different habits. It agrees still less with the other described species of green *Naultini*. It may be a variety of *N. grayii*, Bell, but certainly not of *N. punctatus*, Gray, which species Professor Hutton has subsequently stated to be identical with *N. grayii*.*

ADDENDUM.—Since writing the above, and very recently, I have received a letter from Mr. D. P. Balfour, of Glenross, a member of this Society, dated 16th July, 1886, informing me of a green lizard, a species of *Naultinus*, and believed by him to be of the same species as *N. pentagonalis*, Col., which he had in confinement, having produced two young ones on the 14th of July. One of them was born alive, and the other dead, and then only after some considerable difficulty, Mr. Balfour largely assisting the mother; for when he saw her on this occasion, this second young one was half expelled, tail foremost, the other having been first born. Mr. Balfour also says that the living one measured 3 inches at its birth.

This is the *third* known instance of the birth of these green lizards, and all of them happened about mid-winter,† (a strange season!) when they should be in their natural semi-torpid hibernating state. This additional circumstance, now confirmed, seems very peculiar, and is worthy of being noted. The living young lizard, mentioned by Mr Balfour, seems to be of an extraordinary large size, "3 inches long when born:" those four born here with me, in 1878, were only a little over 1 inch in length when first seen, (*loc. cit.*, p. 263,) and those described in this paper (although still uncoiled in their fetal membranes), cannot be much more.

ART. XVI.—*Remarks on* Palinurus lalandii, M. Edw., *and* P. edwardsii, Hutton.

By T. JEFFERY PARKER, B.Sc., C.M.Z.S., Professor of Biology in the University of Otago.

[*Read before the Otago Institute, 10th August*, 1886.]

Plate X.

IN Miers's "Catalogue of the Stalk- and Sessile-eyed Crustacea of New Zealand," two species of *Palinurus* are assigned to this country—one, *P. lalandii*, M. Edw., identical with a species found in Cape Colony; and the other, *P. edwardsii*, Hutton,

* "Trans. N.Z. Inst.," vol. iv., p. 171.

† See "Trans. N.Z. Inst.," vol. xii., p. 251, for the *first*.

peculiar to New Zealand. In his account of the latter form, Miers remarks: "The specimens from New Zealand, in the collection of the British Museum, that have been referred to *P. lalandii*, belong to this species [*P. edwardsii*]; and hence I am in doubt whether *P. lalandii* be also an inhabitant of the New Zealand seas. It was formerly considered a common New Zealand species."

This remark, and the fact that I constantly found myself unable to distinguish the supposed two species from one another by the diagnostic characters given by Hutton and by Miers, induced me to make a special study of the question, and to this end I have obtained a series of specimens of the undoubted *P. lalandii* from the Cape of Good Hope. For these, I have to thank Mr. R. Trimen, F.L.S., Curator of the South African Museum, Cape Town, who kindly sent me more than a dozen examples belonging to both sexes, and of very various sizes. With these I have carefully compared about an equal number of *Palinuri* from the Dunedin market, as well as Hutton's type specimens in the Otago University Museum, of which one is labelled *P. lalandii*, and two *P. edwardsii*.

The diagnostic characters of *P. edwardsii* relied on by Hutton are best given in his own words: "This species differs from *P. lalandii* in its much smaller size, in the shape of the beak, in having no spine on the penultimate joint of the anterior legs, and in having a small spine at the distal extremity of the third joint of the last four pairs of legs." *

a. Size.—In this respect there is a perfect gradation between the largest and the smallest crayfishes brought to the Dunedin market.

b. Characters of the rostrum.—The rostrum of *P. lalandii* is thus described by Miers: "Rostrum with the lateral spines smooth above and below, and not projecting nearly so far as the small median spine, below the base of which are two small spines." That of *P. edwardsii* is described in the same words, both by Miers and by Hutton: "Beak small, compressed, curved upwards, and with two small spines at its base." From this it would appear that it is the compression and the upward curvature of the rostrum of *P. edwardsii* which distinguishes it from that of *P. lalandii*, since the two small basal spines are common to both species.

As I have elsewhere pointed out,† the above description of the rostrum is wanting in exactness. The two small spines at its base have nothing to do with the rostrum proper, being given off from what I have called the "clasping processes" (figs. 7–11, *cl.p*[1]), pedate structures arising from the præstomial plate,

* "Trans. N.Z. Inst.," vol. vii. (1874), p. 279.

† "Trans. N.Z. Inst.," vol. xvi. (1883), p. 298.

(= epimeral plate, Huxley = the area to which the eye-stalks are attached,) and ascending one on each side of the rostrum (*r*), to the base of which they are closely applied, although quite free from it. Each clasping process consists of a forwardly-directed or anterior limb (*cl.p*), and of an upwardly-directed or dorsal limb (*cl.p*^{1}). The anterior limb usually terminates in a true spine—*i.e.*, is sharp, of a brownish-yellow colour, and horny appearance: more rarely it is pointed, but devoid of a true spine, and occasionally it terminates bluntly. The dorsal limb is sometimes blunt (fig. 9), sometimes bi-lobed (fig. 10), sometimes sharp (fig. 11), and occasionally terminates in a true spine. The rostrum itself may be nearly horizontal (figs. 7, 10), or slightly upturned (fig. 11), or strongly upturned (fig. 9), and usually terminates in a true spine. All these variations are found both in the South African and in the New Zealand specimens, and are therefore in no way diagnostic, but mere matters of individual variation.

c. Propoditic spine of anterior leg.—The presence or absence of this spine is a mere question of age. It is present in all the larger specimens, both from the Cape and New Zealand, absent or rudimentary in the smaller examples.

d. Meropoditic spines of legs 2–5.—The dorsal surface of the distal extremity of the meropodite, or third segment, of one of the four posterior legs of a New Zealand crayfish, is shown in fig. 12. The segment is seen to present a somewhat crescentic elevation (*cr*,) at its distal end, and proximad of this to be produced into a longitudinal ridge (*l.r*), which projects distalwards over the crescentic elevation, ending in a sharp spine (*sp. 1*): This is the spine acknowledged by Hutton and Miers to be common to the two species under discussion. The horns of the crescentic elevation, which are directed forwards, are sometimes both blunt (fig. 12), sometimes each terminates in a spine (fig. 14), while sometimes the anterior only (fig. 13,) and sometimes the posterior only is spinose. It is the presence of one, the anterior, of these small spines (*sp. 2*,) which is held to be diagnostic of *P. edwardsii*, in which species, therefore, the formula of the meropoditic spines is considered to be i.I.o., while in *P. lalandii* it is said to be o.I.o. I find, on the contrary, that the presence or absence of these small lateral spines is a matter of individual variation, the formulæ o.I.o., i.I.o., i.I.i. occurring both in African and in New Zealand specimens, and sometimes in the different legs of the same specimen.

One cannot but conclude, therefore, that, putting aside *P. tumidus*, Kirk,* which I have not examined, there is but one species of *Palinurus* hitherto discovered in New Zealand; and the question next arises, should this be called *P. lalandii* or

* "Trans. N.Z. Inst.," vol. xii, p. 313.

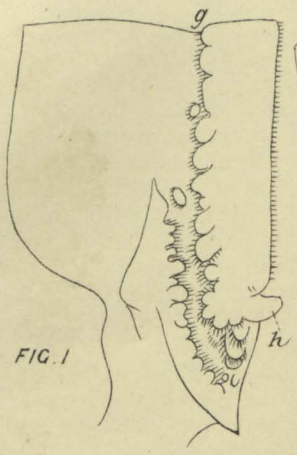

FIG. 1

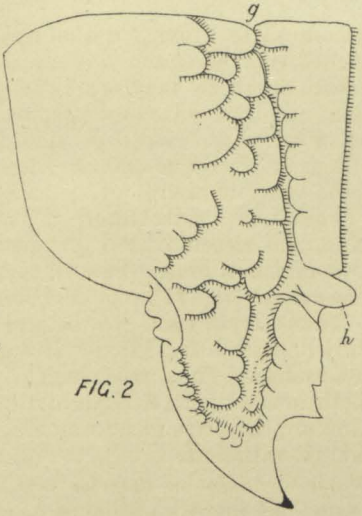

FIG. 2

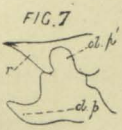

FIG. 7

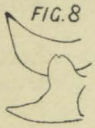

FIG. 8

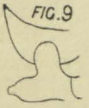

FIG. 9

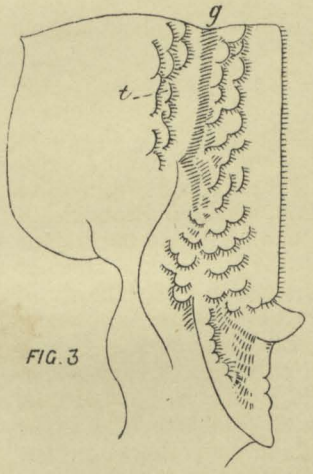

FIG. 3

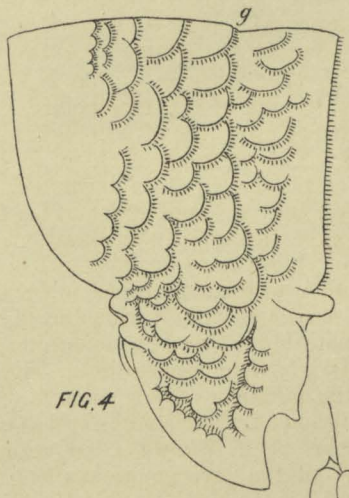

FIG. 4

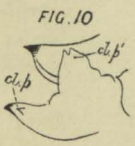

FIG. 10

FIG. 11

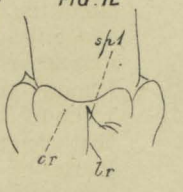

FIG. 12

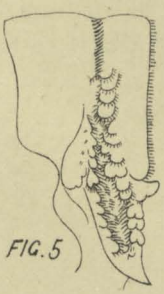

FIG. 5

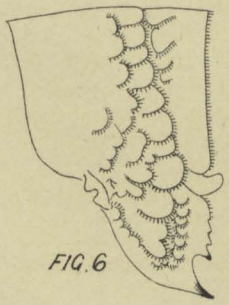

FIG. 6

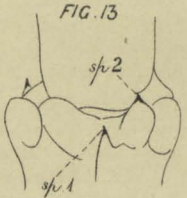

FIG. 13

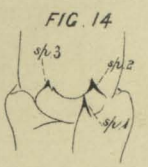

FIG. 14

T.J.P. ad nat. delt. PALINURUS.

P. edwardsii; or, in other words, the diagnostic characters hitherto relied upon having broken down, are there sufficient differences from the Cape species to entitle it to retain a distinct specific name ?

After a careful comparison, by means of drawings and measurements, of the series of New Zealand and African specimens, I find that there is one constant and reliable difference between the individuals from the two localities: It consists in the greater complication of the sculpturing or tuberculation of the abdominal segments in the Cape form.

The difference to which I refer will be apparent from a comparison of figs. 1 and 2, which represent the first and third abdominal segments of a New Zealand specimen, with figs. 3 and 4, which show the corresponding somites of a Cape specimen of about the same size.

In both cases, the first segment is marked by a strong transverse groove (*g*), which divides it into a larger anterior and a smaller posterior portion, the former being covered by the carapace in the extended condition of the abdomen. In all the Cape specimens which have come under my notice the segment in question shows a double row of tubercles (fig. 3, *t*) anterior to the groove; while in New Zealand specimens the anterior section of the somite is either wholly devoid of tubercles (fig. 5), or presents one or two very small detached ones (fig. 1). Further, in the Cape crayfishes, the posterior section of the same segment bears two rows of flattened squamiform tubercles; while in the New Zealand form there is only a single row of imperfectly-formed tubercles.

Similar differences are found in the remaining abdominal segments, which show the same separation into anterior and posterior areas, the groove (figs. 2 and 4) being, however, less clearly marked than in the first. In the Cape specimens (fig. 4) the tubercles on the anterior division are very numerous, only a small portion of the segment being without sculpturing; in New Zealand specimens (figs. 2 and 6), there are only two or three rows, so that fully half the tergum is left bare. In the posterior area of the 2nd–5th segments there is a close agreement with the corresponding region in the first, the Cape specimens (fig. 4) having about two rows of tubercles; the New Zealand specimens (figs. 2 and 6), a single row of imperfectly-formed tubercles.

The figures show at a glance the practical identity in these respects between the two supposed New Zealand species, ("*P. lalandii*," figs. 1 and 2; *P. edwardsii*, figs. 5 and 6,) and the marked difference of both from the true *P. lalandii*, (figs. 3 and 4,) from the Cape.

The carapace in the South African specimens is usually broader in proportion to its length than in New Zealand

examples, the proportion of length to breadth being from 100–72 to 100–65 in the former, 100–65 to 100–60·5 in the latter. The pleura of the abdominal segments, measured from the hinge (figs. 1 and 2, *h*) to the terminal spine, are also, as a rule, proportionately shorter in the African than in the New Zealand specimens. But in both these characters the examination of a large series of individuals shows a complete gradation between those from the two localities.

The Cape specimens were not in a sufficiently good state of preservation to allow of a careful examination of the internal organs. But I find that there is no difference of any importance from the New Zealand form in the gills, the gastric skeleton, the mouth parts, or the microscopic structure of the branchial setæ.

In the sculpturing of the abdomen, on the other hand, the examination of about a dozen specimens of all sizes and both sexes from each locality has shown no intermediate stages.

I conclude, therefore, that there are constant though slight differences between the common New Zealand *Palinurus* and *P. lalandii* from the Cape of Good Hope, and that Hutton's name, *P. edwardsii*, should be retained for the New Zealand species, *P. lalandii* being no longer considered as an inhabitant of our coasts.

The differences relied upon are, however, so small, that but for the wide separation of the two localities one would hardly consider them as of more than varietal importance. Mr. Trimen informs me that *P. lalandii* "is confined to the western (Atlantic) shores of the Cape, and does not occur even in False Bay, immediately east of the Cape of Good Hope itself," and it would certainly be a remarkable fact to find the identical species reappear so far east as New Zealand. Haswell* states, however, that *P. edwardsii* occurs both in Tasmania and St. Paul's Island, two localities which help to bridge over the distance between South Africa and New Zealand, and it is quite possible that specimens from these places may be found to furnish intermediate steps, and thus to necessitate the merging of *P. edwardsii* in *P. lalandii*.

In any case, the existence of a single species, or group of closely-allied geographical sub-species, in South Africa, St. Paul's, Tasmania, and New Zealand, is a strong argument in favour of Hutton's theory† of an antarctic continent, from which the great Southern land-masses were stocked.

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* Cat. of Australian Stalk- and Sessile-eyed Crustacea.

† "N.Z. Journ. of Science," vol. ii., p. 1.

DESCRIPTION OF PLATE X.

Fig. 1. First abdominal somite of Hutton's type specimens of the supposed New Zealand *Palinurus lalandii*; *g*, groove; *h*, hinge.
Fig. 2. Third abdominal somite of the same.
Fig. 3. First abdominal somite of *P. lalandii* from the Cape of Good Hope; *t*, anterior group of tubercles.
Fig. 4. Third abdominal somite of the same.
Fig. 5. First abdominal somite of Hutton's type specimen of *P. edwardsii*.
Fig. 6. Third abdominal somite of the same.
Fig. 7. Rostrum and clasping process of Hutton's type specimen of the supposed New Zealand *P. lalandii*, from the left side; *r*, rostrum; *cl. p*, anterior, and *cl. p'*, dorsal limb of clasping process.
Fig. 8. Rostrum and clasping process of Hutton's type specimen of *P. edwardsii*.
Fig. 9. Rostrum and clasping process of a specimen of the supposed New Zealand *P. lalandii*.
Fig. 10. Rostrum and clasping process of *P. lalandii*, from the Cape of Good Hope.
Fig. 11. Rostrum and clasping process of another specimen of the same.
Fig. 12. Distal end of meropodite and proximal end of carpopodite of the 3rd left leg of Hutton's type specimen of the supposed New Zealand *P. lalandii*; *sp. 1*, the principal spine; *l.r*, longitudinal ridge; *cr*, crescentic elevation.
Fig. 13. Rostrum and clasping process of the corresponding leg of a large specimen of *P. lalandii* from the Cape of Good Hope; *sp. 2*, the anterior accessory spine.
Fig. 14. Rostrum and clasping process of the 4th left leg of a specimen of the supposed New Zealand *P. lalandii*; *sp. 3*, the posterior accessory spine.

All natural size except Figs. 8 and 10, which are slightly magnified.

Art. XVII.—*On a new Species of Giant Cuttlefish, stranded at Cape Campbell, June 30th, 1886* (Architeuthis kirkii).

By C. W. Robson. Communicated by Dr. Hector.

[*Read before the Wellington Philosophical Society*, 19*th July*, 1886.]

Cape Campbell and the adjacent coasts seem to be places of favourite resort for these great Cephalopods during the winter months, a year seldom passing without one or more of them being cast on shore, usually during the months of June and July. The greater number, however, of these, owing to the attacks of sharks, dogfish, and porpoises, are stranded in such a mutilated condition as to be of little value to the naturalist; but I am quite satisfied, from the examination of a number of imperfect and of two perfect specimens, that they are all Decapods. None of the Octopods which have come under my notice have a solid heavy body like the Decapods, and they all seem when cast on shore to be able to return to the water