Type species: *Meyeripollis naharkotensis* sp. nov.

Holotype: Meyer, 1958, pl. 1, figs, 4 & 5.

Type locality: Sediments assignable to Middle Oligocene, Naharkotiya Oil field, Assam, India.

Other illustrated specimens:

1. Gemmate syncolpate pollen—Baksi, 1962, pl. 3, figs. 37 & 38.
2. *Nonaperrturites evansii* Biswas, 1962, pl. 1, fig, 22.

Diagnosis: Triangular 26–40 μ; with rounded angles and prominent convex sides, angles distinguished by the presence of two large tubercles or gemmae on either side; polar compression more than equatorial ones. Trisyncolpate colpi often obscured by the ornamentation. Colpi meeting at distal pole giving the appearance of a trilete mark. Exine ornamented with gemmae, tubercles and verrucae of different sizes, broad prominent gemmae present at the angles of the pollen and at distal pole.

Named after Dr. B. L. Meyer of the Shell Oil Company, who first recognised this type from the Assam Oil fields of India.

Stratigraphical range: Upper Eocene—Miocene.

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A NOTE ON OCCURRENCE OF GRAYWACKE-SLATE COMPLEX IN THE ARAVALLI SYSTEM OF SOUTHERN BANSWARA DISTRICT, RAJASTHAN

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Much of the phyllites, phyllitic slates, slates and flagstones described by Gupta and Mukherjee (1938) as constituting the argillites of the Aravalli System of this southern district of Rajasthan are in fact regionally metamorphosed low grade facies of rhythmically interbedded graywackes and shales, which are well exposed in the sections of the Anas river and its tributaries. The rocks are found to extend into the adjacent Panchmahals district of Gujarat State.

The area which has been mapped by the authors largely on scale 1 : 31,680 and also partly on 1 : 63,360, using aerial photographs and toposheets respectively, fall in between Lats. (N) 23°03′ and 23°22′ and Longs. (E) 74°15′ and 74°30′. The Aravalli sequence as deduced by them is as follows:

Rhythmically interbedded (meta-) graywackes and slates (flysch facies).

Graywacke conglomerate (polymictic) with intimately associated discontinuous bands of dolomite and very subordinate metabasics.

Phyllite with associated low-grade manganese ore (banded), impersistent siliceous dolomite and bedded quartzite.

Quartzite, current bedded.

Arkose, schistose grit and conglomerate.

Though the true thickness of the formations are indeterminable because of folding and consequent deformation of the relatively incompetent layers, if areal spread is considered, the argillites constitute the dominant portion of the geological column.

The graywacke rhythmites are best exposed in the nala and stream sections and give rise to monotonous rolling landscape with poor outcrops. Passage from a true phyllite or mica schist to graywacke rhythmite is transitional.

The Aravallis have undergone a low grade regional metamorphism equivalent to green schist facies. Though the original bedding is transposed into simple upright to tightly appressed isoclinal and plunging folds, it is yet the most prominent mesoscopic feature along which the alternate psammitic and pelitic *layers are sharply divisible. Secondary foliation are the slaty and fracture cleavages in them respectively.*

By counting the thickness of individual layers it is found that the graywacke/shale ratio is about 1 : 4 to 1 : 7. The graywacke beds are rather massive and vary from 2 to 35 cm in thickness. The shale laminites are considerably thicker. The graywackes are devoid of current bedding, but display a graded variation in grain size from very coarse to fine. The hieroglyphs on the bedding surfaces of the psammites are poorly recognizable; but at many places they resemble more closely load casts and flute casts than any other thing. The bedding plane features are mostly obliterated or rendered unrecognizable due to development of slaty and shear cleavage at very acute angle to bedding. Penecontemporaneous deformation in the laminites are present but not common. In one instance 'rolls' and 'balls' of the graywacke are caught up in the laminated layers a few centimetres below the overlying arenaceous bed.

Occasionally in some arenaceous beds one graded layer is succeeded by another graded layer to the complete exclusion of the pelite band. In other instances, which are none too frequent, size gradation is haphazard or no gradation exists across the thickness of the individual sandstone bed. Lenticular beds of pebble conglomerate 10 to 30 m thick are found at places below the graywacke units.

The graywackes are grey to dark grey in colour and have almost a gneissic appearance on weathered outcrop with sub-parallel arrangement of biotite flakes, barring the fact that clastic nature of the constituents are very clear. The rocks are composed of angular to subangular grains of quartz, felspar, biotite, chlorite and muscovite. Secondary biotite is distinguishable by porphyroblastic growth. Magnetite is almost ubiquitous. The pebbles occasionaly found in the graywackes are quartzite (gray and banded), vein quartz and infrequently schists. From visual comparison, matrix is nearly of the same composition as the coarser fraction, but two to three grades finer by Wentworth's scale. The graywackes commonly react with dilute hydrochloric acid, indicating presence of rhombic carbonates.

Under the microscope the carbonates appear as anhedral grains, sometimes arranged in bands and also form micro-veins. Part of the carbonates may be detrital in the rocks. Less frequently the phyllites are also somewhat calcareous.

The graywacke of the area represent a flysch type of sedimentation in an active tectonic belt. That the deposition was not related to fluvial action which may have contributed its load, is evident from the absence of current bedding which is displayed in the orthoquartzites further below in the sequence. Absence of ripple-marks points to deposition below wave base. The rhythmites, therefore represent turbidites. Turbidites of flysch type in the Aravallis have been first reported from Udaipur area, Rajasthan (Poddar and Mathur, 1964). The rhythmites of Banswara area differ from that of Udaipur area by absence of volcanic association. The difference is assignable to locales of sedimentation in the geosynclinal belt. That the commencement of flysch sedimentation was heralded by a major catastrophic episode is borne out by the bed of polymictic conglomerate with largely subangular pebbles and boulders of white, grey and banded quartzite, mica schist, graphitic schist, granite gneiss and vein quartz. Occurrence of pebble conglomerate within the flysch series represents sub-aqueous slumping as one of the causes of generation of turbidity currents.

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GERMANIUM AND OTHER MINOR ELEMENTS IN THE COALS OF UMARIA, M.P.

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The pioneering work of Goldschmidt and his coworkers in early thirties on the association of minor elements in the coal ash, and the post-war demands of germanium in electronic industry stimulated systematic research investigations in different parts of the world for the commercial sources of this rare metal. Though occasionally very high concentrations of germanium have been reported in some coalfield logs and isolated pieces of woody coal, most of the world coals contain less than 0.01% of the element. In India, Mukherjee and Dutta (1948) and Ganguli and Dutta (1956) reported the occurrence of germanium in varying concentrations in coals of Assam, Bihar and Hyderabad coalfields.

The two workable coal seams—No. II and No. III—from the Barakar coal measures and coal occurring in supra-Barakars of Umaria, Sahadol District, M.P.,