

The surface of the abdominal segments are comparatively smooth, being ornamented merely with scattered granules and punctæ, in place of being ornately sculptured or tuberculate, while their lateral edges or pleura are armed with seven or eight acuminate teeth instead of with two only as found in the Tasmanian type. All the points now enumerated accord with the diagnosis of the New South Wales species *Palinurus Hügelli* contained in Mr. Hassell's Catalogue of the "Australasian Stalk and Sessile-eyed Crustacea," and with which I have no hesitation in identifying it. To make more sure of this suggested identification, I remitted drawings of the more essential features of this crawfish to my brother, Mr. Acland Kent, at present residing in Sydney, asking him to compare them with the typical examples in the Sydney Museum. The comparisons instituted resulted in a full confirmation of my anticipations, and we may accordingly include Tasmania in the area of distribution of this species, and which it may be mentioned is regarded as identical with the *Palinurus tumidus*, Kirk, inhabiting North Island, New Zealand. I have much pleasure in presenting the specimen to the Society's Museum.

OBSERVATIONS ON A SUSPECTED HYBRID
SPECIES OF TRUMPETER, AND UPON OTHER
RARE FISH TAKEN IN TASMANIAN WATERS.

BY W. SAVILLE-KENT, F.L.S., F.Z.S.

I propose in this communication to make a few remarks upon certain varieties of fish that have been remitted me by the local fishermen within the past twelve months as varieties with which they were more or less unfamiliar.

The first specimen to which I have to draw attention was captured on the East Coast in a graball net in company with ordinary silver bastard trumpeter, and being brought to Hobart alive was kept for some time in one of the tidal ponds at the fishery establishment. When taken by the fishermen it was at once recognised by them as an unfamiliar form which could not be correctly identified with either the real trumpeter, *Latris hecateia*, or the ordinary red and silver bastard trumpeter, *Latris Forsteri*, but which combined the character of both of these familiar species in a very remarkable manner. The accompanying water-colour drawing (submitted to the meeting) taken from life, and of the natural size, will give an approximate idea of the shape,

colour, and general aspect of the living fish. The specimen did not long survive the injuries it had received in being caught; and upon its death the structural details as here recorded were accurately determined. Its total length was 21 inches, whereof the head occupied slightly less than one-fourth; the greatest depth, measuring from the centre of the spinous portion of the dorsal fin, was $6\frac{1}{2}$ inches. Its weight fresh from the water was $3\frac{3}{4}$ lb., but being in an emaciated condition, 4 lb. may be set down as its approximate living weight. The general colour and the distribution of the markings on the body of the fish, as observed in life, corresponded closely with those of an adult silver bastard, *Latris Forsteri*, consisting of a pearl ground with horizontal lines, and reticulations of light brown and tawny yellow that extended throughout the dorsal region to a little below the lateral line. The fins were, however, of a more pronounced yellow than those of the silver bastard, combined with a tendency to green upon the pectorals and ventrals suggestive of what obtains in the real trumpeter. There was also an entire absence of the black edging to the pectoral, caudal, and hind dorsal fins that is so characteristic of the silver variety. In its general contour, and with respect to the greater portion of its anatomical details, the fish was found to agree most closely with the real trumpeter, *Latris hecateia*. Compared with that species, it coincides in the possession of seventeen rays to the anterior or spinous portion of the dorsal fin, in the number of scales, 110, developed on the lateral line, and in the presence of teeth on the vomer, though these are fewer in number than obtains in the last-named species. In the common or silver bastard trumpeter there are invariably only sixteen spinous rays in the anterior moiety of the dorsal fin; the scales along the lateral line vary from 115 to 120, and there are no teeth whatever upon the vomer.

It has been suggested to me that the individual now under discussion may be identical with the variety known by the title of the New South Wales, or New Zealand trumpeter, *Latris ciliaris*, and which represents the commercial species of the trumpeter genus in the two colonies, from whence it takes its name. Mr. R. M. Johnston, F.L.S., in his "Catalogue of Tasmanian Fishes," 1882, p. 113, expresses the opinion that this type does not exist in these waters, and that the supposed specimens of it, reported by local naturalists, were variations only of the silver bastard. Since the publication of his catalogue, Mr. Johnston, has, however, satisfied himself that the species pays occasional visits to these shores. (Proc. Roy. Soc. Tasmania, p. lxxxix, 1884), and one reputed example, taken at George's Bay, has been deposited in the Society's Museum. The leading peculiarities of the New South Wales

or New Zealand trumpeter, according to the original diagnosis, are the fewer number of scales, 84 only, upon the lateral line, and the small number, six only, of the unbranched pectoral rays. In other respects, except for the presence of an extra dorsal spine, it corresponds with the ordinary silver bastard trumpeter, *Latris Forsteri*.

It will be found on reference to the structural formulæ of the several species of trumpeter presently submitted that the fish forming the subject of this notice corresponds more closely with the real trumpeter, *L. hecateia*, than with *L. ciliaris*, though it cannot be precisely identified with any one of the three generally recognised species belonging to the genus, with which it has now been compared. It may be mentioned here that two additional species are included in the trumpeter genus by Castelnau, viz., *Latris bilineata*, and *L. inornata*, while a third *L. Ramsayi*, has been described by J.D. Ogilby. The structural characters of these three species, however, agree so closely with those of the silver bastard, *L. Forsteri*, the differences upon which they have been founded, relating chiefly to colour, that they are regarded by many ichthyologists as probably local variations only of that species. With some authorities the fish, now introduced, would probably be accepted as the type of a new species, and as a matter of fact its structural characteristics, more particularly with relation to its dentition, invest it with more substantial qualifications for such a distinction, than are found in either of the three supplementary species, last enumerated, established by Castelnau and Ogilby. Were this variety obtainable in any quantity and its structural formula as here recorded found to be constant, I should be inclined also to associate it with a distinct specific title. Taking into account, however, its occurrence as an exceptional specimen, and giving full value to the remarkable manner in which it combines the characteristics of both the real and the silver bastard trumpeter, I find it difficult to avoid the conclusion that it represents an accidental case of hybridism between these two species. Parallel instances of hybridism, as is now generally known, naturally occur or may be brought about by artificial means among diverse species of salmonidæ. It may be further cited as a circumstance in favour of this interpretation that the breeding seasons of the silver bastard, and of the real trumpeter, May to July, and July and August, overlap one another, so that the spawn of the one might be fertilised by the milt of the other. The greatest obstacle to this proposed interpretation is, to my mind, associated with the character of the dentition, the number of vomerine teeth, two only, being so considerably fewer than those of *Latris hecateia*. It might at the same time be anticipated that the interbreeding of two allied

species, the one as in *L. Forsteri* being altogether destitute of vomerine teeth, and the other represented by the real trumpeter having six or eight such teeth, would result in an intermediate form in which teeth were present, but less numerically developed than in *Latris hecateia*.

The precise affinities of the three generally recognised species of the genus *Latris*, both among themselves, and with relation to the suspected hybrid now described, will be most readily comprehended by an examination of their respective structural formulæ when placed in juxtaposition as in the accompanying schedule:—

—	D.	P.	A.	L. lat.	Vom'rine teeth.
<i>L. hecateia</i> —Real trumpeter ..	17:1·36-38	9br·8-9s	3·28-30	110	6-8
<i>L. Forsteri</i> —Silver bastard ..	16:1·37-42	9·10br·8-9s	3·33-38	115-120	None
<i>L. ciliaris</i> —N.S.W. trumpeter..	17:39	9br·6s	3·32	84	None
<i>L. sp.</i> —Hybrid (?)	17:1·39	9br·9s	3·32	110	2

Concerning one of the species enumerated in the foregoing schedule, viz., the so-called New South Wales or New Zealand trumpeter, *Latris ciliaris*, it is, I think, very desirable that more extensive investigations should be made. The structural formula for this species, as above cited, is a transcript of that given in Dr. Gunther's "Catalogue of Fishes," vol. ii, p. 86, and reproduced by other more recent authorities. My friend, Mr. R. M. Johnston, however, informs me that an example has passed through his hands in which there were as many as eight instead of six simple pectoral rays, and on making a careful examination, in company with Mr. Morton, of the type specimen in the Museum, we found that it has only sixteen instead of seventeen spinous rays in the dorsal fin. It consequently follows that if the two specimens just referred to are to be accepted as *bona-fide* examples of *Latris ciliaris*, the claims of this accredited species to an independent specific status rest upon an exceedingly slender basis, and, in fact, solely on the number of scales developed along the lateral line of the body, all the remaining structural details agreeing essentially with those of the ordinary silver bastard trumpeter, *Latris Forsteri*. In order to more fully investigate this matter, and to, if possible, arrive at a satisfactory solution of the problem, Mr. Morton is taking steps to procure genuine examples of *Latris ciliaris* from Sydney. And at a future meeting of this Society I shall hope to report upon the results of a more exhausted comparison between the two species that will then be rendered practical.

In the possible event of this at present suspected hybrid variety being found to have substantial claims for recognition as an independent species, I would propose to bestow upon it

the title of *Latris Mortoni*, such specific title being associated with the name of Mr. Alexander Morton, the curator of the Tasmanian Museum, to whom I am indebted for much assistance in working up the literature of the species allied to the varieties described in this communication.

The second specimen to which I have to draw attention is a representative of the genus *Clinus*, belonging to the family *Blenüdæ*, and including a number of shore-frequenting fishes which rarely exceed a length of a few inches. A single species, *Clinus despicillatus*, Richards, is recorded in Mr. Johnston's "Catalogue of Tasmanian Fishes." It attains to a length of four or five inches, and is one of the forms popularly known as "bullies" that may be abundantly obtained in rock pools or lurking under stones at low water. A second Australian (Port Phillip) species, *Clinus marmoratus*, Klunz.—length 15 centimetres, or say 7 inches—is included in the supplement to Macleay's "Catalogue of Australian Fishes, 1884." Upwards of twenty additional species of the genus are described in Dr. Gunther's "Universal Catalogue of Fishes." A large portion of these are inhabitants of the seas around the Cape of Good Hope, and the remainder inhabit the American coast line and the Chinese Seas. The specimen I have to introduce is remarkable for its comparatively large size—14 inches—and so far as I have been able to determine it differs in several essential structural points from any of the various species hitherto described. An approximate idea of the dimensions, general aspect, and the diversified tints of the living fish may be obtained in reference to the water-coloured drawing from life herewith submitted. These together with the essential structural details are further embodied in the following diagnosis:—

CLINUS JOHNSTONI. Nov. Sp.

D 2-3. 32-33. 5 | A 2. 25-26 | V 1. 3.

Height of body, contained about four times, the length of the head about five times, in the total length; snout, conical, the lower jaw somewhat prominent; a large erect foliaceous branched tentacle developed above each orbit, a similarly large tentacle, with six slender subulate ramifications, developed from each nostril, and directed forwards. A single row of isolated, incurved, conical teeth, developed throughout the outer edge of the upper jaw; a crescentic patch of thickly set, minute, villiform teeth, developed upon the inner edge of the premaxillæ, and a corresponding patch of smaller dimensions developed on the vomer, no teeth on the palatines; a series of six or seven isolated conical teeth, of larger size than those of the upper jaw, developed along each side of the lower jaw, the symphysis of the mandibular region occupied by a crescentic patch of closely approximated small sized teeth of

the same character. The two or three anterior dorsal spines remote from, but connected by membrane with the succeeding ones; the five jointed rays of the posterior portion of the dorsal fin about one-third longer than those of the spinous portion, connected posteriorly with the caudal. Colour in life, ground cream yellow, with spots and markings of crimson, grey and purple. These most conspicuously developed in the form of seven vertical bands, broadest superiorly and which extend from the upper edge of the dorsal fin, across the body, the five posterior bands terminating on the lower edge of the anal fin. A series of similarly coloured streaks radiating from the orbit, and forming a reticulated pattern on the cheeks and opercula; caudal, pectoral, and ventral fins, barred and spotted with crimson. Length, 14 inches. Habitat., Tasmania, Adventure Bay.

The specimen now described was captured in a graball net in Adventure Bay. It was kept alive for some time in one of the tanks at the fishery, and which afforded an opportunity of making the notes and drawing submitted, concerning its natural colours and aspect. It unfortunately received injuries from the net, which ultimately mortified and caused its death. On proceeding to examine it structurally, some difficulty was, in the first place, experienced in assigning it to the genus *Clinus*, in consequence of there being only two rays to the partially isolated anterior portion of the dorsal fin. In all other known species of the genus three appear to be the normal and invariable number. On examining the alcoholic collection in the Tasmanian Museum, I had the good fortune to discover a second specimen of this fish. No history or record was attached to it, and doubts were expressed as to its being a Tasmanian species. These doubts may now be set aside. On comparing the two specimens it was found that the Museum example possessed the normal number of three rays to the anterior segment of the dorsal fin, It was at the same time imperfect in the ventral fins, only a single soft ray being developed on the left, and two on the right of these appendages in place of three. This deficiency may probably be accounted for by an accident in early life. In all other respects the two specimens completely corresponded. Respecting the affinities of the species under discussion, the size alone separates it distinctly from the two relatively small Australian representatives of the genus *Clinus despicillatus* and *C. marmoratus*, hitherto described. There are other more essential points, however, in which it not only differs from these, but so far as I have been able to ascertain from any of the twenty or more species that have been elsewhere described. The development of large tentacular processes in connection with the nostrils, equal in

size to, but different in character from those over the orbits is recorded of no other known species, and may be accepted, I think, as a reliable diagnostic character. From their large size and projecting character, it may be anticipated that these nostril tentacula fulfil the part of efficient tactile organs, or taking their origin from the olfactory chamber may be closely associated with the sense of smell. In the numerous European species of the allied genus, *Blennius*, with which I am familiar, I have always found the form and proportions of the tentacular appendages to be a constant factor, and in my examination of a number of examples of the indigenous *Clinus despicillatus* for the purposes of comparison, I have found no variation in these elements. It may be mentioned here that although nostril tentacula are not included in the diagnosis given of the last-named species, they exist in a rudimentary condition, and may be observed in life as a minute bi- or tri-furcate filament developed from the projecting tube of the nostril. In spirit-preserved examples it shrinks up so as to be scarcely visible. An additional point of divergence with relation to *Clinus despicillatus* that has been established through the examination of a considerable number of this species, is the circumstance that while in this type the number of soft or jointed rays to the hinder extremity of the dorsal fin is invariably four only, in both examples of the variety now introduced there are five such rays.

It appearing desirable that a new specific title should be associated with the form described in this communication, I propose, providing that further investigations should fail to identify it with any previously named type, to distinguish it by the title of *Clinus Johnstoni*. The scientific name suggested, I need scarcely add, is in honour of a well-known Fellow of the Society, Mr. R. M. Johnston, F.L.S., to whom science is so much indebted for the already advanced state of our knowledge concerning the fish fauna of this colony.

The third species of fish which I exhibit on this occasion I had anticipated, on account of the scaly covering of the several vertical fins, to belong to the group distinguished by the title of the *Squamipinnes* or "scale-finned" fishes. Without examining it closely I set it aside at the time as being, in all probability, identical with *Scorpius Georgianus*, the single known species of that group that has so far been captured, though very rarely, in Tasmanian waters. On proceeding very recently to glance through the structural details of the fish, it was found, however, that it could not be referred to the genus *Scorpius* or to any other of the typical *Squamipinnes* but to the tribe of the *Pomacentridæ*, many of whose members bear an external resemblance to those of the first-named group, but, at the same time differ from them in several important

internal anatomical details. Among the Pomacentridæ, this fish finds its place in the genus *Glyphidodon*, and has been identified by my friend, Mr. R. M. Johnston, with *Glyphidodon Victoriæ*, or the so-called "rock perch" of the Melbourne fishermen. As a species and genus it represents the first example recorded from Tasmanian waters. The specimen exhibited was captured on the North Coast, being taken in a graball net by the George Town fishermen. The structural formula, as given by Dr. Gunther, Ann. and Mag., Nat. Hist., 1873, vol. xi., p. 115, is as follows:—

GLYPHIDODON VICTORIÆ, Gunther.

D. 13-17. A. 2-15 | L. Lat. 30. L. Transv. 4-10.

Over fifty additional species of the genus have been described, the majority being inhabitants of the hotter Tropical Seas.

REFERENCE LIST OF THE TERTIARY FOSSILS OF TASMANIA.

BY ROBT. M. JOHNSTON, F.L.S.

So many additions have been made to the list of Tertiary fossils of Tasmania during the last seven years that it is now very desirable that a Reference List, complete to date, should be placed at the disposal of all those who may wish to make themselves acquainted with the Tertiary fossils of this island. I have, with this object in view, prepared the following Reference List, which I hope will be of some advantage to the members of this Society, as well as to geologists generally.

The list embraces about 382 species, of which the following is an abstract:—

	<i>Tertiary.</i>					
Plantæ	114
Rhizopoda	14
Actinozoa	16
Echinodermata	4
Polyzoa...	9
Crustacea	2
Brachiopoda	14
Pelecypoda	60
Gasteropoda	125
Cephalopoda	1
Pisces	3
Marsupialia	3