Notes on the Gobies Recorded from Tasmania, With Description of a New Genus

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ONE PLATE AND TWO TEXT FIGURES

(Read 26th September, 1934)

Four species of Gobiidae have at various times been accredited to Tasmania. It cannot be said, however, that our knowledge of the members of the family occurring in our waters at present rests on a very satisfactory footing. In the present paper, the more precise scope and conclusions of which are summarized in the concluding paragraph, some notes on the recorded forms are given, and a new genus is described.

Registration numbers are those of the Queen Victoria Museum, Launceston.

Family GOBIIDAE

Genus **Nesogobius** Whitley, 1929

Nesogobius hinsbyi (McCulloch and Ogilby)

Gobius pictus Castelnau, *Proc. Zool. Soc. Vict.* I. 1872. p. 124: preoccupied by *G. pictus*, Malm, 1865. *Id.* Macleay, *Proc. Linn. Soc. N.S.W.* V. 1881. p. 599.
Gobius hinsybi Johnston. *Pap. Proc. Roy. Soc. Tas.* 1902 (1903). Abstract. p. 10 : *nomen nudum*. *Id. Waite, Rec. S. Aust. Mus.* II. 1. 1921. p. 146. fig. 229. *Id.* Lord, *Pap. Proc. Roy. Soc. Tas.* 1922 (1923). p. 70. *Id.* Lord and Scott, *Synop. Vert. Anim. Tas.* 1924. pp. 73 and 82.
(Gobius) hinsbyi McCulloch and Ogilby, *Rec. Aust. Mus.* XII. 10. 1919. p. 215. pl. XXXIII. fig. 1: *ex* Johnston MS.
Nesogobius hinsbyi Whitey, *Pap. Proc. Roy. Soc. Tas.* 1928 (1929). p. 62. *Id.* McCulloch, *Aust. Mus. Mem.* V. III. 1929. p. 369.

Locality. McCulloch and Ogilby's Tasmanian specimens came from Wedge Bay, Tasman's Peninsula. I find the species is abundant in pools between tide-marks at Burnie, and West Ulverstone, N.W. Coast.

Life-Colours. The following notes on the colours during life were made from a specimen, 54 mm. in total length, obtained by the writer at Burnie, on 7th August, 1934 (Reg. No. 942a).

General colour above sandy, made up of greyish white dotted and reticulated with golden-brown. Six narrow bars of olivaceous brown on back, the first, which is interrupted mesially, just behind level of preopercular margin, second at level of opercular margin, third near middle of first dorsal, fourth near middle of second dorsal,

fifth behind level of second dorsal, reached by that fin laid back, sixth just in advance of origin of caudal ridge: except the first and second, these bands extend down to about midlateral line, uninterruptedly in last two, interrupted by a forward displacement of the lateral element in others. Sides concolorous with back down to midlateral line, where they pass, rather sharply, into white, which continues over the whole ventral surface: along line of demarcation a greyish band, formed by blackish punctulations, which is best-marked and widest below spinous dorsal. Seven moderate sized, dark brown, almost black blotches along midlateral line, extending half into upper sandy, and half into lower white region; the first elongated vertically; first three covered by adpressed pectoral; last, at base of caudal, Y-shaped with the azygous limb directed forward. From midlateral line to ventral profile run about a dozen very narrow subvertical pale golden brown bars, somewhat irregularly spaced, and scarcely extending behind level of termination of soft dorsal.

Head in general concolorous with body. Behind eyes a dark indeterminate transverse bar, subcontinuous with a sharply defined, almost black bar on operculum, immediately behind, and following outline of, posterior margin of preoperculum; a blackish streak from eye towards angle of mouth; a short black subvertical streak below, but not reaching to, anterior portion of eye. Iris in general greyish brown, freckled with darker brown; pupil narrowly ringed with shining golden orange.

Dorsals with colourless membranes, bearing punctulations that give rise to pale brownish regions forming three or four arcs, the narrower interspaces whitish; these markings rather more conspicuous on first dorsal. Posterior margin of first dorsal with a conspicuous broad white marginal band. Pectorals and anal almost colourless, lightly barred with fawn. Ventrals colourless distally, thickly spotted with opaque pearly white proximally: the general appearance of the fins is beautifully white, tinged in parts with fawn, and exceedingly delicate and feathery.

Variation. As pointed out by McCulloch and Ogilby (1919, p. 216), there is considerable variation in colour-marking. A series of nine specimens (Reg. Nos. 942 a-i) yields the following notes. Narrow transverse bars present only in largest specimen; five specimens with white spot on occiput; three with white spot on superior border of pectoral base; three with white markings on cheek and operculum; seven with white mid-dorsal spot near origin of first dorsal, and a less conspicuous one near origin of second dorsal; opercular stripe scarcely developed in smaller individuals; dorsal cross-bars very variable in width and intensity; five to seven dark blotches along midlateral line, rather variable in extent and intensity, usually squarish, except the one at caudal base, which is either Y-shaped, or else composed of an anterior blotch and an adjacent or confluent vertically elongated stripe, often the darkest

element of the whole series; occasionally small spots, perhaps representing incipient vertical bars, between, and slightly below, the main lateral blotches.

The principal proportions of these nine specimens—the largest, 54 mm. in total length, from Burnie, the remainder, 26·2 mm.–46 mm. in total length, from West Ulverstone and near Goat Island—are noted below for comparison with those of the 86 mm. specimen from Wedge Bay, described by Ogilby and McCulloch. Depth before ventrals 4·6–5·8 in length to hypural joint; head 3·1–3·7 in same. Eye 3·4–4·1 in head, and 0·8–1·3 in snout, which is 2·9–4·1 in head. Depth of caudal peduncle 3·5–4·3 in head. Breadth before pectorals 0·96–1·12 in depth there.

None of my specimens has more than seven spines in first dorsal, but, it is of special interest to note, two have six only. D. VII, 9 in six specimens; VII, 10 in one; and VI, 9 in two. A. I, 8 in eight specimens; I, 9 in one. P. 18-20. V. I, 5. C. 13 + $\frac{c.\ 4 - 10.}{c.\ 4 - 11.}$

Habits. This attractive species is tolerably common in pools between tide-marks at Ulverstone and Burnie, and I have observed what is apparently the same form in great numbers along a shallow sandy bank of the River Leven, about a mile inland. It is very swift moving, and when disturbed darts away with celerity, either to the shelter of a rock, or, remaining in the open, coming to a halt after a yard or two, and resting on the sand, into which it often buries itself to the depth of the midlateral line, the white lower half of the body thus becoming entirely hidden, while the exposed half, with its delicate mottlings of grey and golden brown, harmonizes admirably with the surrounding sand. When at rest, or when disturbed while in a vessel, it not unfrequently completely lowers the dorsals, so that they become scarcely discernible. Though decidedly shy, it is at times captured with little difficulty by sliding a flat stone beneath the sand on which it is resting, and flicking it bodily into a waiting net. It appears to show a marked preference for pools whose bottoms are wholly or partly sandy, and I have found it in general useless to seek it in those of a purely rocky character.

Remarks. The following additions may be made to the excellent description by Ogilby and McCulloch. B. 6. Gill-rakers on lower limb of anterior arch about 6, mamilliform. The double series of mucigerous papillae running towards the angle of the mouth is subcontinuous with a double series on the inner mandibular margin. On the caudal there occurs a series of pore-disks: this regularly comprises a mesial row, present on either surface of the membrane, running from near caudal base to, or almost to, posterior margin of the fin, and commonly includes also one or two shorter, less regularly constituted lateral rows, of which the lower is the more constantly present.

Synonymy. McCulloch and Ogilby with little hesitation relegate to this species *Gobius pictus* Castelnau (not of Malm). As Castelnau's species, from St. Kilda, Melbourne, has not hitherto otherwise been recognized, the suggested synonymy is probably correct. At the same time, however, since Whitley (1929, p. 62) has assessed the presence of more than six dorsal spines—a feature on which McCulloch and Ogilby laid considerable emphasis in advocating this identification—as a character of generic value, it is worth recalling, as a memorandum for future investigation, that Castelnau's description includes some points—*e.g.*, lower jaw projecting, second dorsal spine lower than the others—not readily compatible with the present species.

Genus **Arenigobius** Whitley, 1930

Arenigobius tamarensis (Johnston)

(Plate IV, fig. 1)

Gobius tamarensis Johnston. *Pap. Proc. Roy. Soc. Tas.* 1882 (1883). p. 120. *Id.* Macleay, *Proc. Linn. Soc. N.S.W.* IX. 1. 1884. p. 32. *Id.* Johnston, *Pap. Proc. Roy. Soc. Tas.* 1890 (1891). p. 33. *Id.* Lord, *Pap. Proc. Roy. Soc. Tas.* 1922 (1923). p. 70. *Id.* Lord and Scott, *Synop. Vert. Anim. Tas.* 1924. pp. 13 and 81. *Id.* Whitley, *Pap. Proc. Roy. Soc. Tas.* 1928 (1929). p. 61. *Id.* McCulloch, *Aust. Mus. Mem.* V. III. 1929. p. 370.
(Gobius) tamarensis McCulloch and Ogilby, *Rec. Aust. Mus.* XII. 10. 1919. p. 229.
Gobius lateralis ? Lord and Scott, *Synop. Vert. Anim. Tas.* 1924. p. 81.
Gobius tasmanicus Whitley, *Pap. Roy. Soc. Tas.* 1928 (1929). p. 62: *ex* Johnston MS.

Historical Note. Johnston's original description of his *Gobius tamarensis* is a brief one, occupying some twenty lines in his catalogue. So far as I am aware, the species has not been recognized since Johnston's time; and accordingly a redescription and figure are here offered. A discussion of the synonymy outlined above is conveniently postponed till the species has been described, and hence appears under a separate heading below.

Description. B. 5. D. VI, 9. A, I, 8. P. 18-20. V. I, 5. C. 13 + $\frac{c.\ 2-5}{c.\ 2-5}$. Scales between axilla and hypural joint, 32–33, and between anterior dorsal and anal rays 11–12. Gill-rakers on lower limb of anterior arch about 7, stout, elongated, cylindro-conical.

Greatest depth 6·4–7·3 in total length; depth at level of pectoral base 1·1 in breadth there, and 5·6–6·4 in length to hypural joint. Head 3·4–3·7 in length to hypural. Eye 1·2–1·3 in snout, which is 3·8–4·0 in head. Interorbital width 2·4–2·8 in eye. Depth of caudal peduncle 2·0–2·8 in its own length, and 2·7–3·4 in head.

Head entirely naked; moderately depressed, its depth 1·1–1·4 in its greatest breadth, and 1·0–1·3 in breadth at level of hinder orbital margin. Cheek and opercles with rows of mucigerous pores, arranged as shown (Plate IV, fig. 1). Open pores present in rows along

nuchal grooves; several scattered rostral pores, and an interorbital one. Snout convex, obtusely conical. Anterior nostril in a short tube, about thrice as far from eye as from margin of preorbital; posterior nostril in a scarcely developed tube, about midway between anterior nostril and orbit. Eyes moderate, cutting the dorsal profile. Interorbital space slightly concave. Mouth oblique; jaws subequal anteriorly, or lower distinctly projecting; maxilla extending to below middle, or, exceptionally, posterior third, of eye. No barbels or cirri. Anterior premaxillary teeth in four rows; the outer three rows villiform, but exhibiting some gradation in size, on the whole 3rd > 2nd > 1st row; inner row large, acute, tending to increase in size backwards: behind the middle of the jaw, reduced to two or three rows, those of the outer row, or rows, larger than they are anteriorly, and two or three teeth of the inner row, just behind the middle of the jaw, caniniform, inwardly curved. Palate toothless. Mandibular teeth in about five rows anteriorly, decreasing, by loss or confusion among the middle rows, to three or four posteriorly; outer row cardiform, increasing somewhat in size posteriorly; next three rows villiform, more closely spaced than first row; inner row large, acute, inwardly curved, increasing in size backwardly to about the middle of the series, where there are two or three markedly caniniform. Tongue broad; its posterior half adnate to floor of mouth; its free anterior margin shallowly, somewhat broadly notched. Gill-openings chiefly lateral, a little wider than the isthmus, the breadth of the latter more than length of snout. Exposed edge of shoulder-girdle smooth.

Body fairly robust, subcylindrical anteriorly, compressed posteriorly. Covered with ctenoid scales; angular and rather large posteriorly, where they extend for one or two rows, especially laterally, on to the caudal base, more rounded and smaller anteriorly, where they cease, on the dorsal surface, at about the level of the hinder edge of the pectoral base mesially, and a little in advance of the posterior opercular border laterally, and, on the lower surface, at about the level of the origin of the ventrals; pectoral base naked. Genital papilla moderate.

First dorsal beginning above the anterior fourth of middle pectoral rays; the length to its origin 2·8–2·9 in length to hypural; its base 2·2–2·5 in its distance from tip of snout, and subequal to postorbital portion of head; first spine about one and one-half times as long as last, and about one and one-third in longest (5th), which latter is rather more than half head; laid back, reaches to, or nearly to, origin of second dorsal. Interdorsal 3·0–4·0 in base of first dorsal, and less than eye. Second dorsal beginning behind level of vent; the length to its origin 1·8–1·9 in length to hypural; its base 2·6–2·8 in its distance from tip of snout, and subequal to combined length of base of first dorsal and interdorsal; its longest (3rd) ray but little longer than succeeding rays, and subequal in large specimens to base of the fin; laid back, fails to reach level of base of middle

caudal rays by less than length of its own last ray, which is relatively longer in larger specimens. Anal beginning about below, or a shade behind, second ray of soft dorsal, and ending just behind soft dorsal; the length to its origin 1·7–1·8 in length to hypural; its base 2·9–3·6 in its distance from the snout, and about two-thirds length of head; similar in general form to, but lower than, soft dorsal; laid back, fails to reach level of base of middle caudal rays by a distance varying from rather more than length of its own last ray, in smaller specimens, to less than two-thirds of same, in larger specimens. Pectoral inserted just anterior to ventral; somewhat narowly rounded; without free silk-like rays; its longest (about 10th) ray rather more than one and one-half times postorbital portion of head, and reaching, when adpressed, about to level of middle of interdorsal. Ventrals united; with a well-developed anterior interspinous membrane; their longest (5th) ray subequal to base of anal, and reaching, when adpressed, nearly, or quite, to vent. Caudal pointed, the median rays, which are somewhat produced, 1·0–1·3 in head.

General colour of body (in formalin) varying above from pale greenish grey to dull greenish brown, below from white to pale, faintly greenish grey. Scales of the back and sides narrowly margined posteriorly with blackish, being minutely and abundantly punctulate with sepia, the punctulations extending over the whole scale in darker specimens, but being confined to the posterior half or two-thirds in lighter examples; scales of ventral surface immaculate. In some specimens there are four rather indefinite dark bands across the back, not, or scarcely, discernible in others, which extend about to the midlateral line, the first at level of first dorsal, second rather behind middle of second dorsal, third just behind that fin, fourth near middle of caudal peduncle. A row of small to moderate dark spots along midlateral line, about nine between axilla and caudal base, the last the most conspicuous of the series. Upper surface and sides of head in some specimens very pale greenish, almost white, minutely punctulated with darker greenish, in others brownish, similarly punctulated, but also coarsely blotched and vermiculated with dark brown; a dark streak from eye towards angle of mouth; lower surface pale greenish grey. Dorsals and anal grossly hyaline, membrane and rays, particularly the latter, punctulated with brown, showing a tendency in darker individuals towards the formation, especially in the dorsals, of rows of spots and bars; extremities of the rays usually blackish. Caudal with about six rows of dark spots, chiefly developed radially. Pectoral faintly dusky greenish, more or less heavily punctulated with brownish. Ventrals pale yellow, occasionally dusky, especially distally, on account of the presence of dark punctulations.

Material examined. Described from five specimens in the collection of the Queen Victoria Museum, Launceston (Reg. Nos. 940 a-e), two lighter individuals, 75 and 67·5 mm. in total length, the

smaller of which is figured, obtained 12th March, 1934, three darker individuals, 84·5, 77, and 72·5 mm. in total length, part of a series of ten, obtained 18th April, 1934.

Locality. River Tamar, Tasmania; first series from Launceston wharf, second series from upper reaches of river near Tamar Island.

Synonymy and Taxonymy. Two main questions arise in regard to the synonymy, first, that of the identity of the species with *Favonigobius lateralis* (Macleay), secondly that of its identity with *Gobius tasmanicus* Whitley.

Johnston himself (1883, p. 120) noted regarding his *G. tamarensis*, 'This species approaches very close to *Gobius lateralis* (Macleay).' Succeeding writers without access to specimens—*e.g.*, Macleay (1884, p. 32), McCulloch and Ogilby (1919, p. 229)—have in general been content merely to quote this observation; but Lord and Scott (1924, p. 81), while according *G. tamarensis* a separate heading, express the opinion it is 'probably identical with' Macleay's species. While presenting considerable general resemblance to *Favonigobius lateralis*, as described and figured by McCulloch and Waite (1918, p. 48; Pl. II, fig. 3), the present species may readily be distinguished from that form by, among other characters, its larger number of scales between pectoral base and hypural, and between anterior dorsal and anal rays, the naked pectoral base, the presence of an extra ray in the dorsal, the notched tongue, and nature of the dentition. The degree to which the laid-back soft dorsal and anal extend towards the caudal base appears to vary in both species with the size of the individual, and to be without diagnostic value.

Gobius tasmanicus Whitley is founded upon a short description, with some general measurements of a specimen 69 mm. long, given, under that name, in Johnston's MS., dealt with by Whitley (1929, p. 62). A comparison of the description of *G. tamarensis* and *G. tasmanicus* shows agreement in the following points:—dorsal and anal radial formulae; height one-seventh of total length; head naked, depressed, one-fourth of total length; snout obtuse, convex; eyes approximated; size 2-3 inches: while both are common in the River Tamar. The positive differences noted include:—branchiostegals 4 in *G. tamarensis*, 5 in *G. tasmanicus;* a small difference in the size of the eye; and a rather marked difference in colouration. The difference in the count of the branchiostegals I cannot bring myself to regard as being of great significance; the variation in the size of the eye is more than covered by the range exhibited by the specimens described above; and while a general comparison of a particularly light coloured, little marked specimen with a particularly dark coloured, much marked specimen might well suggest a specific difference, I find a complete gradation between the two extremes in colour exhibited by individuals between which a detailed examination fails to reveal any other differences. With the doubtful exceptions of 'pectoral reaching to vertical from third ray of second dorsal' in *G. tamarensis*, the pectoral not extending beyond the

origin of that fin in any of my specimens, and 'all the teeth small' in the same species, the characters of *G. tamarensis* and *G. tasmanicus* recorded in the description of one only of the two species, and therefore not directly comparable, are compatible with those of the specimens here described. On the whole, in the light of the information now available, I feel little hesitation in regarding *G. tasmanicus* as a synonym of *G. tamarensis*.

After long deliberation, I place this form in *Arenigobius* Whitley. I do so, however, rather as an indication of its general affinities than with any fixed feeling that, when the last word has been said on the Australian genera, it will necessarily remain there. Though the first step towards the solution of the problem of the relationships of the many Australian species originally described under the general name of *Gobius* was taken when McCulloch and Ogilby (1919) first gave adequate descriptions of, and a key to, some of these, and further important advances were made when Whitley (1928, p. 224) instituted *Berowra*, with *(Gobius) lidwelli* McCulloch as orthotype, and (1929, p. 62) *Nesogobius*, with *(Gobius) hinsbyi* McCulloch and Ogilby as orthotype, and later (1930) proposed seven generic names for other species of *(Gobius)* included in McCulloch and Ogilby's key, it is evident there is still a long way to go before the whole matter reaches finality. The present species exhibits close affinities with the species of *Arenigobius* in the important items of the shape of the tongue, and the character of the dentition, but differs from them in the somewhat produced lower jaw, and the smaller number of dorsal and anal rays: it approaches nearer to *A. semifrenatus* than to the genotype, *A. bifrenatus*. It may be observed that McCulloch and Ogilby (1919, p. 204) place these species in their key, to which Whitley (1930, p. 122) in instituting *Arenigobius* refers, in the division 'breast and pectoral base scaly,' but in describing *A. bifrenatus* state (p. 243) that the scales 'extend forward to above the operculum, leaving the nape and the pectoral base naked.' From *Berowra lidwelli*, which, under 'breast and pectoral base naked,' stands immediately adjacent in the key, the present form is readily separable. It finds its nearest ally among extralimital genera with Australian representatives in *Glossogobius* Gill, from which it seems to differ mainly in the degree of notching of the tongue and in the enlargement of some only of the outer teeth. A review of the information at present at my command leaves me with a suspicion that it may at some time be necessary to establish an Australian genus, intermediate in some respects between *Glossogobius* and *Arenigobius*, in which the present species, possibly accompanied by others, may rest.

Genus **Favonigobius** Whitley, 1930

Favonigobius lateralis (Macleay)

Gobius lateralis Macleay, *Proc. Linn. Soc. N.S.W.* V. 4. 1881. p. 602. *Id.* Waite, *Rec. S. Aust. Mus.* II. 1. 1921. p. 146. fig. 230. *Id.* Lord, *Pap. Proc. Roy. Soc. Tas.* 1922 (1923). p. 70. *Id.* Lord and Scott. *Synop. Vert. Anim. Tas.* 1924. pp. 13 and 81. *Id.* McCulloch. *Aust. Mus. Mem.* V. III. 1929. p. 371.

Rhinogobius lateralis McCulloch and Waite, *Rec. S. Aust. Mus.* I. 1. 1928. p. 48. pl. ii. fig. 3.

Favonigobius lateralis Whitley, *Aust. Zool.* VI. 2. 1930. p. 122.

Remarks. This species is not included in either of Johnston's Tasmanian lists, nor is it accredited to Tasmania by McCulloch (1929, p. 371). It first appears, so far as I can ascertain, in the list of Lord (1923, p. 70), which is a simple enumeration of species only; and it is also included by Lord and Scott (1924, pp. 13 and 81), with a reference to Macleay's description, but without records of specimens, or comments. I can find no further mention of it in connexion with Tasmania.

The presence of this species on our local lists appears to be an error. It is, I am inclined to think, traceable to a simple misunderstanding, for which I venture to suggest the following possible explanation. Johnston (1891, p. 33) lists under the heading family Gobiidae two species, namely, *Gobius tamarensis* Johnston and *Callionymus lateralis* Macleay, the Callionymidae being, of course, in Johnston's time included in the Gobiidae—Günther (1861, p. 138), whom Johnston largely followed, placing *Callionymus* and allied genera in his 'fourth group' (virtually subfamily) Callionymina, and Macleay himself (1881, p. 628) not separating in any way his *C. lateralis* from any of the other genera of the Gobiidae as then understood. It seems, in these circumstances, at least possible that—aided perhaps by an unconscious association of ideas centring round the word *lateralis,* an association that might well have been reinforced by Johnston's own direct comparison of *G. tamarensis* with *G. lateralis*—Johnston's record of *Callionymus lateralis* Macleay was inadvertently picked up as *Gobius lateralis* Macleay.

That Johnston's own record really referred to *Callionymus lateralis,* and not to *Favonigobius lateralis,* is placed beyond doubt by the radial formulae accompanying it. Moreover, *Callionymus papilio* Günther, of which *C. lateralis* Macleay is a synonym, is a species well established on our faunal list, and is duly accredited to Tasmania by McCulloch (1929, p. 338).

C. papilio now enters the recently constituted genus *Foetorepus* Whitley (1931, p. 323).

Tasmanogobius, gen. nov.

Diagnosis. Without developed, superficial scales, but with pectinate groups of spines, that probably relate to rudimentary, embedded, non-imbricating scales; transparent. Body elongated, sub-

cylindrical. Pores surrounded by disks, simulating photophores, present in complex system on head, in metameric series on body, and on caudal fin. Head not compressed. Snout blunt. Mouth oblique; jaws subequal. No barbels or cirri. Teeth in several rows anteriorly, those of the outer series much enlarged. Palate toothless. Tongue free anteriorly, produced mesially. Gill-openings extending well forward below; gill-membranes united across a moderate isthmus. Exposed edge of shoulder girdle smooth. Gill-rakers short, stout, about 8 on lower limb of anterior arch. First dorsal with 7 (rarely 6) spines; originating near middle of pectoral; not united with soft dorsal. Soft dorsal and anal similar, the latter slightly the shorter; with about 14-16 rays; ending far in advance of caudal. Pectoral rounded, without specialized rays. Ventrals I, 5, conjoined; with anterior interspinous membrane. Caudal subtruncate; with many procurrent rays. Size apparently small. Myomeres 8 + 18.

Orthotype.—*Tasmanogobius lordi*, sp. nov.

Habitat.—Tasmania.

Tasmanogobius lordi, sp. nov.

(Plate IV, fig. 2; and Text figs. 1 and 2)

B. 6. D. VII [in one paratype VI], 15 [15–16]. A. I, 13 [I, 13–15]. P. 18 [19]. C. 15 + $\frac{8}{8}$ [15 + $\frac{8}{8}$ — 17 + $\frac{10}{10}$]. Gill-rakers short, stout, mamilliform, 8 on lower limb of anterior arch.

Depth 7·3 [7·1–8·0] in total length, and 6·2 [6·0–6·7] in length to base of middle caudal rays. Head 5·1 [4·6–4·9] in total length, and 4·3 [4·0–4·1] in length to base of caudal. Snout 1·0 [0·96–1·1] in eye, and 3·9 [3·9–4·4] in head. Interorbital width 3·8 [3·1–4·4] in eye. Caudal peduncle 5·7 [6·2–7·1] in length to base of caudal, and greater than base of first dorsal; its depth 2·2 [1·8–2·2] in its length, and about three times head.

Head naked, transparent. Its posterior width, and width at level of hinder orbital margin subequal to corresponding depths. Snout broadly rounded from above, obtusely conical in profile. Anterior nostril large, in a short, rather wide tube, placed about midway between orbit and upper lip, and subcontinuous with the short, scarcely developed tube of the posterior nostril, which opens immediately in advance of orbit. Eyes moderate, usually cutting the dorsal profile, the transparent covering that is continuous with the skin of the head always doing so. Interorbital space slightly convex. Mouth decidedly oblique; jaws subequal anteriorly, the lower sometimes slightly projecting; maxillary extending to, or slightly beyond, level of anterior orbital margin. No barbels or cirri. Premaxillary teeth in a single cardiform row in the hinder third of the jaw; anterior to which they are chiefly in two rows, with indications of an intercalated third row near the middle of the series; those of

the outer row all large, recurved, rather blunt near the symphysis, increasing in size and acuteness backwards to just beyond middle of jaw; remainder fairly acute, somewhat recurved, subequal, about half as large as the largest of the outer row. Palate toothless. Mandibular teeth in about three rows anteriorly, decreasing to a single row just before they cease behind; those of the outer row greatly enlarged, elongate, rather blunt, markedly recurved, subhorizontal anteriorly, becoming smaller, relatively stouter, more nearly vertical as they continue backwards; those of the middle row moderate throughout, subequal posteriorly to those of the outer row, moderately acute, recurved; those of the inner row smallest, most acute, least recurved. Tongue free in its anterior half; its broad anterior margin produced mesially. Gill-openings continued forward below about to level of posterior preopercular margin; gill-membranes united across

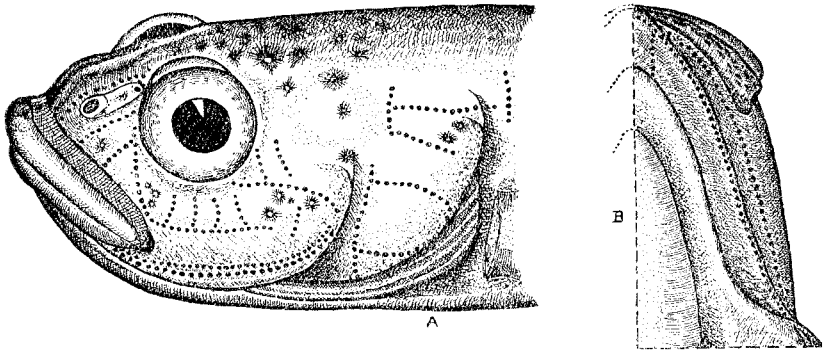

Fig. 1.—*Tasmanogobius lordi*, sp. nov.
A.—Head, lateral aspect, slightly tilted. × 10. B.—Lower jaw, ventral aspect of left half. × 10.

a moderate isthmus, subequal to snout. Exposed edge of shoulder girdle smooth.

Head with a complex system of pores (Text fig. 1, A, B): the double series running forward towards the lower lip (Text fig. 1, A) continuous or subcontinuous with the double series on the chin (Text fig. 1, B). Each pore surrounded by a sharply defined, more or less opaque disk, 80–100 μ in diameter, and set $\frac{1}{3}$–$\frac{2}{3}$ of its diameter from its neighbour, the whole structure somewhat simulating a photophore.

Body transparent, elongated, subcylindrical; breadth at origin of soft dorsal 1·3 [1·1–1·5] in depth there, and breadth at termination of soft dorsal 1·1 [1·1–1·4] in depth there. Pore-disks, the detailed structure of which, as seen in a slide of the skin, examined with a Natchet No. 7 objective and a Leitz No. O ocular, is shown in Text fig. 2 B, are present in subvertical or forwardly convex rows

(Text fig. 2 A) along the side, one to each myomere, the posterior series extending for about five-sixths of the depth of the body, and comprising about a dozen disks, the anterior series usually shorter, with fewer disks. Genital papilla small to moderate.

Without developed, superficial scales; but with non-imbricating pectinate groups of spines, which probably relate to rudimentary scales, arranged in one or three rows posteriorly, as indicated diagrammatically in Text fig. 2 A, and in five or seven similarly staggered rows anteriorly. Usually the spines are wholly embedded, and in preserved specimens invisible without dissection: in several individuals, however, they pierce the integument in the region covered by the adpressed pectoral, presenting a curious superficial resemblance to the spine-groups of some species of Cyclopteridae, *e.g.*, *Lethotremus vinolentus* Jordan and Starks. Spines 8–12 in a series,

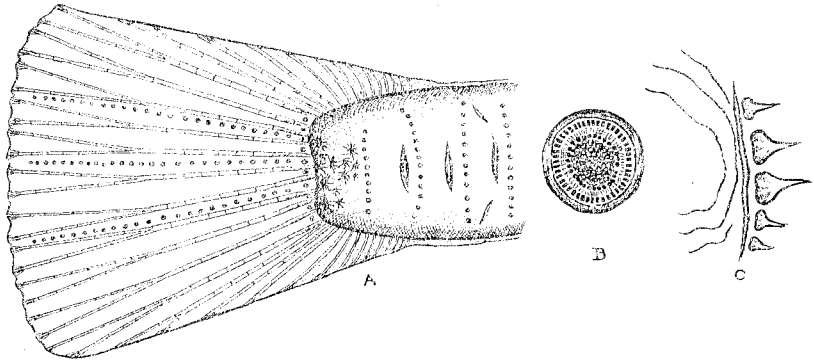

Fig. 2.—*Tasmanogobius lordi*, sp. nov.

A.—Caudal peduncle (with position of basal plates of spine-groups indicated diagrammatically) and caudal fin. × 16. B.—Pore disk. × 150. C.—Spine group and associated scale structure. × 100.

the larger groups restricted to the anterior portion of the body; with broad, non-contiguous bases; each series associated with, but apparently not in contact with, an amphioxid spicule-like basal plate (Text fig. 2 C), in advance of which are at times to be found indications of ordinary scale structure.

First dorsal beginning at, or behind, middle of pectoral; the length to its origin 3·0 [2·9–3·0] in length to base of middle caudal rays; its base 2·7 [2·5–3·3] in its distance from tip of snout, and subequal to postorbital portion of head; first spine two to three times as long as last, and about one and one-third in longest (3rd), which latter is about one-third length of head. Interdorsal 1·5 [1·1–1·9] in base of first dorsal, and about one and one-half times eye. Second dorsal beginning shortly behind vertical from vent; its height about two-thirds that of the body beneath it; the length to its origin 1·9 [1·8] in length to base of middle caudal rays; its base 1·9 [1·8–2·6] in its

distance from tip of snout, and about two and one-half times base of first dorsal; first ray about one and one-quarter times last, and about twice in longest (3rd), which latter is subequal to interdorsal. Anal beginning below interval between 1st and 2nd rays of soft dorsal, and ending about below the penultimate ray of that fin; the length to its origin 2·1 [2·0–2·1] in length to base of middle caudal rays; its base 2·1 [2·0–2·1] in its distance from tip of snout, and about one and one-tenth length of head; similar in form and subequal in height to soft dorsal. Pectoral inserted in advance of ventrals; rounded, obscurely pointed; the majority of the rays branched; upper rays not free from membrane; longest (about 11th) ray rather longer than portorbital portion of head, and reaching, when adpressed, to below 4th [3rd-5th] dorsal spine. Ventrals united, somewhat cup-shaped, not adnate to belly; rays deeply divided, doubly forked from, and usually including, the second onwards; 5th ray longer than 4th, but not greatly so, and subequal to interval between anterior margin of eye and posterior margin of operculum; reaching, when adpressed to, or, a little beyond, midway between its origin and origin of anal. Caudal rounded truncate, the middle of the fin extending horizontally backward beyond the postero-lateral angles by about one-fifth of the length of the median rays, which latter are 1·3 [1·4–1·5] in head; a well-developed series of 8 or 10 procurrent rays above and below. Low ridges connect the caudal with the soft dorsal and the anal fins. Pore-disks on caudal in a vertical basal row, from which run back a midlateral row, and, on either side of it, separated by two, sometimes three, rays, a lateral row: this pattern, which is indicated on one side only of the membrane in Fig. 1 C, occurs on both surfaces of the membrane.

Total length 34·4 mm. [31·7 mm.–34·3 mm.]; length to base of middle caudal rays 29·2 mm. [28·6 mm.–29·3 mm.].

In life transparent; scarcely discernible in the water except for the conspicuous dark eyes. A row of about nine small fawn markings along the midlateral line, the first, below the anterior third of the spinous dorsal, usually the darkest, and regularly forming a narrow subvertical bar, ½–⅔ as high as the body; the third, fifth, and seventh, below the origin, middle, and termination of the soft dorsal respectively, and the ninth, at the end of the caudal peduncle, showing some tendency towards vertical elongation, and commonly larger than the alternating ones, which are subcircular; in one paratype only the posterior three markings are present, the last of these alone being conspicuous. Fawn markings, variable in character, occur on the back. When best developed, as in the holotype, they take the form of seven double bars, made up of subcontinuous longitudinally elongated blotches, and extending slightly on to the sides; the first series in advance of, second below, spinous dorsal, third on interdorsal, fourth-sixth below soft dorsal, seventh near base of procurrent caudal rays. In paratypes they tend to be broken up into spots, each double series, except the first, which in several

cases shows a quincunical arrangement, coming more or less definitely to consist of four dots disposed roughly as at the angles of a square. A row of from eight to twelve small spots along either side of base of anal, as often as not continued back to the anterior procurrent caudal ray. A conspicuous Y-shaped series of dark dots on the ventral surface, the unpaired limb extending mesially from about level of preopercular margin to base of ventrals, where it forks to give rise to two shorter limbs covered, but not hidden, by the conjoined fins. Head variably spotted and punctulated; but regularly with well-marked streak from below eye to angle of mouth, and behind eyes two small blotches, which may be subcontinuous anteriorly, or posteriorly, or both; usually also with more or less definite spots on cheek, behind middle of eye, near posterior preopercular margin, and on operculum; in some specimens two short rows of spots run forward from eye along dorsal surface of snout; lips with faint irregular blotches and some minute punctulations; ventral surface of head immaculate. Pectoral base, which is well developed, lightly punctulated. Dorsals and anal colourless to the naked eye, but all with microscopic punctulations, most numerous basally and posteriorly in the first dorsal, and externally in the other fins. Caudal with dusky marking at base, in sequence with lateral body-series; in some individuals with groups of brownish punctulations forming two or three more or less evident transverse arcs. Pectoral colourless, with a few scattered microscopic dots, particularly basally. Ventrals with numerous punctulations, usually rendering them dusky, particularly distally.

Material examined. Described from the holotype (Plate IV, fig. 2), five paratypes, and mounted paratypic material. Holotype, a paratype, and slides in the collection of the Queen Victoria Museum, Launceston (Reg. Nos. HT.941a, PT.941b, and PT.sl. 941c-g respectively). Paratypes will be offered to the British Museum (Natural History), London; Australian Institute of Anatomy, Canberra; Australian Museum, Sydney; and National Museum, Melbourne.

Locality. Mouth of the River Leven, Tasmania. Not uncommon, in association with *Nesogobius hinsbyi*, in sandy pools formed by the retreating tide behind the retaining wall near the breakwater, West Ulverstone. Several days' collecting in the neighbourhood, while rewarded with other specimens of *Nesogobius hinsbyi*—and, among non-gobioid material, *Atherina tamarensis*, and the usual *Pictiblennius tasmanianus*, *Cristiceps australis*, *Clinus perspicillatus*, *Alabes* spp., and *Parvicrepis cardinalis*—failed to yield further examples.

Named in honour of the late Clive Errol Lord, Director of the Tasmanian Museum, and for fifteen years Secretary of this Society, the most notable local worker in systematic ichthyology since R. M. Johnston's time.

Remarks.—I am unable to suggest the affinities of this form, and have been constrained to establish a new genus for its reception. In addition to the fact that it shares with the otherwise dissimilar

Nesogobius hinsbyi the distinction of being the only known Australian goby with seven dorsal spines, it appears to be readily distinguishable upon other grounds from the described Australian genera; nor are its characters compatible with those of any of the extralimital genera to descriptions of which I have access. My grateful thanks are tendered to Mr. Gilbert P. Whitley, Ichthyologist, the Australian Museum, Sydney, who, in response to inquiries, very kindly referred for me to some extralimital literature on the family—in particular Jordan and Seale's review of the gobies of Oceania—not available in Tasmania.

SUMMARY

1. Four species of Gobiidae have been accredited to Tasmania. Notes on these are given, as indicated seriatim below, and a new genus is described.

2. *Nesogobius hinsbyi* (McCulloch and Ogilby). Life-colours, habits, variation, and new localities recorded; general observations and remarks.

3. *Arenigobius tamarensis* (Johnston). Redescribed and figured; its affinities with *Favongobius lateralis* (Macleay), and its generic status discussed.

4. *Gobius tasmanicus* Whitley. Shown to be probably a synonym of *Arenigobius tamarensis* (Johnston).

5. *Favongobius lateralis* (Macleay). Considered to be accredited to Tasmania in error; an explanation of its presence on some local lists suggested.

6. *Tasmanogobius*, gen. nov., described; orthotype, *Tasmanogobius lordi*, sp. nov., described and figured.

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EXPLANATION OF PLATE

PLATE IV—

Fig. 1.—*Arenigobius tamarensis* (Johnston). Topotypical specimen. Total length 67·5 mm.

Fig. 2.—*Tasmanogobius lordi*, sp. nov. Holotype. Locality, mouth of River Leven, Tasmania. Total length 34·4 mm.

Fig. 1.

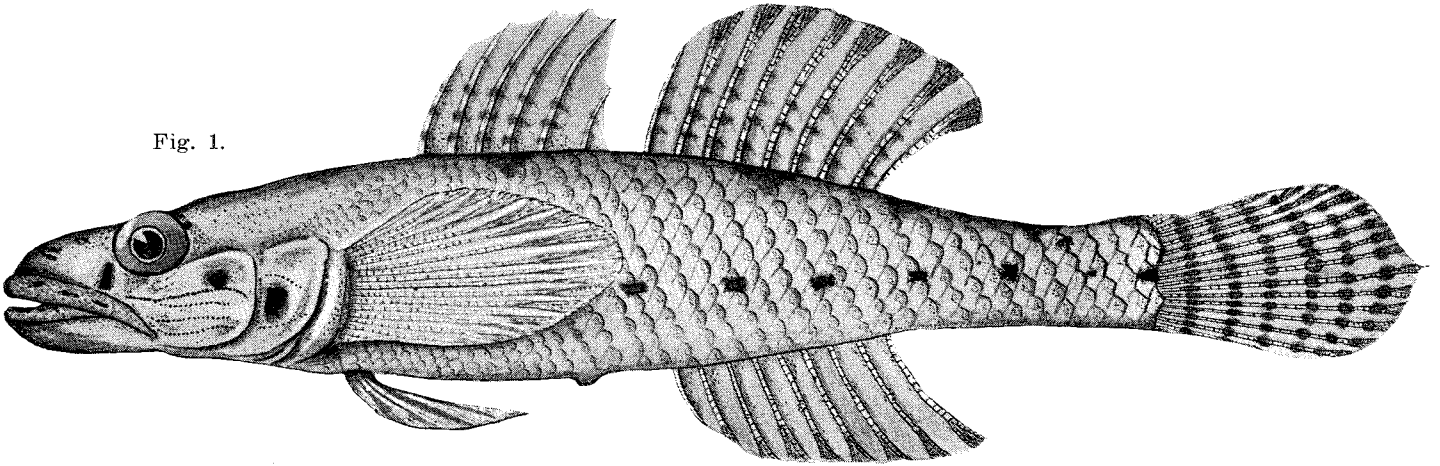

Fig. 2.

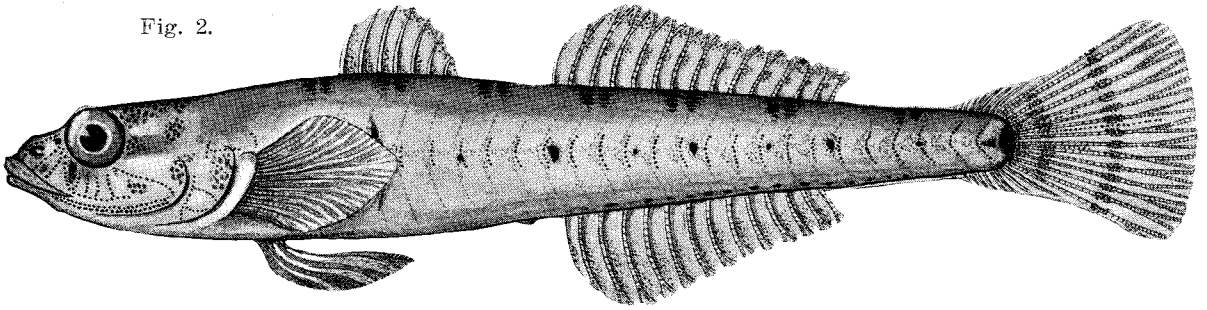

Fig. 1.—*Arenigobius tamarensis* (Johnston). [E.O.G.S. del.]

Fig. 2.—*Tasmanogobius lordi*, sp. nov.