

1901.

NEW ZEALAND.

REPORT ON EXPERIMENTAL TRAWLING.

(BY L. F. AYSON, INSPECTOR OF FISHERIES.)

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

SIR,—

Wellington, 11th July, 1901.

I have the honour to present the following report on the experimental trawling operations undertaken on behalf of the Government round the coasts of the North Island during the months of February, March, April, and May of this year.

The object of the expedition was to continue the experimental survey of the coasts of the colony which was commenced last year, with the object of ascertaining what extent of trawling-grounds exist in certain localities off the coast of the North Island, and to acquire information on the distribution of our food-fishes, and assist the fishing industry by placing the information gained on record for the guidance of those interested.

The Council of the Otago Institute arranged that one of their members (Mr. A. Hamilton) should accompany the trawling expedition again this year, and Mr. Hamilton came on to Gisborne with that intention; but, unfortunately, business recalled him at once to Dunedin, and he was unable afterwards to get away.

Owing to the great extent of clean sand bottom which was trawled over throughout the cruise, the quantity of biological specimens I was able to collect was rather small. These have been sent on to Dunedin for identification, and a preliminary report on these specimens by Professor Benham is appended hereto.

Although Captain Nielsen never quite recovered from the effect of the illness he experienced at the commencement of the cruise, yet there was never any delay on that account, and he displayed his usual skill and energy in carrying out the work.

General Account of the Cruise.

The steam-trawler "Doto" (C. A. Nielsen, captain and trawling-master), which had been used for similar experiments last year, was chartered from the Nelson Fishing Company for a period of eight weeks, to be extended, at the option of the Minister, for a further period of one or two months. I inspected her at Nelson on the 23rd January, 1901, and saw that she had on board the nets and gear necessary for the purpose of the trip, as follows: Trawl-nets—one manila-twine net, 60 ft. head-line, 45 ft. spread, and 65 ft. length; two cotton nets, 70 ft. head-line, 60 ft. spread, and 85 ft. depth; one pair of spare otter boards; one purse Seine net; one bottom dredge; hooks and lines; a large quantity of twine and other material for repairing nets and gear.

Finding the vessel satisfactorily supplied in these and other respects, she was taken over for the cruise, and, having been employed for two days in making investigations with regard to the destruction of fish in Golden and Tasman Bays by the so-called sea-slime which made its appearance in great quantities during last spring and summer, and being further delayed owing to the illness of her master, Captain Nielsen, she left Nelson for Napier at midday on the 31st January.

She had a stormy passage from the French Pass to Napier, where she arrived at 6 p.m. on Sunday, the 3rd February. Captain Nielsen being too unwell to proceed further, another delay of two days was occasioned, but on the 7th February he had sufficiently recovered to proceed.

Accordingly the "Doto" sailed from Napier at 9.30 a.m. on that date for Mahia Peninsula. Bad weather compelled her to shelter under Long Point for thirty-six hours, and the net was not put down for the first haul until 11.20 a.m. on the 9th February, when it was dropped on good trawling-ground north of Table Cape, but with only very moderate results; and, as the weather continued to be unfavourable for the work, a thorough test of this part of the coast could not be attempted until the 11th. On that date several hauls were made, and, though the bottom from Table Cape to Tuahina Point is all that could be desired for trawling, the number of fish taken was not fully satisfying. It must be noted, however, that along that route crayfish were continually netted, which clearly indicates the proximity of rocky bottom, and the possibility of a reef—deeply submerged it may be—existing between those points, or seaward of them.

With the exception of Mahia Bay, the beach from the peninsula to Young Nick's Head is rocky, and close inshore the bottom is unfit for trawling. The water, too, deepens quickly, the 20-fathom line in several places being within two miles of the shore. A soft-sand-and-mud

bottom was found from 10 to 30 fathoms; but marketable fish were not taken in any quantity. On this portion of the coast, however, Poverty Bay proved itself an exception, and some good hauls of flat-fish were taken there.

Trawling from Poverty Bay to Tologa Bay is impossible inside of 10 fathoms owing to the rocky nature of the bottom; but outside of that line the bottom is soft and even, though the quantity of fish taken there was not encouraging.

From Tologa Bay to Hauraki Gulf very little work was done. Soundings were taken at a few places before reaching Tauranga Heads, and one haul of the net was made in Wangaparoa Roadstead, west of Cape Runaway. Both east and west of Tauranga Heads a considerable extent of sand bottom exists, but, as may be expected from the rocks marked on the chart, rough bottom may be met with in many places. From Tauranga to Cape Colville only one haul was made, but the quantity of fish taken at this season—at no point so far tested outside Poverty Bay—was sufficient to warrant its selection as a permanent trawling-ground.

Somewhat different experiences were realised in and around the Hauraki Gulf, where good hauls of marketable fish were made on almost every occasion. Especially was this the case in the Frith of Thames, where fish appear to be particularly plentiful and of good quality. Exhaustive tests were made in all parts of the gulf to the Great Barrier Island on one side, and along the coast to Whangarei on the other, the whole of the bottom proving suitable for trawling operations, and the hauls sufficiently encouraging except in Motuihi Channel, Whangaparapara Harbour, and the vicinity of Whangarei. In each of these places the hauls were poor, but it does not follow that at other seasons these conditions may not be reversed.

After testing the coast southwards of Whangarei, and finding good bottom for trawling but a scarcity of fish, the "Doto" left on the 15th March for Russell to coal, on her way to Kaipara, on the West Coast. In reversing her engines at the Russell Wharf her tail-shaft gave way, and operations had to be suspended until repairs were effected.

A fortnight after the accident the "Doto" was again put to work in Kaipara Harbour, which was fully explored, the hauls varying a great deal. In some localities very fair results were obtained, while in others they were very poor.

From Kaipara to Manukau good results were also obtained, and the bottom found very suitable for trawling operations.

Manukau Harbour was next tested, and, owing to bad weather outside, was more closely exploited than would otherwise have been deemed necessary, for the reason that in this inlet, as in Kaipara, the channels that are deep enough for trawling with a boat drawing 6 ft. 6 in. or over, are too narrow, and, although one or two fair results were obtained here, a much smaller boat and trawl-net would perhaps be more successful in operating in the channels, and perhaps over the mud-flats at high water.

Operations were continued south from Manukau to within ten miles of Cape Egmont Lighthouse, and the general character of the coast off shore was most suitable for trawling, except that opposite Waitara and Urenui, where, within six or seven miles of the shore, the bottom contains patches of rock. Along this stretch of coast-line a few fair hauls were made, and, though the fish were nowhere very numerous, they were well distributed, and included some of the best marketable species. "Bottom" oysters were found in the Kawhia Inlet. These are of very fine quality; but as the oyster area seems to be confined to the inlet the supply obtainable is a limited one, but of great value to residents as a food-supply.

Having exploited this part of the coast, the continued illness of Captain Nielsen rendered it necessary to allow the "Doto" to return to Nelson without renewing her charter for a further term.

Fishermen in Hawke's Bay asked that the ground outside the usual trawling areas should be prospected because of the disappearance of fish from those areas during autumn and winter, and complying with this request the steam-trawler "Rita," owned by Mr. J. Corry, of Napier, was chartered to test the places outside the known trawling-grounds. The "Rita" is a boat of 22 tons net register, and her trawling-gear consists of a 40 ft. beam trawl. Operations with her were commenced on the 13th May in 16 fathoms, half-way between Napier and the Kidnappers, and continued in deep water, but the results showed that the fish had not taken to deeper water, as was supposed.

The "Rita" was chartered for a week, and during that time the grounds were fairly well tested from Napier to the Mahia Peninsula, inshore off Mohaka, Wairoa, and Nuhaka, outside the usual trawling-grounds, and round the Coast to Bare Island. In the time available at this season it was impossible to thoroughly explore the whole of the Hawke's Bay inside a line from Kidnappers to Portland Island, but the results obtained were similar to what has been found when trawling round the coasts of both Islands—*i.e.*, very few flat-fish were taken outside the 20-fathom line.

Summarising the results of the experiments, the list of fish taken shows that there is a wide distribution of fish round the coast, and that they exist in large numbers in certain places. The fact that they are not plentiful upon some first-class trawling-bottom is probably due to their migratory habit, which is influenced by the food-supply, and this in turn being influenced, too, by the state of the weather, tides, and currents so that before anything definite could be arrived at in regard to a permanent fish-supply from trawling; a series of experiments upon the same ground at stated intervals is a necessity. Upon this point Mr. A. Hamilton, of the Otago University, said, in his report last year, referring to one species only, "In this case, as in many 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." And in my accompanying report I stated that, "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 desirability of making further experiments is therefore obvious, and the results of those already made are not in this sense discouraging, for out of 122 hauls made at as many different places, gurnard were captured in 104 of them, schnapper in ninety (sometimes in very large numbers), dog-fish in sixty-three (only one or two at a time), lemon-soles in fifty, flounders in forty, soles in thirty-four, crayfish in eighteen, trevalli in fifteen, tarakihi in fourteen, moki in ten, and so on.

The experience of this year's cruise was similar to that of last year in one respect—viz., that wherever the coast-line was prospected the best results were obtained in from 5 to 25 fathoms, and there appears to be no exception to this rule, although, of course, fish may be taken in small quantities outside these limits.

It will be seen from the appended list of fish taken at the various stations that the most marketable kinds were always the most numerous, and that the variety was quite extensive enough to satisfy ordinary requirements.

Appended to this report will be found—

- (1.) A detailed record of hauls made at each trawling-station.
- (2.) A list of fish taken, and stations where they were obtained.
- (3.) Particulars of hauls.
- (4.) Particulars of the bottom observed at each sounding-station.
- (5.) A memorandum of temperatures observed in different localities.
- (6.) A memorandum of distances steamed and towed by the s.s. "Doto" during the trawling expedition.
- (7.) A memorandum of distances steamed and towed by the s.s. "Rita."
- (8.) An interim report by Professor Benham, D.Sc.Lond., M.A., Oxon, F.Z.S., Professor of Biology, Otago University, on the marine biological specimens collected.
- (9.) Maps showing the position of each trawling- and sounding-station.

I have, &c.

L. F. AYSON,

Inspector of Factories.

The Hon. the Minister of Marine, Wellington.

DETAILS OF TRAWLING EXPERIMENTS.

The Government having obtained the charter of the s.s. "Doto" from the Nelson Fishing Company for the purpose of experimental trawling, and seeing that she possessed the necessary gear and appliances for this special work, the presence of an extraordinary amount of so-called "slime" in Golden and Tasman Bays, causing wholesale destruction to fish, made it necessary for me to make some inquiries in that direction. I accordingly, acting under instructions from the department, left Nelson at 10.40 a.m. on the 24th January in the "Doto," and steamed up the western side of Tasman Bay, and anchored for the night behind Tata Islands. At 5.30 a.m. on the 25th we ran out into 6½ fathoms, and put down the trawl at 6 o'clock. We towed for two hours, and when the trawl was hauled up it contained a few gurnard, schnapper, flounders, and shell-fish, also a large quantity of dead fish. The shell-fish taken up were also dead, and the net was coated with slime. I went ashore at Waitapu to make inquiries, and was informed that in several bays from Separation Point to Collingwood, a distance of about twelve miles, the beach was strewn with dead fish, which were thickest between Tata Bay and Takaka. So numerous were they that residents along the coast had to spend days in burying them to avoid the offensiveness of the decaying quantities. The temperature of the water was 65°, and of the atmosphere 55°.

On the 26th January two hauls of the trawl were made off Pepin Island and Whakapuaka Bay. At both hauls the net came up coated with rotten slime, and containing a good many marketable fish and oysters, all in good condition. It was evident that the slime had settled on the bottom, but had not materially affected the fish on the eastern side of Tasman Bay.

Any attempt to account for this wholesale destruction would result in nothing more conclusive than mere conjecture, and the main object of my inquiries, therefore, was to ascertain the extent of the destruction and the localities most affected. There is no evidence that the effect was noticed anywhere beyond the limits of Tasman and Golden Bays, although the master of the steamer "Waverley" says that his log collected large quantities of slime on his course from some miles south-west of Farewell Spit to Foxton, and the master of the schooner "Planet" reports having seen large quantities of dead and dying fish some distance off shore in Golden Bay.

From thence the "Doto" proceeded to Napier, where I again joined her on the evening of the 3rd February. The master had been ill during the trip, and, having to consult a doctor, we were unable to proceed to Mahia Peninsula, where it was proposed to start trawling, until 9.30 a.m. on the 7th February. A heavy southerly storm and heavy sea was encountered two hours after sailing, and after sheltering a day under Long Point the weather moderated sufficiently to allow the "Doto" to proceed round Portland Island at 6 a.m. on the 9th, and after passing Table Cape got into calmer water. One mile due north of Table Cape the lead showed 8½ fathoms depth, and a rock bottom. Sounded again at 11 a.m., Table Cape bearing S. by E. and distant about five miles, the lead showing 17 fathoms, and the bottom fine sand.

First Haul.—After making the last sounding, steamed a short distance, and shot the net at 11.20 a.m. in 18 fathoms; bottom, fine sand. Towed two hours N.N.W., and hauled up the net in 22 fathoms off a fine-sand bottom. Result: 7 crayfish, 50 gurnard, 1 john dory, and 7 lemon-soles. As the heavy swell continued, no useful work could be done, and we proceeded to Gisborne.

Second Haul.—Weather being fine, we steamed out of Gisborne at 6.15 a.m. on the 11th February, intending to work off the coast southwards to Mahia Bay. After passing Young Nick's Head the trawl-net was shot at 7.30 a.m. in 17 fathoms. Bottom, sand and mud; the Head bearing W. by N., two miles distant. Towed on a course S.W. by S. for an hour and three-quarters, when the net was taken up off a sand bottom at a depth of 17 fathoms. Result: 3 schnapper, 15 crayfish, 1 john dory, 3 moki, 180 gurnard, 4 lemon-soles, 1 red-cod, 1 electric ray, and 2 dog-fish.

Third Haul.—After picking up at station 2, steamed out S.E. for three-quarters of an hour, and shot the net at 10 o'clock in 27 fathoms, on mud. Towed for one hour and a half, and hauled up off a mud bottom in 29 fathoms. Result: 44 gurnard, 9 lemon-soles, 1 sole, 2 flounders, 5 meg-rims, 1 john dory, 5 crayfish, 1 electric ray, and 1 elephant-fish.

Fourth Haul.—Steamed S.S.E. half an hour, and shot the net at 1.40, on a mud bottom, at a depth of 25 fathoms. Towed one hour and three-quarters, and picked up in 25 fathoms. Result: 20 crayfish, 25 gurnard, 4 stingaree, and 6 lemon-soles.

Fifth Haul.—Steamed S.W. by S. an hour, and put down the net at 2.10 p.m. in 22 fathoms, on a mud bottom. Towed W. by S. $\frac{1}{4}$ S. three-quarters of an hour, when the net came fast, and was hauled up off mud in 19 fathoms. Result: 4 crayfish, 20 gurnard, 6 lemon-soles, and 3 dog-fish.

Sixth Haul.—After repairing the net, steamed into the west corner of Mahia Bay, when the net was put over for another haul, in 10 fathoms—bottom, soft sand—at 3.30 p.m. Towed round the bay, and hauled up in $7\frac{1}{2}$ fathoms at 5.30. Result: 12 gurnard, 2 moki, and 2 stingaree.

Seventh Haul.—After picking up the net at east side of Mahia Bay, steamed due north for twenty-five minutes, and put down the net at 6 o'clock in 12 fathoms, on a fine-sand bottom. Towed N. by W. for an hour and ten minutes, and hauled up in 17 fathoms off a mud bottom. Result: 120 gurnard, 6 lemon-soles, 11 crayfish, and 2 dog-fish.

Eighth Haul.—Steamed three-quarters of an hour from station 7, and shot the net at 8.10 p.m. in 23 fathoms, on mud. Towed N. by W. $\frac{1}{4}$ W. for three miles and a half, and picked up in 24 fathoms off mud. Result: 6 gurnard, 6 soles, 1 john dory, 2 tarakihi, 2 schnapper, 5 crayfish, and 2 stingaree.

Ninth Haul.—Steamed again three-quarters of an hour, and shot the net at 10.45 p.m. in 17 fathoms, on a fine-sand bottom. Towed four miles and a quarter, and hauled up half an hour after midnight off fine sand, in 18 fathoms. Result: 12 lemon-soles, 1 flounder, 12 tarakihi, 6 schnapper, 1 gurnard, and 5 crayfish.

Tenth Haul.—Left Gisborne at 5.3 a.m. on the 12th February; steamed out past Tuahina Point, and shot the net in 16 fathoms, two miles N.E. of the point, at 6.30 a.m. Bottom, sand. Towed N.E. for two hours, and picked up off mud five miles distant. Result: 68 gurnard, 12 lemon-soles, 6 crayfish, 1 john dory, and 1 skate.

Eleventh Haul.—Steamed an hour from station 10, and put down the net in 31 fathoms, on mud. Towed on the same course, N.E. $\frac{1}{4}$ N., for an hour, and hauled up three miles away off the same bottom in 36 fathoms. Result: 12 gurnard, 12 lemon-soles, 6 crayfish, 1 john dory, and 7 skate.

Twelfth Haul.—Steamed an hour and a half, and shot the net, about seven miles N.E. of Gable End Foreland, in 26 fathoms, at 12.15 p.m., on a mud bottom. Towed N. $\frac{3}{4}$ W. for an hour and ten minutes, distance four miles, and hauled up in 27 fathoms off mud. Result: 1 crayfish, 21 gurnard, 13 lemon-soles, and 1 tarakihi.

Thirteenth Haul.—Steamed into Tologa Bay, and cast the net on the north side in 7 fathoms, on a sand bottom. Towed for an hour, when the net fouled, and was taken up off a rocky bottom at 6 fathoms, with the body of the net rather badly torn. The fish taken were 45 soles, 2 lemon-soles, 28 gurnard, 1 moki, 31 crayfish. Anchored in Tologa Bay for the night.

Fourteenth Haul.—14th February, left anchorage in Tologa Bay at 5.40 a.m.; steamed south to work inshore to Gisborne. Took soundings from Pourewa Island until about three miles south of Moutara Island and Bluff. Shot the net at 7.10 a.m., about three miles S.E. of Moutara Bluff, in 20 fathoms, on sand. Towed two hours, and picked up from the same depth and bottom. Result: 54 crayfish, 66 gurnard, 1 schnapper, and 22 lemon-soles.

Fifteenth Haul.—Continued along the coast-line until past Whangaroa Island, when the net was put down at 10.15 a.m. in 21 fathoms, on a mud bottom. Towed an hour S. $\frac{3}{4}$ W., two miles and three-quarters, and picked up in 22 fathoms. Result: 1 moki, 1 schnapper, 1 crayfish, 1 john dory, 18 gurnard, 2 lemon-soles, and 2 flounders.

Sixteenth Haul.—From station 15 steamed down the coast until within about four miles of Tuahina Point, and two miles off shore. The lead showed a rocky bottom at 10 fathoms, and soundings taken seaward at short intervals into 15 fathoms; then the depth suddenly decreased to $7\frac{1}{2}$ fathoms for half a mile of rock, and as suddenly dropped down to 17 fathoms on sand. Shot the net in 18 fathoms, on sand, at 1.15 p.m., and towed S.E. $\frac{3}{4}$ S. four miles, and hauled up in 21 fathoms off sand. Result: 54 gurnard, 12 lemon-soles, 5 crayfish, 2 moki, 1 elephant-fish, and 2 dog-fish.

Seventeenth Haul.—15th February, left Gisborne at 6 a.m., and steamed round to bay immediately north of Tuahina Point. Took soundings all over this bay, but found the bottom very uncertain, the lead showing patches of sand and rocks. Twenty-five soundings were made, but, as the bottom was unsafe for trawling, the net was not put down. The net was shot in the opening of Poverty Bay in 11 fathoms, on a fine-sand bottom, at 9.35 a.m.; towed in for two hours, and hauled up two miles and a half distant in 7 fathoms. Result: 37 soles, 8 flounders, 75 gurnard, 2 crayfish, 1 schnapper, 2 elephant-fish, and 1 dog-fish.

Eighteenth Haul.—The net was shot again at noon in 7 fathoms, sand bottom, and towed close

inshore round the south corner of the bay for an hour and a half. Picked up in 6 fathoms, and boarded 150 flounders, 160 soles, 40 gurnard, 6 crayfish, 1 schnapper, 2 warehou, 10 elephant-fish, 2 dog-fish, and 1 skate.

Nineteenth Haul.—Shot the net for the last haul in Poverty Bay in 7 fathoms at 2 p.m., on a fine-sand bottom; towed close inshore four miles, and picked up in 6 fathoms. Result: 90 flounders, 92 soles, 2 red-cod, 120 gurnard, 1 moki, 1 kahawai, 2 brill, and 14 lemon-soles.

Twentieth Haul.—After coaling and refitting in Gisborne we steamed for Bay of Plenty at 3.20 a.m. on Monday, the 18th February; passed East Island at 1.30 p.m.; tested bottom in Kawakawa Roadstead and Hicks Bay; took temperatures, and anchored in Hicks Bay for the night. Left anchorage at 6 a.m. on the 20th; passed Cape Runaway at 8.30 a.m.; took soundings in Wangapararoa Bay. The lead showing a sand bottom the trawl-net was put down for a short haul at 9.35 in 15 fathoms. Towed for an hour and a half S.W. $\frac{1}{4}$ S. two miles, and E. by N. one mile and a quarter, with very poor results, only 6 gurnard and 2 dog-fish being brought up.

Twenty-first Haul.—On the 21st February the "Doto" left the anchorage in Motunui Bay at 4.30 a.m. When well up to Tauranga Heads soundings with the lead were made. A sand bottom being found in $13\frac{1}{2}$ fathoms, the trawl was put down at 3.15 p.m. Towed W. by N. $\frac{1}{2}$ N. for forty-five minutes, when the net fouled a rock and was taken up, when it was found to contain only 4 lemon-soles and 2 gurnard, and we put into Tauranga for water.

Twenty-second Haul.—Leaving Tauranga at 7.30 a.m. on the 21st February, soundings were made outside the bar to the N.E. of Maunganui. The lead showing a sandy bottom, the net was shot in 5 fathoms at 9 a.m. Towed N.W. by W. $\frac{3}{4}$ W. about a mile off shore for two hours, making four miles and three-quarters, and when hauled up off sand 20 schnapper, 22 gurnard, 2 john dory, 1 flounder, and 4 dog-fish were bagged.

Twenty-third Haul.—Proceeded to within two miles south of Katikati Bluff, where the net was shot at noon, on sand, in 10 fathoms. Towed W.N.W. inshore two miles and three-quarters, until close up to the bar in 5 fathoms, and off shore again into 10 fathoms, when it was picked up at 2 p.m., resulting in the capture of only 2 brill, 7 gurnard, and 2 dog-fish.

Twenty-fourth Haul.—From picking up the net at station 23, a line of soundings was made due east into 32 fathoms, and from thence inshore into 15 fathoms. At this depth the bottom dredge was put down, and towed for a mile N.E. $\frac{1}{2}$ E. When taken up it contained only a small quantity of sand, broken shells, and a few white shells. As the weather threatened a strong south-east gale, and a heavy swell getting up, the "Doto" returned to Tauranga.

Twenty-fifth Haul.—On Friday and Saturday, the 22nd and 23rd February, all shipping in Tauranga was suspended owing to the gale and heavy sea; and on Monday, the 25th, we left Tauranga at 7 a.m., intending to work from Tauranga Heads to Mayor Island, but a strong easterly wind and choppy sea prevented the trawl-net being put down. Took soundings along the route, and sheltered in the bay on the west side of Slipper Island all night. At 4.40 a.m. on the 26th the anchor was lifted, and a bad sea encountered until past Ohena Island. When past Tepahi Point, abreast of Great Mercury Island, the trawl-net was shot in $11\frac{1}{2}$ fathoms, on a sand bottom, at 8.45 a.m., and towed W. $\frac{3}{4}$ S. for the opening of Kennedy Bay for an hour and three-quarters over four miles. When picked up the net contained only 6 leather-jackets and a large crayfish.

Twenty-sixth Haul.—After picking up at 25, steamed past Cape Colville, from whence soundings were taken to Whangaparaoa Peninsula, where the anchor was dropped for the night, and lifted at 5.30 a.m. on the 27th. A short distance from the anchorage the net was dropped on a mud bottom in $7\frac{1}{2}$ fathoms, and picked up off similar ground in 8 fathoms, having been towed W. S.W. $\frac{3}{4}$ W. two miles and a half, and N. $\frac{3}{4}$ W. two miles round the head of Whangaparaoa Bay. Result: 30 schnapper, 20 gurnard, 2 lemon-soles, 2 leather-jackets, and 1 large whip-ray. The bottom throughout this haul was mud.

Twenty-seventh Haul.—Shot the net again near where it was last hauled up, and towed into the opening between Motuora and Horora Islands, taking a course E. $\frac{3}{4}$ N. two miles, and N. by W. $\frac{3}{4}$ W. two miles and a half, the depth being about 8 fathoms. This haul yielded 36 schnapper, 4 lemon-soles, 30 gurnard, and 2 john dory.

Twenty-eighth Haul.—From picking up at 27, headed for Tiri Tiri Matangi, and put down the net off Wanga Point in 13 fathoms at 10.30 a.m., on a blue-mud bottom. Towed an hour and three-quarters S.E. for four miles and a quarter, and picked up off mud in 14 fathoms. Result: 21 schnapper, 2 lemon-soles, 18 gurnard, 8 dog-fish, 1 stingaree, and 2 cat-fish.

Twenty-ninth Haul.—Steamed through the channel between Tiri Tiri and Whangaparaoa Peninsula, and shot the net at 1 p.m., on a blue-mud bottom, in 10 fathoms. Towed S.W. $\frac{1}{4}$ S. for an hour and three-quarters, and picked up four miles and a quarter off in 9 fathoms. Result: 168 schnapper, 1 lemon-sole, 135 gurnard, 5 john dory, and 2 dog-fish.

Thirtieth Haul.—Steamed a short distance from last position, and put down the net in 8 fathoms at 2.50 p.m., on a mud bottom. Towed for an hour and a half S. $\frac{1}{2}$ E., and picked up the net in 7 fathoms off blue mud three miles and three-quarters away. It contained 253 schnapper, 190 gurnard, 2 john dory, 2 small flounders, and 1 stingaree.

Thirty-first Haul.—Having coaled and repaired gear in Auckland on the 28th February, left at 5 a.m. on the 1st March. The net was put down north of Rangitoto Island in 8 fathoms at 6.20 a.m., and towed N.W. $\frac{1}{4}$ N. for an hour and a half over a mud bottom. The result of this haul of three miles and a quarter was 193 schnapper, 21 gurnard, and 2 dog-fish.

Thirty-second Haul.—Shot the net again four miles N.E. of Rokino Island in 15 fathoms at 8.10, on a mud bottom, and towed N.E. $\frac{1}{2}$ N. an hour and a half, picking up in 21 fathoms, distant four miles. Result: 179 schnapper, 39 gurnard, 2 lemon-soles, and a large electric ray.

Thirty-third Haul.—The wind having increased to a gale, further work in the direction of Cape Colville was impossible, and we ran for shelter to Waiheke Island, testing the bottom along the line.

Under the shelter of this island the net was put down three miles east of Rokino in 10 fathoms, and picked up after an hour and a half towing in 11 fathoms, the whole three miles traversed being mud. Result: 43 gurnard, 2 lemon-soles, 59 schnapper. Further work was impossible owing to the gale, and we ran to Otangi Bay to shelter for the night.

Thirty-fourth Haul.—Lifted anchor at 5.40 a.m., and shot the net, five miles due north from anchorage, at 6.20 in 18 fathoms, mud. Towed N. $\frac{1}{2}$ E. for an hour and a half into 24 fathoms, and picked up. Result: 43 schnapper, 49 gurnard, 6 john dory, 2 lemon-soles, 10 flounders, 1 crayfish, 1 dog-fish, 1 stingaree.

Thirty-fifth Haul.—Steamed a short distance from last station, and put down the net in 23 fathoms, on mud, at 8. a.m. Towed N.E. $\frac{3}{4}$ E. four miles and a quarter, and picked up in 24 fathoms. This haul yielded 60 schnapper, 90 gurnard, 3 john dory, 4 lemon-soles, and 1 stingaree.

Thirty-sixth Haul.—Steamed S.E. about five miles, and shot the net in 22 fathoms, on mud. Towed an hour S. by E. $\frac{1}{4}$ E., and picked up three miles away in 21 fathoms. Result: 21 schnapper, 30 gurnard, 4 lemon-soles, 2 john dory, 3 sharks, and 1 dog-fish.

Thirty-seventh Haul.—From station 36 took soundings down to the entrance to Waiheke Channel, and when through the channel into Tamaki Straits the net was shot south of Passage Rock in 4 fathoms at 1.40 p.m.; bottom, soft mud. Towed westward towards Rangitoto for an hour and three-quarters, and hauled up in 4 fathoms. The net was full of grass and weeds, and the fish taken were 109 gurnard, 27 schnapper, 1 flounder, and 1 stingaree. Returned to Auckland.

Thirty-eighth Haul.—After taking in coal and water, and repairing gear, left Auckland on the 4th March at 3 p.m. Passing to the south of Rangitoto Island, and finding good broken-shell bottom in the Motuihi Channel, the trawl-net was put down in 6 fathoms at 6.50 p.m. Towed an hour and a half E. $\frac{1}{4}$ N. a mile and a quarter, and N. by W. a mile and three-quarters, and was taken up from 10 fathoms, the net containing 165 good schnapper, 10 gurnard, and 20 dog-fish.

Thirty-ninth Haul.—Weighed anchor at 4.40 a.m. on the 5th March, and steamed N.E. from Motuihi Channel for two hours and a half; sounded 26 fathoms, and a green-mud bottom. Steamed another half-hour, and shot the net on a mud bottom in 26 fathoms at 7.45 a.m. Towed N. $\frac{3}{4}$ E. four miles, and hauled up, the net containing only 6 small schnapper, 3 john dory, 8 leather-jackets, and an octopus.

Fortieth Haul.—Took soundings on to within two miles and a half of Pirogue Rocks; shot the net in 23 fathoms, on a sand-and-shell bottom, at 10.50 a.m., six miles and a half S.W. of Whangaparapara Harbour, and towed in towards the entrance in a N. by E. $\frac{3}{4}$ E. direction for three miles, when the net was hauled up from 23 fathoms, sand-and-shell bottom, but contained only 14 lemon-soles, a few small schnapper, dog-fish, leather-jackets, and an octopus.

Forty-first Haul.—The net was put over again after soundings were made round Pirogue Rocks, off Okupu Bay, and out until Port Tryphena opened out at 3.20 p.m., four miles S.W. of the north head of the bay, and towed in N.E. by E. $\frac{3}{4}$ E. towards the south head. The net was shot in 22 fathoms on a sand bottom, towed four miles, and hauled up from the same depth; but the result was only two or three soles, schnapper, and leather-jackets.

Forty-second Haul.—Weighed anchor in Tryphena Bay at 5.45 a.m. on the 6th March; took soundings half-way across the channel to Cape Colville; and cast the net five miles south of the cape in 26 fathoms, on a sand-and-shell bottom, at 9.10 a.m. Towed two miles and a half S.W. by S. $\frac{1}{2}$ S., and hauled up from the same depth at 10.15 a.m., with the disappointing result of only 4 lemon-soles, 3 schnapper, and a few leather-jackets; but the net contained also a lot of marine growth.

Forty-third Haul.—Put down the net again N.W. by N. of Huieh Island, and distant about three miles and a half, in 15 fathoms. It was towed E. $\frac{3}{4}$ N. three miles and a half over a mud bottom into 7 fathoms towards the centre of Cabbage Bay opening, and when picked up was found to contain 200 schnapper, 25 gurnard, 21 lemon-soles, and 4 dog-fish.

Forty-fourth Haul.—Shot again off the opening of Cabbage Bay in 8 fathoms at 12.45 p.m. Towed E. $\frac{1}{2}$ N. a mile and three-quarters, and S. $\frac{1}{2}$ W. a mile and a quarter, picking up in 9 $\frac{1}{2}$ fathoms. Result: 171 schnapper, 11 gurnard, 4 lemon-soles, and 7 flounders.

Forty-fifth Haul.—Continued working south through the Firth of Thames, and shot again on a mud bottom in 20 fathoms. Towed S.E. by S. $\frac{1}{2}$ S. until abreast of Waimate Island, four miles, and hauled up in 21 fathoms, finding 100 schnapper, 26 gurnard, 1 john dory, 2 lemon-soles, 4 flounders, 2 stingaree, 2 dog-fish, and 1 shark. Anchored for the night in Coromandel Bay.

Forty-sixth Haul.—Left anchorage in Coromandel Bay at 6.15 a.m. on the 7th, and shot the net off the harbour-mouth in 19 fathoms, on mud. Towed S.E. three miles until abreast of Manaia Bay, and hauled in a fair catch, from 15 fathoms, of 208 schnapper, 38 gurnard, 2 lemon-soles, 12 flounders, 1 trevalli, 1 blue-cod, 1 john dory, 2 stingaree, and a lot of large mussels.

Forty-seventh Haul.—Steamed a short distance from last station, and shot the net south of Kirita Bay, three miles off shore, in 18 fathoms, on a sand bottom, at 8.15 a.m., and picked up off soft mud in 9 fathoms, having towed five miles S.E. $\frac{1}{4}$ E., and resulting in the satisfactory haul of 593 schnapper, 187 gurnard, 12 flounders, 9 lemon-soles, 2 john dory, 1 shark, and 6 dog-fish.

Forty-eighth Haul.—Put down the net again at 11.10 a.m., four miles west of Waikawa River. Towed S.E. $\frac{1}{2}$ E. five miles, and picked up in 6 fathoms, yielding the large bag of 860 schnapper, 139 gurnard, 5 lemon-soles, 20 flounders, 3 john dory, 4 stingaree, 1 shark, and 6 dog-fish.

Forty-ninth Haul.—A stiff N.W. wind blowing down the bay compelled us to work closer in to the western shore. The net was put over at 1.30 p.m. Towed N.W. by W. $\frac{3}{4}$ W. four miles, and hauled in out of 12 fathoms, containing 307 schnapper, 76 gurnard, 14 flounders, 6 lemon-soles, 2 john dory, and 9 dog-fish. Anchored for the night off Ponui Island.

Fiftieth Haul.—Weighed anchor at 5 a.m. on the 8th March, and put down the net off Ponui Island, in 10 fathoms, on mud bottom. Towed three miles N. by W. $\frac{1}{2}$ W., and hauled up off mud in 8 fathoms. Result: 39 large schnapper, 9 gurnard, 2 flounders, 2 lemon-soles, 1 john dory, 2 dog-fish, and 2 stingaree.

Fifty-first Haul.—Put down the net again a short distance from last station in 11 fathoms, on a similar bottom, and towed four miles S.E. by E. $\frac{1}{4}$ E., and hauled out of 12 fathoms, when 259 schnapper, 73 gurnard, 16 flounders, 1 john dory, $\frac{1}{4}$ dog-fish, and 2 stingaree were found.

Fifty-second Haul.—Shot the net again abreast of Tapu River, two miles off shore, in 6 fathoms, on mud, at 9.25 a.m. Towed four miles into 8 fathoms, taking 180 schnapper, 36 gurnard, 11 flounders, 9 stingaree, and 8 dog-fish.

Fifty-third Haul.—Shot the net in 5 fathoms, on a mud bottom. Towed four miles W. $\frac{1}{4}$ S., and when picked up in 7 fathoms it contained 176 schnapper, 76 gurnard, 42 flounders, 4 john dory, 8 dog-fish, 2 stingaree, and a lot of large mussels.

Fifty-fourth Haul.—Put down the net for the last haul before returning to Auckland in 6 fathoms at 1.45 p.m. Towed four miles, and picked up off a mud bottom. Result: 120 schnapper, 52 gurnard, 22 flounders, 1 trevalli, 2 john dory, 2 large stingaree, 10 dog-fish, and a large quantity of mussels.

Returned to Auckland on Saturday, the 9th March, and, the weather being unfit for trawling on Monday, Tuesday, and Wednesday, repairs to pumps and gear were effected, and coal and water taken in. Left Auckland at 8 a.m. on Thursday, the 13th, for Whangarei, arriving at the outer anchorage at 7 p.m.

Fifty-fifth Haul.—Left the anchorage at 6 a.m. on the 14th, and dropped the net at 6.30 outside in 5 fathoms, on a sand bottom. Towed three miles S.W. $\frac{3}{4}$ S., and picked up from 9 fathoms, with the very poor result of 3 schnapper and 1 leather-jacket.

Fifty-sixth Haul.—Steamed about three miles down the coast, and put over the net in 10 fathoms, on a sand bottom. Towed three miles S. by E. $\frac{1}{4}$ E. into 9 fathoms, and hauled up the net with absolutely nothing in it.

Fifty-seventh Haul.—Shot the net again a short distance from the last station in 9 fathoms, on sand. Towed another three miles N.E. by E. $\frac{3}{4}$ E., and got only 6 schnapper, 4 gurnard, 4 leather-jackets, and 2 dog-fish.

Fifty-eighth Haul.—Another cast of the net was made in 19 fathoms, and towed into 25 fathoms, four miles N. by W., with similarly poor results, only 2 john dory and 6 lemon-soles coming up with the net.

Fifty-ninth Haul.—Left Whangarei at 6 a.m. on the 15th for Kaipara, *via* Russell, arriving there at 4.45 p.m.; but when near the Russell Wharf the "Doto's" tail-shaft gave way in the stern gland, and she was not again ready for work till the 27th, when she left for Kaipara. During the time the "Doto" was laid up for repairs I made an inspection of the oyster-beds near Russell and in the Hauraki Gulf, and joined the "Doto" on her arrival at Helensville on the 30th March. Left Helensville in the "Doto" at 9 a.m. on the 1st April for Kaipara Channel, and shot the net some distance below Aotea Point. Towed down the stream with the ebb tide, from $2\frac{1}{2}$ fathoms, on a sand bottom, and after towing an hour and a half picked up in 7 fathoms, with the poor result of 25 schnapper, 9 gurnard, 6 flounders, 7 soles, 3 stingaree, 7 dog-fish, and a few oysters.

Sixtieth Haul.—As very strong tide currents are experienced in this inlet, the trawl-net has to be towed with the current. This necessitates shifting ground to suit the tides. To take advantage of these conditions we made for the north of Okaka Head, and the net was shot there at 2.30 p.m., on a sand bottom, in 7 fathoms. Towed an hour and a half up-channel, and picked up in 8 fathoms, with another poor result of only 14 gurnard, 12 schnapper, and a dog-fish.

Sixty-first Haul.—Shot again with the flood-tide at 4 p.m. Towed an hour and twenty minutes, and hauled up in 9 fathoms, netting 32 large schnapper, 15 gurnard, 11 flounders, 11 soles, 1 trevalli, and 2 large stingaree.

Sixty-second Haul.—Weighed anchor at 6 a.m. on the 2nd April, and crossed on to the Omokoiti flats, when the net was put down two hours before high water in $1\frac{1}{2}$ fathoms, on a soft-sand bottom. Towed an hour and a half, and picked up in 3 fathoms. Result: 62 large schnapper, 19 gurnard, 14 flounders, 13 soles, 2 trevalli, and 2 cat-fish.

Sixty-third Haul.—Shot the net again in 5 fathoms. Towed an hour and a quarter, picking up from 10 fathoms in the Kaipara Channel, and netting 21 schnapper, 10 gurnard, 12 flounders, 11 soles, and 2 dog-fish.

Sixty-fourth Haul.—The next shot was made abreast of Pouto Point in 5 fathoms, and the net towed up Otamatea Channel for an hour and a half, and hauled up from 8 fathoms, with 9 large schnapper, 4 gurnard, 6 flounders, 2 soles, and a dog-fish.

Sixty-fifth Haul.—Dropped the net again in the channel in 12 fathoms, and towed up-stream for an hour and a quarter, picking up in 9 fathoms, and netting 9 schnapper, 4 gurnard, 6 flounders, 2 soles, and a dog-fish. Anchored in channel off Batley.

Sixty-sixth Haul.—On the 3rd bad weather prevented our leaving the anchorage, and on the 4th we went on to Aratapu for coal, leaving there again on the 5th to work the coast from Kaipara Heads to Manukau. Three miles from Pouto Point the "Doto" got on to a mud-bank, and remained there till the rising tide floated her off at 8 p.m. The net was put down in 7 fathoms at 9 p.m., towed an hour over sand, and hauled in from 12 fathoms. Result: 39 large schnapper, 27 gurnard, 14 flounders, 9 soles, and 4 trevalli.

Sixty-seventh Haul.—Lifted the anchor near Pouto Point at 4.30 a.m. on the 6th April, and shot the net when well clear of the inner Kaipara bar, and towed S.E. by S. three miles over the end of the southern shoals, the depth varying from 5 to 7 fathoms, over a sand bottom. Result: 49 large schnapper, 38 gurnard, 2 john dory, 3 dog-fish.

Sixty-eighth Haul.—A short distance from the last station it was shot again in 8 fathoms, on a clean sand bottom. Towed E. by S. $\frac{1}{4}$ S. four miles and a quarter, and picked up in 7 fathoms, when it contained 103 large schnapper, 98 gurnard, 3 trevalli, 2 john dory, 4 dog-fish, and 1 cat-fish.

Sixty-ninth Haul.—Put down the net again some distance from last picking-up in 13 fathoms, on dark sand. Towed S.E. $\frac{3}{4}$ S. five miles, and from 14 fathoms landed 215 schnapper, 390 gurnard, 11 soles, 7 stingaree, and 15 dog-fish.

Seventieth Haul.—Before going over the Manukau bar the net was shot in 18 fathoms at 3.30 p.m., and towed down S.E. $\frac{3}{4}$ S. to the entrance of the main channel, and was hauled up in 14 fathoms, with 97 schnapper, 109 gurnard, 9 trevalli, 15 dog-fish, and 3 stingaree.

Seventy-first Haul.—The sea outside being too rough for work, a shot was made in 15 fathoms, on dark sand, inside the heads, on the 8th April, within two hours of high water. Towed up channel, and hauled up off Puponga Point in 16 fathoms. Result: 36 schnapper, 23 gurnard, 4 soles, 6 dog-fish, and 1 stingaree.

Seventy-second Haul.—Shot again off Puponga Point in 16 fathoms, on dark sand, and towed an hour, when the net became fast, and was hauled up badly torn. It contained no fish, but a large quantity of barnacles and shells.

Seventy-third Haul.—After testing the Waiuku Channel, which was found to be quite unsuitable for trawling, we continued work in the Manukau Inlet on the 9th April. The trawl was put down just inside the heads at low water (7.25 a.m.), on a sand bottom, in $5\frac{1}{2}$ fathoms. Towed up the channel for an hour and a quarter, and picked up from 6 fathoms north of Puponga Point, with poor results—21 schnapper, 12 gurnard, and a dog-fish.

Seventy-fourth Haul.—Shot the net again north of Puponga Point in 5 fathoms at 9 a.m. Towed an hour up the Wairopa Channel with the flood tide, but the net got foul and was hauled in, containing 31 schnapper, 19 gurnard, 4 lemon-soles, 8 stingaree, and 10 dog-fish.

Seventy-fifth Haul.—Cast in the Wairopa Channel again in 6 fathoms. Towed an hour, and picked up in 4 fathoms, finding 29 schnapper, 19 gurnard, 17 trevalli, 9 tarakihi, 4 flounders, and 3 stingaree.

Seventy-sixth Haul.—Work outside being impossible owing to the bad weather, the 10th April was spent in cleaning up and taking in coal and water. The following day was also boisterous outside, and was spent in testing Papakura Channel, where the net was put down in 12 fathoms, on dark sand and shell. Towed with the tide an hour and a half, and picked up in 3 fathoms, when only 29 gurnard, 16 schnapper, 11 dog-fish, and 7 stingaree were found.

Seventy-seventh Haul.—Shot the net again in 2 fathoms, and continued towing with the tide, but getting into shoal water abreast of Hiki Hiki bank the net was hauled in after an hour and a quarter's towing, and bringing with it only 39 schnapper, 25 gurnard, 13 flounders, 7 trevalli, and 9 dog-fish.

Seventy-eighth Haul.—Getting outside Manukau Heads at 6 a.m. on the 12th April in a heavy westerly swell that made work very difficult, we shot the net at 9.30 a.m. on dark sand. Towed S. by E. $\frac{3}{4}$ E. for four miles, keeping under 9 fathoms along the coast. Hauled up at 11 a.m., and got 59 schnapper, 28 gurnard, 13 lemon-soles, 2 trevalli, and 7 dog-fish.

Seventy-ninth Haul.—Shot the net again outside Manukau bar in 10 fathoms, dark-sand bottom. Towed W. $\frac{1}{4}$ N. five miles and a quarter, picking up in 15 fathoms, with the net torn and the foot-rope broken. Result: 51 schnapper, 25 gurnard, 12 lemon-soles, 1 trevalli, and 2 dog-fish.

Eightieth Haul.—After repairing the net it was put down again at 1.30 p.m. in 15 fathoms, on sand, and towed with the swell N.E. $\frac{1}{4}$ N. towards the bar, three miles and a quarter. When hauled up at 3 o'clock it held 19 schnapper, 13 gurnard, and 3 lemon-soles. The wind and swell increasing, further experiments had to be given up for the day.

Eighty-first Haul.—Lifted anchor near Puponga Point at 5.30 on the 16th April, and found heavy swell still on, though the storm had abated; and when well down towards Waikato dropped the net on sand in 12 fathoms. Towed S. by E. $\frac{3}{4}$ E. four miles; picked up in 11 fathoms, and found 69 schnapper, 54 gurnard, 3 john dory, and 3 dog-fish.

Eighty-second Haul.—Put down the net again southwards in 15 fathoms, on sand. Towed S. by E. $\frac{1}{2}$ E. four miles into 17 fathoms, and bagged 49 schnapper, 51 gurnard, 4 lemon-soles, and 5 dog-fish.

Eighty-third Haul.—Shot the net again in 24 fathoms, on sand, and towed four miles S.E. by E.; picked up in 22 fathoms, and found 50 schnapper, 63 gurnard, 3 dog-fish, and 1 sole.

Eighty-fourth Haul.—Put inshore to 16 fathoms, and dropped the net again. Towed four miles S.E. into 17 fathoms, and hauled up 73 schnapper, 89 gurnard, 4 john dory, and 4 dog-fish.

Eighty-fifth Haul.—Shot the net once more off the mouth of the Whaingaroa Harbour at 5.30 p.m., and towed two miles and three-quarters. Result: 15 schnapper, 160 gurnard, 3 john dory, 1 trevalli, and 2 soles.

Eighty-sixth Haul.—Weighed anchor at 5.45 a.m. off Whaingaroa on the 17th April; steamed south past Waipapa Point, and shot in 18 fathoms, on sand, at 7.30 a.m. Towed S. $\frac{1}{2}$ E. three miles and three-quarters, where the net had to be hauled in owing to the heavy sea running. Result: 42 schnapper, 77 gurnard, 2 john dory, and 2 trevalli. Stormy weather compelled us to take shelter in Kawhia Harbour until 7.30 on the morning of the 20th, during which time the purse Seine net was tried in the harbour with unsatisfactory results, owing to weeds and marine growth where the net was tried.

Eighty-seventh Haul.—Crossed Kawhia bar outwards at 8 a.m. on the 20th, and put down the net in $13\frac{1}{2}$ fathoms, two miles out, on good sand. Towed N.N.W. four miles, past the opening of the Aotea Harbour, and hauled up from 17 fathoms. Result: 14 schnapper, 171 gurnard, 3 john dory, 1 sole, and 3 dog-fish.

Eighty-eighth Haul.—Dropped the net again to the N.W. in 20 fathoms at 10.25 a.m., on an even soft-sand bottom. Towed four miles S.W. by S. $\frac{1}{2}$ S. into 23 fathoms, and picked up at noon, the net containing 17 schnapper, 156 gurnard, 1 lemon-sole, and 2 dog-fish.

Eighty-ninth Haul.—Steamed south half an hour, and shot in 25 fathoms at 12.30 p.m., on soft sand. Towed S.S.E. four miles, and hauled up from 18 fathoms. Result: 53 schnapper, 113 gurnard, 3 john dory, 1 flounder, and 5 dog-fish.

Ninetieth Haul.—Steamed inside Albatross Point, and dropped the net in 15 fathoms, the bottom of fine sand continuing even. Towed into 8 fathoms towards Kawhia bar, four miles, and hauled in 19 schnapper, 148 gurnard, 3 john dory, and 4 dog-fish.

Ninety-first Haul.—Crossed the Kawhia bar inwards, and put the net over in 3 fathoms. Towed up to the anchorage at Maketu, two miles and a half. When hauled up the net contained 17 schnapper, 10 gurnard, 14 flounders, 18 moki, 10 trevalli, 1 cat-fish, and 10 dog-fish.

Ninety-second Haul.—Left Kawhia anchorage at 8 a.m. on Monday, the 22nd April, and after sounding off Albatross Point the net was put down four miles to the south of it at 9.30, on a 17-fathom soft-sand bottom. Towed S. by E. $\frac{1}{2}$ E. four miles, and hauled out of 16 fathoms, with 79 schnapper, 106 gurnard, 6 small flounders, 4 small soles, and 3 dog-fish.

Ninety-third Haul.—Steamed into 16 fathoms, shot the net, and towed S.W. by S. $\frac{1}{4}$ S. four miles into 25 fathoms, and hauled up 56 schnapper, 41 gurnard, and 4 small flounders.

Ninety-fourth Haul.—Steamed inshore and dropped the net off the mouth of the Marokopo River, in 10 $\frac{1}{2}$ fathoms, on sand. Towed four miles and a quarter S.S.W., and picked up in 9 fathoms. Result: 43 schnapper, 79 gurnard, 2 soles, and 4 dog-fish.

Ninety-fifth Haul.—Took soundings off Rua Point, and shot the net again south of it in 12 fathoms. Towed four miles and quarter into 15 fathoms S. $\frac{1}{4}$ W., and hauled in 27 schnapper, 151 gurnard, 4 john dory, 12 soles, and 2 dog-fish.

Ninety-sixth Haul.—Ran out into 25 fathoms, and dropped the net on a sand-and-shell bottom at 5.15 p.m. Towed S.W. $\frac{1}{2}$ W. into 30 fathoms, four miles, and picked up 14 schnapper, 68 gurnard, 13 lemon-soles, 18 soles, and 4 tarakihi.

Ninety-seventh Haul.—Steamed inshore to 24 fathoms, and put the net over on sand at 7.30 p.m. Towed four miles S.E. by E. $\frac{3}{4}$ E. into 15 fathoms, and at 9 o'clock picked up 39 schnapper, 56 gurnard, and 11 soles.

Ninety-eighth Haul.—Shot the net again at 9.30 p.m. in 16 fathoms, on sand. Towed S.W. $\frac{3}{4}$ S. four miles, and at midnight hauled up. Result: 25 schnapper, 34 gurnard, 7 soles, 3 john dory, and 1 shark.

Ninety-ninth Haul.—Shot again at 12.30 a.m. in 20 fathoms, on sand. Towed S.E. by E. three miles and a quarter into 17 fathoms, and brought in 14 schnapper, 29 gurnard, 1 sole, 3 stingaree, and 1 tiger-shark.

One-hundredth Haul.—Put down the net again at 3.30 a.m. in 19 fathoms, on a sand bottom, and towed four miles W.S.W. into 21 fathoms. Result: 21 schnapper, 7 soles, 3 dog-fish, and 3 stingaree.

One-hundred-and-first Haul.—Steamed inshore, and shot the net in 13 fathoms at 7.30 a.m. Towed four miles and a half S. by W., and when hauled up the net only contained 38 gurnard and 1 john dory.

One Hundred-and-second Haul.—The net was next put down off Urenui in 7 fathoms at 10 a.m. Towed W. by S. $\frac{1}{4}$ S., but a mile and a quarter from the east the net got fast, and was hauled up torn.

One Hundred-and-third Haul.—Soundings were made from where the net got fast, along the coast to Waitara, the lead showing a very rocky bottom at each sounding. When abreast of Waitara we steamed out to 17 fathoms, and, finding sand, the net was put over, but after towing twenty minutes became fast again, so we put into New Plymouth for coal.

One Hundred-and-fourth Haul.—Coaling and repairing net occupied the 24th April, and a week's stormy weather prevented further work being attempted until the 1st May, when we left the breakwater at 7.30 a.m.; sounded off the Sugar-loaves, and, finding 17 and 19 fathoms on sand, shot the net off Katikawa at 8.45. Towed S.W. by W. over an even bottom four miles, and hauled up in 17 fathoms, with the very poor result of only 36 gurnard, 1 lemon-sole, and 3 tiger-sharks.

One-hundred-and-fifth Haul.—Put out to 40 fathoms from last station, and put the net over once more at 10.45 a.m., on a sand bottom. Towed S.W. $\frac{1}{2}$ S. four miles, and hauled in from 44 fathoms, the net containing only 15 small gurnard, 2 skates, 1 lemon-sole, and 1 shark.

One-hundred-and-sixth Haul.—Shot the net again to the north-east of the last station in 42 fathoms, on sand. Towed N. by W. three miles and three-quarters, and picked up in 45 fathoms, with another poor result of only 17 gurnard, 4 lemon-soles, and 2 dog-fish.

One-hundred-and-seventh Haul.—From the last position ran a line of sounding N.E. until abreast of Waitara, when the net was put down on a good bottom in 32 fathoms. Towed N.E. $\frac{3}{4}$ N. five miles, and hauled in from 27 fathoms, with 132 gurnard, 29 lemon-soles, 3 skates, and a tiger-shark.

One-hundred-and-eighth Haul.—Shot the net again in 30 fathoms, on soft sand, at 8.30 p.m., a two-hours haul N. by E. bringing us into 29 fathoms five miles away, where 79 gurnard, 38 lemon-soles, 8 tarakihi, and 3 skates were brought in.

One-hundred-and-ninth Haul.—Put the net down again to the southward, on sand, in 26 fathoms at 11.30 p.m. Towed four miles S.E. by S $\frac{1}{4}$ S., and hauled in 22 gurnard, 15 lemon-soles, 1 skate, and 2 sharks from 17 fathoms.

One-hundred-and-tenth Haul.—Dropped the net once more in 18 fathoms, on a soft-sand bottom, at 1.30 p.m. Towed W. by S. five miles, and from 21 fathoms picked up 139 gurnard, 56 lemon-soles, 11 schnapper, 21 tarakihi, 2 skate, and 2 dog-fish.

One-hundred-and-eleventh Haul.—For the last haul of the trip the net was shot half an hour's steam from the last position, at 4 a.m. in 32 fathoms, on soft sand. Towed S.W. by W. $\frac{1}{4}$ W. five miles, and picked up at 6 a.m. from 38 fathoms. Result: 49 lemon-soles, 20 schnapper, 28 tarakihi, 1 john dory, 6 skate, and 4 sharks. Returned to New Plymouth.

One-hundred-and-twelfth Haul.—The "Doto's" charter having been allowed to expire owing to the continued illness of the captain, the "Rita" was engaged to prospect Hawke's Bay outside the parts worked by local trawlers, and a start was made on 13th May at 8 a.m. Leaving Napier Spit at that hour the net was dropped half-way to the Kidnappers in 16 fathoms at 11 o'clock, on a sand bottom. Towed E. $\frac{3}{4}$ S. four miles, and picked up in 21 fathoms. Result: 44 flounders, 12 soles, 2 john dory, 10 sharks, 64 gurnard, 3 red-cod, 1 kahawai, 3 moki, 4 schnapper, 7 tarakihi, and 15 skate.

One-hundred-and-thirteenth Haul.—Put down the net again in 25 fathoms, on soft sand, and towed into 24 fathoms, N. $\frac{3}{4}$ E. two miles and a half, picking up at 3.35 p.m. Result: 9 flounders, 16 schnapper, 24 tarakihi, 3 john dory, 110 gurnard, 1 red-cod, 9 skate, and 10 dog-fish.

One-hundred-and-fourteenth Haul.—Dropped the net again at 4 p.m. in 24 fathoms, on sand. Towed five miles N.W. by N., and in 23 fathoms hauled in 15 skate, 20 schnapper, 1 frost-fish, 5 john dory, 1 hapuku, 1 barracouta, 2 moki, 5 tarakihi, 158 gurnard, 4 flounders, 4 soles, a porcupine-fish, and a number of octopi. Returned to Napier.

One-hundred-and-fifteenth Haul.—Left the Spit at 6 a.m. on the 14th; steamed north for two hours, and shot the net on a mud bottom in 23 fathoms. Towed N.E. $\frac{1}{4}$ E. four miles into 30 fathoms, and hauled in 13 schnapper, 47 gurnard, 1 flounder, 1 megrim, 1 tarakihi, 11 skate, 5 john dory, 1 red-cod, and 1 porcupine.

One-hundred-and-sixteenth Haul.—Steamed two hours north from last station, and sounded at intervals. Dropped the net on a mud bottom at 12.30 p.m. Towed S.E. by E. $\frac{3}{4}$ E. two miles and three-quarters, when a strong north-east wind compelled us to pick up and run to Mahia Bay for shelter. The haul yielded only 10 small gurnard.

One-hundred-and-seventeenth Haul.—Put down the net in Mahia Bay at 6.45 a.m. on the 15th May, and towed S.W. by S. $\frac{3}{4}$ S. four miles over clean sand. Result: 12 schnapper, 65 gurnard, 12 flounders, 50 soles, 2 john dory, 3 skate, 4 dog-fish, 1 kahawai, and 4 trevalli.

One-hundred-and-eighteenth Haul.—Shot the net again south of the Nuhaka River in 13 fathoms, on clean sand, at 10.30 a.m. Towed W. $\frac{1}{4}$ S. four miles, and hauled up from 10 $\frac{1}{2}$ fathoms, finding 16 schnapper, 36 gurnard, 1 flounder, 9 soles, 3 trevalli, 1 dog-fish, and 1 electric-ray.

One-hundred-and-nineteenth Haul.—The net was next put down in 10 fathoms, near the entrance to Wairoa River, at 1.45 p.m., on a clean-sand bottom. Towed S.W. $\frac{1}{2}$ W. two miles and three-quarters, and S.W. $\frac{3}{4}$ S. three miles, hauling up from 9 fathoms, with 2 schnapper, 42 gurnard, 2 flounders, 16 soles, 1 kahawai, 1 skate, 1 elephant-fish, and a quantity of timber. Sounding along the coast past the Mohaka River, and finding hard bottom, the net was not put down again, and the "Rita" returned to Napier at 11 p.m.

One-hundred-and-twentieth Haul.—After prospecting the hard bank out to 10 fathoms on the 16th, finding nothing but stones or boulders, no further trawling was done, owing to bad weather, until the 19th, when at 1.45 p.m. the net was put down in 16 fathoms, two miles and a half N.W. of Bare Island, on coarse sand. Towed S. by W. four miles, and picked up in 22 fathoms. The net was full of kelp, seaweed, and sand, but also contained 6 schnapper, 71 gurnard, 4 moki, 12 tarakihi, 2 flounders, 7 soles, and 3 porcupines.

One-hundred-and-twenty-first Haul.—Lifted anchor inside the Kidnappers at 6.30 a.m., and, taking soundings, found a mud bottom three miles south of the point, where the net was shot in 24 fathoms. Towed S. $\frac{1}{2}$ W. an hour over one mile and a half, and when picked up contained 2 schnapper, 2 gurnard, 17 tarakihi, 2 john dory, 4 skate, 1 lemon-sole, and 4 dog-fish.

One-hundred-and-twenty-second Haul.—Steamed four miles N.E. of Kidnappers Point, and put down the net on a mud bottom in 35 fathoms. Towed N. $\frac{3}{4}$ E. three miles and three-quarters, but the wind having changed to the west, and a bad cross-sea coming up, the net was hauled in, containing 13 schnapper, 4 gurnard, 11 tarakihi, 1 john dory, 2 red-cod, 4 skate, and 4 dog-fish. With the bad sea running further trawling was impossible, and the "Rita" returned to Napier, arriving there at 4.30 p.m.

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

COMMON FLOUNDER (*Rhombosolea monopus*).—Taken at stations 2, 9, 15, 17, 19, 22, 30, 34, 37, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 61, 62, 63, 64, 65, 66, 75, 77, 89, 91, 92, 93, 112, 113, 114, 115, 117, 118, 119, 120.

BRILL, OR TURBOT (*Ammotretis guntheri*).—Taken at stations 19, 23.

SOLE (*Peltorhamphus novæ-zealandiæ*).—Taken at stations 3, 8, 13, 17, 18, 19, 41, 59, 61, 62, 63, 64, 65, 66, 69, 71, 83, 85, 87, 92, 94, 95, 96, 97, 98, 99, 100, 112, 114, 117, 118, 119, 120, 121.

LEMON-SOLE (*Ammotretis rostratus*).—Taken at stations 1, 2, 3, 4, 5, 7, 9, 10, 11, 12, 13, 14, 15, 16, 19, 21, 26, 27, 28, 29, 32, 33, 34, 35, 36, 40, 42, 43, 44, 45, 46, 47, 48, 49, 50, 58, 74, 78, 79, 80, 82, 88, 96, 104, 105, 106, 107, 108, 109, 110.

MEGRIM (*Ammotretis*, sp. ind.).—Taken at station 3, 115.

RED-COD (*Lotella rhacinus*).—Taken at stations 2, 19, 112, 113, 115, 122.

BLUE-COD (*Percis colias*).—Taken at station 46.

JOHN DORY (*Zeus faber*).—Taken at stations 1, 2, 3, 8, 10, 11, 15, 22, 27, 29, 30, 34, 35, 36, 39, 45, 46, 47, 48, 49, 50, 51, 53, 54, 58, 67, 68, 81, 84, 85, 86, 87, 89, 90, 95, 98, 101, 112, 113, 114, 115, 117, 119, 121, 122.

- BARRACOUTA (*Thyrsites atun*).—Taken at station 114.
- MOKI (*Latris ciliaris*).—Taken at stations 2, 6, 13, 15, 16, 19, 91, 112, 114, 120.
- TARAKIHI (*Chilodactylus macropterus*).—Taken at stations 8, 9, 12, 75, 96, 108, 110, 112, 113, 114, 115, 120, 121, 122.
- RED-GURNARD (*Trigla kumu*).—Taken at stations 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 18, 19, 20, 21, 22, 23, 26, 27, 28, 29, 30, 31, 32, 33, 34, 36, 37, 38, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 57, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 98, 99, 101, 104, 105, 106, 107, 108, 109, 110, 112, 113, 114, 115, 117, 118, 119, 120, 121, 122.
- GROPER, or HAPUKU (*Oligorus gigas*).—Taken at station 114.
- SCHNAPPER (*Pagrus unicolor*).—Taken at stations 2, 8, 9, 14, 15, 17, 18, 22, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 57, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 110, 112, 113, 114, 115, 117, 118, 120, 121, 122.
- SKATE (*Raja nasuta*).—Taken at stations 10, 11, 105, 107, 108, 109, 110, 112, 113, 114, 115, 117, 119, 121, 122.
- CRAYFISH (*Astacus fluviatilis*).—Taken at stations 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 25, 34.
- ELECTRIC RAY (*Torpedo fairchildi*).—Taken at stations 2, 3, 32, 118.
- WHIP-RAY (*Myliobatis aquila*).—Taken at station 26.
- TIGER-SHARK (*Lamna glauca*).—Taken at stations 99, 101, 107.
- DOG-FISH (*Scyllium laticeps*).—Taken at stations 2, 5, 7, 16, 17, 18, 20, 22, 23, 28, 29, 31, 34, 36, 38, 40, 43, 45, 47, 48, 49, 50, 51, 52, 53, 57, 59, 60, 63, 64, 65, 67, 68, 69, 70, 71, 73, 74, 76, 77, 78, 79, 81, 82, 83, 84, 87, 88, 89, 90, 91, 92, 94, 95, 97, 100, 106, 110, 113, 117, 118, 121, 122.
- CAT-FISH (*Anema monopterygium*).—Taken at stations 28, 62, 68, 91.
- ELEPHANT-FISH (*Callorhynchus antarcticus*).—Taken at stations 3, 16, 17, 18, 119.
- LEATHER-JACKET (*Monocanthus convexirostris*).—Taken at stations 25, 26, 39, 40, 41, 42, 55, 57.
- PORCUPINE-FISH (*Chilomycterus jaculiferus*).—Taken at stations 114, 115, 120.
- OCTOPUS.—Taken at stations 39, 40, 114.
- OYSTERS.—Taken at station 59.
- MUSSELS.—Taken at stations 46, 53, 54.
- SHARK.—Taken at stations 36, 45, 47, 48, 98, 105, 109, 112.
- STINGAREE (*Trigon thalassia*).—Taken at stations 4, 6, 8, 28, 30, 34, 35, 37, 45, 46, 48, 50, 51, 52, 53, 54, 59, 61, 69, 70, 71, 74, 75, 76, 100.
- TREVALLI (*Caranax georgianus*).—Taken at stations 46, 54, 61, 62, 66, 68, 70, 75, 77, 78, 79, 85, 86, 91, 117, 118.
- FROST-FISH (*Lepidopus caudatus*).—Taken at station 114.
- KAHAWAI (*Arripis salar*).—Taken at stations 19, 112, 117, 119.
- WAREHOU (*Neptonemus brama*).—Taken at station 18.

PARTICULARS OF HAULS.

No.	Date.	Hour.	Locality.	Direction trawled.	Miles from Shore.	Fathoms Depth.	Nature of Bottom.
1	9 Feb., 1901	11.20 a.m. to 1.20 p.m.	North-west of Table Cape	N.N.W.	6	18 to 22	Fine sand.
2	"	7.30 a.m. to 9.15 a.m.	Off Young Nick's Head	S.W. by W.	2	17	Sand.
3	"	10 a.m. to 11.30 a.m.	Nine miles south-east of Young Nick's Head	S.E.	5 to 7½	27 to 29	Mud.
4	"	1.40 p.m. to 3.25 p.m.	North of Table Cape	W. by S. ½ S.	10½ to 5½	25	"
5	"	2.10 p.m. to 2.55 p.m.	East of Table Cape	W. by S. ½ S.	2½ to 4½	22	"
6	"	3.30 p.m. to 5.30 p.m.	Mahia Bay	Round east side of bay	1	10 to 7½	Soft sand.
7	"	6 p.m. to 7.10 p.m.	"	N. by W.	2	12 to 17	Soft sand and mud.
8	"	8.10 p.m. to 9.40 p.m.	"	N. by W. ½ W.	1½	23 to 24	Mud.
9	"	10.45 p.m. to 12.15 a.m.	Off Tuahina Point	N.N.E.	1	17 to 18	Fine sand.
10	11, 12	6.30 a.m. to 8.30 a.m.	Off Monowai Rock	N.E. ½ N.	2 to 3½	16 to 24	Sand and mud.
11	11, 12	9.25 a.m. to 10.25 a.m.	Off Moutara Island	N. ½ W.	6½	31 to 36	Mud.
12	11, 12	12.15 p.m. to 1.30 p.m.	Tologa Bay	Inshore	3½	26	"
13	"	4 p.m. to 5 p.m.	Off Moutara Island, south-east	Coast-line	2½	7 to 6	Sand and rock.
14	"	7.10 a.m. to 9.10 a.m.	South-east of Whangara Island	S. ½ W.	2	20	Sand.
15	"	1.15 p.m. to 1.15 a.m.	East of Tuahina Point	S.E. ½ S.	2	21 to 22	Mud.
16	"	1.15 p.m. to 2.45 p.m.	Outside Poverty Bay opening	W.S.W., S.W. by W. & N.N.W.	2½ to 7	18 to 21	Sand.
17	"	9.35 a.m. to 11.15 a.m.	In Poverty Bay	Coast-line	2	11 to 7	Fine sand.
18	"	Noon to 1.30 p.m.	"	"	½	6	Sand.
19	"	2 p.m. to 3.30 p.m.	Whangaparaoa Roadstead	S.W. ½ S. and E. by N.	1	7 to 6	"
20	"	9.35 a.m. to 10.35 a.m.	Off Tauranga Heads	W. by N. ½ N.	1	15 to 13	"
21	"	3.15 p.m. to 4 p.m.	North-east of Maunganui	N.W. by W. ½ W.	2½	13½	"
22	"	9 a.m. to 11 a.m.	South-east of Katikati Bluff	N.N.W.	1½	5	"
23	"	Noon to 2 p.m.	Inside Great Mercury Island	N.E. ½ E.	1 to 3	10 to 5	"
24	"	5 p.m. to 5.30 p.m.	Whangaparaoa Bay	W. ½ S.	1½	15	Sand and shell.
25	"	8.45 p.m. to 10.30 a.m.	Between Motuora and Horora Islands	W. by S.W. and N. ½ W.	2	11½	Sand.
26	"	5.55 a.m. to 7.55 a.m.	Whanga Point to Matara Island	E. ½ N. and N. by W. ½ W.	1½ to 3½	7½ to 8	Mud.
27	"	8.10 a.m. to 10.10 a.m.	South of Whangaparaoa	N.W.	1 to 2	13 to 14	"
28	"	10.30 a.m. to 12.15 p.m.	Off Gull Point into Rangitoto Channel	S.W. ½ S.	3	10 to 9	"
29	"	1 p.m. to 2.45 p.m.	North of Rangitoto Island	S. ½ E.	2	8	"
30	"	2.50 p.m. to 4.20 p.m.	South of Tiri Tiri Island	N.W. ½ N.	2	8	"
31	1 March, 1901	6.20 a.m. to 7.50 a.m.	East of Rokino Island	Inshore	3	15 to 21	"
32	"	8.10 a.m. to 9.40 a.m.	Five miles north of Onetangi Bay	N. ½ E.	2½ to ½	10 to 11	"
33	"	11.20 a.m. to 12.50 p.m.	North of Horu Horu Island	N.E. ½ E.	5 to 9½	18 to 24	"
34	"	6.20 a.m. to 7.50 a.m.	North-east of Waitheke Island	S. by E. ½ E.	7 to 10	23 to 24	"
35	"	8 a.m. to 9.30 a.m.	South of Paesage Rock, Tamaki	W.	4 to 7	22 to 21	"
36	"	10.15 a.m. to 11.15 a.m.	West of Cape Colville	E. ½ N. and N. by W.	1	4	Soft sand.
37	"	1.40 p.m. to 3 p.m.	West of Whangaparaoa Harbour	N. ½ E.	7	6 to 10	Shell.
38	"	4.50 p.m. to 6.20 p.m.	West of Tryphena Bay	N. by E. ½ E.	23	26	Mud.
39	"	7.45 a.m. to 9 a.m.	West of Cape Colville	N.E. by E. ½ E.	7 to 4	23	Sand.
40	"	10.50 a.m. to 12.5 p.m.	West of Cape Colville	S.W. by S. ½ S.	3½ to 1½	22	Sand and shingle.
41	"	3.20 p.m. to 4.50 p.m.	West of Cabbage Bay	E. ½ N.	2 to 4½	26	Sand.
42	"	9.10 a.m. to 10.10 a.m.	West of Huich Island	E. ½ N. and S. ½ W.	3 to 1	15 to 7	Mud.
43	"	11 a.m. to 12.30 p.m.	"	S.E. by S. ½ S.	1½ to 3	8 to 9½	"
44	"	12.45 p.m. to 2 p.m.	"	"	3 to 5	20 to 21	"
45	"	3.5 p.m. to 4.35 p.m.	"	"	"	"	"

PARTICULARS OF HAULS—continued.

Hauls	Date.	Hour.	Locality.	Direction trawled.	Miles from Shore.	Fathoms Depth.	Nature of Bottom.
46	7 March, 1901	7.10 a.m. to 8.10 a.m.	West of Rangipukea Island	S.E.	4 to 6	15 to 19	Mud.
47	"	8.50 a.m. to 10 a.m.	South-west of Kiritia Bay	S.E. $\frac{1}{2}$ E.	2 $\frac{1}{2}$	18 to 9	Sand.
48	"	11.10 a.m. to 1.10 p.m.	West of Waikawa River	S.E. $\frac{1}{2}$ E.	4	6	Mud and shingle.
49	"	1.30 p.m. to 3 p.m.	East of Waimongo Pa	N.W. by W. $\frac{3}{4}$ W.	5 to 2 $\frac{1}{2}$	12	Mud.
50	"	5.30 a.m. to 6.30 a.m.	East of Ponui Island	N. by W. $\frac{3}{4}$ W.	1 $\frac{1}{2}$	10 to 8	"
51	"	7 a.m. to 8.30 a.m.	Off Titokarau Rocks	S.E. by S. $\frac{1}{2}$ E.	3 $\frac{1}{2}$	11 to 12	"
52	"	9.25 a.m. to 11.30 a.m.	West of Tapu River	Beach-line.	2 to 3	4 to 6	"
53	"	12.5 p.m. to 1.35 p.m.	North-east of Pukehau Point	W. $\frac{1}{2}$ S.	2 $\frac{1}{2}$ to 5 $\frac{1}{2}$	5 to 7	"
54	"	1.45 p.m. to 3.15 p.m.	Head of Frith of Thames	Beach-line.	2 $\frac{1}{2}$	6 to 7	"
55	"	6.30 a.m. to 7.30 a.m.	Whangarei Bay.	S.W. $\frac{1}{2}$ S.	1 to 2	5 to 9	Sand.
56	"	8.15 a.m. to 9.30 a.m.	"	S. by E. $\frac{1}{2}$ E.	1 $\frac{1}{2}$	10 to 9	"
57	"	10 a.m. to 11.15 a.m.	"	N.E. by E. $\frac{1}{2}$ E.	1 $\frac{1}{2}$ to 2 $\frac{1}{2}$	9	"
58	"	11.30 a.m. to 1 p.m.	Across opening, Whangarei Bay	N. by W.	3 to 5	19 to 25	"
59	1 April, 1901	11.15 a.m. to 12.45 p.m.	Down Kaipara Channel from Aotea Point	Midstream	2 $\frac{1}{2}$ to 7	2 $\frac{1}{2}$ to 7	"
60	"	2.30 p.m. to 4 p.m.	Down Kaipara Channel from Okaka Head	"	"	7 to 8	"
61	"	4 p.m. to 5.20 p.m.	Kaipara Channel	"	"	8 to 9	"
62	"	6.30 a.m. to 8 a.m.	Omokoiti Flats	Across flats	"	1 $\frac{1}{2}$ to 3	"
63	"	8.15 a.m. to 9.30 a.m.	"	Across flats into stream	"	5 to 10	"
64	"	2.30 p.m. to 4 p.m.	Pouito Point up Otamatea Channel	Midstream	"	5 to 8	"
65	"	4.15 p.m. to 5.30 p.m.	Otamatea Channel	"	"	12 to 9	"
66	"	9 p.m. to 10 p.m.	Pouito Point outwards	"	"	9 to 12	"
67	"	6.45 a.m. to 7.45 a.m.	Kaipara Heads	S.E. by S.	3	5 to 7	"
68	"	8 a.m. to 9.30 a.m.	South of Kaipara Heads	E. by S. $\frac{1}{2}$ S.	3	8 to 7	Dark sand.
69	"	11 a.m. to 12.30 p.m.	Off Rangarira Beach	S.E. $\frac{1}{2}$ S.	5 to 6	13 to 14	"
70	"	3.30 p.m. to 5 p.m.	West of Patera Island	S.E. $\frac{1}{2}$ S.	5 $\frac{1}{2}$	18 to 14	Sand.
71	"	10.15 a.m. to 11.30 a.m.	Inside of Manaukau Heads	Midstream	"	15 to 16	Dark sand.
72	"	11.30 a.m. to 12.30 p.m.	Puponga Point	Towards Papakura Channel	"	16	"
73	"	7.25 a.m. to 8.40 a.m.	Wairoa Channel	Round Puponga Point	"	5 $\frac{1}{2}$ to 6	"
74	"	9 a.m. to 10.15 a.m.	"	Towards Onehunga	"	5	"
75	"	10.20 a.m. to 11.20 a.m.	Papakura Channel	Up-stream	"	6 to 4	"
76	"	9.45 a.m. to 11.15 a.m.	Outside Manaukau Heads	E. by S. $\frac{1}{2}$ E.	2 to 3 $\frac{1}{2}$	12 to 3	Sand and shell.
77	"	11.35 a.m. to 12.50 p.m.	"	W. by N.	4 $\frac{1}{2}$ to 9	2	Sand.
78	"	9.30 a.m. to 11 a.m.	"	N.E. $\frac{1}{2}$ N.	8 to 4	9	Dark sand.
79	"	11.10 a.m. to 1.10 p.m.	North-east of Waikato River	S. by E. $\frac{1}{2}$ E.	3 $\frac{1}{2}$ to 4 $\frac{3}{4}$	10 to 15	"
80	"	1.30 p.m. to 3 p.m.	Off Kawa Beach	S. by E. $\frac{1}{2}$ E.	3 $\frac{1}{2}$ to 4 $\frac{3}{4}$	15 to 8	Sand.
81	"	8.30 a.m. to 10 a.m.	South-west of Kapiapia Rock	S.E. by E.	9 to 7	12 to 11	Dark sand.
82	"	11 a.m. to 12.30 p.m.	West of Rangikahu Stream	S.E. by E.	3 $\frac{1}{2}$ to 2 $\frac{1}{2}$	15 to 18	"
83	"	1.15 p.m. to 2.45 p.m.	Off Whaingaroa Harbour	Inshore	3 to 4	24 to 22	Sand.
84	"	3.30 p.m. to 4.50 p.m.	South-west of Waipapa Point	N. $\frac{1}{2}$ E.	2 to 4	17 to 16	Dark sand.
85	"	5.30 p.m. to 6.30 p.m.	North-west of Kawhia Harbour	N.N.W.	6 to 4	14 to 7	Sand.
86	"	7.30 a.m. to 9 a.m.	Inside Gannet Island	S.W. by S. $\frac{1}{2}$ S.	2 to 4	18	Dark sand.
87	"	8.30 a.m. to 10 a.m.	West of Kawhia Harbour	S.S.E.	6 to 9	13 $\frac{1}{2}$ to 17	Dark sand.
88	"	10.30 a.m. to 11.55 a.m.	Kawhia Harbour-mouth	Shore-line	5 to 2	20 to 23	Sand.
89	"	12.30 p.m. to 2 p.m.	"	"	2 to 1	25 to 18	"
90	"	2.40 p.m. to 4.25 p.m.	"	"	"	15 to 8	"

PARTICULARS OF HAULS—continued.

IN FH	Date.	Hour.	Locality.	Direction trawled.	Miles from Shore.	Fathoms Depth.	Nature of Bottom.
91	20 April, 1901	4.55 p.m. to 6. p.m.	Inside Kawhia Harbour ..	Up-channel	..	3	Sand.
92	"	9.30 a.m. to 11 a.m.	South of Albatross Point ..	S. by E. $\frac{1}{2}$ E.	3	13 to 16	Soft sand.
93	"	11.30 a.m. to 1 p.m.	Three miles south-east of Albatross Point ..	S.W. by S. $\frac{1}{4}$ S.	4 to 6 $\frac{1}{2}$	25 to 28	"
94	"	1.50 p.m. to 3.20 p.m.	Off Marakopa River ..	S.S.W.	1 $\frac{1}{2}$	10 $\frac{1}{2}$ to 9	"
95	"	4 p.m. to 5.30 p.m.	Off Te Manku Point ..	S. $\frac{1}{2}$ W.	2 to 2 $\frac{1}{2}$	12	"
96	"	6.15 p.m. to 7.30 p.m.	West of Tokorara Point ..	S.W. $\frac{1}{2}$ W.	7 to 11	25 to 30	"
97	"	8.15 p.m. to 9.30 p.m.	North-east of Awakino River ..	S.E. by E. $\frac{1}{2}$ E.	7 to 8 $\frac{1}{2}$	24 to 15	"
98	"	10 p.m. to midnight	West of Awakino River ..	S.W. $\frac{3}{4}$ S.	4 to 6	18 to 20	"
99	"	12.30 a.m. to 3 a.m.	South-west of Moku River ..	S.E. by E.	9 to 5 $\frac{1}{2}$	20 to 17	"
100	"	3.30 a.m. to 6 a.m.	West of White Cliffs ..	W.S.W.	6 to 8	19 to 21	"
101	"	7.30 a.m. to 9 a.m.	Off Pukearuru Beach ..	S. by W.	2 $\frac{1}{2}$ to 1 $\frac{1}{2}$	13 to 7	"
102	"	10 a.m. to 10.20 a.m.	Off Urenui ..	W. by S. $\frac{1}{4}$ S.	1	7	Sand and rock.
103	"	11.30 a.m. to 11.50 a.m.	Off Waitara ..	N.W. $\frac{3}{4}$ W.	2 $\frac{1}{2}$ to 3 $\frac{1}{2}$	17	"
104	1 May, 1901	8.45 a.m. to 10.15 a.m.	Off Timaru Stream ..	S.W. by W.	1 $\frac{1}{2}$ to 2 $\frac{1}{2}$	20 to 17	Sand.
105	"	10.45 a.m. to 12.15 p.m.	Off Okato Beach ..	S.W. $\frac{1}{2}$ W.	3 to 5 $\frac{1}{2}$	40	"
106	"	1.15 p.m. to 2.30 p.m.	Off Timaru Beach ..	N. by W.	5 to 8	42	"
107	"	6 p.m. to 8 p.m.	North-west of Waitara ..	N.E. $\frac{3}{4}$ N.	8 to 11	32 to 27	"
108	"	8.30 p.m. to 10.30 p.m.	South-west of Moku River ..	N. by E.	13 to 10	30 to 29	"
109	"	11.30 p.m. to 1 a.m.	Off Urenui ..	S.E. by S. $\frac{1}{4}$ S.	8 to 5	26 to 17	"
110	"	1.30 a.m. to 3.30 a.m.	Off Puketapu Reef ..	W. by S.	4 $\frac{1}{2}$ to 5 $\frac{1}{2}$	18 to 21	"
111	"	4 a.m. to 6 a.m.	North of Cape Kidnappers ..	S.W. by W. $\frac{1}{4}$ W.	5 to 7	32 to 38	"
112	"	11 a.m. to 1 p.m.	"	E. $\frac{3}{4}$ S.	5	16 to 21	"
113	"	1.35 p.m. to 3.35 p.m.	"	N. $\frac{1}{2}$ E.	5 to 8	25 to 24	"
114	"	4 p.m. to 6 p.m.	"	N.W. by N.	8 to 11	24 to 23	"
115	"	8 a.m. to 10 a.m.	North-east of Napier ..	N.E. $\frac{1}{2}$ E.	10 to 14	23 to 30	Mud.
116	"	12.30 p.m. to 1.45 p.m.	South-east of Wairoa River, Hawke's Bay ..	S. by E. $\frac{1}{2}$ E.	10 to 12	35	"
117	"	6.45 a.m. to 8.45 a.m.	Mahia Bay ..	S.W. by S. $\frac{3}{4}$ S.	$\frac{1}{2}$ to 2 $\frac{1}{2}$	5 to 14	Sand.
118	"	10.15 a.m. to 12.15 p.m.	Off Whakaki River, Hawke's Bay ..	W. $\frac{1}{2}$ S.	2	13 to 10 $\frac{1}{2}$	"
119	"	1.45 p.m. to 3.45 p.m.	Off Wairoa River ..	S.W. $\frac{1}{2}$ W.	2 to 3	10 to 9	"
120	"	1.45 p.m. to 3.45 p.m.	North of Bare Island ..	S. by W.	1 $\frac{1}{2}$	16 to 22	"
121	"	7.55 a.m. to 9 a.m.	South of Cape Kidnappers ..	S. $\frac{1}{2}$ W.	1 $\frac{1}{2}$ to 3	24	Mud.
122	"	11 a.m. to noon ..	North-east of Cape Kidnappers ..	N. $\frac{3}{4}$ E.	4 to 7	35 to 34	"

PARTICULARS OF SOUNDING-STATIONS.

No.	Locality.	Fathoms Depth.	Nature of Bottom.	No.	Locality.	Fathoms Depth.	Nature of Bottom.
1	Six miles south-east of Young Nick's Head	25	Mud.	57	Hauraki Gulf	26	Green mud.
2	Eight miles north-east of Table Cape	28	"	58	"	21	"
3	Four miles E. by S. of False Gable	27	"	59	"	24	"
4	Six miles E. by N. of False Gable	30	"	60	"	24	Sand & shell.
5	Between Sporing's Island and Moutara Bluff	7	Stones.	61	Off Great Barrier Island ..	20	Sand.
6	Off Moutara Island	10	Rock.	62	"	21	Mud.
7	Two miles south-east of Moutara Island	13	"	63	Okupu Bay (Great Barrier)	22	"
8	Wainui Bay	10	"	64	"	22	"
9	"	10 $\frac{1}{2}$	"	65	"	21	Sand.
10	"	10	"	66	"	21 $\frac{1}{2}$	"
11	"	15	"	67	"	22	"
12	"	7 $\frac{1}{2}$	"	68	Off Tryphena Bay	23	Sand & shell.
13	"	17	Sand.	69	"	22	"
14	"	13	"	70	"	27	Sand.
15	"	13	"	71	South of Cape Colville ..	26	Fine gravel & shingle.
16	"	11 $\frac{1}{2}$	"	72	"	24	Sand & shell.
17	"	5	Rock.	73	"	18	Mud.
18	"	5	"	74	Off Cape Maria van Diemen	23	Sand.
19	"	5	"	75	South of Kaipara Heads ..	12	Dark sand.
20	"	5 $\frac{1}{2}$	"	76	South of Manukau Heads	17	"
21	"	5 $\frac{1}{2}$	"	77	"	20	"
22	"	6	"	78	"	21	"
23	"	6	Dark sand.	79	"	19	"
24	"	6	Rock.	80	"	13	Sand.
25	Between Tauhine Point and Young Nick's Head	15	Sand.	81	In Waiuku Channel, Manukau Inlet	15	Scoria gravel.
26	Off Iron Point	12	"	82	"	7	"
27	Hicks Bay	5	"	83	Between Manakau Head and Wai-kato	9	Dark sand.
28	Whangaparoa Bay	14	"	84	Ditto	13	"
29	Off Tauranga Heads	15	Shell & gravel.	85	Off Albatross Point	10	Sand.
30	"	14	Coarse sand.	86	"	10	"
31	Between Tauranga Heads and Katikati	11	Sand.	87	Off Rua Point	15	"
32	Off Katikati	16 $\frac{1}{2}$	"	88	"	10	"
33	"	23	Coarse sand.	89	Off Pariokarewa Point ..	10	"
34	"	24	"	90	Off coast between Urenui and Waitara	9	Rock.
35	"	27	"	91	Ditto	11	"
36	Nine miles N. by E. of Manganui Bluff	28	"	92	"	13 $\frac{1}{2}$	Sand.
37	Seven miles N. by E. of Manganui Bluff	23	"	93	South of Paratutu (Taranaki coast)	17	"
38	Six miles E. by N. of Manganui Bluff	22	"	94	"	19	"
39	Off Tauranga bar	7	Sand.	95	Off Taranaki coast	40	Soft sand.
40	Between Tauranga and Mayor Island	36	"	96	"	42	"
41	Ditto	43	"	97	"	39	"
42	Between Mayor Island and Slipper Island	No	bottom with an 80-fathom line.	98	"	46	Sand.
43	Ditto	60	Sand.	99	"	30	"
44	"	40	"	100	"	31	"
45	"	22	"	101	"	37	"
46	From Slipper Island to Whangaparoa Peninsula	28	"	102	From Napier to Mahia ..	28	"
47	Ditto	15	"	103	"	31	Mud.
48	"	14	Mud.	104	"	32	"
49	In Whangaporoa Bay	7	Rock.	105	Off Nuhaka	17	Sand.
50	In Tofino Bay	20	Mud.	106	Off Ohuia	9	"
51	"	12	"	107	Off Mohaka	8	Gravel.
52	Off Waiheke Island	10	"	108	"	10	Sand.
53	In Hauraki Gulf, between Waiheke Island and Cape Colville	24	"	109	Off Waikare River	14	Rock.
54	East of Waiheke Island	26	"	110	"	17	"
55	Entrance Waiheke Channel	22	Sand.	111	Between Tuki Tuki and Kidnappers	8	Gravel.
56	In Waiheke Channel	19	Mud.	112	"	7	"
				113	"	8	"
				114	Off Bare Island	12	Rock.
				115	"	20	"
				116	Off Kidnappers	27	"
				117	"	23	"
				118	"	33	Mud.
				119	Off North Cape	70	Sand.
				120	Off Cape Maria van Diemen	28	"

MEMORANDUM OF TEMPERATURES OBSERVED IN DIFFERENT LOCALITIES.

Date.	Locality.	Fathoms Depth.	Surface Temperature.	Bottom Temperature.	Atmospheric Temperature at Noon.
1901.			Degrees.	Degrees.	Degrees.
Jan. 25	Golden Bay	7	65	65	55
" 26	Tasman Bay	15	65	64	69
Feb. 9	Mahia Bay	17	66	64	71
" 13	Off Gable End Foreland	31	67	64	86
" 18	Off Hicks Bay	20	66	63	72
" 19	Off Motunui Bay	25	67	64	80
" 21	Off Tauranga	32	65	63	70
March 2	Between Cape Colville and Waiheke Island	24	65	64	68
" 5	Off Great Barrier Island	22	68	65	72
" 14	In Whangarei Bay	25	66	65	70
" 27	Off North Cape	70	66	61	72
" 28	Off Cape Maria van Diemen	28	63	61	70
April 6	Between Kaipara and Manukau Heads	15	64	63	71
" 20	Off Kawhia Harbour	23	62	63	59
" 22	Between Rua Point and Mokau	33	62	63	68
May 1	Off New Plymouth	43	62	61	63
" 15	In Hawke's Bay	42	58	60	58
" 20	Off Kidnappers	35	58	59	63

MEMORANDUM OF DISTANCES STEAMED AND TOWED DURING THE "DOTO'S" TRAWLING EXPEDITION, 1901.

Date.	Locality.	Miles steamed.	Miles towed.	Total.
1901.	In Tasman and Golden Bays, investigating sea-slime question	96	32	128
Jan. 31 to Feb. 3	From Nelson to Napier	293	...	293
Feb. 7, 8, 9	Napier to Mahia Peninsula	77½	...	77½
" 11, 12	Gisborne to Mahia and back	49	34½	83½
" 13, 14, 15	In Poverty Bay, and working coast to Tologa Bay	59	40	99
" 18	Gisborne to Hicks Bay	90	...	90
" 19	Hicks Bay to Motonui Bay	43½	3	46½
" 20	Motonui Bay to Tauranga	80	2	82
" 21	Off Tauranga	41	11	52
" 25	From Tauranga to Mayor Island	23	...	23
" 25	...	23	...	23
" 26	Slipper Island to Whangaparoa Peninsula	76	4	80
" 27	In Whangaparoa and Tofino Bays	17	21½	38½
Mar. 1	Tofino Bay and off Waiheke Island	20	11	31
" 2	Hauraki Gulf and through Tamaki Straits	36	15	51
" 4	Auckland to Motuihi Channel	11	3½	14½
" 5	Hauraki Gulf	44	10½	54½
" 6	...	35	13½	48½
" 7	Frith of Thames	24	17	41
" 8	...	49	21	70
" 13	Auckland to Whangarei	65	...	65
" 14	In Whangarei Bay	26	13	39
" 15	Whangarei to Russell	74	...	74
" 27, 28, 29	Russell to Kaipara and Helensville	279	...	279
April 1	Kaipara Inlet	21	11	32
" 2	...	22	13½	35½
" 4	Batley to Aratapu	30	...	30
" 5	Aratapu to Kaipara Heads	28	3	31
" 6	Kaipara Heads to Onehunga	67	14½	81½
" 8	Manukau Inlet and outside Heads	38	5½	43½
" 9	In Manukau Inlet	12	9½	21½
" 11	...	26	7	33
" 12	In Manukau Inlet and off Heads	37	13	50
" 15	...	15	...	15
" 16	Manukau to Whaingaroa	39	19	58
" 17	Whaingaroa to Kawhia	19	4	23
" 20	Kawhia Bay and coast	17	15½	32½
" 22, 23	Kawhia to New Plymouth	63	51	114
May 1, 2	Off New Plymouth and Waitara	74	38	112
" ...	From New Plymouth to Nelson	145	...	145
	Grand total of "Doto's" cruise	2,294	457	2,751

MEMORANDUM OF DISTANCES STEAMED AND TOWED BY TRAWLER "RITA" WHEN PROSPECTING HAWKE'S BAY.

Date.	Locality.	Miles steamed.	Miles towed.	Total.
May 13	From Napier and off Kidnappers	21	11½	32½
" 14	From Napier to Mahia Peninsula	44	8½	52½
" 15	Mahia to Napier	42	13	55
" 16	Napier to inside Kidnappers	20	...	20
" 18	Napier to Bare Island and north of Kidnappers	41	4	45
" 19, 20	"	30	5½	35½
	Grand total of "Rita's" cruise...	198	42½	240½

DEAR MR. AYSON,—

24th July, 1901.

I have been requested by Messrs. Thomson and Hamilton to write a preliminary report on the zoological results of this last trawling expedition in the s.s. "Doto."

Unfortunately, we have all been too busy to work up the collections thoroughly; but although the results are poor as compared with those of last year, the few specimens captured are of great interest, and many of them are, as far as we can ascertain at present, new to science—at any rate, have not hitherto been recorded from the New Zealand area.

ANTHOZOA.

In addition to the corals *Flabellum* and *Cyllocia*, an important find is a second species of *Alcyonium*, of which a distinct species was dredged in 1900.

ECHINODERMA.

The common heart-urchin (*Echinocardium zealandicum*), a young *Asterias calamaria*, and the rare *Astropecten edwardsii* of Verrill were the only representatives.

ANNELIDA.

In addition to *Eunice leuconuchalis* that was described by me in last year's report, there are species of *Nereis*, *Eunice*, and *Trophonia*—a poor selection compared with the rich results of last year.

CRUSTACEA.

Several new species of crabs appear to have been obtained which Mr. Thomson has not yet had time to examine. There are also shrimps and prawns. *Hippolyte*, *Leander*, and *Crangon* common everywhere; whale-feed (*Grimothea*), with two species of *Idotea*, one of *Cassinia*, and the peculiar form of amphipod met with last year, but not yet named.

MOLLUSCA.

In addition to a few common shells, some handsome sea-slugs—*Nudibranchiata*—have been captured. These appear to be new to the colony: (1) A white one with orange spots; (2) a grey one with yellow spots; (3) a purplish one. A genus (*Tritonia*) hitherto unrecorded was dredged off the East Coast.

TUNICATA.

A new species of the peculiar compound ascidian *Colella* was obtained from the Hauraki Gulf.

FISHES.

Amongst the half-dozen of small fish, one, *Scorpaena plebeia*, is a rarity.

It is certainly a surprising fact that so few of the lower invertebrates were captured.

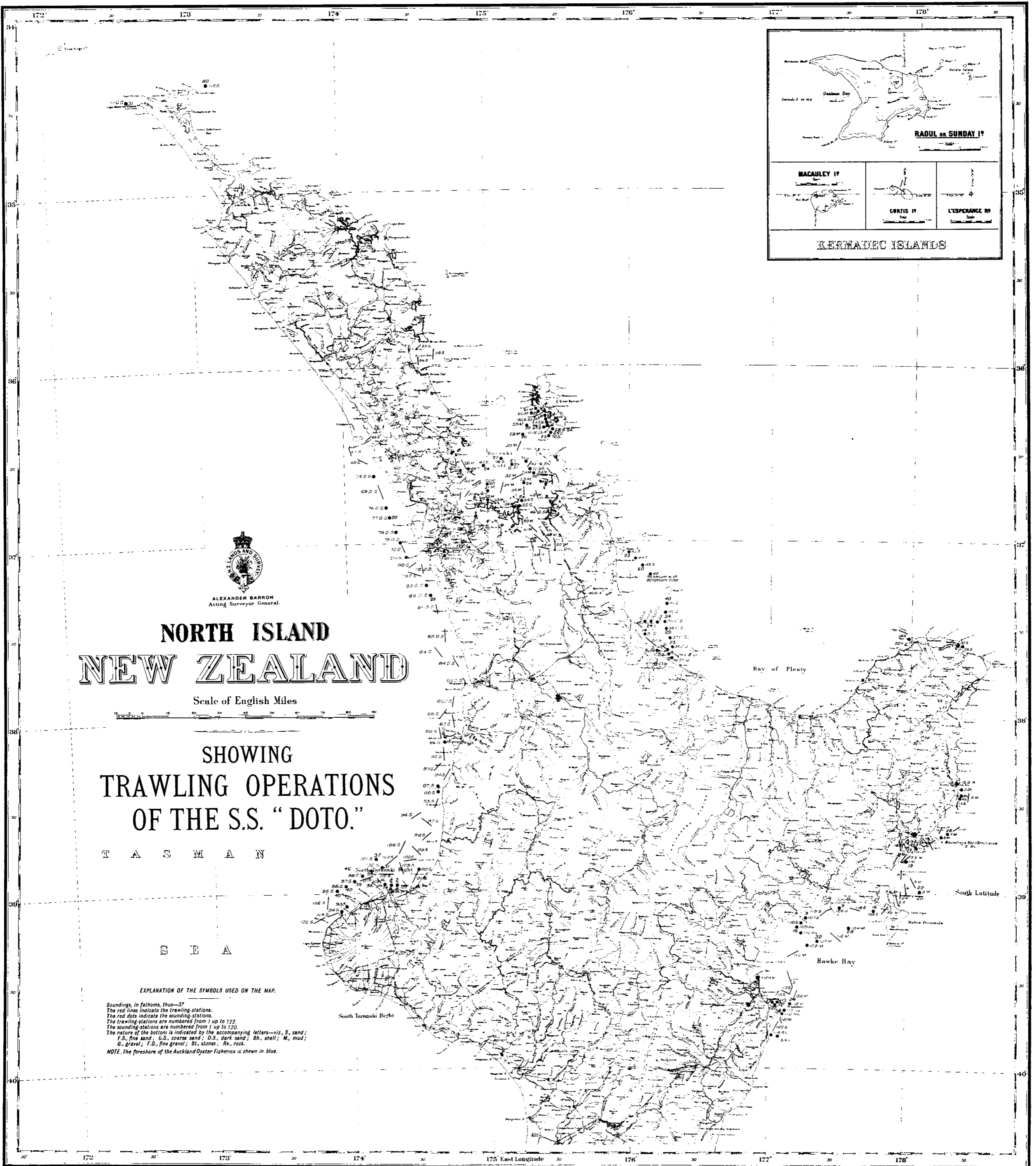
I am, &c.,

W. B. BENHAM,
Professor of Biology in the University of Otago.

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ALEXANDER BARRON
Acting Surveyor General.

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—37
The red lines indicate the trawling-stations.
The red dots indicate the sounding-stations.
The trawling-stations are numbered from 1 up to 122.
The sounding-stations are numbered from 1 up to 120.
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.
NOTE. The foreshore of the Auckland Oyster Fisheries is shown in blue.

