critical remarks on the derivation of the specimens encountered. The majority of nannofossils in that sequence of samples is reworked from older strata (Lower Cretaceous, Upper Cretaceous, Paleocene and Lower Eocene) and reassorted. The stratigraphic value of those species which are considered to be authochthonous is discussed and the variation of these species is studied. *Discoaster lodoensis* and *Chiasmolithus grandis* are characteristic for the Lower Lutetian, *Chiasmolithus oamaruensis* and *Discolithina macropora* for the Bartonian of that section.

A New Contribution to the Oligo-Miocene Stratigraphy of Egypt by Means of Miogypsinids

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Abstract

Little attention has been paid so far to the study of the Miogypsinids in Egypt. This research involves the investigation of the samples containing the Miogypsinids from Gebel Homeira area (Cairo-Suez District).

The arrangments of the nepionic chambers were used for specific determinations. *Miogypsina tani* DROOGER and *Miogypsina cushmani* VAUGHAN are described and illustrated. The microfauna accompanying the *M. tani*-assemblages, which are considered to have stratigraphic or paleoecologic values, were recorded.

For the first time from Egypt the Aquitanian is recorded on account of the presence of *M. tani* DROOGER.

The investigated Miocene section is divided into five biostratigraphic units, namely *Operculina-Scutella Zone* (probably Aquitanian), *Miogypsina tani Zone* (Upper Aquitanian), *Oyster Zone* (probably Burdigalian), *Miogypsina cushmani Zone* (Lower Helvetian) and *Algae Zone* (Vindobonian). These units are introduced with a discussion on their age assignments.

Investigations on *Nummulites clipeus* NUTTALL, 1925 from Dunbar Antieline (West Pakistan)

By M. AHSUN ULLAH KHAN

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Abstract

Out of the Dunbar Anticline (Nari Formation, Baluchistan, West Pakistan) *Nummulites clipeus* NUTTALL 1925 is described. Measurements and figures show the taxonomical items.

With help of this Nummulite it was possible to determine the age of the reddish-brown argillaceous limestone as Oligocene.

The Geology and Petrology of the (Low-Grade Metamorphic) Rocks of the Hoppl Area in the Birkfeld District (East Styria)

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Abstract

The metamorphites of the Hoppl area in the Birkfeld district consist of low grade metamorphosed gneisses, schists, quartzites and the related rocks, which were later invaded by the

minor scale intrusive granophyric granite of probably pre-Alpine age. In the coarse-grained gneiss (grobgneiss) has occurred a 'curious' rock which has been fully described in the adjoining paper by one of the writers as a 'pseudoamphibolite', with hornblende, plagioclase, quartz and mica as the main mineral constituents; zircon and sphene are the notable accessory minerals. The coarse-grained gneisses are granitic in composition, and have quartz, alkali feldspar, plagioclase and mica as the principal minerals. The phyllitic mica schists are essentially quartz-muscovite rocks. The quartzites are arkosic with often detrital crystals of calcite.

The general geology and field relationship of these rocks are fully discussed. Their petrogenesis is described, it is advanced that the whole metamorphic rock series represents products of a polymetamorphism. Metamorphie conditions during the Hercynian orogenesis reached the order of amphibolitic facies, so that the augen gneisses, amphibolite and schists belonging to such facies were formed. The subsequent retrograde metamorphism affecting these rocks during the Alpine orogenesis has given rise to the present metamorphic rock series. It is therefore advanced that the coarse-grained gneisses were derived from the felspar augen gneiss (the latter nevertheless may have been derived from the post-Hercynian granites — WIESENEDER 1961), and the pseudo-amphibolite was formed from the amphibolite (of the Hercynian metamorphic series).

Geological studies on the Northwestern Part of Birkfeld Area (Austria)

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Abstract

Semmering Quartzite of Fischbach Window (Southwestern Part): The exposed bedrocks of the semmering quartzite are related to the basement of the Lower Austro-Alpine Zone of the Upper Permian-Lower Trias. These rocks generally striking NW—SE, dipping SW direction.

Quartz predominates the muscovite and feldspar. Shearing and crushing, with undulatory extinction of quartz, are related to the post crystalline deformation. The feldspars are mostly from the grobgneis series (H. WIESENEDER 1961). Mosaic texture is developed in the rocks, sometimes schistosity, and unequigranoblastic textures are prominent in the rocks. The presence of mica in the quartzite rocks in the form of minute needle shaped crystals, is due to presence of alluminium silicates in the original sandstones undergone low-grade metamorphism.

Grobgneis Series: The grobgneis series corresponds to the Paleozoic granitic plutons, which has undergone moderate-grade metamorphism, dnring the Alpine time (H. WIESENEDER 1967). These rocks generally striking N—S, NE—SW, E—W direction. The rocks are related to amphibolite facies. The series is represented by the following main rock types:

1. Quartzo-felspathic schist.
2. Chloritized-almandine garnet-mica schist.
3. Albite-epidote amphibolite.
4. Tourmaline quartzite rocks.

Thick platty microcline crystals of diam. 1,5 cm in length are recognized, forming lenses of the augen („eyed") structure. Sharply crosshatching of microcline with perthitic texture are noticed, sometimes with prominent schistosity.

The x-ray diffraction method was used for the determination of the degree of triclinity of the potash feldspars, also the orthoclase content of the unmixed phase in the Grobgneis rocks. The degree of triclinity is $\triangle = 0{,}92$, and the percentage of orthoclase is 88,8.