This species is founded on the remarkable foliage, which is quite different from that of any other species, and notably so from that of C. vernicosa, with which it is closely allied. The broad, glabrous, strongly-ribbed, acutely-toothed leaves make it a totally different plant in appearance, and, though the head does not differ materially from that of C. vernicosa, the general appearance of the scape is different. In place of the narrow shining bracts, the tip of each of which reaches the base of the next, the broad serrate bracts of this species, set on a much stouter scape dusted with tomentum hairs, considerably overlap those above them. In one of my specimens the scape is branched, and carries two heads.

This species was discovered by my brother, Mr. Martin Chapman, of Wellington, when we were out together on a small piece of level country, near a large rock marked on the chart, in the vicinity of Venus Cove, Perseverance Harbour, Campbell Island, and I have named it from the locality. We found about a dozen plants in the space of an acre here, and none beyond. I have found it difficult to keep in cultivation.

Art. XLIV.—Further Notes on the Three Kings Islands.


[Read before the Auckland Institute, 3rd November, 1890.]

Plates XXXVII., XXXVIII.

In the spring of 1887, when returning from the Kermadec Islands in the Colonial Government steamer "Stella," I was granted an opportunity of landing on the main island of the Three Kings group, the natural productions of which were previously quite unknown. My visit was limited to three or four hours; but sufficient information was obtained to make it apparent that the group was worth a more careful examination. The notes made on this occasion were embodied in a paper read before this Institute, and printed in vol. xx. of the Transactions.*

It was not long before another opportunity of visiting the group arose. In the spring of 1889 great quantities of wreckage were washed ashore between the North Cape and Cape Maria van Diemen, and elsewhere on the northern coasts of the province. This wreckage was identified as belonging to a missing

ship called the "County of Carnarvon," and, as it was supposed that she might have run upon the Three Kings, and that some of the crew might have reached the islands, the Government determined to despatch the "Hinemoa" to search the group. On applying to the Marine Department, I was very courteously granted permission to accompany the steamer. I now propose to give a description of the physical features of the group, accompanied with some general remarks on the vegetation, and a list of the species observed. In doing this, I shall avoid as far as is possible repeating matter published in my former paper.

The Three Kings Islands were discovered by the celebrated Dutch navigator Tasman on the 5th January, 1643. According to the "New Zealand Pilot," they are situated about thirty-eight miles west-north-west of Cape Maria van Diemen, and occupy a space of about eight miles in an east-north-east and west-north-west direction. Cape Morton Jones, the northern extreme, is in latitude 34° 6' 20" S., longitude 172° 9' 45" W. The group consists of one large island, which is distinguished by the name of the Great King, a smaller island to the north-east known as the East King, another to the west called the West King, and on the western or outer side of this, a group which has been named the Princes Islands, and which consists of a row of eight or nine rocks terminated by a small island.

Leaving our anchorage off Cape Maria van Diemen about 2 o'clock in the morning, we were abreast of the Princes Islands at daylight. As the weather was beautifully fine, Captain Fairchild determined to commence his examination of the group with the smaller islands, our previous visit having shown us that they can only be landed upon when the sea is exceptionally calm. The steamer's head was therefore pointed for the extreme western island, which is called the West King on the Admiralty charts, although of late years this name has been more generally applied to the island immediately to the west of the Great King. We rounded it at a distance of about half a mile, and so had good opportunities of examining it from different points of view. It is probably rather more than a quarter of a mile in length, by perhaps nearly as much in breadth, and reaches a height of about 400 ft. It is surrounded by steep and precipitous cliffs, which are apparently quite inaccessible. In one or two places a landing might have been effected on some rocks at the foot of the cliffs, but the surf was so heavy that the risk would have been considerable, and, as it was evidently impossible to scale the cliffs, it would have been useless waste of time to lower a boat. The vegetation was evidently scanty. Here and there some dark-green patches showed on the cliffs,
probably composed of trailing masses of ice-plant (Mesembryanthemum australe) and Coprosma baueriana; and with the glass some stunted flax and toetoe grass (Arundo conspicua) could be seen growing on the top, as also a few shrubby plants which it was impossible to identify; but, on the whole, the island presented a barren appearance, and was little more than a bare rock.

From the eastern point of this island eight or nine tall conical rocks extend in an almost straight line in the direction of the Great King. They vary in height from 70ft. or 80ft. to 150ft. or more, and are separated by deep and narrow passages, through which a small steamer could probably be taken in case of need. Their linear arrangement is very singular, and their whole appearance highly romantic and picturesque. One of them is perforated; another overhangs considerably; and almost every one has some striking peculiarity of shape. Some of the larger ones are occupied as breeding-places by gannets and other sea-birds, which find on them a home secure at any rate from man's invasion. On one or two some green patches of vegetation show, doubtless Coprosma baueriana and Mesembryanthemum. The smaller ones are bare, black, and forbidding, and are probably washed over by the spray in heavy gales.

Leaving these behind, and proceeding in the direction of the Great King, another island was reached, rough and rugged enough, but yet presenting a much more promising appearance than those just described. It is usually called the West King, although, as mentioned above, it is not the one to which that name is applied on the Admiralty charts.

The West King is about three-quarters of a mile in greatest length by not quite half a mile in greatest breadth. In shape it is roughly triangular, the apex pointing a little to the south of east. The west side, or base of the triangle, is bounded by bare and inaccessible cliffs from 200ft. to 300ft. in height, against the foot of which the sea continually breaks. The south shore is also high and precipitous, and offers no practicable landing-place. On the north the island slopes more gradually to the sea, and in several places the cliffs are comparatively low. But, although this side of the island was carefully scanned from the deck of the "Hinemoa," no place could be seen where the cliffs could be scaled, even supposing it possible to land at their foot. After steaming round the island, the only locality which seemed to promise a tolerably safe landing, so far as we could judge, was at the extreme eastern point. From this point, too, a rocky ridge rises with a steep but practicable slope, so that once on shore there would evidently be no great difficulty in reaching the top of the island.
Landing on small and exposed rocks at a distance from the mainland is always an undertaking requiring some care, and not devoid of danger. In this case there was no shelter or jutting point to break the force of the long ocean-swell continually rolling in, even in the finest weather; and great care had to be taken in approaching the rocks, for if driven broadside on the boat would be instantly swamped and stove in. After some search a rock with a perpendicular face towards the sea, and with deep water alongside, was selected as the landing-place; and by taking advantage of favourable opportunities, our party were able, one by one, to jump on to this from the bow of the boat. No time was lost in making a start for the summit of the island. Rounding some huge rocks which lined the beach at our landing-place, we gained the foot of a long ridge, which leads to the highest point by a rough but not very steep ascent. The lower part was open and bare of vegetation, and was occupied by vast numbers of gannets and mackerel gulls as a breeding-place; thousands of birds sitting on the rocks as closely as they could be packed. The gulls had their quarters on the portion nearest the beach, and on our near approach rose in the air, circling and swooping about just above our heads, screaming and uttering the most discordant cries. The noise from such a multitude of throats was deafening, while the stench from the guano-covered rocks was almost insupportable. Almost every little depression contained a nest, and in some places, they were packed so close that it was impossible to advance without stepping on the eggs. Our sailors were not long in discovering that the eggs were fresh, and it was amusing to see them breaking them against the rocks, and tossing off the contents with the greatest relish. On our return to the boat they collected quite a large hamper of these delicacies for the use of their messmates on board the steamer. The gannet-rookery was of much larger extent, and from the multitude of the birds, and their white plumage, presented from a little distance a striking and attractive sight. It was interesting to see the intentness with which the birds watched our advance-up the hill. Hardly any attempted to leave their nests until we were close to them, but they sat moving their heads from side to side, and uttering hoarse screams. When we were almost treading on them many attempted to take flight, but it was remarkable to see what difficulty they had in doing this. Apparently they are unable to rise straight from the ground, but are obliged to run downhill for a distance, flapping their wings, until they have acquired sufficient momentum to lift themselves from the ground. In their haste to escape they rolled over one another, breaking and scattering their own and their neighbours’ eggs, and creating a scene of the utmost confusion. Quite a large
number refused to leave their homes, and struck out valiantly with their sharp bills at the legs of the intruders; and we all of us found that a peck from the bill of a gannet, vigorously delivered, was by no means to be despised. They do not construct a nest, but deposit a single egg anywhere in a slight hollow. The eggs were just beginning to hatch, and we saw plenty of young baby gannets—ugly fat slate-coloured lumps, without a particle of down or feathers. Later on they acquire a most beautiful covering of snow-white down, but we were too early in the season to find them in this stage.

There is but little vegetation on that portion of the ridge occupied by the birds. The edges of the cliffs on either side are festooned with ice-plant (*Mesembryanthemum*), samphire (*Salicornia*), *Rhagodia*, *Senecio laetus*, and other well-known coast plants. Here and there patches of Captain Cook's scurvy-grass (*Lepidium oleraceum*) were growing vigorously on the highly-manured ground. This plant must have been much more common at the time of Cook's visit than now. In some of the localities where he collected it for the use of his crew it is well-nigh extinct.

Leaving our friends the gulls and gannets behind, and climbing higher up towards the central peak of the island, the first vegetation encountered was composed of patches of toetoe grass, flax, tea-tree, short-stemmed cabbage-trees (*Cordyline*) and *Hymenanthera latifolia*. We passed on rapidly through this, being anxious to reach the light bush which covered the rest of the slope before us, and which was mainly composed of a handsome large-leaved tree which stood out very conspicuously in the distance. We had first noticed it from the deck of the steamer, and had then taken it for the rare puka tree (*Meryta sinclairii*), hitherto supposed to be confined to the Morotiri or Taranga Isles (Hen and Chickens), off Whangarei, and now we found that our surmise was correct. Further examination proved that nearly the whole of the northern side of the island, where not too steep, was covered with it. Growing massed together in this way, its large and bold foliage produced a very striking effect. In sheltered places it was often mixed with luxuriant specimens of the cabbage-tree (*Cordyline australis*), and the combination gave quite a tropical aspect to the scenery, which was enhanced by the undergrowth being chiefly composed of the large-leaved form of the kawakawa (*Piper excelsum*) so common in the Kermadec Islands, and of unusually luxuriant specimens of *Pteris comans*. The average height of the puka was from 10ft. or 15ft. to 20ft., but specimens almost 30ft. in height were noticed. At the time of our visit the female trees were ornamented with large bunches of purplish-black berries.
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The puka must be regarded as one of the most remarkable of the New Zealand trees, and it is certainly one of the rarest. It was first discovered by the veteran botanist Mr. Colenso, who was shown by the Maoris a single tree growing at Paparaumu, Whangaruru Harbour, which they informed him had been brought from the Poor Knights Islands. It was surrounded by a high fence, and was strictly tapu, Mr. Colenso not being permitted access to it, or allowed to remove specimens. Major W. G. Mair was the next to visit the locality, and he succeeded in obtaining specimens of the foliage, some of which were given to Dr. Sinclair. Later on Mr. Robert Mair obtained ripe fruit, which was also forwarded to Dr. Sinclair. This material, imperfect as it was, was forwarded to Kew, and formed the basis of the descriptions given in Sir Joseph Hooker’s, “Flora Nova-Zelandiae,” and in the later published “Handbook.” After the lapse of a few years the solitary tree at Whangaruru was cut down by the natives; but about the same time a Mr. George Henson discovered it growing wild on the Morotiri or Chickens Islands. In 1869 Professor Hutton and Mr. Kirk made a special visit to that locality, with the result of finding some eight or nine plants. A few years later I visited the islands, and saw thirteen old plants and a few seedlings. Mr. Reischek, who landed several times on the Chickens while pursuing his ornithological researches, also saw the tree, and has informed me that about twenty or thirty are all that exist on the group. He observed, however, a solitary specimen on the north side of the Hen Island. Until its discovery on the Three Kings Island these localities remained the only ones known to Europeans. Its existence on the Poor Knights is highly doubtful, and rests entirely on Maori authority. I have been informed that several of the specimens growing on the Chickens have been recently destroyed by fires lighted by fishermen or yachting parties, and no doubt it will soon become extinct in that locality. All lovers of New Zealand plants must therefore rejoice that it has at last been found in abundance, and in a locality where it is not likely to be soon blotted out of existence.

The puka was introduced into cultivation by the late Mr. Justice Gillies and Mr. G. B. Owen about twenty years ago. Since then it has found its way into several gardens in the vicinity of Auckland, but has not by any means been planted as much as it deserves. Few trees have bolder or handsomer foliage, and it might be used with considerable effect in landscape gardening. It is easy of cultivation, perfectly hardy in the North Island, will bear exposure to the strongest winds, and in good soil makes very rapid growth. One planted in my own garden eight years ago is now nearly 18 ft. in height,
with a spreading crown of branches 16ft. in diameter, and with a trunk 24in. in circumference at the base. Many of the leaves (including the petiole) are quite 2ft. 6in. in length.

The other shrubby plants noticed were the ngaio (Myoporum laxum), the two kinds of tea-tree (Leptospermum ericoïdes and L. scoparium), the wharangi (Melicope ternata), and my two new species, Coprosma macrocarpa and Paratrophis smithii. The last mentioned was particularly abundant, especially towards the summit of the island, forming a bush a few feet in height, with flexuous and closely-interlaced branches, and presenting a very different appearance from the tall, slender, sparingly-branched form seen in the gullies of the Great King, and described in my previous paper. The climbing-plants were the common kahiu (Parsonia albiflora), Muhlenbeckia adpressa, and Stycos angulatus. The undergrowth was mainly composed of ferns, Pteris comans and Asplenium lucidum being the species most abundant. Davallia tasmani was plentiful, attaining a greater size than on the main island of the group. A few sedges and grasses were also occasionally seen. The extreme summit of the island is rocky and almost bare of vegetation.

The bell-bird (Anthornis) was the only land-bird really plentiful, but it was present in great numbers. Fantails, grey-warblers, and white-eyes were all seen, but were comparatively scarce. Two or three moreporks were started from the deep shade of the puka-trees; and in a large patch of toetoe grass our sailors found a hawk’s nest containing some fledglings, nearly full grown, which they took on board the steamer. Several petrels breed on the island, digging out burrows among the roots of the puka. From one of them I dislodged a specimen of the small shearwater (Puffinus assimilis). The locality seems a likely one for the tuatara lizard, but unfortunately we neglected to take a spade ashore with us, and were therefore unable to examine the burrows.

After spending the greater part of the morning on shore, we were recalled by the whistle of the “Hinemoa.” The afternoon and the whole of the next day were given to the exploration of the Great King, which is separated from the West King by a deep-water channel, free of all danger, of two or three miles in width.

The Great King is much the largest of the group. It is about a mile and three quarters in greatest length, measuring in an east-and-west direction, and its greatest breadth is over three-quarters of a mile. The outline given in the Admiralty charts is most erroneous, and it is difficult to suppose that it can have been based on a real survey. It is there shown of the shape of an equilateral triangle; but its real outline is very different, and much more irregular. A broad and deep bay
runs in on the north-west side, almost meeting a smaller one from the south-east, and leaving only a narrow neck between. The island is thus almost cut into two portions, an eastern and a western, of which the western is much the largest. The coast-line is bold and rocky, and is formed by steep and precipitous cliffs, varying in height from 300 ft. to 700 ft. The cliffs often rise directly from the water, the waves breaking against them. In some places huge caves have been worn out of the rock, and the deep hollow sound the surf makes when driven into these can be heard at a considerable distance from the shore.

There are at least three landing-places on the island, but no one of them can be said to be good. The one which we used is at the head of the northern bay, and is well sheltered from easterly winds. The south-east bay, just opposite to this, can be made use of in westerly winds; so also can a little bay situated a short distance more to the westward. The set of the wind and waves into these bays has to be carefully studied when a landing is attempted, for a very slight increase to the surf always breaking on the beaches makes the undertaking risky and difficult, if not impossible. Wherever the explorer lands, the cliffs, which are nowhere less than 250 ft. in height, have to be scaled before the top of the island can be reached; and a rough and laborious climb it is.

Starting from the top of the ridge separating the two bays, a path can be found to the highest peak by keeping close to the edge of the northern cliffs. The vegetation is principally short and stunted tea-tree, mixed with the common fern, flax, short-stemmed cabbage-trees, and a few sedges and grasses. The new species of Coprosma described in my previous paper (C. macrocarpa) is plentiful, and when covered with the large orange-yellow berries, which are almost the size of small plums, presents quite a showy appearance. An unusually large-leaved variety of the hangehange (Geniostoma ligustrifolium) is also common. Wherever the tea-tree attains a little higher growth than usual, and consequently affords more shade, the new Davallia discovered in my previous visit abounds. It is in fact one of the characteristic plants of the island; and, as I saw it in great quantity on the Western King, it is probably distributed through the entire group. Its stiff leathery fronds and stout chaffy rhizome are not unlike those of the Polynesian D. solida, and have no resemblance whatever to the other New Zealand species, D. nova-zelandiae. Since writing my previous paper I have been able to compare it with good specimens of the Australian D. pyxidata, to which at one time I thought it might be referred; and I have now no doubt of its perfect distinctness. In this view I am supported by Mr. J. G. Baker, of the Kew Herbarium. He in-
forms me that it is more nearly allied to *Davallia canariensis*, so common in the Canary Islands and Madeira, but is yet quite distinct. As the plant requires a name, I have given it that of Tasman, who was not only the first discoverer of the group, but also of New Zealand, and whose name has not yet been associated with any of its natural productions. It may thus be characterized:—

*Davallia tasmani*, n. sp.

Rhizome stout and long, densely clothed with tawny subulate scales. Stipes rigid, smooth, 3 in.–9 in. long. Frond 4 in.–12 in. long, 3 in.–9 in. broad, deltoid, tri- or quadri-pinnatifid, very coriaceous, quite glabrous. Primary pinnae ovate-deltoid, acuminate; secondary rather narrower; pinnules lanceolate, cut down nearly to the base into 3–6 pairs of segments. Sori numerous, cup-shaped, sunk in the top of the teeth, usually with a projecting horn on the outer side.

The highest point on the island is about 995 ft. above sea-level. On the north it drops with a sheer precipice into the sea; and our sailors amused themselves by rolling stones over the edge, and watching them fall into the water. We looked directly on to the deck of the "Hinemoa," which, though anchored quite half a mile from the shore, seemed to be almost at our feet. The eastern side of the bay, with its black and frowning cliffs, was directly opposite to us. On our left was the extreme western point of the island—perhaps 100 ft. lower than where we were standing. The day was beautifully fine, and the sea below us was hardly moved by a ripple; but the long ocean-swell, with its regular undulations, was plainly visible on its deep-blue surface. The only sounds were the breaking of the swell against the cliffs and the cries of the sea-birds on an isolated rock just beneath us, on which our boatmen had landed in the hope of obtaining eggs.

A large basin-shaped valley commences at the foot of the peak, and occupies most of the centre of this portion of the island. A pretty little stream flows through it in a southerly direction, and is joined by several tributary rills on either side. The valley is mostly covered with tall-growing tea-tree from 12 ft. to 25 ft. in height, mixed with some shrubs and small trees. Most of the interesting plants seen on the island occur here. It was here that the first specimens of the remarkable *Paratrophis smithii* were observed, a description of which appeared in my previous paper. A new *Pittosporum* was also collected, which I have named in honour of Captain Fairchild, the well-known commander of the "Hinemoa." *Panax lessonii*, *Melicope ternata*, *Coprosma macrocarpa*, and *Hedycarya dentata* were all plentiful. Along the edges of the stream were several fern-trees, but only one species (*Cyathea*
MAP OF THE THREE KINGS OR MANAWA TAWHI ISLANDS.

This map is based on the Admiralty Chart; Great 1. is from sketches by Mr. S. Percy Smith (Surveyor General) in 1887. The additional soundings marked thus (18) are by Capt. Fairchild (Marine Department).

Scale of Statute Miles.

Drawn by C.H. Sturtivant, 1889.
NORTH COAST, GREAT ISLAND.
(from a sketch by Mr. S. Percy Smith)
medullaris) was noticed. Of smaller ferns, the most remarkable was Lomaria acuminata, which is plentiful on the Kermadec Islands, but extremely rare in New Zealand proper. In open sunny places were large masses of Colensoa physaloëides, its bold foliage and pretty blue flowers making it very conspicuous.

Anxious to find out what became of the stream, we decided to follow it down; but there was little change in the vegetation along its whole course. After awhile the sides of the valley contracted, the stream running over a rocky bed, with a steep grassy hill on one side, and a very similar one covered with tea-tree on the other. Still following the stream, and turning the corner of a knoll covered with pohutukawa-trees—the finest seen on the island—we suddenly reached the edge of the cliffs, the stream discharging itself over them in a cascade which must be nearly, if not quite, 200 ft. in height. Climbing up the hill to the left, and looking over the cliffs, we saw that the stream fell into the head of a little bay, probably one of the most picturesque localities on the island. Afterwards we took the steamer into it, and thus obtained a better view than could be had by a peep over the cliffs. The western end is formed by a high perpendicular bluff, to the seaward of which three huge rocks, fretted and worn by the waves into fantastic points and pinnacles, stand out in a line. Some distance inside the bluff the cliffs slope away more gradually, and in one place there is a comparatively easy ascent from the shore to the top, starting from a shelving rock which would form an excellent landing-place with the wind off the shore. It was obvious that we had found the place where Tasman attempted to water his vessel, but which we had failed to notice during our previous visit, probably from keeping too far from the shore while steaming round the island. It may not be uninteresting to quote the paragraph relating to it in Tasman's journal, taking the translation given in Burney's "South Sea Discoveries," vol. 3. After mentioning his discovery of the islands, and describing their appearance, he says: "About noon we sent Francis Jacobsz in our shallop, and the supercargo, Mr. Gillimans, in the "Zehaan's" boat, to the island to try if fresh water could be got. In the evening they returned and reported that they had been at a safe small bay, where fresh water came in abundance from a high mountain, but that there was a great surf on the shore, which would make watering there troublesome and dangerous. . . . Our people saw no trees, nor did they observe any cultivated land, except that near the fresh water there were some square plots of ground green and very pleasant, but of what kind the greens were they could not distinguish. Two canoes were drawn up on the shore."
The narrative then goes on to say that on the following morning two boats with water-casks were sent to the shore, and that on nearing it many armed natives were seen, whose demeanour was by no means pacific. The surf was heavy, and landing would have been dangerous; so that after a consultation among the officers the attempt was abandoned, and the boats returned to the ships, which immediately took their departure. Tasman’s words, “where fresh water came in abundance from a high mountain,” can only apply to this bay, for there is no other place on the island where a permanent stream discharges into the sea. The gradual ascent up the cliffs which we noticed would be the one made use of by the Maoris from their landing-place, and the shelving rock on the beach is one of the few places where a canoe could have been safely drawn up.

The eastern portion of the Great King is much less interesting, and needs little description. Its highest point is also on the north-west, and from thence it slopes evenly and gradually to the south-east. It is mainly covered with short tea-tree, flax, common fern, and a few sedges. A shallow gully takes a southerly direction to the edge of the cliffs, and may have water in it during the winter months, but it was quite dry at the time of our visit.

In many parts of the island the cliffs have a good deal of vegetation growing on them; but their inaccessibility precludes an examination, except near the landing-places and one or two other localities. The curious Veronica collected on the Western King was seen in small quantity. Pittosporum fairchildii was not uncommon, growing in a much more compact form than in the gullies. A few karaka-trees (Corynocarpus) were scattered in sheltered nooks. Pohutukawas are seen all round the island, but in small numbers, and are dwarfed and stunted compared with their usual size on the mainland. A remarkable variety of the titoki (Alectryon excelsum), with leaves three or four times the size of the type, was gathered. It is so different in appearance that it might be distinguished as variety grandis. Here and there may be seen small clumps of the parapara (Pisonia brunoniana), with its viscid fruit, which frequently catches small birds which are so unfortunate as to come in contact with it. Several other noteworthy plants occur on the cliffs; but as they are all mentioned in the appended catalogue, it is hardly necessary to particularize them here.

The land-bird most frequently seen on the Great King is the bell-bird (Anthornis), which is present in great numbers. It was most pleasing to listen once more to its song—“like a chime of silver bells”—so familiar to all old colonists, but now, alas! to be heard no more on the mainland of the North
Island. In my previous paper I have given a list of the other kinds seen, and I have no additional species to record now. By far the most interesting is the native quail (Coturnix); for, so far as is known at present, it is absolutely extinct elsewhere in New Zealand. It is by no means common in its last refuge; for, although I walked round the island and crossed it from side to side in two or three places, I did not see more than thirteen or fourteen, and it is possible that several of these may have been started twice over. They usually got up in pairs, generally close to the explorer, and after a flight of 200 or 300 yards would settle again. On one occasion a single bird rose almost from between my feet. Looking down, I noticed a beautifully-made cup-shaped nest, containing six perfectly fresh eggs. These I of course secured, and they are now in the Auckland Museum.

While I was engaged in the examination of the Great King, Captain Fairchild paid a visit in the “Hinemoa” to the East King, to ascertain whether a landing could be effected. It proved to be exceedingly rocky and precipitous on all sides; and, although with care it would have been possible to land at the foot of the cliffs, it appeared to be quite impossible to reach the top of the island. Acting, therefore, on his advice, I made no attempt to land. It is about the same size as the Western King, but is rounder in outline, and a little higher. The whole of the top is covered with light bush, mainly composed of the puka, which appears to be even more plentiful than on the Western King. Cabbage-trees (Cordyline) and pohutukawa were also seen; but the steamer could not be taken sufficiently close inshore to identify any other species.

Few localities would make a better fishing-station than the Three Kings, and it is to be regretted that they are so distant from the chief centres of population. During our three days’ stay the crew of the “Hinemoa” caught large numbers of fish. One hapuka, taken from a boat anchored not more than a quarter of a mile from the shore, weighed 112 lb., and another turned the scale at 96 lb. Kingfish and yellow-tail are also remarkably plentiful, while schnapper, kahawai, and gurnard all abound.

I have appended a catalogue of the flowering-plants and ferns noticed in the group, the total number being 143. Five are new species, and are not known to occur elsewhere, although there is a strong probability that they may exist in the North Cape district, which has been very imperfectly examined for plants. Three others are not known on the mainland, although they occur on other outlying islands. The remaining 135 species are of more or less common occurrence in the northern part of the colony.

Although the Three Kings Islands are nearly thirty-eight
miles distant from the mainland of New Zealand, the sea between is comparatively shallow, the average depth, according to the Admiralty charts, being from 40 to 50 fathoms; but immediately on the outside of the group, the depth rapidly increases, and soundings of nearly 200 fathoms have been obtained within six or seven miles, while in a due north direction the 500-fathom line is not more than twenty miles distant. It is obvious that the islands stand on the very edge of a submarine plateau, which stretches from forty to fifty miles northward of New Zealand, and then suddenly sinks into much deeper water. It is natural to assume that they have been at one time connected with the mainland, and, in support of this, it may be observed that their geological structure corresponds very closely with that of the greater portion of the North Cape peninsula, the rocks composing both being slates of probably Palæozoic age. The late Dr. Hochstetter expressed the opinion that “the peculiar features of the northern peninsula of the North Island are only to be accounted for by adopting the theory of a gradual sinking of the land,” and other geologists maintain similar views. It must also be remembered that the hypothesis which, so far, has given the best explanation of the origin and peculiarities of the fauna and flora of New Zealand has for its chief factor a former extension of New Zealand to the north-west.

It is an interesting question as to whether subsidence is still taking place in this part of New Zealand; for it would require little more to convert the North Cape peninsula into a group of scattered islands. North of Ahipara, the whole of the west coast to within a few miles of Cape Maria van Diemen is composed of low sand-hills, often not more than 50ft. above the level of the sea. On the eastern side the coast is also chiefly composed of sand, with the exception of the hills at Cape Karakara, to the north of Doubtless Bay, and the narrow strip near Ohora Harbour on which Mount Camel stands. The North Cape peninsula proper is moderately high, the hills near the North Cape and near Cape Maria van Diemen being nearly 1,000ft. above sea-level; but even there a stretch of sandy and swampy land joins Tom Bowline’s Bay with the east coast, lying so low that a fall of 50ft. would submerge it, and convert the North Cape into an island. In a similar way, one or two of the arms of Parengarenga Harbour approach very closely to the west coast. A subsidence of 150ft. would unite Doubtless Bay with Rangaounu Harbour and the opposite coast, would join both Ohora and Parengarenga Harbours with the west coast, would cut off the North Cape from the rest of the peninsula, and would convert that portion of the province north of Mongouui into a chain of widely-separated islands. The Three Kings Islands, however,
would still be high above water, and, from their tall cliffs and bold contour, would not be much less in size than now.

I have to express my obligations to the Surveyor-General, Mr. Percy Smith, for the accompanying map of the group (Pl. XXXVII.) and a sketch of one of the landing-places on the Great King (Pl. XXXVIII.). I have also to thank Captain Fairchild, of the "Hinemoa," for the kind assistance he has given to me during both my visits.

Catalogue of the Phoenogamic Plants and Ferns observed on the Three Kings Islands.

2. " foetida, Raoul.
3. Ranunculus plebeius, Br.
4. Cardamine hirsuta, L.
5. Lepidium oleraceum, Forst.
8. Pittosporum fairchildi, Cheeseman, n. sp.
10. Spergularia rubra, Pers.
11. Entelea arborescens, Br.
13. Linum monogynum, Forst.
16. Oxalis corniculata, L.
17. Melicope ternata, Forst.
18. Alectryon excelsum, D C.
20. Coriaria ruscifolia, L.
22. Acæna sanguisorbae, Vahl.
23. Tillææ verticillata, D C.
24. Drosera auriculata, Backh.
25. Haloragis alata, Jacq.
27. " depressa, Hook. f.
28. Leptospermum scoparium, Forst.
30. Metrosideros robusta, A. Cunn.
31. " tomentosa, A. Cunn.
32. " scandens, Banks and Sol.
33. Epilobium nummularifolium, A. Cunn.
34. " juncæum, Forst.
35. Sicyos angulatus, L.
36. Mesembryanthemum australe, Sol.
37. Tetragonia expansa, Murr.
38. " trigyna, Banks and Sol.
39. Hydrocotyle asiatica, L.
40. " heteromera, D C.
41. " nova-zealandiae, D C.
42. Apium australe, Thouars.
43. Angelica rosæfolia, Hook.
44. Daucus brachiatus, Sieber.
45. Panax lessonii, D C.
46. Meryta Sinclairii, Hook. f.
47. Corokia cotoneaster, Raoul.
48. Coprosma macrocarpa, Cheeseman, n. sp.
49. " grandifolia, Hook. f.
50. " baueriana, Endl.
51. " robusta, Raoul.
52. Lagenophora forsteri, D C.
53. Bidens pilosa, L.
54. Gnaphalium luteo-album, L.
55. " involucratum, Forst.
56. " collinum, Lab.
57. Erechtites arguta, D C.
58. " quadridentata, D C.
59. Senecio lautos, Forst.
60. Sonchus oleraceus, L.
63. Lobelia anceps, Forst.
64. Gaultheria antipoda, Forst.
66. " frazeri, A. Cunn.
67. Parsonsia albiflora, Raoul.
68. Geniostoma ligustrifolium, A. Cunn.
69. Myosotis spathulata, Forst.
70. Convolvulus sepium, L.
71. " tuguriorum, Forst.
72. Dichondra repens, Forst.
73. Solanum aviculare, Forst.
74. " nigrum, L.
75. Veronica, sp.
76. Myoporum lautum, Forst.
77. Pisonia umbellifera, Seem.
78. Rhagodia nutans, Br.
79. Salicornia indica, Willd.
80. Scleranthus biflorus; Hook. f.
81. Muhlenbeckia adpressa, Lab.
82. " complexa, Meisn.
83. Hedycarya dentata, Forst.
84. Pimelea virgata, Vahl.
85. " prostrata, Vahl.
86. Paratrophis smithii, Cheeseman, n. sp.
87. Parietaria debilis, Forst.
89. Piper excelsum, Forst.
90. Tetranthera calicaris, Hook. f.
91. Acianthus Sinclairii, Hook. f.
92. Microtis porrifolia, Spr.
93. Thelymitra longifolia, Forst.
94. Cordyline australis, Hook. f.
95. Dianella intermedia, Endl.
96. Arthropodium cirrhatum, Br.
97. Phormium tenax, Forst.
98. " colensoi, Hook. f.
100. " buforius, L.
101. Luzula campestris, D C.
103. Schoenus axillaris, Hook. f.
104. Isolepis nodosa, Br.
105. " riparia, Br.
106. Galinia arenaria, Hook. f.
110. " ternaria, Forst.
111. " testaceae, Sol.
112. " breviculmis, Br.
113. " neesiana, Endl. (?)
114. Paspalum scrobiculatum, L.
115. Panicum imbecille, Trin.
116. Echinopogon ovatus, Pat.
117. Dichelachne crinita, Hook. f.
118. Agrostis aemula, Br.
119. " billardieri, Br.
120. Arundo conspicua, Forst.
121. Danthonia semiannularis, Br.
122. Poa anceps, Br.
123. Cyathea medullaris, Swz.
124. Hymenophyllum polyanthos, Swz.
125. Davallia tasmani, Cheeseman, n. sp.
126. Adiantum affine, Wild.
127. " hispidulum, Swz.
128. Hypolepis tenuifolia, Bernh.
129. Pteris tremula, Br.
130. " aquilina, L.
131. " comans, Forst.
132. Pellaea rotundifolia, Forst.
133. Lomaria procera, Spreng.
135. Doodia media, Br.
136. Asplenium obtusatum, Forst.
137. " falcatum, Lam.
139. Aspidium richardi, Hook.
140. Polypodium tenellum, Forst.
141. " serpens, Forst.
142. " billardieri, Br.
143. Lycopodium volubile, Forst.

ART. XLV.—On a Remarkable Variety of Asplenium umbrósusum, J. Sm.

By T. Kirk, F.L.S.

[Read before the Nelson Philosophical Society, 11th November 1890.]

About twelve years ago I received from the Rev. F. H. Spencer a specimen of an Asplenium collected in the Nelson District, which presented several points of difference from any other New Zealand fern; but, unfortunately, it was in an imperfect condition, and no positive conclusions could be drawn as to its identity: it was therefore laid on one side until better material could be procured, and was forgotten until I had the pleasure of receiving specimens of the same plant from Mr. McKerrow Campbell, when it was clearly seen to be an Asplenium belonging to the sub-genus Athyrium, and at first sight appeared to be distinct from any New Zealand species. A closer examination showed, however, that it was a remarkable variety of Asplenium umbrósusum, J. Sm., a species occurring on calcareous soils in many parts of the colony, although on a cursory examination it appears to have but little in common with the type apart from its membranous texture. A well-developed specimen of the typical form exhibits spreading drooping fronds, from 3ft. to 5ft. in length, and sometimes 4ft. across at their greatest breadth, thrice-pinnate, with the ultimate pinnules distant, and from ½in. to ⅛in. long, deeply lobed or toothed. In a more frequent form the fronds are ovate-lanceolate in outline, from 1ft. 6in. to 2ft. long and from 6in. to 9in. broad, twice-pinnate, with close-set deeply-lobed pinnules; the rhachis in both forms being somewhat robust. The chief points of difference in the present plant are the attenuated rhachis, the smaller size, the weak...