OSTRACODE FAUNA FROM THE EOCENE OF GÁNT (TRANSDANUBIAN CENTRAL MOUNTAINS, HUNGARY)

by

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РЕЗЮМЕ

В работе приведены результаты исследования фауны остракода слоев среднего эоцена бокситовнй шахты Багойхедь, расопложенной в местности Гант (Задунайское среднегорье, Венгрия). Новые виды и подвиды: *Cytherella (Cytherelloidea) gantensis, Novocypris gantensis, Clythrocytheridea faboides gantesis, Cytheridella gantnsis, Bradleya validornata hungarcia, Hermanites acuticosta gantensis, Xestoleberis gantensis.* Из известных вид в нами были найдены следую; *Bairdoppilata gliberi Keij, Pterygocythere jonesi (Méhes), Monsmirabilia triebeli Keil, Neocyprideis Williamsoniana (Bosquet) Krite bartonensis (Jones), Paracytheridea gradata (Bosquet), Caudites monsmirabiliensis Apostolescu, Schizocythere depressa (Méhes), Echinocythereis dadayana (Méhes), Hermanites haidingeri paijenborchiana Keij, Qudracythere augustcostata (Bosquet), Quadracythere vahrenkampi Moos.*

Известные виды соответствуют периоду среднего эоцена, определенного на основе другой фауны. Область образования глины была мелководная маргинальная территория с часто меняющейся концентрацией соли.

Introduction

The Eocene sequence around Gánt is known by its rich mollusc fauna, which was treated monographically by S z ő t s, E. (1953). The author of this present work collected a mollusc material from the overlying Eocene strata of the former bauxite mine of Bagolyhegy-hill and this collection resulted a well-preserved microfauna too. The author published previously the method (M o n o s t o r i 1973) and the preliminary report (M o n o s t o r i 1972) of the faunal investigations, the present work is the detailed description and evaluation of the fauna.

Method

The descriptions of the certain forms are presented here systematically. The systematic order and the scheme of the descriptions follow — with some modifications — those applied in the text-book of V a n M o r k h o v e n (1963.) The descriptions of outlines and ornamental elements were based on meshed ocular studies. The interpretation of the length, height and width is as usual, but measured on the periphery and not on the outer margin as in the cited Glossary (Treatise. 1961, pp. 050, 51 – 52, 56). The horizontal component of the matrix is the length, its vertical component is the maximal height (Fig. 1). In some highly arched or specially shaped forms this latter does not mean actual height measured on the valve, but refers to the vertical distance between the

dorsal and ventral valve tangents parrallel to the length. Applying zoom-optic microscope the mesh can be set to give the positions of the certain characteristic peripheral and ornamentation points directly in the frac-

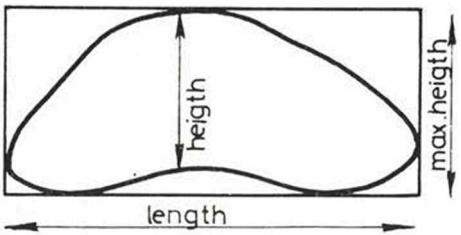

Fig. 1.

tions of the length and height. In lack of that kind of optics the valves can be photographed, and in standard-sized prints the dimensions can be measured with a mesh applied on tracing-paper. The angles (if characteristic) can be measured suitably on photographs. The co-ordinate method suggested by F a r k a s H. (1974) to fresh-water ostracodes can be applied at best to some groups of the marine forms. Related studies, regarding also the co-ordinate method of N e g a d a e v (1970), will be carried out in the future.

Paleontological descriptions

Subclassis Ostracoda Latreille, 1806

Ordo Podocopida Müller, 1894

Subordo Platicopina Sars, 1866

Familia Cytherellidae Sars, 1866

Genus Cytherella Jones, 1849

Cytherella (Cytherelloidea) gantensis n. sp. Pl. I. Fig. 1.

Derivatio nominis: After the name of the locality.

Holotypus: left valve; reposited in the type collection of the Hungarian Geological Survey.

Locus typicus: Bauxite-pit of Bagolyhegy-hill, Gánt, Transdanubian Central Mountains, Hungary.

Stratum typicum: Lutetian Stage, mollusc-bearing marl.

Diagnosis: Weakly ornamented Cytherelloidea, marginal ridge absent on the greater part of the dorsal margin and posteriorly.

D e s c r i p t i o n :

1. *Shape.* In o u t e r l a t e r a l v i e w anterior outline of l e f t v a l v e rounded symmetrically, gradually rounds into ventral

outline, which bears a symmterical sinus between one-third and two-third of length. Ventral outline acutely rounds into the nearly symmetrical posterior outline bearing an extremely shallow, slightly asymmetrical sinus between one-third and three-fifth of length, which is deepest somewhat before half-length of valve. Height posterior.

Right valve outline is similar. In dorsal view surface rises with 15° angle to one-fifth of length, with about 10° angle to two-fifth of length and with 5° angle to five-sixth of length, and from there slopes with small radius, then perpendicularly.

2. *Ornamentation:* Surface of left valve smooth, finely pitted in the best-preserved specimens. Marginal ridge visible on the ventral nine-tenth to the dorsal two-fifth of length, most pronounced along the anterior margin. In dorsal side a slightly asymmetrical triangular depression appears between one-fifth and seven-tenth of length and the muscle-scar area. In ventral side there is an upwardly attenuating depression between the nine-tenth and two-fifth of length and the two-fifth of maximal height, which produces a sack-like swelling on the posteroventral surface. (In a few specimens the posterior tubercle and the depression absent.)
Ornamentation of right valve is similar.

3. *Measurements* (on millimetres):

	Length	Height
left valve	0.64	0.35
right valve	0.63	0.32
right valve	0.56	0.29

4. *Inner lamella:* Very narrow.
5. *Marginal pore-canals:* Simple, visible only in some places.
6. *Hinge:* In left valve an edge, which fits into the groove of right valve around the entire margin.
7. *Normal pores:* Numerous, small, open.
8. Central *muscle scar* area with 11 scars arrenged in feather-shaped pattern.
9. *Eye-spot:* Absent.
10. *Overlap:* Right valve slightly overlaps left around the entire margin.
11. Forms without posterior tubercle and depression are probably the males.

Comparison. This species resembles C. (Cytherelloidea) jonesi Bosquet, 1852, but this latter shows stronger ornamentation, marginal ridge developed posteriorly and stronger anteriorly, and in this way the shape of valves exhibits sharp breaks in dorsal view.
Material: 3 left valves and 3 right valves.

Subordo Podocopina Sars, 1866
Superfamilia Bairdiacea Sars, 1888
Familia Bairdiidae Sars, 1888
Genus Bairdoppilata Coryell, Sample et Jennings, 1935
Bairdoppilata gliberti Keij, 1957
Plate I, Figs. 2–4.

1955. Bairdia subdeltoidea (Münster, 1830) – Apostolescu, pp. 245–246, pl. I figs. 9–10.
1957. Bairdoppilata gliberti Keij, 1957 – Keij, p. 53, pl. I, figs. 18–21.
1958. Bairdoppilata gliberti Keij, 1957 – Marliere, p. 18, pl. II, figs. 5–6.
?1959. Bairdoppilata gliberti Keij, 1957 – Ducasse, pp. 13–14, pl. X, figs. 2a–b.
?1964. Bairdoppilata gliberti Keij, 1957 – Sönmez – Göcken, p. 51, pl. I, fig. 1.
?1968. Bairdoppilata gliberti Keij, 1957 – Haskins, p. 3, pl. II, figs. 29–30.
1969. Bairdoppilata gliberti Keij, 1957 – Seremeta, pp. 57–58., pl. II, 15–16.
1969. Bairdia gliberti (Keij, 1957) – Pietrzeniuk, p. 15, pl. II figs. 9–10, pl. XVI, figs. 1–2.
1969. Bairdoppilata gliberti Keij, 1957 – Ducasse, p. 24, pl. II, fig. 29.
1971. Bairdoppilata gliberti Keij, 1957 – Blondeau, p. 25, pl. III, figs. 3–4.
?1972. Bairdia gliberti (Keij, 1957) – Khosla, p. 483, pl. I, fig. 9.

Description:

1. *Shape:* in outer lateral view anterior outline of left valve rounded asymmetrically, below two-third of maximal height breaks into dorsal outline, which forms a wide arch. Both the anterior and posterior lines of this arch are nearly straight, their directions make 90–120° angle, with weak concavity at about one-fifth of length. Posterior line slopes abruptly, with gradual transition into the posterior outline, which breaks by 80–100° at about one-third of maximal height, then gradually rounds into the ventral outline. The ventral outline straight, (slightly convex), between one-third and two-third of length, then gradually rounds into anterior outline. Height at half-length.
Dorsal outline of right valve is trapezoidally angular, the breaks are situated about two-fifth and three-quarter of length, with 140° angle. The middle, straight portion towards the ventral outline is convergent posteriorly. Posterior outline bears a small sinus between two- and three-fifth of maximal height, which results in acute posterior end. Ventral outline shows a sinus between the three- and six-eighth of the length. Height somewhat anterior.

In inner lateral view the outer margin of the left valve markedly deviates from the outline, it runs similarly as the right valve outline.

In dorsal view the surface rises anteriorly by 30° angle, and near to the middle rounds into a 30° slope, which slightly flattens out caudally. (Individual differences in the shape of the outlines may occur.)

2. *Ornamentation:* Surface of the valves finely, densely punctate.
3. *Measurements:*

	L	H
left valve	0.93	0.57
left valve	0.97	0.60
left valve	1.00	0.63
right valve	0.93	0.48
right valve	0.94	0.48

4. *Inner lamella:* Rather wide anteriorly and posteriorly, line of concrescence deviates from inner margin at the prominent anterior and posterior vestibula, more or less parallel to the outer margin. Selvage near to the outer margin.
5. *Marginal pore-canals:* Very numerous anteriorly and posteriorly, straight, simple.
6. *Hinge:* Dorsal edge of right valve fits into groove of left valve. Within the anterodorsal and posterodorsal angles of the valve, right valve bears crenulate tooth-like, left valve groove-like structure.
7. *Normal pores:* Numerous, small, open.
8. Central *muscle scars:* 10 in number, arranged on opaque area.
9. *Eye-spot:* Absent.
10. *Overlap:* Left valve conspicuously larger than right, especially dorsally and ventrally.

Remarks.

The Gánt form can be ranged into the species Baridoppilata gliberti Keij from the French Lutetian. It differs somewhat from the type, which shows a weak dorsal concavity in the left valve outline, near the posterior end, thus it is slightly acute. The outline shows a similar variability in the material, and the figures and descriptions mentioned in the synonymy suggest also some variations. Thus separation of a distinct subspecies cannot be justified.

Geological and geographical distribution:

Upper Ypresian–Ledian: France
Paleocene: Belgium
Upper Eocene: England
Upper Eocene–Lower Oligocene: GDR
Paleocene–Eocene: USSR
? Lower Eocene: India

Material: 5 left valves, 3 right valves.

Superfamilia Cypridacea Baird, 1845
Familia Cyprididae Baird, 1845
Genus Novocypris Ducasse, 1967
Novocypris ? gantensis n. sp.
Pl. I, Figs. 5–9.

Derivatio nominis: After the name of the locality.

Holotypus: Left valve; reposited in the type collection of the Hungarian Geological Survey.

Locus typicus: Bauxite-pit of Bagolyhegy-hill, Gánt, Transdanubian Central Mountains, Hungary.

Stratum typicum: Lutetian Stage, mollusc-bearing marl.

Diagnosis: Hinge conspicuously crenulate anteriorly and posteriorly, smooth medianly.

Description:

1. *Shape:* In outer lateral view anterior outline of left valve rounded symmetrically by rather small radius, and gradually curves into the dorsal outline, which is arched by greater radius. The outline breaks at four-fifth of length and near posterior end. Posterior outline with rather small radius and weakly breaks beneath the one-third of maximal height. Ventral outline nearly straight, gradually rounds into the anterior outline from about the one-fifth of length. Height at about half-lenght.
   The radius of the right valve anterior outline is somewhat smaller. Anterior portion of dorsal outline straighter. The break of the posterior outline stronger, near to the level of the ventral outline, thus the right valve is more acute posteriorly. Ventral outline bears a conspicious sinus, somewhat before half-length. (The breaks of the posterodorsal side absent in several specimens.)
   In inner lateral view outer outline of left valve markedly differs ventrally from the outer margin, which convergent to the outline of the right valve. In dorsal view the surface rises with 45° angle to one-tenth of length, abruptly in the beginning, then flattening out, the slope is 0–10° to four-fifth length, 10–40° between four-fifth and nine-tenth length and 45–60° to the valve end.
2. *Ornamentation:* Smooth valves without ornamentation.
3. *Measurements:*

	L	H
right valve	0.61	0.28
right valve	0.63	0.30
right valve	0.63	0.32
right valve	0.62	0.29
right valve	0.60	0.28
left valve	0.63	0.34
left valve	0.67	0.34
left valve	0.65	0.34

4. *Inner lamella:* Strongly wideneing anteriorly, somewhat weakly posteriorly. Large anterior and posterior vestibula, which are anteriorly especially larger near the ventral side.
5. *Marginal pore-canals:* Moderate in number, straight, simple, partially false.
6. *Hinge:* Strongly crenulate, fitting elements anteriorly and posteriorly in both valves, median elements smooth, groove in the right, bar in the left valve.
7. *Normal pores:* Few, scattered, small.
8. *Muscle scars:* 11 in number, of which 7 are arranged into a close group.
9. *Eye-spot:* Absent.
10. Left valve definitely *overlaps* right.

Comparison:

The hinge described by Ducasse (1967) as characteristic to this genus appear in modified form in this species, therefore the generic arrangement is conditional.

This Gánt species differs from the type species in outline, having anterior outline with smaller radius, dorsal outline with less pronounced breaks and with less acute posterior end.

Material: About 100 left valves and about 100 right valves.

Superfamilia Cytheracea Baird, 1850

Familia Brachycytheridae Puri, 1954

Genus Pterygocythere Hill, 1954

Pterygocythere jonesi (Méhes, 1936)

Pl. I, Figs. 10–12.

1936. Cytheropteron jonesi Méhes, 1936 – Méhes, pp. 22–25, pl. III, figs. 1–3, text-fig. 4.

Description:

1. *Shape:* In outer lateral view anterior margin of left valve rounded symmetrically. Radius of dorsal two-third part is larger than that of ventral two-third. Anterior outline and dorsal outline encloses an about 140° angle at one -fifth of length, the arch of the dorsal outline is of rather large radius. The junction with the posterior outline shows a hardly visible break, the ventral and dorsal lines of the posterior outline meet with about 90° angle at the two-third of the maximal height. Ventral line rounds with a weakly convex arch into the ventral outline, which is formed by a wing-like ventral extension at three-quarter of length. This gradually grows out from the anterior outline, straight between one-fifth and three-quarter of length, then breaks at about one-sixth of the maximal height and meets the posterior outline. Anterior outline – mainly

anteroventrally – with coarse denticulation, ventral line of posterior outline bears 5 to 6 denticles. Height near half-length.

In right valve the roundness of anterior outline is more symmetric. Anterodorsal angle 150°, dorsal outline nearly straight, encloses 140° angle with the posterior outline at about eight-tenth of length. The wing-like extension overlaps only pertially the ventral outline, ends between two-third and three-quarter of valve-length.

In inner lateral view of the left valve the straight running of the dorsal margin deviates from the outline. Ventral margin deviates from outline in both valves, forming weak sinus, and encloses posteriorly about 30° angle with the hinge margin.

In dorsal view ventral ridge rises by 45° angle, and except its posterior, spinuous end, it slopes with 70–80° angle toward the posteriorly sloping, 10–15° posterior surface.

2. *Ornamentation:* Valve surface smooth. The wing-like extensions of both valves grade into anteromarginal rims, which reach the eye-tubercle.

3. *Measurements:*

	L	H
left valve	0.71	0.42
right valve	0.70	0.39

4. *Inner lamella:* Wide anteriorly, somewhat narrower posteriorly. Line of concrescence and inner margin coincide. Selvage subperipheral in left valve, removed from outer margin in right valve.
5. *Marginal pore-canals:* 20 to 25 in number anteriorly, 10 to 12 posteriorly. Simple, straight, with ampullae in the outer thirds.
6. *Hinge:* In left valve there are large anterior socket, small anteromedian tooth, crenulate posteromedian bar and elongate, crenulate posterior socket. Accomodation groove well-developed.
   In right valve the anterior tooth slightly elongated (bordering the eye-socket), its anterior part lower than the posterior. Anteromedian element is tooth-socket, which continues as crenulate posteromedian groove. Posterior tooth elongate, crenulate.
7. *Normal pores:* Few, open.
8. *Muscle scars:* "V"-shaped frontal scar in front of the row of four elongate adductor scars.
9. *Eye-spots:* Prominent, small in both valves.
10. The larger left valve especially dorsally *overlaps* the right.
11. The break of the dorsal outline is smaller in valves of more elongate specimens, probably these are the males.

Remarks:

On the basis of its morphological features, this Gánt form can be well identified with the species Cytheropteron jonesi described by Méhes (1936) from the Eocene of the vicinity of Budapest.

In the type figures of Pterygocythere hilli Keij, 1957 the antero-

dorsal angle is less prominent and is removed posteriorly, the running of the ventrolateral extension is different, the median hinge-element is acrenulate, and these may suggest at least subspecific difference.

Geological and geographical distribution:

Middle? Eocene: Budapest vicinity, Hungary.
Material: 3 left valves, 1 right valve.

Familia Bythocytheridae Sars, 1926

Genus Monoceratina Roth, 1928

Monoceratina sp.

Pl. II, Fig. 1.

Description:

1. *Shape:* In outer lateral view the outline of the left valve is damaged anteriorly and posteriorly. Dorsal outline completely straight, ventral outline slightly convex, which results from the convex running of the wing-like extension.
2. *Ornamentation:* The surface of the left valve is heavily ornamented. Along dorsal margin coarse ridge-like costa, near the ventral margin strong wing-like extension, which rises from about one-third of maximal height on anterior half, then overhangs the ventral margin and ends recurving posteriorly above that. Subcentrally deep sulcus rund downward in upper one-quarter of maximal height, bordered anteriorly by arched costa, which sharpens toward the end of the wing-like extension. The surface is steep posteriorly from the wing-like extension, the part along the posteroventral margin is wide and flat. Despite of the damage, it is visible, that the anterior valve-part is similarly flat. Height somewhat anterior.

4–5., 7–10: Inner features and the relation of the valves cannot be studied.

6 *Hinge:* Somewhat damaged terminally, hinge-elements on the preserved parts are not visible.

Remarks:

The ornamentation markedly differs from the described and figured Tertiary Monoceratina species, however, this single fragmentary specimen is incomplete for designation of a new species.
Material: One single damaged left valve.

Familia Cytherideidae Sars, 1925

Genus: Clithrocytheridea Stephenson, 1936

Clithrocytheridea faboides gantensis n. ssp.

Pl. II, Figs. 2–4.

Derivatio nominis: After the name of the locality.
Holotypus: Left valve; reposited in the type collection of the Hungarian

Geological Survey.

Locus typicus: Bauxite-pit of Bagolyhegy-hill, Gánt, Transdanubian Central Mountains, Hungary.

Stratum typicum: Lutetian Stage, mollusc-bearing marl.

Diagnosis: A form bearing deep anterior vestibulum, especially near the margins with concentrically arranged strong pits, with poster;orly narrowing left valve of nearly straight ventral and dorsal margins.

Description:

Stratum typicum: Lutetian Stage, mollusc-bearing marl.

Diagnosis: A form bearing deep anterior vestibulum, especially near the margins with concentrically arranged strong pits, with posteriorly narrowing left valve of nearly straight ventral and dorsal margins.

Description:

1. *Shape:* In outer lateral view the anterior outline of the left valve is markedly asymmetric, arching with large radius from about the one-third of the maximal height toward the dorsal outline, with which it encloses about 140° angle at the one-third of the length. Dorsal outline straight (except a weak sinus behind the protruding cardinal angle) to three-quarter of length, where grades with a weak break into the posterior outline, which is rounded by small radius. Posterior outline gradually rounds into the hardly convex ventral outline, of which direction with that of dorsal outline encloses a posteriorly convergent 10 to 15° angle. The ventral outline arches into the anterior outline with a very short radius, before the arch somewhat depressed. The lower part of the anterior outline may bear slight denticulation. Height at anterior cardinal angle.
   The anterior outline of right valve is rounded asymmetrically, from the half of maximal height, arching with a long radius into the dorsal outline, which breaks slightly about the half of the length, then straight to four-fifth of length, and grade with an other break into the posterior outline, which arches with a very small radius into the nearly straight ventral outline. Behind the one-fifth of the length the ventral outline shows weak sinus. Lower third of anterior outline somewhat denticulated. Height slightly anterior.
   In inner lateral view outer margin and outline are nearly coincidental.
   In dorsal view the maximal width is situated somewhat before the middle of the length. Anterior part more compressed, posterior more inflated.
2. *Ornamentation:* Valves markedly pitted, the dense, relatively coarse pots appear in concentric arrangement (similarity to reticulation). In anterior part of the left valve the portion between the pits becomes stronger, just like concentric costa. Ornamentation absent around the cardinal angle of left valve.

3. *Measurements:*

	L	H	Width
left valve	0.42	0.23	
left valve	0.46	0.24	
right valve	0.42	0.22	
carapace	0.41	0.22	0.18

4. *Inner lamella:* Moderately wide, widest anteriorly. Subtriangular vestibulum anteriorly, thus the inner margin markedly different here. Marginal zone widest anteriorly. Selvage subperipheral, in left valve slightly, in right valve strongly removed anteriorly inward.
5. *Marginal pore-canals:* Very numerous. Simple, straight, with ampullae near the half-length. Scattered in upper, and dense in lower part of anterior zone, common along ventral margin and dense in lower part of posterior zone.
6. *Hinge:* In left valve the two terminal elements are coarsely crenulate grooves, connected by crenulate bar.
   In right valve the hinge-elements are corresponding terminally crenulate teeth, medianly crenulate groove.
7. *Normal pores:* Moderately numerous.
8. *Muscle scars:* In left valve the four adductor scars are arranged into a single row, in the level of the uppermost one there is an anteriorly open "V"-shaped frontal scar, in the level of the lowermost adductor scar is an elongate, obliquely, upward and aneriorly oriented scar.
9. *Eye-spot:* Absent.
10. *Overlap:* Left valve overlaps right at cardinal angle, at middle portion of ventral side and slightly anteriorly and posteriorly.
11. A part of the specimens shows more elongate, lower and narrower shape, probably these are males.

Comparison:

This form differs from the type species Clithrocytheridea faboides (Bosquet) revised by Keij (1957), in shape (stronger dorsal and ventral depressions and posteriorly higher left valve in the type subspecies), in ornamentation (somewaht denser and more regular pitting in the Gánt subspecies), and in the structure of the inner lamella (coarse subtriangular vestibulum in the Gánt subspecies). The present new subspecies also differs from the species Clithrocytheridea bipunctata Ducasse (1967) (which can be regarded rather as a subspecies) in the character of the vestibulum and in the absence of the separation of ornamentation.
Material: 6 left valves, 4 right valves.

Genus Neocyprideis Apostolescu, 1946

Neocyprideis williamsoniana (Bosquet, 1852)

Pl. II, Fig. 8.

1852. Cytheridea williamsoniana Bosquet, 1852 – Bosquet, pp. 43–44, pl. II, fig. 6.

1957. Cyprideis (Goelichia) williamsoniana (Bosquet, 1852) – Keij, p. 70, pl. VII, figs. 6–8, pl. XVIII, figs. 18–20.
1958. Neocyprideis williamsoniana (Bosquet, 1852) – Kollmann, p. 137, pl. 12, fig. 8, pl. 20, figs. 8–10, pl. 20, figs. 6–7.
1969. Cyprideis (Neocyprideis) williamsoniana (Bosquet, 1852) – Haskins, pp. 155–158, pl. 4, figs. 10–20.
1972. Neocyprideis williamsoniana (Bosquet, 1852) – Keen, p. 297, pl. 52, fig. 13.

Description:

1. *Shape:* In outer lateral view anterior outline of left valve, which is formed by the markedly strong flange, is somewhat rounded asymmetrically, radius of the arch of the upper part is larger than that of lower part, at the third of the length it gradually rounds into the hardly convex dorsal outline, which breaks in a 120° angle near the five-sixth of length, and curves into the asymmetrically rounded posterior outline. Ventral outline nearly straight, somewhat sinuous in its middle portion. Height posterior.
   In right valve the ventral sinus is somewhat deeper, dorsal outline with weak depression near the middle.
   In inner lateral view the outer margins are more sinuous than the outlines on both valves.
   In dorsal view the surface of the valve, after a flat peripheral portion, rises with about 30° angle to one-sixth of length, then the rise decreases from 20° to 0° angle at half-length, then the rise increases from 0° to 10° angle to five-sixth of length, and finally the slope increases abruptly to 90° to the posterior margin.
2. *Ornamentation:* In left valve the surface is densely pitted or smooth, hyaline and polished, with a weak, downwardly narrowing, triangular depression between one-third and half of length. At posterodorsal angle a small swelling appears, which is visible in outline too.
   In right valve the anterodorsal depression is deeper, with a small swelling before.
3. *Measurements:*

	L	H
left valve	0.72	0.41
right valve	0.67	0.39

4. *Inner lamella:* Rather narrow, inner margin and line of concrescence coincide. Selvage strong, subperipheral.
5. *Marginal pore-canals:* About 15 in number anteriorly, simple, straight, widely separated.
6. *Hinge:* In left valve anteriorly long, posteriorly shorter, curved, crenulate socket, with a crenulate bar which slightly arched in lateral and straight in dorsal view.
   Right valve shows the corresponding hinge-elelments.
   7.–8. *Normal pores* and *muscle scars* cannot be studied.

9. *Eye-spot:* Absent.
10. Left valve *overlaps* right, especially posterodorsally.
11. In the rarer, posteriorly less inflated male left valves the maximal height is removed at, or before the median line.

Remarks:

On the basis of the completely smooth valves and the slight curve of the hinge bar Keij (1957) ranged the Lutetian specimens into the N. apostolescui (Keij, 1957) species. In the Gánt material hyaline ans shiny, smooth and markedly densely-pitted forms are equally common within a single sample, consequently, the appearance or absence of the pitting is a phenotypic feature. The hinge bar is slightly curved in lateral view, thus it is an undiagnostic character. All in the Gánt specimens the ventral outline of the left valve is markedly concave before the anterior outline junction. This feature characterizes the species N. williamsoniana, while in the original description and figures of N. apostolescui the ventral margin of the left valve is straight or convex.

Geological and geographical distribution:

Sannoisian – Stampian: France
Upper Tongrian – Rupelian: Belgium
Tongrian: England
Material: One left valve and one right valve.

Genus Monsmirabilia Apostolescu, 1955

Monsmirabilia triebeli (Keij, 1957)

Pl. II, Figs. 5–7.

1957. Cuneocythere (Monsmirabilia) triebeli Keij, 1957 – Keij, p. 79., pl. IX, figs. 1–4.
1959. Cuneocythere (Monsmirabilia) triebeli Keij, 1957 – Ducasse, p. 23, 23, pl. XII, figs. 2a–b.
1968. Cuneocythere (Monsmirabilia) triebeli Keij, 1957 – Haskins, pp. 174–175, pl. 3, figs. 26–34.
1969. Monsmirabilia triebeli (Keij, 1957) – Ducasse, p. 60, pl. IV, fig. 77.
1971. Monsmirabilia triebeli (Keij, 1957) – Blondeau, p. 79, pl. IX, fig. 4.
1973. Cuneocythere (Monsmirabilia) triebeli Keij, 1957 – Meos, pl. 7, figs. 2–3.

Description:

1. *Shape:* In outer lateral view anterior outline of left valve widely, asymmetricall rounded, gradually curves into dorsal outline, which slightly convex between three-eighth and five-eighth of length, somewhat broken at five-eighth, and after the three--quarter of length, with an other slight break, grades into posterior

outline, which bears a slight break above one-third of maximal height. Posterior outline rounds into convexely arched ventral outline with a rather small radius. Ventral outline gradually rounds into anterior outline. Height near to valve-median.

Anterior outline of r i g h t v a l v e rounds also gradually into dorsal outline, which bears slight breaks near the half and three--quarter of length. Posterior outline of small radius continuously grades into ventral outline, which shows slight asymmetrical sinus between one-quarter and half of length.

In i n n e r l a t e r a l v i e w the outer margin of l e f t v a l v e differs ventrally from the outline, having straight running with slight median sinus instead of convexity.

The outer margin of r i g h t v a l v e nearly coincides with the outline.

In v e n t r a l v i e w the rise of the valve surface is $25-0°$ near to the two-third of length (maximal width), and decreases continuously to nine-tenth of length, finally with 50° angle, and at the end of the valves, a depressive part, corresponding to about a quarter of maximal width may appear.

The r i g h t v a l v e is depressive in one-tenth of length along the anterior margin, here the slope has a smaller angle.

2. *Ornamentation:* Valves densely, finely pitted, on left valve with weak, on right valve with sharp, coarse anteromarginal rim. On both valves the anterodorsal margins show slight depression, which result in a prominent portion on the outer sutface, corresponding to the hinge margin.

3. *Measurements:*

	L	H
left valve	0.53	0.35
left valve	0.53	0.33
right valve	0.47	0.23
right valve	0.49	0.27

4. *Inner lamella:* Very wide anteriorly, inner margin and line of concrescence coincide. Selvage subperipheral, strong in right valve. In left valve at the outer third of the marginal zone a list, farther in striae are visible.
5. *Marginal pore-canals:* Very dense in anterior half, more than 40 in number, and about 20 posteriorly. Simple, slightly curved, with ampullae near the outer margin.
6. *Hinge:* In l e f t v a l v e , between about one-third and eight-ninth of valve-length runs a gradually narrowing groove, which is bordered inward by a narrow, anteriorly slightly thickening ridge. Above the groove weak accomodation groove occurs.

   In r i g h t v a l v e the bar fitting into the groove of left valve shows a small tooth-like thickening before three-eighth of length.
7. *Normal-pores:* Rather numerous.

8. *Muscle scars:* The four undivided adductor scars are arranged into a single row, in right valve a dorsally open „V"-shaped frontal scar and above a smaller scar are visible.
9. Distinct *eye-spot* absent (the prominent dorsal portions mentioned in the ornamentation cannot be regarded as definite eye-structures).
10. *Overlap:* Left valves much larger and overlaps right all around the periphery.
11. A smaller part of the specimens is more elongate, less inflated pos. teriorly, probably these are males.

Remarks:

The specimens from Gánt can be well identified with the type described and figured by K e i j (1957).

Geological and geographical distribution:

Eocene: France
Upper Ypresian – Bartonian: Belgium
Bartonian: the Netherlands
Ypresian – Bartonian: England
Material: Four left valves and four right valves.

Genus Krithe Brady, Crosskey, Robertson, 1874

Krithe bartonensis (Jones, 1857)

Pl. I, Figs. 9, 11, 13 – 14.

1857. Cytherideis bartonensis Jones, 1857 – Jones, p. 50, pl. V, figs. 2a – b, 3a – b.
?1894. Krithe bartonensis (Jones, 1857) – Lienenklaus, pp. 252 – 253. pl. XVII, fig. 9.
?1936. Krithe bartonensis (Jones, 1857), – Méhes, pp. 37 – 38, pl. III, figs. 26 – 29, text-fig. 30.
1957. Krithe bartonensis (Jones, 1857) – Keij, p. 85, pl. VIII, figs. 11 – 12, figs. 13 – 17.
1959. Krithe bartonensis (Jones, 1957) – Ducasse, pp. 49 – 50, pl. III, fig. 1, pl. XX, figs. 3a – b.
1969. Krithe bartonensis (Jones, 1857) – Scheremeta, pp. 88 – 89, pl. VII, figs. 1 – 2.
1969. Krithe bartonensis (Jones, 1857) – Pietrzeniuk, p. 21, pl. V, fig. 12, pl. XV, figs. 4 – 6, text-figs. 5 – 6.
1970. Krithe bartonensis (Jones, 1857) – Haskins, pp. 13 – 16, pl. 1, figs. 5 – 14.
1971. Krithe bartonensis (Jones, 1857) – Blondeau, pp. 82 – 83, pl. IX, fig. 6.
1972. Krithe bartonensis (Jones, 1857) – Khosla, p. 485, pl. 1, fig. 19.

Description:

1. *Shape:* In outer lateral view anterior outline of left valve symmetrically rounded, gradually rounds into dorsal outline,

which nearly straight between one-quarter and two-third of length, then widely arches into the posterior outline, of which radius of roundness decreases in its lower half. At the junction with ventral outline a break occurs, ventral outline nearly straight between eleven--twelfth and one-quarter, shows a weak undulation with concavity at two-fifth of length, weak convexity after three-fifth of valve and a slight concavity at four-fifth of length (regarding the respective symmetry axes). Transition towards anterior outline is continuous. Height posterior.

The lower part of the anterior outline in r i g h t v a l v e is weakly truncate, the nearly straight running of the dorsal outline is divided by a slight sinus before the one-third of the length. The gradual transition into the posterior outline starts slightly earlier, the radius of roundness decreases more slowly, thus the posterior end less obtuse, Anterior concavity on ventral outline strong, with maximum slightly before mid-valve, otherwise the outline is straight.

In l a t e r a l v i e w the outher margin somewhat deviates ventrally from the outline, anterior sinus stronger.

In d o r s a l v i e w the outline in left valve rises with 40° angle to one-tenth of length, then with $40-0°$ angle to half-length, then with $0-20°$ angle to nine-tenth of length and finally with 20 to 90° angle. In right valve the slope is more flattened, recessive at posterior end.

2. *Ornamentation:* Valve surface smooth.

3. *Measurements:*

	L	H	W
left valve	0.66	0.33	
left valve	0.66	0.30	
right valve	0.66	0.30	
right valve	0.63	0.29	
carapace	0.65	0.30	0,27

4. *Inner lamella:* Wide anteriorly and ventrally (except middle portion), narrower posteriorly. In lower half of anterior part is generally the characteristic vestibulum. Line of concrescence and inner margin are markedly separated anteriorly. Selvage subperipheral, posteriorly runs at a considerable distance from the outer margin, crossing straight caudal process.
5. *Marginal pore-canals:* Few, straight, simple, a number are false. About 12 at the anterior, 5 to 7 at the ventral and 4 to 6 at the posterior.
6. *Hinge:* In left valve groove, which is separated between one-quarter and two-third by an inner bar with edge-shaped posterior end.
   The r i g h t v a l v e fits into the groove of left valve with an edge with slight curve before two-fifth of length.
7. *Normal pores:* Few, large.
8. *Muscle scars:* There are rows of four elongate adductor scar in both valves. The lowermost scars are smaller, the uppermost in left valve is curved upward. In front of the upper two scars the frontal scar

of two separated parts is situated. Its forwardly and somewhat upwardly curved part surrounds the smaller, circular part. Mandibular scar is situated more forward, before the lowermost adductor scar.

9. *Eye-spot:* Absent.
10. Left valve larger, *overlaps* right.
11. A smaller part of the forms is more elongate, probaly these are males.

Remarks:

In specimens from Gánt the parallelism of dorsal and ventral outlines is more pronounced as compared to that in specimens of Haskins (1970) from the type locality, and the posterior end is somewhat blunter. Taking the marked variability of this species into consideration, these slight differences cannot be regarded as of taxonomic value.

Geological and geographical distribution:

Lutetian – Stampian: France
? Bartonian: Belgium, the Netherlands
Ledian – Tongrian: England
Upper Eocene – Lower Oligocene: GDR
Upper Eocene: USSR
Lower Eocene: India
Material: About 30 left valves and about 30 right valves.

Familia Cytheruridae G. W. Müller, 1894

Genus Paracytheridea G. W. Müller, 1894

Paracytheridea gradata (Bosquet, 1852) n. ssp. ?

Pl. II, Fig. 12.

1852. Cythere gradata Bosquet, 1852 – Bosquet, pp. 127 – 128, pl. VI, fig. 11.
1955. Paracytheridea gradata (Bosquet, 1852) – Apostolescu, pp. 249 – 250, pl. II, fig. 25.
1957. Paracytheridea (Paracytheridea) gradata (Bosquet, 1852) – Keij, p. 159, pl. XXII, figs. 2 – 4.
?1959. Paracytheridea gradata (Bosquet, 1852) – Moyes, p. 12, pl. 3, fig. 6.
1961. Paracytheridea gradata (Bosquet, 1852) – Deltel, p. 126, pl. 9, fig. 138.
1966. Paracytheridea gradata (Bosquet, 1852) – Moussou, pp. 72 – 73, pl. 20, figs. 82a – c.
1969. Paracytheridea gradata (Bosquet, 1852) – Ducasse, p. 88, pl. VI, fig. 124.
1970. Paracytheridea gradata (Bosquet, 1852) – Haskins, p. 18, pl. 2, figs. 4 – 9.

Description:

1. *Shape:* In outher lateral view anterior outline of left valve angular, straight between one- and four-fifth of maximal height and roughly perpendicular to the dorsal outline, then braking with about 110° angle, runs to cardinal angle (about a quarter of length). Here an abrupt recess occurs (remarkably coarse cardinal angle), then the dorsal outline straight (except parts mentioned in ornamentaion) to slightly more than three-quarter of length, where grades into the convex line of posterior outline with an about 140° angle break. Posterior outline forms prominent caudal process, with a truncate end at one-sixth maximal height. Ventral line of posterior outline is parallel to dorsal outline. Ventral outline is formed by the ventrolateral wing-like extension, which ends perpendicularly to the dorsal line of posterior outline, slightly behind two-third of length. Half of the distance between this perpendicular end and caudal end is covered by the projected posteroventral spine. Ventral outline straight to one-sixth of length, and nearly parallel with dorsal outline. Here grades with an about 140° angle into anterior outline, which is broken with 110° angle at about one-fifth of maximal height. Height at anterodorsal angle.
   In inner lateral view dorsal outline completely straight, ventral outline slightly concave throughout.
   In dorsal view of left valve the outline rises with 45° angle to about one-third of length, horizontal to half-length, where a blunt, short, spiniform process occurs, then slopes with 90° angle to the half of maximal width. In the following portions slopes with 30° angle to seven-eighth of length, with an oblique, backwardly projected spine in the middle. Slope between seven-eighth length and caudal end is lower than 10° angle.
2. *Ornamentation:* The main ornamentation element is the ventral wing-like extension. It bears a sharp, ridge-like edge from the anterior margin throughout. From one-third of length to end of extension three anterodorsally directed processes run, with intervening depressions. The last forms the ridge running between the end of extension and valve-center, the anterior is a ventrally removed, bisected subcentral tubercle. In front of this, between the cardinal angle and ventral extension, runs a costa nearly parallel to the anterior margin. Behind the extension, a large, wide, posteroventrally directed spine is situated. The eye-tubercle is situated in the depressive surface between subcentral tubercle and half of dorsal outline. On dorsal side a prominent surface-part occurs between half and five-eighth of length, modifying the runing of dorsal outline. Posterior and anterior parts are smooth, middle part is weakly, irregularly reticulated.
3. *Measurements:*

	IL	H	W
left valve	0.46	0.20	0.17

4. *Inner lamella:* Rather wide anteriorly and posteriorly. Line of concrescence and inner margin coincide, caudally deviate from outer margin. Selvage subperipheral.
5. *Marginal pore-canals:* Few, simple, straight.
6. *Hinge:* In left valve there is incompletely closed socket anteriorly and posteriorly. On anterior part of median crenulate bar, tooth-like structure of three strong lobes occurs.
7. *Normal pores:* Few, rather large.
8. *Muscle scars:* Not seen.
9. *Eye-spot:* Prominent at caudal angle.

Comparison:

On the basis of the description and figure given by Keij (1957), the Gánt form resembles the type of Paracytheridea gradata (Bosquet, 1852) from France. However, the Gánt specimens differ in having a different running of the caudal process and protrusions dominating the ornamentation, which suggest new subspecies. Only a single left valve is known so far, thus an adequate designation of a new subspecies requires additional specimens.

Geological and geographical distribution:

Middle Eocene – ? Burdigalian: France
Ypresian – Bartonian: Belgium, the Netherlands
Ypresian – Tongrian: England
Material: One left valve.

Familia Hemicytheridae Puri, 1953

Genus Caudites Coryell, Fields, 1937

Caudites monsmirabiliensis Apostolescu, 1955

Pl. II, Fig. 10.

1955. Caudites monsmirabiliensis Apostolescu, 1955 – Apostolescu, p. 251, pl. II, figs. 33–34.
?1959. Caudites minsmirabiliensis Apostolescu, 1955 – Ducasse, p. 57, pl. XXI, fig. 4.

Description:

1. *Shape:* In outer lateral view anterior outline of left valve strongly rounded asymmetrically, upper part truncate. It encloses with the straight dorsal outline an about 140° angle at the one-quarter of the length (at the caudal angle). Cardinal angle projected. The straight dorsal outline runs to five-sixth of length, between five-eighth and three-quarter of length it is disrupted by the projected dorsal ridge. Upper half of posterior outline deeply concave, perpendicular to dorsal outline at the start, but finally encloses an angle smaller than 10°. Caudal part acute, lower and upper lines of posterior

outline enclose an about 55° angle at the start. This angle decreases to about 25° later, at six-seventh of length, where the posterior outline rounds into ventral outline. Ventral outline deviates from dorsal, strongly asymmetric between half and quarter of length, where a sinus occurs. Anterior outline with weak denticulation, lower line of posterior ouline shows 5 to 6 stronger denticles, the middle of the upper line bears a single denticle. Height at anterodorsal angle.

In inner lateral view outer margin completely straight dorsally, its ventral depression is somewhat deeper than that of outline.

In dorsal view shape of side is nearly parallel to about the half of maximal width to one-quarter of length, then rises to three-eighth of length with about 30° angle, slightly depressive between the subcentral tubercle and ventral ridge, and slopes from ventral ridge with 40 – 50° angle, finally parallel to about one-third of maximal width. Dorsal ridge ends nearly perpendicularly to dorsal margin.

2. *Ornamentation:* Wide and coarse marginal ridge runs anteriorly throughout the valve, except dorsal margin. Before half of valve-length, prominent subcentral tubercle occurs. Between half and three-quarter of length runs the dorsal ridge, which encloses a small angle with dorsal outline, finally modifying the latter. At the end it breaks perpendicularly to the dorsal outline, and with an another break encloses a 45° angle with its main line, and fade into the valve surface at one-quarter of height. Ventral ridge prominent only between half and two-third of length, with strongly upwardly curved end. Side-surface depressive anteriorly, and between the cardinal angle and subcentral tubercle. From the line between the ends of ventral and dorsal ridges, the surface slopes abruptly towards the depressive caudal part. Anterior and caudal parts are smooth. The prominent side-surface and the dorsal depression slightly, irregularly reticulated. The subcentral tubercle is smooth.

3. *Measurements:*

	L	H
right valve	0.54	0.25

4. *Inner lamella:* Widest anteriorly, where the line of concrescence deviates from inner margin. Prominent vestibulum. Selvage subperipheral.
5. *Marginal pore-canals:* about 30 anteriorly, about 12 posteroventrally. Generally simple, straight.
6. *Hinge:* In right valve the anterior element is a "two-stepped" tooth, anteromedian is a closed socket, the posteromedian is a groove, and the posterior is a "two-stepped", acute tooth.
7. *Normal pores:* Scattered, large.
8. *Muscle scars:* Not seen.
9. *Eye-spot:* Strong in cardinal angle.

Remarks:

The Gánt form is somewhat less acute caudally, more concave ventrally and slightly more asymmetric anteriorly than the type. With these features it resembles Caudites sp. 1. described by Deltel (1961), however, its ornamentation is closer to thet of the type. On the basis of the available single right valve, these small differences cannot be interpreted even as of subspecific.

Geological and geographical distribution:

Lower Eocene – Upper Eocene + Stampian: France
Material: One right valve.

Familia Linocytheridae Klie, 1938

Genus Cytheridella Daday, 1905

Cytheridella ? gántensis n. sp.

Pl. II, Figs. 15–17.

Derivatio nominis: After the name of the locality.
Holotypus: Right valve; reposited in the type collection of the Hungarian Geological Survey.
Locus typicus: Bauxite-pit of Bagolyhegy-hill, Gánt, Transdanubian Central Mountains, Hungary.
Stratum typicum: Lutetian Stage, mollusc-bearing marl.
Diagnosis: Anteriorly strongly, posteriorly less asymmetrically rounded form, with prominent anteromedian sulcus and weakly, densely pitted surface.

Description:

1 *Shape:* In outer lateral view anterior outline of right valve asymmetrically rounded, its upper half truncate, and arches into dorsal outline with about 140° angle at one-quarter of length. Dorsal outline nearly straight, gradually curves into the nearly asymmetrically rounded posterior outline, which weakly truncate dorsally. Ventral outline slightly concave throughout, the sinus is symmetrical with a maximum at half-length. Height anterior.
Anterior outline of left valve more asymmetric, the arch into the dorsal outline is more gradual. Posterior angle on dorsal outline prominent, dorsal half of posterior outline distinctly truncate, very slightly concave, its ventral half is rounded with a rather small radius and gradually curves into the ventral outline, which runs similarly as that of right valve.
In inner lateral view outline coincides with outer margin. In dorsal view the shape of sides rises with about 20° angle to one-sixth of length then arches convexely (with 45–10° angle) to five-twelfth of length, and rises with 20° angle to seven-twelfth of length. From this point it slopes with about 15° angle to after five-

sixth of length, then curves with 45 – 90° angle nearly to the valve-end, where grades into a very short margin of 45° slope. In a smaller part of the speciemens the slope from seven-twelfth of length is constant nearly throughout, with an angle of about 45°.

2. *Ornamentation:* Valve-surface finely pitted. Along anteromarginal rim weak ridge occurs, which especially prominent in right valve. In the upper part of the valve, the junction of the anterior and dorsal outline, the part of dorsal outline at half-length, as well as the area between dorsal outline and muscle-scars, show depressions. Ventral part of valves extended, abrupt towards ventral margin.

3. *Measurements:*

	L	H
right valve	0.76	0.35
right valve	0.77	0.37
left valve	0.80	0,39
left valve	0.78	0.35

4. *Inner lamella:* Rather wide anteriorly, but very thin, thus the prominent vestibulum is visible rarely and fragmentarily. Marginal zone rather narrow anteriorly and posteriorly too. Prominent selvage in both valves, in right valve near the line of concrescence: in left valve in somewhat outwardly removed position. In both valves its running posteriorly deviates from the outline and is removed inward. Posteroventrally strong flange is visible.
5. *Marginal pore-canals:* Rather numerous anteroventrally, simple, straight.
6. *Hinge:* In right valve hinge-elements are positive, hardly divided from selvage, anteriorly and posteriorly a hardly prominent, undivided tooth occurs, with intervening median bar. All these hinge-elements fit into the corresponding groove of left valve.
7 – 8. *Normal pores* and *muscle scars* not seen.
9. *Eye-spot:* Absent.
10. Left valve slightly *overlaps* right.
11. The few more elongate, low specimens are probably the males; these show the posteriorly less inflated valves mentioned in dorsal view's description.

Comparison:

Morphologically this form has no Tertiary allies. Its visible outer and inner features, as well as its sexual dimorphism suggest agreement with the Recent genus of Daday. The uncertain generic status is necessitated by the partially incomplete preservation.
Material: Eight right valves and three left valves.

Familia Loxoconchidae Sars, 1925

Genus Loxoconcha Sars, 1866

Loxoconcha sp.

Pl. II, Fig. 18.

Description:

1. *Shape:* In outher lateral view anterior outline of left valve asymmetrically rounded, its upper part truncate. It encloses with dorsal outline an about 140° angle behind the one-sixth of the length. Dorsal outline nearly straight (obscured by the coarse ornamentation) to six-seventh of length, where encloses also with posterior outline a nearly 140° angle. Upper line of posterior outline straight in the part corresponding to one-fifth of maximal length, lower line slightly convex, the two lines are perpendicular to each other. Ventral outline is formed by the ventral wing-like extension between one-fifth and two-third of length, its running is hardly convex. The transition of ventral and anterior outlines – because of the damage – cannot be studied. Height at eye-tubercle.
   In inner lateral view the one outer margin of left valve strongly deviates from the margin ventrally, and shows a deep sinus between one- and two-third of length.
   In dorsal view the side-surface rises with about 35° angle to one-quater of length, then with 10 to 8° angle to two-third of length, and slopes with about 50° angle to nine-tenth of length then with 10° angle to the end of the valve.
2. *Ornamentation:* Left valve surface coarsely, irregularly reticulate, with sharp riblets. Reticulation absent on the flattened caudal part. Near the anterior margin runs a fine anteromarginal ridge, from which anteriorly no reticulation is visible. Dorsal side shows a downwardly narrowing, very shallow triangular depression. The ridge-like costa running on the ventral extension breaks upwardly near the ventral outline, at about two-third of length and ends near three-quarter length acutely.
   In ventral view the ventral extension shows paired costa parallel to the outline, which ends perpendicularly towards the ventral margin. Valve -parts below these costae are depressive.
   Ornamentation becomes coarser posterodorsally and is similar to radial ribbing anteriorly.

3. *Measurements:*

	L	H	W/2
left valve	0.37	0.19	0.10

4. *Inner lamella:* Wide anteriorly, inner margin and line of concrescence slightly deviate anteriorly, narrow vestibulum is present. Selvage subperipheral.

5. Anteriorly 8 straight, simple *marginal pore-canals* are visible.
6. *Hinge:* In left valve small socket anteriorly, which is surrounded by the anteromedian tooth. Posteriomedian element is a finely crenulate bar, posterior element cannot be seen.
7. *Normal pores:* Rather few, large.
8. *Muscle scars:* Not seen.
9. *Eye-spot:* Prominent before one-third of length, near to the dorsal outline (behind the cardinal angle).

Remarks:

The Gánt form resembles the species Loxoconcha curryi Keij, 1957 and Loxoconcha limbata Haskins, 1971 in shape and ornamentation. In the type figures of the former the shape is thicker, the dorsal outline more irregular and the end of the ventral costa is different. The latter form seems to be closer in shape, however, in the Gánt specimen the outline – because of the overhang of the ventral extension – is somewhat different, and the anteromarginal ridge is weaker, the ventral ridge is less projected and its anterior and posterior running and ending are also different. Because of the single, incompletely preserved valve, the precise identification is impossible.
Material: One single left valve.

Familia Schizocytheridae Howe, 1961

Genus Schizocythere Triebel, 1950

Schizocythere depressa (Méhes, 1936)

Pl. III, Figs. 1–4.

1936. Eucytherura depressa Méhes, 1936 – Méhes, pp. 25–26, pl. III, figs. 5–8.

Description:

1. *Shape:* In outher lateral view anterior outline of left valve rounded asymmetrically, its upper part truncate, encloses with the nearly straight dorsal outline a 120–130° angle, somewhat before one-quarter of length. The straight running of dorsal outline is disturbed by the prominent cardinal angle, and the strong, obliquely projected spiniform element. At five-sixth of length the dorsal outline rounds into the posterior outline, of which upper line is markedly concave and encloses with its lower line a 90° angle at about one-third of length. This lower line rounds from slightly concave into convex and bears a strong posteroventral spine behind five-sixth length. The caudal process arising from the junction of the two lines is rounded or truncate. The slightly curved ventral outline is formed by the ventral ridge betwen one- and two-third of length. Because of the processes of the ornamentation elements, the lower part of the anterior outline shows 3 to 4 projections. Height anterior, near to the cardinal angle.

Anterior outline of r i g h t v a l v e more truncate above, encloses with dorsal outline an about 140° angle near one-third of length. Dorsal outline slightly convex, without strong cardinal angle and posterior spine, but the strong break at the junction with posterior outline is present.

In inn e r l a t e r a l vi e w ventral outline of l e f t v a l v e shows a shallow sinus between about one-quarter and one-third of length, with maximal concavity behind one-third of length.

In d o r s a l v i e w anterior side-surface rises with 45° angle to one-quarter of length, with about 20° to five-ninth of length, then slopes with about 40° angle to nine-tenth of length, finally with about 30° angle to the posterior end.

2. *Ornamentation:* L e f t v a l v e surface irregularly reticulate. On ventral side a prominent, arched ventral ridge occurs, which is formed by the strenghtening of two costae. The lower runs from lower part of anterior margin towards ventral margin, then forms the ventral outline with a convex arch, and ends abruptly in front of posterior spine. The upper costa arises near the lower third of the maximal height, from anterior margin, to one-third is convergent, then parallel to the lower costa, and at the ending of this latter, fades into the reticulation. Behind lower costa, with a separating interspace, a strong, obliquely backward-oriented spine occurs. Valve surface under lower costa is concave and reticulate. Along the dorsal margin the strengthening of the reticulation forms a weak dorsal ridge, which most prominent posterodorsally and near the cardinal angle; intervening valve surface depressive. Along anterior margin – especially in its lower part – reticulation is weak or absent in wide zones. Above the two costae of ventral margin, an other, weaker and shorter costa runs to the anterior margin. One or two weak longitudinal costae may run onto caudal process. Reticulation weaker anterodorsally and centrally. Reticulation becomes sharper posteriorly.

Ornamentation of r i g h t v a l v e is similar.

3. *Measurements:*

	L	H	W
left valve	0.44	0.27	
left valve	0.40	0.27	
left valve	0.42	0.28	
left valve	0.41	0.27	
left valve	0.40	0.26	
right valve	0.44	0.26	
right valve	0.42	0.27	
right valve	0.40	0.26	
right valve	0.42	0.27	
right valve	0.40	0.25	
carapace	0.44	0.28	0.27
carapace	0.45	0.28	0.27

4. *Inner lamella:* Wide anteriorly and posteriorly. Line of concrescence coincides with inner margin. Flange strong, selvage runs centrally.
5. *Marginal pore-canals:* Few, straight, simple.
6. *Hinge:* In left valve strong anterior socket, bifid tooth, crenulate median bar and elongate crenulate posterior socket.
   In right valve anteriorly strong "two-stepped" bifid tooth, socket, median crenulate groove and posteriorly crenulate, elongate tooth.
7. *Normal pores:* Few, large, sieve-type, situated in interspaces of the reticulation.
8. *Muscle scars:* Hardly visible in detail.
9. *Eye-spot:* Prominent on cardinal angle in both valves.
10. Left valve *overlaps* right dorsally.
11. A part of the specimens is of more elongate, these are probably males.
12. In undeveloped forms the smaller size is associated with weaker ornamentation and less-developed hinge.

Remarks:

The studied specimens can be identified with the species described by Méhes (1936). Certain parts of the original description – especially the hinge – are inaccurate. It is caused by the unadequate equipments and the bad preservation
The Gánt specimens differ from Schizocythere appendicula Triebel, 1950 in having straighter ventral outline, more prominent cardinal and posterodorsal angles, more pronounced caudal process and different details in the ornamentation. From the French Lutetian Deltel (1961) figured forms, under the name Schizocythree appendicula, which seem to belong rather into the species of Méhes. The close relation of the two species seems to be obvious, however, because of the lostness of the holotype, the recognition of the degree of relation needs further studies on material from the type locality.

Geological and geographical distribution:

Middle ? Eocene; Budapest- vicinity, Hungary.
Material: 100 right and left valves, three carapaces.

Familia Tracyleberididae Sylvester-Bradley, 1948

Genus Bradleya Hornibrook, 1952

Bradleya validornata hungarica n. ssp.

Pl. III, Figs. 5–8.

Derivatio nominis: After Hungary.
Holotypus: Left valve, reposited in the type collection of the Hungarian Geological Survey.
Locus typicus: Bauxite-pit of Bagolyhegy-hill, Gánt, Transdanubian Central Mountains, Hungary.

Stratum typicum: Lutetian Stage, mollusc-bearing marl.
Diagnosis: A form with denticulate anterior margin and strong ventral and dorsal costae.

Description:

1. *Shape:* In outer lateral view anterior outline of left valve rounded asymmetrically, with great radius in its upper two-third. Anterior outline encloses with dorsal outline a 120° angle at about one-fifth of length. The straight running of dorsal outline is modified by a slight protrusion at cardinal angle and the extension between one-third and three-quarter of length. Dorsal outline breaks upward by 150° angle threequarter of length and ends with a spiniform projection. The upper part of the joining posterior outline is concave in the start, nearly perpendicular to the main direction of the dorsal outline. Its lower portion slightly convex, somewhat angularly grades into the weakly convex ventral outline, which is formed between two-fifth and seven-tenth by the ventral ridge. Lower line of posterior margin bears 5 denticles, and its junction with the upper line an other, differently directed, smaller denticle occurs. Fine marginal denticulation appears posteriorly. Height near cardinal angle.
In right valve the anterior outline is more symmetrical, rounds into dorsal outline at about one-third of length, with a 140° angle, cardinal angle without protrusion, dorsal outline nearly straight, the short posterior portion of the dorsal outline markedly concave, which results a more pronounced spiniform projection between the dorsal outline and the concave line of posterior outline.
In inner lateral view the outer margin in left valve straight dorsally, deviates from outline. Both valves show ventral sinus on outer margin between one-sixth and two-third of length.
In dorsal view the valves are anteriorly parallel to about one-quarter of maximal width up to one-tenth of length, then rise with about 45° angle to one-third of length. From this to three-quarter length the outline of sides is uneven, nearly parallel, then slopes with about 45° angle to nine-tenth of length, finally parallel to about one-quarter of maximal width.
Ventral ridge in ventral view of carapace is slightly asymmetrical, rises with about 20° angle in left valve, with 30° angle in right valve. Ridges end perpendicularly to hinge-direction in both valves.
2. *Ornamentation:* Along anterior margin of left valve a ridge runs, which extends onto anterior third of the ventral part. Between half and three-quarter length a strong dorsal ridge appears, which breaks with 90° angle at its end, and fade into reticulation at upper one-third of local height. Ventral ridge similarly strong, it is formed by two slightly arched, posteriorly somewhat divergent costae. The upper costa ends at about one-sixth of local height, lower one ends below ventral margin. Valve-surface coarsely reticulate throughout,

the polygonal reticulation is formed by sharp, ridge-like riblets, which are arranged into two concentric rows anteriorly and more irregularly in other parts. The weakly developed subcentral tubercle appears slightly before half-length.
In r i g h t v a l v e the ridges – especially the dorsal one – developed more weakly.

3. *Measurements:*

	L	H
left valve	0.92	0.53
left valve	0.89	0.52
left valve	0.85	0.52
right valve	1.04	0.50
right valve	0.90	0.50
right valve	0.87	0.50

4. *Inner lamella:* Rather wide antero- and posteroventrally. Line of concrescence and inner margin coincide. Selvage distinct, subperipheral.
5. *Marginal pore-canals:* Numerous (higher than 20), about 10 posteriorly Espacially dense anteroventrally. Simple, straight, with ampullae in outer third.
6. *Hinge:* In l e f t v a l v e anterior socket, small anteromedian tooth, smooth posteromedian bar and relatively large posterior socket.
In r i g h t v a l v e anterior element is a strong tooth, anteromedian element is a small socket, which continues in a smooth posteromedian groove. Posterior tooth elongate, arched.
7. *Normal pores:* Numerous, large, sieve-type.
8. *Muscle scars:* The four elongate adductor scars are arranged in a single row, with 2 frontal scars before.
9. *Eye-spot:* Pronounced, slightly behind and below cardinal angle.
10. Left valve *overlaps* right considerably at cardinal angle.
11. A part of the specimens are of more elongate, with weaker ridge; these probably are males.

C o m p a r i s o n :

In relation to the type subspecies of P i e t r z e n i u k (1969), this form shows pronounced ventral and dorsal ridges and finely denticulated anterior margin.
Material: Seven right valves and four left valves.

Genus Echinocythereis Puri, 1954

Echinocythereis dadayana (Méhes, 1941)

Pl. III, Figs. 9–11.

1936. Cythereis dadayi Méhes, 1936 – Méhes, pp. 40–42, pl. IV, figs. 12–13. (non Cythereis dadayi Zalányi, 1913).
1941. Cythereis dadayana Méhes, 1941, nom. nov. – Méhes, p. 43.

Description:

1. *Shape:* Anterior outline in outer lateral view of left valve rounded asymmetrically, radius of roundness is rather small in the lower part. Anterior outline at one-third of length curves into the nearly straight dorsal outline, of which straight running is diturbed by the protrusion of the cardinal angle. Dorsal outline angularly grades into posterior outline, with about 120° angle, slightly behind nine-tenth of length. Upper part of posterior outline slightly concave, lower part gradually curves – after a strong break – into ventral outline, which hardly concave in its running. Lower part of anterior outline finely denticulate, lower line of posterior outline bears 4 to 5 denticles. Height at cardinal angle.
   Anterior outline of right valve is nearly symmetrical, dorsal outline uneven, with short, protruded portion near to two-fifth of length, and with inclined posterior portion. Upper line of posterior outline markedly concave, thus the valve is acute caudally. Ventral outline shows strong asymmetrical sinus between about one-quarter and three-fifth of length, with maximal concavity at two-fifth of length.
   In inner lateral view outer margin deviates from the outline in both valves, straight dorsally and shows strong asymmetric sinus ventrally.
   In dorsal view the surfaces are parallel to one-sixth of maximal width up to one-twelfth of length, rise with 30° angle to about five-twelfth of length, from this part are parallel to about two-third of length, then slopes with about 20° angle to five-sixth of length, and with about 40° angle to eleven-twelfth of length, and finally are parallel to the one-quarter of maximal width.

2. *Ornamentation:* Left valve surface bears dense longitudinal, irregularly branching and convergent costation, with transversal elements, which result a common ornamentetion network. Near ventral margin a strong ventral costa occurs, which runs from the maximum of ventral sinus to the four-fifth of length, and ends abruptly towards the surface. Surface below ventral costa nearly perpendicular to the plane between the valves. Starting from half-length, a short, slightly arched costa runs dorsally, which ends abruptly towards surface before the end of dorsal outline. Reticulation confines to certain parts of the surface, absent behind the connecting line between posterior ends of the two costae, and in anterior third of surface. Coarseness of ornamentation varies individually.
   Ornamentation of right valve is similar.

3. *Measurements:*

	L	H
left valve	0.77	0.46
left valve	0.80	0.45
left valve	0.74	0.44
right valve	0.83	0.42
right valve	0.78	0.41
right valve	0.76	0.40

4. *Inner lamella:* Wide anteriorly and posteriorly, inner margin and line of concrescence coincide. Selvage stronger in right valve, situated in the outer third, with inner striae.
5. *Marginal pore-canals:* Dense, straight, some bifurcating.
6. *Hinge.* In r i g h t v a l v e strong, "two-stepped" anterior tooth, smaller socket with associated smooth median groove and arched, lamellar, somewhat lobate posterior tooth.
   In l e f t v a l v e anterior socket is followed by a smaller, knob-like tooth, which continues into smooth median bar; posterior element is a narrow, arched, ventrally somewhat open socket.
7. *Normal pores:* Few, open.
8. *Muscle scars:* Anterior to the row of four elongate adductor scars two frontal scars are present. Partially constricted or subdivided adductor scars are obliquely oriented, their row is vertical.
9. *Eye-spot:* Clearly developed.
10. Left valve slightly *overlaps* right dorsally and ventrally
11. A part of the specimens are of much elongate, these are probably that males.

R e m a r k s :

This studied form with its outer and inner features suggests a range into the genus Echinocythereis. However, it is unusual, that this genus, known previously as a deep-water form, occurs in a shallow-water, near-shore, even brackish-water environment. It is a common form in other localities in Hungary. (According to preliminary studies, in al cases in shallow-water, near-shore assemblages.)

Geological and geographical distribution:

Middle? Eocene: Budapest-vicinity, Hungary.
Material: 30 right valves and left valves, 1 carapace.

Genus Hermanites Puri, 1955

Hermanites acuticosta gantensis n. ssp.

Pl. IV, Figs. 3 – 6.

Derivation nominis: After the name of the locality.
Holotypus: Left valve; reposited in the type collection of the Hungarian Geological Survey.

Locus typicus: Bauxite-pit of Bagolyhegy-hill, Gánt, Transdanubian Cantral Mountains, Hungary.
Stratum typicum: Lutetian Stage, mollusc-bearing marl.
Diagnosis: Posteriorly more acute valves, as compared to those of the nominate subspecies, with radial costae anteromarginally. In left valve the cardinal angle is spiniform, projected.

Description:

1. *Shape:* In outer lateral view anterior outline of left valve rounded asymmetrically, with truncate upper quarter. Anterior outline with fine denticulation, which is covered by the strong anteromarginal ridge in some places. It encloses with dorsal outline an about 135° angle behind one-quarter of length. Anterodorsal angle is projected highly above dorsal margin. From three-eighth of length the dorsal outline is formed by the two lamellar protrusions of the dorsal ridge, with an interspace near five-eighth of length. The small projected lamella in the posterodorsal angle makes the dorsal outline more uneven. Near five-sixth of length the dorsal outline grades – with a sharp break – into posterior outline, which is straight or somewhat concave in its upper two-third, bears a strong, overhanging spine in its middle portion, and after a break of about 90° angle in the lower third, it rounds gradually into ventral outline. This side shows four strong spines. Ventral outline has an asymmetric sinus between one- and three-quarter of lenght, which is slightly covered by the ventral ridge. Ventral outline rounds with a small radius into anterior.
   In right valve the posterodorsal outline is just projected, dorsal outline less broken at the junction with posterior outline. Upper line of posterior outline is markedly concave, thus the caudal part is more elongate. Upper line rounds into lower with an about 70° angle. The sinus of the ventral outline is more asymmetric.
   In inner lateral view outer margin considerably deviates from outline dorsally, where it is straight. The sinus of ventral outline is also more pronounced than that of outline, with maximal concavity before half-length.
   In dorsal view the surface is parallel to one-third of width to about one-eighth of length, rises with about 30° angle to three-eighth of length, nearly parallel to five-eighth of length, then slopes with about 30° angle to seven-eighth of length and finally parallel to one-quarter of width.
   In ventral view ventral ridge extends to three-quarter of length and rises with about 20° angle (the rise decreases toward its end).
2. *Ornamentation:* Left valve shows sharp, lamellar anteromargonal ridge. The strong, lamellar dorsal ridge forms the greater part of the dorsal outline. It is divided into two lamellae, the posterior one rounds toward valve-center and ends abruptly at three-quarter of

length, at the upper third of the local height. Ventral ridge starts near the ventral outline, from one-quarter of length, shows a weak arch towards ventral side, protrudes over ventral margin and ens in a spine before three-quarter of length, at one-sixth of local height. Strong spiniform elements are situated in posterodorsal angle, in the middle portion of upper line of posterior outline, beside the end of ventral ridge and in the middle of the space between posterior end and ends of the two ridges. Subcentral tubercle with numerous, smaller, protruding knobs. Four strong spines in the space between ridges behind, one strong spine above and 5 smaller spines before subcentral tubercle. From anteromarginal ridge 6 radial costae run to anterior spiniferous field. Weak, irregular reticulation visible throughout the spiny surface.

The ornamentation of the r i g h t v a l v e is similar.

3. *Measurements:*

	L	H
left valve	0.59	0.33
left valve	0.57	0.32
left valve	0.54	0.32
left valve	0.59	0.33
right valve	0.57	0.30
right valve	0.57	0.31
right valve	0.59	0.33

4. *Inner lamella:* Wide anteriorly and posteroventrally, line of concrescence and inner margin coincide. Selvage subperipheral.
5. *Marginal pore-canals:* 35 anteriorly, about 15 posteroventrally. Simple, straight, or slightly bent, with ampullae in their outer part.
6. *Hinge:* In l e f t v a l v e anterior socket, conical tooth and connecting crenulate median bar, the posterior element is a socket. In r i g h t v a l v e strong, "two-stepped" anterior tooth, socket and connecting crenulate median groove, the posterior element is an arched, lobate tooth.
7. *Normal pores:* Numerous, large, sieve-type.
8. *Muscle scars:* Four markedly elongate adductor scars in a ventral row, the lower three are obliquely, anteriorly oriented. In front of row of adductor scars, there are 2 close, circular frontal scars.
9. *Eye-spot:* Well-developed at anterodorsal angle.
10. Left valve *overlaps* right, especially at anterodorsal angle.
11. The somewhat more elongated specimens are presumably the males.

C o m p a r i s o n :

This form differs from the nominate subspecies (P i e t r z e n i u k, 1965) in having stronger caudal acuteness, and costae joining anteromarginal ridge. The reticulation between the ridges is weaker, but more extended. Different is the distribution and number of the spines, as well as the more acutely projected cardinal angle. An other difference is the presence of the "two-stepped" tooth.

The similarly close H. camelus turbidus Moos, 1968 has more numerous ornamental elements and different shape of caudal end.
Material: 300 right and left valves.

Hermanites haidingeri paijenborchiana Keij, 1957

Pl. IV, Figs. 1 – 2.

1852. Cythere haidingeri (Reuss, 1860) – Bosquet, pp. 125 – 126, pl. VI, fig. 10.
1955. Cythereis haidingeri (Reuss, 1850) – Apostolescu, pp. 269, pl. VII, figs. 114 – 115.
1957. Hermanites paijenborchiana Keij, 1957 – Keij, p. 110, pl. XVII, figs. 11 – 14, pl. XXI, figs. 10 – 11.
?1961. Hermanites paijenborchiana Keij, 1957 – Deltel, pp. 168 – 169, pl. 16, ifgs. 279 – 280.
1962. Hermanites paijenborchiana Keij, 1957 – Hinte, pp. 180 – 182, pl. I, fig. 5, pl. III, figs. 1 – 2,8,10.
1969. Hermanites paijenborchiana Keij, 1957 – Seremeta, pp. 199 – 200, pl. XVIII, figs. 15 – 16.
1969. Hermanites paijenborchiana Keij, 1957 – Ducasse, p. 115, pl. VIII, fig. 169.

Description:

1. *Shape:* In outer lateral view anterior outline of left valve somewhat asymmetrically rounded, its upper part truncate. The nearly straight dorsal outline, because of the coarse ornamentation, runs unevenly, and encloses a 130° angle with the anterior outline. Dorsal outline protruded above eye-spot. The dorsal ridge and a posterodorsal extension also modifies the dorsal outline. Dorsal line of posterior outline encloses 120 – 130° angle with dorsal outline, with spiniform, protruded angle at the junction. Its ventral line encloses 130 – 140° angle with the ventral outline. Dorsal line concave, ventral slightly convex. Ventral side of posterior outline shows 7 spines, and an additional one in its lowermost part. Ventral outline nearly straight, divergent anteriorly from dorsal, and arches into anterior outline with a small radius. Anterior outline finely denticulated, especially on its ventral part. Height at cardinal angle.
In inner lateral view outer margin of left valve deviates from outline by the coarse ornamentation. Dorsal outline straight, posterior outline concave dorsally, convex ventrally, ventral outline bears shallow sinus between three- and seven-tenth of length.
In dorsal view the posterior portions of dorsal ridges in left valve are somewhat more projected.
In ventral view the ventral ridge of left valve rises with 30° from one-tenth to about four fifth of length. Surface is parallel to about one-third of maximal width to one-tenth, then subcentral

tubercle forms a convexity to half-length, and the outline is formed by the above described ventral ridge. From that the outline slopes with 60—70° angle to five-sixth of legth, and finally parallel to one-third of maximal width.

2. *Ornamentation:* In left valve, near tot the anterior margin, runs a parallel anteromarginal ridge. Main ornamentation elements are the ventral ridge, the dorsal ridge and the subcentral tubercle. The slightly curved ventral ridge arises near the ventral margin, and later removes from that.
   Dorsal ridge arises at three-tenth of legth, somewhat arched below dorsal outline, and reaches dorsal outline at half-length. Dorsal outline is formed by the dorsal ridge to about four-fifth of length, and, breaking with a 70—80° angle at one-third of local height, it fades into the reticulation. Subcentral tubercle behind one-third of length. Secondary ornamentation is formed by network-reticulation, which is weak in central part of subcentral tubercle. Ornamentation is arranged in concetric rows along anterior margin, especially the three anterior spaces, where an additional, regular radial, arrangement, with 5 pronounced costae, appears. Around subcentral tubercle an annular arrangement of 12 spaces occurs. Reticulation is sponge-like.

3. *Measurements:*

	L	H
left valve	0.72	0.40
left valve	0.77	0.40

4. *Inner lamella:* Moderately wide, inner margin coincides with line of concrescence and runs parallel to outer margin. Selvage is near to outer margin in left valve.
5. *Marginal pore-canals:* Approximately 20 anteriorly, 10 posteriventrally, straight, simple, partially with ampullae.
6. *Hinge:* In left valve large, closed anterior socket, anteromedian element is a smaller tooth, which continues into the smooth posteromedian bar, posterior element is a socket, which is open towards valve-interior.
7. *Normal pores:* Large, their number corresponds to the spaces of the reticulation.
8. *Muscle scars:* In front of the ventral row of four adductor scars, a "V"-shaped frontal scar is situated.
9. *Eye-spot:* Well developed at anterodorsal angle.
10. The more elongate specimens are probably the males.
11. Beside smaller size and weaker calcification, the embrional valves are characterized by weakly-developed inner lamella and hinge.

Remarks:

The French Lutetian forms were described by Keij (1957) as new species H. paijenborchiana, who regarded its less regular anterior ornamentation and laterally more projected dorsal ridge as main distinguishing features

from the Miocene H. haidingeri. Hinte in 1962 described from the Eocene of Sonneberg Hermanites paijenborchiana specimens with a more regular anterior ornamentation, which is close to that of H. haidingeri. The regularity of the anterior ornamentation may be different in several subspecies of H. haidingeri.

On the basis of the literature, H. paijenborchiana and H. haidingeri can be distinguished only on subspecific level.

The specimens from Gánt are identical even in the fines ornamentation details with the left valve of H. haidingeri haidingeri figured by Moos (1965) from the Tortonian of Grusbach (Austria). The shape is slightly different, because in the Gánt specimens the height difference between posterior and anterior ends of dorsal outline is smaller, the anterior margin is more asymmetric, the posterodorsal spine is weaker, the dorsal line of posterior outline is smaller, less concave, and the center of the subcentral tubercle is smooth. Different is the laterally less protruding character of the dorsal ridge, too. As compared to the type of H. paijenborchiana, the Gánt specimens show maximal concavity of ventral outline in anterior third, and more protruded caudal angle. The ornamentation is similar as that of the holotype, but the type figure does not show marked regularity in the anterior ornamentation.

Geological and geographical distribution:

Eocene – Stampian ?: France
Ypresian – Lutetian: Belgium
Eocene: Austria
Lower Eocene: USSR
Material: Two left valves and one embryonal left valve.

Genus Quadracythere Hornibrook, 1952.

Quadracythere angusticostata (Bosquet, 1852)

Pl. IV, Figs. 7 – 10.

1852. Cythere angusticostata (Bosquet, 1852) – Bosquet, pp. 91 – 92, pl. IV, fig. 12.
1957. Quadracythere angusticostata (Bosquet, 1852) – Keij, p. 104, pl. XII, fig. 16, pl. XIX, fig. 12.
1959. Quadracythere angusticostata (Bosquet, 1852) – Ducasse, p. 66, pl. V, fig. 3, pl. XXIV. figs. 30a – b.
1969. Bradleya angusticostata (Bosquet, 1852) – Ducasse, p. 107, pl. VII, fig. 155.
1971. Bradleya angusticostata (Bosquet, 1852) – Blondeau, pp. 39 – 40, pl. IV, figs. 7 – 8.

Description:

1. *Shape:* In outher lateral view anterior outline of left valve asymmetrically rounded, its upper part truncate, and encloses with dorsal outline an about 130° angle at one-fifth of length.

The straight running of dorsal outline is divided by the markedly protruded cardinal angle, the projected part of the dorsal ridge with two smaller protrusions before, and the spiniform projection of the posterodorsal angle. Dorsal outline encloses with posterior outline an about 120° angle at nine-tenth of length, the upper line of posterior outline is somewhat concave, its lower line is slightly convex and these lines enclose an about 130° angle with each other. Lower line bears 5 strong denticles. Ventral outline nearly straight, somewhat concave, and rounds into anterior outline gradually. Height anterior. In r i g h t v a l v e the cardinal angle markedly deviates from the outer margin, which runs straight. Outer margin shows a strong, somewhat asymmetric ventral sinus between one- and two-third of length.

In d o r s a l v i e w the side-outline is parallel to about one-third of width to one-tenth of length, rises with 40° angle to four-tenth of length, then somewhat recessive, and then nearly parallel or rising with 10—15° angle to five-sixth of length, and from that, slopes with about 45° angle to eleven-twelfth of length, and finally parallel to one-fifth of length.

In v e n t r a l v i e w it is visible, that the angle of ventral ridge and plane of valve-closure is decreasing from 30° to 0° between one-sixth and three-fourth of length. Ventral ridges of the two valves are symmetric.

2. *Ornamentation:* Along anterior margin of l e f t v a l v e runs a strong anteromarginal costa. Between half and five-sixth of length an uneven dorsal ridge appears, which ends with a 90° break at one-quarter of local width and fades into the reticulation. Strong ventral ridge appears, which runs with a weak arch, nearly parallel to the ventral margin. It runs from about one-fifth to two-third of length, with a thickening at its abrupt end. Surface markedly reticulated throughout, the riblets are sharp. The 6 strong radial costae enclose large, elongate interspaces, anteriorly, the costa rising from the eye-spot is especially strong. Subcentral tubercle prominent, without reticulation on its central part. The reticulation of the other parts of the surface is irregular. On the surface between ventral ridge and ventral margin, strong riblets occur.

The ornamentation of the r i g h t v a l v e is similar.

3. *Measurement:*

	L	H
left valve	0.83	0.46
left valve	0.79	0.46
right valve	0.81	0.45
right valve	0.83	0.44
right valve	0.80	0.42

4. *Inner lamella:* Relatively wide anteriorly and posteriorly. Line of concrescence and inner margin coincide. Selvage strong, runs centrally.

5. *Marginal pore-canals:* Approximately 30 anteriorly, 10 posteriorly, simple, straight, with ampulla-like thickening in the middle.
6. *Hinge:* In l e f t v a l v e closed anterior socket, conical tooth and associated crenulate median bar, posterior socket. In r i g h t v a l v e strong anterior tooth, socket with associated, crenulate (?) median groove, and lamellar, arched, dorsally curve posterior tooth.
7. *Normal pores:* Numerous, large, sieve-type.
8. *Muscle scars:* In front of the row of adductor scars, two well-visible frontal scars are situated.
9. *Eye-spot:* Well-developed, prominent in the cardinal angle.
10. Left valve *overlaps* right, especially at cardinal and posterodorsal angles.
11. A part of the specimens is of more elongate, these are probaly the males.
12. There are several l a r v a l v a l v e s in the material. In these specimens the ornamental subcentral tubercle, the dorsal, ventral, and anteromarginal ridges are well-developed, reticulation only on central surface. Antero- and posteromarginal denticultion is prominent, on dorsal and ventral ridges prominent spines are visible.
    The inner lamella and the hinge margin are undeveloped, hardly separated.
    In fornt of the row of four adductor scars, "V"-shaped frontal scar appears.
    The valves are thin and fragile, smaller than in adults.

Remarks:

The Gánt specimens are identical in detail with the description and figure of Keij (1957) revision; the difference is the simpler ornamentation of the subcentral tubercle.

Geological and geographical distribution:

Eocene: France
Material: 300 right and left valves.

Quadracythere vahrenkampi Moos, 1965

Plate IV, Figs. 11–13.

1965. Quadracythere (Hornibrookella) vahrenkampi Moos, 1965 – Moos, pp. 599–602, pl. 34, figs. 5–8.
1968. Quadracythere (Hornibrookella) vahrenkampi Moos, 1965 – Moos, pp. 6–7, pl. 1, figs. 5–11.
1969. Quadracythere (Hornibrookella) vahrenkampi Moos, 1965 – Pietrzeniuk, p. 72, pl. XIII, fig. 5, pl. XXVII, figs. 11–14, text-fig. 16.

Description:

1. *Shape:* In outer lateral view anterior outline of right valve rounded asymmetrically, its lower part with small: upper part with large radius. Anterior outline rounds with an about 150° angle into the nearly straight dorsal outline behind one-third of length, Cardinal angle at the junction is somewhat protruded. On dorsal outline, behind the end of dorsal ridge, after four-fifth of length, a small recession appears. Dorsal outline, somewhat before nine-tenth of length, rounds with 110–120° angle into posterior outline, of which upper line is nearly straight, and encloses with its nearly straight median portion a 130–140° angle. Its slightly convex lower line encloses with the median portion a less than 90° angle and grades with a small break into the ventral outline at nine-tenth of length. Ventral outline convex, with a concave sinus, maximal convexity at three-fifth, maximal concavity before two-fifth of legth. Lower line of posterior outline bears 5 denticles and the anterior outline, especially its lower part, is finely denticulated. Height at cardinal angle. In outer lateral view the outer margin straight dorsally. Ventral sinus of ventral margin is stronger as that of the outline. In ventral view the surface is parallel to about one-third of maximal width to one-sixth of length, then rises with about 30° angle to five-twelfth of length, and from this, after a short depression, attains this width again at three-quarter of length, then slopes with about 45° angle to five-sixth of length, and finally is parallel to about one-third of maximal width to the caudal end.
2. *Ornamentation:* In left valve prominent dorsal, anterimarginal and ventral ridges occur. Dorsal ridge forms the dorsal outline between three- and four-fifth of length, then with a 90° angle break in one-third of local height, fades into the reticulation. At the break it is spiniform, being perpendicular to the surface. Ventral ridge runs near the ventral outline, between one-quarter and two-third of length, and curves upward posteriorly. Encloses about 45° angle with the surface at its end. At two-fifth of length a protruded subcentral tubercle appears. Surface coarsely reticulated, concentric and radial arrangement anteriorly, the anteromarginal ridge is associated with 6 strongly elongate, radially arranged interspaces. Ventral ridge is formed by two parallel, strong costae. The reticulate interspaces between the subcentral tubercle and posterior ends of ridges are elongate. Marginal ridge persists on caudal part too.

3. *Measurements:*

	L	H
right valve	0.76	0.39

4. *Inner lamella:* Rather wide anteriorly and posteroventrally. Line of concrescence and inner margin coincide. Selvage runs parallelly and near to the outer margin.

5. *Marginal pore-canals:* Numerous anteriorly, straight, simple, with ampullae in the middle.
6. *Hinge:* In r i g h t v a l v e "two-stepped" conical anterior tooth, large, closed anteromedian socket and continuing crenulate median bar, and outwardly curved, wearkly lobate, flattened posterior tooth.

7–8. *Normal pores* and *muscle scars* cannot be studied sufficiently.

9. *Eye-spot:* Well-developed at cardinal angle.

12. The majority of the specimens is presumably larval valves, or individuals which were modified by the unfavourable ecological conditions. The right valves of these forms are different in having perpendicular prong of dorsal ridge with two spiniform divisions, in longer upper line and in an about 40–50° angle enclosed by lower and median line of posterior outline, thus a more acute caudal extension. Ventral ridge ends spiniformly at two-third of length, and shows two additional spines. Anteromarginal ridge and anterior and posterior valve-halves show a weaker ornamentation as compared to that of adult. Inner lamella less-developed. However, the hinge is specific.

Measurements:	L	H
left valve	0.58	0.33
left valve	0.59	0.34
right valve	0.59	0.31
right valve	0.58	0.31

Remarks:

As compared to the type, in Gánt specimens the cardinal angle is removed backwards, the posterior outline somewhat deeper upwards, angular, reticulation extends to subcentral tubercle too, and the reticulation not sponge-like. The small quantity of the available material does not enable to decide, whether these Hungarian specimens form a new subspecies. So much so, that even the author of this species demonstrated similar individual and spatial differences within the Lower Oligocene of Germany.

Geological and geographical distribution:

Lower Oligocene: Germany
Upper Eocene: GDR
Material: One left valve, 10 larval (?) right and left valves.

Familia Xestoleberididae Sars, 1928

Genus Xestoleberis Sars, 1866

Xestoleberis gantensis n. sp.

Pl. IV, Figs. 14–17.

Derivatio nominis: After the name of the locality.
Holotypus: Left valve; reposited in the type collection of the Hungarian Geological Survey.

Locus typicus: Bauxite-pit of Bagolyhegy-hill, Gánt, Transdanubian Central Mountains, Hungary.

Stratum typicum: Lutetian Stage, mollusc-bearing marl.

Diagnosis: A form with slightly convex ventral outline, moderately truncate anteriorly, dorsal outline broken medianly, its posterior part runs straighter than the anterior.

Description:

1. *Shape:* In outer lateral view anterior outline of left valve rounded asymmetrically. Its lower half curves with small, upper half with large radius, the upper half rounds gradually into the widely arched dorsal outline, which breaks at about half-length, and the somewhat straighter posterior part enclosses with the anterior part an about 150° angle. The junction with the posterior outline shows similar break, posterior outline runs somewhat asymmetrically, but rounds into ventral outline more gradually. Ventral outline slightly convex, with nearly straight anterior part. Height at five-eigth of length. Ventral outline of right valve still less convex, the break on dorsal outline is situated at two-fifth of length, the dorsal outline is nearly parallel to the straight portion of ventral outline behind.
   In inner lateral view outer margin shows a marked asymmetric ventral sinus at about two-fifth of length.
   In dorsal view the slope of the surface decreases from 40° to 0° at two-third of length, i. e. at maximal width, slopes slightly to three-quarter of length, from this its angle increases abruptly, and ends with a 60° angle.
2. *Ornamentation:* Valve-surface smooth, shiny.
3. *Measurements:*

	L	H
left valve	0.59	0.40
left valve	0.55	0.37
right valve	0.55	0.33
right valve	0.55	0.35

4. *Inner lamella:* Rather narrow, widest anteriorly, and posteroventrally. Prominent vestibulum anteriorly.
5. *Marginal pore-canals:* Dense anteriorly and anteroventrally, simple, straight, short.
6. *Hinge:* Anteriorly and posteriorly elongate, strongly crenulate teeth, with median groove between them.
7. *Normal pores:* Relatively few, scattered, large.
8. *Muscle scars:* Four undivided, elongate adductor scars in ventral row. In front of the second adductor scar from above, a „V"-shaped frontal scar, and further down two mandibular scars are situated.
9. *Eye-spot:* Absent. The characteristic "Xestoleberis spot" is visible.
10. Left valve *overlaps* right, especially ventrally and dorsally.

12. Greater part of the available specimens are larval valves. These are generally more elongate than the adults, and their ventral outline is straight or partially concave. Valves are thin, fragile, markedly smaller.

Comparison:

This spesies is close to X. subglobosa (B o s q u e t, 1852), but less inflated and its dorsal outline shows a stronger break. The other similar species, X. muelleriana (Lienenklaus, 1900) has a more truncate dorsal outline anteriorly, just as in X. obtusa (Lienenklaus, 1900).

Material: Two left and two right valves, 22 larval valves and 5 larval carapaces.

Stratigraphic evaluation

From the 19 specifically identified form of the ostracode fauna of Gánt, 4 are new species, 3 are new subspecies and 3 are forms which were described previously only from Hungary, from stratigraphically uncertain samples. Thus merely 9 species can be evaluated stratigraphically. The majority of these latter forms – except two – are represented by small specimen number.

This fauna is unquestionably of Eocene in age, but for a closer age-determination within the Eocene, these 9 species are unsuitable, because there are no species, which confines – according to all authors – to a special part of the Eocene. This can also be due to the fact, that the stratigraphic range of some species is widely interpreted by the authors, on the other hand a more extensive use of subspecies is much to be wished.

The Middle Eocene age of the locality is proved previously by its extremely rich macrofauna (S z ő t s 1953, 1956), and the majority of the stratigraphically evaluable ostracode species are forms common in Middle Eocene. Two forms are known so far from beds not older than Middle Eocene. In the case of Neocyprideis williamsonia it is probably caused by determination problems (see description), while in Quadracythere vahrenkampi the single valve unables the detailed evaluation of the differences.

Paleoecological evaluations

The environmental conditions which ruled during the depostion of te Middle Eocene mollusc-bearing marl in the Gánt area are treated in a previously published study (Monostori 1972).

The detailed studies show that the washing separates, which came from infillings of different gastropods, may be remarkably different, and this fact made possible to work out the varied environmental conditions of the area and the different ecological requirements of the gastropods as well.

The ecological characteristics of the separate elements of the fauna are as foll lows:

1. *Salinity*

The majority of the species of Cytherella, Bairdia, Krithe, Schizocythere, Bradleya, Hermanites and Quadracythere live under normal saline, marine conditions.

Characteristic brackish-water elements are the Neocyprideis and Cytheridella (living even is fresh-water), and a remarkable part of the Xestoleberis species.

The species ranged into Novocypris genus presumably characterizes areas of markedly unstable (seasonally changing) salinity. According to previous studies, this latter species commonly forms monospecific assemblages, or associations with a Cytheromorpha species, under unfavourable circumstances (probably characterized by strong seasonal salinity-changes). These associations are usually the ostracodes appearing first after the coal formations, in the beginning of the Eocene transgression.

2. *Water depth*

a) Euryhaline forms;

The heavily calcified, coarsely ornamented Bradleya, Hermanites and Quadracythere species characterize coastal, shallow-water (litoral – upper sublitoral) environments (B e n s o n 1959).

The Recent species of the genus Schizocythere are somewhat deeper sublitoral forms (Schornikov 1974), and previous studies on Hungarian Eocene sequences show, that these are commonly associated with Krithe species of great specimen number, and this also suggest deeper water.

The majority of the Recent Krithe species are distinctly of deep-water forms (Morkhoven 1963), while the genera Cytherella and Bairdia live in varied water depth.

b) Brackish-water forms commonly inhabit extremely shallow estuaries and tide-pools (Benson 1959).

c) On the basis of the previously evaluated occurences of the genus Novocypris, a litoral – upper sublitoral, open habitat is suggested.

In the evaluation of the following subdivision of the ostracode genera with great specimen number is given:

- Litoral – upper sublitoral forms living in normal salinity: Bradleya + Hermanites + Quadracythere;
- Especially normal salinity forms living in varied water depth: Cytherella + Bairdia + Krithe;
- Deeper sublitoral form living in normal salinity: Schizocythere;
- Litoral – upper sublitoral form living in changing salinity: Novocypris;
- Estuarine forms living in brackish water: Neocyprideis + Cytheridella;
- Form living in tide-pools: Xestoleberis.

The distributions in the certain washing separates are as follows:

1. Washing separate of Cerithium subcorvinum Opph. infilling:
   Bradleya + Hermanites + Quadracythere: more than 50%,
   Cytherella + Bairdia + Krithe: 10%,
   Schizocythere: 10 to 20%,
   Novocypris: 10 to 20%,
   Neocyprideis + Cytheridella: scattered,
   Xestoleberis: scattered.

2. Washing separate of Cantharus brongniarti (d'Orb.) infilling:
   Bradleya + Hermanites + Quadracythere: 40%,
   Cytherella + Bairdia + Krithe: 10%,
   Schizocythere: 10%,
   Novocypris: 30 to 40%,
   Neocyprideis + Cytherodella: more than 5%,
   Xestoleberis: fewer than 10%.

3. Washing separate of Ampullina perusta (Defr.) infilling:
   Bradleya + Hermanites + Quadracythere: 30%.
   Cytherella + Bairdia + Krithe: fewer than 5%,
   Schizocythere: scattered,
   Novocypris: 50 to 60%,
   Neocyprideis + Cytheridella: 10%,
   Xestoleberis: fewer than 5%.

4. Washing separates from other Naticidae infillings:
   Bradleya + Hermanites + Quadracythere: 40%,
   Cytherella + Bairdia + Krithe: 20%,
   Schizocythere: 5%,
   Novocypris: 20 to 30%,
   Neocyprideis + Cytheridella: fewer than 5%,
   Xestoleberis: 5%.

5. Washing separates from Tympanotonus calcaratus (Bongf.) ingnilling:
   Bradleya + Hermanites + Quadracythere: more than 30%,
   Cytherella + Bairdia + Krithe: scattered,
   Schizocythere: scattered,
   Novocypris: 50%,
   Neocyprideis + Cytheridella: 10%,
   Xestoleberis: 5%.

6. Washing separates from Tympanotonus hungaricus (Zitt.) infilling:
   Bradleya + Hermanites + Quadracythere: 40 to 50%,
   Cytherella + Bairidia + Krithe: scattered,
   Schizocythere: fewer than 10%,
   Novocypris: 30 to 40%,
   Neocyprideis + Cytheridella: 5 to 10%,
   Xestoleberis: fewer than 10%.

7. Washing separates from Tympanotonus rozlozsniki Szőts infilling:

Bradleya + Hermanites + Quadracythere: 30%,
Cytherella + Bairdia + Krithe: scattered,
Novocypris: 60%.
Neocyprideis + Cytheridella: 10%,
Xestoleberis: scattered.

8. Washing separates from Faunus fornensis (Zitt.) infilling

Bradleya + Hermanites + Quadracythere: 10%,
Cytherella + Bairdia + Krithe: scattered,
Schizocythere: scattered,
Novocypris: 30 to 40%,
Neocyprideis + Cytheridella: 10%,
Xestoleberis: 40 to 50%.

On the basis of these studies:

1. The fauna came from the infillings of Cerithium subcorvinum, Cantharus brongniarti and Naticidae – except Ampullina perusta – probably lived in near-shore, litoral-shallow sublitoral waters in basically normal, temporally changing salinity.
2. The fauna yielded by infillings of Tympanotonus calcaratus, T. rozlozsniki and Ampullina perusta shells suggests presumably stronger changes in salinity.
3. In the case of the fauna from Faunus fornensis infilling, beside strong salinity changes, litoral environment is suggested.
4. The occurence of estuarine forms increases together with the strenght of salinity changes (approaching coast-line), however, characteristic estuarine fauna is unknown.

The genus Novocypris commonly occurs in all samples, because the salinity changes were characteristic, repeated phenomena. The faunal mixture – naturally – was an important factor. It is well-known from studies on modern sediments, that the data of recent shells in the sediments are divergent from those of distribution of living specimens. It is true especially in the case of fossil sediments, where the washed samples may result populations, which are different temporally as compared to the individual life-spans of the respective animals. In the case of gastropod infillings this latter unfavourable condition can be avoided (M o n o s t o r i 1973).

According to these considerations, it is possible to trace the formerly existed different environments, which were favourable to the ostracodes. Naturally, these faunas can hardly regarded as clear populations, because temporally different forms are represented.

On the basis of the ostracodes, about the formation of the Middle Eocene mollusc-bearing marl of Gánt, the following picture can be drawn.

This region was a near-shore, shallow-water marine area in some extent separated from the open sea. On greater parts the salinity was

near to normal, but great temporal (firstly seasonal) differences may have been occur. On the basis of the fauna, it is suggested the presence of smaller lagoons and tide-pools for certain parts of the region, or for its vicinity. The degree of the salinity changes, as well as the appearance of the lagoonal character was presumably variable in time.

The character of the ostracode fauna suggests that the complete lack of certain faunal groups, e. g. nummulites, cannot be due to a stable low salinity (about 25 0/00 by S t r a u s z 1962), but rather to the frequently changing salinity. This latter is indicated by recently described coral finds, too (Mihály 1975). In this way, the comparison to the Hungarian Sarmatian depositional conditions (S t r a u s z 1962) is unjustified. On the other hand, the Sarmatian rocks contain a completely different ostracode fauna, characterized by distinctly brackish-water forms.

Conclusions

Washing separates from the Middle Eocene mollusc-bearing marl of Gánt yielded an extremely rich ostracode fauna. This fauna contains 19 species and subspecies, from which 7 species and subspecies proved to be as new. On the basis of the several endemic element of the mollusc fauna, a certain endemism of the ostracode fauna was similarly to be expected. To determine the degree of this endemism, it is necessary to study other Eocene faunas of localities in Hungary and in the neighbouring countries.

The previously known species are in accordance with the Middle Eocene age determined by other fossil groups, however, these are inadequate for more detailed stratigraphic determinations at the present.

The marl deposited in shallow-water, near-shore marine region, where marked salinity changes (mainly of seasonal) occured, with associated estuaries.

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PLATE I.

Fig. 1. Cytherella (Cytherelloidea) gantensis n.sp. Left valve; Holotype.

Figs. 2 – 4. Bairdoppilata gliberti Keij.

Figs. 2 – 3.: Left valve

Fig. 4: Right valve

Figs. 5 – 9. Novocypris ? gantensis n.sp.

Figs. 5, 7, 9: Left valve

Figs. 6, 8: Right valve

Fig. 9: Holotype

Figs. 10 – 12. Pterygocythere jonesi (Méhes)

Figs. 10 – 11: Left valve

Fig. 12: Right valve

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PLATE II.

Fig. 1. Monoceratina sp. Left valve

Figs. 2 – 4. Clithrocytheridea faboides gantensis n. ssp.

Fig. 2: Right valve

Figs. 3 – 4: Left valves

Fig. 4: Holotype

Figs. 5 – 7. Monsmirabilia triebeli (Keij)

Fig. 5: Right valve

Figs. 6 – 7: left valve

Fig. 8. Neocyprideis williamsoniana (Bosquet). Right valve

Figs. 9, 11, 13 – 14. Krithe bartonensis (Jones)

Figs. 9, 13: Left valve

Figs. 11, 14: Right valve

Fig. 10. Caudites monsmirabiliensis (Apostolescu). Right valve

Fig. 12. Paracytheridea gradata (Bosquet). Left valve

Figs. 15 – 17. Cytheridella ? gantensis n. sp.

Fig. 15: Left valve anterior, with the sulci

Fig. 16: Right valve; holotype

Fig. 17: Left valve

Fig. 18. Loxoconcha sp. Left valve

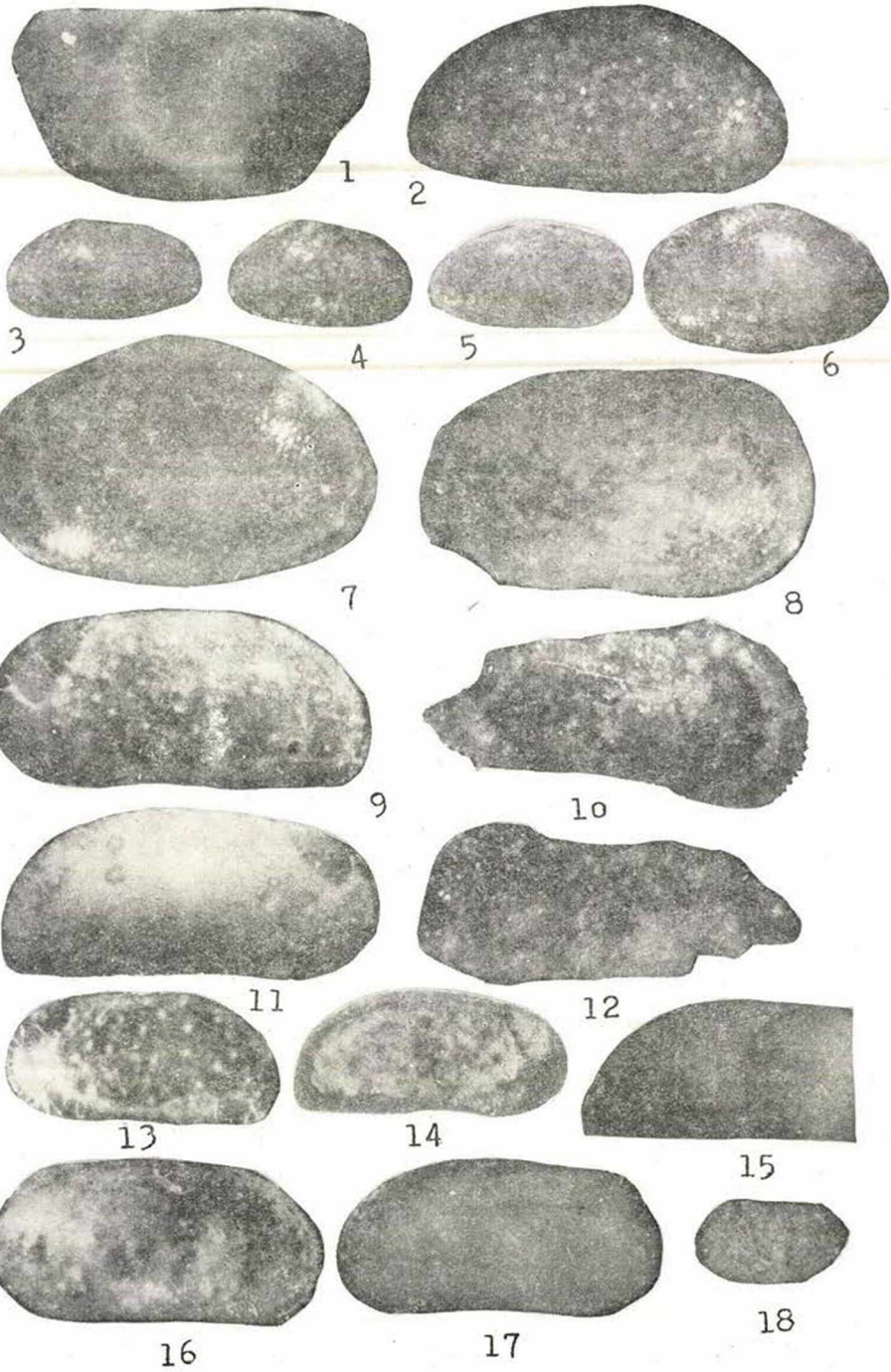
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PLATE III.

Figs. 1–4. Schizocythere depressa (Méhes)

Figs. 1–3: Left valve

Fig. 4: Right valve

Figs. 5–8. Bladleya validornata hungarica n. ssp.

Figs. 1–2: Left valve

Figs. 3–4: Right valve

Fig. 1: Holotype

Figs. 9–11. Echinocythereis dadayana (Méhes)

Figs. 9–10: Left valve

Fig. 11: Right valve

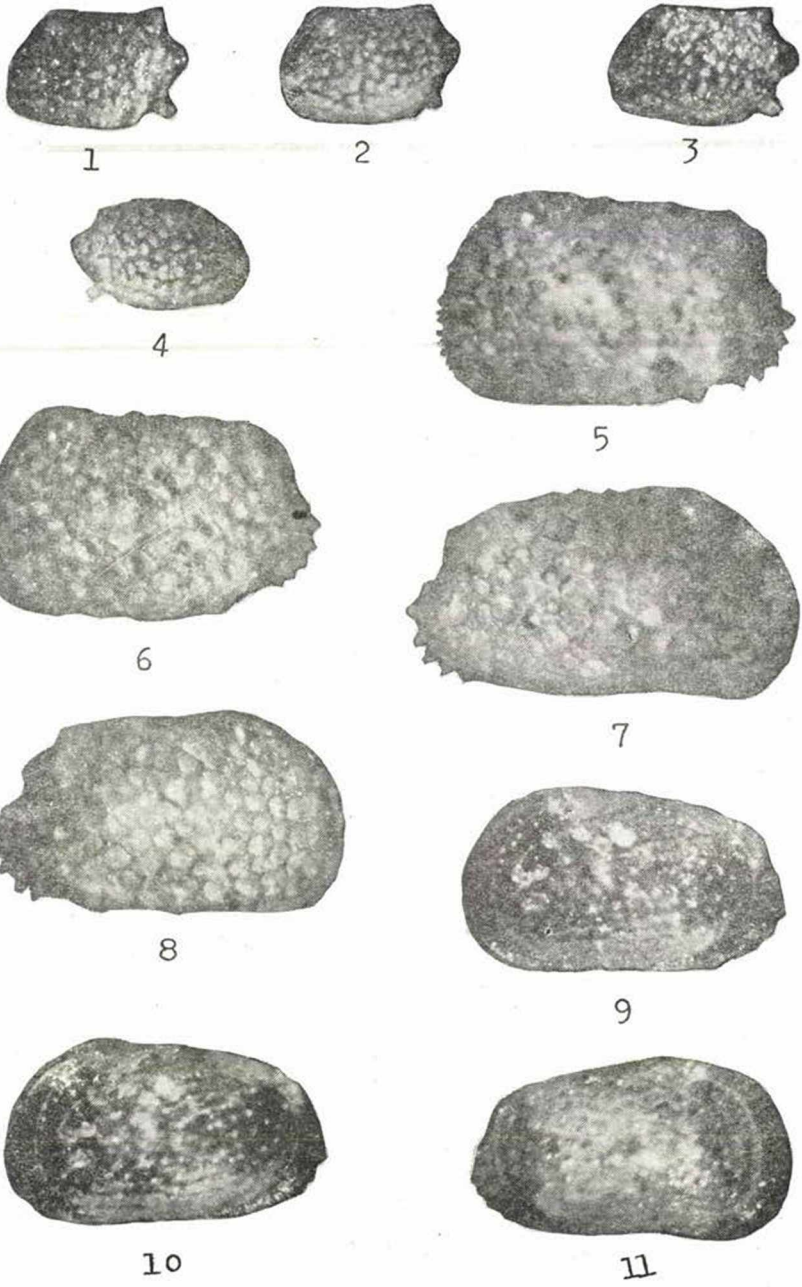
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PLATE IV.

Figs. 1 – 2. Hermanites haidingeri paijenborchiana Keij

Fig. 1: Left valve

Fig. 2: Embryonal left valve

Figs. 3 – 6. Hermanites acuticosta gantensis n. ssp.

Figs. 3 – 4: Left valve

Figs. 5 – 6: Right valve

Fig. 3: Holotype

Figs. 7 – 10. Quadracythere angusticostata (Bosquet)

Figs. 7 – 8: Left valve

Fig. 9: Right valve

Fig. 10: Embryonal left valve

Figs. 11 – 13: Quadracythere vahrenkampi Moos

Fig. 11: Right valve

Fig. 12: Embryonal left valve

Fig. 13: Embryonal right valve

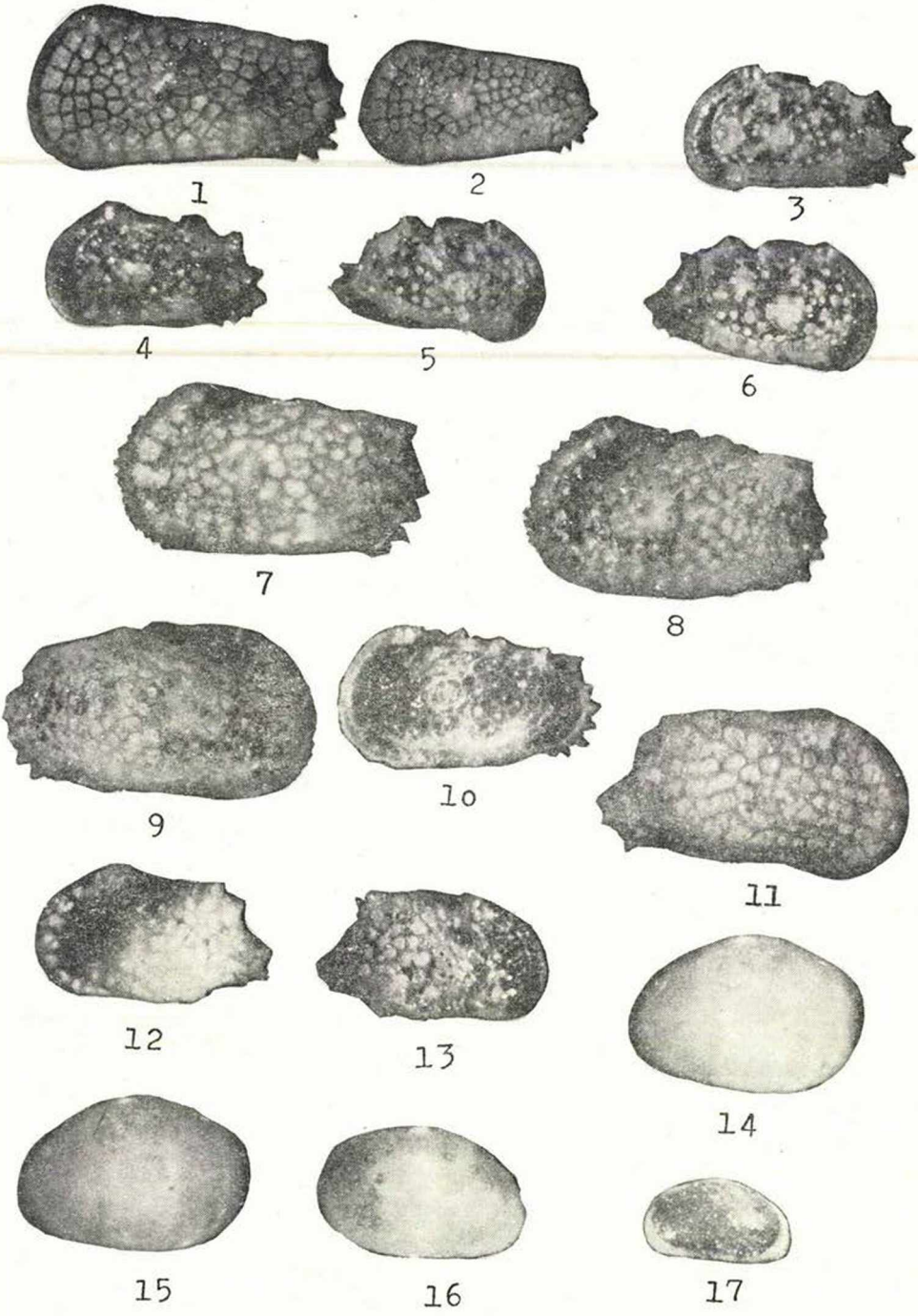
Figs. 14 – 17. Xestroleberis gantensis n. sp.

Figs. 14 – 15: Left valve

Fig. 14: Holotype

Fig. 16: Right valve

Fig. 17: Embryonal right valve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