6223

1000-2

Form 504
Rev. April 1935
DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

DESCRIPTIVE REPORT

~~Topographic~~
Hydrographic } Sheet No. 4 04

State New York - New Jersey

LOCALITY

Approaches to New York Harbor

193 7

CHIEF OF PARTY

H.A.Seran

U. S. GOVERNMENT PRINTING OFFICE

Form 537
Ed. Dec. 1930

REG. NO.

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

HYDROGRAPHIC TITLE SHEET

The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

Field No. 404

REGISTER NO. H6223

State New York, New Jersey

General locality ~~Atlantic Coast~~

Locality Approaches to New York Harbor

Scale 1:40000 Date of survey Aug. Sept., 1937

Vessel OCEANOGRAPHER

Chief of Party H. A. Seran

Surveyed by Field Party (H.Odessey)

Protracted by J. C. Bull, M. O. Witherbee, E. B. Latham

Soundings penciled by M. O. Witherbee, E. B. Latham

Soundings in ~~fathoms~~ feet

Plane of reference M. L. W.

Subdivision of wire dragged areas by

Inked by W.R.Jackson

Verified by W.R.Jackson

Instructions dated April 2,1936. Supl. May 8, March 19, 1937

Remarks: Supersedes Sheet 404, surveyed in 1936.

U. S. GOVERNMENT PRINTING OFFICE

DESCRIPTIVE REPORT

to accompany

Hydrographic Sheet No. 404

Approaches to New York Harbor

Scale 1:40,000

Project No. 207 Ship OCEANOGRAPHER H. A. Seran, Comd'g.

INSTRUCTIONS:

The survey was made in accordance with instructions from the Director dated April 9, 1936 and supplemental instructions dated May 8, 1937 and March 19, 1937.

This is a resurvey; the greater part of the area was surveyed in 1936. The necessity for a resurvey was occasioned by unreliable soundings in the 1936 survey, caused by poor operation of the 312 fathometer.

Field Sheet No. 404 (1936) and sounding records have been destroyed YBR.

Before destroying Field Sheet No. 404 (1936) the bottom characteristics were transferred to H-6223 (1937)

R.H. Carstens 4/21/37

LIMITS:

The area covered by this sheet lies between latitude 39°47' and 40°20' and longitude 73°16' and 73°36'.

The sheet is joined on the east by OCEANOGRAPHER'S Sheets Nos. 403 (H-6191) and 121 (H-6192), on the north by LYDONIA'S Sheet No. ~~401~~ 401a-402a (H-6026) and on the west by LYDONIA'S Sheets Nos. ~~402~~ 401a-402a (H-6026) and 405 (H-6188), all surveyed in 1936. There is no contemporary survey to the south.

CONTROL:

The work was controlled by a line of buoys located by sun azimuth and taut-wire traverse. This traverse started from buoy "ZED" in latitude 40°26'.5, longitude 73°30'.7 located by three point fix from the following triangulation stations: Fire Island Lighthouse, Jones Beach Tower, Navesink Lighthouse. The three

point fix was computed. The traverse was tied in on the south with buoy "DOG", one of the stations in the traverse which was made for the control of Sheet 122, in May 1937.

The closure of the traverse was as follows:

	latitude	longitude
Adjusted position of "DOG" (May 1937)	39°29'22.28"	73°30'33.54"
Position of "DOG" by traverse from "ZED"	39°29'28.04"	73°30'31.06"
Discrepancy	5.76" (178 m)	2.48" (59 m)

Due to the fact that buoy "DOG" had been in place for three months between its original location and the tie-in of the new traverse, the adjusted position of the buoy from the original traverse was not held fixed. Its position was assumed to be mid way between the adjusted position and the position determined by traverse from "ZED" or latitude 39°29'25.16", longitude 73°30'32.30". The traverse from "ZED" to "DOG" was then adjusted to this assumed position of "DOG". The maximum adjustment correction for a segment of the traverse (6.9 miles) was 11.4 meters.

Sono-radio buoys were planted near the traverse buoys and located from them by gyro-compass bearings and depression angles. Following is a list of their positions:

Sono-radio buoy	Survey buoy	Bearing Survey buoy to Sono-radio buoy	Distance (meters)
PI	YOKE	74.8	141
XI	X-RAY	105.9	184
XI 2	X-RAY	---	0
TAU	VICE	187.0	183
RHO	UNIT	60.8	304

SURVEY METHODS:

Positions of the sounding vessel were determined by R.A.R. distances from one station ship, and from one or two sono-radio buoys, supplemented by gyro-compass bearings on survey buoys. From A day to E day inclusive only one sono-radio buoy was in operation, but bearings were obtained on a majority of positions. Both station ship and buoys operated in a satisfactory manner. Some difficulty was caused by heavy static which interferred with returns from the buoys.

The large variable lags of the sono-buoys which were noted in the 1936 season have been eliminated. A large number of bombs were fired during the progress of taut-wiring at different times during the season, and a comparison of R.A.R. distance against taut-wire distance from these bombs indicate that the lag, if any is present, is smaller than the probable error occasioned by the uncertainties of velocity, scope of buoy, and scaling of tapes; it is probably less than .01 second. In plotting the smooth sheet equal weight was given to the arcs from the WELKER and from the buoys.

Soundings were taken by Dorsey Fathometer No. 2, which gave accurate results for the depths encountered on this sheet. Comparisons with wire or lead line were made two to three times daily. These comparisons indicated that there was no correction to be applied to the fathometer soundings other than that for temperature and salinity.

DETERMINATION OF VELOCITIES:

Experimental velocities taken in the area prior to beginning of hydrography indicated actual velocities higher than the theoretical bottom velocity. This confirmed the results obtained in the same area in 1936. This condition evidently occurs when the warm surface layer extends to well below the depth of the receiving magnetophones, or when the temperature gradient is very steep. Reference is made to the special report on this subject submitted by Lieutenant Herman Odessey under date of January 22, 1937.

The velocities used were determined chiefly from bomb positions on or near the line of buoys. The method used in the case of a bomb position on the line of buoys was to take the taut-wire distance between the two survey buoys at the R.A.R. stations apply corrections for distance of magnetophones from these buoys and divide by the sum of the scaled times. In the case of a bomb position near but not on the line of buoys the distance was corrected for distance off line by the formula $C = \frac{h2}{2L_1} + \frac{h2}{2L_2}$, in which C is correction in meters, h is distance off line in meters, and L_1 and L2 distances from the bomb position to the two survey buoys in meters. This formula is an approximation but is accurate for distances off line up to about 1200 meters. A tabulation of velocities determined by this method is appended to this report.

The final accepted velocities are as follows:

A and B days to YOKE 1500 meters, to WATCH 1490 meters.
C day 1502 meters.
D day 1480 meters east of long. 73°30' 1476 meters west of long. 73°30'.
E day 1485 meters.*
F. day 1485 meters with exceptions shown in following table.

Position numbers	WATCH	X-RAY	VICE
7, 8, 18, 30, 31, 83, 84, 95, 96, 102,	1480	1485	1485
103, 105, 111, 112, 119	1480	1480	1480
106-110, 120-122	1480	1480	1485
113	1485	1480	1480
114-118	1485	1485	1480
123-130	1485	1480	1485

G and H days 1484 meters*
J day 1490 meters
K, L and M days 1508 meters.

*(See page 5a)

The above values are arbitary and were arrived at after a study of experimental velocities, serial temperatures and configuration of the bottom. In the case of D day and part of F day velocities were revised during the smooth plotting when it was found that velocities originally selected did not give good intersections.

It is noted that the exceptionally high velocities selected for K, L and M days (September 6, 7 and 8) are nearly the same as those determined on September 15 and 16, 1936 and described in Lieutenant Odessey's report. This abrupt change in velocity was probably due to a storm on the night of September 5, 1937.

METHODS USED IN SMOOTH PLOTTING:

The usual method of plotting was used. Distance circles were drawn for each station, using the position of the survey

Where the conformation of the bottom indicated that the path of the sound wave was subject to deflection by the steep slope of the valley, it was found from a study of the intersections, comparisons with dead reckoning positions, etcetera that the adoption of a velocity of 1480 m/sec. was indicated.

This condition was obtained on the positions listed below:

To Watch:

E day - Positions 64, 65, 77, 78, 113, 115, 127, 128.

F day - As shown on page 5.

G day - Positions 21, & 22.

H day - Positions 8-10, 16-20, 26-28, 35-36, 84-86, 94-96, 104-106, 110-112, 119-120, 124-129, and 138-147, all inclusive.

buoy as center, and an interval of 5000 meters; these circles were left in pencil. Distance arcs (position intersections) were drawn with colored ink, the following colors being used: YOKE red, X-RAY violet, WATCH green, VICE red, UNIT violet and MED green. Gyro-compass bearings were drawn with a black dashed line. Gyro bearings taken on buoy IN were not used because this buoy was not located by taut-wire.

The sounding lines were drawn on tracing paper according to dead reckoning and superimposed over the arcs and bearings so as to select the points which agreed with arcs, bearings, course and distance. In selecting points distance arcs were given preference over bearings except for positions close to the line of buoys, in which case the errors in compass bearings are usually small, and the intersections of distance arcs are weak. On positions where dead reckoning failed to agree with one or more distance arcs an adjusted point was used, usually about midway between the dead reckoning position and the intersection of the arcs.

FATHOMETER CORRECTIONS:

Fathometer corrections were determined in accordance with Field Memorandum No. 3, June 11, 1937. Serial temperatures and salinities were plotted on cross-section paper in three periods, and a mean curve drawn and corrections computed for each period; there was so little difference in the corrections for the three periods, that the three were meaned up and one set of corrections

used for the entire sheet. Since no serial temperatures were taken in the submarine valley in 1937 it was necessary to use serial temperatures observed in 1936 for depths greater than 25 fathoms; this should cause no error in the corrections since they were taken in the same locality at the same time of year. Comparisons of fathometer soundings with vertical casts showed the initial correction to be zero.

DISCREPANCIES:

Crossings of sounding lines are generally good, the majority agreeing within two feet. Following is a list of crossings with a discrepancy of more than 3 feet.

Nearest Pos. Nos. on line	Depths	Remarks
~~8F - 88F~~ OK	~~154-158~~ 149-150	~~Small change in position will rectify.~~
~~88F - 20H~~	~~157-161~~ 157-159 159-161	~~Small change in position will partially rectify.~~
~~96F - 128F~~	~~209-227~~	~~Very steep slope.~~
96F - 16F	243-250	Small change in position will partially rectify,
~~106D - 13E~~ OK	~~136-140~~	~~Small change in position will partially rectify.~~
~~50D - 13E~~ OK	~~163-175~~	~~Very steep slope.~~
~~67F - 117D~~	~~185-176~~	~~Shift of position of approx. 200 meters to rectify.~~
~~21D - 58F~~	~~246-255~~	~~Fairly steep slope.~~
~~102D - 60F~~	~~219-200~~	~~Steep slope.~~
~~54D - 80F~~	~~174-157~~	~~Steep slope.~~
~~27K - 31L~~	~~120-124~~	~~Error in depth.~~

Discrepancies crossed out have been reduced to 3 ft. or less.

COMPARISON WITH ADJOINING SHEETS:

Sheet 121, OCEANOGRAPHER 1936. This sheet was plotted H-6192 in fathoms and as all crossings agree within one fathom the junction is considered satisfactory. See par. 6b, review.

Sheet 403, OCEANOGRAPHER 1936. There is only one discrepancy worth H-6191 see par. 6b review

noting, a difference of 6 feet in latitude 40°14'.9, longitude 73°24'.8.

Sheet 401; LYDONIA 1936. (H-6026) There is no overlap with this sheet, the northernmost line on 404 being parallel and close (H-6223) to the southern line of 401; depths on these two lines appear (H-6026) to be consistent.

Sheet 402; LYDONIA 1936. (H-6026) No photostat of this sheet was available for comparison. A tracing of the boat sheet reveals large discrepancies in two areas. It is possible that these discrepancies may be eliminated or reduced when the comparison is made with the smooth sheet. Following is a list of discrepancies noted:

Latitude	Longitude	Depth Sheet 402	Depth Sheet 404	
~~40°00'.8~~	~~73°35'.9~~	~~135~~	~~113~~	Discrepancies crossed out have been reduced to 3 ft. or less.
~~40 01..6~~	~~73 35 .7~~	~~130~~	~~124~~	
~~40 01 .2~~	~~73 36 .1~~	~~124~~	~~116~~	
~~40 02 .3~~	~~73 35 .7~~	~~118~~	~~127~~	
40 03 .5	73 35 .0	~~131~~ 122	~~120~~ 117	
~~40 04 .7~~	~~73 35 .6~~	~~140~~	~~134~~	
40 04 .7	73 36 .2	~~140~~ 138	~~124~~ 127	Slight shift in position would improve.
~~40 04 .7~~	~~73 36 .4~~	~~136~~	~~123~~	
~~40 16 .8~~	~~73 32 .9~~	~~102~~	~~92~~	
~~40 16 .6~~	~~73 33 .2~~	~~103~~	~~90~~	
40 16 .8	73 33 .2	~~93~~ 98	103	

Sheet 405, LYDONIA, 1936. (H-6188) The east and west lines of Sheet 404 (H-6223) are crossed by two north and south lines of Sheet 405; (H-6188) crossings are very good, the majority agreeing within one foot with a maximum of three feet.

Respectfully submitted,

M. O. Witherbee

M. O. Witherbee, Lieut., C&GS.,
Ship OCEANOGRAPHER.

Approved and forwarded:

Raymond P. Eyman

Raymond P. Eyman, Lt. Comdr., C&GS.,
Comd'g. Ship OCEANOGRAPHER.

STATISTICS

1937

PROJECT H. T. 207 - SHEET #404

DATE	DAY	STAT. MI.	SOUNDINGS	POSITIONS
8/19/37	A	12.3	129	13
8/20/37	B	93.6	1067	105
8/21/37	C	93.4	895	101
8/22/37	D	122.1	1379	132
8/31/37	E	128.8	1448	134
9/1/37	F	115.5	1525	130
9/2/37	G	29.5	315	27
9/3/37	H	141.5	1977	150
9/5/37	J	90.5	872	87
9/6/37	K	43.0	469	46
9/7/37	L	108.4	1096	109
9/8/37	M	37.7	379	33
	TOTALS	1,016.3	11,551	1,067

Area 496 sq. stat. miles.

EXPERIMENTAL DETERMINATION OF VELOCITIES

SHEET 404

DATE	POS. NO.	DIST. OFF LINE M	DIST. FROM STA. 100 M	CORRN. FOR DIST. OFF LINE	CORRN. FOR MAG.	CORRN. FOR SONO BUOY	TOTAL DIST.	TIMES OF BOMBS SECONDS		VELOCITY	MEAN FOR DAY
		WELKER at WATCH; PI at YOKE; DIST. WATCH-YOKE 24,054						WELKER	PI		
Aug. 20	86 B	560	32,209	+ 56	+232	+ 40	24,382	14.14	1.87	1522.7R	
20	87 B	1000	32,209	+180	+232	+ 40	24,506	13.98	2.34	1501.3	
20	92 B	740	25,216	+119	+244	+ 40	24,457	14.59	1.81	1491.1	
20	70 B	560	46,195	+ 42	+272	+ 40	24,408	13.27	3.15	1486.5	
20	59 B	100	55,186	+ 1	+233	+ 40	24,328	12.61	3.77	1485.2	
20	52 B	370	65,176	+ 14	+252	+ 40	24,360	11.98	4.47	1481.8	
20	41 B	850	72,169	+ 71	+272	+ 40	24,437	11.42	5.04	1484.6	
20	42 B	970	72,169	+ 92	+272	+ 40	24,458	11.63	4.75	1493.2	
20	36 B	100	82,159	+ 1	+265	+ 40	24,360	10.86	5.55	1484.5	
20	25 B	540	90,151	+24	+288	+ 40	24,406	10.31	6.15	1482.8	
20	15 B	200	98,143	+ 4	+285	+ 40	24,383	9.70	6.56	1499.5	1489.1
		WELKER at WATCH; XI at X-RAY; DIST 12,795						WELKER	XI		
Aug. 21	47 C	0	---	0	+273	- 50	13,018	7.94	0.72	1503.2	
21	62 C	360	21,107	+37	+265	-50	13,047	7.28	1.41	1501.4	
21	92 C	0	---	0	+245	- 50	12,990	5.51	3.24	1484.6	1496.4
Aug. 22	27 D	0	---	0	+255	- 50	13,000	3.39	5.43	1473.9	
22	48 D	250	33,95	+ 12	+278	- 50	13,035	2.29	6.52	1479.6	
22	80 D	0	---	---	+272 *	-50	13,017	----	8.83	1474.2	1475.9
* Distance of bomb from WATCH by range finder.											
		WELKER at WATCH; TAU at VICE; DIST.			16,631			WELKER	TAU		
Aug. 31	37 E	400	24,142	+39	-607	+182	16,245	1.42	9.57	1478.2	
31	65 E	140	32,134	+ 4	-572	+182	16,245	1.96	9.08	1471.5	
31	76 E	300	48,118	+13	- 531	+182	16,295	3.17	7.83	1481.4	
31	75 E	1000	52,114	+140	- 531	+182	16,442	3.42	7.60	1490.2	
31	98 E	400	58,108	+21	- 555	+182	16,279	4.29	6.71	1479.9	
31	131 E	0	---	0	- 332	+182	16,481	6.50	4.60	1484.8	1481.0
Sept. 1	20 F	1240	72,94	+189	- 596	+182	16,406	4.72	6.35	1482.0	
1	6 F	0	---	0	-594	+182	16,219	5.81	5.19	1474.5	
1	126 F	0	---	0	-390	+182	16,423	7.00	4.04	1487.6	1481.4

DATE	POS. NO.	DIST. OFF LINE, M	DIST. FROM STA. 100 M	CORRN. FOR DIST. OFF LINE	CORRN. FOR MAG.	CORRN. FOR SONO BUOY	TOTAL DIST.	TIMES OF BOMBS SECONDS WELKER	TAU	VELOCITY	MEAN FOR DAY
Sept. 2	17 G	1230	118,48	+222	-270	+182	16,765	8.04	3.25	1484.9	
2	18 G	0	---	0	-270	+182	16,543	7.73	3.38	1489.0	
3	4 H	360	133,33	+ 25	-430	+182	16,408	8.83	2.27	1478.2	
		WELKER	at WATCH; RHO	at UNIT; DIST. 29,746				WELKER	RHO		
Sept. 2	17 G	1230	118,176	+106	-270	-150	29,432	8.04	11.84	1480.5	
2	18 G	0	---	0	-270	-150	29,326	7.73	11.99	1487.1	1485.4
3	4 H	0	---	0	-430	-150	29,166	8.83	10.86	1481.3	
3	67 H	0	---	0	-250	-150	29,346	10.50	9.26	1485.1	
3	68 H	550	159,134	+ 20	-250	-150	29,366	10.70	9.12	1481.6	
3	70 H	0	---	0	-250	-150	29,346	11.59	8.19	1483.6	
3	71 H	980	174,119	+ 67	-250	-150	29,415	11.81	7.98	1486.4	1482.7
		WELKER	at MED; TAU at	VICE; DIST.	19,506			WELKER	TAU		
Sept. 5	4 J	0	---	0	+ 42	-182	19,366	11.82	1.18	1489.7	
5	44 J	0	---	0	-139	-182	19,185	10.42	2.46	1489.5	
5	60 J	600	52,142	+ 48	- 31	-182	19,341	9.39	3.61	1488.9	
5	61 J	0	---	0	- 31	-182	19,293	9.38	3.53	1494.4	1490.6
6	7 K	0	---	0	+586	-182	19,910	7.61	5.58	1509.5	
6	29 K	300	95,104	+ 9	+588	-182	19,921	7.02	6.38	1486.6R	
6	38 K	300	88,111	+ 9	+537	-182	19,870	5.84	7.31	1511.0	
7	34 L	0	---	0	+603	-182	19,927	7.30	5.93	1506.2	
7	45 L	0	---	0	+610	-182	19,934	8.09	5.11	1510.2	
7	46 L	600	126,74	+ 40	+610	-182	19,974	8.31	4.85	1517.8R	
7	48 L	0	---	0	+610	-182	19,934	9.22	3.96	1512.4	
7	61 L	600	56,144	+ 45	+625	-182	19,994	3.69	9.53	1512.4	
7	62 L	150	56,144	+ 3	+570	-182	19,897	3.68	9.58	1500.5	
7	86 L	600	39,161	+ 57	+523	-182	19,904	2.59	10.64	1504.4	
7	6 M	0	---	0	+583	-182	19,907	2.15	11.14	1497.9	
8	30 M	200	23,177	+ 10	+630	-182	19,964	1.50	11.68	1514.7	1507.9 *

* Mean for K, L and M days.

FATHOMETER CORRECTIONS

0-200 Fathoms

Calibrated for 820 fathoms (14996 Meter) per sec.

Table Ia
Aug. 19-22, 1937

Depth in Fathoms	Temp. °C	Mean Temp.	Salinity	Mean Salinity	Factor	Corr. in Fathoms	Corr in Feet
2	24.1		31.9				
7	23.7	23.9	32.0	32.0	+.0175	+.12	+0.7
12	12.5	20.1	32.9	32.3	+.0110	+.13	+0.8
17	07.8	17.0	33.6	32.6	+.0052	+.09	+0.5
22	07.5	15.1	33.7	32.8	+.0015	+.03	+0.2
27	07.2	13.8	33.7	33.0	−.0012	−.03	−0.2
32	06.8	12.8	33.6	33.1	−.0034	−.11	−0.7
37	06.6	12.0	33.5	33.1	−.0053	−.20	−1.2
42	06.2	11.4	33.2	33.1	−.0065	−.27	−1.6

Table Ib

Aug. 31-Sept. 5, 1937

2	21.7		32.7				
7	19.0	20.4	32.9	32.8	+.0120	+.09	+0.5
12	12.1	17.6	33.3	33.0	+.0067	+.08	+0.5
17	10.1	15.7	33.5	33.1	+.0030	+.05	+0.3
22	08.9	14.4	33.6	33.2	−.0002	.00	0.0
27	08.2	13.3	33.6	33.3	−.0023	−.06	−0.4
32	07.4	12.5	33.6	33.3	−.0040	−.13	−0.8
37	06.8	11.8	33.5	33.3	−.0055	−.20	−1.2
42	06.2	11.1	33.2	33.3	−.0072	−.30	−1.8

Table Ic
Sept. 6-8, 1937

2	21.0		32.6				
7	40.3	20.6	32.8	32.7	+.0124	+.09	+0.5
12	15.4	18.9	33.0	32.8	+.0093	+.11	+0.7
17	10.8	16.9	33.2	32.9	+.0052	+.09	+0.5
22	09.3	15.4	33.3	33.0	+.0023	+.05	+0.3
27	08.5	14.2	33.4	33.0	−.0004	−.01	−0.1
32	07.7	13.3	33.5	33.1	−.0022	−.07	−0.4
37	06.8	12.5	33.5	33.2	−.0040	−.15	−0.9
42	06.2	11.8	33.2	33.2	−.0055	−.23	−1.4

FATHOMETER CORRECTIONS

Table I Summary

Depth in Fathoms	Table (1)	Table (2)	Table (3)	Sum	Mean (3) Corr. (feet)
	- - - Correction in feet - - -				
2					
7	+ 0.7	+ 0.5	+ 0.5	+ 1.7	+ 0.6
12	+ 0.8	+ 0.5	+ 0.7	+ 2.0	+ 0.7
17	+ 0.5	+ 0.3	+ 0.5	+ 1.3	+ 0.4
22	+ 0.2	0.0	+ 0.3	+ 0.5	+ 0.2
27	- 0.2	- 0.4	- 0.1	- 0.7	- 0.2
32	- 0.7	- 0.8	- 0.4	- 1.9	- 0.6
37	- 1.2	- 1.2	- 0.9	- 3.3	- 1.1
42	- 1.6	- 1.8	- 1.4	- 4.8	- 1.6

Table II

Depth Range Fathoms and Feet	Correction Feet
0 - 27-3	0
27-4 - 37-3	-1
37-4 - ----	-2

ABSTRACT OF FATHOMETER COMPARISONS

Pos. No.	Day	Vertical Cast	Fath. Sdg.	Velocity Corr'n	Corr'd Fath. Sdg.	Diff. (fms)
1	A	15.8	15.3	∓0.1	15.4	∓0.4
13	A	23.9	24.3	0	24.3	−0.4
1	B	18.6	18.4	∓0.1	18.5	∓0.1
1	C	15.8	15.7	∓0.1	15.8	0.0
1	D	22.5	22.3	0	22.3	∓0.2
132	D	20.4	20.3	0	20.3	∓0.1
1	E	21.0	21.0	0	21.0	0.0
56	E	22.5	22.0	0	22.0	∓0.5
134	E	19.3	19.3	∓0.1	19.4	−0.1
1	F	19.5	19.5	0	19.5	0.0
130	F	19.2	19.0	∓0.1	19.1	∓0.1
1	G	20.0	20.0	0	20.0	0.0
27	G	27.5	27.5	0	27.5	0.0
1	H	19.7	19.8	0	19.8	−0.1
150	H	26.6	26.6	0	26.6	0.0
1	J	18.3	18.3	∓0.1	18.4	−0.1
46	K	25.3	25.3	0	25.3	0.0
1	L	25.2	25.2	0	25.2	0.0
13	L	18.0	18.0	∓0.1	18.1	−0.1
109	L	17.3	17.5	∓0.1	17.6	−0.3
1	M	17.0	17.2	∓0.1	17.3	−0.3
33	M	20.0	20.0	0	20.0	0.0
					Mean difference	∓0.0

(Let 1 inch equal 4 fathoms for deep water and 1 inch equal 0.4 fathom for shoal.)

+1.0 0.0 -1.0 -2.0

CORRECTIONS IN ~~FATHOMS~~ FEET

10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190

DEPTHS IN FATHOMS

(For deep water add a 0 to these figures)

PRINTED IN U.S.A.

FATHOMETER CORRECTIONS
U.S. Coast and Geodetic Survey

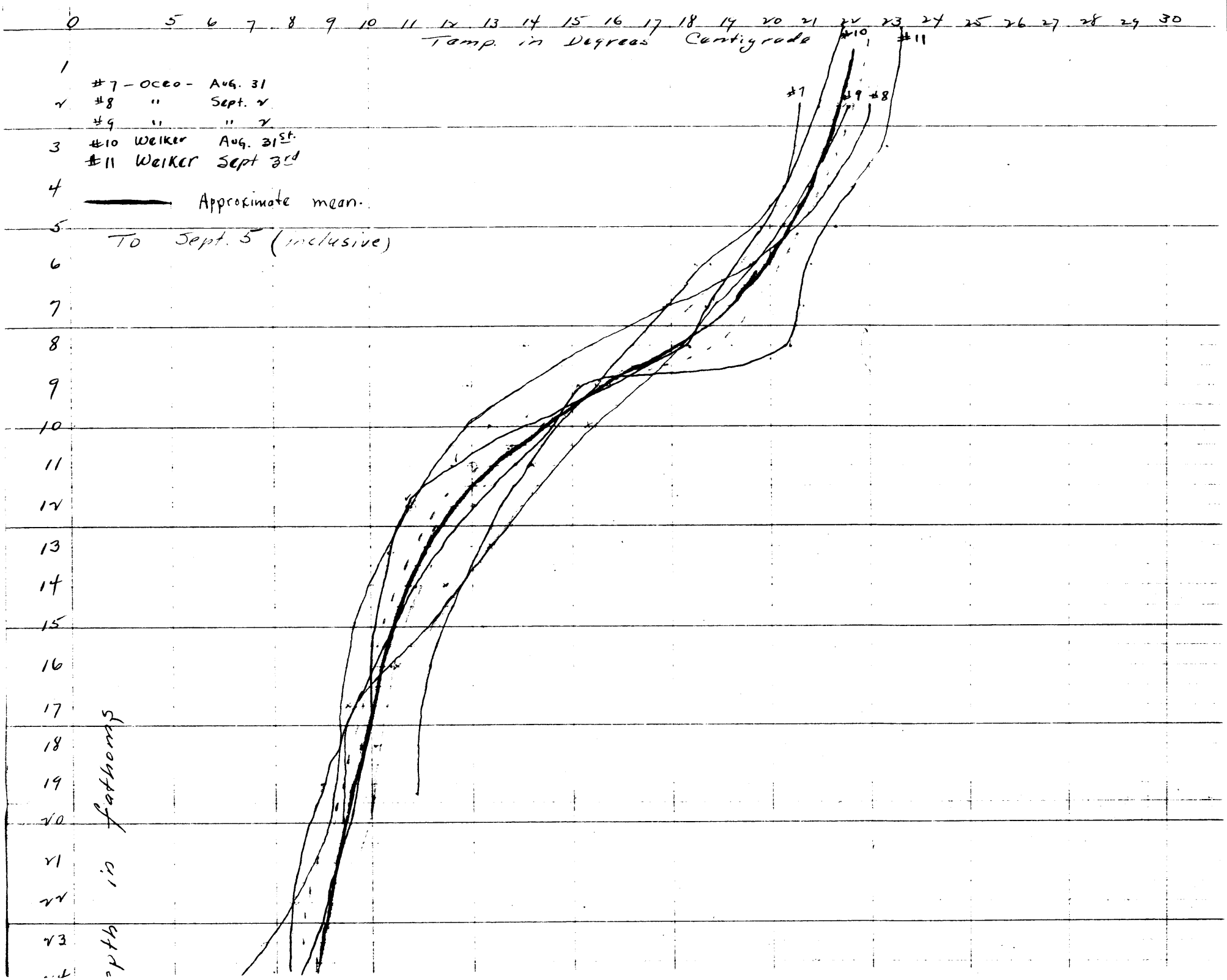
Ship OCEANOGRAPHER

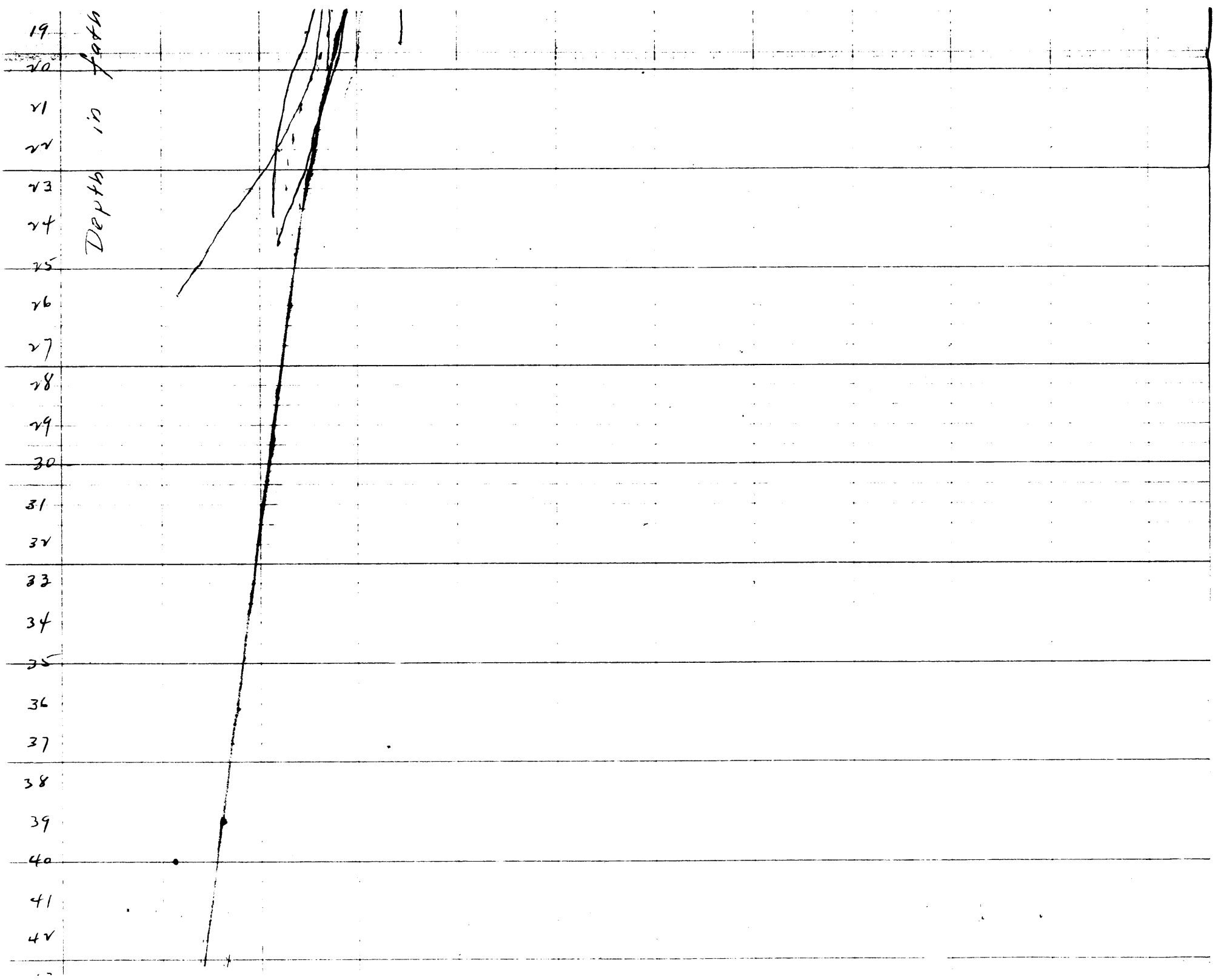
H.A.Seran Comdg.

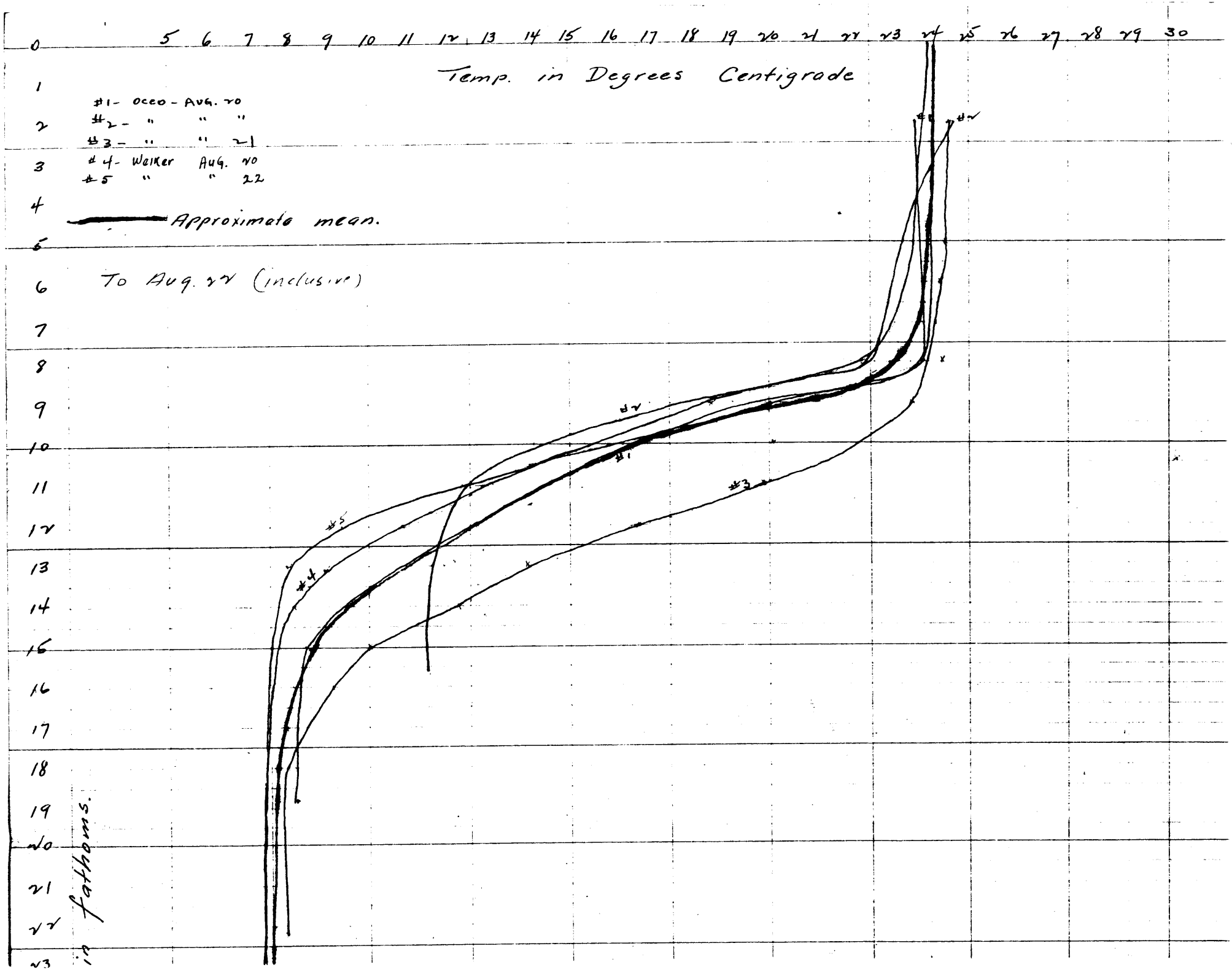
These corrections are to be used between Aug. 13 1937 and Sept.8 1937 in the locality Approaches to New York

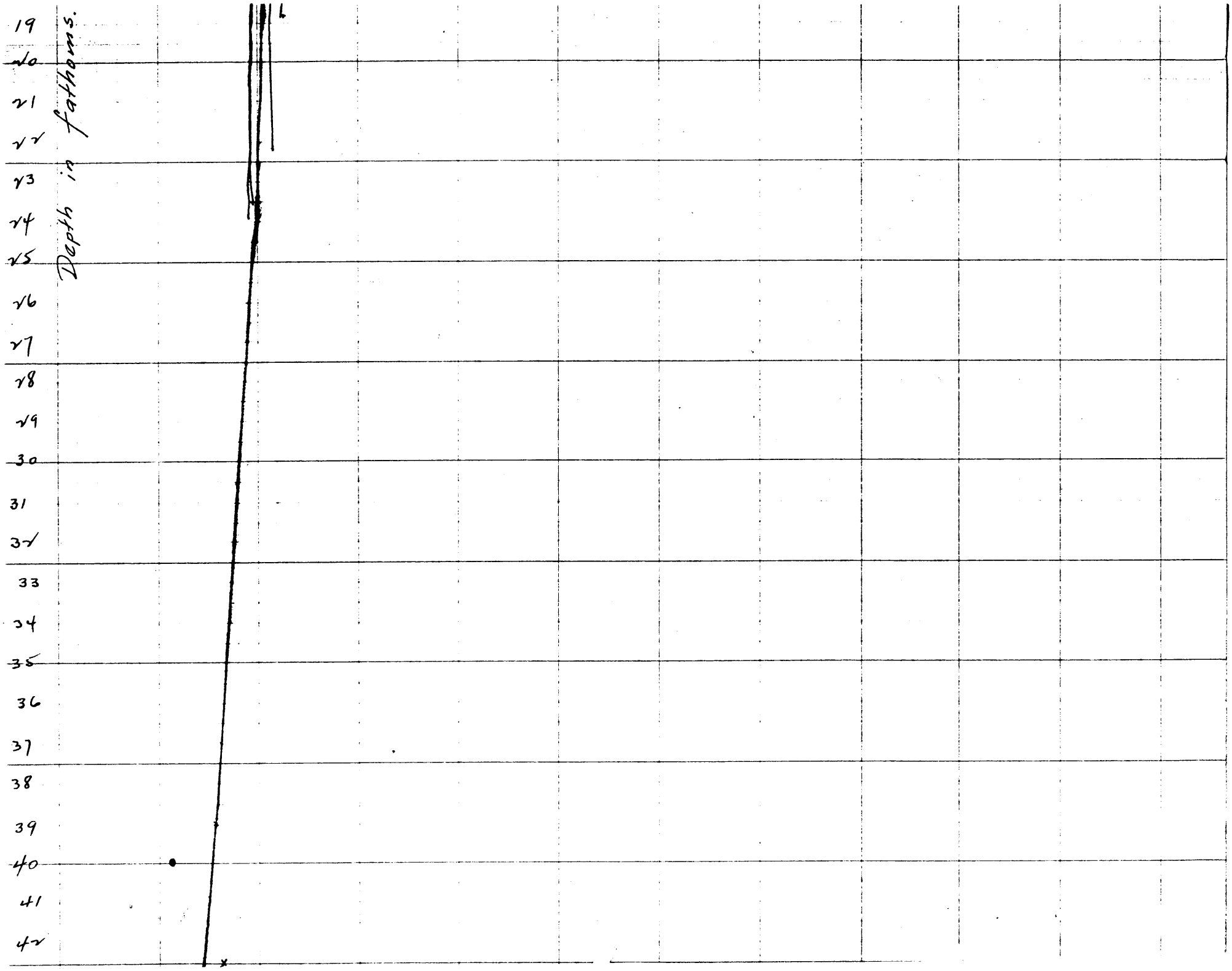
for hydrographic surveys Nos. 4 04

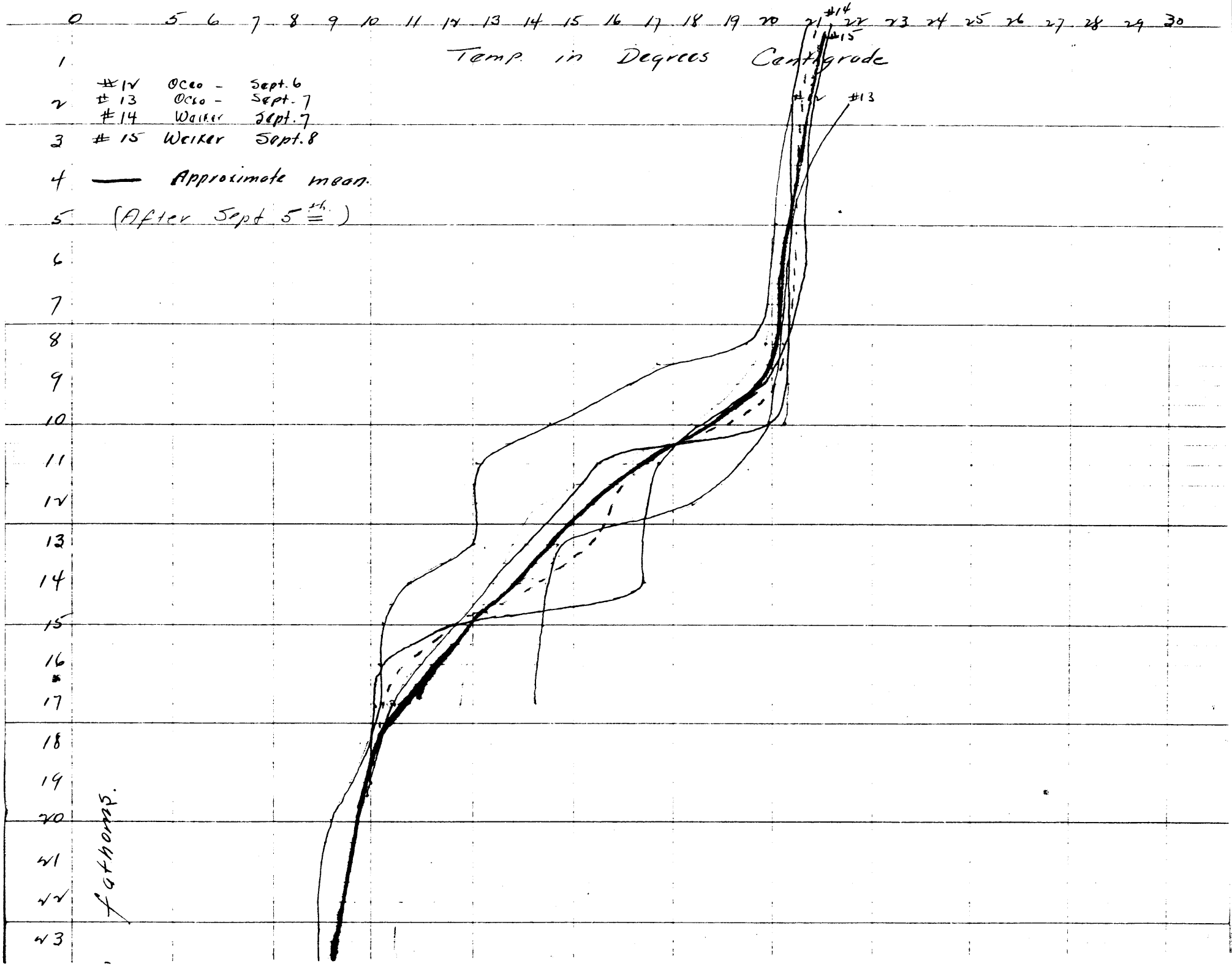
ENGRAVED DIETZGEN CO. N.Y. U.S.A.

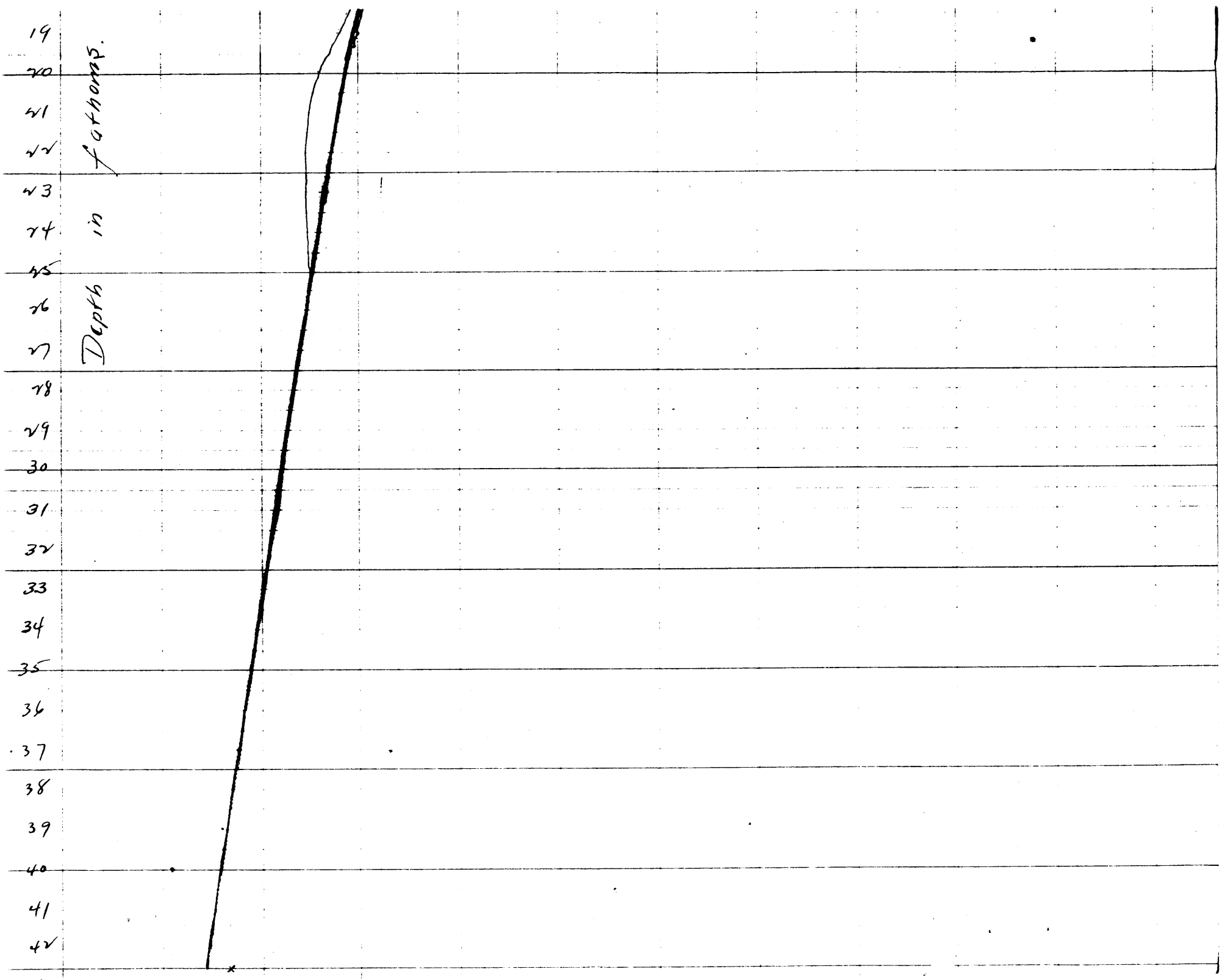

0 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Temp. in Degrees Centigrade
#7 – Oceo – Aug. 31
#8 " Sept. 2
#9 " " 2
#10 Welker Aug. 31st.
#11 Welker Sept 3rd
Approximate mean.
To Sept. 5 (inclusive)
#7
#9
#8
#10
#11
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Depth in fathoms

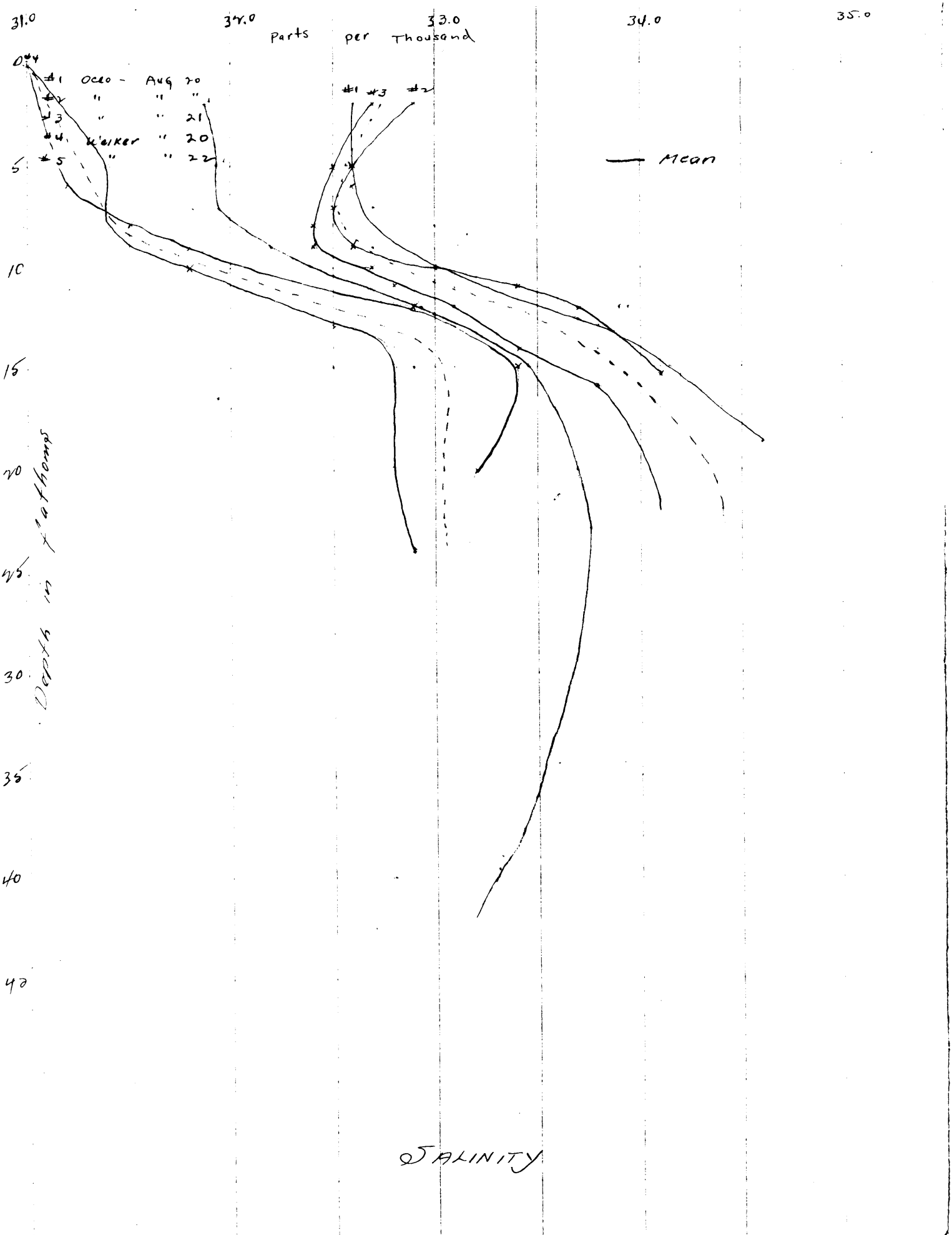

Depth in fathoms
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42

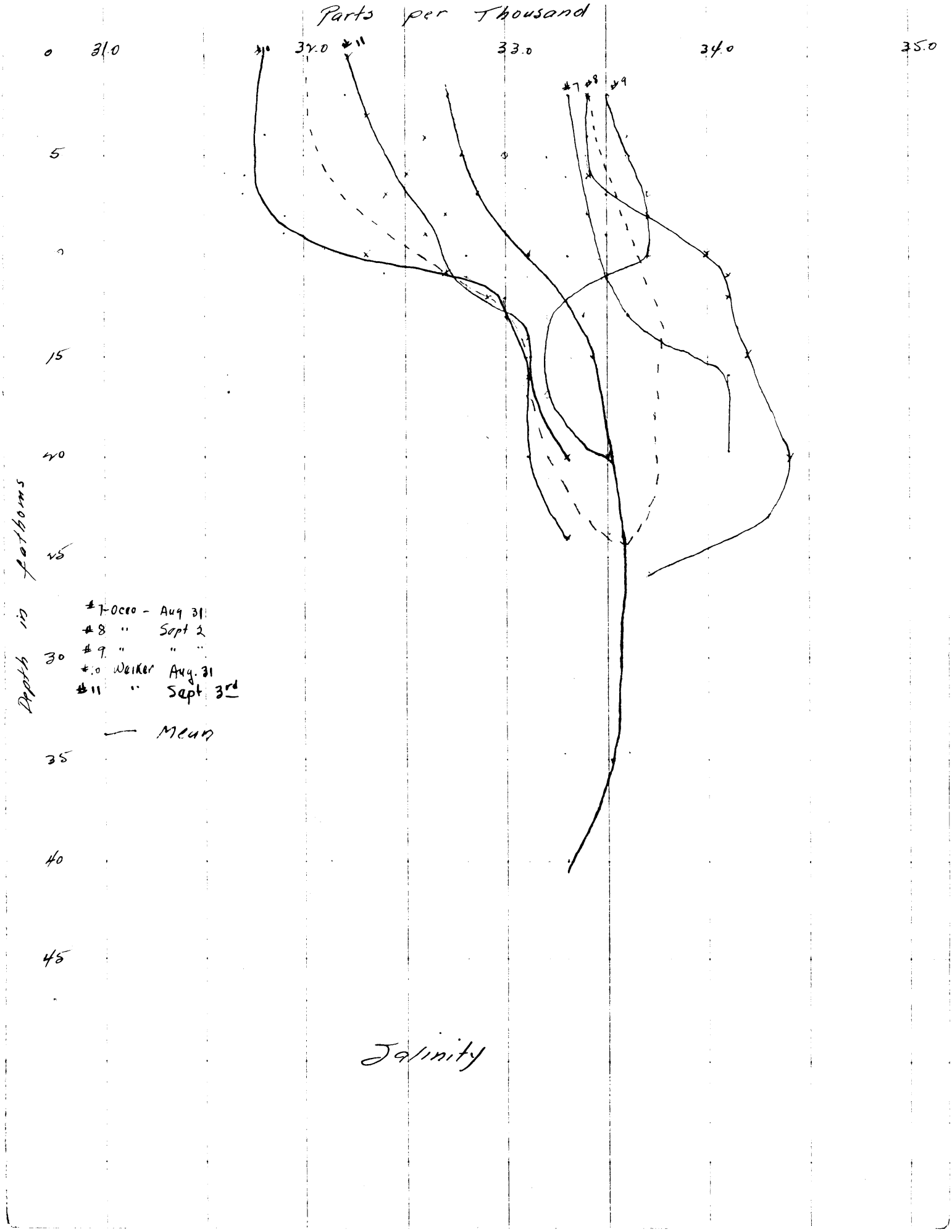

Temp. in Degrees Centigrade
#1- 0000 - Aug. 20
#2- " " "
#3- " " 21
#4- Walker Aug. 20
#5 " " 22
Approximate mean.
To Aug. 22 (inclusive)
in fathoms.

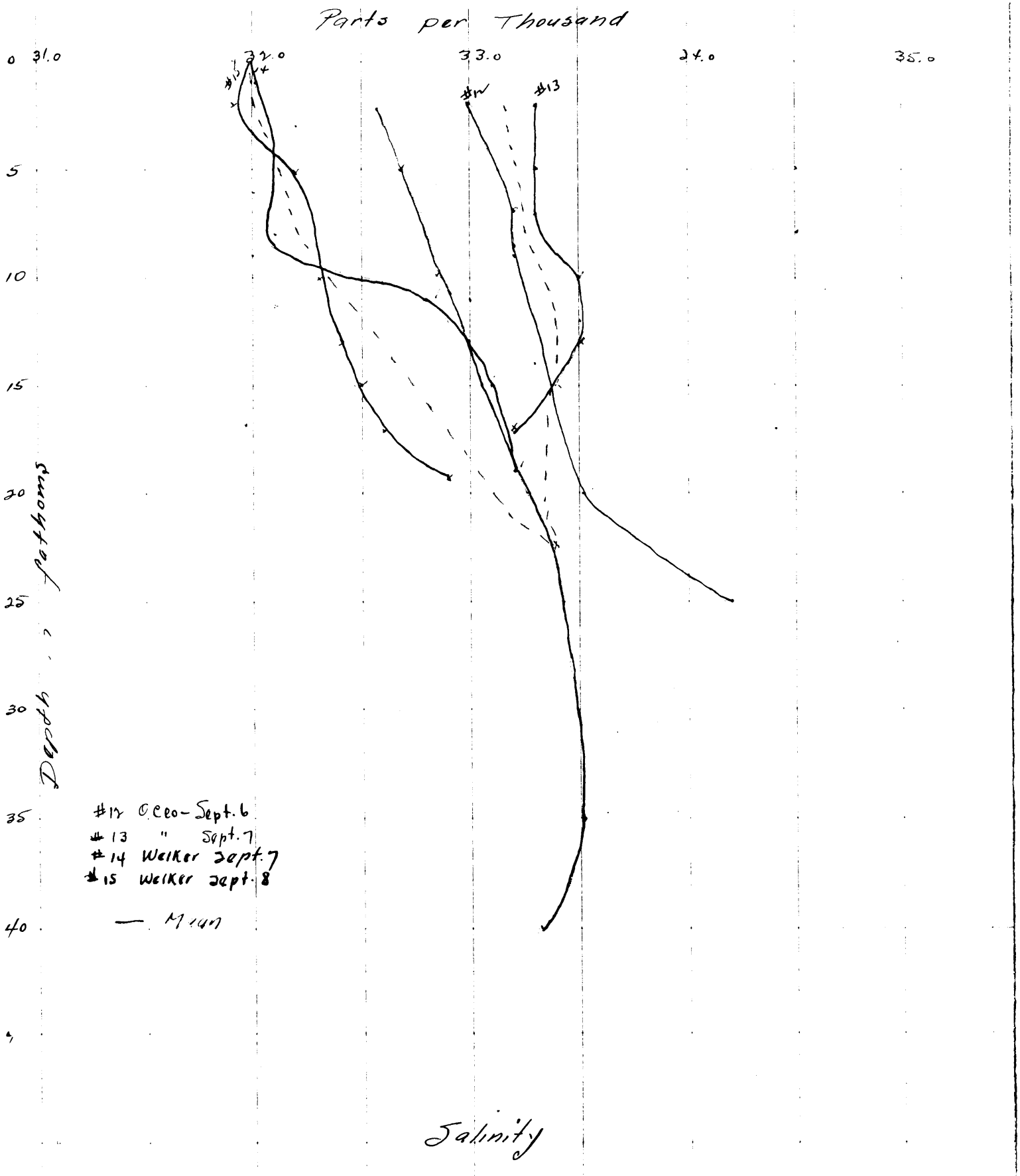

19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
Depth in fathoms.


0 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Temp. in Degrees Centigrade
#14
#15
#13
#12
#12 Oceo - Sept. 6
#13 Oceo - Sept. 7
#14 Walker Sept. 7
#15 Walker Sept. 8
— Approximate mean.
(After Sept 5th)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
Fathoms.


19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
Depth in fathoms.


31.0
32.0
33.0
34.0
35.0
Parts per Thousand
0
#1 Oct 20 - Aug 20
#2 " " "
#3 " " 21
#4 Walker " 20
#5 " " 22
#1 #3 #2
Mean
5
10
15
20
25
30
35
40
45
Depth in Fathoms
SALINITY


Parts per Thousand
0
31.0
32.0
33.0
34.0
35.0
#10
#11
#7
#8
#9
5
10
15
20
25
30
35
40
45
Depth in fathoms
#7-Ocean - Aug 31
#8 " Sept 2
#9 " "
#10 Walker Aug. 31
#11 " Sept 3rd
— Mean
Salinity


Parts per Thousand
31.0
32.0
33.0
34.0
35.0
0
5
10
15
20
25
30
35
40
Depth in Fathoms
#17
#13
#17 Oceo - Sept. 6
#13 " Sept. 7
#14 Walker Sept. 7
#15 Walker Sept. 8
— Mean
Salinity

Field Records Section (Charts)

HYDROGRAPHIC SHEET NO. H6223

The following statistics will be submitted with the cartographer's report on the sheet:

Number of positions on sheet	1067
Number of positions checked	67
Number of positions revised	35 + 30 Pos. replotted.
Number of soundings recorded	11551
Number of soundings revised	72
Number of signals erroneously plotted or transferred	.....

Date: April 12, 1938.

Verification by William R. Jackson Time: 265 hrs.

Review by J. A. McCormick, May 4, 1938 Time: 16 ~~15~~ hrs.

Verification Report on H-6223

R. A. R.

1. The sounding records conform to the requirements of the General Instructions.

   The bomb records should have the "Distances" (meters) entered in the column "For Assumed Velocities" so that when a correction is necessary it may be entered in the column "For Final Velocities." See "D" day, also "F" day (bombs 41-65).

   ~~See~~ Covered in review.

2. The control was started from a three point fix which, although having several repetitions for each angle, did not have a check angle. The traverse starting at the three point fix failed to close on a buoy in a more accurately located scheme by 178 m. in Latitude and 59 m. in Longitude. This fact should be considered when studying the junction (6).

   ✓ Considered.

3. Sounding line crossings are in general satisfactory. Of the eleven discrepancies listed in the D.R. all but ~~four~~ one were rectified, the majority of them by replotting a portion of "F" day.

4. The usual depth curves were drawn except along the junctions where they were left in pencil.

   Inked.

5. The junction with H-6192 (1936) was left in pencil as it was thought a butt junction rather than an overlapping junction should be shown. The soundings from H-6192 are deeper in depths of around 200 ft. and deeper, and shoaler in depths below 200.

   See par. 6b, review.

   The junctions with H-6191 (1936) was left in pencil as the soundings were taken with the 312 type fathometer and are not as reliable as the present survey. It was left to the reviewer to decide whether to make an overlapping or butt junction.

   See par. 6b, review.

   The junction with H-6026 (1936) was partially inked where soundings agreed and the remainder left in pencil, approaching a more or less butt junction.

   Junction satisfactory. Overlap completely inked.

   The junction with H-6188 (1936) was left in pencil except for a few soundings, because it was noticed in making these junctions that in nearly every case the discrepancies could be rectified and the surveys brought into perfect agreement

   Ditto H-6026.

by shifting the present survey, H-6223 (1937), from 150 to 200 meters southward. (See 2.) In the majority of the cases the junction would be greatly improved or in perfect agreement and the remaining cases would make little or no difference.

6. The field plotting was completed to the extent prescribed in the Hydrographic Manual. ✓

7. It was noticed that on "F" day (Pos. 49-80) the arcs from Xray (Xi 2) were short, as clearly indicated by the intersection, the sounding crossings and the bearings. The sound waves from "Watch" were traveling up the valley whereas the sound waves from Xi 2 were traveling in water of approximately half the depth; therefore the velocity from Xi 2 should be greater. It was found that the velocity should be increased from 1485 to 1500 meters per second to give better intersections, to agree with the bearings and to give better crossings. Thus positions 49 to 80 F were re-plotted. ✓

In Latitude 40° 04.7', Longitude 73° 24.5', a sounding of 166 in general depths of 136 has been left in pencil and questioned. Questioned in records. Omitted.

Some of the soundings on turns have been left in pencil as the records did not contain sufficient information to accurately plot them. Omitted where information is indefinite.

Respectfully submitted,

William R. Jackson

William R. Jackson
Asst. Carto. Engr.

April 11, 1938.

HYDROGRAPHIC SURVEY NO. H-6223

Smooth Sheet Yes

Boat Sheet Yes

Sounding Records 7 Vols.
Bomb " 3 "

Descriptive Report Yes

Title Sheet Yes

List of Signals (Offshore)

Landmarks for Charts (Form 567) None

Statistics Yes

Approved by Chief of Party No

Recoverable Station Cards (Form 524) None

Special Chart for Lighthouse Service None
(Circular Nov. 30, 1933)

Remarks HYDROGRAPHY

Total Days 12

Last Date Sept 8 1937

GEOGRAPHIC NAMES

Survey No. H6223

Name on Survey	A, On Chart No. 1215	B, On previous survey No. ~~1215~~	C, On U. S. quadrangle Maps	D From local information	E On local Maps	F P. O. Guide or Map	G Rand McNally Atlas	H U. S. Light List	K	
New York Harbor	✓									1
New York	✓									2
New Jersey	✓									3
										4
										5
										6
										7
										8
										9
										10
										11
										12
										13
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										23
										24
										25
										26
										27

Names underlined in red approved
by GHE on 12/22/37

M 234

FORM M-238

MEMORANDUM

IMMEDIATE ATTENTION

SURVEY
DESCRIPTIVE REPORT } No. H-6223
PHOTOSTAT OF } NoxxTx

received Dec.21,1937
registered Dec.21,1937
verified
reviewed
approved

This is forwarded in order that your attention may be directed to the matters as indicated below. Please initial in column 3 as an acknowledgement that your attention has been thus directed. The complete original records are available if desired. If you cannot give this your immediate attention, please initial, note, and forward to the next section marked, calling for the records at your convenience.

ROUTE		Initial	Attention called to
20			
22			
24			
25			
26			
30			
40			
62			
63			
82			
83			
88			
90			

RETURN TO

82	C. K. Green

✓

RAE

Form 712
DEPARTMENT OF COMMERCE
COAST AND GEODETIC SURVEY
Ed. Feb. 1935

TIDE NOTE FOR HYDROGRAPHIC SHEET

December 27, 1937.

Division of Hydrography and Topography:

✓ Division of Charts: Attention: Mr. E. P. Ellis

Plane of reference
~~Tide Reducers~~ approved in
10 volumes of sounding records for

HYDROGRAPHIC SHEET 6223

Locality Approaches to New York Harbor

Chief of Party: H. A. Seran in 1937
Plane of reference is mean low water reading
4.1 ft. on tide staff at Atlantic City
15.8 ft. below B.M. 32
(Tide assumed to occur 1/2 hour earlier than at Atlantic City).

Height of mean high water above plane of reference is 4.1 feet.

Condition of records satisfactory except as noted below:

Chief, Division of Tides and Currents.

U. S. GOVERNMENT PRINTING OFFICE

Section of Field Records

REVIEW OF HYDROGRAPHIC SURVEY NO. 6223 (1937) FIELD NO. 404

Approaches to New York Harbor, New York - New Jersey
Surveyed in Aug. - Sept. 1937, Scale 1:40,000
Instructions dated April 9, 1936; March 19 and May 8, 1937
(OCEANOGRAPHER)

No. 2 Dorsey Fathometer Soundings. RAR and buoy control.

Chief of Party - H. A. Seran.
Surveyed by - H. Odessey.
Protracted by - J. C. Bull, M. O. Witherbee and E. B. Latham.
Soundings plotted by - M. O. Witherbee and E. B. Latham.
Verified and inked by - W. R. Jackson.

1. Condition of Records.

The records are neat and legible and conform to the requirements of the Hydrographic Manual except as follows:

a. Degree and minute symbols were omitted from values of latitude and longitude on the parallels and meridians. These were added in the office.

b. Assumed velocities were entered in the column for final velocities in the bomb records.

c. Positions were not determined for fathometer comparisons. They were spotted approximately by their relation to controlled lines and in most cases were removed from the sheet in the office because of the uncertainty of position and lack of agreement with adjacent soundings.

The Descriptive Report is complete and satisfactorily covers all items of importance.

2. Compliance with Instructions for the Project.

The survey satisfies the instructions for the project.

3. Shoreline and Signals.

This is an offshore survey and contains no shoreline within its limits.

The buoys used for control were located by a traverse based on sun azimuth and taut wire distances and filed in a cahier under the accession number S-1511.

4. Sounding Line Crossings.

Sounding line crossings are, in general, very good, the agreement in most cases being within two feet. Where the discrepancies exceeded this amount the crossings could usually be improved

by a slight shift of the lines.

5. Depth Curves.

Within the limits of the survey the usual depth curves may be satisfactorily drawn.

6. Junctions with Contemporary Surveys.

a. The junctions with H-6188 (1936) on the southwest and with H-6026 (1936) on the northwest and north are satisfactory.

b. The junctions with H-6191 (1936) on the northeast and with H-6192 (1936) on the southeast are, in general, satisfactory. However, there are differences of as much as 40 feet with depths on the present survey where these 1936 surveys make a common junction with the current work in the vicinity of lat. 39° 58', long. 73° 18'. Some of these differences could be reduced by a shift of lines but others are undoubtedly due to the erratic performance of the Type 312 fathometer used in the 1936 work which resulted in the resurvey of the area covered by the present sheet (see descriptive report, page 1 and review of H-6191 (1936), par. 6c(2)). The greatest differences are confined to the area between lat. 39° 56' and lat. 40° 00'. Within these limits no soundings from the 1936 surveys have been inked in the overlap shown on the 1937 sheet. The present survey should supersede H-6191 (1936) and H-6192 (1936) in the charting of the questionableportion of the overlapping area. Additional soundings from the records of H-6192 (1936) which could not be shown on that survey because of its small scale have been inked in the satisfactory portion of the overlap.

c. There are no contemporary surveys on the south.

7. Comparison with Prior Surveys.

a. H-100 (1842), 1:400,000; H-101 (1844), 1:400,000; H-670 (1859), 1:400,000.

H-670 is a compilation of surveys made prior to 1859 and contains no original information. The other two surveys supplement each other in covering the entire area of the present survey with widely spaced reconnaissance lines. The method of control is undoubtedly based on astronomic observations and dead reckoning. No information from these surveys is now charted in the common area. The present survey, because of its closer development and more accurate control, should supersede the above surveys in futute charting.

b. H-1498a (1881-83), 1:1,200,000; H-1531 (1882) 1:1,200,000; H-2920a (1883-87), 1:1,200,000.

These surveys contain from one to three soundings each within the area of the present survey. They are of no current value and should be superseded for charting purposes by the present survey.

c. H-1538 (1882), 1:40,000; H-1558 (1882-83), 1:300,000; H-1578a (1883), 1:40,000; H-1578b (1883), 1:80,000.

These surveys cover different portions of the present survey. Considered as a group they cover the entire area and are the basic source of the charted information. The method of control is based on dead reckoning. Depths are in fair agreement in many places with those on the present survey but in other places there is evidence of displacement due to the weaker control of the old surveys. The present survey adeuqately covers the common area and should supersede the above surveys in future charting.

8. Comparison with Chart 1215 (New Print dated Aug. 19, 1937), Chart 1108 (New Print dated Aug. 24, 1937).

a. Hydrography.

Within the area of the present survey the charts are based on surveys discussed in the foregoing paragraphs and contain no other information which needs consideration in this review.

b. Aids to Navigation.

There are no navigational aids within the area of the survey.

9. Field Plotting.

The field plotting was generally satisfactory. Revised plottings by the verifier of 35 positions, based on careful adherence to the data in the sounding and bomb records, eliminated practically all of the errors in crossings.

10. Additional Field Work Recommended.

The survey is complete and no additional field work is required.

11. Superseded Old Surveys.

Within the area covered the present survey supersedes the following surveys for charting purposes:

H-100	(1842)	in part	H-1558	(1882-3)	in part
H-101	(1844)	in part	H-1578a	(1883)	in part
H-670	(1859)	in part	H-1578b	(1883)	in part
H-1531	(1882)	in part	H-2920a	(1883-7)	in part.
H-1538	(1882)	in part			

12. Reviewed by - J. A. McCormick, May 4, 1938.

Inspected by - E. P. Ellis.

Examined and approved:

Thos B Reed
T. B. Reed,
Chief, Section of Field Records.

K.T. Adams
Chief, Division of Charts.

Fred. L. Peacock
Chief, Section of Field Work.

G Rude
Chief, Division of H. & T.

Applied to chart 1108 before approval. J.M.A. June 10, 1938.
" " " 1000 " " " " July "