MID-PACIFIC OCEANOGRAPHY
Parts II and III
Transequatorial Waters, 1950-51

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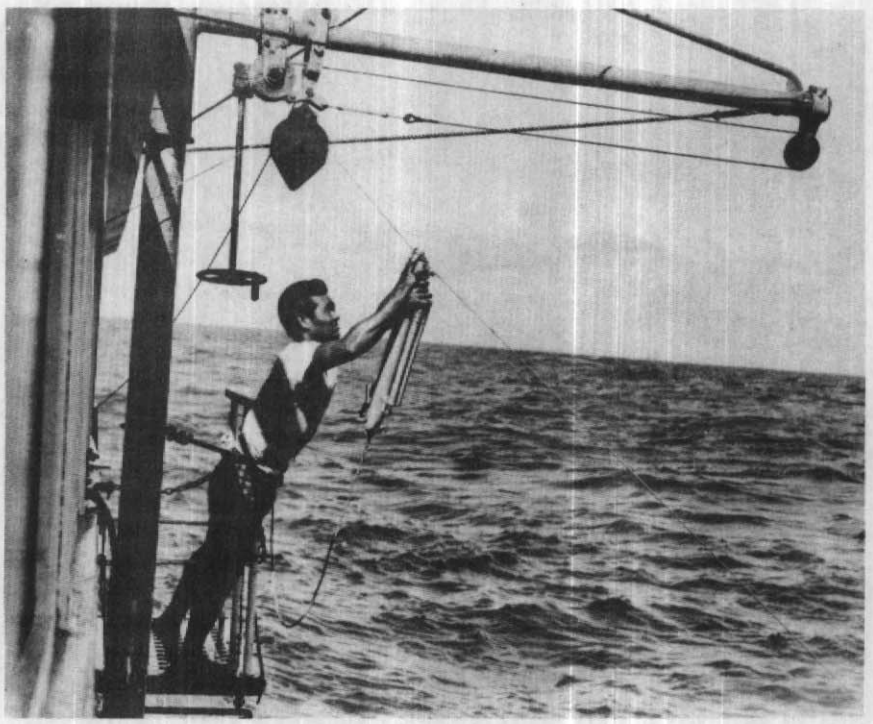

MID-PACIFIC OCEANOGRAPHY II

By

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MID-PACIFIC OCEANOGRAPHY III

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WASHINGTON: JUNE 1954

MID-PACIFIC OCEANOGRAPHY II

TRANSEQUATORIAL WATERS

JUNE - AUGUST 1950

JANUARY - MARCH 1951

By

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PACIFIC OCEANIC FISHERY INVESTIGATIONS

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CONTENTS

MID-PACIFIC OCEANOGRAPHY - II

Introduction

This is the second in a series of reports planned to present oceanographic data obtained by the Pacific Oceanic Fishery Investigations of the U. S. Fish and Wildlife Service. The first (Cromwell 1951) presented oceanographic data in tabular and graphical form with discussions of some of the results of cruise 2 of the Hugh M. Smith, the first equatorial cruise of the POFI program concerned primarily with the collection of physical and chemical data. This present report is concerned with Smith cruises 5 and 8, the second and third equatorial cruises with similar objectives.

The primary purpose of this report is to present the tabulated data and cross-section drawings.[2/] There is only a brief description of results and no attempt is made to relate the present work in a comprehensive fashion to that done by others in the equatorial Pacific.

The primary objective of these oceanographic studies in the equatorial Pacific is to provide information that may be related to biological productivity and particularly to the occurrence of the tunas. POFI's oceanographic program, up to the present time, has centered on describing the distributions of physical and chemical properties and on determining the regions where vertical motion of a type important to productivity occurs.

Vessel, Equipment, and Procedures

Vessel and vessel equipment: The Hugh M. Smith is a former U. S. Navy YP of 700 dead weight tons, converted to carry out oceanographic and fishing research. A previous report (Cromwell 1951) provides a photograph of the vessel and describes the oceanographic and other scientific equipment aboard.

Collection of data: The methods used at sea to collect physical and chemical data were essentially as described in the report mentioned above. Serial temperature observations were made using protected reversing thermometers. Water samples were obtained using Nansen-type bottles (see frontispiece). The concentrations of dissolved oxygen were determined by the Winkler titration

2/ All cross-sections and tabulated data are grouped at the end of the text.

method and of the dissolved inorganic phosphate by the Automatic Servo-operated Photometer (Snodgrass et al. 1953). Portions of each water sample were stored in citrate bottles and returned to the Honolulu laboratory for chlorinity analysis by the Knudsen method.

Processing of data: Sampling depths were determined using reversing thermometers. The readings of protected and unprotected thermometers were adjusted to in situ values by means of graphs. Thermometric depths were computed and plotted on a graph of wire length minus thermometric depth against wire length as developed by R. O. Reid and described by La Fond (1951). The actual depths at which all water samples were obtained were determined from this curve.

Analyses of data: The analyses of the data (their preparation from the tables listing observed values to final presentation in the form of cross sections) were carried out differently from those reported by Cromwell (1951) for cruise 2. Data from that report have been re-analyzed and the resulting set of cross sections appear, in part, in a report by Cromwell (1953) and the remainder in a paper by Montgomery (1954).

For this report, the treatment of data was similar to that employed by Montgomery for one series of Smith stations along the 158° W. meridian (Montgomery 1954). The procedure followed here will be described briefly for those who do not have access to his paper and to point out differences from his method.

A temperature-vs.-depth curve was drawn for each station, the curve passing through each observed point (fig. 1). The BT trace was used to define detail in drawing the upper 200 meters of the curve. A temperature-salinity (T-S) curve then was drawn on the same graph using the same temperature scale. Thus, the depth or depths of occurrence of any particular salinity can be determined by referring to the temperature-depth curve. Successive T-S curves were placed on a light table and altered, where necessary, so that the station-to-station changes were as regular as the data would allow. Since curves along which sigma-t is constant appear printed on the graph, the depth of any particular value of sigma-t can be read by referring to the temperature-depth curve.

In constructing the cross sections, the depths of selected values for salinity and sigma-t were determined as above and plotted against distance. The isopleths were penciled lightly on the cross section. In addition, the values of actual observations were written onto a second cross section using an equivalent pair of scales. The

two were superimposed on a light table and the isopleths modified consistent with the observed values. Up to this point in the treatment of the data, the procedures follow closely those described by Montgomery (1954).

Montgomery used an analogous procedure to construct cross sections for inorganic phosphate and oxygen. The method used here for these two fields was less rigorous but also less time consuming. The observed values of inorganic phosphate were written onto a cross section using depth and distance scales equivalent to those used in drawing the sigma-t section. This sheet was then placed over the completed sigma-t section on the light table. The isopleths were drawn as nearly as possible along the sigma-t surfaces, but not in violation of any of the observed values. This was done in accordance with the principle used in isentropic analysis, namely, that water flows along surfaces of constant potential density (under certain conditions rather generally encountered in the ocean), these surfaces being very nearly coincident with surfaces of constant sigma-t. The same procedure was used in constructing the oxygen cross sections. Neither inorganic phosphate nor oxygen is a conservative property, but proceeding as though they are probably leads to the most accurate cross sections possible in the absence of quantitative information about the biological processes.

Some Results of Hugh M. Smith Cruises 5 and 8

The station pattern for the June - August cruise of 1950, cruise 5, appears as figure 2 while that for the January - March cruise of 1951, cruise 8, is shown in figure 3. Each of these two cruises comprised primarily two lines of stations, one each along 158° W. and 172° W. Cruise 8 included additional stations along a zigzag course between 155° W. and 169° W. longitude.

The cross sections appearing as figures 4 - 32 are based on data collected along the four meridional station lines and stations 62-76 of cruise 8 along a NNE-SSW course (fig. 3). Figures 4-10 result from data collected along the station line 1-27 of Smith cruise 5 (fig. 1), primarily along 172° W. longitude. These figures are in the sequence dynamic topography, geostrophic currents, BT, sigma-t, salinity, phosphate, and oxygen. This sequence is repeated for each long line of stations on Smith cruises 5 and 8, except that the sigma-t, salinity, phosphate, and oxygen sections based on stations 28-51 of Smith cruise 5 appear elsewhere (Cromwell 1953) and are not reproduced here. Stations 27-61, on the zigzag portion of Smith cruise 8, are not represented by cross sections.

Dynamic heights: Figures 4, 11, 14, 20, and 26 show the smoothed profiles of isobaric surfaces with respect to the 1,000-decibar surface. The dots represent the actual results of dynamic computations and are plotted to show what liberties with the data have been taken in the smoothing process.

Geostrophic currents: The relative currents, figures 5, 12, 15, 21, and 27, were computed from the smoothed profiles shown in figures 4, 11, 14, 20, and 26 respectively. The isovels indicate the component of geostrophic flow perpendicular to the plane of the cross section. They are not drawn between the 3-1/2° parallels because flow close to the Equator is not even approximately geostrophic. East currents are hatched.

The cross sections exhibit a complicated arrangement of zonal components of currents. There is some uncertainty in the existence of the lesser flows, particularly in the narrow currents that are based on only two or three stations. It is apparent, however, that there are appreciable regions of easterly flow existing outside the bounds of the Equatorial Countercurrent.

Table I is included to aid in identifying the currents that appear in the figures and to summarize pertinent information about them. The positions to the nearest one-half degree of latitude of the surface boundaries of the Equatorial Countercurrent were read from the figures of dynamic height. The number listed under "Core of Countercurrent" is the latitude of the maximum speed through the plane of the traverse as read from the figures showing geostrophic current. Values within parentheses are uncertain.

Table I

Longitude	Figure numbers	Dates of traverse	Southern boundary of Countercurrent	Northern boundary of Countercurrent	Core of Countercurrent
158°W.	11 and 12	Aug. 1-2, 1950	5°N.	9°N.	7-1/2°N.
158°W.	14 and 15	Jan. 19-22, 1951	2°N.	9-1/2°N.	(5-1/2°N.)
172°W.	4 and 5	July 7-9, 1950	(3-1/2°N.)	8°N.	6°N.
172°W.	26 and 27	Mar. 6-8, 1951	4°N.	10°N.	5-1/2°N.
166°W.	20 and 21	Feb. 12, 1951	5°N.	--	5-1/2°N.

Referring to figures 11 and 12, for example, the east-flowing Equatorial Countercurrent appears between 5° N. and 9° N., with the North Equatorial Current immediately adjacent to the north. South of the southern boundary of the Countercurrent there is a

major flow toward the west, the South Equatorial Current. Since the currents near the Equator cannot be computed through use of the concept of the geostrophic current, the South Equatorial Current, and in some cases the Countercurrent, is interrupted on the sections.

Bathythermograph sections: Temperature sections, using the bathythermograph data, are reproduced in figures 6, 13, 16, 22, and 28.

Two bathythermograph observations were made at each hydrographic station and additional lowerings were made between stations. During cruise 5, BT casts were made at approximately 10-mile intervals. During cruise 8, BT casts were made at approximately 20- to 30-mile intervals except for closer, 10-mile intervals between the Equator and 5° - 7° N.

The curve at the top of each bathythermograph section describes the surface temperature and was drawn using the bucket temperatures smoothed with reference to the continuous-recording thermograph. In figure 6 between 5° 20' N. and 10° 00' N., and in figure 28 between 17° 00' N. and 18° 50' N., the surface temperature is relatively high and varies irregularly. This behavior is associated with light winds. During the times that these irregularities occurred, the wind speed was predominantly Beaufort force 1 and calm.

In figure 13 the surface temperature changes abruptly near 4° 20' N. This occurs at the surface intersection of the Equatorial Front, a feature which is described in some detail elsewhere (Cromwell 1953).

Sigma-t: In figures 7, 17, 23, and 29, the configuration of the sigma-t surfaces indicates relatively dense water in the surface layer near the Equator. This is associated with the equatorial upwelling. Nowhere else in the figure does the density of the surface layer indicate any appreciable addition of water from below.

The lines of constant sigma-t near the Equator bend downward in the lower part of, and just below, the thermocline. In figure 6, for example, the isopleths of sigma-t = 26.6 through sigma-t = 27.0 exhibit pronounced local depth maxima at the Equator. This feature appears in each of the sigma-t sections of this report, in the sections drawn by Cromwell (1953), and in the one by Montgomery (1954). It appears to be a prevalent feature of the central equatorial Pacific.

Salinity: The salinity cross sections are shown in figures 8, 18, 24, and 30. Regions of salinity greater than 34.8 $^{\circ}/_{oo}$ are hatched.

Inorganic phosphate: Two phosphate sections were drawn and appear as figures 9 and 31. In figure 9, there are large variations in the concentration of inorganic phosphate below the thermocline. "Pools" of high or low concentration appear almost at alternate stations in the deeper water and often are found at stations where the concentrations in the surface layer are correspondingly high or low. This suggests that these variations are not in the ocean, but arise fictitiously in the determinations.

Surface water with a relatively high inorganic phosphate concentration appears near the Equator on both cross sections. This prevalent feature of the central Pacific is associated with the equatorial upwelling.

Oxygen: Oxygen sections appear as figures 10, 19, 25, and 32.

Acknowledgements

I wish to express my appreciation to Mary Lynne Godfrey, Richard V. Mead, and to those persons who worked with them in processing the physical data and plotting the sections. Winifred Tseu carried out the chlorinity titrations and processed the chemical data. Tamotsu Nakata drafted the figures. Thomas S. Austin made helpful suggestions and assisted generously in the later stages of the work.

The scientific field party during cruise 5 was: Joseph E. King (field party chief), Townsend Cromwell, Kenji Ego, Herbert Mann, Vernon Brock (Territorial Division of Fish and Game) and William Gosline (University of Hawaii). During cruise 8 the field party was: Joseph E. King (field party chief), Herbert Mann, Richard Mead, Stanley Peterson, Isaac Ikehara and Walter Kawano.

There were many other persons who assisted in this work at sea and ashore and I gratefully acknowledge their contributions.

LITERATURE CITED

CROMWELL, T.

1951 Mid-Pacific oceanography, January - March 1950. U.S. Fish and Wildlife Serv., Spec. Sci. Rep: Fish. No. 54, 9 pp., 17 figs., 53 tables.

1953 Circulation in a meridional plane in the central equatorial Pacific. Jour. of Mar. Res., Vol. 12, No. 2, pp. 196-213, 9 figs.

LA FOND, E. C.

1951 Processing oceanographic data. H. O. Pub. No. 614, 114 pp.

MONTGOMERY, R. B.

1954 Analysis of a Hugh M. Smith oceanographic section from Honolulu southward across the Equator. Accepted for publication in the Jour. of Mar. Res., Vol. 13, No. 1.

SNODGRASS, J. M., D. E. CARRITT, and W. S. WOOSTER

1953 An automatic servo-operated filter photometer. (In press).

REMARKS ABOUT THE OCEANOGRAPHIC DATA

Auxiliary station data:

Weather: Recorded according to the ww (present weather) code as it appears in the seventh edition of the U. S. Weather Bureau Circular M, Instructions to Marine Meteorological Observers. Parts of this code are changed in the 8th edition of the Circular M now in use.

Wind velocity: Measured using an anemometer located 30 m. above the sea surface. The observed direction is that from which the wind was blowing, given in degrees measured clockwise from north.

Tabulated data:

The surface temperature was observed to the nearest tenth of a degree. The hundredths digit appears always as a zero and has no significance.

On some stations, the "surface" Nansen bottle was lowered beneath the surface to avoid striking the side of the rolling vessel. On these stations, the minimum recorded observed depth is that of this top bottle in the cast as no bucket sample was taken.

Paired protected thermometers were used at most depths. When the corrected values are 0.05°C. or more in disagreement, the depth of observation is listed twice so that both temperature values may appear.

Pairs of determinations of inorganic phosphate concentration were made for each sample. If the two values of extinction differ by more than .05 (i.e., by more than approximately .20 μg at/l) the depth of the sample is listed twice so that both values of inorganic phosphate concentration may appear.

Values enclosed within parentheses have been extrapolated to their designated depths.

Cruise 5:

The surface temperature was measured using a bucket thermometer. The thermometer used during cruise 5, stations 1 through 28, read .2°C. too low so that a + .2°C. correction must be added to the values listed to obtain the correct surface temperature. A + .1°C. correction must be added to the surface temperature values listed for Smith cruise 5, stations 29 through 51.

Cruise 8:

Stations 3 and 5 were not occupied because of high winds.

During Smith cruise 8 the Nansen bottle that sampled at the seventh depth for which data are tabulated in this report did not always close properly. Although tabulated, the samples at this depth for stations 17, 65, 66, 80, 82-87, 91, and 104-106 appear to have been contaminated during retrieval of the cast and were not used in drawing the cross sections of this report.

During cruise 8 a large number of observations of inorganic phosphate concentration were lost because the stannous chloride solution was improperly protected from exposure to the air and oxidation of the stannous ion occurred. Examination of the results, particularly of the reagent blank values, indicate that the data of stations 1 through 76 are completely untrustworthy and so the values are deleted from the tabulated data and a cross section appears only for stations 77-106.

A + .1°C. correction must be added to all the surface temperature values of Smith cruise 8.

Figures

28. Meridional section of temperature, 172° W.

29. Meridional section of density, 172° W.

30. Meridional section of salinity, 172° W.

31. Meridional section of phosphate, 172° W.

32. Meridional section of oxygen, 172° W.

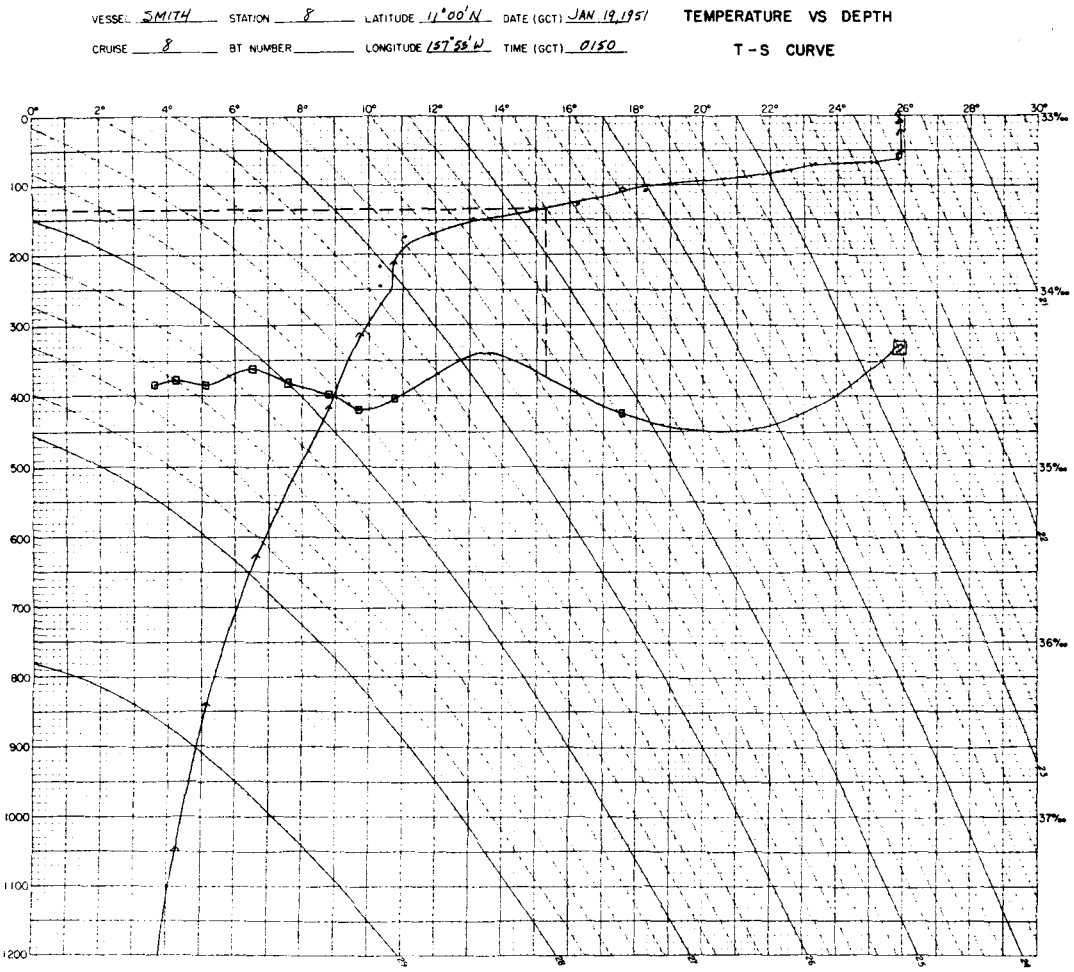

Fig. 1.-- Diagram used to represent temperature and salinity data. Points under an inverted V are the result of temperatures by reversing thermometers. Heavy points are those read from the BT trace. Points inside a square are the result of salinity observations, plotted against temperature. Dashed lines indicate the paths to follow in relating temperature, salinity, and sigma-t to depth. Thus, in the diagram at a depth of 133 meters the temperature is 15.28°C., the salinity, 34.49 °/oo, and the sigma-t, 25.53 g/l.

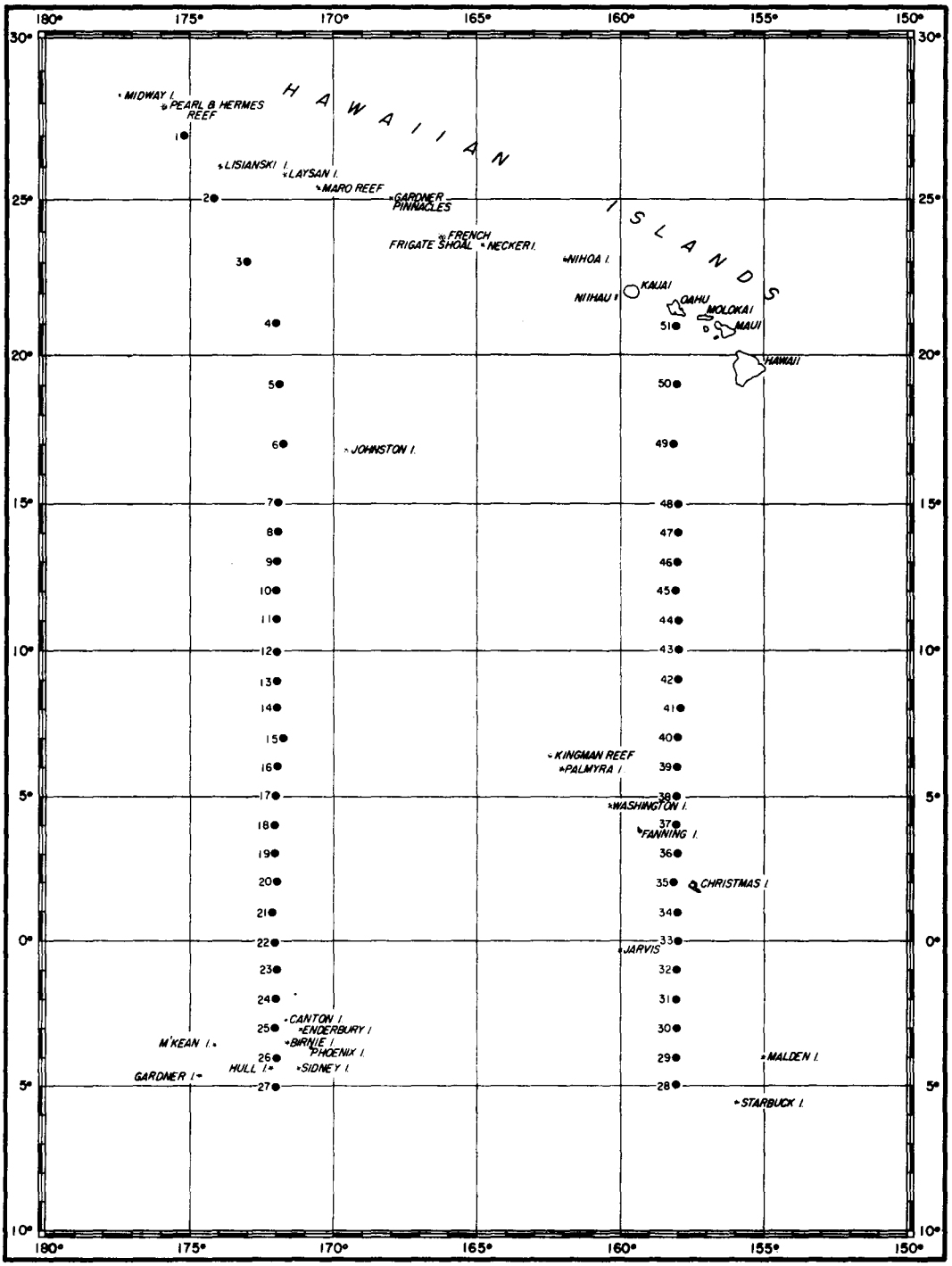

Fig. 2.-- Positions of hydrographic stations. Smith cruise 5, June - August 1950.

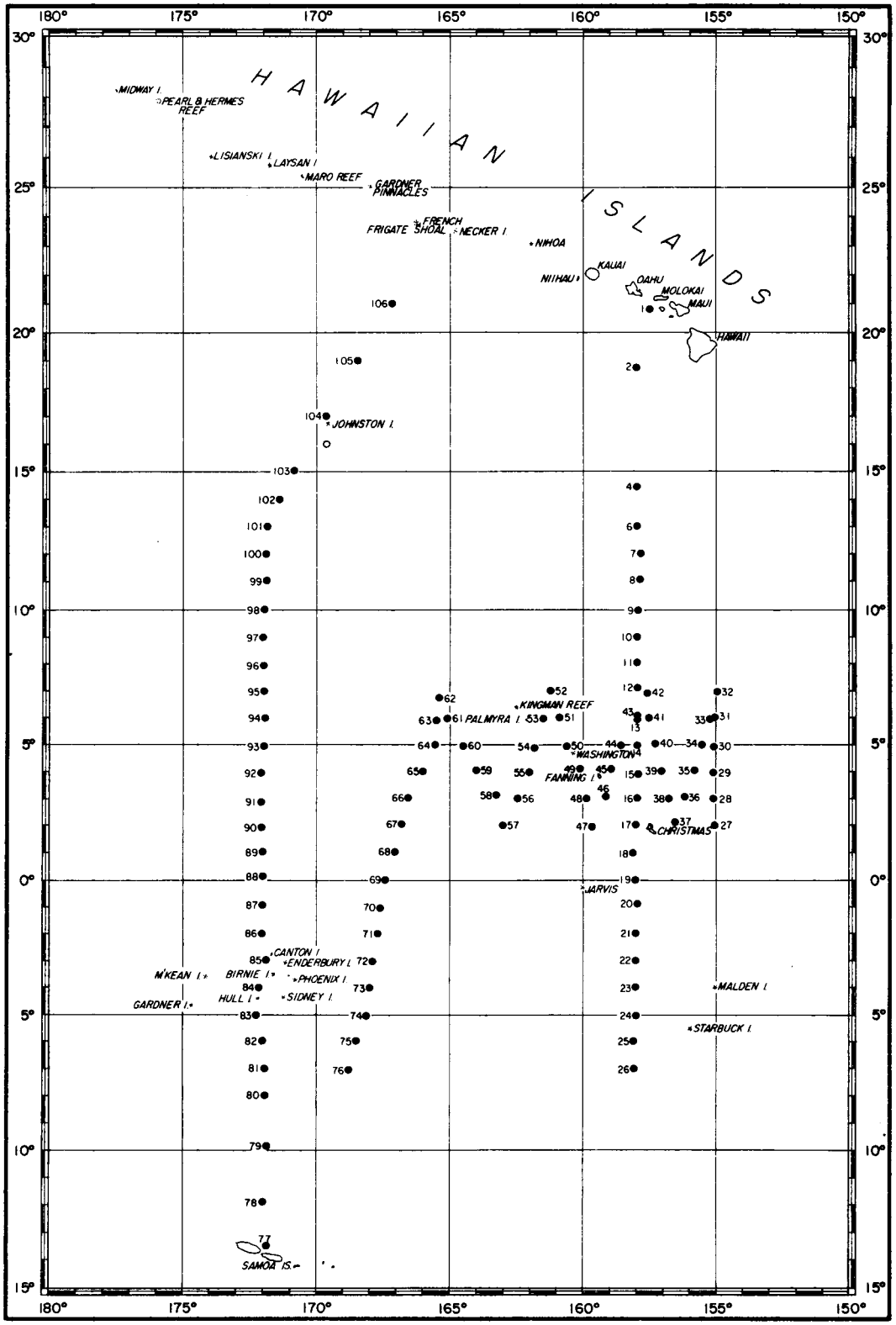

Fig. 3. -- Positions of hydrographic stations. Smith cruise 8, January - March 1951.

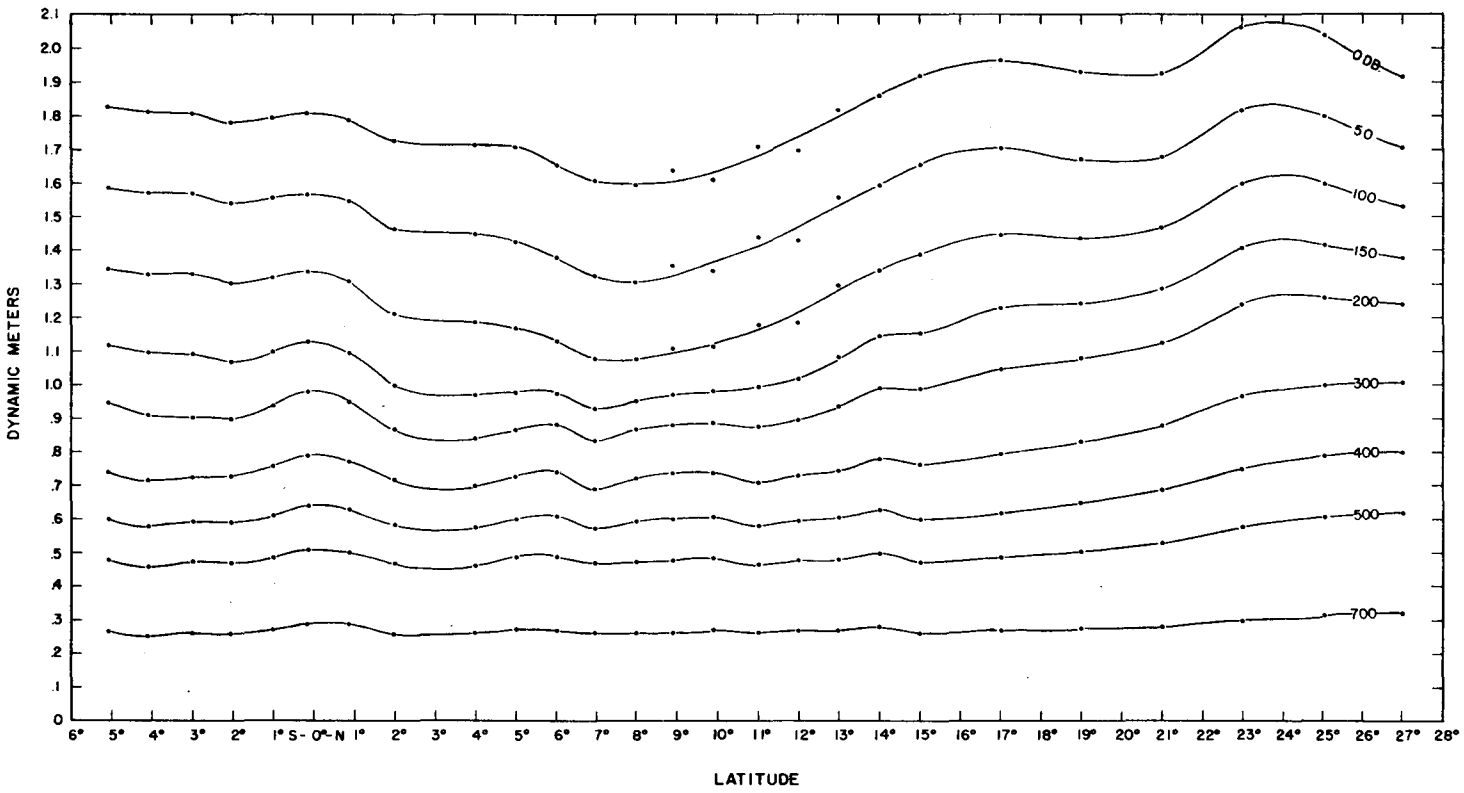

Fig. 4. -- Smoothed profiles of isobaric surfaces relative to the 1,000-decibar surface along 172° W., June 30 - July 12, 1950. Points are the result of dynamic computations. Hugh M. Smith cruise 5, stations 1-27.

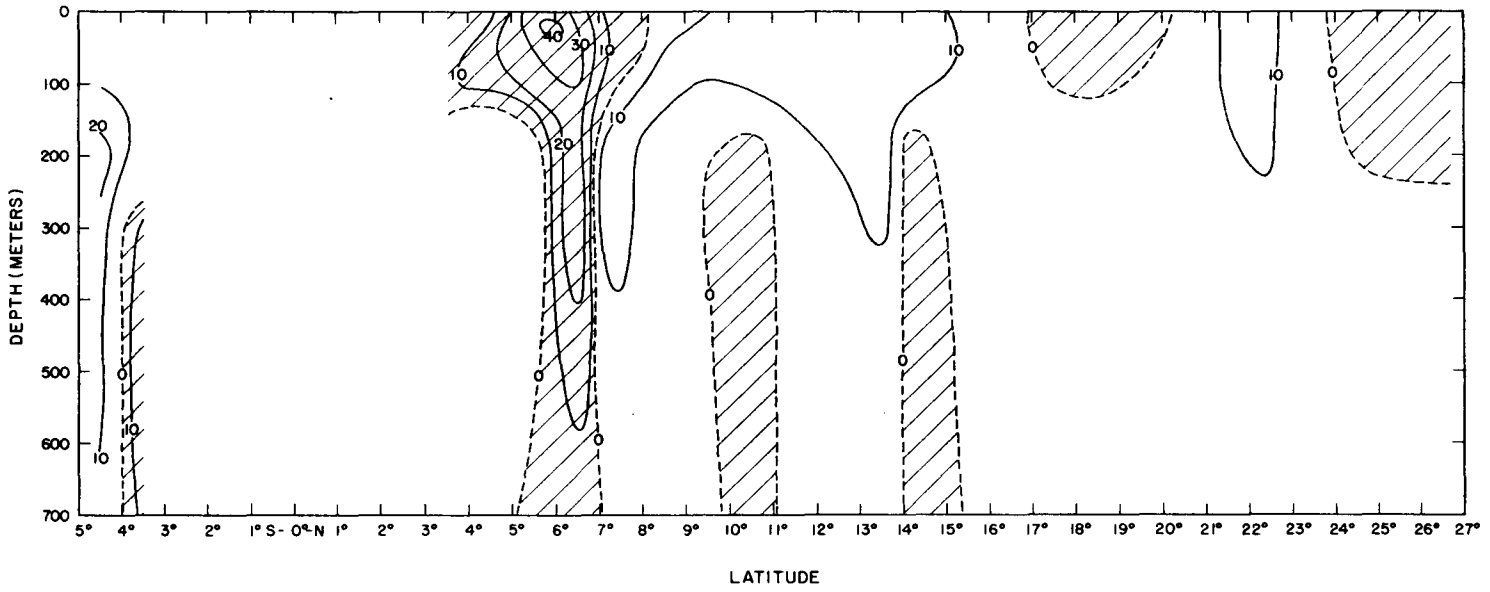

Fig. 5.-- Zonal components of the geostrophic currents across 172° W., June 30 - July 12, 1950. Computations based on smoothed profiles of isobaric surfaces (fig. 4). Current magnitude in cm/sec. East currents hatched. Hugh M. Smith cruise 5, stations 1-27.

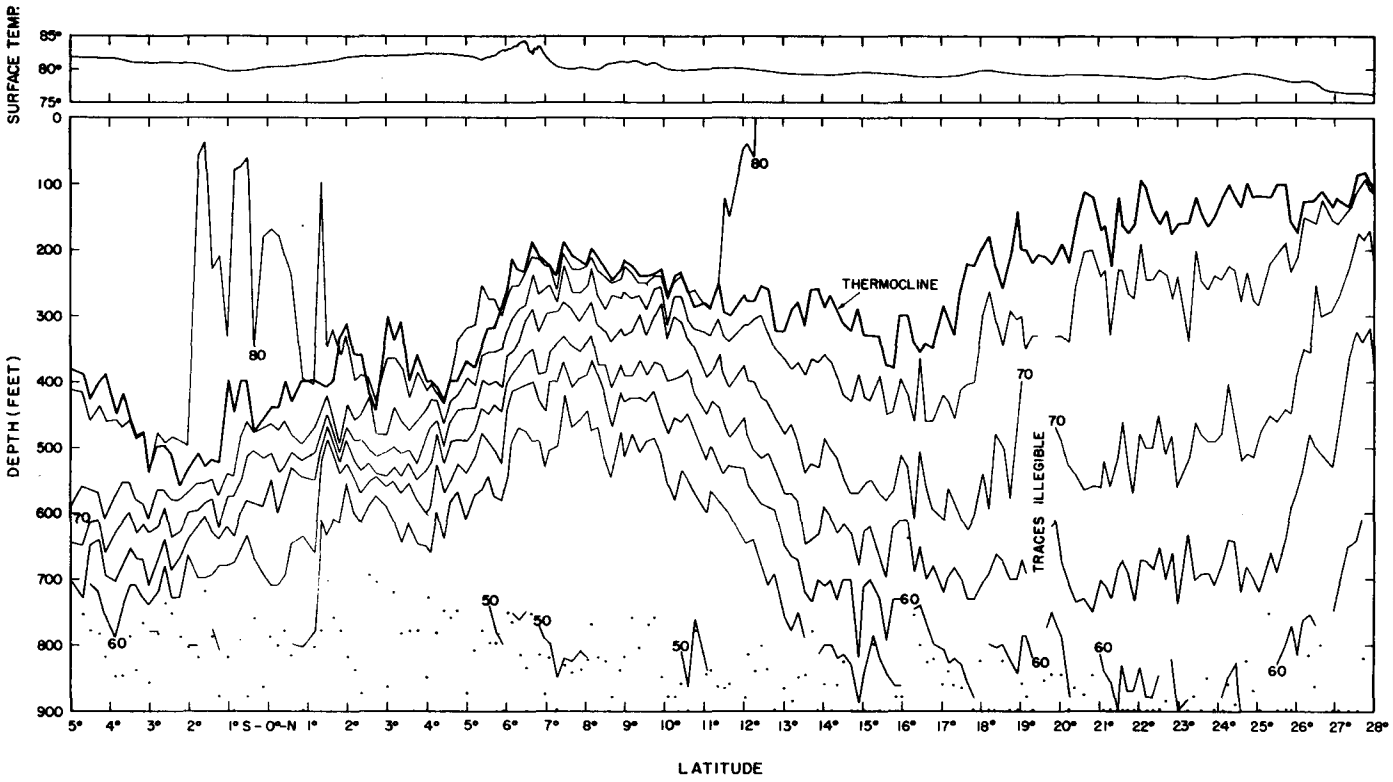

Fig. 6.-- Above, surface temperature and below, temperature section based on bathythermograph data along 172° W., June 30 - July 12, 1950. Isotherms drawn at intervals of 5° F. Dots indicate depths of observations. Hugh M. Smith cruise 5.

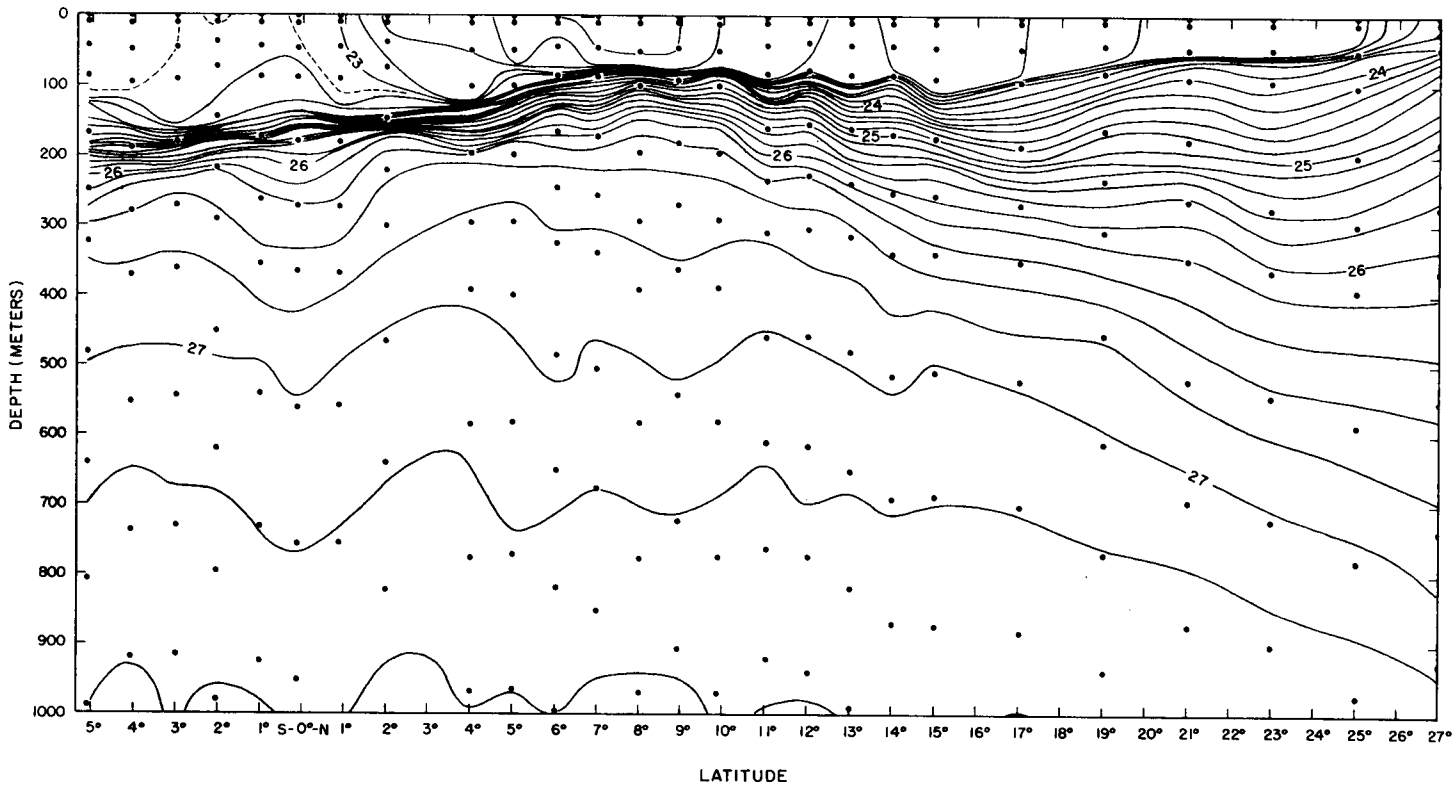

Fig. 7.-- Meridional section showing the distribution of density (σ_t) along 172° W., June 30 - July 12, 1950. Contour interval 0.2 g/l. Hugh M. Smith cruise 5, stations 1-27.

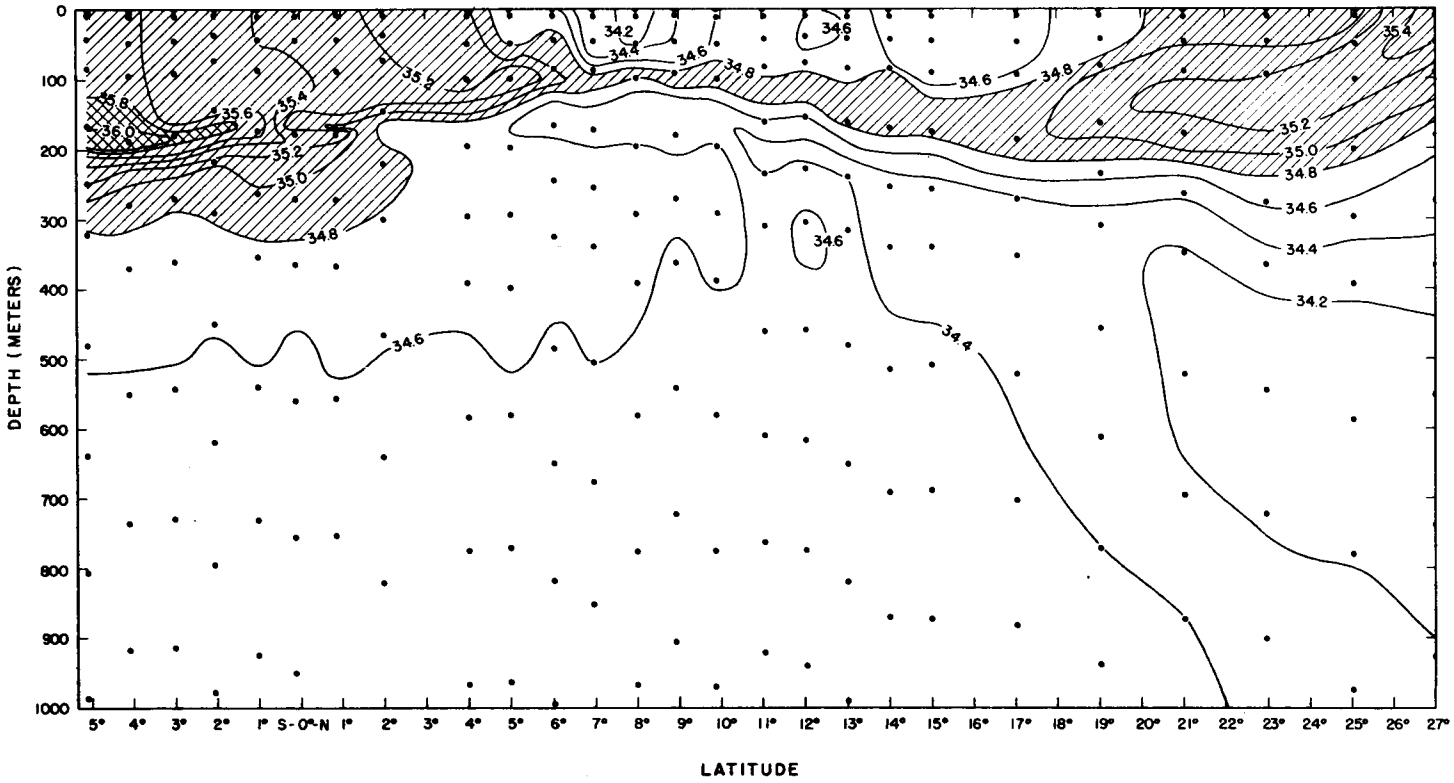

Fig. 8.-- Meridional salinity section along 172° W., June 30 - July 12, 1950. Contour interval 0.2 °/oo. Hugh M. Smith cruise 5, stations 1-27.

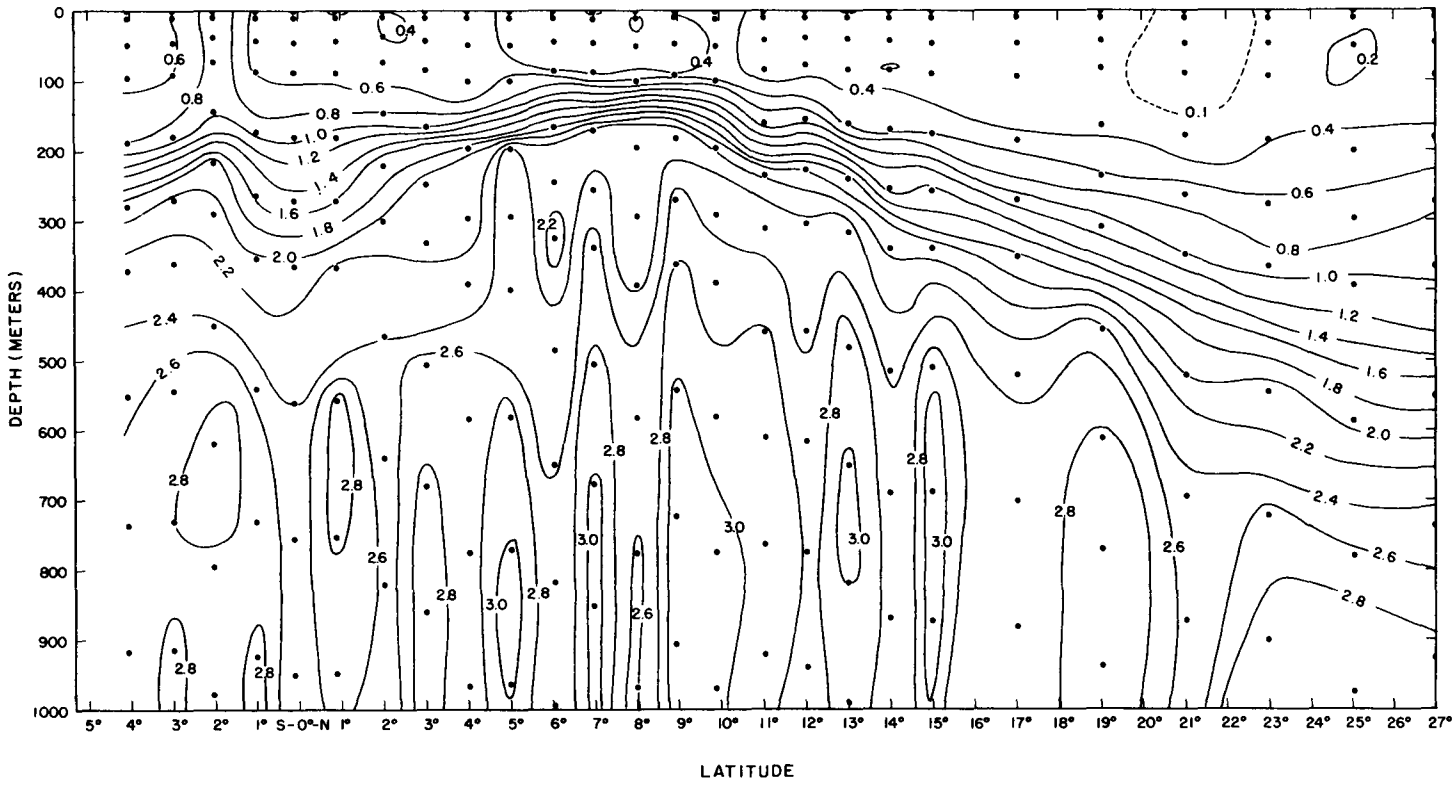

Fig. 9.-- Meridional section showing the concentration of inorganic phosphate along 172° W., June 30 - July 12, 1950. Contour interval 0.2 μg at/l. Hugh M. Smith cruise 5, stations 1-27.

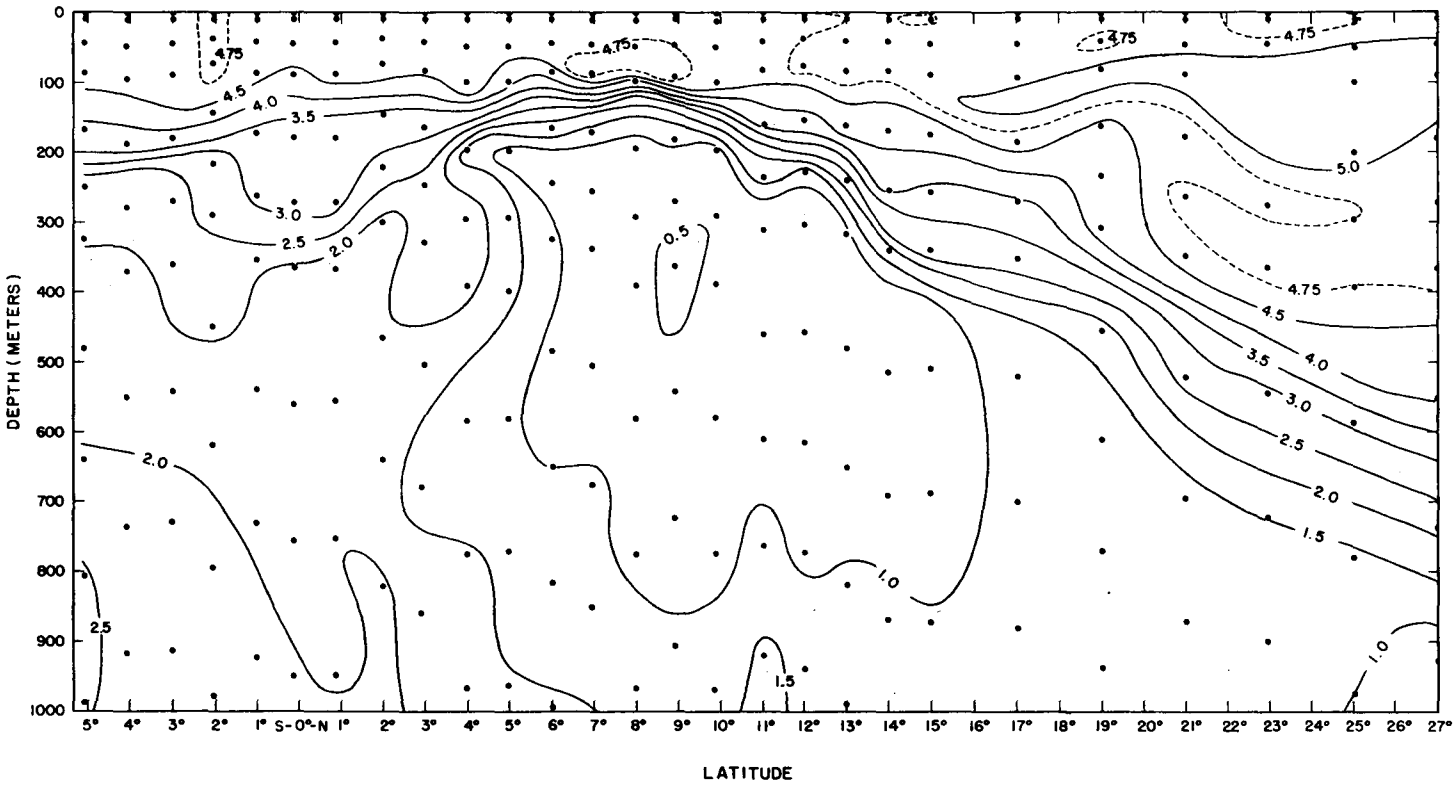

Fig. 10.-- Meridional section showing the concentration of dissolved oxygen along 172° W., June 30 - July 12, 1950. Contour interval 0.5 ml/l. Hugh M. Smith cruise 5, stations 1-27.

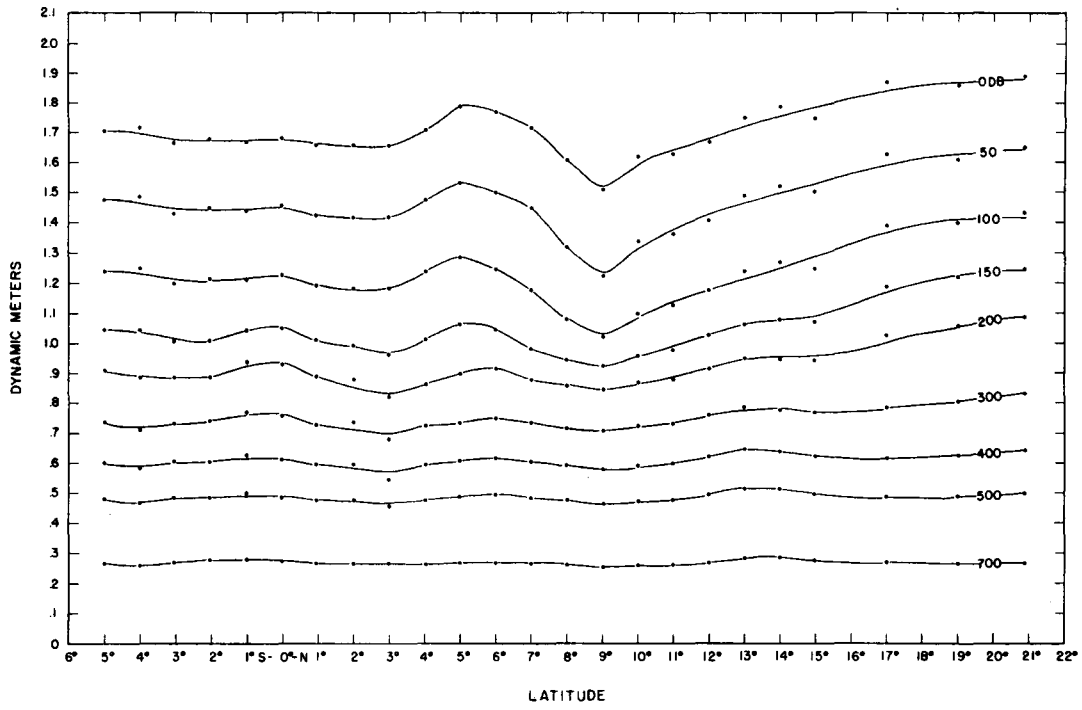

Fig. 11.-- Smoothed profiles of isobaric surfaces relative to the 1,000-decibar surface along 158° W., July 28 - August 6, 1950. Points are the result of dynamic computations. Hugh M. Smith cruise 5, stations 28-51.

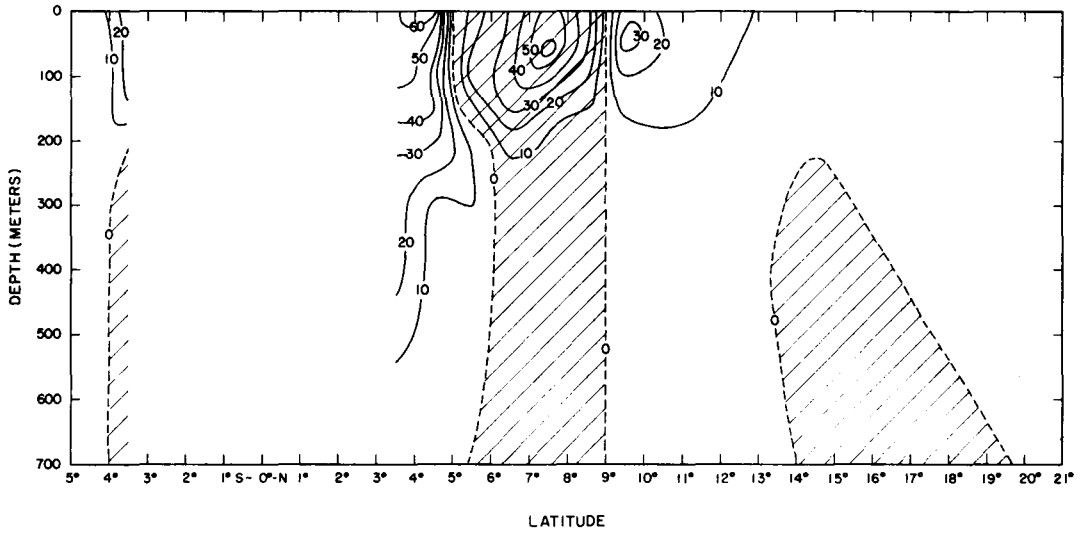

Fig. 12.-- Zonal components of the geostrophic currents across 158° W., July 28 - August 6, 1950. Computations based on smoothed profiles of isobaric surfaces (fig. 11). Current magnitude in cm/sec. East currents hatched. Hugh M. Smith cruise 5, stations 28-51.

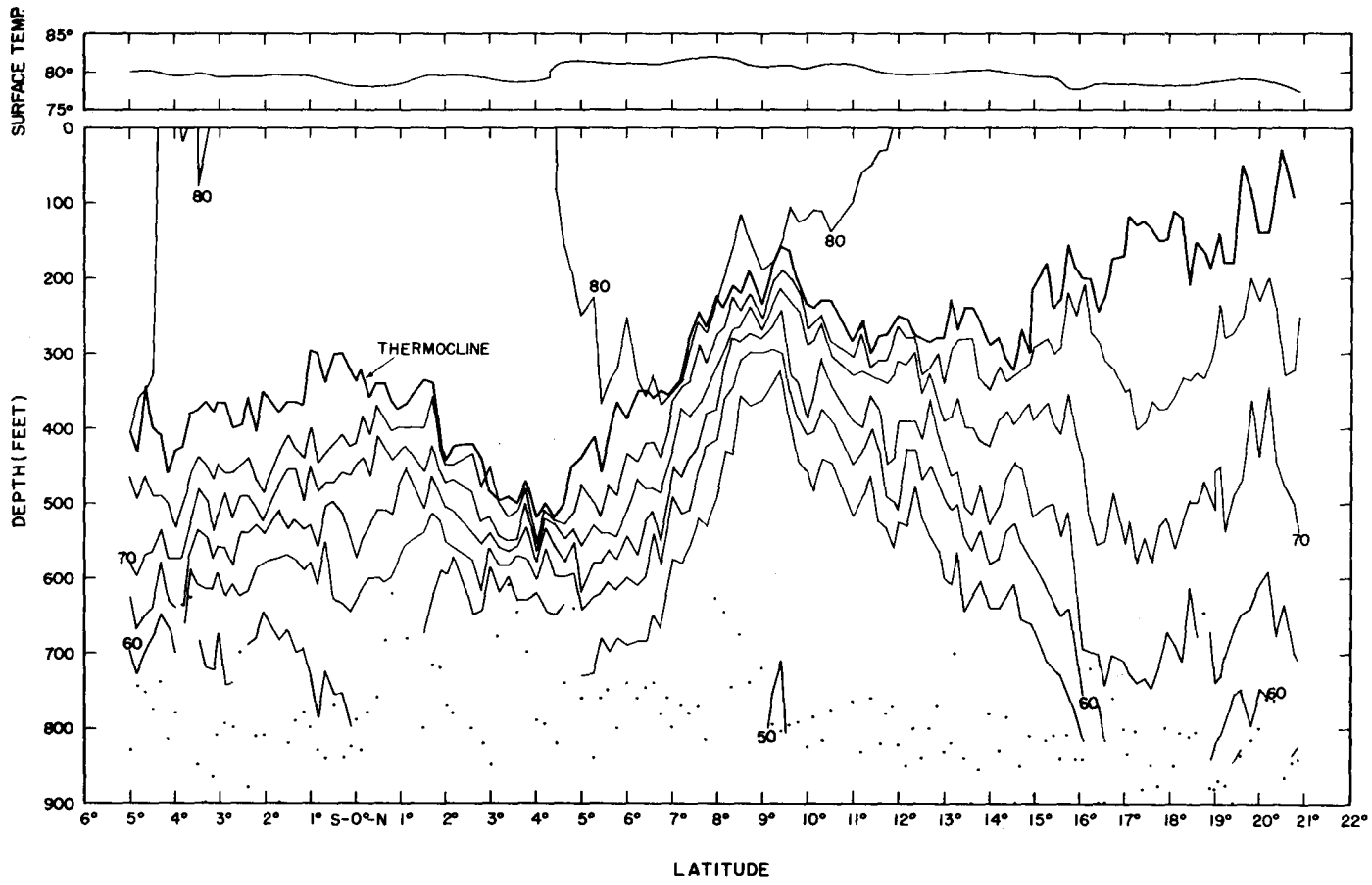

Fig. 13. -- Above, surface temperature and below, temperature section based on bathythermograph data along 158° W., July 28 - August 6, 1950. Isotherms drawn at intervals of 5° F. Dots indicate depths of observations. Hugh M. Smith cruise 5.

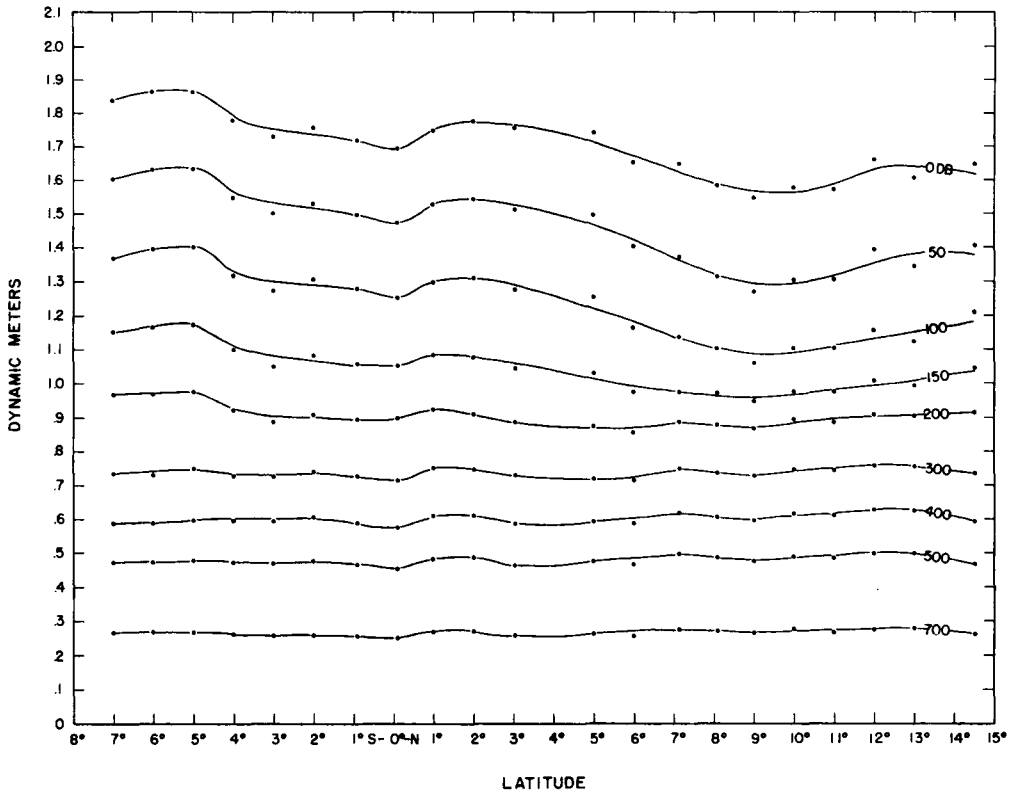

Fig. 14.-- Smoothed profiles of isobaric surfaces relative to the 1,000-decibar surface along 158° W., January 15 - 26, 1951. Points are the result of dynamic computations. Hugh M. Smith cruise 8, stations 1-26.

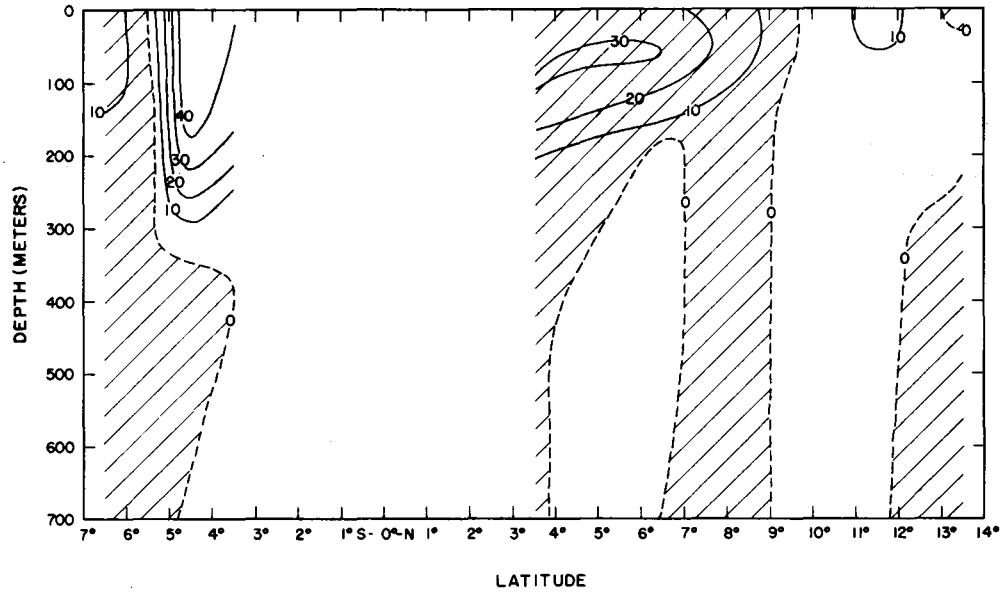

Fig. 15.-- Zonal components of the geostrophic currents across 158° W., January 15 - 26, 1951. Computations based on smoothed profiles of isobaric surfaces (fig. 14). Current magnitude in cm/sec. East currents hatched. Hugh M. Smith cruise 8, stations 1-26.

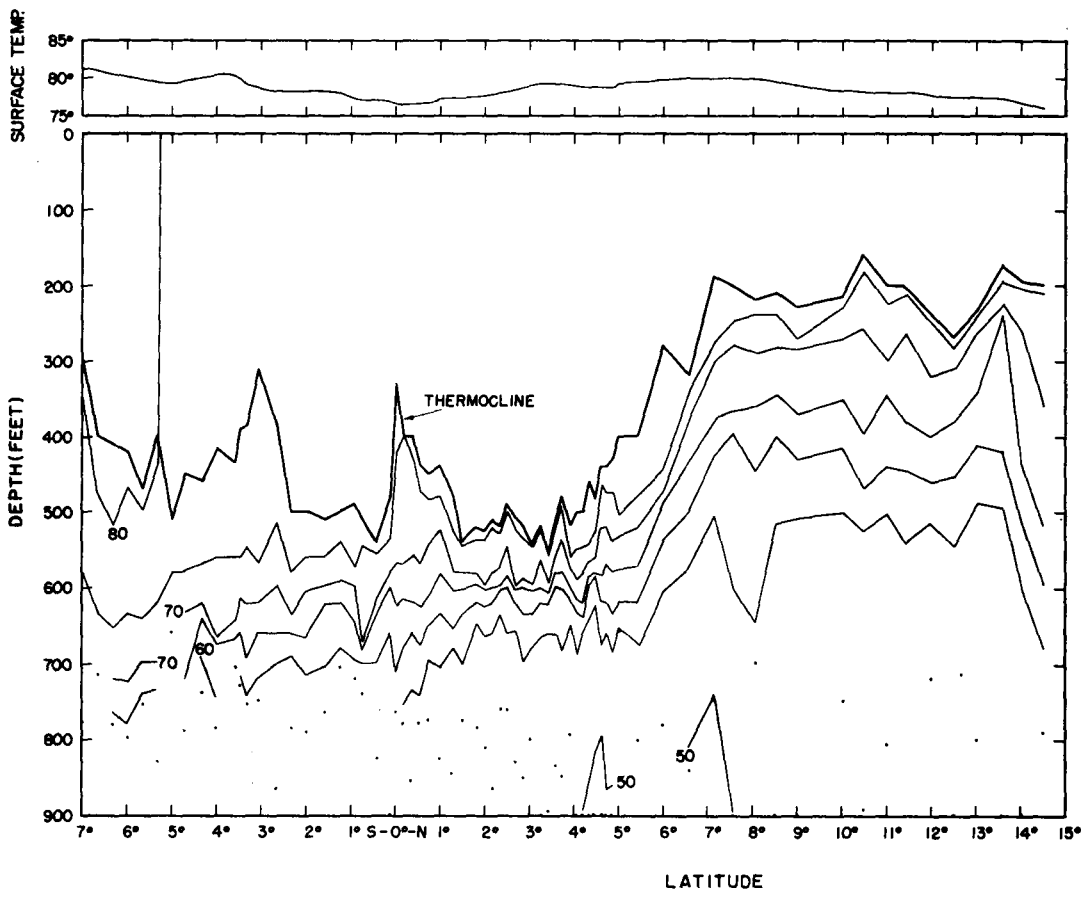

Fig. 16. -- Above, surface temperature and below, temperature section based on bathythermograph data along 158° W., January 15 - 26, 1951. Isotherms drawn at intervals of 5° F. Dots indicate depths of observations. Hugh M. Smith cruise 8.

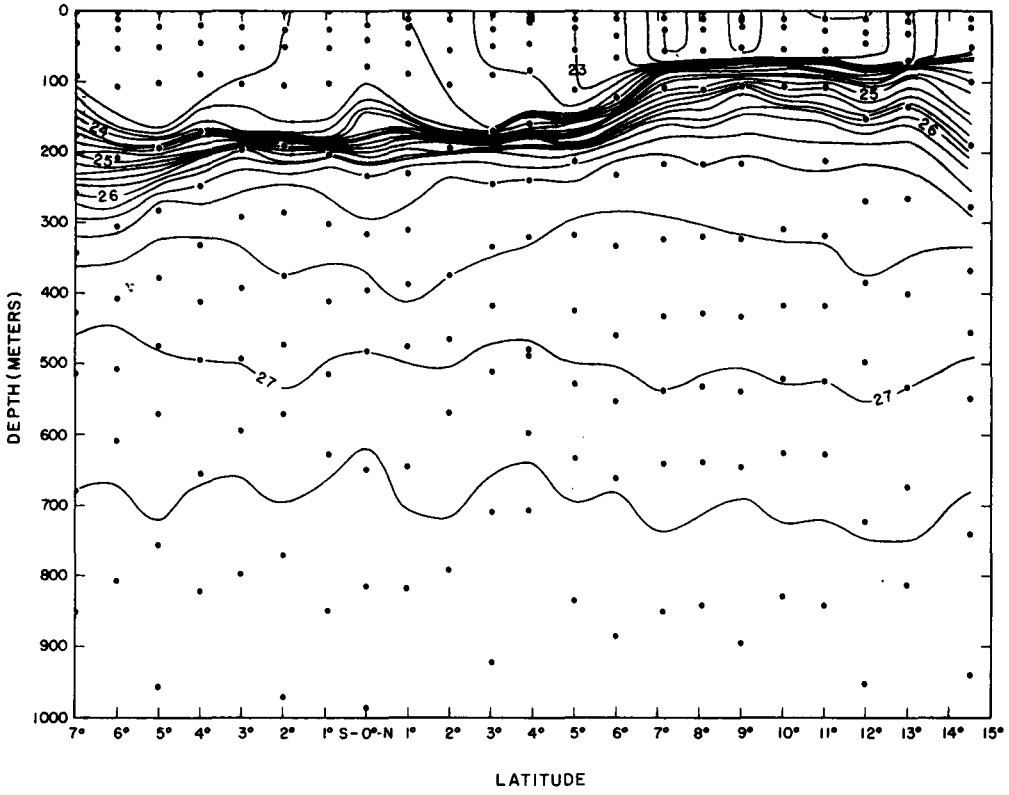

Fig. 17. -- Meridional section showing the distribution of density (σ_t) along 158° W., January 15 - 26, 1951. Contour interval 0.2 g/l. Hugh M. Smith cruise 8, stations 1-26.

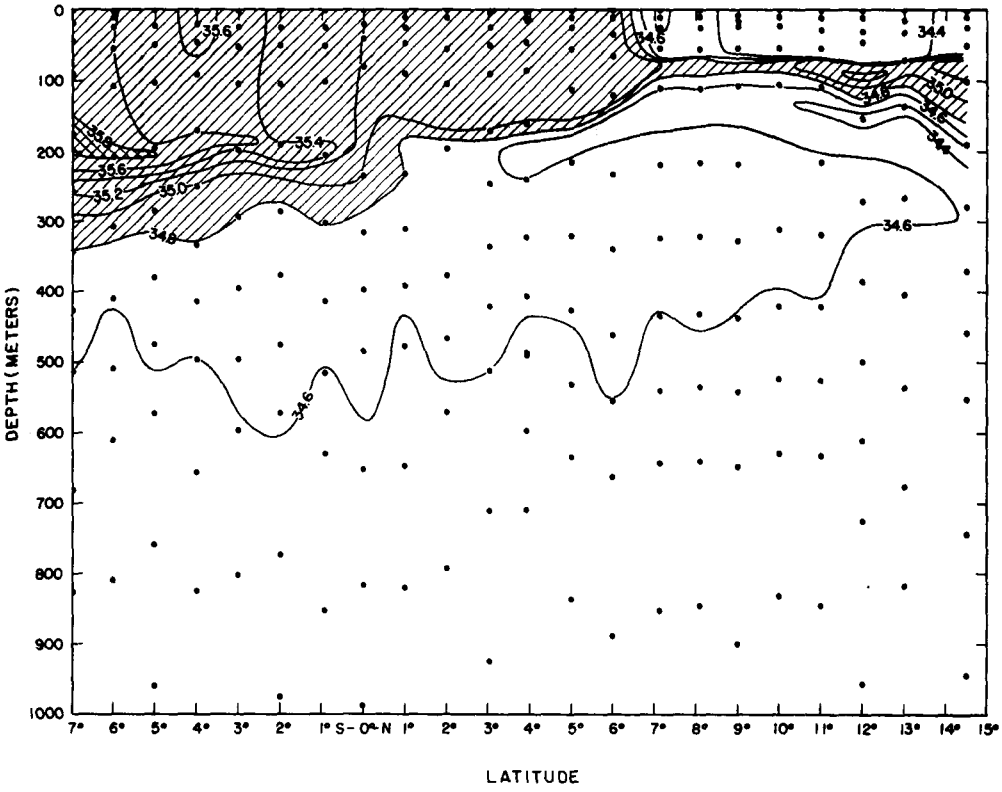

Fig. 18. -- Meridional salinity section along 158° W., January 15 - 26, 1951. Contour interval 0.2 °/oo. Hugh M. Smith cruise 8, stations 1-26.

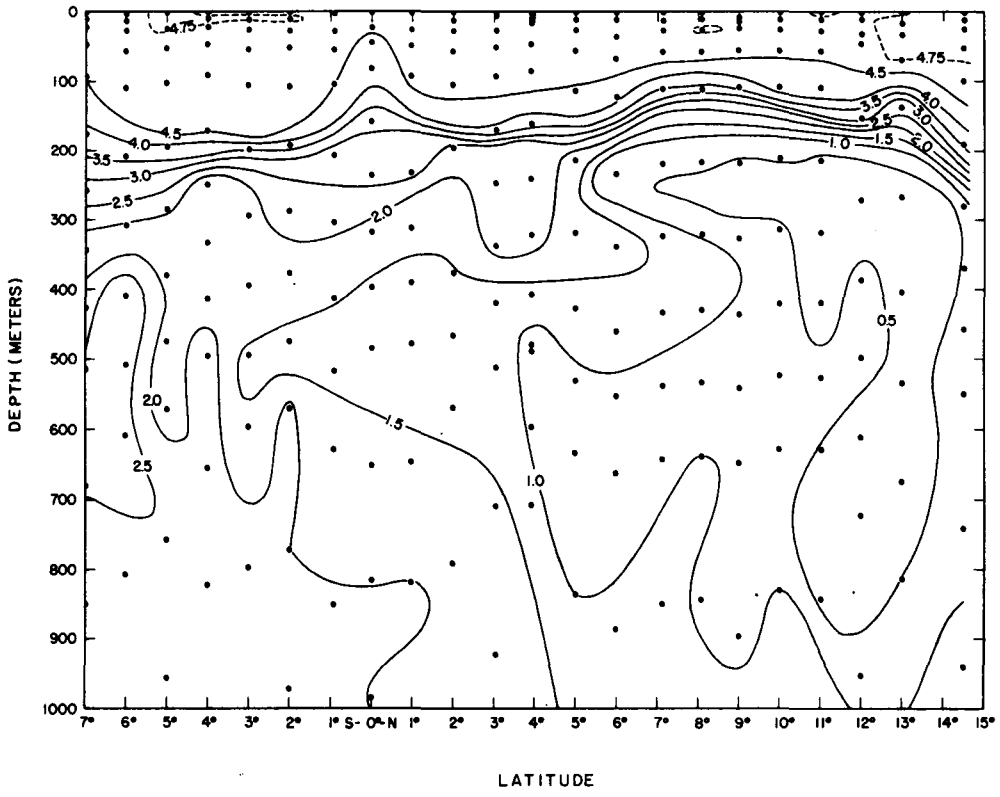

Fig. 19.-- Meridional section showing the concentration of dissolved oxygen along 158° W., January 15 - 26, 1951. Contour interval 0.5 ml/l. Hugh M. Smith cruise 8, stations 1-26.

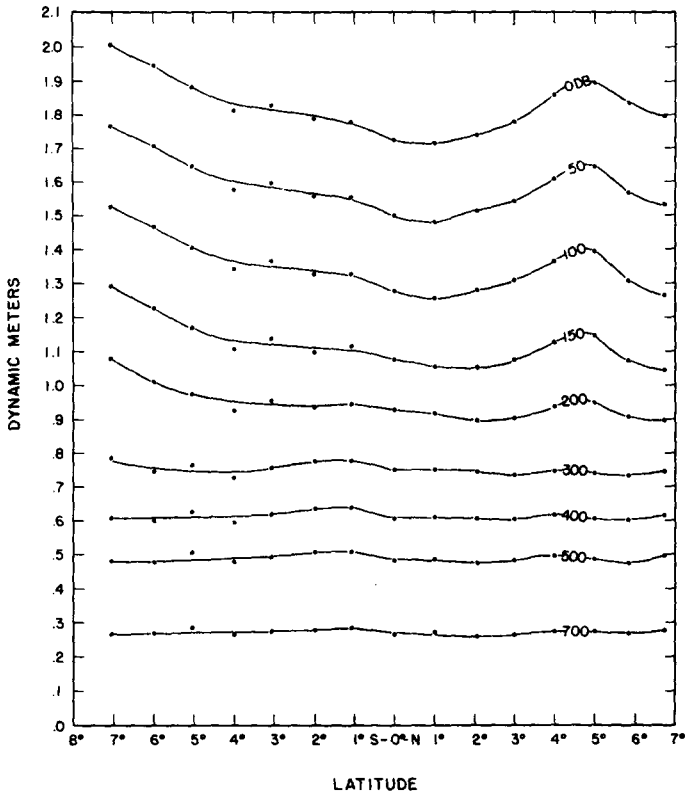

Fig. 20. -- Smoothed profiles of isobaric surfaces relative to the 1,000-decibar surface along a NNE-SSW line between 165° W. and 170° W., February 12 - 16, 1951. Points are the result of dynamic computations. Hugh M. Smith cruise 8, stations 62-76.

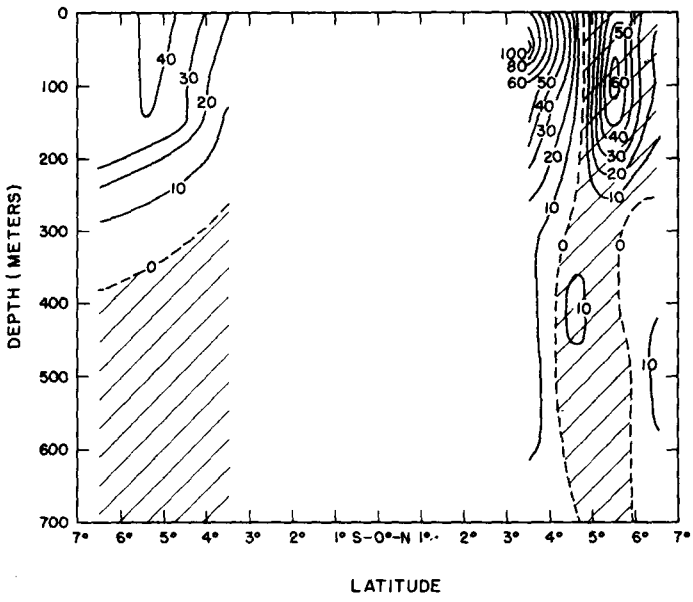

Fig. 21. -- Geostrophic currents across a NNE-SSW line between 165° W. and 170° W., February 12 - 16, 1951. Computations based on smoothed profiles of isobaric surfaces (fig. 20). Current magnitude in cm/sec. East-southeast currents hatched. Hugh M. Smith cruise 8, stations 62-76.

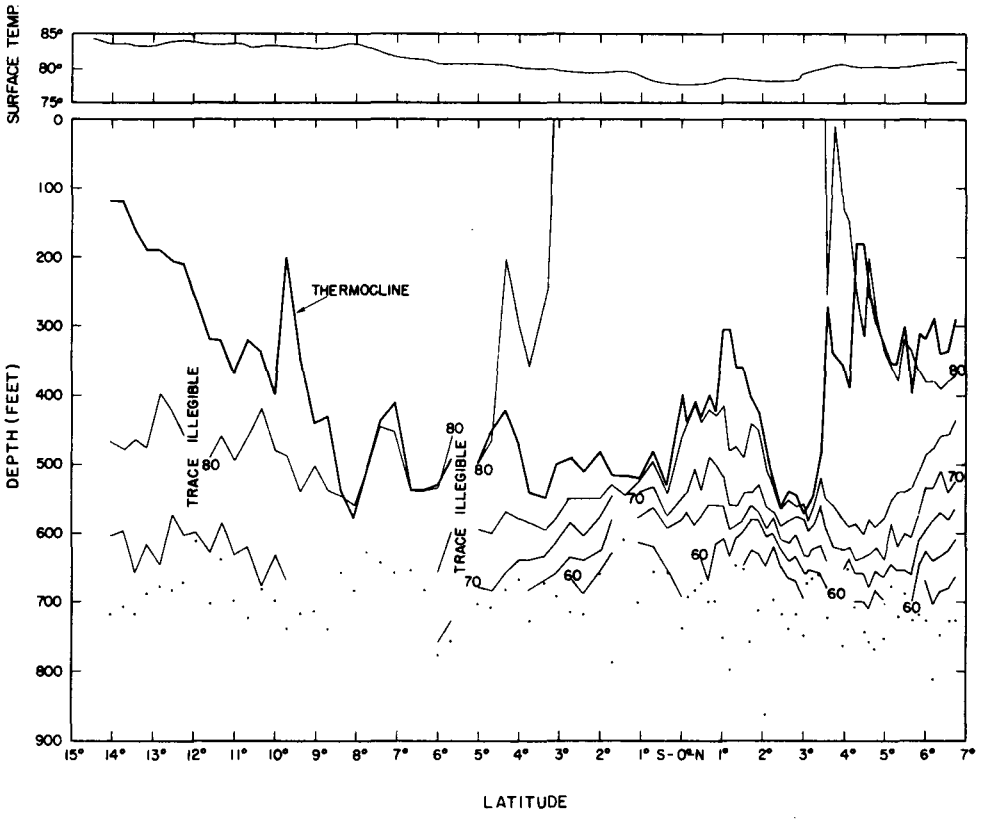

Fig. 22.-- Above, surface temperature and below, temperature section based on bathythermograph data along a NNE-SSW line between 165° W. and 172° W., February 12 - 18, 1951. Isotherms drawn at intervals of 5° F. Dots indicate depths of observations. Hugh M. Smith cruise 8.

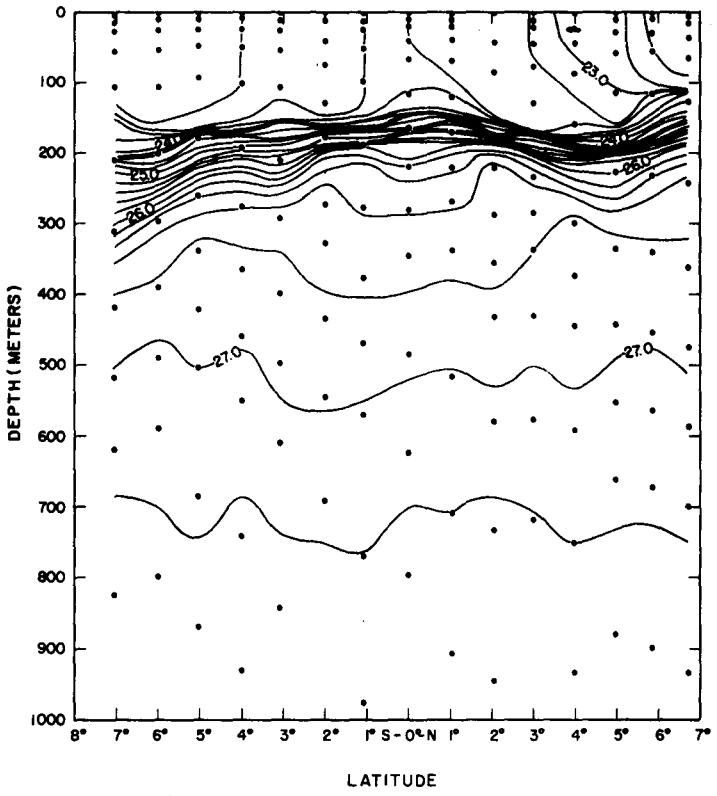

Fig. 23.-- Section showing the distribution of density (σt) along a NNE-SSW line between 165° W. and 170° W., February 12 - 16, 1951. Contour interval 0.2 g/l. Hugh M. Smith cruise 8, stations 62-76.

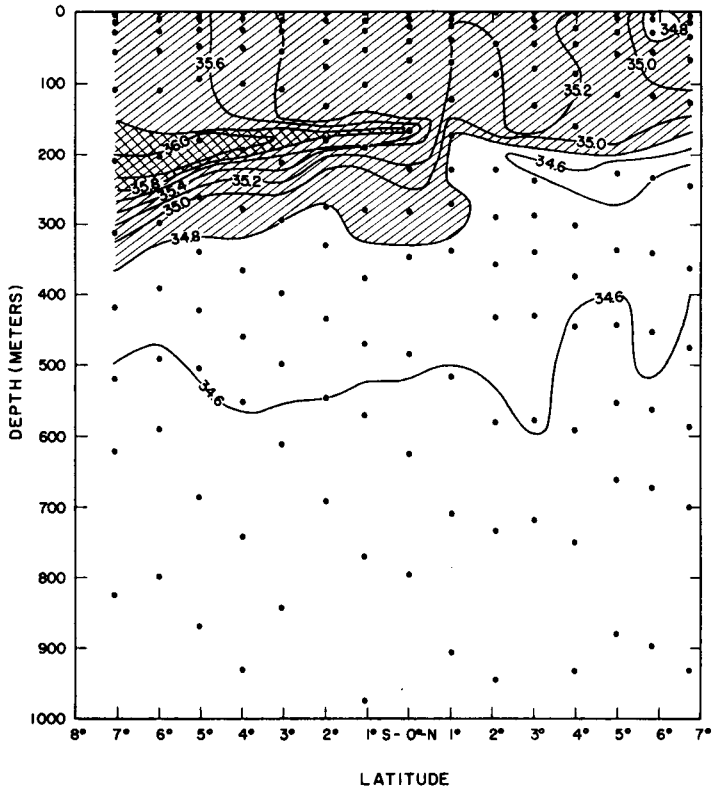

Fig. 24.-- Salinity section along a NNE-SSW line between 165° W. and 170° W., February 12 - 16, 1951. Contour interval 0.2 °/oo. Hugh M. Smith cruise 8, stations 62-76.

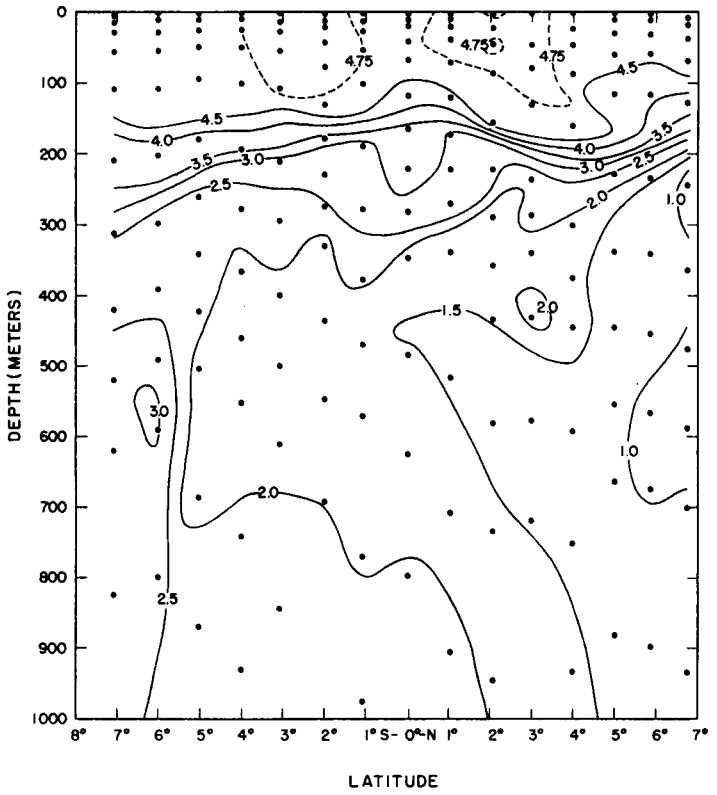

Fig. 25.-- Section showing the concentration of dissolved oxygen along a NNE-SSW line between 165° W. and 170° W., February 12 - 16, 1951. Contour interval 0.5 ml/l. Hugh M. Smith cruise 8, stations 62-76.

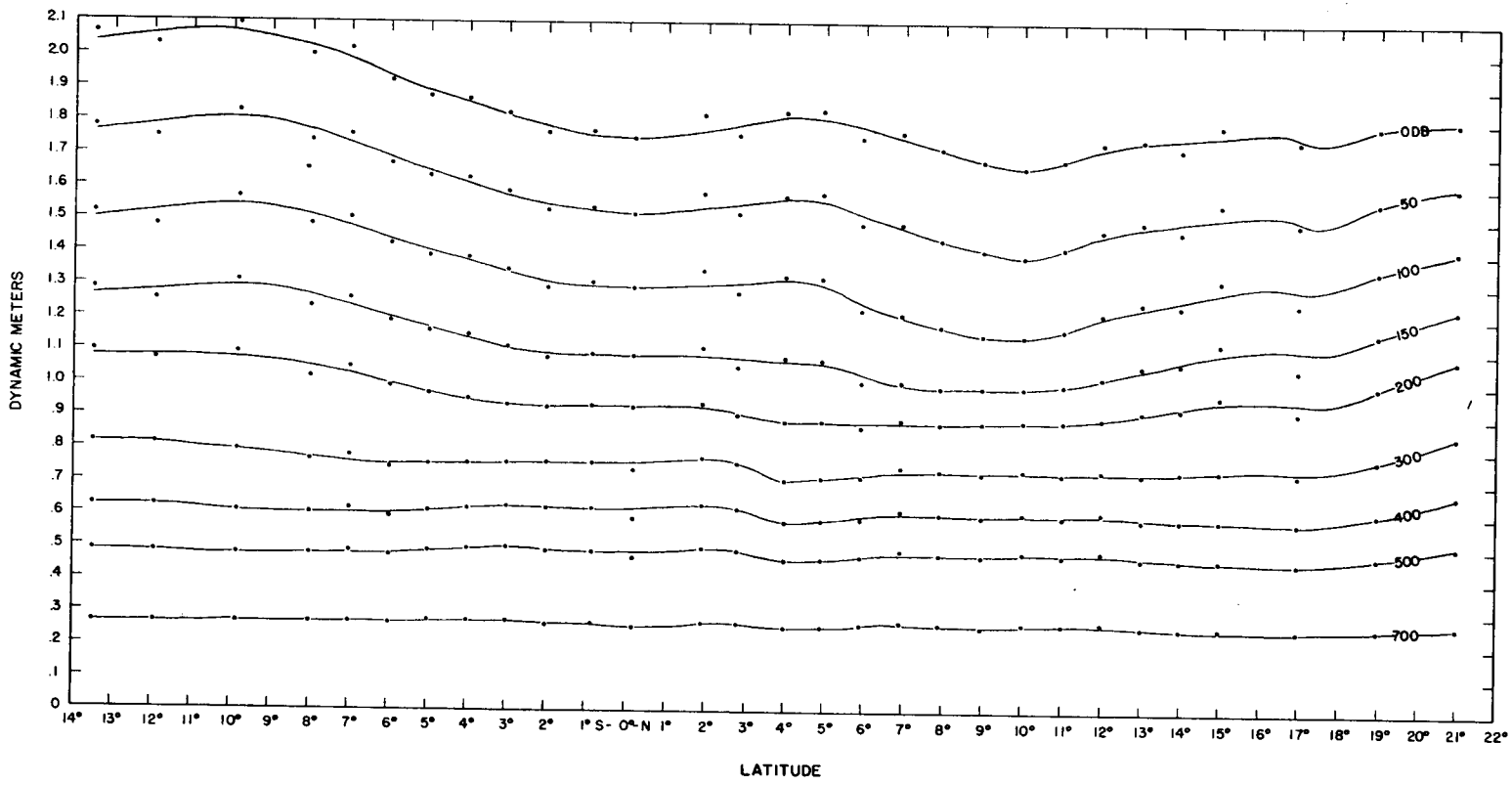

Fig. 26.--Smoothed profiles of isobaric surfaces relative to the 1,000-decibar surface along 172° W., February 27 - March 12, 1951. Points are the result of dynamic computations. Hugh M. Smith cruise 8, stations 77-106.

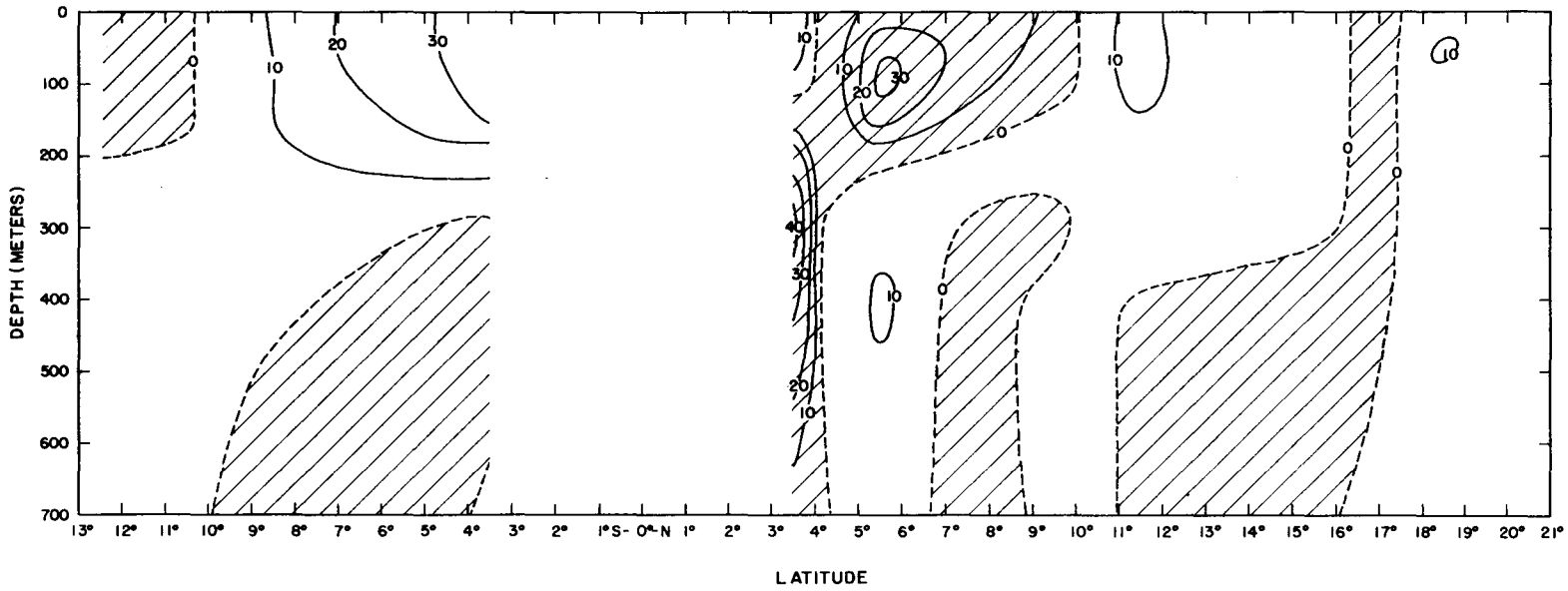

Fig. 27.-- Zonal components of the geostrophic currents across 172° W., February 27 - March 12, 1951. Computations based on smoothed profiles of isobaric surfaces (fig. 26). Current magnitude in cm/sec. East currents hatched. Hugh M. Smith cruise 8, stations 77-106.

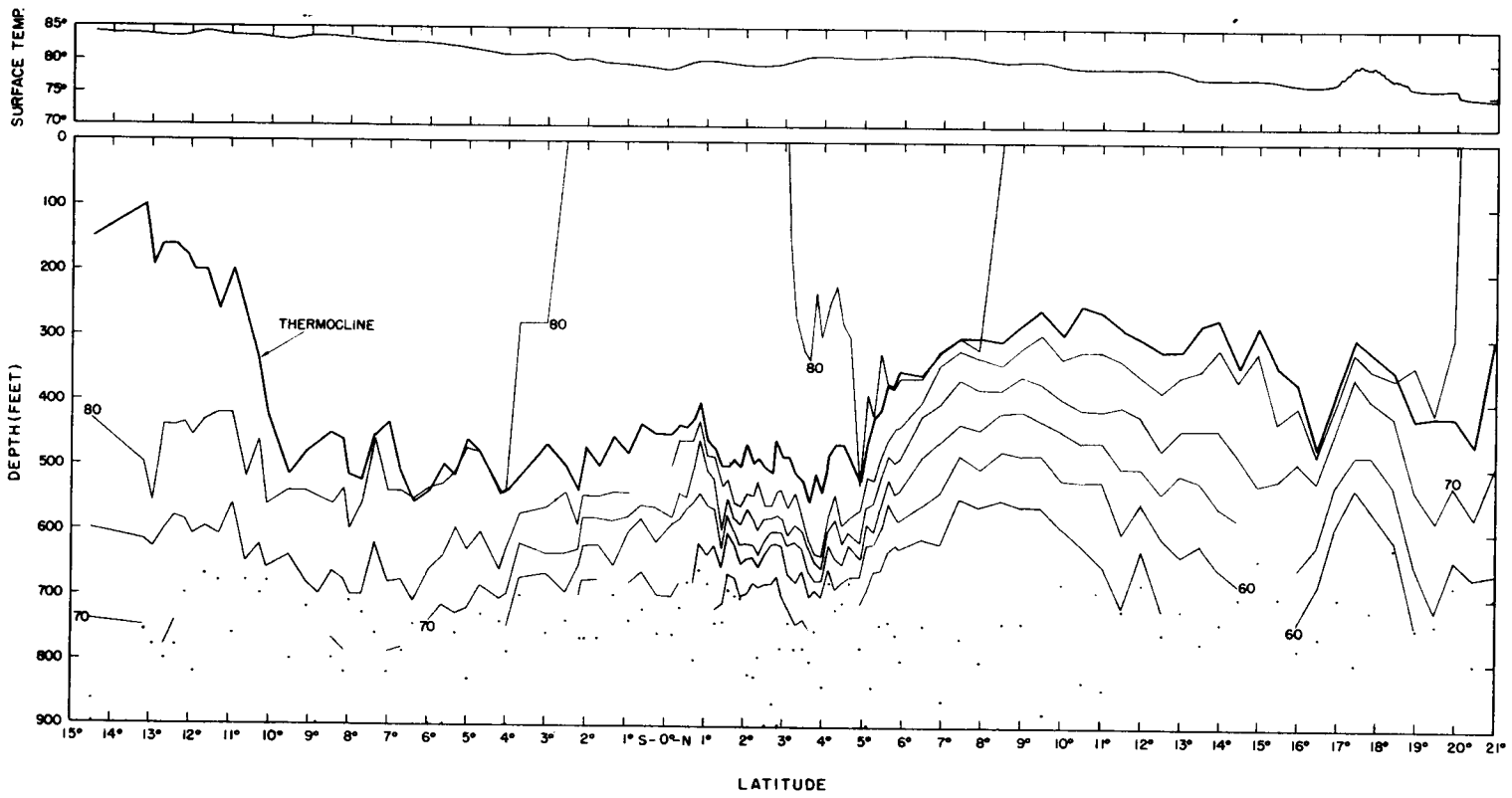

Fig. 28.--Above, surface temperature and below, temperature section based on bathythermograph data along 172° W., February 27 - March 12, 1951. Isotherms drawn at intervals of 5° F. Dots indicate depths of observations. Hugh M. Smith cruise 8.

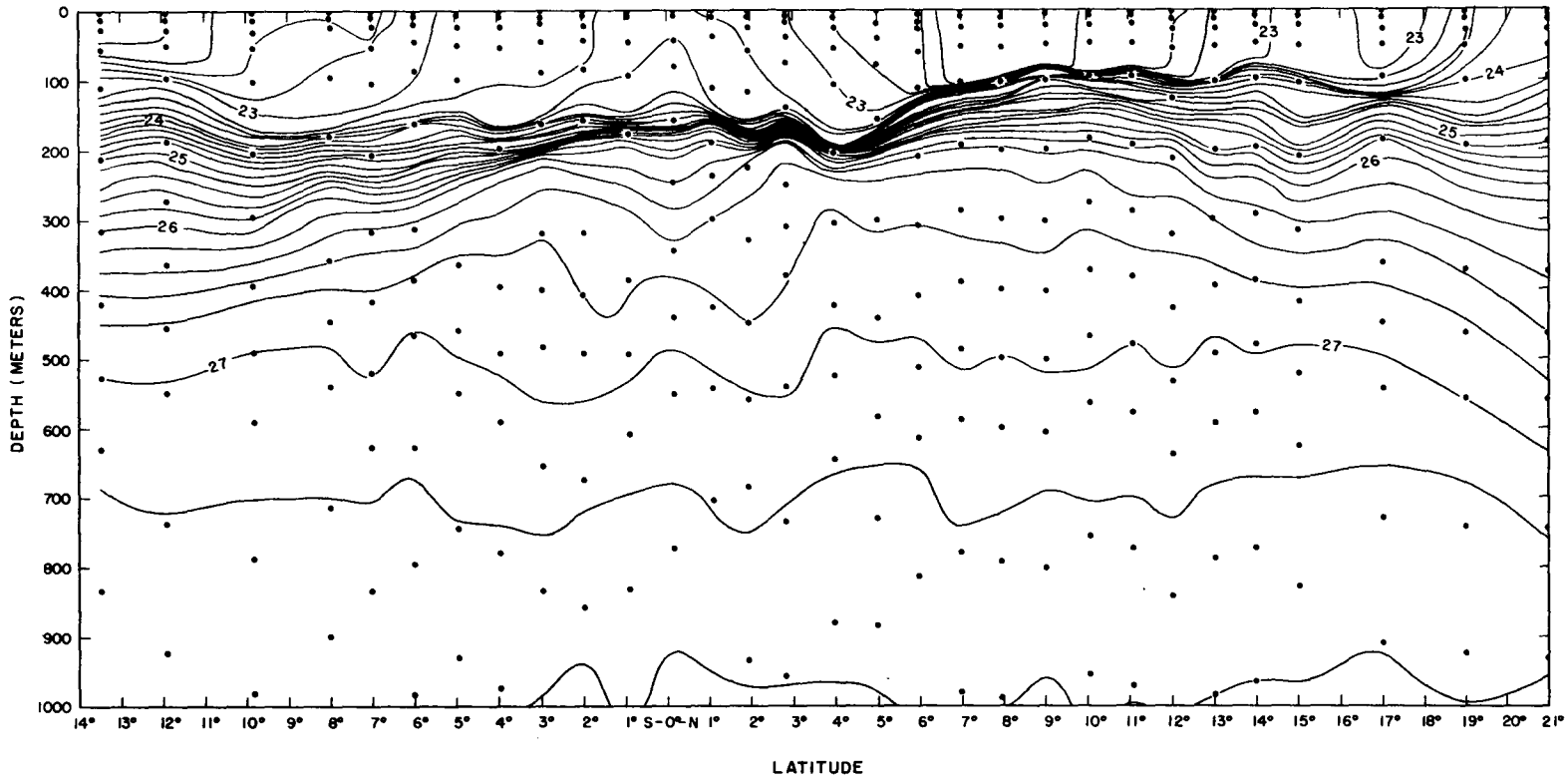

Fig. 29.-- Meridional section showing the distribution of density (σ_t) along 172° W., February 27 - March 12, 1951. Contour interval 0.2 °/oo . Hugh M. Smith cruise 8, stations 77-106.

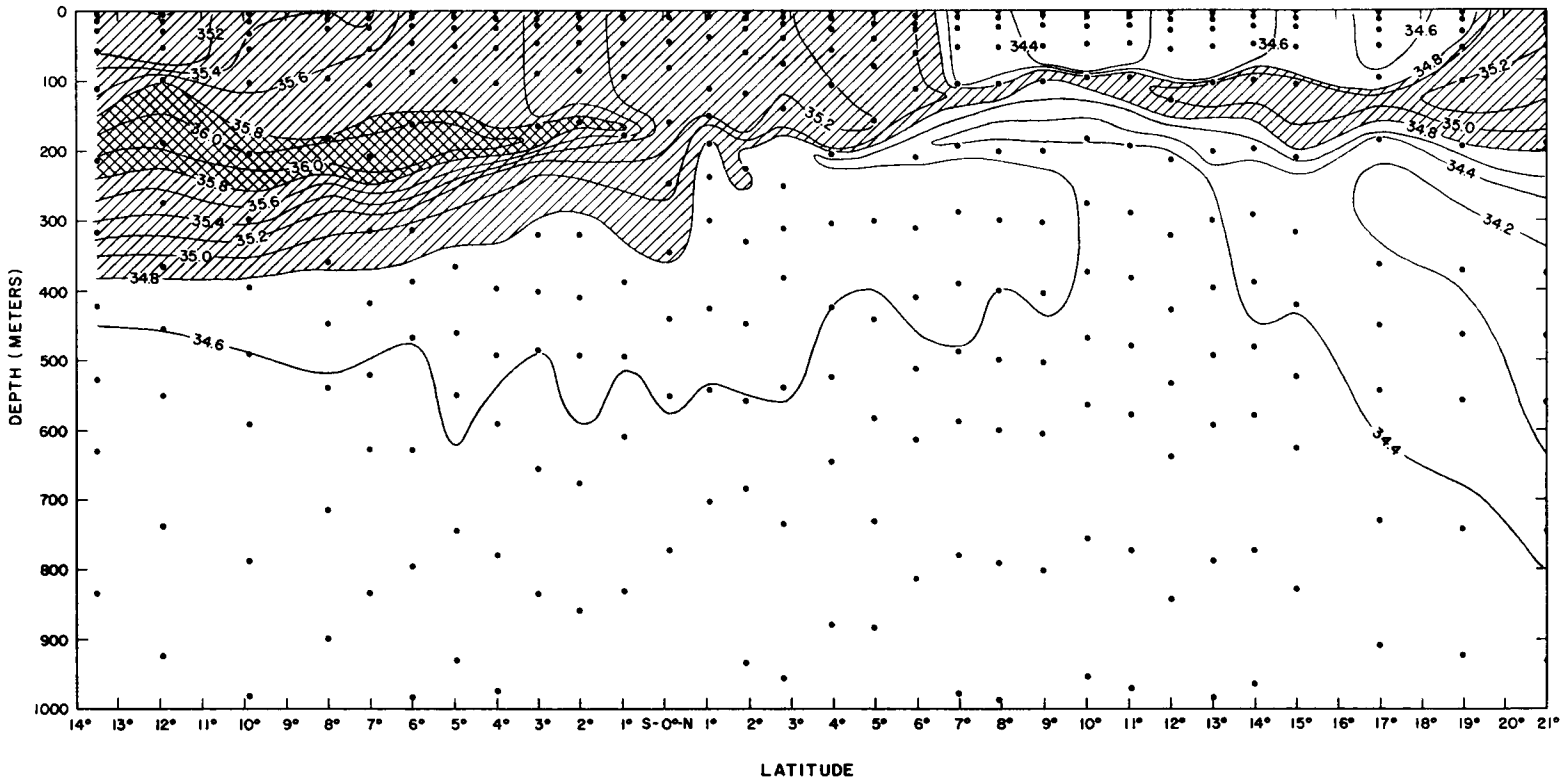

Fig. 30.-- Meridional salinity section along 172° W., February 27 - March 12, 1951. Contour interval 0.2 °/oo. Hugh M. Smith cruise 8, stations 77-106.

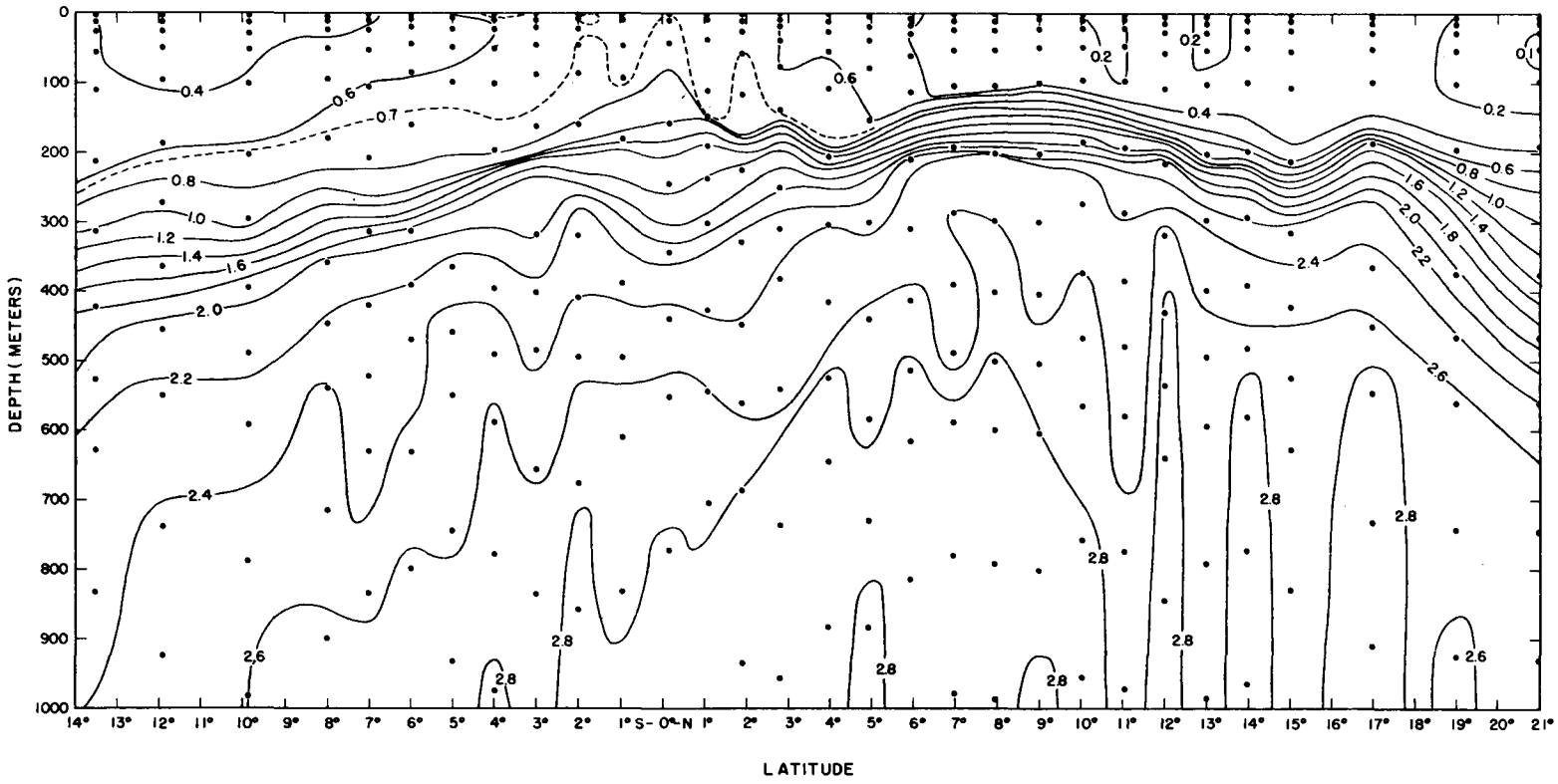

Fig. 31. -- Meridional section showing the concentration of inorganic phosphate along 172° W., February 27 - March 12, 1951. Contour interval 0.2 μg at/l. Hugh M. Smith cruise 8, stations 77-106.

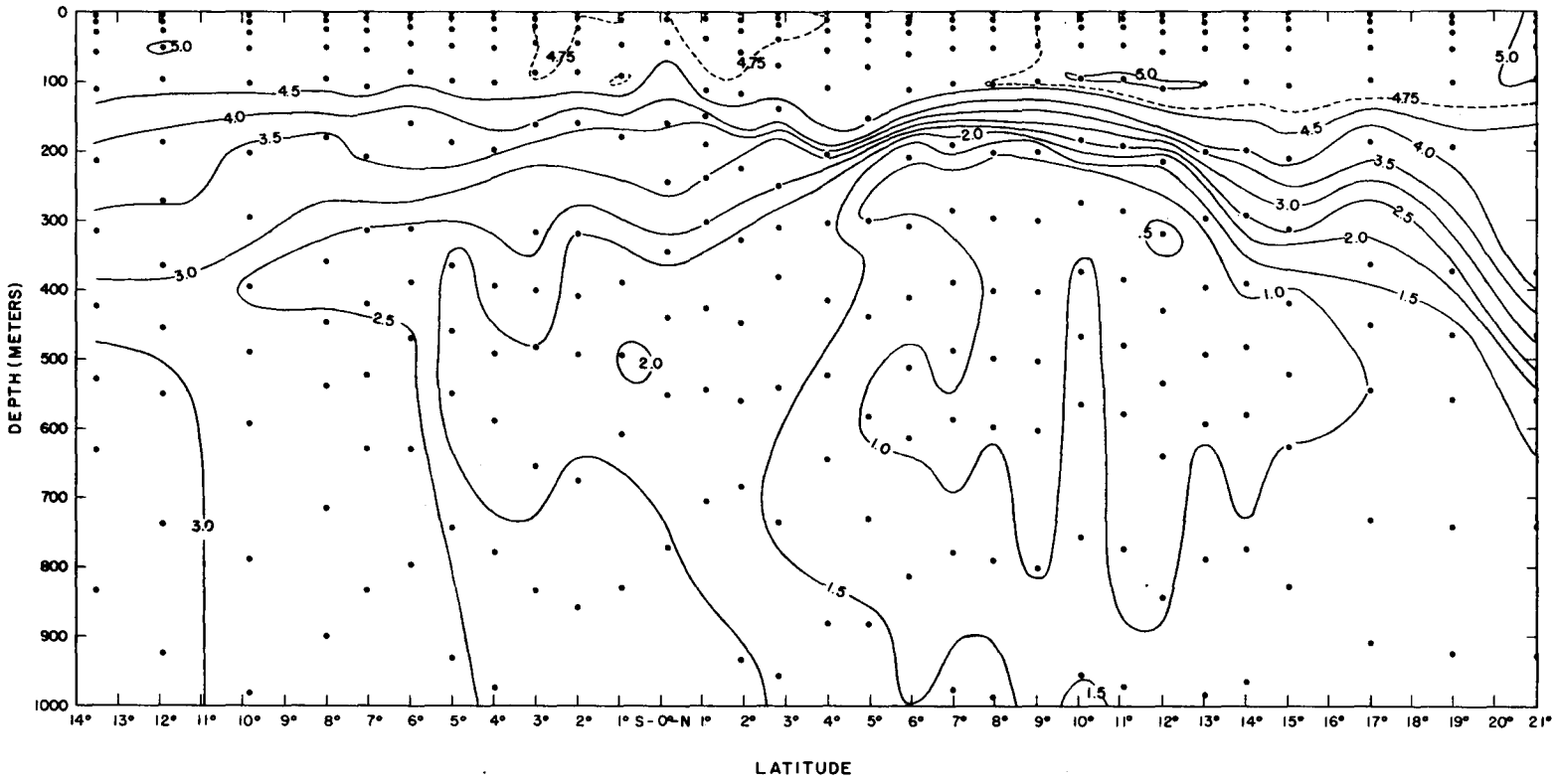

Fig. 32.-- Meridional section showing the concentration of dissolved oxygen along 172° W., February 27 - March 12, 1951. Contour interval 0.5 ml/l. Hugh M. Smith cruise 8, stations 77-106.

STATION 1

M/V Hugh M. Smith: Cruise 5, 27°00'N, 175°11'W, June 30, 1950. Messenger time: 1955 GCT. Weather: scattered clouds, cumulus and altostratus. Wind: 050°, 14 kt. Sea: 3-5 ft. Wire angle: 20°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	24.80	35.46	23.77	4.89	0.34
09	25.12	35.46	23.67	4.86	0.42
09					0.22
46	24.11	35.43	23.95	5.03	0.23
91	1/	35.17		5.24	0.24
182	16.52	34.67	25.39	4.96	0.43
274	13.98	34.49	25.81	4.98	0.77
365	12.09	34.34	26.08	4.99	0.91
551	08.06	34.05	26.54	4.18	1.67
738	05.09	34.05	26.93	2.03	2.56
926	03.93	34.23	27.20	0.90	2.86
1114	03.32	34.38	27.38	1.07	3.00
1114					2.65
1402	02.69	34.45	27.49	1.54	2.93

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	Δ D 1000 - Δ D (dyn. m)
00	24.80	35.46	23.77	0.000	1.912
10	25.10	35.46	23.68	0.042	1.870
20	25.05	35.46	23.69	0.084	1.828
30	25.02	35.46	23.70	0.126	1.786
50	23.68	35.41	24.07	0.207	1.705
75	21.68	35.23	24.50	0.299	1.613
100	20.03	35.06	24.82	0.382	1.530
150	18.38	34.87	25.10	0.534	1.378
200	16.00	34.64	25.49	0.672	1.240
250	14.51	34.54	25.74	0.794	1.118
300	13.40	34.45	25.91	0.907	1.005
400	11.32	34.28	26.18	1.113	0.799
500	09.10	34.11	26.43	1.295	0.617
600	07.17	34.03	26.65	1.455	0.457
700	05.54	34.04	26.87	1.593	0.319
800	04.60	34.10	27.03	1.712	0.200
1000	03.67	34.30	27.29	1.912	0.000

1/ Thermometer was off scale.

STATION 2

M/V Hugh M. Smith: Cruise 5, 25°02'N, 174°10'W, July 1, 1950. Messenger time: 1312 GCT. Weather: overcast (with breaks), cumulus and cirrus. Wind: 100°, 14 kt. Sea: 3-5 ft. Wire angle: 0°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.10	34.94	22.98	4.85	0.26
10	26.30	34.92	22.90	4.71	0.25
50	25.43	35.32	23.47	5.13	0.13
100	23.16	35.37	24.19	5.13	0.81 1/
200	18.60	34.90	25.07	4.34	0.57
297	14.32	34.49	25.74	4.75	0.68
393	11.46	34.25	26.13	4.75	1.15
586	07.07	34.04	26.68	3.02	1.96
781	04.97	34.18	27.05	1.40	2.69
976	03.94	34.31	27.27	0.99	2.92
1171	03.20	34.40	27.41	1.43	2.80
1466	02.66	34.52	27.55	1.66	2.79

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.10	34.94	22.98	0.000	2.038
10	26.30	34.92	22.90	0.049	1.989
20	26.30	34.96	22.93	0.099	1.939
30	26.30	35.00	22.96	0.148	1.890
50	25.43	35.32	23.47	0.242	1.796
75	24.06	35.39	23.94	0.348	1.690
100	23.16	35.37	24.19	0.445	1.593
150	20.78	35.14	24.68	0.623	1.415
200	18.60	34.90	25.07	0.780	1.258
250	16.05	34.65	25.49	0.919	1.119
300	14.19	34.48	25.76	1.041	0.997
400	11.25	34.23	26.15	1.256	0.782
500	08.72	34.08	26.46	1.437	0.601
600	06.87	34.04	26.70	1.593	0.445
700	05.72	34.10	26.90	1.727	0.311
800	04.80	34.20	27.09	1.843	0.195
1000	03.84	34.32	27.28	2.038	0.000

1/ An anomalous value.

STATION 3

M/V Hugh M. Smith. Cruise 5, 22°58'N, 173°00'W, July 2, 1950. Messenger time: first cast, 0613 GCT; second cast, 0837 GCT. Weather: broken clouds, cumulus and cirrus. Wind: 090°, 13 kt. Sea: 3-5 ft. Wire angle: first cast, 20°; second cast, 05°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σt (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.10	34.94	22.98	4.69	0.33
09	26.32	34.92	22.89	4.67	0.22
47	26.24	34.92	22.92	4.86	0.26
94	23.65	35.19	23.91		0.32
186	20.52	34.58[1/]		5.06	0.39
276	15.69	34.63	25.55	4.73	0.61
366	12.04	34.31	26.07	4.80	0.96
366					1.21
545	07.34	34.05	26.64	2.83	2.05
723	05.06	34.16	27.03	1.56	2.61
902	04.34	34.34	27.25	1.05	2.82
1081	03.69	34.42	27.38	1.55	2.72
1351	03.04	34.52	27.52	1.60	2.76
1943	02.10	34.60	27.66	2.27	2.58
2443	01.71	34.63	27.72	2.68	2.02
2443					2.32
2943	01.56	34.54[1/]		2.91	2.16
3943	01.45	34.67	27.77	3.58	2.32

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σt (gm/l)	ΔD (dyn. m)	ΔD 1000 - ΔD (dyn. m)
00	26.10	34.94	22.98	0.000	2.062
10	26.32	34.92	22.89	0.049	2.013
20	26.30	34.92	22.90	0.099	1.963
30	26.28	34.92	22.91	0.149	1.913
50	26.20	34.97	22.97	0.248	1.814
75	24.36	35.17	23.68	0.363	1.699
100	23.51	35.19	23.95	0.466	1.596
150	22.09	35.18	24.35	0.657	1.405
200	19.70	35.06	24.91	0.826	1.236
250	16.85	34.77	25.39	0.971	1.091
300	14.75	34.54	25.69	1.098	0.964
400	10.99	34.22	26.19	1.314	0.748
500	08.32	34.06	26.51	1.491	0.571
600	06.37	34.06	26.78	1.640	0.422
700	05.24	34.14	26.99	1.765	0.297
800	04.70	34.24	27.13	1.875	0.187
1000	03.97	34.39	27.33	2.062	0.000

1/ Anomalous values.

STATION 4

M/V Hugh M. Smith: Cruise 5, 21°00'N, 172°00'W, July 3, 1950. Messenger time: 0232 GCT. Weather: overcast (with breaks), altocumulus and cirrus. Wind: 080°, 17 kt. Sea: 3-5 ft. Wire angle: 24°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σt (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	26.00	34.96	23.02	4.87	0.06
09	26.22	34.92	22.92	4.82	0.04
46	26.19	34.97	22.97	4.88	0.02
90	23.18	35.17	24.03	5.07	0.07
178	20.06	35.14	24.87	4.57	0.22
264	13.64	34.43	25.84	4.83	0.66
349	10.74	34.18	26.20	4.58	1.00
522	06.78	34.07	26.74	2.73	1.99
697	05.27	34.25	27.07	1.22	2.46
874	04.38	34.40	27.29	1.27	2.49
874					2.72
1053	03.85	34.49	27.42	1.46	2.47
1322	03.10	34.51	27.51	1.73	2.43

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σt (gm/l)	ΔD (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.00	34.96	23.02	0.000	1.922
10	26.22	34.92	22.93	0.049	1.873
20	26.21	34.93	22.94	0.098	1.824
30	26.20	34.94	22.95	0.148	1.774
50	26.18	34.96	22.97	0.246	1.676
75	23.79	35.13	23.82	0.360	1.562
100	22.86	35.18	24.13	0.459	1.463
150	21.28	35.21	24.60	0.640	1.282
200	19.00	35.02	25.06	0.800	1.122
250	14.62	34.52	25.70	0.933	0.989
300	12.40	34.32	26.00	1.045	0.877
400	09.40	34.09	26.36	1.237	0.685
500	07.12	34.05	26.68	1.397	0.525
600	06.00	34.15	26.90	1.531	0.391
700	05.26	34.26	27.08	1.646	0.276
800	04.72	34.34	27.21	1.748	0.174
1000	03.98	34.47	27.39	1.922	0.000

STATION 5

M/V Hugh M. Smith: Cruise 5, 19°00'N, 171°52'W, July 3, 1950. Messenger time: 1829 GCT. Weather: broken clouds, cumulus, altocumulus and cirrus. Wind: 080°, 18 kt. Sea: <1 ft. Wire angle: 35°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	26.40	34.74	22.73	4.84	0.38
08	26.52	34.63	22.61	4.81	0.26
41	26.52	34.63	22.61	4.70	0.20
41					0.66 1/
82	24.73	34.96	23.41	5.10	0.22
163	20.54	35.10	24.71	4.48	0.38
255	15.92	34.65	25.52	4.44	0.61
310	11.95	34.27	26.05	4.47	1.12
458	07.07	34.27	26.77	1.84	2.46
614	05.85	34.27	27.02	1.19	2.81
614					3.14 1/
773	05.08	34.40	27.21	1.25	2.99
773					3.33 1/
939	04.39	34.47	27.35	1.42	2.92
1203	03.50	34.52	27.47	1.52	3.08

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.40	34.74	22.73	0.000	1.929
10	26.52	34.63	22.61	0.052	1.877
20	26.52	34.63	22.61	0.104	1.825
30	26.52	34.63	22.61	0.157	1.772
50	26.50	34.64	22.63	0.262	1.667
75	25.12	34.91	23.26	0.386	1.543
100	24.02	35.04	23.69	0.497	1.432
150	21.40	35.14	24.91	0.691	1.238
200	18.85	34.94	25.03	0.853	1.076
250	15.00	34.56	25.65	0.989	0.940
300	12.42	34.31	25.99	1.102	0.827
400	09.07	34.26	26.55	1.285	0.644
500	07.03	34.26	26.85	1.428	0.501
600	05.96	34.26	26.99	1.550	0.379
700	05.43	34.34	27.12	1.659	0.270
800	04.94	34.41	27.24	1.757	0.172
1000	04.14	34.49	27.39	1.929	0.000

1/ Anomalous values.

STATION 6

M/V Hugh M. Smith: Cruise 5, 17°01'N, 171°46'W, July 4, 1950. Messenger time: 1040 GCT. Weather: scattered clouds, no observation. Wind: 100°, 10 kt. Sea: 3-5 ft. Wire angle: 20°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.30	34.54	22.61	4.82	0.35
09	26.42	34.54	22.57	4.76	0.28
47	26.40	34.54	22.58	4.83	0.27
94	25.20	34.67	23.05	4.97	0.26
186	20.78	34.92	24.51	4.58	0.48
271	13.09	34.38	25.91	3.47	1.15
353	09.68	34.23	26.43	2.62	1.91
523	06.70	34.34	26.96	1.10	2.57
701	05.63	34.45	27.19	1.06	2.67
883	04.75	34.47	27.31	1.14	2.62
883					2.38 1/
1067	04.02	34.54	27.44	1.33	2.17 1/
1067					2.41 1/
1346	03.28	34.54	27.51	1.59	2.72

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.30	34.54	22.61	0.000	1.964
10	26.42	34.54	22.58	0.053	1.911
20	26.42	34.54	22.58	0.105	1.859
30	26.40	34.54	22.58	0.158	1.806
50	26.40	34.54	22.58	0.264	1.700
75	26.40	34.54	22.58	0.397	1.567
100	24.80	34.73	23.22	0.522	1.442
150	22.70	34.94	23.99	0.739	1.225
200	19.92	34.88	24.71	0.921	1.043
250	14.78	34.52	25.67	1.064	0.900
300	11.60	34.28	26.12	1.173	0.791
400	08.52	34.26	26.63	1.346	0.618
500	06.99	34.33	26.91	1.481	0.483
600	06.14	34.40	27.08	1.596	0.368
700	05.66	34.45	27.18	1.699	0.265
800	05.14	34.46	27.25	1.794	0.170
1000	04.27	34.53	27.41	1.964	0.000

1/ Anomalous values.

STATION 7

M/V Hugh M. Smith: Cruise 5, 15°00'N, 171°54'W, July 5, 1950. Messenger time: first cast, 0138 GCT; second cast, 0241 GCT. Weather: scattered clouds, cumulus. Wind: 080°, 19 kt. Sea: 3-5 ft. Wire angle: first cast, 24°; second cast, 35°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.70	34.56	22.50	4.80	0.37
09	26.75	34.56	22.49	4.73	0.31
46	26.57	34.54	22.53	4.78	0.33
90	26.53	34.56	22.56	4.78	0.30
175	19.44	34.87	24.83	4.26	0.59
257	12.72	34.34	25.96	3.30	1.43
339	09.60	34.25	26.45	2.63	2.04
511	06.84	34.43	27.01	0.78	2.99
690	05.65	34.45	27.18	0.90	3.11
874	04.77	34.52	27.34	1.01	3.18
1059	04.16	34.52	27.41		3.13
1300	03.38	34.54	27.50	1.55	3.10
1771	02.17	34.58	27.64	2.18	2.31
2247	01.94	34.61	27.68	2.59	2.68
2734	01.70	34.63	27.72	2.90	2.64

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.70	34.56	22.50	0.000	1.917
10	26.74	34.56	22.49	0.054	1.863
20	26.68	34.56	22.51	0.107	1.810
30	26.61	34.55	22.52	0.161	1.756
50	26.56	34.54	22.53	0.267	1.650
75	26.53	34.55	22.55	0.401	1.516
100	26.52	34.56	22.56	0.534	1.383
150	22.70	34.94	23.99	0.767	1.150
200	16.75	34.66	25.33	0.934	0.983
250	13.00	34.36	25.92	1.056	0.861
300	10.97	34.26	26.22	1.157	0.760
400	08.36	34.34	26.72	1.321	0.596
500	06.98	34.43	26.99	1.448	0.469
600	06.13	34.44	27.12	1.558	0.359
700	05.58	34.46	27.20	1.658	0.259
800	05.05	34.50	27.29	1.750	0.167
1000	04.33	34.52	27.39	1.917	0.000

50	26.42	34.61	22.63	0.261	1.553
75	26.43	34.61	22.63	0.393	1.421

STATION 8

M/V Hugh M. Smith: Cruise 5, 14°00'N, 171°57'W, July 5, 1950. Messenger time: 1140 GCT. Weather: broken clouds, no observation. Wind: 100°, 19 kt. Sea: 3-5 ft. Wire angle: 28°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.30	34.54	22.61	4.81	0.28
08	26.52	34.52	22.54	4.76	0.26
42	26.53	34.52	22.53	4.83	0.25
84	25.36	34.74	23.06	4.95	0.20
169	18.94	34.88	24.96	4.26	0.46
254	11.95	34.29	26.07	3.53	1.26
341	09.22	34.34	26.59	1.64	2.14
516	07.28	34.43	26.95	0.81	2.56
692	05.84	34.47	27.18	0.96	2.72
870	05.14	34.47	27.26	1.09	2.76
1052	04.42	34.49	27.36	1.25	2.70
1333	03.53	34.52	27.47	1.60	2.68

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	ΔD (dyn. m)	ΔD1000-ΔD (dyn. m)
00	26.30	34.54	22.61	0.000	1.856
10	26.52	34.52	22.53	0.053	1.803
20	26.52	34.52	22.53	0.106	1.750
30	26.52	34.52	22.53	0.159	1.697
50	26.53	34.52	22.53	0.266	1.590
75	26.50	34.52	22.54	0.400	1.456
100	24.04	34.88	25.56	0.522	1.334
150	20.55	34.94	24.59	0.716	1.140
200	16.41	34.66	25.41	0.867	0.989
250	12.20	34.30	26.03	0.985	0.871
300	10.10	34.34	26.44	1.078	0.778
400	08.52	34.38	26.73	1.231	0.625
500	07.44	34.43	26.93	1.361	0.495
600	06.55	34.46	27.08	1.476	0.380
700	05.80	34.47	27.18	1.579	0.277
800	05.37	34.47	27.23	1.676	0.180
1000	04.66	34.48	27.32	1.856	0.000

STATION 9

M/V Hugh M. Smith: Cruise 5, 13°00'N, 172°01'W, July 5, 1950. Messenger time: 2015 GCT. Weather: overcast (with breaks), cumulus and altocumulus. Wind: 070°, 19 kt. Sea: 3-5 ft. Wire angle: 30°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.20	34.65	22.73	4.82	0.40
09	26.42	34.61	22.63	4.75	0.32
42	26.42	34.61	22.63	4.79	0.30
93	26.43	34.61	22.63	4.79	0.31
162	19.22	34.83	24.85	4.30	0.58
239	11.80	34.38	26.16	2.30	1.81
317	09.46	34.49	26.66	0.94	2.51
481	07.60	34.49	26.95	0.92	2.84
651	06.21	34.51	27.16	0.84	3.02
819	05.18	34.51	27.29	1.19	3.00
991	04.48	34.51	27.37	1.31	2.98
1263	03.66	34.56	27.49	1.60	3.05

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	ΔD (dyn. m)	ΔD 1000-ΔD (Dyn. m)
00	26.20	34.65	22.73	0.000	1.814
10	26.42	34.61	22.63	0.052	1.762
20	26.42	34.61	22.63	0.104	1.710
30	26.42	34.61	22.63	0.157	1.657
50	26.42	34.61	22.63	0.261	1.553
75	26.43	34.61	22.63	0.393	1.421
100	25.86	34.67	22.85	0.522	1.292
150	20.54	34.90	24.56	0.734	1.080
200	15.47	34.54	25.53	0.883	0.931
250	11.35	34.42	26.28	0.991	0.823
300	09.79	34.49	26.61	1.074	0.740
400	08.34	34.49	26.84	1.213	0.601
500	07.43	34.49	26.98	1.336	0.478
600	06.64	34.50	27.10	1.448	0.366
700	05.88	34.51	27.20	1.550	0.264
800	05.26	34.51	27.28	1.643	0.171
1000	04.44	34.51	27.37	1.814	0.000

STATION 10

M/V Hugh M. Smith: Cruise 5, 12°00'N, 172°00'W, July 6, 1950. Messenger time: 0435 GCT. Weather: broken clouds, cumulus, altocumulus and cirrus. Wind: 070°, 21 kt. Sea: 3-5 ft. Wire angle: 35°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σt (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	26.60	34.60	22.57	4.76	0.32
08	26.82	34.60	22.50	4.73	0.27
38	26.76	34.58	22.50	4.75	0.28
76	26.14	34.63	22.73	4.82	0.30
152	16.21	34.60	25.41	3.70	0.86
228	11.14	34.47	26.35	1.21	2.00
304	09.90	34.61	26.68	0.71	2.41
458	07.88	34.56	26.97	0.72	2.47
614	06.64	34.52	27.11	0.81	2.73
774	05.48	34.52	27.26	0.90	2.79
940	04.73	34.54	27.36	1.04	2.72
1205	03.80	34.56	27.48	1.40	2.83

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σt (gm/l)	ΔD (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.60	34.60	22.57	0.000	1.696
10	26.81	34.60	22.50	0.053	1.643
20	26.79	34.59	22.50	0.107	1.589
30	26.78	34.58	22.49	0.160	1.536
50	26.65	34.58	22.53	0.268	1.428
75	26.15	34.63	22.73	0.399	1.297
100	22.80	34.93	23.96	0.513	1.183
150	16.78	34.65	25.32	0.681	1.015
200	12.65	34.37	25.99	0.801	0.895
250	10.67	34.55	26.50	0.892	0.804
300	09.96	34.61	26.67	0.968	0.728
400	08.59	34.59	26.88	1.103	0.593
500	07.46	34.55	27.02	1.222	0.474
600	06.78	34.53	27.10	1.332	0.364
700	06.00	34.52	27.19	1.434	0.262
800	05.32	34.52	27.28	1.527	0.169
1000	04.43	34.55	27.40	1.696	0.000

STATION 11

M/V Hugh M. Smith: Cruise 5, 11°03'N, 172°03'W, July 6, 1950. Messenger time: 1324 GCT. Weather: overcast (with breaks), no observation. Wind: 060°, 20 kt. Sea: 3-5 ft. Wire angle: 28°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.80	34.65	22.54	4.75	0.34
09	27.04	34.63	22.45	4.69	0.27
42	27.10	34.67	22.46	4.71	0.25
82	26.99	34.69	22.51	4.69	0.26
159	15.91	34.58	25.46	3.70	0.88
234	10.66	34.40	26.39	1.63	2.15
309	09.32	34.58	26.76	0.60	2.54
460	07.63	34.56	27.00	0.61	2.82
610	06.26	34.51	27.15	0.90	2.95
763	05.28	34.52	27.28	1.11	2.91
921	04.62	34.52	27.36	1.58	2.87
1187	03.82	34.56	27.48	1.70	2.93

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.80	34.65	22.54	0.000	1.706
10	27.04	34.63	22.45	0.054	1.652
20	27.06	34.64	22.45	0.108	1.598
30	27.08	34.65	22.45	0.162	1.544
50	27.08	34.68	22.47	0.270	1.436
75	27.01	34.68	22.50	0.405	1.301
100	25.06	34.83	23.22	0.531	1.175
150	16.80	34.65	25.31	0.716	0.990
200	12.50	34.37	26.02	0.835	0.871
250	10.28	34.50	26.53	0.926	0.780
300	09.42	34.58	26.74	0.999	0.707
400	08.30	34.57	26.91	1.129	0.577
500	07.27	34.54	27.04	1.246	0.460
600	06.37	34.51	27.14	1.352	0.354
700	05.63	34.52	27.24	1.449	0.257
800	05.12	34.52	27.30	1.539	0.167
1000	04.36	34.53	27.40	1.706	0.000

STATION 12

M/V Hugh M. Smith: Cruise 5, 09°54'N, 172°02'W, July 6, 1950. Messenger time: 2230 GCT. Weather: overcast (with breaks), cumulus and stratocumulus. Wind: light and variable, 4 kt. Sea: < 1 ft. Wire angle: 03°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.80	34.56	22.47	4.75	0.44
10	27.12	34.60	22.40	4.69	0.46
50	27.10	34.63	22.43	4.73	0.42
98	20.06	34.94	24.72	4.73	0.53
196	11.37	34.61	26.42	0.81	2.16
292	09.80	34.67	26.75	0.52	2.53
388	08.86	34.61	26.85	0.54	2.72
581	06.78	34.51	27.08	0.88	2.94
581					2.67
775	05.44	34.51	27.26	0.87	3.12
971	04.48	34.52	27.37	1.25	3.03
971					2.77
1168	03.74	34.54	27.47	1.53	2.71
1466	03.08	34.56	27.55	2.01	2.79
1466					2.43

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	ΔD 1000-ΔD (dyn. m)
00	26.80	34.56	22.47	0.000	1.609
10	27.12	34.60	22.40	0.054	1.555
20	27.12	34.61	22.41	0.109	1.501
30	27.11	34.62	22.42	0.163	1.446
50	27.10	34.63	22.43	0.272	1.337
75	25.20	34.81	23.16	0.399	1.210
100	19.98	34.93	24.73	0.500	1.110
150	12.90	34.40	25.97	0.634	0.975
200	11.30	34.62	26.44	0.728	0.882
250	10.42	34.69	26.66	0.805	0.804
300	09.72	34.66	26.75	0.876	0.734
400	08.72	34.60	26.87	1.008	0.601
500	07.59	34.54	26.99	1.130	0.480
600	06.60	34.51	27.11	1.241	0.368
700	05.91	34.51	27.20	1.343	0.267
800	05.32	34.51	27.27	1.437	0.172
1000	04.38	34.52	27.39	1.609	0.000

STATION 13

M/V Hugh M. Smith: Cruise 5, 08°54'N, 172°00'W, July 7, 1950. Messenger time: 0636 GCT. Weather: overcast (with breaks), no observation. Wind: 180°, 12 kt. Sea: 0. Wire angle: 20°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σt (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	26.90	34.27	22.22	4.75	0.47
09	27.45	34.27	22.05	4.68	0.35
46	27.35	34.45	22.21	4.75	0.34
91	22.54	34.81	23.94	4.86	0.42
181	11.06	34.49	26.39	1.28	2.27
271	09.98	34.63	26.69	0.54	2.63
362	09.02	34.58	26.81	0.46	2.80
543	07.34	34.52	27.01	0.55	3.03
724	05.72	34.49	27.21	0.83	3.17
907	04.73	34.56	27.38	1.13	3.17
1092	04.04	34.54	27.44	1.36	3.14
1374	03.20	34.54	27.52	1.56	2.90

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σt (gm/l)	ΔD (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.90	34.27	22.22	0.000	1.637
10	27.45	34.27	22.05	0.057	1.580
20	27.42	34.33	22.10	0.115	1.522
30	27.39	34.37	22.14	0.172	1.465
50	27.32	34.46	22.23	0.285	1.352
75	26.60	34.59	22.56	0.422	1.215
100	20.86	34.88	24.46	0.533	1.104
150	12.21	34.41	26.11	0.669	0.968
200	10.80	34.57	26.50	0.753	0.879
250	10.19	34.64	26.66	0.834	0.803
300	09.66	34.62	26.73	0.905	0.732
400	08.68	34.57	26.85	1.038	0.599
500	07.73	34.54	26.97	1.161	0.476
600	06.81	34.50	27.07	1.274	0.363
700	05.91	34.49	27.18	1.378	0.259
800	05.23	34.53	27.30	1.471	0.166
1000	04.38	34.55	27.41	1.637	0.000

STATION 14

M/V Hugh M. Smith: Cruise 5, 08°00'N, 171°58'W, July 7, 1950. Messenger time: 1412 GCT. Weather: overcast (with breaks), no observation. Wind: calm. Sea: 0. Wire angle: 04°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.90	34.14	22.12	4.75	0.27
10	27.21	34.18	22.06	4.71	0.20
50	27.23	34.20	22.06	4.78	0.21
99	18.70	34.78	24.95	3.89	0.61
197	10.76	34.61	26.53	0.61	2.14
293	09.79	34.65	26.73	0.55	2.34
390	08.87	34.65	26.88	0.56	2.38
582	06.70	34.51	27.10	0.68	2.65
776	05.39	34.51	27.26	0.82	2.52
968	04.45	34.56	27.41	1.27	2.56
1161	03.72	34.56	27.49	1.48	2.56
1453	02.98	34.56	27.56	1.54	2.44

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	ΔD (dyn. m)	ΔD 1000-ΔD (dyn. m)
00	26.90	34.14	22.12	0.000	1.592
10	27.21	34.18	22.06	0.057	1.535
20	27.21	34.18	22.06	0.115	1.477
30	27.22	34.19	22.06	0.173	1.419
50	27.23	34.20	22.06	0.289	1.303
75	24.95	34.64	23.11	0.421	1.171
100	18.68	34.77	24.95	0.519	1.073
150	11.93	34.47	26.21	0.642	0.950
200	10.66	34.61	26.55	0.727	0.865
250	10.20	34.64	26.66	0.801	0.791
300	09.68	34.65	26.75	0.872	0.720
400	08.80	34.64	26.89	1.002	0.590
500	07.62	34.56	27.01	1.122	0.470
600	06.55	34.50	27.11	1.232	0.360
700	05.82	34.49	27.19	1.333	0.259
800	05.24	34.52	27.29	1.427	0.165
1000	04.34	34.56	27.42	1.592	0.000

STATION 15

M/V Hugh M. Smith: Cruise 5, 06°59'N, 171°46'W, July 7, 1950. Messenger time: 2250 GCT. Weather: broken clouds, cumulus, altostratus and cirrocumulus. Wind: negligible. Sea: < 1 ft. Wire angle: 27°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	28.20	34.33	21.85	4.71	0.43
09	27.20	34.27	22.13	4.67	0.37
44	27.18	34.34	22.18	4.71	0.34
87	23.81	34.70	23.49	4.93	0.38
172	11.92	34.52	26.25	1.31	2.17
255	09.86	34.65	26.72	0.89	2.52
338	09.09	34.63	26.83	0.81	2.68
506	07.62	34.60	27.04	0.97	2.88
677	06.24	34.56	27.20	1.09	3.08
851	05.12	34.56	27.33	1.36	3.02
1026	04.37	34.58	27.43	1.57	3.02
1299	03.42	34.58	27.53	1.67	3.14

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	28.20	34.33	21.85	0.000	1.606
10	27.20	34.28	22.13	0.058	1.548
20	27.19	34.31	22.16	0.115	1.491
30	27.18	34.32	22.17	0.172	1.434
50	27.12	34.36	22.22	0.285	1.321
75	26.20	34.49	22.61	0.422	1.184
100	21.02	34.82	24.37	0.533	1.073
150	14.35	34.55	25.78	0.679	0.927
200	11.07	34.60	26.47	0.776	0.830
250	09.96	34.64	26.70	0.852	0.754
300	09.41	34.63	26.78	0.921	0.685
400	08.57	34.63	26.92	1.036	0.570
500	07.70	34.60	27.02	1.141	0.465
600	06.85	34.57	27.12	1.250	0.356
700	06.07	34.56	27.22	1.350	0.256
800	05.40	34.56	27.30	1.442	0.164
1000	04.43	34.58	27.43	1.606	0.000

STATION 16

M/V Hugh M. Smith: Cruise 5, 06°02'N, 171°56'W, July 8, 1950. Messenger time: 0719 GCT. Weather: broken clouds, no observation. Wind: calm. Sea: 0. Wire angle: 30°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	28.20	34.81	22.21	4.73	0.22
09	27.72	34.72	22.30	4.63	0.27
43	27.74	34.97	22.48	4.66	0.35
85	26.40	34.99	22.92	4.30	0.40
165	12.68	34.54	26.12	1.79	1.71
245	10.07	34.69	26.72	0.77	2.22
325	09.41	34.67	26.81	1.06	2.16
485	08.12	34.58	26.95	0.88	2.46
649	06.53	34.52	27.13	0.99	2.49
818	05.26	34.54	27.30	1.33	2.75
994	04.44	34.54	27.40	1.54	2.70
1273	03.48	34.60	27.54	1.92	2.69

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	28.20	34.81	22.21	0.000	1.651
10	27.72	34.72	22.30	0.056	1.595
20	27.73	34.80	22.35	0.111	1.540
30	27.74	34.88	22.41	0.166	1.485
50	27.71	34.98	22.50	0.274	1.377
75	27.40	34.99	22.60	0.407	1.244
100	23.20	34.94	23.85	0.525	1.126
150	13.70	34.55	25.92	0.681	0.970
200	11.10	34.65	26.50	0.773	0.878
250	10.03	34.68	26.72	0.848	0.803
300	09.60	34.67	26.78	0.916	0.735
400	08.83	34.62	26.87	1.046	0.605
500	08.00	34.57	26.96	1.169	0.482
600	07.07	34.54	27.07	1.284	0.367
700	06.14	34.53	27.18	1.388	0.263
800	05.38	34.54	27.29	1.482	0.169
1000	04.45	34.54	27.39	1.651	0.000

STATION 17

M/V Hugh M. Smith: Cruise 5, 05°00'N, 172°02'W, July 8, 1950. Messenger time: first cast, 1700 GCT; second cast, 1817 GCT. Weather: broken clouds, cumulus and altocumulus. Wind: calm. Sea: 0. Wire angle: first cast, 0°; second cast, 0°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σt (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	27.80	34.70	22.26	4.55	0.35
10	27.90	34.70	22.22	4.67	0.33
50	27.78	34.74	22.29	4.69	0.34
100	26.30	35.21	23.12	4.05	0.72
198	11.14	34.65	26.50	0.85	2.43
294	09.04	34.65	26.86	1.70	2.51
389	08.46	34.63	26.93	1.73	2.51
581	07.22	34.58	27.08	1.30	2.87
772	05.74	34.52	27.23	1.38	3.07
965	04.51	34.54	27.39	1.54	3.10
1160	03.81	34.56	27.48	1.79	3.07
1469	03.08	34.56	27.55	2.03	3.00
1955	02.37	34.61	27.65	2.36	2.81
2441	01.90	34.65	27.72	2.72	2.52
2926	01.69	34.65	27.74	3.05	2.55
3413	01.56	34.61	27.71	3.18	2.58

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σt (gm/l)	ΔD (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	27.80	34.70	22.26	0.000	1.706
10	27.90	34.70	22.22	0.056	1.650
20	27.85	34.72	22.25	0.112	1.594
30	27.82	34.72	22.26	0.168	1.538
50	27.78	34.74	22.29	0.280	1.426
75	27.40	35.14	22.72	0.414	1.292
100	26.30	35.21	23.12	0.539	1.167
150	18.19	34.77	25.07	0.733	0.973
200	11.02	34.65	26.52	0.846	0.860
250	09.80	34.66	26.74	0.919	0.787
300	09.01	34.65	26.86	0.984	0.722
400	08.42	34.62	26.93	1.108	0.598
500	07.73	34.61	27.03	1.224	0.482
600	07.08	34.57	27.09	1.334	0.372
700	06.30	34.53	27.16	1.438	0.268
800	05.57	34.52	27.25	1.535	0.171
1000	04.35	34.55	27.41	1.706	0.000

STATION 18

M/V Hugh M. Smith: Cruise 5, 04°00'N, 172°03'W, July 9, 1950. Messenger time: 0324 GCT. Weather: scattered clouds, cumulus. Wind: 020°, 9 kt. Sea: < 1 ft. Wire angle: 0°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	27.90	35.07	22.50	4.71	0.49
10	27.98	35.05	22.46	4.69	0.44
50	27.78	35.12	22.58	4.71	0.44
99	27.62	35.16	22.66	4.58	0.48
197	12.09	34.65	26.32	1.45	1.94
294	09.42	34.67	26.81	2.06	2.14
390	08.34	34.61	26.93	2.04	2.26
583	06.66	34.58	27.16	1.22	2.75
775	05.38	34.52	27.27	1.71	2.74
968	04.55	34.54	27.38	1.95	2.75
1161	03.87	34.56	27.47	2.02	2.76
1452	03.04	34.58	27.57	2.09	2.87

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	27.90	35.07	22.50	0.000	1.713
10	27.98	35.05	22.46	0.054	1.659
20	27.93	35.08	22.50	0.108	1.605
30	27.85	35.10	22.54	0.161	1.552
50	27.78	35.12	22.58	0.267	1.446
75	27.70	35.14	22.62	0.399	1.314
100	27.62	35.16	22.66	0.531	1.182
150	20.40	34.89	24.59	0.747	0.966
200	11.80	34.68	26.40	0.874	0.839
250	09.98	34.71	26.75	0.950	0.763
300	09.35	34.66	26.82	1.017	0.696
400	08.20	34.61	26.96	1.141	0.572
500	07.30	34.60	27.08	1.254	0.459
600	06.54	34.57	27.16	1.357	0.356
700	05.82	34.54	27.23	1.454	0.259
800	05.25	34.52	27.29	1.545	0.168
1000	04.40	34.54	27.40	1.713	0.000

STATION 19

M/V Hugh M. Smith: Cruise 5, 03°00'N, 172°01'W, July 9, 1950. Messenger time: 1056 GCT. Weather: scattered clouds, no observation. Wind: 070°, 15 kt. Sea: < 1 ft. Wire angle: 32°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	27.70	1/		4.61	0.42
09	27.82			4.60	0.46
42	27.79			4.61	0.42
83	27.59			4.52	0.48
164	19.30			3.24	0.97
247	10.29			2.46	2.02
330	09.54			2.30	2.15
504	07.58			1.62	2.63
681	05.94			1.46	2.98
861	04.89			1.77	2.96
1044	04.24			1.93	2.88
1326	03.28			2.13	2.87

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	27.70				
10	27.81				
20	27.80				
30	27.80				
50	27.75				
75	27.63				
100	26.90				
150	22.70				
200	11.10				
250	10.28				
300	09.86				
400	08.75				
500	07.64				
600	06.65				
700	05.80				
800	05.24				
1000	04.42				

1/ Values available, but no bottle numbers.

STATION 20

M/V Hugh M. Smith: Cruise 5, 02°00'N, 171°53'W, July 9, 1950. Messenger time: 1903 GCT. Weather: scattered clouds, cumulus. Wind: 140°, 14 kt. Sea: < 1 ft. Wire angle: 42°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	27.40	35.08	22.67	4.71	0.42
08	27.70	35.05	22.55	4.69	0.36
36	27.60	35.10	22.62	4.68	0.40
72	27.26	35.32	22.90	4.72	0.52
146	22.79	35.05	24.06	3.40	0.82
221	11.60	34.85	26.56	2.89	1.67
300	10.56	34.79	26.71	1.80	2.03
464	07.77	34.61	27.02	1.97	2.35
640	06.46	34.56	27.17	1.84	2.57
822	04.98	34.54	27.34	2.14	2.59
1009	04.39	34.56	27.42	2.15	2.47
1294	03.54	34.56	27.50	2.35	2.49
1294					2.73

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	27.40	35.08	22.67	0.000	1.723
10	27.68	35.05	22.56	0.053	1.670
20	27.63	35.06	22.58	0.105	1.617
30	27.62	35.08	22.60	0.158	1.564
50	27.48	35.18	22.72	0.262	1.460
75	27.25	35.32	22.90	0.390	1.333
100	27.00	35.36	23.01	0.514	1.209
150	21.50	34.98	24.36	0.728	0.995
200	12.27	34.87	26.45	0.860	0.862
250	11.20	34.82	26.62	0.939	0.784
300	10.56	34.79	26.71	1.011	0.711
400	08.78	34.66	26.91	1.144	0.579
500	07.45	34.60	27.06	1.261	0.462
600	06.76	34.57	27.13	1.368	0.355
700	05.95	34.55	27.22	1.467	0.255
800	05.12	34.54	27.32	1.558	0.165
1000	04.40	34.56	27.42	1.723	0.000

STATION 21

M/V Hugh M. Smith: Cruise 5, 00°54'N, 172°10'W, July 10, 1950. Messenger time: 0407 GCT. Weather: scattered clouds, cumulus. Wind: 140°, 14 kt. Sea: 1-3 ft. Wire angle: 28°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	27.10	35.35	22.97	4.73	0.72
09	27.12	35.35	22.96	4.70	0.58
44	26.90	35.39	23.06	4.70	0.56
88	26.80	35.35	23.07	4.65	0.58
179	17.16	35.23	25.67	3.33	1.14
272	12.42	34.87	26.43	3.11	1.61
366	10.24	34.74	26.73	1.59	2.30
557	07.30	34.58	27.07	1.56	2.82
753	05.96	34.52	27.20	1.96	2.88
950	05.79 1/	34.54 1/	27.24	1.86	2.77
1150	04.34	34.56	27.42	2.04	2.98
1450	03.61	34.56	27.50	2.11	2.87

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	27.10	35.35	22.97	0.000	1.784
10	27.10	35.35	22.97	0.049	1.735
20	27.07	35.37	23.00	0.098	1.686
30	26.97	35.38	23.03	0.147	1.638
50	26.83	35.38	23.06	0.244	1.541
75	26.82	35.37	23.08	0.364	1.420
100	26.78	35.35	23.07	0.486	1.299
150	22.12	35.15	24.32	0.699	1.085
200	15.10	35.08	26.03	0.843	0.941
250	12.70	34.89	26.39	0.937	0.847
300	11.78	34.83	26.52	1.021	0.764
400	09.61	34.70	26.80	1.168	0.616
500	08.00	34.62	27.00	1.294	0.490
600	06.98	34.57	27.10	1.406	0.379
700	06.27	34.54	27.18	1.509	0.275
800	05.63	34.52	27.24	1.607	0.178
1000	04.75	34.55	27.37	1.784	0.000

1/ Looks improbable on Temperature-Depth and T-S curves. Bottom three bottles may have pretripped.

STATION 22

M/V Hugh M. Smith: Cruise 5, 00°08'S, 172°01'W, July 10, 1950. Messenger time: 1201 GCT. Weather: broken clouds, no observation. Wind: 160°, 11 kt. Sea: 1-3 ft. Wire angle: 28°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.80	35.37	23.08	4.75	0.47
09	26.87	35.37	23.06	4.69	0.54
44	26.64	35.37	23.13	4.65	0.52
88	26.21	35.41	23.29	4.48	0.58
178	19.10	35.34	25.27	3.18	0.96
272	12.63	34.90	26.41	3.17	1.43
367	10.54	34.74	26.67	1.75	2.06
561	07.35	34.52	27.01	1.81	2.35
756	06.06	34.51	27.18	1.84	2.54
951	04.82	34.49	27.32	2.08	2.51
951					2.76
1148	04.00	34.51	27.42	2.24	2.40
1430	03.08	34.58	27.56	2.24	2.46

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.80	35.37	23.08	0.000	1.807
10	26.86	35.37	23.06	0.048	1.759
20	26.84	35.37	23.07	0.096	1.711
30	26.79	35.37	23.08	0.144	1.663
50	26.61	35.38	23.15	0.240	1.567
75	26.36	35.41	23.25	0.358	1.449
100	26.13	35.41	23.32	0.474	1.333
150	22.12	35.18	24.34	0.680	1.127
200	16.60	35.19	25.77	0.829	0.978
250	13.60	34.96	26.26	0.932	0.875
300	12.01	34.85	26.49	1.019	0.788
400	09.90	34.69	26.75	1.169	0.638
500	08.17	34.55	26.92	1.301	0.506
600	07.02	34.52	27.06	1.418	0.389
700	06.40	34.52	27.14	1.525	0.282
800	05.79	34.50	27.21	1.625	0.182
1000	04.64	34.50	27.34	1.807	0.000

STATION 23

M/V Hugh M. Smith: Cruise 5, 01°00'S, 171°57'W, July 10, 1950. Messenger time: 1950 GCT. Weather: scattered clouds, cumulus. Wind: 120°, 15 kt. Sea: 1-3 ft. Wire angle: 31°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	26.70	35.43	23.16	4.69	0.59
09	26.62	35.39	23.15	4.66	0.56
42	26.62	35.39	23.15	4.68	0.56
86	26.50	35.43	23.22	4.63	0.59
173	22.50	35.77	24.68	3.30	0.92
262	12.72	34.97	26.44	3.15	1.52
353	10.66	34.76	26.67	2.14	2.02
540	07.30	34.58	27.07	1.80	2.57
731	06.08	34.52	27.19	1.93	2.77
924	04.80	34.54	27.36	2.12	2.83
1118	04.13	34.58	27.46	2.24	2.81
1409	03.18	34.61	27.58	2.24	2.77

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	Δ D 1000 - Δ D (dyn. m)
00	26.70	35.43	23.16	0.000	1.791
10	26.62	35.39	23.15	0.047	1.744
20	26.62	35.39	23.15	0.095	1.696
30	26.62	35.39	23.15	0.142	1.649
50	26.61	35.40	23.16	0.237	1.554
75	26.55	35.41	23.19	0.355	1.436
100	26.47	35.44	23.24	0.473	1.318
150	25.30	35.63	23.75	0.695	1.096
200	16.80	35.34	25.84	0.857	0.934
250	13.19	35.01	26.38	0.956	0.835
300	11.80	34.87	26.55	1.038	0.753
400	09.80	34.71	26.78	1.184	0.607
500	07.90	34.61	27.00	1.310	0.481
600	06.85	34.56	27.11	1.420	0.371
700	06.24	34.53	27.17	1.523	0.288
800	05.60	34.52	27.25	1.520	0.171
1000	04.47	34.56	27.41	1.791	0.000

STATION 24

M/V Hugh M. Smith: Cruise 5, 02°02'S, 171°57'W, July 11, 1950. Messenger time: 0200 GCT. Weather. scattered clouds, cumulus. Wind: 100°, 8 kt. Sea: <1 ft. Wire angle: 40°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	27.30	35.48	23.00	4.79	0.91
08	27.12	35.50	23.07	4.78	0.98
37	26.82	35.44	23.13	4.81	0.94
73	26.74	35.41	23.13	4.80	0.83
144	26.66	35.55	23.26	4.46	0.97
216	14.36	35.14	26.24	2.61	1.83
290	11.12	34.83	26.64	2.95	2.08
450	08.34	34.63	26.95	2.26	2.43
620	06.38	34.54	27.16	1.84	2.89
796	05.00	34.49	27.30	2.31	2.69
979	04.46	34.56	27.41	2.19	2.41
1266	03.56	34.56	27.50	2.24	2.82

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	ΔD1000-ΔD (dyn. m)
00	27.30	35.48	23.00	0.000	1.778
10	27.11	35.49	23.07	0.048	1.730
20	26.99	35.48	23.10	0.096	1.682
30	26.88	35.46	23.12	0.144	1.634
50	26.80	35.42	23.12	0.240	1.538
75	26.73	35.42	23.14	0.359	1.419
100	26.72	35.48	23.19	0.478	1.300
150	26.60	35.57	23.30	0.712	1.066
200	16.90	35.38	25.85	0.884	0.894
250	12.07	34.92	26.53	0.979	0.799
300	10.95	34.82	26.66	1.055	0.723
400	09.12	34.69	26.88	1.191	0.587
500	07.63	34.56	27.00	1.312	0.466
600	06.57	34.51	27.11	1.421	0.357
700	05.63	34.48	27.21	1.522	0.256
800	04.99	34.49	27.29	1.613	0.165
1000	04.40	34.57	27.42	1.778	0.000

STATION 25

M/V Hugh M. Smith: Cruise 5, 02°59'S, 171°59'W, July 11, 1950. Messenger time: 1150 GCT. Weather: scattered clouds, cumulus. Wind: 110°, 16 kt. Sea: 1-3 ft. Wire angle: 20°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.70	35.50	23.21	4.64	0.64
09	27.03	35.48	23.09	4.64	0.62
46	27.00	35.48	23.10	4.69	0.58
92	26.94	35.48	23.12	4.67	0.60
182	24.08	35.97	24.37	3.65	0.82
271	10.94	34.83	26.67	2.12	2.06
361	09.40	34.69	26.83	2.09	2.25
544	07.30	34.58	27.07	1.76	2.61
729	05.56	34.51	27.24	2.32	2.79
915	04.68	34.51	27.35	2.37	2.91
1102	04.02	34.54	27.44	2.34	2.92
1385	03.26	34.69	27.63	2.35	2.36

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.70	35.50	23.21	0.000	1.805
10	27.03	35.48	23.09	0.047	1.758
20	27.02	35.48	23.09	0.095	1.710
30	27.02	35.48	23.09	0.143	1.662
50	27.00	35.48	23.10	0.239	1.566
75	26.96	35.48	23.11	0.359	1.446
100	26.92	35.48	23.13	0.479	1.326
150	26.80	35.51	23.19	0.718	1.087
200	19.95	35.71	25.33	0.905	0.900
250	12.00	34.93	26.55	1.012	0.793
300	10.35	34.78	26.74	1.085	0.720
400	08.92	34.67	26.89	1.216	0.589
500	07.76	34.60	27.02	1.335	0.470
600	06.78	34.54	27.11	1.445	0.360
700	05.78	34.51	27.21	1.546	0.259
800	05.12	34.51	27.29	1.637	0.168
1000	04.40	34.52	27.38	1.805	0.000

STATION 26

M/V Hugh M. Smith: Cruise 5, 04°05'S, 171°56'W, July 11, 1950. Messenger time: 2117 GCT. Weather: scattered clouds, cumulus. Wind: no observation. Sea: 1-3 ft. Wire angle: 15°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σt (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	27.60	35.79	23.14	4.69	0.56
09	27.61	35.71	23.07	4.64	0.51
48	27.60	35.71	23.08	4.63	0.56
95	27.58	35.71	23.08	4.67	0.56
189	23.03	36.09	24.77	3.63	0.80
281	11.66	34.88	26.58	2.08	1.88
371	09.50	34.70	26.82	1.87	2.27
553	07.20	34.58	27.08	1.58	2.53
736	05.46	34.54	27.28	2.17	2.72
918	04.50	34.54	27.39	2.27	2.67
1104	03.92	34.54	27.45	2.35	2.59
1394	03.18	34.60	27.57	2.32	2.66

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σt (gm/l)	ΔD (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	27.60	35.79	23.14	0.000	1.810
10	27.61	35.71	23.08	0.048	1.762
20	27.60	35.71	23.08	0.096	1.714
30	27.60	35.71	23.08	0.144	1.666
50	27.60	35.71	23.08	0.240	1.570
75	27.59	35.71	23.08	0.361	1.449
100	27.57	35.72	23.10	0.481	1.329
150	26.55	35.81	23.49	0.714	1.096
200	22.00	35.99	24.99	0.902	0.908
250	12.98	35.01	26.42	1.020	0.790
300	11.10	34.84	26.65	1.099	0.711
400	09.07	34.68	26.88	1.235	0.575
500	07.80	34.61	27.02	1.355	0.455
600	06.70	34.56	27.13	1.463	0.347
700	05.78	34.56	27.25	1.561	0.249
800	05.04	34.54	27.33	1.649	0.161
1000	04.21	34.54	27.42	1.810	0.000

STATION 27

M/V Hugh M. Smith: Cruise 5, 05°04'S, 171°58'W, July 12, 1950. Messenger time: first cast, 0522 GCT; second cast, 0636 GCT. Weather: scattered clouds, no observation. Wind: 100°, 9 kt. Sea: 1-3 ft. Wire angle: first cast, 30°; second cast, 40°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	27.90	35.79	23.04	4.68	1/
09	27.86	35.70	22.99	4.64	
43	27.68	35.68	23.03	4.69	
85	27.66	35.70	23.05	4.67	
168	24.98	35.97	24.10	3.90	
247	15.10	35.19	26.12	2.36	
324	10.42	34.78	26.73	2.03	
480	08.14	34.63	26.98	1.73	
639	06.60	34.54	27.13	2.15	
806	05.29	34.51	27.28	2.52	
986	04.46	34.54	27.39	2.51	
1162 2/	03.87	35.21	27.99	3.30	
1611 3/	02.76	34.61	27.62	2.76	
2072	02.14	34.63	27.68	2.98	
2537	01.81	34.63	27.71	3.16	
3480	01.49	34.67	27.77	3.69	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	27.90	35.79	23.04	0.000	1.827
10	27.85	35.69	22.98	0.049	1.778
20	27.80	35.69	23.00	0.098	1.729
30	27.75	35.68	23.01	0.146	1.681
50	27.68	35.70	23.05	0.244	1.583
75	27.67	35.70	23.05	0.365	1.462
100	27.62	35.71	23.07	0.486	1.341
150	25.66	35.90	23.84	0.711	1.116
200	20.45	35.80	25.27	0.884	0.943
250	14.90	35.18	26.15	1.002	0.825
300	11.60	34.87	26.58	1.089	0.738
400	09.08	34.68	26.87	1.229	0.598
500	07.96	34.61	26.99	1.350	0.477
600	06.99	34.56	27.09	1.462	0.365
700	06.07	34.53	27.19	1.564	0.263
800	05.35	34.52	27.28	1.658	0.169
1000	04.40	34.54	27.40	1.827	0.000

1/ Photometer not operating properly.

2/ Only the temperature at this depth appears reasonable. Other values suggest that the Nansen bottle sample was contaminated through leakage on the way up.

3/ Depth not reliable.

STATION 28

M/V Hugh M. Smith: Cruise 5, 04°59'S, 158°03'W, July 28, 1950. Messenger time: first cast, 1349 GCT; second cast, 1449 GCT. Weather: broken clouds, cumulus. Wind: 110°, 14 kt. Sea: 3-5 ft. Wire angle: first cast, 35°; second cast, 35°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.60	35.68	23.38	4.67	1/
08	26.64	35.55	23.27	4.63	
41	26.67	35.55	23.26	4.71	
82	26.68	35.53	23.24	4.67	
155	21.76	36.06	25.11	3.73	
226	13.14	34.99	26.38	1.87	
300	10.82	34.81	26.68	2.00	
456	08.02	34.58	26.96	1.93	
622	06.76	34.54	27.11	2.00	
798	05.52	34.51	27.25	1.99	
985	04.22	34.54	27.42	2.28	
1274	03.36	34.65	27.59	2.63	
1756	02.46	34.63	27.66	2.74	
2237	02.05	34.65	27.71	2.93	
2718	01.80	34.67	27.74	3.18	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	ΔD (ml/l)	ΔD 1000-ΔD (μg at/l)
00	26.60	35.68	23.38	0.000	1.701
10	26.63	35.55	23.27	0.046	1.655
20	26.64	35.55	23.27	0.092	1.609
30	26.65	35.55	23.26	0.138	1.563
50	26.67	35.54	23.25	0.231	1.470
75	26.68	35.54	23.25	0.348	1.353
100	26.69	35.53	23.24	0.465	1.236
150	22.45	36.12	24.96	0.658	1.043
200	17.30	35.36	25.74	0.793	0.908
250	12.05	34.92	26.54	0.891	0.810
300	10.82	34.81	26.68	0.966	0.735
400	08.85	34.64	26.88	1.101	0.600
500	07.66	34.56	27.00	1.221	0.480
600	06.90	34.55	27.10	1.332	0.369
700	06.21	34.52	27.17	1.436	0.265
800	05.50	34.51	27.25	1.532	0.169
1000	04.16	34.54	27.43	1.701	0.000

1/ Photometer not operating properly.

STATION 29

M/V Hugh M. Smith: Cruise 5, 04°00'S, 158°03'W, July 29, 1950. Messenger time: 2350 GCT. Weather: broken clouds, cumulus. Wind: 110°, 19 kt. Sea: 3-5 ft. Wire angle: 35°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.20	35.48	23.35	4.81	1/
09	26.51	35.46	23.24	4.63	
40	26.44	35.44	23.25	4.70	
80	26.42	35.46	23.27	4.71	
158	23.86	36.08	24.52	3.83	
235	13.15	34.99	26.37	1.46	
312	10.31	34.81	26.77	1.25	
466	08.12	34.65	27.00	2.05	
621	06.54	34.56	27.16	1.76	
778	05.48	34.54	27.28	1.93	
940	04.67	34.54	27.37	2.07	
1205	03.78	34.58	27.49	2.23	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	Δ D 1000 - Δ D (dyn. m)
00	26.20	35.48	23.35	0.000	1.722
10	26.50	35.46	23.24	0.046	1.676
20	26.46	35.45	23.25	0.092	1.629
30	26.45	35.44	23.24	0.139	1.583
50	26.43	35.44	23.25	0.232	1.490
75	26.42	35.45	23.26	0.348	1.373
100	26.41	35.46	23.27	0.465	1.256
150	24.35	36.01	24.32	0.674	1.047
200	18.75	35.56	25.53	0.830	0.891
250	11.81	34.90	26.57	0.933	0.789
300	10.52	34.83	26.75	1.006	0.716
400	08.98	34.71	26.91	1.137	0.585
500	07.71	34.63	27.05	1.254	0.468
600	06.70	34.57	27.14	1.361	0.360
700	05.92	34.54	27.22	1.460	0.261
800	05.33	34.54	27.29	1.553	0.169
1000	04.48	34.55	27.40	1.722	0.000

1/ Photometer not operating properly.

STATION 30

M/V Hugh M. Smith: Cruise 5, 03°03'S, 158°00'W, July 29, 1950. Messenger time: 0805 GCT. Weather: broken clouds, no observation. Wind: 100°, 21 kt. Sea: 3-5 ft. Wire angle: 40°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.30	35.48	23.32	4.75	1/
09	26.48	35.48	23.27	4.68	
38	26.50	35.48	23.26	4.70	
73	26.45	35.48	23.27	4.71	
146	21.90	35.93	24.97	3.63	
218	12.34	34.94	26.49	1.99	
290	10.08	34.74	26.75	2.12	
437	08.64	34.65	26.92	1.82	
592	07.10	34.60	27.11	1.33	
757	05.70	34.52	27.23	1.92	
930	04.86	34.51	27.32	2.06	
1210	03.73	34.58	27.50	2.34	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.30	35.48	23.32	0.000	1.659
10	26.48	35.48	23.27	0.046	1.613
20	26.48	35.48	23.27	0.092	1.567
30	26.50	35.48	23.26	0.139	1.520
50	26.48	35.48	23.27	0.231	1.428
75	26.44	35.49	23.29	0.347	1.312
100	26.43	35.49	23.29	0.463	1.196
150	21.75	35.91	25.00	0.655	1.004
200	13.65	35.03	26.30	0.775	0.884
250	11.28	34.84	26.62	0.857	0.802
300	09.92	34.73	26.77	0.928	0.731
400	08.93	34.67	26.89	1.057	0.602
500	08.04	34.63	27.00	1.178	0.481
600	07.02	34.59	27.11	1.288	0.371
700	06.12	34.54	27.20	1.390	0.269
800	05.42	34.52	27.27	1.484	0.175
1000	04.69	34.52	27.35	1.659	0.000

1/ Photometer not operating properly.

STATION 31

M/V Hugh M. Smith: Cruise 5, 02°03'S, 158°00'W, July 29, 1950. Messenger time: 1617 GCT. Weather: broken clouds, cumulus. Wind: 080°, 18 kt. Sea: 3-5 ft. Wire angle: 20°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.40	35.53	23.33	4.65	1/
10	26.50	35.48	23.26	4.53	
47	26.52	35.48	23.25	4.64	
93	26.48	35.46	23.25	4.65	
183	13.57	35.07	26.35	2.29	
273	10.45	34.76	26.71	2.04	
362	09.88	34.72	26.77	1.75	
544	07.04	34.58	27.10	1.79	
730	06.05	34.52	27.19	1.88	
919	04.88	34.51	27.32	2.14	
1109	04.33	34.54	27.41	2.25	
1400	03.34	34.56	27.52	2.44	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.40	35.53	23.33	0.000	1.676
10	26.50	35.48	23.26	0.046	1.630
20	26.50	35.48	23.26	0.092	1.584
30	26.50	35.48	23.26	0.139	1.537
50	26.50	35.48	23.26	0.232	1.444
75	26.49	35.47	23.25	0.348	1.328
100	26.46	35.46	23.26	0.464	1.212
150	23.35	35.98	24.59	0.667	1.009
200	12.08	34.93	26.54	0.791	0.885
250	10.63	34.78	26.69	0.865	0.811
300	10.23	34.75	26.74	0.935	0.741
400	09.42	34.69	26.83	1.070	0.606
500	07.68	34.61	27.04	1.191	0.485
600	06.70	34.56	27.13	1.299	0.377
700	06.18	34.53	27.18	1.400	0.276
800	05.67	34.51	27.23	1.497	0.179
1000	04.65	34.52	27.36	1.676	0.000

1/ Photometer not operating properly.

STATION 32

M/V Hugh M. Smith: Cruise 5, 01°00'S, 158°01'W, July 30, 1950. Messenger time: 0047 GCT. Weather: scattered clouds, cumulus. Wind: 090°, 22 kt. Sea: 5-8 ft. Wire angle: 32°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	26.30	35.48	23.32	4.70	1/
08	26.35	35.46	23.29	4.62	
42	26.30	35.48	23.32	4.66	
84	26.04	35.46	23.39	4.54	
169	16.20	35.32	25.96	2.68	
259	12.18	34.88	26.48	2.94	
351	10.71	34.79	26.68	1.73	
539	07.54	34.58	27.03	1.55	
728	06.24	34.52	27.16	1.70	
919	05.00	34.52	27.32	2.04	
1111	04.20	34.54	27.42	2.05	
1402	03.24	34.58	27.55	2.13	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.30	35.48	23.32	0.000	1.663
10	26.32	35.46	23.30	0.046	1.617
20	26.31	35.47	23.31	0.092	1.571
30	26.30	35.48	23.32	0.137	1.526
50	26.28	35.48	23.33	0.229	1.434
75	26.13	35.47	23.37	0.343	1.320
100	25.10	35.47	23.69	0.453	1.210
150	18.43	35.47	25.54	0.622	1.041
200	13.56	35.01	26.30	0.729	0.934
250	12.31	34.90	26.47	0.815	0.848
300	11.57	34.84	26.57	0.894	0.769
400	09.81	34.74	26.80	1.039	0.624
500	08.12	34.62	26.98	1.165	0.498
600	06.99	34.54	27.08	1.278	0.385
700	06.39	34.52	27.14	1.384	0.279
800	05.80	34.52	27.22	1.483	0.180
1000	04.71	34.53	27.36	1.663	0.000

1/ Photometer not operating properly.

STATION 33

M/V Hugh M. Smith: Cruise 5, 00°02'S, 157°58'W, July 30, 1950. Messenger time: 0850 GCT. Weather: scattered clouds, cumulus. Wind: 100°, 18 kt. Sea: 3-5 ft. Wire angle: 41°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	25.70	35.39	23.44	4.64	1/
08	25.84	35.37	23.38	4.58	
38	25.84	35.37	23.38	4.58	
76	25.70	35.37	23.43	4.48	
153	18.93	35.30	25.28	3.28	
237	12.81	34.92	26.39	3.12	
329	11.22	34.83	26.62	2.10	
518	07.72	34.61	27.03	1.57	
708	06.18	34.56	27.20	1.74	
897	05.25	34.52	27.29	1.99	
1088	04.16	34.54	27.43	2.04	
1378	03.20	34.63	27.59	2.11	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	25.70	35.39	23.44	0.000	1.679
10	25.84	35.37	23.38	0.045	1.634
20	25.83	35.37	23.39	0.090	1.589
30	25.84	35.37	23.38	0.135	1.544
50	25.81	35.37	23.39	0.226	1.453
75	25.70	35.37	23.43	0.338	1.341
100	25.42	35.35	23.50	0.450	1.229
150	19.00	35.29	25.26	0.630	1.049
200	15.05	35.10	26.06	0.750	0.929
250	12.50	34.90	26.43	0.842	0.837
300	11.62	34.86	26.57	0.923	0.756
400	09.87	34.73	26.78	1.068	0.611
500	08.00	34.62	27.00	1.194	0.485
600	06.95	34.58	27.12	1.304	0.375
700	06.21	34.56	27.20	1.405	0.274
800	05.70	34.53	27.24	1.501	0.178
1000	04.65	34.52	27.36	1.679	0.000

1/ Photometer not operating properly.

STATION 34

M/V Hugh M. Smith: Cruise 5, 00°57'N, 157°57'W, July 30, 1950. Messenger time: 1715 GCT. Weather: scattered clouds, cumulus. Wind: 100°, 17 kt. Sea: 3-5 ft. Wire angle: 45°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	25.50	35.21	23.37	4.56	1/
07	25.74	35.19	23.28	4.50	
34	25.75	35.17	23.28	4.52	
68	25.69	35.17	23.28	4.48	
137	20.12	34.90	24.67	3.22	
215	13.12	34.96	26.36	3.13	
299	10.85	34.83	26.69	2.01	
476	08.46	34.69	26.98	1.28	
659	06.38	34.58	27.19	1.63	
844	05.45	34.54	27.28	1.92	
1030	04.42	34.56	27.41	2.03	
1316	03.38	34.58	27.53	2.01	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	25.50	35.21	23.37	0.000	1.651
10	25.74	35.19	23.28	0.046	1.605
20	25.74	35.18	23.27	0.092	1.559
30	25.74	35.18	23.27	0.138	1.513
50	25.70	35.17	23.28	0.231	1.420
75	25.62	35.17	23.30	0.346	1.305
100	25.25	35.15	23.40	0.461	1.190
150	18.30	34.88	25.12	0.646	1.005
200	13.46	34.97	26.29	0.764	0.887
250	12.15	34.91	26.51	0.848	0.803
300	10.83	34.83	26.69	0.924	0.727
400	09.32	34.74	26.88	1.058	0.593
500	08.15	34.68	27.02	1.178	0.473
600	06.96	34.62	27.15	1.286	0.365
700	06.09	34.56	27.21	1.385	0.266
800	05.62	34.54	27.26	1.479	0.172
1000	04.55	34.56	27.40	1.651	0.000

1/ Photometer not operating properly.

STATION 35

M/V Hugh M. Smith Cruise 5, 02°00'N, 158°07'W, July 31, 1950. Messenger time: 0158 GCT. Weather: broken clouds, cumulus. Wind: 110°, 17 kt. Sea: 3-5 ft. Wire angle: 37°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.30	35.28	23.17	4.67	0.72
07	26.42	35.23	23.10	4.58	0.69
37	26.21	35.21	23.15	4.56	0.69
73	26.09	35.23	23.20	4.51	0.76
147[1/]	20.14	34.92	24.68	3.20	1.19
221	11.24	34.85	26.63	2.47	2.05
293	10.62	34.81	26.71	1.84	2.22
293					2.46
443	09.06	34.70	26.89	1.31	2.72
443					2.98
595	06.96	34.61	27.14	1.56	2.98
749	06.12	34.58	27.23	1.78	3.08
904	05.12	34.58	27.35	1.99	2.98
1144	04.10	34.60	27.48	2.09	3.07

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	Δ D 1000 - Δ D (dyn. m)
00	26.30	35.28	23.17	0.000	1.652
10	26.39	35.22	23.10	0.047	1.605
20	26.32	35.21	23.11	0.095	1.557
30	26.26	35.21	23.13	0.143	1.509
50	26.18	35.22	23.16	0.238	1.414
75	26.05	35.23	23.21	0.356	1.296
100	25.81	35.22	23.28	0.473	1.179
150	18.25	34.86	25.12	0.661	0.991
200	11.88	34.87	26.53	0.773	0.879
250	11.00	34.83	26.66	0.848	0.804
300	10.55	34.80	26.72	0.919	0.733
400	09.55	34.73	26.84	1.055	0.597
500	08.25	34.66	26.99	1.178	0.474
600	06.91	34.60	27.14	1.288	0.364
700	06.34	34.59	27.21	1.388	0.264
800	05.82	34.58	27.27	1.483	0.169
1000	04.50	34.58	27.42	1.652	0.000

1/ Bottle may have pretripped.

STATION 36

M/V Hugh M. Smith: Cruise 5, 03°00'N, 157°58'W, July 31, 1950. Messenger time: 0932 GCT. Weather: scattered clouds, cumulus. Wind: 100°, 17 kt. Sea: 3-5 ft. Wire angle: 42°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.10	35.30	23.25	4.77	0.68
07	26.30	35.25	23.15	4.75	0.66
38	26.22	35.25	23.17	4.75	0.68
73	26.01	35.23	23.22	4.72	0.69
140	23.83	35.16	23.83	3.85	0.82
200	10.88	34.74	26.61	2.69	1.89
262	10.43	34.78	26.73	1.78	2.18
400	09.53	34.69	26.81	1.62	2.28
542	07.98	34.60	26.98	1.27	2.64
690	06.40	34.52	27.14	1.60	2.69
849	05.30	34.54	27.30	1.78	2.90
1114	04.00	34.56	27.46	1.86	2.87

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	ΔD (dyn. m)	ΔD 1000 - ΔD (dyn. m)
00	26.10	35.30	23.25	0.000	1.733
10	26.29	35.25	23.15	0.047	1.686
20	26.27	35.25	23.16	0.094	1.639
30	26.23	35.25	23.17	0.142	1.592
50	26.14	35.24	23.19	0.236	1.497
75	26.00	35.23	23.23	0.353	1.380
100	25.92	35.22	23.25	0.471	1.262
150	23.62	35.09	23.84	0.692	1.041
200	10.88	34.74	26.61	0.833	0.900
250	10.43	34.78	26.73	0.905	0.829
300	10.31	34.78	26.75	0.974	0.759
400	09.53	34.69	26.81	1.110	0.623
500	08.44	34.63	26.93	1.238	0.495
600	07.31	34.56	27.05	1.356	0.378
700	06.30	34.52	27.16	1.463	0.270
800	05.60	34.53	27.25	1.561	0.172
1000	04.41	34.56	27.41	1.733	0.000

STATION 37

M/V Hugh M. Smith: Cruise 5, 04°02'N, 158°03'W, July 31, 1950. Messenger time: 1712 GCT. Weather: scattered clouds, cumulus and altocumulus. Wind: 090°, 13 kt. Sea: 3-5 ft. Wire angle: 40°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	25.90	35.25	23.27	4.70	0.76
07	26.00	35.19	23.20	4.61	0.72
36	26.00	35.21	23.21	4.65	0.74
71	25.94	35.21	23.23	4.60	0.85
135	25.38	35.25	23.43	4.37	1.01
135					0.81
195	11.04	34.63	26.50	1.85	2.21
257	09.70	34.67	26.76	2.19	2.38
386	08.94	34.65	26.87	1.58	2.72
522	07.96	34.63	27.01	1.48	2.94
659	06.49	34.56	27.16	1.20	3.32
800	05.42	34.54	27.28	1.65	3.24
1042	04.40	34.54	27.40	1.84	3.28

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	Δ D 1000 - Δ D (dyn. m)
00	25.90	35.25	23.27	0.000	1.705
10	26.00	35.20	23.21	0.046	1.659
20	26.00	35.20	23.21	0.093	1.612
30	26.00	35.20	23.21	0.140	1.565
50	25.99	35.21	23.22	0.234	1.471
75	25.90	35.21	23.24	0.351	1.354
100	25.71	35.24	23.33	0.467	1.238
150	25.23	35.25	23.48	0.694	1.011
200	10.57	34.68	26.62	0.842	0.863
250	09.72	34.67	26.76	0.913	0.792
300	09.50	34.66	26.79	0.980	0.725
400	08.86	34.65	26.89	1.109	0.596
500	08.11	34.64	27.00	1.229	0.476
600	07.07	34.59	27.11	1.340	0.365
700	06.14	34.55	27.20	1.442	0.263
800	05.42	34.54	27.28	1.535	0.170
1000	04.50	34.54	27.39	1.705	0.000

STATION 38

M/V Hugh M. Smith: Cruise 5, 05°00'N, 158°00'W, August 1, 1950. Messenger time: first cast, 0023 GCT; second cast, 0135 GCT; third cast, 0333 GCT. Weather: broken clouds, cumulus, stratocumulus and altocumulus. Wind: 130°, 16 kt. Sea: 1-3 ft. Wire angle: first cast, 25°; second cast, 32°; third cast, 35°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	27.20	35.23	22.85	4.69	0.53
08	27.30	35.14	22.75	4.68	0.48
46	27.12	35.14	22.81	4.70	0.49
85	26.30	35.16	23.08	4.63	0.64
169	20.75	34.90	24.50	3.44	0.82
253	10.08	34.70	26.72	0.86	2.41
336	09.04	34.65	26.86	1.95	2.41
507	07.92	34.61	27.00	1.35	2.73
507					2.28
681	06.49	34.56	27.16	1.06	2.85
861	05.20	34.54	27.31	1.10	3.05
1050	04.37	34.54	27.40	1.38	2.94
1244	03.70	34.56	27.49	1.69	2.84
1788	02.50	34.60	27.63	2.07	2.82
2271	02.00	34.65	27.71	2.85	2.68
2752	01.82	34.65	27.73	2.80	2.55
3715	01.44	34.65	27.75	3.61	2.27

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	Δ D 1000 - Δ D (dyn. m)
00	27.20	35.23	22.85	0.000	1.784
10	27.29	35.14	22.75	0.051	1.733
20	27.24	35.14	22.77	0.102	1.682
30	27.19	35.14	22.78	0.153	1.631
50	27.11	35.14	22.79	0.254	1.530
75	26.85	35.15	22.90	0.381	1.403
100	25.95	35.17	23.20	0.502	1.282
150	23.05	35.05	23.98	0.721	1.063
200	16.00	34.70	25.54	0.885	0.899
250	10.10	34.70	26.72	0.983	0.801
300	09.38	34.67	26.82	1.051	0.733
400	08.60	34.63	26.91	1.178	0.606
500	07.96	34.61	26.99	1.297	0.487
600	07.15	34.58	27.09	1.410	0.374
700	06.31	34.56	27.19	1.514	0.270
800	05.58	34.54	27.26	1.610	0.174
1000	04.51	34.54	27.39	1.784	0.000

STATION 39

M/V Hugh M. Smith: Cruise 5, 06°00'N, 157°57'W, August 1, 1950. Messenger time: 1213 GCT. Weather: broken clouds, cumulus. Wind: 120°, 14 kt. Sea: 1-3 ft. Wire angle: 32°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	27.30	34.08	22.55	4.66	0.62
08	27.44	34.83	22.47	4.71	0.51
42	27.44	34.83	22.47	4.64	0.48
81	26.55	34.94	22.84	4.29	0.62
150	17.40	34.72	25.22	3.29	1.17
299	11.54	34.67	26.44	1.15	2.39
309	09.90	34.67	26.73	0.59	2.70
466	08.36	34.61	26.93	0.95	2.90
628	07.12	34.54	27.06	0.78	3.17
796	05.70	34.54	27.25	1.03	3.28
973	04.48	34.54	27.39	1.45	3.28
1258 1/		34.61			

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	27.30	34.08	22.55	0.000	1.767
10	27.44	34.83	22.47	0.053	1.714
20	27.44	34.83	22.47	0.107	1.660
30	27.44	34.83	22.47	0.161	1.606
50	27.44	34.83	22.47	0.269	1.498
75	26.72	34.92	22.77	0.401	1.366
100	25.50	35.06	23.25	0.523	1.244
150	19.75	34.80	24.69	0.723	1.044
200	13.05	34.65	26.13	0.854	0.913
250	11.25	34.68	26.50	0.943	0.824
300	10.07	34.68	26.71	1.018	0.749
400	08.89	34.64	26.87	1.151	0.616
500	08.07	34.59	26.96	1.274	0.493
600	07.32	34.55	27.04	1.390	0.377
700	06.50	34.53	27.14	1.498	0.269
800	05.65	34.54	27.25	1.596	0.171
1000	04.33	34.54	27.41	1.767	0.000

1/ Bottle probably pretripped.

STATION 40

M/V Hugh M. Smith: Cruise 5, 07°00'N, 157°57'W August 1, 1950. Messenger time: 1927 GCT. Weather: scattered clouds, cumulus. Wind: 100°, 17 kt. Sea: 1-3 ft. Wire angle: 32°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	27.40	34.92	22.55	4.65	0.52
09	27.49	34.90	22.51	4.63	0.46
42	27.50	34.90	22.50	4.66	0.41
84	27.46	34.94	22.55	4.63	0.48
164	14.17	34.61	25.87	1.97	1.70
242	10.53	34.72	26.66	0.63	2.34
320	09.55	34.69	26.80	0.72	2.57
479	08.18	34.61	26.96	0.95	2.74
640	06.69	34.54	27.12	0.50	3.13
802	05.34	34.52	27.28	0.78	3.06
971	04.64	34.54	27.37	1.35	3.09
1245	03.64	34.56	27.49	1.60	3.17

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	27.40	34.92	22.55	0.000	1.711
10	27.49	34.90	22.51	0.053	1.658
20	27.49	34.90	22.51	0.107	1.604
30	27.49	34.90	22.51	0.160	1.551
50	27.50	34.90	22.50	0.268	1.443
75	27.49	34.91	22.51	0.402	1.309
100	27.38	34.94	22.57	0.536	1.175
150	15.65	34.63	25.56	0.731	0.980
200	11.40	34.67	26.46	0.833	0.878
250	10.45	34.73	26.68	0.909	0.802
300	09.79	34.71	26.78	0.978	0.733
400	08.88	34.65	26.88	1.108	0.603
500	07.98	34.60	26.98	1.229	0.482
600	07.05	34.55	27.08	1.342	0.369
700	06.11	34.52	27.18	1.446	0.265
800	05.35	34.52	27.28	1.540	0.171
1000	04.55	34.54	27.38	1.711	0.000

STATION 41

M/V Hugh M. Smith: Cruise 5, 08°00'N, 157°49'W, August 2, 1950. Messenger time: 0250 GCT. Weather: scattered clouds, cumulus and cirrus. Wind: 120°, 13 kt. Sea: 1-3 ft. Wire angle: 27°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	27.70	34.43	22.09	4.66	0.43
09	27.78	34.34	22.00	4.58	0.37
44	27.62	34.45	22.13	4.62	0.37
87	22.18	34.79	24.03	4.14	0.68
172	11.39	34.61	26.42	0.69	2.48
258	09.98	34.69	26.73	0.53	2.73
343	09.28	34.69	26.85	0.58	2.82
518	07.53	34.58	27.03	0.54	3.18
695	06.02	34.52	27.20	0.84	3.28
871	05.01	34.56	27.35	0.85	3.40
1051	04.26	1/		1.30	3.26
1327	03.42	34.56	27.51	1.48	3.23

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	Δ D1000-ΔD (dyn. m)
00	27.70	34.43	22.09	0.000	1.605
10	27.77	34.35	22.00	0.058	1.547
20	27.73	34.36	22.02	0.116	1.489
30	27.68	34.37	22.05	0.174	1.431
50	27.58	34.51	22.18	0.289	1.316
75	26.05	34.93	22.99	0.421	1.184
100	19.45	34.64	24.65	0.524	1.081
150	12.75	34.49	26.07	0.658	0.947
200	10.73	34.66	26.58	0.745	0.860
250	10.04	34.68	26.71	0.818	0.787
300	09.63	34.69	26.79	0.886	0.719
400	08.68	34.65	26.92	1.013	0.592
500	07.68	34.58	27.01	1.131	0.474
600	06.83	34.54	27.10	1.241	0.364
700	06.01	34.52	27.19	1.343	0.262
800	05.40	34.54	27.29	1.437	0.168
1000	04.52	34.56	27.40	1.605	0.000

1/ Sample bottle broken.

STATION 42

M/V Hugh M. Smith: Cruise 5, 09°00'N, 157°55'W, August 2, 1950. Messenger time: 1051 GCT. Weather: showers of rain, no observation. Wind: 130°, 12 kt. Sea: 1-3 ft. Wire angle: 10°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σt (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	27.00	34.31	22.22	4.67	0.41
09	27.15	34.23	22.11	4.65	0.38
49	26.88	34.36	22.30	4.72	0.37
97	14.22	34.33	25.64	3.03	1.16
194	10.29	34.63	26.63	0.44	2.39
290	09.45	34.61	26.76	0.47	2.44
385	08.38	34.56	26.89	0.66	2.64
574	06.58	34.51	27.11	0.56	2.87
765	05.40	34.52	27.27	0.73	2.99
955	04.42	34.52	27.38	1.01	2.87
1147	03.88	34.54	27.45	1.29	2.94
1440	03.22	34.52	27.50	1.26	2.92

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σt (gm/l)	ΔD (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	27.00	34.31	22.22	0.000	1.503
10	27.15	34.23	22.11	0.057	1.446
20	27.10	34.25	22.14	0.114	1.389
30	27.02	34.27	22.18	0.171	1.332
50	26.83	34.36	22.31	0.283	1.220
75	22.50	34.68	23.85	0.403	1.100
100	13.85	34.32	25.71	0.483	1.020
150	10.98	34.53	26.43	0.582	0.921
200	10.19	34.63	26.65	0.659	0.844
250	09.78	34.62	26.71	0.730	0.773
300	09.33	34.61	26.78	0.798	0.705
400	08.22	34.56	26.92	0.926	0.577
500	07.19	34.53	27.04	1.042	0.461
600	06.38	34.52	27.15	1.148	0.355
700	05.75	34.52	27.23	1.246	0.257
800	05.20	34.52	27.29	1.338	0.165
1000	04.20	34.53	27.41	1.503	0.000

STATION 43

M/V Hugh M. Smith: Cruise 5, 10°00'N, 157°53'W, August 2, 1950. Messenger time: 1815 GCT. Weather: scattered clouds, cumulus and altocumulus. Wind: 070°, 7 kt. Sea: 1-3 ft. Wire angle: 27°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.90	34.13	22.12	4.96	0.43
09	27.03	34.13	22.08	4.58	0.39
44	26.48	34.54	22.56	4.71	0.40
87	23.51	34.58	23.49	4.75	0.48
173	11.34	34.49	26.33	0.78	2.57
258	10.08	34.63	26.67		
343	09.10	34.63	26.83	0.63	2.83
517	07.46	34.54	27.01	0.65	3.11
694	05.86	34.49	27.19	0.79	3.28
872	04.82	34.52	27.34	1.11	3.34
1053	04.11	34.54	27.43	1.26	3.33
1331	03.26	34.58	27.55	1.70	3.45

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.90	34.13	22.12	0.000	1.616
10	27.03	34.13	22.08	0.057	1.559
20	27.03	34.13	22.08	0.115	1.501
30	27.00	34.14	22.09	0.173	1.443
50	26.45	34.55	22.57	0.283	1.333
75	25.71	34.58	22.83	0.413	1.203
100	20.25	34.62	24.43	0.521	1.095
150	12.22	34.36	26.07	0.659	0.957
200	10.84	34.57	26.49	0.748	0.868
250	10.15	34.63	26.66	0.825	0.791
300	09.58	34.63	26.75	0.895	0.721
400	08.55	34.60	26.90	1.025	0.591
500	07.61	34.55	27.00	1.144	0.472
600	06.68	34.51	27.10	1.255	0.361
700	05.81	34.50	27.20	1.357	0.259
800	05.20	34.51	27.29	1.449	0.167
1000	04.34	34.54	27.41	1.616	0.000

STATION 44

M/V Hugh M. Smith: Cruise 5, 11°00'N, 157°55'W, August 3, 1950. Messenger time: 0215 GCT. Weather: broken clouds, cumulus. Wind: 060°, 12 kt. Sea: 1-3 ft. Wire angle: 40°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σt (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	27.10	34.70	22.48	4.69	0.36
09	27.20	34.60	22.37	4.70	0.32
38	26.58	34.70	22.65	4.76	0.34
74	25.84	34.67	22.85	4.81	0.36
145	13.54	34.29	25.75	2.26	1.64
212	10.52	34.54	26.52	0.76	2.33
279	09.90	34.67	26.73	0.35	2.46
412	08.61	34.60	26.88	0.57	2.51
546	07.11	34.49	27.02	0.26	2.92
680	05.90	34.45	27.15	0.52	3.08
819	05.07	34.52	27.31	0.51	3.08
1066	04.02	34.54	27.44	0.97	3.04

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σt (gm/l)	ΔD (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	27.10	34.70	22.48	0.000	1.625
10	27.17	34.60	22.38	0.054	1.571
20	26.88	34.67	22.53	0.108	1.517
30	26.69	34.70	22.61	0.161	1.464
50	26.42	34.70	22.70	0.266	1.359
75	25.83	34.68	22.87	0.393	1.232
100	21.32	34.82	24.29	0.502	1.123
150	13.05	34.28	25.84	0.649	0.976
200	10.89	34.45	26.39	0.747	0.878
250	10.08	34.64	26.68	0.825	0.800
300	09.72	34.66	26.75	0.894	0.731
400	08.73	34.60	26.87	1.026	0.599
500	07.68	34.53	26.97	1.148	0.477
600	06.60	34.47	27.08	1.261	0.364
700	05.76	34.46	27.18	1.365	0.260
800	05.14	34.51	27.29	1.458	0.167
1000	04.30	34.53	27.40	1.625	0.000

STATION 45

M/V Hugh M. Smith: Cruise 5, 11°59'N, 158°04'W, August 3, 1950. Messenger time: 1016 GCT. Weather: scattered clouds, no observation. Wind: 050°, 11 kt. Sea: 1-3 ft. Wire angle: 25°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.30	34.67	22.71	4.79	0.46
09	26.48	34.63	22.63	4.72	0.41
44	26.22	34.69	22.75	4.70	0.38
88	22.50	34.87	24.00	5.14	0.40
175	12.20	34.47	26.16	1.29	2.31
260	10.72	34.67	26.59	0.44	2.70
345	09.97	34.69	26.74	0.14	2.82
513	08.20	34.58	26.93	0.24	3.08
683	06.48	34.54	27.15	0.37	3.38
854	05.14	34.52	27.30	0.52	3.48
1028	04.38	34.52	27.39	0.91	3.42
1302	03.51	34.56	27.51	1.29	3.32

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.30	34.67	22.71	0.000	1.666
10	26.48	34.63	22.63	0.052	1.614
20	26.47	34.63	22.63	0.104	1.562
30	26.35	34.68	22.70	0.156	1.510
50	26.22	34.69	22.75	0.259	1.407
75	25.93	34.71	22.86	0.386	1.280
100	20.08	34.81	24.62	0.492	1.174
150	15.25	34.43	25.50	0.639	1.027
200	11.85	34.53	26.27	0.748	0.918
250	10.88	34.65	26.54	0.832	0.834
300	10.35	34.69	26.67	0.907	0.759
400	09.43	34.66	26.80	1.046	0.620
500	08.32	34.59	26.92	1.174	0.492
600	07.26	34.56	27.06	1.291	0.375
700	06.30	34.54	27.17	1.397	0.269
800	05.46	34.53	27.27	1.493	0.173
1000	04.59	34.52	27.36	1.666	0.000

STATION 46

M/V Hugh M. Smith: Cruise 5, 13°00'N, 157°58'W, August 3, 1950. Messenger time: 1832 GCT. Weather: broken clouds, cumulus and altocumulus. Wind: 010°, 8 kt. Sea: 1-3 ft. Wire angle: 03°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σt (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	26.20	34.61	22.70	4.76	0.31
10	26.32	34.56	22.62	4.77	0.33
50	26.24	34.61	22.69	4.78	0.32
99	24.46	34.76	23.34	5.04	0.27
198	12.06	34.54	26.24	0.49	2.41
295	10.54	34.67	26.62	0.26	2.50
393	09.55	34.63	26.76	0.29	2.62
586	07.36	34.51	27.00	0.35	2.89
780	05.69	34.47	27.20	0.47	2.88
974	04.72	34.49	27.32	0.76	2.95
1168	03.99	34.51	27.42	1.11	3.00
1461	03.25	34.54	27.51	1.48	2.92

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σt (gm/l)	ΔD (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.20	34.61	22.70	0.000	1.747
10	26.32	34.56	22.62	0.052	1.695
20	26.30	34.58	22.64	0.104	1.643
30	26.29	34.58	22.65	0.157	1.590
50	26.24	34.61	22.69	0.261	1.486
75	26.18	34.63	22.72	0.390	1.357
100	24.15	34.79	23.46	0.511	1.236
150	15.75	34.48	25.42	0.688	1.059
200	12.00	34.55	26.26	0.799	0.948
250	11.13	34.65	26.50	0.884	0.863
300	10.50	34.67	26.63	0.961	0.786
400	09.48	34.62	26.76	1.104	0.643
500	08.39	34.56	26.89	1.236	0.511
600	07.20	34.50	27.02	1.357	0.390
700	06.20	34.47	27.13	1.466	0.281
800	05.55	34.48	27.22	1.566	0.181
1000	04.63	34.49	27.33	1.747	0.000

STATION 47

M/V Hugh M. Smith: Cruise 5, 14°00'N, 157°54'W, August 4, 1950. Messenger time: 0311 GCT. Weather: broken clouds, cumulus, altostratus and cirrostratus. Wind: 080°, 15 kt. Sea: < 1 ft. Wire angle: 08°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	26.60	34.60	22.57	4.78	0.42
10	26.72	34.56	22.50	4.74	0.38
49	26.38	34.56	22.61	4.80	0.39
98	24.48	34.67	23.27	5.02	0.36
195	12.76	34.25	25.88	2.98	1.62
292	09.95	34.52	26.60	0.50	2.78
387	08.98	34.58	26.81	0.48	2.63
578	07.36	34.52	27.01	0.58	3.08
770	05.88	34.47	27.17	0.59	3.26
962	04.98	34.49	27.30	0.67	3.40
1155	04.21	34.49	27.38	1.21	3.18
1446	03.24	34.54	27.52	1.56	3.15

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.60	34.60	22.57	0.000	1.783
10	26.72	34.56	22.50	0.053	1.730
20	26.63	34.56	22.53	0.107	1.676
30	26.51	34.56	22.56	0.160	1.623
50	26.38	34.56	22.60	0.266	1.517
75	26.29	34.56	22.63	0.397	1.386
100	24.15	34.71	23.40	0.520	1.263
150	18.35	34.72	24.99	0.709	1.074
200	12.25	34.27	25.99	0.836	0.947
250	10.50	34.44	26.45	0.929	0.854
300	09.87	34.54	26.63	1.007	0.776
400	08.81	34.58	26.84	1.145	0.638
500	07.98	34.55	26.94	1.271	0.512
600	07.16	34.51	27.03	1.388	0.395
700	06.32	34.48	27.12	1.497	0.286
800	05.69	34.48	27.20	1.598	0.185
1000	04.80	34.49	27.32	1.783	0.000

STATION 48

M/V Hugh M. Smith: Cruise 5, 14°58'N, 157°55'W, August 4, 1950. Messenger time: first cast, 1115 GCT; second cast, 1229 GCT. Weather: scattered clouds, cumulus. Wind: 080°, 20 kt. Sea: 3-5 ft. Wire angle: first cast, 08°; second cast, 07°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.10	34.69	22.79	4.73	0.36
10	26.33	34.67	22.70	4.76	0.33
49	26.32	34.63	22.67	4.81	0.32
97	23.08	34.99	23.93	5.22	0.27
192	13.44	34.33	25.80	3.22	1.19
287	10.23	34.54	26.56	0.79	2.46
382	09.20	34.56	26.76	0.46	2.43
574	07.18	34.51	27.03	0.62	2.73
766	05.62	34.49	27.22	0.73	2.92
960	04.72	34.51	27.34	0.84	3.12
1156	03.99	34.54	27.45	1.27	2.95
1450	03.26	34.60	27.56	1.58	3.06
1942	02.31	34.61	27.65	2.04	2.67
1942					2.89
2438	01.91	34.63	27.72	2.82	2.57
2934	01.75	34.67	27.75	2.76	2.43
3430	01.51	34.67	27.76	2.82	2.44

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.10	34.69	22.79	0.000	1.748
10	26.33	34.67	22.70	0.051	1.697
20	26.33	34.66	22.70	0.103	1.645
30	26.33	34.65	22.69	0.155	1.593
50	26.31	34.63	22.68	0.259	1.489
75	26.20	34.63	22.71	0.389	1.359
100	22.90	35.01	23.99	0.503	1.245
150	18.81	34.86	24.98	0.679	1.069
200	12.58	34.34	25.98	0.808	0.940
250	10.51	34.53	26.52	0.900	0.848
300	10.19	34.54	26.58	0.979	0.769
400	08.98	34.56	26.80	1.123	0.625
500	07.90	34.54	26.95	1.250	0.498
600	06.92	34.51	27.07	1.366	0.382
700	06.06	34.49	27.16	1.472	0.276
800	05.40	34.49	27.25	1.569	0.179
1000	04.62	34.51	27.35	1.748	0.000

STATION 49

M/V Hugh M. Smith: Cruise 5, 17°00'N, 158°08'W, August 5, 1950. Messenger time: 0412 GCT. Weather: broken clouds, cumulus, altostratus and cirrus. Wind: 080°, 17 kt. Sea: 3-5 ft. Wire angle: 30°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	25.60	34.81	23.04	4.82	0.46
08	25.78	34.79	22.96	4.85	0.26
44	25.67	34.79	22.99	4.90	0.26
87	24.76	34.78	23.27	5.00	0.29
171	20.74	35.14	24.69	4.75	0.35
253	14.02	34.40	25.74	4.07	0.97
332	09.70	34.18	26.38	2.99	1.94
493	06.79	34.31	26.93	0.97	2.87
656	05.54	34.36	27.12	0.84	3.08
823	04.82	34.42	27.26	0.93	3.13
999	04.20	34.49	27.38	1.16	3.16
1279	03.40	34.52	27.48	1.40	3.11

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	25.60	34.81	23.04	0.000	1.867
10	25.78	34.79	22.96	0.049	1.818
20	25.76	34.79	22.97	0.098	1.769
30	25.73	34.79	22.98	0.147	1.720
50	25.66	34.79	23.00	0.245	1.622
75	25.01	34.78	23.19	0.365	1.502
100	24.25	34.80	23.44	0.480	1.387
150	21.66	35.18	24.47	0.681	1.186
200	18.82	34.96	25.06	0.844	1.023
250	14.20	34.42	25.72	0.977	0.890
300	11.03	34.18	26.15	1.084	0.783
400	08.08	34.30	26.73	1.251	0.616
500	06.70	34.32	26.95	1.330	0.487
600	05.95	34.34	27.06	1.494	0.373
700	05.31	34.37	27.16	1.598	0.269
800	04.89	34.41	27.24	1.694	0.173
1000	04.19	34.49	27.38	1.867	0.000

STATION 50

M/V Hugh M. Smith: Cruise 5, 19°02'N, 157°59'W, August 5, 1950. Messenger time: 2035 GCT. Weather: broken clouds, cumulus, altocumulus and altostratus. Wind: 050°, 14 kt. Sea: 1-3 ft. Wire angle: 03°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	25.90	34.72	22.87	4.88	0.31
10	26.12	34.70	22.79	4.85	0.26
50	25.30	34.72	23.06	5.04	0.23
99	22.87	35.12	24.08	4.97	0.24
196	18.96	34.96	25.02	4.54	0.40
292	11.60	34.18	26.05	4.09	1.17
388	08.02	34.09	26.58	2.56	2.11
580	05.70	34.25	27.02	0.84	2.61
774	04.86	34.38	27.22	0.92	2.57
967	04.22	34.47	27.36	1.10	2.77
1161	03.66	34.49	27.44	1.25	2.66
1455	02.85	34.49	27.51	1.53	2.75

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	25.90	34.72	22.87	0.000	1.858
10	26.12	34.70	22.79	0.050	1.808
20	26.05	34.70	22.81	0.101	1.757
30	26.01	34.70	22.83	0.152	1.706
50	25.30	34.72	23.06	0.251	1.607
75	23.70	34.97	23.73	0.364	1.494
100	22.82	35.12	24.10	0.464	1.394
150	20.56	35.12	24.72	0.643	1.215
200	18.81	34.94	25.04	0.800	1.058
250	16.25	34.64	25.43	0.941	0.917
300	11.22	34.16	26.10	1.056	0.802
400	07.82	34.09	26.61	1.231	0.627
500	06.32	34.17	26.88	1.369	0.489
600	05.59	34.27	27.05	1.486	0.372
700	05.13	34.33	27.15	1.591	0.267
800	04.78	34.40	27.25	1.687	0.171
1000	04.10	34.48	27.38	1.858	0.000

STATION 51

M/V Hugh M. Smith: Cruise 5, 20°53'N, 158°02'W, August 6, 1950. Messenger time: 0930 GCT. Weather: scattered clouds, no observation. Wind: 060°, 19 kt. Sea: 3-5 ft. Wire angle: 25°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	25.10	34.83	23.20	4.95	0.32
09	25.23	34.78	23.13	4.92	0.31
46	25.24	34.78	23.12	4.94	0.26
91	23.46	34.96	23.79	5.19	0.28
181	19.20	34.88	24.90	4.62	0.44
270	14.12	34.38	25.70	4.13	0.94
359	09.52	34.11	26.36	3.50	1.78
538	06.34	34.16	26.87	1.20	2.82
717	05.07	34.36	27.18	0.97	3.11
901	04.38	34.45	27.33	1.14	3.13
1088	03.80	34.51	27.44	1.27	3.11
1374	03.13	34.54	27.53	1.49	3.04

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	Δ D 1000 - Δ D (dyn. m)
00	25.10	34.83	23.20	0.000	1.887
10	25.23	34.78	23.13	0.047	1.840
20	25.23	34.78	23.13	0.095	1.792
30	25.24	34.78	23.12	0.142	1.745
50	25.24	34.78	23.12	0.238	1.649
75	24.00	34.90	23.59	0.352	1.535
100	23.11	34.98	23.91	0.457	1.430
150	20.78	34.98	24.56	0.644	1.243
200	18.02	34.78	25.12	0.803	1.084
250	15.45	34.51	25.51	0.940	0.947
300	12.32	34.24	25.96	1.057	0.830
400	08.45	34.10	26.52	1.243	0.644
500	06.78	34.14	26.79	1.389	0.498
600	05.81	34.23	26.99	1.514	0.373
700	05.15	34.34	27.16	1.621	0.266
800	04.65	34.41	27.27	1.716	0.171
1000	04.20	34.47	27.37	1.887	0.000

STATION 1

M/V Hugh M. Smith: Cruise 8, 20°48'N, 157°30'W, January 15, 1951. Messenger time: 0522 GCT. Weather: overcast (with breaks), no observation. Wind: 070°, 35 kt. Sea: 12 to 20 ft. Wire angle: 35°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	24.50	34.88	23.42	4.94	
10	24.51	34.88	23.42	4.83	
26	24.52	34.88	23.42	4.85	
51	24.52	34.88	23.42	4.98	
100	24.42	34.96	23.51	4.92	
200	17.41	34.74	25.24	4.22	
302	11.93	34.22	26.02	4.05	
397	08.76	34.13	26.50	3.00	
498		34.92			
595	05.98	34.29	27.02	1.54	
797	04.74	34.43	27.28	0.93	
999	04.00	34.50	27.41	1.23	
1197	03.61	34.56	27.50	1.39	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	24.50	34.88	23.42	0.000	1.854
10	24.51	34.88	23.42	0.045	1.809
20	24.51	34.88	23.42	0.090	1.764
30	24.52	34.88	23.42	0.134	1.720
50	24.52	34.88	23.42	0.224	1.630
75	24.48	34.92	23.46	0.336	1.518
100	24.42	34.96	23.51	0.447	1.407
150	21.17	35.22	24.63	0.642	1.212
200	17.41	34.74	25.24	0.797	1.057
250	13.87	34.39	25.76	0.925	0.929
300	12.00	34.22	26.00	1.035	0.819
400	08.67	34.13	26.51	1.219	0.635
500	07.00	34.20	26.81	1.365	0.489
600	05.93	34.29	27.02	1.488	0.366
700	05.20	34.37	27.17	1.593	0.261
800	04.70	34.41	27.26	1.687	0.167
1000	03.99	34.50	27.41	1.854	0.000

STATION 2

M/V Hugh M. Smith: Cruise 8, 18°47'N, 158°01'W, January 15-16, 1951. Messenger time: first cast, 2330 GCT; second cast, 0000 GCT. Weather: scattered clouds, no observation. Wind: 090°, 25 kt. Sea: 12 to 20 ft. Wire angle: first cast, 50°; second cast, no observation

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
3/00				4.85	
19	24.58	34.84	23.37	4.82	
40	24.56	34.83	23.37	4.79	
73	24.49	34.83	23.39	4.83	
143	24.08	35.05	23.68	4.81	
206	20.20	35.15	24.84	4.69	
268	15.00	34.45	25.57	3.97	
333 1/	11.23	34.21	26.14	3.61	
301 1/2/	10.85	34.19	26.19	3.83	
394					
437 1/2/	08.72	34.35	26.67	1.18	
527					
521 1/2/	07.20	34.33	26.89	0.87	
662					
795 1/	05.56	34.41	27.16	0.78	
795	05.94	34.41	27.12		

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	24.60	34.84	23.36		
10	24.59	34.84	23.37		
20	24.58	34.84	23.37		
30	24.57	34.83	23.36		
50	24.52	34.83	23.38		
75	24.48	34.84	23.40		
100	24.40	34.88	23.45		
150	24.00	35.07	23.72		
200	21.07	35.23	24.67		
250	17.03	34.70	25.30		

1/ Bottles below 268 m. apparently pretripped.

2/ Double depths result from disagreement between readings of unprotected thermometers at these depths.

3/ First 2 Nansen bottles omitted from cast. Surface oxygen value obtained from a bucket sample.

STATION 4

M/V Hugh M. Smith: Cruise 8, 14°30'N, 158°00'W, January 17, 1951. Messenger time: 1808 GCT. Weather: scattered clouds, cumulus. Wind: 060°, 28 kt. Sea: 12 to 20 ft. Wire angle: 45°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00		34.62		4.85	
11	24.52	34.44	23.09	4.77	
24	24.52	34.43	23.08	4.83	
51	24.52	34.43	23.08	4.77	
99	21.44	35.21	24.55	4.74	
190	14.82	34.43	25.59	3.91	
278	10.62	34.52	26.49	0.71	
369	08.65	34.44	26.75	0.53	
457	07.37	34.42	26.93	0.65	
550	06.48	34.43	27.06	0.66	
742	05.21	34.46	27.23	0.86	
942	04.37	34.50	27.37	1.04	
868 1/	04.78	34.50	27.33	1.06	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	24.50	34.62	23.23	0.000	1.646
10	24.52	34.44	23.08	0.047	1.599
20	24.52	34.43	23.08	0.095	1.551
30	24.52	34.43	23.08	0.143	1.503
50	24.52	34.43	23.08	0.297	1.349
75	22.62	35.22	24.23	0.347	1.299
100	21.40	35.20	24.56	0.436	1.210
150	19.00	34.95	25.00	0.598	1.048
200	13.92	34.38	25.74	0.732	0.914
250	11.09	34.46	26.36	0.834	0.812
300	10.07	34.60	26.65	0.914	0.732
400	08.13	34.42	26.82	1.054	0.592
500	06.90	34.43	27.00	1.177	0.469
600	06.11	34.44	27.12	1.286	0.360
700	05.47	34.46	27.21	1.386	0.260
800	04.89	34.48	27.30	1.478	0.168
1000	(04.20)	(34.50)	27.39	1.646	0.000

1/ Bottom bottle pretripped.

STATION 6

M/V Hugh M. Smith: Cruise 8, 13°00'N, 158°00'W, January 18, 1951. Messenger time: 0740 GCT. Weather: broken clouds, no observation. Wind: 090°, 23 kt. Sea: 12-20 ft. Wire angle: 22°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	25.40	34.21	22.64	4.73	
14	25.39	34.23	22.66	4.77	
32	25.40	34.22	22.65	4.79	
69	25.36	34.27	22.70	4.74	
136	13.85	34.39	25.77	2.79	
266	09.86	34.62	26.70	0.41	
402	08.67	34.57	26.85	0.39	
534	07.51	34.52	26.99	0.45	
674	06.28	34.47	27.12	0.38	
814	05.36	34.50	27.26	0.51	
1101	04.25	34.52	27.40	0.78	
1381	03.45	34.56	27.51	1.37	
1680	02.81	34.55	27.56	1.72	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	25.40	34.21	22.64	0.000	1.604
10	25.38	34.22	22.66	0.052	1.552
20	25.39	34.23	22.66	0.104	1.500
30	25.40	34.22	22.65	0.156	1.448
50	25.40	34.24	22.67	0.261	1.343
75	24.30	34.80	23.42	0.382	1.222
100	18.30	34.53	24.86	0.478	1.126
150	12.70	34.40	26.01	0.608	0.996
200	10.85	34.55	26.47	0.700	0.904
250	10.06	34.63	26.67	0.776	0.828
300	09.55	34.60	26.74	0.847	0.757
400	08.70	34.57	26.85	0.981	0.623
500	07.86	34.54	26.95	1.106	0.498
600	06.91	34.49	27.05	1.222	0.382
700	06.12	34.48	27.15	1.329	0.275
800	05.46	34.50	27.25	1.427	0.177
1000	04.53	34.52	27.37	1.604	0.000

STATION 7

M/V Hugh M. Smith: Cruise 8, 11°59'N, 157°50'W, January 18, 1951. Messenger time: 1726 GCT. Weather: broken clouds, cumulus and stratocumulus. Wind: 090°, 23 kt. Sea: 12-20 ft. Wire angle: 09°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σt (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00		34.23		4.73	
10	25.60	34.23	22.60	4.74	
30	25.61	34.21	22.58	4.72	
45	25.62	34.22	22.58	4.71	
152	13.75	34.34	25.75	3.04	
270	09.92	34.62	26.69	0.44	
386	08.95	34.57	26.81	0.71	
498	07.99	34.53	26.93	0.54	
611		34.21			
723	06.10	34.51	27.18	0.34	
954	04.72	34.50	27.33	0.73	
1173	03.87	34.55	27.46	1.31	
1385	03.28	34.53	27.50	1.51	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σt (gm/l)	ΔD (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	25.60	34.23	22.60	0.000	1.660
10	25.60	34.23	22.60	0.053	1.607
20	25.61	34.22	22.59	0.105	1.555
30	25.61	34.21	22.58	0.158	1.502
50	25.62	34.22	22.58	0.264	1.396
75	25.50	34.26	22.65	0.395	1.265
100	21.90	35.23	24.44	0.505	1.155
150	14.00	34.35	25.70	0.652	1.008
200	11.00	34.55	26.44	0.751	0.909
250	10.10	34.62	26.66	0.829	0.831
300	09.68	34.60	26.71	0.900	0.760
400	08.82	34.57	26.83	1.035	0.625
500	07.97	34.53	26.93	1.161	0.499
600	07.12	34.52	27.05	1.278	0.382
700	06.30	34.51	27.15	1.385	0.275
800	05.55	34.50	27.24	1.484	0.176
1000	04.53	34.52	27.37	1.660	0.000

STATION 8

M/V Hugh M. Smith: Cruise 8, 11°00'N, 157°53'W, January 19, 1951. Messenger time: 0150 GCT. Weather: broken clouds, cumulus. Wind: 090°, 20 kt. Sea: 3-5 ft. Wire angle: 20°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00		34.34		4.77	
10	25.88	34.33	22.59	4.73	
27	25.88	34.31	22.57	4.72	
55	25.84	34.31	22.58	4.72	
108	17.58	34.69	25.16	4.24	
214	10.75	34.62	26.54	0.34	
318	09.70	34.68	26.77	0.30	
419	08.78	34.59	26.85	0.36	
526	07.59	34.53	26.99	0.55	
629	06.57	34.45	27.06	0.48	
843	05.12	34.54	27.32	0.45	
1049	04.23	34.51	27.39	1.25	
1261	03.60	34.53	27.47	1.49	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	25.80	34.34	22.62	0.000	1.571
10	25.88	34.33	22.59	0.053	1.518
20	25.88	34.32	22.58	0.105	1.466
30	25.88	34.31	22.57	0.158	1.413
50	25.86	34.31	22.58	0.264	1.307
75	23.20	35.08	23.96	0.380	1.191
100	18.80	34.81	24.95	0.468	1.103
150	12.46	34.40	26.05	0.595	0.976
200	10.87	34.61	26.51	0.684	0.887
250	10.35	34.70	26.68	0.759	0.812
300	09.88	34.70	26.76	0.829	0.742
400	08.93	34.61	26.84	0.961	0.610
500	07.88	34.55	26.96	1.086	0.485
600	06.83	34.46	27.04	1.201	0.370
700	06.03	34.48	27.16	1.308	0.263
800	05.38	34.54	27.29	1.403	0.168
1000	04.40	34.53	27.39	1.571	0.000

STATION 9

M/V Hugh M. Smith: Cruise 8, 10°00'N, 157°56'W, January 19, 1951. Messenger time: 1032 GCT. Weather: overcast (with breaks), cumulus. Wind: 080°, 22 kt. Sea: 5-8 ft. Wire angle: 13°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00		34.33		4.68	
10	26.08	34.24	22.46	4.67	
23	26.10	34.28	22.48	4.69	
53	26.09	34.27	22.48	4.68	
106	17.68	34.61	25.07	4.26	
210	10.76			0.60	
311	09.50	34.63	26.77	0.53	
419	08.45	34.59	26.90	0.65	
522	07.49	34.50	26.98	0.81	
627	06.58	34.55	27.14	0.80	
830	05.22	34.48	27.26	1.00	
1027	04.36	34.52	27.40	1.37	
1239	03.71	34.52	27.46	1.51	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.10	34.33	22.52	0.000	1.575
10	26.08	34.24	22.46	0.054	1.521
20	26.10	34.27	22.47	0.108	1.467
30	26.10	34.28	22.48	0.161	1.414
50	26.09	34.27	22.48	0.269	1.306
75	22.50	34.83	23.97	0.386	1.189
100	18.12	34.85	24.96	0.474	1.101
150	12.48	34.55	26.17	0.598	0.977
200	11.00	34.63	26.51	0.685	0.890
250	10.12	34.65	26.68	0.761	0.814
300	09.63	34.64	26.75	0.831	0.744
400	08.66	34.60	26.88	0.962	0.613
500	07.71	34.52	26.96	1.086	0.489
600	06.82	34.54	27.10	1.199	0.376
700	06.06	34.52	27.19	1.302	0.273
800	05.42	34.48	27.24	1.399	0.176
1000	04.45	34.52	27.38	1.575	0.000

STATION 10

M/V Hugh M. Smith: Cruise 8, 09°00'N, 157°58'W, January 19, 1951. Messenger time: first cast, 1930 GCT; second cast, 2015 GCT. Weather: continuous moderate rain, nimbostratus. Wind: 090°, 22 kt. Sea: 12-20 ft. Wire angle: first cast, 10°; second cast, 10°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
07	26.45	34.24	22.34	4.70	
13	26.45	34.24	22.34	4.72	
22	26.46	34.25	22.35	4.73	
53	26.47	34.23	22.33	4.70	
107	15.57	34.59	25.55	3.60	
217	10.48	34.69	26.64	0.39	
325	09.48	34.67	26.80	0.63	
435	08.49	34.59	26.90	0.56	
540	07.26	34.53	27.03	0.67	
646	06.32	34.51	27.15	0.73	
897	04.94	34.58	27.37	0.91	
1103	04.06	34.52	27.42	1.26	
1305	03.52	34.61	27.54	1.50	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	(26.50)	(34.24)	22.33	0.000	1.547
10	26.45	34.24	22.34	0.055	1.492
20	26.45	34.25	22.35	0.110	1.437
30	26.46	34.24	22.34	0.165	1.382
50	26.47	34.23	22.33	0.276	1.271
75	23.12	34.77	23.75	0.397	1.150
100	17.72	34.69	25.12	0.486	1.061
150	11.55	34.64	26.41	0.599	0.948
200	10.68	34.68	26.60	0.678	0.869
250	10.28	34.69	26.68	0.751	0.796
300	09.73	34.69	26.78	0.820	0.727
400	08.80	34.62	26.87	0.950	0.597
500	07.73	34.55	26.98	1.072	0.475
600	06.71	34.51	27.09	1.184	0.363
700	05.93	34.52	27.20	1.286	0.261
800	05.39	34.55	27.29	1.378	0.169
1000	04.48	34.54	27.39	1.547	0.000

STATION 11

M/V Hugh M. Smith: Cruise 8, 08°04'N, 157°58'W, January 20, 1951. Messenger time: 0540 GCT. Weather: broken clouds, no observation. Wind: 090°, 23 kt. Sea: 12-20 ft. Wire angle: 10°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.70	34.50	22.46	4.65	
10	26.72	34.50	22.45	4.70	
25	26.72	34.50	22.45	4.77	
55	26.76	34.50	22.44	4.66	
110	18.27	34.74	25.02	3.12	
215	10.64	34.66	26.60	0.86	
320	09.44	34.67	26.81	0.98	
429	08.66	34.61	26.89	1.20	
533	07.63	34.58	27.02	0.78	
638	06.59	34.54	27.13	1.00	
843	05.40	34.53	27.28	0.79	
1050	04.42	34.52	27.38	1.51	
1256	03.68	34.57	27.50	1.48	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.70	34.50	22.46	0.000	1.581
10	26.72	34.50	22.45	0.054	1.527
20	26.72	34.50	22.45	0.108	1.473
30	26.72	34.50	22.45	0.162	1.419
50	26.75	34.50	22.44	0.270	1.311
75	23.40	34.95	23.80	0.390	1.191
100	18.79	34.77	24.92	0.480	1.101
150	13.45	34.53	25.96	0.610	0.971
200	11.00	34.63	26.51	0.702	0.879
250	10.19	34.69	26.70	0.776	0.805
300	09.62	34.68	26.79	0.845	0.736
400	08.88	34.62	26.86	0.975	0.606
500	08.00	34.59	26.97	1.098	0.483
600	06.94	34.55	27.09	1.211	0.370
700	06.18	34.61	27.24	1.311	0.270
800	05.64	34.53	27.25	1.404	0.177
1000	04.67	34.52	27.35	1.581	0.000

STATION 12

M/V Hugh M. Smith: Cruise 8, 07°08'N, 157°58'W, January 20, 1951. Messenger time: 1413 GCT. Weather: scattered clouds, cumulus. Wind: 080°, 20 kt. Sea: 5-8 ft. Wire angle: 12°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.70	34.39	22.38	4.63	
10	26.71	34.37	22.36	4.64	
26	26.72	34.39	22.37	4.64	
55	26.74	34.48	22.43	4.63	
108	18.52	34.67	24.91	3.52	
217	10.42	34.70	26.66	0.82	
323	09.15	34.64	26.83	1.07	
433	08.48	34.59	26.90	1.05	
538	07.74	34.56	26.99	0.88	
642	06.71	34.52	27.10	0.87	
851	05.31	34.52	27.28	1.25	
1065	04.32	34.53	27.40	1.43	
1267	03.78	34.53	27.46	1.59	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.70	34.39	22.38	0.000	1.646
10	26.71	34.37	22.36	0.055	1.591
20	26.72	34.38	22.36	0.110	1.536
30	26.72	34.40	22.38	0.165	1.481
50	26.73	34.47	22.43	0.274	1.372
75	25.40	34.94	23.19	0.401	1.245
100	24.00	35.06	23.71	0.513	1.133
150	13.31	34.50	25.96	0.671	0.975
200	10.83	34.68	26.58	0.761	0.885
250	10.02	34.69	26.73	0.834	0.812
300	09.40	34.66	26.81	0.901	0.745
400	08.68	34.61	26.88	1.029	0.617
500	08.07	34.57	26.95	1.152	0.494
600	07.15	34.53	27.05	1.268	0.378
700	06.28	34.52	27.16	1.375	0.271
800	05.57	34.52	27.25	1.472	0.174
1000	04.56	34.53	27.37	1.646	0.000

STATION 13

M/V Hugh M. Smith: Cruise 8, 05°59'N, 158°00'W, January 21, 1951. Messenger time: 0020 GCT. Weather: broken clouds, cumulus and altocumulus. Wind: 100°, 18 kt. Sea: 5-8 ft. Wire angle: 0°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.60	35.11	22.95	4.71	
09	26.60	35.12	22.96	4.65	
35	26.56	35.11	22.96	4.64	
66	26.54	35.08	22.94	4.65	
121	25.18	35.15	23.42	4.13	
232	10.31	34.72	26.70	0.54	
338	08.92	34.65	26.88	1.53	
460	08.18	34.57	26.93	1.33	
553	07.38	34.60	27.07	0.82	
662	06.31	34.54	27.17	0.53	
887	04.89	34.55	27.35	1.10	
1097	04.12	34.59	27.47	1.44	
1296	03.52	34.61	27.54	1.68	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.60	35.11	22.95	0.000	1.652
10	26.60	35.12	22.96	0.049	1.603
20	26.58	35.12	22.96	0.098	1.554
30	26.57	35.11	22.96	0.148	1.504
50	26.55	35.10	22.96	0.246	1.406
75	26.52	35.09	22.96	0.370	1.282
100	25.87	35.15	23.21	0.490	1.162
150	17.24	34.58	25.15	0.680	0.972
200	11.65	34.64	26.39	0.794	0.858
250	10.09	34.72	26.74	0.870	0.782
300	09.40	34.68	26.82	0.937	0.715
400	08.50	34.59	26.90	1.064	0.588
500	07.86	34.57	26.98	1.185	0.467
600	06.90	34.58	27.12	1.295	0.357
700	06.00	34.54	27.21	1.396	0.256
800	05.30	34.55	27.31	1.487	0.165
1000	04.46	34.57	27.42	1.652	0.000

STATION 14

M/V Hugh M. Smith: Cruise 8, 05°00'N, 158°00'W, January 21, 1951. Messenger time: 0845 GCT. Weather: scattered clouds, no observation. Wind: 130°. 25 kt. Sea: 8-12 ft. Wire angle: 15°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.50	35.09	22.97	4.64	
10	26.46	35.08	22.97	4.56	
25	26.41	35.12	23.01	4.61	
55	26.20	35.10	23.07	4.58	
112	26.11	35.16	23.14	4.47	
214	11.78	34.63	26.36	1.17	
319	09.20	34.67	26.85	1.63	
426	08.26	34.61	26.95	1.18	
530	07.68	34.59	27.02	0.96	
633	06.66	34.56	27.14	0.80	
836	05.14	34.53	27.31	1.00	
1046	04.24	34.56	27.43	1.40	
1046	04.32	34.56	27.42		
1252	03.52	34.56	27.50	1.78	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.50	35.09	22.97	0.000	1.740
10	26.46	35.08	22.97	0.049	1.691
20	26.44	35.09	22.98	0.098	1.642
30	26.40	35.12	23.02	0.147	1.593
50	26.20	35.10	23.07	0.244	1.496
75	26.18	35.12	23.09	0.364	1.376
100	26.12	35.16	23.14	0.485	1.255
150	24.12	35.10	23.70	0.711	1.029
200	12.77	34.55	26.11	0.866	0.874
250	10.60	34.71	26.64	0.952	0.788
300	09.52	34.69	26.81	1.021	0.719
400	08.47	34.62	26.92	1.147	0.593
500	07.88	34.59	26.99	1.266	0.474
600	06.97	34.57	27.11	1.377	0.363
700	06.13	34.55	27.20	1.479	0.261
800	05.38	34.53	27.28	1.572	0.168
1000	04.44	34.56	27.41	1.740	0.000

STATION 15

M/V Hugh M. Smith: Cruise 8, 03°55'N, 157°54'W, January 21, 1951. Messenger time: 2015 GCT. Weather: scattered clouds, cumulus. Wind: 140°, 22 kt. Sea: 5-8 ft. Wire angle: 42°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
02	26.22	35.07	23.04	4.61	
09	26.22	35.08	23.04	4.61	
15	26.22	35.12	23.08	4.68	
46	26.16	35.07	23.06	4.60	
83	25.87	35.07	23.15	4.61	
160	22.10	34.94	24.16	3.67	
240	10.46	34.61	26.59	2.30	
321	09.70	34.69	26.78	2.37	
406		34.61		1.07	
488	07.73	34.59	27.01	0.93	
480 1/	07.78	34.59	27.00	0.99	
597 1/	06.68	34.58	27.15	0.93	
708 1/	05.78	34.55	27.25	1.31	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	(26.20)	(35.07)	23.04		
10	26.22	35.08	23.05		
20	26.22	35.11	23.07		
30	26.20	35.10	23.07		
50	26.12	35.07	23.07		
75	25.95	35.07	23.12		
100	25.60	35.10	23.25		
150	25.39	35.11	23.33		
200	12.70	34.55	26.12		
250	10.30	34.64	26.64		
300	09.90	34.68	26.74		
400	08.65	34.61	26.89		
500	07.62	34.59	27.03		
600	06.65	34.58	27.16		
700	05.82	34.56	27.25		

1/ Probable pretrip.

STATION 16

M/V Hugh M. Smith: Cruise 8, 03°02'N, 157°57'W, January 22, 1951. Messenger time: 0640 GCT. Weather: overcast (with breaks), altocumulus. Wind: 110°, 19 kt. Sea: 5-8 ft. Wire angle: 51°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.20	35.08	23.05	4.62	
04	26.26	35.09	23.04	4.64	
26	26.28	35.10	23.04	4.67	
50	26.14	35.08	23.07	4.62	
91	25.60	35.11	23.26	4.67	
170	22.68	34.98	24.03	3.68	
246	10.68	34.69	26.61	2.40	
336	09.90	34.72	26.77	2.09	
419	08.60	34.66	26.93	1.31	
511	07.60	34.60	27.04	1.31	
709	05.80	34.56	27.25	1.65	
923	04.84	34.57	27.38	1.88	
1166	03.94	34.56	27.46	1.84	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.20	35.08	23.05	0.000	1.754
10	26.26	35.09	23.04	0.048	1.706
20	26.28	35.10	23.04	0.097	1.657
30	26.28	35.10	23.04	0.145	1.609
50	26.14	35.08	23.07	0.242	1.512
75	25.85	35.11	23.18	0.361	1.393
100	25.50	35.11	23.29	0.478	1.276
150	25.50	35.11	23.29	0.711	1.043
200	12.33	34.63	26.26	0.872	0.882
250	10.65	34.70	26.62	0.955	0.799
300	10.20	34.72	26.72	1.027	0.727
400	09.90	34.68	26.74	1.167	0.587
500	07.73	34.60	27.02	1.294	0.460
600	06.75	34.57	27.14	1.402	0.352
700	05.87	34.56	27.24	1.500	0.254
800	05.33	34.56	27.31	1.589	0.165
1000	04.50	34.57	27.41	1.754	0.000

STATION 17

M/V Hugh M. Smith: Cruise 8, 02°00'N, 158°01'W, January 22, 1951. Messenger time: first cast, 1623 GCT; second cast, 1730 GCT. Weather: broken clouds, cumulus and altocumulus. Wind: 110°, 19 kt. Sea: 5-8 ft. Wire angle: first cast, 46°; second cast, 49°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	25.60	35.08	23.24	4.59	
11	25.62	35.08	23.23	4.64	
26	25.64			4.65	
56	25.64	35.09	23.23	4.62	
104	25.52	35.10	23.28	4.62	
194	15.22	34.74	25.74	2.42	
276 1/	10.42	34.90	26.82	1.57	
375	09.62	34.70	26.80	1.48	
466	08.39	34.65	26.96	1.23	
569	07.47	34.56	27.03	1.28	
792	05.34	34.50	27.26	1.68	
1121	04.06	34.55	27.44	2.03	
1397	03.20	34.56	27.54	2.03	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	25.60	35.08	23.24	0.000	1.774
10	25.62	35.08	23.23	0.047	1.727
20	25.63	35.08	23.23	0.093	1.681
30	25.64	35.09	23.23	0.140	1.634
50	25.64	35.09	23.23	0.233	1.541
75	25.60	35.09	23.25	0.350	1.424
100	25.53	35.10	23.28	0.466	1.308
150	24.95	35.09	23.45	0.695	1.079
200	14.98	34.73	25.79	0.865	0.909
250	10.70	34.74	26.65	0.958	0.816
300	10.22	34.72	26.72	1.030	0.744
400	09.32	34.68	26.84	1.165	0.609
500	08.06	34.62	26.99	1.289	0.485
600	07.18	34.54	27.05	1.403	0.371
700	06.10	34.51	27.17	1.508	0.266
800	05.28	34.50	27.27	1.603	0.171
1000	04.47	34.54	27.39	1.774	0.000

1/ Anomalous values at this depth. Bottle apparently leaked on way up.

STATION 18

M/V Hugh M. Smith: Cruise 8, 00°58'N, 158°07'W, January 23, 1951. Messenger time: 0245 GCT. Weather: scattered clouds, cumulus. Wind: 080°, 12 kt. Sea: 3-5 ft. Wire angle: 50°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	25.20	35.07	23.35	4.73	
11	25.20	35.08	23.36		
24	24.94	35.05	23.42	4.70	
47	24.90	35.04	23.42	4.65	
90	24.83	35.06	23.46	4.61	
158	21.72				
230	11.94	34.81	26.47	2.71	
310	10.60	34.74	26.66	1.66	
389	09.79	34.65	26.73	1.40	
476	07.94	34.56	26.96	1.18	
645	06.40	34.50	27.13	1.61	
818	05.19	34.50	27.28	2.00	
1052	04.28	34.50	27.38	2.02	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	25.20	35.07	23.35	0.000	1.748
10	25.20	35.08	23.36	0.045	1.703
20	24.95	35.06	23.42	0.090	1.658
30	24.93	35.05	23.42	0.135	1.613
50	24.90	35.04	23.42	0.225	1.523
75	24.87	35.05	23.44	0.337	1.411
100	24.83	35.06	23.46	0.449	1.299
150	23.82	35.04	23.75	0.666	1.082
200	14.67	34.72	25.85	0.827	0.921
250	11.49	34.79	26.54	0.922	0.826
300	10.73	34.75	26.65	0.998	0.750
400	09.59	34.64	26.76	1.140	0.608
500	07.63	34.55	27.00	1.267	0.481
600	06.70	34.50	27.09	1.378	0.370
700	05.92	34.50	27.19	1.481	0.267
800	05.28	34.50	27.27	1.575	0.173
1000	04.41	34.50	27.37	1.748	0.000

STATION 19

M/V Hugh M. Smith: Cruise 8, 00°01'N, 158°02'W, January 23, 1951. Messenger time: 1132 GCT. Weather: broken clouds, cumulus. Wind: 070°, 12 kt. Sea: 5-8 ft. Wire angle: 40°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	25.00	35.17	23.49	4.53	
09	25.00				
20	25.01	35.25	23.55	4.53	
41	24.88	35.17	23.53	4.45	
79	24.80	35.15	23.54	4.43	
155	21.80			3.30	
233	12.84	34.94	26.40	3.18	
316	10.76	34.75	26.64	1.88	
396	09.46	34.70	26.83	1.28	
483	08.23	34.65	26.98	1.37	
649	06.08	34.56	27.22	1.74	
815	05.09	34.52	27.31	1.96	
986	04.25	34.58	27.45	1.99	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	25.00	35.17	23.49	0.000	1.691
10	25.00	35.20	23.51	0.044	1.647
20	25.01	35.25	23.55	0.088	1.603
30	24.96	35.21	23.53	0.131	1.560
50	24.86	35.17	23.53	0.219	1.472
75	24.81	35.15	23.53	0.329	1.362
100	24.66	35.14	23.57	0.438	1.253
150	21.90	35.10	24.34	0.639	1.052
200	17.20	35.05	25.52	0.793	0.898
250	12.35	34.88	26.45	0.898	0.793
300	11.05	34.78	26.61	0.977	0.714
400	09.38	34.70	26.84	1.117	0.574
500	07.98	34.64	27.01	1.239	0.452
600	06.60	34.59	27.17	1.346	0.345
700	05.72	34.54	27.25	1.441	0.250
800	05.13	34.52	27.30	1.531	0.160
1000	(04.20)	(34.59)	27.46	1.691	0.000

STATION 20

M/V Hugh M. Smith: Cruise 8, 00°55'S, 157°54'W, January 23, 1951. Messenger time: 2122 GCT. Weather: scattered clouds, cumulus. Wind: 140°, 13 kt. Sea: 5-8 ft. Wire angle: 40°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	25.30	35.27	23.47	4.65	
11	25.18				
26	25.16	35.21	23.47	4.62	
52	25.12	35.26	23.52	4.57	
102	25.10	35.25	23.52	4.51	
204	16.85	35.47	25.93	2.79	
302	10.68	34.81	26.70	2.19	
412	09.32	34.70	26.85	1.65	
515	07.70	34.59	27.02	1.36	
628	06.50	34.57	27.17	1.62	
850	04.96	34.54	27.34	2.28	
1083	04.07	34.54	27.44	2.23	
1349	03.30	34.58	27.54	2.14	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	25.30	35.27	23.47	0.000	1.718
10	25.19	35.25	23.49	0.044	1.674
20	25.17	35.22	23.48	0.088	1.630
30	25.15	35.22	23.48	0.133	1.585
50	25.12	35.26	23.52	0.221	1.497
75	25.11	35.26	23.53	0.331	1.387
100	25.10	35.25	23.52	0.441	1.277
150	24.97	35.26	23.57	0.661	1.057
200	17.12	35.48	25.87	0.826	0.892
250	12.33	35.00	26.54	0.920	0.798
300	10.70	34.81	26.70	0.995	0.723
400	09.43	34.71	26.84	1.131	0.587
500	07.90	34.61	27.00	1.253	0.465
600	06.78	34.57	27.13	1.362	0.356
700	05.94	34.55	27.23	1.461	0.257
800	05.26	34.54	27.30	1.552	0.166
1000	04.34	34.54	27.41	1.718	0.000

STATION 21

M/V Hugh M. Smith: Cruise 8, 02°00'S, 158°00'W, January 24, 1951. Messenger time: 0840 GCT. Weather: scattered clouds, cumulus. Wind: 120°, 11 kt. Sea: 5-8 ft. Wire angle: 30°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	25.80	35.35	23.38	4.71	
09	25.82	35.51 1/	23.49 1/	4.81	
26	25.64	35.33	23.41	4.70	
50	25.59	35.29	23.40	4.71	
106	25.44	35.32	23.47	4.66	
191	19.84	35.42	25.14	3.65	
286	10.14	34.77	26.77	2.10	
377	09.63	34.70	26.80	1.72	
474	09.03	34.67	26.88	1.32	
571	07.60	34.61	27.05	2.01	
772	05.72	34.57	27.27	2.02	
973	04.35	34.55	27.41	2.19	
1175	03.70	34.58	27.50		

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	25.80	35.35	23.38	0.000	1.755
10	25.82	35.34	23.37	0.045	1.710
20	25.80	35.35	23.38	0.090	1.665
30	25.65	35.34	23.42	0.135	1.620
50	25.59	35.29	23.40	0.225	1.530
75	25.53	35.30	23.43	0.338	1.417
100	25.45	35.32	23.47	0.450	1.305
150	25.38	35.32	23.49	0.674	1.081
200	18.21	35.51	25.63	0.846	0.909
250	11.55	34.91	26.62	0.944	0.811
300	10.06	34.75	26.77	1.015	0.740
400	09.54	34.69	26.81	1.149	0.606
500	08.72	34.66	26.92	1.278	0.477
600	07.26	34.60	27.09	1.394	0.361
700	06.33	34.58	27.20	1.497	0.258
800	05.50	34.56	27.29	1.590	0.165
1000	04.23	34.56	27.43	1.755	0.000

1/ Anomalous values.

STATION 22

M/V Hugh M. Smith: Cruise 8, 03°00'S, 157°59'W, January 24, 1951. Messenger time: 1710 GCT. Weather: broken clouds, cumulus. Wind: 110°, 14 kt. Sea: 5-8 ft. Wire angle: 18°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.20	35.50	23.37	4.74	
10	26.16			4.75	
24	26.18	35.48	23.36	4.73	
52	26.16	35.51	23.39	4.67	
104	25.72	35.44	23.47	4.65	
197	17.46	35.49	25.80	3.57	
293	10.60	34.81	26.72	1.72	
394	09.22	34.70	26.87	1.87	
494	08.26	34.63	26.96	1.44	
595	06.88	34.58	27.13	1.55	
798	05.20	34.51	27.29	2.02	
1005	04.40	34.59	27.44	2.24	
1236	03.56	34.61	27.54	2.40	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.20	35.50	23.37	0.000	1.728
10	26.16	35.49	23.36	0.045	1.683
20	26.17	35.48	23.36	0.091	1.637
30	26.18	35.48	23.36	0.136	1.592
50	26.16	35.51	23.39	0.227	1.501
75	26.16	35.51	23.39	0.340	1.388
100	25.97	35.48	23.43	0.453	1.275
150	25.52	35.46	23.55	0.677	1.051
200	15.95	35.35	26.05	0.839	0.889
250	11.85	34.92	26.57	0.929	0.799
300	10.45	34.79	26.73	1.002	0.726
400	09.18	34.70	26.87	1.136	0.592
500	08.13	34.63	26.98	1.258	0.470
600	06.80	34.57	27.13	1.369	0.359
700	05.85	34.53	27.22	1.469	0.259
800	05.19	34.51	27.29	1.562	0.166
1000	04.42	34.59	27.44	1.728	0.000

STATION 23

M/V Hugh M. Smith: Cruise 8, 04°00'S, 158°00'W, January 25, 1951. Messenger time: 0123 GCT. Weather: scattered clouds, cumulus and altocumulus. Wind: 120°, 14 kt. Sea: 5-8 ft. Wire angle: 34°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	27.00	35.69	23.26	4.72	
09	26.97			4.92	
21	26.80	35.66	23.30	4.72	
46	26.72	35.66	23.33	4.70	
90	26.28	35.54	23.37	4.65	
170	23.86	35.54	24.11	4.64	
249	12.77	34.98	26.44	1.88	
333	09.92	34.79	26.82	1.63	
413	08.87	34.64	26.88	1.82	
495	07.92	34.60	26.99	2.11	
655	06.36	34.56	27.18	2.36	
823	05.12	34.51	27.30	2.22	
1008	04.28	34.52	27.40	2.27	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	27.00	35.69	23.26	0.000	1.774
10	26.96	35.68	23.26	0.046	1.728
20	26.81	35.66	23.30	0.092	1.682
30	26.77	35.66	23.31	0.138	1.636
50	26.70	35.66	23.33	0.230	1.544
75	26.43	35.58	23.36	0.344	1.430
100	26.24	35.53	23.38	0.458	1.316
150	25.00	35.68	23.88	0.675	1.099
200	21.13	35.69	25.00	0.853	0.921
250	12.75	34.98	26.45	0.970	0.804
300	10.75	34.83	26.71	1.047	0.727
400	09.05	34.65	26.86	1.182	0.592
500	07.87	34.59	26.99	1.304	0.470
600	06.87	34.57	27.12	1.414	0.360
700	05.97	34.55	27.22	1.514	0.260
800	05.26	34.52	27.29	1.606	0.168
1000	04.31	34.52	27.39	1.774	0.000

STATION 24

M/V Hugh M. Smith: Cruise 8, 05°00'S, 158°00'W, January 25, 1951. Messenger time: 0903 GCT. Weather: scattered clouds, no observation. Wind: 120°, 16 kt. Sea: 5-8 ft. Wire angle: 24°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.40	35.51	23.31	4.78	
09	26.44				
23	26.42	35.47	23.28	4.76	
51	26.28	35.48	23.33	4.71	
102	26.20	35.46	23.34	4.70	
194	23.47	35.66	24.32	3.82	
284	11.12	34.86	26.66	2.11	
380	09.06	34.69	26.89	1.89	
475	08.03	34.61	26.99	1.90	
572	07.22	34.59	27.09	1.91	
758	05.93	34.54	27.22	2.48	
958	04.53	34.55	27.39	2.23	
1157	03.94	34.56	27.46	2.43	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.40	35.51	23.31	0.000	1.861
10	26.44	35.49	23.29	0.046	1.815
20	26.42	35.47	23.28	0.092	1.769
30	26.41	35.48	23.29	0.138	1.723
50	26.29	35.48	23.33	0.230	1.631
75	26.24	35.46	23.33	0.345	1.516
100	26.21	35.46	23.34	0.460	1.401
150	26.16	35.46	23.35	0.690	1.171
200	22.73	35.79	24.63	0.889	0.972
250	14.20	35.12	26.26	1.020	0.841
300	13.00	34.83	26.28	1.112	0.749
400	08.80	34.66	26.90	1.265	0.596
500	07.80	34.60	27.01	1.384	0.477
600	07.03	34.59	27.11	1.494	0.367
700	06.32	34.55	27.18	1.597	0.264
800	05.60	34.54	27.26	1.693	0.168
1000	04.34	34.56	27.42	1.861	0.000

STATION 25

M/V Hugh M. Smith: Cruise 8, 06°01'S, 158°06'W, January 25, 1951. Messenger time: 1708 GCT. Weather: scattered clouds, cumulus. Wind: 090°, 13 kt. Sea: 5-8 ft. Wire angle: 15°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
02	26.89	35.62	23.24	4.69	
12	26.89	35.63	23.25	4.70	
26	26.90	35.68	23.28	4.69	
55	26.90	35.60	23.22	4.71	
108	26.86	35.62	23.25	4.63	
208	21.94	35.82	24.87	3.74	
307	11.92	34.86	26.51	1.93	
409	08.40	34.62	26.94	2.98	
508	07.24	34.56	27.06	2.76	
609	06.52	34.56	27.16	2.63	
808	05.30	34.50	27.27	2.06	
1013	04.42	34.52	27.38	2.29	
1216	03.76	34.54	27.47	2.55	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	(26.90)	(35.62)	23.24	0.000	1.861
10	26.89	35.63	23.25	0.046	1.815
20	26.89	35.65	23.26	0.093	1.768
30	26.90	35.67	23.28	0.139	1.722
50	26.90	35.61	23.23	0.232	1.629
75	26.90	35.61	23.23	0.349	1.512
100	26.87	35.62	23.25	0.466	1.395
150	26.49	35.69	23.42	0.696	1.165
200	22.60	35.87	24.73	0.892	0.969
250	16.90	35.31	25.79	1.032	0.829
300	12.39	34.90	26.45	1.131	0.730
400	08.58	34.63	26.92	1.275	0.586
500	07.30	34.56	27.05	1.391	0.470
600	06.57	34.56	27.15	1.497	0.364
700	05.90	34.53	27.22	1.595	0.266
800	05.33	34.50	27.26	1.689	0.172
1000	04.48	34.52	27.38	1.861	0.000

STATION 26

M/V Hugh M. Smith: Cruise 8, 07°00'S, 158°01'W, January 26, 1951. Messenger time: 0120 GCT. Weather: scattered clouds, cumulus. Wind: 100°, 13 kt. Sea: 5-8 ft. Wire angle: 28°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	27.50	35.77	23.16	4.69	
09	27.45			4.63	
21	27.38	35.75	23.18	4.59	
46	27.34	35.74	23.19	4.56	
92	27.17	35.74	23.24	4.51	
176	23.64	35.91	24.46	3.85	
258	16.00	35.24	25.95	2.89	
343	10.53	34.79	26.72	1.57	
427	08.70	34.67	26.93	2.39	
513	07.35	34.60	27.08	2.51	
679	05.97	34.51	27.19	2.63	
850	05.20	34.56	27.32	2.05	
1035	04.44	34.54	27.39	2.20	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	27.50	35.77	23.16	0.000	1.837
10	27.44	35.76	23.17	0.047	1.790
20	27.39	35.75	23.18	0.094	1.743
30	27.36	35.74	23.18	0.141	1.696
50	27.29	35.74	23.20	0.236	1.601
75	27.24	35.74	23.22	0.353	1.484
100	27.08	35.74	23.27	0.470	1.367
150	25.22	35.86	23.94	0.687	1.150
200	22.45	35.85	24.76	0.870	0.967
250	16.73	35.30	25.83	1.008	0.829
300	12.53	34.95	26.47	1.106	0.731
400	09.19	34.71	26.88	1.252	0.585
500	07.50	34.61	27.06	1.369	0.468
600	06.52	34.53	27.14	1.475	0.362
700	05.84	34.51	27.21	1.575	0.262
800	05.40	34.54	27.29	1.667	0.170
1000	04.60	34.55	27.39	1.837	0.000

STATION 27

M/V Hugh M. Smith: Cruise 8, 01°58'N, 155°02'W, January 29, 1951. Messenger time: 1955 GCT. Weather: scattered clouds, cumulus and altocumulus. Wind: 090°, 16 kt. Sea: 5-8 ft. Wire angle: 41°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	25.40			4.81	
08	25.43	35.09	23.30	4.76	
41	25.40	35.12	23.33	4.75	
77	25.33	35.15	23.38	4.68	
146	24.85	35.24	23.59	4.52	
242	10.96	34.80	26.65	1.92	

STATION 28

M/V Hugh M. Smith: Cruise 8, 03°00'N, 155°04'W, January 30, 1951. Messenger time: 0400 GCT. Weather: scattered clouds, cumulus. Wind: 080°, 15 kt. Sea: 5-8 ft. Wire angle: 43°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	25.60	35.08	23.22	4.78	
10	25.63	35.09	23.24	4.78	
44	25.48	35.06	23.26	4.73	
92	25.44	35.10	23.30	4.69	
183	12.86	34.69	26.20	2.02	
290	10.30	34.74	26.72	1.52	

STATION 29

M/V Hugh M. Smith: Cruise 8, 03°58'N, 155°04'W, January 30, 1951. Messenger time: 1244 GCT. Weather: no observation. Wind: 090°, 18 kt. Sea: 5-8 ft. Wire angle: 25°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	26.60	35.08	22.92	4.69	
12	26.64	35.08	22.91	4.70	
67	26.63	35.08	22.92	4.66	
136	25.06	35.04	23.37	4.19	
277	09.62	34.69	26.79	2.09	
413	08.50	34.64	26.93	1.46	

STATION 30

M/V Hugh M. Smith: Cruise 8, 04°57'N, 155°04'W, January 30, 1951. Messenger time: 2022 GCT. Weather: overcast (with breaks), cumulus and altocumulus. Wind: 070°, 21 kt. Sea: 5-8 ft. Wire angle: 32°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	26.60	34.99	22.87	4.73	
08	26.58	34.94	22.83	4.71	
48	26.58	34.98	22.86	4.70	
124	25.73	35.16	23.26	4.22	
220	11.86	34.68	26.39	1.11	
321	09.31	34.70	26.85	1.45	

STATION 31

M/V Hugh M. Smith: Cruise 8, 05°59'N, 155°03'W, January 31, 1951. Messenger time: 0422 GCT. Weather: overcast (with breaks), cumulus and nimbostratus. Wind: 070°, 20 kt. Sea: 8-12 ft. Wire angle: 32°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	26.70	35.07	22.90	4.75	
15	26.68	35.07	22.89	4.74	
73	26.39	35.13	23.03	4.70	
145	21.08	34.90	24.41	4.04	
295	09.74	34.70	26.78	0.87	
436	08.38	34.62	26.94	1.02	

STATION 32

M/V Hugh M. Smith: Cruise 8, 06°57'N, 154°56'W, January 31, 1951. Messenger time: 1145 GCT. Weather: slight intermittent rain, no observation. Wind: 070°, 24 kt. Sea: 8-12 ft. Wire angle: 05°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
05	26.63	35.14	22.96	4.71	
19	26.64	35.08	22.91	4.72	
79	26.62	35.08	22.92	4.63	
156	16.05	34.66	25.49	3.08	
303	09.48	34.65	26.78	1.09	
442	08.66	34.63	26.90	1.23	

STATION 33

M/V Hugh M. Smith: Cruise 8, 05°58'N, 155°08'W, January 31, 1951. Messenger time: 2023 GCT. Weather: overcast (with breaks), cumulus. Wind: 090°, 14 kt. Sea: 8-12 ft. Wire angle: no observations.

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.60	35.10	22.94	4.70	
09	26.62	35.03	22.88	4.69	
54	26.62	35.07	22.91	4.68	
110	26.12	35.08	23.08	4.67	
222	11.87	34.66	26.37	1.31	
335	09.52	34.69	26.81	0.83	

STATION 34

M/V Hugh M. Smith: Cruise 8, 05°00'N, 155°28'W, February 1, 1951. Messenger time: 0422 GCT. Weather: scattered clouds, cumulus and stratocumulus. Wind: 090°, 19 kt. Sea: 5-8 ft. Wire angle: 20°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.60	34.98	22.85	4.69	
08	26.64	34.99	22.85	4.69	
53	26.60	34.99	22.86	4.69	
107	26.35	35.02	22.96	4.61	
215	12.24	34.64	26.28	1.00	
323	09.44	34.68	26.81	1.02	

STATION 35

M/V Hugh M. Smith: Cruise 8, 04°04'N, 155°46'W, February 1, 1951. Messenger time: 1201 GCT. Weather: scattered clouds, no observation. Wind: 140°, 19 kt. Sea: 5-8 ft. Wire angle: 24°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	26.60	35.08	22.92	4.69	
08	26.62	35.06	22.91	4.70	
51	26.64	35.08	22.91	4.66	
105	26.14	35.02	23.03	4.52	
209	12.46	34.65	26.25	1.65	
316	09.30	34.69	26.85	1.59	

STATION 36

M/V Hugh M. Smith: Cruise 8, 03°06'N, 156°09'W, February 1, 1951. Messenger time: 2024 GCT. Weather: scattered clouds, cumulus and altocumulus. Wind: 100°, 18 kt. Sea: 5-8 ft. Wire angle: 40°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	26.50	35.10	22.97	4.70	
11	26.52	35.13	22.99	4.70	
52	26.44	35.09	22.98	4.70	
106	25.56	35.11	23.27	4.45	
223	11.18	34.72	26.54	2.36	
346	10.01	34.71	26.74	2.12	

STATION 37

M/V Hugh M. Smith: Cruise 8, 02°07'N, 156°33'W, February 2, 1951. Messenger time: 0414 GCT. Weather: scattered clouds, cumulus. Wind: 110°, 14 kt. Sea: 5-8 ft. Wire angle: 39°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	25.60	35.15	23.28	4.74	
08	25.63	35.20	23.32	4.78	
44	25.46	35.18	23.36	4.77	
84	25.44	35.15	23.34	4.75	
162	23.40	35.04	23.87	4.00	
250	10.92	34.75	26.62	2.11	

STATION 38

M/V Hugh M. Smith: Cruise 8, 02°59'N, 156°43'W, February 2, 1951. Messenger time: 1126 GCT. Weather: scattered clouds, no observation. Wind: 080°, 17 kt. Sea: 5-8 ft. Wire angle: 36°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	26.50	35.11	22.97	4.69	
12	26.54	35.14	22.99	4.65	
61	26.54	35.10	22.96	4.66	
119	25.76	35.10	23.20	4.22	
232	10.78	34.77	26.65	1.65	
365	09.72	34.71	26.79	1.46	

STATION 39

M/V Hugh M. Smith: Cruise 8, 04°02'N, 157°02'W, February 2, 1951. Messenger time: 1850 GCT. Weather: scattered clouds, cumulus and altocumulus. Wind: 090°, 15 kt. Sea: 3-5 ft. Wire angle: 38°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	26.50	35.09	22.95	4.67	
12	26.54	35.08	22.95	4.67	
59	26.54	35.12	22.97	4.67	
110	25.86	35.07	23.15	4.37	
206	11.22	34.71	26.53	0.97	
323	09.18	34.69	26.87	1.64	

STATION 40

M/V Hugh M. Smith: Cruise 8, 05°04'N, 157°17'W, February 3, 1951. Messenger time: 0211 GCT. Weather: scattered clouds, cumulus. Wind: 080°, 18 kt. Sea: 5-8 ft. Wire angle: 18°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	26.60	35.11	22.93	4.70	
09	26.64	35.12	22.94	4.70	
57	26.50	35.12	22.99	4.69	
113	26.46	35.12	23.00	4.68	
227	11.01	34.72	26.56	0.82	
345	09.03	34.69	26.89	1.50	

STATION 41

M/V Hugh M. Smith: Cruise 8, 05°58'N, 157°26'W, February 3, 1951. Messenger time: 0826 GCT. Weather: scattered clouds, cumulus. Wind: 090°, 18 kt. Sea: 5-8 ft. Wire angle: < 5°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
06	26.64	35.16	22.97	4.76	
16	26.63	35.18	22.99	4.74	
66	26.58	35.18	23.01	4.74	
125	26.48	35.17	23.03	4.63	
241	10.58	34.69	26.63	0.92	
357	08.81	34.66	26.90	1.00	

STATION 42

M/V Hugh M. Smith: Cruise 8, 06°50'N, 157°33'W, February 3, 1951. Messenger time: 1550 GCT. Weather: broken clouds, cumulus. Wind: 080°, 18 kt. Sea: 5-8 ft. Wire angle: < 5°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
10	26.70	35.05	22.87	4.70	
20	26.72	35.07	22.88	4.72	
70	26.68	35.19	22.98	4.70	
131	21.04	34.87	24.40	3.59	
247	10.21	34.68	26.69	0.65	
363	09.07	34.62	26.83	0.93	

STATION 43

M/V Hugh M. Smith: Cruise 8, 06°00'N, 157°53'W, February 3, 1951. Messenger time: 2319 GCT. Weather: slight intermittent rain, cumulus. Wind: 100°, 15 kt. Sea: 8-12 ft. Wire angle: <5°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
06	26.66	35.19	22.99	4.70	
16	26.62	35.19	23.00	4.72	
67	26.54	35.19	23.03	4.71	
126	24.28	35.08	23.64	3.91	
245	10.58	34.67	26.61	0.67	
363	08.88	34.64	26.88	0.96	

STATION 44

M/V Hugh M. Smith: Cruise 8, 05°00'N, 158°34'W, February 4, 1951. Messenger time: 0827 GCT. Weather: scattered clouds, cumulus. Wind: 080°, 18 kt. Sea: 5-8 ft. Wire angle: no observation

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.50	35.20	23.05	4.73	
09	26.51	35.17	23.02	4.73	
60	26.50	35.18	23.03	4.70	
118	26.49	35.18	23.04	4.68	
230	11.54	34.65	26.42	1.11	
351	09.18	34.63	26.82	1.59	

STATION 45

M/V Hugh M. Smith: Cruise 8, 04°05'N, 158°53'W, February 4, 1951. Messenger time: 1644 GCT. Weather: overcast (with breaks), cumulus. Wind: 060°, 18 kt. Sea: 5-8 ft. Wire angle: 30°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	26.40	35.11	23.02	4.73	
14	26.36	35.11	23.02	4.73	
67	26.28	35.07	23.02	4.73	
127	26.10	35.16	23.14	4.52	
255	10.46	34.66	26.63	1.37	
391	08.78	34.64	26.89	1.58	

STATION 46

M/V Hugh M. Smith: Cruise 8, 03°03'N, 159°10'W, February 6, 1951. Messenger time: 1420 GCT. Weather: scattered clouds, no observation. Wind: 090°, 16 kt. Sea: 5-8 ft. Wire angle: 46°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	26.40	35.11	23.00	4.70	
11	26.44	35.10	22.99	4.73	
50	26.30	35.09	23.03	4.71	
92	25.94	35.10	23.15	4.72	
159	16.64	34.77	25.44	2.59	
264	10.00	34.70	26.74	2.56	

STATION 47

M/V Hugh M. Smith: Cruise 8, 01°57'N, 159°39'W, February 6, 1951. Messenger time: 2322 GCT. Weather: scattered clouds, cumulus and altostratus. Wind: 100°, 15 kt. Sea: 5-8 ft. Wire angle: 43°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.20	35.11	23.09	4.69	
10	26.14	35.12	23.10	4.71	
52	25.96	35.12	23.16	4.68	
98	25.04	35.09	23.42	4.18	
193	11.16	34.72	26.55	2.51	
311	10.22	34.75	26.74	1.66	

STATION 48

M/V Hugh M. Smith: Cruise 8, 03°00'N, 159°47'W, February 7, 1951. Messenger time: 0808 GCT. Weather: scattered clouds, cumulus and altocumulus. Wind: 080°, 15 kt. Sea: 5-8 ft. Wire angle: 44°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.30	35.13	23.06	4.74	
11	26.31	35.10	23.03	4.74	
48	26.24	35.10	23.05	4.73	
88	26.12	35.10	23.09	4.72	
170	15.70	34.71	25.61	2.55	
266	10.05	34.81	26.81	1.68	

STATION 49

M/V Hugh M. Smith: Cruise 8, 04°06'N, 160°06'W, February 7, 1951. Messenger time: 1625 GCT. Weather: overcast (with breaks), cumulus. Wind: 080°, 18 kt. Sea: 5-8 ft. Wire angle: 26°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	26.40	35.27	23.13	4.66	
13	26.43	35.19	23.06	4.69	
65	26.41	35.20	23.08	4.69	
130	26.18	35.18	23.13	4.65	
269	09.59	34.65	26.77	2.42	
408	08.59	34.62	26.91	1.76	

STATION 50

M/V Hugh M. Smith: Cruise 8, 04°58'N, 160°36'W, February 8, 1951. Messenger time: 0523 GCT. Weather: scattered clouds, cumulus. Wind: 070°, 18 kt. Sea: 5-8 ft. Wire angle: 16°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
03	27.33	34.94	22.59		
12	27.34	34.91	22.56	4.72	
59	27.28	34.92	22.59	4.71	
117	26.24	34.90	22.90	4.45	
232	10.46	34.64	26.61	1.30	
351	08.90	34.65	26.88	1.64	

STATION 51

M/V Hugh M. Smith: Cruise 8, 05°57'N, 160°53'W, February 8, 1951. Messenger time: 1250 GCT. Weather: scattered clouds, no observation. Wind: 060°, 19 kt. Sea: 5-8 ft. Wire angle: 11°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
03	27.19	34.90	22.60	4.73	
13	27.22	34.87	22.57	4.73	
61	27.22	34.90	22.60	4.71	
121	25.28	35.11	23.36	4.17	
235	09.90	34.67	26.73	1.30	
355	08.77	34.63	26.89	1.63	

STATION 52

M/V Hugh M. Smith: Cruise 8, 06°59'N, 161°12'W, February 8, 1951. Messenger time: 2110 GCT. Weather: broken clouds, cumulus. Wind: 050°, 19 kt. Sea: 8-12 ft. Wire angle: no observation

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
06	26.96	35.05	22.79	4.69	
16	26.96	35.05	22.79	4.69	
66	26.94	35.05	22.79	4.69	
125	20.32	34.86	24.59	3.67	
241	10.68	34.68	26.60	0.58	
356	08.92	34.65	26.88	1.07	

STATION 53

M/V Hugh M. Smith: Cruise 8, 05°55'N, 161°27'W, February 9, 1951. Messenger time: 0450 GCT. Weather: heavy intermittent rain, cumulus. Wind: 080°, 19 kt. Sea: 8-12 ft. Wire angle: 21°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
02	27.18	34.96	22.65	4.72	
12	27.20	34.94	22.63	4.74	
58	27.02	35.01	22.74	4.71	
114	25.33	35.05	23.30	4.13	
225	11.00	34.61	26.49	1.04	
342	09.09	34.62	26.83	1.52	

STATION 54

M/V Hugh M. Smith: Cruise 8, 04°52'N, 161°48'W, February 9, 1951. Messenger time: 1523 GCT. Weather: scattered clouds, no observation. Wind: 080°, 22 kt. Sea: 8-12 ft. Wire angle: 23°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	27.20	34.96	22.66	4.73	
14	27.16	34.97	22.67	4.71	
69	27.15	34.96	22.66	4.69	
141	24.64	35.00	23.47	3.97	
281	09.62	34.64	26.75	1.70	
419	08.75	34.63	26.89	1.61	

STATION 55

M/V Hugh M. Smith: Cruise 8, 03°58'N, 162°02'W, February 9, 1951. Messenger time: 2230 GCT. Weather: scattered clouds, cumulus. Wind: 090°, 20 kt. Sea: 8-12 ft. Wire angle: 42°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	27.20	35.00	22.67	4.67	
12	27.22	35.02	22.68	4.67	
54	27.12	35.07	22.76	4.65	
113	26.40	35.19	23.07	4.66	
224	10.60	34.69	26.62	1.28	
343	08.95	34.64	26.86	1.79	

STATION 56

M/V Hugh M. Smith: Cruise 8, 02°58'N, 162°25'W, February 10, 1951. Messenger time: 0607 GCT. Weather: broken clouds, cumulus. Wind: 090°, 14 kt. Sea: 8-12 ft. Wire angle: 52°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.40	35.21	23.07	4.76	
10	26.44	35.19	23.06	4.77	
43	26.16	35.17	23.13	4.78	
80	25.83	35.14	23.21	4.77	
147	25.56	35.15	23.30	4.74	
226	10.80	34.78	26.66	2.45	

STATION 57

M/V Hugh M. Smith: Cruise 8, 02°00'N, 162°57'W, February 10, 1951. Messenger time: 1349 GCT. Weather: scattered clouds, no observation. Wind: 120°, 17 kt. Sea: 8-12 ft. Wire angle: 45°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	25.50	35.12	23.29	4.78	
11	25.54	35.12	23.29	4.80	
49	25.54	35.10	23.27	4.77	
92	25.46	35.13	23.32	4.74	
173	16.16	34.75	25.54	2.62	
266	10.53	34.77	26.70	2.15	

STATION 58

M/V Hugh M. Smith: Cruise 8, 03°08'N, 163°15'W, February 10, 1951. Messenger time: 2223 GCT. Weather: slight intermittent drizzle, cumulus and cumulonimbus. Wind: 100°, 20 kt. Sea: 8-12 ft. Wire angle: 43°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	25.90	35.13	23.19	4.87	
11	25.88	35.10	23.16	4.85	
49	25.77	35.12	23.21	4.84	
90	25.68	35.14	23.26	4.85	
169	23.36	35.07	23.91	3.91	
262	10.12	34.73	26.74	2.51	

STATION 59

M/V Hugh M. Smith: Cruise 8, 04°02'N, 163°58'W, February 11, 1951. Messenger time: 0540 GCT. Weather: broken clouds, cumulus. Wind: 100°, 13 kt. Sea: 8-12 ft. Wire angle: 36°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	26.10	35.13	23.13	4.81	
12	26.08	35.14	23.14	4.81	
56	25.88	35.20	23.24	4.79	
113	25.91	35.21	23.24	4.74	
235	10.56	34.64	26.59	1.64	
364	08.84	34.66	26.90	1.91	

STATION 60

M/V Hugh M. Smith: Cruise 8, 04°57'N, 164°32'W, February 11, 1951. Messenger time: 1253 GCT. Weather: scattered clouds, no observation. Wind: 080°, 10 kt. Sea: 8-12 ft. Wire angle: 08°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	26.90	35.04	22.78	4.71	
15	27.00	35.10	22.81	4.70	
75	27.00	35.11	22.82	4.67	
151	23.45	35.04	23.85	3.69	
299	09.63	34.70	26.80	1.56	
439	08.43	34.64	26.95	1.20	

STATION 61

M/V Hugh M. Smith: Cruise 8, 05°56'N, 165°05'W, February 11, 1951. Messenger time: 2051 GCT. Weather: overcast (with breaks) cumulus. Wind: 100°, 14 kt. Sea: 8-12 ft. Wire angle: 20°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	27.20	34.66	22.42	4.70	
10	27.22	34.56	22.34	4.72	
58	27.04	34.88	22.64	4.57	
113	25.90	35.09	23.15	4.11	
228	11.72	34.63	26.37	1.30	
343	09.17	34.66	26.85	1.37	

STATION 62

M/V Hugh M. Smith: Cruise 8, 06°44'N, 165°23'W, February 12, 1951. Messenger time: 0310 GCT. Weather: slight intermittent rain, nimbostratus. Wind: 070°, 24 kt. Sea: 12 to 20 ft. Wire angle: <05°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
06	27.21	34.85	22.56	4.74	
16	27.22	34.82	22.54	4.72	
36	27.24	34.87	22.56	4.70	
67	27.24	34.83	22.53	4.65	
127	23.82	35.06	23.76	3.78	
244	10.43	34.68	26.65	0.66	
363	08.98	34.62	26.84	1.14	
476	07.98	34.55	26.94	0.97	
588	06.96	34.56	27.10	0.87	
701	06.10	34.49	27.16	1.11	
934	04.86	34.51	27.33	1.39	
1151	04.06	34.52	27.42	1.72	
1369	03.42	34.55	27.51	1.90	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	(27.20)	(34.85)	22.56	0.000	1.796
10	27.21	34.84	22.55	0.053	1.743
20	27.22	34.84	22.55	0.106	1.690
30	27.23	34.85	22.55	0.159	1.637
50	27.24	34.85	22.55	0.266	1.530
75	27.23	34.85	22.55	0.399	1.397
100	26.97	34.96	22.72	0.530	1.266
150	22.12	34.97	24.18	0.755	1.041
200	12.75	34.58	26.14	0.898	0.898
250	10.32	34.68	26.67	0.983	0.813
300	09.66	34.66	26.76	1.053	0.743
400	08.65	34.60	26.88	1.183	0.613
500	07.75	34.55	26.98	1.304	0.492
600	06.86	34.55	27.10	1.416	0.380
700	06.10	34.49	27.16	1.520	0.276
800	05.52	34.49	27.23	1.618	0.178
1000	04.59	34.51	27.36	1.796	0.000

STATION 63

M/V Hugh M. Smith: Cruise 8, 05°51'N, 165°28'W, February 12, 1951. Messenger time: 1040 GCT. Weather: slight intermittent drizzle, cumulus. Wind: 090°, 19 kt. Sea: 8-12 ft. Wire angle: 18°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	27.20	34.72	22.46	4.67	
09	27.20	34.75	22.49	4.68	
29	27.22	34.70	22.45	4.68	
57	27.16	34.91	22.62	4.60	
116	25.92	35.07	23.13	4.08	
233	11.54	34.60	26.38	1.55	
341	09.48	34.72	26.84	1.39	
454	08.32	34.63	26.95	1.17	
565	07.20	34.58	27.08	0.86	
674	06.35	34.52	27.15	0.95	
899	04.86	34.52	27.33	1.45	
1116	04.10	34.52	27.42	1.61	
1324	03.49	34.59	27.53	1.88	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	27.20	34.72	22.46	0.000	1.836
10	27.20	34.74	22.48	0.054	1.782
20	27.21	34.72	22.46	0.108	1.728
30	27.22	34.70	22.44	0.162	1.674
50	27.18	34.84	22.56	0.269	1.567
75	27.07	34.95	22.68	0.401	1.435
100	26.86	35.00	22.78	0.530	1.306
150	24.26	35.06	23.63	0.766	1.070
200	14.78	34.64	25.76	0.932	0.904
250	11.08	34.65	26.51	1.029	0.807
300	10.10	34.72	26.74	1.104	0.732
400	08.88	34.67	26.90	1.235	0.601
500	07.83	34.61	27.01	1.354	0.482
600	06.93	34.56	27.10	1.464	0.372
700	06.20	34.52	27.17	1.567	0.269
800	05.48	34.52	27.26	1.663	0.173
1000	04.43	34.52	27.38	1.836	0.000

STATION 64

M/V Hugh M. Smith: Cruise 8, 04°58'N, 165°35'W, February 12, 1951. Messenger time: 1825 GCT. Weather: overcast (with breaks), cumulus. Wind: 060°, 18 kt. Sea: 8-12 ft. Wire angle: 20°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.90	35.12	22.86	4.71	
09	26.89	35.07	22.83	4.69	
28	26.90	35.10	22.85	4.71	
58	26.91	35.13	22.87	4.67	
115	26.28	35.17	23.09	4.34	
227	13.19	34.51	26.00	2.48	
337	09.30	34.68	26.84	1.06	
444	08.38	34.60	26.92	1.10	
554	07.38	34.59	27.06	1.10	
663	06.46	34.52	27.14	1.17	
882	05.03	34.53	27.32	1.30	
882	05.22	34.53	27.30		
1097	04.11	34.54	27.43	1.63	
1308	03.48	34.56	27.51	1.84	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.90	35.12	22.86	0.000	1.893
10	26.89	35.08	22.83	0.050	1.843
20	26.89	35.09	22.84	0.101	1.792
30	26.90	35.11	22.85	0.151	1.742
50	26.91	35.12	22.86	0.251	1.642
75	26.90	35.14	22.88	0.377	1.516
100	26.83	35.14	22.90	0.503	1.390
150	26.18	35.17	23.13	0.748	1.145
200	18.90	34.81	24.92	0.946	0.947
250	12.10	34.50	26.20	1.071	0.822
300	10.08	34.69	26.72	1.153	0.740
400	08.75	34.62	26.88	1.286	0.607
500	07.88	34.60	27.00	1.407	0.486
600	06.99	34.56	27.09	1.518	0.375
700	06.20	34.51	27.16	1.622	0.271
800	05.59	34.52	27.25	1.719	0.174
1000	04.54	34.54	27.38	1.893	0.000

STATION 65

M/V Hugh M. Smith: Cruise 8, 03°59'N, 166°01'W, February 13, 1951. Messenger time: 0235 GCT. Weather: broken clouds, cumulus, stratocumulus, cirrostratus, and cirrus. Wind: 090°, 17 kt. Sea: 5-8 ft. Wire angle: 40°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	27.10	35.19	22.85	4.71	
09	27.09				
23	27.04	35.10	22.80	4.72	
45	26.98	35.12	22.83	4.71	
86	26.43	35.21	23.08	4.56	
159	25.28	35.13	23.37	4.72	
232 1/	12.60	34.83	26.36	2.95	
301	09.48	34.69	26.82	1.96	
374	08.91	34.60	26.84	1.77	
446	08.46	34.60	26.91	1.87	
593	07.34	34.55	27.04	1.20	
752	05.99	34.52	27.20	1.45	
934	04.85	34.54	27.35	1.71	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	27.10	35.19	22.85	0.000	1.859
10	27.08	35.14	22.82	0.050	1.809
20	27.05	35.11	22.81	0.101	1.758
30	27.02	35.10	22.81	0.152	1.707
50	26.89	35.15	22.89	0.252	1.607
75	26.52	35.20	23.04	0.376	1.483
100	26.40	35.20	23.08	0.497	1.362
150	25.40	35.14	23.35	0.733	1.126
200	17.95	34.78	25.13	0.921	0.938
250	11.41	34.56	26.38	1.036	0.823
300	09.51	34.69	26.81	1.112	0.747
400	08.74	34.60	26.87	1.241	0.618
500	08.06	34.58	26.96	1.364	0.495
600	07.30	34.55	27.04	1.480	0.379
700	06.40	34.53	27.15	1.587	0.272
800	05.65	34.52	27.24	1.686	0.173
1000	(04.55)	(34.56)	27.40	1.859	0.000

1/ Point on T-S curve suggests bottle leaked on way up. Therefore all values at this level except temperature are probably in error.

STATION 66

M/V Hugh M. Smith: Cruise 8, 03°00'N, 166°36'W, February 13, 1951. Messenger time: 1118 GCT. Weather: scattered clouds, no observation. Wind: 090°, 19 kt. Sea: 5-8 ft. Wire angle: 57°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.40	35.26	23.13	4.77	
10	26.42	35.27	23.13		
21	26.42	35.25	23.11		
44	26.42	35.26	23.12	4.77	
78	25.90	35.25	23.27	4.77	
130	25.82	35.24	23.29	4.74	
179 1/	18.98	35.26	25.24		
236	10.91	34.62	26.52	2.06	
287	10.10	34.75	26.76	2.39	
340	09.80	34.72	26.79	1.76	
431	08.84	34.68	26.91	2.07	
578	07.50	34.61	27.06	1.30	
719	06.00	34.53	27.20	1.49	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.40	35.26	23.13	0.000	1.780
10	26.42	35.27	23.13	0.048	1.732
20	26.42	35.25	23.11	0.095	1.685
30	26.42	35.25	23.11	0.143	1.637
50	26.39	35.25	23.12	0.239	1.541
75	25.93	35.25	23.26	0.356	1.424
100	25.86	35.24	23.28	0.473	1.307
150	25.77	35.23	23.30	0.705	1.075
200	15.00	34.69	25.75	0.879	0.901
250	10.63	34.67	26.60	0.974	0.806
300	10.02	34.74	26.77	1.046	0.734
400	09.19	34.69	26.86	1.177	0.603
500	08.23	34.65	26.98	1.299	0.481
600	07.29	34.60	27.08	1.412	0.368
700	06.17	34.54	27.19	1.516	0.264
800	(05.31)	(34.52)	27.28	1.610	0.170
1000	(04.40)	(34.52)	27.38	1.780	0.000

1/ Point on T-S curve suggests bottle leaked on way up. Therefore all values of this level except temperature are probably in error.

STATION 67

M/V Hugh M. Smith: Cruise 8, 02°04'N, 166°47'W, February 13, 1951. Messenger time: 1904 GCT. Weather: scattered clouds, cumulus and stratocumulus. Wind: 090°, 17 kt. Sea: 5-8 ft. Wire angle: 55°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	25.65	35.22	23.33	4.74	
09	25.67				
21	25.66			4.77	
44	25.67	35.20	23.30	4.73	
86	25.66	35.19	23.30	4.75	
156	23.91			4.77	
221	10.94	34.77	26.63	2.58	
289	10.45	34.76	26.71	1.70	
357	10.00	34.73	26.76	1.87	
433	09.24	34.67	26.84	1.49	
581	07.37	34.57	27.05	1.46	
735	05.82	34.56	27.25	1.54	
946	04.52	34.52	27.37	1.93	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	25.60	35.22	23.33	0.000	1.740
10	25.67	35.22	23.32	0.046	1.694
20	25.66	35.21	23.32	0.091	1.649
30	25.66	35.21	23.32	0.137	1.603
50	25.67	35.20	23.31	0.229	1.511
75	25.66	35.19	23.30	0.344	1.396
100	25.66	35.19	23.30	0.460	1.280
150	25.30	35.18	23.41	0.689	1.051
200	11.86	34.62	26.34	0.846	0.894
250	10.72	34.77	26.67	0.926	0.814
300	10.40	34.76	26.71	0.997	0.743
400	09.61	34.69	26.80	1.134	0.606
500	08.40	34.62	26.94	1.262	0.478
600	07.15	34.57	27.08	1.378	0.362
700	06.14	34.56	27.21	1.480	0.260
800	05.30	34.54	27.30	1.573	0.167
1000	(04.34)	(34.52)	27.39	1.740	0.000

STATION 68

M/V Hugh M. Smith: Cruise 8, 01°02'N, 167°02'W, February 14, 1951. Messenger time: first cast, 0344 GCT; second cast, 0641 GCT. Weather: scattered clouds, cumulus. Wind: 090°, 15 kt. Sea: 5-8 ft. Wire angle: first cast, 58°, second cast, 62°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	25.90	35.24	23.27	4.82	
09	25.95	35.21	23.23	4.81	
19	25.90	35.20	23.24	4.86	
39	25.74	35.21	23.29	4.82	
70	25.64	35.19	23.31	4.74	
121	24.45	35.11	23.61	4.37	
172	17.06	34.79	25.36	2.95	
221	12.19	34.73	26.36	2.97	
270	11.50	34.83	26.57	2.74	
338	10.51	34.78	26.71	1.76	
517	07.80	34.59	27.00	1.41	
709	06.05	34.53	27.20	1.83	
907	05.10	34.54	27.32	2.07	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	25.90	35.24	23.27	0.000	1.712
10	25.95	35.21	23.23	0.046	1.666
20	25.90	35.20	23.24	0.093	1.619
30	25.80	35.21	23.28	0.139	1.573
50	25.70	35.21	23.31	0.232	1.480
75	25.63	35.19	23.31	0.347	1.365
100	24.80	35.14	23.53	0.459	1.253
150	21.27	34.97	24.42	0.659	1.053
200	13.15	34.68	26.13	0.797	0.915
250	11.76	34.81	26.51	0.885	0.827
300	11.08	34.82	26.64	0.962	0.750
400	09.50	34.70	26.82	1.102	0.610
500	08.00	34.60	26.98	1.227	0.485
600	06.95	34.55	27.09	1.339	0.373
700	06.12	34.54	27.20	1.441	0.271
800	05.50	34.54	27.27	1.536	0.176
1000	(04.94)	(34.54)	27.34	1.712	0.000

STATION 69

M/V Hugh M. Smith: Cruise 8, 00°01'N, 167°23'W, February 14, 1951. Messenger time: 1256 GCT. Weather: scattered clouds, no observation. Wind: 100°, 15 kt. Sea: 5-8 ft. Wire angle: 58°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	25.50	35.26	23.41	4.70	
09	25.48	35.26	23.41	4.72	
19	25.50	35.26	23.40	4.73	
40	25.45	35.27	23.43	4.73	
67	25.32	35.26	23.46	4.65	
117	24.82	35.26	23.61	4.21	
165	22.99	35.81	24.57	3.34	
220	14.59	35.16	26.20	3.19	
281	11.66	34.88	26.58	2.97	
347	10.58	34.78	26.70	1.86	
485	08.39	34.63	26.94	1.61	
625	06.78	34.54	27.11	1.70	
798	05.36	34.52	27.27	2.05	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	25.50	35.26	23.41	0.000	1.723
10	25.48	35.26	23.41	0.045	1.678
20	25.50	35.26	23.41	0.090	1.633
30	25.48	35.26	23.41	0.135	1.588
50	25.40	35.27	23.44	0.224	1.499
75	25.28	35.26	23.47	0.336	1.387
100	25.07	35.26	23.54	0.447	1.276
150	22.94	35.38	24.26	0.650	1.073
200	16.70	35.35	25.87	0.798	0.925
250	12.80	34.99	26.44	0.895	0.828
300	11.30	34.85	26.62	0.974	0.749
400	09.70	34.71	26.80	1.116	0.607
500	08.19	34.61	26.96	1.242	0.481
600	07.04	34.54	27.07	1.357	0.366
700	06.06	34.53	27.20	1.460	0.263
800	(05.31)	(34.52)	27.28	1.554	0.169
1000	(04.35)	(34.52)	27.39	1.723	0.000

STATION 70

M/V Hugh M. Smith: Cruise 8, 01°05'S, 167°36'W, February 14, 1951. Messenger time: first cast, 2112 GCT; second cast, 2158 GCT. Weather: broken clouds, cumulus and altocumulus. Wind: 090°, 15 kt. Sea: 5-8 ft. Wire angle: first cast, 44°; second cast, 56°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	25.85	35.39	23.40	4.65	
12	25.84	35.39	23.40	4.67	
26	25.84	35.38	23.39	4.67	
52	25.82	35.36	23.38	4.75	
100	25.82	35.37	23.39	4.70	
189	16.46	35.32	25.91	2.70	
278	11.52	34.85	26.58	2.69	
377	10.13	34.75	26.75	2.07	
470	08.76	34.65	26.90	1.52	
571	07.64	34.57	27.01	1.90	
771	05.95	34.52	27.20	1.92	
977	04.72	34.49	27.32	2.24	
1195	03.85	34.52	27.44	1.83	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	Δ D 1000 - Δ D (dyn. m)
00	25.80	35.39	23.40	0.000	1.778
10	25.84	35.39	23.40	0.045	1.733
20	25.84	35.38	23.39	0.090	1.688
30	25.84	35.38	23.39	0.135	1.643
50	25.82	35.36	23.38	0.226	1.552
75	25.82	35.36	23.38	0.339	1.439
100	25.82	35.37	23.39	0.452	1.326
150	25.30	35.44	23.60	0.675	1.103
200	15.25	35.20	26.09	0.834	0.944
250	12.01	34.90	26.53	0.923	0.855
300	11.22	34.82	26.61	1.000	0.778
400	09.81	34.72	26.79	1.143	0.635
500	08.38	34.62	26.94	1.271	0.507
600	07.40	34.56	27.04	1.389	0.389
700	06.54	34.54	27.14	1.497	0.281
800	05.76	34.51	27.22	1.597	0.181
1000	04.60	34.49	27.34	1.778	0.000

STATION 71

M/V Hugh M. Smith: Cruise 8, 02°01'S, 167°42'W, February 15, 1951. Messenger time: 0525 GCT. Weather: broken clouds, cumulus, stratocumulus and cirrus. Wind: 070°, 17 kt. Sea: 5-8 ft. Wire angle: 55°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.00	35.24	23.24	4.82	
11	25.98	35.22	23.23	4.84	
21	25.94			4.84	
42	25.92	35.26	23.28	4.82	
76	25.90	35.25	23.27	4.83	
130	25.61	35.26	23.37	4.61	
178	21.02	35.72	25.05	3.37	
229	12.86	35.23 1/	26.62 1/	2.71	
275	10.62	34.79	26.70	2.47	
329	10.12	34.71	26.73	1.78	
435	09.30	34.67	26.83	1.68	
547	08.09	34.60	26.97	1.91	
693	06.46	34.54	27.15	1.99	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.00	35.24	23.24	0.000	1.788
10	25.98	35.22	23.23	0.047	1.741
20	25.95	35.23	23.24	0.093	1.695
30	25.93	35.24	23.26	0.140	1.648
50	25.92	35.26	23.28	0.232	1.556
75	25.90	35.25	23.27	0.348	1.440
100	25.84	35.25	23.29	0.464	1.324
150	25.42	35.33	23.48	0.692	1.096
200	15.58	35.20	26.01	0.855	0.933
250	11.30	34.86	26.63	0.944	0.844
300	10.38	34.74	26.70	1.016	0.772
400	09.60	34.69	26.80	1.154	0.634
500	08.64	34.63	26.91	1.283	0.505
600	07.41	34.57	27.04	1.402	0.386
700	(06.40)	(34.54)	27.16	1.509	0.279
800	(05.67)	(34.51)	27.23	1.608	0.180
1000	(04.60)	(34.49)	27.34	1.788	0.000

1/ Anomalous value.

STATION 72

M/V Hugh M. Smith: Cruise 8, 03°05'S, 167°50'W, February 15, 1951. Messenger time: 1339 GCT. Weather: scattered clouds, no observation. Wind: 100°, 16 kt. Sea: 5-8 ft. Wire angle: 41°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.40	35.39	23.22	4.80	
12	26.37	35.39	23.23	4.79	
27	26.38	35.41	23.24	4.79	
55	26.34	35.41	23.26	4.74	
108	26.12	35.38	23.30	4.76	
211	18.89	35.52	25.46	2.88	
294	10.71	34.81	26.70	2.63	
399	09.18	34.69	26.87	1.98	
399	09.24	34.69	26.86		
499	08.47	34.64	26.94	1.80	
612	07.24	34.57	27.07	1.68	
844	05.16	34.51	27.29	2.16	
1090	04.14	34.52	27.41	2.29	
1354	03.39	34.55	27.51	2.60	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.40	35.39	23.22	0.000	1.827
10	26.37	35.39	23.23	0.047	1.780
20	26.37	35.40	23.24	0.093	1.734
30	26.37	35.41	23.25	0.140	1.687
50	26.35	35.41	23.25	0.233	1.594
75	26.34	35.41	23.26	0.349	1.478
100	26.22	35.40	23.29	0.465	1.362
150	25.92	35.52	23.47	0.693	1.134
200	20.00	35.63	25.26	0.875	0.952
250	14.01	35.05	26.24	0.991	0.836
300	10.55	34.79	26.71	1.073	0.754
400	09.20	34.69	26.86	1.207	0.620
500	08.47	34.64	26.94	1.332	0.495
600	07.39	34.58	27.05	1.448	0.379
700	06.35	34.53	27.16	1.555	0.272
800	05.50	34.51	27.25	1.652	0.175
1000	04.48	34.51	27.37	1.827	0.000

STATION 73

M/V Hugh M. Smith: Cruise 8, 04°00'S, 167°58'W, February 15, 1951. Messenger time: 2106 GCT. Weather: scattered clouds, cumulus. Wind: 090°, 15 kt. Sea: 5-8 ft. Wire angle: 30°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.90	35.56	23.19	4.74	
08	26.86	35.55	23.20	4.75	
25	26.88	35.56	23.20	4.76	
50	26.88	35.57	23.21	4.73	
100	26.88	35.58	23.21	4.74	
193	21.42	35.95	25.12	3.55	
278	11.68	34.89	26.58	2.16	
366	09.44	34.73	26.86	1.89	
460	08.40	34.66	26.96	1.93	
552	07.42	34.61	27.07	1.75	
743	05.76	34.53	27.23	2.16	
932	04.72	34.52	27.35	2.33	
1124	04.06	34.54	27.44	2.44	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.90	35.56	23.19	0.000	1.810
10	26.86	35.55	23.20	0.047	1.763
20	26.87	35.56	23.20	0.094	1.716
30	26.88	35.56	23.20	0.141	1.669
50	26.88	35.57	23.21	0.235	1.575
75	26.88	35.58	23.21	0.352	1.458
100	26.88	35.58	23.21	0.470	1.340
150	26.62	35.62	23.33	0.703	1.107
200	20.80	35.88	25.24	0.889	0.921
250	13.50	35.04	26.34	1.004	0.806
300	10.88	34.83	26.68	1.083	0.727
400	09.00	34.70	26.90	1.217	0.593
500	08.00	34.64	27.01	1.336	0.474
600	06.93	34.58	27.12	1.446	0.364
700	06.07	34.54	27.20	1.547	0.263
800	05.41	34.53	27.28	1.640	0.170
1000	04.42	34.53	27.39	1.810	0.000

STATION 74

M/V Hugh M. Smith: Cruise 8, 05°03'S, 168°09'W, February 16, 1951. Messenger time: 0445 GCT. Weather: broken clouds, cumulus, stratocumulus and cirrus. Wind: 090°, 13 kt. Sea: 5-8 ft. Wire angle: 35°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	27.52	35.69	23.09	4.65	
09	27.54	25.69	23.08	4.65	
25	27.42	35.69	23.12	4.66	
48	27.38	35.69	23.14	4.66	
94	27.36	35.68	23.14	4.64	
179	24.23	36.17	24.48	3.67	
261	13.26	35.01	26.37	2.17	
340	09.66	34.75	26.83	2.29	
423	08.95	34.66	26.88	2.18	
505	07.98	34.61	26.99	1.83	
687	06.42	34.54	27.16	1.70	
871	05.38	34.54	27.29	2.07	
1060	04.55	34.52	27.37	2.28	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	ΔD1000-ΔD (dyn. m)
00	27.50	35.69	23.10	0.000	1.882
10	27.54	35.69	23.08	0.048	1.834
20	27.47	35.69	23.11	0.096	1.786
30	27.41	35.69	23.13	0.144	1.738
50	27.38	35.69	23.14	0.239	1.643
75	27.38	35.68	23.13	0.358	1.524
100	27.36	35.68	23.14	0.478	1.404
150	27.03	35.72	23.27	0.716	1.166
200	22.26	36.06	24.97	0.910	0.972
250	14.50	35.14	26.21	1.035	0.847
300	10.90	34.83	26.68	1.119	0.763
400	09.18	34.68	26.86	1.256	0.626
500	08.06	34.61	26.98	1.379	0.503
600	07.06	34.56	27.08	1.492	0.390
700	06.34	34.54	27.17	1.597	0.285
800	05.74	34.54	27.24	1.697	0.185
1000	04.81	34.53	27.35	1.882	0.000

STATION 75

M/V Hugh M. Smith: Cruise 8, 05°59'S, 168°29'W, February 16, 1951. Messenger time: 1225 GCT. Weather: broken clouds, no observation. Wind: 090°, 10 kt. Sea: 3-5 ft. Wire angle: 25°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	27.40	35.71	23.13	4.69	
09	27.50	35.70	23.10	4.70	
27	27.51	35.71	23.11	4.72	
54	27.45	35.69	23.11	4.82	
108	27.42	35.70	23.13	4.73	
202	24.23	36.07	24.41	3.74	
298	12.20	34.89	26.48	2.17	
392	09.37	34.70	26.84	2.46	
392	09.45	34.70	26.83		
492	07.54	34.57	27.03	2.92	
591	06.60	34.51	27.11	3.01	
800	05.25	34.49	27.26	2.76	
1005	04.31	34.52	27.39	2.42	
1005	04.25	34.52	27.40		
1209	03.72	34.54	27.47	2.60	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	27.40	35.71	23.13	0.000	1.938
10	27.50	35.70	23.10	0.048	1.890
20	27.50	35.70	23.10	0.095	1.843
30	27.51	35.71	23.11	0.143	1.795
50	27.47	35.69	23.11	0.239	1.699
75	27.43	35.69	23.12	0.359	1.579
100	27.42	35.70	23.13	0.479	1.459
150	27.32	35.72	23.18	0.717	1.221
200	24.70	36.03	24.23	0.931	1.007
250	19.18	35.65	25.49	1.090	0.848
300	12.02	34.88	26.51	1.195	0.743
400	09.21	34.69	26.86	1.339	0.599
500	07.45	34.57	27.04	1.459	0.479
600	06.51	34.50	27.11	1.567	0.371
700	05.88	34.50	27.19	1.668	0.270
800	05.25	34.49	27.26	1.762	0.176
1000	04.31	34.52	27.39	1.938	0.000

STATION 76

M/V Hugh M. Smith: Cruise 8, 07°04'S, 168°48'W, February 16, 1951. Messenger time: 2050 GCT. Weather: scattered clouds, cumulus. Wind: 060°, 9 kt. Sea: 3-5 ft. Wire angle: 16°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
04	27.61	35.63	23.02	4.69	
14	27.56	35.65	23.05	4.76	
28	27.55	35.65	23.05	4.69	
57	27.52	35.66	23.07	4.67	
109	27.43	35.64	23.08	4.67	
210	24.04	36.13	24.51	3.56	
312	14.62	35.08	26.14	2.72	
420	09.16	34.65	26.84	2.44	
420	09.22	34.65	26.83		
520	07.70	34.58	27.01	2.89	
622	06.44	34.51	27.13	2.81	
826	05.06	34.49	27.29	2.56	
1029	04.30	34.51	27.39	2.72	
1232	03.62	34.54	27.48	2.88	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	(27.60)	(35.63)	23.02	0.000	2.007
10	27.59	35.64	23.03	0.049	1.958
20	27.55	35.65	23.05	0.097	1.910
30	27.55	35.65	23.05	0.145	1.862
50	27.54	35.66	23.06	0.242	1.765
75	27.47	35.65	23.05	0.363	1.644
100	27.45	35.64	23.08	0.484	1.523
150	26.40	35.79	23.52	0.717	1.290
200	25.30	35.98	24.01	0.929	1.078
250	20.38	35.81	25.30	1.099	0.908
300	15.83	35.20	25.96	1.223	0.784
400	09.63	34.69	26.79	1.399	0.608
500	08.01	34.60	26.98	1.526	0.481
600	06.72	34.53	27.11	1.638	0.369
700	05.76	34.50	27.21	1.740	0.267
800	05.18	34.49	27.27	1.833	0.174
1000	04.42	34.50	27.37	2.007	0.000

STATION 77

M/V Hugh M. Smith: Cruise 8, 13°30'S, 171°51'W, February 27, 1951. Messenger time: 0555 GCT. Weather: overcast (with breaks), cumulus and cirrus. Wind: 080°, 12 kt. Sea: 5-8 ft. Wire angle: 10°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
05	29.13	35.04	22.07	4.54	0.40
15	29.07	35.03	22.09	4.56	0.42
29	28.96	35.06	22.14	4.57	0.44
58	28.77	35.16	22.28	4.51	0.42
112	27.26	35.56	23.08	4.65	0.55
215	21.64	35.92	25.03	3.75	0.56
316	15.96	35.28	25.99	3.36	1.01
316	15.90	35.28	26.00		
423	10.01	34.64	26.69	2.85	1.78
528	07.50	34.52	26.99	3.16	2.06
631	06.18	34.48	27.14	3.41	2.26
834	04.91	34.49	27.30	3.19	2.21
1041	04.10	34.50	27.40	3.36	2.44
1244	03.46	34.53	27.49	3.18	2.60

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	(29.10)	(35.04)	22.84	0.000	2.061
10	29.09	35.04	22.08	0.058	2.003
20	28.98	35.04	22.12	0.115	1.946
30	28.93	35.06	22.15	0.172	1.889
50	28.82	35.13	22.24	0.285	1.776
75	28.14	35.34	22.63	0.421	1.640
100	27.30	35.55	23.06	0.548	1.513
150	26.02	35.80	23.65	0.779	1.282
200	23.02	36.03	24.73	0.970	1.091
250	20.15	35.77	25.33	1.122	0.939
300	16.90	35.40	25.86	1.248	0.813
400	11.08	34.73	26.57	1.439	0.622
500	08.05	34.54	26.93	1.580	0.481
600	06.51	34.49	27.10	1.694	0.367
700	05.65	34.48	27.21	1.796	0.265
800	05.08	34.48	27.28	1.889	0.172
1000	04.28	34.49	27.37	2.061	0.000

STATION 78

M/V Hugh M. Smith: Cruise 8, 11°55'S, 171°59'W, February 27, 1951. Messenger time: 2200 GCT. Weather: broken clouds, cumulus, stratocumulus, altocumulus and cirrus. Wind: 080°, 7 kt. Sea: 1-3 ft. Wire angle: 19°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
04	28.89	35.00	22.12	4.57	0.32
13	28.82	35.05	22.18	4.54	0.50
13					0.26
27	28.83	35.05	22.18	4.54	0.25
50	28.82	35.07	22.20	4.49	0.30
97	28.10	35.68	22.89	4.60	0.35
187	22.84	36.06	24.80	3.68	0.58
272	17.92	35.53	25.71	3.66	0.83
364	12.94	34.89	26.34	3.25	1.49
455	09.04	34.60	26.82	2.85	2.15
550	07.33	34.52	27.02	3.19	2.27
738	05.57	34.46	27.20	3.37	2.43
924	04.56	34.51	27.36	3.23	2.58
1123	03.94	34.51	27.42	3.11	2.65

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	Δ D 1000 - Δ D (dyn. m)
00	(28.90)	(35.00)	22.12	0.000	2.029
10	28.83	35.05	22.18	0.057	1.972
20	28.82	35.05	22.18	0.114	1.915
30	28.83	35.05	22.18	0.170	1.859
50	28.82	35.07	22.20	0.284	1.745
75	28.67	35.21	22.35	0.423	1.606
100	27.92	35.76	23.01	0.554	1.475
150	25.88	36.02	23.86	0.779	1.250
200	22.10	35.98	24.95	0.959	1.070
250	19.00	35.64	25.53	1.100	0.929
300	16.45	35.35	25.93	1.218	0.811
400	11.15	34.72	26.55	1.407	0.622
500	08.10	34.56	26.93	1.547	0.482
600	06.72	34.49	27.08	1.662	0.367
700	05.80	34.47	27.18	1.765	0.264
800	05.15	34.48	27.27	1.860	0.169
1000	04.25	34.52	27.40	2.029	0.000

STATION 79

M/V Hugh M. Smith: Cruise 8, 09°51'S, 171°51'W, February 28, 1951. Messenger time: 1310 GCT. Weather: overcast (with breaks), cumulus and altocumulus. Wind: 090°, 9 kt. Sea: 1-3 ft. Wire angle: 10°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
04	28.59	35.36	22.49	4.59	0.37
14	28.54	35.36	22.51	4.61	0.37
29	28.60	35.44	22.55	4.59	0.34
52	28.61	35.51	22.60	4.56	0.33
102	28.42	35.58	22.71	4.60	0.44
203	24.58	36.00	24.24	3.21	0.73
296	17.32	35.45	25.80	3.38	0.95
395	10.40	34.71	26.67	2.48	1.97
490	07.97	34.60	26.98	2.76	2.01
592	06.80	34.56	27.12	2.82	2.36
788	05.40	34.50	27.25	2.84	2.44
982	04.46	34.51	27.37	2.85	2.60
1188	03.64	34.56	27.49	2.91	2.57

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	Δ D 1000 - Δ D (dyn. m)
00	(28.60)	(35.36)	22.49	0.000	2.090
10	28.55	35.36	22.51	0.054	2.036
20	28.54	35.40	22.54	0.107	1.983
30	28.60	35.44	22.55	0.160	1.930
50	28.61	35.51	22.60	0.266	1.824
75	28.60	35.54	22.62	0.398	1.692
100	28.45	35.57	22.70	0.529	1.561
150	27.77	35.71	23.02	0.782	1.308
200	24.90	35.99	24.14	1.001	1.089
250	20.92	35.85	25.18	1.170	0.920
300	17.15	35.42	25.82	1.299	0.791
400	10.15	34.70	26.71	1.485	0.605
500	07.81	34.59	27.00	1.614	0.476
600	06.74	34.56	27.13	1.723	0.367
700	06.00	34.52	27.19	1.824	0.266
800	05.32	34.50	27.26	1.918	0.172
1000	04.39	34.52	27.39	2.090	0.000

STATION 80

M/V Hugh M. Smith: Cruise 8, 08°00'S, 171°56'W, March 1, 1951. Messenger time: 0438 GCT. Weather: scattered clouds, cumulus. Wind: 040°, 15 kt. Sea: 3-5 ft. Wire angle: 27°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
04	28.68	35.40	22.49	4.54	0.37
12	28.68	35.43	22.51	4.54	0.36
25	28.34	35.51	22.69	4.55	0.37
51	28.23	35.73 1/	22.89 1/	4.53	0.52
96	28.12	35.62	22.84	4.56	0.54
181	25.79	35.97	23.85	3.41	0.75
267 2/	16.21	35.71	26.26	4.03	0.60
359	11.40	34.83	26.59	2.36	2.06
447	08.56	34.67	26.95	2.99	2.22
538	07.50	34.59	27.05	2.83	2.41
715	05.90	34.51	27.20	2.95	2.53
899	04.90	34.51	27.32	2.93	2.68
1089	04.19	34.53	27.41	2.87	2.76

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	Δ D 1000 - Δ D (dyn. m)
00	(28.70)	(35.40)	22.49	0.000	1.997
10	28.69	35.42	22.50	0.054	1.943
20	28.40	35.49	22.65	0.106	1.891
30	28.31	35.52	22.69	0.158	1.839
50	28.25	35.54	22.74	0.262	1.735
75	28.19	35.60	22.80	0.390	1.607
100	28.12	35.62	22.84	0.517	1.480
150	27.80	35.69	23.00	0.767	1.230
200	24.10	36.05	24.43	0.980	1.017
250	17.95	35.56	25.73	1.129	0.868
300	14.20	35.11	26.25	1.234	0.763
400	09.75	34.72	26.80	1.395	0.602
500	07.90	34.62	27.01	1.519	0.478
600	06.82	34.56	27.12	1.629	0.368
700	06.00	34.52	27.19	1.730	0.267
800	05.40	34.51	27.26	1.824	0.173
1000	04.48	34.52	27.38	1.997	0.000

1/ Anomalous values.

2/ Point on T-S curve suggests bottle leaked on way up. Therefore all values at this level except temperature are probably in error.

STATION 81

M/V Hugh M. Smith: Cruise 8, 07°01'S, 171°54'W, March 1, 1951. Messenger time: 1304 GCT. Weather: broken clouds, cumulus and altocumulus. Wind: 030°, 14 kt. Sea: 3-5 ft. Wire angle: no observation

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	28.50	35.38	22.54	4.59	0.38
10	28.48	35.39	22.55	4.61	0.38
26	28.50	35.41	22.56	4.60	0.48
54	28.18	35.57	22.78	4.54	0.49
107	28.04	35.65	22.89	4.57	0.61
208	23.27	36.12	24.72	3.54	0.77
314	13.04	35.01	26.41	2.47	1.75
420	09.44	34.70	26.83	2.36	2.25
523	07.79	34.57	26.99	2.61	2.30
629	06.62	34.52	27.11	2.87	2.28
834	05.14	34.50	27.29	2.70	2.53
1038	04.30	34.52	27.39	2.79	2.61
1241	03.48	34.55	27.50	2.85	2.58

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	Δ D 1000 - Δ D (dyn. m)
00	28.50	35.38	22.54	0.000	2.016
10	28.48	35.39	22.55	0.053	1.963
20	28.50	35.40	22.55	0.106	1.910
30	28.50	35.42	22.57	0.159	1.857
50	28.18	35.57	22.79	0.263	1.753
75	28.09	35.61	22.84	0.390	1.626
100	28.05	35.62	22.87	0.516	1.500
150	27.37	35.80	23.22	0.761	1.255
200	24.62	36.10	24.31	0.974	1.042
250	19.25	35.73	25.53	1.131	0.885
300	14.02	35.12	26.29	1.241	0.775
400	09.90	34.74	26.79	1.401	0.615
500	08.09	34.59	26.96	1.529	0.487
600	06.91	34.53	27.08	1.643	0.373
700	06.01	34.51	27.19	1.747	0.269
800	05.29	34.50	27.27	1.842	0.174
1000	04.48	34.52	27.38	2.016	0.000

STATION 82

M/V Hugh M. Smith: Cruise 8, 05°59'S, 172°00'W, March 1, 1951. Messenger time: 2147 GCT. Weather: scattered clouds, cumulus and cirrus. Wind: 050°, 16 kt. Sea: 3-5 ft. Wire angle: 35°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	28.20	35.67	22.85	4.57	0.47
08	28.22	35.66	22.84	4.60	0.48
21	28.22	35.67	22.85	4.58	0.43
45	28.08	35.71	22.92	4.53	0.50
86	27.84	35.68	22.98	4.58	0.57
161	25.68	36.06	23.95	3.71	0.74
236 1/	19.16	35.87	25.66	3.65	0.77
313	12.48	34.93	26.46	2.35	1.91
390	09.58	34.73	26.83	2.46	2.21
469	07.92	34.62	27.01	2.72	2.37
630	06.34	34.52	27.15	2.94	2.48
798	05.29	34.51	27.28	2.81	2.63
984	04.56	34.51	27.36		

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	28.20	35.67	22.85	0.000	1.919
10	28.22	35.66	22.84	0.050	1.869
20	28.20	35.67	22.85	0.100	1.819
30	28.21	35.68	22.86	0.151	1.768
50	28.02	35.71	22.94	0.250	1.669
75	27.90	35.68	22.96	0.374	1.545
100	27.63	35.70	23.06	0.497	1.422
150	26.88	35.85	23.42	0.731	1.188
200	23.70	36.13	24.61	0.930	0.989
250	18.15	35.60	25.71	1.075	0.844
300	13.22	35.02	26.38	1.178	0.741
400	09.31	34.71	26.86	1.329	0.590
500	07.50	34.58	27.04	1.448	0.471
600	06.52	34.53	27.14	1.555	0.364
700	05.81	34.51	27.21	1.655	0.264
800	05.28	34.51	27.28	1.747	0.172
1000	(04.49)	(34.52)	27.37	1.919	0.000

1/ Point on T-S curve suggests bottle leaked on way up. Therefore all values at this level except temperature are probably in error.

STATION 83

M/V Hugh M. Smith: Cruise 8, 05°00'S, 172°16'W, March 2, 1951. Messenger time: 0558 GCT. Weather: scattered clouds, cumulus and cirrus. Wind: 050°, 12 kt. Sea: 3-5 ft. Wire angle: 28°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	27.70	35.70	23.02	4.69	0.66
08	27.75	35.69	23.02	4.69	0.57
25	27.68	35.72	23.06	4.69	0.53
50	27.63	35.70	23.06	4.64	0.57
99	27.45	35.70	23.12	4.69	0.64
187	23.86			3.67	
276 1/	13.22	35.48	26.74	3.28	0.53
365	09.74	34.75	26.82	1.87	2.30
459	08.66	34.67	26.93	1.83	2.47
550	07.66	34.66	27.08	1.77	2.44
744	05.90	34.52	27.21	2.42	2.48
931	04.92	34.52	27.33	2.55	2.63
1125	04.16	34.54	27.43	2.47	2.60

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	27.70	35.70	23.02	0.000	1.871
10	27.73	35.70	23.03	0.049	1.822
20	27.70	35.71	23.05	0.097	1.774
30	27.67	35.70	23.05	0.145	1.726
50	27.63	35.70	23.06	0.242	1.629
75	27.55	35.70	23.09	0.363	1.508
100	27.45	35.70	23.12	0.484	1.387
150	26.30	35.89	23.63	0.713	1.158
200	22.08	35.98	24.96	0.903	0.968
250	14.90	35.21	26.17	1.032	0.839
300	11.83	34.90	26.56	1.119	0.752
400	09.23	34.71	26.87	1.262	0.609
500	08.19	34.66	27.00	1.383	0.488
600	07.14	34.62	27.12	1.494	0.377
700	06.29	34.54	27.17	1.597	0.274
800	05.55	34.52	27.25	1.694	0.177
1000	04.63	34.54	27.37	1.871	0.000

1/ Point on T-S curve suggests bottle leaked on way up. Therefore all values at this level except temperature are probably in error.

STATION 84

M/V Hugh M. Smith: Cruise 8, 04°00'S, 172°06'W, March 2, 1951. Messenger time: 1800 GCT. Weather: scattered clouds, cumulus and cirrus. Wind: 040°, 10 kt. Sea: 3-5 ft. Wire angle: 19°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σt (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	27.20	35.60	23.13	4.68	0.77
10	27.27	35.61	23.11	4.67	0.62
24	27.27	35.61	23.11	4.68	0.58
52	27.25	35.61	23.12	4.63	0.64
102	27.10	35.56	23.13	4.67	0.67
198	22.64	34.28 1/	23.51 1/	3.58	0.76
295 2/	11.53	35.15	26.81	2.19	1.60
396	09.12	34.69	26.88	2.18	2.35
492	08.30	34.63	26.96	1.93	2.50
589	07.20	34.56	27.07	1.85	2.68
779	05.70	34.51.	27.22	2.03	2.77
974	04.62	34.52	27.36	2.22	2.83
1170	03.88	34.54	27.45	2.41	2.83

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σt (gm/l)	ΔD (dyn. m)	$\Delta D\,1000 - \Delta D$ (dyn. m)
00	27.20	35.60	23.13	0.000	1.861
10	27.27	35.61	23.11	0.048	1.813
20	27.27	35.61	23.11	0.095	1.766
30	27.26	35.61	23.11	0.143	1.718
50	27.25	35.61	23.12	0.239	1.622
75	27.20	35.58	23.11	0.358	1.503
100	27.09	35.56	23.13	0.478	1.383
150	26.81	35.63	23.27	0.715	1.146
200	22.10	35.93	24.92	0.910	0.951
250	13.06	35.03	26.42	1.030	0.831
300	11.38	34.87	26.62	1.109	0.752
400	09.10	34.69	26.88	1.247	0.614
500	08.21	34.62	26.96	1.370	0.491
600	07.10	34.56	27.08	1.484	0.377
700	06.29	34.52	27.16	1.589	0.272
800	05.58	34.51	27.24	1.687	0.174
1000	04.49	34.53	27.38	1.861	0.000

1/ Anomalous values.

2/ Point on T-S curve suggests bottle leaked on way up. Therefore all values at this level except temperature are probably in error.

STATION 85

M/V Hugh M. Smith: Cruise 8, 03°00'S, 171°50'W, March 3, 1951. Messenger time: 0210 GCT. Weather: broken clouds, cumulus. Wind: 060°, 14 kt. Sea: 3-5 ft. Wire angle: 35°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	27.20	35.51	23.06	4.73	0.68
09	27.12	35.49	23.07	4.76	0.66
21	26.98	35.50	23.12	4.75	0.62
46	26.93	35.50	23.14	4.73	0.66
89	26.81	35.50	23.18	4.76	0.67
163	25.16	35.91	24.00	3.90	0.73
236 1/	12.54	35.40	26.81	3.30	1.01
318	10.02	34.76	26.78	2.53	1.98
401	09.10	34.68	26.87	2.41	2.21
484	08.47	34.61	26.92	1.99	2.35
655	06.94	34.55	27.09	1.92	2.57
835	05.28	34.50	27.27	2.07	2.72
1024	04.35	34.55	27.41	2.27	2.76

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	Δ D 1000 - Δ D (dyn. m)
00	27.20	35.51	23.06	0.000	1.821
10	27.10	35.49	23.08	0.048	1.773
20	26.99	35.50	23.12	0.096	1.725
30	26.97	35.50	23.13	0.144	1.677
50	26.92	35.50	23.14	0.239	1.582
75	26.88	35.50	23.15	0.358	1.463
100	26.80	35.51	23.19	0.477	1.344
150	26.42	35.59	23.37	0.710	1.111
200	19.30	35.63	25.44	0.890	0.931
250	11.91	34.92	26.56	0.994	0.827
300	10.35	34.79	26.75	1.067	0.754
400	09.11	34.68	26.87	1.199	0.622
500	08.31	34.60	26.93	1.323	0.498
600	07.43	34.56	27.03	1.441	0.380
700	06.51	34.53	27.14	1.550	0.271
800	05.55	34.50	27.24	1.649	0.172
1000	04.42	34.55	27.41	1.821	0.000

1/ Point on T-S curve suggests bottle leaked on way up. Therefore all values at this level except temperature are probably in error.

STATION 86

M/V Hugh M. Smith: Cruise 8, 02°00'S, 172°02'W, March 4, 1951. Messenger time: 0234 GCT. Weather: broken clouds, cumulus and cirrocumulus. Wind: 080°, 14 kt. Sea: 3-5 ft. Wire angle: 40°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σt (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	27.00	35.46	23.09	4.77	0.66
08	26.96	35.47	23.11	4.74	0.70
23	26.77	35.46	23.16	4.75	0.68
45	26.73	35.46	23.17	4.67	0.71
86	26.31	35.46	23.30	4.73	0.77
159	24.19	35.81	24.22	3.82	0.86
240 1/	12.90	35.14	26.54	2.64	1.62
319	10.26	34.75	26.73	2.00	2.26
408	09.69	34.70	26.79	1.82	2.40
493	08.86	34.66	26.89	1.65	2.57
676	06.56	34.55	27.15	2.12	2.77
858	04.91	34.53	27.34	2.30	2.90
1054	04.16	34.56	27.44	2.28	2.92

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σt (gm/l)	ΔD (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	27.00	35.46	23.09	0.000	1.762
10	26.97	35.47	23.10	0.048	1.714
20	26.79	35.47	23.16	0.095	1.667
30	26.76	35.46	23.16	0.143	1.619
50	26.71	35.46	23.18	0.237	1.525
75	26.64	35.46	23.20	0.355	1.407
100	26.20	35.47	23.35	0.471	1.291
150	24.90	35.79	23.99	0.686	1.076
200	16.22	35.29	25.94	0.839	0.923
250	12.25	34.93	26.51	0.932	0.830
300	10.48	34.78	26.72	1.008	0.754
400	09.77	34.70	26.78	1.146	0.616
500	08.79	34.65	26.90	1.277	0.485
600	07.51	34.60	27.05	1.396	0.366
700	06.29	34.55	27.18	1.501	0.261
800	05.38	34.53	27.28	1.596	0.166
1000	04.29	34.56	27.43	1.762	0.000

1/ Point on T-S curve suggests bottle leaked on way up. Therefore all values at this level except temperature are probably in error.

STATION 87

M/V Hugh M. Smith: Cruise 8, 00°57'S, 172°00'W, March 4, 1951. Messenger time: 1105 GCT. Weather: broken clouds, no observation. Wind: 080°, 12 kt. Sea: 3-5 ft. Wire angle: 47°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	26.30	35.39	23.25	4.73	0.68
10	26.30	35.38	23.25	4.75	0.68
21	26.20				
47	26.10	35.38	23.31	4.67	0.68
93	25.82	35.38	23.40	4.75	0.67
180	19.67	35.64	25.35	3.16	1.07
280 1/	11.67	35.07	26.72	3.03	1.52
389	10.06	34.74	26.76	1.80	2.31
494	08.47	34.62	26.92	2.04	2.51
609	06.74	34.52	27.10	1.83	2.75
831	05.18	34.51	27.29	2.34	2.70
1059	04.21	34.53	27.41	2.27	2.78
1339	03.21	34.56	27.53	2.31	2.80

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.30	35.39	23.25	0.000	1.767
10	26.30	35.38	23.25	0.046	1.721
20	26.21	35.38	23.28	0.093	1.674
30	26.16	35.38	23.29	0.139	1.628
50	26.09	35.38	23.31	0.231	1.536
75	25.91	35.38	23.37	0.345	1.422
100	25.80	35.38	23.40	0.459	1.308
150	25.22	35.53	23.70	0.679	1.088
200	15.82	35.27	26.01	0.837	0.930
250	13.35	35.04	26.37	0.932	0.835
300	11.25	34.85	26.63	1.012	0.755
400	09.87	34.72	26.78	1.155	0.612
500	08.40	34.61	26.93	1.285	0.482
600	06.86	34.53	27.09	1.400	0.367
700	05.92	34.51	27.20	1.502	0.265
800	05.30	34.51	27.27	1.596	0.171
1000	04.46	34.52	27.38	1.767	0.000

1/ Point on T-S curve suggests bottle leaked on way up. Therefore all values at this level except temperature are probably in error.

STATION 88

M/V Hugh M. Smith: Cruise 8, 00°09'N, 171°58'W, March 4, 1951. Messenger time: 1950 GCT. Weather: scattered clouds, cumulus. Wind: 140°, 8 kt. Sea: 3-5 ft. Wire angle: 52°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.00	35.34	23.31	4.69	0.68
10	26.06	35.37	23.31	4.74	0.77
22	26.02				
44	25.95	35.34	23.32	4.61	0.78
83	25.68	35.37	23.43		
159	22.40	35.24	24.31	3.53	1.01
246	14.17	35.06	26.22	3.34	1.37
345	10.97	34.82	26.66	2.42	2.08
441	08.82	34.71	26.94	1.52	2.50
552	07.52	34.62	27.07	1.95	2.63
773	05.52	34.55	27.28	2.03	2.85
1004	04.32	34.58	27.44	2.14	2.92
1268	03.46	34.59	27.54	2.19	2.92

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.00	35.34	23.31	0.000	1.744
10	26.06	35.37	23.31	0.046	1.698
20	26.02	35.36	23.32	0.092	1.652
30	26.00	35.34	23.31	0.137	1.607
50	25.92	35.34	23.34	0.229	1.515
75	25.73	35.37	23.42	0.342	1.402
100	25.50	35.37	23.49	0.454	1.290
150	23.30	35.32	24.11	0.662	1.082
200	16.39	35.16	25.80	0.816	0.928
250	14.05	35.03	26.22	0.920	0.824
300	12.38	34.91	26.46	1.008	0.736
400	09.61	34.74	26.83	1.156	0.588
500	08.12	34.66	27.01	1.279	0.465
600	07.01	34.58	27.11	1.389	0.355
700	06.09	34.56	27.21	1.490	0.254
800	05.37	34.56	27.30	1.581	0.163
1000	04.37	34.58	27.43	1.744	0.000

STATION 89

M/V Hugh M. Smith: Cruise 8, 01°04'N, 172°00'W, March 5, 1951. Messenger time: 0323 GCT. Weather: scattered clouds, cumulus and cirrus. Wind: 040°, 9 kt. Sea: 3-5 ft. Wire angle: 60°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.70	35.24	23.02	4.81	0.62
09	26.20	35.25	23.18	4.83	0.66
18	26.10				
38	25.95	35.26	23.26	4.80	0.61
67	25.88				
112	25.77	35.30	23.35	4.61	0.66
149	22.00	35.24	24.42	4.81	0.67
191	14.00	34.72	25.99	3.14	1.41
238	12.34	34.67	26.29	3.00	1.62
302	11.07	34.78	26.61	2.54	1.86
427	09.45	34.70	26.83	1.56	2.31
544	07.65	34.59	27.02	1.63	2.61
704	06.25	34.54	27.18	1.86	2.62

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.70	35.24	23.02		
10	26.20	35.25	23.18		
20	26.07	35.25	23.22		
30	26.00	35.26	23.25		
50	25.91	35.27	23.29		
75	25.86	35.27	23.30		
100	25.80	35.29	23.34		
150	21.50	35.21	24.54		
200	13.52	34.69	26.07		
250	12.02	34.69	26.36		
300	11.10	34.78	26.61		
400	09.85	34.72	26.78		
500	08.25	34.62	26.96		
600	07.09	34.56	27.08		
700	06.24	34.54	27.18		

STATION 90

M/V Hugh M. Smith: Cruise 8, 01°54'N, 172°02'W, March 5, 1951. Messenger time: 1050 GCT. Weather: moderate intermittent rain, no observation. Wind: 080°, 10 kt. Sea: 3-5 ft. Wire angle: 36°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.40	35.22	23.10	4.86	0.67
12	26.34	35.22	23.11	4.86	0.68
28	26.22	35.21	23.14	4.84	0.61
59	26.13	35.25	23.20	4.78	0.70
118	26.00	35.22	23.22	4.63	0.76
226	11.97	34.80	26.46	2.95	1.71
329	10.38	34.75	26.71	1.77	2.27
448	09.66	34.70	26.80	1.60	2.41
561	07.76	34.59	27.01	2.08	2.53
685	06.60	34.53	27.12	1.66	2.81
934	04.59	34.53	27.37	2.06	2.90
1200	03.58	34.56	27.50	2.20	2.96
1469	02.96	34.61	27.60	2.40	2.90

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.40	35.22	23.10	0.000	1.814
10	26.38	35.22	23.10	0.048	1.766
20	26.29	35.22	23.13	0.096	1.718
30	26.22	35.21	23.14	0.143	1.671
50	26.15	35.24	23.19	0.238	1.576
75	26.08	35.23	23.20	0.355	1.459
100	26.02	35.22	23.21	0.473	1.341
150	25.93	35.23	23.25	0.708	1.106
200	14.05	34.72	25.98	0.878	0.936
250	11.48	34.80	26.55	0.969	0.845
300	10.70	34.76	26.66	1.044	0.770
400	10.01	34.72	26.75	1.187	0.627
500	08.71	34.65	26.91	1.318	0.496
600	07.39	34.56	27.04	1.437	0.377
700	06.46	34.52	27.14	1.546	0.268
800	05.53	34.52	27.25	1.644	0.170
1000	04.31	34.54	27.41	1.814	0.000

STATION 91

M/V Hugh M. Smith: Cruise 8, 02°48'N, 172°04'W, March 5, 1951. Messenger time: 1858 GCT. Weather: broken clouds, cumulus, stratocumulus and cumulonimbus. Wind: 100°, 17 kt. Sea: 5-8 ft. Wire angle: 52°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.50	35.22	23.06	4.77	0.61
09	26.54	35.22	23.05	4.78	0.60
19	26.54	35.22	23.05	4.76	0.56
40	26.52	35.21	23.05	4.76	0.61
77	26.38	35.21	23.09	4.72	0.60
140	25.38	35.16	23.37	4.33	0.67
192[1/]	12.03	35.19	26.75	4.64	0.76
251	10.64	34.74	26.65	2.51	1.97
311	10.26	34.74	26.72	1.69	2.28
382	09.70	34.70	26.79	1.57	2.44
541	08.09	34.61	26.98	1.91	2.50
736	06.00	34.56	27.23	1.46	2.82
957	04.53	34.53	27.38	1.95	2.88

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.50	35.22	23.06	0.000	1.756
10	26.53	35.21	23.05	0.048	1.708
20	26.53	35.21	23.05	0.097	1.659
30	26.52	35.21	23.05	0.145	1.611
50	26.45	35.21	23.07	0.242	1.514
75	26.38	35.21	23.09	0.362	1.394
100	26.24	35.21	23.14	0.482	1.274
150	24.21	35.13	23.70	0.708	1.048
200	11.70	34.75	26.47	0.855	0.901
250	10.66	34.75	26.66	0.932	0.824
300	10.36	34.74	26.71	1.003	0.753
400	09.52	34.68	26.80	1.141	0.615
500	08.51	34.63	26.93	1.269	0.487
600	07.45	34.59	27.05	1.386	0.370
700	06.38	34.57	27.19	1.492	0.264
800	05.50	34.55	27.28	1.586	0.170
1000	(04.40)	(34.53)	27.39	1.756	0.000

1/ Point on T-S curve suggests bottle leaked on way up. Therefore all values at this level except temperature are probably in error.

STATION 92

M/V Hugh M. Smith: Cruise 8, 03°57'N, 172°02'W, March 6, 1951. Messenger time: 0434 GCT. Weather: broken clouds, cumulus, altocumulus and cirrus. Wind: 070°, 16 kt. Sea: 5-8 ft. Wire angle: 42°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	27.20	35.13	22.77	4.72	0.50
12	27.15	35.10	22.77	4.77	0.49
27	27.02	35.10	22.81	4.68	0.48
56	26.88	35.15	22.89	4.66	0.58
109	26.59	35.21	23.03	4.68	0.68
205	16.99	34.71	25.31	2.84	1.29
303	09.21	34.65	26.83	1.75	2.39
416	08.23	34.60	26.95	2.00	2.47
416	08.29	34.60	26.94		
524	07.31	34.59	27.07	1.23	2.82
645	06.37	34.55	27.17	1.23	3.00
882	04.86	34.56	27.37	1.85	2.94
1127	03.89	34.53	27.45	2.06	2.94
1407	03.12	34.58	27.56	2.08	2.97

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	Δ D 1000-Δ D (dyn. m)
00	27.20	35.13	22.77	0.000	1.823
10	27.15	35.10	22.77	0.051	1.772
20	27.09	35.10	22.79	0.102	1.721
30	27.00	35.10	22.81	0.153	1.670
50	26.90	35.13	22.87	0.253	1.570
75	26.75	35.17	22.95	0.378	1.445
100	26.62	35.19	23.00	0.502	1.321
150	26.40	35.21	23.09	0.746	1.077
200	18.50	34.81	25.02	0.942	0.881
250	10.41	34.72	26.68	1.053	0.770
300	09.26	34.65	26.82	1.121	0.702
400	08.39	34.60	26.92	1.247	0.576
500	07.51	34.59	27.04	1.363	0.460
600	06.71	34.57	27.14	1.469	0.354
700	05.98	34.56	27.23	1.568	0.255
800	05.30	34.56	27.31	1.658	0.165
1000	04.39	34.54	27.40	1.823	0.000

STATION 93

M/V Hugh M. Smith: Cruise 8, 04°56'N, 171°54'W, March 6, 1951. Messenger time: 1308 GCT. Weather: scattered clouds, no observation. Wind: 030°, 13 kt. Sea: 5-8 ft. Wire angle: < 3°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
05	27.07	35.09	22.78	4.67	0.57
20	27.08	35.08	22.77	4.70	0.43
41	27.10	35.08	22.77	4.69	0.45
80	27.00	35.08	22.80	4.69	0.55
154	26.42	35.20	23.07	4.55	0.61
301	09.66	34.67	26.77	1.00	2.35
440	08.17	34.59	26.95	1.11	2.64
584	06.92	34.58	27.12	0.98	2.62
584	06.98	34.58	27.11		
731	05.53	34.53	27.26	1.40	2.88
883	04.74	34.52	27.35	1.57	2.75
1175	03.76	34.56	27.48	1.92	2.74
1469	03.08	34.59	27.57	2.06	2.72
1767	02.54	34.60	27.63	2.15	2.65

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn_o m)	ΔD1000-ΔD (dyn. m)
00	27.10	35.09	22.78	0.000	1.830
10	27.09	35.08	22.77	0.051	1.779
20	27.08	35.08	22.77	0.102	1.728
30	27.09	35.08	22.77	0.153	1.677
50	27.08	35.08	22.77	0.255	1.575
75	27.01	35.08	22.80	0.383	1.447
100	26.98	35.11	22.83	0.510	1.320
150	26.53	35.19	23.03	0.760	1.070
200	16.20	34.66	25.46	0.947	0.883
250	10.60	34.68	26.62	1.049	0.781
300	09.70	34.67	26.76	1.120	0.710
400	08.52	34.60	26.90	1.249	0.581
500	07.67	34.58	27.01	1.368	0.462
600	06.79	34.58	27.14	1.476	0.354
700	05.80	34.54	27.24	1.574	0.256
800	05.12	34.52	27.30	1.665	0.165
1000	04.26	34.53	27.41	1.830	0.000

STATION 94

M/V Hugh M. Smith: Cruise 8, 05°55'N, 171°50'W, March 6, 1951. Messenger time: 2135 GCT. Weather: broken clouds, cumulus, stratocumulus and altocumulus. Wind: 010°, 15 kt. Sea: 5-8 ft. Wire angle: 16°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σt (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
08	27.26	35.01	22.66	4.67	0.45
17	27.26	35.00	22.66	4.69	0.46
30	27.26	34.99	22.65	4.66	0.39
61	27.26	35.01	22.66	4.62	0.47
113	27.10	35.08	22.77	4.63	0.48
210	11.17	34.54	26.41	1.17	2.30
308	09.42	34.65	26.80	1.06	2.53
412	08.45	34.63	26.93	1.15	2.63
412	08.51	34.63	26.92		
513	07.41	34.57	27.04	0.90	2.89
614	06.60	34.55	27.14	0.97	2.97
813	05.32	34.52	27.28	1.27	2.95
1014	04.41	34.53	27.39	1.52	2.97
1217	03.71	34.54	27.47	1.84	2.95

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σt (gm/l)	ΔD (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	(27.30)	(34.99)	22.64	0.000	1.747
10	27.26	34.99	22.65	0.052	1.695
20	27.26	34.99	22.65	0.104	1.643
30	27.26	34.99	22.65	0.157	1.590
50	27.26	35.00	22.66	0.261	1.486
75	27.25	35.01	22.67	0.392	1.355
100	27.22	35.02	22.68	0.522	1.225
150	21.40	34.97	24.38	0.743	1.004
200	11.90	34.47	26.22	0.880	0.867
250	10.20	34.64	26.66	0.962	0.785
300	09.52	34.65	26.78	1.032	0.715
400	08.53	34.63	26.92	1.159	0.588
500	07.58	34.57	27.02	1.277	0.470
600	06.60	34.55	27.14	1.385	0.362
700	05.90	34.54	27.22	1.483	0.264
800	05.39	34.52	27.27	1.576	0.171
1000	04.48	34.53	27.38	1.747	0.000

STATION 95

M/V Hugh M. Smith: Cruise 8, 06°58'N, 171°49'W, March 7, 1951. Messenger time: 0608 GCT. Weather: broken clouds, cumulus, altocumulus and cirrus. Wind: 020°, 17 kt. Sea: 5-8 ft. Wire angle: 23°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	27.30	34.58	22.33	4.70	0.26
10	27.36	34.60	22.32	4.71	0.28
24	27.36	34.58	22.31	4.73	0.23
52	27.25	34.59	22.35	4.70	0.27
104	27.23	34.60	22.37	4.71	0.28
192	11.39	34.45	26.30	1.81	1.98
287	09.75	34.65	26.74	0.78	2.62
390	08.81	34.63	26.88	1.23	2.50
390	08.87	34.63	26.87		
488	08.12	34.59	26.96	1.14	2.54
588	07.18	34.55	27.06	0.92	2.82
780	05.80	34.53	27.23	1.19	2.82
978	04.72	34.54	27.36	1.62	2.83
1179	03.91	34.56	27.47	1.82	2.78

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	27.30	34.58	22.33	0.000	1.763
10	27.36	34.60	22.32	0.055	1.708
20	27.36	34.57	22.30	0.111	1.652
30	27.33	34.57	22.31	0.166	1.597
50	27.22	34.59	22.36	0.277	1.486
75	27.22	34.59	22.36	0.414	1.349
100	27.21	34.60	22.37	0.552	1.211
150	17.18	34.63	25.21	0.761	1.002
200	11.11	34.54	26.42	0.873	0.890
250	10.20	34.65	26.66	0.950	0.813
300	09.63	34.65	26.76	1.020	0.743
400	08.78	34.63	26.88	1.151	0.612
500	08.00	34.58	26.96	1.273	0.490
600	07.05	34.55	27.08	1.387	0.376
700	06.31	34.54	27.17	1.491	0.272
800	05.69	34.53	27.24	1.588	0.175
1000	04.59	34.55	27.39	1.763	0.000

STATION 96

M/V Hugh M. Smith: Cruise 8, 07°56'N, 171°51'W, March 7, 1951. Messenger time: 1434 GCT. Weather: scattered clouds, no observation. Wind: 060°, 15 kt. Sea: 3-5 ft. Wire angle: 24°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	27.10	34.51	22.34	4.74	0.25
11	27.15	34.50	22.32	4.74	0.23
24	27.16	34.48	22.30	4.66	0.22
52	27.15	34.48	22.30	4.65	0.26
104	23.52	34.79	23.65	4.81	0.33
202	10.97	34.57	26.47	0.95	2.40
298	09.60	34.64	26.76	0.61	2.60
401	08.78	34.60	26.86	0.92	2.69
499	07.56	34.53	26.99	0.75	2.81
599	06.68	34.50	27.09	0.90	2.89
791	05.26	34.48	27.25	1.37	2.91
987	04.30	34.51	27.39	1.62	2.88
1188	03.72	34.53	27.46	1.76	2.85

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	27.10	34.51	22.34	0.000	1.715
10	27.14	34.50	22.32	0.055	1.660
20	27.15	34.49	22.31	0.111	1.604
30	27.16	34.48	22.30	0.166	1.549
50	27.15	34.48	22.30	0.277	1.438
75	27.11	34.50	22.33	0.416	1.299
100	24.50	34.79	23.35	0.543	1.172
150	16.40	34.49	25.28	0.726	0.989
200	11.05	34.56	26.44	0.835	0.880
250	10.20	34.64	26.66	0.912	0.803
300	09.60	34.64	26.76	0.983	0.732
400	08.80	34.60	26.86	1.114	0.601
500	07.51	34.53	27.00	1.236	0.479
600	06.66	34.50	27.09	1.347	0.368
700	05.89	34.48	27.18	1.450	0.265
800	05.19	34.48	27.26	1.545	0.170
1000	04.25	34.51	27.39	1.715	0.000

STATION 97

M/V Hugh M. Smith: Cruise 8, 09°00'N, 171°58'W, March 7, 1951. Messenger time: 2346 GCT. Weather: scattered clouds, cumulus and cirrus. Wind: 020°, 14 kt. Sea: 3-5 ft. Wire angle: 24°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.80	34.35	22.31	4.74	0.22
09	26.73	34.34	22.33	4.74	0.22
23	26.72	34.34	22.33	4.75	0.20
50	26.71	34.35	22.35	4.72	0.22
100	21.74	34.78	24.14	4.81	0.34
202	11.34	34.52	26.36	1.24	2.07
301	09.82	34.65	26.73	0.56	2.53
404	08.82	34.62	26.87	0.65	2.51
504	07.88	34.57	26.97	0.74	2.62
604	06.80	34.52	27.09	0.84	2.80
801	05.36	34.55	27.30	0.97	2.89
1003	04.34	34.55	27.41	1.37	2.78
1204	03.70	34.55	27.48	1.66	2.76

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.80	34.35	22.31	0.000	1.680
10	26.72	34.34	22.33	0.055	1.625
20	26.72	34.34	22.33	0.110	1.570
30	26.72	34.34	22.33	0.166	1.514
50	26.71	34.35	22.34	0.276	1.404
75	26.69	34.36	22.36	0.414	1.266
100	21.74	34.78	24.14	0.531	1.149
150	15.60	34.46	25.44	0.691	0.989
200	11.40	34.51	26.34	0.799	0.881
250	10.50	34.64	26.60	0.880	0.800
300	09.88	34.66	26.73	0.953	0.727
400	08.89	34.63	26.87	1.086	0.594
500	07.91	34.57	26.97	1.208	0.472
600	06.82	34.52	27.09	1.321	0.359
700	06.01	34.54	27.21	1.423	0.257
800	05.39	34.55	27.29	1.515	0.165
1000	04.33	34.56	27.42	1.680	0.000

STATION 98

M/V Hugh M. Smith: Cruise 8, 10°02'N, 171°56'W, March 8, 1951. Messenger time: 0818 GCT. Weather: broken clouds, no observation. Wind: 010°, 14 kt. Sea: 3-5 ft. Wire angle: 28°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.30	34.33	22.46	4.80	0.18
09	26.36	34.31	22.42	4.87	0.22
22	26.34	34.30	22.42	4.83	0.37
49	26.26	34.29	22.44	4.79	0.25
96	22.95	34.87	23.87	5.03	0.33
184	11.87	34.37	26.14	2.48	1.76
275	09.46	34.57	26.73	0.80	2.54
374	08.73	34.59	26.86	1.06	2.61
468	08.06	34.55	26.93	1.01	2.68
565	07.26	34.55	27.05	1.09	2.74
757	05.68	34.52	27.23	1.11	2.93
955	04.69	34.53	27.36	1.49	2.87
1158	03.90	34.54	27.45	1.72	2.85

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.30	34.33	22.46	0.000	1.659
10	26.36	34.31	22.42	0.054	1.605
20	26.35	34.31	22.43	0.108	1.551
30	26.32	34.30	22.43	0.163	1.496
50	26.25	34.35	22.49	0.271	1.388
75	26.19	34.38	22.53	0.405	1.254
100	21.50	34.85	24.26	0.518	1.141
150	14.60	34.42	25.63	0.671	0.988
200	11.12	34.47	26.36	0.774	0.885
250	09.80	34.56	26.66	0.853	0.806
300	09.22	34.57	26.77	0.923	0.736
400	08.58	34.58	26.88	1.054	0.605
500	07.80	34.55	26.97	1.176	0.483
600	06.95	34.54	27.08	1.288	0.371
700	06.09	34.52	27.18	1.392	0.267
800	05.42	34.52	27.27	1.487	0.172
1000	04.49	34.53	27.38	1.659	0.000

STATION 99

M/V Hugh M. Smith: Cruise 8, 11°02'N, 171°52'W, March 8, 1951. Messenger time: 1633 GCT. Weather: no observation. Wind: 090°, 10 kt. Sea: 3-5 ft. Wire angle: 24°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.10	34.35	22.53	4.78	0.20
09	26.15	34.35	22.52	4.80	0.19
22	26.14	34.38	22.54	4.81	0.15
48	26.15	34.36	22.53	4.80	0.19
97	23.56	34.96	23.76	5.08	0.19
193	12.13	34.40	26.12	2.48	1.58
287	09.72	34.54	26.66	0.67	2.38
385	08.48	34.55	26.87	0.65	2.47
480	07.65	34.55	26.99	0.83	2.46
579	06.80	34.52	27.09	0.73	2.52
774	05.48	34.51	27.25	0.87	2.68
972	04.46	34.53	27.39	1.24	2.68
1170		34.53		1.53	2.77

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.10	34.35	22.53	0.000	1.681
10	26.14	34.35	22.52	0.053	1.628
20	26.14	34.38	22.54	0.107	1.574
30	26.14	34.36	22.53	0.160	1.521
50	26.14	34.38	22.54	0.266	1.415
75	26.15	34.39	22.55	0.400	1.281
100	23.20	34.98	23.88	0.517	1.164
150	16.00	34.54	25.41	0.685	0.996
200	11.70	34.43	26.22	0.796	0.885
250	10.29	34.52	26.55	0.881	0.800
300	09.53	34.55	26.70	0.956	0.725
400	08.35	34.56	26.90	1.088	0.593
500	07.49	34.54	27.01	1.207	0.474
600	06.62	34.52	27.11	1.317	0.364
700	05.93	34.51	27.20	1.418	0.263
800	05.33	34.51	27.27	1.512	0.169
1000	04.35	34.53	27.40	1.681	0.000

STATION 100

M/V Hugh M. Smith: Cruise 8, 12°00'N, 171°52'W, March 9, 1951. Messenter time: 0048 GCT. Weather: broken clouds, altocumulus and cirrocumulus. Wind: 080°, 7 kt. Sea: 3-5 ft. Wire angle: 10°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
05	26.32	34.43	22.52	4.85	0.23
14	26.08	34.42	22.59	4.91	0.24
29	26.06	34.43	22.61	4.84	0.22
58	26.07	34.43	22.60	4.79	0.25
110	22.22	35.08	24.24	4.92	0.25
215	11.26	34.46	26.33	1.54	2.15
320	09.42	34.59	26.75	0.47	2.64
430	08.30	34.56	26.90	0.62	2.83
535	07.32	34.52	27.02	0.73	2.83
640	06.46	34.51	27.13	0.78	2.93
844	05.28	34.51	27.28	0.84	2.93
1051	04.31	34.56	27.42	1.26	2.93
1254	03.64	34.56	27.49	1.59	2.88

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	(26.30)	(34.43)	22.53	0.000	1.733
10	26.13	34.42	22.58	0.053	1.680
20	26.07	34.42	22.60	0.106	1.627
30	26.06	34.43	22.61	0.158	1.575
50	26.07	34.43	22.60	0.264	1.469
75	26.00	34.45	22.64	0.395	1.338
100	24.90	34.74	23.20	0.520	1.213
150	18.68	34.82	24.98	0.714	1.019
200	11.90	34.43	26.18	0.837	0.896
250	10.48	34.53	26.52	0.924	0.809
300	09.65	34.58	26.70	0.998	0.735
400	08.00	34.57	26.96	1.128	0.605
500	07.65	34.53	26.98	1.245	0.488
600	06.80	34.51	27.08	1.358	0.375
700	06.13	34.51	27.17	1.462	0.271
800	05.53	34.51	27.25	1.559	0.174
1000	04.55	34.54	27.38	1.733	0.000

STATION 101

M/V Hugh M. Smith: Cruise 8, 13°01'N, 171°48'W, March 9, 1951. Messenger time: 0907 GCT. Weather: scattered clouds, no observation. Wind: 100°, 7 kt. Sea: 1-3 ft. Wire angle: 07°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
05	25.74	34.56	22.80	4.85	0.18
15	25.50	34.57	22.88	4.87	0.18
29	25.46	34.56	22.89	4.88	0.17
54	25.44	34.56	22.90	4.85	0.18
102	23.74	35.00	23.74	4.99	0.22
202	14.27	34.45	25.72	3.65	0.97
298	09.74	34.43	26.57	1.19	2.38
398	08.30	34.50	26.86	0.76	2.57
494	07.36	34.53	27.02	0.87	2.70
594	06.52	34.52	27.13	0.98	2.71
791	05.22	34.52	27.29	1.14	2.72
984	04.34	34.52	27.39	1.43	2.68
1191	03.66	34.58	27.51	1.57	2.70

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	(25.70)	(34.56)	22.82	0.000	1.742
10	25.65	34.56	22.83	0.050	1.692
20	25.47	34.57	22.89	0.101	1.641
30	25.45	34.57	22.90	0.150	1.592
50	25.45	34.57	22.90	0.250	1.492
75	25.39	34.58	22.93	0.375	1.367
100	24.60	34.78	23.32	0.494	1.248
150	19.06	34.86	24.92	0.687	1.055
200	14.90	34.50	25.63	0.825	0.917
250	11.40	34.39	26.25	0.932	0.810
300	09.70	34.44	26.59	1.016	0.726
400	08.29	34.50	26.86	1.156	0.586
500	07.30	34.52	27.02	1.276	0.466
600	06.50	34.52	27.13	1.384	0.358
700	05.86	34.52	27.21	1.483	0.259
800	05.20	34.52	27.29	1.575	0.167
1000	04.30	34.53	27.40	1.742	0.000

STATION 102

M/V Hugh M. Smith: Cruise 8, 13°58'N, 171°24'W, March 9, 1951. Messenger time: 1720 GCT. Weather: broken clouds, cumulus and altocumulus. Wind: 080°, 9 kt. Sea: 3-5 ft. Wire angle: 10°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	25.30	34.53	22.92	4.83	0.25
10	25.30	34.54	22.92	4.83	0.23
25	25.32	34.52	22.90	4.89	0.22
50	25.28	34.54	22.93	4.85	0.26
100	23.02	35.09	24.02	4.91	0.22
198	14.95	34.51	25.62	4.03	0.86
292	09.68	34.25	26.44	2.51	2.06
390	07.91	34.34	26.79	1.19	2.57
482	07.08	34.43	26.98	0.90	2.72
581	06.18	34.45	27.12	0.89	2.87
774	05.10	34.50	27.29	1.01	2.97
965	04.36	34.52	27.39	1.29	2.90
1171	03.68	34.51	27.45	1.53	2.90

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	25.30	34.53	22.92	0.000	1.714
10	25.30	34.54	22.92	0.050	1.664
20	25.30	34.54	22.92	0.099	1.615
30	25.29	34.54	22.93	0.149	1.565
50	25.28	34.54	22.93	0.248	1.466
75	24.82	34.69	23.18	0.369	1.345
100	23.02	35.09	24.02	0.477	1.237
150	18.90	34.85	24.95	0.652	1.062
200	14.82	34.50	25.64	0.789	0.925
250	10.92	34.28	26.25	0.895	0.819
300	09.51	34.25	26.47	0.982	0.732
400	07.81	34.36	26.82	1.129	0.585
500	06.92	34.43	27.00	1.251	0.463
600	06.09	34.46	27.14	1.359	0.355
700	05.53	34.48	27.22	1.457	0.257
800	05.00	34.50	27.30	1.548	0.166
1000	04.26	34.52	27.40	1.714	0.000

STATION 103

M/V Hugh M. Smith: Cruise 8, 15°00'N, 170°52'W, March 10, 1951. Messenger time: 0228 GCT. Weather: dry haze, cumulus. Wind: 080°, 9 kt. Sea: 3-5 ft. Wire angle: 12°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	25.20	34.66	23.05	4.89	0.26
10	25.00	34.65	23.10	4.92	0.26
24	24.98	34.67	23.12	4.90	0.24
53	24.95	34.65	23.11	4.89	0.23
106	23.04	35.09	24.01	4.91	0.26
211	16.30	34.63	25.41	4.22	0.60
314	09.48	34.23	26.46	2.52	2.29
421	07.68	34.39	26.86	0.93	2.51
523	06.73	34.46	27.05	0.93	2.69
627	05.81	34.46	27.17	1.01	2.69
829	04.89	34.48	27.30	1.15	2.72
1036	04.00	34.54	27.44	1.35	2.76
1239	03.27	34.57	27.54	1.75	2.78

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	25.20	34.66	23.05	0.000	1.788
10	25.00	34.65	23.10	0.048	1.740
20	24.99	34.66	23.11	0.096	1.692
30	24.98	34.66	23.11	0.144	1.644
50	24.97	34.65	23.11	0.239	1.549
75	24.91	34.70	23.16	0.359	1.429
100	23.55	35.03	23.82	0.470	1.318
150	21.69	35.08	24.38	0.663	1.125
200	18.22	34.80	25.08	0.827	0.961
250	12.59	34.29	25.94	0.954	0.834
300	09.98	34.23	26.37	1.051	0.737
400	07.95	34.35	26.79	1.203	0.585
500	06.90	34.46	27.03	1.326	0.462
600	06.02	34.46	27.15	1.432	0.356
700	05.50	34.46	27.21	1.530	0.258
800	05.02	34.48	27.28	1.623	0.165
1000	04.15	34.53	27.42	1.788	0.000

STATION 104

M/V Hugh M. Smith: Cruise 8, 16°58'N, 169°41'W, March 10, 1951. Messenger time: 1905 GCT. Weather: broken clouds, cumulus, stratocumulus and altocumulus. Wind: 060°, 6 kt. Sea: 3-5 ft. Wire angle: 16°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
04	25.07	34.36	22.86	4.87	0.30
14	25.08	34.34	22.84	4.87	0.27
28	25.08	34.35	22.85	4.90	0.25
52	25.06	34.34	22.85	4.85	0.30
98	24.55	34.46	23.09	4.86	0.26
187	13.68	34.33	25.75	3.19	1.32
274 1/	10.46	34.35	26.39	1.23	2.21
364	07.76	34.22	26.72	1.69	2.51
451	06.62	34.27	26.92	1.14	2.68
546	05.91	34.34	27.06	1.01	2.88
732	05.12	34.48	27.27	1.06	2.88
909	04.30	34.51	27.39	1.30	2.87

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	(25.10)	(34.36)	22.85	0.000	1.741
10	25.09	34.35	22.84	0.050	1.691
20	25.08	34.35	22.85	0.101	1.640
30	25.07	34.35	22.85	0.151	1.590
50	25.05	34.34	22.85	0.251	1.490
75	24.85	34.38	22.94	0.376	1.365
100	24.49	34.56	23.18	0.498	1.243
150	18.80	34.87	24.99	0.693	1.048
200	12.70	34.26	25.90	0.823	0.918
250	10.80	34.18	26.19	0.925	0.816
300	09.21	34.18	26.46	1.013	0.728
400	07.21	34.24	26.81	1.161	0.580
500	06.22	34.30	26.99	1.284	0.457
600	05.63	34.39	27.14	1.393	0.348
700	05.27	34.46	27.24	1.490	0.251
800	04.80	34.49	27.32	1.580	0.161
1000	(03.94)	(34.53)	27.44	1.741	0.000

1/ Point on T-S curve suggests bottle leaked on way up. Therefore all values at this level except temperature are probably in error.

STATION 105

M/V Hugh M. Smith: Cruise 8, 18°58'N, 168°27'W, March 11, 1951. Messenger time: 1230 GCT. Weather: scattered clouds, no observation. Wind: 260°, 7 kt. Sea: 1-3 ft. Wire angle: 09°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
05	24.56	34.65	23.23	4.87	0.20
15	24.51	34.63	23.23	4.92	0.17
30	24.50	34.67	23.26	4.93	0.18
54	24.21	34.96	23.57	4.93	0.17
102	23.43	35.21	23.99	4.94	0.18
195	17.85	34.79	25.17	4.42	0.43
284 1/	11.04	34.25	26.20	2.78	1.67
374	08.32	34.16	26.59	2.13	2.06
374	08.38	34.16	26.58		
466	07.08	34.24	26.83	1.25	2.46
559	06.01	34.27	27.00	1.08	2.69
742	04.99	34.43	27.25	1.24	2.74
925	04.38	34.49	27.36	1.30	2.50
1125	03.76	34.52	27.45	1.51	2.53

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	(24.60)	(34.65)	23.22	0.000	1.785
10	24.53	34.65	23.24	0.047	1.738
20	24.50	34.64	23.24	0.093	1.692
30	24.50	34.67	23.26	0.139	1.646
50	24.25	34.91	23.52	0.230	1.555
75	23.95	35.09	23.74	0.337	1.448
100	23.55	35.18	23.93	0.440	1.345
150	22.01	35.18	24.37	0.631	1.154
200	17.21	34.72	25.27	0.791	0.994
250	12.65	34.29	25.93	0.914	0.871
300	10.40	34.16	26.25	1.014	0.771
400	07.95	34.20	26.67	1.178	0.607
500	06.70	34.25	26.89	1.312	0.473
600	05.68	34.31	27.07	1.428	0.357
700	05.12	34.42	27.22	1.529	0.256
800	04.81	34.46	27.29	1.620	0.165
1000	04.15	34.51	27.40	1.785	0.000

1/ Point on T-S curve suggests bottle leaked on way up. Therefore all values at this level except temperature are probably in error.

STATION 106

M/V Hugh M. Smith: Cruise 8, 20°59'N, 167°07'W, March 12, 1951. Messenger time: 0540 GCT. Weather: broken clouds, cumulus and cirrus. Wind: 300°, 9 kt. Sea: 3-5 ft. Wire angle: 21°

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
05	23.64	35.20	23.92	5.02	0.12
14	23.64	35.21	23.93	5.05	0.12
28	23.48	35.20	23.97	5.03	0.12
28					0.08
51	23.43	35.20	23.98	5.01	0.08
97	23.03	35.28	24.16	5.00	0.12
190	17.73	34.85	25.24	4.35	0.38
280 1/	12.40	34.52	26.16	4.52	0.73
375	09.60	34.14	26.37	4.32	1.31
375	09.67	34.14	26.36		
465	07.64	34.05	26.60	3.16	1.93
559	06.05	34.10	26.86	1.94	2.40
743	04.84	34.33	27.18	1.13	2.75
928	04.20	34.49	27.38	1.36	2.77
1126	03.40	34.52	27.48	1.55	2.77

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	Δ D 1000 - Δ D (dyn. m)
00	(23.70)	(35.20)	23.90	0.000	1.798
10	23.65	35.20	23.92	0.040	1.758
20	23.60	35.20	23.93	0.080	1.718
30	23.48	35.20	23.97	0.120	1.678
50	23.41	35.20	23.99	0.199	1.599
75	23.31	35.23	24.04	0.297	1.501
100	22.99	35.28	24.17	0.394	1.404
150	20.34	35.09	24.76	0.570	1.228
200	17.45	34.82	25.29	0.720	1.078
250	14.30	34.53	25.78	0.846	0.952
300	11.71	34.29	26.11	0.953	0.845
400	09.00	34.10	26.43	1.136	0.662
500	06.96	34.05	26.70	1.291	0.507
600	05.69	34.15	26.94	1.423	0.375
700	05.05	34.28	27.12	1.534	0.264
800	04.68	34.39	27.25	1.631	0.167
1000	03.92	34.51	27.43	1.798	0.000

1/ Point on T-S curve suggests bottle leaked on way up. Therefore all values at this level except temperature are probably in error.

MID-PACIFIC OCEANOGRAPHY III

TRANSEQUATORIAL WATERS

AUGUST - OCTOBER 1951

By

THOMAS S. AUSTIN

PACIFIC OCEANIC FISHERY INVESTIGATIONS

HONOLULU, T. H.

CONTENTS

MID-PACIFIC OCEANOGRAPHY III

Introduction

This is the third in a series of reports on oceanographic data collected by the Pacific Oceanic Fishery Investigations of the Fish and Wildlife Service. The first (Cromwell 1951) presented the oceanographic data from Hugh M. Smith cruise 2, the second (Cromwell 1954), the data from Hugh M. Smith cruises 5 and 8, and this report will be concerned with Hugh M. Smith cruise 11. The apparently missing numbers in the series of cruises by the Smith have been assigned to oceanographic cruises in the waters adjacent to the Hawaiian Islands or to fishery research cruises and will be the subject of other reports.

These reports, descriptive in nature, are being issued in order that the oceanographic data may, as quickly as is feasible, be made available to the other POFI investigations and to other organizations interested in the equatorial mid-Pacific area. It is anticipated that, once the series is complete and the data from all the cruises can be studied together, a series of more comprehensive, analytical reports will follow.

The objectives of the equatorial oceanographic cruises have been to describe, in as great detail as possible, the major currents and the distribution of physical and chemical properties of the waters of the mid-Pacific, to determine the spatial and temporal variations in these phenomena, and finally to provide physical and chemical oceanographic data to which can be related the distribution and abundance of marine organisms, especially tuna, near the Equator.

Description of Vessel, Equipment, and Procedures

The vessel, equipment, and procedures were described in some detail by Cromwell (1951, pp. 1-3). The only significant change, which we will describe below, is in the procedure for drawing the salinity curves and constructing the cross sections as modified from Montgomery (1954).

Some Results of Hugh M. Smith Cruise 11

Quoting from the cruise plan, the primary mission was "By means of (1) longline, (2) hydrographic, and (3) plankton stations,

investigate the abundance of yellowfin tuna with respect to certain physical, chemical, and biological features of equatorial waters away from the influence of emergent land masses."

The results of the longline fishing have been described by Murphy and Shomura (1953); the detailed plankton studies will be reported later.

The station pattern for the oceanographic phase of cruise 11 was planned to duplicate the positions of the fishing stations occupied along the southbound leg. The positions of the fishing and oceanographic stations are shown on figure 1 (all figures are grouped at the end of the text). The data for the 22 stations appear in tabular form at the end of this report. These data, along with those from the bathythermograph lowerings, are represented by vertical sections, figures 2, 3, and, 7 to 12.

In the vertical sections, the position of each sample is indicated by a dot. If for some reason (thermometer stuck, Nansen bottle leaked, bottle pretripped, etc.) it can be definitely ascertained that the value for the particular field is in error, it is discarded, the dot is not carried, and the deleted value is indicated by a dash in the tabulated data. If a particular value is in doubt, but there is no apparent reason for its being in error, the dot is shown, the value is carried in the tabulated data and an appropriate footnote appended.

Temperature: The temperature sections, figures 2 and 3, have been constructed from bathythermograph observations. The data for figure 2 were collected during the southbound leg of the cruise (fishing) and those for figure 3 during the northbound leg (oceanography). The isotherms are plotted at 2-degree (F.) intervals; the maximum depth of penetration is indicated by a dash.

During the southbound leg of the cruise, five BT's were taken at the positions of each fishing station, and one at each 10-mile interval between stations. The data are plotted at 30-mile intervals in figure 2. During the return section lowerings were made at 10-mile intervals between 5° S. and 12° N. and at 30-mile intervals from 12° N. to 19° N. All lowerings are plotted in figure 3.

The most striking features of the two vertical temperature sections, reading north to south in figures 2 and 3, are (1) the shallow, well developed thermocline in the region of the northern boundary of the Countercurrent, and (2) the cooling of the surface water in the region of the equatorial divergence. Typical temperature-depth traces, reconstructed from BT's taken in these regions, are shown on figure 4.

In comparing the two sections, the change in the vertical distribution of temperatures during the period between the two sections is evident. Of particular interest are the changes in slope of the transition layer in the Countercurrent and the meridional shift in the center of the upwelling. In figure 5, plots of the 60°, 70°, and 80° F. isotherms for each leg of the cruise, are given to show these changes.

The wind data from both the southbound and northbound legs are summarized in figure 6. The values from which the arrows were plotted are listed in Table I at the end of the report.

Wind speed and direction were recorded at each bathythermograph lowering. These data were averaged for the total lowerings between each degree of latitude; the speed and direction were averaged separately. When there was a significant change in either speed or direction within 1 degree of latitude, i.e., 8° - 9° N., southbound section, less than the normal spacing of 1° of latitude was used.

Resultant winds were not calculated, as the observational accuracy does not warrant this treatment and as the change in either speed or direction within the 60-mile limits was usually within the accuracy of measurement. The data for each observation (number of observations shown at base of arrows) are available at the POFI, the Scripps Institution of Oceanography, and the U. S. Navy Hydrographic Office.

During the southbound leg the winds were predominantly from the NE to about 8° N., at which time they became light and variable and continued so to about 4° N. From 4° N. to the southern limit of the section the general direction shifted from southeasterly to easterly. Along the northbound leg the arrows show predominantly NE to E. winds.

Sigma-t, salinity, inorganic phosphate, and oxygen: Montgomery (1954) points out the desirability of presenting the several variables, i.e., temperature, salinity, phosphate, etc., in such a manner that the consistency among the several fields is readily visible. This can most easily be achieved by selecting a reference variable, and in this report sigma-t was the choice.

The data for sigma-t at an isopleth interval of 0.2 g/l, as read from plots relating temperature, salinity, and sigma-t (Cromwell 1954, fig. 1), were plotted for each station along with the observed values. The isopleths were then drawn (fig. 7). There was some smoothing, but with no violation of the observed points.

The points for the salinity (0.2 °/oo isopleth interval) were taken from the T/S curves, and those for phosphate (0.2 μg at/l isopleth interval) and oxygen (0.5 ml/l isopleth interval) were read from the station curves and plotted. In each case the observed values were also plotted. Finally, the section plots for each of the three fields, salinity, phosphate, and oxygen, were in turn placed over the sigma-t profile and isopleths drawn allowing them to run smoothly and as nearly parallel with those of the sigma-t surfaces as possible without violating the observed points (figs. 8-10). Each of the fields was plotted only to a depth of 500 meters, thus permitting greater detail within the transition layer.

The principal feature of the sigma-t profile (fig. 7), as with the previously described temperature sections, is the well developed gradient which lies at a minimum depth at the northern boundary of the Countercurrent (10° N.), deepening to the south, with the maximum depth at the southern boundary of the Countercurrent (5° N.). North of 10° N., i.e., in the North Equatorial Current, the distribution of the sigma-t surfaces with depth results in a less well defined density gradient. At the Equator, the equatorial divergence is reflected in a slight "doming" of the sigma-t surfaces.

The salinity maximum at about 150 meters, 2° to 5° S. (fig. 8), corresponds with that shown by Cromwell (1951, figs. 12 and 13), Cromwell (1954, figs. 8, 18, and 30) and by Mao and Yoshida (1953, fig. 15). In Cromwell's 1954 report, a tongue of high salinity (34.8 °/oo) is continuous from the northern to the southern limits of the sections; in the 1951 report, the bridge is continuous on the section along 172° W. longitude but interrupted between about 15° N. and 9° N. on along the 158th meridian. Similarly, although the situation is less well defined, in figure 8 of the present report the tongue of high salinity is interrupted between 13° N. and 8° N. The deep tongue of low salinity water (34.2 °/oo) centered at about 300 m., 19° N., is rather characteristic of this area in equatorial Pacific. The same may be said for the low salinity waters at the surface between 5° N. and 12° N., the zone of the Equatorial Countercurrent and the high rainfall belt.

The values for surface phosphates along the section (fig. 9) are somewhat irregular, but there is evident enrichment of the surface layers immediately south of the Equator (0.6 to 0.8 μg at/l), with a decrease to 0.2 μg at/l in the northern half. At about 8° - 9° N., the boundary zone between the North Equatorial Current and the Equatorial Countercurrent, the cooler, nutrient-enriched waters are to be found slightly above 100 meters, but do not reach the surface.

As was the case with several previous sections in the mid-Pacific equatorial region (Sverdrup et al. 1946, Cromwell 1951), there is direct evidence of upwelling immediately south of the Equator with the deeper, cooler, nutrient-rich waters replacing those at the surface.

Although a rigorous definition of upwelling is not possible at this time, mention should be made of the present apparent ambiguity with respect to the term. Sverdrup et al. (1946, p. 501) describe upwelling off the coast of California as the replacement of the light surface water by heavier sub-surface waters. At the Equator, the deeper waters are mixed into the surface layers from depths not exceeding 200 to 300 meters. Sverdrup and Fleming (1941, p. 317) propose that the replacement of the surface waters should be differentiated from the increase (or decrease) in slope of the isotherms and isohalines resulting from current transport, and suggest that once a transport has reached a steady state the vertical displacement of the isopleths will stop and "the process cannot be called upwelling." This same line of reasoning is undoubtedly applicable when considering the upwelling associated with the equatorial divergence and the increase or decrease in slope of the isotherms and isohalines associated with the mid-Pacific zonal circulation (see fig. 5).

We find both of the above-mentioned phenomena in the meridional section described in this report. Near the Equator there is upwelling associated with a wind-induced divergence. The deeper waters mix with those at the surface, resulting in a cooling of these surface waters and an increase in nutrients, such as phosphates, and conditions favorable to increased biological productivity ensue (King 1953, Murphy 1953, Sette MS).

Throughout the region of the Countercurrent the second phenomenon, that of a vertical displacement of the isopleths associated with zonal flow, is to be found. The sigma-t surfaces (fig. 7) slope markedly, the 24 g/l surface rising from 525 meters at 5° N. to 50 meters at 9° N. The 2.0 μg at/l phosphate isopleth (fig. 9) is near 300 meters at 4° N., sloping upward to 100 meters at 9° N. To this situation Dietrich (1935, p. 57) assigns the term "dynamically caused upwelling." Even if there is occasional cooling and enrichment of surface waters at the boundary of a zonal current, such as the Equatorial Countercurrent, it is believed that any use of the term upwelling is confusing.

Although the data on file at POFI require considerable further study, there is little evidence that there is any mixing of the deeper waters with the surface waters at the northern edge of the

Equatorial Countercurrent. However, one must not overlook possibility that a shallow density gradient (fig. 7) coupled with strong winds might result in mixing of surface and deeper waters and produce a transient enrichment of surface waters. Also, horizontal eddies (Cromwell 1951, Mao and Yoshida 1953) may effect a similar condition. Although deeper waters do not normally reach the surface in this region, the distribution of mass resulting from the zonal currents brings enriched waters into the subsurface euphotic zone. The biological significance of this vertical displacement is not well understood and requires considerable further study.

The principal features of the vertical distribution of oxygen (fig. 10) are the relatively high values at or near the surface (4.0 - 4.5 ml/l) and the oxygen-minimum layer at intermediate depths. An oxygen-rich layer is encountered at depths below 500 meters (see tabulated station data). The subsurface layer of higher oxygen concentrations, 5.0 to 5.7 ml/l, centered at 100 meters between 19° N. and 14° N., may be associated with the intrusion of the northern subtropical water mass, while the inclination of the oxygen isolines in the same latitudes but below 100 meters suggests an association with an intermediate water mass. Comparison at the Equator of figures 7 and 10 suggests the mixing of upwelled waters of relatively low oxygen content with those at the surface.

Currents: The dynamic topography is shown on figure 11, the geostrophic current velocities on figure 12. The actual results of the dynamic calculations are plotted in the former in order that the degree of smoothing of the isolines may be observed. The data for the stations at the Equator and at 1° N. latitude were insufficient for calculations to the 1,000-decibar surface (see footnote in tabulated data for stations 33 and 34). Because of the uncertainty of relative current computation for stations near the Equator, the isovels between 3-1/2° N. and 3-1/2° S. have not been included in figure 12.

In figure 12, only the major features of the velocity distribution as computed by the dynamic calculations are to be considered reliable. Internal waves undoubtedly exert a strong, but quantitatively unknown influence.

The most striking feature on both figures is the evidence of the Countercurrent flowing strongly to the east between 5° N. and 10° N., with the highest velocity of 80 cm. per second near the southern boundary. This velocity may be somewhat low, as the plotted velocities represent an average between successive stations. Another easterly flow, but of very small magnitude, is indicated between 17-1/2° and 19-1/2° N. The North Equatorial Current exists in a broad band between 10° and 17-1/2° N. with velocities of 23 cm./sec. or less.

The Countercurrent is strongest near its southern edge, with a maximum speed of 80 cm./sec. between 55 and 75 meters. The 10 cm./sec. isovel reaches the 700-decibar surface immediately below the band of highest velocity, while at the northern edge the 7 cm./sec. level is between 25 and 50 meters with the bottom of the current (0-10 cm./sec.) below the 700-decibar surface. Considerably higher speeds are indicated down to the 700-decibar surface in the South Equatorial Current.

It is difficult to discuss the flow south of 5° N., the region of the South Equatorial Current, with any degree of certainty. The loss of data from the stations at the Equator and 1° N. precludes drawing of the dynamic topography through this area. This is unfortunate, as inspection of figure 12 shows a considerable difference in level across this region. Figure 12 indicates a moderately strong westerly flow between the southern boundary of the Countercurrent and 3° N. and a westerly flow with velocities over 60 cm./sec. between 3° S. and 5° S. About all that can be said with certainty is that the South Equatorial Current was present during the time of the cruise.

Supplementary information on the velocities of the currents may be determined from the drift of the longline gear (Austin MS) used for sampling the fish population (gear described by Niska 1953) and from the drift of the vessel while on oceanographic stations. The former, in view of the relatively small effect of windage on the 8-mile length of the longline, yields a reliable estimate of both speed and direction of the current integrated over the depth of the lines (100 to 300 feet). The information from vessel drift is less reliable because of the quantitatively unknown effect of wind and the fact that the determination of drift included running time between fixes.

Of particular interest on figure 2, upper panel, is the westerly set (North Equatorial Current) between 15° N. and 9° N., the easterly set (Equatorial Countercurrent) between 8° - 9° N. and 5° - 6° N., and the westerly set (South Equatorial Current) south of this latitude. Attention is called to the easterly set (109° T.) at the Equator, which is significant when considering the submerged countercurrent (the undercurrent) reported by Cromwell et al. (1954). Also the three northernmost stations in the South Equatorial Current, particularly stations 9, 10, and 11 (fig. 1), exhibit a northerly component, while those south of the Equator (25-27) show a southerly component (Cromwell 1953).

When possible to calculate from available navigational data, the direction of drift while on oceanographic stations was

determined and entered to the nearest cardinal point in the upper panel of figure 3. No reliable data were available for 10° N. nor south of 1° N. latitude. The easterly drift of the Countercurrent is evident for stations at 6° and 7° N. latitude. The results for 8° N. yielded a set of 270° T., but if the effect of the wind could be accurately determined, it is believed the resultant current set would be to the east. At 5° N., apparently at the boundary between the South Equatorial Current and the Equatorial Countercurrent, the net drift was zero.

As pointed out by Cromwell (1951), information concerning the currents may be inferred from the wire angles during an oceanographic cast. The average wire angle for all stations in the North Equatorial Current was 23°, the wind speeds on station were 17 - 19 knots, blowing from the northeast. In the Countercurrent, with winds from 14 - 19 knots from NE to ENE, the average wire angle was 12°. Considering the westerly moving North Equatorial Current and the easterly Countercurrent, this was as could be expected.

Moving south from the southern edge of the Countercurrent (5° N.) into the South Equatorial Current, the wire angle increased from station to station from 20° at 5° N. to 65° at the Equator. The wind, from E. to ESE, was between 13 and 16 knots. Considering that the minimum wire angles were found in the region of the maximum velocity of the South Equatorial Current (the northern edge) and that there was no appreciable change in wind between the northern edge of the South Equatorial Current and the Equator, it is possible that the large angles near the Equator were related to the undercurrent reported by Cromwell et al. (1954). South of the Equator (2° S.) the angle fell to 10° (wind 08 knots) and increased to 35° at 5° S. (wind 18 knots). This latter angle is similar to that at stations with similar winds in the North Equatorial Current.

Discussion

Sette (MS), in a recent paper discussing the work of the Pacific Oceanic Fishery Investigations, states that the survey data from the east central equatorial Pacific "demonstrate that divergence and upwelling at the Equator enrich the surface waters with inorganic nutrient salts stimulating plankton production. Surface waters containing plankton drift northerly to an adjacent convergent zone. By inference this is believed to maintain a concentration of organisms of the trophic level above plankton, mainly small fish and squid, which in turn comprise food for yellowfin tuna, Neothunnus macropterus (Temminck and Schlegel). The system is generated and its structure largely governed by the winds."

Figure 13, in effect, summarizes the data from Hugh M. Smith cruise 11 and lends support to the above quotation. In this figure, surface values for temperature, salinity, oxygen, and phosphate, the current speed, the zooplankton volumes, and the yellowfin catch have been plotted against latitude (vertical scale). The first five fields plotted, namely, T, S, O_2, PO_4, and current speed represent conditions as observed during the period of the cruise. The zooplankton, although sampled during the cruise, may be considered as the culmination of a series of events which had their origin during some previous period of upwelling, probably some distance to the east. The charge of nutrients thus brought to the surface was utilized by phytoplankton, and indirectly for the succeeding trophic levels, zooplankton, forage fish and squid, and the tuna.

Although we do not know the time required for the conversion of nutrients through the trophic levels to the tuna, the data presented in figure 13 suggest the integrated relationships among the oceanographic and the biological factors. The curves for the various fields (fig. 13) nicely define the zones of interest. Reading from north to south (top to bottom) the North Equatorial Current extends south to about 10° N., the Equatorial Countercurrent between 10° N. and 5° N., and the South Equatorial Current from 5° N. to the southern limit of the section. The equatorial divergence is centered at 1° S. with the zone of convergence between this latitude and the southern boundary of the Countercurrent. Within the Countercurrent the salinity curve shows the typical increase toward the southern edge. The values for surface phosphates, associated with the center of upwelling, are somewhat atypical, with higher than usual values from the southern boundary of the section and lower values between the upwelling and the southern boundary of the Countercurrent. Several reasons for this could be advanced including mixing with surface waters of lower PO_4 during the meridional transport (1° to 5° N.), variations in intensity of upwelling from cruise to cruise, and a reflection of the biological activity in the waters moving in from the east.

The latitudinal variations in the abundance of zooplankton (fig. 13F) lend emphasis to the proposition of enrichment from the equatorial divergence. A more detailed discussion of this relationship between the plankton and the fish in this area is to be found in the report by Murphy and Shomura (1953) and in the report by Sette (MS).

Acknowledgements

A report of this nature results from the combined efforts of many individuals. Mr. Townsend Cromwell, as field party chief, was largely responsible for the successful completion of the program aboard the vessel. Mary Lynne Godfrey, E. D. Stroup, D. Ching, and others processed the data. Tamotsu Nakata prepared the illustrations.

No sea-going program could be successful without the cooperation of the vessel personnel. Special thanks are due to the master and crew of the M/V Hugh M. Smith.

The efforts of the above, and of many others, are gratefully acknowledged.

LITERATURE CITED

AUSTIN, T. S.

MS Pacific equatorial undercurrent measured by longline drift.

CROMWELL, TOWNSEND

1951 Mid-Pacific oceanography, January - March 1950. U.S. Fish and Wildlife Serv., Spec. Sci. Rep.: Fish. No. 54, 9 pp., 17 figs., 53 tables.

1953 Circulation in a meridional plane in the central equatorial Pacific, Jour. of Mar. Res., Vol. 12, No. 2, pp. 196-213, 9 figs.

1954 Mid-Pacific oceanography II, transequatorial waters, June - August 1950, January - March 1951. U.S. Fish and Wildlife Serv., Spec. Sci. Rep.: Fish. No. 131, 13 pp., 32 figs., 1 table.

_____, R. B. MONTGOMERY and E. D. STROUP

1954 Equatorial undercurrent in Pacific Ocean revealed by new methods. Science, Vol. 119, No. 3097, pp. 648-649, 2 figs.

DIETRICH, G.

1935 Aufbau und Dynamik des südlichen Agulhasstromgebietes. Veröff. Inst. Meeresk. Berlin, n. s. geogr. naturw. ser., pt. 27, 79 pp.

KING, JOSEPH E. and JOAN DEMOND

1953 Zooplankton abundance in the central Pacific. U.S. Fish and Wildlife Serv., Fish. Bull. No. 82 (Vol. 54), pp. 111-144, 11 figs., 18 tables.

MAO, HAN-LEE and K. YOSHIDA

1953 Physical oceanography in the Marshall Islands area. Univ. of Calif., Scripps Inst. of Ocean., Ref. 53-27, April 15, 1953.

MONTGOMERY, R. B.

1954 Analysis of a Hugh M. Smith oceanographic section from Honolulu southward across the Equator. Accepted for publication in the Jour. of Mar. Res., Vol. 13, No. 1.

MURPHY, G. I. and RICHARD S. SHOMURA

1953 Longline fishing for deep-swimming tunas in the central Pacific, 1950-51. U.S. Fish and Wildlife Serv., Spec. Sci. Rep.: Fish. No. 98, 47 pp., 15 figs., 20 tables.

NISKA, EDWIN

1953 Construction details of tuna longline gear used by POFI. Comm. Fish. Rev., Vol. 15, No. 6, pp. 1-6.

SETTE, O. E.

MS Nourishment of central Pacific stocks of tuna by the equatorial circulation system. Paper for Eighth Pacific Science Congress, October 1953.

SVERDRUP, H. U. and R. H. FLEMING

1941 The waters off the coast of southern California, March to July, 1937. Bull. of the Scripps Inst. of Ocean., Vol. 4, No. 10, pp. 261-378, 66 figs.

_____, M. W. JOHNSON, and R. H. FLEMING

1946 The oceans, their physics, chemistry, and general biology (2nd ed.). x, 1087 pp. New York: Prentice-Hall, Inc.

Table I (A)
(Southbound)

Average wind direction and speed for observations recorded between latitudes listed in column 1

Position (along 150°W. longitude)	Average direction °T	Average speed, knots	Number of observations
19°07'N	60	15	1
18°06'N	60	19	3
17°00'N	60	20	3
16°04'N	60	17	3
15°09'N	50	22	3
14°15'N	60	21	6
13°06'N	70	16	6
12°10'N	80	12	7
11°13'N	70	16	7
10°08'N	70	12	4
9°11'N	40	17	8
8°58'N	35	16	5
8°17'N	25	14	4
7°57'N	50	06	5
7°08'N	190	04	5
6°00'N	150	06	14
5°04'N	180	05	5
4°31'N	200	08	7
4°00'N	160	14	8
3°10'N	150	13	5
2°11'N	140	15	10
To Christmas Island and return			
0°00'	120	14	10
0°52'S	120	17	9
1°59'S	100	19	10
2°52'S	110	18	8
3°37'S	120	16	7
4°57'S	100	16	6

Table I (B)
(Northbound)

Position (along 150°W. longitude)	Average direction °T	Average speed, knots	Number of observations
4°57'S	110	18	1
4°00'S	75	08	7
3°00'S	80	07	7
2°00'S	100	08	7
1°00'S	130	09	7
0°01'N	120	14	7
1°02'N	90	16	7
2°10'N	90	15	7
3°00'N	100	16	6
3°58'N	100	15	7
4°59'N	90	13	7
5°56'N	70	14	7
6°51'N	70	17	7
7°51'N	70	17	7
8°57'N	50	17	7
10°00'N	60	19	7
10°57'N	60	17	7
11°59'N	70	19	7
13°00'N	60	17	3
14°01'N	60	18	3
15°01'N	70	19	3
16°05'N	80	19	2
17°00'N	60	18	3
18°00'N	90	19	2
19°00'N	80	16	3

Figures

1. Station chart.
2. Temperature section (southbound).
3. Temperature section (northbound).
4. Representative BT traces.
5. Comparison, northbound and southbound vertical temperature sections.
6. Wind vectors, northbound and southbound sections.
7. Vertical section, sigma-t.
8. Vertical section, salinity.
9. Vertical section, phosphate.
10. Vertical section, oxygen.
11. Dynamic topography.
12. Current velocity section.
13. Summary of various oceanographic and biologic data, northbound and southbound sections.

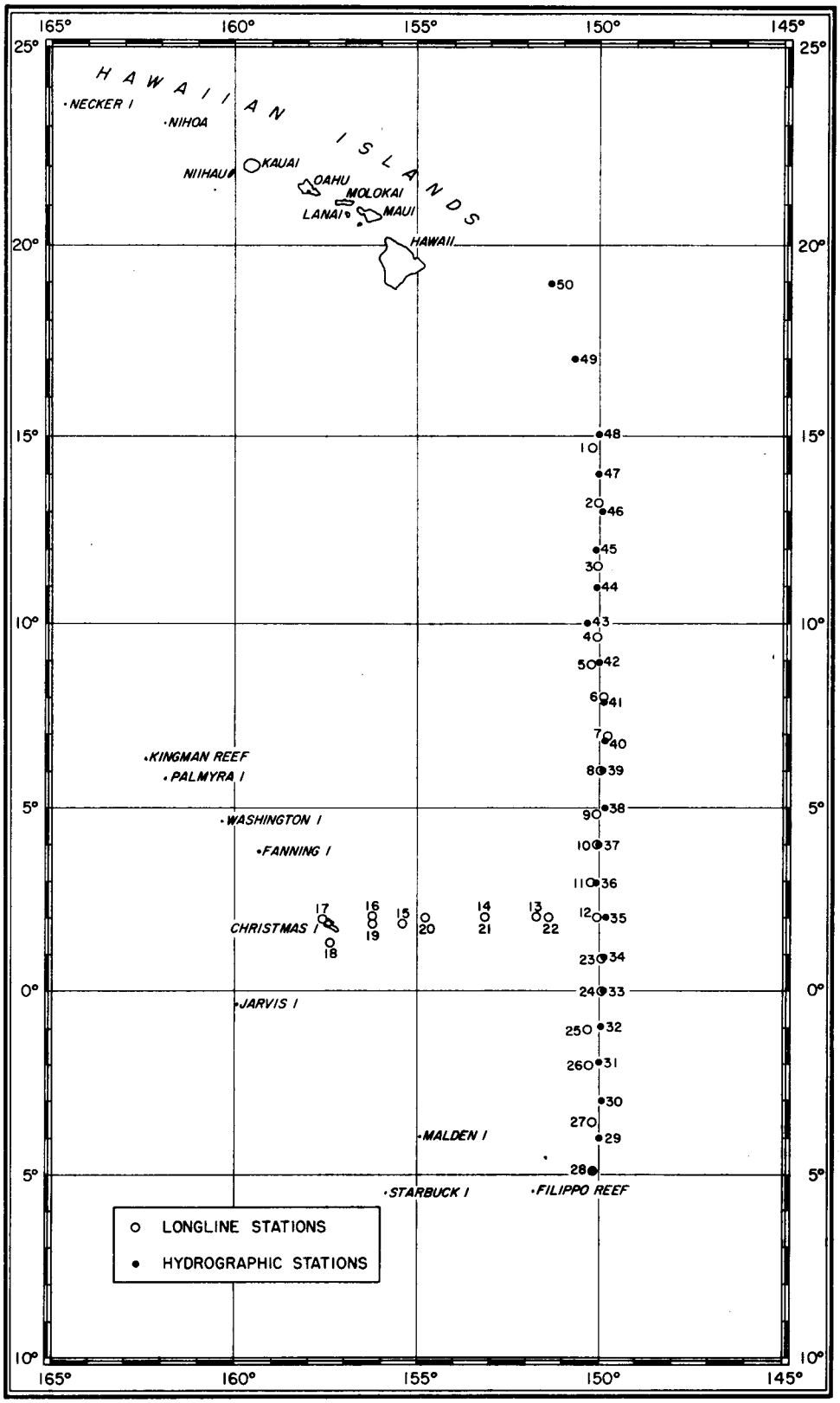

Fig. 1.-- Track chart, Hugh M. Smith cruise 11, August 20 through October 6, 1951. Open circles indicate positions of fishing stations (stations 1-28, August 24 - September 25, 1951); solid dots, the positions of the hydrographic stations (stations 28-50, September 26 - October 4, 1951.)

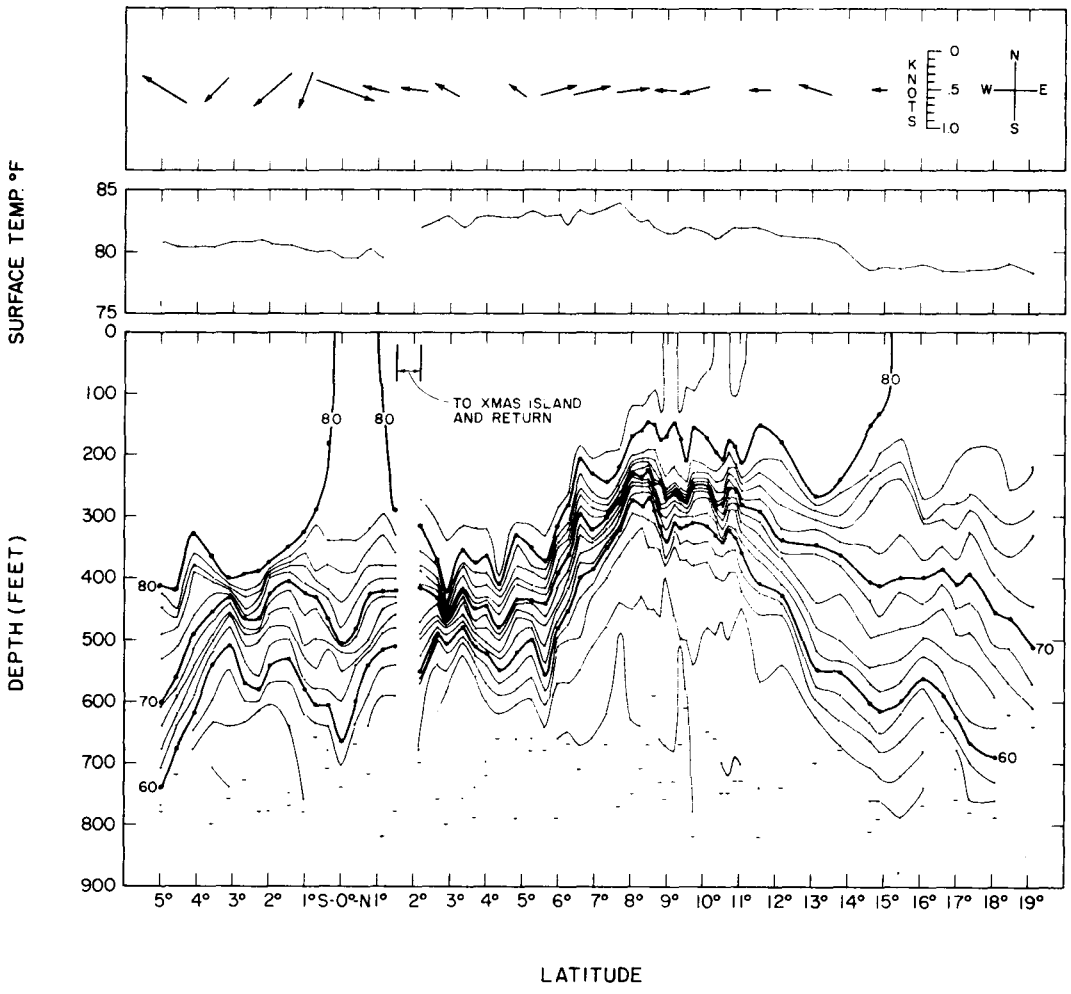

Fig. 2. -- Upper panel - direction and speed of longline drift at position of selected fishing stations (1-12, 23-28) shown on figure 1. Center panel - surface temperatures recorded at position of bathythermograph lowerings during southbound section (fishing), Hugh M. Smith cruise 11. Lower panel - bathythermograph section, southbound section, Hugh M. Smith cruise 11. Isotherm interval 2.0° F., depth of lowering indicated by small horizontal dash. The break in the section, between 1° and 2° N. latitudes, represents period of cruises from 150° W. longitude to Christmas Island and return (stations 12-23, September 4-19, 1951) (fig. 1).

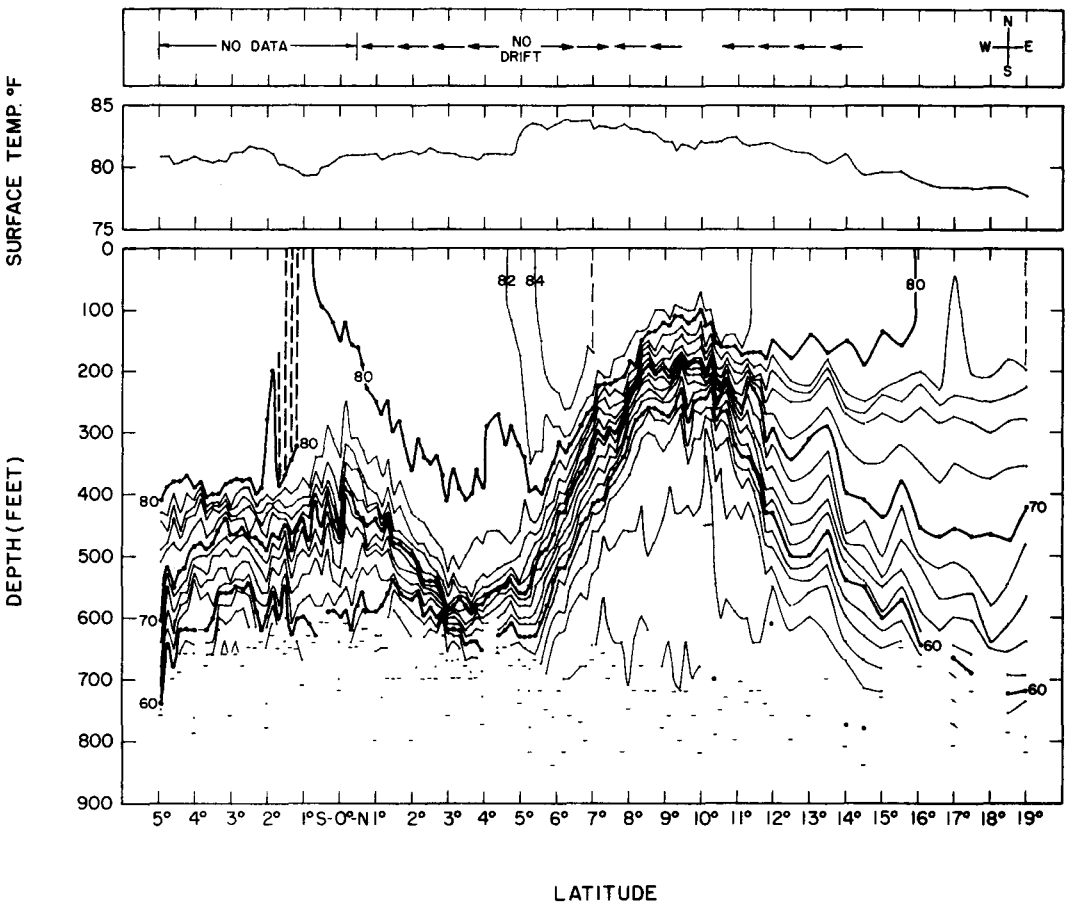

Fig. 3.-- Upper panel - direction of drift of Hugh M. Smith during period on oceanographic stations. Center panel - surface temperatures as measured at each bathythermograph lowering. Lower panel - bathythermograph section, northbound section, Hugh M. Smith cruise 11 (stations 28-50, September 25 - October 4, 1951). Isotherm interval 2.0° F., depths of lowering indicated by small horizontal dash. Vertical dashed lines denote homogeneous water with the same temperature as that of the isotherm intersected by the dashed line.

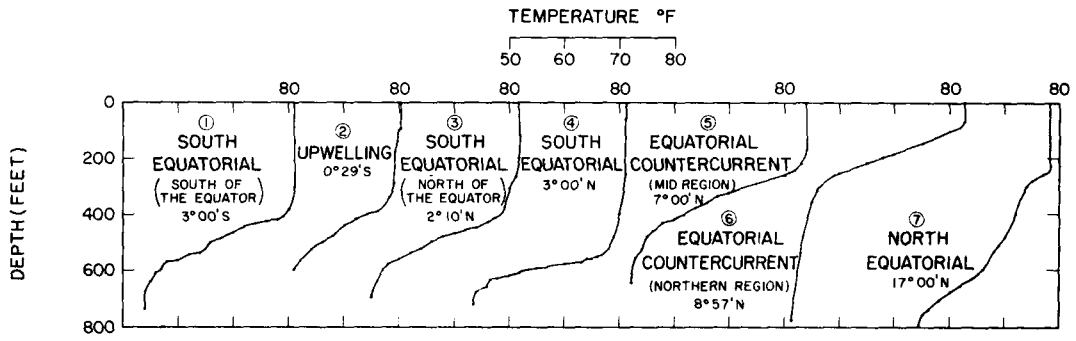

Fig. 4.-- Typical bathythermograph traces for various regions crossed during Hugh M. Smith cruise 11.

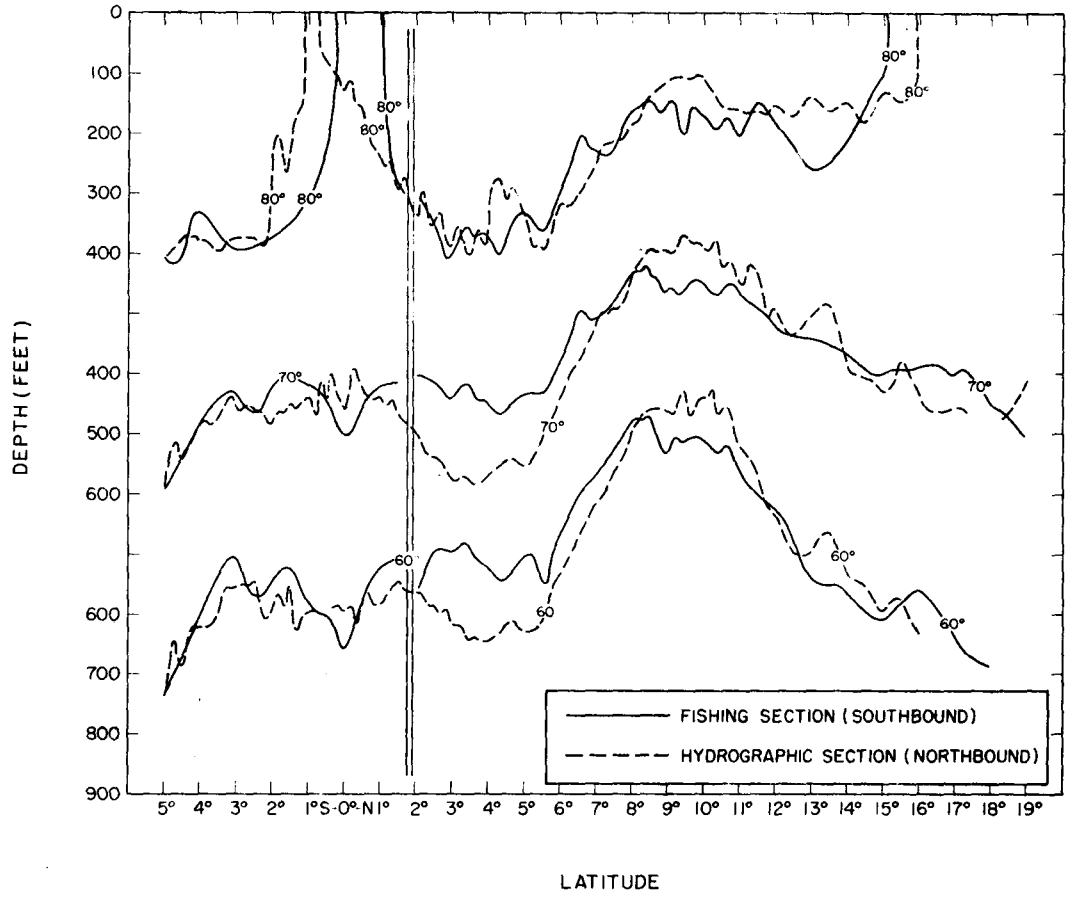

Fig. 5.-- Comparison of the 60°, 70°, and 80° F. isotherms for southbound (solid line) and northbound sections (broken line).

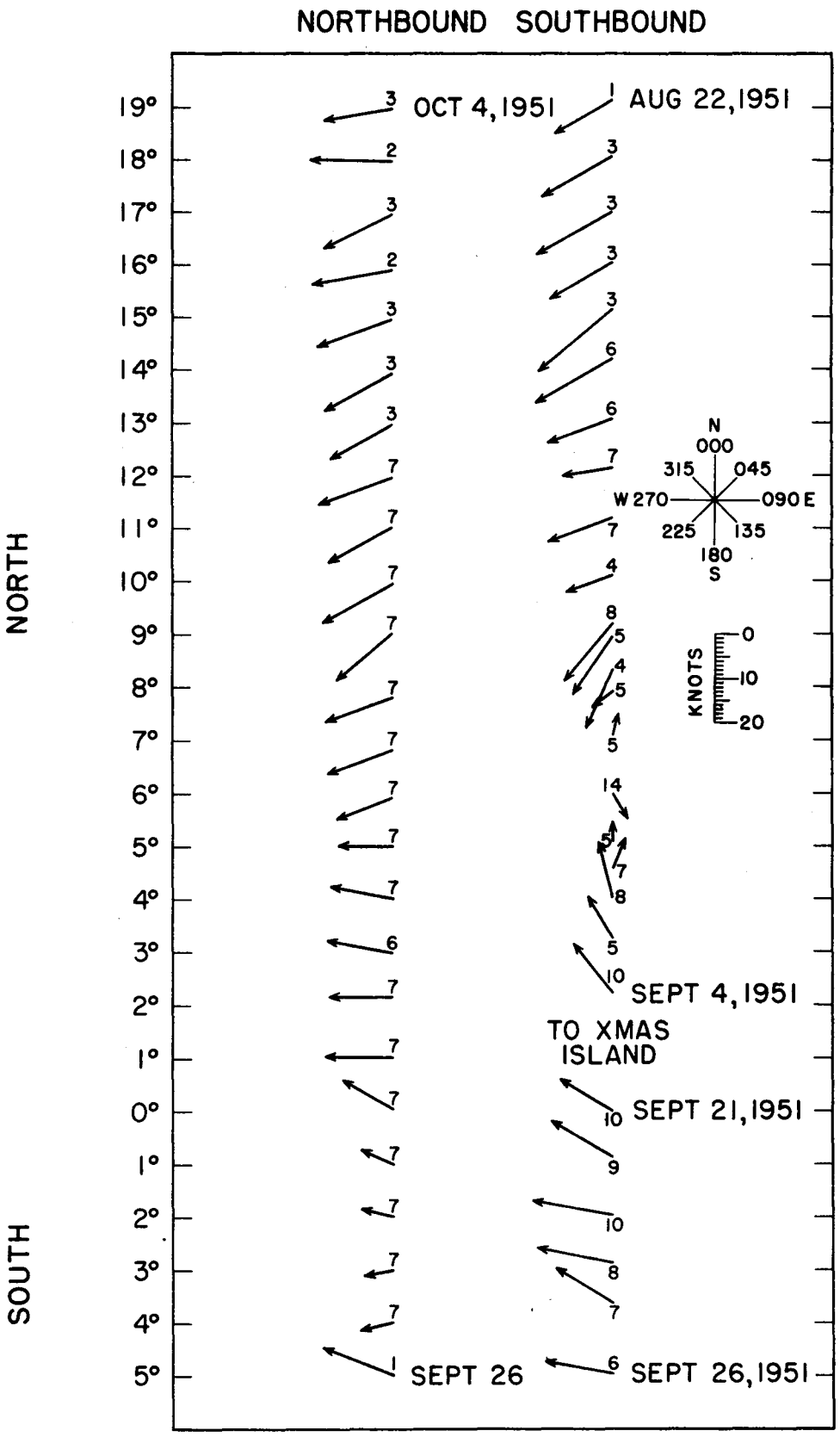

Fig. 6.-- Wind and direction and speed, Hugh M. Smith cruise 11, northbound and southbound sections. Each arrow represents independent averages of speed and direction for total observations between arrows. The figure at the base of the arrow denotes the number of observations included in the averages.

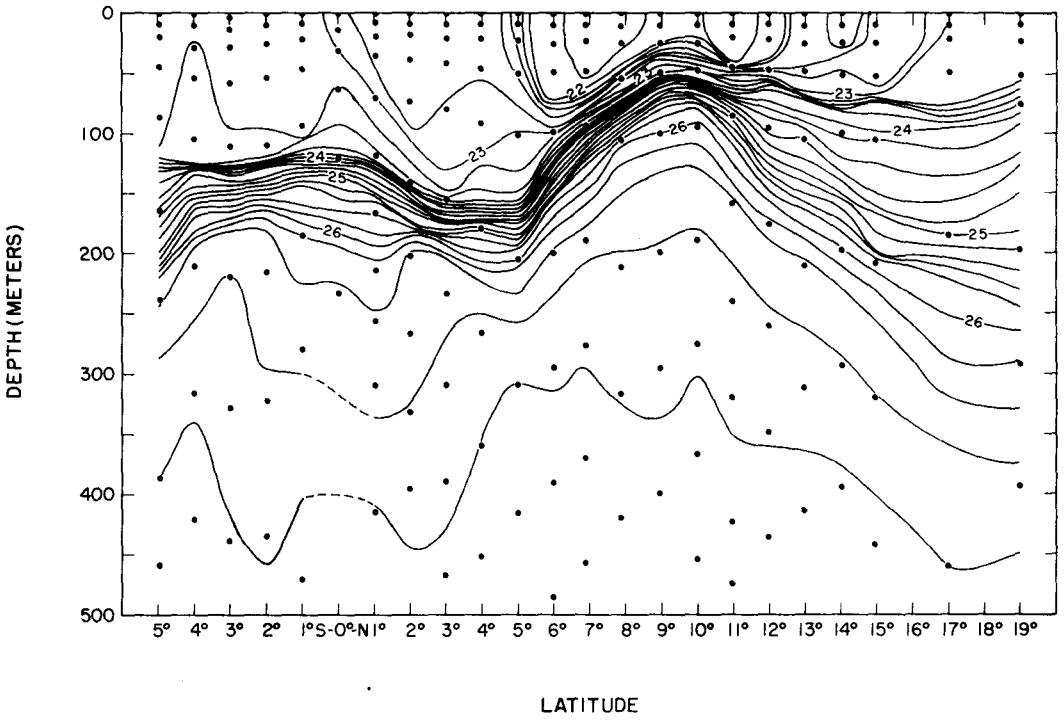

Fig. 7.-- Sigma-t, Hugh M. Smith cruise 11, stations 28-50, 5° S. - 19° N., 150° W. longitude, September 26 through October 4, 1951. Sigma-t in grams per liter, isopleth interval 0.2 gm./l.

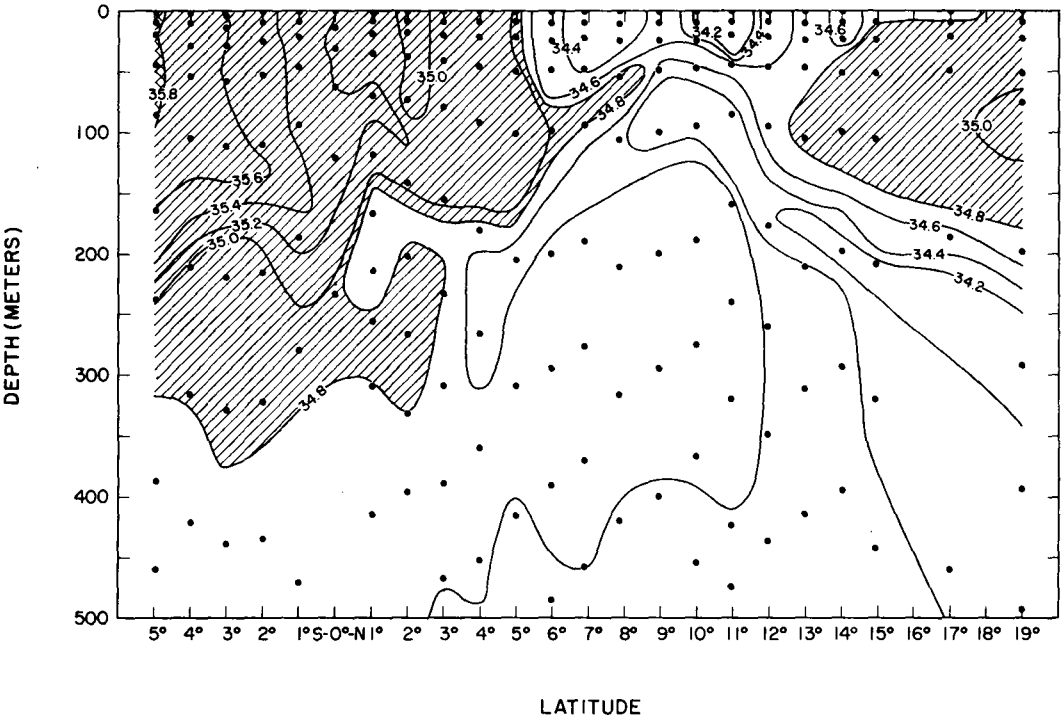

Fig. 8.-- Salinity, Hugh M. Smith cruise 11, stations 28-50, 5° S. - 19° N., 150° W. longitude, September 26 through October 4, 1951. Salinity in parts per thousand, isopleth interval 0.2 °/oo.

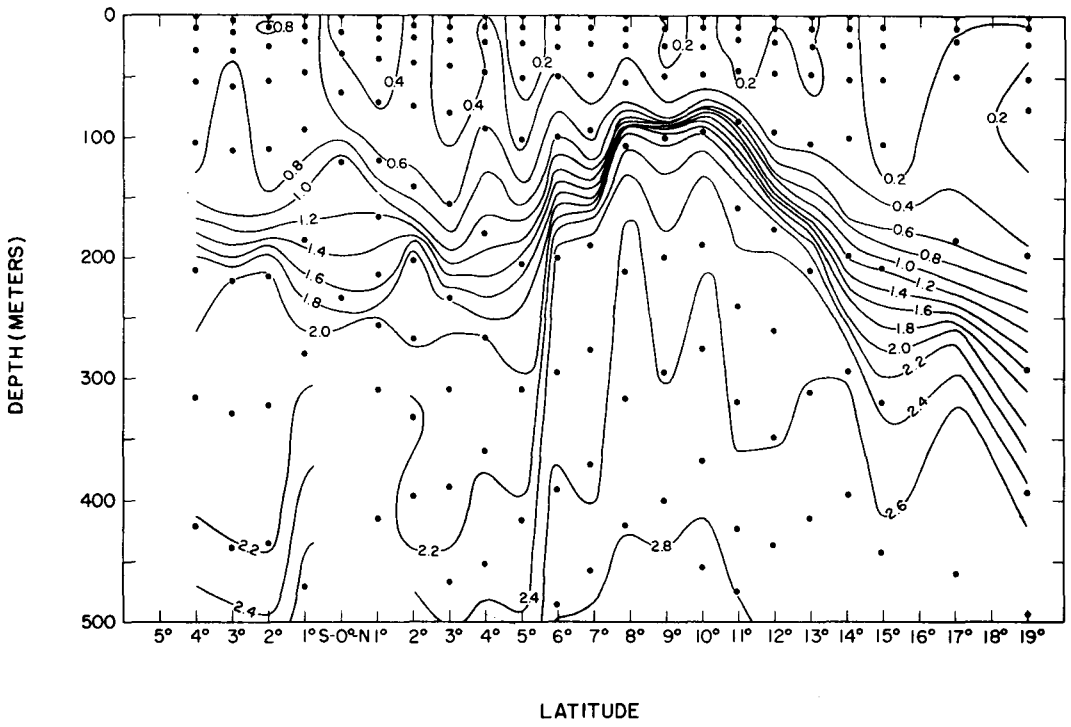

Fig. 9.-- Inorganic phosphate, Hugh M. Smith cruise 11, stations 28-50, 5° S. - 19° N. latitude, 150° W. longitude, September 26 through October 4, 1951. PO_4 in microgram atoms per liter, isopleth intervals 0.2 µg at/l.

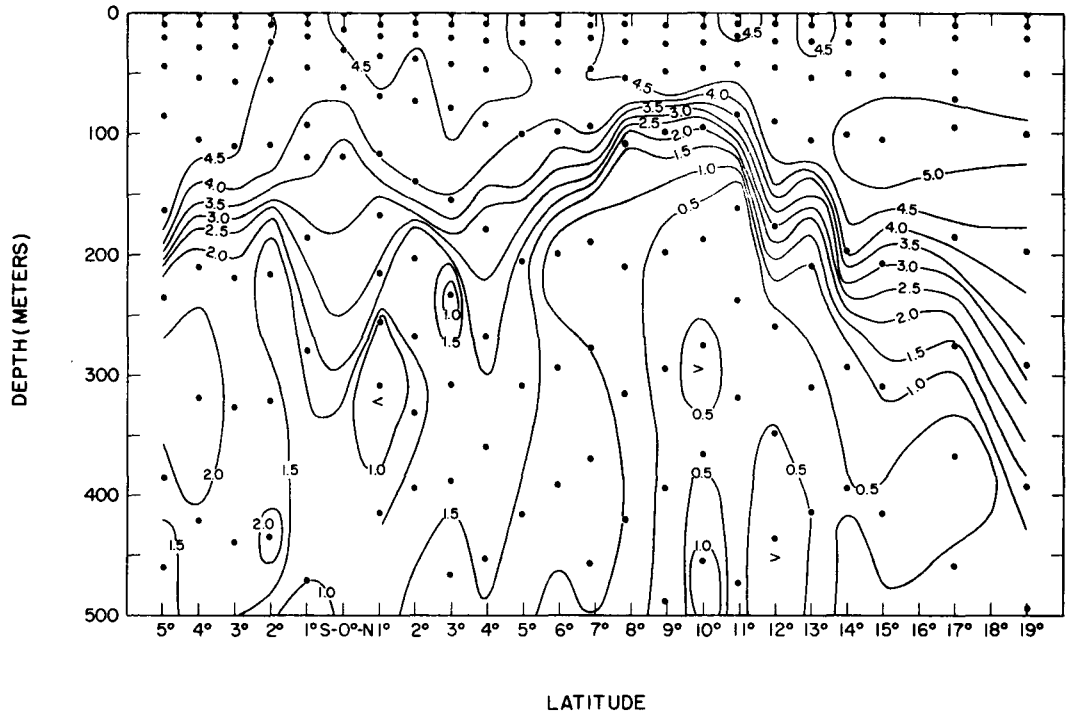

Fig. 10.-- Dissolved oxygen, Hugh M. Smith cruise 11, stations 28-50, 5° S. - 19° N. latitude, 150° W. longitude, September 26 through October 4, 1951. Oxygen in milliliters per liter; isopleth intervals 0.5 ml. /l.

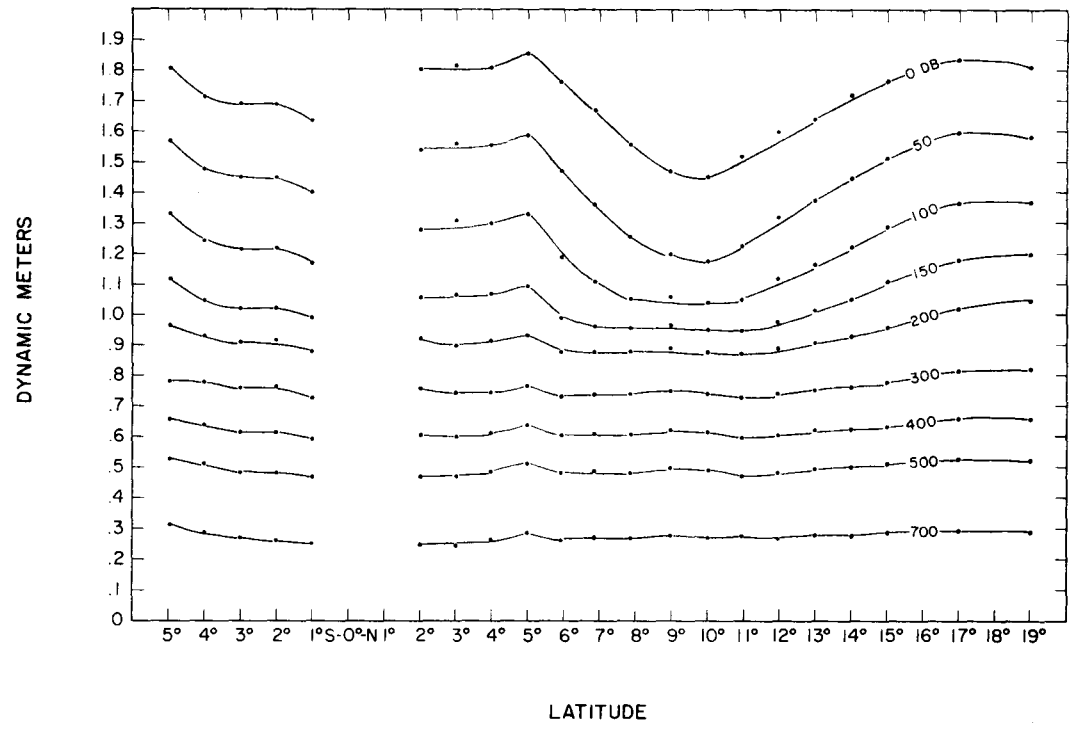

Fig. 11. -- Smooth profiles of the isobaric surfaces relative to the 1,000-decibar surface, Hugh M. Smith cruise 11, stations 28-50, 5° S. - 19° N. latitude, 150° W. longitude, September 26 through October 4, 1951.

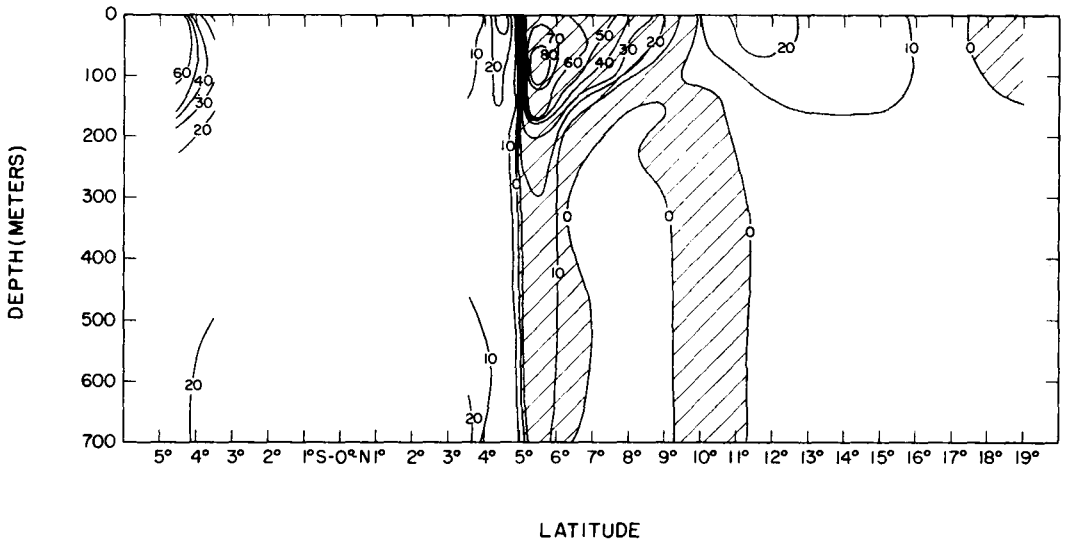

Fig. 12. -- Vertical section, geostrophic currents, Hugh M. Smith cruise 11, based on the smooth profiles (fig. 11). Current speed indicated in centimeters per second.

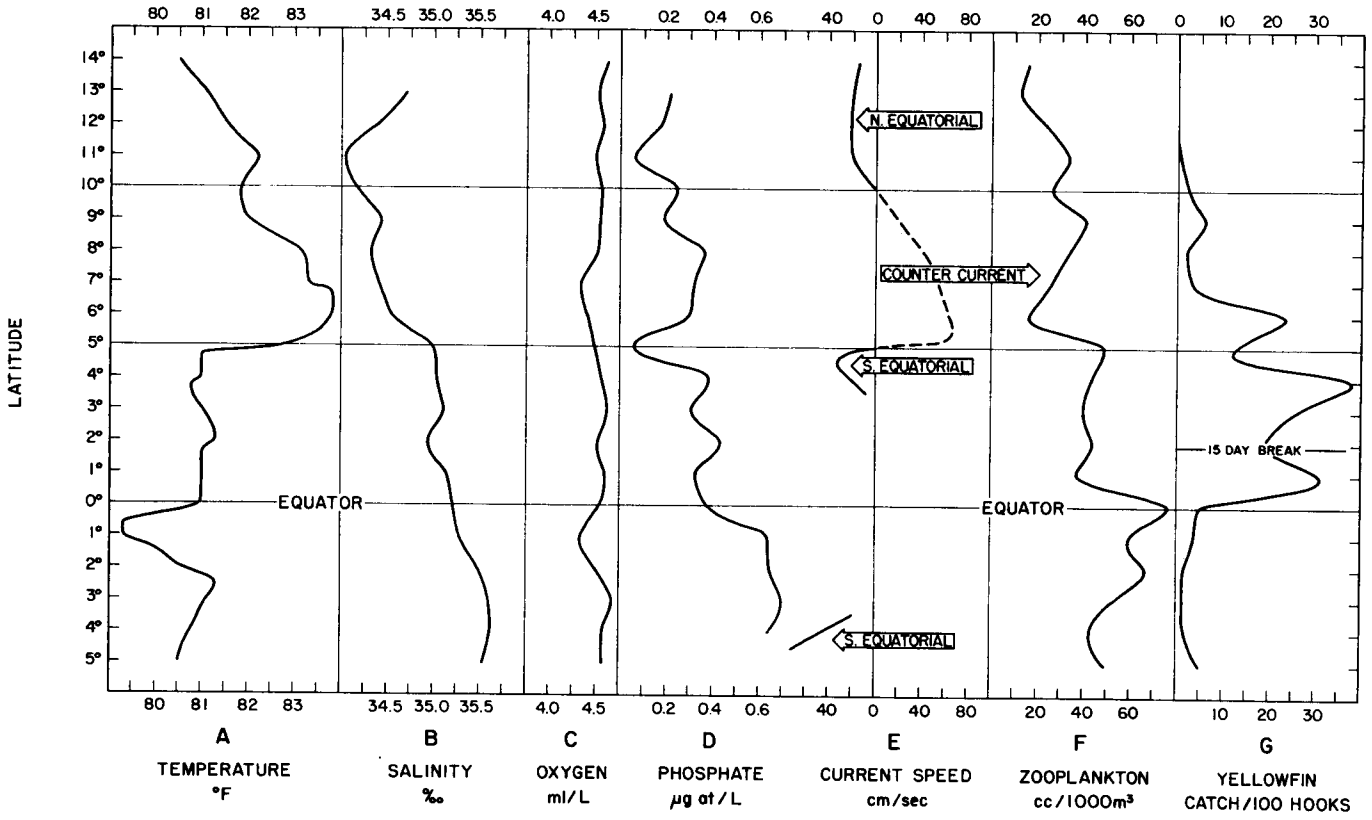

Fig. 13. -- Summary of various oceanographic and biological data, Hugh M. Smith cruise 11. Northbound section, panels (A) through (F), southbound section panel (G).

Remarks about the oceanographic data

Weather was recorded according to the ww code as it appears in The U.S.W.B. Circular M, Instructions to Marine Meteorological Observers.

Wind velocity was measured using an anemometer located 30 m. above the sea surface.

In the tabulated data, the horizontal line(s) between depths separates the two or more casts necessary during the particular station.

Whenever there is no doubt concerning data being in error (Nansen bottle pretrip, bottle leakage, etc.), these data are not carried in the tabulations and a footnote is appended. If values are doubtful, but there is no positive evidence of an error, the data are carried with appropriate footnotes.

STATION 28

M/V Hugh M. Smith: Cruise 11, 04°57'S, 150°04'W,
September 25, 1951. Messenger time: 1818 GCT.
Weather: 02, cloud coverage 4. Wind: 110°, 18 kt.
Sea: 1-3 ft. Wire angle: 35°. Depth of water: no data

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	27.10	35.55	23.13	4.55	
09	27.10	35.57	23.14	4.56	
21	27.10	35.59	23.15	4.56	
44	27.10	35.57	23.14	4.50	
86	27.11	35.59	23.15	4.56	
164	21.93	35.60	24.71	4.56	
237	13.37	35.02	26.35	1.87	
312	10.92	1/		1/	
386	09.70	34.71	26.79	1.75	
459	08.84	34.64	26.88	1.30	
597	07.26	34.61	27.10	1.93	
749	06.03	34.53	27.20	2.16	
921	05.12	34.54	27.32	2.48	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	Δ D 1000 - Δ D (dyn. m)
00	27.10	35.55	23.13	0.000	1.799
10	27.10	35.57	23.14	0.048	1.751
20	27.10	35.59	23.15	0.095	1.704
30	27.10	35.59	23.15	0.142	1.657
50	27.10	35.57	23.14	0.237	1.562
75	27.10	35.58	23.14	0.357	1.442
100	27.08	35.59	23.16	0.476	1.323
150	23.32	35.61	24.32	0.687	1.112
200	18.83	35.48	25.45	0.842	0.957
250	12.74	34.98	26.45	0.945	0.854
300	11.17	34.83	26.63	1.023	0.776
400	09.53	34.70	26.82	1.151	0.648
500	08.30	34.63	26.96	1.278	0.521
600	07.20	34.61	27.11	1.391	0.408
700	06.38	34.55	27.17	1.494	0.305
800	05.74	34.54	27.24	1.592	0.207
1000	04.87	(34.54)	27.35	1.799	0.000

1/ Unreasonable chemical values suggest Nansen bottle leakage.

STATION 29

M/V Hugh M. Smith: Cruise 11, 04°00'S, 150°00'W, September 26, 1951. Messenger time: 0916 GCT. Weather: 02, cloud coverage 0. Wind: 090°, 8 kt. Sea: < 1 ft. Wire angle: 25°. Depth of water: no data.

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
01	27.09	35.61	23.17	4.56	0.64
10	27.10	35.62	23.17	4.58	0.61
28	27.03	35.63	23.20	4.63	0.61
54	27.02	35.64	23.21	4.64	0.60
105	26.98	35.63	23.22	4.60	0.70
211	12.37	34.99	26.53	1.86	1.96
318	10.82	34.81	26.68	2.43	2.02
422	09.26	34.69	26.85	1.94	2.22
531	08.25	34.63	26.97	1.77	2.60
635	06.94	34.52	27.07	1.33	2.75
848	05.52	34.51	27.25	1.98	2.77
1058	04.38	34.56	27.42	2.18	2.70
1265	03.70	1/		2.38	2.39

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	27.09	35.61	23.17	0.000	1.709
10	27.10	35.62	23.17	0.047	1.662
20	27.08	35.63	23.19	0.094	1.615
30	27.03	35.63	23.20	0.141	1.568
50	27.02	35.64	23.21	0.235	1.474
75	27.00	35.64	23.22	0.352	1.357
100	26.98	35.63	23.22	0.470	1.239
150	20.89	35.58	24.98	0.668	1.041
200	12.78	35.04	26.48	0.784	0.925
250	11.70	34.90	26.58	0.861	0.848
300	11.04	34.83	26.65	0.936	0.773
400	09.58	34.71	26.81	1.076	0.633
500	08.51	34.65	26.94	1.202	0.507
600	07.37	34.55	27.03	1.320	0.389
700	06.48	34.51	27.13	1.429	0.280
800	05.83	34.51	27.21	1.530	0.179
1000	04.66	34.54	27.37	1.709	0.000

1/ Salinity sample bottle empty.

STATION 30

M/V Hugh M. Smith: Cruise 11, 03°00'S, 149°57'W, September 26, 1951. Messenger time: 1815 GCT. Weather: 02, cloud coverage 4. Wind: 090°, 9 kt. Sea: < 1 ft. Wire angle: 08°. Depth of water: no data.

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
03	27.30	35.60	23.09	4.68	0.70
13	27.22	35.61	23.13	4.62	0.68
29	27.17	35.59	23.13	4.57	0.65
58	27.16	35.58	23.12	4.53	0.69
112	26.78	35.64	23.29	4.53	0.72
220	11.66	34.91	26.60	1.74	2.00
327	10.95	34.81	26.66	1.57	2/
438	09.83	34.78	26.83	1.99	
545	07.84	34.63	27.03	1.12	
651	06.65	34.58	27.16	1.55	
858	05.25	34.54	27.30	1.96	
1066	04.11	1/		1/	
1264	03.66	34.55	27.48	2.32	

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	27.30	35.60	23.10	0.000	1.687
10	27.25	35.61	23.12	0.048	1.639
20	27.20	35.60	23.13	0.095	1.592
30	27.17	35.59	23.13	0.143	1.544
50	27.16	35.58	23.13	0.238	1.449
75	27.12	35.59	23.14	0.358	1.329
100	26.93	35.61	23.22	0.476	1.211
150	20.25	35.55	25.13	0.675	1.012
200	11.96	34.95	26.58	0.786	0.901
250	11.42	34.87	26.61	0.861	0.826
300	11.10	34.82	26.63	0.935	0.752
400	10.28	34.79	26.76	1.079	0.608
500	08.61	34.68	26.95	1.209	0.478
600	07.16	34.60	27.10	1.322	0.365
700	06.29	34.56	27.19	1.424	0.263
800	05.60	34.54	27.26	1.519	0.168
1000	04.50	34.62	27.45	1.687	0.000

1/ Unreasonable chemical values suggest Nansen bottle leakage.
2/ Phosphate sample useless due to addition of wrong reagents.

STATION 31

M/V Hugh M. Smith: Cruise 11, 02°00'S, 150°02'W, September 27, 1951. Messenger time: 0241 GCT.
Weather: 02, cloud coverage 2. Wind: 120°, 9 kt.
Sea: < 1 ft. Wire angle: 08°. Depth of water: no data

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	27.50	35.49	22.95	4.49	0.65
10	27.02	35.53	23.13	4.73	0.84
25	26.96	35.48	23.11	4.50	0.69
56	26.87	35.51	23.17	4.50	0.65
110	26.62	35.50	23.24	4.33	0.64
217	12.08	34.94	26.54	1.05	2.02
322	11.20	34.82	26.62	1.76	2.02
433	10.16	34.74	26.74	2.03	2.07
539	08.02	34.60	26.98	0.81	2.72
645	06.74	34.57	27.14	1.45	2.68
852	05.10	34.52	27.31	1.93	2.75
1059	04.24	1/		1/	1/
1263	03.58	34.59	27.52	2.26	2.69

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	27.50	35.49	22.95	0.000	1.688
10	27.02	35.53	23.13	0.048	1.640
20	26.98	35.50	23.12	0.096	1.592
30	26.94	35.48	23.12	0.144	1.544
50	26.88	35.49	23.15	0.239	1.449
75	26.81	35.51	23.18	0.357	1.331
100	26.72	35.51	23.21	0.475	1.213
150	19.31	35.51	25.35	0.670	1.018
200	12.42	34.98	26.51	0.777	0.911
250	11.80	34.91	26.57	0.854	0.834
300	11.37	34.84	26.60	0.930	0.758
400	10.54	34.77	26.69	1.079	0.609
500	08.77	34.64	26.89	1.215	0.473
600	07.23	34.58	27.08	1.332	0.356
700	06.26	34.55	27.19	1.436	0.252
800	05.43	34.52	27.26	1.531	0.157
1000	04.42	34.76	27.57	1.688	0.000

1/ Unreasonable chemical values suggest Nansen bottle leakage.

STATION 32

M/V Hugh M. Smith: Cruise 11, 01°00'S, 149°58'W, September 27, 1951. Messenger time: 1129 GCT. Weather: 01, cloud coverage not recorded. Wind: 130°, 9 kt. Sea: < 1 ft. Wire angle: 28°. Depth of water: no data

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.40	35.29	23.15	4.33	0.64
08	26.38	35.28	23.14	4.34	0.65
21	26.36	35.30	23.17	4.28	0.65
47	26.24	35.30	23.20	4.16	0.68
93	26.32	35.52	23.35	3.94	0.72
186	15.04	35.26	26.18	2.78	1.34
280	11.78	34.88	26.55	1.82	2.08
376	10.14	1/		1/	1/
471	08.50	34.64	26.93	1.00	2.69
563	07.51	34.60	27.05	1.02	2.80
750	06.02	34.56	27.22	1.78	2.78
943	04.82	1/	1/	1/	1/
1135	04.04	1/	1/	1/	1/

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.40	35.29	23.15	0.000	1.636
10	26.38	35.28	23.15	0.047	1.589
20	26.36	35.30	23.17	0.095	1.541
30	26.30	35.30	23.19	0.142	1.494
50	26.24	35.30	23.20	0.236	1.400
75	26.28	35.46	23.31	0.352	1.284
100	26.30	35.52	23.35	0.467	1.169
150	18.55	35.47	25.51	0.645	0.991
200	14.32	35.18	26.28	0.750	0.886
250	12.52	34.97	26.48	0.836	0.800
300	11.40	34.84	26.59	0.915	0.721
400	09.72	34.72	26.80	1.047	0.589
500	08.14	34.63	26.98	1.172	0.464
600	07.17	34.58	27.09	1.284	0.352
700	06.37	34.56	27.18	1.388	0.248
800	05.69	34.58	27.28	1.484	0.152
1000	04.50	34.81	27.60	1.636	0.000

1/ Unreasonable chemical values suggest Nansen bottle leakage.

STATION 33

M/V Hugh M. Smith: Cruise 11, 00°02'N, 150°00'W, September 27, 1951. Messenger time: first cast, 2029 GCT; second cast, 2120 GCT. Weather: 02, cloud coverage 4. Wind: 120°, 17 kt. Sea: 1-3 ft. Wire angle: first cast, 65°; second cast, 32°. Depth of water: no data

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	27.20	35.21	22.83	4.53	0.37
14	26.98	35.17	22.87	4.54	0.34
31	26.56	35.19	23.02	4.38	0.39
63	25.93	35.20	23.23	4.15	0.46
122	19.95 2/	35.28	25.01	3.29	1.07
233	26.16 2/	35.07	23.06	3.24	1.11
1/					

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	27.20	35.21	22.83		
10	27.03	35.17	22.86		
20	26.82	35.17	22.92		
30	26.56	35.19	23.02		
50	26.17	35.20	23.15		
75	25.70	35.20	23.30		
100	25.20	35.20	23.45		
150	18.87	35.26	25.28		
200	13.70	35.04	26.30		

1/ Values below 233 meters discarded. Suspect pretripping: depths uncertain.

2/ Suspected wrong break.

STATION 34

M/V Hugh M. Smith: Cruise 11, 01°02'N, 150°01'W, September 28, 1951. Messenger time: first cast, 0744 GCT; second cast, 0811 GCT; third cast, 0845 GCT. Weather: 02, cloud coverage not recorded. Wind: 090°, 16 kt. Sea: 1-3 ft. Wire angle: first cast, 57°; second cast, 57°; third cast, 64°. Depth of water: no data

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	27.30	35.14	22.74	4.59	0.32
09	27.36	35.16	22.74	4.53	0.29
19	27.36	35.17	22.75	4.59	0.29
38	27.33	35.16	22.76	4.55	0.26
70	26.62	35.22	23.03	4.49	0.39
118	25.05	35.12	23.44	4.08	0.61
167	15.80	34.73	25.60	2.65	1.25
215	12.74	34.74	26.26	2.48	1.51
256	12.16	34.87	26.48	0.86	2.05
309	11.58	34.80	26.53	0.68	2.12
415	09.46	34.68	26.81	1.38	2.19
1/					
2/					

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	27.30	35.14	22.74		
10	27.36	35.16	22.74		
20	27.36	35.17	22.75		
30	27.36	35.16	22.74		
50	27.21	35.17	22.80		
75	26.60	35.22	23.03		
100	25.72	35.17	23.27		
150	18.25	34.76	25.05		
200	13.29	34.73	26.14		
250	12.32	34.85	26.43		
300	11.69	34.81	26.52		
400	09.69	34.69	26.78		

1/ Values below 415 meters discarded. Unreasonable chemical values suggest Nansen bottle leakage.

2/ Depths and temperatures uncertain, possibly due to excessive wire angle.

STATION 35

M/V Hugh M. Smith: Cruise 11, 02°01'N, 149°53'W, September 28, 1951. Messenger time: 1802 GCT. Weather: 03, cloud coverage 4. Wind: 080°, 16 kt. Sea: 1-3 ft. Wire angle: 40°. Depth of water: no data

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	27.40	34.93	22.54	4.51	0.43
08	27.44	34.94	22.55	4.50	
18	27.46	34.94	22.55	4.52	0.44
38	27.45	34.96	22.56	4.48	0.45
74	27.30	34.95	22.61	4.47	0.48
141	24.97	35.12	23.46	4.01	0.69
202	12.34	34.85	26.43	1.54	1.92
267	11.84	34.85	26.52	1.53	1.98
331	11.13	34.79	26.61	1.18	2.24
395	10.42	34.73	26.69	1.83	2.07
522	08.44	34.63	26.93	1.04	2.58
658	06.74	1/		1/	1/
817	05.32	34.70	27.42	1.76	2.28

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	27.40	34.93	22.54	0.000	1.800
10	27.44	34.94	22.55	0.053	1.747
20	27.46	34.94	22.55	0.106	1.694
30	27.45	34.95	22.56	0.159	1.641
50	27.42	34.96	22.57	0.265	1.535
75	27.30	34.95	22.61	0.398	1.402
100	26.90	35.19	22.91	0.527	1.274
150	22.30	34.93	24.10	0.749	1.051
200	12.42	34.85	26.41	0.889	0.911
250	11.98	34.86	26.50	0.977	0.829
300	11.48	34.82	26.56	1.050	0.750
400	10.37	34.73	26.70	1.201	0.599
500	08.72	34.64	26.90	1.337	0.464
600	07.40	34.60	27.07	1.455	0.345
700	06.32	34.62	27.23	1.558	0.242
800	05.48	34.69	27.40	1.646	0.155
1000	(04.04)	(34.55)	27.45	1.800	0.000

1/ Unreasonable chemical values suggest Nansen bottle leakage.

STATION 36

M/V Hugh M. Smith: Cruise 11, 03°00'N, 150°08'W,
September 29, 1951. Messenger time: 0238 GCT.
Weather: 02, cloud coverage 3. Wind: 090°, 16 kt.
Sea: 1-3 ft. Wire angle: 42°. Depth of water: 2500 f.

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	27.30	35.12	22.73	4.61	0.31
08	27.32	35.11	22.72	4.64	0.30
21	27.16	35.10	22.76	4.62	0.31
42	27.13	35.09	22.77	4.62	0.32
80	26.95	35.11	22.84	4.58	0.34
156	24.49	35.08	23.57	3.88	0.60
234	11.52	34.79	26.54	0.91	1.79
309	10.60	34.74	26.66	1.92	2.10
388	09.74	34.66	26.75	1.59	2.13
467	08.89	34.61	26.85	1.33	2.29
636	06.86	34.52	27.08	0.95	2.92
812	05.58	1/		1/	1/
996	04.66	34.57	27.39	1.17	2.61

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	Δ D 1000 - Δ D (dyn. m)
00	27.30	35.12	22.73	0.000	1.814
10	27.28	35.11	22.73	0.051	1.763
20	27.16	35.10	22.76	0.103	1.711
30	27.15	35.09	22.76	0.154	1.660
50	27.11	35.09	22.77	0.256	1.558
75	26.98	35.10	22.82	0.383	1.431
100	26.87	35.12	22.87	0.510	1.304
150	25.85	35.16	23.22	0.754	1.060
200	13.12	34.77	26.21	0.919	0.895
250	11.33	34.79	26.57	1.002	0.812
300	10.70	34.75	26.65	1.077	0.737
400	09.62	34.65	26.76	1.219	0.595
500	08.48	34.59	26.90	1.350	0.464
600	07.28	34.53	27.03	1.470	0.344
700	06.30	34.59	27.21	1.575	0.239
800	05.62	34.68	27.37	1.665	0.149
1000	04.62	34.57	27.40	1.814	0.000

1/ Unreasonable chemical values suggest Nansen bottle leakage.

STATION 37

M/V Hugh M. Smith: Cruise 11, 03°58'N, 150°00'W, September 29, 1951. Messenger time: 1117 GCT.
Weather: 02, cloud coverage 1. Wind: 110°, 13 kt.
Sea: 1-3 ft. Wire angle: 30°. Depth of water: 2700 f.

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	27.20	35.04	22.71	4.54	0.38
09	27.19	35.04	22.71	4.53	0.44
23	27.19	35.05	22.72	4.55	0.41
47	27.12	35.09	22.77	4.55	0.40
92	26.71	35.14	22.94	4.42	0.61
180	17.15	34.70	25.27	2.73	1.09
267	09.98	34.58	26.65	2.27	2.00
360	09.15	34.62	26.82	1.63	2.18
451	08.57	34.61	26.90	1.66	2.30
542	07.77	34.58	27.00	1.09	2.81
725	06.20	34.51	27.16	1.34	2.88
914	05.10	34.66	27.42	2.40	2.05
1103	04.34	34.69	27.52	2.43	1.68

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	27.20	35.04	22.71	0.000	1.807
10	27.19	35.04	22.71	0.052	1.755
20	27.19	35.05	22.72	0.103	1.704
30	27.17	35.06	22.73	0.155	1.652
50	27.10	35.09	22.78	0.257	1.550
75	26.90	35.14	22.88	0.384	1.423
100	26.65	35.14	22.96	0.508	1.299
150	24.88	35.10	23.48	0.744	1.063
200	14.24	34.60	25.85	0.903	0.904
250	10.26	34.58	26.60	0.996	0.811
300	09.68	34.60	26.71	1.068	0.739
400	08.91	34.62	26.85	1.202	0.605
500	08.13	34.60	26.96	1.326	0.481
600	07.21	34.55	27.06	1.441	0.366
700	06.38	34.51	27.14	1.548	0.259
800	05.72	34.57	27.27	1.646	0.161
1000	04.60	34.68	27.49	1.807	0.000

STATION 39

M/V Hugh M. Smith: Cruise 11, 05°56'N, 150°00'W,
September 30, 1951. Messenger time: 0439 GCT.
Weather: 02, cloud coverage 1. Wind: 070°, 14 kt.
Sea: 1-3 ft. Wire angle: 10°. Depth of water: 2600 f.

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σt (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	28.90	34.53	21.78	4.42	0.30
10	28.86	34.53	21.78	4.46	0.31
25	28.84	34.52	21.78	4.48	0.32
49	28.80	34.52	21.79	4.48	0.41
98	26.38	35.00	22.93	3.82	0.78
200	11.42	34.65	26.45	0.31	2.47
294	09.54	34.64	26.77	1.17	2.56
391	08.71	34.63	26.89	1.16	2.61
485	07.97	34.57	26.96	0.95	2.77
585	07.16	34.52	27.04	0.78	2.98
782	05.60	34.52	27.24	0.90	2.54
954	04.62	34.62	27.44	1.50	2.67
1136	03.98	34.55	27.45	1.51	3.02

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σt (gm/l)	ΔD (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	28.90	34.53	21.78	0.000	1.766
10	28.86	34.53	21.78	0.060	1.706
20	28.85	34.52	21.78	0.121	1.645
30	28.83	34.52	21.78	0.181	1.585
50	28.80	34.52	21.79	0.302	1.464
75	28.02	34.74	22.21	0.449	1.317
100	26.30	35.00	22.96	0.581	1.185
150	17.50	34.61	25.12	0.777	0.989
200	11.42	34.65	26.45	0.891	0.875
250	10.24	34.64	26.65	0.968	0.798
300	09.50	34.64	26.76	1.038	0.728
400	08.61	34.62	26.90	1.167	0.599
500	07.81	34.56	26.97	1.288	0.478
600	07.01	34.51	27.05	1.402	0.364
700	06.20	34.52	27.17	1.508	0.258
800	05.49	34.53	27.27	1.604	0.162
1000	04.54	34.62	27.45	1.766	0.000

STATION 40

M/V Hugh M. Smith: Cruise 11, 06°51'N, 149°57'W, September 30, 1951. Messenger time: 1310 GCT. Weather: 20, cloud coverage not recorded. Wind: 060°, 18 kt. Sea: 3-5 ft. Wire angle: 15°. Depth of water: 2600 f.

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	28.80	34.39	21.68	4.34	0.32
11	28.86	34.42	21.70	4.48	0.36
23	28.86	34.40	21.68	4.48	0.35
48	28.87	34.44	21.71	4.51	0.34
95	22.38	34.83	24.00	4.10	0.51
190	11.10	34.64	26.50	0.72	2.45
276	09.58	34.66	26.78	0.98	2.59
370	08.93	34.61	26.84	1.21	2.55
458	08.24	34.60	26.94	1.12	2.73
553	07.43	34.54	27.02	0.79	2.94
738	05.60	34.50	27.23	1.22	3.06
923	04.84	34.54	27.35	1.34	2.57
1114	04.10	34.60	27.48	1.17	2.46

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	28.80	34.39	21.68	0.000	1.665
10	28.86	34.42	21.70	0.061	1.604
20	28.86	34.41	21.69	0.123	1.542
30	28.86	34.40	21.68	0.184	1.481
50	28.85	34.44	21.72	0.307	1.358
75	27.30	34.86	22.54	0.450	1.215
100	21.22	34.77	24.28	0.562	1.103
150	12.92	34.47	26.02	0.705	0.960
200	10.84	34.65	26.54	0.794	0.871
250	09.85	34.66	26.72	0.866	0.799
300	09.40	34.65	26.81	0.934	0.731
400	08.70	34.61	26.91	1.063	0.602
500	07.90	34.57	26.97	1.184	0.481
600	06.92	34.52	27.07	1.298	0.367
700	05.91	34.50	27.19	1.402	0.263
800	05.28	34.51	27.28	1.495	0.170
1000	04.64	34.55	27.38	1.665	0.000

STATION 41

M/V Hugh M. Smith: Cruise 11, 07°51'N, 149°57'W, September 30, 1951. Messenger time: 2229 GCT. Weather: 02, cloud coverage 5. Wind: 060°, 16 kt. Sea: 3-5 ft. Wire angle: 15°. Depth of water: 2900 f.

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	28•60	34•34	21•72	4•52	0•36
11	28•58	34•34	21•73	4•55	0•40
25	28•54	34•33	21•73	4•56	0•39
54	27•09	34•90	22•64	4•51	0•46
107	12•98	34•41	25•96	1•59	2•18
212	10•46	34•67	26•63	0•64	2•71
316	09•57	34•67	26•79	0•53	2•76
420	08•72	34•59	26•86	0•71	2•78
520	07•62	34•54	26•99	0•64	3•19
622	06•51	34•52	27•13	0•95	3•14
826	05•22	34•52	27•29	0•73	3•19
1032	04•30	34•54	27•41	1•40	3•04
1230	03•61	34•55	27•49	0•89	2•97

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	28•60	34•34	21•72	0•000	1•554
10	28•58	34•34	21•73	0•061	1•493
20	28•56	34•33	21•73	0•122	1•432
30	28•50	34•35	21•76	0•183	1•371
50	27•72	34•77	22•33	0•299	1•255
75	23•73	34•86	23•64	0•421	1•133
100	15•40	34•48	25•50	0•506	1•048
150	11•41	34•60	26•41	0•602	0•952
200	10•59	34•67	26•61	0•681	0•873
250	10•13	34•68	26•70	0•753	0•801
300	09•70	34•68	26•77	0•822	0•732
400	08•90	34•60	26•84	0•954	0•600
500	07•82	34•55	26•97	1•078	0•476
600	06•72	34•52	27•10	1•190	0•364
700	05•90	34•52	27•21	1•291	0•263
800	05•33	34•52	27•28	1•384	0•170
1000	04•49	34•54	27•39	1•554	0•000

STATION 42

M/V Hugh M. Smith: Cruise 11, 08°57'N, 149°58'W, October 1, 1951. Messenger time: 0801 GCT. Weather: 50, cloud coverage not recorded. Wind: 060°, 16 kt. Sea: 3-5 ft. Wire angle: 10°. Depth of water: 2700 f.

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	28.00	34.42	21.97		0.18
10	28.05	34.43	21.97	4.56	0.20
25	27.96	34.43	22.00	4.55	0.17
49	22.61	34.50	23.69	4.86	0.23
99	12.32	34.30	26.01	2.17	1.85
199	10.58	34.67	26.61	0.21	2.43
295	09.62	34.64	26.75	0.40	2.58
393	08.70	34.59	26.86	0.34	2.75
487	08.03	34.56	26.94	0.43	2.84
587	06.96	34.50	27.05	0.44	2.96
785	05.54	34.51	27.24	0.57	3.05
979	04.66	34.51	27.35	1.03	3.02
1179	03.92	34.54	27.45	1.00	2.84

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	28.00	34.42	21.97	0.000	1.468
10	28.05	34.43	21.97	0.059	1.409
20	28.01	34.43	21.98	0.117	1.351
30	26.95	34.67	22.51	0.174	1.294
50	22.61	34.50	23.69	0.270	1.198
75	15.55	34.32	25.34	0.356	1.112
100	12.31	34.30	26.01	0.414	1.054
150	11.20	34.65	26.49	0.505	0.963
200	10.56	34.67	26.62	0.582	0.886
250	10.05	34.66	26.70	0.654	0.814
300	09.59	34.64	26.76	0.723	0.745
400	08.65	34.59	26.86	0.854	0.614
500	07.90	34.55	26.96	0.977	0.491
600	06.84	34.50	27.07	1.091	0.377
700	06.08	34.50	27.17	1.196	0.272
800	05.47	34.51	27.25	1.292	0.176
1000	04.60	34.51	27.36	1.468	0.000

STATION 43

M/V Hugh M. Smith: Cruise 11, 10°00'N, 150°13'W, October 1, 1951. Messenger time: 1636 GCT. Weather: 02, cloud coverage 3. Wind: 050°, 18 kt. Sea: 3-5 ft. Wire angle: 20°. Depth of water: 2700 f.

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σt (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	27.80	34.16	21.83	4.56	0.24
10	27.86	34.14	21.81	4.56	0.23
25	27.64	34.46	22.13	4.68	0.26
47	23.26	34.54	23.53	4.83	0.30
94	12.37	34.35	26.03	2.11	1.92
188	10.68	34.69	26.61	0.26	2.58
275	09.72	34.67	26.76	0.57	2.62
367	08.84	34.60	26.85	0.46	2.72
454	08.14	34.57	26.94	1.07	2.87
546	07.21	34.52	27.03	0.89	2.87
730	05.80	34.51	27.21	0.73	3.04
914	04.88	34.52	27.33	0.89	2.70
1110	04.14	34.59	27.47	0.78	2.34

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σt (gm/l)	ΔD (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	27.80	34.16	21.83	0.000	1.443
10	27.86	34.14	21.81	0.060	1.383
20	27.72	34.40	22.06	0.119	1.324
30	27.20	34.66	22.42	0.176	1.267
50	22.80	34.51	23.64	0.272	1.171
75	14.15	34.35	25.67	0.355	1.088
100	12.17	34.37	26.09	0.408	1.035
150	11.18	34.68	26.51	0.496	0.947
200	10.51	34.69	26.64	0.572	0.871
250	09.97	34.68	26.73	0.643	0.800
300	09.46	34.65	26.79	0.710	0.733
400	08.61	34.59	26.88	0.839	0.604
500	07.68	34.54	26.98	0.962	0.481
600	06.72	34.51	27.09	1.074	0.369
700	05.98	34.51	27.19	1.177	0.266
800	05.42	34.51	27.26	1.272	0.171
1000	04.49	34.55	27.40	1.443	0.000

STATION 44

M/V Hugh M. Smith: Cruise 11, 10°58'N, 150°02'W, October 2, 1951. Messenger time: 0120 GCT. Weather: 02, cloud coverage 6. Wind: 060°, 16 kt. Sea: 3-5 ft. Wire angle: 33°. Depth of water: 2800 f.

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	28.00	34.03	21.68	4.49	0.06
08	28.03	34.03	21.68	4.42	0.07
20	27.98	34.03	21.69	4.49	0.06
43	26.76	34.68	22.58	4.70	0.12
85	16.70	34.36	25.11	3.57	0.81
163	11.42	34.71	26.49	0.13	3.35
240	10.40	34.68	26.65	0.19	2.44
319	09.60	34.65	26.76	0.18	2.55
397	08.90	34.61	26.85	0.22	2.65
474	07.96	34.54	26.94	0.23	2.79
627	06.54	1/		1/	1/
787	05.36	34.47	27.23	0.59	2.44
977	04.53	34.51	27.36	1.08	2.80

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	28.00	34.03	21.68	0.000	1.515
10	28.00	34.03	21.69	0.061	1.454
20	27.98	34.03	21.69	0.123	1.392
30	27.94	34.12	21.77	0.184	1.331
50	25.30	34.65	23.01	0.293	1.222
75	19.22	34.41	24.53	0.397	1.118
100	14.36	34.35	25.63	0.468	1.047
150	11.72	34.63	26.37	0.571	0.944
200	10.87	34.70	26.59	0.649	0.866
250	10.28	34.67	26.66	0.723	0.792
300	09.81	34.66	26.74	0.793	0.722
400	08.87	34.61	26.85	0.926	0.589
500	07.69	34.52	26.96	1.049	0.466
600	06.78	34.48	27.06	1.164	0.351
700	06.00	34.47	27.16	1.244	0.271
800	05.28	34.47	27.24	1.341	0.174
1000	04.50	34.51	27.37	1.515	0.000

1/ Unreasonable chemical values suggest Nansen bottle leakage.

STATION 45

M/V Hugh M. Smith: Cruise 11, 11°59'N, 150°03'W, October 2, 1951. Messenger time: 1010 GCT. Weather: 02, cloud coverage not recorded. Wind: 070°, 16 kt. Sea: 1-3 ft. Wire angle: 30°. Depth of water: 2800 f.

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	27.70	34.42	22.08	4.58	0.17
08	27.70	34.42	22.08	4.74	0.19
22	27.70	34.41	22.07	4.61	0.24
46	26.20	34.61	22.70	4.80	0.33
90	20.40	34.70	24.45	4.87	0.25
176	10.91	34.24	26.22	2.52	2.28
260	10.17	34.59	26.62	0.31	2.59
349	09.00	34.54	26.78	0.41	2.59
436	08.20	34.53	26.89	0.57	2.74
525	07.29	34.51	27.01	0.63	2.79
707	05.93	34.50	27.19	0.39	3.02
894	04.76	34.52	27.35	0.73	3.05
1078	04.01	34.51	27.42	0.55	2.84

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	27.70	34.42	22.08	0.000	1.597
10	27.70	34.42	22.08	0.058	1.539
20	27.70	34.41	22.07	0.115	1.482
30	27.65	34.43	22.10	0.173	1.424
50	25.28	34.65	23.01	0.280	1.317
75	21.70	34.70	24.09	0.390	1.207
100	19.80	34.68	24.59	0.480	1.117
150	13.10	34.32	25.87	0.619	0.978
200	10.45	34.51	26.51	0.712	0.885
250	10.22	34.58	26.61	0.789	0.808
300	09.65	34.56	26.69	0.862	0.735
400	08.53	34.54	26.85	0.997	0.600
500	07.53	34.51	26.98	1.120	0.477
600	06.73	34.50	27.09	1.232	0.365
700	05.99	34.50	27.18	1.335	0.262
800	05.30	34.51	27.28	1.430	0.167
1000	04.20	34.51	27.40	1.597	0.000

STATION 46

M/V Hugh M. Smith: Cruise 11, 13°00'N, 149°56'W, October 2, 1951. Messenger time: 1835 GCT. Weather: 02, cloud coverage 3. Wind: 060°, 16 kt. Sea: 1-3 ft. Wire angle: 15°. Depth of water: 2900 f.

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	27.30	34.70	22.41	4.51	0.21
10	27.31	34.71	22.42	4.46	0.31
24	27.31	34.72	22.43	4.45	0.20
53	26.29	34.76	22.78	4.61	0.18
106	20.26	34.85	24.60	4.71	0.34
209	10.90	34.44	26.38	1.00	2.34
311	09.36	34.55	26.73	0.35	2.61
418	08.26	34.51	26.87	0.50	2.67
523	07.24	34.47	26.99	0.48	2.80
629	06.37	34.47	27.11		2.93
836	05.14	34.46	27.25	0.82	2.90
1044	04.26	34.51	27.39	1.05	2.82
1241	03.65	34.51	27.45	1.37	2.75

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	27.30	34.70	22.41	0.000	1.639
10	27.31	34.71	22.42	0.054	1.585
20	27.31	34.71	22.42	0.109	1.530
30	27.30	34.73	22.44	0.163	1.476
50	26.40	34.76	22.75	0.268	1.371
75	23.00	34.87	23.86	0.385	1.254
100	20.50	34.86	24.54	0.479	1.160
150	15.88	34.64	25.52	0.629	1.010
200	11.10	34.44	26.34	0.736	0.903
250	10.21	34.51	26.55	0.818	0.821
300	09.48	34.56	26.72	0.892	0.747
400	08.44	34.52	26.84	1.026	0.613
500	07.43	34.48	26.96	1.149	0.490
600	06.55	34.47	27.09	1.262	0.377
700	05.86	34.46	27.17	1.365	0.274
800	05.32	34.46	27.23	1.463	0.176
1000	04.42	34.50	27.37	1.639	0.000

STATION 47

M/V Hugh M. Smith: Cruise 11, 14°01'N, 150°03'W, October 3, 1951. Messenger time: 0302 GCT. Weather: 80, cloud coverage 8. Wind: 080°, 18 kt. Sea: 3-5 ft. Wire angle: 25°. Depth of water: 2900 f.

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	27.20	34.48	22.28	4.62	0.27
09	27.24	34.51	22.29	4.63	0.27
24	27.18	34.51	22.31	4.63	0.25
51	26.59	34.93	22.82	4.71	0.26
100	22.02	34.88	24.14	5.18	0.23
198	11.31	34.13	26.06	4.04	1.16
293	09.76	34.51	26.63	0.72	2.57
394	08.65	34.53	26.82	0.50	2.66
493	07.64	34.48	26.94	0.68	2.77
593	06.66	34.45	27.05	0.76	2.90
788	05.44	34.46	27.22	0.56	3.05
987	04.52	34.51	27.36	1.67	2.15
1184	03.76	34.50	27.43	1.59	2.22

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	27.20	34.48	22.28	0.000	1.716
10	27.24	34.51	22.29	0.056	1.660
20	27.20	34.51	22.31	0.111	1.605
30	27.10	34.53	22.36	0.166	1.550
50	26.59	34.94	22.82	0.272	1.444
75	24.78	34.93	23.38	0.392	1.324
100	22.02	34.88	24.14	0.497	1.219
150	17.90	34.60	25.01	0.668	1.048
200	11.21	34.14	26.09	0.792	0.924
250	10.22	34.39	26.46	0.882	0.834
300	09.68	34.52	26.65	0.959	0.757
400	08.60	34.53	26.83	1.097	0.619
500	07.57	34.48	26.95	1.222	0.494
600	06.60	34.45	27.05	1.337	0.379
700	05.89	34.45	27.15	1.442	0.274
800	05.38	34.47	27.23	1.540	0.176
1000	04.50	34.51	27.36	1.716	0.000

STATION 48

M/V Hugh M. Smith: Cruise 11, 15°02'N, 150°01'W, October 3, 1951. Messenger time: 1110 GCT. Weather: 02, cloud coverage 3. Wind: 080°, 19 kt. Sea: 3-5 ft. Wire angle: 16°. Depth of water: 3000 f.

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (μg at/l)
00	26.70	1/		4.65	0.06
09	26.67	34.80	22.70	4.65	0.06
24	26.64	34.81	22.71	4.65	0.04
52	26.61	34.81	22.72	4.68	0.10
105	21.86	34.89	24.19	5.66	0.05
207	12.52	34.19	25.88	3.07	1.17
309	09.12	34.32	26.59	1.14	2.27
417	08.08	34.43	26.83	0.39	2.60
518	07.00	34.40	26.97	0.60	2.69
621	06.22	34.44	27.10	0.71	2.76
821	05.23	34.44	27.23	0.69	2.89
1023	04.40	34.45	27.33	1.00	2.88
1220	03.72	34.47	27.41	1.53	1.96

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	26.70	34.80	22.70	0.000	1.763
10	26.67	34.80	22.69	0.052	1.711
20	26.65	34.81	22.71	0.103	1.660
30	26.63	34.81	22.71	0.155	1.608
50	26.61	34.81	22.72	0.258	1.505
75	23.73	34.88	23.65	0.377	1.386
100	22.37	34.89	24.05	0.479	1.284
150	20.10	34.78	24.59	0.660	1.103
200	15.12	34.35	25.46	0.810	0.953
250	09.96	34.23	26.38	0.911	0.852
300	09.23	34.31	26.56	0.992	0.771
400	08.25	34.42	26.80	1.135	0.628
500	07.17	34.40	26.95	1.261	0.502
600	06.34	34.43	27.08	1.375	0.388
700	05.80	34.44	27.16	1.478	0.285
800	05.35	34.44	27.21	1.577	0.186
1000	04.72	34.44	27.29	1.763	0.000

1/ Salinity sample bottle broken.

STATION 49

M/V Hugh M. Smith: Cruise 11, 17°00'N, 150°42'W, October 4, 1951. Messenger time: 0215 GCT. Weather: 02, cloud coverage 3. Wind: 050°, 19 kt. Sea: 1-3 ft. Wire angle: 28°. Depth of water: 2900 f.

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	25.80	34.82	22.99	4.76	0.15
09	25.76	34.80	22.98	4.78	0.18
22	25.62	34.81	23.03	4.76	0.22
48	25.60	34.86	23.07	4.78	0.21
95	22.68	34.77	23.87	5.16	0.27
186	17.48	34.53	25.06	4.24	0.59
275	11.18	34.41	26.30	1.41	2.25
368	09.68	34.49 1/	26.63	0.31	2.63
459	08.04	34.36 1/	26.79	0.57	2.66
553	07.18	34.41	26.95	0.66	2.75
738	05.76	34.40	27.13	0.67	2.86
932	04.76	34.44	27.28	0.86	2.88
1124	04.06	34.45	27.36	1.10	2.67

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	25.80	34.82	22.99	0.000	1.836
10	25.75	34.80	22.98	0.049	1.787
20	25.65	34.81	23.02	0.098	1.738
30	25.62	34.83	23.04	0.146	1.690
50	25.60	34.86	23.07	0.243	1.593
75	25.43	34.87	23.13	0.363	1.473
100	22.48	34.76	23.92	0.472	1.364
150	20.57	34.68	24.38	0.663	1.173
200	15.98	34.47	25.36	0.820	1.016
250	11.75	34.41	26.20	0.935	0.901
300	10.77	34.43	26.39	1.024	0.812
400	09.09	34.45	26.69	1.180	0.656
500	07.61	34.39	26.87	1.316	0.520
600	06.80	34.41	27.00	1.437	0.399
700	06.05	34.40	27.10	1.548	0.288
800	05.37	34.41	27.19	1.651	0.185
1000	04.50	34.44	27.31	1.836	0.000

1/ Doubtful.

STATION 50

M/V Hugh M. Smith: Cruise 11, 19°00'N, 151°19'W, October 4, 1951. Messenger time: 1717 GCT. Weather: 02, cloud coverage 3. Wind: 070°, 17 kt. Sea: 1-3 ft. Wire angle: 23°. Depth of water: 2900 f.

OBSERVED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (g/l)	O_2 (ml/l)	PO_4-P (µg at/l)
00	25.50	34.91	23.14	4.75	0.18
09	25.50	34.90	23.13	4.77	0.21
23	25.52	34.91	23.14	4.77	0.25
51	25.51	34.93	23.15	4.77	0.17
101	22.15	35.07	24.25	5.07	0.15
197	17.49	34.69	25.18	4.33	0.45
292	10.50	34.13	26.21	3.22	1.56
393	08.30	34.23	26.64	1.34	2.45
493	07.16	34.29	26.86	0.71	2.76
594	06.64	34.37	26.99	0.62	2.88
794	05.39	34.39	27.17	0.86	3.02
999	04.50	34.51	27.36	1.85	1.84
1198	03.86	34.51	27.43	2.93	1.19

INTERPOLATED AND CALCULATED					
DEPTH (m)	T (°C)	S (°/oo)	σ t (gm/l)	Δ D (dyn. m)	$\Delta D_{1000} - \Delta D$ (dyn. m)
00	25.50	34.91	23.14	0.000	1.815
10	25.50	34.90	23.13	0.047	1.768
20	25.51	34.91	23.14	0.095	1.720
30	25.51	34.92	23.14	0.142	1.673
50	25.51	34.93	23.15	0.237	1.578
75	23.61	35.04	23.81	0.349	1.466
100	22.16	35.07	24.25	0.447	1.368
150	19.58	34.89	24.80	0.620	1.195
200	17.27	34.67	25.22	0.771	1.044
250	12.55	34.19	25.88	0.897	0.918
300	10.28	34.14	26.25	0.997	0.818
400	08.21	34.26	26.68	1.162	0.653
500	07.11	34.30	26.88	1.297	0.518
600	06.60	34.38	27.01	1.418	0.397
700	06.00	34.38	27.09	1.529	0.286
800	05.35	34.39	27.17	1.633	0.182
1000	04.50	34.52	27.37	1.815	0.000