27. PALEONTOLOGICAL EVIDENCE FOR THE TRIASSIC AGE OF ROCKS DREDGED FROM THE NORTHERN EXMOUTH PLATEAU (TETHYAN FORAMINIFERS, ECHINODERMS, AND OSTRACODES)\textsuperscript{1}

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ABSTRACT

A very Late Triassic age can be proven by the microfaunal investigation of samples dredged from the northern Exmouth Plateau close to Ocean Drilling Program Site 764. The samples were previously regarded as Lower Jurassic sediments. The microfossils of known stratigraphic ranges show predominant Tethyan affinities.

In samples dredged during Sonne cruise 8 (1979) from the northern slope of the Wombat Plateau, an Early Jurassic age is excluded by the presence of \textit{Frohndicularia rhaetica}, \textit{Berthelintella rhaetica}, \textit{Fissobractites subsymmetrica}, \textit{Ophiolaebium cristatum}, \textit{Ophiacantha ? binitorulosa}, \textit{Mostleriella n. sp.}, and \textit{Hasibuana asiatica}. As a whole, a Rhaetian age is indicated. This age is also suggested by the foraminifers \textit{Coroniopora austriaca} and \textit{Variostronga}, from determinations in limestone thin sections.

Samples from Rig Seismic cruise 56 (1986), also from the northern slope of the Wombat Plateau, contain an assemblage of foraminifers known from the Triassic and observed in thin sections of carbonate rocks. They include \textit{Trocholina crassa}, \textit{Trocholina laevis}, \textit{Variostronga} sp., and \textit{Variostronga coniforme}. In combination with the lithostratigraphy, the assemblage is characteristic for the Rhaetian Dachsteinkalk facies of the Northern Calcareous Alps of Austria.

Thin sections from rocks dredged from Cygnet Canyon are rich in \textit{Glomospirella friedli} and suggest a Norian to Rhaetian age. A thin section from the nearby Emu Escarpment contains sections of the Anomuran coprolite \textit{Ocitirriangularia septemtriangula} Kristan-Tollmann, which is also present in upper Anisian rocks of Papua New Guinea.

The similarity of these characteristic assemblages of "Alpine" microfaunas and facies types to those of many other sites in the western and easternmost Tethys (Papua New Guinea and Timor) demonstrates a formerly unexpected close similarity of the faunal community throughout the whole Tethys realm.

INTRODUCTION

Dredged rocks from the steep margins of the northern Exmouth Plateau (Swan Canyon, Cygnet Canyon/Emu Escarpment, and Wombat Plateau) were helpful in dating seismic reflectors to obtain a better knowledge of the Triassic to Holocene history of this continental margin (von Stackelberg et al., 1980; Exon et al., 1982; von Rad and Exon, 1983; Exon and Williamson, 1988). The location of the analyzed dredge samples is shown in Figures 1 through 4 (von Rad et al., 1990). Further details on the location, water depth, and lithology of the dredge samples are given in Table 1.

The dredge samples from the stations S08-61KD and S08-62KD were taken in 1979 during cruise 8 of the Sonne at the Wombat Plateau, a small subplateau of the Exmouth Plateau off northwest Australia (Figs. 1, 3, and 4). The Sonne samples had previously been regarded as Early Jurassic (Liassic) in age. The foraminifers had been determined to be Early Jurassic (Sinemurian) by Quilty (1981) and Zobel (in von Stackelberg et al., 1980). Sites 761 and 764 were drilled during Leg 122 of the Ocean Drilling Program (ODP) in the vicinity of the dredge stations (Figs. 3 and 4). The drilled sequence comprises Neogene to Cretaceous sediments, which are underlain by Rhaetian carbonates with \textit{Triasina hankeni}, \textit{Auto-}


According to our experience, these foraminifers are typical of shallow-marine platform carbonates deposited in a lagoonal environment. Comparable rock types from the Northern Calcareous Alps with the same assemblage of foraminifers are the bedded Dachsteinkalk and the Hauptdolomit. The carbonate sediments at Sites 761 and 764 can therefore be considered of Norian to Rhaetian age.

These indications of latest Triassic age close to the location of dredge samples S08-61KD caused shipboard foraminalifer paleontologist A. Wonders (in Haq, von Rad, O'Connell, et al., 1990) to doubt the assignment of the dredge samples to the Liassic. He suggested that the samples be restudied and carefully compared with the results from Site 764 (see Haq, von Rad, O'Connell, et al., 1990, pp. 368–369).

In this paper, we followed this suggestion to restudy the biostratigraphy of the dredge samples in more detail. We started with small quantities of the old residues of the S08-61KD samples, originally studied by Quilty (1981), together with a sample from S08-61KD/2 (Me 9151) studied by B. Zobel and F. Gramann in 1980. These samples proved to contain ostracode genera hitherto known only from the Triassic, together with the foraminifers described by Quilty (1981) as a Sinemurian assemblage. With extension of the ranges of the foraminifers into the Late Triassic based on recent study, a Late Triassic age for the samples from the S08-61KD dredge haul had become a distinct possibility. Based on the species, which were determined in the remaining samples and thin sections, the sediments range into the latest Triassic (Rhaetian or Rhaetian to Norian). The grouping of the material into three units stems from slight differences in lithology, which will be treated in more detail in the following text. We considered not only the foraminifers and ostracodes, but also the echinoderm remains.


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PALEONTOLOGICAL RESULTS

Samples from Sonne Cruise 8

**Whitish Crinoidal Marl** (Sample S08-61KD, Northern Slope of the Wombat Plateau)

**Foraminifers**

A washed sample from the whitish crinoidal marl contained the following foraminifers known from the Upper Triassic and unknown in the Lower Jurassic (Liassic):

*Frondicularia rhaetica* Kristan-Tollmann, S08-61KD/lithology 3.2 (Pl. 2, Fig. 1)

*Berthelinella rhaetica* Kristan-Tollmann, S08-61KD/lithology 3.1 (Pl. 2, Fig. 2)

**Echinoderms**

Holothurians:

*Fissobractites subsymmetrica* Kristan-Tollmann, S08-61KD/3 (Pl. 2, Figs. 3, 4)

*Eoecaudina hexagona* Kristan-Tollman, S08-61KD/3 (Pl. 2, Fig. 5)

Ophiurians:

*Ophiococulina cristatum* Kristan-Tollmann, S08-61KD/lithology 3.2 (Pl. 2, Figs. 7-10)

*Ophioderma ? cf. wallabadensis* Kristan-Tollmann, S08-61KD/lithology 3.1 (Pl. 2, Fig. 11)

*Ophiacantha ? bintorulosa* Kristan-Tollmann, S08-61KD/lithology 3.2 (Pl. 3, Figs. 7, 8)

*Ophiacantha ? subtilirugosa* Kristan-Tollmann n. sp., S08-61KD/lithology 3.2 (Pl. 3, Figs. 1-6)

**Ostracodes**

*Monoceratina* (Neom.) cf. *seebergenensis* (Pl. 4, Fig. 3)

*Mostlerella* n. sp. (Pl. 4, Fig. 4)

*Hasibuana asiatica* Kristan-Tollmann (Pl. 4, Figs. 5-7)

*Cytherelloidea* cf. *unicostata* Bolz (Pl. 4, Figs. 1, 2)

*Ogmoconchella* cf. *martini* (Anderson) (Pl. 4, Fig. 8)

*Ogmoconchella* cf. *aspinata* (Drexler) (Pl. 4, Figs. 9-12)

**White Sparry Biocalcarenite** (Sample S08-62KD, Northern Slope of the Wombat Plateau)

**Ostracodes**

*Ptychobairdia hettangica* (Donze) (Pl. 4, Figs. 13, 14)

*Ogmoconchella* cf. *aspinata* (Drexler) (Pl. 4, Figs. 9-12)

**Thin Sections of Sample S08-61KD/3 (Northern Slope of the Wombat Plateau)**

**Foraminifers**

*Involutina liassica* (Jones) (Pl. 1, Fig. 1)

*Involutina turgida* Kristan (Pl. 1, Fig. 2)

*Trocholina turris* Fren ten (Pl. 1, Fig. 3)

*Coronipora austriaca* (Kristan) (Pl. 1, Fig. 9)

*Variostran semipora*

**Age Assignment**

The microfauna from the washed samples dredged at station S08-61KD as figured by Quilty (1981) contains foraminifers,
which were originally described from the German Liassic and are commonly regarded as characteristic species of Lower Jurassic shales. They have, however, also been observed in Tethyan marls of Rhaetian age, as well as in the Zlambachmergel facies described by Kristan-Tollmann (1964) and in the intraplatform marl of the Kössener Schichten (E. Kristan-Tollmann, unpubl. data). The other foraminifers, which are represented by single juvenile tests, are Frondicularia rhaetica and Berthelinella rhaetica. They are as yet unknown in Lower Jurassic sediments and indicate a Rhaetian age.

The ostracodes from sample S08-61KD are either recorded from the Lower Jurassic, as, for instance, Monoceratina (Neomonoceratina) seebergenensis, or confined to the Triassic, such as Mostlerella n. sp. and Hasibuana asiatica. The Ogmocochella species differ slightly from their Northwest European Rhaetian and Early Jurassic types, which have also been observed in the Rhaetian Kössener Schichten but not in the coeval Zlambachmergel. The small number of poorly preserved individuals makes it difficult to decide whether two species of Ogmocochella are present or only one.

Based on our present knowledge, all the determined echinoderms are restricted to the Triassic.

The foraminifers from thin-section S08-61KD/3 are indicative of a Rhaetian age. The species Involutina liassic, I. turgida, and Trocholina turris are known from the Rhaetian, as well as from the Liassic; they are distributed throughout the Tethys. The same geographic distribution also has Coronipora australica, which is, however, confined to the Rhaetian. The four species have been observed together in the Kuta Limestone of the highlands of Papua New Guinea (Kristan-Tollmann, 1986, text-fig. 1, figs. 4, 7, 8, and text-fig. 2, figs. 1–3). They are present there with Variostoma cocklea, an index fossil of the Rhaetian. Our material contains only an oblique section of Variostoma without the possibility of specific identification.

In summarizing the observed faunal indicators, it has to be considered that among the foraminifers, which were originally described only from the Lower Jurassic, many are now also recorded from Upper Triassic sediments throughout the world, from Alaska (Tappan, 1951), the British Islands (Copestake, 1989) and the Tethys realm, including the Alps and New Zealand (Strong, 1984). Some genera and species have been traced back to the Middle Triassic (Anisian) on the Northwest Shelf of Australia (Heath and Apthorpe, 1986). Sample S08-61KD contains genera and

Figure 2. Bathymetric map of the Swan Canyon-Emu Spur area with the location of Rig Seismic and Sonne seismic lines and dredge hauls. (From von Rad et al., 1990.)
species that were not previously recorded from the Lower Jurassic. Because this group is well represented, the dredge samples should be regarded as sediments of Norian to Rhaetian age. Dépêché and Crasquin-Soleau (this volume) described ostracodes from Sites 761 and 764, drilled close to the dredge haul positions, and identified their biostratigraphic ranges as partly conspecific and indicating the same time interval. This suggests that the Rhaetian formation cored at Sites 761 and 764 crops out at the steep escarpment of Wombat Plateau (see Fig. 4).

### Samples from Rig Seismic Cruise 56

**Northern Slope of the Wombat Plateau**

**Foraminifers**

Four thin-sections contain the following foraminifers.

- **Trocholina crassa** Kristan, RS56-DR13L (Pl. 1, Fig. 6)
- **Trocholina crassa** Kristan, RS56-DR13L1 (Pl. 1, Fig. 7)
- **Variostoma** sp., RS56-DR13L2 (Pl. 1, Fig. 4)
- **Ophthalmodium** ? sp., RS56-DR13L2 (Pl. 1, Fig. 8, 10)
- **Variostoma** coniforme Kristan-Tollmann, RS56-DR14A (Pl. 1, Fig. 13)

The foraminifers, taken together with the lithofacies of the sections, are indicative of the Dachsteinkalk facies equivalent to the Rhaetian. Their Tethys-wide distribution is well documented. The different species extend also into the earlier Late Triassic, but are never younger than Rhaetian. Though the species were first described from the Alps, they have since been recorded as far east as Papua New Guinea (Kristan-Tollmann, 1986, p. 204 ff., fig. 2). The distribution of **Variostoma coniforme** in North America was documented by Kristan-Tollmann and Tollmann (1983, p. 229) and Kristan-Tollmann (1988a, p. 248) from limestones of Norian age in Nevada and Oregon. As previously mentioned, Wonders (in Haq, von Rad, O'Connell, et al., 1990, pp. 368-369) suggested that samples from Rig Seismic cruise 56, considered to be Early Jurassic based on a determination for **Trocholina umbo** by M. Schott (unpubl. data) might be older, because the **Trocholina** might be **Trocholina crassa** or **Trocholina permodiscoides**. The presence of **Trocholina crassa** has been confirmed here (Pl. 1, Figs. 6 and 7, with the pear-shaped lumina also shown in section). **Trocholina laevis**, which has a similar thick shell, is smaller and flatter than **T. crassa**, and its lumina are always circular in cross section (Pl. 1, Figs. 8 and 10).

**Trocholina umbo** is considered a junior synonym of **Trocholina granosa** Frentzen in the sense of Wicher (1951). First described from the lower Liassic of southwestern Germany, the species has since been recorded in the Rhaetian throughout the Tethys, but is also known to occur commonly in Lower Jurassic limestones of the Alpine region.

**Cygnet Canyon Subarea**

**Foraminifers**

The two examined thin sections are rich in foraminifers, which, however, are heavily recrystallized and therefore largely undeterminable. Some are better preserved and show fossil outlines:

- **Glomospirella friedli** Kristan-Tollmann, SO8-39KD/11 (Pl. 1, Figs. 11, 14, 15)
- **Glomospirella friedli** Kristan-Tollmann, RS56-DR04I (Pl. 1, Fig. 12)

**Glomospirella friedli** Kristan-Tollmann (1962) was identified by A. Wonders (in Haq, von Rad, O'Connell, et al., 1990, p. 368) in Sample 122-764A-7R-1, 24–27 cm. In the Eastern Alps the species is present mainly in the Norian Hauptdolomit and in the Norian to Rhaetian bedded, lagoonal Dachsteinkalk.

**Emu Escarpment Subarea**

Most of these thin sections are free of determinable fossils. Only thin-section sample SO8-32KD/2c shows longitudinal and...
TRIASSIC ROCKS DREDGED FROM THE NORTHERN EXMOUTH PLATEAU

Table 1. Location of dredge samples collected during Sonne cruise 8 and Rig Seismic cruise 56 along the northern Exmouth Plateau.

<table>
<thead>
<tr>
<th>Dredge no.</th>
<th>Latitude</th>
<th>Longitude</th>
<th>Water depth (m)</th>
<th>Major lithology</th>
</tr>
</thead>
<tbody>
<tr>
<td>S08-32KD/2c</td>
<td>16°55.2'-16°55.2'</td>
<td>117°21.3'-117°20.3'</td>
<td>2950-2470</td>
<td>Foraminiferal biomicrite</td>
</tr>
<tr>
<td>S08-39KD/11</td>
<td>16°51.0'-16°49.7'</td>
<td>117°24.6'-117°26.7'</td>
<td>4010-3850</td>
<td>Quartzose pelsparite</td>
</tr>
<tr>
<td>S08-61KD2</td>
<td>16°28.7'-16°30.7'</td>
<td>115°14.4'-115°14.3'</td>
<td>4000-4260</td>
<td>Foraminifer-pelcovpod-echinoderm biocalcarente to rudite</td>
</tr>
<tr>
<td>S08-61KD3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S08-61KD3.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S08-62KD</td>
<td>16°34.2'-16°35.2'</td>
<td>115°14.2'-115°15.0'</td>
<td>3110-2580</td>
<td>White sparry biocalcarente</td>
</tr>
<tr>
<td>RSS6-DR04I</td>
<td>16°50.4'-16°51.0'</td>
<td>117°23.4'-117°26.5'</td>
<td>3970-3360</td>
<td>Biocalcarente</td>
</tr>
<tr>
<td>RSS6-DR13L</td>
<td>16°34.0'-16°35.1'</td>
<td>115°15.6'-115°15.0'</td>
<td>3380-2800</td>
<td>Foraminifer-mollusk-echinoderm biocalcarente</td>
</tr>
<tr>
<td>RSS6-DR13L1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RSS6-DR13L2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RSS6-DR14A</td>
<td>16°31.3'-16°34.0'</td>
<td>115°26.5'-115°27.8'</td>
<td>3440-2690</td>
<td>Recrystallized sparry limestone</td>
</tr>
</tbody>
</table>

transverse sections of an Anomuran coprolite. It is of some interest, as many such sections have been obtained from a limestone of late Anisian age in the Yuat River area of Papua New Guinea.

Blau et al. (1987) had erected a new genus of Anomuran coprolites as Octotriangulella after the eight triangular sectors of their type species from the German Liassic (Lower Jurassic). Though the species from the Emu Escarpment, as well as the material from Papua New Guinea, has only seven triangular sectors, it can only be classified only as a new species, not a new genus:

Octotriangulella septemtriangula Kristan-Tollmann (Pl. 1, Fig. 5)

TAXONOMIC NOTES

Foraminifers

Frondicularia rhaetica Kristan-Tollmann, 1964
(Pl. 2, Fig. 1)

Frondicularia rhaetica n. sp. Kristan-Tollmann, 1964, p. 146, pl. 32, figs. 1–8.
Ophiocantha ? binitorulosa Kristan-Tollmann, 1979

(Pl. 3, Figs. 7–6)

Remarks. Species identification was from few, poorly preserved elements. It was first described from the two Iranian localities mentioned previously.

Ophiocantha ? subtilirugosa Kristan-Tollmann n. sp.

(Pl. 3, Figs. 1–6)

Derivation of name. From the Latin subtilis (subtle) and rugosus (plicated), after the finely plicated outer surface of the laterals.

Description. The eight laterals are moderately arched with faint or missing constriction. As shown in the review by Kristan-Tollmann (1988c, p. 218), the species is most common in the Rhaetian, but has also been recorded from deposits of early Carnian or even earlier age. Until now, it was identified from localities in the Tethys between the Eastern Alps and Burma.


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Holothurian Sclerites

Fissobractites subsymmetrica Kristan-Tollmann, 1963

(Pl. 2, Figs. 3, 4)

Fissobractites subsymmetrica n. gen. n. sp. Kristan-Tollmann, 1963, p. 375, pl. 9, figs. 2–5.

Fissobractites subsymmetrica Kristan-Tollmann, 1963 in Kristan-Tollmann, 1988c, p. 218, fig. 4.

Remarks. As shown in the review by Kristan-Tollmann (1968c, p. 218), the species is most common in the Rhaetian, but has also been recorded from deposits of early Carnian or even earlier age. Until now, it was identified from localities in the Tethys between the Eastern Alps and Burma.

Eocaudina hexagona Kristan-Tollmann, 1963

(Pl. 2, Fig. 5)

Eocaudina hexagona n. sp. Kristan-Tollmann, 1963, p. 374, pl. 9, fig. 7.

Remarks. Up to now, only a single fragment was known from the Zlambachmergel (Rhaetian) of the Fischerwiese locality near Aussee (Austria). Typical for the species is an arrangement of the generally hexagonal holes in alternating rows. As seen in the fragment from the Wombat Plateau, the holes may tend to become larger toward the edge of the element. The species is observed together with the more common Fissobractites subsymmetrica at the Austrian locality, as well as in the Wombat Plateau sample.

Ophiurians

Ophioflagellum cristatum Kristan-Tollmann, 1979

(Pl. 2, Figs. 7–10)

Ophioflagellum cristatum Kristan-Tollmann n. sp. in Kristan-Tollmann et al., 1979, p. 167, text-fig. 16, figs. 1–6.

Remarks. This characteristic species was originally described from the Heterastridian marls of Sevatian (late Norian) age at the salt well of Dizla, 10 km northeast of Bagerabad, northeast of Isfahan (Iran). It is also present in the Kössener marls (Rhaetian) of the Steinplatte (Austria). Its identification in sample S08-61KD/lithology 3.2 extends the geographical distribution to include it among the taxa of Tethys-wide distribution.

Ophioderma cf. waliabadensis Kristan-Tollmann, 1979

(Pl. 2, Fig. 11)

Remarks. Some of the lateralia present may belong to Ophioderma waliabadensis, but are too poorly preserved for unambiguous deter-

mination. First described from Rhaetian marls at two localities in Central Iran, they have also been observed from the Kössener Mergel of the Eastern Alps (E. Kristan-Tollmann, unpubl. data).

Ophiocantha ? binitorulosa Kristan-Tollmann, 1979

(Pl. 3, Figs. 7–6)

Hasibuana asiatica Kristan-Tollmann n. sp.

(Pl. 4, Figs. 5–7)

Remarks. The recently erected genus Hasibuana resembles the Triassic genera Rekocythere and Mouchovchisichia, but is a separated genus. So far, it is unknown in the western part of the Tethys realm. The species Hasibuana asiatica has been described from the Upper Triassic limestones of Misol Island in the Ceram Sea of Indonesia.

Ophiocantha ? binitorulosa Kristan-Tollmann n. sp.

(Pl. 3, Figs. 1–6)

Derivation of name. From the Latin subtilis (subtle) and rugosus (plicated), after the finely plicated outer surface of the laterals.

Description. The eight laterals are moderately arched with faint or missing constriction. As there are three to four medium-sized, not very projected bases of thorns and one or two flat pillars at the proximal edge. The whole surface consists of faint, subtle, slightly undulating transversal striae, some of which are branching or vanishing. The striae slightly coarsen toward the distal rim.

Remarks. The best fit, in consideration of the striaion of the laterals, is Ophiura longivertebrata Wolburg, 1939, described from the Liassic of Lower Saxony. The laterals, however, differ by the tongue at the distal end of the base of the thorn, which is cufflike in lateral view (Wolburg, 1939, p. 27). Besides this, the bases of the thorns are smaller and more numerous (five to six).

Ophiocantha ? superjuraistica Hess, 1965, from the lower Oxfordian of Chapois (Departement Jura, Switzerland), has also a fine striated surface, mainly on the laterals of the middle part of the arm. The striaion is, however, restricted to the distal parts of the laterals and is fainter than in our species. Moreover, the bases of the thorns are stronger and more numerous (usually four to six). This observation is confirmed in viewing the material of Hess (1966, p. 1031, figs. 9, 10, and 70–73). The thick annular bases of the thorns are very strong and projected on the constricted surface.

Ophiocantha ? bifurcata Hess, 1975, from the upper Oxfordian of Brocheten in the Gulden valley (Kanton Solothurn, Switzerland), has striaions on only a few of its laterals. The striaion, when present, is confined to the distal part. The species also shows five to six, heavy warlike projections.

Mostlerella n. sp.

(Pl. 4, Fig. 4)

Remarks. The genus Mostlerella Kozur, 1971 (see Bunza and Kozur, 1971) is a typical representative of Triassic assemblages. It was hitherto recorded from the upper Anisian to the Rhaetian from Austria, Italy, Hungary, Iran, and Southern China, but also outside the Tethys realm, in the Carnian of the Sephardic facies from Spain. The single left valve belongs to a new species, differing from the known ones by the absence of an anteriomedian inflation or node.

Hasibuana asiatica Kristan-Tollmann, 1990

(Pl. 4, Figs. 5–7)

Hasibuana asiatica Kristan-Tollmann n. gen. n. sp. in Kristan-Tollmann and Hasibuana, 1990, pl. 1, figs. 1–5.

Remarks. The recently erected genus Hasibuana resembles the Triassic genera Rekocythere and Mouchovchisichia, but is a separated genus. So far, it is unknown in the western part of the Tethys realm. The species Hasibuana asiatica has been described from the Upper Triassic limestones of Misol Island in the Ceram Sea of Indonesia.
Remarks. The single right and left valves available are differentiated from Cytherella jugosa (Jones, 1884) and from Cytherella unicostata Bolz, 1970 by a generally horizontal median ridge and a parallel part at the dorsal of the circular ridge. Some larval individuals of C. unicostata are, however, very close to our valves. As the variation of the Exmouth Plateau representative is still unknown, a decision on the taxonomic status within the species group must be kept open for lack of material.

Ogmoconchella martini (Anderson, 1964)

Remarks. The difference between our left valve and the original description is the absence of the short, rounded caudal process. As described and figured by Bate (1978, pl. 2, fig. 10), the caudal process may be missing. The species, originally described as Hungarella ? martini, is known from the middle Rhätian Westbury Beds of Shropshire (United Kingdom) and the Rhätian of Lower Saxony, where it has been described as "Ostrakode 800" by Wicher (1951) and as Heaudiella tenuirostrata Will, 1969. H. ? martini is also well known from the Alpine Rhätian throughout the Tethys realm. It is very common in the Kössen Beds at the type locality Weißlofer ravine near Kössen (Tyrol, Austria), common in the Kössen Beds at Steinplatte (Salzburg, Austria), and abundant in Rhätian marls at Salt Spring near Bagerabad (near Isfahan, Central Iran).

Fingerprint sculpture in the posterior part of the carapace is seen in other Healdiidae, for instance, in Ogmoconchella adenticulata (Pietrzenuk, 1961), which was originally described from the upper Pliensbachian. The valves of this species are more elongate. Other representatives of the genus Ogmoconchella from our samples have smooth outer surfaces, but are similar in the remaining character. As the number of individuals is small and the preservation far from excellent, it is difficult to decide whether two species are present.

Ogmoconchella cf. aspinata (Drexler, 1958)

Remarks. The ostracodes, tentatively compared here with Ogmoconchella aspinata, which was originally described from the Hettangian of Germany, are smooth and ovoid, with a better rounded and inflated posterior part of the shell and a slight dorsal angle not far behind mid-length. The species was included as a synonym of Hungarella owthorpensis Anderson, 1964, from the English Rhaetian.

The small assemblage of ostracodes from the washed samples from station S08-62KD consists of two valves of the readily determinable Psychobairdia hettangica (Donze) and of some mostly larval Ogmoconchella valves and carapace, poor in specific character and preservation.

Theoretically, an Oligocene age should be considered first, as Psychobairdia hettangica is as yet unknown from Rhätian sediments. The stratigraphic value of the Ogmoconchella representatives is uncertain. But the possibility that the range of P. hettangica may be expanded cannot be excluded, and the age of the sample remains in doubt.

Psychobairdia hettangica (Donze, 1966)

Remarks. The low-arched dorsal rim and the shape of the circular ridge are characteristic for this species. It does not form a symmetric oval, but is ventrally broader and more elevated and therefore different from that of the Alpine species Psychobairdia gracilis (Kristan-Tollmann, 1970) of the same age.

Distribution. P. hettangica was previously known from the early Hettangian Planorbis Zone of the Ardèche, France.

PALEOGEOGRAPHIC CONCLUSIONS

Although the samples from the northern Exmouth Plateau contain only small microfaunal assemblages, they neverthe-
Plate 3. Lateralia of *Ophiura* from the uppermost Triassic (Rhaetian) of the northern slope of Wombat Plateau. 1–6. *Ophiacantha? subtilirugosa* Kristan-Tollmann n. sp. (1, 2, 5) S08-61KD/lithology 3.2. (3, 4, 6) S08-61KD/3. (4) Holotype. Lateral from the middle part of an arm, exterior. 7, 8. *Ophiacantha? binitorulosa* (Kristan-Tollmann, 1979). Lateralia from the middle part of the arm, S08-61KD/lithology 3.2. (8) Fragment.