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SCRIPPS INSTITUTION OF OCEANOGRAPHY

PHYSICAL AND CHEMICAL DATA

VERMILION SEA EXPEDITION

13 April - 29 May 1959

Sponsored by

Office of Naval Research  
Bureau of Ships  
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Approved for distribution:

A handwritten signature in black ink, reading "Roger Revelle". The signature is written in a cursive style with a large initial "R".

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Roger Revelle, Director

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## INTRODUCTION

On Vermilion Sea Expedition two research vessels conducted a geological and geophysical exploration of the Gulf of California from February to May, 1959. Support was obtained from the Office of Naval Research and the Bureau of Ships of the U. S. Navy and from a grant of the American Petroleum Institute.

The data presented in this report were collected by hydrographic casts aboard the R/V Spencer F. Baird of the Scripps Institution of Oceanography during the run from San Felipe, Mexico, to San Diego, California. These data were collected and processed by the Data Collection and Processing Group of the Marine Life Research Program, Division of Marine Resources, at the Scripps Institution as a contribution to the California Cooperative Oceanic Fisheries Investigations (CalCOFI) program.

## STANDARD PROCEDURES

Processing of the data was carried out using the method described by Klein.<sup>1/</sup> Certain approximations have been introduced for the determination of the integrated pressure terms which may result in errors whose maximum values are less than 0.5 dynamic centimeter at 0 over 200 decibars, 1.0 dynamic centimeter at 0 over 500 decibars, and 2.5 dynamic centimeters at 0 over 1000 decibars. On any station where interpolated values exceeded 1500 meters, no approximation of pressure terms was made at any level. (These stations are: 27, 29, 30, 31, 36, 46, 47, 50 and 67.) The 125-meter level was introduced into the integration to obtain greater accuracy in the determination of  $\Delta D$ . The interpolated values at 125 meters are not tabulated.

To indicate degree of accuracy, temperatures are recorded in tenths of a degree when obtained by bucket thermometer, thermograph, or bathythermograph, while temperatures from reversing thermometers are recorded in hundredths of a degree. Extrapolated values and values interpolated between remote observations are entered within parentheses. A hyphen is used to indicate a missing observed value. The time is the time of messenger release. When more than one cast was made on a station, messenger times and wire angles are given in the order of increasing depth. A line is left blank between the observed data of each cast.

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<sup>1/</sup> Klein, Hans T. A new technique for processing physical oceanographic data, MS.

## FOOTNOTES

The footnote, "loose bottle cap," appears in the report. To avoid any confusion as to its meaning the following explanation is included.

Laboratory personnel, before titrating the salinity samples, note any possible imperfections in the sealing of the bottles as follows:

- |                       |                                                                                                                                                                                                        |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Loose bottle cap:     | The cap is definitely loose so that it could be moved with very little applied pressure. The salinity values obtained from these samples may be usable depending on time and/or conditions of storage. |
| Possible evaporation: | Either the cap was sealed with less than usual pressure, the bottle edge chipped, the rubber washer cracked, or the bale broke on opening, etc.                                                        |

Use of the above values in interpolation depends upon consistency with other values of salinity and other properties, and these footnotes are supplemented with "falls on property curve" or "does not fall on property curve," depending upon whether the property curve was drawn through the value or not.

In addition to footnotes, three special notations are used without footnotes because their meaning is always the same.

To indicate a premature or a delayed reversal of the water-sampling device which results in certain depth and property errors, the following notation is used.

p: pretrip or posttrip.

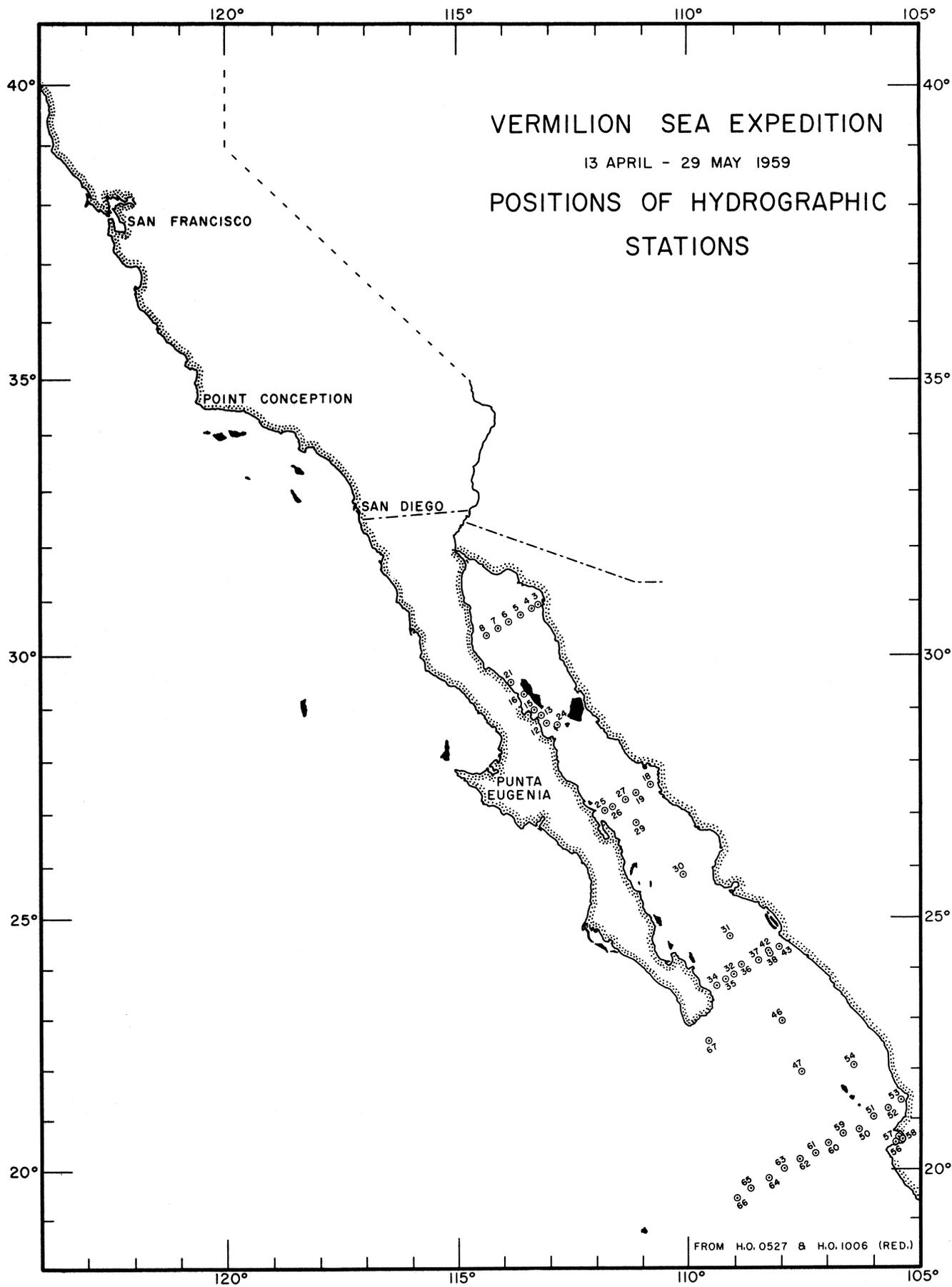
Values which are not drawn through because they seem to be in error without apparent reason are indicated by one of the following notations.

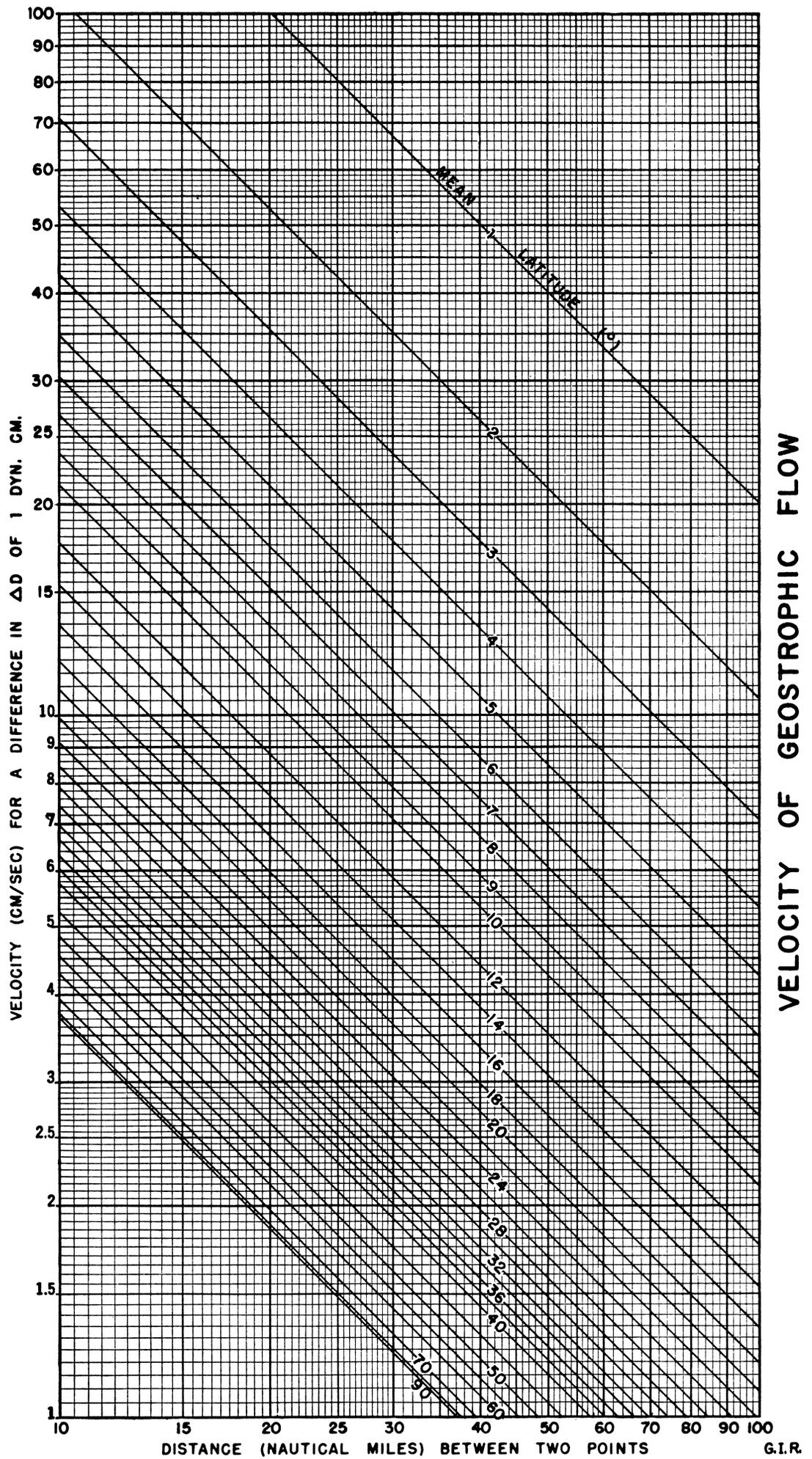
r: rejected value (value seems to be definitely wrong),

u: uncertain value (value may be correct; occasionally it can influence the drawing of the property curve).

## FORMAT

These data are typed in the format of the University of California Press publication, "Oceanic Observations of the Pacific" and will be included in the 1959 volume.





OBSERVED					INTERPOLATED				COMPUTED			
Z	T	S	O <sub>2</sub>	$\delta_{T_3}^{-5}$	Z	T	S	O <sub>2</sub>	$\sigma_t$	$\delta_{T_3}^{-5}$	$\Delta D$	
m	°C	‰	ml/L	10 cm/g	m	°C	‰	ml/L	g/L	10 cm/g	dyn. m	

S10  
VERMILION  
SEA

SPENCER F. BAIRD; April 16, 1959; 0220 GCT; 30°55.5'N, 113°13'W; sounding, 6 fm; wind, 080°, force 4; weather, partly cloudy; sea, rough; wire angle, 02°.

3  
(103G.80)

0	21.62	35.61	4.86	316	0	21.62	35.61	4.86	24.80	316	0.00
5	21.65	35.64	5.00	314							

SPENCER F. BAIRD; April 16, 1959; 0344 GCT; 30°50.5'N, 113°22.5'W; sounding, 30 fm; wind, 100°, force 4; weather, partly cloudy; sea, rough; wire angle, 05°.

4  
(103G.70)

0	20.52	35.52	5.53	293	0	20.52	35.52	5.53	25.04	293	0.00
10	20.52	35.53	5.60	292	10	20.52	35.53	5.60	25.05	292	0.03
20	19.00	35.38	5.59a)	265	20	19.00	35.38	5.59	25.33	265	0.06
29	18.12	35.35	4.63	246	30	18.11	35.35	4.62	25.53	246	0.08
39	17.95	35.37	4.45	240							
49	17.78	35.35	4.18	238							

SPENCER F. BAIRD; April 16, 1959; 0535 GCT; 30°43.5'N, 113°36.5'W; sounding, 44 fm; wind, 100°, force 4; weather, cloudy; sea, rough; wire angle, 08°.

5  
(103G.55)

1	19.90	35.55	5.34	275	0	(19.90)	(35.55)	(5.34)	(25.23)	(275)	(0.00)
11	19.91	35.55	5.42	275	10	19.91	35.55	5.41	25.23	275	0.03
20	18.24	35.52	5.70	237	20	18.24	35.52	5.70	25.63	237	0.05
30	16.83	35.43	3.92	211	30	16.83	35.43	3.92	25.90	211	0.08
49	16.37	35.37	3.02	204	50	16.36	35.37	3.01	25.97	204	0.12
69	16.25	35.39	2.74	201							

SPENCER F. BAIRD; April 16, 1959; 0727 GCT; 30°36'N, 113°52'W; sounding, 48 fm; wind, 130°, force 4; weather, partly cloudy; sea, rough; wire angle, 06°.

6  
(103G.40)

2	20.00	35.56	5.55	277	0	(20.00)	(35.56)	(5.55)	(25.20)	(277)	(0.00)
12	19.97	35.55	5.52	276	10	19.98	35.55	5.53	25.21	276	0.03
21	17.76	35.55	5.44	223	20	17.96	35.55	5.46	25.72	228	0.05
31	16.98	35.45	4.60	212	30	17.04	35.46	4.70	25.87	214	0.07
51	16.44	35.46	3.68	200	50	16.45	35.46	3.70	26.02	200	0.12
75	15.54	35.30	2.23	192	75	15.54	35.30	2.23	26.10	192	0.16

SPENCER F. BAIRD; April 16, 1959; 0924 GCT; 30°29'N, 114°06.5'W; sounding, 82 fm; wind, 120°, force 4; weather, partly cloudy; sea, rough; wire angle, 13°.

7  
(103G.25)

2	19.76	35.54	5.72	272	0	(19.76)	(35.54)	(5.72)	(25.26)	(272)	(0.00)
11	19.75	35.54	5.68	272	10	19.75	35.54	5.68	25.26	272	0.03
30	18.16	35.52	5.33	235	20	18.29	35.52	5.37	25.62	238	0.05
49	16.74	35.43	4.27	209	30	18.16	35.52	5.33	25.65	235	0.08
73	15.95	35.39	3.16	194	50	16.73	35.43	4.25	25.93	208	0.12
100	14.92	35.19	1.95	187	75	15.91	35.38	3.14	26.08	194	0.17
131	14.87	35.21	1.86	184	100	14.92	35.19	1.95	26.16	187	0.22

SPENCER F. BAIRD; April 16, 1959; 1129 GCT; 30°21.5'N, 114°21'W; sounding, 48 fm; wind, 110°, force 4; weather, clear; sea, rough; wire angle, 19°.

8  
(103G.10)

3	19.88	35.75	5.31	260	0	(19.88)	(35.75)	(5.31)	(25.38)	(260)	(0.00)
12	19.82	35.75	5.32	258	10	19.84	35.75	5.32	25.40	259	0.03
21	17.44	35.61	4.53	212	20	17.70	35.62	4.65	25.84	217	0.05
31	16.73	35.62	4.01	195	30	16.74	35.62	4.01	26.07	195	0.07
49	16.68	35.85r	3.52	-	50	16.67	35.63	3.51	26.09	193	0.11
73	16.60	35.65	3.45	189	75	(16.59)	(35.66)	(3.44)	(26.13)	(189)	(0.16)

a) Bubbles in sample bottle.

S10

VERMILION  
SEA

OBSERVED					INTERPOLATED				COMPUTED		
Z	T	S	O <sub>2</sub>	$\delta_{T_3}$	Z	T	S	O <sub>2</sub>	$\sigma_t$	$\delta_{T_3}$	$\Delta D$
m	°C	‰	ml/L	$\frac{-5}{10} \text{ cm/g}$	m	°C	‰	ml/L	g/L	$\frac{-5}{10} \text{ cm/g}$	dyn. m

12  
(115G.20) SPENCER F. BAIRD; April 20, 1959; 0834 GCT; 28°42'N, 113°03'W; sounding, 832 fm; wind, calm; weather, clear; sea, calm; wire angle, 04°.

2	19.42	35.37	4.90	277	0	(19.42)	(35.37)	(4.90)	(25.21)	(277)	(0.00)
11	18.64	35.32	3.80	261	10	18.72	35.32	3.90	25.36	263	0.03
32	18.26	35.34a)	3.60	250	20	18.43	35.33	3.67	25.44	255	0.05
56	17.08	35.25	3.08	230	30	18.28	35.34	3.61	25.48	251	0.08
71	16.18	35.21	2.96	212	50	17.36	35.27	3.19	25.66	234	0.13
86	15.46	35.14	2.65	202	75	15.90	35.18	2.87	25.93	208	0.18
99	15.20	35.14	2.68	196	100	15.18	35.14	2.67	26.06	196	0.23
124	14.85	35.10	2.58	192	150	14.69	35.08	2.54	26.12	190	0.33
152	14.66	35.08	2.53	189	200	14.18	35.07	2.28	26.23	180	0.42
175	14.36	35.08	2.44	183	250	13.97	35.06	2.17	26.26	177	0.52
208	14.13	35.07	2.25	179	300	13.45	35.00	1.90	26.32	171	0.60
263	13.90	35.05	2.14	176	400	12.54	34.89	1.45	26.42	162	0.78
361	12.75	34.91	1.53	164	500	12.20	34.87	1.31	26.47	157	0.94
482	12.26	34.87	1.36	158	600	12.01	34.86	1.23	26.49	155	1.11
628	11.98	34.85	1.18	154	700	11.92	34.84	1.23	26.50	154	1.27
821	11.84	34.81	1.32	155	800	11.87	34.82	1.30	26.50	154	1.44
1065	11.66	34.81	1.05	152	1000	11.70	34.81	1.10	26.52	152	1.77
1234	11.58	34.82	0.78	149							

13  
(114G.20) SPENCER F. BAIRD; April 20, 1959; 1133 GCT; 28°51'N, 113°10'W; sounding, 457 fm; wind, 310°, force 4; weather, clear; sea, moderate; wire angle, 41°.

2	17.92	35.25	4.94	249	0	(17.92)	(35.25)	(4.94)	(25.50)	(249)	(0.00)
11	17.73	35.25	4.82	244	10	17.76	35.25	4.86	25.54	245	0.02
26	17.21	35.22	4.41	235	20	17.60	35.24	4.73	25.58	242	0.05
40	16.43	35.14	4.01	223	30	17.12	35.21	4.35	25.67	233	0.07
59	15.72	35.14	3.39	208	50	15.94	35.14	3.60	25.89	212	0.12
75	15.56	35.13	3.23	205	75	15.56	35.13	3.23	25.97	205	0.17
89	15.44	35.12	3.22	203	100	15.33	35.13	3.20	26.02	200	0.22
107	15.28	35.14	3.18	198	150	14.99	35.15	3.02	26.11	191	0.32
137	15.08	35.12	3.13	196	200	14.79	35.15	2.89	26.16	187	0.42
165	14.93	35.16	2.98	190	250	14.11	35.09	2.50	26.25	178	0.51
195	14.82	35.15	2.90	188	300	13.36	35.02	2.03	26.36	168	0.60
254	14.03	35.08	2.43	177	400	12.85	34.99	1.84	26.44	160	0.77
316	13.21	35.01	1.91	166	500	12.37	34.93	1.48	26.48	156	0.93
383	12.94	35.00	1.85	161							
452	12.60	34.95	1.60	158							
522b)	12.26	34.92	1.42	155							

15  
(113G.18) SPENCER F. BAIRD; April 21, 1959; 0446 GCT; 28°58'N, 113°19'W; sounding, 581 fm; wind, calm; weather, partly cloudy; sea, calm; wire angle, 05°.

1	17.38	35.45	4.72	222	0	(17.38)	(35.45)	(4.72)	(25.79)	(222)	(0.00)
11	16.58	35.34	4.22	212	10	16.65	35.35	4.31	25.88	213	0.02
30	16.68	35.39	4.05	211	20	16.54	35.34	4.08	25.90	211	0.04
55	16.72	35.41	4.03	209	30	16.68	35.39	4.05	25.90	211	0.06
84	16.46	35.38	3.82	206	50	16.72	35.41	4.04	25.91	210	0.11
112	15.40	35.28	2.93	190	75	16.53	35.39	3.87	25.94	207	0.16
141	14.54	35.10	2.75	186	100	15.97	35.33	3.35	26.04	198	0.21
163	14.46	35.16	2.70	180	150	14.50	35.13	2.71	26.20	183	0.30
215	13.92	35.08	2.41	174	200	14.09	35.11	2.52	26.27	176	0.40
260	13.56	35.05	2.07	169	250	13.62	35.06	2.12	26.33	170	0.48
316	13.28	35.01	1.91	167	300	13.35	35.03	1.98	26.35	168	0.57
411	12.87	34.96	1.60	163	400	12.92	34.97	1.66	26.40	164	0.74
513	12.46	34.94	1.42	157	500	12.50	34.94	1.46	26.46	158	0.91
607	11.98	34.90	1.15	151	600	12.01	34.91	1.17	26.52	152	1.07
710	11.78	34.88	1.23	148	700	11.78	34.88	1.22	26.56	148	1.23
819	11.72	34.87	1.32	148	800	11.74	34.87	1.30	26.56	148	1.39
940	11.68	34.85	1.18	149	1000	(11.64)	(34.88)	(0.99)	(26.58)	(146)	(1.71)
990	11.66	34.87	0.99	147							

a) Loose bottle cap; value falls on property curve.

b) Alternate depth of 538 meters rejected.

OBSERVED					INTERPOLATED				COMPUTED		
Z	T	S	O <sub>2</sub>	$\delta T_3$	Z	T	S	O <sub>2</sub>	$\sigma_t$	$\delta T_3$	$\Delta D$
m	°C	‰	ml/L	10 <sup>-5</sup> cm/g	m	°C	‰	ml/L	g/L	10 <sup>-5</sup> cm/g	dyn. m

SIO  
VERMILION  
SEA

SPENCER F. BAIRD; April 21, 1959; 0753 GCT; 29°15'N, 113°32'W; sounding, 386 fm; wind, 250°, force 4; weather, partly cloudy; sea, slight; wire angle, 33°.

16  
(111G.14)

1	17.30	35.48	4.47	218	0	(17.30)	(35.48)	(4.47)	(25.83)	(218)	(0.00)
10	17.29	35.44	4.41	221	10	17.29	35.44	4.41	25.80	221	0.02
27	17.19	35.47	4.34	216	20	17.26	35.45	4.40	25.82	218	0.04
44	17.04	35.50	4.05	211	30	17.14	35.47	4.31	25.86	215	0.07
65	17.07	35.48	4.00	213	50	17.04	35.50	4.04	25.90	211	0.11
83	17.04	35.46	4.05	213	75	17.06	35.47	4.04	25.88	213	0.16
102	17.04	35.50	3.95	211	100	17.04	35.50	3.95	25.90	211	0.22
118	16.72	35.49	3.79	204	150	15.28	35.24	3.20	26.11	191	0.32
145	15.32	35.26	3.26	190	200	15.26	35.21	3.19	26.09	193	0.41
177	15.26	35.21	3.19	193	250	14.94	35.16	2.98	26.13	189	0.51
207	15.26	35.20	3.18	194	300	14.29	35.09	2.59	26.22	181	0.60
238	15.06	35.17	3.07	191	400	13.11	34.96	1.80	26.36	167	0.78
268	14.72	35.15	2.77	186							
301	14.29	35.09	2.59	181							
335	14.13	35.08	2.49	179							
373	13.30	34.99	1.94	169							
409	13.07	34.96	1.75	167							
448	12.59	34.96	1.48	158							

SPENCER F. BAIRD; April 25, 1959; 0158 GCT; 27°33.5'N, 110°49.5'W; sounding, 396 fm; wind, 140°, force 4; weather, partly cloudy; sea, rough; wire angle, 10°.

18  
(127G.90)

2	24.32	35.26	4.24	414	0	(24.32)	(35.26)	(4.24)	(23.77)	(414)	(0.00)
11	24.34	35.21	3.89	419	10	24.33	35.21	3.95	23.72	418	0.04
31	23.72	35.21	3.93	401	20	24.29	35.21	3.89	23.74	417	0.08
40	22.20	35.23	3.39	358	30	23.79	35.21	3.94	23.88	403	0.12
49	20.37	35.35	4.45	301	50	20.26	35.35	4.40	24.98	299	0.19
72	18.92	35.28	3.00	271	75	18.91	35.28	2.99	25.28	270	0.26
95	17.38	35.29	2.68	233	100	17.30	35.28	2.62	25.68	232	0.33
117	15.74	35.10	1.59	211	150	13.90	34.96	0.86	26.20	182	0.43
140	14.55	35.05	1.15	189	200	12.52	34.87	0.29	26.41	163	0.52
164	13.17	34.87	0.51	175	250	11.68	34.81	0.16	26.52	152	0.60
209	12.40	34.87	0.26	161	300	11.01	34.77	0.14	26.61	144	0.68
256	11.56	34.80	0.15	151	400	9.48	34.68	0.08	26.81	125	0.82
325	10.71	34.75	0.12	140	500	8.26	34.62	0.05	26.96	110	0.94
396	9.53	34.68	0.08	126	600	7.07	34.61	0.04	27.12	95	1.05
466	8.68	34.64	0.05	115							
538	7.76	34.61	0.05	104							
610	6.98	34.61	0.04	94							
659	6.64	34.56	0.05	93							

SPENCER F. BAIRD; April 25, 1959; 0448 GCT; 27°23'N, 111°08'W; sounding, 964 fm; wind, 160°, force 3; weather, partly cloudy; sea, moderate; wire angle, 25°.

19  
(127G.70)

2	23.52	35.29	4.78	390	0	(23.52)	(35.29)	(4.78)	(24.02)	(390)	(0.00)
11	23.52	35.30	4.81	389	10	23.52	35.30	4.81	24.03	389	0.04
28	20.26	35.27	5.26	304	20	21.40	35.29	5.12	24.62	333	0.07
46	18.86	35.23	4.08	273	30	20.21	35.27	5.25	24.93	303	0.11
67	17.54	35.23	3.51	241	50	18.10	35.23	3.76	25.44	255	0.16
87	16.02	35.09	2.22	218	75	16.95	35.18	3.00	25.68	232	0.22
115	14.58	35.01	1.95	193	100	15.05	35.03	2.02	26.00	202	0.28
146	14.18	35.03	1.88	183	150	14.14	35.03	1.88	26.20	182	0.37
185	13.78	34.99	1.88	178	200	13.60	34.98	1.74	26.27	176	0.47
228	13.24	34.96	1.35	170	250	12.63	34.91	0.86	26.42	162	0.55
276	11.90	34.84	0.47	153	300	11.44	34.80	0.31	26.56	149	0.63
365	10.38	34.70	0.12	138	400	10.01	34.66	0.12	26.70	135	0.78
447a)	9.60	34.61	0.13	132	500	8.62	34.61	0.14	26.90	117	0.91
531	8.05	34.61	0.15	108	600	7.24	34.59	0.13	27.08	99	1.02
636	6.88	34.58	0.11	95	700	6.25	34.60	0.10	27.22	86	1.12
743	5.92	34.61	0.10	80	800	5.58	34.60	0.10	27.32	77	1.21
920	4.98	34.58	0.16	71	1000	4.54	34.59	0.20	27.42	66	1.37
1106	4.05	34.61	0.31	60							

a) Possible pretrip; alternate depth, 387 meters.

SIO

VERMILION  
SEA

OBSERVED					INTERPOLATED				COMPUTED		
Z	T	S	O <sub>2</sub>	$\delta T_3$	Z	T	S	O <sub>2</sub>	$\sigma_t$	$\delta T_3$	$\Delta D$
m	°C	‰	ml/L	$10^{-5}$ cm/g	m	°C	‰	ml/L	g/L	$10^{-5}$ cm/g	dyn. m

21 (I09G.10) SPENCER F. BAIRD; April 26, 1959; 1721 GCT; 29°29.5'N, 113°49'W; sounding, 457 fm; wind, calm; weather, overcast; sea, smooth; wire angle, 04°.

1	19.82	35.82	4.52	254	0	(19.82)	(35.82)	(4.52)	(25.45)	(254)	(0.00)
11	19.64	35.79	4.39	251	10	19.65	35.79	4.40	25.47	252	0.02
35	19.38	35.80	4.22	244	20	19.51	35.79	4.31	25.52	247	0.05
45	19.35	35.80	4.18	243	30	19.41	35.80	4.27	25.54	245	0.07
54	19.33	35.81	4.05	241	50	19.34	35.81	4.07	25.57	242	0.12
68	18.88	35.75	3.89	235	75	18.25	35.68	3.84	25.75	225	0.18
83	17.40	35.61	3.77	210	100	16.53	35.57	3.02	26.08	194	0.24
106	16.50	35.56	3.01	194	150	15.92	35.51	2.82	26.18	185	0.33
129	16.42	35.55	3.06	193	200	15.78	35.45	2.76	26.16	186	0.43
157	15.86	35.50	2.79	184	250	14.19	35.21	2.02	26.33	170	0.52
204	15.77	35.44	2.75	186	300	13.59	35.07	1.63	26.35	168	0.60
250	14.19	35.21	2.02	170	400	12.94	34.97	1.27	26.40	164	0.78
302	13.57	35.07	1.61	168	500	12.52	34.92	1.24	26.44	160	0.94
394	12.98	34.97	1.28	164	600	12.21	34.90	1.11	26.49	155	1.11
489	12.58	34.99u	1.25	-	700	12.12	34.92	1.01	26.52	152	1.27
584	12.24	34.90	1.12	156	800	(12.03)	(34.94)	(0.87)	(26.56)	(148)	(1.44)
680	12.14	34.92	1.02	152							
777	12.06	34.93	0.92	150							

24 (I16G.31) SPENCER F. BAIRD; April 29, 1959; 0403 GCT; 28°41.5'N, 112°49'W; sounding, 209 fm; wind, 020°, force 4; weather, clear; sea, slight; wire angle, 06°.

0	21.95	35.34	4.86	343	0	21.95	35.34	4.86	24.51	343	0.00
10	19.83	35.34	4.31	289	10	19.83	35.34	4.31	25.08	289	0.03
20	19.01	35.28	3.90	273	20	19.01	35.28	3.90	25.25	273	0.06
30	18.68	35.41	3.74	255	30	18.68	35.41	3.74	25.44	255	0.09
49	17.76	35.21	3.46	248	50	17.75	35.21	3.45	25.52	247	0.14
77	17.04	35.17	3.17	234	75	17.07	35.17	3.18	25.65	235	0.20
101	16.80	35.17	3.09	229	100	16.81	35.17	3.09	25.71	230	0.26
125	16.30	35.17	3.03	218	150	15.32	35.19	2.67	26.07	195	0.36
153	15.18	35.19	2.61	192	200	13.86	35.04	2.11	26.26	177	0.46
177	14.18	35.08	2.30	180	250	12.72	34.93	1.59	26.42	162	0.54
201	13.85	35.04	2.10	176	300	11.88	34.89	1.32	26.56	149	0.62
250	12.72	34.93	1.59	162							
303	11.82	34.89	1.31	149							
352	10.32	34.78	1.04	130							

25 (I27G.30) SPENCER F. BAIRD; April 29, 1959; 1929 GCT; 27°03'N, 111°48.5'W; sounding, 643 fm; wind, calm; weather, cloudy; sea, smooth; wire angle, 02°.

2	23.35	35.32	4.86	383	0	(23.35)	(35.32)	(4.86)	(24.10)	(383)	(0.00)
12	22.65	35.37	5.05	360	10	22.88	35.36	5.03	24.26	367	0.04
21	18.98	35.25	4.14	274	20	19.05	35.25	4.18	25.22	276	0.07
51	17.16	35.21	3.35	234	30	17.92	35.23	3.74	25.49	250	0.10
85	15.86	35.07	2.30	216	50	17.20	35.21	3.38	25.65	235	0.14
118	14.66	35.00	1.50	196	75	16.11	35.10	2.52	25.81	219	0.20
147	14.28	35.01	1.93	187	100	15.34	35.04	1.75	25.95	206	0.26
194	13.42	34.94	1.35	175	150	14.22	35.01	1.93	26.16	186	0.35
240	12.61	34.90	0.81	163	200	13.32	34.93	1.27	26.30	173	0.44
287	11.86	34.80	0.58	156	250	12.43	34.89	0.75	26.43	161	0.53
333	11.09	34.77	0.32	145	300	11.63	34.79	0.51	26.52	153	0.61
425	9.06	34.65	0.18	121	400	9.49	34.67	0.19	26.80	126	0.76
518	8.22	34.64	0.16	109	500	8.39	34.64	0.16	26.96	111	0.88
612	7.03	34.60	0.09	96	600	7.19	34.61	0.10	27.10	97	0.99
707	6.04	34.56	0.09	86	700	6.11	34.56	0.09	27.22	86	1.09
802	5.18	34.61	0.18	72	800	5.20	34.61	0.17	27.38	72	1.17
898	4.58	34.59	0.21	67	1000	4.23	34.60	0.27	27.47	62	1.32
1044	4.12	34.61	0.29	60							

OBSERVED					INTERPOLATED				COMPUTED		
Z	T	S	O <sub>2</sub>	$\delta T_3$	Z	T	S	O <sub>2</sub>	$\sigma_t$	$\delta T_3$	$\Delta D$
m	°C	‰	ml/L	10 <sup>-5</sup> cm/g	m	°C	‰	ml/L	g/L	10 <sup>-5</sup> cm/g	dyn. m

SIO  
VERMILION  
SEA

SPENCER F. BAIRD; April 29, 1959; 2236 GCT; 27°08'N, 111°38'W; sounding, 974 fm; wind, calm; weather, cloudy; sea, calm; wire angle, 02°.

26  
(127G.40)

0	23.30	35.40	5.01	376	0	23.30	35.40	5.01	24.17	376	0.00
10	22.82	35.41	5.08	362	10	22.82	35.41	5.08	24.31	362	0.04
29	22.32	35.39	5.08	349	20	22.82	35.41	5.08	24.31	362	0.07
49	19.80	35.26	4.48	293	30	22.20	35.39	5.07	24.47	347	0.11
73	15.98	35.07	2.70	218	50	19.76	35.26	4.45	25.05	292	0.17
96	14.97	35.17	2.39	189	75	16.88	35.07	2.67	25.85	216	0.24
129	14.52	35.08	2.24	187	100	14.92	35.16	2.35	26.14	189	0.29
166	13.64	34.97	1.83	177	150	14.03	35.02	2.05	26.21	182	0.38
212	12.67	34.86	0.63	166	200	12.90	34.89	0.84	26.34	169	0.47
263	11.50	34.78	0.29	151	250	11.77	34.79	0.32	26.49	155	0.55
318	10.81	34.78	0.22	139	300	11.02	34.78	0.24	26.62	143	0.63
420	9.10	34.65	0.17	121	400	9.44	34.67	0.18	26.81	125	0.77
512	7.86	34.60	0.12	106	500	7.98	34.61	0.13	26.99	108	0.89
606	6.98	34.55	0.11	98	600	7.02	34.55	0.11	27.08	98	1.00
723	5.85	34.56	0.12	83	700	6.08	34.56	0.12	27.22	86	1.10
841	4.87	34.54	0.17	74	800	5.17	34.55	0.15	27.32	76	1.19
1031	4.16	34.59	0.27	62	1000	4.26	34.59	0.24	27.46	64	1.34
1224	3.52	34.58	0.47	57							

SPENCER F. BAIRD; April 30, 1959; 1159, 0958 GCT; 27°16.5'N, 111°21.5'W; sounding, 1021 fm; wind, 090°, force 3; weather, overcast; sea, calm; wire angle, 06°, 02°.

27  
(127G.55)

2	23.22	35.46	4.97	369	0	(23.22)	(35.46)	(4.97)	(24.24)	(369)	(0.00)
11	23.06	35.46	5.00	365	10	23.12	35.46	4.99	24.27	366	0.04
20	20.80	35.37	5.29	311	20	20.80	35.37	5.29	24.85	311	0.07
25	19.14	35.32	4.82	273	30	18.74	35.27	4.36	25.31	267	0.10
30	18.74	35.27	4.36	267	50	17.25	35.25	3.43	25.67	233	0.15
48	17.34	35.26	3.49	235	75	16.32	35.16	2.77	25.82	219	0.21
76	16.31	35.16	2.76	219	100	15.25	35.07	1.80	25.99	203	0.26
99	15.26	35.07	1.81	203	150	13.76	34.98	1.30	26.24	179	0.36
128	14.24	35.00	1.45	187	200	12.50	34.87	0.66	26.42	162	0.44
166	13.38	34.96	1.16	172	250	11.15	34.72	0.19	26.56	149	0.52
213	12.15	34.83	0.49	159	300	10.56	34.72	0.34	26.66	139	0.60
261	10.97	34.71	0.18	147	400	8.87	34.64	0.17	26.88	118	0.74
308	10.48	34.72	0.37	138	500	7.85	34.57	0.11	26.98	109	0.86
368	9.46	34.69	0.20	124	600	7.10	34.58	0.04	27.09	98	0.97
433	8.34	34.60	0.14	114	700	6.28	34.58	0.00	27.21	87	1.07
505	7.76	34.56	0.10	108	800	5.42	34.60	0.05	27.33	75	1.16
576	7.24	34.59	0.09	99	1000	4.52	34.57	0.13	27.41	68	1.32
643	6.68	34.57	0.10	93	1200	3.68	34.59	0.27	27.51	58	1.47
					1500	2.99	34.64	0.62	27.62	48	1.66
500a)	7.90	34.69u	0.00	-							
591	7.23	34.58	0.00	100							
683	6.44	34.58	0.00	89							
775	5.58	34.61	0.00	76							
867	5.16	34.58	0.14	74							
961	4.70	34.58	0.10	69							
1053	4.28	34.56	0.19	66							
1146	3.81	34.60	0.26	58							
1241	3.59	34.58	0.32	58							
1333	3.34	34.63	0.50	52							
1428	3.12	34.65	0.55	48							
1523	2.98	34.64	0.63	48							
1618	2.94	34.66	0.62	46							
1716	2.92	34.67	0.62	45							
1763	2.92	34.63	0.67	48							

a) Overlapping casts; reconciliation of property curves when necessary.

S10

VERMILION  
SEA

OBSERVED					INTERPOLATED				COMPUTED		
Z	T	S	O <sub>2</sub>	$\delta T_3$	Z	T	S	O <sub>2</sub>	$\sigma_t$	$\delta T_3$	$\Delta D$
m	°C	‰	ml/L	$\frac{10^{-5} \text{ } ^\circ\text{C}^3}{\text{cm}^3/\text{g}}$	m	°C	‰	ml/L	g/L	$\frac{10^{-5} \text{ } ^\circ\text{C}^3}{\text{cm}^3/\text{g}}$	dyn. m

29 SPENCER F. BAIRD; May 2, 1959; 0148 GCT; 26°49.5'N, 111°08'W; sounding, 961 fm; wind, 190°, force 4;  
(130G.52) weather, partly cloudy; sea, rough; wire angle, 34°.

0	24.0	35.19	-	411	0	24.0	35.19		23.80	411	0.00
13	23.94	35.19	4.64	409	10	23.97	35.19		23.81	410	0.04
41	18.60	35.32	4.52	260	20	23.30	35.20	4.62	24.02	390	0.08
65	16.99	35.22	3.19	230	30	21.83	35.24	4.61	24.47	347	0.12
102	15.12	35.05	1.55	202	50	17.99	35.29	4.10	25.52	247	0.18
131	14.24	35.01	1.14	186	75	16.00	35.13	2.24	25.87	214	0.24
161	13.57	34.92	0.72	179	100	15.14	35.05	1.56	26.00	202	0.29
200	12.74	34.87	0.59	167	150	13.79	34.95	0.92	26.21	182	0.38
256	11.60	35.02u	0.22	-	200	12.74	34.87	0.59	26.37	167	0.48
352	9.92	34.67	0.11	132	250	11.71	34.81	0.25	26.51	153	0.56
429	8.68	34.64	0.05	115	300	10.79	34.74	0.16	26.63	142	0.64
525	7.59	34.61	0.00	102	400	9.13	34.65	0.07	26.84	122	0.77
681	5.87	34.54	0.04	85	500	7.83	34.62	0.00	27.02	105	0.90
864	4.97a)	34.57	0.12	72	600	6.66	34.57	0.01	27.14	93	1.00
1032	4.30	34.60	0.22	63	700	5.73	34.54	0.04	27.25	83	1.10
1225	3.58	34.61	0.42	56	800	5.23	34.56	0.09	27.32	76	1.19
1401	3.12	34.63	0.61	50	1000	4.42	34.59	0.20	27.44	65	1.35
1606	2.94	34.63	0.70	48	1200	3.65	34.61	0.41	27.54	56	1.49
1702	2.90	34.64	0.74	47	1500	3.01	34.63	0.67	27.61	49	1.68

30 SPENCER F. BAIRD; May 3, 1959; 0148 GCT; 25°50'N, 110°08.5'W; sounding, 1057 fm; wind, calm; weather,  
(138G.70) clear; sea, slight; wire angle, 03°.

0	23.8	35.03	-	416	0	23.8	35.03		23.74	416	0.00
11	23.44	35.01	4.71	408	10	23.48	35.01		23.82	409	0.04
30	20.48	35.22	4.92	314	20	23.15	35.02	4.74	23.93	399	0.08
56	17.81	35.26	3.82	246	30	20.48	35.22	4.92	24.82	314	0.12
80	16.34	35.14	2.51	221	50	18.02	35.26	4.01	25.48	251	0.17
109	15.10	35.05	2.23	201	75	16.80	35.18	2.91	25.72	228	0.24
138	14.08	34.94	1.19	188	100	15.23	35.06	2.27	25.99	203	0.29
167	13.52	34.94	1.26	177	150	13.81	34.94	1.23	26.20	183	0.39
218	12.89	34.88	0.78	169	200	13.11	34.90	0.96	26.31	172	0.48
312	11.50	34.76	0.23	153	250	12.41	34.84	0.52	26.40	164	0.57
404	10.26	34.67	0.12	138	300	11.65	34.77	0.29	26.49	155	0.65
521	8.48	34.60	0.10	115	400	10.32	34.67	0.12	26.66	139	0.80
707	6.08	34.54	-	88	500	8.81	34.61	0.10	26.87	119	0.94
895	4.68	34.53	0.20	72	600	7.29	34.57	(0.12)	27.06	101	1.06
1108	3.95	34.58	0.37	61	700	6.13	34.54	(0.15)	27.19	88	1.16
1296	3.40	34.60	0.63	55	800	5.34	34.53	(0.17)	27.29	79	1.26
1511	2.92	34.61	1.02	50	1000	4.25	34.55	0.27	27.43	66	1.42
1703	2.62	34.61	1.35	47	1200	3.68	34.59	0.47	27.52	58	1.57
1896	2.46	34.62	1.49	45	1500	2.94	34.61	1.01	27.60	50	1.76

a) Mean value of 4.94 and 5.00°C.

OBSERVED					INTERPOLATED				COMPUTED		
Z	T	S	O <sub>2</sub>	$\delta T_{-5}^{-3}$	Z	T	S	O <sub>2</sub>	$\sigma_t$	$\delta T_{-5}^{-3}$	$\Delta D$
m	°C	‰	ml/L	10 cm/g	m	°C	‰	ml/L	g/L	10 cm/g	dyn. m

S10  
VERMILION  
SEA

SPENCER F. BAIRD; May 3, 1959; 2343, 1950 GCT; 24°38'N, 109°08'W; sounding, 1836 fm; wind, 320°, force 2; weather, clear; sea, moderate; wire angle, 25°, 49°.

31  
(147G.85)

2	24.46	35.14	4.77	427	0	(24.46)	(35.14)	(4.77)	(23.63)	(427)	(0.00)
11	24.46	35.12	4.83	429	10	24.46	35.12	4.83	23.62	428	0.04
20	24.34	35.12	4.84	425	20	24.34	35.12	4.84	23.65	425	0.09
33	22.37	35.14	5.04	369	30	23.45	35.14	5.04	24.21	371	0.12
54	20.96	35.23	4.71	326	50	21.01	35.23	4.76	24.68	327	0.20
78	20.45	35.21	4.17	314	75	20.77	35.22	4.52	24.75	321	0.28
90	20.14	35.26	4.12	302	100	19.74	35.23	3.79	25.03	294	0.36
100	19.74	35.23	3.79	294	150	14.52	34.88	0.72	26.01	201	0.48
115	18.11	35.14	2.70	261	200	12.52	34.81	0.20	26.36	167	0.58
139	15.64	34.96	1.26	219	250	11.72	34.79	0.14	26.50	154	0.66
182	12.97	34.81	0.26	176	300	10.97	34.75	0.12	26.61	144	0.74
222	12.13	34.81	0.17	160	400	9.44	34.64	0.10	26.79	127	0.88
269	11.43	34.78	0.12	150	500	8.13	34.59	0.10	26.96	111	1.01
355	10.12	34.69	0.11	134	600	7.03	34.57	0.10	27.09	98	1.12
447	8.78	34.60	0.10	120	700	6.06	34.55	0.09	27.20	87	1.22
541	7.68	34.59	0.10	105	800	5.30	34.54	0.12	27.29	79	1.32
648	6.52	34.55	0.10	92	1000	4.14	34.55	0.26	27.43	66	1.48
805	5.20	34.55	0.17	77	1200	3.66	34.59	0.45	27.52	58	1.62
					1500	2.88	34.59	1.00	27.60	50	1.82
768a)	5.61	34.51	0.09	84	2000	2.20	34.61	1.69	27.67	43	2.10
837	5.14	34.53	0.10	77	2500	1.91	34.69		27.75	36	
982	4.20	34.54	0.25	67							
1125	3.87b)	34.58	0.36	61							
1274	3.46	34.59	0.60	56							
1426	3.10	34.58	0.80	53							
1581	2.66	34.61	1.22	47							
1740	2.54	34.76r	1.33	-							
1908	2.39	34.61	1.52	45							
2078	2.06	34.62	1.84	42							
2254	1.96	34.65	2.02	39							
2432	1.92	34.69	2.12	35							
2613	1.90	34.68	-	36							
2707	1.90	34.69	-	35							

SPENCER F. BAIRD; May 4, 1959; 1156 GCT; 23°53'N, 109°02'W; sounding, 1331 fm; wind, 340°, force 5; weather, clear; sea, rough; wire angle, 43°.

32  
(151G.67)

1	25.30	34.98	4.48	463	0	(25.30)	(34.98)	(4.48)	(23.26)	(463)	(0.00)
9	25.33	35.01	4.54	461	10	25.32	35.01	4.55	23.28	461	0.05
23	24.64	34.99	4.70	443	20	24.69	34.99	4.70	23.45	444	0.09
38	21.48	35.00	4.64	356	30	23.40	34.99	4.70	23.83	408	0.13
56	18.62	34.88	2.42	293	50	19.42	34.91	3.12	24.86	310	0.21
73	17.05	34.88	1.23	256	75	17.04	34.88	1.22	25.42	256	0.28
99	15.74	34.88	0.97	227	100	15.73	34.88	0.98	25.73	227	0.34
123	14.67	34.90	0.77	203	150	13.43	34.82	0.27	26.18	184	0.44
152	13.37	34.81	0.25	183	200	12.20	34.79	0.15	26.41	163	0.53
184	12.53	34.77	0.15	171	250	11.34	34.76	0.15	26.55	150	0.61
219	11.85	34.80	0.16	156	300	10.49	34.68	0.12	26.64	140	0.69
288	10.71	34.70	0.13	143	400	8.76	34.61	0.12	26.87	119	0.82
351	9.46	34.62	0.06	129	500	7.49	34.57	0.14	27.03	104	0.94
418	8.52	34.60	0.13	116	600	6.62	34.51	0.17	27.10	97	1.04
503	7.46	34.57	0.14	104	700	5.99	34.51	0.18	27.19	88	1.14
591	6.68	34.51	0.17	98	800	5.43	34.53	0.21	27.28	80	1.23
743	5.75	34.52	0.19	85	1000	(4.22)	(34.59)		(27.46)	(63)	(1.39)
905	4.82	34.56	0.25	72							

- a) Overlapping casts; reconciliation of property curves when necessary.  
b) Mean value of 3.84 and 3.90°C.

SIO

VERMILION  
SEA

OBSERVED					INTERPOLATED				COMPUTED		
Z	T	S	O <sub>2</sub>	$\delta T_3$	Z	T	S	O <sub>2</sub>	$\sigma_t$	$\delta T_3$	$\Delta D$
m	°C	‰	ml/L	$10^{-5} \text{ cm}^3/\text{g}$	m	°C	‰	ml/L	g/L	$10^{-5} \text{ cm}^3/\text{g}$	dyn. m

34 (15IG.41) SPENCER F. BAIRD; May 4, 1959; 0815 GCT; 23°40'N, 109°24.5'W; sounding, 325 fm; wind, 320°, force 6; weather, clear; sea, very rough; wire angle, 36°.

1	24.72	35.06	4.57	440	0	(24.72)	(35.06)	(4.57)	(23.49)	(440)	(0.00)
21	24.73	35.07	4.59	440	10	24.73	35.07	4.58	23.50	440	0.04
39	20.79	34.93	3.01	343	20	24.73	35.07	4.58	23.50	440	0.09
57	18.83	35.10	2.84	282	30	24.73	35.07	4.59	23.50	440	0.13
73	17.02	34.97	1.76	249	50	19.27	35.07	2.88	25.02	294	0.20
90	15.54	34.90	0.90	221	75	16.70	34.92	1.63	25.54	245	0.27
107	14.98	34.96	0.99	205	100	15.21	34.94	0.96	25.90	211	0.33
141	13.66	34.87	0.45	185	150	13.42	34.86	0.38	26.22	181	0.43
215	12.15	34.78	0.16	163	200	12.41	34.80	0.18	26.36	167	0.52
292	10.74	34.70	0.11	144	250	11.50	34.74	0.12	26.50	154	0.60
372	9.64	34.63	0.09	131	300	10.63	34.69	0.10	26.62	143	0.68
455	8.15	34.63	0.04	108	400	9.17	34.63	0.07	26.82	124	0.82

35 (15IG.52) SPENCER F. BAIRD; May 5, 1959; 1109 GCT; 23°47.5'N, 109°13.5'W; sounding, 1233 fm; wind, 320°, force 6; weather, clear; sea, very rough; wire angle, 33°.

1	24.78	34.99	4.74	447	0	(24.78)	(34.99)	(4.74)	(23.42)	(447)	(0.00)
10	24.80	35.01	4.71	446	10	24.80	35.01	4.71	23.43	446	0.04
26	22.54	34.94	4.88	338	20	24.78	35.01	4.70	23.44	445	0.09
48	19.50	34.92	3.25	311	30	22.25	34.94	4.83	24.12	381	0.13
67	18.04	34.91	2.05	277	50	19.42	34.92	3.18	24.87	309	0.20
91	16.46	34.92	1.59	240	75	17.40	34.91	1.82	25.38	261	0.27
112	15.19	34.88	0.93	215	100	15.81	34.90	1.26	25.73	227	0.33
137	13.95	34.84	0.63	193	150	13.53	34.84	0.53	26.18	184	0.44
179	12.81	34.83	0.38	171	200	12.32	34.80	0.27	26.39	165	0.53
222	11.84	34.76	0.18	158	250	11.36	34.74	0.16	26.53	152	0.61
275	10.98	34.72	0.16	146	300	10.56	34.69	0.15	26.64	141	0.68
362	9.52	34.61	0.11	131	400	9.02	34.59	0.12	26.81	125	0.82
457	8.37a)	34.58	0.16	115	500	7.86	34.57	0.17	26.98	109	0.94
535	7.48	34.56	0.18	105	600	6.88	34.52	0.16	27.08	99	1.06
616	6.74	34.51	0.16	98	700	6.03	34.50	0.14	27.18	90	1.16
777	5.38	34.50	0.17	82	800	5.21	34.50	0.17	27.28	80	1.25
988	4.20	34.58	0.36	64	1000	4.15	34.58	0.38	27.46	63	1.40
1208	3.42	34.58	0.77	56							

a) Mean value of 8.34 and 8.40°C.

OBSERVED					INTERPOLATED				COMPUTED		
Z	T	S	O <sub>2</sub>	$\delta T_3$	Z	T	S	O <sub>2</sub>	$\sigma_t$	$\delta T_3$	$\Delta D$
m	°C	‰	ml/L	$10^{-5}$ cm/g	m	°C	‰	ml/L	g/L	$10^{-5}$ cm/g	dyn. m

SIO  
VERMILION  
SEA

SPENCER F. BAIRD; May 5, 1959; 1807, 2105 GCT; 24°04'N, 108°52.5'W; sounding, 1630 fm; wind, 350°, force 6; weather, clear; sea, very rough; wire angle, 27°, 41°.

2	24.52	34.99	4.70	440	0	(24.52)	(34.99)	(4.70)	(23.50)	(440)	(0.00)
11	24.53	35.05	4.71	436	10	24.53	35.05	4.71	23.54	436	0.04
19	24.52	35.06	4.70	434	20	24.52	35.06	4.70	23.56	434	0.09
33	21.34	34.83	3.88	364	30	21.85	34.86	4.02	24.17	376	0.13
54	18.98	34.94	2.71	297	50	19.69	34.91	3.10	24.80	316	0.20
79	16.30	34.83	1.07	243	75	16.58	34.84	1.24	25.51	248	0.27
102	14.91	34.88	0.64	209	100	14.97	34.88	0.64	25.91	210	0.33
124	14.06	34.83	0.45	196	150	13.27	34.81	0.22	26.21	182	0.43
146	13.36	34.81	0.21	183	200	12.46	34.78	0.08	26.34	169	0.52
173	12.91	34.81	0.32	175	250	11.82	34.75	0.10	26.45	159	0.60
201	12.44	34.78	0.08	169	300	10.95	34.71	0.11	26.58	146	0.68
239	11.98	34.76	0.10	161	400	9.12	34.60	0.11	26.81	125	0.82
297	11.02	34.72	0.11	148	500	7.76	34.55	0.14	26.98	109	0.95
377	9.48	34.61	0.10	130	600	6.66	34.54	0.11	27.11	95	1.06
460	8.23	34.56	0.14	115	700	5.87	34.55	0.10	27.24	84	1.16
564	7.00	34.54	0.11	100	800	5.22	34.55	0.17	27.32	77	1.25
693	5.90	34.56	0.10	84	1000	4.32	34.56	0.30	27.43	66	1.41
827	5.06	34.54	0.20	76	1200	3.68	34.61	0.62	27.53	57	1.55
					1500	2.88	34.64	1.14	27.63	47	1.74
453a)	8.48	34.61	0.36u	115	2000	2.17	34.63	1.88	27.68	42	2.01
602	6.60	34.52	0.11	96	2500	1.90	34.64	2.27	27.72	39	
752	5.58	34.54	0.16	81							
901	4.74	34.58	0.25	69							
1053	4.12	34.57	0.36	64							
1205	3.66	34.61	0.62	57							
1358	3.22	34.61	0.88	52							
1514	2.87	34.64	1.14	47							
1672	2.57	34.63	1.41	45							
1834	2.38	34.64	1.66	43							
1997	2.18	34.63	1.87	42							
2165	2.04	34.67	2.03	38							
2335	1.94	34.66	2.21	38							
2512	1.90	34.64	2.27	39							
2602	1.90	34.63	2.24	40							

36  
(151G.81)

SPENCER F. BAIRD; May 6, 1959; 0642 GCT; 24°10'N, 108°30'W; sounding, 781 fm; wind, 320°, force 4; weather, clear; sea, rough; wire angle, 22°.

2	23.89	35.06	4.61	417	0	(23.89)	(35.06)	(4.61)	(23.74)	(417)	(0.00)
12	23.92	35.07	4.57	416	10	23.92	35.07	4.57	23.75	416	0.04
30	22.48	34.95	4.47	386	20	23.93	35.07	4.57	23.75	416	0.08
54	19.38	35.05	2.97	298	30	22.48	34.95	4.47	24.06	386	0.12
76	17.50	34.98	1.90	259	50	19.68	35.05	3.14	24.90	306	0.19
102	15.62	34.81	0.85	230	75	17.52	34.98	1.93	25.39	259	0.26
127	13.85	34.77	0.13	196	100	15.64	34.81	0.86	25.70	230	0.33
153	13.26	34.78	0.09	184	150	13.32	34.78	0.09	26.18	185	0.43
196	12.52	34.76	0.12	171	200	12.44	34.76	0.12	26.33	170	0.52
242	11.66	34.74	0.04	157	250	11.52	34.74	0.02	26.49	155	0.60
297	10.85	34.70	0.00	146	300	10.79	34.70	0.00	26.60	145	0.68
387	9.44	34.61	0.06	130	400	9.24	34.60	0.06	26.78	127	0.82
486	8.10	34.54	0.05	114	500	7.92	34.53	0.05	26.94	112	0.95
588	6.94	34.51	0.05	101	600	6.81	34.51	0.05	27.08	99	1.06
692	5.92	34.51	0.08	88	700	5.84	34.51	0.09	27.20	87	1.16
801	5.19	34.49	0.16	81	800	5.20	34.49	0.16	27.27	81	1.25
913	4.64	34.52	0.21	73	1000	4.29	34.54	0.31	27.41	68	1.41
1143	3.78	34.55	0.47	62							

37  
(151G.100)

a) Overlapping casts; reconciliation of property curves when necessary.

SIO

VERMILION  
SEA

OBSERVED					INTERPOLATED				COMPUTED		
Z	T	S	O <sub>2</sub>	$\delta T_{3-5}$	Z	T	S	O <sub>2</sub>	$\sigma_t$	$\delta T_{3-5}$	$\Delta D$
m	°C	‰	ml/L	10 cm/g	m	°C	‰	ml/L	g/L	10 cm/g	dyn. m

38 (15IG.115) SPENCER F. BAIRD; May 6, 1959; 0916 GCT; 24°17.5'N, 108°16'W; sounding, 660 fm; wind, 320°, force 4; weather, clear; sea, rough; wire angle, 23°.

3	23.83	35.05	4.77	416	0	(23.83)	(35.05)	(4.77)	(23.75)	(416)	(0.00)
12	23.83	35.05	4.76	416	10	23.83	35.05	4.76	23.75	416	0.04
30	23.78	35.03	4.77	416	20	23.82	35.04	4.77	23.75	416	0.08
52	19.07	35.01	2.97	294	30	23.78	35.03	4.77	23.75	416	0.12
72	17.64	34.99	2.08	262	50	19.23	35.01	3.05	24.99	298	0.20
95	15.80	34.87	1.14	229	75	17.30	34.97	1.86	25.44	254	0.26
116	14.40	34.81	0.49	204	100	15.30	34.85	0.92	25.81	220	0.33
139	13.60	34.74	0.15	193	150	13.32	34.75	0.08	26.16	187	0.43
162	12.98	34.77	0.05	179	200	12.39	34.76	0.07	26.35	168	0.52
190	12.52	34.76	0.07	171	250	11.62	34.78	0.04	26.51	153	0.60
238	11.79	34.79	0.05	156	300	10.94	34.73	0.01	26.60	145	0.68
287	11.12	34.74	0.00	148	400	9.41	34.65	0.11	26.80	126	0.82
377	9.78	34.67	0.11	130	500	7.74	34.59	0.11	27.01	106	0.94
478	8.07	34.60	0.11	110	600	6.60	34.55	0.11	27.14	93	1.04
581	6.80	34.56	0.11	95	700	5.62	34.51	0.14	27.23	84	1.14
686	5.72	34.51	0.13	86	800	5.03	34.53	0.20	27.32	76	1.23
848	4.85	34.54	0.23	74	1000	4.29	34.54	0.29	27.41	68	1.38
1036	4.16	34.54	0.31	66							

42 (15IG.115) SPENCER F. BAIRD; May 11, 1959; 1045 GCT; 24°21'N, 108°18'W; sounding, 477 fm; wind, calm; weather, clear; sea, smooth; wire angle, 00°.

1	24.94	35.12	4.10	442	0	(24.94)	(35.12)	(4.10)	(23.47)	(442)	(0.00)
11	24.54	35.12	3.91	431	10	24.60	35.12	3.93	23.57	433	0.04
20	24.29	35.07	3.92	427	20	24.29	35.07	3.92	23.63	427	0.09
35	21.56	35.02	4.05	356	30	23.02	35.03	3.99	23.98	394	0.13
50	18.96	35.05	2.42	288	50	18.96	35.05	2.42	25.09	288	0.20
73	17.19	34.95	1.24	254	75	17.12	34.95	1.20	25.47	252	0.26
96	15.32	34.90	0.51	216	100	15.08	34.90	0.44	25.89	212	0.32
123	13.94	34.89	0.17	189	150	13.31	34.86	0.00	26.24	178	0.42
151	13.28	34.86	0.00	178	200	12.20	34.79	0.00	26.41	163	0.51
197	12.25	34.79	0.00	164	250	11.59	34.74	0.00	26.48	156	0.59
248	11.61	34.74	0.00	156	300	10.69	34.70	0.00	26.62	143	0.67
298	10.73	34.70	0.00	144	400	9.22	34.63	0.00	26.81	125	0.80
350	9.94	34.90r	0.00	-	500	7.90	34.55	0.00	26.96	111	0.93
397	9.26	34.63	0.00	125	600	6.73	34.53	0.00	27.11	96	1.04
497	7.94	34.55	0.00	111	700	5.73	34.55	0.00	27.25	83	1.13
601	6.72	34.53	0.00	96	800	5.09	34.55	0.14	27.32	76	1.22
707	5.67	34.55	0.00	82							
804	5.08	34.55	0.14	76							

43 (15IG.129) SPENCER F. BAIRD; May 12, 1959; 1247 GCT; 24°25'N, 108°03.5'W; sounding, 26 fm; wind, 220°, force 1; weather, partly cloudy; sea, smooth; wire angle, 00°.

2	24.88	35.08	4.53	443	0	(24.88)	(35.08)	(4.53)	(23.46)	(443)	(0.00)
12	24.84	35.10	4.50	441	10	24.85	35.10	4.51	23.49	441	0.04
21	21.78	34.98	4.25	365	20	22.00	34.98	4.29	24.23	370	0.08
31	19.90	34.99	3.14	316	30	19.91	34.99	3.15	24.80	316	0.12
41	18.40	34.88	1.83	287							

OBSERVED					INTERPOLATED				COMPUTED		
Z	T	S	O <sub>2</sub>	$\delta T_3$	Z	T	S	O <sub>2</sub>	$\sigma_t$	$\delta T_3$	$\Delta D$
m	°C	‰	ml/L	10 <sup>-5</sup> cm/g	m	°C	‰	ml/L	g/L	10 <sup>-5</sup> cm/g	dyn. m

SIO  
VERMILION  
SEA

SPENCER F. BAIRD; May 14-15, 1959; 0222, 2347 GCT; 22°58'N, 108°00'W; sounding, 1567 fm; wind, calm; weather, clear; sea, smooth; wire angle, 07°, 07°.

46  
(159G.30)

2	24.60	34.70	4.81	463	0	(24.60)	(34.70)	(4.81)	(23.26)	(463)	(0.00)
12	23.11	34.67	4.97	423	10	23.30	34.67	4.94	23.62	428	0.04
30	21.50	34.63	5.01	383	20	22.48	34.66	5.00	23.84	407	0.09
49	18.42	34.34	4.34	327	30	21.50	34.63	5.01	24.10	383	0.13
68	16.76	34.52	1.46	276	50	18.37	34.34	4.31	24.70	325	0.20
86	15.25	34.58	0.73	238	75	16.10	34.55	1.06	25.40	258	0.27
105	14.56	34.70	0.47	216	100	14.69	34.69	0.51	25.82	219	0.33
128	13.52	34.70	0.23	194	150	12.98	34.74	0.32	26.22	181	0.43
154	12.86	34.74	0.32	179	200	11.81	34.72	0.19	26.43	161	0.52
182	12.17	34.72	0.28	168	250	11.10	34.71	0.12	26.55	150	0.60
215	11.59	34.72	0.14	157	300	10.35	34.66	0.10	26.65	140	0.68
269	10.82	34.69	0.11	146	400	8.64	34.55	0.12	26.84	122	0.81
342	9.66	34.61	0.09	133	500	7.62	34.57	0.10	27.02	105	0.94
417	8.40	34.54	0.12	119	600	6.52	34.50	0.08	27.12	96	1.04
511	7.51	34.57	0.10	104	700	5.77	34.50	0.06	27.20	88	1.14
606	6.39	34.50	0.11	94	800	5.19	34.50	0.05	27.27	81	1.24
701	5.78	34.50	0.11	87	1000	4.32	34.52	0.06	27.39	70	1.41
798	5.20	34.52	0.14	79	1200	3.68	34.55	0.30	27.48	61	1.56
					1500	3.00	34.58	0.86	27.58	52	1.76
611a)	6.52	34.49	0.00	96	2000	2.19	34.61	1.78	27.67	43	2.05
745	5.48	34.49	0.00	84	2500	1.84	34.64	2.27	27.72	39	
883	4.78	34.49	0.00	76							
1020	4.26	34.52	0.09	69							
1156	3.80	34.54	0.25	63							
1294	3.46	34.57	0.46	57							
1434	3.13	34.57	0.73	54							
1573	2.84	34.60	1.00	50							
1713	2.58	34.59	1.29	48							
1855	2.38	34.61	1.56	45							
1995	2.20	34.61	1.78	43							
2138	2.08	34.63	1.95	41							
2281	1.96	34.63	2.12	40							
2424	1.88	34.63	2.23	40							
2570	1.83	34.64	2.29	39							
2715	1.84	34.62	2.32	40							
2765	1.84	34.63	2.34	39							

a) Overlapping casts; reconciliation of property curves when necessary.

S10

VERMILION  
SEA

OBSERVED					INTERPOLATED				COMPUTED		
Z	T	S	O <sub>2</sub>	$\delta T_{-5}^3$	Z	T	S	O <sub>2</sub>	$\sigma_t$	$\delta T_{-5}^3$	$\Delta D$
m	°C	‰	ml/L	10 cm/g	m	°C	‰	ml/L	g/L	10 cm/g	dyn. m

47 SPENCER F. BAIRD; May 15-16, 1959; 0032, 2205 GCT; 21°57.5'N, 107°35'W; sounding, 1661 fm; wind,  
(162G.25) 300°, force 2; weather, clear; sea, moderate; wire angle, 25°, 31°.

2	26.36	34.81	4.69	506	0	(26.36)	(34.81)	(4.69)	(22.80)	(506)	(0.00)
10	26.18	34.81	4.72	501	10	26.18	34.81	4.72	22.86	501	0.05
28	25.28	34.79	4.84	476	20	25.72	34.80	4.82	22.99	488	0.10
44	22.00	34.70	4.07	391	30	25.05	34.78	4.84	23.18	470	0.15
52	19.68	34.58	0.84	340	50	20.05	34.59	1.28	24.45	349	0.23
59	18.92	34.66	1.46	316	75	16.22	34.69	0.28	25.48	251	0.31
69	17.02	34.67	0.34	271	100	14.38	34.81	0.07	25.98	204	0.36
80	15.68	34.72	0.23	238	150	12.79	34.78	0.10	26.29	174	0.46
107	14.10	34.81	0.06	198	200	12.02	34.79	0.10	26.44	160	0.54
129	13.34	34.76	0.15	187	250	11.51	34.77	0.10	26.52	152	0.63
160	12.58	34.79	0.09	170	300	10.94	34.73	0.09	26.60	145	0.70
215	11.87	34.78	0.11	157	400	9.30	34.66	0.10	26.83	123	0.84
300	10.94	34.73	0.09	145	500	7.95	34.58	0.09	26.98	109	0.97
406	9.21	34.66	0.10	122	600	6.80	34.55	0.09	27.11	96	1.08
538	7.48	34.56	0.09	105	700	5.95	34.55	0.10	27.23	85	1.18
716	5.83	34.55	0.11	84	800	5.39	34.54	0.11	27.29	79	1.27
947	4.64	34.53	0.21	72	1000	4.46	34.52	0.11	27.38	71	1.44
					1200	3.76	34.57	0.46	27.49	60	1.59
838a)	5.22	34.51	0.12	80	1500	2.97	34.61	0.97	27.60	50	1.79
1003	4.44	34.52	0.11	71	2000	2.14	34.64	1.87	27.70	41	2.07
1168	3.84	34.56	0.40	62	2500	1.84	34.63	2.29	27.71	39	
1336	3.34	34.59	0.76	55	3000	1.86	34.65		27.72	38	
1507	2.96	34.61	0.99	50							
1682	2.60	34.62	1.31	45							
1859	2.34	34.63	1.62	43							
2034	2.10	34.64	1.92	40							
2212	1.94	34.65	2.10	39							
2393	1.86	34.64	2.27	39							
2575	1.83	34.63	2.31	40							
2759	1.82	34.65	2.30	38							
2944	1.85	34.63	2.35	40							
3036	1.86	34.65b)	-	38							

a) Overlapping casts; reconciliation of property curves when necessary.

b) Some silt in Nansen bottle.

OBSERVED					INTERPOLATED				COMPUTED		
Z	T	S	O <sub>2</sub>	$\delta T_{-5}^3$	Z	T	S	O <sub>2</sub>	$\sigma_t$	$\delta T_{-5}^3$	$\Delta D$
m	°C	‰	ml/L	10 cm/g	m	°C	‰	ml/L	g/L	10 cm/g	dyn. m

SIO  
VERMILION  
SEA

SPENCER F. BAIRD; May 17, 1959; 0727, 0357 GCT; 20°49'N, 106°22'W; sounding, 2429 fm; wind, 320°, force 2; weather, clear; sea, smooth; wire angle, 15°, 28°.

50  
(170G.32)

2	28.14	34.65	4.67	573	0	(28.14)	(34.65)	(4.67)	(22.10)	(573)	(0.00)
11	27.38	34.70	4.63	546	10	27.42	34.70	4.64	22.38	547	0.06
30	21.46	34.69	3.03	378	20	23.05	34.69	3.57	23.70	420	0.10
53	18.42	34.64	0.42	305	30	21.46	34.69	3.03	24.14	378	0.14
81	15.60	34.76	0.10	233	50	18.90	34.64	0.79	24.80	316	0.21
103	14.50	34.78	0.04	208	75	16.00	34.74	0.13	25.57	242	0.28
129	13.37	34.78	0.10	186	100	14.57	34.78	0.04	25.91	210	0.34
155	12.87	34.79	0.05	176	150	12.97	34.79	0.06	26.26	177	0.44
203	12.16	34.78	0.08	163	200	12.19	34.78	0.07	26.40	163	0.52
251	11.48	34.72	0.13	155	250	11.48	34.72	0.13	26.49	155	0.61
300	10.90	34.72	0.00	145	300	10.90	34.72	0.00	26.60	145	0.69
392	9.38	34.61	0.09	128	400	9.23	34.60	0.10	26.79	127	0.83
489	7.96	34.56	0.10	111	500	7.83	34.56	0.10	26.97	110	0.96
587	6.92	34.53	0.12	99	600	6.81	34.53	0.12	27.09	98	1.07
686	6.12	34.52	0.10	90	700	6.03	34.52	0.10	27.19	88	1.17
786	5.46	34.52	0.13	82	800	5.36	34.52	0.14	27.28	81	1.26
987	4.42	34.54	0.26	69	1000	4.37	34.54	0.27	27.40	68	1.43
1223	3.64	34.57	0.58	59	1200	3.75	34.58	0.47	27.50	59	1.58
					1500	3.07	34.62	0.93	27.60	50	1.78
1237a)	3.72	34.60	0.45	58	2000	2.17	34.64	1.90	27.70	41	2.06
1399	3.25	34.60	0.77	53	2500	1.84	34.65	2.36			
1564	2.94	34.63	1.04	48	3000	1.84	34.68	2.42			
1730	2.59	34.62	1.41	46	4000	1.94	34.65	2.45			
1898	2.33	34.64	1.72	43							
2068	2.08	34.64	2.00	40							
2239	1.98	34.67	2.16	38							
2413	1.88	34.65	2.31	38							
2589	1.83	34.65	2.37	38							
2765	1.84	34.67	2.38	37							
2943	1.83	34.68	2.42	36							
3120	1.85	34.67	2.40	37							
3300	1.88	34.67	2.45	37							
3483	1.89	34.65	2.39	38							
3666	1.91	34.67	2.47	37							
3851	1.94	34.67	2.45	37							
4036	1.94	34.65	2.45	39							
4221	1.98	34.65	2.43	39							

SPENCER F. BAIRD; May 18, 1959; 0235 GCT; 21°04'N, 106°04'W; sounding, 122 fm; wind, 320°, force 4; weather, partly cloudy; sea, moderate; wire angle, 08°.

51  
(170G.38)

2b)	28.41	34.76	4.43	574	0	(28.41)	(34.76)	(4.43)	(22.10)	(574)	(0.00)
12	28.20	34.75	4.43	568	10	28.32	34.76	4.43	22.13	570	0.06
21	23.41	34.62	3.96	435	20	23.80	34.63	4.04	23.44	445	0.11
31	20.31	34.58	1.09	356	30	20.38	34.58	1.16	24.36	357	0.15
50	17.06	34.67	0.14	272	50	17.06	34.67	0.14	25.26	272	0.21
74	15.36	34.72	0.00	230	75	15.35	34.72	0.00	25.70	230	0.27
97	14.73	34.78	0.00	213	100	14.53	34.80	0.00	25.94	207	0.33
119	14.16	34.83	0.00	198	150	13.57	34.81	0.00	26.15	187	0.43
156	13.43	34.81	0.00	185	200	(12.51)	(34.81)	(0.17)	(26.36)	(167)	(0.52)
192	12.69	34.81	0.13	170							

a) Overlapping casts; reconciliation of property curves when necessary.

b) Possible pretrip; depths may be slightly in error.

S10

VERMILION  
SEA

OBSERVED					INTERPOLATED				COMPUTED		
Z	T	S	O <sub>2</sub>	$\delta T_{-5}^3$	Z	T	S	O <sub>2</sub>	$\sigma_t$	$\delta T_{-5}^3$	$\Delta D$
m	°C	‰	ml/L	10 cm/g	m	°C	‰	ml/L	g/L	10 cm/g	dyn. m

52 SPENCER F. BAIRD; May 18, 1959; 0458 GCT; 21°14'N, 105°46'W; sounding, 246 fm; wind, 020°, force 1;  
(17OG.43) weather, clear; sea, slight; wire angle, 05°.

1	27.20	34.92	4.55	524	0	(27.20)	(34.92)	(4.55)	(22.61)	(524)	(0.00)
11	27.18	34.90	4.56	525	10	27.19	34.90	4.56	22.60	525	0.05
20	25.76	34.81	4.84	489	20	25.76	34.81	4.84	22.98	489	0.10
29	24.66	34.78	4.88	459	30	24.60	34.78	4.86	23.31	457	0.15
48	19.74	34.65	1.32	336	50	19.40	34.65	1.18	24.67	328	0.23
71	16.67	34.67	0.33	263	75	16.48	34.68	0.28	25.42	257	0.30
93	15.66	34.73	0.10	236	100	15.29	34.75	0.11	25.74	226	0.36
117	14.45	34.79	0.14	207	150	13.23	34.81	0.08	26.22	181	0.47
154	13.13	34.81	0.08	179	200	12.38	34.81	0.10	26.39	165	0.55
191	12.49	34.81	0.11	167	250	11.77	34.79	0.02	26.49	155	0.64
238	11.92	34.80	0.00	157	300	10.99	34.74	0.14	26.60	145	0.71
285	11.22	34.76	0.14	148	400	9.23	34.63	0.09	26.81	125	0.85
346	10.23	34.69	0.12	136							
413	8.96	34.61	0.06	122							

53 SPENCER F. BAIRD; May 18, 1959; 0724 GCT; 21°24'N, 105°28'W; sounding, 27 fm; wind, calm; weather,  
(17OG.48) clear; sea, smooth; wire angle, 00°.

1	27.43	34.86	4.84	536	0	(27.43)	(34.86)	(4.84)	(22.49)	(536)	(0.00)
10	26.80	34.90	5.16	513	10	26.80	34.90	5.16	22.73	513	0.05
20	23.52	34.79	4.47	426	20	23.52	34.79	4.47	23.64	426	0.10
30	20.62	34.67	1.29	357	30	20.62	34.67	1.29	24.37	357	0.14
44	18.96	34.63	0.22	319							

54 SPENCER F. BAIRD; May 18, 1959; 2113 GCT; 22°06'N, 106°29'W; sounding, 399 fm; wind, 030°, force 1;  
(16OG.35) weather, clear; sea, moderate; wire angle, 02°.

2	27.16	35.03	3.96	515	0	(27.16)	(35.03)	(3.96)	(22.71)	(515)	(0.00)
12	26.33	34.98	4.72	494	10	26.40	34.98	4.71	22.92	495	0.05
21	25.70	34.96	4.72	476	20	25.73	34.96	4.72	23.11	477	0.10
35	22.56	34.85	5.01	395	30	23.75	34.90	4.95	23.66	424	0.14
49	20.86	34.70	4.36	361	50	20.84	34.70	4.35	24.32	361	0.22
63	19.58	34.88	2.34	316	75	17.16	34.76	0.87	25.31	267	0.30
76	17.14	34.76	0.86	266	100	15.07	34.78	0.41	25.81	220	0.36
95	15.26	34.74	0.21a)	227	150	13.26	34.78	0.26	26.19	184	0.47
113	14.86	34.85	0.76a)	211	200	12.34	34.79	0.09	26.38	166	0.56
136	13.70	34.79	-	191	250	11.49	34.74	0.09	26.50	154	0.64
163	12.96	34.78	0.11	178	300	10.83	34.70	0.10	26.60	145	0.72
192	12.49	34.79	0.09	168	400	9.29	34.61	0.07	26.79	127	0.86
251	11.48b)	34.74	0.09	154	500	7.66	34.56	0.05	27.00	107	0.98
335	10.34	34.67	0.11	139	600	6.50	34.54	0.06	27.14	93	1.08
419	8.98	34.60	0.05	123	700	5.81	34.51	0.09	27.21	87	1.18
514	7.44	34.56	0.05	104							
610	6.40	34.54	0.06	92							
707	5.78	34.51	0.10	86							

a) Sample bottles may have been reversed at these levels.

b) Mean value of 11.45 and 11.51°C.

OBSERVED					INTERPOLATED				COMPUTED			SIO VERMILION SEA
Z m	T °C	S ‰	O <sub>2</sub> ml/L	$\delta T_3$ -5 10 cm/g	Z m	T °C	S ‰	O <sub>2</sub> ml/L	$\sigma_t$ g/L	$\delta T_3$ -5 10 cm/g	$\Delta D$ dyn. m	

SPENCER F. BAIRD; May 20, 1959; 1208, 1258 GCT; 20°31.5'N, 105°32.5'W; sounding, 730 fm; wind, 090°, force 1; weather, cloudy; sea, smooth; wire angle, 02°, 02°.

56  
(174G.40)

2	26.94	34.58	4.60	541	0	(26.94)	(34.58)	(4.60)	(22.44)	(541)	(0.00)
12	24.52	34.57	4.44	470	10	25.25	34.57	4.55	22.96	491	0.05
21	20.88	34.58	1.03	370	20	20.90	34.58	1.05	24.22	371	0.09
31	20.54	34.59	0.89	361	30	20.56	34.59	0.90	24.32	361	0.13
50	19.06	34.62	0.22	322	50	19.06	34.62	0.22	24.74	322	0.20
75	16.52	34.70	0.00	257	75	16.52	34.70	0.00	25.42	257	0.27
102	14.99	34.78	0.00	218	100	15.06	34.78	0.00	25.80	220	0.33
124	14.16	34.76	0.00	203	150	13.72	34.79	0.00	26.10	192	0.44
148	13.75	34.79	0.00	193	200	12.89	34.80	0.00	26.28	175	0.53
198	12.92	34.80	0.00	176	250	12.15	34.75	0.00	26.39	165	0.62
249	12.16	34.75	0.00	165	300	11.41	34.70	0.00	26.48	156	0.70
295	11.50	34.70	0.00	157	400	9.56	34.60	0.00	26.74	132	0.85
392	9.69	34.61	0.00	133	500	8.11	34.57	0.00	26.94	112	0.98
					600	6.71	34.52	0.08	27.10	97	1.09
520	7.84	34.56	0.00	109	700	5.99	34.54	0.09	27.21	86	1.19
611	6.60	34.52	0.09	96	800	5.20	34.51	0.14	27.28	80	1.28
703	5.97	34.54	0.09	86	1000	4.48	34.56	0.26	27.41	68	1.44
798	5.22	34.51	0.14	80							
892	4.88	34.56	0.16	73							
987	4.54	34.56	0.25	69							
1130	4.04	34.58	0.42	62							

SPENCER F. BAIRD; May 20, 1959; 1406 GCT; 20°39'N, 105°29'W; sounding, 57 fm; wind, 100°, force 2; weather, overcast; sea, smooth; wire angle, 06°.

57  
(174G.42)

2	26.44	34.50	4.77	532	0	(26.44)	(34.50)	(4.77)	(22.54)	(532)	(0.00)
12	25.04	34.55	4.48	487	10	25.45	34.54	4.58	22.88	499	0.05
21	21.80	34.56	2.35	396	20	21.90	34.56	2.41	23.93	398	0.10
31	20.99	34.60	1.68	372	30	21.03	34.60	1.70	24.20	373	0.13
50	19.36	34.59	0.53	332	50	19.36	34.59	0.53	24.63	332	0.20
73	17.32	34.63	0.19	280	75	17.25	34.63	0.18	25.20	278	0.28
96	16.02	34.72	0.09	245	100	(15.88)	(34.73)	(0.08)	(25.58)	(241)	(0.35)

SPENCER F. BAIRD; May 20, 1959; 1535 GCT; 20°36'N, 105°18.5'W; sounding, 193 fm; wind, 020°, force 2; weather, overcast; sea, smooth; wire angle, 00°.

58  
(174G.44)

1	26.55	34.38	4.78	543	0	(26.55)	(34.38)	(4.78)	(22.42)	(543)	(0.00)
11	23.65	34.58	3.52	445	10	23.80	34.57	3.63	23.40	449	0.05
31	21.70	34.60	2.19	390	20	23.40	34.59	3.36	23.53	437	0.09
50	19.20	34.61	0.62	326	30	21.76	34.60	2.23	24.00	392	0.14
74	17.54	34.68	0.24	282	50	19.20	34.61	0.62	24.69	326	0.21
102	15.46	34.75	0.09	231	75	17.52	34.68	0.23	25.17	281	0.28
125	14.52	34.81	0.08	206	100	15.58	34.75	0.09	25.67	233	0.35
152	13.87	34.80	0.05	194	150	13.92	34.80	0.05	26.07	195	0.46
209	12.54	34.79	0.12	170	200	12.75	34.79	0.12	26.30	173	0.55
276	11.38	34.74	0.12	152	250	11.80	34.76	0.12	26.46	158	0.63

SIO VERMILION SEA	OBSERVED					INTERPOLATED				COMPUTED		
	Z m	T °C	S ‰	O <sub>2</sub> ml/L	$\delta T_3$ $10^{-5}$ cm/g	Z m	T °C	S ‰	O <sub>2</sub> ml/L	$\sigma_t$ g/L	$\delta T_3$ $10^{-5}$ cm/g	$\Delta D$ dyn. m

59 (170G.28) SPENCER F. BAIRD; May 22, 1959; 0420 GCT; 20°44'N, 106°41.5'W; sounding, 2080 fm; wind, 310°, force 3; weather, partly cloudy; sea, moderate; wire angle, 16°.

3	27.31	34.96	4.40	524	0	(27.31)	(34.96)	(4.40)	(22.61)	(524)	(0.00)
12	27.33	34.94	4.32	527	10	27.32	34.94	4.33	22.59	526	0.05
31	23.01	34.72	4.80	417	20	25.90	34.86	4.48	22.98	489	0.10
55	18.53	34.83	1.84	294	30	23.09	34.72	4.80	23.72	419	0.15
78	15.62	34.72	0.92	236	50	18.60	34.83	1.88	25.02	295	0.22
105	14.26	34.78	0.57	204	75	15.90	34.73	1.00	25.58	242	0.29
127	13.25	34.78	0.12	184	100	14.39	34.78	0.61	25.95	205	0.34
165	12.56	34.84	0.11	166	150	12.80	34.82	0.11	26.32	172	0.44
212	11.90	34.76	0.06	160	200	12.08	34.78	0.07	26.42	162	0.52
259	11.26	34.74	0.07	150	250	11.39	34.74	0.07	26.52	152	0.60
318	10.43	34.69	0.04	140	300	10.70	34.71	0.05	26.62	143	0.68
413	9.06	34.62	0.12	123	400	9.24	34.63	0.11	26.80	125	0.82
512	7.82a)	34.60	0.11	106	500	7.95	34.60	0.11	26.99	107	0.94
611	6.90	34.52	0.10	99	600	7.00	34.53	0.10	27.07	100	1.05
721	5.92	34.51	0.12	88	700	6.09	34.51	0.11	27.18	90	1.15
878	4.91	34.54	0.18	74	800	5.39	34.53	0.14	27.28	80	1.25
1081	4.12	34.54	0.37	66	1000	4.39	34.54	0.28	27.40	68	1.41
1288	3.42	34.58	0.79	56							

60 (170G.24) SPENCER F. BAIRD; May 22, 1959; 0726 GCT; 20°32'N, 106°59'W; sounding, 1753 fm; wind, 280°, force 4; weather, clear; sea, rough; wire angle, 34°.

2	26.77	34.81	4.34	519	0	(26.77)	(34.81)	(4.34)	(22.67)	(519)	(0.00)
10	26.79	34.81	4.35	520	10	26.79	34.81	4.35	22.66	520	0.05
26	23.22	34.68	3.70	426	20	24.70	34.73	4.01	23.25	464	0.10
47	20.40	34.60	1.90	357	30	22.77	34.67	3.48	23.77	414	0.14
66	16.76	34.49	1.74	278	50	19.82	34.58	1.87	24.51	344	0.22
87	14.85	34.67	0.87	224	75	15.50	34.59	1.29	25.57	242	0.29
105	13.88	34.81	0.10	194	100	14.12	34.78	0.26	26.01	201	0.35
135	13.06	34.81	0.06	178	150	12.78	34.82	0.06	26.32	171	0.44
175	12.44	34.83	0.05	165	200	12.19	34.82	0.10	26.44	160	0.53
214	12.02	34.81	0.11	158	250	11.56	34.78	0.09	26.52	152	0.61
265	11.36	34.77	0.08	149	300	10.88	34.74	0.08	26.61	144	0.68
346	10.21	34.69	0.08	136	400	9.32	34.64	0.10	26.80	125	0.82
433	8.78	34.61	0.12	120	500	7.79	34.55	0.14	26.98	109	0.95
520	7.53	34.54	0.14	107	600	6.72	34.52	0.10	27.10	97	1.06
618	6.58	34.52	0.09	95	700	5.94	34.52	0.10	27.20	87	1.16
760	5.56	34.53	0.13	82	800	5.32	34.53	0.16	27.29	79	1.25
950	4.56	34.55	0.23	70	1000	4.33	34.56	0.28	27.42	67	1.41
1150	3.84	34.60	0.51	59							

61 (170G.20) SPENCER F. BAIRD; May 22, 1959; 1040 GCT; 20°20'N, 107°16'W; sounding, 2251 fm; wind, 310°, force 4; weather, partly cloudy; sea, moderate; wire angle, 26°.

3	26.34	34.83	4.58	504	0	(26.34)	(34.83)	(4.58)	(22.82)	(504)	(0.00)
12	26.36	34.83	4.57	505	10	26.35	34.83	4.57	22.82	504	0.05
30	23.76	34.72	4.41	438	20	25.00	34.77	4.49	23.18	470	0.10
52	20.64	34.63	1.64	361	30	23.76	34.72	4.41	23.52	438	0.14
72	17.54	34.45	2.54	298	50	21.02	34.64	1.87	24.23	370	0.22
97	14.88	34.69	0.61	223	75	17.40	34.46	2.53	25.02	294	0.31
116	14.14	34.82	0.04	198	100	14.82	34.70	0.57	25.80	221	0.38
150	13.55	34.80	0.11	188	150	13.55	34.80	0.11	26.15	188	0.48
193	12.76	34.81	0.10	172	200	12.62	34.81	0.10	26.34	169	0.57
236	11.93	34.81	0.07	156	250	11.71	34.80	0.08	26.50	154	0.65
292	11.13	34.74	0.10	148	300	11.02	34.73	0.10	26.58	146	0.73
379	9.89	34.69	0.05	130	400	9.55	34.67	0.05	26.79	127	0.87
472	8.33	34.58	0.09	115	500	7.91	34.55	0.09	26.96	110	0.99
566	7.1b)	34.52	0.08	102	600	6.72	34.52	0.10	27.10	97	1.10
670	6.13	34.52	0.11	90	700	5.90	34.52	0.12	27.21	87	1.20
817	5.00	34.52	0.17	76	800	5.12	34.52	0.15	27.30	78	1.29
1012	4.18	34.54	0.33	66	1000	4.21	34.54	0.31	27.42	67	1.45
1216	3.56	34.60	0.72	56							

- 16 a) Mean value of 7.79 and 7.86°C.  
b) Temperature inferred from pressure-thermometer and wire depth.

OBSERVED					INTERPOLATED				COMPUTED		
Z	T	S	O <sub>2</sub>	$\delta T_{-5}^3$	Z	T	S	O <sub>2</sub>	$\sigma_t$	$\delta T_{-5}^3$	$\Delta D$
m	°C	‰	ml/L	10 <sup>-5</sup> cm/g	m	°C	‰	ml/L	g/L	10 <sup>-5</sup> cm/g	dyn. m

SIO  
VERMILION  
SEA

SPENCER F. BAIRD; May 22, 1959; 1410 GCT; 20°13'N, 107°36.5'W; sounding, 1117 fm; wind, 230°, force 4; weather, partly cloudy; sea, very rough; wire angle, 36°.

62  
(170G.13)

2	24.52	34.72	4.65	459	0	(24.52)	(34.72)	(4.65)	(23.30)	(459)	(0.00)
10	25.54	34.72	4.64	459	10	24.54	34.72	4.64	23.29	459	0.05
26	24.38	34.70	4.69	456	20	24.48	34.71	4.66	23.30	458	0.09
46	21.46	34.69	2.41	378	30	22.85	34.60	3.70	23.69	421	0.14
63	18.70	34.46	3.43	325	50	20.96	34.66	2.58	24.27	366	0.21
84	15.92	34.51	1.28	258	75	16.85	34.48	2.08	25.17	281	0.30
101	14.98	34.70	0.61	224	100	14.99	34.70	0.62	25.76	224	0.36
132	13.76	34.81	0.05	191	150	13.29	34.83	0.05	26.22	181	0.46
173	12.83	34.83	0.07	172	200	12.27	34.82	0.11	26.42	162	0.55
213	12.00	34.81	0.12	158	250	11.57	34.79	0.08	26.53	152	0.63
265	11.40	34.78	0.07	150	300	10.83	34.73	0.10	26.62	143	0.71
347	10.08	34.67	0.12	136	400	9.30	34.62	0.10	26.80	126	0.85
434	8.76	34.59	0.08	120	500	7.74	34.54	0.12	26.97	110	0.97
525	7.42	34.53	0.13	106	600	6.74	34.56	0.14	27.12	95	1.08
625	6.52	34.56	0.14	91	700	5.89	34.55	0.15	27.24	84	1.17
766	5.40	34.54	0.17	80	800	5.19	34.54	0.18	27.31	77	1.26
955	4.54	34.54	0.30	70	1000	4.39	34.54	0.35	27.40	68	1.42
1152	3.88	34.55	0.50	63							

SPENCER F. BAIRD; May 22, 1959; 2309 GCT; 20°01'N, 107°56'W; sounding, 1774 fm; wind, 330°, force 4; weather, cloudy; sea, rough; wire angle, 26°.

63  
(170.13)

3	26.46	34.81	4.58	510	0	(26.46)	(34.81)	(4.58)	(22.77)	(510)	(0.00)
11	26.48	34.82	4.60	510	10	26.47	34.82	4.60	22.77	510	0.05
29	26.46	34.83	4.59	508	20	26.47	34.82	4.60	22.77	510	0.10
51	21.52	34.74	3.57	375	30	26.46	34.83	4.59	22.78	508	0.15
72	18.08	34.75	1.35	289	50	21.60	34.74	3.60	24.15	377	0.24
97	15.14	34.78	0.10	222	75	17.62	34.75	1.07	25.20	278	0.32
117	14.14	34.83	0.06	198	100	14.96	34.78	0.09	25.83	218	0.39
152	12.91	34.83	0.07	173	150	12.98	34.83	0.07	26.29	174	0.48
197	12.02	34.83	0.14	157	200	11.98	34.83	0.14	26.48	156	0.57
242	11.51	34.81	0.14	149	250	11.43	34.81	0.13	26.56	148	0.65
298	10.95	34.78	0.11	142	300	10.93	34.78	0.11	26.64	141	0.72
388	9.33	34.60	0.11	129	400	9.13	34.58	0.11	26.79	127	0.86
484	7.75a)	34.51	0.10	111	500	7.52	34.51	0.10	26.98	108	0.98
580	6.51	34.51	0.13	95	600	6.34	34.51	0.13	27.15	93	1.09
688	5.74	34.51	0.12	86	700	5.68	34.51	0.12	27.23	85	1.19
841	5.08	34.49	0.16	80	800	5.22	34.49	0.14	27.27	81	1.28
1042	4.22	34.57	0.36	65	1000	4.42	34.56	0.31	27.41	68	1.44
1248	3.58	34.58	0.67	58							

SPENCER F. BAIRD; May 23, 1959; 0208 GCT; 19°50'N, 108°16'W; sounding, 1630 fm; wind, 320°, force 3; weather, cloudy; sea, rough; wire angle, 28°.

64  
(170.17)

3	25.74	34.85	4.61	485	0	(25.74)	(34.85)	(4.61)	(23.02)	(485)	(0.00)
11	25.76	34.86	4.59	485	10	25.76	34.86	4.59	23.02	485	0.05
29	23.29	34.69	4.31	427	20	25.45	34.85	4.54	23.11	477	0.10
50	19.45	34.44	3.96	345	30	23.12	34.68	4.30	23.68	422	0.14
70	17.20	34.69	0.65	273	50	19.45	34.44	3.96	24.50	345	0.22
94	15.34	34.75	0.16	228	75	17.10	34.70	0.59	25.28	270	0.30
113	14.32	34.80	0.12	203	100	15.14	34.76	0.14	25.78	223	0.36
144	13.06	34.78	0.13	180	150	12.90	34.77	0.13	26.26	177	0.46
185	12.20	34.76	0.12	165	200	11.99	34.76	0.11	26.43	161	0.54
226	11.66	34.76	0.10	156	250	11.30	34.73	0.09	26.54	151	0.62
278	10.86	34.69	0.08	147	300	10.52	34.66	0.08	26.62	143	0.70
362	9.60	34.62	0.11	131	400	8.98	34.60	0.11	26.83	123	0.84
452	8.08	34.57	0.11	112	500	7.47	34.54	0.11	27.01	106	0.96
545	6.96	34.52	0.11	100	600	6.46	34.52	0.12	27.14	94	1.06
648	6.12	34.52	0.13	90	700	5.82	34.52	0.14	27.22	86	1.16
797	5.32	34.52	0.16	80	800	5.30	34.52	0.16	27.28	80	1.25
997	4.30	34.57	0.32	65	1000	4.29	34.57	0.33	27.44	65	1.41
1207	3.65	34.56	0.62	60							

a) Mean value of 7.72 and 7.78°C.

S10

VERMILION  
SEA

OBSERVED					INTERPOLATED				COMPUTED		
Z	T	S	O <sub>2</sub>	$\delta T_{-5}^3$	Z	T	S	O <sub>2</sub>	$\sigma_t$	$\delta T_{-5}^3$	$\Delta D$
m	°C	‰	ml/L	10 cm/g	m	°C	‰	ml/L	g/L	10 cm/g	dyn. m

65 SPENCER F. BAIRD; May 23, 1959; 0915 GCT; 19°37'N, 108°39.5'W; sounding, 1299 fm; wind, 320°, force 2; weather, cloudy; sea, moderate; wire angle, 17°.

3	24.46	34.76	4.59	454	0	(24.46)	(34.76)	(4.59)	(23.35)	(454)	(0.00)
12	24.48	34.73	4.58	458	10	24.47	34.73	4.58	23.31	457	0.05
31	24.36	34.75	4.67	452	20	24.46	34.73	4.59	23.31	457	0.09
55	21.63	34.58	4.89	390	30	24.37	34.75	4.66	23.37	452	0.14
77	19.00	34.72	2.90	313	50	22.14	34.60	4.89	23.90	402	0.22
103	15.36	34.73	0.17	230	75	19.15	34.72	3.05	24.79	317	0.31
125	14.62	34.76	0.14	212	100	15.78	34.73	0.36	25.60	239	0.38
162	13.03	34.77	0.14	180	150	13.43	34.77	0.14	26.14	188	0.49
209	11.94	34.78	0.05	159	200	12.12	34.78	0.05	26.42	162	0.58
256	11.26	34.73	0.12	151	250	11.34	34.74	0.12	26.53	152	0.66
315	10.29	34.68	0.10	138	300	10.56	34.69	0.10	26.64	141	0.74
410	8.45	34.57	0.11	118	400	8.63	34.58	0.11	26.86	120	0.87
510	7.14	34.54	0.09	101	500	7.23	34.54	0.09	27.04	103	0.99
612	6.44	34.56	0.15	91	600	6.51	34.56	0.15	27.16	92	1.09
724	5.71	34.54	0.11	83	700	5.87	34.54	0.12	27.23	85	1.19
884	4.98	34.56	0.16	74	800	5.31	34.54	0.12	27.30	78	1.28
1093	4.12	34.61	0.39	60	1000	4.47	34.60	0.25	27.43	66	1.44
1308	3.46	34.61	0.74	54							

66 SPENCER F. BAIRD; May 23, 1959; 1215 GCT; 19°26'N, 108°57.5'W; sounding, 1474 fm; wind, 330°, force 3; weather, cloudy; sea, moderate; wire angle, 20°.

3	25.63	34.86	4.61	481	0	(25.63)	(34.86)	(4.61)	(23.06)	(481)	(0.00)
12	25.66	34.87	4.55	481	10	25.65	34.87	4.56	23.06	481	0.05
30	24.32	34.74	4.82	452	20	25.65	34.87	4.55	23.06	481	0.10
53	21.27	34.52	4.96	384	30	24.32	34.74	4.82	23.37	452	0.14
75	19.21	34.45	3.78	338	50	21.78	34.55	4.96	23.96	396	0.23
102	16.66	34.72	1.04	259	75	19.21	34.45	3.78	24.57	338	0.32
123	15.16	34.72	0.68	226	100	16.76	34.72	1.09	25.37	261	0.40
160	13.50	34.78	0.22	188	150	14.00	34.76	0.36	26.03	199	0.51
205	12.15	34.76	0.09	164	200	12.26	34.76	0.09	26.38	166	0.60
252	11.55	34.72	0.12	157	250	11.57	34.72	0.12	26.47	157	0.69
309	10.73	34.65	0.09	148	300	10.88	34.66	0.10	26.56	149	0.77
400	8.96	34.55	0.10	126	400	8.96	34.55	0.10	26.80	126	0.91
496	7.73	34.51	0.11	112	500	7.69	34.51	0.11	26.96	111	1.04
595	6.69	34.48	0.10	100	600	6.64	34.48	0.10	27.08	99	1.15
704	5.88	34.49	0.10	89	700	5.90	34.49	0.10	27.18	89	1.25
859	5.05	34.47	0.17	81	800	5.34	34.47	0.13	27.24	84	1.34
1062	4.26	34.64r	0.32	-	1000	4.49	34.47	0.27	27.33	75	1.52
1271	3.54	34.52	0.72	61							

OBSERVED					INTERPOLATED				COMPUTED		
Z	T	S	O <sub>2</sub>	$\delta T_{-5}^3$	Z	T	S	O <sub>2</sub>	$\sigma_t$	$\delta T_{-5}^3$	$\Delta D$
m	°C	‰	ml/L	10 <sup>-5</sup> cm/g	m	°C	‰	ml/L	g/L	10 <sup>-5</sup> cm/g	dyn. m

SIO  
VERMILION  
SEA

67  
(157.12)

SPENCER F. BAIRD; May 24, 1959; 1856, 1620 GCT; 22°34.5'N, 109°32'W; sounding, 1552 fm; wind, 330°, force 1; weather, partly cloudy; sea, moderate; wire angle, 11°, 39°.

2	22.02	34.72	4.71	390	0	(22.02)	(34.72)	(4.71)	(24.02)	(390)	(0.00)
11	21.72	34.73	4.69	381	10	21.73	34.73	4.69	24.11	381	0.04
30	18.82	34.35	4.28	336	20	21.68	34.73	4.67	24.12	380	0.08
39	17.12	34.34	2.69	297	30	18.82	34.35	4.28	24.59	336	0.11
49	16.18	34.38	1.99	273	50	16.08	34.38	1.93	25.28	270	0.17
59	15.06	34.38	1.49	249	75	14.70	34.55	0.85	25.71	229	0.24
73	14.78	34.51	0.93	234	100	13.79	34.70	0.50	26.03	199	0.29
90	14.09	34.69	0.57	207	150	12.57	34.72	0.17	26.28	175	0.38
109	13.51	34.71	0.45	193	200	11.68	34.72	0.14	26.46	158	0.47
127	12.91	34.70	0.30	183	250	11.00	34.68	0.16	26.54	150	0.55
144	12.67	34.72	0.19	177	300	10.33	34.62	0.14	26.62	143	0.63
190	11.82	34.73	0.14	161	400	8.57	34.52	0.11	26.84	122	0.77
240	11.14	34.69	0.16	152	500	7.52	34.50	0.11	26.97	109	0.89
305	10.26	34.61	0.13	143	600	6.55	34.47	0.10	27.08	98	1.00
406	8.50	34.52	0.11	122	700	5.81	34.47	0.10	27.18	90	1.11
508	7.44	34.50	0.12	108	800	5.26	34.48	0.09	27.26	82	1.20
612	6.44	34.49	0.12	96	1000	4.32	34.50	0.21	27.38	71	1.37
717	5.67	34.46	0.15	88	1200	3.75	34.52	0.43	27.45	64	1.53
					1500	3.01	34.57	0.99	27.56	54	1.74
558a)	7.01b)	34.48	0.11	104	2000	2.31	34.58	1.68	27.64	46	2.04
723	5.70	34.47	0.07	88	2500	1.88	34.61	2.25	27.69	41	
889	4.84	34.48	0.09	78							
1059	4.13	34.51	0.29	68							
1229	3.68	34.52	0.49	63							
1400	3.24	34.55	0.80	57							
1573	2.85	34.58	1.14	51							
1747	2.53	34.58	1.41	49							
1923	2.38	34.58	1.61	47							
2101	2.20	34.60	1.78	44							
2282	1.96	-	2.08	-							
2464	1.89	34.61	2.23	42							
2653	1.82	34.61	2.37	41							

- a) Overlapping casts; reconciliation of property curves when necessary.  
b) Mean value of 6.98 and 7.04°C.