this experiment that amino-acids are excreted by plants in their early growth period whether they are grown in dark or in alternating darkness and light.

Ranchi Agricultural
College, Kanke, Ranchi, Bihar, November 22, 1966.


TERTIARY BEDS OF KANOJ-SEHE AREA, WESTERN KUTCH

This note records the first occurrence from India, of two genera of planktonic Foraminifera of the family Orbulinidae. Two new species have been recorded. The Tertiary rocks of Kanoj-Sehe area, Western Kutch, are being correlated with standard section from India and abroad.

Systematic collections and geological mapping were carried out in an almost continuous section of the Tertiary strata exposed in the Kanoj-Sehe stream passing near the villages of Kanoj (23° 41' : 68° 35') and Sehe (23° 39' 47'' : 68° 31' 35'') in the vicinity of Narainsarowar (23° 41' : 68° 32') in Western Kutch. The beds have a low dip of about 2° to 3° towards northwest.

Stratigraphical and palaeontological work on the Tertiary rocks of Kutch has been carried out by several geologists. Among important stratigraphic workers mention may be made to Carter, Wynne, Grant, Nuttall, Tewari and Biswas. The following sequence of beds has been observed in the Kanoj-Sehe stream section:

Bed 6. Yellow and cream-coloured limestones, sandy clays and brown sandstones, which are about 50' to 55' in thickness containing Spirocyclus ranjanae, Miogypsinoidea dehaarti, Alveolinella sp., Austrotrillina howchin, and Bryozoans and Corals.

Bed 5. Green mudstones and shales with intercalations of hard foraminiferal limestones. The bed is about 60' in thickness and has yielded Nummulites intermedius, N. clipeus, N. subclipeus, N. achteli, Linderina cf. kutchensis, Lepidocyclus (Eulipidina) dilatata, Anomalina strata, Gypsina globulus besides Molluscs, Echinoderms, Bryozoans and Corals.

Bed 4. Cream-coloured limestones and greenish shales characterised by the abundance of glauconite and presence of higher percentage of iron minerals. The bed measures about 30°-35' in thickness and has yielded various reticulate Nummulites, Heterostegina sp., Gypsina globulus and Archias sp.

Bed 3. Soft yellowish foraminiferal marl with abundant Alveolina elliptica. The bed is about 35' in thickness and contains typical larger Foraminifera of the Kirthar Stage together with Carpenteria sp. and Spiroloculina sp. Specimens of Globigerina and Globigerinatheka have not been met with.

Bed 2. Somewhat yellowish-white compact foraminiferal limestones measuring about 125' in thickness. The bed contains, besides characteristic larger Kirthar Foraminifera, Globigerinatheka kutchensis, Globigerina praebulloides occulta, G. angustiamblicata, Globorotalia (Turborotalia) increbescens, Cibicides lobatus, Rectoconoides sp., Cycloloculina annulata.

Bed 1. Cream-coloured compact foraminiferal limestone weathering into dirty white soft bed. It is about 55' in thickness and contains in addition to regular Kirthar Foraminifera, Globigerinopsis indica, Globorotalia (Turborotalia) centralis, Globigerina yeuguensis pseudovenezuelana.

Out of these, Bed No. 1 is referable to Lutetian on account of the presence of Globigerinopsis indica n. sp. and Globorotalia (Turborotalia) centralis, Globigerina yeuguensis pseudovenezuelana. The Bed No. 2 may be assigned to the lower part of the Auverrian on account of the presence of Globigerinatheka kutchensis n. sp., which is restricted to Globigerinopsis semi-involuta zone of Southern Trinidad and Lindi area (E. Africa, Banner and Blow et al.). The Bed No. 3 which is conformable to the preceding bed has comparatively a poor assemblage and could represent the upper part of Eocene, may be the upper part of Auverrian. In view of this, the Bed Nos. 1 to 3 have been referred to the Kirthar Stage (Mid. Eocene) and overlie unconformably the Deccan Traps.

The Bed Nos. 4 and 5 which are conformable with each other and overlie the Kirthar beds.
unconformably are together referred to the Nari Stage. The Bed No. 4 can be referred to Lattorian on account of the presence of abundant reticulate Nunnulites and Heterostegina and the absence of Lepidocyclina (Eulepidina) dilatata. While the Bed No. 5 which contains in addition to reticulate Nunnulites, Lepidocyclina (Eulepidina) dilatata in abundance, could thus be assigned to Rupelian.

The Bed No. 6 which overlies unconformably the preceding bed has yielded typical Aquitanian assemblage and is referred to the lower part of the Gaj. Beds referable to Chattian age seem to be absent in this region.

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**RYOLITE AND ALKALI BASALT FROM THE SYLHET TRAP, KHASI HILLS, ASSAM**

The Sylhet Trap, occurring in the southern part of the Shillong plateau in Assam, has previously been described as mostly basalts with intercalated tuff beds; Palmer (1923) described andesites from the western part of the Khasi Hills. Studies during systematic mapping in 1965-66 in the Dwara and Umiew gorges, in toposheet No. 78 0/12, have led to the discovery of rhyolites and alkali basalts in addition to basalts and acid tuffs; the area, lying east of Palmer's, does not show andesites. The 600 m. of bedded lava, exposed in the gorges, can be grouped into: (a) the lower basaltic group (300 m.), (b) the middle group of megaporphyritic alkali basalts, rhyolites and acid tuffs (150 m.), and (c) the upper basaltic group (90-150 m.).

Basalts of the Sylhet Trap can be grouped into (1) massive trap with or without amygdules and (2) amygdaloidal trap with abundant amygdules passing into a scoriceous type. Texturally, the traps vary from tachylite through basalt to dolerite. In thin sections, the basalts show labradorite, augite, opaques, glass, rare pseudomorphs of olivine, needles of apatite and secondary minerals. The rocks are mostly microphenocrysts, phenocrysts of labradorite dominating over those of augite. Phenocrysts define the porphyritic and glomerophytic texture; the groundmass shows byaline, interstitial, intergranular, sub-ophitic and ophitic textures.

Alkali basalt, in hand specimens, shows megaphenocrysts of bottle green, vitreous euhedral pyroxene (up to 1 cm. in length) with preferred flow orientations set in a greyish green aphanitic base. In thin sections, the rock consists mostly of phenocrysts of clinopyroxene (diopsidic augite) showing occasional oscillatory zoning and a few altered and resorbed hornblende crystals in a micro-crystalline groundmass. The groundmass consists of microclasts of a pleochroic (in shades of yellowish green) clinopyroxene (aegirine-augite?) showing occasional flow textures, a few anhedral, pleochroic in green, highly birefringent clinopyroxene (may be aegirine), euhedral nepheline (mostly square and rectangular, rarely six-sided) magnetite and interstitial isotropic patches of a felspathoid (analcite?). Plagioclase is totally absent and the rock closely resembles nepheline of the alkali basalt family.

Rhyolites consist of phenocrysts of embayed alkali felspar (some grains crypto- and microperthitic), altered oligoclase, wrecks of original quartz, fayalite pseudomorphs, decomposed biotite and magnetite in a microcrystalline base. Two distinct types of rhyolite are recognised, the difference being in the nature of the base. One type shows a groundmass with well developed flow structure defined by minute iron ore granules and abundant lens-shaped amygdules. Spherulitic structure in this type is shown by a brown, weakly birefringent, fibrous indeterminate mineral mostly bordering the phenocrysts. The other type is non-spherulitic with a devitrified microfelsitic base.