

WOODS HOLE OCEANOGRAPHIC INSTITUTION
Woods Hole, Massachusetts

Reference No. 49-8

ATLANTIS Cruise 151
to Mediterranean Area

Scientific Report No. 2

Bottom Samples and
Underwater Photography

By

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Approved by

C. O. D. Austin
Director

INTRODUCTION

The material presented in this report is preliminary. Further investigation of the bottom photographs is being conducted by Dr. Louis W. Hutchins. A more complete description of the Mediterranean submarine geology, on the basis of mechanical analyses of the sediments, will be made by Mr. Henry C. Stetson.

Dr. Hutchins made many helpful comments on the photographs that follow in this report, and Mr. Stetson was responsible for the preliminary sediment descriptions.

One of the objectives of Cruise 151, covering the period from 7 December 1947 to 18 June 1948, was to obtain as complete a sampling of the sea bottom of the Mediterranean and Aegean Seas as was compatible with the remainder of the scientific program. It was furthermore planned to make concurrent bottom photographs as a means for studying the correlation between bottom sediments and the morphology of the sea floor. The photographs also held the possibility of determining the presence of bottom fauna.

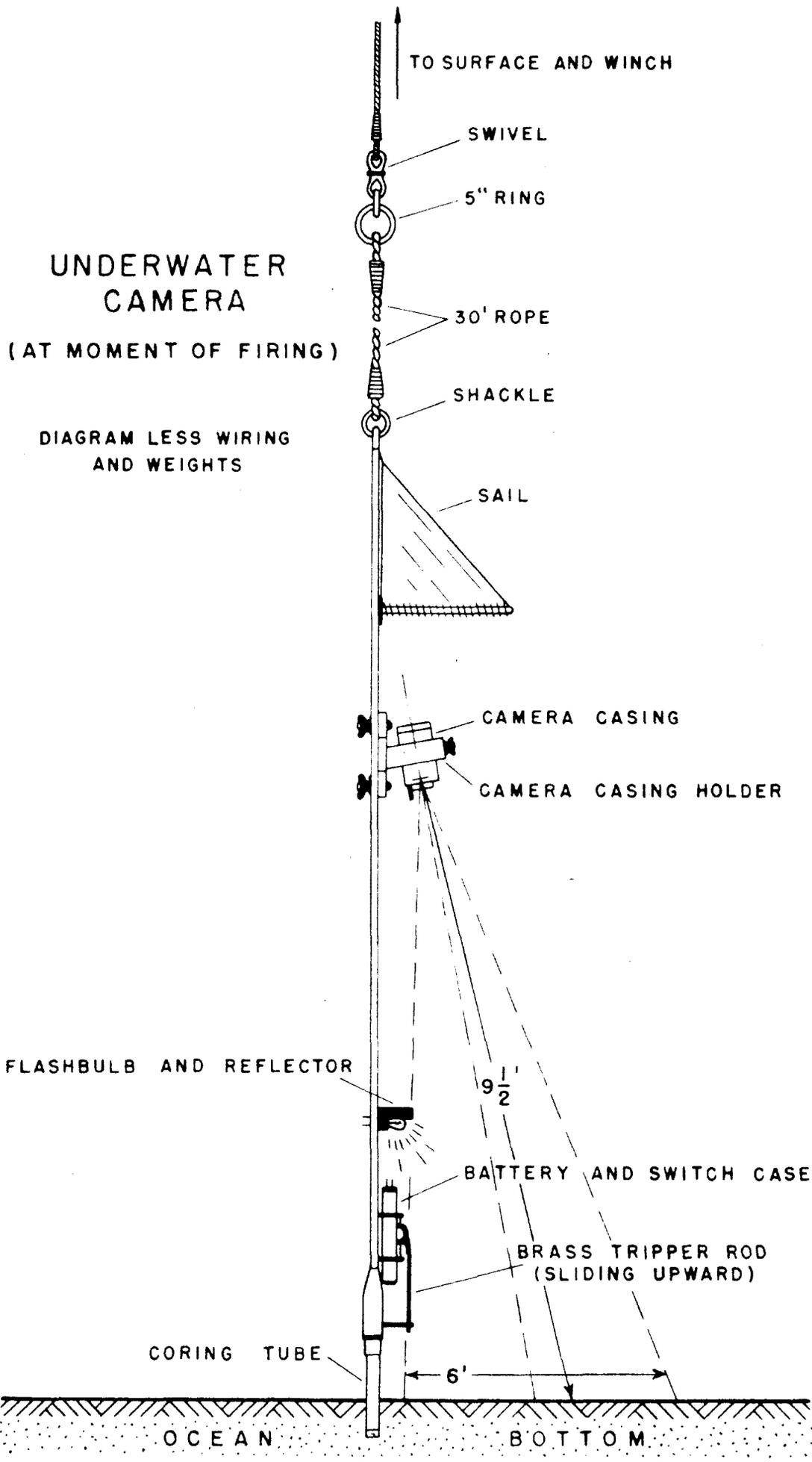
The underwater camera used for this work was loaned to us by Dr. Maurice Ewing of Columbia University. As it was fitted with a one foot long coring tube at the base of its pole a majority of the bottom samples were obtained by the camera itself. The remaining samples were collected with various standard bottom sampling instruments. The following table lists their geographical distribution and types of samplers used, as well as the distribution of the bottom photographs.

<u>Sampler used</u>	<u>Atlantic</u>	<u>Mediterranean</u>	<u>Aegean</u>
Camera	12	37	26
Phleger	$\frac{1}{2}$	1	6
Scoopfish	$\frac{1}{2}$	15	19
BT scoop	1	0	5
Orange Peel	0	1	4
Plankton Net	<u>0</u>	<u>1</u>	<u>0</u>
Total	14	55	60
Photographs	7	39	24

Of the instruments used, the camera corer, Phleger and orange peel samplers required the ship to be hove to. On the other hand, depth of bottom was not a limiting factor since they were always lowered on the 6000 meter hydrographic wire. The orange peel sampler was employed only when the bottom was too hard or rocky for penetration by either of the two coring devices. The scoopfish and BT scoop were lowered on the BT wire, generally while the ship was under way, and, due to their light weight, were effective only to depths of about 75 fathoms.

Since detailed descriptions of the underwater camera can be found in other reports, only a few of the salient features of the rig used on this cruise will be mentioned here. The illumination for each picture was provided by a midget #5 photoflash bulb, protected by a glass carburetor bowl, and fired by the bottom sampling mechanism at the base of the pole. Synchronized with the flashlight is the shutter of the camera, which is enclosed in a pressure proof case mounted approximately $9\frac{1}{2}$ feet from the ocean bottom at the moment of tripping. The area covered by the resulting picture is approximately 6 feet in diameter. The accompanying diagram shows the complete camera rig.

Several techniques employed in the operation of the camera proved valuable in preventing physical damage to the instrument in the course of the lowering. For instance, in



**UNDERWATER
CAMERA**

(AT MOMENT OF FIRING)

DIAGRAM LESS WIRING
AND WEIGHTS

TO SURFACE AND WINCH

SWIVEL

5" RING

30' ROPE

SHACKLE

SAIL

CAMERA CASING

CAMERA CASING HOLDER

FLASHBULB AND REFLECTOR

BATTERY AND SWITCH CASE

BRASS TRIPPER ROD
(SLIDING UPWARD)

CORING TUBE

6'

9 1/2'

OCEAN

BOTTOM



Inserting Ewing under-
water camera in pressure-
proof aluminum casing.



order to avoid kinks in the wire when too much of it is piled on the bottom, a 30-foot line and a swivel were interposed between it and the camera pole. A 6-inch ring between the line and the wire was an effective guard against jamming the shackle into the snatchblock which was lowered from the cargo boom to hoist the pole over the side in vertical position. When the ship is not rolling appreciably a stick, held against the outgoing wire, has been used to determine the instant of striking bottom down to depths of 1950 meters. The winch was always run at slow speed for a few hundred meters before the camera was expected to hit bottom and for a similar period when beginning to retrieve the instrument. In the former case, this reduces the downward motion of the camera during exposure and lessens the shock and vibration produced by hitting bottom. In the latter case the danger of fouling the camera pole with the line or wire is reduced considerably.

Over 80% of the camera lowerings made were successful, with a majority of misfires due to failures in the wiring system or leakage in the flash bulb housing. As the cruise progressed and more experience was acquired in the use of the instrument and in determining possible sources of trouble, results improved markedly, particularly at depths greater than 1000 fathoms.

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Some of the more noteworthy results of the cruise are discussed in the following paragraphs.

In the course of two Atlantic Ocean crossings, the Mid-Atlantic Ridge area yielded 5 one foot cores to the undersea camera, 2 from one section of the Ridge itself and the remainder straddling the mountain range to a maximum depth of 3026 fathoms. The former consisted of Globigerina ooze while the latter were largely soft brown mud alone.

Ampere Bank, west of Gibraltar, received some degree of attention. The scoopfish, BT scoop, and Phleger core sampler could extract only a few grains of sand and shell from the apparently hard bottom at 25 fathoms. Approaching Gibraltar one day later, the camera obtained a very soft brown mud core from 2287 fathoms

Alboran Sea, east of the Strait of Gibraltar, gave cores of Globigerina ooze which were dark brown at the top and gray near the bottom. The Strait of Sicily was widely sampled with the undersea camera and scoopfish. At depths from 35 to 85 fathoms the scoopfish obtained coral, while it brought up shell and gravel from 89 fathoms, sand and gray and brown mud from 95 fathoms. Use of the camera resulted in cores of sand and shell in 92 fathoms, gray sand in 208 fathoms, gritty light brown and gray mud in 310 fathoms. The eastern Mediterranean bottom was pre-

dominantly light brown and gray mud, seeming to contrast with a darker brown mud in the western part of the Sea.

In the Aegean Sea it is difficult at this time to compare bottom sediment types of individual localities. It can be said, however, that deep water sediments were predominantly soft brown mud, becoming sandy mud, shell, sand, or coral in shallow or inshore waters. The deepest coral observed lay on a 77 fathom bank 15 miles east of Skiros Island. The bottom in the vicinity of the Dardanelles entrance consisted almost entirely of gray ~~sand~~, shell, and coral at an average depth of 45 fathoms. Operations off the island of Lesbos revealed brown or gray mud outside the 100 fathom curve, sand, and shells further inshore.

Although many cores contained mud of two colors in distinct layers, only one, from the eastern Mediterranean, was composed of three muds. From top to bottom (one foot), light brown, green, and gray made up this unusual combination. Several specimens of Scaphopods were found in this sample, taken in 1900 fathoms.

The first two camera lowerings out of Woods Hole, on 7 December, were made in 21 and 53 fathoms respectively with the Bathythermograph winch. The resulting bottom pictures were unclear, possibly due to either muddy water near the bottom, or camera trouble not ascertained as yet. Lowering number three, however, made in 1000 fathoms on the

Continental Shelf, caught a sea spider, three brittle starfish, and numerous tracks and holes in the bottom. This is perhaps the outstanding bottom photograph of the cruise. This and all subsequent lowerings were made with the hydrographic winch.

Two attempts to photograph the crest of the Mid-Atlantic Ridge met with failure. This was partially compensated for by one of the subsequent lowerings, east of the Ridge, when a photograph at the record breaking depth of 2287 fathoms was obtained. The capabilities of the camera rig were clearly demonstrated in this instance as success was achieved despite unfavorable wind and sea conditions resulting in a wire angle of 50°. On the return trip across the Atlantic an even greater depth of 3026 fathoms was attained. This picture shows a number of ovoid objects as yet not positively identified, which resemble sponges.

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The following table is a combined list of the bottom samples and photographs obtained, together with their positions and a brief description of the sediments. The latter are also plotted on the accompanying set of four charts. A few selected bottom photographs are appended. These include a description of the sediment texture and of the life existing on the bottom.

ATLANTIC OCEAN

Sample No.	Photo No.	Depth-Fathoms	Latitude	Longitude	Sediment Description
	3	1000	39-46 N	70-50 W	-
1	-	940	31-15	41-30	Globigerina ooze
2	-	1773	32-28	30-04	" "
3	-	1975	34-35	16-11	Stiff " "
4	-	35	35-03	12-55	Shell sand from apparently hard
5	-	25	35-03	12-55	Same as previous sample bottom
6	5	2287	35-22	10-23	Stiff brown clay
122	70	707	35-17	07-25	Glob. ooze, some clay
123	-	2418	34-10	10-30	Soft brown mud, Foraminifera
124	-	2387	30-07	17-27	Soft brown mud
125	-	2912	26-36	30-09	" " "
126	71	2475	25-14	41-32	Glob. ooze, some clay
127	72	2808	27-25	50-23	Soft brown mud
128	73	3026	30-37	59-07	" " "
129	-	1674	36-42	67-57	Sandy mud
-	69	150	35-53	05-59	-

GENERAL MEDITERRANEAN

7	6	1570	38-26 N	05-33 E	Brown mud
8	-	880	38-17	09-31	Brown clay
9	7	400	36-28	12-55	Stiff brown clay
70	35	2174	35-46	28-28	Stiff brown mud
71	36	1019	35-34	29-49	Soft brown mud
72	37	1560	34-03	30-12	Brown mud
73	38	1290	32-59	30-28	Stiff brown clay
74	39	354	32-06	30-41	" " "
75	40	437	32-06	32-05	" " "
76	-	345	31-49	33-29	Soft brown mud
77	-	718	32-42	32-43	" " "
78	41	1336	33-32	32-09	" " "
79	42	728	33-17	34-59	Stiff brown clay

GENERAL MEDITERRANEAN (cont'd)

Sample No.	Photo No.	Depth-Fathoms	Latitude	Longitude	Sediment Description
80	43	587	35-08 N	34-56 E	Stiff brown clay
81	44	310	36-02	35-03	Soft brown mud
82	45	577	35-47	33-30	Mud
83	46	1498	34-24 N	29-34 E	Soft brown mud
84	-	1510	32-33 N	26-03 E	" " "
85	-	437	32-05	25-16	" " "
86	-	87	32-16	23-58	Sandy mud
87	-	302	32-48	23-13	Glob. ooze, brown clay
88	-	978	33-44	23-18	Soft brown mud
89	48	1914	36-01	21-37	Brown mud
90	49	1773	37-49	19-19	Very soft brown mud
91	50	1810	34-58	19-24	Soft brown mud
92	51	374	31-37	17-32	" " "
93	52	364	32-30	15-49	Foraminifera ooze, brown clay
94	53	754	33-52	15-47	" " " "
95	-	296	35-06	15-44	Brown clay, Foraminifera
96	54	1893	36-27	15-48	Sandy brown mud
116	63	1518	37-26	07-03	Soft brown mud
117	64	1357	38-51	03-27	Foraminifera ooze, clay matrix
118	65	1513	37-15	01-30	Soft brown mud
119	66	1352	35-59 N	00-53 W	Glob. ooze, few clay minerals
120	67	1050	36-08	02-21	" " " " "
121	68	733	36-01 N	03-58 W	" " " " "

STRAIT OF SICILY

97	55	98	36-48 N	12-54 E	Foraminifera ooze, brown clay
-	56	65	36-25	11-43	-
98	57	92	37-03	11-51	Shell sand
99	58	310	37-12	11-34	Foraminifera ooze, brown clay
100	59	48	37-18	11-33	Shell gravel, algae
101	-	35	37-17	11-32	Algal fragments

STRAIT OF SICILY (cont'd)

Sample No.	Photo No.	Depth-Fathoms	Latitude	Longitude	Sediment Description
102	-	95	37-08 N	11-11 E	Mud and shell sand
103	-	45	37-24	11-26	Shell gravel, algae, little mud
104	-	45	37-24	11-26	" " " "
105	-	45	37-24	11-26	Shell sand, algae
106	60	55	37-18	11-07	Shell sand
107	-	85	38-15	11-32	Shell sand, algae
108	-	75	38-14	11-31	Shell gravel, algae
109	-	75	38-13	11-29	" " "
110	-	89	38-08	11-19	Shell sand
111	61	208	38-22	11-23	Foraminifera ooze, brown clay
112	62	75	38-14	11-31	Shell sand and Foraminifera, algae
113	-	75	37-44	11-00	Shell sand, algae
114	-		37-43	11-01	" " "
115	-		37-26	11-09	Shell sand

AEGEAN SEA

10	8	200	37-09 N	23-38 E	Soft brown mud
11	9	185	38-56	24-18	Brown mud
12	10	692	39-35	23-53	Stiff brown mud
13	-	58	40-23	25-25	Sandy mud
14	-	58	40-23	25-25	" "
15	11	470	40-14	24-42	" "
16	-	59	38-35	26-16	Sandy mud and shell fragments
17	12	110	38-50	25-52	Sandy mud
18	-	65	39-52	26-00	Shell gravel
19	-	88	39-19	25-59	Sandy mud
20	-	115	39-19	26-00	Silty glob. ooze
21	-	112	39-21	26-03	Sandy mud
22	-	408	39-04	24-54	Soft brown mud
23	-	65	39-05	25-56	Sandy mud and shell sand
24	-	65	38-56	25-14	Shell sand

AEGEAN SEA (cont'd)

Sample No.	Photo No.	Depth-Fathoms	Latitude	Longitude	Sediment Description
25	-	77	38-52 N	25-00 E	Shell sand
26	-	150	38-51	24-59	Mud and fine sand
27	-	63	39-12	25-13	Glob. ooze, brown mud
28	13	78	38-54	25-24	Sandy mud, coral
29	-	157	38-23	25-55	Brown mud and Foraminifera
30	14	603	37-50	26-25	Stiff brown clay
31	-	372	37-59	25-31	Soft brown mud
32	-		Piraeus Harbor		Muddy sand
33	15	210	38-32	24-54	Stiff brown clay
34)	16	57	39-05	25-58	Fine sand, mud
35)		57	39-05	25-58	" " "
36	17	140	39-04	25-56	Fine mud
-	18	60	39-07	25-55	-
37	19	113	39-06	25-53	Fine mud
38	-	58	39-40	25-51	Shells
39	-	38	39-44	25-53	Sand and mud
40	-	28	39-46	25-54	Shell sand
41	20	45	39-58	25-47	Sand and mud
42	21	465	40-18	25-45	Soft greenish mud
43	22	365	40-24 N	26-02 E	Soft brown mud
44	-	32	40-32 N	26-08 E	Sand and mud
45	-	37	40-10	26-6	Sand, with shell fragments
46	-	41	40-05	26-04	Shell sand, coral
47	23	28	39-47	26-00	Very sandy mud
48	-	42	40-16	26-11	Mineral sand, shell & gravel fragments
49	-	40	40-13	26-03	Fine sand, little mud
50	-	48	40-14	26-04	Fine sand, little mud
51	-	48	40-18	26-07	Algal coating on pebbles (coral)
52	24	360	40-28	26-25	Soft brown mud
53	25	868	40-15	25-18	Soft mud
54	-	38	40-06	25-37	Sandy mud
55	-	11	40-04	25-37	Fine sand
56	26	39	40-04	25-46	Very sandy mud

AEGEAN SEA (cont'd)

<u>Sample No.</u>	<u>Photo No.</u>	<u>Depth-Fathoms</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Sediment Description</u>
57	27	47	39-47 N	25-41 E	Very sandy mud
58	28	64	37-54	24-33	Sandy mud, coral
59	-	37	36-25	23-08	Shell sand
60	-	75	35-59	23-09	Algae, Foraminifera, mud
61	-	253	35-51	23-16	Sandy mud
62	29	545	35-49	23-27	Brown mud
63	-	83	37-31	23-49	Shell sand
64	-	68	37-29	23-44	Shell sand
65	-	40	37-47	23-37	Shell gravel, algae (coral)
66	30	556	36-16	24-18	Soft brown mud
-	31		35-31	24-47	-
67	32	1009	35-55	25-16	Soft brown mud
68	33	426	36-09	26-53	Fine mud
69	34	582	35-21	26-40	Brown mud

Discussion of Bottom Photographs

From the biological viewpoint, evidence of deep sea life existing on the bottom consisted mainly of tracks, holes of varying sizes and shapes, burrows, worm excavations and excretions, mounds, and "nobs" of undetermined origin. Acting on the assumption that the underwater camera did not telegraph its approach to the bottom fauna, inducing them to flee, it would seem that the creatures spend a great deal of their time in their burrows, since few were caught in the photographs.

The biologist is hard pressed in most cases to say what sort of animal the evidence indicates, since the possibilities are numerous. For obvious reasons, in the past deep sea bottom inhabitants have not been observed in their natural surroundings and literature on the subject is scarce. There is also the possibility that the creature is unknown to science, never taken in a dredge.

Obviously, the ideal situation would involve a dredge sample accompanying each bottom picture. The present core tube mounted on the camera pole samples a very small area, about 1-3/8 inches in diameter. On Cruise 151 no animals, or fragments of marine life were obtained in this manner.

At least 50% of all pictures taken in 800 fathoms or less revealed holes of approximately one-half inch in dia-

meter, the percentage increasing with shallowness. Holes of varying sizes and shapes generally were found in bottoms of stiff clay or mud, 42% of smaller holes under 200 fathoms. This was the most common sign of activity on the deep sea bottom, followed by snail, worm, or fish fin tracks occurring in 12% of all pictures made in 2000 fathoms, increasing to 45% between 200 and 400 fathoms. 38% of the tracks, regardless of source, occurred between 200 and 400 fathoms. The following table gives an overall indication of the frequency of bottom activity at differing depths.

Depth (fathoms)	Total shots	Life freq.	Plants animals	Other Signs of Life			Depres- sions
				Tracks	Small Holes	Large Holes	
0-100	14	14	8	-	7	1	1
101-200	5	5	2	-	4	0	0
201-400	11	10	3	5	6	4	0
401-600	9	9	0	4	4	1	2
601-800	6	6	1	1	3	2	1
801-1000	2	2	0	0	0	1	-
1001-1500	8	6	2	2	2	0	2
1501-2000	8	6	0	1	0	0	1
2001-2500	3	3	1	0	0	0	2
2501-3000	2	2	1	0	0	0	0

The Mediterranean is notoriously low in animal life, particularly expressed in terms of bottom fauna by R. Sparck in reports of the Danish Oceanographical Expeditions of 1908-10. This fact may be explained by

the high salinity and scarcity of nutritive material in Mediterranean waters, with only slightly better conditions existing the Aegean. Shallow coastal regions are more conducive to animal and plant life than mid-ocean depths.

The previous table was compiled from a list of the photographs taken in the Atlantic, Mediterranean, and Aegean Seas on Cruise 151. The following two tables will attempt to make a comparison of animal and plant life activity found in the Mediterranean and Aegean Seas. Although bottom photographs have been made in the Atlantic Ocean during past "ATLANTIS" cruises, they are not available at this time and cannot be combined with the seven made during Cruise 151 to form a comparison with the Mediterranean and Aegean Seas.

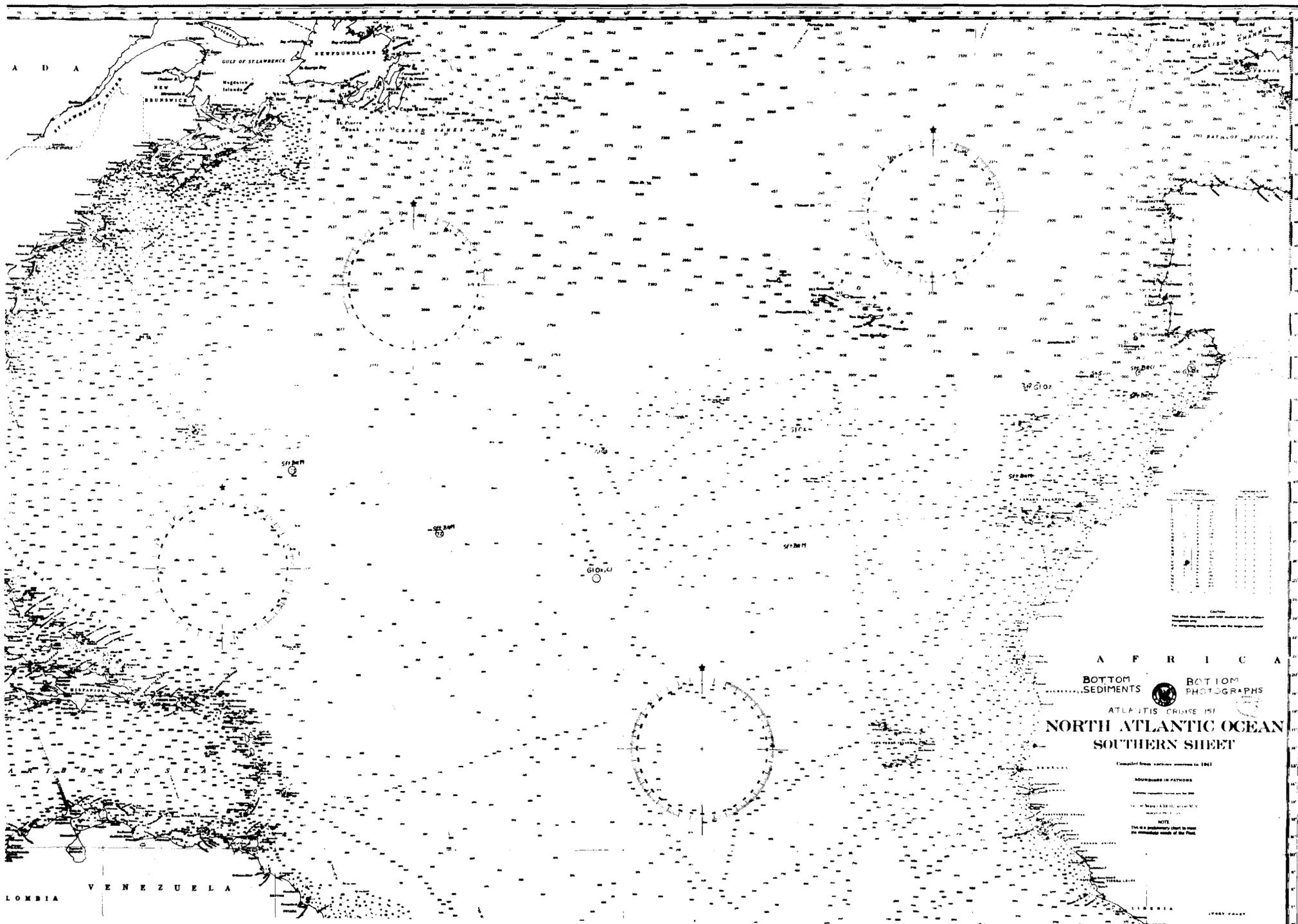
MEDITERRANEAN SEA

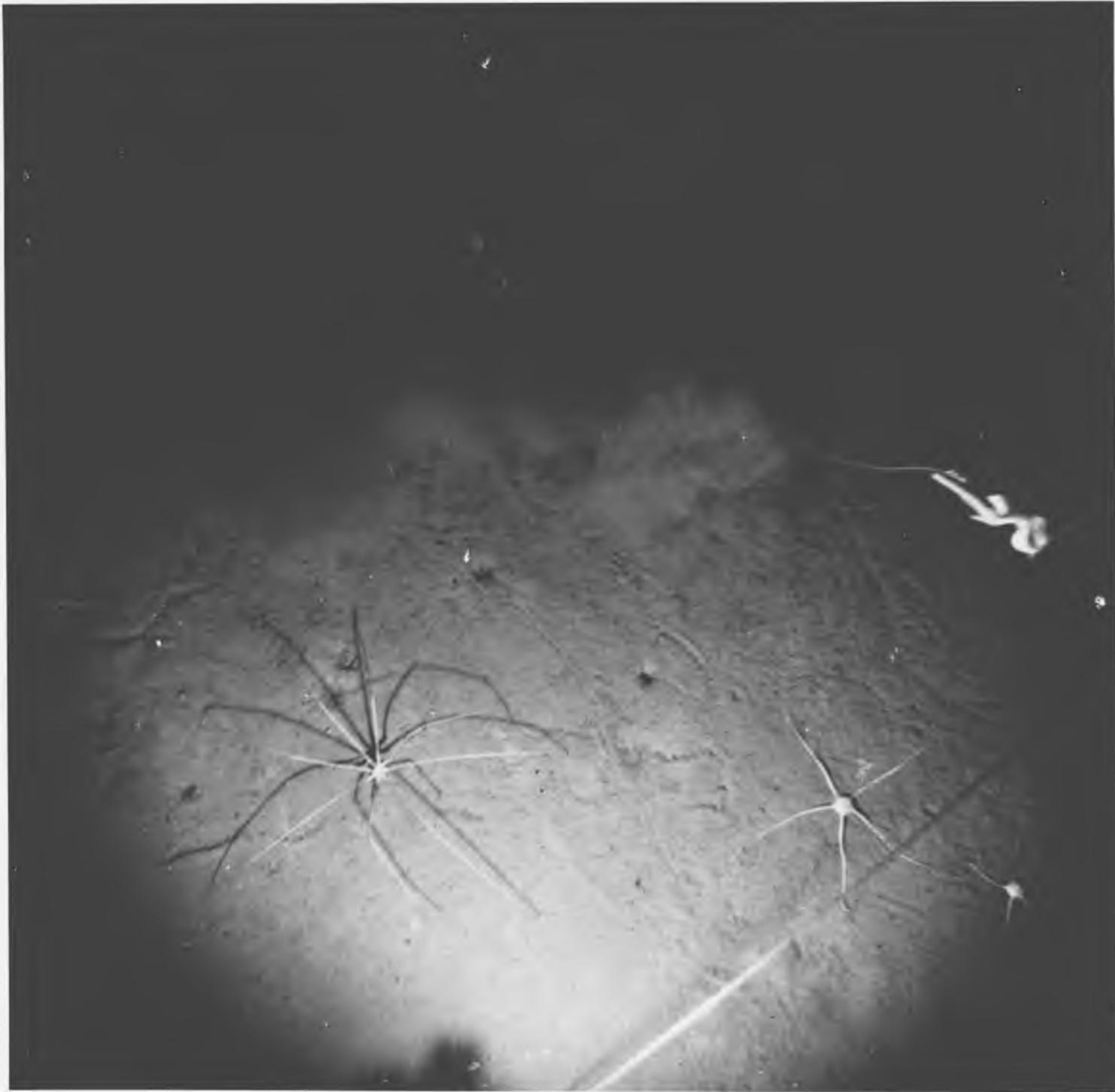
Depth (fathoms)	Total shots	Life freq.	Plants animals	Other Signs of Life			Depres- sions
				Tracks	Small holes	Large holes	
0-100	6	6	5	0	2	1	0
101-200	0	0	-	-	-	-	-
201-400	6	6	2	2	4	4	0
401-600	3	3	0	1	2	1	0
601-800	3	3	0	0	1	0	1
801-1000	0	-	-	-	-	-	-
1001-1500	7	5	1	0	1	-	1
1501-2000	8	6	0	0	0	-	1
2001-2500	1	1	0	0	0	-	1
2501-3000	0	-	-	-	-	-	-

AEGEAN SEA

Depth (fathoms)	Total shots	Life freq.	Plants animals	Other Signs of Life			
				Tracks	Small holes	Large holes	Depres- sions
0-100	8	8	3	0	7	0	1
101-200	4	4	1	0	4	0	0
201-400	5	4	1	3	2	0	0
401-600	6	6	0	3	2	0	2
601-800	2	2	0	0	1	2	0
801-1000	1	1	0	0	0	1	0
1001-1500	1	1	1	1	0	0	1
1501-2000	0	-	-	-	-	-	-
2001-2500	0	-	-	-	-	-	-
2501-3000	0	-	-	-	-	-	-

The descriptions which accompany the following pictures include the depth, calculated field of view for the particular camera lens, brief description of the core sample (if obtained with the picture), and the possible biological significance. A more detailed comparison of the bottom sediments cannot be given at this time until mechanical analyses are completed.





Bottom Photo #3

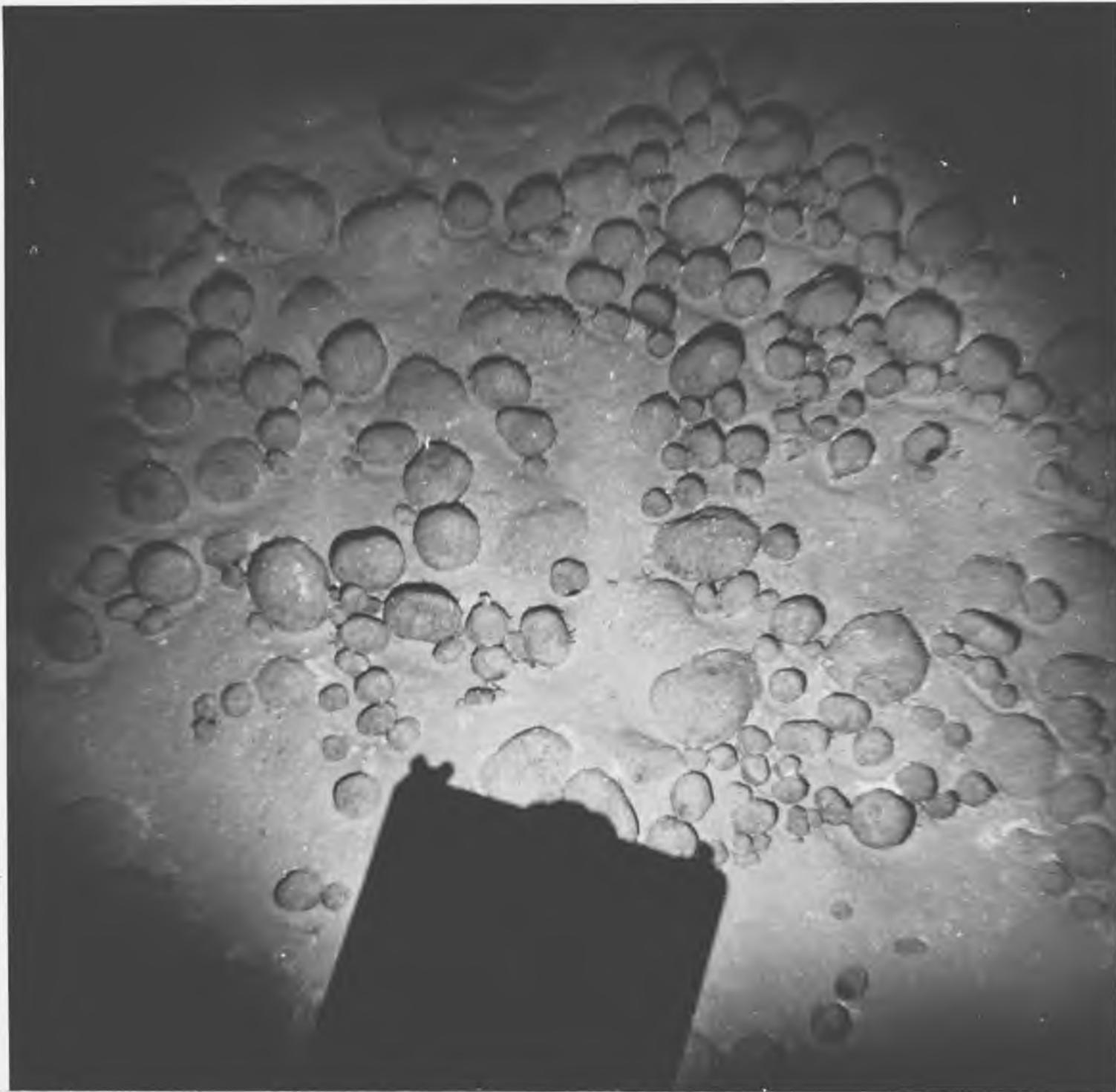
Depth 1009 fathoms.

Lat. 39-46'N
Long. 70-50'W

Field of view six feet

Pycnogonid (Sea Spider) measuring 28 inches lower left; three
Brittlestars.

Bottom sample not taken.



Bottom Photo #73

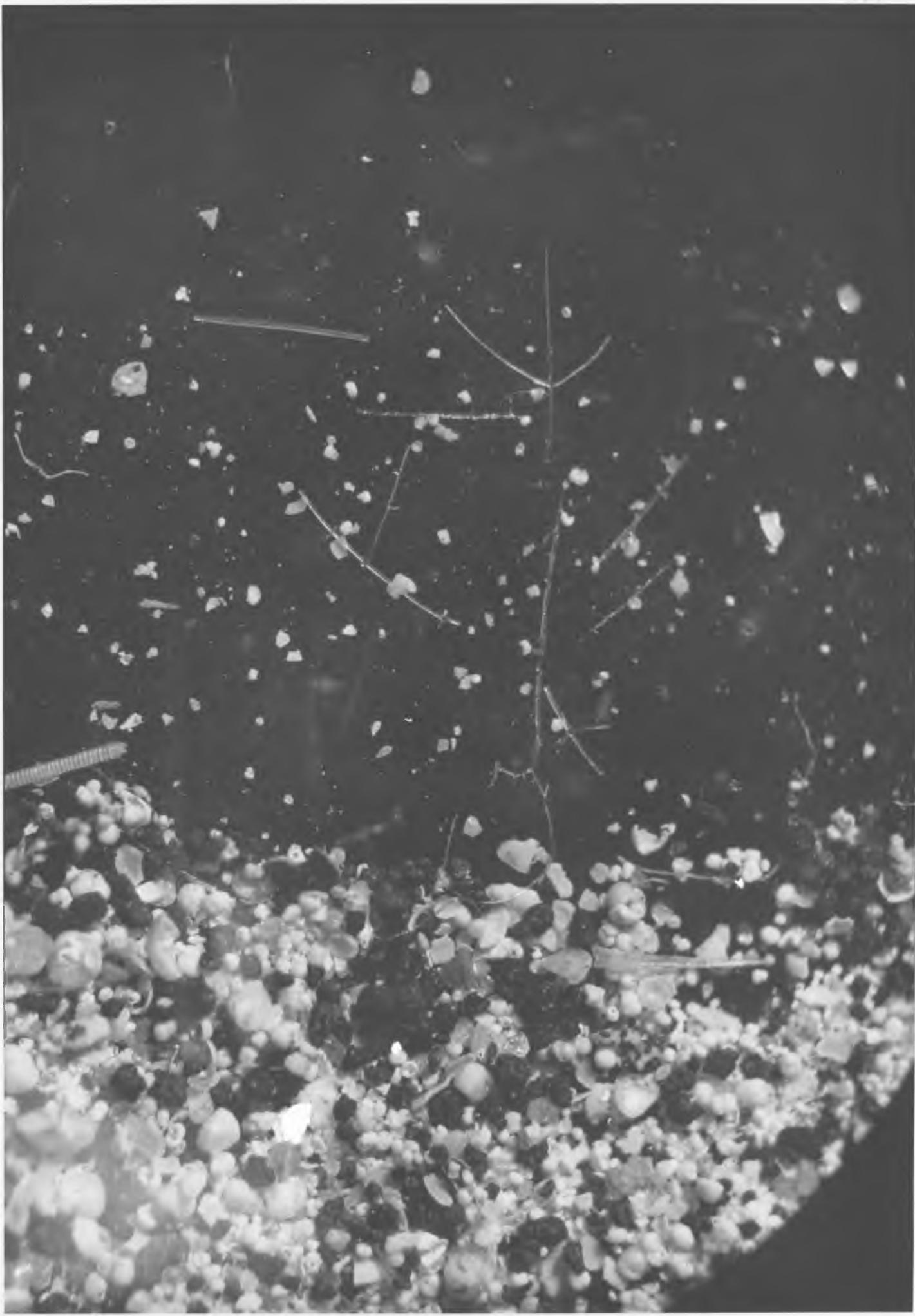
Depth 3026 fathoms

Lat. 30-37'N

Field of view six feet

Long. 59-07'W

Deepest underwater photograph showing clusters of approximately five inch diameter objects on a very soft bottom of brown mud. They are thought to be sponges, from their size, shape and presence of dark spots on several corresponding to vascular openings on actual sponges. The most conclusive evidence in favor of sponges is the presence of sponge spicules in the core sample --- a photomicrograph of which is shown on the next page, with a few Foraminifera shells.

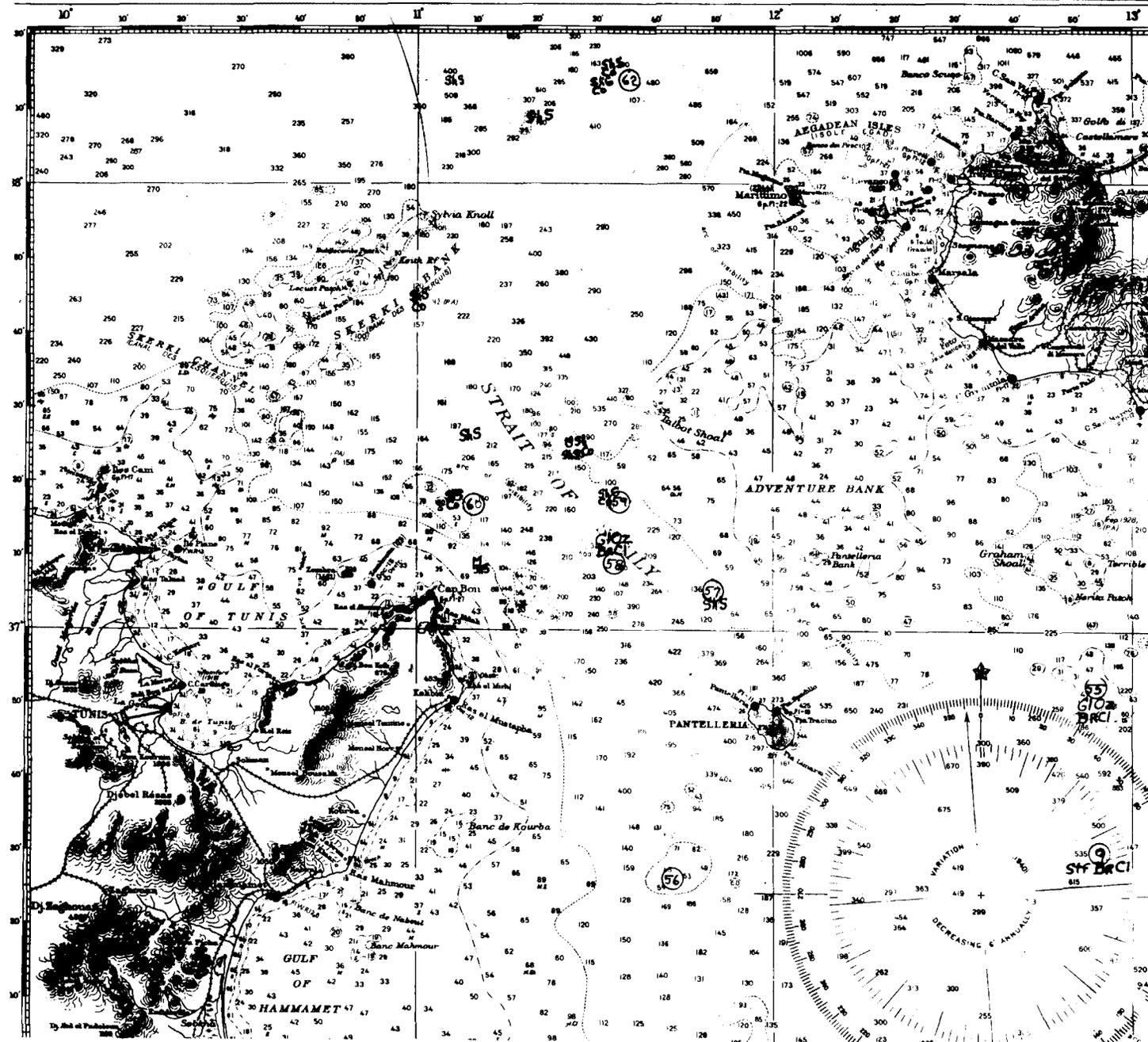


No. 3920

Fykes 60 scale

BOTTOM PHOTOGRAPHS
BOTTOM SEDIMENTS (60)

ATLANTIS CRUISE 151





Bottom Photo #62

Lat. 38-14'N
Long. 11-31'E

Depth 73 fathoms

Field of view six feet

Gorgonians and sponges

Bottom Sample #112; shell sand, Foraminifera and algae



Bottom Photo #14

Depth 603 fathoms

Lat. 37-50'N
Long. 26-25'E

Field of view six feet

Two inch holes of undetermined origin

Bottom Sample #39; stiff brown clay



Bottom Photo #39

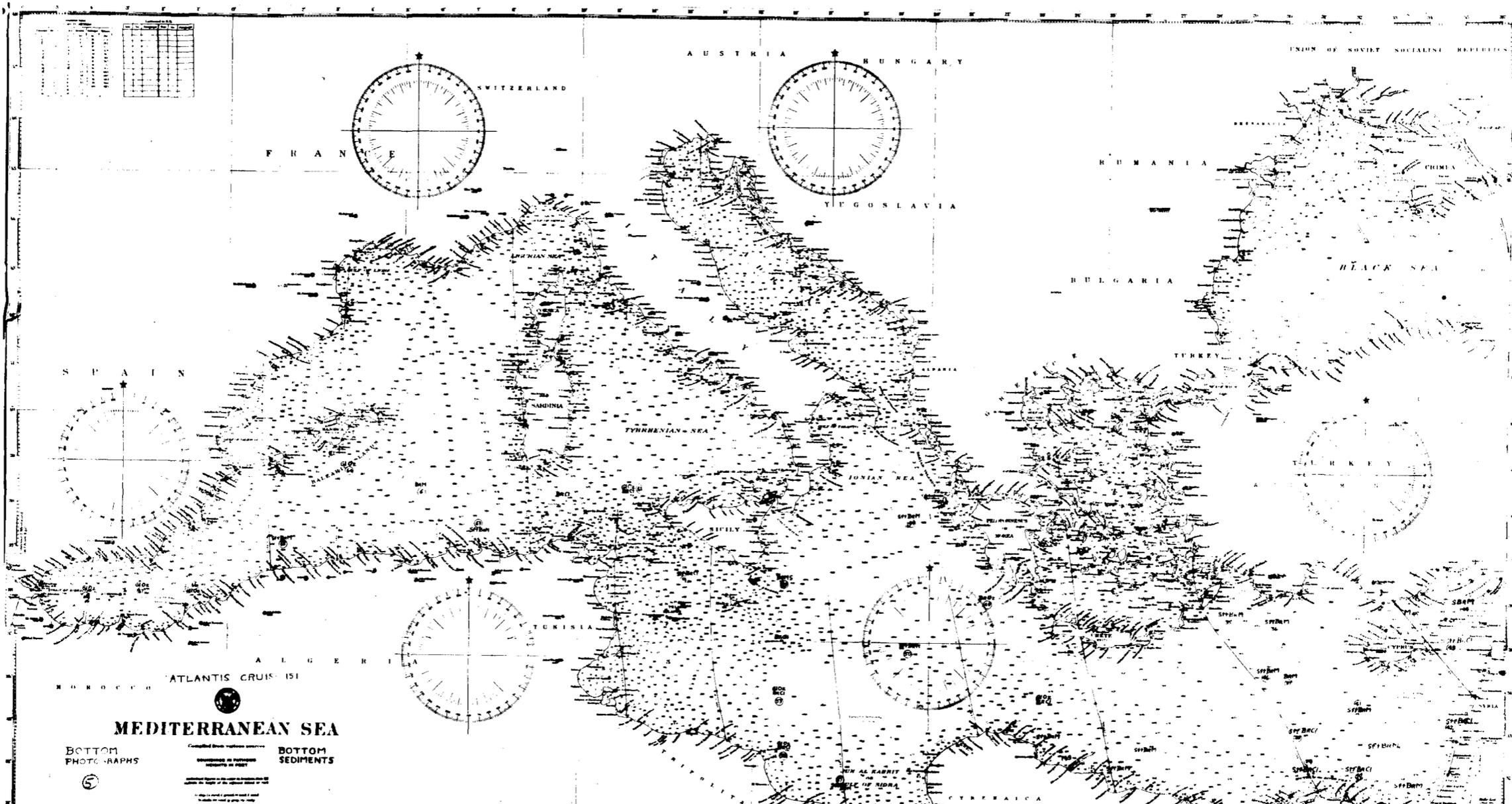
Depth 354 fathoms

Lat. 32-06'N
Long. 30-41'E

Field of view six feet

Shrimp, nearly five inches in length, swimming close to bottom

Bottom Sample #74; stiff brown clay

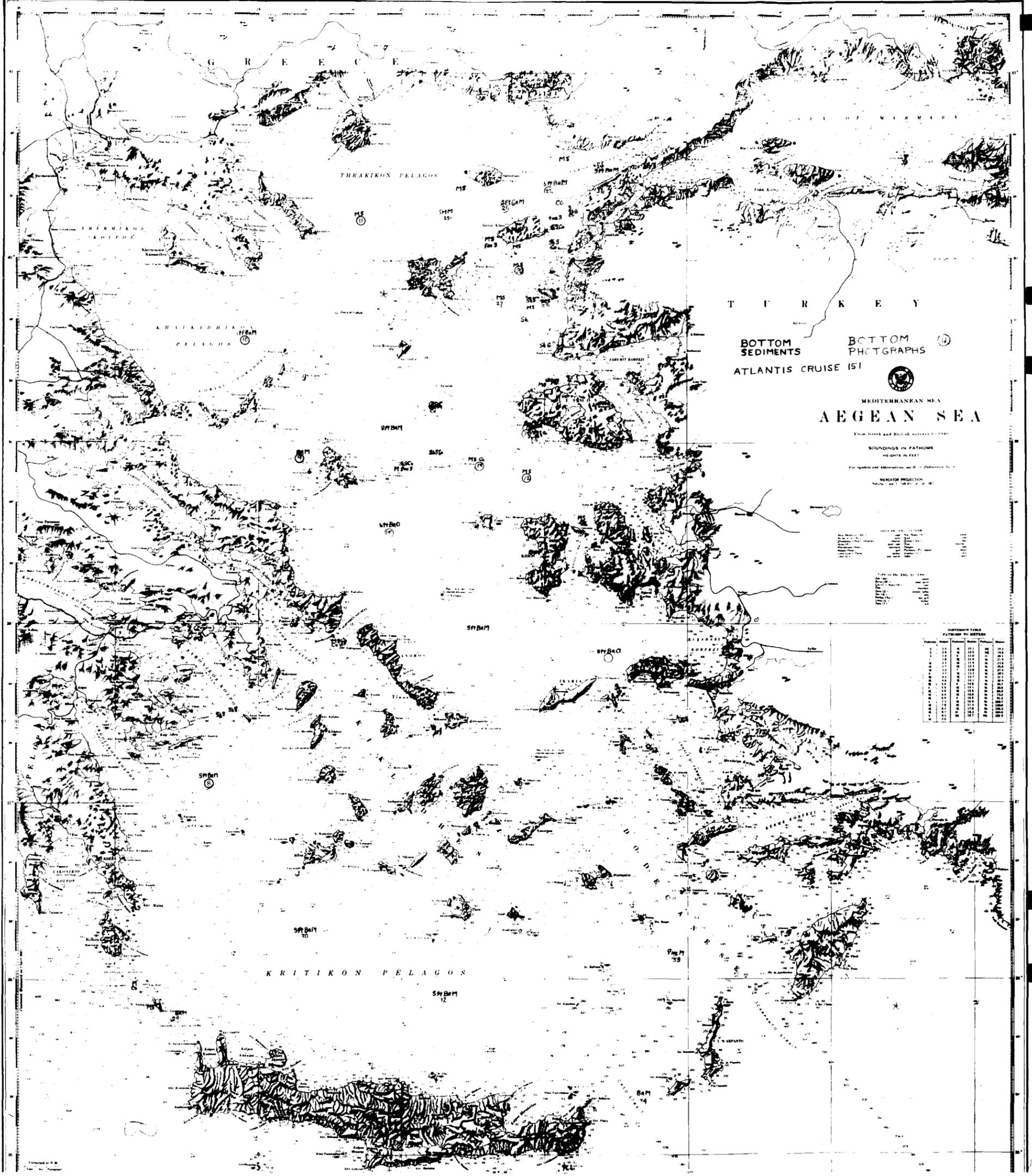


1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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MEDITERRANEAN SEA

BOTTOM PHOTOGRAPHS **BOTTOM SEDIMENTS**

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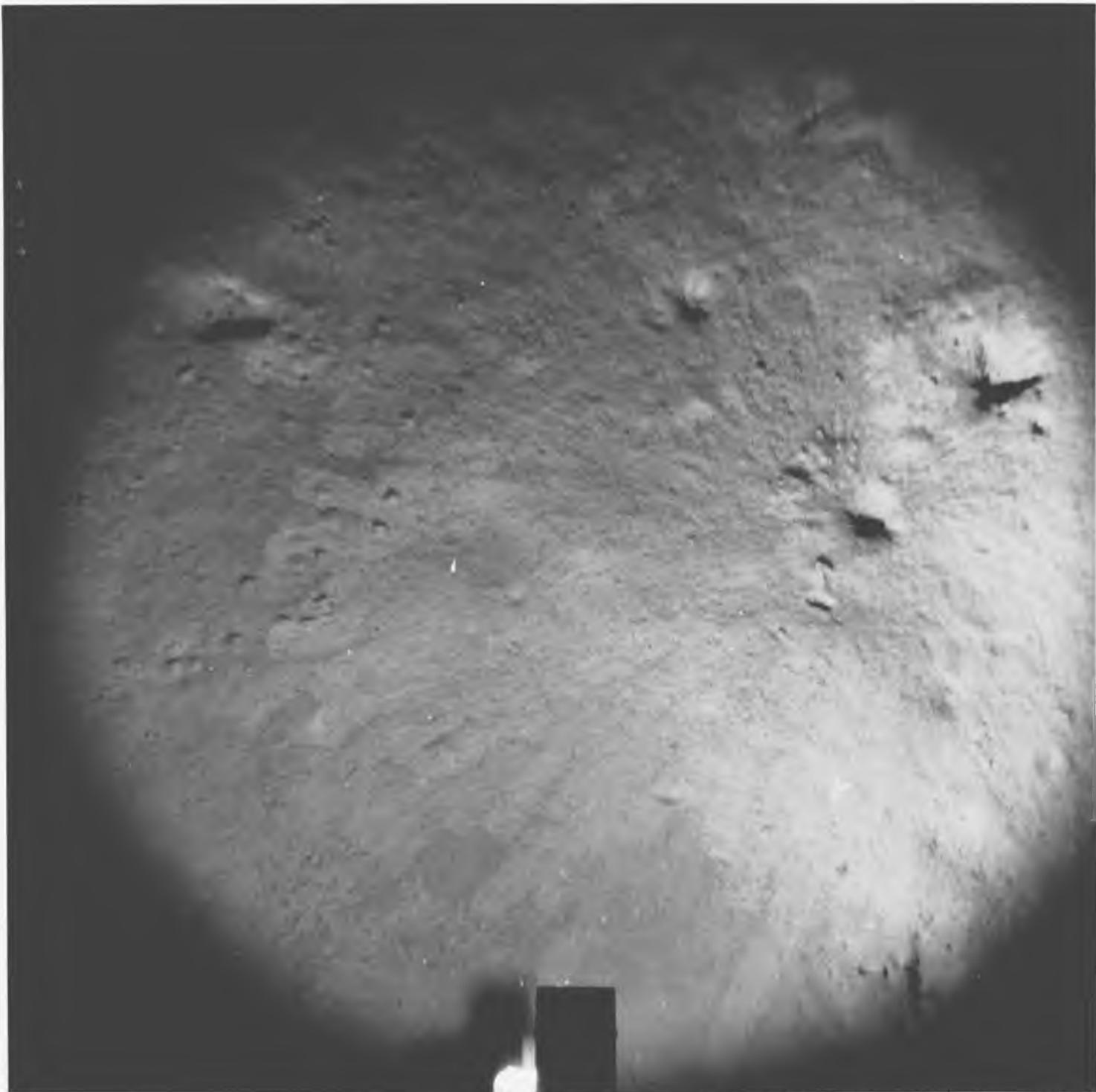
BOTTOM SEDIMENTS **BOTTOM PHOTOGRAPHS**
ATLANTIS CRUISE 151


 MEDITERRANEAN SEA
AEGEAN SEA

From Greek and British surveys to 1940
 SOUNDINGS IN FATHOMS
 HEIGHTS IN FEET
For Symbols and Abbreviations see H. O. Publication No. 1
 MERCATOR PROJECTION
Scale 1:100,000

CONVERSION TABLE
FATHOMS TO METERS

Fathoms	Meters
1	1.8
2	3.7
3	5.5
4	7.3
5	9.1
6	11.0
7	12.8
8	14.6
9	16.5
10	18.3
11	20.1
12	22.0
13	23.8
14	25.6
15	27.4
16	29.3
17	31.1
18	32.9
19	34.7
20	36.6
21	38.4
22	40.2
23	42.1
24	43.9
25	45.7
26	47.6
27	49.4
28	51.2
29	53.0
30	54.9
31	56.7
32	58.5
33	60.4
34	62.2
35	64.0
36	65.8
37	67.7
38	69.5
39	71.3
40	73.2
41	75.0
42	76.8
43	78.6
44	80.4
45	82.3
46	84.1
47	85.9
48	87.8
49	89.6
50	91.4
51	93.2
52	95.1
53	96.9
54	98.8
55	100.6
56	102.4
57	104.3
58	106.1
59	107.9
60	109.7
61	111.6
62	113.4
63	115.2
64	117.0
65	118.9
66	120.7
67	122.5
68	124.3
69	126.1
70	128.0
71	129.8
72	131.6
73	133.4
74	135.3
75	137.1
76	138.9
77	140.7
78	142.5
79	144.3
80	146.1
81	147.9
82	149.7
83	151.5
84	153.3
85	155.1
86	156.9
87	158.7
88	160.5
89	162.3
90	164.1
91	165.9
92	167.7
93	169.5
94	171.3
95	173.1
96	174.9
97	176.7
98	178.5
99	180.3
100	182.1



Bottom Photo #44

Depth 310 fathoms

Lat. 36-02'N
Long. 35-03'E

Field of view six feet

Two inch diameter hole, with radiating tracks $2\frac{1}{2}$ inches wide and nearly three feet long. Nature of inhabitant unknown.

Bottom Sample #81; soft brown mud