

A NEW SPECIES OF *HETEROSTEGINA* IN MIDDLE PALEOCENE FROM THE KHUZESTAN AREA (S.W. IRAN)

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Abstract

New evidence gained by the study of Foraminifera from Khuzestan province in southwest Iran reveals that the basal limit of the genus *Heterostegina* is not restricted to the Eocene epoch. By introducing a new species of this genus (*H. rezvaninejadi*), this study shows that the early appearance of this genus should be lowered down further still, at least, into the Middle Paleocene.

Introduction

The Pabdeh Formation, from late Paleocene to Oligocene, at Tang-e Pabdeh in Khuzestan province, was measured and resampled. The samples were closely collected by Dr. S. M. Rezvaninejad, the Deputy Director of Exploration in N. I. O. C., during field work carried out from January to February 1991. For his personal interest, nearly 250 thin sections were passed to the writer to study the zonations of planktonic biostratigraphy of the Pabdeh Formation. During studies of the pelagic facies, a thin benthic limestone bed (70 cm thick) with nine species of larger Foraminifera was also noticed. An interesting point in this study was to find a new species of the genus *Heterostegina*. As far as the writer knows, the lowest limit of this genus has not been recorded before the Eocene epoch. The occurrence of *Heterostegina* in this study suggests for the first time that the first appearance of this genus in the chronostratigraphic column should be re-evaluated. It should also be mentioned that the stratigraphic position of this form has been checked against the Paleocene planktonic zonations. Therefore, the lowest limit of this genus, or the first appearance of *Heterostegina* occurs in the Middle Paleocene. The stratigraphic succession of the section studied is de-

scribed below and the location of this section is also given in Figure 1.

The Pabdeh Stratigraphic Section in Khuzestan Province, S.W. Iran

This stratigraphic section is slightly over 285 meters thick. Such thick deposits are from parts of two time units of Paleocene and Lower Eocene. The lithology and biostratigraphy of this section from bottom to top are as follows:

Paleocene: This long interval falls into the lower Pabdeh Formation. Paleocene sediments are well developed and reach up to 253 meters. This time unit is made of two types of calcareous shale and marls in the lower parts (129 m thick) and alternations of purple shale and medium bedded limestone in the upper part (124 m thick).

In addition, a thin bed of benthic limestone (more than 70 cm thick) occurs in the Middle Paleocene sediments (about 130 meters above the base of the Paleocene deposits). This limestone contains some benthonic larger Foraminifera such as: *Heterostegina rezvaninejadi* n.sp., *Discocyclina seunesi*, *Operculina* sp., *Ranikothalia* sp., *Kathina* sp., *Glomal-veolina primivea*, *Coskinolina* sp., *Daviesina persica* and *Sakesaria* sp. This assemblage of benthonic Foraminifera is placed in the upper zonation of *Globorotalia*

Keywords: A revision on the first appearance of genus *Heterostegina*

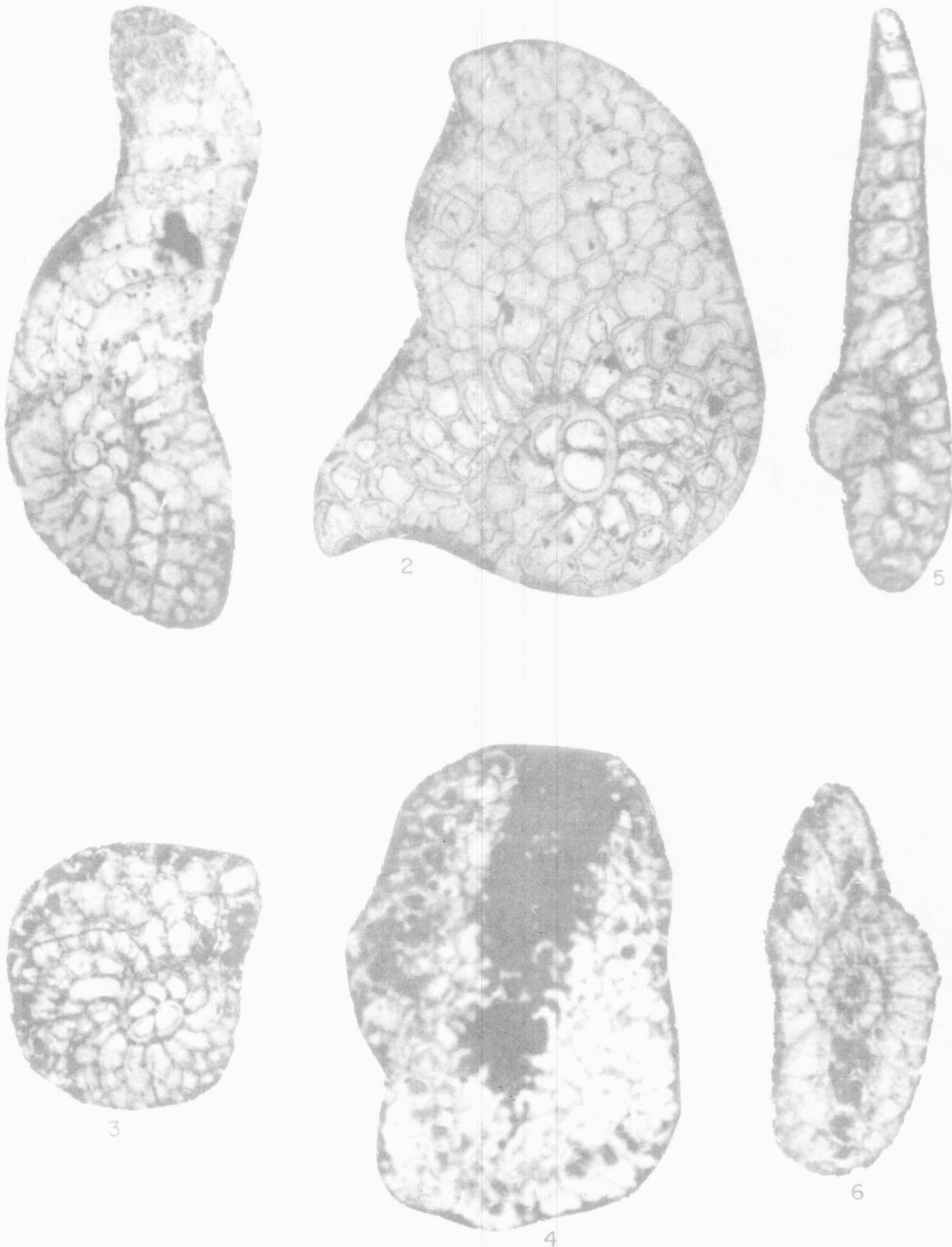


Plate 1

Figures 1-6. *Heterostegina rezvaninejadi*. n. sp. A. Kalantari, Holotype from 32° 25.00. north 49° 16. 22 East, Khuzestan, Tang-e Pabdeh S. W. Iran. Middle Paleocene. Figs. 1-4, equatorial sections X40
Figures 5-6. Axial sections X40

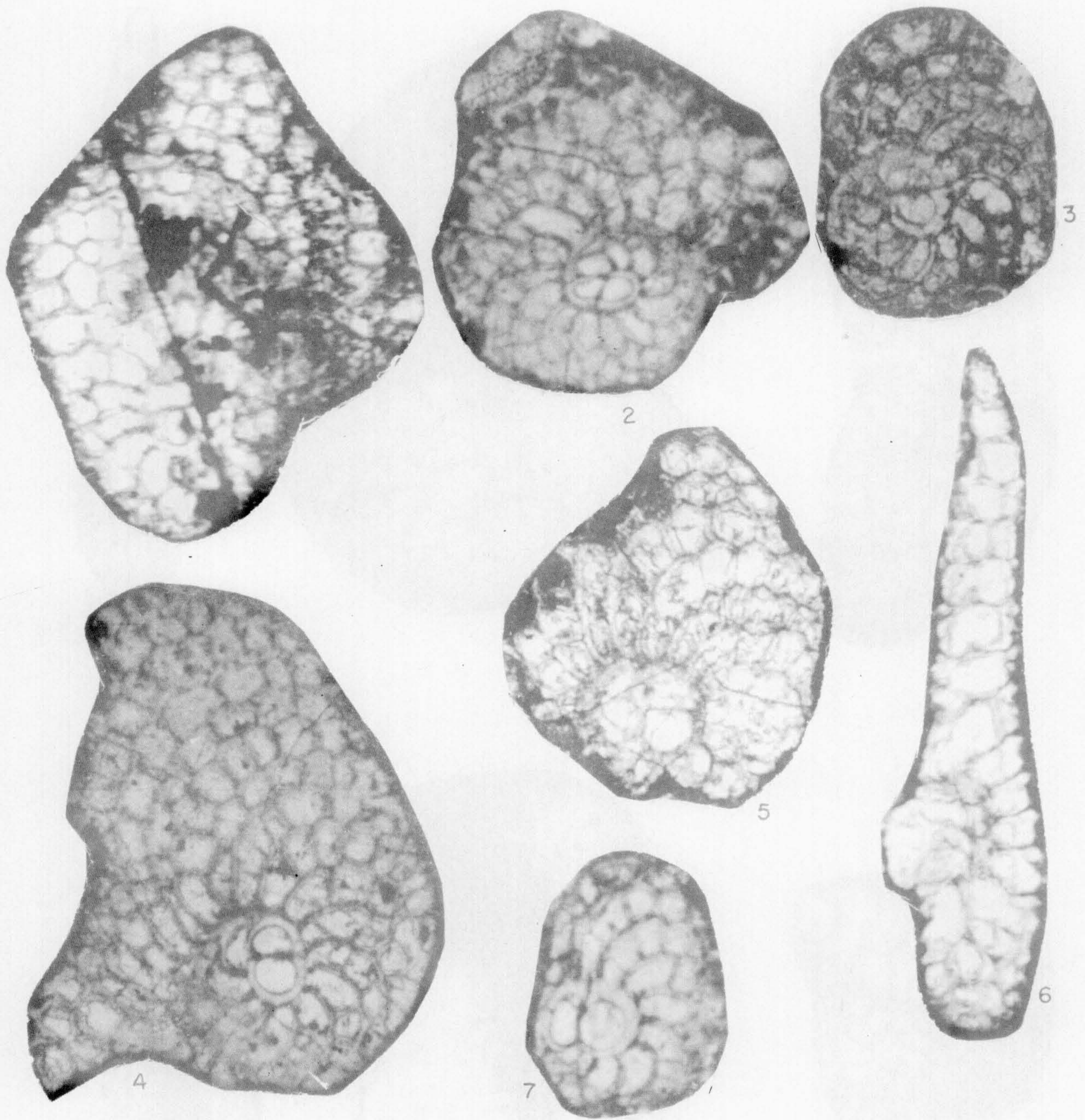
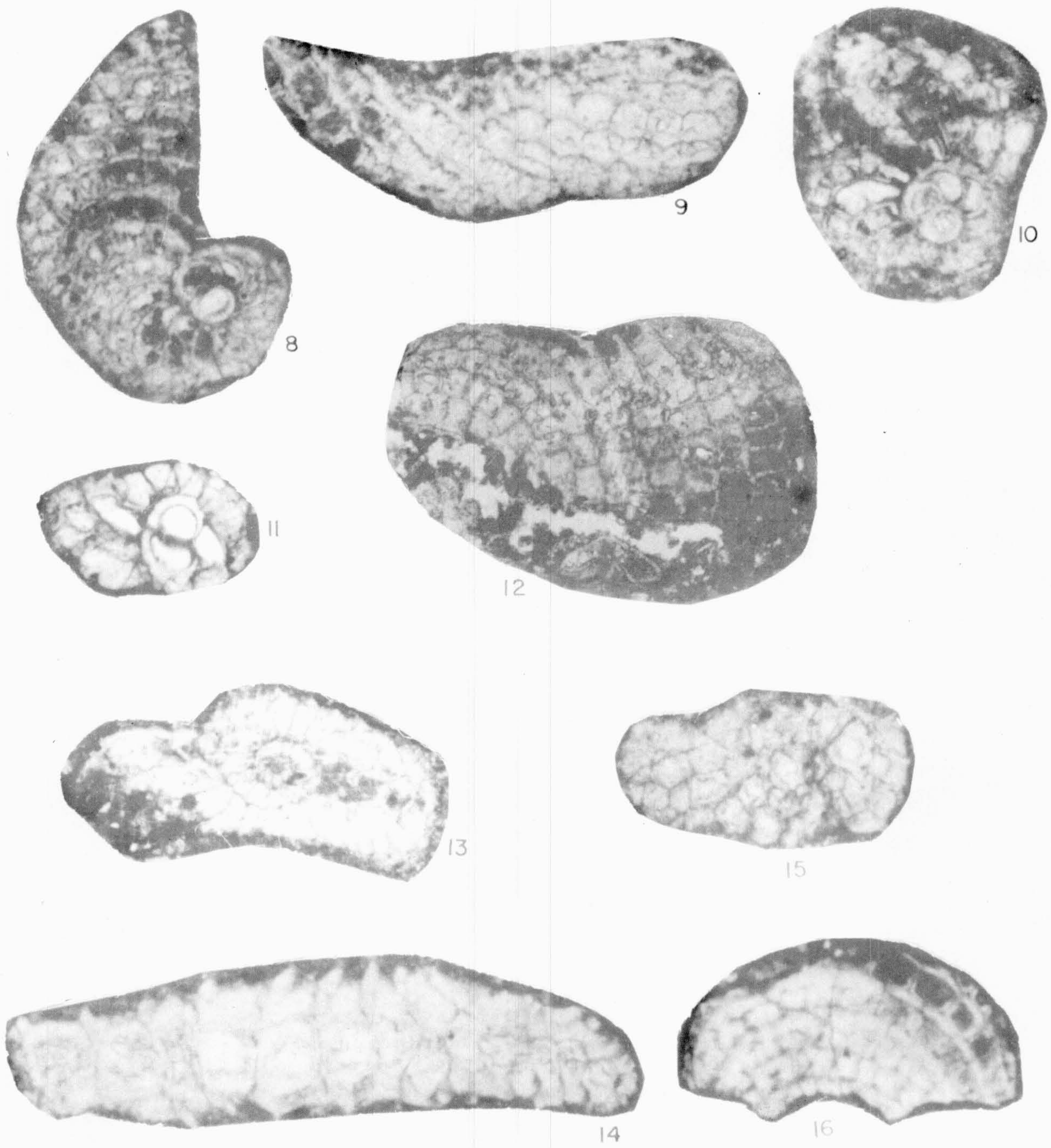


Plate 2

Figures 1-16. *Heterostegina rezvaninejadi* n. sp. A.
Kalantari, from Khuzestan area, Tang-e Pabdeh, S. W. Iran
Middle Paleocene

- 1, equatorial sec. X35
- 2, equatorial sec. X30
- 3, equatorial sec. X25
- 4, equatorial sec. X40
- 5, equatorial sec. X30
- 6, axial sec. X40
- 7, equatorial sec. X25



8, equatorial sec. X30
9, axial sec. X35
10, equatorial sec. X35
11, equatorial sec., showing embryonic chamber X30
12, equatorial sec. X30
13, equatorial sec., showing three whorls X30
14, axial sec. X40
15, 16, equatorial sec. X30

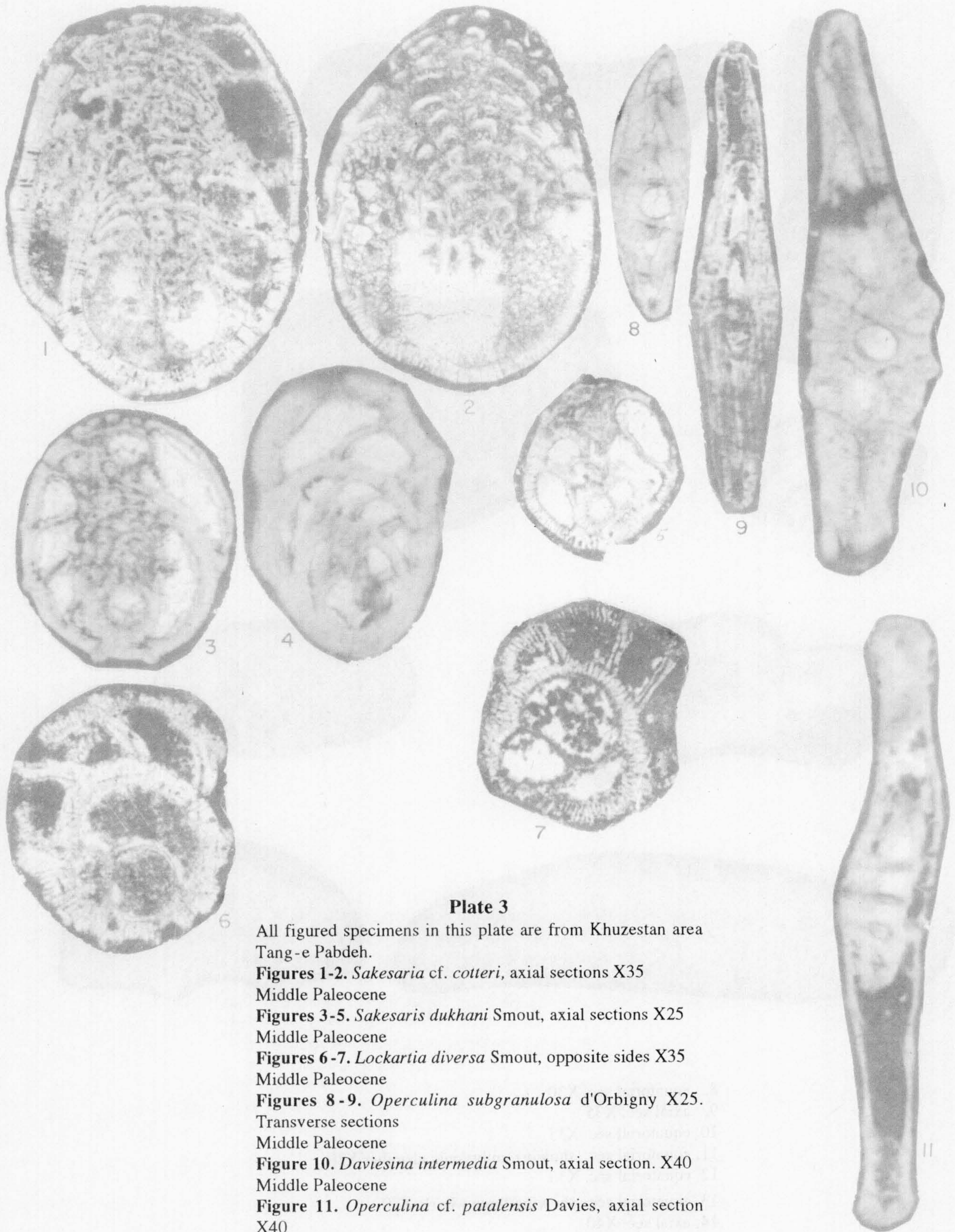


Plate 3

All figured specimens in this plate are from Khuzestan area
Tang-e Pabdeh.

Figures 1-2. *Sakesaria* cf. *cotteri*, axial sections X35
Middle Paleocene

Figures 3-5. *Sakesaris dukhani* Smout, axial sections X25
Middle Paleocene

Figures 6-7. *Lockartia diversa* Smout, opposite sides X35
Middle Paleocene

Figures 8-9. *Operculina subgranulosa* d'Orbigny X25.
Transverse sections
Middle Paleocene

Figure 10. *Daviesina intermedia* Smout, axial section. X40
Middle Paleocene

Figure 11. *Operculina* cf. *patalensis* Davies, axial section
X40
Middle Paleocene

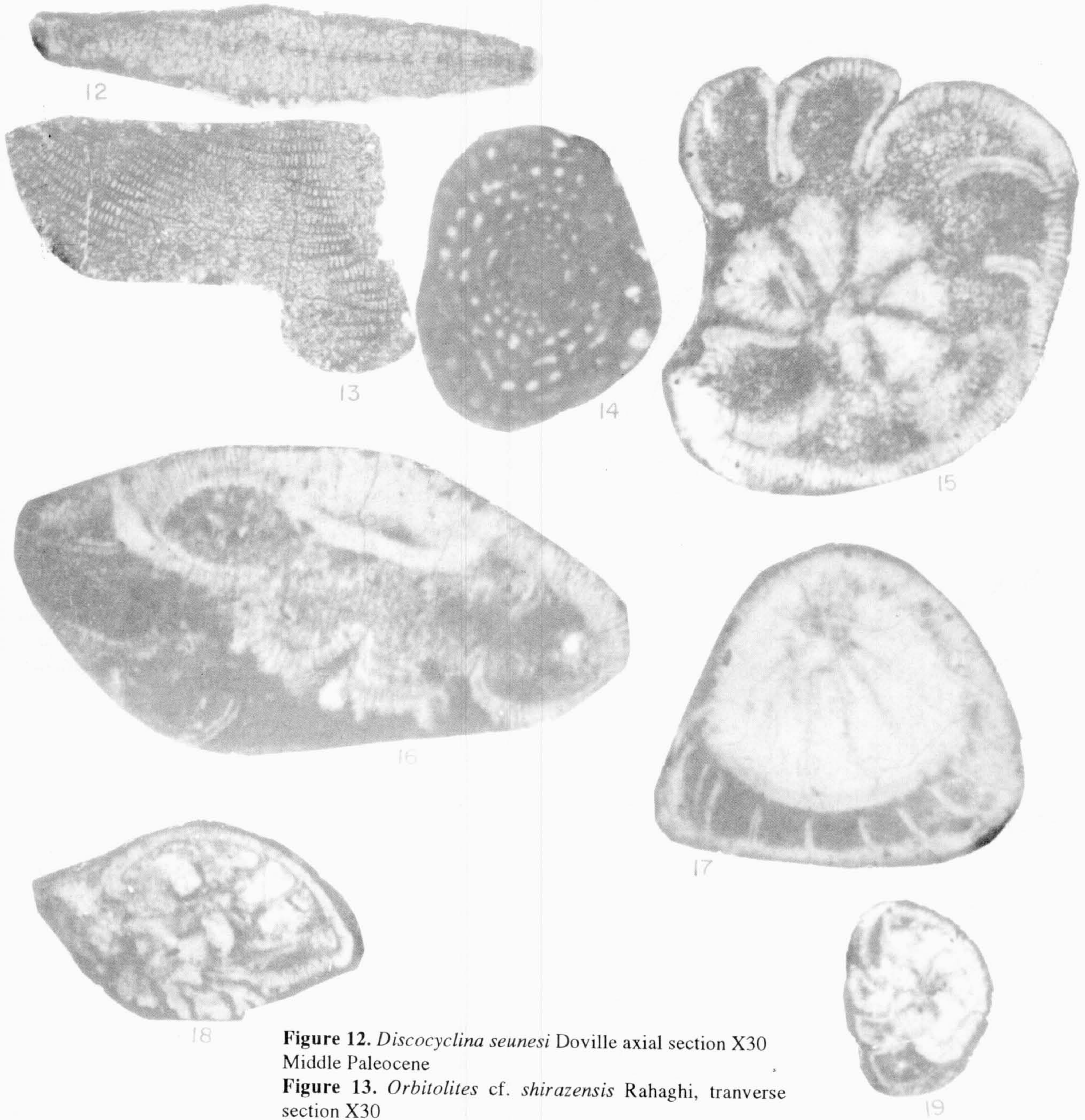


Figure 12. *Discocyclina seunesi* Duville axial section X30
Middle Paleocene

Figure 13. *Orbitolites* cf. *shirazensis* Rahaghi, tranverse section X30
Middle Paleocene

Figure 14. *Glomalveolina primivea* Reichel X40. Equatorial section X30
Middle Paleocene

Figures 15-16. *Daviesina persica* Rahgahi X75
Fig. 15 opposite side, Fig. 16 subvertical sections
Middle Paleocene

Figure 17. *Rotalia* sp. X75, axial section
Middle Paleocene

Figures 18-19. *Kathina* cf. *subsphaerica* Sirel X30
18-19. Axial sections
Middle Paleocene

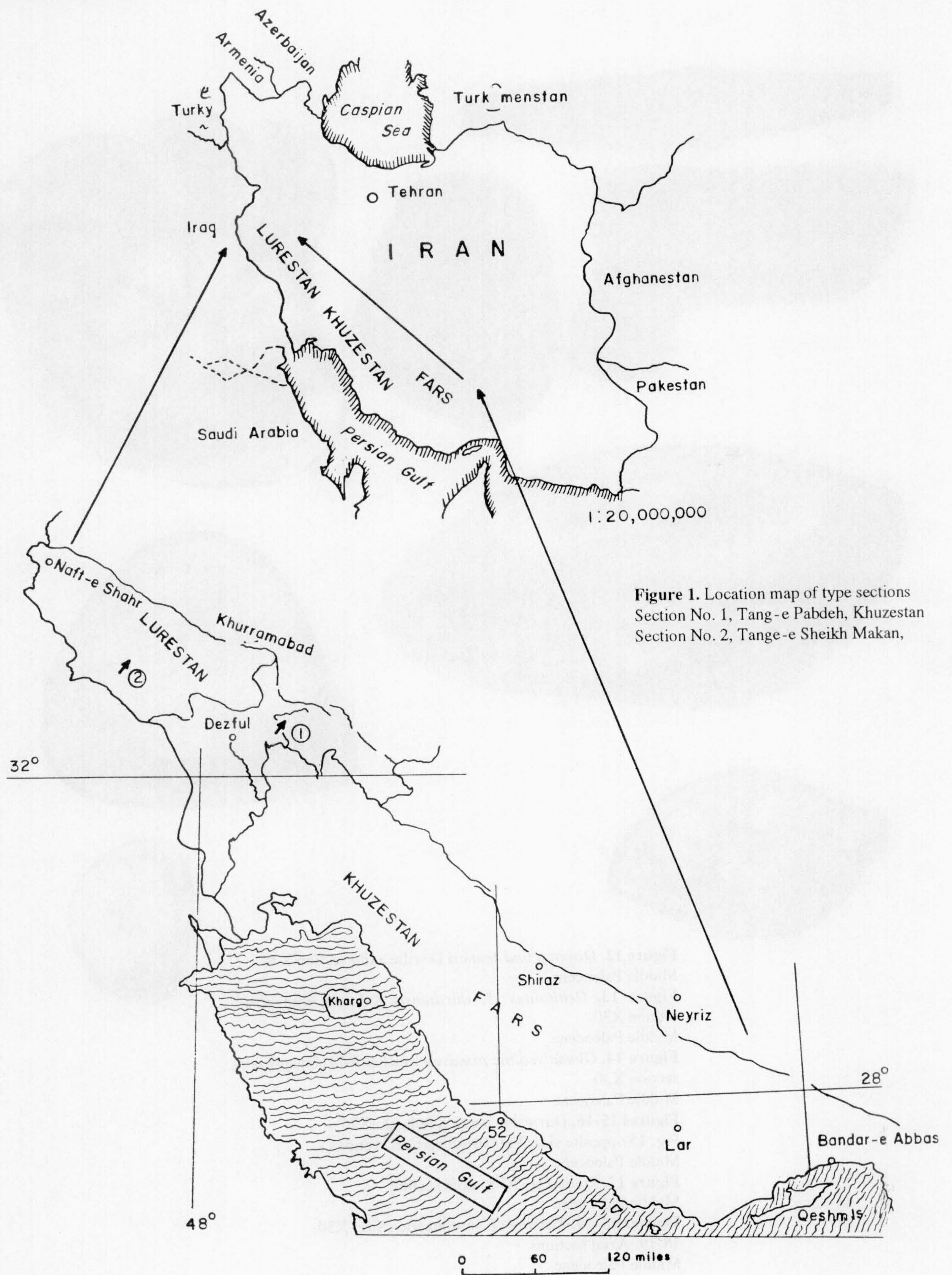
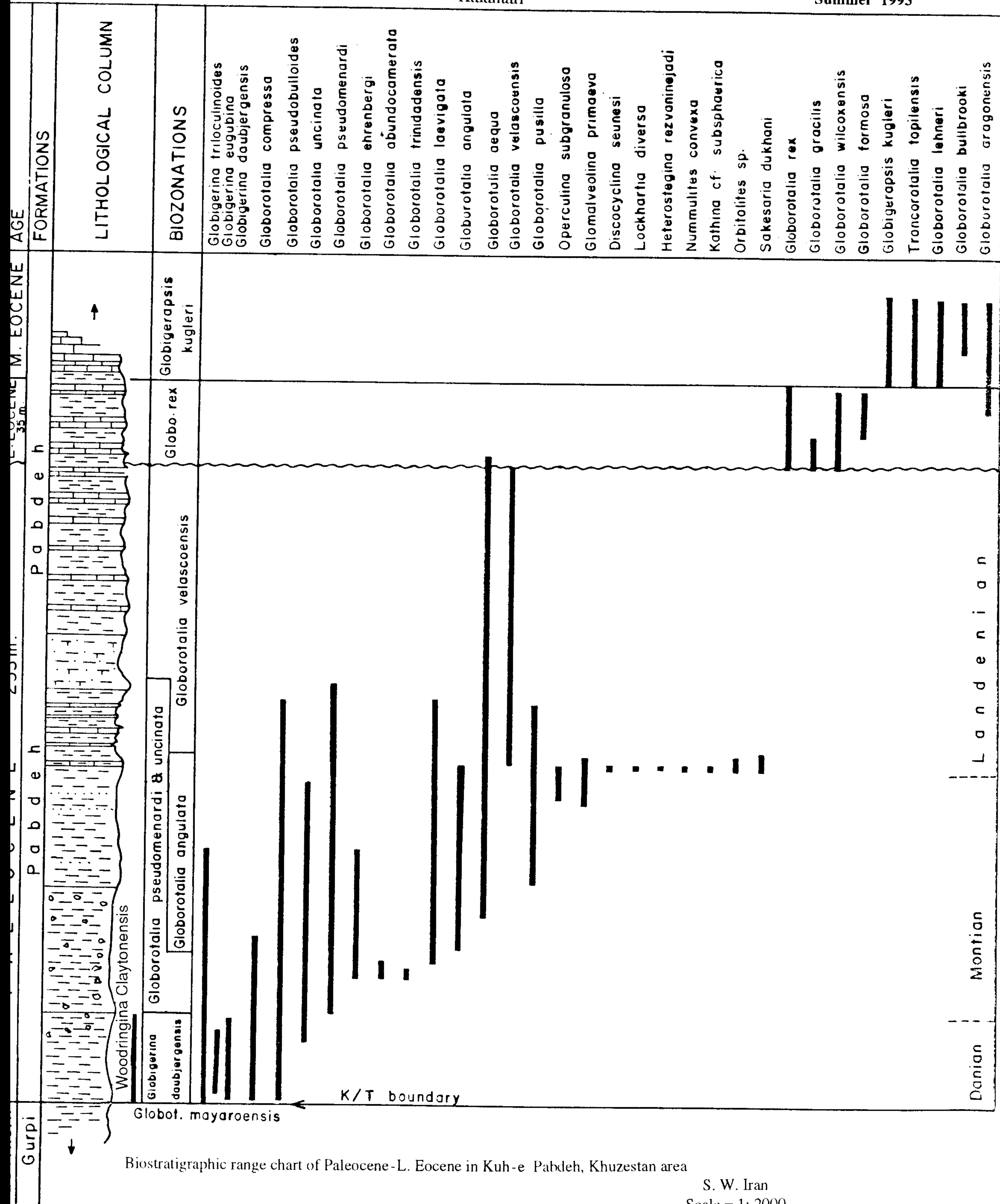
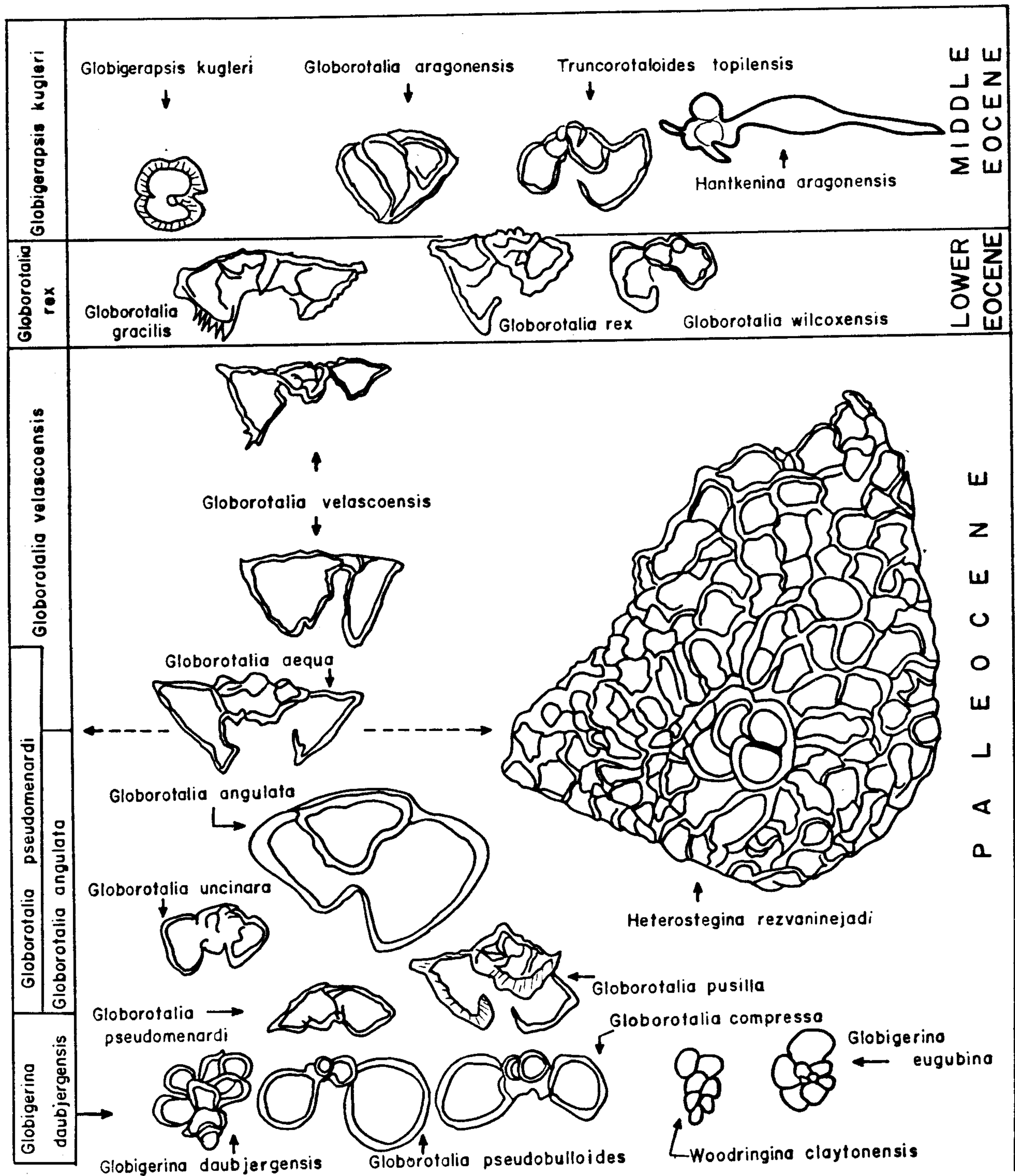


Figure 1. Location map of type sections
Section No. 1, Tang-e Pabdeh, Khuzestan
Section No. 2, Tange-e Sheikh Makan,



Biostratigraphic range chart of Paleocene-L. Eocene in Kuh-e Pabdeh, Khuzestan area

S. W. Iran
Scale = 1: 2000



Biozonations of index Foraminifera throughout Paleocene to Lower -Middle Eocene in Kuh-e Pabdeh, Khuzestan area

S. W. Iran

pseudomenardi and *Globorotalia angulata* of Middle Paleocene.

The attached range chart shows the important paleocene planktonic Foraminifera of the section studied. The recognized forms, from bottom to top are as follows: *Globigerina daubjergensis*, *Globorotalia compressa*, *Globorotalia pseudobuloides*, *Globorotalia trinidadensis*, *Globorotalia uncinata*, *Globorotalia pseudomenardi*, *Globorotalia angulata*, *Globorotalia aequa*, *Globorotalia velascoensis*, *Globorotalia ehrenbergi*, *Globorotalia pusilla* and *Globorotalia laevigata*.

Lower Eocene: This time unit is not well developed and falls in the lower to middle Pabdeh Formation. The Lower Eocene sediments are not more than 32 meters thick in this section as they disconformably overlie the Paleocene sediments. This interval of Lower Eocene, lithologically, consists of grey shale and thin bedded creamy silty limestone in the lower parts, and alternations of olive grey shale with medium bedded grey to creamy limestone in the upper parts. The biozones of index planktonic Foraminifera seem to be incomplete and the age of the Lower Eocene is based upon the presence of *Globorotalia rex*, *Globorotalia gracilis*, *Globorotalia wilcoxensis* and *Globorotalia aragonensis*. (Fig. 2)

***Heterostegina rezvaninejadi* n.sp. A. Kalantari**

Pl.1 , Figures 1-3

Pl.2 , Figures 1-16

Test evolute medium size, composed of about three whorls, greater diameter up to 2.25 mm, small diameter up to 1.72 mm; thickness in area over embryonic apparatus up to about .65 mm.; thickness through flange about 0.18 to 0.22 mm. The embryonic chamber is bilocular with a subcircular initial chamber, followed by a reniform chamber, minimum diameter about 0.15mm; maximum diameter about 0.18 mm. Third and fourth chambers are not subdivided; the successive chambers subdivided into subrectangular chamberlets. The largest specimen consists of about seventeen unfolded bilamellate septa; the secondary septa are complete and nearly straight, but becoming nearly circular at the top, and also some of them take a sudden bend near the margin. Vertical section shows that the test is thickest over the embryonic apparatus.

Remarks: *Heterostegina rezvaninejadi* differs from *Planostegina adamsi* (Emas and Clarke) by having complete secondary septa in three whorls which form complete chamberlets, whereas the posterior lamellae of septa remain smoothly curved and anterior lamellae hump and fold forwards, and then form a rarity of complete chamberlets in *Planostegina adamsi*.

Heterostegina rezvaninejadi also differs from *Planostegina adamsi* by having an older vertical range which occurs in Middle Paleocene, whereas the occurrence of *Planostegina adamsi* is in the late Paleocene.

Type level: Middle Paleocene. Occurred in the upper part of the *Globorotalia pseudomenardi* and *Globorotalia angulata* zones.

Type locality: Type section of Pabdeh and Gurpi Formations in Tang-e Pabdeh Khuzestan area (S.W. Iran). This new species has been recognized in several thin sections by the writer in Sept. 1992.

Type section: Holotype deposited in the collection of the laboratories and geological research of the Exploration and Production group of the National Iranian Oil Company, Tehran, Islamic Republic of Iran.

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