Review of Calcareous Nannoplankton Investigations

(carried out 1964/72 in connection with the Vienna UNESCO Postgraduate Training Center)

(1 table, 1 plate)

By H. Küpper & H. Stradner

In the years since 1950 contributions on the calcareous nannoplankton were building up fields of research of increasing importance for geosciences. Today they are indispensable as quick tool for stratigraphic investigations of deep sea cores and also as an independent check for age determinations of mesozoic and cenozoic rocks, next to the classical methods of stratigraphy.

Scientific and laboratory facilities in this field were made available to those members of our courses, who wanted to acquaint themselves with this field of study. Moreover a general introduction into this topic was part of the normal programme for all course participants. As for the time being our course venture comes to a conclusion, we like to underline in the following a few facts, which we consider as relevant to be handed on.

The very fact, that nannoplankton stratigraphy was new and is opening new possibilities to approach sample material, which so far has resisted yielding any clues as to its age assignment, was a bond which brought together investigators from Korea, India, Egypt, Argentine on the basis of a common scientific zeal. As seen from the UNESCO-point of view here a basis of transcontinental dimensions was offered by these ultra-minute fossils, which thus promoted common understanding even beyond the science field.

Naturally nannoplankton investigations developed rapidly during the years of our courses in the international field. The ideas of 1970 are different and better documented than those of 1960. Conferences and symposia were marking this progress, thus opening for participating investigators the door to international cooperation and worldwide contacts. This gateway to new scientific and human realms was, what made it highly attractive for teachers and students.

Notwithstanding that in recent years electron microscopy and scanning techniques became desirable working methods, the very roots of the working techniques remained relatively noncomplicated. And this again resulted in a wide and quick dissemination in some countries, where the first steps in this working field were introduced successfully. In this respect we may refer to our colleagues from Egypt, where quite a flow of stratigraphical investigations resulted in new views as to correlations and subdivisions, which before had to be based on less certain considerations.

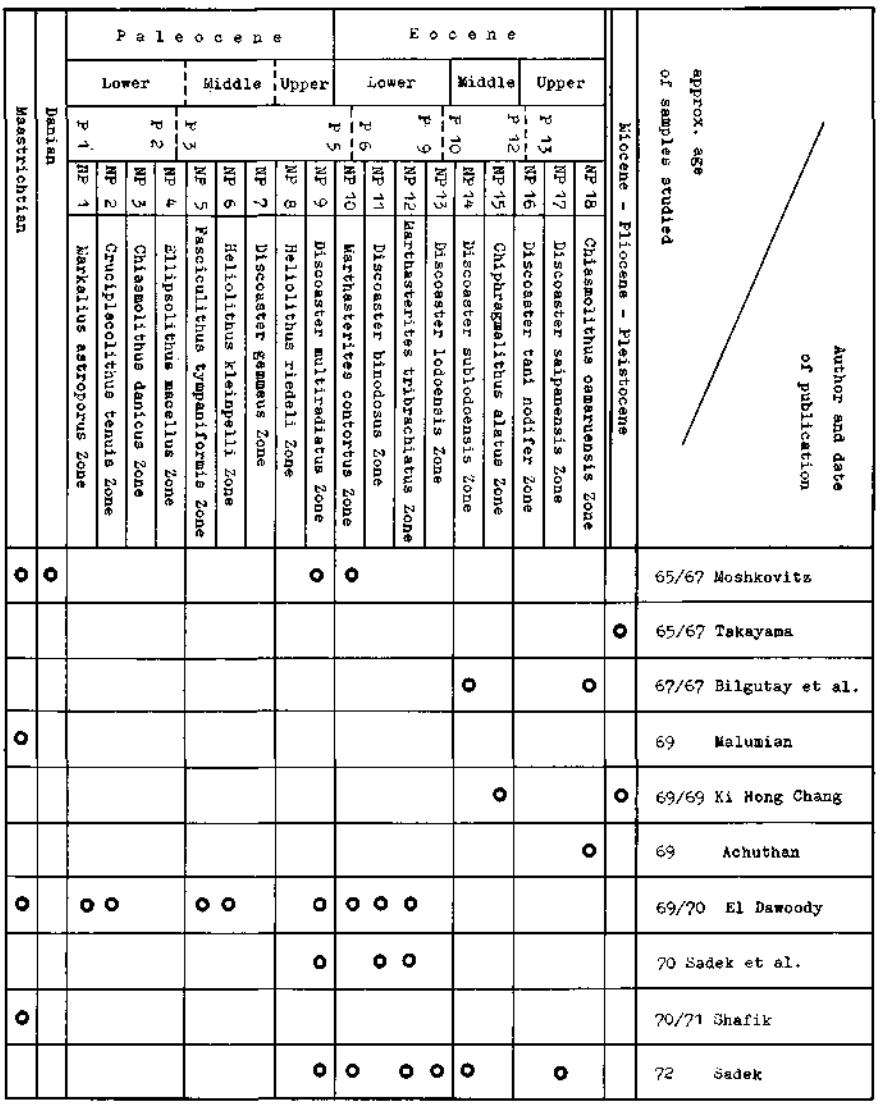


Table 1. Chart indicating which parts of the stratigraphic column were covered by the nannoplankton studies of UNESCO Postgraduate Course participants.

We might refrain from entering into a discussion of scientific results and reasoning. Just to give an impression as to the part of the geological time scale, which was covered by the investigations of the Vienna course members here and abroad, we might refer to the attached table 1. which should give a synopsis of the situation. Likewise plate 1. with electron micrographs of Egyptian Paleocene coccoliths, is to illustrate the type of

morphological studies performed during the last two years by some of our postgraduates; for details see explanation to plate 1. Finally we refer to the enclosed list of publications, to round out this general information.

Concluding we would like to quote a few lines from Professor Ki Hong Chang, Korea, course term 1968/69, which he has written as a general evaluation of his impressions in this field of study:

"the unique, though trivial merit of this study lies in its approach; it is to throw a new stepping stone for coming students of evolution and biostratigraphy, who want to understand the evolving world of life through nannofossils and to define stratigraphical stages according to the well substantiated evolutionary stages of nannofossils. Nannoplankton, respresenting a basic step towards the living things from the inorganic stage of being, might show the fundamental feature of evolution, supposedly exclusive of perplexing details."

References

1965

Moshkovitz, S. (1965): First Report on the occurrence of Nannoplankton in Upper Cret.-Paleocene sediments of Israel. — Verh. Geol. B.-A., S. A 74.

Takayama, T. (1965): First Report on Nannoplankton of Upper Tertiary and Quaternary of the S Kwanto Region, Japan. — Verh. Geol. B.-A., S. A 75.

1966 (these 1966 — contributions were published independently from the course work, still they are generally connected with the Vienna activities of the authors).

Bilal ul Haq, U. Z.: Electron Microscope studies on some Upper Eocene Calcareous nannoplankton from Syria. Stockholm Contributions in Geology, XV : 3.

Pant, S. C., & Mamgain, V. D.: Fossil Nannoplankton from the Indian Subcontinent. — Rec. Geol. Survey of India, Vol. 97/2.

1967

Bilgutay, U., Jafar, S. A., Stradner, H., & Szöts, E. (1967): Calcareous Nannoplankton from the Eocene of Biarritz, France. — Verh. Geol. B.-A., S. A 69.

Moshkovitz, S. (same title as 1965, full report). — Jahrb. Geol. B.-A., Bd. 110, S. 135—168.

Takayama, T. (same title as 1965, full report). — Jahrb. Geol. B.-A., Bd. 110, S. 169—198.

1969

Achutan, M. V., & Stradner, H.: Calcareous Nannoplancton from the Wemmelien Stratotype. — Proc. First. Intern. Conference on Planktonic Microfossils, Geneva 1967, Leiden 1969.

Bilgütay, U., Jafar, S. A., Stradner, H., & Szöts, E.: Calcareous Nannoplankton from the Eocene of Biarritz, France. — Proc. First. Intern. Conference on Planktonic Microfossils, Geneva 1967, Leiden 1969.

Ki Hong Chang (1969): Evolution of Micrantholithus parisiensis Bouché and related species of middle and late Eocene nannoplankton. — Verh. Geol. B.-A., S. A 94.
(same title, full report) — Journ. Geol. Soc. Korea, Vol. 5, No. 2.

El Dawoody, A. S. A. (1969): First report on fossil Nannoplankton from the Duwi range, Quseir Distr. Egypt. — Verh. Geol. B.-A., S. A 95.

Malumian, N.: First report on fossil Nannoplankton from Neuquen, Argentina. — Verh. Geol. B.-A., S. A 93.

1970

El Dawoody, A. S. A.: Stratigraphical and Palaeontological studies on some Cretaceous and Lower Tertiary Sediments in Egypt (thesis, Cairo University, Fac. of Science 1970).

Shafik, S. (1969): The Nannoplankton assemblages of the Maastrichtian of the Red Sea Coast, Egypt. — Verh. Geol. B.-A., S. A 103.

Sadek, A., & Abd El Razik (1970): Zonal Stratigraphy of the Lower Tertiary at Gabel Um El Huetat, Red Sea Coast, by means of Nannofossils. 7th Arab. Petr. Congr. Paper 51 (B-3).

1971

Shafik, S. (1971): Nannofossils from the Eastern Desert Egypt. — Jahrb. Geol. B.-A., Sb. 17, S. 69—104.

1972

Sadek, A. (1972): Nannofossils from the Middle Upper Eocene Strata of Egypt. — Jahrb. Geol. B.-A., Sb. 19 (in print, this issue).

PLATE 1.

Transmission electron micrographs of *Prinsius bisulcus* (STR.) HAY & MOHLER.
These coccoliths were studied in detail by Dr. A. S. A. EL DAWOODY and the co-author during an investigation of Upper Paleocene nannoplankton from the Upper Esna Shale in the Gebel Duwi, Quseir District, Egypt (UNESCO Postgraduate Course 1969/70).

Fig. 1. *Prinsius bisulcus* (STR.), distal view showing the distal outer shield, the two crystal-cycles of the inner wall and the central area with six pores. Magnification: 10,600 ×.

Fig. 2. Distal view of coccolith with more complicated central area. Magnification: 16,000 ×.

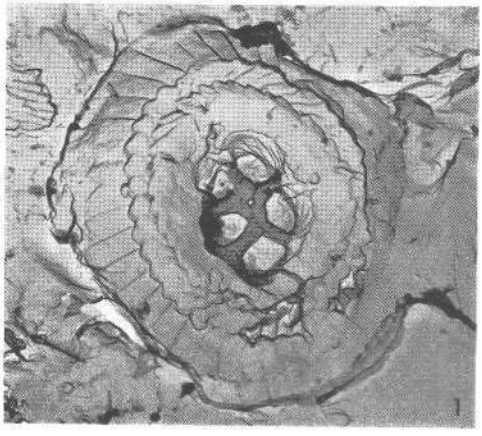
Fig. 3. Distal view of coccolith with central area perforated by two cycles of pores. Magnification: 16,000 ×.

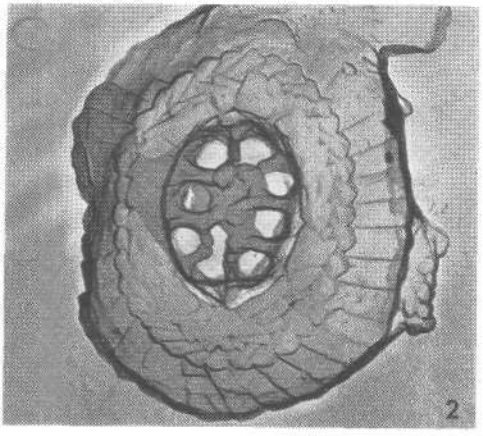
Fig. 4: Distal view of coccolith with central area partly closed by the second, inner wall. Magnification: 10,600 ×.

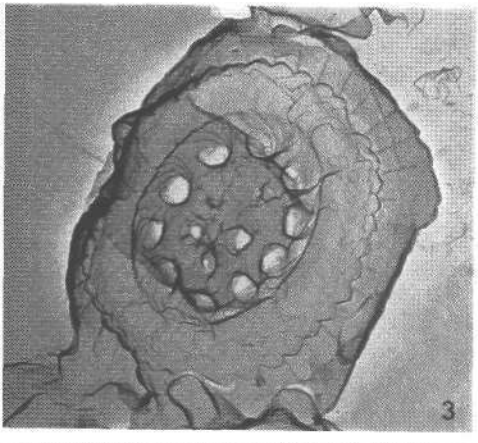
Fig. 5. Proximal view of a coccolith with only four perforations of the central area. Magnification: 11,700 ×.

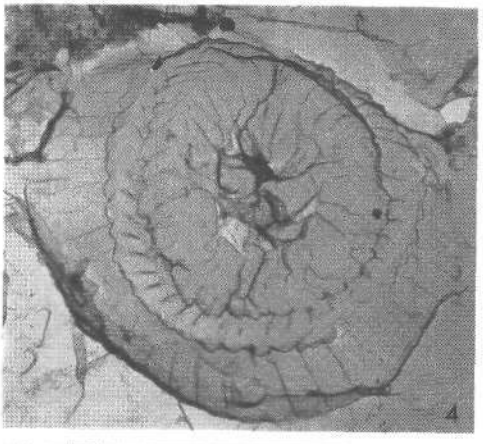
Fig. 6. Proximal view of a coccolith showing both proximal and distal shield and six perforations round a central knob. These perforations do not seem to reach the distal side of the coccolith, which there apparently is closed by cover plates. Magnification: 10,600 ×.

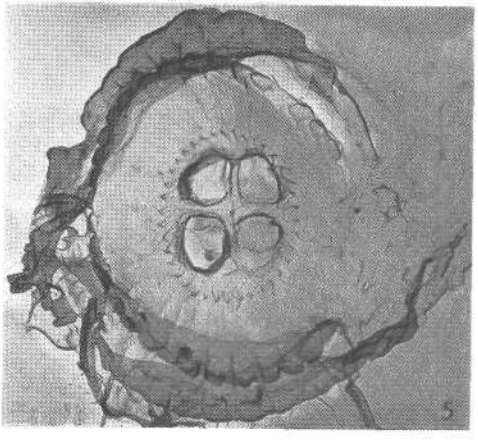
Instrument: SIEMENS Elmiskop I of the College for Veterinary Medicine, Vienna.

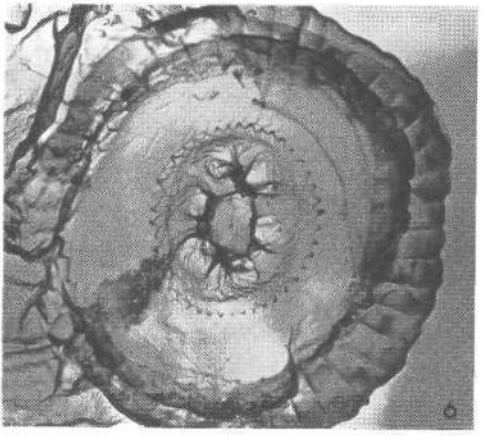

1


2


3


4


5


6