

Subgenus *MONSMIRABILIA* APOSTOLESCU, 1955.

TYPE SPECIES *Monsmirabilia subovata* APOSTOLESCU, 1955.

Cuneocythere (*Monsmirabilia*) *subovata* APOSTOLESCU, 1955.

Pl. XI, figs. 3-5.

Bairdia perforata, BOSQUET (pars) (non ROEMER), 1852, vol. 24, p. 24, pl. 1, fig. 8.

Monsmirabilia perforata (BOSQUET), APOSTOLESCU, 1955, p. 256, pl. 1, fig. 8.

Monsmirabilia subovata APOSTOLESCU nom. nov., 1955 a, p. 327.

Distribution. — Belgium: Upper Ypresian of Forest (Brussels); Lutetian of Braine-l'Alleud; Ledian of Bambrugge, Forest (Brussels), Meldert and Balegem, probable Ledian of the boring Heist-op-den-Berg; Bartonian of the borings Heist-op-den-Berg and Brussegem. France: Lutetian of Damery and Montmirail (BOSQUET), Neauphlette, Villiers-Saint-Frédéric, Neauphle-le-Château. Netherlands: Bartonian of the boring Delden.

Diagnosis. — A species of the subgenus *Monsmirabilia* with the following characteristics: outline ovate to subtriangular; surface pitted; females strongly swollen postero-dorsally; carapace ovate in dorsal view.

Description. — Sexual dimorphism is distinct. The females are thick-set and swollen postero-dorsally. The males are more elongate.

The outline of the female left valve is ovate to subtriangular, highest just behind the middle. The dorsal outline is obtusely angled to evenly arched, the anterior and posterior ends are broadly rounded, the ventral outline is straight to slightly convex. The right valve is much lower than the left one. It has a less curved dorsal outline and a more narrowly rounded postero-ventral end.

The male carapace is larger and more elongate.

In dorsal view the female carapace is broadly swollen behind the middle; the male carapace is elongate-oval.

The surface is covered with pits. An inconspicuous ridge may be present along the anterior margin.

The internal features are as for the genus. The hinge-teeth of the left valve are pronounced.

Dimensions. — Female left valve: L: 0,69, H: 0,46, $\frac{1}{2}$ W: 0,24.

Remarks. — *Cuneocythere subovata* shows some resemblance to *C. oblonga*, for instance in the punctation. *C. oblonga* is more elongate and has an angled posterior end, the ventral part of which is fringed with marginal spines. Moreover, *C. subovata* lacks a compressed postero-ventral zone, as is found in *C. oblonga*.

Cuneocythere (*Monsmirabilia*) *oblonga* APOSTOLESCU.

Pl. IX, figs. 5-7.

Bairdia subradiosa, BOSQUET (non ROEMER), 1852, vol. 24, p. 22, pl. 1, fig. 6.

Bairdia perforata, BOSQUET (pars) (non ROEMER), 1852, vol. 24, p. 24, pl. 1, fig. 8.

Monsmirabilia subradiosa, BOSQUET (non ROEMER), APOSTOLESCU, 1955, p. 257, pl. 4, fig. 56, 57.

Monsmirabilia oblonga nov. nom., APOSTOLESCU, 1955 a, p. 327.

Distribution. — Belgium: Ledian of Forest, Assse, Meldert, Bambrugge, Vlierzele, Balegem and Gent; Bartonian of boring Brussegem. Netherlands: Bartonian of

the boring Delden. France : Upper Ypresian of Cuise-Lamotte; Lutetian of Chaméry, Châteaurouge, Chaumont, Courtagnon, Ferme de l'Orme, Grignon, Parnes, Saint-Félix, Le Vivray, Damery, Montmirail, Gomerfontaine, Neauphlette, Villiers-Saint-Frédéric, Neauphle-le-Château.

Diagnosis. — A species of the subgenus *Monsmirabilia* with the following characteristics : surface smooth or pitted; dorsal margin of the left valve with obtuse angle in the middle; right valve with denticulate postero-ventral flange; compressed zone along the posterior margin.

Description. — The left valve has a dorsal margin with an obtuse angle in the middle. The anterior margin is broadly rounded, while the ventral margin is straight or slightly convex. The posterior margin is broadly rounded, bordered by a narrow compressed zone. The right valve is much lower and more elongate than the left one. It has a straight or slightly convex dorsal margin, a broadly rounded anterior margin and a ventral margin which is concave in the middle. The posterior margin has an obtuse angle in the middle, and a broad compressed postero-ventral zone. Often there is a narrow marginal rim along its anterior margin. Along the postero-ventral margin of the right valve there are often about ten, short, rounded marginal spines.

Seen in dorsal view the greatest width is found behind the middle; the width diminishes rapidly towards the posterior end.

The surface is covered with widely spaced fine pits.

The marginal area is moderately broad along the anterior margin, but rather narrow along the ventral and posterior margins. There are sometimes very shallow anterior and posterior vestibules. Numerous, closely spaced, curved radial pore-canals perforate the anterior and posterior duplicature. In the postero-ventral region the selvage and the flange of the right valve are widely apart.

The muscle-scar consists of a posterior row of four scars with one kidney-shaped scar in front of them. Below this single scar, but near the ventral inner margin, lies another scar. Three more were found above the central muscle-scar. The whole scar lies before the middle of the valve.

In the posterior half of the valve, two or three, straight and obliquely placed grooves run from the muscle-scar region to the inner margin.

The hinge of the right valve consists of three ridges with two grooves in between. The middle ridge branches off from the upper ridge, but coalesces with it after some distance. The lower groove ends in an anterior shallow, terminal depression. The lower ridge ends in a knoblike elevation, situated antero-ventrally of the anterior depression. The hinge of the left valve consists of a ridge, formed by the selvage, with an accommodation groove above it. At the anterior cardinal angle a tooth-like elevation is situated on the selvage.

Dimensions. — Right valve L : 1,00, H : 0,51, $\frac{1}{2}$ W : 0,24; left valve L : 1,04, H : 0,59, $\frac{1}{2}$ W : 0,29.

Remarks. — *Cuneocythere oblonga* stands quite apart from the other species of this genus, by its outline, its finely pitted or smooth surface and the possession of a compressed zone along the posterior margin.

The straight grooves, found in the posterior half of the interior of both valves of *C. oblonga*, are certainly a reflection of some anatomical feature of the animal, but their exact meaning is unknown.

Cuneocythere (Monsmirabilia) foveolata (Bosquet).

Pl. IX, figs. 8-11.

Bairdia foveolata BOSQUET, 1852, vol. 24, p. 21, pl. 1, fig. 5.*Monsmirabilia foveolata* (BOSQUET), APOSTOLESCU, 1955, p. 256, pl. 3, fig. 49-51.

Distribution. — Belgium : Ledian of Balegem, Forest, Asse, Vlierzele, and Lambrugge, and probable Ledian of boring Heist-op-den-Berg; Bartonian of Oedelem, Heizel and the borings Brussegem and Heist-op-den-Berg. Netherlands : Bartonian of the boring Delden. France : Lutetian of Grignon, Saint-Félix, Parnes, Châteaurouge, Ferme de l'Orme, Chaumont, Chaméry, Le Vivray, Damery, Montmirail, Courtagnon (coll. BOSQUET, No. 7b); Louchy-le-Châtel, Gomerfontaine, Montmirail, Villiers-Saint-Frédéric, Neauphle-le-Château (APOSTOLESCU).

Remarks. — This species was described by BOSQUET from the Auversian (= Ledian) of Auvers. The original material got lost and no material from the type-locality could be obtained. For this reason no neotype could be chosen. We found many carapaces and detached valves in the Upper Eocene of Belgium. It looks likely that BOSQUET figured a male specimen. The females are much higher and more triangular. They have a strong swelling in their postero-dorsal region. The ornamentation consists of coarse rounded or angular depressions, covering the entire surface of the valves.

This species was often found together with the much larger, and smooth or finely pitted *C. oblonga*.

Cuneocythere (Monsmirabilia) triebeli n. sp.

Pl. IX, figs. 1-4.

Etymology : Named after Dr. E. TRIEBEL, Frankfurt, the author of many valuable contributions to the study of Ostracoda.

Holotype : A complete carapace (S 2052).

Paratypes : 16 complete carapaces and 5 detached valves (S 2053-2060, 2714, 2815).

Type-locality : Hyon (MMV 80) near Mons, Belgium.

Type-level : Upper Ypresian.

Distribution. — Belgium : Upper Ypresian of Hyon and Forest (Brussels); Lutetian of Saint-Job (Brussels) and Godarville; Bartonian of Oedelem and the boring Heist-op-den-Berg. Netherlands : Bartonian of the boring Delden. England : Ledian of Whitecliff bay, Wight (*Nummulites variolarius* zone).

Diagnosis. — A species belonging to the subgenus *Monsmirabilia* with the following characteristics : ventral margin convex, dorsal margin without distinct cardinal angles; with curved, shallow furrow below eye-tubercle; marginal rim along anterior and postero-ventral margins of right valve.

Description. — Sexual dimorphism is distinct. Short, high and wide specimens are more numerous than long, low and narrow ones. The first form probably belonged to the female, the second to the male.

The outline of the female carapace is egg-shaped. The anterior margin is broadly rounded. The ventral margin is convex; the dorsal margin is slightly convex or straight. The cardinal angles are very broadly rounded in both valves. The posterior margin merges gradually into the dorsal and ventral margins; it is broadly rounded below the middle. The male carapace is different by its longer dorsal margin, which is almost straight.

In dorsal view the carapace is more or less lozenge-shaped and asymmetrical. In the anterior part the left valve is wider than the right one. The female carapace is widest behind the middle; that of the males just at the middle.

The surface of the valves is finely pitted. Along the anterior and postero-ventral margins of the right valve runs a marginal rim, formed by the flange. Below the anterior cardinal angle lies a low, elongate elevation of the eye-tubercle. A rather broad, curved, shallow furrow runs downwards from this eye-tubercle.

The marginal area is very broad anteriorly and postero-ventrally. The inner margin coincides with the line of concrescence. A great number of long closely spaced and curved radial pore-canals perforate the anterior and posterior duplicatures. Close to their external end these canals have an elongate dilation.

The muscle-scar is as for the genus.

The hinge of the right valve consists of a smooth ridge. Near the anterior cardinal angle this ridge possesses a very low, elongate elevation suggesting a tooth. The hinge of the left valve consists of a groove of which the anterior end is somewhat deeper, to fit the tooth-like elevation of the bar of the right valve.

Dimensions. — Holotype (female carapace) : L : 0,56, H : 0,37, W : 0,26.

Remarks. — This species stands quite apart from the other Eocene members of this subgenus in its egg-shaped outline.

SUBFAMILY CYTHERIDEIDINAE PURI, 1952.

Genus HEMICYTHERIDEIS RUGGIERI, 1952.

TYPE SPECIES *Cytheridea elongata* BRADY, 1868.

Diagnosis. — Carapace elongate, cylindrical; left valve slightly overlaps the right one ventrally; surface smooth, pitted, reticulate or with ridges. Marginal area moderately broad, radial pore-canals fairly numerous, simple or bifurcating, with anterior and posterior vestibules. Muscle-scar with posterior row of four scars and a single kidney-shaped scar in front. Hinge of the right valve with short median groove and a knob-like tooth behind it.

Range : Jurassic (?) to recent.

Hemicytherideis curvata (BOSQUET).

Pl. VI, figs. 13-15.

Bairdia curvata BOSQUET, 1852, vol. 24, p. 35, pl. 2, fig. 2.

Hemicytherideis curvata (BOSQUET), KEIJ, 1955, vol. 21, n° 2, p. 122, pl. 18, fig. 14-15.

Lectotype : A right valve (coll. BOSQUET, No. 16).

Paratypes : 27 detached valves and 18 complete carapaces (coll. BOSQUET, No. 16).

Locus-typicus-restrictus : Léognan, France.

Type-level : Lower Miocene.

Distribution. — France : Aquitaine Basin : Léognan, Dax und Mérignac, according to BOSQUET; Aquitanian of Labrède, Moulin de Bernachon, Moulin de Gamachot and Moulin de Fortis; Burdigalian of Moulin Danay, Moulin de l'Église, Moulin de Brisson, Gieux, Moulin de Lagus, Le Coquillat and Pont-Pourquey : Helvetian of La Sime, Cazenave and Le Minoy.

Diagnosis. — A species of the genus *Hemicytherideis* with the following characteristics : Carapace very long and slender, highest at anterior cardinal angle; commonly with slightly concave ventral margin; with narrow compressed zone postero-ventrally.

Description. — The dorsal margin is long and almost straight. It slopes very slightly backwards from the anterior cardinal angle. The anterior margin is obliquely rounded. The ventral margin is concave. The posterior margin is broadly or obliquely rounded in the left valve. In the right valve it is drawn-out ventrally.

The surface is smooth with few very small pits. Immature specimens have the ventral surface slightly striated. A small zone along the postero-ventral margin is compressed.

In dorsal view the carapace has nearly parallel sides. The anterior end is obtusely pointed, while the posterior end is triangular. The valves are of almost equal size, the left valve being slightly larger than the right one.

There is an anterior, irregularly shaped vestibule, sometimes only consisting of extremely broadened radial pore canals.

Hinge, muscle-scar and selvage are as for the genus.

Dimensions. — Lectotype (right valve) : L : 0,96, H : 0,38, $\frac{1}{2}$ W : 20.

Remarks. — BOSQUET's material from the Neogene of Antwerp got lost.

***Hemicytherideis grosjeani* n. sp.**

Pl. VII, figs. 3-5.

Etymology : Named after Mr. A. GROSJEAN, Director of the Geological Survey of Belgium.

Holotype : A right valve (S 1976).

Paratypoids : Some 80 detached valves and a dozen of complete carapaces (S 1977-1986).

Type-locality : Stadium of Forest (BD 391), Belgium.

Type-level : Lutetian.

Distribution. — Belgium : Lutetian of Diegem, Forest, Saint-Job (Brussels), Bertange, Genappe and Braine-l'Alleud, and in the basal layer of the Ledian at Forest (Brussels).

Diagnosis. — A species of the genus *Hemicytherideis* with the following characteristics: males approximately 2,5 times as long as high; females approximately 2,3 times as long as high; dorsal margin evenly arched, anterior margin drawn-out ventrally and narrowly rounded; surface with widely scattered shallow pits; right valve with wide postero-ventral flange.

Description. — Sexual dimorphism is distinct. The females are 2,3 times higher than long, the males 2,5 times.

The dorsal margin is evenly arched, somewhat more strongly so in the females than in the males. The anterior margin is drawn-out ventrally and narrowly rounded, and sometimes faintly lobed. The ventral margin is in most cases concave, but sometimes almost straight. The posterior margin is obliquely rounded, broadly so in the left valve and narrowly in the right one.

The left valve overlaps the right one antero-dorsally and ventrally to a slight extent.

The flange along the anterior and ventral margin is very narrow. The postero-ventral angle of the right valve is formed by a wide, hollow flange.

The surface is covered with widely scattered pits. Sometimes a faint indication of concentric striation was observed along the anterior margin.

The anterior vestibule is deep and triangular. Some 20 straight or slightly curved, simple radial pore-canals were observed along the anterior margin. Some 25 are situated along the ventral margin and some 7 along the postero-ventral margin.

Hinge and muscle-scar are as for the genus.

Dimensions. — Holotype (male right valve): L : 0,77, H : 0,31, $\frac{1}{2}W$: 0,14; paratypoid (female right valve): L : 0,71, H : 0,31, $\frac{1}{2}W$: 0,16.

Remarks. — A closely resembling species is *Cytherideis byramensis* HOWE (1936, p. 67, pl. 4, fig. 30, pl. 5, fig. 29) from the Oligocene of Louisiana, which has a marked posterior cardinal angle, lacking in our species. Moreover, the length/height ratio is greater for the American species, (approximately 2,9) than for the Belgian species (2,3-2,6).

***Hemicytherideis lithodomoides* (BOSQUET).**

Pl. VII, fig. 1.

Bairdia lithodomoides BOSQUET, 1852, vol. 24, p. 36, pl. 2, fig. 3.

Lectotype: A right valve (coll. BOSQUET, No. 17c).

Paratypoids: Some 20 detached valves and one complete carapace (coll. BOSQUET, No. 17b, c).

Type-locality: Berg near Kleine-Spouwen, Belgium.

Type-level: *Nucula comta*-clay (= Rupelian).

Distribution. — Belgium: Rupelian of Kleine-Spouwen and Bilzen-Katteberg. France: Paris Basin: Oligocene of Jeurre and Etréchy (coll. BOSQUET, No. 17b).

Diagnosis. — A species of the genus *Hemicytherideis* with the following characteristics: anterior end strongly drawn-out; surface ornamented with concentric ridges parallel to anterior and ventral margins.

Description. — The dorsal margin is straight in the hinter part and curved in its anterior part. It merges gradually into the long straight dorsal part of the strongly drawn-out anterior margin, which is narrowly rounded antero-ventrally. The ventral margin is concave in the middle. The posterior margin is slightly to strongly convex. In the right valve it is narrowly rounded postero-ventrally; in the left valve this part is more broadly rounded.

The left valve overlaps the right one very slightly along the ventral margin.

The surface is ornamented with, sometimes undulating, concentric ridges, parallel to the anterior and ventral margins. The remainder of the surface is smooth with a few shallow pits.

The internal characters are as for the genus.

Dimensions. — Lectotype (right valve) : L : 0,83, H : 0,33, $\frac{1}{2}$ W : 0,15

Remarks. — The material of BOSQUET from the Lutetian of Ferme de l'Orme and the Miocene of Dax got lost.

Hemicytherideis mayeri (HOWE and GARRETT).

Pl. VI, fig. 12.

Cytherocypris (?) *mayeri* HOWE and GARRETT, 1934, p. 29, pl. 1, fig. 8-10.

Pestoleberis mayeri (HOWE and GARRETT), SCHMIDT, 1948, p. 410, pl. 63, fig. 10.

Cytherideis mayeri (HOWE and GARRETT), CHEETHAM, 1952, p. 944, textfig. 7.

Cytherideis neauphlensis APOSTOLESU, 1955, p. 265, pl. 6, fig. 98, 99.

Distribution. — Belgium : Upper Ypresian-Bartonian. France : Lutetian of the Paris Basin. United States : Eocene.

Remarks. — Our specimens are markedly reticulate, with a bifid sulcus, that descends from the dorsal margin. Sometimes only one of the branches of the sulcus is present, the other is lacking or very shallow. The anterior margin is denticulate.

Genus *NEOCYTHERIDEIS* PURI, 1952.

TYPE SPECIES *Neocytherideis elongatus* PURI, 1952.

Diagnosis. — Carapace elongate, cylindrical, surface smooth or pitted, left valve strongly overlaps the right one ventrally. Internal features like *Hemicytherideis*.

Range : Miocene to recent.

Neocytherideis linearis (ROEMER).

Pl. VII, fig. 2.

Cytherina linearis ROEMER, 1838, p. 517, pl. 6, fig. 19.

Bairdia linearis (ROEMER), BOSQUET, 1852, vol. 24, p. 34, pl. 2, fig. 1.

Cytherideis linearis (ROEMER), KEIJ, 1955, vol. 21, n° 2, p. 122, pl. 18, fig. 17.

Distribution. — France : Lower Miocene of the Aquitaine Basin. Italy : Pliocene or Pleistocene of Sicily.

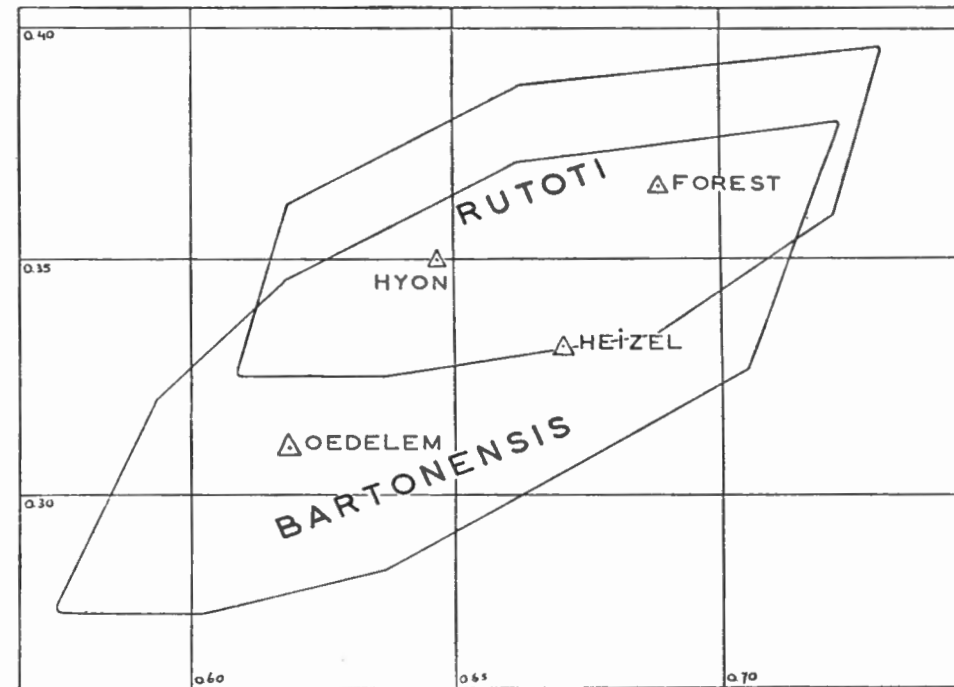
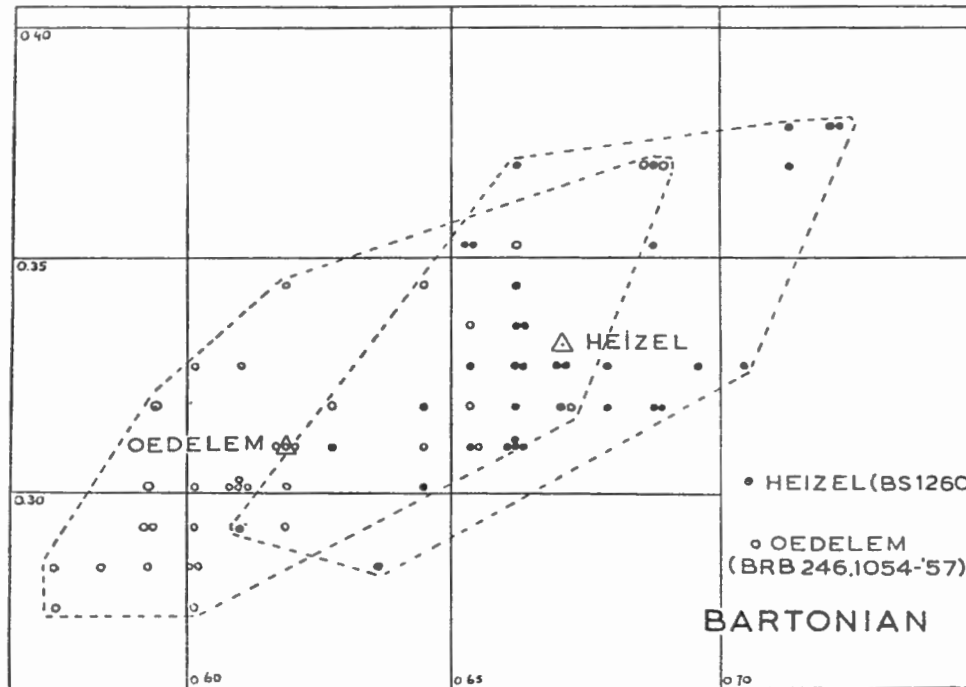
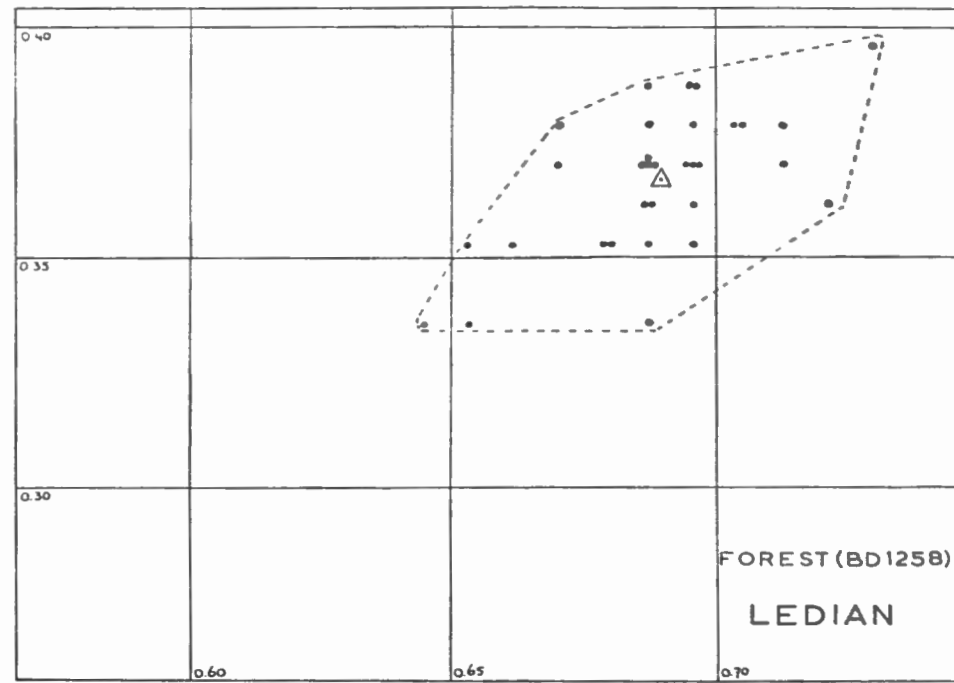
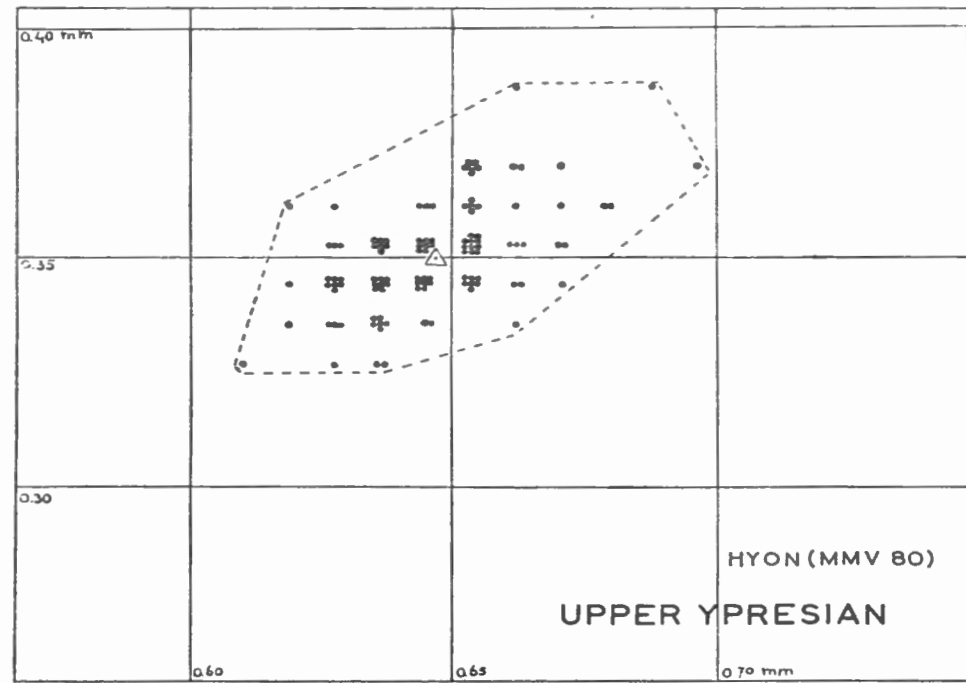


FIG. 9. — Diagrams of length and height measurements of *Krithe rutoti* and *Krithe bartonensis*.

Genus KRITHE BRADY, CROSSKEY and ROBERTSON, 1874.

TYPE SPECIES *Cythere* (*Cytherideis*) *bartonensis* JONES, 1857.

Diagnosis. — Carapace ovate or elongate, generally angled postero-ventrally. In dorsal view with rounded or incised posterior end. Surface smooth. Anterior vestibule large, generally with narrowed entrance. Radial pore-canals moderately numerous, rather widely spaced. Hinge of the left valve consists of a smooth groove, bordered ventrally by a prominent smooth ridge; right valve fits with dorsal edge into this groove. Muscle-scar consists of vertical, posterior row of four scars, with a single scar in front of the top of the row, and a single scar in front of the base of the row.

Range : Cretaceous to recent.

***Krithe bartonensis* (JONES).**

Pl. VIII, figs. 11-17.

Cythere (*Cytherideis*) *bartonensis* JONES, 1857, p. 50, pl. 5, fig. 2-3.

Distribution. — Belgium : Bartonian. Netherlands : Bartonian. England : Bartonian.

Remarks. — We had single carapaces of a male and a female, derived from the Barton clay at Barton, type-locality of *Krithe bartonensis*. This species is evidently characterized by its almost parallel dorsal and ventral margins, and when seen in dorsal view, by its rounded posterior end.

In the Bartonian deposits of Belgium and the Netherlands numerous specimens were found which belong to this species. Generally the dorsal and ventral margins are not so straight as those of the English carapaces. This is especially true of the specimens from the sands of Wemmel (loc. Heizel); the females in particular are more convex than the one from the type-locality.

Length and height were measured of all complete carapaces and detached left valves (since the left valve is larger than the right one, the values for left valves are comparable with those found for complete carapaces) of some localities. In this way a sample from the sand of Heizel and one from the clay of Oedelem were measured. The mean length and height of the individuals of Heizel are : L : 0,67, H : 0,33, and for those of Oedelem; L : 0,62, H : 0,31 respectively. The mean length/height ratio for the specimens of Heizel is $2,04 \pm 0,020$ (35 individuals), that for those of Oedelem $2,01 \pm 0,016$ (35 individuals). The length/height ratio for the single carapaces of Barton are : female 1,9, male : 2,2 (see textfig. 9).

***Krithe papillosa* (BOSQUET).**

Pl. VIII, figs. 1-4.

Cytheridea papillosa BOSQUET (pars), 1852, vol. 24, p. 42, pl. 2, fig. 3.

Krithe papillosa (BOSQUET), KEIJ, 1955, vol. 21, n° 2, p. 115, pl. 17, fig- 11.13.

Lectotype : A right valve (coll. BOSQUET, No. 19).

Paratypes : 25 complete carapaces and 48 detached valves (coll. BOSQUET, No. 19).

Locus-typicus-restrictus : Léognan, Aquitaine, France.

Type-level : Lower Miocene.

Distribution. — France : Aquitaine Basin : Stampian of Cambes; Aquitainian of Labrède, Laricy and Moulin de Gamachot; Burdigalian of Moulin de Brisson, Moulin de l'Église, Moulin Danay, Moulin de Lagus, Gieux, Pont-Pourquey, Pont de Léognan and Le Coquillat.

Diagnosis. — A species belonging to the genus *Krithe* with the following characteristics : dorsal margin arched, with greatest height near posterior cardinal angle; obtusely pointed postero-ventrally; anterior vestibule with narrow entrance; complete carapace in dorsal view rounded posteriorly.

Description. — The dorsal margin is evenly arched and merges gradually into the anterior and posterior margins. The anterior margin is broadly rounded. The ventral margin is slightly concave, but sometimes straight in the left valve. The posterior margin has the form of a circle-quadrant and it meets the ventral margin at about a right angle, which is rounded off.

The surface is smooth.

The anterior vestibule has a narrowed entrance. Some 13 simple or bifurcating radial pore-canals run between the vestibule and the anterior margin. Three long and straight radial pore-canals are situated along the ventral margin. There is a small posterior vestibule in the postero-ventral corner with some six radial pore-canals.

The hinge and muscle-scar are as for the genus.

Dimensions. — Lectotype (male right valve) : L : 0,82, H : 0,36, $\frac{1}{2}$ W : 0,19; paratypoid (female right valve) : L : 0,79, H : 0,38, $\frac{1}{2}$ W : 0,19.

Remarks. — The specimens described by BOSQUET as *Cytheridea papillosa*, from the Lutetian of the Paris Basin are not conspecific with his specimens from the Miocene of the Aquitaine Basin. The lectotype of *Krithe papillosa* was chosen among the Miocene specimens; the remaining Eocene individuals belong to *Krithe rutoti* n. sp. Both species have many features in common, but they differ in outline. The females of *K. rutoti* are much shorter and more thick-set than the females of *K. papillosa*. The ventral margin of *K. rutoti* is mostly straight, while that of *K. papillosa* is generally concave.

***Krithe pernoides* (BORNEMANN).**

Pl. VI, fig. 11.

Bairdia pernoides BORNEMANN, 1855, vol. 7, p. 358, pl. 20, fig. 7, 8 (?).

Krithe pernoides (BORNEMANN), KUIPER 1918, p. 36, pl. 1, fig. 12; VAN DEN BOLD, 1946, p. 77, pl. 4, fig. 19.

Distribution. — Belgium : Rupelian (Boom-clay). Netherlands : Rupelian. Germany : Rupelian. Cuba : Oligo-Miocene.

***Krithe rutoti* n. sp.**

Pl. VIII, figs. 5-10.

Cytheridea papillosa, BOSQUET (pars), 1852, vol. 24, p. 42.

Krithe bartonensis, APOSTOLESCU (non JONES), 1955, p. 266, pl. 6, fig. 100, 101.

Etymology : Named after the late Mr. A. RUTOT, Belgian geologist.

Holotype : A left valve (S 1940).

Paratypes : 150 complete carapaces and 220 detached valves (coll. BOSQUET, No. 19b and S 1941-1963, 2814, 2854, 2860, 2901).

Type-locality : Mont-Saint-Aubert (DH 1210), Belgium.

Type-level : Upper Ypresian.

Distribution. — Belgium : Upper Ypresian of Frasnes-lez-Buissenal, Mont-Saint-Aubert, Hyon, Forest (Brussels), Maulde, Luingne; Lutetian of Godarville; Ledian of Forest, Bambrugge, Asse, Meldert, Vlierzele, Gent and Balegem. France : Upper Ypresian of Cuise-Lamotte and Ménilmontant; Lutetian of Châteaurouge, Parnes, Chaumont, Grignon, Saint-Félix, Chaméry, Courtagnon, Mouchy-le-Châtel, Chaussy, Damery, Neauphlette, Villiers-Saint-Frédéric, Neauphle-le-Château. England : Upper Bracklesham beds of Whitecliff bay, Wight.

Diagnosis. — A species of the genus *Krithe* with the following characteristics : mean length/height ratio about 1,85; posterior end rounded when seen in dorsal view.

Description. — Sexual dimorphism is pronounced. The female carapace is shorter and more thick-set than that of the male.

The dorsal margin is evenly arched, gradually merging into the anterior and posterior margins. The anterior margin is broadly rounded. The ventral margin is straight or slightly convex in the left valve; straight to concave in the right valve. The posterior margin is convex, meeting the ventral margin at right angles and forming a narrowly rounded postero-ventral end.

The surface is smooth.

The anterior vestibule is moderately large with a narrow entrance. There are 12 or 13 simple, straight or curved, anterior radial pore-canals, some 6 more are situated postero-ventrally.

The hinge and the muscle-scar are as for the genus.

Dimensions. — Holotype (female left valve) : L : 0,66, H : 0,37, $\frac{1}{2}$ W : 0,22.

Remarks. — This species is clearly related to *Krithe bartonensis* (JONES) as delimited above. Especially the Ledian specimens have much in common with the individuals of *K. bartonensis* derived from sandy deposits. *K. rutoti* and *K. bartonensis* are distinguishable from one another by the mean length/height ratios of their populations. This ratio was found to amount to $1,85 \pm 0,002$ (for 111 specimens) for a sample from the Upper Ypresian of Hyon (MMV 80) and $1,88 \pm 0,011$ (for 32 specimens) for a sample from the Ledian of Forest (Brussels) (BD 1258). *K. bartonensis* has a ratio of slightly more than 2,0. Moreover, specimens of *K. rutoti* are mostly more convex dorsally than individuals of *K. bartonensis*.

K. rutoti is different from *K. papillosa* (BOSQUET) in outline of the right valve : specimens of the latter species have a much more concave ventral margin. The sexual dimorphism of *K. papillosa* is less apparent than in *K. rutoti*.

SUBFAMILY EUCYTHERINAE PURI, 1954.

Genus EUCYTHERE BRADY, 1868.

TYPE SPECIES *Cythere declivis* NORMAN, 1865.

Diagnosis. — Carapace subtriangular, highest at anterior cardinal angle, left valve larger than right one, surface smooth; marginal area broad, radial pore-canals few, straight and simple, with anterior vestibule; muscle-scar with posterior row of four or five scars with a kidney-shaped scar in front; hinge of the right valve with terminal, crenulate dental areas and a smooth or crenulate groove in between.

Range : Cretaceous to recent.

Eucythere triordinis SCHMIDT.

Pl. II, fig. 13.

Eucythere triordinis SCHMIDT, 1948, vol. 22, p. 411, pl. 63, fig. 26-27, textfig. 2c.

Distribution. — Belgium : Lutetian of Saint-Job; Bartonian of Oedelem. France : Lutetian of Grignon. United States : Eocene.

SUBFAMILY CYTHERINAE DANA, 1853.

Genus CYTHEROMORPHA HIRSCHMANN, 1909.

TYPE SPECIES *Cythere fuscata* BRADY, 1869.

Diagnosis. — Carapace small, ovate, with upturned posterior end; surface ornamented with pits, reticulation or ridges; marginal area rather narrow, radial pore-canals few, simple and straight, no vestibules; hinge and muscle-scar as *Loxoconcha*.

Range : Paleocene to recent.

Cytheromorpha brabantica n. sp.

Pl. XVI, figs. 10-11; Pl. XXIII, fig. 17.

Etymology. : Named after the province Brabant, in which the type-locality of this species is situated.

Holotype. : A right valve (coll. S 2496).**Paratypes.** : 7 detached valves and 4 complete carapaces (coll. S 2497, 2498).**Type-locality.** : Forest (BD 1257) (corner avenue du Domaine-avenue Minerve), Brussels.**Type-level.** : Ledian.

Diagnosis. — A species of the genus *Cytheromorpha* with the following characteristics : Ornamented with coarse, irregularly placed ridges. With longitudinal ridge in the middle crossing a shallow vertical sulcus.

Description. — Sexual dimorphism was observed. The females are higher and posteriorly more rounded than the males. The latter are more elongate and have a triangular posterior end. The males have a well-developed sulcus, while this feature is scarcely developed in the females.

The dorsal outline is straight; the anterior outline is broadly rounded; the ventral outline is slightly concave. The posterior outline of the female is broadly rounded with an upward swing; the posterior outline of the male is obtusely angular above the middle.

In dorsal view the female is ovate, widest behind the middle. The male is more elliptical with tapering ends, sharper at the posterior than at the anterior end.

The ornamentation consists of a network of high ridges. In the anterior part there is a tendency to form a polygonal reticulation. In the posterior part the ridges are irregularly arranged. There is a somewhat more pronounced longitudinal ridge, which crosses the broad, very shallow, vertical sulcus.

The anterior marginal area is rather broad, with some 7, widely-spaced, simple and straight radial pore-canals.

The hinge of the left valve consists of a crenulated bar with a socket at both ends. In front of the anterior socket, and in the middle of the posterior socket, lies a knoblike tooth. The right valve hinge is the complement.

Dimensions. — Holotype (female right valve) : L : 0,34, H : 0,22, $\frac{1}{2}$ W : 0,09; paratypoid (complete male carapace) : L : 0,35, H : 0,21, W : 0,17.

Remarks. — This heavily ornamented species cannot be confounded with any other known species of this genus.

The age of our specimens is not certain, for it has only been found in the basal layers of the Ledian. In this layer material derived from the Lutetian has been frequently encountered.

***Cytheromorpha zinndorfi* (LIENENKLAUS).**

Pl. XVI, figs. 8-9.

Limnocythere zinndorfi LIENENKLAUS, 1905, p. 58, pl. 4, fig. 32-33.

Distribution. — Belgium : Upper Tongrian of Kleine-Spouwen. Germany : Rupelian-Aquitainian of the Mayence Basin and Rhine-graben.

SUBFAMILY TRACHYLEBERIDINAE SYLVESTER-BRADLEY, 1948.

Genus TRACHYLEBERIS BRADY, 1898; emend. HARDING and SYLVESTER-BRADLEY, 1953.

TYPE SPECIES *Cythere scabrocuneata* BRADY, 1880.

Diagnosis. — Carapace subquadrate, with compressed triangular, posterior end. Marginal area fairly broad, radial pore-canals moderately numerous, no vestibules. Muscle-scar with single crescentic scar in front of posterior row of four scars. Hinge of the right valve with conical anterior tooth, postjacent socket, serrate groove, and smooth ovate posterior tooth.

Range : Upper Cretaceous to recent.

Subgenus TRACHYLEBERIS BRADY, 1898.

Diagnosis. — Surface ornamented with spines and blades.

Range : Upper Cretaceous to recent.

Trachyleberis (Trachyleberis) aculeata (BOSQUET).

Pl. XIII, figs. 16-17; Pl. XVI, figs. 14-15.

Cythere aculeata BOSQUET, 1852, vol. 24, p. 107, pl. 5, fig. 10.

Cythere approximata, BOSQUET (pars), 1852, vol. 24, p. 88.

Cythere arachnoidea BOSQUET, 1852, vol. 24, p. 99, pl. 5, fig. 4.

Cythereis horrescens, JONES (non BOSQUET), 1857, p. 38, pl. 5, fig. 17.

Cythere bowerbankiana JONES, 1857, p. 38, pl. 6, fig. 7-8.

Trachyleberis aculeata (BOSQUET), APOSTOLESCU, 1955, p. 271, pl. 8, fig. 123-124.

Lectotype : A left valve (coll. BOSQUET, No. 65b).

Paratypes : 3 complete carapaces and two detached valves (coll. BOSQUET, No. 65 and 65b).

Locus-typicus-restrictus : Grignon, France.

Type-level : Lutetian.

Distribution. — Belgium : Ypresian of Kortemark, Luvingne, Hyon, Maulde, Mont-Saint-Aubert, Forest (Brussels) and Frasnes-lez-Buissenal; Lutetian of Gobertange and Nalinnes; Bartonian of Oedelem. France : Upper Ypresian of Cuise-Lamotte; Lutetian : Chambors, Chaméry, Châteaurouge, Chaumont, Ferme de l'Orme, Grignon, Parnes, Saint-Félix, Mouchy-le-Châtel, Villiers-Saint-Frédéric, Neauphle-le-Château; Ledian of Le Guépelle, Tancrou and Ver. Netherlands : Bartonian of boring Almelo. England : Ledian of Whitecliff bay, Wight and Bartonian of Barton.

Diagnose. — A species of the genus *Trachyleberis* with the following characteristics : anterior marginal ridge ornamented with spines; edge of the wing bears seven large blade-like spines; with row of some six spines running from beneath the eye-tubercle towards the postero-dorsal corner; subcentral swelling with blade-like spines.

Description. — The outline is jagged; the valves are tapering towards the posterior end. Both cardinal angles protrude. The dorsal margin is straight; the anterior margin is obliquely rounded; the posterior margin is convex in the left valve, pointed in the middle of the right valve. The anterior, ventral and posterior margins are fringed with marginal spines.

A broad, rounded and irregular marginal ridge, ornamented with spines runs along the anterior, ventral and posterior margins. The edge of the wing is ornamented with seven blade-like, vertical spines. Beneath the posterior spine of the wing's edge there is another large spine. A curved row of some six spines starts beneath the eye-tubercle and runs towards the postero-dorsal corner. These spines often consist of a main spine, with two or three subordinate spines near the top. Two more spines are placed between the posterior

spine of the wing and the spine in the postero-dorsal corner. The subcentral swelling is crowned with an agglomerate of blades and spines; with three more spines in front and four behind it.

The posterior end of the valve is compressed.

The eye-tubercle is pronounced.

The hinge and marginal area are as for the genus.

The muscle-scar was not clearly visible.

Dimensions. — Lectotype : L : 0,88, H : 0,52, $\frac{1}{2}$ W : 0,27.

Remarks. — Only one damaged right valve of *Cythere arachnoidea* BOSQUET was found back in his collection. Its ridges of the reticulation are high, and often ornamented with small spines, but in all other features it is identical with *Trachyleberis aculeata* (BOSQUET).

The few specimens from the Bartonian of Oedelem and the boring Almelo (Neth.) are elongate, with sharp, high wing and anterior marginal ridge, and with a high conical subcentral swelling.

We have specimens of *T. aculeata* from the Upper Eocene of the Hampshire Basin; JONES incorrectly assigned such individuals from Barton to *Cythere horrescens* BOSQUET. *Cythere bowerbankiana* JONES of the English London clay (Ypresian) is also a synonym of *T. aculeata*.

***Trachyleberis (Trachyleberis) asperrima* (REUSS) *echinata* (REUSS).**

Pl. XII, figs. 1-2; Pl. XIII, fig. 15.

Cypridina asperrima REUSS, 1850, vol. 3, p. 74, pl. 10, fig. 5.

Cythereis asperrima (REUSS), KUIPER, 1918, p. 43, pl. 2, fig. 15.

Cypridina echinata REUSS, 1851, vol. 3, p. 90, pl. 7, fig. 66.

Cythere lyelliana BOSQUET, 1852, vol. 24, p. 102, pl. 5, fig. 6.

Distribution. — Belgium : Rupelian (Boom-clay). Netherlands : Oligo-Miocene. Germany : Rupelian. Austria : Miocene.

Remarks. — *Cypridina echinata* was described by REUSS from the Rupelian of Hermsdorf and Freienwalde in Germany. In a sample from Hermsdorf we found two valves which were identical with the specimens of *Cythere lyelliana* BOSQUET from Belgium. As no other species has been described from Hermsdorf which can be confused with *Cypridina echinata*, we think it most likely that *Cythere lyelliana* is synonymous with *Cypridina echinata*. It is quite understandable that REUSS overlooked the three, low, broad, longitudinal plications in the posterior half of the valve, the more so since they are often indistinct and always somewhat obscured by the reticulation and the short spines.

We also examined specimens of *Trachyleberis asperrima* (REUSS) from the Tortonian of Moos in Baden (Austria). The adult specimens of this species are in possession of three, low, longitudinal plications in the posterior half of their valves, in the same manner as *Trachyleberis echinata* (REUSS) of the Oligocene. The only difference between these two forms is that the spines of *T. asperrima* are more numerous and better developed than with *T. echinata*. For this reason we classified *T. echinata* as a subspecies of *T. asperrima*.

Trachyleberis (Trachyleberis) lichenophora (BOSQUET).

Pl. XII, figs. 4-5; Pl. XIII, fig. 9.

Cythere lichenophora BOSQUET, 1852, vol. 24, p. 123, pl. 6, fig. 8.*Cythere formosa* BOSQUET, 1852, vol. 24, p. 108, pl. 5, fig. 11.*Trachyleberis lichenophora* (BOSQUET), APOSTOLESCU, 1955, p. 270, pl. 7, fig. 107-108.

Lectotype : A left valve (coll. BOSQUET, No. 77).

Paratypoids : 26 detached valves and 12 complete carapaces.

Locus-typicus-restrictus : Grignon, France.

Type-level : Lutetian.

Distribution. — Belgium : Lutetian of Saint-Job (Brussels), Diegem and Nalines; Ledian of Forest (Brussels), Bambrugge and Balegem, and probable Ledian of the boring Heist-op-den-Berg. France : Lutetian of Parnes, Chaumont, Saint-Félix, Grignon, Chambors, Châteaurouge, Chamery end Ferme de l'Orme, Mouchy-le-Châtel, Gomerfontaine, Damery, Neauphlette, Villiers-Saint-Frédéric, Neauphle-le-Château.

Diagnosis. — A species of the subgenus *Trachyleberis* with the following characteristics : ventral ridge consists of a thin plate with thickened pillars at regular distances; postero-dorsal region with low, irregular ridge; surface ornamented with high irregular ridges, plates and spines.

Description. — Sexual dimorphism is distinct; the males are larger and more elongate than the females.

The outline is jagged. The dorsal and ventral margins are slightly converging towards the posterior end. The anterior outline is broadly rounded and fringed with some twenty, small marginal spines. The posterior outline of the right valve is angled in the middle; its dorsal part is concave and without marginal spines, while the ventral part is convex and fringed with some seven marginal spines. The posterior outline of the left valve has an obtuse angle below the middle. The dorsal and ventral part are slightly convex and ornamented with some spines.

Along the anterior outline runs a marginal ridge covered with small spines. A rather high ridge, composed of thickened pillars at regular distances with a thin plate in between, borders the ventral and lateral surface. There is an irregular ridge in the postero-dorsal region; it turns downward at a right angle near the posterior cardinal angle.

The subcentral swelling is distinct. The whole surface is reticulate, but the ridges are so irregularly developed in blades and spines, that the reticulation pattern is mostly entirely obscured. The posterior part of the valve is compressed.

The marginal area and the muscle-scar pattern are as for the genus. The right valve has a wide anterior and postero-ventral flange.

The hinge is as for the genus, with a smooth posterior tooth in the right valve.

Dimensions. — Lectotype (male left valve) : L : 0,93, H : 0,49, $\frac{1}{2}$ W : 0,27; female right valve : L : 0,86, H : 0,49, $\frac{1}{2}$ W : 0,25.

Remarks. — The valves of *Cythere formosa* in BOSQUET's collection are in all details identical with those of his *Cythere lichenophora*. *Trachyleberis lichenophora* has some features in common with *Trachyleberis aculeata* (BOSQUET), such as the jagged outline, situation of the ventral ridge and the postero-dorsal ridge. But the surface of *T. aculeata* bears only a limited number of strong spines and is not densely covered with spines and blades. Moreover the ventral ridge is composed of thick spines with vertical edges.

***Trachyleberis (Trachyleberis) spinosa* (LIENENKLAUS).**

Pl. XII, fig. 3; Pl. XIII, fig. 5.

Cythereis spinosa LIENENKLAUS, 1900, vol. 52, p. 516, pl. 20, fig. 4.

Distribution. — Belgium : Rupelian Boom-clay of Schriek, Niel and Boom. Germany : Lower Oligocene.

Remarks. — The single valve found at Boom has only a few tridentate spines among many normal and simple spines. Another valve found at Niel is covered with long and short tridentate spines. In the ventral region there is an obliquely placed row of spines.

Our four specimens are less strongly tapering than the one figured by LIENENKLAUS. They resemble the figure given by TRIEBEL (1941, Senckenb., Vol. 23, pl. 12, fig. 146) of (?)*Cythereis hystrix* (REUSS), but they lack the five radiating ridges, behind the anterior margin of the latter species.

Subgenus COSTA NEVIANI, 1928.

TYPE SPECIES *Cytherina edwardsi* ROEMER, 1838.

Diagnosis. — Ornamentation with three longitudinal ridges, the median one of which bends abruptly downward at its posterior end.

Range : Miocene to recent.

***Trachyleberis (Costa) edwardsi* (ROEMER).**

Pl. XII, figs. 6-7; Pl. XIII, fig. 14.

Cytherina edwardsi ROEMER, 1838, p. 518, pl. 6, fig. 27.

Cypridina edwardsi (ROEMER), REUSS, 1850, vol. 3, p. 84, pl. 10, fig. 24.

Cythere edwardsi ROEMER, BOSQUET, 1852, vol. 24, p. 94, pl. 4, fig. 4.

Trachyleberis (Rectotrachyleberis) edwardsi (ROEMER), RUGGIERI, 1950, vol. 21, textfig. 4.

Distribution. — France : Lower and Middle Miocene of Aquitaine Basin; Pliocene of Perpignan. Italy : Quaternary. Austria : Miocene of the Vienna Basin.

Remarks. — Sometimes the posterior tooth of the right valve is subdivided into three cusps. The anterior scar of the central muscle-scar is always single.

Genus PTERYGOCYHEREIS BLAKE, 1933.

TYPE SPECIES *Cythereis jonesi* BAIRD, 1850.

Diagnosis. — Carapace elongate to subquadrangular, with arrowhead-shape in dorsal view; prominent wing, posterior end triangular and compressed, surface smooth or with spines, blades or short, rounded ridges. Marginal area and muscle-scar as *Trachyleberis*. Hinge of the right valve with smooth or lobed anterior tooth, postjacent socket, long crenulate groove and a smooth or lobed posterior tooth.

Range : Upper Cretaceous to recent.

***Pterygocythereis cornuta* (ROEMER).**

Pl. XIII, fig. 13; Pl. XIV, fig. 5.

Cytherina cornuta ROEMER, 1838, p. 518, pl. 6, fig. 31.

Cythere cornuta (ROEMER), BOSQUET, 1852, vol. 24, p. 117, pl. 6, fig. 4; REUSS, 1855, vol. 7, p. 282, pl. 10, fig. 10; EGGER, 1858, p. 438, pl. 19, fig. 11; SPEYER, 1863, vol. 13, p. 35, pl. 4, fig. 7.

Cythereis cornuta (ROEMER), JONES, 1857, p. 39, pl. 4, fig. 19, pl. 5, fig. 15; JONES and SHERBORN, 1889, p. 35, pl. 4, fig. 7.

Alatacythere cornuta (ROEMER), APOSTOLESCU, 1955, p. 250, pl. 2, fig. 28.

Distribution. — Belgium : Ypresian-Bartonian. France : Upper-Ypresian-Ledian. Netherlands : Bartonian of borings of Almelo (158-162 m) and Delden (70-119 m). In the literature reported from Eocene to Miocene (?).

Remarks. — Typical *P. cornuta* has a smooth surface, ornamented only with a short, curved ridge in the postero-dorsal region. The wing is very variable in extension. The spine at the posterior end of the wing varies from heavy and short, to long and slender. Generally, the edge of the wing is sharp or slightly rounded. But often, especially in Ledian and Bartonian specimens, small knobs are present at the dorsal side of the wing, near the edge. They alternate with the six to eight pores which perforate the wing. These Upper Eocene specimens sometimes possess one to three knobs between the subcentral swelling and the posterior margin of the wing.

***Pterygocythereis fimbriata fimbriata* (VON MÜNSTER).**

Pl. XIII, fig. 12; Pl. XIV, figs. 3-4.

Cythere fimbriata VON MÜNSTER, 1830, p. 63; LIENENKLAUS, 1894, vol. 46, p. 216.

Cythereis fimbriata (VON MÜNSTER), LIENENKLAUS, 1905, p. 36; KUIPER, 1918, p. 70, pl. 3, fig. 30.

Pterygocythereis fimbriata (VON MÜNSTER), KEIJ, 1955, vol. 21, n° 2, p. 129, pl. 17, fig. 1-2.

Cythere ceratoptera BOSQUET, 1852, vol. 24, p. 114, pl. 6, fig. 2.

Cythereis ceratoptera (BOSQUET), JONES, 1857, p. 39, pl. 4, fig. 1.

Cythere franquana BOSQUET, 1852, vol. 24, p. 112, pl. 5, fig. 14.

Cypridina coronata (ROEMER), REUSS, 1850, vol. 3, p. 80, pl. 10, fig. 17, pl. 11 fig. 18.

Cythere latidentata BORNEMANN, 1855, vol. 7, p. 366, pl. 21, fig. 6.

Cythere subcoronata SPEYER, vol. 13, p. 38, pl. 4, fig. 9-10.

Distribution. — Belgium : Bartonian-Rupelian. France : Oligocene of the Paris Basin, Miocene of the Aquitaine Basin.

Remarks. — Only the adults possess spines on their lateral surface, the immature specimens are entirely smooth in this part of the valve.

***Pterygocythereis fimbriata* (VON MÜNSTER) *bartonensis* n. subsp.**

Pl. XIII, fig. 11; Pl. XIV, fig. 2.

Cythereis horrescens JONES (non *Cythere horrescens* BOSQUET), 1857, p. 38, pl. 5, fig. 9.

Holotype : A left valve (S 2833).

Paratypoids : 50 detached valves and 6 complete carapaces (S 2834-2836).

Type-locality : Barton Cliff (D3) Barton, England.

Type-level : Middle Bartonian.

Distribution. — England : Lower and Middle Bartonian of Barton Cliff, Lower Bartonian of Alum Bay, Wight.

Diagnosis. — A subspecies of *Pterygocythereis fimbriata* with the following characteristics : Carapace rather small and rather thick-shelled; wing's edge often not subdivided into spines; posterior spine of the wing, heavy and directed backwards; spines on lateral surface varying between low knobs and three-edged blades.Dimensions. — Holotype (left valve) : L : 0,77, H : 0,43, $\frac{1}{2}$ W : 0,22.Remarks. — This subspecies differs from the nominate subspecies in its smaller size, its heavier carapace, and the wing's edges which are often not subdivided into spines. But it resembles the nominate subspecies in outline, number of marginal spines, and number and arrangement of the spines on the lateral surface. In the subspecies *fimbriata* the latter spines are for the greater part composed of spines ending in one or three blades. This feature occurs also in the subspecies *bartonensis*, but here the greater part of the spines are knobs, conical spines or spines ending in a somewhat flattened top.***Pterygocythereis fimbriata* (VON MÜNSTER) *spinigera* n. subsp.**

Pl. XIII, fig. 18; Pl. XIV, fig. 1.

Etymology : From the latin *spinigera* : thorn-bearing.

Holotype : A left valve (S 2144).

Paratypoids : Some 100 detached valves and 3 complete carapaces (S 2145-2147, 2734-2736).

Type-locality : Mont-Saint-Aubert (DH 1211), Belgium.

Type-level : Upper Ypresian of Maulde and Mont-Saint-Aubert; Bartonian of boring Brussegem (17,20-17,60 m). Netherlands : Bartonian of boring Delden (70-119 m).

Diagnosis. — A sub-species of *Pterygocythereis fimbriata*, characterized by its large, well developed spines.

Remarks. — The spines of this subspecies are often blade-like and densely placed, giving the valves and extremely rugose appearance. But the configuration of the spines is, except in some details, identical with that of the nominate subspecies.

***Pterygocythereis tuberosa* n. sp.**

Pl. XIII, figs. 19-20; Pl. XIV, figs. 6-7.

Etymology : From the Latin : *tuberosus* = humpy.

Holotype : A right valve (coll. S 2148).

Paratypes : 3 complete carapaces and 28 detached valves (S 2149-2155, 2737).

Type-locality : Boring Heist-op-den-Berg, Belgium.

Type-level : Probably Ledian (129,50 m).

Distribution. — Belgium : Probable Ledian of the boring Heist-op-den-Berg; Bartonian of Heizel, Oedelem, borings Heist-op-den-Berg and Brussegem. Netherlands : Bartonian of boring Delden (70-119 m).

Diagnosis. — A species of the genus *Pterygocythereis* with the following characteristics : surface covered with knobs and rounded ridges, wing's edge with some eight pronounced knobs at its dorsal side.

Description. — The dorsal margin of the right valve is straight or slightly convex; that of the left valve has protruding cardinal angles. The anterior margin is broadly, but somewhat obliquely rounded and fringed with 5 to 7 marginal spines. The ventral margin is convex, but often obscured by the wing. The posterior margin is angular in the middle, its ventral part is fringed with 5 marginal spines.

The wing is of variable extension. The dorsal side of it bears some 8 knobs at regular distances. There is a marginal ridge along the dorsal and anterior margin. The lateral surface is ornamented with a number of knobs and short, elongate, rounded ridges. In the postero-dorsal corner there is a rather long ridge; its anterior part is downward bent. The subcentral swelling bears some 3 heavy, rounded ridges. A vertical ridge is situated beneath the eye-tubercle. Between the bend postero-dorsal ridge and the terminal spine of the wing, there are a dozen of knobs.

The carapace is arrowhead-shaped in dorsal view. The edge of the wing is saw-shaped. There are some small pustules on the ventral surface.

Hinge and marginal area are as for the genus.

Dimensions. — Holotype (right valve) : L : 0,88, H : 0,45, $\frac{1}{2}$ W : 0,30.

Remarks. — This rugose species differs strongly from the other Belgian *Pterygocythereis* species. Many specimens of *Pterygocythereis cornuta* (ROEMER) from the Belgian Upper Eocene possess a wings edge ornamented with 8 knobs. The wing of the greater part of the specimens of *P. cornuta* is with a sharp or rounded edge, but without these knobs. Some specimens from the Bartonian even possess a few indistinct knobs between the subcentral swelling and the base of the terminal spine of the wing.

Genus BRADLEYA HORNIBROOK, 1952.

TYPE SPECIES *Cythere arata* BRADY, 1880.

Diagnosis. — Carapace subquadrangular to subrhomboidal, surface smooth to reticulate with distinct dorsal and ventral keels; marginal area fairly broad, radial pore-canals numerous, simple or bifurcating, no vestibules; muscle-scar with posterior row of four scars and two scars in front; hinge of the right valve with conical anterior tooth, postjacent socket, crenulate groove and posterior lobed tooth.

Range : Upper Cretaceous to recent.

***Bradleya approximata* (BOSQUET).**

Pl. XV, fig. 18; Pl. XVII, figs. 1-2.

Cythere approximata BOSQUET, 1852, vol. 24, p. 88, pl. 4, fig. 9.

Cythereis approximata (BOSQUET), APOSTOLESCU, 1955, p. 268, pl. 6, fig. 105-106.

Lectotype : A right valve (coll. BOSQUET, No. 50).

Paratypes : Three detached valves.

Locus-typicus-restrictus : Grignon, Paris Basin, France.

Type-level : Lutetian IV.

Distribution. — Belgium : Upper Ypresian of Hyon and Forest (Brussels). France : Lutetian of Chaumont, Ferme de l'Orme, Grignon, Chambors, Parnes, Saint-Félix, Neauphlette, Villiers-Saint-Frédéric, and Neauphle-le-Château.

Diagnosis. — A species of the genus *Bradleya* with the following characteristics : valves rather strongly inflated; ventro-posterior margin with some five tridentate, marginal spines; low, curved ridge borders lateral and ventral surfaces; surface reticulate, depressions partly or wholly filled in by secondary outgrowths of the ridges.

Description. — Sexual dimorphism is distinct. The males are larger and more elongate than the females.

The dorsal margin is almost straight. The posterior cardinal angle of the left valve bears a backward directed triangular spine. The anterior margin is evenly or obliquely rounded. It is fringed by some 15 small marginal spines. The ventral margin is straight. The posterior margin has an obtuse angle in the middle. The ventral part of the posterior margin bulges out postero-ventrally. It is fringed with some 5 stout, tridentate, marginal spines. The dorsal part of the posterior margin is concave or straight.

A marginal ridge runs along the anterior, ventral and posterior margins. The valve is rather strongly inflated, with a low broad subcentral swelling. The border between the lateral and ventral surfaces is marked by a low, rounded ridge which bends upwards near its posterior end. Another low ridge runs along the posterior half of the dorsal margin. At some distance before the posterior cardinal angle this ridge bends downward at a right angle.

The surface is covered with a lace-like reticulation. Outgrowths from the ridges obscure the depressions for the greater part. Sometimes the depressions are nearly closed

off by these thin, plate-like protuberances of the ridges. From the anterior marginal ridge converge 6 short, straight ridges backwardly. In their middle these ridges all show an outgrowth to both sides.

The marginal area and muscle-scar pattern are as for the genus. In one valve the two anterior scars were seen to be connected by a narrow patch. The posterior tooth of the right valve is composed of three cusps.

Dimensions. — Lectotype (female right valve) : L : 0,95, H : 0,56, $\frac{1}{2}$ W : 0,29; paratypoid (male left valve) : L : 1,00, H : 0,52, $\frac{1}{2}$ W : 0,26.

Remarks. — *Hermanites pajenborchiana* n. sp. has the same mode of ornamentation as *Bradleya approximata*, but its dorsal ridge is more protruding and the ventral ridge forms the edge of a widely extending pointed ala.

***Bradleya bosquetiana* (JONES and SHERBORN).**

Pl. XVIII, fig. 11; Pl. XIX, figs. 8-9.

Cythere angulatopora BOSQUET (non REUSS), 1852, vol. 24, p. 68, pl. 3, fig. 5.

Cythere bosquetiana JONES and SHERBORN, 1889, p. 22, pl. 3, fig. 15.

Leguminocythereis pustulosa (ROEMER), APOSTOLESCU, 1955, p. 253, pl. 3, fig. 43-44.

Distribution. — Belgium : Ledian-Bartonian. Netherlands : Bartonian of boring Delden (90-103 m). France : Lutetian-Ledian. England : Upper Eocene.

Remarks. — In the majority of our specimens, from Belgium as well as from the Paris Basin, the ridges of the reticulation have secondary outgrowths towards the depressions. In this case the angular depressions are transformed into petaloid depressions by four triangular spurs of the ridges.

APOSTOLESCU named this species *Leguminocythereis pustulosa* (ROEMER) after *Cytherina pustulosa*, originally described by ROEMER from Paris. ROEMER's figures and diagnosis are so vague that in our opinion nothing can be done with it.

(?) ***Bradleya cornueliana* (BOSQUET).**

Pl. XV, figs. 16-17; Pl. XVII, figs. 3-5.

Cythere cornueliana BOSQUET, 1852, vol. 24, p. 89, pl. 4, fig. 10.

Lectotype : A left valve (coll. BOSQUET, No. 51).

Paratypoids : Four detached valves.

Type-locality : Cuise-Lamotte, Paris Basin, France.

Type-level : Upper Ypresian (= Cuisian).

Distribution. — Belgium : Upper Ypresian of Hyon; basal layer of Lutetian of Gobertange. France : Upper Ypresian of Cuise-Lamotte.

Diagnosis. — A species tentatively assigned to the genus *Bradleya* with the following characteristics : dorsal and ventral margins straight and slightly converging towards

the posterior end; valves inflated; ornamentation with coarse reticulating ridges with lateral outgrowths; a heavy rounded ridge parallel to the anterior margin; a low ridge from the sub-central swelling to postero-dorsal corner.

Description. — The males are larger and more elongate than the females. The dorsal margin is almost straight. The anterior margin is evenly rounded in the right valve, and obliquely rounded in the left valve; it is fringed with many small marginal spines. The ventral margin is straight. The posterior margin is obtusely angled in the middle. The ventral part bears some four, broad triangular marginal spines.

A broad rounded, marginal ridge runs along the anterior and posterior margins. The surface is covered by a network of thick ridges. These ridges possess lateral outgrowths which partly cover the depressions. From the sub-central swelling runs a low, rounded ridge to the postero-dorsal corner. Here it turns with a loop and continues for some distance along the dorsal margin. In the postero-ventral region there is a rounded, somewhat protruding knob. The posterior part of the valve is compressed.

The marginal area and muscle-scar pattern are as for the genus. The posterior tooth of the right valve is large and conical.

Dimensions. — Lectotype (male left valve) : L : 1,01, H : 0,52, $\frac{1}{2}$ W : 0,27; paratypoid (female left valve) : L : 0,90, H : 0,52, $\frac{1}{2}$ W : 0,26.

Remarks. — The conical posterior tooth of the right valve, and the general external habitus make it dubious whether this species belongs to the genus *Bradleya*; no better assignment could be made at the moment.

***Bradleya kaasschieteri* n. sp.**

Pl. XVI, figs. 12-13; Pl. XIX, figs. 13-14.

Etymology : Named after Mr. J. P. H. KAASSCHIETER, Geological Institute of Utrecht.

Holotype : A right and a left valve belonging to one carapace (S 2181).

Paratypoids : 95 detached valves and 2 complete carapaces (S 2182-2197, 2730).

Type-locality : Bambrugge (ZD 343), Belgium.

Type-level : Ledian.

Distribution. — Belgium : Ledian of Saint-Gilles and Forest (Brussels), Asse, Meldert, Bambrugge, Vlierzele, and probable Ledian of the boring Heist-op-den-Berg (129-129,5 m); Bartonian of Heizel, Gent, borings Heist-op-den-Berg and Brussegem. Netherlands : Bartonian of boring Delden (90-119 m).

Diagnosis. — A species of the genus *Bradleya* with the following characteristics : ornamentation with three prominent longitudinal ridges; a short curved ridge connects the eye-tubercle with the ridge which runs parallel to the anterior margin; posterior outline almost truncate.

Description. — Sexual dimorphism is well developed. The males are longer and more elongate than the females.

The dorsal edge is jugged in the posterior half, formed by a longitudinal ridge. The anterior outline is broadly rounded ventrally, and somewhat flattened dorsally. The ventral outline is convex. The posterior outline of the left valve is sub-truncate and only slightly convex; it bears four or five marginal spines. In the right valve the posterior outline is concave just beneath the posterior cardinal angle.

At a short distance from the anterior outline runs a high, parallel ridge which continues on the ventral surface as a low, inconspicuous ridge. A short, curved ridge connects the eye-tubercle with this ridge. Along the ventral border of the lateral surface runs a longitudinal ridge, which turns upward at its posterior end. In the middle of the lateral surface runs another longitudinal ridge. From the sub-central swelling starts a short straight ridge, parallel to the anterior part of the middle longitudinal ridge. A third longitudinal ridge forms the posterior part of the dorsal outline. It bends downwards at both ends. Between the eye-tubercle and the anterior end of this ridge there is a deep groove. The surface between these ridges is coarsely reticulate. The posterior part (about one tenth of the length) of the valve is compressed. The eye-tubercle is well developed.

The marginal area is moderately broad. Inner margin and line of concrescence coincide. About fifteen radial pore-canals and a few false radial pore-canals are situated along the anterior margin. About ten radial pore-canals were observed along the posterior margin.

The central muscle-scar consists of a posterior row of four elongate scars, with two, closely set, round scars in front of them. A small round scar lies antero-ventrally, at least two others dorsally of the central scar.

The hinge of the right valve has a smooth posterior tooth.

Dimensions. — Holotype (male right valve) : L : 0,98, H : 0,49, $\frac{1}{2}$ W : 0,31; (male left valve) : L : 0,98, H : 0,52, $\frac{1}{2}$ W : 0,33. Paratypoid (female left valve) : L : 0,86, H : 0,48, $\frac{1}{2}$ W : 0,31.

Remarks. — In mode of ornamentation *Bradleya kaasschieteri* resembles such heavily ornamented species as *Bradleya dictyon* (BRADY), *Cythereis hamata* (MÜLLER) and *Trachyleberis polytrema* (BRADY). It is different from these species in the pattern of the smaller ridges.

Genus CARINOCYTHEREIS RUGGERI, 1956.

TYPE SPECIES *Cytherina carinata* ROEMER, 1838.

Diagnosis. — Carapace subrectangular, with compressed, triangular posterior end. Ornamentation with anterior marginal ridge, pronounced longitudinal ridges, spines and reticulation. Marginal area with anterior and posterior vestibules; radial pore-canals simple, curved and moderately numerous. Muscle-scar as in *Trachyleberis*. Hinge of the right valve with conical, anterior tooth, situated on longate base, a postjacent socket and crenulate groove and subdivided posterior tooth.

Range : Pliocene to recent.

Carinocythereis carinata (ROEMER).

Pl. XIII, fig. 10; Pl. XX, fig. 12.

Cytherina carinata ROEMER, 1838, p. 518, pl. 6, fig. 28.*Cythere edwardsi* BOSQUET (non ROEMER) (pars), 1852, vol. 24, p. 94.*Carinocythereis carinata* (ROEMER), RUGGIERI, 1956, p. 165, textfig. 1.

Distribution. — Pliocene to recent in southern Europe.

Genus *HIRSUTOCYHERE* HOWE, 1951.TYPE SPECIES *Hirsutocythere hornotina* HOWE, 1951.

Diagnosis. — Carapace ovate with compressed posterior end, surface ornamented with numerous spines and blades. Marginal area broad, radial pore-canals numerous, no vestibules. Muscle-scar with two anterior scars in front of row of four scars. Hinge as in *Trachyleberis*, but posterior tooth of the right valve sometimes indistinctly lobed.

Range : Eocene.

Hirsutocythere horrescens (BOSQUET).

Pl. XV, fig. 4; Pl. XVII, fig. 6-7.

Cythere horrescens BOSQUET, 1852, vol. 24, p. 119, pl. 6, fig. 5.*Cythere thierensiana* BOSQUET (pars), 1852, p. 98.*Cythere nebulosa* BOSQUET, 1852, p. 105, pl. 5, fig. 8.*Trachyleberis horrescens* (BOSQUET), APOSTOLESCU, 1955, p. 272, pl. 8, fig. 125-126.

Lectotype : A right valve (coll. BOSQUET, No. 74b).

Paratypoids : 52 detached valves.

Locus-typicus-restrictus : Grignon, Paris Basin, France.

Type-level : Lutetian.

Distribution. — Belgium : Lutetian of Diegem; Ledian of Forest (Brussels) and Bambrugge. France : Upper Ypresian of Cuise-Lamotte and Menilmontant (Paris); Lutetian of Chambors, Chaméry, Châteaurouge, Chaumont, Courtagnon, Daméry, Ferme de l'Orme, Grignon, Gomerfontaine, Houdan, Montmirail, Nanteuil, Neauphle-le-Château, Parnes, Saint-Félix, Le Vivray, Villiers-Saint-Frédéric; Ledian of Auvers, Le Guépelle and Ver.

Diagnosis. — A species belonging to the genus *Hirsutocythere*, with the following characteristics : wing ending in a spine; with a strong, three-edged spine in the postero-dorsal corner; posterior margin with five or six long marginal spines.

Description. — The dorsal margin is straight and spiniferous. The anterior margin is broadly rounded and fringed with some twenty, small, marginal spines. The posterior part of the wing overhangs the ventral margin. The posterior end of the left valve is convex or obtusely angled in the middle. The posterior margin of the right valve is convex below the angle and straight above it. The ventral part bears five or six long marginal spines.

Along the anterior margin runs a spiniferous marginal rim. There is a wing formed by a thin, high ridge with thickenings at irregular distances. Sometimes the thin plate is dissolved, leaving the thickened parts as spines. The wing ends posteriorly in a more or less distinct spine.

The subcentral swelling is distinct.

There is a prominent three-edged spine in the postero-dorsal corner. The whole surface is covered by spines of variable size. The eye-tubercle is well developed.

There is a wide flange along the anterior and postero-ventral margin. The marginal area is broad; there are some thirty, anterior radial pore-canals. The posterior tooth of the right valve may consist of two cusps, but generally it is ovate and undivided.

The anterior part of the muscle-scar consists of two round scars.

Dimensions. — Lectotype : L : 0,70, H : 0,35. $\frac{1}{2}$ W : 0,22.

Remarks. — It is not clear (to the author) what BOSQUET meant with his two variants, since the material is homogeneous.

This species is assigned to the genus *Hirsutocythere* HOWE. Outline, ornamentation and hinge-pattern are in full agreement with the description given by HOWE. The marginal area, however, is not so extremely broad as with *Hirsutocythere hornotina* HOWE (Florida Geol. Surv., Geol. Bull., No. 34, 1951, p. 22, pl. 4, figs. 3, 6, 9, 12). HOWE gave no details about the muscle-scar.

The single valve of *Cythere nebulosa* BOSQUET, shows the same ornamentation pattern as *H. horrescens*, but it is somewhat more heavily built, having rounded knobs at the places of the spines.

Genus TRACHYLEBERIDEA BOWEN, 1953.

TYPE SPECIES *Cythereis prestwichiana* JONES and SHERBORN, 1887.

Diagnosis. — Carapace subquadrangular, tapering towards the posterior end. Surface ornamented with three longitudinal ridges and reticulation. Marginal area fairly broad, radial pore-canals moderately numerous, no vestibules. Muscle-scar with two anterior scars and a posterior row of four scars. Hinge of the right valve with conical anterior tooth, postjacent socket, serrate groove and lobed posterior tooth.

Range : Eocene to Oligocene.

Trachyleberidea aranea (JONES and SHERBORN).

Pl. XVII, fig. 20; Pl. XIX, fig. 15.

Cythereis aranea JONES and SHERBORN, 1887, p. 453, pl. 9, fig. 10; 1889, p. 33, pl. 2, fig. 15; ALEXANDER, 1934, vol. 8, p. 220, pl. 32, fig. 14-15.

Trachyleberidea prestwichiana BOWEN (non JONES and SHERBORN), 1953, vol. 64, p. 286, fig. A-6.

Distribution. — Belgium : Ypresian, Bartonian. Netherlands : Bartonian. England : Ypresian (London-clay). United States : Paleocene.

Remarks. — This species has the same mode of ornamentation as *T. prestwichiana*, but has less sharp ridges, a more obtusely angular posterior end, and the middle longitudinal

ridge turning upwards at its posterior end, forming a connection with the upper longitudinal ridge. The valve is more inflated, than that of *T. prestwichiana*.

The males are longer and more elongate than the females. The lobation of the teeth of the right valve are variable. Even the anterior tooth was in some cases divided in two cusps.

Trachyleberidea hollandica (KUIPER).

Pl. XVIII, fig. 6.

Cythereis hollandica KUIPER, 1918, p. 49, pl. 2, fig. 19.

Distribution. — Belgium : Rupelian (Boom-clay). Netherlands : Middle and Upper Oligocene.

Remarks. — The specimens of this Oligocene species differ from those of the Eocene *Trachyleberidea aranea* in being larger and somewhat more compressed in dorsal view, with dorsal and ventral outlines less converging towards the posterior end. In the configuration of the ridges, the double anterior marginal ridge, they are identical with *T. aranea*.

Trachyleberidea prestwichiana (JONES and SHERBORN).

Pl. XVII, fig. 19.

Cythereis prestwichiana JONES and SHERBORN, 1887, vol. 4, p. 454, pl. 11, fig. 11; 1889, p. 33, pl. 2, fig. 13-14.

Distribution. — Belgium : Ypresian. England : Ypresian.

Remarks. — Two right valves were found in the Belgian Upper-Ypresian. These valves show all characteristic features as figured by JONES and SHERBORN. In our opinion the specimens described and figured by ALEXANDER (Journ. of Pal., Vol. 8, 1934, p. 220, pl. 32, figs. 14-15) and BOWEN (Proc. Geol. Assoc., Vol. 64, 1953, p. 286, fig. A-6) belong to *Trachyleberidea aranea* (JONES and SHERBORN).

Genus **ECHINOCYTHEREIS** PURI, 1954.

TYPE SPECIES *Cythereis garetti* HOWE and MCGUIRT, 1935.

Diagnosis. — Carapace subovate, highest anteriorly, with posteroventral outline turned upwards. Surface ornamented with knobs and spines, superimposed on reticulation. Muscle-scar with two scars in front of posterior row of four scars. Hinge and marginal area as *Trachyleberis*.

Range : Eocene to recent.

Echinocythereis hispida (SPEYER).

Pl. XV, fig. 3; Pl. XVII, fig. 8

Cythere hispida SPEYER, 1863, vol. 13, p. 23, pl. 2, fig. 9.

Distribution. — Belgium : Rupelian *Nucula*-clay. Germany : Middle (?) and Upper Oligocene of the region of Cassel. France : Oligocene of the Paris Basin.

Remarks. — SPEYER remarked that only in one of his specimens, the ridges of the reticulation were beset with small spines. In our Belgian material (four detached valves) we found one immature valve, which shows this feature. External and internal features agree with those of *Echinocythereis*, except the almost imperceptible spines.

***Echinocythereis scabra* (VON MÜNSTER).**

Pl. XV, fig. 2; Pl. XVII, figs. 9-10.

Cythere scabra VON MÜNSTER, 1830, p. 63; BOSQUET, 1852, vol. 24, p. 103, pl. 5, fig. 7; LIENENKLAUS, 1894, vol. 46, p. 193.

Cytherina scabra (VON MÜNSTER), ROEMER, 1838, p. 516, pl. 6, fig. 9.

Distribution. — Belgium : Ypresian-Bartonian. Netherlands : Ypresian of boring Almelo (169-181 m) and Bartonian of borings Delden (70-119 m) and Almelo (158-162 m). Germany : Oligocene. France : Upper Eocene-Miocene.

Remarks. — *Echinocythereis scabra* from the Miocene of the Aquitaine Basin has rounded tubercles and short elongate ridges (pl. XVII, fig. 10). The specimens from the Belgian and Netherlands Eocene and the German Oligocene have only rounded and sharp spines (pl. XVII, fig. 9).

The muscle-scar of *E. scabra* consists of a posterior row of four elongate scars, with two rounded scars in front; a similar arrangement has also been mentioned by LIENENKLAUS (1894) for the specimens of the German Oligocene. The posterior tooth of the right valve is elongate, curved and smooth.

Genus QUADRACYTHERE HORNIBROOK, 1952.

TYPE SPECIES *Cythere truncula* BRADY, 1898.

Diagnosis. — Carapace subquadrate to subovate, ornamentation with reticulation and distinct ventral and dorsolateral keels, with distinct compressed caudal process. Central muscle-scar with posterior row of four scars and two anterior scars. Marginal area moderately broad, with numerous radial pore-canal, no vestibules. Hinge of the right valve with conical anterior tooth, postjacent socket, crenulate groove and lobed posterior tooth.

Range : Eocene to recent.

***Quadracythere angusticostata* (BOSQUET).**

Pl. XII, fig. 16; Pl. XIX, fig. 12.

Cythere angusticostata BOSQUET, 1852, vol. 24, p. 91, pl. 4, fig. 12.

Cythere deshayesiana BOSQUET, 1852, vol. 24, p. 121, pl. 6, fig. 7.

Cythere lichenophora BOSQUET (pars), 1852, p. 123.

Cythere macropora BOSQUET (pars), 1852, p. 97.

Cythere thierensiana BOSQUET, 1852, vol. 24, p. 98, pl. 5, fig. 3.

Cythere thierensiana (BOSQUET), APOSTOLESCU, 1955, p. 271, pl. 7, fig. 118-119.

Lectotype : Two valves of one carapace (coll. BOSQUET, No. 53).

Type-locality : Parnes, Paris Basin.

Type-level : Lutetian.

Distribution. — France : Lutetian of Parnes, Chaméry, Châteaurouge, Ferme de l'Orme, Mouchy-le-Châtel, Neauphlette, Villiers-Saint-Frédéric, Neauphle-le-Château, Saint-Félix, Chaumont, Nanteuil and Le Vivray.

Diagnosis. — A species of the genus *Quadracythere* with the following characteristics : carapace strongly inflated, ornamentation with reticulation, ridge in the postero-dorsal corner with two tops, and a ridge running from the subcentral swelling to each of the tops.

Description. — The dorsal outline is jugged. The posterior cardinal angles of the left valve bears a rounded knob. The anterior outline is broadly rounded; the ventral outline is almost straight. The posterior outline is fringed with many small spines. The convex part of the posterior outline bears some six rather strong spines.

Along the anterior and posterior outline runs a marginal ridge, inconspicuously along the ventral and dorsal margins. The wing is often widely extended, giving rise to a wide ventral surface. The wing ends bluntly.

Four radial ridges run from the anterior marginal ridge centre-ward. Sometimes they can be followed to the sub-central swelling, but they often disappear in an irregular reticulation.

A short, two-topped ridge is situated in the postero-dorsal corner. Each top is connected with the subcentral swelling by an oblique, curved ridge. The ridges in the postero-ventral region are more or less radially arranged, but this is more or less obscured by the numerous transverse connections. The posterior tenth of the valve is compressed.

In dorsal view the carapace is strongly inflated and has a truncate anterior end, caused by the strong marginal ridge. The subcentral swelling is slightly protruding. Behind this swelling the lateral outline is nicked.

The hinge of the right valve has a posterior tooth, probably consisting of three small cusps.

The central muscle-scar has two rounded scars, which lie in front of the posterior row of four scars.

The marginal area is as for the genus.

Dimensions. — Lectotype : L : 0,77, H : 0,46, W : 0,45.

Remarks. — Comparison of the material of *Cythere thierensiana* BOSQUET, *Cythere deshayesiana* BOSQUET and *Cythere angusticostata* BOSQUET, made it clear that they belong to one species, for which the name *angusticostata* was chosen.

In ornamentation this species is closely resembling the more elongate *Quadracythere macropora* (BOSQUET), from which it differs in dorsal view, in the more broadly rounded anterior margin and in the double-topped ridge in the postero-dorsal corner.

***Quadracythere lamarckiana* (BOSQUET).**

Pl. XIX, fig. 6; Pl. XX, figs. 9-10.

Cythere lamarckiana BOSQUET, 1852, vol. 24, p. 71, pl. 3, fig. 8.

Lectotype : A right valve (coll. BOSQUET, No. 36).

Paratypes : Two complete carapaces and one detached valve.

Type-locality : Parnes, Chaumont, Courtagnon or Saint-Félix, Paris Basin, France.

Type-level : Lutetian.

Distribution. — France : Lutetian of Chaumont, Courtagnon, Parnes and Saint-Félix. BOSQUET's material from the Upper Ypresian of Cuise-Lamotte got lost.

Diagnosis. — A species belonging to the genus *Quadracythere*, with the following characteristics : valves of medium size, with strongly developed postero-dorsal and postero-ventral protrusions; anterior half of the valve more or less smooth, posterior half with angular depressions.

Description. — The dorsal outline is straight with a protruding anterior cardinal angle, especially in the left valve. The anterior outline is broadly rounded; the ventral outline has a slight concavity before the middle. The posterior outline has a ventral caudal process. The postero-ventral margin bears two or three marginal spines.

A broad, rounded marginal rim runs along the anterior margin. The ventral border of the lateral surface is formed by a curved, rounded ridge, which ends posteriorly in an obtusely pointed protrusion. In the postero-dorsal region there is a well-developed, truncated protrusion. The long straight dorsal outline of this protrusion forms the posterior half of the dorsal outline. The subcentral swelling is low. Behind the anterior marginal rim there are some 7 depressions. The remainder of the surface of the valve's anterior half is sometimes smooth, sometimes with some depressions. The posterior half is covered with radially arranged depressions. The caudal process is compressed. The eye-tubercle is well developed and situated at the dorsal end of the anterior marginal rim.

The marginal area is moderately broad. Few, rather widely spaced radial pore-canals were scarcely visible. The hinge is as for the genus.

Dimensions. — Lectotype (right valve) : L : 0,58, H : 0,29, $\frac{1}{2}$ W : 0,16.

Remarks. — As far as can be ascertained by the description and figures given by REUSS of *Cypridina transylvanica* (1850, p. 78, pl. 11, fig. 9), our species show many affinities to this species. But this species is entirely covered with shallow angular depressions, while *Quadracythere lamarckiana* is almost smooth in the anterior half. Moreover, the postero-dorsal protrusion of *Q. lamarckiana* looks to be much larger.

***Quadracythere macropora* (BOSQUET).**

Pl. XII, figs. 9-11; Pl. XIX, figs. 1-2.

Cythere macropora BOSQUET, 1852, vol. 24, p. 97, pl. 5, fig. 2; JONES, 1857, p. 35, pl. 3, fig. 9; BRADY, 1879, vol. 10, pt. 8, p. 392, pl. 66, fig. 6, pl. 67, fig. 1; LIENENKLAUS, 1894, vol. 46, p. 206, pl. 14, fig. 7-8; CAPEDE, 1902, vol. 37, p. 12, fig. 20.

Cythereis macropora (BOSQUET), KUIPER, 1918, p. 62, pl. 3, fig. 26.

Trachyleberis macropora (BOSQUET), KEIJ, 1955, vol. 21, n° 2, p. 127, pl. 17, fig. 9, pl. 20, fig. 1.

Lectotype : A left valve (coll. BOSQUET, No. 57).

Paratypes : 3 complete carapaces and 3 single valves.

Type-locality : Region of Jeurre and Etréchy near Etampes, Paris Basin, France.

Type-level : Stampian.

Distribution. — Paris Basin : Stampian of Jeurre and Etréchy. In the literature Oligocene to Pliocene of Europe.

Diagnosis. — A species of the genus *Quadracythere* with the following characteristics: ornamentation with ridges radiating in anterior direction from the pronounced subcentral swelling; posterior-dorsal corner with short curved, projecting ridge.

Description. — The males are more elongate than the much more numerous females.

The dorsal outline is slightly undulating. The anterior cardinal angle is protruding; the posterior cardinal angle of the left valve bears a stout rounded knob. The anterior outline is broadly rounded ventrally, somewhat flattened dorsally. The ventral outline is slightly concave in the anterior half and slightly convex in the posterior half. The posterior outline is convex below the obtuse angle in the middle; it is concave in the dorsal part. The anterior outline is fringed with some 30 small marginal spines. The ventral half of the posterior margin bears some 4 long marginal spines.

A marginal ridge runs along the entire margin. There is a slightly projecting wing in the ventral half of the valve. The subcentral swelling protrudes. Four ridges radiate from the sub-central swelling towards the anterior marginal ridge. The rest of the surface is covered with irregular reticulation. There is a short, curved, projecting ridge in the postero-dorsal corner. The eye-tubercle is distinct. The posterior part of the valve is compressed.

In dorsal view the anterior end is truncate, caused by the strong marginal ridge. The subcentral swelling is strongly protruding.

The ventral surface of the wing is ornamented with large irregular depressions.

The anterior marginal area is perforated by some 30, almost straight radial pore-canals, which widen slightly in their middle. About 15 are situated along the posterior margin.

The vertical row of four elongate scars is situated on the posterior border of the muscle-scar pit. In this pit, near its anterior margin, lie two round scars. Between the central scar and the hinge line there are at least 3 small scars.

The hinge is as for the genus. The posterior tooth of the right valve consists of a large anterior cusp, with a smaller posterior one, which is also less high.

Dimensions. — Lectotype: L : 0,76, H : 0,43, $\frac{1}{2}$ W : 0,22.

Remarks. — *Quadracythere macropora* (BOSQUET) differs from *Q. vermiculata* (BOSQUET) in the ornamentation in which all ridges (radial and others) are of equal height. The latter species is characterized by the absence or only faint development of ridges other than radial. Moreover *Q. vermiculata* is strongly inflated in dorsal view and has a scarcely protruding subcentral swelling. The ridge in the postero-dorsal corner is double-topped in *Q. vermiculata*, rounded in *Q. macropora*.

***Quadracythere orbignyana* (BOSQUET).**

Pl. XII, figs. 14-15; Pl. XV, fig. 10.

Cythere orbignyana BOSQUET, 1852, vol. 24, p. 86, pl. 4, fig. 8.

Lectotype: A right and a left valve belonging to one carapace (coll. BOSQUET, No. 49).

Paratypoids: Three complete carapaces.

Type-locality: Region between Ver and Guépelle, Paris Basin, France.

Type-level: Ledian.

Distribution. — France : Ledian of Ver, Acy, Pisseloup and Le Guépelle.

Diagnosis. — A species of the genus *Quadracythere* with the following characteristics : anterior cardinal angle strongly protruding, caused by a deep concavity situated behind it; with a low, straight ventral ridge and a jagged ridge in the postero-dorsal quadrant; subcentral swelling and zone above it almost smooth, remainder of the surface coarsely reticulate.

Description. — The dorsal outline is convex and jagged in its posterior half. The anterior half is formed by a strongly protruding anterior cardinal angle and a deep concavity behind it. The anterior margin is obliquely rounded and fringed with many, small marginal spines. The ventral margin is concave before the middle. The posterior margin is convex ventrally and concave dorsally. The ventral part is fringed with some four marginal spines.

There is a strong marginal ridge along the anterior and posterior margins. A long, straight, rounded ridge forms the border between the lateral and ventral surface. The postero-dorsal, jagged ridge turns downwards at a right angle just before the posterior cardinal angle. The posterior part of the valve is compressed. The surface is covered with a coarse reticulation, except in the area of the subcentral swelling and a zone vertically above it. The ridges of the reticulation of the posterior half are radially arranged.

The marginal area, muscle-scar pattern and hinge are as for the genus. The posterior tooth of the right valve is composed of a long anterior cusp, with a small secondary cusp postero-ventrally against it.

Dimensions. — Lectotype (right valve) : L : 0,73, H : 0,41, $\frac{1}{2}$ W : 0,19; (left valve) : L : 0,73, H : 0,42, $\frac{1}{2}$ W : 0,19.

Remarks. — This species is different from the other species of *Quadracythere* in the outline of the dorsal margin and the smooth area between the subcentral swelling and the dorsal concavity.

***Quadracythere vermiculata* (BOSQUET).**

Pl. XII, figs. 12-13; Pl. XIX, fig. 19.

Cythere vermiculata BOSQUET, 1852, vol. 24, p. 90, pl. 4, fig. 11.

Cythereis vermiculata (BOSQUET), APOSTOLESCU, 1955, p. 271, pl. 7, fig. 120-121.

Lectotype : A complete carapace (coll. BOSQUET, No. 52).

Paratypoids : A complete carapace.

Locus-typicus-restrictus : Grignon, France.

Type-level : Lutetian.

Distribution. — Belgium : Lutetian of Genappe, Saint-Job and Forest (Brussels), Braine-l'Alleud and Diegem. France : Lutetian of Parnes and Grignon and Ledian of Le Guépelle.

Diagnosis. — A species of the genus *Quadracythere* with the following characteristics : ornamentation with some five horizontal ridges in front of the subcentral swelling, and another three obliquely placed ridges behind it; lateral and ventral surfaces bordered by faintly curved ridge.

Description. — The dorsal outline is slightly undulating and with marked cardinal angles; the anterior one protrudes. The anterior margin is obliquely rounded. The ventral outline is straight. The posterior end is triangular and compressed. The anterior margin is often fringed with many, very small marginal spines; the ventro-posterior margin bears some long spines.

The ventral surface is separated from the lateral surface by a slightly curved ridge. A marginal ridge goes along all margins except the dorsal one. Here there is an undulating ridge which runs at some distance from the dorsal free edge. It forms a pronounced, often projecting angle near the posterior cardinal angle. The subcentral swelling is pronounced. The anterior part of the valve is ornamented with some five, almost horizontal ridges. The postero-ventral region of the valve bears some three obliquely placed ridges, running in an antero-dorsal to postero-ventral direction. In the postero-dorsal part two wavy ridges run obliquely upwards to the ridge which forms the dorsal outline.

The central muscle-scar consists of a posterior row of four very elongate scars the uppermost scar of which was once observed to be subdivided into two scars. Anteriorly of this row lie two scars. Two more scars are situated toward the dorsal margin.

The hinge and marginal area are as for the genus.

Dimensions. — Lectotype (complete carapace) : L : 0,67, H : 0,39, W : 0,34.

Remarks. — The figures given by BOSQUET are somewhat exaggerated as to the width of the ridges.

Genus HERMANITES PURI, 1955.

TYPE SPECIES *Hermania reticulata* PURI, 1954.

Diagnosis. — Carapace subquadrangular with distinct ventral and postero-dorsal keels, subcentral swelling prominent, posterior end compressed, surface reticulate; marginal area fairly broad, radial pore-canals moderately numerous, no vestibules; muscle-scar with posterior row of four scars and single crescentic scar in front; hinge as *Trachyleberis*.

Range : Eocene to Miocene.

Hermanites hebertiana (BOSQUET).

Pl. XIII, fig. 4; Pl. XVIII, figs. 1-4.

Cythere hebertiana BOSQUET, 1852, vol. 24, p. 95, pl. 5, fig. 1; LIENENKLAUS, 1895, p. 142.

Trachyleberis hebertiana (BOSQUET), KEIJ, 1955, vol. 21, n° 2, p. 127, pl. 16, fig. 5-6.

Cythere reussiana BOSQUET, 1852, vol. 24, p. 109, pl. V, fig. 12.

Cythere trituberculata REUSS, 1869, vol. 59, p. 485, pl. 6, fig. 6.

Lectotype : A right valve (coll. BOSQUET, No. 56).

Paratypes : Four complete carapaces and 61 detached valves (id.).

Type-locality : Jeure of Etréchy, near Étampes, Paris Basin, France.

Type-level : Stampian.

Distribution. — Belgium : Rupelian *Nucula*-clay of Berg and Kleine-Spouwen. France : Stampian of Jeurre, Etréchy and Auvers-Saint-Georges (Paris Basin) and Stampian of Cambes and Gaas (Aquitaine Basin).

Diagnose. — A species of the genus *Hermanites* with the following characteristics : ornamentation with high, anterior marginal ridge and three longitudinal ridges; anterior half of the middle longitudinal ridge double; lower longitudinal ridge with a thick, rounded knob at the posterior end.

Description. — The dorsal outline is convex in the posterior half, concave in the anterior half. The anterior cardinal angle of the left valve protrudes. The anterior margin is broadly rounded and mostly fringed with many, short, marginal spines. The ventral outline is almost straight. Often, a short rounded knob situated at the posterior end of the lower longitudinal ridge, overhangs the margin in the postero-ventral region. The posterior margin of the left valve is truncate; that of the right valve is concave in the dorsal part. The ventral half of the posterior margin bears four or five marginal spines.

In dorsal view both ends are truncate. Behind the subcentral swelling the lateral margin is nicked.

Along the anterior margin runs a stout marginal rim; it is less pronounced along the ventral and posterior margins. An undulating ridge runs along the pronounced edge of the wing. This ridge ends posteriorly in a thick, rounded knob. Three straight ridges, start from the subcentral swelling, of which the upper and middle ones reach the anterior marginal ridge. The lower ridge is very short. A single, straight ridge runs from the subcentral swelling towards the postero-dorsal corner of the valve. The upper longitudinal ridge forms 3/5 of the dorsal outline. It starts postero-ventrally of the eye-tubercle. Near the posterior cardinal angle it bends downwards and continues to a point close to the postero-ventral margin. Sometimes it has a very low part in the middle. The space between the ridges is reticulate, but not all secondary ridges of this reticulation are of the same height. This gives the impression of an ornamentation with wavy lines.

The eye-tubercle is pronounced.

Marginal area, radial pore-canals, and hinge are as for the genus. The right valve has a gide flange in the postero-ventral region.

Dimensions. — Lectotype (right valve) :L : 0,87, H : 0,48. $\frac{1}{2}$ W : 0,22.

Remarks. — The specimens from the Aquitaine Basin (see KEIJ, 1955, p. 127, pl. 16, figs. 5-6) have much heavier ridges, and less developed reticulation between the ridges than the individuals of the Paris Basin or the Belgian specimens.

***Hermanites paijenborchiana* n. sp.**

Pl. XVII, figs. 11-14; Pl. XXI, figs. 10-11.

Cythere haidingeri BOSQUET (non REUSS), 1852, vol. 24, p. 125, pl. 6, fig. 10.

Cythereis haidingeri APOSTOLESCU (non REUSS), 1955, p. 269, pl. 7, fig. 114-115.

Etymology : Named after « Paijenborch », the Geological Institute of the State University of Utrecht, Netherlands.

Holotype : A left valve (coll. S 2915).

Paratypes : 25 complete carapaces and 60 detached valves (coll. S 2241-2247; 2865, 2916, 2917; coll. BOSQUET, No. 79c and d).

Type-locality : Grignon, Paris Basin, France.

Type-level : Lutetian.

Distribution. — Belgium: Upper Ypresian of Hyon and Forest (Brussels); Lutetian of Saint-Job (Brussels), Nalinnes, Diegem and Genappe. France: Upper Ypresian of Ménilmontant and Cuise-Lamotte; Lutetian of Grignon, Chambors, Chaumont, Parnes, Saint-Félix, Mouchy-le-Châtel, Châteaurouge, Gomerfontaine, Damery, Neauphlette, Montmirail, Villiers-Saint-Frédéric, Neauphle-le-Château.

Diagnosis. — A species of the genus *Hermanites* with the following characteristics: reticulated ornamentation consisting of ridges, all of the same height; from the ridges spurs project into the depressions.

Description. — Sexual dimorphism is pronounced; the males are more elongate than the females.

The dorsal outline of the valve is rather irregular. The posterior part of the dorsal margin is hidden by an overhanging ridge; the cardinal angles are marked. The posterior cardinal angle of the right valve bears a spine. The anterior margin is broadly or somewhat obliquely rounded and fringed with some 18 marginal spines. The ventral outline is concave in the left valve and straight to sinuous in the right valve. The posterior margin is subtruncate in the left valve; in the right valve its dorsal portion is concave. The ventral part of the posterior margin of both valves bears some five tridentate marginal spines.

A marginal rim runs along the dorsal, ventral and posterior margins. A prominent rounded keel is situated at the border of the ventral and lateral surface; it ends posteriorly in a rounded knob. The subcentral swelling is pronounced. Another longitudinal ridge is situated in the postero-dorsal region of the valve; it bends sharply downwards at its posterior end. The surface of the valves is ornamented with reticulating ridges, all of equal height, with angular depressions in between. Small, thin spurs project from the ridges into the meshes, sometimes almost closing them. The eye-tubercle is prominent.

The marginal area is moderately broad; the line of concrescence coincides with the inner margin. There are some 30, almost straight, anterior radial pore-canals; some 15 such canals were observed along the posterior margin.

The central muscle-scar consists of a posterior, vertical row of four elongate scars, with one crescentic scar in front of them, and another antero-ventrally.

The hinge of the right valve consists of a high, conical, anterior tooth, a postjacent socket which merges into a long, straight, faintly crenulate groove, and a high, distinctly lobed posterior tooth.

Dimensions. — Holotype (male left valve): L : 0,74, H : 0,38, $\frac{1}{2}$ W : 0,20.

Remarks. — This Eocene species closely resembles *Hermanites haidingeri* (REUSS) (REUSS, 1850, p. 78, pl. 10, fig. 13) from the Oligo-Miocene of western Europe. It is different from this species by lacking the regular ornamentation of the anterior part of the valves of *H. haidingeri*. In the latter species this consists of 4 straight ridges radiating from the subcentral swelling, crossed at right angles by three concentric ridges. In *H. paijenborchiana* the ridges are irregular in this region. Moreover the postero-dorsal ridge of *H. paijenborchiana* is generally much less pronounced than it is with *H. haidingeri*, where it often looks like a postero-dorsal wing.

Genus RUGGIERIA n. gen.

TYPE SPECIES *Cythere micheliniana* BOSQUET, 1852.

E t y m o l o g y : This genus is named after Prof. Dr. G. RUGGIERI of Bologna, Italy.

D i a g n o s i s. — A genus belonging to the subfamily *Trachyleberidinae*, with the following characteristics : carapace ovate, with upturned posterior end; anterior and posterior margins with marginal spines; surface partly or entirely ornamented with reticulation or longitudinal ridges, with depressions in between and with postero-ventral spine.

Marginal area fairly broad, line of concrescence and inner margin coincide throughout. Radial pore-canal are moderately numerous, simple, wavy and widened in the middle.

Central muscle-scar with posterior row of four scars, with a single horeshoe-shaped scar, open towards the dorsal side, in front of them; three other scars lie above the central scar.

Hinge of the right valve with a conical anterior tooth, situated at the posterior end of a bent elevation, a postjacent socket which merges into a serrate, straight groove, and an ovate, smooth, or obscurely lobed, posterior tooth. Hinge of the left valve with terminal sockets and a crenulate bar with a conical tooth at its anterior end.

With distinct eye-sinus antero-ventrally of the anterior hinge-element.

Sexual dimorphism is pronounced, the males being more slender than the females.

Range : Miocene to recent.

R e m a r k s. — *Ruggieria* resembles the genus *Leguminocythereis* HOWE, 1936 in outline, hinge-pattern and the construction of the marginal area. It is different from this genus in the ornamentation, as *Leguminocythereis* has a typical system of concentric ridges, and in the muscle-scar pattern.

Ruggieria also resembles the genus *Thalmannia* LE ROY, 1939 from the Miocene of Sumatra. Both genera have an upturned posterior end, a swollen carapace, ornamentation with longitudinally arranged depressions and a postero-ventral spine. The marginal area and the muscle-scar are almost identical. They differ in the hinge-structure. The anterior tooth in the right valve of *Ruggieria* consists of an elongate, bent elevation with a conical tooth at its posterior end. *Thalmannia* has in its right valve an anterior tooth which is highest at its anterior end and which gradually decreases in height towards the postjacent socket. This tooth may be obscurely subdivided.

***Ruggieria micheliniana* (BOSQUET).**

Pl. XV, figs. 5-6; Pl. XX, figs. 1-3.

Cythere micheliniana BOSQUET, 1852, vol. 24, p. 111, pl. 5, fig. 13.

Trachyleberis micheliniana (BOSQUET), KEIJ, 1955, vol. 21, n° 2, p. 127, pl. 17, fig. 3-6.

L e c t o t y p e : A right valve, badly damaged (coll. BOSQUET, No. 68).

T y p e - l o c a l i t y : Dax, France.

T y p e - l e v e l : Burdigalian.

D i s t r i b u t i o n. — France : Burdigalian of Moulin de Brisson and Le Coquillat (KEIJ, 1955) near Léognan, Aquitaine Basin.

Diagnosis. — A species of the genus *Ruggieria* with the following characteristics : ornamentation with a rounded ridge along the edge of the wing and with three short, broad, low and rounded ridges in the posterior half of the valve. Between these ridges there are rows of angular depressions; anterior region of the valve smooth.

Description. — Sexual dimorphism is distinct. The males are longer and more elongate than the females.

The dorsal margin of the left valve is slightly arched in the middle; that of the right valve is almost straight. The anterior margin is obliquely rounded and fringed with some nine to fifteen marginal spines. The ventral margin of the left valve is straight in its anterior part. It bends upwards and merges gradually into the posterior margin. The posterior margin is obtusely pointed in the middle and fringed with some five marginal spines. The ventral margin of the right valve is convex in the middle. The dorsal and ventral margins of the right valve converge towards the posterior end.

A broad, rounded ridge, which probably ends in a small spine, runs along the edge of the wing. Above the posterior half of this ridge lie three more short, broad, low, rounded ridges. In between these ridges there are rows of angular depressions. The row along the edge of the wing is always single, the others are double, often with the depressions alternating. Generally there are some irregularly placed depressions near the middle of the dorsal margin. The anterior and posterior region of the valve is smooth. On the ventral surface two ridges are found with a row of angular depressions along each of them; one of these rows is visible in lateral view.

The inner margin and the line of conchescence coincide throughout. 25 to 30 closely spaced, curved, simple or rarely bifurcating, radial pore-canals perforate the anterior duplicature. Posteriorly seven to ten, simple, somewhat curved radial pore-canals have been observed. The canals are widened near the middle.

The muscle-scar and hinge pattern are as for the genus.

Dimensions. — Female (coll. KEIJ) : L : 0,89, H : 0,51, $\frac{1}{2}$ W : 0,30; male : L : 0,92, H : 0,46, $\frac{1}{2}$ W : 0,24.

Remarks. — The lectotype is a very badly damaged right valve, which shows just sufficient details to prove that it is conspecific with our material from the Aquitaine Basin. So the description is mainly based on valves of our collection.

BOSQUET made mention of but one row of angular depressions above the ridge which forms the edge of the wing. But the lectotype shows that at least three such rows are present.

***Ruggieria* sp.**

Pl. XIV, fig. 10; Pl. XV, fig. 7.

Cythere pectinata BOSQUET (pars), 1852, vol. 24, p. 113.

Distribution. — France : Pliocene of Perpignan (coll. BOSQUET, No. 70).

Remarks. — Only two left valves were found. These specimens are assigned provisionally to the genus *Ruggieria*; outline, hinge, muscle-scar pattern and the presence of a ventral ridge justify such decision. Until the taxonomically important right valves of this species are found, the systematic place of these specimens remains uncertain. A species which probably resembles our specimens is the recent *Cythere reussi* BRADY (Les Fonds de la Mer, 1868, p. 153, pl. 18, figs. 9-10) from Middle America.

Genus FALUNIA GREKOFF and MOYES, 1955

TYPE SPECIES *Falunia girondica* GREKOFF and MOYES, 1955.

Diagnosis. — Carapace truncate posteriorly, surface reticulate with longitudinal ridges and a ridge parallel to the anterior margin. Marginal area moderately broad, radial pore-canals fairly numerous, shallow vestibule. Muscle-scar with single crescentic scar in front of posterior row of four scars. Hinge of the right valve with ovate, distinctly subdivided terminal teeth, deep anterior socket and straight, serrate groove.

Range : Miocene to recent (?).

***Falunia plicatula* (REUSS).**

Pl. XI, fig. 6; Pl. XII, fig. 8.

Cypridina plicatula REUSS, 1850, vol. 3, p. 84, pl. 10, fig. 23.

Cythere plicatula (REUSS), BOSQUET, 1852, vol. 24, p. 92, pl. 4, fig. 13; EGGER, 1858, p. 432, pl. 18, fig. 6-7; BRADY, 1879, vol. 10, pt. 8, p. 387, pl. 64, fig. 6.

Cythereis plicatula (REUSS), KUIPER, 1918, p. 45, pl. 2, fig. 16; KEIJ, 1955, vol. 21, n° 2, p. 125, pl. 17, fig. 8, pl. 20, fig. 3.

Distribution. — Upper Oligocene to Miocene of western Europe.

Remarks. — This species shows many affinities to *Falunia girondica*, for instance the ornamentation and the outline. GREKOFF's textfigure 1, however, suggests immature specimens, seen the very narrow marginal area and the weakly developed hinge. Moreover, the outline, ornamentation, hinge and muscle-scar pattern point to the *Trachyleberidinae* and not to the *Loxoconchinae*, were this genus was originally assigned to by GREKOFF.

SUBFAMILY HEMICYTHERINAE PURI, 1953.

Genus AURILA POKORNY, 1955.

TYPE SPECIES *Cythere convexa* BAIRD, 1850.

Diagnosis. — Carapace ovate to almond shaped; marginal area fairly broad, with shallow anterior and postero-ventral vestibules; radial pore-canals numerous, straight and simple. Muscle-scar with posterior row of four scars, the central ones of which subdivided into two, and an anterior row of three scars. Hinge of the right valve with conical anterior tooth, postjacent socket, straight or curved, finely serrate groove and large, elongate posterior tooth with an incision in the middle of its ventral wall.

Range : Miocene to recent.

***Aurila cicatricosa* (REUSS).**

Pl. XIII, fig. 3; Pl. XX, fig. 8.

Cypridina cicatricosa REUSS, 1850, vol. 3, p. 67, pl. 9, fig. 21.

Cythere cicatricosa (REUSS), BOSQUET (pars), 1852, vol. 24, p. 76, pl. 3, fig. 13; BRADY, 1879, vol. 10, p. 387, pl. 64, fig. 3.

Distribution. — Belgium : Pliocene of Antwerp. France : Pliocene of Perpignan. Austria : Miocene of the Vienna Basin.

Remarks. — The surface is covered with many small pits. On the ventral surface there are longitudinally arranged, quadrangular depressions. Along the anterior margin some 7 quadrangular depressions are situated.

***Aurila punctata* (VON MÜNSTER).**

Pl. XIII, fig. 7; Pl. XX, fig. 7.

Cythere punctata VON MÜNSTER, 1830, p. 62.

Cytherina punctata (VON MÜNSTER), ROEMER, 1838, p. 515, pl. 6, fig. 5.

Cythere cicatricosa (REUSS), BOSQUET (pars), 1852, vol. 24, p. 76.

Distribution. — France: Pliocene of Perpignan. Italy: Pliocene of Castellarquato and Palermo.

Remarks. — Our specimens greatly resemble the figures given by ROEMER. The left valves are very high with a strongly arched dorsal margin. The maximum height lies near the anterior cardinal angle. Along the anterior margin there are shallow, quadrangular depressions.

Genus UROCYTHEREIS RUGGERI, 1950.

TYPE SPECIES *Cytherina favosa* ROEMER, 1838.

Diagnosis. — Carapace elongate, subquadrangular; surface coarsely reticulate; marginal area and muscle-scar as *Aurila*; anterior tooth of the right valve on low, anteriorly elongated base; in the left valve the tooth at the anterior end of the bar not prominent.

Range: Miocene to recent.

(?) ***Urocythereis bidentata* (BOSQUET).**

Pl. XVIII, fig. 17; Pl. XXI, fig. 17.

Cythere bidentata BOSQUET, 1852, vol. 24, p. 72, pl. 3, fig. 9.

Lectotype: A left valve (coll. BOSQUET, No. 37).

Type-locality: Dax, Aquitaine Basin, France.

Type-level: Lower Miocene.

Description. — Only one immature left valve was found in BOSQUET's collection.

The dorsal margin is long and slightly undulating. The anterior margin is obliquely rounded. The ventral margin has a concavity before the middle and is nearly parallel to the dorsal margin. The posterior margin has a caudal process below the middle. The postero-ventral margin bears two marginal spines.

There is a low anterior marginal rim, and a low rounded knob in the postero-ventral region. A curved ridge runs along the posterior part of the dorsal margin. Just in front of the posterior cardinal angle it projects a short branch vertically downwards. The subcentral swelling is low and with faint ornamentation. Along the anterior and ventral margins the depressions are arranged in concentric rows. In the posterior half they are arranged in rows

which diverge from the subcentral swelling. Postero--ventrally of the eye-tubercle there is an obliquely placed depression. The caudal process is compressed.

The marginal area is very narrow and incomplete. As far as visible anterior radial pore-canals are moderately numerous.

The muscle-scar was not visible.

The hinge of the left valve consists of an anterior and a posterior socket with a long bar in between that ends in a conical anterior tooth.

Dimensions. — Lectotype : L : 0,78, H : 0,35, $\frac{1}{2}$ W : 0,16.

Remarks. — This species has many affinities in outline and ornamentation with the genus *Urocythereis*, but more specimens have to be studied, to clarify the systematical position of this species.

***Urocythereis favosa* (ROEMER).**

Pl. XVI, fig. 7; Pl. XIX, figs. 17-18.

Cytherina favosa ROEMER, 1838, p. 516, pl. 6, fig. 7.

Cythere favosa (ROEMER), BOSQUET, 1852, vol. 24, p. 70, pl. 3, fig. 6.

Distribution. — France : Pliocene of Perpignan. Italy : Miocene-Quaternary.

Genus POKORNYELLA OERTLI, 1956.

TYPE SPECIES *Cythere limbata* BOSQUET, 1852.

Diagnosis. — Carapace in outline as *Aurila*; surface with weak reticulation; muscle-scar with two anterior scars; anterior radial pore-canals some 20-25; posterior tooth of the right valve smooth.

Range : Oligocene.

***Pokornyella limbata* (BOSQUET).**

Pl. XIII, fig. 6; Pl. XVIII, figs. 12-14.

Cythere limbata BOSQUET, 1852, vol. 24, p. 78, pl. 4, fig. 1.

Pokornyella limbata (BOSQUET), OERTLI, 1956, p. 98, pl. 14, fig. 366-377.

Lectotype : A left valve (coll. BOSQUET, No. 42).

Paratypoids : 10 detached valves.

Type-locality : Region of Jeurre and Etréchy, Paris Basin, France.

Type-level : Stampian.

Distribution. — France : Oligocene of Jeurre and Etréchy. We found this species in the Stampian of Auvers-Saint-Georges ($\pm 2,5$ km ESE of Etréchy). Switzerland : Rupelian.

Diagnosis. — A species of the genus *Pokornyella* with the following characteristics : 7 or 8 angular depressions along the anterior margin. On the ventral surface and on the central part of the posterior half of the lateral surface angular depressions arranged in longitudinal rows. A low curved ridge parallel to the posterior half of the dorsal margin.

Description. — The females are shorter and thicker than the males. The dorsal margin of the left valve is straight, that of the right valve arched. The anterior margin is broadly rounded and drawn-out ventrally. The ventral margin is slightly convex. The posterior margin has a ventral caudal process. The ventral part of the posterior margin is convex, the dorsal part is concave. The ventral part bears some blunt marginal spines. These spines are the ends of short straight, longitudinal ridges of the compressed caudal process.

The surface is covered with angular depressions. These depressions are arranged in curved, longitudinal rows on the ventral surface and on the posterior half of the lateral surface. From the anterior margin some 6 short radial ridges converge towards the centre of the valve. In between these ridges there are large, quadrangular depressions. A short, slightly curved ridge runs along the posterior part of the dorsal margin. There is a distinct eye-tubercle.

There are some 20 to 25 anterior radial pore-canals; towards the dorsal margin they are arranged in (widely spaced) pairs.

The hinge and muscle-scar are as for the genus.

Dimensions. — Lectotype : L : 0,63, H : 0,43; complete female carapace from Auvers-Saint-Georges : L : 0,70, H : 0,48, W : 0,40; male left valve : L : 0,68, H : 0,41, $\frac{1}{2}W$: 0,17.

Remarks. — The material of the collection BOSQUET is in an extremely bad state of conservation. Fortunately material of Auvers-Saint-Georges was available, which locality lies in the type-region of this species. The description given above for the greater part has been based on our new material.

Genus CAUDITES CORYELL and FIELDS, 1937.

TYPE SPECIES *Caudites medialis* CORYELL and FIELDS, 1937.

Diagnosis. — Carapace elongate subtriangular, with ventral caudal process, thickshelled; ornamentation with ridges and nodes; marginal area fairly broad, radial pore-canals numerous; muscle-scar with posterior row of four scars, each scar divided into two, and three anterior scars; hinge of the right valve with conical anterior tooth, postjacent socket elongate and curved, serrate groove, ending against ovate posterior tooth.

Range : Eocene to recent.

Caudites monsmirabiliensis APOSTOLESCU.

Caudites monsmirabiliensis APOSTOLESCU, 1955, p. 251, pl. 2, fig. 33-34.

Distribution. — France : Lutetian of Châteaurouge, Montmirail, Neauphle-le-Château and Grignon, Paris Basin.

Remarks. — Only a single carapace was found in a sample taken from the Lutetian IV of Grignon.

SUBFAMILY BRACHYCYTHERINAE PURI, 1954.

Genus BOSQUETINA n. gen.

TYPE SPECIES *Cythere pectinata* BOSQUET, 1852.

Etymology : Named after the late Mr. J. BOSQUET, outstanding 19th century Ostracoda specialist.

Diagnosis. — A genus of the subfamily *Brachycytherinae* with the following characteristics : valves subtriangular in outline; surface smooth or partly covered with shallow depressions; with ventro-lateral keel, bearing one or more spines; marginal area moderately broad, line of concrescence coinciding with the inner margin; radial pore-canals simple or branching, numerous along the anterior margin; central muscle-scar with two anterior scars; hinge of the right valve with elongate, cusped, terminal teeth, the posterior one with long ridgelike anterior extension; sexual dimorphism distinct.

Range : Oligocene to recent of Europe.

Remarks. — *Bosquetina* shows affinities to the genus *Brachycythere* in outline and ornamentation, muscle-scar and marginal area. It is different from this genus in hinge-pattern, *Brachycythere* having a broad accommodation groove in the left valve, while its posterior tooth in the right valve lacks the long, anterior extension as found in *Bosquetina*. In addition the teeth of *Brachycythere* are heavier and more protruding. *Brachycythere* has a conical anterior tooth in the left valve, *Bosquetina* lacks this tooth but the bar has a slightly thickened anterior end.

The following species belong to the genus *Bosquetina* :

1. *Cythere pectinata* BOSQUET from the Pliocene of Perpignan (France).
2. *Cythereis dentata* G. W. MÜLLER (1894, p. 379, pl. 32, figs. 23, 27, 31) of the Quaternary and recent of Italy.
3. A species so far described as belonging to *Cythereis dentata* from the Upper Oligocene of Budapest (Hungary) (MÉHES, 1941, p. 55, pl. 4, figs. 1-3) and the Oligo-Miocene of the Netherlands (KUIPER, 1918, p. 68, pl. 3, fig. 29). The specimens of *Cythereis dentata* in the collection KUIPER were studied; they belong to *Bosquetina* (for hinge see Pl. XV, fig. 15), but are very probably not conspecific with this recent species.
4. *Cythere tarentina* BAIRD, at least the specimens described as such by BRADY (1878, p. 390, pl. 63, fig. 1), very probably belong to *Bosquetina*. They occur in the Miocene of Antwerp (Belgium).

***Bosquetina pectinata* (BOSQUET).**

Pl. XV, figs. 11-14.

Cythere pectinata BOSQUET, 1852, vol. 24, p. 113, pl. 6, fig. 1.**Lectotype** : Al left valve (coll. BOSQUET, No. 70).**Paratypes** : 20 detached valves.**Type-locality** : Perpignan, France.**Type-level** : Pliocene.

Diagnosis. — A species of the genus *Bosquetina* with the following characteristics : surface smooth, with broad, rounded ridge in the ventral half of the valve; posterior third of the ridge with two to four spines; anterior and posterior margin fringed with many small spines.

Description. — The dorsal margin is almost straight, or slightly convex. The anterior cardinal angle of the left valve protrudes. The anterior margin is broadly rounded and fringed with many small marginal spines. The ventral margin is convex. The posterior margin is obtusely pointed in the middle and fringed with small marginal spines.

Along the anterior margin runs a low, inconspicuous marginal ridge. The surface is smooth. A high, broadly rounded ridge marks the border between the lateral and ventral surfaces. The posterior third of this ridge bears two to four conical spines.

The marginal area is moderately broad. The radial pore-canals are undulating, simple or branching. They are closely set in the antero-ventral region and near the posterior point. Most canals are widened in the middle or near the margin. There are several false radial pore-canals among them.

The muscle-scar consists of a posterior vertical row of four, elongate scars with two round scars in front. A single scar lies at some distance beneath these two scars. Two other scars are situated above the central scar.

The hinge of the right valve consists of an ovate anterior tooth and an elongate, crenulate posterior tooth, highest at the posterior end and with a long ridgelike anterior extension. Between these teeth there is a shallow groove. The left valve has an anterior and a posterior socket, connected by a curved crenulate bar of which the anterior end is somewhat thickened. The anterior socket is open towards the interior. The posterior socket is separated by a low ridge from the interior.

Dimensions. — Lectotype : L : 1,07, H : 0,65, $\frac{1}{2}$ W : 0,30; paratypoid (right valve) : L : 1,05, H : 0,59, $\frac{1}{2}$ W : 0,30.

Remarks. — *Bosquetina pectinata* differs from *B. tarentina* (BAIRD) as figured by BRADY from the Antwerp Crag, by the possession of two to four spines on the ventral ridge instead of one, and in the entirely smooth lateral surface of the valves, which is described as undulated in *B. tarentina* by BRADY.

Genus BRACHYCYTHERE ALEXANDER, 1933.

TYPE SPECIES *Cythere sphenoides* REUSS, 1854.

Diagnosis. — Carapace ovate, subtriangular or subquadrangular; surface smooth or reticulate, sometimes with ventral keel; marginal area fairly broad, radial pore-canals moderately numerous, no vestibules; muscle-scar with posterior row of four scars and two anterior scars; hinge of the right valve with conical or ovate, smooth or lobed, anterior tooth, a postjacent socket, a serrate groove and an elongate cusped posterior tooth; left valve with marked accommodation groove.

Range : Cretaceous to recent (?).

***Brachycythere nalinnesensis* n. sp.**

Pl. XI, figs. 7-8.

Holotype : A right valve (S 2248).

Paratypes : 12 detached valves (S 2249).

Type-locality : Nalines (THB 1189), Belgium.

Type-level : Lutétian.

Diagnosis. — A species of the genus *Brachycythere* with the following characteristics : surface smooth, with deep, short groove behind the eye-tubercle, and a row of small, indistinct knobs parallel to the antero-ventral margin; ventral surface with some striae and ridges; postero-ventral zone of the valve strongly compressed.

Description. — The carapace is ovate in outline, highest at the anterior cardinal angle. The dorsal margin is almost straight and obliquely placed. The anterior cardinal angle of the left valve protrudes. The right valve sometimes has a slight concavity just anterior to the anterior cardinal angle. The anterior margin is broadly rounded and in most cases fringed with many small marginal spines. The ventral margin of the left valve is convex. In the right valve it is concave before the middle. The ventral margin merges gradually into the posterior margin, which is angled in the middle and ornamented with small marginal spines.

The carapace is strongly swollen ventrally, but it does not overhang the ventral margin. Parallel to the antero-ventral margin there is a row of small, indistinct knobs. Except for these knobs, the lateral surface is smooth. The eye-tubercle is pronounced and posteriorly bordered by a short, deep groove. The posterior end of the valve is strongly compressed, especially so a zone along the postero-ventral margin. Faint traces of radially arranged striae were observed on this zone. The ventral surface bears some low, longitudinal ridges, which become visible in lateral view in the antero-ventral region. The posterior tooth of the right valve is directed strongly outward, so that it is visible in lateral view.

The hinge and the marginal area are as for the genus.

The eye-cavity is separated from the anterior hinge socket by a thin septum. The sinus leading to this cavity lies antero-ventrally of the socket.

The muscle-scar consists of a posterior row of four elongate scars, with two scars in front of them. Sometimes each posterior scar is divided into two scars. A round scar is situated antero-ventrally of the two anterior scars. Another two scars are situated dorsally of the central scar.

The flange of the right valve is rather broad along the anterior and postero-ventral margins.

Dimensions. — Holotype (right valve) : L : 0,72, H : 0,41, $\frac{1}{2}$ W : 0,18; paratypoid (left valve) : L : 0,72, H : 0,43, $\frac{1}{2}$ W : 0,18.

Remarks. — This species resembles *Brachycythere sphenoides* (REUSS), but it is less high and has a more weakly developed ventral swelling. *B. nalinnesensis* lacks a true wing which characterizes many species of the genus. Our specimens are all somewhat corroded. Some show long channels in their shells, as if made by some sort of boring organisms, or bryozoans. The latter organisms occur abundantly in this locality.

Brachycythere ventricosa (BOSQUET).

Pl. IV, figs. 16-17; Pl. XX, figs. 5-6.

Cythere ventricosa BOSQUET, 1852, vol. 24, p. 80, pl. 4, fig. 2.*Hemicythere ventricosa* (BOSQUET), APOSTOLESCU, 1955, p. 267, pl. 2, fig. 31-32.

Lectotype : A left valve (coll. BOSQUET, No. 43b).

Paratypoids : A left valve and a complete carapace.

Type-locality : Cuise-Lamotte.

Type-level : Upper Ypresian (= Cuisian).

Distribution. — Belgium : Upper Ypresian of Hyon; Ledian of Bambrugge. France : Upper Ypresian of Cuise-Lamotte; Lutetian of Chaumont, Ferme de l'Orme, Grignon, Neauphlette, Montmirail, Villiers-Saint-Frédéric and Parnes.

Diagnosis. — A species of the genus *Brachycythere* with the following characteristics : ornamentation with horizontal ridges; those below the middle bend upwards in the posterior half of the valve, behind the anterior marginal ridge eight radial ridges, four of which are united in pairs; caudal process often long.

Description. — Sexual dimorphism is distinct, the males are more elongate than the females.

The dorsal outline of the left valve is slightly arched; that of the right valve is almost straight. The anterior margin is broadly rounded. The ventral outline is convex. The posterior margin has a caudal process in the middle. Above the angle the posterior margin is concave; below it it is convex.

In dorsal view the female carapace is ovate, with a short compressed, caudal process. The male carapace is more pointed anteriorly and has a longer posterior caudal process.

A marginal ridge runs along the anterior margin. Parallel to it runs a concentric ridge which forms also the edge of the ventral swelling. Between these ridges there are eight short, radial ridges. In the antero-ventral region four are united two by two. The rest of the ornamentation consists of longitudinal ridges. The ridges of the ventral half bend upward in the postero-dorsal quadrant, and run towards the dorsal margin. Between all these lie deep, rounded depressions.

The eye-tubercle is low and rather indistinct.

The marginal area is rather broad. The radial pore-canals are fairly numerous along the anterior margin, widely spaced along the postero-ventral margin.

The muscle-scar consists of a posterior row of four scars, of which the second scar from above is double. Three round scars lie on the anterior border of the muscle-scar pit.

The hinge is as for the genus.

Dimensions. — Lectotype (female left valve) : L : 0,76, H : 0,47, $\frac{1}{2}$ W : 0,24; complete male carapace : L : 0,85, H : 0,46, W : 0,44.

Genus *PTERYGOCY THERE* HILL, 1954.

TYPE SPECIES *Cypridina alata* BOSQUET, 1847.

Diagnosis. — Carapace elongate ovate to subtriangular, strongly alate, surface smooth. Internal features as *Brachycythere*.

Range : Upper Cretaceous to Oligocene.

***Pterygocythere hilli* n. sp.**

Pl. XIV, fig. 11; Pl. XV, fig. 1.

Etymology : Named after BERNARD L. HILL, New Orleans, Louisiana, United States.

Holotype : A left valve (S 2252).

Paratypoids : 5 detached valves (S 2253-2255, 2763).

Type-locality : Boring Heist-op-den-Berg (129,50 m), Belgium.

Type-level : Upper Eocene, probably Ledian.

Distribution. — Belgium : Upper Ypresian of Maulde and Mont-Saint-Aubert; Ledian (or Bartonian) of boring Heist-op-den-Berg. Netherlands : Bartonian of boring Delden (96-103 m).

Diagnosis. — A species of the genus *Pterygocythere* with the following characteristics : dorsal outline and upper part of posterior outline of the left valve an almost straight line; anterior and posterior ends fringed with large, marginal spines; wing widely extending, ending in large, backwardly directed spine.

Description. — Sexual dimorphism is distinct. The female valves are much more triangular than those of the males.

The dorsal outline of the left valve and the upper part of the posterior outline form together an almost straight line. In the right valve there is an obtuse posterior cardinal angle. In the female valves the dorsal outline has a steeper slope than in the male valves. The anterior end is broadly rounded in the male, more obliquely so in the female. The ventral outline is formed by the edge of the overhanging wing. The posterior end is angled subdorsally. The anterior end is fringed with some ten blade-like, marginal spines; the posterior end bears some six, long, sharp spines.

The surface is smooth. There is a weak marginal rim along the anterior and dorsal outlines. The eye-tubercle is small, but distinct. The wing is compressed and widely extending; it ends in a large, backwardly directed spine. A blade-like ridge is situated along the posterior border of the wing.

The internal characters are as for the genus.

Dimensions. — Holotype (female left valve) : L : 0,95, H : 0,58, $\frac{1}{2}$ W : 0,43.

Remarks. — *Pterygocythere hilli* is different from *P. murrayi* HILL from the Eocene of Alabama, by the more triangular outline, by the almost straight dorsal outline of the left valve, and in dorsal view by the greater outward extension of the wing.

INSERTAE SEDIS.

Genus LEGUMINOCYHEREIS HOWE, 1936.

TYPE SPECIES *Leguminocythereis scarabeus* HOWE, 1936.

Diagnosis. — Carapace bean-shaped, ovate and generally very wide; ornamentation with reticulation or ridges. Marginal area fairly broad, radial pore-canals moderately few, no vestibules. Muscle-scar with two anterior scars in front of posterior row of four. Hinge as *Trachyleberis*.

Range : Upper Cretaceous to Oligocene.

***Leguminocythereis dumonti* n. sp.**

Pl. XIII, fig. 8; Pl. XVI, figs. 5-6.

Etymology : Named after Mr. A. DUMONT, famous 19th century Belgian geologist.

Holotype : A right valve (S 2256).

Paratypes : 2 complete carapaces and 14 detached valves (S 2257-2261).

Type-locality : Boring Heist-op-den-Berg (129,50 m), Belgium.

Type-level : Upper Eocene, probably Ledian.

Distribution. — Belgium : Probable Ledian of the boring Heist-op-den-Berg (129 and 129,50 m); Bartonian of Heizel the borings Brussegem and Heist-op-den-Berg. France : Ledian of Auvers (coll. BOSQUET, No. 25).

Diagnosis. — A species of the genus *Leguminocythereis* with the following characteristics : Posterior margin obtusely angled in the middle; ornamentation with eight simple or bifurcating, longitudinal ridges and three concentric ridges running parallel to the anterior margin. With groove behind the eye-tubercle. Flange of the right valve broad anteriorly and postero-ventrally.

Description. — The males are longer and more elongate than the females.

The dorsal outline is slightly arched and somewhat irregularly undulating. The anterior cardinal angle of the left valve protrudes. The anterior margin of the right valve is broadly rounded, that of the left valve is obliquely rounded. The ventral margin in the left valve is straight, that of the right valve has a concavity before the middle. The posterior margin has an upward swing and is obtusely angled in the middle. The anterior margin may be fringed with low, indistinct marginal spines. The posterior margin has some three marginal spines at, and below the angle.

In dorsal view the carapace is ovate with an obtuse point behind. The left valve overlaps the right one at the anterior cardinal angle.

Parallel to the anterior margin there are three concentric ridges. The outer and middle ones, continue parallel to the ventral, posterior and dorsal margins. Within the area

circumscribed by these ridges, there are some 9 other ridges some of which anastomose at several points. Posteriorly of the eye-tubercle lies a deep, obliquely placed, short groove. The posterior compressed part of the valve is with less distinct ornamentation.

The marginal area is moderately broad, with some twenty simple and composed radial pore-canals along the anterior margin. Some 10 such canals are arranged along the posterior margin. The flange of the right valve is broad along the anterior and postero-ventral margins.

The central muscle-scar is situated on the border of a shallow pit. There is a posterior row of four elongate scars with two rounded scars in front of them.

The hinge is as for the genus, with a long, curved, smooth posterior tooth in the right valve.

Dimensions. — Holotype (male right valve) : L : 0,81, H : 0,43, $\frac{1}{2}$ W : 0,22; paratypoid (female right valve) : L : 0,75, H : 0,42, $\frac{1}{2}$ W : 0,20.

Remarks. — *Leguminocythereis dumonti* resembles *L. verrucosus* HOWE and LAW (Louisiana Vicksburg Olig. Ostr., Louis. Geol. Surv., Geol. Bull., 7, p. 65, pl. 4, fig. 15) in outline and in mode of ornamentation. However, the pattern of the ridges in both species is quite different.

***Leguminocythereis genappensis* n. sp.**

Pl. XV, fig. 19; Pl. XVI, figs. 1-4.

Etymology : Named after the type-locality Genappe, Belgium.

Holotype : A left valve (S 2262).

Paratypoids : Some 20 complete carapaces and 150 detached valves (S 2263-2276).

Type-locality : Genappe (ND 411), Belgium.

Type-level : Lutetian.

Distribution. — Belgium : Lutetian of Genappe, Braine-l'Alleud, Saint-Job and Forest (Brussels), Diegem, Nalinnes and Blanden.

Diagnosis. — A species belonging to the genus *Leguminocythereis* with the following characteristics : specimens elongate, males 2,2 times as long as high, females twice as long as high; three concentric ridges parallel to the anterior outline, which is fringed with some 10 downwardly directed spines; posterior outline, of the left valve truncate.

Description. — Sexual dimorphism well-developed. The males are longer than the females (length/height ratio for the males 2,2, for the females 2,0).

The dorsal outline is slightly convex in the middle. The anterior cardinal angle protrudes. The anterior outline is broadly or somewhat obliquely rounded and fringed with some 10 downwardly directed marginal spines. The ventral outline is straight with an upturned posterior part. The posterior outline of the left valve is truncate; that of the right valve has an obliquely placed tract dorsally. The ventral part of the posterior margin bears some 4 backwardly directed spines.

The valves have their maximum inflation postero-ventrally. The ornamentation consists of a regular reticulation. There are three concentric ridges parallel to the anterior margin. They continue along the ventral surface, turn upwards posteriorly with a broad

loop and form 3 of the curved ridges in the ornamentation of the dorsal part of the lateral surface. In the valve's ventral half the ridges are bent downwards, while in the dorsal part they are upwardly bent. These ridges are connected by short, less broad ridges forming sub-quadrate, rectangular and triangular depressions between them. The subcentral swelling is indistinct, but marked by less distinct reticulation at this place.

The internal features are as for the genus.

Dimensions. — Holotype (male left valve) : L : 0,84, H : 0,38, $\frac{1}{2}$ W : 0,22; paratypoid (female left valve) : L : 0,76, H : 0,38. $\frac{1}{2}$ W : 0,21.

Remarks. — This species has only been found in the Belgian Lower Lutetian. Sometimes it occurs together with *Leguminocythereis scrobiculata* (VON MÜNSTER) and (or) *L. striatopunctata* (ROEMER). It shows affinities to both species in the mode of ornamentation, somewhat more to *L. scrobiculata* than to *L. striatopunctata*. It differs from the former species in the more elongate outline, the number of concentric ridges parallel to the anterior margin, and the pattern of the ridges on the lateral surface.

(?) *Leguminocythereis multicostata* (BOSQUET).

Pl. XIII, fig. 1-2; Pl. XVIII, fig. 9.

Cythere multicostata BOSQUET, 1852, vol. 24, p. 59, pl. 2, fig. 12.

Leguminocythereis multicostata (BOSQUET), APOSTOLESCU, 1955, p. 252, pl. 3; fig. 39-40.

Lectotype : A left valve (coll. BOSQUET, No. 26b).

Paratypoids : One complete carapace and four detached valves.

Type-locality : Chaumont or Ferme de l'Orme, France.

Type-level : Lutetian.

Distribution. — France : Lutetian of Chaumont and Ferme de l'Orme (BOSQUET), Grignon, Amblainville, Neauphlette, Villiers-Saint-Frédéric (APOSTOLESCU). (The material of the Ledian of Acy, Guépelle, Mortefontaine, Pisseloup, Tancrou and Ver got lost.)

Diagnosis. — A species tentatively assigned to the genus *Leguminocythereis*, with the following characteristics : ornamentation with undulating, longitudinal and curved ridges of variable length and two concentric ridges parallel to the anterior outline; the longitudinal ridge at the border of the lateral and ventral surfaces slightly higher than the other ridges.

Description. — The dorsal outline is slightly arched; the anterior outline is somewhat obliquely rounded; the posterior cardinal angle protrudes. The ventral outline is straight. The posterior outline has an upward swing and a rounded subdorsal angle.

The ornamentation consists of two ridges parallel to the anterior margin. The inner ridge is shorter than the outer one; it starts just above the middle of the valve. The border between the lateral and ventral surface is formed by a straight ridge, which at the posterior end turns upwards in the direction of the posterior sub-dorsal angle.

This ridge is slightly higher than the other ridges. Above this ridge a dozen other ridges, of different length become gradually more curved towards the dorsal margin. A narrow posterior zone of the valve is compressed.

The marginal area is moderately broad. The anterior duplicature is perforated by some 25 simple, or composed radial pore-canals. Along the posterior margin there are some 15 radial pore-canals.

Posterior tooth of the right valve, elongate and lobed.

Dimensions. — Lectotype (female left valve) : L : 0,69, H : 0,44, $\frac{1}{2}W$: 0,18; paratypoid (left valve) : L : 0,74, H : 0,46, $\frac{1}{2}W$: 0,18.

Remarks. — This species has the same mode of ornamentation as *Leguminocythereis dumonti* n. sp., from which it is different in the pattern of the ridges.

If the crenulate posterior tooth is normal for this species, it belongs to a new genus, for with *Leguminocythereis* this tooth is smooth.

Leguminocythereis pertusa (ROEMER).

Pl. XX, fig. 11.

Cytherina pertusa ROEMER, 1838, p. 515, pl. 6, fig. 2.

Cythere striatopunctata BOSQUET (pars), 1852, vol. 24, p. 62.

Leguminocythereis pertusa (ROEMER), APOSTOLESCU, 1955, p. 253, pl. 3, fig. 41-42.

Distribution. — France : Lutetian and Ledian of the Paris Basin. Belgium : Ledian of Balegem and Forest (Brussels).

Leguminocythereis scrobiculata (VON MÜNSTER).

Pl. XII, fig. 17; Pl. XIX, fig. 16.

Cythere scrobiculata VON MÜNSTER, 1830, p. 63; BOSQUET, 1852, vol. 24, p. 64, pl. 3, fig. 2 LIENENKLAUS, 1896, vol. 22, p. 23, pl. 2, fig. 2.

Cytherina scrobiculata (VON MÜNSTER), ROEMER, 1838, p. 515, pl. 6, fig. 1.

Cythereis ? scrobiculata (VON MÜNSTER), TRIEBEL, 1941, vol. 23, pl. 4, fig. 43.

Leguminocythereis scrobiculata (VON MÜNSTER), APOSTOLESCU, 1955, p. 254, pl. 3, fig. 45-46.

Distribution. — Belgium : Lutetian-Rupelian. France : Lutetian, Oligocene. Germany : Oligocene. Netherlands : Bartonian borings Delden (70-103 m) and Almelo (158-162 m). Switzerland : Middle Oligocene.

Remarks. — This species is rather variable. Some Lutetian and Ledian localities yield very long, spindle-shaped specimens. But all have the typical ornamentation with a curved groove antero-dorsally. This groove lies between the second and third heavy, concentric ridges which are parallel to the anterior margin.

The central muscle-scar consists of a vertical row of four elongate scars, the second from above being largest; in front of them lie two more scars.

Leguminocythereis striatopunctata (ROEMER).

Pl. XII, fig. 18; Pl. XV, fig. 8.

Cytherina striato-punctata ROEMER, 1838, p. 515, pl. 6, fig. 3.

Cythere striatopunctata (ROEMER), BOSQUET, 1852, vol. 24, p. 62, pl. 3, fig. 1; JONES, 1857, p. 27, pl. 5, fig. 6, 7, 10.

Leguminocythereis striatopunctata (ROEMER), APOSTOLESCU, 1955, p. 254, pl. 3, fig. 47-48.

Distribution. — Belgium : Ypresian-Tongrian. France : Upper Ypresian-Ledian. England : Ledian-Bartonian. Germany : Eo-Oligocene. Netherlands : Bartonian of boring Delden (70-103 m).

Remarks. — Immature specimens often have a curved longitudinal ridge marking the boundary between the lateral and ventral surfaces.

The muscle-scar consists of a vertical row of four scars, with two more scars in front of them. There are three other small scars between the central scar and the hinge line.

Genus TRINGLYMUS BLAKE, 1950.

TYPE SPECIES *Tringlymus hyperochus* BLAKE, 1950.

Diagnosis. — Carapace elongate, subquadrangular, ornamented with reticulation, low ridges or punctae. Marginal area fairly broad, radial pore-canals moderately numerous, no vestibules. Muscle-scar with two anterior scars and a posterior row of four scars. Hinge as *Trachyleberis*, but with short additionnal groove beneath anterior end of median hinge-element and triangular or irregular protrusion just beneath.

Range : Eocene.

***Tringlymus angulatopora* (REUSS).**

Pl. XVIII, fig. 10; Pl. XIX, fig. 7.

Cypridina angulatopora REUSS, 1850, vol. 3, p. 86, pl. 10, fig. 32.

Cythere jonesiana BOSQUET, 1852, vol. 24, p. 67, pl. 3, fig. 4.

Cythere angulatopora (REUSS), JONES and SHERBORN, 1889, p. 22, pl. 3, fig. 15.

Leguminocythereis jonesiana (BOSQUET), APOSTOLESCU, 1955, p. 252, pl. 3, fig. 37-38.

Distribution. — Belgium : Lutetian-Bartonian. France : Lutetian-Ledian. Netherlands : Bartonian of boring Delden (85-103 m).

Remarks. — REUSS' original description and figures of *Cypridina angulatopora* are too vague and insufficient to identify the species with certainty. But after all, this description and figures fit better to the original specimens of *Cythere jonesiana* BOSQUET, than to the specimens which BOSQUET named *Cythere angulatopora* (REUSS). This was already observed by JONES and SHERBORN, who made *Cythere jonesiana* a synonym of *Cythere angulatopora* and established a new species for BOSQUET'S *Cythere angulatopora*, which they named *Cythere bosquetiana*.

***Tringlymus grignonensis* APOSTOLESCU.**

Cythere jonesiana BOSQUET (pars), 1852, vol. 24, p. 67.

Tringlymus grignonensis APOSTOLESCU, 1955, p. 273, pl. 8, fig. 128-129.

Distribution. — Lutetian of the Paris Basin, France.

***Tringlymus heistensis* n. sp.**

Pl. XVIII, figs. 7-8; Pl. XIX, fig. 3-4.

Cythere jonesiana BOSQUET, (pars), 1852, vol. 24, p. 67.

Holotype : A right valve (S 2382).

Paratypoids : 30 complete carapaces and 37 detached valves (S 2375-2381, 2383-2387, 2748).

Type-locality : Boring Heist-op-den-Berg (129 m), Belgium.

Type-level : Upper Eocene, probably Ledian.

Distribution. — Belgium : Ledian of Forest, Balegem, Vlierzele, Asse, Meldert and Gent and probable Ledian of the boring Heist-op-den-Berg; Bartonian of Oedelem and boring Heist-op-den-Berg. France : Lutetian of the Paris Basin, Ledian of Tancrou.

Diagnosis. — A species of the genus *Tringinglymus* with the following characteristics : ornamentation consists of an irregular reticulation with low, rounded ridges and three low, concentric ridges, parallel to the anterior margin, depressions between the ridges pitted.

Description. — Sexual dimorphism could be observed. The males are more elongate than the females.

The dorsal margin is slightly arched or almost straight. The anterior cardinal angle protrudes. The anterior margin is broadly rounded and fringed with a dozen small, marginal spines. The ventral margin is concave before the middle, and straight towards the posterior end. The posterior margin is obtusely angled in the middle and composed of a straight or slightly concave dorsal part, and a convex ventral part. The latter bears five or six marginal spines.

In dorsal view the carapace is ovate with a compressed posterior end. The left valve overlaps the right one at the anterior cardinal angle and along the dorsal part of the posterior margin.

The surface is covered with a reticulation of low rounded ridges. The main direction of these ridges is from postero-dorsal to antero-ventral. Three or four concentric ridges run parallel to the anterior margin. In the postero-ventral part there is a low elongate elevation. The depressions between the ridges are closely pitted. The subcentral swelling is slightly elevated. The eye-tubercle is well-developed.

The marginal area is rather wide. The line of concrescence and the inner margin coincide throughout. The radial pore-canals are moderately numerous, straight, simple and slightly widened near their middle. There is a distinct flange along the anterior, ventral and postero-ventral margin of the right valve.

The central muscle-scar consists of a posterior row of four elongate scars. Two round scars lie anteriorly of this row. Halfway between these anterior scars and the ventral line of concrescence lies another rounded or ovate scar. At least three scars are situated between the central scar and the hinge line.

The hinge of the right valve has an additional short groove below the anterior end of the main groove.

Dimensions. — Holotype (female right valve) : L : 0,75, H : 0,40, $\frac{1}{2}W$: 0,20; paratypoid (male right valve) : L : 0,85, H : 0,43, $\frac{1}{2}W$: 0,22.

Remarks. — *Tringinglymus heistensis* has some resemblance to (?) *Cythereis dadayi* MÉHES (Geol. Hung., ser. Pal., Vol. 12, 1936, p. 40, pl. 4, figs. 12-14), from the Eocene of Hungary, but this species is smooth anteriorly and has a concave dorso-posterior outline. It also lacks the postero-ventral marginal spines.

Tringlymus neauphlensis APOSTOLESCU.

Pl. XIX, fig. 10; Pl. XX, fig. 4.

Tringlymus neauphlensis APOSTOLESCU, 1955, p. 273, pl. 8, fig. 130-131.

Distribution. — Lutetian of the Paris Basin, France.

Remarks. — We found this species in our samples of the Lutetian of Grignon.

Tringlymus tenuistriatus APOSTOLESCU.*Cythere jonesiana* (pars), BOSQUET, 1852, vol. 24, p. 67.*Tringlymus tenuistriatus* APOSTOLESCU, 1955, p. 274, pl. 8, fig. 132-135.

Distribution. — Lutetian of the Paris Basin, France.

Genus KINGMAINA n. gen.

TYPE SPECIES *Cythere forbesiana* BOSQUET, 1852.

Etymology: Named after Dr. J. TH. KINGMA of the Geological Survey of New Zealand.

Diagnosis. — A genus of the family *Cytheridae* with the following characteristics: carapace inflated with prominent wing, pierced by six to seven foramina; dorsal outline straight, anterior end rounded, posterior end triangular and compressed; in dorsal view the carapace is ovate or arrowhead-shaped. Surface reticulate, concentric ridges may be present along the anterior outline; with eye-tubercle.

Marginal area moderately broad, radial pore-canals fairly numerous, line of concrescence coincides with inner margin throughout.

Muscle-scar consists of vertical, posterior row of four scars with a single horseshoe-shaped scar in front.

Hinge of the right valve with high, conical anterior tooth, post-jacent socket which merges into a straight groove that ends against an ovate posterior tooth. Beneath the anterior end of the hinge there is a protuberance from a muscle-attachment.

Range: Maastrichtian to Bartonian of Europe.

Remarks. — *Kingmaina* differs from *Pterygocythereis* BLAKE in the reticulated surface, the perforated wing and the protuberance beneath the anterior part of the hinge. It is different from *Tringlymus* BLAKE in the presence of a wing and in the compressed triangular, posterior end.

To the genus *Kingmaina* belong the Cretaceous species, described by BOSQUET (1854, pp. 120-122, pl. 10, figs. 2-4) as *Cythere hagenowi*, *Cythere cristata* and *Cythere macroptera*, and the species described by VAN VEEN (1936, p. 158, pl. 7, figs. 53-60) as *Cythereis minutoides*.

Kingmaina forbesiana (BOSQUET).

Pl. XI, figs. 9-10; Pl. XIV, figs. 8-9.

Cythere forbesiana BOSQUET, 1852, vol. 24, p. 129, pl. 6, fig. 13.*Triginglymus forbesianus* (BOSQUET), APOSTOLESCU, 1955, p. 273, pl. 8, fig. 127.

Lectotype : A right valve (coll. BOSQUET, No. 82b).

Paratypes : Ten, partly damaged, detached valves (coll. BOSQUET, Nos. 82, 82b).

Type-locality : Ménilmontant (Paris), France.

Type-level : Upper Ypresian.

Distribution. — Belgium : Upper Ypresian of Hyon and Forest (Brussels); Lutetian of Diegem, Genappe, Saint-Job and Forest (Brussels); Ledian of Forest, and probable Ledian of the boring Heist-op-den-Berg; Bartonian of Gent. France : Upper Ypresian of Ménilmontant (Paris); Lutetian of Chaumont, Ferme de l'Orme, Grignon, Montmirail, Nanteuil, Parnes and Saint-Félix; Ledian of Le Guépelle.

Diagnosis. — A species of the genus *Kingmaina* with the following characteristics : carapace strongly inflated and coarsely reticulated; ventral part of the posterior margin with distinct marginal spine; often with two grooves parallel to the ventral part of the anterior margin.

Description. — The dorsal margin is straight or slightly arched. The anterior margin of the left valve is broadly rounded, that of the right valve has a flattened part near the anterior cardinal angle. The lower half of the valve may be fringed with many small marginal spines, which in most cases are lacking. The ventral free edge is almost straight; it is obscured by the overhanging wing, along its entire length. The posterior end is triangular. There is a marginal spine in the ventral part of the posterior margin. In a few cases some marginal spines were observed near the middle of the posterior margin. The posterior part is compressed.

In dorsal view the carapace is ovate, with a tendency to become arrowhead-shaped. The left valve overlaps the right one anteriorly of the anterior cardinal angle.

There is a strongly developed wing, which is rounded posteriorly. The wing is pierced by 6 or 7 circular foramina. Sometimes the foramina are so large that the ridge along the wing's edge is a free beam supported by pillars. The surface is coarsely reticulate. Often there are two grooves parallel to the ventral part of the anterior margin. The subcentral swelling is low and indistinct. There is an indistinct, glassy eye-tubercle, situated at some distance beneath the anterior cardinal angle.

The flattened ventral surface is coarsely reticulate.

The marginal area is moderately broad. The line of concrescence and the inner margin coincide throughout. Some 25 simple and straight radial pore-canals perforate the anterior duplicature. They are widely spaced dorsally and closely set ventrally. Some 10 such canals are situated at the posterior angle.

The central muscle-scar is situated in a shallow muscle-scar pit and consists of a posterior row of four elongate scars with one horseshoe-shaped scar in front of this row. An elongate scar was observed near the ventral line of concrescence, and at least three others are situated above the central scar.

The hinge is as for the genus *Tringinglymus* BLAKE, while beneath the hinge line, just behind the anterior socket of the right valve, or the anterior tooth of the left valve, there is a thick, solid protuberance. In some cases this knob was situated at some distance of the hinge-line on the inner surface of the valve.

Dimensions. — Lectotype (right valve) : L : 0,66, H : 0,34, $\frac{1}{2}$ W : 0,21; paratypoid (left valve) : L : 0,64, H : 0,34, $\frac{1}{2}$ W : 0,22.

Remarks. — *Kingmaina forbesiana* has many resemblances to the Cretaceous *K. hagenowi* (BOSQUET), except that the latter lacks the two grooves near the ventral part of the anterior margin. *K. forbesiana* differs from *K. cristata* and *K. macroptera* in lateral and dorsal view.

SUBFAMILY CYTHERETTINAE TRIEBEL, 1952.

Genus CYTHERETTA G. W. MÜLLER, 1894.

TYPE SPECIES *Cytheretta rubra* G. W. MÜLLER, 1894.

Diagnosis. — Carapace obliquely ovate or egg-shaped with upturned postero-ventral end. Left valve overlaps the right one, especially at the cardinal angles. Surface smooth, punctate, with ridges, or reticulate. Marginal area very broad, the inner margin S-shaped anteriorly and one or two protrusions posteriorly. Radial pore-canals numerous, thin, curved and with widening in their middle. Muscle-scar with posterior vertical row of four ovate scars, with a single kidney-shaped scar in front. Hinge of the right valve with prominent, triangular, anterior tooth, with edge perpendicular to the hinge-line; a postjacent socket merging into a crenulate groove and an ovate posterior tooth.

Range : Eocene to recent.

Cytheretta bambrugensis n. sp.

Pl. VI, fig. 10; Pl. X, figs. 9-11.

Holotype : A left valve (coll. S 2402).

Paratypoids : Some 70 detached valves and 9 complete carapaces (S 2403-2419, 2719).

Type-locality : Bambrugge (ZD 1011), Belgium.

Type-level : Ledian.

Distribution. — Belgium : Lutetian of Saint-Job and Forest (Brussels), Diegem, Genappe, Braine-l'Alleud; Ledian of Saint-Gilles and Forest (Brussels), Balegem, Bambrugge, Asse, and probable Ledian of the boring Heist-op-den-Berg (129,50 and 129 m); Bartonian of the boring Brussegem. Netherlands : Bartonian of the boring Delden (96-103 m).

Diagnosis. — A species of the genus *Cytheretta* with the following characteristics : dorsal and ventral outlines almost straight and converging posteriorly; surface ornamented with eight longitudinal ridges, with rounded depressions in between.

Description. — The anterior margin is obliquely rounded and ornamented with a few very short marginal spines. The posterior margin has an upward swing and is provided with another three spines. The dorsal and ventral outlines of the right valve are long and almost straight; the ventral margin is somewhat concave just before the middle. The cardinal angles of the left valve are protruding, especially the posterior one. In the middle the dorsal margin is slightly convex. The ventral margin of this valve is straight; it merges gradually into the posterior margin.

The surface is ornamented with eight longitudinal ridges. At some places connections between two ridges occur in the form of an upturned branch of one of them. All ridges are inter-connected by small transverse ridges, with rounded depressions in between. A marginal rim runs along the anterior, ventral and posterior margins. The valves have their greatest inflation postero-ventrally. From this point the width diminishes abruptly towards the posterior end.

The marginal area is very broad, probably with shallow, anterior and posterior vestibules. The inner margin is S-shaped, both anteriorly and posteriorly. It is straight or slightly undulating in the middle. Beneath the muscle-scar and just behind the anterior protrusion of the marginal area, the inner margin forms a deep, narrow wedge-shaped indentation. Seventeen to eighteen long, curved radial pore-canals start closely together and diverge towards the anterior margin. From the posterior outward bend numerous, short, closely spaced radial pore-canals spread towards the posterior margin.

The muscle-scar consists of a posterior curved row of four, small, ovate scars and one rounded scar in front of them. Some additional scars were observed above them.

The hinge is typical for the genus.

Dimensions. — Holotype (left valve) : L : 0,76, H : 0,42, $\frac{1}{2}$ W : 0,21; paratypoid (complete carapace) : L : 0,76, H : 0,41, W : 0,35.

Remarks. — *Cytheretta bambruggensis* shows some resemblance to *C. howei* SWAIN (Journ. of Pal., 1946, Vol. 20, p. 380, pl. 54, fig. 12; pl. 55, fig. 8), but the latter has parallel dorsal and ventral margins instead of converging ones. The ornamentation is similar but the exact pattern is different.

Cytheretta concinna TRIEBEL.

Pl. X, fig. 6.

Cythere plicata BOSQUET (pars) (non VON MÜNSTER), 1852, vol. 24, p. 60, pl. 2, fig. 13.

Cythereis plicata LIENENKLAUS (non VON MÜNSTER), 1905, p. 37, 64.

Cytheretta concinna TRIEBEL, 1952, vol. 3, p. 27, pl. 5, fig. 31-33.

Distribution. — Belgium : Bartonian, Rupelian. France : Oligocene of Paris Basin. Germany : Rupelian of the Mayence Basin. Netherlands : Bartonian of the borings Almelo (158-162 m) and Delden (70-85, 95-103, 111-119 m).

Cytheretta costellata (ROEMER).

Pl. VI, fig. 9; Pl. XXII, fig. 7.

Cytherina costellata ROEMER, 1838, p. 517, pl. 6, fig. 24.

Cythere costellata (ROEMER), BOSQUET (pars), 1852, vol. 24, p. 58, pl. 2, fig. 11; JONES, 1857, p. 32, pl. 5, fig. 11.

Cythere costellata (ROEMER) var: *triangulata* JONES and SHERBORN, 1889, p. 30, pl. 1, fig. 21.

Distribution. — Belgium : Lutetian-Bartonian. England : Bracklesham beds (Ledian). France : Lutetian and Ledian of the Paris Basin.

Remarks. — Generally both costae and intercostal surface are smooth. In some samples (Balegem, Bambrugge and Forest) however, specimens were found with a reticulate intercostal surface.

Cytheretta crassivenia APOSTOLESCU.

Pl. VI, fig. 4; Pl. X, figs. 12-14.

Cythere costellata BOSQUET (non ROEMER) (pars), 1852, p. 58.

Cytheretta crassivenia APOSTOLESCU, 1955, p. 261, pl. 5, fig. 77-79.

Distribution. — Belgium: Ledian-Bartonian. France: Lutetian and Ledian of the Paris Basin.

Cytheretta decipiens n. sp.

Pl. VI, fig. 8; Pl. X, figs. 15-16.

Cytheretta concinna APOSTOLESCU (non TRIEBEL), 1955, p. 261, pl. 4, fig. 72-74.

Etymology: From the latin *decipiens*, meaning deceiver, this referring to the close resemblance to *Cytheretta concinna* TRIEBEL and *Cytheretta gracilicosta* (REUSS).

Holotype: A complete carapace (coll. S 2452).

Paratypes: Some 25 complete carapaces and some 25 detached valves (S 2453-2462, 2869).

Type-locality: Forest (BD 445), Belgium.

Type-level: Upper Ypresian.

Distribution. — Belgium: Upper Ypresian of Hyon, Forest and Frasnes-lez-Buissenal; Lutetian of Saint-Job; Ledian of Balegem, Bambrugge, Forest and Meldert, and probable Ledian of the boring Heist-op-den-Berg (129,50 m); Bartonian of the boring Brussegem. France: Lutetian of Damery, Gomerfontaine and Montmirail-les-Marais.

Diagnosis. — A species of the genus *Cytheretta* with the following characteristics: ornamentation of lateral surface consisting of three main longitudinal ridges and three additional lower ones; the first of the latter ridges runs above the posterior part of the lower longitudinal ridge; the second branches off ventrally from the middle of the central longitudinal ridge; the third runs beneath the posterior part of the upper longitudinal ridge.

Description. — Sexual dimorphism is well developed; the males are more elongate than the females.

The middle part of the dorsal margin of both valves is hidden by the prominent upper longitudinal ridge. The cardinal angles of the left valve are marked. The anterior margin is obliquely rounded and often fringed with several small marginal spines. The ventral margin of the left valve is nearly straight, that of the right valve slightly concave in the middle. The posterior margin has a strong upward swing and bears three, subdorsal marginal spines.

The ornamentation of the lateral surface consists of three main longitudinal ridges and some additional shorter ridges. The lower longitudinal ridge runs at the border of the lateral and ventral surface. It is connected at its anterior end with the marginal rim, which runs along the anterior, ventral and posterior margins. Above the posterior part of this

lower longitudinal ridge runs a rather short, slightly curved ridge. The middle longitudinal ridge is sinuous; it ends against the anterior marginal rim. From its middle a ridge branches off, running closely parallel and beneath the main ridge in frontal direction. The upper longitudinal ridge consists of a strongly curved posterior part, and a downward sloping anterior part. At some distance below the posterior part runs a parallel ridge. The intercostal surface is reticulated. Often there are prominent connections between the anterior ends of the three main ridges. The ventral surface is ornamented with some four longitudinal ridges of various lengths. They are more conspicuous on the left valve than on the right one.

The marginal area is very broad, forming a large protrusion in the posterior half of the valve, and a smaller one in the antero-ventral region.

The hinge and muscle-scar are as for the genus.

Dimensions. — Holotype (female carapace) : L : 0,74, H : 0,42, W : 0,35.

Remarks. — This species show affinities to *Cytheretta gracilicosta* (REUSS) as well as to *C. concinna* TRIEBEL. It shares the outline and presence of the ridge beneath the upper longitudinal ridge with *C. gracilicosta*. With *C. concinna* it has the branch of the middle longitudinal ridge and the ornamentation of the anterior part of the valve in common. It is different from both these species in the combination of their features, and by the possession of a low ridge above the posterior end of the lower, main longitudinal ridge. The ridge beneath the upper longitudinal ridge is almost vanished in the Ledian specimens. We think it highly probable that *C. decipiens* is the ancestor of *Cytheretta concinna* TRIEBEL, which we found from the Bartonian to the Rupelian.

Cytheretta eocaenica n. sp.

Pl. VI, fig. 6; Pl. X, fig. 2-4.

Cythere jurinei BOSQUET (pars) (non VON MÜNSTER), 1852, vol. 24, p. 56, pl. 2, fig. 9.

Cytheretta jurinei, APOSTOLESCU (non VON MÜNSTER), 1955, p. 263, pl. 5, fig. 86-89, pl. 6, fig. 90-91.

Holotype : A right valve (coll. S 2908).

Paratypoids : 50 complete carapaces and 70 detached valves (coll. S 2463-2472, 2809-2810).

Type-locality : Grignon (CAB 1002), France.

Type-level : Lutetian IV.

Distribution. — Belgium : Lutetian of Saint-Job and Forest (Brussels), Diegem and Gobertange; Ledian of Forest (Brussels), Asse, Meldert, Bambrugge and Vlierzele, and probable Ledian of the boring Heist-op-den-Berg (129,50 and 129 m). France : Upper Ypresian of Ménilmontant; Lutetian of Grignon, Saint-Félix, Parnes, Châteaurouge, Ferme de l'Orme, Chaumont, Chaméry, Le Vivray, Mouchy-le-Châtel, Gomerfontaine, Amblainville, Chaussy, Damery, Neauphlette, Montmirail-les-Marais, Villiers-Saint-Frédéric, Neauphle-le-Château.

Diagnosis. — A species of the genus *Cytheretta* with the following characteristics : anterior margin obliquely rounded, obtusely angular ventrally; with horizontal rows of rounded depressions posteriorly; inner margin with three inward protrusions in the ventral half of the valve.

Description. — Sexual dimorphism is distinct. The females are much shorter and wider than the males.

The dorsal margin of the much larger left valve is convex in the anterior part and concave in front of the protruding posterior cardinal angle. The anterior margin is obliquely rounded and with two subacute angles, the antero-ventral one being the most conspicuous. The ventral margin is very slightly convex or straight; it merges gradually into the broadly rounded posterior margin. The latter is sometimes extended in the shape of a bluntly rounded angle.

The right valve has a slightly convex dorsal margin with a marked posterior cardinal angle; its anterior margin is strongly obliquely rounded with two obtuse angles; its ventral margin is concave before the middle, and convex behind it; the posterior margin has an upward swing, its dorsal part is concave.

In dorsal view the female carapace is ovate, widest behind the middle; the male carapace is less wide.

The surface is smooth, except in its postero-ventral part, where three to five horizontal rows of rounded depressions occur. The females often have many additional widely scattered rounded depressions.

The marginal area is very broad along the anterior and antero-ventral margins, where it possess 25 tot 30 long, curved radial pore-canal. In the posterior part of the marginal area a great number of closely set, short radial pore-canal were observed. The inner margin, if undamaged, is S-shaped anteriorly, with a deep wedge-shaped outward indentation below the muscle-scar and with two broad inward protrusions along the ventral and posterior margin.

The muscle-scar consists of a posterior, vertical row of four scars, the uppermost one of which is obliquely placed. The anterior scar is horseshoe-shaped with the opening towards the dorsal side.

The hinge is typical for the genus.

Dimensions. — Holotype (male) : L : 1,01, H : 0,50, $\frac{1}{2}$ W : 0,21; female : L : 0,98, H : 0,58, W : 0,48.

Remarks. — *Cytheretta eocaenica* resembles *C. jurinei* (VON MÜNSTER) in many aspects, as for instance in the ornamentation with some rows of rounded depressions in the posterior half of the valve. It is different in the outline of the anterior margin, which is not evenly rounded, but provided with two blunt angles; especially the antero-ventral angle is conspicuous. In *C. jurinei* the inner margin forms a large outward curve in its posterior half, while in *C. eocaenica* the inner margin curves widely inwards in this region. In the Ledian of Bambrugge and Forest (BD 1258) some specimens were observed that possess a number of deep, angular depressions near the ventral part of the anterior margin.

***Cytheretta gracilicosta* (REUSS).**

Pl. X, fig. 5.

Cythere gracilicosta REUSS, 1855, vol. 7, p. 280, pl. 10, fig. 8.

Cytheretta gracilicosta (REUSS), TRIEBEL, 1952, vol. 3, p. 29, pl. 5, fig. 36-39.

Distribution. — Germany : Upper Eocene. England : Bartonian of Hampshire Basin. Netherlands : Bartonian of the boring Delden (90-103 m, 111-119 m).

Cytheretta haimeana (BOSQUET).

Pl. VI, fig. 7; Pl. X, figs. 7-8.

Cythere haimeana BOSQUET, 1852, vol. 24, p. 61, pl. 2, fig. 14.*Cythere costellata* BOSQUET (pars) (non ROEMER), 1852, p. 58.*Cytheretta haimeana* (BOSQUET), APOSTOLESCU, 1955, p. 262, pl. 5, fig. 84-85.

Neotype : A complete carapace (coll. S 2912).

Hypotypoids : 15 complete carapaces and 12 detached valves (coll. BOSQUET, No. 25c; S 2913, 2914).

Type-locality : Grignon, France.

Type-level : Lutetian IV.

Distribution. — France : Upper Ypresian of Ménéilmontant (Paris) (coll. BOSQUET, No. 25c); Lutetian of Grignon, Gomerfontaine, Chaumont-en-Vexin, Boury-en-Vexin, Parnes, Chaussy, Neauphlette, Villiers-Saint-Frédéric, Neauphle-le-Château.

Diagnosis. — A species belonging to the genus *Cytheretta* with the following characteristics : surface ornamented with some eleven longitudinal ridges, one of them turns upwards in the middle of the valve; additional vertical connections between the longitudinal ridges.

Description. — Sexual dimorphism is distinct; the males are longer and more elongate than the females.

The dorsal margin possesses two prominent cardinal angles; in the middle it is concealed by an outwardly curved ridge. The anterior margin is obliquely or broadly rounded. The ventral margin is straight and parallel to the dorsal outline; its posterior end is bent upwards. The posterior margin has an upward swing, and bears four small marginal spines.

The carapace is wedge-shaped in dorsal view.

The surface is ornamented with eleven, curved longitudinal ridges. The uppermost one conceals the middle part of the dorsal margin. The fifth ridge from above turns upwards in the middle of the valve. The sixth and seventh and the seventh and eighth ridges are anastomosing in the postero-ventral region, where all longitudinal ridges either bend downward or form hairpin-bends. Parallel to the anterior margin there is a reticulated zone with some large and small meshes. Between the longitudinal ridges there are numerous transverse connections.

The hinge is typical for the genus. The calcified portion of the inner lamella is very broad. In the valve's posterior half it forms a large upwardly directed extension, which almost reaches the hinge-line.

Dimensions. — Neotype (female carapace) : L : 0,63, H : 0,34, W : 0,27; hypotypoid (male carapace) : L : 0,67, H : 0,34, W : 0,27.

Remarks. — BOSQUET's original material of this species from the Lutetian of Grignon evidently got lost. In our material from Grignon we found many individuals of the genus *Cytheretta*, which closely resemble *Cythere haimeana* as described and figured by BOSQUET. There are a few differences, i.e. all longitudinal ridges are of the same height instead of three being higher than the others; the three nodes near the antero-ventral margin are

lacking, this region being occupied by the reticulated zone. On the other hand, however, the number and pattern of the longitudinal ridges, the upward bent ridge in the middle of the valve (see the vertical ridge in fig. 14a of BOSQUET), the vertical connections between the ridges, the outline in lateral and dorsal view, all these features are entirely corresponding with the description and figures given by BOSQUET of *Cythere haimeana*.

Moreover, this *Cytheretta*-species is the only one found at Grignon which comes into consideration for comparison, so we think we are justified in designating a new type from among our material.

None the less, this species does occur in BOSQUET's collection but among the individuals of his *Cythere costellata* (ROEMER). They had been derived from the Upper Ypresian of Ménilmontant (Paris).

C. haimeana resembles *C. bambruggensis* n. sp. in outline and mode of ornamentation, but it is different by the outline of the depressions between the ridges and the number and configuration of the ridges.

Cytheretta jurinei (VON MÜNSTER).

Pl. X, fig. 1.

Cythere jurinii VON MÜNSTER, 1830, p. 62.

Cytherina jurinii (VON MÜNSTER), ROEMER, 1838, p. 516, pl. 6, fig. 12.

Cythere jurinii VON MÜNSTER, BOSQUET (pars), 1852, vol. 24, p. 56, pl. 2, fig. 9.

Cytheretta jurinei (VON MÜNSTER), TRIEBEL, 1952, vol. 3, p. 23, pl. 3, fig. 16-17.

Distribution. — In the literature : Oligocene to Pliocene, but probably confined to Oligocene and Lower Miocene.

Cytheretta laticosta (REUSS).

Pl. XVII, figs. 15-18; Pl. XXI, fig. 16.

Cypridina laticosta REUSS, 1850, vol. 3, p. 87, pl. 11, fig. 13.

Cythere plicata JONES (non VON MÜNSTER), 1857, p. 33, pl. 4, fig. 16, pl. 5, fig. 8, pl. 6, fig. 17.

Cythere plicata var. *laticosta* REUSS, JONES and SHERBORN (non VON MÜNSTER), 1889, p. 29, pl. 1, fig. 18.

Distribution. — Belgium : Bartonian. England : Ledian and Bartonian.

Remarks. — REUSS was correct in establishing a separate species for these English specimens. They have nothing in common with *Cytheretta plicata* (VON MÜNSTER) of the German Oligocene (see TRIEBEL, 1952, Notizbl. hess. L.-Amt Bodenforsch., 3, pl. 5, figs. 34-35).

The shell is very thick, the surface smooth and shiny. The lower and middle longitudinal ridges are broadened at their posterior ends, caused by coalescing of each these ridges with a smaller one. In the broadened part of the middle ridge four depressions are visible. In the left valve the dorsal longitudinal ridge, conceals the posterior part of the dorsal margin. Just before the middle it turns sharply downwards in antero-ventral direction, forming a festoon below the anterior cardinal angle. It continues along the anterior outline to the lower longitudinal ridge. The ventral surface is covered with another four or five less pronounced longitudinal ridges.

The marginal area is very broad anteriorly, pierced by some 20 long, sinuous, radial pore-canals. The line of concrescence is S-shaped anteriorly, fairly straight posteriorly.

The hinge is typical for the genus.

The sexual dimorphism is pronounced. The females are very short and high, sometimes almost circular in outline. The males are more elongate, having an outline which is the more common in the genus.

Dimensions. — Female : L : 0,80, H : 0,50, W : 0,44; male : L : 0,90, H : 0,50, W : 0,47.

***Cytheretta ramosa* (LIENENKLAUS) *sublaevis* TRIEBEL.**

Pl. X, fig. 19.

Cytheretta ramosa (LIENENKLAUS) *sublaevis* TRIEBEL, 1952, vol. 3, p. 21, pl. 2, fig. 9-11; KEIJ, 1955, vol. 21, n° 2, p. 119, pl. 19, fig. 9.

Distribution. — Germany : Chattian of Mayence Basin. France : Burdigalian of Aquitaine Basin.

***Cytheretta rhenana rhenana* TRIEBEL.**

Pl. X, figs. 17-18.

Cytheretta rhenana rhenana TRIEBEL, 1952, vol. 3, p. 25, pl. 4, fig. 24-27; KEIJ, 1955, vol. 21, n° 2, p. 119, pl. 19, fig. 10.

Distribution. — Germany : Rupelian of Mayence Basin. France : Aquitanian-Burdigalian of the Aquitaine Basin.

***Cytheretta tenuipunctata* (BOSQUET).**

Pl. V, fig. 21; Pl. VI, fig. 5.

Cythere jurinei BOSQUET (pars) (non VON MÜNSTER), 1852, vol. 24, p. 56.

Cythere jurinei VON MÜNSTER var. *tenuipunctata* BOSQUET, 1852, vol. 24, p. 56, pl. 2, fig. 10.

Cytherella tenuistriata REUSS, 1853, p. 676, pl. 9, fig. 10.

Cythereis jurinei (VON MÜNSTER), LIENENKLAUS (pars), 1905, fig. 31.

Cytheretta tenuistriata (REUSS), TRIEBEL, 1952, vol. 3, p. 22, pl. 3, fig. 12-15.

Lectotype : A right valve (coll. BOSQUET, No. 24c).

Paratypoids : 6 detached valves.

Locus-typicus-restrictus : Berg near Kleine-Spouwen, Belgium.

Type-level : *Nucula comta*-clay (= Rupelian).

Distribution. — Belgium : Tongrian (?) of Borgloon and Oude-Biezen; Rupelian of Berg and Kleine-Spouwen. France : Oligocene of Jeurre and Etréchy, Paris Basin; Burdigalian of the Aquitaine Basin. Germany : Rupelian of the Mayence Basin.

Diagnosis. — A species of the genus *Cytheretta* with the following characteristics : ornamentation with six to eight low, longitudinal ridges, which vanish gradually towards the anterior and posterior ends; distance between the ridges slightly more than their width; surface between the ridges finely pitted with pits mostly in two rows; anterior, dorsal and posterior parts of the valve smooth.

Description. — The dorsal and ventral margins of the left valve are parallel and slightly convex. The ventral margin of the right valve is slightly concave, the dorsal margin evenly arched. The anterior margin of both valves is broadly rounded. The posterior margin has an upward swing. The posterior cardinal angle of the left valve is broadly rounded and protruding.

The ornamentation consists of six to eight undulating, longitudinal ridges, which at some places anastomose. These ridges vanish gradually towards the anterior and posterior ends. There is an elongate, smooth patch with the longer axis vertical, at the place where at the inner side the posterior row of four scars of the muscle-scar is situated. The surface between the ridges is finely pitted, with the pits mostly in two rows. Towards the dorsal margin there is a zone which is only pitted. Along the anterior, dorsal and posterior margins there is a smooth area.

In dorsal view the male carapaces are elongate; the female carapaces are egg-shaped, with the greatest width posteriorly.

The marginal area and hinge are as for the genus.

Dimensions. — Lectotype (male right valve) : L : 0,96, H : 0,47, $\frac{1}{2}$ W : 0,23; paratypoid (female left valve) : L : 0,88, H : 0,51, $\frac{1}{2}$ W : 0,26.

Remarks. — The specimens from Jeurre and Etréchy (coll. BOSQUET, No. 24b) described by BOSQUET as *Cythere jurinei*, also partly belong to this species. These valves are worn, but some of them very well show the typical ornamentation of *tenuipunctata*.

A comparison of the specimens of BOSQUET's collection with the description and excellent figures given by TRIEBEL made it clear that *C. tenuistriata* (REUSS) is a synonym of *C. tenuipunctata* (BOSQUET).

SUBFAMILY LOXOCONCHINAE SARS, 1925.

Genus LOXOCONCHA SARS, 1866.

TYPE SPECIES *Cythere rhomboidea* FISCHER, 1855.

Diagnosis. — Carapace rhomboidal, ovate or elongate quadrangular, posterior end produced or angular above the middle, swollen ventrally or in the middle; surface pitted to coarsely reticulate; marginal area fairly broad, radial pore-canals few, simple and straight, with anterior and shallow posterior vestibules; muscle-scar with posterior row of four scars and a single kidney-shaped anterior scar; hinge of the right valve with anterior tooth, a groove curving around it, a straight serrate median groove and a posterior tooth, round about a socket.

Range : Cretaceous to recent.

Loxoconcha curryi n. sp.

Pl. XXI, fig. 15.

Etymology : Named in honour of Mr. DENNIS CURRY M. A., of Pinner, Middlesex, England.

Holotype : A left valve (coll. S 2846).

Paratypoids : 9 detached valves (col. S 2847).

Type-locality : Whitecliff bay, Wight, England.

Type-level : Ledian (*Nummulites variolarius*-zone of the Bracklesham beds).

Diagnosis. — A species of the genus *Loxoconcha* with the following characteristics : Surface with coarse reticulation; with ridge along dorsal margin and edge of ventral swelling and with some curved ridges coming downward from the central part of the dorsal ridge.

Description. — The dorsal outline is undulating. The anterior margin is somewhat obliquely rounded. The ventral outline is convex in the middle, caused by the ventral swelling of the valve overhanging the middle of the straight ventral outline. The posterior end has a rounded subdorsal caudal process.

The valve has a ventral swelling, bordered by a ridge. A vertical, broad, but shallow depression divides the valve into two parts. A smooth zone along the posterior outline is strongly compressed. The remainder of the valve is covered with a very coarse reticulation. The dorsal margin is obscured by an undulating ridge. From this ridge some three or four curved ridges branch off and run obliquely in antero-ventral direction.

The marginal area is broad. There is a shallow anterior vestibule. Some seven widely spaced, straight, anterior radial pore-canals were observed. Between these canals some false radial pore-canals were found. Three radial pore-canals are situated in the caudal process, and two or three more were observed along the postero-ventral margin.

The muscle-scar was not visible.

The hinge of the left valve consists of a crenulate median bar with a conical tooth at its posterior end, and a socket at its anterior end. A conical tooth lies anteriorly of this socket; behind the posterior tooth there is a socket. The right valve hinge is the complement.

Dimensions. — Holotype (left valve) : L : 0,42, H : 0,25, $\frac{1}{2}$ W : 0,10; paratypoid (right valve) : L : 0,40, H : 0,25, $\frac{1}{2}$ W : 0,10.

Remarks. — In outline *Loxoconcha curryi* resembles *L. woodwardensis* HOWE (Louis. Vicksb. Oligoc. Ostr., 1936, p. 76, pl. 6, figs. 14-16), but the latter species has a more regular reticulation pattern.

***Loxoconcha grateloupiana* (BOSQUET).**

Pl. XXI, fig. 19; Pl. XXII, figs. 9-11.

Cythere grateloupiana BOSQUET, 1852, vol. 24, p. 81, pl. 4, fig. 3.

Loxoconcha grateloupiana (BOSQUET), KEIJ, 1955, vol. 21, n° 2, p. 132, pl. 20, fig. 4-6.

Lectotype : A right valve (coll. BOSQUET, No. 44).

Paratypoids : 32 complete carapaces and 22 single valves.

Locus-typicus-restrictus : Léognan, Aquitaine Basin, France.

Type-level : Lower Miocene.

Distribution. — France : Aquitaine Basin : Aquitanian of Moulin de Gamachot and Moulin de Fortis; Burdigalian of Moulin Danay, Le Peloua, Moulin de l'Église, Pont de Léognan, Moulin de Brisson, Gieux, Pont-Pourquey; Helvetian of La Sime.

Diagnosis. — A species of the genus *Loxoconcha* characterized by : dorsal and ventral margins straight and parallel. With a broad depression in the postero-ventral region, mostly with a short, triangular extension at the anterior margin of the depression.

Description. — Sexual dimorphism is pronounced. The males have a long, almost straight dorsal outline, which merges gradually into the semi-circular anterior outline. The female valve shows a convexity in the middle of the dorsal outline. The ventral outline is parallel to the dorsal outline and merges gradually into the anterior and posterior outlines. The posterior end has an upward swing and a short, rounded, sub-dorsal caudal process. In the left valve the posterior cardinal angle is protruding. The female carapace is shorter in lateral view.

The surface is covered with high reticulating ridges. In the anterior and ventral part of the lateral surface, two dominating directions of the ridges can be recognised. The first is almost parallel to the anterior outline, the second slopes slightly downward from the anterior outline and crosses the first ridges with acute angles. The ridges which run on the ventral side, parallel to the ventral outline, turn upwards in the postero-ventral region, forming a semi-circular curve, extending horizontally in anterior direction on to the middle of the valve. A large depression is situated in the postero-ventral region. One of the ridges circumscribes the depression ventrally and posteriorly. In this depression the ridges of the reticulation are low and few. The anterior side of this depression is limited by a steeply sloping ridge, from antero-dorsally to ventro-posteriorly. Mostly this ridge is somewhat extended, forming a low, broad, triangular spine.

The marginal area is rather broad. A shallow vestibule was observed along the anterior, posterior and postero-ventral margins. Some eight radial pore-canals are situated along the anterior margin; some eight others along the postero-ventral and posterior margin. They are hardly visible, being obscured by the ridges at the exterior showing through. A broad flange runs along the anterior, postero-ventral and posterior margins of the right valve.

Below the anterior cardinal angle a large eye-hole is perceptible.

The central muscle-scar consists of a posterior row of four, ovate scars, the lowermost which is situated more towards the anterior end than the others. Another rounded scar lies anteriorly of this row. Below this scar an elongate scar was observed. Above the central scar several more small scars are visible.

The hinge is as for the genus.

Dimensions. — Lectotype (male) : L : 0,65, H : 0,35, $\frac{1}{2}$ W : 0,23. Mean length and height of the female valve (coll. BOSQUET) : L : 0,57, H : 0,34 mm; id. of the male : L : 0,63, H : 0,34 mm.

Remarks. — This species differs from all other species of *Loxoconcha*, known to the author, by having the peculiar postero-ventral depression. The specimens of BRADY and KUIPER certainly do not belong to *Loxoconcha grateloupiana* for they lack this depression.

***Loxoconcha kuiperi* n. sp.**

Pl. XXI, fig. 9; Pl. XXII, fig. 8.

Cythere nystiana BOSQUET (pars), 1852, vol. 24, p. 65.

Loxoconcha grateloupiana KUIPER (non BOSQUET), 1918, p. 23, pl. 1, fig. 6.

Etymology : Named after the late Dr. W. N. KUIPER, who described Ostracoda from the Oligo-Miocene of the Netherlands.

Holotype : A left valve (coll. S 2477).

Paratypes : 6 detached valves (coll. BOSQUET, No. 31; S 2478-2480).