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ART. XIII.—*Australian Unionidae*.

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(With Plate XVI.)

(A contribution in part from the South Australian Museum.)

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Australian members of the family *Unionidae* are difficult to classify owing to the variability of the individuals which constitute a species and the tendency of one species to merge into another.

Simpson placed all the Australian *Unionidae* under the generic name *Diplodon* Spix, and under the subgeneric names *Hyridella* Swainson and *Cucumeria* Conrad. Accepting Simpson's diagnosis of *Diplodon*, no Australian fresh-water mussel could be included in it, for they have neither "beaks which are more or less radially sculptured, the ridges usually curved and approaching below," nor "beak sculpture consisting of unbroken ridges covering the whole beaks."

Swainson's description of *Hyridella* is "Transversely oval; bosses not sulcated; posterior margin elevated and winged; one cardinal and one lateral tooth in each valve." Type, *H. australis* Lamarck.

It is proposed to locate *Unio australis* Lamarck and allied species in the genus *Hyridella* Swainson. In this genus the hinge teeth are weakly formed. The left valve has the posterior lateral tooth bilaminate to form a groove for the reception of the unilaminate tooth of the right valve.

The paper includes the descriptions of two new genera, *Propehyridella* and *Protohyridella*.

Genus **Hyridella** Swainson.

HYRIDELLA AUSTRALIS (Lamarck).

(Pl. XVI., Fig. 1.)

- 1819. *Unio australis* Lamarck, Anim. S. Vert. Ed. 1, vi., p. 80.
- 1836. *Margarita* (*Unio*) *depressus* Lea, Syn., p. 32.
- 1843. *Unio australis* (Lamarck) Hanley, Bivalve Shells, p. 192, pl. xxi., fig. 25.
- 1850. *Unio balonnensis* Conrad, P. Ac. Nat. Sc. Phil., v., p. 10.
- 1856. *Unio shuttleworthi* Kuster, Conch. Cab. *Unio*, p. 152, pl. xlv., fig. 2.
- 1861. *Unio philippianus* Kuster, op. cit., p. 235, pl. lxxix., fig. 2.
- 1868. *Unio moretonicus* Reeve, Conch. Icon., pl. xxiv., fig. 118.
- 1871. *Unio danieli* Villa, Journ. de Conch., xix., p. 328.
- 1882. *Unio bednalli* Tate, T.R.S.S.A., v., p. 56.

1888. *Unio australis* Lamarck. Cox, P.L.S., N.S.W., iii. (2), p. 1253.
 1888. *Unio australis* Lamarck. Tate, T.R.S.S.A., xi, p. 69.
 1889. *Unio legrandi* Pett, P.R.S. Tas., p. 81.
 1900. *Diplodon australis* (Lamarck) Hanley. Simpson, P.U.S.N. Mus., xxii., p. 890.
 1900. *Diplodon* (*Hyridella*) *australis* var. *legrandi* Petterd. Simpson, op. cit., p. 891.
 1900. *Diplodon moretonicus* Reeve. Simpson, op. cit., p. 891.
 1921. *Diplodon australis* Lamarck. May, Check List Moll. Tas., p. 21, No. 155.
 1921. *Diplodon moretonicus* Reeve. May, op. cit., p. 21, No. 156.
 1923. *Diplodon moretonicus* Reeve. May, Ill. Index Tas. Shells, pl. ix., fig. 12.
 1923. *Diplodon australis* Lamarck. May, op. cit., pl. ix., fig. 11.

Localities.—Queensland: Rockhampton (C. L. Barrett). New South Wales: River Allyn (C. L. Barrett), River Namoi at Narrabri (Cox), River Clarence, Richmond (Nat. Mus. Melb.), South Creek near Sydney (Cox), Reedy Lake at junction of Murray and Darling Rivers. Victoria: River Yarra, River Tanjil near Longford, River Mitchell, Chalka Creek near River Murray, River Mackenzie, Longerenong (J. L. Gatliff), Horsham (J. H. Gatliff), Birregurra, Lake Lonsdale (C. L. Barrett), River Glenelg (W. H. Dillon), River Murray, Gooramadda (A. S. Kenyon), Gardiner's Creek, Saltwater River, Keilor Plains, River Goulburn, Kialla West. Tasmania: River Esk. South Australia: River Murray and Onkaparinga. Western Australia: Exact locality not known (Nat. Mus. Melb.).

Observations.—Lamarck gave "Nouvelle Hollande" as type locality. Three whole shells and two valves sent by Dr. Cox of Sydney have the label inscribed "*Unio australis* Lamarck, from South Creek near Sydney where Lamarck's types were first secured." These are typical *Hyridella australis*, and therefore South Creek near Sydney may be accepted as the type locality. An average specimen measures 71 mm. x 44 mm. The specimen illustrated measures 94 mm. x 55 mm.

HYRIDELLA AMBIGUA (Philippi).

(Pl. XVI., Fig. 2.)

1848. *Unio ambiguus* Philippi, Abbild. iii., lief. 2, p. 47, pl. iii., fig. 2.
 1859. *Unio vittatus* Lea, P. Ac. Nat. Sc. Phil. iii., p. 153.
 1864. *Unio* (*Alasmodon*) *evansi* Adams and Angas, P.Z.S. Lond., p. 39.
 1868. *Unio evansi* Adams and Angas. Reeve, Conch. Icon., pl. lvi., fig. 285.
 1868. *Unio vittatus* Lea. Reeve, Conch. Icon., pl. xviii., fig. 83.
 1887. *Unio vittatus* Lea. Tate, T.R.S.S.A., ix., p. 101.
 1888. *Unio ambiguus* Phil. Tate, *ibid.*, xi., p. 69.
 1888. *Unio evansi* Adams and Angas. Tate, *ibid.*, xi., p. 69.
 1900. *Diplodon* (*Hyridella*) *vittatus* Lea. Simpson, P.U.S. Nat. Mus., xxii., p. 890.
 1900. *Diplodon* (*Hyridella*) *evansi* Adams and Angas. Simpson, op. cit., p. 892.
 1916. *Diplodon ambiguus* Philippi. Hedley, J.R.S.W. Aust., i., p. 7.

Localities.—New South Wales: Reedy Lake at junction of Murray and Darling (Nat. Mus. Melb.). South Australia: River Murray at Mannum, Point Sturt, Lake Alexandrina, Moorook near Overland corner. Western Australia (Hedley).

Observations.—This species is very common in the River Murray. Fifty specimens taken at Mannum, South Australia, agree closely with Philippi's illustration. It inhabits only the lagoons, whereas *H. australis* is found in the main stream. The present species is thinner, higher, more compressed and lighter coloured than *H. australis*. The sub-fossil, *Unio protovitatus* Hale and Tindale, from Tartanga, River Murray, South Australia, is closely related to this species but has a consistently thicker shell formation. A typical specimen measures 77 mm. x 54 mm. (illustrated).

HYRIDELLA ANGASI (Reeve).

(Pl. XVI., Fig. 3.)

- 1856. *Unio shuttleworthi* Lea, P. Ac. Nat. Sc. Phil., viii., p. 94 (nom. preoc.).
- 1868. *Unio angasi* Sowerby. Reeve, Conch. Icon., p. 55, fig. 282.
- 1882. *Unio angasi* Reeve. Tate, T.R.S.S.A., v., p. 56.
- 1888. *Unio angasi* Sowerby. Tate, T.R.S.S.A., xi., p. 69.
- 1900. *Diplodon* (*Hyridella*) *shuttleworthi* Lea. Simpson, P.U.S. Nat. Mus., xxii., p. 893.
- 1917. *Diplodon shuttleworthi* Lea. Odhner, K. Sv. Vet. Ak. Handl., lii. (16), p. 74.

Localities.—Queensland: River Coleman. North Australia: Strangeways River (type), Gulf of Carpentaria, Croydon Goldfields, Mackinlay River. New South Wales: Woolloomooloo, Macquarie River, Dubbo (largest specimen 130 mm. x 72 mm.), Upper Richmond River, Boro, Shoalhaven River, Darling River, junction of Darling and Murray Rivers. Victoria: Cramenton.

Observations.—An average specimen measures 100 mm. x 58 mm. (illustrated).

HYRIDELLA WILSONI (Lea).

(Pl. XVI., Fig. 4.)

- 1859. *Unio wilsoni* Lea, P. Ac. Nat. Sc. Phil., p. 153.
- 1863. *Unio* (*Alasmodon*) *stuarti* Adams and Angas, P.Z.S. Lond., p. 417.
- 1896. *Unio stuarti* Adams and Angas. Tate, Horn Exped. Zool., p. 217.
- 1917. *Diplodon wilsoni* Lea. Odhner, K. Sv. Vet. Ak. Handl., lii. (16), p. 74.
- 1918. Id. Hedley, Proc. Roy. Geog. Soc. Aust., S.A. Branch (1916-17), p. 2.
- 1900. Id. Simpson, P.U.S. Nat. Mus., xxii., p. 892.

Localities.—Central Australia: (Spencer and Gillen Exped., 1901), Nat. Mus. Melb., Lagoon, Mt. Margaret (type), Algebuckina Creek, River Stevenson. North Australia: Red Lily Lagoon (Sir Baldwin Spencer), Nat. Mus. Melb. South Australia: Oodnadatta. Western Australia: River Fitzroy.

Observations.—A typical specimen measures 86 mm. x 40 mm. Two examples from Red Lily Lagoon, obtained by Sir Baldwin Spencer, possess a slightly broader posterior end, but otherwise answer to the above species.

HYRIDELLA JEFFREYSIANA (Lea).

1871. *Unio jeffreysianus* Lea, P. Ac. Nat. Sc. Phil., i., p. 188.

1882. Id. Smith, J.L.S., Lond., xvi., p. 311.

1900. *Diplodon jeffreysianus* Lea. Simpson, P.U.S. Nat. Mus., xxii., p. 891.

Locality.—Australia.

Observations.—Smith states, "The remarkable peculiarity of this species consists in the lateral teeth in both valves being single. In all other respects it agrees with *U. ambiguus*." Melbourne has been given as the locality for this species, but no Victorian collection is known to us containing specimens bearing this name. We have never seen a specimen.

Propehyridella, gen. nov.

Shell similar in shape to *H. australis* Lamarck; divaricately, irregularly wrinkled in the juvenile, becoming gradually smooth in the adult; solid, hinge teeth well developed; epidermis shining, smooth.

Type.—*Unio nepeanensis* Conrad.

This genus is intermediate between *Hyridella* and *Protohyridella*, a new genus described below. The corrugated sculpture present only in the umbonal area in *Propehyridella* extends over a far greater area in *Protohyridella*.

PROPEHYRIDELLA NEPEANENSIS (Conrad).

(Pl. XVI., Fig. 5.)

1830. *Unio depressus* Lesson. Voy. Coquille, ii., p. 427, pl. xv., fig. 5 (nom. preoc.).

1850. *Unio nepeanensis* Conrad, P. Ac. Nat. Sc. Phil., v., p. 10.

1852. Id. Conrad, J. Ac. Nat. Sc. Phil., ser. 2, p. 297, pl. xxvi., fig. 4.

1865. *Unio lessoni* Kuster, Conch. Cab. pl. xxxvi., fig. 4.

1900. *Diplodon* (*Hyridella*) *dorsuosus* Gould. Simpson, P.U.S. Nat. Mus. xxii., p. 889.

1900. *Diplodon* (*Hyridella*) *lessoni* Kuster. Simpson, *ibid.*, p. 890.

Localities.—New South Wales: River Nepean. Victoria: River Mitchell at Bairnsdale, River Wallagaraugh.

Observations.—A typical specimen measures 62 mm. x 38 mm.

PROPEHYRIDELLA CULTELLIFORMIS (Conrad).

(Pl. XVI., Fig. 6.)

1819. *Unio depressus* Lamarck, An. s. Vert., vii., p. 79 (preoc. Donovan, 1801).
 1841. Id. Delessert, Rec. Coq. Lam., pl. xii., fig. 5.
 1850. *Unio cultelliformis* Conrad, P. Ac. Nat. Sc. Phil., v., p. 10.
 1850. *Unio profugus* Gould, P. Boston Soc. Nat. Hist., p. 295.
 1854. *Unio depressus* Lamarck. Lea, J. Ac. Nat. Sc. Phil., p. 295, pl. 26, fig. 2.
 1862. *Unio* (*Niaa*) *depressus* Lamarck. Chenu, Man. de Conch. ii., p. 140, fig. 679.
 1882. *Unio depressus* Lamarck. Smith, J.L.S. Lond., xvi., p. 308.
 1887. *Unio depressus* Lamarck. Tate, T.R.S.S.A., xi., p. 101.
 1900. *Diplodon* (*Hyridella*) *profugus* Gould. Simpson, P.U.S. Nat. Mus., xxii., p. 891.
 1900. *Diplodon* (*Hyridella*) *mutabilis* Lea. Simpson, *ibid.*, p. 308.

Localities.—New South Wales: Richmond River (153 mm. x 71 mm.), Byangum, Nepean River near Penrith, Clarence River, Parramatta River, Bargo River, Picton. Victoria: Glen-garry River, Mitchell River at Bairnsdale, River Yarra at Woori-yallock, River Erskine at Lorne, River Wallagaraugh, Tarra Creek, Mt. Evelyn (M. E. Gatliff), Heidelberg, Lilydale, Bunyip (Nat. Mus. Melb.)

Observations.—Delessert's figure is that of a juvenile. In very young specimens, the umbos, not being eroded, are seen to be distinctly wrinkled. A typical specimen measures 84 mm. x 41 mm.

PROPEHYRIDELLA NARRACANENSIS, sp. nov.

(Pl. XVI., Fig. 8.)

Shell ovate, elongate, rounded anteriorly, produced and angled posteriorly; divaricately wrinkled near the umbos, but smooth elsewhere; epidermis yellowish-brown, dull; hinge teeth strongly formed; a weak depression runs from the umbo to the ventro-posterior margin; accremental striae close, fine, and irregular.

Localities.—Victoria: Narracan River at Thorpdale, Gipps-land (type), 25.3 mm. x 15.5 mm. (Nat. Mus. Melb.); collected by W. Kershaw. Birregurra.

Observations.—The Birregurra examples are darker and a little more inflated, but otherwise inseparable.

Protohyridella, gen. nov.

Shell solid, subrhomboidal, sub-depressed, inequilateral, rather produced posteriorly; an indistinct rib running from the umbo to the postero-ventral margin divides the surface into two areas, an anterior corrugated area and a posterior smooth area; umbos not prominent; hinge teeth well developed. Type, *Unio glenelg-ensis* Denmant.

The peculiar sculpture occupying the greater portion of the shell, readily distinguishes this from any other Australian species,

so that it is here made the type of a new genus. *Protohyridella* is probably even more primitive than *Propehyridella*. The corrugated sculpture, typical of fresh-water mussels inhabiting quick-flowing rivers seems scarcely warranted in present day, slow-flowing Australian rivers.

PROTOHYRIDELLA GLENELGENSIS (Dennant).

(Pl. XVI., Fig. 9.)

1898. *Unio glenelgensis* Dennant, P.R.S. Vict., x., p. 112, pl. 4.

1900. *Diplodon* (*Hyridella*) *glenelgensis* Dennant. Simpson, P.U.S. Nat. Mus., xxii., p. 889.

Localities.—Victoria: River Glenelg at Dartmoor (J. Dennant and W. H. Dillon), Roseneath (J. Dennant and Rev. W. Whan).

Observations.—The type specimen measures 40 mm. x 23 mm. The specimen illustrated here measures 31 mm. x 18 mm. (Both in Nat. Mus. Melb.)

Genus **Cucumeria** Conrad.

Shell elongated, trapezoidal, widest behind; pseudocardinals irregular, small, not well developed, showing a tendency to break into denticles; laterals feeble; pallial line strongly pitted; nacre much thicker in front.

Type.—*Unio novaehollandiae* Gray.

CUCUMERIA NOVAEHOLLANDIAE Gray.

(Pl. XVI., Fig. 7.)

1834. *Unio novaehollandiae* Gray, P.Z.S. Lond., p. 57.

1840. *Unio cucumoides* Lea, P. Amer. Phil. S., p. 285.

1852. *Unio cumingianus* Dunker, Zeits. f. Mal., ix., p. 53.

1900. *Diplodon* (*Cucumeria*) *novaehollandiae* Gray. Simpson, P.U.S. Nat. Mus., xxii., p. 893.

Localities.—New South Wales: Richmond River, Byangum, Tweed River, Macquarie River (type).

Observations.—The type in the British Museum is labelled "Macquarie River," according to Smith. A typical specimen measures 168 mm. x 67 mm.

The following species listed by Smith are probably not Australian:—*Unio fulmineus* Philippi, *multidentatus* Philippi, *semiplicatus* Kuster, *rugulosus* Charpentier, *gratiosus* Philippi.

Explanation of Plate XVI.

Fig. 1.—*Hyridella australis* Lamarck.

Fig. 2.—*H. ambigua* Philippi.

Fig. 3.—*H. angasi* Reeve.

Fig. 4.—*H. wilsoni* Lea.

Fig. 5.—*Propehyridella nepeanensis* Conrad.

Fig. 6.—*Propehyridella cultelliformis* Conrad.

Fig. 7.—*Cucumeria novaehollandiae* Gray.

Fig. 8.—*Propehyridella narracanensis*, sp. nov.

Fig. 9.—*Protohyridella glenelgensis* Dennant.



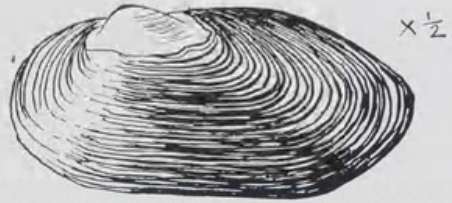
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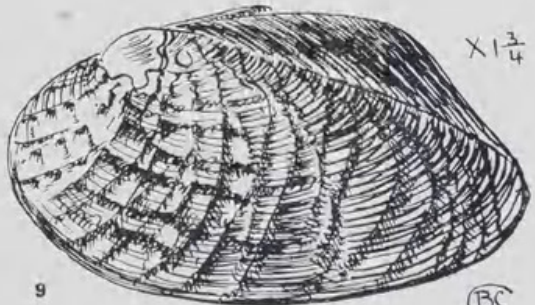
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Australian Unionidae.



Cotton, Bernard C. and Gabriel, Charles John. 1932. "Australian Unionidae." *Proceedings of the Royal Society of Victoria. New series* 44(2), 155–161.

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