

REVISION OF THE ASIATIC SPECIES OF THE GENUS *CORBICULA*.

II.—THE INDO-CHINESE SPECIES OF THE GENUS *CORBICULA*.

By B. PRASHAD, D.Sc., F.R.S.E., F.A.S.B.,
Zoological Survey of India, Calcutta.

(Plates V, VI.)

This paper deals with the species of the genus *Corbicula* Meg. von Mühlfeldt found in the Malay Peninsula, Siam and French Indo-China including Cambodia, Annam, Laos and Tonkin. This area of south-eastern Asia is a very convenient unit for dealing with the conchological fauna, and is the same as was adopted by me in my paper on the Viviparidae.¹ It lies between India and Burma on the one side and China on the other, and is a convenient zoogeographical unit. Crosse and Fischer² in 1876 suggested for this area together with Burma the name Indo-Chinese Province. I have, however, dealt with the Burmese species already in my account of the Indo-Ceylonese species,³ as this course appeared to me to be more convenient, and, further, because I believe that the Burmese forms are more allied to the Indian than to those of the area under consideration.

Crosse and Fischer when discussing the peculiarities of the land and freshwater molluscs of Indo-China remarked:⁴ “Enfin, nous signalerons comme caractéristique le grand nombre de espèces du genre *Corbicula* qui habitent l'Indo-Chine et dont la détermination est, par cela même, rendue très-difficile. M. Temple Prime, dans son Catalogue des Corbiculidae, publié en 1869 (Amer. Journ. of Conchology), connaissait, à cette époque, 17 espèces de *Corbicula*, propres à l'Indo-Chine (et la plupart habitent le Siam et le Cambodge). Ce chiffre de 17 espèces est égal au sixième des espèces connues dans le monde entier. On peut donc dire que l'Indo-Chine est un des points du globe où le genre atteint son maximum de développement spécifique.” Later Fischer⁵ modified this view to some extent for he remarked “Le genre *Corbicula* est très développé en Indo-Chine; mais il abonde également en Inde, Chine, Japon, Formose, Malacca, Sumatra, Java, Philippines, Australie. Il est représenté en Afrique, en Asie occidentale et en Amérique.” In his list of species from this area he enumerated 35 species, but did not mention two species which had been described by Mabilie in 1889.⁶ Fischer's list only includes the species which had been recorded to date from the area and is by no means critical. In 1904 H. Fischer and Dautzenberg⁷ listed 41 species from this area, but even in this list Mabilie's two species mentioned above

¹ Prashad, B.—*Mem. Ind. Mus.*, VIII, p. 173 (1928).

² Crosse, H. & Fischer, P.—*Journ. Conchyliol.*, XXIV, p. 335 (1876).

³ Prashad, B.—*Mem. Ind. Mus.*, IX, pp. 15-27, pls. iii, iv (1928).

⁴ *Op. cit.*, p. 342 (1876).

⁵ Fischer, P.—*Bull. Soc. Aun.*, IV, pp. 257, 258 (1891).

⁶ Mabilie, J.—*Contributions à la Faune Malacologiques du Tonkin*, p. 17 (Paris, Oct. 1889).

⁷ Fischer, H. & Dautzenberg, P.—*Cat. moll. terr. fluv. Indo-Chine etc.*, in *Mission Pavie, etc.*, III, pp. 441, 442 (1904).

were missed. In 1905, however, Dautzenberg and Fischer¹ attempted a preliminary revision of some of the species from French Indo-China only, and this work was continued in a paper published in the following year.² The authors considered the dominant species of the area to be the same as the Chinese *Corbicula fluminea* (Müller), and included in its synonymy several forms described by later authors, while a number of others were considered as simple varieties of this variable species.

Thanks to the courtesy of the authorities of the British Museum (Natural History) and the Museum d'Histoire Naturelle, Paris, and above all to Monsieur P. Dautzenberg I have been able to examine not only very large collections of *Corbicula* from various parts of the region for my revision, but also most of the specimens named by Crosse, Fischer, Morelet, Mabille, Wattebled, Clessin, Prime and Dautzenberg, including the types or paratypes of several species of these authors. It has thus been possible to deal with the species fairly fully, and consider the question of their synonymies with confidence. Only in exceptional cases I have not had any authentic material for examination, and have had to rely on the published descriptions and figures of older authors.

Of the old species I recognize *C. malaccensis* Desh., *C. lydigiana* Prime, *C. larnaudieri* Prime, *C. consularis* Prime and *C. regia* Clessin as valid from Siam and the Malay Peninsula, while a new species *C. siamensis* is described for the first time. From French Indo-China including Cambodia, Annam, Laos and Tonkin I recognize the following 14 species:—*C. baudoni* Morlet, *C. bocourti* Morelet, *C. moreletiana* Prime, *C. cyreniformis* Prime, *C. erosa* Prime, *C. castanea* Prime, *C. solidula* Prime, *C. gubernatoria* Prime, *C. lamarckiana* Prime, *C. tenuis* Clessin, *C. blandiana* Prime and *C. leviuscula* Prime, and in addition *C. dautzenbergi*, sp. nov. and *C. luteola*, sp. nov. The last two species appear to be new to science and are described in this paper. *C. luteola* is the most interesting species, as the other two species—*C. lutea* Morelet and *C. subsulcata* Clessin—of the group to which it belongs, are found in China and Formosa respectively. The three species occur near the sea shore, and are distinguished from all other species of the genus by their having very minute, closely placed striae, which give the shells an almost smooth appearance, and by the comparatively thin and inflated shells.

I do not propose discussing here in detail the relationships of the various species with those found in the adjacent areas, but it may be noted that the Siamese and Malayan species show distinct affinities with the Burman forms, while those of French Indo-China are certainly allied to the Chinese species.

(a) SIAM AND MALAY PENINSULA.

***Corbicula malaccensis* Deshayes.**

(Pl. V, figs. 1—3.)

1854. *Corbicula Malaccensis*, Deshayes, *Proc. Zool. Soc. London*, p. 343.

1854. *Corbicula Malaccensis*, Deshayes, *Cat. Conch. Brit. Mus.*, II, p. 229.

1857. *Corbicula Malaccensis*, Adams, H. & A., *Gen. Rec. Moll.*, II, p. 447.

¹ Dautzenberg, P. & Fischer, H.—*Journ. Conchyliol.*, LIII, pp. 225-232 (1905).

² Dautzenberg, P. & Fischer, H.—*Journ. Conchyliol.*, LIII, p. 466 (1906).

1860. *Corbicula Malacensis* (sic) and *C. rhomboidea*, Prime, *Proc. Acad. Nat. Sci. Philadelphia*, XII, pp. 271, 273.
1861. *Corbicula rhomboidea*, Prime, *Proc. Acad. Nat. Sci. Philadelphia*, XIII, p. 127.
1864. *Corbicula Mallaccana*, Prime, *Ann. Lyc. Nat. Hist. New York*, VIII, p. 65, fig. 10.
1864. *Corbicula rhomboidea*, *id.*, *ibid.*, p. 66, fig. 11.
1875. *Corbicula insularis*, Morelet (nec Prime), *Sér. Conch.* IV, p. 361, pl. xvi, fig. 4.
1877. *Corbicula Malaccana*, Clessin, *Martini u. Chemn. Conch.-Cab.* (n. f.) *Cycladeen*, p. 137, pl. xxiv, figs. 14, 15.
1877. *Cyrena rhomboidea* and *C. Mallacensis* (in Index as *C. Mallaccensis*), Sowerby, *Conch. Icon.* XX, *Cyrena*, pl. xii, fig. 52, pl. xvi, fig. 88.
1878. *Corbicula rhomboidea*, Clessin, *op. cit.*, p. 168, pl. xxx, figs. 1, 2.

C. malaccensis has been fully described by Deshayes, Prime and Sowerby, while figures of the species have been published in the works of the two latter authors. I publish photographs of what appear to be the type-series from the "Cuming Collection" in the British Museum (Nat. Hist.), London.

The species is distinguished from other species found in the area by its shell being subtrigonal, transversely elongated, not very inflated, and the sculpture consisting of concentric, close-set, somewhat raised and regular ridges.

Distribution.—*C. malaccensis*, as the name indicates, is found in the rivers of Malacca.

Remarks.—In the various collections before me I found several series of *C. colonialis* Prime and *C. consularis* Prime identified as *C. malaccensis*; both these species, however, differ in the shape of the shell as well as in sculpture. I have no doubt that *C. rhomboidea* Prime is a synonym of this species.

***Corbicula lydigiana* Prime.**

(Pl. V, figs. 4, 5.)

1861. *Corbicula Lydigiana*, Prime, *Journ. Conchyliol.* IX, p. 355.
1862. *Corbicula Lydigiana*, Prime, *Journ. Conchyliol.* X, p. 388, pl. xiv, fig. 8.
1866. *Corbicula Lydigiana*, Prime, *Ann. Lyc. Nat. Hist. New York*, VIII, p. 214, fig. 41.
1869. *Corbicula Lydigiana*, Prime, *Amer. Journ. Conch.* V, p. 133.
1877. *Corbicula Lydigiana*, Clessin, *Martini u. Chemn. Conch.-Cab.* (n. f.) *Cycladeen*, p. 148, pl. xxvi, fig. 14.
1877. *Cyrena Lydigiana*, Sowerby, *Conch. Icon.* XX, *Cyrena*, pl. xvi, fig. 83.
1891. *Corbicula Lydigiana*, Fischer, *Bull. Soc. Autun*, IV, p. 238.
1904. *Corbicula Lydigiana*, Fischer & Dautzenberg, *Mission Pavie, etc.*, III, p. 441.

Prime's and Sowerby's descriptions of *C. lydigiana* are incomplete and their figures of the shells do not show the distinguishing characters of this interesting form. I, therefore, give below a new description and publish photographs of the shells which I have seen.

Species of medium size, thick-shelled, moderately inflated, trigonal, subequilateral, of a greenish-yellow to brownish colour, sometimes with brown stripes running vertically on the shells. Upper slope short, greatly arched; anterior side longer than the posterior, nearly straight; posterior side regularly arched; ventral margin greatly arched; distinct heart-shaped lunule; umbones large, inflated, curved inwards and forwards, eroded but

often showing traces of close-set striae. Shell surface with concentric, regular, sharp, distantly placed ribs, almost equally developed; nymphs narrow, linear, almost smooth throughout; ligament thick, prominent. Hinge strong, well developed; laterals almost straight, except for the anterior laterals at the lower end, where they are somewhat impressed by the muscle scars impinging on them; muscle scars rather shallow. Nacre violet.

Measurements (in millimetres).

Length	..	..	..	..	..	17	18
Maximum height	..					18.5	16.5
Thickness	..	..			..	13	10

Distribution.—The species was described from Siam. Of the two complete shells, which I have seen, one is without any locality, while the second is from Upper Siam. It has wrongly been recorded from French Indo-China. With some doubt I also refer two young shells from Kilantan, Malacca, to this species.

Remarks.—*C. lydigiana* is distinguished by its shape, very tumid umbones, and the sharp, distantly placed ribs on the shells.

Corbicula larnaudieri Prime.

(Pl. V, figs. 6, 7.)

1862. *Corbicula Larnaudieri*, Prime, *Ann. Lyc. Nat. Hist. New York*, VII, p. 480.
 1864. *Corbicula Larnaudieri*, Prime, *Ann. Lyc. Nat. Hist. New York*, VIII, p. 415, fig. 69.
 1869. *Corbicula Larnaudieri*, Prime, *Amer. Journ. Conch.*, V, p. 132.
 1875. *Corbicula Larnaudiei* (emended), Morelet, *Sér. Conch.*, IV, p. 363, pl. xv, fig. 2.
 1878. *Corbicula Larnaudieri*, Clessin, *Martini u. Chemn. Conch.-Cab.* (n. f.), *Cycladeen*, p. 178, pl. xxxi, figs. 10, 11.
 1891. *Corbicula Larnaudiei*, Fischer, *Bull. Soc. Autun*, IV, p. 238.
 1904. *Corbicula Larnaudiei*, Fischer & Dautzenberg, *Mission Pavie, etc.*, III, p. 441.

I assign provisionally *C. pisidiiformis* Prime¹ to the synonymy of *C. larnaudieri*; the former species is based on young shells, which from the description and figure appear to be the young of *C. larnaudieri*. If this conclusion of mine is correct, the name of the species will have to be changed to *C. pisidiiformis*.

Species of a small size, thick-shelled, somewhat inflated, oval, subequilateral; of a shining yellowish-green colour with the umbones dark green. Upper slope short, moderately arched; anterior side slightly longer than posterior, both almost straight; rounded anteriorly, subtruncate posteriorly; ventral margin greatly arched; distinct heart-shaped lunule; escutcheon not marked; umbones small, somewhat inflated, curved inwards, eroded. Shell surface with concentric, regular, somewhat raised distantly placed ribs, which, except for the region of the lunule, are equally developed all over the shell; nymphs narrow, almost

¹ Prime, T.—*Ann. Lyc. Nat. Hist. New York*, VIII, p. 215, fig. 42 (1866).

smooth; ligament small, not very prominent. Hinge rather weak, normal; laterals subequal, equally arched; muscle scars slightly impressed. Nacre violet.

Measurements (in millimetres).

Length	..	..	..	16	15.5
Maximum height	..	..	..	14.3	14.5
Thickness	..	..	..	11.2	10.6

Distribution.—The species was described by Prime from shells collected by Abbé Larnaudier in Siam. The two specimens, which I figure, are from Pexaburi, Siam.

Remarks.—*C. larnaudieri* is allied to *C. lydigiana* Prime and *C. colonialis* Prime, but its shape is very characteristic; it is less inflated than either of the two species, and the sculpture is less sharply marked.

***Corbicula consularis* Prime.**

(Pl. V, figs. 8, 9.)

1869. *Corbicula consularis*, Prime, *Amer. Journ. Conch.*, V, p. 129.

1870. *Corbicula consularis*, Prime, *Ann. Lyc. Nat. Hist. New York*, IX, p. 300.

1878. *Corbicula consularis*, Clessin, *Martini u. Chemn. Conch.-Cab.* (n. f.), *Cycladeen*, p. 200.

C. consularis has not been figured so far, and its description by Prime is incomplete. I, therefore, redescribe the species below, and reproduce photographs of some adult shells.

Species of a medium size, rather thick-shelled, greatly inflated, subtrigonal, subequilateral, of a lemon yellow to brown or black colour. Upper slope moderately arched; anterior side shorter than posterior; anterior side slightly arcuate, posterior nearly straight; rounded anteriorly, subtruncate posteriorly; ventral margin moderately arched; small, deep, heart-shaped lunule of a darker colour than the rest of the shell; escutcheon not marked; umbones rather small, inflated, curved inwards and almost meeting in the middle, eroded. Shell surface with concentric, somewhat irregular, rather low, not very sharp ribs; nymphs very narrow, almost linear, smooth; ligament strong, not very prominent. Hinge moderately strong, normal; anterior cardinals longer and more curved than posterior. Nacre white with traces of salmon-pink under the umbones to dark bluish-violet.

Measurements (in millimetres).

		Kinta.			Perak.		
Length	..	19	19	18.5	18.4	19.8	18
Maximum height		16.3	15.5	16.4	16.2	17	14.4
Thickness		13.5	12	12.3	12.8	13	12

Distribution.—The types of the species are stated to have come from Malacca, the two series before me bear the locality labels Kinta, Malacca, and Kuvala Kangsar, Perak.

Remarks.—*C. consularis* Prime is distinguished by the shape of its shell, and the sculpture which is neither very regular nor well developed. The specimens recorded as *C. mollekeana* Prime from Singapore by von Martens¹ are to be referred to this species.

¹ von Martens, E.—*Weber's Zool. Ergel.n. Niederländ. Ost.-Ind.*, IV, p. 111 (1897).

Corbicula regia Clessin.

(Pl. V, figs. 10—12.)

1879. *Corbicula regia*, Clessin, *Martini u. Chemn. Conch.-Cab.* (n. f.), *Cycladeen*, p. 267, pl. xliii, fig. 5.

1915. *Corbicula regia*, Preston, *Faun. Brit. Ind. Freshw. Moll.*, p. 221.

Benson distributed shells of this species under the manuscript name *C. regia*, but neither described nor figured the species. Clessin described the species from shells in the Berlin Museum from Paetel's collection, but gave the wrong locality—"Wahrscheinlich Indien," and in this was followed by Preston. I have seen what are probably the types of the species in the Berlin Museum, and these bear the correct locality—Penang. Other specimens from the same donor in the collections of the British Museum (Nat. Hist.) and the Indian Museum, Calcutta, are also from Penang, Malay Peninsula.

Clessin's description and a verbatim translation of it by Preston render a redescription of the species unnecessary, but the published figure of the species is poor, and I, therefore, reproduce photographs of some shells. *C. regia* is a small species, and is to be distinguished by its ovate, swollen shell, with very distantly placed, rather irregular, low ribs, prominent and tumid umbones and the very thick shell.

Measurements (in millimetres).

Length	..	..	..	11.4	10	9	8.5
Maximum height		..	..	9	9	7.8	7.3
Thickness		..	..	8	6.4	6.3	5.2

Distribution.—All the shells of *C. regia*, which I have seen, are from Penang, Malay Peninsula.

Remarks.—*C. regia* appears to be allied to *C. consularis* Prime from Malacca, and *C. arata* (Sowerby) from Tenasserim, Burma, but the form of the shell and the sculpture are quite characteristic.

Corbicula siamensis, sp. nov.

(Pl. V, figs. 13, 14.)

1875. *Corbicula episcopalis*, Morelet (*nec* Prime), *Sér. Conch.*, IV, p. 364, pl. xvi, fig. 3.

1889. *Corbicula erosa* (Morlet *nec* Deshayes *non* Prime) and *C. Nevilli* (Morlet *nec* Clessin), Morlet, *Journ. Conchylol.*, XXXVII, pp. 170, 171.

1891. *Corbicula Nevilli*, Fischer, *Bull. Soc. Autun*, IV, p. 239.

1904. *Corbicula erosa* and *C. Nevilli*, Fischer & Dautzenberg, *Mission Pavie, etc.*, III, pp. 441, 442.

In addition to the above synonymy probably the specimens recorded as *Cyrena* (subg. *Corbicula*) *orientalis* Lam. by von Martens¹ from Siam are also to be referred to this species.

Species of a fair size, thick-shelled, trigonal, inequilateral, of a lemon-yellow to brownish colour. Upper slope narrowly arched, anterior side longer than posterior, somewhat arched, posterior nearly straight; narrowly rounded anteriorly, subtruncate posteriorly; ventral

¹ von Martens, E.—*Proc. Zool. Soc., London*, p. 16 (1860).

margin regularly arched; no distinctly marked lunule or escutcheon; umbones large, prominent, greatly inflated, curved inwards and somewhat forwards, eroded in full-grown shells. Shell surface with concentric, regular, somewhat distantly placed, rather sharp, low ridges, equally developed over the entire surface of the shells; nymphs rather broad, almost smooth; ligament strong, prominent. Hinge moderately strong, normal; laterals subequal, somewhat curved; muscle scars not greatly impressed. Nacre dirty violet.

Measurements (in millimetres).

			Holotype.		Lampan, N. Siam.			
Length	26.8	24	21.5	20	18
Maximum height		25	20	21	17	15.4
Thickness	18.8	13.2	12.3	10.7	10.5

Holotype.—No. M. $\frac{12840}{2}$ in the collections of the Zoological Survey of India (Indian Museum), Calcutta, from Siam. Paratypes in the Museum d'Histoire Naturelle, Paris and British Museum (Nat. Hist.), London.

Distribution.—*C. siamensis* appears to be widely distributed in Siam. It has hitherto been confused with species like *C. episcopalis* Prime (= *C. solidula* Prime), *C. nevillei* Clessin and *C. erosa* Prime.

Remarks.—Young shells of *C. siamensis* are comparatively thin, but the adults for their size are very thick-shelled. Its form and sculpture distinguish it from the other species found in the area.

(b) FRENCH INDO-CHINA.

Corbicula baudoni Morlet.

(Pl. V, figs. 15—19.)

1886. *Corbicula Baudoni*, Morlet, *Journ. Conchyliol.*, XXXIV, pp. 268, 293, pl. xiv, figs. 6, 6a.

1887. *Corbicula Baudoni*, Dautzenberg & d'Hamonville, *Journ. Conchyliol.*, XXXV, p. 224.

1887. *Corbicula Baudoni*, Mabille, *Bull. Soc. Malacol. France*, IV, p. 163.

1889. ? *Corbicula vericunda* and *C. ovatella*, Mabille, *Contr. Faun. Malacol. Tonkin*, p. 17.

1891. *Corbicula Baudoni*, Fischer, *Bull. Soc. Autun*, IV, p. 236.

1904. *Corbicula Baudoni*, Fischer & Dautzenberg, *Mission Pavie, etc.*, III, p. 441.

1905. *Corbicula fluminea* var. *Baudoni*, Dautzenberg & Fischer, *Journ. Conchyliol.*, LIII, p. 232.

In addition to the above synonymy I have little doubt that the specimens recorded as *C. largillierti* (Philippi) by Crosse and Fischer¹ and by Mabille and Le Mesle² are also to be referred to this species. *C. vericunda* Mabille has been included in the synonymy with some doubt as I have not been able to trace the type of the species in any collection; from the description, however, I have little doubt that the species is based on medium sized shells of *C. baudoni*.

I have also had for examination a beautiful shell labelled *C. maxima* Prime from Tourane in the Dautzenberg Collection. The exact locality of Prime's type of this species was not

¹ Crosse & Fischer, — *Journ. Conchyliol.*, XI, p. 345 (1863).

² Mabille & Le Mesle, — *Journ. Conchyliol.*, XIV, p. 121 (1866).

known, but the shell before me agrees entirely with Prime's description.¹ The interest of the specimen, photographs of which I reproduce as fig. 19 on plate V, however, lies in the fact that it is connected by shells of intermediate sizes with shells of *C. baudoni*. If my identification of the adult shell is correct, the name of the species will have to be changed to *C. maxima* Prime.

Morlet's description of the half-grown shells under the name *C. baudoni*, and Clessin's description of the adult under the name *C. maxima* render it unnecessary to redescribe the species, and I, therefore, only give below its distinguishing characters. I have also added a few notes on the changes which the shell undergoes during growth to a shell measuring as much as 60 mm. in length.

Young shells of *C. baudoni* are subtrigonal or almost trigonal, markedly inequilateral with the posterior side drawn out into a prominent beak. In full-grown adults the posterior beak sometimes becomes truncate. The anterior side is relatively short and is broadly rounded. The umbones are prominent and very tumid, curved forwards and inwards; in older shells they are always eroded. The sculpture on the young shells consists of concentric, regular, low ridges, but in older shells the ridges on the lower third and the beak are irregular and may often be quite obsolete. On a full-grown shell the ridges are very irregular and over the greater part of the valves indistinct. The colour of the shells varies from some shade of yellow in young specimens to shining dark brown or even black. The nacre is bluish violet in young shells, but almost white in full-grown adults.

Measurements (in millimetres).

	Tourane.		Tonkin.				
Length ..	60	39	38.2	38	29	29	28
Maximum height ..	54	32.2	33	31.4	25.4	25.2	25
Thickness ..	40	20.6	22.4	19.3	16.2	16.4	16.3

Distribution.—*C. baudoni* has a wide distribution in Tonkin and Cambodia and I have examined large series of specimens from Loc Nam and the surrounding area.

Remarks.—This is the largest species of *Corbicula* found in Tonkin and the area under consideration, and resembles *C. fluminea* (Müller) of China, but the shape and the sculpture of the shell are different.

***Corbicula bocourti* Morlet.**

(Pl. V, figs. 20—25.)

1865. *Cyrena (Corbicula) Bocourti*, Morelet, *Journ. Conchyliol.*, XIII, p. 228.

1869. *Corbicula Bocourti*, Prime, *Amer. Journ. Conch.*, V, p. 129.

1875. *Corbicula Bocourti*, Morelet, *Sér. Conch.*, IV, p. 361, pl. xvi, fig. 2.

1879. *Corbicula Bocourti*, Clessin, *Martini u. Chemn. Conch.-Cab.* (n. f.), *Cycladeen*, p. 203.

1886. *Corbicula Annamitica*, Watterbled, *Journ. Conchyliol.*, XXXIV, p. 69, pl. v, fig. 3.

1886. *Corbicula bilineata, C. variegata* (Morlet *nec* Heude) and *C. Sandai*, Morlet (*nec* Rheinhardt), *Journ. Conchyliol.*, XXXIV, p. 267.

¹ Prime, T.—*Proc. Zool. Soc. London*, p. 321 (1860). In Clessin's Monograph—*Martini u. Chemn. Conch.-Cab.* (n. f.), *Cycladeen*, p. 201, pl. xlii, fig. 1 (1879)—a shell with the peculiar locality—"Asien, Inseln des südlichen Ocean's" is doubtfully referred to *C. maxima*. Clessin's figure and description agree almost entirely with the Tourane shell before me.

1887. *Corbicula Bocourti*, Clessin, *Malakozool. Blätt.* (n. f.), IX, p. 75, pl. iii, fig. 3.
 1889. *Corbicula Bocourti* and *C. Gravisi* (sic),¹ Morlet, *Journ. Conchyliol.*, XXXVII, p. 170.
 1891. *Corbicula Annamitica*, *C. bilineata*, *C. Bocourti*, *C. gravis*, *C. Sandai*² and *C. vespertina*,³ Fischer, *Bull. Soc. Autun*, IV, pp. 236, 237.
 1891. *Corbicula insularis* (Morlet nec Prime) and *C. Primeana*, Morlet, *Journ. Conchyliol.*, XXXIX, pp. 238, 253.
 1904. *Corbicula Annamitica*, *C. bilineata*, *C. Bocourti*, *C. gravis*, *C. Sandai* and *C. vespertina*, Fischer & Dautzenberg, *Mission Pavie, etc.*, III, pp. 441, 442.
 1905. *Corbicula fluminea* (Dautzenberg & Fischer nec Müller), and vars. *Bocourti* and *Orientalis* (Dautzenberg & Fischer nec Lamarck), Dautzenberg & Fischer, *Journ. Conchyliol.*, LIII, pp. 225, 229, 230.
 1906. *Corbicula fluminea* and var. *Bocourti* (in part), Dautzenberg & Fischer, *Journ. Conchyliol.*, LIII, p. 466.

Species of a large size, thick-shelled, greatly inflated anteriorly and in the umbonal region, very much compressed in the posterior and lower half of the valves; young shells subtrigonal, subequilateral, adults with the anterior side greatly shortened and posterior drawn out into a beak; young shells lemon yellow, becoming brownish with age, adults shining black. Upper margin very short and greatly arched, anterior side short, somewhat concave, compressed in the upper third, evenly rounded below; posterior side elongated, almost straight; truncate posteriorly; ventral margin moderately arched; lunule distinct in young shells, less marked in adults, heart-shaped; no escutcheon; umbones very prominent, large, greatly inflated, in some shells very much compressed anteriorly, greatly curved forwards and inwards, almost meeting in the middle line. Shell surface covered with concentric, very regular, slightly raised ridges in young and half-grown shells; in full grown shells ridges on the beak and lower parts of the shell are finer, more closely placed and somewhat irregular; nymphs elongate, broad, somewhat roughened; ligament thick prominent. Hinge normal, well developed; posterior cardinals almost straight, much longer than anterior; pallial line very distinctly marked, somewhat angulate; muscle scars not greatly impressed. Nacre bluish-violet, in full-grown adults dull white below the umbones.

Measurements (in millimetres).

Length	46	44	40.8	40.2	34.8	26.4	15.3
Maximum height	44.4	41	39.2	37.4	33	27	16
Thickness	..	26	27	24	25.4	21.3	19
						19	11.6

Distribution.—*C. bocourti* was described from Saigon, Cambodia. I have seen large series of shells from Cambodia, Annam and Tonkin.

Remarks.—This species is allied to *C. baudoni* Morlet, but its very inequilateral shell with the shortened anterior side and the very tumid umbones easily distinguish it from that species.

¹ The reference is to *C. gravis* Heude from China, but the Chinese species is not synonymous with *C. bocourti*; it is rather the shells named as such by Morlet from the area under consideration which are to be included here.

² Not the Japanese species of this name.

³ This was the new name proposed by Fischer for *C. variegata* Heude owing to the latter being preoccupied by *C. variegata* (d'Orbigny), but the Chinese species is not synonymous with *C. bocourti*.

Corbicula moreletiana Prime.

(Pl. VI, figs. 1—5.)

1867. *Corbicula Moreletiana*, Prime, *Ann. Lyc. Nat. Hist. New York*, VIII, p. 416.
 1869. *Corbicula Moreletiana*, Prime, *Amer. Journ. Conch.*, V, p. 134.
 1875. *Corbicula Moreletiana*, Morelet, *Sér. Conch.*, IV, p. 360, pl. xvii, fig. 4.¹
 1876. *Corbicula Moreletiana* and *C. Lydigiana*, Crosse & Fischer, *Journ. Conchyliol.*, XXIV, p. 334.
 1877. *Corbicula erosa*, Sowerby (as Deshayes's *Mss.* species), *Conch. Icon.*, XX, *Cyrena*, pl. xi, fig. 46, a, b.
 1878. *Corbicula Moreletiana*, Clessin, *Martini u. Chemn. Conch.-Cab.* (n. f.), *Cycladeen*, p. 198.
 1886. *Corbicula Petiti*, Morlet (as Clessin's *Mss.* species), *Journ. Conchyliol.*, XXXIV, pp. 268, 294.
 1887. *Corbicula Tonkingensis*, *C. flava* and *C. Petiti*, Clessin, *Malakozool. Blätt.*² (n. f.), IX, pp. 67, 68, 71, pl. ii, figs. 1, 2, 6.
 1889. *Corbicula Moreletiana* and *C. Petiti*, Morlet, *Journ. Conchyliol.*, XXXVII, p. 171.
 1891. *Corbicula Moreletiana*, *C. Petiti* and *C. trajecta* (*nom. nov.* for *C. Tonkingensis* Clessin), Fischer, *Bull. Soc. Autun*, IV, pp. 238-240.
 1904. *Corbicula Moreletiana*, *C. Petiti* and *C. trajecta*, Fischer & Dautzenberg, *Mission Pavie, etc.*, III, p. 442.
 1905. *Corbicula fluminea* vars. *Petiti* and *Moreletiana*, Fischer & Dautzenberg, *Journ. Conchyliol.*, LIII, pp. 227, 228.
 1906. *Corbicula fluminea* vars. *Petiti* and *Moreletiana*, Dautzenberg & Fischer, *Journ. Conchyliol.*, LIII, p. 466.

The earlier descriptions of this species are not very satisfactory, and I, therefore, re-describe the species below :—

Species of moderate size, fairly thick, rather tumid ; adult shells almost trigonal in outline, young shells more oblique with the posterior margin shortened and curving forwards anteriorly thereby becoming pear-shaped or even cordiform in outline, some adult shells more triangular with the umbones almost centrally situated and the posterior side only slightly shorter than the anterior ; young shells light olive or yellowish, full-grown shells olive to dark brown. Upper margin very short, almost concealed by the prominent umbones ; anterior side usually markedly concave towards the umbones, and almost wholly taken up by the broad, concave and very well marked heart-shaped lunule, greatly curved normally, but less so in triangular shells ; posterior side only slightly arched, in some shells almost straight, escutcheon distinct but less so than the lunule ; ventral margin beginning from the ventrally directed tip of the lunule, greatly arched but less so in the triangular shells, sharply curving up or even forming a broad angle with the posterior side. Umbones prominent, very tumid, rolled inwards and forwards, not meeting in the middle line, often eroded but with distinct closely placed ridges ; shell surface with low, sharp, distantly placed ridges on the entire surface, ridges less raised and prominent on the lunule and escutcheon,

¹ In the collections of the British Museum (Natural History), London, I found some shells of this species labelled *Corbicula irregularis* Morelet from the Morelet Collection : this is only a manuscript name.

² Clessin, in the publication cited, does not refer anywhere to figure 3 on plate ii, but I have no doubt that it represents a shell of this species.

in some shells these areas appear almost smooth to the naked eye; secondary finer ridges less regularly arranged also present between the primary ones. Nymphs short and narrow; ligament broad, thick and prominent. Hinge normal with the cardinal teeth well developed; laterals almost straight or only slightly curved; muscle scars only slightly impressed, in older shells anterior muscle scar impinging slightly on the anterior lateral: pallial line without any sinus. Nacre whitish to dark violet, shining.

Measurements (in millimetres).

	Cambodia.				Cochin-China.		Loc. Nam.
	28	27	19.4	16	32	30.5	24.5
Length	28	27	19.4	16	32	30.5	24.5
Maximum height	31.4	28.2	25.5	21.8	33.4	31.7	25
Thickness	22.2	19	21.8	19.8	24.3	20.4	16.2

Distribution.—*C. moreletiana* has a very wide range in the area. I have seen large series of specimens from Tonlé Sap or the Great Lake of Cambodia, the valley of the Mekong, various localities in Cochin-China, Loc Nam and other localities in Tonking and Annam. It seems to be the common bivalve of the Great Lake of Cambodia.

Remarks.—The species resembles *C. recurvata* (Eydoux) from the Philippines, and var. *cor* (Lamarck) of *C. fluminalis* from Central Asia, but is distinguished by its very oblique shell and the sculpture.

Corbicula cyreniformis Prime.

(Pl. VI, figs. 6—9.)

1860. *Corbicula cyreniformis*, Prime, *Proc. Zool. Soc. London*, p. 321.
 1861. *Corbicula cyreniformis*, Prime, *Journ. Conchylol.*, IX, p. 41, pl. ii, fig. 5.
 1875. *Corbicula insularis*, Morelet (*nec* Prime), *Sér. Conch.*, IV, p. 364, pl. xvi, fig. 4.
 1877. *Cyrena cyreniformis*, Sowerby, *Conch. Icon.*, XX, *Cyrena*, pl. xiv, fig. 69.
 1878. *Corbicula cyreniformis*, Clessin, *Martini u. Chemn. Conch.-Cab.* (n. f.) *Cycladeen*, p. 190, pl. xxxviii, fig. 8.
 1881. *Corbicula insularis*, de Rochebrune (*nec* Prime), *Bull. Soc. Philomat. Paris* (ser. 7), VI, p. 47.
 1886. *Corbicula gryphaea* (Morlet *nec* Heude) and *C. insularis*, Morlet, *Journ. Conchylol.*, XXXIV, pp. 267, 268.
 1886. *Corbicula tonkiniana*, Morlet, *ibid.*, pp. 268, 292, pl. xiv, figs. 5, 5a.
 1887. *Corbicula tonkiniana*, Dautzenberg & d'Hamonville, *Journ. Conchylol.*, XXXV, p. 224.
 1887. *Corbicula jullieniana*, Clessin, *Malakozool. Blätt.* (n. f.), IX, p. 73, pl. iii, fig. 1.
 1889. *Corbicula gryphaea*, ? *C. indigotina* (Morlet *nec* Heude) and *C. Tonkiniana*, Morlet, *Journ. Conchylol.*, XXXVIII, p. 171.
 1891. *Corbicula gryphaea*, ? *C. indigotina*, *C. Jullieniana*, and *C. Tonkiniana*, Fischer, *Bull. Soc. Autun*, IV, pp. 237-240.
 1904. *Corbicula gryphaea*, ? *C. indigotina*, *C. Jullieniana* and *C. tonkiniana*, Fischer & Dautzenberg, *Mission Pavie, etc.*, III, pp. 441, 442.
 1905. *Corbicula fluminea* var. *tonkiniana*, Dautzenberg & Fischer, *Journ. Conchylol.*, LIII, p. 227.

I have examined what appears to be the holotype of the species from the 'Cuming Collection' in the British Museum (Nat. Hist.), London and a fair series of specimens identified as *C. tonkiniana* Morlet. I have also little doubt that Clessin's *C. jullieniana* of unknown habitat is also based on young shells of this species.

Morlet's description of *C. tonkiniana*, which is very detailed, would serve very well for this species and it is, therefore, not necessary to redescribe it. Its characteristic features may, however, be noted. The species is of a fairly large size, very thick, inflated and sub-trigonal or cordiform in outline. The umbones are prominent, greatly inflated and curved inwards. The sculpture consists of concentric, very coarse, raised and distantly placed ridges. The hinge is normal and strongly developed.

Measurements (in millimetres).

	? Holotype. Cambodia.		Mekong.	
Length	29.8	27.7	24.6	24.4
Maximum height ..	29	27	24	23.2
Thickness ..	21.6	18.6	17	16

Distribution.—The species appears to be widely distributed in Tonkin and Cambodia.

Remarks.—*C. cyreniformis* is apparently derived from *C. moreletiana* to which it is closely allied, and with which it has a common distribution.

Corbicula erosa Prime.

(Pl. VI, fig. 10.)

1861. *Corbicula erosa*, Prime, *Proc. Acad. Nat. Sci. Philadelphia*, XIII, p. 126.

1866. *Corbicula erosa*, Prime, *Ann. Lyc. Nat. Hist. New York*, VIII, p. 213, fig. 40.

1869. *Corbicula erosa*, Prime, *Amer. Journ. Conch.*, V, p. 131.

1877. *Corbicula erosa*, Clessin, *Martini u. Chemn. Conch.-Cab.* (n. f.), *Cycladeen*, p. 148, pl. xxvi, figs. 12, 13.

1889. *Corbicula erosa*, Morlet, *Journ. Conchyliol.*, XXXVII, p. 170.

1891. *Corbicula erosa*, Fischer, *Bull. Soc. Autun*, IV, p. 238.

1904. *Corbicula erosa*, Fischer & Dautzenberg, *Mission Pavie, etc.*, III, p. 441.¹

I have also little doubt that *Corbicula ammiralis* Prime² is synonymous with this species. Prime in his remarks on this species stated that the species is closely allied to *C. lydigiana*, *C. erosa* and *C. castanea*, and compared it with the first two species; he, however, made no remarks with reference to *C. erosa*.

Prime's description of the species is fairly complete, but the figure is rather poor, and I, therefore, reproduce photographs of what appears to be the 'holotype' of the species from the 'Cuming Collection' in the British Museum (Nat. Hist.), London. This is the only specimen of this species which I have seen. On the tablet bearing this shell no locality is noted but Prime gives the habitat as Cambodia.

¹ As Dautzenberg & Fischer, *Journ. Conchyliol.*, LIII, pp. 228, 229 (1905) have rightly pointed out, Deshayes never described any *Corbicula* as *Cyrena erosa*, and the manuscript name adopted by Sowerby in *Conch. Iconica* is, as has been shown already (*antea* p. 38), only a synonym of *C. moreletiana* Prime.

² Prime, T.—*Ann. Lyc. Nat. Hist., New York*, IX, p. 298, fig. 70 (1870).

The type shell is of medium size, fairly thick, almost trigonal, very inflated with the umbones greatly eroded, and the sculpture consists of irregular and not very raised striae. The hinge, which is peculiar, is broadly arched with the cardinals broad and distantly placed, and the laterals almost straight. The muscle scars are not at all impressed, and the pallial line has a shallow sinus. The measurements of the unique shell (in millimetres) are :—
20×19×14.

***Corbicula castanea* Morelet.**

(Pl. VI, figs. 11—13.)

1865. *Corbicula castanea*, Morelet, *Journ. Conchyliol.*, XIII, p. 228.
 1869. *Corbicula castanea*, Prime, *Amer. Journ. Conch.*, V, p. 129.
 1875. *Corbicula castanea*, Morelet, *Sér. Conch.*, IV, p. 362, pl. xv, fig. 4.
 1879. *Corbicula castanea*, Clessin, *Martini u. Chemn. Conch.-Cab.* (n. f.), *Cycladeen*, p. 202.
 1881. *Corbicula striatella*, de Rochebrune (*nec* Deshayes), *Bull. Soc. Philomat. Paris*, (ser. 7) VI, p. 47.
 1887. *Corbicula castanea*, Clessin, *Malakozool. Blätt.* (n. f.), IX, p. 74, pl. iii, fig. 2.
 1891. *Corbicula insularis* and *C. Crosseana*, Morlet (*nec* Prime), *Journ. Conchyliol.*, XXXIX pp. 238, 239.
 1891. *Corbicula subnitens*, Morlet (*nec* Clessin), *Journ. Conchyliol.*, XXXIX, p. 253.
 1891. *Corbicula castanea*, *C. Crosseana*, *C. insularis*, *C. striatella* and *C. subnitens*, Fischer. *Bull. Soc. Autun*, IV, pp. 237-239.
 1904. *Corbicula castanea*, *C. Crosseana*, *C. insularis*, *C. striatella* and *C. subnitens*, Fischer & Dautzenberg, *Mission Pavie, etc.*, III, pp. 441, 442.

Morelet's name of this species is quite inappropriate as all shells are by no means castaneous in colour. His description of the species is also incomplete, and I, therefore, give a fresh description below :—

Species of small size, rather thin-shelled, compressed or only slightly inflated; adult shells almost equilateral, transversely oval; of a lemon-yellow to brown or castaneous colour. Upper margin slightly arched, anterior side shorter than posterior, evenly rounded anteriorly and posteriorly; ventral margin greatly arched; distinct heart-shaped lunule of a darker shade than the rest of the shell; escutcheon not marked; umbones small, hardly prominent, somewhat obtuse and only slightly tumid. Shell surface covered with very regular, prominent ridges. Nymphs short, narrow, almost smooth; ligament prominent, well developed. Hinge normal; anterior lateral somewhat longer and more arched than the posterior. Nacre dull bluish-white to deep violet.

Measurements (in millimetres).

Length		20.5	18.5	17.2	14.5
Maximum height	..	17	16	14.3	12
Thickness	.. ..	11	10.5	8.7	6.7

Description.—The species was first described from Cochin-China and was later recorded from Cambodia. Under the names *C. striatella*, *C. insularis*, *C. crosseana* and *C. subnitens* it was recorded by several authorities from Cambodia, Laos Mountains and Annam. It appears to have a wide distribution in the area under consideration leaving aside Siam and the Malay Peninsula.

Remarks.—I have examined a fair number of specimens identified differently by various authorities from the Dautzenberg Collection, and am of opinion that these were without any justification referred to Indian, Ceylonese, Philippine and the Formosan species. The distinguishing characters of the species are well shown in the photographs reproduced.

Corbicula solidula Prime.

(Pl. VI, figs. 14, 15.)

1861. *Corbicula solidula*, Prime, *Proc. Acad. Nat. Sci. Philadelphia*, XIII, p. 127.
 1864. *Corbicula solidula*, Prime, *Ann. Lyc. Nat. Hist. New York*, VIII, p. 81, fig. 31.
 1869. *Corbicula episcopalis* and *C. solidula*, Prime, *Amer. Journ. Conch.*, V, pp. 131, 136.
 1870. *Corbicula episcopalis*, Prime, *Ann. Lyc. Nat. Hist. New York*, IX, p. 300, fig. 72.
 1878. *Corbicula solidula* and *C. episcopalis*, Clessin, *Martini u. Chemn. Conch.-Cab.* (n. f.), *Cycladen*, pp. 183, 186, pl. xxxii, figs. 4, 14.
 1886. *Corbicula Souverbiana*, Wattebled, *Journ. Conchyliol.*, XXXIV, p. 70, pl. v, fig. 4.
 1887. *Corbicula solidula*, Clessin, *Malakozool. Blätt.* (n. f.), IX, p. 69, pl. ii, fig. 4.
 1891. *Corbicula episcopalis*, *C. Larnaudiei* (nec Prime), *C. solidula* and *C. Souverbiana*, Fischer, *Bull. Soc. Autun*, IV, pp. 237, 239.
 1891. *Corbicula Larnaudiei* (nec Prime) and *C. episcopalis*, Morlet, *Journ. Conchyliol.*, XXXIX, pp. 238, 239.
 1904. *Corbicula episcopalis*, *C. Larnaudiei*, *C. solidula* and *C. Souverbiana*, Fischer & Dautzenberg, *Mission Pavie, etc.*, III, pp. 441, 442.

C. solidula was described by Prime from specimens without any locality, but Clessin referred specimens in the Morelet Collection from Cochin-China to this species. I have, following Clessin, selected with some hesitation *C. solidula* for the name of the species which I figure on plate VI. In the synonymy of this species I have included *C. episcopalis* Prime from Cambodia, and have no doubt that *C. souverbiana* Wattebled is also to be referred to it. Wattebled's description of *C. souverbiana* is very detailed, and it will, therefore, be enough to note only the distinguishing features of the species.

C. solidula is a small-sized species with fairly thick and inflated shells. The umbones are prominent, but almost always eroded and do not show any sculpture. The sculpture of the valves consists of distantly placed, somewhat raised but not very prominent striae. The hinge is normal.

Distribution.—*C. solidula* appears to have a wide range in Cambodia, Cochin-China and Annam.

Remarks.—The species is very variable, and has, as the synonymy given above shows, been described under several names by various authors.

Corbicula gubernatoria Prime.

(Pl. VI, figs. 16—19.)

1869. *Corbicula gubernatoria*, Prime, *Amer. Journ. Conch.*, V, p. 132.
 1870. *Corbicula gubernatoria*, Prime, *Ann. Lyc. Nat. Hist. New York*, IX, p. 298, fig. 71.
 1891. *Corbicula gubernatoria*, Morlet, *Journ. Conchyliol.*, XXXIX, p. 239.
 1891. *Corbicula gubernatoria*, Fischer, *Bull. Soc. Autun*, IV, p. 238.
 1904. *Corbicula gubernatoria*, Fischer & Dautzenberg, *Mission Pavie, etc.*, III, p. 441.

Prime's description of this species is incomplete, and I, therefore, give a new description based on two specimens from the type-locality—Saigon.

Species of small size, thin-shelled, compressed; shells almost equilateral, transversely ovate, of a greenish-brown colour. Upper margin greatly arched, anterior side only slightly longer than posterior; narrowly rounded anteriorly and posteriorly; ventral margin greatly arched; lunule and escutcheon not marked. Umbones small, rounded, not at all prominent, eroded. Shell surface with minute, rather irregular striae, hardly visible to the naked eye; striae on the posterior third of the shell almost obsolete. Nymphs very feebly developed, smooth; ligament narrow, well developed. Hinge normal; lateral teeth subequal, greatly curved; muscle scars hardly impressed. Nacre light violet.

Measurements (in millimetres).

Length	..	..	..	..	..	18	18
Maximum height	..	..	..	..	..	16.3	15.4
Thickness	..	..	..	..	..	10	8.8

Distribution.—I have seen a large series of specimens of *C. gubernatoria* from Saigon, Cambodia, the type-locality of the species.

Remarks.—*C. gubernatoria* is distinguished by its small size, compressed shell and very feebly developed sculpture on the shell valves. A large series of shells of this species was found in the Dautzenberg Collection labelled *C. diminuta*.

***Corbicula lamarckiana* Prime.**

(Pl. VI, figs. 20, 21.)

1864. *Corbicula Lamarckiana* and *C. Linneana*, Prime, *Ann. Lyc. Nat. Hist. New York*, VIII, pp. 68, 70, figs. 16, 17.
1869. *Corbicula Lamarckiana* and *C. Linneana*, Prime, *Amer. Journ. Conch.* V, pp. 132, 133.
1877. *Corbicula lamarckiana*, Nevill, *Journ. Asiat. Soc. Bengal*, XLVI, p. 40.
1878. *Corbicula lamarckiana*, Nevill, *Anat. Zool. Res. Yunnan Exped.*, p. 902.
1878. *Corbicula Lamarckiana*, and *C. Linneana*, Clessin, *Martini u. Chemn. Conch.-Cab.* (n. f.) *Cycladeen*, pp. 170, 171, pl. xxx, figs. 9, 10, 11.
1883. *C. Debriziana*, *C. Fenouilliana* and ? *C. Presseplicata*, Heude, *Conch. Fluv. Nanking et Chine Centrale*, X, pls. iv, v, vii, figs. 23, 24, 42.
1891. *Corbicula Linneana*, Fischer, *Bull. Soc. Autun*, IV, p. 238.
1901. *Corbicula Messageri*, Bavay & Dautzenberg, *Journ. Conchyliol.*, XLIX, p. 9, pl. i, figs. 5-7.
1904. *Corbicula Lamarckiana*, *C. Linneana* and *C. Messageri*, Fischer & Dautzenberg, *Mission Pavie, etc.*, III, pp. 441, 442.
1924. *Corbicula lamarckiana*, Prashad, *Journ. Asiat. Soc., Bengal* (n. s.), XIX, p. 425, pl. xvi, fig. 9.

In addition to the above synonymy probably the specimens recorded as *C. compressa* (Mousson *Mss.*) Deshayes by Morlet¹ from the environments of Chu and Loc Nam are to be referred to this species.

¹ Morlet, L.—*Journ. Conchyliol.*, XXXIV, p. 268 (1886).

Prime's description of this species is apparently drawn up from half-grown shells, and I, therefore, redescribe the species below :—

Species of fair size, moderately thick, transversely oval, of an olive to dark brown colour, young shells much lighter, bright lemon-yellow. Upper slope not greatly curved ; anterior side short, broadly rounded ; posterior side longer than the anterior, rounded anteriorly, truncated posteriorly ; ventral margin regularly but not greatly arched to a point where it meets the truncated posterior side ; young shells compressed, older shells more inflated with the umbones quite prominent, curving forwards and inwards, often eroded. Shell surface with low, regular striae on the younger parts and the umbones, becoming irregular and almost obsolete on the posterior third and on the lower half of the shells ; nymphs narrow, linear, almost smooth ; ligament thick, prominent. Hinge well developed ; teeth normal ; anterior laterals becoming curved by the muscle scars impinging on them ; muscle scars shallow ; pallial line without a sinus. Nacre lilac or bluish, lighter in younger shells.

Measurements (in millimetres).

Length ..	..	26.2	25	24	21	20	16
Maximum height	..	20	19.2	19.7	16	19.5	12
Thickness	..	12	11.6	11	11.4	11.2	7

Distribution.—The species was originally described from the streams of the Laos Mountains in Annam. Later specimens from Yunnan were referred to this species by Nevill, and this was confirmed by me in the paper cited above. I have now examined a fair series of specimens from various localities in the Laos Mountains, Cochin-China, Tonkin and Yunnan, China, and can find no specific differences in them.

Remarks.—In my paper cited above, I had provisionally included some of Heude's species in the synonymy of *C. lamarckiana*, but after an examination of the types or paratypes of most of Heude's species, I find that the synonymy of the species would be as given above and not as suggested in my previous paper. I have also no doubt that *C. linneana* Prime and *C. messengeri* Bavay and Dautzenberg are to be referred to this species. *C. lamarckiana* with its characteristic elongated form and regular sculpture is easily distinguished from other allied species.

Corbicula tenuis Clessin.

(Pl. VI, figs. 22—25.)

1887. *Corbicula tenuis*, Clessin, *Malakozool. Blätt.* (n. f.), IX, p. 72, pl. ii, fig. 7.

1887. *Corbicula cochinchinensis*, Clessin, *ibid.*, p. 73, pl. ii, fig. 8.

1891. *Corbicula Lemoinei*, Morlet, *Journ. Conchyliol.*, XXXIX, p. 253, pl. vii, fig. 5.

1891. *Corbicula cochinchinensis* and *C. tenuis*, Fischer, *Bull. Soc. Autun*, IV, pp. 237, 239.

1904. *Corbicula cochinchinensis*, *C. Lemoinei*, and *C. tenuis*, Fischer & Dautzenberg, *Mission Pavie, etc.*, III, pp. 441, 442.

Clessin described young shells of this species as *C. tenuis* and *C. cochinchinensis* from Cochin-China in 1887, and the species was described by Morlet in 1891 from Annam as *C. lemoinei*. Morlet's description of *C. lemoinei* is fairly complete, and I will only note its distinguishing characters here.

The shells of *C. tenuis* grow to a fair size, and the adult shells are subovate in outline. For its size the species is very thin-shelled, and though somewhat inflated in the umbonal region it is very compressed below. The anterior margin is broad and evenly rounded, while the posterior is usually truncate. The umbones are small, acute and prominent; they are usually eroded in full-grown shells. The shell surface is covered with close, irregular and low ridges; these are almost obsolete and hardly to be distinguished on the posterior third and lower half of the shells. For the size of the shell the hinge is very feebly developed; the cardinal teeth are normal but very weak, while the laterals are short, thin and almost linear or only slightly curved. The muscle scars are hardly impressed. The periostracum is of a brownish colour, and the nacre is dull white to bluish.

Measurements (in millimetres).

Length ..	..	..	32.8	32	29.8	24.5	17.2	14.4
Maximum height ..	..	..	25.4	26.3	23.7	21	14.4	12.5
Thickness ..	..	..	14.3	14.2	13.2	10.5	7.6	6.4

Distribution.—As noted above the species is found in both Cochin-China and Annam.

Remarks.—*C. tenuis* is a very characteristic species. Its thin shell, poorly developed hinge and irregular sculpture distinguish it from all species found in Cochin-China and Annam.

***Corbicula blandiana* Prime.**

(Pl. VI, figs. 26, 27.)

1864. *Corbicula Blandiana*, Prime, *Ann. Lyc. Nat. Hist. New York*, VIII, p. 71, fig. 18.

1869. *Corbicula Blandiana*, Prime, *Amer. Journ. Conch.*, V, p. 129.

1878. *Corbicula Blandiana*, Clessin, *Martini u. Chemn. Conch.-Cab.* (n. f.), *Cycladeen*, p. 171, pl. xxx, figs. 12, 13.

1891. *Corbicula Blandiana*, Fischer, *Bull. Soc. Autun*, IV, p. 237.

1904. *Corbicula Blandiana*, Fischer & Dautzenberg, *Mission Pavie, etc.*, III, p. 441.

Prime's description of *C. blandiana* is fairly complete, but his figure of the type-shell is very misleading, and except for the outline hardly shows the distinguishing features of the species. I reproduce photographs of some shells on Plate VI, and give below the main characteristics of the species.

The young shells are equilateral, trigonal, and have the anterior and posterior sides rounded with the ventral margin greatly arched. In the adult shells the anterior side is longer than the posterior and appears almost straight, while the posterior is distinctly arched. The posterior margin of the adult shells is also more obtuse than the anterior and is more broadly rounded. The shell sculpture consists of regular, sharp and distantly placed ribs; the interspaces between the ribs are more than twice as broad as the ribs themselves. Young shells are yellowish, while the adults are usually of a dirty olive brown colour. The nacre is dirty white with traces of violet in it.

Measurements (in millimetres).

Length ..	..	..	17	15.6	15.5	14.8	14.5	11
Maximum height ..	..	..	16.4	14.8	14.4	14	13.2	10
Thickness ..	..	..	11.6	10.7	10.3	10	9.8	7

Distribution.—Prime gave the habitat of the type-specimen as Laos. I have seen a fair series of shells from the valleys of Sé Sam and Sé Bangkam, Laos Mountains collected by Dugast.

Remarks.—A series in the Dautzenberg Collection was labelled *C. variegata* Heude, but apparently these are not the shells which were recorded by Morlet under this name from the environments of Chu and Loc Nam, Tonkin, and for which Fischer proposed the new name *C. vespertina*; these latter, as is discussed already (see p. 37), are to be referred to *C. bocourti* Morelet. The species is of small size and is easily distinguished by its characteristic sculpture.

Corbicula leviuscula Prime.

(Pl. VI, figs. 28, 29.)

1864. *Corbicula leviuscula*, Prime, *Ann. Lyc. Nat. Hist. New York*, VIII, p. 64, fig. 9.

1869. *Corbicula leviuscula*, Prime, *Amer. Journ. Conch.*, V, p. 132.

1876. *Corbicula laeviuscula* (*sic*), Crosse & Fischer, *Journ. Conchyliol.*, XXIV, p. 334.

1877. *Corbicula leviuscula*, Clessin, *Martini u. Chemn. Conch.-Cab.* (n. f.), *Cycladeen*, p. 136, pl. xxiv, figs. 12, 13.

1891. *Corbicula laeviuscula* (*sic*), Fischer, *Bull. Soc. Autun*, IV, p. 238.

1904. *Corbicula laeviuscula* (*sic*), Fischer & Dautzenberg, *Mission Pavie, etc.*, III, p. 441.

Prime's description of this species is fairly complete, and it is not necessary to redescribe it beyond noting a few outstanding features of the species. The anterior side in the shells which I have examined is not so greatly produced as is shown in Prime's figure. The sculpture consists of minute and very regular striae covering the entire surface of the shells. The shells are not greatly inflated, and are rather thin. The ligament is prominent, and the nymphs are narrow and almost smooth. The specimens vary in colour from yellowish to dark brown, and the nacre is bluish-white to lilac.

Distribution.—Prime gives the distribution of this species as Cochin-China. The specimens which I have examined are from Nghia-Yen, Ha-Tinh Province, Annam, and Long Xuyen, Hué.

Remarks.—Prime's comparison of this species with *C. difficilis* Prime from ? North Africa is rather far fetched. It appears to be allied to *C. lamarckiana* Prime from Laos, Cambodia and China, and to *C. striatella* Deshayes from India.

Corbicula dautzenbergi, sp. nov.

(Pl. VI, figs. 30, 31.)

Shell comparatively thin, of small size, greatly compressed, ovate, of a reddish-yellow colour. Upper margin short; anterior side short, broadly rounded or even truncate; posterior markedly truncate; lower margin greatly arched. Umbones sub-central, hardly prominent and only slightly inflated; no distinct lunule or escutcheon. Shell surface very finely striate, striae very minute and regular, just visible to the naked eye. Hinge feebly developed, hinge-teeth normal. Nymphs very narrow, almost linear, smooth. Muscle

scars very shallow, not at all impressed ; pallial line without any sinus. Interior of shells dull white.

Measurements (in millimetres).

		Holotype.					
Length		17	17	16.8	16.4	16.2	13.6
Maximum height .. ..	.. ..	13.8	13.3	13.2	13.1	13	11
Thickness		7	7.1	7	7	7	6.1

Holotype.—No. M. $\frac{12839}{2}$ in the collection of the Zoological Survey of India (Indian Museum), Calcutta. Paratypes in the Dautzenberg Collection, and in the British Museum (Natural History), London.

Distribution.—I have had before me a good series of shells of this species from Trinh Tuong, Annam, and a few shells from near Hué, Annam.

Remarks.—The species, which I have associated with the name of the distinguished conchologist Monsieur P. Dautzenberg of Paris, is quite distinct from any other species of the genus from the area. In sculpture and to some extent in form the shells resemble *C. bensoni* Deshayes from India.

***Corbicula luteola*, sp. nov.**

(Pl. VI, fig. 32.)

Shell rather large, not very thick and rather delicate for its size ; young shells almost equilateral, subtrigonal ; older shells becoming more inequilateral, oblique and oval-trigonal. Young shells lemon-yellow with a trace of lilac on the umbonal region, older full-grown specimens dirty yellow with whitish eroded umbones. Upper margin arched, more so posteriorly than anteriorly, anterior side broadly rounded, posterior subtruncate ; ventral margin greatly arched. The ribbing on the shell surface very delicate, almost obsolete on the umbones, on the other parts appearing as very minute, closely placed regular striae, a little more prominent on the anterior margin. Shell rather depressed except in the region of the umbones, where it is a little swollen ; umbones rather small but tumid, acute, curving inwards and forwards, and almost meeting in the middle line ; lunule and escutcheon not definitely marked ; nymphs fairly long but narrow, almost smooth ; ligament moderately broad and thick, not very prominent ; hinge-teeth feebly developed but normal, laterals short, thin, almost linear, very finely serrated. Nacre polished white.

Measurements (in millimetres).

		Holotype.					
Length		38	35	34.8	26.8	24	
Maximum height .. ..	.. ..	..	35.6	32.4	31.6	22.2	21.6
Thickness .. ..		..	21.4	20.6	19.8	15	14.6

Holotype.—No. M. $\frac{12838}{2}$ in the collection of the Zoological Survey of India (Indian Museum), Calcutta. Paratypes in Monsieur Dautzenberg's collection, Paris, and in the British Museum (Natural History), London.

Distribution.—All the specimens I have seen are from Haiphong or Hai-fong, Tonking, and were collected by Dorr in 1892.

Remarks.—The species is closely allied to *C. luteola* Morelet¹ from China, but differs in outline, shape and sculpture, and the shell being more inflated ; the hinge is also different.

¹ Morelet, A.—*Rev. Mag. Zool.* (ser. ii), XIV, p. 481 (1862) ; also see Prime, T.—*Ann. Lyc. Nat. Hist. New York*, VIII, p. 61, fig. 6 (1864).