

K E S A T U A N   K A J I B U M I   M A L A Y S I A  
GEOLOGICAL SOCIETY OF MALAYSIA

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N E W S L E T T E R

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## GEOLOGIC NOTE

Fossils from the Fort Iskander Area, South Pahang<sup>1</sup>

T. Suntharalingam

Geological Survey of West Malaysia

A new fossil locality discovered by Enche Peter Cross, Enche Shuib bin Ahmad and Amin bin Abu Bakar yielded well-preserved pelecypod moulds and crinoid stems. The rock type is mainly sandy shales and grey-white sandstone - brownish white when affected by iron stains. Some of the fossils have also been affected by iron staining. The exact location of this new fossil locality is found in the New Series Map Sheet No.97 at Map Ref. No. (coordinates) 609610.

From preliminary investigation the following lamelli-branches are found to occur:

Myophoria 2 species

Parallelodon sp.

Pecten (Entolium) sp.

Pecten sp.

Chlamys valoniensis?

Nucula sp.

Modiolus sp.?

Lima sp.?

About three additional genera yet to be identified

The presence of Myophoria sp. indicates the age to be Middle or Late Triassic. This shows that the Triassic in Malaya is extensive and that shallow-water environment must have persisted at that time in this area.

At present further work is being conducted to study the species. The species of Myophoria found may determine whether these rocks are Middle or Upper Triassic.

References: Chin, F., 1966. Triassic sediments of Singapore. Unpub. B.Sc. (Hons.) Thesis, U. of Malaya.

Cox, L.R., 1936. On a fossiliferous Upper Triassic shale from Pahang, Federated Malay States. Ann. Mag. Nat. Hist. Vol. 17, Ser. 10, p.213-221.

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<sup>1</sup>Reported with the kind permission of the Director, Geological Survey of West Malaysia.

Jones, C.R., Gobbett, D.J., and Kobayashi, T., 1966. Summary of fossil record in Malaya and Singapore 1900-1965. in *Geology and Paleontology of Southeast Asia*, Vol. II, p.309-359.

Newton, R.B., 1900. On marine Triassic lamelli-branches discovered in the Malay Peninsula. *Proc. Malacol. Soc. London*, Vol 4, Ser. pt. 2, p. 130-135.

Tokuyama, A., 1961. On some Triassic pelecypoda from Pahang Province, Malaya. *Trans. Proc. Paleont. Soc. Japan*, N.S., No.44, p.175-181.

#### EXPLORATION ACTIVITIES OF SHELL COMPANIES IN NW BORNEO

The following summary of recent activities by the Shell Companies has been kindly provided by the Manager, Sarawak Shell Oilfields Ltd., Lutong, Sarawak.

##### 1. Geological field-work in Lambir Hill area (SE Miri) by Shell Staff:

Shell geologists studied a well exposed section in the Lambir Hills, along the recently opened Riam road. For some weeks three students from the Department of Geology, University of Malaya, participated in this survey.

The section studied gives a stratigraphic succession of about 8500 feet of sediments from Miocene (Te5-Tf) to Pliocene (Tgh) age. It represents a regressive cycle of sedimentation from inner neritic shales at the base (about 200 ft. exposed) through deltaic to continental deposits at the top.

Only the lower 2500 ft. has been examined in detail, the remainder of the section will be studied in the early part of 1968.

##### 2. Sparker survey in Sarawak offshore area:

During the summer months of 1966 Shell employed a relatively new exploration tool in the Sarawak offshore area: The Sparker. This was used in an area between Balinian and Miri in water depths of up to about 30 fathoms.

A sparker survey system is essentially identical to conventional seismic; its main difference lies in the source of energy. In conventional seismic surveys a charge of explosives is used which gives a burst of sound energy after detonation. The sound wave reflects from such lithological boundaries where a difference in acoustic properties exists. On the other hand, the energy source with the sparker method

is derived from a high voltage (20,000 volts) which creates a spark between two electrodes which are submerged in the water.

Obviously there is a smaller energy output than with a charge of explosive so that the depth of penetration is less, but as one can repeat the spark more frequently than when detonating an explosive charge (time interval between succeeding sparks is 4 seconds; time interval between succeeding explosive detonations is 75 seconds at best) one obtains more frequent reflection samples from the subsurface.

In selected areas the sparker method proved to be quite successful; combined with conventional seismic it can give very valuable subsurface information.

#### OCEANOGRAPHIC CRUISE

Malaysian scientists recently had the opportunity to participate as guests and observers in the world cruise of the new American government research vessel, the "Oceanographer." This handsome ship of 3800 tons and with a length of 303 ft. is run by the U.S. Coast and Geodetic Survey, an old organization which is now part of a new government branch, ESSA (Environmental Science Services Administration). The ship is now on a round-the-world cruise doing oceanographic research in cooperation with local scientists of the countries she visits. For the portion of the cruise from India to Australia, Dr. Robert E. Burns of the Pacific Marine Center, Seattle (USA) was chief scientist.

When the ship left Penang on 21 July to work in the Andaman Sea, on board were F.Chand and W.K. Ng of the Geological Survey, Ipoh, together with P.H. Stauffer, D.S. Dillon, and M. b. Ayob of the University of Malaya Geology Department. During the two weeks in the Andaman Sea, the visitors were able to observe and participate in a variety of marine research activities: seismic reflection profiling; sampling of the sea bottom, both by corers and grab-samplers; sampling of sea water, both on the surface and at depth; heat-flow measurements in the sea-bottom sediments; and almost continuous recording of bottom topography, gravity, magnetic field, and a host of meteorological parameters.

Particular problems attacked included the structure of the shelf-break on the east side of the Andaman Basin, heat flow in the deep part of the Basin, and the structure and topography of the delta-front off the mouth of the Irrawaddy River. Suspended-sediment studies by Dr. Kelvin S. Rodolfo of the U. of Illinois (Chicago) outlined the distribution of

turbid Irrawaddy River water. The ship returned to Penang on 4 August.

On 8 August the "Oceanographer" sailed south from Penang with N.S. Haile from the University of Malaya as visiting scientist from Malaysia. In the Main Strait off Singapore anomalously deep soundings (as much as 112 fathoms) were investigated by echo sounding runs, and cores taken east of Singapore Strait. In the Java Sea more sediment samples were taken, including one highly fossiliferous muddy sand inadvertently obtained in a plankton net which somehow scraped the sea floor!

From the Lombok Strait (with Bali tantalizingly near) a continuous run using seismic reflection profiler (SRP), gravimeter, magnetometer, and echo sounders was made out over the Java trench. In the Wharton Basin cores, bottom samples, and bottom photographs were taken, and SRP runs, and dredge hauls were made over a number of crossings of the continental slope and shelf-break off West Australia. In addition, many biological and meteorological observations were made, and large water samples for geochemical studies taken. This section of the cruise ended in Perth on 24 August.

The "Oceanographer" is equipped in very modern fashion, with an on-board computer and a large amount of automation. One nice feature is a satellite-tracking navigation system, which, coupled with the computer, gives precise corrected positions for stations within hours of their having been occupied.

A pleasant feature of the cruise was the enlightened open-handedness of the U.S. scientists. The announced policy is that any visiting scientist may copy any records obtained without restriction, even before these have been processed in Washington, when they will form part of the public records, available to all. All that is asked in return is due acknowledgement if such records are used in a publication.

The "Oceanographer" will be based in Seattle and will specialize in the Indian Ocean and Southwest Pacific, so we hope to see her frequently again in these waters.

PHS/NSH

## MALAYSIAN CODE OF STRATIGRAPHIC NOMENCLATURE

When the GSM was organized a year ago, one of the problems it was felt it could usefully tackle was the state of stratigraphic terminology in West Malaysia. Accordingly, a working party was formed, consisting of J. bin Ahmad, H.C. Olander, and P.H. Stauffer, with instructions to prepare a draft Code for use in this country. Such a draft was prepared, and circulated to geologists active in stratigraphic work here for comment. The comments were then considered and a revised draft prepared. This was submitted to the Council as a proposed Malaysian Code of Stratigraphic Nomenclature on 11 April 1967. As Borneo geologists felt that much oil company work could not yet be brought into conformity with the Code, it was proposed that the Code take effect initially in West Malaysia only. A copy of the Code was then sent to each member of the GSM with a ballot for its approval or rejection and a space for comments.

At its meeting of 9 September the Council considered the Code again, most of the members responding having approved it. There was considerable discussion and criticism of the Code, but eventually it was decided to regard the Code as adopted by the Society, with the recognition that it is an imperfect document always open to revision.

The critics of the Code, led by N.S. Haile, generally felt that while the sections on rock units are fairly well worked out, those dealing with time, time-rock, and biostratigraphic units are confused and inadequate. Ideal time units, inferred time-rock units, and objective biostratigraphic units should be clearly separated, they felt.

Supporters of the Code, represented by P.H. Stauffer and D.J. Gobbett, felt that ideal time units have no existence separate from evidence in rocks, and that practical time-rock units are in fact nearly always biostratigraphic units, except in pre-Cambrian rocks. P.H. Stauffer, on behalf of the working party, emphasized that the Code was designed to serve the needs in Malaysia, where pre-Cambrian rocks are not known, where the principal need is for clear and proper rock-unit nomenclature, and where there is unlikely to be need for defining time or time-rock units in the near future. The Code was intended to help guide the field geologist who would actually have to define new units or redefine old ones in this country, and was not intended as a complete international Code.

N.S. Haile replied that not being international was no excuse for being confused, and suggested discussion of the whole question of nomenclature at a meeting of the Society.



The Council also asked the Committee on Stratigraphic Nomenclature, which has replaced the working party, to prepare a 'Guide to rock-unit nomenclature for field geologists.'

Members are urged to write the Secretary expressing their views and their interest in a discussion. If there is sufficient interest, the Society will organize a special meeting on nomenclature and the Code. Written comments received, either with the ballot or later, could be read out at such a meeting if their authors wish it.

All members of the GSM should have received a copy of the Code. Additional copies may be obtained from the Secretary at M\$ 0.50 (or £ 0.1.0 or US\$ 0.20) each.

- PHS

### SEDIMENTOLOGICAL CONGRESS

The Seventh International Sedimentological Congress was held in the United Kingdom during August 1967. Two days of sessions were held at the University of Reading and two days at the University of Edinburgh, with excursions both before and after. The theme of the Congress was "Theory and Experiment in Sedimentology." Attending from Malaysia was P.H. Stauffer of the University of Malaya Geology Department, who presented a short paper on "Mass-flow deposits in flysch sequences," based partly on work done in Sabah.

For a meeting of its kind and size (450 delegates) the Congress was unusually well-organized and successful. No publications are planned from the meeting, and this allowed cutting down on formal reading of papers. Instead, the Congress was centered around two types of sessions: Special Lectures by invited experts, and Discussion Groups on particular topics (3 or 4 simultaneously). In general this format worked very well. The invited lectures were good and several were outstanding, especially K.O. Emery on "Relict sediments of the Continental Shelves" and A.W. Skempton on "Consolidation of Clays." The Discussion Groups were sometimes quite lively, and the liveliest were continued as Informal Discussion Groups, for which time had been left open.

The "turbidite" concept and its many ramifications generated considerable heat and some light in quite intense discussions. The theme of the Congress - "theory and experiment" - was borne out by the increasing emphasis on experimental studies, particularly in sediment transport, to substantiate interpretations of ancient sediments. In addition to laboratory experiments (such as artificial turbidity currents), some experiments are now done in the field. German sedimentologists have developed techniques involving



lowering a large metal sheet to the bottom of an estuary, allowing normal sedimentation to proceed on it - with colored dyes released periodically as time markers - and finally recovering the entire sediment mass by raising the sheet.

Another obvious trend is the increasingly quantitative nature of sedimentological studies. Qualitative description is just not enough anymore for real understanding.

The hospitality and friendliness of the British hosts more than overcame the chilliness of the climate, and the organizing committee are to be congratulated for the excellent arrangements for the Congress. Sedimentologists can now look forward to the Lighth International Congress, which will be held in Heidelberg, Germany, in 1971.

- PHS

#### CLARIFICATION ON ESSO GIFT

In Newsletter 7 (July 1967) we acknowledged the generous gift to the Society which was presented by Dr. H.H. Hall. The gift - a check for M\$6000. - was, however, wrongly attributed to Esso Standard Ltd. Its actual source was Esso Exploration Malaysia Inc., which is exploring for petroleum in Malaysia, and with which Dr. Hall is affiliated. Esso Standard Ltd. is a marketing company, not concerned with geology; the references to it on pages 5 to 10 in Newsletter 7 should read 'Esso Exploration Malaysia Inc.'

We welcome this opportunity to apologize for the error, and to express our gratitude to Esso Exploration Malaysia Inc.

- PHS

#### MEETINGS OF THE SOCIETY

##### Field Meeting: Raub area, September 2 - 3:

The leader of the Society's first field meeting was Enche Ja'afar bin Ahmad of the Geological Survey of West Malaysia, Kuala Lumpur office. Ten members of the Society attended: J. Bignell, D.S. Dillon, N.S. Haile, Mrs. Haile, C.S. Hutchison, T.T. Khoo, B.W. Koopmans, Miss K.H. Ong, S.P. Sivam, and P.H. Stauffer, all of the University of Malaya. The rather short notice given for the meeting undoubtedly prevented a wider attendance, and this is regretted.

The party met for dinner at the Raub Rest House on Saturday, 2 September. After dinner Enche Ja'afar gave a talk on the geology of the area to be visited - the Sungci Dong area.

This area is along the west side of the Gunong Benom granitic massif, where between the Benom granites and the Triassic sediments occurs an assemblage of crystalline rocks ranging from granitic and syenitic to ultrabasic in composition. This assemblage was described as "hybrid rocks" by Richardson (1939), who ascribed their origin to assimilation of ultrabasic rocks by the Benom granites.

Enche Ja'afar, who has been studying this area for the Geological Survey, has concluded that the Benom granites are distinctly younger than the hybrids, which must therefore be related to an older set of granites. Several lines of evidence support this conclusion: Joints in the Benom granite run mainly in the directions  $45^{\circ}$  and  $135^{\circ}$ , while those in the hybrids run mainly  $90^{\circ}$  and  $180^{\circ}$ . At the actual contact, inclusions of the hybrid rocks are found within the Benom granite.

The hybrid rocks are mostly syenites, with some diorites and other compositions. They are mostly foliated and show lineation, and therefore probably formed contemporaneously with the folding of the geosyncline. Small granitic bodies associated with the hybrids have Na and K content similar to Reed's "syn-kinematic" type granite, while the main Benom granites are like Reed's "post-kinematic" type. In chemical variation diagrams, the syenites stand off by themselves, suggesting a separate origin.

Enche Ja'afar feels that an early granite mixed with calcareous sediments to give the syenites, while some mixing with ultrabasic rocks produced the other lithologies in the assemblage.

Both the Benom granite and the older granite bodies appear to intrude the Triassic rocks around them, but the contacts of the hybrids and older granites with the Triassic rocks could all be faults, and hence the assemblage could be pre-Triassic in age.

Discussion by Enche Ja'afar's talk:

N.S. Haile asked why ultrabasic rocks should fortuitously occur only here, not in surrounding areas. It seemed more likely that they were part of the "hybrid" assemblage, rather than accidentally occurring only where the granites were to come in.

C.S. Hutchison said that a University of Malaya Honours student, T.T. Khoo, working in an adjoining area, thought the "hybrid" rocks could be explained by simple regional metamorphism, rather than mixing of magmas. The syenites were something of a problem, but Khoo has found in them some microcline crystals with relict plagioclase zoning, suggesting metasomatism.

Ja'afar pointed out that there were some roof pendants of amphibole schists found - at higher elevations only - in the area of hybrid rocks.

B.N. Koopmans asked why these were called "roof pendants" - could they not be merely lower-grade portions of a single granitized sequence?

Ja'afar replied that the hybrids showed evidence of having been through a fluid phase.

Koopmans remarked that he did not feel the difference in joint directions in the hybrids and the Benom granite was strong evidence of difference in age. Such a pattern could arise contemporaneously, and in fact this was suggested by the occurrence of both sets of directions in a transition zone.

After an early breakfast on Sunday morning, 3 September, the party drove out to the area.

STOP 1 : East of Kampong Dong. Roadcut exposures.

Triassic sediments (shales), moderately metamorphosed to sericite schists. This outcrop is between two granite bodies and, according to Ja'afar, somewhat more metamorphosed than is the rule in these sediments.

STOP 2 : A short distance E of 1. Roadcut exposure.

Sandier sediments, altered to quartzites.

STOP 3 : A short distance E of 2. Roadcut exposure.

After passing through an area of poorly-exposed granite, the rocks here are heavily veined quartz-epidote rock.

STOP 4 : Farther E, at Sungei Chenara. Roadcut and stream exp.

Amphibolites cut by pegmatites. In the stream outcrop is a 4"-thick layer of "conglomerate" : pebble-size fragments of the surrounding rocks, angular to subrounded, in a quartz matrix. Ja'afar called this a fault breccia, but several members of the party said it did not look like one, and wondered if it could not be a genuine intra-formational conglomerate, later metamorphosed with the rest of the rock. Samples were taken for sectioning.

STOP 5 : Sungei Chinchin. Hillside outcrops.

After a short walk along the stream, we came to a clearing with large bouldery outcrops and cliffs. Hybrid

rocks crop out at the base of the slope, granites of the main Benom granite higher up. The contact is not exposed, but xenoliths of the hybrid rocks (dark, partly foliated rocks rich in amphibole and large biotite) occur in the granite. Some of these xenoliths are extensive, thin, and tabular, and there was much discussion as to whether these were not in fact dykes of basic intrusive. But other bodies of similar composition were clearly xenoliths. One large one was cut and offset slightly by a shear zone, and along one side of it the granite had developed a local pegmatitic band. Some of the xenoliths showed metamorphic foliation and were finer-grained, locally including patches of calc-silicate material.

STOP 6 : Ulu Dong. Stream outcrops.

The main Benom granite is exposed here, and shows two types: both are coarse-grained and porphyritic, but one is white, while the other has pink feldspar and hornblende. Xenoliths of undoubted genuineness occur, as to dykes of fine-grained quartz-porphyry.

The party then drove back out to the main Raub-Kuala Lumpur road (stopping for a quick lunch on the way.

STOP 7 : Sungei Lipis, 19th Mile (Raub). Stream outcrops.

Very extensive outcrops of foliated porphyroblastic granite-gneiss, unfoliated porphyritic granite, with many xenoliths of metasediments. Those in the gneiss are small, flattened and follow the foliation, while those in the granite are up to large sizes and variously oriented. Small dykes of aplite cut the gneiss. The gneiss-granite contact is sharp where exposed, but undulating rather than planar.

Erosive action by the river water has resulted in very extensive and beautiful development of deep potholes.

STOP 8 : Benta Quarry.

Greenish foliated syenite, with considerable epidote and some garnet-epidote bands, intruded by more granitic-looking bodies. Clear evidence of mobility and genuine intrusive relations here, as well as partial migmatization of the meta-sediments in large xenoliths. A large specimen showing these relations was marked for later removal (this specimen now stands in front of the new Geology Building, University of Malaya).



The party returned to the Raub Rest House for refreshments. N.S. Haile proposed a vote of thanks to Enche Ja'afar for a most interesting and successful excursion.

- PHS

Planned future Field Meetings:

Tekka and S.E.K. Mines: For the month of October an excursion has been planned to Tekka Mines and S.E.K. Mines in the Kinta Valley. As tentative date Saturday the 14th of October has been chosen, but this date will be confirmed in a later circular. Dr. George Riley has been approached to act as leader for the first part of the excursion. Members who attended his interesting talk on the Tekka Mines in June will be able to discuss matters further in the field, and to study the local relations between the different mineralizations.

The S.E.K. Mines are recently studied by Mr. Rodger Newell, who has been requested to lead the second part of the excursion. A thick alluvial sequence is present in the S.E.K. Mines in which very interesting sedimentary structures can be observed.

The excursion will start from Gopeng Police Station at 10:00 a.m. to allow K.L. members to arrive in time, and end not later than 4:00 p.m. Lunch will be held in Kampar at your own cost. Local transport by LandRover will be arranged.

River Muda Scheme: A suggestion has been made to arrange an excursion to the damsites and tunnel works of the upper Sg. Muda Scheme near Nami in Kedah. The stage of the engineering works at present makes a visit worthwhile. Two damsites are stripped of overburden and display very interesting sedimentary and structural features. The tunnel sections are in an early stage of lining but rock sections can still be studied. From geological as well as engineering-geological aspects an excursion to this scheme at this stage is highly instructive and of great interest.

It is proposed to spend one to two days in the area. With the trip up and down from K.L. or Ipoh included, the excursion would last 4 days. As tentative date is suggested the first four days of November, but we should like to learn the response of the members first before definite planning. Members who wish to attend should fill in the form attached to the end of this Newsletter and send it to the Secretary of the Society by 6 October. The cost of the excursion will be carried by the members attending.

- BNK

Coming ordinary meetings: Ordinary meetings of the Society have been arranged as follows:

Tuesday 26 September : Dr. G.E. Wilford - "The Bau gold mining district, Sarawak". Department of Geology, University of Malaya, 5:15 p.m.

(Note that the Department of Geology, University of Malaya, has moved to its new building across the road from the old building)

Monday 9 October : Dr. J.J. Veevers - "Geology of Northwest Australia". Department of Geology, University of Malaya, 11:00 a.m. (Note time).

Thursday 26 October : Mr. E. Hamilton-Smith - "Caves of Australia" (geomorphology and fauna) Joint meeting with the Malayan Nature Society. British Council Hall, Jln. Bluff, K.L., 8:00 p.m.

- DJG

#### NEW MEMBERS

The following were elected to membership in the GSM at the meeting of the Council on 9 September 1967 (A = Associate Member; S = Student Member; others Full Members):

Arrieta, A.B.	Ona, A.A.
Bignell, J.D.	Parsch, K.O.A.
Daleon, B.A.	Ratti, A.R. (A)
Foo, T.C. (A)	Skipwith, P.A.
Hails, Mrs. M.P.D. (A)	Snijders, P.A.
Hill, R.D.	Spykerman, A.
Leow, S.F. (A)	Tamesis, E.V.
Leow, Y.S. (A)	Tan, H.T. (A)
Lum, H.C. (S)	Tran, K.T.
MacDonald, S.	McKenna, M.C.
Muir, G.T.	

- DJG

GEOLOGICAL SOCIETY OF MALAYSIA

Field Excursion to the Muda River Scheme

Tentative dates: 1-4 November 1967

- I intend to join the excursion to the  
damsites of the Upper Muda Scheme  
on 1-4 November .....
- I intend to arrange my own transport....
- I should like to get transport arranged  
from \_\_\_\_\_ to Nami and back..
- I like the dates 1-4 November for this  
excursion .....
- I cannot come on 1-4 November and would  
prefer the dates \_\_\_\_\_ .....

Date \_\_\_\_\_

Name \_\_\_\_\_