

### XIII. RESULTS OF PRELIMINARY STUDY ON SOME MICROFOSSILS

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Although many of the micro-organisms and microfossils remain undetermined in genus and species under the present phase of investigation, the authors' preliminary observations show that their abundant forms are identified with or similar to the species already known in some DSDP holes. In the following, particular descriptions are given to radiolaria and ichthyoliths, and their main forms are illustrated in Figs. XIII-1—3, together with a few unidentified diatom and mineral grains.

Our preliminary investigation does not include those of the other constituent elements as yet. However, consideration of the occurrence of each form (Chap. X) suggests that the stratigraphic sequence obtained by both grab and corer possibly comprise the Quaternary—Mid-Tertiary sediments and in many cases it represents only those of Mid-Tertiary, although details are still to be elucidated.

#### **Radiolaria**

Radiolaria, one of the main compositional elements, includes both fresh and stained or silicified representatives.

In the fresh radiolaria, typical Quaternary forms such as *Euchitonia elegans* (Ehrenberg), *E. mulleri* Haeckel, *Pterocanium praetextum* (Ehrenberg), and *Hexapyle dodecantha* Haeckel, are found, together with two undetermined species of actinommid, each of which have been reported from the Quaternary sediments in the holes of DSDP by RENZ (1974).

The majority of the stained and silicified radiolaria are too ill-preserved to be determined, but their predominant forms are represented by those of Miocene, *Dorcadospyrus dentata* Haeckel and *Calocyclella costata* (Riedel). They have been considered to be Early Miocene and Early-Middle Miocene species respectively (GOLL, 1972). Also, probable Tertiary forms, *Lithopera* ? sp. and *Carpocanistrum* ? sp. are identified.

#### **Ichthyoliths**

Ichthyoliths have been morphologically classified by DOYLE *et al.* (1974) in DSDP samples. Some DSDP contributions by these authors and others were useful for our determination.

One of the ichthyoliths from the GH76-1 area is represented by a transversely trigono-oval form as shown in Fig. XIII-3-3, and is considered to belong to Type *a2/b2* of DOYLE *et al.* (1974). The specimens have five prominent radiate peaks with dentate on one side and are obsoletely acute opposite side. The peaks seem to be more than in the known forms of the type. So far as known ichthyoliths are concerned, the present form which tends to be restricted to the upper part of grab sample sequence seems to be

similar to some forms of Type *a2/b2* group of Oligocene age (DOYLE *et al.*, 1974, pl. 2B).

The ichthyoliths with long triangle form are rather abundantly distributed in the lower horizons of cores, particularly below the magnetic reversal horizon. They comprise at least three forms.

The first (Fig. XIII-3-2) has a triangle, inclined, constricted shape, and is probably attributed to Type *a9/b6* group of DOYLE *et al.* (1974), being somewhat similar to some of its Eocene-Oligocene forms. The second is somewhat similar to the curved triangle form among Type *a9/b1* group (Fig. XIII-3-3).

The last, which is the most abundant form found in the samples, is characterized by a rather large, high isosceles triangle shape, with a relatively broad base and a nearly straight or slightly curved axis, attaining to 900  $\mu$  in maximum height (Figs. XIII-3-4—6). Morphologically it is very similar to and identified to HELMS and RIEDEL (1971)'s fish tooth Type *D-1* from Eocene-Lower Miocene parts of the Pacific DSDP holes, and also to DOYLE *et al.* (1974)'s Type *a9/b1/c1/d1/e1/f4/g1/h1/i2/j2/k2/l0.2/m2.2/n6/o1/p1* from the Lower Miocene part of an Indian Ocean core.

All the triangle ichthyoliths described above seem to be somewhat similar to existing shark's scales. Although the correlation is not certain as yet, they were tentatively termed shark's scales here for convenience (see Chap. X).

#### References

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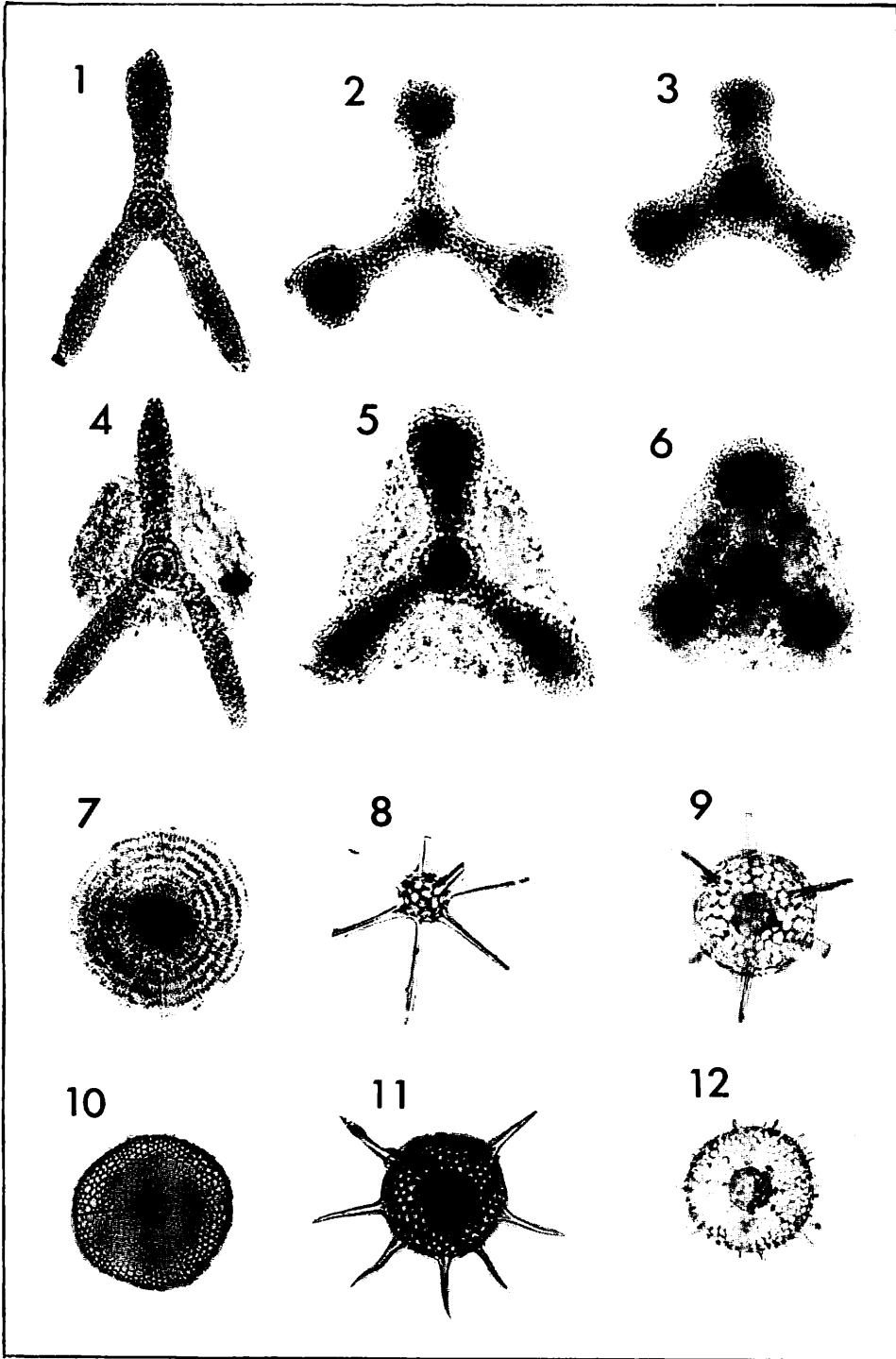


Fig. XIII-1 Fresh radiolarians (1-12).

All figures magnified  $\times 130$ . 1, 4 *Euchitonina elegans* (Ehrenberg). Identified to *Euchitonina elegans* of JOHNSON (1974, pl. 9, fig. 11). 2, 3, 6 *Rhopalastrum* sp. 5 *Euchitonina mulleri* HAECKEL. 7 Porodiscidae (gen. et sp. undet.). 8 Actinommitinae (very similar to Actinommid, 2 gen. and sp. indet. of RENZ (1974, pl. 14, fig. 2). 9 *Haliomma* sp. 10 *Theocalyptra* sp. 11 *Heliodiscus* sp. 12 Aff. *Heliodiscus echiniscus* HAECKEL.

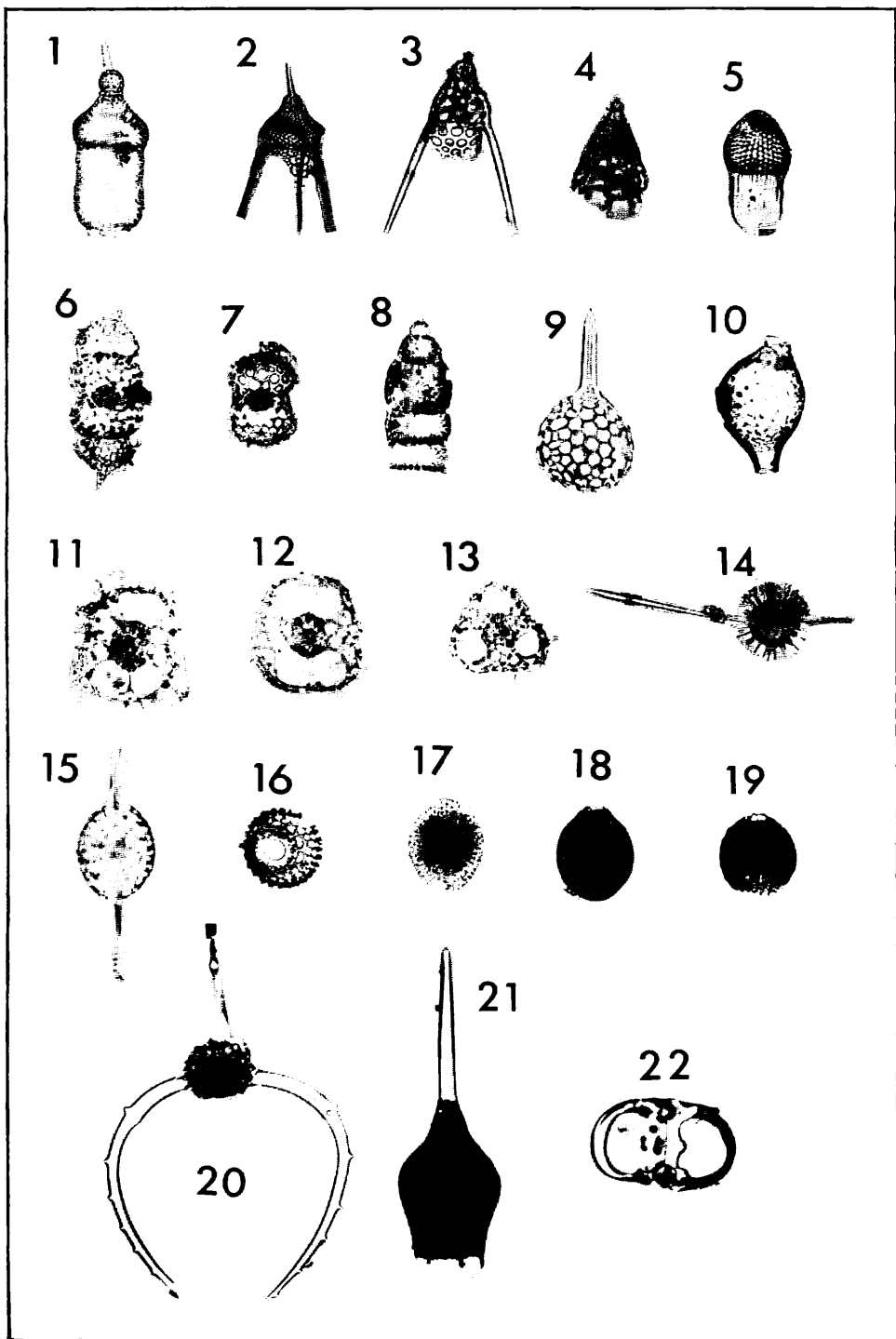


Fig. XIII-2 Fresh radiolarians (1-16, 22) and stained radiolarians (17-21).

All figures magnified  $\times 130$ . 1 Undet. 2 *Pterocanium praetextum* (EHRENBERG). 3 *Dictyophimus* sp. 4 Plectopyramidinae (gen. et sp. undet.). 5 *Carpocanistrum* sp. 6, 7 *Ommatartus* sp. 8 *Stichocorys?* sp. 9 Actinommatainae (gen. et sp. undet.). 10 *Otosphaera?* sp. 11 Actinommatainae (similar to Actinommid, 1 gen. and sp. indet. of RENZ, 1974, pl. 13, fig. 20). 12 Pyloniidae (gen. et sp. undet.) 13 *Hexapyle dodecantha* HAECKEL. 14-17 Undet. 18 *Lithopera?* sp. 19 *Carpocanistrum?* sp. (somewhat similar to a part of *Carpocanistrum* spp. illustrated by RIEDEL and SANFILIPPO, 1971). 20 *Dorcadospyrus dentata* HAECKEL. 21 *Calocycletta costata* (RIEDEL). 22 *Liriospyris* sp.

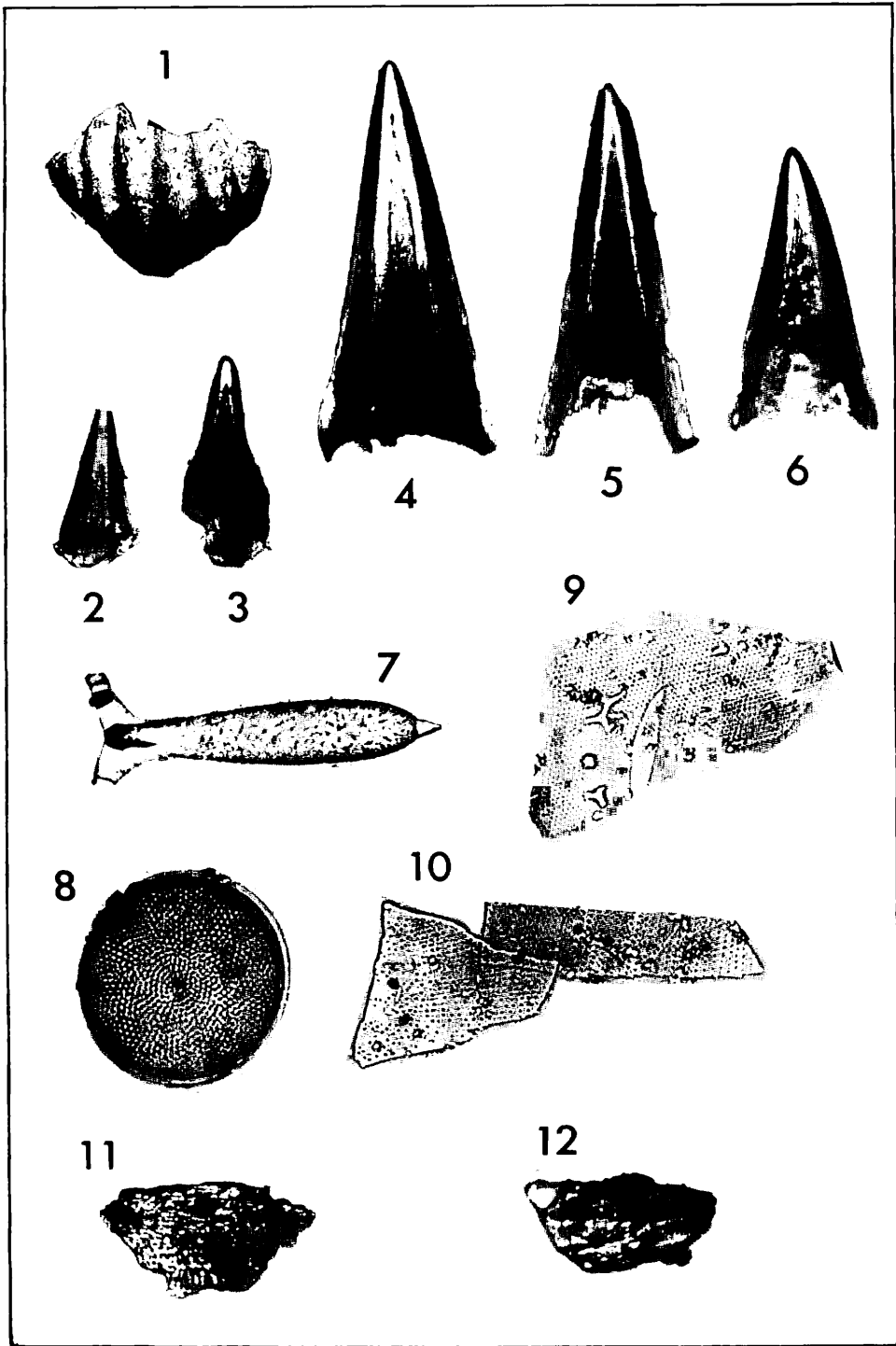


Fig. XIII-3 Ichthyoliths, diatom, and minerals.

Figs. 1-7 and 8-12 magnified  $\times 70$  and  $\times 400$  respectively. 1 Ichthyolith. Identified to Type  $a_2/b_2$  group of DOYLE *et al.* (1974). 2 Ichthyolith. Probably identified to Type  $a_9/b_6$  group of DOYLE *et al.* (1974). 3 Ichthyolith. Probably identified to Type  $a_9/b_1$  group of DOYLE *et al.* (1974). 4-6 Ichthyoliths. Identified to Type *D-1* of HELMS and RIEDEL (1971) and Type  $a_9/b_1/c_1/d_1/e_1/f_4/g_1/h_1/i_2/j_2/k_2/l_0.2/m_2.2/n_6/o_1/p_1$  of DOYLE *et al.* (1974). 7 Undetermined form. 8-10 Diatom (undet.). 11, 12 Mineral grains (undet.).