

other ; and also, on the surface, one has the shields of the back of the shell nearly smooth, and the other covered with close sunken dots.

The animal is dark slate-coloured above, and paler grey beneath. There is a broad well-marked white streak from the hinder angle of the mouth, margining the underside of the tympanum and extending nearly to the middle of the base of the front legs ; the hind legs have a series of rather large prominent scales from the outer side of the knee to the base of the outer toes, which are largest near the toes ; tail short, with two series of shields on the underside, behind the vent.

VIII.—*Additions to the knowledge of Australian Reptiles and Fishes*. By ALBERT GÜNTHER, M.A., M.D., Ph.D., F.R.S.

THE British Museum has received in the course of the last three or four years various collections of reptiles and fishes from Australia, and quite recently one made at Champion Bay and Nicol Bay (Western and North-western Australia) by Mr. Duboulay, and two others brought by Hr. Dämel from Cape York and Port Denison. The following notes were made during the arrangement of these specimens ; and, besides the new species, only those are mentioned which were either previously desiderata in the British Museum, or for which new localities can be given.

TORTOISES.

1. *Elseya latisternum*.

See the preceding paper by Dr. Gray.

LIZARDS.

2. *Odatria punctata* (Gray).

West and North Australia.

Var. *timoriensis*. Timor, Torres Straits.

3. *Odatria ocellata* (Gray) = ? *O. tristis* (Schleg.).

West and North-west coast of Australia (Nicol Bay, Duboulay).

Distinguished by the large spines of the tail.

4. *Pygopus lepidopus* (Lac.).

Pygopus squamiceps (Gray).

Swan River, Champion Bay, Sydney, Van Diemen's Land.

5. *Lygosoma laterale*, sp. n.

Habit slender ; limbs feeble, fore limbs equal in length to the

distance of the ear from the snout; toes very unequal in length. Nasals slightly in contact behind the rostral; central occipital not much larger than a præoccipital. Eyelid with a transparent disk; ear-opening very small. Body surrounded by twenty-two series of scales; sixty-seven scales in a series between the axils of the fore and hind limbs. Two large præanal scales. A deep-black band, two scales broad, runs from behind the eye along each side to the root of the tail.

South Australia. $5\frac{1}{2}$ inches long (Krefft, 47).

6. *Lygosoma australis* (Gray).

Swan River, Cape York.

7. *Delma Fraseri* (Gray).

Champion Bay and Nicol Bay.

8. *Lialis Burtonii* (Gray).

Scales in seventeen rows. Swan River, Houtman's Abrolhos.

Var. with the ornamental colours very pale; chin not dark-coloured. Champion Bay.

9. *Lialis punctulata* (Gray).

Scales in nineteen rows. Sydney, Port Essington.

Var. bicatenata. Port Essington.

Var. uniformly coloured. Sydney, Cape York.

10. *Rhodona punctata* (Gray).

Swan River.

11. *Rhodona Gerrardii*, sp. n.

Rhodona punctata, var. *Gerrardii*, Gray.

Nasals slightly in contact with each other; upper labials six; frontal triangular, thrice as large as the central occipital. Body surrounded by twenty-one longitudinal series of scales; seventy-one scales in a longit. series between the axils of the fore and hind limbs. Two large præanal scales. Ear-opening small, covered by scales. Fore limb very small, single-toed on one side, and with two toes on the other. Two toes behind, the outer more than twice as long as the inner. Body with three black longit. bands, one along the middle, and one on each side of the back.

Swan River, Champion Bay. 5 inches long.

The fore limb of *Rhodona punctata* is about as large as a scale, that of *Rhodona Gerrardii* equals the length of six scales; *Rh. punctata* has only one large central occipital, *Rh. Gerrardii* one central and a pair of præoccipitals. The eyelid has a transparent disk in the middle.

12. *Rhodona punctato-vittata*, sp. n.

Nasals forming together a broadish suture; upper labials six; frontal triangular, twice as large as the central occipital. Body surrounded by seventeen longit. series of scales; eighty-two scales in a longit. series between the axils of the fore and hind limbs. Two large præanal scales. Ear-opening small, covered with scales. Fore limb minute, tapering, terminating in a straight minute claw, with scarcely an indication of a second claw. Two toes behind, the outer more than twice as long as the inner. Each scale on the upperside with a black dot, the dots forming six or eight longit. lines.

Queensland. 5 inches long.

13. *Anomalopus Verreauxii* (Dum.).

Brisbane, Clarence River, New South Wales. Specimens from the last two localities through Mr. Krefft.

The eyelid is scaly, as observed by Prof. Peters in 'Monatsber. Ak. Wiss. Berl.' 1867, p. 24. All our specimens are distinguished by the light occipital cross band, which is pure white in young examples, but only faintly marked in adults of twelve inches in length.

14. *Hinulia fasciolata*, sp. n.

Ear-opening small, rounded, and not denticulated in front. Nasals separated by the præfrontal, which is of a triangular shape. Postoccipitals forming a suture together behind the central occipital, which is a little smaller than the præoccipitals. Body surrounded by thirty-three longit. series of scales, the vertebral scales being scarcely larger than the others; there are fifty scales in a longit. series between the axils of the fore and hind limbs. Subcaudal scales broad. Each series of scales on the upperside of the tail with a low ridge. Six præanal scales, the central pair being much the largest. Limbs rather feeble; tail of moderate length, but very thick. Body with narrow, black, rather irregular cross bands, some of them obliquely descending forwards.

Rockhampton, Port Curtis. 8 inches long.

15. *Hinulia branchialis*, sp. n.

Ear-opening small, rounded, and not denticulated in front. Nasals forming together a suture; the central occipital separating entirely the postoccipitals. Body surrounded by twenty-four longit. series of scales, of which the vertebral pair is broadest; there are fifty scales in a longit. series between the axils of the fore and hind limbs. Subcaudal scales broad. Four præanal scales, the central pair largest. Limbs rather feeble; tail of

moderate length. Three black transverse spots on each side of the neck.

Three specimens, 4 inches long, from Champion Bay, north-west coast of Australia.

16. *Hinulia Richardsonii* (Gray).

Abrolhos, Champion Bay.

17. *Hinulia* (*Hemisphæriodon*) *Gerrardii* (Gray).

Rockhampton (Krefft, 43, 512).

18. *Cyclodus gigas*.

The stomach contained the remains of crabs and a fungus.

19. *Cyclodus occipitalis* (Ptrs.).

Adelaide, Swan River.

20. *Cyclodus Adelaidensis* (Ptrs.).

Adelaide (Krefft, 40).

21. *Tropidolepisma nitidum* (Gray).

Swan River.

22. *Tropidolepisma majus* (Gray).

Rockhampton.

23. *Mabouia macrura*, sp. n.

Tail strong, much longer than the body; limbs rather feeble. Supranasals separate. Præfrontal forming a long suture with the rostral and parietal, separating the postfrontals, which are small. Central occipitals three, of nearly the same size; post-occipitals forming a short suture together behind the central occipital. Anterior margin of the ear-opening with very small denticulations. Body surrounded by twenty-eight longit. series of scales, the vertebral pair being broadest. There are forty-eight scales in a longit. series between the fore and hind limbs. Eight præanal scales nearly equal in size. Uniform brownish-olive above, white below.

Cape York. 14½ inches long, the length of the tail being 9 inches.

24. *Tetradactylus decresiensis* (Péron).

Kangaroo Island, Swan River, Champion Bay.

Young specimens with a very distinct and well-defined black lateral band from the snout to the end of the trunk.

25. *Hemiergus polylepis*, sp. n.

Very similar to *H. decresiensis*, but with smaller scales, the

body being surrounded by twenty-six series (in *H. decresiensis* by eighteen or twenty). Also the toes are more developed, the anterior as well as the posterior being conspicuously longer than the eye. Posterior frontals well developed. Seventy-two scales in a series between the axils of the fore and hind limbs.

South Australia. 4 inches long (Krefft, 48).

26. *Chelomeles quadrilineatus* (D. & B.).

Houtman's Abrolhos, Swan River.

27. *Soridia miopus*, sp. n.

Form of the head and arrangement of head-shields as in *S. lineata*, but with the snout somewhat less wedge-shaped. No free fore limbs, but there is a short longitudinal groove, in the upper end of which a minute tubercle (the first indication of an external limb) is visible; hind limb as long as the head, terminating in a single longish toe. Body surrounded by twenty series of scales. Coloration nearly uniform, pale olive; four very indistinct stripes of minute blackish dots along the dorsal series of scales.

Six inches long. Champion Bay.

28. *Ædura marmorata* (Gray).

Port Essington, New South Wales (Krefft, 52).

29. *Ædura rhombifera* (Gray).

?*Phyllodactylus Lesueurii*, D. & B.

New South Wales (Krefft).

30. *Strophura spinigera* (Gray).

Houtman's Abrolhos, Champion Bay, South Australia (Krefft, 42).

31. *Diplodactylus vittatus* (Gray).

Champion Bay, New South Wales.

32. *Diplodactylus ornatus* (Gray).

Houtman's Abrolhos, New South Wales, through Mr. Krefft (114, 518).

33. *Diplodactylus marmoratus* (Gray).

Houtman's Abrolhos, Freemantle, Champion Bay.

34. *Diplodactylus ocellatus* (Gray).

Diplodactylus bilineatus (Gray).

Houtman's Abrolhos, Champion Bay.

35. *Diplodactylus polyophthalmus*, sp. n.

Allied to *D. ocellatus* (Gray), but with much smaller scales,
Ann. & Mag. N. Hist. Ser. 3. Vol. xx. 4

which in that species are particularly rough and tubercular. Tail rounded, rather swollen. Head scarcely depressed. Subdigital plates narrow. Scales minute, those on the belly scarcely larger than those on the back. Upper parts brownish or greyish, with round white spots, which, in young examples, are surrounded by a brown ring. Uniform white below.

Two specimens, 3 and 2 inches long.

Nicol Bay, Champion Bay.

36. *Gecko albo-fasciolatus*, sp. n.

Body covered with small flat granulations arranged in cross series, and with ten longitudinal series of mamilliform tubercles; scales of the belly in about twenty-six longitudinal series; præ-anal pores sixteen, in a slightly angular series. Nostril separated from the rostral by an intervening shield. Thirteen upper and eleven lower labials; the front pair of chin-shields are as long as the first lower labial. Head depressed, longer than broad. Tail rounded on the sides, with an irregular series of enlarged subcaudals. Reddish-olive, marbled with greyish; upperside of the head with a few small white spots; a narrow white horseshoe-shaped band across the neck, the convexity being directed backwards. Trunk with six rather irregular, narrow, transverse bands, composed of white spots. Lower parts uniform whitish.

Ten inches long; without tail $6\frac{1}{2}$.

Polynesia?

37. *Gehyra australis* (Gray).

Swan River, Port Essington, Champion Bay, Norfolk Islands.

38. *Heteronota Binoei* (Gray).

Eublepharis derbianus (Gray).

Hoplodactylus australis, Steindachner, Reise d. Novara, p. 18, taf. 1. fig. 2.

Houtman's Abrolhos, Champion Bay, Port Essington, North Australia, Queensland.

39. *Hemidactylus vittatus* (Gray).

Borneo, Port Essington.

The Australian specimen differs from the types only in having a pair of additional rows of very small tubercles along the median line of the back.

40. *Phyllurus Milliusii* (Bory).

Sydney, Houtman's Abrolhos, Champion Bay.

RHYNCHOEDURA (g. n., Geckot.).

All the toes are compressed, rather slender, not dilated in any

part, granular below, with feeble claws. Head and body with very small granule-like scales, without any tubercles; tail rounded, slightly swollen, covered with rings of small square plates. Snout pointed, peculiarly compressed; labial shields minute, front of upper jaw covered with a prominent, nail-like shield. Tongue narrow, rather pointed in front, not notched. Eye very large. Some larger shields, without pores, before and behind the vent.

41. *Rhynchoedura ornata*, sp. n.

Greyish, each side with confluent black half-rings, a black band across the occiput. Head and body with round, faint, whitish spots. Lower parts white.

Nicol Bay. $2\frac{1}{2}$ inches long.

42. *Physignathus Lesueurii* (Gray).

Istiurus Lesueurii (D. & B.).

Amphibolurus heterurus (Ptrs.).

Clarence River (Kreffft).

43. *Chlamydosaurus Kingii* (Gray).

Port Essington, Cape York, Nicol Bay.

44. *Lophognathus Gilberti* (Gray).

Redtenbacheria fasciata, Steindachner, Reise d. Novara, Rept. p. 31.

Port Essington, Swan River, Champion Bay, Nicol Bay.

45. *Grammatophora reticulata* (Gray).

Nicol Bay.

46. *Grammatophora maculata* (D. & B.).

Nicol Bay, Champion Bay.

47. *Grammatophora macrolepis*, sp. n.

No larger scales scattered between the others; all the scales comparatively large, those on the back larger than the labial shields; body surrounded by fifty-four series of scales, of which fourteen belong to the back. Scarcely a trace of a dorsal crest is visible on the back. Hind limbs long, extending to the ear, if laid forwards. Snout short, nostril midway between the end of the snout and the angle of the ocular slit. A few small prominent scales above and behind the tympanum. Yellowish-olive, with some darker markings on the side of the body and tail. Snout deep brown, interorbital space yellowish; lateral fold of the neck black.

Adult female, 8 inches long, tail $7\frac{1}{2}$ inches.

48. *Grammatophora laevis*, sp. n.

Back with a median series and several irregular transverse series of larger scales. None of the dorsal scales with a distinct keel or spine; scales of the limbs and tail distinctly, those of the belly very faintly keeled. Head broad, high; snout very short, the nostril being midway between the end of the snout and the angle of the ocular slit. Limbs of moderate length, hind limb extending nearly to the gular fold. Sides of the head and neck with conical tubercle-like scales. Yellowish brown, with a series of irregular large blackish-brown blotches along each side of the back; sometimes the whole back reticulated with brown.

Champion Bay. 7 inches long, tail 4 inches.

49. *Grammatophora temporalis*, sp. n.

No larger scales scattered between the others, those on the back small, shorter than the labial shields; a slight dorsal crest runs from the nape to the end of the trunk. Hind limbs very long, extending beyond the eye, if laid forwards. Nostril much nearer to the end of the snout than to the angle of the ocular slit. A few prominent scales in the middle between the tympanum and the lateral fold of the neck. A white band along the lips, below the tympanum to the lateral fold of the neck; a black band above it from the eye to the tympanum; a white streak above the black band, more or less distinctly continued along the side of the anterior part of the trunk. Back with more or less complete black cross bars, the anterior only being distinct in adult examples. Tail more or less distinctly annulated.

Port Essington, Nicol Bay. The largest example is 13 inches long, the tail being 9 inches.

50. *Grammatophora calotella*.

Calotella australis, Steindachner, Reise d. Novara, p. 28.

Cape York.

51. *Tympanocryptis cephalus*, sp. n.

Body very stout; head very short, high, and broad; snout extremely short, the nostril being midway between the angle of the ocular slit and the end of the snout; hind limb extending somewhat beyond the gular fold, if laid forwards. Head above with keeled scales, larger than those on the back, those on the occiput being particularly large. Back with numerous enlarged spinous scales intermixed with the others; upper parts of the limbs with large spinous imbricate scales. Body reddish olive, with a brown collar; blackish-brown bands across the limbs and tail.

Nicol Bay. Adult female $5\frac{1}{2}$ inches long, tail 3 inches.

SNAKES.

52. *Tropidonotus picturatus* (Schleg.).

This snake varies in coloration. We have received a nearly entirely black example from Cape York.

Port Essington, Cape York, Rockhampton.

53. *Dendrophis punctulata* (Gray).

Attains to a length of 66 inches.

Port Essington, Moreton Bay, Cape York, Sydney.

54. *Dendrophis calligastra*, sp. n.

Scales in thirteen rows. Loreal none. Eight upper labials, the fourth and fifth entering the orbit; one præ- and two post-orbitals; temporals 1 + 2 + 2. Abdominal shields 179, strongly keeled. Some of the scales with a single terminal pore. Greenish brown above, sides of the head and neck yellow; a black band across the rostral shield through the eye to the side of the neck. Belly purplish yellow, powdered with purplish brown.

Cape York. 36 inches long, tail 12 inches.

55. *Brachysoma diadema* (Schleg.).

Elaps ornata (Gray).

Glyphodon ornatus (Gthr.).

Extends over the whole of Australia.

56. *Diemenia superciliosa* (Fisch.).

= *Pseudoelaps Sordelli* (Jan) = *Ps. Kubingii* (Jan) = *Cacophis Güntheri* (Steindachner).

New South Wales, Adelaide, Norfolk Islands?

Of this snake we possess now a series of nine examples, varying in length from 16 to 60 inches.

57. *Hoplocephalus nigriceps* (Gthr.).

Swan River, Champion Bay.

58. *Hoplocephalus maculatus* (Steindachner).

The young has the upperside of the head and neck uniform black.

Rockhampton.

FROGS.

1. *Pterophryne Georgiana* (Bibr.).

Port Essington, Sydney, King George's Sound (Krefft, 4).

2. *Pterophryne fasciata* (Steindachner).

Houtman's Abrolhos, Sydney. (*Cystignathus sydneyensis*, Krefft, 16.)

3. *Limnodynastes Krefftii* (Gthr.).

Limnodynastes Salmini, Steindachner, Reise d. Novara, p. 27, taf. 4. figs. 12-15.

Specimens from Rockhampton, collected by Hr. Dämel, have the hinder surface of the thighs black, dotted with white.

Sydney, Brisbane, Rockhampton, Clarence River (Krefft, 59), Port Denison.

4. *Limnodynastes ornatus* (Gray).

Opisthodon Frauenfeldi, Steindachner, Reise d. Novara, p. 9, taf. 1. figs. 1-3 (representing the usual coloration).

Extremely variable in coloration.

Port Denison, Cape York.

5. *Limnodynastes (Platyplectron) Dumerilii* (Ptrs.).

Heliorana Grayi, Steindachner, Reise d. Novara, p. 32, taf. 2. figs. 11-14. Adelaide.

6. *Limnodynastes platycephalus*, sp. n.

Closely allied to *L. tasmaniensis*, but with the head much broader and depressed. Snout very short, not longer than the eye. Hind leg without large gland. Two small metatarsal tubercles. Hind toes slightly fringed. Choanæ very small. Olive, with large dark-brown blotches, sometimes a white vertebral line. A broad dark band along the canthus rostralis, another from the eye to behind the angle of the mouth; an oblique band-like spot below the eye descending forwards.

Adelaide (Krefft, 39).

7. *Chiroleptes australis* (Gray).

Cyclorana Novæ Hollandiæ, Steindachner, Reise d. Novara, p. 29, taf. 2. figs. 7-10.

?*Phractops alutaceus* (Ptrs.) = old example?

Clarence River, Rockhampton, Port Denison, Nicol Bay.

8. *Chiroleptes alboguttatus*, sp. n.?

?*Chiroleptes inermis*, Ptrs.

Head as long as broad; snout depressed, with very indistinct canthus rostralis, somewhat pointed; the distance between the nostrils is less than that from a nostril to the eye. Tympanum at least one-third smaller than the eye. Vomerine teeth between the choanæ, in two transverse series, separated by an interspace, but extending to the edge of the choanæ. The inner metatarsal disciform tubercle well developed; no outer metatarsal tubercle. Smooth above; hinder lower parts very finely granulated. Toes half webbed. Blackish ashy above, indistinctly marbled with black. A white vertebral line. Sides of the

body and hind part of the thighs black, with numerous round white spots. A black band along the canthus rostralis and above the tympanum. Lower parts white; throat reticulated with greyish.

Port Denison, Cape York. Body $2\frac{1}{3}$ inches long, hind limb $3\frac{1}{2}$ inches.

9. *Heleioporus albopunctatus* (Gray).

Swan River, Port Essington, River Murray, New South Wales.

10. *Uperolia marmorata* (Gray).

West Australia, Cape York, Sydney.

11. *Pseudophryne Bibronii* (Gthr.).

Van Diemen's Land, Sydney, Clarence River (Krefft, 60).

12. *Eucnemis bicolor* (Gray).

Port Essington, Cape York, Brisbane, Blue Mountains, Port Denison.

13. *Litoria Wilcoxii* (Gthr.).

?*Litoria Copei*, Steindachner, Reise d. Novara, p. 56, taf. 3. figs. 14–17.

Clarence River, Rockhampton, Port Curtis, Brisbane (Krefft, 62, 55), Richmond (Krefft, 12).

14. *Litoria nasuta* (Gray).

Port Essington, Clarence River (Krefft, 56), Brisbane (Krefft, 57), Sydney (Krefft, 54).

15. *Litoria latopalmata*, sp. n.

Snout of moderate length, somewhat pointed in front, the distance between the front angles of the orbit being equal to that between the eye and the extremity of the snout. Canthus rostralis rather obtuse; nostril much nearer to the end of the snout than to the eye. Tympanum very distinct, not much smaller than the eye. Back with a few indistinct, short, glandular folds or tubercles. Vomerine teeth in two oblique short series between the choanæ. Tongue with scarcely a trace of a notch behind. Openings of the Eustachian tubes at least as wide as the choanæ. Limbs rather slender, the third finger much longer than the fourth. The length of the body is less than the distance between vent and heel. Tarsus with a lateral fold of the skin. Metatarsus with two small tubercles, the inner being minute. Toes broadly webbed, the web extending to the disks of the third and fifth toes. The length of the fourth toe is one-half that of the body. Disks small.

Upper parts reddish-olive, with numerous small irregular

brown spots. An irregular brown cross band between the eyes. A brown streak along the canthus rostralis; tympanum in front and behind with a narrow deep-brown margin. Hinder surface of thighs marbled with brown, as the upperside.

Length of the body	18 lines.
Width of cleft of the mouth	5½ „
Length of fore limb	12 „
„ third finger	3 „
„ hind limb	33 „
„ entire foot	14 „
„ fourth toe	9 „

Two specimens from Port Denison (Krefft, 11).

16. *Hylorana erythræa* (Schleg.).

East-Indian archipelago, San Christoval, Cape York.

17. *Hyla Ewingii* (D. & B.).

Hobart Town, North-east Australia, Melbourne, King George's Sound (Krefft, 2).

18. *Hyla adelaidensis* (Gray).

Port Essington, King George's Sound (Krefft, 23).

19. *Hyla rubella* (Gray).

Port Essington, Houtman's Abrolhos, Port Denison (Krefft, 36).

20. *Hyla Peronii* (D. & B.).

Port Essington, New South Wales, Clarence River, Rockhampton.

21. *Hyla infrafronata*, sp. n.

Snout short, rounded, with obtuse canthus rostralis. Vomerine teeth in two transverse series on a level with the hind part of the choanæ, which are wide. Skin minutely granular. Fingers one-third webbed. Uniform green above (bluish in spirits). A pure white band round the margin of the *lower* jaw, and continued in a straight line to below and behind the tympanum. Lower parts whitish.

Cape York.

Body 1¾ inch long, hind limb 3 inches, foot ¾ inch.

22. *Hyla nigrofronata*, sp. n.

Allied to *H. adelaidensis*, but with longer hind limbs, wider choanæ, and different coloration.

Snout long and pointed. Vomerine teeth in two transverse groups on a level with the front part of the choanæ. Choanæ

about one-fourth the size of the tympanum. Fingers not webbed. Skin perfectly smooth above. Light olive-coloured; a broad black band runs from the extremity of the snout through the eye and tympanum, to the side of the abdomen, being *interrupted a short distance behind the tympanum*. A blackish band across the back of the wrist. Hind limbs marbled with blackish along the fore and hinder surfaces.

Cape York.

Body $1\frac{3}{4}$ inch long, hind limb $3\frac{1}{4}$ inches, foot 10 lines.

23. *Pelodryas cæruleus* (White).

Port Essington, Moreton Bay, Nicol Bay, Sydney.

FISHES.

1. *Serranus fuscoguttatus* (Rüpp.).

East Africa, Hope Island, Port Essington, Port Denison, Cape York.

2. *Serranus undulato-striatus* (Ptrs.).

New South Wales.

3. *Plectropoma maculatum* (Bl.).

Cape York.

4. *Priacanthus Bennebari* (Schleg.).

Japan, Sydney.

5. *Ambassis agrammus*, sp. n.

D. 7 | $\frac{1}{8}$. A. $\frac{3}{8}$. L. lat. 26-27.

The height of the body is two-fifths of the total length (without caudal). Lateral line visible on the foremost scale only. The second dorsal spine is longer than the third, much longer than the second and third anal spines (which are equal in length), not much shorter than the head, and two-sevenths of the total length (without caudal). Uniform greenish olive, with a narrow bluish-silvery band along the middle of the tail.

Cape York.

6. *Ambassis Agassizii* (Steindachner).

D. 6 | $\frac{1}{7}$. A. $\frac{3}{8}$. L. lat. 25.

The height of the body is contained twice and one-third in the total length (without caudal). Lateral line none. The second dorsal spine is scarcely longer than the third, much longer than the anal spines, shorter than the head without snout, and less than one-fourth of the total length (without caudal). Body immaculate, with a narrow bluish-silvery lateral band.

Clarence River (Kreff, 65).

7. *Apogon aterrimus*, sp. n.D. 7 | $\frac{1}{9}$. A. $\frac{2}{8}$. L. lat. 25.

The height of the body is one-third of the total length (without caudal). Entirely uniform deep black.

Cape York.

8. *Apogon Novæ Hollandiæ* (Val.).

New South Wales.

9. *Arripis georgianus* (C. & V.).

Port Jackson, Hobson's Bay, Holdfast Bay, Houtman's Abrolhos.

10. *Therapon percoides* (Gthr.).

Fitzroy River, Nicol Bay.

The cross bands become less distinct in large examples, of 7 inches in length.

11. *Therapon unicolor* (Gthr.).

New South Wales, Fitzroy River, Rockhampton.

12. *Therapon caudovittatus* (Rich.).

Victoria, Harvey River, Cape York.

13. *Diagramma reticulatum* (Gthr.).

China, Cape York.

14. *Scatophagus argus* (L.).

= *Sc. ornatus* (C. & V.).

In young specimens the markings are frequently like those represented in *Sc. ornatus* by Cuvier and Valenciennes; but these specimens do not constitute a distinct species, being in other respects entirely similar to young *Sc. argus* without light bands on the head. The length of the dorsal spines is subject to much variation. Young specimens from Australia exhibit the coloration of *Sc. ornatus*; adult do not differ from East-Indian *Sc. argus*.

Cape York, Sydney (Krefft, 102).

15. *Atypichthys strigatus* (Gthr.).

Young with a black ocellus on the soft dorsal fin.

Swan River, Holdfast Bay, Champion Bay, Raoul Island, Sydney.

16. *Scorpiæ equipinnis* (Rich.).

Scorpiæ lineolatus (Kner).

— *Richardsonii* (Steindachner).

This species varies a little in the shape of the body, and in the

proportions of parts of the head; but from an examination of eight examples in the British Museum, I cannot convince myself that these variations represent distinct species.

Swan River, King George's Sound, New South Wales (Kreff, 5), Sydney (Schütte).

17. *Upeneus porosus* (C. & V.).

D. 8 | $\frac{1}{8}$. A. 7. L. lat. 30.

Distinguished by the elevated anterior part of the body, the greatest depth of which is not more than one-third of the total length (without caudal). Upper profile of the head and neck describing a fourth of a nearly regular circle. Snout elevated, not quite twice as long as the eye. Barbels extending to the vertical from the hind margin of the opercle. The dorsal fin commences above the root of the pectoral; its spines are flexible, the longest being two-thirds the height of the body. Tubes of the lateral line with a cluster of short branchlets. Parts above the lateral line clouded with darker. Spinous dorsal blackish.

Sydney (Kreff), Melbourne, Van Diemen's Land, New Zealand.

18. *Upeneus signatus*, sp. n.

Allied to *U. barberinus*, but with the head much deeper, the snout much shorter, and larger caudal spot.

D. 8 | $\frac{1}{8}$. A. $\frac{1}{6}$. L. lat. 30–31.

The height of the body is contained thrice or thrice and one-third in the total length (without caudal). Head not much longer than deep; snout only twice as long as the diameter of the eye. Barbels extending to the hind margin of the præoperculum. Dorsal spines slightly flexible at the top. Tubes of the lateral line with rather long lateral branchlets in small number. Coloration as in *U. barberinus*, but with the black caudal spot large, square, extending over the back of the tail; a whitish blotch in front of it.

Port Jackson (Kreff, 12). 0^m·18 long.

19. *Lethrinus Richardsonii* (Gthr.).

China, Cape York.

20. *Girella tricuspidata* (Q. & G.).

New South Wales.

21. *Chilodactylus nigricans* (Rich.).

D. $\frac{15-16}{26}$. A. $\frac{3}{9-10}$. L. lat. 48–53.

King George's Sound, Victoria.

22. *Chilodactylus gibbosus* (Rich.).

The tuberosities on the snout and the long dorsal spines are probably sexual characters developed with age.

Sydney (Krefft).

23. *Scorpæna bynoensis* (Rich.).

Scorpæna bynoensis, Richards. Ereb. & Terr. Fish. pl. 14. figs. 3-5 (young).

— *jacksoniensis*, Steindachner, Wien. Sitzgsber. xiii. taf. 3. fig. 2 (adult; tentacles and membrane between dorsal spines badly figured).

North-west coast of Australia, Port Jackson (Krefft, 6).

24. *Centropogon australis* (White).

Sydney, Port Jackson.

25. *Centropogon robustus* (Gthr.).

Centropogon Troschelii (Steindachner).

Sydney, Port Jackson, Cape York.

26. *Centropogon marmoratus* (Gthr.).

Moreton Bay.

27. *Polynemus macrochir*, sp. n.

D. 8 | $\frac{1}{12}$. A. $\frac{2}{12}$. L. lat. 70.

Five pectoral appendages, three of which extend to the anal fin; pectoral fin nearly as long as the head, the length of which is contained thrice and two-thirds in the total (without caudal), and equal to the distance between the root of the ventral and the anal. A distinct spine above the angle of the præoperculum. Coloration uniform.

New South Wales (Krefft, 103). 0^m.22 long.

28. *Otolithus atelodus*.

D. 10 | $\frac{1}{31}$. A. $\frac{2}{9}$.

Scales small; canine teeth none. Body elongate. The height of the body is contained five times in the total length (without caudal), the length of the head thrice and two-thirds. The maxillary does not quite extend to the vertical from the hind margin of the orbit. Præoperculum rounded, with small, slender, distant, spinous teeth. Dorsal spines moderately feeble. Caudal fin slightly emarginate. Silvery; indistinct, oblique, dark lines along the series of scales. Axil black behind.

Australia. 0^m.31 long.

29. *Acanthurus matoides* (C. & V.).

Indian Ocean, Pacific, Nicol Bay.

30. *Trachynotus Baillonii* (Lac.).

Indian Ocean, Pacific, New South Wales (Krefft, 101).

31. *Psettus argenteus* (L.).

New South Wales.

32. *Aphritis Urvillii* (C. & V.).

D. 7 | 17-19. A. 23. L. lat. 61.

(Van Diemen's Land.) Sydney (Krefft, 506).

33. *Batrachus diemensis* (Les.).

Port Essington, Cape York.

34. *Batrachus dubius* (White).

New South Wales (Krefft).

35. *Antennarius pinniceps* (C. & V.).

Sydney.

36. *Antennarius Commersonii* (C. & V.).

Sydney (Krefft).

Entirely uniform deep black.

37. *Lepidotrigla phalæna* (C. & V.).

Melbourne.

38. *Gobius crassilabris* (Gthr.).

Oualan, Aneiteum, Australia (63. 7, 29, 20, Krefft).

39. *Gobius bynoensis* (Richards.).

Port Essington, Cape York.

40. *Gobius ornatus* (Rüpp.).

Indian Ocean, Pacific, Nicol Bay.

41. *Gobius Voigtii* (Blkr.).

Port Essington, Cape York.

42. *Gobiodon quinquestrigatus* (C. & V.).

Tubercles on the forehead minute.

East-Indian archipelago, Cape York.

43. *Eleotris australis* (Krefft).

Eastern Creek.

44. *Eleotris gymnocephalus* (Steindachner).

Hawkesbury River (Krefft, 52).

45. *Eleotris Coxii* (Krefft).

Hawkesbury River, Mulgoa Bay (Krefft).

46. *Eleotris grandiceps* (Krefft).

Bronte (Krefft).

47. *Eleotris fusca* (Bl., Schn.).

Indian and Pacific Oceans, Australia.

48. *Eleotris compressus* (Krefft).

This species varies much in the form of the body, according to age and season, being rather elongate when young and before spawning-time. Also the coloration varies, old males having, in the spawning-season, a bright orange anal fin with a broad black and white margin.

Clarence River (Krefft), River Dunn (Port Denison).

49. *Eleotris aporos* (Blkr.).

Islands of the East-Indian archipelago and Pacific, Port Denison, Cape York.

50. *Eleotris muralis* (Q. & G.).

East-Indian archipelago, Philippine Islands, Cape York.

51. *Periophthalmus Koelreuteri* (Pall.).

Port Essington, Nicol Bay.

52. *Salarias meleagris* (C. & V.).

Van Diemen's Land, Cape York.

53. *Petroscirtes anolis* (C. & V.).

Port Jackson.

54. *Lepidoblennius haplodactylus* (Steindachner).

Rockhampton (Krefft).

55. *Cristiceps robustus*, sp. n.D. 3 | $\frac{32}{7}$. A. $\frac{2}{25}$.

The anterior dorsal fin commences over the hinder margin of the præoperculum, and is not higher than the posterior. A fringed tentacle above the orbit, a small one at the nostril.

Back with seven dark cross bands, the first below the anterior dorsal, subocellated.

Melbourne. 5 inches long.

STICHARIUM, gen. nov. (Blenn.).

Body elongate, compressed, naked, or with scarcely a trace of rudimentary scales hidden in the skin. Anterior part of the lateral line distinct, near the dorsal profile. Snout short; small teeth in the jaws, without canines; palate apparently toothless. Dorsal fin long, formed by pungent spines only. Ventrals jugular, with two rays; caudal distinct. Gill-openings rather wide, the gill-membranes being broadly united below the throat and quite free from the isthmus.

56. *Sticharium dorsale*, sp. n.

D. 41. A. $\frac{2}{36}$.

The height of the body is two-thirds of the length of the head, which is contained six times and a half in the total length (without caudal). Cleft of the mouth extending to below the middle of the eye; lower jaw slightly prominent. Length of the trunk not much exceeding that of the head. Dorsal and anal fins very low, terminating in a low fold of the skin, which is continued to the caudal. Ventrals much longer than pectorals. A broad white band runs along the upper surface of the head and back. Sides finely marbled with brown, the markings radiating from the eye on the head.

Two examples, 0^m·066 long, formed part of a collection from Australia, containing several species known from Port Jackson.

NOTOGRAPTUS, gen. nov. (Blenn.).

Body elongate, compressed, covered with minute scales. Lateral line complete, running along the base of the dorsal fin. Head longish and rather depressed; snout of moderate extent, somewhat pointed; cleft of the mouth wide; a short flat barbel at the symphysis of the lower jaw. Bands of villiform teeth in the jaws and palatine bones, none on the vomer; tongue narrow, long, free. Vertical fins confluent; dorsal and anal with numerous spines, the posterior becoming gradually stiffer and more pungent than the anterior. Ventrals jugular, close together, reduced to a single bifid ray. The gill-membrane is attached to the isthmus before the ventrals. Pseudobranchiæ well developed. Intestinal tract short, simple, without pyloric appendages. Air-bladder none.

57. *Notograptus guttatus*, sp. n.

D. 69. C. 11. A. 43.

The height of the body is one-twelfth of the total length (without caudal), length of the head two-fifteenths. Eye small. Barbel shorter than the ventrals, which are about twice as long as the eye. Reddish or brown; dorsal fin, upper, and lateral parts with numerous blue dots, those on the head largest. Young with the spots on the body indistinct, and of a brown colour.

Cape York. 0^m.17 long.

58. *Mugil subviridis* (C. & V.).

India, Cape York.

59. *Mugil cephalotus* (C. & V.).

China, Hawkesbury River.

60. *Mugil breviceps* (Steindachner).

Hawkesbury River (L. lat. 48-50).

61. *Atherina stercus muscarum*, sp. n.

D. 7 | $\frac{1}{8}$. A. $\frac{1}{9}$. L. lat. 33. L. transv. 8 or 9.

Origin of the spinous dorsal behind the root of the ventrals. The height of the body is contained four times and two-thirds in the total length (without caudal), length of the head thrice and two-thirds. Snout not much shorter than the eye. Dorsal spines feeble. Pectoral short, extending to the root of the ventral. A black band from the snout through the eye to the root of the pectoral. A silvery band along the fourth series of scales. Each scale with a black dot at the base.

Cape York. 2 inches long.

62. *Atherina signata*, sp. n.

D. 3 | $\frac{1}{6}$. A. $\frac{1}{10}$. L. lat. 28. L. transv. 7.

Origin of the spinous dorsal behind the root of the ventrals. The height of the body is contained thrice and three-fourths in the total length (without caudal), length of the head four times. Snout obtuse, shorter than the eye. The three dorsal spines are united into a narrow lobe, terminating in a long filament. Anterior dorsal and anal rays, lobes of the caudal, and the ventrals prolonged into long filaments. The middle of the sides silvery; the prolonged parts of the fins deep black; ventrals white.

Cape York.

This is the smallest species of *Atherina* known at present, the single specimen, an adult male, being only $1\frac{1}{2}$ inch long. Probably the female and young are without the prolongations of the fins.

63. *Nematocentris nigra*.

Atherina nigrans, Richards.

Atherinichthys nigrans, Gthr.

Nematocentris splendida, Peters, Monatsber. Ak. Wiss. Berlin, 1866, July 23, p. 516 (published in 1866).

Strabo nigrofasciatus, Kner und Steindachner, Sitzgsber. Ak. Wiss. Wien, 1866, Oct. 4, p. 372. fig. 10 (immature example) (published in 1867).

Of this species, which was formerly represented in the British Museum by some skins in a more or less bad state of preservation, we possess now a fine and complete series, viz.:—

a. A skin, 3 inches long, from King's River, near Victoria, which is the type of the species. (Not from Port Essington as stated by Sir J. Richardson.)

b. A skin, 3 inches long, from Port Essington.

c-e. Three skins, 21 lines long, from Severn River, New South Wales.

f-l. Six examples, in spirits, 3-5 inches long, from Rockhampton (Kreff). [*Nematocentris splendida*, Ptrs.]

m-n. Two examples in spirits, 18-24 lines long, from Clarence River (Kreff, 67).

o. One example in spirits, 20 lines long, from Brisbane. [Godeffroy Coll., *Strabo nigrofasciatus*.]

p. One example, in spirits, 4 inches long, from Port Denison (Kreff).

q-t. Four examples in spirits, 3 inches long, from Cape York (Dämel).

I have convinced myself, from an examination of these specimens, that the names lately proposed and mentioned above refer to the same species, which appears to be spread over the whole of Australia. The black band, so distinct in the typical example, is paler in specimens from Port Denison and Rockhampton, replaced by a bluish band in other examples from Rockhampton and other parts of Queensland and New South Wales, and disappears sometimes entirely in apparently very old examples. The form of the body varies, of course, according to age and season. The pungent dorsal spines become stouter with age, and some of the rays become produced. The number of longitudinal series of scales varies from ten to thirteen, the lowest being more or less developed. D. 5 | $\frac{1}{10-12}$. A. $\frac{3}{18-21}$.

64. *Parma microlepis* (Gthr.).

Port Jackson.

65. *Parma squamipinnis* (Gthr.).

Port Jackson (Krefft, 2).

66. *Heliastes hypsilepis*, sp. n.D. $\frac{13}{14}$. A. $\frac{2}{13-14}$. L. lat. 29.

This species is allied to *H. notatus*; but each scale on the middle of the side of the body is twice as deep as long, whilst it is only somewhat deeper than long in that Japanese species. The height of the body is a little less than one-half of the total length (without caudal). A whitish spot below the end of the soft dorsal. Upper half of the base of the pectoral black.

New South Wales (Krefft). 0^m·18 long.67. *Labrichthys gymnogenys* (Gthr.).

Port Jackson (Krefft, 2).

The specimens from Port Jackson are 8 and 9 inches long, and agree perfectly with the typical examples, which are of the same length. However, Mr. Krefft has sent us two other examples, 11 inches long, which differ in a remarkable manner in their coloration, but appear to be merely a variety. They are uniform dark brown, only the tail being somewhat lighter, the middle ventral rays black. In other respects they are perfectly identical with the younger examples.

68. *Labrichthys laticlavus* (Rich.).

Tasmania, King George's Sound, Port Jackson (Krefft).

Young with the lateral bands very indistinct or entirely absent.

69. *Odax Richardsonii* (Gthr.).*Odax Hyrtlui* (Steindachner).

New South Wales (Krefft, 61), Hobson's Bay, Victoria.

70. *Gerres philippinus* (Gthr.).

Philippine Islands, Cape York, Nicol Bay.

71. *Dinematichthys mizolepis*, sp. n.

Very similar to *D. iluocæteoides* and *marginatus*, but with conspicuously larger scales, there being about ninety transverse series. Head naked. Palatine teeth in a long stripe.

Cape York. 2 inches long.

72. *Copidoglanis brevidorsalis*, sp. n.

This species differs in a singular manner from its congeners in

having the anterior half of the second dorsal fin replaced by a pad of fat, from which the rays gradually emerge behind; the anterior portion does not contain any rays. It is therefore impossible to give an exact number of dorsal rays. The anal fin is composed of about eighty-five rays. The nasal barbel extends to the origin of the dorsal fin; none of the others reach beyond the extremity of the pectoral. The eye is one-seventh of the length of the head. Entirely black.

Cape York, Nicol Bay. 6 inches long.

Neosilurus Hyrtlii (Steindachner), from Rockhampton, is evidently closely allied to this species.

73. *Exocætus atrodorsalis*, sp. n.

D. 8-9. A. 10. L. lat. 35.

Closely allied to *E. hillianus*. The pectoral extends to the end of the dorsal. The ventral fin is scarcely nearer to the root of the caudal than to the end of the snout, extending to the origin of the anal. Dorsal fin elevated, its longest anterior rays being as long as the head; it commences in front of the anal. Upper pectoral rays blackish, lower whitish; dorsal fin entirely black.

Cape York. 5 inches long.

74. *Hemiscyllium trispeculare* (Rich.).

Turtle Island, Cape York.

75. *Crossorhinus tentaculatus* (Ptrs.).

Adelaide, Cape York.

76. *Triænodon obesus* (M. & H.).

Red Sea, Aneiteum.

77. *Trygonorhina fasciata* (M. & H.).

? New South Wales (Kreff).

ADDENDUM.

Holacanthus Duboulayi, sp. n.

D. $\frac{11}{23}$. A. $\frac{3}{20}$.

Allied to *H. mesoleucus*. Scales small. Præopercular spine with a scarcely perceptible groove, reaching to the vertical from the hind margin of the operculum. Dorsal and anal fins rounded posteriorly. Head with the anterior part of the trunk yellowish, which colour is sharply defined from the remaining brown portion. A very broad brown ocular band, broader than the eye,

descends from the neck to the ventral fins. The brown portion of the body coarsely reticulated with yellowish, the lines descending from the back to the belly. Caudal fin and a cuneiform band along the hinder half of the base of the dorsal yellow.

North-west coast of Australia (Duboulay).

IX.—*On the Shell-structure of Spirifer cuspidatus, and of certain allied Spiriferidæ.* By WILLIAM B. CARPENTER, M.D., F.R.S.

To the Editors of the Annals of Natural History.

GENTLEMEN,

Being now in a condition to give a complete and explicit reply to the question raised by Mr. Meek, on which I addressed you six months ago (Ann. Nat. Hist. Jan. 1867, p. 29), I take the earliest opportunity of communicating to you the results of my researches, which will be found, if I mistake not, of singular interest to such palæontologists as pay special attention to the *Brachiopoda*.

I think it due both to Mr. Meek and to myself to point out that the note in the 'Annals' for August, 1866 (p. 144), in which he is represented as calling in question the accuracy of my original observations on the imperforate structure of the shell of *Spirifer cuspidatus*, did not correctly express his views. In a letter with which he favoured me immediately on reading my previous communication he says:—

"I am sorry you had not seen my little paper before you read the notice of it to which you allude. If you had done so, I am sure you would have at once seen that I made no attempt whatever to cast doubts upon the accuracy of your investigations. I never for a moment questioned the fact that the shells examined by you are not punctate. The only question with me, after seeing, as I believed, very minute and very scattering punctures in the shells I had examined, was, whether there might not be in Ireland, and possibly in England, another rare type, not seen by you, indistinguishable by form and other external characters from *S. cuspidatus*, and yet widely separated by having a punctate structure. Believing that this might be the case, and knowing that, if so, it would be a matter of some interest to know which was the true *cuspidatus*, I published my remarks mainly in order to cause further investigations.

"As you have doubtless ere this seen my little paper, you must have observed that the words 'contrary to the opinion of Dr. Carpenter,' quoted by you, do not occur in it, nor any others



Günther, Albert C. L. G. 1867. "Additions to the knowledge of Australian reptiles and fishes." *The Annals and magazine of natural history; zoology, botany, and geology* 20, 45–68.

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