

1900.

NEW ZEALAND.

REPORT ON EXPERIMENTAL TRAWLING

BY L. F. AYSON, Esq., INSPECTOR OF FISHERIES.

Presented to both Houses of the General Assembly by Command of His Excellency.

SIR,—

Wellington, New Zealand, 23rd July, 1900.

I have the honour to present the following report on the trawling expedition undertaken on behalf of the Government during the autumn and early winter months of the present year.

The object of the expedition was to make an experimental survey of the coasts of the colony, especially in the neighbourhood of the more thickly populated centres, to ascertain what extent of trawling-grounds existed, what varieties of marketable fish were obtainable in the different localities, to prove whether the conditions necessary for carrying on successful trawling existed in certain localities within workable distance of the best markets; and, if so, to place the information on record for the guidance of those interested in the trawling industry; and generally to acquire information on the distribution of food-fishes, &c., in the sea surrounding these Islands.

Mr. A. Hamilton, Registrar of the Otago University, joined me at Lyttelton on the 10th March, and accompanied the expedition during the whole of the work in Pegasus Bay and off Banks Peninsula. On the 7th April Professor Benham, Messrs. Hamilton and G. M. Thomson accompanied the vessel while areas about ten miles east of Cape Saunders were being worked in depths up to 50 fathoms. Mr. G. M. Thomson, F.L.S., also joined me at Wellington on the 14th May, and remained on board until the 23rd; during that time Cloudy Bay and the greater part of Tasman Bight were worked. Owing to the short time available it has been impossible for these gentlemen to work up the material collected and present a complete scientific report for publication with this report; but in the meantime they have supplied interim reports, which are appended hereto. When completed their full reports will be forwarded for publication as soon as I receive them.

To carry out the experimental trawling operations the Government chartered the steam-trawler "Doto," owned by B. A. Petersen and Co., of Napier. The "Doto" was originally built for a steam-yacht, but was subsequently bought by Captain Nielsen, for Messrs. Petersen and Co., in Sydney and taken over to Napier, where she was fitted out and used as a trawler. She is a composite vessel of 28 tons gross register, 66 ft. in length, 12 ft. beam, draught 6 ft. 6 in., and fifteen horse power nominal. The vessel was fitted with the otter-trawl, which while quite as effective can be much more easily and quickly put down and picked up than the beam trawl, and is therefore altogether better suited for the short tows required for experimental work.

Extra gear and fittings were carried in the shape of spare otter-boards, warps, and four nets of the following sizes, viz.:—

- No. 1. Head-line, 70 ft.; spread, 50 ft.; length, 110 ft.; mesh, 4½ in. body, 3 in. at cod-end.
- No. 2. Head-line, 65 ft.; spread, 55 ft.; length, 90 ft.; mesh, 4 in. body, 3 in. at cod-end.
- No. 3. Head-line, 50 ft.; spread, 35 ft.; length, 70 ft.; mesh, 5 in. body, 3½ in. at cod-end.
- No. 4. Head-line, 80 ft.; spread, 60 ft.; length, 120 ft.; mesh, 4½ in. body, 3 in. at cod-end.

There were, besides, a 1 in. mesh surface-net of 50 ft. spread, and two dredges for taking up samples of the bottom.

Captain Nielsen, who was in charge of the "Doto," has had a life-long experience in the North Sea fisheries. He was employed by the New South Wales Government as trawling-master for the experimental trawling expedition undertaken on the coast of that colony in 1898, and the skill and energy displayed by him throughout our expedition proved that the Government were fortunate in securing his services to carry out the work.

The "Doto" proved to be an excellent boat for inshore-work, but a larger and more powerful vessel will be required when areas are explored in the open ocean.

GENERAL ACCOUNT OF THE CRUISE.

The term of the charter of the "Doto" commenced on the 6th March. On that date I inspected and took over the vessel at Napier for the Government, and, as it was decided to begin work off Lyttelton Heads, she sailed for that port the following morning, arriving there on the 9th.

We commenced operations in Pegasus Bay on the 10th, working there and to the north of Banks Peninsula until the 17th, when we went on to Akaroa. We left Akaroa at 6 a.m. on the 19th March to prospect off the Heads, but a heavy swell prevented any work being done, and it was decided to go to the south of Banks Peninsula, where the net was put down about five miles off Lake Ellesmere Spit at 9.35 a.m. Work was continued down the coast off the Ninety-mile Beach to Timaru, where we arrived at 5.35 p.m. on the 20th. Continued operations off the Ninety-mile Beach, Timaru, and the coast south to the Waihao River, in depths varying from 5 to 50 fathoms, and from one to thirty miles off shore, until the 30th March, when we proceeded south to prospect the coast from the Waihao to Oamaru. Fine weather was experienced at Oamaru from the 30th March to the 4th April. In that time the ocean was prospected from the Waitaki River to All Day's Bay, in depths varying from 4 to 46 fathoms, and distances from half a mile to twenty miles off shore.

On the 5th April we left Oamaru and proceeded further south to work off the coast from Moeraki Lighthouse to the Otago Peninsula. Operations were continued along this range of coast until the 13th, the bottom being tested in depths from 6 to 50 fathoms. Unsettled weather was experienced while in this neighbourhood, several days being unfit for trawling. We left Port Chalmers for the Bluff and Foveaux Straits on the 13th April, intending to prospect off the Taieri Beach and in Molyneux Bay on the way south, but owing to a north-east wind setting in, with a choppy sea, we were able to do very little work at either place, and after one haul of the trawl-net in Molyneux Bay proceeded on to the Bluff. Arriving at the Bluff on the 14th April, work was continued in Foveaux Straits and around Stewart Island until the 26th. During that time Toitoto, Riverton, Tewaewae Bays, and part of Foveaux Straits were prospected. Stewart Island was circumnavigated, and the principal bays and inlets round that island tested for trawling-grounds. Having finished the preliminary survey for trawling-grounds in southern waters, we left the Bluff for the north on the 27th April. Unfavourable weather again prevented us from completing the survey of Molyneux Bay on the return from the south, and we proceeded on to Timaru, arriving there on the 28th.

As a considerable extent of good trawling-bottom was found off the coast of Timaru and the Ninety-mile Beach when the expedition was working south, but with very few fish at that time, I determined to further test certain areas to ascertain whether the different tides and weather conditions obtaining at this time had affected the supply of fish. Two days were devoted to this work with fair results, the best being obtained in 12 and 13 fathoms. Leaving Timaru on the 2nd May, a southerly storm prevented the further investigation of grounds between Timaru and Banks Peninsula, the little steamer having a rough time until East Head was rounded.

In the shelter of Banks Peninsula three hauls of the net were made, arriving at Lyttelton on the 3rd. Having coaled, the "Doto" sailed for Wellington at 7 a.m. on the 4th April. Arriving off Wellington Heads early the following morning, it was decided to try a few hauls of the net in Palliser Bay before going in to port, but soundings made in different parts showing rough bottom at every cast of the lead the net was not put down. As some repairs were necessary to the gear before proceeding further with the cruise, the Government allowed the "Doto" to go out of commission for a week to have these effected.

Resuming work on the 14th May, we left Wellington on that date for Cloudy Bay, and continued working there until the following afternoon, when, owing to unfavourable weather conditions further work could not be carried on, we left for Nelson. From the 16th to the 28th was occupied in prospecting Tasman and Golden Bays. During that time two days were lost through bad weather, but by working at night when the weather settled we were able to get over most of the ground in that quarter. On the 28th May we left Nelson for Wanganui, intending to visit Admiralty and Guard's Bays *en route*, but had to shelter in Port Hardy Inlet for thirty hours. The weather clearing on the 30th the "Doto" left the anchorage in Port Hardy Inlet at 2.30 p.m. for Wanganui. The bottom was tested with the lead at various depths on the way across, and two hauls of the net were made off the mouth of the Wanganui River before going into harbour on the 31st. When the weather would allow work was continued in the Wanganui Bight and south to Kapiti Island until the 7th June. On that date the final haul of the trawl-net was made, and the vessel left for Wellington and Napier, as according to agreement she had to be delivered at the latter port at the termination of the charter period.

RESULTS OBTAINED AT DIFFERENT LOCALITIES.

In Pegasus Bay and off Banks Peninsula good results were obtained, both with regard to the character of the bottom for trawling and supply of fish. The net was picked up at No. 2 Station off a rocky bottom near Motonau Island; but with that one exception the bottom at all the other trawling and sounding-stations was either sand, soft sand, or mud; while market fish were plentiful and of good quality. This area being well sheltered and close to Lyttelton Harbour should be a profitable trawling-ground. A ready market for large quantities of fish would be found in Christchurch, the inland towns, and among the shipping at Lyttelton.

From Banks Peninsula to the Waitaki River there is a considerable extent of good trawling-ground. Shingle banks, however, exist at intervals, extending from close inshore out to 20 fathoms. Beyond the 20-fathom line the bottom, as far as tested, was soft sand, broken shell, and mud. These stony banks are probably formed by the stones and shingle brought down by the four large rivers that flow into the ocean along this range of coast. By reference to the map it will be seen that a large area of sand bottom was found off Timaru, this, although good trawling-bottom at the time it was worked, yielded only a moderate supply of the best market fish; it is probable, however, that at some other season good fish may be plentiful.

From the Waitaki River to Moeraki light we found an uneven bottom. Shingle banks exist off the Waitaki and at intervals south to Oamaru, with patches of sand bottom between. These

shingle banks extend from the shore out to in places 20 fathoms, beyond that depth the bottom was similar to what we found further north, being soft sand, shell, and mud. To the south of Oamaru reefs exist with a considerable extent of sand bottom between. Even where good bottom was found very few fish were taken in the trawl-net. Uneven bottom was found from Moeraki to abreast of Waikouaiti—soundings taken showed the bottom in places to be sand, but when the net was put down it soon got foul of rocks. In Blueskin Bay and to the north of the Otago Peninsula an even sand bottom was found with fish fairly plentiful. In Blueskin Bay flat-fish were taken in considerable quantities.

Owing to unfavourable weather, both going to and returning from the South, very little work could be done off Taieri Beach and in Molyneux Bay. In Toitoti Bay the gravelly bottom extends well in shore, but a good piece of trawling-bottom was found off the mouth of the Mataura River with fish in considerable quantities. Riverton Bay has a considerable extent of good bottom with flat-fish plentiful. There are, however, patches of gravel, and rocks exist well into the bay. The result of our operation in Tewaewae Bay were eminently satisfactory. Splendid even bottom was found wherever soundings were made or the net was put down, while large quantities of flat-fish were taken at every haul of the net. Soles were particularly plentiful, also a considerable number of flounders and turbot.

The survey made of the bays and inlets round Stewart Island shows that the extent of trawling-grounds round the Island is limited. Soundings made showed an uneven bottom, patches of sand with rocks jutting out here and there. In Mason Bay a sand bottom was found, but the net came up at every haul full of weed and with very few fish.

Although Cloudy Bay was not, owing to bad weather, as carefully prospected as was intended, the results obtained from what we were able to do were satisfactory. Good bottom was found all over, with fish fairly plentiful.

In Tasman and Golden Bays rough bottom was only found at one station (136). A mud bottom was found all over out to the line of sounding- and trawling-stations from D'Urville Island to off Farewell Spit.

The best hauls of fish taken during the cruise were made here, while our best market fish were well represented, including flounders, soles, john dory, hake, gurnard, schnapper, moki, tarakihi, and oysters were taken up in the trawl-net in different parts of the bays.

The bad weather experienced, and the short time available, owing to the expiration of the charter of the "Doto," prevented Wanganui Bight and the coast south to Kapiti Island from being properly tested. From the survey we were able to make the results obtained were not very satisfactory. From five miles south of Wanganui River to about the same distance north of Patea the bottom was tested at depths ranging from 7 to 22 fathoms, and was found to be coarse sand, gravel, and rocks. As stated in the record of hauls made, the quantity of fish taken in this locality was very poor, and the nets were badly torn. From abreast of the Turakina River to the Waikanae a fine sand bottom was found wherever the net was put down or soundings made, but very few fish were taken in the net.

In reading the record of each haul made with the trawl-net the actual time towing should be noted, as the time it was kept down varied according to circumstances. On several occasions the net was not towed more than half an hour at a time, but the hauls were generally from an hour to an hour and a half, unless where night-work was undertaken, when longer hauls were made so as to allow the crew by turns to get some rest.

In prospecting new grounds a great deal of time is taken up in steaming between each shot of the net, and to the different areas to be tested.

Round all the coast-line prospected fish-life was found to be most prolific in from 5 to 25 fathoms. Over the 25-fathom line soft bottom was generally found, but very few fish were taken at this season.

As the migrations of fish are affected by temperatures, tides, and weather conditions, the extent of the fish-supply in any locality can only be ascertained correctly by having each locality fished at different seasons, so that areas mentioned in this report as showing good trawling-bottom but with a very poor supply of fish at the time they were prospected may at another season prove to be prolific fishing-grounds.

The charter term of the "Doto" extended for thirteen weeks. In that time fifteen days were lost through bad weather. One hundred and fifty-four hauls of the trawl-net were made, and the bottom was tested with the lead at 122 stations. The trawl-net was towed altogether 501 miles, while the steaming distance was 2,893 miles, making the total distance travelled 3,396 miles.

With regard to the value of the work done for the colony by this expedition, I maintain that the favourable conditions for successful trawling that we have proved to exist in Tasman, Golden, Pegasus, Riverton, and Tewaewae Bays is worth to the colony ten times more than the whole amount expended on the cruise, while the knowledge gained of the nature of the ocean's bottom, and fish-life existing round other parts of the coast that were explored, is of considerable value and interest in dealing with our fisheries.

The Government can assist the fisheries of the colony in no better way than by carrying on the experimental trawling round other parts of the colony. I would therefore respectfully recommend that experimental trawling be continued round the coast of the North Island, and that a suitable vessel should be chartered sufficiently early to allow her to be fitted out and the work commenced by the beginning of January. And also that a scientific expert be appointed to accompany the expedition, so that a biological survey of the areas prospected may be carried out.

In future work of the kind I propose that the vessel shall carry, besides the trawl-nets, an oyster-dredge, a seine, a purse-seine, and a lining outfit, so that when circumstances are not favourable for trawling the value of the fisheries in certain localities may be ascertained by other suitable means.

Attached to this report will be found—

- (1.) A detailed record of hauls made at each trawling-station.
- (2.) A list of fish taken, stations where they were obtained, and particulars of hauls.
- (3.) Particulars of the bottom observed at each of the sounding-stations.
- (4.) A memorandum of temperatures observed in different localities.
- (5.) A memorandum of distances steamed and towed by s.s. "Doto" during the trawling expedition.
- (6.) An interim report by Mr. A. Hamilton, Registrar of the University of Otago.
- (7.) An interim report by Mr. G. M. Thomsom, F.C.S.
- (8.) A report by Captain Nielson.
- (9.) Maps showing the position of each station.

I have, &c.,

L. F. Axson, Inspector of Fisheries.

The Hon. the Minister of Marine, Wellington.

DETAILED RECORD OF HAULS MADE.

First Haul.—The first haul of the net was made in Pegasus Bay on the 10th March. On that date the "Doto" left Lyttelton Wharf at 1.30 p.m., and after passing the Heads steamed up the coast till abreast of the Waimakariri River, where the net was put down in 8 fathoms, about three miles off shore, at 4.20 p.m., on a soft-sand bottom. Towed S.E. $\frac{1}{2}$ S. for three hours, when the net was picked up off the same bottom in 12 fathoms, with the following result, viz.: 150 flounders, 13 soles, 6 ling, 100 *Macrurus australis*, 1 schnapper, 1 brill, and 450 red-cod. The net came up clean and free from weeds. Steamer returned to Lyttelton, arriving there at 9 p.m.

Second Haul.—On Monday, the 12th March, we left Lyttelton at 5.40 a.m., and steamed north from the Heads (about thirty-four miles) to within eight miles of Motonau Island. Soundings showing sand-and-mud bottom the trawl-net was put down in 21 fathoms at 10 a.m. Towed N. $\frac{1}{4}$ E. for two hours, and picked up in 22 fathoms off a stony bottom. Result: 12 *Macrurus australis*, 6 red-cod, 1 skate, and 1 crayfish, a few shells and pieces of rock.

Third Haul.—After picking up at 12 noon, steamed E. six miles, and shot the net in 24 $\frac{1}{2}$ fathoms, bottom sand, at 12.45 p.m. Towed again for two hours, direction S.E. by E., and hauled up the net in 25 fathoms. Result nil, owing to the rope tying the cod-end slipping.

Fourth Haul.—The net was again put down in 25 fathoms at 3 p.m., towed S.E. by E. for an hour, and taken up off a soft-sand bottom in 22 fathoms. The fish taken were 1 ling, 8 tarakihi, 3 lemon-soles, 1 flounder, 10 megrims, 5 *Macrurus australis*, 17 red-cod, and a few elephant-fish.

Fifth Haul.—After picking up the net at station 4 we steamed due W. to Double Corner, off the mouth of the Waipara River. The net was shot on a mud-and-sand bottom, in 9 fathoms, about two miles off shore, at 6 p.m. Towed S. $\frac{3}{4}$ W. for two hours and a half, when it was taken up off the same bottom in 8 fathoms. Result: 36 soles, 5 flounders, 4 lemon-soles, 4 conger-eels, and 210 red-cod.

Sixth Haul.—The net was shot at once in 9 fathoms at 9 p.m., the bottom still mud and sand, and continued towing down the coast for three hours, course due S. Picked up at 12 a.m. in 7 fathoms, the result being very satisfactory—viz., 76 soles, 5 lemon-soles, 48 flounders, 2 groper, 5 conger, 20 *Macrurus australis*, 12 skate, 460 red-cod, 2 electric rays, 50 dog-fish, and a number of elephant-fish.

Seventh Haul.—Shot the net again near where it was last picked up, in 7 fathoms, on a soft-sand bottom, at 12.15 a.m. Towed S.E. $\frac{1}{2}$ E., and picked up in 8 fathoms at 3.30 a.m. The result was again satisfactory, being 27 soles, 2 ling, 87 flounders, 50 *Macrurus australis*, and 500 red-cod.

Eighth Haul.—Continuing work in Pegasus Bay, the net was put down on the same soft-sand bottom, in 8 fathoms, at 4 a.m. Towed E. by N., and picked up in 12 fathoms at 6.45 a.m. Result: 55 soles, 31 flounders, 1 turbot, 260 red-cod, 6 ling, 2 conger-eels, and 20 skate.

Ninth Haul.—The net was shot for the last time before returning to port at 7.30 a.m., in 12 fathoms, on an even sand bottom. Towed E. by N. $\frac{1}{4}$ N. for two hours, when the net was taken up in 13 fathoms. The fish taken were 12 soles, 12 flounders, 50 red-cod, and 4 skate.

Tenth Haul.—We left Lyttelton again at 8.15 a.m. on the 14th March, and steamed round Banks Peninsula until abreast of Long Lookout Point, where the net was put down in 9 fathoms, on a sand bottom, about three miles off shore, at 11.20 a.m. Towed E. $\frac{3}{4}$ N., and picked up at 12.30 p.m. in 11 fathoms. Result: 1 $\frac{1}{2}$ tons of red-cod, 10 soles, and a large quantity of dog-fish, sharks, and elephant-fish.

Eleventh Haul.—From picking up at station 10 steamed an hour and shot the net in 27 fathoms, on a sand bottom, about seven miles off and abreast of East Head, at 1.20 p.m. Towed W. southerly for an hour and forty minutes, and picked up the net in 10 fathoms off an even sand bottom abreast of Pah Point. The net contained an immense quantity of fish, estimated at about 4 tons in weight, principally red-cod, dog-fish, young sharks, and elephant-fish. In hauling this mass up with the steam-winch the mizzen-mast carried away.

Twelfth Haul.—After picking up the last haul steamed towards Lyttelton Heads, and put down the net at 4.10 p.m., in 11 $\frac{1}{2}$ fathoms, three miles off Decanter Bay. Towed W. $\frac{3}{4}$ S. for an hour, and hauled up the net off a sand bottom. The fish taken in this haul were 13 soles, 20 red-cod, 3 skate, 1 ling, and a large quantity of dog- and elephant-fish. Returned to Lyttelton to get the "Doto's" mast repaired.

Thirteenth Haul.—On the 15th March we left Lyttelton Wharf at 3 p.m. to further prospect Pegasus Bay. The net was put down in 6 fathoms, off the coast north of Sumner, at 4.30 p.m., and towed N.W. by N. $\frac{1}{2}$ N. for three hours, the bottom varying from soft sand to mud. The net was picked up abreast of the Waimakariri River in 6 fathoms. The fish taken were 59 soles, 5 flounders, 4 turbot, 2 skate, 250 red-cod, and 2 *Macrurus australis*.

Fourteenth Haul.—The net was put down again abreast of the Waimakariri River, in 6 fathoms, at 7.45 p.m.; bottom sand and mud. Towed an hour and a half N.E. $\frac{3}{4}$ N., then altered the course to E. by S. $\frac{1}{4}$ S., and towed on this course for another hour and a half, and took up the net in 11 fathoms. The result was 43 soles, 42 flounders, 460 red-cod, 12 skate, and 4 *Macrurus australis*.

Fifteenth Haul.—Shot the net again at 11 p.m., in 12 fathoms, on a sand bottom, and towed for two hours and a half. The first half of the course was N. $\frac{1}{2}$ E., and the second half S.E. by E. $\frac{1}{2}$ S. The fish taken were 29 soles, 46 flounders, 2 ling, 164 red-cod, 4 *Macrurus australis*, 2 skate, and a number of elephant-fish, dog-fish, and octopi.

Sixteenth Haul.—The net was put down for the last time before returning to port at 2 a.m., in 12 fathoms, on a sand bottom, and picked up in the same depth at 4 a.m. The direction towed was S.E. by S. $\frac{1}{2}$ S. The fish taken were 8 soles, 9 flounders, 440 red-cod, 1 ling, 2 skate, and 4 *Macrurus australis*.

On the 17th March the "Doto," having coaled, sailed from Lyttelton for Akaroa at 3 p.m., arriving there at 10 p.m.

Seventeenth Haul.—On Monday, the 19th March, we left Akaroa at 6 a.m. Off Akaroa Heads a stiff southerly breeze was blowing, with a confused sea, that made work impossible there, so we steamed south until we were abreast of Lake Ellesmere Spit. Good bottom was found at 10 fathoms, and the net was put over for the first time at 9.35 a.m. Towed S.W. $\frac{3}{4}$ W. for one hour and a half, and picked up in 10 fathoms off a sand bottom. Result: 75 red-cod, 18 soles, 23 flounders, 1 gurnard, and 1 conger-eel.

Eighteenth Haul.—After the net was taken up at station 17 steamed out S.S.W. for an hour into 20 fathoms, soundings with the lead showing a clean sand bottom. Shot the net at 12.30 p.m., and towed due south for one hour and a half. Hauled up in 23 fathoms; bottom clean sand. The fish taken in this haul were 14 lemon-soles, 2 soles, 1 megrim, 2 horse-mackerel, 1 gurnard, 2 skate, and 20 red-cod.

Nineteenth Haul.—Steamed inshore from station 18, and put down the net off the mouth of the Rakaia River, in 7 fathoms, on a sand bottom, at 3.30 p.m. Towed S.W. $\frac{1}{2}$ S. for seventy minutes, when the net was taken up in 10 fathoms, the result being 16 soles, 13 flounders, 3 turbot, 60 red-cod, 20 skate, 15 dog-fish, and 4 octopi.

Twentieth Haul.—Steamed out from station 19, course due south, for half an hour. Tested the bottom in 11 fathoms, but found it stony. Continued the same course into 12 fathoms, but found bad bottom. Further on, in 13 fathoms, got on to sand, and put over the net at 6.5 p.m. Towed S.W. $\frac{1}{4}$ S. for fifteen minutes, and got on to bad bottom in 14 fathoms. When the net was taken up skate and red-cod were the only fish represented.

Twenty-first Haul.—A strong breeze off the land, with a choppy sea, compelled us to go inshore after picking up at station 20. Soundings were made in 10 $\frac{1}{2}$ and 8 $\frac{1}{2}$ fathoms, but the lead brought up stones. Steamed in to 7 fathoms, where a sand bottom was found, and the net was put down about a mile and a half off shore, half way between the Rakaia and Ashburton Rivers, at 7.25 p.m. Towed S.W. $\frac{1}{4}$ S. for one hour and a half, and picked up off a gravelly bottom in 7 fathoms. The fish taken were 6 flounders, 4 soles, and 28 red-cod. Quantity and variety of fish very poor.

Twenty-second Haul.—Continuing work down the coast, off the Ninety-mile Beach, the net was put down to the north of the Ashburton River, in 5 $\frac{1}{2}$ fathoms, on a soft-sand-and-mud bottom, at 9.35 p.m. The course towed was S.W. by S. $\frac{1}{4}$ S., and the net was hauled up at 12 midnight in 7 fathoms. The fish taken were 29 flounders, 10 soles, and 50 red-cod.

Twenty-third Haul.—The net was again put down in 7 fathoms, at 12.55 a.m., on a sand bottom. Continued towing down the coast S.W. $\frac{1}{2}$ S., and hauled up at 3.15 a.m. in 8 fathoms. This haul of the net yielded 12 flounders, 9 soles, 93 red-cod, 2 skate, 2 ling, 7 gurnard, and a number of dog- and elephant-fish.

Twenty-fourth Haul.—Shot the net in 8 fathoms, at 3.40 a.m., on a sand bottom. Towed S.W. $\frac{3}{4}$ S. for two hours and twenty minutes, and hauled up in 9 fathoms. The result of this haul was very poor, only yielding 4 soles, 4 flounders, 3 gurnard, and a number of elephant-fish and octopi.

Twenty-fifth Haul.—After picking up at station 24 we steamed out S.E. by S. into 28 fathoms, and the net was put down on a sand-and-shell bottom at 8 a.m. Towed S.W. for two hours, picking up at 10 o'clock in 24 fathoms. This haul proved a blank, owing to the net getting twisted in shooting.

Twenty-sixth Haul.—Steamed inshore from station 25 N.W. by N. for two hours and ten minutes. Soundings were made at 18, 16, and 12 fathoms. The trawl was put down about four miles south of the Rangitata River, in 4 fathoms, at 12.20 p.m.; bottom coarse sand. Towed S. by W. $\frac{1}{4}$ W. for an hour and twenty minutes, when it was picked up in 6 fathoms off a gravelly bottom. This haul yielded 20 soles, 4 flounders, 120 red-cod, 2 ling, 8 *Macrurus australis*, and 1 hapuku.

Twenty-seventh Haul.—Steamed down the coast for half an hour, and shot the net in 4 $\frac{1}{2}$ fathoms, immediately south of the Ophi River, at 2.30 p.m. Towed due south for an hour and a quarter, when the net got foul of a snag, and was taken up badly damaged. The cod-end being intact contained 13 soles, 1 turbot, 2 ling, and 150 red-cod. Went into Timaru to coal and repair nets and gear.

Twenty-eighth Haul.—Went out from Timaru at 7.50 a.m. on the 22nd March, steamed an hour due east, and put down the net in 10 fathoms; bottom soft sand. Towed E. by S. $\frac{1}{4}$ S., and picked up the net in 13 fathoms at 10.20 a.m. The fish taken in this haul were 28 soles, 11 megrims, 1 barracouta, 10 skate, and 1 tarakihi.

Twenty-ninth Haul.—From station 28 steamed E.S.E. two hours. Soundings with the lead in 25 fathoms showing sand and broken shell the net was put down at 12.30 p.m., towed E.S.E., and picked up in 50 fathoms at 2.5 p.m. Result: 152 tarakihi, 2 megrims, 1 gurnard, 3 oysters, a collection of crabs, and a large quantity of marine vegetation.

Thirtieth Haul.—Steamed S.W. half an hour, and put down the net at 2.45 p.m., in 43 fathoms, on a mud bottom. Towed S.W. by W. $\frac{3}{4}$ W., and hauled up at 4.15 p.m. in 27 fathoms. Result: 8 tarakihi, 2 megrims, 10 lemon-soles, and 2 oysters.

Thirty-first Haul.—Weather being unfavourable this morning we delayed leaving Timaru until 8.15 a.m. Headed down the coast for seven miles, but the wind increasing, with a choppy sea getting up, it was decided to return to Timaru, trying a haul of the net on the way back. The net was put down in 10 fathoms on a sand bottom, towing with the wind N. $\frac{3}{4}$ N. for an hour and a half, and picked up in 8 fathoms. The result of this haul was about 3 tons of fish, principally red-cod, a large number of dog-fish, sharks, 18 soles, and 19 flounders.

Thirty-second Haul.—We left Timaru again at 4.25 a.m. on the 26th March, steamed N.E. for an hour and a half, and put down the net at 6 a.m., in 11 fathoms, on a sand bottom. Towed E. by N. $\frac{3}{4}$ N., and picked up in 14 fathoms at 7.15 a.m. The result of this haul was 2 baracouta, 11 lemon-soles, 17 gurnard, and 3 megrims.

Thirty-third Haul.—From picking up at the last station we steamed inshore half an hour, and shot the net in 10 $\frac{1}{2}$ fathoms, on a sand bottom, at 8.20 a.m. Towed N.W. $\frac{3}{4}$ N. for an hour, and picked up off a rough bottom. The fish taken were 3 ling, 3 gurnard, 10 soles, 4 flounders, and about a ton of red-cod.

Thirty-fourth Haul.—Steamed up the coast for an hour, and put down the net in 4 $\frac{1}{2}$ fathoms, about three miles south of the Ashburton River, at 10.40 a.m., lead soundings showing sand. Towed for an hour S.W. $\frac{1}{4}$ W., and picked up in 5 fathoms. The fish taken were 5 soles, 3 flounders, 200 red-cod, and a few skate.

Thirty-fifth Haul.—After taking up the net at the station 34 steamed down the coast for three-quarters of an hour, and put down the net in 3 $\frac{1}{2}$ fathoms, on a sand bottom, at 12.30 p.m. Towed S.W., and hauled up in 5 fathoms at 1.20 p.m. This haul yielded 250 red-cod, 9 soles, 3 flounders, 2 *Macrurus australis*, and a few skate.

Thirty-sixth Haul.—Steamed three-quarters of an hour from station 35, and shot the net abreast of the Orari River in 5 $\frac{1}{2}$ fathoms at 2.25 p.m. Soundings with the lead showed the bottom to be soft sand. Towed S. by W. $\frac{3}{4}$ W. for three-quarters of an hour, when the net got foul of a snag. Great difficulty was experienced in getting the net clear of the obstruction, and when it came up it was torn to shreds, a new foot-rope broken, and the chains of the otter-board bridles broken. Returned to Timaru to effect repairs.

Thirty-seventh Haul (27th March).—We left Timaru again at 7 a.m. on the 27th to work off the coast as far south as the Waihao. Steamed down the coast for an hour, and shot the net in 9 fathoms, on a sand bottom, at 8 a.m. Towed for an hour due south, and picked up in 9 fathoms. The fish taken were 10 soles, 1 flounder, 250 red-cod, and a number of skate, dog- and elephant-fish.

Thirty-eighth Haul.—Steamed twenty minutes, and shot again in 8 fathoms at 9.40 a.m.; bottom fine sand. Towed S. $\frac{1}{2}$ E. for an hour, the result being 250 red-cod, 9 soles, 1 ling, and a quantity of skate, dog-fish, and 2 octopi.

Thirty-ninth Haul.—Continuing down the coast we steamed half an hour from station 38, and put over the net in 7 fathoms, on a sand bottom, at 11.35 a.m. Towed N.W. $\frac{1}{2}$ W. for an hour, and took up the net in 8 fathoms off the Waihao River. The fish taken in this haul were 9 soles, 1 conger, 1 moki, and 500 red-cod.

Fortieth Haul.—From station 39 we steamed out into 16 fathoms, eight miles off shore, and abreast of the Waihao River. The net was shot at 3 p.m. on a sand bottom, and towed N.W. $\frac{1}{2}$ W. for an hour, when it was picked up in 18 fathoms. The result of this haul was rather poor, yielding only 27 soles, 1 gurnard, and a few skate and octopi.

Forty-first Haul.—Went out from Timaru at 7.15 a.m. on the 28th March, steamed up the coast for twenty minutes, and shot the net off the Washdyke Lagoon; bottom soft sand. Towed for an hour N.E. by N. $\frac{3}{4}$ N., and picked up off a gravel bottom in 6 $\frac{1}{2}$ fathoms. The result of this haul was rather poor, yielding only 50 red-cod, 3 gurnard, 1 conger, and 1 octopus.

Forty-second Haul.—Steamed out into 7 fathoms, the lead showing sand; the net was put down at 9.30 a.m., towed an hour N.E. by N. $\frac{3}{4}$ N., and picked up off gravel in 6 $\frac{1}{2}$ fathoms. The fish in the net were 50 red-cod, 1 conger-eel, 3 gurnard, and 1 octopus.

Forty-third Haul.—Went out into 10 fathoms, and put down the net at 11 a.m. on a sand bottom. Towed S.E. by S. $\frac{1}{2}$ S. for three-quarters of an hour, then altered the course to W. by S. $\frac{1}{2}$ S., and towed for the same time on this course, and picked up in 10 fathoms at 12.30 p.m. The fish taken were 2 hapuku, 4 gurnard, and 300 small red-cod.

Forty-fourth Haul.—We left Timaru at 4 a.m. on the 30th March, and steamed south until past the mouth of the Waihao River. Soundings in 8 fathoms showing a gravel bottom; steamed out E.S.E., and got bad bottom in 10 and 14 fathoms; continued out into 18 fathoms, and got sand and shell. The net was put over at 10 a.m., and towed three-quarters of an hour E. by S. $\frac{3}{4}$ S., and hauled up in 20 fathoms. The result of this haul was very poor, the net containing only a few lemon-soles, a collection of shells, sponges, and sea-weed.

Forty-fifth Haul.—After picking up at station 44 we steamed due west into 5 fathoms, a mile to the north of the Waitaki River. Soundings showing a bad bottom all the way in. The bad bottom continued in from 5 to 8 fathoms to the south of the Waitaki. The course was altered to due east, and the bottom was tested on that course out to 23 fathoms. The net was put down at 2.10 p.m., in 23 fathoms, on a sand-and-broken-shell bottom, and towed E. $\frac{1}{2}$ S. for half an hour. Hauled up at 2.40 p.m. in 27 fathoms. The fish taken were 15 megrims, 20 tarakihi, and a collection of weeds and shells. Tested the bottom on a course S.W. in to 6 fathoms, and then down the coast to Oamaru, getting bad bottom at every sounding.

Forty-sixth Haul.—Left Oamaru at 6 a.m. to make further tests off the Waitaki, the weather being favourable for inshore-work, a steady breeze blowing off shore. When well up to the mouth of the river soundings with the lead showed a gravel bottom until inside of 4 fathoms, when

we got on to sand, and the net was put down at 8.20 a.m., and towed across the opening of the river (N. by E.) until abreast of the North Head, where we got on to rough bottom, and the net was taken up in 4 fathoms after towing three-quarters of an hour. The result of this haul was very poor, giving only a few flat-fish and red-cod. In towing we went into 2 fathoms, getting good bottom, but outside of 4 fathoms got on to gravel.

Forty-seventh Haul.—From the Waitaki returned to the S.E. of Oamaru Bluff, and prospected between the reefs that exist in that locality. The net was put down at 10.40 a.m. in 10 fathoms, bearing S.E. from Cape Wanbrow, and distant four miles and a half. Towed S.E. $\frac{1}{2}$ S. for three-quarters of an hour, and picked up in 12 fathoms off a sand bottom. This haul only yielded 1 ling, 1 moki, 3 blue-cod, 1 tarakihi, and 13 megrims.

Forty-eighth Haul.—Steamed twenty-five minutes into 14 fathoms, and put down the net on a sand-and-shell bottom at 1 p.m. Towed S.E. $\frac{1}{4}$ E. for an hour, and hauled up in 15 fathoms. The result again very poor, the net containing only 2 ling and a few skate.

Forty-ninth Haul.—From station 48 steamed N.W. seventy-five minutes, and put over the net in 10 fathoms, on a sand bottom, at 3.15 p.m., abreast of the Kakanui River, and distant four miles and a half. Towed an hour, and picked up off a rough bottom, the net badly torn. Result, nil.

Fiftieth Haul.—Went out from Oamaru at 6.30 a.m. on the 2nd April; steered a course due east for two hours into 28 fathoms; bottom sand and shell. The net was lowered for the first time at 8.45 a.m., and towed E. by S. for an hour and forty minutes, and picked up in 33 fathoms. Result poor, only 10 megrims, a number of small tiger-sharks, and a large quantity of shells, starfish, and weeds.

Fifty-first Haul.—Shot the net again in 35 fathoms on a sand-and-shell bottom; time 10.40 a.m. Towed S. by E. $\frac{1}{2}$ E., and picked up in 46 fathoms off sand and mud. Result again poor, only 12 megrims, 4 tarakihi, and a quantity of shells. After picking up steamed W.S.W. for an hour; sounded in 61 fathoms on sand and shell, but owing to a choppy sea getting up the net was not put over. Soundings were made at stations 43, 42, and 41 on the return to Oamaru.

Fifty-second Haul.—On the 3rd April we left Oamaru at 8.10 a.m. to prospect off the coast south of Oamaru. The lead showed a rough bottom until All Day's Bay was reached. The net was put down on a sand bottom, in 5 fathoms, at 10 a.m. Towed for forty minutes, and picked up off a stony bottom in 3 fathoms. The net contained 16 soles, 1 lemon-sole, 1 turbot, 1 flounder, and a number of skate and dog-fish.

Fifty-third Haul.—Went out into 13 fathoms, and put down the net at 11.30 a.m.; bottom coarse sand. Towed N. $\frac{3}{4}$ W. for an hour, and hauled up in 12 fathoms. The only fish taken in this haul were a few lemon-soles, 3 *Macrurus australis*, and skate.

Fifty-fourth Haul.—Went out from Oamaru on the morning of the 5th April at 5.30 a.m. to work south of Otago Heads. Tested the bottom at various depths, and got bad bottom until abreast of Moeraki Heads, when soundings showed sand and shell. The net was put over in 18 fathoms at 8.15 a.m. Towed S. $\frac{1}{4}$ W. for half an hour, when the net got foul, and was picked up badly damaged, the foot-rope broken, wings torn from the ropes, and a large piece of the body of the net carried away.

Fifty-fifth Haul.—Continuing south from station 54, soundings showed rough bottom until abreast of Ahuriri Rock; getting on to sand the net was put down at 1.50 p.m. Towed S. $\frac{3}{4}$ W. for an hour and hauled up in 13 fathoms off sand. This haul yielded 32 lemon-soles, 4 gurnard, 6 megrims, 4 sea-perch, 150 red-cod, and a number of skate and elephant-fish. As weather threatening we went in to Port Chalmers for the night.

Fifty-sixth Haul.—As the weather was unfavourable for working on the 6th the net damaged off Moeraki was repaired. Went out from Port Chalmers at 8.50 a.m. on the 7th April. Professor Benham, Messrs. G. M. Thomson and Hamilton, members of the Otago Institute, accompanying the expedition for the day. After passing Taiaroa Head steered a course due east into 12 fathoms, and put down the net on a soft-sand bottom at 10.25 a.m. Towed for thirty-five minutes, and hauled up in 16 fathoms at 11 o'clock, the net containing 4 soles, 7 lemon-soles, 2 ling, and 50 red-cod.

Fifty-seventh Haul.—Steamed E. from station 56 for half an hour, and shot the net on a sand-and-shell bottom in 35 fathoms. Towed for thirty-five minutes N., and hauled the trawl up in 31 fathoms. The net contained only a variety of crabs, crustaceans, and a few soles.

Fifty-eighth Haul.—Steamed out from station 57 into 48 fathoms, and shot the net at 1.25 p.m. on a sand-and-shell bottom. Towed N.W. by N. $\frac{1}{4}$ N. for an hour, and hauled up in 41 fathoms. The net contained no market fish, but a collection of crabs, shells, and sea-weed.

Fifty-ninth Haul.—Altered the course from station 58 to N.W. by W., and steamed into 27 fathoms, where the dredge was put down and towed for fifteen minutes. Steamed towards Taiaroa Head, and shot the net in 14 fathoms at 4.5 p.m.; bottom soft sand. Towed S.W. $\frac{1}{2}$ W. for half an hour, and hauled up in 12 fathoms. The fish taken were 3 barracouta, 10 lemon-soles, 2 soles, and 1 ling. After landing members of the Otago Institute at Port Chalmers returned to near Taiaroa Head, and anchored for the night.

Sixtieth Haul.—Left anchorage at 7 a.m. on the 8th April. After passing Taiaroa Head steered a course N.N.E. for an hour and a quarter, and put down the net at 9.5 a.m., in 18 fathoms, on sand. Towed N. $\frac{1}{2}$ E. for an hour and a quarter, and picked up in 20 fathoms. The fish taken were 20 lemon-soles, 25 tarakihi, 1 ling, 3 gurnard, 1 king-fish, and a number of dog-fish, tiger-sharks, elephant-fish, and octopi.

Sixty-first Haul.—Went north from station 60 to explore Kartiki Bay. Using the lead off Shag Point we got an uneven bottom; getting sand to the north end of the bay the net was put down in 6 fathoms at 12.25 p.m. Towed for twenty minutes, and got foul of a snag. When hauled up the net was full of kelp, and a piece of rock quite 200 lb. in weight. Soundings over the bay showed patches of sand and rocks.

Sixty-second Haul.—Left Kartiki Bay at 1.20 p.m. working south. Rough bottom was found until Waikouaiti Bay opened out. Passed Wakouaiti Bay, and shot the net in 12 fathoms off Teeth Rocks at 3.25 p.m.; bottom sand. Towed S.E. $1\frac{1}{2}$ S. for two hours, and hauled up off a good bottom in 13 fathoms. The net contained 3 gurnard, 10 lemon-soles, 2 soles, 3 ling, 200 red-cod, and a few skate. Anchored in Dowling Bay.

Sixty-third Haul.—Left anchorage in Dowling Bay at 6.30 a.m. on the 9th April to prospect off Otago Peninsula and Blueskin Bay. The net was put down off Potato Point, in Blueskin Bay, at 7.40 a.m., and towed across the mouth of Purakanui Inlet. Soft-sand bottom; depth 7 fathoms. Hauled up, after towing half an hour, in 6 fathoms. This haul yielded 10 soles, 32 flounders, 1 lemon-sole, 200 red-cod, a number of skate and elephant-fish.

Sixty-fourth Haul.—The net was put down again in Blueskin Bay, at 8.30 a.m., in 6 fathoms, on a soft-sand bottom. Towed N.E. by N. $\frac{1}{2}$ N. for an hour and twenty minutes, picking up in 11 fathoms off Harris Bluff. Owing to the net getting twisted in shooting this haul proved a blank.

Sixty-fifth Haul.—Explored the bottom off Otago Peninsula to White Island, the lead showing sand until abreast of Cape Saunders, when we got on to gravel. Put down the net in Wickliffe Bay at 2.35 p.m., on a sand bottom, in 7 fathoms, and towed round the Bay half an hour, picking up in 6 fathoms. This haul yielded 5 soles, 4 lemon-soles, 18 flounders, 106 red-cod, and a number of dog-fish, sharks, and elephant-fish.

Sixty-sixth Haul.—Returning to Blueskin Bay, the net was put down off Hayward Point, in 9 fathoms, on sand. Towed in to the centre of the bay an hour and twenty minutes. Result: 10 flounders, 20 soles, 16 lemon-soles, 2 ling, and 150 red-cod.

Sixty-seventh Haul.—The net was put over again in the middle of the bay, in 7 fathoms, at 5 p.m.; bottom soft sand. After towing an hour and a half hauled up in 12 fathoms at 6.30 p.m. This haul yielded 27 flounders, 20 soles, 9 lemon-soles, 200 red-cod, and 5 ling.

Sixty-eighth Haul.—Owing to stormy weather we were unable to leave Port Chalmers for further south until the 13th April. On that date we sailed at 6 a.m., intending to explore off the Taieri Beach and in Molyneux Bay. Soundings from Green Island well up to the Taieri River showed an uneven rough bottom. The lead showing sand about six miles north of Taieri Island the net was put down in 15 fathoms, but got foul of a rock after towing twenty minutes. When picked up it was found the net had sustained considerable damage.

Sixty-ninth Haul.—After passing Taieri Island soundings showed a sand bottom. The net was put over in 11 fathoms at 12.30 p.m., but immediately got foul of a rock and was picked up.

Seventieth Haul.—A short distance from where the net was picked up, the lead showing a sand bottom again, the net was put down once more, but was only towed a short distance when it got fast, and was hauled up considerably damaged and containing several pieces of rock. The otter-boards were scarred and chipped by being towed over rocks.

Seventy-first Haul.—From station 70 continued down the coast to Molyneux Bay. Good bottom was got in 9 fathoms, off Coal Point. The net was put down at 4.30 p.m., and towed S. $\frac{1}{4}$ E. for an hour and a half. Hauled up off an even soft-sand bottom at 6 o'clock. Result: 1 turbot, 25 soles, 200 red-cod, and 1 crayfish. Bad weather from the north-east having set in further operations in this bay were impossible, and it was decided to go on to Foveaux Straits and the Bluff.

Seventy-second Haul.—Several soundings were made from Waipapapa Point well up to Dog Island. Fine gravel was taken up every cast of the lead. The net was put over in 7 fathoms, but after towing a short time got fast, and was taken up, containing several pieces of rock.

Seventy-third Haul.—Left the Bluff for Toitōi Bay at 7 a.m. on the 16th April. Tested the bottom after passing Sandy Point in depths from 6 to 10 fathoms, getting fine gravel until well up to the Maitāura River. At 9.50 a.m. we got on to sand, and the net was put down in 6 fathoms. Getting foul of some obstruction, after towing a short distance, it was taken up, containing a large block of sandstone. Fish were represented by a few flounders and red-cod.

Seventy-fourth Haul.—Soundings showing a good bottom the net was put down again in 6 fathoms, on fine sand, at 10.25 a.m. Towed an hour and a half, and hauled up in 5 fathoms; bottom fine sand. The fish taken in this haul were 12 flounders, 13 soles, 6 lemon-soles, 3 megrims, 4 gurnard, 1 ling, and 50 red-cod.

Seventy-fifth Haul.—The net was put down again in Toitōi Bay, close in to the mouth of the Maitāura River, in 7 fathoms, on sand, at 12.20 p.m., and towed an hour. The result of this haul was 15 soles, 6 flounders, 6 gurnard, 2 ling, 150 red-cod, and a number of elephant- and dog-fish.

Seventy-sixth Haul.—A south-west gale on the 17th compelled us to stay in port all day. On the 18th, as the weather was still too stormy to work off the coast to the westward, it was decided to cross the Straits to Stewart Island and prospect the bays and inlets on the eastern side of the Island. Left the Bluff at 7 a.m. After a rough passage across Foveaux Straits commenced operations to the south of Saddle Point at 10.30 a.m. Soundings in 17 fathoms showed patches of sand with occasionally rock. A more regular bottom was got in 8 fathoms, and the net was put down abreast of Murray Bay at 11.10 a.m. Towed half an hour, got foul of a rock, and hauled up in 9 fathoms. The net contained a few blue-cod, sea-perch, soles, megrims, ling, and a large piece of rock.

Seventy-seventh Haul.—Soundings showed a rough bottom from Murray Bay to Port William. The net was put down in Port William close inshore in $3\frac{1}{2}$ fathoms; bottom soft sand. Towed out for three-quarters of an hour, when the net got fast once more, and was hauled up in 5 fathoms full of weeds and with several pieces of rock. The only fish represented were megrims and sea-perch. Anchored for the night off Cooper Island, Paterson's Inlet.

Seventy-eighth Haul.—Left anchorage at 7 a.m. on the 19th. Put down the bottom dredge in Big Glory Bay. Visited all the sawmills working and old sawmill-sites in connection with a water-pollution question. Tests made at different parts of the inlet showed the bottom to be uneven,

occasional patches of sand, with rocks jutting out at intervals. The net was put down in Paterson Inlet, off Abraham Bay, in $4\frac{1}{2}$ fathoms, the lead showing a soft bottom. Towed for twenty minutes, and got foul of a snag that pulled the steamer up. The obstruction proved to be a piece of rock several tons in weight, which had got right into the net. The net being a new one, made of strong Manila twine, it held fast, and three hours were occupied hauling at it before a breach was effected and the rock went through. With the exception of a large hole in the net no other damage was done to the gear. Put into Half-moon Bay for the night.

Seventy-ninth Haul.—We left Half-moon Bay at 7 a.m. on the 20th. After visiting an old sawmill-site in Horseshoe Bay we steamed south. When off "The Neck" the net was put down in 17 fathoms, on what seemed a good even bottom, but we had only towed half an hour when it got fast. When hauled up it contained a lot of weeds, several pieces of rock, while fish were represented by a few megrims and small tarakihi. Soundings taken up to East Head showed the bottom to be sand and rock. Steamed on to Pegasus Inlet.

Eightieth Haul.—Soundings in the north arm of Pegasus Inlet showed sand and mud. The net was put down in 19 fathoms and towed for twenty-five minutes, when it again got fast, and was hauled up full of weeds and with several pieces of rock. Fish were represented by soles, megrims, and tarakihi. Anchored for the night at the head of the North Arm. Weighed anchor at 6 a.m. on the 21st April, and after taking in a supply of fresh water tested the south arm with the lead, but got an unsafe bottom. Steamed round to Wilson Bay, where the bottom showed patches of sand, with occasional rocks. Left Wilson Bay at 12.30 p.m. for Mason Bay, arriving there at 6.30 p.m.

Eighty-first Haul.—The anchor was taken up in Mason Bay at 5.50 a.m. on the 22nd April. The net was put down in 9 fathoms, at 5.55 a.m., on sand. Towed half an hour, and picked up in 12 fathoms full of weeds, but with very few fish, the following kinds being represented: ling, tarakihi, soles, flounders, and cat-fish.

Eighty-second Haul.—Steamed a short distance after picking up, and put down the net in 10 fathoms on soft sand. After being down three-quarters of an hour the net was noticed to be towing heavily, and was hauled up full of weeds, but with very few fish, a few flounders, soles, ling, tarakihi, and cat-fish being all it contained. Fine weather prevailing with a steady glass it was decided, while the weather conditions were so favourable, to cross the Straits to the mainland and work Tewaewae Bay.

Eighty-third Haul.—Left Mason Bay at 9 a.m. Fine sand bottom was found in 36, 34, 31, and 32 fathoms. The net was put down in 25 fathoms on fine sand. Towed for an hour and a half, and picked up in 23 fathoms. The net came up free from weeds, and the only fish were a few lemon-soles, ling, and 40 large cat-fish.

Eighty-fourth Haul.—After picking up at station 83 a fine sand bottom was found all the way into Tewaewae Bay. The net was put down well in the bay in 8 fathoms at 3.30 p.m.; bottom soft sand. Towed N.W. $\frac{3}{4}$ N. for an hour and a half, and hauled up in 7 fathoms off an even soft sand bottom. This haul yielded 18 soles, 50 red-cod, 11 flounders, 1 gurnard, and a number of dog- and elephant-fish.

Eighty-fifth Haul.—Shot the net again in 8 fathoms on a soft sand bottom. Towed E.S.E. for an hour, and hauled up in 8 fathoms. This haul yielded 9 flounders, 24 soles, 6 gurnard, 40 red-cod, and a number of dog- and elephant-fish. Anchored for the night off Monkey Island, behind Pahia Point.

Eighty-sixth Haul.—Left anchorage in Tewaewae Bay at 7.15 a.m. on the 23rd April. Steamed a short distance, and put over the net in 8 fathoms on a soft sand bottom. Hauled up after towing an hour and a half in 7 fathoms. The result of this haul was very satisfactory, yielding 20 ling, 160 soles, 1 turbot, 55 flounders, 200 red-cod, 2 skate, and a quantity of dog- and elephant-fish.

Eighty-seventh Haul.—The net was put over again in 7 fathoms, on soft sand, at 9.30 a.m. Towed for two hours, and hauled up in 7 fathoms. This haul yielded 78 soles, 3 turbot, 20 flounders, 6 ling, 250 red-cod, besides skate, dog- and elephant-fish.

Eighty-eighth Haul.—After picking up steamed a short distance and found the bottom still 7 fathoms, and soft sand. The net was put down once more at that depth, and towed S.E. $\frac{3}{4}$ E. for an hour and a half, when it was taken up in 6 fathoms. The result was again very good, giving 160 soles, 30 flounders, 4 turbot, 20 red-cod, 4 ling, 10 gurnard, and a number of elephant- and dog-fish.

Eighty-ninth Haul.—The trawl was put down in Tewaewae Bay for the last time at 1.45 p.m. in 6 fathoms; bottom soft sand. Towed S.E. by S. $\frac{3}{4}$ S. for an hour and a quarter, and hauled up in 7 fathoms. Result: 104 soles, 20 flounders, 2 turbot, 3 ling, 30 red-cod, 3 skate, and a few dog- and elephant-fish. Returned to the Bluff to coal.

Ninetieth Haul.—After coaling and taking in water we left the Bluff at 10.40 a.m. on the 24th April for Riverton Bay. The net was put down to the west of New River in 7 fathoms, bottom sand and fine gravel, and taken up in 6 fathoms, after towing an hour and a half. This haul gave 23 soles, 18 flounders, 13 lemon-soles, 3 ling, and 50 red-cod.

Ninety-first Haul.—The net was put down again about the middle of the bay in 5 fathoms at 2.15 p.m.; bottom sand. Towed in the direction of Riverton Bar for an hour and a half, and hauled up in $3\frac{1}{2}$ fathoms. Result: 36 flounders, 6 soles, 13 lemon-soles, 10 tarakihi, and 106 red-cod.

Ninety-second Haul.—A gravelly bottom was got for some distance after picking up at station 91. Close in to Riverton Bar we got on to soft sand in $2\frac{1}{2}$ fathoms, and the net was put down. Towed S.E. by S. $\frac{3}{4}$ S. for an hour and a half. When hauled up the net contained 36 flounders, 7 soles, 97 red-cod, 1 ling, and a few dog- and elephant-fish. Soundings made in 15 and 16 fathoms showed a gravel bottom. Returned to the Bluff at 9.45 p.m.

Stormy weather prevented us leaving port on the 25th and 26th April. The "Doto" left Bluff Harbour at 7 a.m. on the 27th for the north, and arrived at Timaru on the 28th.

Ninety-third Haul.—We left Timaru Harbour at 6.45 a.m. on the 30th April. Steamed due east for an hour and a half, and put down the net in 18 fathoms on a soft sand bottom. Towed an hour E. $\frac{1}{4}$ N., then altered the course to S.W. by S. for another, and hauled up in 22 fathoms off a good bottom. The fish taken in this haul were 22 lemon-soles, 26 megrims, 13 tarakihi, 8 gurnard, 4 ling, 200 red-cod, 6 skate, and a number of elephant- and dog-fish.

Ninety-fourth Haul.—The net was shot again in 18 fathoms on a soft sand bottom at 11 a.m. Towed W. by S. $\frac{1}{4}$ S. for two hours, and picked up off a good bottom in 13 fathoms. This haul was very satisfactory, giving 112 lemon-soles, 8 ling, 19 megrims, 31 tarakihi, 10 gurnard, 2 king-fish, 20 skate, 250 red-cod, and a large quantity of dog-fish and young sharks.

Ninety-fifth Haul.—Shot again in 13 fathoms at 1 p.m.; bottom soft sand. Towed S.W. by W. for two hours, and picked up in 12 fathoms. This haul yielded 8 flounders, 10 lemon-soles, 4 gurnard, 1 tarakihi, 1 barracouta, 3 king-fish, 2 ling, 6 skate, about 2 tons of red-cod, and a large number of sharks and elephant-fish.

Ninety-sixth Haul.—Put down the net for the last time to-day at 3.15 p.m., in 12 fathoms, on a soft sand bottom. Towed N.W. $\frac{3}{4}$ W. for an hour and a half, and picked up in 11 fathoms. This haul yielded 13 flounders, 2 lemon-soles, 1 gurnard, 200 red-cod, 3 skate, and a few small sharks.

Ninety-seventh Haul.—Left Timaru Harbour at 7 a.m. on the 1st May. Steamed S.E. for three-quarters of an hour, when the net was put down nearly abreast of St. Andrew's, and four miles off shore, in 10 $\frac{1}{2}$ fathoms, the lead showing a sand bottom. Towed an hour S.E. by S. $\frac{1}{2}$ S., and picked up in 12 fathoms. The fish taken were 9 flounders, 12 soles, 1 conger, 1 ling, and 250 red-cod.

Ninety-eighth Haul.—The net was shot again in 12 fathoms; time 10 a.m. Towed two and a half hours; the first half of the time the course towed was S.E. by E. $\frac{1}{4}$ E., and the second half N.E. by E. The net was taken up off a good sand bottom in 12 $\frac{1}{2}$ fathoms, and contained 12 flounders, 6 lemon-soles, 2 king-fish, 12 skate, and quite a ton of red-cod.

Ninety-ninth Haul.—The net was put down at 12.45 p.m., in 12 $\frac{1}{2}$ fathoms, on a sand bottom. Towed an hour E. by S., then altered the course to N.E. $\frac{3}{4}$ E. for another hour, and hauled up in 14 fathoms, the net containing 46 lemon-soles, 12 soles, 3 ling, 1 gurnard, quite 1 $\frac{1}{2}$ tons of red-cod, and a quantity of elephant- and dog-fish.

One-hundredth Haul.—Put down the net on a soft sand bottom, in 13 fathoms, at 3 p.m. Towed for an hour and a half due west, and hauled up in 11 fathoms, the net containing 13 flounders, 6 lemon-soles, 13 gurnard, 4 ling, 1 ton of red-cod, and a large number of elephant-fish, sharks, and dog-fish.

One-hundred-and-first Haul.—We left Timaru at 1 p.m. on the 2nd May, intending to make further tests off the Ninety-mile Beach and Banks Peninsula. A south-east storm coming on nothing could be done until we got to the north of the Peninsula on the 3rd May. The lead showing a sand bottom the net was put over in 10 fathoms at 4.30 a.m. abreast of Okain's Bay and distant 5 miles. Towed N.W. $\frac{1}{4}$ W. for two hours and a half, and picked up in 13 fathoms off soft sand. The fish taken were 18 soles, 12 flounders, 1 gurnard, 3 conger, 1 ling, 170 red-cod, 30 elephant-fish, and a number of dog-fish.

One-hundred-and-second Haul.—The net was put down again on a soft sand bottom, in 13 fathoms, at 7 a.m. Towed S.W. $\frac{1}{2}$ S. for two hours and a half, and picked up in 11 fathoms. This haul yielded 29 flounders, 19 soles, 1 ling, 7 *Macrurus australis*, 130 red-cod, and about half a ton of dog-fish.

One-hundred-and-third Haul.—The last haul before going into Lyttelton to coal was made at 10 a.m., when the net was put over in 11 fathoms on a mud bottom, and towed for three hours. The first hour and a half the course towed was N.W. $\frac{3}{4}$ N., and the last hour and a half S.W. by S. $\frac{1}{4}$ S. When picked up in 11 fathoms the net contained 6 flounders, 5 gurnard, 13 lemon-soles, a ton of red-cod, and a number of dog- and elephant-fish.

The "Doto" sailed from Lyttelton for Wellington at 7 a.m. on the 4th May, arriving there on the 5th, and was put out of commission for a week.

One-hundred-and-fourth Haul.—Resuming operations on the 14th May, we left Wellington at 10 a.m. on that day for Cloudy Bay, anchoring near White Bluff at 6 p.m. Left anchorage in Cloudy Bay at 6.50 a.m. on the 15th, steamed south to prospect from White Bluff to Clifford Bay, but a strong easterly getting up we were unable to make a haul of the net, and after testing the bottom with the lead off the Awatere and Blind Rivers returned to Cloudy Bay. The net was put down in 15 fathoms on a soft sand bottom at 8.50 a.m. Towed for one hour W.N.W., and picked up in 11 fathoms. The fish taken were 15 soles, 1 turbot, 50 large red-cod, 10 tarakihi, 1 *Macrurus australis*, 2 skate, and elephant-fish, dog-fish, and octopi.

One-hundred-and-fifth Haul.—Shot in 11 fathoms at 10.40 a.m.; bottom soft sand. Towed N.W. by W. for one hour, and hauled up off a soft bottom in 8 $\frac{1}{2}$ fathoms, the net containing 14 soles, 10 flounders, 40 red-cod, 8 tarakihi, 2 skate, and 2 *Macrurus australis*.

One-hundred-and-sixth Haul.—Put down the net again on a soft sand bottom, in 7 $\frac{1}{2}$ fathoms, at 12.5 p.m. Towed N. $\frac{1}{2}$ E. for an hour, and hauled up in 10 $\frac{1}{2}$ fathoms, the net containing 10 tarakihi, 7 soles, 13 flounders, 45 red-cod, 1 *Macrurus australis*, and a few skate, dog-fish, and elephant-fish.

One-hundred-and-seventh Haul.—After picking up at station 106 steamed into 18 fathoms abreast of Robertson Point and distant five miles, when the net was put down on a soft-sand bottom at 1.15 p.m. Towed N.N.E. for an hour and a quarter, and picked up in 30 fathoms. The fish taken were 15 tarakihi, 6 flounders, 50 large red-cod, and 2 skate.

Owing to a strong east wind with a bad sea getting up work had to be discontinued in Cloudy Bay, and we steamed out for Nelson, arriving there on the 16th.

One-hundred-and-eighth Haul.—After taking coal and water the "Doto" left Nelson at 11 a.m. on the 17th May to prospect the eastern side of Tasman Bay. The lead showing a mud bottom the net was put down for the first time five miles north of the lighthouse and two miles off shore, in 9 fathoms at 12.45 p.m. Towed N.E. $\frac{1}{2}$ N. for an hour and twenty minutes, and picked up off the same bottom in 12 $\frac{1}{2}$ fathoms. The fish taken in this haul were 5 flounders, 1 john dory, 6 lemon-soles, 200 gurnard, 2 red-cod, and several dozen oysters.

One-hundred-and-ninth Haul.—Steamed three-quarters of an hour from station 108, and shot the net off Wakapuaka Bay, in 13 fathoms, at 3 p.m.; bottom blue mud. Towed for an hour N.E. by N. $\frac{1}{4}$ N., and picked up in 14 fathoms, the net containing 36 lemon-soles, 5 flounders, 2 megrims, 2 john dory, 150 gurnard, 1 ling, 18 red-cod, and a bucketful of oysters.

One-hundred-and-tenth Haul.—The net was put down abreast of Graham Point and distant from shore three miles and a half, in 15 fathoms, on a mud bottom, at 4.25 p.m. Towed an hour and twenty minutes N. $\frac{3}{4}$ W., and picked up in 16 fathoms abreast of the Croisilles Harbour. The result of this haul was 125 gurnard, 25 lemon-soles, 4 schnapper, 1 john dory, and 2 dog-fish. Dropped anchor in the Croisilles Harbour at 7.30 p.m.

One-hundred-and-eleventh Haul.—Left anchorage in Croisilles Harbour at 5.30 a.m. The net was put down two miles to the north of Jules Island, in 20 fathoms, on a mud bottom, at 6.40 a.m. Towed N. $\frac{3}{4}$ W. across the opening of the Current Basin, and hauled up at 8 o'clock in 23 fathoms, the net containing 42 lemon-soles, 20 gurnard, 1 blue-cod, 4 dozen oysters, and a large quantity of shells.

One-hundred-and-twelfth Haul.—Steamed N. by E. five miles from station 111, and put down the net on a mud bottom, in 26 fathoms, at 9.10 a.m., the position being two miles south of Greville Harbour and distant four miles from D'Urville Island. Towed N. $\frac{3}{4}$ W. for an hour, and hauled up in 27 $\frac{1}{2}$ fathoms. This was a very poor haul, the net only bringing up a few megrims and small gurnard.

One-hundred-and-thirteenth Haul.—From station 112 we steamed N. by W. for an hour and a half, and put down the net in 36 fathoms, on a clean sand bottom, at 12 o'clock. Towed N. $\frac{1}{4}$ W. for forty minutes, and hauled up in 37 fathoms, the net coming up clean, free from weeds, and only containing 18 lemon-soles and 4 megrims.

One-hundred-and-fourteenth Haul.—After picking up at station 113 steamed W. by S. for two hours and a half. The net was put down in 27 fathoms, on a clean sand bottom, at 3.20 p.m., and towed for an hour E.S.E. When hauled up in 28 fathoms the net only contained a few shells. Soundings with the lead between stations 113 and 114 showed a clean sand bottom all the way.

One-hundred-and-fifteenth Haul.—A short distance from station 114 the dredge was put down and towed a few minutes; when hauled up it was full of sticky blue mud. Steamed E.S.E. ten miles, and put down the net in 33 fathoms, on a mud bottom, at 5 p.m. Towed S.E. by E. $\frac{1}{2}$ E. for forty-five minutes, and hauled up in 34 fathoms, the net bringing up 13 lemon-soles, 2 blue-cod, 4 tarakihi, a few oysters, and a quantity of coral and shells.

One-hundred-and-sixteenth Haul.—Altered the course from station 115 to S.W., and steamed ten miles. The net was put over in 27 fathoms, on a mud bottom, at 7.5 p.m., and towed S.W. by S. for three-quarters of an hour. When taken up in 26 fathoms it only contained 21 tarakihi and 3 megrims, and free from weed and shells.

One-hundred-and-seventeenth Haul.—From station 116 the course was altered to S.E. Steamed an hour, and put down the net at 8.45 p.m., in 26 fathoms, on mud. Towed S.E. $\frac{1}{4}$ E. for two hours, and hauled up in 26 fathoms, off mud. The fish taken in this haul were 11 schnapper, 1 groper, 5 lemon-soles, and 1 megrim.

One-hundred-and-eighteenth Haul.—Changed the course again to S.W., and steamed an hour and twenty minutes, when the net was put down in 20 fathoms, on mud, at 12.10 a.m. Towed for two hours S.E. $\frac{1}{2}$ E., and hauled up in 16 fathoms, the result being 9 schnapper, 23 john dory, 31 soles, 18 flounders, 125 gurnard, 1 megrim, and 50 red-cod.

One-hundred-and-nineteenth Haul.—Shot again in 16 fathoms, on mud, at 2.30 a.m. Towed S.W. $\frac{1}{4}$ W. for two hours, and picked up in 11 $\frac{1}{2}$ fathoms. The result of this haul proved satisfactory both as regards variety and quantity of fish, giving the following numbers: 16 soles, 12 flounders, 4 hake, 26 john dory, 23 red-cod, 9 schnapper, 113 gurnard, 2 dozen oysters, and a number of sting-rays, dog-fish, and octopi.

One-hundred-and-twentieth Haul.—The net was put over for another haul in 11 fathoms, on mud bottom, at 4.55 a.m. Another two-hour haul was made, towing S.E. $\frac{3}{4}$ S., and picked up in 7 fathoms at 6.55 a.m. The fish taken were 14 hake, 4 john dory, 26 flounders, 6 soles, 7 schnapper, 107 gurnard, 12 red-cod, and 3 dozen oysters, besides a quantity of shells.

One-hundred-and-twenty-first Haul.—The net was put over for the last haul before returning to port at 7.15 a.m., in 7 fathoms, on mud, and towed W. by N. $\frac{3}{4}$ N. for an hour and three-quarters. The net was hauled up in 7 $\frac{1}{2}$ fathoms, and contained 3 hake, 300 gurnard, 10 soles, 3 flounders, 4 john dory, 3 schnapper, 6 red-cod, 4 $\frac{1}{2}$ dozen oysters, and shells and weeds.

One-hundred-and-twenty-second Haul.—North-east storm on the 20th and 21st May, with heavy sea, in Tasman Bay. We left Port Nelson at 1 a.m. on the 22nd to prospect off Farewell Spit and in Golden Bay. Soundings to the south of Farewell Spit showed the bottom to be soft sand and mud. The net was put down in 13 fathoms on mud, well up to the end of the spit. Towed about W. by S. for two hours, and hauled up in 14 fathoms. When landed on deck the net was half-full of sea-wrack, but with very few fish. 26 lemon-soles, 2 megrims, 2 schnapper, 2 gurnard, and 12 tarakihi were all that could be found amongst the mass of weed.

One-hundred-and-twenty-third Haul.—After picking up at station 122 steamed west for half an hour, and put down the net in 17 fathoms on mud. Towed W. by N. $\frac{1}{4}$ N. for forty minutes, and hauled up in 5 $\frac{1}{2}$ fathoms. The net again contained a large quantity of sea-wrack, from which we sorted out 35 lemon-soles, 5 megrims, 10 gurnard, and 2 red-cod.

One-hundred-and-twenty-fourth Haul.—Steamed half an hour after picking up the net at

station 123, and put down the net in 13 fathoms on a mud bottom. Towed for an hour and ten minutes, and picked up in 11 fathoms. The fish taken in this haul were 14 gurnard, 5 schnapper, 1 ling, 1 john dory, 2 blue-cod, 14 lemon-soles, 5 megrims, 7 flounders, 45 red-cod, and a few dog-fish. The net again brought up a large quantity of sea-wrack. The small dredge was put down at this station, towed for a short distance, and brought up full of blue mud.

One-hundred-and-twenty-fifth Haul.—The net was put down about the centre of Golden Bay abreast of Collingwood, in 10 fathoms, on mud, at 11.50 a.m. Towed N.W. by N. $\frac{1}{2}$ N. an hour, and ten minutes, and hauled up in 7 fathoms, containing 90 gurnard, 5 schnapper, 30 red-cod, 18 flounders, 16 lemon-soles, 6 megrims, and half a sack of oysters.

One-hundred-and-twenty-sixth Haul.—Shot the net again in Golden Bay, abreast of Tukurua Point, three miles off shore, in 8 fathoms, on mud, at 1.30 p.m. Towed S.E. by E. $\frac{3}{4}$ E. an hour and forty minutes, and hauled up in 10 fathoms. The fish taken were 9 lemon-soles, 39 flounders, 18 megrims, 1 king-fish, 10 red-cod, 1 schnapper, 150 gurnard, 4 dozen oysters, and a few skate and dog-fish.

One-hundred-and-twenty-seventh Haul.—A north-easterly wind, with a choppy sea, putting a stop to further work in Golden Bay, it was decided to return to the south end of Tasman Bay. The net was put over in Tasman Bay in 14 fathoms, four miles off Adele Island, at 10.20 p.m., on a mud bottom. Towed for two hours S.S.E., and hauled up in 15 fathoms, the net containing 30 flounders, 2 schnapper, 10 lemon-soles, and 15 gurnard. The weather continuing unfavourable we returned to port at 2.30 a.m.

One-hundred-and-twenty-eighth Haul.—Left Nelson Harbour again at 4 a.m. on the 24th May. The net was put down for the first haul off the White Cliffs, in 6 fathoms, on mud, at 5.30 a.m. Towed an hour N. by W. $\frac{1}{4}$ W., and hauled in 7 fathoms. Result: 5 flounders and 6 red-cod.

One-hundred-and-twenty-ninth Haul.—From picking up at station 128 steamed four miles N. by E., and shot in 11 $\frac{1}{2}$ fathoms at 7.15 a.m., towing S.E. by E. $\frac{3}{4}$ E. for an hour and three-quarters. When hauled up in 15 fathoms the net contained 103 hake, 8 john dory, 33 schnapper, 177 flounders, 18 lemon-soles, 300 gurnard, 20 red-cod, 2 sting-rays, dog-fish, octopus, and half a sack of oysters.

One-hundred-and-thirtieth haul.—Shot again in 16 fathoms, on mud, at 9.35 a.m. Towed two hours N.W. by N. $\frac{1}{2}$ N., and hauled up in 16 fathoms, the net coming up empty, having got twisted in shooting.

One-hundred-and-thirty-first Haul.—Steamed east four miles from where we picked up at station 130, and put down the net in 17 fathoms, at 11.40 a.m., on mud. Towed an hour, and hauled up in 18 fathoms, the net containing 35 schnapper, 12 hake, 12 lemon-soles, 8 john dory, 250 gurnard, 95 flounders, 30 red-cod, and half a sack of oysters.

One-hundred-and-thirty-second Haul.—The last haul of the net was made to-day at 1.20 p.m., when the net was put down in 16 fathoms on mud bottom. When hauled up at 3 o'clock the net contained 55 hake, 23 schnapper, 30 red-cod, 2 john dory, 150 gurnard, 107 flounders, 13 soles, and a sack of oysters.

One-hundred-and-thirty-third Haul.—After the vessel had taken coal and water, we left Port Nelson at 9.45 a.m. on the 25th May, intending to work off the west coast of Tasman and part of Golden Bay. The first haul was made off Greenwood Point in 8 $\frac{1}{2}$ fathoms. The net was put over at 11.20 a.m. on mud, and towed N.W. by N. $\frac{3}{4}$ N. for an hour. When taken up in 9 fathoms it contained 43 flounders, 5 soles, 50 gurnard, 3 schnapper, 15 red-cod, and half a sack of oysters and large mussels.

One-hundred-and-thirty-fourth Haul.—The next haul was made two miles off Adele Island. The net was put down in 11 $\frac{1}{2}$ fathoms, at 1.5 p.m., on the same mud bottom found all over this bay. Towed N. $\frac{3}{4}$ N. for an hour and five minutes, and hauled up in 11 fathoms. The result of this haul was 77 gurnard, 8 schnapper, 7 hake, 50 flounders, 18 soles, quite half a sack of oysters, and a similar quantity of mussels. After picking up steamed into Golden Bay, and anchored at 6 p.m.

One-hundred-and-thirty-fifth Haul.—Left anchorage in Golden Bay at 6 a.m. on 26th May. The net was put down three miles off Waitapu, in 9 fathoms, at 6.45 a.m., on mud. Towed an hour N.E. by N. $\frac{1}{4}$ N., and picked up in 11 fathoms. The fish taken were 131 gurnard, 58 red-cod, 30 flounders, 2 sea-perch, 20 lemon-soles, 10 blue-cod, 5 schnapper, 1 megrim, 4 skate, 2 tiger-sharks, a few dog-fish, and three dozen oysters.

One-hundred-and-thirty-sixth Haul.—The next haul was made off Separation Point. The net was put down in 17 fathoms, on mud, at 8.25 a.m. Towed an hour and five minutes, and hauled up in 19 fathoms. The net brought up a large quantity of coral and mud, and the following variety of fish: viz., 32 blue-cod, 15 red-cod, 2 moki, 23 sea-perch, 3 schnapper, 19 tarakihi, 19 soles, 15 flounders, 36 gurnard, 1 megrim, and a few dozen oysters.

One-hundred-and-thirty-seventh Haul.—Steamed inshore and shot the net in 15 fathoms, and towed across the opening of Awaroa Bay. The net was put down at 10.20 a.m., towed S.E. for an hour and ten minutes, and picked up in 12 fathoms, containing 21 flounders, 11 soles, 9 megrims, 1 schnapper, 9 tarakihi, 4 blue-cod, 31 gurnard, and six dozen oysters.

One-hundred-and-thirty-eighth Haul.—The last haul was made in Tasman Bay in 20 fathoms, eight miles off Tonga Island. The net was put over at 12.50 p.m., towed for an hour and ten minutes S.E. by E. $\frac{1}{2}$ E., and picked up in 24 fathoms. The result of this haul was 29 lemon-soles, 11 flounders, 29 blue-cod, 11 gurnard, 3 schnapper, 23 tarakihi, and five dozen oysters.

We left Nelson at 10 p.m. on the 28th May for Wanganui, *via* Admiralty and Guard's Bays, but owing to bad weather we had to leave out those bays and go on to Port Hardy Inlet for shelter.

One-hundred-and-thirty-ninth Haul.—In the shelter of Port Hardy Inlet the net was put down in 13 fathoms, on a mud bottom, at 10.30 a.m., on the 29th May. Towed for thirty-five minutes, and hauled up in 17 fathoms, the net containing 6 lemon-soles, 20 blue-cod, 10 gurnard, and 6 horse mackerel.

One-hundred-and-fortieth Haul.—Sheltering in Port Hardy Inlet until the 30th. On that date we left the anchorage at 2.30 p.m. to cross to Wanganui. Tested the bottom at various depths on the way across, but the swell was too heavy to allow the net to be put down until well across. Twelve miles south of Wanganui the net was put down in 17 fathoms, on a fine gravel bottom, at 5 a.m., on the 31st May. Towed N.E. by E. $\frac{3}{4}$ E. for an hour and a half. When taken up the net contained 1 john dory, 1 schnapper, 2 gurnard, 15 soles, and 10 tarakihi, and a quantity of old oyster-shells and sponges.

One-hundred-and-forty-first Haul.—Steamed a short distance, and put down the net in 16 fathoms on a somewhat rough bottom, the lead bringing up sand and fine gravel. Towed two hours and a half N.N.W., and picked up in 11 fathoms, close up to the mouth of Wanganui River, off a gravel bottom. The fish taken in this haul were 16 tarakihi, 2 soles, 2 lemon-soles, 1 gurnard, 1 schnapper, 1 red-cod, and 1 john dory. Went in to Wanganui for coal.

One-hundred-and-forty-second Haul.—Stormy weather prevented us getting out from Wanganui until the 4th June. On that date we left the wharf at 1 a.m., and after crossing the bar steamed W.S.W. for an hour. Soundings showed a rough bottom for some distance, but getting on to coarse sand in 12 fathoms the net was put down at 3 a.m. Towed fifteen minutes, when the net got fast, and was hauled up badly torn, and with several pieces of rock in the cod-end.

One-hundred-and-forty-third Haul.—After taking up the damaged net at station 142 steamed W. by S. for half an hour into 14 fathoms, the lead showing a coarse sand bottom for some distance. The net was put down at 3.45 a.m. Towed for two hours, and picked up off coarse sand in 16 $\frac{1}{2}$ fathoms. The fish taken were 18 lemon-soles, 17 tarakihi, 6 gurnard, 1 blue-cod, 1 john dory, 1 sea-perch, and one schnapper.

One-hundred-and-forty-fourth Haul.—Steamed three-quarters of an hour from station 143, and put over the net in 13 $\frac{1}{2}$ fathoms, at 6.30 a.m., on coarse sand. Towed W. by N. $\frac{3}{4}$ N. for an hour, and picked up in 13 $\frac{1}{2}$ fathoms. The result of this haul was very poor, only giving 3 tarakihi, 2 gurnard, and 2 john dory.

One-hundred-and-forty-fifth Haul.—From station 144 steamed into 7 fathoms, and put down the net at 8.30 a.m. on coarse sand. Towed a few minutes, when the net came fast, and was hauled up considerably damaged.

One-hundred-and-forty-sixth Haul.—Steamed five miles, and after net and gear were repaired the net was put down once more. Soundings showing coarse sand we shot in 10 fathoms, and towed W. by S. $\frac{3}{4}$ S. for half an hour, when the net again came fast, and was hauled up badly torn. A strong easterly breeze, with a nasty sea, getting up further trawling was out of the question on such a rough bottom. I decided to test the bottom by running a line of soundings from abreast of Patea, ten miles off shore, to fifteen miles off shore and abreast of Wanganui. Returned to Wanganui at 2.30 a.m. on the 5th.

One-hundred-and-forty-seventh Haul.—Left Wanganui at 3 a.m. on the 6th June, steamed down the coast ten miles. The lead showing a sand bottom the net was put over in 17 fathoms, four miles off shore, at 5.40 a.m. Towed S.E. by S. $\frac{1}{4}$ S. for an hour and three-quarters, and hauled up in 15 fathoms. A good even sand bottom was found all the distance towed, yet the quantity of fish taken was very poor, the net only bringing up 17 lemon-soles, 4 gurnard, 1 john dory, and a small tiger-shark.

One-hundred-and-forty-eighth Haul.—After picking up at station 147 steamed east into 11 fathoms, and put down the net at 9.15 a.m. on fine sand. Towed S.S.W. for an hour and ten minutes, and picked up in 12 fathoms. This haul was also a very poor one, the net coming up free from weeds, and only containing 5 lemon-soles and 12 gurnard.

One-hundred-and-forty-ninth Haul.—The next haul was made off the Rangitikei River. The net was put down in 8 fathoms, on soft sand, in muddy water (the river evidently being in flood). Towed S.S.E. for an hour and a quarter, and picked up in 9 fathoms; bottom soft sand. This haul was also a poor one, only giving 15 gurnard and 2 soles.

One-hundred-and-fiftieth Haul.—Continuing down the coast, the next haul was made off the Manawatu River. The net was put down in 6 fathoms, bottom soft sand, at 1.35 p.m. Towed S. $\frac{1}{4}$ E. across the opening of the river for an hour and twenty minutes, and hauled up in 8 fathoms, containing 15 gurnard, 1 schnapper, 2 flounders, 6 soles, 12 small tiger-sharks, and a few elephant-fish.

One-hundred-and-fifty-first Haul.—After picking up at station 150 went closer in shore, and put down the net in 12 fathoms on soft sand at 3.15 p.m. Towed S.W. an hour and a quarter, and hauled up in 13 fathoms. The net came up clean and containing only 12 soles and 1 gurnard.

One-hundred-and-fifty-second Haul.—Went out into deeper water to see if better results could be obtained. The net was put over in 42 fathoms, on mud, at 4.30 p.m., and hauled up after towing an hour in 41 fathoms. The result of this haul was not any more satisfactory than what was obtained in shallower water coming down the coast. When taken up the net only contained 10 tarakihi, 2 lemon-soles, 2 megrims, and 4 gurnard. Anchored for the night off the Ohau River.

One-hundred-and-fifty-third Haul.—Left the anchorage at 6 a.m. on the 7th June. Steamed down the coast four miles, and put over the net on a fine sand bottom, in 5 fathoms, at 6.45 a.m. Towed S. by W. $\frac{3}{4}$ W. across off the mouth of the Otaki River for an hour and a half, and hauled up in 11 $\frac{1}{2}$ fathoms. This haul proved a blank, as the net came up clean with neither fish nor weeds.

One-hundred-and-fifty-fourth Haul.—This was the last haul made. The net was put over in 12 fathoms, at 10 a.m., on soft sand, between Kapiti Island and the mainland. Towed S.W. by S. $\frac{1}{2}$ S. for an hour and five minutes, and hauled up in 18 fathoms off fine sand. This was also a poor haul, the net only bringing up 11 lemon-soles and 1 skate. After testing the bottom off Kapiti we left for Wellington, arriving there at 10.30 a.m.

A LIST OF THE FISH TAKEN AND STATIONS WHERE THEY WERE OBTAINED.

- COMMON FLOUNDER (*Rhombosolea monopus*).—Taken at stations 1, 4, 5, 6, 7, 8, 9, 13, 14, 15, 16, 17, 18, 19, 21, 22, 23, 24, 25, 26, 27, 31, 33, 34, 35, 37, 46, 52, 63, 65, 66, 67, 73, 74, 75, 81, 82, 84, 85, 86, 87, 88, 89, 91, 92, 95, 96, 97, 98, 100, 101, 102, 103, 105, 106, 107, 108, 109, 118, 119, 120, 124, 125, 126, 127, 128, 129, 131, 132, 133, 134, 135, 136, 137, 138, 150.
- YELLOW-BELLIED FLOUNDER (*Rhombosolea leporina*).—Taken at stations 1, 6, 7, 8, 14, 15, 19, 22, 26, 63, 65, 88, 89, 105, 107, 109, 118, 120, 121, 124, 125, 126, 127, 129, 131, 132, 133, 136.
- BRILL, OR TURBOT (*Ammotretis guntheri*).—Taken at stations 1, 8, 13, 19, 27, 52, 71, 86, 87, 88, 89, 104.
- SOLE (*Peltorhamphus novæ-zealandiæ*).—Taken at stations 1, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 21, 22, 23, 24, 26, 27, 31, 33, 34, 35, 37, 38, 39, 41, 46, 52, 56, 59, 62, 63, 65, 66, 67, 68, 71, 74, 75, 80, 81, 84, 85, 86, 87, 88, 89, 90, 91, 92, 97, 99, 101, 102, 104, 105, 106, 118, 119, 120, 121, 129, 132, 133, 134, 136, 137, 140, 141, 150, 151.
- LEMON-SOLE (*Ammotretis rostratus*).—Taken at stations 1, 4, 5, 6, 18, 28, 30, 32, 40, 44, 52, 53, 55, 56, 57, 59, 60, 62, 63, 65, 66, 67, 74, 76, 82, 83, 90, 91, 93, 94, 95, 96, 98, 99, 100, 103, 108, 109, 110, 111, 113, 115, 117, 122, 123, 124, 125, 126, 127, 129, 131, 132, 135, 138, 139, 141, 143, 147, 148, 152, 154.
- MEGRIM (*Ammotretis*, sp. ind.).—Taken at stations 4, 18, 28, 29, 30, 32, 45, 47, 50, 51, 55, 57, 74, 76, 77, 79, 80, 93, 94, 109, 112, 113, 116, 117, 118, 122, 123, 124, 125, 126, 135, 136, 137, and 152. This fish was found at any depth, but generally present in the deepest water tested, and then frequently found in considerable numbers when no other flat-fish were taken. The largest specimen taken measured 12½ in. These fish are peculiarly transparent, flesh white, and full of fine bones.
- HAKE (*Lotella rhacinus*).—Taken at stations 119, 120, 121, 129, 131, 132, and 134.
- RED-COD (*Lotella bacchus*).—Taken at stations 1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 26, 27, 31, 33, 34, 35, 37, 38, 39, 41, 42, 43, 46, 55, 56, 62, 63, 65, 66, 67, 68, 71, 73, 74, 75, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 118, 119, 121, 122, 124, 125, 126, 128, 129, 131, 132, 133, 135, 136, 141.
- BLUE-COD (*Percis colias*).—Taken at stations 47, 76, 111, 115, 124, 135, 136, 137, 138, 139, and 143.
- JOHN DORY. (*Zeus faber*).—Taken at stations 108, 109, 110, 118, 119, 120, 121, 124, 129, 131, 132, 140, 141, 143, 144, 147.
- HORSE-MACKEREL (*Trachurus trachurus*).—Taken at stations 18 and 139.
- KING-FISH (*Seriola lalandii*).—Taken at stations 60, 94, 95, 98, and 126.
- BARRACOUTA (*Thyrssites atun*).—Taken at stations 28, 32, 59, 95.
- MOKI (*Latris ciliaris*).—Taken at stations 39, 47, 136, 142.
- TARAKIHI (*Chilodactylus macropterus*).—Taken at stations 4, 28, 29, 30, 45, 47, 51, 60, 79, 80, 81, 82, 91, 93, 94, 95, 104, 105, 106, 107, 115, 116, 122, 136, 137, 138, 140, 141, 143, 144, 152.
- RED GURNARD (*Trigla kumu*).—Taken at stations 17, 18, 23, 24, 29, 32, 33, 40, 42, 43, 55, 60, 62, 74, 75, 84, 85, 88, 93, 94, 95, 96, 99, 100, 101, 103, 108, 109, 110, 111, 112, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 129, 131, 132, 133, 134, 135, 136, 138, 139, 140, 141, 143, 144, 147, 148, 149, 150, 151, 152.
- LING (*Genypterus blacodes*).—Taken at stations 1, 4, 7, 8, 12, 15, 16, 23, 26, 27, 33, 38, 47, 48, 56, 57, 59, 60, 62, 66, 67, 74, 75, 76, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 92, 93, 94, 97, 99, 100, 101, 102, 109, 124.
- MACRURUS AUSTRALIS.—Taken at stations 1, 2, 4, 6, 7, 13, 14, 15, 16, 26, 35, 53, 102, 104, 105, 106.
- CONGER-EEL (*Conger vulgaris*).—Taken at stations 5, 6, 8, 17, 39, 42, 97, 101.
- GROPER, OR HAPUKU (*Oligorus gigas*).—Taken at stations 6, 26, 43, 117.
- SCHNAPPER (*Pagrus unicolor*).—Taken at stations 1, 110, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 129, 131, 132, 133, 134, 135, 136, 137, 138, 140, 141, 143, 150.
- SKATE (*Raja nasuta*).—Taken at stations 2, 6, 8, 9, 12, 13, 14, 15, 16, 18, 19, 20, 22, 23, 28, 34, 35, 37, 38, 40, 41, 48, 52, 53, 55, 62, 63, 75, 86, 87, 89, 93, 94, 95, 96, 98, 99, 100, 104, 105, 106, 107, 126, 129, 135, 154.
- SEA-PERCH (*Sebastes percoides*).—Taken at stations 54, 55, 76, 77, 135, 136, 143.
- CRAYFISH.—Taken at stations 2, 71.
- ELECTRIC RAY (*Torpedo Fairchildii*).—Taken at stations 6, 35, 119, 129.
- WHIP RAY (*Myliobatis aquila*).—Taken at stations 119, 129.
- TIGER-SHARK (*Lamna glauca*).—Taken at stations 10, 31, 50, 60, 65, 88, 94, 95, 96, 99, 100, 124, 135, 147, 150.
- DOG-FISH (*Scyllium laticeps*).—Taken at stations 1, 6, 10, 11, 12, 19, 22, 23, 30, 37, 38, 52, 60, 75, 84, 86, 87, 88, 89, 92, 93, 94, 99, 100, 101, 102, 103, 106, 110, 124, 126, 129, 135.
- CAT-FISH (*Anema monoptyerygium*).—Taken at stations 81, 82, 83.
- ELEPHANT-FISH (*Callorhynchus antarcticus*).—Taken at stations 1, 4, 6, 10, 11, 12, 23, 24, 37, 41, 55, 60, 63, 65, 75, 84, 85, 86, 87, 88, 89, 92, 93, 95, 99, 101, 103, 104, 106, 150.
- LEATHER-JACKET (*Monacanthus convexirostris*).—Taken at stations 123, 125, 133, 136, 137.
- PORCUPINE-FISH (*Chilomycterus jaculiferus*).—Taken at station 147.
- OCTOPUS.—Taken at stations 15, 19, 24, 38, 40, 42, 60, 104, 119, 129.
- OYSTERS.—Taken at stations 29, 30, 108, 109, 111, 115, 119, 120, 121, 125, 126, 129, 131, 132, 133, 134, 135, 136, 137, 138.
- MUSSELS.—Taken at stations 133, 134.

PARTICULARS OF HAULS.

Date.	Hour.	Locality.	Direction trawled.	Distance from Shore in Miles.	Depth in Fathoms.	Nature of Bottom.
10 March, 1900	4.20 p.m. to 7.20 p.m.	Off Waimakariri River	S. E. $\frac{1}{2}$ S.	3	8 to 12	Soft sand.
"	10 a.m. to noon	Eight miles from Motonau Island	N. $\frac{1}{2}$ E.	8	21 to 22	Sand, mud, and stone.
"	12.45 p.m. to 2.45 p.m.	Six miles east of preceding haul	S. E. by E.	"	24 $\frac{1}{2}$ to 25	Sand.
"	3 p.m. to 4 p.m.	Continuation of preceding haul	S. E. by E.	"	25 $\frac{1}{2}$ to 22	Soft sand.
"	6 p.m. to 8.30 p.m.	Double Corner off Waipara River	S. $\frac{1}{2}$ W.	2	9 to 8	Mud and sand.
"	9 p.m. to midnight	Continuation of preceding haul	S.	"	9 to 7	"
"	12.15 a.m. to 3.30 a.m.	"	S. E. $\frac{1}{2}$ E.	"	7 to 8	Soft sand.
"	4 a.m. to 6.45 a.m.	Pegasus Bay	E. by N.	"	8 to 12	"
"	7.30 a.m. to 9.30 a.m.	"	E. by N. $\frac{1}{2}$ N.	"	8 to 12	Sand.
"	11.20 a.m. to 12.30 p.m.	Off Long Lookout Point	E. $\frac{1}{2}$ N.	3	12 to 13	"
"	1.20 p.m. to 3 p.m.	From East Head to Pah Point	W. southerly	7	9 to 11	"
"	4.10 p.m. to 5.10 p.m.	Off Decanter Bay	W. $\frac{1}{2}$ S.	3	27 to 10	"
"	4.30 p.m. to 7.30 p.m.	Off coast from Sumner to Waimakariri	N. W. by N. $\frac{1}{2}$ N.	11 $\frac{1}{2}$	11 $\frac{1}{2}$	Soft sand and mud.
"	7.45 p.m. to 10.45 p.m.	Off Waimakariri	N. E. $\frac{1}{2}$ N. and E. by S. $\frac{1}{2}$ S.	"	6 to 11	Sand and mud.
"	11 p.m. to 1.30 a.m.	Continuation of preceding haul	N. $\frac{1}{2}$ E. and S. E. by E. $\frac{1}{2}$ S.	"	11	"
"	2 a.m. to 4 a.m.	"	S. E. by S. $\frac{1}{2}$ S.	"	12	"
"	9.35 a.m. to 11.5 a.m.	Off Lake Ellesmere	S. W. $\frac{1}{2}$ W.	"	10	"
"	12.30 p.m. to 2 p.m.	South of Lake Ellesmere	S. W. $\frac{1}{2}$ S.	"	20 to 23	Clean sand.
"	3.30 p.m. to 4.40 p.m.	Off Rakaia River	S. W. $\frac{1}{2}$ S.	"	7 to 10	Sand.
"	6.5 p.m. to 6.20 p.m.	South of Rakaia	S. W. $\frac{1}{2}$ S.	"	13 to 14	Sand and stone.
"	7.25 p.m. to 8.55 p.m.	Between Rakaia and Ashburton River	S. W. $\frac{1}{2}$ S.	1 $\frac{1}{2}$	7	Sand and gravel.
"	9.35 p.m. to midnight	North of Ashburton River	S. W. by S. $\frac{1}{2}$ S.	"	5 $\frac{1}{2}$ to 7	Soft sand and mud.
"	12.55 a.m. to 3.15 a.m.	Continuation of preceding haul	S. W. $\frac{1}{2}$ S.	"	7 to 8	Sand.
"	3.40 a.m. to 6 a.m.	"	S. W. $\frac{1}{2}$ S.	"	8 to 9	"
"	8 a.m. to 10 a.m.	Sixteen miles east of Patiti Point	S. W. $\frac{1}{2}$ S.	"	28 to 24	Sand and shell.
"	12.20 p.m. to 1.40 p.m.	Four miles south of Rangitata River	S. by W. $\frac{1}{2}$ W.	"	4 to 6	Coarse sand and gravel.
"	2.30 p.m. to 3.45 p.m.	South of Opihi River	S.	"	4 $\frac{1}{2}$	"
"	7.50 a.m. to 10.20 a.m.	Off Timaru	E. by S. $\frac{1}{2}$ S.	7	10 to 13	Soft sand.
"	12.30 p.m. to 2.5 p.m.	Twenty-five miles east of Pareora River	E. S. E.	"	25 to 50	Sand and shell.
"	2.45 p.m. to 4.15 p.m.	Twenty-two miles east of Makikihi River	S. W. by W. $\frac{1}{2}$ W.	"	43 to 27	Mud.
"	9 a.m. to 10.30 a.m.	South of Timaru	N. $\frac{1}{2}$ N.	"	10 to 8	Sand.
"	6 a.m. to 7.15 a.m.	North-east of Timaru	N. W. $\frac{1}{2}$ N.	"	11 to 14	"
"	8.20 a.m. to 9.20 a.m.	Three miles east of Rangitata River	N. W. $\frac{1}{2}$ N.	3 to 6	5	"
"	10.40 a.m. to 11.40 a.m.	Continuation of preceding haul	S. W. $\frac{1}{2}$ W.	8	5	Soft sand.
"	12.30 p.m. to 1.20 p.m.	Across mouth of Rangitata River	S. by W. $\frac{1}{2}$ W.	"	9	Sand.
"	2.25 p.m. to 3.10 p.m.	Off Orari River	S. W. $\frac{1}{2}$ W.	2	8	Fine sand.
"	8 a.m. to 9 a.m.	Off Otaio River	S. by W. $\frac{1}{2}$ W.	"	5 $\frac{1}{2}$	"
"	9.40 a.m. to 10.40 a.m.	East of Makikihi River	S. $\frac{1}{2}$ E.	2 $\frac{1}{2}$	9	"
"	11.35 a.m. to 12.35 a.m.	Off Waibao River	N. W. $\frac{1}{2}$ W.	2	8	"
"	3 p.m. to 4 p.m.	"	N. W. $\frac{1}{2}$ W.	8	18	"
"	7.35 a.m. to 8.35 a.m.	Off Washdyke Lagoon	N. E. by N. $\frac{1}{2}$ N.	"	6 $\frac{1}{2}$	Soft sand.
"	9.30 a.m. to 10.30 a.m.	Three miles and a half south of Opihi River	N. E. by N. $\frac{1}{2}$ N.	"	6 $\frac{1}{2}$	Gravel.
"	11 a.m. to 12.30 p.m.	North of Timaru	S. E. by S. $\frac{1}{2}$ S. and W. by S. $\frac{1}{2}$ S.	"	10	Sand.
"	10 a.m. to 10.45 a.m.	Thirteen miles E. S. E. of Waibao River	E. by S. $\frac{1}{2}$ S.	10	18 to 20	Sand and shell
"	2.10 p.m. to 2.40 p.m.	South of Waitaki River	E. $\frac{1}{2}$ S.	"	23 to 27	"
"	8.20 a.m. to 9.5 a.m.	At mouth of Waitaki River	N. by E.	"	4	Sand and gravel.
"	10.40 a.m. to 11.25 a.m.	S. E. of Cape Wainbow	S. E. $\frac{1}{2}$ S.	4 $\frac{1}{2}$	10 to 12	Sand and shell.
"	1 p.m. to 2 p.m.	Eight miles east of Lookout Bluff	S. E. $\frac{1}{2}$ E.	"	14 to 15	Sand.
"	3.15 p.m. to 4.15 p.m.	Off Kakanui River	N. W.	4 $\frac{1}{2}$	10	"
"	8.45 a.m. to 10.25 a.m.	Off Oamaru	E. by S.	"	28 to 33	Sand and shell.
"	10.40 a.m.	Continuation of preceding haul	S. by E. $\frac{1}{2}$ E.	"	35 to 46	Sand and shell, and sand and mud.

PARTICULARS OF HAULS—continued.

Hauls	Date.	Hour.	Locality.	Direction trawled.	Distance from Shore in Miles.	Depth in Fathoms.	Nature of Bottom.
52	3 April, 1900	10 a.m. to 10.40 a.m.	Off All Day's Bay	N. $\frac{3}{4}$ W.	4 $\frac{1}{2}$	5 to 3	Sand and stone.
53	"	11.30 a.m. to 12.30 p.m.	Four miles and a half east of Lookout Bluff	S. $\frac{1}{4}$ W.	..	13 to 12	Coarse sand.
54	"	8.15 a.m. to 8.45 a.m.	Off Moeraki Heads	..	..	13	Sand and shell.
55	"	1.50 p.m. to 2.50 p.m.	Abreast of Ahuriri Rock	S. $\frac{3}{4}$ W.	..	13	Sand.
56	"	10.25 a.m. to 11 a.m.	East of Taiaroa Head	E.	..	12 to 16	Soft sand.
57	"	$\frac{1}{2}$ hour	"	N.	..	35 to 31	Sand and shell.
58	"	1.25 p.m. to 2.25 p.m.	North-east of Taiaroa Head	N. W. by N. $\frac{1}{4}$ N.	..	48 to 41	Soft sand.
59	"	4.5 p.m. to 4.35 p.m.	Two miles and a half north of Taiaroa Head	S. W. $\frac{1}{2}$ S.	..	14 to 12	Sand.
60	"	9.5 a.m. to 10.20 a.m.	N. N. E. of Taiaroa Head	N. $\frac{1}{2}$ E.	..	18 to 20	Sand.
61	"	12.25 p.m. to 12.45 p.m.	Kartiki Bay	N.	..	6	Sand and rock.
62	"	3.25 p.m. to 5.25 p.m.	Off Teeth Rocks	S. E. $\frac{1}{2}$ S.	..	12 to 13	Sand.
63	"	7.40 a.m. to 8.10 a.m.	Blueskin Bay and Purakanui Inlet	N. E. by N. $\frac{1}{2}$ N.	..	11	Sand.
64	"	8.30 a.m. to 9.50 a.m.	Blueskin Bay	Round Bay	..	7 to 6	Sand.
65	"	2.35 p.m. to 3.5 p.m.	Wickliffe Bay	In Blueskin Bay	..	9	Soft sand.
66	"	1 hour 20 minutes	Off Heyward Point	..	..	12	Sand.
67	"	5 p.m. to 6.30 p.m.	Blueskin Bay	..	..	15	Sand.
68	"	20 minutes	Six miles north of Taiari River	..	..	11	Rocks.
69	"	12.30 p.m.	South of Taiari Island	..	..	..	Soft sand.
70	"	4.30 p.m. to 6 p.m.	Off Coal Point	S. $\frac{1}{2}$ E.	..	9	Soft sand.
71	"	..	Between Waipapapa Point and Dog Island	..	..	7	Rock.
72	"	..	Toitoti Bay	..	..	6	Sand.
73	"	9.50 a.m.	"	..	..	6 to 5	Fine sand.
74	"	10.25 a.m. to 11.55 a.m.	Toitoti Bay, close in to mouth of Mataura River	..	..	7	Sand.
75	"	12.20 p.m. to 1.20 p.m.	Abreast of Murray Bay, Stewart Island	..	..	8 to 9	Sand and rock.
76	"	11.10 a.m. to 11.40 a.m.	Port William, Stewart Island	..	..	3 $\frac{1}{2}$ to 5	Soft sand.
77	"	$\frac{3}{4}$ hour	Pateron's Inlet, off Abraham Bay, Stewart Island	..	..	4 $\frac{1}{2}$	Sand and rock.
78	"	20 minutes	Off "The Neck," Stewart Island	S.	..	17	Sand and mud.
79	"	$\frac{1}{2}$ hour	Pegasus Inlet, Stewart Island	..	..	19	Sand.
80	"	25 minutes	Mason Bay, Stewart Island	..	..	9	Soft sand.
81	"	5.55 a.m. to 6.25 a.m.	Continuation of preceding haul	..	..	10	Fine sand.
82	"	$\frac{3}{4}$ hour	Off Pahia Point	N. W. $\frac{3}{4}$ N.	..	25 to 23	Soft sand.
83	"	1 $\frac{1}{4}$ hours	Tewaeae Bay	E. S. E.	..	8 to 7	Soft sand.
84	"	3.30 p.m. to 5 p.m.	"	..	..	8	"
85	"	1 hour	"	..	..	8 to 7	"
86	"	7.15 a.m. to 8.45 a.m.	"	..	..	7	"
87	"	9.30 a.m. to 11.30 a.m.	"	..	..	7 to 6	"
88	"	1 $\frac{1}{4}$ hours	"	S. E. $\frac{3}{4}$ E.	..	6 to 7	"
89	"	1.45 p.m. to 3 p.m.	"	S. E. by S. $\frac{3}{4}$ S.	..	7 to 6	"
90	"	1 $\frac{1}{4}$ hours	Riverton Bay, west of New River	..	..	5 to 3 $\frac{1}{2}$	Sand and fine gravel.
91	"	2.15 p.m. to 3.45 p.m.	Middle Riverton Bay	Towards Riverton Bar	..	2 $\frac{1}{2}$	Sand.
92	"	1 $\frac{1}{4}$ hours	Close in to Riverton Bar	S. E. by S. $\frac{3}{4}$ S.	..	18 to 22	Soft sand and gravel.
93	"	8.15 a.m. to 10.15 a.m.	East of Timaru	E. $\frac{1}{2}$ N. and S. W. by S.	..	18 to 13	Soft sand.
94	"	11 a.m. to 1 p.m.	Off Timaru	W. by S. $\frac{1}{4}$ S.	..	13 to 12	"
95	"	1 p.m. to 3 p.m.	"	S. W. by W.	..	12 to 11	"
96	"	3.15 p.m. to 4.45 p.m.	"	N. W. $\frac{3}{4}$ W.	..	10 $\frac{1}{2}$ to 12	Sand.
97	1 May, 1900	7.45 a.m. to 8.45 a.m.	Off St. Andrew's	S. E. by S. $\frac{1}{4}$ S.	..	12 to 12 $\frac{1}{2}$	"
98	"	10 a.m. to 12.30 p.m.	Continuation of preceding haul	S. E. by E. $\frac{1}{4}$ E. and N. E. by E.	4	12 $\frac{1}{2}$ to 14	"
99	"	12.45 p.m. to 2.45 p.m.	"	E. by S. and N. E. $\frac{3}{4}$ E.	..	13 to 11	"
100	"	3 p.m. to 4.30 p.m.	Off Okain's Bay	W.	..	10 to 13	Soft sand.
101	"	4.30 a.m. to 7 a.m.	"	N. W. $\frac{1}{4}$ W.	..	13 to 11	"
102	"	7 a.m. to 9.30 a.m.	"	S. W. $\frac{3}{4}$ S.	5	10 to 13	"
103	"	10 a.m. to 1 p.m.	Off Lyttelton	N. W. $\frac{3}{4}$ N. and S. W. by S. $\frac{1}{4}$ S.	..	11	Mud.

PARTICULARS OF HAULS—continued.

Hauls	Date	Hour	Locality	Direction trawled.	Distance from Shore in Miles.	Depth in Fathoms.	Nature of Bottom.
104	15 May, 1900	8.50 a.m. to 9.50 a.m.	Clondy Bay	W.N.W.	..	15 to 11	Soft sand.
105	"	10.40 a.m. to 11.40 p.m.	Continuation of preceding haul	N.W. by N.	..	11 to 8½	"
106	"	12.5 p.m. to 1.5 p.m.	"	N. ½ E.	..	7½ to 10½	"
107	"	1.15 p.m. to 2.30 p.m.	Off Robertson Point	N.N.E.	..	18 to 30	"
108	"	12.45 p.m. to 2.5 p.m.	Eastern side of Tasman Bay	N.E. ½ N.	..	9 to 12½	Mud.
109	"	3 p.m. to 4 p.m.	Off Wakapuaka Bay	N.E. by N. ½ N.	..	13 to 14	Blue mud.
110	"	4.25 p.m. to 5.45 p.m.	Off Graham's Point and Croisilles Harbour	N. ½ W.	..	15 to 16	Mud.
111	"	6.40 a.m. to 8 a.m.	Jules Island and Current Basin	"	..	20 to 23	"
112	"	9.10 a.m. to 10.10 a.m.	Two miles south of Greville Harbour, and four miles from D'Urville Island	N. ½ W.	..	26 to 27½	"
113	"	12 noon to 12.40 p.m.	N.W. of Port Hardy	N. ½ W.	..	36 to 37	Clean sand.
114	"	3.20 p.m. to 4.30 p.m.	Twelve miles N.E. of Farewell Spit	E.S.E.	..	27 to 28	"
115	"	5 p.m. to 5.45 p.m.	Twenty miles east of Farewell Spit	S.E. by E. ½ E.	..	33 to 34	Sticky blue mud.
116	"	7.5 p.m. to 7.50 p.m.	Fourteen miles east of Separation Point	S.W. by S.	..	27 to 26	Mud.
117	"	8.45 p.m. to 10.45 p.m.	Nine miles N.W. of Cape Soucis	S.E. ½ E.	..	26	"
118	"	12.10 a.m. to 2.10 a.m.	Tasman Bay	S.E. ½ E.	..	20 to 16	"
119	"	2.30 a.m. to 4.30 a.m.	"	S.W. ½ W.	..	11½	"
120	"	4.55 a.m. to 6.55 a.m.	"	S.E. ½ S.	..	11 to 7	"
121	"	7.15 a.m. to 9 a.m.	"	W. by N. ½ N.	..	7 to 7½	"
122	"	2 hours	One mile and a half south of Farewell Spit	W. by S.	..	13 to 14	Soft sand and mud.
123	"	40 minutes	Seven miles S.W. of Farewell Spit Light	W. by N. ½ N.	..	17 to 5½	Mud.
124	"	1 hour and 10 minutes	Six miles east of Collingwood	"	..	13 to 11	"
125	"	11.50 a.m. to noon	Centre Golden Bay, off Collingwood	N.W. by N. ½ N.	..	10 to 7	"
126	"	1.30 p.m. to 3.10 p.m.	Off Tukuru Point, in Golden Bay	S.E. by E. ½ E.	..	8 to 10	"
127	22 & 23 May, 1900	10.20 p.m. to 12.20 a.m.	Four miles off Adelaide Island, in Tasman Bay	S.S.E.	..	14 to 15	"
128	24 May, 1900	5.30 a.m. to 6.30 a.m.	Off White Cliffs	N. by W. ½ W.	..	6 to 7	"
129	"	7.15 a.m. to 9 a.m.	"	S.E. by E. ½ E.	..	11½ to 15	"
130	"	9.35 a.m. to 11.35 a.m.	Six miles north of Nelson Harbour	N.W. by N. ½ N.	..	16	"
131	"	11.40 a.m. to 12.40 p.m.	Five miles N.W. of Peppin Island	"	..	17 to 18	"
132	"	1.20 p.m. to 3 p.m.	Continuation of preceding haul	"	..	16	"
133	"	11.20 a.m. to 12.20 p.m.	Off Greenwood Point	N.W. by N. ½ N.	..	8½ to 9	"
134	"	1.5 p.m. to 2.10 p.m.	Off Adelaide Island	N. ½ N.	..	11½ to 11	"
135	"	6.45 a.m. to 7.45 a.m.	Off Waitapu	N.E. by N. ½ N.	..	9 to 11	"
136	"	8.25 a.m. to 9.30 a.m.	Off Separation Point	"	..	17 to 19	"
137	"	10.20 a.m. to 11.30 a.m.	Off Awaroa Bay	S.E.	..	15 to 12	"
138	"	12.50 p.m. to 2 p.m.	Tasman Bay, and eight miles off Tonga Island	S. E. by E. ½ E.	..	20 to 24	"
139	"	10.30 a.m. to 11.5 a.m.	Port Hardy Inlet	"	..	13 to 17	"
140	"	5 a.m. to 6.30 a.m.	Twelve miles south of Wanganui	N.E. by E. ½ E.	..	17	Mud.
141	"	2½ hours	Close to mouth of Wanganui River	N.N.W.	..	16 to 11	Gravel.
142	4 June, 1900	3 a.m. to 3.15 a.m.	West of Wanganui River	W.S.W.	..	12	Sand and fine gravel.
143	"	3.45 a.m. to 5.45 a.m.	Five miles south of Wanganui River	W. by S.	..	14 to 16½	Coarse sand.
144	"	6.30 a.m. to 7.30 a.m.	Six miles south-west of Patea River	W. by N. ½ N.	..	7	"
145	"	8.30 a.m. (towed few minutes)	Four miles south-west of Patea River	"	..	13½	"
146	"	¾ hour	Ten miles west of Patea River	W. by S. ½ S.	..	10	"
147	"	5.40 a.m. to 7.25 a.m.	Five miles south of Turakina River	S.E. by S. ½ S.	..	17 to 15	Sand.
148	"	9.15 a.m. to 10.25 a.m.	Five miles north-west of Rangitikei River	S.S.W.	..	11 to 12	Fine sand.
149	"	14 hours	Off Rangitikei River	S.S.E.	..	8 to 9	Soft sand.
150	"	1.35 p.m. to 2.55 p.m.	Off Manawatu River	S. ½ E.	..	6 to 8	"
151	"	3.15 p.m. to 4.30 p.m.	"	S.W.	..	12 to 13	"
152	"	4.30 p.m. to 5.30 p.m.	Six miles west of Ohau River	S. by W. ½ W.	..	42 to 41	Mud.
153	"	6.45 a.m. to 8.15 a.m.	Off Otaiki River	S.W. by S. ½ S.	..	5 to 11½	Fine sand.
154	"	10 a.m. to 11.5 a.m.	Between Kapiti Island and mainland	"	..	12 to 18	Soft and fine sand.

PARTICULARS OF SOUNDING-STATIONS.

No.	Locality.	Depth in Fathoms.	Nature of Bottom.	No.	Locality.	Depth in Fathoms.	Nature of Bottom.
1	Pegasus Bay	13	Sand.	62	Off Coal Point, Molyneux Bay	8	Sand.
2	"	18	"	63	Off Waipapapa Point	15	Gravel.
3	"	28	Soft sand.	64	Toitoto Bay	8	"
4	"	12	"	65	"	9	"
5	Off Okains Bay, Banks Peninsula	8	Sand.	66	"	8	"
6	Off Little Akaroa Bay, Banks Peninsula	9	"	67	"	8	"
7	Off Ninety-miles Beach	12	Stones.	68	"	6	"
8	"	15	"	69	"	7	"
9	"	13	"	70	"	6	"
10	"	9	"	71	"	6	Sand.
11	"	15	Sand.	72	"	18	Gravel.
12	"	20	"	73	Off Murray River, Stewart Island	17	Sand.
13	"	18	"	74	Off The Neck, Stewart Island..	16	Rock.
14	Off Timaru	18	Coarse sand.	75	Off East Head,	13	Sand and rock.
15	"	13	"	76	Off Owen Island,	8	Rock.
16	"	4	Gravel.	77	In Pegasus Inlet,	11	Sand.
17	Off coast, south of Timaru	11	Sand.	78	"	13	"
18	"	14	Coarse sand.	79	Wilson Bay,	13	"
19	"	16	"	80	"	14	"
20	"	16	Sand.	81	"	22	"
21	"	18	"	82	Off Boat Group,	17	"
22	"	20	Sand and shell.	83	Mason Bay,	5	"
23	Off Waihao River	8	Stones.	84	Foveaux Strait	36	"
24	"	11	"	85	"	34	"
25	Off Waitaki River	15	"	86	"	31	"
26	"	19	Sand.	87	"	32	"
27	"	18	Stones.	88	Tewaewae Bay	15	Fine sand.
28	"	14	"	89	"	11	"
29	"	11	"	90	"	8	"
30	"	7	"	91	"	7	"
31	"	8	"	92	"	6	"
32	"	12	"	93	"	5	"
33	"	16	"	94	Howell Road, Riverton Bay ..	5	Fine gravel.
34	"	20	Gravel.	95	"	4	"
35	"	23	"	96	Riverton Bay	12	Sand.
36	"	18	Stones.	97	"	15	Coarse sand.
37	"	15	"	98	"	16	Gravel.
38	Off coast, between Waitaki and Oamaru	6	"	99	Palliser Bay	"	"
39	Ditto	6	Gravel.	100	"	45	Sand.
40	"	5	"	101	"	27	Gravel.
41	Off Oamaru	23	"	102	"	13	"
42	"	28	"	103	"	7	"
43	"	42	Fine gravel.	104	Cloudy Bay	6	Sand.
44	"	61	Sand and shell.	105	"	11	"
45	Off Kakanui River	4	Gravel.	106	"	11	"
46	Off coast, between Oamaru and Kakanui	6	"	107	Between D'Urville Island and Farewell Spit	38	"
47	Off Shag River	35	"	108	Ditto	40	"
48	Off coast, south of Shag River	22	"	109	"	30	"
49	"	16	Rock.	110	Golden Bay, off Farewell Spit	20	Fine sand.
50	"	18	"	111	Cook Strait, between Stephens Island and Wanganui	"	"
51	Kartiki Bay	10	"	112	Ditto	45	Mud.
52	"	11	Rocks and kelp.	113	"	39	Coarse sand.
53	Blueskin Bay	9	Sand.	114	Off Wanganui River	21	Sand and gravel.
54	Off Taiaroa Heads	12	"	115	Off Patea River	29	Fine gravel.
55	Off Wickliffe Bay, Otago	10	"	116	"	28	"
56	Off Cape Saunders	29	Gravel.	117	Off coast, between Patea and Wanganui	33	"
57	Off St. Clair's Bay, Otago Peninsula	26	"	118	Ditto	29	"
58	Off Green Island, Otago	22	Rock.	119	Wanganui Bight	31	Coarse sand.
59	Off coast, from Green Island to Taieri River	16	Sand.	120	"	34	"
60	Ditto	16	Rock.	121	Off coast, south of Manawatu River	9	Sand.
61	Off Tokomairiro River	17	"	122	Ditto	9	"

* No soundings with lead.

MEMORANDUM OF TEMPERATURE OBSERVED IN DIFFERENT LOCALITIES.

Date.	Locality.	Depth in Fathoms.	Surface Temperature.	Bottom Temperature.	Atmosphere.
Mar. 12	Pegasus Bay	22	Degrees. 61	Degrees. 58	Degrees. 67
" 20	Off Ninety-mile Beach	28	58	57	64
April 2	Off Oamaru	35	58	57	65
" 7	Off Otago Peninsula	48	57	56	64
" 8	Off Waikouaiti	13	58	56	66
" 13	Off Coal Point (Otago)	15	57	56½	65
" 18	Off Murray Bay (Stewart Island)	20	57	56	58
" 22	Foveaux Straits, between Codfish Island and Tewaewae Bay	35	57	56	64
" 22	Mason Bay (Stewart Island)	15	58	56	61
May 26	Golden Bay	19	55	56	53
" 26	Tasman Bay	24	56	56	58
" 29	Port Hardy (D'Urville Island)	30	55	56	54
June 4	Off Wanganui	28	56	56	57
" 7	Off Kapiti Island	41	52	55	51

MEMORANDUM OF DISTANCES STEAMED AND TOWED BY S.S. "DOTO" DURING THE TRAWLING EXPEDITION.

Date.	Locality.	Distance towed.	Distance steamed.	Total.
Mar. 7-9	Napier to Lyttelton ... ..	...	334	334
" 10	Pegasus Bay	6	23½	29½
" 12, 13	"	39	67½	106½
" 14	Off Banks Peninsula	10	40½	50½
" 15, 16	Pegasus Bay	26½	20½	47
" 17	Lyttelton to Akaroa ... ..	...	45	45
" 19, 20	Akaroa to Ninety-miles Beach and on to Timaru	47½	118	165½
" 22	Off Timaru	14	55	69
" 23	"	4	7	11
" 26	"	14½	43	57½
" 27	"	10	45½	55½
" 28	"	8½	12½	21
" 29	" ... ..	...	4	4
" 20	Timaru to Oamaru	6	81	87
" 31	Off Oamaru	10	46	56
April 2	"	7½	39	46½
" 3	"	5	22½	27½
" 5	From Oamaru to Dunedin	6	41	47
" 7	Off Port Chalmers	10½	26½	37
" 8	"	8	47	55
" 9	"	13½	57½	71
" 13, 14	From Port Chalmers by Molyneux Bay to Bluff	5	135	140
" 16	Toitoti Bay	6	34½	40½
" 18	From Bluff to Stewart Island	3½	29	32½
" 19	Off Stewart Island	2½	22	24½
" 20	"	3	41	44
" 21	" ... ..	...	51½	51½
" 22	From Stewart Island to Tewaewae Bay	13	49	62
" 23	In Tewaewae Bay and to Bluff	13	32	45
" 24	Bluff to and in Riverton Bay	9	40½	49½
" 27	From Bluff to Wellington by Timaru and Lyttelton	20	520	540
May 5	From Wellington to Cloudy Bay ... ..	...	40	40
" 14	In Cloudy Bay and on to Picton	15½	65½	81
" 15	From Picton to Nelson ... ..	...	84	84
" 16	Nelson to Croiselles Harbour	10½	17	27½
" 17	In Tasman Bay	42	86	128
" 18, 19	To Farewell Spit and in Golden Bay	20½	93½	114
" 22, 23	In Tasman Bay	21½	24	45½
" 24	In Tasman and Golden Bays	6½	33	39½
" 25	"	13	41	54
" 26	Nelson to Port Hardy Inlet	2	50	52
" 28, 29	Port Hardy Inlet to Wanganui	11	73	84
" 30, 31	From Wanganui North to Patea... ..	12	76	88
June 4, 5	From Wanganui down coast to Manawatu	18	23	41
" 6	Manawatu down coast to Wellington	7	58	65
" 7	" ... ..	...	...	...
	Total	501	2,895	3,396

SIR,—

Dunedin, 3rd August, 1900.

I have the honour to present the following interim report on the scientific results of the trawling expedition on the coast of the South Island of New Zealand in the s.s. "Doto."

When it became known that it was the intention of the Government to undertake this investigation, I, on behalf of the Council of the Otago Institute, wrote to the Marine Department, urging that provision should be made for a scientific expert to accompany the vessel. Unfortunately, this could not be arranged, but I was notified that accommodation would be provided for any properly qualified person whom the Institute might appoint as its representative. Owing to various causes, such as shortness of notice and difficulty of getting away from other duties, it was not possible to arrange for any naturalist to accompany the "Doto" for more than a short period of the time she was occupied. Mr. A. Hamilton, Registrar of the Otago University, joined the vessel at Lyttelton at the beginning of the cruise, and was with her as long as Port Cooper was the starting-point of the trawling. I myself joined Mr. Ayson at Wellington on the 14th May, and was on board while the boat worked in Cloudy Bay, Tasman and Golden Bays, leaving her at Nelson on the 23rd May. Professor Benham, Mr. Hamilton, and I were out for one day of special deep-sea work off Cape Saunders, while one or other was out on several occasions with the Dunedin Harbour Board steamer "Plucky" on trawling expeditions off Otago Heads.

In addition to the material collected by us, Mr. Ayson was provided with collecting-vessels and preserving media, and put aside a good many specimens from several localities along the coast. The collections made were assorted in Dunedin at the close of the cruise, and the various groups distributed as follows: Fishes, mollusca, and polyzoa to Mr. Hamilton; crustacea to Mr. George M. Thomson; and all the other invertebrates to Professor Benham. The complete working-out of all the specimens collected will take a considerable time; meanwhile a brief *résumé* of the results so far arrived at has been made, and is submitted here. In future operations of the same nature I would recommend that provision be made for recording the temperature and density of the sea-water at all the stations where the trawl is worked.

I would take this opportunity of expressing, on behalf of my co-workers and myself, our appreciation of the cordial manner in which Mr. Ayson aided our work in every way in his power, and of the kindness shown and trouble taken by him and Captain Nielson to make us as comfortable as possible on the "Doto."

I have, &c.,

The Hon. W. Hall-Jones, Minister of Marine, Wellington.

GEO. M. THOMSON.

University of Otago, Dunedin, 5th July, 1900.

I HAVE the honour to report that I have made a preliminary examination of the fish and the mollusca obtained during the cruise of the "Doto" on the coasts of the South Island. In addition to the species enumerated in Mr. Ayson's report, the following species already on the list of New Zealand fishes occurred: *Clupea sprattus*, var. *Antipodum* (Hector), *Argentina decagon* (Clarke), *Calloptilum punctatum*, *Clinus flavescens* (Hutton), *Acanthoclinus*, sp. One specimen procured at station 76, in Foveaux Strait, is probably an addition of a new genus to our list. It closely resembles a small torpedo or cramp-fish, but in detail it appears to be a member of the genus *Astrape*, hitherto recorded from the Cape of Good Hope. If on further examination this view holds good I propose to call it *Astrape aysoni*. The *Macrurus*, taken in several hauls off Akaroa Peninsula, is a hitherto little known fish of a family generally found at much greater depths. In this case, as in many of the others, it is desirable that returns of the kinds of fish taken on the same grounds should be available for each month in the year.

Trawling does not as a rule provide any except the largest varieties of mollusca, but on one of two occasions we were able to use a dredge, and in the material thus obtained were a number of mollusca which are both scarce and interesting. Some curious species of *Myadora* were obtained off the Otago Heads, and some good specimens of *Trichotropis* in Cook Strait. A full list of the mollusca is given below.

The Hon. W. Hall-Jones, Minister of Marine, Wellington.

A. HAMILTON.

FISHES.

In addition to the list of fishes given at p. 14 of this report and in the letter above, the following species have been more recently identified by Mr. Hamilton:—

<i>Acanthoclinus littoreus</i> .	<i>Hemerocetes acanthorhynchus</i> .	<i>Chelidonichthys kumu</i> .
<i>Diplocrepis puniceus</i> .	<i>Myliobates aquila</i> , <i>jw</i> .	<i>Neophrynichthys latus</i> .
<i>Trachelochismus pinnulatus</i> .	<i>Monacanthus convexirostris</i> .	<i>Sebastes percoides</i> .
<i>Doryichthys elevatus</i> .	<i>Notothenia</i> , <i>sp</i> .	<i>Agriopus leucopœcilus</i> .

MOLLUSCA.

<i>Corbula erythrodon</i> .	<i>Mytilus edulis</i> .	<i>Turbonilla neo-zelandica</i> .
<i>Saxicava arctica</i> .	<i>Modiola australis</i> .	<i>Murex zealandicus</i> .
<i>Venerupis reflexa</i> .	<i>Myodora subrostrata</i> .	<i>Turitella rosea</i> .
<i>Venerupis siliqua</i> .	<i>Mesodesma ventricosa</i> .	<i>Umbonium zealandica</i> .
<i>Diplodonta</i> , <i>sp</i> .	<i>Emarginula striatula</i> .	<i>Trophon plebeius</i> .
<i>Venericardia australis</i> .	<i>Bittium terebelloides</i> .	<i>Ziziphinus cunninghami</i> .
<i>Venericardia compressa</i> .	<i>Bittium exile</i> .	<i>Fusus zealandicus</i> .
<i>Cardita australis</i> .	<i>Chemnitzia zealandica</i> .	<i>Voluta pacifica</i> .
<i>Kellia sanguinea</i> .	<i>Clathurella dictyota</i> .	<i>Ostrea</i> , <i>sp</i> .
<i>Kellia cycladiformis</i> .	<i>Clathurella varians</i> .	<i>Lima squamosa</i> .
<i>Tellina angulata</i> .	<i>Gibbula sanguinea</i> .	<i>Pecten zealandicus</i> .
<i>Venus mesodesma</i> .	<i>Pisania littorinoides</i> .	<i>Astralium imperialis</i> .
<i>Meretrix multistriata</i> .	<i>Trichotropis</i> , <i>sp</i> .	<i>Fusus nodosus</i> .

POLYZOA.

Cellaria setigera.	Membranipora spinosa.	Scrupocellaria simplex.
Cellaria grandis.	Lepralia imbellis, B.—pertusa.	Cabarea texta.
Flustra episcopalis.	Catinicella ventricosa.	Cabarea rostrata.
Calwellia sinclairii.	Catinicella cribraria.	Burgula, sp.
Dimetopia spicata.		

Professor W. B. Benham, D.Sc., reports as follows:—

The number of smaller invertebrates are few in proportion to the number of hauls; this is owing to the absence of a suitable dredge. Nevertheless, amongst those that were gathered there are quite a number of interesting species, some of which have not been recorded since the reports on the early voyages published by Quoy and Gaimard, by Schmarda, and others, while a considerable number are new to science. In the brief period since they arrived in Dunedin it has been impossible to identify with accuracy all the species of these lower forms, and, in the case of new species, it is inadvisable to publish their names without a description sufficient to characterize them. Hence only a few of these new ones will be enumerated at the present time.

CŒLENTERA.

Of the few species obtained, two are new to science—one belonging to the Anthozoa, the other to the Ctenophora.

1. A handsome, Indian-red species of *Alcyonium* was obtained in Tasman Bay. It is attached to shells, &c., by a very short, broad stalk, which bears a number of short, rounded lobes or branches covered with the polyps, which are white, with an orange band just below the white tentacles. The cœnenchyme is so densely crowded throughout with spicules as to be extremely hard.

2. A single specimen of a species belonging to the genus *Euplokamis* of Chun was captured in the tow-net between D'Urville Island and Farewell Spit. It is an ovoid, transparent organism, with the eight comb-bearing ridges extending along its whole length, which is a little less than an inch. The two tentacles issue from their sacs close to the aboral pole. At the same time a number of young ctenophores, belonging to a different genus and another order, were captured.

Mention may also be made of *Flabellum rubrum*, Quoy and Gaimard, of which half a dozen specimens were obtained in Tasman Bay.

ECHINODERMA.

Representatives of all the classes, except Crinoids, were gathered, and amongst them there are two, or perhaps three, starfishes which appear to be new. Of the rest we obtained *Asterias scabra*, *Astrogonium abnormalis*, *Madracis globosa*, *Echinocardium zealandicum*, as well as a few ophiurids and some large holothurians, which have not been worked over.

BRACHIOPODA.

Three common species were obtained from various localities—*Magellania* (*Waldheimia*) *australis*, *Terebratula cruenta*, *Terebratella rubicunda*.

ANNELIDA.

The marine segmented bristle-bearing worms (or Polychætes) occurring round our coasts have never been systematically worked at, and, except for a few scattered records in older memoirs, we know nothing of this group, whose genera and species are very abundant. Many of those described by earlier writers are scarcely recognisable nowadays, owing to the brevity of their accounts, so that it is not surprising that out of the score of species so far examined with care, that were collected during the cruise, at least fifteen are new to science. Of these I mention a few only:—

Lepidonotus giganteus, Kirk.—A very handsome polynoid or scale-bearing worm was obtained at several stations, and it appears to be widely distributed along, at any rate, the east coast of the South Island.

Aphrodita maorica, n. sp., is chiefly remarkable for the absence of the iridescent hairs so generally present in the genus. The animal is 2½ in. long by about 1½ in. across; the grey felt which covers the back is penetrated by long bronze-coloured bristles forming two irregular rows on each side, directed backwards and upwards, while a third bunch of similar bronze bristles, directed outwards and backwards, in each segment forms a brown margin to the body. The position of the usual iridescent hairs is occupied, on each foot, by a bunch of short, delicate, flexible, yellow hairs, which are covered with mud; these do not project far enough to be visible from above. The ventral lobes of the foot bears about fifteen stout brown chætæ, arranged in three tiers. Two specimens were obtained off Blind Bay and Golden Bay, 8–17 fathoms.

Aphrodita talpa, Quatrefages, and several small polynoids were also obtained at various stations.

Of the genus *Eunice* three new species have to be recorded, one of which may be briefly characterized, as it is a very common worm round the coast.

Eunice leuconuchalis, n. sp., is a rich, reddish brown, darker anteriorly than posteriorly, where the colour may fade to nearly white. The nuchal segment is white (hence the name). The worm measures 3 in. to 4½ in. by about ½ in. across, and consists of a considerable number of segments. The prostomium, deeply coloured, is bifid, and carries five moniliform tentacles, which are coloured with alternate brown and white rings. The median tentacle is as long as the peristomium and following four segments; the lateral tentacles are smaller. The gills commence on the 7th foot, and cease at the 35th. They are longest on the 12th to the 22nd feet, where they bear about fifteen

filaments. The right jaw has five teeth; the left has none, having only an irregular undulating margin; but the left, unpaired, accessory jaw is of considerable size, has six teeth, and comes to lie opposite the right jaw, as in *Onuphis*.

Another species of *Eunice* is a giant, measuring probably 2 ft. in length, and bears some resemblance to *E. aphroditois*, Pallas. A new species of the rare worm, *Halla*, of a dark-brown colour, so as to appear black, was obtained from Blind Bay, Port Hardy, and Golden Bay. It differs considerably from the only species hitherto recorded from Australasian waters.

New species were also obtained of the following genera: *Pterocirrus*, *Staurocephalus*, *Harmothoe*, *Phyllodoce*, *Glycera*, *Nereis*, *Branchiomma*, and others; while a large species of the tube-worm, *Protula*, from a depth of about 40 fathoms off Timaru, deserves mention, as it forms a calcareous tube several inches—possibly feet—in length and $\frac{1}{2}$ in. across. The animal is 6 in. long and about $\frac{1}{2}$ in. in diameter; each of the gills, 1 in. in length, arises from a spiral base, with nine whorls. It is allied to *P. bispira* of Cuvier, from which it differs in certain details.

Further, *Flabelligera bicolor* of Schmarda was obtained in two or three localities.

HIRUDINEA.

The two marine genera—viz., *Branchellion*, which attacks skates, and *Pontobdella*, attacking sharks and rays, were obtained. Both these appear to be new species, but they have not yet been studied with sufficient care to be named.

ECHIURIDA.

A single specimen of *Echiurus* was obtained, which had evidently been swallowed by a fish and regurgitated on to the deck. About a year ago I received from Mr. Stewart, a fisherman of Dunedin, a similar worm removed from a fish's stomach. The species is very similar to *E. uncinatus* from Japanese seas, and has already been recorded from our seas by Dr. Dendy.

MOLLUSCA.

Living specimens of the following species were taken in Port Pegasus: *Acanthochites porosus*, *Fissurella*, sp., *Voluta pacifica* (very fine specimens, 8 in. long), *Neptunea zealandica*, *Neptunea nodosa*, *Ranella argus*, *Astraliium imperialis*, and *Vermetus zealandicus*, Quoy, which does not appear to have been recorded since the voyage of the "Astrolabe." The Opisthobranchs have not yet been worked over, but a fine dorid, some 5 in. or 6 in. long, and of a violet colour, covered with rounded papillæ, was obtained from Port Pegasus and east of Otago Heads; while *Philine angasi*, *Pleurobranchus*, *Pleurobranchæa*, *Bulla*, *Doris*, and other genera were obtained from various hauls.

Of the bivalves, *Lima squamosa* was trawled in Port Pegasus, *Pecten zealandica* in Tasman Bay, *Standella elongata* between D'Urville Island and Farewell Spit, as well as *Ostrea*, sp., and *Cardita* in Port Pegasus.

Cephalopods are represented by some small specimens of *Octopus maorum*, though no doubt other species were brought on board and destroyed after the usual habit of the sailor.

TUNICATA.

A few compound and solitary ascidians were dredged, of which one species of *Leptoclinum* is new. This is a white encrusting form, elegantly marked with blue-grey marbling. The others have not yet received attention.

Mr. George M. Thomson, F.L.S., reports as follows:—

The species of crustacea, belonging to nearly every sub-order of this extensive group, which were taken during this trawling expedition were very numerous, but, owing to the want of a dredge and to the limited opportunities for using the tow-net, a great number of the smaller forms were not recorded. A dredge of suitable construction should be part of the equipment of the next trawling expedition. It has been impossible in the limited time at my disposal since the arrival of the material to do more than give a cursory examination to it. A few species are apparently new to science, while the determination and nomenclature of several others requires revision.

BRACHYURA.

The number of species of crabs collected was not large.

A very fine undescribed species of *Paramithrax* with long slender legs, which spread to a width of 13 in., was taken about ten miles off Cape Saunders, in from 45 to 50 fathoms; while another species, much smaller and apparently differing from any hitherto described from New Zealand, occurred commonly in Tasman and Golden Bays, in from 10 to 30 fathoms.

Other species of crabs taken were,—

- Trichoplatus huttoni*, M. Edw.; a single specimen at Nelson.
- Eurynolambrus australis*, M. Edw. and Lucas; from various localities.
- Cancer nova-zealandicæ*, Jacq. and Lucas; very common.
- Nectocarcinus antarcticus*, Jacq. and Lucas; a common swimming crab.
- Macrophthalmus* (= *Cleistostoma* ?) *hirtipes*, Jacq. and Lucas; abundant between tide-marks and 10 fathoms, off Akaroa, Lyttelton, and in Otago Harbour.
- Pinnotheres pisum*, L.; in *Mytilus*.
- Halicarcinus planatus*, Fab.; common.
- Hymenicus varius*, Dana; Tasman Bay, 27 fathoms.
- Ebalia lævis*, Bell; Tasman and Golden Bays, 10–30 fathoms.

ANOMURA.

Hermit-crabs were taken in nearly every cast of the trawl, often in great numbers. The following species have been identified:—

Eupagurus novæ-zealandiæ, Dana; common.

Eupagurus cookii, Filhol; Golden Bay, 10 fathoms; Tasman Bay, 27 fathoms.

Eupagurus edwardsii, Filhol; off Otago Heads.

Eupagurus rubricatus, Henderson; common in Tasman and Golden Bays, and off Otago Heads.

Stratiotes setosus, G. M. Thomson; off Otago Heads.

Munida sub-rugosa, White; Tasman Bay, 27 fathoms.

Grimothea gregaria, Leach; whale-feed is abundant along the east coast of Otago, but becomes rare north of Lyttelton.

Galathea pusilla, Henderson; common in Tasman Bay, in 30 fathoms.

Petrolisthes novæ-zealandiæ, Filhol; Blueskin Bay, 10 fathoms; Tasman Bay, 30 fathoms.

MACRURA.

Crayfish (*Palinurus*) were occasionally taken in the trawl at several stations, but prawns and shrimps mostly escaped, except when entangled among weeds, sertularians, &c. The following species are among those taken:—

Pontophilus (Crangon) australis, Hutton; common off the east coast of Otago and about Stewart Island.

Virbius bifidirostris, Miers; off Otago Heads. This species is of a bright-green colour when alive.

Alpheus socialis, Heller. One specimen trawled in Tasman Bay.

Leander, sp. A species which appears to be scarcely different from *L. affinis*, Edw., was taken in Tasman Bay and off the coast of Otago.

SCHIZOPODA.

Some specimens of opossum shrimps were taken in Tasman and Golden Bays, but have not been identified as yet.

AMPHIPODA.

Several species of amphipods occur in the collection, but as they are small, active crustacea they mostly escaped capture. Very few have yet been identified, but of these one or two are of considerable interest.

Liljeborgia haswelli, Stebbing, was found living in pairs commensally in the upper spires of shells tenanted by hermit-crabs; but, as far as I have made out, only by the one species, *Eupagurus rubricatus*. This amphipod is an elegantly coloured species, the thoracic portion of the body being of a fine pinkish-red.

Amaryllis macropthalmus, Haswell. One specimen was obtained at Lyttelton. I also have it from Moko Hinou. It was originally described from Tasmania, and has since been collected in Patagonia.

ISOPODA.

Specimens of this group were not taken abundantly, most being too small to be captured by the wide mesh of the trawl-net. But the species are not, as a rule, such active swimmers as the amphipods, and they were more frequently met with on the ropes, and among the weeds, than specimens of the latter group. Species of *Sphæroma*, *Amphoroidea*, *Aega*, and *Cymothes* occur. *Cassidina neo-zealandica*, G. M. Thomson, was got off Otago Heads in shells inhabited by hermit-crabs; also in Tasman Bay. *Nesæa canaliculata*, G. M. Thomson, occurred frequently in Tasman Bay, at a depth of 30 fathoms. A species of *Liriotheca* (?), boring among rotten wood, was taken off Timaru.

PHYLLOCARIDA.

Nebalia longicornis, G. M. Thomson, was taken abundantly among zostera and other weed, of which a great quantity was banked up inside of Farewell Spit. It is a beautiful and lively little species.

COPEPODA.

The tow-net gatherings include a great many species of this order of small crustacea, which are of such importance as food material for fishes. The examination of these will take a considerable time. So far, they have only been looked over cursorily. *Temora tenuicauda*, Brady, was found abundantly in Tasman Bay and off Otago Harbour. It was formerly recorded from Auckland and the Bay of Islands.

Dr. Benham records *Lernæa branchialis* from the red-cod, taken off Timaru at a depth of 40 fathoms.

The following genera are represented in the finds: *Calanus*, *Paracalanus*, *Clausocalanus*, *Acartia*, *Centropages*, *Labidocera*, *Oithona*, *Eutерpe*, *Amymone*, *Dactylopus*, *Phroso*, *Harpacticus*, *Peltidium*, *Scutellidium*, *Corycæus*, *Paurocope*, (?) *Centromma*, and *Arietotrogus*.

OSTRACODA.

Specimens of this order also occurred in the tow-net gatherings, but not so abundantly as the copepods. Species of *Asterope* and of *Philomedes* appear to be represented

Captain C. A. NIELSEN to the MINISTER OF MARINE.

SIR,—

I have the honour to submit to you a short report of the recent trawling experiments carried out in the "Doto" by me for the New Zealand Government, and under the personal superintendence of Mr. L. F. Ayson, Chief Inspector of Fisheries.

The time allowed for the operations was not sufficient to give each locality such a thorough exploration as I would wish, seeing such a large extent of coast-line had to be tested in the time at our disposal. However, the work that we did proved conclusively to me that the sea-bottom around the coast of New Zealand, wherever we tried it, with few exceptions, is most suitable for trawl-fishing.

I was very much surprised that we met with such few instances where the bottom proved of such a character that trawling operations could not be carried on. In many instances we found the bottom all that could be desired, but, unfortunately, we did not find many marketable fish in these places. This may be accounted for in many ways. I think, owing to the lateness of the season when these experiments were carried out, that at the time of the year we tested these grounds the fish were not frequenting them. Such grounds could only be thoroughly tested and proved with anything like success by trawling over them at different periods or seasons of the year. I am of opinion, and the recent trials also prove, that wherever a soft mud-bottom is found, it is in these places fish will always be found in payable quantities, especially soles and flounders.

I was very much disappointed with the small quantity of flat-fish we obtained along the Ninety-mile Beach, for it was along this part of the coast I anticipated we should catch them in large quantities. Our trials proved that for a considerable distance from the shore the bottom, at intervals, consists of shingle and much bottom-growth, which is altogether unsuitable for fish, and also trawling. We tried several times in deep water, and, although the bottom proved clean and good, we did not obtain any better results. Whenever we tried beyond the 20-fathom line, I think, without exception, the results were very much the same.

By the recent trials I firmly believe that deep-sea trawling could be carried on with profitable results in and around Pegasus Bay, Blueskin Bay, Tewaewae Bay, and Tasman Bay. In each of these places there is a great extent of trawling-grounds, for the bottom proved most suitable. I consider that Pegasus Bay would prove a most valuable and convenient trawling-ground for the Christchurch district, the same as Blueskin Bay would be to the Dunedin district, and Tasman Bay to Wellington. Tewaewae Bay, I think, would prove most prolific for many kinds of fish, especially soles and flounders, and this bay could be easily worked by suitable steamers from the Bluff, and this would also be a very good centre from which to supply the Australian markets. At present Napier is the only place where trawling is carried on to any extent and with success, but I am of opinion that if deep-sea trawling was carried on with the same energy in other parts of the colony it would prove equally successful.

The trials made in the Wanganui Bight impressed me that trawling operations could not be carried on with success on that part of the coast. Our trials to the north of the Wanganui River proved that the bottom was very rough, consequently we were unable to tow the trawl for many minutes clear of rocks or boulders. The bottom south of the river as far as Kapiti Island proved very good, consisting of sand, but very clean, and I am of opinion that this bight is too exposed to heavy north-west weather, which sweeps the ground of all feed, hence the scarcity of all kinds of fish, more especially flat-fish.

The trials we made around Stewart Island in most instances proved that the bottom was not favourable for trawling operations.

I consider the Government were very wise to carry out the recent trials, for it has proved beyond doubt that many valuable fishing-grounds exist around these shores, and if private enterprise were now to take the matter up I have no doubt that deep-sea fishing in this colony would soon become a great and valuable industry. Comparing the quality and class of fish that abound in these waters with those in the Old Country, and taking into consideration the great difference in their present value, I believe that a large and profitable export trade could be established in frozen fish.

In conclusion, I think the Government should make further experiments, but for a longer period, which would enable other parts of the coast to be tested, and also revisit some of the places already tested, but at a different time of the year, and thereby ascertain if fish are to be found in places which proved almost barren during the recent trials.

The Hon. W. Hall-Jones, Minister of Marine.

I have, &c.,

C. A. NIELSEN.

Approximate Cost of Paper.—Preparation, not given; printing (1,775 copies), £17 12s. 6d.

By Authority: JOHN MACKAY, Government Printer, Wellington.—1900.

Price 9d.]

PART OF
NORTH ISLAND
NEW ZEALAND

Scale of English Miles



SHOWING
TRAWLING OPERATIONS
 OF THE S.S. "DOTO."

T A S M A N

S E A

EXPLANATION OF THE SYMBOLS USED ON THE MAP.

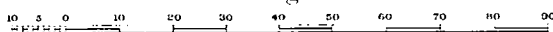
Soundings in fathoms thus—35
 The red lines indicate the trawling stations.
 The red dots indicate the sounding stations.
 The trawling stations are numbered from 1 up to 154.
 The sounding stations are numbered from 1 up to 122.
 The nature of the bottom is indicated by the accompanying letters—viz., S., sand;
 F.S., fine sand; C.S., coarse sand; D.S., dark sand; Sh., shell; M., mud; G., gravel;
 F.G., fine gravel; St., stones; Rk., rock.





MIDDLE ISLAND NEW ZEALAND

Scale of English Miles



SHOWING TRAWLING OPERATIONS OF THE S.S. "DOTO."

T A S M A N I A N S E A

South Latitude

S O U T H P A C I F I C

(T E M O A N A N U I - A - K I W A)

O C E A N

EXPLANATION OF THE SYMBOLS USED ON THE MAP.

Soundings in fathoms, thus - 62.
The red lines indicate the trawling stations.
The red dots indicate the sounding stations.
The trawling stations are numbered from 1 up to 154.
The sounding stations are numbered from 1 up to 122.
The nature of the bottom is indicated by the accompanying letters—viz., S, sand;
F.S., fine sand; C.S., coarse sand; D.S., dark sand; Sh., shell; M., mud; G., gravel;
F.G., fine gravel; St., stones; Rk., rock.

Stewart Island

167 168 169 170 East Longitude 171 172 173 174

