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OBSERVATIONS ON SOME TASMANIAN FISHES: PART XVII

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(One text figure)

ABSTRACT

Three species are added to the Tasmanian list: *Ichthyocampus cristatus* McCulloch & Waite, 1918 (Syngnathidae), *Scorpis lineolatus* Kner, 1865 (Scorpidae), *Pseudolabrus parilis* (Richardson), 1850 (Labridae): some general observations are made on these species. *Coelorhynchus mortoni* Ogilby, 1897 (Macruridae), relegated in the Check-List to the synonymy of *C. australis* (Richardson), 1849, is reinstated as a valid species, and a redescription and figure, based on material from the West Coast, are supplied. Other species discussed are *Raja whitleyi* Iredale, 1938 (Rajidae) [metrical data on 17 examples], *Vincentia lemprièri* (Johnston), 1883 (Apogonidae) [new material], *Neoplatycephalus speculator* (Klunzinger), 1872 (Platycephalidae) [confirmation of Tasmanian status], *Platycephalus bassensis bassensis* Cuvier, 1829 (Platycephalidae) [variation in fin counts]. Tasmanian representatives of the families Scorpidae, Platycephalidae, and Australia and New Zealand species of the genus *Coelorhynchus* Giorna, 1809 are keyed.

INTRODUCTION

This paper follows the general plan of the others in the series. Where the unit of length measurement is not given, millimetre(s) is to be understood. The abbreviations *Ls, Lt, TLs, TLt* denote standard length, total length, thousandths of standard length, thousandths of total length, respectively. Certain other conventions are noted in earlier contributions. Parts I-XV are published in this journal, 1934-1967; Part XVI appears in *The Australian Zoologist*, 15, 2, 1969: 160-177, figs 1-2.

Family RAJIDAE

Genus **RAJA** Linné, 1758

Raja whitleyi Iredale, 1938

Raja whitleyi Iredale, 1938, *Austr. Zool.*, 9, 2: 169. Type locality, Port Phillip, Victoria.

Raja whitleyi Iredale,. Scott, 1967, *Pap. Proc. Roy. Soc. Tasm.*, 101: 190 (synonymy).

Remarks.—In a previous contribution (1967)—in which it was observed that the nomenclature of this ray appears to have received more attention than its external features—it was shown that several characters commonly relied on to separate this species from *R. lemprièri* Richardson, 1848 are not constant; and an account of 3 males and 1 female was accompanied (table 1: 191) by a full set of measurements. An examination of 5 males and 12 females, taken during the St Helens Surf Angling Club's Championships at Swimcart Beach, near St Helens, Cornwall on 5 May 1968 provides useful data on individual variation in overall size and in relative development of certain features, and casts light on the question of possible differences in size and/or proportions in the sexes. Some dimensions of the females are set out in table 1 and of the males in table 2; in both cases expressed as millesimals of disc width.

In the present sample total length (measured in all females, in 4 of 5 males) ranges rather widely from 565 to 948; $\bar{x}$ 747.9±25.6, σ 102.3±18.1, V 13.7±2.4: the only specimen in the earlier sample with the tail tip not removed, a male, measured 695. For all 17 present specimens disc width ranges from 420 to 673; $\bar{x}$ 532.3±17.2, σ 70.7±12.1, V 13.3±2.3: corresponding values for the earlier sample being 454-603, $\bar{x}$ 501.5±30.4, σ 60.8±21.5, V 12.1±4.3.

An interesting qualitative individual variation is presented by the relation of the dorsals. In 1 of the 4 males in which the relevant region is intact and in 3 of the 12 females the bases of the fins are continuous, while all other individuals have an interdorsal interval of 4-12, modally 6, thousandths of disc width.

For all measurements recorded the coefficient of variation has been calculated; for ready assessment of the diagnostic reliability of the dimensions concerned these V values are recorded in the tables. Apart from the formally invalid V of 60.7 (males) 67.8 (females) for interdorsal interval, the values are seen to range from 1.1 to 13.3, with a mean of 5.9. Values of V of, say, $\leq$10 may in general be taken as indicative of tolerably constant body form: an arbitrary V=10.0 being exceeded here, and then but slightly, by second dorsal base (both sexes), length of ventral (both sexes), interorbital width (males).

Comparison of mean values in the tables reveals no noticeable differences between the sexes in relative magnitude of the dimensions recorded. Though mean absolute disc width of females, 542.4±22.0 (σ 76.3±15.6, V 14.1±2.9) exceeds that of males, 508.0±13.5 (σ 47.0±9.6, V 9.3±1.9) by 6.8%, and mean total length of females, 754.1±32.1 (σ 111.4±22.7, V 14.8±3.1) exceeds that of males, 729.25±32.4 (σ 64.7±22.9, V 8.9±3.2) by 3.4%, neither difference, in samples with such a high variance, is statistically significant—while, indeed, in the previous sample disc width of all 3 males (455, 498, 603) exceeded that of the single female.

TABLE 1

Raja whitleyi Iredale, 1936. Dimensions, expressed as thousandths of disc width, of 12 females from Swimcart Beach, near St Helens, Dorset, Tasmania, 5 May, 1958.

Dimension	Specimen: disc width, mm												$\bar{x}$	σ	V
	(*f*) 420	(*g*) 427	(*h*) 479	(*i*) 489	(*j*) 511	(*k*) 530	(*l*) 565	(*m*) 581	(*n*) 602	(*o*) 610	(*p*) 622	(*q*) 673			
Total length	1,345	1,436	1,392	1,403	1,354	1,342	1,515	1,377	1,342	1,395	1,408	1,409	1,393.2±13.5	46.8±9.6	3.4± 0.7
Length to origin of first dorsal	1,157	1,204	1,201	1,188	1,132	1,151	1,242	1,208	1,151	1,148	1,119	1,193	1,174.5±10.1	35.1±7.2	3.0± 0.6
Base of first dorsal	75	87	86	90	80	87	92	88	87	98	87	95	88.0±1.5	5.2± 1.1	5.9± 1.2
Interdorsal	0	12	4	6	6	6	9	0	6	8	0	9	[5.5±1.1]	[3.7±0.8]	[67.8±19.2]
Base of second dorsal	71	89	73	84	78	81	85	76	81	75	56	56	75.4±2.9	10.0±2.0	13.3± 2.8
Length to front of vent	733	771	756	740	750	743	788	749	743	736	751	755	751.3± 4.3	14.8±3.0	2.1± 0.4
Length of vent	33	40	46	49	41	47	39	43	47	39	43	37	42.0± 1.3	4.5±0.9	10.8± 2.2
Length to mouth	212	183	230	215	211	213	224	213	213	207	217	217	212.9± 3.1	10.8±2.2	5.0± 1.0
Width of mouth	129	150	134	137	149	147	140	136	147	136	130	135	139.2± 2.0	7.0±1.4	5.1± 1.0
Length to eye	233	265	253	227	237	240	248	246	240	218	240	241	240.7± 3.3	11.6± 2.4	4.8± 1.0
Interorbital	85	98	79	96	72	92	90	98	92	85	97	104	90.5± 2.4	8.3±1.7	9.2± 1.9
Length to first gill-slit	347	413	372	350	360	353	359	349	353	369	357	345	360.6± 5.3	18.5±3.8	5.1± 1.0

TABLE 2

Raja whitleyi Iredale, 1938. Dimensions, expressed as thousandths of disc width, of 12 females from Swimcart Beach, near St Helens, Dorset, Tasmania, 5 May, 1968.

Dimension	Specimen: disc width, mm					$\bar{x}$	σ	*V*
	(*a*) 457	(*b*) 464	(*c*) 495	(*d*) 548	(*e*) 578			
Total length	..	1,362	1,466	1,366	1,407	1,400.3 ± 20.9	41.8 ± 14.8	3.0 ± 1.1
Length to origin of first dorsal	1,179	1,149	1,168	1,174	1,149	1,163.8 ± 5.7	12.5 ± 4.0	1.1 ± 0.3
Base of first dorsal	..	95	87	79	94	88.8 ± 3.2	6.4 ± 2.3	7.2 ± 2.6
Interdorsal	..	6	0	4	5	[3.8 ± 1.1]	[2.3 ± 0.8]	[60.7 ± 28.2]
Base of second dorsal	..	65	81	80	66	73.0 ± 2.8	7.5 ± 2.7	10.3 ± 3.7
Length to front of vent	792	739	731	738	780	756.0 ± 11.2	24.9 ± 7.9	3.3 ± 1.0
Length of vent	42	47	44	57	43	46.6 ± 2.4	5.5 ± 1.7	11.7 ± 3.8
Length to mouth	225	222	212	214	215	217.6 ± 2.2	5.0 ± 1.6	2.3 ± 0.7
Width of mouth	153	144	131	139	143	142.0 ± 3.2	7.2 ± 2.3	5.0 ± 1.6
Length to eye	256	239	235	251	228	241.8 ± 4.6	10.3 ± 3.3	4.3 ± 1.4
Interorbital	92	80	87	90	66	83.0 ± 4.2	9.4 ± 3.0	11.4 ± 3.6
Length to first gill-slit	374	384	362	372	352	368.8 ± 4.9	10.9 ± 3.5	3.0 ± 0.9

Family SYNGNATHIDAE

The Check-List (McCulloch, 1929) credits Tasmania with 7 species, the Handbook (Munro; cited, 1958) with 15. In a paper containing the first local record of *Syngnathus poecilolaemus* Peters, 1869, the writer (1968:4), listing 20 species, entered both *Hippocampus novaehollandiae* Steindachner, 1866 and *H. whitei* Bleeker, 1855, noting, however that Munro treats Steindachner's species as a synonym of Bleeker's—it seems clear this identification is to be accepted. With the addition below of the first notice from Tasmanian waters of a representative of the genus *Ichthyocampus* Kaup, 1853 the total for this State remains at 20.

A key to 17 Tasmanian species is given in Part X (1961:58). *Hippocampus whitei,* first reported from Tasmania (Port Arthur, Pembroke), by Whitley & Allan (1955:32), but not noted in the key, would enter it at couplet 15. From both the species diagnosed there, *H. abdominalis* Lesson, 1827, and *H. breviceps* Peters, 1870, it differs in having fewer dorsal rays (16-17; *cf.* 26-31, 19-22), fewer caudal rings (33-36; *cf.* 42-49, 38-42); it differs also from the former species in its shorter dorsal base (fin on 2-3+1 annuli; *cf* 2-5+2-5), and from the latter in its longer snout (2 in head, 3-3.5 eye; *cf.* 3 in head, 2.1 eye).

S. poecilolaemus would run down to couplet 9. Agreement with all entries in the second half of this couplet, except number of dorsal rays, would separate it from *S. mollisoni* in the first couplet. From both species in couplet 10 (to which couplet it would be referred, apart from dorsal fin count), namely, *S. curtirostris* Castelnau, 1872 and *S. phillipi* Lucas, 1891, it is distinguished by more numerous dorsal rays (26-29; *cf.* 20-24, 22-28), by much longer head (about 1.5 in trunk; *cf.* about 3, about 2); further from *S. curtirostris* by the keeled operculum.

From *Stigmatopora argus* (Richardson), 1840 and *S. nigra* Kaup, 1853—the only other Tasmanian pipefishes having the constellation of characters, TV continuous with CU, TL continuous with CL, TM ending free—*Ichthyocampus cristatus* may be recognised at sight by presence of caudal fin, fewer dorsal rays (26-27; *cf.* 43-58, 35-43), predorsal length about 4 (*cf.* 1-2) times dorsal base.

Genus **ICHTHYOCAMPUS** Kaup, 1853

Ichthyocampus cristatus McCulloch & Waite, 1918

Ichthyocampus cristatus McCulloch & Waite, 1918, *Rec. S. Austr. Mus.*, 1, 1: 40, fig. 26. Type locality, Spencer Gulf, South Australia.

Tasmanian record.—This species—reported in the Check-List only from South Australia: Scott (1962: 115) notes also Victoria—is here added to the Tasmanian list, a specimen having been collected on 20 July 1968 by Mr D. C. Wolfe by dredging, 400 yards south-east of the wharf at Lady Barron, Flinders Island, county Flinders.

Fin counts and dimensions.—D.27. A.3? P.12 (left), 13 (right). C.8. Annuli 20+40; subdorsal 1.2+4.5. *Ls* 230.0, *Lt* 235.0. Some dimensions as *TLs*: head 70; snout 21; eye 13, orbit 17; interorbital 9; length to pectoral 79; length of pectoral 19, oblique pectoral base 8; length to dorsal origin 333, dorsal base 73; length of anal 5; length to vent 352; trunk 283; tail without fin 648, with fin 670; length of pouch fold 240 (left), 254 (right); depths (in parentheses widths) at points noted, middle of snout 17 (9), front of eyes 21 (13), back of eyes 22 (21), operculum 29 (21), vent 30 (22), middle of tail 17 (17); maximum 31 (34).

No data on fin counts or proportions other than those noted by Waite & Hale (1921: 304) for 4 individuals (longest 214) from Spencer and St Vincent Gulfs appear to have been published, their values being those given in the Handbook diagnosis (Munro, 1958: 88). For the ratios they record our values are as follows (South Australian data in parentheses): snout in head 3.27 (3.4);

eye in snout 1.63 (1.3), orbit in snout 1.23 (—); eye in head 5.33 (4.7), orbit in head 4.00 (—); head in trunk 4.06 (3.6-4.4); head in *Lt* 14.7 (13.3-15.3); trunk in tail without fin 2.29, with fin 2.37 ('in tail' 1.8-2.1).

Brood pouch.—The ovisac of the holotype was filled with well developed young, and covered 13 tail rings. In our example the pouch is open and empty; even when the folds, the free margins of which are rolled, are fully extended, they fail to meet in the middle: the pouch is clearly either not fully developed or is in course of regression. The folds begin at the front of the 1st caudal ring, just embracing here base of anal; they terminate, the right on 0.1, the left on 0.8, of the 15th caudal ring; without strengthening plates; hyaline, with a narrow irregular proximal band of brown chromatophores; with up to 10 longitudinal plicae. The pouch floor is covered with whitish somewhat opalescent integument, clearly traceable as such through the first 12 annuli, behind which the floor progressively approximates in texture and colour the general ventral surface of tail; through integument can be recognised the transverse ridges of the scutes; pouch shallowly divided into compartments by fusiform cross partitions, representing the element of scute sculpture described below under the name of escutcheon, but, being covered with smooth whitish integument, not exhibiting their tuberculate ornamentation.

External structure of scutes.—The sculpturing of the scutes in Tasmanian syngnathids has received but little attention: ornamentation of body scutes is diagnostic in *Solegnathus* Swainson, 1839, and the Handbook (Munro, 1958: 89) notes differences in the occipital scutes of 3 species; Günther (1870: 162, footnote) remarked of the primary pattern of ridges in *Leptonotus semistriatus* Kaup, 1853 'the bands are transverse (*fasciae*) and not longitudinal (*striae*)', and suggested emendation of the trivial name to *semifasciatus*; brief descriptions of the morphology of scutes have been given for that species (Scott, 1939: 145) and for *S. tuckeri* Scott, 1942 (1942: 18), while a more detailed analysis, recognising as chief motifs fan, double fan or spindle, rotula, festoon, has been made for *S. mollisoni* Scott, 1955 (1955: 133). The sculpturing in the present form is of considerable interest, both for its own sake and for its correlation with the distribution of certain elements of the colour pattern.

The following elements of sculpture are here recognised: (*i*) spindle, a group of small ridges, consisting of rows of coalesced, contiguous, or closely set minute granules, suggestive, typically, of a blunt karyokinetic spindle (the equator along main anteroposterior axis of fish), with at times some modification of the direction of the ridges, culminating in their subparallelism; (*ii*) fan or half spindle; (*iii*) barrel, a dolioform unit, comprising two fans representing the halves of two adjoining spindles, the ridges thus tending to converge at the middle of the unit; (*iv*) escutcheon, a small raised region, lozenge-shaped, fusiform, ovoid, or subcircular, here found separating spindles; (*v*) interstice, any area other than one of the four elements defined above.

In the specification of the sculpture pattern the following conventions and symbols are adopted. Standard symbols for body ridges are employed, namely, TU, TM, TL, TV for upper, middle, lower, ventral ridges, respectively, of trunk; CU, CL for upper, lower ridges of tail. Subscripts used are: s=superior, i=inferior, l=left, r=right. On-the-line symbols (other than those for ridges), with or without subscripts, if without parentheses refer to the trunk, if with parentheses to the tail. Spindles are denoted by capital letters, barrels by dashed capital letters, escutcheons by lower case letters. In numbering elements, the fish is viewed from the tail end, with head pointed away from observer; counting for spindles begins in trunk at TV, in tail at midventral line, for barrels at that crossed in trunk by TV, in tail by CL_l; counting proceeds clockwise.

The fact that the spindles present themselves as such obvious sculpture elements, and, moreover, have their poles located at the body ridges naturally suggests the formulation of an overall pattern in terms of them as definitive units—giving, for tail, 4 spindles, thus, from midventral line to CL_l, spindle half (A_l); spindle CL_l-CU_l, (B); CU_l-CU_r, (C); CU_r-CL_r, (D); CL_r-midventral line, (Ar); with, for the same regions, in that sequence, 4 escutcheons, namely (a_l), (b), (c), (d), (a_r): and for trunk 7 spindles, thus, TV-TL_l, spindle A; TL_l-TM_l, B; TM_l-TU_l, C; TU_l-TU_r, D; TU_r-TM_r, E; TM_r-TL_r, F; TL_r-TV, G; with 7 escutcheons, a-g, situated severally in the same regions, each apposed to a spindle. The arrangement of certain of the interstitial elements leads however, to a possible alternative pattern, the chief elements of which are the doliform units, barrels, each made of halves of adjacent spindles—giving, for tail, 4 barrels, thus, $(A^1)=(A_l)+(B_i)$; $(B^1)=(B_s)+(C_l)$; $(C^1)=(C_r)+(D_s)$; $(D^1)=(D_i)+(A_r)$; with 4 escutcheons, (a)-(d), their centres at barrel junctions: and for trunk 7 barrels, thus, $A^1=G_l+A_r$; $B^1=A_l+B_i$; $C^1=B_s+C_i$; $D^1=C_s+D_l$; $E^1=D_r+E_s$; $F^1=E_l+F_s$; $G=F_i+G_r$; with 7 escutcheons, a-g, their centres at barrel junctions. That this latter formulation, though probably not the morphologically prior one, can claim some validity beyond that dependent on selective visual susceptibility of the observer is evidenced by three considerations: (*i*) the nature and disposition of the interstitial elements, in particular the grooves, including an equatorial one found in all spindles (least developed in D); (*ii*) the nature of the barrel A^1, the ornamentation of which is essentially one of irregularly disposed granules, in marked contrast to the presence of well developed ridges in the adjoining A_l, G_r; (*iii*) the spatial correspondence obtaining, more or less precisely, between the main elements of colour pattern and the barrels rather than the spindles (see coloration, below).

A typical caudal scute comprises about a score of minute mammilate elevations so closely set as to suggest to the naked eye a continuous ridge; in a scute just behind brood pouch, median row with approximately 50 tubercles, number being less in scutes further back. In some trunk spindles, tubercles are fused basally; in some lines, or parts of lines, coalescent, their identity becoming virtu-

ally or entirely lost; least developed spindles B, F. On tail, escutcheons early elliptical or fusiform, the anterior border tending in annuli further back to become less strongly curved, the marking coming to approximate the shape of a bent bow; all somewhat elevated, (b) and (c) most noticeably so; extending anteriorly across about two-thirds, posteriorly about four-fifths, or more, of width of scute; anterior and posterior borders each delimited by narrow shallow groove, the two grooves, of which the anterior is usually the better developed, uniting at each pole of escutcheon, thence continuing, either as a groove (in (a) deep, forming nick at CL), or, in many cases in (b_s), (c), (d_s), as a grooved strap to scute border; covered with minute tubercles, similar to those of spindles, but mostly disposed irregularly, with in some scutes indications of a partial radial arrangement. Trunk escutcheons much like those on tail, similarly tuberculated, exhibiting parallel changes of shape according to position; posterior examples of c, e only half as long as, but subequal in width to, anterior examples of (b), (d); b, f smaller than c, e; d narrower, and in general more pointed, than c, e. Most noticeable interstitial elements of trunk are: a median depressed nonturberculate region between a and g, traversed medially by (the discontinuous) TV (here well elevated, but not traceable through most, in a few scutes all, longitudinal extent of A^1); a short wide deep groove running from outer pole of a and of g to meet, at a short keel on each TL, the corresponding groove descending from b and f; the grooves round b and f, which are deeper and wider than grooves round other escutcheons: in d the groove round the posterior border shows some obsolescence. the integrity of the element being maintained partly by its mere elevation.

Coloration.—Notes made after preservation for some time in alcohol. Lateral surface of trunk brownish the chief pattern being provided by the darker dolioform D^1, E^1 [*cf.* Waite & Hale, 'Each scute on the upper half of the body from the nape to the end of the tail with a grey ring which touches its fellow in the median dorsal line, the upper angle bisecting the rings'.]. Apart from a small non-tuberculate brownish or amber region before, behind, sometimes wholly surrounding, b, whole flank minutely, irregularly blotched, and on some ridges of B, F, and less markedly C, E, briefly lined with whitish; escutcheons lighter than spindles, b, f being less extensively, but somewhat more intensely, white than c, e; an extension of light colour of ventral surface to just above TV as a very narrow lower border to lateral surface, in each scute either with inferior margin continuous and superior margin of 3 upwardly convex arcs, or occurring as 3 barely separate more or less hemispherical tongues. Dorsal surface of trunk darker than lateral; contributing a moiety of the conspicuous pattern element of D^1, E^1; along TU an irregular series of whitish spots and small splashes, best developed in the anterior one-third. Ventral surface mainly silvery white; on last 5 rings, and less noticeably on right side of preceding half dozen, some sulphur yellow near external borders. Lateral surface of tail brownish, with some indications of darker pattern elements provided by (C^1), (D^1) [apparently conspicuous in Waite & Hale's material]; some whitish or greyish mottling, least developed on escutcheons; much the most conspicuous pattern element, a series of light fawn extensions from ventral surface, their convex superior borders reaching anteriorly rather less than, posteriorly just, halfway up the lateral surface, in general one to an annulus (in 5 cases on right, in 4 on left, matching 4 on right, virtually continuous across 2 rings), thus coming, apart from exceptions noted, to coincide in extent, in posterior part of tail, with (A^1_s), (D^1_i); units separated, along CL, by short vertical strokes of brown, located on the lower angles of (b), (d), and in the adjoining grooved interstitial region; these short strokes just extending, occupying interstitial groove, on to ventral surface, which is otherwise immaculate light bright fawn. Dorsal surface of tail much like that of trunk.

Head: except for white markings noted below, whole preorbital head very dark, almost black, postorbital portion brown on lateral surface, darker on dorsal surface, whitish with some sulphur yellow on ventral surface; small white patch on each side just below angle of gape; 3 white ovoid spots from inferior border of orbit, the largest reaching lower border of face; 2 apposed white spots in midventral line of middle of snout; lower one-third of operculum continuous with light ventral surface, rest crossed by 10 imperfect subhorizontal lines, of which 5th from bottom expands in its posterior two-fifths, a row of 6 white dots below lowest line; supraorbital ridges, rostral ridge near its junction with them, a short narrow median interorbital stripe, and a fine median line from shortly behind eye to middle of nape, all silvery white. Dorsal fin dirty whitish, 1st ray wholly white; beginning immediately behind this and covering next half dozen rays and their membrane a conspicuous black blotch. Caudal light brownish, somewhat darker at tips of rays. Pectoral pale golden; narrow oblique brown bar near base of rays; all of 1st (uppermost) ray, most of 2nd ray, membrane between them, and proximal half of membrane between 2nd and 3rd rays black. Anal colourless.

Family MACRURIDAE

The adoption of the name Macruridae for this family here—and in, *e.g.*, Munro (1957), Scott (1962)—follows Berg (1947), who subsumes in it Macrouridae and Coryphaenoididae, the former occurring in the Check-List (McCulloch, 1929) and widely in Australian and New Zealand works up to, and beyond, that date (including Part VI of the present series), the latter being met with in, *e.g.*, McCulloch (1926), Whitley (1968).

The Check-List records from Tasmania: (*i*) *Coelorhynchus australis* Richardson, 1839 [the original spelling of Giorna's genus is *Coelorinchus*, given in the Check-List as *Coelorhinchus*: the original orthography is retained by Whitley (1968); usually amended as here]; (*ii*) *Lepidorhynchus denticulatus* Richardson, 1846; (*iii*) *Macruronus novaezelandiae* (Hector), 1871; with (*iv*) *C. mirus* McCulloch, 1926 listed from Bass Strait (and New South Wales). Munro (1957: 60) adds Bass Strait to the range of (*v*) *C. innotabilis* McCulloch,

1927 (described from New South Wales). The present communication proposes the rehabilitation of (*vi*) *C. mortoni* Ogilby, 1897, sunk in the Check-List in the synonymy of *C. australis*, and since generally abandoned.

A key to the Australian Macruridae has been given earlier (Scott, 1953: 150): 9 species are referred to in that paper, but in their enumeration, as printed, the sixth entry, *C. fasciatus* (Günther), 1870, has inadvertently been dropped out (this species, however, duly appears in the key). The separation of *C. mortoni* from other members of the genus is discussed below.

Genus **COELORHYNCHUS** Giorna, 1809

Coelorhynchus mortoni Ogilby, 1897

(Fig. 1)

Coelorhynchus mortoni Ogilby, 1897, *Pap. Proc. Roy. Soc. Tasm.*, 1896: 83. Type locality, Estuary of the Derwent River, Tasmania. ['Type destroyed' (McCulloch, 1929: 127)].

Coelorhinchus australis (Richardson). McCulloch, 1929, *Mem. Austr. Mus.*, V: 127, *partim. Non Lepidoleprus australis* Richardson, 1839, *Proc. Zool. Soc. Lond.*, vii: 100—type locality, Port Arthur [Pembroke], Tasmania.

Material and localities.—(*a*) Complete specimen, *Ls* 509, *Lt* 514, taken in 100 fathoms off Bicheno, Glamorgan, on a long-line set for trevally in mid-1967; (*b*) complete specimen, *Ls* 508, *Lt* 513, captured in a shark net in 60 fathoms, south of Pedra Branca, on 9 June 1968 by Dillon Brothers on *Savarus;* (*c*) head only of fish taken on a shark long-line in 100 fathoms, south of South West Cape, Kent, in mid-June 1968 by R. Petman on the *James Leigh*—all material made available for examination by Mr D. C. Wolfe. Specimens (*a*) and (*c*) will be deposited in the Tasmanian Museum, Hobart, specimen (*b*) in the Australian Museum, Sydney.

Description.—Where a statement in this account, verbal or numerical, has two values, the first relates to the larger individual, (*a*), the second to (*b*): unless otherwise indicated, single statements are applicable to both complete examples (only): a few entries referring to (*c*) are so specified.

D. ii, 10; 76: ii, 9; 75. A. 79, 81. V. 7. P. 17 (left), 16: 16, 16. C. 6. Br. 6. L. lat. 106: 108. Sc. tr. 4/1/14; 4/1/9 (obliquely back from origin of first dorsal, from origin of second dorsal). Gillrakers 2+5 (second arch).

Head 4.80, 5.35, trunk 8.78, 8.61, tail 1.47, 1.44, in *Ls*.

Head and trunk stout, lowest point at vent, highest at first dorsal origin; tail in lateral view tapering evenly caudad, progressively compressed to a terminal thickness of about a millimetre. Vent below early part of interdorsal. Maximum depth, found near pectoral origin, 6.61, 6.60, depth at vent 7.59, 7.36, in *Ls*. Maximum width, found near middle of ventrals, 8.48, 8.06, width at pectoral origin 8.93, 8.76, in *Ls*; width at middle of anal 1.79, 1.88 in *Ls*, or 2.33, 2.16 in depth there.

Head subconical: dorsal profile moderately convex forward to near middle of eye; then slightly and briefly concave; shortly convex above nostrils; virtually straight, gently convex, to tip of snout: ventral profile increasingly curved up to mouth; between upper lip and tip of snout slightly concave, the general direction here at about 45° to anteroposterior axis of fish. Snout pointed: tip of upper jaw slightly produced as a blunt rostral tubercle, its length less than half its basal width; rather more pronounced in (*a*) and (*c*) than in (*b*); its inferior surface elevated, strongly spinose. Eye large, not cutting profile; elliptical, its transverse 1.35, 1.24 [(*c*) 1.41] its vertical diameter; its transverse diameter 3.23, 3.33, that of orbit 3.07, 3.06, in head; snout tip to orbit less than (1.10, 1.17; (*c*) 1.07 in) orbit, and less than (1.03, 1.02 in) [(*c*) equal to] transverse eye; snout tip to eye less than (1.06, 1.07; (*c*) 1.03) in orbit, equal to or barely exceeding (1.02) [(*c*) 1.06] transverse eye. Interorbital 1.08, 1.02 [(*c*) 1.09] in eye, transversally flat for virtually whole extent near middle of eye; behind this, about to posterior border of orbit, a central flat platform, bordered on either side by a barely concave oblique strip, widening posteriorly and becoming continuous behind with the upper larger moiety of lateral slope of occiput. Posterior nostril large, immediately in advance of orbit, at 8.30, 9.30 o'clock (left side of fish viewed); subelliptical, sloping downward and forward, its length about thrice its width, subequal to its direct distance from rostro-infraorbital ridge. Anterior nostril subelliptical, about half as long, nearly as broad, as posterior, set against middle half of latter, separated from it only by a flat common fleshy rim. Supraorbital ridge low, best developed immediately behind posterior nostril, ceasing near horizontal level of bottom of latter. Suborbital ridge inconspicuous, low, acute, spinose. Well developed supranarial ridge, coalescent behind with supraorbital ridge, running forward as upwardly convex arc to join rostro-infraorbital ridge a little below level of inferior orbital rim; constituting superior and anterior border of an ovoid shallow fleshy narial basin, bounded below by less developed ridge: from upper end of this ridge a genal ridge, best developed in (*c*) least in (*b*), down and back between orbital rim and rostro-infraorbital ridge, nearer latter for most of its length, becoming confluent with it behind level of orbit: a fine ridge, involving only 3-4 scales, behind and just above point of confluence. Low but distinct median ridge from rostral tubercle to just beyond level of front of eye; region between this and supranarial ridge slightly concave. In (*a*) dorsum and sides of postorbital head strongly rounded, presenting a virtually continuous arc, obscurely divisible into 8 flattish platforms, delimited by 7 ridges: median ridge detectable, rather as low mounding than true ridge, only in anterior half of interval between level of eye and origin of dorsal; on each side a ridge from posterosuperior angle of orbit, where it is subcontinuous with supraorbital ridge, obliquely back to upper angle of operculum; above last-named a sinuous ridge joining a point shortly above middle of orbit to beginning of lateral line; above this on each side a ridge with anterior origin subcontinuous with that of last-named ridge, extending, gently convex upwardly, to back of head, the pair furthest apart posteriorly, their interval there

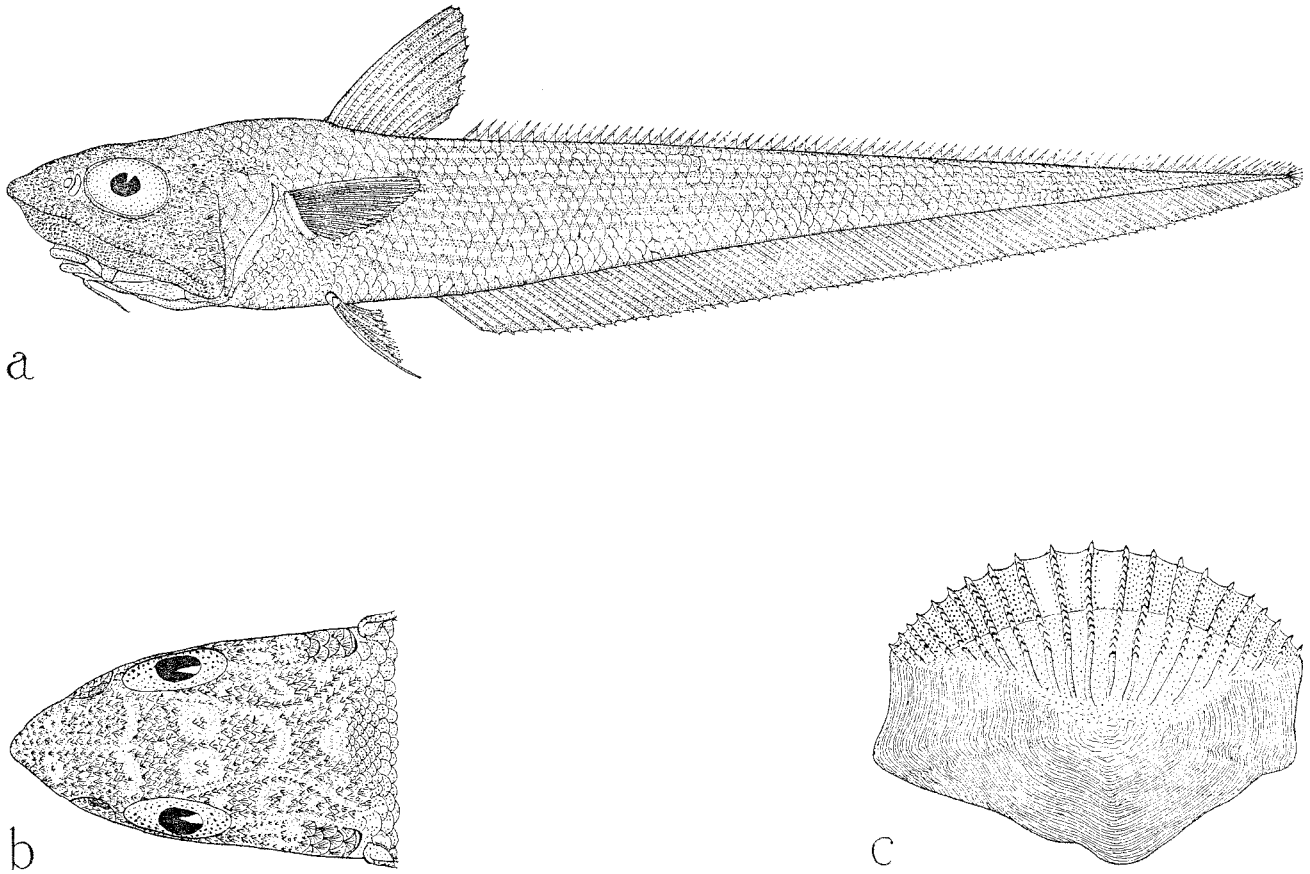

FIG. 1.—*Coelorhynchus mortoni* Ogilby, 1897. *a*.—Lateral aspect of a specimen, 514 mm in total length, caught off Bicheno, Glamorgan, Tasmania, in 100 fathoms; x ⅓. *b*.—Dorsal aspect of head of a specimen, 513 mm in total length, caught off Pedra Branca, south of South East Cape, Kent, in 60 fathoms, showing colour pattern (not indicated in *a*); x ½. *c*.—A scale from flank below interdorsal; x 5½.

two-thirds orbit: in (*b*) platforms and ridges less pronounced, except last-described ridges, which are prominent. Rostro-infraorbital ridge prominent, slightly sinuous, with three main forward and downward convexities; extending from rostral tubercle to just short of preoperculum, ending in a flattened downwardly and backwardly directed projection; subcontinuous here with lower end of poorly developed ridge, obsolescent superiorly, along preopercular border; main ridge comprising some two score scales, each with backwardly diverging fan of striae, most terminating in spines; scales separated by grooves normal to general direction of ridge, resulting in a crenulate or subcrenulate border; at about half a dozen scales behind rostral tubercle main exposure of scales briefly descends, on each side of head, on to lower surface of snout, forming a revetment of 4-6 scales.

Mouth undershot; length to its origin (a little in advance of level of front nostril) 5.89, 5.28 in head, 2.11, 1.78 in its width measured between outer borders of maxillae: lower jaw wholly received into upper. Maxilla to 0.6, 0.7 eye; lateral border of mandible to 0.95 eye, to past eye by 0.1 eye, inferior border to 0.3, 0.4 eye beyond eye. Whole external surface of lower lip, more than half external surface of upper lip, internal surface of both lips, highly papillate, complex, particularly in (*b*) and (*c*), each papilla with up to half a dozen distal processes or lobules. Mental barbel a simple short filament, becoming regularly more slender distally; length 1.22, 1.03 preoral length, subequal to interdorsal. Operculum subtriangular, posterior border markedly concave; inferior angle a rounded point continued as a small membranous lobe. In front half of upper jaw a rather narrow band of villiform teeth, anteriorly in 4-5 tolerably regular series, posteriorly becoming rather more irregular. Whole length of lower jaw to gape with villiform teeth in a band, widest anteriorly, width exceeding greatest width in upper jaw, 5-6 rows here, decreasing behind to a couple of closely set irregular rows; whole series one-third longer than that of upper jaw. Palate and tongue edentulous. Save in immediate vicinity of nostrils (very small fraction of narial basin) whole of head above rostro-infraorbital ridge scaly. Scales on operculum and most of preoperculum approaching in size trunk scales, and not notably more spinose, but with carinae radiating instead of being subparallel: rest of lateral surface of head with smaller scales of variable size, smallest in narial basin and in vicinity of orbit, virtually all spinose, most very spinose: dorsum of head with closely set smallish scales, nearly all intensely, many quite complexly, spiny. Whole oblique strip bounded above by rostro-infraobital ridge, below by mouth and by backward extension of line of mouth, granulate, minutely spinulose, spines directed backwards, the feel being velvety or prickly according as finger is drawn across it from or towards snout tip. About posterior two-thirds of pennon-like ventral surface of mandible similarly rugose, slightly spinulose, except narrowly along its borders: rest of inferior surface of head smooth, fleshy. Branchiostegals 6; membranes united briefly anteriorly across the isthmus. Gillrakers on second arch 2+5; low spinulose mounds, those on upper limb closely set, those of lower arch further apart, interval at middle of series somewhat exceeding basal diameter of raker. A membrane, widest above, connecting first gill-arch with inner side of cheek, and greatly restricting opening of first gill-slit. Pseudobranchiae rudimentary. Trunk and tail covered with scales, except on pectoral and ventral bases, in a median sulcus, about one-third as long as ventral fin, extending forward from vent, and along a slip, widest anteriorly, bordering anal on each side. Each body scale with, usually, 18-22 (some near end of tail as few as 12) subparallel keels, each consisting of some minute but strong, acute, decumbent, backwardly overlapping spines, the distal spine projecting beyond general free border of scale, this border continuously rounded, not scalloped between carinae. Each lateral line scale with a median groove, partly or wholly glazed white, dividing the ridges into two sets, and continued back, as a fleshy connexion, to next scale. Lateral line with 106, 108 scales; originating about midway between dorsal profile and upper angle of operculum; running back and down, approximately in a straight line, to about $1\frac{4}{5}$, $1\frac{5}{6}$ times head behind head, *ie.*, to about 30th tubercle, being here about half as far again from ventral as from dorsal profile; thence running virtually straight back, remaining throughout somewhat nearer to dorsal than to ventral profile.

First dorsal ii+10, ii+9; 1st spine minute, largely embedded, full length (4.0, 3.8 mm) revealed only by dissection, in (*a*) spine-like, acute, in (*b*) massive, obtuse; contiguous with base of next spine; 2nd element non-sepate, unbranched, spinous, smooth; remaining elements septate, branched rays; length of spines 26..5, 25.0; 1.59, 1.42, in head; lengths of rays 1.56, 1.41; 1.59, 1.46; 1.66, 1.61; 1.77, 1.79; 2.08, 2.16; 2.49, 2.57; 2.90, 3.25; 3.37, 4.42; 5.05, 5.46; 1.01, —, in head; fin originating above hind border of pectoral base; length to its origin 3.95, 4.27 in *Ls*, 1.22, 1.25 head; base 3.17, 3.31 in head; laid back, 2nd ray reaches 4th, 3rd ray of second dorsal, last ray falls short of, penultimate ray reaches, 1st ray of second dorsal. Interdorsal 5.58, 4.32 in head, about 3/5, 3/4 eye. Second dorsal 76, 77; very low; 1st and 2nd rays equal, 3rd a little longer, in (*a*) increasing slightly to about 10th then decreasing slowly, in (*b*) decreasing to about 10th, remaining constant to about 40th, then decreasing slowly backward; lengths of 1st, 2nd, 3rd, 10th, 20th, 30th, 40th, 50th, 60th, 70th, last rays 10.8, 8.64; 10.8, 8.64; 10.6, 8.56; 10.2, 9.50; 11.2, 9.50; 12.9, 9.50; 13.1, 9.50, —, 9.60; —, 10.4; 14.7, 13.6; 15.4, 14.0, in head; originating above interval between 3rd and 4th anal rays; length to origin 2.80, 2.99 in *Ls*. Anal 79, 81; well developed; longest ray 1.0, 1.4 eye; lengths of 1st, 2nd, 3rd, 10th, 20th, 30th, 40th, 50th, 60th, 70th, last rays 4.71, 4.08; 4.00, —; 3.80, 3.24; 3.29, 2.72; 3.24, 2.64; —, 2.57; 3.31, 2.47; —, 2.94; 3.94, 3.53; 5.30, 5.00; 7.85, 7.92, in head; length to origin 2.99, 3.12 in *Ls*. Pectoral 17 (left), 16 (right), 16, 16; small, subequal to head behind middle of eye; pointed; 1st (uppermost) and last 3-4 rays not, or barely, split, remainder feebly divided; 1st ray 1.05, 1.02 in longest (3rd), which is 2.19, 1.77 in head; whole fin 1.89, 1.73 in head; extending to level of end of vent. Ventral 7;

smaller than pectoral, a little more than post-orbital head; pointed; 1st (outermost) ray prolonged, reaching to anal origin; 1st ray simple, rest well divided; lengths of rays 2.35, 2.24; 2.92, 2.57; 3.03, 2.67; 3.21, 3.07; 3.37, 3.22; 3.53, 3.41; 3.90, 3.67, in head; whole fin 2.19, 2.07 in head; originating below hind border of pectoral base; length to origin 4.04, 4.64 in *Ls*. Caudal 6; minute; confluent with dorsal and anal.

General colour of trunk and tail in (*a*) medium grevish brown above and on upper part of sides; about lower one-third of flank, as far back as, perhaps beyond, last one-fifth of anal base, lighter brown, this extending, with some lightening, on to ventral surface: in (*b*) upper colour somewhat lighter brown, lower dirty whitish: both fish with some metallic lustre, due to presence of a short bronze streak on posterior part of all, or most, of keels of scales. On whole body, each scale with a medial white bar, covering from about one-fourth to about one-third of its exposed vertical extent, the white more intense, somewhat wider, near embedded margin; these markings giving rise to subcontinuous or continuous white lines, presenting, on whole of upper and anterior part of lower region of flank, a conspicuous pattern. Four such lines on the four rows of scales above lateral line (itself white), 1st starting behind dorsal base and extending back, flanking second dorsal, for about one and one-third head-lengths; 2nd, 3rd, 4th originating behind head, extending, like 1st, through full length of scale series, 2nd reaching extinction approximately a head-length before tail tip. While all body scales, even on ventral surface, have their median region lighter, on only about 8 of the lateral scale series below lateral line do these constitute a conspicuous, contrasting white line, even then only, among the lower series, in their anterior portion. In (*a*) most of hard part of head more or less concolorless with trunk; operculum and most of preoperculum darker; behind eye, and, continuing in same vertical line, below it, an obscurely delimited somewhat pinkish bar; narial basin whitish, somewhat dusky; tuberculated strip below ridge from rostral tubercle to near preopercular angle fawn, lightest round mouth, dusky near snout tip; tuberculated area on mandible dirty whitish; lips fawn; barbel pale yellowish; branchiostegal membrane flesh-coloured: in (*b*) head in general decidedly darker than trunk; darkest on dorsum, here approaching black; an ovoid light patch behind and below eye; rest of cheek somewhat darker than opercle; narial region, tuberculated areas, barbel, lips, branchiostegal membrane much as in (*a*). Both specimens, also (*c*), with light markings on upper and post-orbital lateral surface of head and on nape. In (*b*) these markings constituting an ornate conspicuous pattern of white and pale fawn (fig. 1b) symmetrically disposed as follows: on dorsum (*i*) a pair of small circles on snout, interval between them subequal to their distances from snout tip and anterior nostril; in interorbital space (*ii*) wide, forwardly directed chevron over, projecting a trifle in advance of, front one-fifth of eye; (*iii*) two contiguous circles occupying two-thirds of head width above about last half of eye; (*iv*) between (*ii*) and (*iii*) a median spot; (*v*) above orbit, external to, posteriorly level with back of, each item of (*iii*), a double (left), treble (right) spot; on median platform of occiput (*vi*) a pro-concave arc, its chord subequal to its distance from orbit, about two-thirds eye diameter; on each side of occiput (*vii*), external to, extending well in front of, reaching a little behind, (*vi*), a curved loop, convex upward and forward, (*viii*) and (*ix*), directly behind (*vii*), two markings, on right side forming clear, on left imperfect, circles, the hinder, (*ix*), the larger, its posterior border about level with middle of hind border of operculum; (*x*) at junction of head scales and trunk scales, a median circle with central spot, its distance from base of dorsal equal to its oblique distance from orbit; between (*ix*) and (*x*), a spot, (*xi*), double on left side; on lateral surface behind eye, a vertical series of three closely set markings, (*xii*), (*xiii*), (*xiv*), tending on left side to constitute circles; (*xv*), immediately behind uppermost, (*xii*), of last three markings, shortly in advance of antero-superior angle of operculum, a circle: also, on operculum 3-4 scales lighter than rest, whitish; on preoperculum 6-8 scales lighter than rest, mainly yellowish green, several with pinkish tinge. In (*a*) this complex pattern less clearly, less fully developed. In (*c*) all preserved part (most of dorsum behind eye missing) conspicuously patterned with whitish as in (*b*), except that markings (*i*) are arcs, not circles; markings (*xii*)-(*xiv*) represented by general subvertical bar, adjacent (*xv*) remaining distinct.

First dorsal with minute 1st spine hyaline, 2nd spine pale greyish, rays dark greyish basally, becoming brownish distally; basal half of membrane hyaline, with minute sparse dark punctulations, particularly adjacent to rays, distal half heavily punctulated, dusky. Rays of second dorsal with base either almost wholly black, or dark grey, narrowly bordered with blackish; tips whitish; membrane apparently vestigial, grey. Anal rays for most of their length slaty, darkening to brownish caudad; anteriorly with small brownish dots and splashes that progressively give way caudad to very closely set minute punctulations; bases of rays, pterygiophores and depression in which they lie all white; tips of rays mostly whitish; membrane largely greyish with distal duskiness anteriorly, duskiness increasing caudad to involve virtually whole membrane. Pectoral base whitish externally, approaching black internally; external surface of rays pale grey, internal surface of all except lowest 3-4 (which are white) dark brown; membrane white. External surface of prolonged ray of ventral white, of other rays slate; internal surface of rays, except prolonged ray, which is pale grey turning white distally, exhibiting, in obscure succession from base, blackish, dark brown, light grey, slate, light grey; membrane grey; rays and membrane with small dark brown spots and with minute dark peppering.

Dimensions as TLs.—Some dimensions of the two complete individuals examined are set out in table 3.

Discussion.—The history of *Coelorhynchus mortoni* Ogilby, 1897, type locality, Estuary of the River Derwent, has largely been one of taxonomic neglect or rejection. Not noticed in Lord (1923)

or Lord & Scott (1924), and not represented in the key to Australian and New Zealand species of the (relevant) subgenus *Paramacrurus* as there interpreted in the *Endeavour* Report of 1926 (McCulloch: 176), it was relegated by McCulloch in the Check-List (1929: 127), and earlier (1911: 38), to the synonymy of *C. australis* (Richardson), 1839, which also has Tasmania as type locality (Port Arthur [Pembroke]).

In instituting a direct comparison between his material (a specimen 520 mm long) and *C. australis*, Ogilby (giving values for Richardson's species in parentheses) deals with several characters that call for notice here: 'the much greater size of the head, the comparative measurements being $4\frac{1}{3}$ and (nearly 5) in the total length'; no significant difference obtains here, the '$4\frac{1}{3}$', given earlier as '$4\frac{1}{2}$', being indistinguishable from the 4.4 for *C. australis* noted by Munro (1957: 61); in our specimens head is smaller than any of these being 4.85, 5.40 in *Lt*: 'the much smaller number of rays in the second dorsal, 68 (88), and anal 71 (87-96) fins'; our counts, 76, 77 and 79, 81, are intermediate: 'the much larger scales, 88 and (ca 130)'; again our counts, 106, 108, are intermediate: 'the different pattern and strength of the scale armature, for while the number of keels present on each body scale in *C. mortoni* is from 18 to 23, and these are arranged in parallel series and terminate each in a strong, free spine, which conjointly form the posterior border of the scale, in *C. australis* there are only 12-18 rows of keels and the border of the scale is more or less scalloped in appearance'; scales of our fish (fig 1c) conform wholly to the specifications of those of *C. mortoni*, and differ from those thus given for *C. australis* and from the figure by Waite (1911, fig. 1).

Two important resemblances to *C. mortoni*, and therewith contrasts to *C. australis*, exhibited by the present material are those of size of snout and colour pattern. Ogilby observes of snout 'a little longer than the eye': with 'eye' taken here as soft or true eye, our specimens have snout 1.00, 1.02 eye; whereas in *C. australis* snout is decidely greater than ($\geqq 1\frac{1}{3}$) eye. *C. australis* is in general light grey, with some rather broad oblique dark bands on the upper side, two being most constant and best defined, the first immediately in advance of first dorsal, the second below the front part of the second dorsal; a blue black line runs along at least the hinder half of the dorsal and anal bases. Ogilby's colour note reads, 'Dark brown above, lighter brown below, all the darker scales with a whitish oblong spot at their base'; such white markings are well developed in our specimens, forming a striking series of more or less continuous white lines, very apparent on all darker parts of the body. The light coloured pattern on the head is a prominent feature in our examples. In respect of characters dealt with in Ogilby's account but not mentioned above, *e.g.*, cephalic ridges, location and size of fins, agreement with the present material is in general satisfactory: exceptions include more slender body here, 6.68, 6.66 (*cf.* $5\frac{1}{2}$) in *Lt*; laid back 2nd ray of first dorsal reaching 3rd ray of second dorsal (*cf.* not reaching fin); presence of minute anterior spines of first dorsal (overlooked in Ogilby's specimen?), and fewer following rays, 10, 9 (*cf.* 13).

The first dorsal is noted by Ogilby as being inserted 'immediately behind the base of the pectoral'; an observation reasonably applicable to all members of the genus. However, a quantitative specification in terms of orbit-dorsal interval provides a useful character: in *C. australis* the dorsal begins 'one and a half diameters behind the orbit' (Waite, 1911: 177; and so figured by him, pl. XXIX, fig. 1): in our fish the interval is two diameters (1.98, 2.16). In Waite's figure of *C. australis* the mouth, as determined by the front of the upper lip, is shown extending forward to level of junction of nostrils, the preoral length being approximately 3.2 in head: in our specimens the lip extends well in advance of nostrils, preoral length being 5.3, 5.9 in head.

Overall the present fish thus exhibit significant differences from descriptions of *C. australis*, and good agreement with Ogilby's account of his material. It is concluded that *C. mortoni* Ogilby, 1897 is a valid species, and that these specimens are to be referred to it.

The Australian and New Zealand species can be separated thus.

KEY TO AUSTRALIAN AND NEW ZEALAND SPECIES OF *Coelorhynchus* Giona, 1803

1	Anal and second dorsal subequal in height. Depth small (=10-12 in *Lt*). Snout conical, ending in a spine	*C. innotabilis*
	Anal distinctly higher than second dorsal. Depth moderate (=5.7 in *Lt*). Snout not conical, not ending in a spine	2
2	Lower surface of head with asperities. Scales on upper surface of head close-set	3
	Lower surface of head almost or entirely naked. Scales on upper surface of head spaced	5
3	Interdorsal $<\frac{1}{2}$ ($=\frac{1}{3}$) base of first dorsal. Scales between tip of adpressed dorsal and lateral line $\geqq 5\frac{1}{2}$. Black bar along anal crossing middle of rays	*C. aspercephalus*
	Interdorsal $>\frac{1}{2}$ (0.6-1.1) base of first dorsal. Scales between tip of adpressed dorsal and lateral line $<5\frac{1}{2}$ ($3\frac{1}{2}$-$4\frac{1}{2}$). No such black bar	4

4	Dorsal origin behind orbit by <2 (≐1½) orbit. Snout >eye. Length to mouth <4 (≐3.0-3.5) in head. Scales with 12-18 carinae; hind border of scale scalloped between pointed tips of keels. Light grey; at least 2 oblique dark bars (near origins of dorsal fins; no white lines on flank	*C. australis*
	Dorsal origin behind orbit by ≐2 orbit. Snout <eye. Length to mouth >4 (5.3-5.9) in head. Scales with 18-23 carinae; hind border of scale not scalloped between pointed tips of keels. Brownish, no dark bars; conspicuous white lines along flank	*C. mortoni*
5	Interdorsal ≐ base of first dorsal. Eye > postorbital head. No scales on lower surface of head. Dorsal origin above 4th-6th anal ray. Second dorsal very low posteriorly, almost obsolete anteriorly. Whitish; some dark cross bars	*C. fasciatus*
	Interdorsal >(≐2) base of first dorsal. Eye ≤ postorbital head. Some scales on lower surface of head (behind angle of mouth). Dorsal origin above 8th-9th anal ray. Second dorsal low, tolerably even in height throughout. Uniform grey; small black spot on pectoral	*C. mirus*

The description of the New Zealand *C. oliverianus* Phillipps, 1927 does not include data to permit the making of the choice presented in couplet 2 of the above key. If the fish satisfies the first entry of that couplet, one is led, through 3 (by disagreement with the first 2 entries for *C. aspercephalus*) to 4; from both species of which it is distinguished by more attenuate form, depth at 35th anal ray being 25 (*cf.* 15-18) in *Lt*, by having snout 1.7 (*cf.* 0.8-1.4) in orbit, pectoral, ventral extending to 3rd ray, 2nd ray, respectively, of second dorsal (*cf.* neither reaching that fin). If it satisfies the second entry of couplet 2, one is led directly to couplet 5, where it is found to differ from *C. fasciatus* in its higher second dorsal, in head 'a little under 5' (*cf.* 3.8) in *Lt*, depth at dorsal origin 7.1 (*cf.* 5-6) in *Lt*, and apparently in colour pattern, and from *C. mirus* in respect of the first 2 specifications in the key.

TABLE 3

Coelorhynchus mortoni Ogilby, 1897. Dimensions, as thousandths of standard length (*TLs*), of 2 specimens, (*a*) *Ls* 509 mm, *Lt* 514, (*b*) *Ls* 508, *Lt* 513, from off Bicheno, Glamorgan, and south of Pedra Branca, Tasmania.

Dimension	(*a*)	(*b*)
Total length	1010	1010
Length to origin, termination of first dorsal	253, 319	234, 291
Length to origin of second dorsal	357	335
Length to origin of anal	335	321
Length to origin of pectoral, length of pectoral	218, 110	195, 108
Length to origin of ventral, length of ventral	248, 95	216, 91
Lengths of spines of first dorsal	8, 131	7, 132
Lengths of rays of first dorsal	134, 131, 125, 117, 99, 83, 72, 62, 41, 21	133, 128, 116, 104, 85, 73, 57, 51, 34
Lengths of 1st, 2nd, 3rd, 10th, 20th, 30th, 40th, 50th, 60th, 70th, last ray of second dorsal	19, 19, 20, 20, 19, 16, 16, —, —, 14, 14	22, 22, 22, 20, 20, 20, 20, 19, 18, 14, 13
Lengths of 1st, 2nd, 3rd, 10th, 20th, 30th, 40th, 50th, 60th, 70th, last ray of anal	44, 53, 55, 63, 63, 63, 63, 53, 53, 41, 27	46, 54, 57, 69, 71, 73, 76, 64, 52, 37, 24
Lengths of 1st, 3rd (longest) pectoral ray	95, 100	95, 96
Lengths of ventral rays	88, 71, 69, 65, 62, 59, 53	84, 73, 70, 61, 58, 55, 51
Length to middle of vent	322	307
Head	208	187
Snout to orbit, to eye	62, 64	55, 57
Transverse diameter of eye, of orbit	64, 68	56, 61
Vertical diameter of eye, of orbit	47, 47	45, 45
Interorbital	59	55
Length to mouth, full width of mouth	35, 75	35, 63
Length of mental barbel	43	36
Maximum depth, maximum width	151, 116	152, 124
Depth, width at vent	132, 106	136, 112
Maximum depth, maximum width, of head	143, 112	144, 114
Depth at front, at back of eyes	90, 132	85, 118

Family APOGONIDAE

Genus **VINCENTIA** Castelnau, 1872

Vincentia lemprièri (Johnston), 1883

Apogon lemprièri Johnston, 1883, *Pap. Proc. Roy. Soc. Tasm.* (1882): 142. Type locality: Dunkley's Point, Sandy Bay [Buckingham], Tasmania.

Apogon lemprièri Johnston. Lord & Scott, 1924, Synopsis Vert. Anim. Tasm.: 10, 55. McCulloch, 1929, *Mem. Austr. Mus.*, V, 11: 172.

Vincentia novaehollandiae (Valenciennes), 1832. Munro, 1960, Handbook Aust. Fish.: 144, fig. 901 [*in Fisheries Newsletter*—now *Australian Fisheries*—XIX, 2: 20, fig. 901], *partim*.

Vincentia lemprièri Johnston, 1883. Scott, 1964, *Pap. Proc. Roy. Soc. Tasm.*, **98**, 99, fig. 1.

New material.—Johnston's species has been discussed, redescribed and figured by the writer (1964), the material on which the account was based consisting of 2 specimens of *Ls* 68.0, 73.0, *Lt* 86.9, 91.1, both from George Bay, near St Helens, Cornwall. An additional example, *Ls* 34.0, *Lt* 37+ (imperfect), collected by Mr J. Singline, St Helens (received May 1969) exhibits the separation of the two dorsals noted earlier as constituting the main difference between *V. lemprièri* and *V. novaehollandiae*, of which latter Munro (1960: 144)—who sinks in it Johnston's species—observes 'Dorsal fins united at least basally', the figure reproduced showing the attachment of the membrane of the first dorsal extending up the spine of the second dorsal for about one-third the spine length. In the present specimen the membrane fails to reach the base of the second dorsal spine by 0.9 mm. A wider interorbital region in *V. lemprièri* as compared with *V. novaehollandiae*, on which some emphasis was placed in the earlier account, appears perhaps insufficiently pronounced to justify the significance there attached to it, and in Mr Singline's example the ratio eye in interorbital, 1.14, falls within the range (1-1.2) given by Munro for *V. novaehollandiae*. For the latter species gill rakers are reported as 4-5+12: for the 1964 material of Johnston's species the count was 3+12; however, in the 1969 individual the anterior arch bears only 4+9 gill rakers. The lateral line count is here 25 (*cf.* 27; and for *V. novaehollandiae*, 24-27).

Proportions as TLs.—Most of the proportions, expressed as millesimals of standard length, recorded for the earlier specimens (1964, Table V) are noted below for the present fish; omissions being those necessitated by the imperfect condition of most of the rays and of the spine of the second dorsal. The general close agreement between the 3 individuals is indicated by the values of the coefficient of variation cited (in parentheses) after the *TLs* entries. The mean value of *V* is 4.47, with just over half the items having a magnitude of less than 3.0, and only 3 items reaching double figures. Head 397 (*V* 2.2); snout 88 (19.0); eye 147 (3.2); interorbital 129 (6.4); length to middle of vent 571 (2.7); length to first dorsal origin 418 (4.8), termination 538 (1.3) (spine) or 568 (membrane); length to second dorsal origin 594 (2.0), termination 706 (1.8) (spine; no posterior membrane; length to anal origin 600 (1.9), termination 753 (0.3); length to pectoral origin 365 (2.4), length (total) of fin 265 (1.1), length of longest (5th-6th ray) 228 (2.5); length to pelvic origin 382 (3.5), length (total) of fin 324 (4.1), length of spine 162 (5.8); lengths of spines of first dorsal 29 (13.0), 112 (2.7), 229 (4.3), 176 (2.2), 144 (2.6), 94 (2.3), 35 (7.6); lengths of anal spines 47 (14.6), 144 (7.4); depth at anterior border of eye 147 (6.5), posterior border of eye 324 (4.0), opercular border 412 (3.1), vent 338 (2.2), termination of anal 206 (6.9); maximum depth (occurring at first dorsal origin) 397 (2.2); depth of caudal peduncle 147 (1.2).

Length pattern of spines of first dorsal.—In the 2 examples previously reported upon it was found that the lengths of the spines of the first dorsal follow, with significant fidelity, a simple pattern: first, for the anterior suite of spines (I-III), in which spine length increases caudad, the logarithm of length of spine is a linear function of the logarithm of serial number of spine; while, secondly, for the posterior suite of spines (IV-VII), in which spine length decreases caudad, it is the logarithm of the difference between length of longest spine (III) and length of spine considered that is a linear function of the logarithm of the spine's (total) serial number. These relations obtain also in Mr Singline's fish. With L=length of spine; n (whether as on-the-line symbol or as suffix) =serial number of spine, L_3 denoting length of longest spine (III), we have, for the anterior 3 spines, the general equation

$$\log L_n = k \log n + d \qquad (i)$$

and, for the posterior 4 spines, the general equation

$$\log(L_3 - L_n) = k \log n - d \qquad (ii)$$

For specimens (*a*), (*b*) of 1964 and the present specimen, in that order, we find for the anterior spines (lengths here, and throughout, in millimetres)

$$\log L_n = 1.507 \log n + 0.438 \qquad (iii)$$
$$\log L_n = 1.662 \log n + 0.420 \qquad (iv)$$
$$\log L_n = 1.876 \log n + 0.004 \qquad (v)$$

Values of t for (*iii*), (*iv*), (*v*) are 21.94*, 32.23*, 46.80*, respectively. For the same specimens the equations found for the posterior spines are

$$\log (L_3 - L_n) = 2.650 \log n - 1.189 \qquad (vi)$$
$$\log (L_3 - L_n) = 2.656 \log n - 1.124 \qquad (vii)$$
$$\log (L_3 - L_n) = 2.337 \log n - 1.589 \qquad (viii)$$

Values of t for (*vi*), (*vii*), (*viii*) are 6.38*, 35.33**, 40.12**, respectively.

For the holotype, total length 4 inches, Johnston reported only 6 spines in the first dorsal, giving their lengths as 7, 16, 15, 13, 8, 3 mm. In the 1964 individuals, of comparable size (*Lt* 86.9, 91.1), the 7 spines measure (*a*) 2.7, 8.1, 14.0, 11.5, 9.4, 6.7, 2.4; (*b*) 2.6, 8.6, 16.0, 13.0, 10.7, 6.9, 3.0. The possibility presents itself (1964: 102) that in Johnston's fish a spine, corresponding to our I, was missing or was overlooked. If the assumption is made that Johnston's I-VI correspond to II-VII of our material, equations (*i*), (*ii*) here become

$$\log L_n = 2.037 \log n + 0.232 \qquad (ix)$$
$$\log L_3 - L_n = 4.689 \log n - 2.805 \qquad (x)$$

For (*x*) $t = 9.21^*$. It will be noted (*a*) that in equation (*ix*) (2 spines only) the parameters are of the same order of magnitude as those in equations (*iii*), (*iv*), and also, in respect of the slope, as that in equation (*v*); (*b*) that equation (*x*) affords a satisfactory fit—these facts, together with the absolute magnitudes of the spine lengths as reported (of which latter the former of course are merely a formal codification) seem strongly to suggest that the 6 spines reported for the holotype are the homologues of II-VII in our material. However, no obvious reason is apparent for the noticeable difference in magnitude of the parameters of equation (*x*) and those of equations (*vi*), (*vii*), (*viii*).

Equation (*i*), $\log L_n = k \log n + d$ can also be written as

$$\log L_n = k \log n + \log b \qquad (xi)$$

or $$L_n = b \log n^k \qquad (xii)$$

Thus expressed, the relation is seen to be formally that of simple allometry or heterogony (Huxley, 1932). However, in place of the variables customarily involved in allometric growth studies—linear magnitude of an organism and of part of an organism (or of organ and of part of organ)—we here have linear magnitudes of a series of morphological entities and the natural numbers indicative of their sequence of insertion along the general anteroposterior axis of the organism: thus the equation, in this context, specifies a pattern of total growth (length) of a serial variate relative to its location. The ordinal numbers of the spines may represent a formulation in other terms of magnitude of anteroposterior extension of fish at points of spine-insertion. For equation (*ii*), $\log (L_3 - L_n) = k \log n - d$, the graph of which presents a negative intercept on the log L_n axis, the general equation corresponding to the alternative form (*xii*) of (*i*), above, is

$$L_n = L_3 - \frac{n^k}{b} \qquad (xiii)$$

In this equation in the 1964 paper the coefficient of n^k is printed as d (equivalent to present b), in error for its reciprocal.

Lengths of the spines of the first dorsal of the present specimen predicted by the regression equations (*v*), (*viii*)—for earlier examples, and, in part, the holotype see 1964 Table VI—are as follows (measured lengths in parentheses): 1.0 (1.0), 3.7 (3.8), 7.8 (7.9), 6.0 (6.0), 3.2 (3.2), 1.2 (1.2).

The best straight lines have been calculated with minimisation of the sum of the squares of the deviations of the logarithmic values. It has been found that the procedure, perhaps formally preferable, of fitting the line under the condition that the sum of the squares of the absolute residuals shall be a minimum yields equations that do not provide significantly better estimates of spine-length (1964, Table VI). In the estimation of significance the logarithmic values as plotted have been treated as raw data for the calculation of *t*.

Family SCORPIDAE

Only one member of the family, *Scorpis georgianus* Valenciennes, 1832, is credited to Tasmania in the Check-List (McCulloch, 1929: 237). A second species, *S. aequipinnis* Richardson, 1848 (type locality, King George's Sound, Western Australia; no other State noted in Check-List) has been added to the local list by the writer (1935: 67); the record based on 2 examples from near George Town, Dorset. A third species, *S. lineolatus* Kner, 1865, is here reported from Tasmania: the distribution given in the Check-List is Queensland, New South Wales, Lord Howe Island; the species does not appear in T. D. Scott's catalogue of South Australian fishes (1962).

The subjoined key to these three species leans heavily on McCulloch (1917). For *S. georgianus* McCulloch has D. x, 24-25, A. iii, 25-26, for *S. aequipinnis* D. ix-x, 25 (-27), A. iii, 25-26: counts of dorsal rays recorded by Scott (1962: 223) are 23-24, 27-28, and of anal rays 25-26, 25-26, respectively.

Genus **SCORPIS** Valenciennes, 1832

Scorpis lineolatus Kner, 1865

Scorpis lineolatus Kner, 1865, Reise Novara, Zool. 1, Fische, pt 1: 108, pl. V, fig. 3. Type locality, Sydney.

Scorpis richardsonii Steindachner, 1866, *Sitzb. Akad. Wiss. Wien*, liii: 437, pl. V, fig. 1. Type locality, Port Jackson.

Agenor modestus Castelnau, 1879, *Proc. Linn. Soc. N.S.W.*, iii, 4: 350, 371. Type locality, Sydney Market.

KEY TO SCORPIDAE RECORDED FROM TASMANIA

1	Second dorsal and anal strongly produced anteriorly. Body with darker cross bars. Maxilla reaching to middle of pupil. Body, in adults, deeper, $\geq \frac{1}{2}$ length to hypural joint	*S. georgianus*
	Second dorsal and anal not or only slightly produced anteriorly. Body without darker cross bars. Maxilla not reaching to middle of pupil. Body, in adults, shallower, $\leq \frac{1}{2}$ length to hypural joint	2
2	Second dorsal and anal slightly produced anteriorly. Scales smaller, >100 above lateral line between its origin and hypural joint. Maxilla reaching to below anterior border of pupil, its width = to its distance from eye. Number of anal rays ≤ number of dorsal rays. Scales between pectoral base and ventral spine ≥20	*S. aequipinnis*
	Second dorsal and anal not produced anteriorly. Scales larger, <100 (=90) above lateral line between its origin and hypural joint. Maxilla not reaching to below anterior of pupil, its width > (decidedly) than its distance from eye. Number of anal rays ≥ number of dorsal rays. Scales between pectoral base and ventral spine <20 (=12-14)	*S. lineolatus*

TABLE 4

Scorpis lineolatus Kner, 1865. Fin counts, and dimensions as thousandths of standard length (*TLs*), of 7 juveniles from Swimcart Beach, Cornwall, Tasmania, 5 May, 1968.

Count or Dimension	Specimen: standard length, mm							Mode or Mean
	(*a*) 68.1	(*b*) 73.0	(*c*) 75.9	(*d*) 78.1	(*e*) 79.9	(*f*) 100.0	(*g*) 104.1	
Dorsal	x, 26	x, 27	x, 27	x, 27	x, 27	x, 27	ix, 28	x, 27
Anal	iii, 28	iii, 27	iii, 27	iii, 27	iii, 27	iii, 27	iii, 27	iii, 27
Pectoral (left, right)	18, 18	18, 18	18,(17)	18, 18	18, 18	18, 18	18, 18	18
Caudal, main rays	20	18	20	20	19	17	18	20
Total length	1,357	1,344	1,324	1,314	1,331	1,315	1,352	1,333.9 ± 6.7
Length to end of middle caudal rays	1,198	1,241	1,212	1,206	1,176	1,153	1,159	1,192.1 ± 11.0
Length to origin of first dorsal	380	360	391	370	399	364	361	360.7 ± 2.9
Length to termination of first dorsal (spine base)	587	562	569	570	610	583	567	578.3 ± 5.4
Length to origin of second dorsal	601	575	588	580	625	596	580	592.1 ± 6.0
Length to termination of second dorsal (ray base)	903	879	899	886	897	883	878	889.3 ± 3.6
Length to origin of anal	577	519	565	538	508	502	504	530.4 ± 10.7
Length to termination of anal	915	903	908	895	885	902	874	897.4 ± 4.9
Length to origin of pectoral	294	289	277	269	250	230	264	267.6 ± 7.8
Length of pectoral	251	258	250	244	236	250	246	247.9 ± 3.5
Length to origin of ventral	323	288	343	335	293	311	300	313.3 ± 7.4
Length of ventral	156	147	145	139	163	159	156	152.1 ± 3.0
Length to middle of vent	543	488	527	506	463	460	447	490.6 ± 12.7
Head	308	296	316	288	307	260	288	294.7 ± 6.5
Snout	58	69	73	65	73	60	67	66.4 ± 2.1
Eye	109	110	105	101	108	95	91	102.7 ± 2.6
Interorbital	73	80	79	70	86	74	72	77.6 ± 2.6
Maximum depth	514	575	527	525	537	550	558	540.9 ± 7.0
Depth at end of operculum	455	493	448	442	469	455	461	460.4 ± 5.9
Depth at vent	507	548	514	513	526	540	543	527.3 ± 5.8
Depth of caudal peduncle	104	123	105	105	114	97	114	108.9 ± 2.8
Length of 2nd dorsal ray	176	173	171	160	169	162	164	167.8 ± 2.1
Length of last dorsal ray	48	55	53	51	50	50	50	50.9 ± 2.2
Length of last dorsal spine	132	129	129	128	125	115	125	126.1 ± 1.9
Length of 2nd anal ray	185	178	184	186	181	169	168	178.7 ± 2.6
Length of last anal ray	44	55	53	51	51	40	37	47.1 ± 2.4
Length of last anal spine	97	110	128	128	131	110	103	115.3 ± 4.8
Length of longest (4th) pectoral ray	235	227	219	206	219	220	220	220.9 ± 3.1
Length of longest (1st) ventral ray	135	130	132	134	149	141	140	137.3 ± 2.3

Tasmanian record.—*Scorpis lineolatus* is here added to the Tasmanian list on a record of 7 juveniles, *Ls* 68.1-104.1, $\bar{x}$ 82.73±5.71, *Lt* 92.4-140.7; $\bar{x}$ 110.31±8.41, caught during the St Helens Surf Angling Club's Championship at Swimcart Beach, near St Helens, Cornwall on 5 May 1968. One other juvenile, taken during an earlier competition, has also been examined. McCulloch (1927: 64) observes that in New South Wales 'young specimens are very plentiful in inlets, while adults are more commonly captured along the coast'. The fish reaches a length of about 300. We have here another entry in the interesting list of species recorded from New South Wales and Tasmania, but not reported from Victoria or South Australia. The present examples are designated (*a*)-(*g*) in order of increasing *Ls*.

Fin counts.—One example, (*g*), has D. ix, 28 (fish with 9 spines have been reported also in *S. aequipinnis*), 5 have D. x, 27 (in (*e*), (*f*) last ray split to base), 1, (*a*), x, 26. All show A. iii, 27 (in (*b*), (*d*) last ray split to base) except smallest, which has A. iii, 28. Apart from one imperfect fin—right of (*c*)—all pectorals, on both sides, have 18 rays. Main caudal rays 17-20.

Dimensions and proportions.—A set of dimensions, expressed as *TLs*, is given in Table 4. These millesimals in general exhibit a satisfactorily low measure of variability, only 2 of the 29 items having a coefficient of variation in excess of 10 (length of last anal ray 13.7, length of last anal spine 10.9), *V* for the rest having a frequency distribution for classes 1-9 of 3, 3, 5, 6, 2, 2, 3, 2, 1; the mean value (all items) being 5.26±0.50.

Values of range /σ vary from 1.52 to 5.01, with $\bar{x}$ 2.96±0.11, no fewer than 18 entries lying within ±0.50 of 2.70, the mean value in the normal distribution with $n=7$.

Ranges and means of important diagnostic proportions are: head in *Ls* 3.2-3.8, 3.40±0.08; length to vent in *Ls* 1.8-2.2, 2.06±0.03; trunk in head 1.3-1.8, 1.51±0.07; eye in head 2.7-3.2, 2.88±0.05; snout in eye 1.4-1.9, 1.55±0.09; interorbital in eye 1.3-1.4, 1.32±0.06; first dorsal base in second dorsal base 1.3-1.5, 1.43±0.03; anal base in second dorsal base 1.1-1.4, 1.24±0.04; length of pectoral in head 1.2-1.3, 1.21±0.02; length of ventral in head 1.6-2.2, 1.94±0.06; maximum depth in *Ls* 1.7-2.0, 1.85±0.03; depth at vent in *Ls* 1.8-2.1, 1.92±0.03; 2nd dorsal ray in head 1.6-1.9, 1.75±0.03; 2nd anal ray in head 1.5-1.7, 1.62±0.03; last dorsal ray in 2nd dorsal ray 3.1-3.7, 3.31±0.07; last anal ray in 2nd anal ray 3.3-4.6, 3.87±0.04; longest (4th) pectoral ray in head 1.2-1.5, 1.33±0.03; longest (outermost) ventral ray in head 1.8-2.4, 2.15±0.06; last dorsal spine in head 2.2-2.5, 2.34±0.03; last anal spine in head 2.1-3.2, 2.56±0.13. For these proportions, values of *V* are tolerably low, exceeding 10 in only 2 instances (snout in eye 16.0, trunk in head 13.1), the distribution of the remaining 19 items being, for $V=1\text{-}9, 1, 0, 3, 5, 3, 2, 3, 1, 1$; $\bar{x}$ 6.02±0.55.

Within the sample a significant correlation of a recorded *TLs* value, other than for rays or spines, with *Ls* is afforded by eye diameter, with r −0.94, z 1.74, t 6.18**. However, all 8 *TLs* values for rays and spines given in table 4, except the last entry (longest ventral ray) exhibit a negative correlation with *Ls*, though this correlation is statistically significant in 3 cases only, namely, last dorsal spine (r −0.79, z 1.08, t 2.91*), 2nd anal ray (r −0.90, z 1.49, t 4.68**), last anal ray (r−0.77, z 1.01, t 2.68*).

Compared with the standard figure, reproduced in McCulloch (1927, pl. xxvi, fig. 227*a*) the juveniles exhibit relatively greater extensions in the anterior regions, with larger *TLs* values for head and for lengths to origins of dorsal, anal, and ventral fins; greater relative values are found also for eye, length of ventral, maximum depth, all perhaps expectable in juvenile material. McCulloch (1917: 179) has noted some proportions of a specimen 257 in length to end of middle caudal rays as follows: depth at ventrals 2.2 in *Ls*; head 3.7 in *Ls*; eye, 2nd dorsal ray, 2nd anal ray 3.7, 2.1, 2.9, respectively, in head: in each case the mean size of the region or organ cited as denominator is greater in our examples. In McCulloch's fish 2nd anal ray exceeds, in our example is shorter than, 2nd dorsal ray.

Other features.—Scale counts are compatible with those recorded by McCulloch (his values in parentheses): scales above lateral line between its origin and hypural joint *ca* 87-*ca* 94 (about ninety); between *base* of anterior dorsal rays and lateral line 14-16 (about fifteen); between base of pectoral and ventral spine 11-14 (about thirteen). Maxilla fails to reach level of pupil, falling short of it by 0.2-0.7 of interval between anterior borders of pupil and eye; its distal width 2.2-3.5 (McCulloch, much greater than) its distance from eye. Whole border of preoperculum and about lower half of preorbital border ctenoid. In all examples except (*a*) and (*c*) ventral extends to level of vent. Adpressed pectoral reaches to, or in smaller individuals just falls short of, level of origin of anal.

Family LABRIDAE

Labridae credited to Tasmania in the Check-List (in Coridae) are: (*i*) *Pictilabrus laticlavius* (Richardson), 1839 [genus *Pictilabrus* Gill, 1892]; (*ii*) *Pseudolabrus fucicola* (Richardson), 1840 [genus *Pseudolabrus* Bleeker, 1862]; (*iii*) *P. miles* (Bloch & Schneider), 1801; (*iv*) *P. celidotus* (Bloch & Schneider), 1801; (*v*) *P. tetricus* (Richardson), 1840; (*vi*) *P. cuvieri* (Castelnau), 1873. Of these no fewer than 3—(*i*), (*ii*), (*v*)—have Tasmania as type locality (all Port Arthur [Pembroke]); further, Tasmania provides type localities for 2 species synonymized by McCulloch with (*iii*), namely, *Labrus psittaculus* Richardson, 1840 (Port Arthur) and *Labrichthys mortoni* Johnston, 1885 (mouth of the Derwent River [Monmouth/Buckingham]), as well as for 1 species synonymized by McCulloch with (*iv*), namely, *Labrus botryocosmus* Richardson, 1846 (South Australia and Van Diemen's Land). Lord & Scott (1924) omit (*v*), and replace (*iii*) by a species synonymized by McCulloch with that form, namely, *Labrus psittaculus* Richardson, 1840 (appearing in *Pseudolabrus*), sinking in this Johnston's 1885 species. On p. 74 Lord & Scott credit (*i*) to Cuvier & Valenciennes, but correctly enter it in their list on p. 12.

Astrolabrus maculatus (Macleay), 1881 [genus *Austrolabrus* Steindachner, 1883] was added to our list in Part V (1942: 50), on the strength of an example secured in a trawl at the mouth of the Tamar River, Devon/Dorset, in December 1939. *Pseudolabrus parilis* (Richardson), 1850 is here for the first time reported from Tasmanian waters.

Genus **PSEUDOLABRUS** Bleeker, 1862

Pseudolabrus parilis (Richardson), 1850

Tautoga parila Richardson, 1850, *Proc. Zool. Soc. Lond.*: 70. Type locality, King George's Sound, Western Australia.

Labrichthys rubra Castelnau, 1875, *Res. Fish. Austr.* (*Vict. Offic. Rec. Philad. Exhib.*): 37. Type locality, Swan River, Western Australia.

Pseudolabrus parilis (Richardson). McCulloch, 1929, *Austr. Mus. Mem.* V, IV: 311.

Tasmanian record.—The species is added to the Tasmanian list on the basis of a specimen, *Ls* 112, *Lt* 138, collected (Rowley) at Low Head, Dorset, 16 July 1964 Queen Vict. Mus. Reg. No. 1969.5.30). Examples have been seen also in collections made (R. H. Green) on the reef at Green's Beach, Devon.

Remarks.—D. ix, 11. A. iii, 10. P. 12. V. i, 5. C. 17. 10 contributing to posterior border. L. lat. 25 (on left, 18 in upper segment, 2 connectives, 5 in lower segment; on right, 19+1+5). L. tr. 2+1+9.

Dorsal originating just in advance of level of opercular lobe, length to origin 3.56 in *Ls*, 1.17 its spinous base (spine-spine), which is 1.37 in soft base (ray-ray). Dorsal spines increasing behind 1st, the longest (last) 1.52 in longest (3rd) dorsal ray, which is equal to longest (3rd-4th) anal ray. Anal originating beneath 1st, terminating beneath penultimate, dorsal ray. Pectoral broadly rounded, its length subequal to head without snout, extending to level of 7th dorsal spine, not reaching anal origin [contrast figure reproduced in Scott (1962: 275)]. Ventral pointed, subequal in length to postorbital head, extending 0.59 of distance to anal. Head 3.5 in *Ls*. Eye equal to interorbital, 1.12 in snout, 4.57 in head. Greatest depth, occurring about at end of adpressed pectoral, just exceeding head, 1.69 depth of caudal peduncle, which is 2.79 eye. In each side of upper jaw a single series of about a dozen teeth, the anterior one a curved canine, the remainder decreasing backward from the 2nd, which is about half the 1st; internal to the bases of the first 4 teeth a row of 6-7 minute teeth, barely erupted, possibly representing a replacer series; well behind the main teeth, and noticeably external to their general line, a pair of closely set canines. In each half of lower jaw a single row of about a dozen teeth, decreasing in size backward. Scales large, extending forward mesially on dorsum, in 4 or 5 predorsal rows, to level of preopercular border, continuing laterally, by 2 or 3 large scales on each side, to reach upper hind border of eye; beginning adjacent to these large scales, and extending round lower posterior quadrant of eye, small scales, in 1 row above, in 2 or 3 rows below.

In general more or less horn coloured, tolerably uniform, with a number of small scattered, obscurely delimited dark splashes or spots. No dark lines radiating from eye [contrast Scott: 278]. Dorsal with a conspicuous dark area on first 2 interspaces between rays, a conspicuous spot on basal half of last interspace, some small obscure dark markings elsewhere. Anal darker along free margin. Caudal somewhat dusky distally. Pectoral and ventral pale brown, immaculate. Examples from Green's Beach, examined earlier, exhibited a ground colour predominantly greenish.

Family PLATYCEPHALIDAE

In the Check-List only a single species, entered as *Platycephalus bassensis* Cuvier & Valenciennes, 1829, is definitely credited to Tasmania, with this State as a queried locality for a second species, *P. fuscus* Cuvier & Valenciennes, 1829 [both are described in vol. IV of *Nat. Hist. Poiss.*, which is by Cuvier]. The first of these is now recognised as including, besides the typical form from the eastern States, a Western Australian subspecies, *P. b. westraliae* Whitley, 1938. The second species is now accepted as a Tasmanian fish (*cf.* Scott, 1962: 148). A third species, *P. laevigatus* Cuvier, 1829, not treated as Tasmanian by McCulloch (1929) or by Scott (1962), is included in the local list of Lord (1923), and appears in Lord & Scott's Tasmanian vertebrate synopsis (1924), unaccompanied by precise locality records. A note on the Tasmanian status of a fourth species, *Neoplatycephalus speculator* (Klunzinger), 1872, appears below.

Platycephalus bassensis, P. fuscus and *Neoplatycephalus speculator* have been nominated by Whitley (1938) as orthotypes of three genera, *Trudis, Planipora, Cacumen*, respectively: in his recent Australian list (1964) the first two of these are retained, the third is abandoned.

Lord & Scott also treat as a member of this family *Oplichthys haswelli* McCulloch, 1907, referred in the Check-List to Oplichthyidae: in both the original account (McCulloch, 1907: 351, pl. lxiv) and in Lord & Scott the generic name is rendered as *Hoplichthys*—the two spellings occurring in Cuvier (1829). Oplichthids are naked, and have a row of spinate bucklers on each side: platycephalids are scaled, and lack the bucklers.

KEY TO PLATYCEPHALIDAE RECORDED FROM TASMANIA

1	Jaws and palate with canines. First dorsal base $>\frac{1}{2}$ anal base	*Neoplatycephalus speculator*
	Jaws and palate without canines. First dorsal base $\leq\frac{1}{2}$ anal base	2
2	Anal origin in advance of second dorsal origin. Preopercular spines strong, the lower the longer	*Platycephalus bassensis bassensis*
	Anal origin behind second dorsal origin. Preopercular spines weak, subequal, or the upper the longer	3
3	First and second dorsals continuous or subcontinuous. Anal termination not, or barely, behind second dorsal termination. Upper surface of head without ridges. Interorbital < transverse diameter of eye. Ventral without produced rays, subequal to pectoral. Flank with closely set large rounded brown spots	*Platycephalus laevigatus*
	First and second dorsals not continuous (separated by about an eye diameter). Anal termination behind second dorsal termination (by 2-3 rays). Upper surface of head with ridges. Interorbital > transverse diameter of eye. Ventral with one or more rays produced, longer than pectoral. Flank with irregular dark markings	*Platycephalus fuscus*

Two South Australian species it would not be altogether surprising to find extending to our waters are *Thysanophrys cirronasus* (Richardson), 1848 and *Platycephalus haackei* Steindachner, 1844. The former agrees with *Neoplatycephalus*, and differs from other species in the key, in having first dorsal base $>\frac{1}{2}$ anal base: it differs from Klunzinger's species in having the teeth villiform, and in possessing a rostral tentacle. *P. haackei* would run down to the third couplet of the key: it can be separated from both species there by having head subequal to interval between origin of second dorsal and hypural joint, instead of subequal to dorsal base, and by having combined dorsal and anal rays about 23-24 (*cf. P. fuscus* modally 26, *C. laevigatus* modally 28).

Genus **NEOPLATYCEPHALUS** Castelnau, 1872

Neoplatycephalus speculator (Klunzinger), 1872

Platycephalus speculator Klunzinger, 1872, *Arch. Naturg.* xxxviii, 1: 28. Type locality, Hobson's Bay.

Tasmanian status.—This species does not occur in any of the local lists of Johnston (1883, 1891), Lord (1923), Lord & Scott (1924); nor, as a Tasmanian fish, in McCulloch (1929), Scott (1962). In a paper on fishes trawled in the Great Australian Bight, Munro & Kurth (1960: 19) state 'It is now known to extend along the coast off Victoria, Tasmania, South Australia and Western Australia'. A specimen obtained at one of three trawl stations in Bass Strait, east of the Hogan Group, occupied by the Japanese research vessel *Umitaka Maru* on 19 January 1968 has been noted in a systematic list of the fishes collected by that expedition in Tasmanian waters (Harrison & Scott, 1969: 9, 11).

Genus **PLATYCEPHALUS** Bloch, 1795

Platycephalus bassensis bassensis Cuvier, 1829

Platycephalus bassensis Cuvier, 1829, *Hist. Nat. Poiss.*, IV: 247. Type locality, Port Western, Victoria.

Platycephalus tasmanius Richardson, 1842, *Trans. Zool. Soc. Lond.*, iii: 96. Type locality, Port Arthur [Pembroke], Tasmania.

Platycephalus bassensis bassensis Cuvier & Valenciennes. Scott, 1962, Marine and Fresh Water Fishes of South Australia: 148, unnumbered fig. on p. 148.

Variation in fin counts.—A current conventional diagnosis (Scott, 1962: 148) gives D. vii-viii, 14: A. 14. A sample of 11 examples from Swimcart Beach, near St Helens, Cornwall (St Helens Surf Angling Club Championship, 4 May 1968) provides the following counts: D. vii, 13 (1 specimen; last ray split to base), vii, 14 (8; last ray split to base in 3), vii, 15 (1), viii, 14 (1): A. 13 (1), 14 (10).

The standard length of the sample was 289-448, $\bar{x}$ 361.1±13.1, σ 43.4±9.04, V 12.0±2.6.

REFERENCES

BERG, L. S., 1940.—The Classification of Fishes both Recent and Fossil. *Trav. Inst. Zool. Acad. Sci. U.R.S.S.*, 5: 87-517, 90 figs (in Russian: not seen). Edition in Russian and English, 1947, Ann Arbor, Michigan, U.S.A.

GUNTHER, A., 1870.—*Catalogue of the Acanthopterygian Fishes in the Collection of the British Museum*, viii. London.

HARRISON, A. J. & SCOTT, E. O. G., 1969.—A Systematic List of the Fishes Collected in Tasmanian Waters by the *Umitaka Maru* in January 1968. *Tasm. Fish. Res.*, 3, 1: 7-11.

HUXLEY, J. S., 1932.—*Problems of Relative Growth.* London.

JOHNSTON, R. M., 1883.—General and Critical Observations on the Fishes of Tasmania with a Classified Catalogue of all known Species. *Pap. Proc. Roy. Soc. Tasm.*, 1882: 58-144.

————, 1891.—Further Observations upon the Fishes and Fishing Industries of Tasmania, together with a Revised List of Indigenous Species. *Pap. Proc. Roy. Soc. Tasm.*, 1890: 22-46.

LORD, C. E., 1923.—A List of the Fishes of Tasmania. *Pap. Proc. Roy. Soc. Tasm.*, 1922: 60-73.

———— & SCOTT, H. H., 1924.—*A Synopsis of the Vertebrate Animals of Tasmania.* Hobart.

MCCULLOCH, A. R., 1907.—The Results of Deep-Sea Investigation in the Tasman Sea: ii. The Expedition of the 'Woy Woy': 1. Fishes and Crustaceans from Eight Hundred Fathoms. *Rec. Austr. Mus.*, 6, 5: 345-355, pl. lviii-lxv, text fig. 55.

————, 1911.—Report on the Fishes obtained by the F.I.S. 'Endeavour' on the Coasts of New South Wales, Victoria, South Australia and Tasmania. Part 1. *Zool. Res. Endeavour*, 1, 1: 1-87, pl. i-xvi.

————, 1917.—Studies in Australian Fishes. No. 4. *Rec. Austr. Mus.*, 11, 7: 163-188, pl. 29-31, text figs 1-2.

————, 1926.—Report on some Fishes obtained by the F.I.S. 'Endeavour' on the Coasts of Queensland, New South Wales, Victoria, Tasmania, South and South-Western Australia. Part V. *Biol. Res. Endeavour*, 5, 4: 157-216, pl. xliii-lvi, figs 1-4.

————, 1927.—*The Fishes and Fish-Like Animals of New South Wales*: 2nd ed., with additions by G. P. Whitley. Sydney.

————, 1929.—A Check-List of the Fishes Recorded from Australia. *Austr. Mus. Mem.*, V, i-iii (iv, Index, 1930).

MUNRO, I. S. R., 1957.—Handbook of Australian Fishes; serially in *Fisheries Newsletter* (subsequently *Australian Fisheries Newsletter*, now *Australian Fisheries*), 16, 8 and 9 [Macruridae]. Canberra.

————, 1958.—Handbook of Australian Fishes. *Fish. Newsl.* [see 1957 entry], 17, 2-5 [Syngnathidae].

————, 1960.—Handbook of Australian Fishes. *Fish. Newsl.* [see 1957 entry], 19, 8-12 [Apogonidae].

———— & KURTH, D. E., 1960.—Trawl Fishes of the Bight. *Fish. Newsl.* [see previous entry], 19, 7: 16-21, figs 1-17.

OGILBY, J. D., 1897.—Some Tasmanian Fishes. *Pap. Proc. Roy. Soc. Tasm.*, 1896: 69-85.

PHILLIPPS, W. J., 1927.—Notes on New Zealand Fishes. *Trans. Proc. N.Z. Inst.*, 58: 125-135, pl. 3-8.

SCOTT, E. O. G., 1935.—Observations on Some Tasmanian Fishes: Part III. *Pap. Proc. Roy. Soc. Tasm.*, 1934: 63-73, pl. V.

————, 1939.—Observations on Some Tasmanian Fishes: Part IV. *Pap. Proc. Roy. Soc. Tasm.*, 1938: 139-159, text figs 1-2.

————, 1942.—*Syngnathus tuckeri sp. nov*: A New Tasmanian Pipefish. *Rec. Queen Vict. Mus.*, 1, 1: 17-20, pl. V.

————, 1953.—Observations on Some Tasmanian Fishes: Part VI. *Pap. Proc. Roy. Soc. Tasm.*, 1952: 141-164, figs 1-4.

————, 1955.—Observations on Some Tasmanian Fishes: Part VII. *Pap. Proc. Roy. Soc. Tasm.*, 1954, 89: 131-166, pl. 1.

————, 1961.—Observations on Some Tasmanian Fishes: Part X. *Pap. Proc. Roy. Soc. Tasm.*, 1960, 95: 49-65, figs 1-3.

————, 1967.—Observations on Some Tasmanian Fishes: Part XV. *Pap. Proc. Roy. Soc. Tasm.*, 1966, 101: 189-220, figs 1-3.

SCOTT, E. O. G., 1968.—First Tasmanian Record of the Long-snouted Pipefish, *Syngnathus poecilolaemus* Peters. *Tasm. Fish. Res.*, 2, 2: 4-7.

SCOTT, T. D., 1962.—*The Marine and Fresh Water Fishes of South Australia.* Adelaide.

WAITE, E. R., 1911.—Scientific Results of the New Zealand Government Trawling Expedition, 1907. Pisces, Part II. *Rec. Canterb. Mus.*, 1, 3: 157-258, pl. XXIV-LVII, figs 1-3.

———— & HALE, H. M., 1921.—Review of the Lophobranchiate Fishes of South Australia. *Rec. S. Austr. Mus.*, 1, 4: 293-324, figs 39-56.

WHITLEY, G. P., 1931.—New Names for Australian Fishes. *Austr. Zool.*, 6, 4: 310-334, pl. xxxv-xxxvii, and text fig.

————, 1938.—Studies in Ichthyology. No. 11. *Rec. Austr. Mus.*, XX, 3: 195-199, pl. XXI, and fig 1.

————, 1964.—A Survey of Australian Ichthyology: Presidential Address. *Proc. Linn. Soc. N.S.W.*, LXXXIX, 1: 11-127.

————, 1968.—A Check-list of the Fishes Recorded from the New Zealand Region. *Austr. Zool.*, XV, 1: 1-102.