

The Benthonic Coastal Fauna of Surtsey in 1968

By

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INTRODUCTION

The marine biological research in the tidal and subtidal zones of Surtsey and adjacent islands was continued in the same way in 1968 as in the year before (Sigurdsson 1968), but in addition underwater photography was used with good results. All the submarine work was skillfully performed by the crew of M/S "Sæör".

Dr. Henning Lemche, Zoological Museum, Copenhagen, takes care of the identification of the Nudibranchia and will include them in a major work which he is preparing on the North-Atlantic Nudibranchia.

Mrs. Karen Bille Hansen, Zoological Museum, Copenhagen, is responsible for the identification of the Bryozoa and will include them in her work on the Icelandic Bryozoa to be published in the Zoology of Iceland.

Mr. K. W. Petersen, Zoological Museum, Copenhagen, and Mr. Jean Just, University of Copenhagen, are responsible for hydrozoans and amphipods, respectively, in cooperation with the principal investigator and it is to be hoped that they will later be able to participate in the sampling around Surtsey and in adjacent waters.

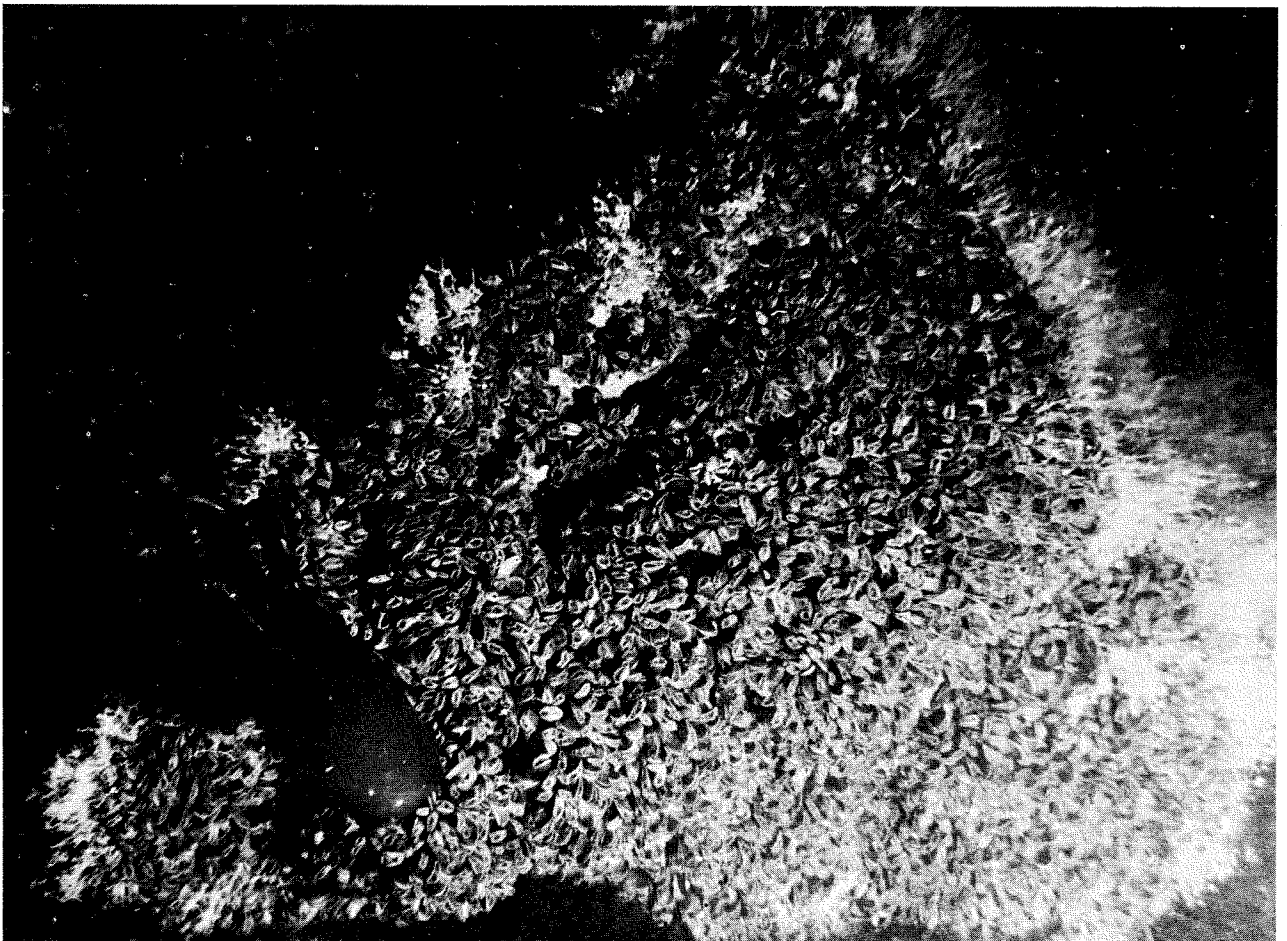


Fig. 1. Underwater photograph from the east coast of Surtsey in 1968, chiefly showing *Mytilus edulis*, but also some hydrozoans and a seaweed.

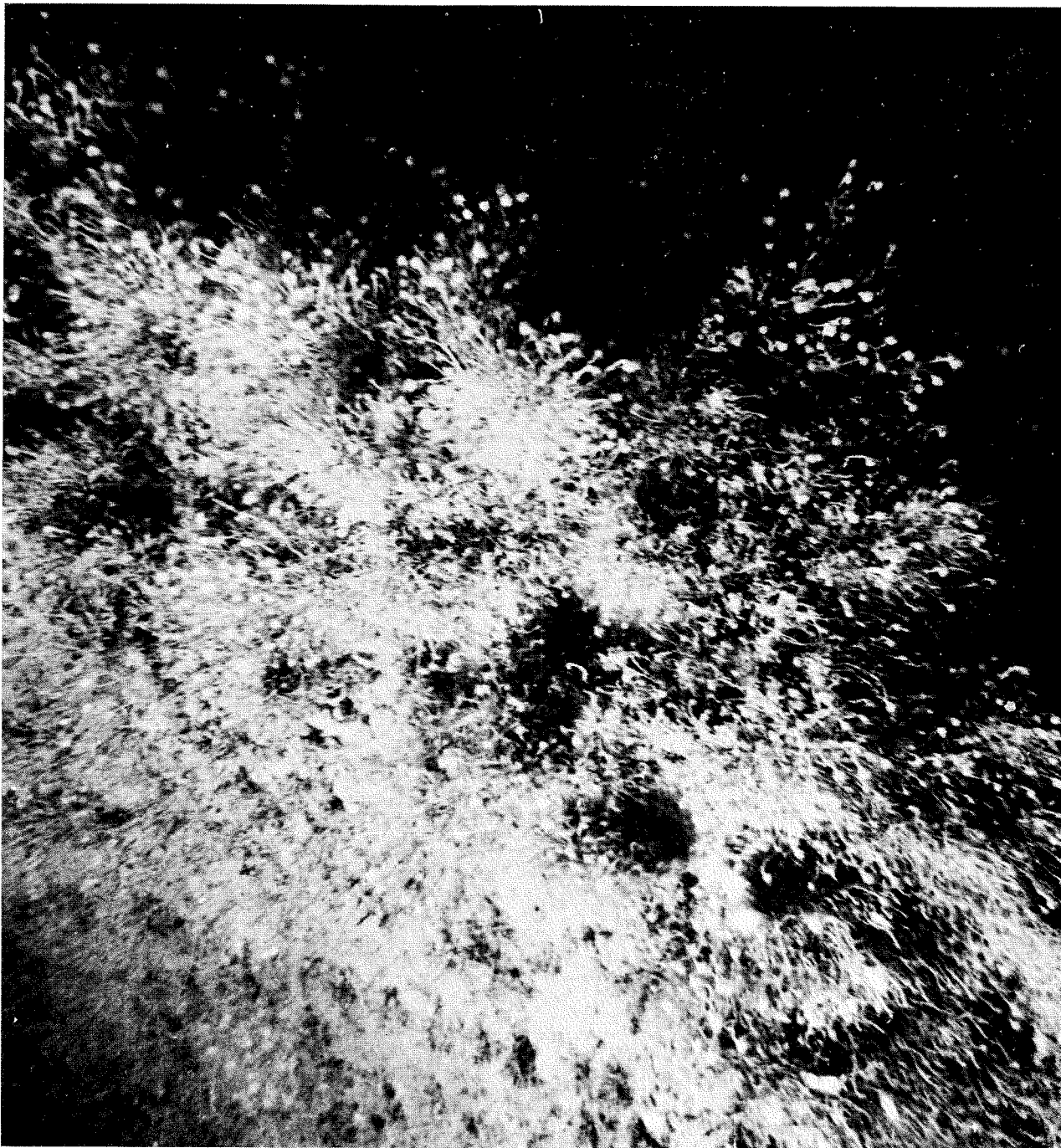


Fig. 2. Underwater photograph from the east coast of Surtsey in 1968, chiefly showing hydrozoans.

Several other Danish zoologists have participated in this research project by providing identification of animals.

For information on the distribution of benthonic animals the appropriate "Parts" of the Zoology of Iceland have been used.

SAMPLING

The sampling of the marine invertebrates in 1968 was, as the year before, partly made by surveys of the shore and partly by the technique of SCUBA-diving as described by Sigurdsson (1968).

In the tidal zone of Surtsey (Table 1) sampling was carried out on April 13 and 14, June 26, August 9 and 10 and November 23.

Mostly due to bad weather conditions, but also on account of lack of usable means of transport, it was impossible to reach the island during September, October and the first half of November.

Due to heavy surf the sampling on November 23 was ineffective.

Intensive sampling was carried out in shallow waters around Surtsey (Tables 1–6) and the other islands of the Vestmannaeyjar from July

27 to August 7. Throughout this period the weather was rather windy and all good days but one were used at Surtsey. During the rest of the time work was carried out wherever it was possible to find shelter. Therefore, it was not possible to repeat the sampling of any of the 1967 traverses outside the Surtsey region except partly at Álsey and Eidid.

Samples were taken in the Surtsey-region as follows:

The west coast (Table 2). Hard bottom.

Near the boundary of sand and hard bottom, depth 17–20 m.

Off the northern part of the lava field (the same traverse as in 1967), depth 3–28 m.

Off the SW corner of the island, depth 4–18 m.

The south coast (Table 3). Hard bottom.

The middle of the south coast, depth 12–19 m.

The east coast (Tables 3–5). Hard bottom.

Off the south east corner of the island, depth 12–22 m.

The north end of the SE cliffs, depth 10 m.

South of the NE cliffs, depth 10 m.

Off the NE cliffs, depth 1.5–30 m.

The north end of the NE cliffs near the boundary of hard and sandy bottom, depth 10–20 m.

The north coast (Table 5). Sandy bottom with dispersed boulders at 12 m.

Off the sandy shore of the easterly north coast, depth 12–20 m.

Syrtingur, east of Surtsey, sandy bottom, depth 28 m.

Jólnir, southwest of Surtsey, sandy bottom, depth 27 m.

Samples were taken on hard bottom at five islands of the Vestmannaeyjar archipelago as follows:

Heimaey:

West of Latur (N.), in a cave in the tidal zone and outside it down to 12 m depth.

North of Dalfjall (N.), depth 8–14 m.

At Stóri Örn (N.), depth 10–14 m.

Eidid (N.), in the tidal zone.

Brimurd (SE.), in the tidal zone.

Álsey (N.), on the same traverse as in 1967, depth 9–13 m.

Hellisey (NE.), on an almost perpendicular rock, depth 0–44 m.

Súlnasker (N.), in the tidal zone and 6–27 m depth.

Thridrangar, in the tidal zone and 15–24 m depth.

TABLE 1
Animals from the Tidal Zone of Surtsey in 1968

	April 13 and 14		June 26	Aug. 9	Aug. 10	Nov. 23
	West Coast	East Coast	Northwest Coast	East Coast	West Coast	West Coast
HYDROZOA	¹⁾ ×	×	×
POLYCHAETA	1	1	Tubes	Tubes	..	×
BRYOZOA:
<i>Membranipora membranacea</i> (L.)	×
<i>Electra pilosa</i> (L.)	×
<i>Cribrilina punctata</i> (Hassall)	×
COPEPODA	12	130	×
CIRRIPEDIA:
<i>Verruca stroemia</i> (Müller) Schum.	36
<i>Balanus balanoides</i> (L.) Bruguère	15	102	17
AMPHIPODA
NUDIBRANCHIA	1	..
LAMELLIBRANCHIA:
<i>Heteranomia squamula</i> (L.)	..	Shells	..	..	..	27
<i>Mytilus edulis</i> (L.)	..	6	..	..	4	6
<i>Syndosmya nitida</i> (Müller)	1
<i>Saxicava arctica</i> (L.)	..	1	..	..	..	17

1) Drifted ashore on Ascophillum. × = animals not counted

2) Drifted ashore (pelagic)

TABLE 2
Animals from the Subtidal Zone of the West Coast of Surtsey in 1968

	Off the Northern Part of the Lava Field (W.)				The Boun- dary of Sand and Hard Bottom (W.)	Off the S.W. Corner
	July 27				August 4	August 6
	3 m	13 m	20 m	28 m	17—20 m	4—18 m
HYDROZOA		×	×	×	×	×
NEMATODA		25	20	10	2	
POLYCHAETA		11	9	11	61	5
BRYOZOA:						
<i>Flustra foliacea</i> (L.)				×		
<i>Amphiblestrum flemingii</i> (Busk)				×		
<i>Alcyonidium parasiticum</i> (Flem.)				×		
<i>Alcyonidium polyoum</i> (Hass.)			×			
<i>Scruparia ambigua</i>				×		
<i>Membranipora membranacea</i> (L.)					×	
<i>Umbonula littoralis</i> Hastings					×	
<i>Electra pilosa</i> (L.)						×
OSTRACODA		2	1	2	3	
COPEPODA	12	300	200-300	18	55	100
CIRRIPEDIA:						
<i>Verruca stroemia</i> (Müller) Schum.				250-300	3	3
<i>Balanus balanoides</i> (L.) Bruguière				Shells		1
<i>Balanus hammeri</i> (Ascanius) Brown					1	
AMPHIPODA:						
<i>Metopa</i> ssp.		×	23		×	
<i>Metopa alderi</i> (Sp. B.)				8		
<i>Ischyrocerus</i> ssp.		×			×	6
DECAPODA:				1 juv.	1 juv.	
<i>Hyas coarctatus</i> Leach					5	
<i>Portunus holsatus</i> Fabr.					1	
PROSOBRANCHIA:						
<i>Aporrhais pes-pelecani</i> ? (L.)		1 juv.				
<i>Lacuna divaricata</i> (Fabr.)				1		
NUDIBRANCHIA		5	4		9	9
LAMELLIBRANCHIA:						
<i>Heteranomia squamula</i> (L.)		2	2	1	17	2
<i>Chlamys distorta</i> (da Costa)				1		
<i>Mytilus edulis</i> (L.)		47	6	18	64	19
<i>Cardium fasciatum</i> Mont.				1		
<i>Saxicava arctica</i> (L.)		11	9	11	47	1
ASTEROIDEA:						
<i>Asterias rubens</i> L.				2	2	
ASCIDIACEA:						
<i>Ascidia callosa</i> Stimpson					1	
PISCES:						
<i>Ammodytes lancea</i> Cuvier						1

TABLE 3
Animals from the Subtidal Zone of Surtsey in 1968

	The South Coast		Off the S.E. Cliffs		N. End of the S.E. Cliffs	S. of the N.E. Cliffs
	August 6		July 31		July 31	July 31
	12 m	19 m	12 m	15-22 m	10 m	10 m
<i>HYDROZOA</i>	×	×	×	×	×	×
<i>POLYCHAETA</i>	1	99	5	3	..	..
<i>OSTRACODA</i>	..	12	..	..	..	..
<i>COPEPODA</i>	1	150	100	10	1	..
<i>CIRRIPEDIA:</i>	..	..	..	..	..	..
<i>Balanus balanoides</i> (L.) Bruguère	..	..	1	..	..	..
<i>AMPHIPODA:</i>	..	..	..	..	..	..
<i>Metopa alderi</i> (Sp. B.)	..	×	..	..	..	..
<i>Calliopius laeviusculus</i> (Krö.)	..	×	2	×	..	..
<i>Ischyrocerus</i> ssp.	..	×	..	×	..	..
<i>NUDIBRANCHIA:</i>	7	20	11	6	..	..
<i>PTEROPODA:</i>	..	..	..	..	..	..
<i>Limacina helicina</i> (Phipps)	..	×	..	..	..	..
<i>LAMELLIBRANCHIA:</i>	..	..	..	..	..	..
<i>Chlamys distorta</i> (da Costa) juv. ?	..	1	..	..	..	..
<i>Mytilus edulis</i> (L.)	8	85	3	..	..	..
<i>Heteranomia squamula</i> (L.)	5	4	..	..	..	..
<i>Saxicava arctica</i> (L.)	..	36	..	..	..	..
<i>OPHIUROIDEA</i> juv.	..	2	..	..	..	..

RESULTS

The samples from Surtsey in 1968 have been analysed, but identification of some of the animals is still incomplete. The marine benthonic animals found in the Surtsey region are listed in Tables 1–6, which should give a fairly good idea of the composition of the fauna.

Comparing these tables to Tables I and II in the 1967 report (Sigurdsson 1968) the number of species is obviously much higher in the 1968 material than in that of the year before. However, the number of species from the tidal zone is similar in both years. From these there are seemingly only 2 species capable of living naturally in the tidal zone, i.e. the barnacle *Balanus balanoides* and the common mussel (*Mytilus edulis*). Other species have obviously settled down in the subtidal zone and have then been carried up to the tidal zone by the heavy oceanic waves which frequently pound the shores of Surtsey during autumn and winter. Most of the common mussel also come from the subtidal zone, as it has been found living on stones among other animals from this region. The only individuals of this species which evidently have originally settled down in the tidal zone were found on a huge block of rock on the north-west coast.

As pointed out previously the sampling in the tidal zone was much more efficient in the au-

turn of 1967 than in that of 1968 and therefore it is difficult to compare the results.

In April and June 1968 there were almost no animals in the tidal zone. Even the few barnacles living there in the autumn 1967 had apparently been killed during the winter.

In August 1968 a new brood of barnacles had settled down along the whole of the west and east coasts of Surtsey where the substrate was suitable. They were numerous in places on the west coast.

Although observations were very much limited due to heavy swell, it was obvious that by late November the surf had brought about an obvious retreat of the barnacle population on the west coast. The only two localities in which barnacles were found living on solid rocks in August 1968 were in the impassable region of the shore.

In the subtidal zone the number of species and specimens had increased very much from the previous year. In 1968 the common mussel and hydrozoans were extremely numerous (Figs. 1 and 2) covering great areas of the bottom off the south, west and east coasts. The sandy bottom on top of Jólnir and Syrtlingur and the submarine slopes of the north coast of Surtsey (Tables 5 and 6) are only sparsely populated by benthonic animals. However, some sandeels and small flatfish were detected on the top of Syrtl-

TABLE 4
Animals from the Subtidal Zone of Surtsey in 1968

	Off the North-East Cliffs				
	July 30			Aug. 4	July 30
	1.5—8 m	5—10 m	12—13 m	10—15 m	13—30 m
HYDROZOA	×	×	×	×	×
NEMATODA	1
POLYCHAETA	..	4	3	2	37
BRYOZOA:	×
<i>Scruparia chelata</i> (L.)	×
<i>Tricellaria ternata</i> (Ellis & Solander)	×
OSTRACODA	1	4
COPEPODA	6	450	2	..	130
CIRRIPEDIA:
<i>Balanus balanoides</i> (L.) Bruguère	1	..	Shells
<i>Verruca stroemia</i> (Müller) Schumacher	..	2	..	..	2
AMPHIPODA:	37
<i>Hyperia galba</i> (Mont.)	1	..	..	..	..
<i>Metopa alderi</i> (Sp. B.)	×	..
<i>Metopa</i> ssp.	..	×
<i>Stenothoë monoculoides</i> (Sp. B.)	1	..
<i>Calliopius laeviusculus</i> (Krö.)	..	×
<i>Gammarellus homari</i> (Fabr.)	1	×	×	..	..
<i>Hyale</i> sp.	×
<i>Amphithoë rubricata</i> (Mont.)	×
<i>Jassa falcata</i> (Mont.)	×
<i>Ischyrocerus</i> ssp.	..	×	..	×	..
<i>Caprella</i> sp.	1	..	..
DECAPODA:
<i>Hyas coarctatus</i> Leach.	6
ACARINA	2
NUDIBRANCHIA	4	18	21	6	5
LAMELLIBRANCHIA:
<i>Heteranomia squamula</i> (L.)	..	21	..	1	5
<i>Heteranomia squamula</i> var. <i>aculeata</i>	1
<i>Mytilus edulis</i> (L.)	2	210	1	6	751
<i>Saxicava arctica</i> (L.)	..	6	..	2	10
ASTEROIDEA:
<i>Asterias rubens</i> L.	2
OPHIUROIDEA juv.	1	..	..
PISCES:
<i>Anmodytes lancea</i> Cuvier	2	..	..	..	..

ingur and some few invertebrates were found at the north coast and on the top of Jólnir, especially on stones which are sparsely distributed in these regions.

Three of the species found around Surtsey in 1968 (Tables 2—4) are new for the south coast of Iceland including Vestmannaeyjar. These are:

Balanus hammeri

Calliopius laeviusculus

Ascidia callosa

Earlier Icelandic record of the last one is from Faxaflói.

Most of the animals listed in Tables 1—6 were in their first or second year of life.

The only measurements available were of three samples of the common mussel giving the mean length of one year olds as 14.7, 16.6 and 18.6 mm, as shown in Table 7. Bottom stages of the 1968 brood were not measured. Although the samples were not quantitative the number in each will give some idea of the density of the

TABLE 5

Animals from the Subtidal Zone of Surtsey
in 1968

	N. End of the N.E. Cliffs		Easterly N.Coast	
	July 31		August 5	
	10—20 m		12 m	20 m
HYDROZOA .....	×	×	..	..
NEMATODA	2	..	..	..
POLYCHAETA	30	8	1	..
BRYOZOA:	..	..	..	..
<i>Scruparia ambigua</i> .....	×	..	..	..
<i>Tubulipora</i> sp. (young colony) ..	..	..	×	..
COPEPODA	640	..	..	..
AMPHIPODA:	..	..	..	..
<i>Hyperia galba</i> (Mont.) .....	×	..	..	..
<i>Metopa alderi</i> (Sp. B.) .....	×	..	..	..
<i>Gammarellus homari</i> (Fabr.) ..	×	..	..	..
<i>Ischyrocerus</i> sp. ....	×	..	..	..
DECAPODA:	..	..	..	..
<i>Hyas coarctatus</i> Leach	1	..	..	..
PROSOBRANCHIA:	..	..	..	..
<i>Lacuna divaricata</i> (Fabr.)	2	..	..	..
NUDIBRANCHIA	18	..	..	..
LAMELLIBRANCHIA:	..	..	..	..
<i>Heteranomia squamula</i> (L.) ..	3	..	..	..
<i>Mytilus edulis</i> (L.)	49	..	..	..
<i>Saxicava arctica</i> (L.)	3	..	..	..
OPHIUROIDEA juv. ....	..	1	..	..

TABLE 6

Animals from Syrtlingur and Jólnir in 1968

	Jólnir		Syrtlingur	
	August 6		August 4	
	27 m		28 m	
HYDROZOA .....	×	..	..	..
POLYCHAETA	11	..	1)?	..
BRYOZOA .....	×	..	..	..
COPEPODA	6	..	..	..
CIRRIPEdia:	..	..	..	..
<i>Verruca stroemia</i> (Müller) Schum.	2	..	..	..
NUDIBRANCHIA	2	..	..	..
LAMELLIBRANCHIA	..	..	..	..
<i>Heteranomia squamula</i> (L.) ..	20	..	..	..
PISCES:	..	..	..	..
<i>Ammodytes lancea</i> Cuvier ..	..	..	2	..
<i>Heterosomata</i> juv. ....	..	..	2)×	..

1) One small tube seen by the divers.

2) The divers saw a few specimens which might have been
Limanda limanda (L.)

TABLE 7

Mean Length of One Year Old *Mytilus edulis*
at Surtsey in 1968

Date	Region	Depth m	Number Measured	Mean Length mm
July 30	NE	5—10	202	16.6
July 30	NE	13—30	720	14.7
August 4	W	20	53	18.6

species. A comparison of the mean length and number of individuals from one sample to another might therefore indicate a density dependent growth, as the highest number of individuals in a sample corresponds to the lowest mean length and vice versa.

Analysis of the samples from Vestmannaeyjar in 1968 is as yet incomplete and consequently only little can be said about them. However, the samples from the tidal zone at Eidid have been worked up, but the only remarkable animal found there was one specimen of the pycnogonid *Phoxichilidium femoratum* (Rathke) which has only been found a few times earlier at Iceland and never at the south coast.

Two species of *Porifera* earlier found occasionally at Vestmannaeyjar have been identified from 3 and 4 stations, respectively, which were worked last summer.

Among approximately 14 species of *Amphipoda* from 6 stations there was one new for the south coast of Iceland, i.e. *Podocerosopsis nitida* (Stimp.) which was taken at Súlnasker on August 5 1968 at a depth of 6—27 m.

NEW IDENTIFICATIONS FROM THE SAMPLES IN 1967

Porifera:

Four species were collected at Eidid and Geirfuglasker (Sigurdsson 1968). They were all found earlier at Vestmannaeyjar.

Polychaeta:

In the samples from the tidal zone of Surtsey (see Table I, Sigurdsson 1968) were two common Icelandic species, i.e. *Pomatoceros triqueter* L. and *Hydroides norvegica* (Gunnerus). They were both common on the west coast, especially the first one. On the east coast, however, only one specimen of *P. triqueter* was collected, but sampling in that region was restricted due to an unfavourable tide level.

Acarina:

Halacaridae. Three species have been identified of which 2 are likely to be new for Iceland but only young stages were available so the identification is uncertain. The species in question are *Metarhombognathus (armatus?)* and *Thalassarachna baltica* (Lohmann). These animals are from samples taken from the tidal zone of Eidid down to 10 m depth.

Polyplacophora:

Three species were collected at Eidid and Geirfuglasker of which one is new for the south coast of Iceland, i.e. *Ischnochiton albus* (L.). One specimen was found at 20–27 m depth off Eidid.

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