

REPORT

ON THE



FOOD OF FISHES COLLECTED DURING 1903,

BY

R. A. TODD, B.Sc.,

Assistant Naturalist on the Staff.

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I.—INTRODUCTION.

During the period from November, 1902, to December, 1903, the food of 27 species of fish was examined. The fish were generally in batches of 10 to 50, and numbered altogether 3,636. With few exceptions both stomach and intestines were examined, the exceptions being the Elasmobranchs and Latchet (*Trigla hirundo*), of which the contents of the stomachs only were recorded. By far the greatest portion was examined at the Laboratory, after preservation in formalin, a few stomachs only, chiefly those of Dog-fishes, having been examined on board the s.s. *Huxley*.

The object of the earlier investigations was to determine the general contrasts between the food of different species of fish, and incidentally to check the results of dredging investigations as to the biological characteristics of the various fishing grounds. No note was taken of the sizes of the fish from which the stomachs were obtained until nearly the end of the period of which this paper treats. As a rule, however, the fish were a fair sample of the catch, with perhaps slightly more of the larger fish than a truly representative sample would have given. Our present method is to divide the Flat-fish into 10 cm. groups, Cod into 20 cm. groups, &c., &c.

The method adopted for displaying the results of each examination has been to record in the detailed tables the number of stomachs in which a particular organism was found to be present as food. The alternative method of recording the number of specimens of each organism found in the stomachs was rejected on the ground that the normal preferences of a fish were less likely to be illustrated by that method. It is of more importance to know that 50 fish out of a hundred have fed upon a particular organism than to know that 100 fish have eaten 50 specimens of the organism between them, since the fact may have been due to the exceptional repast of a few individuals. The number of specimens found in each stomach has been regularly recorded in the course of the work, but the results are of secondary value in most cases, and have only been referred to here in connection with the food of the Plaice. In the statement of results concerning that species, the average number of specimens found in the stomachs has been given in addition to the usual information on the principal food recognised in the samples.

The percentages dealing with the general condition of the stomachs, *i.e.*, "empty," "containing sand," "recognisable or unrecognisable food," &c., are calculated from the total number of stomachs examined, whilst those dealing with the "recognisable food contents" are calculated from the "number of stomachs containing recognisable food."

The percentages were all worked out by means of a slide rule to the nearest whole number ($10 \cdot 50 = 10$, $10 \cdot 51 = 11$, &c.). When a species was present in less than 0·5 per cent., it is represented in the percentage column by the *plus* sign +.

In the case of the Haddock (*Gadus aeglefinus*) from station VIII., 2, seven hundred stomachs were examined, and an analysis of the food contents of each separate 100 stomachs may be of interest, as showing the variation of food contents in the same batch of stomachs. The extremes of variation were, of course, rather considerable, yet the investigation showed that an examination of any single hundred stomachs from the batch would have given one a very fair measure of the food of the Haddock on that ground. The order of frequency of the four principal food groups in the separate hundreds differed from the mean order in three cases only, and then merely by the transposition of Polychaeta and Echinodermata. In these two groups the mean percentage differed by 3 per cent. only.

In the above 700 Haddock stomachs, which for purposes of analysis were divided into seven groups of 100, the greatest variation was shown by the Polychaeta, *viz.*, 57 per cent. to 82 per cent. with a mean of 69. Mollusca varied from 45 per cent. to 59 per cent. with a mean of 51 per cent.; Crustacea from

20 per cent. to 32 per cent., with a mean of 26 per cent., and Echinodermata from 68 per cent. to 74 per cent., with a mean of 72 per cent. Of the commoner food species present *Pectinaria* (generally *P. Koreni*) varied between 54 per cent. and 77 per cent. with a mean of 66 per cent., and *Ophiothrix fragilis* between 29 per cent. and 56 per cent. with a mean of 43 per cent.

Of the 57 food species identified, 16 occurred in all seven groups, whilst one species occurred in six groups only, six species each in five groups, five species in four groups, four species in three groups, seven species in two groups, and 18 species were present in one group only.

The following Table (I.) shows for each group of 100 the percentage of stomachs containing the food groups specified, with their chief representatives :—

TABLE I.

—	1st 100 group.	2nd 100 group.	3rd 100 group.	4th 100 group.	5th 100 group.	6th 100 group.	7th 100 group.	Mean.
Pisces	1	...	...	1	...	1	...	...
Mollusca	45	55	51	47	49	53	59	51
<i>Solen pellucidus</i>	7	10	3	5	3	7	3	5
<i>Solen sp.</i>	6	6	11	4	4	6	16	8
<i>Montacuta bidentata</i> ...	17	40	30	27	17	33	37	29
Crustacea	27	24	20	26	24	27	32	26
<i>Portunus pusillus</i>	13	14	9	9	10	10	11	11
<i>Callinassa subterranea</i> ...	3	1	4	10	3	3	8	5
<i>Gebia sp.?</i>	1	2	4	6	7	5	5	4
Polychaeta	57	82	66	69	62	70	74	69
<i>Pectinaria</i> (generally <i>P. Koreni</i>). ...	54	77	65	65	58	69	72	66
Echinodermata	74	74	73	69	74	68	73	72
<i>Ophiothrix fragilis</i> ...	29	40	50	38	41	45	56	43
<i>Echinocyamus pusillus</i> ...	42	28	40	39	43	44	50	41

According to Ramsay Smith (10th Report S.F.B., Part III., page 212), in order to reduce the limit of error to one per cent. it would be necessary by Poisson's rule to examine 10,000 fish ; but the analysis of the Haddock stomachs seems to indicate that for all practical purposes the examination of a hundred stomachs is more than sufficient to give one an idea, sufficiently accurate for most purposes, of the food of a given species on any particular ground. As it is, the majority of the following records are based on examinations of samples numbering 50 or less.

As regards the identification of the food species, I am responsible for nearly all, the exceptions including the majority of the Polychaeta, for the identification of which I am indebted to Dr. Allen, and a certain number of records made on board the s.s. *Huxley* by Mr. Garstang and Dr. Wallace. To Mr. Garstang I am also indebted for many useful suggestions regarding the treatment of the results.

Where the number of the stomachs of a species was sufficient, the results of the examination have been tabulated in detail (*see* Detailed Tables A to L, p. 262), and condensed into a summary table which is included in the text. (Tables II. to XI.)

The nomenclature used throughout the present paper is that of the following authors :—

Pisces	...	...	...	Day, British Fishes.
Mollusca	...	...	...	Jeffreys, British Conchology.
Crustacea (in general)	...	...	...	Bell, British stalk-eyed Crustacea ; and Sars, Crustacea of Norway.
Polychæta...	...	...	...	St. Joseph, Les Annélides Polychètes des Côtes de Dinard.
Echinodermata	...	...	...	Bell, Catalogue of British Echinoderma, British Museum.

II.—RESULTS OF THE EXAMINATION OF STOMACHS.

A. ROUND FISHES.

FATHER LASHER. (*Cottus scorpius*, L.).

BETWEEN YMUIDEN AND EGMONT. XXIII. 2. November. 8–9 fathoms. c.g.s., f.g.s. (B. 94.)

Nine fish were examined, of which two were empty. The remaining seven contained recognisable food. Crustacea, represented by *Crangon*, *Nika*, and Amphipods, occurred in four stomachs ; fish remains in two, and Mollusca in one.

GREY GURNARD. (*Trigla gurnardus*, L.).

Seventy-eight stomachs were examined from four stations. Of these, one per cent. were empty, one per cent. contained sand only, and 97 per cent. contained recognisable food. Crustacea, which were present in 99 per cent., formed the chief food, the only other groups represented being Pisces 5 per cent., Mollusca 7 per cent., and Nemertinea 1 per cent.

The commonest Crustacea in the stomachs were the various species of *Crangon*, *Gastrosaccus spinifer*, and *Ampelisca lævigata*.

For details of the contents of the various samples of stomachs *see* Table A, of which the following Table II. is a summary :—

TABLE II. Grey Gurnard.

Region.							Whitby Ground.	Dogger Bank.			
Voyage ...	...	...	...	...	...	...	X.	X.	X.	X.	
Station ...	...	...	...	...	...	...	4	6	9	11	
Number of stomachs containing recognisable food							12	16	29	19	
Pisces ...	...	...	...	...	...	...	%	%	%	%	
Mollusca	...	...	...	...	...	...	25	...	3	5	
Crustacea	...	...	...	...	...	...	100	100	97	100	
Nemertinea	...	...	...	...	...	...	...	6	...	...	

WHITBY GROUND. X. 4. April. 30-31 fathoms. f.s., c.s., gl. (O. 53.)

The Grey Gurnard from this haul had been feeding almost wholly on Crustacea (100 per cent.), the principal species present being *Crangon Allmanni* (83 per cent.). Mollusca, represented solely by *Sepiola atlantica*, were present in 25 per cent.

N. AND E. OF WEST SHOAL OF DOGGER. X. 6. April. 12-13 fathoms. f.g.s., f.d.s. and X. 9. April. 12-15½ fathoms. f.g.s. (O. 55 and 59.)

Crustacea (100 per cent. and 97 per cent.) were represented in 75 per cent. and 48 per cent. respectively by *Crangon* sp. (*Cr. Allmanni* and *Cr. trispinosus* in the case of X. 6) in 69 per cent., and in 66 per cent. by *Gastrosaccus spinifer*, whilst Cumacea occurred in 19 per cent. and 38 per cent., *Ampelisca laevigata* in 6 per cent. and 38 per cent., and *Portunus holsatus* in 12 per cent. and 3 per cent. *Galathea* and Isopoda were each present in 6 per cent. of X. 6. Pisces, represented by *Centronotus* and *Solea*, were present in 12 per cent. (X. 6), and unidentified fish-remains in three per cent. (X. 9). Mollusca were present in three per cent. (X. 9) and Nemertinea in six per cent. (X. 6).

HOSPITAL (DOGGER). X. 11. April. 16-20 fathoms. f.d.s., f.g.s. (O. 60.)

Crustacea, present in 100 per cent., were represented by *Ampelisca laevigata* (74 per cent.), *Crangon trispinosus* (63 per cent.), *Schistomysis* sp. ? (26 per cent.), with *Portunus* (10 per cent.), and *Crangon spinosus* (5 per cent.). Mollusca and Pisces were each present in 5 per cent. only.

LATCHET. (*Trigla hirundo*, L.)

Sixty-seven stomachs from three stations were examined. Of these, 13 per cent. were empty, and 87 per cent. contained recognisable food.

The food consisted chiefly of Pisces, which occurred in 81 per cent., with Crustacea in 26 per cent., Mollusca in 17 per cent., and Echinodermata in 2 per cent. The fish remains identified were *Solea* sp. in 22 per cent., *Callionymus lyra* in 16 per cent., with five other species in from 2 per cent. to 9 per cent., whilst unidentified fish-remains occurred in 45 per cent. Crustacea were represented by *Portunus* in 9 per cent., and by seven other species in 2 per cent. to 7 per cent.

For details of each sample see Table A, of which the following is a summary:—

TABLE III. Latchet.

Region.									Well Bank.	E. Deep Water.	Middle Ground.
Voyage	...	...	...	...	...	...	...	...	XV.	XI.	XI.
Station	...	...	...	...	...	...	...	...	8	4	6
Number of stomachs containing recognisable food									7	24	27
Pisces...	...	...	...	...	...	...	...	...	% 100	% 67	% 89
Mollusca	...	...	...	...	...	...	...	...	...	29	11
Crustacea	...	...	...	...	...	...	...	...	14	38	19
Echinodermata	...	...	...	...	...	...	...	...	14	...	...

SOUTH END OF WELL BANK. XV. 8. July. 17-20 fathoms. f.g.s. (B. 50.)

Pisces constituted the chief food of the Latchets from this station, being present in all stomachs. *Gobius* and *Callionymus* were each found in 14 per cent., *Solea* sp. in 29 per cent., and unidentified remains in 57 per cent. Crustacea and Echinoderma were represented in one stomach only (14 per cent.).

EAST DEEP WATER AND MIDDLE GROUND. XI. 4. May. 20-20½ fathoms. f.g.s., s.sh., and
XI. 6. May. 20-22 fathoms. f.sp.s., f.b.s. (O. 71, 73.)

The Latchets from these stations were feeding chiefly on Pisces (67 per cent. and 89 per cent.). Unidentified fish-remains occurred in 42 per cent. and 44 per cent., *Callionymus lyra* in 17 per cent. and 15 per cent., *Ammodytes* in 8 per cent. and 4 per cent., *Pleuronectes limanda* in 17 per cent. and 4 per cent., and *Solea lutea* in 4 per cent. and 37 per cent. respectively. *Trachinus vipera* was present in 4 per cent. of XI. 6, and *Arnoglossus* in 4 per cent. of XI. 4. Crustacea, which were next in frequency, occurred in 38 per cent. and 19 per cent. respectively, being represented in the samples from both stations by *Portunus holsatus* 4 per cent. and 11 per cent. and *Eupagurus Bernhardus* 12 per cent. and 4 per cent. XI. 4 contained in addition *Thia polita* 8 per cent., *Crangon trispinosus* 4 per cent., *Gastrosaccus spinifer* 17 per cent., and *Urothoe norvegica* 4 per cent. XI. 6 contained also *Portunus* sp. and *Crangon* sp., each in 4 per cent.

MONK OR ANGLER. (*Lophius piscatorius*, L.)

OFF SUNDERLAND. XII. 21. June. 43½-44 fathoms. m. (B. 15.)

The stomachs of three fish were examined. Of these, one was empty and the other two each contained a single Gadoid.

LYNN DEEP. XVIII. 12. August. 9-13 fathoms. c.s., c.s.gl.sh. (B. 70.)

The only fish examined contained a Clupeoid and one *Portunus holsatus*.

CAT-FISH. (*Anarrhichas lupus*, L.)

N. OF CALIFORNIA. X. 1. April. 30 fathoms. gl. & sh. (O. 50.)

Two fish were examined; of these, one contained ten *Pecten opercularis* and the legs of *Hyas* sp.?, and the other the remains of nine *Buccinum undatum*, eight *Eupagurus Bernhardus*, and one *Aphrodite aculeata*.

WHITBY GROUND. X. 4. April. 30-31 fathoms. c.s.gl., f.s. (O. 53.)

The stomachs of three fish were examined. *Pecten opercularis* occurred in two, *Buccinum undatum* in two, *Natica catena* in one, *Astarte compressa* in one, *Eupagurus Bernhardus* in three, *Hyas coarctatus*, *Stenorhynchus* sp.?, and the legs of a crab each in one, and *Ophiothrix fragilis* in all.

SOUTH OF BRUCEY'S GARDEN. XIII. 22. June. 36-39 fathoms. f.d.s. (O. 85.)

The single stomach examined contained *Pecten opercularis*, *Eupagurus Bernhardus*, and a large quantity of Echinoderm remains, consisting almost wholly of *Ophiothrix fragilis*.

COD. (*Gadus morrhua*, L.)

Two hundred and twenty-one Cod and Codling were examined from 10 stations; of these, 3 per cent. were empty, 2 per cent. contained stones mixed with food, 1 per cent. contained unrecognisable food, and 96 per cent. contained recognisable food.

The food consisted chiefly of Crustacea (89 per cent.), Pisces (31 per cent.), Polychaeta (20 per cent.), with Mollusca (12 per cent.). *Eupagurus Bernhardus* was the only species which was found in stomachs from all stations and was at the same time the most frequent, occurring in 51 per cent. of the total.

For details of each sample see Table B, of which the following is a summary :—

TABLE IV. COD.

Region.	Off Arbroath.	Berwick to Flamboro'.					Markham's Hole.	Terschelling.	Brown Ridges.	Knoll Deep.	Western Deep Water.		
Voyage	XXI.	X.	X.	X.	X.	XII.	VIII.	III.	XVII.	V.	IX.	IX.	IX.
Station... ..	3	1	1	4	4	21	2	7	5	3	3	3	5
Number of stomachs containing recognisable food.	34	4 (1)*	10 (s)*	3 (1)*	18 (s)*	10	65	5	10	43	3	5	2
Pisces	% 3	% ...	% 80	% ...	% 28	% 60	% 37	% 40	% 30	% 37	% 33	% ...	% ...
Mollusca	9	75	10	...	...	...	17	...	10	12	67	...	...
Crustacea	97	100	80	100	83	100	82	80	90	93	100	100	100
Polychaeta	...	50	40	33	17	30	29	20	...	9	100	20	50
Nemertinea	...	...	..	...	6	...	...	...	...	...	...	...	...
Echinodermata	3	...	...	33	...	...	5	...	...	...	...	...	...

* 1 = large fish ; s = small fish.

OFF ARBROATH. XXI. 1. September. 34-36 fathoms. s.m., ds.sh. (O. 118.)

Crustacea formed the principal food of the Cod from this haul, being present in 97 per cent., whilst Pisces (3 per cent.), Mollusca (9 per cent.), and Echinoderms (3 per cent.) also occurred. The chief Crustacea present were *Portunus holsatus* and *Eupagurus Bernhardus*, each in 38 per cent., *Hyas coarctatus* in 26 per cent., *Pandalus Montagu* in 21 per cent., whilst other species were *Pandalina brevirostris*, *Galathea* sp., *Crangon* sp., *Atelecyclus heterodon* and Amphipoda.

N. OF CALIFORNIA GROUND. X. 1. April. 20 fathoms. g., sh. (O. 50.)

The small Cod had been feeding on Pisces (80 per cent.), Crustacea (80 per cent.), and Polychaeta (40 per cent.). Of the Pisces, *Centronotus gunnellus* occurred in 70 per cent. and *Liparis vulgaris* in 20 per cent. Crustacea were represented by *Eupagurus Bernhardus*, *Crangon Allmanni*, and *Siriella crassipes*, each in 40 per cent. *Galathea squamifera*, *G. intermedia*, and *Pandalus Montagu* each in 20 per cent., whilst of the Polychaeta, *Aphrodite aculeata* occurred in 30 per cent. The four large Cod examined were feeding on Crustacea (100 per cent.), Mollusca (75 per cent.), and Polychaeta (50 per cent.), no Pisces being found. Crustacea were represented in all four by *Hyas coarctatus*, in three by *Eupagurus Bernhardus* and *Portunus pusillus*, whilst of the Mollusca and Polychaeta, *Fusus* and *Aphrodite aculeata* were each present in two stomachs.

WHITBY GROUND. X. 4. April. 30-31 fathoms. f.s., c.s., g. (O. 53).

The three large Cod examined all contained *Hyas coarctatus*, and two contained in addition *Eupagurus Bernhardus*, whilst *Aphrodite aculeata* and *Ophiothrix fragilis* each occurred in one.

The small Cod were feeding chiefly on Crustacea (83 per cent.) and Pisces (28 per cent.). The chief species of the former were *Eupagurus Bernhardus* and *Pandalus Montagu*, each in 50 per cent., and

Hyas coarctatus in 22 per cent., whilst of the Pisces the only ones identified were *Gobius* sp. and *Centronotus gunnellus* in 6 per cent. and 17 per cent. respectively. Polychaeta and Nemertinea were represented in 17 per cent. and 6 per cent. respectively.

OFF SUNDERLAND. XII. 21. June. 43½–44 fathoms. m. (B. 15.)

The Cod from this station were all feeding on Crustacea. In addition Pisces occurred in 60 per cent. and Polychaeta in 30 per cent. The Crustacea were represented chiefly by *Nephrops norvegicus* (80 per cent.), with *Calocaris Macandreae*, *Eupagurus Bernhardus*, *Crangon*, and *Pandalus Montagu*, each in 20 per cent. All the fish-remains were identified, and consisted of *Gadus merlangus* (20 per cent.), *Motella [cimbria?]* (30 per cent.), and *Hippoglossoides limandoides* (30 per cent.). *Aphrodite aculeata* (30 per cent.) was the only Polychaete found.

MARKHAM'S HOLE. VIII. 2. March. 27–33 fathoms. m. (O. 33.)

The food of the Codling from this haul consisted of Crustacea (82 per cent.), Pisces (37 per cent.), Polychaeta (29 per cent.), Mollusca (17 per cent.), and Echinoderma (5 per cent.).

Of the Crustacea, *Eupagurus Bernhardus* was present in 38 per cent., *Crangon Allmanni* 23 per cent., *Portunus holsatus*, *P. pusillus*, and *Portunus* [sp. ?], probably *P. holsatus*, occurred in 14 per cent., 8 per cent., and 17 per cent. respectively, with *Nephrops norvegicus* in 11 per cent. Of the Pisces, the following were identified:—*Gobius* sp. (3 per cent.), *Callionymus lyra* (6 per cent.), *Centronotus gunnellus* (2 per cent.), *Gadus* sp. (2 per cent.), *Hippoglossoides limandoides* (5 per cent.), *Pleuronectes platessa* (2 per cent.), *Solea lutea* (2 per cent.), and *Solea* sp. ? 6 per cent. Mollusca were represented by *Cyprina islandica* (9 per cent.), the feet only being present in all cases but one, in which a fragment of the shell was also found, and *Buccinum undatum* (6 per cent.). Of the Polychaeta, *Aphrodite aculeata* occurred in 26 per cent., and *Pectinaria* in 3 per cent., whilst Echinodermata were represented solely by *Ophiothrix fragilis* (5 per cent.).

OFF TERSCHELLING. III. 7. December. 20–22 fathoms. f.s.m. m. (O. 16.)

Five Cod only from this station were examined, the food being Pisces in two (*Callionymus lyra* in two, *Pleuronectes limanda* and *Clupea sprattus* each in one); Crustacea in four, represented chiefly by *Eupagurus Bernhardus* (in three), whilst Polychaeta occurred in one only.

N.E. OF BROWN RIDGES. XVII. 5. July. 16–17 fathoms. f.g.s., f.d.s. (O. 91.)

Crustacea (90 per cent.) and Pisces (30 per cent.) constituted the chief food of the Cod from this station. Of the former the species represented were *Eupagurus Bernhardus* (70 per cent.), *Portunus holsatus* (60 per cent.), *Corystes cassivelaunus* (20 per cent.), and *Cancer pagurus* (10 per cent.), whilst of Pisces the only species identified was *Solea lutea*, which occurred in 20 per cent. Mollusca, the only other group represented, occurred in 10 per cent.

SOUTH PART OF KNOLL DEEP. V. 3. January. 23–24 fathoms. f.s., f.g. (O. 22.)

The Cod from this station were feeding chiefly on Crustacea, which occurred in 93 per cent. of the stomachs, the chief species being *Eupagurus Bernhardus* (84 per cent.), *Pandalus Montagu* (44 per cent.), *Crangon* sp. (35 per cent.), and *Portunus holsatus* (23 per cent.). Pisces, which were present in 37 per cent., were represented by *Solea lutea* (12 per cent.), *Gadus* sp. (7 per cent.), *Centronotus gunnellus* and *Clupea sprattus* each in 2 per cent. Mollusca, present in 12 per cent., were represented by *Buccinum undatum* (7 per cent.), and *Fusus* sp. (5 per cent.). Polychaeta occurred in 9 per cent., the chief species being *Aphrodite aculeata* (7 per cent.).

WESTERN DEEP WATER. IX. 3. March. 22 fathoms. c.s., d.s. and IX. 5. March. 23-24 fathoms. c.s., d.s. (O. 48, 49.)

Ten fish only were examined from these hauls. Mollusca and Pisces occurred in one and two stomachs respectively from IX. 3, but were absent from IX. 5. Crustacea were represented in all the stomachs *Eupagurus Bernhardus* being present in 90 per cent., whilst twelve other species were present in one or two stomachs from IX. 3, and two, each in one stomach, from IX. 5. *Aphrodite aculeata* was present in 50 per cent. of the stomachs from both stations.

HADDOCK. (*Gadus aeglefinus*, L.)

1,127 stomachs were examined from 9 stations. Of these, 4 were empty, 7 contained sand only, 21 (2 per cent.) contained sand mixed with food, 11 (1 per cent.) contained unrecognisable food, and 1,105 (98 per cent.) contained recognisable food.

Taking all the stomachs together, Mollusca, Polychaeta and Echinodermata, which were represented respectively in 64 per cent., 54 per cent. and 59 per cent. of the stomachs, formed the principal food, Crustacea, which occurred in 26 per cent., coming next in frequency. The species of Mollusca most frequently found in samples from various localities were *Solen* sp., *Macra* sp., *Tellina fabula*; whilst *Montacuta bidentata* was very common in the sample from Markham's Hole (VIII. 2). Of the Polychaeta, *Pectinaria* and *Nephtys* occurred in all samples, whilst of the Echinoderms, *Echinocyamus pusillus*, *Ophiothrix fragilis*, *Amphiura filiformis*, and *Ophiura*, were the most frequent. Crustacea were represented in all samples by Amphipoda and in nearly all by *Eupagurus Bernhardus*, whilst *Portunus* sp., *Callinassa subterranea*, *Gebia* sp., and *Nika edulis*, were each found in several samples.

For details of each sample, see Table C., of which the following is a summary:—

TABLE V. HADDOCK.

Region.	Off Arbroath.	Hartle- pool.	Mark- ham's Hole	Terschel- ling.	Dogger Bank.				
Voyage	XXI.	X.	VIII.	III.	X.	X.	XII.	XII.	XII.
Station	1	5	2	7	8	11	12	13	16
Number of stomachs containing recognisable food.	50	9	699	18	100	50	50	81	48
Pisces	%	%	%	%	%	%	%	%	%
Tunicata	...	...	...	...	...	...	2	...	...
Mollusca	80	56	51	39	89	88	96	85	83
Crustacea	20	44	26	89	7	52	28	25	31
Polychaeta	32	67	69	78	9	62	22	11	54
Nemertinea	...	...	...	...	...	2	...	...	...
Echinodermata	92	67	72	89	...	46	10	19	75
Coelenterata	4	...	...	6	...	2	...	...	...

OFF ARBROATH.—XXI. 1. September. 34–36 fathoms. s. m., d.s. sh. (O. 118.)

The haddock from this station were feeding chiefly on Echinoderma (92 per cent.) and Mollusca (80 per cent.), with Crustacea (20 per cent.), and Polychaeta (32 per cent.).

The principal Echinoderms present were *Echinocyamus pusillus* (54 per cent.), *Ophiothrix fragilis* (46 per cent.), and *Amphiura filiformis* (20 per cent.), whilst of the Mollusca, *Solen pellucidus* (18 per cent.), *Solen* sp. ? (22 per cent.), *Scrobicularia* sp. ? (22 per cent.), *Cylichna cylindracea* (18 per cent.), and *Philine scabra* (20 per cent.), were the chief forms. Of the Polychaeta *Ophelia limacina* and *Pectinaria Koreni* each occurred in 10 per cent. of the stomachs. Coelenterata, represented solely by *Tubularia* sp. ?, occurred in 4 per cent.

HARTLEPOOL GROUND. X. 5. April. 33–34 fathoms. f.d.s. (O. 54.)

Nine haddock only were examined from this haul. Of these, five contained Mollusca (*Solen* sp. in three, and four other species, each in one stomach). Crustacea, represented by three species, occurred in four stomachs, whilst Polychaeta and Echinodermata each occurred in six stomachs, *Pectinaria* occurring in two stomachs and *Echinocyamus pusillus* and *Ophiothrix fragilis* each in three.

MARKHAM'S HOLE. VIII. 2. March. 27–33 fathoms. m. (O. 33.)

700 haddock were examined from this station, of which all but one contained recognisable food. The chief groups represented were Echinodermata in 72 per cent., Polychaeta in 69 per cent., Mollusca in 51 per cent., and Crustacea in 26 per cent.

Of the Echinodermata, the commonest species were *Echinocyamus pusillus* (in 41 per cent.) and *Ophiothrix fragilis* (in 43 per cent.). The former were present in great quantities in some stomachs, 50 to 100 often being present in a single stomach, whilst in one stomach no less than 210 were counted, varying in size from 1 to 10 mm. in length. The other Echinoderms present were *Ophiura albida* in 14 per cent., *Amphiura filiformis* in 7 per cent., *Ophiura ciliaris* in 3 per cent. and *Echinus miliaris*, *Thyone* and *Synapta*, each in less than 1 per cent.

The Polychaeta, which as a group were next in frequency, were represented chiefly by *Pectinaria*, which occurred in quantities up to 30 per stomach in 66 per cent., being in fact the most frequent species. Of the nine other Polychaetes which were identified, none occurred in more than 2 per cent. of the stomachs.

Mollusca were represented in 29 per cent. of the stomachs by *Montacuta bidentata*, this species being accompanied in all cases by *Pectinaria*, which suggests the possibility that it may be a commensal. *Solen pellucidus*, which occurred in 5 per cent., and *Solen* (sp. ?) in 8 per cent., together with 18 other species occurring in 4 per cent. and less were also present.

Of the Crustacea, *Portunus pusillus* (11 per cent.), *Callinassa subterranea* (5 per cent.), *Gebia* sp. (4 per cent.), and Amphipoda (4 per cent.), were the chief forms, whilst Pisces were only represented by *Callionymus lyra*, *Clupea sprattus*, and unidentified remains, each in one stomach only.

From an examination of the records it is evident that the Haddock is a most indefatigable and at the same time indiscriminate feeder, and quite capable of feeling and picking up very small organisms, such as half-grown *Eulima distorta* and young *Echinocyamus pusillus* barely a millimetre in length.

OFF TERSCHELLING. III. 7. December. 20-22 fathoms. f.s., m. (O. 16.)

The chief food of the Haddock from this station was *Amphiura filiformis* (in 78 per cent.), *Gebia* sp. (72 per cent.), *Pectinaria* (67 per cent.), *Nika edulis* (61 per cent.), whilst *Ophiura ciliaris* occurred in 33 per cent. and Isopoda in 28 per cent.

N. OF W. SHOAL OF DOGGER. X. 8. April. 14-16 fathoms. f.g.s. (O. 57.)

The Haddock from this station were almost entirely feeding on the feet of *Macra subtruncata* (87 per cent.), no other species occurring in more than 6 per cent.

HOSPITAL (DOGGER). X. 11. April. 16-20 fathoms. f.d.s., f.g.s. (O. 60.)

The Haddock from this station were feeding on Mollusca (88 per cent.), Crustacea (52 per cent.), Polychaeta (62 per cent.), and Echinodermata (46 per cent.). The principal Molluscs present were *Montacuta bidentata* (36 per cent.), *Tellina fabula* (38 per cent.), *Solen pellucidus* (22 per cent.), *Solen* sp.? (*S. ensis* or *S. siliqua*) (38 per cent.), whilst Amphipoda (50 per cent.), *Pectinaria* (46 per cent.), and *Amphiura filiformis* (42 per cent.), were the principal representatives of their respective groups.

SOUTH-EAST OF TAIL-END OF DOGGER. XII. 12. June. 20-23 fathoms. f.s., f.l.s. (O. 81.)

Mollusca constituted the chief food of the Haddock from this station, being present in 96 per cent. of the stomachs. The most frequent forms were Bivalve fry, probably that of *Macra* sp.? in 70 per cent., *Macra solida* (38 per cent.), *Tellina fabula* (14 per cent.), *Scrobicularia prismatica* (16 per cent.), *Natica Alderi* (14 per cent.), and *Cylichna cylindracea* (44 per cent.). Crustacea occurred in 28 per cent., Amphipoda being represented in 20 per cent., whilst Polychaeta were present in 22 per cent., and Echinodermata in 10 per cent.

N. PART OF DOGGER. XII. 13. June. 19-20 fathoms. c.b.s., f.s. sh. (O. 82.)

The Haddock from this station were feeding chiefly on Molluscs (85 per cent.), the principal species being *Macra subtruncata* in 25 per cent., ditto feet only (37 per cent.), and *Solen* sp. (21 per cent.). Amphipoda (15 per cent.), and *Portunus* sp.? (7 per cent.) were the chief representatives of the Crustacea, whilst Polychaeta and Echinodermata occurred in 11 per cent. and 19 per cent. respectively.

NORTH OF NORTH-WEST ROUGH OF DOGGER. XII. 16. June. 27-35 fathoms. f.d.s. (O. 84.)

Mollusca were the most frequently represented group in the stomachs from this station, occurring in 83 per cent., the principal species being *Tellina* sp.? (32 per cent.), *Solen pellucidus* (21 per cent.), *Solen* sp. (*S. ensis* or *S. siliqua*) (44 per cent.), and bivalve fry (15 per cent.). Crustacea occurred in 31 per cent., Amphipoda being the most frequent (21 per cent.). Polychaeta were present in 54 per cent., *Nephtys* (8 per cent.), and *Pectinaria* (6 per cent.), being the most frequent of the identified species, whilst unidentified Polychaeta occurred in 40 per cent. Echinodermata were represented in 75 per cent., chiefly by *Amphiura filiformis* (54 per cent.), with *Ophiothrix fragilis* (10 per cent.), and *Echinocyamus pusillus* (8 per cent.).

WHITING. (*Gadus merlangus*. L.)

One hundred and one fish were examined from five stations. Of these, five were empty, the remainder all containing recognisable food.

The chief food consisted of Crustacea, which occurred in 76 per cent., and Pisces (43 per cent.), whilst Mollusca and Polychaeta occurred in 3 per cent. and 4 per cent. respectively.

For details of the samples, see Table D., of which the following is a summary :—

TABLE VI. Whiting.

Region.						Markham's Hole.	Well Bank.	Smith's Knoll.	Off Egmond.	
Voyage	...	...	...	...	...	VIII.	XV.	XIX.	XXIII.	XXIII.
Station	...	...	...	...	...	2	9	2	2	3
Number of Stomachs containing recognisable food.						15	25	23	23	10
Pisces	...	...	...	...	...	53	28	9	70	90
Mollusca	...	...	...	...	...	...	2	...	...	...
Crustacea	...	...	...	...	...	53	72	96	91	30
Polychaeta	...	...	...	...	...	...	12	...	4	...

MARKHAM'S HOLE. VIII. 2. March. 27-33 fathoms. m. (O. 33.)

Crustacea and Pisces were each represented in 53 per cent. of the stomachs. Of the Pisces present *Gadus merlangus*, in one stomach (7 per cent.), was the only one identified, the remaining stomachs, (47 per cent.) containing unrecognisable fish—remains only. Crustacea were represented by *Crangon Allmanni* in 27 per cent., and *Stenorhynchus* sp. ? and *Pandalus Montagu*, each in 13 per cent.

WELL BANK. XV. 9. July. 7-20 fathoms. f.g.s. (B. 51.)

The Whiting from this haul were feeding chiefly on Crustacea (72 per cent.), with Pisces (28 per cent.), Polychaeta (12 per cent.), and Mollusca (8 per cent.). The most frequent Crustacea were *Eupagurus Bernhardus* (44 per cent.), *Portunus* sp. (16 per cent.), with *Crangon* sp. and *Portunus variegatus*, each in 8 per cent. Of the Pisces, *Ammodytes* sp. occurred in 12 per cent., *Solea lutea* in 8 per cent., and unidentified remains in 8 per cent., whilst of the Mollusca, *Scrobicularia prismatica* occurred in 4 per cent. The only Polychaete identified, *Pectinaria*, occurred in 4 per cent., unidentified Polychaetes being present in 8 per cent.

NORTH-EAST OF SMITH'S KNOLL LIGHT-VESSEL. XIX. 2. August. 18-23 fathoms. (O. 94.)

Crustacea were the principal food of the Whiting from this haul, occurring in 96 per cent. of the stomachs, the chief species being *Crangon Allmanni* (43 per cent.), *Pandalus Montagu* (26 per cent.), Mysidæ (17 per cent.), and *Eupagurus Bernhardus* (13 per cent.). Pisces occurred in 9 per cent. only, *Ammodytes* (in 4 per cent.) being the only genus identified.

BETWEEN YMUIDEN AND EGMOND. XXIII. 2. November. 8-9 fathoms. c.g.s., f.g.s. (B. 94.)

The Whiting from this haul were feeding chiefly on Pisces (70 per cent.), (*Ammodytes* sp. 57 per cent.) and Crustacea (91 per cent.), (*Crangon* sp. var. 65 per cent., *Gastrosaccus spinifer* 35 per cent.).

OFF EGMOND. XXIII. 3. December. 10-11 fathoms. f.g.s. (B. 95.)

Pisces were the chief food of the Whiting from this haul, occurring in 90 per cent. and consisting chiefly of *Ammodytes* sp. ? (70 per cent.). Crustacea, represented by four species, were present in 30 per cent.

COAL FISH. (*Gadus virens*. L.).

EAST OF THE WEST SHOAL OF THE DOGGER. X. 14. April. 15½–17 fathoms. f.g.s. (O. 63.)
The only stomach examined from this haul contained three fish backbones.

SOUTH OF BRUCEY'S GARDEN. XIII. 27. June. 36–39 fathoms. f.d.s. (O. 86.)

Four stomachs were examined, all of which contained from one to four Haddock (*Gadus aeglefinus*) from 8 to 11 ins. in length. In addition, one contained a Dab (*Pleuronectes limanda*) of 4½ ins. in length, and two contained other fish remains.

LING. (*Molva vulgaris*.)

NORTH OF CALIFORNIA. X. 1. April. 30 fathoms. gl., sh. (O. 50.)

Two fish were examined, of which one was empty and the other contained a Cod (*Gadus morrhua*), 12 ins. in length, and other fish remains.

HOSPITAL (DOGGER). X. 11. April. 16–20 fathoms. f.d.s., f.g.s. (O. 60.)

A large spawning female, 122 cm. in length and weighing 36 lbs., was examined, but the stomach and intestine were both quite empty.

B. FLAT FISH.

HALIBUT. (*Hippoglossus vulgaris*. Flem.)

NORTH OF THE NORTH-WEST ROUGH OF THE DOGGER. XII. 15. June. 21–27 fathoms. f.g.s., f.d.s. (O. 83.)

The stomach of the only fish examined contained one *Solea* (sp. ?) of 2½ ins., one *Solen* (sp. ?), one *Eupagurus Bernhardus*, and two *Portunus* (sp. ?).

LONG ROUGH DABS. (*Hippoglossoides limandoides*. Bloch.)

The stomachs of 40 fish from two stations were examined. Of these, two contained unrecognisable food and the remaining 38 recognisable food. Pisces occurred in 24 per cent., Crustacea in 79 per cent., Polychaeta in 32 per cent., and Echinodermata in 29 per cent.

OFF SHIELDS. XII. 20. June. 27–28 fathoms. d.s. (B. 14.)

Thirty-three fish were examined, of which 31 contained recognisable food. Crustacea occurred in 77 per cent., represented by Mysidae in 74 per cent., Paguroids in 10 per cent., *Ampelisca* sp. and *Ebalia* sp. each in 3 per cent. Polychaeta (in 39 per cent.) were represented by unidentified remains in 29 per cent., Polynoids in 6 per cent., Clymenids in 6 per cent., and a Terebellid in 3 per cent. Unidentified fish remains were present in 23 per cent., and Echinodermata in 23 per cent., represented by *Amphiura filiformis* in 19 per cent., and *Ophiura albida* in 3 per cent.

WHITBY GROUND. X. 4. April. 30–31 fathoms. f.s., c.s., g. (O. 53.)

The stomachs of seven fish were examined, all of which contained recognisable food. Pisces, represented by *Gobius* (sp. ?), occurred in two, Crustacea in six (*Crangon* (sp. ?) in two, *Anapagurus laevis* in four), and Echinodermata in four (*Ophiothrix fragilis* in three, *Ophiura albida* in one).

TURBOT. (*Rhombus maximus*. L.)

The stomachs of 22 Turbot from five stations have been examined. Of these, 10 were empty and 12 contained recognisable food. Pisces constituted the sole food in all cases where food was present.

Cestodes were recorded as present in all the fish examined, excepting those from VIII. 9. They were probably present however in that case also although not recorded.

HARTLEPOOL GROUND. XII. 23. June. 30–39 fathoms. s.s., s.o., m. (B. 17.)

The only stomach examined contained a Gadoid eight inches long. Cestodes were present.

CLAY DEEP TO UPPER SCRUFF. VIII. 9. March. 23–23½ fathoms. f.g.s., f.g.s., m. (O. 37.)

The stomachs of 11 fish were examined, of which four were empty. Of the remaining seven, all contained fish remains, the species identified being *Gadus merlangus* in two, *Pleuronectes limanda*, *Solea lutea* and *Solea* sp. each in one, and unidentified fish remains in three. The presence or absence of Cestodes was not noted.

NORTH OF THE WEST SHOAL OF THE DOGGER. X. 8. April. 14–16 fathoms. f.g.s. (O. 57.)

The two fish examined did not contain any food. Cestodes were present in both.

EAST OF THE WEST SHOAL OF THE DOGGER. X. 14. April. 15½–17 fathoms. f.g.s. (O. 63.)

The stomachs of seven fish were examined, of which three were empty, the remainder containing Pisces only. *Solea* sp. four inches long and *Pleuronectes platessa* six inches long, each occurred in two, and the backbone of a flat-fish in one. All were infested with Cestodes.

SOUTH-WEST OF WINTERTON SHOAL. V. 5. January. 24–25 fathoms. f.g.s. (O. 24.)

The stomach of the only fish examined was empty. Cestodes were present.

BRILL. (*Rhombus lævis*. Rond.)

WESTERN DEEP WATER. IX. 5. March. 23–24 fathoms. c.s., d.s. (O. 49.)

The stomach of the only fish examined contained four Whiting (*Gadus merlangus*) 4 ins. to 6 ins. in length, one *Pandalus Montagu*, and one *Crangon Allmanni*.

PLAICE. (*Pleuronectes platessa*. L.)

The stomachs of 1,090 Plaice from 35 stations were examined; of these, 173 were empty, 862 contained recognisable food remains, 42 contained unrecognisable food, 43 contained food mixed with mud or sand in appreciable quantities, and 13 contained mud or sand only.

Of the 862 stomachs containing recognisable food, Mollusca, consisting almost entirely of Lamelli-branches, occurred in 78 per cent., Polychaeta in 38 per cent., Echinodermata in 17 per cent., and Crustacea in 15 per cent., whilst Pisces, Tunicata, Polyzoa, Nemertinea, and Coelenterata were each represented in less than 2 per cent. of the stomachs.

Of the Mollusca, the principal food species were *Tellina fabula*, *Macra subtruncata*, *M. solida*, *Solen* spp., *Scrobicularia* spp., and *Donax anatinus*, the dominant species varying, of course, on the various grounds.

Of the Polychaeta which were identified, *Pectinaria* (generally *P. Koreni*) was by far the most frequent, and in two or three cases was the dominant species, notably in XIX. 9.

Of the other groups, no single species was dominant in the stomachs from any locality, with the exception of *Echinocardium* (sp. ?) in Plaice stomachs from haul XIX. 4, and Nemertinea in stomachs from haul X. 9.

For details of samples, see Table E., of which the following is a summary.

TABLE VII. Plaice.

Region.	Whitby and Hartlepool.				Saltfleet.		Leman Banks and Neighbourhood.																Brown Ridges.		Off Egmond and Ymuiden.				Off Ameland &c.		Horn Reef.		Dogger.								
Voyage	X.	X.	XII.	Bridlington Bay.	XVIII.	XVIII.	Off Sherinham	X.	X.	XV.	XV.	XV.	XV.	XV.	XIX.	XIX.	XIX.	XV.	XVI.	XV.	XV.	XV.	XVIII.	XVII.	XXIII.	XXIII.	XXIII.	XXIII.	III.	III.	XXI.	XXI.	XII.	XII.	X.	X.	X.	X.			
Station	4	5	23		3	18		17	17	3	5	8	9	10	2	4	9	13	3	14	15	16	23	5	1	2	3	3	1	9	4	5	15	16	9	11	12	14			
Number of stomachs containing recognisable food.				12	13	7	13	17	10	6	43	58	30	33	34	33	50	27	40	50	29	18	20	22	39	39	50	O	O	14 (S)*	9 (m)*	2	1	33	20	8	18	16	29	22	27
				%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%		
Pisces	..	..	..	..	..	..	..	..	..	7	3	..	..	..	..	2	3	33	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
Tunicata	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
Polyzoa	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
Mollusca	92	91	100	92	82	60	100	98	96	67	91	97	85	68	81	90	50	17	17	80	86	87	72	90	..	..	7	11	100	..	100	100	75	95	50	83	100	89			
Crustacea	8	8	..	8	6	..	..	2	21	20	3	..	3	18	11	2	10	38	44	25	23	15	44	6	..	..	43	11	..	..	21	..	25	11	6	31	23	15			
Polychaeta	50	46	..	15	24	40	..	14	18	27	18	21	24	56	26	40	24	76	22	35	41	13	51	34	..	..	36	89	50	100	24	30	38	28	6	79	36	48			
Nemertinea	8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	62	..	..	..	..				
Echinodermata	25	46	14	..	..	..	..	26	39	17	24	18	33	26	7	62	6	45	6	10	32	15	13	6	..	..	36	..	..	100	..	..	25	..	..	3	..	..			
Coelenterata	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4			

* S = Small fish; m = medium-sized fish.

HARTLEPOOL AND WHITBY GROUNDS. X. 4. Whitby Ground. April. 30-31 fathoms. f.s., c.s., gl. X. 5. Hartlepool Ground. April. 33-34 fathoms. f.d.s. XII. 23. Hartlepool Ground. June. 30-39 fathoms. s.s., s.o., m. (O. 53, 54. B. 17.)

The three samples of Plaice stomachs taken from these grounds vary considerably in food contents, *Solen pellucidus* and *Solen* (sp. ?) being the only species common to all three, but this, considering the very varied nature of the bottom deposit, is to be expected.

On the whole the samples from Stations X. 4 and X. 5 bear the most resemblance, there being 14 species (of which three were common) which occurred in both samples. The chief points of difference between these two samples were the presence of *Pelonaia* (sp. ?) in 42 per cent. and another Ascidian in 25 per cent. of the stomachs from X. 4, and their absence in those from X. 5; and the greater frequency of *Venus ovata* and *Macra subtruncata* in X. 4 and *Solen* (sp. ?) in X. 5 compared with their frequency in X. 5 and X. 4 respectively. Two specimens of each of the species constituting the chief food, with the exception of *Pelonaia*, were, on the average, present in each stomach containing them. Only seven Plaice from XII. 23 contained recognisable food remains, the chief species present being *Solen pellucidus* in 2 (29 per cent.) and *Solen* (*S. ensis* or *S. siliqua*) in 3 (43 per cent.). No species, excepting *Amphiura*, of which three specimens were present in one stomach, was represented, on the average, by more than one specimen in a stomach.

BRIDLINGTON BAY. June 10, 1903.

A sample of 13 Plaice, caught in the bay by small trawlers, was examined. Of these, 12 (92 per cent.) had been feeding on Mollusca, the chief species found being *Tellina* (? *tenuis*) in 54 per cent. with an average of three per stomach, and *Solen* (sp. ?) in 23 per cent. Polychaeta were present in two, and Crustacean remains in one of the stomachs.

OFF SALTFLEET. XVIII. 3. August. 8 fathoms. c.s., gl. XVIII. 18. August. 5-10 fathoms. gl., m., s. (B. 67, 73.)

The Plaice examined from these hauls were feeding almost wholly on *Scrobicularia alba*, (82 per cent. and 60 per cent.), with averages of 12 and 8 per stomach, and Polychaeta (24 per cent. and 40 per cent.), the only other food present being *Ampelisca laevigata* in one stomach (6 per cent.) from Station XVIII. 3.

OFF SHERINGHAM.

A sample of six Plaice was sent to us on September 1st, 1903, which had been caught the preceding day by the Sheringham fishermen, and, according to them, had been feeding on mussel brood. On examination, however, it was found that they had been feeding exclusively on *Modiolaria discors*, from $\frac{1}{8}$ inch to $\frac{1}{4}$ inch long, the stomach and intestine being in all cases quite distended by these small bivalves.

According to the Eastern Sea Fisheries Inspector's Report for half-year ending September 30, 1902, page 20, the Blakeney mussel laymen themselves mistook *Modiolaria discors* for brood mussels, and, in fact, applied for permission to dredge them up for laying purposes.

THE LEMAN AND OWER BANKS AND SMITH'S KNOLL.

The feeding grounds of the Plaice in this neighbourhood may be divided as follows, according to the dominant food species present in the stomachs from each haul.

I. FROM THE OWER TO THE SWARTE BANK, TOGETHER WITH THE GROUNDS LYING ROUND THE SOUTH AND EAST OF THE SWARTE AND WELL BANKS. Depth varying from $5\frac{1}{2}$ to 23 fathoms. Soil variable.

In this area I have recorded the food of the Plaice from the following stations* :—

X. 17	...	April	...	10–13 $\frac{1}{2}$	fathoms.	f.b.s., f.g.s.	(O. 66.)
XV. 3	...	July	...	20–21	fathoms.	f.g.s.	(B. 45.)
XV. 5	...	July	...	21	fathoms.	f.s., sh.	(B. 47.)
XV. 8	...	July	...	17–20	fathoms.	f.g.s.	(B. 50.)
XV. 9	...	July	...	7–20	fathoms.	f.g.s.	(B. 51.)
XV. 10	...	July	...	5 $\frac{1}{2}$ –17	fathoms.	f.g.s., c.s.	(B. 52.)
XIX. 2	...	August	...	18–23	fathoms.	f.d.s.	(O. 94.)
XIX. 4	...	August	...	16–17	fathoms.	f.s.	(O. 96.)

On this ground the Plaice examined from hauls taken in April, July, and August, were feeding to a very large extent on *Tellina fabula*, the percentage frequency of the stomachs containing this mollusc being as follows :—91 per cent. in April (X. 17), from 74 per cent. (XV. 8) to 37 per cent. in July (XV. 3), and from 59 per cent. (XIX. 2) to 30 per cent. in August (XIX. 4), with an average percentage for all the stations of 64 per cent., whilst the average number per stomach varied from three (XIX. 4) to 11 (X. 17).

The lowest percentage of Plaice stomachs containing *Tellina fabula* was shown at Station XIX. 4 (30 per cent.), and here the Plaice were feeding to a larger extent on *Donax vittatus* (37 per cent., with an average of two per stomach), and *Scrobicularia* s.p. (32 per cent., also with an average of two). *Donax vittatus* was also present in 27 per cent. (average two) of the stomachs from Station XV. 9 and in 18 per cent. (average two) from Station XV. 8, whilst *Scrobicularia prismatica* was present in 26 per cent. of the stomachs from Station XV. 8 (average three). *Natica Alderi* was present in the samples from all stations excepting X. 17, although only in a few stomachs, varying from 4 per cent. to 16 per cent., with averages of one to four per stomach.

Crustacea were not present in any quantity. Amphipoda were present in 21 per cent. (average three) of the small Plaice from Station X. 17 and in 8 per cent. of the Plaice from XV. 10, but with these exceptions no other Crustacean was present in more than 4 per cent. of the stomachs from any one station.

Polychaeta. *Pectinaria* was the only Polychaete taken at all stations, but only in a few stomachs (up to 11 per cent.), excepting at Station XIX. 4, where it was present in 37 per cent. (average two per stomach). *Nephtys* (sp.?) was present in a few stomachs from all stations except Station XIX. 4. *Sabellaria spinulosa* and *Owenia fusiformis* were both present in 18 per cent. of the stomachs from Station XV. 10, with averages per stomach of four and five respectively.

Echinodermata. *Amphiura filiformis* was present in the stomachs from Station X. 17 (large Plaice 23 per cent., small 38 per cent.) and Station XV. 9 (9 per cent.), whilst *Echinocyamus pusillus* was present in all samples excepting that from Station XIX. 2, being commonest at Station XV. 5, where it occurred in 18 per cent. of the stomachs, but in no case with an average of more than three per stomach. *Echinocardium* (sp.?) occurred in stomachs from all stations except X. 17, and, in the case of the Plaice from Station XIX. 4, was the chief food, occurring in 57 per cent. of the stomachs. As regards the average number present we have no information, as the shells were too much broken to be counted.

* For the position of these hauls see *Report on Trawling*, charts 1 and 2.

II. AN AREA TO THE SOUTH OF STATION XIX. 4. Station XIX. 9. August. 16-19 fathoms. f.d.s. (O. 101.)

Pectinaria was by far the chief food of the Plaice from this haul, occurring as it did in 82 per cent., with an average of nine per stomach. *Tellina fabula* occurred in 8 per cent. only, whilst *Scrobicularia* spp. occurred in 30 per cent. From a comparison of the food of the Plaice from Areas I. and II., it would appear probable that Station XIX. 4 of Area I., in which *Pectinaria* occurred in 7 per cent. and *Tellina fabula* in 30 per cent., lies on or near the boundary between these two feeding grounds.

III. BETWEEN THE LEMAN AND OWER BANKS. XV. 13. July. 20 fathoms. f.s., c.s. (B. 55.)

The food of the Plaice from this station was not characterised by the dominance of any one species. *Echinocyamus pusillus* 24 per cent., *Ophelia limacina* 21 per cent., *Portunus* sp. 14 per cent., *Pectinaria* 14 per cent., *Ophiura albida* 14 per cent., *Eupagurus Bernhardus* 10 per cent., Mysidæ 10 per cent., and a *Phyllodocid* 10 per cent., constituted the chief food, whilst Mollusca, which in Area I. were present in 66 per cent. to 79 per cent. of the stomachs, were here present in 17 per cent. only. The average number of any one species in the stomachs was in all cases two or less.

IV. BETWEEN HEWETT'S RIDGES AND SMITH'S KNOLL. XVI. 3. July. 16-20 fms. f.g.s. (B. 61.)

The food of the Plaice from this station consisted of *Ammodytes* (sp. ?) in 33 per cent. (average two) and *Urothoe norvegica* (average six), Mysidæ (average two), and Polychaeta each in 22 per cent., whilst Mollusca were present in 17 per cent. only.

V. BETWEEN THE LEMAN BANK AND HASBRO' LIGHT-VESSEL. XV. 14. July. 19-20 fms. d.s., f.g.s. XV. 15. July. 18 fms. d.s., c.s. XV. 16. July. 18-20 fms. c.s. (B. 56, 57, 58.)

Of these three hauls, 14 and 16 were parallel to one another along their whole length, whilst 15 was parallel to 14 and 16 along a short portion of its course, the major portion being to the west. The result of this is that the stomachs of the Plaice from 14 and 16 show the greatest similarity in their contents, the following species occurring in 14 and 16, and not in 15: *Scrobicularia* spp. 40 per cent. and 51 per cent., *Solen* sp. and *Natica alderi*. *Pecten opercularis* was present in all three samples, but most common in Station 15 (14 %). *Macra subtruncata* was also most common in Station 15 (77 %), being the chief food of the Plaice from that station. *Tellina fabula* was most common in Stations 14 and 16 (10 per cent. and 23 per cent.).

Polychaeta, chiefly *Pectinaria*, were present only in Stations 14 and 15 (50 and 46 per cent.), whilst Echinoderms were most common in Station 15 (46 per cent.), and least so in Station 16 (14 per cent.).

VI. OFF N.W. END OF HASBRO' SAND. XVIII. 23. August. 15-17 fathoms. s., sh. (B. 78.)

The food of the Plaice from this station was well marked by the dominance of *Macra solida* (in 56 per cent.; average 2), and *Ophelia limacina* (in 51 per cent., with an average of 3). *Gebia* sp. ? which did not occur in the stomachs of Plaice from any other station in the neighbourhood, was present in 23 per cent., whilst *Echinocyamus pusillus* and *Ebalia* (sp. ?) were both present in 13 per cent.

NORTH OF BROWN RIDGES. XXIII. 1. November. 14-17 fathoms. f.g.s. (B. 93.)

Both the stomachs and intestines of all the 37 fish examined from this haul were absolutely empty.

NORTH-EAST OF BROWN RIDGES. XVII. 5. July. 16-17 fathoms. f.g.s., f.d.s. (O. 91.)

The food of the Plaice from this station shows a resemblance to that of the Plaice in Area I. of the Leman Grounds. The following species, *Donax vittatus* (in 58 per cent. average 5), *Tellina fabula* (in 38 per cent. average 2), *Scrobicularia* sp. ? (in 14 per cent.), *Solen* sp. ? (in 28 per cent.), and *Pectinaria* (in 12 per cent.), being also more or less common in the stomachs of the Plaice from Area I. *Tellina tenuis* (?), however, which was present in 22 per cent. (average 2), from XVII. 5, was absent from Area I.

BETWEEN YMUIDEN AND EGMOND. XXIII. 2. November. 8-9 fathoms. c.g.s., f.g.s. (B. 94.)

Forty-four Plaice under 20 cm. in length were examined from this haul, but in no case was any food or sand found, the stomachs and intestines being quite empty.

OFF EGMOND. XXIII. 3. December. 10-11 fathoms. f.g.s. (B. 95.)

Thirty-one fish between 20 and 30 cm. in length, and 36 under 20 cm., were examined. Of the former, 64 per cent. were empty, 29 per cent. contained recognisable food, and 3 per cent. unrecognisable food.

The food identified consisted chiefly of Polychaeta (in 89 per cent.), represented by *Ophelia* and *Nephtys*, each in 33 per cent., and unidentified remains in 44 per cent. Mollusca and Crustacea were each present in one stomach only.

Of the 36 Plaice under 20 cm. in length, 53 per cent. were empty, 39 per cent. contained recognisable food, and 6 per cent. unrecognisable food. Crustacea, represented by *Gastrosaccus spinifer* in 29 per cent., were present in 43 per cent. of those containing recognisable food, whilst Polychaeta and Echinoderma were each present in 36 per cent., the latter being represented in 21 per cent. by *Ophiura*. In none of the fish, however, was there more than a very small quantity of food.

OFF AMELAND. III. 1. December. 15-17 fathoms. f.s. (O. 10.)

OFF TERSCHELLING. III. 9. December. 22-24 fathoms. m., s.m. (O. 18.)

The Plaice stomachs from these stations were almost all empty, the number of empty and food-containing stomachs being 30 and 2 respectively in the case of Station III. 1, and 11 and 1 in the case of Station III. 9. The two stomachs from Station III. 1 contained a single *Solen pellucidus* in one, and single specimens of *Solen pellucidus*, *Mactra stultorum*, *Tellina fabula*, *Scrobicularia prismatica*, and *Pectinaria* in the other; whilst the one from Station III. 9 contained two *Pectinaria* and a dozen *Amphiura* (sp. ?). These records, together with those from XXIII. 1, 2, and 3, seem to show that Plaice do not feed to any extent in November and December, which is in agreement with the general view that they do not grow in the winter. The above hauls were taken between the hours of 4 a.m. and 3 p.m.; XXIII. 3, the only one in which the Plaice had been feeding to any extent, having been taken between 7.30 and 10.30 a.m.; XXIII. 1 and 2, in which all the Plaice were quite empty, were taken between 8 a.m. and 1 p.m.; whilst III. 1 and 9, in which they were feeding very slightly, were taken respectively between 4 and 8 a.m. and 12 noon and 3 p.m. In no case in which fish were examined from hauls taken both by day and night between April and October was the number of empty stomachs greater than 16 per cent. This tends to show that there is no correlation between a large percentage of empty stomachs and the hour at which the haul was taken.

NORTH OF HORN REEF. XXI. 4. October. 7-10 fathoms. f.s. (O. 120.)

The Plaice from this ground were all feeding on *Macra solida* (100 per cent., average 15), whilst *Pectinaria* occurred in 21 per cent., *Ampelisca* in 18 per cent., and six other species in one or two stomachs only.

OFF GRAA DYK. XXI. 5. October. 7 fathoms. f.s. (O. 121.)

On this ground the chief food of the Plaice was *Scrobicularia alba*, which occurred in 100 per cent. (average 7), whilst *Pectinaria* was present in 30 per cent. The only other species found was *Macra* sp. ? in 5 per cent.

NORTH OF THE NORTH-WEST ROUGH OF THE DOGGER. XII. 15. June. 21-27 fathoms. f.g.s., f.d.s. XII. 16. June. 27-35 fathoms. f.d.s. (O. 83, 84.)

The Plaice from each of these two fine sand grounds had been feeding chiefly on *Macra subtruncata*, *Solen pellucidus* (XII. 16, 61 per cent., average 9), and *Solen* sp. ? (*S. ensis* or *S. siliqua*). *Cardium* sp. ? was present in 22 per cent. of the stomachs from XII. 16, but absent from XII. 15. *Macra* and *Solen* sp. occurred with the greatest frequency in the stomachs from XII. 15, whilst *Solen pellucidus* was more common in XII. 16 than in XII. 15. Echinodermata were not represented in XII. 16, nor was *Chone infundibuliformis*, although both were found in the stomachs from XII. 15.

N.E. OF THE WEST SHOAL OF THE DOGGER. X. 9. April. 12-15½ fathoms. f.g.s. (O. 58.)

The Plaice from this station were feeding almost wholly on Nemertines (? *Cerebratulus* or allied genus), which were present in 62 per cent., and *Solen* sp. ? (*S. ensis* or *S. siliqua*) (50 per cent., average 3), the other five species present being each present in one stomach (6 per cent.) only.

HOSPITAL AND EAST OF THE WEST SHOAL OF THE DOGGER. X. 11. April. 16-20 fathoms. f.d.s., f.g.s. X. 12. April. 14-16 fathoms. f.g.s., f.d.s. X. 14. April. 15½-17 fathoms. f.g.s. (O. 60, 61, 63.)

The Plaice from these stations were feeding chiefly on *Solen* spp. (*S. ensis* and *S. siliqua*), which occurred in 65 per cent., 69 per cent., and 59 per cent. respectively of the samples, with an average of about 3 per stomach. Other common species were *Tellina fabula* (17 per cent., 32 per cent., and 33 per cent., average 3), *Pectinaria* (52 per cent., average 8, 23 per cent., average 2, and 33 per cent., average 3), *Owenia fusiformis* (28 per cent., 14 per cent., and 19 per cent.), and Amphipoda species unidentified (28 per cent., 23 per cent., and 11 per cent.), whilst *Macra subtruncata* occurred in X. 12 (50 per cent.) and X. 14 (11 per cent.), but was absent from the stomachs from Station X. 11.

LEMON SOLES. (*Pleuronectes microcephalus*. Don.)

One hundred and forty stomachs were examined from 11 stations. Of these, 2 per cent. were empty, 1 per cent. contained mud mixed with food, 35 per cent. contained unrecognisable food, and 63 per cent. contained recognisable food.

The food consisted chiefly of Polychaeta, which occurred in 90 per cent., whilst Crustacea occurred in 15 per cent., Mollusca in 8 per cent., and Coelenterata in 5 per cent.

The Polychaetes were chiefly represented by those species which build tubes (*Sabellaria*, *Sabella*, *Thelepus*, etc.), very few errant forms being found.

For details of each sample, see Table F., of which the following is a summary :—

TABLE VIII. Lemon Soles.

Region.					Off Sunderland and Hartlepool.				Off Whitby and Flamboro' Head.				Leman Banks.	Dogger.	Brucey's Garden.	
Voyage	...	...	...	...	XII.	XII.	XII.	X.	X.	X.	X.	X.	XV.	XII.	XIII.	XIII.
Station	...	...	...	...	21	22	23	5	4	2	1	14	15	27	22	
Number of Stomachs containing recognisable food.					4	12	11	3	15	14	3	20	2	0	4	
Mollusca					%	%	%	%	%	%	%	%	%	%	%	%
Crustacea					...	8	18	...	...	21	...	...	50	...	...	...
Polychaeta					50	17	36	67	7	...	...	10	...	...	...	...
Coelenterata					75	83	82	33	93	100	100	100	50	...	100	...
					...	8	...	33	13	...	...	...	...	...	...	...

OFF SUNDERLAND AND HARTLEPOOL. XII. 21. June. 43½–44 fathoms. m. XII. 22. June. 35–39 fathoms. m. XII. 23. June. 30–39 fathoms. s.s., s.o., m. X. 5. April. 33–34 fathoms. f.d.s. (B. 15, 16, 17, O. 54.)

The Lemon Soles from these stations were feeding on Polychaetes and Crustacea, the former being present in 75 per cent., 83 per cent., 82 per cent., and 33 per cent. respectively; and the latter in 50 per cent., 17 per cent., 36 per cent., and 67 per cent. *Sabella pavonina* was present in 17 per cent. (XII. 22) to 75 per cent. (XII. 21.). Sand tubes (? *Owenia fusiformis*) in 50 per cent. (XII. 22.), *Sabellaria spinulosa* 9 per cent., and *Onuphis* sp. ? 36 per cent. (XII. 23.), and unidentified Polychaetes in 17 per cent., in XII. 22. *Eupagurus* sp. was present in XII. 22., XII. 23., and X. 5. *Chiton* sp. ? was present in 18 per cent., of XII. 23., whilst Hydroids were present in 8 per cent. and 33 per cent. of XII. 22. and X. 5. respectively.

WHITBY, FLAMBOROUGH HEAD, AND NORTH OF CALIFORNIA GROUNDS. X. 4. April. 30–31 fathoms. f.s., c.s.gl. X. 2. April. 32–34 fathoms. c.s., m. X. 1. April. 30 fathoms, gl., sh. (O. 53, 51, 50.)

Polychaetes constituted the chief food of the Lemon Soles from these grounds, being present in 97 per cent. of the stomachs containing recognisable food remains, whilst Mollusca, 9 per cent., Crustacea. 3 per cent., and Coelenterates, 6 per cent., were also present. Polychaetes were represented in 94 per cent. by *Thelepus cincinnatus*, no other species occurring in more than 9 per cent.

NORTH-WEST OF LEMAN BANK. XV. 14. July. 19–20 fathoms. d.s., f.g.s. (B. 56.)

Sabellaria spinulosa constituted practically the sole food of the Lemon Soles from this ground, being present in 100 per cent. The only other species found were *Sabella pavonina* 15 per cent., and *Porcellana longicornis* 10 per cent.

NORTH OF THE NORTH-WEST ROUGH OF THE DOGGER. XII. 15. June. 21–27 fathoms. f.g.s., f.d.s. (O. 83.)

Two stomachs only of the five examined contained recognisable food, consisting in one case of a *Dendronotus arborescens*, and in the other of *Chone infundibuliformis* (?).

BRUCEY'S GARDEN. XIII. 27. July. 32-35 fathoms. f.d.s. (O. 86.)

The seven stomachs examined contained only unrecognisable food.

SOUTH OF BRUCEY'S GARDEN. XIII. 22. July. 36-39 fathoms. f.d.s. (O. 85.)

Four stomachs contained recognisable food, which was in all cases *Sabella pavonina*.

WITCHES. (*Pleuronectes cynoglossus*. L.)

OFF SUNDERLAND. XII. 21. June. 43½-44 fathoms. m.

Three fish only were examined, all of which contained *Gebia* (sp. ?), and two contained *Sabella pavonina* in addition.

DABS. (*Pleuronectes limanda*. L.)

The stomachs of 329 dabs from 11 stations were examined. Of these, 8 per cent. were empty, 2 per cent. contained sand only, 2 per cent. sand or stones mixed with food, and 12 per cent. contained unrecognisable food remains. Recognisable food remains were found in 79 per cent.

Of these latter, Mollusca, almost wholly lamellibranchs, occurred in 60 per cent., Crustacea in 33 per cent., Polychaeta in 17 per cent., Coelenterata in 9 per cent., Echinodermata in 7 per cent., Nemertinea and Polyzoa each in 3 per cent., Pisces in 5 per cent., and Tunicata in 3 per cent.

Of the Mollusca, the chief food was *Solen* sp. and *Macra subtruncata*, the feet only being present in the majority of cases. Crustacea were represented on all grounds by *Eupagurus*, but no other species was common.

For details of each sample, see Table G., of which the following is a summary :—

TABLE IX. Dabs.

Region.	Salt-fleet.	Leman Banks.			Dutch Coasts.			Dogger.					
Voyage	XVIII.	X.	XI.	XVIII.	XXIII.	III.	III.	X.	X.	X.	X.	X.	X.
Station	18	17	12	23	2	1	1	6	8	9	12	12	14
Number of stomachs containing recognisable food.	14	14	16	30	10	16 (1)*	24 (s)*	24	14	36	13 (1)*	17 (s)*	30
Pisces	%	%	%	%	%	%	%	%	%	%	%	%	%
Tunicata	...	7	...	...	20	12	8	...	...	8	...	...	7
Polyzoa	...	...	...	3	...	...	...	...	...	...	...	...	...
Mollusca	...	...	...	27	...	...	...	...	...	...	...	...	...
Crustacea	...	86	94	10	20	44	62	96	100	83	77	65	47
Polychaeta	57	14	12	57	20	69	62	8	7	19	38	29	30
Nemertinea	71	...	...	33	20	31	17	4	...	8	15	12	17
Echinodermata	...	...	...	3	...	6	...	...	...	...	...	...	20
Coelenterata	...	14	19	10	60	19	...	...	...	...	...	6	3
	...	...	...	40	...	12	21	...	...	3	...	...	3

* 1 = large fish ; s = small fish.

OFF SALTFLLEET. XVIII. 18. August 5-10 fathoms. gl.m.s. (B. 73.)

The Dabs from this station were feeding on Polychaeta (71 per cent.), and *Eupagurus Bernhardus* (57 per cent.). The Polychaetes identified were *Lanice conchilega* in 35 per cent., *Nephtys*, *Ophelia*, *Pectinaria*, and *Sabella pavonina*, each in one stomach (7 per cent.), whilst unidentified Polychaetes occurred in two stomachs, 14 per cent.

LEMAN AND OWER GROUNDS. AREA I. X. 17. April. 10-13½ fathoms. f.b.s., f.g.s. XI. 12. May. 15-16 fathoms. f.s., s.sh. (O. 66, 79.)

The Dabs taken in both these hauls were feeding chiefly on *Solen* sp. ? (*S. ensis* or *S. siliqua*) (66 per cent. and 75 per cent.), the feet only being present in the majority of cases. *Tellina fabula*, which in the case of the Plaice from haul X. 17 was present in 91 per cent., occurred in 29 per cent. of the Dabs from that haul, and in 6 per cent. only of those from haul XI. 12. *Ophiura ciliaris* was present in 14 per cent. of those from haul X. 17, and in 19 per cent. from XI. 12.

AREA VI. XVIII. 23. August. 15-17 fathoms. s.sh. (B. 78.)

The Dabs from this ground had been feeding on a very varied diet, no less than 21 species being recognised in the stomachs of 30 fish. The chief food present was *Alcyonidium* (27 per cent.), *Eupagurus Bernhardus* (37 per cent.), *Ophelia* sp. ? and *Sabella pavonina*, each in 20 per cent., and *Antennularia* sp. ? in 23 per cent. *Macra solida*, which constituted the chief food of the Plaice from this ground, was absent.

BETWEEN YMUIDEN AND EGMOND. XXIII. 2. November. 8-9 fathoms. c.g.s., f.g.s. (B. 94.)

Of the 29 Dabs examined from this haul, 15 (52 per cent.) were empty, and 10 (34 per cent.) contained recognisable food (*cf* Plaice from XXIII. 2). Echinoderms, chiefly *Echinocardium* sp., were present in six stomachs; and Pisces, Mollusca, Crustacea and Polychaeta, each in two stomachs.

OFF AMELAND. III. 1. December. 15-17 fathoms. f.s. (O. 10.)

The Dabs from this station had been feeding largely on *Solen pellucidus* (45 per cent.) and a miscellaneous collection of Crustacea (65 per cent.), comprising 12 species, the most frequent of which were *Portunus* (sp. ?), *Corystes cassivelaunus* and *Nika edulis*, each in 15 per cent., and *Callianassa subterranea* and *Eupagurus Bernhardus* in 7 per cent. Polychaeta occurred in 22 per cent., *Pectinaria* (in 15 per cent.) being the most frequent. Coelenterata (in 17 per cent.) were represented by *Obelia* in 12 per cent., whilst Pisces (*Solea lutea*, *Callionymus lyra* and *Gobius minutus*) were present in 10 per cent. The Plaice stomachs from this station were practically empty. (See page 246.)

N. OF THE WEST SHOAL OF THE DOGGER. X. 6. April. 12-13 fathoms. f.g.s., f.d.s. (O. 55.)

The Dabs from this haul were feeding almost wholly on *Solen* (*S. siliqua* or *S. ensis*), the feet of which were present in 87 per cent. and siphons in 8 per cent., but with little or no shell fragments. The only other species present in the stomachs were *Eupagurus Bernhardus* 8 per cent., and *Phyllodoce* sp. ? in 4 per cent.

NORTH AND EAST OF THE WEST SHOAL OF THE DOGGER. X. 8. April. 14-16 fathoms. f.g.s. X. 9. April. 12-15½ fathoms. f.g.s. (O. 57, 58.)

On these grounds, lying just to the N.E. of X. 6, the Dabs were feeding chiefly on the feet of *Macra subtruncata* (86 per cent. and 64 per cent. respectively). *Solen* sp. feet were present in 7 per cent. and 19 per cent., and siphons in 7 per cent. and 3 per cent. *Eupagurus* sp. was also present in the stomachs from both stations (7 per cent. and 17 per cent.), whilst seven other species were present in X. 9, but absent in X. 8. In addition 8 per cent. of the Dabs from X. 9 had been feeding on fish offal, *i.e.*, the intestines, stomach and liver, probably of Haddock, which had been thrown overboard.

EAST OF THE WEST SHOAL OF THE DOGGER. X. 12. April. 14-16 fathoms. f.g.s., f.d.s.

X. 14. April. 15½-17 fathoms. f.g.s. (O. 61, 63.)

Solen sp. ? occurred in about 30 per cent. of the stomachs from each station, and *Eupagurus Bernhardus* in 27 per cent. and 20 per cent., respectively. The feet of a species of bivalve, probably *Macra subtruncata*, were present in 33 per cent. of the stomachs from X. 12, but absent from X. 14. Nemertines were present in 20 per cent. of the stomachs from X. 14, but practically absent from X. 12. A single specimen of *Pinnotheres pisum* was present in one stomach from X. 14, but no signs of a bivalve shell were seen in the same stomach. Fish offal in the form of liver, intestines, &c., was also present in two stomachs from X. 14 (*cf.* Dabs from X. 9). *Obelia* was found in 10 per cent. of the stomachs from X. 14, but whether it was taken as food, or in attempts, successful or otherwise, to capture Amphipods, I cannot say.*

FLOUNDER. (*Pleuronectes flesus*, L.)

Twenty-four stomachs from one station (XXIII. 2, between Ymuiden and Egmond. November. 8-9 fathoms. f.g.s., c.g.s. (B. 94)), were examined. Of these, 23 (96 per cent.) were empty, the remaining one containing single specimens of *Gastrosaccus spinifer*, Amphipoda and *Echinocardium* sp. ? (*cf.* Plaice from XXIII. 2.).

THE COMMON SOLE. (*Solea vulgaris* (Quensel).)

The stomachs of 192 Soles from 11 stations were examined. Of these, 36 per cent. were empty, 9 per cent. contained sand or mud only, 4 per cent. contained mud or stones mixed with food, 2 per cent. contained unrecognisable food, and 54 per cent. contained recognisable food. The food consisted of Polychaeta in 59 per cent., Crustacea in 34 per cent., Mollusca in 11 per cent., Echinoderms in 12 per cent., Pisces in 12 per cent., Nemertines in 5 per cent., Polyzoa and Coelenterata each in one per cent. Of the Polychaeta, *Lanice*, *Ophelia* and *Sabellaria* were the chief ones identified, each occurring in 8 to 9 per cent. whilst unidentified Polychaetes occurred in 25 per cent. Of the Crustacea, *Crangon*, *Ampelisca*, and *Porcellana* occurred in 9 to 5 per cent.

For details of each sample see Table H, of which the following is a summary :—

TABLE X. Common Sole.

Region.	Off Flam- boro'.	Humber.	Salt- fleet.	Lynn Deep.	Leman Banks and Smith's Knoll.				Terschel- ling.	Deep Water.	
Voyage	X.	Sand	XVIII.	XVIII.	XVIII.	XV.	XVI.	XVI.	III.	V.	V.
Station	2.	Haile.	18.	11.	22.	16.	3.	2.	9.	2.	3.
Number of stomachs contain- ing recognisable food.	1	10	21	10	18	14	5	13	6	4	2
Pisces	%	%	%	%	%	%	%	%	%	%	%
Polyzoa	...	...	5	...	...	...	...	...	...	...	...
Mollusca	...	...	19	20	6	7	20	...	33	...	...
Crustacea	...	20	33	60	39	14	40	46	17	25	50
Polychaeta	...	40	76	60	78	64	40	46	33	50	..
Nemertinea	...	40	...	...	6	...	...	...	...	...	...
Echinodermata... ..	100	...	...	...	6	21	20	8	33	50	50
Coelenterata	...	...	...	...	...	7	...	...	...	...	...

* *Obelia* seems to be quite a favourite food of the Dab on some parts of the Dogger, judging from stomachs examined during 1904 and 1905.

FLAMBOROUGH HEAD GROUND. X. 2. April. 32-34 fathoms. c.s., m. (O. 51.)

Only one stomach contained food remains, which consisted of a single *Echinocyamus pusillus*.

SAND HAILE. RIVER HUMBER. July.

The food of the Soles from this locality consisted of Polychaeta and Nemertinea, each in 40 per cent., Pisces in 30 per cent., and Crustacea in 20 per cent. Of the Polychaetes *Nephtys* in one stomach (10 per cent.) was the only one identified, whilst none of the Nemertines were recognisable. Pisces were represented in all three stomachs by young dabs [*Pleuronectes limanda*], varying in length from 1.9-2.8 cms., the numbers in the respective stomachs being 6 (1.9-2.8 cm.), 7 (2.5-2.8 cm.), and 10 (1.3-2 cm.). Crustacea, in two stomachs (20 per cent.), were represented in each by *Crangon* and Mysidæ.

OFF SALTFLEET. XVIII. 18. August. 5-10 fathoms. m.s.gl. (B. 73.)

Polychaeta formed the chief food of the Soles from this station, occurring in 76 per cent. *Lanice conchilega* (24 per cent.) was the commonest. Unidentified Polychaeta were present in 38 per cent. Crustacea, represented chiefly by Amphipoda (24 per cent.), occurred in 33 per cent., Mollusca in 19 per cent., and Pisces in 14 per cent.

LYNN DEEP. XVIII. 11. August. 9-10 fathoms. c.s.sh., c.s. (B. 69.)

The Soles from this station were feeding chiefly on Polychaeta (60 per cent.), none of which were identified. Crustacea, represented by *Crangon* (20 per cent.), *Ampelisca* (10 per cent.), and unidentified remains (30 per cent.), were present in 60 per cent. also, whilst Mollusca, of which *Scrobicularia alba* was the only species present, occurred in 20 per cent. The food when present was in all cases found in the last half of the intestine, none being found in the stomach or fore part of the gut.

OFF HASBRO' SAND. XVIII. 22. August. 15-17 fathoms. c.s. c.s., ross. (*Sabellaria*). (B. 77.)

Polychaeta, present in 78 per cent., formed the chief food, the species identified being *Ophelia limacina* (33 per cent.), *Sabellaria spinulosa* (17 per cent.), and *Lanice conchilega* (22 per cent.). Crustacea, represented chiefly by *Ampelisca larigata*, were present in 39 per cent., whilst Mollusca, Echinodermata, and Nemertinea were each present in one stomach only (6 per cent.).

NORTH WEST OF LEMAN SAND. XV. 16. July. 18-20 fathoms. c.s. (B. 58.)

The Soles from this station were feeding chiefly on Polychaeta (64 per cent.), the species identified being *Sabellaria* in 21 per cent., *Pectinaria* and *Phyllodoce* sp. ? each in 14 per cent., and *Sigalion boa* and *Ophelia limacina* each in 7 per cent. Echinodermata were present in 21 per cent. represented in all cases by *Echinocyamus pusillus*, Crustacea in 14 per cent., and Pisces, Mollusca, and Coelenterata in 7 per cent. each.

BETWEEN SMITH'S KNOLL LIGHT-VESSEL AND HEWETTS RIDGES. XVI. 3. July. 16-20 fathoms. f.g.s. (B. 61.)

Pisces, Crustacea, and Polychaeta each occurred in two stomachs, Mollusca and Echinodermata each in one.

BETWEEN SMITH'S KNOLL AND WINTERTON RIDGE. XVI. 2. July. 14-22 fms. f.g.s. (B. 60.)

Fifteen Soles were examined from this haul, of which 13 (87 per cent.) contained recognisable food. Crustacea, represented by *Crangon* sp. var. and *Porcellana longicornis*, were present in 46 per cent.; Polychaeta in 46 per cent. (*Nephtys* 15 per cent., and unidentified remains 31 per cent.); Pisces in 23 per cent., and Echinoderms in 8 per cent. Nematodes were present in 45 per cent. of the stomachs.

OFF TERSCHELLING. III. 9. December. 22-24 fathoms. m., s.m. (O. 18.)

Pectinaria, *Solen pellucidus*, and *Amphiura* each occurred in two stomachs (33 per cent.), *Gebia* sp. ? and an unidentified Isopod each in one.

MIDDLE GROUND AND KNOLL DEEP. V. 2. January. 23-25 fathoms. f.s., f.g.s. V. 3. January. 23-24 fathoms. f.s., f.g.s. (O. 21, 22.)

Fifty-two Soles were examined from these stations. Of these, 46 were empty, the food contained in the others being *Crangon* in one stomach from each station, *Ophelia* and *Ophiura albida* in two (V. 2), and *Amphiura* in one from V. 3.

C. CARTILAGINOUS FISH.

TOPE. (*Galeus vulgaris*. Flem.)

The stomachs of 33 Tope were examined from 12 stations, and all contained recognisable food.

Pisces were present in 85 per cent., Mollusca in 6 per cent., and Crustacea in 36 per cent.

Of the Pisces, *Clupea* was present in 58 per cent., *Gadus merlangus* in 12 per cent., *Callionymus lyra* in 9 per cent., *Ammodytes* (sp. ?) in 6 per cent., and *Gobius* in 3 per cent. Crustacea were represented in 12 per cent. by *Cancer pagurus*, in 15 per cent. by *Eupagurus Bernhardus*, in 21 per cent. by *Crangon*, in 6 per cent. by *Gebia*, and in 6 per cent. by *Carcinus* and *Portunus holsatus*. Mollusca were represented solely by *Sepiolo atlantica*. For details, see Table J.

LESSER DOG-FISH. (*Scyllium canicula*. L.)

OFF BLAKENEY. XVIII. 21. August. 10 fathoms. s.sh. (B. 76.)

The only stomach examined contained one each of the following Crustacea, *Gebia* (sp. ?), *Cancer pagurus*, and *Pandalus Montagu*.

OFF HASBRO' SAND. XVIII. 22. 15-17 fathoms. c.s., ross. (B. 77.)

The only stomach examined contained *Pandalus Montagu*, *Ophelia* (sp. ?), and *Eupagurus Bernhardus*.

SPUR DOG. (*Acanthias vulgaris*. Risso.)

The stomachs of 61 Spur Dogs from 11 stations were examined. Of these, 41 were empty, the remainder (20) contained recognisable food. The food consisted of Pisces in 4 (19 per cent.), Mollusca in 1 (5 per cent.), Crustacea in 9 (43 per cent.), and Gephyreans in 15 (71 per cent.).

Those from XVIII. 22 (12 fish), XVIII. 23 (12 fish), and XVIII. 24 (14 fish), all of small fish, were quite empty. The fish from XX. 6 (6) and XXI. 5 (8) had all been feeding on *Echiurus*, and in some cases on *Eupagurus* and *Crangon* as well. The two fish examined from XXI. 3 had both been feeding on *Eupagurus*, whilst one contained in addition *Crangon* and *Echiurus*.

Of the three *Acanthias* examined from XII. 4, two were empty, the remaining one containing pieces of Plaice (*Pleuronectes platessa*), i.e., a head end, a tail end, and a piece from the edge of the body near the tail. These had clearly been bitten off separately. Two Plaice which were caught in the same haul of the trawl had had semicircular pieces bitten out of the body some time previously, as the wounds were quite healed. These bites were clearly made by *Acanthias*. Plaice with similar wounds were also taken in haul XII. 1 (W.G.).

For details of the stomachs see Table K.

BLONDE. (*Raia blanda*. Holt.)

OFF CROMER. XVIII. 23. August. 15-17 fathoms. s.sh. (B. 78.)

The only fish examined contained a Dab (*Pleuronectes limanda*) 5 ins. long and four *Ammodytes* sp. ? of about 10 ins.

HOMELYN. (*Raia maculata*. Mont.)

OFF BLAKENEY OVERFALL. XVIII. 1. August. 10 fathoms. c.s. (B. 65.)

Five fish were examined. Fish remains were present in one ; Polychaetes in two (*Ophelia* in one and unidentified Polychaetes in two). Crustacea occurred in four, being represented by *Crangon* in one and by quantities of Mysidæ in the other three.

SKATE. (*Raia batis*. Linn.)

WESTERN DEEP WATER. IX. 3. March. 22 fathoms. c.s., d.s. (O. 48.)

Two fish were examined, the stomachs of each containing specimens of *Crangon Allmanni* and *Pandalus Montagu*.

THORNBACK. (*Raia clavata*. Linn.)

The stomachs of 68 Thornbacks from eight stations were examined. Of these, five were empty and 63 contained recognisable food. Crustacea were the chief food in all cases (98 per cent.), Pisces, Polychaeta and Mollusca only occurring in the stomachs from one or two stations, and then in small quantities. Crustacea were represented chiefly by *Portunus*, *Eupagurus*, and *Crangon* with seven other species, and were in the large majority of instances quite decalcified and soft. Only in one or two cases, where the food had evidently been quite recently eaten, were they in anything like a firm condition.

For details of each sample see Table L, of which the following is a summary :—

TABLE XI. Thornback.

Region.	Flamboro'.	Blakeney.	Lynn Deepes.		Ymuiden.	Horn Reef.		Deep Water.
Voyage	X.	XVIII.	XVIII.	XVIII.	XXIII.	XXI.	XXI.	IX.
Station	2	1	11	12	2	3	5	3
Number of stomachs containing recognisable food.	17	5	1	1	2	14	16	7
Pisces	% 29	% ...	% ...	% ...	% ...	% ...	% ...	% ...
Mollusca	6	20	...	...	...	...	...	...
Crustacea	94	100	100	100	100	100	100	100
Polychaeta	12	...	...	...	...	...	...	...

FLAMBOROUGH HEAD GROUND. X. 2. April. 32-34 fathoms. c.s., m. (O. 51.)

The Thornbacks from this station were feeding principally on Crustacea (94 per cent.), consisting chiefly of *Crangon Allmanni* (18 per cent.), *Crangon* sp.? (41 per cent.), and *Eupagurus Bernhardus* (35 per cent.). Pisces occurred in 29 per cent., *Liparis vulgaris* in 6 per cent. being the only one identified. Mollusca occurred in 6 per cent. and Polychaeta in 12 per cent.

OFF BLAKENEY OVERFALL. XVIII. 1. August. 10 fathoms. c.s. (B. 65).

Crustacea formed the chief food of the Thornbacks from this station, occurring in all stomachs, the species present being *Portunus pusillus* in four (80 per cent.), *Cancer pagurus* and *Crangon Allmanni* each in two, *Pandalus Montagu* and Amphipoda in one each. Mollusca, represented by *Buccinum undatum* in one stomach, provided the only other food present.

LYNN DEEP. XVIII. 11. August. 9-10 fathoms. c.s.sh., c.s. XVIII. 12. August. 9-13 fathoms. c.s., c.s.grv.sh. (B. 69, B. 70.)

One fish only from each haul was examined. Each contained *Eupagurus Bernhardus* and that from XVIII. 11 contained in addition a *Carcinus maenas*.

BETWEEN YMUIDEN AND EGMOND. XXIII. 2. November. 8-9 fathoms. c.g.s., f.g.s. (B. 94).

Two stomachs were examined, each of which contained *Crangon vulgaris* only.

NORTH OF HORN REEF. XXI. 3. October. 8-9½ fathoms. f.s. (B. 82.)

The Thornbacks from this station were all feeding solely on Crustacea, three species only being found, viz., *Portunus holsatus* in 71 per cent., *Eupagurus Bernhardus* in 29 per cent., and *Crangon vulgaris* in 93 per cent.

OFF GRAA DYB. XXI. 5. October. 7 fathoms. f.s. (O. 121.)

Crustacea constituted the sole food in all the stomachs examined, and consisted of *Crangon vulgaris* in all, with *Eupagurus Bernhardus* and *Portunus holsatus* each in about 30 per cent.

WESTERN DEEP WATER. IX. 3. March. 22 fathoms. d.s., c.s. (O. 48.)

Crustacea were present in all stomachs, no other group being represented. *Crangon Allmanni* (71 per cent.), *Portunus holsatus* and *Pandalus Montagu* each in 43 per cent., and *Portunus pusillus* in 29 per cent., with *Ampelisca laevigata* in 14 per cent., being the only species present.

III.—COMPARISON OF THE FOOD OF DIFFERENT SPECIES OF FISH CAUGHT IN THE SAME HAUL OF THE TRAWL.

PLAICE (*Pleuronectes platessa*) AND DAB (*P. limanda*).

BELOW SWARTE BANK. X. 17. April. 10-13½ fathoms. f.br.s., f.g.s. (O. 66.)

Seventy-one Plaice and 14 Dabs were examined which contained recognisable food. The Plaice were feeding almost wholly on *Tellina fabula* (91 per cent.), the other frequent species being *Amphiura filiformis* (28 per cent.) and *Solen* sp.? (17 per cent.), whilst the Dabs were feeding chiefly on *Solen* sp. (64 per cent.), with *Tellina fabula* next in frequency (29 per cent.).

OFF THE NORTH-WEST END OF HASBRO' SAND. XVIII. 23. August. 15-17 fathoms. s.sh. (B. 78.)

Thirty-nine Plaice and 30 Dabs, which contained recognisable food, were examined. The former were feeding chiefly on *Ophelia* (51 per cent.) and *Macra solida* (56 per cent.), with *Gebia* in 23 per cent., whilst the Dabs were feeding on a miscellaneous collection, comprising over 20 species, the commonest, *Alcyonidium*, occurring in 27 per cent., whilst eight other species occurred in 10 per cent. to 23 per cent., *Ophelia* being present in 20 per cent.

OFF AMELAND. III. 1. December. 15-17 fathoms. f.s. (O. 10.)

Thirty-two Plaice and 40 Dabs were examined from this haul. The former, with two exceptions, were all empty, whilst all the latter contained food. Of the five species which occurred in the stomachs of the Plaice, four were found also in the stomachs of the Dabs, one (*Solen pellucidus*) being present in 45 per cent., and another (*Pectinaria*) in 15 per cent.

The fact that such a large percentage (94 per cent.) of the Plaice were empty tends to confirm the belief that Plaice neither feed nor grow to any extent during the winter months, at least on this ground.

HOSPITAL (DOGGER). X. 12. April. 14-16 fathoms. f.g.s., f.d.s. (O. 61.)

Twenty-two Plaice and 30 Dabs of those examined from this haul contained recognisable food. Both Plaice and Dabs were feeding largely on *Macra subtruncata* (50 per cent. and 33 per cent.) and *Solen* sp. (69 per cent. and 30 per cent.), the other common species being, in the Plaice *Tellina fabula* (32 per cent.), *Pectinaria* (23 per cent.), and *Ampelisca* (23 per cent.), whilst the Dabs were also feeding on *Eupagurus Bernhardus* (27 per cent.).

EAST OF THE WEST SHOAL OF THE DOGGER. X. 14. April. 15½-17 fathoms. f.g.s. (O. 63.)

Thirty Dabs and 27 Plaice contained recognisable food.

Here again *Solen* sp. constituted the chief food of both Plaice (63 per cent.) and Dabs (30 per cent.). The former were, in addition, feeding on *Tellina fabula* and *Pectinaria*, each in 33 per cent., whilst the latter were also feeding on *Pectinaria* (10 per cent.), Nemertines (20 per cent.), *Eupagurus Bernhardus* (13 per cent.), and Amphipoda 10 per cent.

— PLAICE, DABS, AND GREY GURNARD (*Trigla gurnardus*).

NORTH AND EAST OF THE WEST SHOAL OF THE DOGGER. X. 9. April. 12-15½ fathoms. f.g.s. (O. 58.)

Of the Plaice, Dabs, and Grey Gurnard examined from this haul, 16, 36 and 29 respectively contained recognisable food.

The Plaice were feeding chiefly on *Solen* sp. (50 per cent.) and Nemertines (62 per cent.), the Dabs on *Macra subtruncata* feet (64 per cent.), *Solen* sp. ? feet, &c. (25 per cent.), *Eupagurus Bernhardus* (17 per cent.), whilst the Grey Gurnard were feeding on *Gastrosaccus spinifer* (66 per cent.), *Crangon* sp. ? (48 per cent.), Cumacea and *Ampelisca laevigata*, (each in 38 per cent.)

— PLAICE, DABS, AND SOLES (*Solea vulgaris*).

OFF SALTFLLEET. XVIII. 18. August. 5-10 fathoms. grv., m. s. (B. 73.)

Ten Plaice, 14 Dabs, and 21 Soles of those examined contained recognisable food. Polychaeta formed the chief constituent of the food of the Soles (76 per cent.) and Dabs (71 per cent.), and to a less extent of that of the Plaice (40 per cent.) The Soles were also feeding to a small extent on Amphipoda

(19 per cent.), whilst the chief food of the Plaice was *Scrobicularia alba* (60 per cent.). Dabs were feeding to a large extent on *Eupagurus Bernhardus* (57 per cent.).

PLAICE AND LEMON SOLES (*P. microcephalus*).

BETWEEN THE LEMAN BANK AND HASBRO' SAND. XV. 14. July. 19-20 fathoms. d.s., f.g.s. (B. 56.)

Twenty Lemon Soles and 20 Plaice were examined. The Lemon Soles, without exception, were feeding on *Sabellaria*, the only other species present being *Porcellana longicornis* (10 per cent.), and *Sabella pavonina* (15 per cent.). The two latter also occurred in the Plaice stomachs, but only in 25 per cent. and 10 per cent. respectively, the chief food consisting of *Scrobicularia* sp. (40 per cent.), *Macra subtruncata* 35 per cent., and *Pectinaria* 30 per cent.

PLAICE AND SOLES.

BETWEEN THE LEMAN BANK AND HASBRO' SAND. XV. 16. July. 18-20 fathoms. c.s. (B. 58.)

Fourteen Soles and 39 Plaice of those examined contained recognisable food. The former were feeding chiefly on Polychaeta (64 per cent.), consisting principally of *Sabellaria*, *Phyllodoce* and *Pectinaria*, with *Echinocyamus pusillus* (21 per cent.) and *Porcellana longicornis* (14 per cent.), whilst the Plaice were feeding chiefly on Mollusca (87 per cent.), consisting of *Macra subtruncata* (46 per cent.), *Scrobicularia* (41 per cent.), and *Tellina fabula* (23 per cent.), whilst all the species mentioned above as food of the Lemon Sole, excepting *Phyllodoce*, were also present in from 8 per cent. to 18 per cent.

PLAICE, HADDOCK (*Gadus aeglefinus*) AND GREY GURNARD.

HOSPITAL (DOGGER). X. 11. April. 16-20 fathoms. f.d.s., f.g.s. (O. 60.)

Twenty-nine Plaice, 50 Haddock, and 19 Grey Gurnard examined from this haul contained recognisable food.

The Plaice and Haddock were feeding commonly on *Solen* sp. (65 per cent. and 38 per cent.), *Tellina fabula* (17 per cent. and 38 per cent.), *Pectinaria* (52 per cent. and 46 per cent.), and *Ampelisca laevigata* (28 per cent. and 50 per cent.), whilst in addition the Plaice contained a Polychaeta sand tube (28 per cent.), and the Haddock were also feeding on *Amphiura filiformis* (42 per cent.), *Montacuta bidentata* (36 per cent.), and *Solen pellucidus* 38 per cent.

The Grey Gurnard were all feeding on Crustacea, consisting chiefly of *Crangon trispinosus* (63 per cent.), *Schistomysis* sp. ? (26 per cent.), and *Ampelisca laevigata* (74 per cent.).

PLAICE, GREY GURNARD, COD AND CATFISH.

WHITBY GROUND. X. 4. April. 30-31 fathoms. f.s., c.s., grv. (O. 53.)

Twelve Plaice, 12 Grey Gurnard, 21 Cod and four Catfish, which were examined from this haul, contained recognisable food.

The Cod and Catfish were both feeding largely on *Hyas coarctatus* (33 per cent. and 50 per cent.), and *Eupagurus Bernhardus* (52 per cent. and 75 per cent.). The chief food, however, of the Catfish appeared to be *Ophiothrix fragilis*, large quantities of the remains of which occurred in all the stomachs. Other species found in Catfish stomachs were *Buccinum undatum* and *Pecten opercularis*, both in 50 per cent. *Pandalus Montagu* was the only other species at all common in the Cod stomachs, occurring in 43 per cent.

The Plaice were feeding chiefly on Mollusca (*Venus ovata* 50 per cent., *Macra subtruncata* 58 per cent., and *Solen pellucidus* 50 per cent.), Tunicata (*Pelonaia* 42 per cent.), and Polychaeta (*Pectinaria* 42 per cent.), whilst the Grey Gurnard were almost all feeding on *Crangon Allmanni* (83 per cent.), with *Sepiola atlantica* in 25 per cent.

PLAICE AND HADDOCK.

NORTH OF THE NORTH-WEST ROUGH OF THE DOGGER. XII. 16. June. 27-35 fathoms. f.d.s. (O. 84.)

Eighteen Plaice and 48 Haddock examined from this haul contained recognisable food. Both species were feeding to a large extent on *Solen pellucidus* and *Solen* sp., but whereas in the Plaice the respective frequencies of the two were 61 per cent. and 33 per cent., in the Haddock they were 21 per cent. and 44 per cent. Other species present in the Plaice were *Macra subtruncata* (22 per cent.) and *Cardium* sp. (22 per cent.). The Haddock had also been feeding on *Amphiura filiformis* (54 per cent.), *Tellina* sp. (33 per cent.), and Amphipoda (21 per cent.), whilst Polychaeta occurred in 28 per cent. of the Plaice and 54 per cent. of the Haddock.

COD, HADDOCK AND WHITING.

MARKHAM'S HOLE. VIII. 2. March. 27-33 fathoms. m. (O. 33.)

Sixty-five Codling, 699 Haddock and 15 Whiting, which were examined from this haul, contained recognisable food.

The species present with the greatest frequency were (i.) in the Codling, *Eupagurus Bernhardus* (38 per cent.), *Crangon Allmanni* (23 per cent.), *Portunus holsatus* (14 per cent.), *Portunus* sp. ? (17 per cent.), and *Nephrops norvegicus* (11 per cent.); (ii.) in the Haddock, *Pectinaria* (66 per cent.), *Echinocyamus pusillus* (41 per cent.), *Ophiothrix fragilis* (43 per cent.), *Montacuta bidentata* (29 per cent.), and *Ophiura albida* (14 per cent.); (iii.) in the Whiting, *Crangon Allmanni* (27 per cent.), *Stenorhynchus* sp. ? (13 per cent.), and *Pandalus Montagu* (13 per cent.), and Pisces remains (53 per cent.). In addition, the Codling contained 24, the Haddock 52, and the Whiting one other species, none of which, however, occurred in more than 10 per cent. of the stomachs.

On the whole, the Whiting were feeding chiefly on Pisces and Crustacea, the Cod on Crustacea, and the Haddock on *Pectinaria* and Echinodermata. Whether *Montacuta bidentata* was eaten intentionally by the Haddock, or only as a result of eating *Pectinaria*, I cannot say. Judging from the fact that the *Montacuta* was in all cases accompanied by *Pectinaria*, it seems probable that the latter is the case, and that in fact *Montacuta bidentata* is a commensal with *Pectinaria*, but in what way the evidence does not tell us. In the Haddock from X. 11, in which *Montacuta* and *Pectinaria* were both present, the former was in the majority of cases accompanied by the latter, but not in all, as in VIII. 2.

COD AND HADDOCK.

OFF ARBROATH. XXI. 1. September. 34-36 fathoms. s.m., d.s.sh. (O. 118.)

Thirty-four Cod and 50 Haddock of those examined contained recognisable food.

The Cod were feeding almost wholly on Crustacea (*Hyas coarctatus*, *Portunus holsatus*, *Eupagurus Bernhardus* and *Pandalus Montagu*), whilst the Haddock were feeding chiefly on Mollusca (*Solen* and *Scrobicularia* principally) and Echinodermata (*Ophiothrix*, *Echinocyamus* and *Amphiura filiformis*).

In conclusion, I present the following Table, which shows for each species of fish the number of stomachs examined, and the number containing recognisable food, with the percentage of the latter in which representatives of the various groups mentioned were present as food :—

[illegible]

It will be seen from the above that some fish specialize in food much more than others ; thus Grey Gurnard (*Trigla gurnardus*) feed almost wholly on Crustacea, Turbot (*Rhombus maximus*) wholly on Pisces, and Thornback (*Raia clavata*) almost wholly on Crustacea. Other species, although feeding chiefly on one group, feed to a fairly large extent on other groups ; thus Plaice (*Pleuronectes platessa*), while feeding chiefly on Mollusca, also eat a number of species belonging to the Polychaeta, Echinodermata, and Crustacea. Haddock (*Gadus aeglefinus*), which are very indiscriminate feeders, had been feeding almost equally on Mollusca, Echinodermata, and Polychaeta, and to a less extent on Crustacea, whilst the other groups, Pisces, Tunicata, Polyzoa, Nemertinea, and Coelenterata were also all present, but in a very small number of stomachs.

Judging from the present records, the amount of competition between Plaice and Dabs in the matter of food varies considerably on different grounds. Mollusca, represented chiefly by *Macra*, *Solen* and *Tellina fabula*, is the principal group over which there is any competition ; for instance, at X. 12., where both Plaice and Dabs were feeding chiefly on *Macra subtruncata* and *Solen* sp., and to a lesser extent X. 17., where *Solen* sp. and *Tellina fabula* were the chief food of the Dab, and *Tellina fabula*, *Amphiura*, and *Solen* sp., the chief food of the Plaice. No serious competition was shown in XVIII. 23., where Plaice were feeding chiefly on *Ophelia limacina* and *Macra solida*, whilst Dabs were feeding on a miscellaneous collection of species, in which however *Ophelia* was included, but of which no species occurred in more than 27 per cent. of the stomachs.

There seems to be some competition also between the Haddock and Plaice, at least in the only two hauls from which samples of both were examined. Thus in X. 11., both were feeding largely on *Solen* sp., *Tellina fabula*, *Pectinaria*, and *Ampelisca laevigata*, whilst in XII. 16. both were feeding on *Solen* sp. and *S. pellucidus*, but in this case *Amphiura filiformis* was the favourite food of the Haddock.

TABLES A TO L.

V.—DETAILED TABLES.

Showing for the various species of fish examined (i.) the locality and date of capture, with depth and bottom deposit; (ii.) the number of stomachs examined, distinguishing between those which contained recognisable food and those which were empty, &c.; and (iii.) the numbers of stomachs containing the various food species specified. In certain cases, where the numbers appeared to be sufficient for the purpose, percentages have been added.

ABBREVIATIONS: L=large fish. M=medium fish. S=small fish.
For abbreviations referring to Bottom Soil, see Report on Trawling, pp. 134, 135.

TABLE A.

		Latchet (<i>Trigla hirundo</i>).					Grey Gurnard (<i>Trigla gurnardus</i>).					
Region		Well Bank.	Lowestoft Deep.			Berwick to Flamboro'	Dogger.					
Voyage and Station ..		XV. 8.	XI. 4.		XI. 6.	X. 4.	X. 6.	X. 9.		X. 11.		
Month		July.	May.		May.	April.	April.	April.		April.		
Depth in Fathoms ..		7-20.	20-20½.		20-22.	30-31.	12-13.	12-15½.		16-20.		
Soil		f.g.s.	s.sh.	f.g.s.	f.spk.s. — f.br.s.	c.s.gl., fs.	f.g.s., f.br.s.	f.g.s.		f.d.s. — f.g.s.		
		No.	No.	%	No.	%	No.	No.	No.	%	No.	%
Number of stomachs examined ...		7	25	...	35	...	12	16	30	...	20	...
" " " empty ...		...	1	4	8	23	...	...	...	...	1	5
Stomachs con- taining—	{ sand, mud, stones, only ...	...	...	...	...	...	...	...	1 sd	3	...	...
	{ sand with food ...	...	...	...	...	...	...	...	...	...	...	...
	{ unrecognisable food ...	...	...	...	...	...	...	...	...	...	...	...
	{ recognisable food ...	7	24	96	27	77	12	16	29	97	19	95
PISCES ...		7	16	67	24	89	...	2	1	3	1	5
Remains unidentified ...		4	10	42	12	44	...	...	...	...	1	5
Trachinus vipera, Cuv. and Val. ...		...	...	...	1	4	...	...	...	...	...	...
Gobius (sp.?) ...		1	...	...	...	...	...	...	...	...	...	...
Callionymus lyra, L. ...		1	4	17	4	15	...	...	...	...	...	...
Centronotus gunellus (L.) ...		...	...	...	...	...	...	1	...	...	...	...
Ammodytes (sp.?)... ..		...	2	8	1	4	...	...	...	...	...	...
Arnoglossus (sp.?) ...		...	1	4	...	...	...	...	...	...	...	...
Pleuronectes limanda, L....		...	4	17	1	4	...	...	...	...	...	...
Solea lutea, Risso. ...		7	1	4	10	37	...	...	1	3	...	...
" (sp.?) ...		2	...	...	...	...	...	1	...	...	...	...
MOLLUSCA ...		...	7	29	3	11	3	...	1	3	1	5
Remains unidentified ...		...	2	8	1	4	...	...	...	...	...	...
Mactra (sp.?) ...		...	...	...	...	...	...	...	1	3	...	...
Scrobicularia (sp.?) ...		...	4	17	2	7	...	...	...	...	...	...

TABLE A.—*continued.*

Region	Latchet (<i>Trigla htrundo</i>).					Grey Gurnard (<i>Trigla gurnardus</i>).					
	Well Bank.	Lowestoft Deep.				Berwick to Flamboro'.	Dogger.				
Voyage and Station ..	XV. 8.	XI. 4.		XI. 6.		X. 4.	X. 6.	X. 9.		X. 11.	
Month	July.	May.		May.		April.	April.	April.		April.	
Depth in Fathoms ..	17-20.	20-20½.		20-22.		30-31.	12-13.	12-15½.		16-20.	
Soil	f.g.s.	s.sh.	f.g.s.	f.spk.s.	f.br.s.	c.sgl.f.s.	f.g.s. f.br.s.	f.g.s.		f.d.s.	f.g.s.
MOLLUSCA—cont.	No.	No.	%	No.	%	No.	No.	No.	%	No.	%
<i>Solen siliqua</i> , L.	...	1	4	...	...	...	...	...	...	...	...
„ (sp. ?)	...	1	4	...	...	...	...	...	...	...	...
<i>Corbula gibba</i> (Oliv.)	...	...	...	...	...	...	...	...	...	1	5
<i>Sepiolo atlantica</i> , D'Orb.	...	...	...	...	...	3	...	...	...	...	...
CRUSTACEA	1	9	38	5	19	12	16	28	97	19	100
Remains unidentified	...	2	8	...	...	1	...	...	...	...	...
<i>Portunus holsatus</i> , Fabr.	1	1	4	3	11	...	...	...	...	1	5
„ (sp. ?)	...	...	...	1	4	...	2	1	3	1	5
<i>Theia polita</i> , Leach	...	2	8	...	...	...	...	...	...	...	...
<i>Eupagurus Bernhardus</i> (Linn.)	...	3	12	1	4	...	...	...	...	...	...
<i>Galathea</i> (sp. ?)	...	...	...	...	...	...	1	...	...	...	...
<i>Crangon Allmanni</i> , Kin.	...	...	...	...	...	10	12	...	...	...	...
„ <i>trispinosus</i> (Hailstone)	...	1	4	...	...	...		...	...	12	63
„ <i>spinosus</i> , Leach	...	...	...	...	...	...	...	...	...	1	5
„ (sp. ?)	...	...	...	1	4	...	...	14	48	...	...
<i>Pandalus Montagni</i> , Leach	...	...	...	...	...	1	...	...	...	...	...
<i>Boreophausia Raschii</i> ? (M. Sars)	...	...	...	...	...	1	...	...	...	...	...
<i>Gastrosaccus spinifer</i> (Goës)	...	4	17	...	...	...	11	19	66	...	...
<i>Schistomysis</i> (sp. ?)	...	...	...	...	...	...	...	...	...	5	26
Cumacea, unidentified	...	...	...	...	...	...	3	11	38	...	...
Isopoda „	...	...	...	...	...	...	1	...	...	...	...
<i>Urothoe norvegica</i>	...	1	4	...	...	...	...	...	...	...	...
<i>Ampelisca laevigata</i> , Lilljeborg	...	...	...	...	...	...	1	11	38	14	74
<i>Parathemisto obliqua</i> (Kröyer)	...	...	...	...	...	1	...	...	...	...	...
NEMERTINEA	...	...	...	...	...	...	1	...	...	...	...
Remains unidentified	...	...	...	...	...	...	1	...	...	...	...
ECHINODERMATA	1	...	...	...	...	...	...	...	...	...	...
<i>Ophiura ciliaris</i> (Linn.)	1	...	...	...	...	...	...	...	...	...	...

TABLE B.

COD (*Gadus morrhua*).

[illegible]

TABLE B. COD—continued.

Region	Off Arbroath.	Berwick to Flamboro'.					Markham's Hole.	Off Ters-chelling.	Brown Ridges.	Knoll Deep.	Western Deep Water.		
Voyage and Station ..	XXI. 1.	X. 1.	X. 1.	X. 4.	X. 4.	XII. 21.	VIII. 2.	III. 7.	XVII. 5.	V. 3.	IX. 3.	IX. 3.	IX. 5.
Month	Sept.	April.	April.	April.	April.	June.	March.	Dec.	July.	Jan.	Mar.	Mar.	Mar.
Depth in Fathoms ..	34-36.	30.	30.	30-31.	30-31.	43-44.	27-33.	20-22.	16-17.	23-24.	22.	22.	23-29.
Soil	s. & m. d.s. & sh.	gl. & sh.	gl. & sh.	c.s. gl. f.s.	c.s. gl. f.s.	m.	m.	f.s. & m. m.	f.g.s. f.d.s.	f.s. f.g.s.	d.s. c.s.	d.s. c.s.	d.s. c.s.
MOLLUSCA—cont.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
<i>Cardium</i> (sp. ?)...	...	...	...	...	...	...	1	...	...	...	...	...	...
<i>Cyprina islandica</i> ...	...	...	...	...	...	...	6	...	...	...	...	...	...
<i>Donax vittatus</i> ...	...	...	...	...	...	...	...	...	...	1	...	...	...
<i>Mactra stultorum</i> ...	1	...	...	...	...	...	...	...	...	...	...	...	...
<i>Dentalium entalis</i> ...	1	...	...	...	...	...	...	...	...	...	...	...	...
<i>Buccinum undatum</i> ...	1	1	...	...	...	...	4	...	...	3	2	...	...
<i>Fusus</i> (sp. ?) ...	...	2	...	...	...	...	...	...	...	2	...	...	...
<i>Loligo</i> (sp. ?) ...	...	1	...	...	...	...	...	...	...	1	...	...	...
<i>Sepiolo atlantica</i> ...	...	...	1	...	...	...	...	...	...	...	...	...	...
CRUSTACEA ...	33	4	8	3	15	10	53	4	9	40	3	5	2
Remains unidentified ...	1	...	...	...	...	...	...	...	...	...	...	3	...
<i>Stenorhynchus phalangium</i> ...	...	...	...	...	...	...	...	...	...	3	2	...	...
„ <i>tenuirostris</i> ...	...	...	...	...	...	...	...	...	...	2	1	...	...
„ (sp. ?) ...	...	...	...	...	...	...	2	...	...	...	...	...	...
<i>Hyas araneus</i> ...	...	...	...	...	...	...	...	...	...	...	...	1	...
„ <i>coarctatus</i> ...	9	4	1	3	4	1	...	...	...	1	2	1	...
„ (sp. ?) ...	...	...	...	...	...	...	1	...	...	...	...	...	...
<i>Cancer pagurus</i> ...	...	...	...	...	...	...	...	...	1	...	...	...	...
<i>Pilumnus hirtellus</i> ...	...	...	...	...	...	...	...	...	...	...	1	...	...
<i>Portunus holsatus</i> ...	13	...	1	...	1	...	9	...	6	10	...	2	1
„ <i>pusillus</i> ...	...	3	1	...	...	...	5	...	...	1	1	2	...
„ (sp. ?) ...	...	...	1	...	...	...	11	...	...	...	1	1	...
<i>Ebalia</i> (sp. ?) ...	...	...	...	...	...	...	1	...	...	...	...	...	...
<i>Atelecyclus heterodon</i> ...	1	...	...	...	...	1	...	...	...	...	...	...	...
<i>Corystes cassivelaunus</i> ...	...	...	...	...	...	1	1	1	2	2	...	...	...
<i>Eupagurus Bernhardus</i> ...	13	3	4	2	9	2	25	3	7	36	2	5	2
<i>Porcellana longicornis</i> ...	...	...	...	...	...	...	...	...	...	3	...	...	...
<i>Galathea squamifera</i> ...	...	...	2	...	1	...	...	...	...	...	...	...	...
„ <i>dispersa</i> ...	...	...	...	...	...	...	...	...	...	...	1	...	...
„ <i>intermedia</i> ?... ..	...	...	2	...	...	...	...	...	...	...	...	...	...
„ (sp. ?) ...	3	...	...	...	...	...	4	...	...	...	...	...	...
<i>Callinassa subterranea</i> ...	...	...	...	...	...	...	...	...	...	...	1	...	...

TABLE B. COD—*continued*.

Region	Off Ar- broath.	Berwick to Flamboro'.					Mark- ham's Hole.	Off Ters- chelling.	Brown Ridges.	Knoll Deep.	Western Deep Water.		
Voyage and Station ..	XXI. 1.	X. 1.	X. 1.	X. 4.	X. 4.	XII. 21.	VIII. 2.	III. 7.	XVII. 5.	V. 3.	IX. 3.	IX. 3.	IX. 5.
Month	Sept.	April.	April.	April.	April.	June.	March.	Dec.	July.	Jan.	Mar.	Mar.	Mar.
Depth in Fathoms ..	34-36.	30.	30.	30-31.	30-31.	43½-44.	27-33.	20-22.	16-17.	23-24.	22.	22.	23-29.
Soil	s. & m. d.s. & sh.	gl. & sh.	gl. & sh.	c.s. gl. f.s.	c.s. gl. f.s.	m.	m.	f.s. & m. m.	f.g.s. f.d.s.	f.s. f.g.s.	d.s. c.s.	d.s. c.s.	d.s. c.s.
CRUSTACEA— <i>cont.</i>		No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Gebia (sp.?)	...	...	...	...	...	...	3	...	...	...	1	...	...
Calocaris Macandreae	...	...	...	...	...	2	...	...	...	...	...	...	...
Nephrops norvegicus	...	...	...	...	...	8	7	...	...	...	...	...	...
Crangon vulgaris	...	...	...	...	...	...	...	...	...	2	...	...	...
„ Allmanni	...	...	4	...	...	...	15	...	...	...	...	...	1
„ (sp.?)... ..	3	...	...	...	1	2	...	1	...	15	...	...	...
Nika edulis	...	...	...	...	...	...	3	...	...	...	...	...	...
Pandalina brevirostris	4	...	...	...	...	...	3	...	...	...	...	...	...
Pandalus Montaguï	7	...	2	...	9	2	3	...	...	19	...	...	...
Mysidae, unidentified	...	...	...	...	...	...	1	...	...	...	...	...	...
Siriella crassipes	...	...	4	...	...	...	...	...	...	...	...	...	...
Amphipoda, unidentified	2	...	...	...	...	...	...	...	...	...	...	...	...
Ampelisca laevigata	...	...	...	...	...	...	1	...	...	...	...	...	...
POLYCHAETA...		2	4	1	3	3	19	1	...	4	3	1	1
Remains unidentified	...	...	1	...	1	...	...	...	...	...	...	...	...
Aphrodite aculeata	...	2	3	1	1	3	17	1	...	3	3	1	1
Phyllodoce (sp.?)	...	...	...	...	1	...	...	...	...	1	...	...	...
Pectinaria (sp.?)	...	...	...	...	...	...	2	...	...	...	...	...	...
NEMERTINEA		...	...	...	1	...	...	...	...	...	...	...	...
Lineus bilineata	...	...	...	...	1	...	...	...	...	...	...	...	...
ECHINODERMATA		1	...	...	1	...	3	...	...	...	...	...	...
Ophiothrix fragilis	1	...	...	1	...	...	3	...	...	...	...	...	...

TABLE C.

HADDOCK (*Gadus aeglefinus*).

[illegible]

TABLE C.—HADDOCK—*continued*.

Region	Off Arbroath.	Hartle- pool Ground.	Markham's Hole.	Off Terschel- ling.	Dogger.							
Voyage and Station ..	XXI. 1.	X. 5.	VIII. 2.	III. 7.	X. 8.	X. 11.	XII. 12.	XII. 13.	XII. 16.			
Month	Sept.	April.	March.	Dec.	April.	April.	June.	June.	June.			
Depth in Fathoms ..	34-36.	33-34.	27-33.	20-22.	14-16.	16-20.	20-23.	19-20.	27-35.			
Soil	s.m., d.s. & sh.	f.d.s.	m.	f.s. & m., m.	f.g.s.	f.d.s., f.g.s.	f.s., f.l.s.	c.br.s., f.s. & sh.	f.d.s.			
CRUSTACEA— <i>cont.</i>	No.	No.	No.	%	No.	No.	No.	No.	%	No.	%	
Galathea (sp.?)	...	...	14	2	...	...	...	2	2	...	...	...
Callianassa subterranea	...	...	32	5	1	...	2	...	...	...	...	...
Gebia (sp.?)	...	...	30	4	13	...	...	1	1	...	...	...
Crangon Allmanni	...	...	...	...	3	...	...	2	2	...	...	...
„ trispinosus. H.	...	...	...	...	1	...	...	...	...	...	...	...
„ bispinosus. W.	...	...	1	...	...	1	...	1	1	...	...	...
„ spinosus. L.	...	...	1	...	...	...	...	...	...	...	...	...
„ sp. ?	...	...	...	...	...	3	1	...	...	...	...	...
Nika edulis	...	...	7	1	11	...	1	...	...	...	...	...
Pandalina brevirostris	...	...	8	1	...	...	...	...	...	...	...	...
Pandalus Montagu	1	...	...	...	...	...	1	1	1	...	...	...
Mysidae, unidentified	1	...	...	...	...	...	...	...	...	1	2	...
Gastrosaccus spinifer	...	...	6	1	...	...	...	1	1	...	...	...
Cumacea, unidentified	...	...	2	...	...	...	...	...	...	...	...	...
Isopoda „	...	...	...	...	5	...	...	...	...	...	...	...
Amphipoda „	5	1	...	...	...	1	...	10	12	15	10	21
Urothoe norvegica	...	...	25	4	...	...	...	...	...	...	...	...
Ampelisca laevigata	...	...			1	...	25	...	...	...	1	2
Caprella (sp.?)	...	...	...	...	...	...	...	3	4	...	...	...
POLYCHAETA	16	6	480	69	14	9	31	11	9	11	26	54
Remains unidentified	6	3	12	2	...	2	5	8	6	7	19	40
Aphrodite aculeata	...	1	17	2	...	...	...	...	...	...	...	...
Polynoid	...	...	1	...	...	...	...	...	...	...	...	...
Nereis (sp.?)	...	...	2	...	...	...	...	...	...	...	...	...
Nephtys (sp.?)	1	1	7	1	4	1	3	2	3	4	4	8
Phyllodoce (sp.?)	...	...	9	1	...	5	6	...	1	1	1	2
Glycera (sp.?)	...	...	1	...	...	...	...	...	...	...	2	4
Ophelia limacina (Rathke)	5	...	1	...	...	...	...	1	1	1	...	...
Trophonia plumosa	...	...	1	...	...	...	...	...	...	...	...	...
Terebellida	...	...	4	1	...	...	...	...	...	...	...	...
Pectinaria (sp.?) (chiefly P. Koreni, Mign.)	5	2	460	66	12	1	23	1	3	4	3	6
Sabella pavonina	...	...	...	...	...	...	...	...	1	1	...	...
NEMERTINEA (unidentified)	...	...	...	...	...	...	1	...	...	...	...	...

TABLE C.—Haddock—*continued*.

Region	Off Arbroath.	Hartle- pool Ground.	Markham's Hole.	Off Terschel- ling.	Dogger.							
Voyage and Station ..	XXI. 1.	X. 5.	VIII. 2.	III. 7.	X. 8.	X. 11.	XII. 12.	XII. 13.	XII. 13.	XII. 16.		
Month	Sept.	April.	March.	Dec.	April.	April.	June.	June.	June.	June.		
Depth in Fathoms ..	34-36.	33-34.	27-33.	20-22.	14-16.	16-20.	20-23.	19-20.	19-20.	27-35.		
Soil	s.m., d.s. & sh.	f.d.s.	m.	f.s. & m., m.	f.g.s.	f.d.s., f.g.s.	f.s., f.l.s.	c.br.s., f.s. & sh.	c.br.s., f.s. & sh.	f.d.s.		
	No.	No.	No.	%.	No.	No.	No.	No.	No.	%.	No.	%.
ECHINODERMATA	46	6	505	72	16	...	23	5	15	19	36	75
Synapta (sp. ?)	...	...	2	...	...	...	...	...	...	...	...	...
Thyone fusus	...	...	1	...	...	...	...	...	...	...	...	...
Ophiura ciliaris	2	...	24	3	6	...	...	...	1	1	2	4
„ albida	1	...	101	14	...	...	1	2	8	10	2	4
Amphiura filiformis	10	...	50	7	14	...	21	...	...	...	26	54
Ophiothrix fragilis	23	3	299	43	1	...	4	...	6	7	5	10
Echinus miliaris	...	...	4	1	...	...	...	...	1	1	...	...
Echinocyamus pusillus	27	3	286	41	...	...	...	3	3	4	4	8
Echinocardium (sp. ?)	...	...	...	...	4	...	...	...	...	...	...	...
COELENTERATA	2	...	...	...	1	...	1	...	...	...	...	...
Tubularia (sp. ?)	2	...	...	...	...	...	...	...	...	...	...	...
Actinian	...	...	...	...	1	...	1	...	...	...	...	...

TABLE D.
WHITING (*Gadus merlangus*).

Region	Markham's Hole.		Well Bank.		Off Smith's Knoll.		Off Ymuiden		Off Egmond.		
Voyage and Station	VIII. 2.		XV. 9.		XIX. 2.		XXIII. 2.		XXIII. 3.		
Month	March.		July.		August.		November		December.		
Depth in Fathoms	23-27.		7-20.		18-23.		8-9.		10-11.		
Soil	m.		f.g.s.		f.d.s.		c.g.s., f.g.s.		f.g.s.		
Number of stomachs examined			No. 20	% ...	No. 25	% ...	No. 23	% ...	No. 10		
" " " empty			5	25	...	...	...	...	...		
" " " containing recognisable food.			15	75	25	100	23	100	10		
PISCES			8	53	7	28	2	9	16	70	9
Remains unidentified			7	47	2	8	1	4	3	13	1
Gobius minutus			...	...	...	...	...	...	...	...	1
Gadus merlangus, L.			1	7	...	...	...	...	...	...	...
Gasterosteus aculeatus			...	...	...	...	...	...	...	...	1
Ammodytes (sp. ?)			...	...	3	12	1	4	13	57	7
Solea lutea, Risso... ..			...	...	2	8	...	...	...	...	...
MOLLUSCA			...	...	2	8	...	...	...	...	...
Remains unidentified			...	...	1	4	...	...	...	...	...
Scrobicularia prismatica (Mont.)			...	...	1	4	...	...	...	...	...
CRUSTACEA			8	53	18	72	22	96	21	91	3
Remains unidentified			...	...	1	4	...	...	...	...	...
Stenorhynchus (sp. ?)			2	13	...	...	...	...	...	...	...
Portumnus variegatus, Leach			...	...	2	8	...	...	...	...	...
Portunus (sp. ?)			...	...	4	16	1	4	...	...	1
Thia polita			...	...	...	...	...	...	...	...	1
Eupagurus Bernhardus (L.)			...	...	11	44	3	13	2	9	...
Porcellana longicornis (Penn.)... ..			...	...	...	...	1	4	...	...	...
Crangon vulgaris, L.			...	...	...	...	...	...	...	...	1
" Allmanni, Kin.			4	27	...	...	10	43	...	...	...
" trispinosus			...	...	...	...	...	...	4	17	...
" sp.			...	...	2	8	...	...	11	48	...
Nika edulis			...	...	...	...	...	...	2	9	...
Pandalus Montagu, Leach			2	13	...	...	6	26	2	9	...
Gastrosaccus spinifer			...	...	...	...	...	...	8	35	1
Mysidae, unidentified			...	...	1	4	4	17	...	...	...
POLYCHAETA			...	...	3	12	...	...	1	4	...
Remains unidentified			...	...	...	...	...	...	1	4	...
Phyllodoce (groenlandica ? Oerst)			...	...	1	4	...	...	...	...	...
Goniada maculata, Oerst			...	...	1	4	...	...	...	...	...
Pectinaria (sp. ?)			...	...	1	4	...	...	...	...	...

—continued.

Leman Banks and Neighbourhood.

	XV. 3.		XV. 5.		XV. 8.		XV. 9.		XV. 10.		XIX. 2.		XIX. 4.		XIX. 9.		XV. 13.		XVI. 3.	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
47	6	20	1	3	..	..	1	3	9	18	3	11	1	..	5	10	11	38	8	44
48	..	..	..	..	..	..	..	..	..	..	3	11	..	..	..	..	..	..	..	..
49	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
50	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
51	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	4	14	..	..
52	1	3	..	..	..	..	..	..	1	2	..	..	..	..	..	..	1	3	..	..
53	1	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	3	..	..
54	1	3	..	..	..	..	..	..	..	..	..	..	..	4	8	..	..	..	..	..
55	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	10	..	..
56	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
57	1	3	..	..	..	..	..	..	2	4	..	..	..	..	..	..	1	3	..	..
58	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
59	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	..	..	..
60	1	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
61	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
62	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
63	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
64	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	..	..	..
65	1	3	..	..	..	..	..	..	..	..	..	..	..	1	2	3	10	4	22	..
66	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
67	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..
68	..	..	1	3	..	..	1	3	4	8	..	..	..	..	..	..	1	3	..	..
69	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
70	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	22	..
71	8	27	6	18	7	21	8	24	28	56	7	26	16	40	42	84	22	76	4	22
72	3	10	1	3	..	..	2	6	..	..	..	..	..	..	..	..	3	10	..	..
73	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
74	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	..	..	..
75	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
76	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	3	..	..
77	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
78	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	7	..	..
79	1	3	1	3	1	3	..	..	2	4	1	4	..	..	..	..	..	..	2	11
80	..	..	..	..	..	..	1	3	..	..	2	8	..	..	..	..	1	3	2	11
81	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	1	3	..	..
82	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	3	..	..
83	2	7	..	..	..	..	1	3	..	..	1	4	1	2	..	..	..	..	..	..
84	..	..	..	..	1	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..
85	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	6
86	..	..	..	..	..	..	..	..	..	..	1	4	..	..	..	..	3	10	..	..
87	..	..	2	6	4	12	1	3	6	12	..	..	..	..	..	..	6	21	..	..
88	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
89	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	6
90	..	..	..	..	..	..	..	..	9	18	..	..	..	..	..	..	..	..	..	..
91	..	..	1	3	..	..	..	..	9	18	..	..	..	..	..	..	1	3	..	..
92	2	7	2	6	1	3	3	9	5	10	3	11	15	37	41	82	4	14	..	..
93	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
94	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
95	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
96	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
97	5	17	8	24	6	18	11	33	13	26	2	7	25	62	3	6	13	45	1	6
98	..	..	..	..	..	..	..	..	..	..	..	..	3	7	..	..	1	3	..	..
99	..	..	..	..	..	..	1	3	6	12	..	..	1	2	..	..	4	14	..	..
100	..	..	1	3	..	..	..	..	..	..	1	4	..	..	..	..	1	3	..	..
101	..	..	..	..	..	..	3	9	..	..	..	..	..	..	..	..	..	..	..	..
102	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
103	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	..	..	..
104	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	..	..	..
105	4	13	6	18	5	15	2	6	5	10	..	..	4	10	3	6	7	24	1	6
106	1	3	2	6	2	6	7	21	3	6	1	4	23	57	1	2	..	..	..	..
107	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	3	..	..
108	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
109	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	3	..	..

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Egmond.	Off Ameland.	Off Terschelling.	N. of Horn Reef.	Graa Dyb.	Dogger.													
XXIII. 3. December. 10-11. f.g.s.	III. 1. Dec. 15-17. f.s.	III. 9. Dec. 22-24. m., s.m.	XXI. 4. October. 7-10. f.s.	XXI. 5. October. 7. f.s.	XII. 15. June. 21-27. f.g.s., f.d.s.	XII. 16. June. 27-35. f.d.s.	X. 9. April. 12-15½ f.g.s.	X. 11. April. 16-20. f.g.s., f.d.s.	X. 12. April. 14-16. f.d.s., f.g.s.	X. 14. April. 15½-17. f.g.s.								
No. 31 20-30 cm. 20	No. 32 30	No. 13 12	No. 33 ..	% ..	No. 20 ..	% ..	No. 8 ..	No. 18 ..	% ..	No. 17 ..	% ..	No. 30 ..	% ..	No. 25 ..	% ..	No. 29 ..	% ..	
1 s	..	..	..	..	..	..	..	..	..	1	6	1	3	2	8	2	7	
2	..	..	..	..	..	..	..	1st	6	..	..	..	..	..	..	..	..	
1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	4	..	..	
9	2	1	33	100	20	100	8	18	100	16	94	29	97	22	88	27	93	
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
8	1	2	..	33	100	20	100	6	17	95	8	50	25	86	22	100	24	89
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	4	
10	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	
11	..	..	..	..	..	..	..	1	6	..	..	..	..	..	..	..	..	
12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
13	..	..	..	..	..	..	..	1	3	17	..	1	3	..	..	..	..	
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
15	..	..	..	..	..	..	..	4	22	..	..	..	..	..	..	..	..	
16	..	..	..	..	..	..	..	..	..	..	..	1	3	..	..	..	..	
17	..	..	..	..	..	..	..	1	6	..	..	..	..	1..	..	..	..	
18	..	..	..	..	..	..	..	1	1	6	..	..	..	..	..	..	..	
19	..	..	..	..	..	..	..	1	1	6	..	..	..	..	..	..	..	
20	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
21	..	1	..	1	3	..	..	..	..	..	..	5	17	7	32	9	33	
22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
23	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
24	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
26	..	..	..	33	100	..	..	..	..	..	..	..	..	..	..	..	..	
27	..	..	..	..	..	..	..	3	4	22	1	6	..	..	11	50	3	11
28	..	1	..	1	3	..	..	..	1	6	1	6	..	..	..	..	..	
29	..	..	..	..	..	1	5	..	2	11	..	..	1	3	..	..	..	
30	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
32	..	..	..	2	6	20	100	..	..	..	..	..	..	..	..	..	..	
33	..	..	..	..	..	..	..	..	..	..	..	2	7	1	5	..	..	
34	..	1	..	..	..	..	..	2	11	61	..	..	..	..	..	..	..	
35	..	..	..	..	..	..	..	..	..	..	..	..	..	1	5	1	4	
36	..	..	..	..	..	..	..	..	..	..	..	12	41	13	59	7	26	
37	1	..	..	..	..	..	..	4	6	33	8	50	7	24	1	5	9	33
38	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
39	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
40	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
41	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
42	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
43	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
44	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
45	..	..	..	..	..	..	..	..	..	..	..	1	3	1	..	..	..	
46	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	

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Egmond.		Off Ameland.	Off Terschelling.	N. of Horn Reef.		Graa Dyb.		Dogger										
XXIII. 3.		III. 1.	III. 9.	XXI. 4.		XXI. 5.		XII. 15.	XII. 16.		X. 9.		X. 11.		X. 12.		X. 14.	
No.	No.	No.	No.	No.	%	No.	%	No.	No.	%	No.	%	No.	%	No.	%	No.	%
47	1	..	..	7	21	..	..	2	2	11	1	6	9	31	5	23	4	15
48	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
49	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
50	..	..	..	..	..	..	..	..	1	6	..	..	..	..	..	..	..	..
51	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	5	..	..
52	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
53	..	..	..	..	..	..	..	..	..	..	..	..	1	3	..	..	..	..
54	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
55	..	..	..	..	..	..	..	2	1	6	1	6	..	..	..	..	1	4
56	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
57	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
58	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
59	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
60	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
61	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
62	..	..	..	1	3	..	..	..	..	..	..	..	..	..	..	..	..	..
63	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
64	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
65	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
66	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
67	..	..	..	1	3	..	..	..	..	..	..	..	..	..	..	..	..	..
68	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	11
69	..	..	..	6	18	..	..	..	1	6	..	..	8	28	5	23	..	..
70	..	..	..	2	6	..	..	..	..	..	..	..	..	..	..	..	..	..
71	8	1	1	8	24	6	30	3	5	28	1	6	23	79	8	36	13	48
72	4	..	..	1	3	..	..	..	..	..	..	..	..	..	..	..	2	7
73	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
74	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
75	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	5	..	..
76	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
77	..	..	..	..	..	..	..	..	1	6	..	..	..	..	..	..	..	..
78	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
79	..	..	..	..	..	..	..	..	2	11	..	..	1	3	1	5	..	..
80	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
81	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	4
82	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
83	..	..	..	..	..	..	..	..	..	..	1	6	1	3	1	5	..	..
84	..	..	..	..	..	..	..	..	..	..	..	..	1	3	..	..	..	..
85	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
86	..	..	..	1	3	..	..	..	..	..	..	..	..	..	1	5	..	..
87	3	..	..	..	..	..	..	..	..	..	..	..	..	..	1	5	..	..
88	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
89	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
90	..	..	..	..	..	..	..	..	1	6	..	..	8	28	3	14	5	19
91	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
92	..	1	1	7	21	6	30	1	1	6	..	..	15	52	5	23	9	33
93	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
94	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
95	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..
96	..	..	..	..	..	..	..	..	..	..	10	62	..	..	..	..	..	..
97	..	..	1	..	..	..	..	2	..	..	..	..	1	3	..	..	..	..
98	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..
99	..	..	..	..	..	..	..	1	..	..	..	..	1	3	..	..	..	..
100	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
101	..	..	..	..	..	..	..	..	..	..	..	..	1	3	..	..	..	..
102	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
103	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
104	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
105	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
106	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
107	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	4
108	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	4
109	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

TABLE F.
LEMON SOLES (*Pleuronectes microcephalus*).

Region	Off Sunderland and Hartlepool.				Off Whitby and Flamboro.				Leman Banks.	Dogger.	Brucey's Garden.	
Voyage and Station ..	XII. 21.	XII. 22.	XII. 23.	X. 5.	X. 4.	X. 2.	X. 1.	XV. 14.	XII. 15.	XIII. 27.	XIII. 22.	
Month	June.	June.	June.	April.	April.	April.	April.	July.	June.	July.	June.	
Depth in fathoms ..	43½-44.	35-39.	30-39.	33-34.	30-31.	32-34.	30.	19-20.	21-27.	32-35.	38-39.	
Soil	m.	m.	s.s. s.o.z.m.	f.d.s.	fs. c.s.gl.	c.s. m.	gl. sh.	d.s., f.g.s.	f.g.s., f.d.s.	f.d.s.	f.d.s.	
Number of stomachs examined ...	No. 6	No. 18	No. 33	No. 6	No. 17	No. 14	No. 4	No. 20	No. 5	No. 7	No. 10	
" " " empty ...	...	2	...	1	...	...	...	...	...	...	...	
Sand, mud, stones only ...	...	...	...	...	...	...	...	...	...	...	...	
Sand with food ...	...	...	...	1sd	...	...	...	...	...	...	...	
Unrecognisable food ...	2	4	22	2	2	...	1	...	3	7	6	
Recognisable food ...	4	12	11	3	15	14	3	20	2	0	4	
MOLLUSCA ...	...	1	2	...	...	3	...	...	1	...	...	
Chiton (sp.?) ...	...	...	2	...	...	...	...	...	...	...	...	
Trochus? operculum only ...	...	1	...	...	...	...	...	...	...	...	...	
Doris (sp.) ...	...	...	...	...	...	1	...	...	...	...	...	
Dendronotus arborescens (Müller) ...	...	...	...	...	...	2	...	...	1	...	...	
CRUSTACEA ...	2	2	4	2	1	...	...	2	...	...	...	
Portunus (sp.?) ...	...	...	1	...	...	...	...	...	...	...	...	
Eupagurus Bernhardus (Linn.) ...	...	1	3	...	1	...	...	...	...	...	...	
" sp.? ...	...	...	...	1	...	...	...	...	...	...	...	
Porcellana longicornis (Penn.) ...	...	...	...	...	...	...	...	2	...	...	...	
Gebia (sp.?) ...	1	...	...	...	...	...	...	...	...	...	...	
Balanus? remains ...	1	...	...	...	...	...	...	...	...	...	...	
Amphipod remains ...	...	1	...	1	...	...	...	...	...	...	...	
POLYCHAETA ...	3	10	9	1	14	14	3	20	1	...	4	
Remains, unidentified ...	...	2	...	...	...	...	...	...	...	...	...	
Harmothoe? sp.? ...	...	...	...	...	...	1	...	...	...	...	...	
Onuphis. sp.? ...	...	...	4	...	...	...	...	...	...	...	...	
Nereis pelagica? (Linn.) ...	...	...	...	...	...	1	1	...	...	...	...	
Phyllodoce groenlandica (Oersted) ...	...	...	...	...	...	1	...	...	...	...	...	
Maldanid ...	...	...	...	...	...	1	...	...	...	...	...	
Sabellaria spinulosa (Leuck.) ...	...	...	1	...	...	...	...	20	...	...	...	
Pectinaria ...	...	...	...	...	...	1	...	...	...	...	...	
Thelepus cincinnatus (Grube) ...	...	...	...	...	14	13	2	...	...	...	...	
Ampharete gracilis ...	...	...	...	...	...	1	...	...	...	...	...	
" Goesi (?) ...	...	...	1	...	...	...	...	...	...	...	...	
Sabella pavonina (Savigny) ...	3	2	4	1	...	...	...	3	...	...	4	
Chone infundibuliformis (Kröyer) ...	...	...	...	...	...	...	...	...	1	...	...	
Sand tubes ...	...	6	...	...	...	...	...	...	...	...	...	
COELENTERATA ...	...	1	...	1	2	...	...	...	...	...	...	
Sertularia (sp.?) ...	...	...	...	...	1	...	...	...	...	...	...	
Obelia (sp.?) ...	...	1	...	...	...	...	...	...	...	...	...	
Hydroid remains ...	...	...	...	1	...	...	...	...	...	...	...	
Actinian ...	...	...	...	...	1	...	...	...	...	...	...	

TABLE H.—SOLES—*continued*.

Region	Off Flamboro'.	Off the Humber.	Off Saltfleet.	Lynn Deep.	Off Hasbro' Sand.	Off Leman Sand.	Off Smith's Knoll.	Off Smith's Knoll.	Off Terschel- ling.	Middle Ground and Knoll Deep.	
Voyage and Station ..	X. 2.	Sand Haile.	XVIII. 18.	XVIII. 11.	XVIII. 22.	XV. 16.	XVI. 3.	XVI. 2.	III. 9.	V. 2.	V. 3.
Month	April.	July.	August.	August.	August.	July.	July.	July.	December.	January.	January
Depth in fathoms ..	32-34.	?	5-10.	9-10.	15-17.	18-20.	16-20.	14-22.	22-24.	23-25.	23-24.
Soil	c.s., m.	?	gl.m.s.	c.s.sh., c.s.	c.s., c.s.r.	c.s.	f.g.s.	f.g.s.	s.m., m.	f.s., f.g.s.	f.s., f.g.s.
CRUSTACEA— <i>cont.</i>	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Unciola irrorata, Gosse ...	...	...	...	...	...	1	...	...	...	...	...
Ampelisca laevigata, Lilljeborg.	...	...	1	1	5	...	...	...	...	...	...
Remains unidentified ...	...	...	...	3	...	...	...	1	...	...	...
POLYCHAETA	...	4	16	6	14	9	2	6	2	2	...
Remains unidentified ...	...	4	8	6	2	...	...	4	...	...	...
Evarne impar (Johnston) ...	...	...	1	...	...	...	...	...	...	...	...
Sthenelais boa (Johnston) ...	...	...	...	...	...	1	...	...	...	...	...
Nephtys sp. ?	...	1	...	...	...	...	1	2	...	...	...
Phyllodoce teres (Mugn.)? ...	...	...	1	...	...	...	...	...	...	...	...
„ sp. ?	...	...	...	...	...	2	...	...	...	...	...
Ophelia limacina (Rathke) ...	...	...	...	...	6	1	...	...	...	2	...
Sabellaria spinulosa (Leuck.) ...	...	...	1	...	3	3	1	...	...	...	...
Pectinaria	...	...	...	...	...	2	...	...	2	...	...
Lanice conchilega (Pallas) ...	...	...	5	...	4	...	...	...	...	...	...
NEMERTINEA	...	4	...	...	1	...	...	...	...	...	...
Remains unidentified ...	...	4	...	...	1	...	...	...	...	...	...
ECHINODERMATA	1	...	...	...	1	3	1	1	2	2	1
Amphiura sp.	...	...	...	...	...	...	...	...	2	...	1
Ophiura albida (Forbes) ...	...	...	...	...	...	1	...	...	...	2	...
Echinocyamus pusillus (O.F.M.)	1	...	...	...	1	3	1	...	...	...	...
COELENTERATA	...	...	...	...	...	1	...	...	...	...	...
Cerianthus ?	...	...	...	...	...	1	...	...	...	...	...

TABLE J.

(Galeus vulgaris).

Region	Blakeney.	Lynn Deep.				Saltfleet.	Blakeney.	Cromer.	Off Terschelling Light-vessel.	Sylt Inner.	Helgo-land.	Horn Reef Deep Water.
Voyage and Station ..	XVIII. 1.	XVIII. 9.	XVIII. 11.	XVIII. 12.	XVIII. 18.	XVIII. 21.	XVIII. 23.	XX. 16.	XX. 6.	XX. 8.	XX. 9.	XX. 12.
Month	August.	August.	August.	August.	August.	August.	August.	Sept.	Sept.	Sept.	Sept.	Sept.
Depth in fathoms ..	10.	14.	9-10.	9-13.	5-10.	10.	15-17.	20.	8.	8-9.	20-21.	24-26.
Soil	c.s.	s.	c.s., c.s.sh.	s., s.gl.sh.	m.s.gl.	s.sh.	s.sh.	m.	f.d.s.	f.b.s.	f.d.s.	m.
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Number of Stomachs examined.	2	3	2	2	2	1	1	1	1	1	15	2
Containing recognisable food.	2	3	2	2	2	1	1	1	1	1	15	2
PISCES	1	1	1	1	2	1	1	1	1	1	15	2
Remains unidentified ...	...	1	1	...	...	1	...	...	...	1	...	...
Gobius (sp.?)	...	...	...	...	...	...	...	...	1	...	...	...
Callionymus lyra, Linn.	1	...	...	...	...	...	1	...	1	...	...	...
Ammodytes (sp.) ...	...	...	...	...	...	...	...	...	1	1	...	...
Gadus merlangus, Linn.	...	...	...	1	...	...	...	1	...	...	...	2
Clupea (sp.?)	...	...	...	1	2	...	...	...	1	...	15	...
MOLLUSCA	...	...	1	...	1	...	...	...	...	...	...	...
Sepiola atlantica, ...	...	...	1	...	1	...	...	...	...	...	...	...
CRUSTACEA	2	3	2	2	...	1	...	...	1	1	...	...
Cancer pagurus, Linn.	1	1	...	1	...	1	...	...	...	...	...	...
Carcinus maenas (Penn.)	...	1	...	...	...	...	...	...	...	...	...	...
Portunus holsatus, Fabr.	...	...	1	...	...	...	...	...	...	...	...	...
Eupagurus Bernhardus (Linn.)	...	...	2	...	...	1	...	...	1	1	...	...
Gebia (sp.?)	1	...	...	...	...	1	...	...	...	...	...	...
Crangon vulgaris, Fabr.	...	3	2	1	...	...	...	...	...	...	...	...
" (sp.?)	...	...	...	...	...	...	...	...	...	1	...	...

TABLE K.

SPUR DOG (*Acanthias vulgaris*).

Region	Off Saltfleet.	Off Cromer.	Off Hasbro' Sand.	Off Cromer.	S. of Horn Reef.	Sylt Inner.	N. of Horn Reef.	Off Graa Dyb.	Leman Ground.		
Voyage and Station ..	XVIII. 2.	XVIII. 18.	XVIII. 22.	XVIII. 23.	XVIII. 24.	XII. 4.	XX. 6.	XX. 8.	XXI. 3.	XXI. 5.	XVII. 1.
Month	August.	August.	August.	August.	August.	May.	Sept.	Sept.	October.	October.	July.
Depth in fathoms ..	8.	5-10.	15-17.	15-17.	17-18.	8½	8.	8-9.	8-9½.	7.	15-18.
Soil	c.s.gl.	m.s.gl.	c.s.r.	s.sh.	s.sh.r.	f.s.	f.d.s.	f.b.s.	f.s.	f.s.	f.g.s.
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Number of stomachs examined ...	1	1	12	12	14	3	6	1	2	8	1
" " " empty ...	...	...	12	12	14	2	...	...	...	...	...
Containing recognisable food ...	1	1	...	...	...	1	6	1	2	8	1
PISCES	1	...	...	...	...	1	...	1	...	?	1
Remains unidentified ...	...	...	...	...	...	...	...	1	...	...	...
Ammodytes (sp. ?) ...	...	...	...	...	...	...	...	1	...	...	...
Gadus merlangus, Linn. ...	...	...	...	...	...	...	...	...	...	...	1
Pleuronectes platessa, Linn. ...	...	...	...	...	...	1	...	...	...	...	...
Clupea (sp. ?) ...	1	...	...	...	...	...	...	...	...	...	...
MOLLUSCA	...	1	...	...	...	...	...	...	...	...	...
Buccinum undatum, Linn. ...	...	1	...	...	...	...	...	...	...	...	...
CRUSTACEA	...	1	...	...	...	...	?	1	2	5+?	...
Portunus holsatus, (Fabr.) ...	...	...	...	...	...	...	...	...	...	1	...
Eupagurus Bernhardus (Linn.) ...	...	1	...	...	...	...	?	1	..	5?	...
" (sp. ?) ...	...	...	...	...	...	...	...	...	2	...	...
Crangon (sp. ?) ...	...	...	...	...	...	...	?	...	1	1	...
Gephyrea	...	...	...	...	...	...	6	...	1	8	...
Echiurus sp. ? ...	...	...	...	...	...	...	6	...	1	8	...

TABLE L.
THORNBACKS (*Raia clavata*).

Region	Off Flambro'.	Off Blakeney.	Lynn Deep.		Off Ymuiden.	N. of Horn Reef.	Graa Dyb.	Western Deep Water.
Voyage and Station	X. 2.	XVIII. 1.	XVIII. 11.	XVIII. 12.	XXIII. 2.	XXI. 3.	XXI. 5.	IX. 3.
Month	April.	August.	August.	August.	Nov.	Oct.	Oct.	March.
Depth in Fathoms	32-34.	10.	9-10.	9-13.	8-9.	8-9½.	7.	22.
Soil	c.s.m.	cs.	cs.cs.sh.	cs.gl.sh.	cgs.fgs.	fs.	fs.	ds.
Number of stomachs examined ...	No. 20	No. 5	No. 1	No. 1	No. 2	No. 14	No. 16	No. 9
" " " empty	3	...	...	...	...	...	...	2
Recognisable food	17	5	1	1	2	14	16	7
PISCES	5	...	...	...	...	...	...	...
Remains unidentified	4	...	...	...	...	...	...	...
Liparis vulgaris, Flem.	1	...	...	...	...	...	...	...
MOLLUSCA	1	1	...	...	...	...	...	...
Buccinum undatum, Linn.	...	1	...	...	...	...	...	...
Sepiolo atlantica, D'Orb....	1	...	...	...	...	...	...	...
CRUSTACEA	16	5	1	1	2	14	16	7
Remains unidentified	1	...	...	...	...	...	...	...
Hyas coarctatus, Leach	2	...	...	...	...	...	...	...
Cancer pagurus, Linn.	...	2	...	...	...	...	...	...
Carcinus maenas (Penn.)	...	...	1	...	...	...	...	...
Portunus holsatus, Fabr....	...	...	...	...	...	10	5 ca.	3
" pusillus, Leach	...	4	...	...	...	...	...	2
Eupagurus Bernhardus (Linn.)...	6	...	1	1	...	4	5 ca.	...
Galathea dispersa, Sp. Bate ...	1	...	...	...	...	...	...	...
Crangon vulgaris, Fabr.	...	...	...	...	2	13	16	...
" Allmanni, Kinn.	3	2	...	...	...	...	...	5
" sp. ?	7	...	...	...	...	...	...	...
Pandalus Montagu, Leach	1	1	...	...	...	...	...	3
Amphipoda, unidentified	...	1	...	...	...	...	...	...
Ampelisca laevigata, Lilljeborg...	...	...	...	...	...	...	...	1
POLYCHAETA	2	...	...	...	...	...	...	...
Remains unidentified	1	...	...	...	...	...	...	...
Nephtys sp. ?	1	...	...	...	...	...	...	...