A REVISION OF THE BURMESE UNIONIDAE.

By B. PRASHAD, *D.Sc., Assistant Superintendent, Zoological Survey of India.*

(Plate II.)

In spite of various eminent malacologists having paid considerable attention to the Burmese Unionidae from early times, our knowledge of these forms was hitherto in a very confused state. Of the earlier authors, references to whose works are embodied in this paper, Benson Gould, Blanford, Theobald and Nevill deserve special mention, all of them with the exception of Blanford, who in 1866[1] tried to summarize all that was known to date, described numbers of species at various times from collections made in various parts of Burma. The most comprehensive collection of Burmese Unionidae was made by Leonardo Fea in the years 1885–1887 for the Genoa Museum and a detailed paper[2] on these collections was published by Tapparone-Canefri. In the part dealing with the Unionidae thirteen new species and varieties were described and notes were included on twenty-two of the already known species and varieties. A small part of the collection, however, which was probably received after the report was written, was not included in it. Apparently Tapparone-Canefri had to base his work to a very great extent, if not entirely, on the incomplete published descriptions of the earlier authors and on the illustrations in the *Conchologia Indica* of Hanley and Theobald, for most of his identifications are incorrect, this would not have happened if he had had authentically named material for comparison. He referred all his new species to the composite genus *Unio*, and gave elaborate descriptions but did not publish any figures, his work, therefore, has been a great stumbling block in the way of all later work. Simpson[3] tried to remedy this by an examination of the named duplicates of some of these species which the United States National Museum had received by exchange, but did not succeed in many cases owing probably to the small amount of material available. Haas[4] also has tried to deal with some of the species, but the results of his work on the predominent Indo-Burmese genera have not been published as yet.

---

[1] Blanford, *Journ. As. Soc. Bengal*, XXXV, pt. i, pp. 134–155 (1866).

[2] Tapparone-Canefri, *Ann. Mus. Civ. Stor. Nat. Genova*, XXVII, pp. 339–355 (1889).

[3] Simpson, *Desc. Cat. Naiades* (Detroit, 1914).

[4] Haas, in Martini and Chemn. *Conch.-Cab. Unio* (in the course of publication).

The author whose work is most open to criticism, however, is Preston, who in two of his works [1] dealt with the Indo-Burmese Unionidae. He had for the basis of these works the entire collection belonging to the Indian Museum, which besides being very rich in specimens of various species, is specially valuable because of the many type-specimens or of specimens from type-localities, in many cases named or seen by the authors of the species. Another feature of the collection is the existence of labels in the hand-writings of the various specialists, of whom Blanford, Theobald and Nevill deserve special mention. Nevill in particular had rearranged the whole collection and given provisional names to species and varieties which he considered as new. Preston without any further work accepted Nevill's identifications and under his manuscript names described these species or varieties as new. He did not even attempt to sort out the specimens of different species where Nevill had left large series mixed up, but labelled all the specimens in one lot according to Nevill's label which he found with it. In attempting to revise Preston's work I found that it was quite impossible adequately to work out the Burmese forms without an examination of Tapparone-Canefri's type-specimens, and I applied to Dr. R Gestro of the Genoa Museum. He was not only kind enough sent me the whole of Fea's Burmese collection on loan, but also generously presented to the Indian Museum specimens of a number of the species, duplicates of which were still available. This kindness on Dr. Gestro's part, for which I am greatly indebted to him, has made it possible for me to assign T.-Canefri's species to their proper generic and specific position. I have besides carefully gone through the large collections of Indo-Burmese Unionidae already in the Indian Museum.

The results of the work may be briefly summarized here. Most of the forms described by T.-Canefri and Preston were found to be referrable to already known species and I have not come across any new forms. Notes are given on the generic position, relationships, structure and geographical distribution of the twenty-six species and varieties (excluding *M. woodthorpi*, Godwin-Austen) which I am now able to recognize as being endemic in Burma. They belong to the following genera, *Margaritanopsis*, Haas; *Indonaia*, Prashad; *Oxynaia*, Haas; *Physunio*, Simpson; *Pseudodon*, Gould; *Trigonodon*, Conrad; *Indopseudodon*, Prashad; *Parreyssia*, Conrad; *Lamellidens*, Simpson and *Trapezoideus*, Simpson.

Genus **Margaritanopsis** Haas.

1913. *Margaritanopsis*, Haas, *Nachr. Deutsch. Malakozool. Ges.* LXV p. 33.
1913. *Margaritanopsis*, Haas, in Martini and Chemnitz *Conch. Cab. Unio*, p. 121.
1914. *Margaritana* (in part) Simpson, *Descr. Cat. Naiades*, p. 511.

---

[1] Preston, *Rec. Ind. Mus.* VII, pp. 279–308, pl. viii (1912) and *Faun. Brit. Ind. Freshw.-Moll.* pp. 134-195 (1915).

Haas erected this genus for *Unio laosensis* Lea in 1913, but Simpson considers that the species is an undoubted *Margaritana* and that the new genus is not justified. The genus, however, appears to be well characterized and I agree with Haas in separating *M laosensis*, with its peculiar distribution in Cambodia, Siam and Burma, from the other species of the genus *Margaritana*. Godwin-Austen has recently described another species from the Shan States under the name *M woodthorpi* [1], but of this I have seen no specimens.

Margaritanopsis laosensis (Lea).

Pl. II, figs. 1–4.

1863. *Unio laosenis*, Lea, *Proc. Acad. Nat. Sci. Philadelphia* VII, p. 190.
1913. *Margaritanopsis laosensis*, Haas, *op. cit.*, p. 33.
1913. *Margaritanopsis laosensis*, Haas, *op. cit.*, pp. 122, 123, pl. vii, figs. 1, 2.
1914. *Margaritanopsis laosensis*, Simpson, *op. cit.*, pp. 520, 521.

My reasons for agreeing with Haas in keeping this species in his new genus *Margaritanopsis* are based on an examination of four specimens collected by Fea in the Karin Hills, Burma, at an altitude of 1000–1200 feet and labelled *Unio sella* T Canefri, a manuscript name only as the species was never described as such. These specimens, as was rightly considered by Haas, are referrable to this species and are of special interest because they beautifully illustrate the changes that take place in the structure of the hinge during the growth of the young into the adult shell, changes which appear to be characteristic of the genus.

The young shells are somewhat rhomboidal and only show a beginning of the arcuate outline of the ventral margin of the adult shells. They are thin and not at all solid. The pseudocardinals in the right valves of the young shells are lamellar, thin, and lie one above the other; in the adult shell the upper or anterior becomes very thick, somewhat knob-like and lies just next to the scar of the anterior adductor muscle, the lower (or now the posterior) comes to be more or less in line with the anterior and is separated from it by a fairly deep groove, it now takes the form of an elongated ridge with its anterior edge raised into a trigonal tooth-like structure. In the left valve there is a single lamellar pseudocardinal in the young shells, but in the adult it becomes very thick and divided into two parts—an anterior smaller and somewhat trigonal and a posterior much larger and conical, for interlocking with the teeth of the other valve. I have nothing further to add to Lea's original description of the species and to Haas' elaborate notes on it.

The species described as *Unio rectangularis* by Tapparone, Canefri (*loc. cit.*, pp. 354, 355) is based on a single very young-shell. It is undoubtedly to be referred to the genus *Margaritanop-*

[1] Godwin-Austen, *Rec. Ind. Mus.* XVI, pp. 202–204, pl. xv. (1919).

sis and probably represents another species of the genus. Owing, however, to a single young shell being available I do not feel disposed to consider it as a distinct species but a figure of the unique specimen (pl. II, fig. 5) is published for future reference.

Genus **Indonaia** Prashad.

1918. *Indonaia*, Prashad, *Rec. Ind. Mus.* XV, pp. 148–148, fig. 2.
1921. *Indonaia*, *id.*, *ib.*, XXII, p. 602.

Six species of this genus are known to occur in Burma. Of these *I caerulea* has a wide distribution throughout India and Burma, *I. bonneaudi* and *I pachysoma* occur in Assam and Burma, *I. crispisulcata* and *I chaudhurii* are only known from Burma, while *I. crispata* has a wide range in Burma, Siam and Cambodia.

Indonaia caerulea (Lea).

1889. *Unio leioma*, Tapparone-Canefri, *op. cit.*, p. 344.
1914. *Nodularia caerulea*, Simpson, *op. cit.*, pp. 978–980.
1915. *Nodularia caeruleus*, Preston, *op. cit.*, pp. 136, 137.

As a result of my examination of the large series of specimens of this species in the Indian Museum, I am able to confirm Simpson's conclusion that *Unio gerbidoni* Eydoux, *Unio humilis* Lea, *Unio corrianus* Küster, *Unio leioma* Benson, *Unio pilatus* Lea, *Unio evitatus* Lea, *Unio trirostris* Sowerby and *Unio andersonianus* Nevill (part only) are synonyms of this species.

This is the commonest species of the genus throughout India and Burma and it is represented by a large series of specimens in the Indian Museum.

Indonaia bonneaudi (Eydoux).

1889. *Unio Bonneaudi*, Tapparone-Canefri, *op. cit.*, p. 343.
1914. *Nodularia bonneaudi*, Simpson, *op. cit.*, pp. 988, 989.
1915. *Nodularia bonneaudi*, Preston, *op. cit.*, pp. 140, 141.

I have not seen the specimens referred to this species by Tapparone-Canefri, but have no doubt as to his identification.

The species is widely distributed in Assam and Burma and is represented by a large series of shells in the Indian Museum. The specimens show great variation both as regards shape and colour. Normally they are oval or ovate but some are distinctly rostrate posteriorly, in colour they vary from yellowish green to dull brown or even black.

Indonaia chaudhurii (Preston).

1912. *Nodularia chaudhurii*, Preston, *Rec. Ind. Mus.* VII, p. 290.
1914. *Nodularia chaudhurii*, Simpson, *op. cit.*, p. 988.
1915. *Nodularia chaudhurii*, Preston, *op. cit.*, p. 140, fig. 7 (1, 2).

I am not quite certain as to the validity of this species. The only specimens I have seen are the type-series of Preston. They come very near *I. bonneaudi*, but the shells are shorter, more

ovate, less inflated and have the sculpture more pronounced. For the present I propose considering this species as distinct, but believe that it will only turn out to be a form of *I bonneaudi* when more material is collected.

Indonaia pachysoma (Benson).

1914 *Nodularia pachysoma*, Simpson, *op. cit.*, p. 987.
1915. *Nodularia pachysoma*, Preston, *op. cit.*, pp. 139, 140.

I pachysoma is nearly related to *I. bonneaudi* and *I. caerulea*. From the former it is distinguished by its more elongate, more inflated, but less deep shells, more pronounced umbones and much stronger hinge, while from the latter it differs in having much brighter and more inflated shells and in the entire absence of the radial sculpture on the sides.

The species has practically the same distribution as *I. bonneaudi* and is represented in the Indian Museum by a large series of specimens from the Brahmaputra River, Assam, and the Irrawadi River, Burma.

Indonaia crispata (Gould).

1914. *Nodularia crispata*, Simpson, *op. cit.*, pp. 994, 995.
1915. *Nodularia crispata*, Preston, *op. cit.*, p. 142.

Gould's original description is very short but Simpson has recently given an elaborate description. It is a very characteristic form and is easily distinguished from all other Burmese species of the genus by its sculpture, which consists of green zigzag radial lines interspersed here and there with thicker nodules on a yellowish to brownish ground; the ridges run transversely in the anterior region and vertically in the posterior part of the shell.

In the Indian Museum collection the species is represented by specimens from Bhamo (Burma), Siam and Cambodia.

Indonaia crispisulcata (Benson).

1914. *Nodularia crispisulcata*, Simpson, *op. cit.*, p. 1017.
1915. *Nodularia (Radiatula) crispisulcata*, Preston, *op. cit.*, pp. 146, 147.

Simpson in 1900 separated this species along with his *N lima* to form a new section, *Radiatula*, of the genus *Nodularia*; but as I have recently [1] shown there is no justification for separating *I. lima* from species like *I caerulea* and *I. bonneaudi*. Nothing is known about the anatomy of *I crispisulcata* and I do not consider the shell characters alone as being sufficient for the separation of this species into a distinct section.

The species, as represented by a large series of shells from Bongong River, Burma, in the Indian Museum, is remarkably constant in the sculpture of the shell.

---

[1] Prashad, *Rec. Ind. Mus.* XXII, p. 604 (1921).

Genus **Oxynaia** Haas.

1913. *Oxynaia*, Haas, *op. cit.*, p. 34.
1913. *Oxynaia*, Haas, *op. cit.*, p. 152.
1914. *Nodularia* (in part), Simpson, *op. cit.*, p. 115.

Haas established this genus for the species *N jourdyi*, *N diespiter*, *N micheloti* and *N pugio* of Simpson's composite genus *Nodularia*. Of these I have only seen specimens of *Oxynaia pugio*, but the descriptions of the other species and my examination of the specimens of *O. pugio* justifies Haas' separation of these species into a distinct genus.

Oxynaia pugio (Benson).

1862. *Unio pugio*, Benson, *Ann. Mag. Nat. Hist.* (3) X, p. 193.
1889. *Unio pugio*, Tapparone-Canefri, *op. cit.* p. 344.
1913. *Oxynaia pugio*, Haas, *op. cit.*, pp. 158, 159, pl. xiv, figs. 6, 7.
1914. *Nodularia pugio*, Simpson, *op. cit.*, p. 990.
1915. *Nodularia pugio*, Preston, *op. cit.*, p. 141.

This species has a strongly marked and angled posterior ridge running to the cuneate posterior margin, the shell region lying internal to the ridge between the two valves is nearly flat, but is divided in some specimens by the line of union of the two valves rising in the middle; both the anterior and posterior margins are very short, the posterior being much the shorter of the two and distinctly cuneate owing to the ventral margin sharply rising up to meet the point of union of the posterior ridge; the beaks are elevated but not very full. The hinge is characteristic in that the pseudocardinals in the right valve are double, but the anterior is reduced to a thin, lamellar structure only, while the posterior is thickened into a triangular, conical and more or less canine-shaped tooth; in the left valve also there are two pseudocardinals placed in line with one another, the anterior is small and somewhat conical, the posterior is elongate, ridge-like or triangular and the two are separated from one another by a fairly deep concavity in which the tooth of the corresponding valve fits. Nothing is known about the anatomy of any of the species of the genus *Oxynaia*.

In the Indian Museum the species is represented by a large series of shells from Tenasserim, Pegu, Sawaddy River and from Myadong in Burma.

A single specimen from Arrakan appears to belong to a distinct variety, but with this scanty material I do not feel justified in describing it as such.

Genus **Physunio** Simpson.

1918. *Physunio*, Annandale, *Rec. Ind. Mus.* XIV, p. 138.

In the paper cited above Annandale described two interesting species of this genus from the Inlé Basin. The soft-parts of these were described by Ghosh [1] and further notes on the anatomy were

[1] Ghosh, *Rec. Ind. Mus.* XV, pp. 109–122, pl. xvi (1918).

added by me[1] later. I have nothing further to add regarding these two species (*P. micropteroides* Annandale and *P. ferrugineus* Annandale).

Genus **Pseudodon** Gould.

1844. *Pseudodon*, Gould, *Proc. Boston Soc. Nat. Hist.* I, p. 161.
1853. *Monodontina*, Conrad, *Proc. Acad. Nat. Sci. Philadelphia*, VI, p. 269.
1914. *Pseudodon* (in part), Simpson, *op. cit.*, p. 1079.
1915. *Pseudodon s. s.* (in part), Preston, *op. cit.*, p. 152.
1919. *Monodontina*, Prashad, *Rec. Ind. Mus.* XVI, pp. 403–408.
1920. *Pseudodon* (subgen. *Monodontina*), Haas, *op cit.*, p. 318.

I am afraid I am responsible for introducing some confusion in the already confused state of affairs regarding this genus. In the paper cited above I revived the generic name *Monodontina* for species like *P. vondembuschiana*, since the animal of *P. chaperi*, which I consider as one of the varieties of this species, was very different from that of *P. salwenianus* (wrongly spelt *salvenianus*) described by me in a previous paper.[2] In the genus *Monodontina* I also included the species *P. inoscularis* as a variety of *P. vondembuschianus*, having through oversight considered *P. salwenianus*, instead of *P. inoscularis*, as the type of the genus *Pseudodon*. Since the genus *Monodontina*, with *P. vondembuschiana* as its type-species, is synonymous with *Pseudodon* with *P. inoscularis* as its type, the former name must give way to the latter, it having been described about nine years after *Pseudodon*. The genus *Pseudodon* as now restricted will include the species or varieties *orbicularis*, *cambodjensis*, *ovalis*, *ellipticus*, *zollingeri*, *vondembuschianus*, *chaperi*, *ponderosus* and *inoscularis*. The specimen which I doubtfully assigned to *cumingii* (*loc. cit.*, p. 408) is not the true *cumingii* and cannot be included here.

Pseudodon vondembuschiana var. **inoscularis** (Gould).

1919. *Monodontina vondembuschiana* var. *inoscularis*, Prashad, *op. cit.*, p. 408.
1921. *Pseudodon* (*Pseudodon*) *inoscularis*, Haas, *op. cit.*, p. 341, pl. xlii, fig. 7.

In the paper cited above I have given reasons for considering this species as a variety of Lea's *vondembuschiana*, but as I have stated above I made a mistake in adopting the generic name *Monodontina*.

In the Indian Museum collection this variety is represented by two specimens from Tenasserim.

Genus **Trigonodon** Conrad.

1865. *Trigonodon*, Conrad, *Amer. Journ. Conch.* I, p. 233

In view of the differences in hinge and other shell characters of the species that now have to be assigned to the genus *Pseudodon*,

[1] Prashad, *Rec. Ind. Mus.* XIV pp. 183–185, pl. xxii (1918) and XVI, p. 294, fig. 5 (1919). [2] Prashad, *Rec. Ind. Mus* XVI, p. 295, fig. 6 (1919).

the species *peguensis* with its two varieties must now be separated from it. The arrangement, however, is only provisional till the soft parts of these forms are investigated.

Trigonodon peguensis (Anthony).

1900. *Pseudodon crebristriatus* var. *peguensis*, Simpson, *op. cit.* p., 835.
1914. *Pseudodon peguensis*, Simpson, *op. cit.*, pp. 1083, 1084.
1915. *Pseudodon peguensis*, Preston, *op. cit.*, p. 150.

As stated in the notes on the genus above, I have been obliged to revive Conrad's generic name *Trigonodon* for this species and its varieties. The type-species of the genus is *Monocondylaea crebristriatus* Anthony, which I think is no more than a variety of *T peguensis*.

Simpson in his first work treated this species as a variety of *M crebristriatus*, but in his Descriptive Catalogue he was doubtful whether the two were distinct. His first course was not correct since, if the two forms are varieties of the same species, the name of the species should be *T peguensis*, this being the first of the two species described by Anthony.

As a result of my examination of a fair series of specimens of this species and of the form *crebristriatus* from Pegu I am unable to consider the two as distinct species. The latter, however, owing to the shells being more compressed and the sculpture more strongly marked, with the umbones a little more inflated, may be regarded as a distinct variety.

var. crebristriatus (Anthony).

1914. *Pseudodon crebristriatus*, Simpson, *op. cit.*, pp, 1082, 1083.
1915. *Pseudodon crebristriatus*, Preston, *op. cit.*, pp. 150, 151.

There are only two specimens of this form in the Indian Museum collection, from Pegu, the type-locality. They resemble the original description very closely and only differ from typical *T. peguensis* in the points already noted.

var. curvata (Preston).

1915. *Pseudodon peguensis* var. *curvata*, Preston, *op. cit.*, p. 152, fig. 9 (1, 2, 3).

This form, of which I have seen a large series from Pegu, differs from the *forma typica* and the var. *crebristriatus* in having a less ovate shape, distinctly curved ventral margin, hardly projecting umbones and in having only very faint sculpture on the posterior wing.

Genus Indopseudodon, nov.

I have very reluctantly adopted the course of introducing a new generic name for the species *P. salwenianus* and *P. ava*, as the anatomy of the related forms is not known and as so many new

subgeneric names have recently been introduced by Haas. Probably my new name may have to be dropped when the exact generic positions of the various subgenera of Haas can be decided by examination of the animals of these species.

The soft parts of this genus were described by me in 1919 [1] as those of *Pseudodon, s.s.*, based on an examination of the animal of *P. salwenianus.*

Indopseudodon salwenianus (Gould).

1844. *Anodon salwenianus*, Gould, *op cit.*, p. 160.
1914. *Pseudodon salwenianus*, Simpson, *op. cit.*, pp. 1093, 1094.
1915. *Pseudodon salwenianus*, Preston, *op. cit.*, p. 152.
1919. *Pseudodon salwenianus*, Prashad, *op. cit.*, pp. 295, 296, fig. 6 (animal).
1920. *Pseudodon salwenianus*, Haas, *op. cit.*, pp. 341, 342, pl. xliii, fig. 4.

I. salwenianus, as Simpson pointed out in his description of the species, is distinguished from the allied species by its considerable length and by the strong plicated sculpture on the posterior wing.

In the Indian Museum collection it is represented by a fair series of specimens from the Tenasserim River and a shell with the label "Burma," exact locality not stated. No specimens of this species were obtained by Fea.

Indopseudodon ava (Theobald).

1873. *Monocondylaea avae*, Theobald, *Journ. As. Soc. Bengal*, XLII. pt. ii, p. 209, pl. xvii, fig. 15.
1900. *Pseudodon ava*, Simpson, *op. cit.*, p. 839.
1914. *Pseudodon ava*, Simpson, *op. cit.*, p. 1098.
1915. *Pseudodon ava*, Preston, *op. cit.* pp. 153, 154.
1920. *Pseudodon avae*, Haas, *op. cit.*, p. 343, pl. xliii, figs. 5, 6.

Simpson in his first work included this species in his section *Binereus* of the genus *Pseudodon*, but in his recent 'Catalogue' was doubtful as to its exact position though he still retained it in this section. Haas, however, from an examination of an authentic Burmese specimen was able to assign the species to its exact position near *I. salwenianus.* I have before me one of Theobald's specimens from Mandalay and can confirm Haas' conclusions. Theobald's comparison of this species with *cumingi* and *inoscularis* in the remarks at the end of his description is rather unfortunate as the species is not related to either of them.

Genus **Parreyssia** Conrad.

1914. *Parreysia*, Simpson, *op. cit.*, pp. 1103, 1104.
1919. *Parreysia*, Prashad, *op. cit.*, p. 292, fig. 3.

Eight species of this genus are now known from Burma. Of these only *P. smaragdites* occurs in Assam as well, all the others

[1] Prashad, *Rec. Ind. Mus.* XVI, pp. 295, 296, fig. 6 (1919).

being confined to Burma. Most of these Burmese species, though they show near relationships with the other Indian species of the genus, form a definite group among themselves.

Parreyssia bhamoensis (Theobald).

1873. *Unio bhamoensis*, Theobald, *Journ. As. Soc. Bengal* XLII, pp. 207, 208, pl. xvii, fig. 1.
1876. *Unio bhamoensis*, Hanley and Theobald, *Conch. Ind.* p. 62, pl. clv, fig. 2.
1878. *Unio bhamoensis* (in part), Nevill, in Anderson's *Zool. Res. Yunnan Exped.* p. 900.
1890. *Unio bhamoensis*, Paetel, *Conch Sam.* III, p. 146.
1899. *Unio bhamoensis*, von Martens, *Arch. Naturgesch.* LXV, pp. 38, 39, pl. v, figs. 2, 4.
1900. *Parreysia bhamoensis* (in part), Simpson, *Proc. U.S. Nat. Mus.* XXII, p. 483.
1914. *Parreysia bhamoensis*, Simpson, *Descr. Cat. Naiades*, pp. 1111, 1112.
1915. *Parreysia* (*Parreysia*) *bhamoensis*, Preston, *Faun. Brit. Ind. Freshw. Moll.* p 163.

The type-specimen of this species from Bhamo, with the label "*U Bhamoensis* n. sp." written in Theobald's hand, is preserved in the Indian Museum collection. The species was stated to be a rare one, and Theobald considered it and *U mandelayensis*, the species described next to it, to form "a natural little subgroup of osculent species," which, however, he did not feel "justified in separating from the great Indian *corrugatus* group." Nevill, while working out the Yunnan collections, did not agree with Theobald's conclusions and united the two species *U bhamoensis* and *U mandelayensis* under the former name. Tapparone-Canefri,[1] in his paper on the Burmese molluscs collected by Fea, agreed with Nevill in his interpretation of Theobald's two forms, but wrongly selected the name *U mandelayensis* for the species. I have examined one of Tapparone-Canefri's specimens and find that it is a true *mandelayensis*. Von Martens, who published good figures of this species, considered the species *U bhamoensis* as distinct from *U mandelayensis*. Simpson in his first work united the two species under the name *P. bhamoensis*, and in this was followed by Preston; in his later work, however, having examined more specimens, he rightly regarded the two species as distinct.

I have examined the types of the two species besides a large series of specimens in the Indian Museum and find the following differences between the two species:—(i) The shell of *P. bhamoensis* is only sub-triangular as opposed to the distinctly triangular shell of *P. mandelayensis*, (ii) the beaks in *P. bhamoensis* are high but not placed well forwards, (iii) in young shells of *P. bhamoensis* the beaks and the umbonal region have only a faintly marked zigzag radial sculpture which extends over the posterior wing and a little on the anterior side, but no tubercles

[1] Tapparone-Canefri, *Ann. Mus. Civ. Stor. Nat. Genova*, XXVII, p. 342 (1889).

are ever developed, in *P. mandelayensis* on the other hand the tubercles are always distinctly developed and the sculpture is much coarser, and (iv) the hinge of *P. bhamoensis* has lamellar pseudocardinals which are not very thick, not at like tooth-like and only slightly ragged.

In the Indian Museum collection the species is represented by the type-specimen from Bhamo and a fair series of specimens of all ages from Sagaing, Zayleyman and Tavoy in Burma.

Parreyssia mandelayensis (Theobald).

1873. *Unio mandelayensis*, Theobald, *op. cit.*, p. 208, pl. xvii, fig. 2.
1876. *Unio mandelayanus*, Hanley and Theobald, *op. cit.*, p. 62, pl. cliv, fig. 4.
1878. *Unio bhamoensis* (in part), Nevill, *op. cit.*, p. 900.
1889. *Unio mandelayensis*, Tapparone-Canefri, *op. cit.*, p. 342.
1890. *Unio mandelayensis*, Paetel, *op cit.*, p. 158.
1899. *Unio mandelayensis*, von Martens, *op. cit.*, p. 38.
1900. *Parreysia bhamoensis* (in part), Simpson, *op. cit.*, p. 843.
1914. *Parreysia mandelayensis*, Simpson, *op. cit.*, pp. 1112, 1113.
1915. *Parreysia* (*Parreysia*) *bhamoensis* (in part), Preston, *op. cit.*, pp. 163, 164.

The question of the validity of this species as distinct from *P. bhamoensis* has been discussed already in the account of the latter species, and I would only note here the distinguishing features of the species.

The shell is triangular with a very high and forwardly placed beak, the beak and the umbonal region are both very strongly sculptured and often have distinct tubercles or even spines developed in this region. The hinge is very strong, with compact, thick and distinctly tooth-like pseudocardinals.

I have examined a specimen from Theobald's collection, which is the one figured by him in the paper cited above and is probably the type of the species. Besides I have examined one of the specimens named by Tapparone-Canefri, and other specimens in the Indian Museum collection from Bhamo, Sheinmagah, Maydong and Pegu in Burma.

Parreyssia houngdaranicus (Tapparone-Canefri).

Pl. II, fig. 6.

1889. *Unio houngdaranicus*, Tapparone-Canefri, *op. cit.*, p. 341.
1900. *Parreysia tavoyensis* var. *triembolus* (in part), Simpson, *op. cit.*, p. 844.
1914. *Parreysia tavoyensis* var. *triembolus* (in part), Simpson, *op. cit.*, pp. 1115, 1116.
1915. *Parreysia tavoyensis* var. *triembolus* (in part), Preston, *op. cit.*, p. 167.

Simpson, on the basis of a specimen labelled *U. houngdaranicus* from Fea's collection in the U.S. National Museum, placed *U. houngdaranicus* in the synonymy of what he called *Parreysia tavoyensis* var. *triembolus*, but from his remarks it appears that he was not quite certain as to the correctness of his conclusions.

As a result of a careful examination of Tapperone-Canefri's type-specimen of the species and the forms with which Simpson included it, I am of opinion that Simpson's conclusions are quite untenable. Not only is the species quite distinct from Benson's *Unio triembolus*, but it also has no relationship whatsoever with Gould's *Unio tavoyensis*. It is on the other hand to be grouped with species like *U bhamoensis* and *U mandelayensis*, forms in which the anterior margin is greatly shortened, the beak placed far forwards and the posterior side drawn out into a cuneate or elliptical lobe. The species may be redescribed as follows:—

Shell subrhomboidal to subovate, moderately inflated, subsolid, inequilateral; beaks high and full, very forwardly placed and recurved outwards and downwards, with a fairly deep cavity, sculptured irregularly with low zigzag transverse bars extending over a little more than the depth of the shell; posterior ridge only feebly marked, dorsal margin slightly arched, somewhat truncate; anterior margin very short, rapidly curving inwards between the umbones in the lunule region and regularly curving below over the podium to meet the nearly straight or slightly arcuate ventral margin; posterior margin longer than the anterior, sharply truncate and rather slanting; epidermis dark brown to black, somewhat shining, ligament prominent, of an amber to chocolate brown colour, hinge-teeth moderately strong; pseudocardinals slightly ragged, three in the right valve, of which the middle is the largest, and three in the left valve, of which the posteriormost is the best developed; laterals slightly arched, single in the right and two in the left valve, anterior muscle scar deeply impressed, posterior quite shallow; nacre shining white in the umbonal region but with a light bluish tinge below.

The type-series was collected by Fea in the Houngdaran River, Meetan, Tenasserim, Lower Burma.

Parreyssia smaragdites (Benson).

1862. *Unio smaragdites*, Benson, *Ann. Mag. Nat. Hist.*, (3) X, p. 190.
1866. *Unio smaragdites*, Blanford, *Journ. As. Soc. Bengal* XXXV, p. 147.
1876. *Unio smaragdites*, Hanley and Theobald, *op. cit.*, p. 5, pl. x, fig. 5.
1877. *Unio andersoniana* (in part), Nevill, *Journ. As. Soc. Bengal*, XLVI, p. 40.
1878. *Unio andersoniana* (in part), Nevill, *op. cit.*, pp. 901, 902, pl. lxxx, figs. 9, 9*a*, 9*b*.
1889. *Unio smaragdites*, Tapparone-Canefri, *op. cit.*, p. 343.
1890. *Unio smaragdites*, Paetel, *op. cit.*, p. 167.
1899. *Unio smaragdites*, von Martens, *op. cit.*, p. 39.
1900. *Parreysia smaragdites*, Simpson, *op. cit.*, p. 843.
1914. *Parreysia favidens* (in part), Simpson, *op. cit.*, pp. 1109, 1110.
1915. *Parreysia* (*Parreysia*) *smaragdites*, Preston, *op. cit.*, p. 163.

Simpson recently regarded *P. smaragdites* as only a synonym of *P. favidens*, but the former species, as is clear from the large series of specimens in the Indian Museum, is quite distinct from the latter. Nevill's large series of *Unio andersoniana* from Burma

mostly consists of this species, the remainder being young shells of *Indonaia caerulea.*

P. smaragdites, as was noted by Benson, is characterized by the shells being of a beautiful green colour interspersed with lemon-yellow in the middle, the beaks being submedian and greatly deflected forwards, with deep cavities and a well-marked lunule.

Benson's specimens were taken in the Berhampooter (Brahmaputra) River, Assam, but the species is now known to have a wide range in Burma and Assam.

Parreyssia burmanus (Blanford).

1869. *Unio burmanus*, Blanford, *Proc. Zool. Soc. London*, p. 449.
1875. *Unio vulcanus*, Hanley, *Proc. Zool. Soc. London*, p. 606.
1876. *Unio burmanus* and *Unio vulcanus*, Hanley and Theobald, *op. cit.*, p. 19, pl. xlii, fig. 7 and p. 62, pl. clv, fig. 3.
1878. *Unio burmanus*, Nevill, *op. cit.*, p. 900.
1879. *Unio burmanus*, Tapparone-Canefri, *op. cit.*, p. 343.
1890. *Unio burmanus* and *Unio vulcanus*, Paetel, *op. cit.*, pp. 146 and 172.
? 1899. *Unio burmanus*, von Martens, *op. cit.*, p. 38, pl. v, fig. 5.
1900. *Parreysia burmanus* and *P. vulcanus*, Simpson, *op. cit.*, p. 845 and p. 844.
1912. *Parreysia pernodulosa*, Preston, *Rec. Ind. Mus.* VII, p. 300.
1914. *Parreysia burmanus*, Simpson, *op. cit.*, p. 1120.
1915. *Parreysia burmanus*, *P. pernodulosa*, and *P. vulcanus*, Preston, *op. cit.*, pp. 170, 164, 168.

The only specimen of this species which I have seen from Fea's collection is a half-grown individual. It is decidedly longer in proportion to the height and is abnormal so far as the sculpture is concerned. The nodular sculpture which is a characteristic of the umbones of the young and half-grown shells of this species is quite obsolete and the radial sculpture over the rest of the beak is also feebly developed.

The specimens figured by von Martens (*loc. cit.*) are, in my opinion, not referrable to this species and I have therefore included a reference to his notes on this species with a reservation only. Hanley's *Unio vulcanus*, which was described from a single specimen and later figured by Hanley and Theobald in the *Conchologia Indica*, is undoubtedly based on a young specimen of this species. Some of the half-grown shells from Bhamo in the Indian Museum collection answer to Hanley's description and are quite like the figure of the type-shell in the *Conchologia Indica*. According to von Martens (*loc. cit.*, p. 38), however, the young shells of *Unio tavoyensis* resemble the figure of the type of *U. vulcanus*. Preston's *P. pernodulosa* is based on very young shells of this species.

The types of this species along with a large series of specimens from the type-locality, the Irrawadi River near Bhamo, are preserved in the Indian Museum. The types of Preston's *P. pernodulosa* were collected by Dr. Anderson at Zaleyman in Upper Burma; Fea's specimens were taken at Teinzo in the Mule Stream, north-east of Bhamo.

Parreyssia tavoyensis (Gould).

1843. *Unio tavoyensis*, Gould, *Proc. Boston Soc. Nat. Hist.* I, pp. 140, 141.
1856. *Unio tavoyensis*, Küster, in Martini and Chemnitz, *Conch.-Cab.*, *Unio*, p. 166, pl. xlviii, fig. 2.
1862. *Unio tavoyensis*, Gould, *Otia Conch.* p. 190.
1864. *Unio tavoyensis*, Reeve, *Conch. Icon.* XVI, pl. xiii, fig. 49.
1866. *Unio tavoyensis*, Blanford, *Journ. As. Soc. Bengal* XXXV, p. 148.
1868. *Unio parma*, Benson, Sowerby in *Conch. Icon.* XVI, pl. xclviii, fig. 514.
1870. *Margaron* (*Unio*) *tavoyensis*, Lea, *Synonyms*, p. 31.
1876. *Unio parma* and *U. tavoyensis*, Hanley and Theobald, *op. cit.*, p. 61, pl. cliv, fig. 1 and p. 62, pl. cliv, figs. 6, 7.
1889. *Unio parma*, Tapparone-Canefri, *op. cit.*, p. 239.
1890. *Unio parma*, *U. savoyensis* and *U. tavoyensis*, Paetel, *op. cit.*, pp.164, 166, 169.
1899. *Unio tavoyensis*, von Martens, *op. cit.*, pp. 37, 38.
1900. *Parreysia tavoyensis*, Simpson, *op. cit.*, p. 843.
1914. *Parreysia tavoyensis*, Simpson, *op. cit.*, pp. 1114, 1115.
1915. *Parreysia tavoyensis*, Preston, *op. cit.*, pp. 167, 168.

Unio parma Benson, was doubtfully included by Simpson and Preston in the synonymy of this species; having before me, however, one of Benson's original specimens, probably a cotype of the species, I am now able to confirm Simpson's conclusions. Tapparone-Canefri's specimen from Bhamo, referred to in his paper cited above as *U parma* and another from Tenasserim labelled *Unio sp.* also belong to this species. Simpson considered Benson's *Unio triembolus* as a variety of *P. tavoyensis*, but an examination of one of Benson's type-series of specimens shows that *U triembolus* is quite a distinct species.

The umbones and a considerable part of the valves in the young shells are covered with a beautiful zigzag sculpture; this however, becomes obsolete with age and hardly a trace of it is left in full-grown individuals.

P. tavoyensis is represented in the collection of the Indian Museum by a large series of shells from Pegu, Tenasserim, Tavoy and Arrakan.

Parreyssia feddeni (Theobald).

1874. *Unio feddeni*, Theobald, *Journ. As. Soc. Bengal* XLII, pt. ii, p. 208, pl. xvii, fig. 3.
1877. *Unio feddeni*, Nevill, *Journ. As. Soc. Bengal* XLVI, pt. ii, p. 38.
1878. *Unio feddeni*, Nevill, *op. cit.*, p. 900.
1900. *Parreysia feddeni*, Simpson, *p. cit.*, p. 165.
1914. *Parreysia feddeni*, Simpson, *p. cit.*, pp. 1113, 1114.
1915. *Parreysia* (*Parreysia*) *feddeni*, Preston, *op. cit.*, p. 165.

This species was described by Theobald from shells collected by Mr. F. Fedden and said to have been obtained from the Peemgunga River in Central India. Later Nevill, when reporting on Dr. Anderson's Yunnan collections, stated that the species is tolerably abundant in the rice-fields at Pegu and also at Yaylaymaw in Burma. He also doubted Central India as the provenance of this species from the fact that in the "carefully kept

collections of Mr. H. F Blanford" specimens of *U. feddeni* obtained from Fedden were labelled as from Burma. Since Fedden had collected in both localities the probabilities were that Theobald had mixed up the labels of his specimens. The only specimen of this species now in the Indian Museum collection is from Burma and none of the Central Indian specimens in the collection are referrable to this species. It is probable, therefore, that Nevill was correct in considering this species as a true Burmese form.

Theobald's description of the shell of this species, except for the inaccuracy in his description of the hinge pointed out by me in a recent paper [1], is quite complete and needs no amplification.

The species is not represented in Fea's Burmese collections.

Parreyssia feae (Tapparone-Canefri).

Pl. II, figs. 7, 8.

1889. *Unio feae*, Tapparone-Canefri, *op. cit.*, p. 340.
1900. *Parreysia feae*, Simpson, *op. cit.*, p. 844.
1914. *Parreysia feae*, Simpson, *op. cit.*, pp. 1116, 1117.
1915. *Parreysia (Parreysia) feae*, Preston, *op. cit.*, p. 168.

This species, which was described from specimens collected at Meetan in the Houngdaran River, Burma, has never been figured and was hitherto known only from the author's original description and the short notes added recently by Simpson from an examination of some of Fea's specimens. The following additional notes are based on three specimens one labelled "Type" and the other two "Co-types," which have been presented to the Indian Museum by Dr. R. Gestro of the Genoa Museum.

The shells of this species vary in outline. In the young they are subrhomboidal but become more elongate as growth proceeds. The zigzag radial sculpture of the young shells becomes obsolete with age and in fully grown shells is just faintly indicated. The umbones are high, recurved forwards and inwards but not meeting in the middle line; they are often weathered even in half-grown individuals. The young shells are dirty yellow interspersed with green in the region with raised zigzag sculpture, older shells are yellowish-brown, while the full-grown type is dark chocolate-brown. The nacre is bluish white.

Genus **Lammellidens** Simpson.

1914. *Lamellidens*, Simpson, *op. cit.*, p. 1165.
1919. *Lamellidens*, Prashad, *op. cit.*, p. 293, fig. 4.

A large number of specific and varietal names have been given by previous authors to ordinary variations of the commoner Indo-Burmese forms of this genus, and it has been found necessary on examination of the large collections of Unionids now available, to drop most of these names. I am now able to recognize only six definite species and varieties as occurring within the

[1] Prashad, *Rec. Ind. Mus.* XIX, p. 713 (1920).

limits of Burma. Three of these *L. generosus, L. lamellatus* and *L. scutum* are confined to Burma, while the other three have a much wider distribution.

Lamellidens marginalis (Lamarck).

1876. ? *Unio marginalis* var. *zonata*, Hanley and Theobald, *op. cit.*, p. 20, pl. xliv, fig. 2.
1889. *Unio marginalis* with vars. *subflabellatta, cylindrica* (*nec* Hanley and Theobald) and *obesa* (*nec* Hanley and Theobald), *U. protensus* var. *obtusatus*, Tapparone-Canefri, *op. cit.*, pp. 345, 346, 350.
1914. *Lamellidens marginalis*, Simpson, *op. cit.*, pp. 1166–1168.
1915. *Lamellidens marginalis*, Preston, *op. cit.*, pp. 175, 176.
1921. *Lamellidens marginalis*, Prashad, *Rec. Ind. Mus.* XXII, p. 606, fig 6A.

In the paper cited above I have recently given the distinctive characters of the species and have figured the hinge of a typical specimen.

Tapparone-Canefri was apparently unaware of the great variation in the shape and form of this species and gave specific and varietal names to shells which are quite typical. As a result of my examination of Tapparone-Canefri's named specimens I find that five of his names, including his true *marginalis*, must be treated as synonyms. Simpson doubtfully included *Unio dolichorhynchus* and *U. gianelli* in the synonymy of *L. marginalis*, but the former on examination of the type was found to be an elongate specimen of *L. corrianus* and the latter a half-grown *L. scutum*. The various Burmese forms included by Preston as varieties and subspecies of this species, are discussed in the notes on the several species.

L. marginalis has a very wide range of distribution, throughout India, Burma and Ceylon.

Lamellidens corrianus (Lea).

Pl. II, figs. 9-11.

1889. *Unio corrianus, U. dolichorhynchus, U. protensus* and var. *ellipticus*, Tapparone-Canefri, *op. cit.*, pp. 347–350.
1900. *Lamellidens canefrinus*, Simpson, *op. cit.*, p. 857.
1914. *Lamellidens canefrinus*, Simpson, *op. cit.*, p. 1176.
1915. *Lamellidens canefrinus*, Preston, *op. cit.*, p. 187.
1921. *Lamellidens corrianus*, Prashad, *op. cit.*, p. 609, fig. 29C.

In the paper cited above I have given reasons for considering *L. corrianus* as a species distinct from *L. marginalis*. As a result of my examination of Tapparone-Canefri's types of *U protensus* and its var. *ellipticus* I find, that both of them should be referred to this species, Simpson's new name *canefricus* must, therefore, be sunk in the synonymy of *L. corrianus*. The type specimen of *L. dolichorhynchus* differs from typical shells of *L. corrianus* in being a little more elongate and the cuneation of the posterior margin is therefore more pronounced, but these differences in the shape of the shell in the case of a variable species

such as *L. corrianus* are not enough to warrant the erection of a distinct variety, much less a separate species.

L. corrianus like *L. marginalis*, is widely distributed throughout India and Burma.

Lamellidens jenkinsianus subsp. obesa (Hanley and Theobald).

1920. *Lamellidens jenkinsianus* subsp. *obesa*, Prashad, *Rec. Ind. Mus.* XIX, pp. 170–172, pl. ix, figs. 1, 2.

In the paper cited above I have recently discussed the question of the various forms of *L. jenkinsianus*. In Fea's collection from Burma there is a young specimen of the form *obesa* from Tonghoo. This specimen is one of the few unnamed specimens of Fea's collection and only had the name '*Unio*' on the label. The specimen is from the same locality from which Theobald's specimens, now in the Indian Museum, were collected.

It may also be noted here that the specimens referred to as *Unio marginalis* var. *obesus* by Tapparone-Canefri (*loc. cit.*, p. 346) are, as has been pointed out already, only typical specimens of *L. marginalis*.

Lamellidens generosus (Gould).

Pl. II, figs. 12-17.

1847. *Unio generosus*, Gould, *op. cit.*, p. 220.
1870. *Margaron* (*Unio*) *generosus*, Lea, *Synonyms*, p. 20.
1876. *Unio generosus* and var. *angustior*, *id.*, *ib.*, p. 22, pl. xlvi, figs. 4, 7.
1876. *Unio lamellatus*, var. (*nec* Lea), Hanley and Theobald, *op. cit.*, p. 5, pl. ix, fig. 6.
1889. *Unio marginalis* var. *zonata* (*nec* Hanley and Theobald),[1] var. *tricolor* (*nec* Küster), *U. pulcher* and var. *lamellatiformis*, *U. generosus* and var. *delapsus*, Tapparone-Canefri, *op. cit.*, pp. 346, 347, 350, 351, 352.
1899. *Unio generosus*, von Martens, *op. cit.*, p. 46.
1900. *Lamellidens generosus*, Simpson, *op. cit.*, p. 857.
1912. *Lamellidens marginalis* subsp. *sawaddyensis*, Preston, *Rec. Ind. Mus.* VII, p. 305.
1914. *Lamellidens marginalis* var. *tricolor* and subsp. *sawaddyensis*, *L. Burmanus*[2] and *L. generosus*, Simpson, *op. cit.*, pp. 1168, 1169. 1170, 1175.
1915. *Lamellidens marginalis* var. *tricolor* and subsp. *sawaddyensis*, and *L. pulcher* with var. *lamellatiformis*, Preston, *op. cit.*, pp. 176, 177, 185.

The above elaborate synonymy is based on a careful examination of the type-specimens of Tapparone-Canefri's and Preston's new species and also of authentic specimens of others in the Indian Museum collection.

The specimens identified by both Tapparone-Canefri and Preston as belonging to the var. *tricolor* Küster are undoubtedly

[1] Hanley and Theobald, *Conch. Ind.* p. 20, pl. xliv, fig. 2. The shell figured is apparently a young specimen of *L. marginalis*.

[2] The second name, *Lamellidens Burmanus*, on the same page (1170) certainly a *lapsus calami* for *I thwaitesi*.

the young of this species and I have little doubt that Küster's types also belonged to it.

Simpson has recently described this species very fully and I have nothing more to add to his description beyond noting the changes that take place in the colour of the shell during growth. The young shells are fulvous or chocolate-brown in the umbonal region and the greater part of the shell is bordered by a broad band of deep yellow on the inner side, while the dorsal slope together with the posterior wing and the rest of the shell are shining green. As the shell grows the green and yellow gradually disappear and the shells as a whole become dark chestnut to black; the umbonal region, however, is always much lighter. A certain amount of variation is also exhibited by the posterior wing and the posterior margin; in young shells the wing is usually much broader proportionately and more marked, but as the shells increase in size it becomes much narrower, the posterior margin shows much greater variation, it may be only somewhat narrowed or may even take on a distinct cuneate appearance.

In the Indian Museum collection this species is represented by a large series of specimens of all ages from various localities in Burma.

Lamellidens lamellatus (Lea).

1838. *Unio lamellatus*, Lea, *Trans. Amer. Phil. Soc.* VI, p. 19, pl. vi, fig. 16.
1889. *Unio pulcher* var. *ponderosulus*, Tapparone-Canefri, *op. cit.*, pp. 351, 352.
1914. *Lamellidens lamellatus*, Simpson, *op. cit.*, pp. 1172, 1173.

Both Simpson and Preston have wrongly included Lea's *Unio layardi* in the synonymy of *L. lamellatus*. *Lamellidens layardi* has no relationship whatsoever with such Burmese species as *L. generosus*, *L. lamellatus* and *L. scutum*, but is closely allied to *L. marginalis*.

L. lamellatus, as has been noted above, is allied to *L. generosus*, but is distinguished by its general shape, thinner shell, less well developed post-dorsal wing and more delicate hinge-teeth.

I have examined a large series of this species from various localities in Burma, in the Indian Museum collection.

Lamellidens scutum (Sowerby).

1868. *Unio scutum*, Sowerby, *Conch. Icon.* XVI, pl. xciv, fig. 510.
1876. *Unio scutum*, Hanley and Theobald, *Conch. Ind.* p. 22, pl. xlvi, fig. 1.
1889. *Unio gianelli* with var. *degener*, Tapparone-Canefri, *op. cit.*, pp. 353, 354.
1899. *Unio scutum*, with var. *humilior*, von Martens, *op. cit.*, pp. 45, 46.
1912. *Lamellidens marginalis* var. *sublamellata*, Preston, *op. cit.*, p. 305.
1914. *Lamellidens scutum*, Simpson, *op. cit.*, pp. 1173, 1174.
1915. *Lamellidens marginalis* vars. *zonata* (*nec* Hanley and Theobald), *sublamellata*, *scutum* and *humilior*, Preston, *op. cit.*, pp. 177, 181, fig. 19 (1–3).

An examination of the types of *Unio giannelli*, its var. *degener*, *L. marginalis* var. *sublamellata* and shells identified as var. *zonata*, has shown that they are all referrable to this species. The shells of var. *humilior* von Martens also gradually fade into those of the typical form and it is impossible, therefore, to distinguish this variety.

L. scutum has a comparatively less broad, less tumid, but more elongate type of shell than that of either *L. generosus* or *L. lamellatus*—the other two species of this interesting group. The group, so far as is known at present, is confined to Burma.

Genus **Trapezoideus** Simpson.

1921. *Trapezoideus*, Prashad, *Rec. Ind. Mus.* XXII, p. 609.

In the paper cited above I have described the anatomy of this interesting genus. In Burma it is represented by five species, all of which, with the exception of *T foliaceus*, are endemic in Burma.

Trapezoideus exolescens (Gould).

1843. *Unio exolescens*, Gould, *op. cit.*, p. 141.
1852. *Margaron* (*Unio*) *exolescens*, Lea, *Synoyms*, p. 32.
1862. *Unio exolescens*, Gould, *Otia Conch.*, p. 191.
1866. *Unio exolescens*, Blanford, *Journ. As. Soc. Bengal*, XXXV pt. i, p. 149.
1876. *Unio exolescens*, Hanley and Theobald, *op. cit.*, p. 43, pl. cvii, fig. 5.
1877. *Unio fragilis*, Nevill, *Journ. As. Soc. Bengal*, XLVI, p. 39.
1878. *Unio foliaceus* var. *fragilis*, Nevill, *op. cit.*, p. 400, pl. lxxx, fig. 8.
1889. *Unio exolescens*, Tapparone-Canefri, *op, cit.*, p. 349.
1899. *Unio exolescens*, von Martens, *op. cit.*, p. 42.
1900. *Trapezoideus exolescens*, Simpson, *op. cit.*, p. 859.
1914. *Trapezoideus exolescens*, Simpson, *op. cit.*, p. 1185.
1915. *Trapezoideus exolescens*, Preston, *op. cit*, p. 195.
1920. *Trapezoideus exolescens*, Haas, *op. cit.*, p. 272.

An examination of Nevill's type of *Unio fragilis* has shown that the species should be referred to *T exolescens* rather than to var. *comptus* of *T foliaceus* as Simpson thought (*loc. cit.*, p. 1182) or to *T misellus* as Haas has done. One of the specimens in Fea's collection is labelled *Unio microsomus*, T. Canefri, n. sp.,' but this is not referred to in his paper; the specimen is only a young example of *T exolescens*; the other shells referred by T. Canefri to *T exolescens* are correctly identified.

The locality of the type-specimens was not certain, but von Martens' specimens were obtained at Mandalay and the Indian Museum specimens are from Bhamo.

Trapezoideus foliaceus (Gould).

1843. *Unio foliacea*, Gould, *op. cit.*, p. 141.
1852. *Margaron* (*Unio*) *foliacea*, Lea, *op. cit.*, p. 39.
1862. *Unio foliacea*, Gould, *op. cit.*, p. 191.
1865. *Unio Peguensis*, Anthony, *Amer. Journ. Conch.* I, p. 351, pl xxv, fig. 2.

1866. *Unio foliaceus* and *Unio peguensis*, *op. cit.*, pp. 148, 154.
1868. *Unio peguensis*, Reeve, *Conch. Icon.* XVI, pl. xcv, fig. 519.
1876. *Unio foliaceus*, Hanley and Theobald, *op. cit.*. p. 19, pl. xlii, fig. 3.
1889. *Unio foliaceus*, Tapparone-Canefri, *op. cit.*, p. 345.
1900. *Trapezoideus foliaceus*, Simpson, *op. cit.*, p. 858.
1912. *Trapezoideus foliaceus*, Preston, *op. cit.*, p. 307.
1914. *Trapezoideus foliaceus*, Simpson, *op. cit.*, pp. 1181, 1182.
1915. *Trapezoideus foliaceus*, Preston, *op. cit.*, p. 193.
1919. *Trapezoideus foliaceus*, Haas, *op. cit.*, pp. 261, 262, pl. xxxii, fig. 3.

Anthony's *Unio peguensis* is synonymous with this species and is not referrable to the genus *Pseudodon* as Simpson believed. Deshayes and Julien's *Unio comptus* is *T misellus*, and the type of *Unio fragilis*, Nevill, is a specimen of *T exolescens* (*vide* p. 109). Preston's new variety *zaleymanensis* is not a variety of this species, but is based on young and half-grown shells of *T misellus*.

T foliaceus is represented in the Indian Musuem collection by specimens from Bhamo and Zaleyman, Burma.

Trapezoideus dallianus (Frierson).

1899. *Unio foliaceus*, von Martens, *op. cit.*, p. 42.
1913. *Parreysia dalliana*, Frierson, *Nautilus*, XXVI, p. 142.
1919. *Trapezoideus dallianus*, Haas, *op. cit.*, p. 263, pl. xxxii, fig. 4.

Frierson's species, as Haas has pointed out, is a *Trapezoideus* and not a *Parreyssia* as the author of it thought. Haas has also, I think, rightly referred von Martens' specimens of *T foliaceus* to this species.

In the Indian Museum there is a single right valve from Burma, exact locality not stated, which belongs to this species.

Trapezoideus misellus (Morelet).

1912. *Trapezoideus foliaceus* var. *zaleymanensis*, Preston, *op. cit.*, p. 307.
1915. *Trapezoideus foliaceus* var. *zaleymanensis*, Preston, *op. cit.*, p. 194.
1919. *Trapezoideus misellus*, Haas, *op. cit.*, pp. 266–270, pl. xxxii, figs, 6–9, pl. xxxiii, figs. 1–5.

Haas has given the complete synonymy of this species quite recently. However, he wrongly included in it Nevill's *Unio fragilis*, the type of which, as I have stated already, is *T misellus*, and he did not include in the synonymy Preston's var. *Zaleymanensis* of *T foliaceus*, which was described from young and half-grown shells of this species.

The species is represented in the Indian Museum collection by a fair series of specimens of all ages from Tenasserim, the Irrawadi River, Zaleyman and Bhamo.

Trapezoideus subclathratus (v. Martens).

1919. *Trapezoideus subclathratus*, Haas, *op. cit.*, pp. 270–272, pl. xxiii, fig. 6.

Careful examination of a single specimen of this form taken at Sheinpagali, Burma, leaves no doubt in my mind that, as Haas correctly states, this species is distinct from *T misellus*, of which von Martens considered it to be a variety.