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MICROPALAEONTOLOGICAL EXAMINATION OF ROCK SAMPLES FROM THE UPPER SEPIK-AUGUST RIVER AREA, NEW GUINEA

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A collection of 49 samples was submitted for micropalaeontological examination by Enterprise of New Guinea Gold and Petroleum Development N.L. These samples consisted of greywackes, detrital limestones, siltstones, mudstones and pebbly conglomerates. Age determinations have been difficult because of poor faunal assemblages which often contains only a few planktonic forms. The most interesting samples were AA.44 from the Mountain Gate Section which contained tests of Eulepidina and numerous Miogypsinoides and AA.100 from the section west of Sepik River at 4°30'S Latitude which contained a mixed assemblage of Upper Cretaceous and lower Tertiary species.

Stratigraphical columns were supplied by the Company indicating the position of some of the samples. A locality map was also supplied on which the majority of samples were shown. However, AA.144, 178 and 182 were not marked either on the map or column, AA.109, 110, 137, 138, 140, 161 were on the map but not in the columns, and AA.43, 48 and 103 although shown in the columns, were not received.

Details of the micropalaeontological examination are given below.

A. "Mountain Gate" Section on west side of Schultze's Anabranch of the Sepik River.

Ten specimens were examined from this section which is shown as having a thickness of 3,200 feet. The specimens, arranged in upward stratigraphical sequence, are AA.45, 42, 44, 162, 163, 165, 166, 167, and 168. AA.48, marked immediately above AA.45 and AA.43 and indicated as being on a similar horizon to AA.42 and AA.44, was not present in the collection. The rocks are greywackes and detrital limestones, and are capped by volcanics, which immediately overlie sample AA.168.

A detailed description of the samples is given below.

AA.45, at the base of the section is a greywacke which contains the following calcareous algae and foraminifera:

Plantae

Lithothamnium spp.
Halimeda sp.

Foraminifera

Amphistegina sp.
Cycloclypeus sp.
Lepidocyclina spp.
cf. Eulepidina
Small foraminifera indeterminate

The age of the rock is probably "f_1" stage.

AA.42, 44 and 162 are detrital limestones which were collected from the same horizon.

AA.42

Foraminifera:

Amphistegina sp.
Flosculinella globulosa (Rutten)

Small Lepidocyclina indeterminate
Fragment of Miogypsina
Operculina sp.

AA.44 contained numerous foraminifera especially Lepidocyclinae and Miogypsinae

Foraminifera:

Cycloclypeus sp.
Carpenteria cf. alternata Chapman and Crespin
Lepidocyclina (Eulepidina) papuaensis Chapman
Lepidocyclina (Eulepidina) cf. insulaenatalis Jones and Chapman
Lepidocyclina parva Oppenorth
Lepidocyclina cf. dehiscens Scheffen
Lepidocyclina verbeeki Newton and Holland
Lepidocyclina cf. robusta Scheffen
Lepidocyclina sumatrensis (Douville)
Miogypsinoides dehaartii (Hanzawa)
Miogypsinoides sp.nov. (common)
Miogypsina cf. borneensis Tan
Miogypsina cf. cushmani Tan

AA.162 contained poorly preserved foraminifera including small indeterminate Lepidocyclina and Globigerina spp.

It is difficult to decide whether these detrital limestones belong to "e" stage or are "f" stage with derived "e" stage forms. The preservation of the large tests of L.(E.) papuaensis, the test of Flosculinella globulosa and the numerous tests of Miogypsinoides (all typical "e" stage forms) suggests that they may be indigenous to "e" stage rocks. Smaller species of Lepidocyclina typical of "f" stage rocks are also present but these are also found in "e" stage limestones. Several thin sections of AA.44 have been cut from the small sample available to assist in solving this problem, but no definite conclusion could be reached.

AA.163, 164, 165, 166, 167 and 168 are greywackes containing poorly preserved foraminifera. The species recognised in these specimens are as follows:

Cibicides mundulus (Brady, Parker and Jones)
Globigerina baroemoenensis Le Roy
Globigerina bulloides d'Orb.
Globigerinoides trilobus (d'Orb.)
Lepidocyclina sp. (in AA.166).

It is difficult to give a definite age to these greywackes because of the poorly preserved foraminifera. There is no reason to doubt that the test of Lepidocyclina is indigenous to the rock in which case the greywackes are probably "f" stage. The Globigerinidae occur throughout the Tertiary in association with diagnostic benthonic forms and it is difficult to establish a precise age on these forms along.

B. Section West of Sepik River at 4°30'S Latitude

Samples from this section, arranged in upward stratigraphical sequence, are AA.93, 94, 95, 96, 97, 99, 100, 103, 104, 105, 106, 108 and 107. The rocks consist of conglomerate, calcareous greywacke, mudstone, sandstone and pebbly conglomerate.

AA.93 at the base of the section, is a greywacke in which the foraminifera are so poorly preserved as to be indeterminate.

AA.94 is a calcareous greywacke containing a few distorted tests of foraminifera including Cyclammina sp. and Glomospira charoides. The latter species is widely distributed in lower Tertiary deposits.

AA.95, 96 and 97 are unfossiliferous greywackes.

AA.99 and 100 are mudstones which contain abundant derived Upper Cretaceous foraminifera together with lower Tertiary forms.

The Upper Cretaceous species are:

Globotruncana cf. citae Bolli
Globotruncana cf. contusa Cushman
Globotruncana sp.
Marssonella oxycona (Reuss)
Pseudotetularia sp.

Lower Tertiary (Palaeoecene) forms are:

Globorotalia cf. membranacea (Ehrenberg)
Globigerina finlayi Brotzen
Bolivinella sp. nov.

The Upper Cretaceous assemblage is typically Maastrichtian. The lower Tertiary species belong most probably to the Palaeocene. The general Bolivinella and Globorotalia are not known to appear before the Palaeocene (lower Tertiary). These rocks are most probably of Palaeocene age.

AA.104 is unfossiliferous.

AA.105 is a greywacke containing fragments of Inoceramus prisms as well as poorly preserved arenaceous species of foraminifera. The Inoceramus prisms have been derived from Upper Cretaceous deposits and the rock is most probably the same age as AA.99 and AA.100 which is Palaeocene.

AA.108, which, according to the column supplied, is considerably higher in the section, is unfossiliferous.

AA.107, at the top of the section contains an assemblage of foraminiferal species that is characteristic of "h" stage. All species are found in deposits from Pliocene to Recent. The species include:

Anomalinella rostrata (Brady)
Elphidium craticulatum (F. & M.)
Operculina bartschi Cushman
Operculinella venosa (F. & M.)

C. Bowye Limestone Section

Nine samples of limestone were examined from this section which is situated on the Bowye Anabranch of the August River and which is approximately 100 feet thick. The samples, arranged in ascending stratigraphical sequence are AA.39, 40, 38, 37, 36, 35, 34, 33 and 32. The lithology of all samples except AA.38 is similar with calcareous algae, foraminifera and fragments of coral being common. AA.38 is a dense limestone in which sections of small foraminifera such as Globigerina and Globorotalia can be recognised. The general foraminiferal assemblage which is dominated by Miogypsina in the other samples is similar to that found in "f_1-f_2" stage rocks in New Guinea and elsewhere in the Indo-Pacific region.

The foraminifera are as follows:

Cycloclypeus sp.
Lepidocyclina sumatrensis (Douville)
Lepidocyclina cf. verbeeki (Newton and Holland)
Lepidocyclina spp.
Miogypsina polymorpha Rutten (common)
Miogypsina thecidaeformis Rutten
Miogypsina kotoi Tan

D. October River Section

(a) This section from which three samples of siltstone were collected, is 2,970 feet thick. The samples were AA.119, 118,

117 in ascending stratigraphical sequence. All were unfossiliferous.

(b). Three samples AA.176, 175 and 174, were taken from a section 800 feet thick. They consisted of siltstone and pebbly conglomerate.

AA.175 and 174 were unfossiliferous.

AA.176 contained a foraminiferal assemblage characteristic of "g" stage.

Amphistegina sp.
Elphidium advenum Cushman
Orbulina universa d'Orb.
Sphaeroidinella dehiscens (Parker and Jones)

(c). This section consists of 1,930 feet of siltstone and greywacke. Only one sample, AA.117 was submitted and this was unfossiliferous.

(d). Three specimens, AA.179, 180 and 181, were collected from the section of sandstone and siltstone 750 feet thick.

The lowest sample AA.179 was a siltstone which contained only Globigerinoides trilobus (d'Orb.)

AA.180 was unfossiliferous.

AA.181 contained several planktonic foraminifera which occur abundantly in "g" stage assemblages.

Foraminifera:

Cyclammina sp.
Eponides praecinctus (Schwager)
Globigerinoides sacculiferus (Brady)
Globigerinoides trilobus (d'Orb.)
Globorotalia menardii (d'Orb.)
Loxostoma sp.
Orbulina universa d'Orb.
Sphaeroidinella dehiscens (Parker and Jones)

The following samples were not indicated on the locality map - AA.109, 110, 137, 138, 140, 144, 161, 178 and 182. Of these AA.109, 110, 137, 138, 140, 161 and 178 were unfossiliferous.

AA.182 contained only Orbulina universa (d'Orb.)

AA.144 contained a rich "g" stage assemblage.

Foraminifera:

Arenobulimina sp.
Ammodiscus sp.
Bathysiphon sp.
Bolivina hebes Macfadyen
Bulimina striata d'Orb
Bulimina aculeata d'Orb
Cassidulina pacifica Cushman
Cassidulina subglobosa d'Orb
Cibicides ungerianus (d'Orb)
Cibicides soendaensis LeRoy
Cibicides sp.
Cyclammina sp.
Globigerina trilocularis d'Orb
Globigerina baroemoensis LeRoy
Globigerinoides trilobus (d'Orb)
Globigerinoides sacculiferus (Brady)
Globorotalia menardii (d'Orb)
Glomospira sp.

Gyroidina soldanii (d'Orb)
Martinotiella sp.
Nodosaria acuminata Hantken
Orbulina universa d'Orb
Plectofrondicularia interrupta Korror
Pullenia bulloides d'Orb.
Pulleniatina obliquiloculata P. and J.
Schenckiella sp.
Sphaeroidinella dehiscens (P. and J.)
Sphaeroidina variabilis Reuss
Sigmoilina schlumbergeri Silvestri
Siphonodosaria adolphina (d'Orb)
Textularia laxata Schwager
Textularia fistulosa Brady
Uvigerina hispida Schwager
Uvigerina multicostata LeRoy
Verneuilina sp.