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ON THE FIRST OCCURRENCE OF AMMONITES IN THE CRETACEOUS STRATA OF THE PARNASSUS-GHIONA ZONE, CENTRAL GREECE

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ABSTRACT

Cretaceous ammonite fauna is recorded for the first time in the Parnassus-Ghiona Zone in pelagic limestone beds exposed close to the village of Distomo in Central Greece. From the fauna which is poorly preserved only the species *Saghalinites* cf. *wrighti* Birkelund, 1965 is identified indicating that the limestone beds were deposited during the Late Maastrichtian. The Late Maastrichtian age age of the beds is also confirmed through the examination of the foraminiferal fauna recorded in the beds.

INTRODUCTION

Cretaceous ammonites are unknown in the Parnassus-Ghiona Zone. Only Jurassic ammonites have been found in the zone, those which were reported by Papastamatiou (1960) from the Penteoria area situated in the western margin of the zone. None of the following, CELET (1960, 1962), RICHTER & MARIOLAKOS (1974), KALPAKIS (1979), CAMINITI (1985), SOLAKIUS et all. (1989) who investigated the Mesozoic strata of the Parnassus-Ghiona Zone, reported any ammonite record from the Cretaceous formations.

Ammonites havenot previously been found in the Cretaceous strata of the platform; this because dedimentation took place in a very shallow water (neritic facies which in a short period became continental) in the Parnassus-Ghiona Zone during the Early Cretaceous. Such environments are known to be unfavourable habitats for ammonites. These shallow marine conditions changed in the Late Cretaceous since the platform was broken into horsts and grabens (RICHTER & MARIOLAKOS, 1974), whereas in the areas situated in shallow waters the neritic environment continued to exist, in the grabens the environment became pelagic and thus favourable to ammonites.

In limestone beds deposited under such pelagic conditions, exposed close to the village of Distomo, ammonites were found together with brachiopods, ostracods and foraminifera (Fig. 1). Only one ammonite species was identified and is described below the foraminifera occurring

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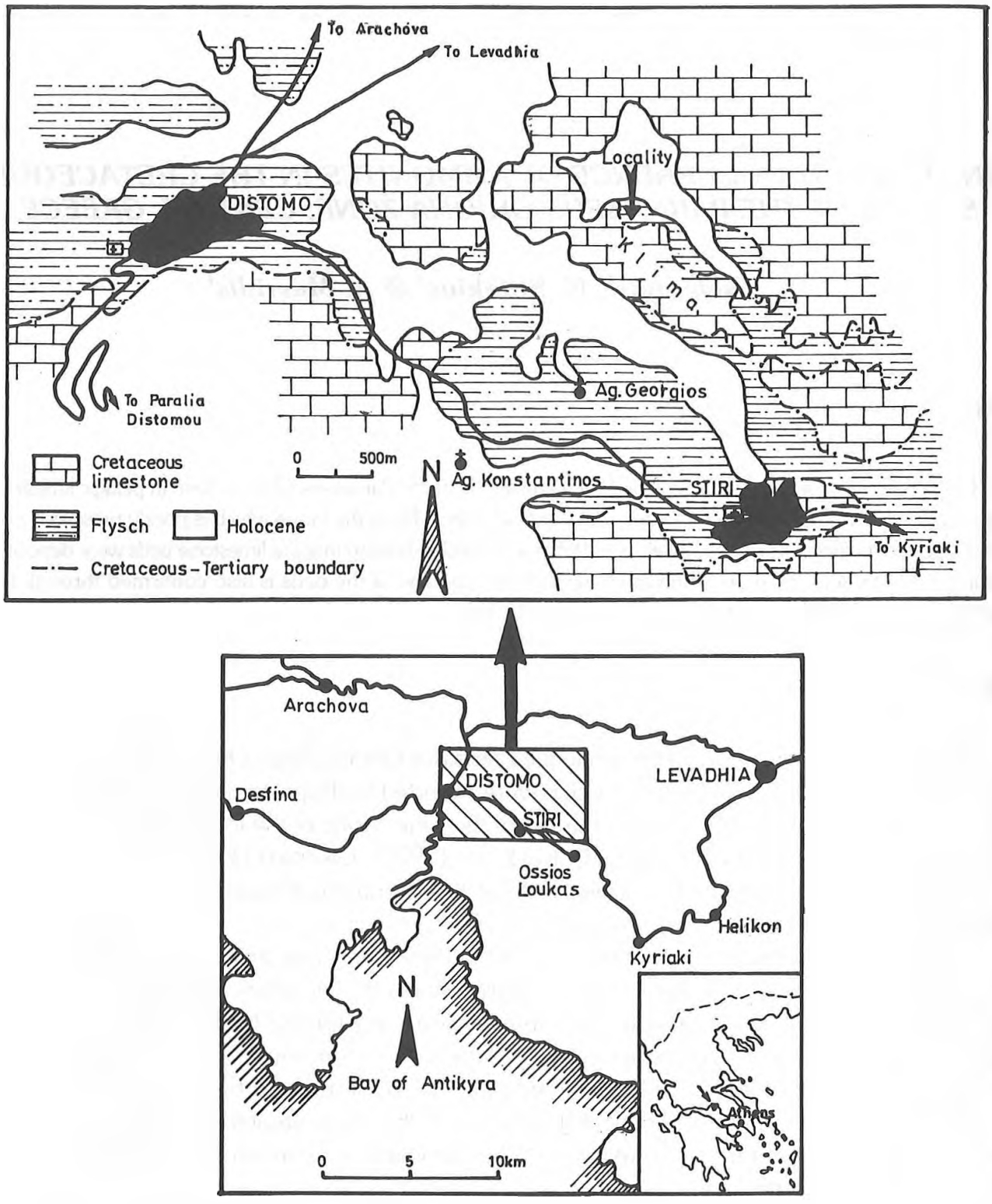

Fig. 1: Geological map showing the location of the limestone bedsw with ammonites.

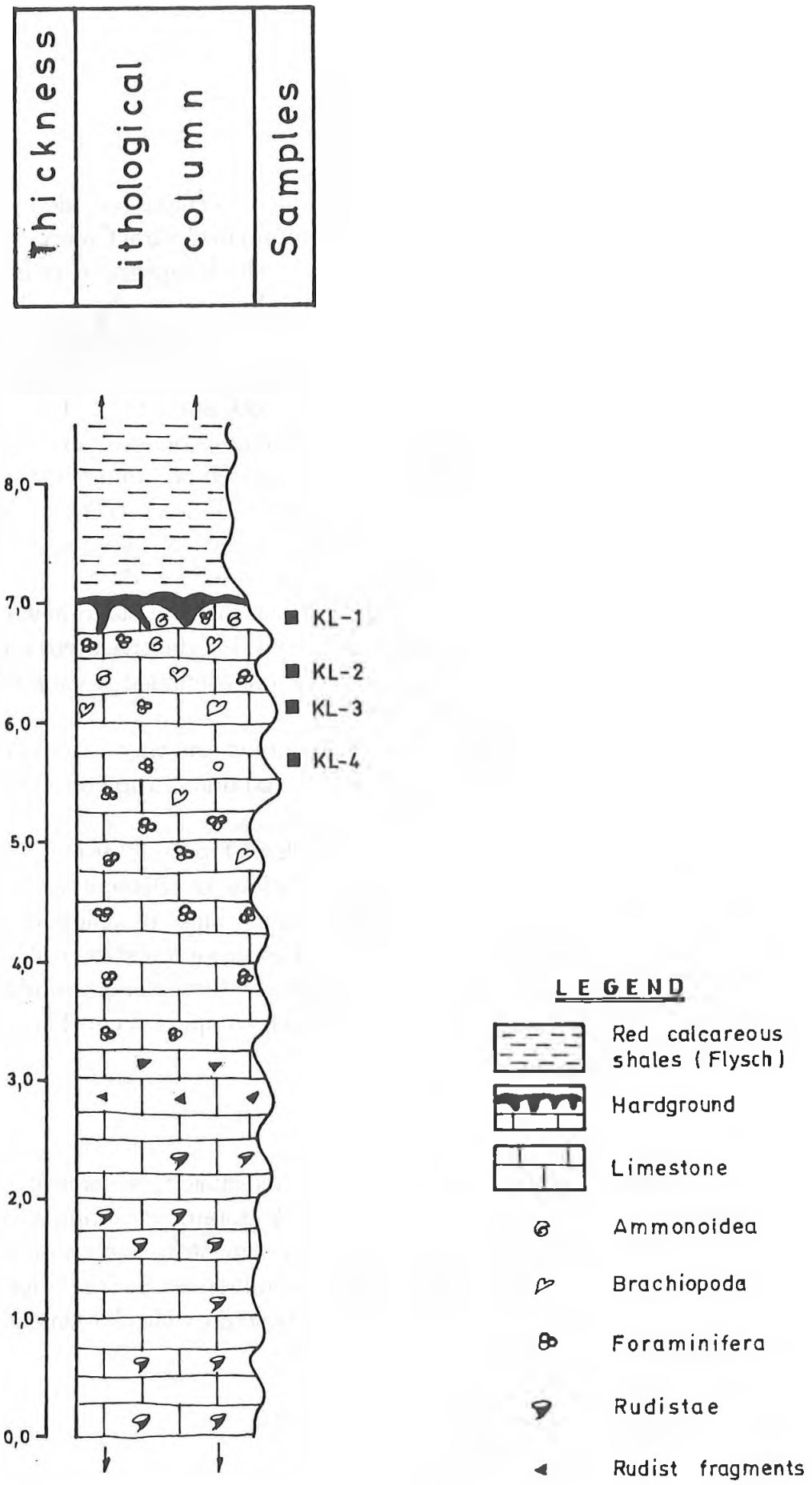

Fig. 2: Diagram of the section at Klima showing the lithology and fauna included in the beds.

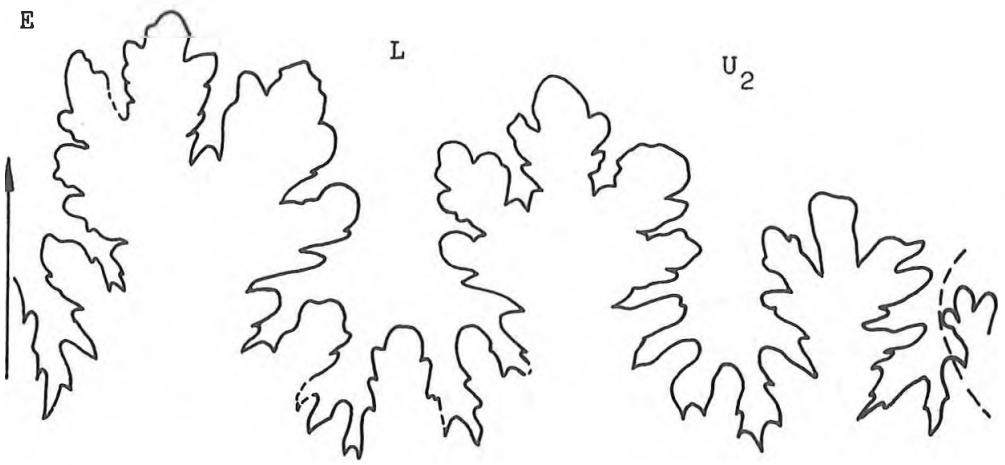

Fig. 3: External suture of *Saghalinites* cf. *wrighti* Birkelung, 1965. K1-1. Bar scale 13mm.

Beschreibung: Das Exemplanr K1-1 umfasst 1/2 - Windung der Wohnkammer. Ein Teil von ihm ist durch den Hardground aufgelosst. Die Nabelgegend konnte wegen des harten Materials (Eisen-und Manganoxide) nicht sauber genug prapariert werden.

Dimensionen: (in mm):

D(Durchmesser)	Wh(Windungshohe)	Wb(Windungsbreite)	U(Umbilicus)
37,8?	13	14	?

Die Aufrollung scheint sehr evolut zu sein. Der Durchmesser kann nicht exakt gemessen werden. Aber die Windungsbreite ist sicher etwas grosser als die -hohe oder geht mit Sicherheit auf Seite der Wb.

Die Umbilikal-und Marginalkanten verleihen dem Querschnitt einen deutlich eckigen Umriss. Die Flanken der Windungen sind verflacht und am Rückenrand laufen sie mit eckiger Kante gerundet um der Rücken.

Die Nabelwand ist gerundet und fallt ziemlich flach. Der Windungsquerschnitt ist im hoheren Teil des Stückes deutlich komprimiert als im unteren und die ventrolaterale Schulter gerundet. Der Venter ist flach gerundet.

Der Steinkern ist glatt mit Erhaltung der Sutur. Es konnen keine Einschnurungen oder Überhaupt Skulptur unterschieden werden. Nur an einem Teil des Venters ist eine schwache Querstreifung zu beobachten.

Die Sutur ist gut erhalten und deutlich zu erkennen (Fig. 3). Wahrend der tiefe E (=Externlobus) und der retracte Suspensivlobus asymmetrisch bifid sind, ist der engstammige, aber breite Laterllobus symmetrisch bifid. Der breitstammige 1. Lateralsattel ist asymmetrisch. Die weiteren Sattel zeigen eine fast symmetrishe Entwicklung auf.

Beziehungen: Die allgemeine Ubereinstimmung der Sutur, mit der des *S. wrighti* bei Kennedy & Summesberger (text-fig. 3, p.187, 1986; kleine Unterschiede ergaben sich beim Externlobus und der Spaltungsart der Umbilikalsattel), der kantige Querschnitt, die Massangaben und die Windungsentwicklung sprechen für die Zugehorigkeit des Exemplars K1-1 zu diieser Art. Wegen des glatten Steinkerns sind keine Einschnürungen deutlich, wie sie von Birkelund (1982) und Kennedy & Summsberger (1986) beschrieben werden. Da aber innerhalb der Saghaliniten das starke Zurücktreten der Einschnürungen auf die ausseren Windungen am ehesten für die Art *S. wrighti* spricht, insbesondere im Vergleich mit der sonst sehr ahnlichen Art *S. cala*, und *S.*

wrighti einen breiteren Querschnitt und eine evoluture Aufrollung besitzi (Immel, Klinger & Wiedmann 1982), kann hier mit grosserer Sicherheit das Exemplar K1-1 dem *S. wrighti* am ehesten zugehoren.

Der Unterschied mit dem von Immel, Klinger & Wiedmann (1982) liegt in der Aufrollung, dem Verhaltnis der Windungsmassen und dem Fehlen der zum Sipho parallel verlaufenden Streifen.

Verbreitung: Nach Birkellund (1982) kommt *S. wrighti* in Jutland (Danemark), Nord Deutschlnd und Gronland an der Unter-/Ober-Maastrichtien-Grenze, in der Brachiopoden-Zone 7-8, vor. In der Gegend von Klima (E' von Distomo) ist der Befund zahlreicher Brachiopodenfauna, die weiter bearbeitet werdenn soll, neben Ammonoideen bemerkenswert. Nebenbei treten auch Foraminifera und einige Ostracoden.

Unser Ammonitenexemplar K1-1 gehort nachdem der *Abathomphalus mayaroensis*-Zone, die letzte Zone des Ober-Maastrichtiens, an.

FORAMINIFERA

The foraminiferal assemblages recorded from the pelagic limestone beds at Klima are poorly preserved particularly those that are found in the hardground bed. From these assemblages only the planktonic foraminiferal species were treated. They are of significance for determining the age of the beds. The identified species are few and are as follows: *Abathophalus mayaroensis* (Bolli) (pl. 2, Fig. 1-2; pl. 3, Fig. 4), *Racemiguembelina powelli* Smith & Pessagno (pl. 2, Fig. 3), *Globotruncana* cf. *arca* (Cushman) (pl. 2, Fig. 6), *Globotruncana insignis* Gandolfi (pl. 3, Fig. 6) and *Heterohelix* sp. *Abathomphalus mayaroensis* is an index species in the Upper Maastrichtian marking the *Abathomphaslus mayaroensis* Zone. *Racemiguembelina powelli* is found throughout the Upper Maastrichtian, and, thus, thhoughout the *Abathomhalus mayaroensis* Zone. On the basis of the above species it can be concluded that the limestone beds at Klima were deposited during the later part of the Maastrichtian.

However, as is shown in plate 2, Fig. 4, and plate 3, Figs. 1, 5 small Tertiary Globigerinids found in borings and fissures, occur in the hardground bed which was formed after the lithification of the limestone bed. The fact that these structures were filled by Tertiary sediments indicates that they were made and remained open after a hiatus. Such borings and fissures filled with Tertiary sediments are common in the hardground bed and have previously been reported by Solakius *et al.* (1989) and Pomoni-Papaioannou & Solakius (in press) from the hardground bed exposed in Sernikaki and Prossilion areas in the Parnassus-Ghiona zone. They were formed during the interruption in the deposition which started in at the end of the Maastrichtian and continued into the Early Paleocene (Solakius *et al.*, 1989: Pomoni-Papaioannou & Solakius, in press).

CONCLUDING REMARKS

The ammonite fauna recorded for the first time in the Parnassus-Ghiona Zone is found to belong to the Maastrichtian species *Saghalinites* cf. *wrighti* Birkelund. The species is recorded in pelagic limestone beds in which apart of the ammonites also brachiopods, ostracods and foraminifera are also found. On the basis of this ammonite species and the foraminiferal species

identified, the age of the limestone is determined as being Late Maastrichtian. This indicates that *S. wrighti* which was previously only been reported from the strata deposited across the Lower/Upper Maastrichtian boundary also appeared in the Upper Maastrichtian.

Finally, the record of ammonites from the pelagic limestone beds at Klima may indicate that ammonites could be present in similar beds elsewhere in the Parnassus-Ghiona Zone.

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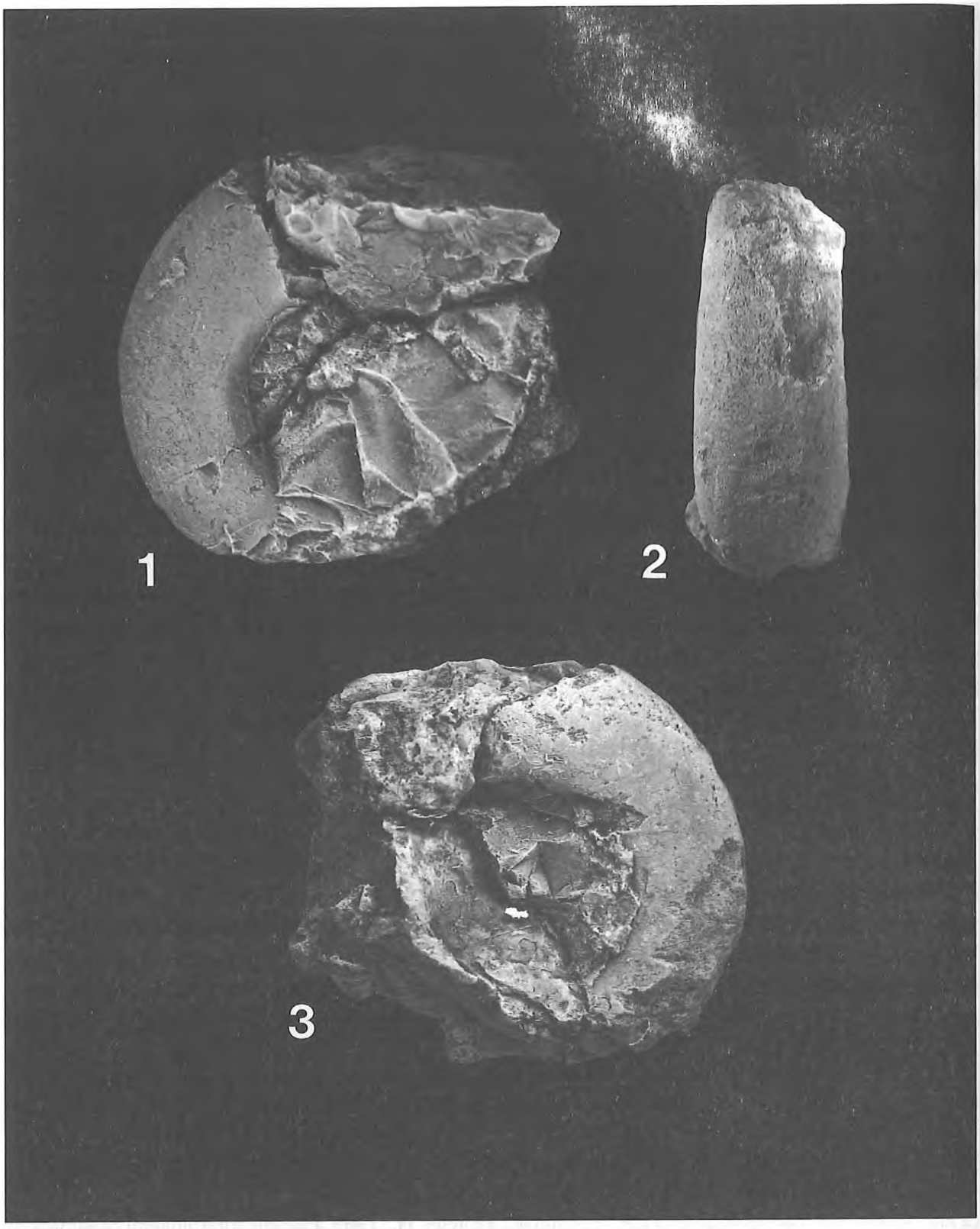
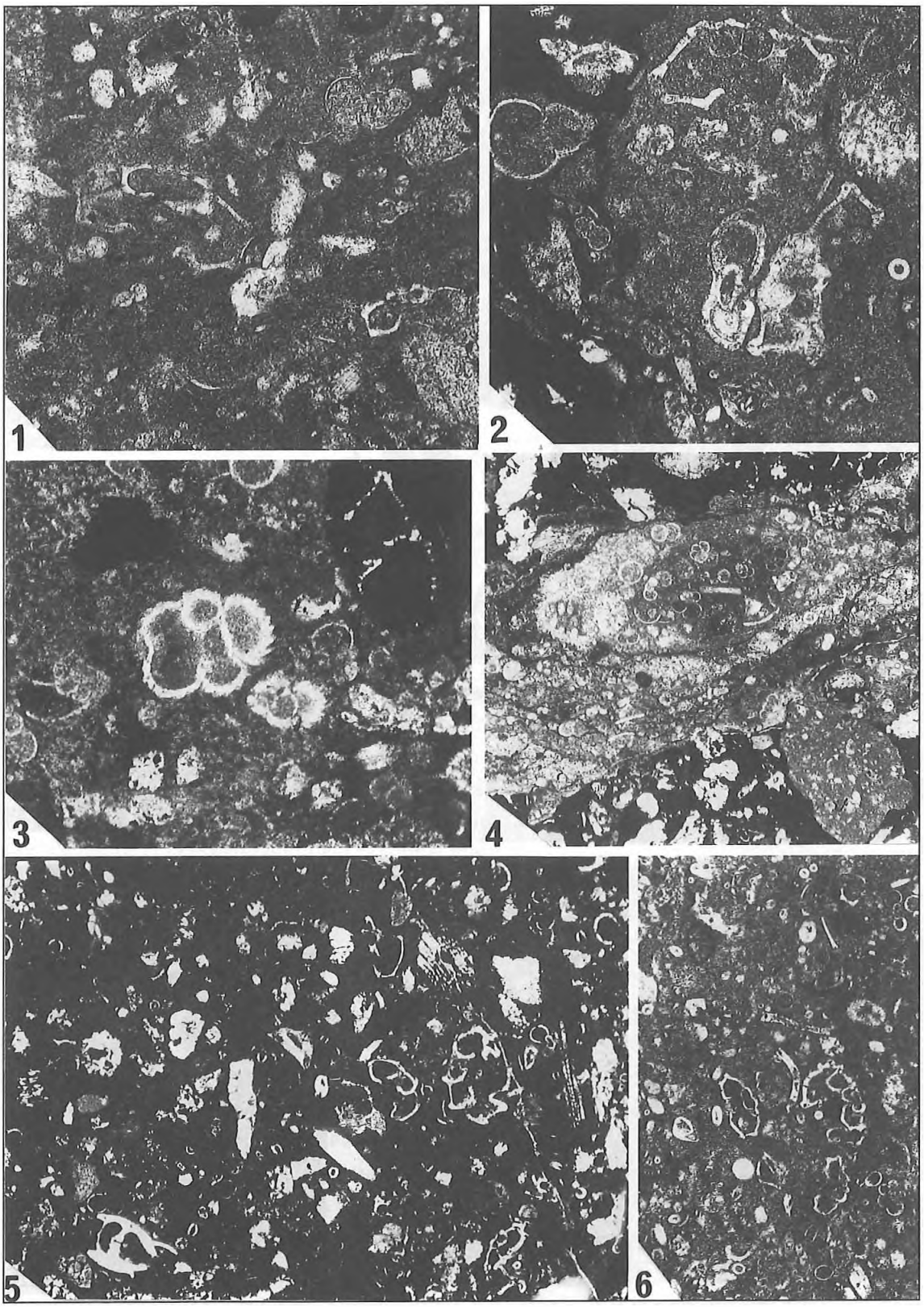
PLATE 1



Figs 1-3: *Saghalinites* cf. *wrighti* Birkelung, 1965 Bars in Figs 1 and 3 = 8 mm. Bar in Fig. 2 = 6.6 mm.

PLATE 2



Figs 1-2: *Abathomphalus mayaroensis* (Bolli) Fig. 1: X 70; Fig. 2: X 87.5.
Fig. 3: *Racemiguembelina powelli* Smith & Pessagno. X70
Fig. 4: A boring including Tertiary Globigerinids. X35
Fig. 5: Foraminifera and fragments from brachiopods surrounded by iron oxides. X48
Fig. 6: *Globotruncana* cf., *arca* Cushman. X37
All photos from sample K1-1

PLATE 3

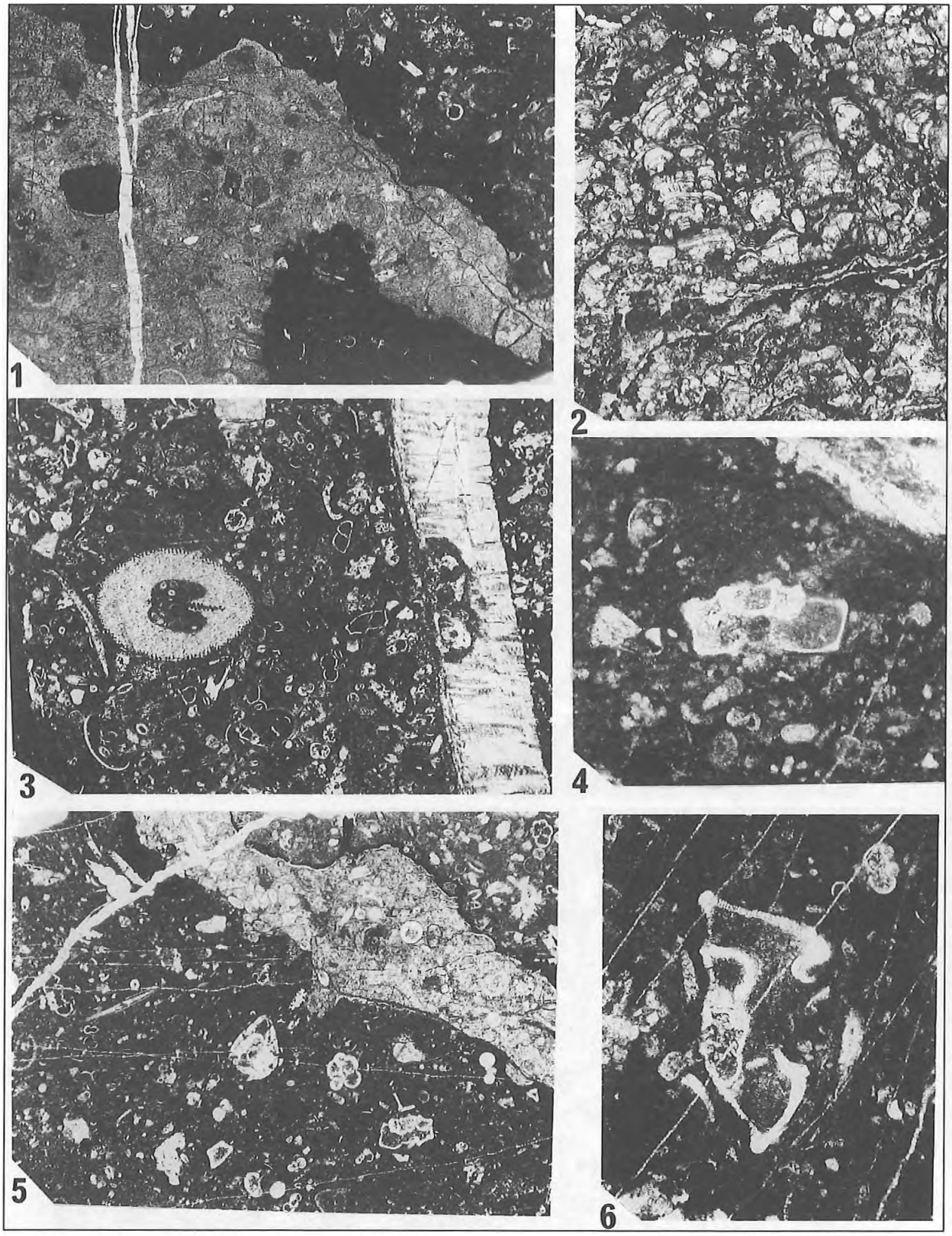


Fig. 1: A fissure filled with Tertiary sediment KL-3, X 35.
Fig. 2: Stromatolites from the hardground bed K1-1, X35.
Fig. 3: Photo showing a brachiopod together with planktonic foraminifera. KL-4, X35
Fig. 4: *Abathomphalus mayaroensis* (Bolli) KL-4, X73
Fig. 5: A boring including Tertiary planktonic foraminifera KL-2, X37
Fig. 6: *Globotruncana insignis* Gandolfi Kl-4, X66