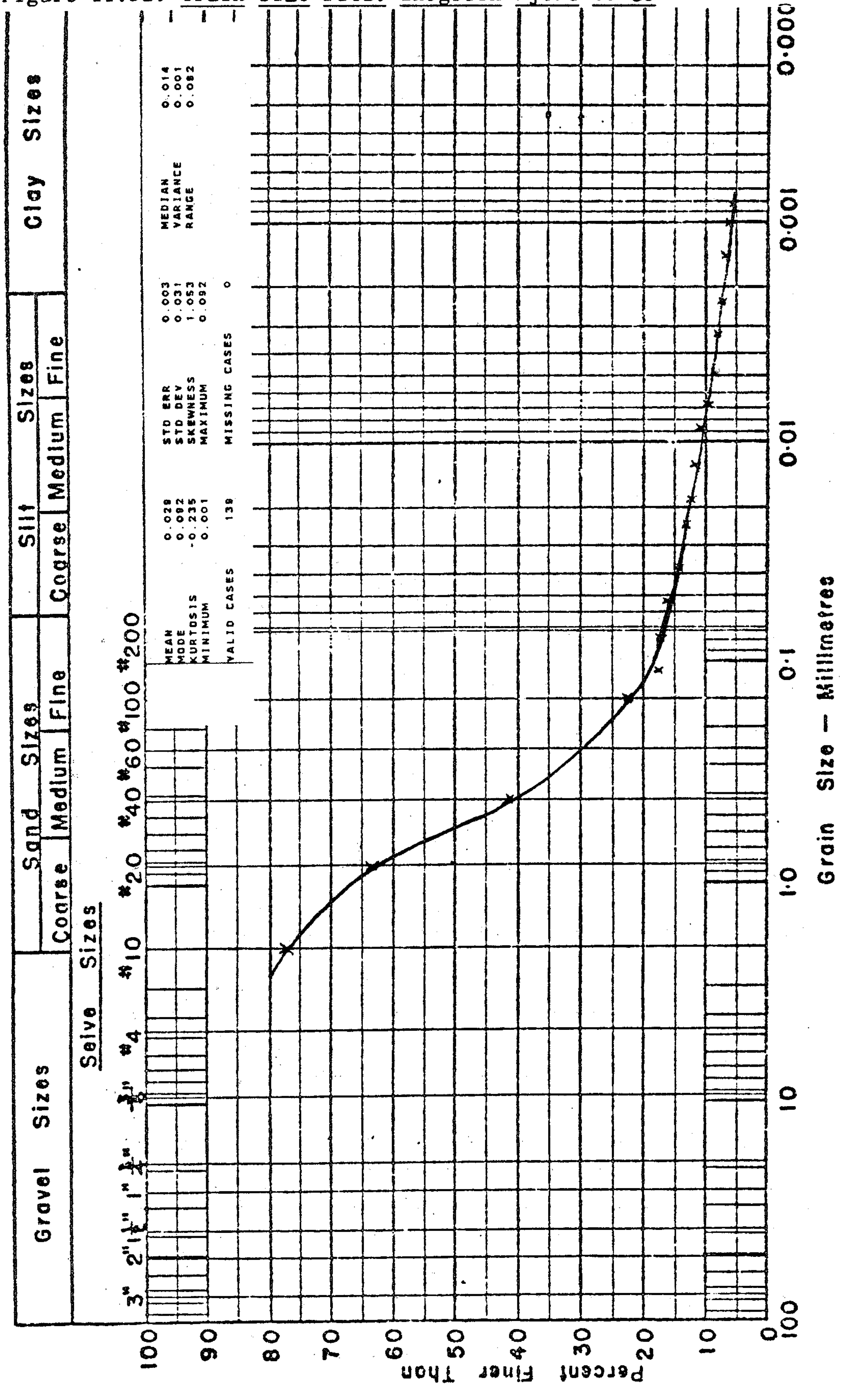


Figure 11.51. Grain Size Data: Inugsuin Fjord GT-62



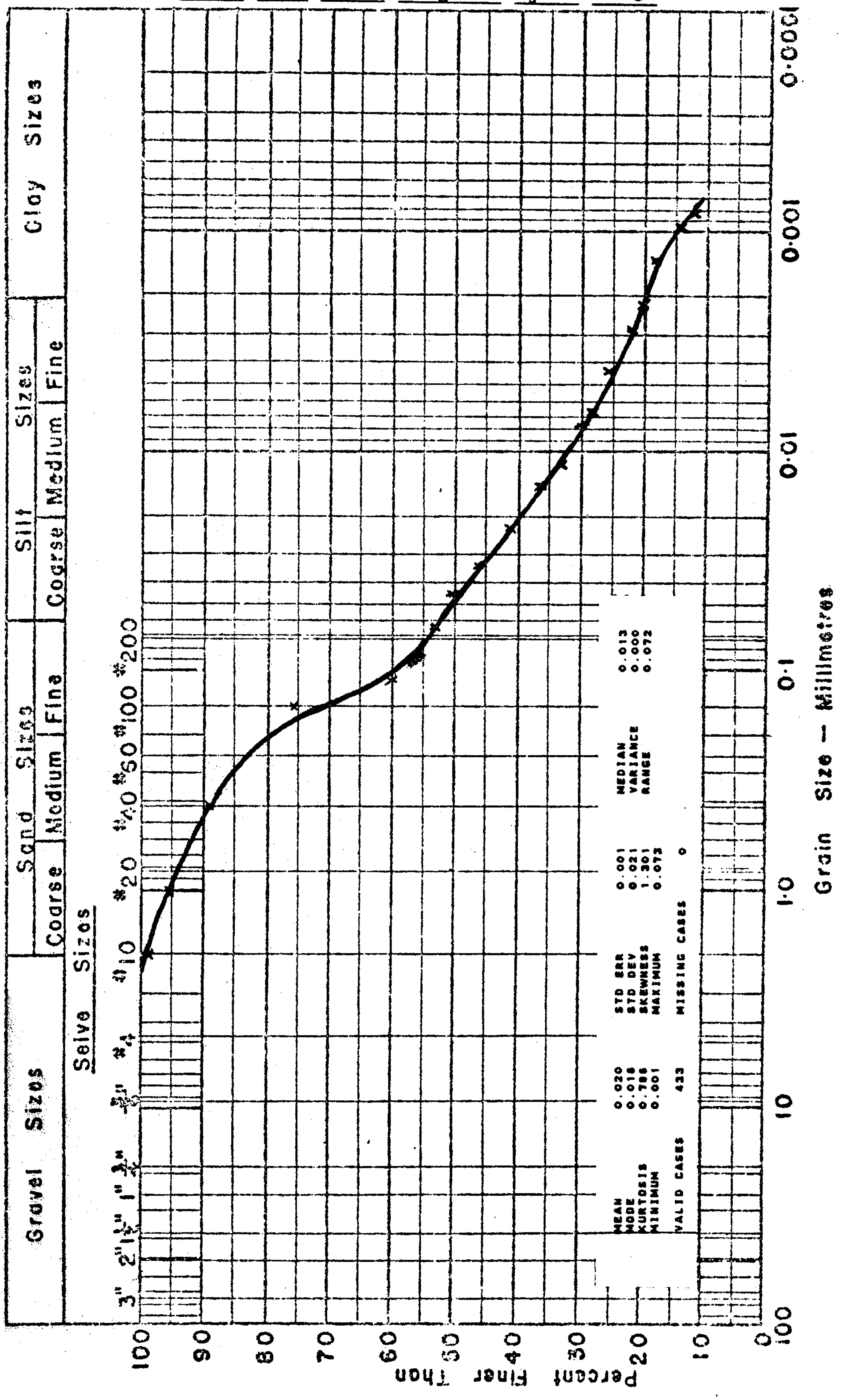
```
MEAN        0.020    STD ERR        0.001    MEDIAN      0.013
MODE        0.017    STD DEV        0.021    VARIANCE    0.000
KURTOSIS    0.478    SKEWNESS       1.228    RANGE       0.072
MINIMUM     0.001    MAXIMUM        0.072

VALID CASES   582    MISSING CASES      0
```

Figure 11.52. Grain Size Data: Inugsuin Fjord GT-63



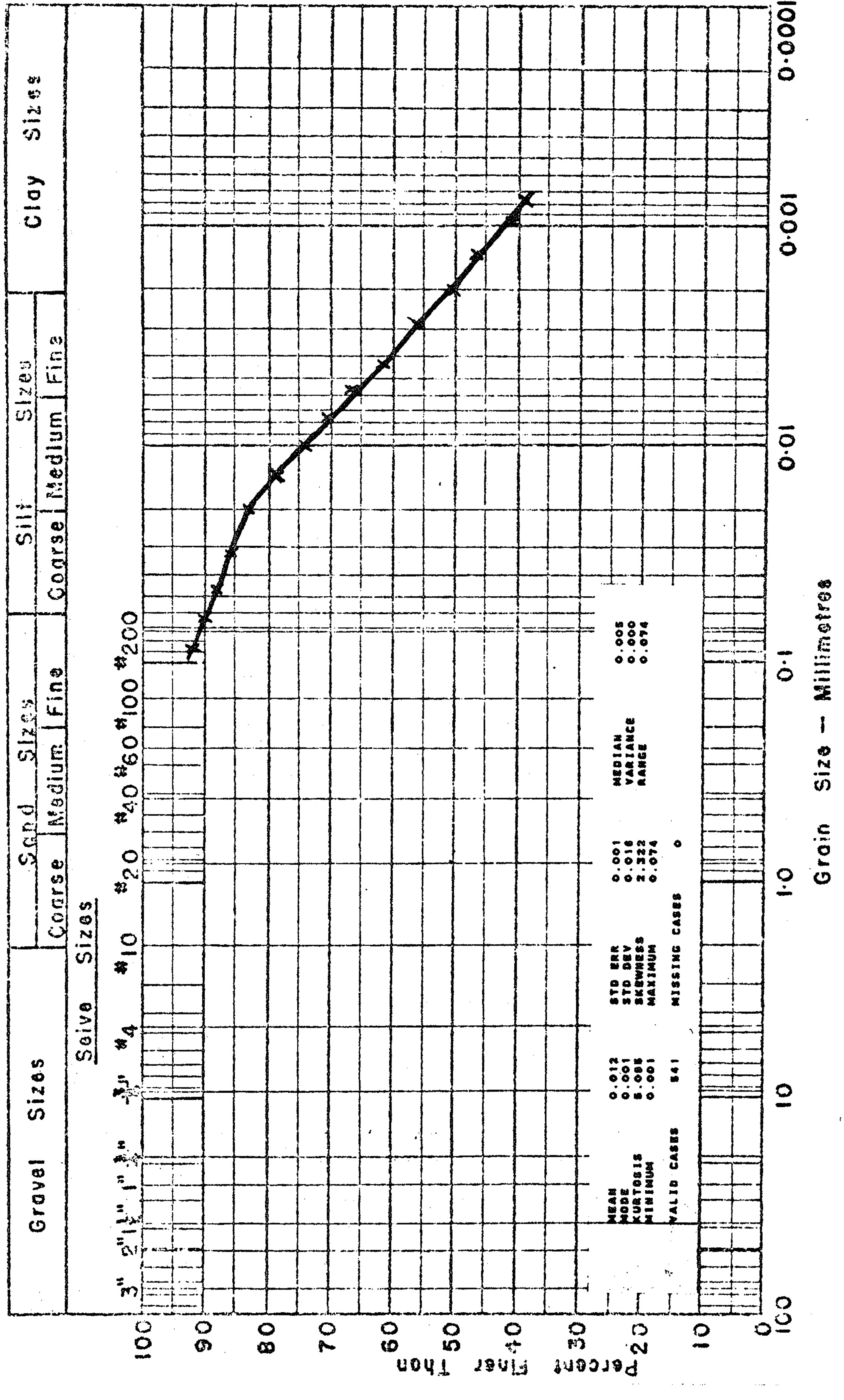
```
MEAN          0.028     STD ERR         0.003     MEDIAN        0.014
MODE          0.092     STD DEV         0.031     VARIANCE      0.001
KURTOSIS     -0.235     SKEWNESS        1.053     RANGE         0.082
MINIMUM       0.001     MAXIMUM         0.092

VALID CASES     139     MISSING CASES       0
```

Figure 11.53. Grain Size Data: Inugsuin Fjord GT-64



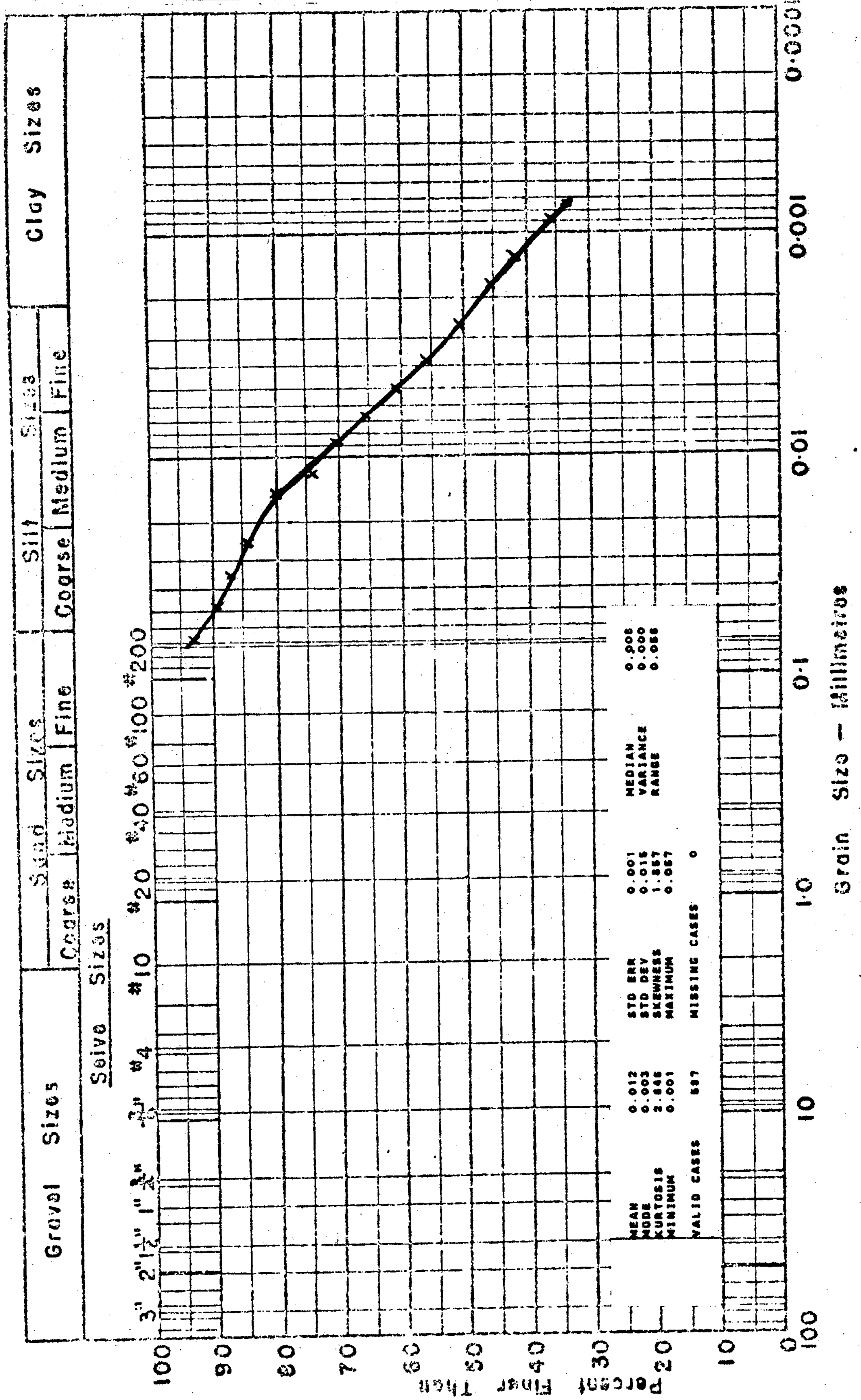
```
MEAN        0.020     STD ERR      0.001     MEDIAN      0.013
MODE        0.018     STD DEV      0.021     VARIANCE    0.000
KURTOSIS    0.786     SKEWNESS     1.301     RANGE       0.072
MINIMUM     0.001     MAXIMUM      0.073

VALID CASES   433     MISSING CASES    0
```

Figure 11.54. Grain Size Data: Inugsuin Fjord GT-65



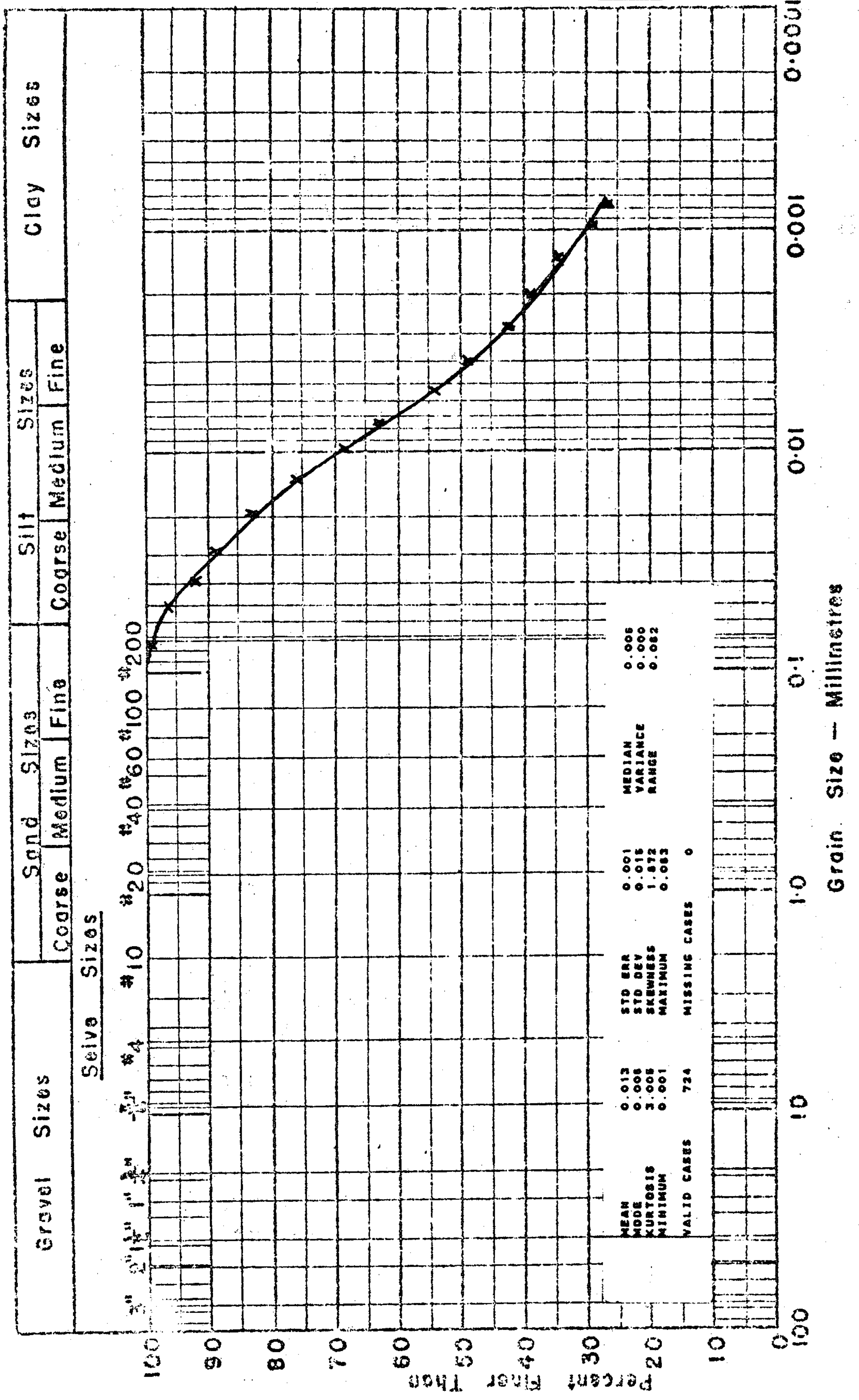
```
MEAN        0.012    STD ERR     0.001    MEDIAN      0.005
MODE        0.001    STD DEV     0.016    VARIANCE    0.000
KURTOSIS    5.055    SKEWNESS    2.322    RANGE       0.074
MINIMUM     0.001    MAXIMUM     0.074

VALID CASES   541    MISSING CASES   0
```

Figure 11.55. Grain Size Data: Inugsuin Fjord GT-66



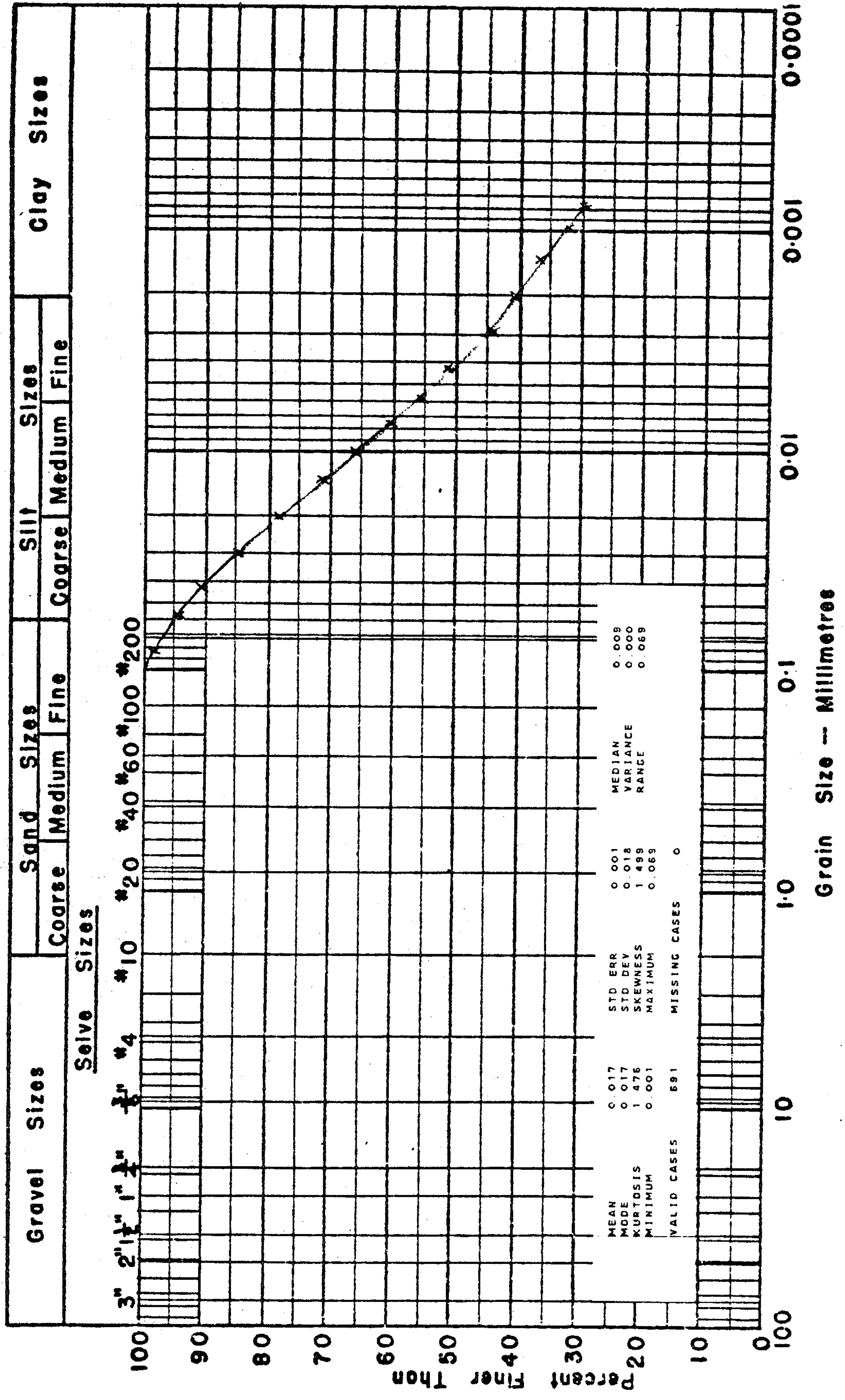
MEAN	0.012	STD ERR	0.001	MEDIAN	0.006
MODE	0.003	STD DEV	0.015	VARIANCE	0.000
KURTOSIS	2.846	SKEWNESS	1.857	RANGE	0.056
MINIMUM	0.001	MAXIMUM	0.057		
VALID CASES	587	MISSING CASES	0		

Figure 11.56. Grain Size Data: Inugsuin Fjord GT-67



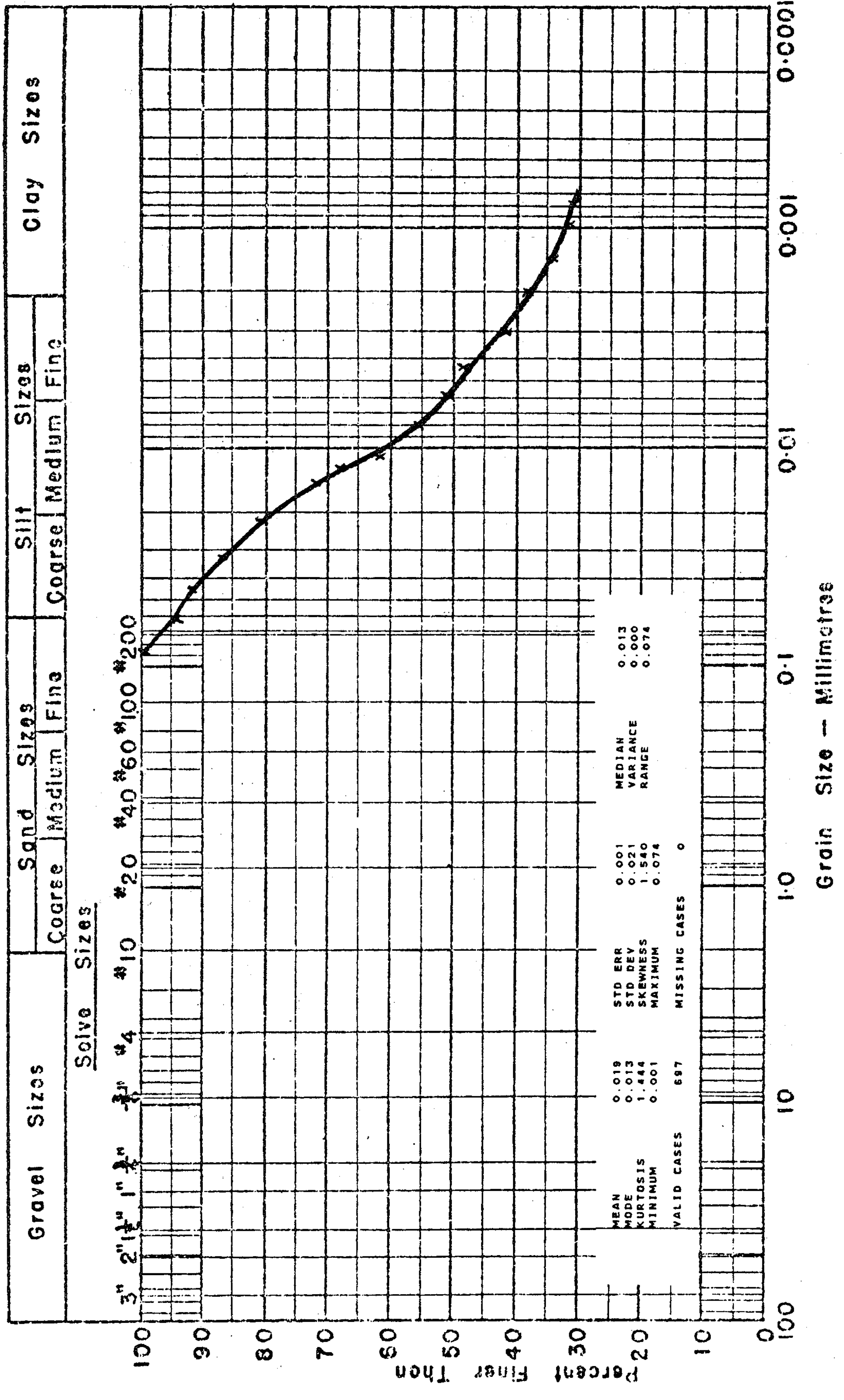
```
MEAN         0.013     STD ERR        0.001     MEDIAN      0.006
MODE         0.005     STD DEV        0.015     VARIANCE    0.000
KURTOSIS     3.005     SKEWNESS       1.872     RANGE       0.082
MINIMUM      0.001     MAXIMUM        0.083

VALID CASES    724     MISSING CASES    0
```

Figure 11.57. Grain Size Data: Inugsuin Fjord GT-68



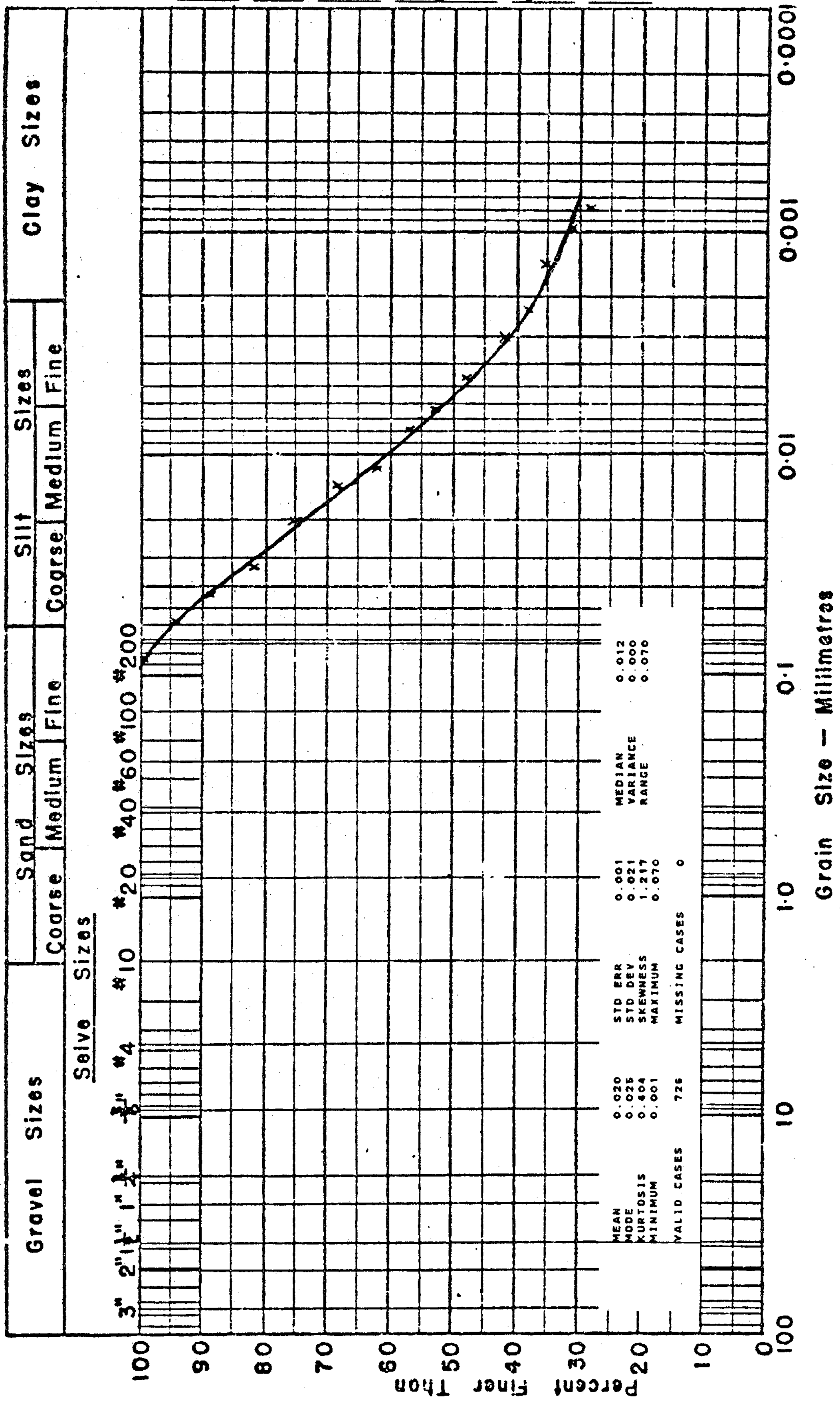
MEAN	0.017	STD ERR	0.001	MEDIAN	0.009
MODE	0.017	STD DEV	0.018	VARIANCE	0.000
KURTOSIS	1.476	SKEWNESS	1.499	RANGE	0.069
MINIMUM	0.001	MAXIMUM	0.069		
VALID CASES	691	MISSING CASES	0		

Figure 11.58. Grain Size Data: Inugsuin Fjord GT-69



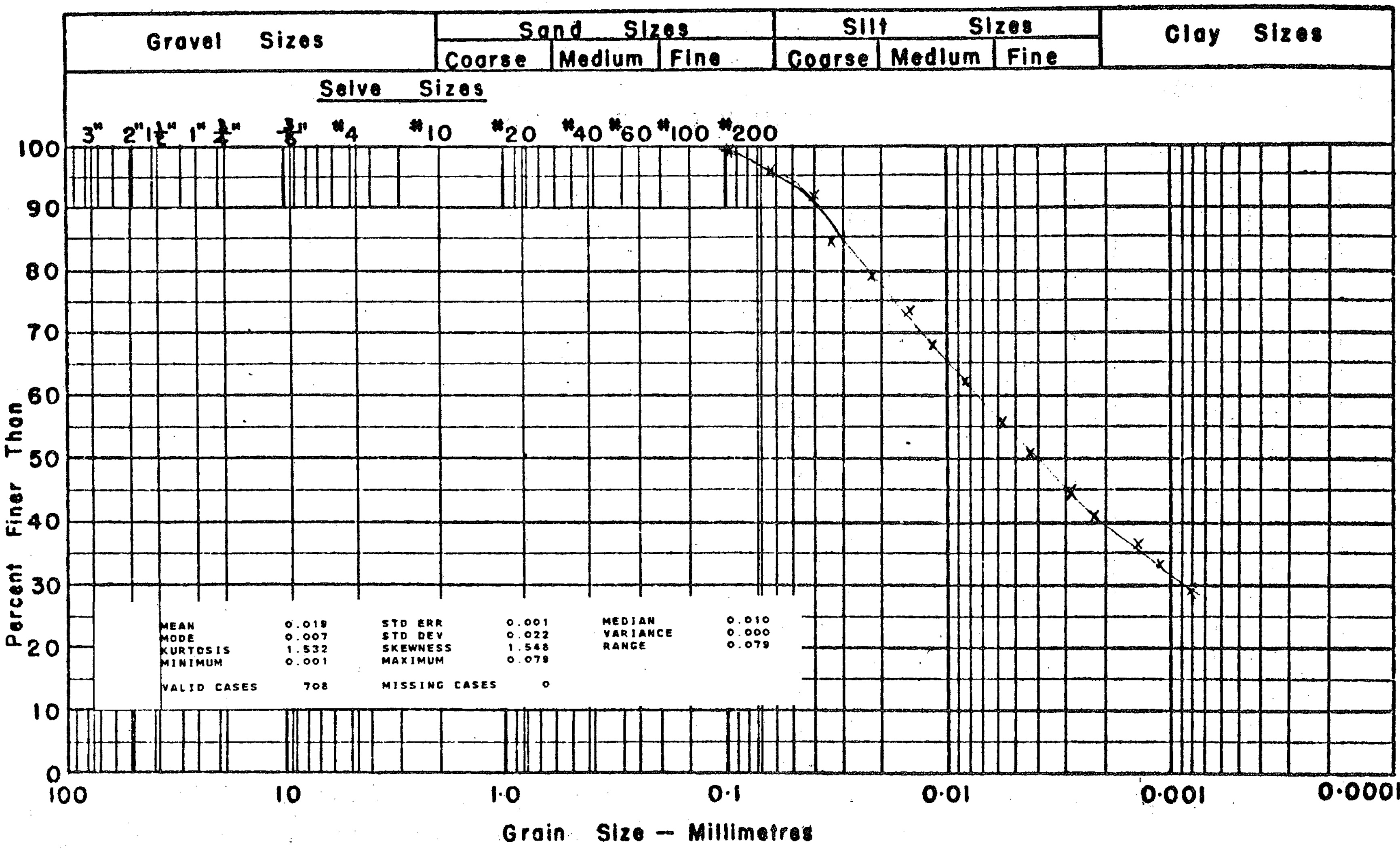
```
MEAN        0.019    STD ERR        0.001    MEDIAN      0.013
MODE        0.013    STD DEV        0.021    VARIANCE    0.000
KURTOSIS    1.444    SKEWNESS       1.540    RANGE       0.074
MINIMUM     0.001    MAXIMUM        0.074

VALID CASES   697    MISSING CASES      0
```

Figure 11.59. Grain Size Data: Inugsuin Fjord GT-70



```
MEAN          0.020    STD ERR         0.001    MEDIAN      0.012
MODE          0.025    STD DEV         0.021    VARIANCE    0.000
KURTOSIS      0.404    SKEWNESS        1.217    RANGE       0.070
MINIMUM       0.001    MAXIMUM         0.070

VALID CASES     726    MISSING CASES       0
```

Figure 11.60. Grain Size Data: Inugsuin Fjord GT-71



```
MEAN            0.018     STD ERR         0.001     MEDIAN       0.010
MODE            0.007     STD DEV         0.022     VARIANCE     0.000
KURTOSIS        1.532     SKEWNESS        1.548     RANGE        0.079
MINIMUM         0.001     MAXIMUM         0.078

VALID CASES       708     MISSING CASES       0
```

Figure 11.61. Grain Size Data: Inugsuin Fjord GT-72

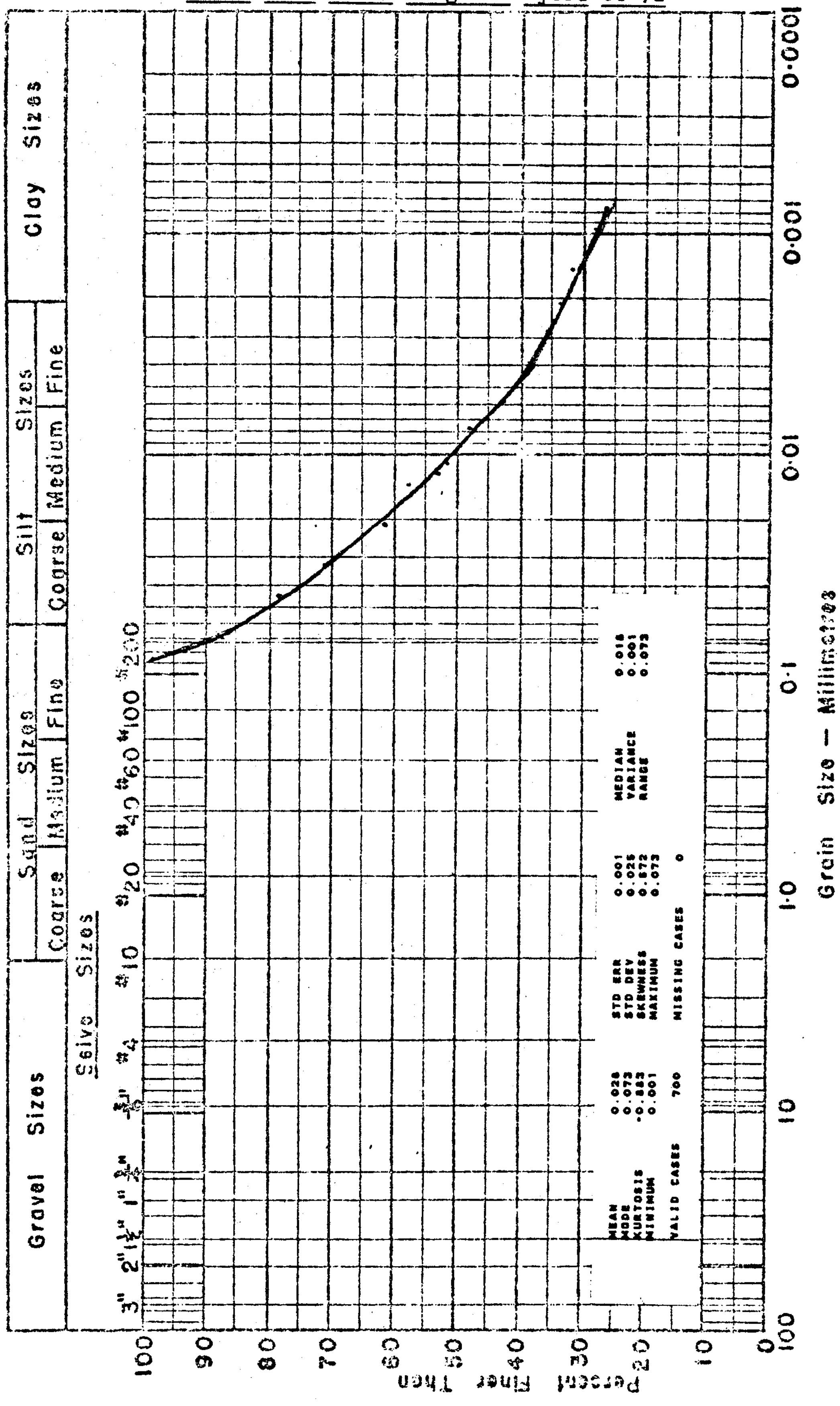
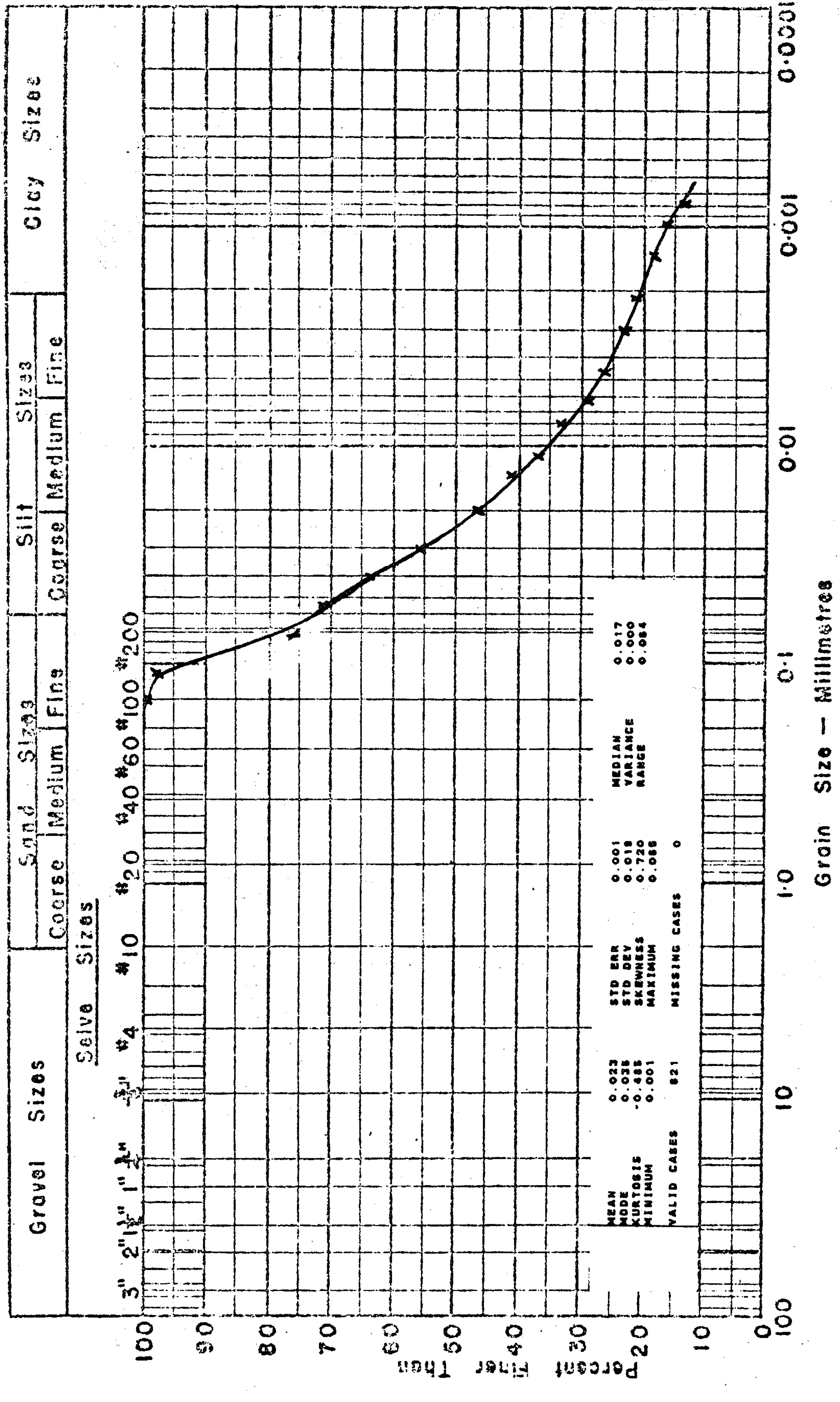
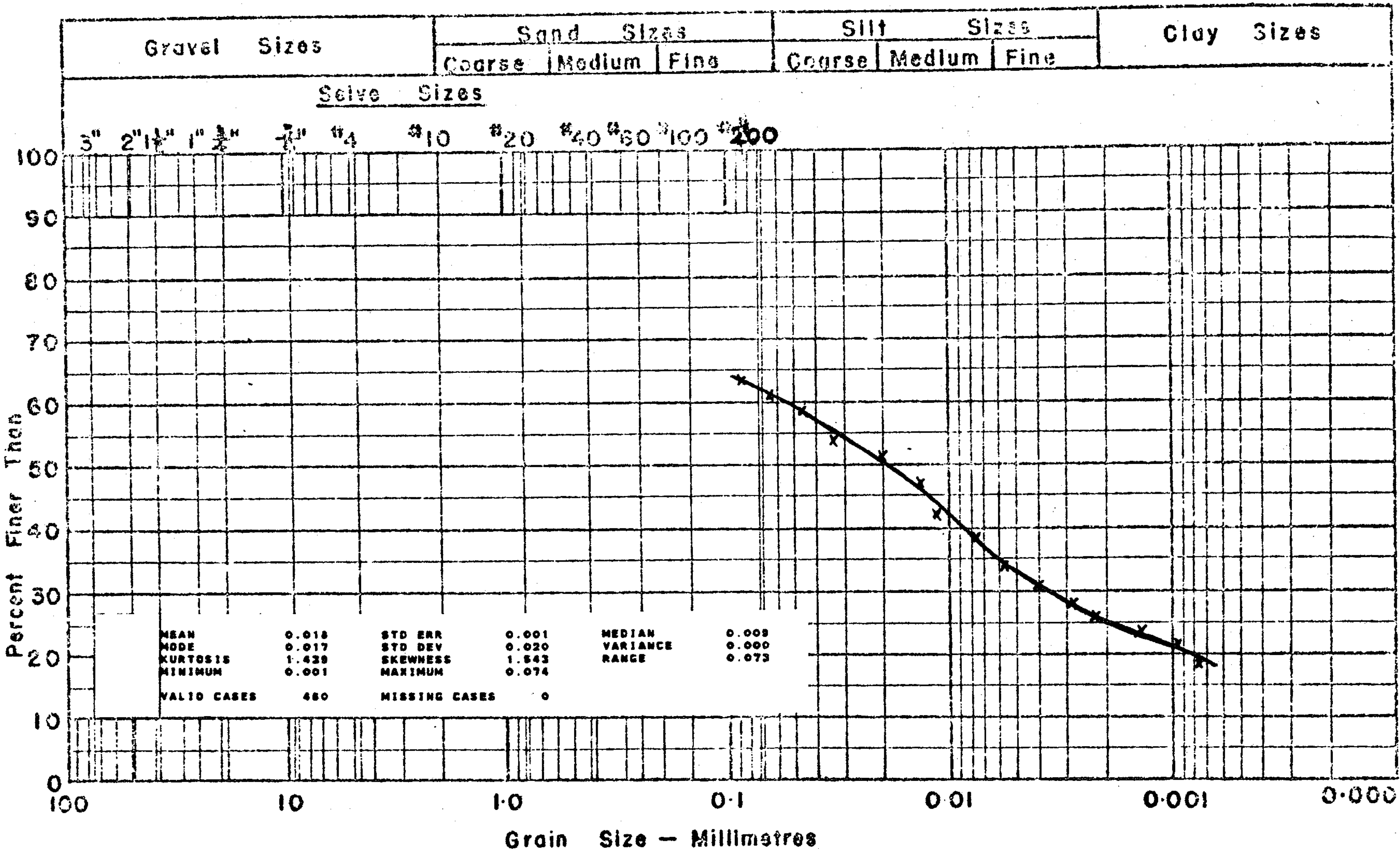


Figure 11.62. Grain Size Data: Inugsuin Fjord GT-73



MEAN	0.023	STD ERR	0.001	MEDIAN	0.017
MODE	0.035	STD DEV	0.018	VARIANCE	0.000
KURTOSIS	-0.485	SKEWNESS	0.720	RANGE	0.084
MINIMUM	0.001	MAXIMUM	0.086		
VALID CASES	821	MISSING CASES	0		

Figure 11.63. Grain Size Data: Inugsuin Fjord GT-74



```
MEAN          0.018    STD ERR         0.001    MEDIAN      0.009
MODE          0.017    STD DEV         0.020    VARIANCE    0.000
KURTOSIS      1.439    SKEWNESS        1.543    RANGE       0.073
MINIMUM       0.001    MAXIMUM         0.074

VALID CASES     460    MISSING CASES       0
```

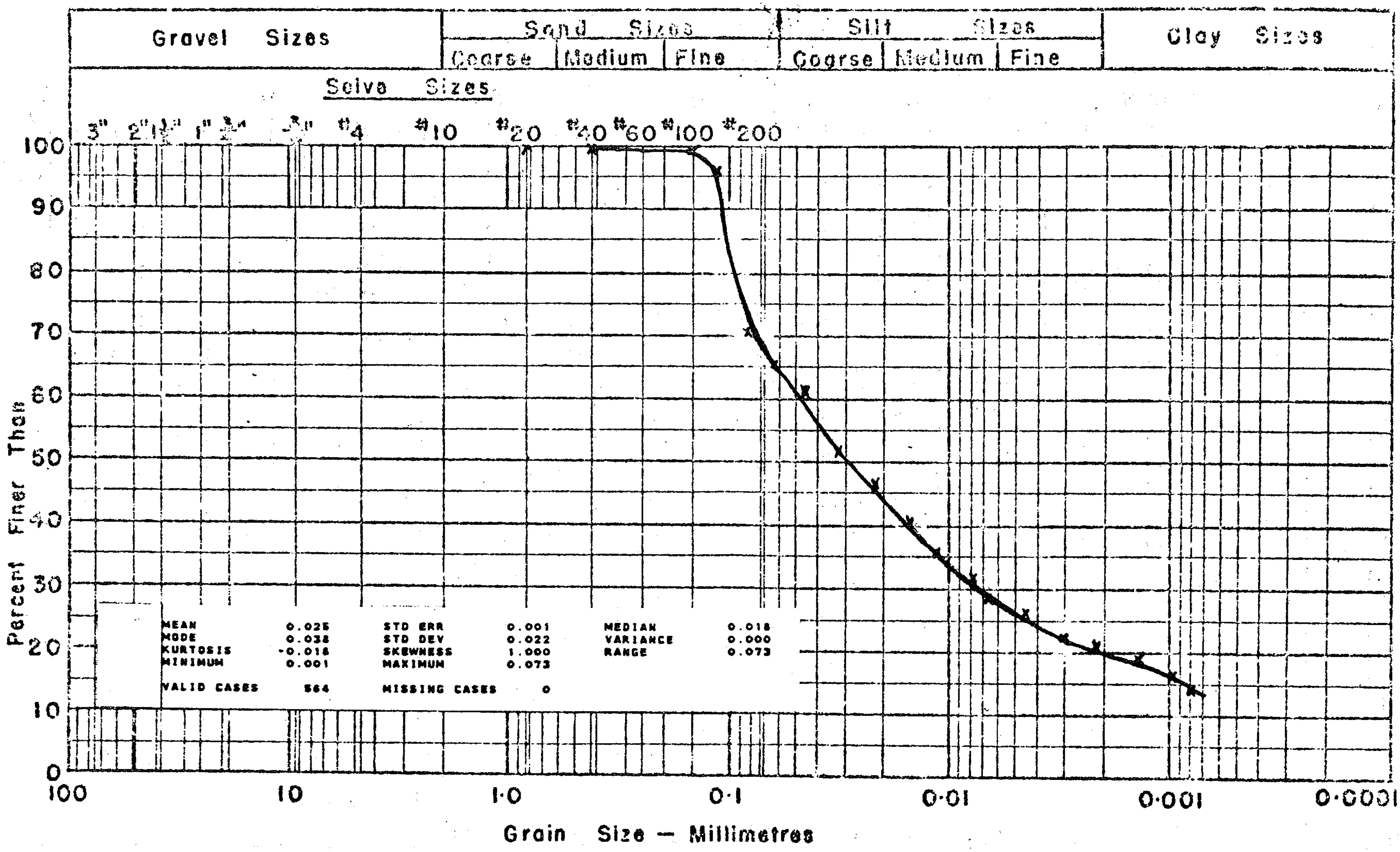
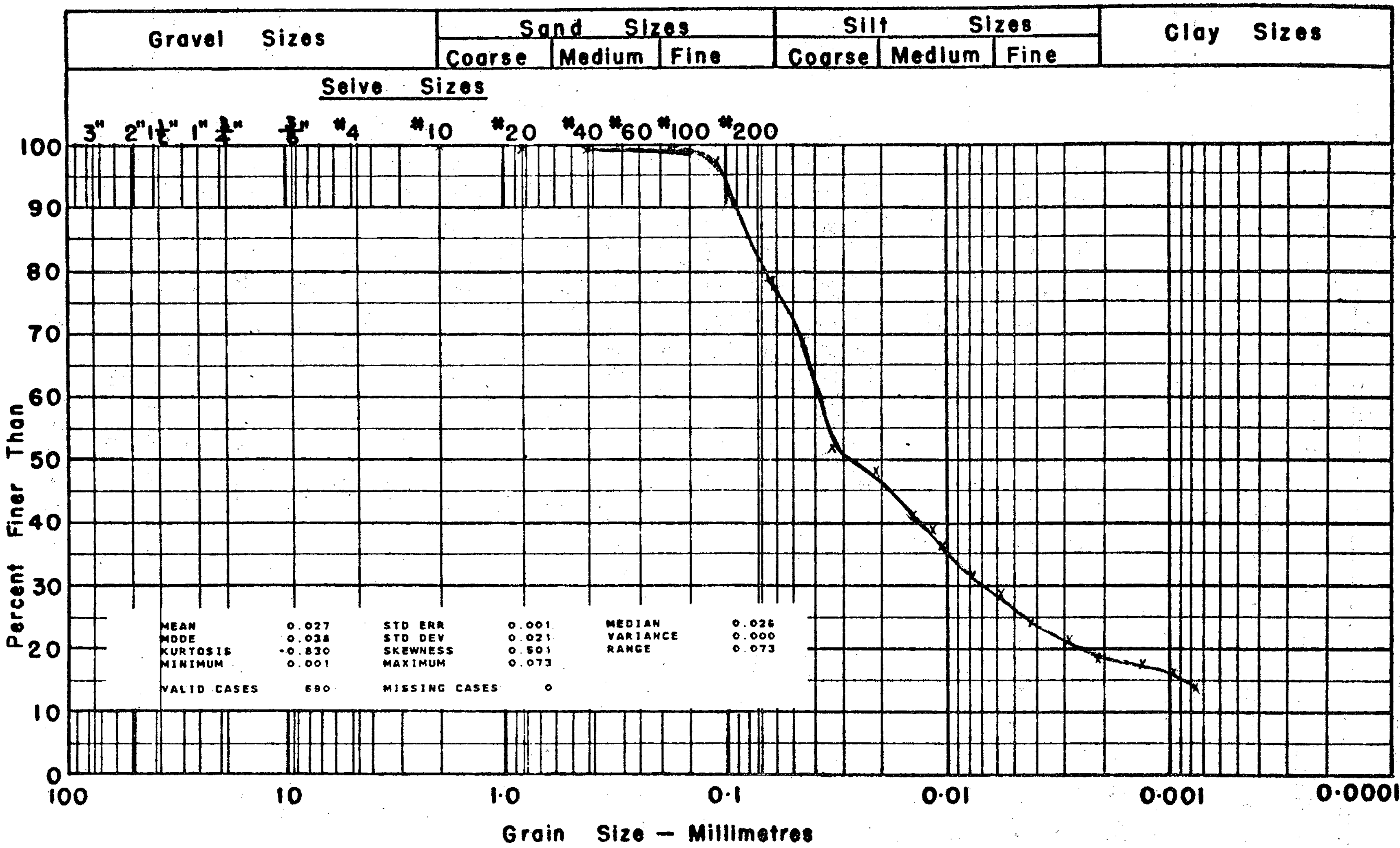


Figure 11.64. Grain Size Data: Inugsuin Fjord GT-75

Figure 11.65. Grain Size Data: Inugsuin Fjord GT-76



MEAN	0.027	STD ERR	0.001	MEDIAN	0.026
MODE	0.038	STD DEV	0.021	VARIANCE	0.000
KURTOSIS	-0.830	SKEWNESS	0.501	RANGE	0.073
MINIMUM	0.001	MAXIMUM	0.073		
VALID CASES	690	MISSING CASES	0		

Table 11.16 Geotechnical Data: Inugsuin Fjord

Sample #	Depth (m±2.5cm)	Water Content (Dry Basis) w(%)	Natural Water Content w(%)	Atterberg Limits WL(%)	WP(%)	IP
Core: IN-1 82-04425						
GT-59	0-0.05	62.98	38.64	45.0	29.6	15.4
GT-60	1.30	46.52	31.75	30.8	22.2	8.6
GT-61	0.05	52.55	34.45	45.3	28.5	16.8
GT-62	0.15	53.78	34.97	41.7	25.7	16.0
GT-63	0.23	22.22	18.18	N.P.	N.P.	N.P.
GT-64	0.30	45.85	31.44	32.3	23.2	9.1
GT-65	0.50	75.44	43.00	42.6	24.9	17.7
GT-66	0.70	69.72	41.08	37.5	22.8	14.7
GT-67	0.80	54.41	34.81	33.1	22.4	10.7
GT-68	1.00	57.61	36.55	33.8	22.4	11.4
GT-69	1.33	51.54	34.01	33.3	22.5	10.8
GT-70	1.43	49.91	33.29	30.6	22.0	8.6
GT-71	1.50	49.42	33.08	31.0	22.1	8.9
GT-72	1.75	41.04	29.10	21.1	18.3	2.8
GT-73	2.00	34.79	25.81	19.6	19.2	0.4
GT-74	2.25	33.00	24.81	22.5	20.7	1.8
GT-75	2.31	30.97	23.65	22.5	18.9	3.6
GT-76	2.40	30.40	23.32	18.1	17.4	0.7

w= water content WL= liquid limit

WP= plastic limit IP= plasticity index

Table 11.17 Geotechnical Data: Inugsuin Fjord

Miniature Vane Shear Test Results

Sample #	Depth (m±2.5cm)	Undisturbed Shear Stress (Kg-cm)	Remolded Shear Stress (Kg-cm)	Sensitivity
Core: IN-1 82-04425				
GT-61	0.05	.0633	.0271	2.34
GT-62	0.15	.0679	.0391	1.74
GT-63	0.23	.0357	.0161	2.22
GT-64	0.30	.0858	.0420	2.04
GT-65	0.50	.0167	.0058	2.88
GT-66	0.70	.0219	.0040	5.48
GT-67	0.80	.0253	.0063	4.02
GT-68	1.00	.0201	.0058	3.47
GT-69	1.33	.0345	.0081	4.26
GT-70	1.43	.0340	.0069	4.93
GT-71	1.50	.0340	.0095	3.58
GT-72	1.75	.0449	.0086	5.22
GT-73	2.00	.0541	.0124	4.36
GT-74	2.25	.0696	.0363	1.92
GT-75	2.31	.0691	.0201	3.44
GT-76	2.40	.0495	.0236	2.10

Table 11.18 Mineralogy of <2 μm Material: Inugsuin Fjord

Sample	Depth	Relative % Clays[1]				Other Phases[2]			
#	(m±2.5cm)	K	I	CHL	SW	Q	PL	KF	AMP
Core: IN-1 82-04425									
GT-59	0-0.05	9	89[5]	1	1	t	m	m	t
GT-65	0.50	5	92[5]	3	nd	mt	m	m	t
GT-69	1.33	6	91[5]	3	nd	mt	m	m	t
GT-72	1.75	9	85[5]	3	3	mt	m	m	t
GT-76	2.40	6	91[5]	3	nd	mt	m	m	t

K= kaolinite I= illite CHL= chlorite SW= swelling clay

Q= quartz PL= plagioclase KF= potassium feldspar

AMP= amphibole

[1] The relative amounts of clay minerals reported are weighted percentages, normalized to 100 %, using the procedures described in the text.

[2] m = minor phase, mt = minor to trace phase, t = trace phase, nd = not detected.

[5] A small amount of randomly interstratified illite/smectite or degraded illite is also indicated. Chloritic hydroxy-interlayer material may also be present in some of the illite.

Core Descriptions

CORE MC-1, 82-04303, McBETH FJORD, LENGTH=1.0m

0-0.1m: 5y 4/3; Greenish tan mud, disturbed.

0.1-0.33m: 10yr 3/1; Well-graded dark coarse-medium sand to grey fine sandy, silty mud; parallel lamination in coarse sand; slight burrowing in upper divisions; sharp, loaded base. (turbidite, ? AD(E))

0.33-0.35m: 10yr 3/1 (5y 4/2); Well-graded dark medium-fine sand to grey silty mud with scattered mica sand-size flakes; slight burrowing and dark reduced streaks in upper mud division , sharp base. (turbidite, ? AE)

0.35-0.39m: 10yr 3/1 (5y 4/2); Well-graded dark medium-fine sand to grey silty mud; mottled with dark reduced zones in upper silty mud; sharp base. (turbidite, ? AE)

0.39-0.45m: 10yr 3/1 (5y 4/2); Well-graded dark fine sand to grey tan mud, slight burrowing with reduced zones in upper mud. (turbidite, ? AE)

0.45-0.60m: 10yr 3/1 (5y 4/2); Very well-graded coarse sand to silty mud, bioturbated by polychaetes; somewhat mottled with dark reduced streaks in upper mud. (turbidite, ? AE)

0.60-1.0m: 5y 4/3 (5y 2.5/1); Green/grey silty mud, top 0.1m and lowest

0.1m have slight burrowing, middle part is extensively bioturbated with heavily reduced black zones.

Disturbance: Upper 0.10m of core disturbed during split. Sand at the bases of two thick turbidites (0.33 and 0.60m) washed out of core while being split; sands collected for grain size analyses.

Figure 11.66. Grain Size Data: McBeth Fjord GT-51

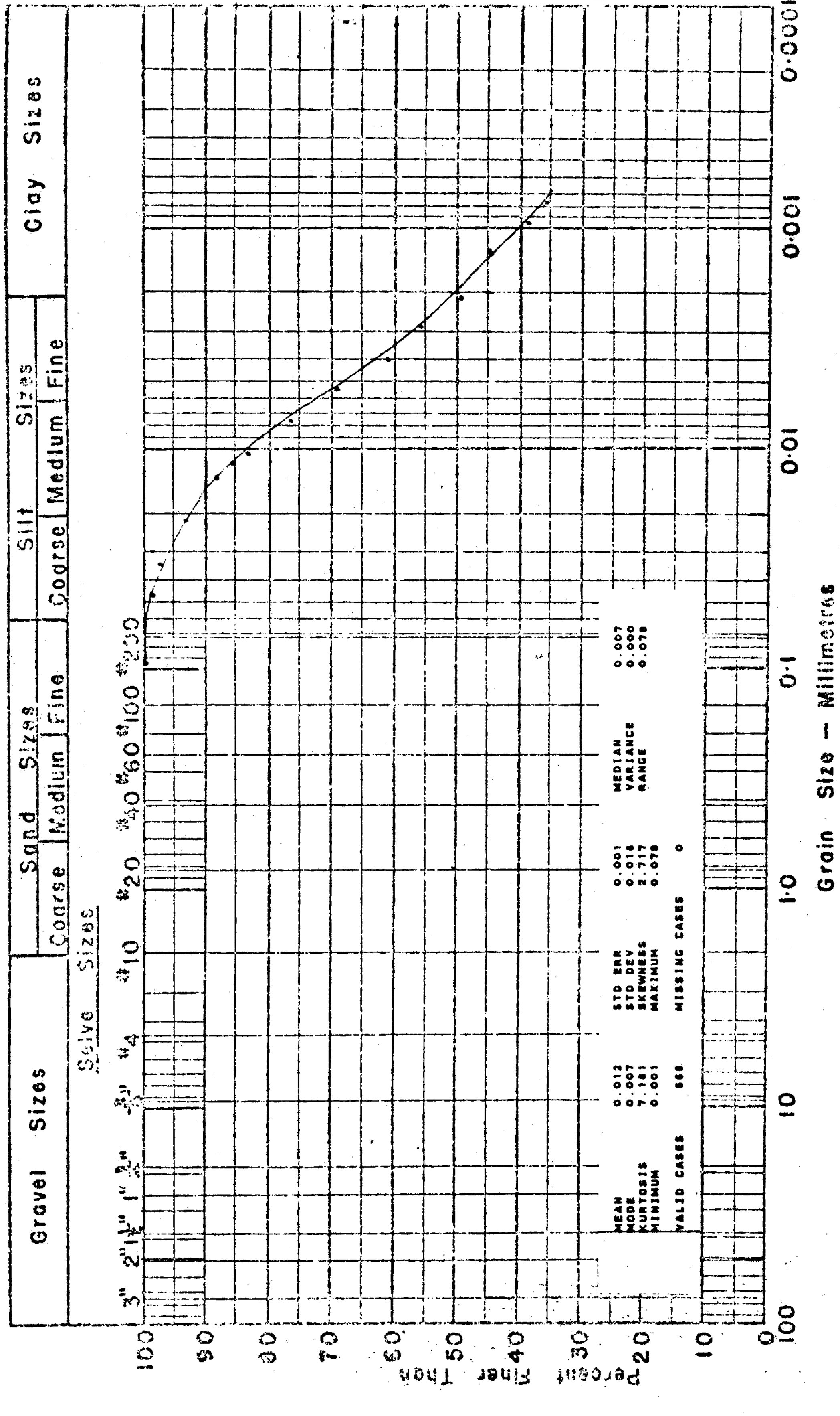
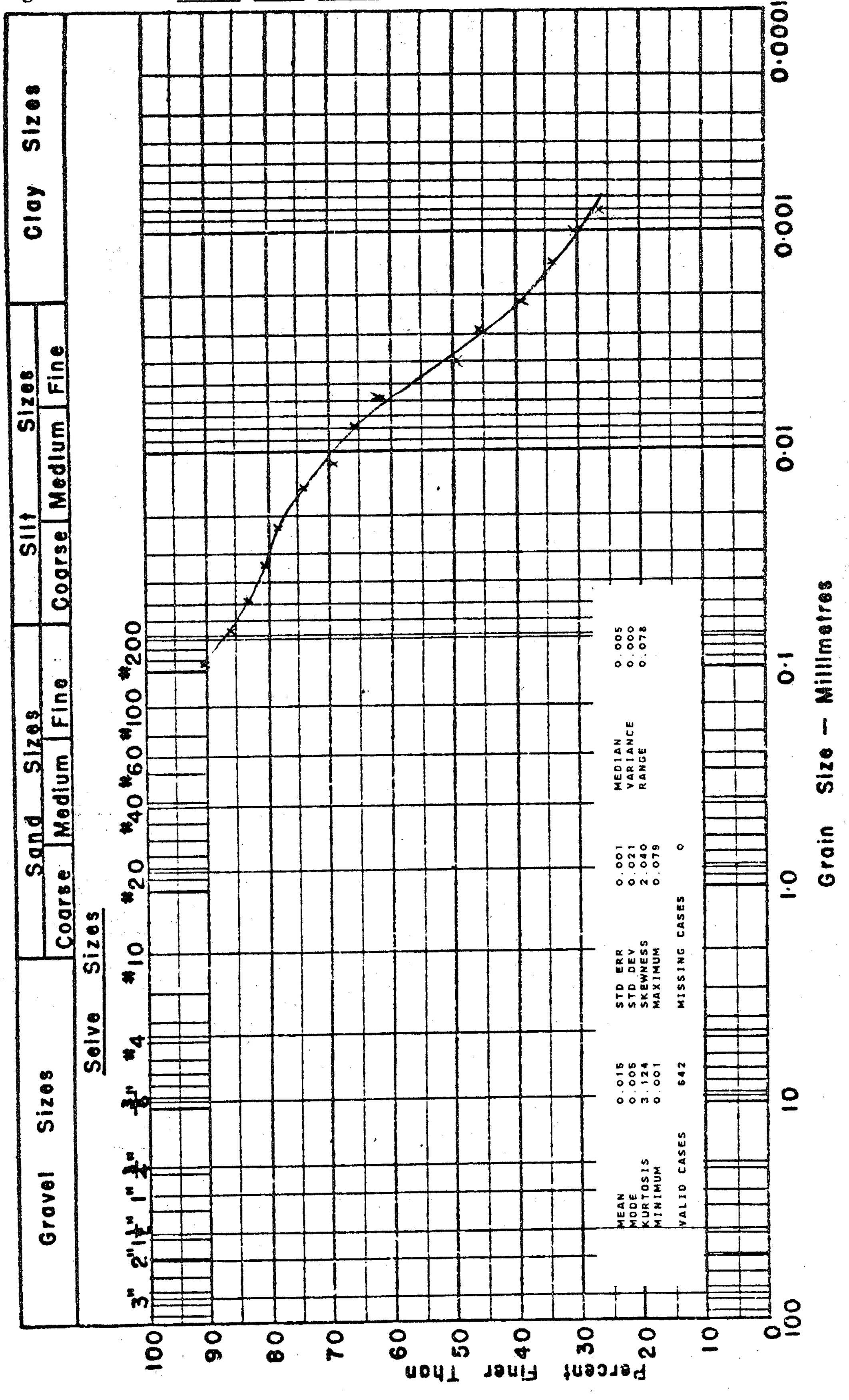
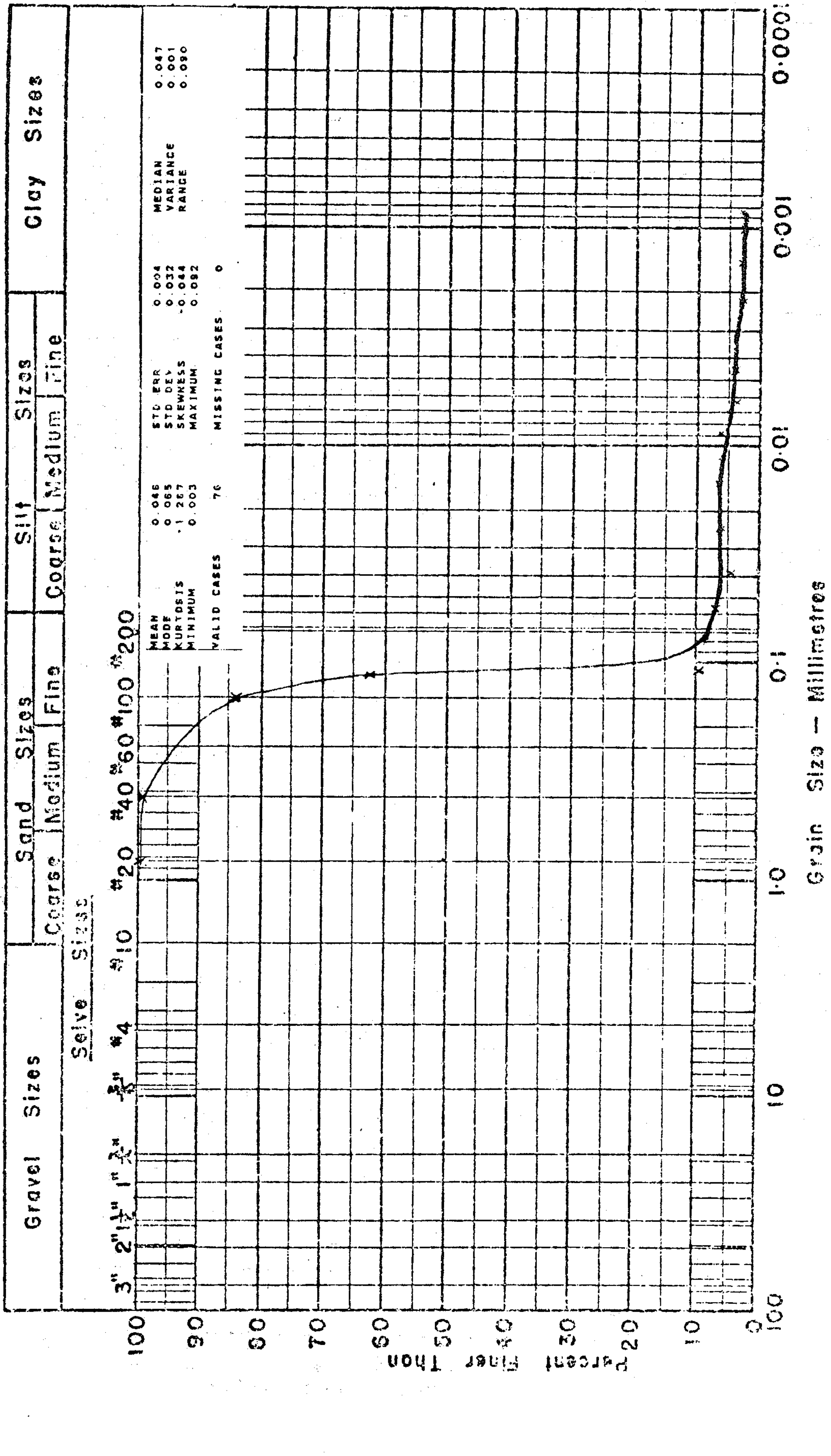


Figure 11.67. Grain Size Data: McBeth Fjord GT-52



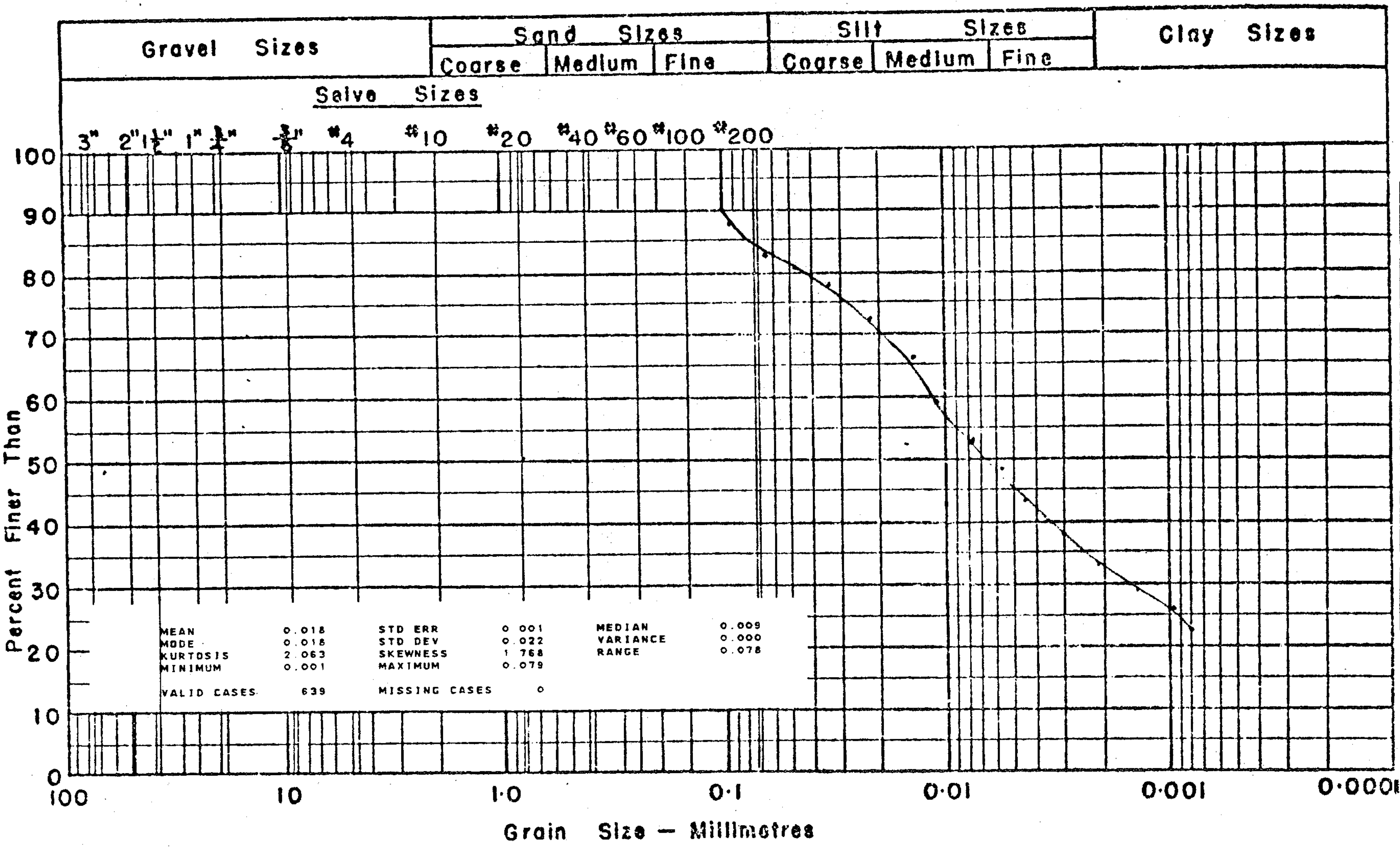
```
MEAN        0.015    STD ERR        0.001    MEDIAN      0.005
MODE        0.005    STD DEV        0.021    VARIANCE    0.000
KURTOSIS    3.124    SKEWNESS       2.040    RANGE       0.078
MINIMUM     0.001    MAXIMUM        0.079

VALID CASES   642    MISSING CASES      0
```

Figure 11.68. Grain Size Data: McBeth Fjord GT-53



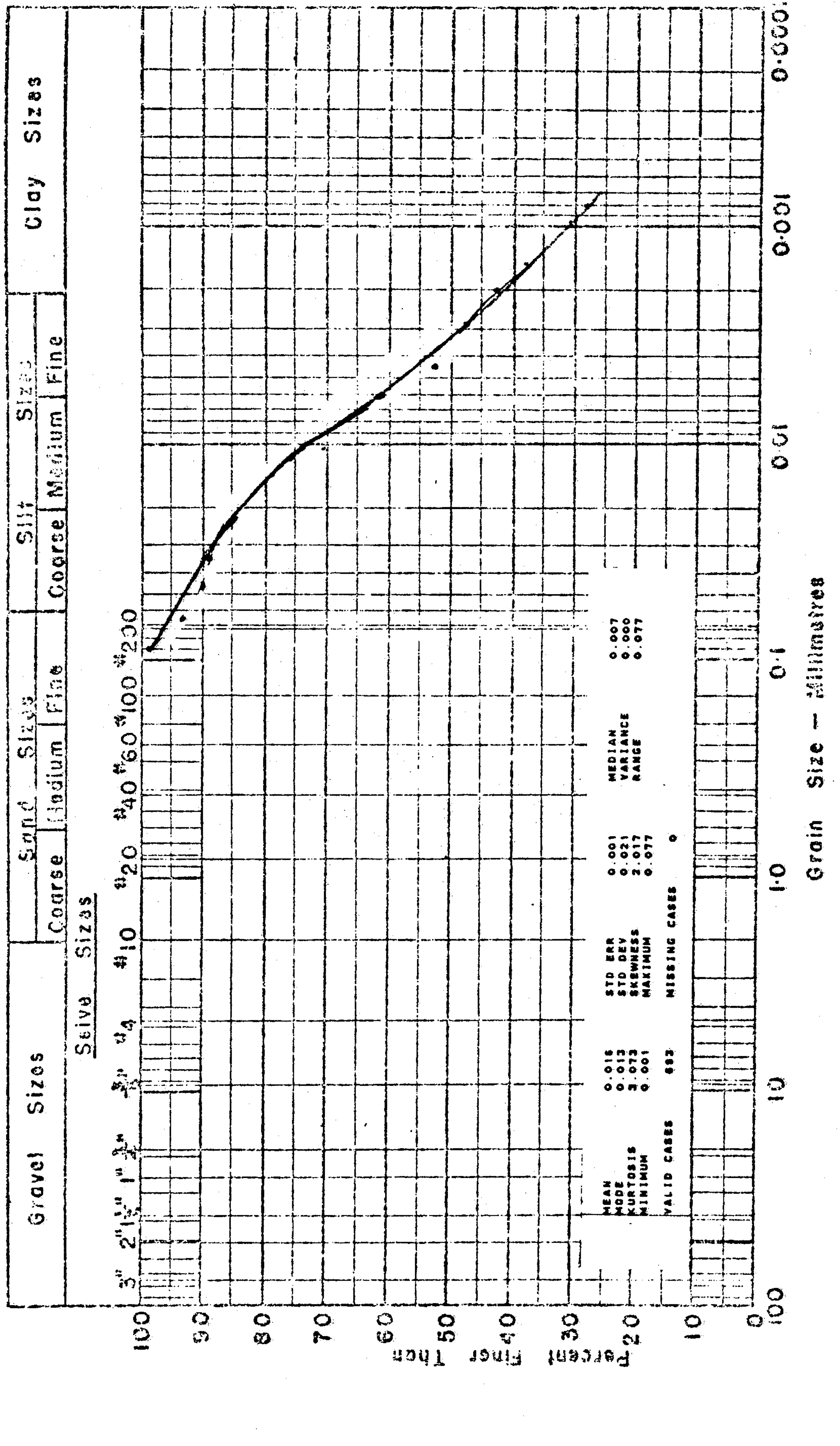
MEAN	0.046	STD ERR	0.004	MEDIAN	0.047
MODE	0.065	STD DEV	0.032	VARIANCE	0.001
KURTOSIS	-1.267	SKEWNESS	-0.044	RANGE	0.090
MINIMUM	0.003	MAXIMUM	0.092		
VALID CASES	76	MISSING CASES	0		

Figure 11.69. Grain Size Data: McBeth Fjord GT-54



MEAN	0.018	STD ERR	0.001	MEDIAN	0.009
MODE	0.018	STD DEV	0.022	VARIANCE	0.000
KURTOSIS	2.063	SKEWNESS	1.768	RANGE	0.078
MINIMUM	0.001	MAXIMUM	0.079		
VALID CASES	639	MISSING CASES	0		

Figure 11.70. Grain Size Data: McBeth Fjord GT-55



```
MEAN       0.016   STD ERR        0.001   MEDIAN     0.007
MODE       0.013   STD DEV        0.021   VARIANCE   0.000
KURTOSIS   3.073   SKEWNESS       2.017   RANGE      0.077
MINIMUM    0.001   MAXIMUM        0.077

VALID CASES  883   MISSING CASES  0
```

Figure 11.71. Grain Size Data: McBeth Fjord GT-56

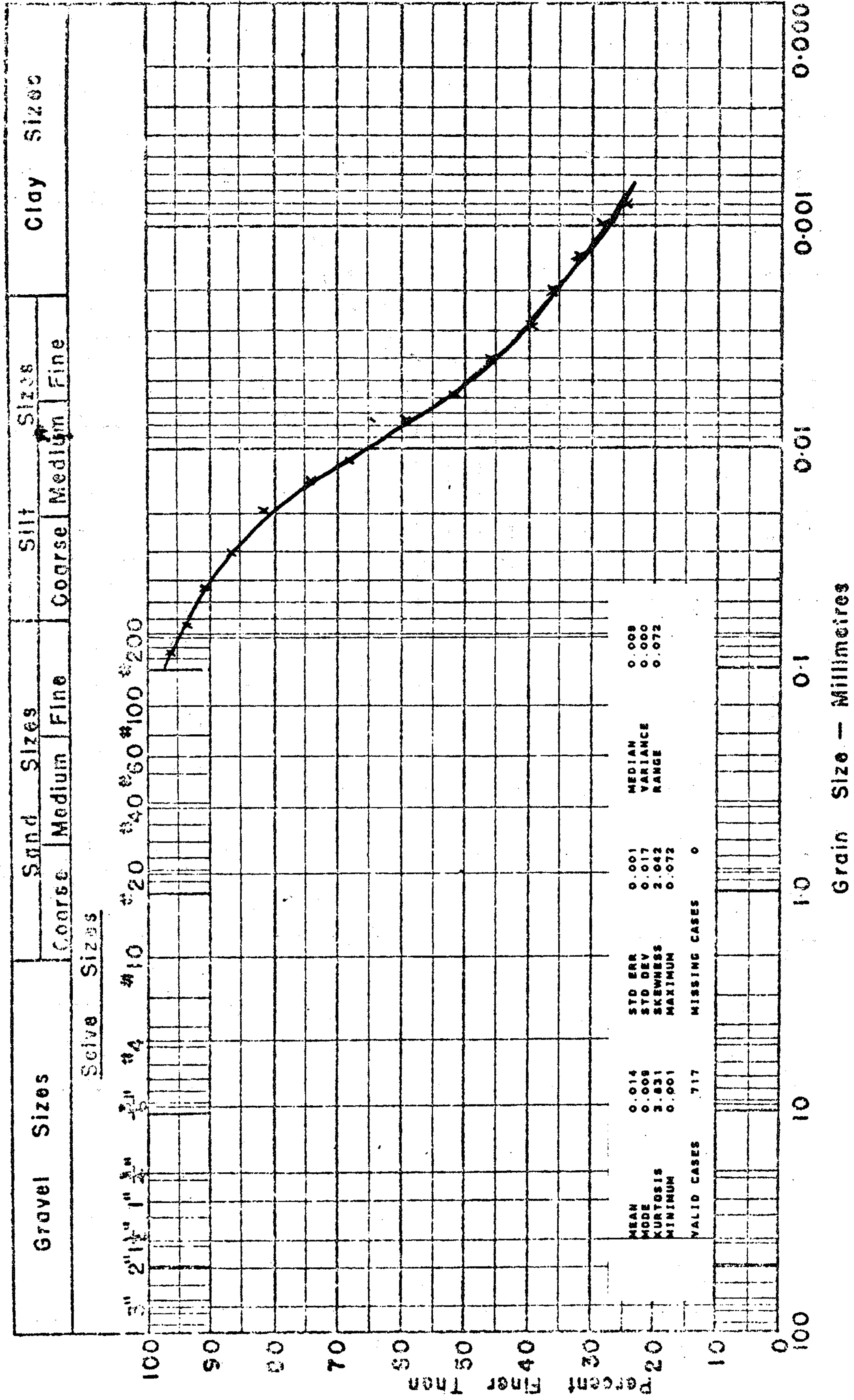


Figure 11.72. Grain Size Data: McBeth Fjord GT-57

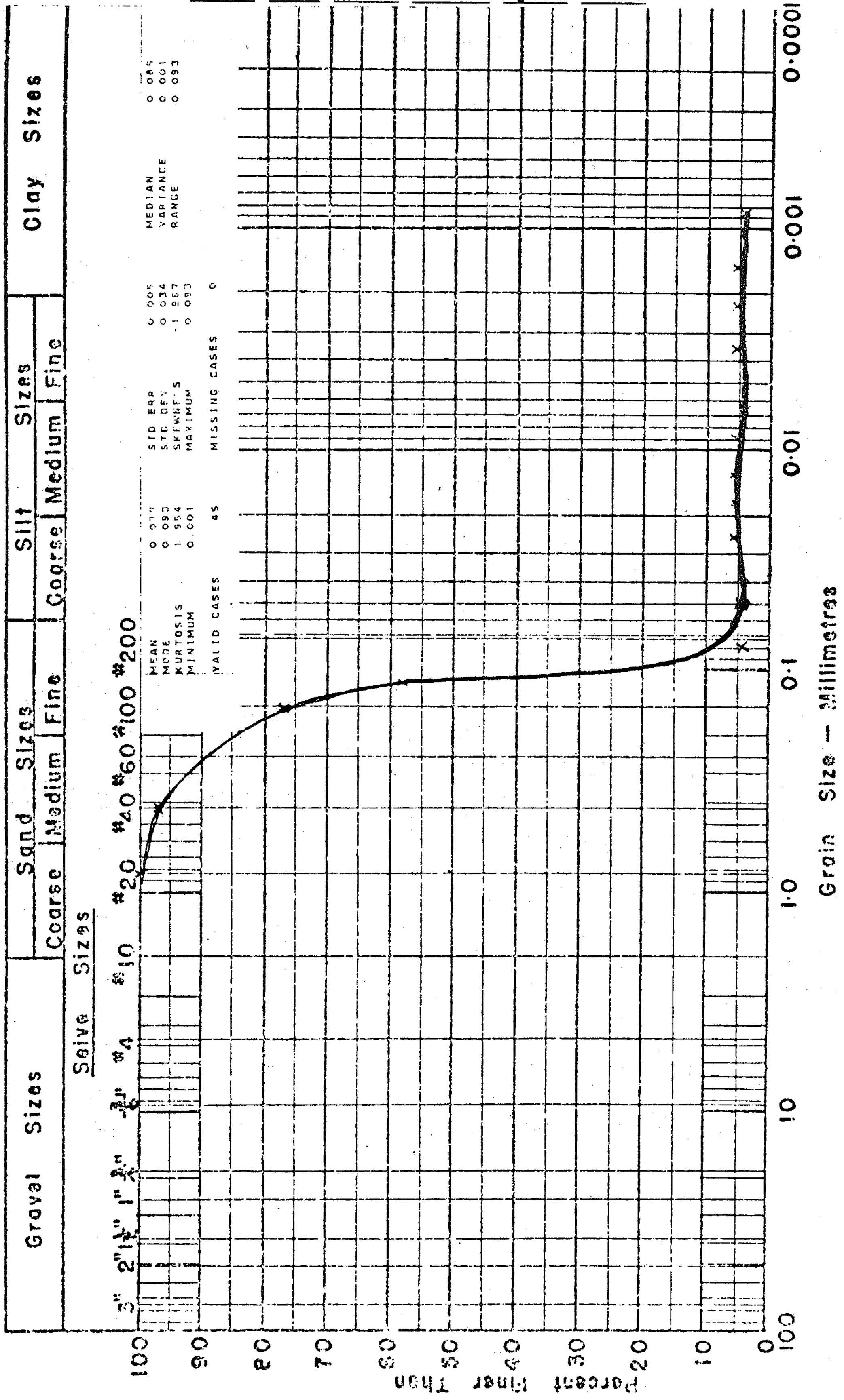
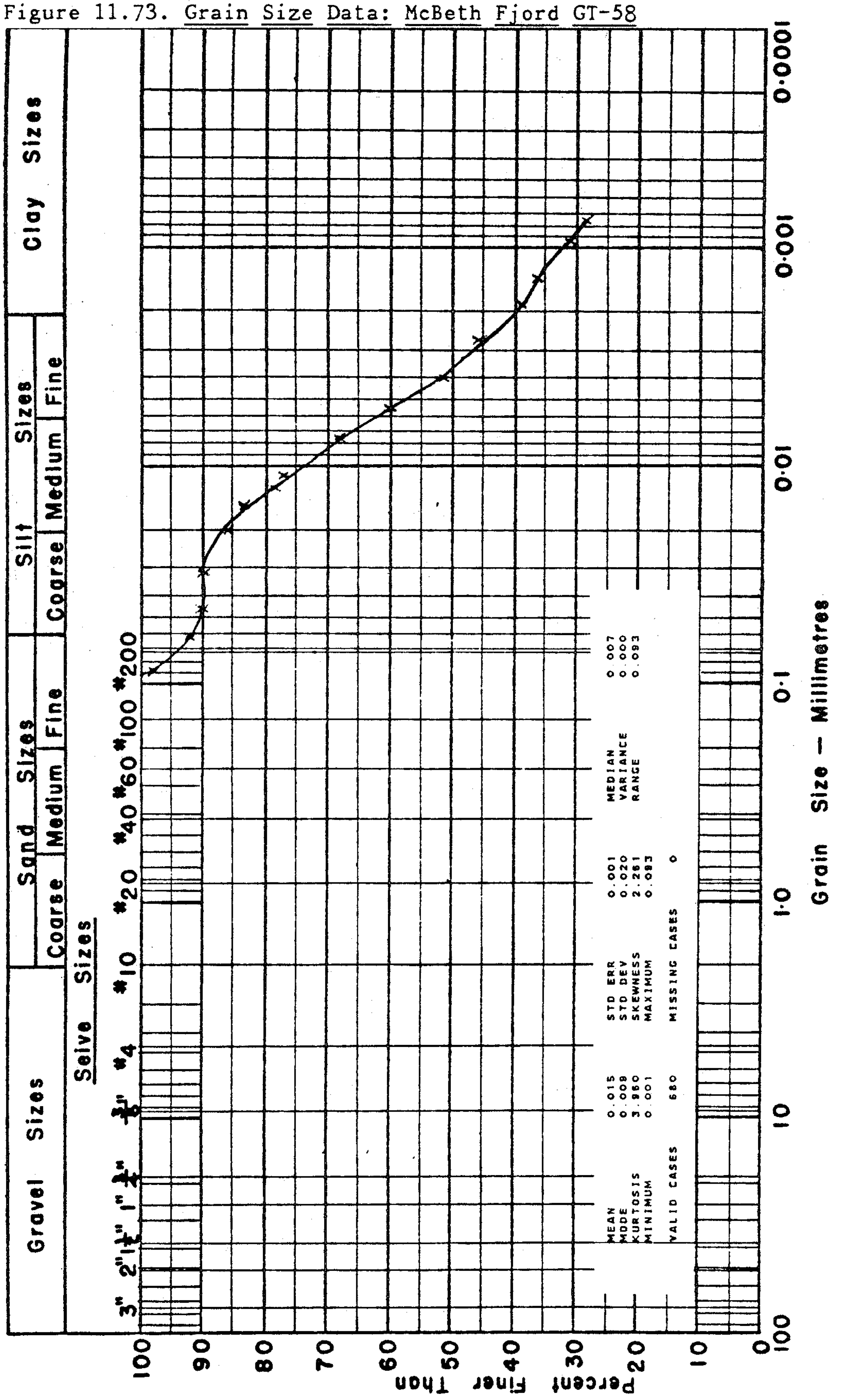


Figure 11.73. Grain Size Data: McBeth Fjord GT-58



MEAN	0.015	STD ERR	0.001	MEDIAN	0.007
MODE	0.008	STD DEV	0.020	VARIANCE	0.000
KURTOSIS	3.960	SKEWNESS	2.261	RANGE	0.093
MINIMUM	0.001	MAXIMUM	0.083		
VALID CASES	680	MISSING CASES	0		

Table 11.19 Geotechnical Data: McBeth Fjord

Sample # 	Depth (m±2.5cm) 	Water Content (Dry Basis) w(%)	Natural Water Content w(%)	Atterberg Limits WL(%)	 WP(%)	 IP
Core: MC-1 82-04303						
GT-51	0-0.10	86.27	46.32	62.0	34.8	27.2
GT-52	0.15	78.44	43.96	52.1	29.4	22.7
GT-53	0.30	25.93	20.59	N.P.	N.P.	N.P.
GT-54	0.37	68.45	40.63	49.0	30.9	18.1
GT-55	0.40	64.90	39.36	50.6	29.9	20.7
GT-56	0.50	57.16	36.37	45.9	30.1	15.8
GT-57	0.60	22.79	18.56	N.P.	N.P.	N.P.
GT-58	0.80	72.50	42.03	52.7	32.1	20.6

w= water content

WL= liquid limit

WP= plastic limit

IP= plasticity index

Table 11.20 Geotechnical Data: McBeth Fjord

Miniature Vane Shear Test Results

Sample #	Depth (m±2.5cm)	Undisturbed Shear Stress (Kg-cm)	Remolded Shear Stress (Kg-cm)	Sensitivity
Core: MC-1 82-04303				
GT-52	0.15	.0121	.0075	1.61
GT-53	0.30	.0247	.0109	2.26
GT-54	0.37	.0340	.0184	1.84
GT-55	0.40	.0432	.0132	3.26
GT-56	0.50	.0588	.0178	3.29
GT-57	0.59	.0714	.0806	0.89
GT-58	0.80	.0616	.0178	3.45

Table 11.21 Mineralogy of <2 μm Material: McBeth Fjord

Sample	Depth	Relative % Clays[1]				Other Phases[2]			
#	(m±2.5cm)	K	I	CHL	SW	Q	PL	KF	AMP
Core: MC-1 82-04303									
GT-51	0-0.10	2	90[5]	7	1	t	mt	mt	mt
GT-53	0.30	9	80[4]	6	5[3]	t	mt	mt	t
GT-55	0.40	4	92[5]	4	t	t	mt	mt	t
GT-57	0.60	9	78[4]	6	7[3]	t	m	m	t
GT-58[6]	0.80	4	93[5]	3	t	t	mt	mt	t

K= kaolinite I= illite CHL= chlorite SW= swelling clay

Q= quartz PL= plagioclase KF= potassium feldspar

AMP= amphibole

[1] The relative amounts of clay minerals reported are weighted percentages, normalized to 100 %, using the procedures described in the text.

[2] m = minor phase, mt = minor to trace phase, t = trace phase, nd = not detected.

[3] The swelling clay material is mostly smectite.

[4] Regularly interstratified illite/smectite is also present.

[5] A small amount of randomly interstratified illite/smectite or degraded illite is also indicated.

[6] Traces of a 9 Å mineral also detected (pyrophyllite or talc). Peaks disappear upon heating to 550°C.

Core Descriptions

CORE CL-1, 82-04440, CLARK FJORD, LENGTH=1.25m

0-0.1m: 2.5y 4/2; Disturbed pebbly muds, dispersed granules and pebbles, massive, structureless, darker reduced zones and streaks around dispersed coarser debris.

0.1-0.32m: 2.5y 4/2 to 2.5y 3/2; Pebbly, silty fine sands, dispersed granules and pebbles, massive, structureless, darker reduced zones around dispersed coarser debris.

0.32-0.40m: 2.5y 4/2 (2.5y 2/0); Pebbly silts, dispersed granules and fine gravels, massive, structureless silts with patches of darker reduced zones.

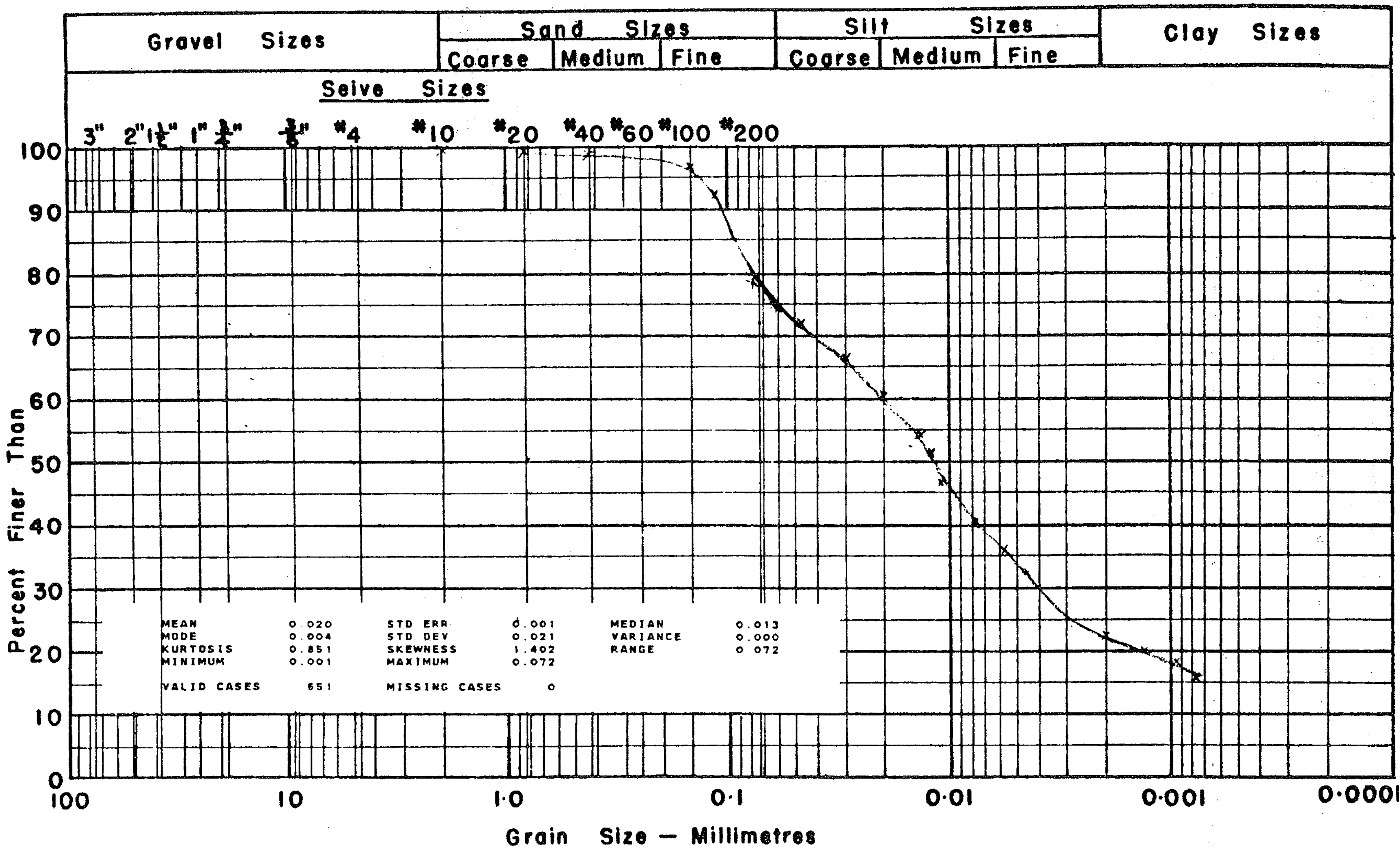
0.40-0.73m: 2.5y 4/2; Coarse sand to silty fine sand, very well-graded, few scattered granules and fine gravel-sized clasts throughout bed. At 0.6m more concentration of gravel-granule size material. (19 pebbles counted, clasts are unweathered hornblende gneiss, averaging 0.75-1cm long) Sands very poorly sorted. Indistinct darker reduced zones throughout bed.

0.75-0.89m: 2.5y 4/2; Medium/coarse sand to fine sandy, silty mud, well-graded, scattered granules throughout bed, a few dark reduced streaks.

0.98-1.25m: 2.5y 4/2; Fine sand to fine sandy silt, well-graded, thick, structureless, many dark reduced streaked zones (? bioturbation), some scattered dispersed, angular, hornblende pebbles (2cm long) through bed.

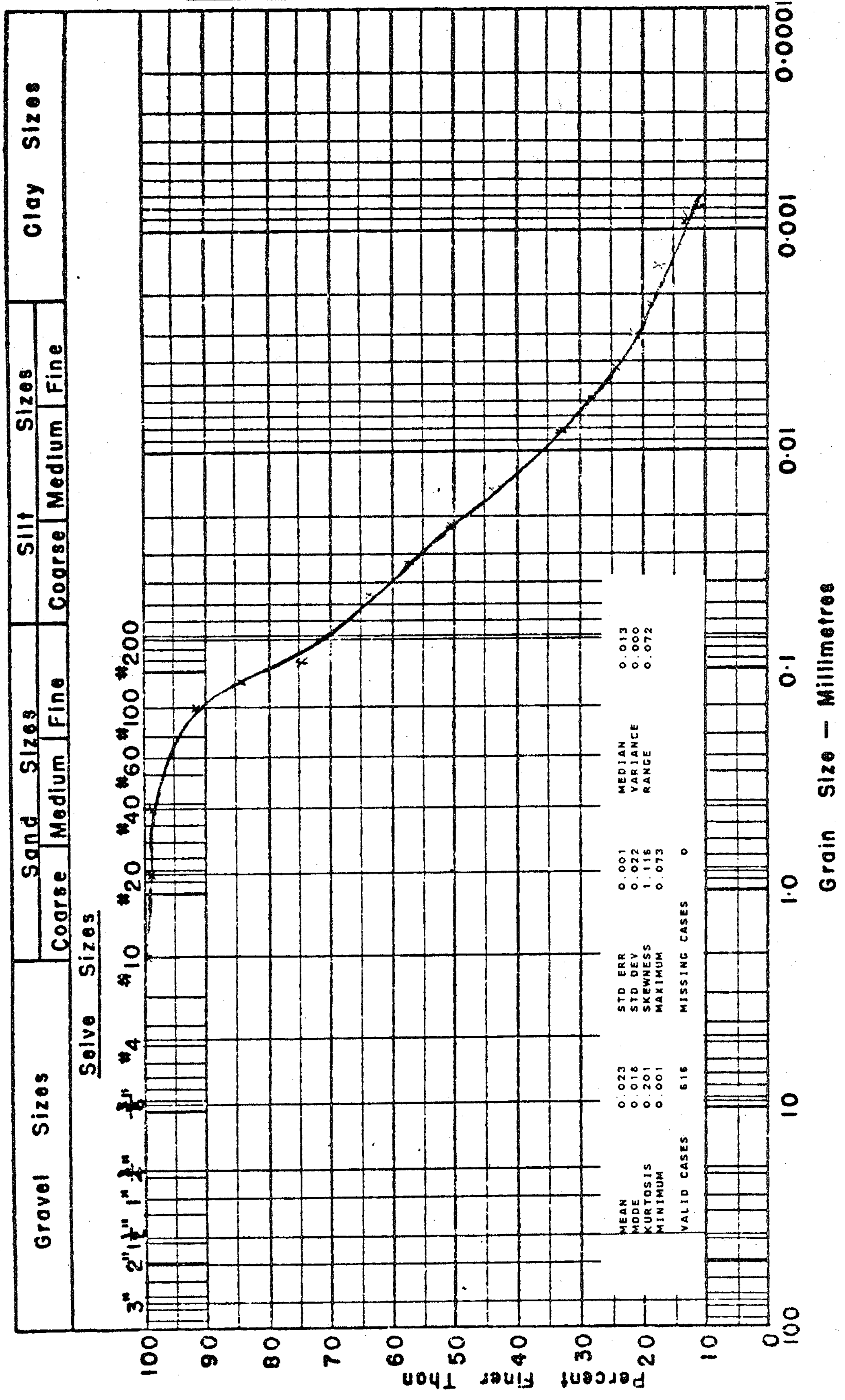
Disturbance: Top 0.1m disturbed with some flow-out during splitting.

Figure 11.74. Grain Size Data: Clark Fjord GT-77



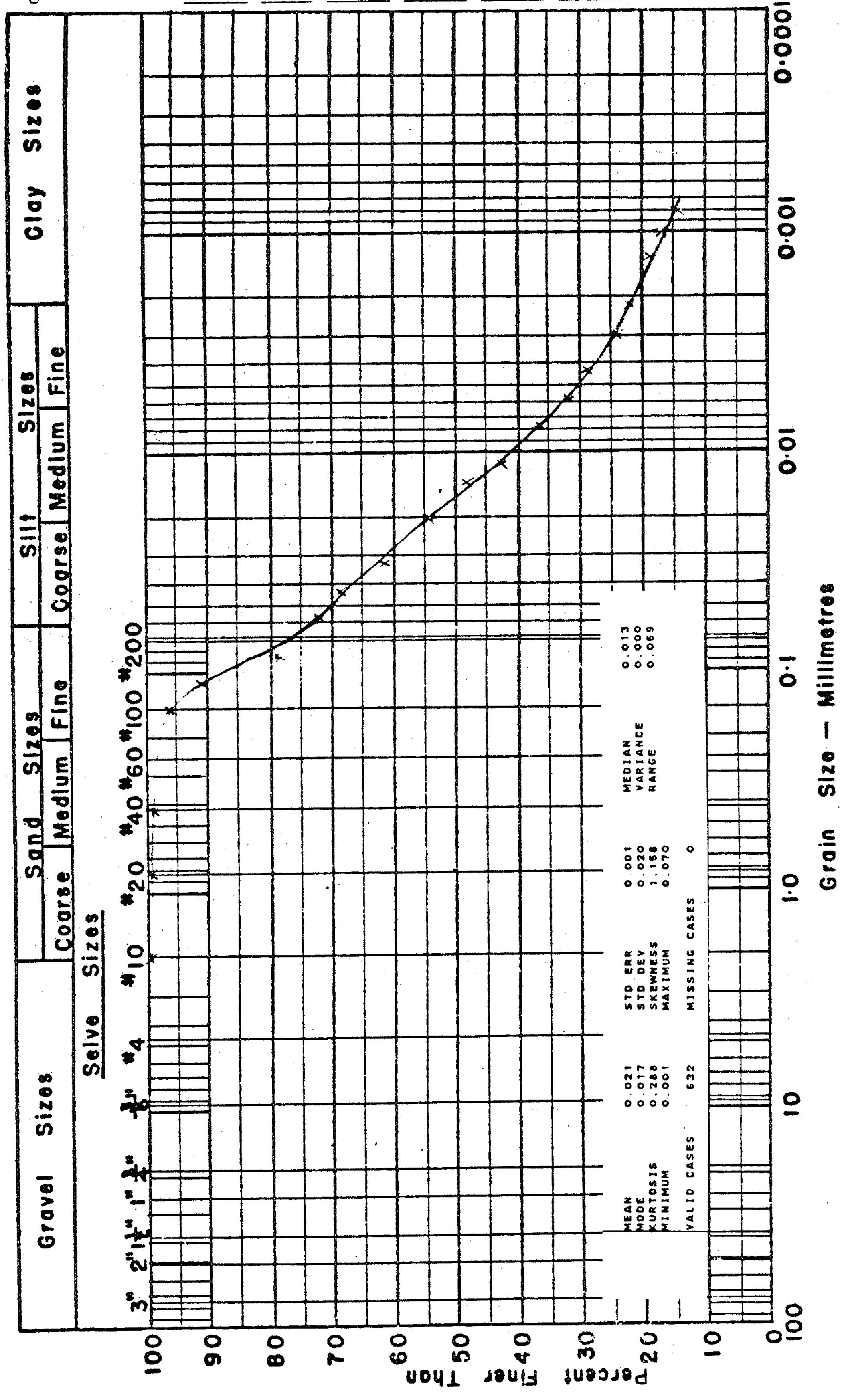
MEAN	0.020	STD ERR	0.001	MEDIAN	0.013
MODE	0.004	STD DEV	0.021	VARIANCE	0.000
KURTOSIS	0.851	SKEWNESS	1.402	RANGE	0.072
MINIMUM	0.001	MAXIMUM	0.072		
VALID CASES	651	MISSING CASES	0		

Figure 11.75. Grain Size Data: Clark Fjord GT-78



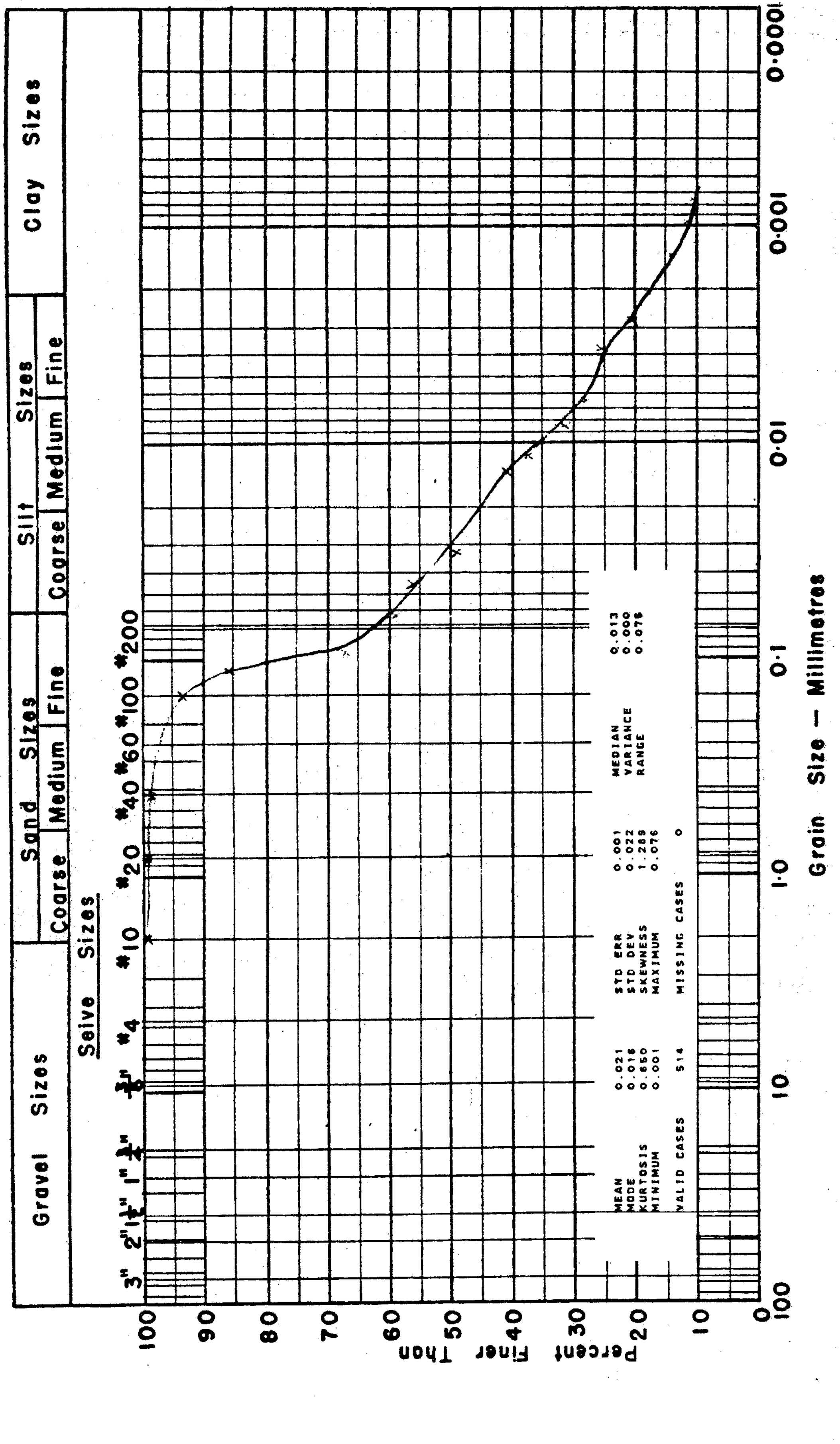
MEAN	0.023	STD ERR	0.001	MEDIAN	0.013
MODE	0.018	STD DEV	0.022	VARIANCE	0.000
KURTOSIS	0.201	SKEWNESS	1.116	RANGE	0.072
MINIMUM	0.001	MAXIMUM	0.073		
VALID CASES	616	MISSING CASES	0		

Figure 11.76. Grain Size Data: Clark Fjord GT-79



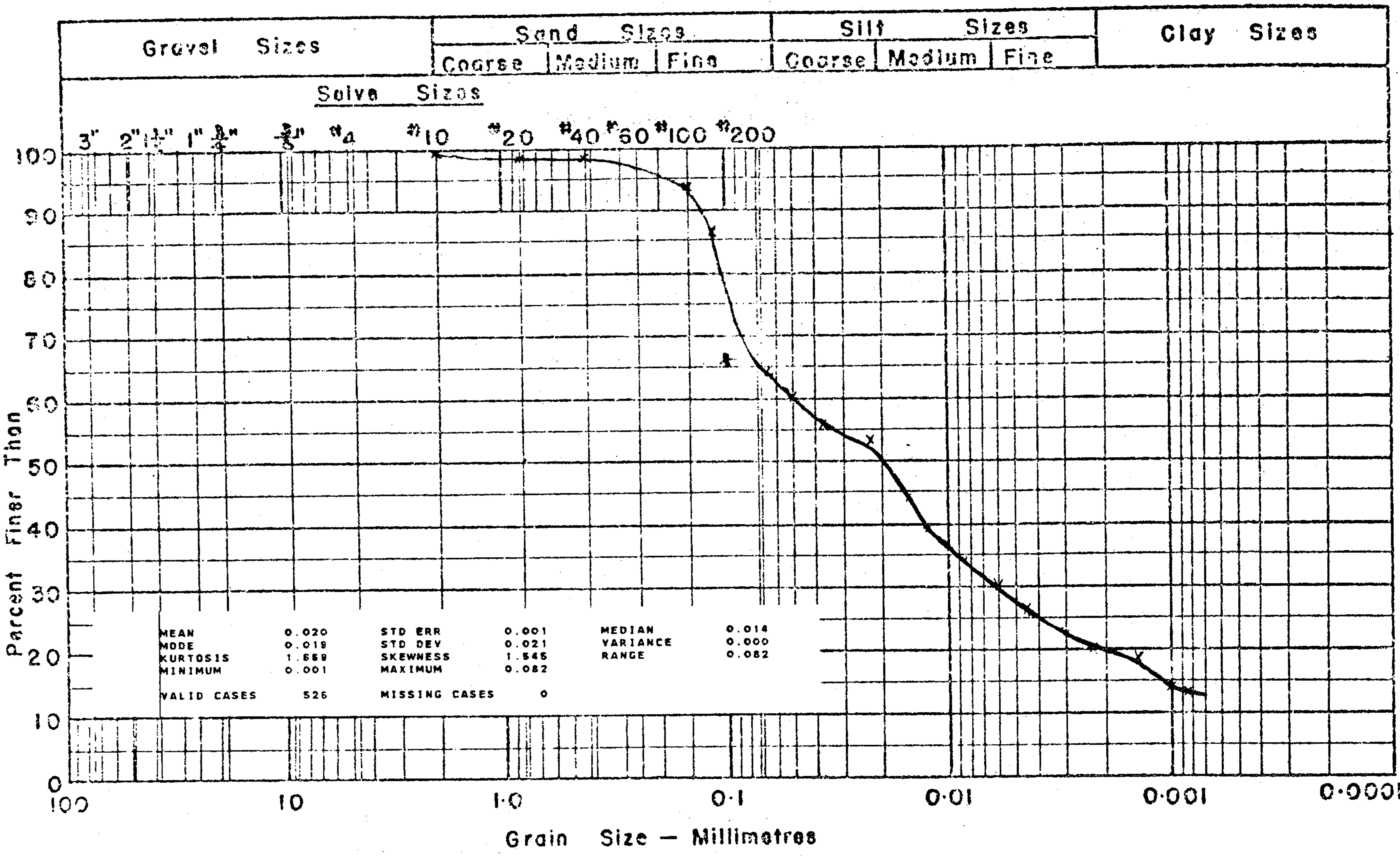
```
MEAN          0.021     STD ERR        0.001     MEDIAN      0.013
MODE          0.017     STD DEV        0.020     VARIANCE    0.000
KURTOSIS      0.288     SKEWNESS       1.158     RANGE       0.069
MINIMUM       0.001     MAXIMUM        0.070

VALID CASES     632     MISSING CASES      0
```

Figure 11.77. Grain Size Data: Clark Fjord GT-80



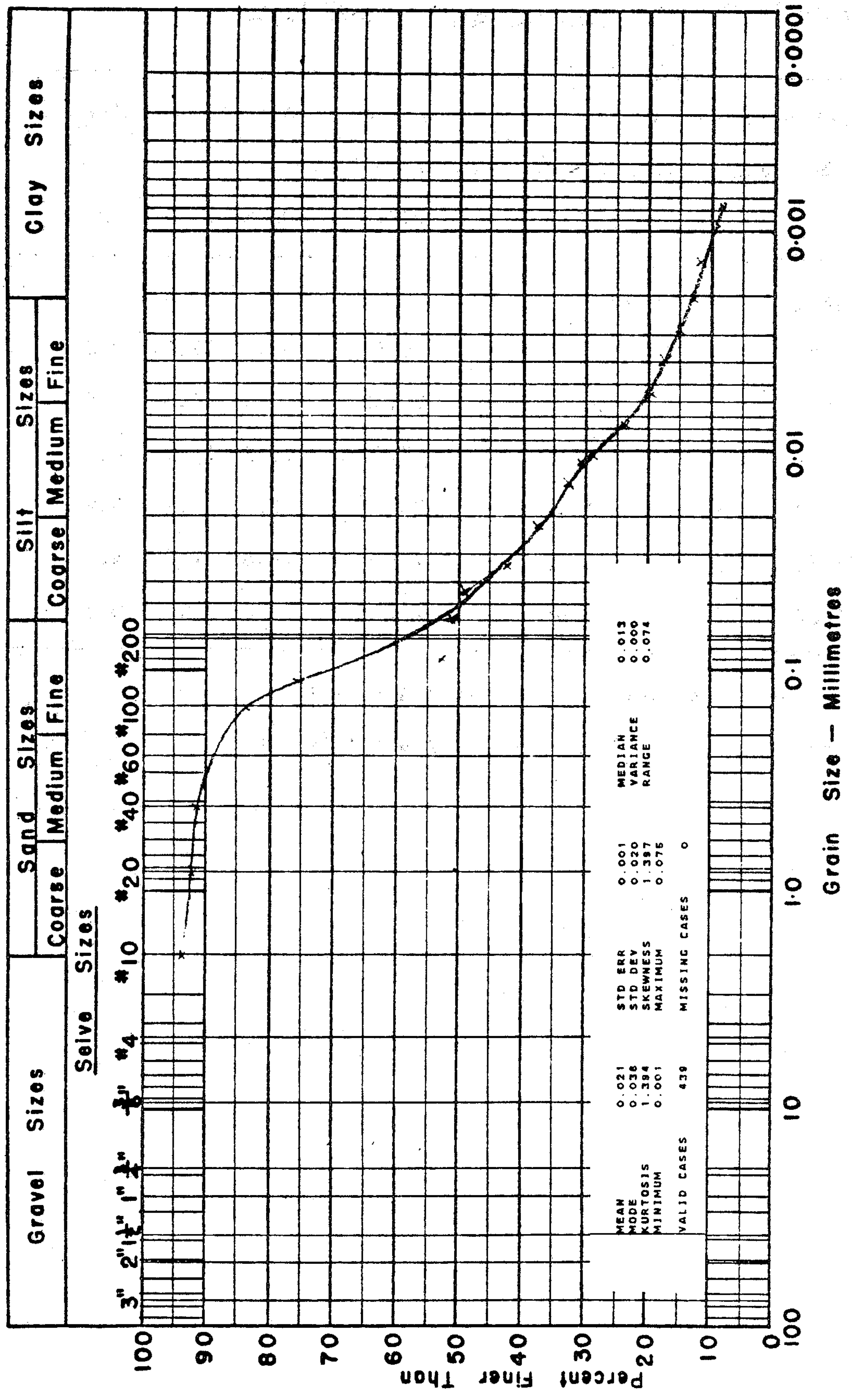
MEAN	0.021	STD ERR	0.001	MEDIAN	0.013
MODE	0.018	STD DEV	0.022	VARIANCE	0.000
KURTOSIS	0.650	SKEWNESS	1.289	RANGE	0.076
MINIMUM	0.001	MAXIMUM	0.076		
VALID CASES	514	MISSING CASES	0		

Figure 11.78. Grain Size Data: Clark Fjord GT-81



```
MEAN            0.020    STD ERR          0.001    MEDIAN       0.014
MODE            0.019    STD DEV          0.021    VARIANCE     0.000
KURTOSIS        1.669    SKEWNESS         1.545    RANGE        0.082
MINIMUM         0.001    MAXIMUM          0.082

VALID CASES       526    MISSING CASES        0
```

Figure 11.79. Grain Size Data: Clark Fjord GT-82



```
MEAN        0.021    STD ERR         0.001    MEDIAN      0.013
MODE        0.036    STD DEV         0.020    VARIANCE    0.000
KURTOSIS    1.384    SKEWNESS        1.397    RANGE       0.074
MINIMUM     0.001    MAXIMUM         0.075

VALID CASES   439    MISSING CASES       0
```

Table 11.22 Geotechnical Data: Clark Fjord

Sample #	Depth (m±2.5cm)	Water Content (Dry Basis) w(%)	Natural Water Content w(%)	Atterberg Limits WL(%)	WP(%)	IP
Core: CL-1 82-04440						
GT-77	0-0.05	41.65	29.41	30.5	22.3	8.2
GT-78	0.20	34.01	25.38	25.5	19.0	6.5
GT-79	0.35	37.97	27.52	26.8	20.5	6.3
GT-80	0.60	31.02	23.67	22.8	18.9	3.9
GT-81	0.80	36.99	27.00	24.8	20.0	4.8
GT-82	1.00	38.48	27.79	25.8	19.0	6.8

w= water content

WL= liquid limit

WP= plastic limit

IP= plasticity index

Table 11.23 Geotechnical Data: Clark Fjord

Miniature Vane Shear Test Results

Sample #	Depth (m±2.5cm)	Undisturbed Shear Stress (Kg-cm)	Remolded Shear Stress (Kg-cm)	Sensitivity
Core: CL-1 82-04440				
GT-78	0.20	.0581	.0247	2.35
GT-79	0.35	.0639	.0276	2.32
GT-80	0.60	.0944	.0247	3.82
GT-81	0.80	.0754	.0288	2.62
GT-82	1.00	.0581	.0328	1.77

Table 11.24 Mineralogy of <2μm Material: Clark Fjord

Sample #	Depth (m±2.5cm)	Relative % Clays[1] K	I	CHL	SW	Other Phases[2] Q	PL	KF	AMP
Core: CL-1 82-04440									
GT-77	0-0.05	2	87	8[4]	3[3]	t	m	m	t
GT-79	0.35	t	76[5]	19[4]	5[3]	mt	m	m	t
GT-80	0.60	3	74	15[4]	8[3]	mt	m	m	t
GT-81	0.80	t	69	21[4]	10[3]	mt	m	m	t
GT-82	1.00	2	79	16[4]	3[3]	mt	m	m	t

K= kaolinite I= illite CHL= chlorite SW= swelling clay

Q= quartz PL= plagioclase KF= potassium feldspar

AMP= amphibole

[1] The relative amounts of clay minerals reported are weighted percentages, normalized to 100 %, using the procedures described in the text.

[2] m = minor phase, mt = minor to trace phase, t = trace phase, nd = not detected.

[3] The swelling clay material is mostly smectite.

[4] A regularly interstratified mineral, probably corrensite, is also present in abundance. It contributes to both the reported chlorite and smectite abundances and causes the kaolinite percentages to be minimum estimates only.

[5] A small amount of randomly interstratified illite/smectite or degraded illite is also indicated.

Core Descriptions

CORE CA-6, 82-04465, CAMBRIDGE FJORD, LENGTH= 2.72m

0-0.1m: 10yr 5/4; Disturbed, ochre tan silty mud with dispersed fine sand, large angular granitic dropstone (4cm long) at 0.08m.

0.1-0.19m: 10yr 6/2 (10yr 6/3); Sandy silt, graded from darker more sandy base to grey tan more silty top, structureless.

0.19-0.34,m: 5y 3/2 (5y 2.5/1); Greenish grey sandy silt, graded, sand more concentrated toward base, more dispersed toward top, few dark reduced streaks scattered throughout bed.

0.34-0.45m: 5y 4/2; Grey tan sandy silty mud, sand is dispersed throughout silty mud, structureless.

0.45-0.88m: 5y 4/2 to 5y 4/1; Grey tan medium sandy silt to grey silt with dispersed fine sand, few scattered burrows and dark reduced streaks.

0.88-0.905m: 5y 4/2 (5y 4/1); Coarse sand to fine sand, capped by 1cm thick grey silt (5y 4/1), medium-coarse feldspathic sand at base; sand is graded-stratified or graded with low angle cross-bedding, marked by heavy mineral concentrations.

0.905-0.96m: 5y 4/2; Granule sand to silty sand, well-graded, scattered shell debris at top of bed and some dark reduction streaks at contact with overlying bed. Very coarse feldspathic sand in basal 0.025m, overlain by more silty sand with an increased concentration of heavy minerals and scattered shell debris, some dark reduced spots in upper silty sand, scalloped, scoured base cuts 1.5cm into underlying bed.

0.96-1.87m: 5y 4/2; Sandy silt, very thick massive silt with dispersed fine sand, dropstones (1.5 and 2.7cm long) at 1.69-1.71m, prominent burrows (5mm diameter) at 1.35m, otherwise scattered burrows and a few dark reduced spots, otherwise structureless, mottled base.

1.87-1.92m: 5y 4/1; Medium sand to silt, well-graded, concentrated feldspathic sand with heavy minerals in lower few mm, overlain by light grey bioturbated silt with a mottled appearance, very sharp (knife-edge) flat base.

1.92-2.08m: 5y 4/2; Granule/sand to sandy, silty mud, slightly graded, fine sand more concentrated toward base, granules scattered throughout bed, thick, massive, slight burrowing, very sharp (knife-edge) flat base.

2.08-2.28m: 5y 4/2; Sandy silty mud, dominantly silty mud with scattered (dispersed) very fine sand and mica flakes, bioturbated and blocky fracture.

2.28-2.72m: 5y 4/2; Greyish silty mud, faintly laminated, medium bioturbation, giving a somewhat mottled appearance, a few scattered dark reduced zones.

Disturbance: Upper 0.1m disturbed and upper 0.5m slumped a bit during splitting.

Figure 11.80. Grain Size Data: Cambridge Fjord GT-83

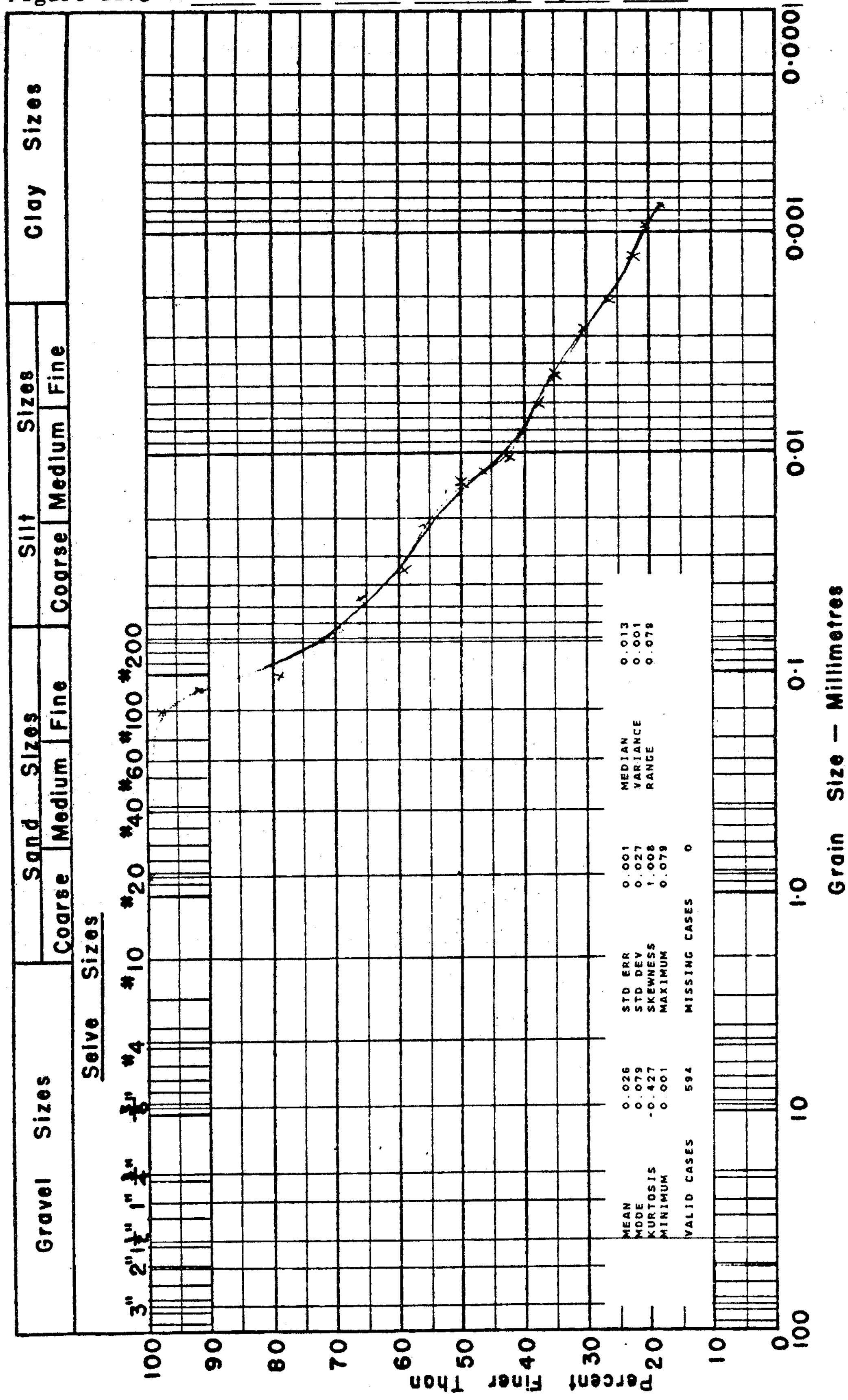
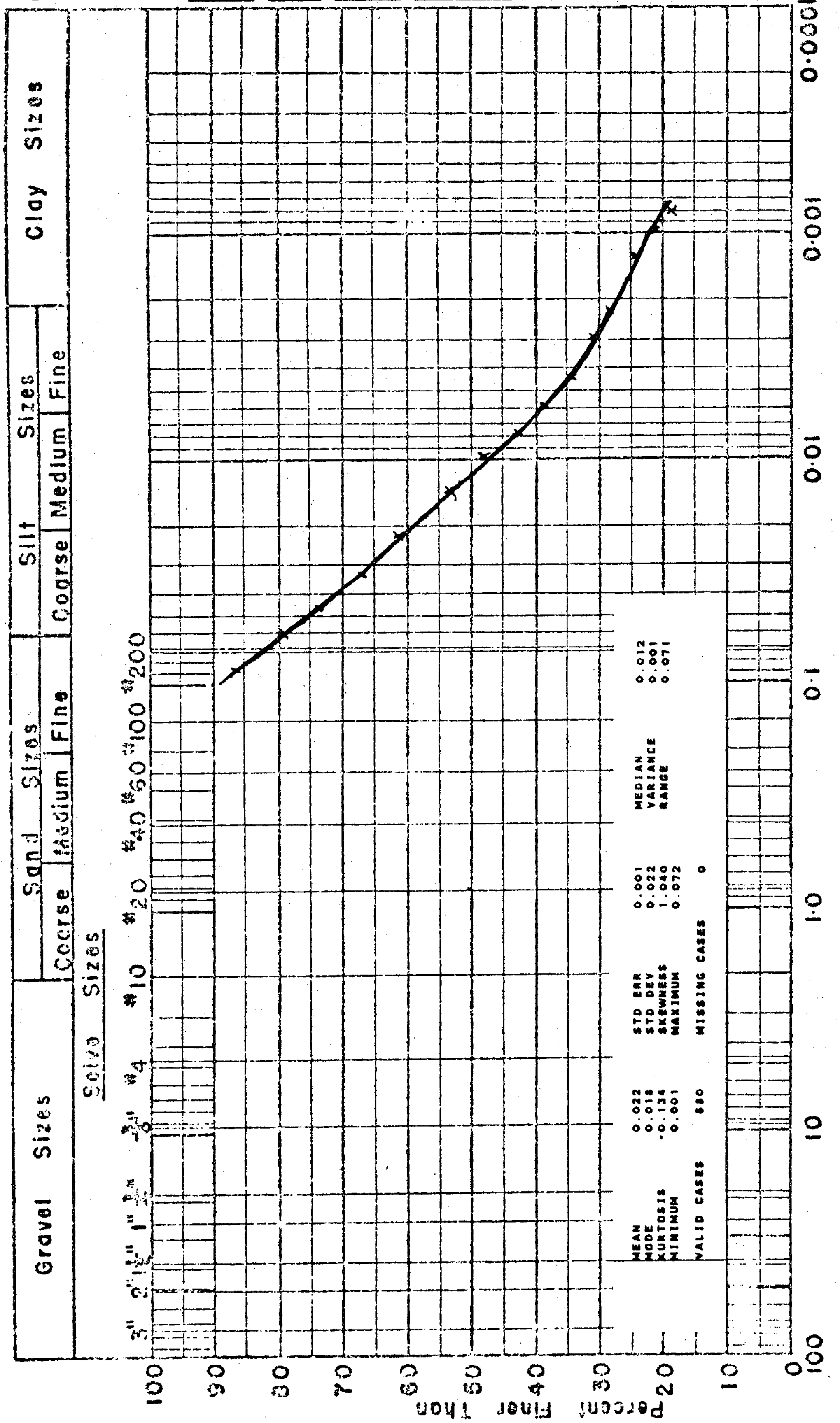
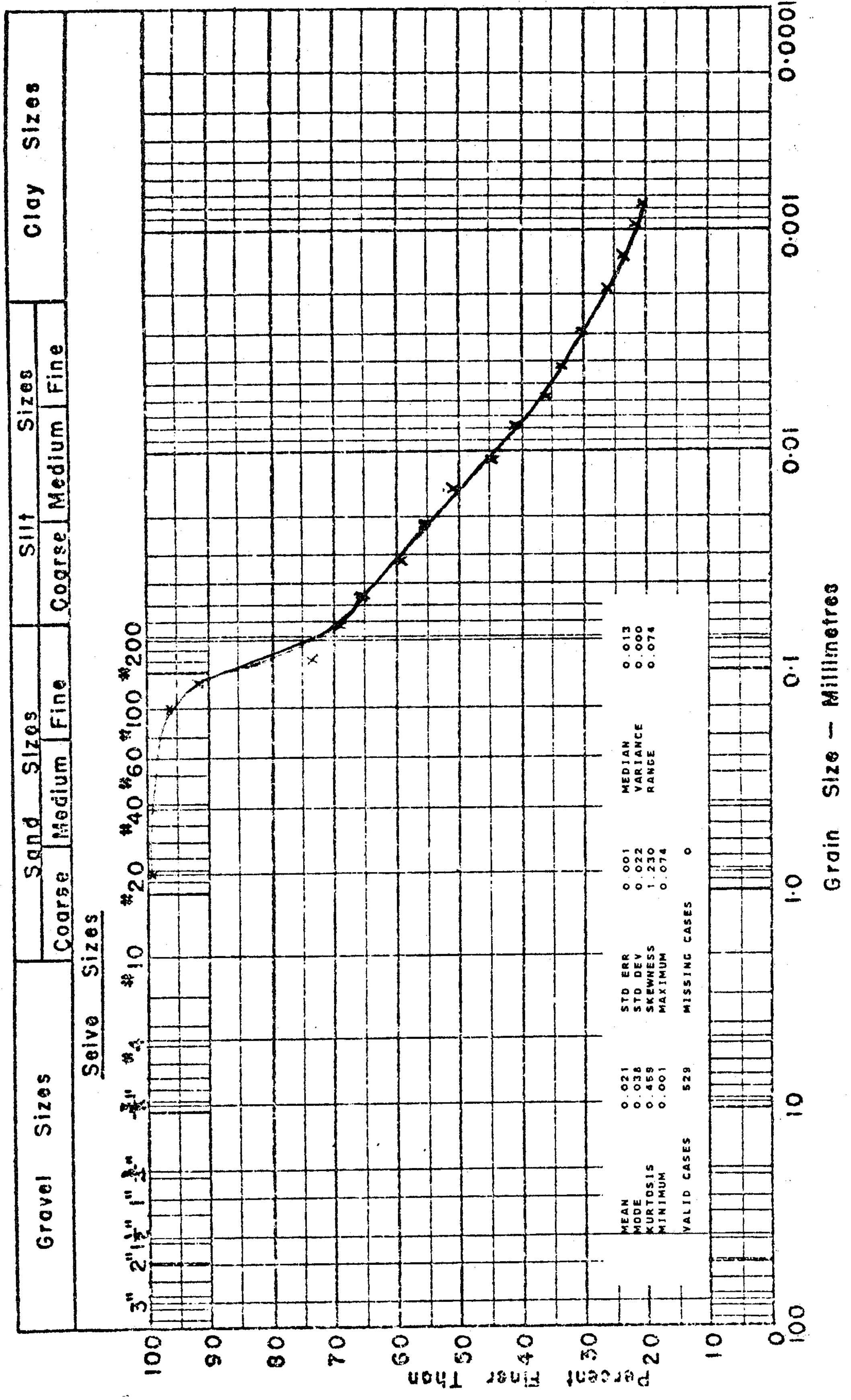


Figure 11.81. Grain Size Data: Cambridge Fjord GT-84



```
MEAN          0.022    STD ERR        0.001    MEDIAN      0.012
MODE          0.018    STD DEV        0.022    VARIANCE    0.001
KURTOSIS     -0.134    SKEWNESS       1.040    RANGE       0.071
MINIMUM       0.001    MAXIMUM        0.072

VALID CASES     880    MISSING CASES      0
```

Figure 11.82. Grain Size Data: Cambridge Fjord GT-85



MEAN	0.021	STD ERR	0.001	MEDIAN	0.013
MODE	0.038	STD DEV	0.022	VARIANCE	0.000
KURTOSIS	0.459	SKEWNESS	1.230	RANGE	0.074
MINIMUM	0.001	MAXIMUM	0.074		
VALID CASES	529	MISSING CASES	0		

Figure 11.83. Grain Size Data: Cambridge Fjord GT-93

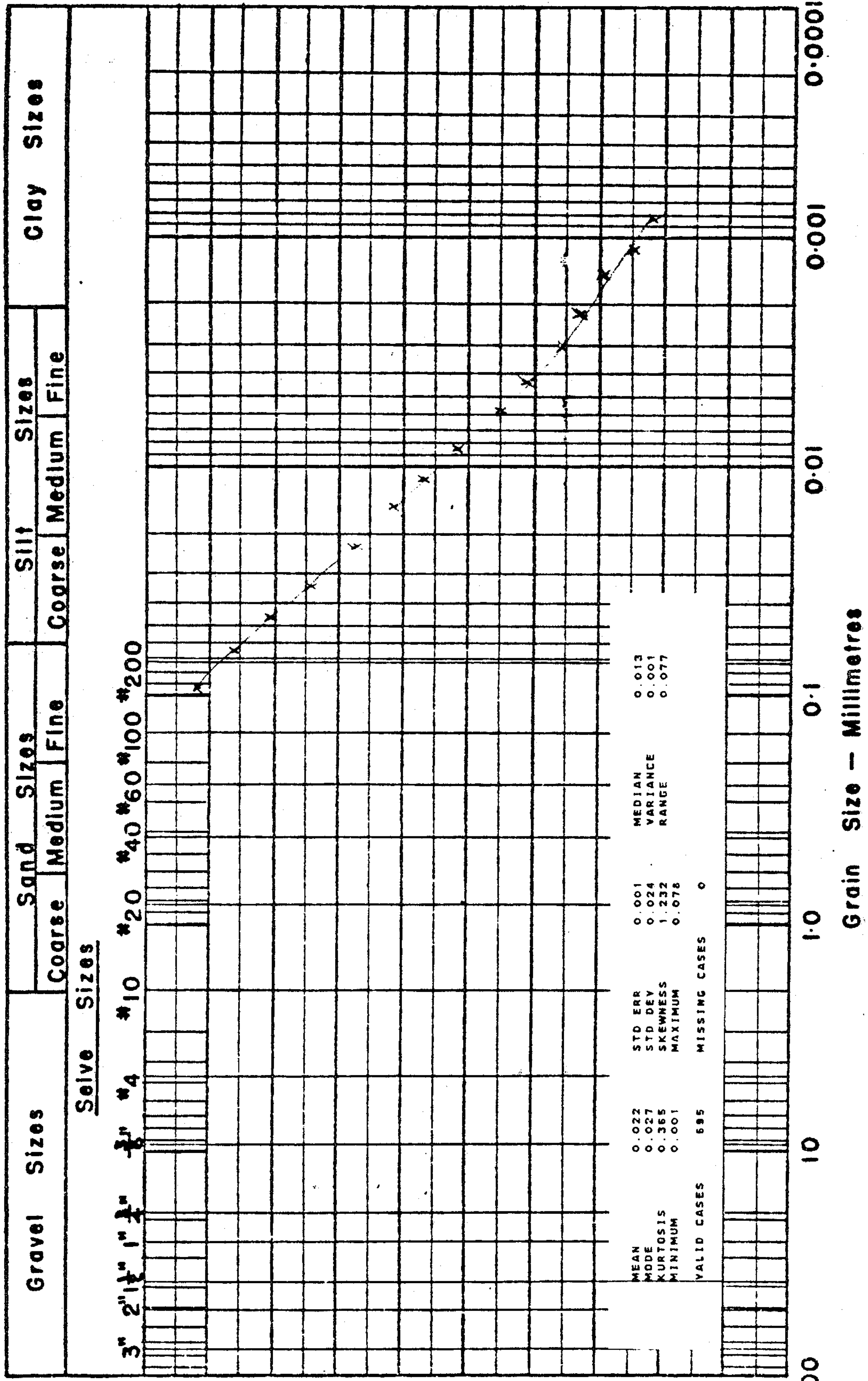


Figure 11.84. Grain Size Data: Cambridge Fjord GT-86

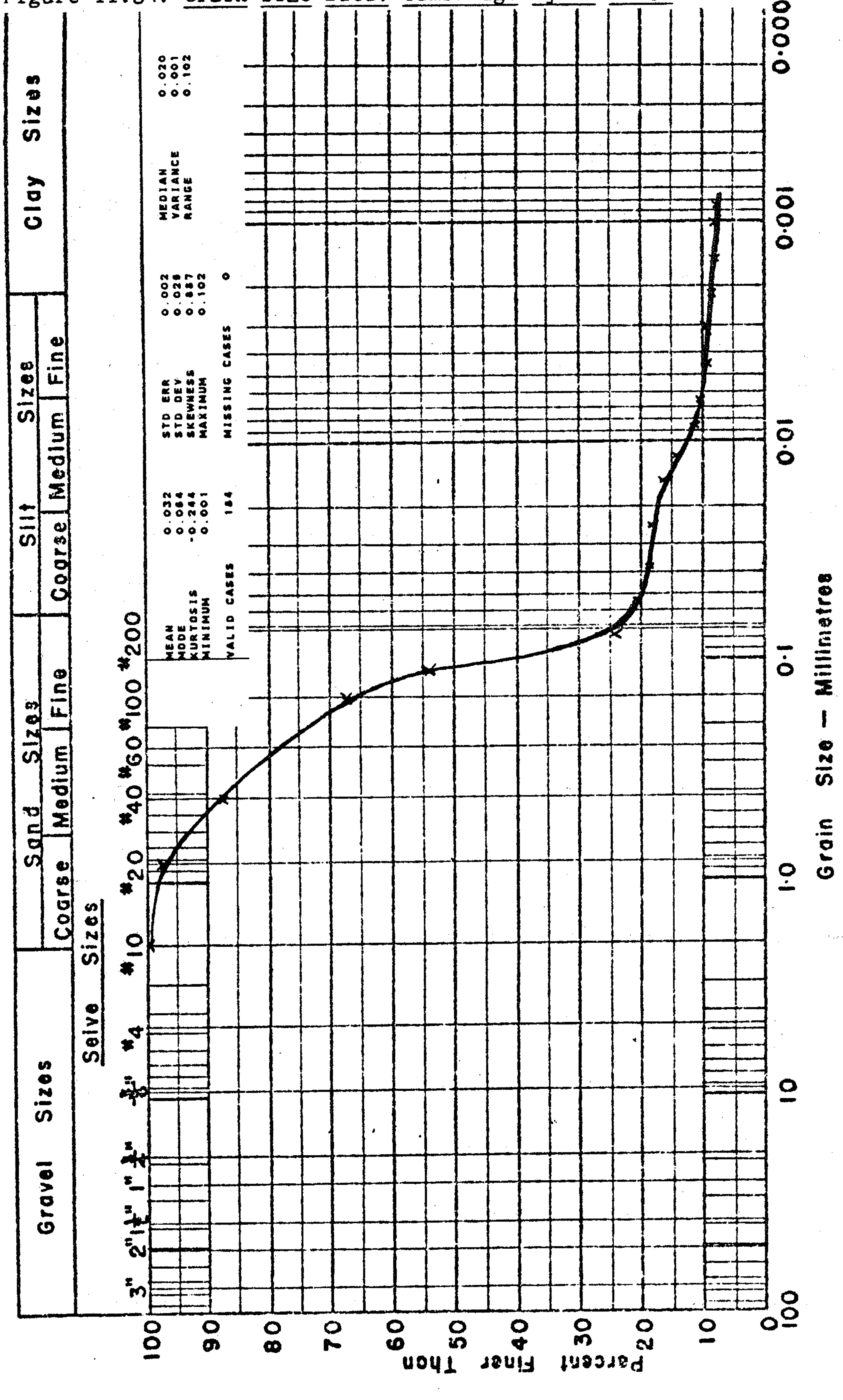


Figure 11.85. Grain Size Data: Cambridge Fjord GT-87

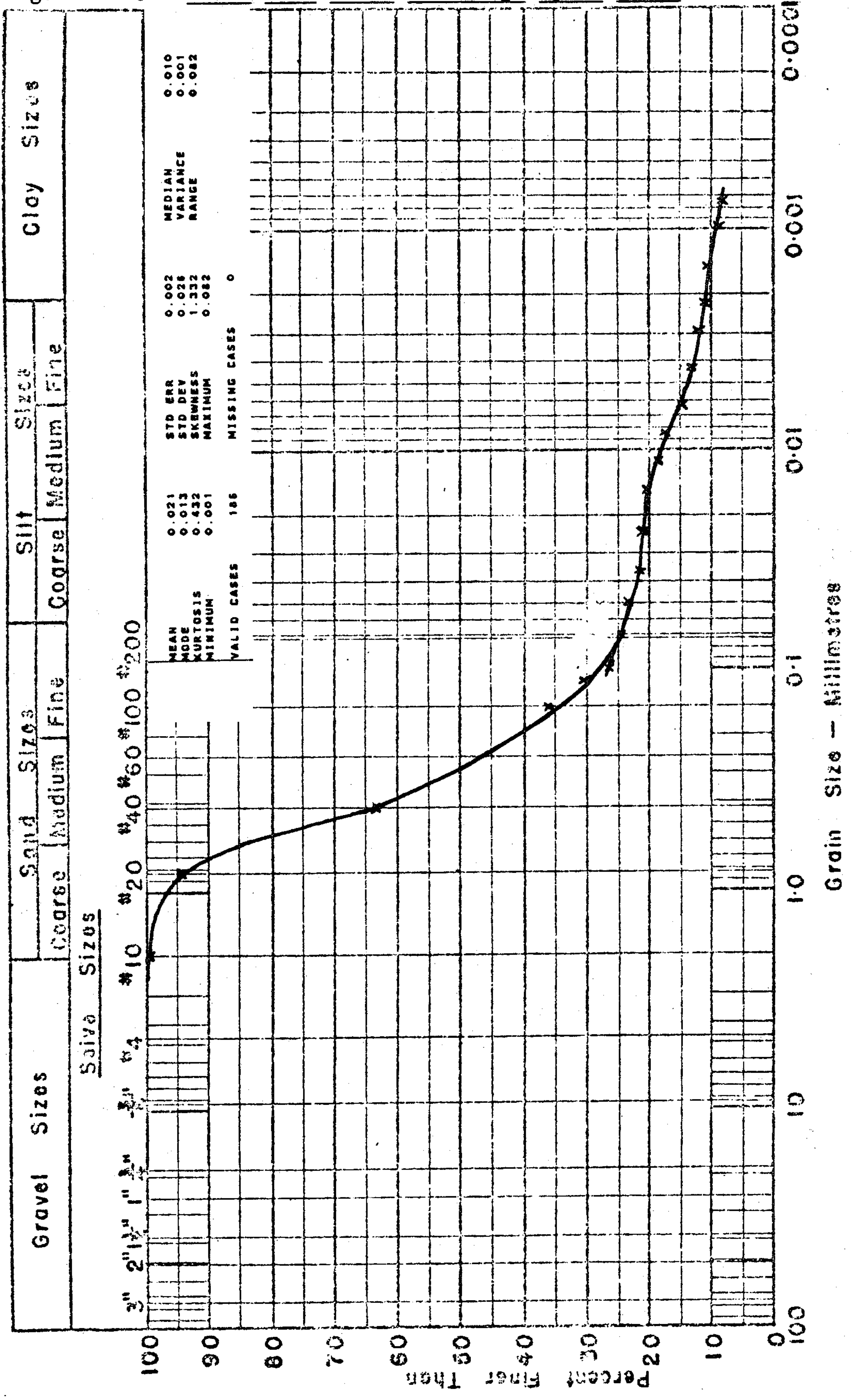
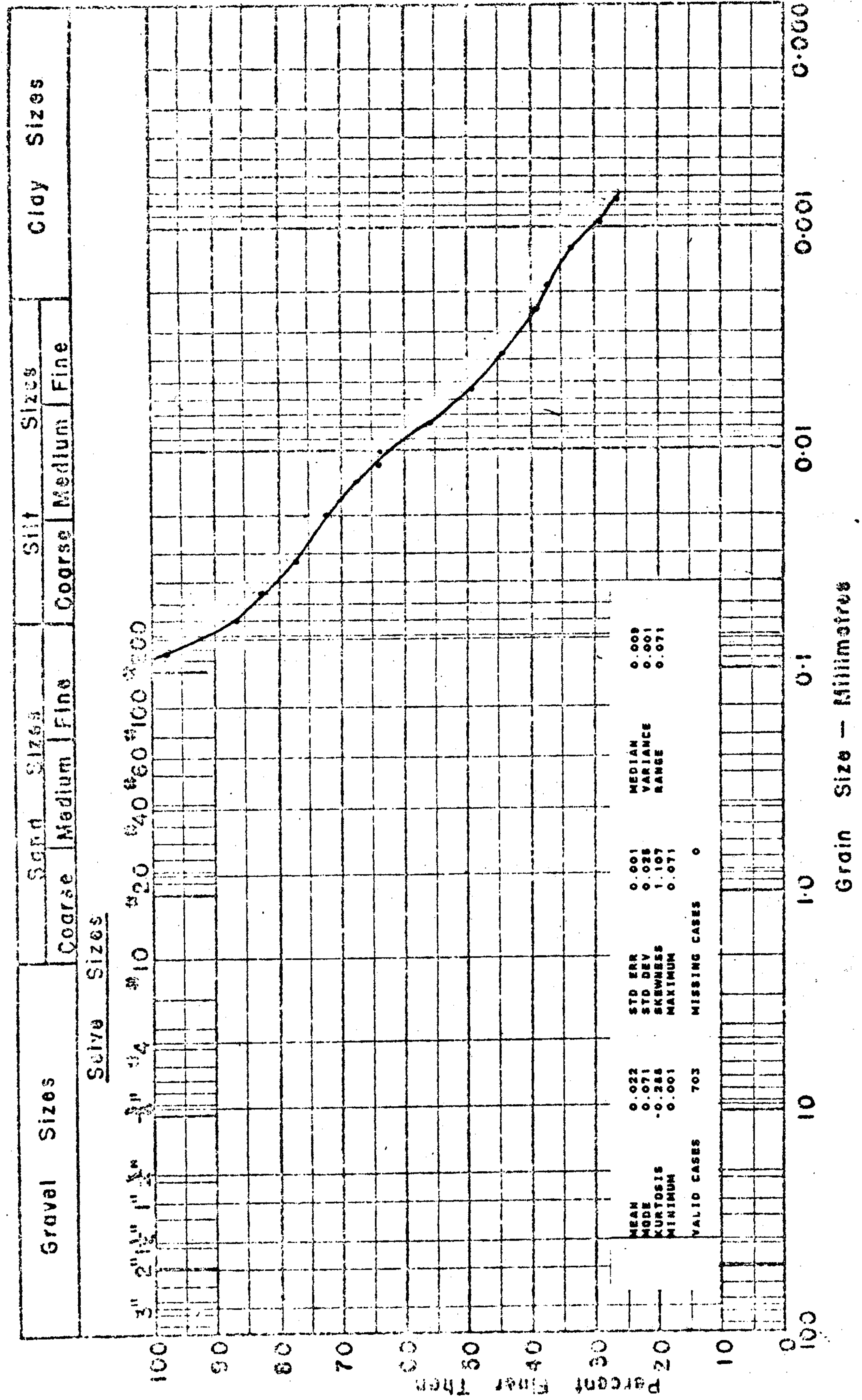
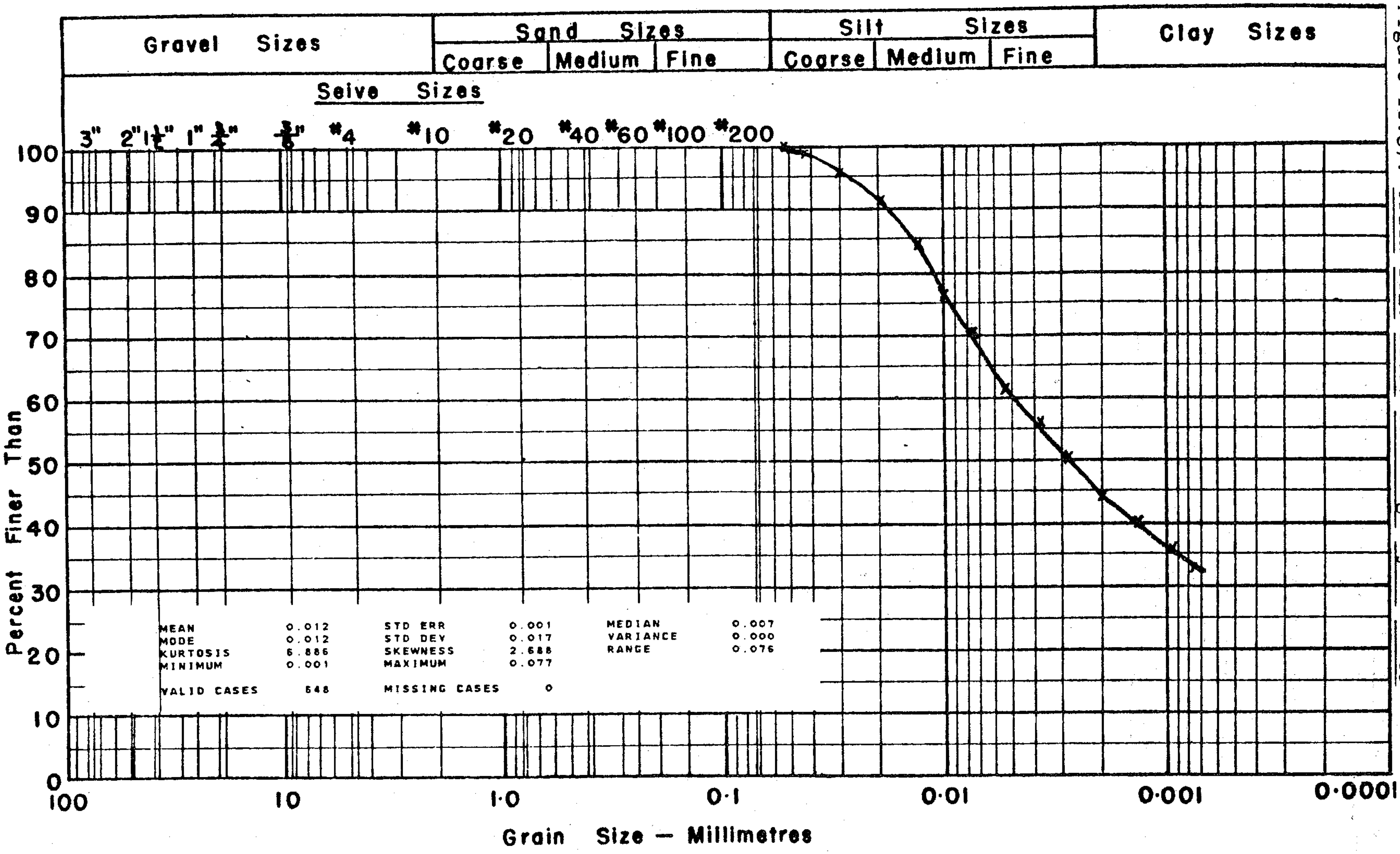


Figure 11.86. Grain Size Data: Cambridge Fjord GT-88



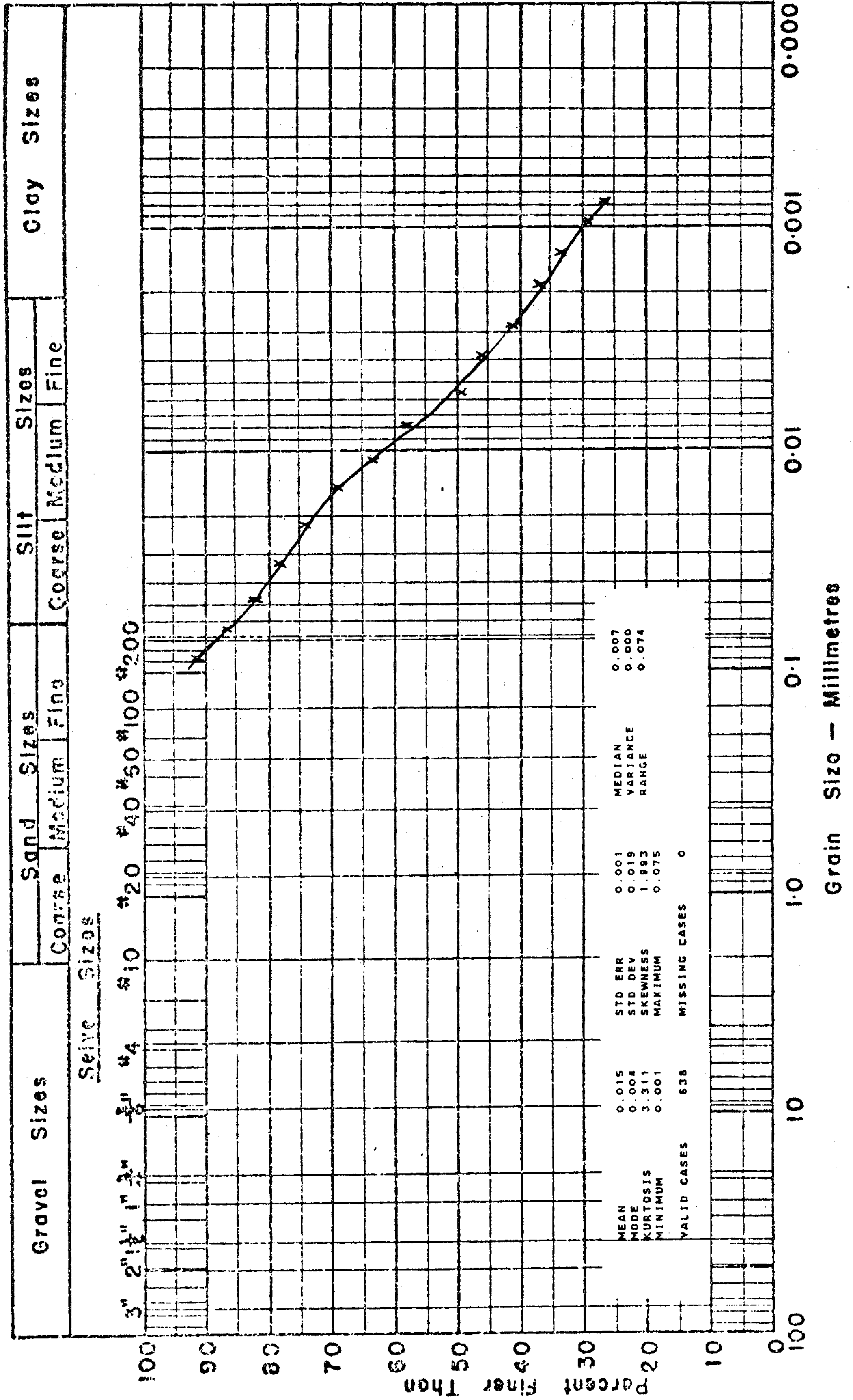
```
MEAN          0.022     STD ERR     0.001     MEDIAN     0.009
MODE          0.071     STD DEV     0.028     VARIANCE   0.001
KURTOSIS     -0.288     SKEWNESS    1.107     RANGE      0.071
MINIMUM       0.001     MAXIMUM     0.071

VALID CASES   703       MISSING CASES   0
```

Figure 11.87. Grain Size Data: Cambridge Fjord GT-89



```
MEAN          0.012     STD ERR        0.001     MEDIAN      0.007
MODE          0.012     STD DEV        0.017     VARIANCE    0.000
KURTOSIS      6.886     SKEWNESS       2.688     RANGE       0.076
MINIMUM       0.001     MAXIMUM        0.077

VALID CASES     648     MISSING CASES      0
```

Figure 11.88. Grain Size Data: Cambridge Fjord GT-90



```
MEAN         0.015   STD ERR        0.001   MEDIAN     0.007
MODE         0.004   STD DEV        0.019   VARIANCE   0.000
KURTOSIS     3.311   SKEWNESS       1.993   RANGE      0.074
MINIMUM      0.001   MAXIMUM        0.075

VALID CASES    638   MISSING CASES      0
```

Figure 11.89. Grain Size Data: Cambridge Fjord GT-91

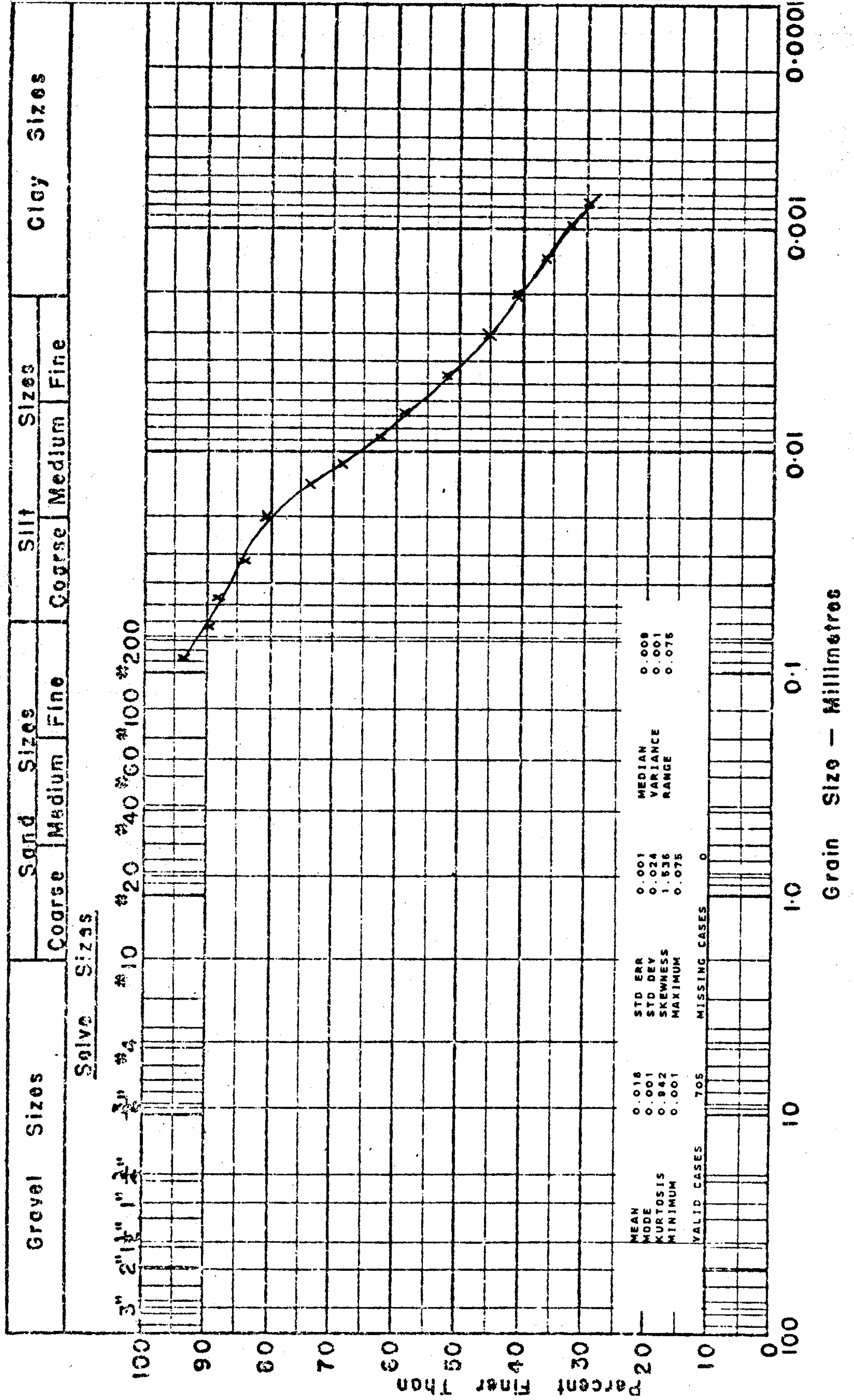
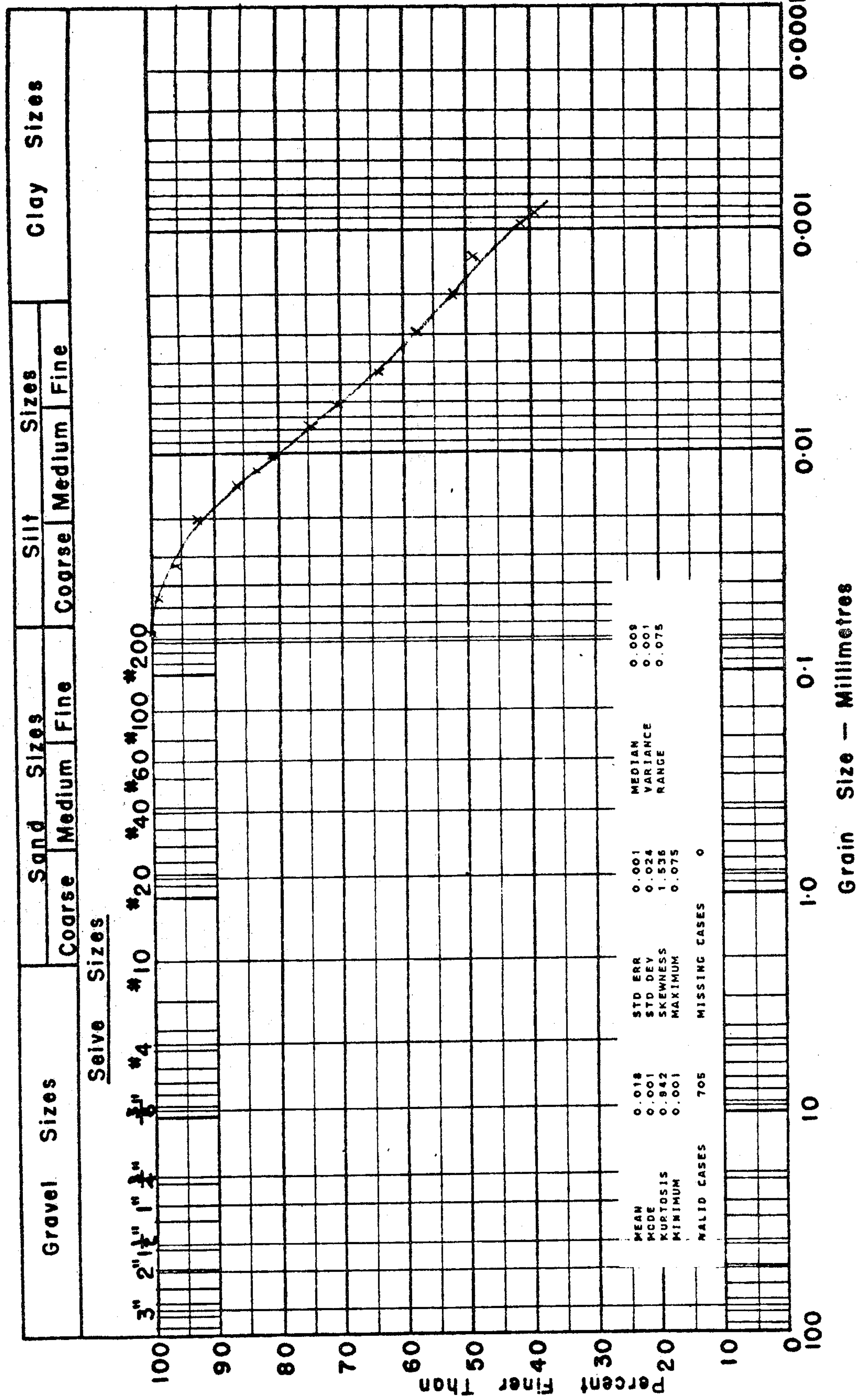


Figure 11.90. Grain Size Data: Cambridge Fjord GT-92



MEAN	0.018	STD ERR	0.001	MEDIAN	0.009
MODE	0.001	STD DEV	0.024	VARIANCE	0.001
KURTOSIS	0.842	SKEWNESS	1.536	RANGE	0.075
MINIMUM	0.001	MAXIMUM	0.075		
VALID CASES	705	MISSING CASES	0		

Table 11.25 Geotechnical Data: Cambridge Fjord

Sample #	Depth (m±2.5cm)	Water Content (Dry Basis) w(%)	Natural Water Content w(%)	Atterberg Limits WL(%)	WP(%)	IP
Core: CA-6 82-04465						
GT-83	0-0.15	68.43	40.63	41.3	24.2	17.1
GT-84	0.22	42.85	30.00	34.2	23.5	10.7
GT-85	0.50	56.17	35.97	33.2	23.2	10.0
GT-93	0.75	61.25	37.99	38.9	24.4	14.5
GT-86	0.90	26.40	20.88	N.P.	N.P.	N.P.
GT-87	0.95	25.23	20.15	N. P	N.P.	N.P.
GT-88	1.50	64.55	39.23	45.5	28.5	17.0
GT-89	1.90	59.34	62.76	43.7	26.8	16.9
GT-90	2.00	64.18	39.09	50.4	28.0	22.4
GT-91	2.20	65.30	39.51	56.6	30.6	26.0
GT-92	2.50	77.14	43.55	62.4	30.4	32.0

w= water content

WL= liquid limit

WP= plastic limit

IP= plasticity index

Table 11.26 Geotechnical Data: Cambridge Fjord

Miniature Vane Shear Test Results

Sample #	Depth (m±2.5cm)	Undisturbed Shear Stress (Kg-cm)	Remolded Shear Stress (Kg-cm)	Sensitivity
Core: CA-6 82-04465				
GT-84	0.22	.0489	.0247	1.98
GT-85	0.50	.0437	.0216	2.02
GT-93	0.75	.0558	.0155	3.60
GT-86	0.90	.0892	.0098	9.10
GT-87	0.95	.0610	.0196	3.11
GT-88	1.50	.0967	.0241	4.01
GT-89	1.90	.1289	.0219	5.89
GT-90	2.00	.1203	.0294	4.09
GT-91	2.20	.1433	.0363	3.95
GT-92	2.50	.1416	.0271	5.23

Table 11.27 Mineralogy of <2 μm Material: Cambridge Fjord

Sample	Depth	Relative % Clays[1]				Other Phases[2]			
#	(m±2.5cm)	K	I	CHL	SW	Q	PL	KF	AMP
Core: CA-6 82-04465									
GT-83	0-0.15	2	81[5]	14[4]	3[3]	t	m	m	m
GT-93	0.75	9	81[5]	7[4]	3[3]	t	m	m	m
GT-86	0.90	4	65[5]	23[4]	8[3]	t	m	m	m
GT-88	1.50	4	78[5]	14[4]	4[3]	t	m	m	m
GT-92	2.50	4	67	18[4]	11[3]	t	m	m	m

K= kaolinite I= illite CHL= chlorite SW= swelling clay

Q= quartz PL= plagioclase KF= potassium feldspar

AMP= amphibole

[1] The relative amounts of clay minerals reported are weighted percentages, normalized to 100 %, using the procedures described in the text.

[2] m = minor phase, mt = minor to trace phase, t = trace phase, nd = not detected.

[3] The swelling clay material is mostly smectite.

[4] A regularly interstratified mineral, probably corrensite, is also present in abundance. It contributes to both the reported chlorite and smectite abundances and causes the kaolinite percentages to be minimum estimates only.

[5] A small amount of randomly interstratified illite/smectite or degraded illite is also indicated.

IV. DISCUSSION

Sedimentological and Geotechnical Properties

The Leheigh gravity cores taken from surficial sediments show a variety of facies as discernable in split cores. All of the cored sediments are mainly silty or sandy muds, with rare granule or pebbly muds. These sediments are classed into four major facies: (1) turbidites well-graded, 0.4 to 0.8 m thick with Bouma A or Ab sequences; (2) massive sediments - ungraded and structureless, 0.1 to 0.9 m thick; (3) laminated - graded or ungraded, finely interbedded (cm scale) fine sands/silts alternating with muds; and, (4) bioturbated/burrowed silty muds - mottled or burrowed, 0.1 to 2.2 m thick . Sediments are mainly bioturbated/burrowed to the south in Sunneshine and North Pangnirtung / Maktak Fjord systems. To the north, sediments in Cambridge Fjord are mainly massive. Turbidites are dominant in Inugsuin, McBeth and Clark Fjords.

Initial analyses suggest that the bulk geotechnical properties vary with facies, lithology and geographic location. Downcore variations are quite variable. Laminated facies have the lowest plasticities; turbidites range from low to intermediate plasticities; bioturbated facies have the highest plasticities; and, massive facies range from very low to very high plasticities. Sediment shear strength and sensitivity appear to vary most with geographic (proximal/distal) position within a fjord system.

Mineralogy

Clay minerals constitute the bulk of the mineral matter present in the <2 µm size-fraction of sediments from the Baffin Island fjords (Tables 11.3, 11.6, 11.9, 11.12, 11.15, 11.18, 11.21, 11.24 and 11.27). In all cases, illite is the dominant phase present, while chlorite, kaolinite and swelling clays (mostly smectite) occur in minor or moderate amounts.

The most striking mineralogical differences between clay-sized materials from the various fjords involve chlorite content and the presence or absence of interstratified clay minerals, especially corrensite. Sediment from southernmost fjord (Sunneshine) contains the lowest amount of chlorite (about 3 %) of all fjords examined (Table 11.3). In addition, only traces of interstratified clay minerals were detected in sediment samples from this area. The greatest amount of chlorite (about 15 %; Tables 11.27 and 11.24) occurs in the sediments of the northernmost fjords (Cambridge, Clark). The <2 µm material from these sediments also includes a regularly interstratified clay mineral, probably corrensite (chlorite/smectite). This mineral is absent in samples from the other fjords, except for trace quantities. Degraded illite (illite/smectite?) is also found in sediments from Cambridge and Clark Fjords. The <2 µm clay material from Cambridge Fjord also has the highest amphibole content of samples analyzed in this investigation (Table 11.27). Lower chlorite abundances (about 10 %) were obtained for sediments from Maktak, Coronation and North Pangnirtung Fjords (Table 11.12, 11.9 and 11.6). Interstratified clay minerals were not detected in the <2 µm material from these areas. Samples from Inugsuin, McBeth and Itirbilung Fjords contain still less chlorite (about 5 %), but unlike Maktak, Coronation and North Pangnirtung Fjords, also contain degraded illite (illite/smectite?) (Tables 11.18, 11.21 and 11.15).

V. FUTURE WORK

Sedimentological and Geotechnical Properties

The following studies are in progress for cores studied in this report:

1. Definition of facies based upon detailed examination of sedimentary structures from X-radiographic prints of Leheigh cores;
2. Petrographic analysis of coarse sand fractions;
3. Determination of inorganic and organic carbon contents for selected samples;
4. Development of a facies model based upon the sedimentological and engineering properties of the sediments.

Mineralogy

Additional mineralogical studies involving samples from the cores described in this section are in progress. This work includes:

5. X-ray diffraction analysis of 2-5 μm and 5-20 μm size-fractions separated from selected samples of all nine fjords;
6. Detailed characterization of interstratified clay mineral phases present in some of these sediments;
7. Corrobative quantification of the X-ray diffraction data for the clay and non-clay minerals, including peak area measurements of the kaolinite (002) and chlorite (004) reflections obtained from slow scan X-ray diffraction;
8. Clay mineral polytype determinations for selected samples from all nine fjords;

9. Where necessary, analysis of additional samples from Itirbilung, McBeth, Inugsuin, Clark and Cambridge Fjords.

VI. ACKNOWLEDGEMENTS

We express our appreciation to D. Caird for her capable assistance with the X-ray diffraction and water content analyses. M.A. Reasoner determined the Atterberg limits, conducted most of the hydrometer analyses and assisted in preparation of this report. Des Wynn provided the technical assistance in computer analysis of the data. The help of I. Collar, P. Wagner and A. Wolberg during various aspects of this project is also greatly appreciated.

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Description and X-radiographs of the Baffin Fjord Cores

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OBJECTIVES:

To provide a detailed visual and X-radiographic summary of the cores before sampling is carried out, to identify intervals for analysis that will aid in the interpretation and correlation of the Holocene and late glacial sedimentological and paleontological record, to relate the position and depth of penetration of each piston core to the stratigraphic setting depicted by associated reflection seismic records.

FIELD AND LABORATORY METHODS:

Core splitting and logging methods are essentially the same for both Benthos piston and Leheigh gravity cores.

Each three metre piston core barrel was cut into two sections for easier handling and subsequent storage. The sections were split into two half cores, using a router to cut the plastic core liner and a thin wire to cut the sediment.

Both core halves were covered with cling-type plastic wrap, primarily to exclude airborne contaminants such as pollen or smoke, but also to slow the oxidation of exposed sediment surfaces. Oxidation may alter sediment surface colour appreciably within minutes of exposure especially if the organic content of the sediment is high.

One half of each core section was wrapped in heavy plastic and held in reserve as an "archive" half. The other half was labelled as the "working" or "sample" half, and was logged in detail. A tape measure was used to measure the core length in cm and to log the location of sedimentary structures and colours. A Munsell Soil Colour Chart was used for colour determination to insure uniformity of description. All visible structures such as sand beds, laminae, clasts, shells, burrows and mottling have also been recorded. The logged core half was then wrapped in heavy plastic and X-radiographed.

Colour and visual descriptions were correlated with the X-radiographs to provide detailed information on sedimentary structures before subsampling.

RESULTS:

Descriptions and line drawings based on the X-radiographs are given for the piston cores only. Leheigh core descriptions are also available but have not been printed here to avoid duplication since the coring site was essentially the same for both types of core. Also, the Leheigh gravity cores were split and logged on board the ship, and were somewhat damaged during a severe storm that occurred during the return voyage. Since the piston cores are generally in better physical condition, and will be used more frequently for detailed analyses then will the Leheighs, their descriptions were given more emphasis.

Not all the X-radiographs and reflection seismic records for the piston cores were available during the preparation of this report. All those that were available are included here (Figs. 12-1 through 12-20).

CAMBRIDGE CA2 922 cm strong H_2S

Sect. 7 of 7 0-60 cm.

0-8cm	silty clay, soft; 5Y3/2
8-12.5 cm	silty sand; 5Y3/2
12.5-18 cm	sand-silt clay; 5Y3/2; distinct contact with next sediment band.
18-35 cm	5Y4/2 clay
35-40.5 cm	clay, grading to fine sand at bottom; mixed 5Y4/2 and 5Y3/2.
40.5-57.5 cm	firm clay, 5Y4/2 and 5Y3/2, with 7.5YR2/0 mottling decreasing as go down.
57.5-50.5 cm	5Y3/2 clay
58.5-60 cm	5Y4/2 clay-oxidized

gap in bottom of core liner.

Section 6 of 7 60-208.5 cm

60-71 cm	5Y3/2 with horizontal mottlings of 2.5Y3/0 and 7.5YR2/0; clay
71-78 cm	5Y3/2 and 5Y4/2 mixed clays, with " " " mottlings
78-88 cm	5Y4/2 with roughly horizontal 2.5Y3/0 mottlings
88-166 cm	5Y3/2 and 5Y4/2 clay, with irregular bioturbation 7.5YR2/0, some 2.5Y3/0 large burrows show at 138-142 cm, 156-177 cm; 2 cm across smaller burrows as well show 7.5YR2/0 linings.
166-172 cm	5Y4/2 clay, with very fine sand lamina at 167.5 cm.
172-173 cm	5Y3/2 fine sand.

173-199 cm	5Y4/2 with 7.5YR2/0 and 2.5Y3/0 mottled bioturbation with some horizontal structuring 176-180 cm; clay.
199-204.5 cm	5Y3/2 fine sand and clay.
204.5-205.5 cm	5Y2.5/2 fine sand
205.5-208.5 cm	5Y3/2 clay with 2.5Y3/0 mottling, some 5Y4/2

Section 5 of 7 208.5-359 cm

208.5-232 cm	5Y4/2 clay, with faint 2.5Y3/0 bioturbation mottling
232-237 cm	5Y4/2 clay, more distinct 2.5Y3/0 " "
237-239 cm	" " less 2.5Y3/0 bioturbation mottling
239-240 cm	irregular layer 2.5Y3/0; clay
240-248 cm	5Y4/2 with 2.5Y3/0 mottling; clay
248-251 cm	" " less " " ; "
251-252 cm	2.5Y3/0 lamina; clay
252-259 cm	5Y4/2 clay with 2.5Y3/0 mottling
259-261 cm	" " " heavy " "
261-264 cm	" " " less " "
264-266 cm	5Y4/1 clay
266-270 cm	5Y4/2 clay, heavily mottled with 2.5Y3/0 and 7.5YR2/0
270-273 cm	5Y4/2 " , light mottlings " " "
273-274.5 cm	2.5Y3/0 irregular band
274.5-314.5 cm	5Y4/2 with 2.5Y3/0 mottling
314.5-315 cm	2.5Y3/0 sand lamina
315-316.5 cm	5Y4/2 clay
316-317 cm	2.5Y3/0 fine sand lamina
317-318 cm	5Y4/2 clay
318 cm	very fine 2.5Y3/0 sand lamina

318-350 cm	5Y4/2 clay heavily mottled with 2.5Y3/0; some slight banding visible at 327-334 cm
350-359 cm	5Y4/2 clay, lightly mottled 2.5Y3/0

Section 4 of 7 359-488.5 cm

359-370.5 cm	5Y3/2 silty clay with faint bioturbation marks
370.5-371.5 cm	5Y3/1 silty sand
371.5-372 cm	5Y4/2 silty clay
372-372.5 cm	5Y3/1 sand
372.5-373.5 cm	5Y4/2 clay
373.5-374.5 cm	5Y3/1 sand
374.5-376 cm	5Y4/2, grading to 5Y3/2 quickly; clay
376-389 cm	gap with fine sand scattered in it; water
389-394.5 cm	5Y4/2 clay
394.5-395 cm	5Y3/1 sand
395-396 cm	5Y4/2 clay
396-396.5 cm	5Y3/1 sand
396.5-397 cm	5Y4/2 clay, with thin lamina of 5Y3/1 sand at bottom
397-398 cm	5Y4/2 clay
398-398.5 cm	5Y3/1 sand
398.5-399.5 cm	5Y4/2 clay
399.5-401.0 cm	5Y3/1 and 5Y4/2 in two sets of layers
401-401.5 cm	5Y3/1 sand
401.5-402.5 cm	5Y4/2 clay
402.5-403 cm	5Y3/1 sand
403-403.5 cm	5Y4/2 clay
403.5-404 cm	5Y3/1 sand

404-405 cm	5Y4/2 clay
405-406 cm	5Y3/1 sand
406-407 cm	5Y4/2 clay
407-407.5 cm	5Y3/1 sand
407.5-408 cm	5Y4/2 clay with thin lamina 5Y3/1 sand at bottom
408-409 cm	5Y4/2 clay
409-409.5 cm	5Y3/1 sand
409.5-413 cm	5 sets of thin alternating laminae of 5Y4/2 clay and 5Y3/1 sand
413-414 cm	5Y4/2 clay
414-415 cm	5Y3/1 sand
415-416.5 cm	5Y4/2 clay, with laminae of 5Y3/1 sand
416.5-418 cm	5Y3/1 sand
418-424 cm	5Y4/2 clay, and 3 small laminae of 5Y3/1
424-428.5 cm	5Y3/1 sand
428.5-432 cm	alternation of 5Y4/2 clay and 5Y3/1 sand laminae, 3 sets
432-433 cm	5Y3/1 sand
433-435 cm	5Y4/2 clay, grading to 5Y3/1 sand
435-447 cm	5Y3/1 sand, grading fine down to coarser
447-488.5 cm	sucked 5Y4/2 day, 5Y3/1 sands

Section 3 of 7	488.5-629 cm sucked
2 of 7	629-769 cm sucked
1 of 7	768-922 sucked

CAMBRIDGE FJORD CA-6 0-896 cm Strong H_2S

Section 5 of 5 0-140 cm

0-12 cm	5Y4/2 with 2.5Y3/0 mottlings; silty clay
12-16 cm	5Y2.5/1 coarse sand
16-57 cm	5Y4/2 silty clay, some sand, with some 2.5Y3/0 mottling which tends to be horizontal or sloping; pebbles 43-45 cm
57-59 cm	5Y4/1 bed of clay
59-100 cm	5Y3/2 predominantly clay, some silt, with 2.5Y3/0 mottles tending to be horizontal, pebbles at 69-70 cm
100-110 cm	5Y3/2 grading quickly to 5Y4/2
110-114 cm	5Y3/1 silt bed
114-123 cm	5Y4/2 clay with 2.5Y3/0 mottling
123-125 cm	5Y4/2 clay, grading in color to 5Y4/1
125-140 cm	5Y4/1

approximately 150 cm of core was lost from this section at time of core station.

Section 4 of 5 290-440 cm

290-302 cm	5Y4.5/1 clay, some silt
302 cm	thin band 5Y3.5/1, sloping from left to right
302-308 cm	5Y4.5/1 clay
308-309 cm	horizontal 5Y3.5/1 band
309-311 cm	5Y4.5/1 clay
311 cm	irregular, somewhat horizontal 5Y3.5/1 band, clay
311-313 cm	5Y4.5/1 clay
313-315 cm	gravel
315-317 cm	5Y4.5/1 clay
317 cm	irregular 5Y3.5/1 bed, clay

317-326 cm	5Y4.5/1 clay
326 cm	irregular 5Y3.5/1 bed, clay
326-328 cm	5Y4.5/1 clay
328-329.5 cm	5Y3/1 sand
320.5-330 cm	5Y4.5/1 clay
330 cm	5Y3.5/1 partial bed
330-333 cm	5Y4.5/1 clay
333-333.5 cm	5Y3/1 fine sand
333.5-342 cm	5Y4.5/1 clay
341-343 cm	5Y4.5/1 clay with sand in it
343-346 cm	5Y4.5/1 clay
346 cm	5Y3.5/1 partial bed
346-351 cm	5Y4.5/1 clay
351-351.5 cm	5Y3.5/1 partial bed
351.5-354 cm	5Y4.5/1 clay
354-354.5 cm	5Y3.5/1 partial "
354.5-358.5 cm	5Y4.5/1 clay
358.5-359 cm	5Y3/1 sand bed
359-360 cm	5Y4.5/1 clay
360-360.5 cm	partial bed of 5Y3.5/1 clay
360.5-362 cm	5Y4.5/1 clay
362 cm	thin band 5Y3.5/1
362-392 cm	5Y4.5/1 clay, with thin bands 5Y3.5/1 at 363, 364.5, 366, 374 and 376 cm
392 cm	5Y3.5/1 bed with some 2.5YR3/0 intermingled
392-410 cm	5Y4.5/1 clay, with faint, sloping (to left) bands of 5Y3.5/1, one distinct one at 394 cm
410 cm	bleb of 5Y3/0 in 5Y4.5/1 clay

410-414 cm	5Y4.5/1 clay
414 cm	thin, sloping band 5Y3.5/0
414-419 cm	5Y4.5/1 clay
419-419.5 cm	5Y3.5/0 band, sloping to left
419.5-=423.5 cm	5Y4.5/1 clay
423.5-424 cm	5Y3/0 band, with thin bed of 5Y4/2 underneath
424-434 cm	5Y4.5/1 clay with fine 5Y3.5/0 band at 434 cm
434-440 cm	5Y4.5/1 clay
Section 3 of 5	440-590 cm
440-442 cm	5Y4.5/1 clay
442 cm	thin sloping (to right) band of 5Y3.5/1
442-444 cm	5Y4.5/1 clay
444 cm	thin, sloping layer 5Y3.5/1
444-445 cm	5Y4.5/1 clay
445 cm	5Y3.5/1 thin band, horizontal
445-463 cm	5Y4.5/1 clay
463-467 cm	5Y4.5/1 clay with sand and gravel mixed in
467-474 cm	5Y4.5/1 clay
474-476 cm	" " " " " " " "
476-503 cm	5Y4.5/1 " with 5Y3/1 lenses at 497 and 499 cm
503-508 cm	5Y4.5/1 clay with gravel, some sand; horizontal top, base widening out to right
508-518 cm	sandy clay, 5Y4.5/1; pebbles at 509, 511; more sand 514-518 cm
518-536 cm	more clay, less sand, faint 5Y4/1 mottling of 5Y4.5/1 color

536-554 cm	5Y4/1, with pebble at 545 cm, some irregular 2.5Y3/0 bands and mottling at 547, 549-554 cm
554-567 cm	clay, with some sand, 5Y4.5/1, some 2.5Y3/0 mottling
567-573 cm	sand; 5Y4/1 with some 5Y3/1
573-590 cm	5Y4/1 sandy clay, some 2.5Y3/0 mottling
Section 2 of 5	590-745 cm
590-594 cm	5Y4/1 clay
594-598 cm	2.5Y4/0 and 2.5Y3/0 scattered mottling, and some 7.5YR2/0, in 5Y4/1 clay
548-618 cm	5Y4/1 clay, with pebbles at 601 cm and mottlings of 2.5Y4/0; sand and pebbles at 604-608 cm, also 2.5Y3/0 mottlings 611-614 cm.
618 cm	thin layer 2.5Y3/0.
618-620 cm	5Y4/1 clay
620-628 cm	mixture of sand, clay and gravel; colors 2.5Y3/0 and 7.5YR2/0 predominate.
628-633 cm	5Y4/1 clay
633-634 cm	5Y4/1 clay and sand
634-653.5 cm	5Y4/1 clay, with some mottling of 2.5Y3/0, 7.5YR2/0, and some 2.5Y4/0.
653.5-655 cm	3 fine laminae of 2.5Y3/0 with 5Y4.5/0 above, between and below them
655-661 cm	5Y4/1 clay
661-663 cm	5Y4.5/0 bleb with 2.5Y4/0 conna; clay
663-680 cm	5Y4/1 clay with 2.5Y3/0 laminae at 668, 674 and 677 cm
680-683 cm	large pebble in 5Y4/1 clay

683-704 cm	5Y4/1 clay with blebs of 2.5Y3/0 at 686-688, 692-696 cm, and roughly laminar mottles at 70.
704-705 cm	irregular sandy layer 2.5Y3/0
705-706 cm	5Y4/1 clay
706-707 cm	irregular sandy layer, 2-5Y3/0 and 7.5YR2/0
707-712 cm	5Y4/1 with a few flecks 7.5YR2/0.
712-733 cm	5Y4/1 clay with scattered flecks 2.5Y3/0 and 7.5Y$2/0, some scattered sand
733-734 cm	2.5Y3/0 bleb
731-745 cm	5Y4/1 clay, with 5Y3/0 bleb at 738-740, composed of sand; some flecks of 2.5Y3/0 below to 745 cm.
Section 1 of 5	745-896 cm
745-763 cm	5Y4/1 clay
763-765 cm	5Y4/1 grading to 5Y4.5/1 and back again, with sand, 5Y3/2 at 763 cm
765-896 cm	5Y4/1 clay, with pebbles and coarse sand 766-771, 796-844, 844-882 cm; color changes at 796 where there is a thin layer of sand 5Y3/2, sloping up to right.
882-896 cm	core catcher.

CLARK FJORD	CL-1 406 cm strong H_2S
Section 3 of 3	0-106 cm
0-11 cm	5Y3/2 sandy, silty clay with roughly horizontal markings of 7.5YR2/0 and 2.5Y3/0
11-13 cm	5Y3/2, with much heavier 7.5YR2/0 and 2.5Y3/0 markings; sand and pebbles
13-19 cm	unsorted sand-silt-clay, with markings of 7.5YR2/0 and 2.5Y3/0; basically 5Y3/2 still.
19-20 cm	more 7.5YR2/0 and 25Y3/0
20-32 cm	basically 5Y3/2 unsorted sediment, variable, mostly horizontal markings of 7.5YR2/0 and 2.5Y3/0
32-37 cm	5Y3/2 sediment with gravel, usual markings
37-49 cm	5Y3/2 sand-silt-clay, with markings of 7.5YR2/0 and 2.5Y3/0
49-52 cm	band of 2.5Y3/0
52-80 cm	5Y3/2 with markings; bands of 2.5Y3/0 at 61-62 cm and 65-66 cm
80-81 cm	pebbles
80-96 cm	sediment 5Y3/2 with horizontal markings 7.5YR2/0 and 2.5Y3/0
96-105 cm	mottling irregular, more dense
Section 2 of 3	105-260 cm
105-132 cm	sand-silt-clay, 5Y3/2, with mottlings 7.5YR2/0, 7.5YR3/0, 2.5Y3/0; pebble at 107-110 cm
132-134 cm	7.5YR2/0 bleb
134-140 cm	5Y3/2 very soft, watery clay

140-151 cm	5Y3/2 sand-silt-clay, with some 7.5YR2/0 and 7.5YR3/0 mottling
151-153 cm	pebble
153-188.5 cm	5Y3/2 " " " " " " " " mottling
188.5-189.5 cm	7.5YR3/0 band
189.5-214 cm	5Y3/2 sand-silt-clay, " " 7.5YR3/0 " 2.5Y2/0 "
214-243 cm	slumped sediment-intermixed sand and unsorted sand-silt-clay; 5Y3/1 and 5Y3/2 mixed, some 5Y4/2
243-248.5 cm	sand-silt-clay, 5Y4/2 with some 7.5YR2/0 mottling
248.5-252 cm	2 sand layers, each 2 cm thick, each with top 1 cm 5Y3/1, bottom 1 cm 5Y2.5/1
252 cm	very narrow band 5Y4/2 sand-silt clay
252.5-253 cm	band of 5Y3/2 sand-silt-clay
253-260 cm	5Y4/2 with some 7.5YR2/0

Section 1 of 3   260-406 cm   SUCKED

All vertical structures, sand blebs; "pseudo-burrows" at 365 and 396 cm from cracks that oxidized, then resealed.

82031 CLARK FJORD CL5

Section 7 of 7 Strong odour of H_2S 81 cm

0-26 cm	irregular gap which may have contained sand
26-28 cm	5Y3/1 sand
28-52 cm	5Y4/1 and 7.5YR2/0 mottled together, ostly silty clay, with very fine sand 41.5-44 cm
52-59 cm	gap in core
59-66 cm	5Y4/1 and 5Y3/1, mixed; mostly a graded bed of sand grading upwards into clays
66-68.5 cm	5Y4.1 and 7.5YR2/0 heavily, irregularly mottled clay
68.5-81 cm	5Y4/1 mottled with roughly horizontal markings of 7.5YR2/0, clay

Section 6 of 7 81-234 cm; strong H_2S

81-83 cm	5Y4/1 clay, with oxidized surface 5Y4/2
83-84 cm	5Y4/1 clay, mottled with 7.5YR2/0
84-90.5 cm	5Y4/1 clay
90.5-104 cm	5Y4/1 clay with 7.5YR2/0 mottlings
104-106 cm	5Y4/1 sandy, silty clay, 5Y4/1 and 7.5YR2/0
106-108 cm	1 cm gap, curving across core, with sndy lining
108-111 cm	5Y4/1 mottled with 7.5YR2/0; clay
111-114 cm	5Y4/1, fewer mottlings; clay
114-123 cm	5Y4/1 clay
123-130 cm	silty clay, some sand 5Y4/1
130-137 cm	5Y4/1 with mottlings, roughly horizontal 7.5YR2/0; clay
137-139 cm	5Y4/1 clay with silt
139-140 cm	5Y3/2 sand

140-147 cm	5Y4/1 clay, silt
147-148 cm	5Y3/2 sand
148-155 cm	5Y4/1 clay, silt
155-156 cm	5Y3/2 sand
156-161.5 cm	5Y4/1 clay, silt
161.5-162.5 cm	5Y3/2 sand
162.5-167.5 cm	5Y4/1 clay, silt
167.5-168 cm	5Y3/2 sand
168-173.5 cm	5Y4/1 clay, silt
173.5-177 cm	5Y3/2 sand
177-183 cm	5Y4/1 clay, mottled with 7.5YR2/0, some silt
183-190 cm	5Y4/1 clay, decreasing mottlings
190-194 cm	5Y4/1 clay with roughly horizontal mottling 7.5YR2/0
194-195 cm	5Y3/1 sand layer
195-207 cm	5Y4/1 silty clays, increasing 7.5YR2/0 mottling
207-208 cm	5Y3/2 sand
208-209 cm	5Y4/1 clay with silts
209-209.5 cm	5Y3/2 sand with fine clay immediately under it
209.5-212 cm	5Y4/1 alternating layers of sand and clay, varying in thickness from 2 to 4 cm each
212-213.5 cm	5Y4/1 clay
213.5-215 cm	5Y4/1 alternating thin layers sands and clays
215-217 cm	5Y4/1 silty clay
217-219 cm	more alternating layers
219-222.5 cm	5Y4/1 sandy, silty clay
222.5-223 cm	5Y3/1 sand
223-234 cm	5Y4/1 clay with some silt

Section 5 of 7 less H_2S; 234-385.5 cm

234-296 cm	5Y4/1 slightly silty clay, mottled irregularly with 7.5YR2/0 - purer clay 277-281, 284 cm
296-297 cm	5Y3/1 graded sand layer, with sharp contact at bottom, with fine clays underlying it
297-297.5 cm	5Y4/1 pure clay
297.5-298 cm	5Y3/1 very fine sand
298-302 cm	5Y4/1 silty clay
302-303 cm	5Y4/1 sandy silty clay
303-304 cm	5Y4/1 silty clay
304-305 cm	5Y3/1 graded sand layer
305-307 cm	5Y4/1 pure clay
307-307.5 cm	5Y4/1 sandy, silty clay
307.5-312 cm	5Y4/1 silty clay, some mottlings 7.5YR2/0
312-385.5 cm	5Y4/1 sticky clay

Section 4 of 7; some H_2S; 385.5-538 cm

385.5-519 cm	5Y4/1 clay
519-522 cm	gap
522-538 cm	5Y4/1 clay

Section 3 of 7; 538-687 cm

538-687 cm	5Y4/1 clay, with small gaps; 2 mm one at 615 cm, and a 1 cm one 678-679 cm

Section 2 of 7; 687-839 cm

687-692 cm	5Y4/1 clay

692-703 cm	5Y4/1 clay, with a few small 7.5YR2/0 mottlings
703-707 cm	5Y4/1 clay
707-714 cm	5Y4/1 with 7.5YR2/0; clay
714-720 cm	5Y4/1 clay
720-726 cm	5Y4/1 with 7.5YR2/0; clay
726-730 cm	5Y4/1 clay
730-734 cm	5Y4/1 with 7.5YR2/0; clay
734-735 cm	5Y4/1; with a narrow, non-continuous band of 7.5YR2/0; clay
735-738 cm	5Y4/1 with some 7.5YR2/0; clay
738-755 cm	5Y4/1 with rare 7.5YR2/0; clay
755-759 cm	5Y4/1 with more 7.5YR2/0; clay
759-760 cm	7.5YR2/0 in broken horizontal band; clay
760-772 cm	5Y4/1 clay
772-793 cm	5Y4/1 with 7.5YR2/0 mottling, increasing in frequency, and two non-continuous bands at 790 and 792 cm
793-797 cm	5Y4/1 clay
797-805 cm	5Y4/1 clay, with 7.5YR2/0 mottling
805-814 cm	5Y4/1 clay, with rare 7.5YR2/0 mottling
814-820 cm	5Y4/1 clay with more 7.5YR2/0 "
820-839 cm	5Y4/1 clay with rare 7.5YR2/0 "

Section 1 of 7	839-988
839-874 cm	5Y4/1 with faint mottling 7.5YR2/0; clay
874-880 cm	5Y4/1 with more frequent 7.5YR2/0; clay
880 cm	5Y4/1 clay with thin, non-continuous layer 7.5YR2/0
880-903 cm	5Y4/1 clay with occasional 7.5YR2/0

903-907 cm	5Y4/1 clay with abundant 7.5YR2/0
907-916 cm	5Y4/1 clay with occasional 7.5YR2/0
916-919 cm	gap
919-934 cm	5Y4/1 clay, rare 7.5YR2/0 mottlings
934-935 cm	5Y4/1 clay, more 7.5YR2/0
935-942 cm	5Y4/1 clay
942-947 cm	5Y4/1 mottled with 5Y3.5/1; clay
947-982 cm	5Y4/1 clay
982-988 cm BTM	5Y4/1, more mottling 7.5YR2/0

CORONATION FJORD CO-2 850 cm

Section 6 of 6 0-124 cm

0-1 cm	2.5Y4/4 oxidized layer very soft, semi-liquid clay
1-47 cm	2.5Y4/2 clay with 2.5Y3/0 mottling
47 cm	2.5Y3/0 thin layer sand
47-49 cm	2.5Y4/2 clay with some 25Y3/0 mottling
49 cm	2.5Y3/0 thin sand layer
49-74 cm	2.5Y4/2 clay with 2.5Y3/0 mottling
74-74.5 cm	2.5Y3/0 3 thin layers of sand with clay between
74.5-78.5 cm	2.5Y4/2 clay with some 2.5Y3/0 mottling
78.5-80 cm	2.5Y4/2 clay with 2 thin, discontinuous laminae of 2.5Y3/0
80-93 cm	2.5Y4/2 clay, some 2.5Y3/0 mottling
93 cm	2.5Y3/0 thin sand layer
93-95 cm	2.5Y4/2 clay
95 cm	2.5Y3/0 sand, thin layer
95-96.5 cm	2.5Y4/2 clay
96.5 cm	2.5Y3/0 thin sand layer
96.5-100 cm	2.5Y4/2 clay
100cm	2.5Y3/0 thin sand layer
100-108 cm	2.5Y4/2 clay with 2.5Y3/0 ottlings
108-109 cm	2.5Y3/0 sand
109-118 cm	2.5Y4/2 clay, some 2.5Y3/0 in roughly horizontal markings
118-118.5 cm	2.5Y3/0 sand
118.5-120 cm	2.5Y4/2 clay
120 cm	2.5Y3/0 sand, thin layer
120-124 cm	2.5Y4/2 clay

Section 5 of 6	124-270 cm
124-124.5 cm	thin layer oxidized clay, 2.5Y5/2
124.5-136 cm	5Y4/1 and 2.5Y4/2 clay, with 2.5Y3/0 mottling, some sand 130-131 cm, 132 cm
136-139 cm	5Y4/1 sand
139-150 cm	2.5Y4/2 clay with 2.5Y3/0 mottling; pebble 143-144 cm
150-152.5 cm	5Y4/1 sand
152.5-154 cm	2.5Y4/2 clay with 5Y4/1 mottling
154-155 cm	5Y4/2 sand
155-158 cm	5Y4/1 clay with 2.5Y3/0 mottling
158 cm	thin sand layer
158-176.5 cm	5Y4/1 clay with 2.5Y3/0 mottling
176.5-177 cm	5Y4/1 sand
177-178.5 cm	5Y4/1 clay " " "
178.5-179 cm	" sand
179-180 cm	" clay with much " "
180-185 cm	" " " some " ", pebble at 182 cm
185-185.5 cm	" sand
185.5-210 cm	5Y4/1 clay with 2.5Y3/0 mottling which is irregular except between 197 and 198 cm; pebble at 195-196 cm
210 cm	5Y4/1 thin sand layer
210-222 cm	5Y4/1 clay with 2.5Y3/0 mottling, roughly horizontal
222-234 cm	5Y4/1 clay with irregular 2.5Y3/0 mottling, some 2.5Y4/2 as well
234-235.5 cm	2.5Y4/2 clay layer with sand at bottom
235.5-249 cm	5Y4/1 clay with 2.5Y3/0 mottling, mostly irregular, some horizontal (244 cm); pebble at 240 cm

249-251 cm	2.5Y3/0 sand laminae with clay between-5Y3.5/1 pebble 255-256 cm
Section 4 of 6	270-417 cm
270-271 cm	2.5Y4/2 oxidized clay
271-322 cm	5Y4/1 clay with mottlings 2.5Y3/0, 271-279 cm, 291-294 cm, 306-313 cm, 317-318 cm; sand bleb 5Y3/1 at 283-289 cm
322-324 cm	5Y4/1 sand, with some 2.5Y3/0
324-337 cm	5Y4/1 clay with 2.5Y3/0 mottled bioturbation
337-338.5 cm	5Y3/1 sand
338.5-342 cm	5Y4/1 clay " " mottling
342-343 cm	5Y3/1 sand
343-348 cm	5Y4/1 clay " " "
348-349.5 cm	5Y3/1 sand
349.5-352.5 cm	5Y4/1 clay " " "
352.5-353 cm	5Y4/1 sand
353-361 cm	5Y4/1 clay " " "
361-365.5 cm	5Y3/1 sand
365.5-400 cm	5Y4/1 clay " " " , sand bleb 5Y3/0 at 390-391 cm
400-413 cm	5Y3/1 sand with irregular upper contact, grading much coarser as you go downwards
413-417 cm	5Y4/1 sandy silty clay mixture
Section 3 of 6	417-562 cm
417-420 cm	5Y4/1 clay
420-421 cm	5Y3.5/1 sand

421-426 cm	5Y4/1 clay with 2.5Y3/0 mottlings
426-429 cm	5Y3.5/1 sand, " " "
429-434.5 cm	5Y4.1 clay " " "
434.5-436 cm	5Y3.5/1 fine sand " " "
436-455 cm	5Y4/1 clay with " "; broken shell 443-447 cm in burrow like hole
455-465.5 cm	5Y4/1 clay with rare scattered 2.5Y3/0 mottling; pebble at 460 cm
465.5-473 cm	5Y3.5/1 sand; grading coarser downwards, also color changing to 5Y3/1
473-481 cm	5Y4/1 clay with sand bleb 5Y3.5/1 and intermingled sand
481-487 cm	5Y3.5/1 fine sand grading downwards to 5Y3/1 coarser sand, with 2.5Y3/0 layer at bottom
487-493 cm	5Y4/1 clay with 2.5Y3/0 mottling
493-502 cm	5Y4/1 clay, no mottling; sand mixed in 494-496 cm
502-503 cm	5Y3.5/1 sand
503-515 cm	mixed chunks of 5Y3.5/1 sand in 5Y4/1 clay
515-527 cm	blebs of 5Y4/1 clay mixed into 5Y3.5/1 silty sand; some 2.5Y3/0 mottling
527-534 cm	5Y4/1 clay with 5Y3.5/1 fine sand in lenses; some 2.5Y3/0 and 7.5YR2/0 mottling
534-562 cm	mixed chunks of 5Y3.5/1 silty sand and 5Y4/1 clay, tending to be lens shaped.

Section 2 of 6	562-707 cm
562-565 cm	oxidized sandy, silty clay 2.5Y4/2
565-610 cm	5Y3.5/1 sandy silty clay with vertical crack, oxidized 2.5Y4/2; clay belbs of 5Y4/1 and flecks of 2.5Y3/0 throughout

610-616 cm	5Y4/1 clay with 25Y4/2 and 2.5Y3.0 mixed through
616-629.5 cm	5Y4/1 fine sand, grading to 5Y3/1 coarser sand at bottom
629.5-660 cm	5Y4/1 clay, with silt, 2.5Y3/0 mottling
660-690 cm	5Y4/1 fine sand, grading downward to coarse 5Y3.5/1 sand
690-707 cm	5Y4/1 silty clay with 2.5Y3/0 mottling
Section 1 of 6	707-850 cm
707-710 cm	2.5Y4/2 oxidized silty clay
710-711 cm	5Y3.5/ sand
711-719 cm	5Y4/1 clay with 2.5Y3/0 mottling
719-726 cm	5Y3.5/1 sand, grading downwards to coarser 5Y3/1 sand
726-786 cm	5Y4/1 clay with some 2.5Y3/0 mottling
786-789 cm	5Y3.5/1 and 5Y3/1 mixed, sand
789-816 cm	5Y4/1 clay with increasing 2.5Y3/0 mottling
816-822 cm	5Y4/1 clay with 2.5Y3/0 mixed heavily through
822-838 cm	mixed sands, clay; 5Y3.5/1, 5Y3/0, 5Y4/1, 2.5Y3/0, 7.5Y$2/0 probably sucked
839-850 cm	core catcher

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Section 7 of 7 0-175 cm

0-2 cm	oxidized surface clay and silt
2-5 cm	5Y4.5/2 silty clay, bioturbated
5-10 cm	2.5Y4.5/2 silty clay
10-12 cm	2.5Y4.5/2 silty clay, bioturbated
12-17 cm	2.5Y4.5/2 silty clay
17 cm	narrow band 5Y3/1 silty clay
17-18 cm	2.5Y4.5/2 silty clay
18 cm	narrow band 5Y3/1 silty clay
18-24 cm	2.5Y4.5/2 silty clay
24-27 cm	sandy layer; 5Y4.5/2; graded finer towards top
27-43 cm	2.5Y4.5/2 clay, some silt, bioturbated 5Y3/2 29-30 cm, also burrows 34 cm down, no color change
43-45 cm	2.5Y4.5/2 changing to 5Y4.5/2; more burrow marks
45-47 cm	5Y4.5/2 clay, burrow marks
47-82 cm	2.5Y4.5/2 clay, with pebble at 78 cm, burrows
82-94 cm	2.5Y4/2 color, bioturbation marks 5Y3.5/1 and 5Y2.5/1 clay with some silt
94-106 cm	2.5Y4/2 clay, bioturbation mottlings 5Y4/1 increasingly distinct as go downwards, some burrow marks
106-118 cm	2.5Y4/2 clay, abundant mottlings 5Y3/1, burrow marks
118 cm	thin non continuous layer 5Y3/1
118-132 cm	2.5Y4/2 clay with abundant 5Y3/1 mottlings
132-160 cm	2.5Y4/2 clay, with 2.5Y2.5/0 mottlings
160-175 cm	2.5Y4/2 clay, less distinct, less abundant 5Y3.5/1 mottlings

Section 6 of 7	175-325 cm
175-215 cm	2.5Y4/1 clay, with rare bioturbation marks, 7.5YR2/0 to 5Y3/1 in color
215-218.5 cm	2.5Y4.5/2 clay
218.5-220 cm	2.5Y4/2 clay, bioturbated
220-221 cm	2.5Y4.5/2 clay
221-222 cm	2.5Y4/2 clay
222-225 cm	2.5Y4.5/2 clay
225-226 cm	2.5Y4/2 clay
226-229 cm	2.5Y4.5/2 clay
229-242 cm	2.5Y4/2 clay
242-244 cm	5Y3/1 graded sand - some 2.5Y4/2
244-248 cm	2.5Y4.5/2 clay
248-249 cm	2.5Y4/2 clay
249-253 cm	2.5Y4.5/2 clay
253-268 cm	2.5Y4/2 clay
268-272 cm	2.5Y4/2 pebbles, coarse sand and clay
272-274 cm	2.5Y4/2 clay
274-275 cm	5Y3/1 sand, grading upwards
275-278 cm	2.5Y4/2 clay
278-280 cm	5Y4/2 sand
280-282 cm	2.5Y4/2 clay
282-283 cm	5Y3/2 fine sand
283-285 cm	2.5Y4/2 clay
285-286 cm	5Y3/2 silty clay
286-288 cm	2.5Y4/2 clay
288-289 cm	2.5Y4/2 sand

289-300 cm	2.5Y4/2 clay mottled with 5Y3/1
300-302 cm	5Y3/2 sand layer, graded finer upwards
302-304 cm	2.5Y4/2 clay
304-305 cm	5Y3/2 graded sand
305-313.5 cm	2.5Y4/2 clay
313.5-314 cm	5Y3/2 sand
314-315 cm	2.5Y4/2 clay
315-315.5 cm	5Y3/2 sand
315.5-320 cm	2.5Y4/2 clay
320-320.5 cm	5Y3/2 sand
320.5-325 cm	2.5Y4/2 clay

Section 5 of 7	325-473 cm
325-326 cm	2.5Y4.5/2 clay
326-327 cm	5Y4/2 clay
327-328 cm	5Y4/1 sand
328-345 cm	5Y4/2 clay
345-350 cm	5Y4/2 and 5Y4/1 graded, coarse sand, with irregular base
350-361 cm	5Y4/2 clay with thin sand layers every 1/2 to 2 cm
361-361.5 cm	5Y4/1 sand
361.5-420 cm	5Y4/2 clay with variable sandlayers 1-5 mm thick, every 1/2 to 2 cm apart, 5Y4/1 in color
420-422 cm	5Y4/2 with graded 5Y2.5/0 sand
422-434.5 cm	5Y4/2 clay with 5Y4/1 sand layers again, 1/2 to 2 cm apart
434.5-435.5 cm	5Y4/1 very fine sand
435.5-445 cm	5Y4/2 clay with a few 5Y4/1 thin sand layers
445-446 cm	5Y4/1 sand layer, some 5Y3/1

446-473 cm	5Y4/2 clay, with very few thin sand layers at 451, 454, 458, 468, etc. cm - all 5Y4.1
Section 4 of 7	473-625
473-474 cm	5Y4/2 clay
474-475 cm	5Y4/1 narrow band angling from 474 on left to 475 cm on right
475-483 cm	5Y4/2 clay with pebble
483-487 cm	narrow 5Y4/1 sand layer angling down to left from 483 on right to 487 on left; clay base 5Y4/2
487-491 cm	5Y4/2 clay, with another 5Y4/1 sand layer, angling from 487 on right to 491 on left
491-493 cm	5Y4/2 clay
493 cm	narrow, horizontal band 5Y4.1
493-494.5 cm	5Y4/2 clay
494.5-496 cm	5Y4/2 clay with angling narrow 5Y4/1 band, from left 494.5 to 496 cm on right
496-498 cm	series of thin 5Y4/1 bands angling from left down to right in 5Y4/2 clay
498-500 cm	5Y4/2 clay
500-503 cm	band angling from left 500 cm to 503 on right, in 5Y4/2 clay
503-505 cm	3 more narrow angling bands in 5Y4/2 clay, all 3 bands sand
505-508 cm	5Y4/2 clay
508-511 cm	5Y4/2 clay with angled bands sand, 5Y4/1
511-514 cm	5Y4/2 clay

514-517 cm	5Y4/2 clay with angled bands sand 5Y4/1
517-518 cm	5Y4/2 clay
518-521 cm	5Y3/1 sand band angling from left 518 to right 521 cm
519-523 cm	5Y4/2 clay
523-524 cm	5Y3/1 angled band
524-528 cm	5Y4/1 thin angled bands in 5Y4/2 clay
528-529 cm	5Y4/1 band, silt
529-542 cm	assorted narrow, angled bands, varying from 1/2 to 1 1/2 cm apart, in 5Y4/2 clay
542-544 cm	triangular, 5Y4/2 clay zone with faint 5Y4/1 bands angling down to right
545-547 cm	band angling down right to left, 1 cm thick, 5Y4/1 silt, with 2.5Y4/2 band directly under it
549 cm	another down to left angled band
550 cm	another down to left angled band
550-554.5 cm	5Y4/2 clay, no banding
554.5-555 cm	5Y4/1 horizontal band
555-560.5 cm	series of thin bands in 5Y4/2 clay
560.5-561 cm	5Y4/1 sand
561-563 cm	faint bands 2-3 mm apart, 2.5Y4/2 in 5Y4/2 clay
563 cm	5Y4/1 layer
563-567 cm	more faint layers in 5Y4/2 clay
567-568 cm	broader band 5Y4/1
568-568.5 cm	5Y4/2 clay
568.5-569 cm	2.5Y4/2 clay and silt
569-572 cm	assorted faint bands in 5Y4/2 clay
572-572.5 cm	5Y4/1 sand

572.5-574 cm	5Y4/2 clay
574-577 cm	several 5Y4/1 sand layers, top one 1 cm thick
577-578.5 cm	faintly banded, 5Y4/2 clay
578.5-579 cm	5Y4/1 silty clay
579-583 cm	5Y4/2 clay with faint banding
583-585 cm	5Y4/1 and 2.5Y2.5/0 sand
585-585.5 cm	2.5Y4/2 clay
585.5-586.5 cm	2.5Y4/2 banded with 5Y4/1; silty clay
586.5-587.5 cm	2.5Y4/2 clay, with narrow band 5Y4/1 at bottom
587.5-588 cm	2.5Y4/2 clay
588-590 cm	mixture of bands of 2.5Y4/2, 5Y4/1 and 5Y4/2; silty clay
590-591.5 cm	5Y4/2 clay
591.5-592 cm	5Y4/1 bands, with narrow layer of 5Y4/2 between; clay
592-593.5 cm	5Y4/2 clay
593.5-594 cm	5Y4/1 clay
594-595 cm	2.5Y4/2 clay
595-596 cm	5Y4/1 clay
596-597 cm	5Y4/2 clay
597-599 cm	several bands 5Y4/2, 5Y4/1 clay
599-601 cm	5Y4/2 with narrow layer 5Y4/1; clay
601-602 cm	5Y4/2 clay, with faint layers
602-603 cm	2 layers 2.5Y2.5/0 and 5Y4/1
603-614 cm	5Y4/2 clay with assorted faint 5Y4/1 bands
614-615 cm	5Y4/2 clay with darker layers 5Y3/1
615-621 cm	5Y4/2 with very faint layers
621-625 cm	5Y4/2 clay with thin layers at 621, 622.5 and 623 cm

Section 3 of 7 625-774 cm

625-628 cm	5Y4/2 clay
628-631 cm	5Y4/1 bands in 5Y4/2 clay
631-632 cm	5Y4/2 w. 5Y4/1 bands
632-633 cm	5Y4/2 clay with 5Y4/1 bands
633-633.5 cm	5Y4/2 clay with 5Y4/1
633-635.5 cm	5Y4/2 clay
635.5-636 cm	2.5Y4/2 clay
636-638 cm	5Y4/2 clay
638-638.7 cm	5Y4/1 silty clay
638.7-639 cm	5Y4/2 clay
639-639.5 cm	5Y4/1 silty clay
634.5-640 cm	5Y4/2 clay
640-640.5 cm	5Y4/1 silty clay
640.5-641 cm	5Y4/2 clay
641-646.5 cm	5Y4/2 with several narrow layers 5Y4/1; clay
646.5-647 cm	5Y4/2 clay
647-648 cm	2.5Y4/2 clay and silt
648-651 cm	5Y4/2 clay
651-651.5 cm	5Y4/1 clay
651.5-668 cm	5Y4/2 with narrow bands 5Y4/1 clay
668-669.5 cm	5Y4/1 silt
669.5-671 cm	2.5Y4/2 clay
671-674 cm	5Y4/2 clay
674-676 cm	2.5Y4/2 silty clay
676-691 cm	5Y4/2 with narrow bands 5Y4/1
691-691.5 cm	5Y4/1 layer

691.5-694 cm	5Y4/2 with thin layers 5Y4/1
694-694.5 cm	5Y4/1
694.5-702 cm	5Y4/2 with layers 5Y4/1
702-702.5 cm	5Y4/1
702.5-703.5	5Y4/2 clay
703.5-704 cm	5Y4/1
704-706 cm	5Y4/2 clay
706-706.5 cm	2.5Y3/1 silt
706.5-710.5 cm	5Y4/2 clay with bands 5Y4/1
710.5-711 cm	5Y3/1
711-713.5 cm	5Y4/2 with bands 5Y4/1
71.35-714 cm	5Y4/1
714-718.5 cm	5Y4/2 with bands 5Y4/1
718.5-719 cm	2.5Y4/2 silty clays
719-719.5 cm	5Y4/1 clay w. silt
719.5-720 cm	5Y4/2
720-721 cm	5Y4/1
721-729.5 cm	5Y4/2 with bands 5Y4/1
729.5-730 cm	5Y4/1
730-730.5 cm	5Y4/2 clay
730.5-731 cm	5Y4/1
731-749 cm	5Y4/2 with bands of 5Y4/1; clay, silt
749-750 cm	5Y4/1
750-752 cm	5Y4/2 with bands 5Y4/1
752-752.5 cm	2.5Y4/2
752.5-756 cm	5Y4/2
756-760 cm	5Y4/1 coarse sand

760-764.5	5Y4/2 silty clay
764.5-765 cm	2.5Y4/2 silt
765-766.5 cm	5Y4/1 fine sand
766.5-768 cm	5Y4/2 silty clay, grading into 2.5Y4/2 silt
768-770 cm	5Y4/1 sand
770-770.5 cm	5Y4/1 sand layer that angles down from left to 772 cm at right, with 5Y4/2 clay
Section 2 of 7	774-926 cm
774-775 cm	5Y4/2 mingled with 5Y4/1; silty clay
775-777.5 cm	5Y4/1 with small amount 5Y4/2; silty clay
777.5 cm	sand layer 5Y3/1
777.5-778 cm	5Y4/1 silty clay
778-778.5 cm	sand 5Y3/1
778.5-780 cm	clay 5Y4/1
780-781 cm	5Y3/1 sand
781-785.5 cm	5Y4/1 silty clay with sand layers at 781.5, 782, 7825, 783, 783.5, 784, 785 cm
785.5-786 cm	5Y3/1 sand
786-786.5 cm	5Y4.1 clay
786.5-786.8 cm	5Y3/1 sand
786.8-795.5 cm	5Y4/1 clay silt with 5Y3/1 sand at assorted layers
795.5-796 cm	5Y3/1 sand
796-799.5 cm	5Y4/1 silty clay with 5Y3/1 sand layers
799.5-801 cm	5Y3/1 sand
801-813 cm	5Y4/1 silty clay with 5Y3/1 sand layers
813-813.5 cm	5Y3/1 sand

813.5-814 cm	5Y4/1 clay
814-814.4 cm	5Y3/1 sand
814.4-820 cm	5Y4/1 clays and silt, with assorted 5Y3/1 sand layers
820-820.5 cm	2.5Y4/2 sand
820.5-828 cm	5Y3/1 sand
828.5-829 cm	5Y4/1 clay
829-829.5 cm	5Y3/1 sand
829.5-840.5 cm	5Y4/1 silty clay, assorted 5Y3/1 bands
840.5-841.5 cm	5Y3/1 sand
841.5-842 cm	5Y4/1 silty clay
842-843 cm	5Y3/1, with burrow; sand
843-843.5 cm	5Y4/2 clay
843.5-845 cm	5Y4/1 clay
845-845.5 cm	5Y3/1 sand
845.5-846.5 cm	5Y4/1 clay
846.5-847.5 cm	5Y3/1 sand
847.5-850.5 cm	5Y4/1 clay with bands of 5Y3/1
850.5-851 cm	5Y3/1 sand
851-860.8 cm	5Y4/1 clay with layers 5Y3/1
860.8-861.5 cm	5Y3/1 sand
861.5-863.4 cm	5Y4/1 silty clay with 5Y3/1 sand layers
863.4-864 cm	5Y3/1 sand
864-866 cm	5Y4/1 silty clay with 5Y3/1 sand layers
866-868 cm	5Y3/1 sand
868-868.5 cm	5Y4/1 silty clay
868.5-869.5 cm	5Y3/1 sand with burrows
869.5-878 cm	5Y4/1 clay with 5Y3/1 layers

878-880 cm	5Y3/1 silty sand
880-888 cm	5Y4/1 clay with 5Y3/1 layers
888-888.5 cm	5Y3/1 silty sand
888.5-889 cm	5Y4/1 silty clay
889-890.5 cm	5Y3/1 silty sand
890.5-899.5 cm	5Y4/1 mixed with 5Y3/1 sand, all whorled and mixed
899.5-903 cm	5Y4/1 silty clay with 5Y3/1 sand layers
903-903.5 cm	5Y3/1 sand
903.5-905 cm	5Y4/1 silty clay
905-907.5 cm	5Y3/1 sand
907.5-910 cm	5Y4/1 silty clay with faint layers of 5Y3/1
910-910.5 cm	5Y3/1 sand
910.5-912 cm	5Y4/1 silty clay
912-912.5 cm	5Y3/1 sand
912.5-913.5 cm	5Y4/1 silty clay
913.5-914 cm	5Y3/1 sand
914-914.5 cm	5Y4/1 silty clay
914.5-915 cm	5Y3/1 sand
915-915.5 cm	5Y4/1 silty clay
915.5-916 cm	5Y3/1 sand
916-926 cm	5Y4/1 silty clay with sand layers 5Y3/1

Section 1 of 7	926-1063 cm
926-932 cm	5Y4/1 clay with thin bands 5Y3/1 sand
932-934.5 cm	5Y3/1 sand
934.5-937.8 cm	5Y4/1 clay with thin bands 5Y3/1 sand
937.8-938.2 cm	5Y3/1 sand

938.2-938.7 cm	5Y4/1 clay with thin bands 5Y3/1 sand
938.7-939.2 cm	5Y3/1 sand
939.2-943.5 cm	5Y4/1 clay " " " " "
943.5-945 cm	5Y3/1 sand
945-949 cm	5Y4/1 clay " " " " "
949-949.5 cm	5Y3/1 sand
949.5-951.5 cm	5Y4/1 clay " " " " "
951.5-952 cm	5Y2.5/1 sand
952-952.5 cm	5Y4/1 clay " " " " "
952.5-953.5 cm	5Y3/1 sand
953.5-953.8 cm	5Y4/1 clay " " " " "
953.8-955 cm	5Y3/1 sand
955-955.5 cm	5Y2.5/1 sand
955.5-960 cm	5Y4/1 clay " " " " "
960-960.5 cm	5Y3/1 sand
960.5-967.5 cm	5Y4/1 clay " " " " "
967.5 cm	5Y3/1 lens of sand widening from left to right
967.5-971 cm	5Y4/1 clay with thin horizontal bands of 5Y3/1 sand
971-972 cm	5Y3/1 lens narrowing from left to right
972-974.5 cm	5Y4/1 clay
974.5-976 cm	5Y3/1 lens narrowing left to right; sand
976-977 cm	5Y4/1 clay
977-978 cm	5Y3/1 sand
978-978.5 cm	5Y4/1 clay
978.5-979 cm	5Y3/1 sand
979-982.5 cm	5Y4/1 clay with thin bands 5Y3/1 sand
982.5-983 cm	5Y3/1 sand
983-986 cm	5Y4/1 clay " " " " "

986-986.5 cm	5Y3/1 sand
986-990 cm	5Y4/1 clay with thin bands 5Y3/1 sand
990-993 cm	5Y3/1 sand
993-993.5 cm	5Y4/1 clay
993.5-995 cm	5Y3/1 sand
995-1005 cm	5Y4/1 clay " " " " "
1005-1008 cm	5Y3/1 sand
1008-1008.5 cm	5Y4/1 clay
1008.5-1009.5 cm	5Y3/1 sand
1009.5-1010.5 cm	5Y4/1 clay
1010.5-1012 cm	5Y3/1 sand
1012-1012.5 cm	5Y4/1 clay
1012.5-1013 cm	5Y3/1 sand
1013-1016 cm	5Y4/1 clay " " " " "
1016-1017 cm	5Y3/1 sand
1017-1023 cm	5Y4/1 clay " " " " "
1023-1023.5 cm	5Y3/1 sand
1023.5-1024 cm	5Y4/1 clay
1024-1025 cm	5Y3/1 sand, with warm burrow
1025-1032 cm	5Y4/1 clay with thin layers 5Y3/1 sand
1032-1033 cm	5Y3/1 sand
1033-1033.5 cm	5Y4/1 clay
1033.5-1042 cm	5Y3/1 sand
1042-1045 cm	5Y3/1 clay " " " " "
1045-1047 cm	5Y4/1 sand
1047-1063 cm BTM	5Y3/1 clay " " " " "

INUGSUIN FJORD	IN-1 521 cm
Section 5 of 5	0-98 cm
0-6 cm	5Y4/2 clay, some silt, top oxidized to7.5YR2/0 and 7.5YR3/0. some 7.5YR2/0 bioturbation
6-7 cm	5Y4/2 grading to 5Y3/2, more 7.5YR2/0 mottling
7-14 cm	5Y3/2 silty clay, irregularly mottled 7.5YR2/0
14-21 cm	5Y3/1 and 7.5YR2/0 irregularly bonded through 5Y3/2 silty clay
21-25 cm	5Y3/2 silty clay, very little mottling
25-35.5 cm	5Y2.5/2 silty clay with irregularly mixed 5Y3/2 and 7.5YR2/0.
35.5-36 cm	7.5YR2/0 silty clay
36-40 cm	543.5/2 sand
40-40.5 cm	7.5YR2/0 silty clay
40.5-50.5 cm	5Y3/2 silty clay with 7.5YR2/0 mottling
50.5-53 cm	5Y4/1 silty clay " " horizontal mottlings
53-54 cm	5Y3/2 layer with distinct margins
54-81.5 cm	5Y4/1 silty clay
81.5-82 cm	5Y3/2 layer silty clay
82-82.5 cm	5Y4/1 layer with some 7.5YR2/0 mottling
82.5-83.5 cm	5Y3/2 silty clay with some 7.5YR2/0 mottling
83.5-85 cm	5Y4/1 " " " " " "
85-91 cm	5Y4/1 with more 7.5YR2/0 horizontal mottling
91-98 cm	5Y4/1 silty clay
Section 4 of 5	98-211 cm
98-103 cm	5Y3/1 mixed with 5Y4/1; silty clay with sand 100-103 cm

103 cm	7.5YR2/0 layer clay
103-106.5 cm	5Y3/1 clay
106-5 cm	7.5YR2/0 lamina
106.5-110.5 cm	5Y3/1 clay, some sand
110.5-111 cm	7.5YR2/0 laminae
111-115.5 cm	5Y3/1 clay, thin sand layer 113 cm
115.5-116 cm	7.5YR2/0 discontinuous laminae
116-121 cm	5Y3/1 clay with flects of 7.5YR2/0, some 5Y4/1 towards bottom
121-126 cm	5Y4/1, 5Y3/2 swirled together; 5Y4/1 silty clay, 5Y3/2 silty sand, with some 7.5YR2/0
126-129 cm	5Y3/2 silty clay with 7.5YR2/0 mottling, and one laminae of 5Y3/1 at 127 cm
129-129.5 cm	5Y4/1 silty clay
129.5-130 cm	5Y3/2 silty sand
130-131 cm	5Y4/1 silty clay
131-132 cm	5Y4/1 " " with 7.5YR2/0 mottlings
132-136 cm	mixed 5Y4/1, 5Y3/2, 7.5YR2/0, 5Y2.5/1
136-136.5 cm	5Y4/1
136.5-137 cm	irregular band of 5Y2.5/1
137-139 cm	5Y4/1 clay
139-140 cm	5Y4/1 and 5Y2.5/1 laminae of clay
140-141 cm	5Y3/2 and 5Y4/1 laminae, silty clay
141-142 cm	5Y2.5/1
142-142.5 cm	5Y4/1 clay
142.5-144 cm	5Y3/2 silty sand
144-145 cm	5Y4/1 clay

145-145.5 cm	5Y3/2 sandy clay
145.5-149 cm	5Y4/1 clay with thin 5Y2.5/1 laminae
149-151 cm	5Y2.5/1 with 5Y4/2 oxidized hole; silty sand
151-154 cm	5Y4/1 clay
154-154.5 cm	5Y3/2 silty sand
154.5-155 cm	5Y4/1 clay
155-156 cm	5Y3/2 silty clay
156-156.5 cm	5Y2.5/1 clay
156-158 cm	5Y2.5/2 sand in triangular deposit
158-160 cm	thin laminae of 5Y3/2 and 5Y4/1 days, sloping up to right
160-161 cm	5Y2.5/1 sand
161-162 cm	5Y4/1 clay
162-163 cm	mixed 5Y4/1 clay and 5Y2.5/1 sand
163-165	laminae 5Y4/1, 5Y3/2
165-166 cm	5Y4/1, 5Y3/2 laminae curving down to right; silty sandy clay
166-169 cm	5Y4/1, 5Y3/2, 5Y2.5/1 mixed beds
169-176.5 cm	5Y2.5/1 and 7.5YR20 at top, alternating 5Y4/1 and 5Y3/2 laminae of clay, with some 5Y2.5/1
176.5-177.5 cm	5Y2.5/1 bed
177.5-182 cm	5Y4/1 clay, with pebble
182-182.5 cm	thin clay laminae 5Y3/1, 5Y4/1
182.5-183 cm	5Y3/1 sand, very fine
183-197 cm	5Y3/2 sand, becoming coarser towards bottom, with eroded contact at base.
197-200 cm	5Y3.5/1 bed sloping slightly down to right, with some 5Y4/1 at base and 5Y2.5/1 lens at one side; clay

200-204 cm	5Y3.5/1 with 5Y4/1 mixed through; clay
204-204.5 cm	5Y2.5/1 clay with silt
204.5-205 cm	5Y4/1 silty clay, lensing wider to right some sand
205-207 cm	5Y2.5/1 with some 5Y4/1 through it; clay
207-208 cm	5Y4/1 silty clay
208-209 cm	5Y3/2 silty sand
209-210 cm	5Y4/1 silty clay
210-211 cm	5Y4/1 sandy silt
Section 3 of 5	211-347 cm
211-215 cm	silty clay, 5Y4/1, some sand near top
215-260 cm	5Y5/2 sands, fine at top, growing coarser downwards, with chunks of clay mixed in at 243-246 cm, 247-251 cm; 5Y4/1 clay
260-271 cm	5Y4/1 sands mixing into 5Y5/2, sloping down to right
271-345 cm	5Y4/1 sands, becoming coarser downwards, more 5Y3/2 and 5Y4/1 clay chunks, 269-271 cm, 311-313, 315-316, 318-319, 333-334 cm
345-347 cm	5Y6/1 granular sand
Section 2 of 5	347-490 cm
347-377 cm	5Y5/2 sand, granular and fine mixed, some pebbles 350, 360 cm
377-378 cm	irregular contact zone of 5Y4/1 sand
378-475 cm	5Y5/2 sand, fine at top, becoming coarser downwards; some disturbance of core 378-385 cm, at one side, where 5Y4/1 sand and granules from above are mixed in.

475-477 cm	color change to 7.5YR3/0 and 7.5YR2/0.
477-490 cm	7.5YR32/0 coarse sand
Section 1 of 5	490-521 cm
490-508 cm	5Y5/2 coarse sand, cobbles, pebbles
508-521 cm	5Y4/1 coarse sand, " "

INUGSUIN FJORD	IN-3 550 cm
Section 4 of 4	0-128.5 cm
0-7.5 cm	interbedded 5Y3/1, 5Y4/1 and 7.5YR2/0; swirled and mixed silty clays
7.5-9 cm	5Y4/1 clay
9-42 cm	interbedded 5Y4/1 and 7.5YR2/0 laminae, 2 to 5 mm thick, sand laminae at 34 and 38 cm; with vertical crack
42-43 cm	5Y4/2 lined gap, underlain with 5Y3/1
43-44.5 cm	5Y2.5/1 sand, sloping down to right
44.5-47 cm	sloping interbedded laminae of 7.5Y2/0 and 5Y3/1 silty clays
47-50 cm	5Y3/1, 5Y4/1, 7.5YR2/0 horizontal laminae, silty clays
50-51 cm	5Y2.5/1 sand
51-64 cm	mottled 5Y3/1 and 7.5YR2/0 for 3 cm, then thin laminae of 5Y3/1, 5Y2.5/1, 7.5YR2/0; 5Y4/2 in two broader bands 60-64 cm; silty clay
64-65 cm	5Y2.5/1 sand with 5Y3/1 silt above and below
65-76 cm	5Y3/1 and 5Y4/1 thin silty clay laminae, with one thick bed 5Y4/1 at 72-74 cm
76-87 cm	5Y4/2 layer silty clay
77-81.5 cm	5Y3/1 and 5Y2.5/1 interbedded thin laminae
81.5-83 cm	5Y2.5/1 and 5Y3/1 sand
83-99 cm	interbedded 5Y3/1, 5Y2.5/1 laminae of silty clay, with thin sand beds 89.5, 94, 95.5 and 98 cm
99-100 cm	5Y2.5/1 irregular layer sand
100-109 cm	5Y3/1, 5Y2.5/1 laminae, silty clay, some sand at 106, 108.5 cm

109-110 cm	5Y2.5/1 sand
110-125 cm	5Y3/1, 5Y2.5/1 laminae silty clay, thicker beds of 5Y4/1 at 111-112 and 116-118 cm
125-127 cm	5Y4/1 clay
127-128.5 cm	5Y3/1, 5Y2.5/1, 5Y4/1 laminae, silty clay, slightly mottled

Section 3 of 4 (laminated) 128.5-268 cm

128.5-132.5 cm	5Y4/1, 5Y3/1, 7.5YR2/0 silty clay, with sand at 130 cm
132.5-133 cm	5Y4/1 sand
133-135.5 cm	laminae, silty clay
135.5-136 cm	5Y5/1 sand
136-141 cm	5Y3/1, 5Y4/1 silty clay laminae with broad 5Y3/2 band 137-139 cm
141-141.5 cm	thin sand, 5Y2.5/1
141.5-142.5 cm	darker, 7.5YR3/0 band, sand at bottom
142.5-144 cm	mixed laminae silty clay
144-145 cm	5Y3/1 sand
145-155 cm	mixed laminae, silty clay with mottled, disturbed mixture 149 to 155; sand at 146 and 153 cm
155 cm	sand, 5Y3/1, thickening to right
155-159.5 cm	mottled silty clay 5Y3/1, 5Y4/1, 7.5YR2/0, with sand at 157.5
159.5-160 cm	7.5YR2/0 silty clay
160-161 cm	5Y4/1 sand
161-164 cm	5Y3/2 and 5Y3/1 mottled clay and silt
164-165 cm	5Y3/2, 5Y4/1, 7.5YR2/0 laminae silty clay

165-165.5 cm	5Y4/1 sand
165.5-166 cm	5Y2.5/1 silty clay
166 cm	thin sand layer
166-167.5 cm	5Y3/2 silty clay
167.5-169 cm	5Y2.5/1 silty clay and sand
169-171 cm	5Y3/1, 5Y3/2, 7.5YR2/0 laminae silty clay
171-180 cm	5Y5/1 sand, becoming coarser downwards, 5Y4/1, 175-176 cm
180-183 cm	irregular contact to 5Y4/1 and 5Y2.5/1 mixed silty clay
183-194.5 cm	5Y3/2, 5Y3/1, 5Y2.5/1 laminae, silty clay
184.5-185 cm	5Y3/1 sand
185-185.5 cm	5Y2.5/1 silty clay
185.5-187 cm	5Y3/1 irregular layer sand
187-190 cm	5Y3/2, 5Y4/1, 7.5YR2/0 laminae sandy silty clay
190-191 cm	5Y3.5/1 silty clay
191-199.5 cm	5Y3/1 sand, very fine, grading to coarser towards bottom
199.5 cm	irregular contact
199.5-203 cm	5Y3/2, 5Y4/1, 5Y2.5/1 laminae, silty clay
203-212 cm	gap with loose sand
212-213 cm	coarse 5Y3/1 sand
213-215 cm	irregular contact with 5Y4/1 clay, 7.5YR2/0 layer below clay
215-217.5 cm	5Y4/1 clay
217.5-222 cm	5Y3/1 sand, fine grading down to coarse
222-233.5 cm	5Y4/1 clay with some layers 7.5YR2/0
233.5-235 cm	5Y4/1 and 5Y3/1 silty clay laminae, some sand
235-268 cm	sands: 234-236 cm 5Y3/1 fine sand 236-238 cm 5Y3.5/1 fine sand

238-243.5 cm	5Y3.5/1	medium sand
243.5-247 cm	5Y3/1	" "
247-268 cm	5Y3/1	coarse sand

Section 2 of 4	268-405 cm
268-272 cm	5Y3/1 coarse sand
272-310 cm	stretched and sucked clay beds, 5Y4/1, with 7.5YR2/0 mottled layers, sand mobilized down sides
310-321 cm	5Y4/1 with 7.5YR2/0 mottled beds; silty clay
321-322 cm	5Y4/1 fine sand
322-329 cm	5Y4/1 silty clay with heavy 7.5YR2/0 mottling
329-330 cm	5Y3/1 fine sand
330-341 cm	5Y4/1 silty clay, with some 7.5YR2/0 "
341-345 cm	5Y4/1 " " " heavier " "
345-353 cm	" " " " less " "
353-353.5 cm	5Y3/1 sand
353.5-362 cm	5Y4/1 silty clay with light 7.5YR2/0 mottling
362-364 cm	5Y3/1 fine sand " " " "
364-374 cm	5Y4/1 silty clay " " " "
374-376 cm	5Y3/1 sands with 5Y4/1 clay blebs and pebble
376-379.5 cm	5Y3/1 sand
379.5-380 cm	5Y3.5/1 clay
380-390 cm	5Y4/1 clay with small amount 7.5YR2/0 mottling
390-392 cm	5Y4/1 clay grading to 5Y3.5/1, bioturbation 7.5YR2/0 mark with 5Y4/1 "halo" or "aura"
392-405 cm	5Y3.5/1 clay with burrow, 5Y4/1 "aura" at 403 cm; bottom oxidized to 5Y4/1

Section 1 of 4	405-550 cm
405-405.5 cm	5Y4/1 oxidized clay
405.5-462 cm	5Y3.5/1 clay, very sticky; "auras" of 5Y4/1 at 408, 413, 418, 421, and 441 cm, some with 7.5YR2/0 centres
462 cm	sharp contact
462-463 cm	5Y3/2 sand
463-468 cm	mixed 5Y3/2 and 5Y3.5/1 silty clay
468-509 cm	coarse 5Y3/2 sand with chunks of clay some showing vertical laminae; some 7.5YR2/0 mottling
509-522 cm	5Y4/1 silty clay with some thin 5Y3/1 laminae
522-550 cm	5Y3.5/1 clay and silt, some mottling 7.5YR2/0 and 5Y4/1

MAKTAK FJORD MA-2 1060 cm

Section 7 of 7	0-177 cm
0-104 cm	7.5YR4/2 clay with 7.5YR2/0 and 2.5Y4/2 bioturbation marks, mostly small burrows, some large ones 2-4 cm, 41-42 cm, 64-66 cm. Surface oxidized 7.5YR4/4
104-124 cm	7.5YR4/2 clay grading to 2.5Y4/2, bioturbation 7.5YR2/o and 7.5YR3/0
123-139 cm	2.5Y4/2 with 7.5YR2/0 and 7.5YR3/0 mottling; less distinct marks
139-157 cm	2.5Y4/2 mixed with 2.5Y3/2 and mottlings as above; clays still
157-177 cm	2.5Y4/2 with some 2.5Y3/2, 7.5YR2/0 and 7.5YR3/0; clay, burrow or hole at 163 cm

Section 6 of 7	177-330 cm
177-330 cm	2.5Y4/2 clay with 7.5YR2/0, 2.5Y3/0, 7.5YR3/0 bioturbation and mottling
	177-202 light markings, shall fragment at 183 cm
	202-245 cm heavy markings, large burrows showing
	245-290 cm less markings
	290-328 cm heavy markings, large burrows, shell at 307 cm
	328-330 cm fewer markings

Section 5 of 7	330-477 cm
330-365 cm	2.5Y4/2 clay with 7.5YR2/0 and 7.5YR3/0 bioturbation
365-381 cm	2.5Y4/2 clay, mottlings sharply reduced, very faint
381 cm	thin, sinuous sand layer 2.5Y3/2

381-409 cm	laminated clays, 2.5Y4/2 and 2.5Y3/2
409 cm	thin 2.5Y3/2 sand layer
409-418.5 cm	laminae, clay; 2.5Y4/2 and 2.5Y3/2
418.5 cm	thin 2.5Y3/2 sand layer
418.5-425 cm	2.5Y4/2 and 2.5Y3/2 and 2.5Y5/2 laminae; clay
425-426 cm	2 thin 2.5Y3/2 sand laminae with 2.5Y5/2 clay between
426-453 cm	laminae of 2.5Y4/2 and 2.5Y3/2 clays, sand laminae at 427, 429.5, 435, 437, 439, 441, 443.5, 444, 446, 447, 448, 449, 452 cm; pebble at 434-436 cm
453-453.5 cm	2.5Y3/2 sand
453.5-469 cm	laminae of 2.5Y4/2 and 2.5Y3/2, some 2.5Y5/2 clays
469-476 cm	same laminae, some 7.5YR2/0 flecks
476-477 cm	gravelly 2.5Y4/2

Section 4 of 7 477-627 cm

All interbedded, thin laminae of 2.5Y4/2, 2.5Y3/2, 2.5Y4.5/2 and 7.5YR3/0 clays, with some sand beds scattered through, mostly 2.5YR3/0 thick sand beds 576-577 cm, 593-595 cm, 616-618 cm; burrow with coarse sand filling it at 607 cm

Section 3 of 7 627-773 cm

Interbedded laminae of varying thicknesses, mostly clays of 2.5Y4.5/2 and 2.5Y4/2 clays, with 2.5Y4/2 and 2.5Y3/2 sands

Thicker sand layers: 627-630.5, 636-637, 638-640, 643-645 cm, 648-648.5, 683-685.5, 689-691, 731-732, 733-736, 738-740, 750-751 cm

Section 2 of 7 773-917 cm

Interbedded laminae 2.5Y3/2, 2.5Y4/2, 2.5Y4.5/2, 7.5YR3/0 clays, silt, sands

Thick sands 779-780, 828-834, 856-858, 886-889.5, 894-898, 906-912 cm

Thick claybeds 780-788.5, 799-808, 862-864.5, 872-875, 889-897.5, 903-905 cm

Section 1 of 7 917-1060

Laminae of 2.5Y3/2, 2.5Y4/2, 2.5Y4.5/2 and 7.5YR3/0 clays and sands

Thick sands: 935.5-937, 955-956, 959-965.5, 974.5-975, 977-978, 982-985.5, 1010-1014, 1024-1025, 1031-1032, 1045-1047.5, 1054-1055 cm

Thick clay beds: 927-934, 1002.5-1010, 1048-1052 cm

MAKTAK FJORD MA-4 985 cm

Section 7 of 7 0-123 cm

10YR4/2 clay, with bioturbation mottlings of 7.5YR2/0 and 7.5YR3/0 scattered lightly throughout, roughly horizontal in nature from 46 to 123 cm

Section 6 of 7	123-261 cm
123-125 cm	10YR4/2 clay, very liquid
125-130 cm	10YR4/2 changing to 2.5YR4/2; silty clay
130-163 cm	2.5YR4/2 silty clay, with 7.5YR2/0 and 7.5YR3/0 mottlings; gravel pocket 156 cm, with 7.5YR2/0 edge
163-165 cm	2.5YR3.5/2 with 7.5YR3/0 bands, silty clay and sand
165-207 cm	2.5YR4/2 silty clay, with some 10YR4/2 mixed in, and 7.5YR2/0 and 7.5YR3/0 mottlings very distinct
207-208 cm	2.5YR3/2 sand layer
208-216 cm	2.5YR4/2 silty clay, some mottling
216-217 cm	7.5YR3/0 distorted band
217-261 cm	2.5YR4/2 silty clay, some mottling, with thin sand laminae at 232.5, 248.5 cm, 2.5YR3.5/2 in color

Section 5 of 7	261-405 cm
261-298.5 cm	2.5Y4/2 with roughly horizontal mottlings of 2.5YR3/0 and 7.5YR2/0; silty clays
298.5-299 cm	5Y3/2 sand layer
299-400 cm	fine laminae of silty clay; 2.5YR4/2, some 2.5YR3/2, 5Y3/2 and 7.5YR3/0; many fine, silty sand layers throughout thicker sand layers 312-313, 350-352 cm; most sands 5Y3/2 color

400-405 cm	2.5YR4/2 silty clay with some 7.5YR3/0 mottling

Section 4 of 7	405-547 cm
405-436 cm	2.5YR4/2 clay with a few burrow-type marks of 7.5YR3/0 and 7.5YR2/0
436-461 cm	2.5YR4/2 unsorted sand, silt, clay, with mottlings
461-467 cm	2.5YR4/2 clay
467-496 cm	2.5YR4/2 sand, grading coarser downward, with some 7.5YR3/0, and some 2.5YR5/2 at side
496-500 cm	2.5YR4/2 clay with 7.5YR3/0 mottlings, becoming silty towards bottom
500-516 cm	2.5YR4/2 silty clay, with very fine sand towards bottom
516-547 cm	2.5YR4/2 sand, fine grading to coarser downward; some bioturbation mottlings of 7.5YR2/0 and 7.5YR3/0

Section 3 of 7	547-692 cm
547-687 cm	somewhat laminated, predominantly 2.5YR4/2 clay and silty clay, 7.5YR3/0 and 7.5YR2/0 mottling, and 5Y3/2 sands

Mottling in specific areas: 560-564, 577-581, 614-615, 617-623, 633-651, 656-665, 675-682 c

Thicker sand beds: 558-559, 574-576, 589-590, 596-596.5, 597.5-598, 599.5-601, 620-622, 627.5-628, 651-654, 669-673.5

687-692 cm	2.5YR4/2 silty clay

Section 2 of 7	692-845 cm
692-718.5 cm	laminae of silty clays and clay, 2.5YR4/2, 7.5YR2/0, and sands 5Y3/2

Thicker sand layers: 693.5-694, 703-703.5, 705-706, 710-712.5, 716-718.5 cm

718.5-720 cm	2.5YR4/2 clay
720-721 cm	2.5YR4/2 clay grading into 5Y4/1 silty clay
721-845 cm	5Y4/1 silty clay with a few large 7.5YR2/0 burrows, at 724, 750, 784, 797, 806 cm, and smaller, more frequent ones 815-842 cm.

Section 1 of 7	845-985 cm
845-846 cm	oxidized 2.5YR4/2 silty clay
846-870 cm	5Y4/1 silty clay
870-985 cm	laminated 5Y4/1, 5Y3/1, 5Y3/2, 7.5YR3/0, 7.5YR2/0 silty clays and sands

Thicker sands: 903-908 (several bands) 926-927, 932-936, 939-941, 953-962, 966.5-968, 969-972, 976-979 cm; last 3 beds are 5Y3/1 in color

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Section 7 of 7 0-80 cm

sfc-oxidized to 10YR3/3

1-13 cm	5Y3/2 with 7.5YR2/0 bleb at 6-7 cm; 5Y4/2 bleb at 8-10 cm sandy
13-25	irregular contact line at 13 cm 5Y4.5/2 with 5Y3/2 mottlings and layers at 16-18 cm, 23-24 cm (sandy) in clay
25-26.5	5Y3.5/2 and 5Y2.5/2 sand
26.5-27.5	5Y3.5/1 clay
27.5-32	5Y3.5/1 with 7.5YR2/0 mottling; clay
32-33	5Y2.5/2
33-34.5	5Y4/2
34.5-37	5Y3/1
37-39.5	5Y3/2 and 5Y2.5/2 sand
39.5-46.5	5Y4/2 and 7.5YR2/0 mottled silty clay
46.5-48	5Y3/2 and 7.5YR2/0 sand
48-54	5Y4/2 and 7.5YR2/0 clay
54-56	5Y3/2 sand, sloping down diagonally
56-80	5Y4/2 with 7.5YR2/0 mottling; clay

Section 6 of 7 80-225 cm

80-155	5Y4/2 clay, with 7.5YR2/0 mottlings fine sand layer at 130 cm
155-164 cm	5Y4/2 clay with decreased mottlings 7.5YR2/0, bluming; color changes slowly to 5Y4/1
164-167	5Y4/1 and 5Y4/2 mixed; clay
167-171	5Y3.5/1 with 2.5Y3/0 bleb; clay

171-182	5Y4/1 clay
182-184	5Y4/1 with 7.5YR2/0 blebs; very faint banding in this clay
184-188	5Y3/2 with 7.5YR2/0 silty clay, grading to fine sand at bottom
188-199.5	5Y4/1 with 7.5YR2/0 distinct mottlings; clay
199.5-202	5Y3/2 with some 5Y3/1 sand
202-214	5Y4/1 with 7.5YR2/0 mottling; clay with some silt
214-215	5Y3/2 sand
215-219	5Y4/1 clay, some " " " " " "
219-221	5Y3/2 sand
221-225	5Y4/1 clay, some silt
Section 5 of 7	225-380 cm
225-250.5	5Y4/1 clay, with more 7.5YR2/0 mottlings; distinct
250.5-251	5Y3/1 sand
251-263	5Y4/1 clay, with heavy mottling 7.5YR2/0
263-266.5	5Y3/1 sand
266.5-270	5Y4/1 clay, with 5Y3/1, fine soft sand
270-312	5Y4/1 clay with 7.5YR2/0 mottling
312-313.5	5Y3/1 sand
313.5-315	5Y3/1 soft clay
315-323	5Y4/1 clay with 7.5YR2/0 mottling
323-327 cm	7.5YR2/0 lumpy silty clay
327-369	5Y4/1 clay with distinct bioturbations 7.5YR2/0
369-370	5Y3/1 sand
370-380	5Y4/1 clay, 7.5YR2/0 mottlings

Section 4 of 7 380-527 cm

380-413	5Y4/1 clay with 7.5YR2/0 mottlings
413-416	5Y4/1 " " 5Y3/2 "
416-418	band 5Y4/1 with 7.5YR2/0 strip across middle
418-485	5Y4/1 with 7.5YR2/0 mottlings; silty clay some 5Y3/2 at 434-435 cm, 470-473 cm
485-489	5Y4/1 clay with 7.5YR2/0 mottlings; some 5Y3/2
489-490	5Y4/1, 5Y3/2, 5Y2.5/1 silty clay
490-493	5Y3/2 and 5Y2.5/1 silty clay
493-494.5	5Y2.5/1 and 7.5YR2/0 " "
494.5-496	5Y2.5/1 sand
496-527 cm	5Y4/1 with 7.5YR2/0 distinct mottlings; small amount 5Y3/2 at 500-502 cm

Section 3 of 7 527-679 cm

527-579.5	5Y4/1 with distinct mottlings 7.5YR2/0; silty clay; some 5Y3/2
579.5-580	gap
580-612	5Y4/1, distinct mottling 7.5YR2/0; silty clay
612-613	5Y3/2 fine sand
613-629.5	5Y4/1 clay with 7.5YR2/0 mottling
629.5-630	5Y3/2 sand
630-635	5Y4/1 clay " " "
635-650	5Y4/1 and 5Y3/2 clay, less distinct mottlings 7.5YR2/0
650-652	5Y4/1 and 5Y3/2 clay
652-672	5Y4/1 clay with some slightly mottled layers 5Y3/1, some 5Y3/2

672-679	5Y4/1 clay with fine sand layers at 673, 674, 675 and 677 cm
Section 2 of 7	679-829 cm
679-683	5Y4/1 clay with sand layers of 5Y3/2 and 5Y2.5/0
683-689.5	5Y4/1 clay, with 5Y3/2 mottling
689.5-700	5Y4/1 clay, fine sands at 692, 694.5, 697.5
700-703	5Y4/1, mottled bands 5Y2.5/1; clay
703-724	5Y4/1 clay, very fine sand beds,723.5 cm one most noticeable
724-727	5Y3.5/1 with bottom layer 7.5YR2/0; clay
727-739	5Y4/1 and 7.5YR4/1 clay
739-742	7.5YR2/0, some 5Y3/2; sandy silt
742-754.5	7.5YR2/0, some 5Y3/2; sandy silt
754.5-756	7.5YR2/0 and 5Y2.5/1, 5Y3/2 mottled through it; clay
756-799	5Y4/1 with distinct 7.5YR2/0 mottlings; clay
799-801	5Y4/1 and 5Y3/2, mottled blurrily; clay
801-802	5Y3/2 sand
802-804	5Y4/1 and 5Y3/2 clay, mottled blurrily
804-829	5Y4/1 with 7.5YR2/0 and 5Y3/2 blurrily mottled; clay
Section 1 of 7	829-974 cm
829-865	5Y4/1 clay, blurrily mottled with 7.5YR2/0 and 5Y3/2
865-876	5Y4/1 clay, with few mottlings of 5Y3/2 and 5Y5/1
876-910	5Y4/1 clay, changing to silt and fine sand at 905 cm
910-912	5Y4/1 with a bleb of 7.5YR2/0; silty clay, some sand
912-913	5Y3.5/1 silty sand

913-913.5	5Y5/1 band; silty clay
913.5-918	5Y4/1 with 7.5YR2/0 at bottom, plus streak at 916 cm; sandy
918-932	5Y4/1 with distinct 7.5YR2/0 mottlings; silty clay
932-934	5Y4/1 silty clay, distinct 7.5YR2/0 band
934-974	5Y4/1 " " " " mottlings, in distinct bands at 949, 955 cm

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Section 7 of 7	0-95 cm strong H_2S
0-95 cm	5Y4/1 with 7.5YR2/0 and 5Y2.5/1 mottlings; silty clay mottlings somewhat horizontal 7-32 cm; irregular 32-63, less common; 63-95 horizontal mottlings. Shell fragm. 52-53 cm
Section 6 of 7	95-245
	5Y4/1 with 7.5YR2/0 and 5Y3/1 bioturbation mottlings; silty clay burrow 98-101 cm showing color change in sides. 100-151 black mottling distinct, roughly horizontal, decreasing in frequency
151-163	almost no mottling
163-177	increasing mottling
177-178	7.5YR2/0 layer
178-237	horizontal mottling, 7.5YR2/0; some 5Y3/1, less distinct.
237-238	7.5YR2/0 layer
238-245	horizontal mottling
Section 5 of 7	245-395
245-285 cm	5Y4/1 with 7.5YR2/0 slightly horizontal mottlings; silty clay
285-288	5Y4/1 and 5Y3.5/1 mixed
288-291	5Y3.5/1 silt
291-293.5	5Y3.5/1 grading into 7.5YR2/0 band; silt
293.5-300.5	5Y4/1 silt with horizontal marks of 7.5YR2/0

300.5-306	interbedded 5Y3.5/1 and 5Y3/1 silt and clay
306-324.5	silty 5Y3/1 whotled on one side and 5Y4/1 clasts in clayey silty sand, 5Y3.5/1
324.5-331.5	sand-fine to coarser at bottom; 5Y3/1 grading to 7.5YR2/0 at 329 cm
330.5-342	5Y4/1 with 7.5YR2/0 blebs; clayey silt
342-343	2.5Y2.5/0 silty clay
343-343.5	5Y4/1 silt
343.5-344.5	5Y3.5/1 mixed with 2.5Y2.5/0
344.5-355.5	5Y4/1 silt, with 7.5YR2/0 and 2.5Y2.5/0 mottlings
355.5-356	2.5Y2.5/0 with clast of 7.5YR2/0; silt
356-379	5Y4/1 with 7.5YR2/0 mottling, some horizontal; a small amount of 2.5Y2.5/0 present at 374-376 cm; silt
379-382	2.5Y2.5/0, some 5Y4/1; silt
382-395	5Y4/1 with 7.5YR2/0 bioturbation
Section 4 of 7	395-547
395-497	5Y4/1 silty clay, with 7.5YR2/0 and some 2.5Y2.5/0 mottling, mostly faintly horizontal bioturbation, especially 411-415 cm layer of 7.5YR2/0 2 mm thick at 427 cm 468 cm break in core
497-511	5Y3/1 small amounts 5Y4/1 mixed in, 497-500 cm; silty clay
511-547	gap in core liner w. chunks of loose clay scattered through out.

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Section 5 of 5 0-157 cm

0-22 cm	5Y3/1 dominant color, with 5Y4/1, and 7.5YR2/0 mottlings bioturbated; top 2 cm silt, rest silty clay
22-23 cm	5Y4/1 layer of clay
23-28 cm	5Y3/1 with some 5Y4/1 and a little 7.5YR2/0; clay
28-29 cm	bleb of 5Y4/1 in 5Y3/1; clays w. some silt
29-30 cm	5Y3/1 clay with some silt
30-31 cm	5Y4/1 with 7.5YR2/0 indirect; clay with silt
31-38 cm	5Y3/1 clay; gastropod at 37 cm
38-43 cm	5Y3/1 darkening to 5Y2.5/1; silty clay
43-45 cm	5Y2.5/1 silty clay, with some 7.5YR2/0
45-46 cm	5Y4/1 layer of clay
46-54 cm	5Y3/1 clay with mottlings of 5Y4/1 and 7.5YR2/0
54-55 cm	5Y3/1 clay
55-60 cm	5Y3/1 silty clay, with some 7.5YR2/0 and 5Y4/1
60-64 cm	5Y2.5/1 with 7.5YR2/0; silty clay
64-72 cm	5Y4/1 with 5Y3/1 mixed, and a little 5Y2.5/1; clay
72-84 cm	5Y3/1 and 5Y2.5/1 faintly layered silty clay, with some 7.5YR2/0 mixed in
84-86 cm	5Y4/1 clay
86-111 cm	5Y3/1 dominant color; mottled with 5Y2.5/1, 5Y4/1, 7.5YR2/0; silty clay
111-112 cm	faint 5Y4/1 band of silty clay
112-157 cm	5Y3/1 dominant color; series of faint, narrow bands of silty clay, with areas of 5Y2.5/1, 7.5YR2/0, and some 5Y4/1

Section 4 of 5	157-310 cm
157-182 cm	5Y3/1 mixed variably with 5Y4/1, 5Y2.5/1, 7.5YR2/0; silty clays
182-196 cm	5Y4/1 dominates with some 5Y3.5/1 and 5Y2.5/1 in distinct bands and mottlings; silty clay shell fragments at 188 cm
196-222 cm	5Y3.5/1 and 5Y4/1 indistinctly banded clays, with some 7.5YR2/0 mottling
222-224 cm	5Y3/1 silty clay
224-227 cm	5Y4/1 clay
227-229 cm	5Y2.5/1 silt
229-231 cm	5Y3/1 clayey silt
231-234 cm	5Y4/1 clay
234-237 cm	5Y3/1 clay with 5Y4/1 mottling
237-238 cm	5Y4/1 clay
238-240.5 cm	5Y3/1 clay
240.5-242.5 cm	5Y4/1 clay
242.5-243.5 cm	5Y2.5/1 silty clay
243.5-244 cm	5Y3/1 silty clay
244-258 cm	5Y4/1 and 5Y3/1 dominating, some 5Y2.5/1 mottlings; clay silt
258-260 cm	5Y3/1 silty clay
260-270 cm	5Y4/1 and 5Y3/1, some 5Y2.5/1 and 7.5YR2/0; semi banded silty clays
270-271 cm	5Y3/1 silty clay
271-277 cm	5Y4/1 silty clay
277-278 cm	5Y3/1 silt layer, with shell fragments and whole shells, pebbles

278-281.5 cm	5Y4/1 with slight irregular mottling; silty clay
281.5-283 cm	5Y3/1 clay with some silt, bioturbated
283-285 cm	5Y4/1 clay with silt
285-288 cm	5Y3/1 grading to 7.5YR2/0 at bottom, siltyclay
288-310 cm	5Y4/1 with 7.5YR2/0 mottlings; silty clay
Section 3 of 5	310-462 cm
310-327 cm	5Y4/1 bioturbated silty clay with 5Y2.5/1 and 7.5YR2/0
327-329 cm	5Y3/1 silty clay layer
329-332 cm	5Y4/1 with some vertical burrows or twig impressions
332-333 cm	5Y4/1 with 7.5YR2/0 mottlings; silty clay
333-344 cm	5Y4/1 and 5Y2.5/1 mottled, silty with some clay - shell fragment at 333, and angular well-defined cavity 341-343 cm
344-353 cm	5Y4/1 with 7.5YR2/0 mottlings; silt
353-371 cm	5Y4/1 dominates, with 7.5YR2/0; silt and clays mixed - shells at 369-370 cm, and a scaphopod shell at 353 cm
371-378 cm	5Y4/1, almost no mottling; clay, some silt
378-387 cm	5Y4/1 with heavir 7.5YR2/0 mottling, mostly of burrows large burrow starts at 382 cm, goes down vertically to 401 cm
387-395 cm	5Y4/1 clay, some silt
395-401 cm	5Y4/1 dominant, with 5Y3/1 in burrow, and band at 395-397; clay
401-404 cm	5Y4/1 clay
404-410 cm	5Y4/1 and 7.5YR2/0 mottlings; clay
410-414 cm	5Y4/1 clay
414-419 cm	5Y4/1 clay with 5Y2.5/1 vertical burrow markings

419-427 cm	5Y4/1 clay, faintly mottled
427-429 cm	5Y4/1 clay with vertical burrows not colored
429-434 cm	5Y4/1 clay, some 5Y2.5/1 mottlings
434-435 cm	5Y4/1 clay; vertical burrows, 5Y2.5/1
435-462 cm	5Y4/1 with some 5Y3.5/1 burrow markings at 442-445, 449-450, 452-455, 458-460 cm
Section 2 of 5	462-615 cm
462-482 cm	5Y4/1 hard clay; shell fragment at 475 cm
482-485 cm	5Y4/1 clay with worm burrows
485-492 cm	5Y4/1 clay
492-509 cm	5Y4/1 clay with burrows
509-520 cm	5Y4/1 clay
520-522 cm	5Y4/1 clay, with burrows
522-534 cm	5Y4/1 clay
534-534.5 cm	5Y4/1 sand layer with 2 mm gap in it
534.5-539 cm	5Y4/1 clay
539-542 cm	5Y4/1 clay, with 5Y2.5/1 burrows
542-551 cm	5Y4/1 clay
551-551.5 cm	5Y4/1 sandy silt
551.5-552.5 cm	5Y4/1 clay
552.5-553 cm	5Y4/1 sandy silt
553-556 cm	5Y4/1 clay
556-556.5 cm	5Y4/1 sandy silt
556.5-560 cm	5Y4/1 clay
560-560.5 cm	5Y4/1 clay of very slightly lighter color
560.5-562 cm	5Y4/1 clay
562-563 cm	5Y4/1 silt

563-566 cm	5Y4/1 clay
566-567.5 cm	5Y4/1 silty sand
567.5-570 cm	5Y4/1 clay
570-572 cm	5Y4/1 sand
572-581 cm	5Y4/1 clay
581-582 cm	5Y4/1 silty sand
582-589 cm	5Y4/1 clay
589-595 cm	5Y4/1 clay with triangular bleb of sand 5Y3/1
595-597 cm	5Y4/1 clay
597-601 cm	5Y4/1 graded sand layer, coarsest at bottom
601-609 cm	5Y4/1 clay
609-610 cm	5Y4/1 sandy silt
610-613 cm	5Y4/1 clay
613-613.5 cm	5Y4/1 sandy silt
613.5-615 cm	5Y4/1 clay
Section 1 of 5	614-769 cm
614-634 cm	5Y4/1 clay, with shells at 615-7=616 cm, and burrows at 625-626 cm
634-653 cm	5Y4/1 and 5Y3/1 in horizontal bands
653-656 cm	5Y4/1 clay
656-656.5 cm	5Y3/1 sand layer, 1 mm thick, on top of 5Y3/1 clay
656.5-658 cm	5Y3/1 clay
658-658.5 cm	gap
658.5-672 cm	5Y3/1 clay with 5Y2.5/1 band at 663 cm; grading gradually to 5Y4/1 between 670-672 cm
672-686 cm	5Y4/1 clay, with angular pebble and shell fragments at 677-679 cm

686-691 cm	5Y4/1 gravelly sand grading finer upwards, some shell fragments
691-697 cm	5Y4/1 clay, slightly mottled with 5Y2.5/1 and 5Y3/1
697-701 cm	5Y3/1 clay
701-702 cm	5Y2.5/1 clay
702-707 cm	5Y3/1 clay
707-735 cm	5Y3/1 clay with 5Y2.5/1 mottlings; shells at 726 cm
735-742 cm	5Y3/1 clay with large burrows, 5Y2.5/1
742-760 cm	5Y3/1 clay, shell fragments at 755 cm
760-761 cm	5Y2.5/1 broken band; clay
761-769 cm BTM	5Y3/1 clay

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Section 5 of 5	0-195 cm
0-36 cm	5Y5/2 sand, med. sized, no visible layering
36-41.5	5Y4/2 silty snd with 5Y2.5/1 mottlings
41.5-44	5Y4/2 and 5Y5/2 silt and fine sand layers
44-47	5Y4/2 grading down into 5Y3/2; silty with some sand; 5Y2.5/1 and 7.5YR2/0 mottlings
47-132 cm	5Y3/2 sandy silt with 5Y2.5/1 and 7.5YR2/0 mottlings, and a sand layer, 5Y5/2, at 93.4-94.5 cm
132-133	5Y5/2 sand
133-133.5	5Y2.5/1 and 7.5YR2/0 sandy silt
133.5-141.5	5Y3/2 with mottlings of above colors - sandy silt
141.5-142	5Y2.5/1 and 7.5YR2/0 sandy silt
142-172	5Y3/2 sandy silty clay with 7.5YR2/0 mottlings
172-173	5Y2.5/1 and 7.5YR2/0 sand silt
173-185	5Y3/2, mottled sandy silty clay
185-189	5Y3/2, mottled more heavily with 5Y2.5/1
189-195	5Y3/2

Section 4 of 5	195-348 cm
195-230	5Y3/2 with mottlings of 7.5YR2/0 and 5Y2.5/1; sandy silt at top, grading downwards to silty clay
230-244	5Y3/2, mottled; silty clay
244-253	5Y4/1 silty clay with gravel
253-255	5Y3/2, mottled silty clay
255-274	5Y4/1 silty clay with gravel
274-278	5Y4/1 with bleb of 5Y3/2, silty clay with gravel

278-296	5Y4/1 silty clay
296-297	5Y5/1 clay
297-298.5	5Y4/1 silty clay
298.5-300	small bands 5Y4/1, 5Y3/2 and 5Y2.5/1 silty clay
300-302.5	5Y5/1 silty clay
302.5-306	5Y3/2, 5Y2.5/1 and 7.5YR2/0 mixed; silt
306-313	5Y5/1 banded zone; clayey silt
313-319	5Y4/1 clayey silt
319-322.5	5Y5/1 " "
322.5-325	whorled bands 5Y3/2, 5Y5/1, 5Y2.5/1, 5Y5/1
325-329	5Y3/2 with silty bleb or clast, 5Y3/1
329-330	5Y4/1 band, dragged downward on one side
330-331	5Y3/2 clay
331-334	5Y4/1 with narrow band 7.5YR2/0; clay
334-335	5Y4/1 clay
335-336	5Y5/1 clay
336-339	5Y4/1
339-345	5Y5/1 with 7.5YR2/0, 5Y3/2 clast of silt running 337-342
345-348	5Y3/2 gravelly silty clay

Section 3 of 5	348-503 cm
348-371	sand?
371-374 cm	5Y3/1, 5Y3/2 and 7.5YR2/0 mottled together - silty sand
398-401	gap
401-409	more 5Y3/1, 5Y3/2 silt
409-411	sandy silt 5Y3/1, with thin bottom layer 7.5YR2/0
411-412	5Y3/1 silt

412-436	5Y3/1 sand, with some clay at 430
436-438	5Y2.5/1 and 7.5YR2/0 silts
438-443	5Y3/1 sand
443-446	5Y2.5/1 and 7.5YR2/0 silts
446-465	5Y3/1 sandy silt
465-466	5Y2.5/1 silt
466-469	5Y3/1 silt
469-470	5Y2.5/1 silt
470-471	5Y3/1 silt
471-472	5Y4/1 clay
472-473	5Y3/1 silt
473-473.5	5Y2.5/1 sand
473.5-474	5Y4/1 clay
474-475	5Y3/1 and 5Y2.5/1 mottlings
475-476	5Y4/1 clay
476-484	5Y3/1 with 7.5YR2/0 and 5Y2.5/1 mottlings silty clay
484-486	5Y4/1 silt, sand, clay
486-491	5Y3/1 silty clay
491-491.5	5Y4/1 silty clay
491.5-495	5Y3/1 " "
495-498	7.5YR2/0 with some 5Y3/1; silty clay
498-503	5Y3/1 with some 7.5YR2/0 mottlings; silty clay

Section 2 of 5	503-657
503-504.5	5Y4/1 clay
504.5-657	5Y3/2 sandy silty clay, with distinct burrows, heavily mottled, with 5Y2.5/1 and 7.5YR2/0

Section 1 of 5	657-809 cm
657-710 cm	5Y3/2 with 7.5YR2/0 mottlings; becoming less distinct; silty clay
710-725 cm	5Y3/2 moderating to 5Y4/1, less distinct mottling silty clay
725-809 cm	5Y4/1 with some mottlings; sandy silty clay, some vertical orientations may indicate drag

82-031 - TI-3 CORE 1114 cm

0.0 - 290.0 cm - 5Y4/2 mottled with burrows 2.5Y2.5/0, very heavy mottling
- burrows of 2 types - most are 2 mm thick, a few are 5 mm
- fine silty clay

Section 7 of 7

290.0 - 357.0 cm - 5Y4/2 changing slowly to 5Y4/1; still clay
- mottling of 2.5Y2.5/0 decreasing gradually
- rock at 320-325 cm

Section 6 of 7

357.0 - 358.0 cm - in core cap
358.0 - 372.0 cm - 5Y4/1 mottled with 2.5Y2.5/0; clay
372.0 - 373.0 cm - horizontal band of 2.5Y2.5/0; clay
373.0 - 377.0 cm - 5Y4/1 with some mottling of 2.5Y2.5/0; clay
377.0 - 378.0 cm - horizontal band of 2.5Y2.5/0; clay
378.0 - 384.0 cm - 5Y4/1 clay
384.0 - 385.0 cm - 5Y4/1 fine sand layer
385.0 - 391.0 cm - 5Y4/1 clay
391.0 - 393.0 cm - 2 small horizontal bands of 2.5Y2.5/0; clay
393.0 - 396.0 cm - 5Y4/1 clay
396.0 - 397.0 cm - 2.5Y2.5/0 clay
397.0 - 398.0 cm - 5Y4/1, clay
398.0 - 399.0 cm - 5Y4/1, sand layer
399.0 - 400.0 cm - 2.5Y2.5/0 clay
400.0 - 403.0 cm - 5Y4/1 clay
403.0 - 404.0 cm - 2.5Y2.5/0 clay
404.0 - 406.5 cm - 5Y4.5/1 clay
406.5 - 408.0 cm - 5Y4/1 with mottlings of 2.5Y2.5/0; clay
408.0 - 411.0 cm - 5Y4.5/1, clay
411.0 - 411.5 cm - sand and silt, grading from coarse to fine upwards; 5Y4/1
411.5 - 412.0 cm - 5Y4/1 clay
412.0 - 415.0 cm - bands of 2.542.5/0 with mottled 5Y4/1 between; clay
4.5.0 - 416.0 cm - 5Y4/1 clay

416.0 - 418.0 cm - 2 bands 2.5Y2.5/0 with 5Y4/1 between
418.0 - 420.0 cm - 5Y4.5/1 clay
420.0 - 420.5 cm - graded sand-silt layer, oblique, grading to finer material up core; 5Y4/1
420.5 - 421.0 cm - 5Y4/1, clay
421.0 - 423.0 cm - 5Y4/1 with irregular layers of 2.5Y2.5/0, clay
423.0 - 430.0 cm - 5Y4.5/1 clay
430.0 - 431.0 cm - 5Y3/2 - sandy layer, again grading finer up core.
431.0 - 435.0 cm - 2.5Y2.5/0 mottled with 5Y4/1, clay
435.0 - 437.0 cm - 5Y4/1 clay
437.0 - 441.0 cm - 5Y4.5/1 clay
441.0 - 442.0 cm - 5Y4/1 clay
442.0 - 442.5 cm - 5Y3/2 sandy layer, grading finer up core
442.5 - 444.0 cm - 5Y4/1 mottled with 2.5Y2.5/0; clay
444.0 - 444.5 cm - 2.5Y2.5/0 clay
444.0 - 446.0 cm - 5Y4/1 mottled with 2.5Y2.5/0; clay; mottling more or less horizontal
446.0 - 451.0 cm - same as above, but no horizontal layering visible
451.0 - 453.0 cm - 5Y4.5/1 mottling decreasing
453.0 - 468.5 cm - 5Y4/1 with horizontal but non-continuous 2.5Y2.5/0 mottlings
468.5 - 470.0 cm - mostly horizontal layers of 2.5Y2.5/0 with some 5Y4/1; clay
470.0 - 475.0 cm - 5Y4.5/1 with mottlings of 2.5Y2.5/0 running horizontally; clay
475.0 - 476.0 cm - change to 5Y4/1; clay
476.0 - 509.0 cm - 5Y4/1 with a few mottled burrows at 484, 499 and 508 cm, 2.5Y2.5/0; clay

Section 5 of 7

509.0 - 511.0 cm - in core cap
511.0 - 520.0 cm - silty clay grading into coarse sand at bottom; 5Y4/1
520.0 - 664.0 cm - abrupt transition to clay, 5Y4/1, soft zone 526-566 cm, and some dark burrow markings at 628 cm (2.5Y2.5/0); gradually changing from 5Y4/1 to a slightly darker shade

Section 4 of 7

664.0 - 709.0 cm - firm clay, color between 5Y4/1 and 10YR4/1, with mottlings in horizontal bands, 5Y4/1; 2.5Y2.5/0 burrows at 679, 682, 699 and 702 cm

709.0 - 715.0 cm - grading from color between 5Y4/1 and 10YR4/1 to 5Y4/1; clay

715.0 - 722.0 cm - 5Y4/1 with burrows 2.5Y2.5/0 at 721 cm

722.0 - 722.0 cm - liquid clay layer 5Y4/1

722.5 - 788.0 cm - 5Y4/1 clay, with 2.5Y2.5/0 burrows at 724, 730, 741, 772 and 775 cm

788.0 - 811.0 cm - abrupt change to color between 5Y4/1 and 10Y4/1, clay; small burrows 2.5Y2.5/0 at 794 and 808 cm

Section 3 of 7

811.0 - 841.0 cm - approximate measure - stretched and slumped badly in core liner tube

- clay, all between 5Y4/1 and 10YR4/1

841.0 - 875.0 cm - clay, between 5Y4/1 and 10YR4/1

875.0 - 906.0 cm - gradual gradation from clay to coarse sand, same color

- very irregular contact between coarse sand and underlying clay; color grading from 5Y4/1 and 10Y4/1 through 5Y3/1 to 7.5YR2/0 at bottom of sand layer

906.0 - 966.0 cm - slump material - clay mostly, some large blebs of coarse sand at 936 - 940 cm and 940 - 948 cm

- whorled 5Y4.5/1 and 5Y4/1 colors; sand blebs 7.5 YR2/0 and 5Y2.5/2, plus a little 2.5Y4/2

- one black mottling at 947 cm - 7.5YR2/0

Section 2 of 7

966.0 - 970.0 cm - alternating clay layers of 5Y5/2 and 5Y3.5/1; layers are about 0.5 cm wide

970.0 - 1110.0 cm - silty clay, 5Y4/1 to 10YR4/1 color

- numerous burrows visible, with well-defined zones of colors centres 7.5YR2/0, surrounded by 2.5Y3/0, then outer halo of 5Y5/2; total width about 2 cm

- burrows at 973, 981, 989, 993, 996, 1001, 1046, 1050, 1051, 1055, 1076 and 1089 cm

Section 1 of 7

1110.0 - 1114.0 cm - core bottom in core cap

INTERRBILUNG FJORD IT-1

This cote was not logged for color at the time of splitting.

Section 5 of 5 0-19 cm

0- 12 cm	silty sand, with silty clay bleb 5-9 cm.
12- 19 cm	silty clay with fine sand, most noticeable at 17 cm.

Section 4 of 5 19-172 cm

19 - 95 cm	gap
95 -110 cm	sloping surface, gap reducing; silty sandy clay
110 -116 cm	silty clay, some sand
116 -119 cm	fine sand
119 -125 cm	silty clay, some sand
125 -125.5 cm	sand
125.5-136 cm	silty clay, sand mixed through
136 -138 cm	fine sand
138 -141.5 cm	silty, sandy clay
141.5-149.5 cm	sand, grading coarser downwards
149.5-150 cm	silty clay
150 -153 cm	sand, silt mixed through
153 -155 cm	sandy, silty clay
155 -158 cm	fine sand
158 -163 cm	sandy, silty clay
163 -172 cm	sand, grading coarser downwards

Section 3 of 5 172-325 cm

175 -182 cm	sand
182 -196 cm	sandy, silty clay, with gap down side
196 -197 cm	sand
197 -198 cm	sand silty clay
198 -200 cm	silty sand, very fine
200 -200 cm	gap with loose sediment chunks
200 -239 cm	sand, grading coarser downwards
239 -240 cm	sandy, silty clay
240 -244.5 cm	silty clay
244.5-246 cm	sand

Section 2 of 5 (Cont'd)

420 -424 cm	irregular shaped sand zone
424 -429 cm	sandy silty clay
429 -429.5 cm	fine sand
429.5-431 cm	silty clay, sand throughout
431 -434 cm	fine sand
434 -442 cm	sandy silty clay
442 -448 cm	sand, grading coarser downward to granules
448 -450 cm	sandy silty clay
450 -451 cm	silty sand
451 -466 cm	sandy, silty clay, pebble at 459 cm
466 -467.5 cm	fine sand
467.5-477 cm	sandy silty clay

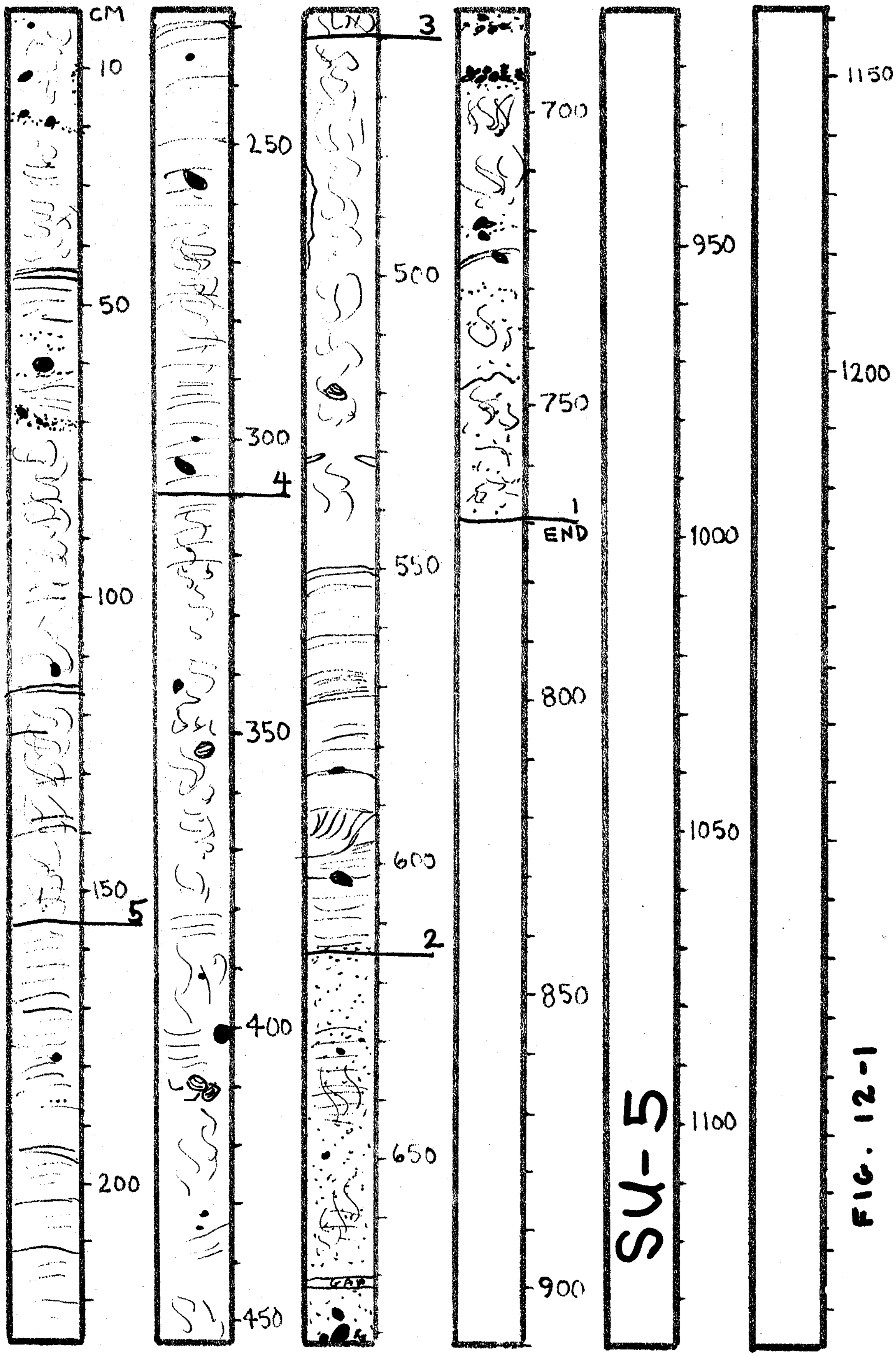
Section 1 of 5 477-632 cm end of use.

477 -480 cm	gap
480 -536 cm	sediment stretched? gap down side
480 -510 cm	silty sand with some clay in it
510 -532 cm	mostly silty clay with some sand
532 -539 cm	sand
539 -552 cm	whorled and mixed sand; sandy silty, clay
552 -566 cm	silty, sandy clay
566 -598 cm	silty, sandy clay with gap down side
598 -632 cm	sandy, silty clay

Section 3 of 5 (Cont'd)

244.5-246 cm	sand
246 -252 cm	silty clay, banding visible, sand mixed through
252 -253 cm	sand, very fine grained
253 -256.5 cm	sandy silty clay
256.5-257 cm	fine sand
257 -262 cm	sandy silty clay
262 -263 cm	sand, very fine
263 -269 cm	sandy, silty clay; 3 very fine laminae of sand at 264, 266 and 267 cm
269 -270 cm	fine sand
270 -274 cm	banded sandy, silty clay
274 -276 cm	fine sand
276 -277 cm	silty clay, some sand
277 -278 cm	fine sand
278 -282 cm	finer sand, grading coarser downwards
282 -287 cm	sandy, silty clay
287 -288 cm	fine sand
288 -302 cm	sandy, silty clay with fine laminae of sand at 292, 296, 301 cm
302 -303 cm	fine sand
303 -325 cm	sandy, silty clay

Section 2 of 5	325-477 cm
325 -347 cm	gap with loose sand
347 -351 cm	fine sand
351 -356 cm	sandy clay
356 -359 cm	fine sand
359 -367 cm	finer sand, more quartz
367 -401 cm	sandy, silty clay, pebble at 79 cm
401 -402 cm	indistinct sand
402 -409 cm	sandy, silty clay
409 -410 cm	fine sand, curing layer dragged down at both ends
410 -414 cm	sandy silty clay
414 -414.5 cm	sand
414.5-420 cm	sandy silty clay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350
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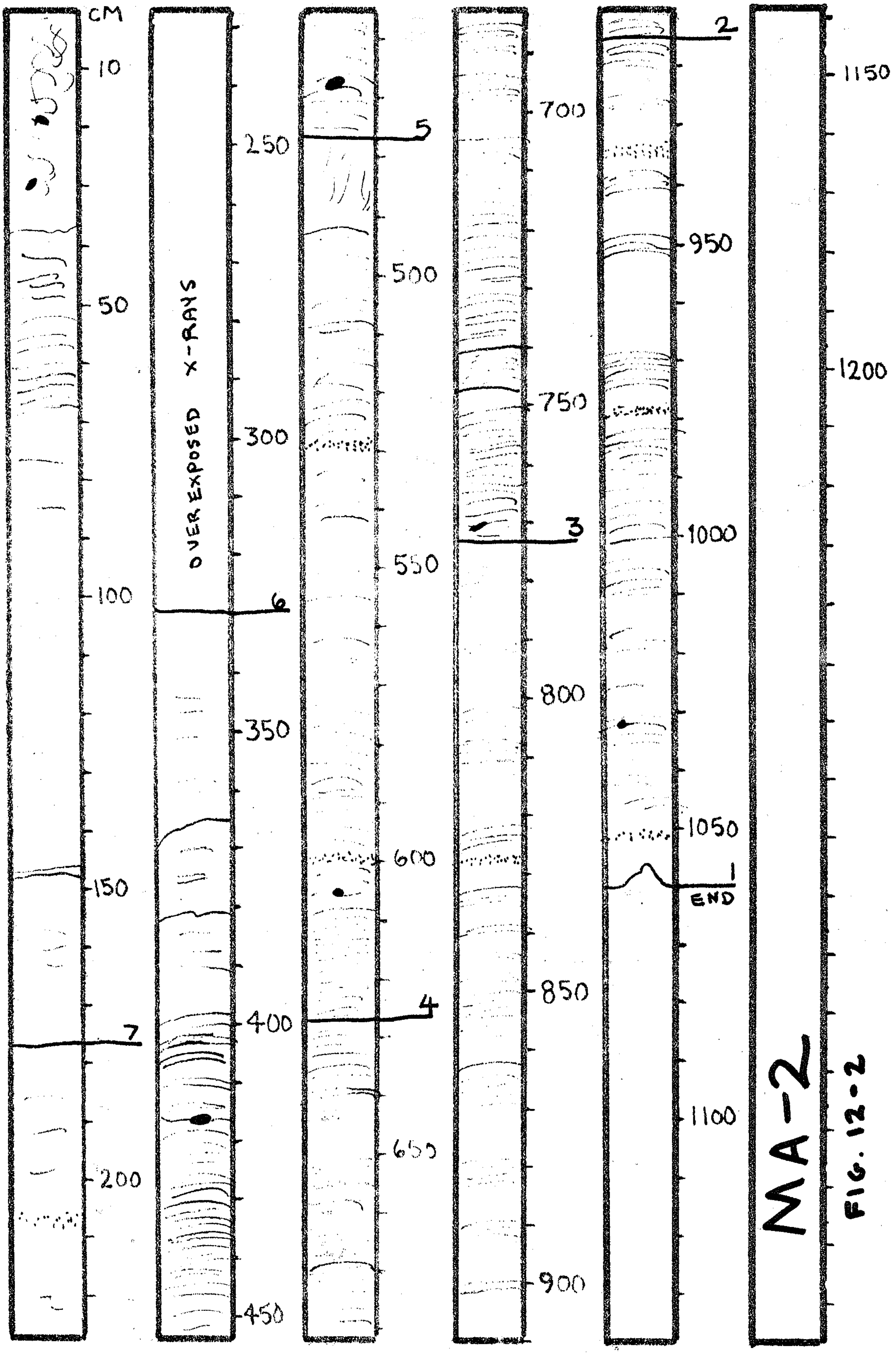
450
500
550
600
650
700
750
800
850
900
950
1000
1050
1100
1150
1200
5
4
3
2
1
END
GAP
SU-5

FIG. 12-1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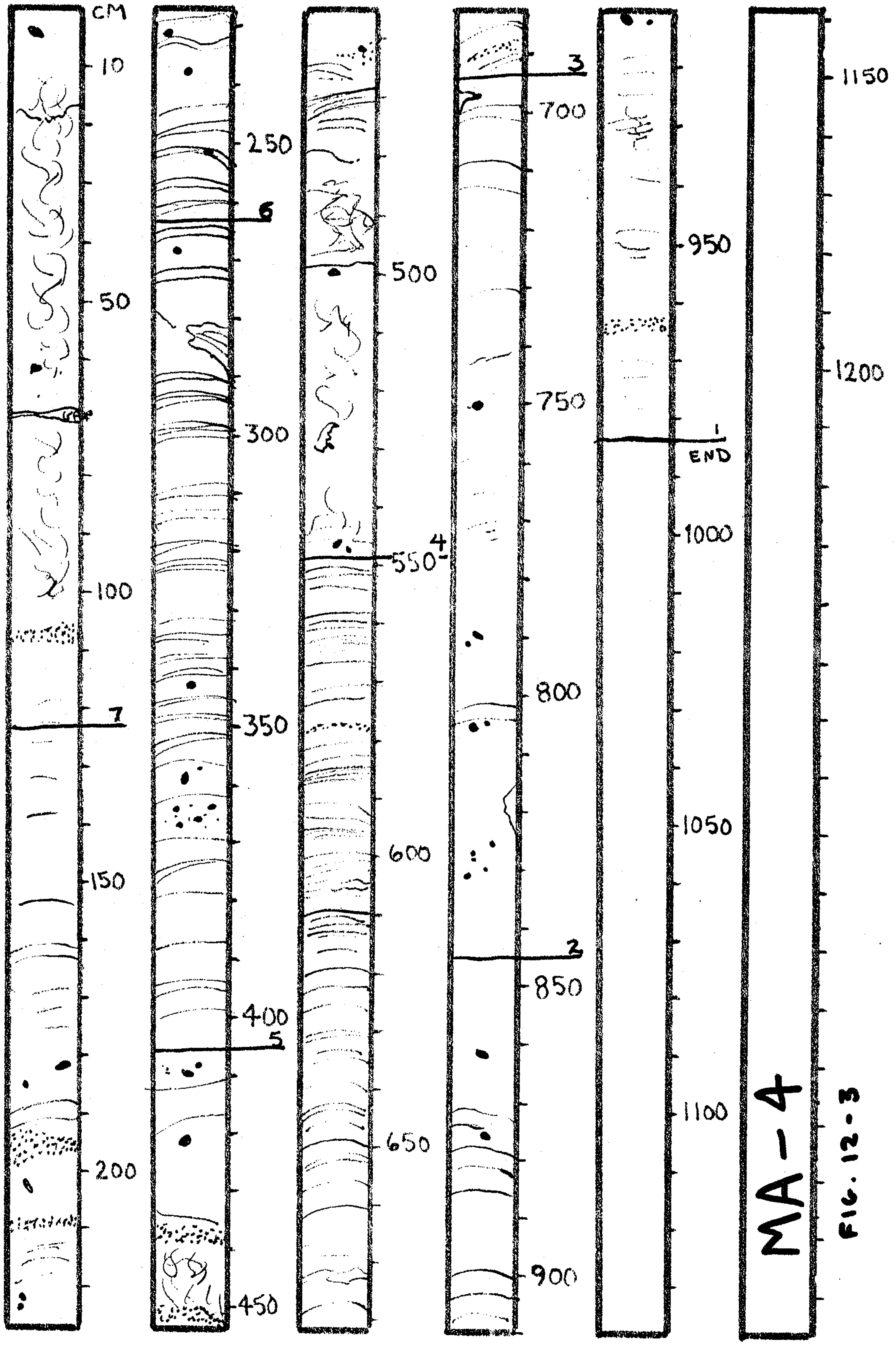
150
200
7
OVER EXPOSED X-RAYS
250
300
6
350
400
450
5
500
550
600
4
650
700
750
3
800
850
900
2
950
1000
1050
1
END
1100
1150
1200

MA-2

FIG. 12-2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50
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7
150
200
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6
300
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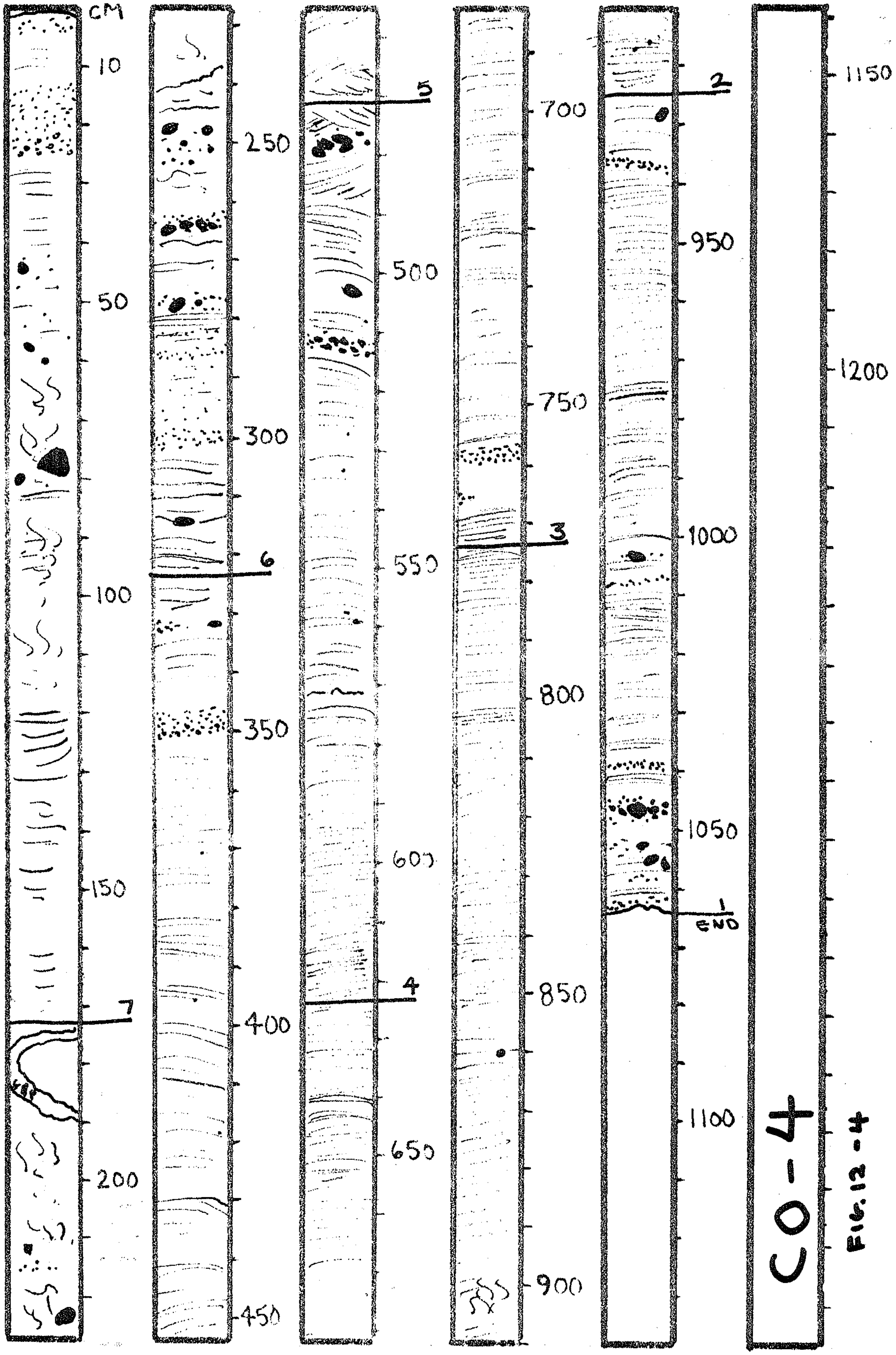
400
5
450
500
550
4
600
650
3
700
750
800
2
850
900
950
1
END
1000
1050
1100
1150
1200

MA-4

FIG. 12-3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150
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600
650
700
750
800
850
900
950
1000
1050
1100
1150
1200
7
6
5
4
3
2
1
END
CO-4

FIG. 12-4

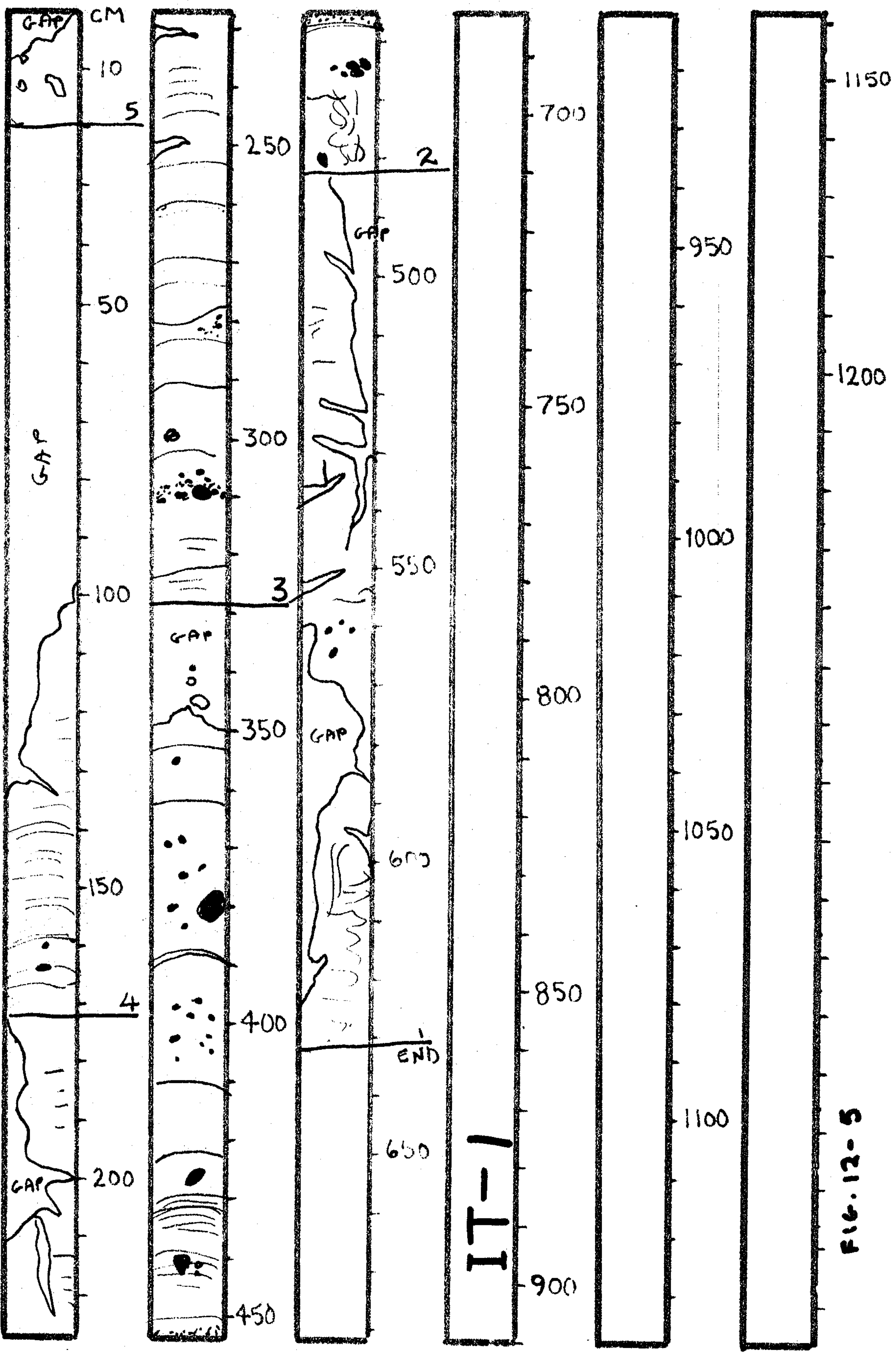

GAP
CM
10
5
50
GAP
100
150
4
200
GAP
250
300
3
GAP
350
400
450
2
GAP
500
550
GAP
600
1
END
650
700
750
800
850
900
IT-1
950
1000
1050
1100
1150
1200

FIG. 12-5

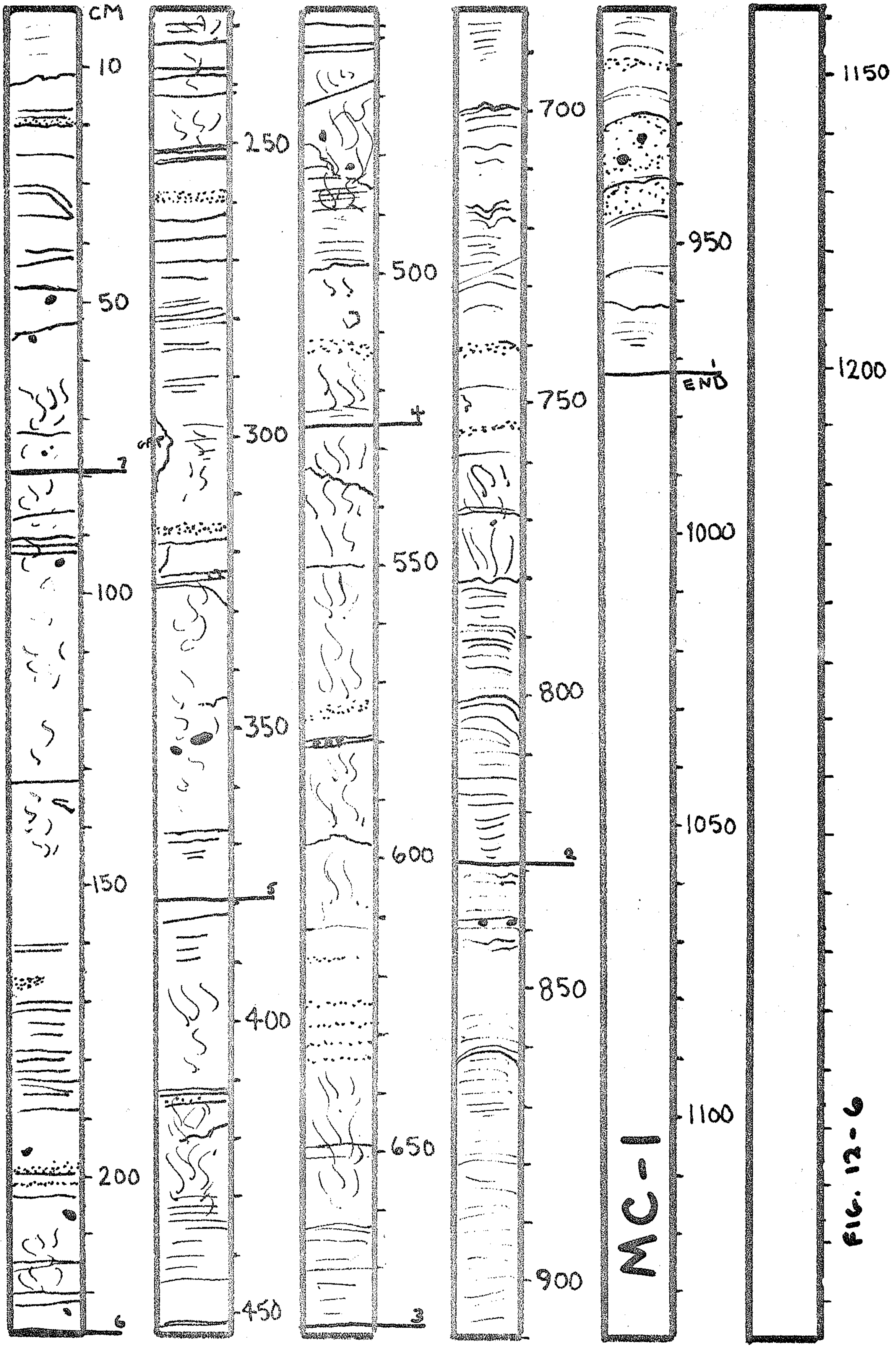
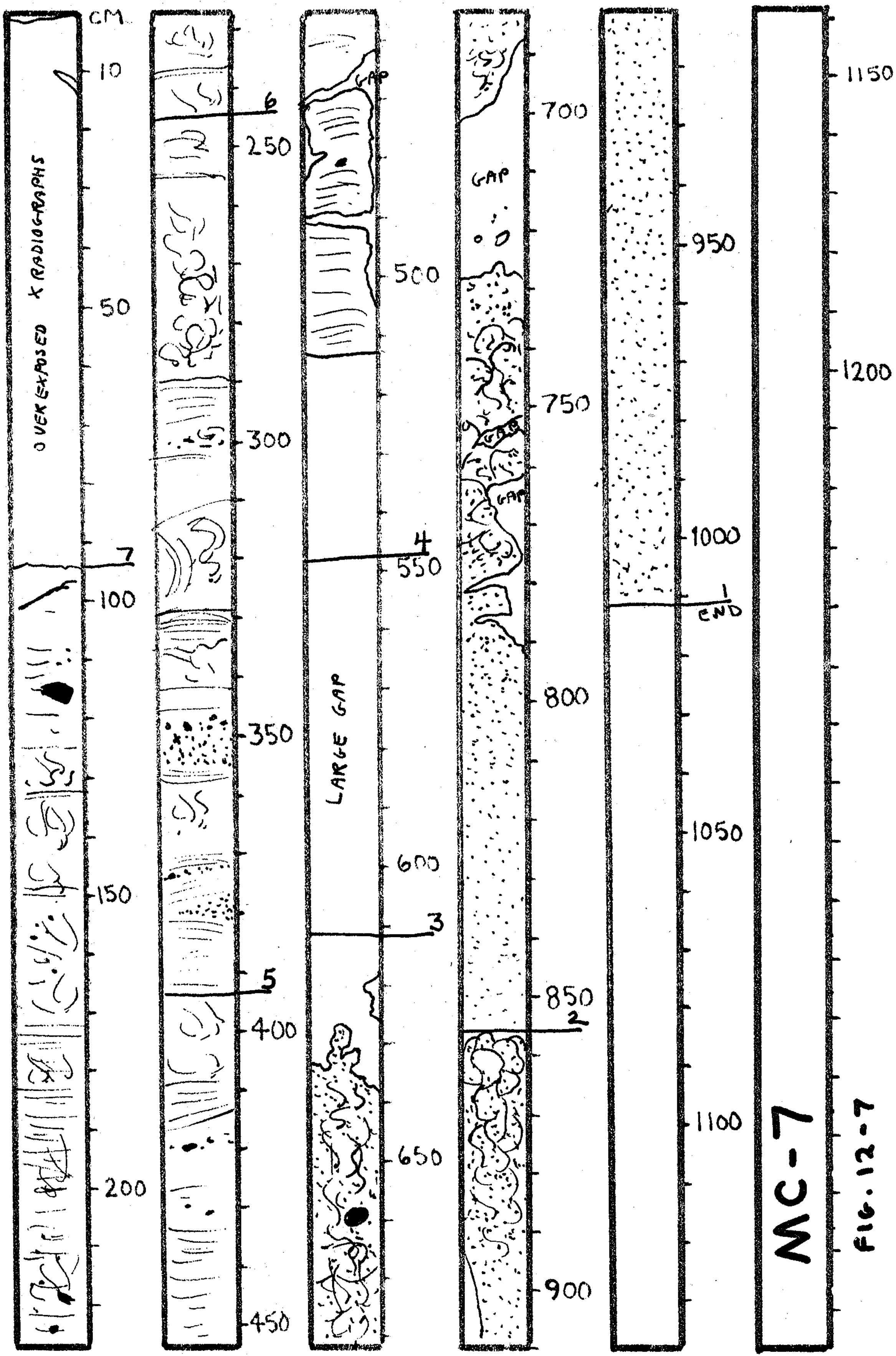
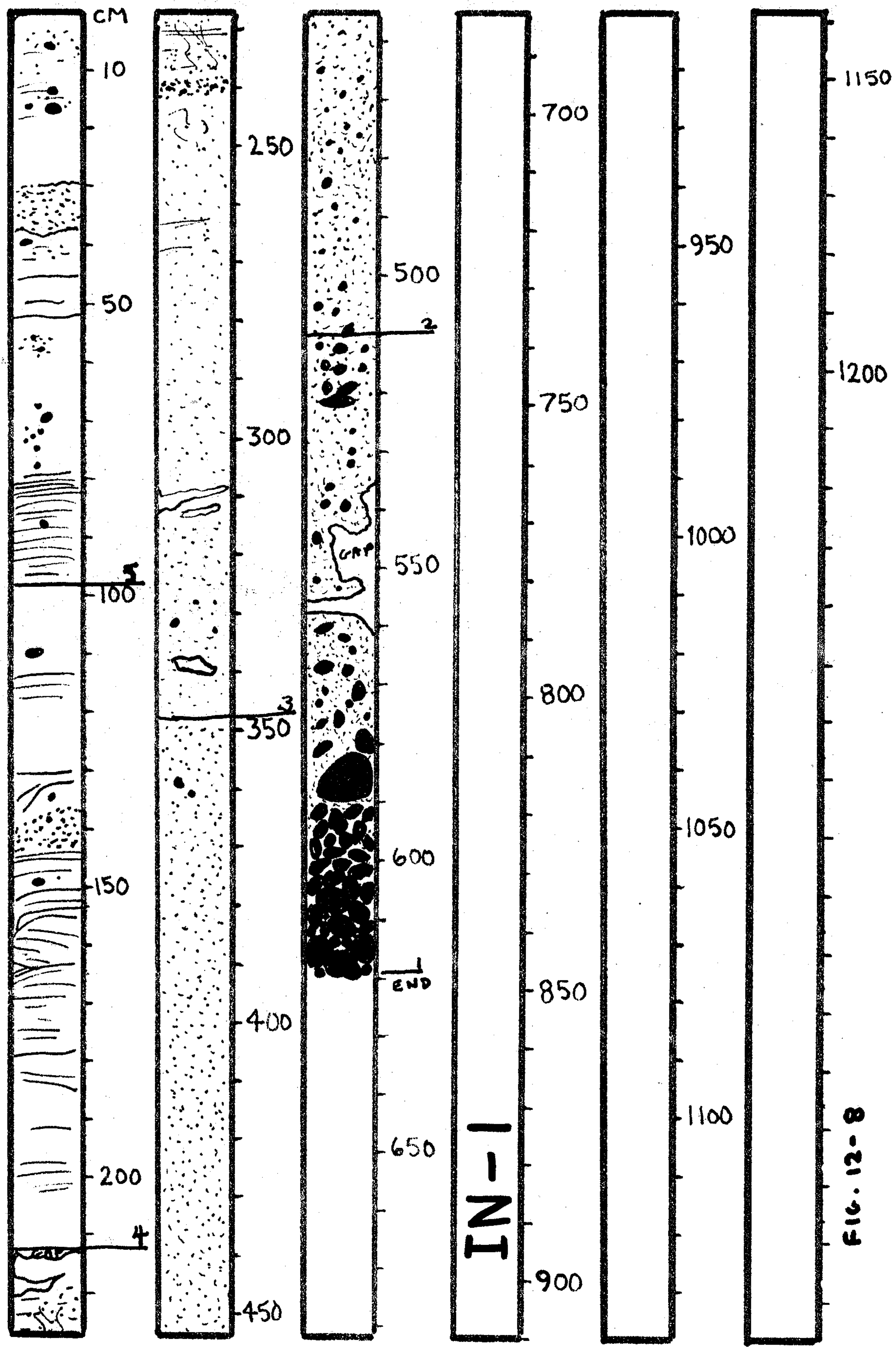

CM
10
50
100
150
200
7
6
GAP
250
300
350
400
450
5
500
550
600
650
4
3
700
750
800
850
900
2
950
1000
1050
1100
END
1
MC-1
1150
1200

FIG. 12-6


CM.
10
50
OVER EXPOSED X RADIOGRAPHS
7
100
150
200
6
250
300
350
5
400
450
GAP
500
4
550
LARGE GAP
600
3
650
700
GAP
750
GAP
GAP
800
850
2
900
950
1000
1
END
1050
1100
1150
1200

MC-7

FIG. 12-7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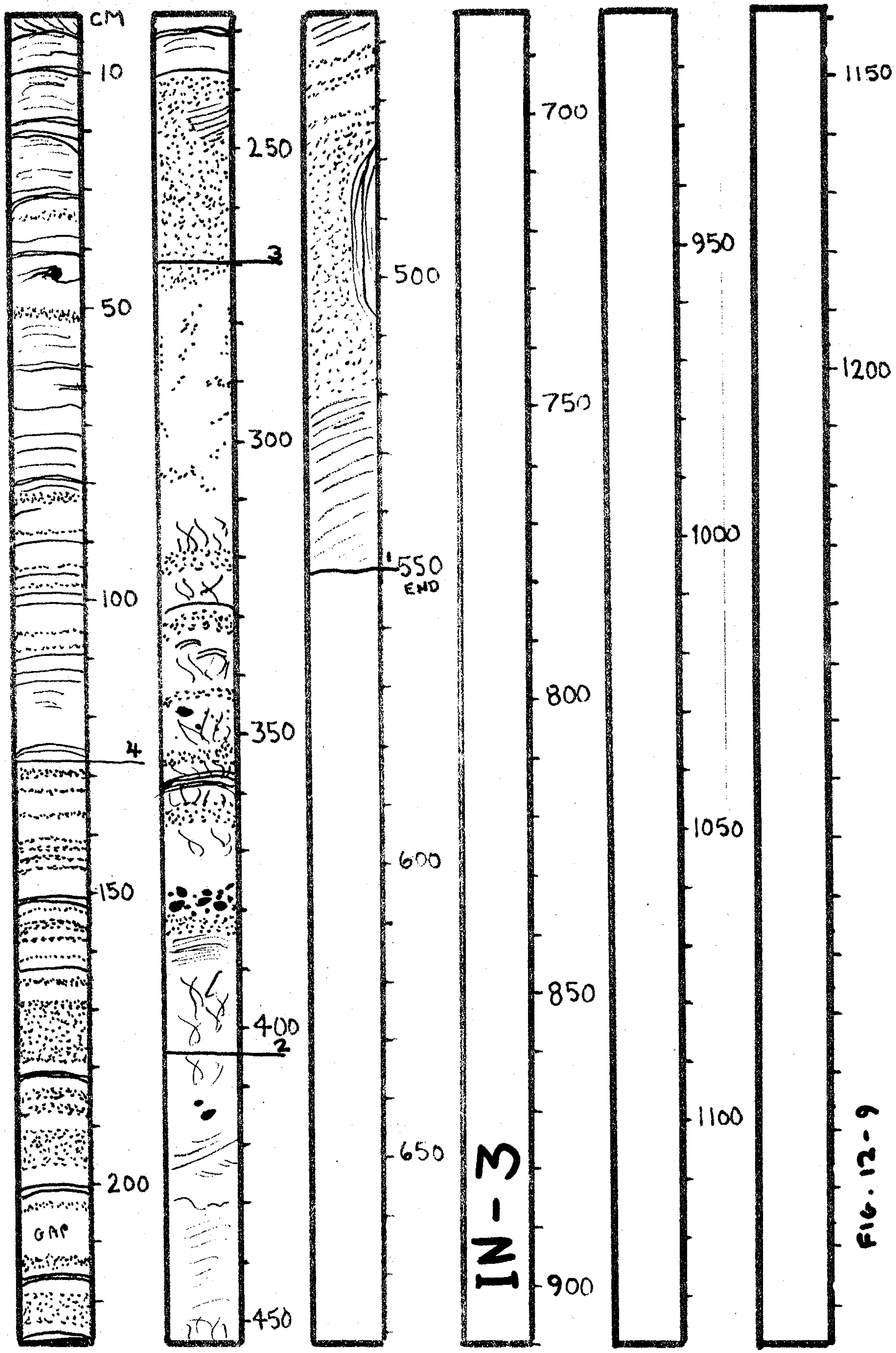
50
100
150
200
5
4
250
300
350
400
450
3
500
550
600
650
2
GRT
1
END
700
750
800
850
900
IN-1
950
1000
1050
1100
1150
1200

FIG. 12-8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50
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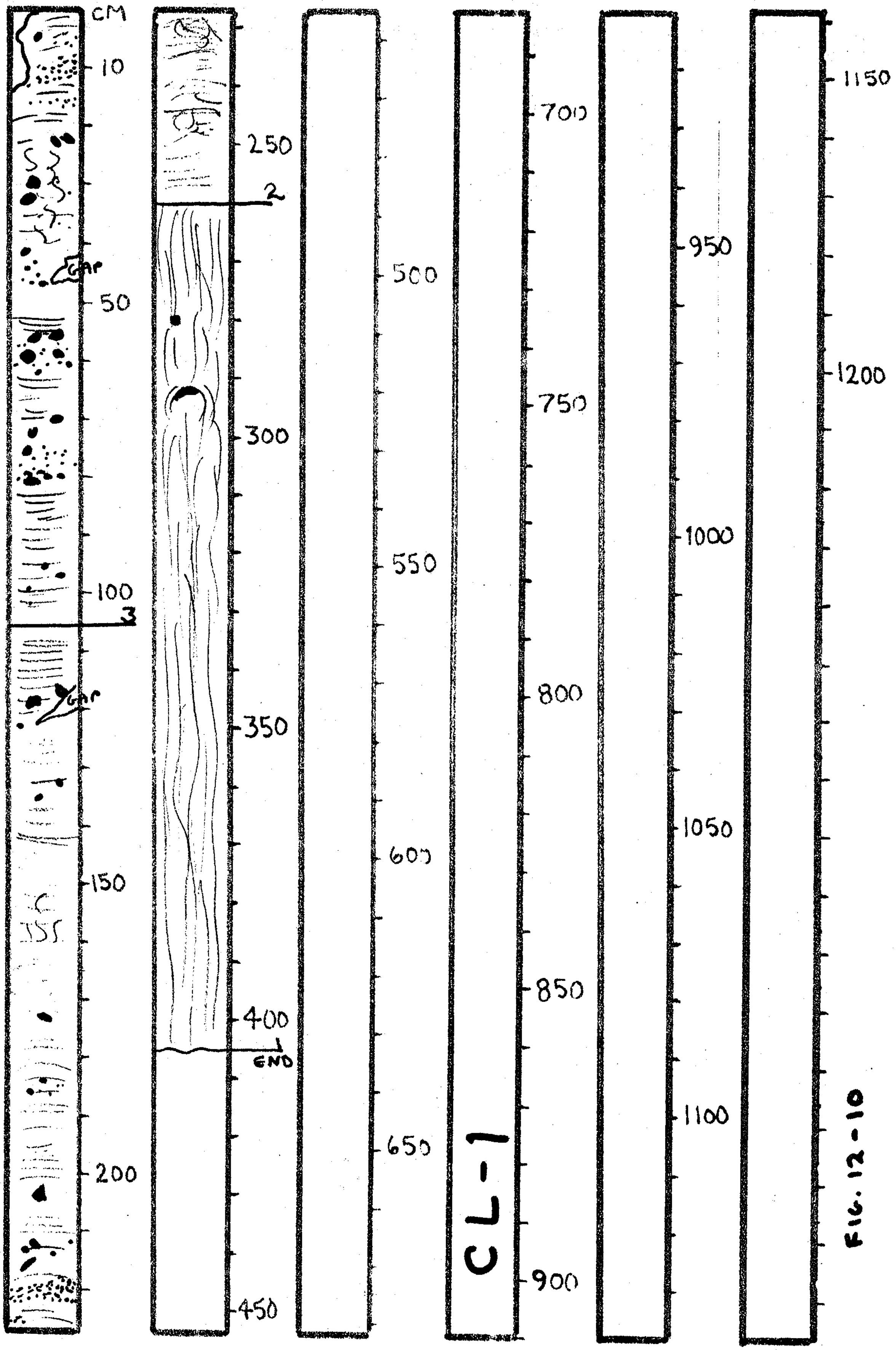
4
150
200
GAP
250
3
300
350
400
2
450
500
550
END
1
600
650
700
750
800
850
900
IN-3
950
1000
1050
1100
1150
1200

FIG. 12-9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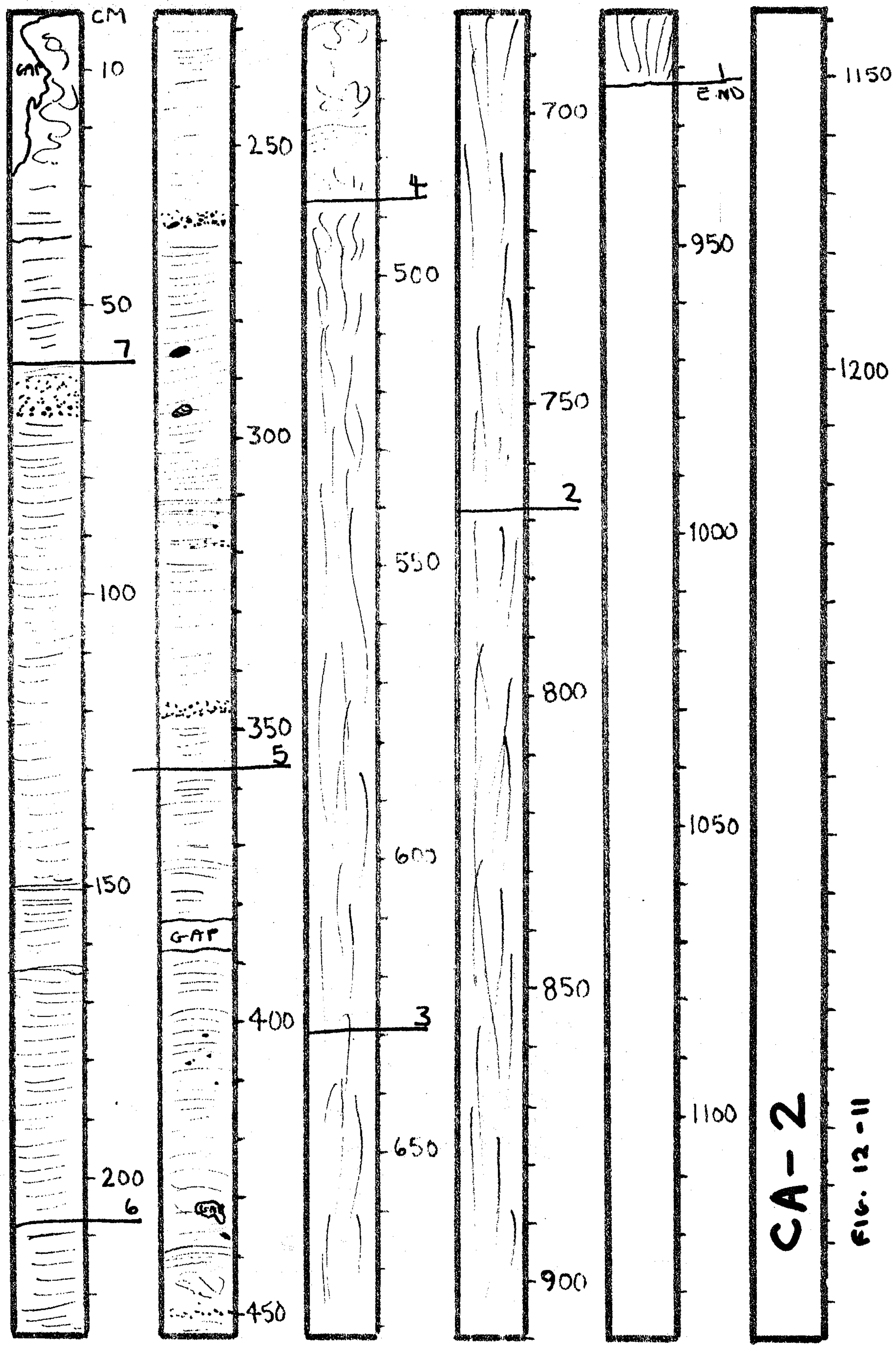
10
GAP
50
100
3
GAP
150
200
250
2
300
350
400
END
450
500
550
600
650
700
750
800
850
900
950
1000
1050
1100
1150
1200
CL-1

FIG. 12-10


CM
10
50
100
150
200
250
300
350
400
450
500
550
600
650
700
750
800
850
900
950
1000
1050
1100
1150
1200
GAP
GAP
GAP
7
6
5
4
3
2
1
END

CA-2

FIG. 12-11

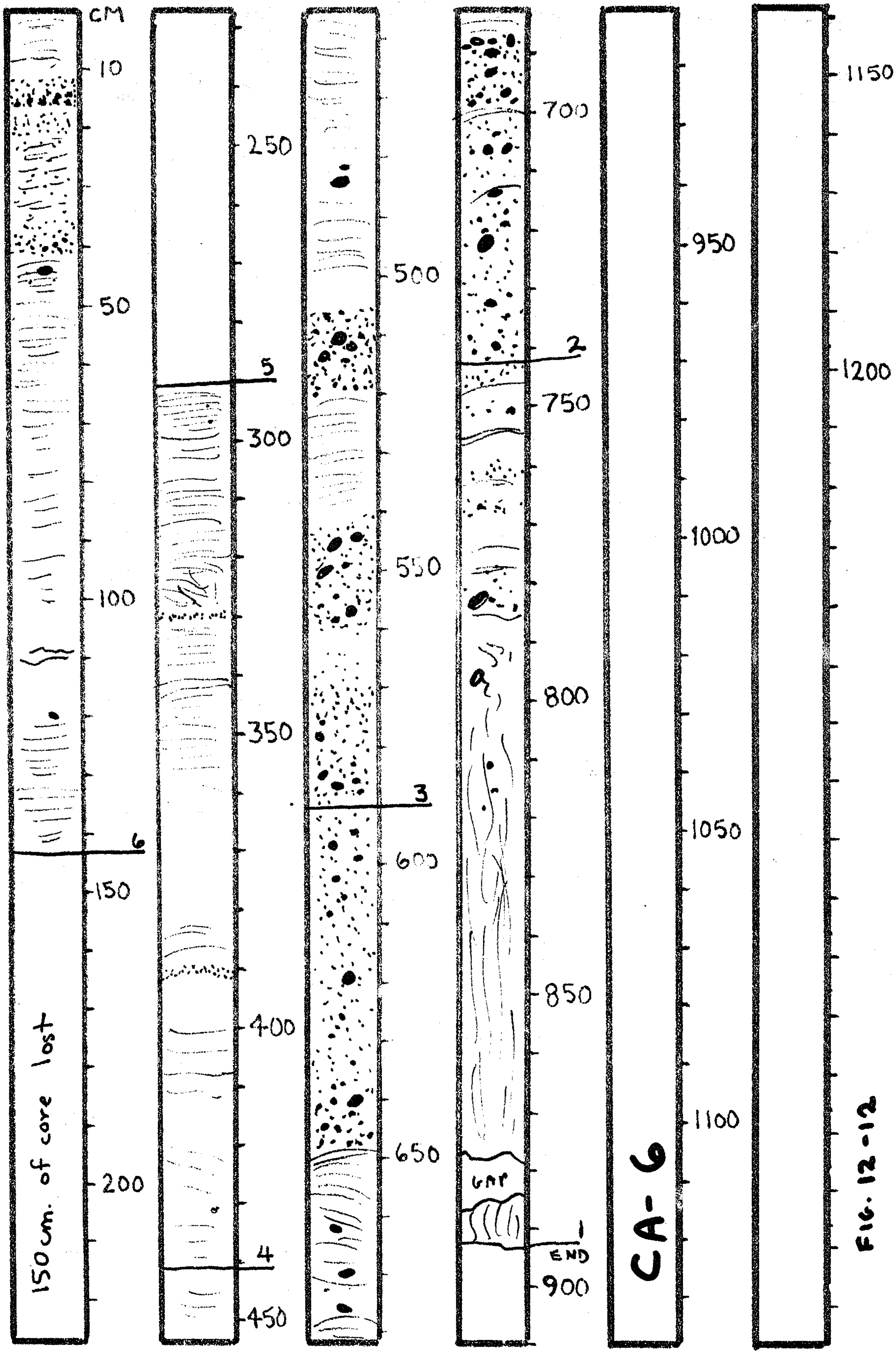

CM
10
50
100
150
200
150 cm. of core lost
6
250
5
300
350
400
4
450
500
550
3
600
650
700
2
750
800
850
GAP
1
END
900
950
1000
1050
1100
CA-6
1150
1200

FIG. 12-12

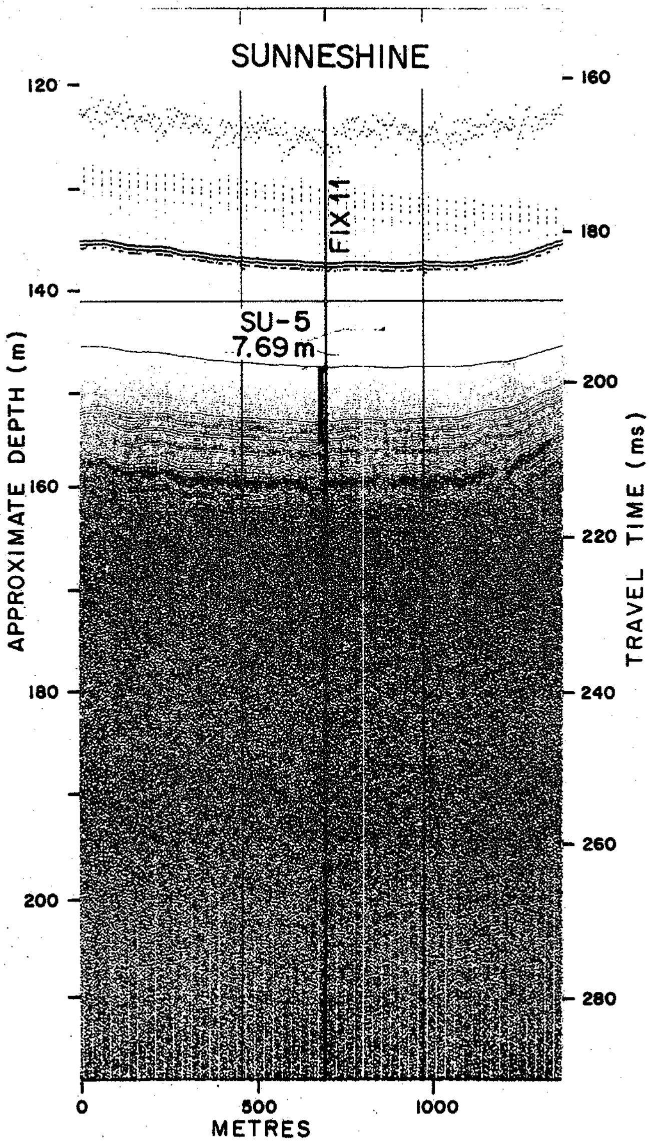

SUNNESHINE
FIX 11
SU-5
7.69 m
APPROXIMATE DEPTH (m)
120
140
160
180
200
TRAVEL TIME (ms)
160
180
200
220
240
260
280
0
500
1000
METRES

FIG. 12-13

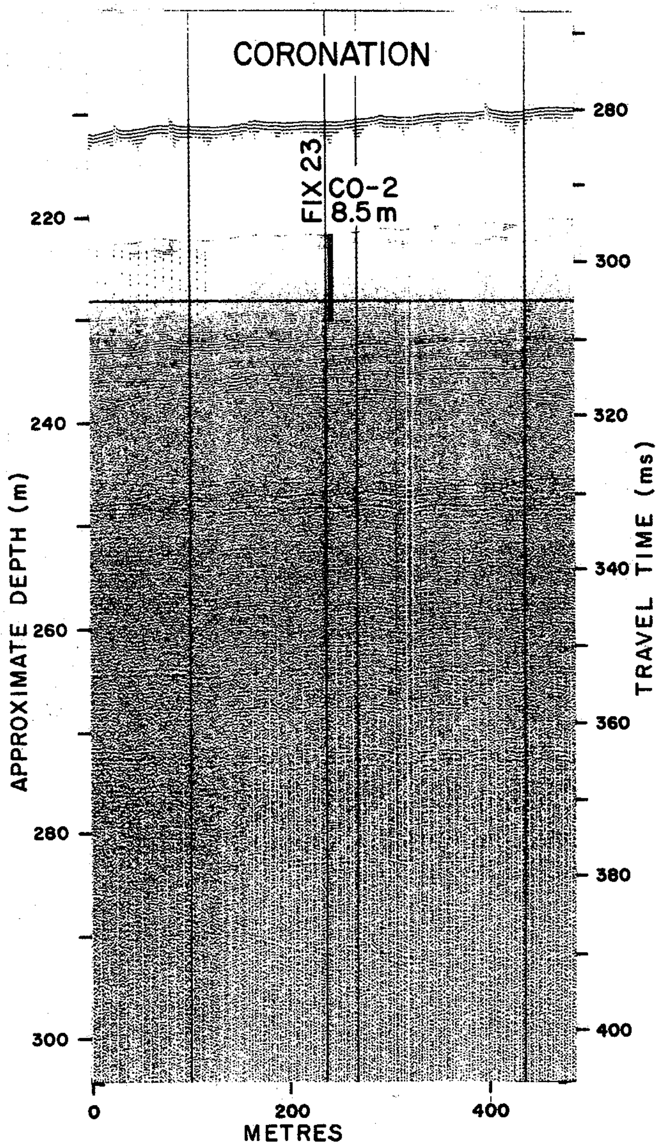

CORONATION
FIX 23
CO-2
8.5m
APPROXIMATE DEPTH (m)
220
240
260
280
300
TRAVEL TIME (ms)
280
300
320
340
360
380
400
0
200
400
METRES

FIG. 12-14

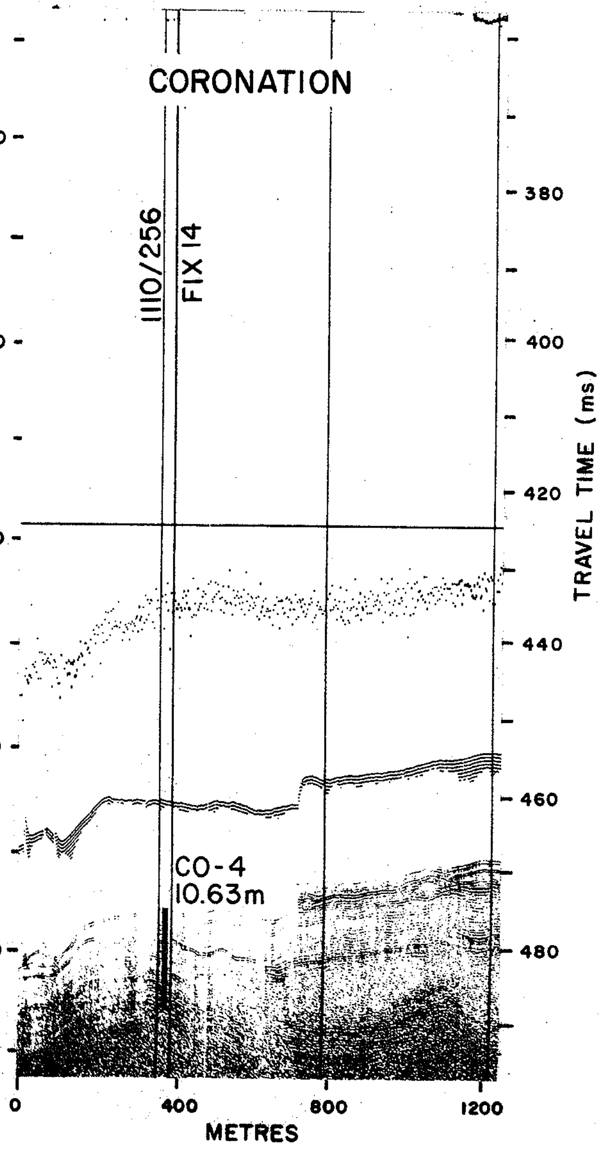

CORONATION
1110/256
FIX 14
CO-4
10.63m
APPROXIMATE DEPTH (m)
280
300
320
340
360
TRAVEL TIME (ms)
380
400
420
440
460
480
0
400
800
1200
METRES

FIG. 12-15

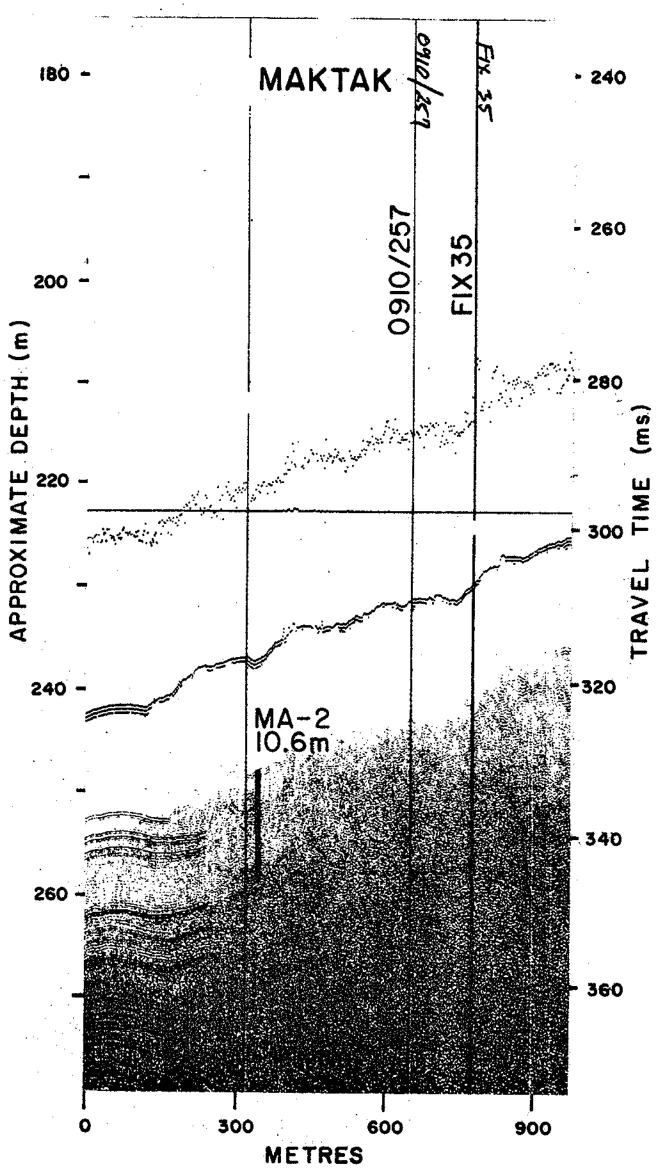

MAKTAK
0910/257
Fix 35
0910/257
FIX35
MA-2
10.6m
APPROXIMATE DEPTH (m)
180
200
220
240
260
TRAVEL TIME (ms)
240
260
280
300
320
340
360
0
300
600
900
METRES

FIG. 12-16

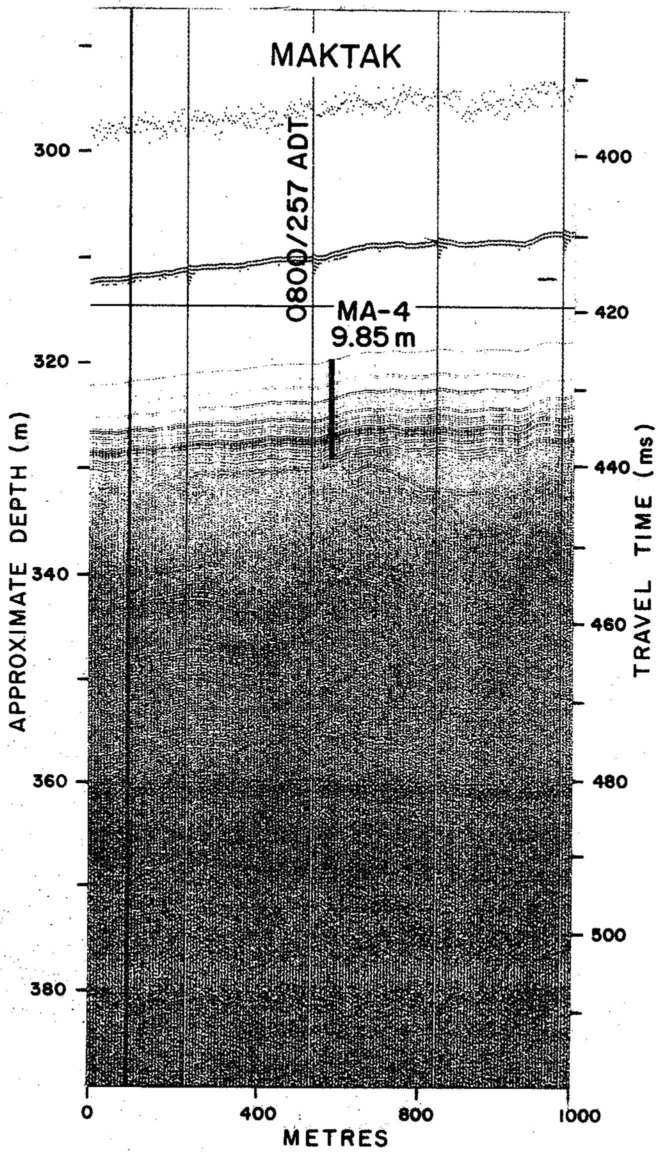

MAKTAK
0800/257 ADT
MA-4
9.85 m
APPROXIMATE DEPTH (m)
300
320
340
360
380
TRAVEL TIME (ms)
400
420
440
460
480
500
0
400
800
1000
METRES

FIG. 12-17

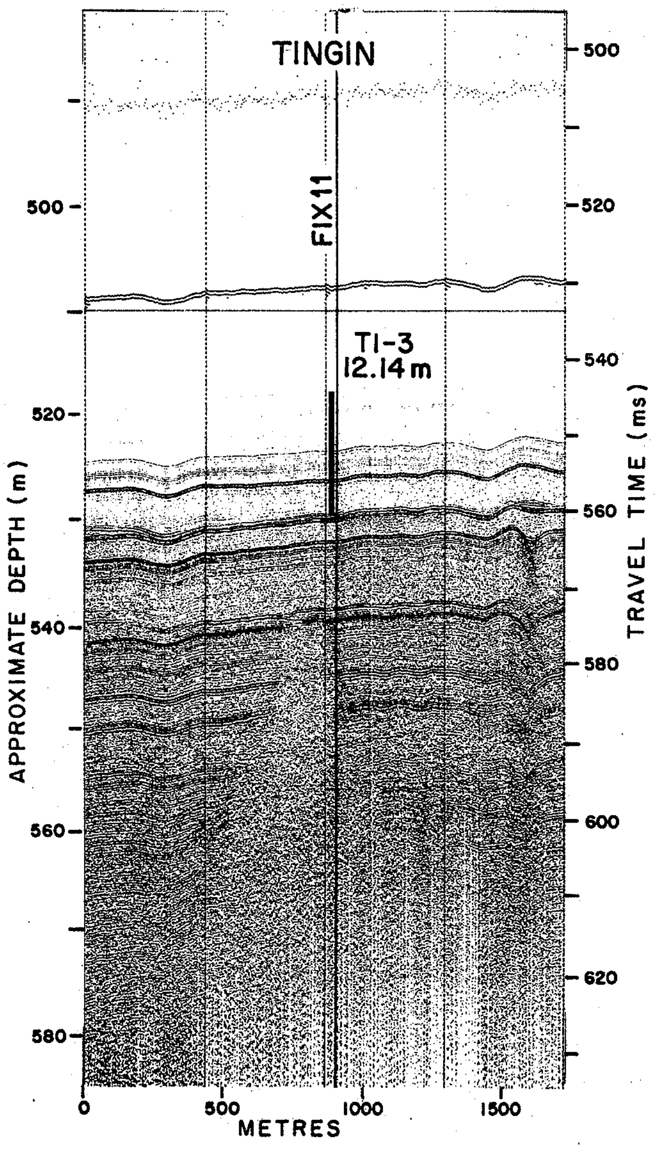

TINGIN
FIX11
TI-3
12.14 m
APPROXIMATE DEPTH (m)
500
520
540
560
580
TRAVEL TIME (ms)
500
520
540
560
580
600
620
0
500
1000
1500
METRES

FIG. 12-18

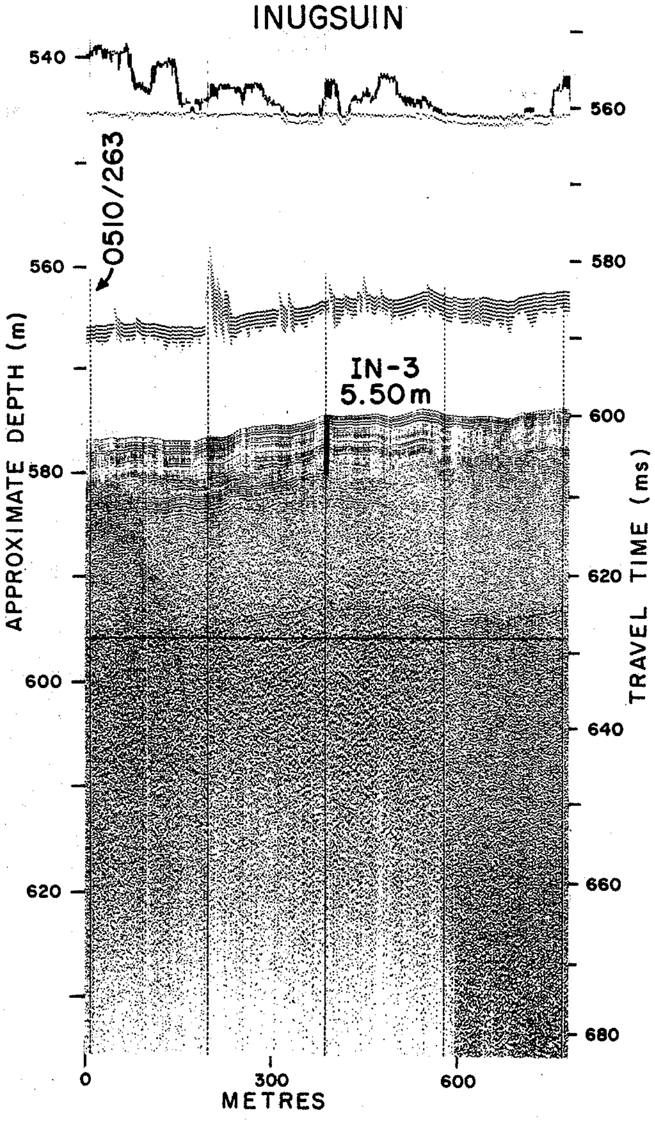

INUGSUIN
540
560
580
600
620
APPROXIMATE DEPTH (m)
560
580
600
620
640
660
680
TRAVEL TIME (ms)
0510/263
IN-3
5.50 m
0
300
600
METRES

FIG. 12-19

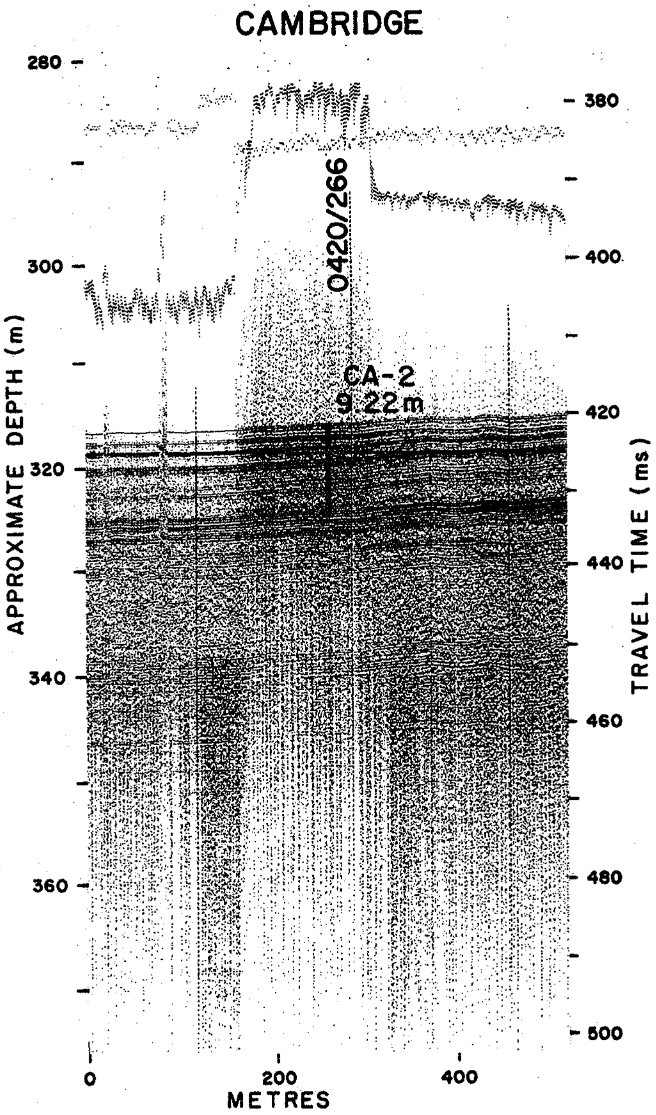

CAMBRIDGE
APPROXIMATE DEPTH (m)
280
300
320
340
360
TRAVEL TIME (ms)
380
400
420
440
460
480
500
0420/266
CA-2
9.22m
0
200
400
METRES

FIG. 12-20

CHAPTER 14: QUATERNARY PISTON CORES

Compiled by John T.Andrews,University of Colorado

Contributors:Lisa Osterman,J.Kravitz
Ann Jennings,Jay Stravers
Kerstin Williams
John Mothersill, Lakehead University

DATA OF DATA REPORTS

Contributors to the tables:Tables 14-3 to 14-13,Ann Jennings; Tables 14-14 to 14-16,Lisa Osterman; Table 14-17 Kertin Williams;Table 14-18 to 14-19 John Andrews and Ann Jennings;Table 14-20 J. Kravitz and R. Kihl; Tables 14-22 to 14-23 John Mothersill. Sediment analysis undertaken by R. Kihl in the INSTAAR Sedimentology Larobatory. Paleomagnetic measurements were carried out at University of Colorado, U.S.G.S., Denver, and Lakehead University.

INTRODUCTION

A series of piston cores were collected during the 1982 S.A.F.E. cruise of HUDSON into a series of fiords along the eastern coast of Baffin Island. The piston cores are being examined ,at the present time, by three main groups-- namely the Atlantic Geoscience Center,Dr John Mothersill at Lakehead University, and a group of researchers at the University of Colorado. The overall objective of the Quaternary piston core program is to evaluate changes in nearshore oceanography and in adjacent glacial conditions during the length of time represented by the cores. To this end the different groups are undertaking a variety of different studies on the cores. At the moment all the piston cores which were collected have not been sampled, but it is anticipated that most will be in the next one or more years. In addition to the piston cores collected during the 1982 SAFE cruise the University of Colorado group have also been studying a series of piston cores from the shelf region of eastern Baffin Island. Some data from these cores is included in this Data Report as together the cores from the fiords and the shelf provide a transect from more open marine conditions to the more estuarine environment of the fiords. In that there have been studies on deep sea piston cores within Baffin Bay (Aksu, 1981) we view the work on the shelf and within the fiords are providing a highly significant transect of changing Quaternary oceanographic conditions throughout some portion of the late Quaternary.

The main data for this report are listed as a series of tables. Each table is identified to the source of the information(i.e. the individual(s) who contributed the material to the data report). We note that virtually all the material included is currently unpublished and thus the information is subject to revision.

The study of the piston cores by the Quaternary group includes four main topics:

1. Radiocarbon and other dating of the cores;
2. Study of the sediments for grain-size,mineralogy and mass physical properties;
3. An evaluation of the paleomagnetic signal carried in the cores(partly relates to #1 above); and
4. A study of the biotic components retained with the core sediments. These include several groups, including pollen, foraminifera(both benthic and planktonic),diatoms, and dinoflagellates.

DATA REPORT AND TABLES

The tables presented in Chapter 14 of this SAFE#1 Date Report are not produced in a standardized format because of limitations of time and money! Nevertheless they do indicate that the Quaternary study group has already ammassed a considerable body of information that should be reaching some sort of publication stage within the next year or so. In addition it should be noted that there are a series of MSc theses and PhD dissertations currently ongoing which will use in whole or part piston cores collected during the 1982 and 1983 SAFE cruises into the Baffin Island fiords.We have attempted to provide abstracts for these, where available, at the end of this chapter.

TABLE 14-1

Core locations,water depth, and core length

CORE	LATITUDE	LONGITUDE	LENGTH (CM)	DEPTH (M)
SU-5	66 33 30	61 42 60	770.	146 CU
TI-3	69 11 50	68 23 50	1141.	487 CU
CL-5	71 05 50	71 53 00	1016.	683 CU
MC-1	69 32 90	69 47 50	1100.	322 LH
MC-7	69 37 50	68 16 00	1121.	497 LH
TI-1A	69 05 40	68 54 00	824.	302 LH
HU78-37	68 15.05	65 12.09	593.	457 CU
HU78-24	71 13.02	70 45.06	581.	832 CO
HU76-26	71 26 00	70 17 00	144.	500 CU
HU77-156	61 51.05	64 12.03	313.	487 CU
HU77-159	62 50.05	67 02.04	969.	570 CU

Radiocarbon dates-:At the present moment we have obtained 6 radiocarbon dates from the cores collected during the 1982 S.A.F.E. cruise of Hudson-. In addition we have obtained 8 dates on cores from the northern shelf of Baffin Island. All the dates so far have been on finely disseminated organic carbon obtained by the method outlined by Kihl(1975: Arctic and Alpine Research-). In this proceedure the sample is treated with hydrochloric acid to remove detrital carbonates. The sample is then disaggregated and mixed into a slurry. The water is slowly evaporated over the course of several days, after which time the organic residue forms a thin black film on the surface of the mineral matter. The film is taken from the evaporating dish, bagged, and submitted for dating. Although the dates in Table 14-2 appear "reasonable" and are in correct stratigraphic order it is possible that they give dates that are too old. We are going to test the reliability of the carbon dates by having the University of Arizona TAMS system date some small samples (10-50mg) of both foraminifera and shells-- where possible. For example, our description of SU-5 indicates that there are shells or shell fragments in that core. At the moment the interpretation of the radiocarbon dates on Table 14-2 is that they represent ages equal or less than- the quoted age determination.It should be noted that these age estimates are based on small samples. The problem of accurately dating the sediments on the shelf and within the fiords must be a major focus within the next one to two years if the Quaternary program is to be truly successful.

TABLE 14-2

Radiocarbon dates, all on fine grained organic carbon (for method of preparing the samples see Kihl, 1975), from cores on the Baffin Island shelf and in the fiords.*

CORE	DEPTH (cm)	LAB #	^{14}C LAB #	DATE
SU-5	327-358	GRL-599-0	GX-9432	11,365 ± 365
	660-684	GRL-600-0	GX-9433	22,720 + 1420 − 1210
TI-3	364-384	GRL-602-0	GX-9434	10,430 ± 1250
	1077-1108	GRL-604-0	AA-190[#]	12,890 ± 290
CL-5	167-185	GRL-595-0	GX-9430	7900 ± 255
	410-440	GRL-597-0	GX-9431	12,350 ± 950
HU78-24	270-280	GRL-558-0	GX-8753	9570 ± 370
	410-420	GRL-559-0	GX-8754	10,915 ± 600
	523-540	GRL-594-0	GX-9344	16,070 + 1550 − 1300
HU76-26	28-38	GRL-552/3/4-0	GX-8751	9480 ± 565
	119-144	GRL-445/338-0	GX-6607	17,005 ± 720
HU78-37	207-223	GRL-561/2/3-0	GX-8755	8285 ± 285
	430-440	GRL-564-0	GX-8756	12,035 ± 600
	550-588	GRL-338/446-0	GX-6608	16,360 ± 650

* Radiocarbon dates purchased on funds from the National Science Foundation, to the University of Colorado.

Accelator date from the University of Arizona.

TABLE 14-3

CORE HU76-023-26

PARTICLE SIZE DISTRIBUTION IN WEIGHT % OF DRY MINERAL MATERIAL PER PHI SIZE FRACTION

CASE-NO	DEPTH (cm)	-1 to 0	0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8
1	0	.5	.7	1.1	1.8	5.3	15.4	14.5	10.9	11.8
2	10.0	1.0	.1	.3	.7	3.1	11.4	13.5	10.4	7.7
3	25.0	.1	.2	.5	1.4	7.0	23.6	22.7	11.8	6.8
4	28.0	.3	.7	1.3	2.1	5.5	14.6	16.1	9.1	6.6
5	31.0	1.5	1.9	2.4	2.9	6.7	15.6	15.3	7.7	6.1
6	34.0	1.9	1.1	2.6	3.4	6.6	17.2	13.7	8.3	5.7
7	40.0	1.9	1.9	2.6	2.7	5.2	13.9	13.9	8.8	6.0
8	55.0	1.0	2.6	5.0	6.1	4.5	5.2	9.3	8.5	11.7
9	70.0	1.8	2.8	3.4	4.2	4.0	7.1	9.3	10.1	8.5
10	83.0	.8	2.0	7.0	7.4	6.6	9.0	9.8	10.1	9.0
11	100.0	.5	1.0	1.9	2.5	3.0	6.4	9.6	12.3	13.2
12	117.0	2.8	4.1	5.6	7.5	7.6	12.2	11.2	9.6	7.6
13	142.0	.2	.2	.4	.6	.8	3.4	4.9	11.2	13.2

TABLE 14-3 CONT.

CORE HU76-023-26

PARTICLE SIZE DISTRIBUTION IN WEIGHT % OF DRY MINERAL MATERIAL PER PHI SIZE FRACTION CONT'D

CASE-NO	DEPTH (cm)	8 to 9	9 to 10	10 to 11	>11
1	0	9.1	7.3	7.3	14.5
2	10.0	8.1	7.7	8.1	28.0
3	25.0	5.9	3.6	4.1	12.3
4	28.0	6.6	6.6	7.0	23.5
5	31.0	6.1	5.4	6.1	22.2
6	34.0	6.1	5.3	6.4	21.6
7	40.0	7.2	6.4	7.2	22.3
8	55.0	8.5	7.7	7.7	22.2
9	70.0	8.5	8.5	10.1	21.8
10	83.0	8.7	7.6	6.9	15.2
11	100.0	10.5	7.7	8.7	22.8
12	117.0	6.9	5.6	4.6	14.6
13	142.0	11.2	8.8	11.2	33.7

TABLE 14-4

CORE HU78-029-24

PARTICLE SIZE DISTRIBUTION IN WEIGHT % OF DRY MINERAL MATERIAL PER PHI SIZE FRACTION

CASE-NO	DEPTH (cm)	-1 to 0	0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8
1	11.0	0	.1	.3	.3	1.6	4.2	10.1	12.5	11.0
2	31.0	0	0	.2	.3	1.0	4.2	8.3	12.1	11.7
3	71.0	0	0	.2	.3	1.0	4.6	8.3	12.6	10.7
4	101.0	0	0	.2	.4	1.3	4.2	7.3	12.6	11.1
5	140.0	0	.1	.2	.2	1.0	3.6	7.8	11.7	11.7
6	160.0	0	.0	.1	.2	.8	4.1	7.8	12.2	11.7
7	181.0	0	.0	.2	.2	.8	3.6	8.8	9.3	14.2
8	211.0	0	.0	.1	.2	.7	4.7	8.8	11.7	11.2
9	251.0	0	0	.1	.9	4.9	7.8	9.0	9.9	10.3
10	270.0	0	0	.2	.2	.7	4.0	8.3	12.2	9.8
11	291.0	0	.2	.2	.2	.7	4.2	8.8	12.2	10.7
12	331.0	0	.1	.2	.2	.7	3.0	9.3	11.7	11.7
13	351.0	0	0	.1	.1	.3	2.4	9.4	11.9	10.9
14	391.0	0	0	0	.0	.0	.5	1.5	9.0	10.0
15	410.0	0	.1	.2	.2	.5	2.8	9.3	10.8	10.3
16	431.0	0	0	.1	.8	4.5	6.3	10.9	9.5	10.0
17	471.0	0	.0	.2	.3	.8	4.1	9.8	12.2	9.3
18	511.0	0	.1	.2	.3	.5	1.6	4.4	7.4	10.3
19	530.0	0	0	.1	.1	.3	2.2	5.0	9.4	9.9
20	561.0	0	0	.0	.2	1.1	3.9	16.1	11.7	8.8
21	580.0	0	0	.0	.0	.1	4.4	27.8	15.9	6.5

TABLE 14-4 CONT.

CORE HU78-029-24

PARTICLE SIZE DISTRIBUTION IN WEIGHT % OF DRY MINERAL MATERIAL PER PHI SIZE FRACTION CONT'D

CASE-NO	DEPTH (cm)	8 to 9	9 to 10	10 to 11	>11
1	11.0	8.6	9.1	33.6	9.1
2	31.0	9.2	8.7	9.2	35.0
3	71.0	9.2	9.7	8.8	34.5
4	101.0	9.7	8.2	10.2	34.8
5	140.0	9.7	9.7	9.2	35.0
6	160.0	9.8	8.8	9.8	34.6
7	181.0	9.3	9.3	10.2	34.2
8	211.0	9.3	9.3	9.3	34.7
9	251.0	8.5	7.6	8.5	32.4
10	270.0	8.8	8.8	9.8	37.2
11	291.0	8.8	8.3	10.2	35.5
12	331.0	8.8	9.8	9.8	34.7
13	351.0	8.9	10.4	12.4	33.2
14	391.0	12.0	12.5	17.5	37.0
15	410.0	9.8	9.3	11.3	35.4
16	431.0	8.6	8.6	8.1	32.6
17	471.0	9.3	8.8	8.8	36.6
18	511.0	10.8	11.3	14.3	38.9
19	530.0	10.9	11.4	14.4	36.3
20	561.0	8.3	9.3	11.2	29.3
21	580.0	7.0	7.0	8.4	22.9

CORE HU78-029-37

TABLE 14-5

PARTICLE SIZE DISTRIBUTION IN WEIGHT % OF DRY MINERAL MATERIAL PER PHI SIZE FRACTION

CASE-NO	DEPTH (cm)	-1 to 0	0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8
1	0	0	0	.1	.2	1.2	12.4	18.2	16.1	12.9
2	25.0	0	0	.1	.2	1.1	11.7	16.5	11.8	8.0
3	40.0	0	0	.1	.2	.9	12.9	16.5	12.3	8.5
4	55.0	0	0	.1	.2	1.1	12.4	18.3	11.7	8.0
5	70.0	0	0	.1	.2	1.3	11.7	17.4	11.8	7.5
6	85.0	0	0	.1	.2	1.0	11.3	17.0	11.8	9.0
7	100.0	0	0	.1	.1	.7	11.9	17.8	15.4	12.9
8	115.0	0	0	.1	.1	.8	11.0	15.8	12.9	8.6
9	130.0	0	0	.1	.1	.6	9.0	15.4	11.6	10.1
10	145.0	0	0	.0	.1	.5	7.1	15.1	12.1	9.2
11	160.0	0	0	.1	.2	.6	6.6	15.0	11.1	10.7
12	175.0	0	.0	.0	.1	.5	7.2	13.7	10.2	11.2
13	205.0	0	.0	.1	.1	.5	7.0	14.4	14.4	12.9
14	207.0	0	0	.1	.1	.5	5.7	11.7	11.7	9.3
15	215.0	0	0	.3	.2	.6	5.7	11.2	10.2	10.2
16	220.0	0	0	.1	.1	.4	5.0	11.2	10.8	10.3
17	235.0	0	0	.1	.2	1.2	6.1	11.5	9.1	10.6
18	250.0	0	0	.1	.3	2.6	8.7	13.5	10.3	10.3
19	265.0	0	0	.1	.3	2.8	10.1	15.6	10.6	10.1
20	280.0	0	0	.1	.3	3.3	10.4	16.0	10.1	9.6
21	295.0	0	.1	.1	.3	3.4	13.5	15.8	11.3	9.0
22	310.0	.1	.1	.6	.8	5.2	14.9	16.8	9.5	8.4
23	325.0	0	.1	.3	.6	2.2	9.0	14.4	12.1	11.2
24	339.0	0	0	0	1.0	26.2	44.4	15.2	2.1	1.9
25	355.0	0	.2	.5	10.5	43.6	22.3	5.6	2.5	2.7
26	365.0	0	.1	.6	.6	2.7	11.5	17.4	11.9	9.1
27	380.0	0	.3	.5	.7	2.2	7.5	16.7	10.7	10.7
28	395.0	0	.1	.2	.3	1.7	7.1	13.8	13.8	9.0
29	410.0	.5	.6	.7	.9	2.0	7.6	13.8	14.8	10.9
30	430.0	0	.2	.5	.6	1.5	5.6	13.3	13.3	10.0
31	470.0	0	0	.1	.3	2.2	8.0	15.5	12.6	8.4
32	500.0	0	0	.2	.3	1.6	7.1	13.8	12.4	9.0
33	545.0	.1	.7	1.5	1.7	1.7	2.9	10.7	12.1	10.2
34	575.0	.3	.6	1.0	1.2	1.4	4.8	7.6	12.4	11.9

TABLE 14-5 CONT

CORE HU78-029-37

PARTICLE SIZE DISTRIBUTION IN WEIGHT % OF DRY MINERAL MATERIAL PER PHI SIZE FRACTION CONT'D

CASE-NO	DEPTH (cm)	8 to 9	9 to 10	10 to 11	>11
1	0	10.4	6.7	6.2	15.6
2	25.0	7.1	5.7	8.5	29.3
3	40.0	6.1	5.7	8.5	28.3
4	55.0	6.1	5.6	8.4	28.1
5	70.0	6.6	6.1	8.5	28.8
6	85.0	5.7	6.1	8.5	29.3
7	100.0	8.4	6.9	6.9	18.8
8	115.0	6.7	5.7	8.6	29.6
9	130.0	5.8	6.3	8.7	32.7
10	145.0	6.3	7.3	9.2	33.0
11	160.0	6.3	6.3	8.7	34.4
12	175.0	6.3	6.8	9.3	34.6
13	205.0	9.9	8.4	9.4	22.8
14	207.0	6.8	8.3	9.7	36.1
15	215.0	7.8	8.3	9.7	35.9
16	220.0	7.3	8.3	9.8	36.7
17	235.0	7.7	7.7	9.6	36.1
18	250.0	7.0	6.5	8.9	31.8
19	265.0	5.0	7.3	7.3	30.7
20	280.0	6.9	6.4	7.3	29.7
21	295.0	5.4	5.9	7.2	27.9
22	310.0	4.7	5.6	6.9	26.2
23	325.0	6.0	7.4	7.4	29.3
24	339.0	.7	.9	.9	6.5
25	355.0	1.6	1.6	1.7	7.2
26	365.0	5.9	6.4	6.9	26.9
27	380.0	6.5	7.0	7.0	30.2
28	395.0	6.6	7.6	9.5	30.4
29	410.0	8.1	7.1	7.1	25.7
30	430.0	8.1	7.1	9.0	30.8
31	470.0	6.6	7.5	8.9	30.0
32	500.0	7.6	8.6	10.5	29.0
33	545.0	7.9	8.8	11.6	30.1
34	575.0	10.5	8.1	9.6	30.6

TABLE 14-6

CORE HU76-023-26

PARTICLE SIZE GRADE SCALE (WENTWORTH)

CASE-NO	DEPTH	GRAN	SAND	SILT	CLAY
1	0	2.3	9.4	52.6	38.0
2	10.0	0	5.2	42.9	51.9
3	25.0	0	9.2	64.9	25.9
4	28.0	.5	9.8	46.4	43.8
5	31.0	.6	15.5	44.7	39.8
6	34.0	3.5	15.7	44.9	39.4
7	40.0	3.9	14.4	42.6	43.0
8	55.0	4.2	19.3	34.7	46.0
9	70.0	.1	16.0	35.0	49.0
10	83.0	.4	23.8	37.9	38.3
11	100.0	3.0	8.9	41.5	49.6
12	117.0	3.0	27.6	40.7	31.7
13	142.0	0	2.2	32.8	65.0

DEPTH-Depth in cm
GRAN-%Granules 2mm
SAND-%Sand
SILT-%Silt
CLAY-%Clay

TABLE 14-7

CORE HU78-029-24

PARTICLE SIZE GRADE SCALE (WENTWORTH)

CASE-NO	DEPTH	GRAN	SAND	SILT	CLAY
1	11.0	0	2.2	37.8	60.0
2	31.0	0	1.6	36.2	62.2
3	71.0	0	1.5	36.3	62.2
4	101.0	0	1.9	35.2	62.9
5	140.0	0	1.5	34.7	63.8
6	160.0	0	1.3	35.8	62.9
7	181.0	0	1.3	35.8	62.9
8	211.0	0	1.1	36.4	62.5
9	251.0	0	6.0	37.0	57.0
10	270.0	0	1.0	34.4	64.6
11	291.0	0	1.3	35.9	62.8
12	331.0	.5	1.2	35.8	63.0
13	351.0	0	.4	34.6	65.0
14	391.0	0	.1	21.0	78.9
15	410.0	0	1.0	33.2	65.8
16	431.0	0	5.5	36.6	57.9
17	471.0	0	1.3	35.3	63.4
18	511.0	0	1.0	23.7	75.3
19	530.0	0	.4	26.6	73.0
20	561.0	0	1.3	40.6	58.1
21	580.0	0	.2	54.6	45.2

DEPTH-Depth in cm
GRAN-%Granules 2mm
SAND-%Sand
SILT-%Silt
CLAY-%Clay

TABLE 14-8

CORE HU78-029-37

PARTICLE SIZE GRADE SCALE (WENTWORTH)

CASE-NO	DEPTH	GRAN	SAND	SILT	CLAY
1	0	0	1.5	59.6	38.9
2	25.0	0	1.4	48.1	50.5
3	40.0	0	1.2	50.2	48.6
4	55.0	0	1.3	50.4	.8
5	70.0	0	1.5	48.5	50.0
6	85.0	0	1.3	49.1	49.6
7	100.0	0	.9	58.0	41.1
8	115.0	0	1.0	48.3	50.7
9	130.0	0	.8	46.1	53.1
10	145.0	0	.6	43.6	55.8
11	160.0	0	.9	43.4	55.7
12	175.0	0	.7	42.3	57.0
13	205.0	0	-0	-0	-0
14	207.0	0	.8	38.3	60.9
15	215.0	0	1.1	37.2	61.7
16	220.0	0	1.4	37.3	62.1
17	235.0	0	1.5	37.4	61.1
18	250.0	0	3.0	42.8	54.2
19	265.0	0	3.2	46.3	50.5
20	280.0	0	3.7	46.0	50.3
21	295.0	0	4.4	49.6	46.4
22	310.0	0	6.9	49.7	43.4
23	325.0	0	3.2	46.6	50.2
24	339.0	0	27.3	63.6	9.1
25	355.0	0	54.8	33.1	12.1
26	365.0	0	4.0	49.9	46.1
27	380.0	0	3.7	45.6	50.7
28	395.0	.1	2.3	43.6	54.1
29	410.0	1.3	4.8	47.1	48.1
30	430.0	0	2.8	42.2	55.0
31	470.0	0	2.6	44.5	52.9
32	500.0	0	2.1	42.3	55.6
33	545.0	.6	5.8	35.8	58.4
34	575.0	.3	4.5	36.8	58.7

DEPTH-Depth in cm

GRAN-%Granules 2mm

SAND-%Sand

SILT-%Silt

CLAY-%Clay

TABLE 14-9

CORE HU76-023-26

SEDIMENT PROPERTIES

CASE-N0	DEPTH	HM	0M	CLAY:ST	CARB	PH
1	0	-0	-0	-0	7.5	-0
2	10.0	.4	.9	1.2	6.6	7.8
3	25.0	-0	-0	-0	7.5	-0
4	28.0	.4	.5	.9	10.2	8.2
5	31.0	.3	.5	.9	8.6	8.1
6	34.0	.4	.6	.9	9.2	8.2
7	40.0	.2	.6	1.0	10.5	8.1
8	55.0	-0	-0	-0	7.5	-0
9	70.0	.3	.5	1.4	20.1	8.3
10	83.0	.2	.4	1.0	53.3	8.3
11	100.0	-0	-0	-0	12.5	-0
12	117.0	.2	.3	.8	39.0	8.3
13	142.0	-0	-0	-0	2.5	-0

DEPTH-Depth in cm
HM- %Hygroscopic Moisture
OM-%Organic Matter
CLAY:ST-Ratio of Clay to Silt
CARB-%carbonate
PH-pH Value

TABLE 14-10

CORE HU78-029-24

SEDIMENT PROPERTIES

CASE-N0	DEPTH	HM	0M	CLAY:ST	CARB	PH
1	11.0	.4	1.1	1.6	9.2	7.9
2	31.0	.5	1.0	1.7	11.2	7.9
3	71.0	.4	1.2	1.7	10.3	7.9
4	101.0	.2	1.1	1.8	10.4	8.0
5	140.0	.4	1.1	1.8	10.8	8.1
6	160.0	.3	1.0	1.8	11.1	8.1
7	181.0	.4	.9	1.8	9.7	8.1
8	211.0	.3	.9	1.7	11.1	8.1
9	251.0	.3	.8	1.5	9.4	8.1
10	270.0	.8	1.1	1.9	9.4	7.8
11	291.0	.4	.9	1.8	10.1	7.8
12	331.0	.2	.9	1.8	9.6	8.0
13	351.0	.2	.7	1.9	7.8	8.1
14	391.0	.3	.7	3.8	7.1	8.2
15	410.0	.7	2.0	2.0	8.8	8.0
16	431.0	.3	.7	1.6	8.9	8.1
17	471.0	.3	.9	1.8	14.8	7.9
18	511.0	.2	.8	3.2	7.1	8.0
19	530.0	.6	.6	2.8	6.3	8.1
20	561.0	.2	.5	1.4	7.6	8.3
21	580.0	.2	.4	.8	8.7	8.3

DEPTH-Depth in cm
HM- %Hygroscopic Moisture
OM-%Organic Matter
CLAY:ST-Ratio of Clay to Silt
CARB-%carbonate
PH-pH Value

TABLE 14-11

CORE HU78-029-37

SEDIMENT PROPERTIES

CASE-N0	DEPTH	HM	0M	CLAY:ST	CARB	PH
1	0	-0	-0	-0	2.5	-0
2	25.0	1.0	2.1	1.0	4.7	7.6
3	40.0	.7	2.0	1.0	4.4	7.6
4	55.0	.8	1.8	1.0	4.5	7.7
5	70.0	.7	2.1	1.0	4.0	7.6
6	85.0	.7	2.0	1.0	4.2	7.7
7	100.0	-0	-0	-0	2.5	-0
8	115.0	.9	1.8	1.0	4.4	7.6
9	130.0	.7	1.8	1.1	4.4	7.6
10	145.0	.7	1.8	1.3	4.4	7.6
11	160.0	.7	1.6	1.3	4.0	7.7
12	175.0	.5	1.6	1.4	4.0	7.6
13	205.0	-0	-0	-0	2.5	-0
14	207.0	1.3	1.5	1.6	4.0	7.6
15	215.0	.6	1.5	1.7	4.3	7.6
16	220.0	1.0	1.4	1.7	3.8	7.7
17	235.0	.5	1.1	1.6	4.1	7.7
18	250.0	.4	1.1	1.3	4.2	7.7
19	265.0	.4	1.2	1.1	4.8	7.7
20	280.0	.3	1.0	1.1	4.4	7.9
21	295.0	.4	1.1	.9	4.4	7.9
22	310.0	.3	.9	.9	4.8	8.0
23	325.0	.3	.9	1.1	4.2	8.0
24	339.0	.0	.2	.1	3.0	8.0
25	355.0	.1	.4	.4	3.5	8.0
26	365.0	.3	.9	.9	5.6	8.0
27	380.0	.3	1.0	1.1	5.8	8.0
28	395.0	.3	.9	1.2	5.8	7.9
29	410.0	-0	-0	-0	2.5	-0
30	430.0	.8	.9	1.3	8.9	7.9
31	470.0	.2	.8	1.2	5.6	8.2
32	500.0	.2	.7	1.3	6.4	8.2
33	545.0	.2	.5	1.6	7.6	8.2
34	575.0	-0	-0	-0	7.5	-0

DEPTH-Depth in cm
HM-%Hygroscopic Moisture
OM-%Organic Matter
CLAY:ST-Ratio of Clay to Silt
CARB-%carbonate
PH-pH Value

TABLE 14-12

Results of Factor Analysis of Detailed Grain Size Data from HU78-029-37-P, HU78-029-24-P and HU76-023-26-P

The detailed grainsize data from cores HU78-029-37-P, HU78-029-24-P, and HU76-023-26-P are shown in Tables 14-3, 14-4 and 14-5 These percent data were analyzed with the CABFAC factor analysis program. Three factors, explaining 97.61% of the variance were recognized with this test. The most statistically significant of these factors explains 91.06% of the variance and is characterized by very fine clay (greater than 11 phi). The second factor explains 5.09% of the variance and is dominated by very fine sand and very coarse silt (3-4 phi and 4-5 phi). The third factor accounts for 1.46% of the variance and coarse silt (5-6 phi) is the most influential grain size.

Downcore changes in the sedimentation regime are shown by factor variations. Core HU78-029-37-P sediments generally fluctuate between coarse silt and very fine clay with very fine sand and very coarse silt only becoming important between 340 and 365 cm. Sediments of core HU78-029-24-P are dominated by coarse silt in the upper 25 cm and the lower 20 cm, while very fine clay consistently dominates the sediment in the remainder of the core. Core HU76-023-26-P sediments rapidly fluctuate between coarse silt and very fine clay. Further analysis of these data in the absence of the primary factor, very fine clay (greater than 11 phi), will resolve the importance of the other grain sizes to a greater extent and assist paleoenvironmental interpretations.

Relative Abundance of Clay Minerals from Core HU78-029-24-P

TABLE 14-13

GRL #	DEPTH (cm)	TOTAL CLAY MINERALOGY						
		Chlorite	Kaolinite	Illite	Vermiculite	Mixed Layer Clays	Quartz	Feldspar
4088	11	x	x	xx	?	...	xx½	x
4089	31	x	x	xx	T	?	xx½	x
4090	71	x	x	xx	T	T	xx	x
4091	101	x	x	x	?	?	xxx	x
4092	140	x	x	xx	...	...	xxx	x
4093	160	T	x	xx	...	...	xxx	x
4094	181	x	x	xx	T	...	xx	x
4095	211	x	x	xx	...	...	xx	x
4096	251	x	x	xx	...	...	xx	x
4097	275	x	x	xx	...	...	xxx	x
4098	291	x	x	xx	...	...	xxx	x
4099	331	x	xx	xxx	...	...	xxx	xx
4100	351	x	x	xxx	...	...	xx½	x
4101	391	x	x	xxx	...	...	xx½	xx
4102	415	x	x	xx	T	T	xx	x
4103	431	T	x	xx	T	...	xxx	xx
4104	471	x	xx	xxx	...	...	xxx	xx
4105	511	x	x	xxx	...	...	xxx	x½
4106	535	½	x	xxx	...	...	xx½	xx
4107	561	½	x	xxx	...	...	xx½	xx
4108	580	½	x	xxx	...	...	xx½	xx

...-Not Present
? -Possibly present
T -Trace amounts
x -minor amounts
xx -moderate amounts
xxx-dominant amounts

TABLE 14-14

FACTOR ANALYSIS OF HU76-023-26

Factor Scores

VAR.	1	2	3
LAGENA	.003	.019	.000
OOLINA	.024	.004	.000
FISSUR	.003	-.000	.000
DENTAL	.003	-.000	.000
GLAND	.001	.001	.000
V.LOEB	.003	-.000	.000
TRILOC	.020	-.005	-.001
MILIONEL	-.001	.018	-.000
I.HELEN	.193	.072	.005
C.RENIF	.960	-.107	-.012
I.ISLAND	.004	.001	.000
E.EX.F.C	.109	.012	.191
E.INCERT	.003	-.000	.000
N.BAR	.090	.990	-.003
ASTRO	.004	.022	.186
B.FRIG	.010	.015	-.001
BUC.SP	.015	-.001	.001
EPONIDES	.010	-.004	-.001
OT.CAL	.002	-.001	-.000
E.ECAV	.000	.019	-.000
V.SCHRIB	.002	-.001	-.000
I.NORC	.137	-.012	.004
R.DIST	-.003	-.001	.186
R.DIFF	-.007	-.004	.556
TROCAM	.011	.002	.187
OT.ARE	-.012	-.004	.742

Factor Loadings

			COMM.	1	2	3
1	HU76-26	25	1.001	.010	.001	1.000
2	HU76-26	40	.993	.094	.992	.001
3	HU76-26	55	.841	.891	.212	.036
4	HU76-26	70	.987	.993	-.037	-.001
5	HU76-26	82	.967	.983	-.015	-.004
6	HU76-26	100	.909	.950	.062	.036
			VARIANCE	60.981	17.247	16.717
			CUM. VAR	60.981	78.229	94.946

TABLE 14-15

FACTOR ANALYSIS OF HU78-029-24

Factor Scores

VAR.	1	2	3
LAGENA	-.012	.006	-.055
FISSUR	.214	-.126	.027
TRILOC	-.009	.039	.004
QUINLOC	.038	.023	.026
IHELENA	.230	.745	-.098
CRENIF	-.132	.440	-.160
ECLAVA	003	.051	.015
NONBARL	.281	-.156	-.933
ASTRONO	-.000	.017	-.044
BUCELFR	.107	-.063	.013
BUCELS	.107	-.063	.013
CLOBATU	.818	.026	.273
CREFUL	-.012	-.012	-.043
OTHCALC	.321	-.047	.084
EEXCAVA	.012	.011	.011
VSCHREI	-.027	.005	-.059
INORCR	-.081	.441	-.003

Factor Loadings

			COMM.	1	2	3
1	HU78-24	31	.884	.852	-.163	-.363
2	HU78-24	130	.989	.290	.376	-.874
3	HU78-24	231	.909	.840	.242	-.380
4	HU78-24	330	.838	.683	.587	-.167
5	HU78-24	430	.978	.407	.124	-.893
6	HU78-24	560	.908	.024	.932	-.198
			VARIANCE	35.797	24.256	31.719
			CUM. VAR	35.797	60.052	91.772

TABLE 14-16

FACTOR ANALYSIS OF HU78-029-37

Factor Scores

VAR.	1	2	3	4
LAGENA	.008	-.002	.035	.005
OOLINA	.011	.018	-.002	-.006
FISSUR	.026	.005	-.012	.041
OT.NODO	.002	.000	.000	-.001
DENTAL	.001	.002	.002	.004
GLAND	.001	.004	-.000	-.005
V.LOEB	.005	.032	.004	.000
BOLIV	.025	.003	-.001	.022
TRILOC	.010	.006	-.004	.010
QUINQ	.000	-.003	-.004	.034
I.HELEN	.047	.119	-.015	-.027
C.RENIF	.034	.760	-.030	.347
I.ISLAND	-.000	.002	.000	-.002
P.ORB	-.001	.010	-.001	.025
E.EX.F.C	.058	.342	.011	-.258
E.INCERT	-.001	-.002	.021	-.008
N.LAB	-.015	-.040	-.062	.734
N.BAR	.982	-.042	-.076	-.039
ASTRO	.067	.066	.041	.002
BUC.SP	.008	.017	.000	.000
ROSAL	.001	.002	.001	.004
C.LOB	-.009	.115	.002	-.065
C.REF	-.003	-.002	.035	-.005
TRIFAR	-.001	-.003	-.004	.033
ROBERT	.000	.013	-.003	.012
P.WILL	.009	-.002	-.002	.004
E.EXCAV	.021	.043	-.007	-.051
V.SCHRIB	.011	.064	.008	.068
I.NORC	-.041	.510	.032	-.294
OSC.TER	.054	.021	-.017	.043
AD.GLO	-.015	-.003	.288	.050
R.DIST	.002	-.007	.089	-.013
R.DIFF	.076	.025	.124	.327
TEXTULAR	-.016	-.022	.524	-.096
TROCHA	.101	.008	.772	.088
JABDAM	-.001	-.006	.077	-.024
OT.AREN	.012	-.010	-.020	.199

Factor Loadings

			COMM.	1	2	3	4
1	HU78-37	105	.954	.083	.003	.970	.076
2	HU78-37	145	.879	.086	.095	.915	.158
3	HU78-37	175	.969	.105	.028	.977	.052
4	HU78-37	203	.960	.297	.632	.579	.369
5	HU78-37	233	.814	.047	.095	.250	.860
6	HU78-34	263	.968	.973	.119	-.061	-.052
7	HU78-37	293	.835	.793	.397	.077	.208
8	HU78-37	325	.988	.994	.009	.022	-.003
9	HU78-37	360	.950	.968	.067	.042	.086
10	HU78-37	380	.932	.931	-.030	.252	.021
11	HU78-37	410	.965	.922	.301	.154	-.002
12	HU78-37	440	.877	.207	.861	.112	.283
13	HU78-37	470	.866	.157	.910	.062	-.099
14	HU78-37	500	.842	.035	.857	.010	.327
15	HU78-37	545	.942	.947	.170	.051	.116
16	HU78-37	590	.616	.513	.582	-.040	-.112
17	HU78-37	592	.765	.023	.857	.016	-.173
			VARIANCE	38.607	24.070	19.126	7.152
			CUM. VAR	38.607	62.676	81.802	88.954

PREPARATION METHODS FOR DIATOM ANALYSIS OF CLARK FIORD (TABLES 14-17A,B,C,D,E)

The water samples which were obtained with the rosette sampler, were filtered through a 20 millipore filter paper. About 1/4 of each filter paper was available for diatom anaylsis. To prepare the diatom slides, the filter papers were boiled in dilute H_2O_2 (ca. 10%) for 5 minutes, to digest any organic material and to dislodge the diatom frustules from the filters.

The liquid containing the frustules was centrifuged and decanted, leaving only the diatom frustules. These were washed with distilled H_2O and centrifuged 5 times, after which smear slides were made from the residue. The diatoms were mounted in Hyrax.

To make it possible to get an absolute count of the diatoms, a known number of marker grains (Lycopodium spores) was added to the initial step of the preparation. The idea is to know the number of grains added, in this case 11,300 ± 400 per tablet (tablets containing marker grains are available commercially for palynological use). The ratio of counted diatoms to counted exotic grains times the total number of added markers equal the total number of diatoms in the sample. When markers are added at the initial step it is also possible to assess the loss which occur during the preparation procedure. Naturally the method has its limitations, as discussed in Maher (1981). It works best if the ration of diatom/markers 2 (Maher, 1981). Also, the size difference between diatom and pollen should be as small as possible.

Only diatoms represented by more than 1/2 frustule were counted as 1, to avoid couting several fragments of the same frustule as separate specimens. In the case of Chaetoceros, spores were also counted and considered each as one specimen. Generally 200 - 300 specimens were counted per sample in traverses across the slide, except were the diatoms were relatively rare. This usually occured below 100 m water depth. The marker grains encountered in these traverses were also counted. Station CL-4 was processed without marker grains, thus no total could be calculated.

REFERENCES

Maher, L.J., 1981. Statistics for microfossil concentration measurements employing samples spiked with marker grains. Rev. Paleobot. Palynol., 32: 153 - 191.

TABLE 14-17 A

DIATOM ANALYSIS OF CLARK FIORD STATION CL-3

CL-3

	% species at the following depths (m):									
	1	5	10	20	30	50	75	100	200	240
CENTRALES										
Actinocyclus curvatulus			0.3	0.3	1					
A. sp.		0.4								
Chaetoceros sp.	95	97	97	96	92	97	97	98	84	86
Coscinodiscus curvatulus				0.3					0.4	
C. sp.										
Porosira glacialis									0.4	
Rhizosolenia sp.	2	0.4	0.3	1	1	1	0.5	1		1
Thalassiosira eccentrica	0.7		1	0.6	1	0.3	0.5	0.6	2	2
T. gravida										
T. hyalina										
T. kryophila					1	0.3				
T. nordenskioldii					0.3		0.5		1	0.4
PENNALES										
Cocconeis costata		0.4	0.6							
C. imperatrix	0.7	1							0.4	0.4
Dicladia pylea					0.3					
Diploneis sp.			0.3			0.3	0.5			
Grammatophora angulosa										
G. marina										
G. sp.				0.3						
Navicula directa	0.7			0.3					0.4	
N. distans										
N. sp.									1	0.4
Nitzschia cf. delicatissima					0.3				0.4	
N. cf. invisa										1
N. marina					1					0.4
N. sp.			0.6	1			0.5			1
Pleurosigma sp.	0.7									
Synedra sp.									0.4	
Thalassionema nitzschioides		0.4					0.5		6	6
Unidentified					1	2	0.5	0.6	4	1.5
Total no. of diatoms in sample	3,700	2,800	15,200	13,400	12,600	12,450	15,800	5,500	8,200	8,000

TABLE 14-17 B

DIATOM ANALYSIS OF CLARK FIORD STATION CL-4

CL-4

	% species at the following depths (m)									
	1	5	10	20	30	50	100	200$^{x)}$	400$^{x)}$	535
CENTRALES										missing
Actinocyclus curvatulus		0.7								
A. sp.										
Chaetoceros sp.	100	93	100	98	99	98	97			
Coscinodiscus curvatulus										
C. sp.										
Porosira glacialis										
Rhizosolenia sp.		2		0.4	0.2		0.4			
Thalassiosira eccentrica										
T. gravida							0.4			
T. hyalina				0.8	0.5	0.6				
T. kryophila							0.4			
T. nordenskioldii		0.7								
PENNALES										
Cocconeis costata		0.3								
C. imperatrix										
Dicladia pylea										
Diploneis sp.					0.2					
Grammatophora angulosa										
G. marina										
G. sp.										
Navicula directa		0.3								
N. distans										
N. sp.										
Nitzschia cf. delicatissima										
N.cf. invisa						0.3				
N. cf. marina		0.3		0.4		0.3				
N. sp.		0.7								
Pleurosigma sp.										
Synedra sp.		0.3								
Thalassionema nitzschioides						0.6				
Unidentified						0.3	1			
Total no. of diatoms in sample										

x) barren

TABLE 14-17 C

DIATOM ANALYSIS OF CLARK FIORD STATION CL-5

CL-5

% species at the following depths (m)

	5	10	20	30	50	100	200	400	600 x)	685
<u>CENTRALES</u>										missing
Actinocyclus curvatulus	0.6						1			
A. sp.										
Chaetoceros sp.	94	85	91	92	96	93	83	56		
Coscinodiscus curvatulus						1				
C. sp.										
Porosira glacialis										
Rhizosolenia sp.	0.6	3	2	0.5	1		1	6		
Thalassiosira eccentrica	0.3									
T. gravida					0.3					
T. hyalina										
T. kryophila										
T. nordenskioldii				1		1				
<u>PENNALES</u>										
Cocconeis costata	0.3	1	0.4				2	6		
C. imperatrix		0.3								
Dicladia pylea										
Diploneis sp.		0.3								
Grammatophora angulosa							1			
G. marina		0.6								
G. sp.										
Navicula directa					0.3					
N. distans										
N. sp.	0.3						1			
Nitzschia cf. delicatissima										
N.cf. invisa	0.3	1			1		1			
N. cf. marina			1	1						
N. sp.										
Pleurosigma sp.										
Synedra sp.	0.3									
Thalassionema nitzschioides	2	5		2	1	3	7	28		
Unidentified	0.6	0.6	0.4	3	2	2		6		
Total no. of diatoms in sample	14,200	9,800	8,700	6,000	32,300	9,800	2,800	1,400		

x) barren

TABLE 14-17 D

DIATOM ANALYSIS OF CLARK FIORD STATION CL-6

CL-6

	% species at the following depths (m)									
	1	10	20	30	50	100	200	400	600x)	655x)
CENTRALES										
Actinocyclus curvatulus										
A. sp.										
Chaetoceros sp.	91	86	84	94	93	96	86	75		
Coscinodiscus curvatulus		0.6								
C. sp.					0.3					
Porosira glacialis				0.6				2		
Rhizosolenia sp.	0.7	2	1	1	2	0.1				
Thalassiosira eccentrica					0.3		0.5			
T. gravida										
T. hyalina							2			
T. kryophila				1	0.3					
T. nordenskioldii										
PENNALES										
Cocconeis costata	1	0.6	0.7		0.3		1	2		
C. imperatrix										
Dicladia pylea						0.1				
Diploneis sp.					0.3					
Grammatophora angulosa				0.6						
G. marina										
G. sp.										
Navicula directa			0.7	0.6		0.2				
N. distans			0.3							
N. sp.		1	0.3	0.6						
Nitzschia cf. delicatissima										
N.cf. invisa	0.7					0.1	1	2		
N. cf. marina	3	2	3	0.6	2	0.5	0.5	2		
N. sp.	0.4									
Pleurosigma sp.										
Synedra sp.										
Thalassionema nitzschioides	2	1	3		2	1	7	16		
Unidentified	0.4	5	4		0.6	0.4	4			
Total no. of diatoms in sample	11,000	3,600	15,700	6,300	11,900	28,000	13,000	4,000	700	350

x) % not meaningful - too few specimens on the slide.

TABLE 14-17 E

DIATOM ANALYSIS OF CLARK FIORD STATION CL-7

CL-7

	% species at the following depths (m)									
	1	10	20	30	50	100	200	400$^{x)}$	600$^{x)}$	680$^{x)}$
CENTRALES										
Actinocyclus curvatulus					0.3					
A. sp.			0.6							
Chaetoceros sp.	87	83	65	89	93	98	87			
Coscinodiscus curvatulus										
C. sp.										
Porosira glacialis										
Rhizosolenia sp.	2	1	4	2	2					
Thalassiosira eccentrica						1				
T. gravida										
T. hyalina										
T. kryophila										
T. nordenskioldii					0.3	1				
PENNALES										
Cocconeis costata	0.8	3	4	2	0.3					
C. imperatrix							0.6			
Dicladia pylea										
Diploneis sp.	0.8		0.6		0.7					
Grammatophora angulosa										
G. marina										
G. sp.										
Navicula directa	0.8		7	2	0.3					
N. distans										
N. sp.		2	2		1		2			
Nitzschia cf. delicatissima	0.8									
N.cf. invisa										
N. cf. marina		1	2							
N. sp.		5	4	2			2			
Pleurosigma sp.			0.6	0.5						
Synedra sp.										
Thalassionema nitzschioides	2	3	5	0.5			6			
Unidentified	7		5	2	0.7		3			
Total no. of diatoms in sample	-	4,700	6,000	8,200	21,600	8,700	8,600	1,500	800	500

x) % not meaningful - too few specimens on the slide.

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TABLE 14-18

PALEOMAGNETIC DATA

CASE-NO	DEPTH	WETWT	CORDEC	INCLIN	INTEN	SUSCEP
1	11.0	1.9	-121.0	.4	112.8	1.9
2	24.0	1.8	-145.0	-39.7	134.8	6.7
3	26.0	1.8	-175.0	-37.8	142.8	7.3
4	31.0	1.7	180.0	-55.6	174.8	2.5
5	36.0	1.7	-167.0	-39.0	187.6	5.2
6	41.0	1.7	-159.0	-25.1	147.6	5.6
7	46.0	1.7	-154.0	-50.5	95.2	4.5
8	51.0	1.6	-160.0	-56.8	209.1	2.5
9	56.0	1.5	-160.0	-36.8	189.6	3.6
10	61.0	2.0	-178.0	-4.9	302.9	1.2
11	66.0	1.7	-151.0	-8.6	220.8	9.2
12	71.0	1.6	-166.0	-31.3	91.6	4.1
13	78.0	1.6	-175.0	-35.8	95.1	3.8
14	85.0	1.6	-175.0	67.0	84.5	4.4
15	90.0	1.6	148.0	82.1	75.7	3.6
16	95.0	1.6	-156.0	70.6	83.9	4.3
17	103.0	1.6	-122.0	83.2	75.7	3.6
18	110.0	1.7	-88.0	82.1	100.7	5.1
19	115.0	1.6	-125.0	86.1	74.5	3.8
20	120.0	1.7	-140.0	74.7	93.2	4.2
21	130.0	1.6	121.0	67.2	109.4	3.4
22	135.0	1.6	-19.0	84.2	76.7	3.1
23	140.0	1.8	-78.0	76.2	88.9	1.9
24	145.0	1.7	-32.0	74.5	54.7	3.9
25	148.0	1.8	-122.0	75.0	99.4	3.9
26	150.0	1.6	173.0	68.0	77.0	3.5
27	156.0	1.8	-91.0	68.5	112.9	1.8
28	162.0	1.9	-54.0	69.4	97.7	1.2
29	167.0	1.7	-105.0	78.0	114.0	2.7
30	175.0	1.7	108.0	67.1	103.8	4.6
31	180.0	1.6	-157.0	74.9	159.6	3.5
32	185.0	1.7	-151.0	64.9	146.0	3.8
33	195.0	1.7	-84.0	76.1	176.0	5.5
34	205.0	1.7	-75.0	83.0	117.2	4.9
35	210.0	1.9	-150.0	84.5	143.5	7.6
36	215.0	1.7	-64.0	88.7	122.9	1.9
37	220.0	1.8	12.0	86.6	184.4	5.7
38	225.0	1.7	-107.0	88.9	197.1	4.1
39	240.0	1.7	-107.0	66.3	169.7	3.6
40	245.0	1.6	-97.0	67.4	245.3	3.5

DEPTH-Depth (cm)
WETWT-Unit Wet Weight (gm)
CORDEC-Declination (degrees)
INCLIN-Inclination (degrees)
INTEN-Intensity x 10-6 (emu/cc)
SUSCEP-Susceptibility x 10-4 (emu/cc)

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TABLE 14-18 CONT'D

PALEOMAGNETIC DATA CONT'D

CASE-NO	DEPTH	WETWT	CORDEC	INCLIN	INTEN	SUSCEP
41	250.0	1.6	-122.0	70.4	191.7	2.8
42	255.0	1.6	-114.0	56.8	140.8	3.4
43	260.0	1.6	-119.0	67.2	260.1	3.1
44	265.0	1.7	-109.0	68.6	274.9	3.4
45	270.0	1.7	-165.0	53.3	282.2	2.7
46	275.0	1.6	-106.0	55.5	164.3	3.0
47	280.0	1.6	-127.0	67.8	331.2	2.9
48	285.0	1.7	-144.0	72.6	329.9	3.6
49	290.0	1.7	-145.0	72.0	336.1	3.2
50	297.0	1.9	-178.0	52.7	217.1	7.2
51	303.0	1.8	-130.0	76.7	296.8	4.8
52	306.0	1.9	-168.0	62.2	172.9	6.7
53	315.0	1.6	176.0	67.3	54.0	2.0
54	320.0	1.6	-159.0	65.7	118.7	2.0
55	325.0	1.6	-165.0	52.9	112.9	2.0
56	330.0	1.6	-131.0	47.4	105.4	2.0
57	335.0	1.6	-131.0	62.3	102.8	2.0
58	340.0	1.6	-118.0	48.3	92.3	1.9
59	350.0	1.6	-114.0	41.6	142.8	2.1
60	355.0	1.6	-114.0	45.2	144.8	2.2
61	360.0	1.6	-130.0	46.0	143.0	2.2
62	365.0	1.6	-136.0	42.3	162.6	2.2
63	370.0	1.6	-134.0	44.6	135.2	2.2
64	375.0	1.5	-127.0	43.5	142.6	2.1
65	380.0	1.6	-128.0	43.4	156.6	2.3
66	385.0	1.6	-126.0	45.0	137.7	2.3
67	390.0	1.6	-126.0	55.5	133.1	2.3
68	395.0	1.6	71.0	56.4	133.1	2.2
69	400.0	1.6	-71.0	76.7	124.8	2.3
70	415.0	1.6	166.0	75.8	104.2	2.4
71	420.0	1.6	131.0	73.2	147.7	2.4
72	425.0	1.6	141.0	72.9	146.3	2.4
73	430.0	1.6	-137.0	62.6	151.6	2.3
74	435.0	1.6	52.0	59.2	122.4	2.3
75	440.0	1.6	80.0	58.2	123.9	2.4
76	450.0	1.6	-154.0	53.7	116.2	2.3
77	470.0	1.6	116.0	46.8	148.4	2.3
78	480.0	1.6	-46.0	53.0	63.6	2.5
79	490.0	1.6	-14.0	65.1	125.2	2.7
80	500.0	1.7	-4.0	54.4	140.3	2.9
81	510.0	1.7	-21.0	60.0	136.8	2.8
82	520.0	1.7	32.0	-60.8	113.7	2.9
83	530.0	1.7	-10.0	44.3	173.7	2.9
84	540.0	1.7	-10.0	29.4	175.1	3.0
85	550.0	1.7	-10.0	33.2	190.3	2.9
86	560.0	1.6	-7.0	42.8	154.9	3.0
87	570.0	1.7	-7.0	37.3	181.3	3.0
88	580.0	1.6	12.0	32.8	169.2	2.9
89	590.0	1.7	10.0	42.6	174.2	3.0

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TABLE 14-18 CONT'D

PALEOMAGNETIC DATA CONT'D

CASE-NO	DEPTH	WETWT	CORDEC	INCLIN	INTEN	SUSCEP
90	600.0	1.7	20.0	38.6	165.2	3.2
91	610.0	1.7	16.0	37.6	165.8	3.1
92	620.0	1.7	19.0	36.0	159.8	3.1
93	630.0	1.7	18.0	33.9	163.9	3.2
94	640.0	1.7	35.0	24.5	154.3	3.2
95	650.0	1.7	44.0	37.2	94.7	3.4
96	660.0	1.7	58.0	43.3	174.7	3.3
97	670.0	1.7	78.0	52.7	142.2	3.4
98	680.0	1.7	88.0	56.2	146.7	3.3
99	690.0	1.8	88.0	67.8	116.4	4.1
100	700.0	1.8	151.0	-35.5	124.5	3.9
101	710.0	1.7	-78.0	-6.7	79.8	4.0
102	720.0	1.8	-129.0	-1.1	71.7	4.1
103	730.0	1.7	163.0	-3.9	119.6	4.0
104	740.0	1.7	-174.0	-10.9	183.3	4.4
105	750.0	1.7	-152.0	-66.1	101.3	4.6
106	760.0	1.7	161.0	-24.3	138.3	4.8
107	770.0	1.7	-141.0	62.4	68.2	5.1
108	780.0	1.8	88.0	44.6	51.3	6.3
109	790.0	1.8	151.0	22.4	90.9	7.4
110	800.0	1.8	112.0	16.7	100.0	6.9
111	810.0	1.8	43.0	69.1	97.9	7.1
112	820.0	1.9	116.0	26.6	100.8	7.3
113	830.0	1.8	-171.0	44.7	38.4	6.9
114	840.0	1.7	-171.0	70.7	146.7	3.6
115	850.0	1.8	-171.0	76.8	135.6	3.7
116	860.0	1.7	-123.0	38.1	106.3	3.3
117	870.0	1.7	147.0	23.8	146.8	3.5
118	880.0	1.7	-154.0	2.9	85.4	3.5
119	890.0	1.7	178.0	76.8	135.6	3.6
120	900.0	1.7	67.0	28.0	92.8	3.8
121	910.0	1.7	84.0	31.8	128.4	3.8
122	920.0	1.7	99.0	0	119.1	3.4
123	930.0	1.7	-177.0	-57.4	69.3	3.9
124	940.0	1.7	26.0	-3.8	46.7	4.3
125	950.0	1.7	31.0	8020.5	94.2	4.7
126	960.0	1.7	71.0	46.8	123.1	4.5
127	980.0	1.8	27.0	9.2	143.5	5.4

TABLE 14-19

HU82-031-TI3-P

PALEOMAGNETIC DATA

CASE-NO	DEPTH	WETWT	DECLIN	INCLIN	INTEN
1	10.0	1.5	180.0	78.0	38.9
2	15.0	1.4	-173.0	66.0	29.5
3	20.0	1.3	-121.0	81.0	33.7
4	25.0	1.4	-124.0	62.0	36.5
5	30.0	1.4	-130.0	77.0	33.5
6	35.0	1.3	-91.0	75.0	42.2
7	40.0	1.4	-0	-0	-0
8	45.0	1.3	-139.0	67.0	41.3
9	50.0	1.4	-157.0	72.0	45.6
10	55.0	1.4	-154.0	77.0	42.7
11	60.0	1.3	-164.0	66.0	38.5
12	65.0	1.3	-144.0	77.0	38.9
13	70.0	1.4	-169.0	71.0	49.0
14	75.0	1.3	-153.0	70.0	47.6
15	80.0	1.4	-146.0	69.0	48.3
16	85.0	1.4	-154.0	71.0	47.9
17	90.0	1.5	-166.0	67.0	53.2
18	95.0	1.4	-150.0	69.0	51.5
19	98.0	1.4	-141.0	63.0	34.5
20	105.0	1.4	-173.0	75.0	48.4
21	110.0	1.4	-160.0	71.0	49.8
22	115.0	1.4	-141.0	74.0	53.7
23	120.0	1.4	-153.0	73.0	45.7
24	125.0	1.4	-146.0	81.0	45.2
25	130.0	1.4	-178.0	66.0	33.6
26	135.0	1.4	-146.0	64.0	40.6
27	140.0	1.4	-177.0	72.0	42.1
28	145.0	1.4	128.0	76.0	45.0
29	150.0	1.3	-179.0	80.0	38.3
30	155.0	1.4	130.0	72.0	39.1
31	160.0	1.2	136.0	63.0	29.3
32	165.0	1.3	-138.0	81.0	42.7
33	170.0	1.4	-114.0	85.0	39.7
34	175.0	1.3	149.0	75.0	46.1
35	180.0	1.4	-125.0	83.0	53.7
36	185.0	1.4	-143.0	78.0	52.9
37	190.0	1.4	-126.0	83.0	52.6
38	195.0	1.4	-151.0	68.0	31.9
39	200.0	1.4	-114.0	75.0	27.8
40	205.0	1.5	-151.0	65.0	37.8
41	210.0	1.4	161.0	81.0	37.7
42	215.0	1.5	161.0	68.0	45.6
43	220.0	1.4	140.0	76.0	33.4
44	225.0	1.4	143.0	74.0	50.0
45	230.0	1.4	118.0	71.0	21.9
46	235.0	1.3	-177.0	64.0	29.4

DEPTH-Depth (cm)

WETWT-Unit Wet Weight (gm)

DECLIN -Declination (degrees)

INCLIN-Inclination (degrees)

INTEN-Intensity x 10-6 (emu/cc)

TABLE 14-19 CONT'D

HU82-031-TI3-P

PALEOMAGNETIC DATA CONT'D

CASE-N0	DEPTH	WETWT	DECLIN	INCLIN	INTEN
47	240.0	1.4	134.0	76.0	33.6
48	245.0	1.4	99.0	78.0	46.9
49	250.0	1.4	150.0	69.0	49.8
50	255.0	1.4	155.0	74.0	53.3
51	260.0	1.4	117.0	77.0	44.4
52	265.0	1.3	148.0	78.0	35.0
53	270.0	1.4	133.0	77.0	40.9
54	275.0	1.4	146.0	67.0	41.2
55	280.0	1.4	137.0	70.0	37.6
56	285.0	1.4	-164.0	80.0	43.8
57	290.0	1.4	142.0	73.0	44.8
58	295.0	1.1	177.0	51.0	30.5
59	300.0	1.5	132.0	74.0	46.2
60	305.0	1.5	156.0	72.0	56.7
61	310.0	1.4	142.0	73.0	51.7
62	315.0	1.5	157.0	73.0	41.5
63	320.0	1.5	126.0	80.0	37.5
64	330.0	1.5	148.0	85.0	41.4
65	335.0	1.5	147.0	74.0	60.4
66	340.0	1.5	151.0	79.0	58.5
67	345.0	1.5	164.0	81.0	56.4
68	350.0	1.5	141.0	81.0	62.0
69	355.0	1.5	-166.0	60.0	54.0
70	363.0	1.5	165.0	80.0	56.3
71	372.0	1.6	87.0	81.0	57.9
72	380.0	1.5	58.0	79.0	36.3
73	385.0	1.7	68.0	63.0	129.7
74	390.0	1.6	-10.0	75.0	45.5
75	395.0	1.6	50.0	79.0	77.6
76	400.0	1.6	75.0	78.0	18.9
77	405.0	1.6	74.0	72.0	14.9
78	410.0	1.7	27.0	63.0	92.4
79	415.0	1.6	50.0	79.0	52.5
80	420.0	1.7	106.0	68.0	44.4
81	425.0	1.6	16.0	14.0	72.5
82	430.0	1.7	103.0	34.0	89.8
83	435.0	1.5	58.0	87.0	46.1
84	440.0	1.7	29.0	65.0	46.9
85	445.0	1.6	46.0	85.0	78.5
86	450.0	1.6	33.0	85.0	63.2
87	455.0	1.6	5.0	78.0	48.4
88	460.0	1.6	-18.0	85.0	66.8
89	465.0	1.6	28.0	81.0	68.0
90	470.0	1.6	-15.0	85.0	60.1
91	475.0	1.3	2.0	17.0	80.1
92	480.0	1.6	31.0	22.0	106.9
93	485.0	1.6	-0	-0	-0
94	490.0	1.6	-10.0	63.0	42.9
95	495.0	1.6	112.0	47.0	52.4
96	500.0	1.6	68.0	25.0	70.4
97	506.0	1.8	143.0	39.0	59.2

HU82-031-TI3-P

TABLE 14-19 CONT'D

PALEOMAGNETIC DATA CONT'D

CASE-NO	DEPTH	WETWT	DECLIN	INCLIN	INTEN
98	520.0	1.6	147.0	71.0	42.6
99	525.0	1.5	162.0	46.0	47.8
100	533.0	1.6	156.0	42.0	50.1
101	545.0	1.6	139.0	55.0	59.3
102	550.0	1.5	79.0	46.0	46.9
103	555.0	1.5	87.0	44.0	36.8
104	560.0	1.3	95.0	45.0	47.2
105	570.0	1.6	-66.0	80.0	29.6
106	575.0	1.5	-103.0	64.0	52.5
107	580.0	1.6	-165.0	76.0	33.6
108	590.0	1.6	163.0	67.0	42.9
109	595.0	1.6	160.0	67.0	61.5
110	600.0	1.6	-175.0	75.0	55.5
111	605.0	1.6	-155.0	52.0	38.8
112	610.0	1.7	-139.0	73.0	41.9
113	615.0	1.7	115.0	83.0	55.1
114	620.0	1.6	56.0	82.0	38.8
115	630.0	1.6	150.0	72.0	36.4
116	635.0	1.7	167.0	81.0	29.2
117	640.0	1.6	-57.0	84.0	24.1
118	645.0	1.6	-129.0	69.0	24.2
119	650.0	1.7	-65.0	74.0	22.3
120	655.0	1.6	-131.0	63.0	24.7
121	660.0	1.6	-73.0	71.0	15.8
122	670.0	1.6	-63.0	60.0	16.6
123	680.0	1.6	-134.0	85.0	31.7
124	685.0	1.6	-89.0	81.0	26.8
125	690.0	1.7	-110.0	70.0	26.5
126	700.0	1.6	-115.0	50.0	33.2
127	705.0	1.6	-126.0	55.0	30.2
128	710.0	1.5	149.0	69.0	31.1
129	715.0	1.6	154.0	65.0	53.6
130	720.0	1.7	70.0	70.0	30.3
131	725.0	1.7	38.0	38.0	37.2
132	730.0	1.7	39.0	39.0	43.9
133	735.0	1.6	35.0	35.0	35.4
134	740.0	1.7	-47.0	79.0	29.5
135	745.0	1.7	-112.0	38.0	80.7
136	750.0	1.7	-176.0	29.0	100.2
137	755.0	1.7	-166.0	44.0	120.5
138	760.0	1.7	-141.0	55.0	125.8
139	765.0	1.7	-171.0	53.0	111.6
140	770.0	1.7	-142.0	72.0	120.1
141	775.0	1.9	-167.0	59.0	62.6
142	780.0	1.9	-175.0	49.0	76.7
143	785.0	1.9	159.0	40.0	103.1
144	790.0	1.7	44.0	45.0	26.3
145	795.0	1.8	154.0	-9.0	47.6
146	800.0	1.8	159.0	35.0	28.9

TABLE 14-19 CONT'D

PALEOMAGNETIC DATA CONT'D

CASE-NO	DEPTH	WETWT	DECLIN	INCLIN	INTEN
147	805.0	0	159.0	6.0	50.1
148	810.0	1.8	-148.0	13.0	23.6
149	830.0	1.9	-175.0	-11.0	6.2
150	840.0	1.9	150.0	-13.0	45.5
151	850.0	1.9	169.0	8.0	91.2
152	855.0	2.0	-159.0	14.0	99.9
153	860.0	2.1	-174.0	51.0	95.4
154	865.0	2.1	154.0	21.0	92.4
155	870.0	2.0	-165.0	38.0	54.8
156	875.0	2.0	-177.0	26.0	67.4
157	880.0	2.1	-162.0	40.0	46.9
158	885.0	1.8	180.0	54.0	25.3
159	910.0	1.6	178.0	69.0	30.9
160	920.0	1.7	155.0	70.0	20.2
161	925.0	1.6	-111.0	27.0	11.9
162	934.0	1.6	138.0	35.0	11.5
163	950.0	1.6	-134.0	27.0	14.2
164	960.0	1.6	-176.0	19.0	17.7
165	965.0	1.7	157.0	44.0	37.9
166	970.0	1.6	157.0	69.0	19.3
167	980.0	1.6	-61.0	54.0	21.9
168	985.0	1.7	-124.0	58.0	10.6
169	990.0	1.6	-120.0	53.0	14.8
170	995.0	1.6	173.0	11.0	12.7
171	1000.0	1.6	159.0	32.0	14.6
172	1005.0	1.7	-147.0	21.0	11.2
173	1010.0	1.6	-68.0	17.0	15.1
174	1015.0	1.7	156.0	63.0	25.5
175	1020.0	1.6	-172.0	60.0	26.2
176	1025.0	1.6	-161.0	17.0	27.9
177	1030.0	1.6	-174.0	30.0	29.1
178	1040.0	1.6	-175.0	38.0	13.6
179	1045.0	1.7	143.0	56.0	13.9
180	1050.0	1.6	70.0	63.0	21.1
181	1055.0	1.6	3.0	69.0	28.5
182	1060.0	1.6	1.0	17.0	15.7
183	1065.0	1.4	-85.0	5.0	12.6
184	1070.0	1.6	-100.0	12.0	8.9
185	1075.0	1.6	-105.0	19.0	8.4

TABLE 14-20

MOISTURE CONTENT CORE CL-5

Laboratory Number	Field Data		% Moisture	% Organic Matter	% Carbonate
GRL - 4301	CL-5	2 - 7cm.	24.92		
- 4302	-5	27 - 29cm.	43.08		
- 4303	-5	45 - 48cm.	52.06		
- 4304	-5	55 - 59cm.	66.01		
- 4305	-5	61 - 66cm.	26.15		
- 4306	-5	71 - 78cm.	58.40		
- 4307	-5	83 - 92cm.	52.65		
GRL - 4308	CL-5	95 - 101cm.	57.39		
- 4309	-5	107 - 114cm.	54.05		
- 4310	-5	119 - 128cm.	55.60		
- 4311	-5	150 - 155cm.	57.14		
- 4312	-5	164 - 167cm.	57.54		
- 4290 [GRL-595-0]*	-5 #1	167 - 185cm.		0.99	3.4
- 4313	-5	183 - 190cm.	55.01		
GRL - 4314	CL-5	195 - 202cm.	52.75		
- 4315	-5	209 - 216cm.	37.29		
- 4316	-5	223 - 231cm.	48.79		
- 4317	-5	234 - 246cm.	53.93		
- 4318	-5	269 - 276cm.	57.23		
- 4319	-5	285 - 292cm.	55.58		
- 4320	-5	308 - 315cm.	56.24		
GRL - 4321	CL-5	319 - 328cm.	68.27		
- 4291 [GRL-596-0]*	-5 #2	375 - 403cm.		0.76	2.9
- 4322	-5	377 - 385cm.	64.43		
- 4323	-5	400 - 410cm.	58.32		
- 4292 [GRL-597-0]*	-5 #3	410 - 440cm.		0.69	1.0
- 4324	-5	442 - 450cm.	65.24		
- 4325	-5	450 - 460cm.	63.10		
GRL - 4326	CL-5	500 - 510cm.	52.10		
- 4327	-5	550 - 560cm.	53.03		
- 4328	-5	600 - 610cm.	56.80		
- 4329	-5	650 - 660cm.	53.01		
- 4330	-5	690 - 696cm.	47.11		
- 4331	-5	750 - 756cm.	43.58		
- 4332	-5	768 - 776cm.	43.43		
GRL - 4333	CL-5	800 - 805cm.	39.80		
- 4334	-5	825 - 833cm.	38.80		
- 4335	-5	840 - 850cm.	52.05		
- 4336	-5	900 - 905cm.	51.62		
- 4337	-5	950 - 957cm.	48.46 (48.53)[1] (48.66)[2]		
- 4293 [GRL-598-0]	-5 #4	957 - 986cm.		0.47	0.8

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* Separate Sample Material Submitted For Radiocarbon Dating Preparation. Representative Material Obtained (Riffle Sampler Method) For Sediment Analyses.

[1] First Duplicate Test Sample Taken At Time Of Test.

[2] Second Duplicate Test Sample Taken At Time Of Test.

TABLE 14-20

MOISTURE CONTENT FOR CORE SU-5

Laboratory Number	Field Data		% Moisture	% Organic Matter	% Carbonate
GRL - 4338	SU-5	15 - 23cm	112.36		
- 4339	-5	40 - 50cm.	101.87		
- 4340	-5	60 - 68cm.	97.72		
- 4341	-5	80 - 89cm.	91.58		
- 4342	-5	99 - 107cm.	83.31		
- 4343	-5	120 - 130cm.	76.33		
- 4344	-5	140 - 150cm.	67.36		
GRL - 4345	SU-5	157 - 167cm	51.97		
- 4346	-5	180 - 187cm.	51.17		
- 4347	-5	200 - 207cm.	41.30		
- 4348	-5	220 - 227cm.	38.51		
- 4349	-5	240 - 247cm.	35.95		
- 4350	-5	260 - 267cm.	41.56		
- 4351	-5	290 - 297cm.	44.49		
GRL - 4352	SU-5	317 - 326cm.	43.96		
- 4294 [GRL-599-0]*	-5 #1	327 - 358cm.		0.89	6.3
- 4353	-5	370 - 379cm.	40.56		
- 4354	-5	400 - 407cm.	45.04		
- 4355	-5	420 - 427cm.	47.08		
- 4356	-5	440 - 447cm.	45.79		
- 4357	-5	463 - 470cm.	45.75		
GRL - 4358	SU-5	480 - 487cm.	40.37		
- 4359	-5	500 - 511cm.	42.53		
- 4360	-5	520 - 527cm.	45.48		
- 4361	-5	540 - 547cm.	44.01		
- 4362	-5	560 - 570cm.	34.58		
- 4401 **	-5	571cm.			
- 4363	-5	580 - 588cm.	40.78		
GRL - 4364	SU-5	594 - 601cm.	35.13		
- 4402 **	-5	609cm.			
- 4403 **	-5	613cm.			
- 4365	-5	617 - 627cm.	40.74		
- 4366	-5	650 - 657cm.	63.65		
- 4295 [GRL-600-0]*	-5 #2	660 - 684cm.		2.20	2.9
- 4367	-5	685 - 695cm.	43.89		
GRL - 4368	SU-5	705 - 715cm.	56.18		
- 4369	-5	720 - 730cm.	43.80		
- 4370	-5	740 - 750cm.	44.74		
- 4371	-5	760 - 767cm.	38.29		

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* Separate Sample Material Submitted For Radiocarbon Dating Preparation. Representative Material Obtained (Riffle Sampler Method) For Sediment Analyses.

** Paleomagnetic Cube Material For Bulk Density Data And Sediment Analyses.

Sampling Note

GRL - 4367	One Pebble	c. 16 - 8mm. - Not Included In Moisture Test.
GRL - 4369	One Granule	c. 4 - 2mm. - Not Included In Moisture Test

TABLE 14-20

MOISTURE CONTENT FOR CORE CO-4

Laboratory Number	Field Data		% Moisture	% Organic Matter	% Carbonate
GRL - 4372	CO-4	5 - 12cm.	85.72		
- 4404 **	-4	23cm.			
- 4373	-4	50 - 59cm.	93.09		
- 4374	-4	100 - 107cm.	90.04		
- 4375	-4	150 - 157cm.	97.50		
- 4376	-4	180 - 187cm.	78.54		
- 4377	-4	210 - 217cm.	84.07		
GRL - 4405 **	CO-4	245cm.			
- 4406 **	-4	280cm.			
- 4378	-4	282 - 290cm.	43.05		
- 4407 **	-4	305cm.			
- 4379	-4	315 - 322cm.	42.99		
- 4380	-4	330 - 339cm.	39.69		
- 4381	-4	380 - 388cm.	39.40		
GRL - 4382	CO-4	425 - 434cm.	39.35		
- 4383	-4	462 - 471cm.	37.25		
- 4384	-4	480 - 487cm.	29.82		
- 4385	-4	530 - 537cm.	29.39		
- 4386	-4	560 - 567cm.	29.94		
- 4387	-4	580 - 587cm.	29.84		
- 4296 [GRL-601-0]*	-4	590 - 615cm.		0.33	0.6
GRL - 4388	CO-4	600 - 607cm.	33.38		
- 4389	-4	616 - 624cm.	35.17		
- 4390	-4	630 - 637cm.	34.42		
- 4391	-4	670 - 677cm.	36.92		
- 4392	-4	700 - 707cm.	33.67		
- 4393	-4	750 - 757cm.	30.90		
- 4394	-4	790 - 797cm.	29.50		
GRL - 4395	CO-4	825 - 833cm.	23.83 (23.96)[1]		
- 4396	-4	848 - 858cm.	24.30		
- 4397	-4	919 - 926cm.	25.44		
- 4398	-4	939 - 946cm.	23.86		
- 4399	-4	977 - 985cm.	25.69		
- 4400	-4	1024 - 1032cm.	31.16		

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* Separate Sample Material Submitted For Radiocarbon Dating Preparation. Representative Material Obtained (Riffle Sampler Method) For Sediment Analyses.

** Paleomagnetic Cube Material For Bulk Density Data And Sediment Analyses.

[1] Kravitz Moisture Procedure Demonstration [19 Jan. 83]

TABLE 14-20

MOISTURE CONTENT FOR CORE TI-3

Laboratory Number		Field Data		
GRL - 4408		TI-3		0 - 5cm.
- 4409		-3		58 - 63cm.
- 4410		-3		96 - 104cm.
- 4411		-3		158 - 163cm.
- 4412		-3		196 - 202cm.
- 4413		-3		257 - 262cm.
- 4414		-3		297 - 303cm.
GRL - 4297	[GRL-602-0]*	TI-3	#1	364 - 384cm.
- 4415		-3		398 - 403cm.
- 4416		-3		447 - 452cm.
- 4417		-3		485 - 491cm.
- 4418		-3		524 - 526cm.
- 4419		-3		558 - 560cm.
- 4420		-3		597 - 599cm.
GRL - 4421		TI-3		670 - 673cm.
- 4422		-3		708 - 710cm.
- 4423		-3		748 - 750cm.
- 4424		-3		788 - 790cm.
- 4298	[GRL-603-0]*	-3	#2	819 - 842cm.
- 4425		-3		878 - 880cm.
- 4426		-3		929 - 932cm.
GRL - 4427		TI-3		968 - 976cm.
- 4428		-3		1007 - 1010cm.
- 4429		-3		1047 - 1049cm.
- 4299	[GRL-604-0]*	-3	#3	1077 - 1108cm.

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* Separate Sample Material Submitted For Radiocarbon Dating Preparation. Representative Material Obtained (Riffle Sampler Method) For Sediment Analyses.

Late Quaternary Marine Environments of Northeastern Baffin Island: A Shelf/Slope Transect

Master of Science Research Proposed by Anne E. Jennings

Three piston cores (HU82-031-CL5, HU78-029-24, and HU76-023-26) constituting a transect of fiord and continental shelf environments are being studied to elucidate the glacial and oceanographic history of northeastern Baffin Island. Previous studies in this area indicate that the last glacial advance occured approximately 36,000 years B.P. as well as a significant neoglacial advance. However, others contend that glacier ice was grounded to the continental shelf at 18,000 years B.P. Detailed study of these three piston cores will resolve the question of ice extent. Analysis of downcore changes in texture, chemistry, mineralogy, foraminiferal assemblages and paleomagnetic variations is in progress. Physical evidence derived from these downcore analyses in conjunction with available radiocarbon dates will be used to correlate the cores. Once the cores are correlated, sedimentologic and paleoecologic interpretations can be made along the transect, thus generating an understanding of the response of fiord and continental shelf environments to glacial/interglacial oscillations.

MASTERS THESIS PROPOSAL BY KERSTIN WILLIAMS

LATE QUATERNARY DIATOM ASSEMBLAGES FROM BAFFIN BAY/DAVIS STRAIT.

Little work has been done on recent and fossil marine diatom assemblages from the Canadian Arctic. Numerous investigations in other areas, notably the North Pacific (i.e. Sancetta, 1981) and the Antarctic region, show that diatoms are potentially powerful stratigraphic tools, which can also be used in paleoclimatic and oceanographic reconstructions.

Also, diatoms are sensitive indicators of sudden changes in water chemistry and thus can help to assess different levels of water pollution (Bradbury and Megard, 1972). This could be an interesting and fruitful field of study because the shelves of Baffin Island and Greenland are suspected sources of hydrocarbons.

The study will be divided into two parts. The first part will investigate the present geographical boundaries and environmental limits of the Baffin Bay/Davis Strait region, as reflected in the diatom composition of the ocean bottom surface sediments. For this purpose ca 70 samples are presently available, and it is possible that many more can be obtained from the middle, deep sections of Baffin Bay/Davis Strait. About 1/3 of the available samples have already been analyzed. The preliminary results show that the diatoms do indeed reflect changes in oceanographic variables such as salinity, ice-cover duration and temperature.

The second part deals with plankton samples (diatoms) from Clark Fjord, Baffin Island. Samples from 5 stations have been provided by the Bedford Institute of Oceanography. Of these, 9 - 10 samples were taken at each station at varying water depths from near surface down to 400 - 600 m. Complete water-chemistry analyses are available for each sample location in the water column. This is a unique opportunity to correlate species distribution in the water column with water parameters. In addition, grab-samples or core tops are available from these stations, and these will make it possible to compare living floral assemblages with the thanatocoenoses.

These studies are essential for my future research in interpreting the changes in diatom assemblages in long marine cores from the Baffin Island shelf areas, with respect to paleoclimatic and paleooceanographic fluctuations during the late Quaternary.

REFERENCES

Bradbury, J.P., and Megard, R.O., 1973, A stratigraphic record of pollution in Shagawa Lake, norheastern Minnesota: Geol. Soc. America Bull., v.83 p.2639 - 2648.

Sancetta, C., 1981, Oceanographic and ecologic significance of diatoms in surface sediments of the Bering and Okhotsk seas: Deep-Sea Research, vol. 28A, No.8, p789 - 817.

TABLE 14-21

McBETH I Location $69^{o}31.9'N$
$69^{o}47.5'W$

Depth	Declination		Inclination	Intensity	Declination		Inclination
(cm)	Reading	Rotated			Reading	Rotated	
2	153.1		59.9	53.3	126.8		74.9
5	234.3		81.5	12.6	234.6		44.1
8	193.0		70.5	26.6	288.3		85.3
11	218.6		45.5	23.9	256.7		56.1
14	196.4		64.3	26.3	234.1		77.6
17	203.5		79.5	28.8	285.5		85.6
20	156.2		76.6	31.5	332.1		77.2
23	183.3		75.7	25.2	220.0		85.4
26	155.2		70.1	31.9	151.7		77.0
29	168.2		64.4	35.3	164.1		73.0
32	139.2		66.4	69.7	133.1		66.9
35	127.7		44.1	81.7	124.1		38.9
38	142.6		6.5	52.1	108.8		22.1
41	111.3		68.2	37.4	72.5		67.9
44	147.6		80.7	25.3	39.2		84.3
47	62.0		77.8	44.9	43.2		67.4
50	132.0		75.2	28.2	87.4		79.3
53	99.9		69.9	30.2	61.7		66.8
56	151.2		64.3	30.3	144.9		71
59	157.4		71.0	38.4	138.8		86.1
62	154.4		73.9	42.2	156.3		78.7
65	171.9		68.4	35.7	165.5		71.5
68	172.8		71.4	39.9	174.5		76.5
71	161.1		63.6	37.5	154.3		76.5
74	167.7		58.0	41.8	166.4		67.0
77	163.6		19.4	31.4	164.4		32.2
80	352.2	157	54.5	29.0	-	-	-
83	292.1	124	74.2	39.0	317.4	149	69.2
86	269.9	96	79.6	47.7	297	124	76.7
89	315.2	147	79.0	26.3	355	168	50.7
92	86.7	278	81.7	34.2	30.4	222	77.1
95	36.3	228	79.5	36.8	14.7	206	66.0
98	43.3	235	83.3	45.8	358.8	190	71.3
101	2.6	194	80.4	39.8	349.7	181	75.3
104	19.4	211	86.9	44.8	354.5	186	77.9
107	10.6	202	82.9	40.4	345.5	177	73.9
110	337.4	169	83.7	37.9	341.7	173	70.5
113	346.6	178	80.2	42.1	346.6	178	73.6
116	351.9	183	82.2	44.0	343.3	175	75.5
119	337.6	189	83.7	42.3	357.7	189	77.4
122	326.9	158	86.5	49.2	316.8	148	83.3
125	345.1	177	81.6	42.3	-	-	-
128	256.8	88	85.8	37.5	305.9	137	81.6
131	335.6	167	77.9	32.7	338.5	170	66.9
134	338.9	170	83.1	38.1	341.6	173	72.8
137	169.8	1	84.6	28.2	345.2	177	81.6
140	322.8	154	84.4	32.1	341.1	173	75.2
143	353.2	185	81.3	39.1	350.5	182	72.3

TABLE 14-21 Continued
McBETH I Continued

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
146	317.3	149	84.4	33.7	343.6	175	73.8
149	328.8	160	87.8	39.8	352.6	184	78.6
152	310.2	142	83.6	32.9	332.6	164	76.4
155	287.7	119	75.8	69.5	292.9	124	74.4
158	290.2	122	62.9	67.5	292.2	124	58.5
161	301.2	133	75.8	79.1	309.7	141	71.7
164	276.7	108	76.8	66.6	288.8	120	73.9
167	261.1	93	74.6	57.3	278.9	110	71.9
170	310.3	142	66.8	48.1	313.3	145	59.3
173	225.5	57	62.7	55.8	235.1	67	56.6
176	227.9	59	56.7	77.1	234.5	66	52.7
180	224.4	56	48.8	75.3	-	-	-
183	270.9	102	83.8	56.0	304.2	136	82.2
186	314.5	146	53.6	80.1	324.3	156	42.3
189	321.0	153	77.9	34.9	324.3	156	69.8
192	325.4	157	83.9	40.4	336.3	168	75.3
195	342.8	174	79.3	38.4	350.7	182	71.2
198	335.4	167	81.3	31.8	351.6	183	73.1
201	31.1	223	81.8	22.9	26.8	218	78.3
204	269.3	101	71.3	24.8	-	-	-
207	336.4	168	79.7	30.7	349.5	181	74.4
210	286.0	118	83.3	32.2	-	-	-
213	314.3	146	80.0	25.4	327.7	159	76.5
216	10.6	202	85.1	38.9	35.4	227	82.3
219	208.9	40	85.8	28.1	359.4	191	83.3
222	254.1	86	77.6	23.4	241.2	73	75.8
225	349.7	181	88.1	29.3	349.8	181	83.2
228	183.1	196	72.4	31.6	176.6	189	76.7
231	174.9	187	71.4	42.8	266.0	279	70.2
234	249.1	262	73.3	74.6	142.3	155	81.0
237	142.3	155	81.5	36.3	180.9	193	69.6
240	203.2	216	80.7	21.1	219.2	232	82.3
243	172.3	185	68.1	25.4	210.7	223	73.7
246	200.2	213	73.5	19.4	202.1	215	75.4
249	195.7	208	72.9	25.6	237.5	250	63.3
252	229.8	242	69.6	28.3	227.5	240	65.3
255	214.6	227	67.0	25.8	250.1	263	69.4
258	220.4	233	69.6	22.1	231.1	244	71.3
261	219.2	232	75.6	18.2	194.1	207	70.7
264	195.6	108	71.6	24.1	241.1	254	62.6
267	208.5	221	72.3	86.8	222.1	235	71.7
270	194.0	207	74.8	23.6	212.2	225	68.6
273	203.7	216	74.8	19.6	219.4	232	65.8
276	173.3	186	65.9	24.4	185.7	198	65.8
279	184.6	197	64.4	27.5	156.2	169	50.6
282	210.7	223	64.4	21.8	227.4	240	75.4
285	200.6	213	62.9	16.3	82.6	95	81.1
288	213.1	226	70.1	18.7	208.1	221	74.9

TABLE 14-21 CONTINUED

McBETH I Continued

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
291	214.0	227	63.6	20.6	221.3	234	72.1
294	218.4	231	69.2	20.2	-	-	-
297	212.2	225	71.4	21.1	223.4	236	72.0
300	194.7	207	70.6	27.9	201.9	214	70.6
303	193.3	206	68.6	25.5	198.2	211	72.9
306	205.7	218	67.9	25.3	224.3	237	74.9
309	217.4	230	69.1	35.9	220.4	233	76.4
312	207.7	220	69.1	28.2	229.1	242	73.6
315	198.4	211	65.2	29.0	210.9	223	66.9
318	213.7	226	68.6	26.8	-	-	-
324	203.6	216	62.3	25.3	-	-	-
327	206.1	219	67.4	28.6	233.8	246	68.1
330	189.2	202	64.1	28.2	52.6	65	-61.3
333	186.5	199	64.5	25.2	214.6	227	65.4
336	154.3	167	74.9	54.2	233.9	246	67.6
339	153.4	166	49.1	108.2	208.7	221	65.8
342	198.1	211	75.0	31.4	193.3	206	67.4
345	245.2	258	64.8	17.3	140.3	153	80.7
348	5.7	18	79.2	27.7	133.4	146	33.8
351	11.9	25	84.8	26.7	269.9	282	58.4
354	5.1	18	87.3	36.5	358.5	11	72.9
357	346.8	0	69.6	58.7	343.5	356	75.5
360	117.9	130	84.2	21.9	337.5	350	78.6
366	33.4	46	81.0	23.4	5.9	18	59.4
369	64.6	77	84.6	26.4	3.1	16	79.6
372	83.6	96	81.6	20.7	4.2	17	76.4
378	54.2	67	81.2	21.9	102.6	115	88.2
382	150.8	233	76.7	20.4	142.3	225	77.8
385	124.8	211	77.3	23.2	-	-	-
388	151.7	238	65.9	17.5	-	-	-
391	6.6	89	74.4	48.7	357.5	80	58.8
394	57.9	141	80.8	19.9	17.1	100	75.5
397	76.3	159	78.7	20.6	38.7	121	73.2
400	111.4	194	81.8	18.7	73.7	156	84.1
403	149.6	232	85.8	27.0	340.6	63	84.0
406	120.2	203	78.8	16.3	39.1	122	82.2
409	96.7	179	86.4	28.1	49.5	132	83.2
412	114.4	197	84.4	28.9	29.1	112	79.1
415	87.8	170	84.2	25.9	29.3	112	78.8
418	150.5	233	81.4	33.8	59.3	142	86.5
421	106.4	189	82.3	26.7	57.4	140	80.4
424	90.3	173	78.1	27.5	72.8	155	76.0
427	34.1	117	66.1	45.2	26.2	109	58.6
430	128.9	211	78.7	53.1	92.4	175	77.8
433	100.4	183	77.4	31.9	81.1	164	74.8
436	94.4	177	77.0	49.9	69.4	152	71.5
439	72.5	155	80.6	25.9	55.9	139	70.3
442	77.8	160	76.9	31.3	56.0	139	77.3
445	79.6	162	79.1	35.3	60.6	143	75.0
448	104.3	187	76.4	29.2	-	-	-

TABLE 14-21 CONTINUED

McBETH I Continued

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
451	99.9	183	84.4	32.2	-	-	-
454	78.1	161	83.9	30.9	40.4	123	80.2
457	98.9	181	83.8	30.4	18.9	101	79.6
460	83.4	166	81.6	32.2	42.7	125	77.1
463	83.9	166	83.9	28.8	41.6	124	80.4
466	127.8	210	83.2	26.8	32.5	115	86.1
469	102.4	185	80.3	29.3	59.5	142	78.1
472	67.1	150	85.6	33.8	40.2	123	76.5
475	81.8	164	79.6	31.8	47.8	130	72.6
478	71.2	154	81.2	30.6	46.0	129	71.7
481	72.8	155	78.6	34.4	56.0	139	74.3
484	83.6	166	80.4	32.5	54.9	138	76.4
487	63.7	146	79.9	28.1	-	-	-
490	30.1	113	82.2	32.7	2.1	85	71.1
493	52.7	135	81.0	35.1	21.2	105	73.6
496	38.4	121	82.5	35.6	29.3	112	77.6
499	6.1	89	79.7	62.4	357.8	80	73.4
502	313.8	36	71.5	71.2	306.0	29	65.5
505	20.2	103	83.6	42.8	17.1	100	74.2
508	34.6	117	85.2	26.3	14.7	97	76.3
511	27.4	110	80.8	31.2	-	-	-
514	26.7	109	79.6	29.9	27.2	110	73.8
517	73.1	156	83.6	28.7	34.7	117	80.9
520	36.8	119	83.3	27.4	9.1	92	75.3
523	26.1	109	82.4	22.4	16.9	100	76.9
526	35.8	118	81.9	26.4	2.8	85	73.6
529	24.8	107	81.2	26.9	14.5	97	71.9
532	42.8	125	78.6	33.2	19.9	103	69.7
535	120.8	27	85.9	25.3	19.6	103	75.0
538	232.6	139	79.2	22.0	269.6	176	82.9
541	215.6	122	79.0	25.8	267.9	174	81.5
544	215.4	122	80.5	29.9	267.5	174	82.9
547	203.9	110	75.4	24.9	224.4	131	82.7
550	205.2	112	75.7	36.6	221.3	128	79.8
553	207.8	114	78.7	42.1	227.3	134	81.6
556	203.1	110	77.5	36.6	235.5	142	84.3
559	196.6	103	78.7	59.5	205.9	112	84.7
562	225.8	132	78.7	33.1	279.7	186	84.1
565	204.1	111	76.3	43.3	214.1	121	83.2
568	208.6	115	79.3	45.1	230.4	137	83.9
571	215.1	122	77.3	36.8	227.6	134	81.5
574	222.4	129	77.7	40.9	260.6	167	82.2
577	222.8	129	77.9	38.8	257.2	164	79.0
580	211.8	118	80.8	37.8	262.2	169	83.1
583	228.4	135	80.3	35.3	256.7	163	81.1
586	230.8	137	82.2	37.7	277.4	184	84.5
589	255.5	162	82.6	41.7	296.8	203	81.6
592	234.6	141	82.8	40.2	308.8	215	83.3
595	232.6	139	82.4	42.8	296.3	203	82.7

TABLE 14-21 CONTINUED

McBETH I Continued

Depth	Declination Reading	Declination Rotated	Inclination	Intensity	Declination Reading	Declination Rotated	Inclination
598	223.4	130	81.8	33.9	287.6	194	85.8
601	222.8	129	82.1	33.4	286.1	193	84.6
604	226.8	133	83.0	34.6	267.7	174	84.9
607	265.2	172	82.3	29.9	294.4	201	82.7
610	251.5	158	82.4	31.5	275.9	182	80.9
613	248.1	155	79.9	28.8	264.6	171	79.6
616	275.1	182	77.5	31.8	283.5	190	76.3
619	275.2	182	81.0	28.3	304.0	211	80.5
622	265.5	172	78.7	64.7	274.5	181	81.9
625	288.3	195	74.5	24.1	321.8	288	77.3
628	275.2	182	75.1	24.3	285.1	192	77.0
631	232.8	139	77.8	28.3	290.5	197	82.1
634	266.4	173	76.5	27.2	296.7	203	77.4
637	245.7	150	70.1	35.9	267.4	174	70.6
640	253.9	160	75.8	61.1	389.6	196	77.2
643	251.1	158	76.5	71.6	287.3	194	77.7
646	233.4	140	72.6	38.7	260.9	167	75.7
649	244.1	151	73.4	44.5	279.4	186	73.8
652	279.7	186	76.8	52.8	292.4	199	76.4
655	260.0	167	76.3	83.9	284.2	191	77.3
658	283.6	190	68.3	66.8	295.7	202	67.7
661	265.2	172	72.5	47.4	277.8	184	72.8
664	282.4	189	63.2	123.9	280.8	187	59.8
667	235.0	142	66.6	68.1	252.7	159	70.4
670	288.6	195	77.9	43.2	305.6	212	73.3
673	241.6	148	81.8	78.3	242.4	149	83.2
676	259.5	166	72.8	79.0	288.5	195	70.9
679	273.8	180	74.2	25.1	289.9	196	70.4
682	257.5	164	63.1	92.9	257.9	164	61.1
685	275.5	182	68.5	138.9	278.6	185	69.0
688	345.5	252	72.9	142.7	344.3	251	68.9
691	1.9	269	55.0	71.9	1.8	269	45.9
694	106.9	129	74.1	67.3	91.7	114	71.1
697	103.9	126	73.6	82.1	86.8	110	70.9
700	116.4	139	65.8	130.1	103.8	126	65.3
703	128.5	151	74.3	117.67	128.5	151	73.8
706	151.7	174	69.7	110.8	151.5	174	68.7
709	169.9	192	72.9	88.1	162.1	185	76.6
712	251.4	274	82.6	50.0	262.0	285	85.2
715	218.7	241	72.3	50.0	224.3	247	72.4
718	225.4	248	65.3	74.2	230.1	253	63.6
721	233.6	256	79.3	102.9	249.5	272	81.1
724	188.3	211	80.9	101.7	185.7	208	80.5
727	203.3	226	73.9	118.1	209.2	232	73.8
730	175.4	198	63.3	113.2	173.8	196	61.2
733	160.1	183	57.8	127.5	162.7	185	55.7
736	149.9	173	45.5	232.3	150.6	173	44.0
739	280.7	303	76.7	87.1	284.9	307	74.3
742	185.1	208	74.4	23.1	210.3	233	81.5
745	190.5	213	81.1	49.3	169.8	192	83.9

TABLE 14-21 CONTINUED

McBETH I Continued

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
748	194.6	217	76.3	19.3	214.1	237	78.6
751	176.3	199	67.4	78.6	159.1	182	55.1
754	239.4	262	82.5	21.4	208.9	231	79.9
757	195.7	218	73.9	18.1	214.9	237	79.9
760	195.2	218	79.1	16.4	252.6	275	86.7
763	195.2	218	77.9	33.9	210.9	233	80.9
766	169.9	192	74.1	82.6	160.8	283	74.7
769	186.5	209	68.6	19.9	196.7	119	74.4
772	193.3	216	82.3	21.0	233.2	256	82.5
775	184.7	207	76.2	24.9	221.1	244	83.9
778	186.4	209	72.9	25.2	200.1	223	76.4
781	202.6	225	78.6	50.3	211.6	234	79.0
784	194.7	217	75.9	33.7	-	-	-
787	191.9	214	76.4	42.6	196.9	119	78.9
790	183.7	206	79.8	29.6	191.7	214	75.9
793	180.5	203	70.3	29.2	184.2	207	74.1
796	203.3	226	80.4	38.5	234.0	257	80.6
799	199.9	223	79.5	25.6	229.3	252	79.9
802	189.4	212	76.2	26.5	200.7	223	79.8
805	184.3	207	79.7	24.3	205.2	228	80.1
808	185.7	208	74.4	35.8	194.6	219	76.8
811	197.3	220	75.2	61.7	217.5	240	79.4
814	168.5	191	70.3	71.8	171.4	294	72.2
817	185.6	208	79.1	29.8	218.3	241	76.3
820	185.9	208	75.2	25.4	197.1	220	78.3
823	184.3	207	79.2	27.6	206.2	229	84.6
826	191.7	214	72.9	27.8	204.0	227	80.7
829	186.8	210	74.1	30.9	190.7	213	77.7
832	184.8	207	79.4	39.6	188.6	211	77.4
835	194.9	217	76.9	25.9	209.8	232	81.3
838	191.8	214	73.8	29.9	197.9	220	80.0
844	335.9	220	64.6	6.7	355.1	240	56.6
847	311.6	196	77.1	10.8	335.5	220	66.0
850	294.5	181	66.8	6.6	330.1	215	49.9
856	318.9	203	62.6	5.6	330.1	215	52.2
859	336.4	221	51.5	20.9	333.2	218	63.6
862	341.6	226	65.0	26.9	344.9	229	53.2
865	346.9	231	61.3	35.0	348.2	233	52.2
868	347.6	232	50.1	46.0	351.2	236	66.8
871	348.7	233	69.1	48.9	333.5	218	65.8
874	340.2	225	68.8	19.3	341.5	226	61.2
877	357.5	242	78.3	17.6	344.3	229	71.6
880	5.1	250	67.4	70.9	7.0	252	61.7
883	58.4	303	77.1	72.2	52.7	297	68.9
886	324.8	209	78.6	86.1	321.2	206	75.4
889	274.9	159	56.8	97.1	273.1	158	50.0
892	302.3	187	49.1	90.3	299.8	184	38.6
895	298.5	183	54.7	86.7	300.7	185	45.7
898	287.8	172	53.9	90.3	288	173	44.4

McBETH I Continued

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
901	252.8	137	63.9	76.1	252.6	137	57.4
904	237.1	122	61.9	78.8	240.5	125	55.7
907	140.6	25	27.3	90.3	139.9	24	21.6
910	159.7	44	55.3	46.4	166.4	51	57.9
913	159.3	44	56.7	31.5	187.4	72	71.5
916	200.8	85	23.1	78.2	208.1	93	22.8
919	189.8	74	40.1	53.1	199.4	84	49.3
922	109.8	-6	64.4	113.6	94.9	339	66.8
925	292.8	177	44.9	200.3	297.9	182	41.7
928	330.8	215	33.3	127.3	329.1	214	29.9
931	320.5	205	30.3	44.1	326.3	211	22.7
934	8.1	250	45.5	13.5	0.4	245	42.2
937	350.1	235	71.7	39.8	354.9	239	63.6
940	356.8	241	70.2	42.7	359.6	244	66.5
943	359.6	244	65.9	29.5	0.6	245	61.2
946	352.2	237	66.2	34.1	351.1	236	60.9
949	352.9	237	72.5	29.6	347.1	232	64.7
952	4.3	249	67.8	28.2	3.9	248	61.7
955	1.0	246	62.0	27.5	358.4	243	54.8
958	355.0	240	67.9	27.8	347.4	232	61.4
961	4.8	249	78.5	28.0	4.3	249	71.8
964	0.1	245	77.4	26.7	356.2	241	74.1
967	1.3	246	72.1	24.1	3.4	248	64.4

TABLE 14-22

McBETH 7 Location 69°37'50"N
68°16'00"W

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
2	180.0		-10.8	21.7	191.6		-19.4
5	179.0		36.1	37.3	184.0		44.3
8	170.0		57.2	37.2	176.1		63.0
11	186.1		64.5	44.6	202.5		71.3
14	223.2		85.2	36.5	293.5		78.8
17	337.5		89.6	43.8	335.2		81.8
20	142.1		86.4	38.3	23.0		86.1
23	76.1		81.6	47.4	37.8		81.4
26	113.0		85.0	47.0	52.4		81.3
29	39.9		83.3	48.9	14.3		79.8
32	102.2		84.9	46.7	27.6		84.1
35	117.1		78.7	51.2	93.8		80.6
38	63.2		79.1	49.1	35.9		76.0
41	91.9		80.1	58.8	60.1		79.5
44	138.7		79.7	46.9	102.4		85.7
47	64.1		76.0	55.1	34.9		73.5
50	110.7		78.5	48.8	62.7		80.7
53	76.9		78.4	45.6	46.7		75.5
56	77.4		77.8	39.9	52.6		78.8
59	46.7		74.7	42.8	23.5		69.5
62	73.0		74.8	43.6	52.1		73.2
65	87.6		74.9	40.4	50.9		77.5
68	59.5		80.6	49.1	28.4		77.1
71	73.4		83.6	50.2	28.1		79.8
74	40.6		81.6	46.6	3.1		76.5
77	40.5		79.9	45.4	4.9		72.5
80	63.8		85.3	54.1	-	-	-
83	73.2		84.9	54.5	2.7		78.1
86	54.4		80.6	56.1	18.4		74.5
89	87.9		83.2	62.5	22.8		80.9
92	130.3		79.5	64.6	82.7		85.4
95	170.1		81.5	79.9	300.5		86.4
98	56.2		76.9	59.7	32.0		73.2
101	314.9	59	70.7	57.0	-	-	-
104	312.2	57	75.9	52.3	323.7	68	66.4
107	306.9	51	74.7	55.1	306.6	51	66.2
110	271.1	16	78.7	56.8	297.4	42	73.9
113	267.3	12	79.6	65.4	297.7	42	74.2
116	281.4	26	80.2	55.9	302.0	47	73.5
119	298.8	43	76.3	58.3	312.7	57	68.3
122	313.0	58	73.2	77.9	327.5	72	70.3
125	289.2	34	81.9	62.3	316.8	61	72.7
128	327.2	72	81.1	56.1	326.5	71	73.6
131	274.9	19	82.7	51.7	309.4	54	73.7
134	346.0	91	81.5	50.5	343.5	88	72.1
137	345.1	90	82.7	67.1	337.6	82	74.1
140	354.0	99	79.5	46.9	339.7	84	71.3
143	359.6	105	74.9	52.5	347.9	92	66.5

TABLE 14-22 CONTINUED

McBeth 7 Continued

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
146	345.9	90	76.6	41.6	342.0	87	64.7
149	7.3	112	85.5	56.1	342.4	87	79.6
152	20.4	125	77.9	45.2	359.1	104	71.7
155	61.1	166	83.8	54.7	3.1	108	78.4
158	97.0	202	84.6	75.8	354.1	99	82.8
161	69.4	174	87.7	75.1	334.9	79	78.6
164	309.5	54	78.4	66.8	-	-	-
167	327.4	72	80.0	81.8	326.4	71	67.9
170	305.8	50	85.1	78.2	324.5	69	80.3
173	324.3	69	86.4	77.9	344.2	89	77.6
176	2.4	107	84.9	71.8	359.7	104	79.2
179	38.1	143	85.9	85.2	26.4	131	81.9
182	51.1	156	83.9	80.9	34.1	139	81.6
185	46.0	155	85.1	93.1	17.1	122	81.3
188	73.5	178	87.6	77.1	26.5	131	
191	43.3	148	81.6	80.9	44.2	149	78.5
194	59.1	164	82.9	80.0	39.8	144	81.1
197	120.5	225	81.4	86.1	97.7	202	82.1
200	49.7	154	83.9	73.1	36.1	141	79.2
203	127.1	132	84.2	78.9	87.1	192	85.3
206	87.2	222	84.1	73.1	44.6	149	83.8
209	77.6	182	87.8	79.6	26.4	131	85.5
212	113.4	218	85.2	89.3	70.3	175	84.6
215	78.8	183	84.5	93.9	-	-	-
218	77.5	182	83.2	107.3	61.2	166	80.9
221	52.9	157	79.6	114.4	45.7	150	79.5
224	51.2	156	82.5	94.7	34.8	139	79.8
227	59.8	164	79.1	112.8	47.7	152	77.1
230	56.5	161	79.7	102.0	31.5	139	78.3
233	24.2	129	84.2	118.1	18.7	123	81.3
236	6.7	111	80.6	90.9	0.1	105	77.8
239	7.2	112	80.8	103.3	2.6	107	80.3
242	13.1	118	80.0	78.5	5.3	110	79.1
245	5.1	110	78.2	84.2	358.9	103	74.4
248	146.4	106	79.3	74.9	132.3	92	84.5
251	115.0	75	84.2	70.3	80.0	40	85.1
254	105.7	65	82.3	85.9	73.7	33	82.6
257	106.9	66	84.9	78.5	56.8	16	85.7
260	151.3	111	83.2	92.9	150.9	110	85.4
263	90.6	50	85.4	103.2	25.7	-15	83.5
266	60.8	20	84.1	101.9	48.5	8	83.9
269	102.7	62	85.7	78.6	-	-	-
272	119.5	79	80.9	96.9	113.4	73	83.5
275	93.4	53	81.4	100.6	71.1	31	82.5
278	133.6	93	79.9	93.4	128.9	88	83.3
281	83.8	43	83.1	120.3	59.2	19	83.7
284	90.4	50	83.6	108.4	78.5	38	84.1
287	112.1	72	76.3	121.4	107.4	67	78.5

TABLE 14-22 CONTINUED
McBeth 7 Continued

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
290	112.1	72	81.4	217.4	106.2	66	84.4
293	85.0	45	81.5	188.2	72.0	32	83.1
296	264.7	224	27.3	302.5	269.5	229	22.3
299	100.8	60	73.5	116.9	84.1	44	78.7
301	89.6	49	75.5	96.8	85.2	45	75.2
304	68.2	28	75.3	114.5	62.5	22	76.9
307	234.9	194	46.3	86.9	245.8	205	41.6
310	256.7	216	19.7	150.7	264.3	224	14.6
313	168.1	128	64.8	79.3	230.5	190	62.9
316	137.9	97	63.5	41.2	156.7	116	80.9
319	76.7	36	48.7	45.4	64.0	24	46.8
322	56.2	16	62.4	65.0	40.3	0	60.3
325	26.4	-14	77.0	60.1	351.4	311	72.9
328	193.6	153	68.5	64.4	210.6	170	67.3
331	210.9	170	44.4	75.8	258.8	218	51.4
337	153.5	113	77.9	51.7	180.7	140	82.4
340	175.9	135	74.5	100.3	174.7	134	75.0
343	172.4	132	73.6	92.2	169.1	129	73.9
346	179.6	139	70.9	132.9	177.4	137	70.7
349	246.7	206	65.4	100.2	260.5	220	62.9
352	248.9	208	69.2	105.9	259.0	219	68.5
355	283.8	243	84.7	66.6	321.1	281	80.5
358	287.1	247	52.5	53.9	293.1	253	49.8
361	252.4	212	62.2	113.2	258.3	218	61.9
364	102.0	62	87.3	71.2	-	-	-
367	244.4	204	78.7	90.3	261.9	221	78.6
370	234.2	194	81.2	106.6	-	-	82.0
373	269.3	229	70.7	97.7	277.7	237	68.8
376	271.9	231	72.2	88.5	269.9	229	34.1
379	312.8	272	72.3	70.3	318.5	278	25.7
382	324.4	284	73.3	108.8	331.7	291	71.3
385	7.0	327	65.1	86.6	7.3	327	62.4
388	334.2	294	50.4	83.9	337.5	297	45.7
391	321.5	281	30.7	38.1	325.1	285	21.7
394	32.2	352	73.4	67.3	29.9	349	68.6
397	103.9	163	59.7	44.5	95.5	155	60.0
400	155.2	215	64.1	29.9	149.2	209	70.5
403	221.3	281	16.9	13.6	232.5	292	15.3
406	274.1	334	46.8	23.3	286.3	346	39.6
409	272.8	332	83.4	67.8	299.4	359	79.3
412	212.1	252	40.1	97.1	213.4	273	34.9
415	213.8	253	56.5	86.4	220.0	280	58.8
418	196.9	236	56.7	28.9	198.6	258	62.7
421	336.9	36	77.7	73.1	337.4	37	73.1
424	205.6	265	79.2	80.8	207.9	267	80.9
427	258.9	318	76.0	74.8	284.7	344	77.0
430	201.3	261	71.7	127.4	213.2	273	73.8

TABLE 14-22 CONTINUED

McBeth 7 Continued

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
433	206.3	266	66.0	128.6	209.0	269	63.4
436	202.6	262	59.1	85.0	209.7	269	60.1
439	183.8	243	71.4	73.2	185.1	245	72.3
442	154.9	214	55.5	76.5	154.4	214	58.2
445	196.1	256	67.0	89.6	200.1	260	66.5
448	179.9	239	68.2	93.4	181.5	241	69.8
451	163.3	223	77.2	73.9	191.4	251	64.1
454	186.6	246	62.1	70.3	153.9	213	66.7
457	154.1	214	66.1	90.4	160.9	220	68.6
460	157.1	217	67.8	86.0	160.4	220	67.9
463	162.2	222	64.7	82.8	180.6	240	68.9
466	165.5	225	65.6	87.4	160.5	220	64.2
469	177.6	237	59.1	83.1	180.6	240	64.2
472	161.0	221	45.1	76.1	160.5	220	46.3
475	177.4	237	80.2	100.1	190.6	250	80.9
478	161.4	221	66.9	67.8	166.1	226	67.4
481	142.5	202	76.7	67.6	149.1	209	76.2
484	209.0	269	77.7	149.8	210.1	270	77.4
487	287.4	347	83.6	47.3	285.6	345	80.9
490	159.5	219	83.5	89.2	170.3	230	86.6
493	69.9	129	87.9	69.7	15.8	75	86.8
496	189.7	249	79.5	85.5	203.4	263	80.9
499	209.8	269	83.3	83.1	245.3	315	82.7
502	180.2	240	73.2	125.8	180.8	240	73.8
505	173.9	233	80.5	149.5	184.6	245	80.8

TABLE 14-23

ITIRBILUNG 1 Location 69°18'50"N
69°10'00"W

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
2	282.1	62	-35.8	62.8	272.8	52	-17.0
5	301.1	81	-38.4	85.5	295.3	75	-43.4
8	302.3	82	-27.8	121.1	-	-	-
11	29.9	169	9.9	28.9	42.0	182	-23.3
14	346.1	126	75.9	211.0	15.7	155	75.6
17	330.4	110	75.8	243.3	-	-	-
20	299.1	109	63.3	74.3	302.8	112	66.0
23	289.8	99	62.8	134.8	295.8	105	65.8
26	280.1	90	76.0	112.1	-	-	-
29	300.9	110	54.2	55.8	304.7	114	56.1
32	320.1	132	73.4	91.5	330.1	140	75.3
35	316.1	126	72.0	93.0	-	-	-
38	12.2	182	77.6	176.1	27.0	197	73.1
41	315.6	125	73.9	226.8	329.8	139	74.7
44	336.6	146	75.8	129.9	-	-	-
47	244.4	54	71.8	99.3	238.1	48	76.8
50	287.4	97	64.2	107.3	334.5	144	58.2
53	205.9	15	60.3	83.8	-	-	-
56	266.3	76	53.3	73.9	277.0	87	57.4
59	283.5	93	17.4	44.9	298.3	108	23.7
62	22.9	192	61.2	129.9	-	-	-
65	74.2	244	62.4	148.2	71.8	241	52.4
68	70.5	240	64.6	131.4	63.6	233	58.3
71	358.2	168	46.1	89.4	-	-	-
74	358.2	168	68.3	82.7	4.0	174	63.9
77	166.9	336	75.0	40.3	142.8	312	77.6
80	146.8	316	76.7	26.8	-	-	-
83	101.7	271	63.1	76.6	87.6	257	59.5
86	126.4	296	80.9	51.2	100.0	270	76.4
89	279.5	89	62.8	138.8	-	-	-
92	170.4	340	46.3	105.8	158.9	328	49.7
95	104.4	274	75.7	72.2	348.5	158	73.8
98	13.3	173	77.6	31.3	-	-	-
101	103.8	273	0.97	42.2	101.5	271	-2.2
104	153.9	323	-26.1	44.7	168.0	338	-26.5
107	316.5	126	20.1	50.4	-	-	-
110	271.8	81	27.2	113.4	270.8	80	31.0
113	233.4	43	76.9	246.9	215.6	45	82.5
116	226.0	36	34.4	80.6	-	-	-
119	190.8	0	70.5	125.1	173.9	-17	72.9
122	145.5	-45	75.1	182.7	117.9	-73	74.4
125	67.7	237	85.6	303.2	-	-	-
128	359.7	169	69.4	132.5	7.6	177	65.2
131	6.5	176	69.3	114.4	355.0	165	60.7
134	345.1	155	57.1	105.2	-	-	-
137	327.4	137	46.0	199.9	329.3	139	46.7
140	329.4	139	27.7	236.4	328.4	138	26.8

TABLE 14-23 CONTINUED

ITIRBILUNG 1 Continued

Depth	Declination Reading	Declination Rotated	Inclination	Intensity	Declination Reading	Declination Rotated	Inclination
143	19.1	189	33.6	156.0	-	-	-
146	7.1	177	40.5	218.2	6.9	176	38.0
149	45.7	215	86.1	124.3	67.7	237	82.6
152	303.7	113	51.2	177.0	-	-	-
155	321.2	131	42.5	188.4	320.8	130	42.9
179	334.8	34	-59.9	9.2	-	-	-
182	276.8	336	74.1	67.2	280.7	340	75.7
185	165.8	225	81.7	206.4	113.6	173	85.3
188	201.5	261	56.7	19.1	-		-
191	53.6	111	75.1	73.7	48.2	171	73.4
194	84.1	144	82.4	47.5	72.5	204	80.6
197	63.9	123	65.0	42.8	-	-	-
200	14.7	74	48.8	53.9	15.1	75	50.4
203	58.1	118	66.3	44.9	54.0	114	64.9
206	351.5	51	76.6	79.5	-	-	-
209	46.7	106	60.2	41.1	51.8	111	58.4
212	118.0	178	83.2	72.5	112.7	172	79.7
215	183.6	243	87.6	62.1	322.3	22	84.2
218	305.3	5	85.3	54.6	-	-	-
221	165.8	225	83.1	67.4	143.6	203	85.6
224	84.8	144	77.8	152.7	-	-	-
227	135.9	195	81.1	48.3	142.0	202	74.1
230	134.3	194	81.4	68.6	117.6	177	81.6
233	115.0	175	81.2	63.2	-	-	-
236	103.8	163	75.8	86.3	95.2	155	73.7
239	118.4	178	78.5	103.7	100.3	160	76.8
242	140.4	200	73.1	134.4	-	-	-
245	141.3	201	71.6	77.9	126.8	186	73.3
248	116.7	176	79.9	110.6	92.6	152	78.3
251	111.7	171	68.5	94.3	-	-	-
254	239.0	299	81.2	80.4	262.0	322	82.9
257	112.1	172	70.0	248.8	99.4	159	69.4
260	120.9	180	72.5	171.7	-	-	-
263	112.3	172	72.1	294.0	104.9	164	71.5
266	123.6	183	74.1	80.2	121.3	184	70.9
269	102.4	162	80.0	93.6	-	-	-
272	103.1	163	66.6	312.9	98.4	158	64.7
275	86.3	144	71.5	187.3	86.4	146	67.3
278	150.8	210	49.9	122.4	-	-	-
281	104.3	164	61.8	256.4	99.7	159	60.3
284	106.5	166	72.9	219.2	87.9	147	71.9
287	90.9	150	73.4	170.5	-	-	-
290	248.5	308	61.3	89.5	247.8	307	62.4
293	104.7	164	73.5	59.8	88.2	148	71.6
296	138.2	198	15.6	74.3	-	-	-
299	24.9	84	16.3	102.9	22.6	82	13.7
302	25.6	85	34.5	163.5	24.1	84	33.2

ITIRBILUNG 1 Continued

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
305	44.1	104	24.6	126.2	-	-	-
308	61.2	121	40.4	70.5	61.4	121	37.7
311	73.1	133	43.3	31.9	73.4	133	38.5
315	32.3	92	-6.1	19.5	-	-	-
318	50.4	110	-22.4	18.9	47.2	107	-35.7
321	16.9	76	-34.1	14.7	17.8	77	-35.7
324	9.6	69	-70.8	13.6	-	-	-
327	232.2	73	12.2	23.1	218.8	68	20.1
330	201.6	51	59.6	72.0	196.8	46	60.9
333	224.7	74	11.3	22.6	-	-	-
336	217.3	67	4.8	27.7	208.7	58	7.2
339	315.7	166	54.8	7.4	-	-	-
342	178.1	28	65.2	54.6	-	-	-
345	231.7	81	66.8	24.7	212.4	62	64.0
348	262.2	112	61.7	23.5	255.4	105	64.7
351	52.3	262	65.8	30.6	-	-	-
354	50.2	260	68.9	38.4	35.3	245	67.9
357	29.2	239	53.0	21.0	36.2	246	43.8
360	325.8	175	65.7	17.4	-	-	-
363	75.7	285	65.0	10.5	117.1	327	79.8
366	351.0	201	69.4	5.4	301.4	151	72.4
369	4.8	214	1.2	12.4	-	-	-
372	25.0	235	18.7	25.4	21.8	231	22.9
375	334.7	184	86.2	51.2	-	-	-
378	268.3	118	86.5	84.2	-	-	-
381	25.8	235	58.6	72.2	31.2	241	56.8
384	350.5	200	86.9	50.6	73.8	283	87.5
387	15.4	225	76.6	57.5	-	-	-
390	237.9	87	78.9	62.5	255.1	105	84.0
393	300.2	150	67.8	71.8	303.4	153	68.7
396	308.5	158	77.5	99.5	138.9		87.9
399	349.7	199	62.8	74.9	354.4	204	68.3
402	50.7	260	67.5	79.2	49.5		59.4
405	7.6	217	54.4	104.7	-	-	-
408	310.2	160	80.8	76.8	326.2	176	77.3
411	293.6	143	63.6	86.5	300.2	150	63.5
414	338.8	188	45.4	60.5	-	-	-
417	270.4	120	52.7	35.7	267.1	117	55.4
420	289.0	139	74.6	48.9	276.0	126	79.7
423	318.4	168	57.6	69.3	-	-	-
426	294.3	144	65.8	92.2	298.2	148	66.5
429	283.7	133	69.9	75.8	289.1	139	71.9
432	235.0	85	75.3	115.7	-	-	-
435	289.5	139	72.5	113.2	271.9	121	59.4
438	332.4	182	72.2	154.1	342.5	192	69.2
441	309.5	159	60.4	157.9	-	-	-

TABLE 14-23 CONTINUED

ITIRBILUNG 1 Continued

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
444	274.7	124	79.8	67.6	262.8	112	30.3
447	213.6	63	57.5	43.0	202.4	52	61.6
450	274.1	124	60.4	58.6	-	-	-
453	285.8	135	75.9	70.1	200.4	50	70.8
456	330.6	180	70.5	109.8	333.6	183	70.4
459	298.7	148	51.0	163.4	-	-	-
462	217.6	67	26.1	14.0	198.9	48	35.2
546	215.8		9.3	6.7	-	-	-
549	228.0	147	6.0	15.9	217.7	149	16.0
561	51.2	343	12.2	29.1	53.7	345	10.0
564	227.1	146	58.9	40.5	-	-	-
567	159.7	91	54.9	50.8	154.0	86	56.1
570	223.5	155	65.4	53.9	216.1	148	69.0
573	174.9	114	78.6	68.3	-	-	-
576	224.2	156	67.4	61.9	219.2	151	71.9
579	275.4	207	67.5	56.3	280.3	212	70.5
582	222.5	154	-4.2	36.7	-	-	-
585	256.6	188	29.6	28.1	-	-	-
588	6.9	298	32.2	8.8	12.5	304	31.8
591	24.5	316	23.2	24.8	-	-	-
594	337.1	269	78.8	14.7	-	-	-
597	12.0	304	70.4	34.6	28.9	320	70.7
600	91.4	23	74.7	56.5	-	-	-
603	85.9	17	39.9	39.0	88.7	20	36.5
606	17.5	309	43.0	28.6	19.5	311	43.1
609	343.0	275	36.0	28.1	-	-	-
612	337.6	269	17.9	67.2	327.2	259	32.0
615	349.2	281	8.5	17.8	332.7	264	-3.5
621	354.2	268	35.9	9.5	-	-	-
627	66.9	358	46.6	18.5	25.2	317	17.2
630	130.2	62	23.4	21.2	-	-	-
633	241.2	173	62.4	20.6	248.8	180	67.9

TABLE 14-24

TINGIN-1A Location 69°05'40"N
68°54'00"W

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
8	327.4	147	-22.8	15.3	-	-	-
11	276.8	96	45.7	9.6	182.4	2	48.5
14	76.8	256	24.4	14.2	67.6	247	56.5
17	244.7	64	16.1	39.6	-	-	-
20	226.7	44	27.0	11.2	222.7	42	
23	270.7	90	52.5	38.8	243.6	43	58.1
26	108.7	288	62.1	49.7	-	-	-
29	317.4	137	21.4	73.5	326.2	146	20.7
32	332.8	152	48.3	14.4	-	-	-
35	353.0	173	62.1	13.5	348.2	168	58.5
38	53.6	233	60.9	25.4	50.2	230	65.8
41	329.7	149	63.0	7.5	-	-	
44	23.0	203	69.9	6.0	47.3	227	68.5
47	29.4	209	53.2	9.6	38.5	218	48.4
50	203.6	23	86.8	11.6	-	-	-
53	164.7	-16	53.2	11.5	345.9	169	37.9
56	240.1	60	69.6	10.1	-	-	-
59	336.2	156	50.5	12.0	334.2	154	44.9
62	19.6	179	56.0	7.6	46.0	226	38.0
65	323.1	143	60.9	11.2	-	-	-
68	133.1	313	48.2	23.7	-	-	-
71	256.5	76	57.2	11.2	237.2	57	52.1
74	8.5	188	78.0	12.1	-	-	-
77	342.3	162	85.7	17.3	83.4	263	86.5
80	200.1	20	17.2	6.5	196.5	16	16.0
83	9.1	189	48.3	16.9	-	-	-
86	78.3	258	73.9	9.1	131.8	311	63.6
89	4.6	184	85.0	15.9	132.0	3.2	80.6
92	220.8	40	75.1	16.3	-	-	-
95	351.8	171	85.5	28.5	55.3	235	80.7
98	300.6	120	79.1	14.2	284.1	104	85.3
101	254.6	74	46.8	12.7	-	-	-
104	343.5	163	59.7	10.5	1.2	181	55.5
107	263.3	83	68.8	7.6	284.5	104	61.3
110	211.6	31	64.4	14.3	-	-	-
113	242.6	62	67.0	17.0	255.4	75	62.7
116	0.4	180	60.5	9.2	349.1	169	39.7
119	271.5	91	81.3	9.1	-	-	-
122	101.0	281	71.5	11.2	124.8	304	61.0
125	264.9	84	63.4	16.1	239.6	59	64.1
128	290.8	110	49.8	18.6	-	-	-
131	17.5	197	56.6	14.7	51.3	231	52.1
134	69.8	249	72.0	22.8	81.7		67.7
137	115.4	295	78.0	23.1	-	-	-
140	91.2	171	69.6	16.2	99.4	279	53.9

TABLE 14-24

TINGIN-1A Continued

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
143	27.2	207	75.9	13.4	45.0	225	74.8
146	327.1	147	75.2	19.6	-	-	-
149	30.3	210	69.5	10.9	11.0	191	64.3
152	120.3	300	76.3	10.5	117.8	297	76.5
155	107.0	287	55.4	18.7	-	-	-
158	26.5	206	69.8	17.0	28.8	208	51.2
161	87.3	267	50.8	17.1	79.4	259	41.0
164	0.6	180	85.3	28.9	-	-	-
167	266.1	86	79.5	13.2	321.8	141	62.9
170	130.2	290	30.4	9.8	161.0	341	2.5
173	67.1	247	59.1	5.6	-	-	-
176	144.9	304	50.4	13.4	188.3	8	26.0
179	259.0	79	72.4	4.5	201.7	21	2.1
182	92.6	272	13.0	12.7	-	-	-
185	265.2	86	77.7	14.2	214.1	34	61.3
215	55.6	340	-15.6	3.8	-	-	-
218	319.4	244	-14.2	10.2	311.2	236	-38.1
221	324.0	249	-17.1	11.7	335.9	260	-9.2
224	326.0	251	48.7	10.3	-	-	-
227	41.6	325	54.3	12.1	47.6	332	48.7
230	45.0	330	43.8	13.8	33.5	318	36.4
233	5.9	290	41.5	12.2	-	-	-
236	52.5	337	39.7	14.7	42.0	327	32.4
239	11.1	295	18.4	11.4	359.8	284	12.7
242	243.0	168	45.3	3.7	-	-	-
245	224.7	149	83.0	8.1	229.6	154	62.8
248	137.8	62	80.8	11.3	159.1	84	63.1
251	233.4	158	68.0	6.3	-	-	-
254	294.1	219	65.7	13.6	278.0	203	60.2
257	307.1	232	67.6	15.3	319.8	244	76.5
260	303.0	228	48.3	9.0	-	-	-
263	264.0	189	63.6	13.9	255.8	180	64.2
266	248.1	173	-22.4	8.6	241.5	166	2.7
269	315	240	16.1	7.3	-	-	-
272	284.8	209	40.6	15.3	286.7	211	52.7
275	325.0	250	28.3	5.0	345.8	270	27.7
278	337.7	262	42.0	13.0	-	-	-
281	346.6	271	35.3	14.0	335.9	260	27.3
284	60.5	345	76.4	10.6	63.5	348	71.6
287	37.1	322	66.7	8.9	-	-	-
290	170.7	95	83.0	11.1	216.1	141	79.1
293	126.3	51	73.3	9.4	139.1	64	68.6
296	244.4	169	-0.8	2.3	-	-	-
299	198.2	123	46.6	4.2	187.2	112	43.3
303	96.4	20	53.1	2.0	168.2	93	26.9
306	30.3	315	64.1	7.3	-	-	-
309	263.8	188	56.0	2.1	174.3	99	56.5

TABLE 14-24

TINGIN-1A Continued

Depth	Declination Reading	Declination Rotated	Inclination	Intensity	Declination Reading	Declination Rotated	Inclination
312	27.8	312	64.7	6.7	53.2	388	71.8
315	60.3	345	70.9	12.3	-	-	-
318	57.7	342	36.5	5.5	70.8	355	30.8
321	49.1	334	61.0	3.6	38.4	323	48.0
324	30.7	315	61.8	10.4	-	-	-
327	64.0	349	31.2	8.4	54.5	339	33.0
330	5.4	290	22.6	6.7	345.0	270	-12.4
333	352.7	277	60.5	8.0	-	-	-
336	237.0	162	76.9	9.7	206.4	131	84.1
339	34.3	319	71.0	8.0	47.6	332	65.0
342	345.0	270	59.6	17.7	-	-	-
345	40.5	325	76.2	26.0	32.9	317	71.4
348	18.8	303	70.5	30.0	5.8	290	65.6
351	3.3	303	76.3	33.3	-	-	-
354	18.8	318	75.3	35.2	338.9	276	80.6
357	13.2	313	82.6	39.9	234.8	174	87.4
360	33.6	333	73.5	35.2	-	-	-
363	29.2	329	79.1	37.2	65.6	5	80.3
366	37.0	337	73.0	35.9	62.3	2	73.9
369	32.4	332	74.2	33.7	-	-	-
372	40.3	340	75.5	36.4	42.5	342	72.1
375	42.5	342	78.3	34.5	18.2	318	73.5
378	56.8	356	77.5	34.2	-	-	-
381	50.1	350	75.5	40.9	2.2	302	62.5
384	42.1	342	78.4	39.3	36.6	336	85.2
387	34.3	334	72.3	32.1	-	-	-
390	39.6	339	73.8	35.5	51.9	351	79.0
393	19.0	319	68.9	29.9	2.2	302	62.5
396	346.4	286	71.5	24.0	-	-	-
399	162.6	102	71.3	18.3	138.5	78	61.8
402	160.6	100	81.8	30.4	186.7	126	80.3
405	152.3	92	66.4	15.6	-	-	-
408	244.9	184	62.7	14.9	250.9	290	62.3
411	46.5	26	67.4	5.6	70.5	11	67.1
414	142.4	82	52.2	10.1	-	-	-
417	200.1	140	-26.0	4.8	224.3	264	-6.0
420	206.5	146	45.2	6.8	228.8	268	59.7
423	223.9	163	77.2	15.5	-	-	-
426	203.6	143	78.8	16.5	180.2	120	81.7
429	258.3	198	69.7	9.2	266.5	206	51.4
432	201.6	141	53.7	5.4	-	-	-
435	177.0	117	53.2	16.9	188.2	127	48.8
438	186.2	126	81.2	8.5	184.6	124	83.4
441	154.9	94	62.8	8.6	-	-	-
444	172.0	112	60.4	8.1	181.5	121	59.1
447	38.6	338	81.6	15.0	97.9	37	82.1
450	94.1	34	76.5	9.8	-	-	-
453	115.1	55	64.1	22.5	120.0	60	63.4
456	151.7	91	65.9	10.0	133.4	73	66.6
459	147.5	87	67.4	12.8	-	-	-

TABLE 14-24

TINGIN-1A Continued

Depth	Declination Reading	Declination Rotated	Inclination	Intensity	Declination Reading	Declination Rotated	Inclination
462	132.2	73	57.5	22.3	114.2	54	56.4
465	121.5	61	69.0	20.7	91.9	31	75.1
468	113.2	53	69.7	15.6	-	-	-
471	139.3	79	67.6	17.5	143.7	83	68.9
474	123.6	63	61.2	15.5	132.6	72	61.1
477	133.7	73	74.3	17.1	-	-	-
480	135.6	75	60.5	16.0	129.1	69	64.6
483	123.3	62	72.0	24.0	105.0	45	61.9
486	130.3	70	75.1	17.3	-	-	-
489	114.1	54	74.2	8.7	101.2	41	46.5
492	182.3	122	65.5	8.1	114.7	54	29.0
495	260.5	200	75.8	16.8	-	-	-
498	193.3	133	79.7	25.7	112.4	52	83.4
501	298.9	123	82.7	36.3	298.6	123	78.8
504	297.4	122	82.4	45.3	-	-	-
507	288.1	113	79.0	39.2	263.6	88	74.1
510	265.3	90	79.5	38.2	241.8	66	75.9
513	247.1	72	78.5	34.3	-	-	-
516	297.2	122	83.6	14.4	223.9	48	84.7
519	261.8	86	83.0	29.7	151.8	336	81.7
522	241.1	66	80.9	36.7	-	-	-
525	240.8	65	83.1	41.0	95.0	280	72.4
528	215.2	40	77.9	39.5	50.4	236	44.1
531	226.8	51	80.4	37.5	-	-	-
534	240.5	65	82.2	44.0	240.8	65	81.0
537	284.1	109	84.4	48.9	261.7	86	83.5
540	268.8	93	85.0	46.4	-	-	-
543	217.5	42	79.0	52.7	217.0	42	79.4
546	327.4	152	79.9	44.6	333.6	158	54.8
549	328.1	153	83.7	49.3	-	-	-
552	282.7	107	84.7	39.1	305.2	130	69.9
555	246.4	71	81.3	33.0	282.0	107	71.2
558	291.8	116	82.5	34.7	-	-	-
561	258.2	83	82.1	39.1	286.8	111	65.4
564	305.6	130	74.1	39.2	305.8	130	38.7
567	292.7	117	77.2	40.9	-	-	-
570	273.4	98	77.1	37.9	335.5	160	-5.0
573	284.2	109	80.0	33.5	27.0	212	-2.0
576	266.4	91	80.3	39.5	-	-	-
579	282.4	107	81.2	32.2	104.0	285	45.8
582	281.4	106	82.6	35.4	165.2	-10	78.8
585	235.6	60	80.8	31.1	-	-	-
588	249.3	74	81.6	39.2	221.3	46	76.8
591	226.1	51	82.1	36.5	244.4	69	75.5
594	225.3	50	86.1	33.6	-	-	-
597	175.9	0	85.4	32.3	234.6	59	71.7
600	193.2	23	85.7	27.4	221.9	46	60.1

TABLE 14-24

TINGIN-1A Continued

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
603	149.0	334	79.9	29.7	-	-	-
606	176.8	1	85.0	32.3	190.8	15	51.0
609	179.3	4	81.7	31.7	127.4	-48	37.4
612	189.0	14	83.0	30.6	-	-	-
615	205.6	30	84.3	32.9	38.6	223	17.3
618	180.3	5	75.5	26.6	340.9	165	6.0
621	200.8	25	78.3	28.0	-	-	-
624	212.7	37	74.4	26.9	302.7	127	24.0
627	200.1	25	76.2	25.5	273.2	98	53.9
630	185.3	10	70.7	30.2	-	-	-
633	192.3	17	74.3	32.9	266.2	91	60.1
636	187.6	12	79.2	35.6	305.9	130	51.1
639	179.5	4	80.5	29.1	-	-	-
642	194.1	19	70.7	25.7	344.1	169	41.0
645	154.9	339	79.4	28.6	290.2	115	-28.7
648	177.0	2	76.4	30.0	-	-	-
651	194.9	19	81.0	25.9	149.9	-	19.1
654	167.8	352	76.2	32.9	203.7	28	16.2
657	167.4	352	83.5	34.9	-	-	-
660	198.0	110	85.4	33.9	231.1	143	66.4
663	72.7	344	88.0	29.4	211	123	71.6
666	86.7	358	29.5	29.7	-	-	-
669	220.4	132	87.2	32.0	235	146	39.2
672	79.1	351	85.9	35.6	210.0	122	63.9
675	84.6	356	84.9	35.7	-	-	-
678	165.1	77	84.6	33.8	180.5	92	50.7
681	166.9	78	83.8	30.0	143.4	55	42.6
684	78.8	350	82.4	31.4	-	-	-
687	29.7	301	83.9	32.1	69.7	341	54.7
690	85.3	357	85.6	30.3	69.1	341	35.0
693	145.7	57	78.6	27.9	-	-	-
696	115.4	27	88.4	35.7	12.2	284	54.1
699	97.5	11	86.1	29.1	331.6	243	61.6
702	119.2	31	83.4	28.9	-	-	-
705	5.7	277	86.6	31.8	311.1	223	69.2
708	130.0	42	84.2	32.6	301.7	213	71.2
711	347.9	259	88.2	32.6	-	-	-
714	176.4	88	82.1	31.9	318.6	230	59.0
717	145.3	57	85.4	29.2	359.6	271	42.6
720	155.2	67	78.3	27.3	-	-	-
723	149.6	61	78.7	27.2	111.5	23	57.6
726	153.2	65	81.0	28.6	173.0	85	61.0
729	191.2	103	86.0	28.9	-	-	-
732	81.9	253	81.1	27.7	193.8	105	72.1
735	54.3	326	87.2	26.9	226.2	138	79.1
738	90.1	2	83.9	25.9	-	-	-
741	98.8	10	79.6	24.0	167.9	79	82.7
744	125.4	37	81.2	29.0	159.3	71	77.9
747	92.8	4	83.2	24.6	-	-	-

TABLE 14-24

TINGIN-1A Continued

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
750	161.7	73	81.0	24.2	129.1	41	75.9
753	62.4	344	85.1	24.5	77.5	349	60.9
756	91.7	3	81.5	25.6	-	-	-
759	85.9	357	81.4	27.1	47.6	315	37.8
762	258.2	170	87.7	26.0	2.1	274	43.7
765	100.9	12	85.7	24.8	-	-	-
768	120.7	32	82.1	22.0	344.6	256	63.0
771	81.9	353	81.9	31.6	71.0	343	70.8
774							85.0
777				21.4	286.2	198	
780				19.5	55.0		83.8
783							
786				17.0	356.6	268	76.4
789				19.4	18.4	290	74.1
792							
795				23.9	126.9	48	65.0
798				26.3	159.4	71	69.7
801							
804				17.9	84.5	356	73.3

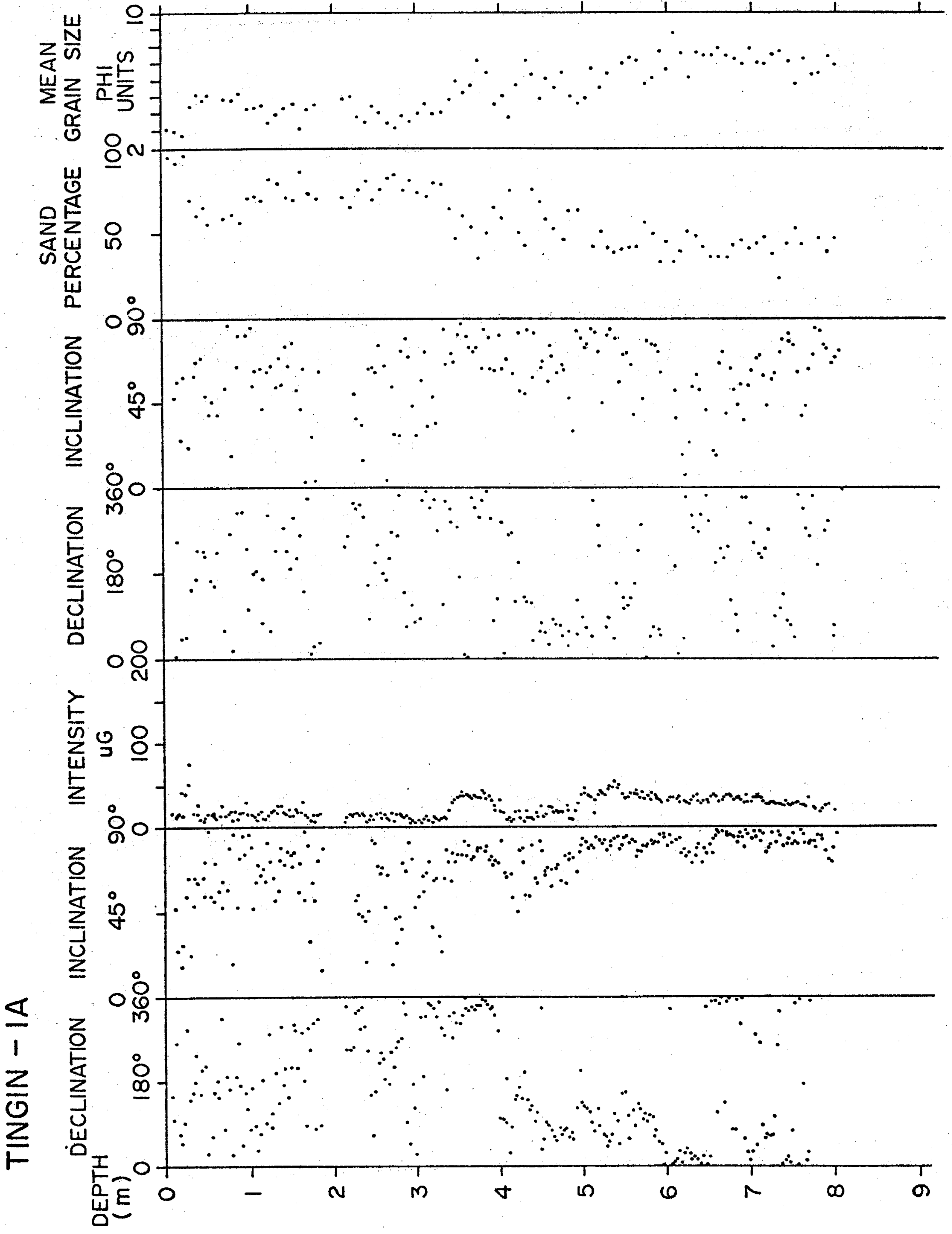
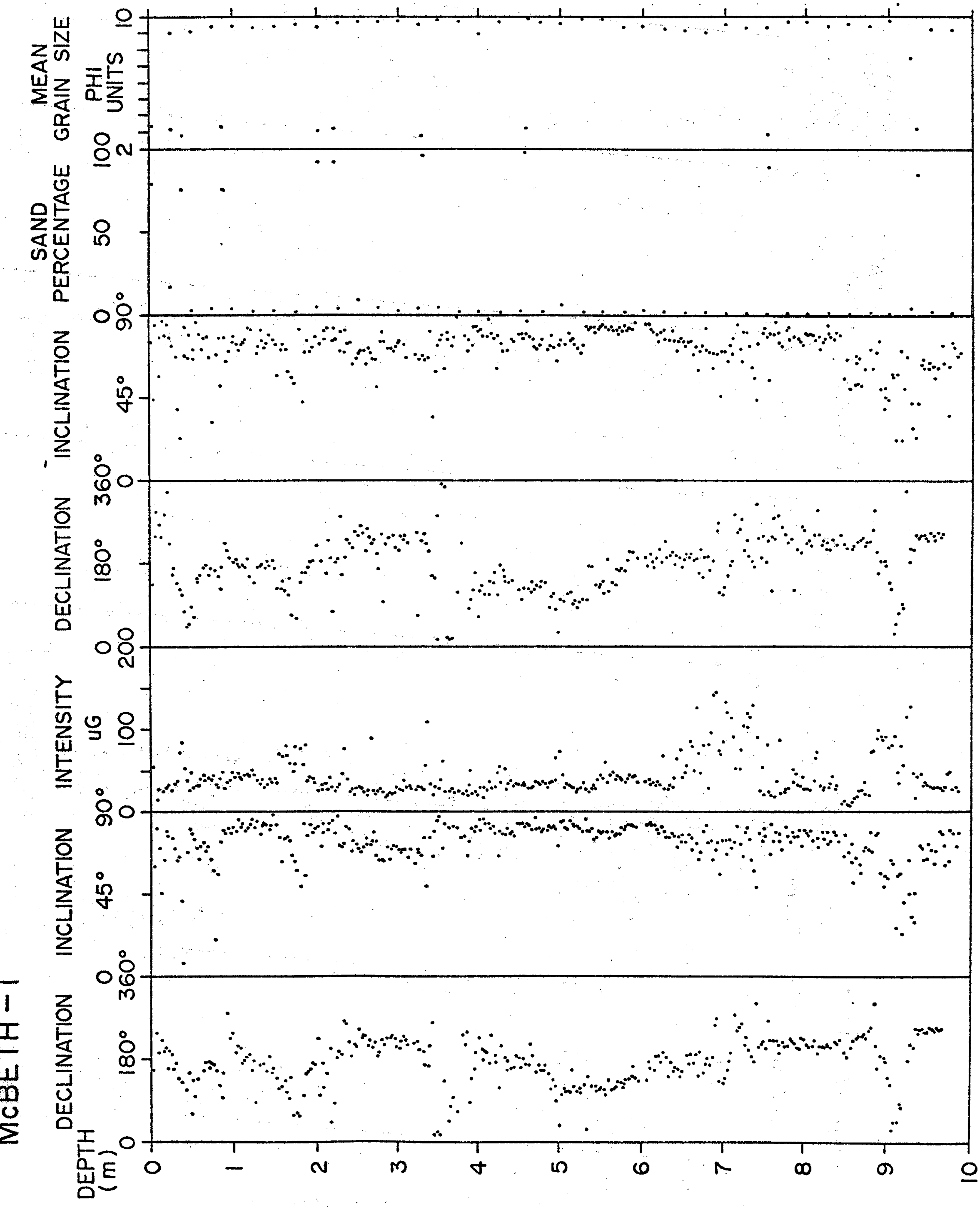

TINGIN - IA
DEPTH (m)
0
1
2
3
4
5
6
7
8
9
DECLINATION
0
180°
360°
INCLINATION
0
45°
90°
INTENSITY
uG
0
100
200
DECLINATION
0
180°
360°
INCLINATION
0
45°
90°
SAND PERCENTAGE
0
50
100
MEAN GRAIN SIZE
PHI UNITS
2
10

fig. 14-1


McBETH-I
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2
SAND PERCENTAGE
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50
0
INCLINATION
90°
45°
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DECLINATION
360°
180°
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INTENSITY uG
200
100
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INCLINATION
90°
45°
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DECLINATION
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DEPTH (m)
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3
4
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6
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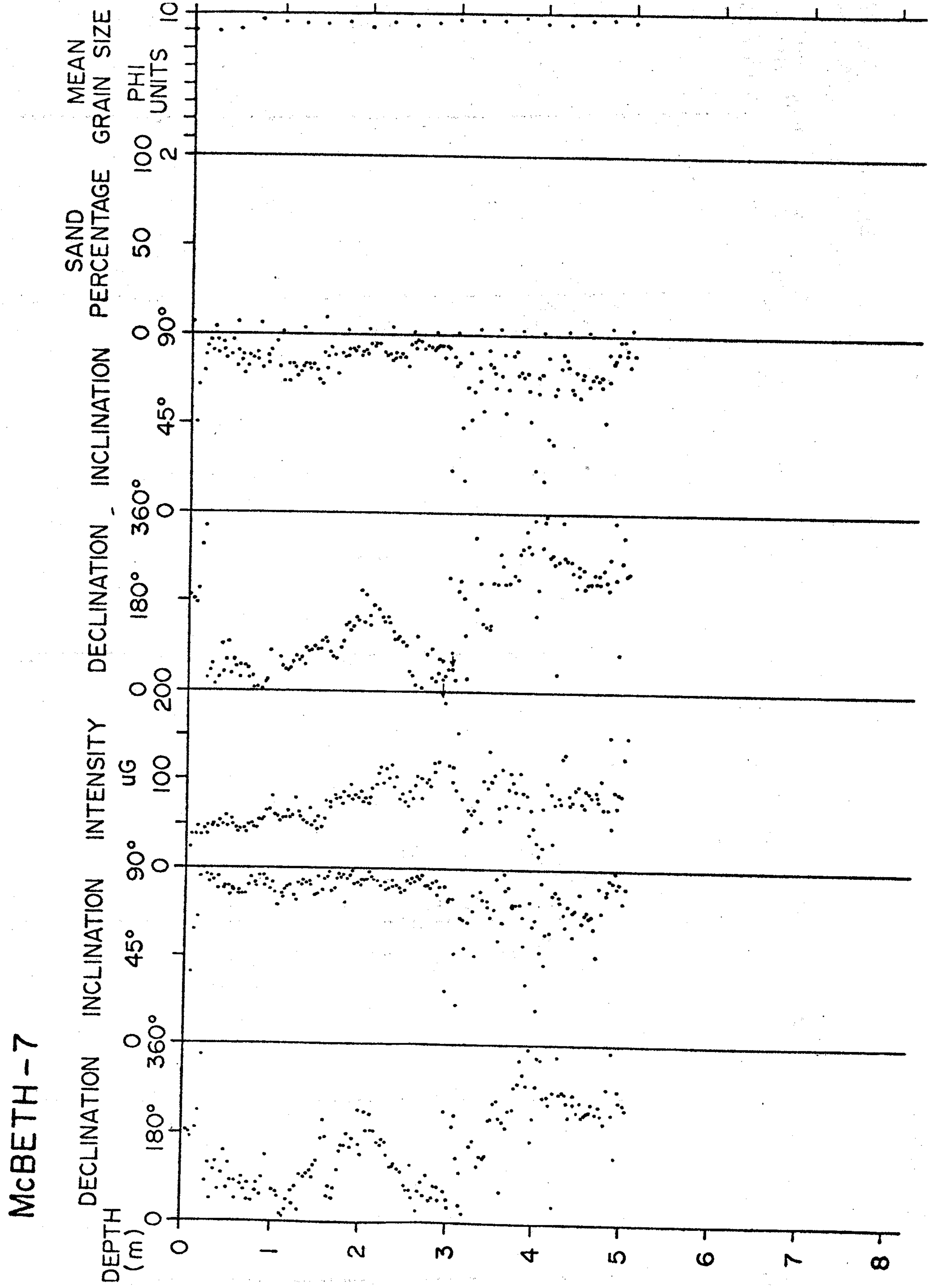
8
9
10

fig. 14-3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45°
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INTENSITY
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DECLINATION
0
180°
360°
INCLINATION
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45°
90°
SAND PERCENTAGE
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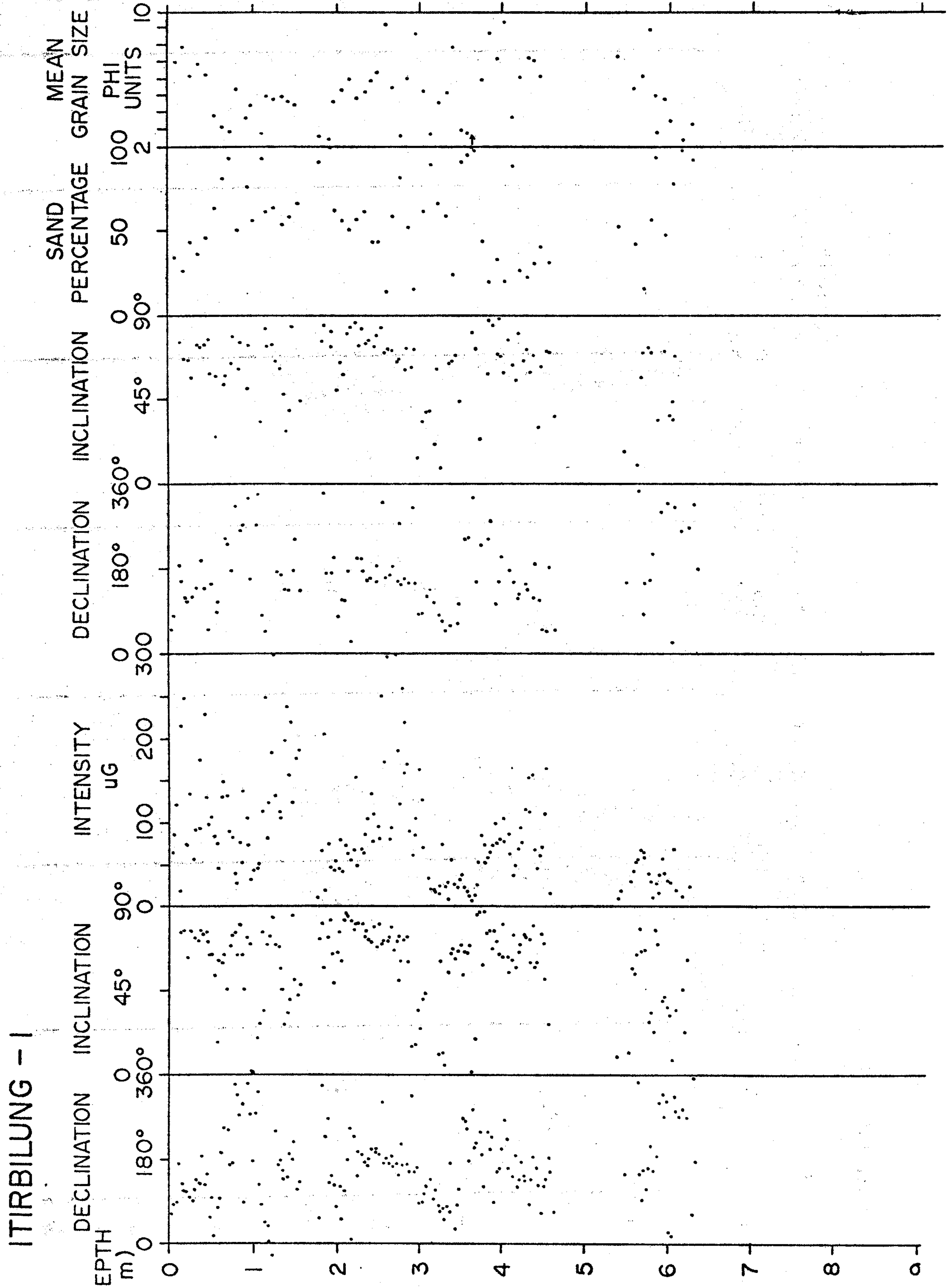
50
100
MEAN GRAIN SIZE
PHI UNITS
2
10

fig. 14-4


ITIRBILUNG - I
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2
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DECLINATION
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INTENSITY
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200
300
DECLINATION
0
180°
360°
INCLINATION
0
45°
90°
SAND PERCENTAGE
0
50
100
MEAN GRAIN SIZE
PHI UNITS
2
10

fig. 14-2

GEOPHYSICAL STUDIES BASED ON CONVENTIONAL SHALLOW AND HUNTEC HIGH RESOLUTION SEISMIC SURVEYS OF FIORDS ON BAFFIN ISLAND

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INTRODUCTION

In this report we describe the results of seismic reflection surveys with a 40 cubic inch (0.655 L) compressed air source and a Huntec deep towed, high resolution seismic system conducted during the Sedimentology of Arctic Fiords Experiments (SAFE'82) from C.S.S. Hudson. The location of the fiords which were studied is described elsewhere in this report. The data are presented with a minimum of interpretation, although some inferences about the nature of the sedimentary processes have been made from the records shown here. The length and locations of the survey lines are given in Table 1 and Fig. 1. Also included in this report are selected results from other studies (Hudson 78-029 and 82-034) of Scott Inlet and extending into the outer regions of Gibbs and Clark Fiords. In total, 624 km of seismic lines are available.

Survey tracks were laid out in straight segments as nearly as possible along the middle of the fiords. On the SAFE '82 lines, fix points were located at 1 nautical mile intervals (1.85 km) except in Inugsuin and Clark Fiords where they were at 2 nautical mile intervals (3.71 km). Navigation by radar ranging was reported from the ship's bridge and each fix point and course alteration were noted on the recorders. On the lines from Hudson 78-029 and 82-034, fixes at 0.5 hour intervals were determined from Satnav and radar fixes. The distances from the head of each fiord to the fix points and intermediate points used in all subsequent presentation are given in Appendix I.

CHARACTERISTICS OF THE SEISMIC RECORD AND STRATIGRAPHIC INTERPRETATION

The first stage in the interpretation of the seismic records involved transcribing the reflecting surfaces from the seismic reflection (air gun) record on the graphic recorder. The results, shown after reduction in Fig. 2, portray the general patterns of bathymetry and sedimentation in the fiords. The profiles are not corrected for changes in ship speed which varied from 1.11 m/s (2.16 knots) between stations 22 and 23 near the head of Coronation Fiord to 3.79 m/s (7.36 knots) between stations 3 and 4 near the mouth of Inugsuin Fiord. Thus, the vertical exageration of Fig. 2 varies from 5.6 to 19.6 with an average of about 15.

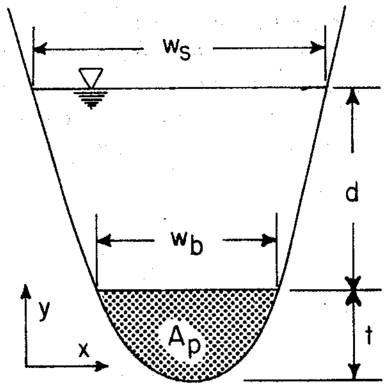
In most locations there is a clear distinction between the acoustically opaque bedrock and the relatively transparent, sub-horizontally layered sediments above, which we shall designate as "glaciomarine sediments". The main exceptions are in Sunneshine Fiord and Canso Channel where the sediment cover is thin and where the distinction between glacial sediment or bedrock beneath is not clear (see further discussion below). For these reasons and because the records for these sites are incomplete, they are not included in the calculations below.

The travel time of sound in the glaciomarine sediments can be easily determined from the recorder trace. Although no data are available on the velocity of sound in these sediments, we have assessed their thickness approximately using the relation presented by Nafe and Drake (1964):

$$v = 1.70 + 4.30\ [1 - \exp(-0.9.z)] \quad \ldots\ldots\ldots\ldots[1]$$

where v is the sound velocity in km/s and z is the depth of burial in km. Thickness was determined at each fix point and at 2 points equally spaced between (except in Inugsuin and Clark Fiords where 5 intermediate points were used between the more widely spaced fix points). The results are given in Appendix I and plotted in Fig. 3. Values range up to 300 m in the central portions of McBeth and Cambridge Fiords.

An approximation of the volume of glaciomarine sediment in the fiords was made as follows. In addition to estimating sediment thickness (t) at each site described above, the depth of water (d) and the width of the fiord at the surface (W_s) were recorded. It is assumed that the fiord is parabolic in cross section, and the sediment fills the bottom to a nearly horizontal surface at d metres depth (see definition sketch, Fig. 4). The general equation of a



W	is the width of the fiord at the surface ($_s$) and bottom ($_b$),
d	is the depth of the fiord,
t	is the thickness of glaciomarine sediment, and
L	is the distance between successive sections.

Figure 4. Definition sketch for sediment volume calculations.

parabola is $x^2 = a.y$. For the fiord, the parameter, a, may be defined as follows:

$$(W_s/2)^2 = a(d + t)$$

and thus, $a = (W_s/2)^2/(d + t)$.

The width at the bottom may be calculated from $(W_b/2)^2 = a.t$

$$\text{i.e.}\quad W_b = 2(a + t)^{0.5}$$

The area, A_p, of sediment fill is calculated as:

$$A_p = \frac{4}{3}\, x.y = \frac{4}{3}(a + t)^{0.5}.t = \frac{4}{3}\, a^{0.5}\, t^{1.5}$$

The volume in the ith section is: $V = A(L_{i-1}/2 + L_i/2)$.

These data are also presented in Appendix I. Summary statistics of the morphology of the fiords including maximum sediment thickness and total volume are given in Table 2.

These calculations of sediment thickness and volume involve a number of assumptions.

1. It is assumed that equation [1] applies to the fiord sediments. Nafe and Drake (1964, p. 813) indicate that in relatively shallow water, a high rate of velocity increase with depth might be expected. The equation used gives the maximum rate of velocity increase with depth of those presented by Nafe and Drake, and therefore the most

conservative estimate of sediment accumulation.

2. It is assumed that the basin is U shaped and can be approximated by the equation of a parabola given the width of the fiord and the depth of water. For the most part the assumption is approximately correct except where tributary fiords or bays join the fiord. In these cases widths are estimated from headland to headland along the side of the fiord.

3. It is assumed that the track is in the middle (i.e. the deepest location) of the fiord. This is not the case in some sections (e.g. Fix 12, Tingin Fiord; Fix 10 - 13, Itirbilung Fiord; fix 16 - 17, Inugsuin Fiord; Fix 24 - 26, Clark Fiord; and Fix 11, Cambridge Fiord) where the ship was closer to one side. Again the calculations are conservative here.

4. Side echos can be distinguished from bottom and sub-bottom echos. This is normally possible based on the faintness of the intruding side echo and the continuation of the bottom echo from the nearly flat lying sediments through the side echo (see examples between 35 and 45 km in Clark Fiord and 40 and 50 km in Cambridge Fiord - Fig. 2).

EXAMPLES OF SEISMIC RECORDS TO ILLUSTRATE SEDIMENTARY FEATURES

Figures 5 to 14, one for each fiord from Sunneshine to Cambridge, show sections of the air gun and Huntec records to illustrate particular characteristics of the sediments. Along the top of each section is the distance from the fiord head in km and along the bottom are the fix locations. Fig. 15 is a scale of water depth (where v = 1480 m/s and thickness is according to equation [1] for the air gun records. These may be compared with the location of the tracks plotted in Fig. 1 and the generalized profiles shown in Fig. 2.

Glaciomarine sediments:

Nearly horizontal, sub-parallel bedded sediments: The most commonly occurring sedimentary features are the "pools" of sediment filling depressions in the floor of the fiord. These fillings may be isolated and relatively shallow (e.g. Fig. 6a, b, 8a, b, f, 13c, d) or large areas extending over a number of basins (Fig. 7c, d, e, f, 9b, c, f, g, 11a, b, e, f, o, p, 12a, b, 14a, b, e, f, g, h). In the latter case, the sediment may be draped over the topographic highs in the bedrock beneath, thus preserving some of the relief of the fiord floor. Itirbilung Fiord (Fig. 10a, g, h) contains the best examples of these. Much more commonly, however, the sediment smooths the relief and the bedrock where it projects through is largely without sediment cover (Fig. 9f, g, 11a, b, e, f, 12a, b, 14a, b, e, f, g, h).

Within the sediment column at many locations there is a clear distinction in the reflecting characteristics of the upper and lower sections of the sediment. Approximately the upper one quarter to one half of the deposit consists of strong reflecting horizons at close vertical intervals. Normally, each of these is continuous over distances of up to several kilometres and there is little or no evidence of truncation of these beds by erosion. The sediments below are characterized by weaker, discontinuous and frequently distorted reflecting surfaces. In the examples (Fig. 6a, b, 7a, b, 8a, b, 9f, g, h, i, 12a, b, 14c, d, g, h) the air gun records show clearly the distinction between the two sediment units, while the Huntec record shows fine detail especially within the upper section. We consider both to be glaciomarine in origin, but that the upper represents conditions favouring deposition of layers of coarser sediment from frequent mass flow events or aeolian sources interspaced with fine material from suspension.

In other cases (Fig. 8e, f, 9b, c, 10h, 11o, p, 14a, b), the distinction is not evident. For some locations, this may indicate that all of the sediment was deposited recently (as at the head of Coronation Fiord -- Fig. 7c, d, e, f) in front of the retreating glacier, although this is almost certainly not the case in other fiords and at more distal locations.

In a few cases, a relatively thin layer of acoustically transparent material presumably composed of fine sediment is deposited on top of the strongly bedded sediment. Examples are shown in Fig. 6g, h, 9e, and i.

Mass wasting: Among the most notable features, and the ones which involve the largest amount of material in single morphological units are slump deposits. These are irregular mounds of sediment derived from the fiord walls and deposited on top of and within other glaciomarine sediments. The Huntec record shows these features especially well, as the sound energy is reflected from the rough, relatively opaque surface. The air gun shows the relation of the slumped material to other sediments, especially those beneath. Examples are given in Fig. 9b, c, i, 12c, d, 13a, b, 14g, and h.

In some cases (as Fig. 13a, b) the slumped material acts as a dam behind which more recent glaciomarine sediment has become ponded. In other cases (as Fig. 11d) the glaciomarine sediment appears in interfinger with the slumped material, suggesting that a series of slumps may have occurred at this site, and that the two sediment types were deposited contemporaneously.

Evidence of erosion of the glaciomarine sediments: While the horizontally banded sediments apparently include sediments deposited from gravity flow events as well as fine sediments from suspension, there is also considerable evidence of erosion of these sediments by mass wasting and by subsequent gravity flow processes. Cliffs of sediment with layers truncated at the cliff face stand in several locations. The most notable are in McBeth Fiord (Fig. 11m, n) and Cambridge Fiord (Fig 14c, d). The latter may be a particularly useful site for submersible observations. Other examples are shown in Fig. 6c, d, 10c, d, g, h, 11k, 1, 13e, f. These features are often associated with slump mounds nearby.

In some cases, the layers in the sediment are apparently deformed downward near the cliff face, perhaps by creep following the slope failure. However, thinning sediments and slower sound velocity in water as compared to sediments commonly produces the effect of downward sloping reflectors near valley walls or cliff faces in bedrock -- the so-called "velocity pull-down" effect. It is probable here where the sections are only up to several tens of metres thick, and the velocity difference between sediment water is small, that velocity pull-down is insignificant. As well, beds truncated at other cliff faces do not show this effect.

At several sites beds are truncated apparently by erosion, and discontinuities exist with the beds above. The best example is shown in the Huntec record from Coronation Fiord (Fig. 7b).

At a number of sites trenches, have been eroded in the fiord floor, apparently by gravity flow events, especially turbidity currents. Some of these features are flanked by bedrock walls (Fig. 9a, h), some are on the open fiord floor (Fig. 9h, i, 11 g, h), some have levees (Fig. 6e, f, 11g, h) and some are partially filled with sediment (Fig. 9h, i, 11g, h).

Other features: Several features which cannot be explained unequvocally are shown in the records. These include V notches not only in the surface sediment, but carried through the layers at depth (Fig. 8d at 16.1 km)

Perhaps related to these are wedge-like features, some with apparantly deformed sediments along side (Fig. 9b and c at 37.1 km, 11e and f at 41.2 km). Some at least may be related to faulting within the sediments, while others may be old trenches in the fiord floor now completely filled with sediment.

Non-glaciomarine sediments:

In this catigory we include sediments which may be of ice contact origin (especially in moraines and related features) and other sedimentary materials which appear to be of non-glacial origin. The section from Sunneshine Fiord (Fig. 5a, b, c, d) appears to show a series of moraine ridges under a thin veneer of glaciomarine sediment. In the floors of depressions beneath the glaciomarine sediments elsewhere may be glacial or preglacial sediments (Fig. 6e, 7a, c, e, 8a, 10g, 11g, i). In Itirbilung Fiord (Fig. 10 c, e, f) is a series of beds in the lower sections of the glaciomarine sediments which are inclined upfiord. These may represent surfaces overridden during minor advances of a retreating glacier. In none of the records, except possibly from Scott Inlet, is there strong evidence of pre-Pleistocene sedimentation.

CHARACTERISTICS OF THE FIORD BASINS

In order to investigate the relation between the distribution of the marine sediments and the physiography of the fiord basins, measurements of characteristics of the drainage basins were made on N.T.S. 1:250,000 maps. On a 2 km interval grid the following were recorded:

- elevation,
- slope between contour lines,
- nature of the surface (bare ground, snow and ice, or lake surface), and
- whether water flowing from this point passes through a lake before entering the fiord.

The latter is of importance, as all of the coarse sediments and a large portion of the fine, suspended material (depending on the ratio of inflow to lake volume) is filtered from the rivers by lakes along their courses. The maps used showing the drainage divides, the glaciers and icefields, and the lakes have been redrawn and are shown at smaller scale as Fig. 1. The statistics are summarized in Table 3, and the hypsometric data derived from them plotted in Fig. 16 and 17. The area of each basin and the area presently glacier covered are plotted against the volume of of glaciomarine sediment in each fiord in Fig. 18. The poor correlation indicates that the following factors may be of importance and worthy of further investigation.

- Significant quantities of sediment may be lost from some fiords, especially those without sills or with deep sills such as North Pangnirtung, Coronation, and Maktak. The larger tidal range of the more southerly fiords may influence the extent of circulation and flushing of sediment from the fiords.

- The glacial processes may vary among fiords. Factors here include the increasing probability of cold based glaciers farther north, and the role that very slowly flowing ice caps may play in protecting the surface from erosion in comparison to actively eroding valley glaciers.

- The history of glaciation may be much more important than present day conditions. For example, Cambridge Fiord was influenced by the northern limit of the Laurentide ice sheet, which may have been responsible for deposition of the thick sequences of glaciomarine sediments, while the fiords farther south were influenced by ice from local mountain sources. In addition, fluvial processes during interglacial periods may have varied significantly from those occurring at present.

REFERENCE

NAFE, J.E. and DRAKE, C.L. 1964. Physical properties of marine Sediments. In: Hill, M.N. (ed.). The Sea, Wiley and Sons, New York, 794-815.

TABLE 1: SUMMARY OF SEISMIC RUNS IN BAFFIN ISLAND FIORDS

Fiord	Distance from fiord head (km) begining of line	end of line	line length (km)	Comment
Sunneshine	44.2	22.2	22.0	Sea ice in fiord prevented more extensive survey
Canso Channel	-	-	9.6	
North Pangnirtung	49.5	7.2	42.3	
Coronation	46.2	1.6	44.6	
Maktak	33.6	2.8	30.8	
Tingin	57.9	3.9	54.0	
Itirbilung	73.0	8.8	64.2	Including the outer reaches of Tingin Fiord (Fixes 1-4)
McBeth	80.0	7.4	72.6	
Inugsuin	107.0	5.1	101.9	
Clark	52.0	4.1	47.9	
Clark-Scott Inlet	67.2	98.6	31.4	From Hudson 78-029, continues the Clark Fiord line with a gap from 52 to 67.2 km
Gibbs-Scott Inlet	91.2	35.8	55.4	from Hudson 82-034
Cambridge	50.2	3.2	47.0	
TOTAL SAFE'82			536.9	
GRAND TOTAL			623.7	

TABLE 2: MORPHOMETRIC DATA SUMMARY - BAFFIN ISLAND FIORDS

Fiord	Surface area km^2	Water volume $m^3 x10^9$	Maximum depth m	Sill depth m	Length km	Mean width km	Sill (mouth) width	Maximum sediment thickness km	Sediment volume[a] $m^3 x10^9$ m	Tidal prism[b] $m^3 x10^6$
Sunneshine	131	?	?	64	36.2	3.6	4.5	?	?	300
North Pang	170	33	479	none	48.3	3.5	5.0	40	0.42	155
Coronation	131	30	606	none	41.0	3.2	4.0	130	1.06	142
Maktak[c]	60	9.8	320	none	25.8	2.3	2.5	70	0.45	65
Tingin	218	48	523	180?	47.0	4.6	6.2	130	2.10	119
Itirbilung	162	41	435	249	54.9	3.0	5.4	200	3.60	89
McBeth	402	137	563	249	93.0	4.3	6.8	297	7.67	196
Inugsuin	563	101	633	121	98.0	5.7	6.0[h]	110	1.83[i]	240
Clark	144	107	287[d] 720[f]	108[e] 185[g]	67.0	2.1	6.4	200	2.17[i]	57
Cambridge	219	70	708	439	60.8	3.6	3.2	290	6.55	140

a. not includng the region between the end of the seismic line and the head of the fiord; b. using mean spring tidal range; c. to the confluence with Coronation Fiord; d. behind the inner sill; e. inner sill 25.0 km from the head; f. near the mouth; g. connecting sill to Gibbs Fiord; h. not including the islands; i. not including the outer reaches of the fiord where thick sediment has accumulated.

TABLE 3: DRAINAGE BASIN DATA SUMMARY - BAFFIN ISLAND FIORDS

Fiord	Area km^2				Area Per cent			% Area filtered through lakes		Maximum elevation m
	land	glacier	lake	total	land	glacier	lake	land	glacier	
Sunneshine	460	92	12	564	81.6	16.3	2.1	16.5	34.8	1707
North Pang.	1332	720	12	2064	64.5	34.9	0.6	15.0	8.9	2057
Coronation	340	788	<4	1128	30.1	69.9	0	3.5	1.5	2057*
Maktak	604	528	<4	1132	53.4	46.6	0	6.0	6.8	2057*
Tingin	760	452	16	1228	61.9	36.8	1.3	25.3	32.7	1432
Itirbilung	1452	696	36	2184	66.5	31.9	1.6	61.1	42.5	1751
McBeth	2620	916	48	3584	73.1	25.6	1.3	21.4	18.3	1751
Inugsuin	1584	520	88	2192	72.3	23.7	4.0	32.1	21.5	1680
Clark	768	524	32	1324	58.0	39.6	2.4	35.9	36.6	1554
Cambridge	1628	240	124	1992	81.7	12.1	6.2	62.4	28.3	1367

* Summit of Penny Ice Cap. Summit of Barnes Icecap is 1123 m and the highest point in eastern North America is Mt Barbeau, Ellesmere Island at 2590 m

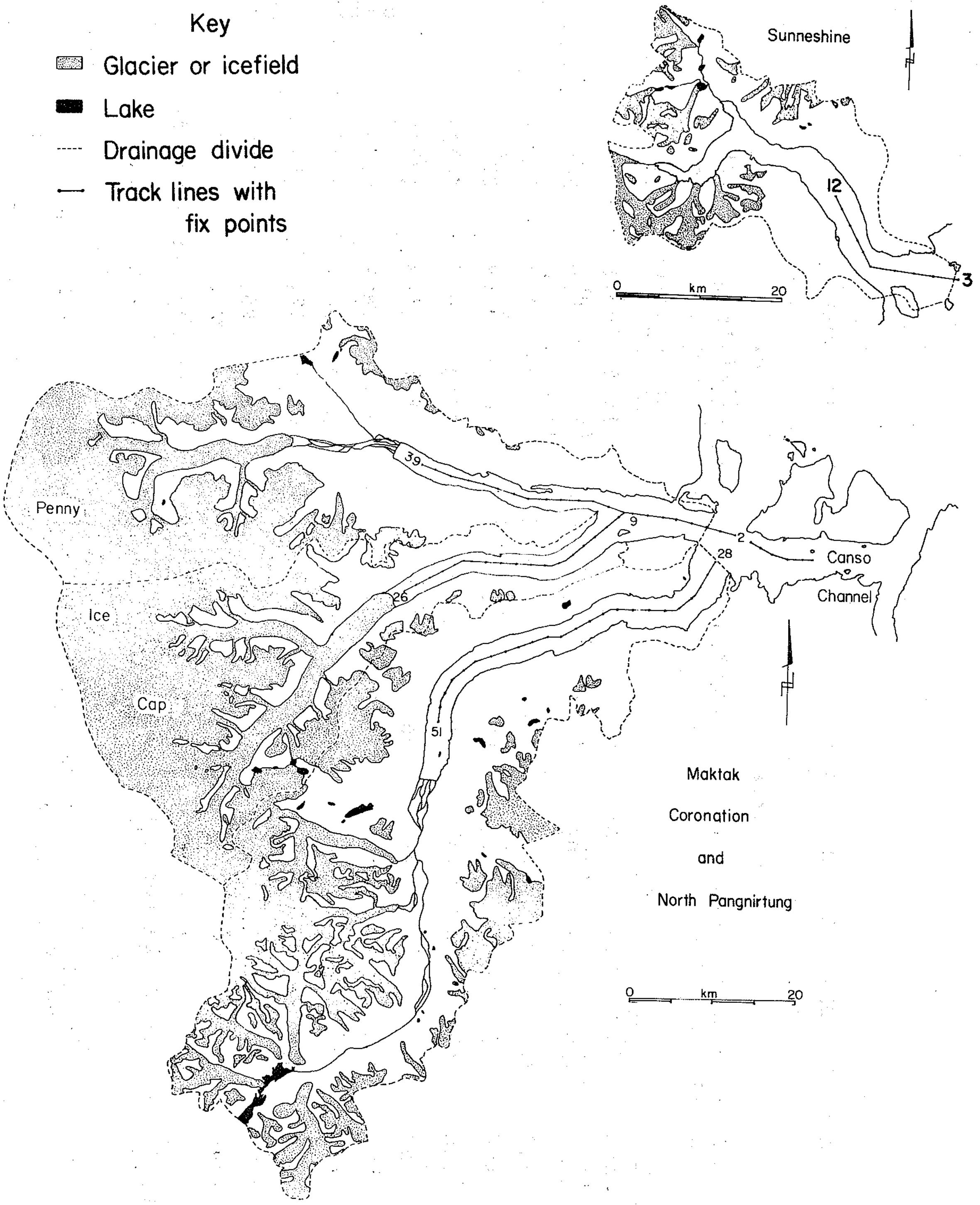


Figure 1. Maps showing drainage basins, glaciers and track lines of the Baffin Island fiords. From National Topographic Series 1:250 000 maps.

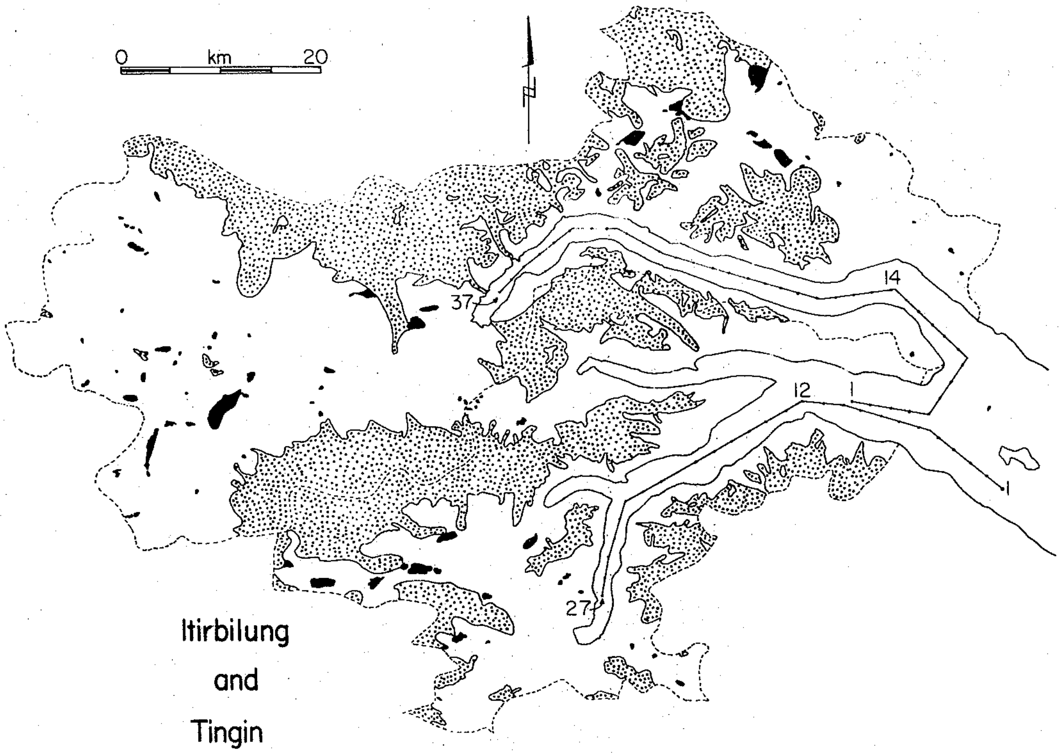


Figure 1 continued

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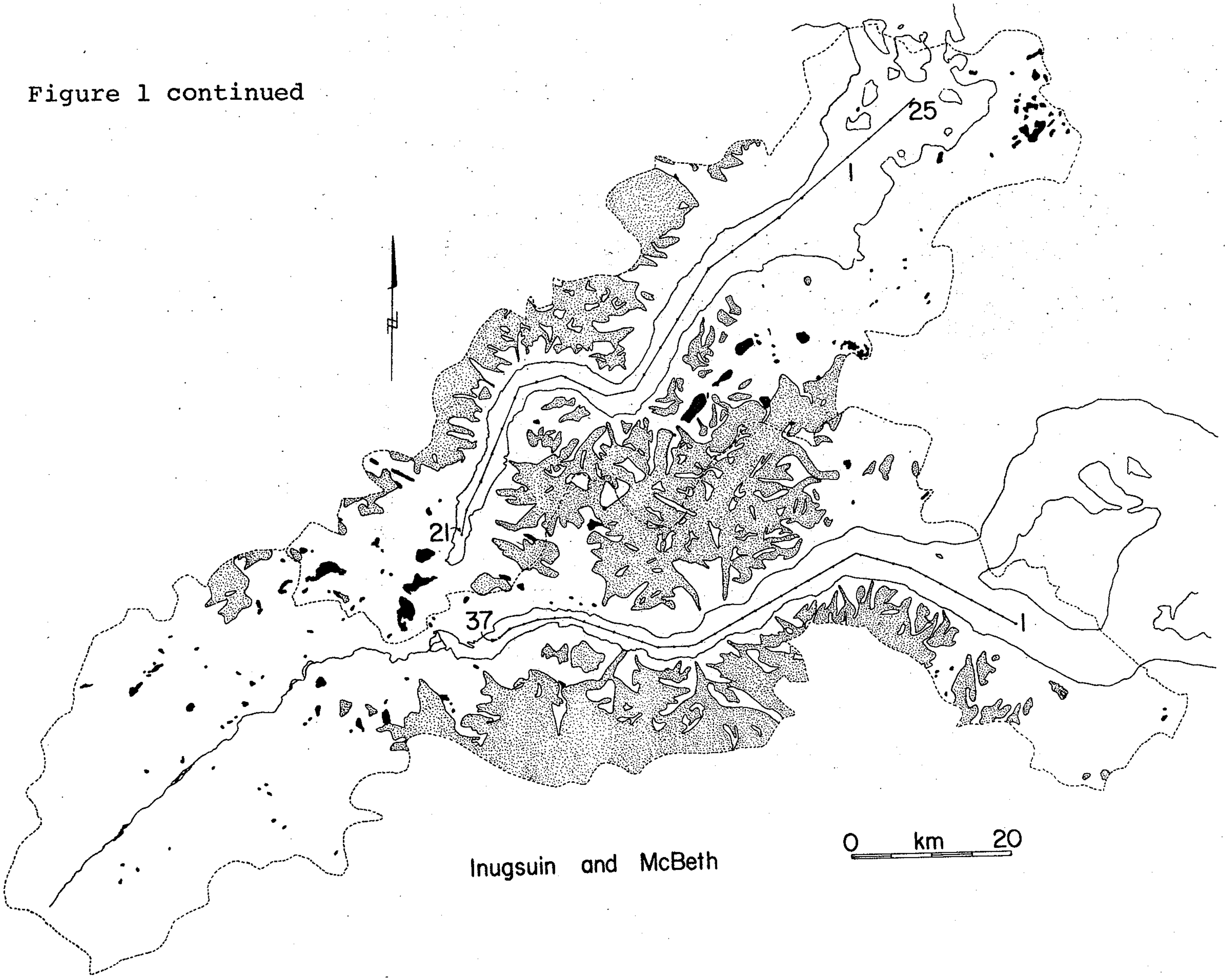

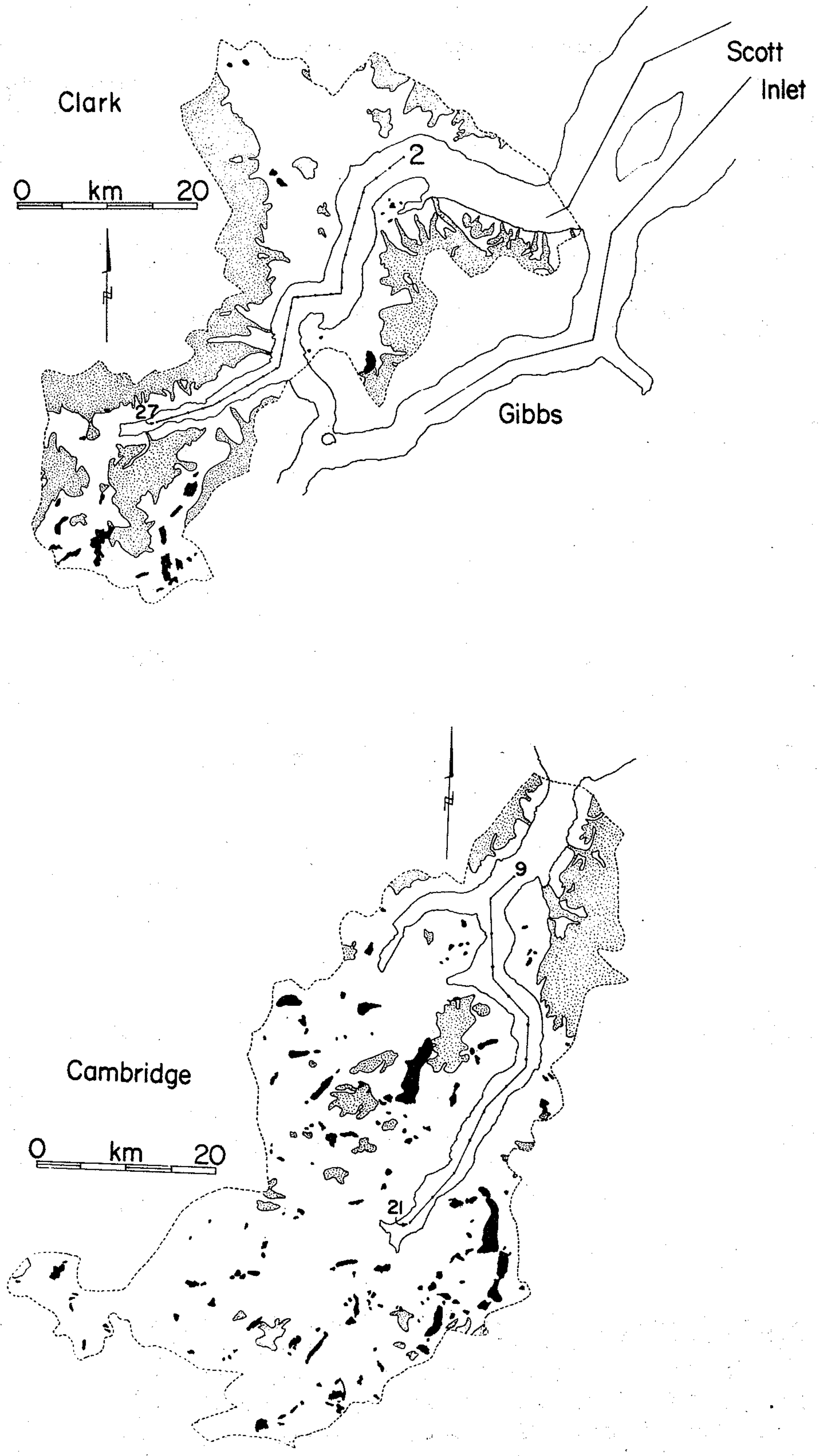

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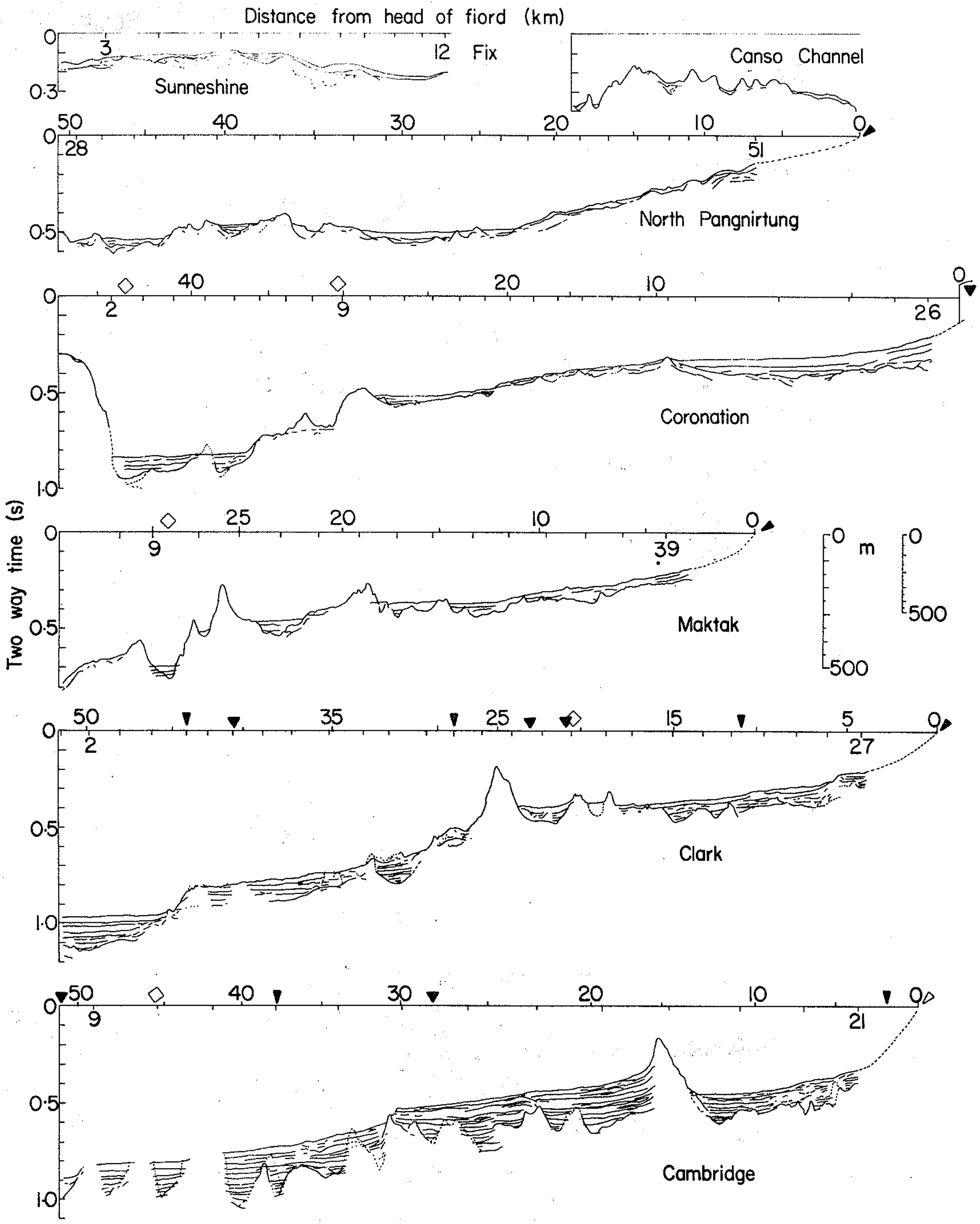


Figure 2. Interpretation of air gun seismic profiles. Locations of fix points are shown on Figure 1. Sources of terrestrial sediment are shown by symbols along upper axes (key on page following). Water depth (left) and sediment thickness (right) scales are calculated as described in text.

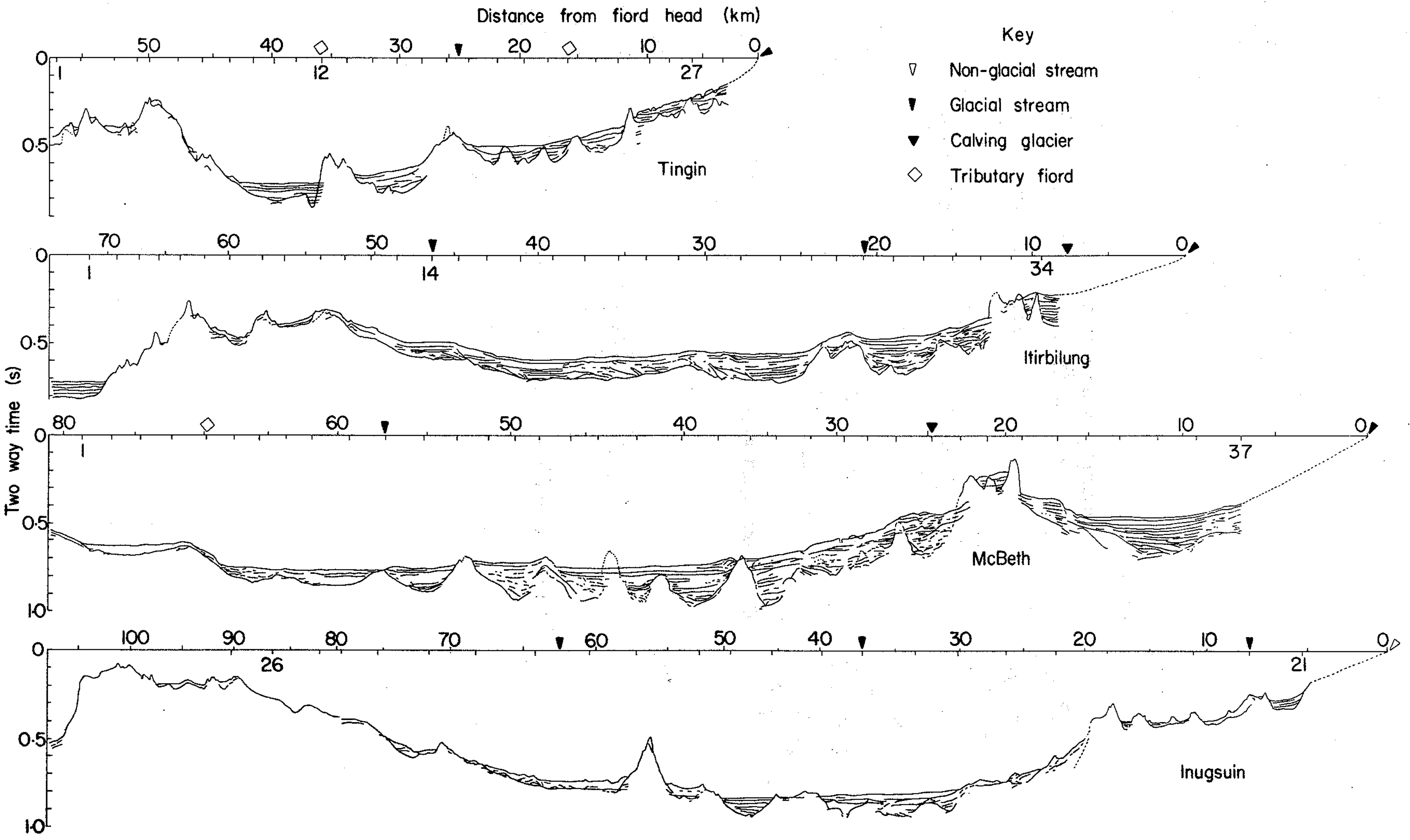
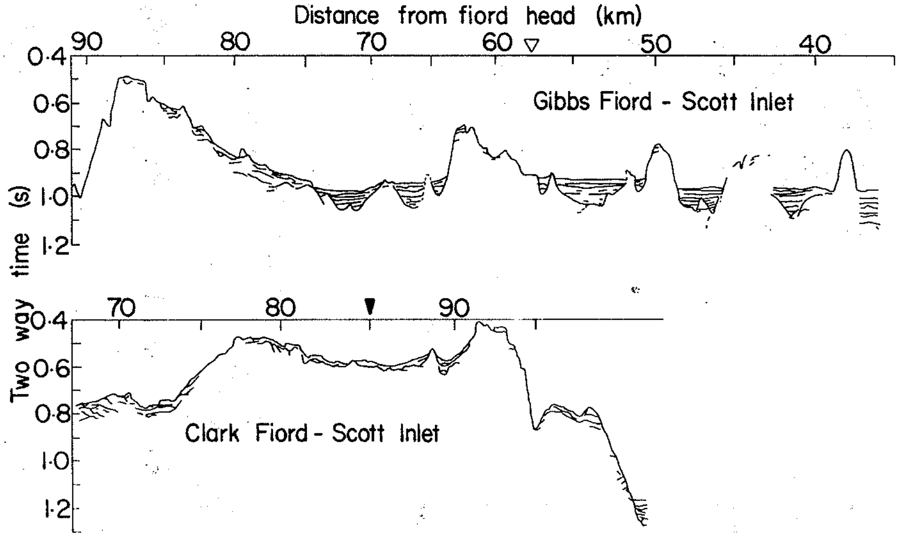


Figure 2 continued



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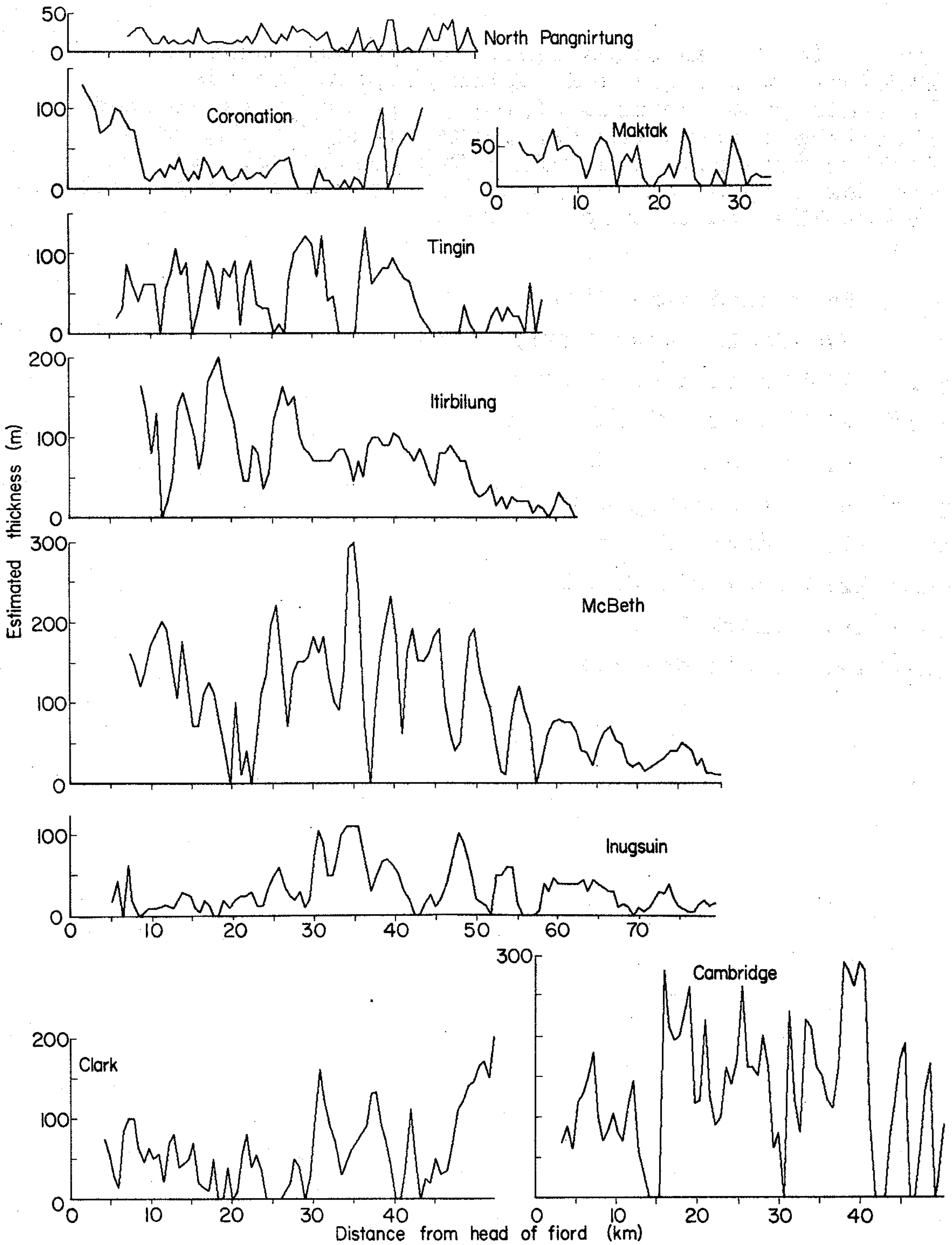
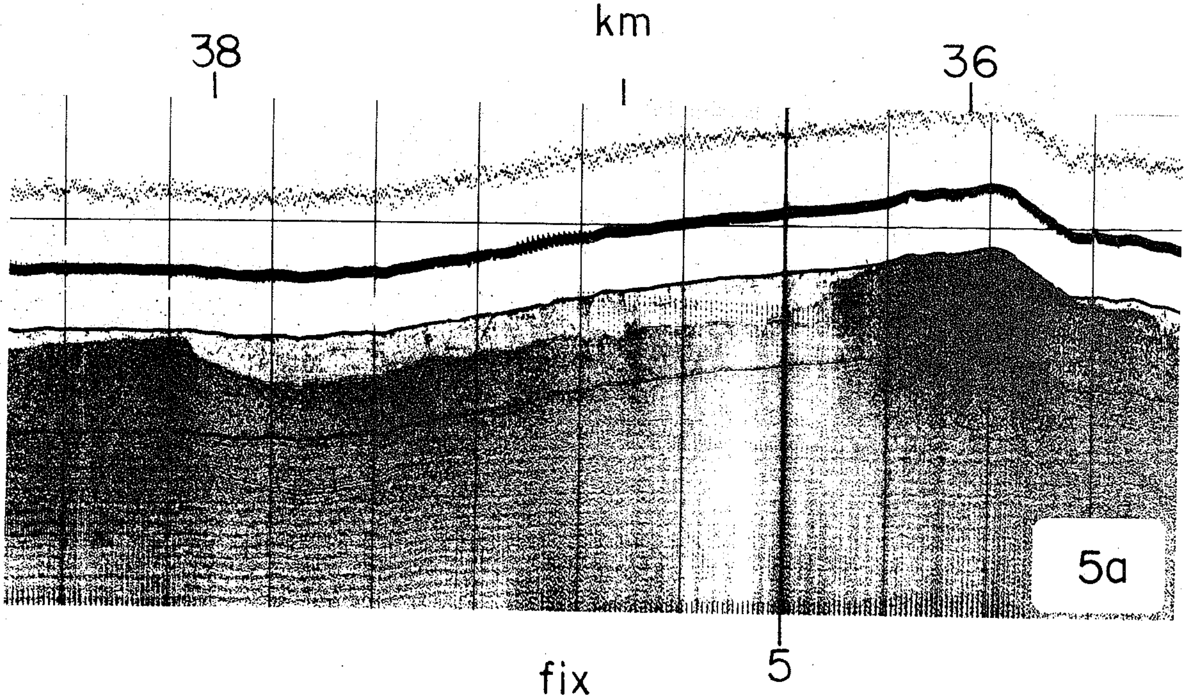


Figure 3. Thickness of glaciomarine sediments determined from air gun records.

Figures 5 to 14 (on pages following): Representative sections of air gun and Huntec seismic records. Distance from the head of the fiord in km is plotted along the top and the fix marks along the bottom of each record (cf. figure 2). Two way travel time in seconds is plotted to the left of the air gun profiles. Scales are provided in figure 15.

Figure 5: Sunneshine Fiord
Figure 6: North Pangnirtung Fiord
Figure 7: Coronation Fiord
Figure 8: Maktak Fiord
Figure 9: Tingin Fiord
Figure 10: Itirbilung Fiord
Figure 11: McBeth Fiord
Figure 12: Inugsuin Fiord
Figure 13: Clark Fiord
Figure 14: Cambridge Fiord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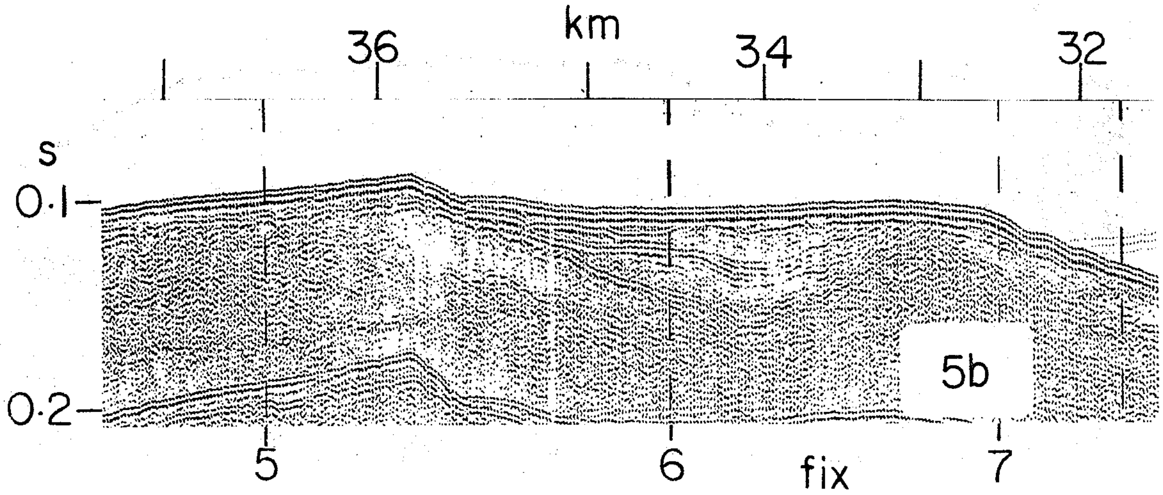
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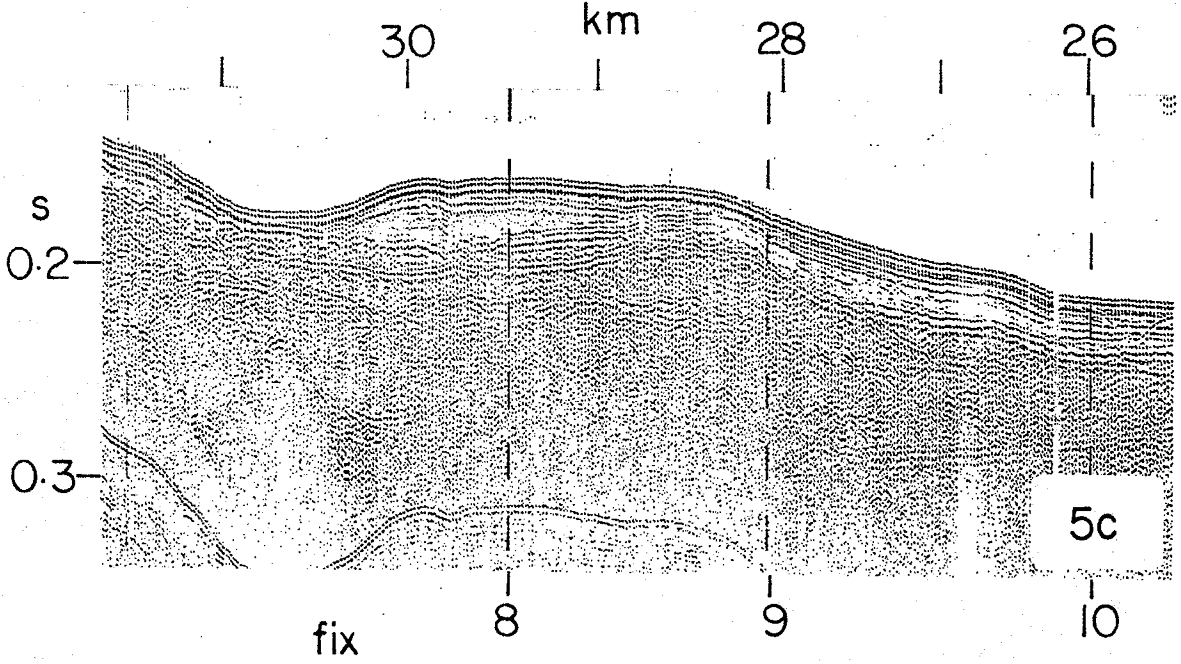
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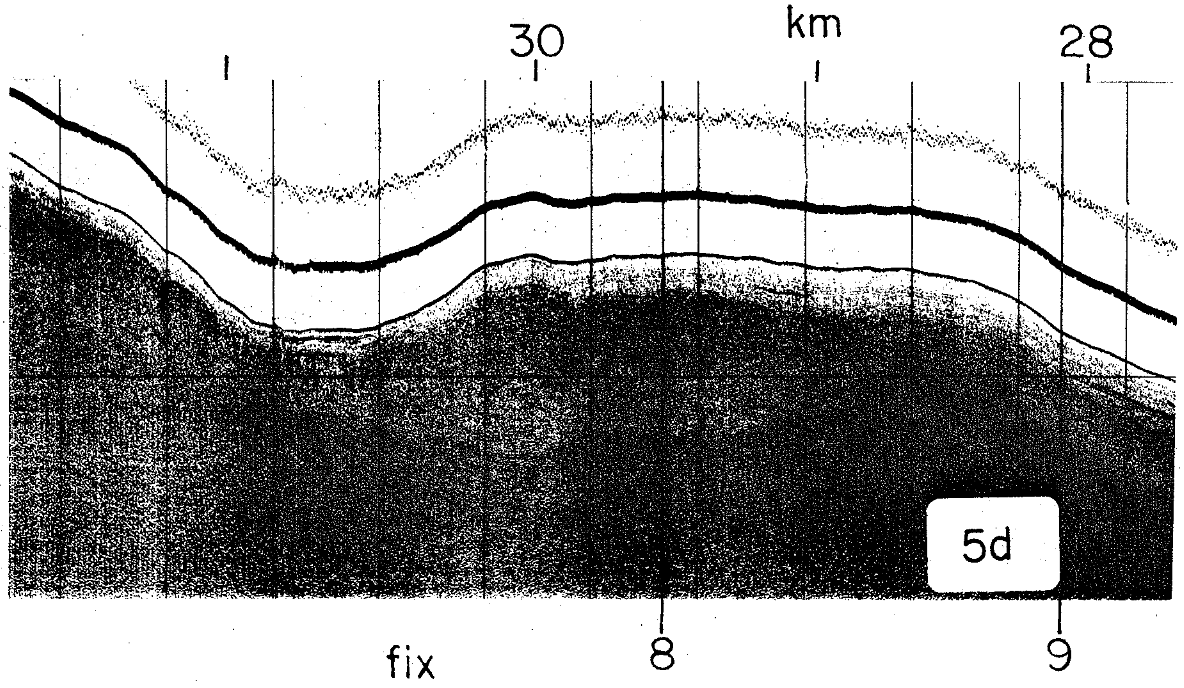
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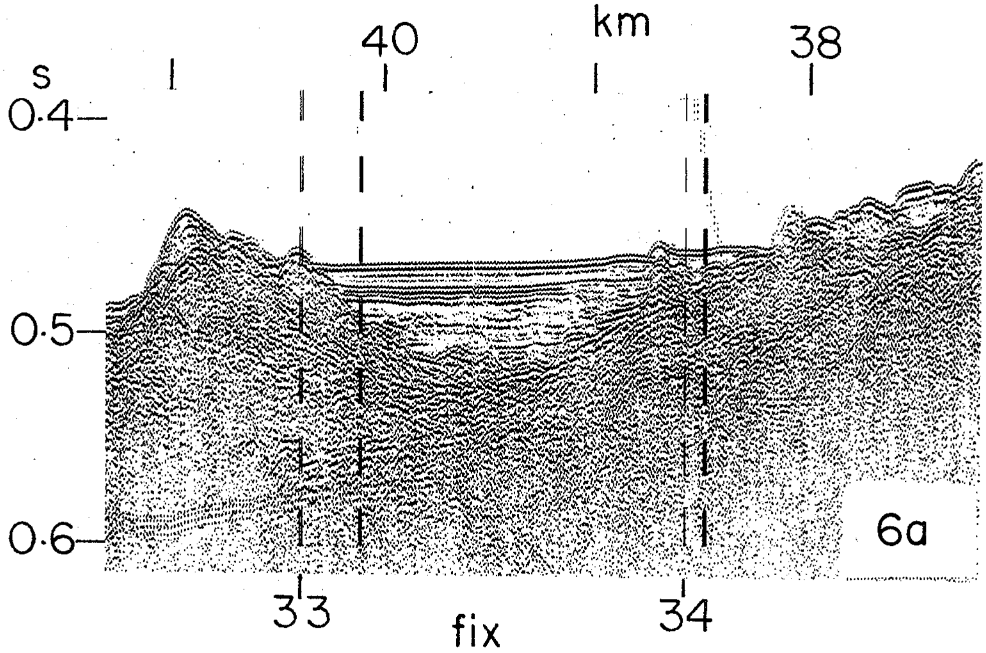

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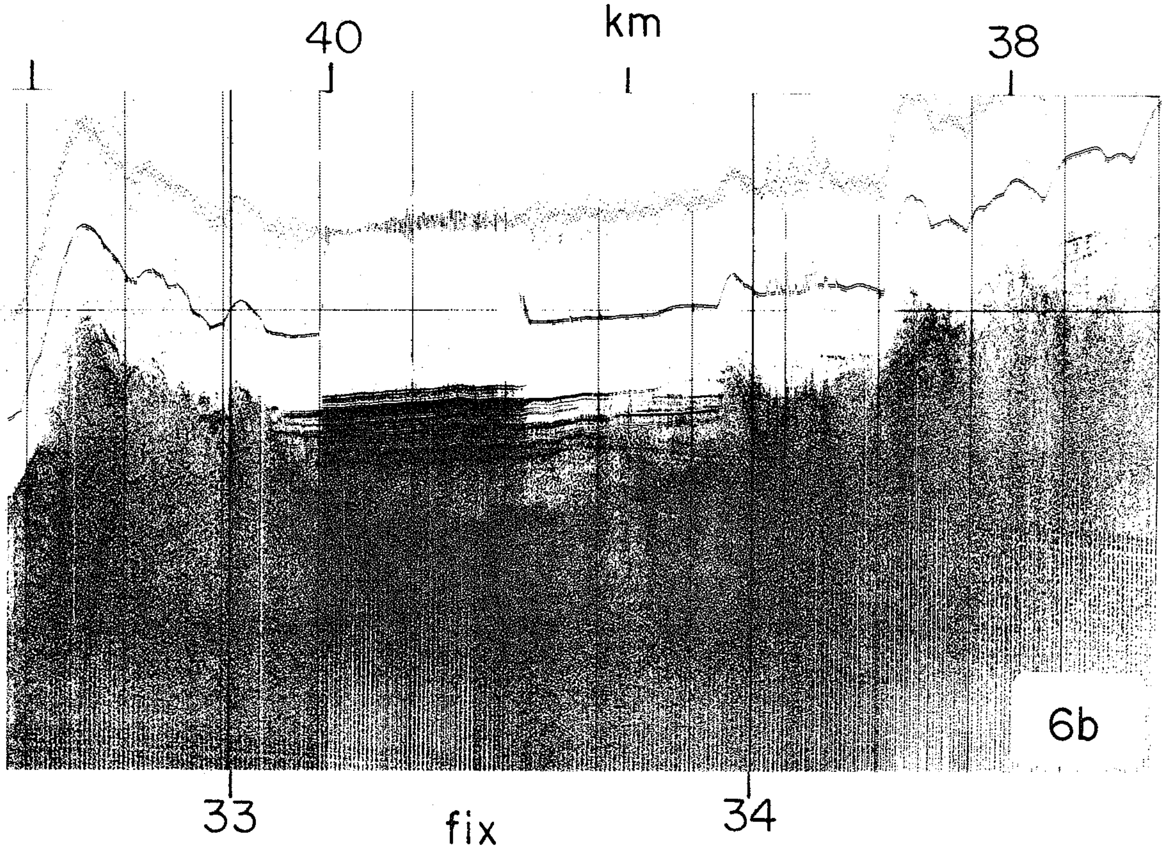

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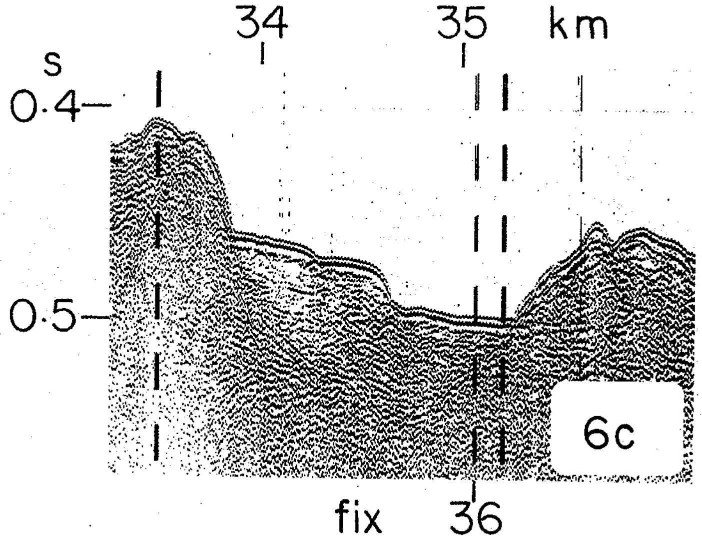
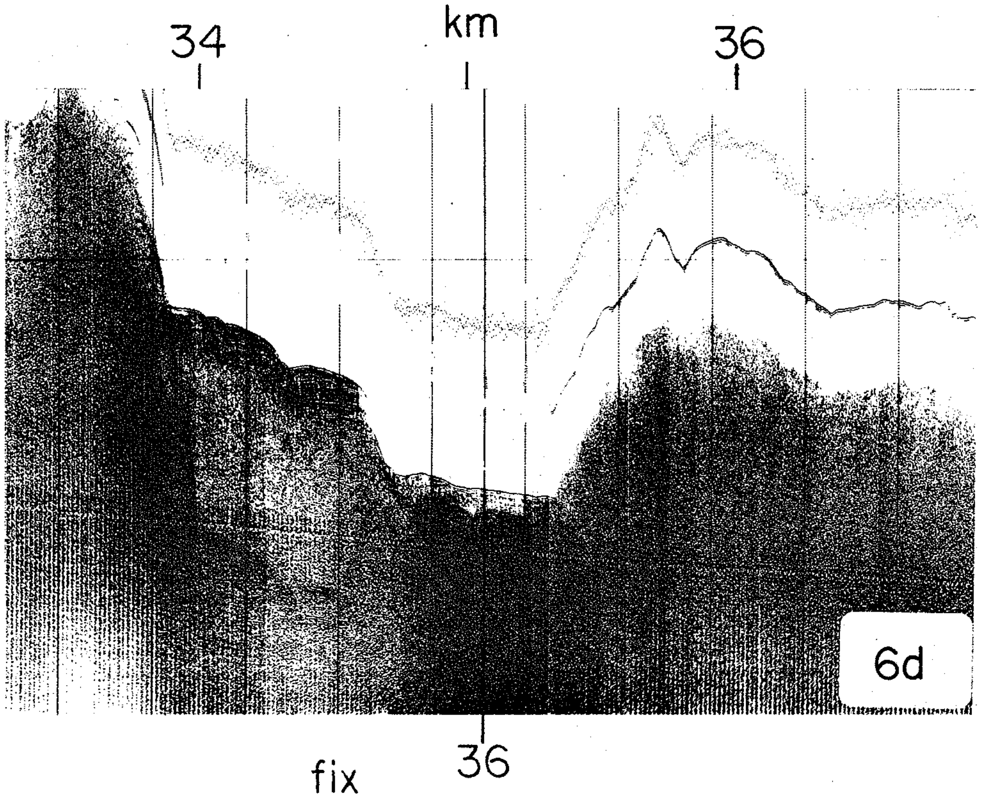

34
35
km
s
0.4
0.5
6c
fix
36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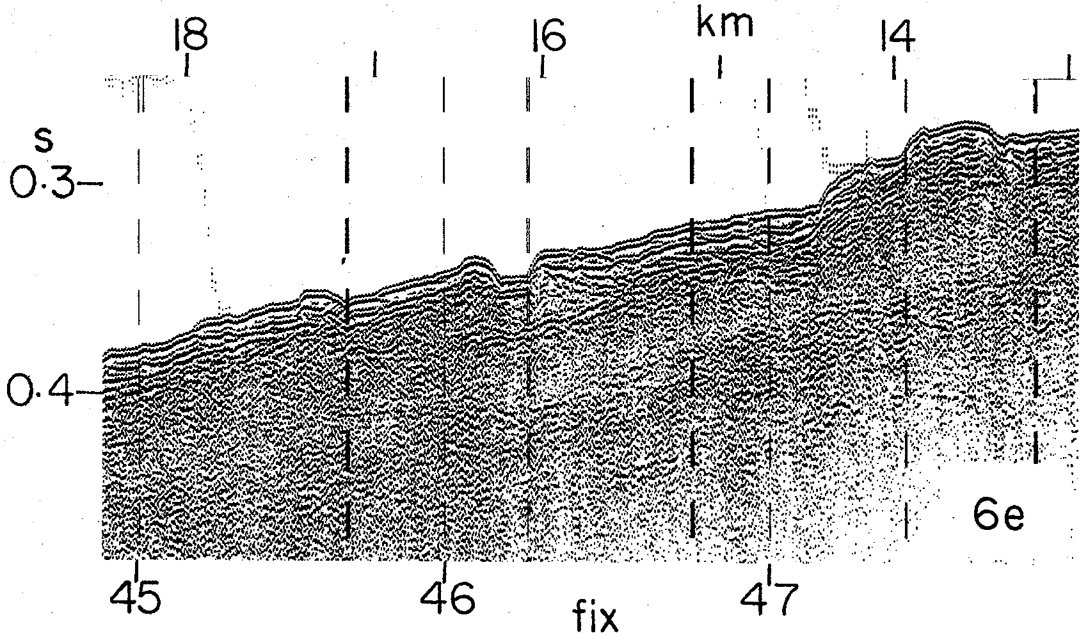
6d
fix
36



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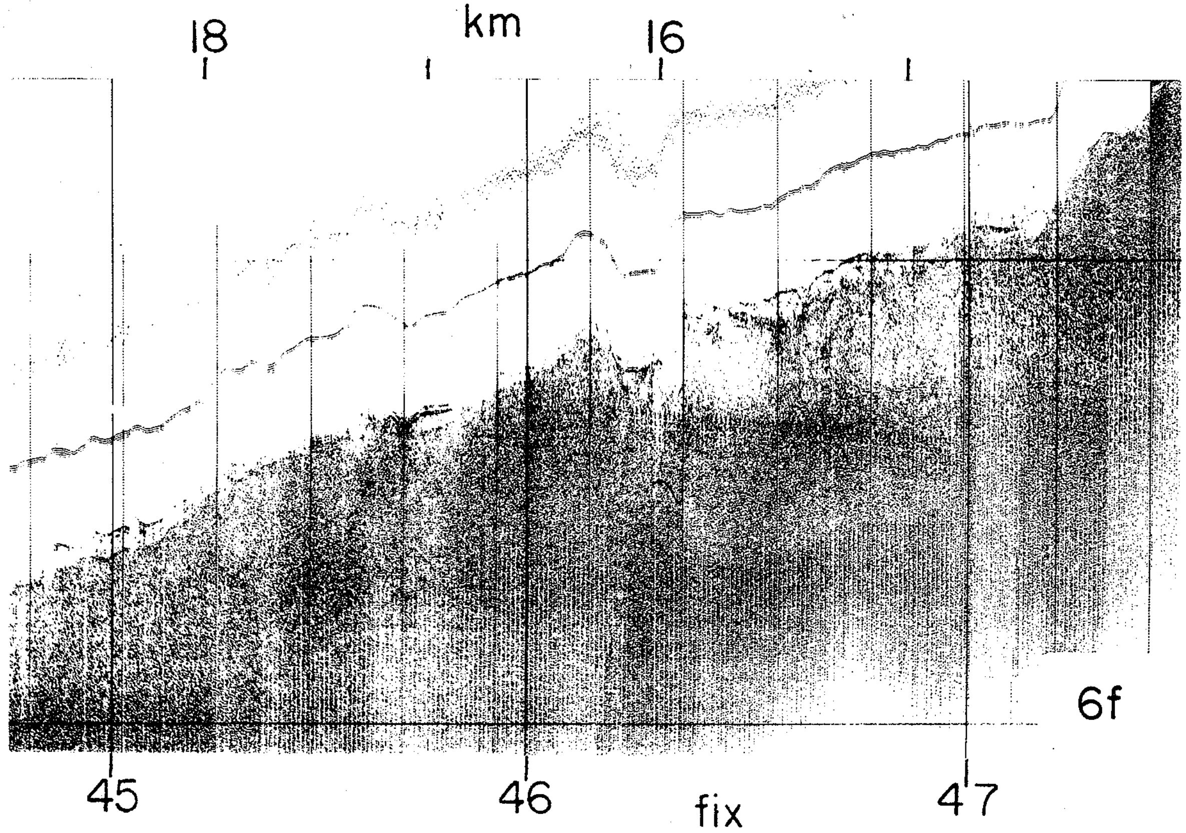

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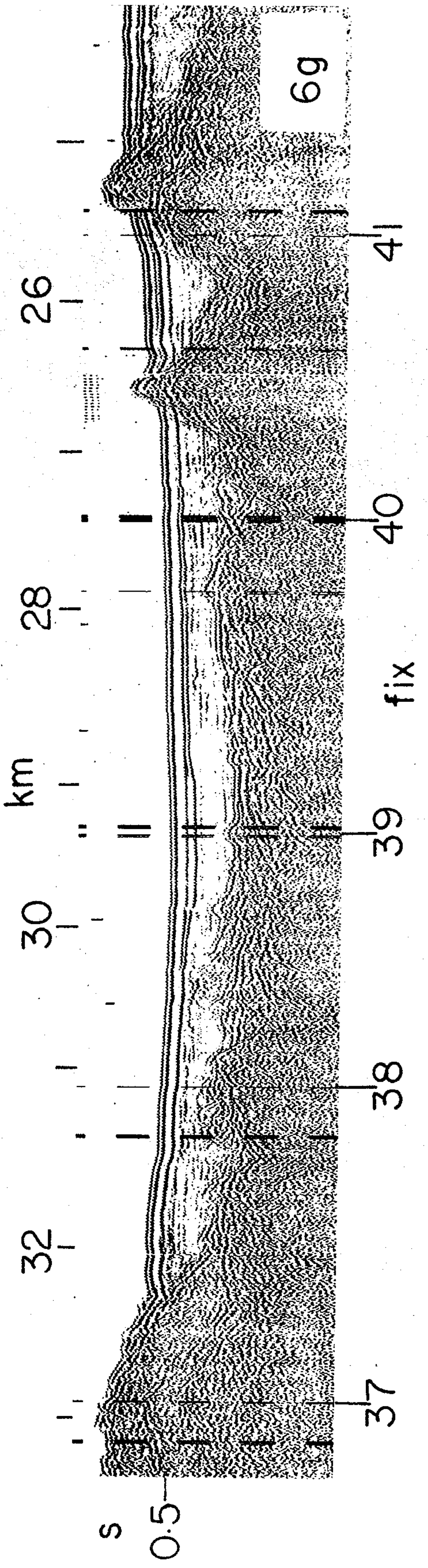
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km
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40
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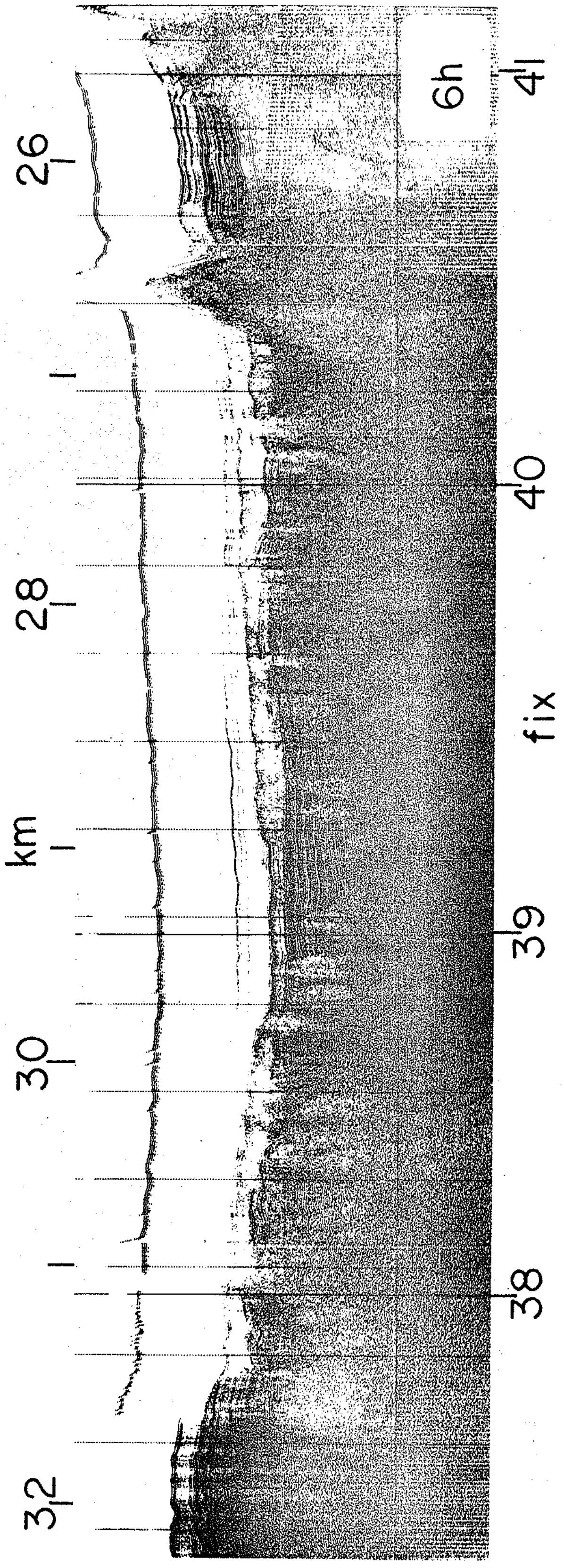
38
37
s
0.5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28
fix
km
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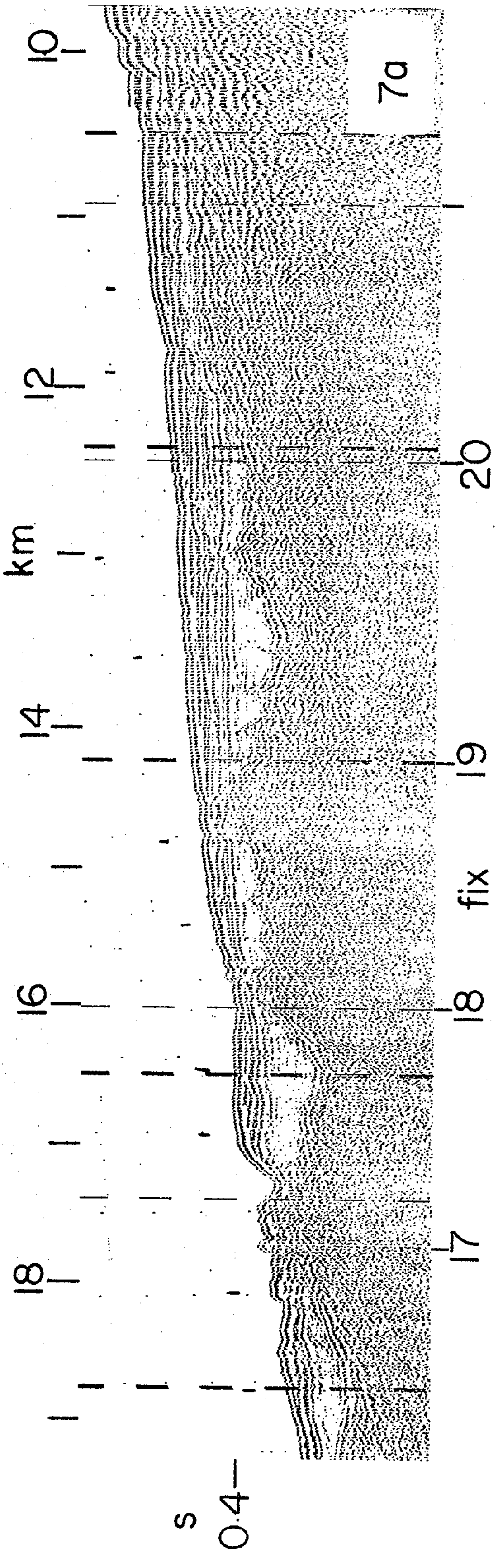
30
38
32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17
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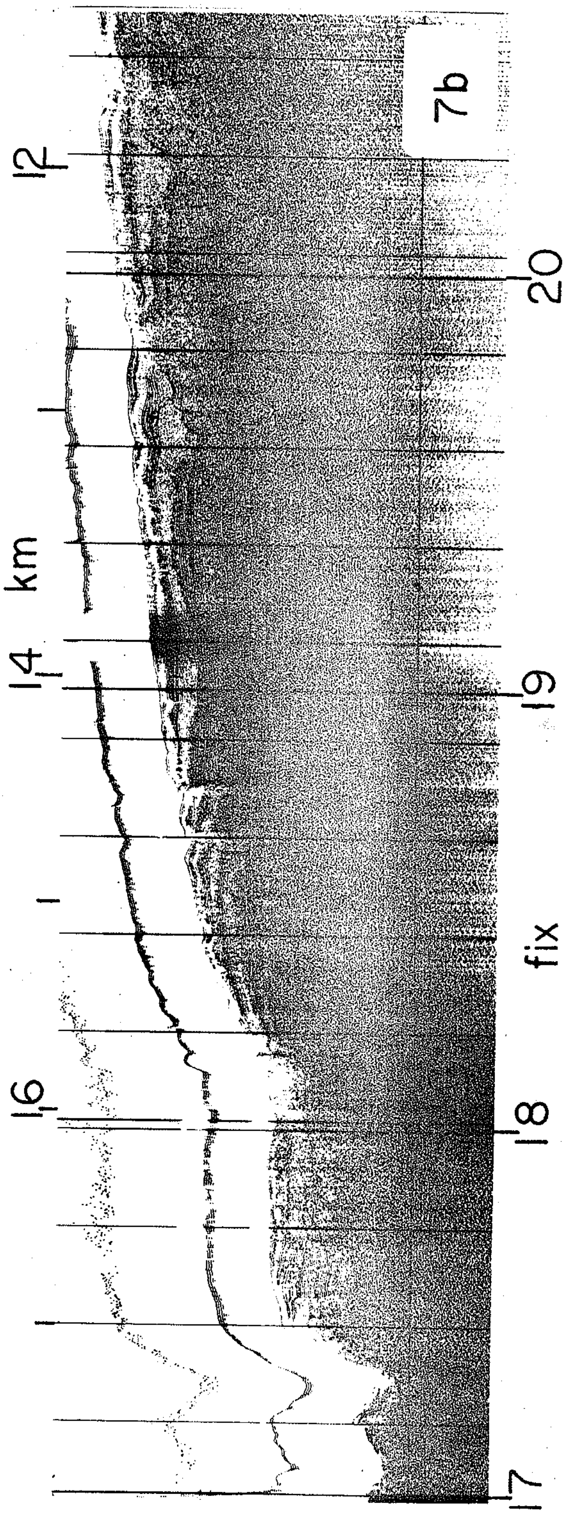
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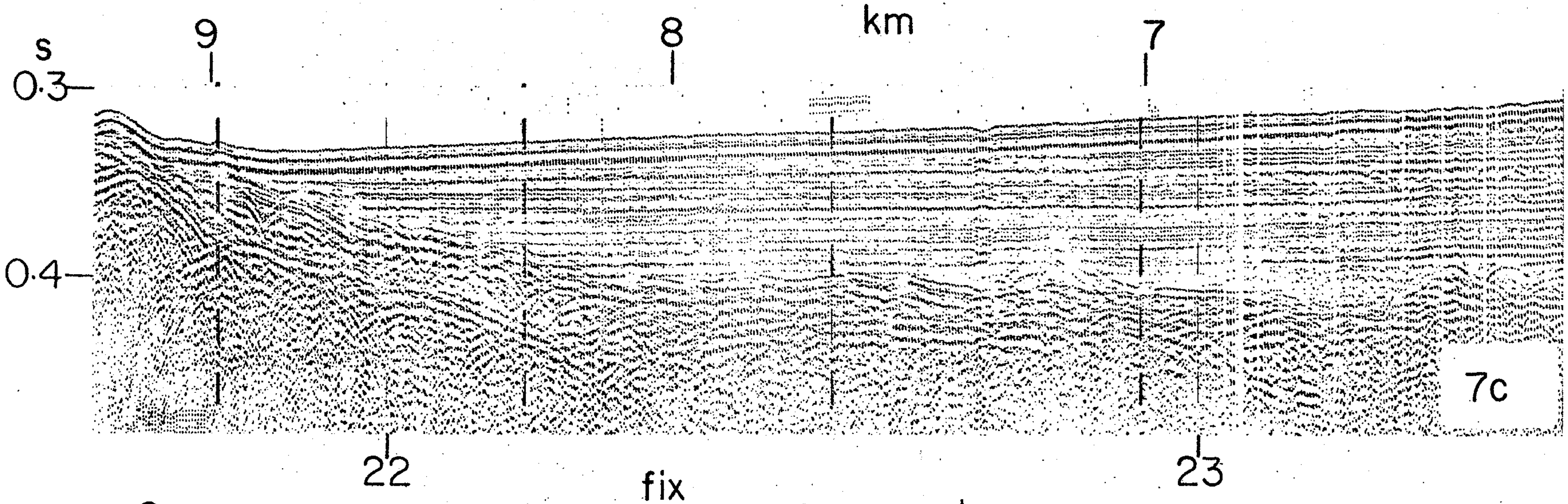
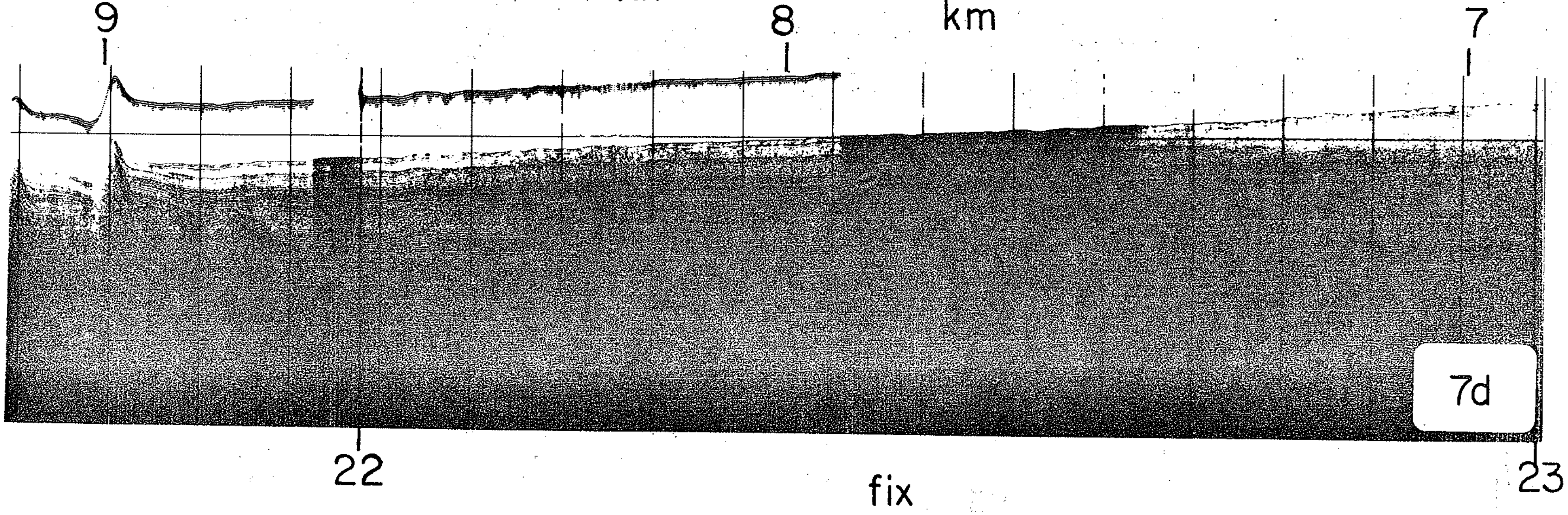
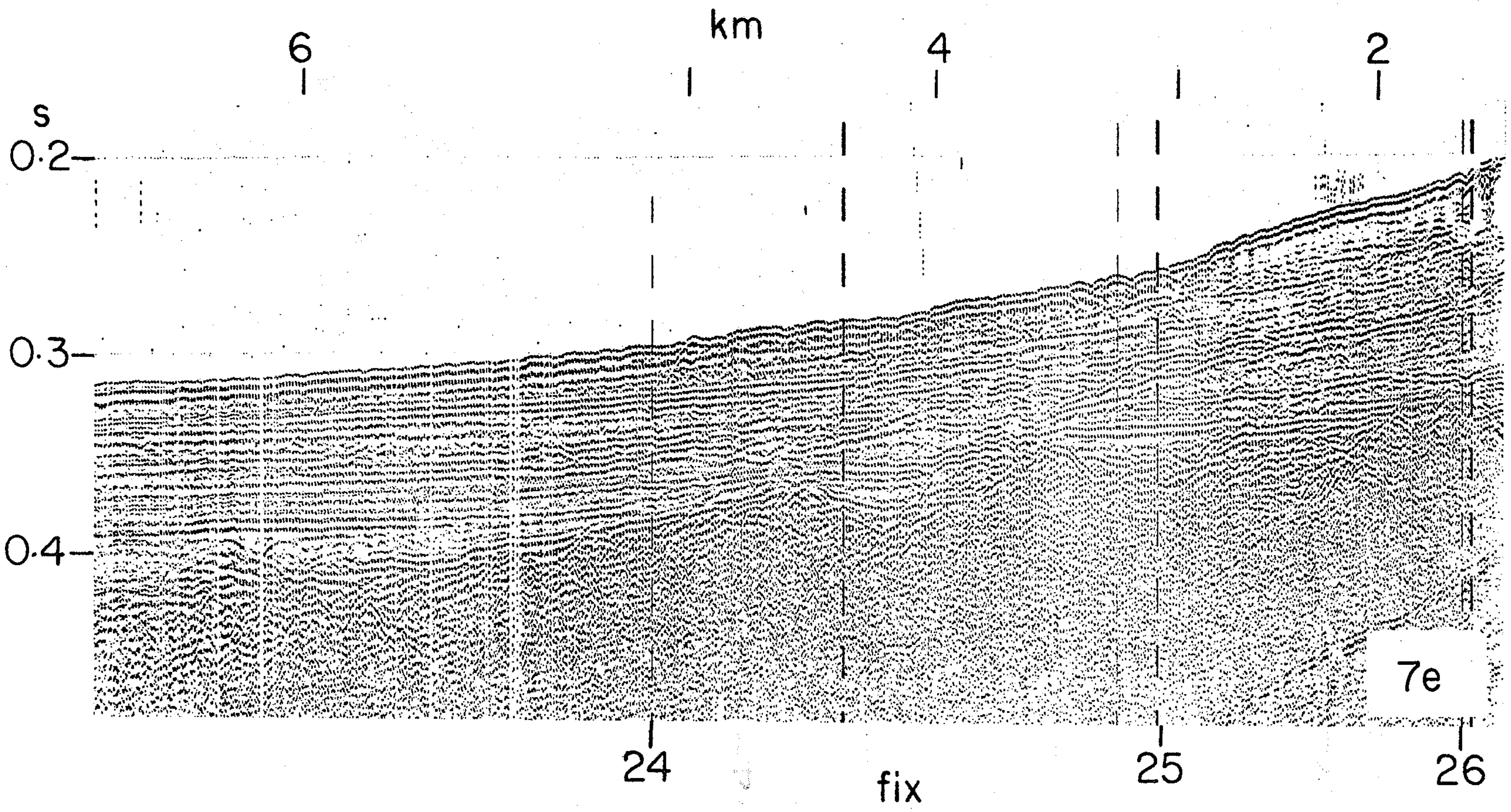
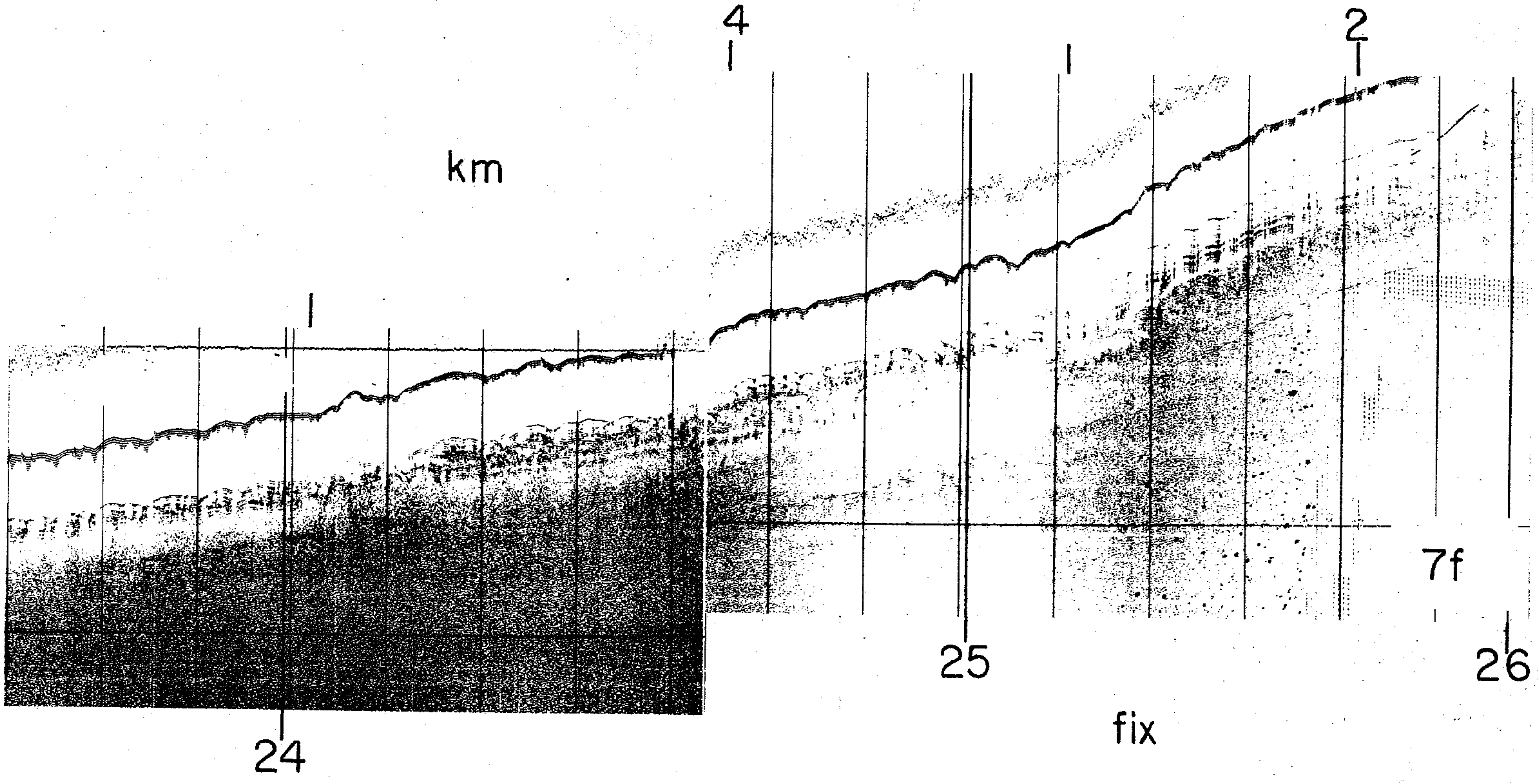

s
0.3
0.4
9
8
km
7
7c
22
fix
23


9
8
km
7
7d
22
fix
23


km
6
4
2
s
0.2
0.3
0.4
7e
24
fix
25
26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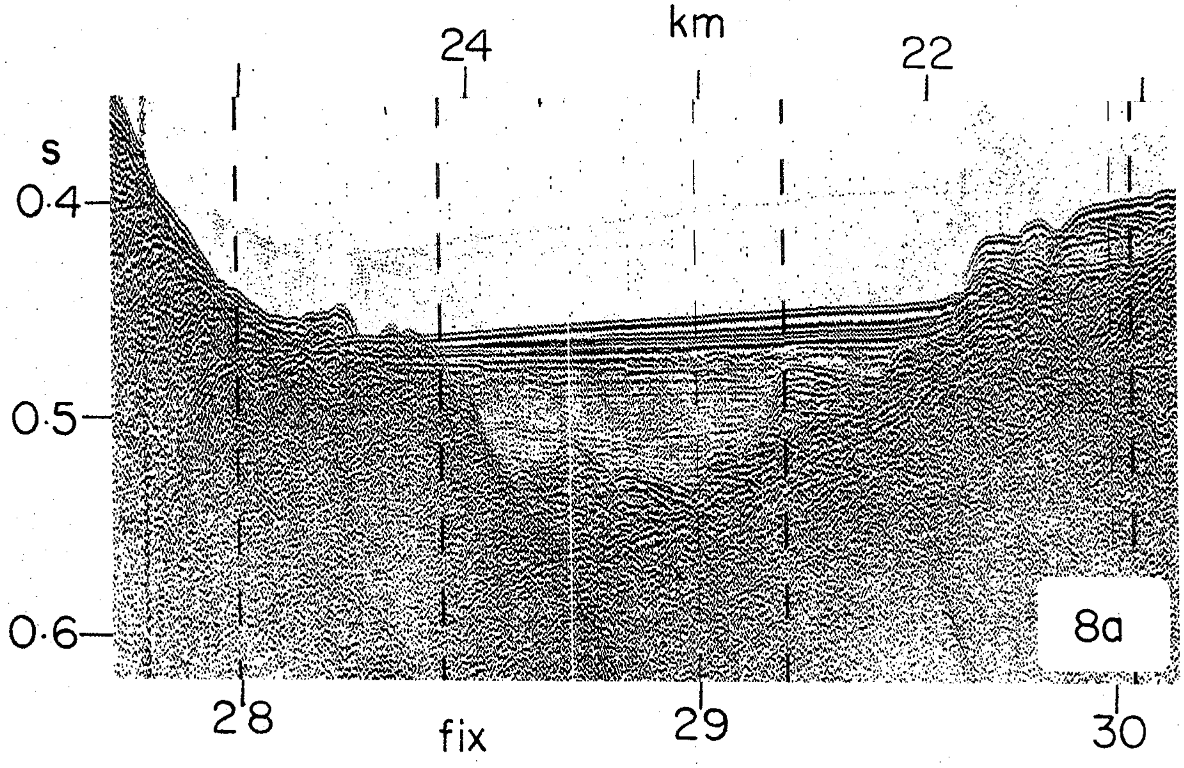
2
km
7f
25
26
24
fix



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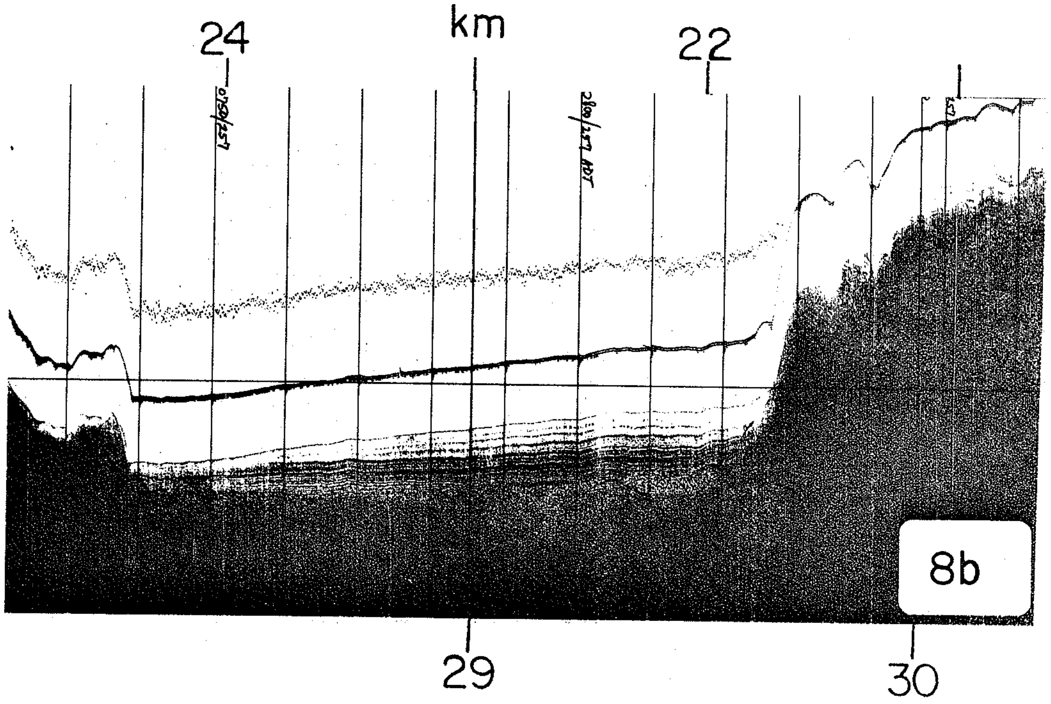

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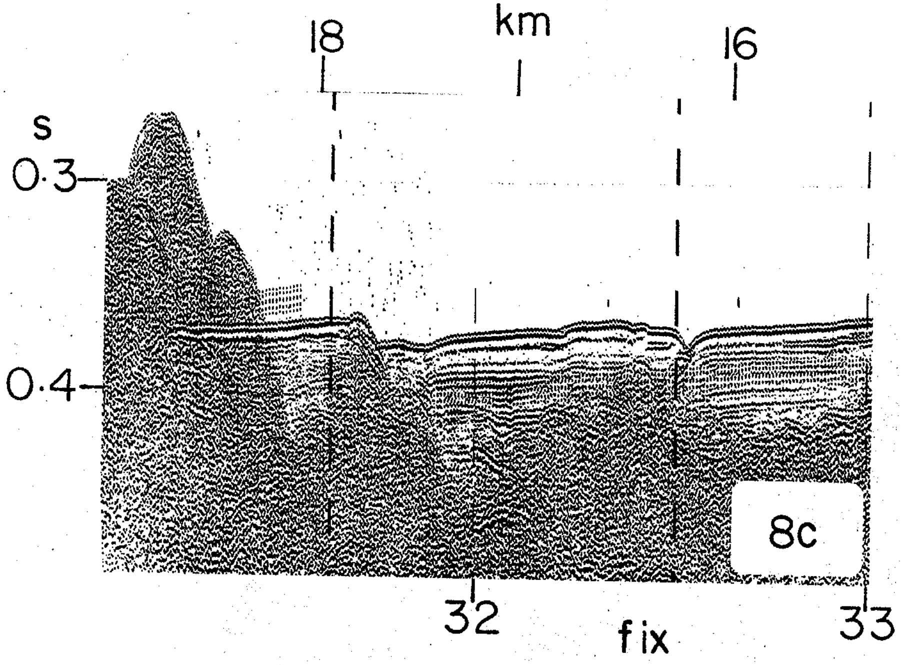
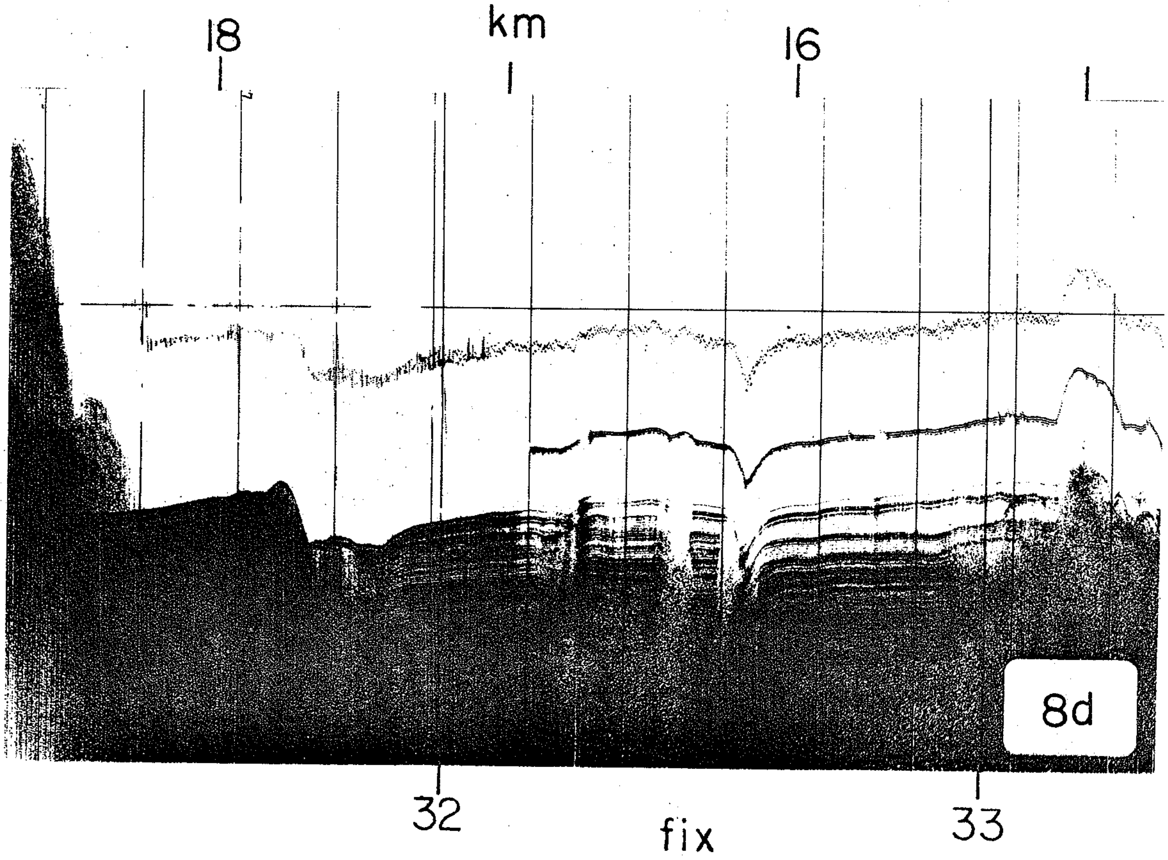

18
km
16
s
0.3
0.4
8c
32
fix
33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km
16
8d
32
fix
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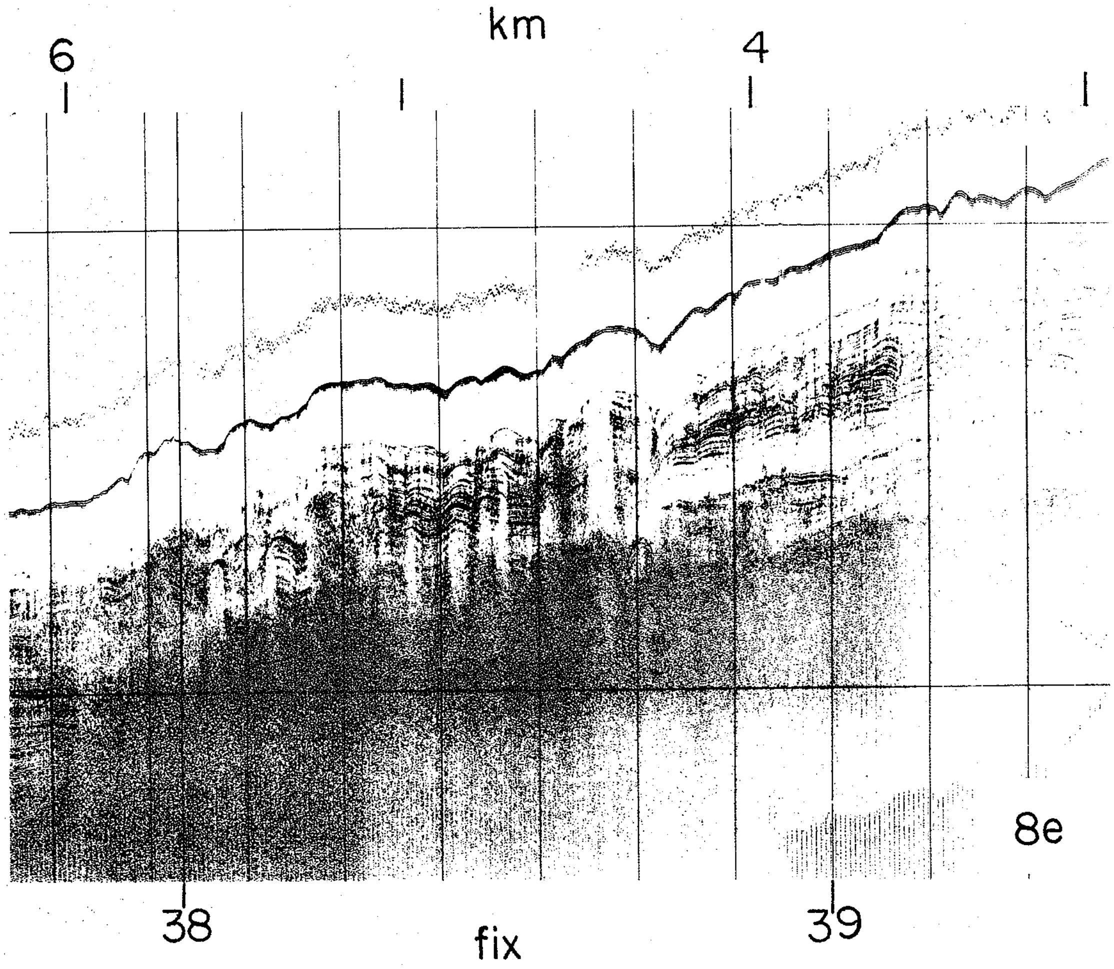
km
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4
8e
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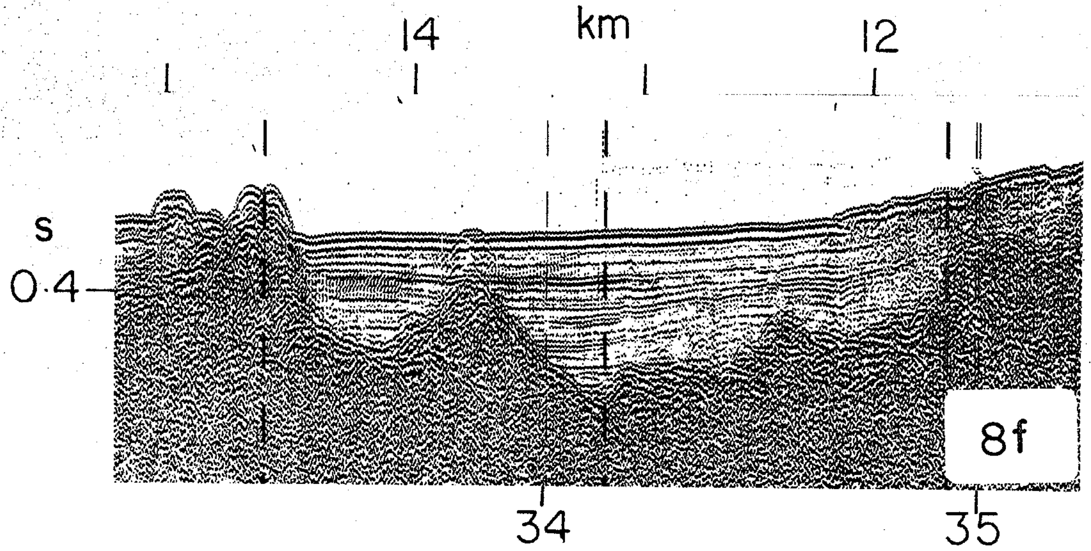
fix
39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km
12
s
0.4
8f
34
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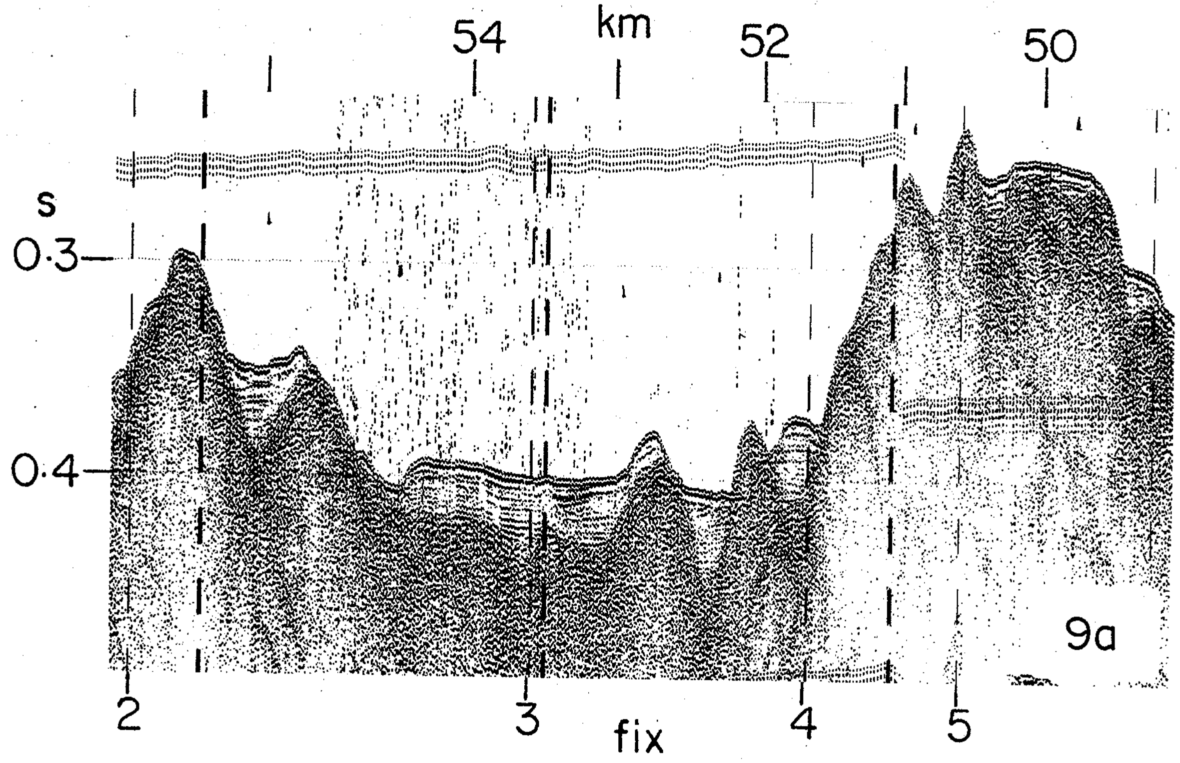
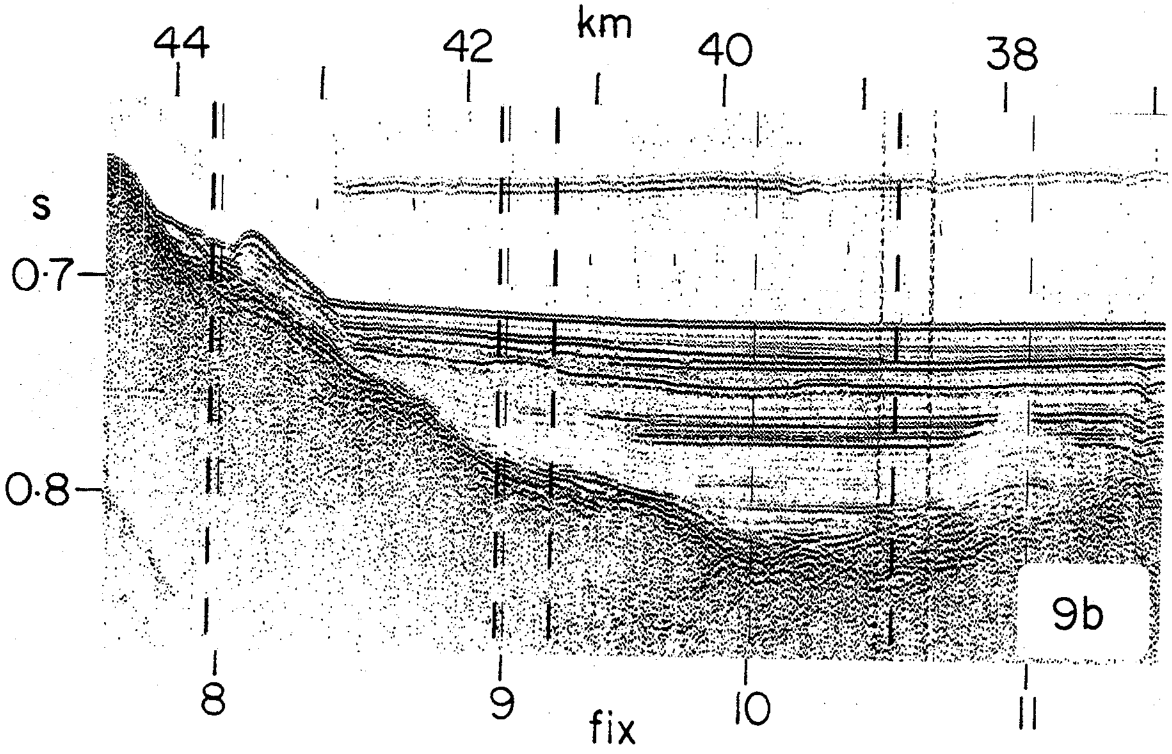
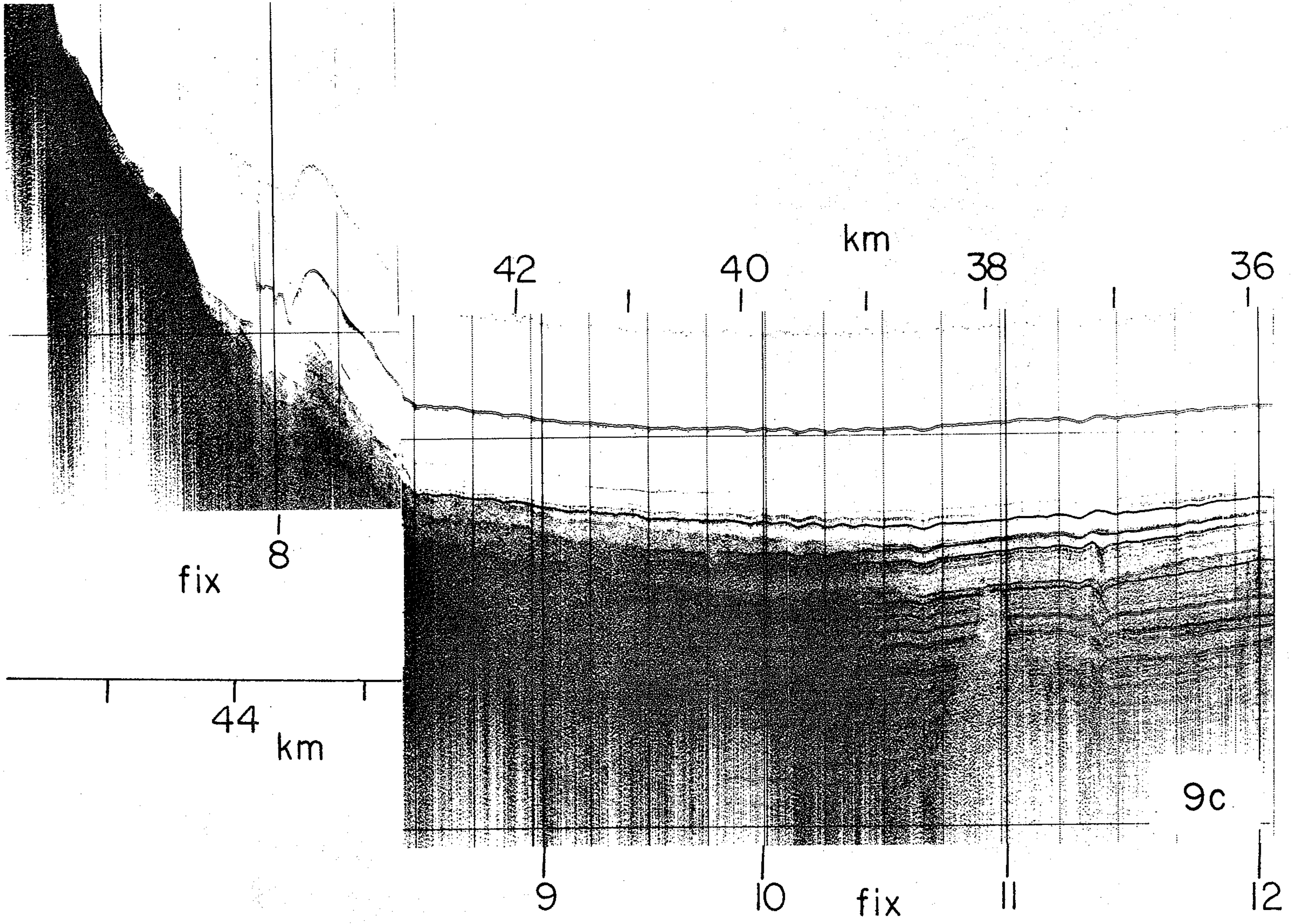

54
km
52
50
s
0·3
0·4
2
3
fix
4
5
9a


44
42
km
40
38
s
0·7
0·8
8
9
fix
10
11
9b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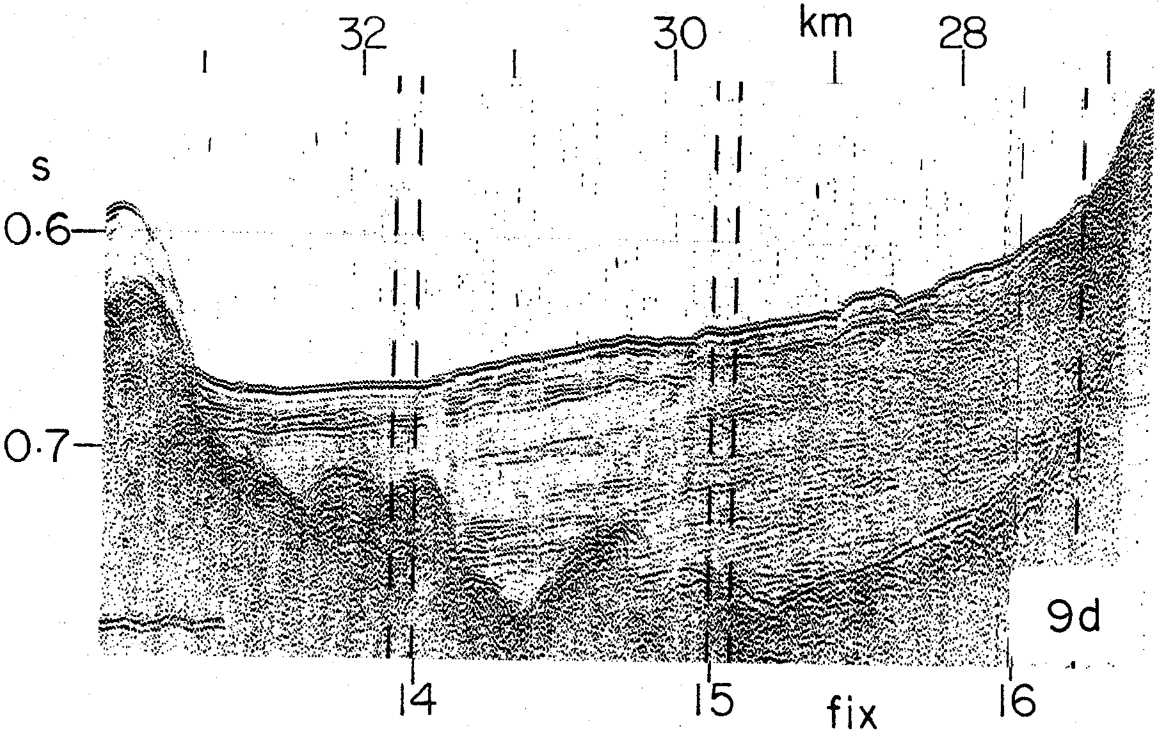
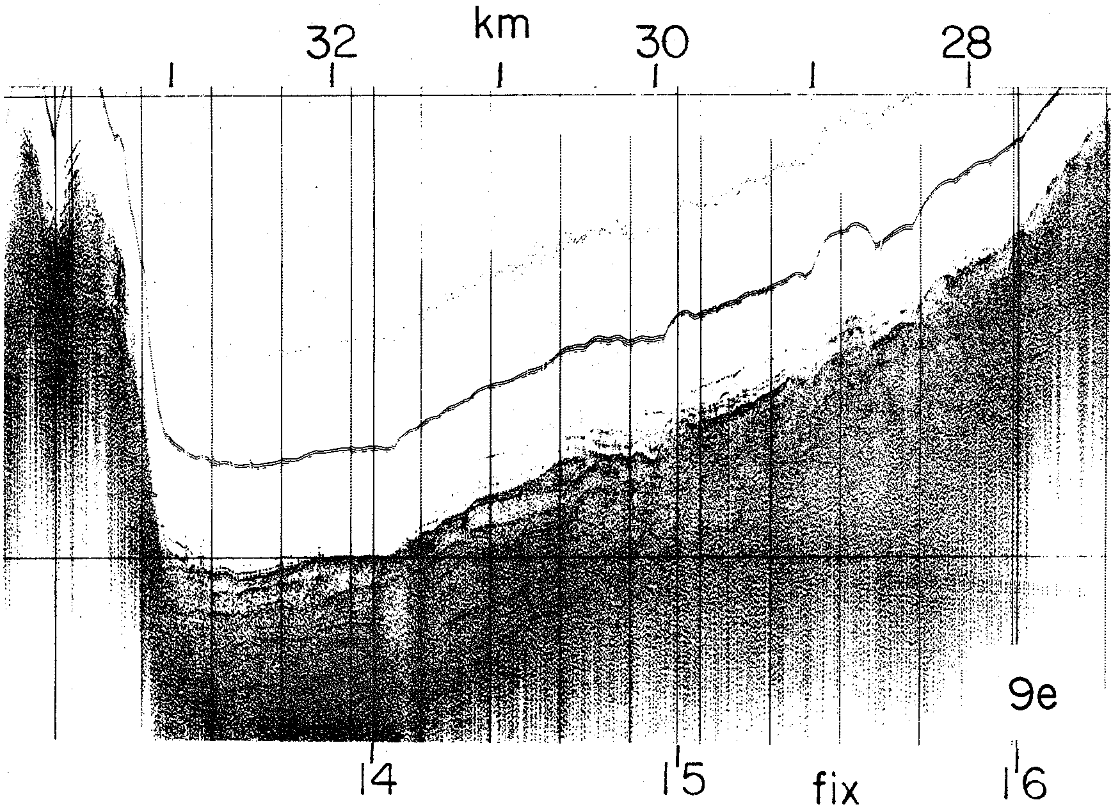
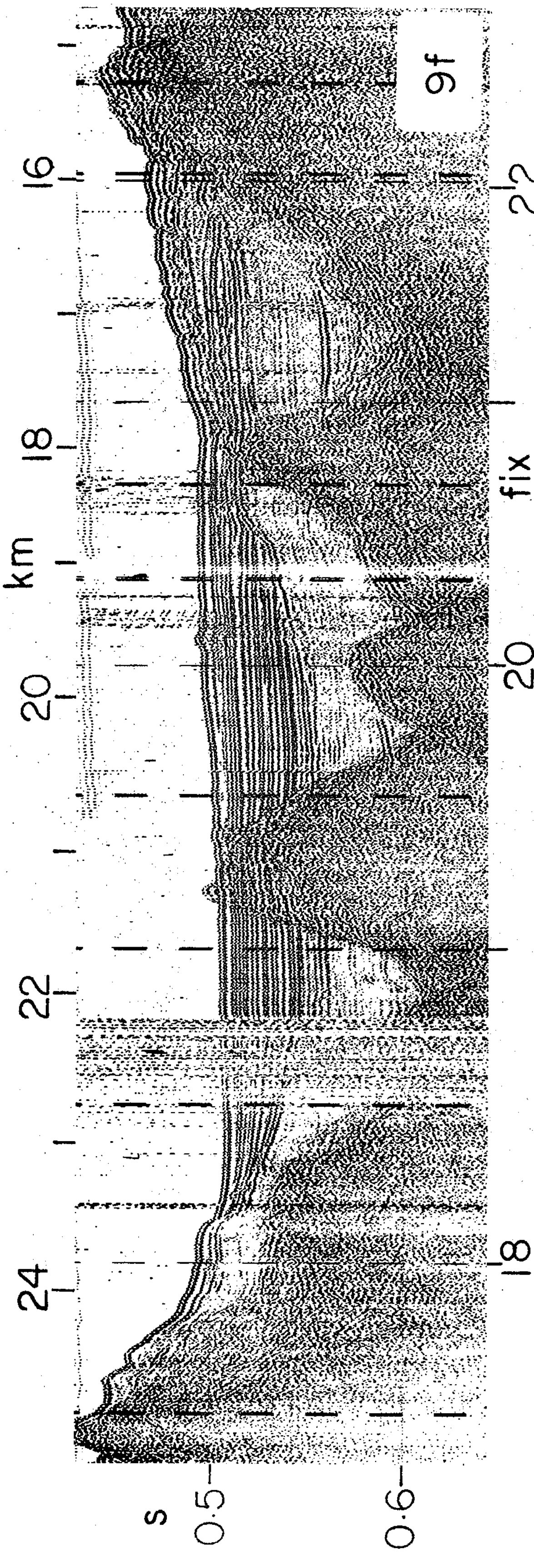
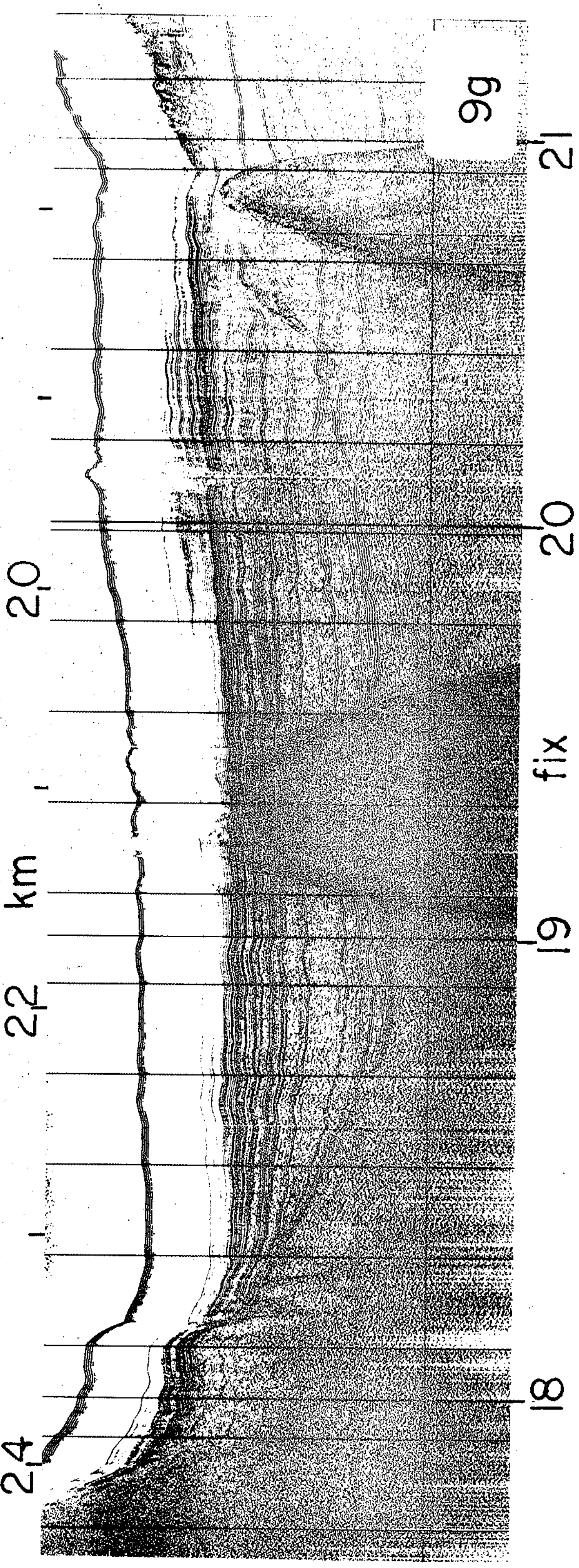
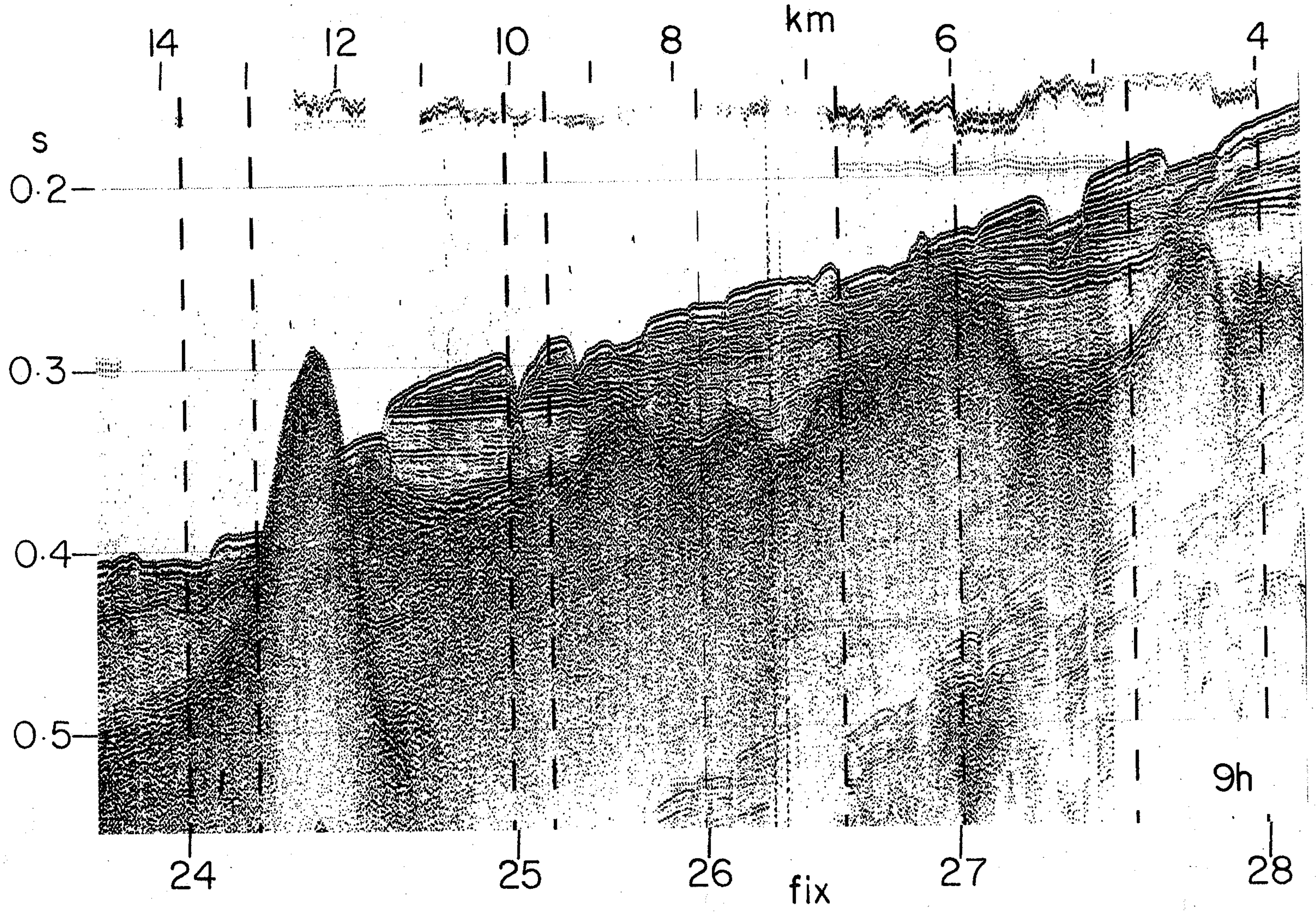
40
38
36
8
fix
44
km
9c
9
10
fix
11
12


32
30
km
28
s
0·6
0·7
9d
14
15
fix
16


km
32
30
28
9e
14
15
fix
16


9f
16
18
km
20
22
24
22
fix
20
18
s
0.5
0.6


9g
21
20
fix
19
18
20
km
22
24



km
14
12
10
8
6
4
s
0.2
0.3
0.4
0.5
9h
24
25
26
27
28
fix

TABLE 14-17 A

DIATOM ANALYSIS OF CLARK FIORD STATION CL-3

CL-3

	% species at the following depths (m): 1	5	10	20	30	50	75	100	200	240
CENTRALES										
Actinocyclus curvatulus			0.3	0.3	1					
A. sp.		0.4								
Chaetoceros sp.	95	97	97	96	92	97	97	98	84	86
Coscinodiscus curvatulus				0.3					0.4	
C. sp.										
Porosira glacialis									0.4	
Rhizosolenia sp.	2	0.4	0.3	1	1	1	0.5	1		1
Thalassiosira eccentrica	0.7		1	0.6	1	0.3	0.5	0.6	2	2
T. gravida										
T. hyalina										
T. kryophila					1	0.3				
T. nordenskioldii					0.3		0.5		1	0.4
PENNALES										
Cocconeis costata		0.4	0.6							
C. imperatrix	0.7	1							0.4	0.4
Dicladia pylea					0.3					
Diploneis sp.			0.3			0.3	0.5			
Grammatophora angulosa										
G. marina										
G. sp.				0.3						
Navicula directa	0.7			0.3					0.4	
N. distans										
N. sp.									1	0.4
Nitzschia cf. delicatissima					0.3				0.4	
N. cf. invisa										1
N. marina					1					0.4
N. sp.			0.6	1			0.5			1
Pleurosigma sp.	0.7									
Synedra sp.									0.4	
Thalassionema nitzschioides		0.4					0.5		6	6
Unidentified					1	2	0.5	0.6	4	1.5
Total no. of diatoms in sample	3,700	2,800	15,200	13,400	12,600	12,450	15,800	5,500	8,200	8,000

TABLE 14-17 B

DIATOM ANALYSIS OF CLARK FIORD STATION CL-4

CL-4

	% species at the following depths (m)									
	1	5	10	20	30	50	100	200^{x)}	400^{x)}	535
CENTRALES										missing
Actinocyclus curvatulus		0.7								
A. sp.										
Chaetoceros sp.	100	93	100	98	99	98	97			
Coscinodiscus curvatulus										
C. sp.										
Porosira glacialis										
Rhizosolenia sp.		2		0.4	0.2		0.4			
Thalassiosira eccentrica										
T. gravida							0.4			
T. hyalina				0.8	0.5	0.6				
T. kryophila							0.4			
T. nordenskioldii		0.7								
PENNALES										
Cocconeis costata		0.3								
C. imperatrix										
Dicladia pylea										
Diploneis sp.					0.2					
Grammatophora angulosa										
G. marina										
G. sp.										
Navicula directa		0.3								
N. distans										
N. sp.										
Nitzschia cf. delicatissima										
N.cf. invisa						0.3				
N. cf. marina		0.3		0.4		0.3				
N. sp.		0.7								
Pleurosigma sp.										
Synedra sp.		0.3								
Thalassionema nitzschioides						0.6				
Unidentified						0.3	1			
Total no. of diatoms in sample										

x) barren

TABLE 14-17 C

DIATOM ANALYSIS OF CLARK FIORD STATION CL-5

CL-5

% species at the following depths (m)

	5	10	20	30	50	100	200	400	600 x)	685
										missing
<u>CENTRALES</u>										
Actinocyclus curvatulus	0.6						1			
A. sp.										
Chaetoceros sp.	94	85	91	92	96	93	83	56		
Coscinodiscus curvatulus						1				
C. sp.										
Porosira glacialis										
Rhizosolenia sp.	0.6	3	2	0.5	1		1	6		
Thalassiosira eccentrica	0.3									
T. gravida					0.3					
T. hyalina										
T. kryophila										
T. nordenskioldii				1		1				
<u>PENNALES</u>										
Cocconeis costata	0.3	1	0.4				2	6		
C. imperatrix		0.3								
Dicladia pylea										
Diploneis sp.		0.3								
Grammatophora angulosa							1			
G. marina		0.6								
G. sp.										
Navicula directa					0.3					
N. distans										
N. sp.	0.3						1			
Nitzschia cf. delicatissima										
N.cf. invisa	0.3	1			1		1			
N. cf. marina			1	1						
N. sp.										
Pleurosigma sp.										
Synedra sp.	0.3									
Thalassionema nitzschioides	2	5		2	1	3	7	28		
Unidentified	0.6	0.6	0.4	3	2	2		6		
Total no. of diatoms in sample	14,200	9,800	8,700	6,000	32,300	9,800	2,800	1,400		

x) barren

TABLE 14-17 D

DIATOM ANALYSIS OF CLARK FIORD STATION CL-6

CL-6

% species at the following depths (m)

	1	10	20	30	50	100	200	400	600 x)	655 x)
CENTRALES										
Actinocyclus curvatulus										
A. sp.										
Chaetoceros sp.	91	86	84	94	93	96	86	75		
Coscinodiscus curvatulus		0.6								
C. sp.					0.3					
Porosira glacialis				0.6				2		
Rhizosolenia sp.	0.7	2	1	1	2	0.1				
Thalassiosira eccentrica					0.3		0.5			
T. gravida										
T. hyalina							2			
T. kryophila				1	0.3					
T. nordenskioldii										
PENNALES										
Cocconeis costata	1	0.6	0.7		0.3		1	2		
C. imperatrix										
Dicladia pylea						0.1				
Diploneis sp.					0.3					
Grammatophora angulosa				0.6						
G. marina										
G. sp.										
Navicula directa			0.7	0.6		0.2				
N. distans			0.3							
N. sp.		1	0.3	0.6						
Nitzschia cf. delicatissima										
N.cf. invisa	0.7					0.1	1	2		
N. cf. marina	3	2	3	0.6	2	0.5	0.5	2		
N. sp.	0.4									
Pleurosigma sp.										
Synedra sp.										
Thalassionema nitzschioides	2	1	3		2	1	7	16		
Unidentified	0.4	5	4		0.6	0.4	4			
Total no. of diatoms in sample	11,000	3,600	15,700	6,300	11,900	28,000	13,000	4,000	700	350

x) % not meaningful - too few specimens on the slide.

TABLE 14-17 E

DIATOM ANALYSIS OF CLARK FIORD STATION CL-7

CL-7

	% species at the following depths (m)									
	1	10	20	30	50	100	200	$400^{x)}$	$600^{x)}$	$680^{x)}$
CENTRALES										
Actinocyclus curvatulus					0.3					
A. sp.			0.6							
Chaetoceros sp.	87	83	65	89	93	98	87			
Coscinodiscus curvatulus										
C. sp.										
Porosira glacialis										
Rhizosolenia sp.	2	1	4	2	2					
Thalassiosira eccentrica						1				
T. gravida										
T. hyalina										
T. kryophila										
T. nordenskioldii					0.3	1				
PENNALES										
Cocconeis costata	0.8	3	4	2	0.3					
C. imperatrix							0.6			
Dicladia pylea										
Diploneis sp.	0.8		0.6		0.7					
Grammatophora angulosa										
G. marina										
G. sp.										
Navicula directa	0.8		7	2	0.3					
N. distans										
N. sp.		2	2		1		2			
Nitzschia cf. delicatissima	0.8									
N.cf. invisa										
N. cf. marina		1	2							
N. sp.		5	4	2			2			
Pleurosigma sp.			0.6	0.5						
Synedra sp.										
Thalassionema nitzschioides	2	3	5	0.5			6			
Unidentified	7		5	2	0.7		3			
Total no. of diatoms in sample	-	4,700	6,000	8,200	21,600	8,700	8,600	1,500	800	500

x) % not meaningful - too few specimens on the slide.

HU82-031-CL5-P

TABLE 14-18

PALEOMAGNETIC DATA

CASE-NO	DEPTH	WETWT	CORDEC	INCLIN	INTEN	SUSCEP
1	11.0	1.9	-121.0	.4	112.8	1.9
2	24.0	1.8	-145.0	-39.7	134.8	6.7
3	26.0	1.8	-175.0	-37.8	142.8	7.3
4	31.0	1.7	180.0	-55.6	174.8	2.5
5	36.0	1.7	-167.0	-39.0	187.6	5.2
6	41.0	1.7	-159.0	-25.1	147.6	5.6
7	46.0	1.7	-154.0	-50.5	95.2	4.5
8	51.0	1.6	-160.0	-56.8	209.1	2.5
9	56.0	1.5	-160.0	-36.8	189.6	3.6
10	61.0	2.0	-178.0	-4.9	302.9	1.2
11	66.0	1.7	-151.0	-8.6	220.8	9.2
12	71.0	1.6	-166.0	-31.3	91.6	4.1
13	78.0	1.6	-175.0	-35.8	95.1	3.8
14	85.0	1.6	-175.0	67.0	84.5	4.4
15	90.0	1.6	148.0	82.1	75.7	3.8
16	95.0	1.6	-156.0	70.6	83.9	4.3
17	103.0	1.6	-122.0	83.2	75.7	3.8
18	110.0	1.7	-88.0	82.1	100.7	5.1
19	115.0	1.6	-125.0	86.1	74.5	3.8
20	120.0	1.7	-140.0	74.7	93.2	4.2
21	130.0	1.6	121.0	67.2	109.4	3.4
22	135.0	1.6	-19.0	84.2	76.7	3.1
23	140.0	1.8	-78.0	76.2	88.9	1.9
24	145.0	1.7	-32.0	74.5	54.7	3.9
25	148.0	1.8	-122.0	75.0	99.4	3.9
26	150.0	1.6	173.0	68.0	77.0	3.5
27	156.0	1.8	-91.0	68.5	112.9	1.8
28	162.0	1.9	-54.0	69.4	97.7	1.2
29	167.0	1.7	-105.0	78.0	114.0	2.7
30	175.0	1.7	108.0	67.1	103.8	4.6
31	180.0	1.6	-157.0	74.9	159.6	3.5
32	185.0	1.7	-151.0	64.9	146.0	3.8
33	195.0	1.7	-84.0	76.1	176.0	5.5
34	205.0	1.7	-75.0	83.0	117.2	4.9
35	210.0	1.9	-150.0	84.5	143.5	7.6
36	215.0	1.7	-64.0	88.7	122.9	1.9
37	220.0	1.8	12.0	86.6	184.4	5.7
38	225.0	1.7	-107.0	88.9	197.1	4.1
39	240.0	1.7	-107.0	66.3	169.7	3.6
40	245.0	1.6	-97.0	67.4	245.3	3.5

DEPTH-Depth (cm)
WETWT-Unit Wet Weight (gm)
CORDEC-Declination (degrees)
INCLIN-Inclination (degrees)
INTEN-Intensity x 10-6 (emu/cc)
SUSCEP-Susceptibility x 10-4 (emu/cc)

HU82-031-CL5-P

TABLE 14-18 CONT'D

PALEOMAGNETIC DATA CONT'D

CASE-N0	DEPTH	WETWT	C0RDEC	INCLIN	INTEN	SUSCEP
41	250.0	1.6	-122.0	70.4	191.7	2.8
42	255.0	1.6	-114.0	56.8	140.8	3.4
43	260.0	1.6	-119.0	67.2	260.1	3.1
44	265.0	1.7	-109.0	68.6	274.9	3.4
45	270.0	1.7	-165.0	53.3	282.2	2.7
46	275.0	1.6	-106.0	55.5	164.3	3.0
47	280.0	1.6	-127.0	67.8	331.2	2.9
48	285.0	1.7	-144.0	72.6	329.9	3.6
49	290.0	1.7	-145.0	72.0	336.1	3.2
50	297.0	1.9	-178.0	52.7	217.1	7.2
51	303.0	1.8	-130.0	76.7	296.8	4.8
52	306.0	1.9	-168.0	62.2	172.9	6.7
53	315.0	1.6	176.0	67.3	54.0	2.0
54	320.0	1.6	-159.0	65.7	118.7	2.0
55	325.0	1.6	-165.0	52.9	112.9	2.0
56	330.0	1.6	-131.0	47.4	105.4	2.0
57	335.0	1.6	-131.0	62.3	102.8	2.0
58	340.0	1.6	-118.0	48.3	92.3	1.9
59	350.0	1.6	-114.0	41.6	142.8	2.1
60	355.0	1.6	-114.0	45.2	144.8	2.2
61	360.0	1.6	-130.0	46.0	143.0	2.2
62	365.0	1.6	-136.0	42.3	162.6	2.2
63	370.0	1.6	-134.0	44.6	135.2	2.2
64	375.0	1.5	-127.0	43.5	142.6	2.1
65	380.0	1.6	-128.0	43.4	156.6	2.3
66	385.0	1.6	-126.0	45.0	137.7	2.3
67	390.0	1.6	-126.0	55.5	133.1	2.3
68	395.0	1.6	71.0	56.4	133.1	2.2
69	400.0	1.6	-71.0	76.7	124.8	2.3
70	415.0	1.6	166.0	75.8	104.2	2.4
71	420.0	1.6	131.0	73.2	147.7	2.4
72	425.0	1.6	141.0	72.9	146.3	2.4
73	430.0	1.6	-137.0	62.6	151.6	2.3
74	435.0	1.6	52.0	59.2	122.4	2.3
75	440.0	1.6	80.0	58.2	123.9	2.4
76	450.0	1.6	-154.0	53.7	116.2	2.3
77	470.0	1.6	116.0	46.8	148.4	2.3
78	480.0	1.6	-46.0	53.0	63.6	2.5
79	490.0	1.6	-14.0	65.1	125.2	2.7
80	500.0	1.7	-4.0	54.4	140.3	2.9
81	510.0	1.7	-21.0	60.0	136.8	2.8
82	520.0	1.7	32.0	-60.8	113.7	2.9
83	530.0	1.7	-10.0	44.3	173.7	2.9
84	540.0	1.7	-10.0	29.4	175.1	3.0
85	550.0	1.7	-10.0	33.2	190.3	2.9
86	560.0	1.6	-7.0	42.8	154.9	3.0
87	570.0	1.7	-7.0	37.3	181.3	3.0
88	580.0	1.6	12.0	32.8	169.2	2.9
89	590.0	1.7	10.0	42.6	174.2	3.0

HU82-031-CL5-P

TABLE 14-18 CONT'D

PALEOMAGNETIC DATA CONT'D

CASE-NØ	DEPTH	WETWT	CØRDEC	INCLIN	INTEN	SUSCEP
90	600.0	1.7	20.0	38.6	165.2	3.2
91	610.0	1.7	16.0	37.6	165.8	3.1
92	620.0	1.7	19.0	36.0	159.8	3.1
93	630.0	1.7	18.0	33.9	163.9	3.2
94	640.0	1.7	35.0	24.5	154.3	3.2
95	650.0	1.7	44.0	37.2	94.7	3.4
96	660.0	1.7	58.0	43.3	174.7	3.3
97	670.0	1.7	78.0	52.7	142.2	3.4
98	680.0	1.7	88.0	56.2	146.7	3.3
99	690.0	1.8	88.0	67.8	116.4	4.1
100	700.0	1.8	151.0	-35.5	124.5	3.9
101	710.0	1.7	-78.0	-6.7	79.8	4.0
102	720.0	1.8	-129.0	-1.1	71.7	4.1
103	730.0	1.7	163.0	-3.9	119.6	4.0
104	740.0	1.7	-174.0	-10.9	183.3	4.4
105	750.0	1.7	-152.0	-66.1	101.3	4.6
106	760.0	1.7	161.0	-24.3	138.3	4.8
107	770.0	1.7	-141.0	62.4	68.2	5.1
108	780.0	1.8	88.0	44.6	51.3	6.3
109	790.0	1.8	151.0	22.4	90.9	7.4
110	800.0	1.8	112.0	16.7	100.0	6.9
111	810.0	1.8	43.0	69.1	97.9	7.1
112	820.0	1.9	116.0	26.6	100.8	7.3
113	830.0	1.8	-171.0	44.7	38.4	6.9
114	840.0	1.7	-171.0	70.7	146.7	3.6
115	850.0	1.8	-171.0	76.8	135.6	3.7
116	860.0	1.7	-123.0	38.1	106.3	3.3
117	870.0	1.7	147.0	23.8	146.8	3.5
118	880.0	1.7	-154.0	2.9	85.4	3.5
119	890.0	1.7	178.0	76.8	135.6	3.6
120	900.0	1.7	67.0	28.0	92.8	3.8
121	910.0	1.7	84.0	31.8	128.4	3.8
122	920.0	1.7	99.0	0	119.1	3.4
123	930.0	1.7	-177.0	-57.4	69.3	3.9
124	940.0	1.7	26.0	-3.8	46.7	4.3
125	950.0	1.7	31.0	8020.5	94.2	4.7
126	960.0	1.7	71.0	46.8	123.1	4.5
127	980.0	1.8	27.0	9.2	143.5	5.4

TABLE 14-19

HU82-031-TI3-P

PALEOMAGNETIC DATA

CASE-NO	DEPTH	WETWT	DECLIN	INCLIN	INTEN
1	10.0	1.5	180.0	78.0	38.9
2	15.0	1.4	-173.0	66.0	29.5
3	20.0	1.3	-121.0	81.0	33.7
4	25.0	1.4	-124.0	62.0	36.5
5	30.0	1.4	-130.0	77.0	33.5
6	35.0	1.3	-91.0	75.0	42.2
7	40.0	1.4	-0	-0	-0
8	45.0	1.3	-139.0	67.0	41.3
9	50.0	1.4	-157.0	72.0	45.6
10	55.0	1.4	-154.0	77.0	42.7
11	60.0	1.3	-164.0	66.0	38.5
12	65.0	1.3	-144.0	77.0	38.9
13	70.0	1.4	-169.0	71.0	49.0
14	75.0	1.3	-153.0	70.0	47.6
15	80.0	1.4	-146.0	69.0	48.3
16	85.0	1.4	-154.0	71.0	47.9
17	90.0	1.5	-166.0	67.0	53.2
18	95.0	1.4	-150.0	69.0	51.5
19	98.0	1.4	-141.0	63.0	34.5
20	105.0	1.4	-173.0	75.0	48.4
21	110.0	1.4	-160.0	71.0	49.8
22	115.0	1.4	-141.0	74.0	53.7
23	120.0	1.4	-153.0	73.0	45.7
24	125.0	1.4	-146.0	81.0	45.2
25	130.0	1.4	-178.0	66.0	33.6
26	135.0	1.4	-146.0	64.0	40.6
27	140.0	1.4	-177.0	72.0	42.1
28	145.0	1.4	128.0	76.0	45.0
29	150.0	1.3	-179.0	80.0	38.3
30	155.0	1.4	130.0	72.0	39.1
31	160.0	1.2	136.0	63.0	29.3
32	165.0	1.3	-138.0	81.0	42.7
33	170.0	1.4	-114.0	85.0	39.7
34	175.0	1.3	149.0	75.0	46.1
35	180.0	1.4	-125.0	83.0	53.7
36	185.0	1.4	-143.0	78.0	52.9
37	190.0	1.4	-126.0	83.0	52.6
38	195.0	1.4	-151.0	68.0	31.9
39	200.0	1.4	-114.0	75.0	27.8
40	205.0	1.5	-151.0	65.0	37.8
41	210.0	1.4	161.0	81.0	37.7
42	215.0	1.5	161.0	68.0	45.6
43	220.0	1.4	140.0	76.0	33.4
44	225.0	1.4	143.0	74.0	50.0
45	230.0	1.4	118.0	71.0	21.9
46	235.0	1.3	-177.0	64.0	29.4

DEPTH-Depth (cm)

WETWT-Unit Wet Weight (gm)

DECLIN -Declination (degrees)

INCLIN-Inclination (degrees)

INTEN-Intensity x 10-6 (emu/cc)

TABLE 14-19 CONT'D

HU82-031-TI3-P

PALEOMAGNETIC DATA CONT'D

CASE-N0	DEPTH	WETWT	DECLIN	INCLIN	INTEN
47	240.0	1.4	134.0	76.0	33.6
48	245.0	1.4	99.0	78.0	46.9
49	250.0	1.4	150.0	69.0	49.8
50	255.0	1.4	155.0	74.0	53.3
51	260.0	1.4	117.0	77.0	44.4
52	265.0	1.3	148.0	78.0	35.0
53	270.0	1.4	133.0	77.0	40.9
54	275.0	1.4	146.0	67.0	41.2
55	280.0	1.4	137.0	70.0	37.6
56	285.0	1.4	-164.0	80.0	43.8
57	290.0	1.4	142.0	73.0	44.8
58	295.0	1.1	177.0	51.0	30.5
59	300.0	1.5	132.0	74.0	46.2
60	305.0	1.5	156.0	72.0	56.7
61	310.0	1.4	142.0	73.0	51.7
62	315.0	1.5	157.0	73.0	41.5
63	320.0	1.5	126.0	80.0	37.5
64	330.0	1.5	148.0	85.0	41.4
65	335.0	1.5	147.0	74.0	60.4
66	340.0	1.5	151.0	79.0	58.5
67	345.0	1.5	164.0	81.0	56.4
68	350.0	1.5	141.0	81.0	62.0
69	355.0	1.5	-166.0	60.0	54.0
70	363.0	1.5	165.0	80.0	56.3
71	372.0	1.6	87.0	81.0	57.9
72	380.0	1.5	58.0	79.0	36.3
73	385.0	1.7	68.0	63.0	129.7
74	390.0	1.6	-10.0	75.0	45.5
75	395.0	1.6	50.0	79.0	77.6
76	400.0	1.6	75.0	78.0	18.9
77	405.0	1.6	74.0	72.0	14.9
78	410.0	1.7	27.0	63.0	92.4
79	415.0	1.6	50.0	79.0	52.5
80	420.0	1.7	106.0	68.0	44.4
61	425.0	1.6	16.0	14.0	72.5
82	430.0	1.7	103.0	34.0	89.8
83	435.0	1.5	58.0	87.0	46.1
84	440.0	1.7	29.0	65.0	46.9
85	445.0	1.6	46.0	85.0	78.5
86	450.0	1.6	33.0	85.0	63.2
87	455.0	1.6	5.0	78.0	48.4
88	460.0	1.6	-18.0	85.0	66.8
89	465.0	1.6	28.0	81.0	68.0
90	470.0	1.6	-15.0	85.0	60.1
91	475.0	1.3	2.0	17.0	80.1
92	480.0	1.6	31.0	22.0	106.9
93	485.0	1.6	-0	-0	-0
94	490.0	1.6	-10.0	63.0	42.9
95	495.0	1.6	112.0	47.0	52.4
96	500.0	1.6	68.0	25.0	70.4
97	506.0	1.8	143.0	39.0	59.2

HU82-031-TI3-P

TABLE 14-19 CONT'D

PALEOMAGNETIC DATA CONT'D

CASE-NO	DEPTH	WETWT	DECLIN	INCLIN	INTEN
98	520.0	1.6	147.0	71.0	42.6
99	525.0	1.5	162.0	46.0	47.8
100	533.0	1.6	156.0	42.0	50.1
101	545.0	1.6	139.0	55.0	59.3
102	550.0	1.5	79.0	46.0	46.9
103	555.0	1.5	87.0	44.0	36.8
104	560.0	1.3	95.0	45.0	47.2
105	570.0	1.6	-66.0	80.0	29.6
106	575.0	1.5	-103.0	64.0	52.5
107	580.0	1.6	-165.0	76.0	33.6
108	590.0	1.6	163.0	67.0	42.9
109	595.0	1.6	160.0	67.0	61.5
110	600.0	1.6	-175.0	75.0	55.5
111	605.0	1.6	-155.0	52.0	38.8
112	610.0	1.7	-139.0	73.0	41.9
113	615.0	1.7	115.0	83.0	55.1
114	620.0	1.6	56.0	82.0	38.8
115	630.0	1.6	150.0	72.0	36.4
116	635.0	1.7	167.0	81.0	29.2
117	640.0	1.6	-57.0	84.0	24.1
118	645.0	1.6	-129.0	69.0	24.2
119	650.0	1.7	-65.0	74.0	22.3
120	655.0	1.6	-131.0	63.0	24.7
121	660.0	1.6	-73.0	71.0	15.8
122	670.0	1.6	-63.0	60.0	16.6
123	680.0	1.6	-134.0	85.0	31.7
124	685.0	1.6	-89.0	81.0	26.8
125	690.0	1.7	-110.0	70.0	26.5
126	700.0	1.6	-115.0	50.0	33.2
127	705.0	1.6	-126.0	55.0	30.2
128	710.0	1.5	149.0	69.0	31.1
129	715.0	1.6	154.0	65.0	53.6
130	720.0	1.7	70.0	70.0	30.3
131	725.0	1.7	38.0	38.0	37.2
132	730.0	1.7	39.0	39.0	43.9
133	735.0	1.6	35.0	35.0	35.4
134	740.0	1.7	-47.0	79.0	29.5
135	745.0	1.7	-112.0	38.0	80.7
136	750.0	1.7	-176.0	29.0	100.2
137	755.0	1.7	-166.0	44.0	120.5
138	760.0	1.7	-141.0	55.0	125.8
139	765.0	1.7	-171.0	53.0	111.6
140	770.0	1.7	-142.0	72.0	120.1
141	775.0	1.9	-167.0	59.0	62.6
142	780.0	1.9	-175.0	49.0	76.7
143	785.0	1.9	159.0	40.0	103.1
144	790.0	1.7	44.0	45.0	26.3
145	795.0	1.8	154.0	-9.0	47.6
146	800.0	1.8	159.0	35.0	28.9

HU82-031-TI3-P

TABLE 14-19 CONT'D

PALEOMAGNETIC DATA CONT'D

CASE-NO	DEPTH	WETWT	DECLIN	INCLIN	INTEN
147	805.0	0	159.0	6.0	50.1
148	810.0	1.8	-148.0	13.0	23.6
149	830.0	1.9	-175.0	-11.0	6.2
150	840.0	1.9	150.0	-13.0	45.5
151	850.0	1.9	169.0	8.0	91.2
152	855.0	2.0	-159.0	14.0	99.9
153	860.0	2.1	-174.0	51.0	95.4
154	865.0	2.1	154.0	21.0	92.4
155	870.0	2.0	-165.0	38.0	54.8
156	875.0	2.0	-177.0	26.0	67.4
157	880.0	2.1	-162.0	40.0	46.9
158	885.0	1.8	180.0	54.0	25.3
159	910.0	1.6	178.0	69.0	30.9
160	920.0	1.7	155.0	70.0	20.2
161	925.0	1.6	-111.0	27.0	11.9
162	934.0	1.6	138.0	35.0	11.5
163	950.0	1.6	-134.0	27.0	14.2
164	960.0	1.6	-176.0	19.0	17.7
165	965.0	1.7	157.0	44.0	37.9
166	970.0	1.6	157.0	69.0	19.3
167	980.0	1.6	-61.0	54.0	21.9
168	985.0	1.7	-124.0	58.0	10.6
169	990.0	1.6	-120.0	53.0	14.8
170	995.0	1.6	173.0	11.0	12.7
171	1000.0	1.6	159.0	32.0	14.6
172	1005.0	1.7	-147.0	21.0	11.2
173	1010.0	1.6	-68.0	17.0	15.1
174	1015.0	1.7	156.0	63.0	25.5
175	1020.0	1.6	-172.0	60.0	26.2
176	1025.0	1.6	-161.0	17.0	27.9
177	1030.0	1.6	-174.0	30.0	29.1
178	1040.0	1.6	-175.0	38.0	13.6
179	1045.0	1.7	143.0	56.0	13.9
180	1050.0	1.6	70.0	63.0	21.1
181	1055.0	1.6	3.0	69.0	28.5
182	1060.0	1.6	1.0	17.0	15.7
183	1065.0	1.4	-85.0	5.0	12.6
184	1070.0	1.6	-100.0	12.0	8.9
185	1075.0	1.6	-105.0	19.0	8.4

TABLE 14-20

MOISTURE CONTENT CORE CL-5

Laboratory Number	Field Data		% Moisture	% Organic Matter	% Carbonate
GRL - 4301	CL-5	2 - 7cm.	24.92		
- 4302	-5	27 - 29cm.	43.08		
- 4303	-5	45 - 48cm.	52.06		
- 4304	-5	55 - 59cm.	66.01		
- 4305	-5	61 - 66cm.	26.15		
- 4306	-5	71 - 78cm.	58.40		
- 4307	-5	83 - 92cm.	52.65		
GRL - 4308	CL-5	95 - 101cm.	57.39		
- 4309	-5	107 - 114cm.	54.05		
- 4310	-5	119 - 128cm.	55.60		
- 4311	-5	150 - 155cm.	57.14		
- 4312	-5	164 - 167cm.	57.54		
- 4290 [GRL-595-0]*	-5 #1	167 - 185cm.		0.99	3.4
- 4313	-5	183 - 190cm.	55.01		
GRL - 4314	CL-5	195 - 202cm.	52.75		
- 4315	-5	209 - 216cm.	37.29		
- 4316	-5	223 - 231cm.	48.79		
- 4317	-5	234 - 246cm.	53.93		
- 4318	-5	269 - 276cm.	57.23		
- 4319	-5	285 - 292cm.	55.58		
- 4320	-5	308 - 315cm.	56.24		
GRL - 4321	CL-5	319 - 328cm.	68.27		
- 4291 [GRL-596-0]*	-5 #2	375 - 403cm.		0.76	2.9
- 4322	-5	377 - 385cm.	64.43		
- 4323	-5	400 - 410cm.	58.32		
- 4292 [GRL-597-0]*	-5 #3	410 - 440cm.		0.69	1.0
- 4324	-5	442 - 450cm.	65.24		
- 4325	-5	450 - 460cm.	63.10		
GRL - 4326	CL-5	500 - 510cm.	52.10		
- 4327	-5	550 - 560cm.	53.03		
- 4328	-5	600 - 610cm.	56.80		
- 4329	-5	650 - 660cm.	53.01		
- 4330	-5	690 - 696cm.	47.11		
- 4331	-5	750 - 756cm.	43.58		
- 4332	-5	768 - 776cm.	43.43		
GRL - 4333	CL-5	800 - 805cm.	39.80		
- 4334	-5	825 - 833cm.	38.80		
- 4335	-5	840 - 850cm.	52.05		
- 4336	-5	900 - 905cm.	51.62		
- 4337	-5	950 - 957cm.	48.46 (48.53)[1] (48.66)[2]		
- 4293 [GRL-598-0]	-5 #4	957 - 986cm.		0.47	0.8

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* Separate Sample Material Submitted For Radiocarbon Dating Preparation. Representative Material Obtained (Riffle Sampler Method) For Sediment Analyses.

[1] First Duplicate Test Sample Taken At Time Of Test.

[2] Second Duplicate Test Sample Taken At Time Of Test.

TABLE 14-20

MOISTURE CONTENT FOR CORE SU-5

Laboratory Number	Field Data		% Moisture	% Organic Matter	% Carbonate
GRL - 4338	SU-5	15 - 23cm	112.36		
- 4339	-5	40 - 50cm.	101.87		
- 4340	-5	60 - 68cm.	97.72		
- 4341	-5	80 - 89cm.	91.58		
- 4342	-5	99 - 107cm.	83.31		
- 4343	-5	120 - 130cm.	76.33		
- 4344	-5	140 - 150cm.	67.36		
GRL - 4345	SU-5	157 - 167cm	51.97		
- 4346	-5	180 - 187cm.	51.17		
- 4347	-5	200 - 207cm.	41.30		
- 4348	-5	220 - 227cm.	38.51		
- 4349	-5	240 - 247cm.	35.95		
- 4350	-5	260 - 267cm.	41.56		
- 4351	-5	290 - 297cm.	44.49		
GRL - 4352	SU-5	317 - 326cm.	43.96		
- 4294 [GRL-599-0]*	-5 #1	327 - 358cm.		0.89	6.3
- 4353	-5	370 - 379cm.	40.56		
- 4354	-5	400 - 407cm.	45.04		
- 4355	-5	420 - 427cm.	47.08		
- 4356	-5	440 - 447cm.	45.79		
- 4357	-5	463 - 470cm.	45.75		
GRL - 4358	SU-5	480 - 487cm.	40.37		
- 4359	-5	500 - 511cm.	42.53		
- 4360	-5	520 - 527cm.	45.48		
- 4361	-5	540 - 547cm.	44.01		
- 4362	-5	560 - 570cm.	34.58		
- 4401 **	-5	571cm.			
- 4363	-5	580 - 588cm.	40.78		
GRL - 4364	SU-5	594 - 601cm.	35.13		
- 4402 **	-5	609cm.			
- 4403 **	-5	613cm.			
- 4365	-5	617 - 627cm.	40.74		
- 4366	-5	650 - 657cm.	63.65		
- 4295 [GRL-600-0]*	-5 #2	660 - 684cm.		2.20	2.9
- 4367	-5	685 - 695cm.	43.89		
GRL - 4368	SU-5	705 - 715cm.	56.18		
- 4369	-5	720 - 730cm.	43.80		
- 4370	-5	740 - 750cm.	44.74		
- 4371	-5	760 - 767cm.	38.29		

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* Separate Sample Material Submitted For Radiocarbon Dating Preparation. Representative Material Obtained (Riffle Sampler Method) For Sediment Analyses.

** Paleomagnetic Cube Material For Bulk Density Data And Sediment Analyses.

<u>Sampling Note</u>

GRL - 4367	One Pebble	c. 16 - 8mm. - Not Included In Moisture Test.
GRL - 4369	One Granule	c. 4 - 2mm. - Not Included In Moisture Test

TABLE 14-20

MOISTURE CONTENT FOR CORE CO-4

Laboratory Number	Field Data		% Moisture	% Organic Matter	% Carbonate
GRL - 4372	CO-4	5 - 12cm.	85.72		
- 4404 **	-4	23cm.			
- 4373	-4	50 - 59cm.	93.09		
- 4374	-4	100 - 107cm.	90.04		
- 4375	-4	150 - 157cm.	97.50		
- 4376	-4	180 - 187cm.	78.54		
- 4377	-4	210 - 217cm.	84.07		
GRL - 4405 **	CO-4	245cm.			
- 4406 **	-4	280cm.			
- 4378	-4	282 - 290cm.	43.05		
- 4407 **	-4	305cm.			
- 4379	-4	315 - 322cm.	42.99		
- 4380	-4	330 - 339cm.	39.69		
- 4381	-4	380 - 388cm.	39.40		
GRL - 4382	CO-4	425 - 434cm.	39.35		
- 4383	-4	462 - 471cm.	37.25		
- 4384	-4	480 - 487cm.	29.82		
- 4385	-4	530 - 537cm.	29.39		
- 4386	-4	560 - 567cm.	29.94		
- 4387	-4	580 - 587cm.	29.84		
- 4296 [GRL-601-O]*	-4	590 - 615cm.		0.33	0.6
GRL - 4388	CO-4	600 - 607cm.	33.38		
- 4389	-4	616 - 624cm.	35.17		
- 4390	-4	630 - 637cm.	34.42		
- 4391	-4	670 - 677cm.	36.92		
- 4392	-4	700 - 707cm.	33.67		
- 4393	-4	750 - 757cm.	30.90		
- 4394	-4	790 - 797cm.	29.50		
GRL - 4395	CO-4	825 - 833cm.	23.83 (23.96)[1]		
- 4396	-4	848 - 858cm.	24.30		
- 4397	-4	919 - 926cm.	25.44		
- 4398	-4	939 - 946cm.	23.86		
- 4399	-4	977 - 985cm.	25.69		
- 4400	-4	1024 - 1032cm.	31.16		

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* Separate Sample Material Submitted For Radiocarbon Dating Preparation. Representative Material Obtained (Riffle Sampler Method) For Sediment Analyses.

** Paleomagnetic Cube Material For Bulk Density Data And Sediment Analyses.

[1] Kravitz Moisture Procedure Demonstration [19 Jan. 83]

TABLE 14-20

MOISTURE CONTENT FOR CORE TI-3

Laboratory Number		Field Data		
GRL - 4408		TI-3		0 - 5cm.
- 4409		-3		58 - 63cm.
- 4410		-3		96 - 104cm.
- 4411		-3		158 - 163cm.
- 4412		-3		196 - 202cm.
- 4413		-3		257 - 262cm.
- 4414		-3		297 - 303cm.
GRL - 4297	[GRL-602-0]*	TI-3	#1	364 - 384cm.
- 4415		-3		398 - 403cm.
- 4416		-3		447 - 452cm.
- 4417		-3		485 - 491cm.
- 4418		-3		524 - 526cm.
- 4419		-3		558 - 560cm.
- 4420		-3		597 - 599cm.
GRL - 4421		TI-3		670 - 673cm.
- 4422		-3		708 - 710cm.
- 4423		-3		748 - 750cm.
- 4424		-3		788 - 790cm.
- 4298	[GRL-603-0]*	-3	#2	819 - 842cm.
- 4425		-3		878 - 880cm.
- 4426		-3		929 - 932cm.
GRL - 4427		TI-3		968 - 976cm.
- 4428		-3		1007 - 1010cm.
- 4429		-3		1047 - 1049cm.
- 4299	[GRL-604-0]*	-3	#3	1077 - 1108cm.

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* Separate Sample Material Submitted For Radiocarbon Dating Preparation. Representative Material Obtained (Riffle Sampler Method) For Sediment Analyses.

Late Quaternary Marine Environments of Northeastern Baffin Island: A Shelf/Slope Transect

Master of Science Research Proposed by Anne E. Jennings

Three piston cores (HU82-031-CL5, HU78-029-24, and HU76-023-26) constituting a transect of fiord and continental shelf environments are being studied to elucidate the glacial and oceanographic history of northeastern Baffin Island. Previous studies in this area indicate that the last glacial advance occured approximately 36,000 years B.P. as well as a significant neoglacial advance. However, others contend that glacier ice was grounded to the continental shelf at 18,000 years B.P. Detailed study of these three piston cores will resolve the question of ice extent. Analysis of downcore changes in texture, chemistry, mineralogy, foraminiferal assemblages and paleomagnetic variations is in progress. Physical evidence derived from these downcore analyses in conjunction with available radiocarbon dates will be used to correlate the cores. Once the cores are correlated, sedimentologic and paleoecologic interpretations can be made along the transect, thus generating an understanding of the response of fiord and continental shelf environments to glacial/interglacial oscillations.

MASTERS THESIS PROPOSAL BY KERSTIN WILLIAMS

LATE QUATERNARY DIATOM ASSEMBLAGES FROM BAFFIN BAY/DAVIS STRAIT.

Little work has been done on recent and fossil marine diatom assemblages from the Canadian Arctic. Numerous investigations in other areas, notably the North Pacific (i.e. Sancetta, 1981) and the Antarctic region, show that diatoms are potentially powerful stratigraphic tools, which can also be used in paleoclimatic and oceanographic reconstructions.

Also, diatoms are sensitive indicators of sudden changes in water chemistry and thus can help to assess different levels of water pollution (Bradbury and Megard, 1972). This could be an interesting and fruitful field of study because the shelves of Baffin Island and Greenland are suspected sources of hydrocarbons.

The study will be divided into two parts. The first part will investigate the present geographical boundaries and environmental limits of the Baffin Bay/Davis Strait region, as reflected in the diatom composition of the ocean bottom surface sediments. For this purpose ca 70 samples are presently available, and it is possible that many more can be obtained from the middle, deep sections of Baffin Bay/Davis Strait. About 1/3 of the available samples have already been analyzed. The preliminary results show that the diatoms do indeed reflect changes in oceanographic variables such as salinity, ice-cover duration and temperature.

The second part deals with plankton samples (diatoms) from Clark Fjord, Baffin Island. Samples from 5 stations have been provided by the Bedford Institute of Oceanography. Of these, 9 - 10 samples were taken at each station at varying water depths from near surface down to 400 - 600 m. Complete water-chemistry analyses are available for each sample location in the water column. This is a unique opportunity to correlate species distribution in the water column with water parameters. In addition, grab-samples or core tops are available from these stations, and these will make it possible to compare living floral assemblages with the thanatocoenoses.

These studies are essential for my future research in interpreting the changes in diatom assemblages in long marine cores from the Baffin Island shelf areas, with respect to paleoclimatic and paleooceanographic fluctuations during the late Quaternary.

REFERENCES

Bradbury, J.P., and Megard, R.O., 1973, A stratigraphic record of pollution in Shagawa Lake, norheastern Minnesota: Geol. Soc. America Bull., v.83 p.2639 - 2648.

Sancetta, C., 1981, Oceanographic and ecologic significance of diatoms in surface sediments of the Bering and Okhotsk seas: Deep-Sea Research, vol. 28A, No.8, p789 - 817.

TABLE 14-21

McBETH I Location 69°31.9'N
69°47.5'W

Depth (cm)	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
2	153.1		59.9	53.3	126.8		74.9
5	234.3		81.5	12.6	234.6		44.1
8	193.0		70.5	26.6	288.3		85.3
11	218.6		45.5	23.9	256.7		56.1
14	196.4		64.3	26.3	234.1		77.6
17	203.5		79.5	28.8	285.5		85.6
20	156.2		76.6	31.5	332.1		77.2
23	183.3		75.7	25.2	220.0		85.4
26	155.2		70.1	31.9	151.7		77.0
29	168.2		64.4	35.3	164.1		73.0
32	139.2		66.4	69.7	133.1		66.9
35	127.7		44.1	81.7	124.1		38.9
38	142.6		6.5	52.1	108.8		22.1
41	111.3		68.2	37.4	72.5		67.9
44	147.6		80.7	25.3	39.2		84.3
47	62.0		77.8	44.9	43.2		67.4
50	132.0		75.2	28.2	87.4		79.3
53	99.9		69.9	30.2	61.7		66.8
56	151.2		64.3	30.3	144.9		71
59	157.4		71.0	38.4	138.8		86.1
62	154.4		73.9	42.2	156.3		78.7
65	171.9		68.4	35.7	165.5		71.5
68	172.8		71.4	39.9	174.5		76.5
71	161.1		63.6	37.5	154.3		76.5
74	167.7		58.0	41.8	166.4		67.0
77	163.6		19.4	31.4	164.4		32.2
80	352.2	157	54.5	29.0	-	-	-
83	292.1	124	74.2	39.0	317.4	149	69.2
86	269.9	96	79.6	47.7	297	124	76.7
89	315.2	147	79.0	26.3	355	168	50.7
92	86.7	278	81.7	34.2	30.4	222	77.1
95	36.3	228	79.5	36.8	14.7	206	66.0
98	43.3	235	83.3	45.8	358.8	190	71.3
101	2.6	194	80.4	39.8	349.7	181	75.3
104	19.4	211	86.9	44.8	354.5	186	77.9
107	10.6	202	82.9	40.4	345.5	177	73.9
110	337.4	169	83.7	37.9	341.7	173	70.5
113	346.6	178	80.2	42.1	346.6	178	73.6
116	351.9	183	82.2	44.0	343.3	175	75.5
119	337.6	189	83.7	42.3	357.7	189	77.4
122	326.9	158	86.5	49.2	316.8	148	83.3
125	345.1	177	81.6	42.3	-	-	-
128	256.8	88	85.8	37.5	305.9	137	81.6
131	335.6	167	77.9	32.7	338.5	170	66.9
134	338.9	170	83.1	38.1	341.6	173	72.8
137	169.8	1	84.6	28.2	345.2	177	81.6
140	322.8	154	84.4	32.1	341.1	173	75.2
143	353.2	185	81.3	39.1	350.5	182	72.3

TABLE 14-21 Continued
McBETH I Continued

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
146	317.3	149	84.4	33.7	343.6	175	73.8
149	328.8	160	87.8	39.8	352.6	184	78.6
152	310.2	142	83.6	32.9	332.6	164	76.4
155	287.7	119	75.8	69.5	292.9	124	74.4
158	290.2	122	62.9	67.5	292.2	124	58.5
161	301.2	133	75.8	79.1	309.7	141	71.7
164	276.7	108	76.8	66.6	288.8	120	73.9
167	261.1	93	74.6	57.3	278.9	110	71.9
170	310.3	142	66.8	48.1	313.3	145	59.3
173	225.5	57	62.7	55.8	235.1	67	56.6
176	227.9	59	56.7	77.1	234.5	66	52.7
180	224.4	56	48.8	75.3	-	-	-
183	270.9	102	83.8	56.0	304.2	136	82.2
186	314.5	146	53.6	80.1	324.3	156	42.3
189	321.0	153	77.9	34.9	324.3	156	69.8
192	325.4	157	83.9	40.4	336.3	168	75.3
195	342.8	174	79.3	38.4	350.7	182	71.2
198	335.4	167	81.3	31.8	351.6	183	73.1
201	31.1	223	81.8	22.9	26.8	218	78.3
204	269.3	101	71.3	24.8	-	-	-
207	336.4	168	79.7	30.7	349.5	181	74.4
210	286.0	118	83.3	32.2	-	-	-
213	314.3	146	80.0	25.4	327.7	159	76.5
216	10.6	202	85.1	38.9	35.4	227	82.3
219	208.9	40	85.8	28.1	359.4	191	83.3
222	254.1	86	77.6	23.4	241.2	73	75.8
225	349.7	181	88.1	29.3	349.8	181	83.2
228	183.1	196	72.4	31.6	176.6	189	76.7
231	174.9	187	71.4	42.8	266.0	279	70.2
234	249.1	262	73.3	74.6	142.3	155	81.0
237	142.3	155	81.5	36.3	180.9	193	69.6
240	203.2	216	80.7	21.1	219.2	232	82.3
243	172.3	185	68.1	25.4	210.7	223	73.7
246	200.2	213	73.5	19.4	202.1	215	75.4
249	195.7	208	72.9	25.6	237.5	250	63.3
252	229.8	242	69.6	28.3	227.5	240	65.3
255	214.6	227	67.0	25.8	250.1	263	69.4
258	220.4	233	69.6	22.1	231.1	244	71.3
261	219.2	232	75.6	18.2	194.1	207	70.7
264	195.6	108	71.6	24.1	241.1	254	62.6
267	208.5	221	72.3	86.8	222.1	235	71.7
270	194.0	207	74.8	23.6	212.2	225	68.6
273	203.7	216	74.8	19.6	219.4	232	65.8
276	173.3	186	65.9	24.4	185.7	198	65.8
279	184.6	197	64.4	27.5	156.2	169	50.6
282	210.7	223	64.4	21.8	227.4	240	75.4
285	200.6	213	62.9	16.3	82.6	95	81.1
288	213.1	226	70.1	18.7	208.1	221	74.9

TABLE 14-21 CONTINUED

McBETH I Continued

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
291	214.0	227	63.6	20.6	221.3	234	72.1
294	218.4	231	69.2	20.2	-	-	-
297	212.2	225	71.4	21.1	223.4	236	72.0
300	194.7	207	70.6	27.9	201.9	214	70.6
303	193.3	206	68.6	25.5	198.2	211	72.9
306	205.7	218	67.9	25.3	224.3	237	74.9
309	217.4	230	69.1	35.9	220.4	233	76.4
312	207.7	220	69.1	28.2	229.1	242	73.6
315	198.4	211	65.2	29.0	210.9	223	66.9
318	213.7	226	68.6	26.8	-	-	-
324	203.6	216	62.3	25.3	-	-	-
327	206.1	219	67.4	28.6	233.8	246	68.1
330	189.2	202	64.1	28.2	52.6	65	-61.3
333	186.5	199	64.5	25.2	214.6	227	65.4
336	154.3	167	74.9	54.2	233.9	246	67.6
339	153.4	166	49.1	108.2	208.7	221	65.8
342	198.1	211	75.0	31.4	193.3	206	67.4
345	245.2	258	64.8	17.3	140.3	153	80.7
348	5.7	18	79.2	27.7	133.4	146	33.8
351	11.9	25	84.8	26.7	269.9	282	58.4
354	5.1	18	87.3	36.5	358.5	11	72.9
357	346.8	0	69.6	58.7	343.5	356	75.5
360	117.9	130	84.2	21.9	337.5	350	78.6
366	33.4	46	81.0	23.4	5.9	18	59.4
369	64.6	77	84.6	26.4	3.1	16	79.6
372	83.6	96	81.6	20.7	4.2	17	76.4
378	54.2	67	81.2	21.9	102.6	115	88.2
382	150.8	233	76.7	20.4	142.3	225	77.8
385	124.8	211	77.3	23.2	-	-	-
388	151.7	238	65.9	17.5	-	-	-
391	6.6	89	74.4	48.7	357.5	80	58.8
394	57.9	141	80.8	19.9	17.1	100	75.5
397	76.3	159	78.7	20.6	38.7	121	73.2
400	111.4	194	81.8	18.7	73.7	156	84.1
403	149.6	232	85.8	27.0	340.6	63	84.0
406	120.2	203	78.8	16.3	39.1	122	82.2
409	96.7	179	86.4	28.1	49.5	132	83.2
412	114.4	197	84.4	28.9	29.1	112	79.1
415	87.8	170	84.2	25.9	29.3	112	78.8
418	150.5	233	81.4	33.8	59.3	142	86.5
421	106.4	189	82.3	26.7	57.4	140	80.4
424	90.3	173	78.1	27.5	72.8	155	76.0
427	34.1	117	66.1	45.2	26.2	109	58.6
430	128.9	211	78.7	53.1	92.4	175	77.8
433	100.4	183	77.4	31.9	81.1	164	74.8
436	94.4	177	77.0	49.9	69.4	152	71.5
439	72.5	155	80.6	25.9	55.9	139	70.3
442	77.8	160	76.9	31.3	56.0	139	77.3
445	79.6	162	79.1	35.3	60.6	143	75.0
448	104.3	187	76.4	29.2	-	-	-

TABLE 14-21 CONTINUED

McBETH I Continued

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
451	99.9	183	84.4	32.2	-	-	-
454	78.1	161	83.9	30.9	40.4	123	80.2
457	98.9	181	83.8	30.4	18.9	101	79.6
460	83.4	166	81.6	32.2	42.7	125	77.1
463	83.9	166	83.9	28.8	41.6	124	80.4
466	127.8	210	83.2	26.8	32.5	115	86.1
469	102.4	185	80.3	29.3	59.5	142	78.1
472	67.1	150	85.6	33.8	40.2	123	76.5
475	81.8	164	79.6	31.8	47.8	130	72.6
478	71.2	154	81.2	30.6	46.0	129	71.7
481	72.8	155	78.6	34.4	56.0	139	74.3
484	83.6	166	80.4	32.5	54.9	138	76.4
487	63.7	146	79.9	28.1	-	-	-
490	30.1	113	82.2	32.7	2.1	85	71.1
493	52.7	135	81.0	35.1	21.2	105	73.6
496	38.4	121	82.5	35.6	29.3	112	77.6
499	6.1	89	79.7	62.4	357.8	80	73.4
502	313.8	36	71.5	71.2	306.0	29	65.5
505	20.2	103	83.6	42.8	17.1	100	74.2
508	34.6	117	85.2	26.3	14.7	97	76.3
511	27.4	110	80.8	31.2	-	-	-
514	26.7	109	79.6	29.9	27.2	110	73.8
517	73.1	156	83.6	28.7	34.7	117	80.9
520	36.8	119	83.3	27.4	9.1	92	75.3
523	26.1	109	82.4	22.4	16.9	100	76.9
526	35.8	118	81.9	26.4	2.8	85	73.6
529	24.8	107	81.2	26.9	14.5	97	71.9
532	42.8	125	78.6	33.2	19.9	103	69.7
535	120.8	27	85.9	25.3	19.6	103	75.0
538	232.6	139	79.2	22.0	269.6	176	82.9
541	215.6	122	79.0	25.8	267.9	174	81.5
544	215.4	122	80.5	29.9	267.5	174	82.9
547	203.9	110	75.4	24.9	224.4	131	82.7
550	205.2	112	75.7	36.6	221.3	128	79.8
553	207.8	114	78.7	42.1	227.3	134	81.6
556	203.1	110	77.5	36.6	235.5	142	84.3
559	196.6	103	78.7	59.5	205.9	112	84.7
562	225.8	132	78.7	33.1	279.7	186	84.1
565	204.1	111	76.3	43.3	214.1	121	83.2
568	208.6	115	79.3	45.1	230.4	137	83.9
571	215.1	122	77.3	36.8	227.6	134	81.5
574	222.4	129	77.7	40.9	260.6	167	82.2
577	222.8	129	77.9	38.8	257.2	164	79.0
580	211.8	118	80.8	37.8	262.2	169	83.1
583	228.4	135	80.3	35.3	256.7	163	81.1
586	230.8	137	82.2	37.7	277.4	184	84.5
589	255.5	162	82.6	41.7	296.8	203	81.6
592	234.6	141	82.8	40.2	308.8	215	83.3
595	232.6	139	82.4	42.8	296.3	203	82.7

TABLE 14-21 CONTINUED

McBETH I Continued

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
598	223.4	130	81.8	33.9	287.6	194	85.8
601	222.8	129	82.1	33.4	286.1	193	84.6
604	226.8	133	83.0	34.6	267.7	174	84.9
607	265.2	172	82.3	29.9	294.4	201	82.7
610	251.5	158	82.4	31.5	275.9	182	80.9
613	248.1	155	79.9	28.8	264.6	171	79.6
616	275.1	182	77.5	31.8	283.5	190	76.3
619	275.2	182	81.0	28.3	304.0	211	80.5
622	265.5	172	78.7	64.7	274.5	181	81.9
625	288.3	195	74.5	24.1	321.8	288	77.3
628	275.2	182	75.1	24.3	285.1	192	77.0
631	232.8	139	77.8	28.3	290.5	197	82.1
634	266.4	173	76.5	27.2	296.7	203	77.4
637	245.7	150	70.1	35.9	267.4	174	70.6
640	253.9	160	75.8	61.1	389.6	196	77.2
643	251.1	158	76.5	71.6	287.3	194	77.7
646	233.4	140	72.6	38.7	260.9	167	75.7
649	244.1	151	73.4	44.5	279.4	186	73.8
652	279.7	186	76.8	52.8	292.4	199	76.4
655	260.0	167	76.3	83.9	284.2	191	77.3
658	283.6	190	68.3	66.8	295.7	202	67.7
661	265.2	172	72.5	47.4	277.8	184	72.8
664	282.4	189	63.2	123.9	280.8	187	59.8
667	235.0	142	66.6	68.1	252.7	159	70.4
670	288.6	195	77.9	43.2	305.6	212	73.3
673	241.6	148	81.8	78.3	242.4	149	83.2
676	259.5	166	72.8	79.0	288.5	195	70.9
679	273.8	180	74.2	25.1	289.9	196	70.4
682	257.5	164	63.1	92.9	257.9	164	61.1
685	275.5	182	68.5	138.9	278.6	185	69.0
688	345.5	252	72.9	142.7	344.3	251	68.9
691	1.9	269	55.0	71.9	1.8	269	45.9
694	106.9	129	74.1	67.3	91.7	114	71.1
697	103.9	126	73.6	82.1	86.8	110	70.9
700	116.4	139	65.8	130.1	103.8	126	65.3
703	128.5	151	74.3	117.67	128.5	151	73.8
706	151.7	174	69.7	110.8	151.5	174	68.7
709	169.9	192	72.9	88.1	162.1	185	76.6
712	251.4	274	82.6	50.0	262.0	285	85.2
715	218.7	241	72.3	50.0	224.3	247	72.4
718	225.4	248	65.3	74.2	230.1	253	63.6
721	233.6	256	79.3	102.9	249.5	272	81.1
724	188.3	211	80.9	101.7	185.7	208	80.5
727	203.3	226	73.9	118.1	209.2	232	73.8
730	175.4	198	63.3	113.2	173.8	196	61.2
733	160.1	183	57.8	127.5	162.7	185	55.7
736	149.9	173	45.5	232.3	150.6	173	44.0
739	280.7	303	76.7	87.1	284.9	307	74.3
742	185.1	208	74.4	23.1	210.3	233	81.5
745	190.5	213	81.1	49.3	169.8	192	83.9

TABLE 14-21 CONTINUED

McBETH I Continued

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
748	194.6	217	76.3	19.3	214.1	237	78.6
751	176.3	199	67.4	78.6	159.1	182	55.1
754	239.4	262	82.5	21.4	208.9	231	79.9
757	195.7	218	73.9	18.1	214.9	237	79.9
760	195.2	218	79.1	16.4	252.6	275	86.7
763	195.2	218	77.9	33.9	210.9	233	80.9
766	169.9	192	74.1	82.6	160.8	283	74.7
769	186.5	209	68.6	19.9	196.7	119	74.4
772	193.3	216	82.3	21.0	233.2	256	82.5
775	184.7	207	76.2	24.9	221.1	244	83.9
778	186.4	209	72.9	25.2	200.1	223	76.4
781	202.6	225	78.6	50.3	211.6	234	79.0
784	194.7	217	75.9	33.7	-	-	-
787	191.9	214	76.4	42.6	196.9	119	78.9
790	183.7	206	79.8	29.6	191.7	214	75.9
793	180.5	203	70.3	29.2	184.2	207	74.1
796	203.3	226	80.4	38.5	234.0	257	80.6
799	199.9	223	79.5	25.6	229.3	252	79.9
802	189.4	212	76.2	26.5	200.7	223	79.8
805	184.3	207	79.7	24.3	205.2	228	80.1
808	185.7	208	74.4	35.8	194.6	219	76.8
811	197.3	220	75.2	61.7	217.5	240	79.4
814	168.5	191	70.3	71.8	171.4	294	72.2
817	185.6	208	79.1	29.8	218.3	241	76.3
820	185.9	208	75.2	25.4	197.1	220	78.3
823	184.3	207	79.2	27.6	206.2	229	84.6
826	191.7	214	72.9	27.8	204.0	227	80.7
829	186.8	210	74.1	30.9	190.7	213	77.7
832	184.8	207	79.4	39.6	188.6	211	77.4
835	194.9	217	76.9	25.9	209.8	232	81.3
838	191.8	214	73.8	29.9	197.9	220	80.0
844	335.9	220	64.6	6.7	355.1	240	56.6
847	311.6	196	77.1	10.8	335.5	220	66.0
850	294.5	181	66.8	6.6	330.1	215	49.9
856	318.9	203	62.6	5.6	330.1	215	52.2
859	336.4	221	51.5	20.9	333.2	218	63.6
862	341.6	226	65.0	26.9	344.9	229	53.2
865	346.9	231	61.3	35.0	348.2	233	52.2
868	347.6	232	50.1	46.0	351.2	236	66.8
871	348.7	233	69.1	48.9	333.5	218	65.8
874	340.2	225	68.8	19.3	341.5	226	61.2
877	357.5	242	78.3	17.6	344.3	229	71.6
880	5.1	250	67.4	70.9	7.0	252	61.7
883	58.4	303	77.1	72.2	52.7	297	68.9
886	324.8	209	78.6	86.1	321.2	206	75.4
889	274.9	159	56.8	97.1	273.1	158	50.0
892	302.3	187	49.1	90.3	299.8	184	38.6
895	298.5	183	54.7	86.7	300.7	185	45.7
898	287.8	172	53.9	90.3	288	173	44.4

McBETH I Continued

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
901	252.8	137	63.9	76.1	252.6	137	57.4
904	237.1	122	61.9	78.8	240.5	125	55.7
907	140.6	25	27.3	90.3	139.9	24	21.6
910	159.7	44	55.3	46.4	166.4	51	57.9
913	159.3	44	56.7	31.5	187.4	72	71.5
916	200.8	85	23.1	78.2	208.1	93	22.8
919	189.8	74	40.1	53.1	199.4	84	49.3
922	109.8	-6	64.4	113.6	94.9	339	66.8
925	292.8	177	44.9	200.3	297.9	182	41.7
928	330.8	215	33.3	127.3	329.1	214	29.9
931	320.5	205	30.3	44.1	326.3	211	22.7
934	8.1	250	45.5	13.5	0.4	245	42.2
937	350.1	235	71.7	39.8	354.9	239	63.6
940	356.8	241	70.2	42.7	359.6	244	66.5
943	359.6	244	65.9	29.5	0.6	245	61.2
946	352.2	237	66.2	34.1	351.1	236	60.9
949	352.9	237	72.5	29.6	347.1	232	64.7
952	4.3	249	67.8	28.2	3.9	248	61.7
955	1.0	246	62.0	27.5	358.4	243	54.8
958	355.0	240	67.9	27.8	347.4	232	61.4
961	4.8	249	78.5	28.0	4.3	249	71.8
964	0.1	245	77.4	26.7	356.2	241	74.1
967	1.3	246	72.1	24.1	3.4	248	64.4

TABLE 14-22

McBETH 7 Location 69°37'50"N
68°16'00"W

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
2	180.0		-10.8	21.7	191.6		-19.4
5	179.0		36.1	37.3	184.0		44.3
8	170.0		57.2	37.2	176.1		63.0
11	186.1		64.5	44.6	202.5		71.3
14	223.2		85.2	36.5	293.5		78.8
17	337.5		89.6	43.8	335.2		81.8
20	142.1		86.4	38.3	23.0		86.1
23	76.1		81.6	47.4	37.8		81.4
26	113.0		85.0	47.0	52.4		81.3
29	39.9		83.3	48.9	14.3		79.8
32	102.2		84.9	46.7	27.6		84.1
35	117.1		78.7	51.2	93.8		80.6
38	63.2		79.1	49.1	35.9		76.0
41	91.9		80.1	58.8	60.1		79.5
44	138.7		79.7	46.9	102.4		85.7
47	64.1		76.0	55.1	34.9		73.5
50	110.7		78.5	48.8	62.7		80.7
53	76.9		78.4	45.6	46.7		75.5
56	77.4		77.8	39.9	52.6		78.8
59	46.7		74.7	42.8	23.5		69.5
62	73.0		74.8	43.6	52.1		73.2
65	87.6		74.9	40.4	50.9		77.5
68	59.5		80.6	49.1	28.4		77.1
71	73.4		83.6	50.2	28.1		79.8
74	40.6		81.6	46.6	3.1		76.5
77	40.5		79.9	45.4	4.9		72.5
80	63.8		85.3	54.1	-	-	-
83	73.2		84.9	54.5	2.7		78.1
86	54.4		80.6	56.1	18.4		74.5
89	87.9		83.2	62.5	22.8		80.9
92	130.3		79.5	64.6	82.7		85.4
95	170.1		81.5	79.9	300.5		86.4
98	56.2		76.9	59.7	32.0		73.2
101	314.9	59	70.7	57.0	-	-	-
104	312.2	57	75.9	52.3	323.7	68	66.4
107	306.9	51	74.7	55.1	306.6	51	66.2
110	271.1	16	78.7	56.8	297.4	42	73.9
113	267.3	12	79.6	65.4	297.7	42	74.2
116	281.4	26	80.2	55.9	302.0	47	73.5
119	298.8	43	76.3	58.3	312.7	57	68.3
122	313.0	58	73.2	77.9	327.5	72	70.3
125	289.2	34	81.9	62.3	316.8	61	72.7
128	327.2	72	81.1	56.1	326.5	71	73.6
131	274.9	19	82.7	51.7	309.4	54	73.7
134	346.0	91	81.5	50.5	343.5	88	72.1
137	345.1	90	82.7	67.1	337.6	82	74.1
140	354.0	99	79.5	46.9	339.7	84	71.3
143	359.6	105	74.9	52.5	347.9	92	66.5

TABLE 14-22 CONTINUED

McBeth 7 Continued

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
146	345.9	90	76.6	41.6	342.0	87	64.7
149	7.3	112	85.5	56.1	342.4	87	79.6
152	20.4	125	77.9	45.2	359.1	104	71.7
155	61.1	166	83.8	54.7	3.1	108	78.4
158	97.0	202	84.6	75.8	354.1	99	82.8
161	69.4	174	87.7	75.1	334.9	79	78.6
164	309.5	54	78.4	66.8	-	-	-
167	327.4	72	80.0	81.8	326.4	71	67.9
170	305.8	50	85.1	78.2	324.5	69	80.3
173	324.3	69	86.4	77.9	344.2	89	77.6
176	2.4	107	84.9	71.8	359.7	104	79.2
179	38.1	143	85.9	85.2	26.4	131	81.9
182	51.1	156	83.9	80.9	34.1	139	81.6
185	46.0	155	85.1	93.1	17.1	122	81.3
188	73.5	178	87.6	77.1	26.5	131	
191	43.3	148	81.6	80.9	44.2	149	78.5
194	59.1	164	82.9	80.0	39.8	144	81.1
197	120.5	225	81.4	86.1	97.7	202	82.1
200	49.7	154	83.9	73.1	36.1	141	79.2
203	127.1	132	84.2	78.9	87.1	192	85.3
206	87.2	222	84.1	73.1	44.6	149	83.8
209	77.6	182	87.8	79.6	26.4	131	85.5
212	113.4	218	85.2	89.3	70.3	175	84.6
215	78.8	183	84.5	93.9	-	-	-
218	77.5	182	83.2	107.3	61.2	166	80.9
221	52.9	157	79.6	114.4	45.7	150	79.5
224	51.2	156	82.5	94.7	34.8	139	79.8
227	59.8	164	79.1	112.8	47.7	152	77.1
230	56.5	161	79.7	102.0	31.5	139	78.3
233	24.2	129	84.2	118.1	18.7	123	81.3
236	6.7	111	80.6	90.9	0.1	105	77.8
239	7.2	112	80.8	103.3	2.6	107	80.3
242	13.1	118	80.0	78.5	5.3	110	79.1
245	5.1	110	78.2	84.2	358.9	103	74.4
248	146.4	106	79.3	74.9	132.3	92	84.5
251	115.0	75	84.2	70.3	80.0	40	85.1
254	105.7	65	82.3	85.9	73.7	33	82.6
257	106.9	66	84.9	78.5	56.8	16	85.7
260	151.3	111	83.2	92.9	150.9	110	85.4
263	90.6	50	85.4	103.2	25.7	-15	83.5
266	60.8	20	84.1	101.9	48.5	8	83.9
269	102.7	62	85.7	78.6	-	-	-
272	119.5	79	80.9	96.9	113.4	73	83.5
275	93.4	53	81.4	100.6	71.1	31	82.5
278	133.6	93	79.9	93.4	128.9	88	83.3
281	83.8	43	83.1	120.3	59.2	19	83.7
284	90.4	50	83.6	108.4	78.5	38	84.1
287	112.1	72	76.3	121.4	107.4	67	78.5

TABLE 14-22 CONTINUED
McBeth 7 Continued

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
290	112.1	72	81.4	217.4	106.2	66	84.4
293	85.0	45	81.5	188.2	72.0	32	83.1
296	264.7	224	27.3	302.5	269.5	229	22.3
299	100.8	60	73.5	116.9	84.1	44	78.7
301	89.6	49	75.5	96.8	85.2	45	75.2
304	68.2	28	75.3	114.5	62.5	22	76.9
307	234.9	194	46.3	86.9	245.8	205	41.6
310	256.7	216	19.7	150.7	264.3	224	14.6
313	168.1	128	64.8	79.3	230.5	190	62.9
316	137.9	97	63.5	41.2	156.7	116	80.9
319	76.7	36	48.7	45.4	64.0	24	46.8
322	56.2	16	62.4	65.0	40.3	0	60.3
325	26.4	-14	77.0	60.1	351.4	311	72.9
328	193.6	153	68.5	64.4	210.6	170	67.3
331	210.9	170	44.4	75.8	258.8	218	51.4
337	153.5	113	77.9	51.7	180.7	140	82.4
340	175.9	135	74.5	100.3	174.7	134	75.0
343	172.4	132	73.6	92.2	169.1	129	73.9
346	179.6	139	70.9	132.9	177.4	137	70.7
349	246.7	206	65.4	100.2	260.5	220	62.9
352	248.9	208	69.2	105.9	259.0	219	68.5
355	283.8	243	84.7	66.6	321.1	281	80.5
358	287.1	247	52.5	53.9	293.1	253	49.8
361	252.4	212	62.2	113.2	258.3	218	61.9
364	102.0	62	87.3	71.2	-	-	-
367	244.4	204	78.7	90.3	261.9	221	78.6
370	234.2	194	81.2	106.6	-	-	82.0
373	269.3	229	70.7	97.7	277.7	237	68.8
376	271.9	231	72.2	88.5	269.9	229	34.1
379	312.8	272	72.3	70.3	318.5	278	25.7
382	324.4	284	73.3	108.8	331.7	291	71.3
385	7.0	327	65.1	86.6	7.3	327	62.4
388	334.2	294	50.4	83.9	337.5	297	45.7
391	321.5	281	30.7	38.1	325.1	285	21.7
394	32.2	352	73.4	67.3	29.9	349	68.6
397	103.9	163	59.7	44.5	95.5	155	60.0
400	155.2	215	64.1	29.9	149.2	209	70.5
403	221.3	281	16.9	13.6	232.5	292	15.3
406	274.1	334	46.8	23.3	286.3	346	39.6
409	272.8	332	83.4	67.8	299.4	359	79.3
412	212.1	252	40.1	97.1	213.4	273	34.9
415	213.8	253	56.5	86.4	220.0	280	58.8
418	196.9	236	56.7	28.9	198.6	258	62.7
421	336.9	36	77.7	73.1	337.4	37	73.1
424	205.6	265	79.2	80.8	207.9	267	80.9
427	258.9	318	76.0	74.8	284.7	344	77.0
430	201.3	261	71.7	127.4	213.2	273	73.8

TABLE 14-22 CONTINUED

McBeth 7 Continued

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
433	206.3	266	66.0	128.6	209.0	269	63.4
436	202.6	262	59.1	85.0	209.7	269	60.1
439	183.8	243	71.4	73.2	185.1	245	72.3
442	154.9	214	55.5	76.5	154.4	214	58.2
445	196.1	256	67.0	89.6	200.1	260	66.5
448	179.9	239	68.2	93.4	181.5	241	69.8
451	163.3	223	77.2	73.9	191.4	251	64.1
454	186.6	246	62.1	70.3	153.9	213	66.7
457	154.1	214	66.1	90.4	160.9	220	68.6
460	157.1	217	67.8	86.0	160.4	220	67.9
463	162.2	222	64.7	82.8	180.6	240	68.9
466	165.5	225	65.6	87.4	160.5	220	64.2
469	177.6	237	59.1	83.1	180.6	240	64.2
472	161.0	221	45.1	76.1	160.5	220	46.3
475	177.4	237	80.2	100.1	190.6	250	80.9
478	161.4	221	66.9	67.8	166.1	226	67.4
481	142.5	202	76.7	67.6	149.1	209	76.2
484	209.0	269	77.7	149.8	210.1	270	77.4
487	287.4	347	83.6	47.3	285.6	345	80.9
490	159.5	219	83.5	89.2	170.3	230	86.6
493	69.9	129	87.9	69.7	15.8	75	86.8
496	189.7	249	79.5	85.5	203.4	263	80.9
499	209.8	269	83.3	83.1	245.3	315	82.7
502	180.2	240	73.2	125.8	180.8	240	73.8
505	173.9	233	80.5	149.5	184.6	245	80.8

TABLE 14-23

ITIRBILUNG 1 Location 69°18'50"N
69°10'00"W

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
2	282.1	62	-35.8	62.8	272.8	52	-17.0
5	301.1	81	-38.4	85.5	295.3	75	-43.4
8	302.3	82	-27.8	121.1	-	-	-
11	29.9	169	9.9	28.9	42.0	182	-23.3
14	346.1	126	75.9	211.0	15.7	155	75.6
17	330.4	110	75.8	243.3	-	-	-
20	299.1	109	63.3	74.3	302.8	112	66.0
23	289.8	99	62.8	134.8	295.8	105	65.8
26	280.1	90	76.0	112.1	-	-	-
29	300.9	110	54.2	55.8	304.7	114	56.1
32	320.1	132	73.4	91.5	330.1	140	75.3
35	316.1	126	72.0	93.0	-	-	-
38	12.2	182	77.6	176.1	27.0	197	73.1
41	315.6	125	73.9	226.8	329.8	139	74.7
44	336.6	146	75.8	129.9	-	-	-
47	244.4	54	71.8	99.3	238.1	48	76.8
50	287.4	97	64.2	107.3	334.5	144	58.2
53	205.9	15	60.3	83.8	-	-	-
56	266.3	76	53.3	73.9	277.0	87	57.4
59	283.5	93	17.4	44.9	298.3	108	23.7
62	22.9	192	61.2	129.9	-	-	-
65	74.2	244	62.4	148.2	71.8	241	52.4
68	70.5	240	64.6	131.4	63.6	233	58.3
71	358.2	168	46.1	89.4	-	-	-
74	358.2	168	68.3	82.7	4.0	174	63.9
77	166.9	336	75.0	40.3	142.8	312	77.6
80	146.8	316	76.7	26.8	-	-	-
83	101.7	271	63.1	76.6	87.6	257	59.5
86	126.4	296	80.9	51.2	100.0	270	76.4
89	279.5	89	62.8	138.8	-	-	-
92	170.4	340	46.3	105.8	158.9	328	49.7
95	104.4	274	75.7	72.2	348.5	158	73.8
98	13.3	173	77.6	31.3	-	-	-
101	103.8	273	0.97	42.2	101.5	271	-2.2
104	153.9	323	-26.1	44.7	168.0	338	-26.5
107	316.5	126	20.1	50.4	-	-	-
110	271.8	81	27.2	113.4	270.8	80	31.0
113	233.4	43	76.9	246.9	215.6	45	82.5
116	226.0	36	34.4	80.6	-	-	-
119	190.8	0	70.5	125.1	173.9	-17	72.9
122	145.5	-45	75.1	182.7	117.9	-73	74.4
125	67.7	237	85.6	303.2	-	-	-
128	359.7	169	69.4	132.5	7.6	177	65.2
131	6.5	176	69.3	114.4	355.0	165	60.7
134	345.1	155	57.1	105.2	-	-	-
137	327.4	137	46.0	199.9	329.3	139	46.7
140	329.4	139	27.7	236.4	328.4	138	26.8

TABLE 14-23 CONTINUED

ITIRBILUNG 1 Continued

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
143	19.1	189	33.6	156.0	-	-	-
146	7.1	177	40.5	218.2	6.9	176	38.0
149	45.7	215	86.1	124.3	67.7	237	82.6
152	303.7	113	51.2	177.0	-	-	-
155	321.2	131	42.5	188.4	320.8	130	42.9
179	334.8	34	-59.9	9.2	-	-	-
182	276.8	336	74.1	67.2	280.7	340	75.7
185	165.8	225	81.7	206.4	113.6	173	85.3
188	201.5	261	56.7	19.1	-		-
191	53.6	111	75.1	73.7	48.2	171	73.4
194	84.1	144	82.4	47.5	72.5	204	80.6
197	63.9	123	65.0	42.8	-	-	-
200	14.7	74	48.8	53.9	15.1	75	50.4
203	58.1	118	66.3	44.9	54.0	114	64.9
206	351.5	51	76.6	79.5	-	-	-
209	46.7	106	60.2	41.1	51.8	111	58.4
212	118.0	178	83.2	72.5	112.7	172	79.7
215	183.6	243	87.6	62.1	322.3	22	84.2
218	305.3	5	85.3	54.6	-	-	-
221	165.8	225	83.1	67.4	143.6	203	85.6
224	84.8	144	77.8	152.7	-	-	-
227	135.9	195	81.1	48.3	142.0	202	74.1
230	134.3	194	81.4	68.6	117.6	177	81.6
233	115.0	175	81.2	63.2	-	-	-
236	103.8	163	75.8	86.3	95.2	155	73.7
239	118.4	178	78.5	103.7	100.3	160	76.8
242	140.4	200	73.1	134.4	-	-	-
245	141.3	201	71.6	77.9	126.8	186	73.3
248	116.7	176	79.9	110.6	92.6	152	78.3
251	111.7	171	68.5	94.3	-	-	-
254	239.0	299	81.2	80.4	262.0	322	82.9
257	112.1	172	70.0	248.8	99.4	159	69.4
260	120.9	180	72.5	171.7	-	-	-
263	112.3	172	72.1	294.0	104.9	164	71.5
266	123.6	183	74.1	80.2	121.3	184	70.9
269	102.4	162	80.0	93.6	-	-	-
272	103.1	163	66.6	312.9	98.4	158	64.7
275	86.3	144	71.5	187.3	86.4	146	67.3
278	150.8	210	49.9	122.4	-	-	-
281	104.3	164	61.8	256.4	99.7	159	60.3
284	106.5	166	72.9	219.2	87.9	147	71.9
287	90.9	150	73.4	170.5	-	-	-
290	248.5	308	61.3	89.5	247.8	307	62.4
293	104.7	164	73.5	59.8	88.2	148	71.6
296	138.2	198	15.6	74.3	-	-	-
299	24.9	84	16.3	102.9	22.6	82	13.7
302	25.6	85	34.5	163.5	24.1	84	33.2

ITIRBILUNG 1 Continued

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
305	44.1	104	24.6	126.2	-	-	-
308	61.2	121	40.4	70.5	61.4	121	37.7
311	73.1	133	43.3	31.9	73.4	133	38.5
315	32.3	92	-6.1	19.5	-	-	-
318	50.4	110	-22.4	18.9	47.2	107	-35.7
321	16.9	76	-34.1	14.7	17.8	77	-35.7
324	9.6	69	-70.8	13.6	-	-	-
327	232.2	73	12.2	23.1	218.8	68	20.1
330	201.6	51	59.6	72.0	196.8	46	60.9
333	224.7	74	11.3	22.6	-	-	-
336	217.3	67	4.8	27.7	208.7	58	7.2
339	315.7	166	54.8	7.4	-	-	-
342	178.1	28	65.2	54.6	-	-	-
345	231.7	81	66.8	24.7	212.4	62	64.0
348	262.2	112	61.7	23.5	255.4	105	64.7
351	52.3	262	65.8	30.6	-	-	-
354	50.2	260	68.9	38.4	35.3	245	67.9
357	29.2	239	53.0	21.0	36.2	246	43.8
360	325.8	175	65.7	17.4	-	-	-
363	75.7	285	65.0	10.5	117.1	327	79.8
366	351.0	201	69.4	5.4	301.4	151	72.4
369	4.8	214	1.2	12.4	-	-	-
372	25.0	235	18.7	25.4	21.8	231	22.9
375	334.7	184	86.2	51.2	-	-	-
378	268.3	118	86.5	84.2	-	-	-
381	25.8	235	58.6	72.2	31.2	241	56.8
384	350.5	200	86.9	50.6	73.8	283	87.5
387	15.4	225	76.6	57.5	-	-	-
390	237.9	87	78.9	62.5	255.1	105	84.0
393	300.2	150	67.8	71.8	303.4	153	68.7
396	308.5	158	77.5	99.5	138.9		87.9
399	349.7	199	62.8	74.9	354.4	204	68.3
402	50.7	260	67.5	79.2	49.5		59.4
405	7.6	217	54.4	104.7	-	-	-
408	310.2	160	80.8	76.8	326.2	176	77.3
411	293.6	143	63.6	86.5	300.2	150	63.5
414	338.8	188	45.4	60.5	-	-	-
417	270.4	120	52.7	35.7	267.1	117	55.4
420	289.0	139	74.6	48.9	276.0	126	79.7
423	318.4	168	57.6	69.3	-	-	-
426	294.3	144	65.8	92.2	298.2	148	66.5
429	283.7	133	69.9	75.8	289.1	139	71.9
432	235.0	85	75.3	115.7	-	-	-
435	289.5	139	72.5	113.2	271.9	121	59.4
438	332.4	182	72.2	154.1	342.5	192	69.2
441	309.5	159	60.4	157.9	-	-	-

TABLE 14-23 CONTINUED

ITIRBILUNG 1 Continued

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
444	274.7	124	79.8	67.6	262.8	112	30.3
447	213.6	63	57.5	43.0	202.4	52	61.6
450	274.1	124	60.4	58.6	-	-	-
453	285.8	135	75.9	70.1	200.4	50	70.8
456	330.6	180	70.5	109.8	333.6	183	70.4
459	298.7	148	51.0	163.4	-	-	-
462	217.6	67	26.1	14.0	198.9	48	35.2
546	215.8		9.3	6.7	-	-	-
549	228.0	147	6.0	15.9	217.7	149	16.0
561	51.2	343	12.2	29.1	53.7	345	10.0
564	227.1	146	58.9	40.5	-	-	-
567	159.7	91	54.9	50.8	154.0	86	56.1
570	223.5	155	65.4	53.9	216.1	148	69.0
573	174.9	114	78.6	68.3	-	-	-
576	224.2	156	67.4	61.9	219.2	151	71.9
579	275.4	207	67.5	56.3	280.3	212	70.5
582	222.5	154	-4.2	36.7	-	-	-
585	256.6	188	29.6	28.1	-	-	-
588	6.9	298	32.2	8.8	12.5	304	31.8
591	24.5	316	23.2	24.8	-	-	-
594	337.1	269	78.8	14.7	-	-	-
597	12.0	304	70.4	34.6	28.9	320	70.7
600	91.4	23	74.7	56.5	-	-	-
603	85.9	17	39.9	39.0	88.7	20	36.5
606	17.5	309	43.0	28.6	19.5	311	43.1
609	343.0	275	36.0	28.1	-	-	-
612	337.6	269	17.9	67.2	327.2	259	32.0
615	349.2	281	8.5	17.8	332.7	264	-3.5
621	354.2	268	35.9	9.5	-	-	-
627	66.9	358	46.6	18.5	25.2	317	17.2
630	130.2	62	23.4	21.2	-	-	-
633	241.2	173	62.4	20.6	248.8	180	67.9

TABLE 14-24

TINGIN-1A Location 69°05'40"N
68°54'00"W

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
8	327.4	147	-22.8	15.3	-	-	-
11	276.8	96	45.7	9.6	182.4	2	48.5
14	76.8	256	24.4	14.2	67.6	247	56.5
17	244.7	64	16.1	39.6	-	-	-
20	226.7	44	27.0	11.2	222.7	42	
23	270.7	90	52.5	38.8	243.6	43	58.1
26	108.7	288	62.1	49.7	-	-	-
29	317.4	137	21.4	73.5	326.2	146	20.7
32	332.8	152	48.3	14.4	-	-	-
35	353.0	173	62.1	13.5	348.2	168	58.5
38	53.6	233	60.9	25.4	50.2	230	65.8
41	329.7	149	63.0	7.5	-	-	
44	23.0	203	69.9	6.0	47.3	227	68.5
47	29.4	209	53.2	9.6	38.5	218	48.4
50	203.6	23	86.8	11.6	-	-	-
53	164.7	-16	53.2	11.5	345.9	169	37.9
56	240.1	60	69.6	10.1	-	-	-
59	336.2	156	50.5	12.0	334.2	154	44.9
62	19.6	179	56.0	7.6	46.0	226	38.0
65	323.1	143	60.9	11.2	-	-	-
68	133.1	313	48.2	23.7	-	-	-
71	256.5	76	57.2	11.2	237.2	57	52.1
74	8.5	188	78.0	12.1	-	-	-
77	342.3	162	85.7	17.3	83.4	263	86.5
80	200.1	20	17.2	6.5	196.5	16	16.0
83	9.1	189	48.3	16.9	-	-	-
86	78.3	258	73.9	9.1	131.8	311	63.6
89	4.6	184	85.0	15.9	132.0	3.2	80.6
92	220.8	40	75.1	16.3	-	-	-
95	351.8	171	85.5	28.5	55.3	235	80.7
98	300.6	120	79.1	14.2	284.1	104	85.3
101	254.6	74	46.8	12.7	-	-	-
104	343.5	163	59.7	10.5	1.2	181	55.5
107	263.3	83	68.8	7.6	284.5	104	61.3
110	211.6	31	64.4	14.3	-	-	-
113	242.6	62	67.0	17.0	255.4	75	62.7
116	0.4	180	60.5	9.2	349.1	169	39.7
119	271.5	91	81.3	9.1	-	-	-
122	101.0	281	71.5	11.2	124.8	304	61.0
125	264.9	84	63.4	16.1	239.6	59	64.1
128	290.8	110	49.8	18.6	-	-	-
131	17.5	197	56.6	14.7	51.3	231	52.1
134	69.8	249	72.0	22.8	81.7		67.7
137	115.4	295	78.0	23.1	-	-	-
140	91.2	171	69.6	16.2	99.4	279	53.9

TABLE 14-24

TINGIN-1A Continued

- 2 -

Depth	Declination Reading	Declination Rotated	Inclination	Intensity	Declination Reading	Declination Rotated	Inclination
143	27.2	207	75.9	13.4	45.0	225	74.8
146	327.1	147	75.2	19.6	-	-	-
149	30.3	210	69.5	10.9	11.0	191	64.3
152	120.3	300	76.3	10.5	117.8	297	76.5
155	107.0	287	55.4	18.7	-	-	-
158	26.5	206	69.8	17.0	28.8	208	51.2
161	87.3	267	50.8	17.1	79.4	259	41.0
164	0.6	180	85.3	28.9	-	-	-
167	266.1	86	79.5	13.2	321.8	141	62.9
170	130.2	290	30.4	9.8	161.0	341	2.5
173	67.1	247	59.1	5.6	-	-	-
176	144.9	304	50.4	13.4	188.3	8	26.0
179	259.0	79	72.4	4.5	201.7	21	2.1
182	92.6	272	13.0	12.7	-	-	-
185	265.2	86	77.7	14.2	214.1	34	61.3
215	55.6	340	-15.6	3.8	-	-	-
218	319.4	244	-14.2	10.2	311.2	236	-38.1
221	324.0	249	-17.1	11.7	335.9	260	-9.2
224	326.0	251	48.7	10.3	-	-	-
227	41.6	325	54.3	12.1	47.6	332	48.7
230	45.0	330	43.8	13.8	33.5	318	36.4
233	5.9	290	41.5	12.2	-	-	-
236	52.5	337	39.7	14.7	42.0	327	32.4
239	11.1	295	18.4	11.4	359.8	284	12.7
242	243.0	168	45.3	3.7	-	-	-
245	224.7	149	83.0	8.1	229.6	154	62.8
248	137.8	62	80.8	11.3	159.1	84	63.1
251	233.4	158	68.0	6.3	-	-	-
254	294.1	219	65.7	13.6	278.0	203	60.2
257	307.1	232	67.6	15.3	319.8	244	76.5
260	303.0	228	48.3	9.0	-	-	-
263	264.0	189	63.6	13.9	255.8	180	64.2
266	248.1	173	-22.4	8.6	241.5	166	2.7
269	315	240	16.1	7.3	-	-	-
272	284.8	209	40.6	15.3	286.7	211	52.7
275	325.0	250	28.3	5.0	345.8	270	27.7
278	337.7	262	42.0	13.0	-	-	-
281	346.6	271	35.3	14.0	335.9	260	27.3
284	60.5	345	76.4	10.6	63.5	348	71.6
287	37.1	322	66.7	8.9	-	-	-
290	170.7	95	83.0	11.1	216.1	141	79.1
293	126.3	51	73.3	9.4	139.1	64	68.6
296	244.4	169	-0.8	2.3	-	-	-
299	198.2	123	46.6	4.2	187.2	112	43.3
303	96.4	20	53.1	2.0	168.2	93	26.9
306	30.3	315	64.1	7.3	-	-	-
309	263.8	188	56.0	2.1	174.3	99	56.5

TABLE 14-24

TINGIN-1A Continued

- 3 -

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
312	27.8	312	64.7	6.7	53.2	388	71.8
315	60.3	345	70.9	12.3	-	-	-
318	57.7	342	36.5	5.5	70.8	355	30.8
321	49.1	334	61.0	3.6	38.4	323	48.0
324	30.7	315	61.8	10.4	-	-	-
327	64.0	349	31.2	8.4	54.5	339	33.0
330	5.4	290	22.6	6.7	345.0	270	-12.4
333	352.7	277	60.5	8.0	-	-	-
336	237.0	162	76.9	9.7	206.4	131	84.1
339	34.3	319	71.0	8.0	47.6	332	65.0
342	345.0	270	59.6	17.7	-	-	-
345	40.5	325	76.2	26.0	32.9	317	71.4
348	18.8	303	70.5	30.0	5.8	290	65.6
351	3.3	303	76.3	33.3	-	-	-
354	18.8	318	75.3	35.2	338.9	276	80.6
357	13.2	313	82.6	39.9	234.8	174	87.4
360	33.6	333	73.5	35.2	-	-	-
363	29.2	329	79.1	37.2	65.6	5	80.3
366	37.0	337	73.0	35.9	62.3	2	73.9
369	32.4	332	74.2	33.7	-	-	-
372	40.3	340	75.5	36.4	42.5	342	72.1
375	42.5	342	78.3	34.5	18.2	318	73.5
378	56.8	356	77.5	34.2	-	-	-
381	50.1	350	75.5	40.9	2.2	302	62.5
384	42.1	342	78.4	39.3	36.6	336	85.2
387	34.3	334	72.3	32.1	-	-	-
390	39.6	339	73.8	35.5	51.9	351	79.0
393	19.0	319	68.9	29.9	2.2	302	62.5
396	346.4	286	71.5	24.0	-	-	-
399	162.6	102	71.3	18.3	138.5	78	61.8
402	160.6	100	81.8	30.4	186.7	126	80.3
405	152.3	92	66.4	15.6	-	-	-
408	244.9	184	62.7	14.9	250.9	290	62.3
411	46.5	26	67.4	5.6	70.5	11	67.1
414	142.4	82	52.2	10.1	-	-	-
417	200.1	140	-26.0	4.8	224.3	264	-6.0
420	206.5	146	45.2	6.8	228.8	268	59.7
423	223.9	163	77.2	15.5	-	-	-
426	203.6	143	78.8	16.5	180.2	120	81.7
429	258.3	198	69.7	9.2	266.5	206	51.4
432	201.6	141	53.7	5.4	-	-	-
435	177.0	117	53.2	16.9	188.2	127	48.8
438	186.2	126	81.2	8.5	184.6	124	83.4
441	154.9	94	62.8	8.6	-	-	-
444	172.0	112	60.4	8.1	181.5	121	59.1
447	38.6	338	81.6	15.0	97.9	37	82.1
450	94.1	34	76.5	9.8	-	-	-
453	115.1	55	64.1	22.5	120.0	60	63.4
456	151.7	91	65.9	10.0	133.4	73	66.6
459	147.5	87	67.4	12.8	-	-	-

TABLE 14-24

TINGIN-1A Continued

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
462	132.2	73	57.5	22.3	114.2	54	56.4
465	121.5	61	69.0	20.7	91.9	31	75.1
468	113.2	53	69.7	15.6	-	-	-
471	139.3	79	67.6	17.5	143.7	83	68.9
474	123.6	63	61.2	15.5	132.6	72	61.1
477	133.7	73	74.3	17.1	-	-	-
480	135.6	75	60.5	16.0	129.1	69	64.6
483	123.3	62	72.0	24.0	105.0	45	61.9
486	130.3	70	75.1	17.3	-	-	-
489	114.1	54	74.2	8.7	101.2	41	46.5
492	182.3	122	65.5	8.1	114.7	54	29.0
495	260.5	200	75.8	16.8	-	-	-
498	193.3	133	79.7	25.7	112.4	52	83.4
501	298.9	123	82.7	36.3	298.6	123	78.8
504	297.4	122	82.4	45.3	-	-	-
507	288.1	113	79.0	39.2	263.6	88	74.1
510	265.3	90	79.5	38.2	241.8	66	75.9
513	247.1	72	78.5	34.3	-	-	-
516	297.2	122	83.6	14.4	223.9	48	84.7
519	261.8	86	83.0	29.7	151.8	336	81.7
522	241.1	66	80.9	36.7	-	-	-
525	240.8	65	83.1	41.0	95.0	280	72.4
528	215.2	40	77.9	39.5	50.4	236	44.1
531	226.8	51	80.4	37.5	-	-	-
534	240.5	65	82.2	44.0	240.8	65	81.0
537	284.1	109	84.4	48.9	261.7	86	83.5
540	268.8	93	85.0	46.4	-	-	-
543	217.5	42	79.0	52.7	217.0	42	79.4
546	327.4	152	79.9	44.6	333.6	158	54.8
549	328.1	153	83.7	49.3	-	-	-
552	282.7	107	84.7	39.1	305.2	130	69.9
555	246.4	71	81.3	33.0	282.0	107	71.2
558	291.8	116	82.5	34.7	-	-	-
561	258.2	83	82.1	39.1	286.8	111	65.4
564	305.6	130	74.1	39.2	305.8	130	38.7
567	292.7	117	77.2	40.9	-	-	-
570	273.4	98	77.1	37.9	335.5	160	-5.0
573	284.2	109	80.0	33.5	27.0	212	-2.0
576	266.4	91	80.3	39.5	-	-	-
579	282.4	107	81.2	32.2	104.0	285	45.8
582	281.4	106	82.6	35.4	165.2	-10	78.8
585	235.6	60	80.8	31.1	-	-	-
588	249.3	74	81.6	39.2	221.3	46	76.8
591	226.1	51	82.1	36.5	244.4	69	75.5
594	225.3	50	86.1	33.6	-	-	-
597	175.9	0	85.4	32.3	234.6	59	71.7
600	193.2	23	85.7	27.4	221.9	46	60.1

TABLE 14-24

TINGIN-1A Continued

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
603	149.0	334	79.9	29.7	-	-	-
606	176.8	1	85.0	32.3	190.8	15	51.0
609	179.3	4	81.7	31.7	127.4	-48	37.4
612	189.0	14	83.0	30.6	-	-	-
615	205.6	30	84.3	32.9	38.6	223	17.3
618	180.3	5	75.5	26.6	340.9	165	6.0
621	200.8	25	78.3	28.0	-	-	-
624	212.7	37	74.4	26.9	302.7	127	24.0
627	200.1	25	76.2	25.5	273.2	98	53.9
630	185.3	10	70.7	30.2	-	-	-
633	192.3	17	74.3	32.9	266.2	91	60.1
636	187.6	12	79.2	35.6	305.9	130	51.1
639	179.5	4	80.5	29.1	-	-	-
642	194.1	19	70.7	25.7	344.1	169	41.0
645	154.9	339	79.4	28.6	290.2	115	-28.7
648	177.0	2	76.4	30.0	-	-	-
651	194.9	19	81.0	25.9	149.9	-	19.1
654	167.8	352	76.2	32.9	203.7	28	16.2
657	167.4	352	83.5	34.9	-	-	-
660	198.0	110	85.4	33.9	231.1	143	66.4
663	72.7	344	88.0	29.4	211	123	71.6
666	86.7	358	29.5	29.7	-	-	-
669	220.4	132	87.2	32.0	235	146	39.2
672	79.1	351	85.9	35.6	210.0	122	63.9
675	84.6	356	84.9	35.7	-	-	-
678	165.1	77	84.6	33.8	180.5	92	50.7
681	166.9	78	83.8	30.0	143.4	55	42.6
684	78.8	350	82.4	31.4	-	-	-
687	29.7	301	83.9	32.1	69.7	341	54.7
690	85.3	357	85.6	30.3	69.1	341	35.0
693	145.7	57	78.6	27.9	-	-	-
696	115.4	27	88.4	35.7	12.2	284	54.1
699	97.5	11	86.1	29.1	331.6	243	61.6
702	119.2	31	83.4	28.9	-	-	-
705	5.7	277	86.6	31.8	311.1	223	69.2
708	130.0	42	84.2	32.6	301.7	213	71.2
711	347.9	259	88.2	32.6	-	-	-
714	176.4	88	82.1	31.9	318.6	230	59.0
717	145.3	57	85.4	29.2	359.6	271	42.6
720	155.2	67	78.3	27.3	-	-	-
723	149.6	61	78.7	27.2	111.5	23	57.6
726	153.2	65	81.0	28.6	173.0	85	61.0
729	191.2	103	86.0	28.9	-	-	-
732	81.9	253	81.1	27.7	193.8	105	72.1
735	54.3	326	87.2	26.9	226.2	138	79.1
738	90.1	2	83.9	25.9	-	-	-
741	98.8	10	79.6	24.0	167.9	79	82.7
744	125.4	37	81.2	29.0	159.3	71	77.9
747	92.8	4	83.2	24.6	-	-	-

TABLE 14-24

TINGIN-1A Continued

Depth	Declination		Inclination	Intensity	Declination		Inclination
	Reading	Rotated			Reading	Rotated	
750	161.7	73	81.0	24.2	129.1	41	75.9
753	62.4	344	85.1	24.5	77.5	349	60.9
756	91.7	3	81.5	25.6	-	-	-
759	85.9	357	81.4	27.1	47.6	315	37.8
762	258.2	170	87.7	26.0	2.1	274	43.7
765	100.9	12	85.7	24.8	-	-	-
768	120.7	32	82.1	22.0	344.6	256	63.0
771	81.9	353	81.9	31.6	71.0	343	70.8
774							85.0
777				21.4	286.2	198	
780				19.5	55.0		83.8
783							
786				17.0	356.6	268	76.4
789				19.4	18.4	290	74.1
792							
795				23.9	126.9	48	65.0
798				26.3	159.4	71	69.7
801							
804				17.9	84.5	356	73.3

TINGIN - IA

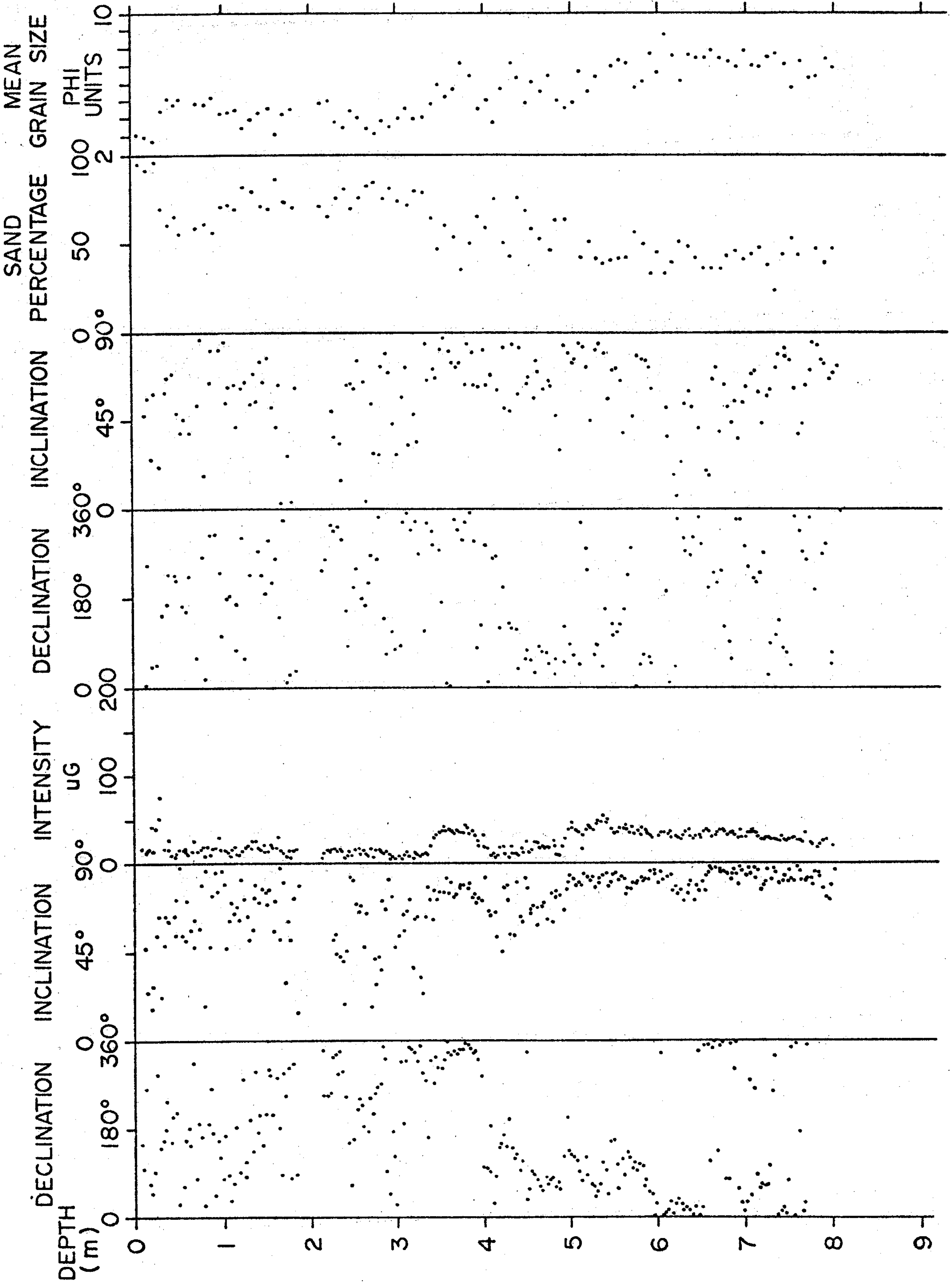

fig. 14-1

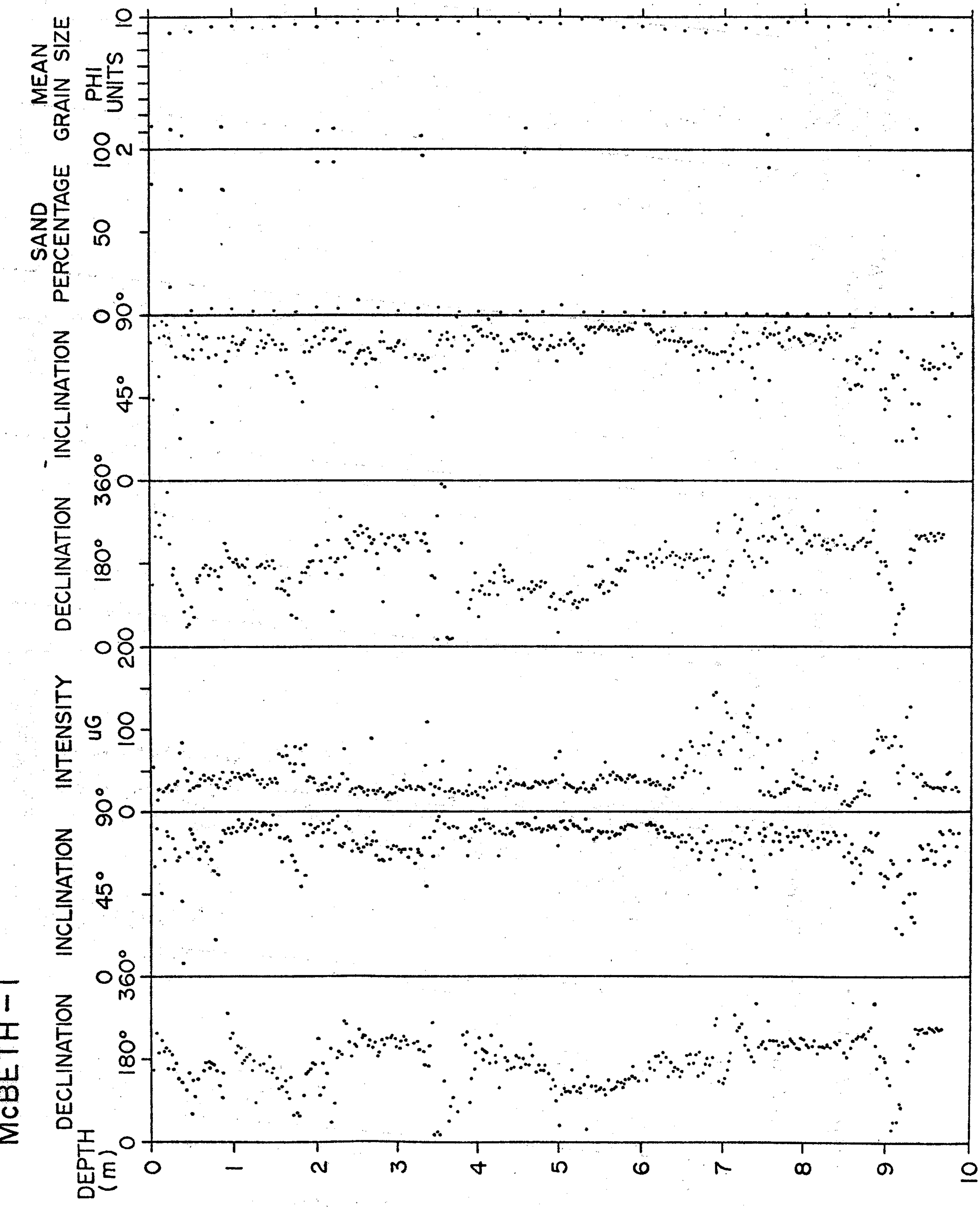
McBETH - I
MEAN GRAIN SIZE
PHI UNITS
10
2
SAND PERCENTAGE
100
50
0
INCLINATION
90°
45°
0
DECLINATION
360°
180°
0
INTENSITY
uG
200
100
0
INCLINATION
90°
45°
0
DECLINATION
360°
180°
0
DEPTH (m)
0
1
2
3
4
5
6
7
8
9
10

fig. 14-3

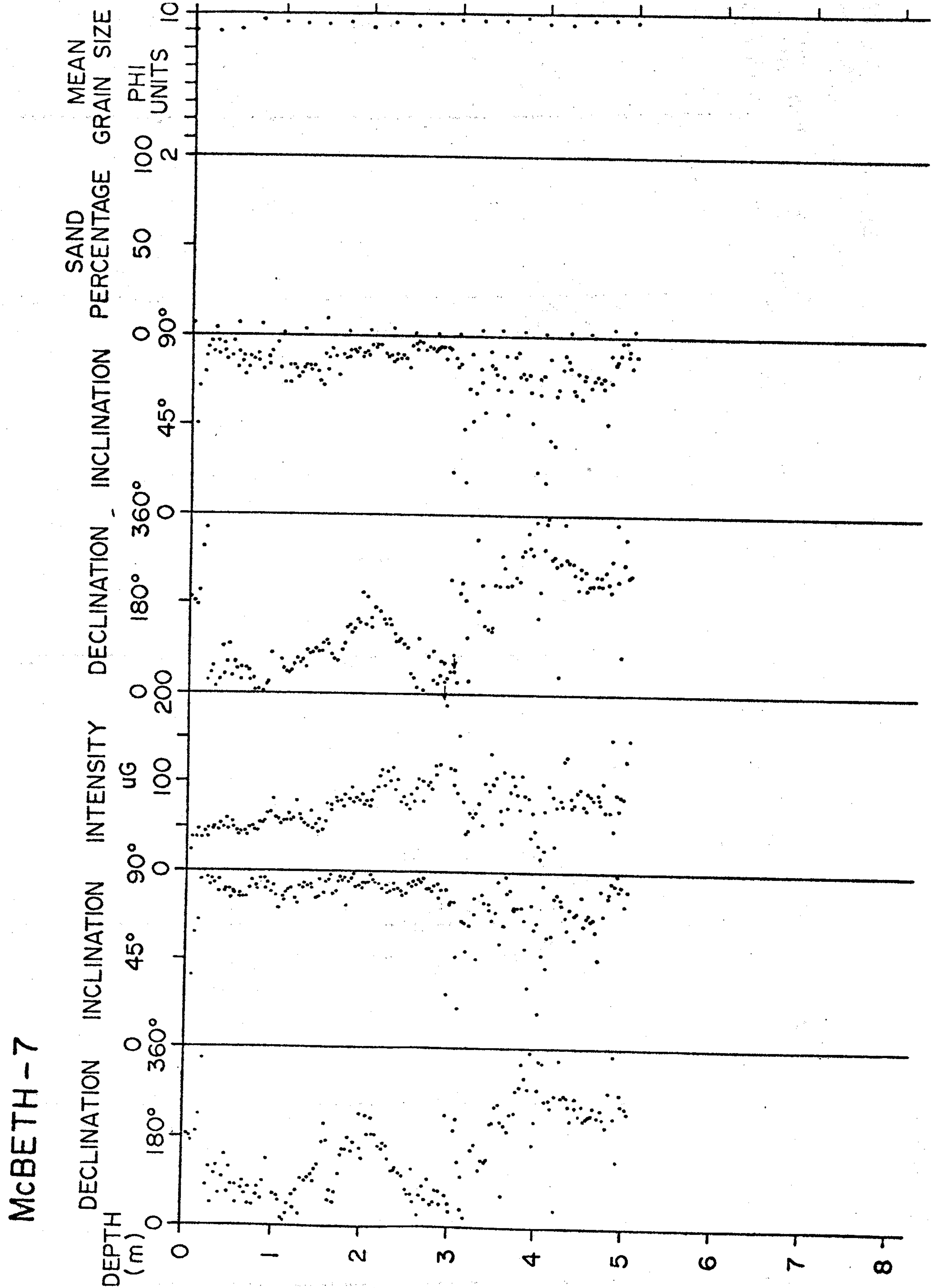
McBETH-7
DEPTH (m)
0
1
2
3
4
5
6
7
8
DECLINATION
0
180°
360°
INCLINATION
0
45°
90°
INTENSITY uG
0
100
200
DECLINATION
0
180°
360°
INCLINATION
0
45°
90°
SAND PERCENTAGE
0
50
100
MEAN GRAIN SIZE PHI UNITS
2
10

fig. 14-4

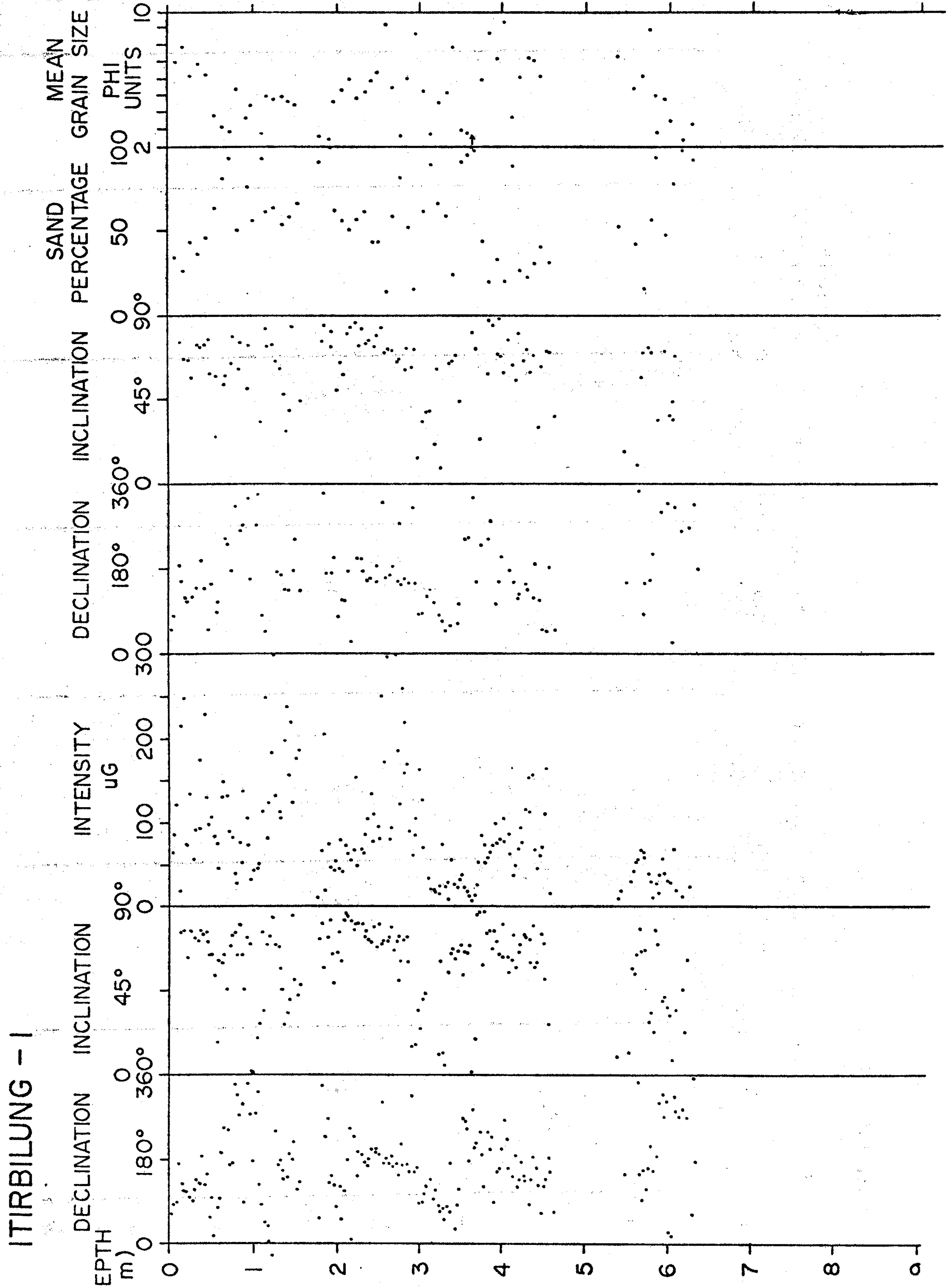
ITIRBILUNG - I
DEPTH (m)
0
1
2
3
4
5
6
7
8
9
DECLINATION
0
180°
360°
INCLINATION
0
45°
90°
INTENSITY uG
0
100
200
300
DECLINATION
0
180°
360°
INCLINATION
0
45°
90°
SAND PERCENTAGE
0
50
100
MEAN GRAIN SIZE PHI UNITS
2
10

fig. 14-2

GEOPHYSICAL STUDIES BASED ON CONVENTIONAL SHALLOW AND HUNTEC HIGH RESOLUTION SEISMIC SURVEYS OF FIORDS ON BAFFIN ISLAND

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INTRODUCTION

In this report we describe the results of seismic reflection surveys with a 40 cubic inch (0.655 L) compressed air source and a Huntec deep towed, high resolution seismic system conducted during the Sedimentology of Arctic Fiords Experiments (SAFE'82) from C.S.S. Hudson. The location of the fiords which were studied is described elsewhere in this report. The data are presented with a minimum of interpretation, although some inferences about the nature of the sedimentary processes have been made from the records shown here. The length and locations of the survey lines are given in Table 1 and Fig. 1. Also included in this report are selected results from other studies (Hudson 78-029 and 82-034) of Scott Inlet and extending into the outer regions of Gibbs and Clark Fiords. In total, 624 km of seismic lines are available.

Survey tracks were laid out in straight segments as nearly as possible along the middle of the fiords. On the SAFE '82 lines, fix points were located at 1 nautical mile intervals (1.85 km) except in Inugsuin and Clark Fiords where they were at 2 nautical mile intervals (3.71 km). Navigation by radar ranging was reported from the ship's bridge and each fix point and course alteration were noted on the recorders. On the lines from Hudson 78-029 and 82-034, fixes at 0.5 hour intervals were determined from Satnav and radar fixes. The distances from the head of each fiord to the fix points and intermediate points used in all subsequent presentation are given in Appendix I.

CHARACTERISTICS OF THE SEISMIC RECORD AND STRATIGRAPHIC INTERPRETATION

The first stage in the interpretation of the seismic records involved transcribing the reflecting surfaces from the seismic reflection (air gun) record on the graphic recorder. The results, shown after reduction in Fig. 2, portray the general patterns of bathymetry and sedimentation in the fiords. The profiles are not corrected for changes in ship speed which varied from 1.11 m/s (2.16 knots) between stations 22 and 23 near the head of Coronation Fiord to 3.79 m/s (7.36 knots) between stations 3 and 4 near the mouth of Inugsuin Fiord. Thus, the vertical exageration of Fig. 2 varies from 5.6 to 19.6 with an average of about 15.

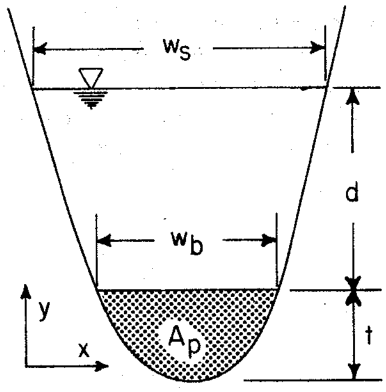
In most locations there is a clear distinction between the acoustically opaque bedrock and the relatively transparent, sub-horizontally layered sediments above, which we shall designate as "glaciomarine sediments". The main exceptions are in Sunneshine Fiord and Canso Channel where the sediment cover is thin and where the distinction between glacial sediment or bedrock beneath is not clear (see further discussion below). For these reasons and because the records for these sites are incomplete, they are not included in the calculations below.

The travel time of sound in the glaciomarine sediments can be easily determined from the recorder trace. Although no data are available on the velocity of sound in these sediments, we have assessed their thickness approximately using the relation presented by Nafe and Drake (1964):

$$v = 1.70 + 4.30 [1 - \exp(-0.9.z)] \quad \text{...........[1]}$$

where v is the sound velocity in km/s and z is the depth of burial in km. Thickness was determined at each fix point and at 2 points equally spaced between (except in Inugsuin and Clark Fiords where 5 intermediate points were used between the more widely spaced fix points). The results are given in Appendix I and plotted in Fig. 3. Values range up to 300 m in the central portions of McBeth and Cambridge Fiords.

An approximation of the volume of glaciomarine sediment in the fiords was made as follows. In addition to estimating sediment thickness (t) at each site described above, the depth of water (d) and the width of the fiord at the surface (W_s) were recorded. It is assumed that the fiord is parabolic in cross section, and the sediment fills the bottom to a nearly horizontal surface at d metres depth (see definition sketch, Fig. 4). The general equation of a



W is the width of the fiord at the surface ($_s$) and bottom ($_b$),

d is the depth of the fiord,

t is the thickness of glaciomarine sediment, and

L is the distance between successive sections.

Figure 4. Definition sketch for sediment volume calculations.

parabola is $x^2 = a.y$. For the fiord, the parameter, a, may be defined as follows:

$$(W_s/2)^2 = a(d + t)$$

and thus, $a = (W_s/2)^2/(d + t)$.

The width at the bottom may be calculated from $(W_b/2)^2 = a.t$

$$\text{i.e.} \quad W_b = 2(a + t)^{0.5}$$

The area, A_p, of sediment fill is calculated as:

$$A_p = \frac{4}{3}\,x.y = \frac{4}{3}(a + t)^{0.5}.t = \frac{4}{3}\,a^{0.5}\,t^{1.5}$$

The volume in the ith section is: $V = A(L_{i-1}/2 + L_i/2)$.

These data are also presented in Appendix I. Summary statistics of the morphology of the fiords including maximum sediment thickness and total volume are given in Table 2.

These calculations of sediment thickness and volume involve a number of assumptions.

1. It is assumed that equation [1] applies to the fiord sediments. Nafe and Drake (1964, p. 813) indicate that in relatively shallow water, a high rate of velocity increase with depth might be expected. The equation used gives the maximum rate of velocity increase with depth of those presented by Nafe and Drake, and therefore the most

conservative estimate of sediment accumulation.

2. It is assumed that the basin is U shaped and can be approximated by the equation of a parabola given the width of the fiord and the depth of water. For the most part the assumption is approximately correct except where tributary fiords or bays join the fiord. In these cases widths are estimated from headland to headland along the side of the fiord.

3. It is assumed that the track is in the middle (i.e. the deepest location) of the fiord. This is not the case in some sections (e.g. Fix 12, Tingin Fiord; Fix 10 - 13, Itirbilung Fiord; fix 16 - 17, Inugsuin Fiord; Fix 24 - 26, Clark Fiord; and Fix 11, Cambridge Fiord) where the ship was closer to one side. Again the calculations are conservative here.

4. Side echos can be distinguished from bottom and sub-bottom echos. This is normally possible based on the faintness of the intruding side echo and the continuation of the bottom echo from the nearly flat lying sediments through the side echo (see examples between 35 and 45 km in Clark Fiord and 40 and 50 km in Cambridge Fiord - Fig. 2).

EXAMPLES OF SEISMIC RECORDS TO ILLUSTRATE SEDIMENTARY FEATURES

Figures 5 to 14, one for each fiord from Sunneshine to Cambridge, show sections of the air gun and Huntec records to illustrate particular characteristics of the sediments. Along the top of each section is the distance from the fiord head in km and along the bottom are the fix locations. Fig. 15 is a scale of water depth (where v = 1480 m/s and thickness is according to equation [1] for the air gun records. These may be compared with the location of the tracks plotted in Fig. 1 and the generalized profiles shown in Fig. 2.

Glaciomarine sediments:

Nearly horizontal, sub-parallel bedded sediments: The most commonly occurring sedimentary features are the "pools" of sediment filling depressions in the floor of the fiord. These fillings may be isolated and relatively shallow (e.g. Fig. 6a, b, 8a, b, f, 13c, d) or large areas extending over a number of basins (Fig. 7c, d, e, f, 9b, c, f, g, 11a, b, e, f, o, p, 12a, b, 14a, b, e, f, g, h). In the latter case, the sediment may be draped over the topographic highs in the bedrock beneath, thus preserving some of the relief of the fiord floor. Itirbilung Fiord (Fig. 10a, g, h) contains the best examples of these. Much more commonly, however, the sediment smooths the relief and the bedrock where it projects through is largely without sediment cover (Fig. 9f, g, 11a, b, e, f, 12a, b, 14a, b, e, f, g, h).

Within the sediment column at many locations there is a clear distinction in the reflecting characteristics of the upper and lower sections of the sediment. Approximately the upper one quarter to one half of the deposit consists of strong reflecting horizons at close vertical intervals. Normally, each of these is continuous over distances of up to several kilometres and there is little or no evidence of truncation of these beds by erosion. The sediments below are characterized by weaker, discontinuous and frequently distorted reflecting surfaces. In the examples (Fig. 6a, b, 7a, b, 8a, b, 9f, g, h, i, 12a, b, 14c, d, g, h) the air gun records show clearly the distinction between the two sediment units, while the Huntec record shows fine detail especially within the upper section. We consider both to be glaciomarine in origin, but that the upper represents conditions favouring deposition of layers of coarser sediment from frequent mass flow events or aeolian sources interspaced with fine material from suspension.

In other cases (Fig. 8e, f, 9b, c, 10h, 11o, p, 14a, b), the distinction is not evident. For some locations, this may indicate that all of the sediment was deposited recently (as at the head of Coronation Fiord -- Fig. 7c, d, e, f) in front of the retreating glacier, although this is almost certainly not the case in other fiords and at more distal locations.

In a few cases, a relatively thin layer of acoustically transparent material presumably composed of fine sediment is deposited on top of the strongly bedded sediment. Examples are shown in Fig. 6g, h, 9e, and i.

Mass wasting: Among the most notable features, and the ones which involve the largest amount of material in single morphological units are slump deposits. These are irregular mounds of sediment derived from the fiord walls and deposited on top of and within other glaciomarine sediments. The Huntec record shows these features especially well, as the sound energy is reflected from the rough, relatively opaque surface. The air gun shows the relation of the slumped material to other sediments, especially those beneath. Examples are given in Fig. 9b, c, i, 12c, d, 13a, b, 14g, and h.

In some cases (as Fig. 13a, b) the slumped material acts as a dam behind which more recent glaciomarine sediment has become ponded. In other cases (as Fig. 11d) the glaciomarine sediment appears in interfinger with the slumped material, suggesting that a series of slumps may have occurred at this site, and that the two sediment types were deposited contemporaneously.

Evidence of erosion of the glaciomarine sediments: While the horizontally banded sediments apparently include sediments deposited from gravity flow events as well as fine sediments from suspension, there is also considerable evidence of erosion of these sediments by mass wasting and by subsequent gravity flow processes. Cliffs of sediment with layers truncated at the cliff face stand in several locations. The most notable are in McBeth Fiord (Fig. 11m, n) and Cambridge Fiord (Fig 14c, d). The latter may be a particularly useful site for submersible observations. Other examples are shown in Fig. 6c, d, 10c, d, g, h, 11k, 1, 13e, f. These features are often associated with slump mounds nearby.

In some cases, the layers in the sediment are apparently deformed downward near the cliff face, perhaps by creep following the slope failure. However, thinning sediments and slower sound velocity in water as compared to sediments commonly produces the effect of downward sloping reflectors near valley walls or cliff faces in bedrock -- the so-called "velocity pull-down" effect. It is probable here where the sections are only up to several tens of metres thick, and the velocity difference between sediment water is small, that velocity pull-down is insignificant. As well, beds truncated at other cliff faces do not show this effect.

At several sites beds are truncated apparently by erosion, and discontinuities exist with the beds above. The best example is shown in the Huntec record from Coronation Fiord (Fig. 7b).

At a number of sites trenches, have been eroded in the fiord floor, apparently by gravity flow events, especially turbidity currents. Some of these features are flanked by bedrock walls (Fig. 9a, h), some are on the open fiord floor (Fig. 9h, i, 11 g, h), some have levees (Fig. 6e, f, 11g, h) and some are partially filled with sediment (Fig. 9h, i, 11g, h).

Other features: Several features which cannot be explained unequvocally are shown in the records. These include V notches not only in the surface sediment, but carried through the layers at depth (Fig. 8d at 16.1 km)

Perhaps related to these are wedge-like features, some with apparantly deformed sediments along side (Fig. 9b and c at 37.1 km, 11e and f at 41.2 km). Some at least may be related to faulting within the sediments, while others may be old trenches in the fiord floor now completely filled with sediment.

Non-glaciomarine sediments:

In this catigory we include sediments which may be of ice contact origin (especially in moraines and related features) and other sedimentary materials which appear to be of non-glacial origin. The section from Sunneshine Fiord (Fig. 5a, b, c, d) appears to show a series of moraine ridges under a thin veneer of glaciomarine sediment. In the floors of depressions beneath the glaciomarine sediments elsewhere may be glacial or preglacial sediments (Fig. 6e, 7a, c, e, 8a, 10g, 11g, i). In Itirbilung Fiord (Fig. 10 c, e, f) is a series of beds in the lower sections of the glaciomarine sediments which are inclined upfiord. These may represent surfaces overridden during minor advances of a retreating glacier. In none of the records, except possibly from Scott Inlet, is there strong evidence of pre-Pleistocene sedimentation.

CHARACTERISTICS OF THE FIORD BASINS

In order to investigate the relation between the distribution of the marine sediments and the physiography of the fiord basins, measurements of characteristics of the drainage basins were made on N.T.S. 1:250,000 maps. On a 2 km interval grid the following were recorded:

- elevation,
- slope between contour lines,
- nature of the surface (bare ground, snow and ice, or lake surface), and
- whether water flowing from this point passes through a lake before entering the fiord.

The latter is of importance, as all of the coarse sediments and a large portion of the fine, suspended material (depending on the ratio of inflow to lake volume) is filtered from the rivers by lakes along their courses. The maps used showing the drainage divides, the glaciers and icefields, and the lakes have been redrawn and are shown at smaller scale as Fig. 1. The statistics are summarized in Table 3, and the hypsometric data derived from them plotted in Fig. 16 and 17. The area of each basin and the area presently glacier covered are plotted against the volume of of glaciomarine sediment in each fiord in Fig. 18. The poor correlation indicates that the following factors may be of importance and worthy of further investigation.

- Significant quantities of sediment may be lost from some fiords, especially those without sills or with deep sills such as North Pangnirtung, Coronation, and Maktak. The larger tidal range of the more southerly fiords may influence the extent of circulation and flushing of sediment from the fiords.

- The glacial processes may vary among fiords. Factors here include the increasing probability of cold based glaciers farther north, and the role that very slowly flowing ice caps may play in protecting the surface from erosion in comparison to actively eroding valley glaciers.

- The history of glaciation may be much more important than present day conditions. For example, Cambridge Fiord was influenced by the northern limit of the Laurentide ice sheet, which may have been responsible for deposition of the thick sequences of glaciomarine sediments, while the fiords farther south were influenced by ice from local mountain sources. In addition, fluvial processes during interglacial periods may have varied significantly from those occurring at present.

REFERENCE

NAFE, J.E. and DRAKE, C.L. 1964. Physical properties of marine Sediments. In: Hill, M.N. (ed.). The Sea, Wiley and Sons, New York, 794-815.

TABLE 1: SUMMARY OF SEISMIC RUNS IN BAFFIN ISLAND FIORDS

Fiord	Distance from fiord head (km) begining of line	end of line	line length (km)	Comment
Sunneshine	44.2	22.2	22.0	Sea ice in fiord prevented more extensive survey
Canso Channel	-	-	9.6	
North Pangnirtung	49.5	7.2	42.3	
Coronation	46.2	1.6	44.6	
Maktak	33.6	2.8	30.8	
Tingin	57.9	3.9	54.0	
Itirbilung	73.0	8.8	64.2	Including the outer reaches of Tingin Fiord (Fixes 1-4)
McBeth	80.0	7.4	72.6	
Inugsuin	107.0	5.1	101.9	
Clark	52.0	4.1	47.9	
Clark-Scott Inlet	67.2	98.6	31.4	From Hudson 78-029, continues the Clark Fiord line with a gap from 52 to 67.2 km
Gibbs-Scott Inlet	91.2	35.8	55.4	from Hudson 82-034
Cambridge	50.2	3.2	47.0	
TOTAL SAFE'82			536.9	
GRAND TOTAL			623.7	

TABLE 2: MORPHOMETRIC DATA SUMMARY - BAFFIN ISLAND FIORDS

Fiord	Surface area km^2	Water volume $m^3 x 10^9$	Maximum depth m	Sill depth m	Length km	Mean width km	Sill (mouth) width	Maximum sediment thickness km	Sediment volume[a] $m^3 x 10^9$ m	Tidal prism[b] $m^3 x 10^6$
Sunneshine	131	?	?	64	36.2	3.6	4.5	?	?	300
North Pang	170	33	479	none	48.3	3.5	5.0	40	0.42	155
Coronation	131	30	606	none	41.0	3.2	4.0	130	1.06	142
Maktak[c]	60	9.8	320	none	25.8	2.3	2.5	70	0.45	65
Tingin	218	48	523	180?	47.0	4.6	6.2	130	2.10	119
Itirbilung	162	41	435	249	54.9	3.0	5.4	200	3.60	89
McBeth	402	137	563	249	93.0	4.3	6.8	297	7.67	196
Inugsuin	563	101	633	121	98.0	5.7	6.0[h]	110	1.83[i]	240
Clark	144	107	287[d]	108[e]	67.0	2.1	6.4	200	2.17[i]	57
			720[f]	185[g]						
Cambridge	219	70	708	439	60.8	3.6	3.2	290	6.55	140

a. not includng the region between the end of the seismic line and the head of the fiord; b. using mean spring tidal range; c. to the confluence with Coronation Fiord; d. behind the inner sill; e. inner sill 25.0 km from the head; f. near the mouth; g. connecting sill to Gibbs Fiord; h. not including the islands; i. not including the outer reaches of the fiord where thick sediment has accumulated.

TABLE 3: DRAINAGE BASIN DATA SUMMARY - BAFFIN ISLAND FIORDS

Fiord	Area							% Area filtered through lakes		Maximum elevation m
	km^2				Per cent					
	land	glacier	lake	total	land	glacier	lake	land	glacier	
Sunneshine	460	92	12	564	81.6	16.3	2.1	16.5	34.8	1707
North Pang.	1332	720	12	2064	64.5	34.9	0.6	15.0	8.9	2057
Coronation	340	788	<4	1128	30.1	69.9	0	3.5	1.5	2057*
Maktak	604	528	<4	1132	53.4	46.6	0	6.0	6.8	2057*
Tingin	760	452	16	1228	61.9	36.8	1.3	25.3	32.7	1432
Itirbilung	1452	696	36	2184	66.5	31.9	1.6	61.1	42.5	1751
McBeth	2620	916	48	3584	73.1	25.6	1.3	21.4	18.3	1751
Inugsuin	1584	520	88	2192	72.3	23.7	4.0	32.1	21.5	1680
Clark	768	524	32	1324	58.0	39.6	2.4	35.9	36.6	1554
Cambridge	1628	240	124	1992	81.7	12.1	6.2	62.4	28.3	1367

* Summit of Penny Ice Cap. Summit of Barnes Icecap is 1123 m and the highest point in eastern North America is Mt Barbeau, Ellesmere Island at 2590 m

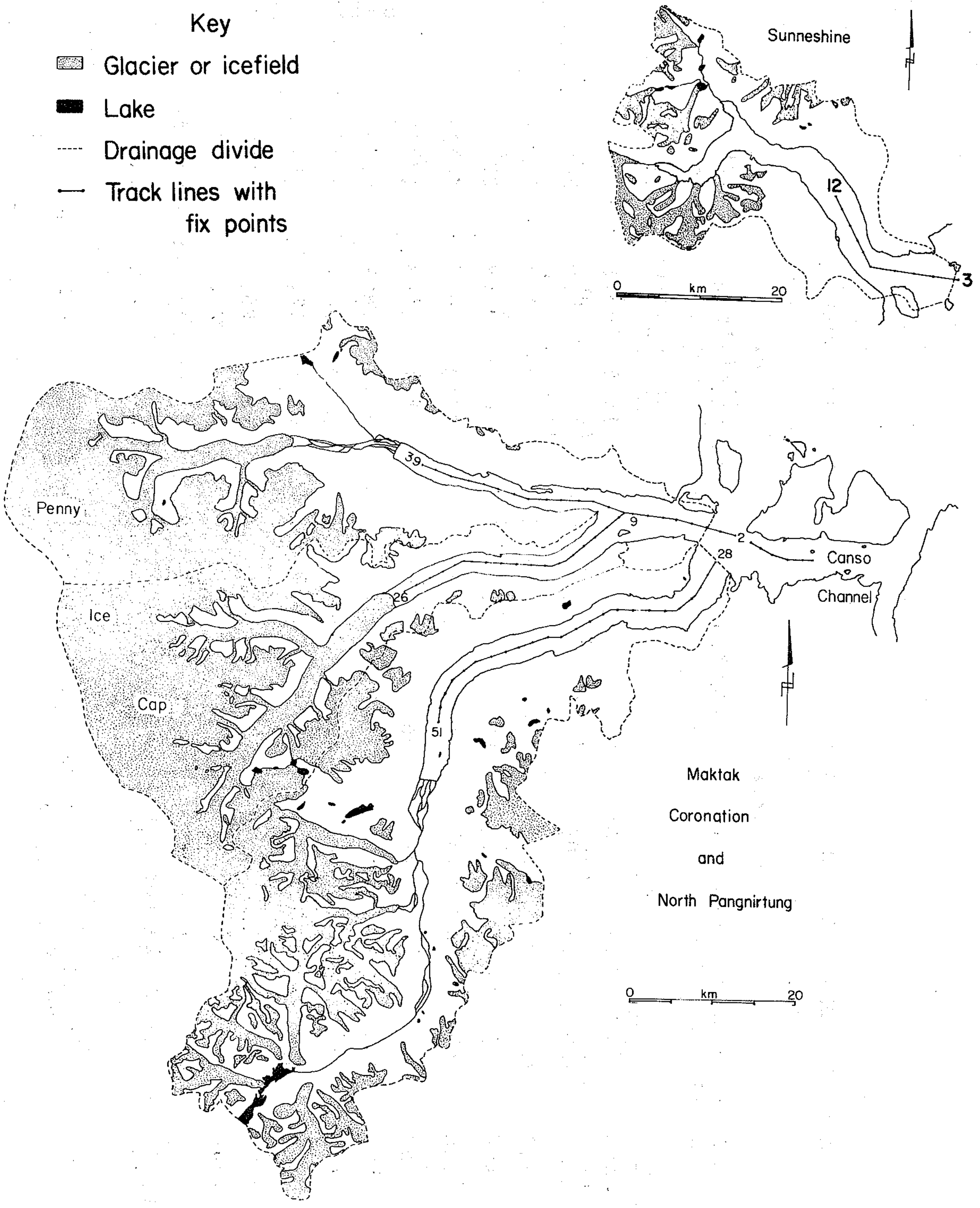
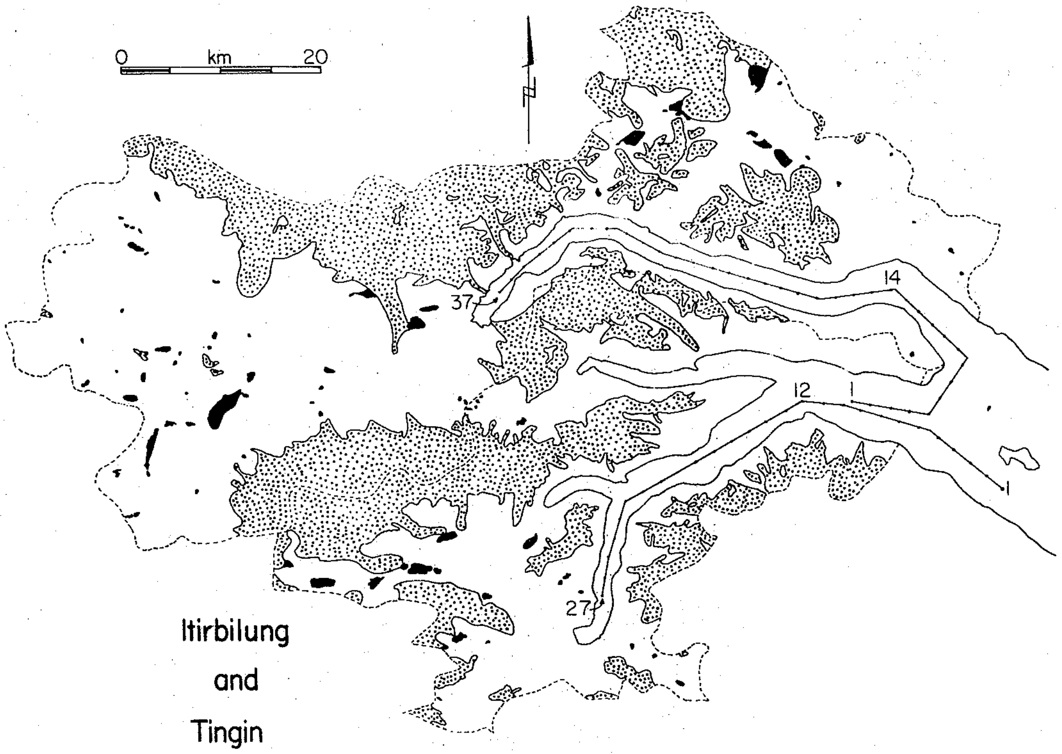


Figure 1. Maps showing drainage basins, glaciers and track lines of the Baffin Island fiords. From National Topographic Series 1:250 000 maps.



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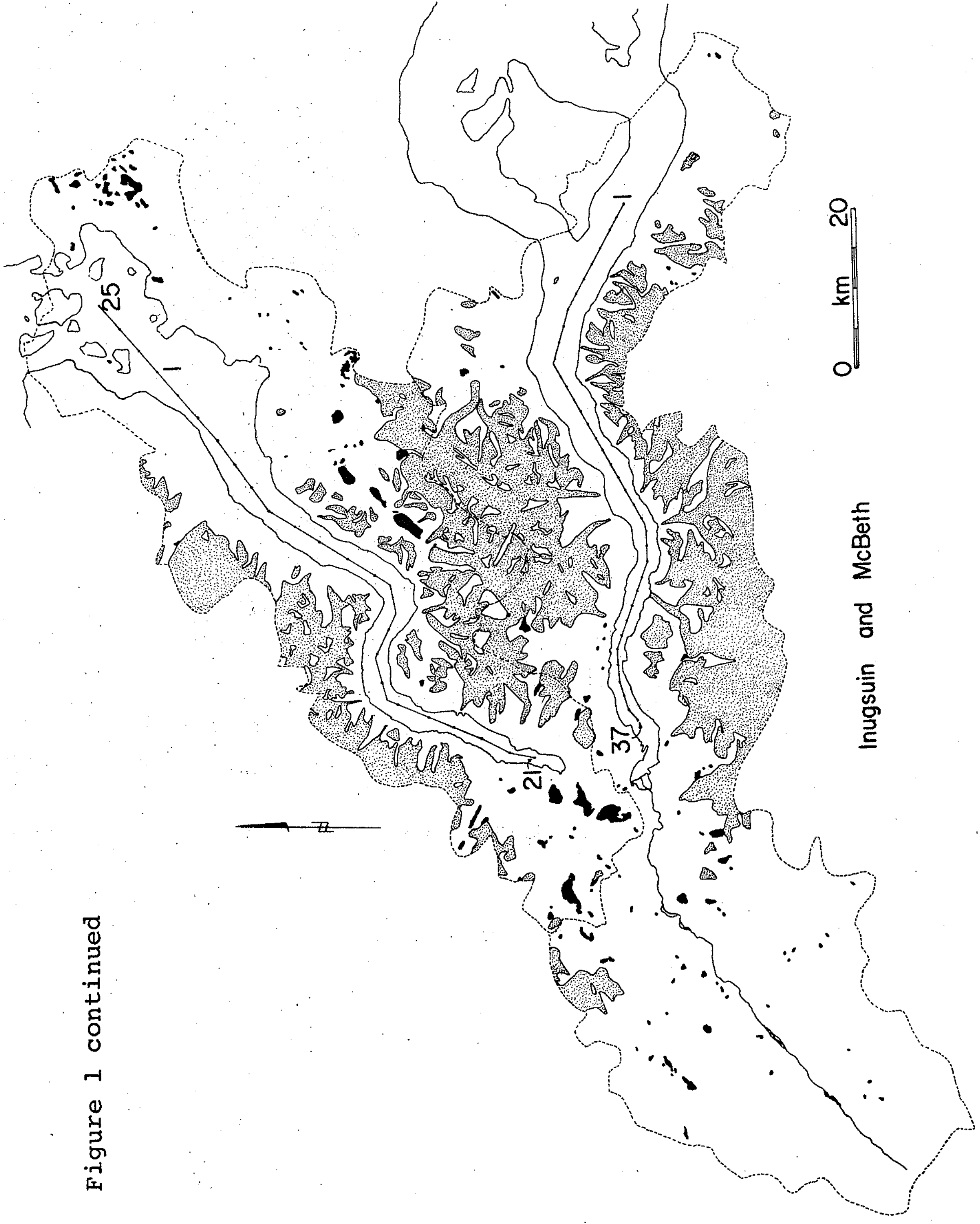
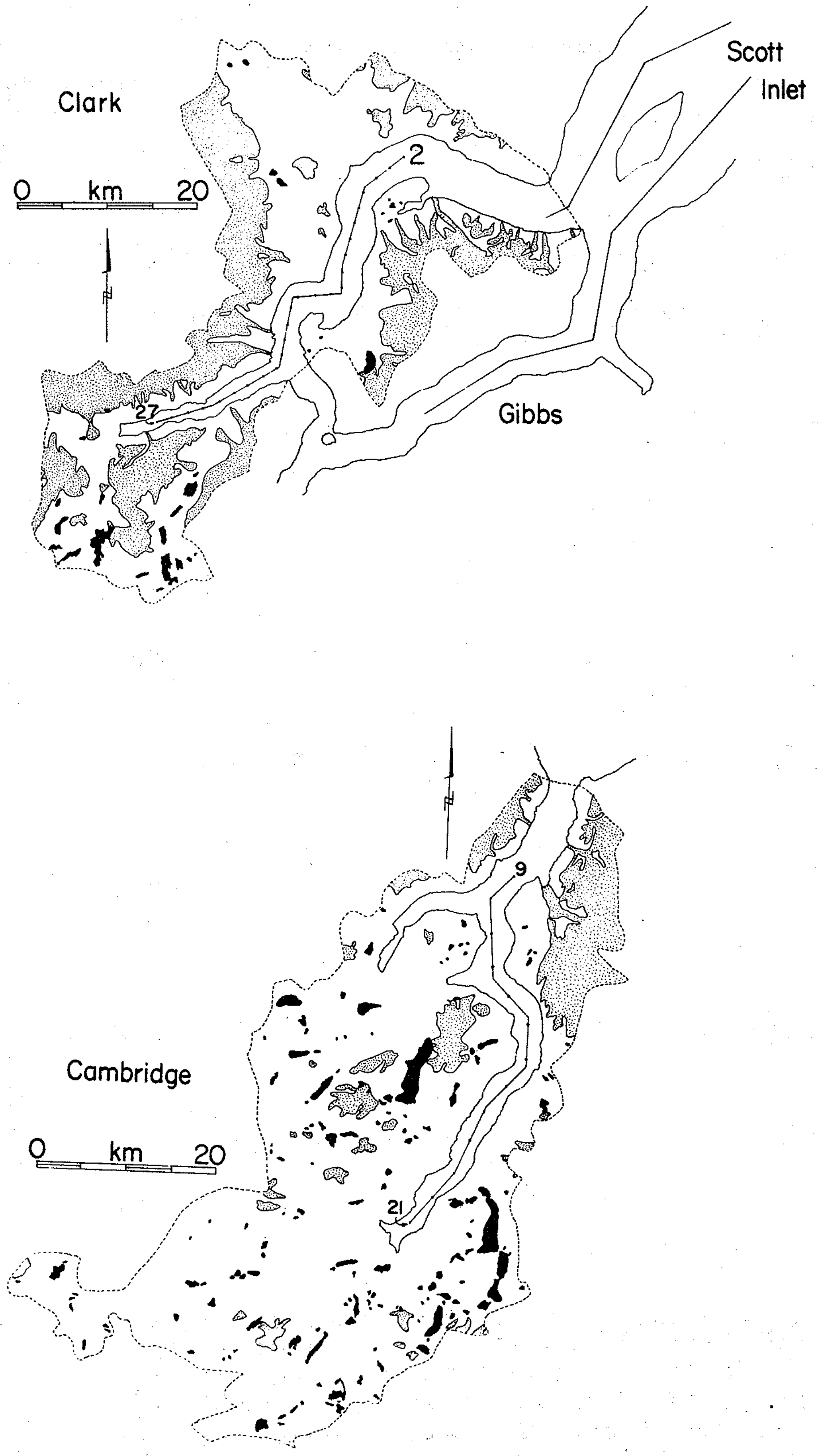


Inugsuin and McBeth

Figure 1 continued



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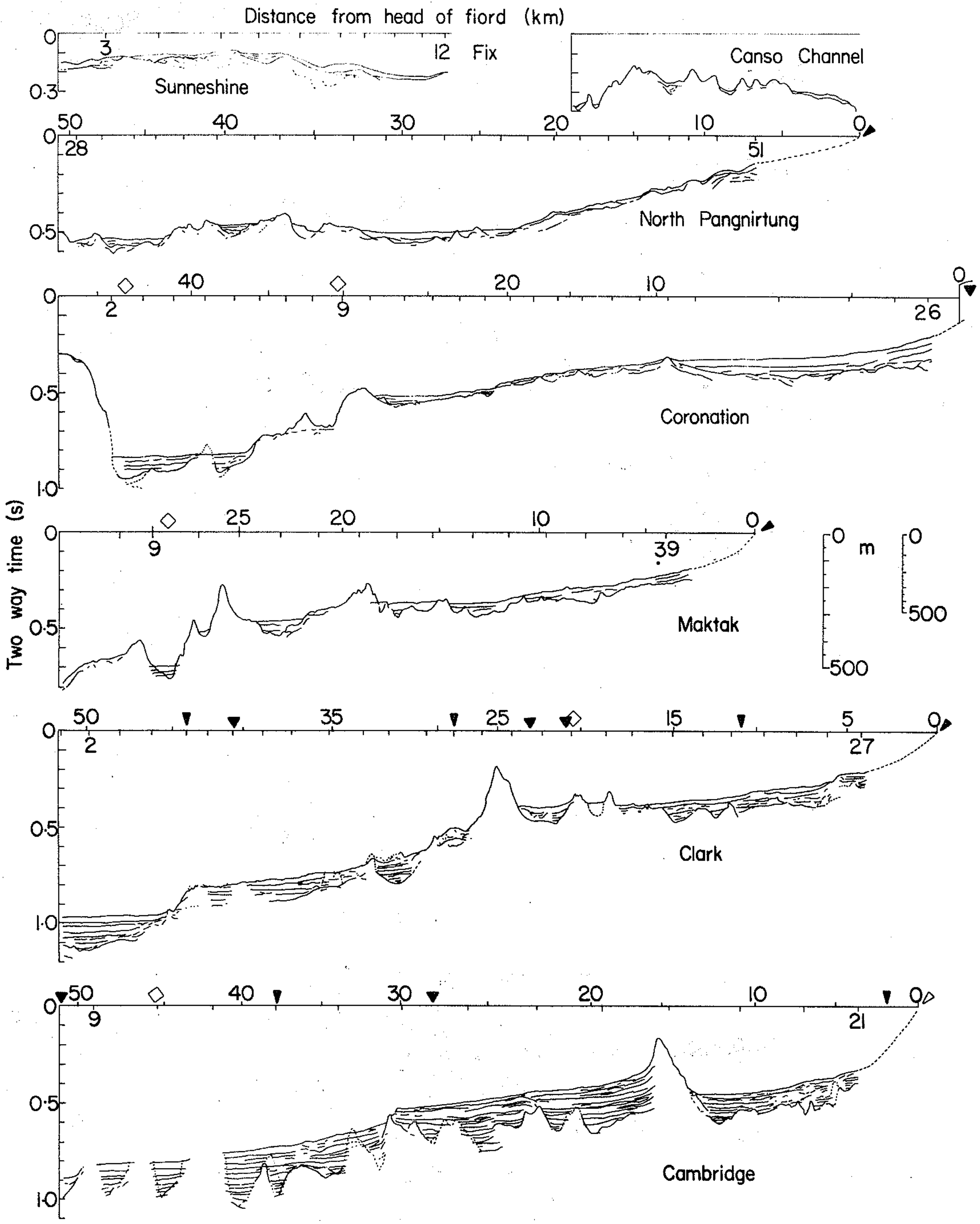
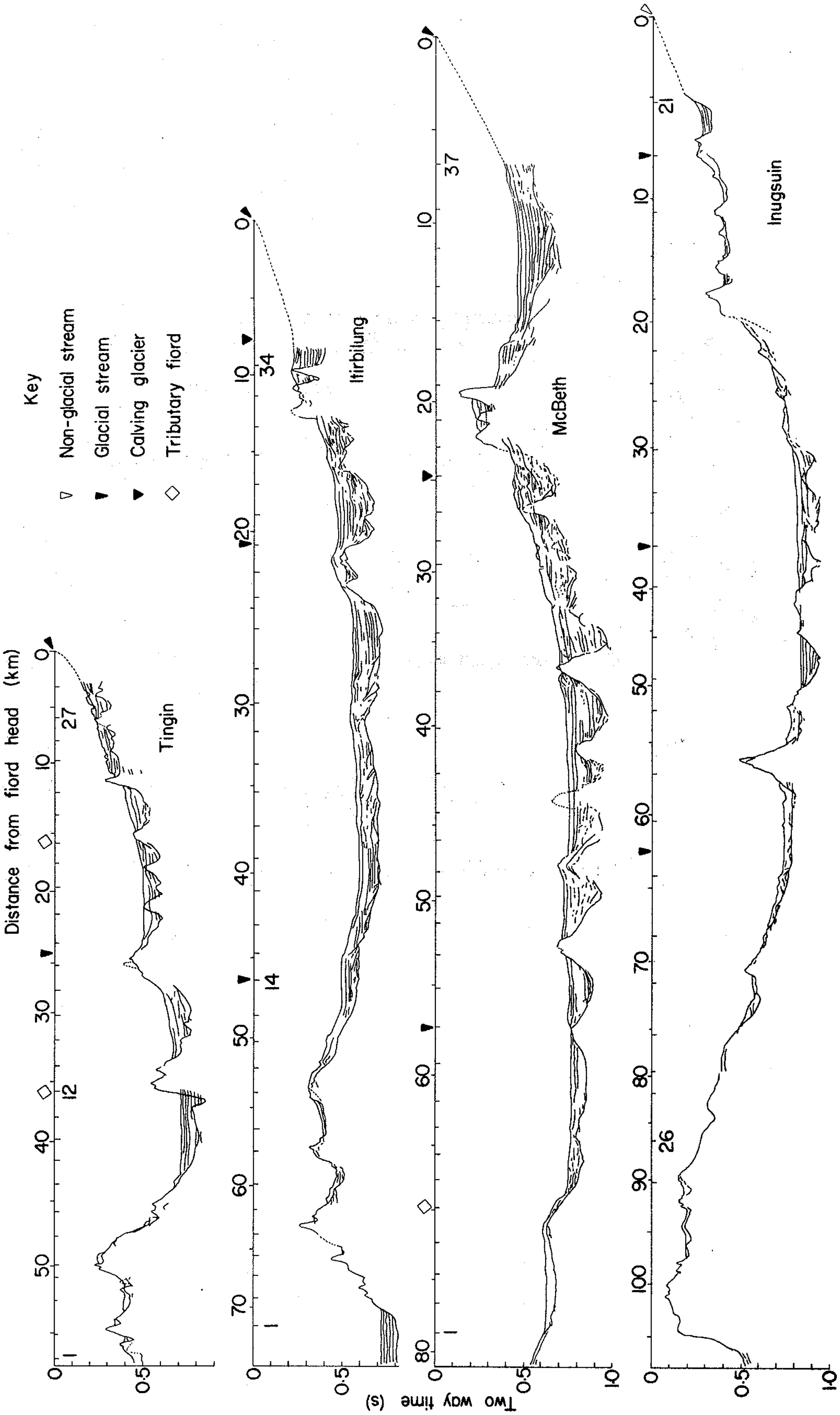


Figure 2. Interpretation of air gun seismic profiles. Locations of fix points are shown on Figure 1. Sources of terrestrial sediment are shown by symbols along upper axes (key on page following). Water depth (left) and sediment thickness (right) scales are calculated as described in text.



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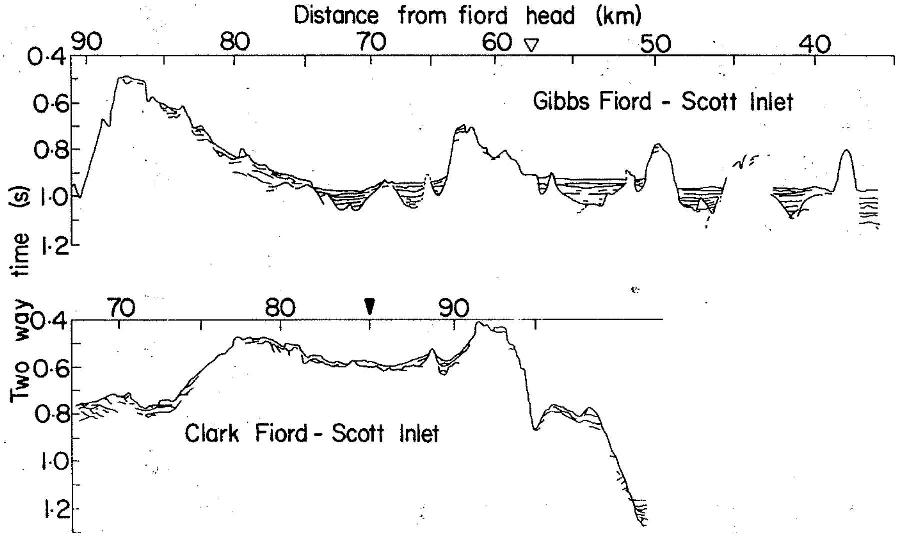

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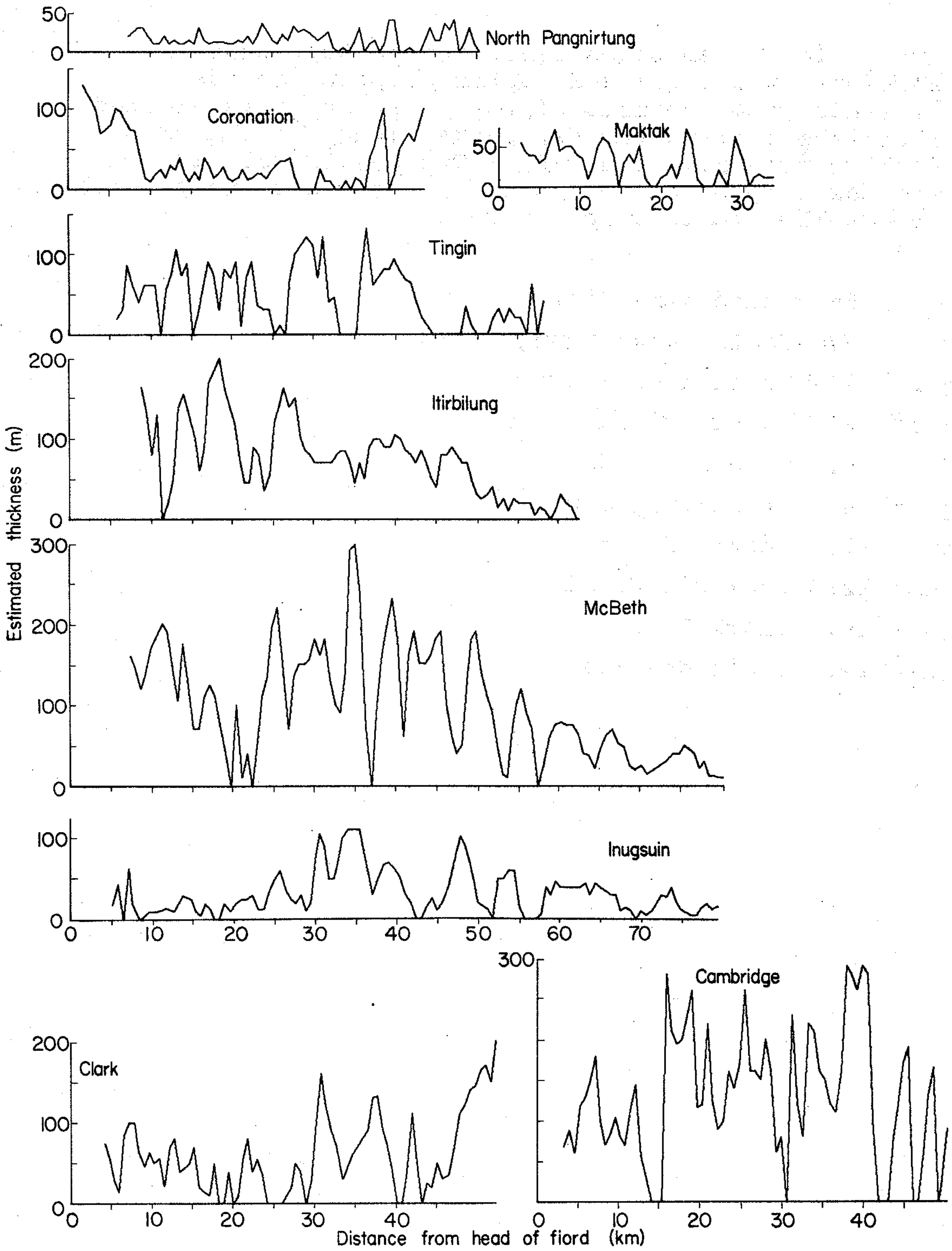
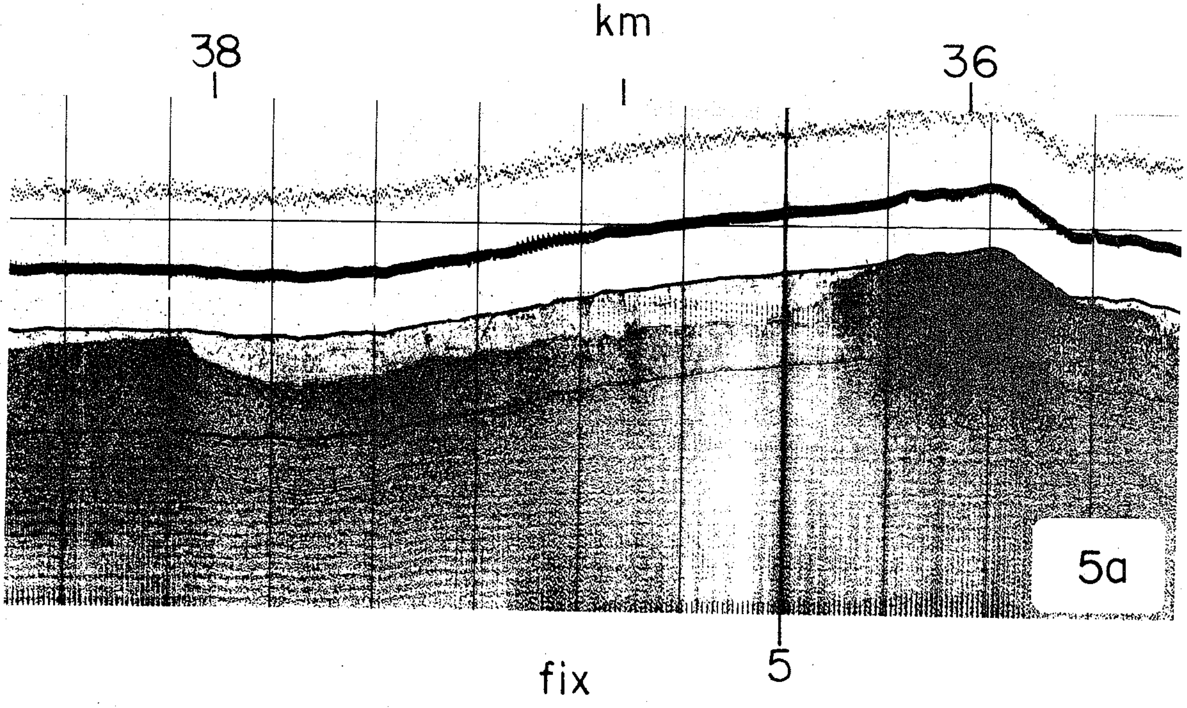


Figure 3. Thickness of glaciomarine sediments determined from air gun records.

Figures 5 to 14 (on pages following): Representative sections of air gun and Huntec seismic records. Distance from the head of the fiord in km is plotted along the top and the fix marks along the bottom of each record (cf. figure 2). Two way travel time in seconds is plotted to the left of the air gun profiles. Scales are provided in figure 15.

Figure 5: Sunneshine Fiord
Figure 6: North Pangnirtung Fiord
Figure 7: Coronation Fiord
Figure 8: Maktak Fiord
Figure 9: Tingin Fiord
Figure 10: Itirbilung Fiord
Figure 11: McBeth Fiord
Figure 12: Inugsuin Fiord
Figure 13: Clark Fiord
Figure 14: Cambridge Fiord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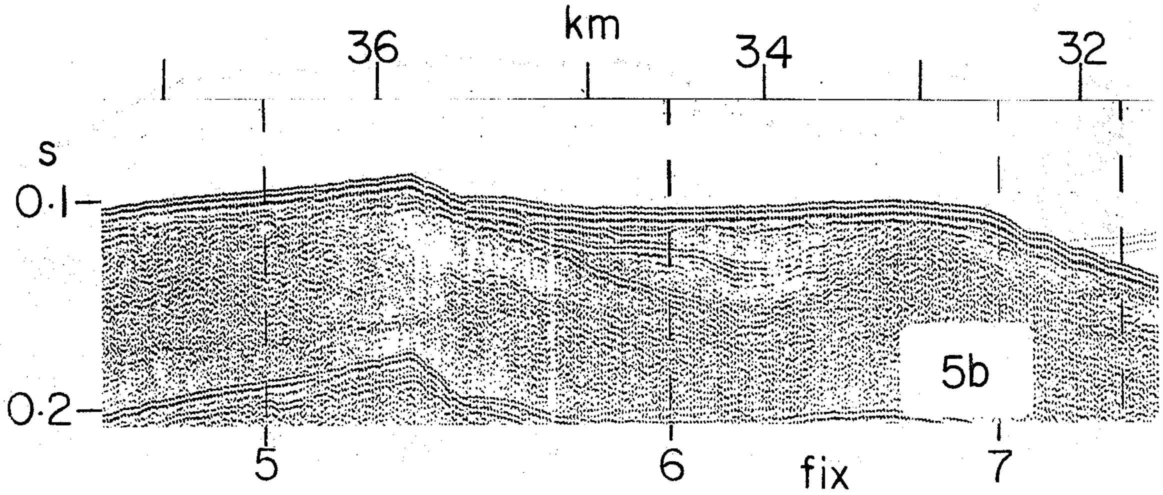
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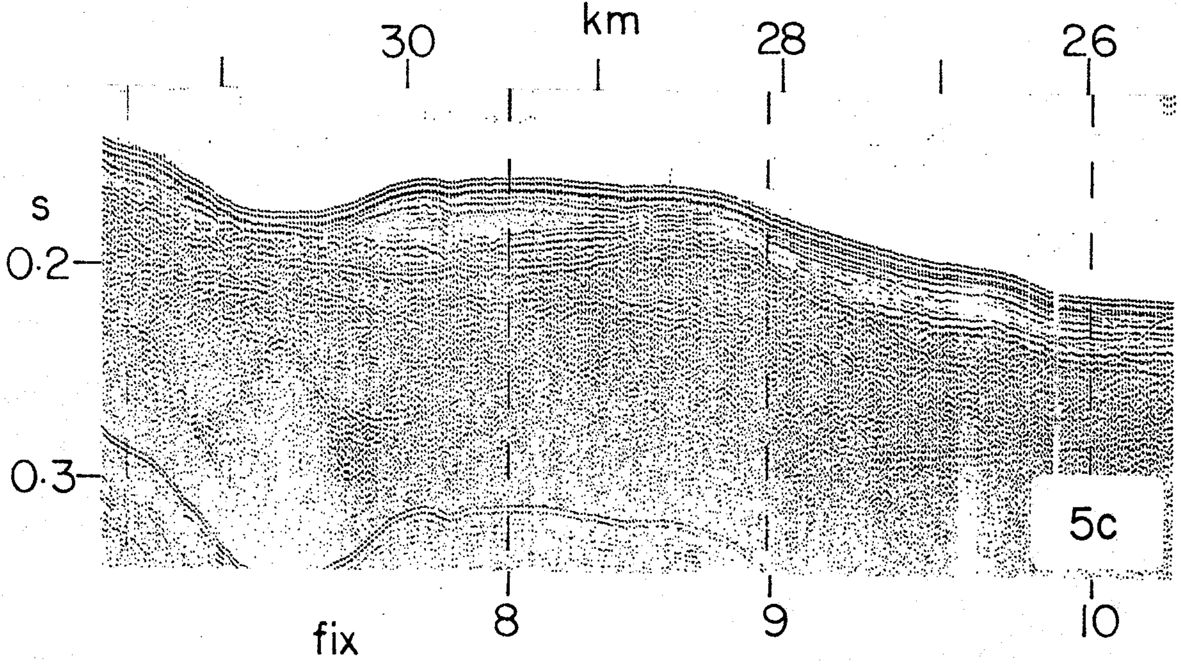
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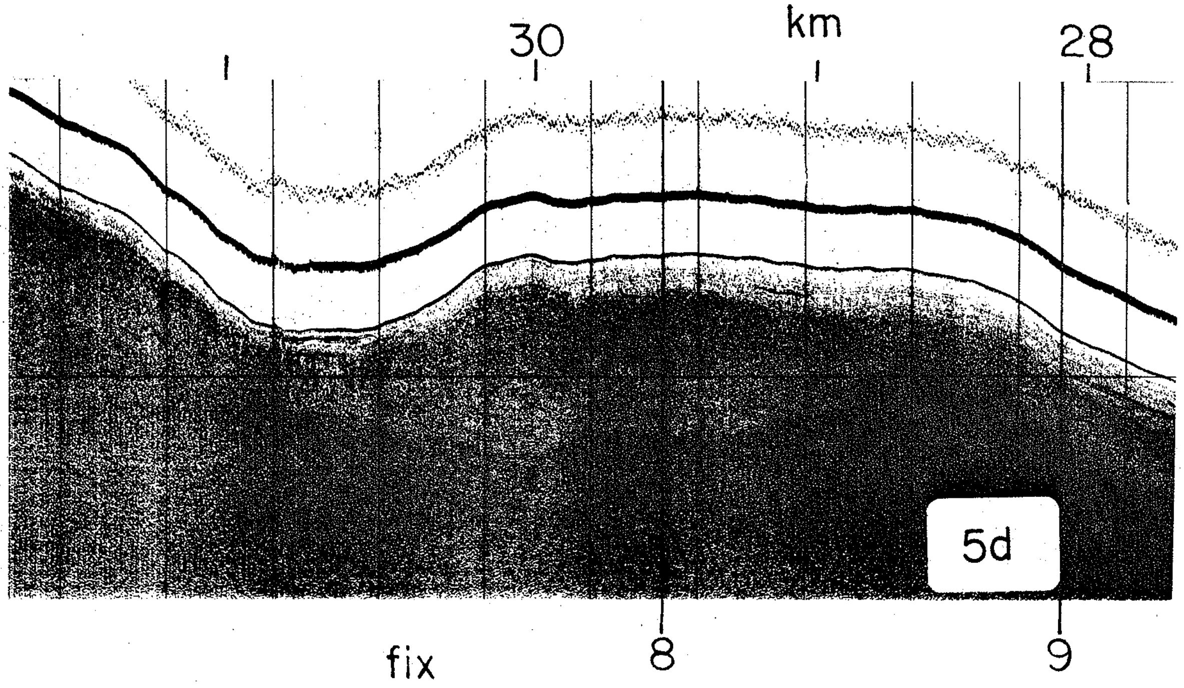
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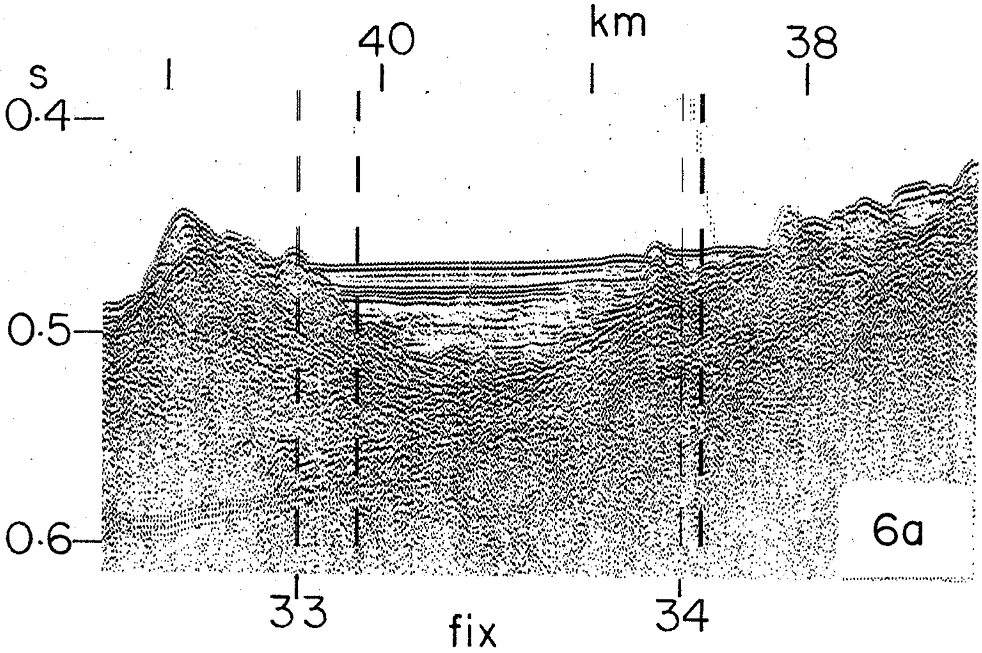

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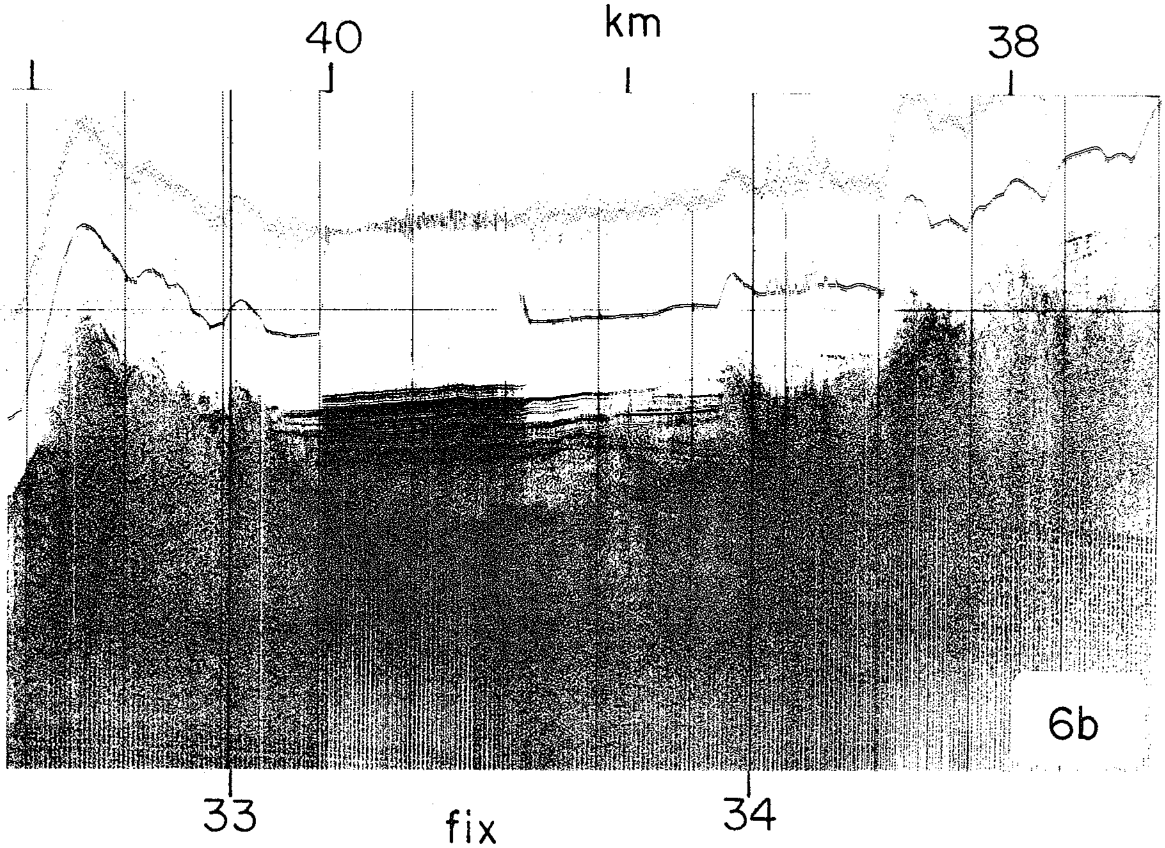

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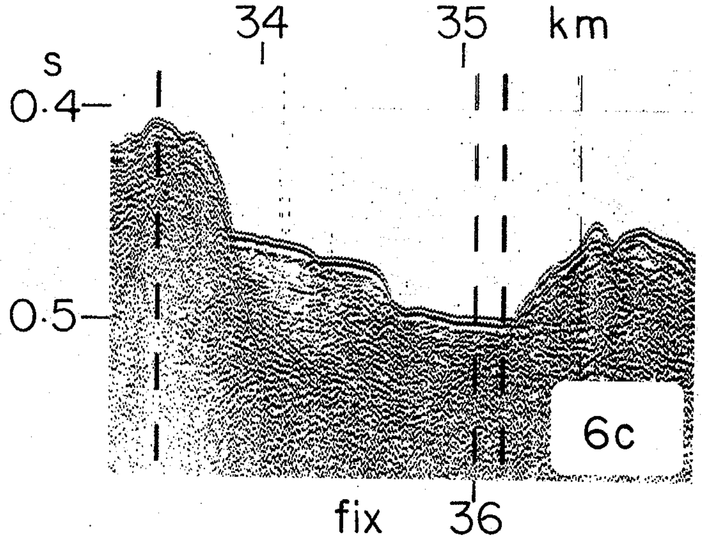

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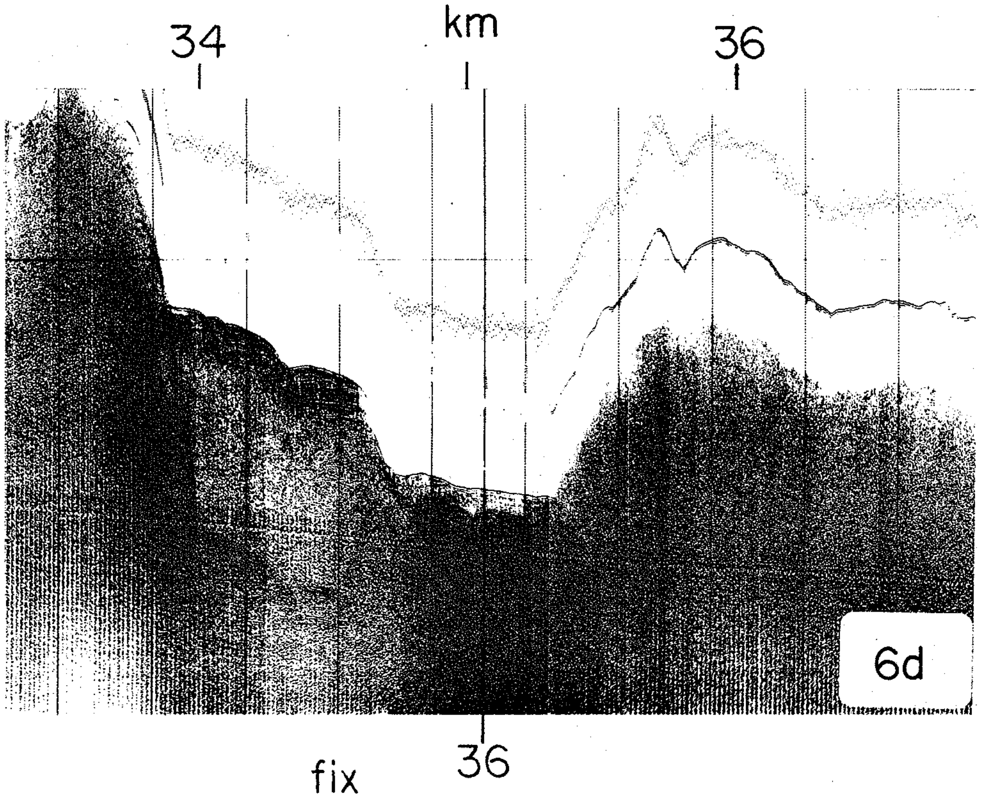

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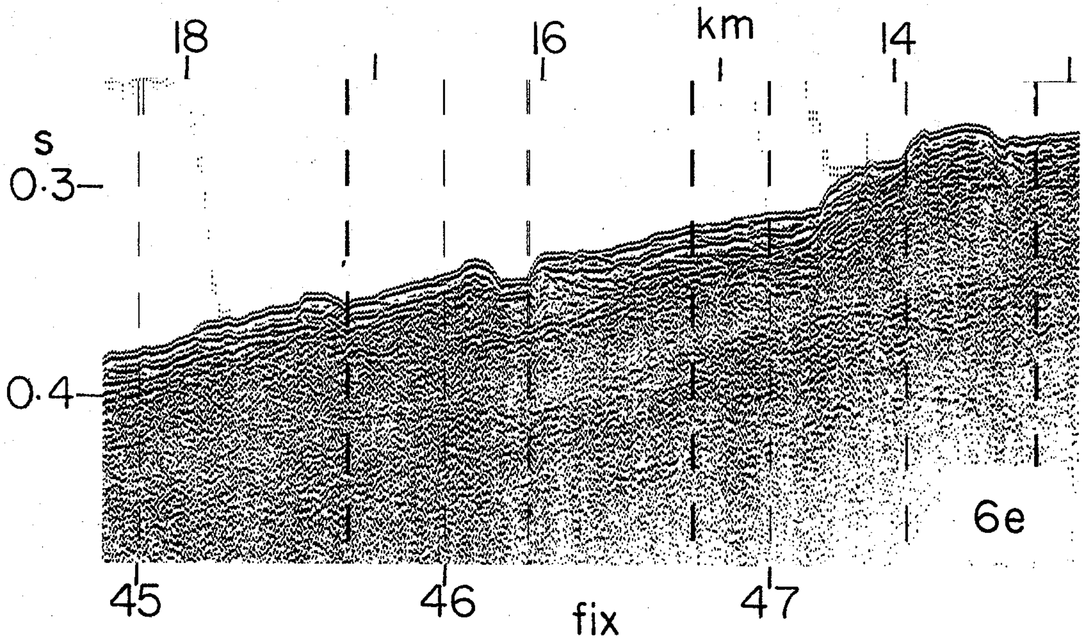

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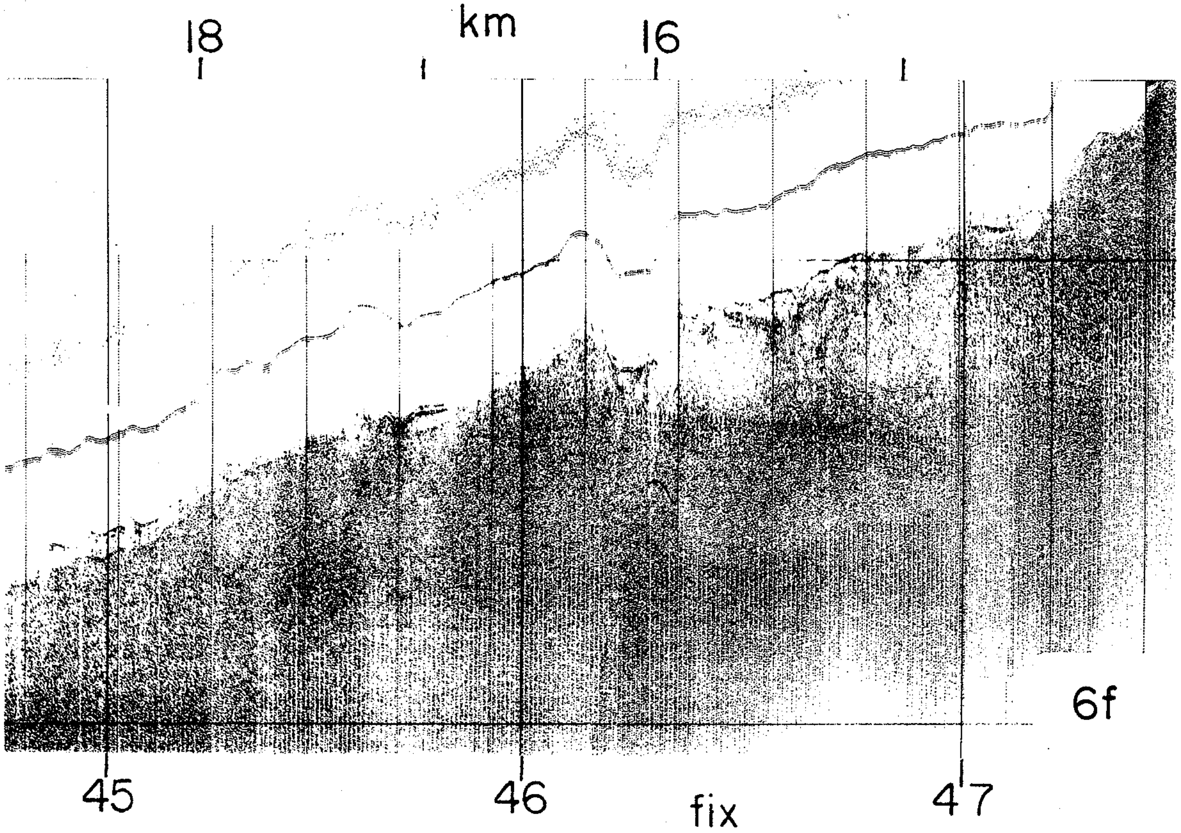

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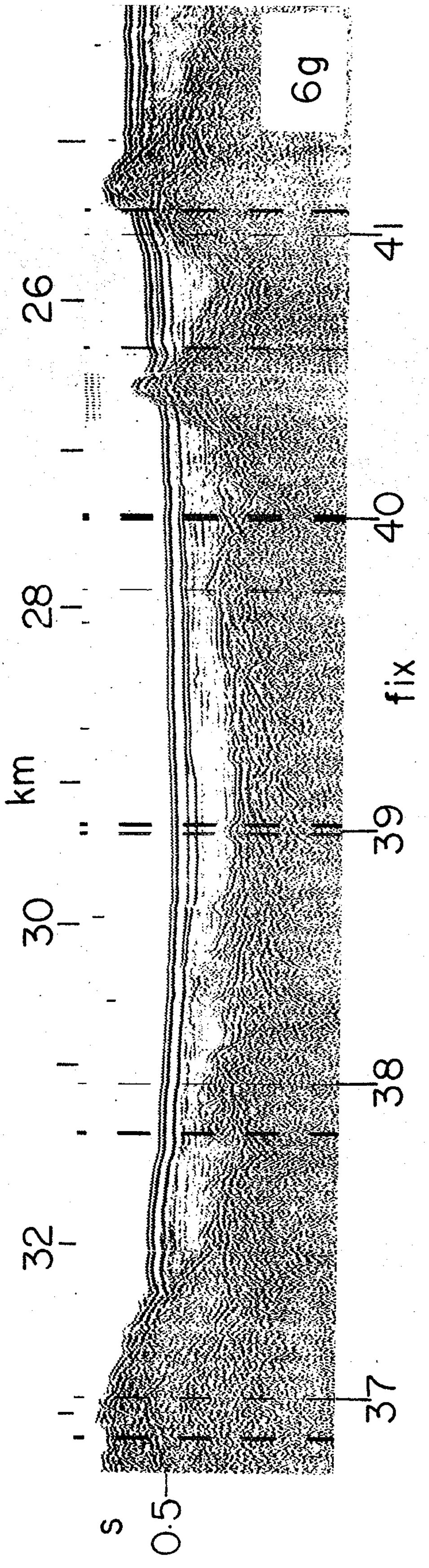
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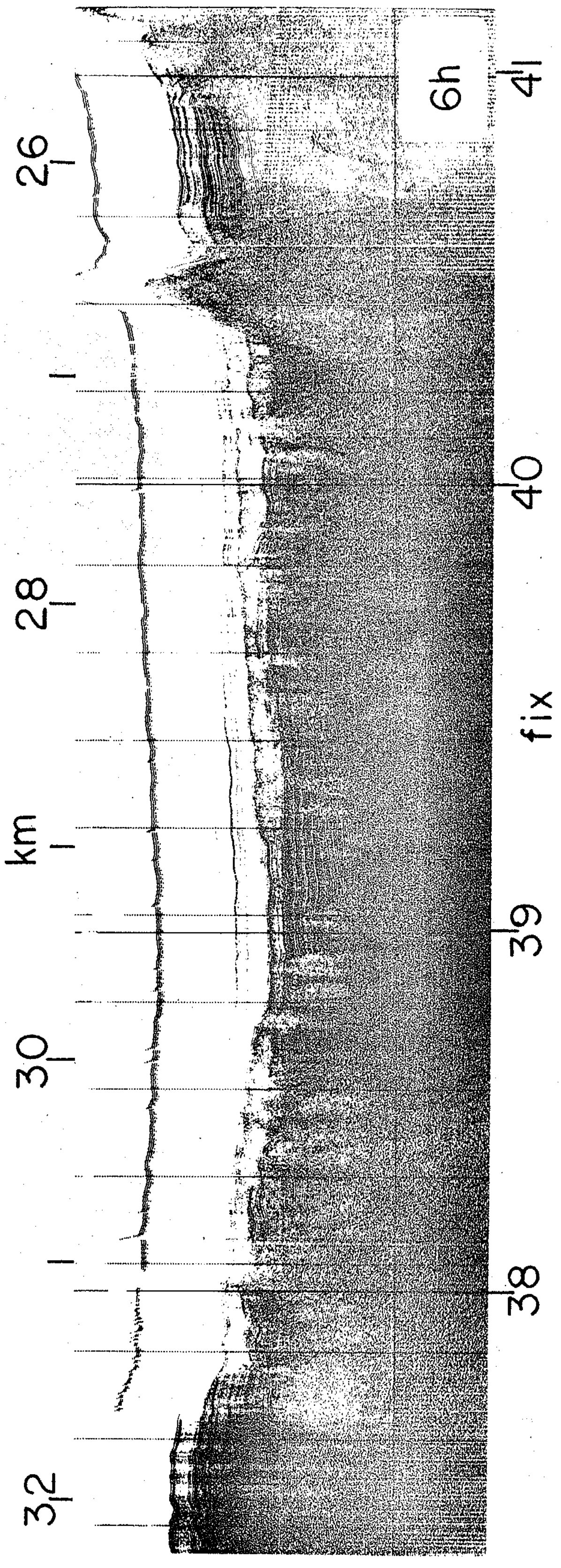
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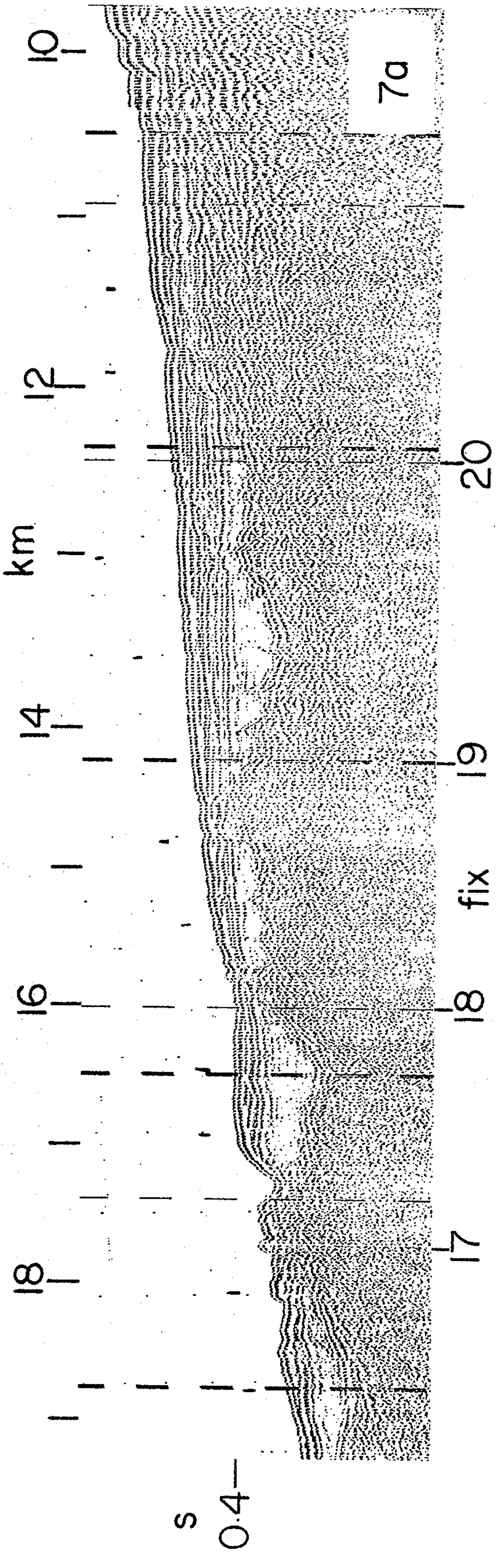
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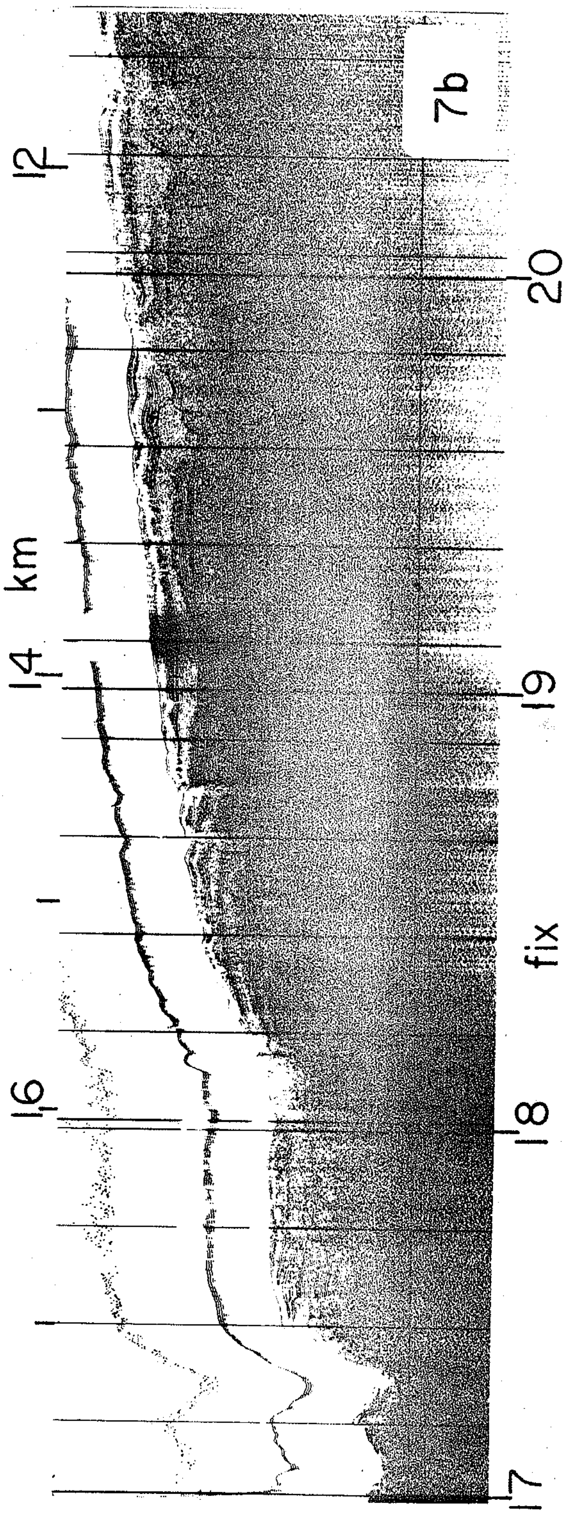
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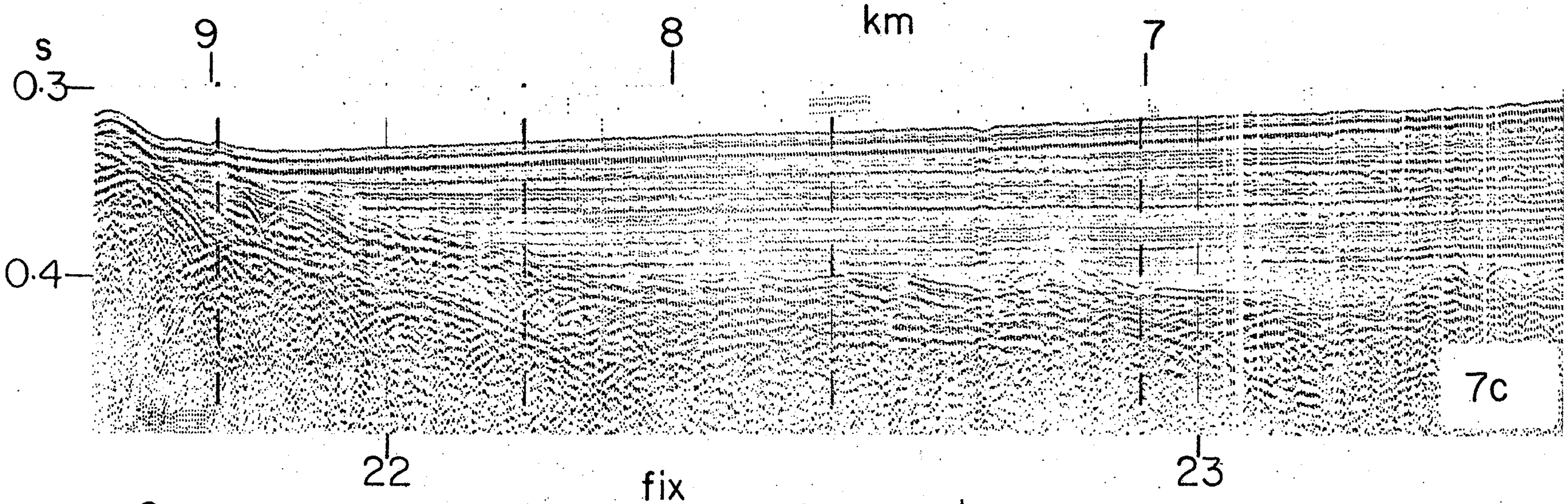
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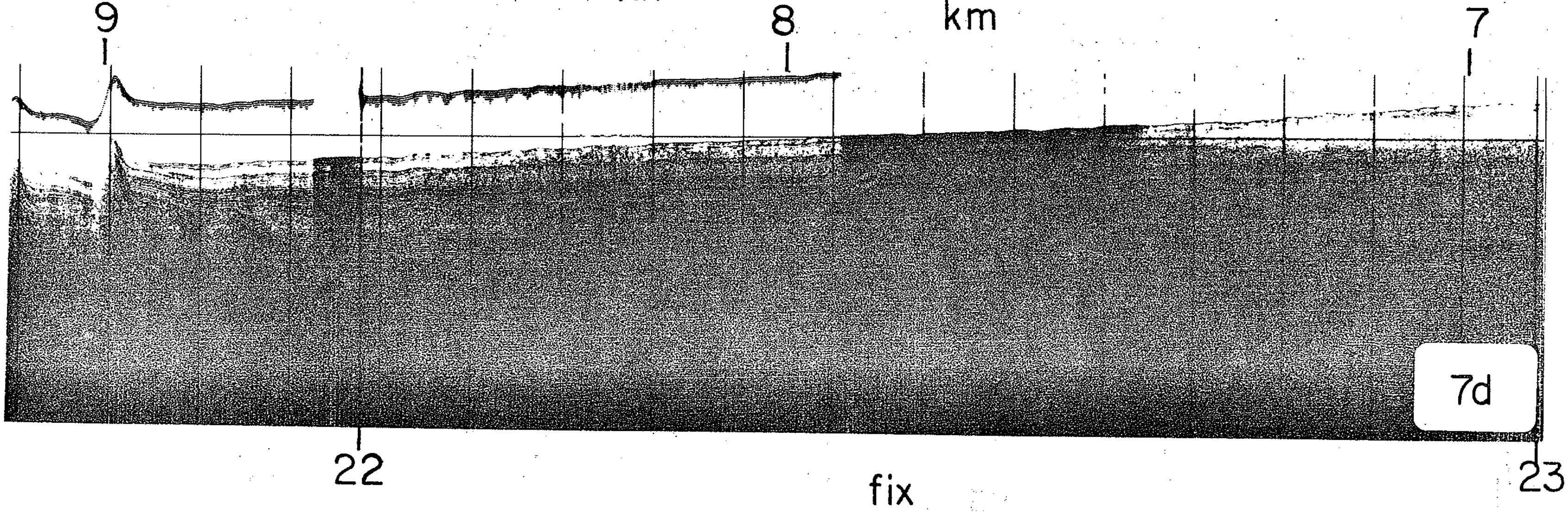
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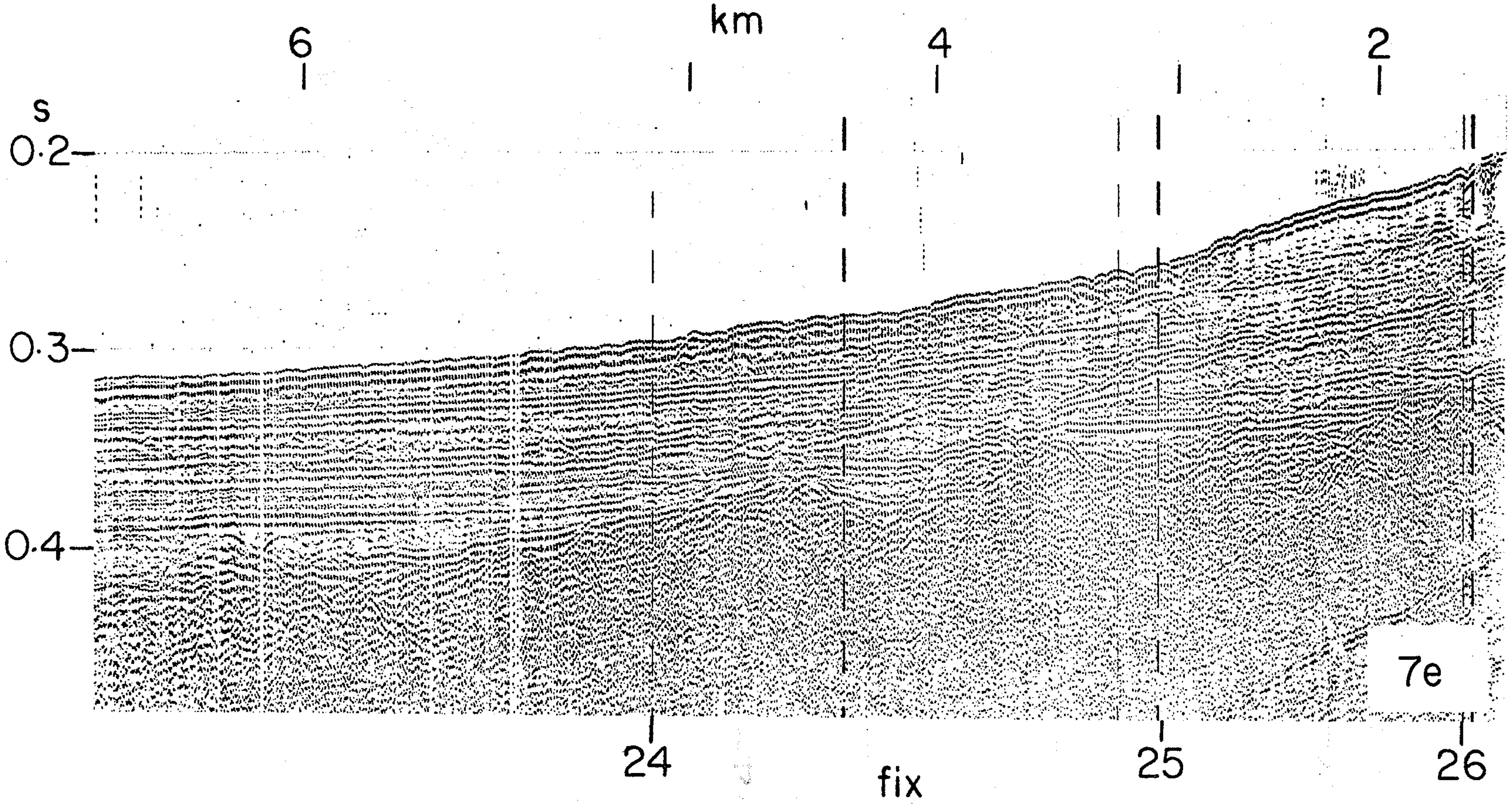
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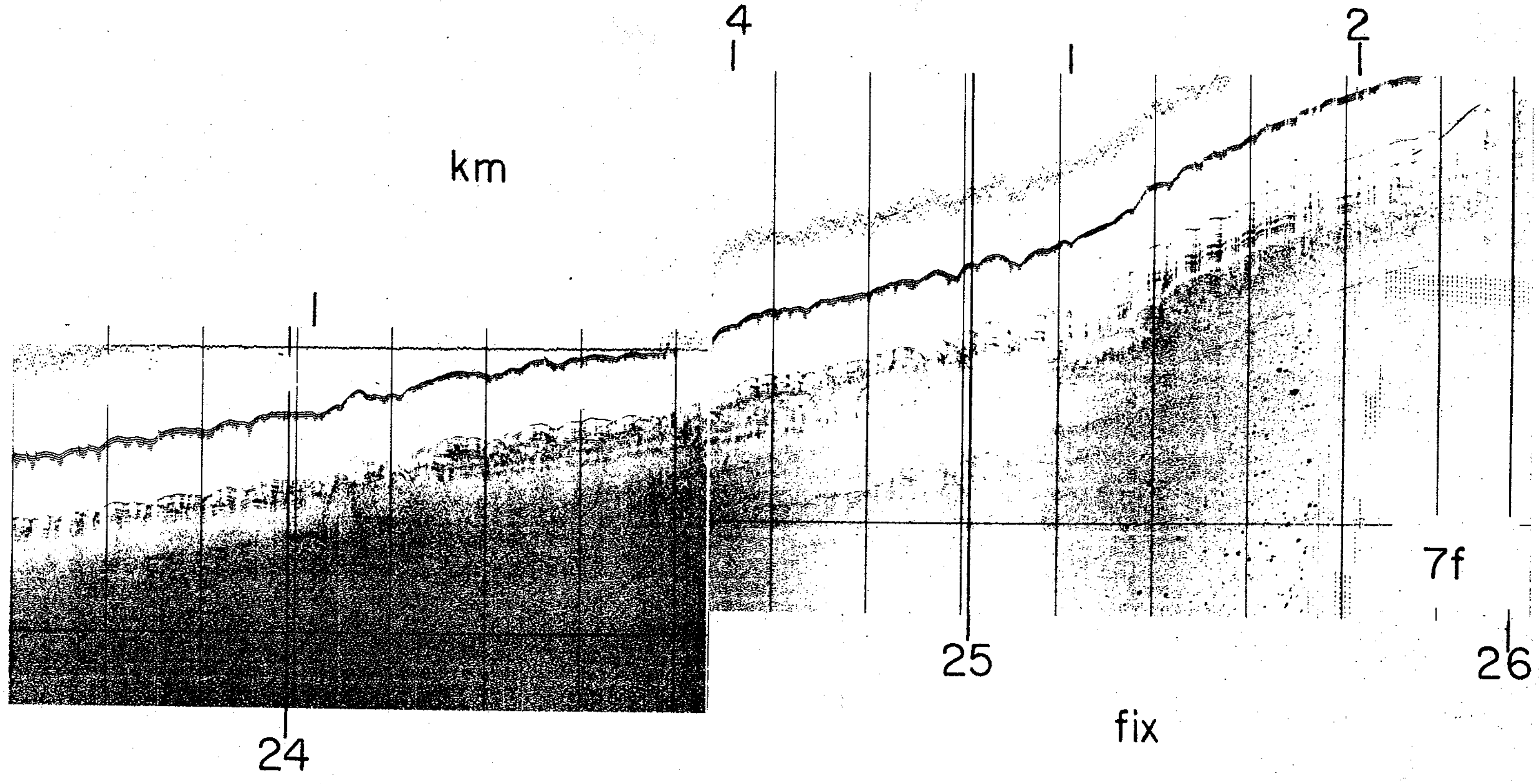
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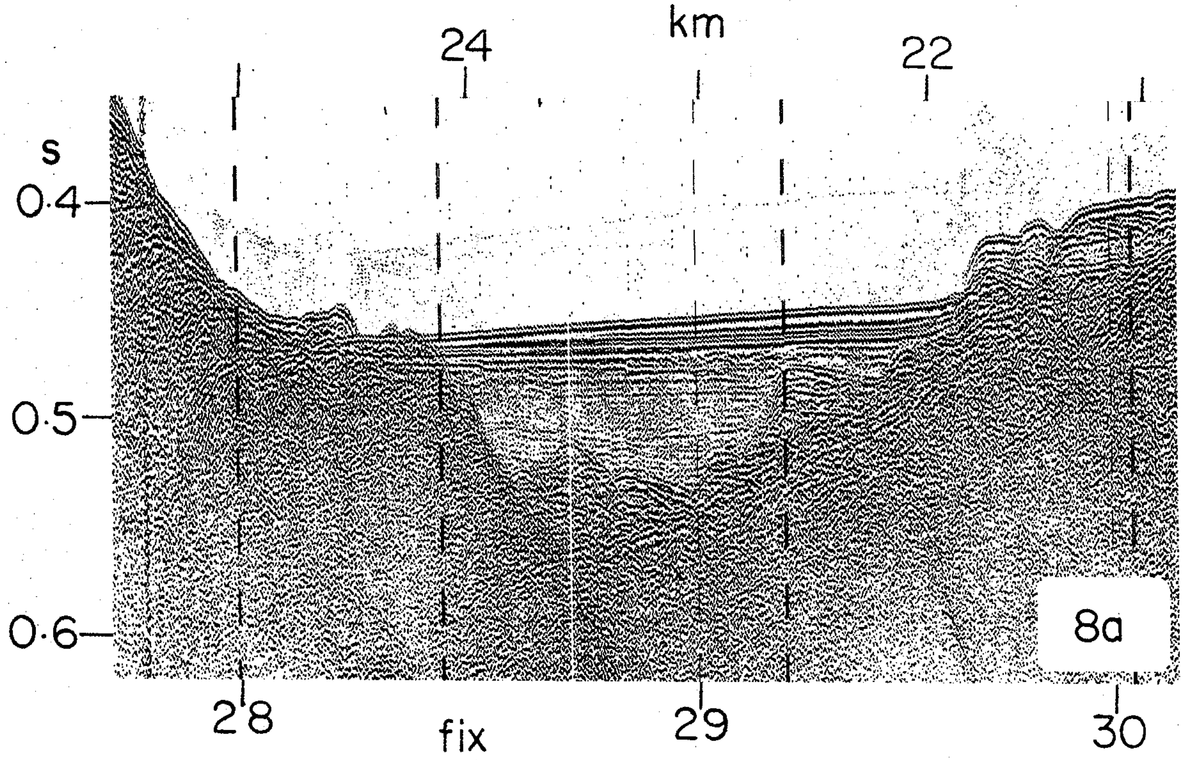

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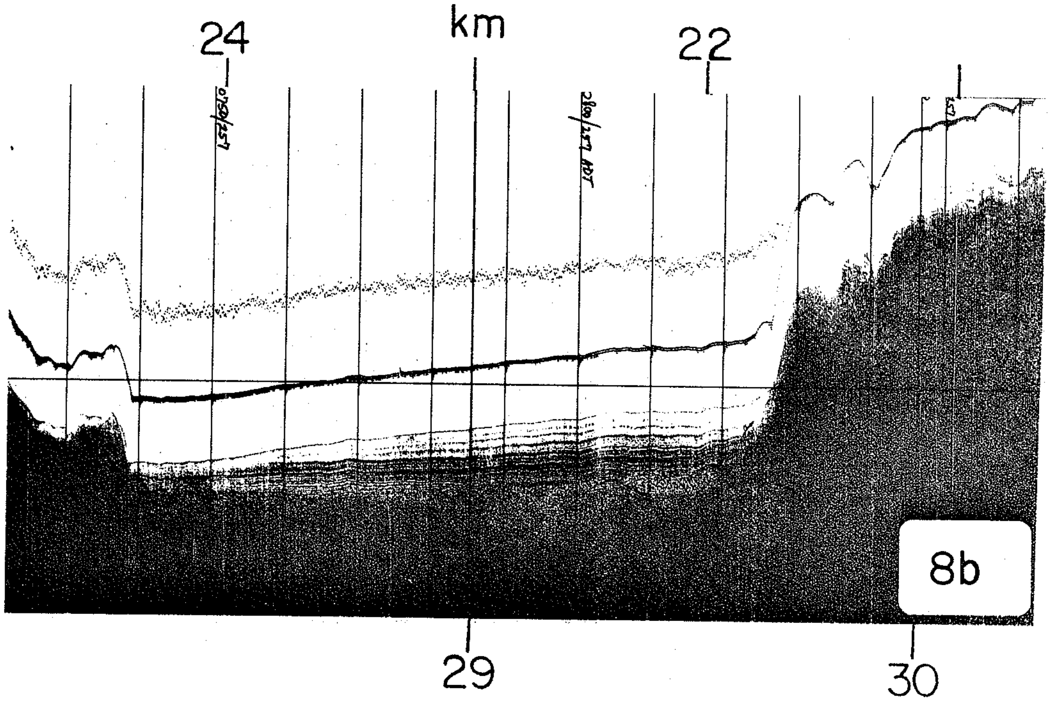

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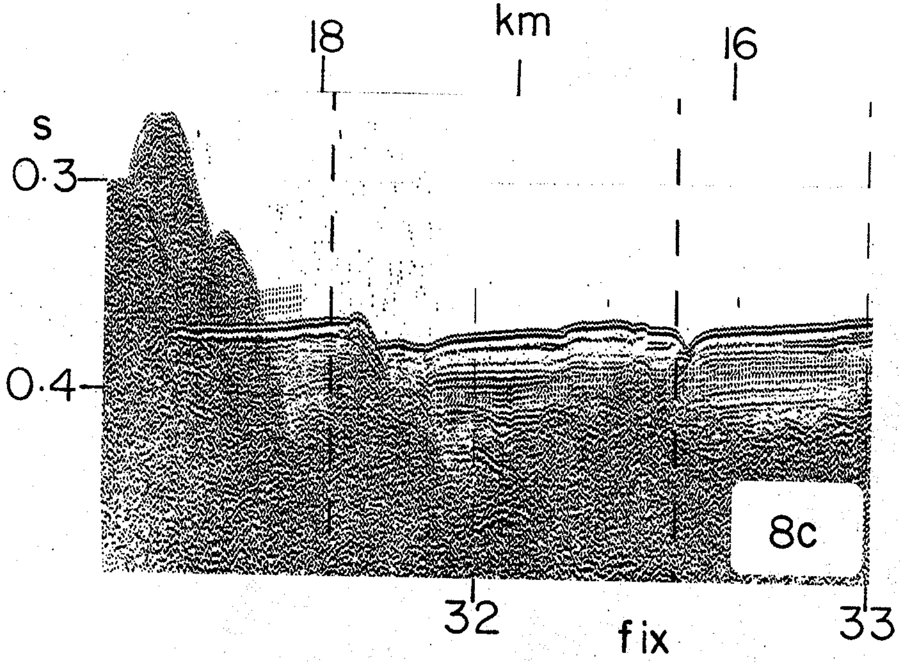
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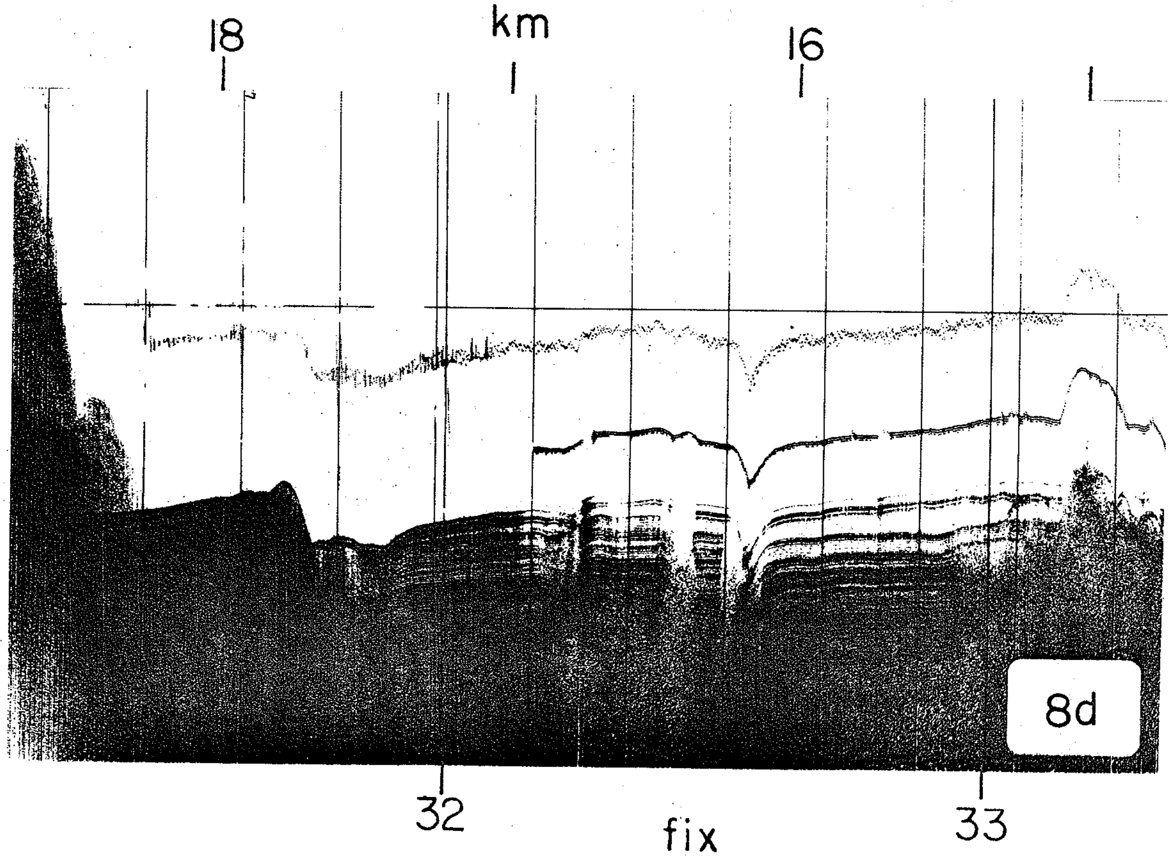
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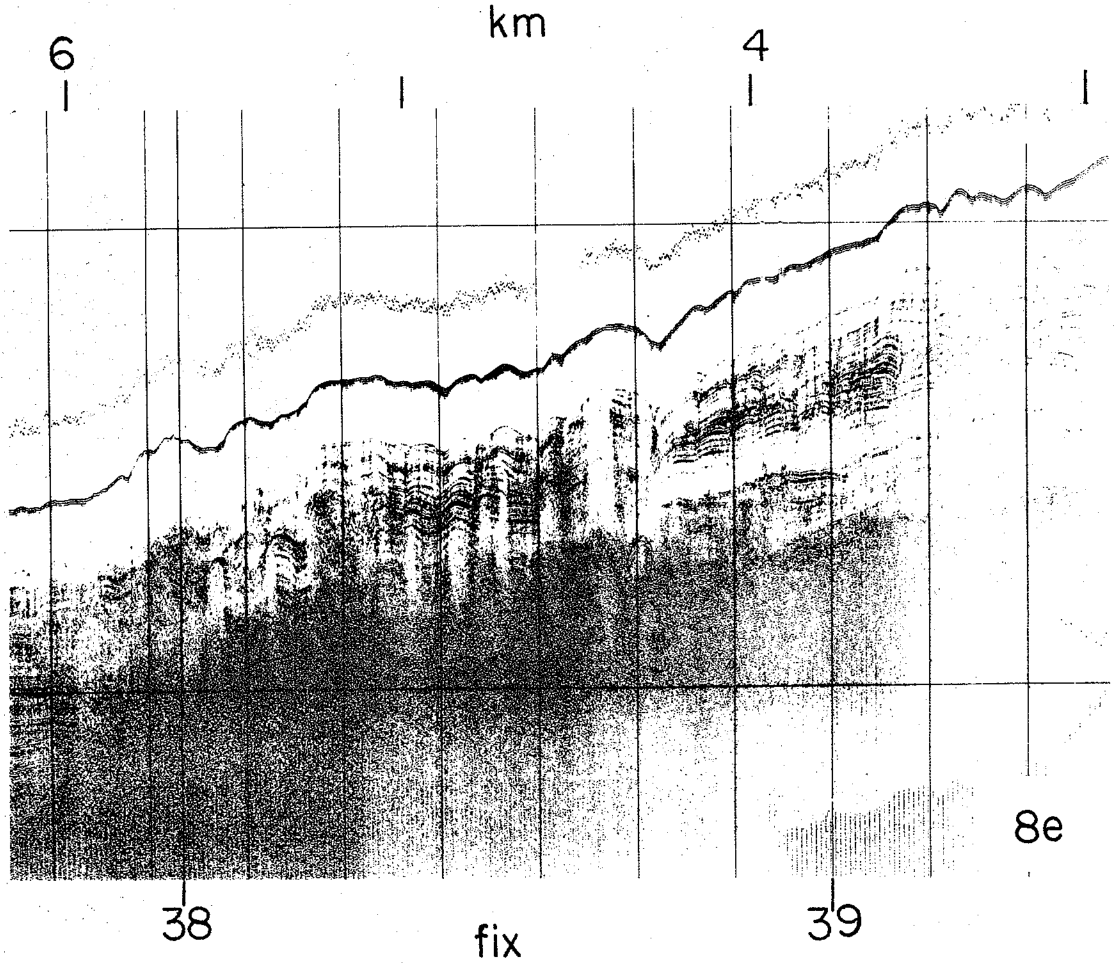

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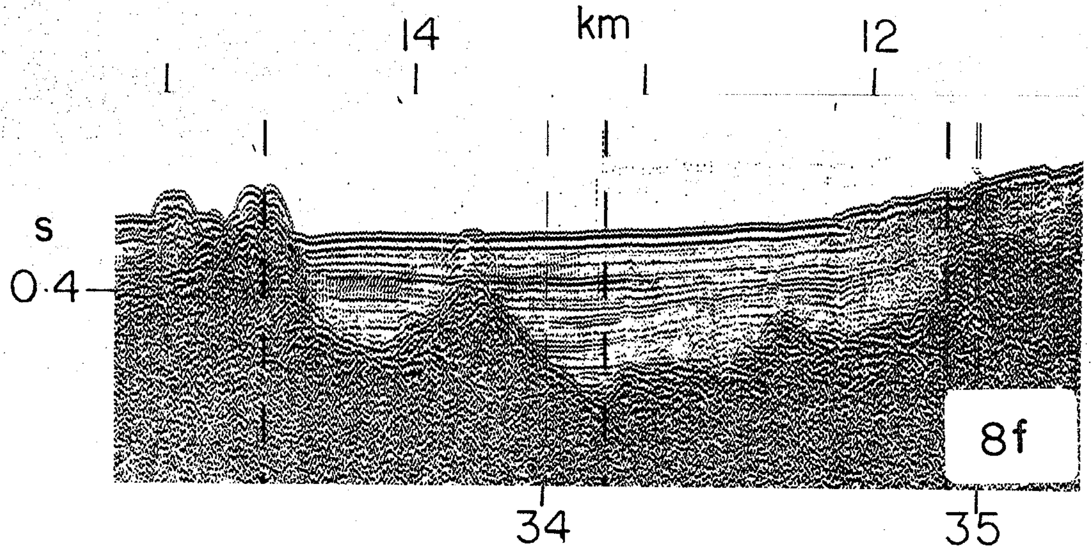

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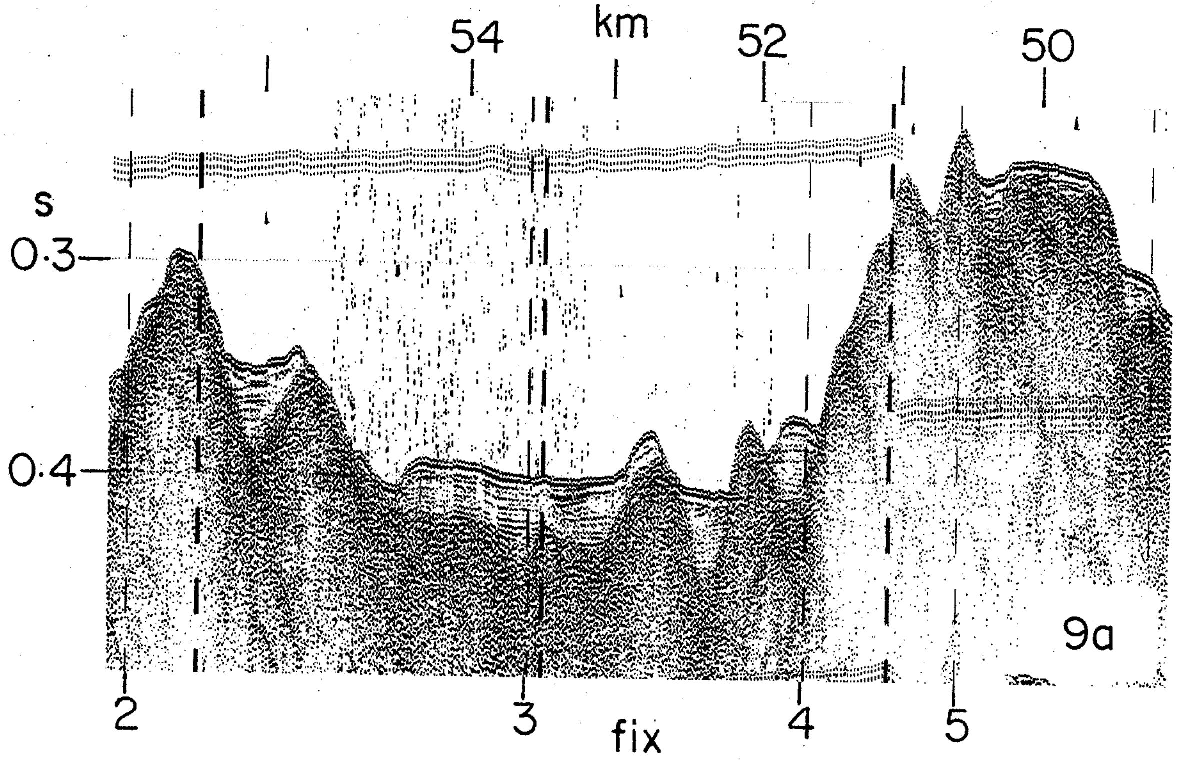
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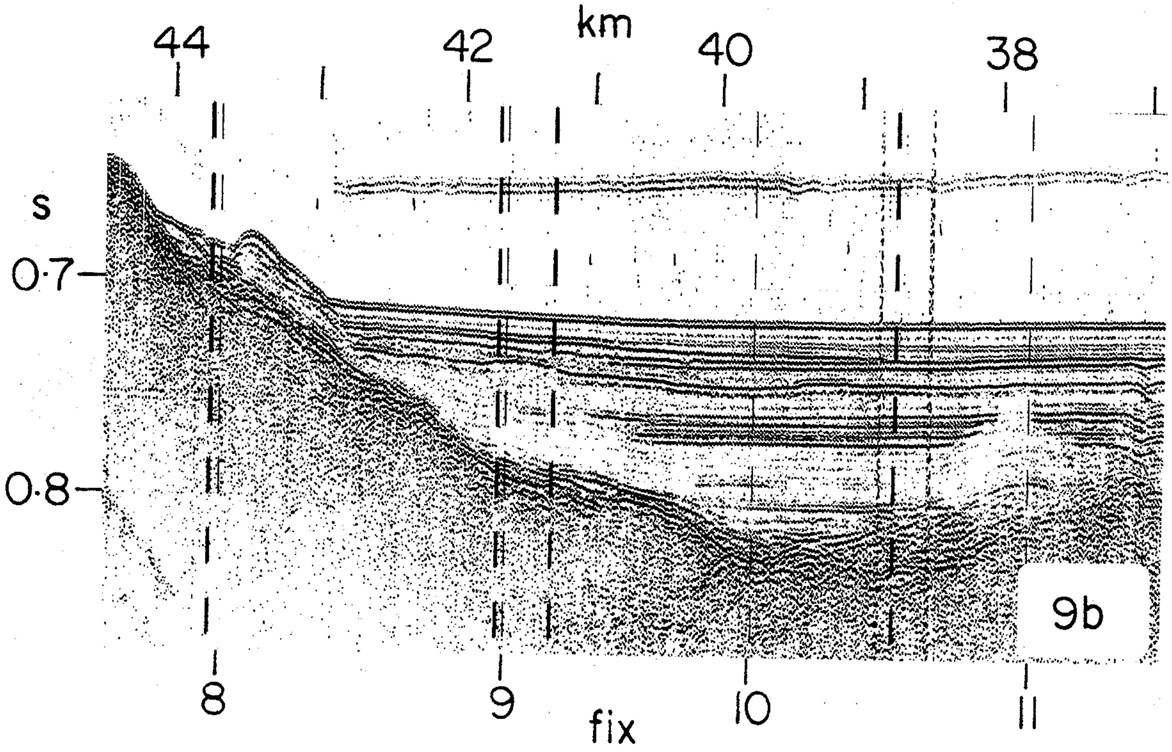
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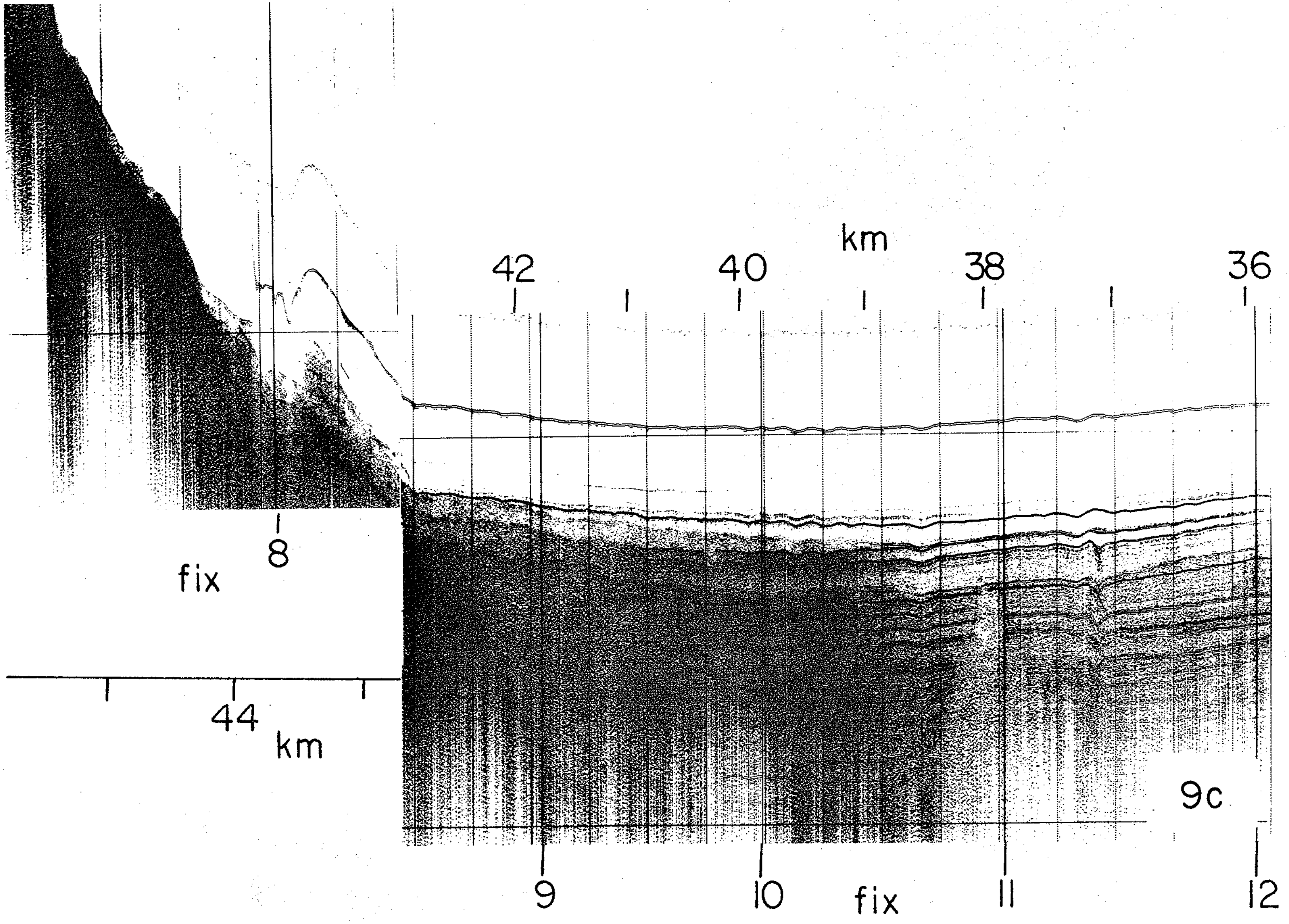
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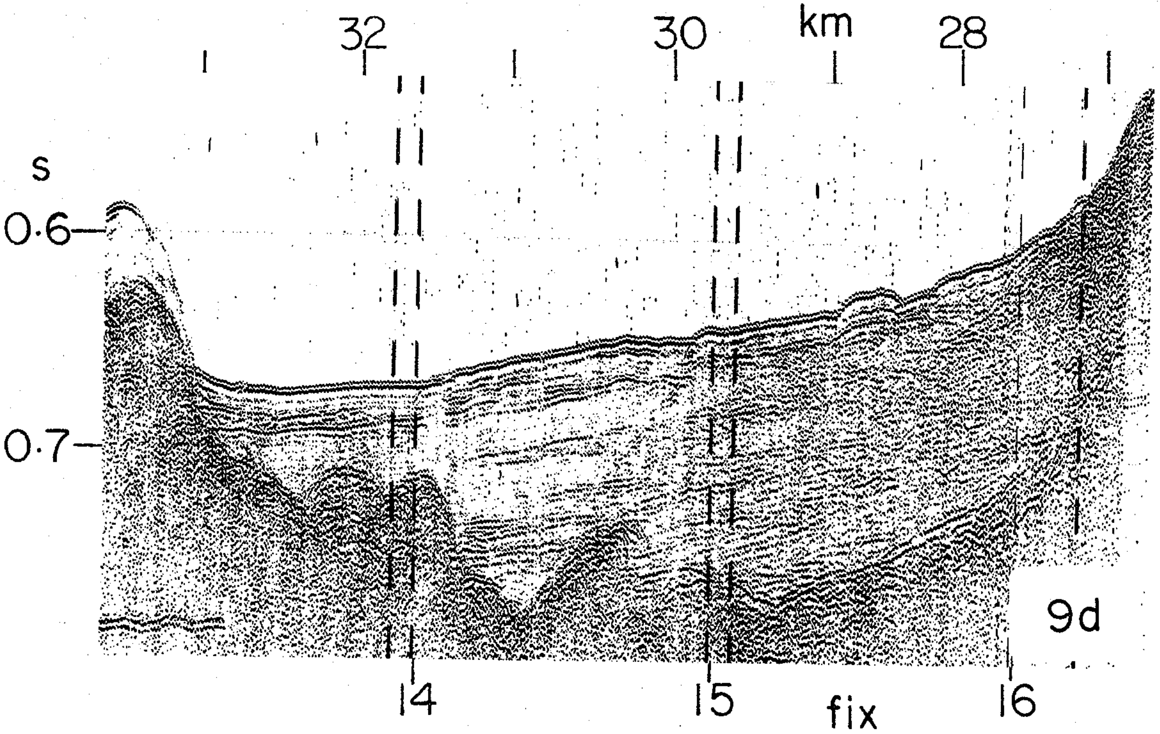
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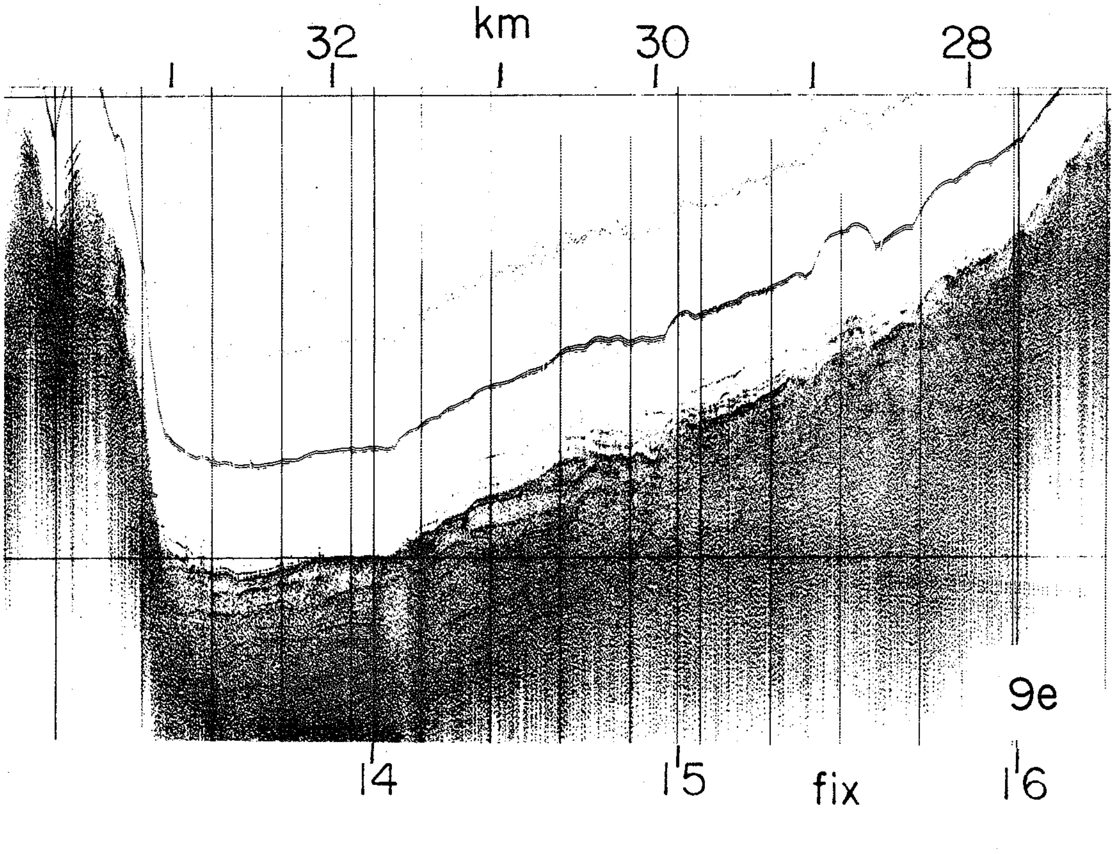
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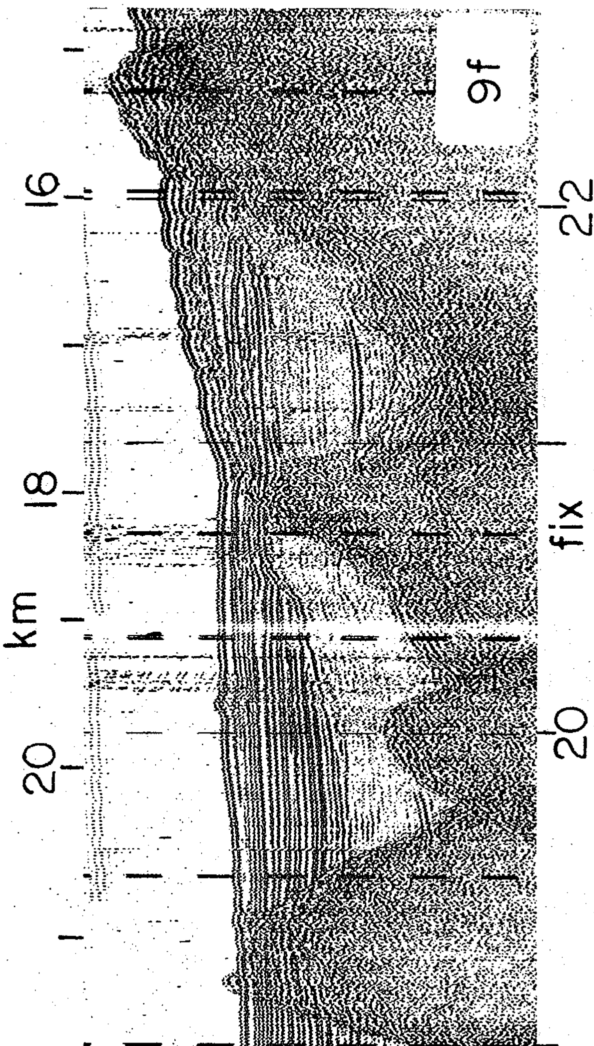
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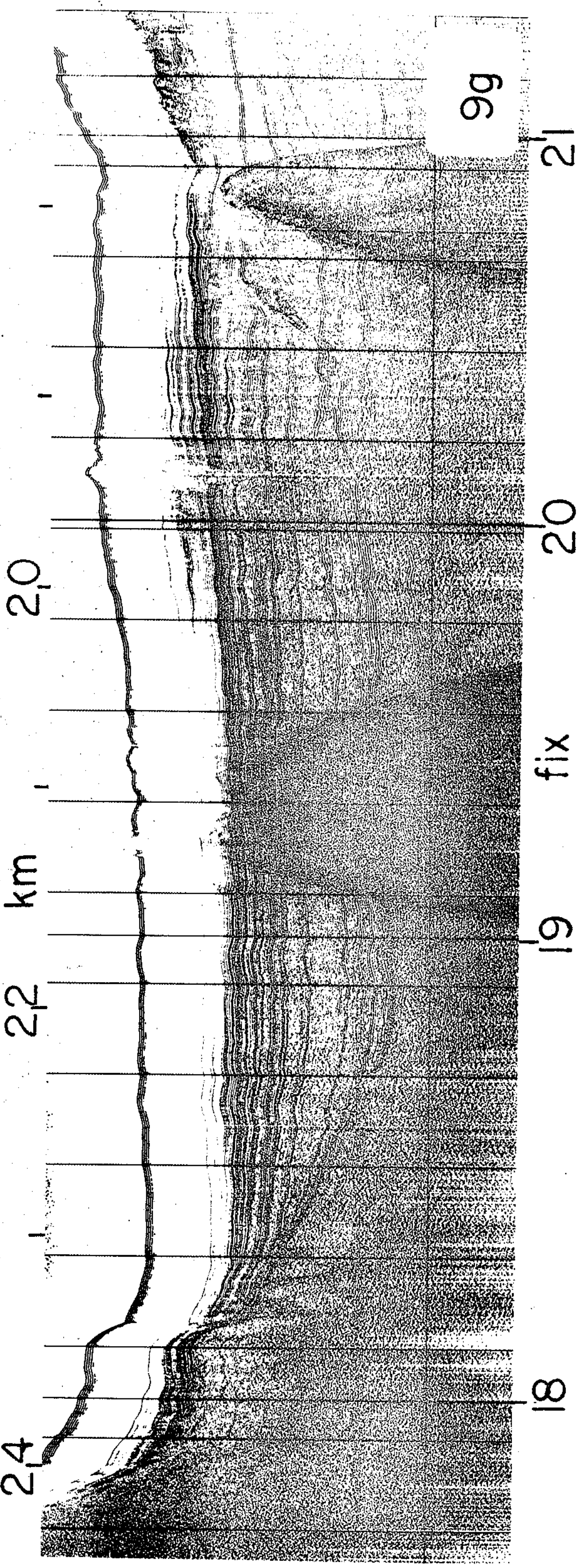
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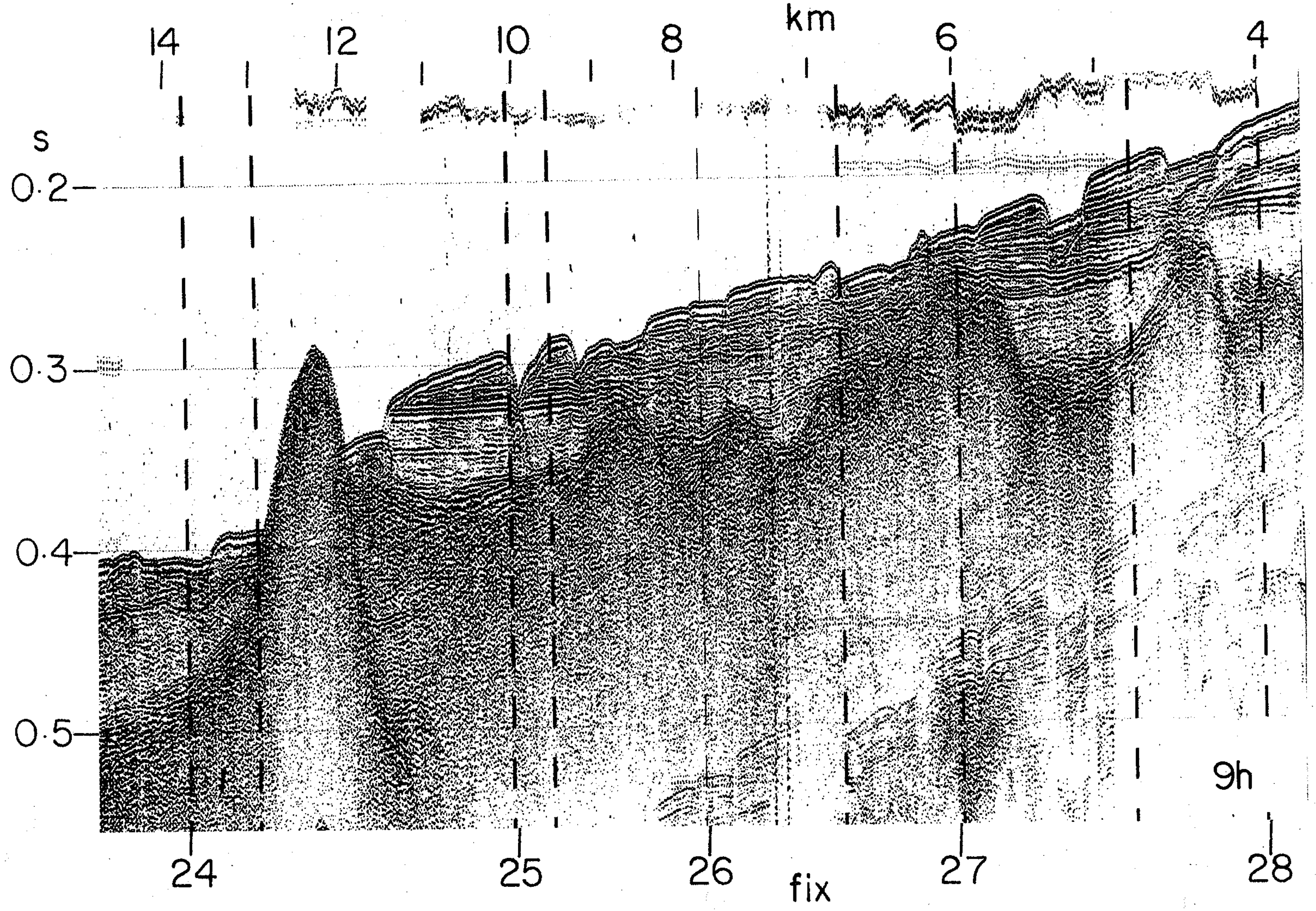
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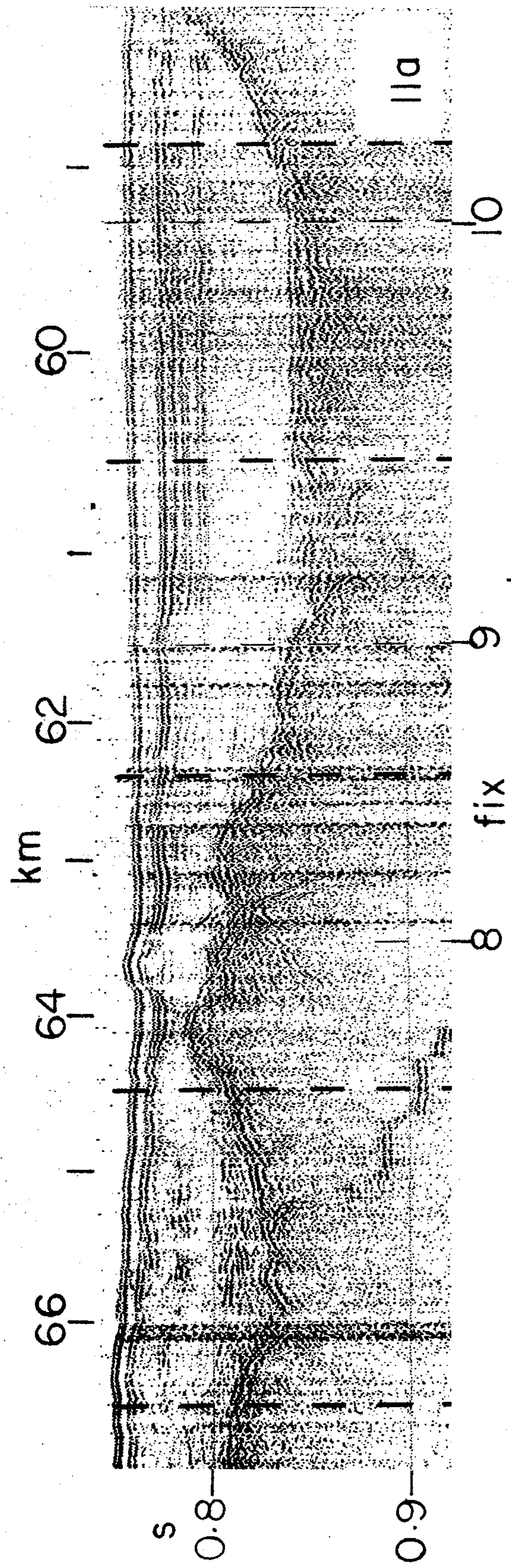

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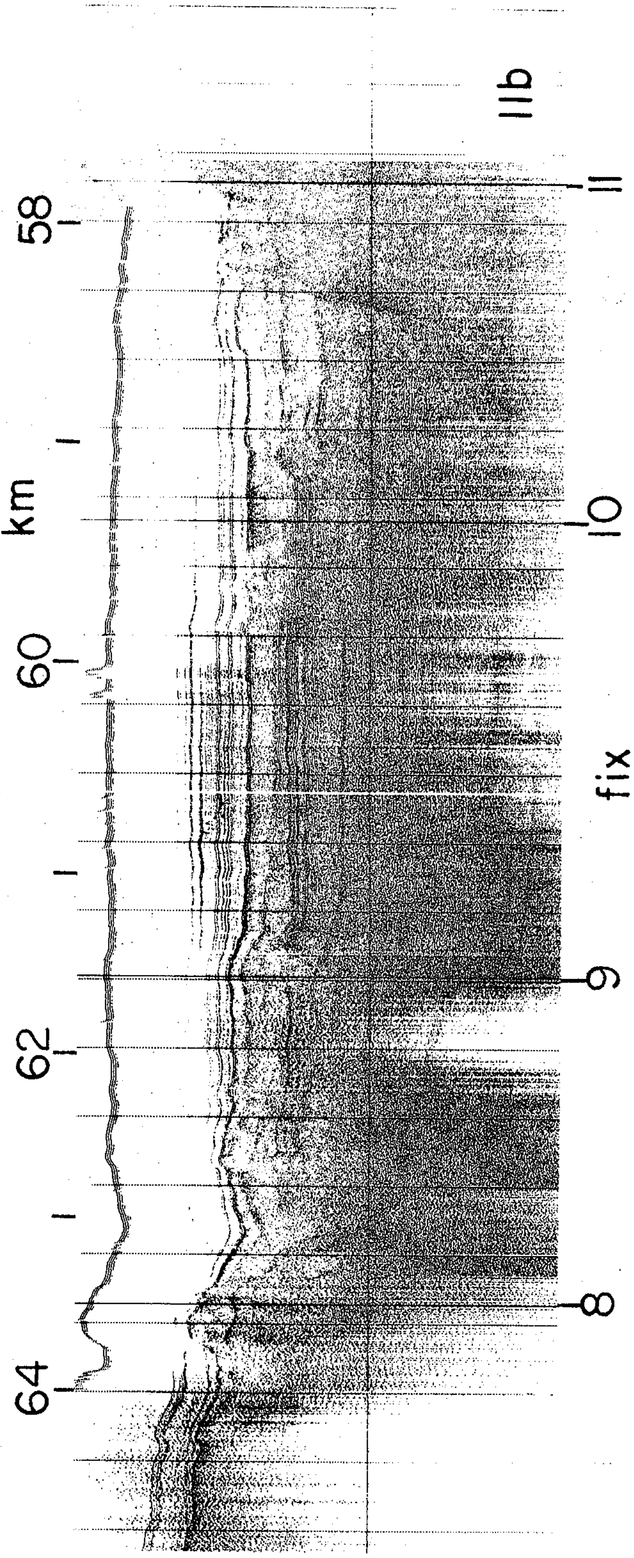

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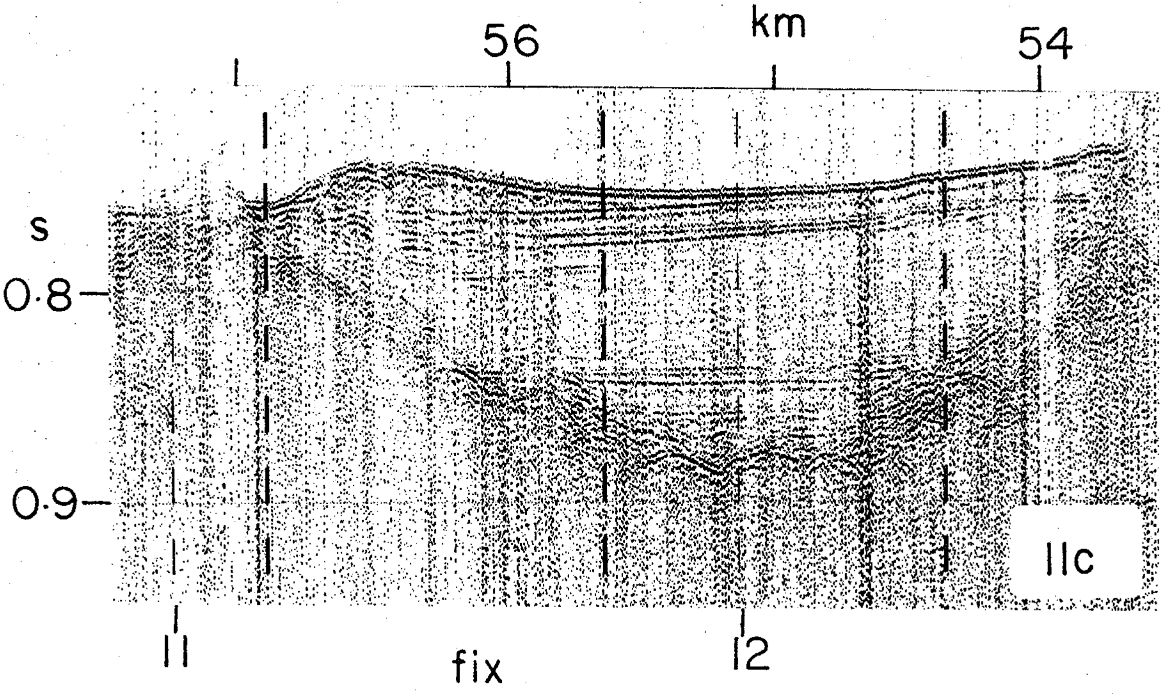
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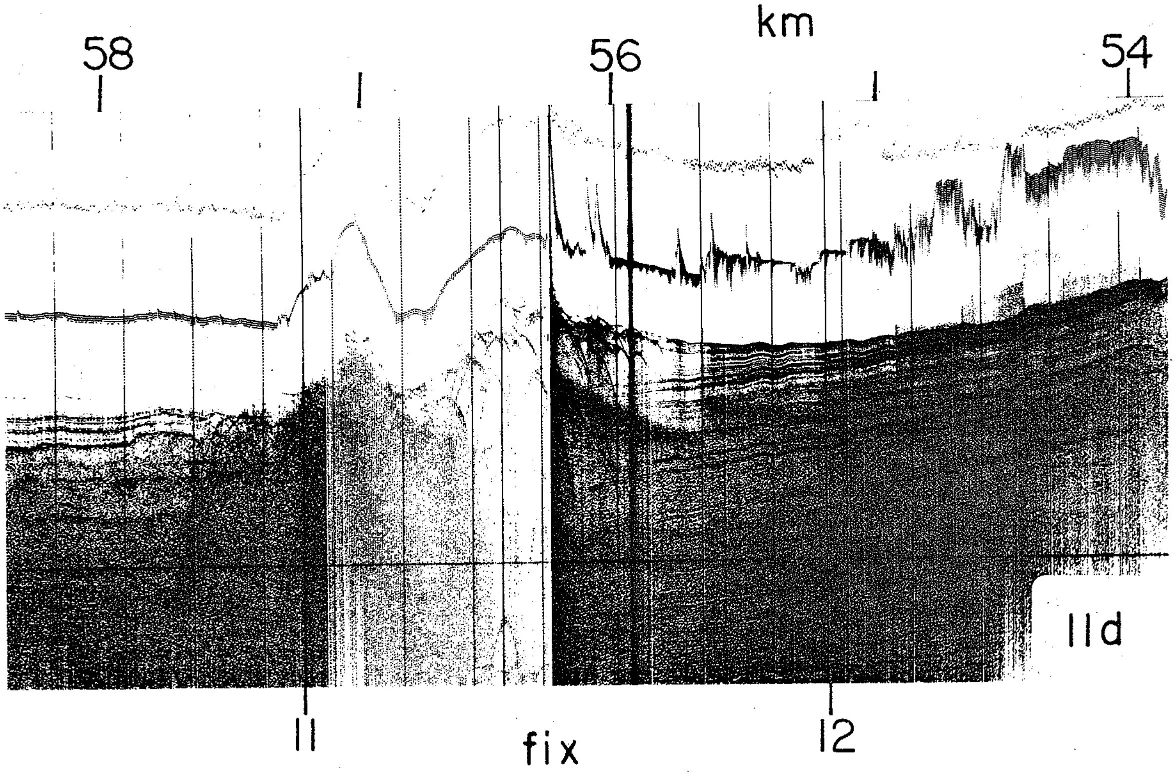
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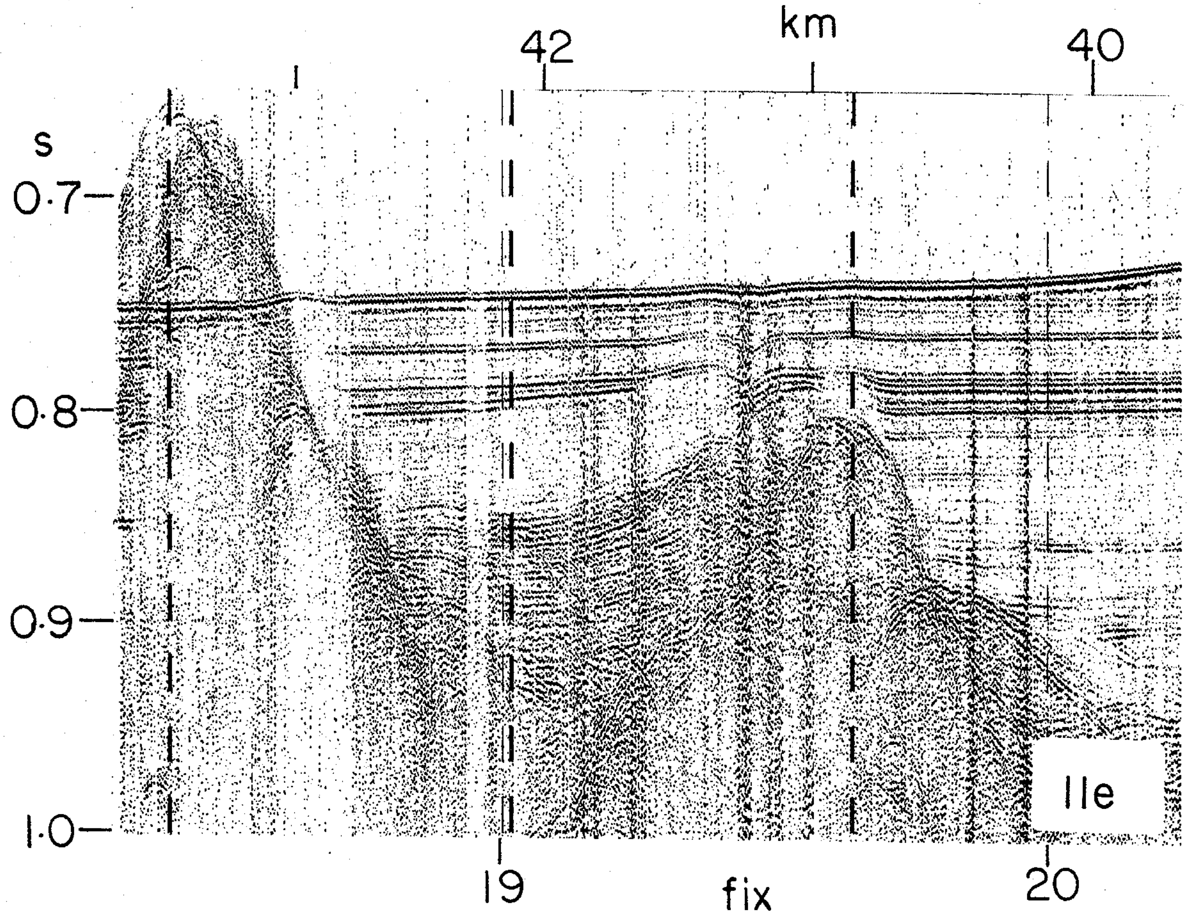
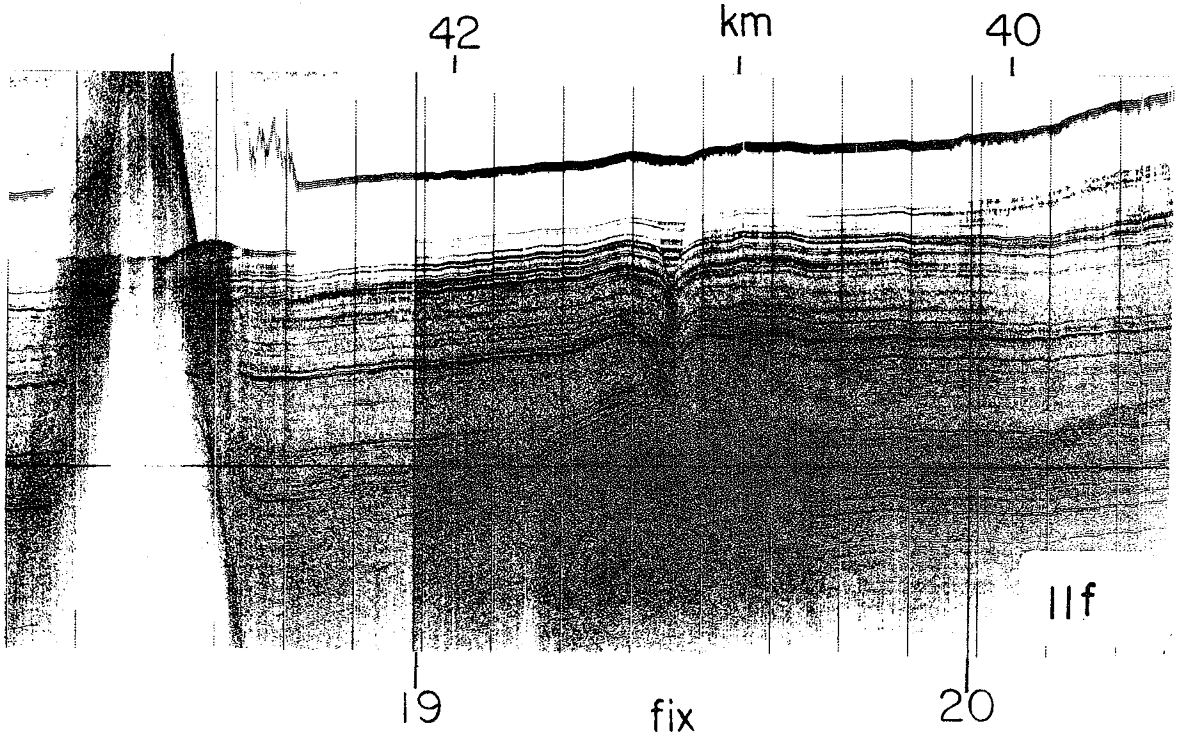


11e



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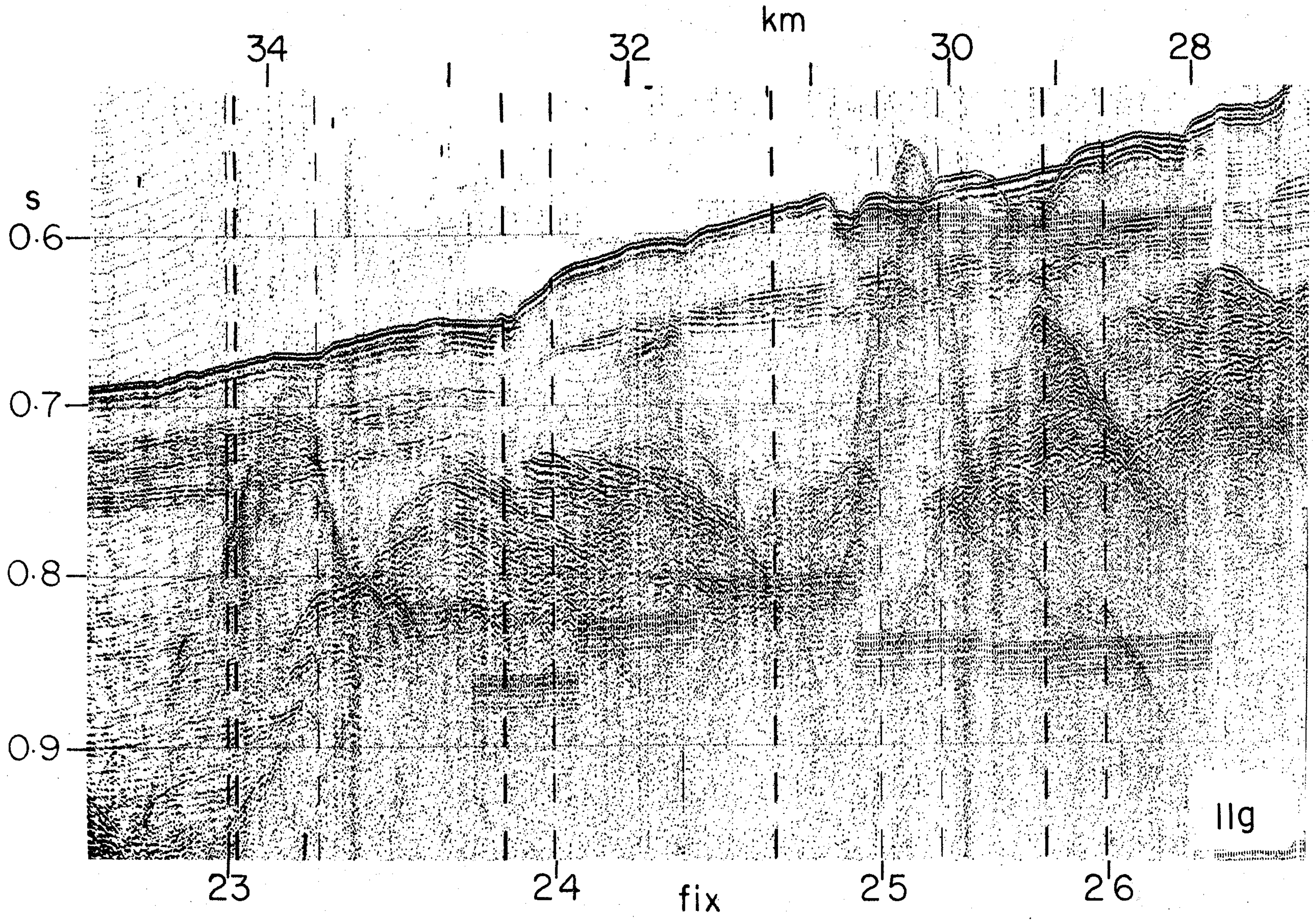
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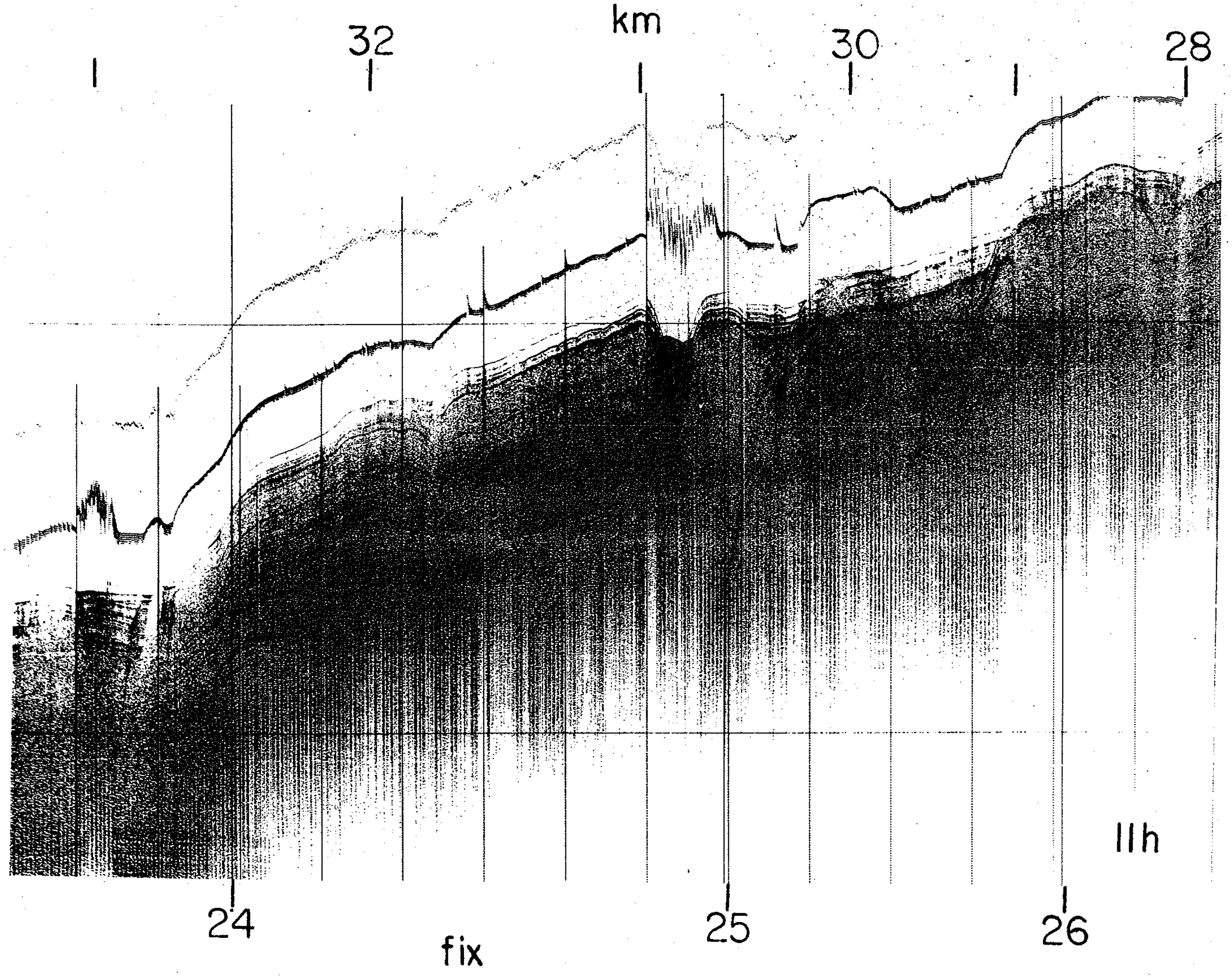
32
30
28
s
0.6
0.7
0.8
0.9
11g
23
24
fix
25
26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km
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11h
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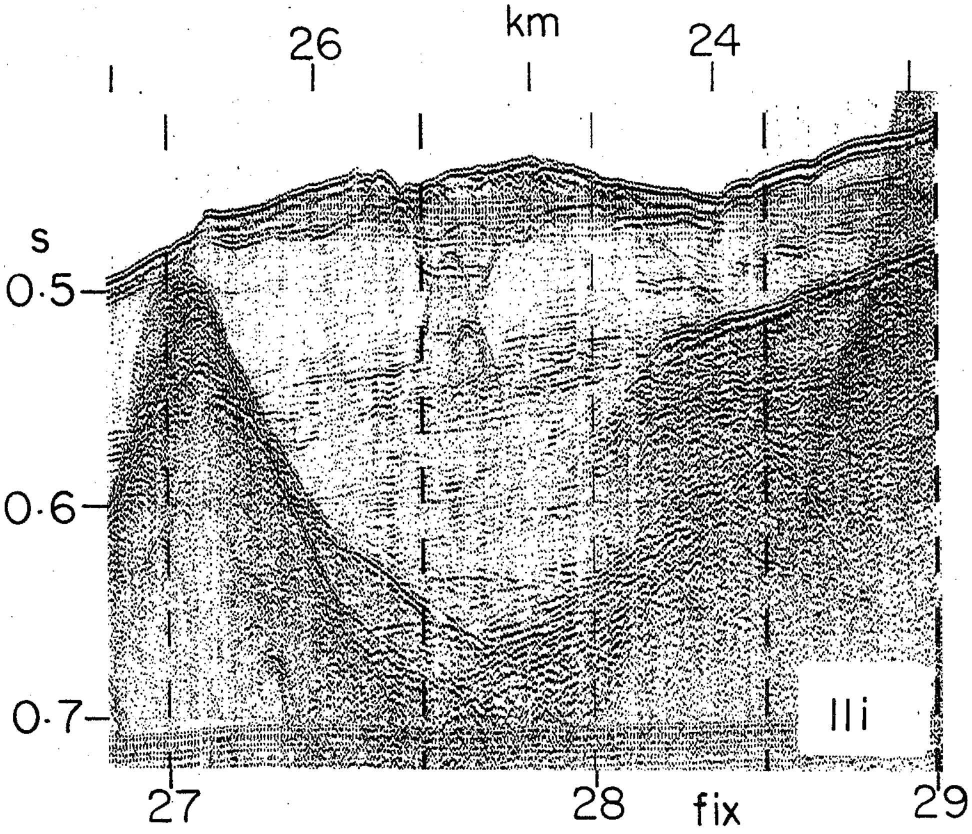

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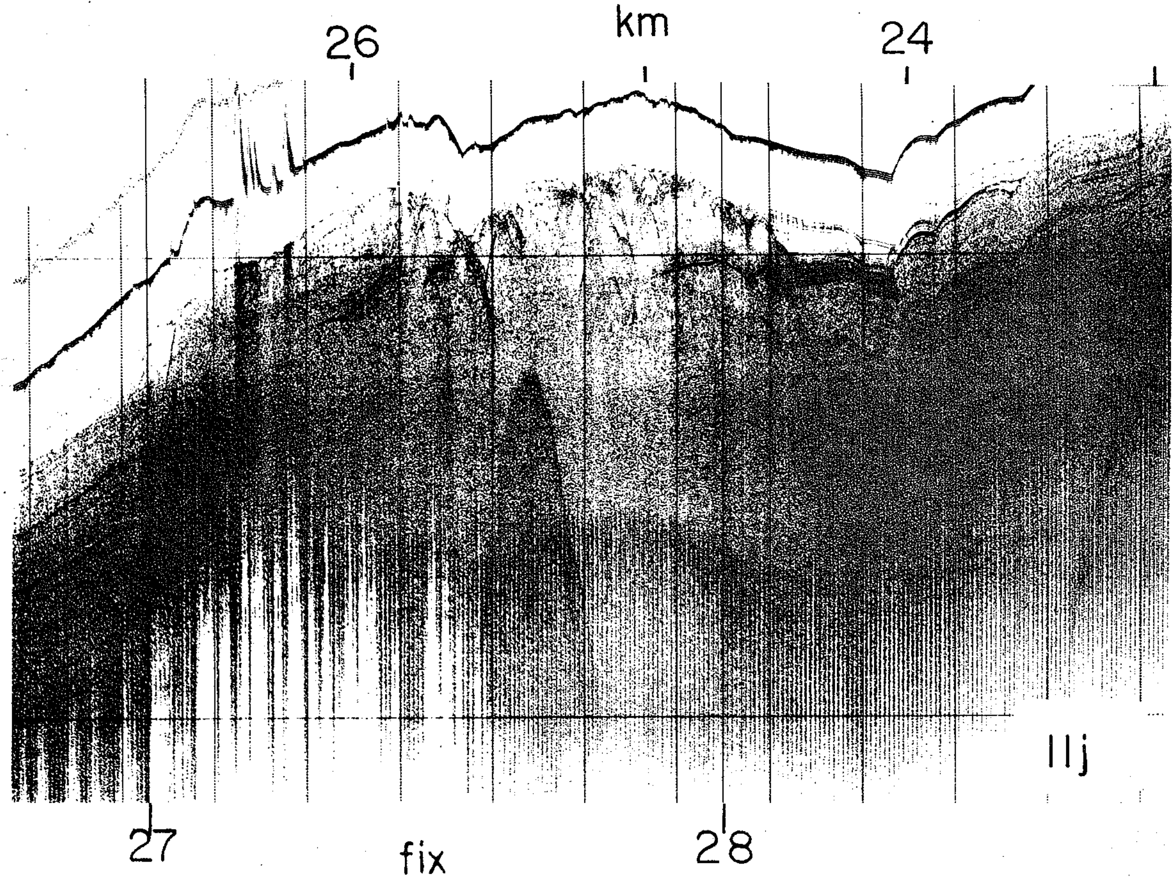

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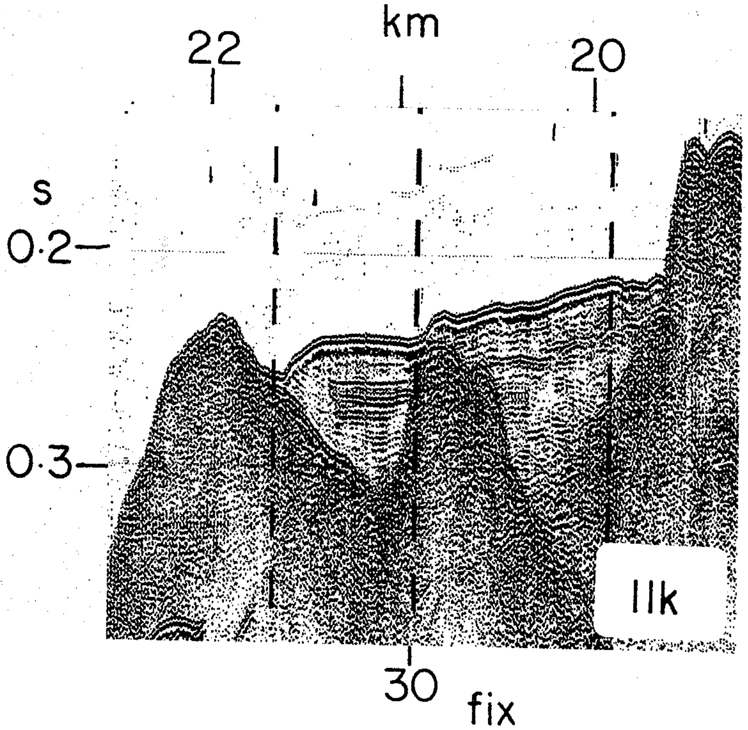
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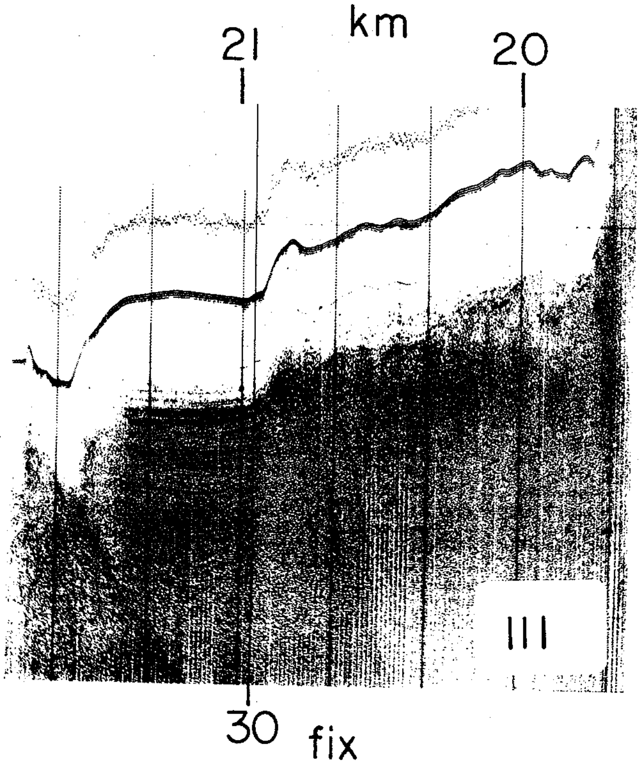
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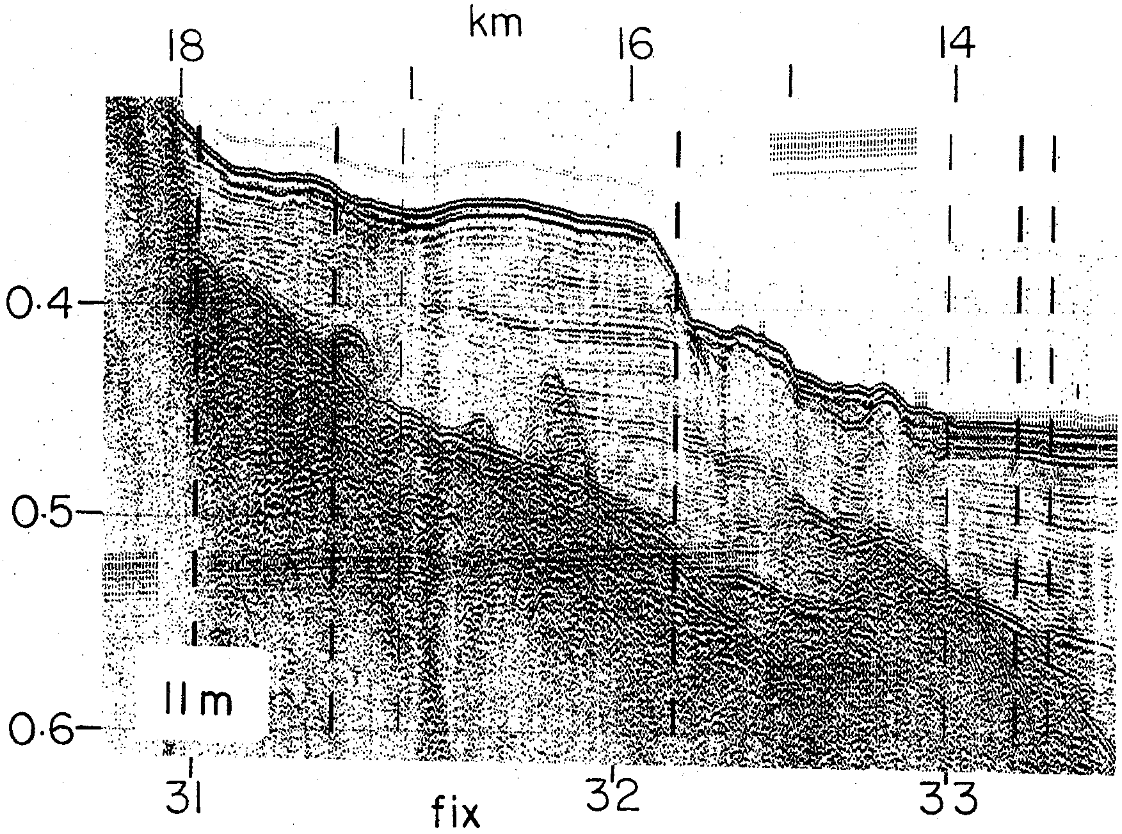
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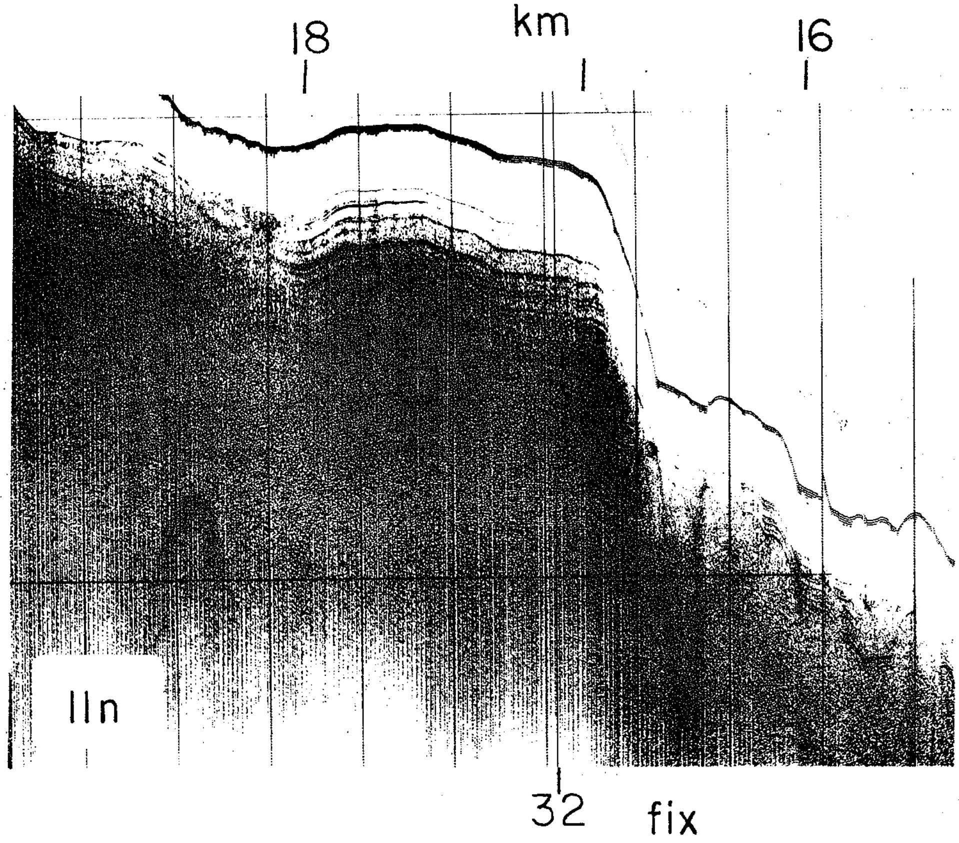
0.5
0.6
11m
31
32
33
fix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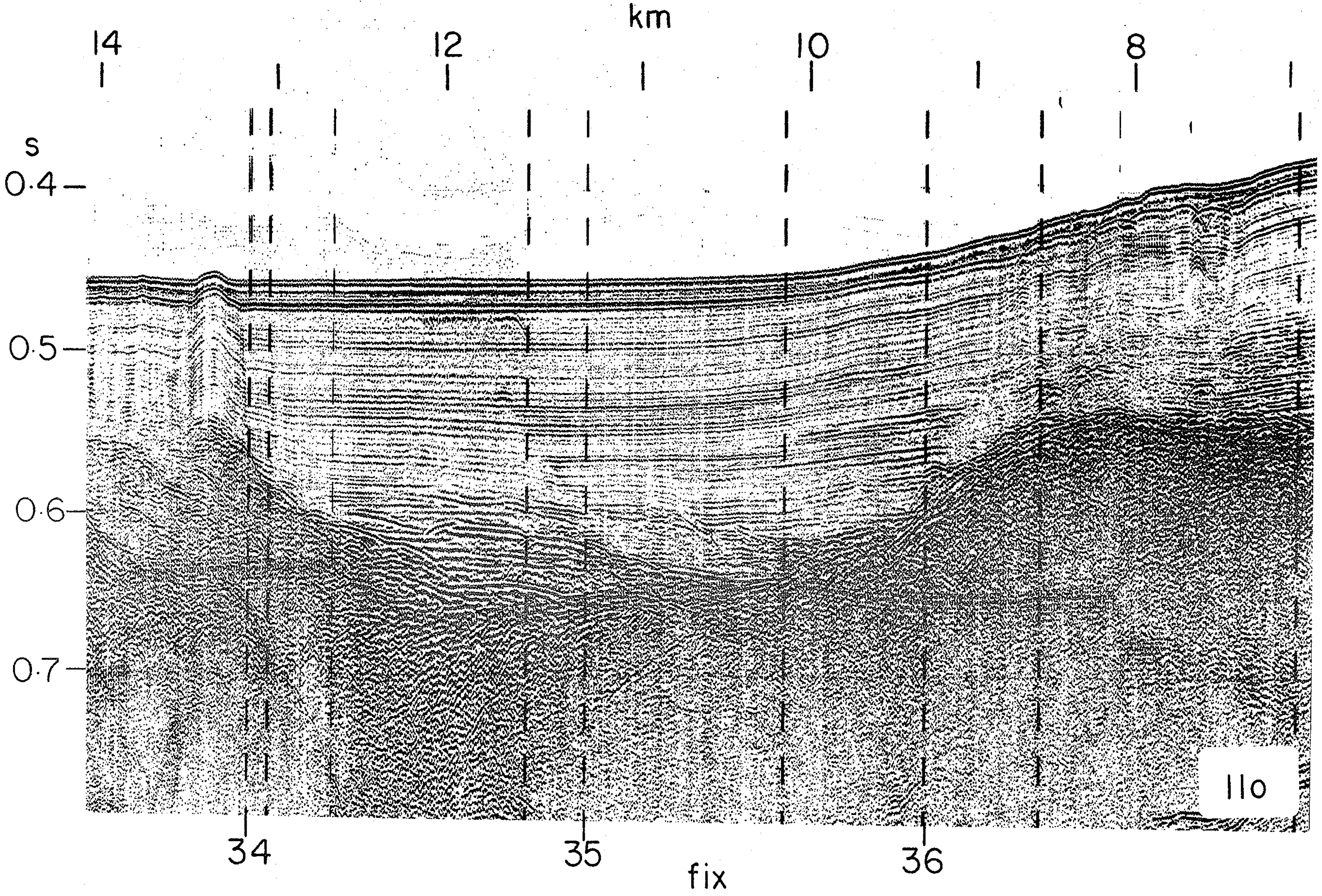
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8
s
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0.5
0.6
0.7
11o
34
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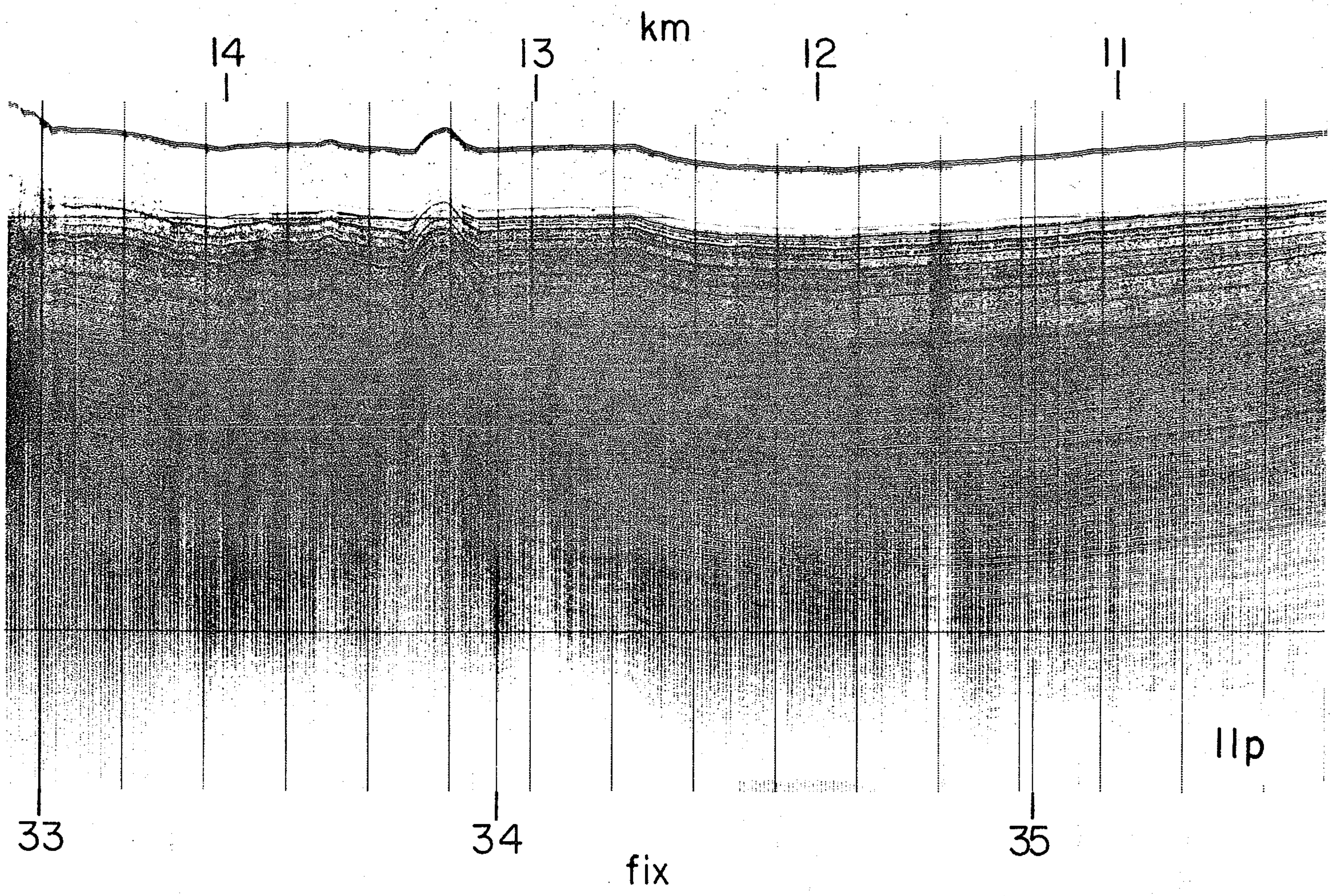
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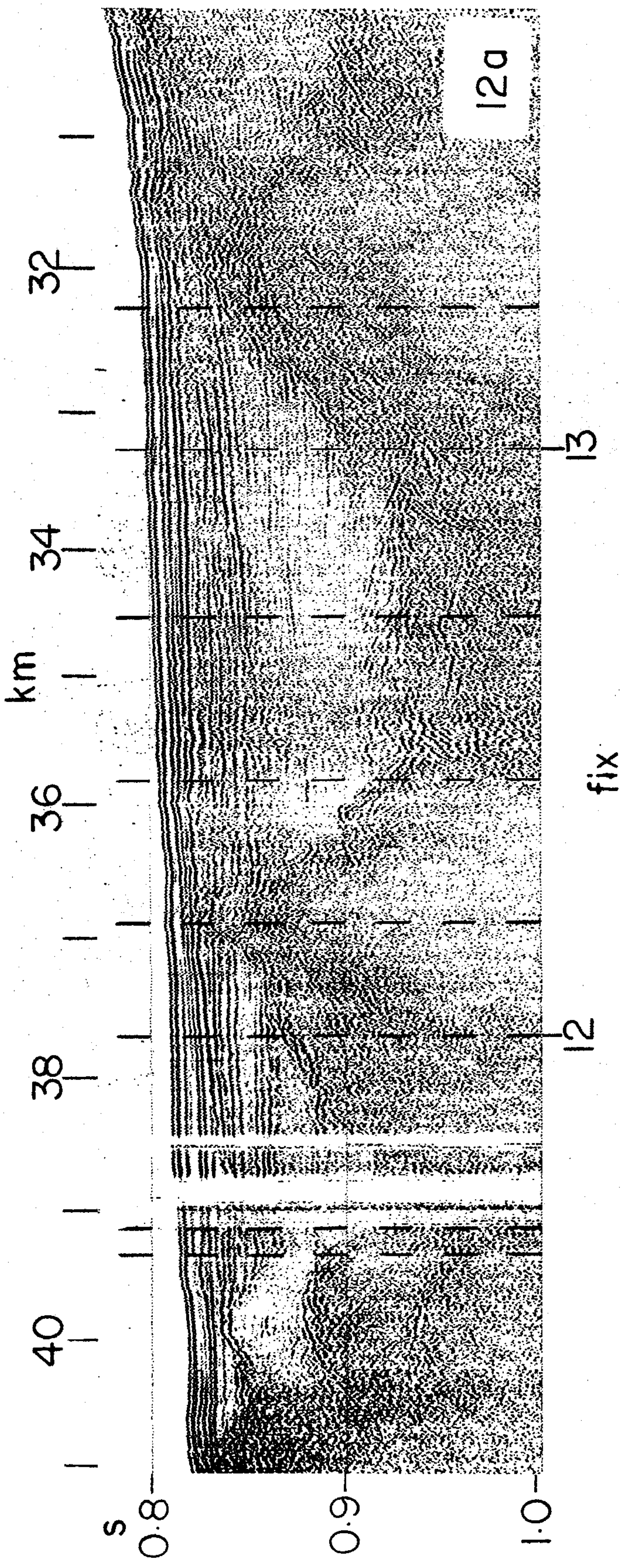
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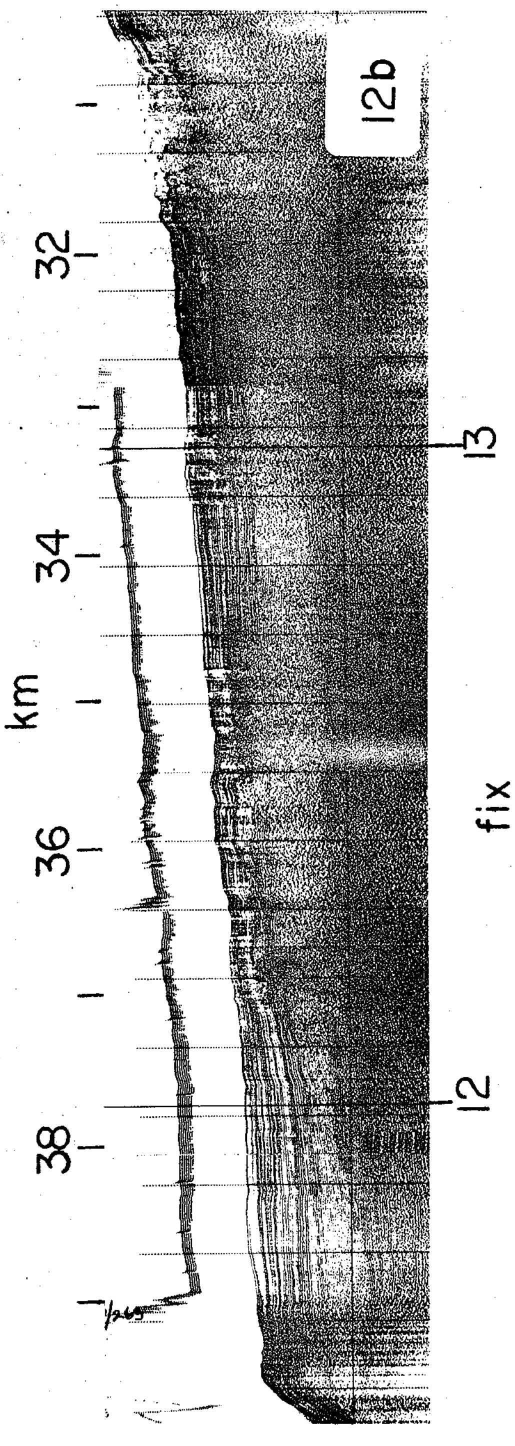
40
km
fix
13
12
s
0.8
0.9
1.0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36
38
km
fix
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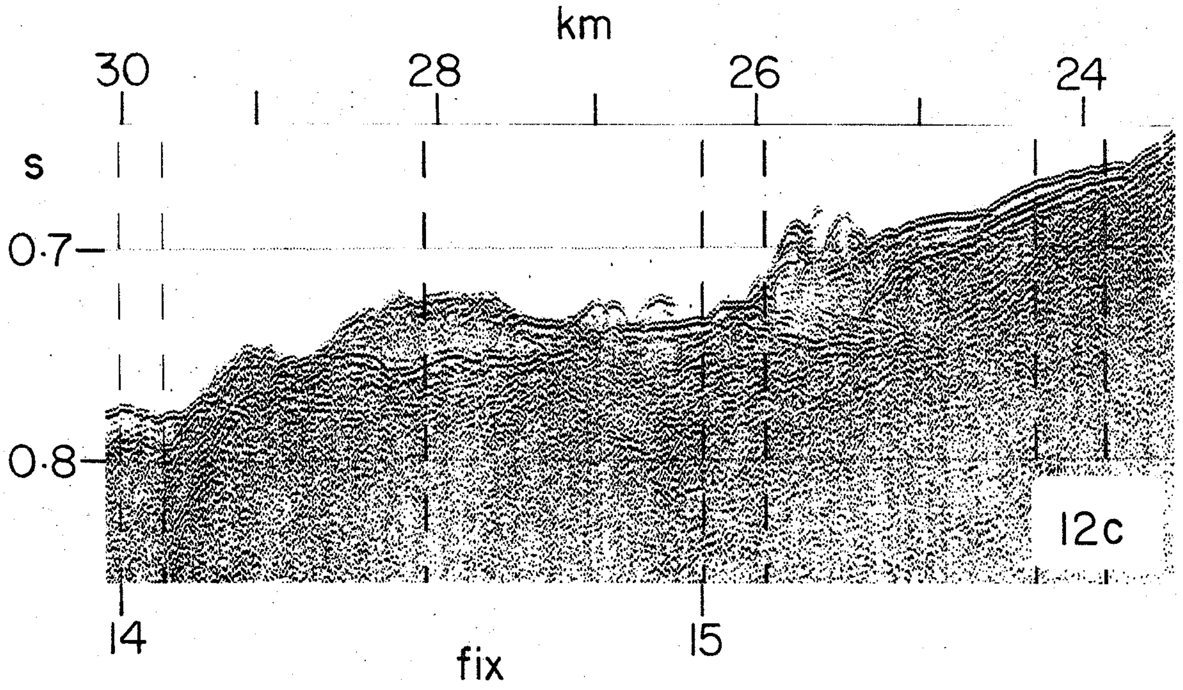
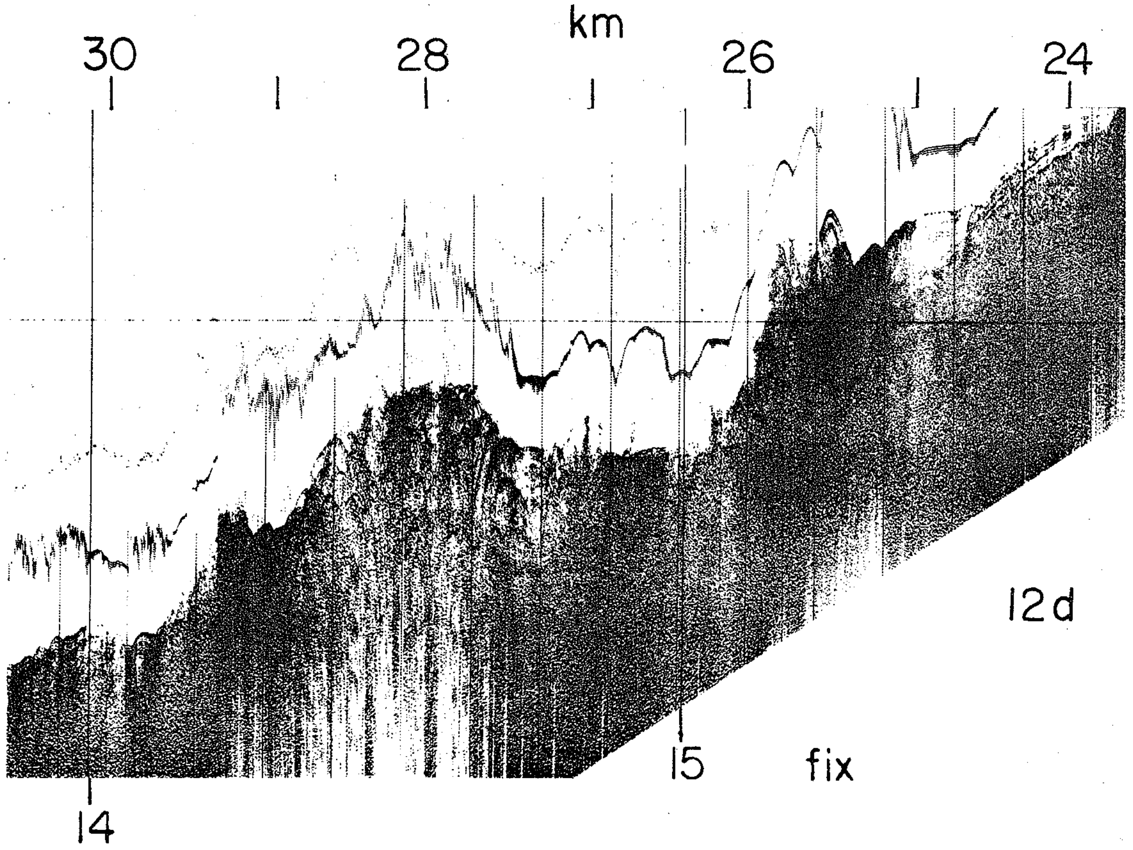
12


km
30
28
26
24
s
0·7
0·8
12c
14
fix
15


km
30
28
26
24
12d
15
fix
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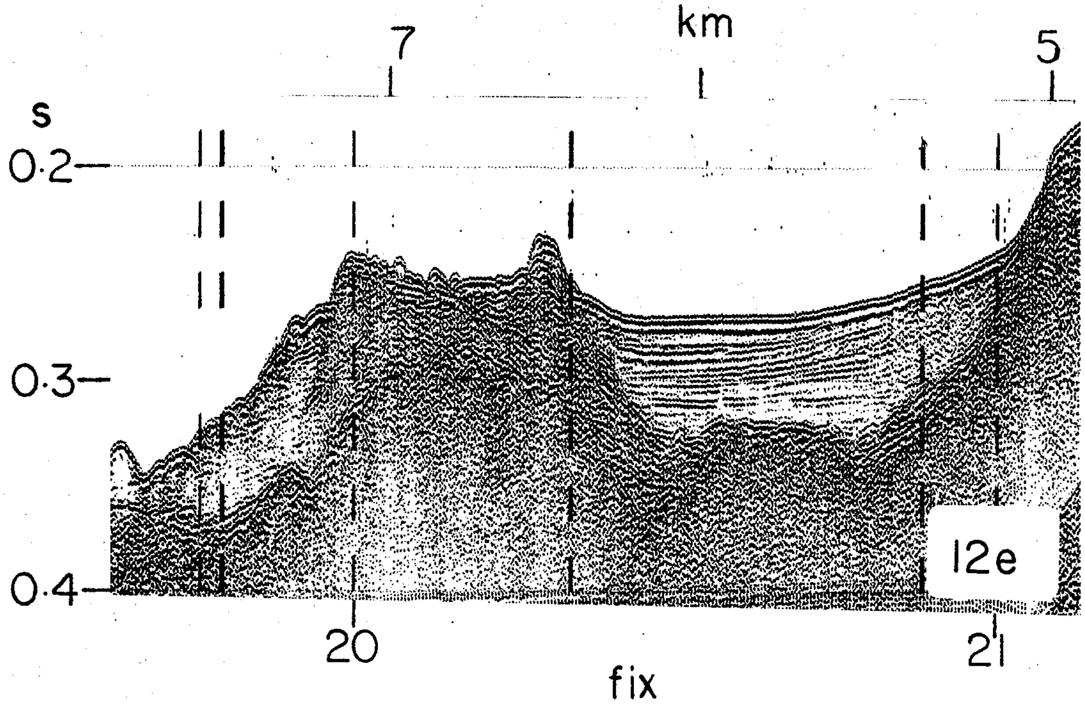
km
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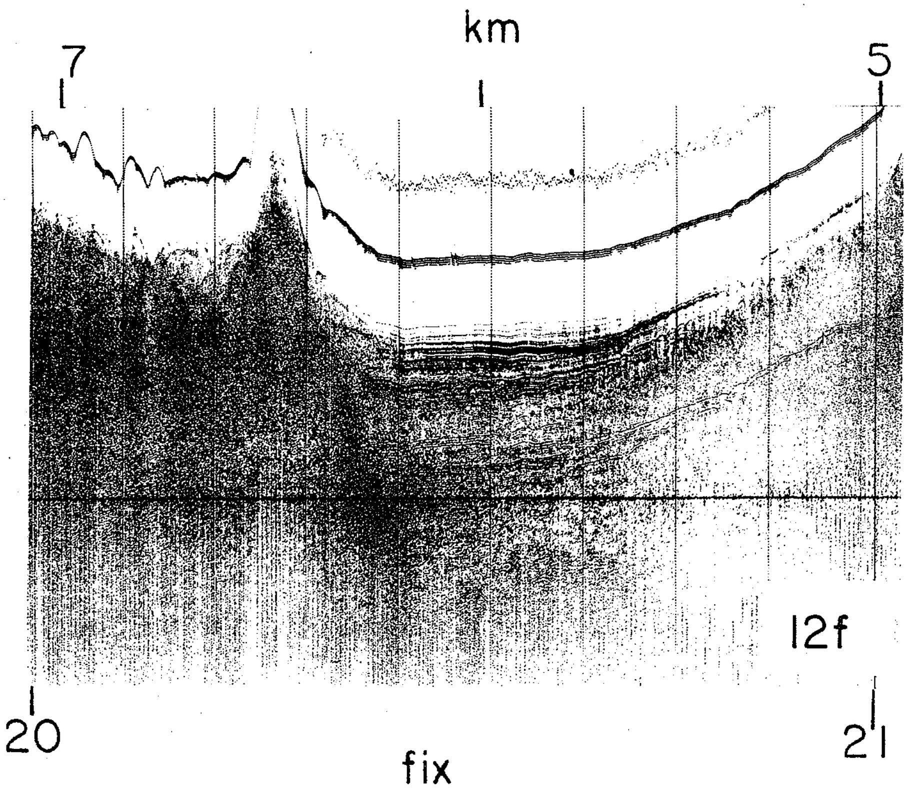
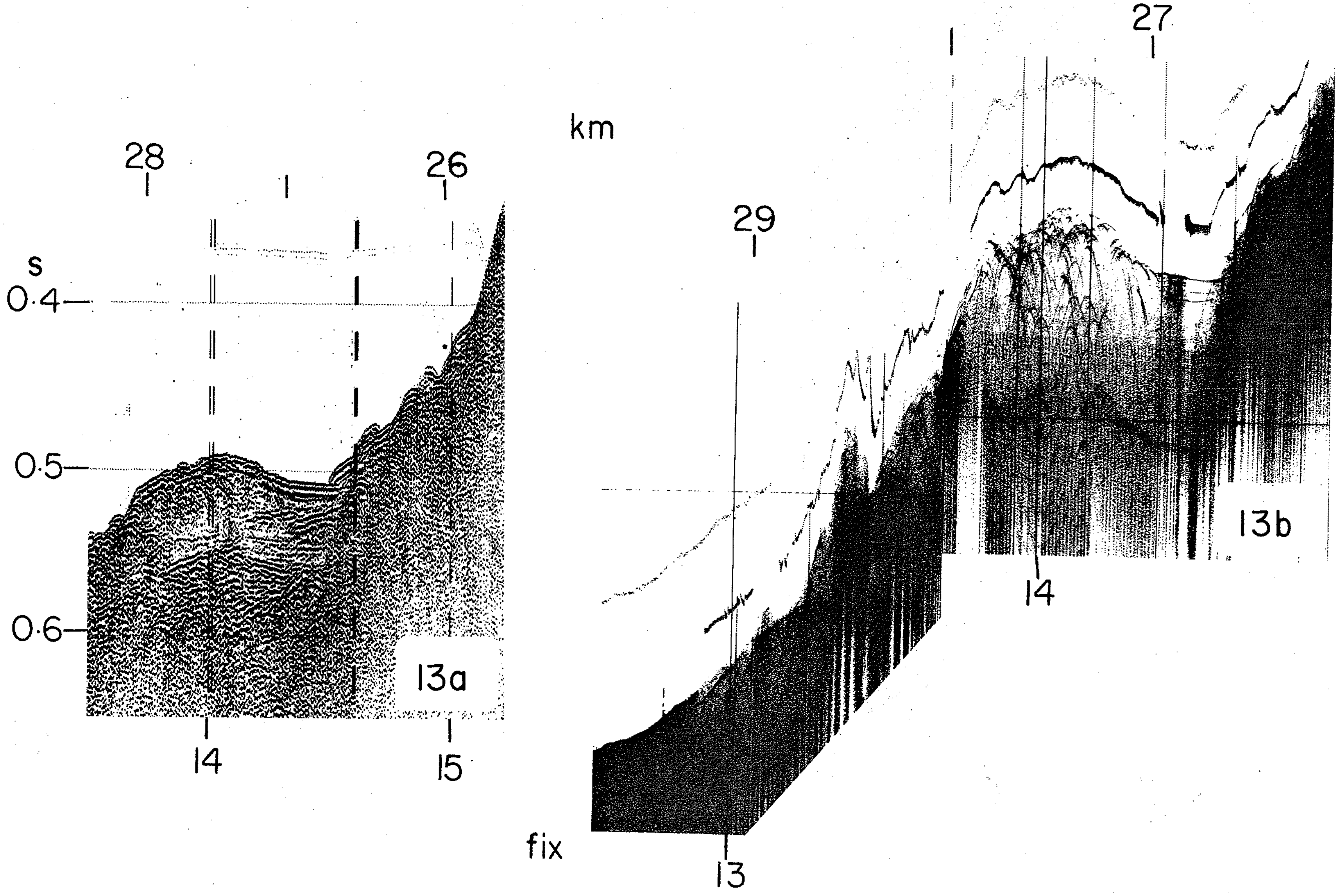
5
s
0·2
0·3
0·4
12e
20
21
fix


km
7
5
12f
20
21
fix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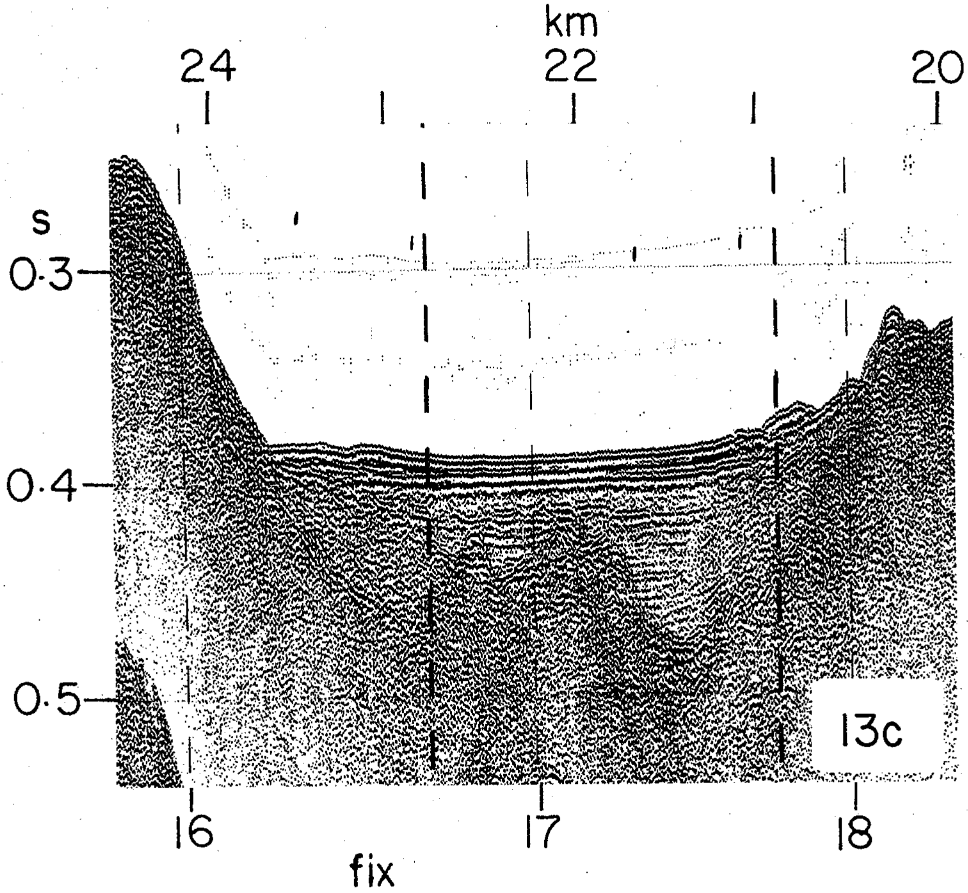
26
s
0·4
0·5
0·6
13a
14
15
km
29
27
14
13b
fix
13



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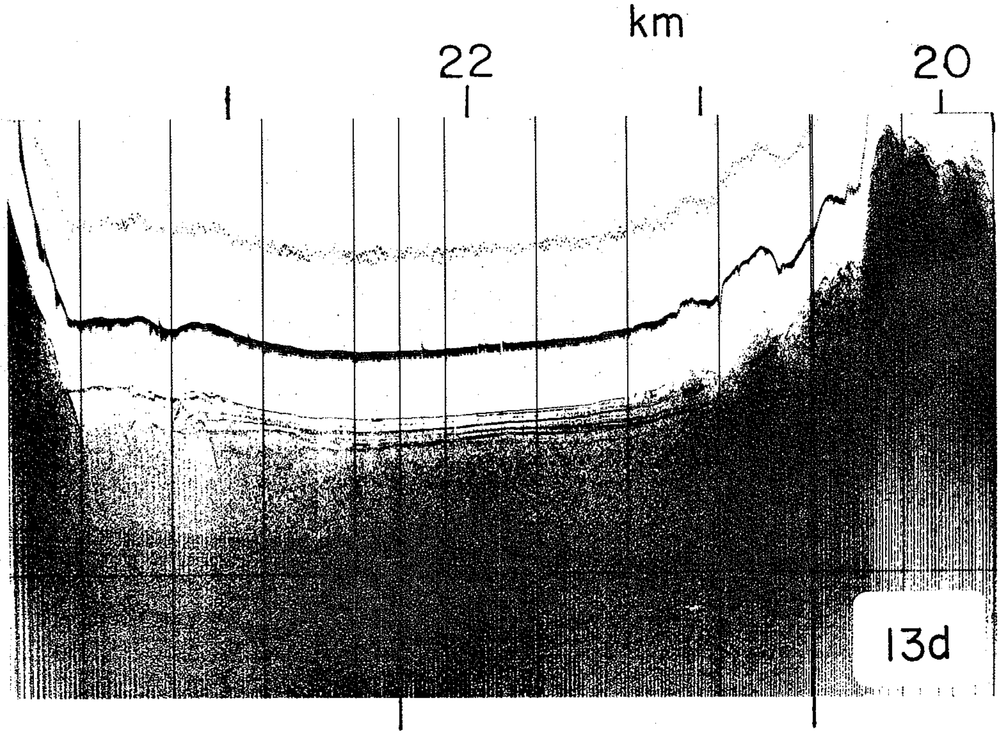

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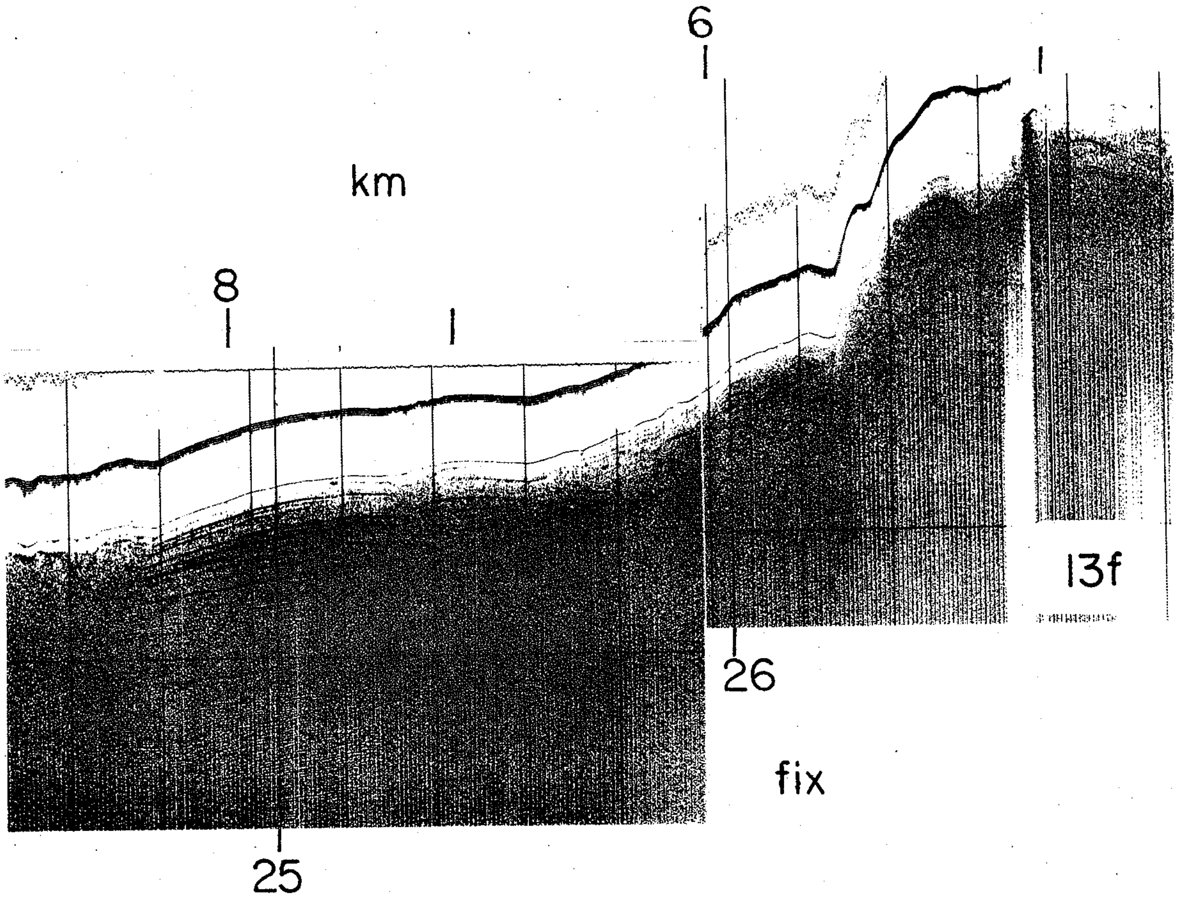

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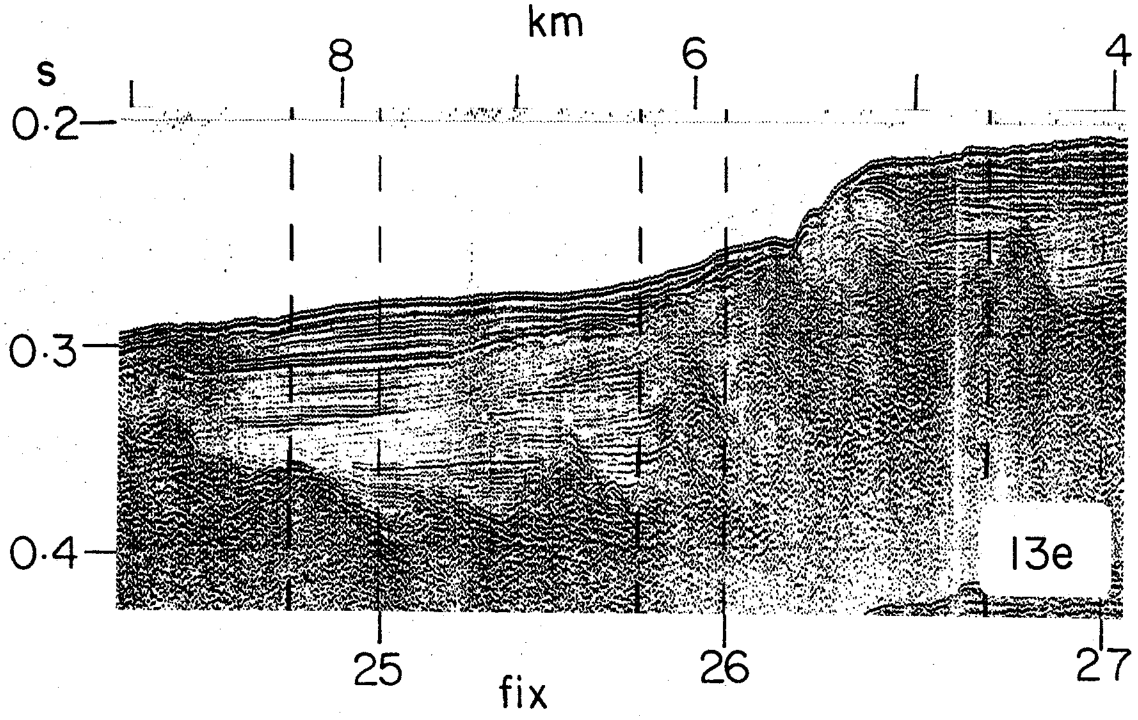

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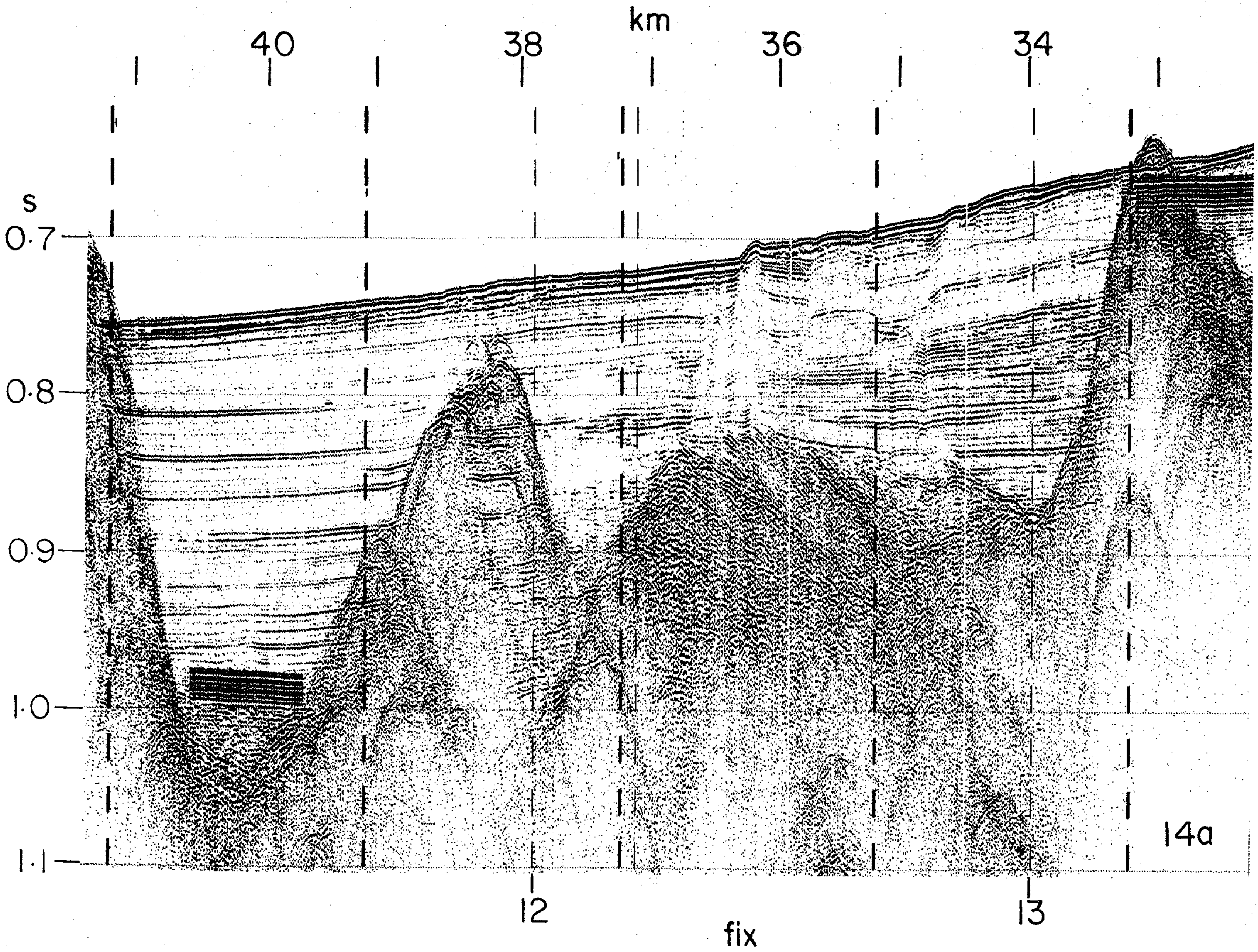
km
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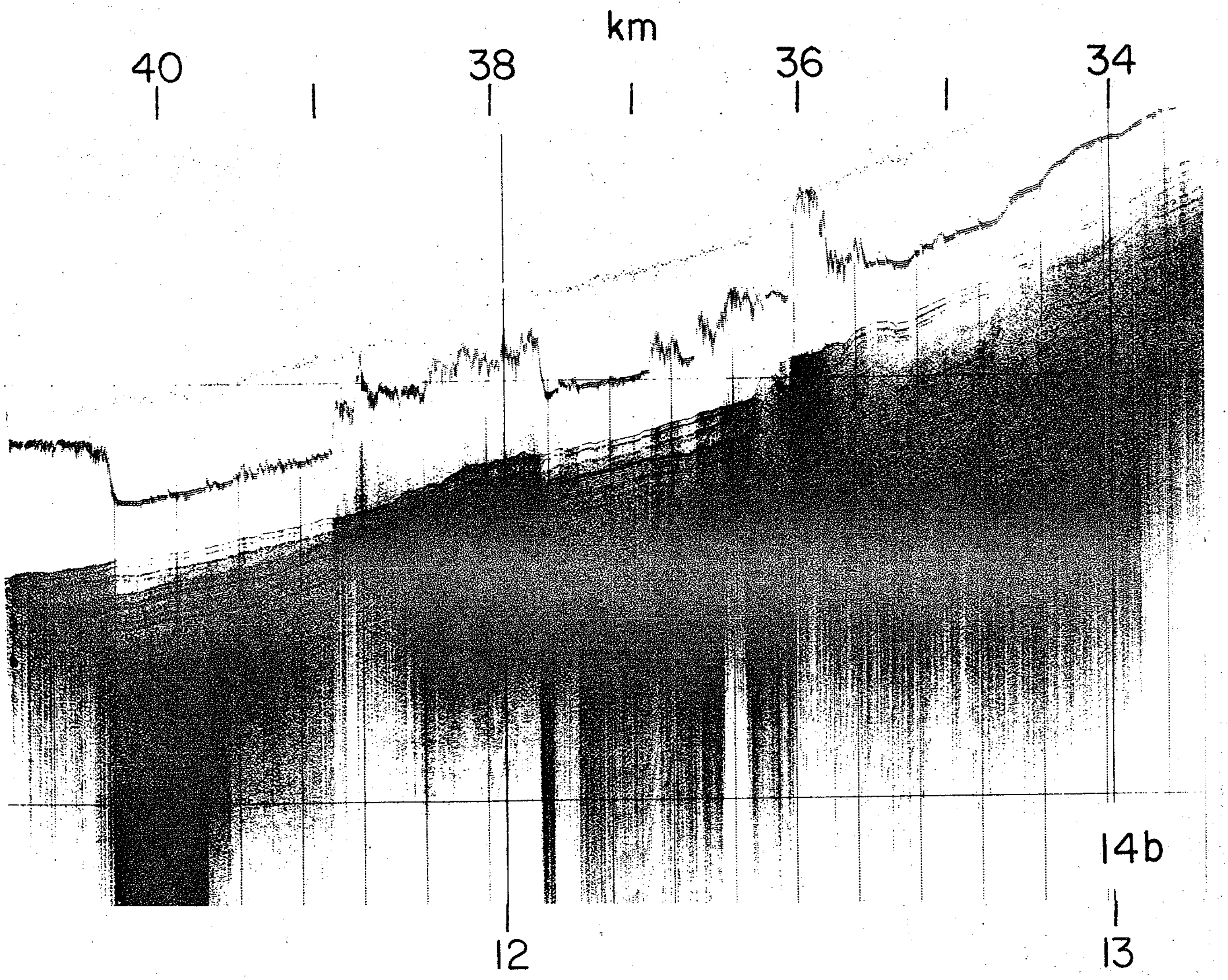
38
36
34
s
0.7
0.8
0.9
1.0
1.1
14a
12
13
fix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38
36
34
14b
12
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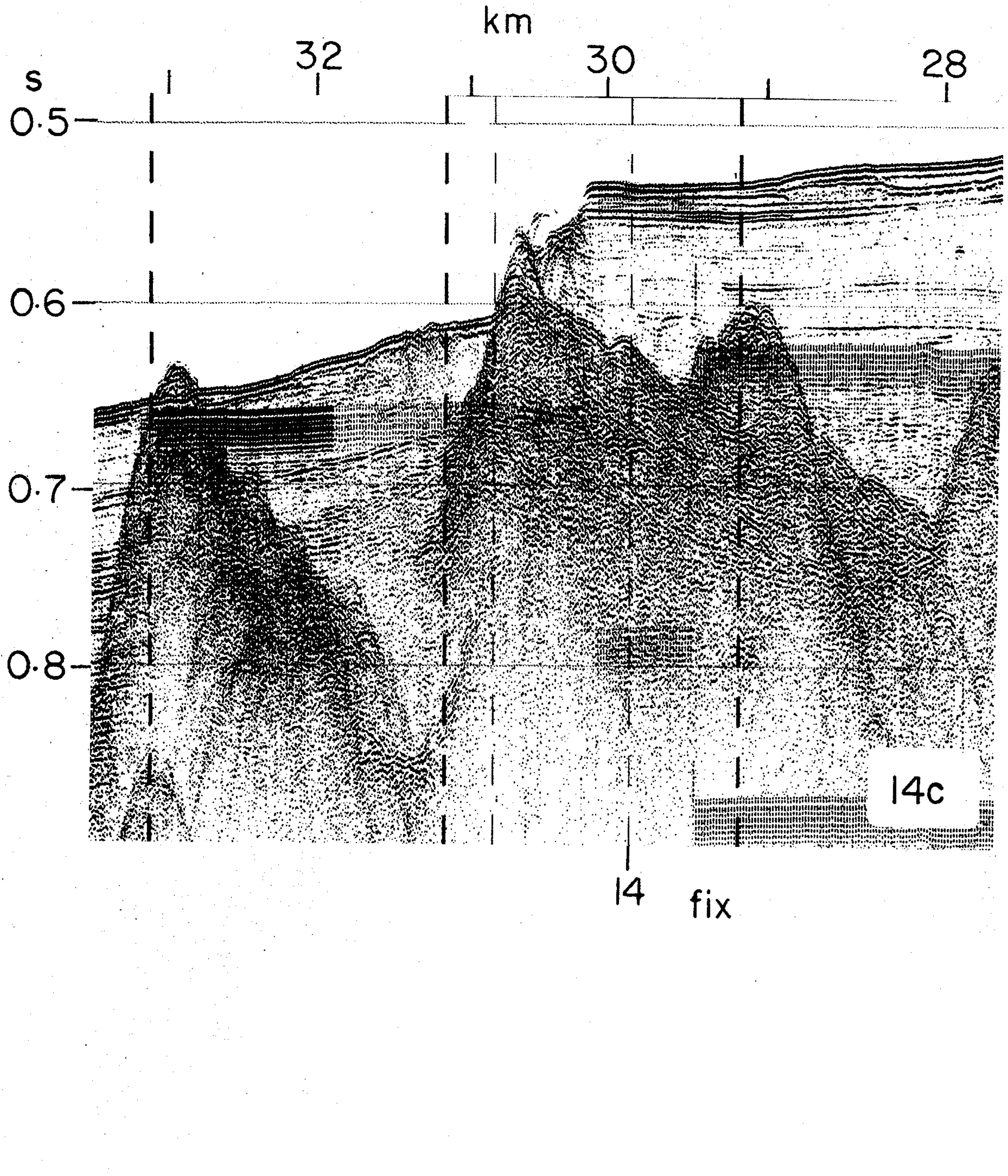
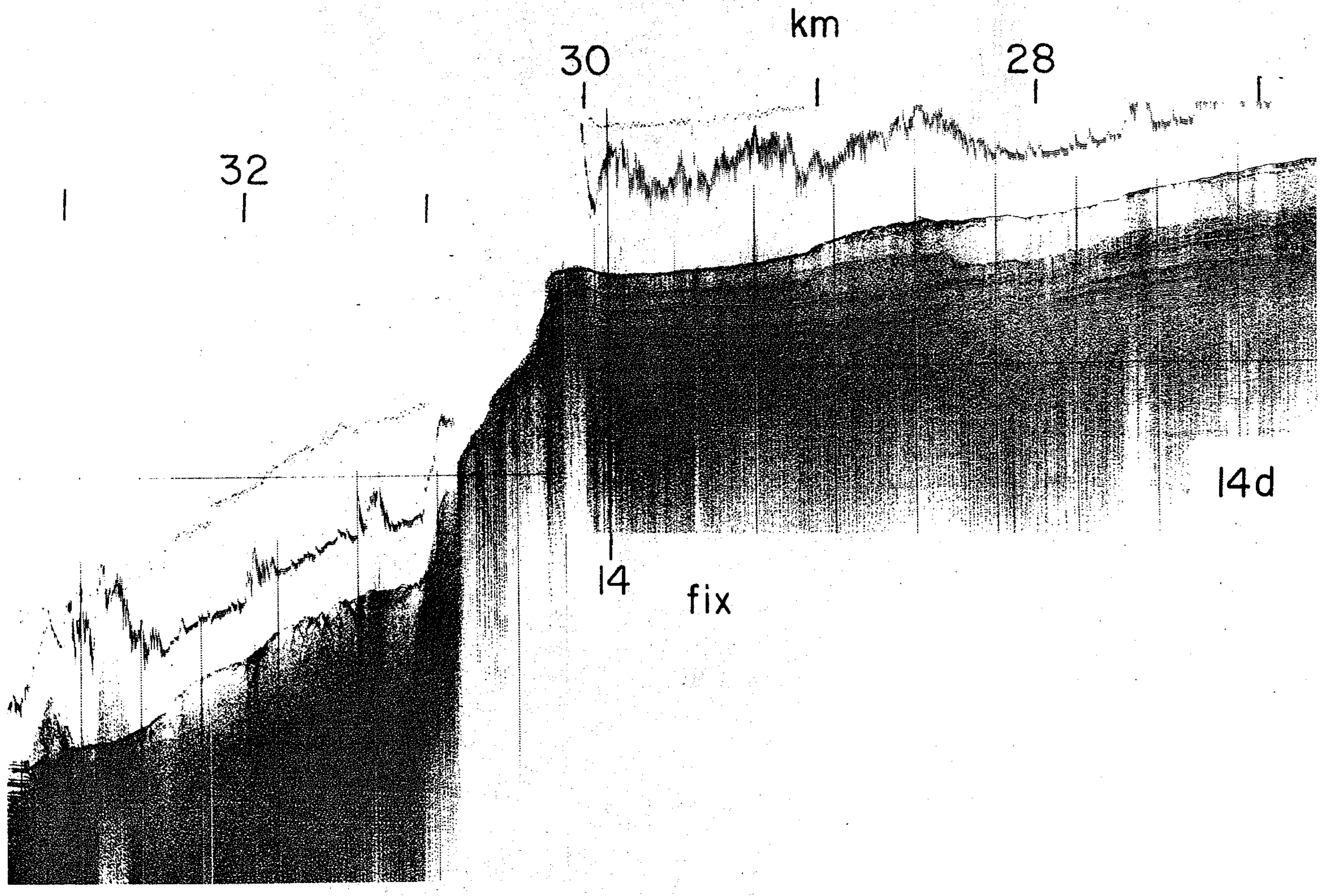
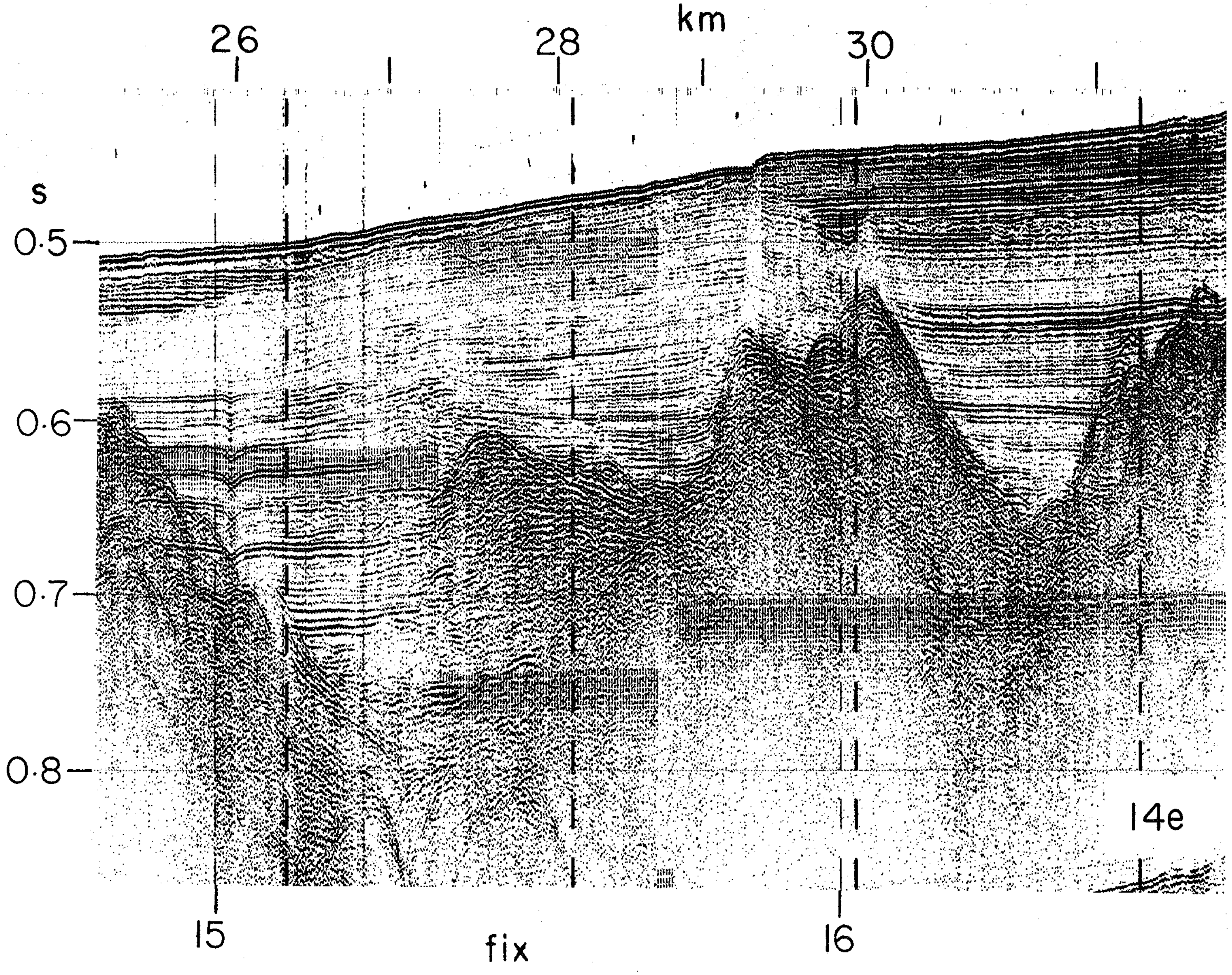
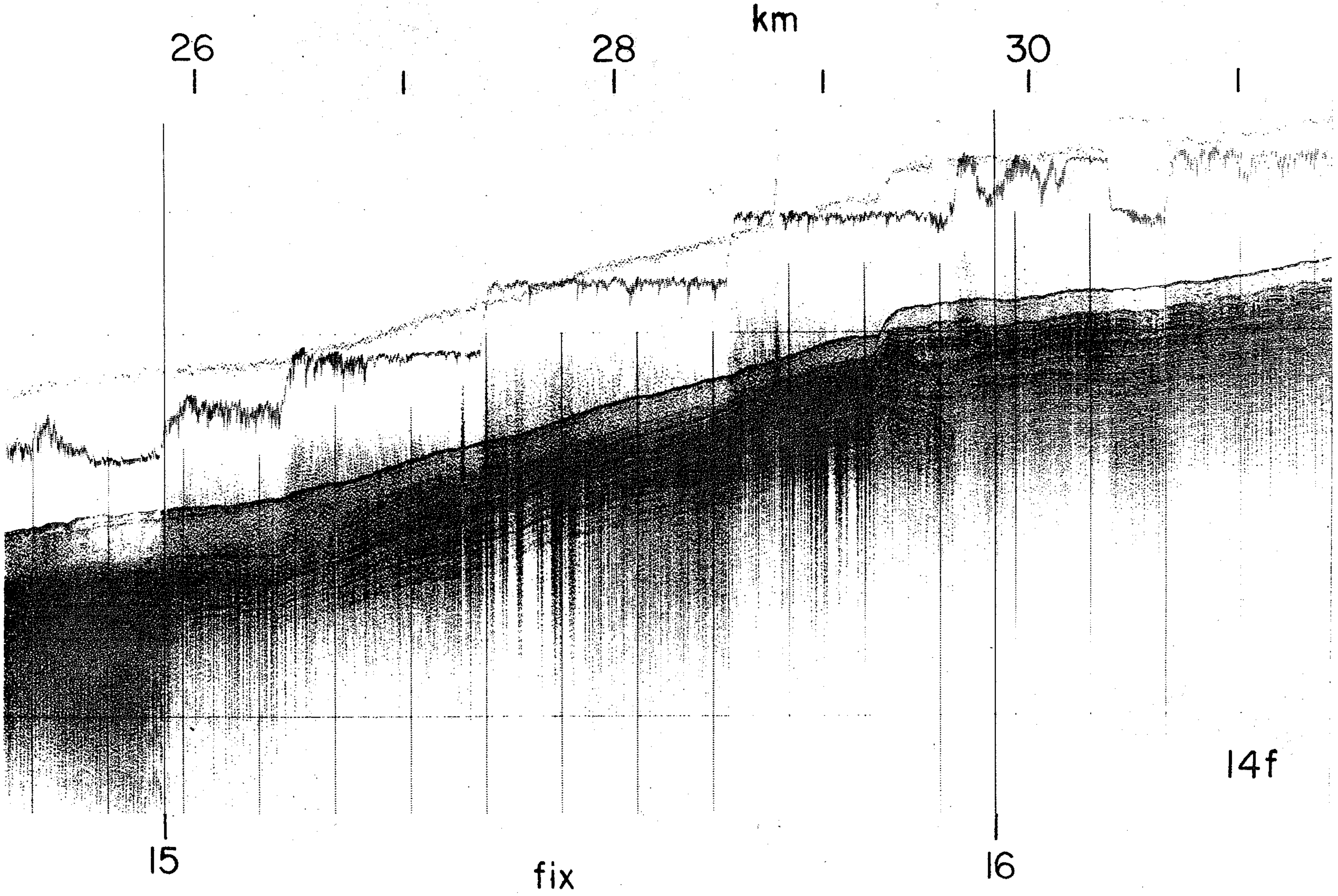
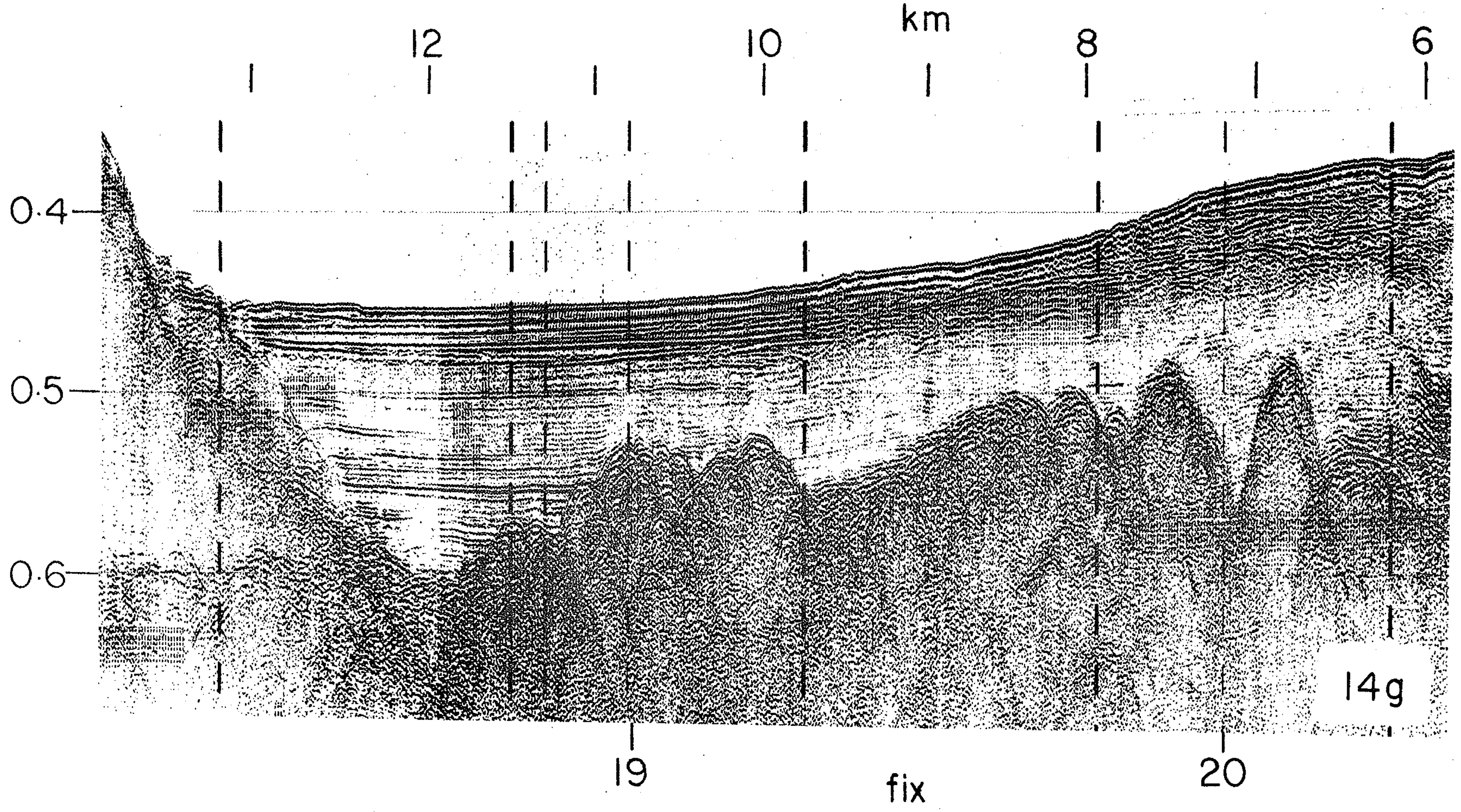

km
32
30
28
s
0·5
0·6
0·7
0·8
14c
14
fix

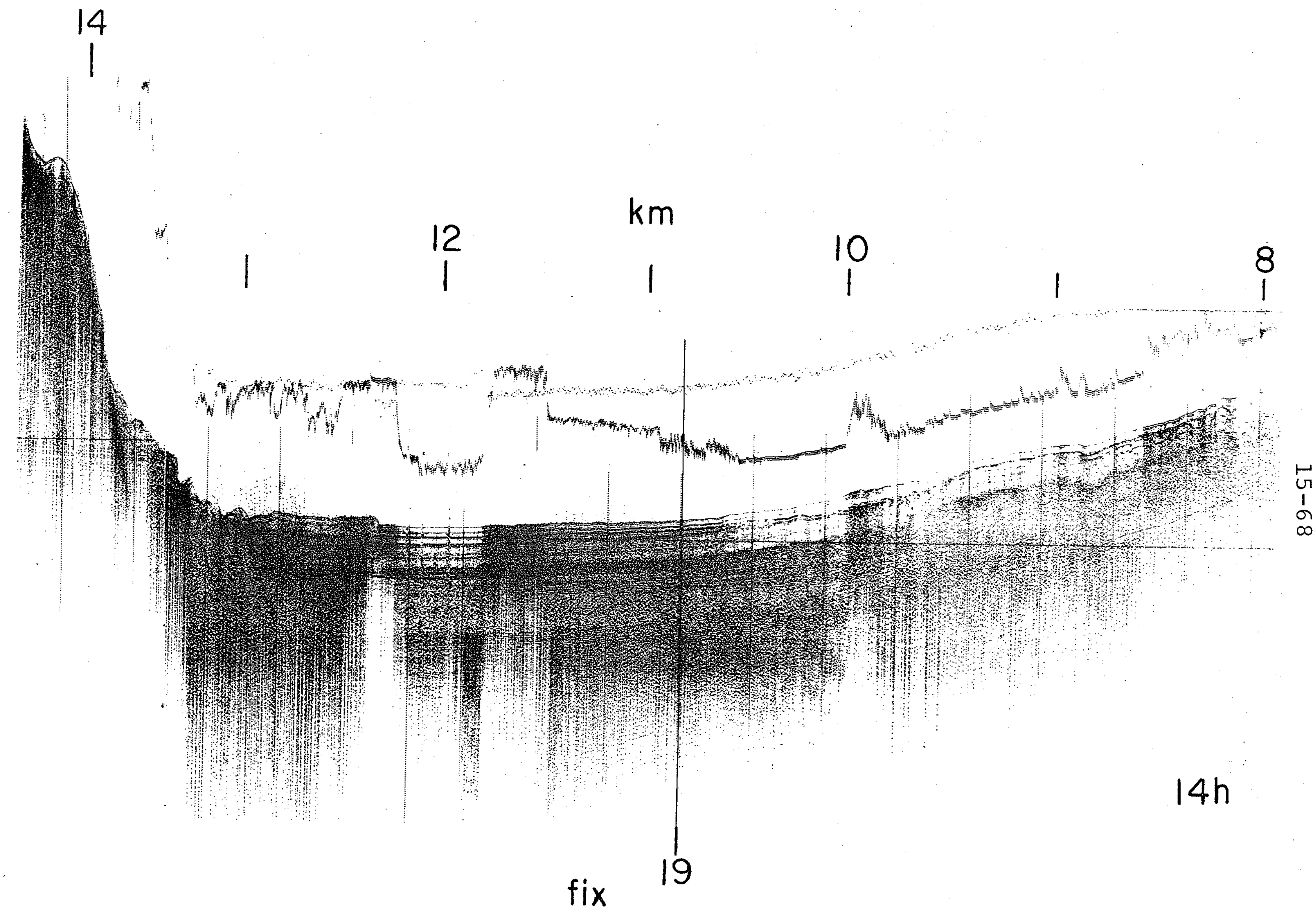

km
30
28
32
14d
14
fix


km
26
28
30
s
0.5
0.6
0.7
0.8
14e
15
fix
16


km
26
28
30
15
fix
16
14f



km
12
10
8
6
0.4
0.5
0.6
14g
19
fix
20


14
12
km
10
8
15-68
14h
19
fix

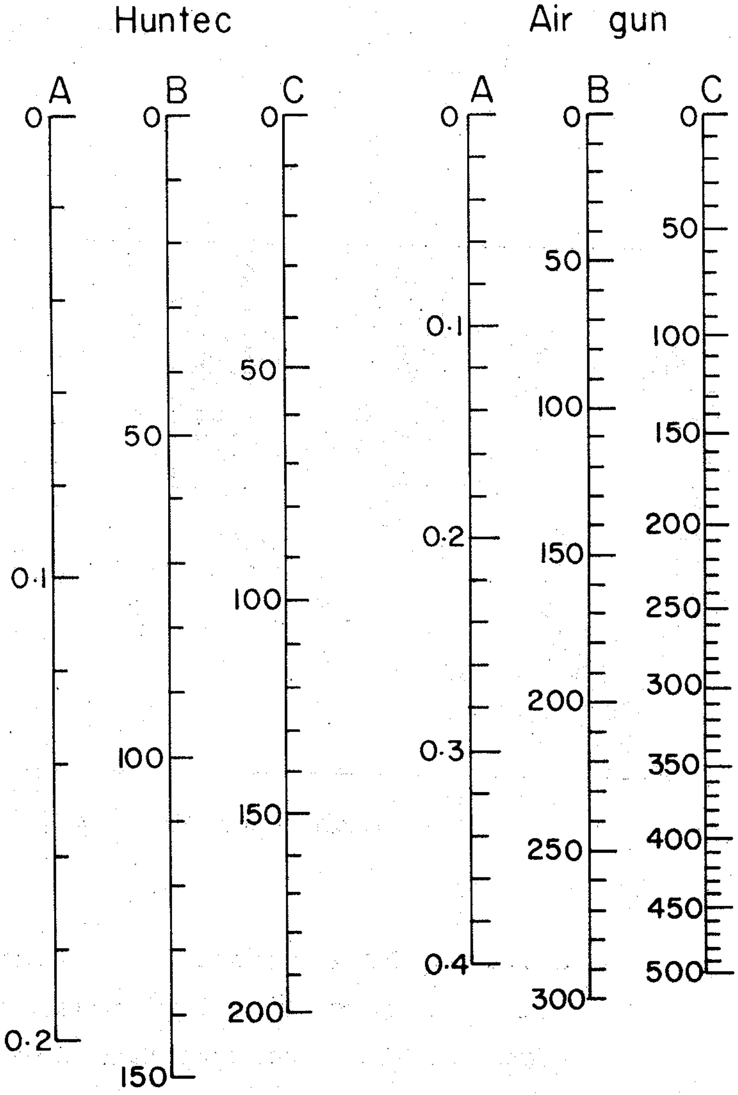


Figure 15: Scales for the Huntec and air gun records shown in Figures 5 to 14. A refers to the two way travel time of sound in seconds, B to the water depth assuming a velocity of sound in water of 1480 m/s, and C to the thickness of sediment. For explanation of the latter, see discussion in the text.

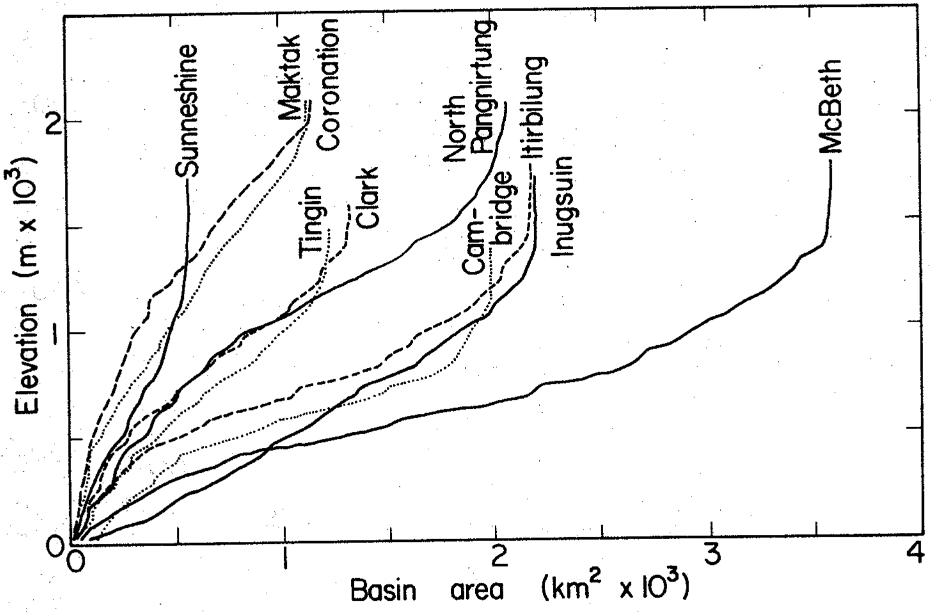


Figure 16. Area-elevation relations for the fiord drainage basins determined from National Topographic Series 1:250 000 maps.

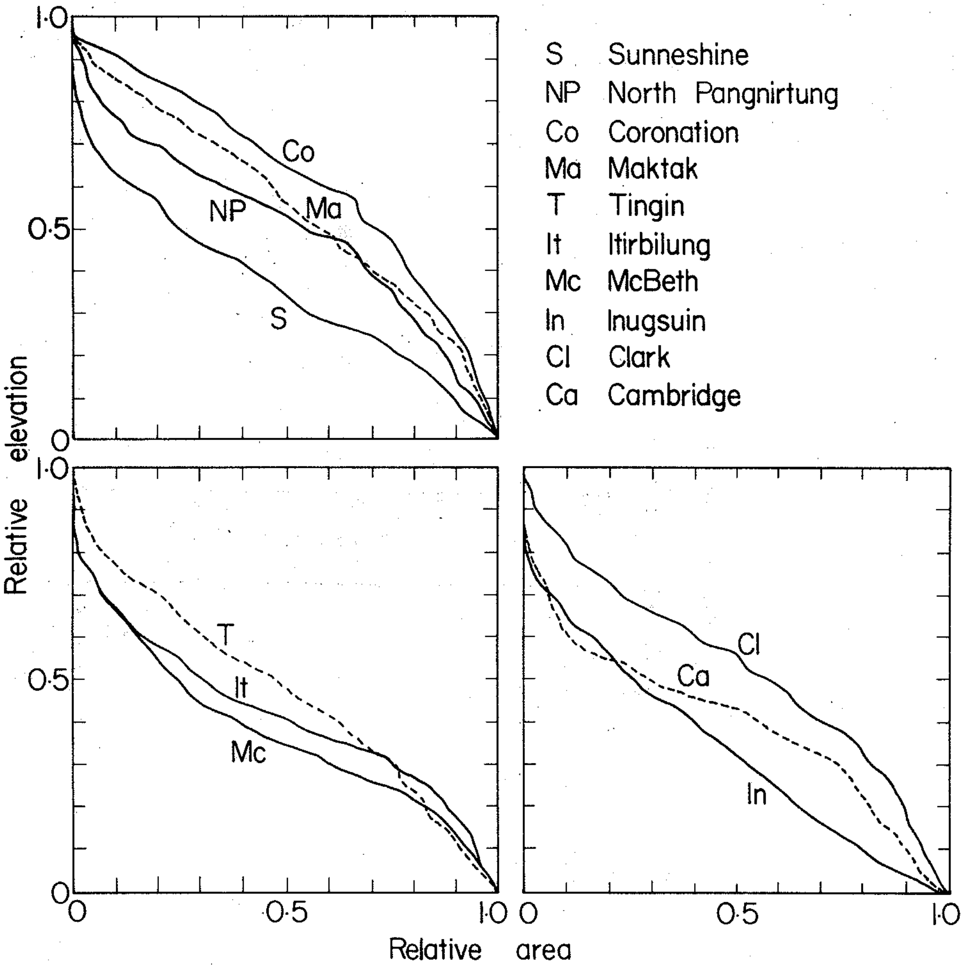


Figure 17. Hypsometric intergals for the fiord drainage basins determined from the data presented in Figure 16

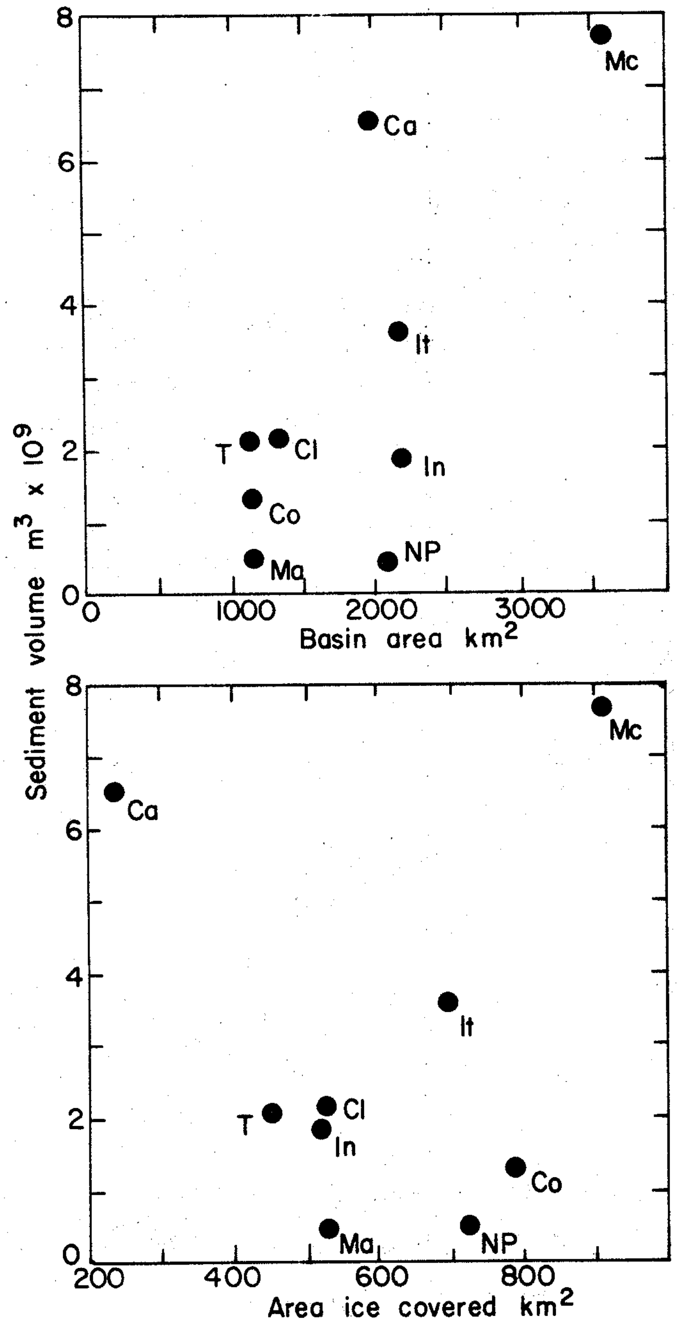


Figure 18. Relation between sediment volume in the fiords and basin area (above) and ice-covered area (below).

APPENDIX I LOCATION OF FIX POINTS ON SEISMIC LINES, FIORD WIDTH FROM N.T.S. MAPS, AND WATER DEPTH, THICKNESS AND VOLUME FROM SEISMIC RECORDS.

SUNNESHINE FIORD

Fix	Dist. from head km	Width km	Depth m	Sediment thickness m	Sediment volume $m^3 * 10^6$
12	22.25	No data from the seismic record			
11	23.83				
10	26.02				
9	28.07				
8	29.52				
7	31.80				
6	34.50				
5	36.62				
4	39.17				
3	42.25				
2	44.20				

NORTH PANGNIRTUNG

Fix	Dist. from head km	Width km	Depth m	Sediment thickness m	Sediment volume $m^3 * 10^6$
51	7.24	2.94	103.	20.	9.
	7.84	2.95	123.	25.	12.
	8.43	2.96	125.	30.	16.
50	9.03	2.97	131.	30.	17.
	9.69	2.99	160.	20.	9.
	10.36	3.01	161.	10.	3.
49	11.02	3.03	167.	10.	3.
	11.64	3.06	185.	20.	8.
	12.26	3.09	192.	10.	3.
48	12.88	3.12	194.	15.	5.
	13.50	3.05	202.	10.	3.
	14.11	2.97	209.	10.	3.
47	14.73	2.90	226.	15.	4.
	15.34	2.89	232.	10.	2.
	15.95	2.88	239.	30.	12.
46	16.56	2.88	247.	15.	4.
	17.14	3.00	257.	10.	2.

	17.73	3.12	262.	12.	3.
45	18.31	3.25	274.	12.	3.
	18.92	3.28	280.	12.	3.
	19.54	3.32	283.	10.	3.
44	20.15	3.35	290.	10.	2.
	20.73	3.37	305.	15.	4.
	21.32	3.38	319.	12.	3.
43	21.90	3.40	109.	20.	11.
	22.50	3.31	341.	10.	2.
	23.10	3.22	349.	20.	6.
42	23.70	3.12	350.	35.	13.
	24.31	3.08	329.	25.	8.
	24.92	3.04	351.	15.	4.
41	25.53	3.00	355.	10.	2.
	26.19	3.17	359.	22.	7.
	26.84	3.33	368.	15.	4.
40	27.50	3.50	368.	32.	13.
	28.12	3.46	368.	25.	9.
	28.73	3.42	369.	28.	10.
39	29.35	3.38	370.	25.	8.
	29.94	3.31	370.	20.	6.
	30.54	3.25	368.	15.	4.
38	31.13	3.19	367.	20.	6.
	31.73	3.25	363.	25.	8.
	32.34	3.31	360.	5.	1.
37	32.94	3.38	343.	0.	0.
	33.61	3.38	341.	5.	1.
	34.27	3.38	337.	0.	0.
36	34.94	3.38	359.	12.	3.
	35.56	3.54	341.	30.	13.
	36.19	3.71	319.	0.	0.
35	36.81	3.88	301.	10.	3.
	37.41	3.83	315.	15.	5.
	38.00	3.79	319.	0.	0.
34	38.60	3.75	334.	10.	3.
	39.20	3.70	337.	40.	19.
	39.80	3.65	339.	40.	19.
33	40.40	3.60	334.	0.	0.
	41.02	3.75	320.	0.	0.
	41.64	3.91	348.	5.	1.
32	42.26	4.06	348.	0.	0.
	42.88	3.92	355.	0.	0.
	43.51	3.77	384.	15.	5.
31	44.13	3.63	381.	30.	11.
	44.71	3.71	386.	15.	4.
	45.30	3.79	390.	15.	4.
30	45.88	3.88	392.	35.	16.
	46.48	4.04	391.	28.	12.
	47.09	4.21	389.	40.	21.
29	47.69	4.37	384.	0.	0.
	48.29	4.42	373.	10.	3.

	48.90	4.46	392.	30.	14.
28	49.50	4.50	399.	10.	3.
	50.08	4.50	384.	0.	0.
	50.67				
27	51.25				

CORONATION FIORD

Fix	Dist. from head km	Width km	Depth m	Sediment thickness m	Sediment volume $m^3 * 10^6$
26	1.63	2.44	152.	130.	80.
	2.19	2.45	163.	120.	72.
	2.75	2.47	175.	110.	63.
25	3.31	2.49	189.	98.	58.
	3.92	2.55	197.	70.	37.
	4.52	2.62	207.	74.	40.
24	5.13	2.69	215.	80.	44.
	5.71	2.63	223.	100.	57.
	6.30	2.56	227.	97.	53.
23	6.88	2.50	231.	85.	43.
	7.46	2.46	233.	75.	35.
	8.05	2.42	238.	73.	33.
22	8.63	2.38	241.	45.	19.
	9.30	2.38	239.	15.	4.
	9.96	2.38	238.	10.	2.
21	10.63	2.38	252.	20.	5.
	11.24	2.37	254.	25.	7.
	11.84	2.37	261.	15.	3.
20	12.45	2.36	262.	30.	9.
	13.03	2.41	265.	25.	7.
	13.61	2.45	268.	40.	14.
19	14.19	2.50	270.	20.	5.
	14.79	2.50	276.	10.	2.
	15.39	2.50	281.	22.	6.
18	15.99	2.50	289.	12.	2.
	16.59	2.58	289.	40.	14.
	17.18	2.67	290.	30.	10.
17	17.78	2.75	300.	15.	4.
	18.37	2.83	305.	20.	6.
	18.95	2.92	310.	28.	9.
16	19.54	3.00	319.	15.	4.
	20.12	3.02	334.	10.	2.
	20.71	3.04	344.	15.	4.
15	21.29	3.06	349.	25.	8.
	21.88	3.10	354.	12.	3.
	22.47	3.15	361.	15.	4.
14	23.06	3.19	361.	20.	5.

	23.62	3.17	370.	20.	5.
	24.19	3.15	376.	14.	3.
13	24.75	3.12	377.	23.	7.
	25.33	3.17	377.	30.	10.
	25.92	3.22	377.	35.	13.
12	26.50	3.28	378.	35.	13.
	27.08	3.48	380.	40.	17.
	27.67	3.68	378.	15.	4.
11	28.25	3.88	364.	0.	0.
	28.87	4.06	348.	0.	0.
	29.48	4.25	363.	0.	0.
10	30.10	4.44	422.	0.	0.
	30.73	4.71	493.	25.	11.
	31.37	4.98	493.	10.	3.
9	32.00	5.25	482.	10.	3.
	32.63	5.20	448.	0.	0.
	33.25	5.15	482.	0.	0.
8	33.88	5.10	508.	10.	3.
	34.47	4.86	521.	0.	0.
	35.05	4.62	526.	15.	5.
7	35.64	4.37	529.	10.	2.
	36.22	4.19	573.	0.	0.
	36.81	4.00	589.	40.	16.
6	37.39	3.81	591.	55.	25.
	37.99	3.73	584.	80.	42.
	38.60	3.65	581.	100.	56.
5	39.20	3.56	562.	0.	0.
	39.80	3.63	595.	20.	5.
	40.41	3.69	602.	50.	21.
4	41.01	3.75	603.	60.	27.
	41.61	3.75	603.	70.	34.
	42.21	3.75	605.	60.	27.
3	42.81	3.75	605.	80.	41.
	43.42	4.17	606.	100.	63.
	44.02	4.58	606.	105.	75.
2	44.63	5.00	544.	0.	0.
	45.15	5.00	290.	0.	0.
	45.67	5.00	225.	0.	0.
1	46.19	5.00	223.	10.	4.

MAKTAK FIORD

Fix	Dist. from head km	Width km	Depth m	Sediment	
				thickness m	volume $m^3 * 10^6$
40	2.25	2.35			
	2.75	2.36	131.	55.	24.
	3.25	2.37	145.	45.	17.

39	3.75	2.38	158.	40.	18.
	4.38	2.36	168.	40.	17.
	5.00	2.35	178.	30.	11.
38	5.63	2.34	189.	35.	13.
	6.25	2.23	197.	55.	24.
	6.88	2.13	204.	70.	31.
37	7.50	2.03	210.	45.	18.
	8.21	1.93	210.	50.	20.
	8.92	1.84	218.	50.	19.
36	9.63	1.75	224.	40.	12.
	10.26	1.67	232.	35.	9.
	10.90	1.58	239.	10.	1.
35	11.53	1.50	248.	25.	5.
	12.15	1.79	261.	50.	15.
	12.78	2.08	265.	60.	22.
34	13.40	2.38	267.	55.	23.
	14.05	2.49	267.	40.	16.
	14.70	2.61	252.	0.	0.
33	15.35	2.72	262.	30.	11.
	15.99	2.37	267.	40.	15.
	16.62	2.01	265.	30.	8.
32	17.26	1.65	268.	50.	14.
	17.92	1.85	265.	10.	2.
	18.57	2.05	218.	0.	0.
31	19.23	2.25	218.	0.	0.
	19.86	2.46	268.	10.	2.
	20.50	2.67	279.	15.	4.
30	21.13	2.88	294.	27.	9.
	21.75	2.71	312.	10.	2.
	22.38	2.54	328.	30.	9.
29	23.00	2.38	331.	70.	31.
	23.67	2.46	334.	55.	23.
	24.33	2.54	334.	8.	1.
28	25.00	2.63	319.	0.	0.
	25.65	1.75	218.	0.	0.
	26.29	0.88	319.	0.	0.
27	26.94		377.	20.	
	27.96		457.	0.	
	28.98		500.	60.	
9	30.00		500.	30.	
	30.63		407.	0.	
	31.27		446.	10.	
8	31.90		482.	15.	
	32.48		492.	10.	
	33.07		494.	10.	
7	33.65		504.	10.	

TINGIN FIORD

Fix	Dist. from head km	Width km	Depth m	Sediment	
				thickness m	volume $m^3 * 10^6$
27	5.85	1.87	167.	20.	5.
	6.48	1.81	180.	30.	9.
	7.12	1.75	183.	85.	35.
26	7.75	1.69	194.	60.	23.
	8.46	1.78	207.	40.	14.
	9.17	1.88	207.	60.	25.
25	9.88	1.98	218.	60.	24.
	10.54	2.07	228.	60.	25.
	11.19	2.16	225.	0.	0.
24	11.85	2.25	294.	55.	21.
	12.48	2.25	294.	75.	32.
	13.12	2.25	301.	105.	51.
23	13.75	2.25	312.	73.	32.
	14.42	2.38	319.	88.	43.
	15.08	2.50	319.	0.	0.
22	15.75	2.63	337.	25.	7.
	16.38	2.79	341.	60.	27.
	17.02	2.96	348.	90.	51.
21	17.65	3.12	353.	75.	45.
	18.34	3.17	355.	30.	12.
	19.04	3.21	355.	80.	51.
20	19.73	3.25	357.	70.	40.
	20.39	3.17	363.	90.	56.
	21.04	3.08	363.	10.	2.
19	21.70	3.00	365.	70.	38.
	22.37	2.96	366.	90.	53.
	23.04	2.92	366.	35.	13.
18	23.71	2.88	355.	30.	11.
	24.39	2.96	334.	30.	12.
	25.07	3.04	308.	0.	0.
17	25.75	3.12	341.	10.	2.
	26.40	3.46	363.	0.	0.
	27.04	3.79	370.	70.	46.
16	27.69	4.13	435.	100.	84.
	28.40	4.00	450.	110.	92.
	29.10	3.88	458.	120.	100.
15	29.81	3.75	464.	110.	77.
	30.45	3.63	471.	70.	39.
	31.10	3.50	477.	120.	81.
14	31.74	3.38	484.	40.	17.
	32.41	3.60	487.	45.	21.
	33.08	3.83	482.	0.	0.

13	33.75	4.06	435.	0.	0.
	34.42	4.33	457.	0.	0.
	35.08	4.60	399.	0.	0.
12	35.75	4.88	515.	80.	67.
	36.45	5.08	516.	130.	138.
	37.15	5.29	518.	60.	48.
11	37.85	5.50	518.	70.	57.
	38.49	5.56	518.	80.	70.
	39.14	5.62	518.	80.	71.
10	39.78	5.69	519.	93.	90.
	40.44	5.92	517.	78.	73.
	41.09	6.15	517.	68.	62.
9	41.75	6.38	516.	64.	61.
	42.43	6.46	515.	40.	31.
	43.10	6.54	511.	20.	11.
8	43.78	6.63	493.	10.	4.
	44.44	6.46	465.	0.	0.
	45.09	6.29	399.	0.	0.
7	45.75	6.13	399.	0.	0.
	46.42		392.	0.	
	47.08		366.	0.	
6	47.75		268.	0.	
	48.43		232.	33.	
	49.10		181.	10.	
5	49.78		167.	0.	
	50.44		189.	0.	
	51.09		228.	0.	
4	51.75		268.	20.	
	52.42		294.	30.	
	53.08		286.	15.	
3	53.75		290.	30.	
	54.43		294.	20.	
	55.12		250.	20.	
2	55.80		247.	0.	
	56.49		283.	60.	
	57.19		283.	0.	
1	57.88		326.	40.	

ITIRBILUNG FIORD

Fix	Dist. from head km	Width km	Depth m	Sediment	
				thickness m	volume $m^3 * 10^6$
35	7.50	1.38			
	8.13	1.75			
	8.77	2.13	164.	165.	105.
34	9.40	2.50	160.	130.	91.
	10.03	2.41	156.	80.	47.
	10.65	2.32	163.	130.	84.

33	11.28	2.22	181.	0.	0.
	11.93	2.33	123.	20.	8.
	12.58	2.43	254.	50.	21.
32	13.23	2.53	262.	140.	96.
	13.92	2.55	276.	155.	109.
	14.61	2.58	294.	130.	86.
31	15.30	2.61	297.	100.	50.
	15.87	2.50	303.	60.	23.
	16.43	2.39	318.	90.	38.
30	17.00	2.28	324.	170.	101.
	17.67	2.40	325.	184.	118.
	18.33	2.53	331.	200.	138.
29	19.00	2.66	335.	160.	97.
	19.60	2.59	339.	140.	78.
	20.20	2.51	339.	120.	62.
28	20.80	2.44	337.	70.	26.
	21.35	2.49	325.	45.	14.
	21.89	2.55	315.	45.	15.
27	22.44	2.60	328.	90.	47.
	23.09	2.65	337.	80.	40.
	23.73	2.70	359.	35.	12.
29	24.38	2.75	386.	55.	21.
	24.98	2.67	396.	120.	62.
	25.58	2.58	400.	140.	74.
25	26.18	2.50	402.	162.	100.
	26.87	2.54	402.	140.	83.
	27.56	2.58	404.	150.	93.
24	28.25	2.63	405.	100.	42.
	28.79	2.81	400.	85.	36.
	29.34	3.00	397.	80.	36.
23	29.88	3.19	397.	70.	41.
	30.60	3.12	392.	70.	41.
	31.31	3.06	395.	70.	40.
22	32.03	3.00	404.	70.	29.
	32.57	3.01	406.	80.	35.
	33.11	3.03	413.	85.	38.
21	33.65	3.04	413.	85.	41.
	34.23	3.05	415.	70.	31.
	34.80	3.05	415.	45.	17.
20	35.38	3.06	413.	70.	33.
	35.98	3.08	413.	50.	20.
	36.59	3.10	417.	90.	47.
19	37.19	3.12	421.	100.	59.
	37.84	3.17	424.	100.	60.
	38.48	3.21	425.	90.	52.
18	39.13	3.25	425.	90.	52.
	39.76	3.26	425.	105.	64.
	40.40	3.27	423.	100.	60.
17	41.03	3.28	422.	86.	48.
	41.65	3.35	417.	80.	44.
	42.26	3.43	410.	70.	38.

16	42.88	3.50	397.	85.	51.
	43.50	3.54	384.	72.	42.
	44.11	3.58	378.	52.	27.
15	44.73	3.63	366.	40.	19.
	45.36	3.88	352.	80.	56.
	46.00	4.13	354.	80.	60.
14	46.63	4.37	354.	90.	74.
	47.25	4.29	359.	80.	61.
	47.88	4.21	359.	70.	49.
13	48.50	4.13	344.	70.	46.
	49.08	4.04	326.	48.	27.
	49.67	3.96	313.	30.	14.
12	50.25	3.88	294.	25.	12.
	50.92	4.16	312.	30.	16.
	51.58	4.44	277.	40.	28.
11	52.25	4.72	265.	15.	7.
	52.90	4.76	232.	25.	16.
	53.54	4.79	225.	10.	4.
10	54.19	4.82	228.	25.	16.
	54.84	5.17	262.	20.	12.
	55.48	5.52	274.	20.	12.
9	56.13	5.88	278.	20.	13.
	56.75		283.	5.	
	57.38		265.	15.	
8	58.00		247.	10.	
	58.63		305.	0.	
	59.25		334.	10.	
7	59.88		326.	30.	
	60.55		308.	20.	
	61.21		299.	15.	
6	61.88		265.	0.	
	62.50		247.	0.	
	63.13		189.	0.	
5	63.75		268.	0.	
	64.38		326.	0.	
	65.00		363.	0.	
4	65.63		334.	0.	
	66.23		348.	0.	
	66.84		381.	0.	
3	67.44		421.	0.	
	68.09		446.	0.	
	68.73		439.	0.	
2	69.38		464.	0.	
	70.00		508.	0.	
	70.63		518.	60.	
1	71.25		518.	80.	

McBETH FIORD:

Fix	Dist. from head km	Width km	Depth m	Sediment thickness m	Sediment volume $m^3 * 10^6$
37	7.38	2.38	273.	160.	97.
	8.01	2.47	286.	145.	87.
	8.63	2.56	301.	120.	68.
36	9.26	2.65	315.	140.	94.
	9.94	2.52	325.	170.	114.
	10.63	2.38	328.	185.	121.
35	11.31	2.25	329.	200.	113.
	11.92	2.33	329.	190.	110.
	12.54	2.42	329.	150.	83.
34	13.15	2.50	330.	105.	56.
	13.80	2.17	329.	175.	97.
	14.45	1.83	329.	130.	55.
33	15.10	1.50	109.	70.	29.
	15.77	1.79	315.	70.	24.
	16.43	2.08	296.	110.	53.
32	17.10	2.38	260.	125.	71.
	17.73	2.21	254.	110.	56.
	18.37	2.04	252.	75.	31.
31	19.00	1.87	234.	40.	13.
	19.67	2.08	109.	0.	0.
	20.33	2.28	160.	100.	63.
30	21.00	2.47	174.	10.	2.
	21.63	2.44	174.	40.	18.
	22.27	2.41	167.	0.	0.
29	22.90	2.38	305.	55.	21.
	23.52	2.67	319.	110.	61.
	24.14	2.96	328.	135.	89.
28	24.76	3.25	320.	195.	171.
	25.42	3.00	319.	220.	185.
	26.07	2.75	326.	150.	101.
27	26.73	2.50	348.	70.	32.
	27.40	2.56	370.	135.	80.
	28.06	2.63	388.	150.	92.
26	28.73	2.69	399.	150.	90.
	29.37	2.71	411.	155.	94.
	30.01	2.73	413.	180.	115.
25	30.65	2.75	413.	160.	96.
	31.27	2.85	425.	180.	115.
	31.88	2.96	436.	130.	76.
24	32.50	3.06	236.	100.	69.
	33.12	2.99	470.	90.	44.
	33.73	2.92	479.	140.	80.

23	34.35	2.85	489.	290.	213.
	34.98	3.00	497.	297.	230.
	35.62	3.16	500.	235.	177.
22	36.25	3.31	504.	70.	36.
	36.92	3.46	500.	0.	0.
	37.58	3.60	499.	100.	65.
21	38.25	3.75	513.	160.	123.
	38.88	3.72	523.	200.	165.
	39.52	3.68	529.	230.	197.
20	40.15	3.65	535.	180.	146.
	40.81	3.60	537.	60.	30.
	41.48	3.55	538.	160.	120.
19	42.14	3.50	540.	190.	152.
	42.81	3.58	542.	150.	114.
	43.48	3.67	544.	150.	114.
18	44.15	3.75	544.	160.	123.
	44.79	3.81	542.	180.	147.
	45.44	3.88	542.	190.	161.
17	46.08	3.94	542.	100.	66.
	46.71	3.96	537.	60.	32.
	47.35	3.98	515.	40.	18.
16	47.98	4.00	515.	50.	23.
	48.55	4.21	521.	130.	93.
	49.12	4.42	522.	180.	153.
15	49.69	4.63	523.	190.	196.
	50.34	4.75	523.	140.	132.
	50.98	4.88	522.	110.	96.
14	51.63	5.00	521.	90.	73.
	52.26	4.96	518.	50.	31.
	52.90	4.92	493.	15.	5.
13	53.53	4.88	529.	10.	2.
	54.07	4.92	537.	70.	42.
	54.60	4.96	544.	100.	70.
12	55.14	5.00	545.	120.	118.
	55.84	5.46	544.	90.	86.
	56.53	5.92	537.	70.	65.
11	57.23	6.38	544.	0.	0.
	57.94	6.21	551.	25.	15.
	58.64	6.04	551.	60.	54.
10	59.35	5.88	551.	75.	72.
	60.06	5.79	551.	78.	75.
	60.77	5.71	551.	75.	70.
9	61.48	5.62	551.	75.	67.
	62.16	5.54	551.	65.	53.
	62.85	5.46	551.	40.	26.
8	63.53	5.38	550.	38.	25.
	64.25	5.42	551.	22.	11.
	64.97	5.46	550.	48.	36.
7	65.69	5.50	547.	62.	51.
	66.40	5.42	544.	70.	60.
	67.10	5.33	543.	52.	39.

6	67.81	5.25	542.	48.	33.
	68.50	5.29	537.	25.	13.
	69.19	5.33	511.	20.	10.
5	69.88	5.38	479.	25.	15.
	70.63	5.33	453.	15.	7.
	71.38	5.29	442.	20.	11.
4	72.13	5.25	447.	25.	17.
	72.96	5.46	486.	30.	22.
	73.80	5.67	451.	40.	36.
3	74.63	5.88	455.	40.	28.
	75.25	5.96	455.	50.	39.
	75.88	6.04	453.	45.	34.
2	76.50	6.13	455.	40.	27.
	77.08	6.08	453.	22.	11.
	77.67	6.04	451.	30.	18.
1	78.25	6.00	442.	12.	5.
	78.83	5.96	426.	12.	5.
	79.42	5.92	413.	10.	4.
0	80.00	5.88	399.	10.	4.

INUGSUIN FIORD

Fix	Dist. from head km	Width km	Depth m	Sediment thickness m	Sediment volume $m^3 * 10^6$
21	5.13	1.63	173.	20.	5.
	5.80	1.87	194.	45.	16.
	6.46	2.13	181.	0.	0.
20	7.13	2.38	174.	65.	25.
	7.59	2.46	247.	20.	4.
	8.04	2.54	279.	10.	1.
19	8.50	2.63	245.	0.	0.
	9.55	2.75	276.	10.	4.
	10.60	2.88	286.	10.	4.
	11.65	3.00	268.	15.	7.
	12.70	2.75	288.	10.	4.
	13.76	2.50	289.	30.	16.
18	14.81	2.25	289.	25.	6.
	15.37	2.46	261.	10.	2.
	15.94	2.67	257.	5.	1.
	16.50	2.88	289.	20.	5.
	17.06	2.78	286.	14.	3.
	17.63	2.69	228.	0.	0.
17	18.19	2.60	232.	0.	0.
	18.87	2.65	268.	20.	6.
	19.55	2.70	290.	10.	2.
	20.23	2.75	370.	20.	6.
	20.91	2.78	393.	25.	8.

	21.60	2.81	428.	25.	8.
16	22.28	2.84	424.	30.	10.
	22.96	2.89	458.	12.	3.
	23.65	2.95	479.	12.	3.
	24.33	3.00	489.	35.	12.
	25.01	3.15	500.	50.	22.
	25.70	3.29	500.	60.	29.
15	26.38	3.44	533.	35.	12.
	26.99	3.42	526.	25.	7.
	27.61	3.40	510.	20.	5.
	28.22	3.38	526.	30.	10.
	28.83	3.30	544.	10.	2.
	29.45	3.22	547.	20.	5.
14	30.06	3.15	559.	80.	32.
	30.60	3.16	567.	105.	47.
	31.14	3.18	573.	90.	38.
	31.68	3.19	574.	50.	16.
	32.22	3.17	577.	50.	16.
	32.77	3.15	579.	70.	26.
13	33.31	3.12	579.	100.	59.
	34.05	3.33	580.	110.	72.
	34.78	3.54	581.	110.	76.
	35.52	3.75	583.	110.	81.
	36.26	3.75	584.	70.	42.
	36.99	3.75	586.	30.	12.
12	37.73	3.75	587.	52.	24.
	38.38	3.75	587.	68.	36.
	39.04	3.75	588.	70.	37.
	39.69	3.75	590.	62.	31.
	40.35	3.71	593.	52.	24.
	41.00	3.67	593.	30.	11.
11	41.66	3.63	595.	20.	6.
	42.30	3.58	580.	0.	0.
	42.93	3.54	595.	0.	0.
	43.57	3.50	598.	15.	3.
	44.21	3.48	596.	25.	7.
	44.84	3.46	595.	10.	2.
10	45.48	3.44	600.	20.	6.
	46.22	3.48	602.	40.	17.
	46.95	3.52	602.	70.	39.
	47.69	3.56	602.	100.	47.
	48.21	3.71	602.	90.	42.
	48.73	3.85	602.	70.	30.
9	49.25	4.00	582.	50.	23.
	49.86	4.00	602.	20.	6.
	50.46	4.00	589.	15.	4.
	51.07	4.00	580.	10.	2.
	51.68	4.17	573.	0.	0.
	52.29	4.33	547.	50.	25.
8	52.90	4.50	557.	50.	29.
	53.58	4.42	563.	60.	37.

	54.26	4.33	557.	60.	37.
	54.94	4.25	547.	15.	5.
	55.62	4.21	464.	0.	0.
	56.30	4.17	384.	0.	0.
7	56.98	4.13	486.	0.	0.
	57.57	4.27	515.	5.	1.
	58.17	4.42	522.	40.	19.
	58.76	4.56	542.	30.	12.
	59.33	4.88	529.	47.	25.
	59.91	5.19	531.	40.	21.
6	60.48	5.50	531.	40.	24.
	61.10	5.75	531.	40.	25.
	61.73	6.00	531.	40.	26.
	62.35	6.25	531.	40.	28.
	62.98	6.08	528.	45.	32.
	63.60	5.92	526.	30.	17.
5	64.23	5.75	511.	45.	30.
	64.85	5.71	508.	40.	26.
	65.47	5.67	504.	35.	21.
	66.09	5.62	486.	30.	17.
	66.71	5.83	479.	30.	18.
	67.34	6.04	470.	10.	4.
4	67.96	6.25	450.	15.	7.
	68.59	6.67	448.	10.	4.
	69.23	7.08	431.	0.	0.
	69.86	7.50	405.	10.	5.
	70.49	7.50	386.	5.	2.
	71.13	7.50	399.	10.	5.
3	71.76	7.50	405.	20.	13.
	72.36	7.50	407.	30.	24.
	72.97	7.50	413.	28.	21.
	73.57	7.50	389.	40.	37.
	74.17	7.50	377.	22.	16.
	74.78	7.50	355.	12.	7.
2	75.38	7.50	323.	8.	4.
	76.02	7.50	312.	5.	2.
	76.65	7.50	297.	5.	2.
	77.29	7.50	286.	15.	11.
	77.93	7.50	281.	20.	16.
	78.57	7.50	283.	12.	8.
1	79.21	7.50	283.	17.	13.

CLARK FIORD

Fix	Dist. from head km	Width km	Depth m	Sediment thickness m	Sediment volume $m^3 * 10^6$
27	4.14	1.38	151.	75.	23.

	4.71	1.38	152.	55.	15.
	5.28	1.38	163.	30.	6.
26	5.85	1.38	189.	15.	2.
	6.48	1.46	202.	85.	28.
	7.10	1.54	204.	100.	37.
25	7.73	1.63	207.	100.	39.
	8.35	1.67	212.	63.	21.
	8.98	1.71	216.	46.	14.
24	9.60	1.75	221.	64.	21.
	10.20	1.83	228.	50.	16.
	10.80	1.92	233.	56.	19.
23	11.40	2.00	247.	22.	5.
	12.05	2.01	248.	70.	29.
	12.70	2.02	252.	80.	34.
22	13.35	2.03	254.	40.	11.
	13.92	2.14	254.	45.	14.
	14.48	2.26	261.	50.	17.
21	15.05	2.38	265.	70.	33.
	15.71	2.29	268.	20.	5.
	16.37	2.21	272.	15.	3.
20	17.03	2.13	276.	10.	2.
	17.60	2.33	274.	50.	17.
	18.16	2.54	268.	0.	0.
19	18.73	2.75	243.	0.	0.
	19.31	2.75	272.	40.	15.
	19.90	2.75	247.	0.	0.
18	20.48	2.75	257.	10.	2.
	21.07	2.75	272.	55.	25.
	21.67	2.75	279.	80.	41.
17	22.26	2.75	281.	40.	16.
	22.87	2.84	279.	55.	26.
	23.49	2.93	276.	35.	14.
16	24.10	3.03	210.	0.	0.
	24.70	3.14	149.	0.	0.
	25.30	3.26	196.	0.	0.
15	25.90	3.38	305.	0.	0.
	26.44	3.46	341.	10.	2.
	26.99	3.54	366.	20.	6.
14	27.53	3.63	355.	50.	28.
	28.18	3.58	381.	40.	19.
	28.83	3.54	399.	0.	0.
13	29.48	3.50	446.	30.	10.
	30.07	3.67	464.	100.	61.
	30.66	3.83	457.	160.	123.
12	31.25	4.00	479.	120.	98.
	31.94	4.17	482.	90.	68.
	32.62	4.33	464.	70.	50.
11	33.31	4.50	500.	30.	13.
	33.92	4.42	521.	45.	23.
	34.54	4.33	533.	60.	34.
10	35.15	4.25	535.	70.	42.

	35.77	4.17	535.	80.	49.
	36.38	4.08	547.	90.	57.
9	37.00	4.00	552.	130.	93.
	37.62	4.00	558.	132.	95.
	38.23	4.00	554.	90.	55.
8	38.85	4.00	566.	70.	36.
	39.44	4.00	566.	40.	16.
	40.02	4.00	508.	0.	0.
7	40.61	4.00	508.	0.	0.
	41.20	4.04	584.	40.	16.
	41.80	4.08	587.	110.	71.
6	42.39	4.13	591.	50.	22.
	42.97	4.13	586.	0.	0.
	43.55	4.13	587.	25.	8.
5	44.13	4.13	609.	20.	7.
	44.84	4.10	667.	50.	26.
	45.54	4.08	687.	30.	12.
4	46.25	4.06	690.	35.	14.
	46.90	4.06	695.	70.	37.
	47.55	4.06	696.	110.	72.
3	48.20	4.06	695.	120.	80.
	48.84	4.08	696.	140.	100.
	49.49	4.10	697.	145.	106.
2	50.13	4.13	700.	165.	124.
	50.75	4.25	700.	170.	133.
	51.38	4.37	700.	150.	115.
1	52.00	4.50	701.	200.	176.

CAMBRIDGE FIORD

Fix	Dist. from head km	Width km	Depth m	Sediment	
				thickness m	volume $m^3 * 10^6$
21	3.25	2.13	228.	70.	32.
	3.92	2.00	241.	90.	42.
	4.59	1.87	252.	60.	22.
	5.26	1.75	257.	120.	49.
	5.88	1.96	268.	130.	60.
	6.51	2.17	276.	150.	80.
20	7.13	2.38	280.	180.	109.
	7.74	2.42	296.	100.	50.
	8.35	2.47	305.	70.	30.
	8.96	2.53	529.	85.	32.
	9.57	2.50	318.	105.	53.
	10.17	2.47	325.	80.	35.
19	10.78	2.44	326.	70.	31.
	11.42	2.58	326.	115.	65.
	12.07	2.71	326.	145.	94.

	12.71	2.85	326.	55.	25.
	13.35	2.74	312.	30.	10.
	13.99	2.63	254.	0.	0.
18	14.63	2.53	167.	0.	0.
	15.26	2.64	116.	0.	0.
	15.88	2.76	232.	280.	239.
	16.51	2.88	257.	210.	168.
	17.13	2.88	276.	195.	150.
	17.76	2.88	286.	200.	153.
17	18.38	2.88	296.	230.	183.
	19.01	2.80	305.	260.	206.
	19.63	2.72	310.	117.	70.
	20.26	2.65	318.	120.	69.
	20.88	2.64	319.	220.	154.
	21.51	2.63	325.	125.	72.
16	22.13	2.63	326.	90.	49.
	22.80	2.62	334.	100.	56.
	23.46	2.61	341.	160.	105.
	24.13	2.60	344.	140.	87.
	24.80	2.71	355.	170.	117.
	25.46	2.82	359.	260.	212.
15	26.13	2.94	365.	160.	110.
	26.77	2.79	368.	160.	104.
	27.40	2.65	371.	150.	90.
	28.04	2.50	377.	200.	124.
	28.67	2.67	377.	160.	98.
	29.31	2.83	386.	60.	26.
14	29.94	3.00	384.	80.	44.
	30.61	3.05	413.	0.	0.
	31.27	3.10	442.	230.	185.
	31.94	3.15	457.	120.	77.
	32.61	3.14	470.	80.	43.
	33.27	3.13	476.	220.	172.
13	33.94	3.12	484.	210.	159.
	34.60	3.25	493.	160.	113.
	35.26	3.38	504.	150.	107.
	35.92	3.50	509.	120.	81.
	36.58	3.63	518.	110.	73.
	37.24	3.75	509.	160.	129.
12	37.90	3.88	526.	290.	286.
	38.54	3.69	531.	280.	259.
	39.18	3.50	537.	260.	222.
	39.82	3.31	542.	290.	241.
	40.46	3.29	544.	280.	228.
	41.09	3.27	547.	100.	55.
11	41.73	3.25	464.	0.	0.
	42.34	3.23	392.	0.	0.
	42.95	3.21	442.	0.	0.
	43.56	3.19	573.	80.	36.
	44.17	3.42	579.	120.	69.
	44.77	3.65	581.	170.	119.

10	45.38	3.88	582.	190.	151.
	46.00	3.73	486.	0.	0.
	46.62	3.58	515.	0.	0.
	47.24	3.44	587.	60.	26.
	47.86	3.50	587.	130.	80.
	48.48	3.56	589.	165.	114.
9	49.10	3.63	529.	0.	0.
	49.45	3.67	602.	20.	3.
	49.81	3.71	645.	60.	15.
	50.16	3.75	645.	90.	28.

SAFE: HU82-031 SIDESCAN SONAR and SOUNDER PROFILES

by

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CRUISE OBJECTIVES

A) Ascertain the shallowness of sills and depth of basins: important parameters for fjord circulation studies.

B) Identify sea floor markings such as bedforms (for sediment dynamics), ice scours and dropstones (indicative of ice activity), submarine channels (indicative of sediment gravity flows), and slide scars (mass movement activity).

METHOD

The HUDSON deployed the AGC sidescan sonar: a system with a 3 km maximum swath range that is at the limit of resolution. The analog system was recorded on paper and with a Racal Store 4DS-FM recorder. The scale lines on the sonograms are 75m wide, independent of range setting. The sonar resonant frequency used was 72.5 kHz beam width of 1.5° horizontal, 20° vertical, and band width of 1 kHz. The accompanying echogram was recorded on a UGR 196 recorder using a Ratheon PTR 105 transiever.

The GREBE launch deployed a Klein 421T sidescan sonar: the analog signal was recorded on paper and on both a Racal Store 4DS-FM recorder and a Teac R70A recorder. Scale lines on all sonograms are 15m wide, independent of range setting. Swath wide normally covered 600m. The sonar resonant frequency used was 100 kHz with a 20 kHz band width and beam width of 1° horizontal and 40° vertical. A Ross acoustic profiler, with a transducer resonant frequency of 192 kHz, bandwidth of 18 kHz and beam width of 2.6°, provided the accompanying echogram.

The fjord bathymetric survey was carried out using an EDO 9040, 30 kHz, echo sounder on the launch GULL.

The HUDSON positioning used a 3 point RADAR triangulation method as did the two launches GULL and GREBE. The GREBE radar was down for the last five fjords and end of line positioning was only approximated using line of sight sextant fixing. GREBE track lines will be provided in a subsequent data report.

RESULTS

The axial depth profiles of the ten fjords surveyed are given in Figure 16-1. Sunneshine profile is in slight error in that the echo sounder was not operated to the head due to ice conditions. The fjord is shallow with maximum depth at station SU-1 at 215m. It has no sharp protruding sill, rather the floor gently shallows to less than 60m. Coronation Fiord has no sill rather can be pictured as a hanging-valley tributary that drops from a depth of 400m to over 500m into the Maktak system. The Maktak inner basin is deeper than 600m. It has a number of well-defined sills, the shallowest less than 200m. North Pangrirtung has basin depths of 400m behind a deep sill of 290m. The Tingin Fiord basin reaches a depth of 550m behind a sill of 180m. Iterbilung Fiord reaches a maximum depth of 430m with a rather gentle shallowing to 220m in the outer reaches. Iterbilung has a sharp protruding inner sill of 105m. McBeth Fiord has an outer basin of 280m maximum depth separated from an inner basin (max. depth of 325m) by a sharply protruding inner sill of 95m. Inugsuin Fiord has a number of inner basins separated from the shelf by a gentle sloping outer sill of 110m. The inner basins reach 550m, 570m and 195m respectively going landward separated by sharply protruding inner sills of 370m and 220m (respectively). A sharply protruding 110m sill in Clark Fiord separates the outer basin of 690m from the inner basin of 270m. The outer Cambridge Sill is very large with a minimum depth of 285m. Inside Cambridge Fiord proper, there are three basins (going landward) of 696m, 640m and 320m maximum depth and these are respectively divided by sills with minimum depths of 250m and 102m.

This report provides eleven examples of the raw unfiltered record from the AGC sidescan sonar. Dedicated sidescan profiling time was limited: a) the ship speed of 5 to 6 knots limited signal resolution; b) in many cases the fjord bottom was deeper than the 350m depth limitation; and c) the port sidescan tranducer was down part of the time. The following is a brief description of the record highlights.

The outer areas of Coronation Fiord (i.e. between stations CO5-MA5) appear covered in a bouldery till. Inside the Coronation sill, the fjord floor appears flat. At fix 13 the northern wall appears as a rough talus fan. Between fix 16 to 21.5 (Fig. 16-2) sediment on the slopes of the subaqueous fans have creep rolls or folds along their slope giving it a stepped appearance. Between fix 22 to 24 coarse talus blocks appear fuzzy (possibly covered in finer sediment). Between fix 24 to 25 boulder dumps or piles appear scattered on the flat floor. Channels are commonly indented in the side wall slopes (widths up to 20m). Near the fjord-head or ice front, sinuous undulations or waves with crests running perpendicular to the fjord-axis cover the entire floor.

The Maktak Fiord sill is very rough. The side walls are similarly rough with large blocks of sediment or rock faulted away from the main wall (Fig. 16-3). Side wall slopes have s stepped appearance (creep rolls?). Minor channels run down the walls and the number of channels increases towards the delta (Fig. 16-4).

Near the North Pangnirtung Fiord delta, 75 to 200m long furrows of 5 to 10m width cover the fjord floor. The furrow orientation is mostly along the axis of the fjord, although nearest the delta the orientation is more chaotic. Also, large pot marks, up to 50m in diameter, occur singularly or in trails. Evidence suggests ice scour activity by bergs. The fjord floor appears somewhat undulating.

Near the Tingin Fiord delta, a large rotational slump scar was identified on the northern slope (fix 30, Fig. 16-5). From the scar is a large 225m wide channel that winds its way down the fjord. The side wall slopes appear gullied and steep but generally rather smooth. The three subaqueous fans? on the south wall (fix 23.5, 24.7 and 26.5, Fig. 16-5) appear associated with side entry glaciers (hanging valley type).

Itirbilung Fiord has a major subaqueous prodelta (fan) with creep? folds along its slope (Fig. 16-6). Between fix 18-26 the side wall slopes are relatively smooth with few bedrock outcroppings. Talus blocks appear imbedded in finer sediment. At fix 27.5 a large side-entry river from the N slope has produced a prodelta with creep folds along its slope. Subaqueous fans appear off the side entry glacier (fix 31, fix 34).

At fix 11 on the N. slope of McBeth Fiord is a subaqueous fan with coarse boulders on soft sediment. Between fix 18 through 20 the side wall slopes are sediment covered with a number of large gullies and other slide scars. Between fix 23 to 25, the sea floor appears rippled with crest orientation sub parallel to the main fjord axis and to one side of a channel that itself is parallel to the fjord axis. The channel width ranges from 65m to 100m with well recognizable levees. Figure 16-8 gives a view of the northern half of the McBeth sill showing major gullies cut into the seaward side of the sill. Between fix 30.7 to 33.7, the landward basin behind McBeth sill, the northern slope has a smooth sediment covering in large bowls (Fig. 16-7). Side wall channels or gullies are more common nearest the main fjord delta. Similarly, gullying or submarine talus fans are more dominant closer to the delta in Inugsuin Fiord.

Side entry fans are common in Clark Fiord with creep folds. The Clark sill, between fix 16 to 15, appears smooth on its surface but well gullied on its seaward side.

Side wall slopes appear smooth, i.e. sediment covered, in Cambridge Fiord with many gullies cut into slope (Fig. 16-9). The Cambridge inner sill (fix 17.8) appears in part smooth with a sediment cover, although a number of large rocks or boulders protrude on its surface (Fig. 16-11). Large gullies 60m wide appear on both sides of the sill. Slump scars and gullies are prominant on the side wall slopes inside the sill (fix 18.5-19.5, Fig. 16-10). Closer to the main delta (fix 20.3 - fix 21) there is incrased gullying on slopes with creep folds (Fig. 16-12).

Figures 16-13 to 16-26 are self explanatry cross-channel profiles of the seven fjords surveyed. A detailed analysis of slope angles will follow in a subsequent data report.

Figures 16-27 to 16-35 are typical examples of the raw unfiltered record of the Klein side scan survey of the prodelta environment. Below is a brief description.

Along the Coronation ice front (fix 3 to 11) there is a 40 to 90m zone of dark absorbant sediment (mud?): a featureless zone with large re-entrant cusps.

Linear ridges perpendicular to the ice front run out some 50 to 100m. These surround channels floored with megaripples (λ=15m). Further out from the ice front (some 200m seaward) large bedforms (ripples or creep mounds) become prevalent.

The Maktak prodelta is lined with coalescing channels covered in megaripples (Fig. 16-27, 16-29, 16-30). The megaripples have crests perpendicular to the channel axis. The ripple wavelength initially incrases from 12m to 25m down the channel but reverses further down-fjord where the channel eventually fades into the flat seafloor. The GREBE followed two channels down-axis (Fig. 16-28) and noted the previously confirmed ripples breached the channel walls onto the neighboring plain. Interchannel bars are mostly featureless close to the delta but eventually are found to have chaotic undulations on their surface. Channel beginnings are within 60m of the delta/prodelta intersection (Fig. 16-30), a zone which appears devoid of bedforms and channels. This same featureless zone was identified on most other prodelta's investigated.

On the Tingin prodelta, large undulations cover the slope: some areas closely resemble megaripples, other areas are more chaotic (Fig. 16-31). Further offshore the slope is relatively smooth with occassional pot marks and ice? scours (Fig. 16-32).

Itirbilung prodelta is similar to Maktak with coalescing channels (Fig. 16-34) only being larger and fewer in number (Fig. 16-33). The channels were also lined with megaripples. The McBeth and Clark prodeltas had no channels rather the chaotic undulations (Fig. 16-35) as found on Tingin.

The Inugsuin records are hard to read but at the very least indicate a rough prodelta terrain, with abundant slump scars.

Table 16-1 provides a general overview of the prodelta features. Future massaging of the records will provide details on the angles of side wall and prodelta slopes.

We gratefully acknowledge the many 'souls' who helped out in the launch work, especially if they participated in hand lowering and raising of the Klein sidescan. The technical assistance and expertise of A. Boyce was a god-send.

TABLE 16-1

PRODELTA

Fjord	megaripples	coalescing channels	megachannel	slump features	ice marks
Coronation	X	?	X	X	X
Maktak	X	X	?	X	
N. Pangnirtung	?	?	?	X	
Tingin	X		X	X	X
Itirbilung	X	X		X	
McBeth	X		X	X	
Inugsuin	X	X	X	X	
Clark	X		X	X	X
Cambridge	?	X	X	?	?

FIGURE CAPTIONS

FIG. 16-1: Down-axis depth profile of 10 selected Baffin Island fjords.

FIG. 16-2: Inverted Coronation Fiord, AGC sidescan between fix 16 to fix 21.5 (distance between any two fixes is approximately one nautical mile).

FIG. 16-3: Maktak Fiord, AGC sidescan between fix 30 and fix 35.

FIG. 16-4: Maktak Fiord, AGC sidescan between fix 33 and fix 38.

FIG. 16-5: Tingin Fiord, AGC sidescan betwen fix 22.5 and fix 30.

FIG. 16-6: Itirbilung Fiord, AGC sidescan between fix 11 and fix 13.

FIG. 16-7: McBeth Fiord, AGC sidescan between fix 30.7 and fix 33.7.

FIG. 16-8: McBeth Fiord, AGC sidescan between fix 29 and fix 30.

FIG. 16-9: Cambridge Fiord, AGC sidescan between fix 16.5 and fix 17.5.

FIG. 16-10: Cambridge Fiord, AGC sidescan between fix 18.5 and fix 19.5.

FIG. 16-11: Cambridge Fiord sill, AGC sidescan between fix 18.2 and fix 17.5.

FIG. 16-12: Cambridge Fiord, AGC sidescan between fix 20.3 and fix 21.

FIG. 16-13: Coronation Fiord bathymetry (Vertical exaggeration times 2, VEx2).

FIG. 16-14: Coronation Fiord bathymetry (VEx18).

FIG. 16-15: Tingin Fiord bathymetry (VEx2).

FIG. 16-16: Tingin Fiord bathymetry (VEx18).

FIG. 16-17: Itirbilung Fiord bathymetry (VEx2).

FIG. 16-18: Itirbilung Fiord bathymetry (VEx18).

FIG. 16-19: McBeth Fiord bathymetry (VEx2).

FIG. 16-20: McBeth Fiord bathymetry (VEx18).

FIG. 16-21: Ingusuin Fiord bathymetry (VEx2).

FIG. 16-22: Inugsuin Fiord bathymetry (VEx18).

FIG. 16-23: Clark Fiord bathymetry (VEx2).

FIG. 16-24: Clark Fiord bathymetry (VEx18).

FIG. 16-25: Cambridge Fiord bathymetry (VEx2).

FIG. 16-26: Cambridge Fiord bathymetry (VEx18).

FIG. 16-27: Maktak prodelta, Klein sidescan.

FIG. 16-28: Maktak prodelta, Klein sidescan.

FIG. 16-29: Maktak prodelta, Klein sidescan.

FIG. 16-30: Maktak prodelta, Klein sidescan.

FIG. 16-31: Tingin prodelta, Klein sidescan.

FIG. 16-32: Tingin prodelta, Klein sidescan.

FIG. 16-33: Itirbilung prodelta, Klein sidescan.

FIG. 16-34: Itirbilung prodelta, Klein sidescan.

FIG. 16-35: McBeth prodelta, Klein sidescan.

FIG. 16-36: Typical bottom profile in Maktak Fiord along a transect parallel to the delta face (fixes 1-10), showing the numerous channels in cross-section. See also FIGS. 16-29 & 30.

FIG. 16-37: Bottom profile in Itirbilung Fiord along a transect parallel to the delta face (fixes 1-3), showing several channels with very pronounced levees. See also FIGS. 16-33 & 34.

FIG. 16-38: As in FIG. 16-37, but further away from the delta (fixes 4-7). The leveed submarine channels appear to be wider in this profile.

FIG. 16-39: Bottom profile in Itirbilung Fiord along a transect perpendicular to the delta face (fixes 8-11). Note the large scale ripples of rather uniform wavelength and amplitude (about 0.5m) along the initial section of the transect between 35 and 50m depth, which is along achannel axis. See also FIGS. 16-33 & 34.

FIG.16-1 (i)

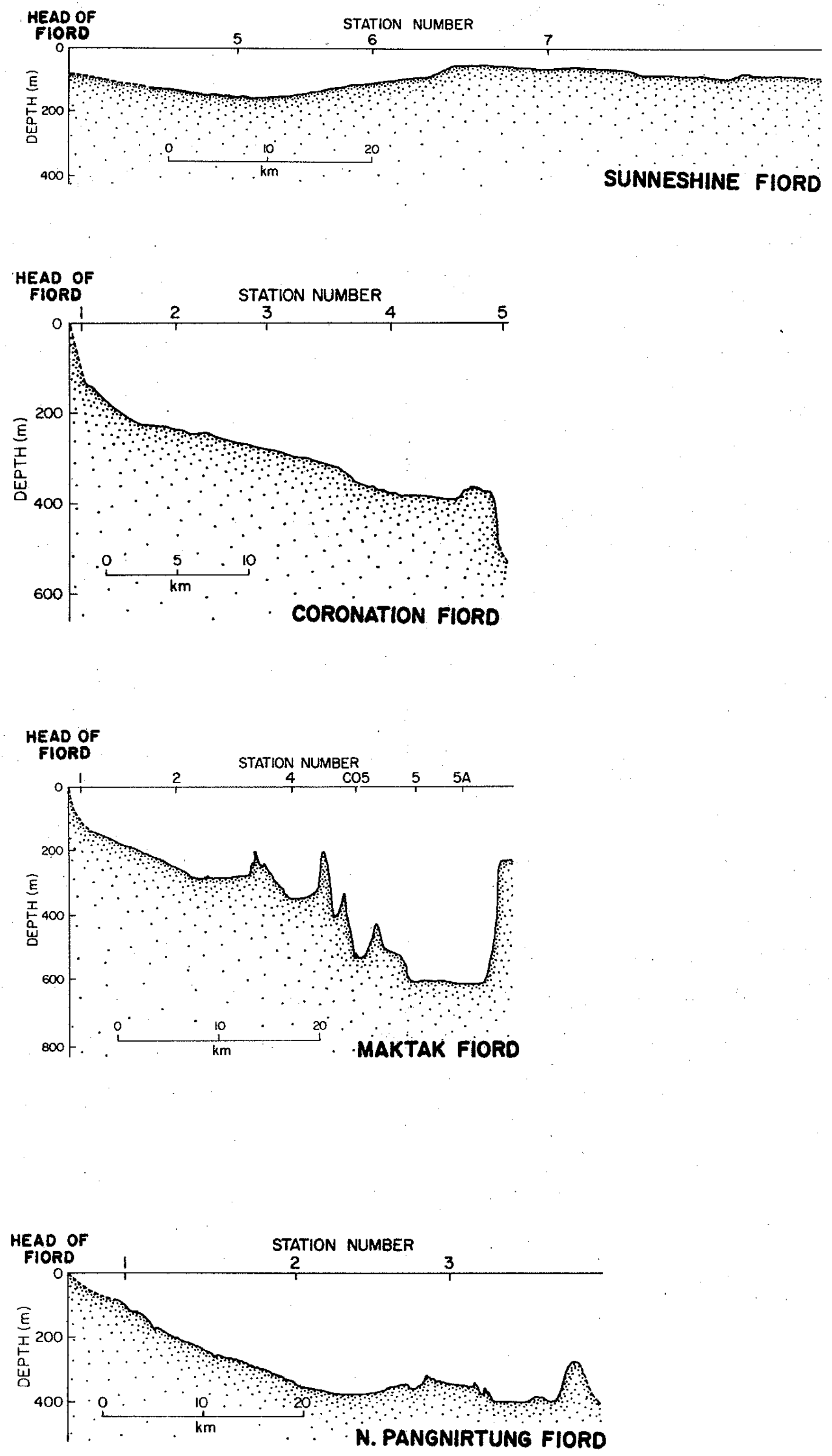
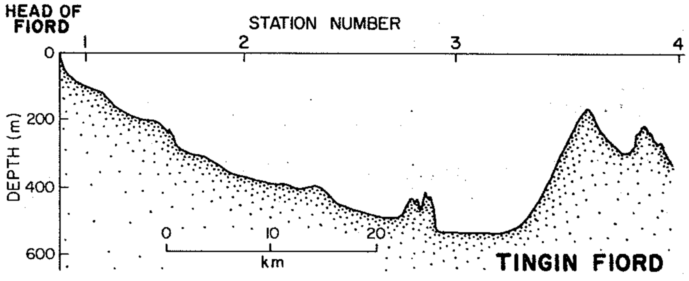
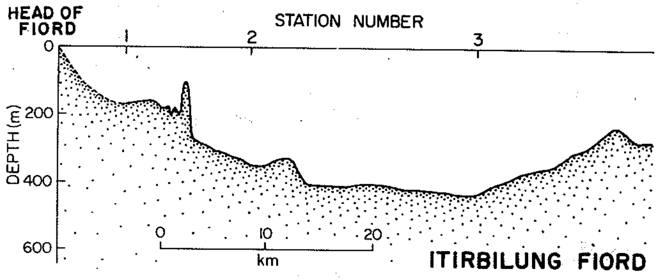

HEAD OF FIORD
STATION NUMBER
5
6
7
0
200
400
DEPTH (m)
0
10
20
km
SUNNESHINE FIORD
HEAD OF FIORD
STATION NUMBER
1
2
3
4
5
0
200
400
600
DEPTH (m)
0
5
10
km
CORONATION FIORD
HEAD OF FIORD
STATION NUMBER
1
2
4
CO5
5
5A
0
200
400
600
800
DEPTH (m)
0
10
20
km
MAKTAK FIORD
HEAD OF FIORD
STATION NUMBER
1
2
3
0
200
400
DEPTH (m)
0
10
20
km
N. PANGNIRTUNG FIORD

FIG. 16-1 (ii)


HEAD OF FIORD
STATION NUMBER
1
2
3
4
0
200
400
600
DEPTH (m)
0
10
20
km
TINGIN FIORD


HEAD OF FIORD
STATION NUMBER
1
2
3
0
200
400
600
DEPTH (m)
0
10
20
km
ITIRBILUNG FIORD

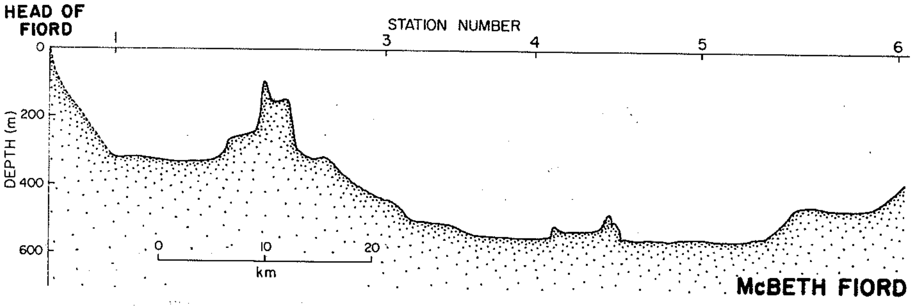
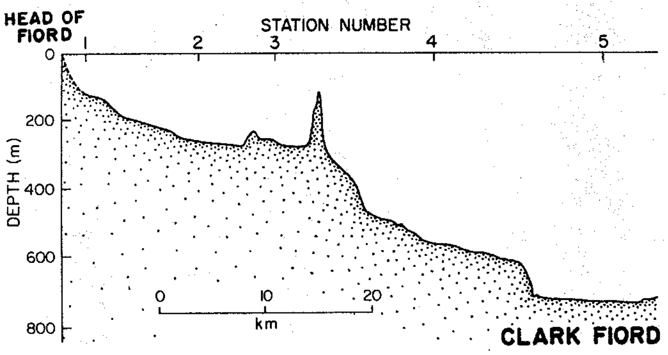
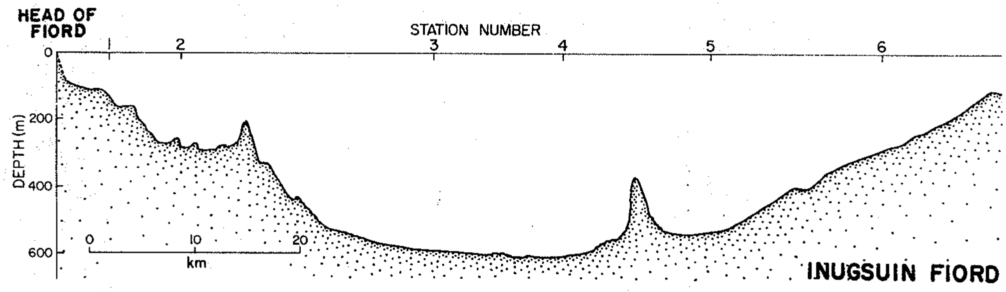
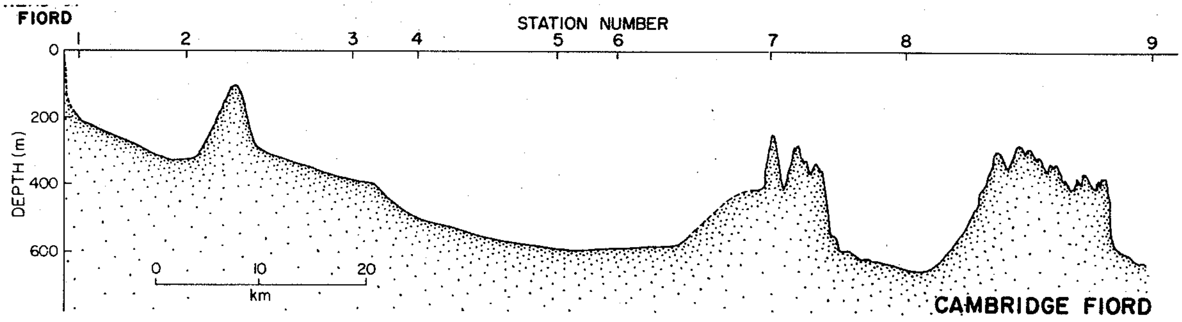

HEAD OF FIORD
STATION NUMBER
1
3
4
5
6
0
200
400
600
DEPTH (m)
0
10
20
km
McBETH FIORD

FIG. 16-1 (iii)


HEAD OF FIORD
STATION NUMBER
1
2
3
4
5
0
200
400
600
800
DEPTH (m)
0
10
20
km
CLARK FIORD


HEAD OF FIORD
STATION NUMBER
1
2
3
4
5
6
0
200
400
600
DEPTH (m)
0
10
20
km
INUGSUIN FIORD


FIORD
STATION NUMBER
1
2
3
4
5
6
7
8
9
0
200
400
600
DEPTH (m)
0
10
20
km
CAMBRIDGE FIORD

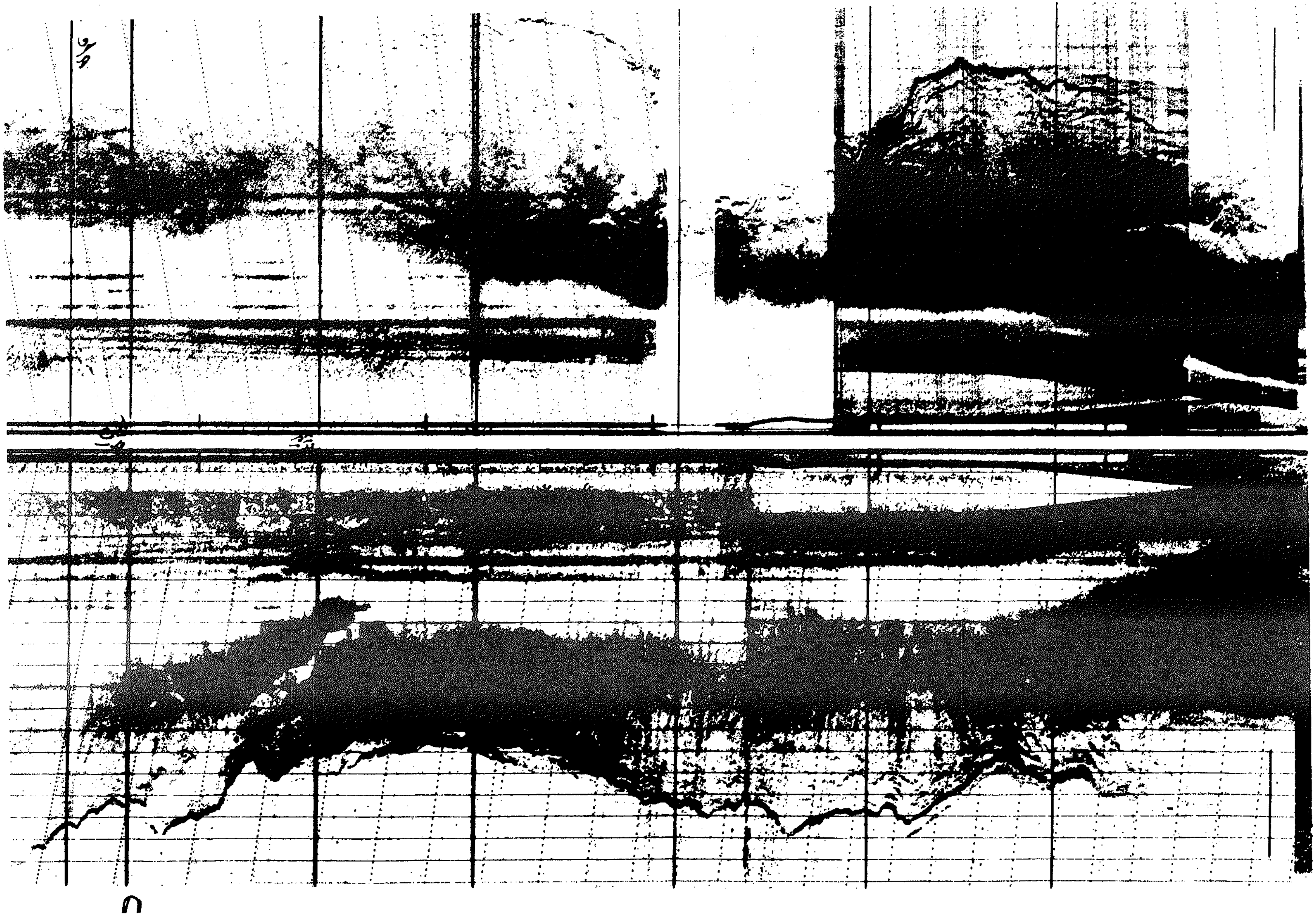


FIG. 16-2

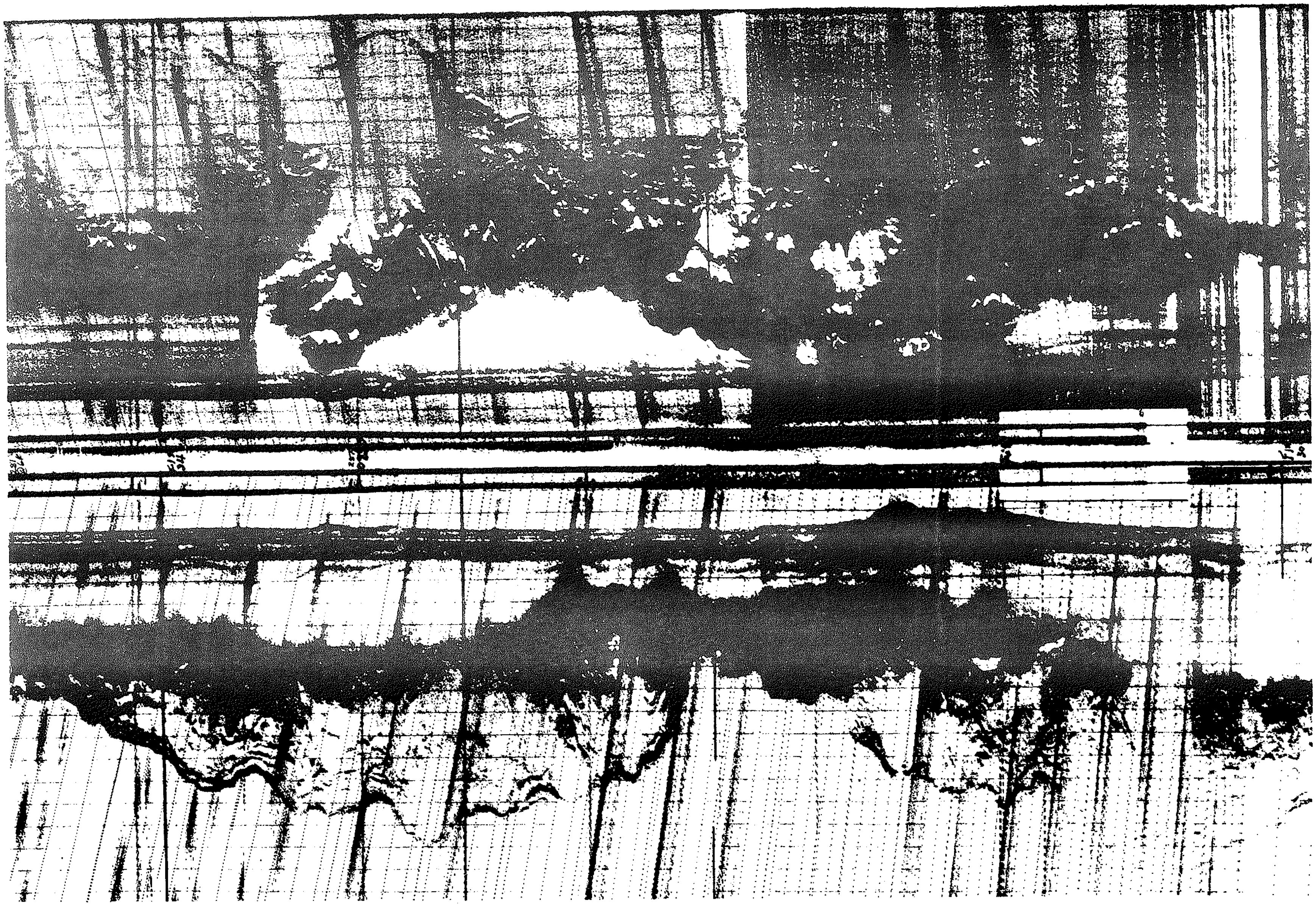


FIG. 16-3

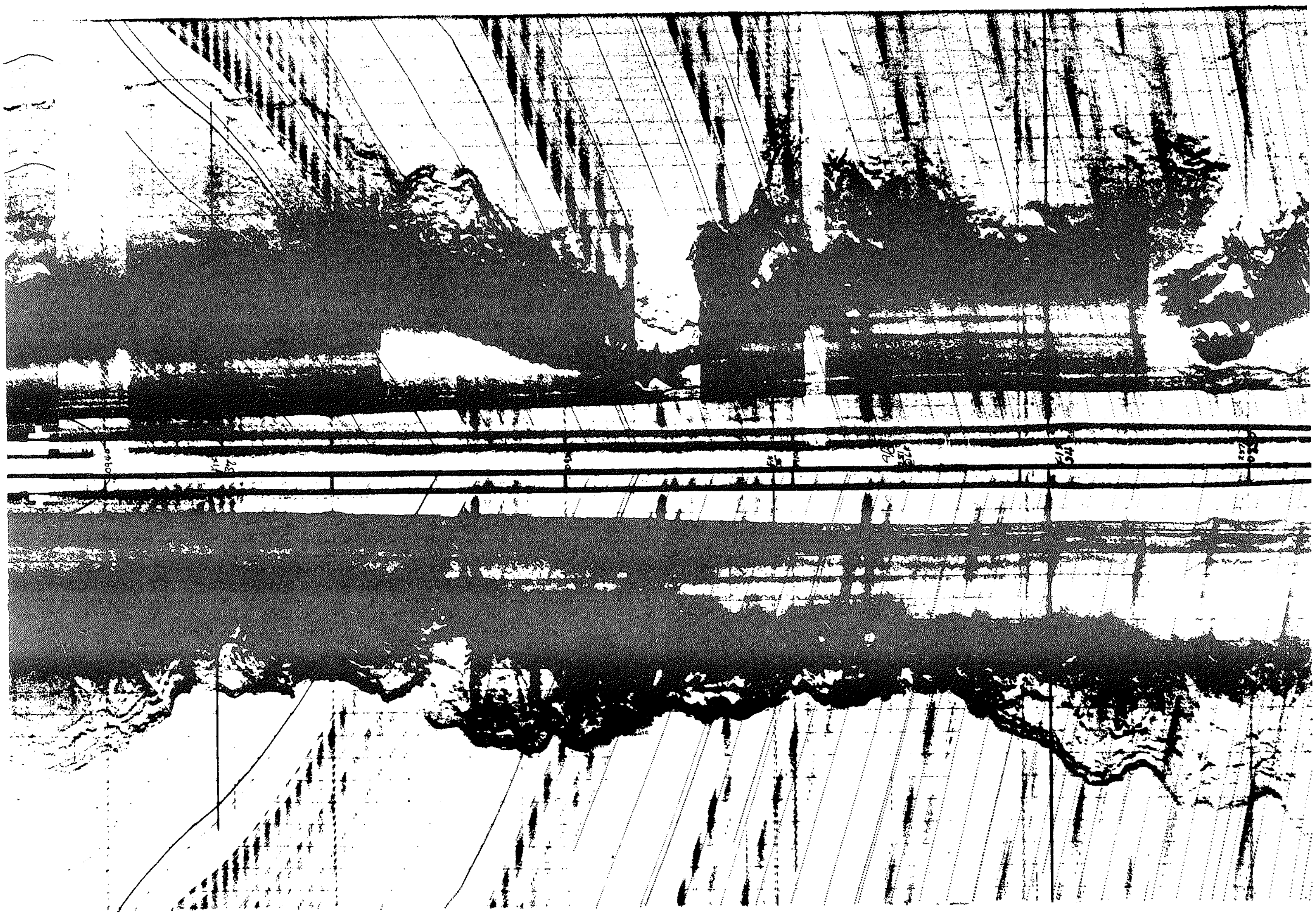


FIG. 16-4

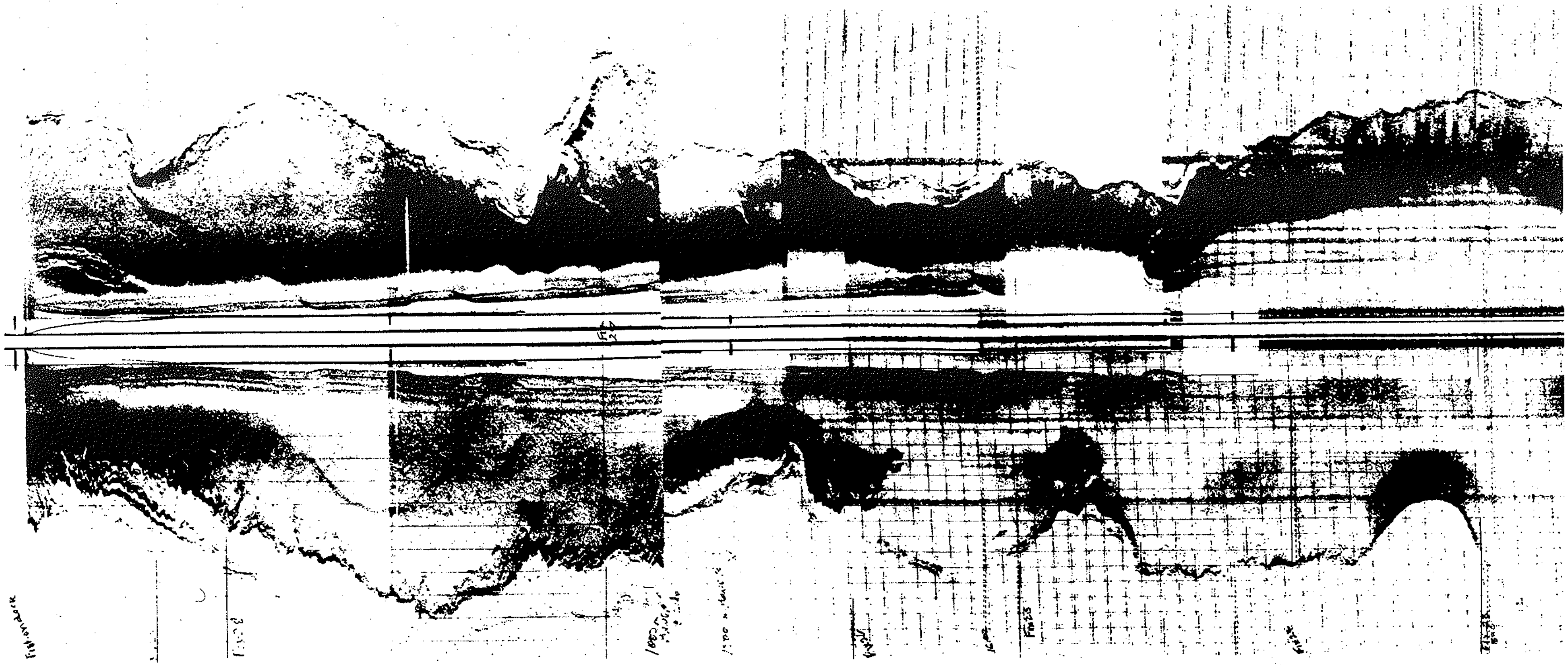


FIG. 16-5

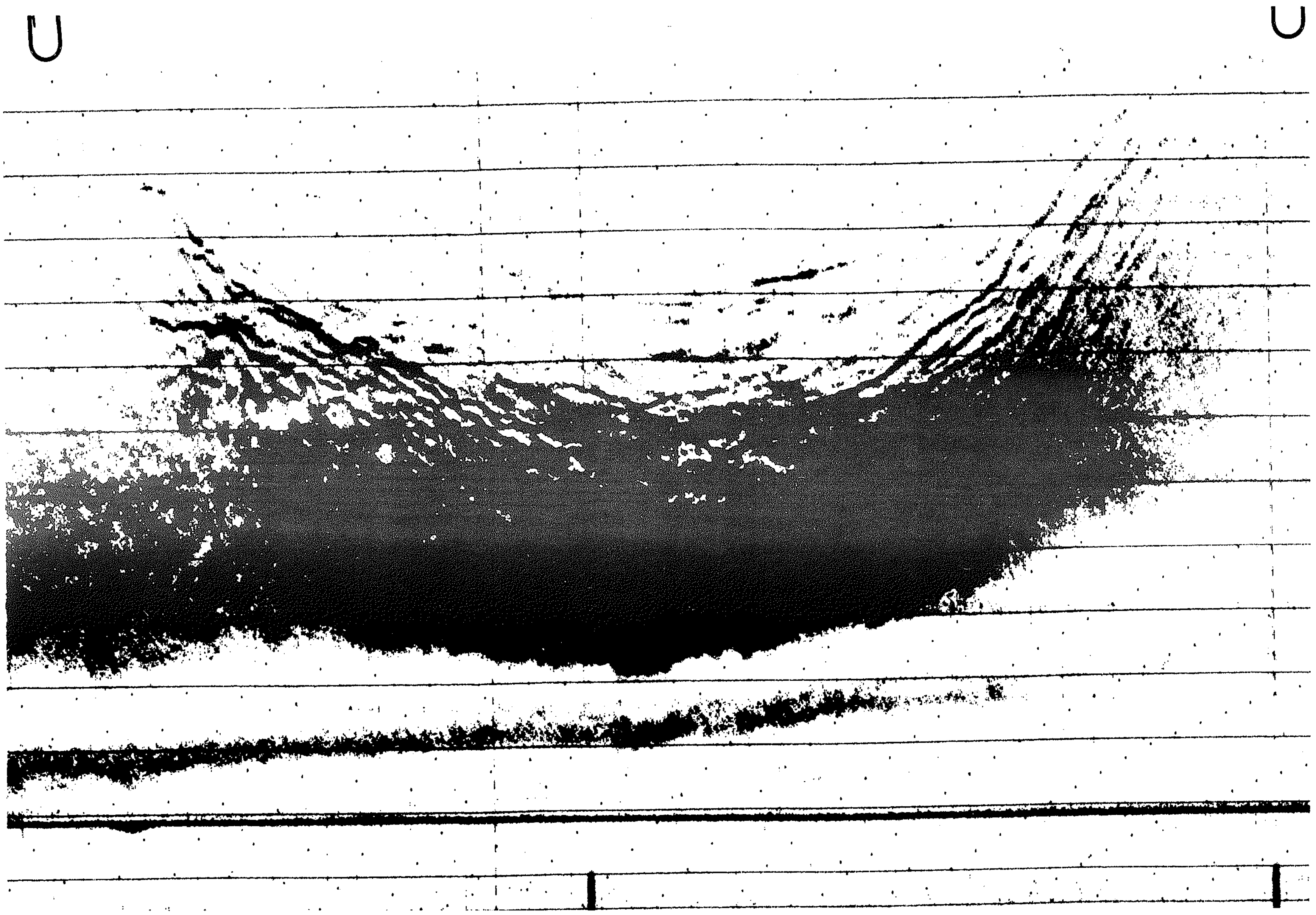


FIG. 16-6

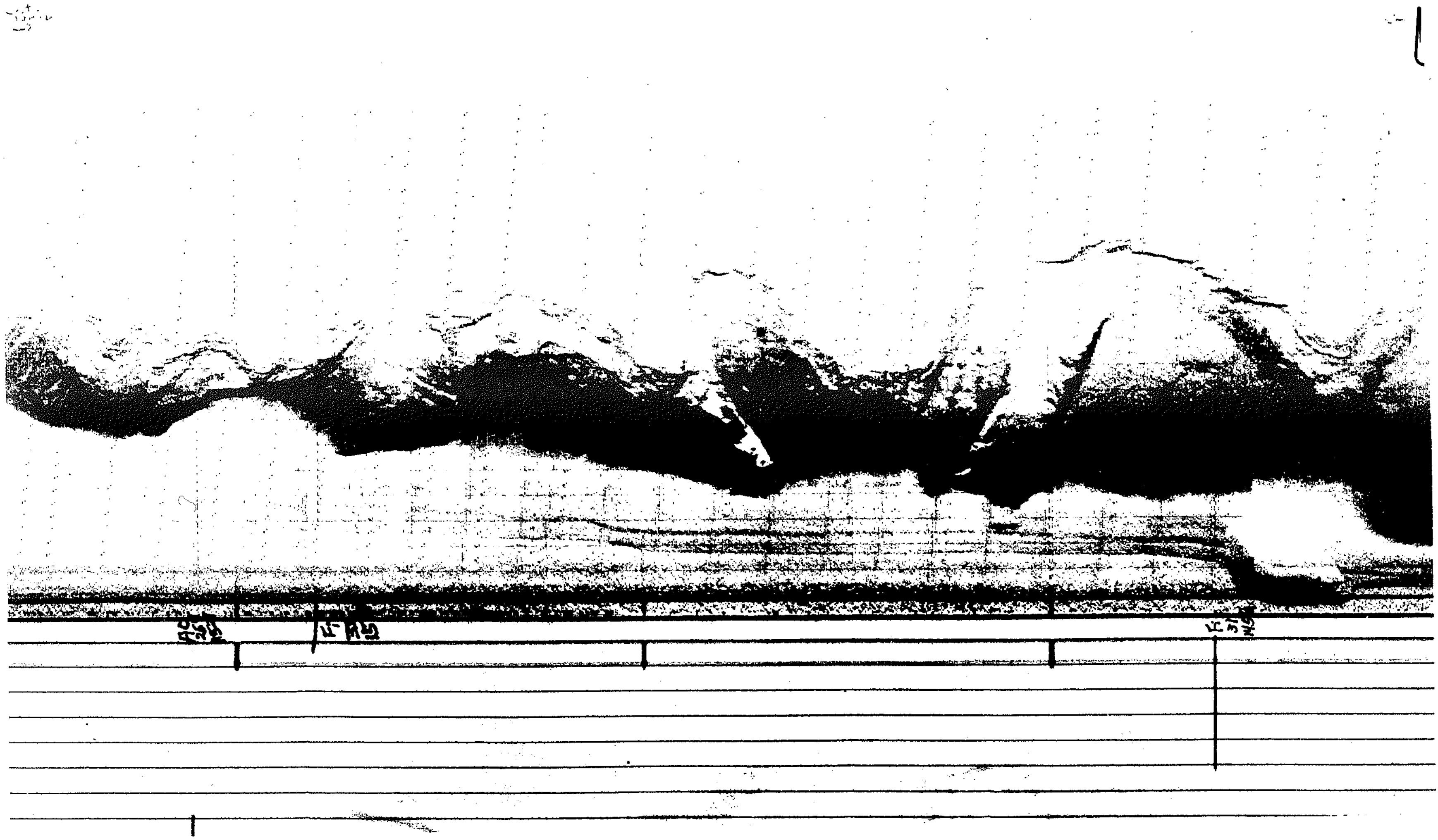


FIG. 16-7

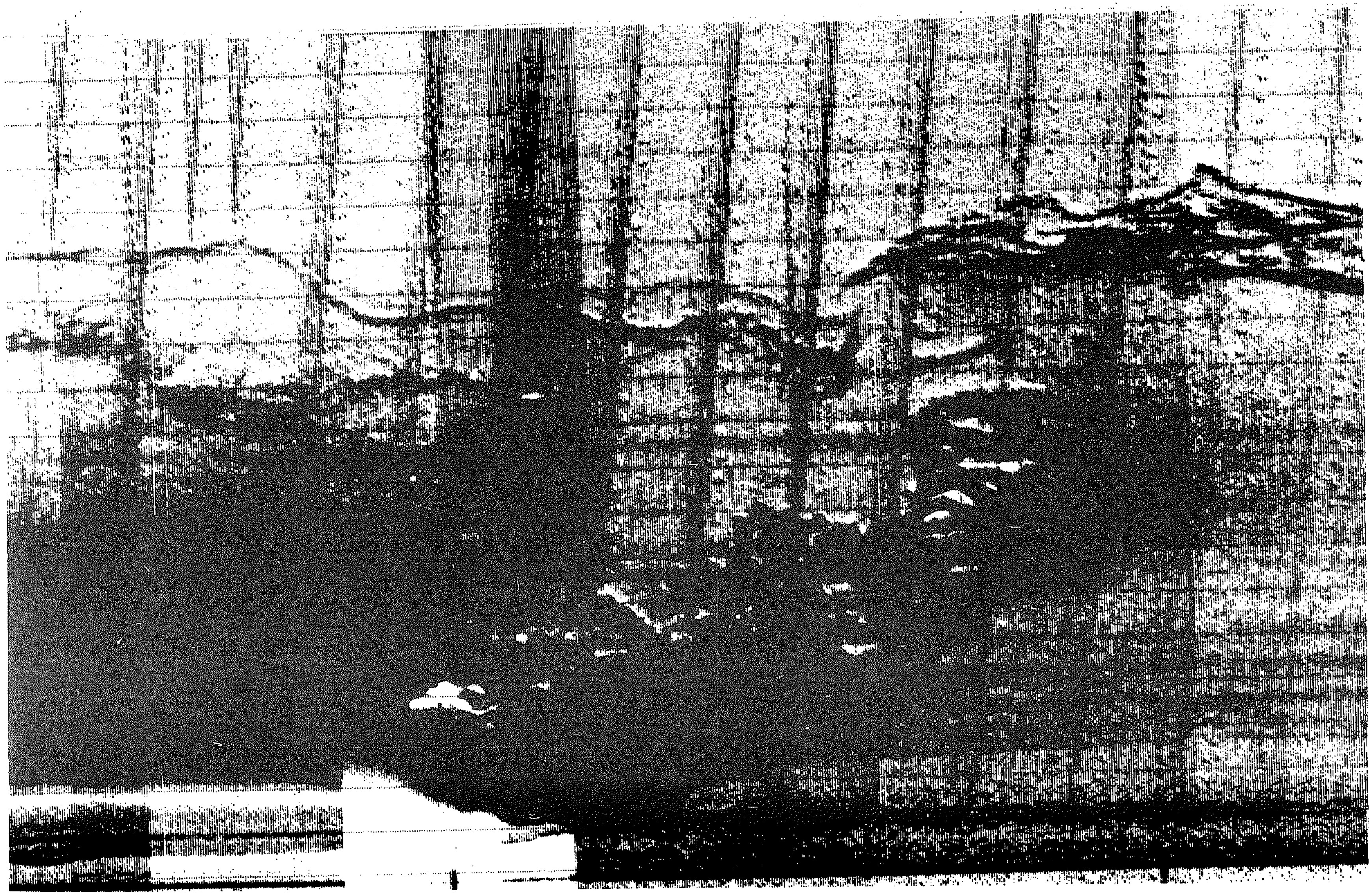


FIG. 16-8

H/C 204°@7k

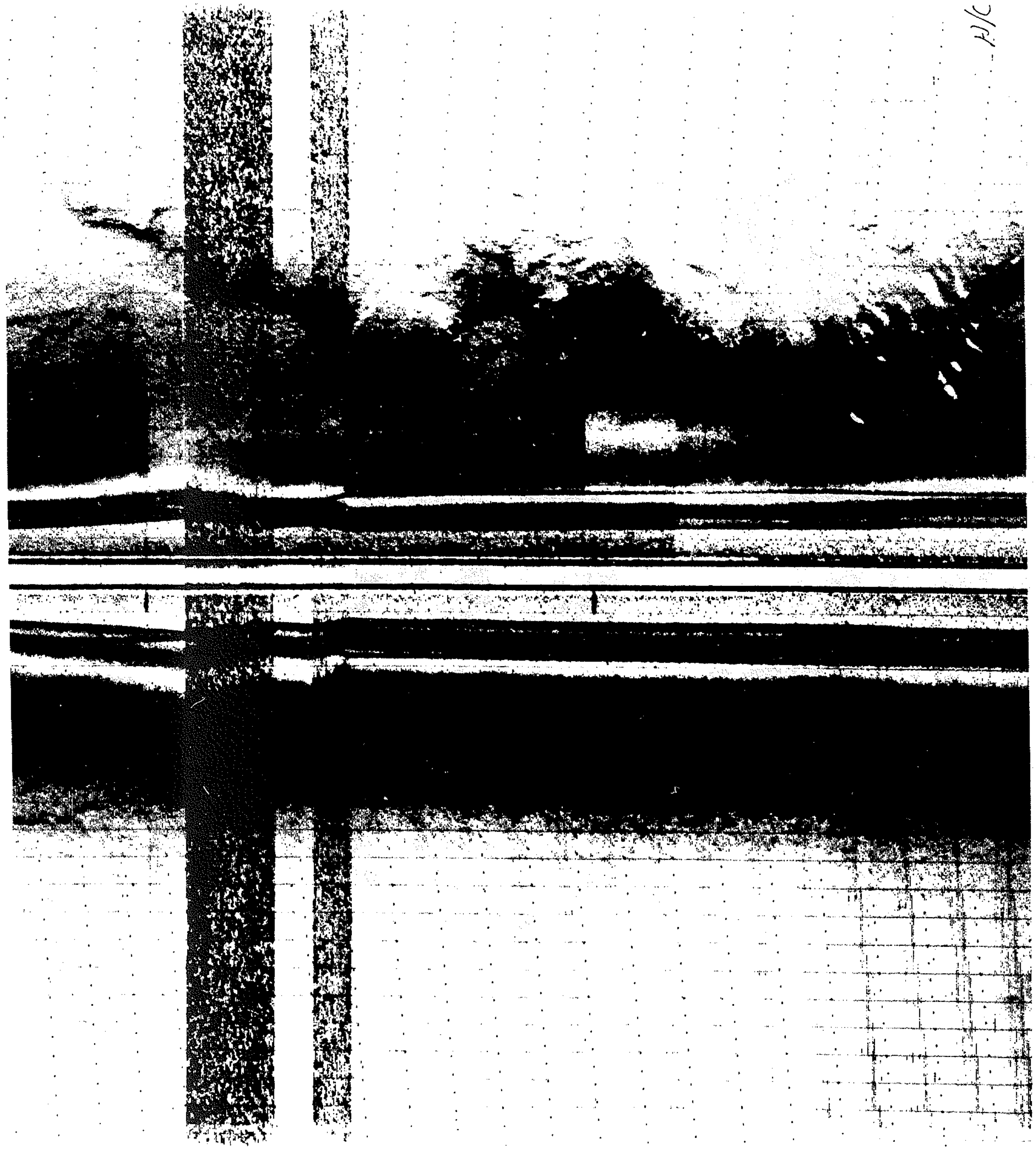


FIG. 16-9

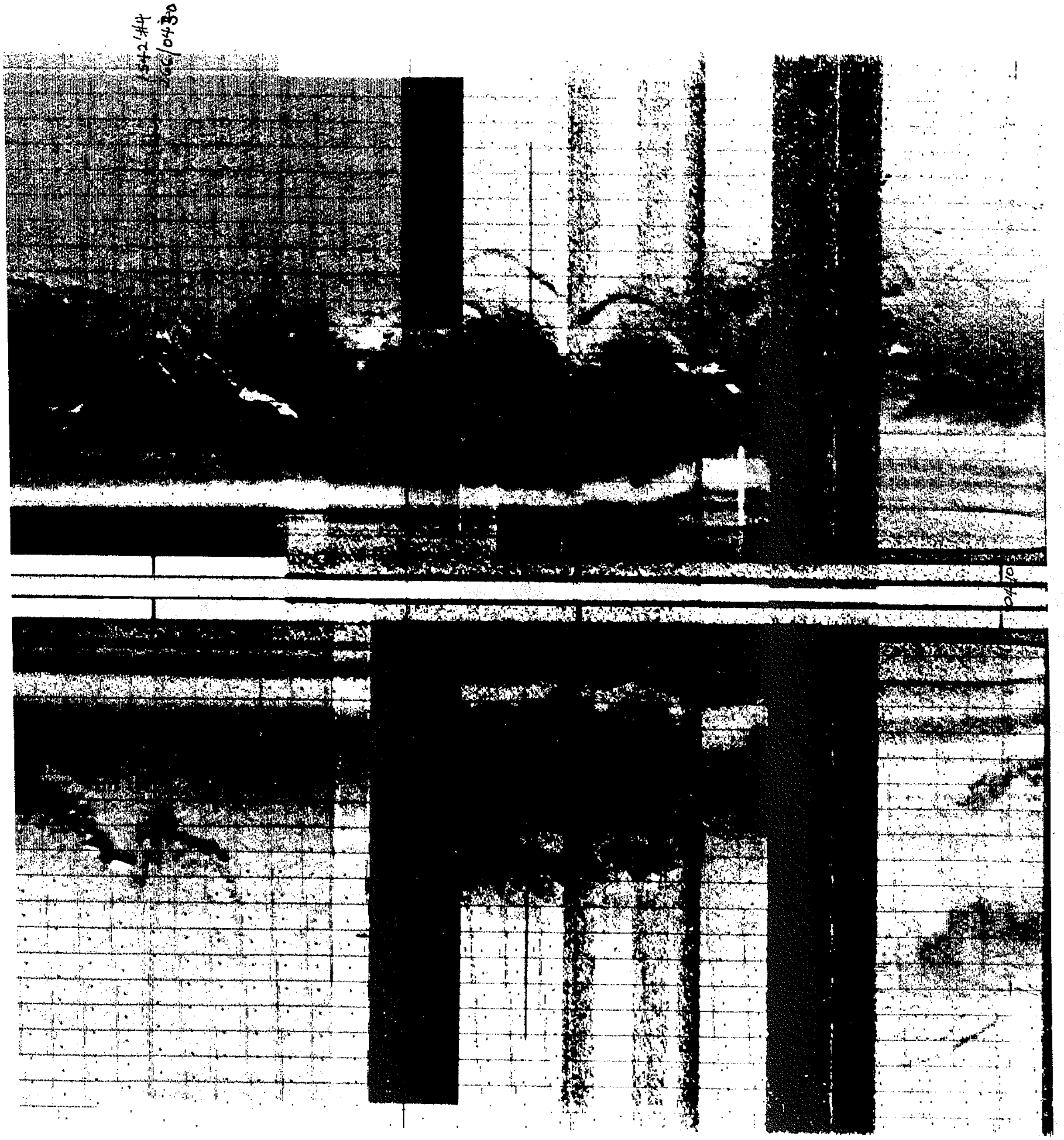


FIG. 16-10

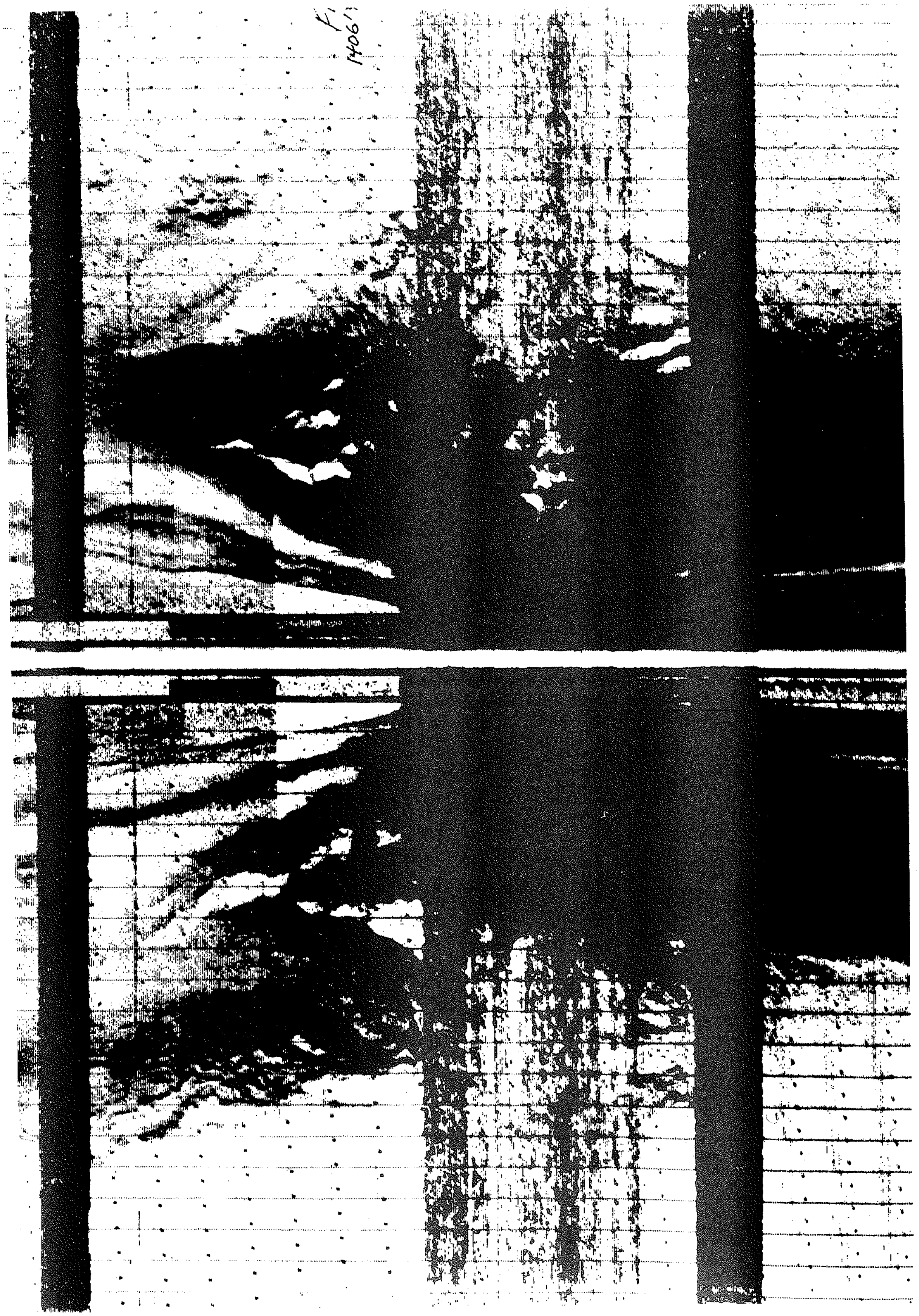


FIG. 16-11

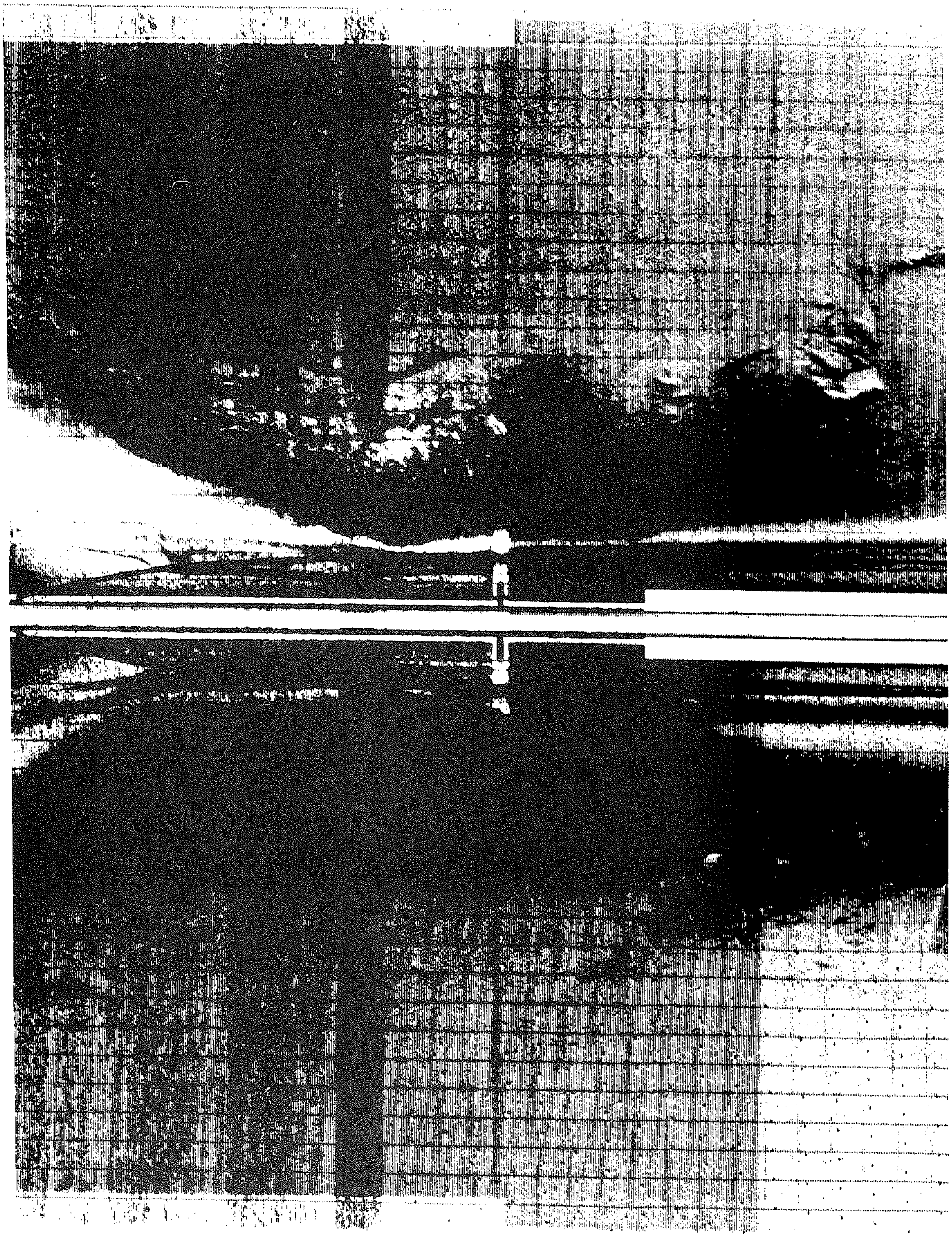


FIG. 16-12

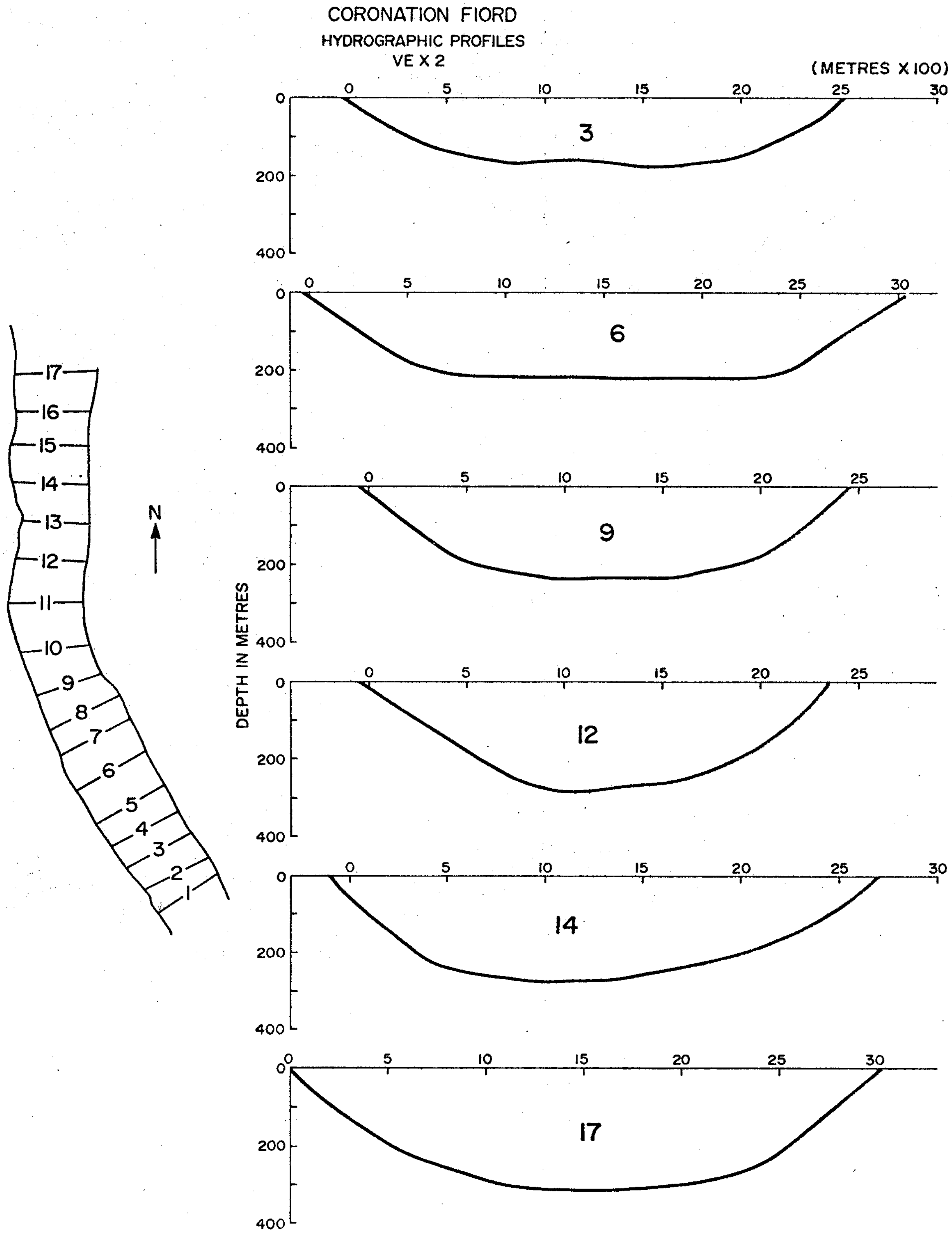

CORONATION FIORD
HYDROGRAPHIC PROFILES
VE X 2
(METRES X 100)
DEPTH IN METRES
0
200
400
0
5
10
15
20
25
30
3
6
9
12
14
17
N
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17

Fig. 16-13

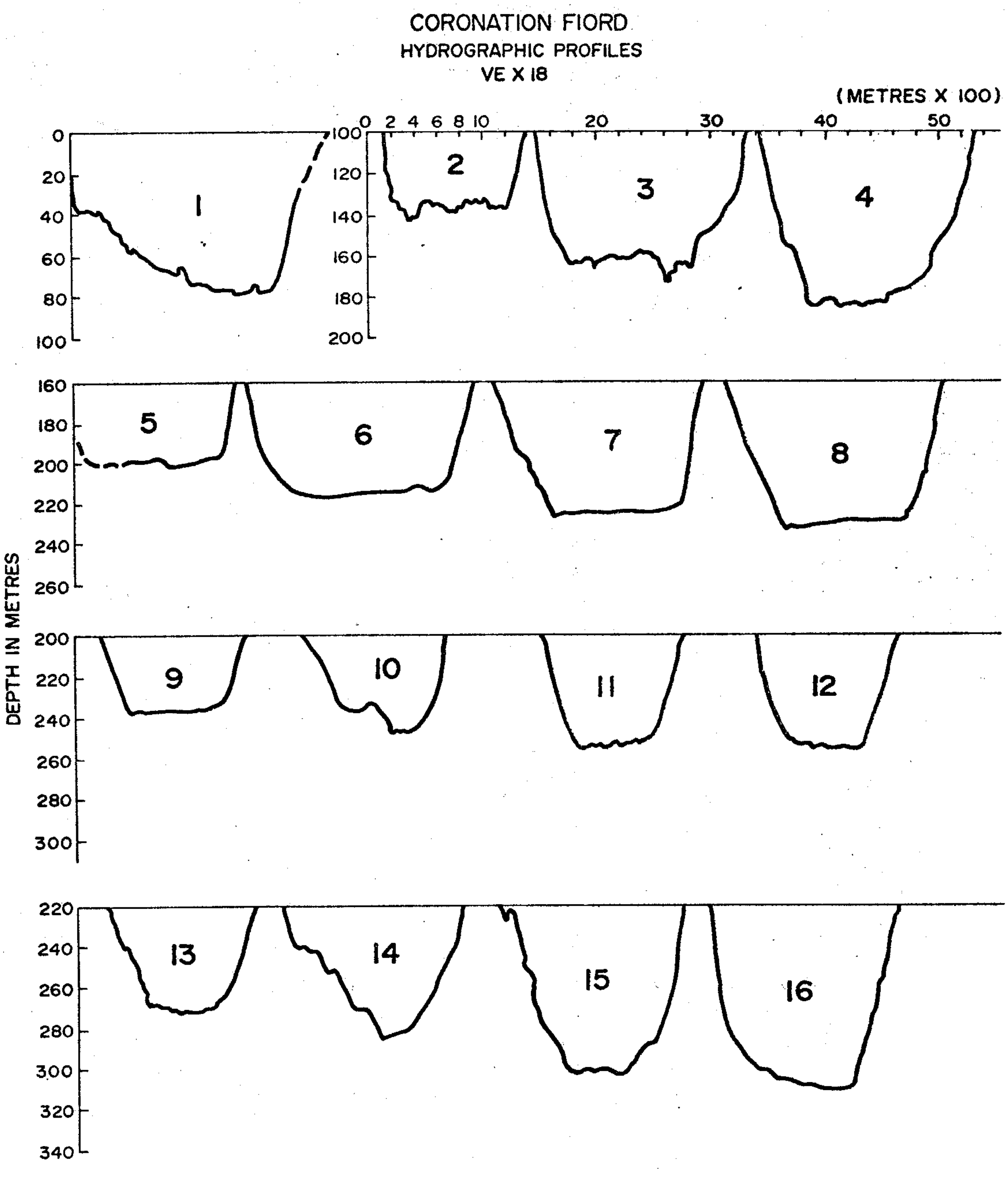

CORONATION FIORD
HYDROGRAPHIC PROFILES
VE X 18
(METRES X 100)
0 2 4 6 8 10 20 30 40 50
DEPTH IN METRES
0 20 40 60 80 100
100 120 140 160 180 200
160 180 200 220 240 260
200 220 240 260 280 300
220 240 260 280 300 320 340
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Fig. 16-14

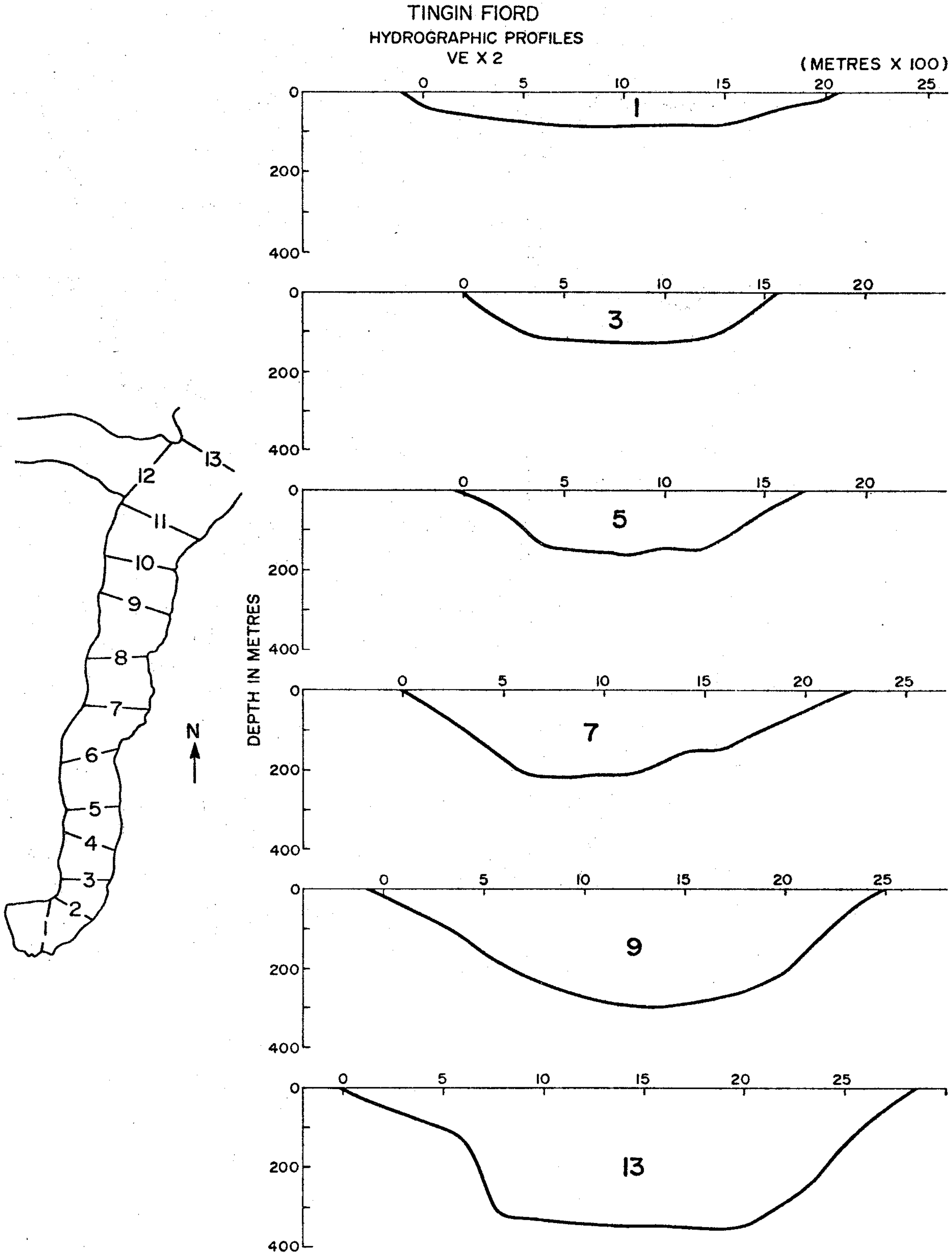

TINGIN FIORD
HYDROGRAPHIC PROFILES
VE X 2
(METRES X 100)
DEPTH IN METRES
0
200
400
0
5
10
15
20
25
1
3
5
7
9
13
N
2
4
6
8
10
11
12

Fig. 16-15

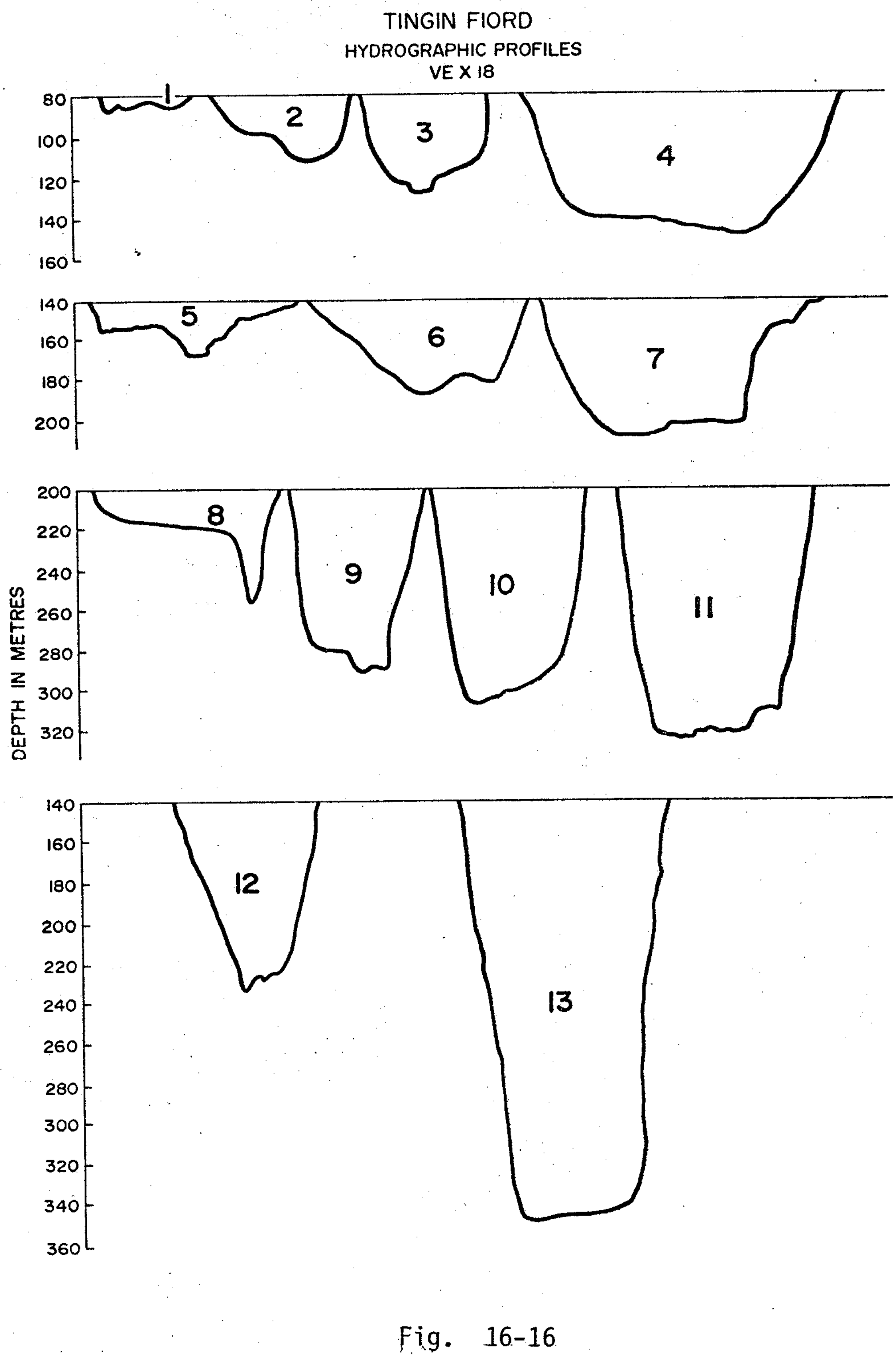

TINGIN FIORD
HYDROGRAPHIC PROFILES
VE X 18
DEPTH IN METRES
80
100
120
140
160
140
160
180
200
200
220
240
260
280
300
320
140
160
180
200
220
240
260
280
300
320
340
360
1
2
3
4
5
6
7
8
9
10
11
12
13

Fig. 16-16

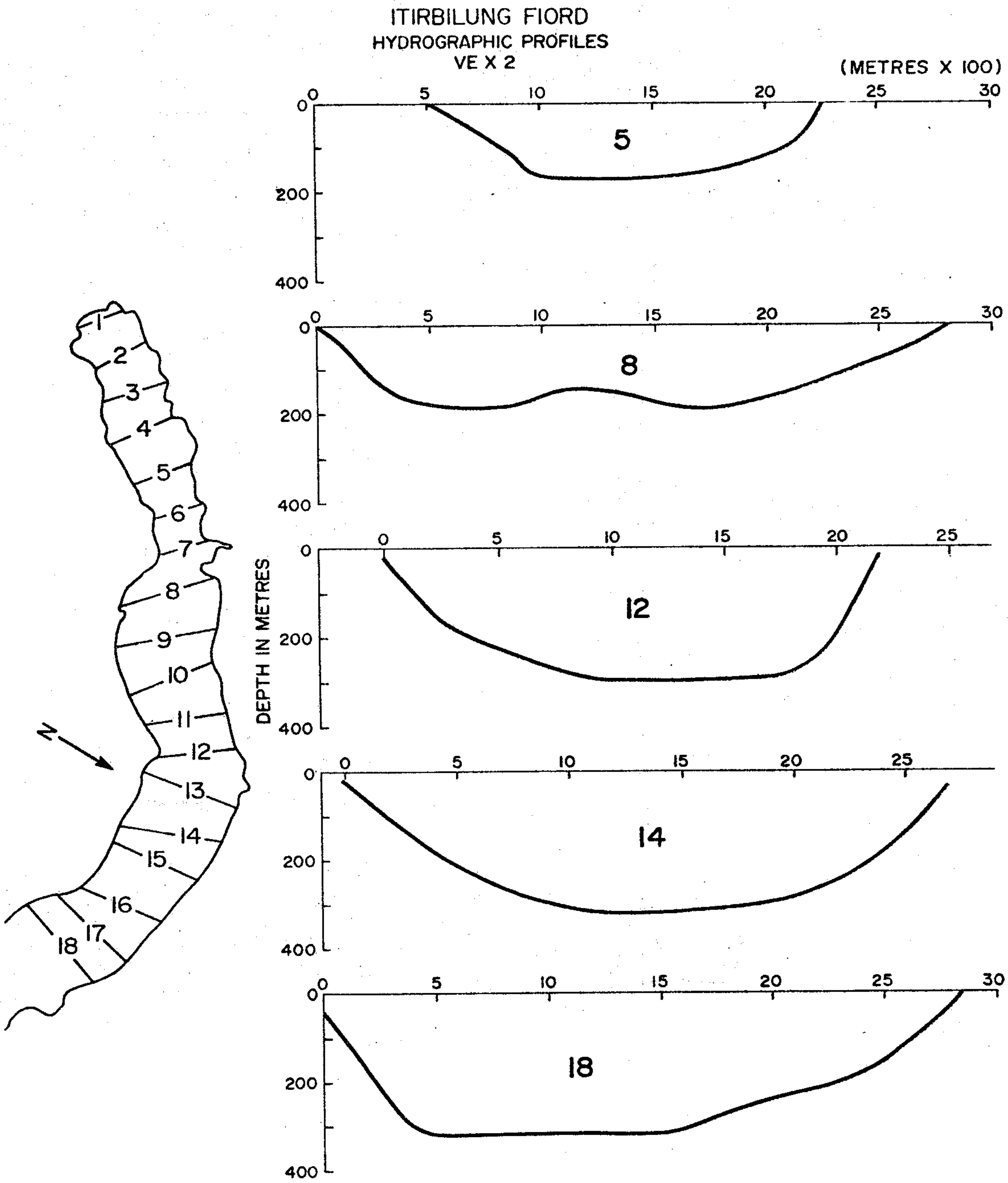

ITIRBILUNG FIORD
HYDROGRAPHIC PROFILES
VE X 2
(METRES X 100)
0 5 10 15 20 25 30
DEPTH IN METRES
0 200 400
5
8
12
14
18
N
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

Fig. 16-17

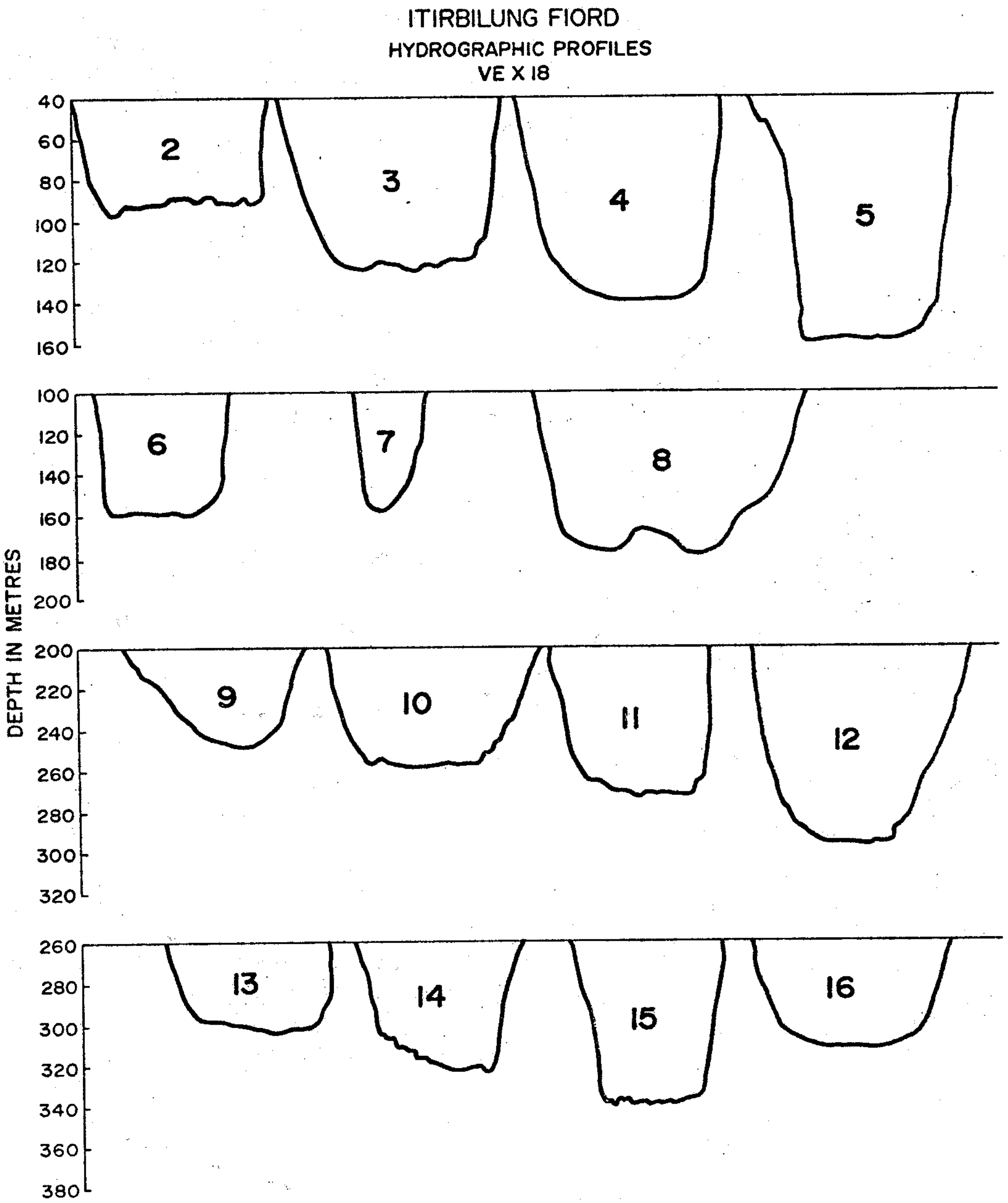

ITIRBILUNG FIORD
HYDROGRAPHIC PROFILES
VE X 18
DEPTH IN METRES
40
60
80
100
120
140
160
2
3
4
5
100
120
140
160
180
200
6
7
8
200
220
240
260
280
300
320
9
10
11
12
260
280
300
320
340
360
380
13
14
15
16

Fig. 16-18

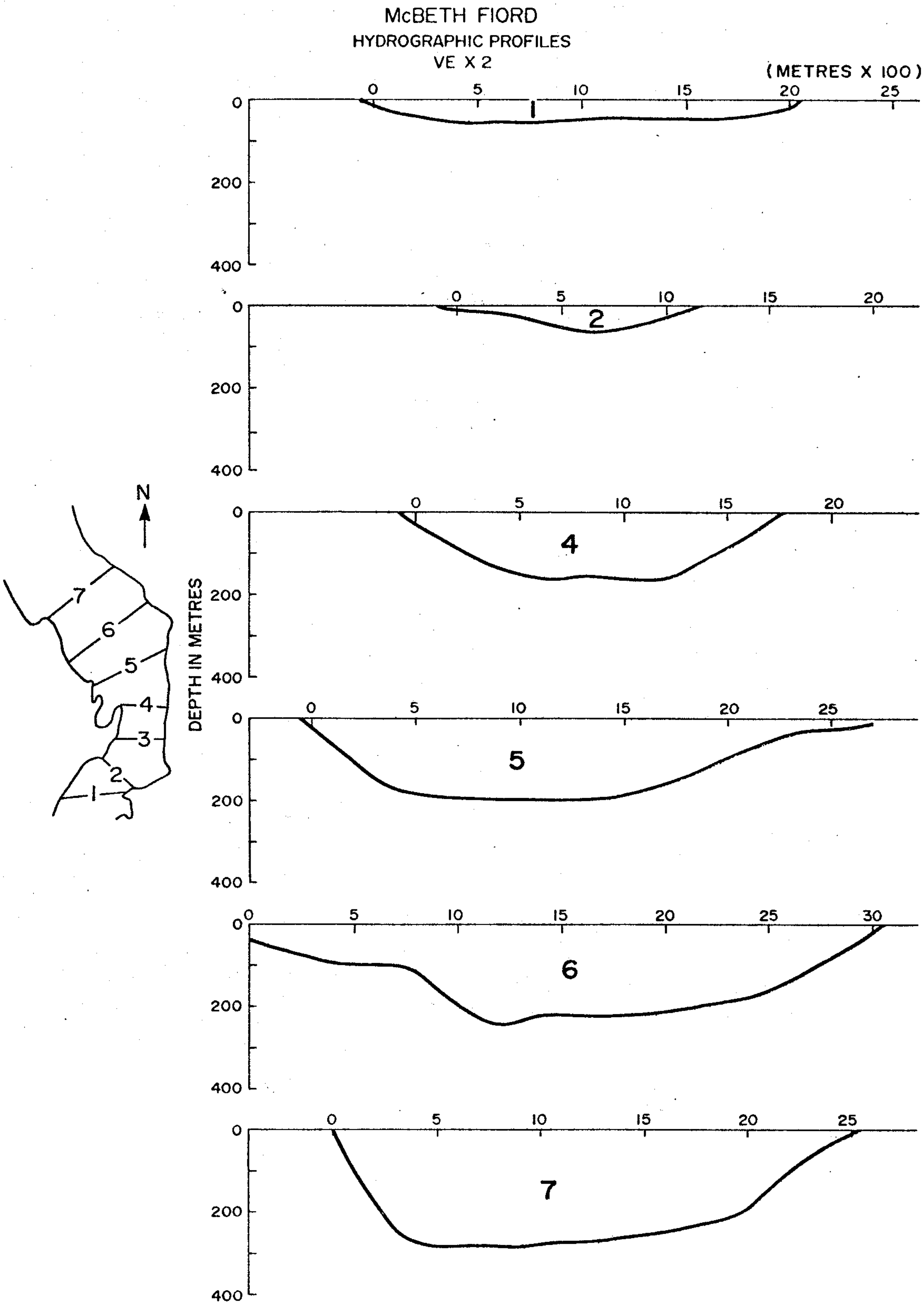

McBETH FIORD
HYDROGRAPHIC PROFILES
VE X 2
(METRES X 100)
DEPTH IN METRES
N
0
200
400
0
5
10
15
20
25
30
1
2
3
4
5
6
7

Fig. 16-19

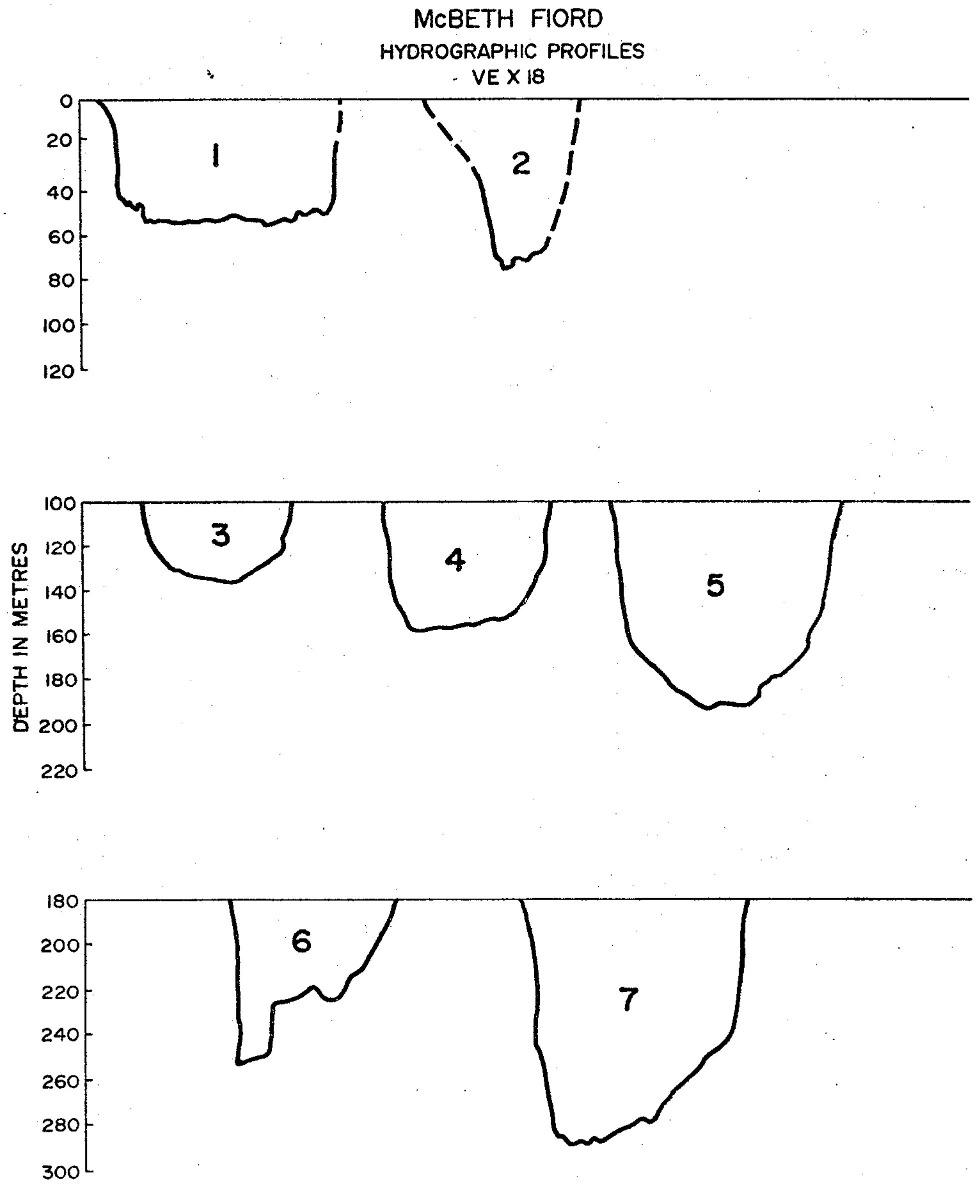

McBETH FIORD
HYDROGRAPHIC PROFILES
VE X 18
0
20
40
60
80
100
120
1
2
100
120
140
160
180
200
220
3
4
5
DEPTH IN METRES
180
200
220
240
260
280
300
6
7

Fig. 16-20

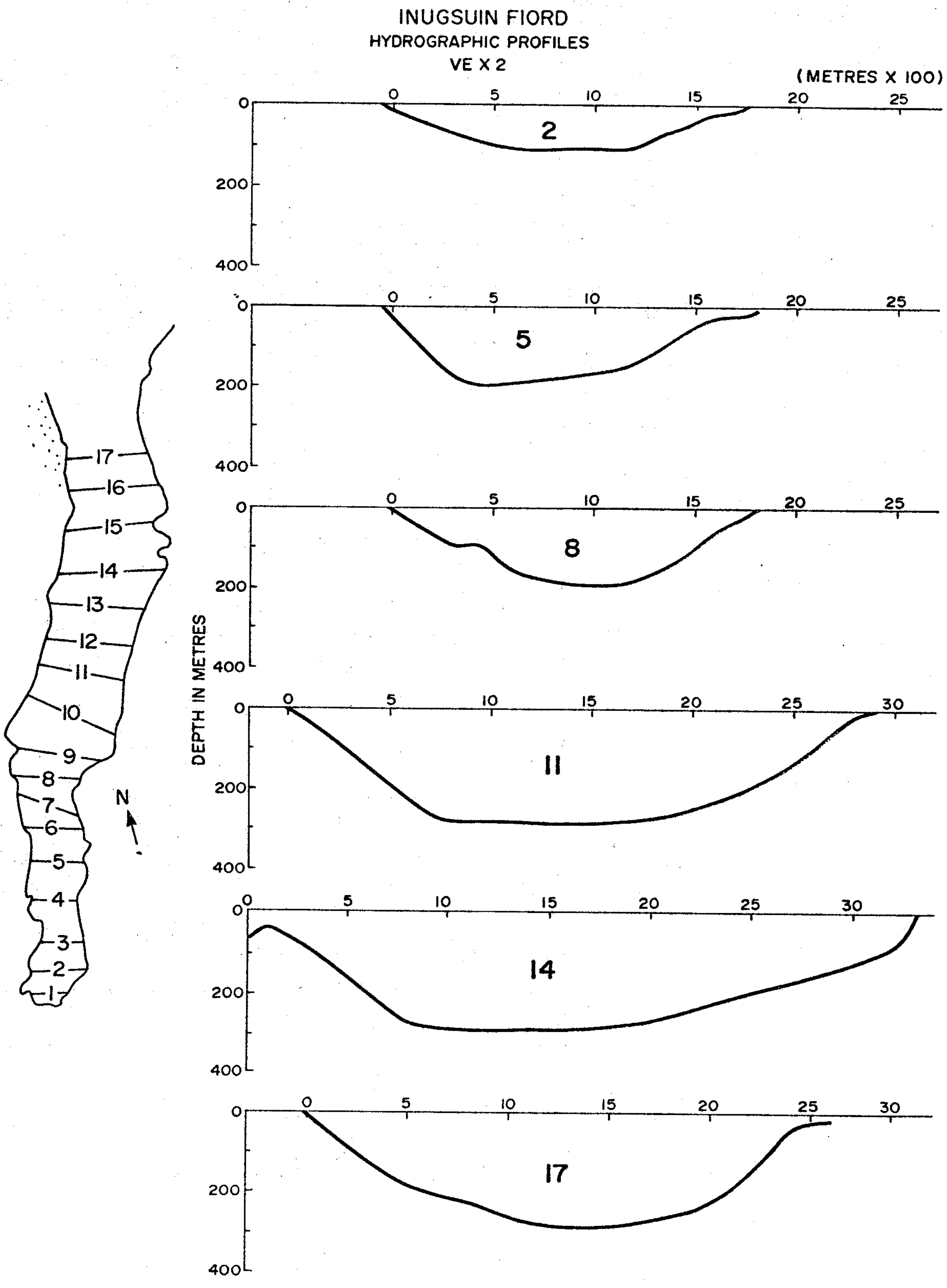

INUGSUIN FIORD
HYDROGRAPHIC PROFILES
VE X 2
(METRES X 100)
DEPTH IN METRES
0
200
400
0
5
10
15
20
25
30
2
5
8
11
14
17
N
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17

Fig. 16-21

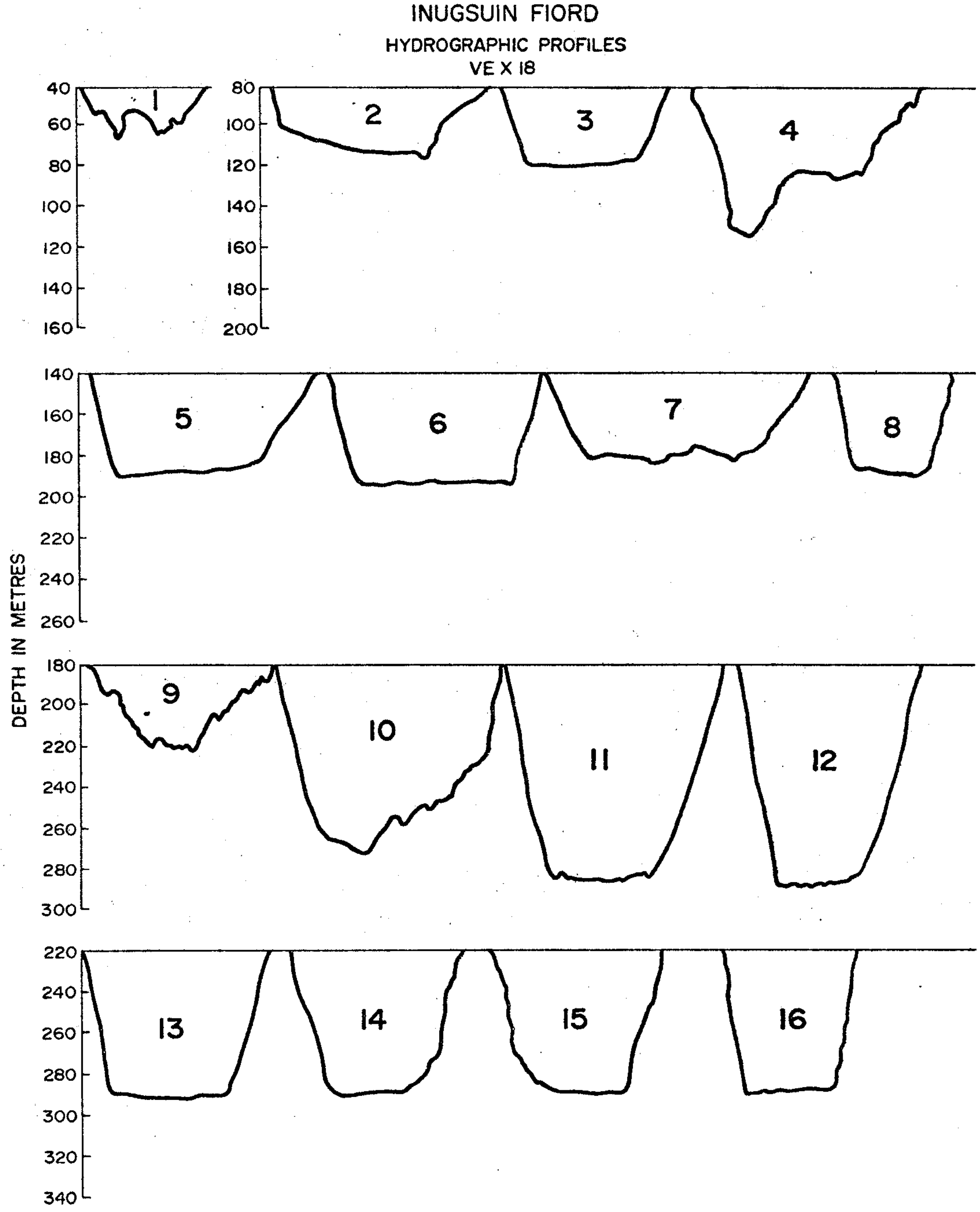

INUGSUIN FIORD
HYDROGRAPHIC PROFILES
VE X 18
DEPTH IN METRES
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
40
60
80
100
120
140
160
80
100
120
140
160
180
200
140
160
180
200
220
240
260
180
200
220
240
260
280
300
220
240
260
280
300
320
340

Fig. 16-22

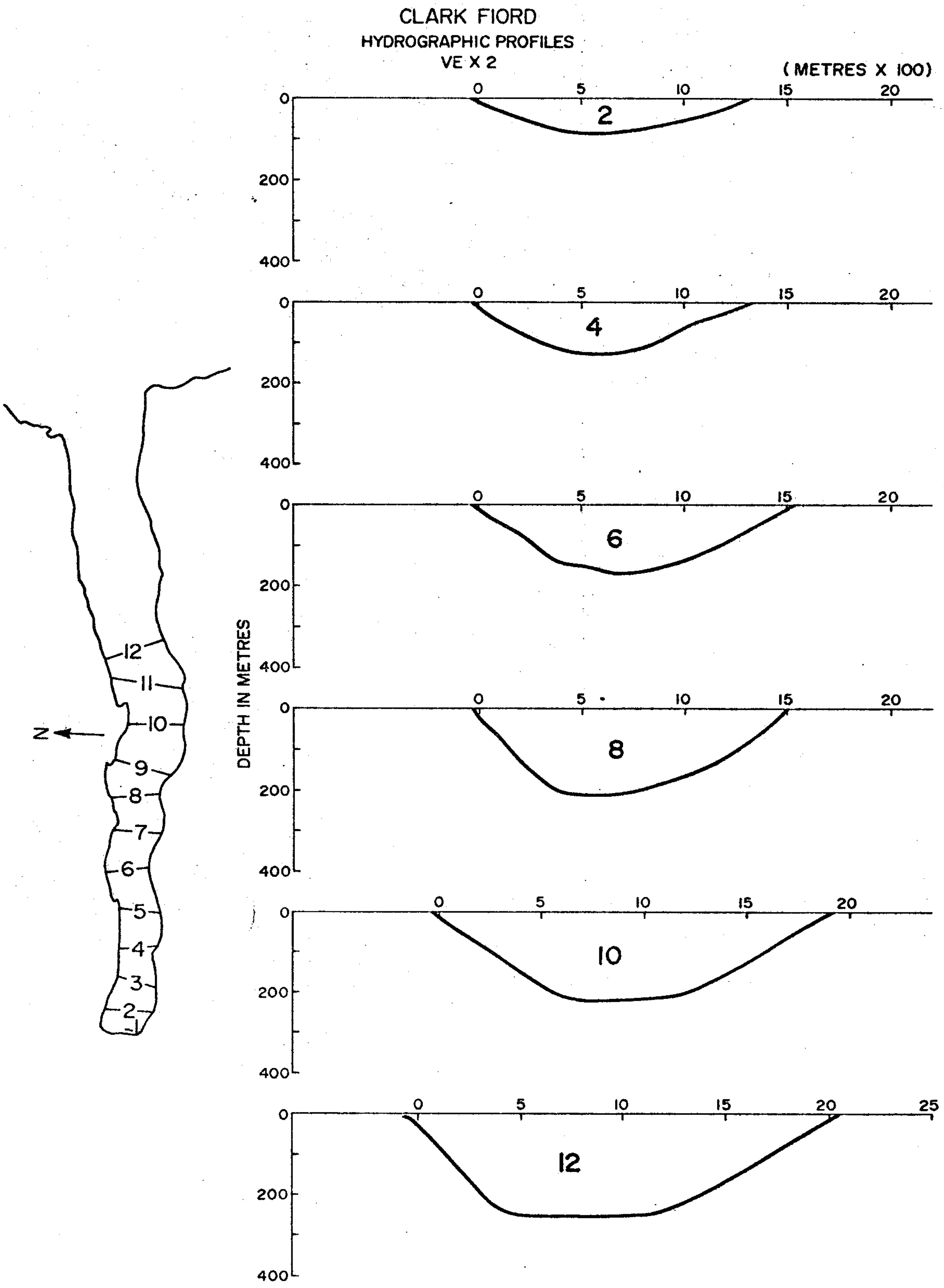

CLARK FIORD
HYDROGRAPHIC PROFILES
VE X 2
(METRES X 100)
DEPTH IN METRES
0
200
400
0
5
10
15
20
25
2
4
6
8
10
12
N
1
2
3
4
5
6
7
8
9
10
11
12

Fig. 16-23

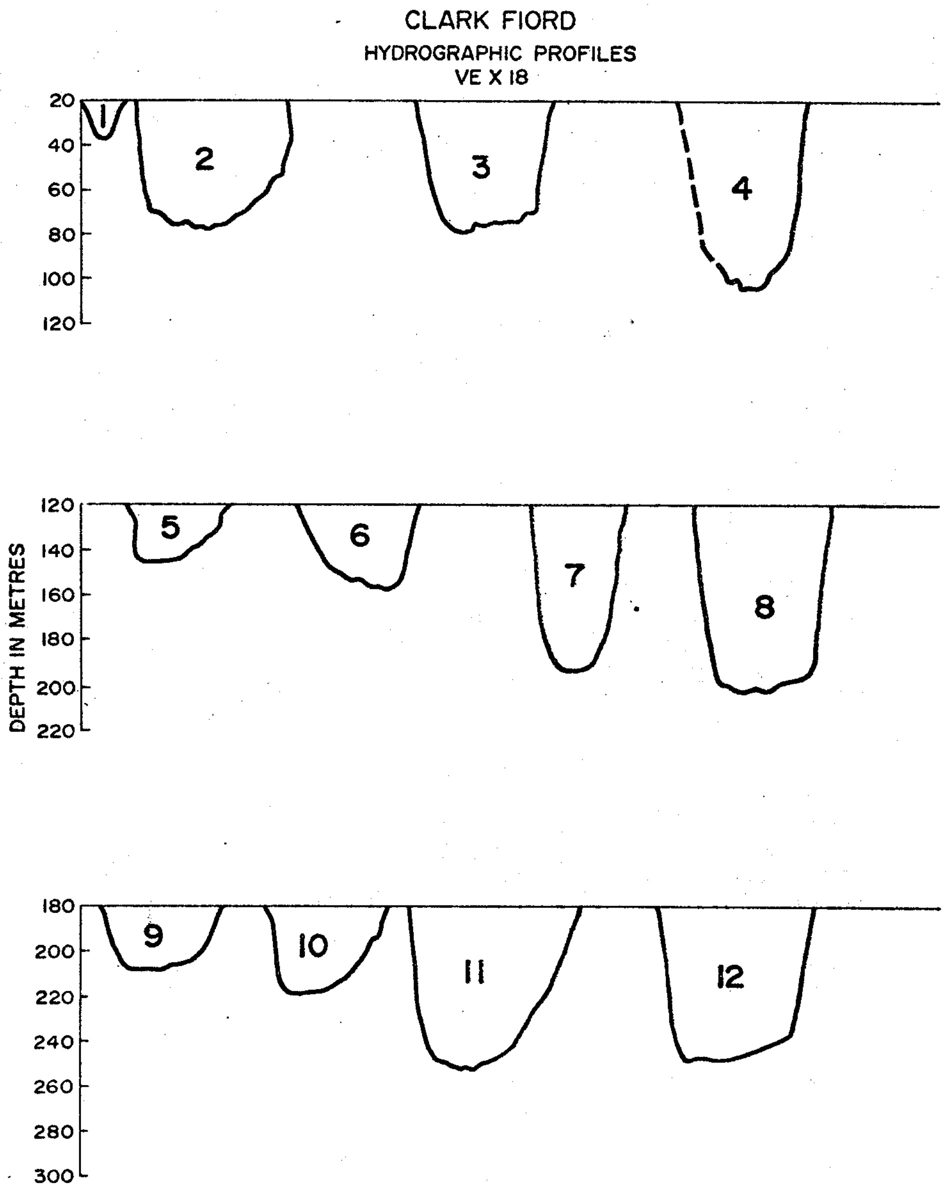

CLARK FIORD
HYDROGRAPHIC PROFILES
VE X 18
DEPTH IN METRES
20
40
60
80
100
120
1
2
3
4
120
140
160
180
200
220
5
6
7
8
180
200
220
240
260
280
300
9
10
11
12

Fig. 16-24

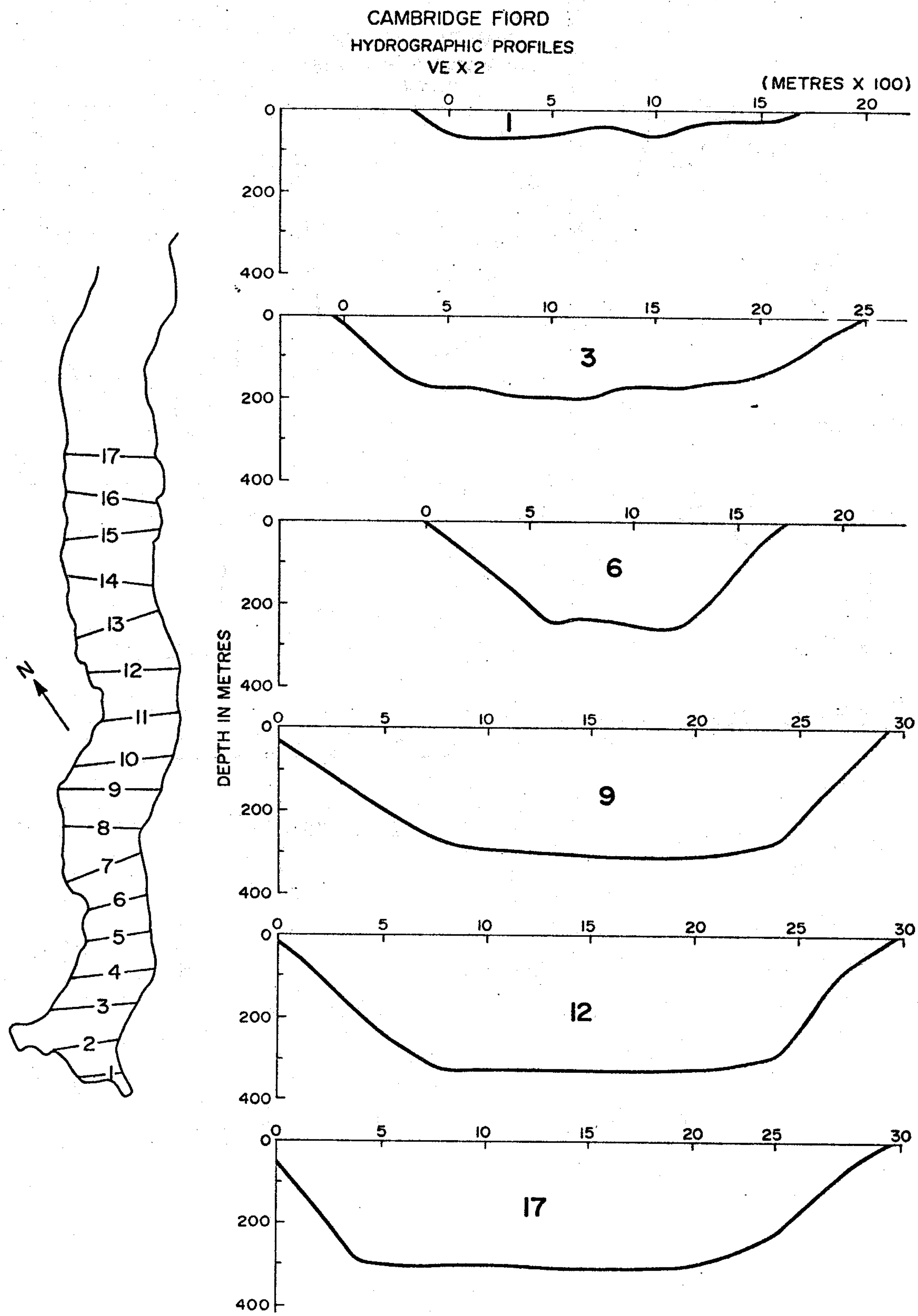

CAMBRIDGE FIORD
HYDROGRAPHIC PROFILES
VE X 2
(METRES X 100)
DEPTH IN METRES
N
1
3
6
9
12
17
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
0
5
10
15
20
25
30
0
200
400

Fig. 16-25

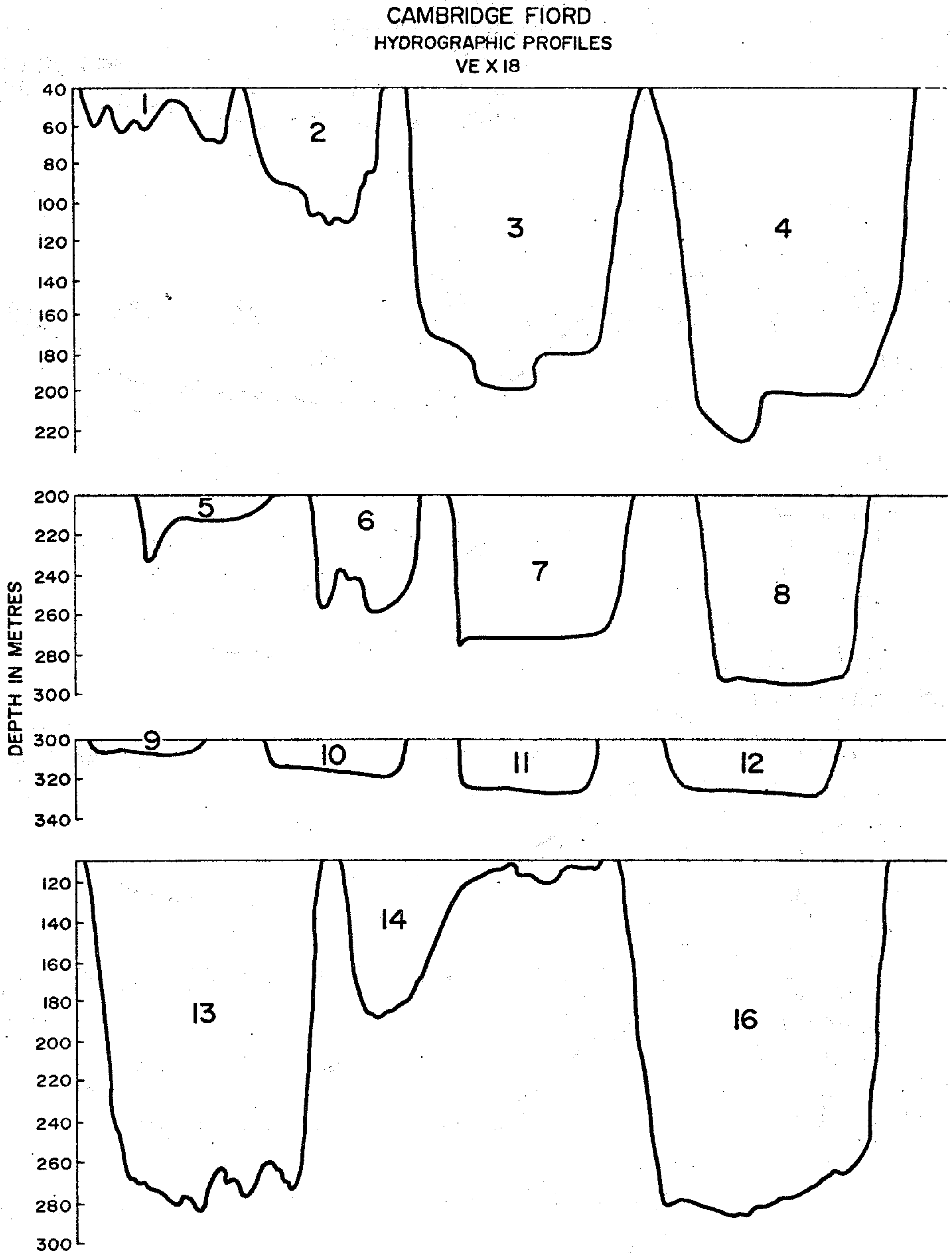

CAMBRIDGE FIORD
HYDROGRAPHIC PROFILES
VE X 18
DEPTH IN METRES
40
60
80
100
120
140
160
180
200
220
1
2
3
4
200
220
240
260
280
300
5
6
7
8
300
320
340
9
10
11
12
120
140
160
180
200
220
240
260
280
300
13
14
16

Fig. 16-26

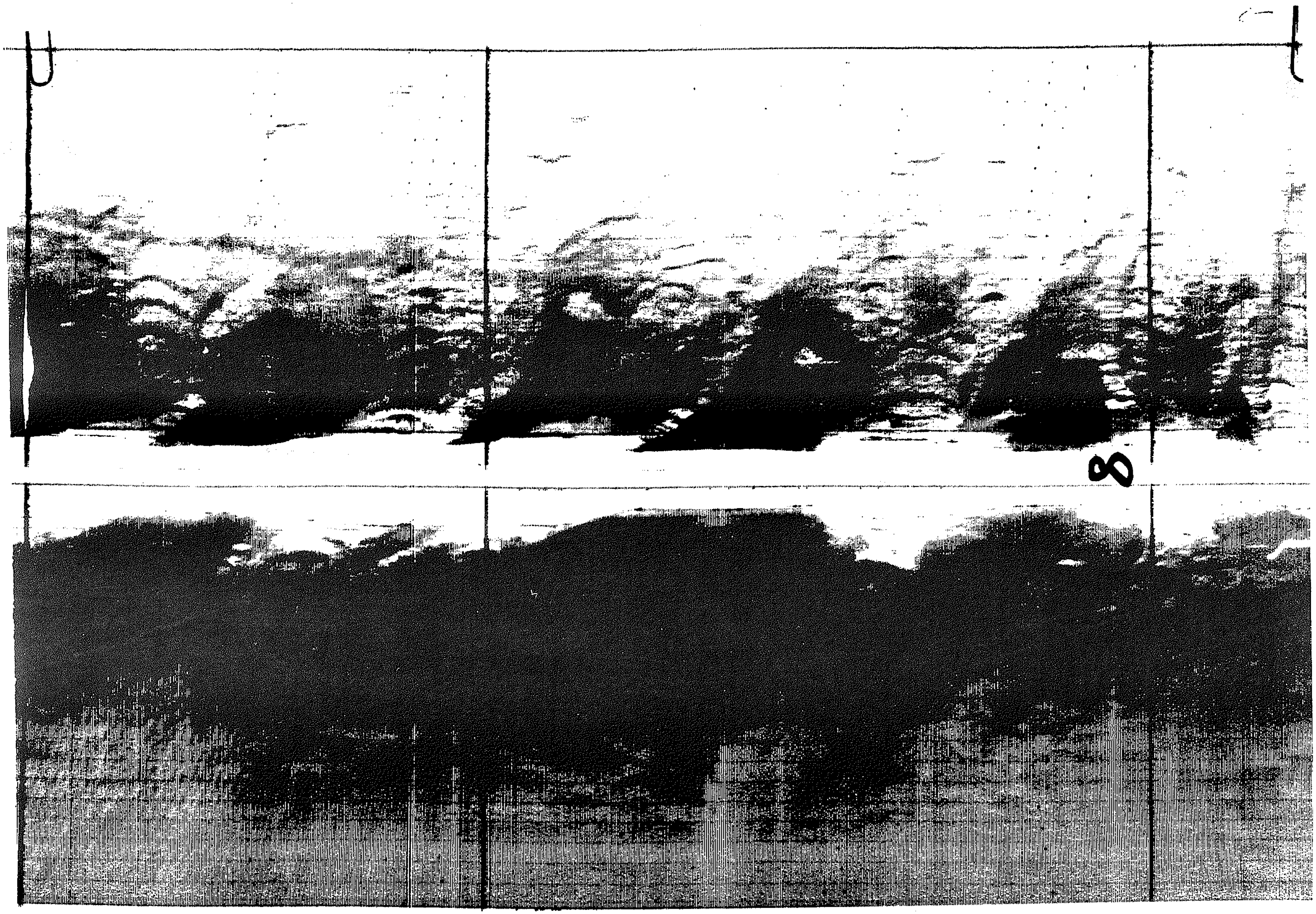


FIG. 16-27

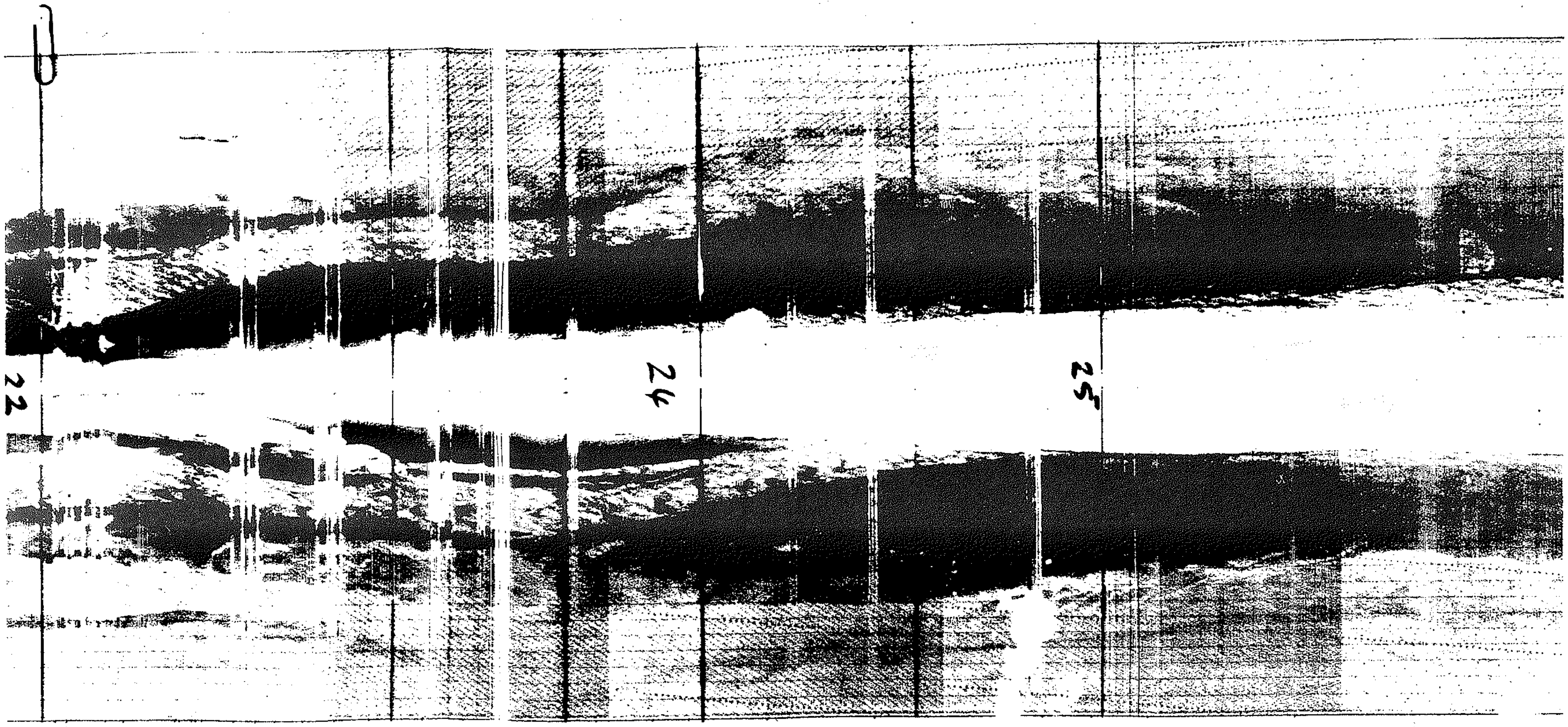


FIG. 16-28

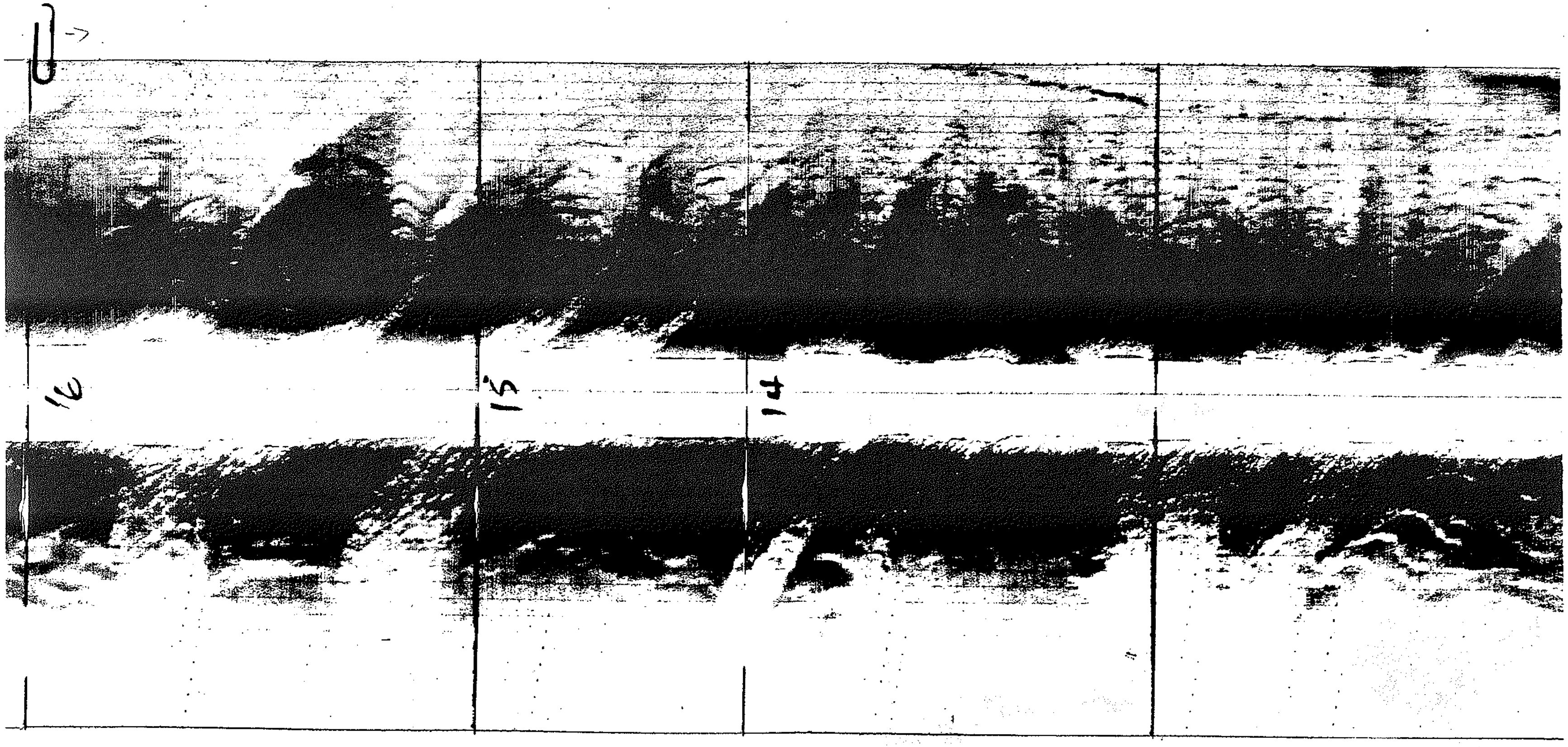


FIG. 16-29

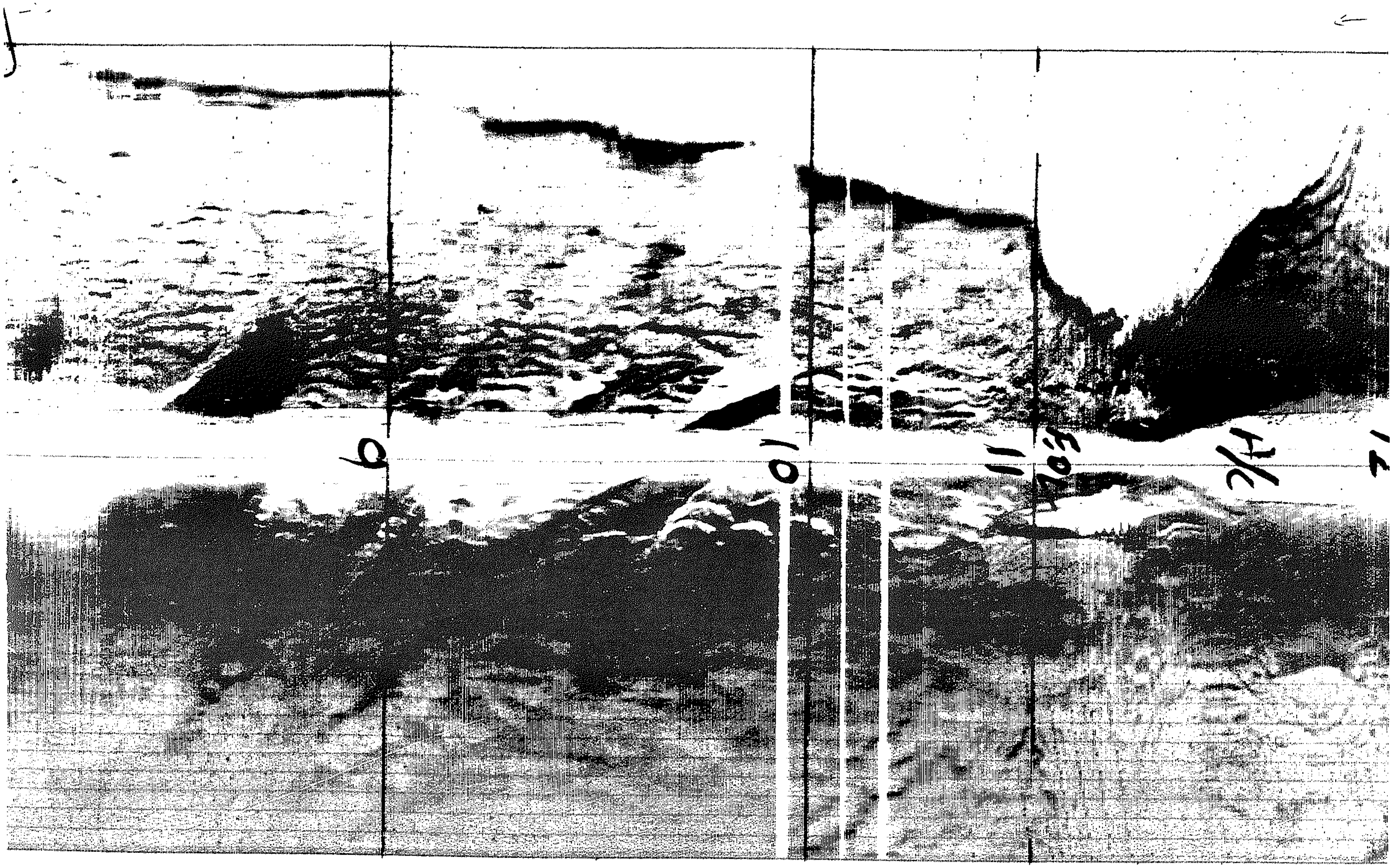


FIG. 16-30

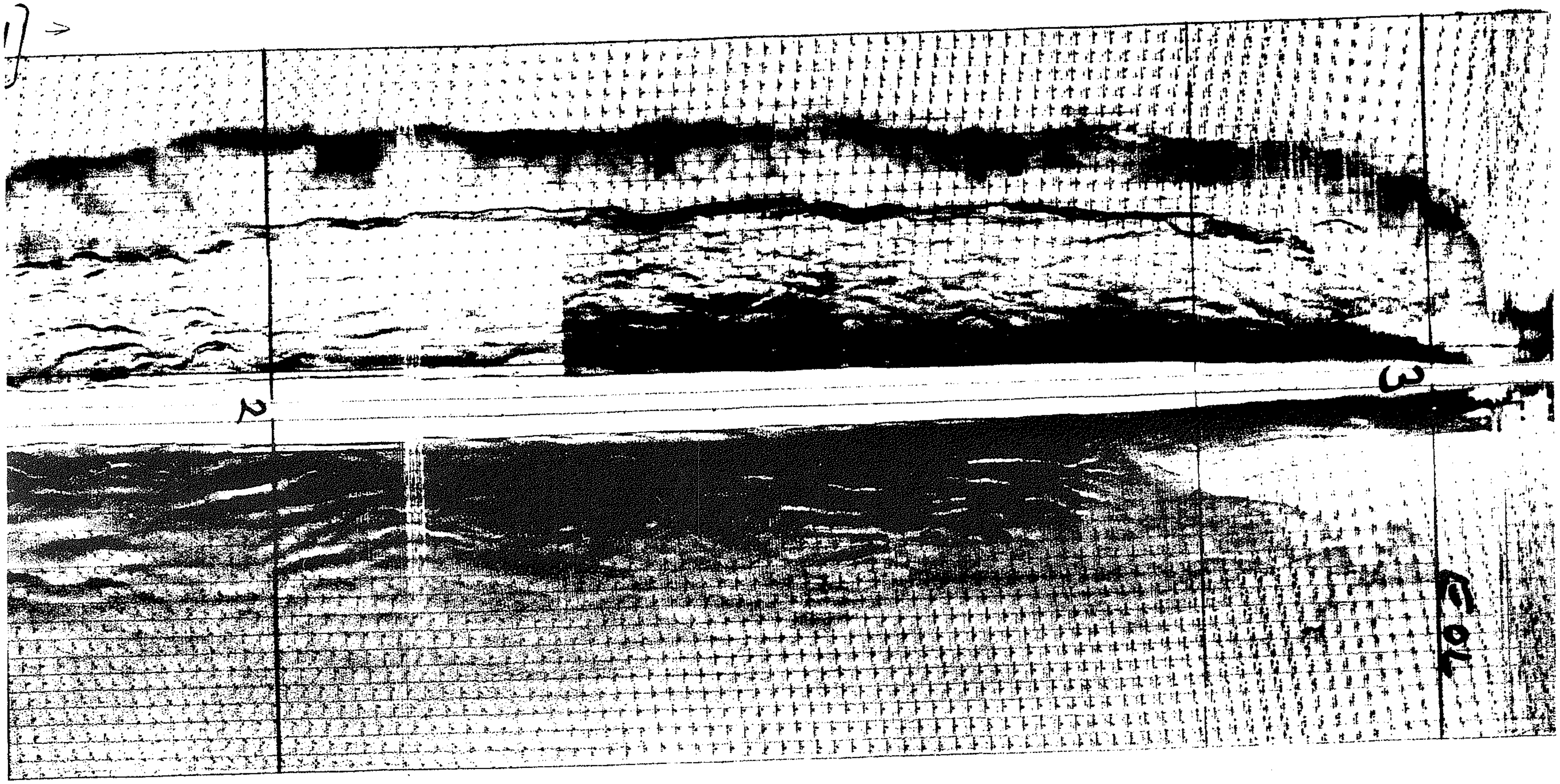


FIG. 16-31

16-42

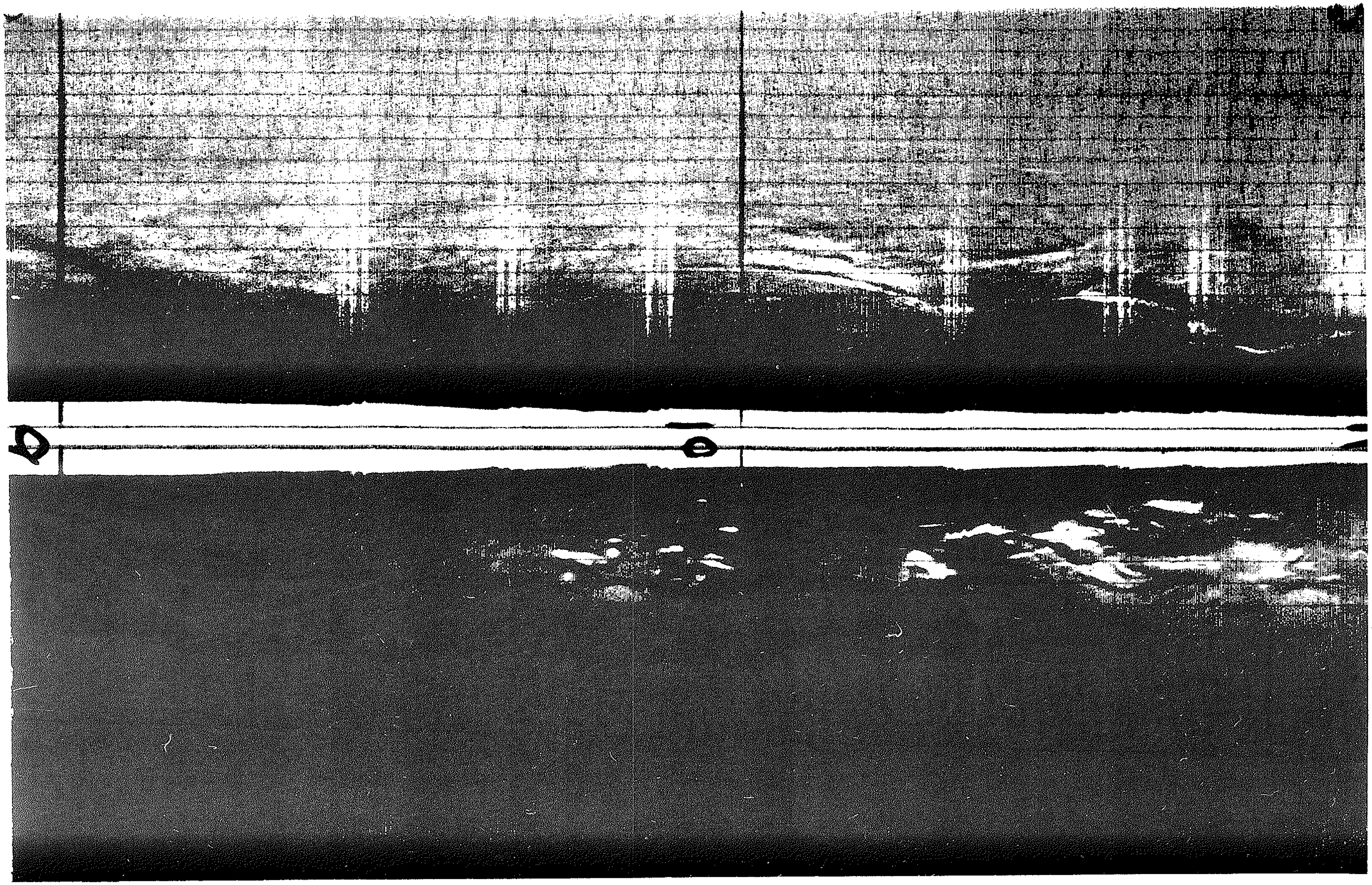


FIG. 16-32

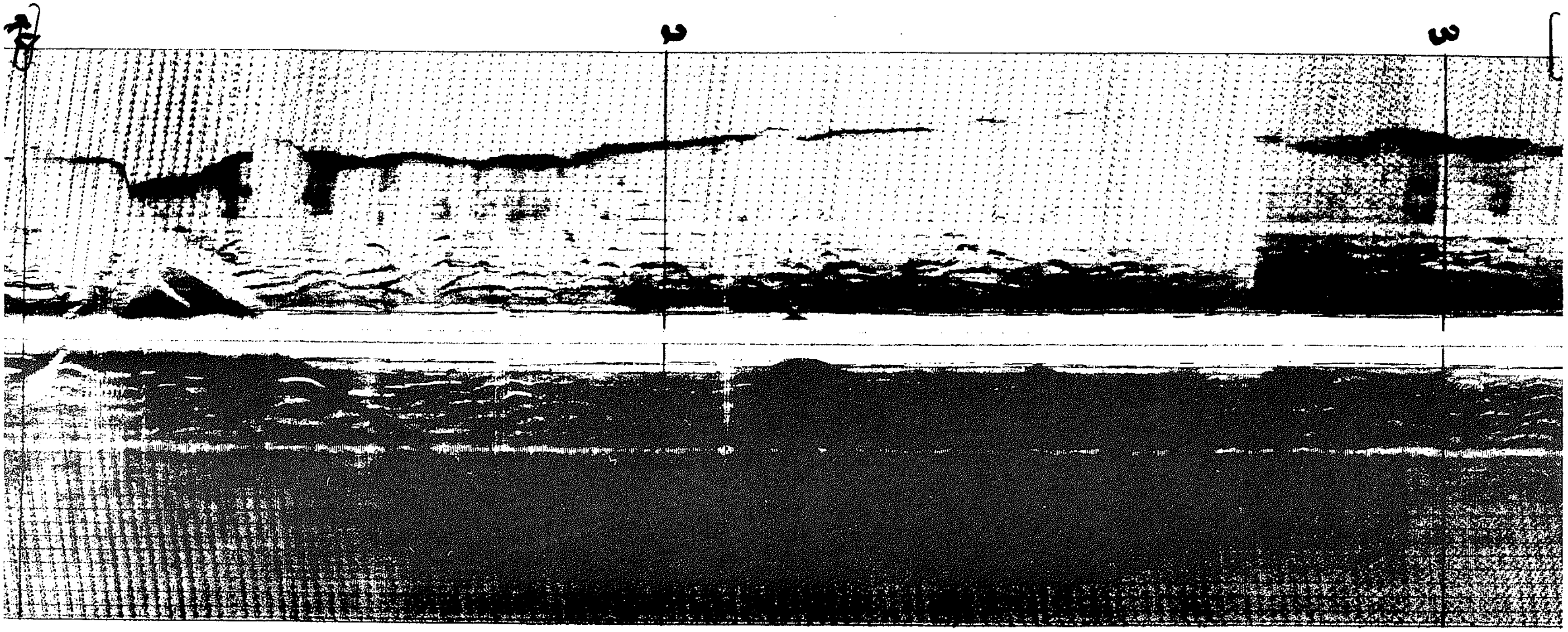


FIG. 16-33

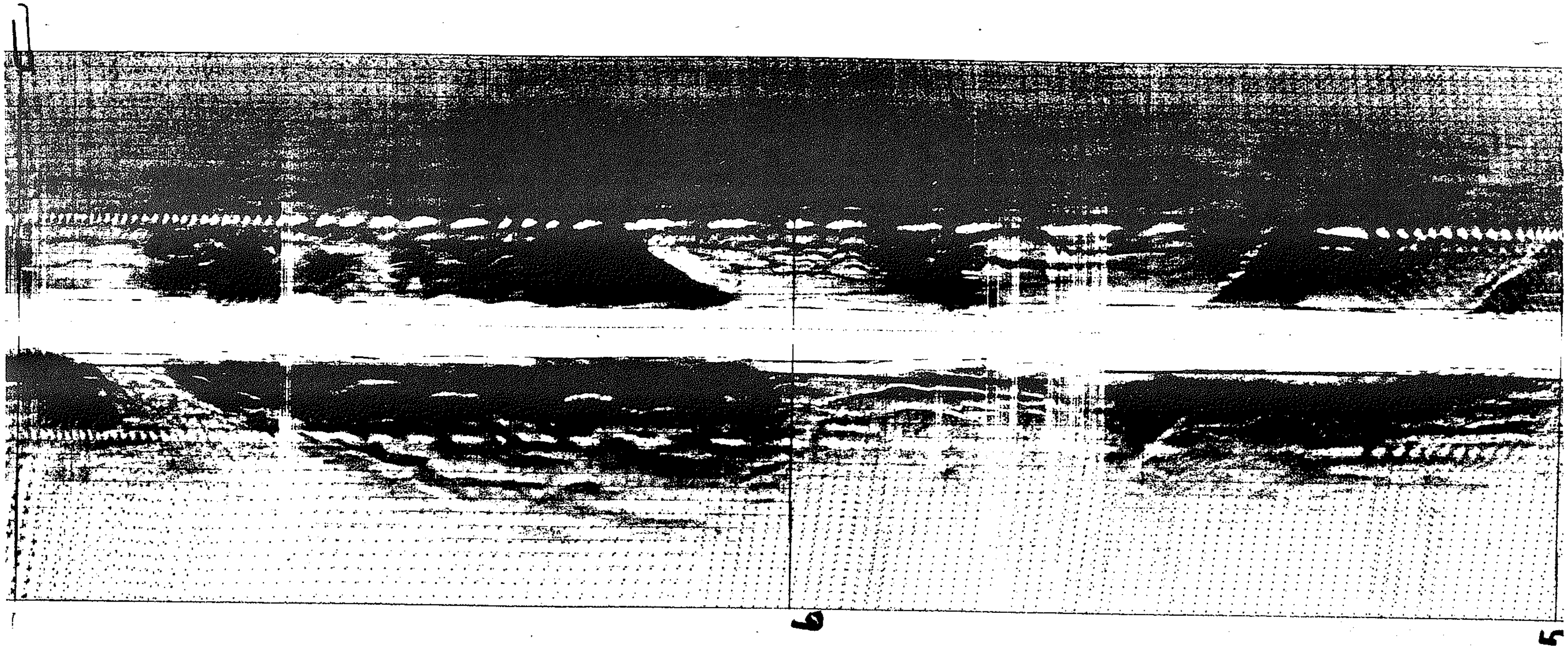


FIG. 16-34

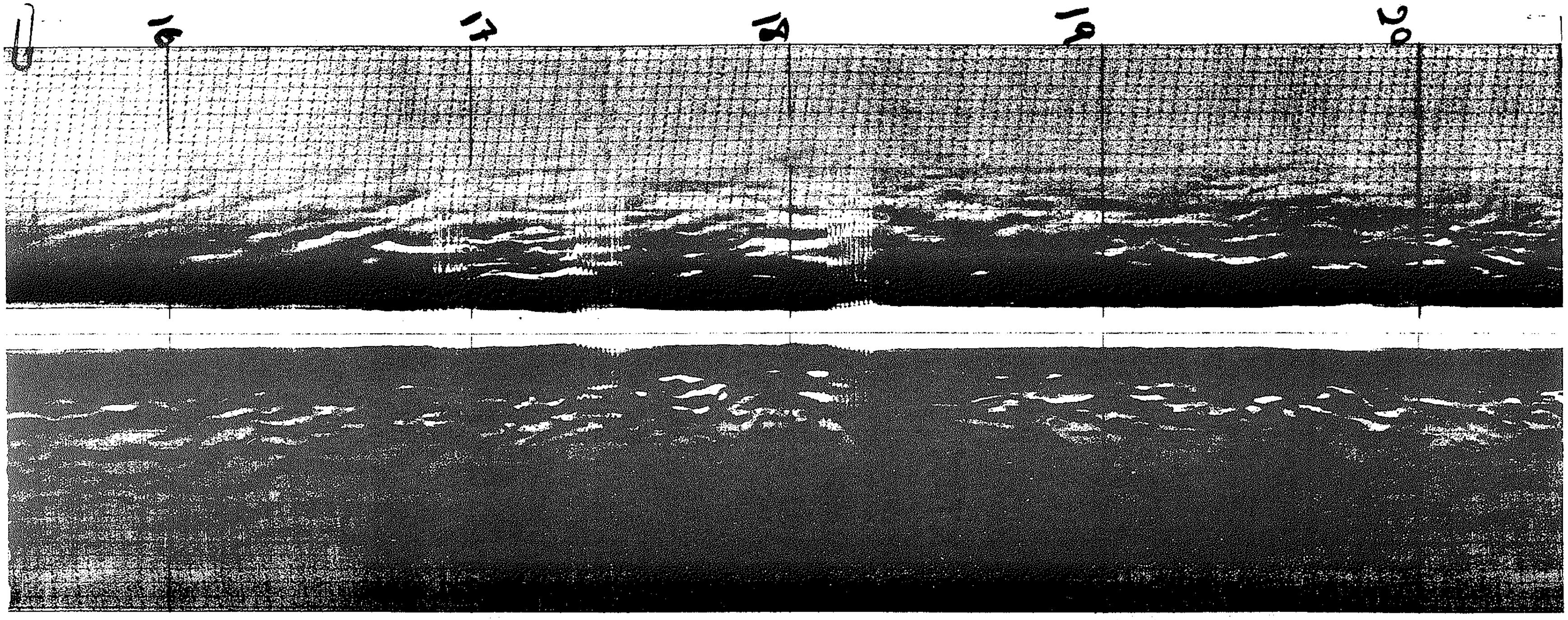


FIG. 16-35

Fig. 16-36

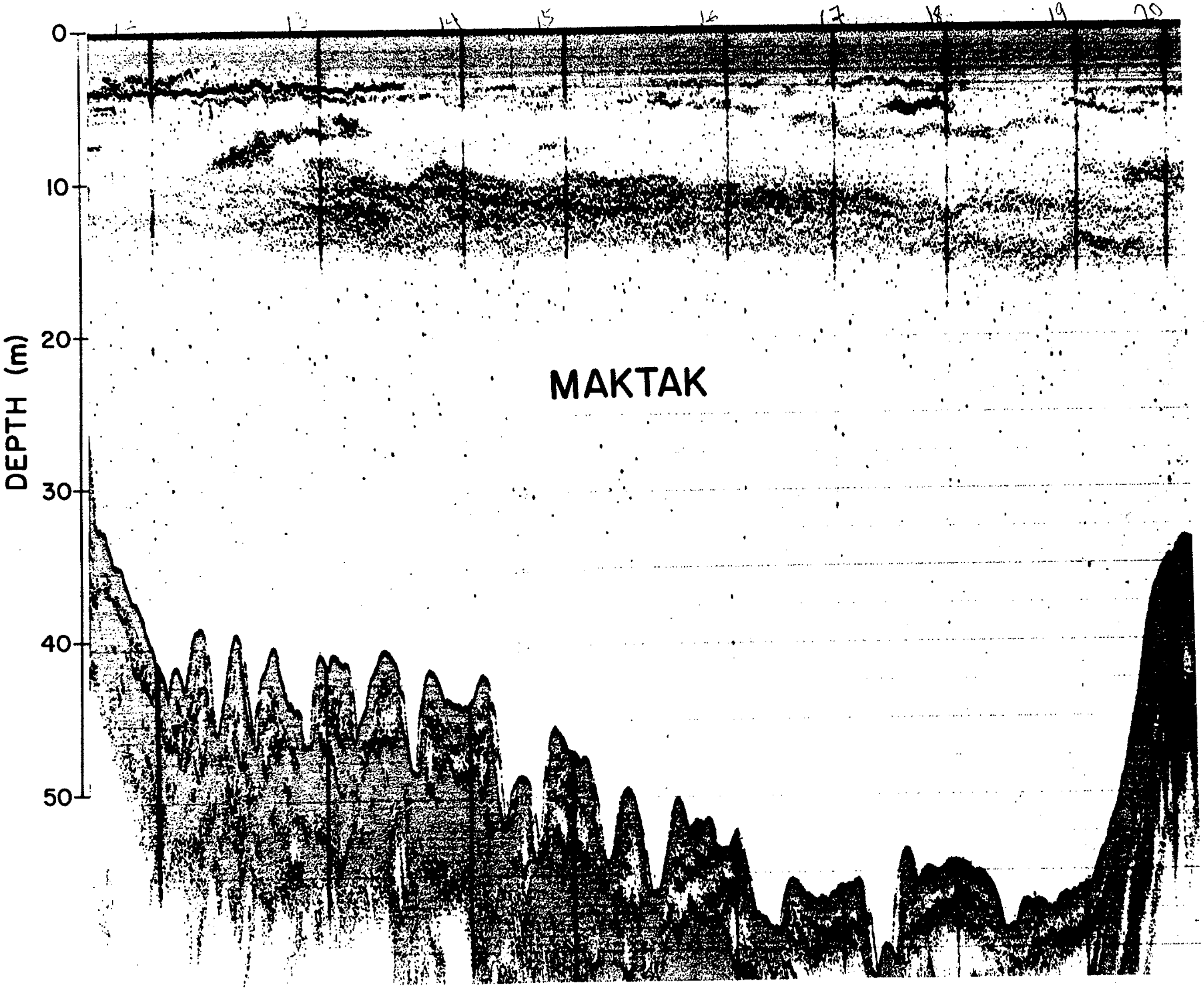


Fig. 16-37

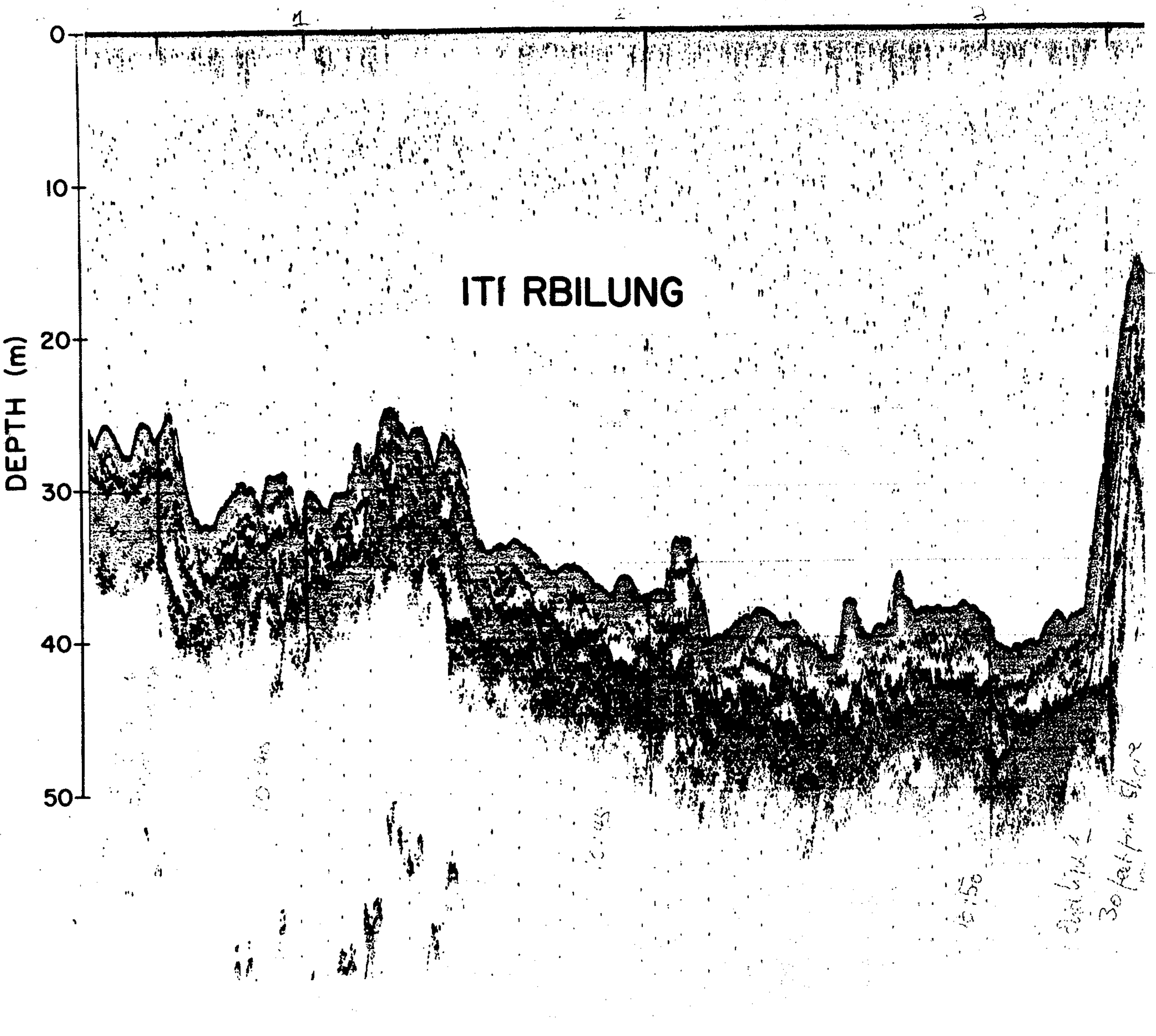


Fig. 16-38

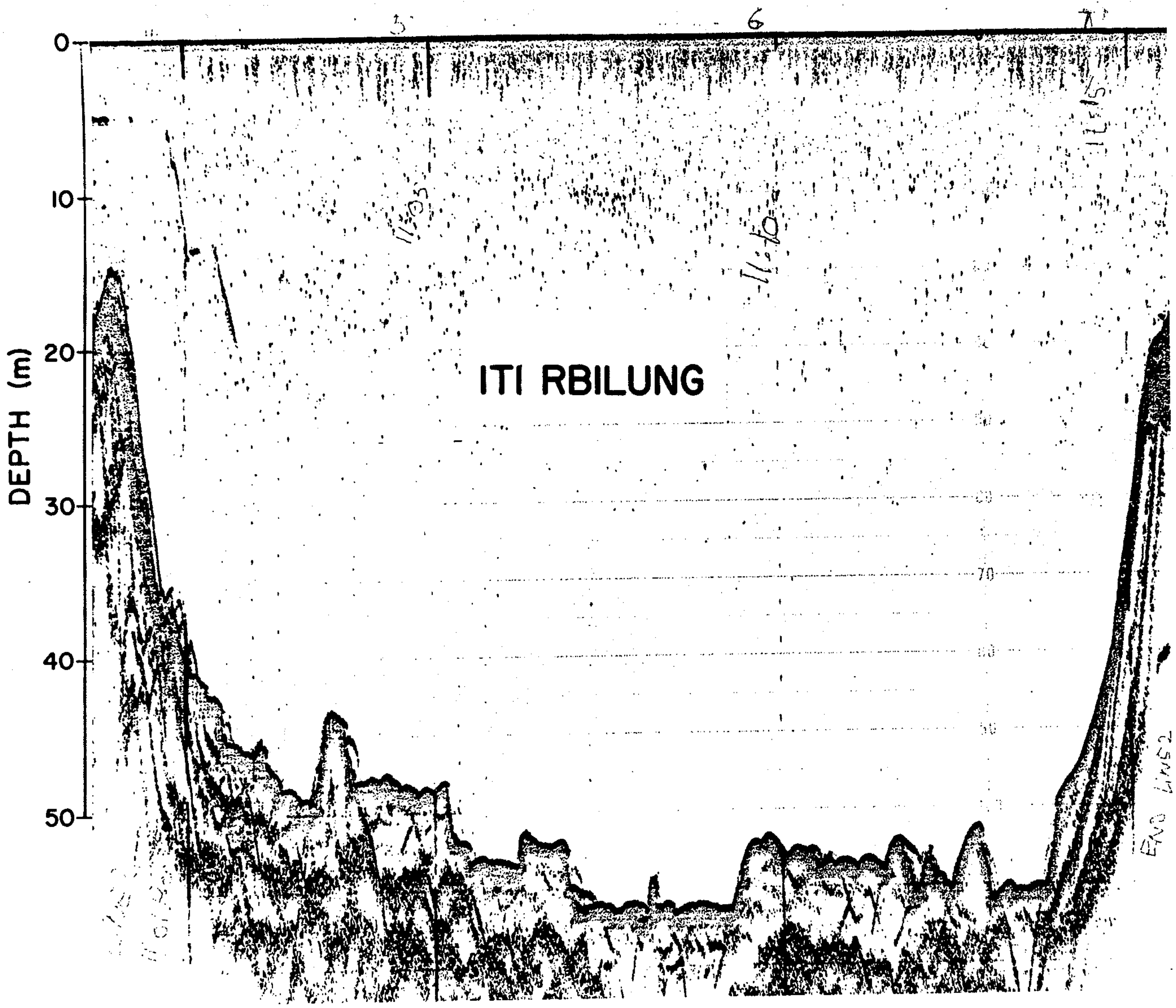
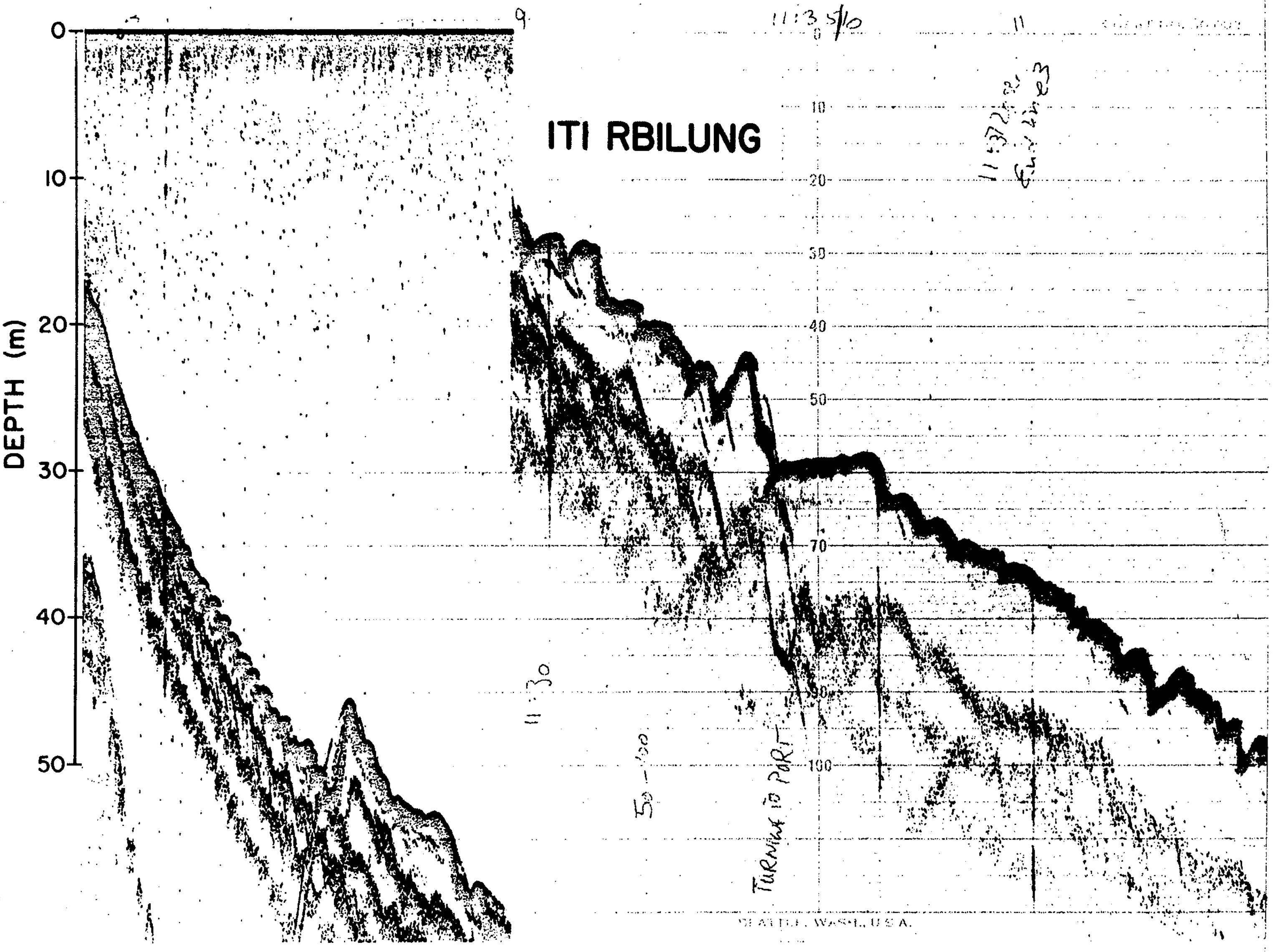

ITI RBILUNG
DEPTH (m)
0
10
20
30
40
50
5
6
7
11:05
11:10
11:15
End Line 2

Fig. 16-39


ITI RBILUNG
DEPTH (m)
0
10
20
30
40
50
9
11:35/10
11
11:37 2/10
End line 3
11:30
50-100
Turning to Port
10
20
30
40
50
70
90
100
SEATTLE, WASH., U.S.A.

17. ACOUSTIC REMOTE SENSING

Alex E. Hay, Dept. of Physics and Newfoundland Institute for Cold
Ocean Science, Memorial University of Newfoundland, St. John's, Nfld.

PURPOSE

The program is designed to investigate the relationships between temperature, salinity and density gradients, suspended sediment concentrations, and increased levels of acoustic backscatter as a function of axial position within a fjord, and on a comparative basis between fjords. Of special interest are internal wave-prodelta interactions, internal hydraulic phenomena in the vicinity of shallow sills, and the buoyant jet from the submarine freshwater spring in Cambridge Fjord.

EQUIPMENT AND METHODS

Two acoustic sounder systems were used: (1) a 192 kHz Ross Laboratories portable scientific sounder with a transducer beamwidth of 2.6 degrees; and (2) a Datasonics Model DFT-210 dual frequency (80 and 200 kHz) system with an EPC Model 3200S Graphic Recorder. The transducer beamwidths are nominally 2.5 and 5 degrees at 200 and 80 kHz respectively. The Ross system was mounted on the scientific launch GREBE. The Datasonics system was operated from HUDSON during geophysical tows. However, because the towfish has a noise-limited top speed of 5 knots, and this speed was usually exceeded in order to obtain adequate coverage during the geophysical tows, this sytem was not used very much. Nevertheless the few results obtained with the Datasonics system were satisfactory.

SUMMARY OF RESULTS

A visual comparison of the CTD profiles with the acoustic records indicates a strong correlation between the amplitude of acoustic backscatter and zones of high temperature and salinity gradients. As an example of the potential of this technique for the study of internal wave-sediment interactions at the prodelta, an acoustic image of a headward-propagating internal surge in Inugsuin Fjord is shown in Fig. 17-1. Acoustic images of the buoyant jet rising from the submarine freshwater spring are presented in Chapter 7 of this report.

FUTURE WORK

Future efforts will focus on: (1) quantitative investigations of the relationship between the amplitudes of the backscattered signal, suspended sediment concentrations and size distributions, and the magnitude of temperature, salinity and density gradients, particularly in the prodelta area and in the freshwater jet in Cambridge Fjord; (2) the dynamics of the internal gravity surge observed in Inugsuin Fjord are being studied in conjunction with R. Trites; (3) continued study of internal wave-sediment interactions at the prodelta with J. Syvitski; and (4) investigation of tidally-generated internal hydraulic phenomena at the sill in Pangnirtung Fjord.

FIGURE CAPTIONS

Fig. 17-1. Internal gravity surge observed with 192 kHz Ross Labs acoustic sounder at the head of Inugsuin Fjord on 20 September 1982. Note the change in depth scale from 0-50 m to 0-100 m at the left of the echogram.

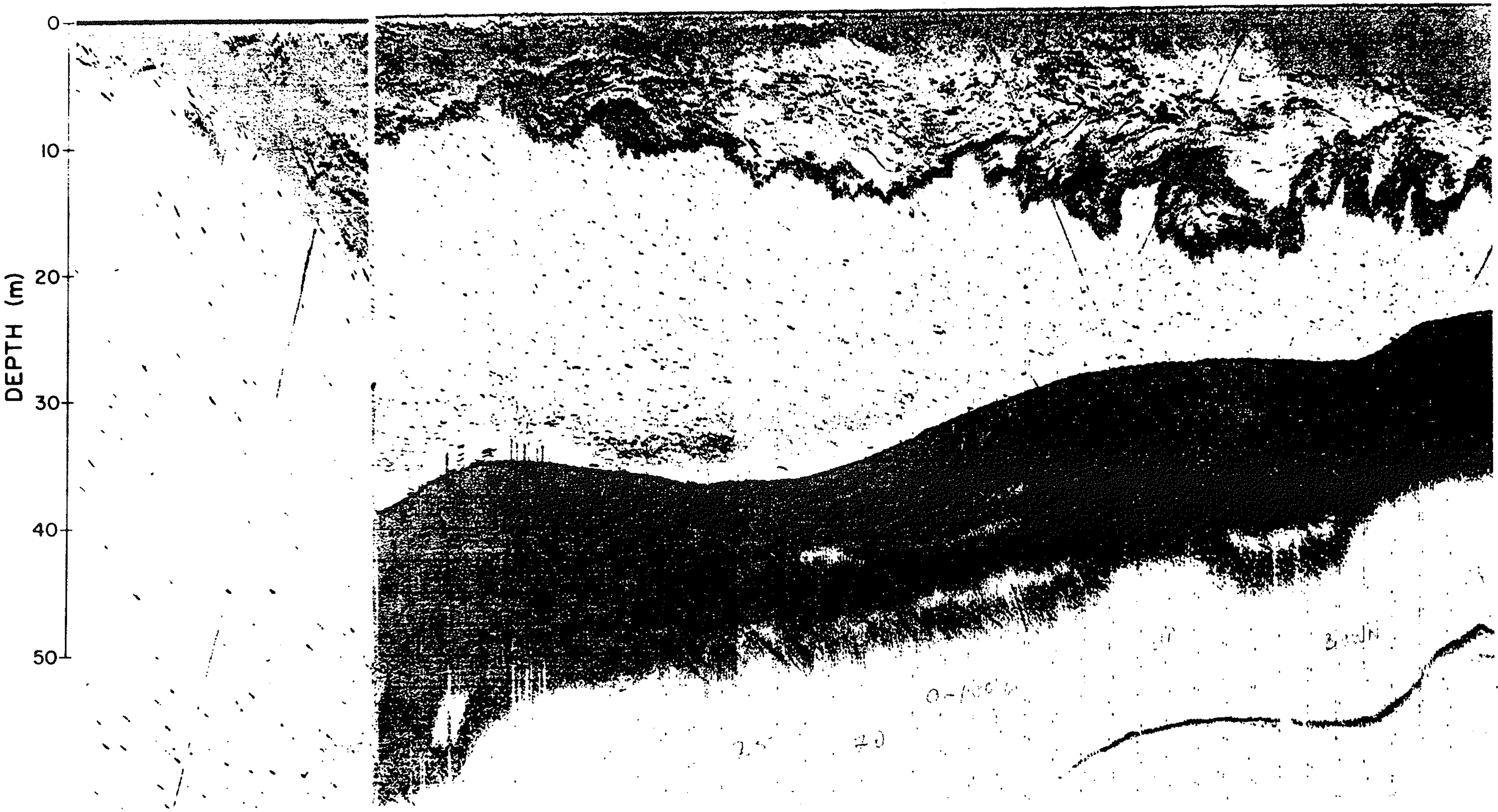


Fig. 17-1

SAFE: 1982 Delta Report

by

James P.M. Syvitski, Ken W. Asprey, Claudia P. Blakeney
Donald Clattenburg

Geological Survey of Canada
Bedford Institute of Oceanography
Box 1006, Dartmouth, Nova Scotia

and

Gordon Duncan Hodge

Department of Geological Sciences
University of British Columbia
Vancouver, British Columbia

CRUISE OBJECTIVES

The terrestrial sedimentary processes occurring at the head of each fjord were investigated as part of the HUDSON 82-031 cruise to Baffin Island Fiords. The objectives of these brief surveys were to: 1) ground truth EMR 1958/1960 air photos; 2) document the major patterns and conditions of sediment transport from land to fjord; and 3) classify the bayhead deltas in terms of an end-member concept of deltaic processes and facies for the Arctic environment.

FIELD AND LABORATORY METHODS

A four or five member land party travelled from the CSS HUDSON to shore with a 5.5 m, semi-enclosed, boston-whaler. Each land survey was completed within four to five hours. Water samples were collected by hand lowering 1-litre Nalgene bottles into the fjord surface or into freshwater outflow. Surface or subsurface sediment samples were collected using a trowel. Care was taken to subsample only one sedimentation event. Details of transects were voice-recorded and photographed.

Size frequency distributions were obtained from all sediment samples. The gravel fraction was analyzed for its nominal grain diameters using ASTM procedures and 1/4 ∅ sieves. The sandy fraction (25 μm to 2000 μm) was analyzed for its equivalent spherical sedimentation diameter at 1/5 ∅ interval using the Atlantic Geoscience Centre settling tube. The mud fraction, where significant, was analyzed on a computerized Sedigraph® 5000D for the particles equivalent spherical sedimentation diameters at 1/5 ∅ interval over the range of 0.5 μm to 63 μm. Water suspensates were analyzed at 1/3 ∅ interval by a TA II computerized Coulter Counter® for their equivalent volume diameters. Representative samples were also analyzed for weight percent organic carbon using a LECO® carbon analyzer.

DESCRIPTIVE RESULTS

The Sunneshine Fiord delta was not investigated due to heavy winter-ice conditions. North Pangnirtung and Maktak Fiords were also not investigated due to night time arrival.

Coronation

The head of Coronation Fiord is occupied by the Coronation tide-water glacier (Fig. 18-1, 18-2a). The glacier is presently retreating ≈ 15.2 m/a (R. Gilbert, pers. communication). The glacier cliffs extend from sea level (southern medial moraine) to 80 m above sea level in the central portion of the terminus. Side scan sonar records of the glacier front are poor but do not indicate any lift off point. The glacier is considered grounded on the sea floor, some fifty to seventy meters below sea level.

A recessional moraine, formed seaward of the southern medial moraine complex, is composed of equal amounts of all grain sizes (sample 4977, Fig. 18-2b). The moraine is ice-cored and the overlying sediment is loose and unstable. Along the cliff crest of the leading edge of the glacier, overhanging the water, boulders of all sizes appear precariously balanced (Fig. 18-2c). Many were observed falling into the water (and in one case our boat). Along the glacier front, the sediment was concentrated along curvilinear joints and fractures. Icebergs and bits were covered with sediment dropstones or melt out material (Fig. 18-3a). Ice chunks thawed and sediment fraction removed (samples 4980, 4994) had up to 38.2 $g{\bullet}L^{-1}$ of gravelly sandy sediment incorporated into the ice matrix. Ice caves were common and especially concentrated beneath the medial moraines.

A large ice-dammed pond or lagoon is surrounded by 40 m mounds of water lain (Fig. 18-4c) and aeolian (Fig. 18-4b) loess-type deposits. The sediments are mostly fine sand and coarse silt (samples 4989, 4990). The main (jölkulhlaup) channel (Fig. 18-4d) is lined with a lag of well rounded cobbles. South of that complex is a talus mound of gravelly sandy sediment (sample 4988) at the glacier toe yet away from the medial moraines (possibly a push or terminal moraine).

Tingin

The Tingin delta, is a coarse-grained sandur with fifty percent of the area composed of older fluvial deltaic terraces or raised marine sequences (Fig. 18-5,b). Surface runoff on the delta was in part groundwater seepage. Tidal channels (Fig. 18-6c) had a muddy sand over-lying a gravel bottom (sample 4913), with a carbon content of 0.44%. The general slope of the streams is steep with several small waterfalls close to the high tide line.

Itĭrbilung

The closest northern-slope, side-wall glacier to the main delta was investigated (Fig. 18-7). Large (40 m high) lateral moraine flanks stretch out into the fjord, allowing a small pocket beach to develop in between (Fig. 18-8c). The sediments are angular, with evidence of wave action slight. Ground water seeping out onto the beach surface was the only source of freshwater surface flow. Wind blown sand was found in small pockets on the beach (Fig. 18-8A, sample 4920).

The main Itĭrbilung delta, appeared capable of being fluvially active across the entire width of the fjord-valley (Fig. 18-8B). Winter ice chunks were scattered across the intertidal sand flats (Fig. 18-8B). Ice furrows and melt-out pots containing pebbles were common on the flats (Fig. 18-9B), disrupting small-scale wave ripples. Up-river of the sand flats, the sediment was coarser (fine gravel/coarse sand) yet relatively well-sorted compared to the Tingin delta (Fig. 18-9A,C).

We witnessed an impressive aeolian storm with dust clouds reaching 100's of metres high (Fig. 18-9A, 10A). The central portion of the sandur was covered with rippled sand ribbons over a pebble deflation lag (Fig. 18-9D). Where the pebble lag was absent, the delta surface was actively being eroded (Fig. 18-10A). Fluvial channels exposed at low water levels contained frozen sand. The sand was polished flat due to the sand blasting of the aeolian action, revealing the intricate structures of linguoid current ripples (Fig. 18-10C). The aeolian transported sediment was mostly blown off the delta into the fjord waters. The sediment sinks on the delta include: 1) snow patches which act as blotters to the wind blown sand (Fig. 18-10B); 2) the lee of fluvial channel banks (Fig. 18-10D); and 3) the river water. A plastic bag was held 10 cm over a rippled sand surface, collecting wind blown sediment over a 30 second period. The result is sample 3496, a moderately well-sorted fine sand. The rippled sand beneath had very similar characteristics (sample 3499).

McBeth

The subtidal portion of the delta (in 2 m of water) appears composed of coarse sand. The northern part of the delta is dominated by a salt marsh (Fig. 18-12C). Further inland the salt marsh merged into Arctic tundra vegetation (Fig. 18-12D). In the outer flat areas, ice-rafted boulders were infrequently observed. The main river channel is very large, hundreds of metres across at its widest and two to three metres deep at its center (Fig. 18-12B, 13A). Its floor is covered with low amplitude gravel ribbons with wavelengths of 10 m (Fig. 18-13A). Channel banks revealed a fining upward sequence from a ferrous oxyhydroxide gravel to small-scale current ripples (Fig. 18-12A): the sequence repeats ever 10 to 30 cm.

The flood plain is broken by polygons of triangular, rectangular or polygonal shape. Each polygon is several hundred m^2 in area (Fig. 18-13B). Some of the cracks have infilled with finer aeolian sand (sample 4316A) compared to the normal pebble deflation lag (sample 4316B). Many of the polygon cracks are wet indicating preferential ground water movement along the cracks. Channels from the mountain side are found at right angles to the main river. The channel floors were dry covered in fluvial current ripples.

The influence or imprint of wind action on the delta is impressive. Large banks of aeolian sand are found concentrated behind large outcrops of bed rock (Fig. 18-11, 1813C,D, sample 4319). The flood plain is in part protected by a water lain (wadiis) sandy mud (Fig. 18-14A, B, sample 4317). Where this mud is eroded away, the wind has deflated the delta surface some 10 to 15 cm. Much of the flood plain is of uneven surface topography from aeolian blow outs (Fig. 18-14C). Tundra sedge is successful in anchoring down some of the sediment (Fig. 18-13C). Wind rippled gravelly sand indicates impressive winds that must occur over the delta (Fig. 18-14D).

Large patches of ferrous-oxide sand is well cemented and may act as a stabilizing factor on the delta making erosion harder (sample 4314A). Sandy mud on the delta (samples 4314, 4317) had organic carbon values of 0.34 and 0.30 weight percent respectively.

Inugsuin

The delta is virtually non-existent due to nearby lakes that trap much of the riverine sediment (Fig. 18-15). The survey was also hindered by a recent snow cover. The beach was littered with fuel drums from a previous expedition (Fig. 18-16B). The river from the lake to fjord is short (≈ 2 km) flowing down some 60 m in elevation. The river bed is covered with large boulders, some over 1 m in diameter (Fig. 18-16D). The river cuts through raised marine terraces (Fig. 18-16C). Where exposed the terraces indicate impressive glacio-marine prodelta sedimentation (Fig. 18-16A, sample 4517).

Clark

The slope of the northern beach was a constant 10° to heights of 35 m above sea level (Fig.18-17, 18D). The beach is covered with angular talus boulders that have rolled down to overly the otherwise sandy sediment. Heavy minerals are concentrated along the beach strand lines (sample 4327) possibly due to flotation (Fig.18-18C). The main delta is covered in dozens of 1 to 3 m wide fluvial channels with depths less than 1 m. The channels are covered in bouldery sediment (sample 4330, maximum size: 15 cm diameter) overlying very poorly sand (Fig. 18-18B). Patches of aeolian sand are presently being concentrated from the melting of underlying snow. Heavy minerals are concentrated as thin subsurface layers (sample 4329b). Dr. Weyer estimated the water flowing from springs into one particular channel at 2 $L \cdot s^{-1}$. Away from the channels on the flood plain the sediment is sandier with large iron pans (Fig. 18-18A). Large patches of high-Arctic tundra vegetation cover the protected parts of the flood plain (Fig. 18-19C). It is thought that many of the boulders on the flood plain have accumulated through differential upheave. A number of tensional cracks were crossed: possibly they are the beginnings of polygons. Active polygons lined with boulders (upheaved?) were much larger than those found on Itirbilung delta (Fig. 18-19B). Less active or non-active polygons were found on the raised deltaic sequences (Fig. 18-19). There the boulders are heavily covered in lichen and do not appear 'fresh'. The raised terrace is undergoing solifluction on its steep slopes (Fig.18-19D).

A side entry glacier presently stretches across most of the valley surrounded by 100 m high terminal moraine apparently pushed into the raised terrace (Fig. 18-20B). Boulders on the moraine are very angular up to 2 m in diameter. The glacier apparently is contributing a large fresh outflow estimated by Dr. Weyer at 50 to 100 $m^3 \cdot s^{-1}$ (Fig. 18-20 C,D). The glacial stream has cut through the moraine to the floor level of main delta (Fig. 18-20C). The terminus bulb of the glacier has retreated some 0.5 km from the moraine; between, the floor is covered in a very bouldery recessional and ground moraine. The ice front is lined with water lines (Fig. 18-20A) that may indicated a lake that once occupied a position between the glacier and its terminal moraine.

Cambridge

Two deltas seperated by bedrock from the head of Cambridge Fiord (Fig. 18-21). The southern delta consists of raised terraces up to 75 m above sea level (Fig.18-22). The terraces are lined by a narrow beach (Fig. 18-22A). The beach was the site of hundreds of ground water seepage sites ($\approx$ 0.1 $L \cdot s^{-1}$): one flow was as high as 10 $L \cdot s^{-1}$. The raised terraces are covered in well-preserved paleo-river channels (Fig. 18-22C), although many are dissected by polygon-ice fissures (Fig. 18-22D). Two icebergs were grounded on the prodelta slopes, Fig. 18-22B is a helicopter view of the delta-prodelta intersection through some 2 m of water: a submarine chute can be seen in the lower left corner.

The Keel River delta was not investigated on land. A helicopter reconnaissance revealed a more dynamic river system (Fig.18-23). The river bed is sand dominated. The river is highly meandering (Fig.18-23C, 18-21). The flood plain is dissected by large polygons (Fig.18-23D). Figure 18-23C shows a linear, raised, sand body, possibly an esker from the last ice advance. The delta front is considerably more braided (Fig.18B). The prodelta-delta intersection is fine grained and covered in heavy mineral concentrates (Fig. 18-23A).

ACKNOWLEDGEMENTS

Dr. S. Schafer is thanked for his support on Tingin, Inugsuin and Cambridge Deltas; likewise Mr. J. Stravers for his support on Tingin Delta; Dr. F. Hein for her support on Iterbilung Delta; Dr. U. Weyer for his support on Clark Delta; Mr. B. Maclean for his support on McBeth and Clark Deltas; and Dr. R. Gilbert for his support on Inugsuin Delta. Ms. B. Kelly provided scientific assistance for the completion of this data report.

TO FOLLOW

Within the next year the delta samples will be analyzed for major and minor mineral percentages (XRD and petrographic analysis). The heavies will be seperated from the lights and re-analyzed for composition and size-frequency distribution. Appropriate samples will be analyzed for gold content. Selected quartz-grain samples will be examined (as part of a larger study) for their surface texture characteristics using the Scanning Electron Microscope.

NUMERIC RESULTS

Table 1. Delta collected water samples and their suspended sediment concentration (SSC)

SAMPLE-ID (820-#)	SSC mg•L^{-1}	Comments
CORONATION FIORD		
4978	14.3	
4979	44.5	
4981	34.7	
4982	8.0	
4984	1.3	
4984	3.9	
4986	1.1	
4987	1.7	
4992	28.9	
4993	5.3	
TINGIN FIORD		
4911	3.1	Salinity 0°/oo
4914	0.17	Salinity 25°/oo
4916	0.40	
ITIRBILUNG FIORD		
3494	1.32	Sampled from mouth of main channel, salinity 25°/oo
3495	0.16	Sampled at whaler mooring, N side of delta, salinity 25°/oo
CLARK FIORD		
4333	11.6	Stream water near edge of moraine
4334	13.3	Stream water closer to glacier

TABLE 2. Grain Size Data

SAMPLE -ID 820-#	gravel (%)	sand (%)	mud (%)	X (Ø)	σ (Ø)	SK	K	Comments
CORONATION								
4977	37.1	42.2	20.7	0.3	4.4	0.1	1.0	recessional moraine
4983*	11.1	87.6	1.3	0.7	0.8	0.3	3.1	stream sediment on glacier
4988*	16.9	82.9	0.2	0.6	0.7	0.0	2.8	talus slope in front of glacier
4989	0	99.6	0.4	2.0	0.6	0.2	7.1	aeolian loess in front of pond
4990	0	82.8	17.2	2.9	0.8	0.4	2.8	aeolian loess in front of pond
4991*	1.3	89.2	9.6	2.3	0.8	-0.5	4.0	water lain pond bank
4994	41.1	49.6	9.3	-0.3	2.8	0.0	1.1	sediment from washed ice chunk
TINGIN								
4912*	56.2	41.7	2.2	0.6	0.9	1.0	4.3	near point of mid-channel bar
4913*	0.5	71	28.5	1.0	0.9	1.0	3.9	middle of tidal creek, 0.44% organic carbon
4915	0.4	93.6	5.9	1.1	0.9	0.7	3.3	middle of bar, sand on gravel, sand sampled
4917	0.3	99.5	0.3	1.0	0.5	1.0	10.0	aeolian sand patch
ITIRBILUNG								
4920	0	93.2	7.5	2.1	1.1	0.6	2.8	aeolian sand, side wall glacier
3496	0	89	11	3.2	0.6	0.5	3.2	collected 10 cm above ripples, wind 45 knts
3497	0	75	25	3.5	0.7	0.3	2.6	wind deposited sd near bedrock
3498	3.7	95	1.3	0.8	1.1	0.8	3.8	sheet sd, coarse fraction, beginning of lag?
3499	0	90	10	3.2	0.6	0.5	3.6	wind deposited ripples on lee of gravel bar
MCBETH								
4313	0.8	91.5	7.7	2.0	1.1	-0.5	2.7	aeolian sd mix with fluvial flood plain sd
4314A*	0.2	46.8	53	2.3	1.0	-0.1	2.0	sandy, mud from last flood condition 0.34% organic carbon
4314B	5.8	94.2	0	1.2	0.9	-0.3	3.2	coarser fraction directly underneath
4315	85.6	14.4	0	-3.0	1.0	0.5	1.8	river bed sample
4316A	9.2	86.9	3.9	1.2	1.3	0.1	1.9	finer sd infilling polygon

TABLE 2. (Cont'd)

SAMPLE -ID 820-#	gravel (%)	sand (%)	mud (%)	X (ϕ)	σ (ϕ)	SK	K	Comments
4316B	50.8	47.2	2.0	-1.0	2.2	0	0.7	surface lag beside polygon
4317	1.3	26.1	72.6	6.3	4.0	0	1.0	flood plain mud 0.30% organic carbon
4318	97.2	2.8	0	-2.5	0.6	-0.2	1.1	surface deflation lag
4319	0	100	0	1.7	0.6	1.4	5.0	aeolian sand at top of cliff
4320	0	100	0	1.2	0.8	1.2	4.1	current ripple λ = 1.5 m, h = 20 cm
INUGSUIN								
4517	0	29.2	70.8	5.1	2.5	0.4	1.3	glaciomarine sediment, raised terrace
CLARK								
4327	0	100	0	1.2	0.4	0.4	7.9	shoreline beach with heavies
4328	28	72	0	1.0	0.9	0.2	2.9	delta front surface
4329A	0.8	96.9	2.3	1.0	0.8	0.8	3.9	delta front surface lights
4329B	1.5	93.3	5.2	1.4	1.1	0.1	2.0	delta front subsurface heavies
4330	100	0	0	-3.0	0.4	0	1.2	aeolian deflation lag
4331	7.4	67.9	24.7	0.7	0.9	0.9	3.9	iron pan sandy mud
4332	23.5	65.1	11.4	0.3	2.2	0.3	1.3	gravelly mud from ice front

TABLE 3. Drainage basins into fjords

Fjord	Delta		N. Slope		S. Slope		Valley (River) Slope
	Km^2	% Ice	Km^2	% Ice	Km^2	% Ice	
Sunneshine	96	19	135	19	258	34	0.0263
Clark	171	26	378	46	628	47	0.0526
Tingin	298	20	248	36	292	40	0.0313
Inugsuin	220	5	693	80	1036	20	0.014
Pangnirtung	556	53	713	12	475	10	0.007
Itirbilung	1281	28	794	52	111	40	0.0065
North Pang.	1329	57	271	19	339	5	0.005
Cambridge	584	3	713	17	471	33	0.005
McBeth	1629	4	843	45	669	66	0.004
Maktak	898	53	157	4	131	8	0.005

FIGURE CAPTIONS

Figure 18-1: Coronation glacier survey

Figure 18-2: A. Overview of glacier, ≈ 4 km from terminus (CO-16)
  B. Ice-cored recessional moraine, south end (CO5-8).
  C. Precariously perched boulders on ice cliff (CO5-14).

Figure 18-3: A. Bergy-bit with ice-rafted sediment on surface (C)5-17).
  B. Fine-grained sediment hills surrounding ice-lake (CO-23)
  C. Medial-moraine on ice-surface with ice caves beneath (CO-26).

Figure 18-4: A. Ice-lake at glacier toe (CO5-30).
  B. Loess-type? deposits on ice-cored hill (CO5-28).
  C. Water lain sediment caving into lake (CO5-32).
  D. Lake drainage channel with well-rounded pebbles (CO5-35)

Figure 18-5: Tingin Delta Survey

Figure 18-6: A. View of south end of Tingin delta showing active sandur (T1-21).
  B. Tingin raised terraces dividing active sandurs (T1-22).
  C. Tidal channel at delta front (T1-16).
  D. Fluvial mid-channel bars (T1-15).

Figure 18-7: Itirbilung delta survey

Figure 18-8: A. Aeolian sand patch covering (IT-12-15).
  B. Main fiord-head delta in It rbilung Fiord (2IT-16).
  C. View along lateral moraine of side-entry glacier showing pocket beach (IT 12-12).

Figure 18-9: A. Active fluvial channels along mountain wall. Note wind storm clouds in distance (IT-2).

B. Ice trawl marks disrupting wave ripples along front of delta (IT12-12).

C. Main fluvial channel on Itirbilung Delta (IT-5).

D. Aeolian rippled sand covering pebble lag on delta center (IT-10).

Figure 18-10: A. Sand drifts on wind blasted surface
Note: Wind storm clouds in distance (IT13-9).

B. Wind blown sand imbedded on snow patch along the river channel (IT-11).

C. Frozen river bed, sand-blasted flat, revealing the intricate structure of linguoid ripples (IT-3).

D. Wind blown sand accumulation along the lee of a river bank (IT-9).

Figure 18-11: McBeth Delta Survey

Figure 18-12: A. One-years(?) fluvial event from glove to deflation lag surface (2MC-11)

B. River bank along main channel of McBeth delta (MC16-13).

C. Salt marsh, algal mat, tidal channel (2MC-5).

D. Arctic tundra vegetation along flood-plain (MC16-7).

Figure 18-13: A. Gravel ribbons on bed of main river channel (2MC-10).

B. Aeolian filled polygon crack of medium sand beside flood plain pebble lag (2MC-14).

C. Large aeolian sand accumulation on the lee side of protruding bedrock head land (2MC-21).

D. Arctic desert-grass anchoring down wind swept flood plain sediment (2MC-20).

Figure 18-14: A. Wadiis-type mud resisting wind erosion (MC16-20).

B. Patches of wind-resistant mud over-lying rapidly? eroding sand (MC-04).

C. Large ripple-looking wind bowls formed from sand depletion (2MC-8).

D. Wind-rippled coarse sand covering flood plain mud (MC-23)

Figure 18-15: Inugsuin delta survey

Figure 18-16: A. Raised glaciomarine terrace. Note dropstone in layered sediment, and truncation of beds (IN18-14).

B. Head of Inugsuin Fiord (IN-15).

C. River cutting through raised marine terraces (IN-12).

D. Boulder lag on river rapids. Note Gunar Ostrem river stage drum (IN18-6).

Figure 18-17: Clark delta survey

Figure 18-18: A. Clark flood plain showing iron pan (drk streak) sediments (C122-4).

B. Active sandur channel bed (CL-16).

C. Floating sand patches (CL-12).

D. Raised beach profiled covered with talus boulders (CL21-18).

Figure 18-19: A. Large polygon crack on raised terrace (CL-20).

B. Polygon crack on recent delta surface. Note the fresh boulders along the crack (CL22-5).

C. Arctic tundra grass on active flood-plain. Note raised terrace in background, which is in front of moraine ridge surrounding glacier (CL22-6).

D. View from moraine ridge looking down on raised terrace and sandur surface. Note rock slide in background that extends onto the delta surface (CL22).

Figure 18-20: A. Parallel layers of sediment imbedded into glacier front (Probably indicative of water lines) (CL-15).

B. View from glacier to terminus moraine (CL-11).

C. Glacial stream has cut through the moraine, down to the level of the delta front (2CL-15).

D. View from terminus moraine to glacier showing ground and recessional morainic debris reworked by proglacial strea (CL-6).

Figure 18-21: Cambridge delta survey.

Figure 18-22: A. View along beach of Cambridge delta raised terraces. Polyna is off to the upper right (CA23-19).

B. View from helicopter some several hundred metres above the delta/prodelta intersection. Note the continuation of the fluvial channel past the intersection point (CA-2).

C. Active river channel that cuts through the raised terraces. Note the paleo-channel on the raised deltaic surface (CA-20).

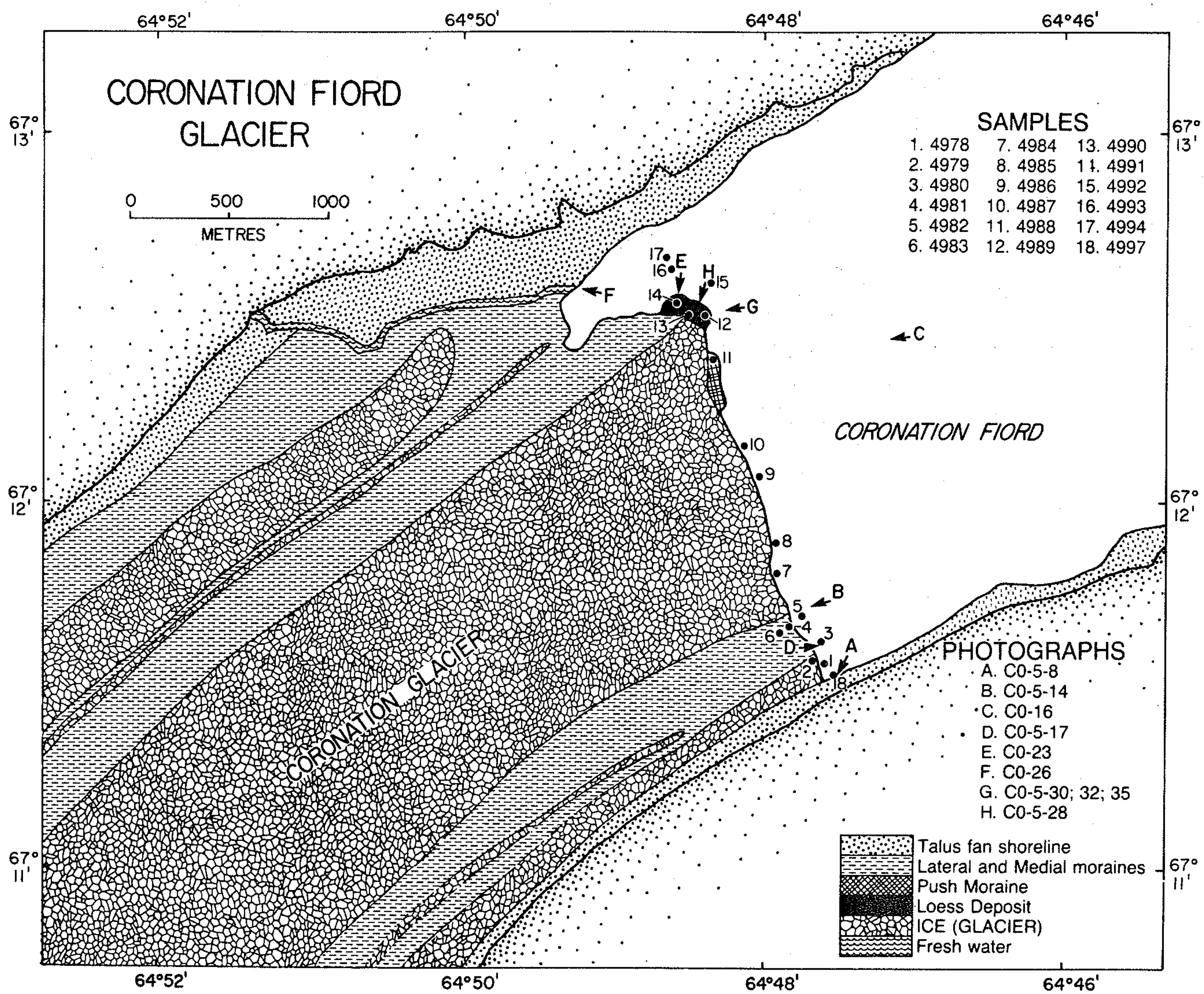
D. View of polygons on raised deltaic terraces with two grounded icebergs in the distance (CA-17).

Figure 18-23: A. View of delta/prodelta intersection of the Keel River delta. Note the heavy mineral accumulation on the rippled surface (CA-14).

B. Meander channels on the Keel delta (CA-7).

C. Possible remnant esker or bar exposed on the Keel delta (2CA-17).

D. Large area of Pattern ground on the raised terraces of the Keel delta (2CA-20).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64°50'
64°48'
64°46'
67° 13'
67° 12'
67° 11'
CORONATION FIORD GLACIER
0 500 1000
METRES
SAMPLES
1. 4978 7. 4984 13. 4990
2. 4979 8. 4985 14. 4991
3. 4980 9. 4986 15. 4992
4. 4981 10. 4987 16. 4993
5. 4982 11. 4988 17. 4994
6. 4983 12. 4989 18. 4997
CORONATION FIORD
CORONATION GLACIER
PHOTOGRAPHS
A. C0-5-8
B. C0-5-14
C. C0-16
D. C0-5-17
E. C0-23
F. C0-26
G. C0-5-30; 32; 35
H. C0-5-28
Talus fan shoreline
Lateral and Medial moraines
Push Moraine
Loess Deposit
ICE (GLACIER)
Fresh water
A
B
C
D
E
F
G
H
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Fig. 18-1

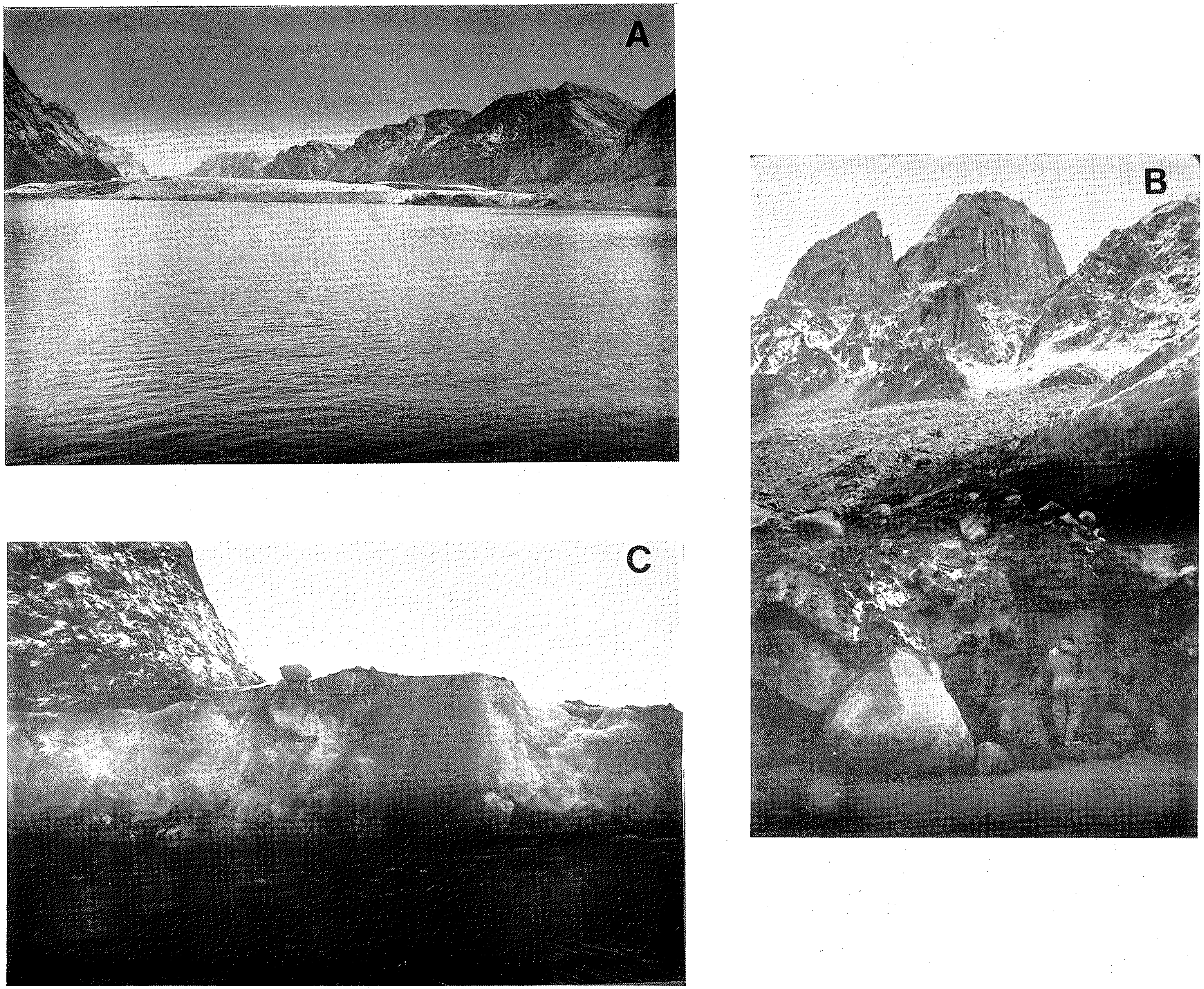


Fig 18-2

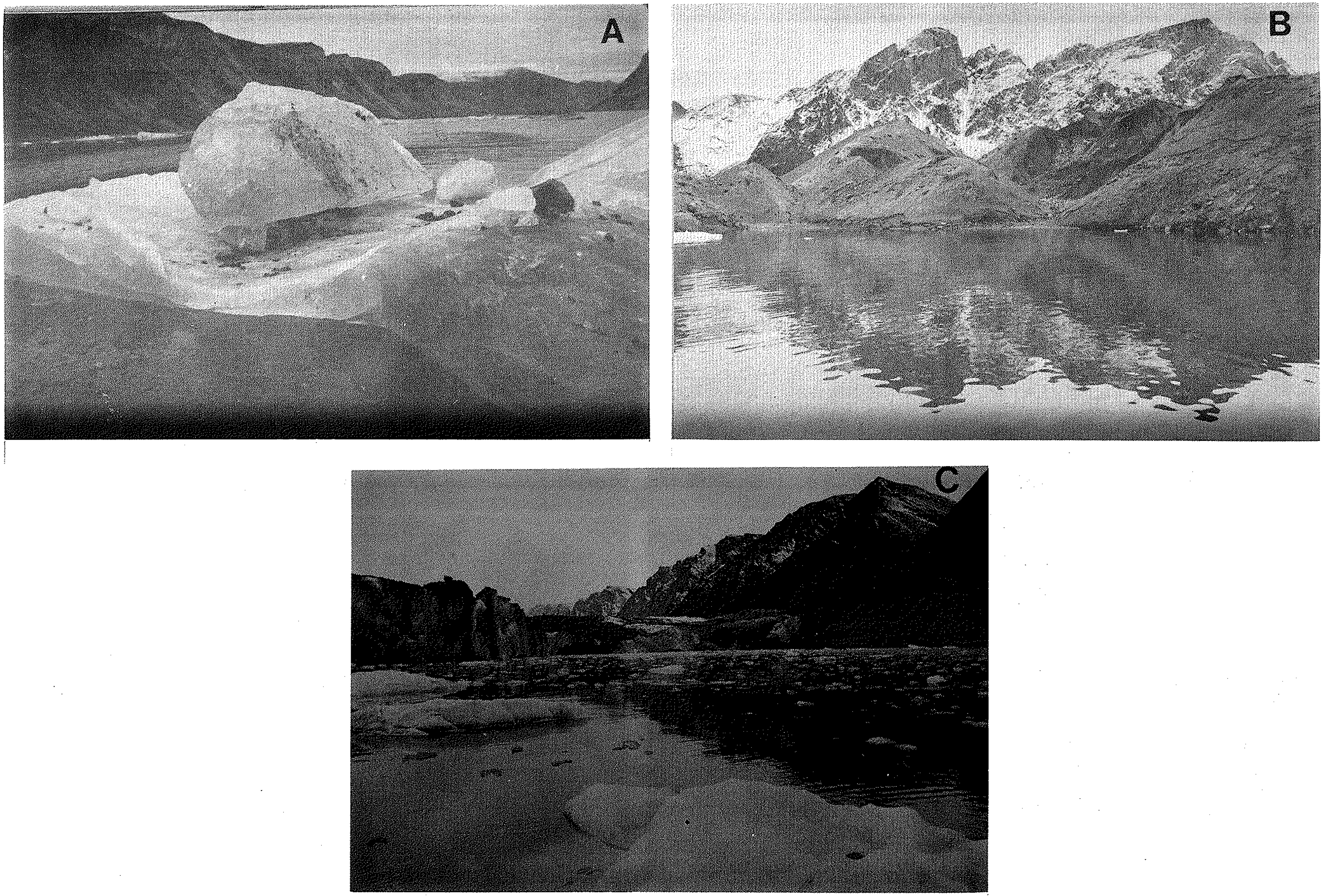


Fig 18-3

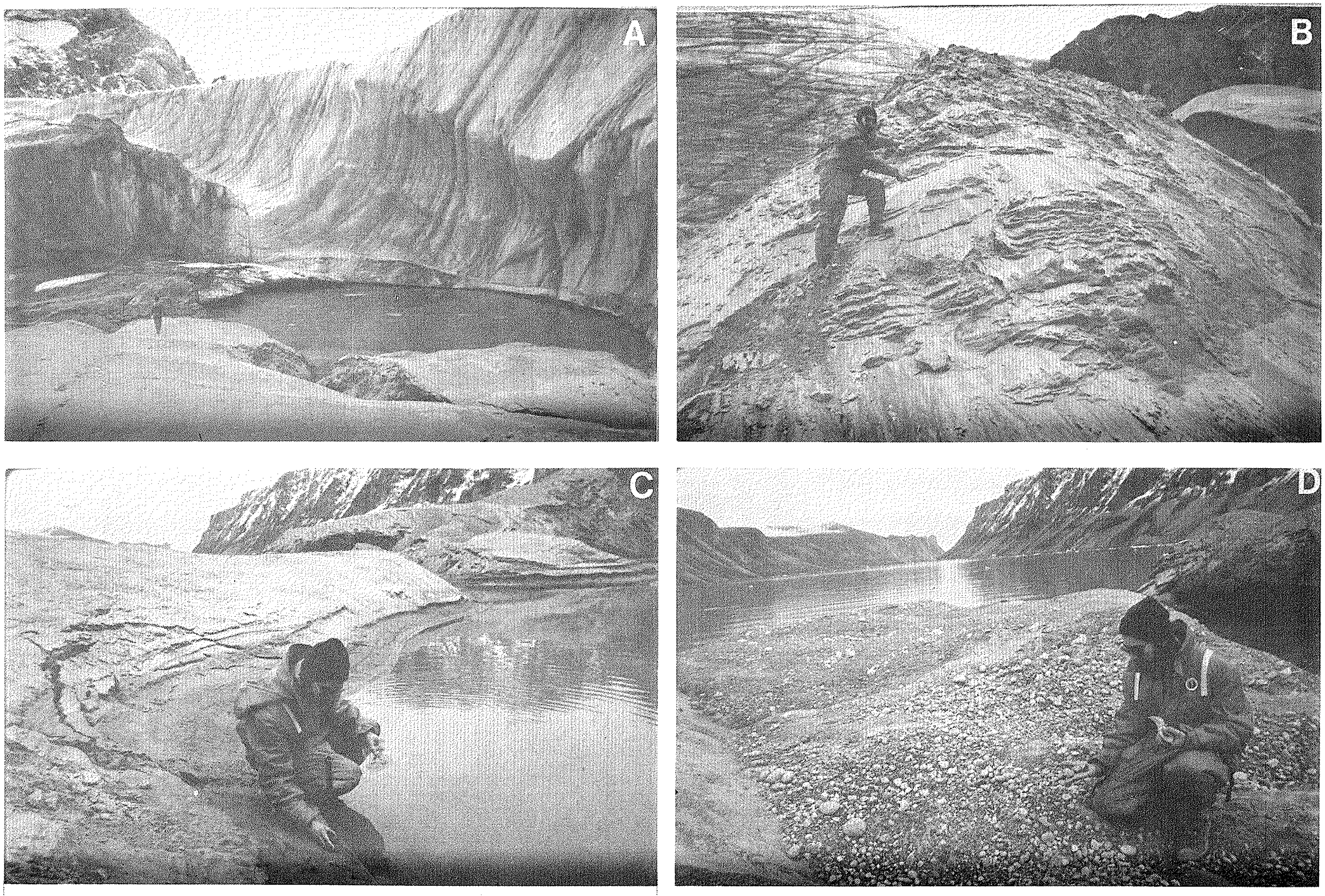
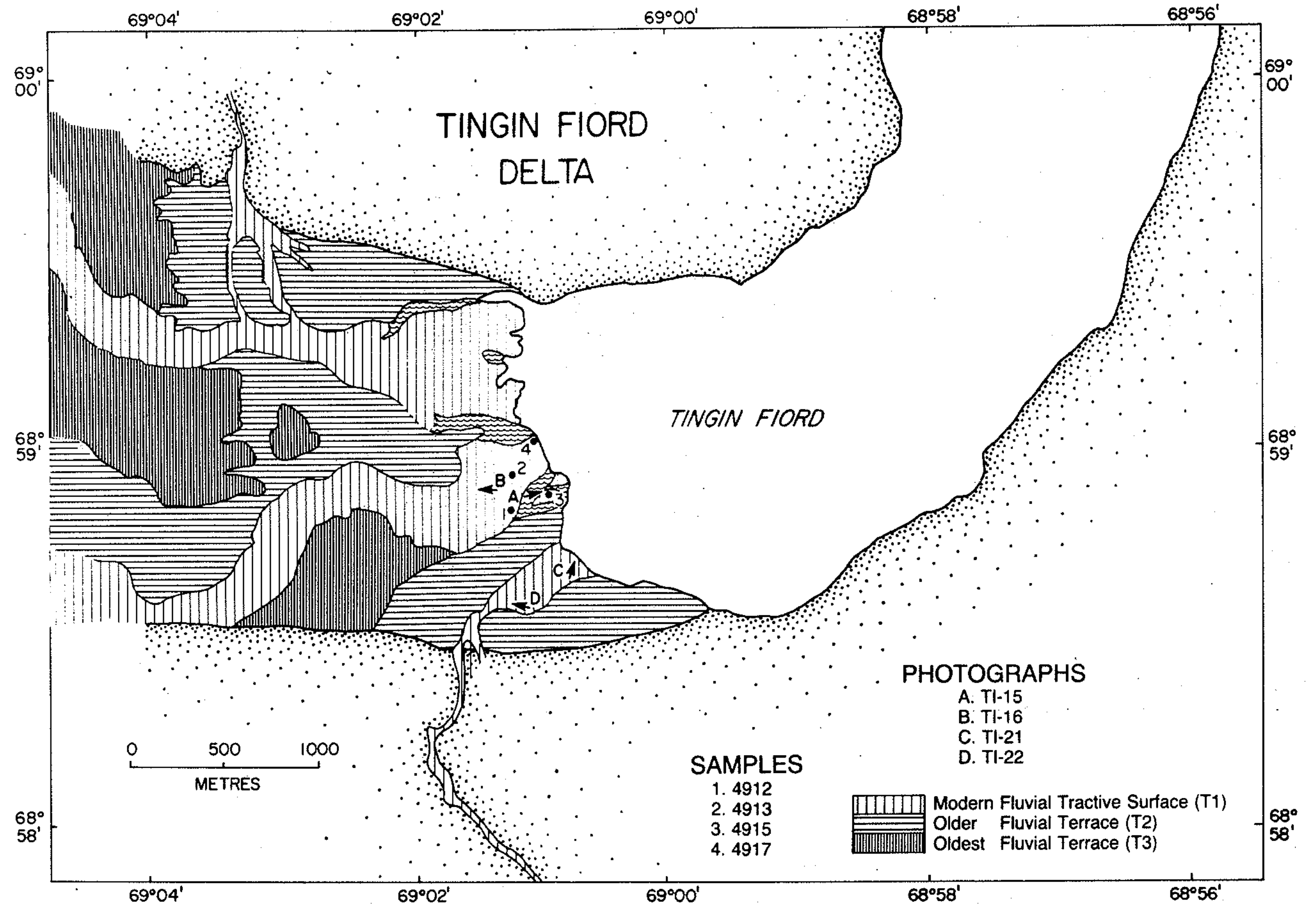


Fig 18-4


69°04'
69°02'
69°00'
68°58'
68°56'
69° 00'
68° 59'
68° 58'
TINGIN FIORD DELTA
TINGIN FIORD
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1000
METRES
SAMPLES
1. 4912
2. 4913
3. 4915
4. 4917
PHOTOGRAPHS
A. TI-15
B. TI-16
C. TI-21
D. TI-22
Modern Fluvial Tractive Surface (T1)
Older Fluvial Terrace (T2)
Oldest Fluvial Terrace (T3)

Fig. 18-5

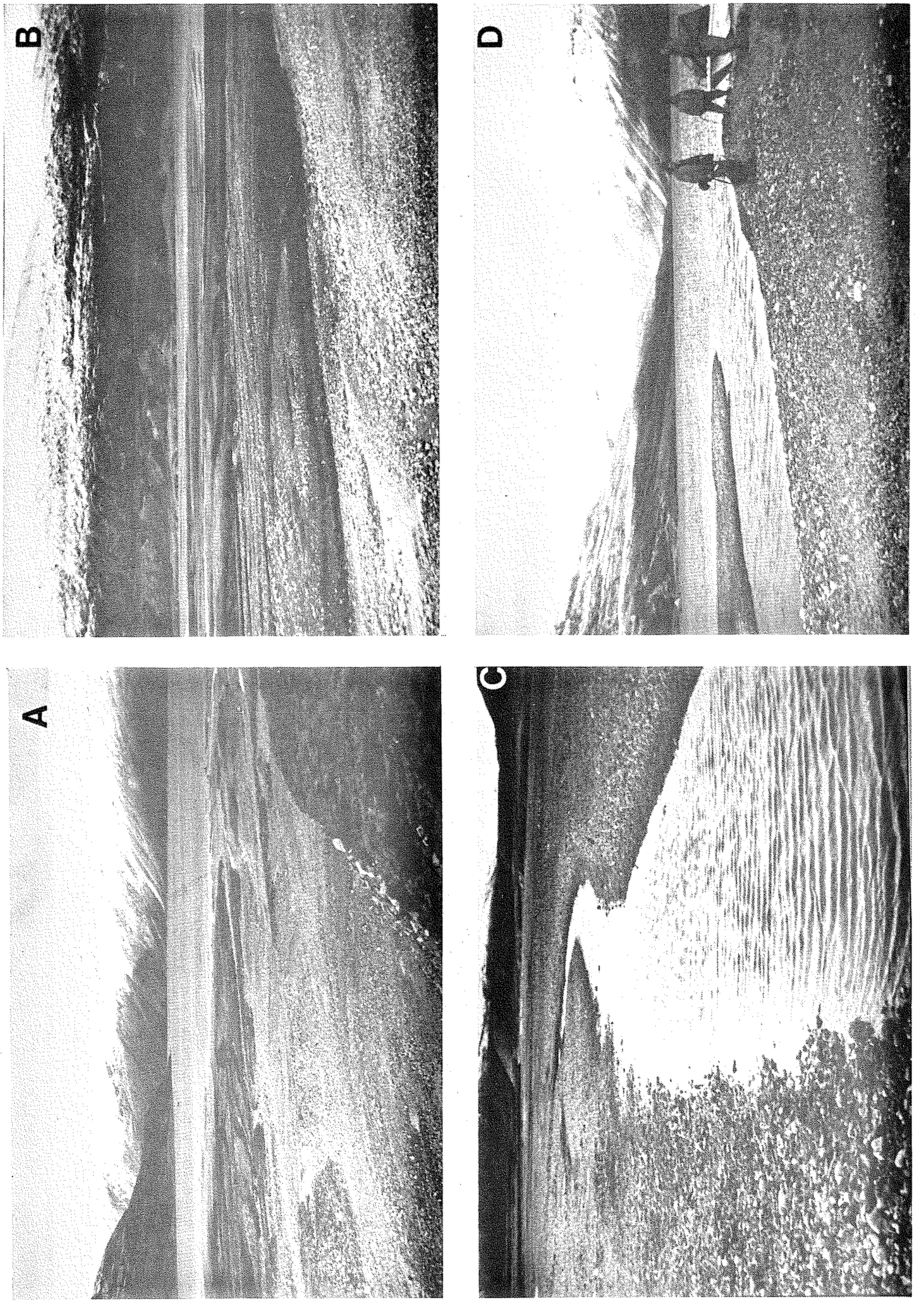

Fig 18-6

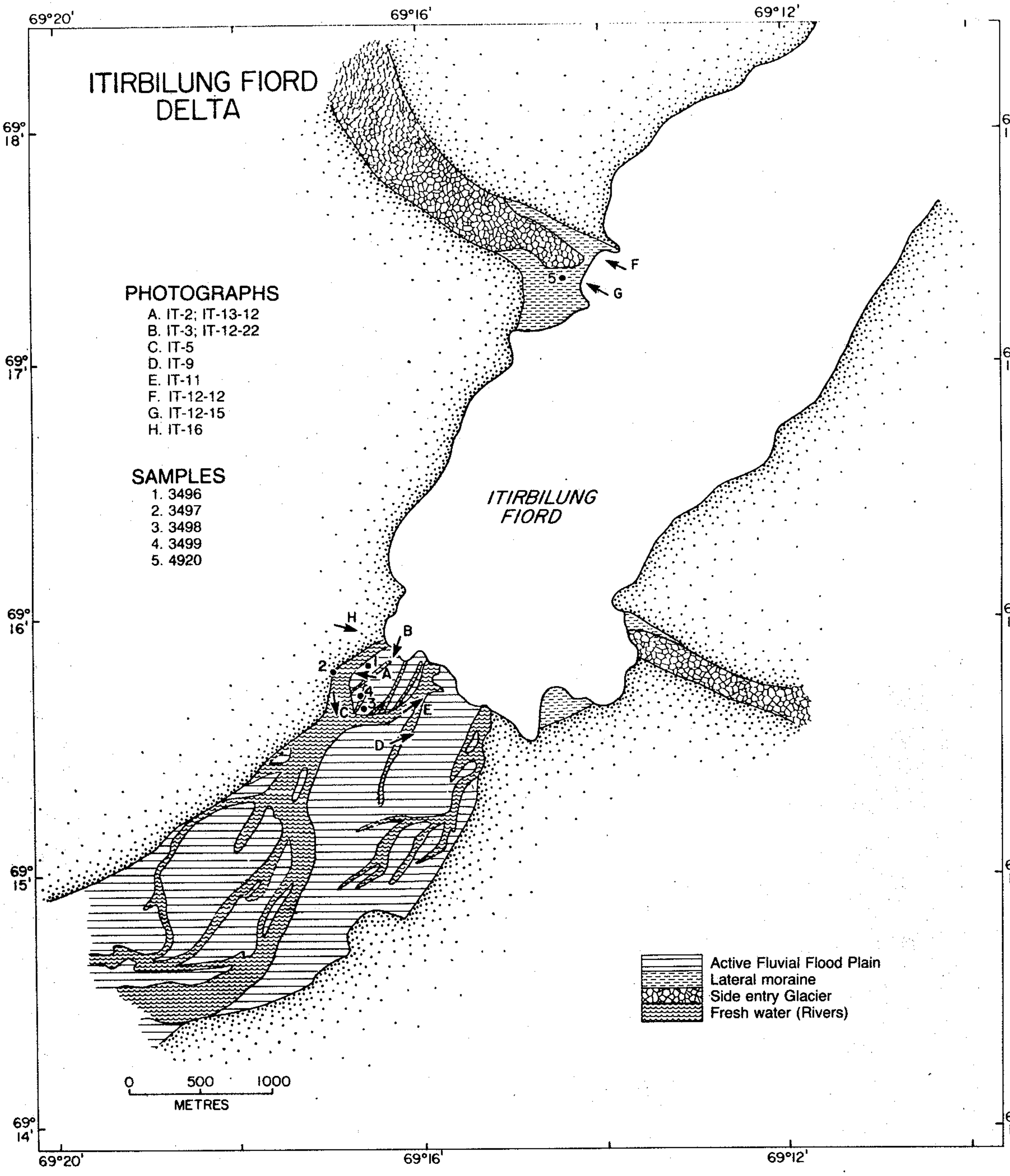
ITIRBILUNG FIORD DELTA
PHOTOGRAPHS
A. IT-2; IT-13-12
B. IT-3; IT-12-22
C. IT-5
D. IT-9
E. IT-11
F. IT-12-12
G. IT-12-15
H. IT-16
SAMPLES
1. 3496
2. 3497
3. 3498
4. 3499
5. 4920
ITIRBILUNG FIORD
Active Fluvial Flood Plain
Lateral moraine
Side entry Glacier
Fresh water (Rivers)
0 500 1000
METRES
69°20'
69°16'
69°12'
69° 18'
69° 17'
69° 16'
69° 15'
69° 14'
A
B
C
D
E
F
G
H
1
2
3
4
5

Fig.18-7

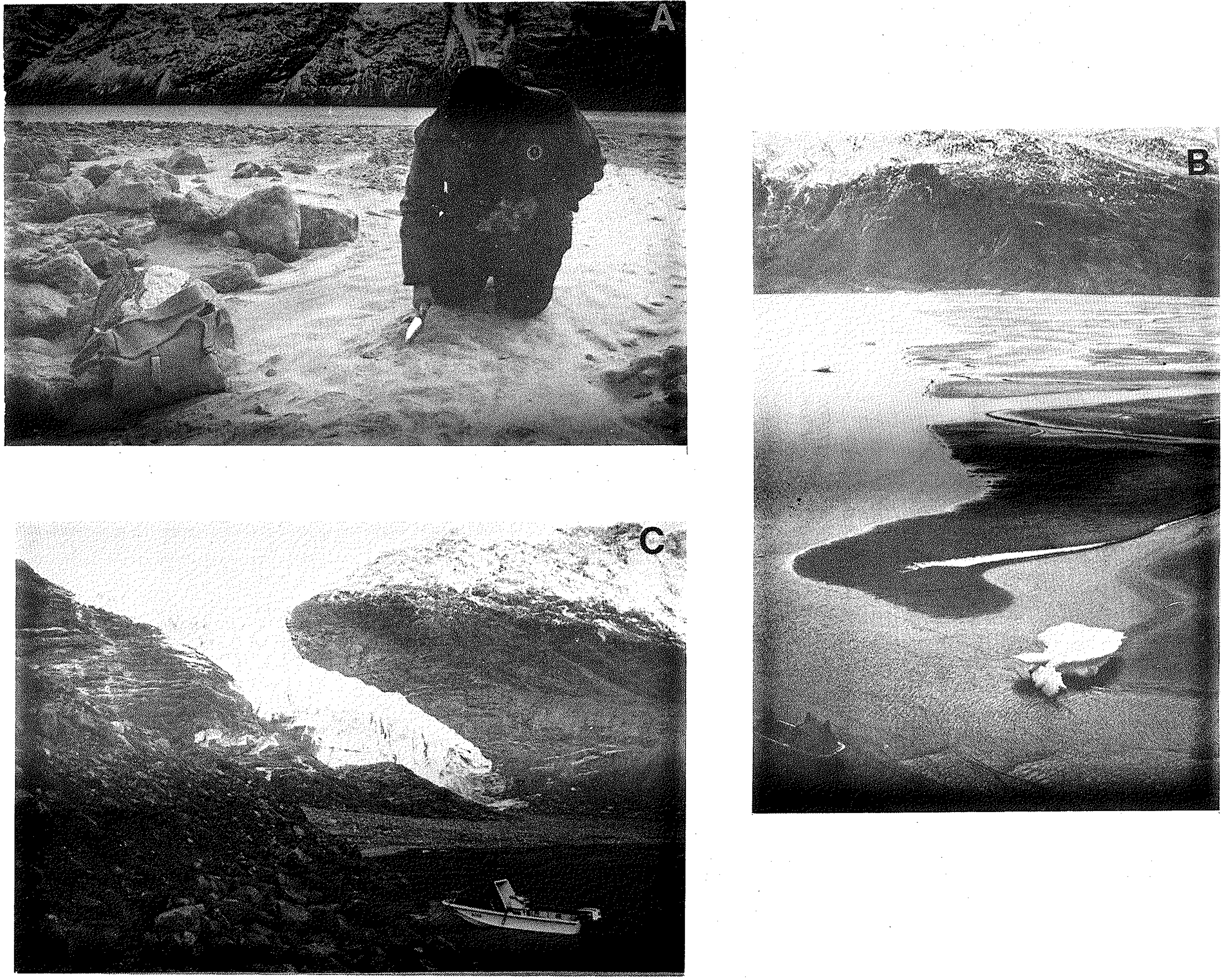

Fig 18-8

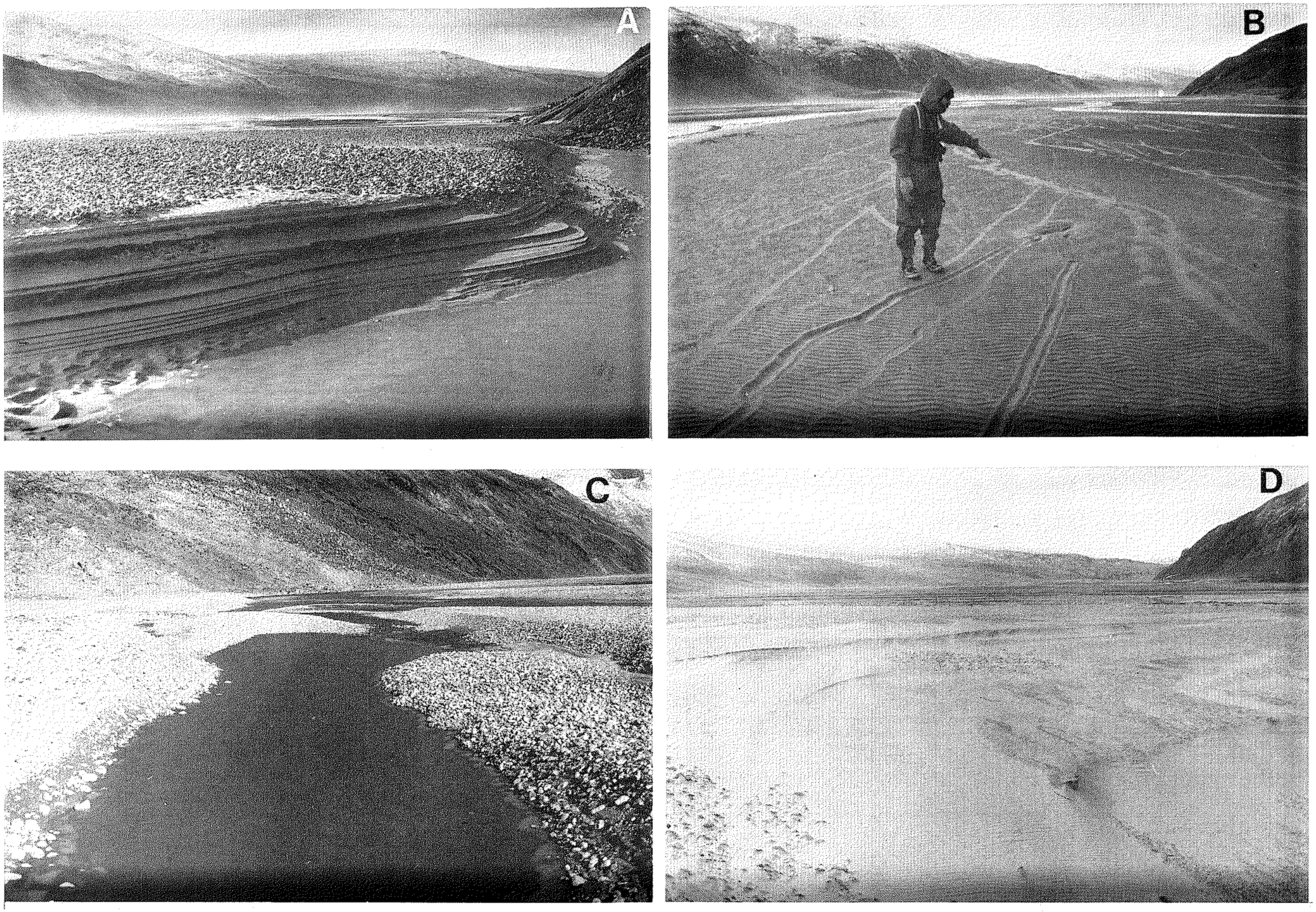

Fig 18-9

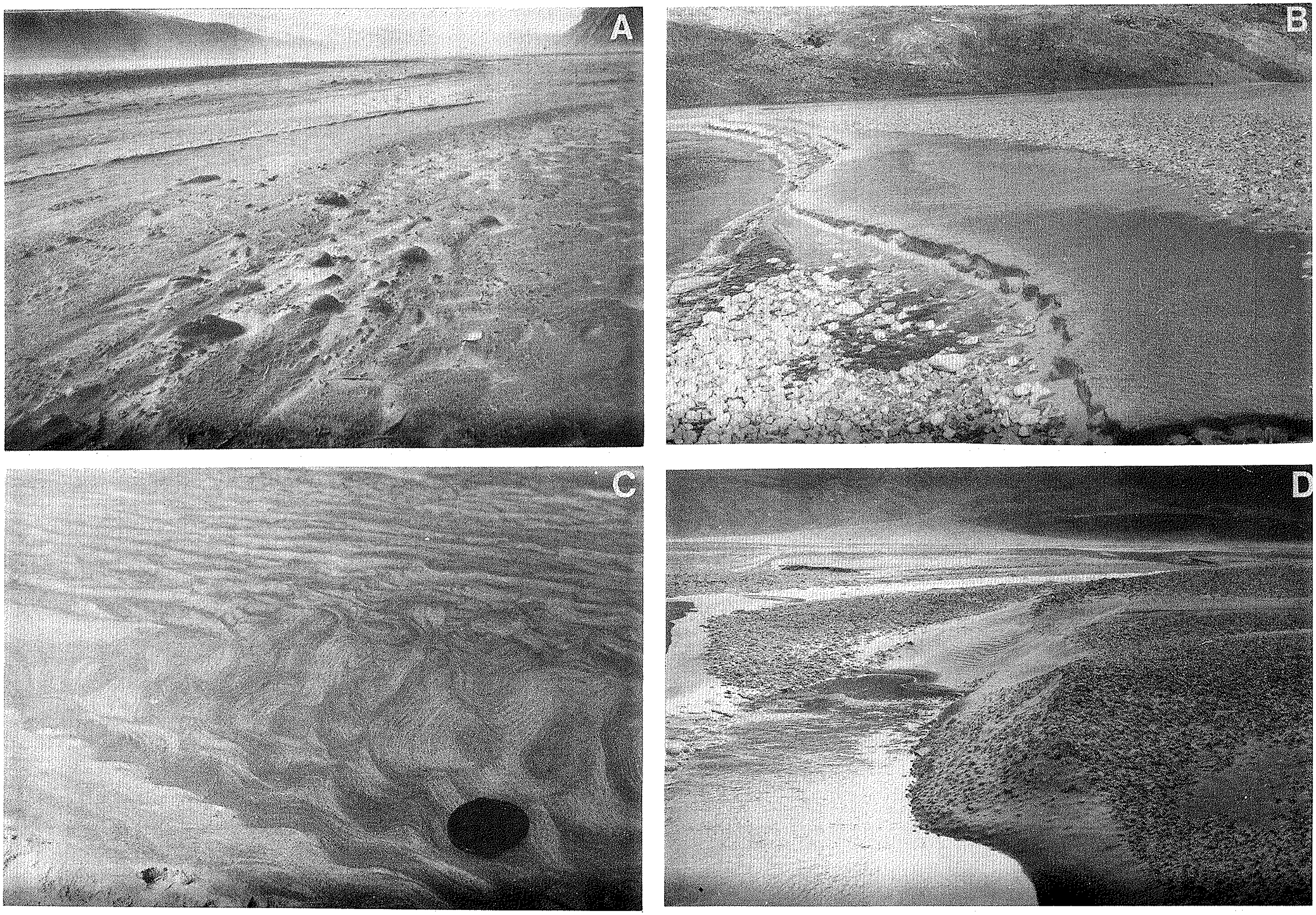

Fig 18-10

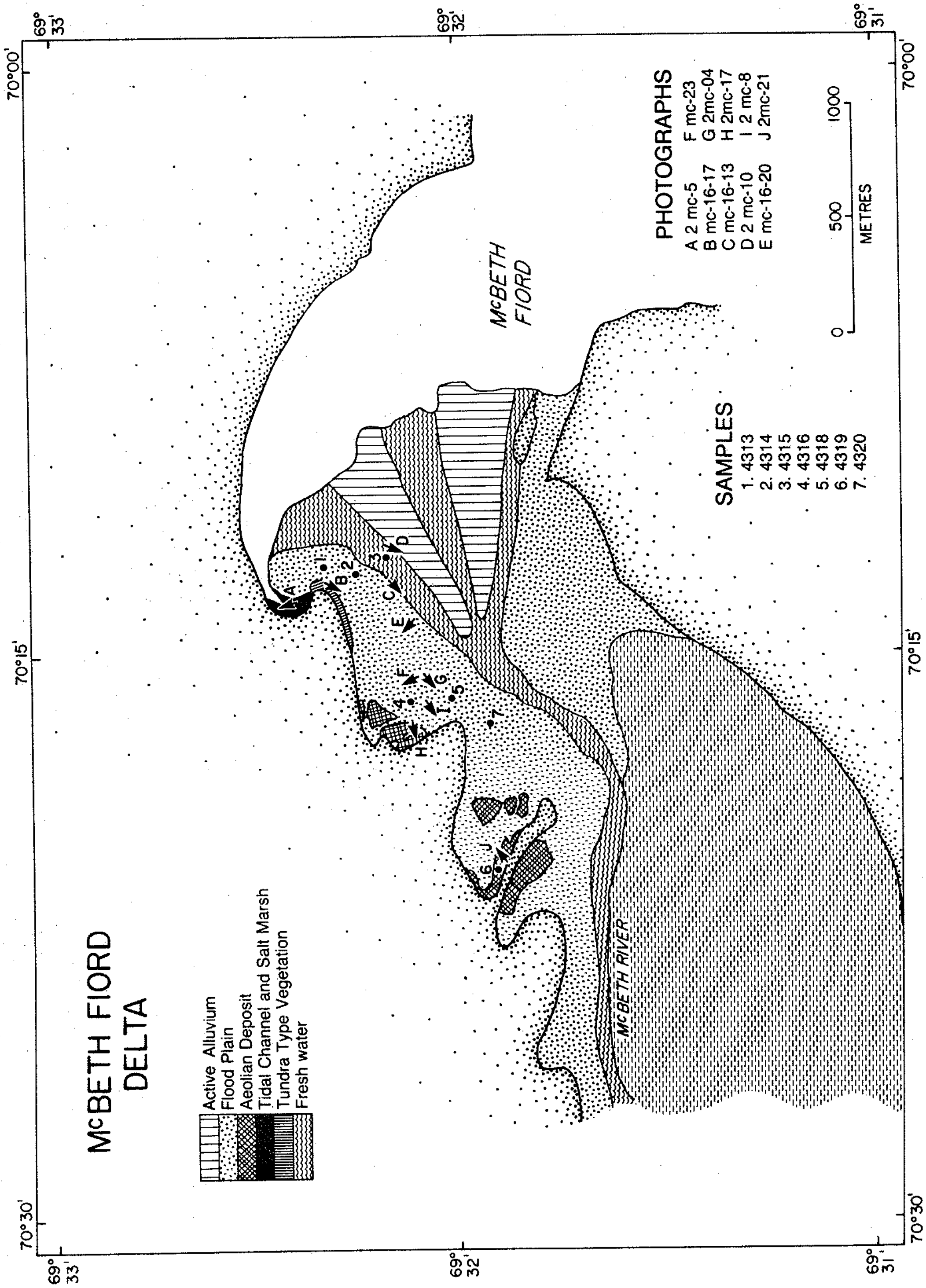
McBETH FIORD DELTA
Active Alluvium
Flood Plain
Aeolian Deposit
Tidal Channel and Salt Marsh
Tundra Type Vegetation
Fresh water
McBETH FIORD
McBETH RIVER
SAMPLES
1. 4313
2. 4314
3. 4315
4. 4316
5. 4318
6. 4319
7. 4320
PHOTOGRAPHS
A 2 mc-5
B mc-16-17
C mc-16-13
D 2 mc-10
E mc-16-20
F mc-23
G 2mc-04
H 2mc-17
I 2 mc-8
J 2mc-21
0
500
1000
METRES
69° 33'
69° 32'
69° 31'
70°00'
70°15'
70°30'
A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7

Fig. 18-11

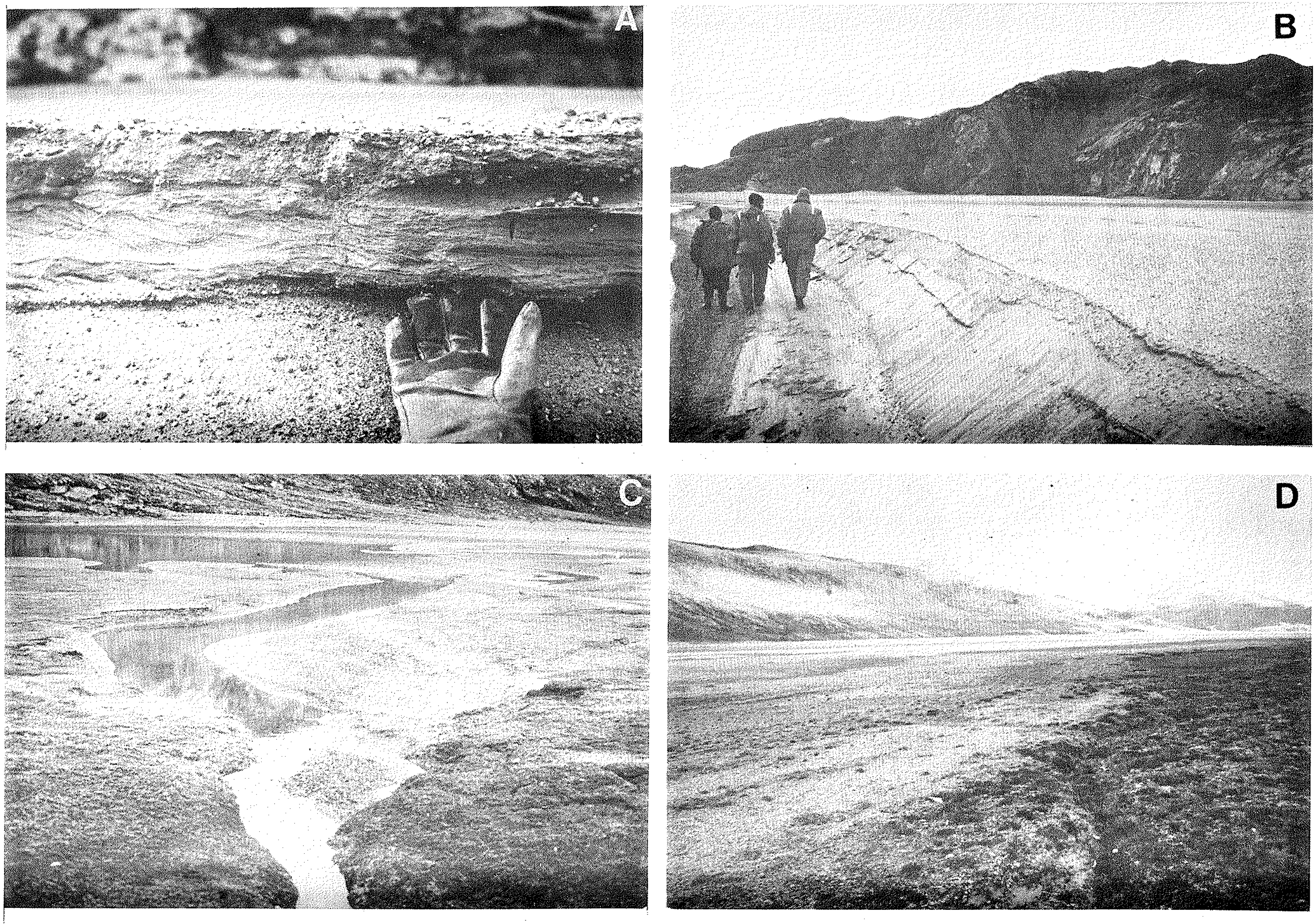

Fig 18-12

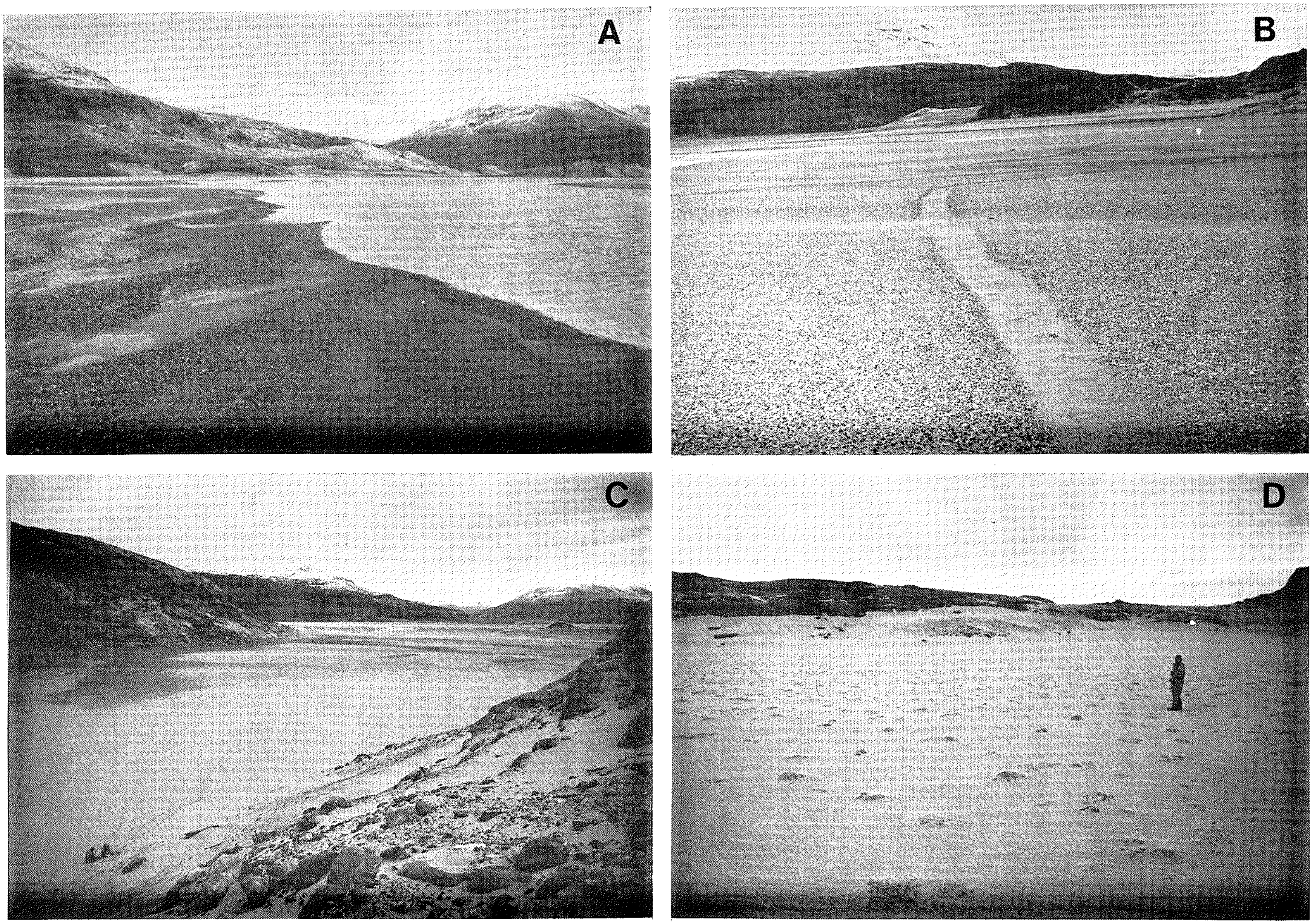

Fig 18-13

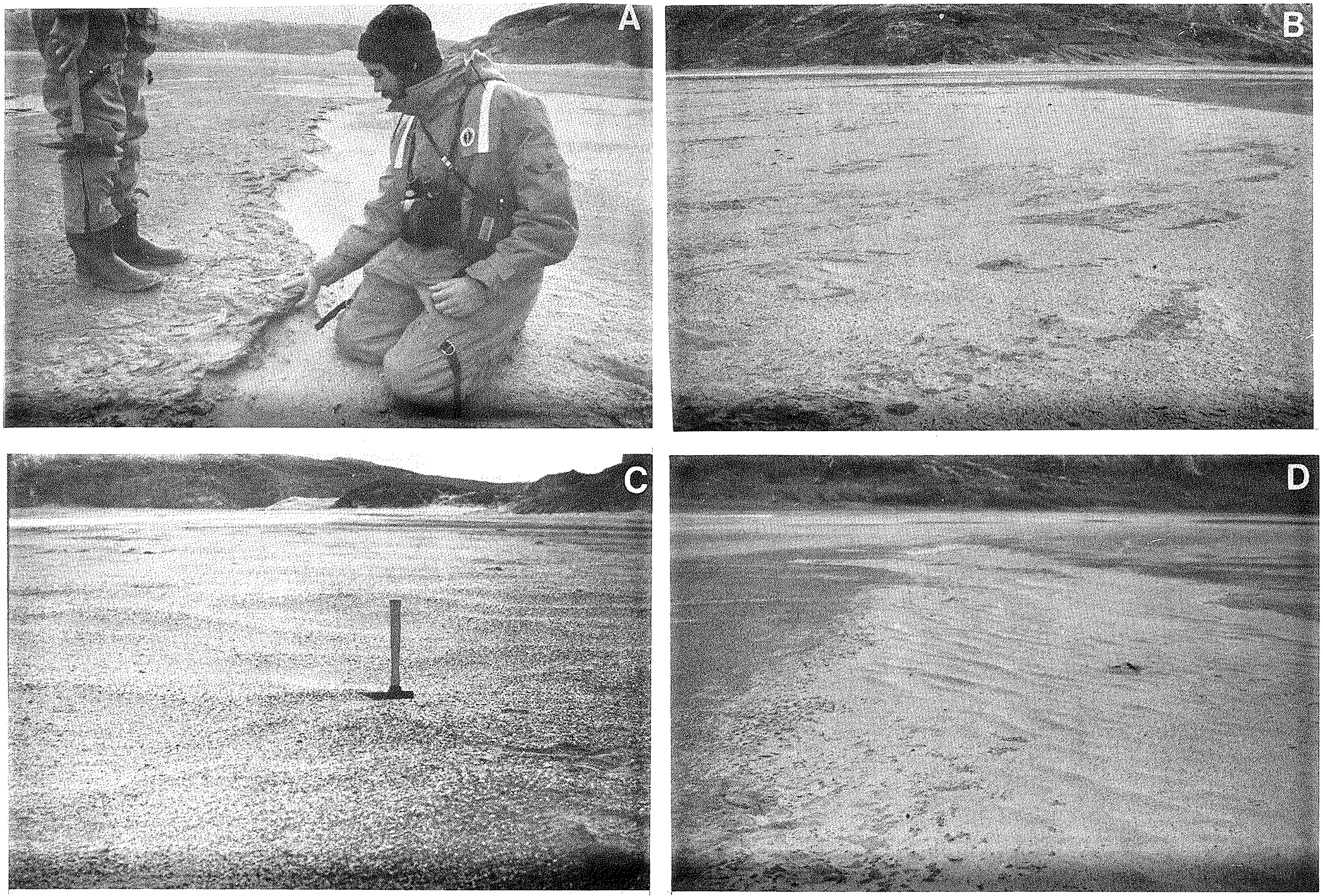

Fig 18-14

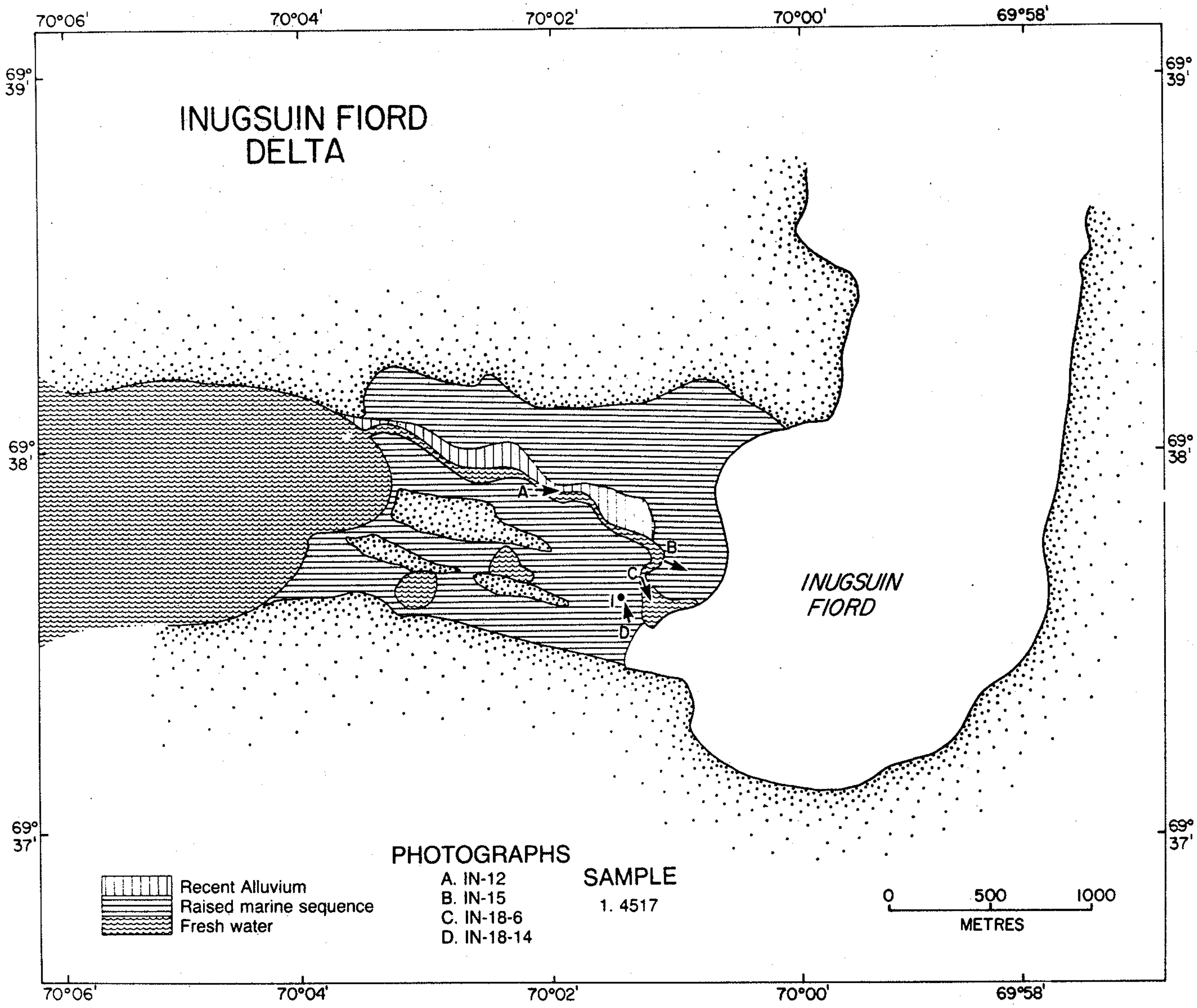
INUGSUIN FIORD
DELTA
70°06'
70°04'
70°02'
70°00'
69°58'
69° 39'
69° 38'
69° 37'
INUGSUIN FIORD
A
B
C
D
1
PHOTOGRAPHS
A. IN-12
B. IN-15
C. IN-18-6
D. IN-18-14
SAMPLE
1. 4517
Recent Alluvium
Raised marine sequence
Fresh water
0
500
1000
METRES

Fig.18-15

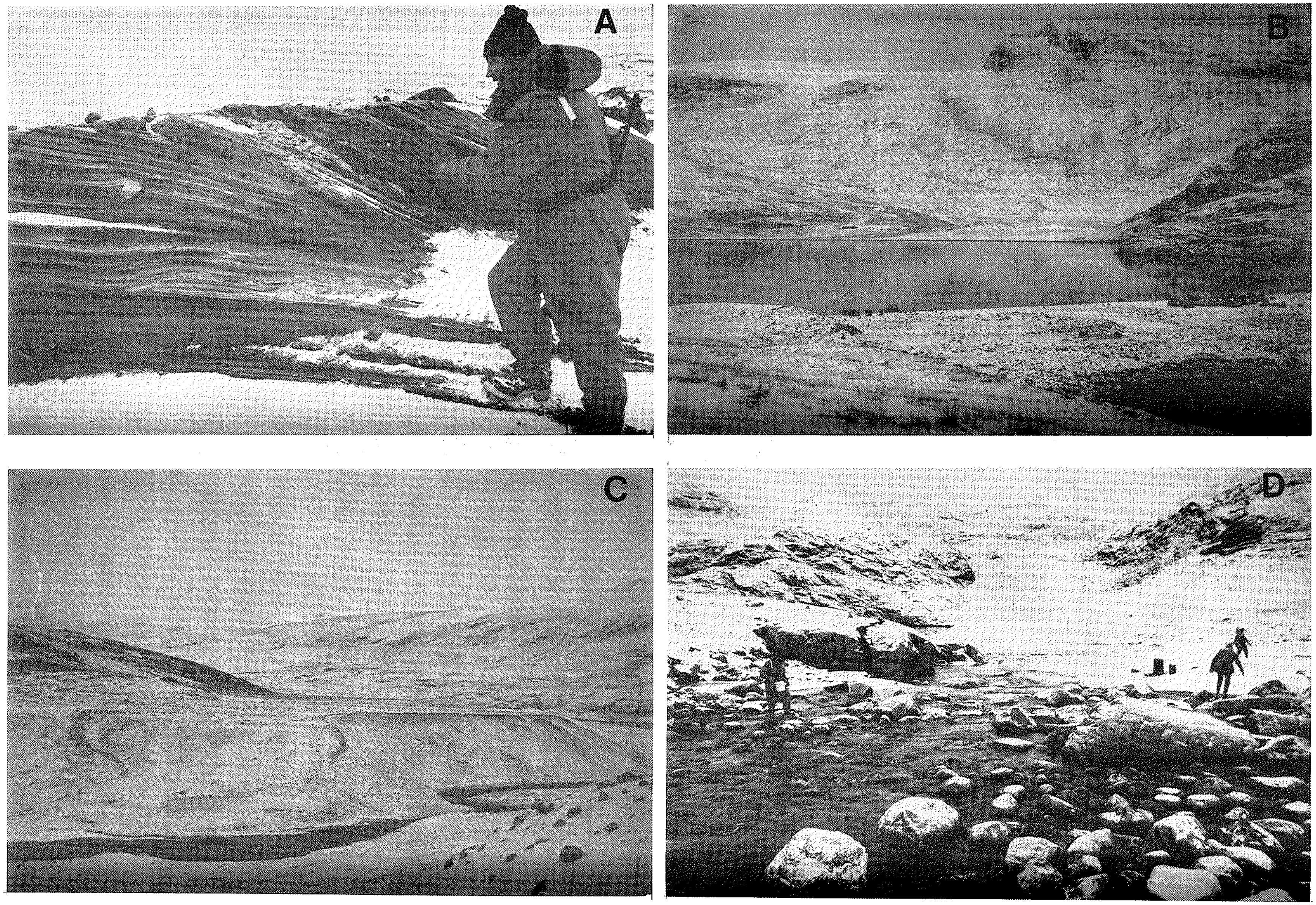

Fig 18-16

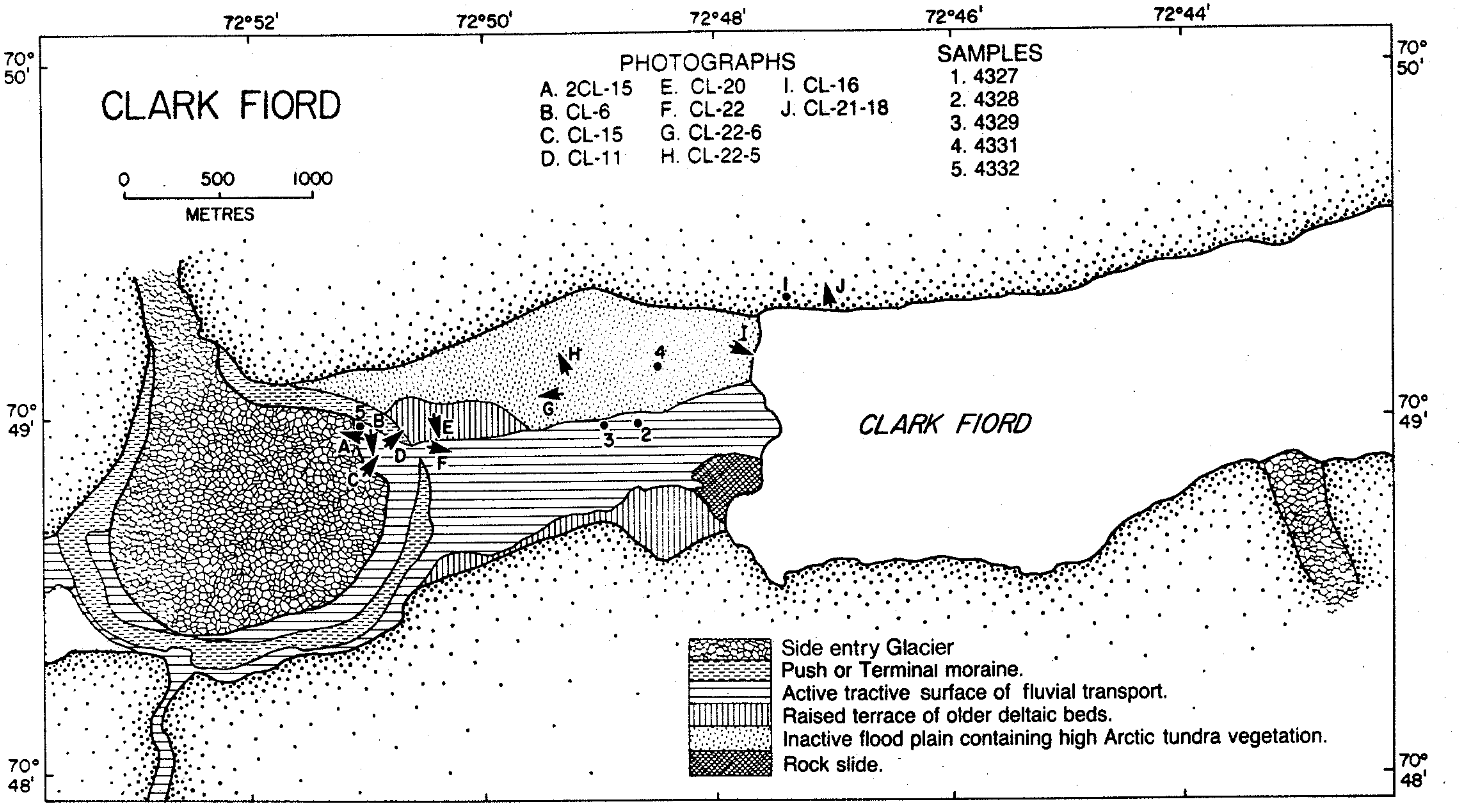
CLARK FIORD
0 500 1000
METRES
PHOTOGRAPHS
A. 2CL-15
B. CL-6
C. CL-15
D. CL-11
E. CL-20
F. CL-22
G. CL-22-6
H. CL-22-5
I. CL-16
J. CL-21-18
SAMPLES
1. 4327
2. 4328
3. 4329
4. 4331
5. 4332
CLARK FIORD
Side entry Glacier
Push or Terminal moraine.
Active tractive surface of fluvial transport.
Raised terrace of older deltaic beds.
Inactive flood plain containing high Arctic tundra vegetation.
Rock slide.
72°52'
72°50'
72°48'
72°46'
72°44'
70° 50'
70° 49'
70° 48'
A
B
C
D
E
F
G
H
I
J
1
2
3
4
5

Fig.18-17

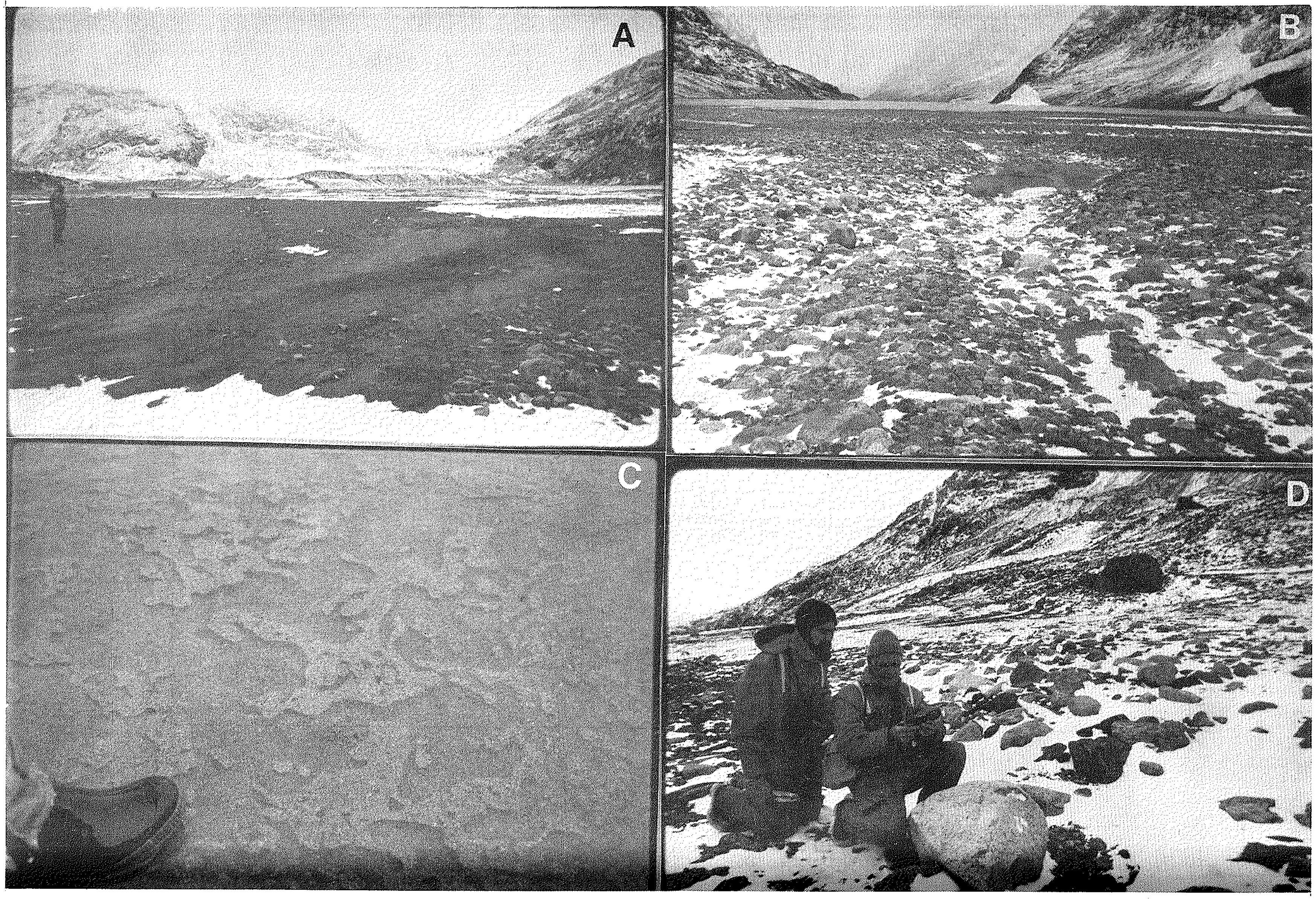

Fig18-18

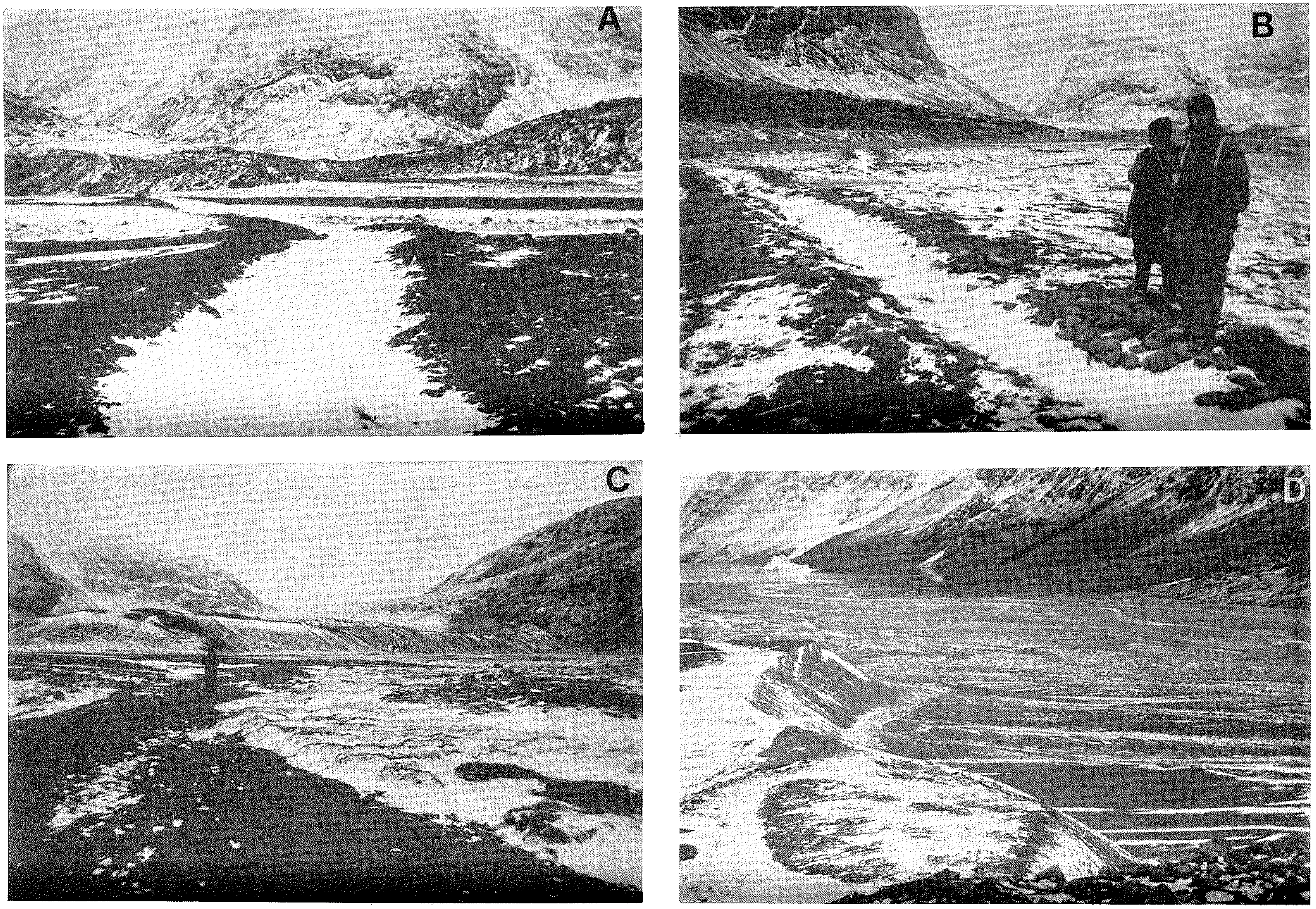

Fig 18-19

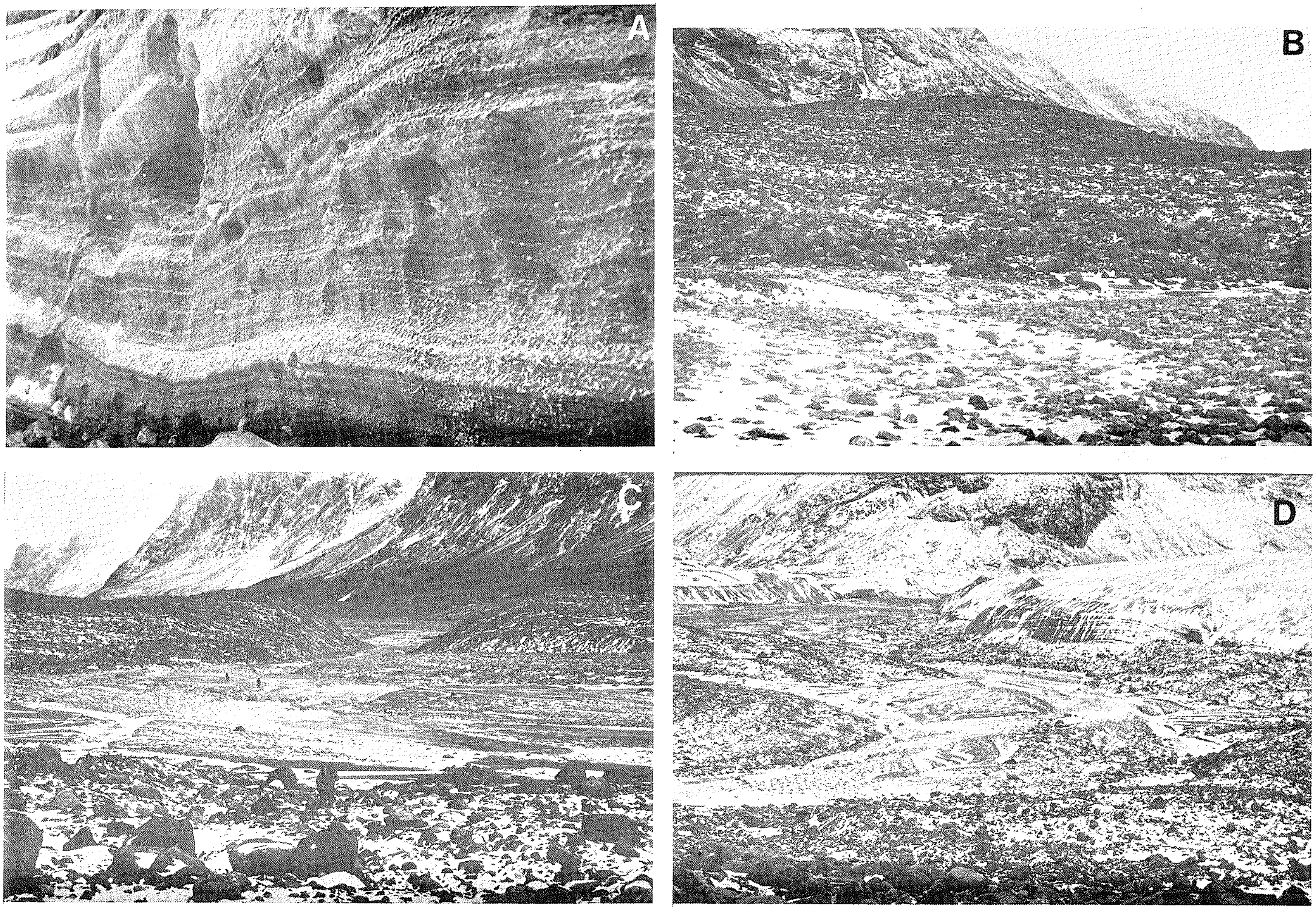

Fig 18-20

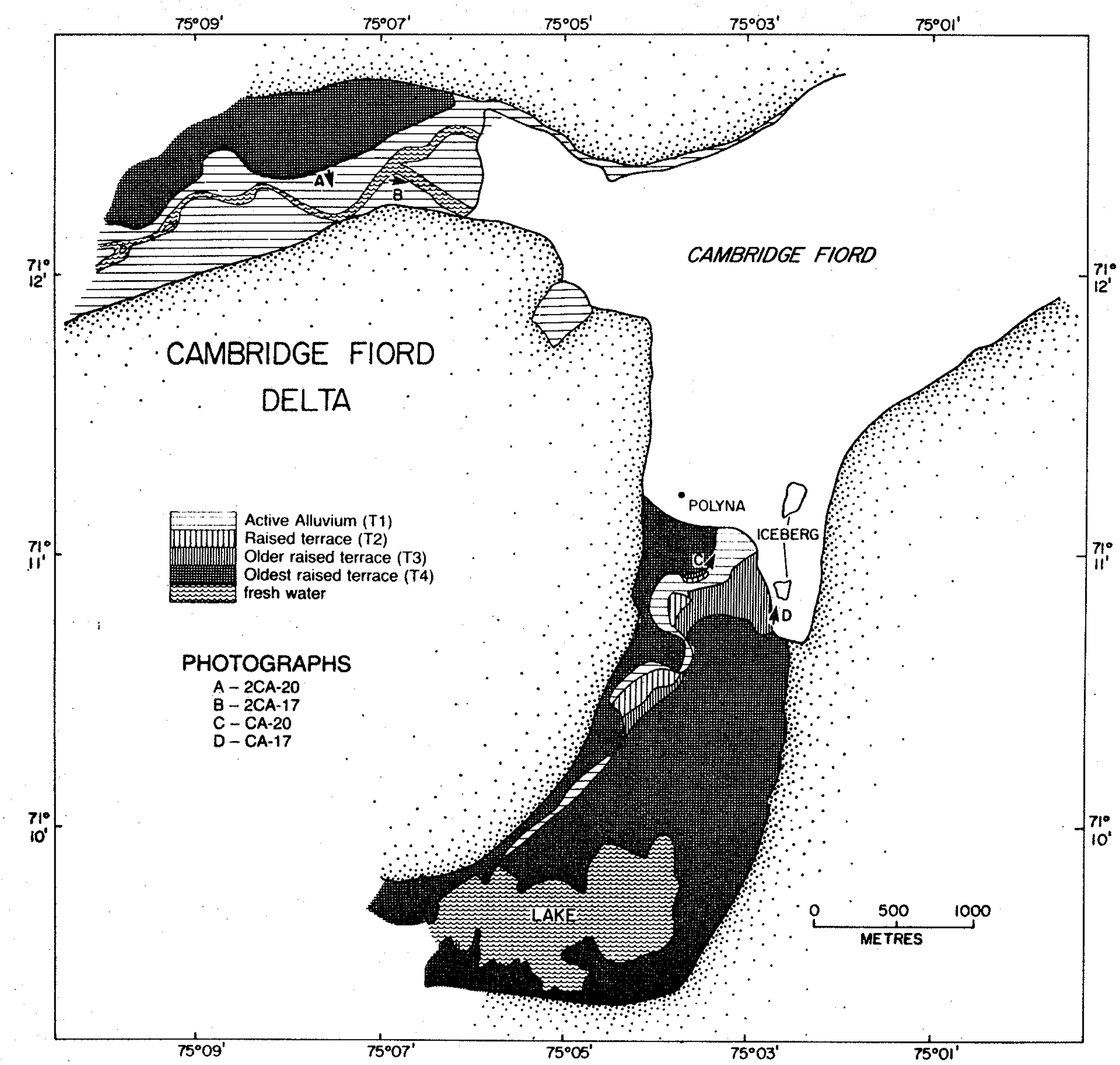
75°09'
75°07'
75°05'
75°03'
75°01'
71° 12'
71° 11'
71° 10'
CAMBRIDGE FIORD
CAMBRIDGE FIORD DELTA
POLYNA
ICEBERG
A
B
C
D
LAKE
Active Alluvium (T1)
Raised terrace (T2)
Older raised terrace (T3)
Oldest raised terrace (T4)
fresh water
PHOTOGRAPHS
A – 2CA-20
B – 2CA-17
C – CA-20
D – CA-17
0
500
1000
METRES

Fig.18-21

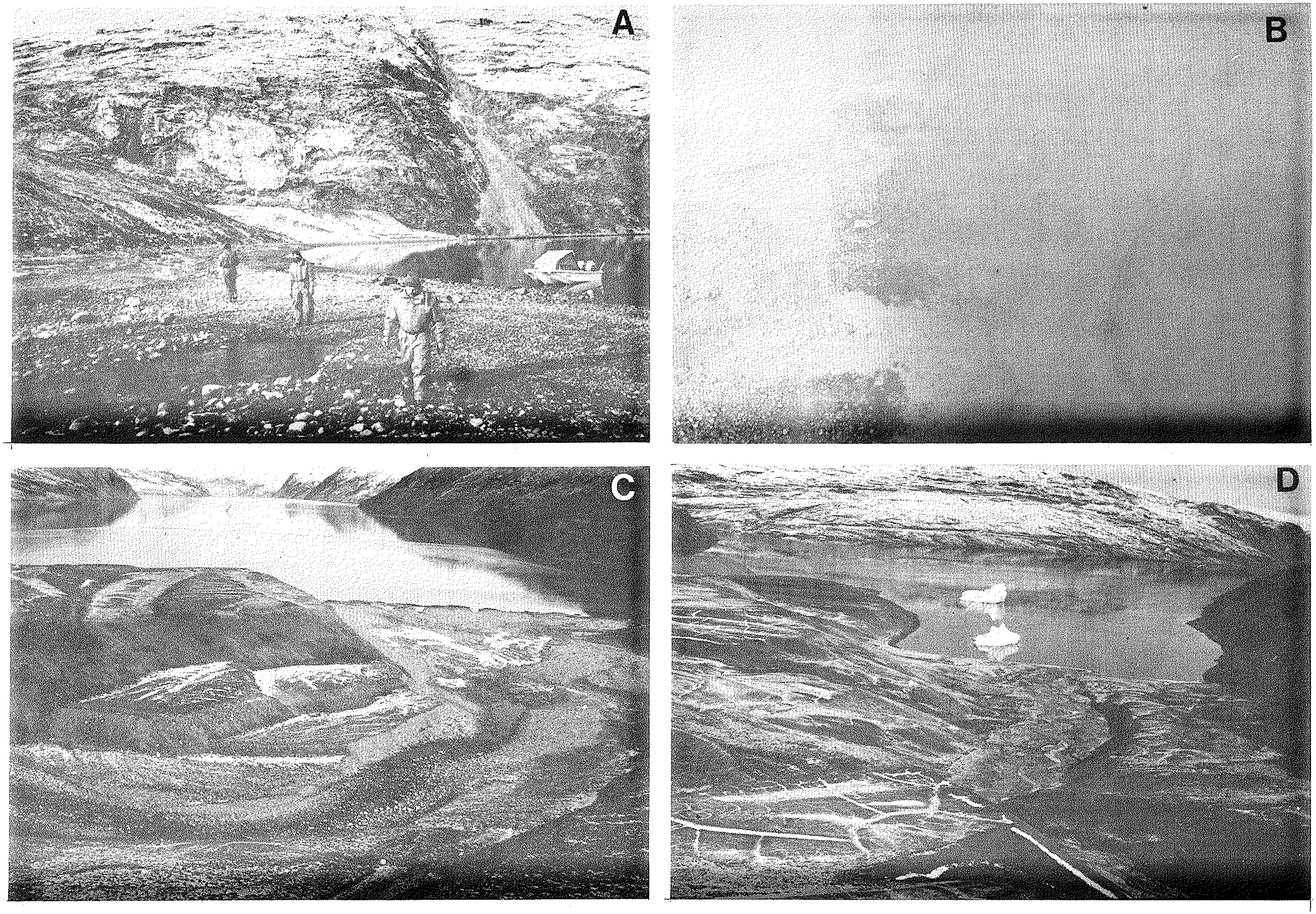

Fig 18-22

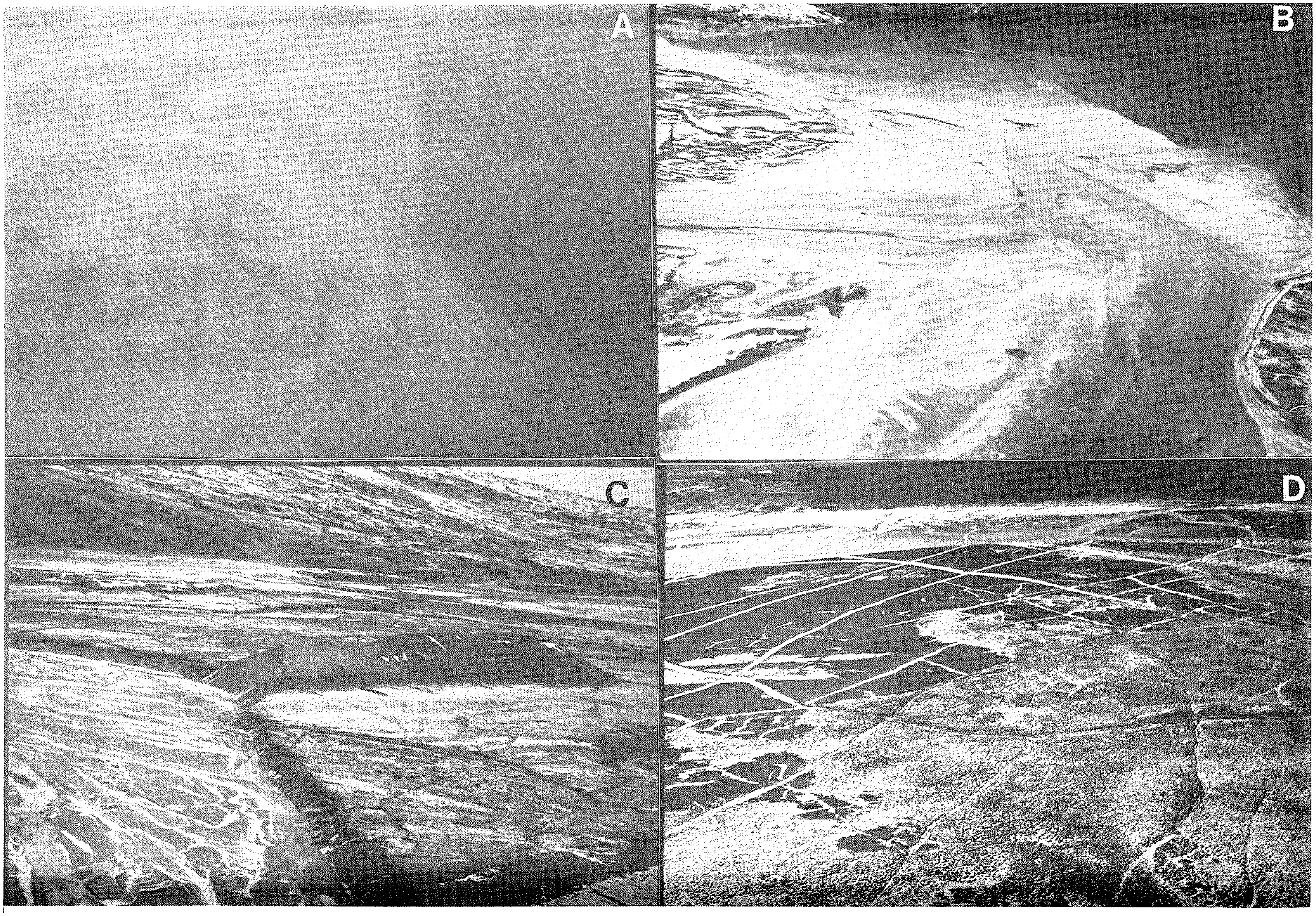

Fig18-23

SAFE: 1982 HYDROGRAPHY

by

G. Rodgers

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Bedford Institute of Oceanography
P.O. Box 1006
Dartmouth, Nova Scotia B2Y 4A2

CRUISE OBJECTIVES

Before the SAFE expedition, the Baffin Island Fjords were poorly surveyed in terms of hydrography. Most contained only one or two survey lines (1966,1967) from the C.C.G.S. D'Iberville that were themselves not accurately positioned. Thus the main aim of this study was to provide accurate bathymetry using standard CHS navigation procedures.

METHOD

Using the launch GULL, lines running near perpendicular to the fjord-axis were run at approximately constant speed. Beginning and end of line fixes were located through Radar triangulation. The launch direction during a given run was monitored on the Radar scope. Except for Coronation Fiord no tie-in lines along the fjord axis was undertaken due to time restrictions. The GULL employed an EDO 9040, 30 kHz, echo sounder.

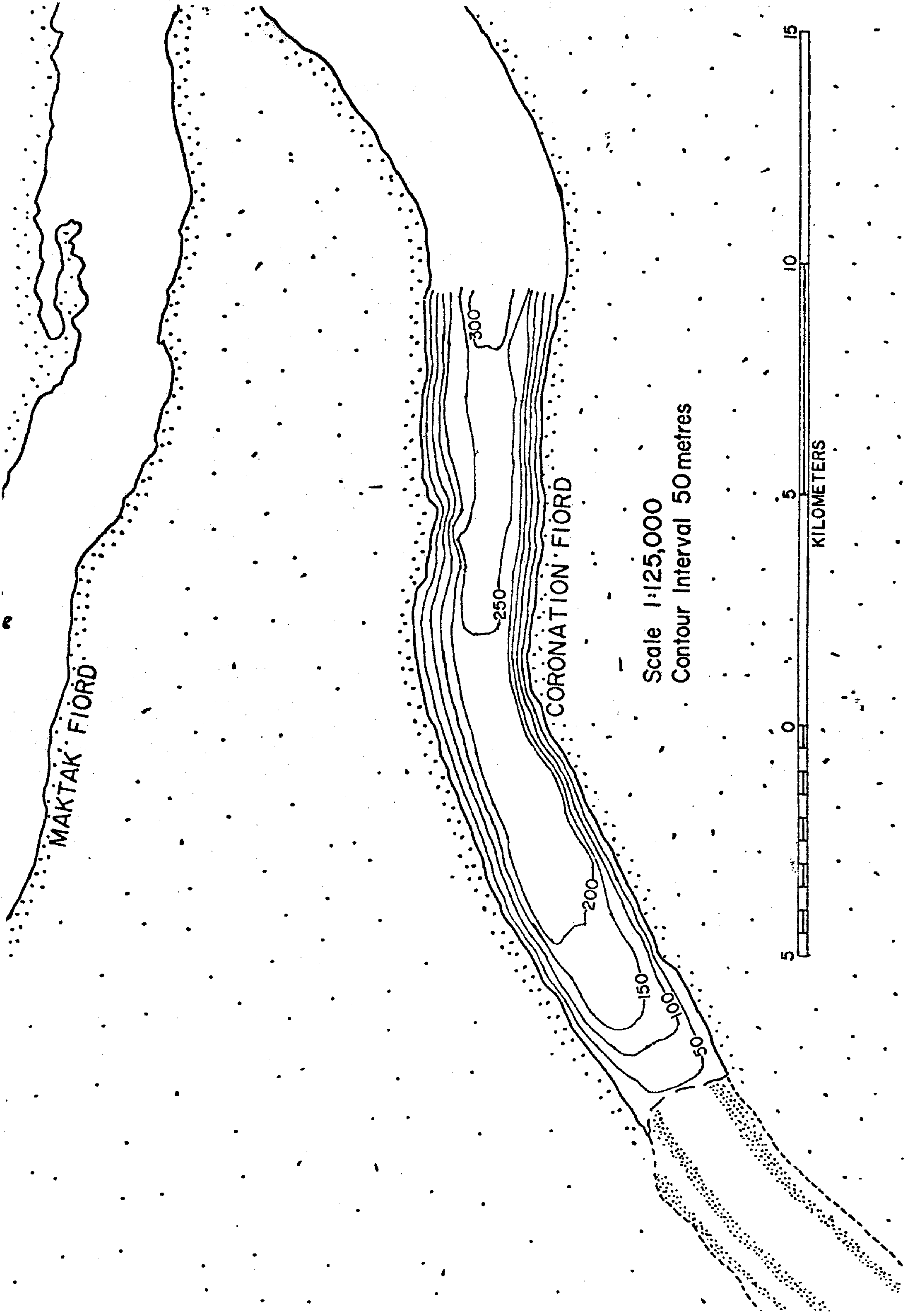
MAKTAK FIORD
CORONATION FIORD
300
250
200
150
100
50
Scale 1:125,000
Contour Interval 50 metres
5
0
5
10
15
KILOMETERS

FIG. 19-1

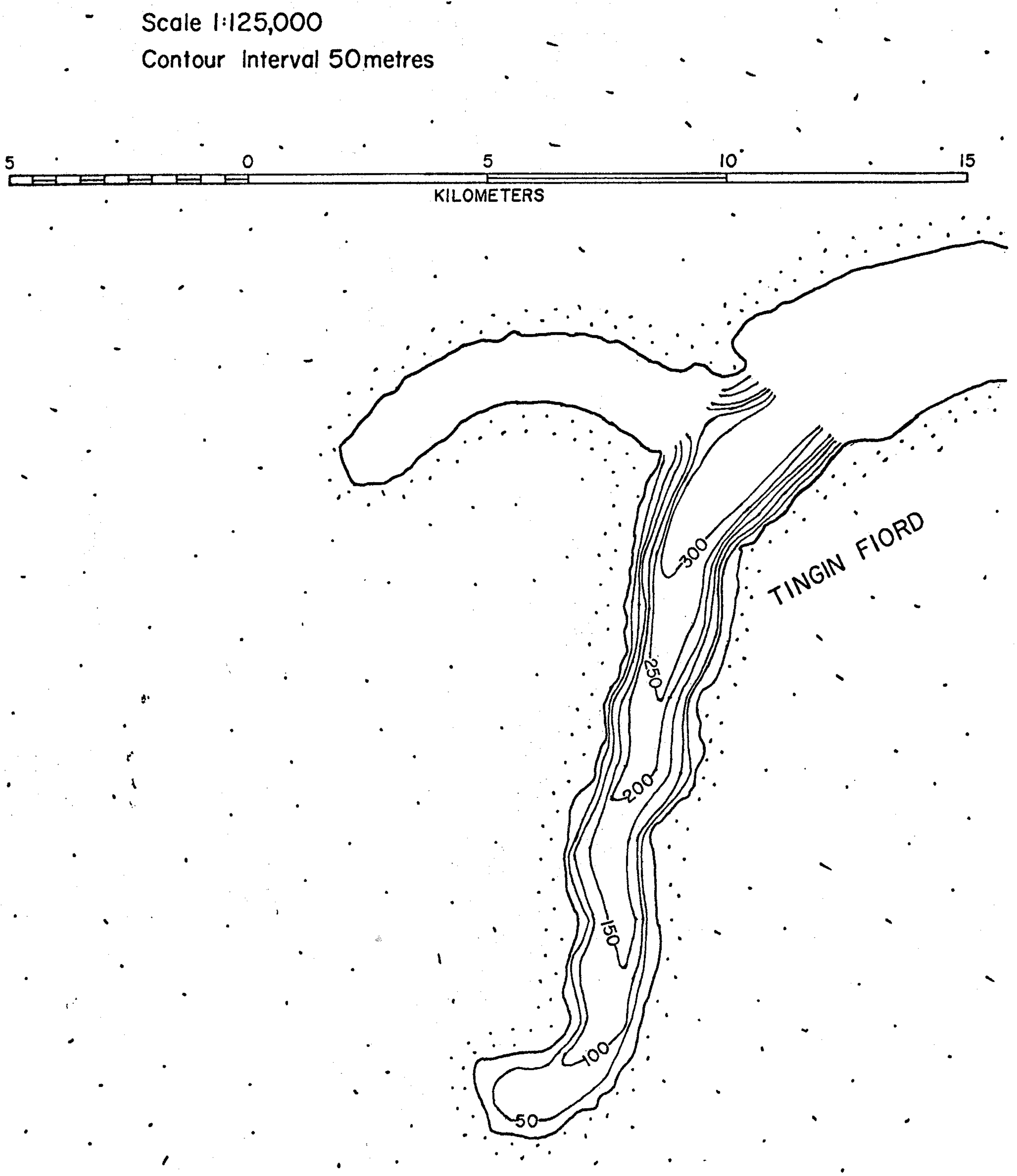
Scale 1:125,000
Contour Interval 50 metres
5
0
5
10
15
KILOMETERS
300
250
200
150
100
50
TINGIN FIORD

FIG. 19-2

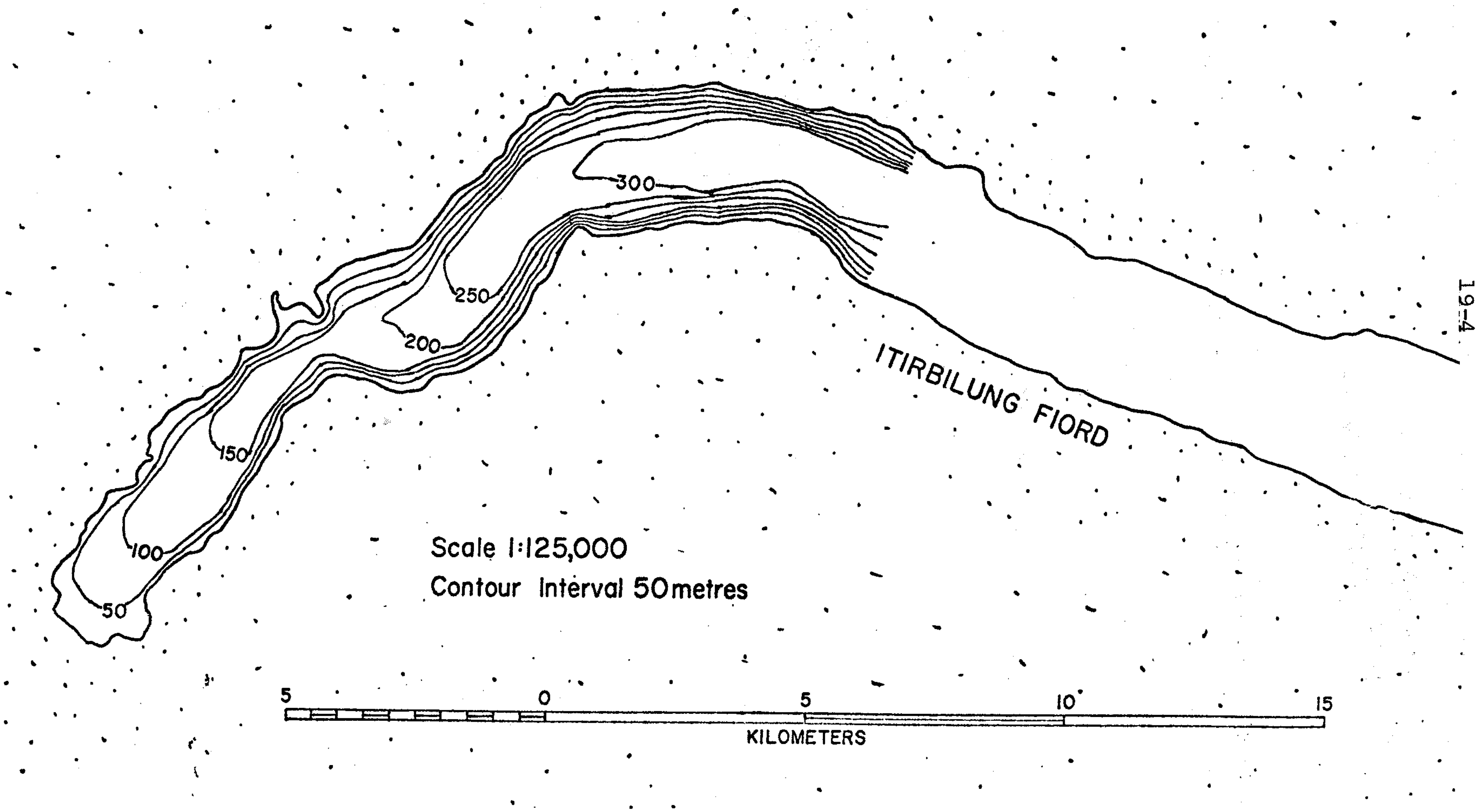
300
250
200
150
100
50
ITIRBILUNG FIORD
Scale 1:125,000
Contour Interval 50 metres
5
0
5
10
15
KILOMETERS

FIG. 19-3

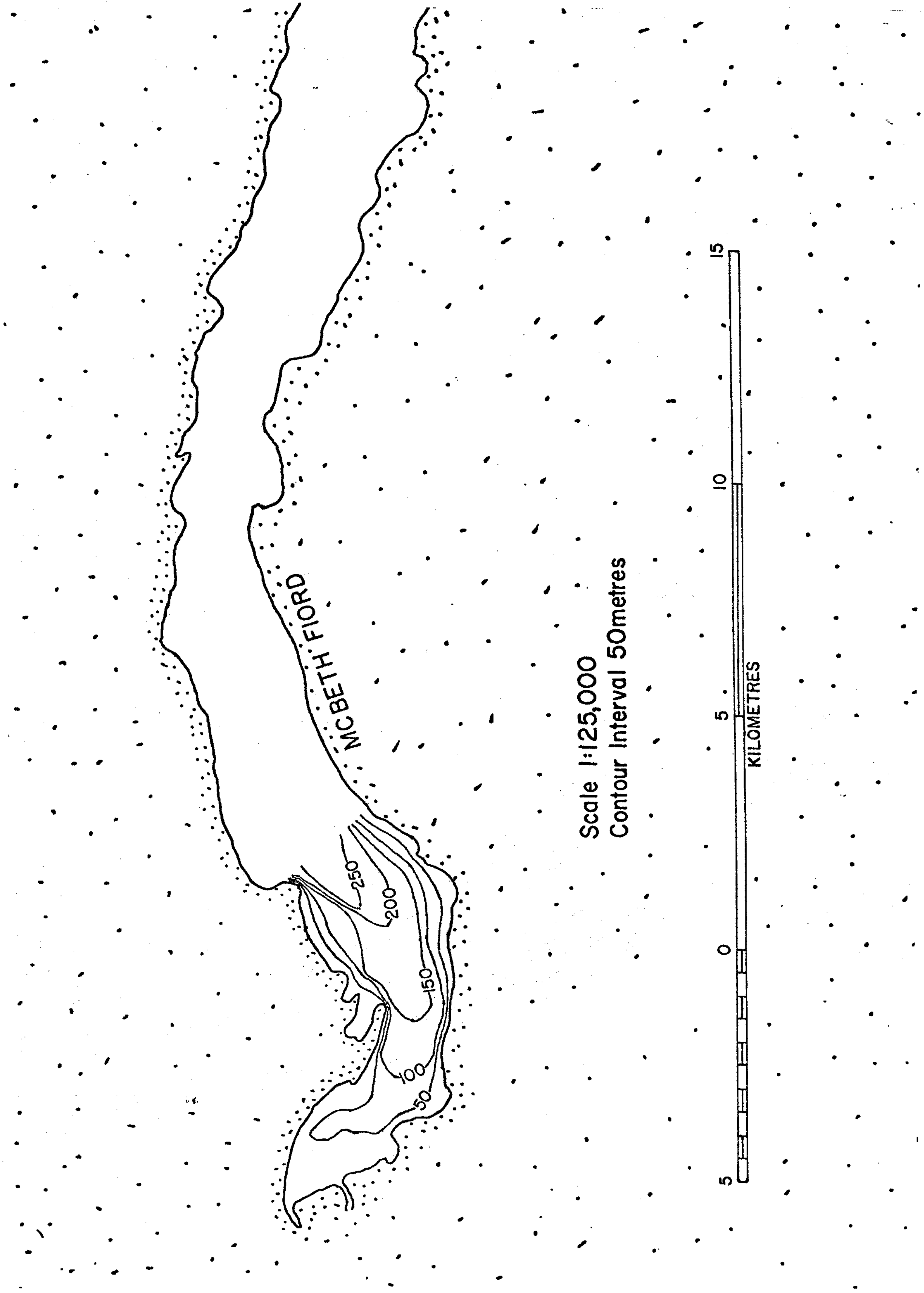
MC BETH FIORD
250
200
150
100
50
Scale 1:125,000
Contour Interval 50metres
5
0
5
10
15
KILOMETRES

FIG. 19-4

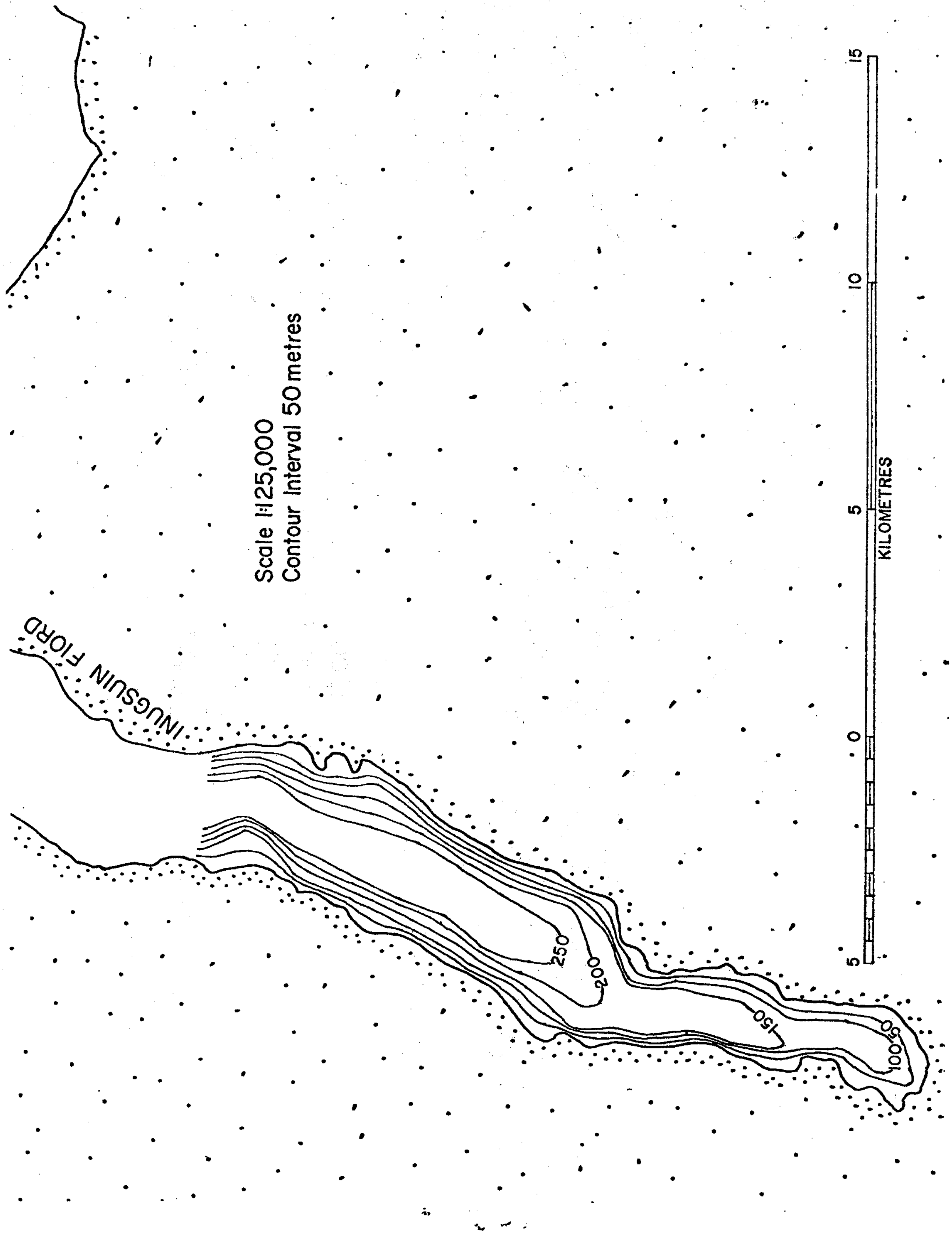
Scale 1:125,000
Contour Interval 50 metres
INUGSUIN FIORD
KILOMETRES
15
10
5
0
5
250
200
150
100
50

FIG. 19-5

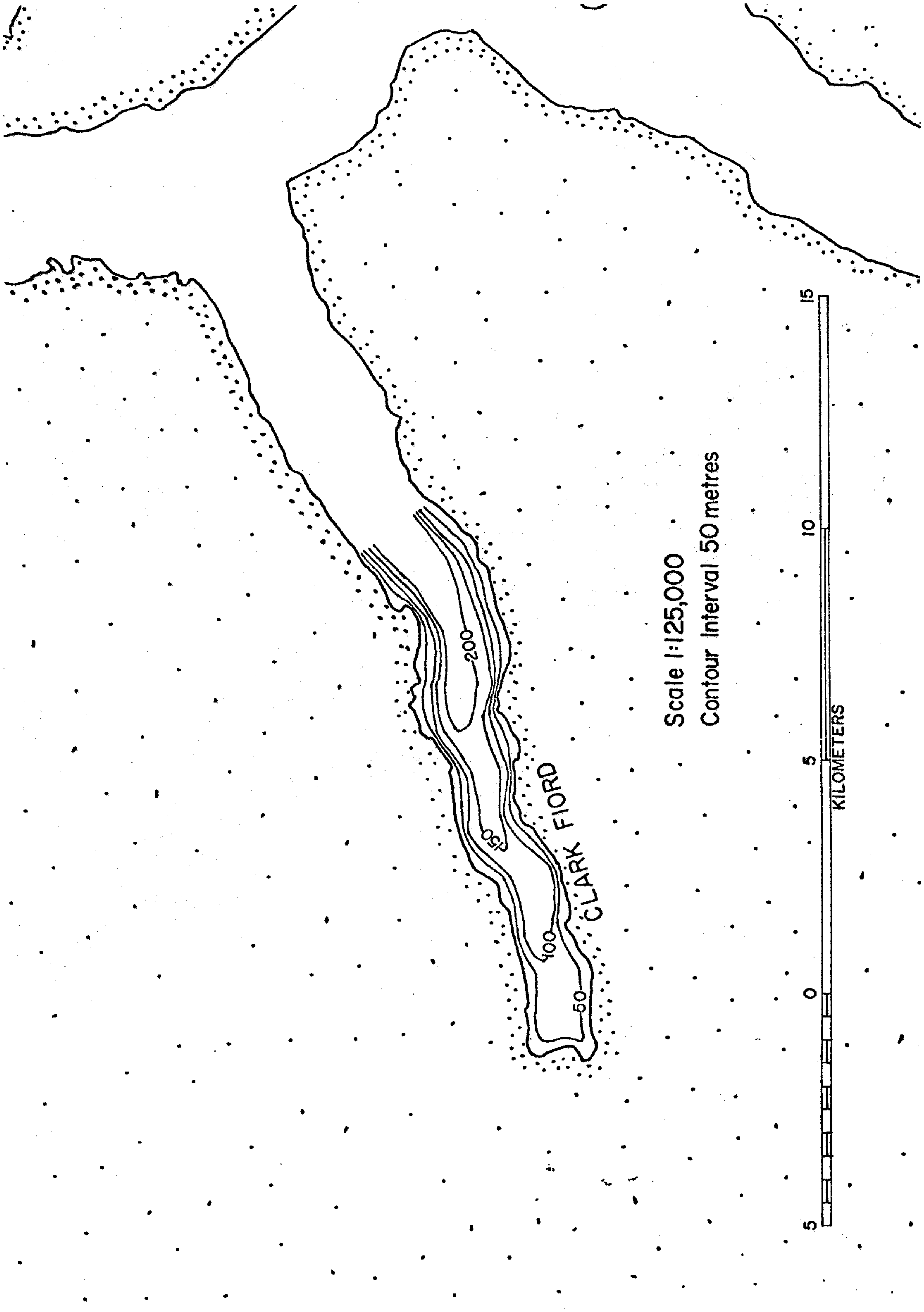
CLARK FIORD
200
150
100
50
Scale 1:125,000
Contour Interval 50 metres
KILOMETERS
5
0
5
10
15

FIG. 19-6

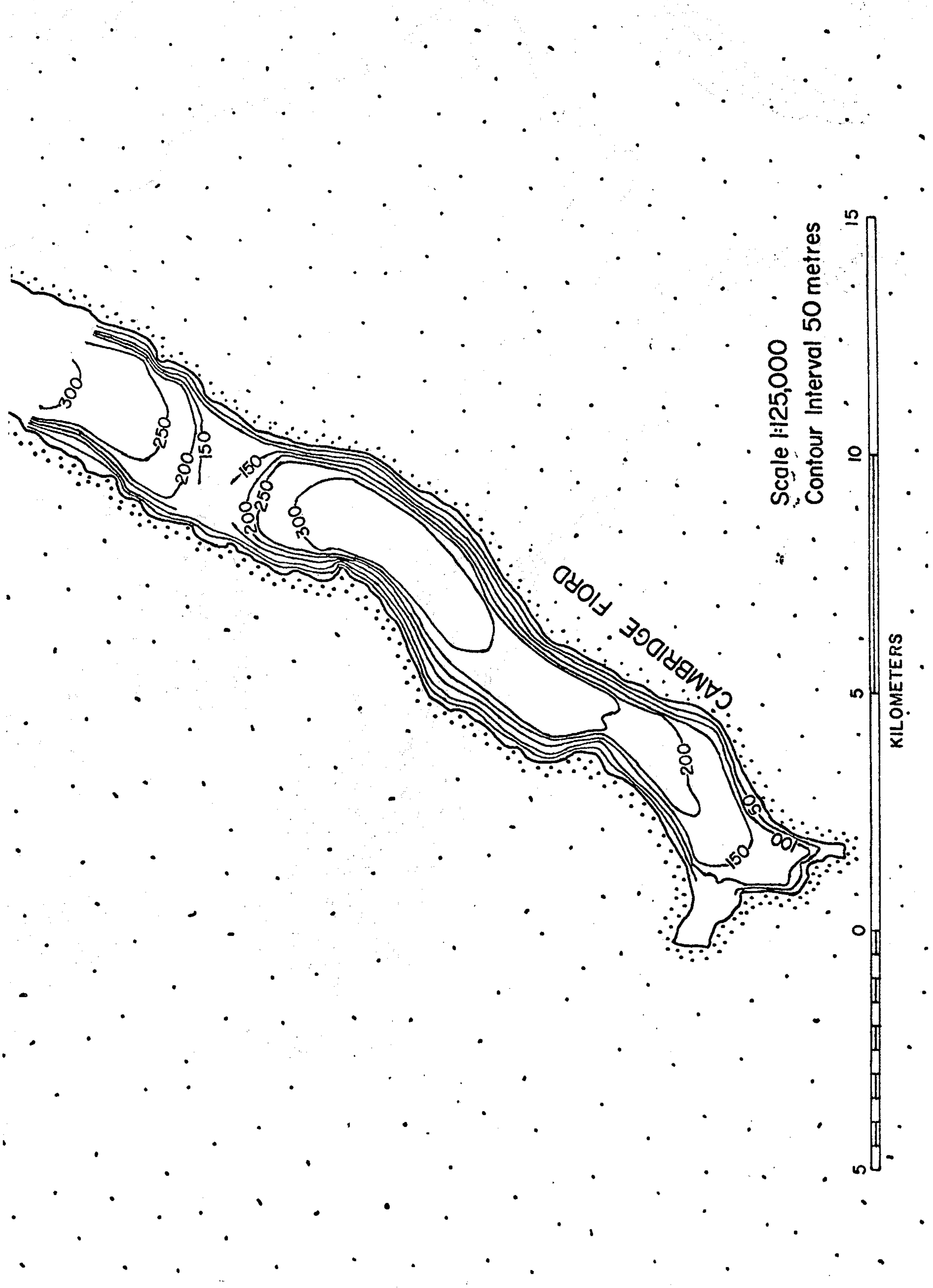
CAMBRIDGE FIORD
Scale 1:125,000
Contour Interval 50 metres
KILOMETERS
5
0
5
10
15
300
250
200
150
150
250
200
300
200
150
100
50

FIG. 19-7

Chapter 20. Dinoflagellates and Pollen from Plankton Tows and Surface Sediments, Baffin Island Fjords

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OBJECTIVES

A recent review of Quaternary palynological studies in the eastern Canadian Arctic (Mudie & Short, in press) shows that pollen and dinoflagellates in cores from Baffin Bay provide a 300,000 year continuous record of climatic and oceanographic changes for this Arctic region. Pollen analysis of a core from Frobisher Bay (Mudie & Short,in press) further shows that fjord pollen assemblages can be closely correlated with C-14 dated Holocene palynostratigraphies from neighbouring onshore sites. Pollen analysis may therefore be the most precise method of dating those fjord sediments which are unsuitable for radiocarbon or paleomagnetic dating. Dinoflagellate cysts and other organic walled resting spores are proxy-environmental indicators of surface water conditions. They may be the best microfossils for Arctic paleoecological studies of environments where calcite or silica dissolution limits the resolution of foraminiferal, diatom and radiolarian fossil records.

The main factors presently limiting the interpretation of Arctic marine palynostratigraphies are: (i) poor understanding of the nature and magnitude of palynomorph sorting in the water column and on the sea bottom; (ii) the need for well-illustrated taxonomic studies of Arctic dinoflagellates and other cysts; (iii) uncertainties regarding the dominant factors controlling cyst production in the Arctic; and (iv) the need to confirm taxonomic correlations between motile-stage dinoflagellates and their fossilizable cysts (= resting stages). These limitations form the basis of the short-term objectives for SAFE palynological studies. The long-term objective is to construct quantitative, multi-compartment box models for pollen and dinoflagellate transport-deposition pathways in Baffin Island fjords, using the method outlined by Mudie (1982) for fjords in Nova Scotia.

FIELD AND LABORATORY METHODS

1. Plankton Tow Samples

A plankton net with 200 µm mesh openings was used for vertical hauls at the 20 localities listed in Table 20-1. The samples were stored in 1-litre glass jars filled with seawater to which formaldehyde was added as a preservative. In the laboratory, the samples were sieved through a 63 µm mesh to separate most of the dinoflagellates and pollen from the larger zooplankton. A 15 ml subsample of the coarse fraction was added to the filtrate so that larger dinoflagellates might be observed. After a 7-day settling time, the supernatant was decanted and the phytoplankton were sieved through a 180 µm mesh to remove most of the zooplankton. The entire phytoplankton sample was then counted under a stereomicroscope at a magnification of up to x 200.

Specimens were subsequently removed for study by scanning electron microscopy (SEM). Special SEM preparation techniques had to be developed for this work because of the brittle nature of the dinoflagellate theca walls after preservation in formaldehyde rather than gluteraldehyde. A stage-mounted micropipette and single-hair picking brush were designed by B. Deonarine and contructed at AGC. The theca-stage dinoflagellates could then be transferred to SEM stubs with minimal damage (see Plate 20-1, figs 1 & 3). The specimens were studied with a Cambridge SEM 180 after coating with gold palladium.

The remainder of the filtered samples was concentrated by centrifuging. Subsamples of the concentrates were mounted in glycerine gel for study by transmitted light (TL) microscopy at magnifications up to x 1000. This method is satisfactory for determination of dinoflagellate plate structures and taxonomic study, but the theca plate boundaries are obscured by pigments in the TL photographs (see Plate 20-1, figs 6 & 7), hence illustrating the importance of obtaining good SEM photomicrographs.

2. Water Samples

On Cruise 82-031, 5-litre water samples were collected by rosette sampler and were pressure filtered onto No.20 Millipore filters. In the laboratory, two of the dried filters were examined , from sites MC1 and SU1 where the plankton samples contained abundant dinoflagellates. No dinoflagellates or pollen were found during examination of the filters by stereoscan or TL microscopy. Pollen might have been extracted from the filters by ultrasonification and chemical methods, but this would have destroyed the theca-stage dinoflagellates. Therefore, no further work was carried out on the filter samples.

3. Grab Samples

Grab samples were taken at the plankton tow sites, using a Van Veen or Shipek sampler. Unfortunately, insufficient sediment was obtained from the surface layer (0 - 2 cm) to allow for palynological study in conjunction with the surface foraminifera samples. However, 5 cm^3 samples were obtained from the bulk sediment samples. These were processed for dinoflagellate cysts, pollen and spores, using the laboratory methods described by Mudie (1982).

RESULTS

Nine dinoflagellate species have been identified from the plankton tow samples (Table 20-1). This is three times more taxa than has been reported for Baffin Island fjord samples taken during spring in Frobisher Bay (Hsiao, 1979) and Pond Inlet (Cross, 1982). Unfortunately, this list of summer dinoflagellates is probably incomplete because many small species would not have been retained by the 200 µm mesh of the net used on Cruise 82-031. This is the first report, however, which identifies the Baffin fjord dinoflagellates to species level (only genera are listed in the previous studies). This level of taxonomic accuracy is essential in order to relate the phytoplankton populations to fossil records of dinoflagellates in the fjord sediments.

Table 20-2 lists the probable relationship between the theca- and cyst-stage dinoflagellates that has been determined on the basis of morphological characteristics. Plate 20-1 illustrates this taxonomic correlation for 3 of the most important paleoecological indicators, viz. Multispinula minuta, Leiosphaera species A, and Brigantedinium simplex. During the next SAFE cruise, surface sediment samples should be collected for laboratory culture of these cysts, in order to confirm the apparent theca-cyst relationships.

Pollen was found in only 8 of the 20 plankton samples. The species present were Picea mariana and Pinus banksiana, both of which are the largest pollen species found in Baffin Island sediments. This suggests that the more common, smaller pollen species which were found in all the grab samples (viz. Cyperaceae, Gramineae, Ericales, Rumex/Oxyria, Salix, & Lycopodium) were not retained by the plankton net. It is possible, however, that most of the pollen is transported to the surface sediments in large (> 180 µm) faecal pellets or in the sediment boundary layer. Preliminary study of sandy silt - silty clay couplets in Core IN3 show that pollen concentrations are two times greater in the sandy laminae than in the clayey laminae. In Cambridge, Inugsuin and North Pangnirtung fjords, there is a two-fold decrease in pollen concentration between the fjord heads and mid-fjord grab samples. When sedimentation rates have been determined for these fjords, it should be possible to estimate the concentration and frequency of pollen deposition required to account for the measured pollen concentrations in the fjord cores.

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CROSS, W.E. 1982. Under-ice biota at the Pond Inlet ice edge and adjacent fast ice areas during spring. Arctic 35:13-27.

MUDIE, P.J. 1982. Pollen distribution in recent marine sediments, eastern Canada. Canadian Journal of Earth Sciences 19:729-747.

MUDIE, P.J., and SHORT, S.K. In press. Marine palynology of Baffin Bay. In: Andrews, J.T. and Andrews, M. (eds) Quaternary History of Baffin Island, Baffin Bay and Greenland. John Wiley and Sons, Inc.

HSIAO, S.I.C. 1979. Phytoplankton and sea ice microalgal data from Frobisher Bay, 1971 - 1978. Canada Fisheries and Marine Service Data Report No. 155, 82 pp.

PLATE 20-1

Photomicrographs of theca-stage dinoflagellates from plankton samples and their corresponding cysts from surface sediment grabs. Scale bar = 20 micrometres. SEM = scanning electron microscope; TL = transmitted light microscope.

Fig. 1. *Protoperidinium pellucidum* Bergh. SEM photo of ventral theca surface; posterior plates $1'''$,$4'''$ and $2''''$ are damaged due to the brittleness of the formaldehyde-preserved material. Specimen from plankton tow CL5; SEM sample 1115-12.

Fig. 2. *Multispinula minuta* Harland and Reid. TL photo of dorsal cyst surface, showing the hexagonal archeopyle which relates this cyst to *P. pellucidum*. Specimen from Core 82-034-57; sample PJM 82/034/57, 0-5 cm; R50/2.

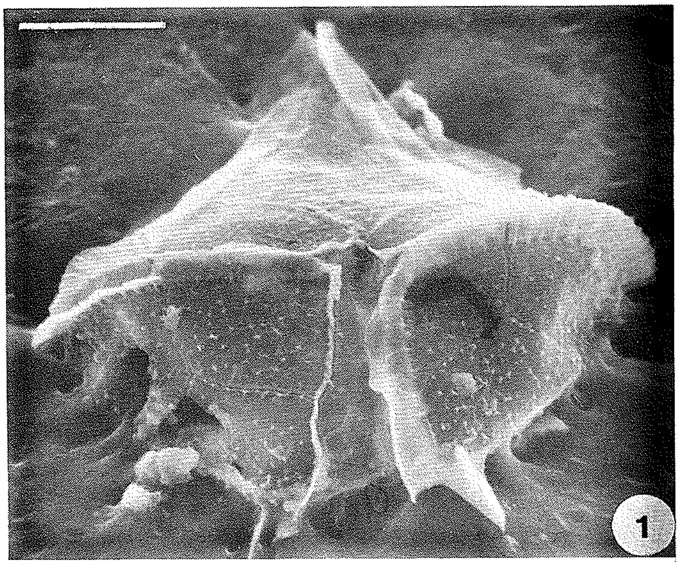
Figs 3 & 6. *Protoperidinium depressum* (Bailey)Balech. Ventral and left lateral theca surface as seen by SEM (Fig.3) and TL microscopy (Fig.6). Specimens from plankton tow CL1. Fig. 3 - SEM sample 1114-02. Fig. 6 - sample PJM CL1-0/4.

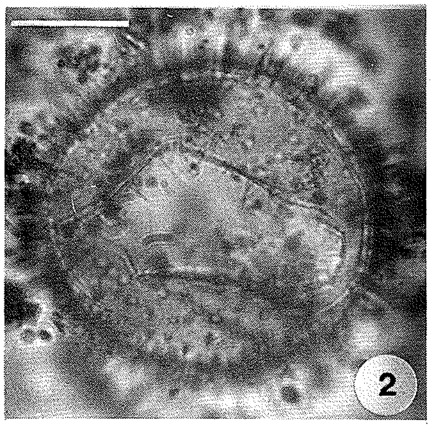
Fig. 4. Unidentified ?*Gymnodinium* species. TL photo of the thin walled cell containing abundant greenish-yellow pigment bodies, a very large nucleus (n) and an apical projection (a) by which multicellular chains may be formed. Specimen from plankton tow CL1; sample PJM CL1-0/3.

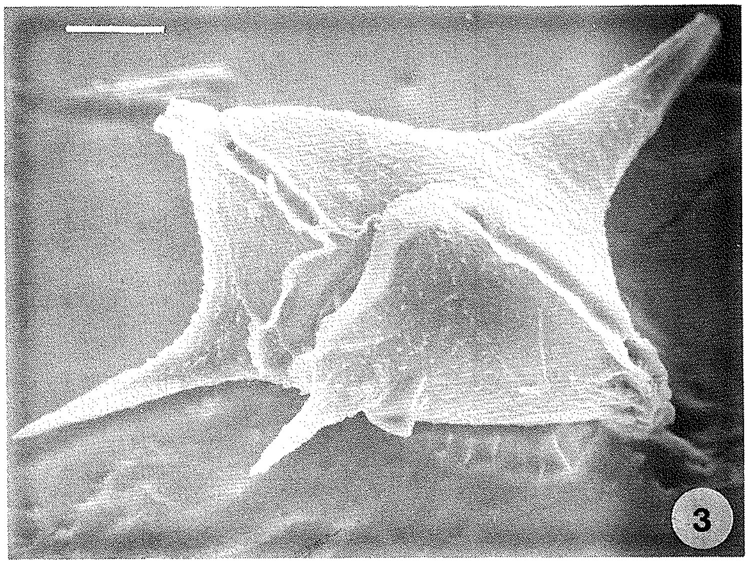
Fig.5. *Leiosphaera* species A. TL photo of the reddish brown cyst, showing the small apical notch (a) by which multicellular (2 - 8) chains may be formed. Specimen from grab sample NP2; sample PJM NP2, H38/2.

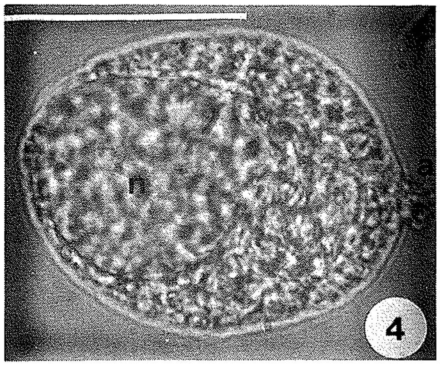
Fig.7. *Protoperidinium conicoides*(Paulsen)Balech. TL photo of ventral epitheca surface; boundaries of the diagnostic ortho first apical and Ss sulcal plates are obscured in the photograph by the dense yellowish pigment bodies. Specimen from plankton tow CL1; sample PJM CL1-0/2.

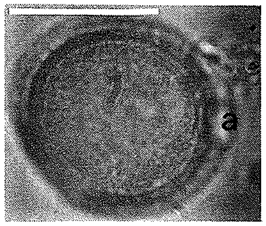
Fig. 8. *Brigantedinium simplex* (Wall)Reid. TL photo of the dorsal cyst surface, showing the distinctive quadrangular archeopyle to which the operculum remains attached immediately after excystment of a motile cell which develops into *P. conicoides*. Specimen from grab sample IN2; sample PJM IN2,D52/1.



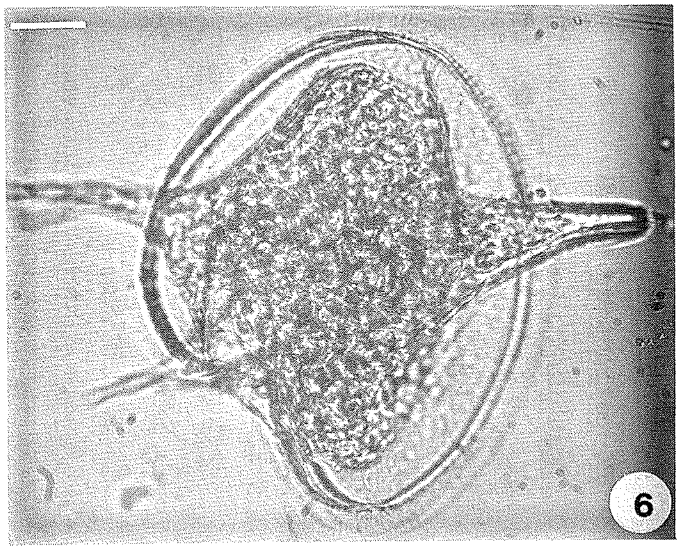


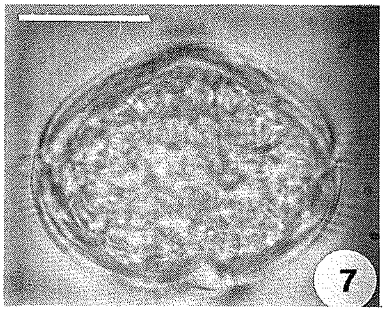






5





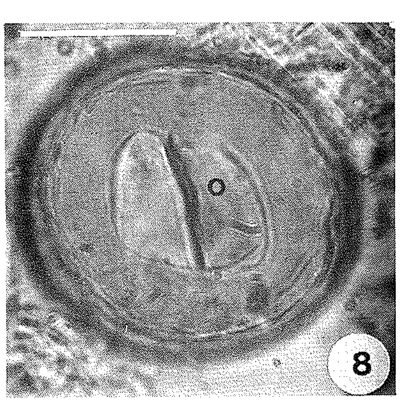


Table 20-1. Dinoflagellate species in plankton tow samples from Baffin Island fjords, Sept. 9-24, 1982. ++ common to abundant; + present; - not found.

	PLANKTON TOW SITE										
TAXON	CA1	CA6	CL1	CL5	IN1	IN3	MC1	IT1	IT3	TI1	TI3
Ceratium arcticum (Ehrenberg)Cleve	++	+	++	+	-	-	+	-	-	-	-
C. tripos (O.F. Müller)Nitsch f. *neglecta*	-	-	+	-	+	-	-	-	-	-	-
Dinophysis arctica Mereschkowsky	+	-	+	-	-	-	-	-	-	-	+
D. rotundata Claparede & Lachmann	-	-	-	-	-	-	-	-	-	-	+
?*Gymnodinium* species	+	-	+	-	+	-	+	-	+	-	-
Protoperidinium conicoides(Paulsen)Balech	-	-	+	-	+	-	-	-	-	-	-
P. depressum (Bailey)Balech	+	-	++	+	++	-	+	-	++	-	-
P. pellucidum Bergh	-	-	-	-	-	-	+	-	-	-	-
Zygabikodinium lenticulatum(Paulsen) Loeblich & Loeblich	+	-	-	-	+	+	-	-	+	-	-

	MA2	MA4	MA5	CO2	CO4	NP3	SU1	SU2	SU7
Ceratium arcticum	-	+	-	+	-	+	-	-	-
C. tripos f. *neglecta*	-	-	-	-	-	-	-	-	-
Dinophysis arctica	-	-	-	-	-	-	-	-	-
D. rotundata	-	-	-	-	-	-	-	-	-
?*Gymnodinium* species	+	-	-	+	-	-	-	-	-
Protoperidinium conicoides	-	-	-	-	-	-	-	+	-
P. depressum	-	-	-	-	-	-	-	+	++
P. pellucidum	-	-	-	-	-	-	-	-	-
Zygabikodinium lenticulatum	-	-	-	-	-	++	+	-	-

Table 20-2. Probable taxonomic correlation between theca-stage dinoflagellates and cysts in grab samples from Baffin Island fjords.
* species not found in SAFE 1982 plankton tows;
grab sample frequency: a = abundant; c = common; r = rare

THECA NAME	CYST NAME & FREQUENCY
Ceratium arcticum	fossilizable cysts not formed
C. tripos f. neglecta	" " " "
Dinophysis arctica	" " " "
D. rotundata	" " " "
?Gymnodinium species	Leiosphaera species A (a)
Protoperidinium conicoides	Brigantedinium simplex (c)
P. depressum	Multispinula quanta (c)
P. pellucidum	Multispinula minuta (r)
Zygabikodinium lenticulatum	Dubridinium caperatum (c)
*Gonyaulax grindleyi	Operculodinium centrocarpum (r)
*G. scrippsae	Spiniferites frigidus (r)
*Polykrikos schwartzii	Polykrikos schwartzii cyst form (c)