

***Gruendelella*, a new Carboniferous ostracod genus from the Namurian of the Cantabrian Mountains (N. Spain)**

L. C. SANCHEZ DE POSADA

Department of Palaeontology, University of Oviedo, Spain.

ABSTRACT – Etching limestones of Arnsbergian (Namurian A) age from the northern slope of the Cantabrian Mountains (N. Spain) has yielded a diverse ostracod fauna. One of the forms found is especially interesting as it represents a new genus resembling in some aspects the family Rectonariidae. The new genus *Gruendelella* is described.

INTRODUCTION

Recent data on Namurian ostracods from Western Europe are scarce. Since the pioneer studies of Jones and Jones & Kirkby in the second half of the nineteenth century, most of the work on marine Carboniferous ostracods has been on Dinantian forms and Westphalian faunas described mainly by Bless, Jordan & Michel (1969) and Bless (1974) collected in several localities in the Aegir Marine Band and its equivalents (cf. Sánchez de Posada, 1977 and Sohn & Jones, 1984 for a review on this subject). Recently, Robinson (1978) gave a summary of selected British ostracod species ranging in age from Tournaisian to Chokerian.

Becker & Bless (in Becker, Bless & Kullmann, 1975) and Becker (1976) studied several ostracod faunas composed of the entomozoid genus *Truyolsina* coming from shales of Namurian A age from the Cantabrian Mountains and Sánchez de Posada (1974) found an interesting fauna of Namurian B age at the locality of Meré some 100 km east of Entrago, in the Nappes Province of the Cantabrian Mountains, which will be published shortly. Perhaps the most striking fact about the latter fauna is the presence, in this association (as it occurs at Entrago), of strongly spinose species, with an “old aspect” which leads the author (Sánchez de Posada, 1974, 1976) to compare it with ostracod faunas described by German authors (especially Gründel and Blumenstengel) from nodular limestones of Devonian and Dinantian ages.

Processing of samples for conodont study by J. R. Menéndez-Alvárez yielded a reasonably well preserved ostracod fauna of Namurian A age (Arnsbergian) including some twenty different species, which are currently being studied. One of them is especially interesting as it represents a new genus with some characteristics of the carapace (particularly the great length of the posterior spines) which gives it some external resemblance to a peculiar group of ostracods, the rectonarids.

This new genus, *Gruendelella* is considered to be a metacopid.

GEOLOGICAL SETTING

The Cantabrian Zone (Fig. 1) is the most external area of the Iberian Massif. Cropping out throughout the area is a succession of Carboniferous rocks deposited in several sedimentary environments. The reader is referred to Truyols & Sánchez de Posada (1981) and Martínez Diaz (1983) for a summary of the Carboniferous stratigraphy from the Cantabrian Mountains.

The Early Carboniferous (Tournaisian to Arnsbergian) is represented by a rather uniform condensed sequence some 40m thick (Fig. 2). The lowermost Carboniferous rocks (Candamo or Baleas Formation) are light grey bioclastic limestones which have yielded conodonts of Upper Famennian age (*costatus* Zone) in the lower part (Pello, 1972; Budinger & Kullmann, 1964; Higgins *et al.*, 1964; Rio & Menéndez-Alvárez, 1978) and of Upper Tournaisian age near the top. At some localities, the Candamo Formation is in part replaced by black shales (Vegamián Formation) with conodonts, cephalopods and ostracods of Upper Tournaisian age near the boundary with the overlying formation. The Baleas or Vegamián Formations are overlain by the “Caliza Griotte”, a very distinctive horizon of red, pink or grey, nodular “wavy bedded” limestones with interbedded shales, usually with a remarkable siliceous member and containing cephalopods and conodonts of the Upper Tournaisian, Visean and Lower Namurian zone ages. The “Caliza de Montaña” overlies the Alba Formation in most units of the Cantabrian Zone; only in the most internal structural units (those located towards the convex part of the Asturian Arc), are these limestones replaced by a turbidite sequence. The lower part of the “Caliza de Montaña” (Barcaliente Formation) is made up of dark laminated foetid limestones with a very poor fossil

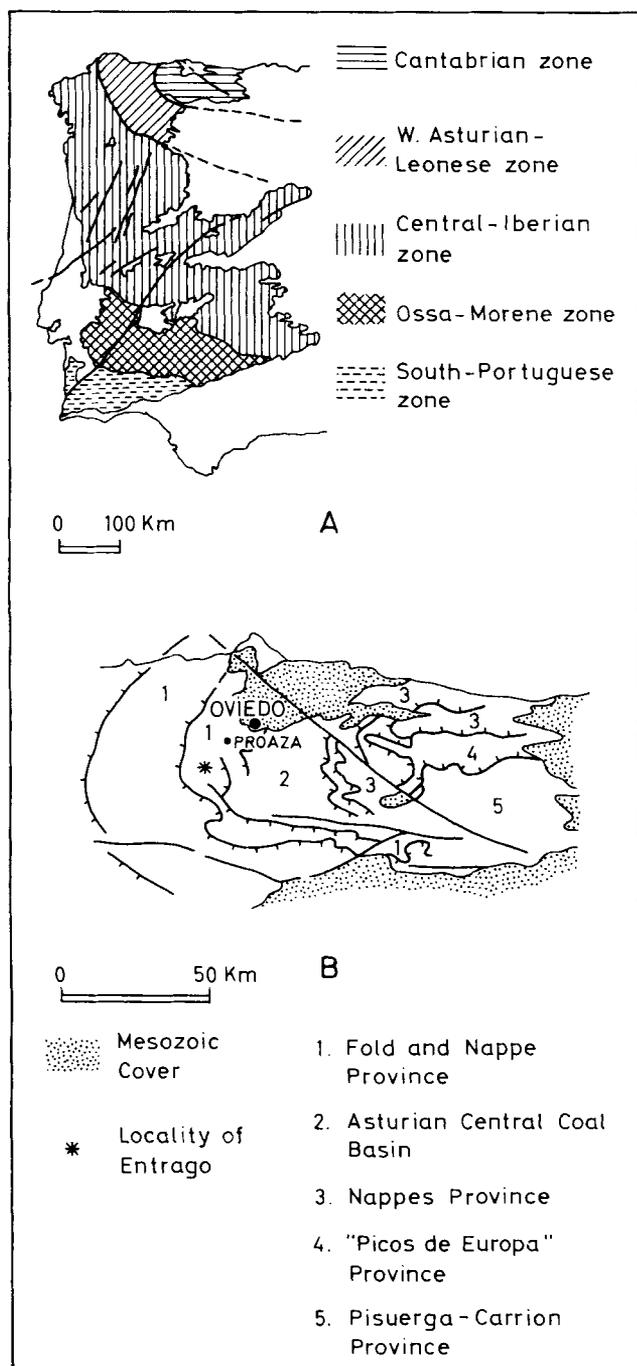


Fig. 1. A. Sketch of the Iberian Massif (after Julivert *et al.*, 1974, simplified) showing the location of the Cantabrian Zone.

B. Position of the Entrago section (*) within the Cantabrian Zone.

content. Only conodonts indicating a Namurian B age for its upper beds and conodonts and cephalopods of Namurian A age (*Eumorphoceras* Zone), coming from transitional beds between Alba and Barcaliente Formations at several localities, are recorded in the literature.

The ostracods described in this paper were obtained from a silicified limestone exposed in a quarry, 2 km N.E. of the village of Entrago (Teverga, Asturias), just on the S.E. side of the road linking Trubia (Oviedo) and Puente Orugo (Babia baja, Province of León) in the area called after Julivert (1967) "Región de Pliegues y Mantos" (Fold and Nappe Province) (Fig. 1B).

The rocks exposed in this quarry range in age from Famennian to Arnsbergian (although a more extensive sequence of Carboniferous rocks can be recognised in the neighbouring area) comprising the Baleas, Alba and Barcaliente Formations with a total thickness of some 33m (Fig. 3).

Cephalopods (Delepine, 1943; Wagner-Gentis, 1963; Kullmann, 1962), ostracods (Bate, 1968), tintinids (Cuvillier & Barreyre, 1964) and conodonts (Higgins, in Higgins *et al.*, 1964; Budinger & Kullmann, 1964; Pello, 1970; Menéndez-Alvárez, 1978) have all been recorded from this section. Menéndez-Alvárez (1978) investigated in detail the conodonts of the Alba Formation and levels below and above it and discovered a complete succession of conodont zones ranging in age from Tournaisian to Lower Namurian (Fig. 3).

The ostracod genus here described comes from grey limestones (level J-2 of Menéndez-Alvárez) belonging to the zone of *Gnathodus bilineatus bollandensis* (bearing *Gnathodus bilineatus bilineatus*, *G. bilineatus bollandensis*, *Paragnathodus cruciformis*, *P. commutatus*, *P. monodosus* and *P. nodosus*) which was considered by that author to be the base of the Barcaliente Formation.

SYSTEMATIC DESCRIPTION

Order Metacopida Sylvester-Bradley, 1961
 Superfamily Thlipsuracea Ulrich, 1894
 Family Incertae
 Genus *Gruendelella* gen. nov.

Type species. *Gruendelella jordani* gen. et sp. nov.

Derivation of name. The genus is named in honour of Dr. J. Gruendel for his contribution to the knowledge of fossil ostracods, especially of the Palaeozoic silicified faunas from G.D.R.

Diagnosis. Ostracods of medium size. Lateral outline subpentagonal elongated. Dorsal and ventral borders straight or nearly straight. Near the junction of posterior margin with the dorsal and ventral margins there are two spines on each valve. Ventral spines long, dorsal ones much shorter. The spines are directed posteriorly. A slender rim, probably caused by a thickening of the valve, is present along at least a part of the borders. Lateral surface smooth. Hinge tripartite, with two terminal sockets in the left valve. Left valve larger than the right and overlapping it. Larger valve provided with contact groove.

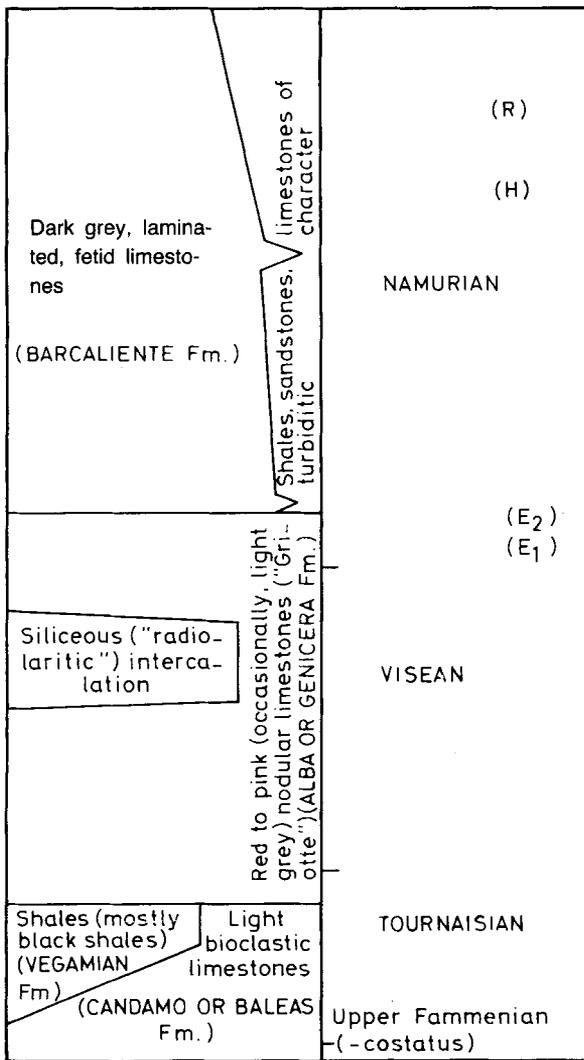


Fig. 2. Generalised stratigraphic succession of Early Carboniferous rocks in the Cantabrian Zone.

Remarks. The great length of the posterior spines in the only known species of the genus, the different size of the posterodorsal and posteroventral spines and, to some extent, the lateral outline of the carapaces are characteristics giving *Gruendelella* some resemblance to members of the family Rectonariidae Gruendel, 1962. In fact, some species belonging to this family are characterised by the unusual size of the spines and by the different development of the dorsal and ventral spines (cf. Blumenstengel, 1965; Gruendel, 1962). However, *Gruendelella* seems to have differences from the Rectonariidae both in internal and external characters. *Rectoplacera* Blumenstengel and *Triplacera* Gründel are the only rectonarid genera with their main spines in a posteroventral position. However, the type species of *Rectoplacera* (*R. elongata* Blumenstengel)

and *Triplacera* (*T. triquetra* Gründel), as well as other species assigned to both genera, possess only one spine on one of their valves and not two as in the case of the genus here discussed. The dorsal spines of the known species of *Rectoplacera* are directed posterodorsally and the lateral outline of *Gruendelella*, *Rectoplacera* and *Triplacera* are different. In *Rectoplacera* the dorsal margin is arched or, if straight, it runs parallel to the ventral border and in *Triplacera* the dorsal and ventral margins converge strongly to the anterior end producing a roughly "subtriangular" outline. In the only known species of *Gruendelella* the dorsal border is straight and converges slightly with the ventral margin towards the posterior end.

The limited knowledge of the internal characteristics of members of Rectonariidae (and as a consequence its controversial systematic position) hampers their comparison with the new genus here described.

The presence of a contact groove (presumably excavated on the outer lamella) in the larger valve of *Gruendelella* is considered indicative of metacopid affinities (see Adamczak, 1976 on the constitution of free margin in podocopids and metacopids). As far as I know, such a structure has not been described in rectonarids, which had been considered as belonging to the Podocopida by Gründel (1962) (on the basis of the close relationships between *Rectoplacera* and *Triplacera* and the existence of a calcareous inner lamella and a *vestibulum* in this genus), to the Metacopida by Blumenstengel (1965) (although he did not give additional details on the inner morphology), and as a probable heterogeneous group, but not metacopids, by Becker (1981) (although according to this author some species of *Orthonaria* have a clear metacopid aspect). The hinge of *Gruendelella* is quite different from the hinge of Rectonariidae described by Gründel (*op. cit.*) as being simple, without clear furrows or teeth. On the contrary, it is quite similar to that described and figured by Adamczak (1976) and other authors for some metacopid genera such as *Cleithranchiste* Becker and *Bufina* Coryell & Malkin. The external morphology of the carapace of *Gruendelella* show some similarities to that of some species of *Bufina*, particularly the existence of spines at the posterior part of the valves, the smooth lateral surface and to some extent in the lateral outline. The new genus, however, lacks the marginal tubercles characteristic of *Bufina*, the marginal ridges are very faint and the nature of the spines of *Bufina* and *Gruendelella* is very different.

Gruendelella jordani sp. nov.

(Pl. 1, figs. 1-10)

Derivation of name. The species is named in honour of Dr. Harspenter Jordan (Freiberg, G.D.R.) for his contribution to the knowledge of Palaeozoic ostracods.

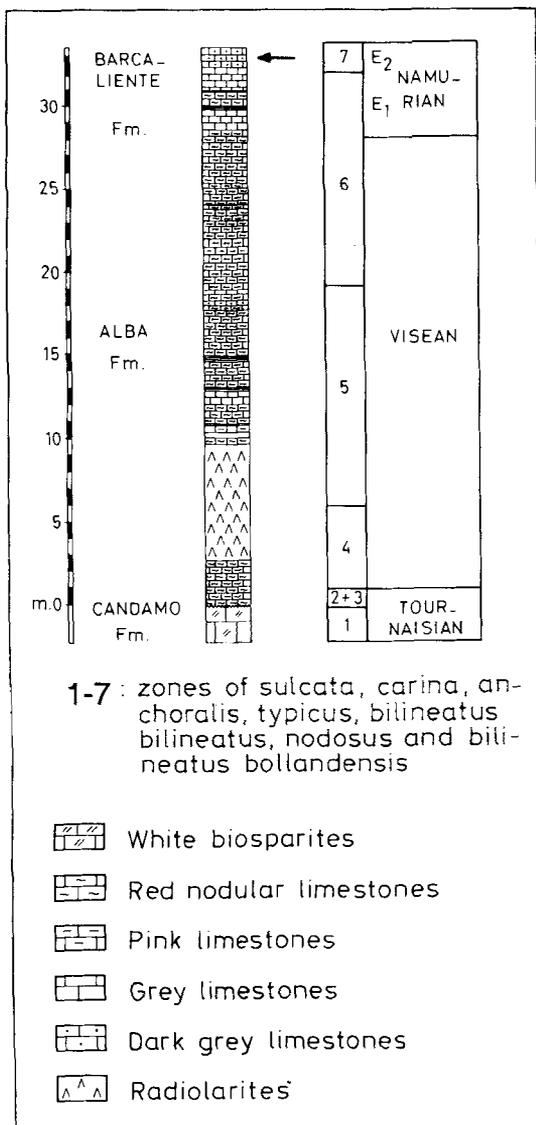


Fig. 3. Stratigraphic section of Early Carboniferous rocks at the Entrago section. (After Menéndez-Alvárez, 1978, simplified).

Diagnosis. A species of *Gruendelella* with elongated, irregularly subpentagonal outline. Dorsal and ventral borders nearly parallel, slightly converging towards the posterior end. Maximum height of the carapace anterior. Ventral spines very long, their length being about 40–60% of the length of the valve. Dorsal spines short, not exceeding of about 15% of the length of the valve. Lateral surface smooth.

Material. Holotype (a carapace, DPO 14002, Pl. 1, figs. 1-3) and 13 paratypes, 4 right valves and 9 left valves (DPO 14003-16), deposited with the collection of the Department of Palaeontology, University of Oviedo.

Dimensions of figured specimens (in mm)

		Length	Height
Holotype	DPO 14002	0,69	0,31
Paratype	DPO 14003	0,77	0,38
Paratype	DPO 14004	0,68	0,32
Paratype	DPO 14005	0,61	0,31
Paratype	DPO 14006	0,68	0,32
Paratype	DPO 14007	0,61	0,31

Locality and Horizon. Quarry 2 km N.E. of Entrago (Teverga, Asturias, Spain) (sheet number 52 of the map of Spain, Scale 1:50.000. Grid Ref.: 6° 4' 45"W; 43° 10' 57"N). Base of Barcaliente Formation. Arnsbergian (E₂), Namurian.

Description. Carapaces of medium size. Lateral outline irregular subpentagonal. Dorsal border straight. Ventral margin straight, with a faint concavity in its middle part which is barely perceptible in some specimens. Dorsal and ventral borders slightly converging towards the posterior end and diverging towards the anterior one. Anterodorsal border straight, merging with dorsal border at an angle of some 5-10°; anteroventral margin convex. Anterodorsal and dorsal borders clearly delimited. The ventral margin bends gradually at its anterior end, merging indistinctly with the anterior margin. Anterior border nearly straight, with dorsoanterior-ventroposterior direction and interrupted near its dorsal and ventral ends by posterior spines.

Maximum height of the carapace at the anterior third, extending from the junction of anterodorsal and dorsal borders to ventral margin.

Explanation of Plate 1

All figures are ×65

Gruendelella jordani sp. nov.

Figs. 1-3. Holotype (carapace, DP 14002): fig. 1, right view; fig. 2, dorsal view; fig. 3, ventral view.

Figs. 4-5. Paratype, DPO 14006 (right valve): fig. 4, lateral view; fig. 5, internal view.

Fig. 6. Paratype, DPO 14004 (left valve). Lateral view.

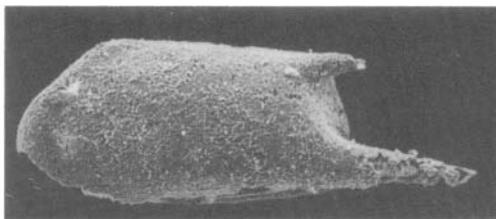
Figs. 7-8. Paratype, DPO 14005 (left valve): fig. 7, internal view; fig. 8, internal view slightly tilted.

Fig. 9. Paratype, DPO 14007 (right valve). Lateral view.

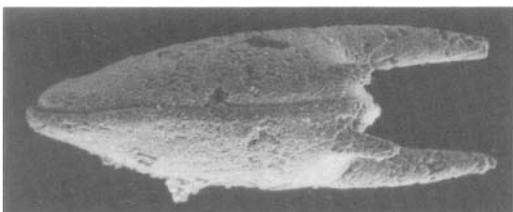
Fig. 10. Paratype, DPO 14003 (left valve). Lateral view.



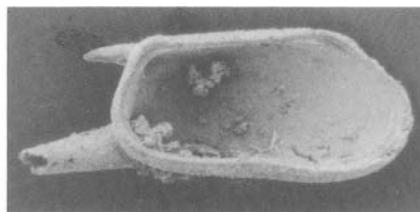
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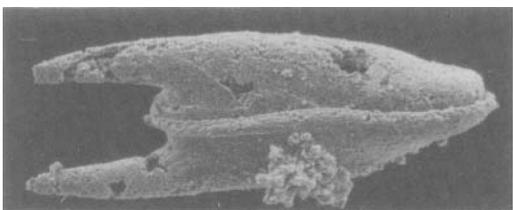
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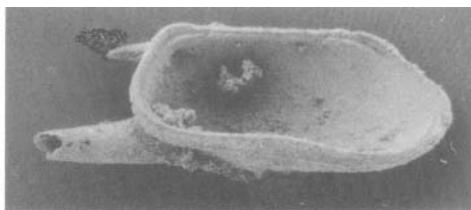
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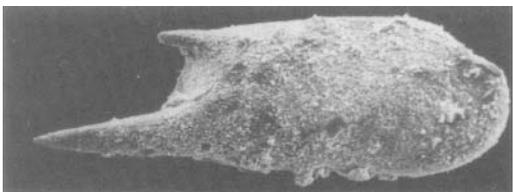
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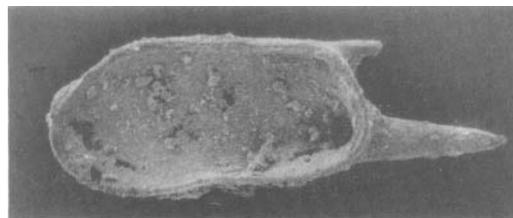
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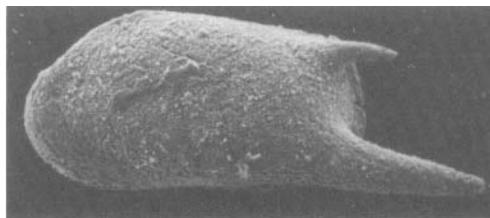
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Lateral surface smooth. Near the dorsal and ventral extremities of the posterior margin and at some distance from it, there are in each valve two spines of unequal size and directed backwards, slightly ventrally; the dorsal spine is always much shorter than the ventral. In specimens with unbroken spines the dorsal spine does not exceed 15% of the maximum length of the valve and the ventral one reaches 40 – 60% of the maximum length. Along the anterior and posterior margins and passing along the dorsal and ventral surfaces there is a faint rim, which seems to be due to a faint thickening of the valve. This rim is more obvious at the anteroventral border.

In dorsal and ventral views the sides of the carapace are slightly convex, with two small concavities near the anterior and posterior ends. The outline of the carapace is rhomboidal, very asymmetrical with regard to the minor (= dorsoventral) axis; the posterior sides being much shorter than the anterior ones. The spines lie at the dorsal and ventral vertex of the posterior side. Maximum width posterior, near the area of insertion of spines. Hinge slightly depressed.

In spite of the masking of these structures by the silification, the hinge can be studied in some specimens. In the left valve it consists of two terminal sockets extending towards the central part of the hinge so that the central bar is much more reduced or even absent. In the right valves the hinge is not as well preserved. Apparently, it consists of a hinge groove and cardinal lists. The left valves are provided with a contact groove which seems to be interrupted ventrally.

Left valve larger than the right and overlapping it. In the only complete carapace found the overlap is maximum at the ventral margin and very reduced along the remainder of the outline.

REMARKS

At the locality of Entrago, *Gruendelella* was found at the base of the Barcaliente Formation, which comprises dark, bedded, micritic, foetid limestones, very poorly fossiliferous and possibly deposited in a quiet and poorly oxygenated environment. The new genus is a part of a peculiar ostracod fauna mainly made of *Triplacera*, *Healdiopsis?*, healdiids, primitive bythocytherids, tricorinids, bairdiids, quasillitids and cladocopines, associated to conodonts and primitive and little diverse foraminifers. Some of these forms are peculiar ostracods mainly known from nodular limestones of Devonian and Dinantian strata from the German Democratic Republic and had not been described from the usual faunas of Carboniferous age of North America and Europe.

The position and direction of the spines of *Gruendelella* resembles that of healdiids, but the constitution of the hinge prevents a close relationship being assumed between the new genus and those organisms.

The great size of the posterior spines of *Gruendelella* may be related to the great development of these attributes of the carapace in some associations of ostracods (Thuringian associations, "Thuringer Okotype" of Becker, 1975, in Bandl & Becker). In spite of the lack of knowledge of the inner morphology of rectorarids (one of the typical members of Thuringian ostracod association provided long posterior or dorso-posterior spines), *Gruendelella* seems to have a morphology sufficiently different to be considered as a member of a different family.

Progress in the research of Carboniferous ostracods from facies like that of the locality of Entrago or somewhat similar (sediments deposited in quiet waters containing at least a moderate amount of pelagic fossils) will disclose the extent of the geographical distribution of *Gruendelella*, its facial range and stratigraphic usefulness. At the moment, *Gruendelella* remains one of the few ostracod genera known from limestones with silicified faunas in Western Europe.

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