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KESATUAN KAJIBUMI MALAYSIA

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CONTENTS

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GEOLOGIC NOTES

Note on the geomorphology and geology of Pulau Perak, Malacca Straits

R.B. Lulofs[1] and N.S. Haile[2]

[1] Batu Pekaka Estate, Kuala Ketil, Kedah, Malaysia

[2] Department of Geology, University of Malaya, Kuala Lumpur

Pulau Perak is a bare rocky island 115.2 m (378 feet) high situated in the Malacca Straits at latitude 5°42'N. longitude 98°56'E. about 137 km (85 miles) west-southwest of the Kedah Estuary.

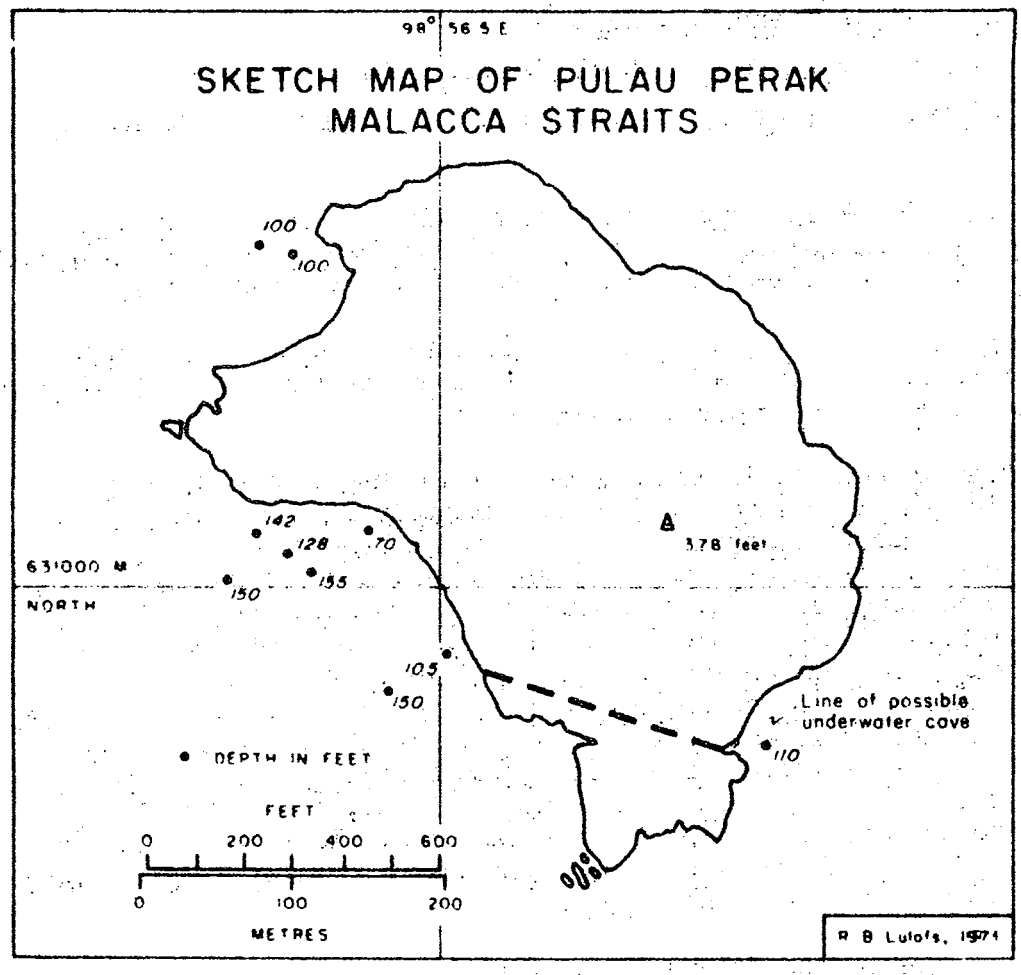
The island was visited on 9 April 1949 by C.A. Gibson-Hill and T.W. Burdon, who recorded some observations, mainly of birds (Gibson-Hill, 1950). Gibson-Hill recorded that:

> "The island itself is roughly oval in shape, with a maximum length, in a line running approximately from north-west to south-east, of about 550 yards, and a breadth of about 400 yards. It rises steeply to an uneven, sloping summit with a a maximum altitude, according to the Malacca Straits Pilot (1926; 121), of 378 feet. The greater part of the north-east face has an inclination of 65-70°. The other three sides are less steep, and have an average slope of about 45°. The island is entirely devoid of vegetation. Much of the surface is irregularly whitened by bird-lime, giving it in full sunlight, when seen from a distance, the silver-shot appearance from which it gets its name. It is composed of igneous rock thickly veined with quartz, and with small areas of limestone near sea-level."

General notes on the Island (R.B. Lulofs)

The island was visited by the first author on 20-21 February 1970 with a view to exploring the surrounding sea floor by diving, and in the course of this some general observations were made and rock specimens collected, which were examined and reported on by the second author.

On this visit (1970) it was noted that the rock on the southwest and west sides is decidedly smoother, but tends to rise more vertically, whereas the other half of the island is generally rounded in profile with rock which is more hackly and broken. The island is almost completely bare of vegetation only a few isolated small ferns and a patch of grass (Axonopus compressus) being seen.

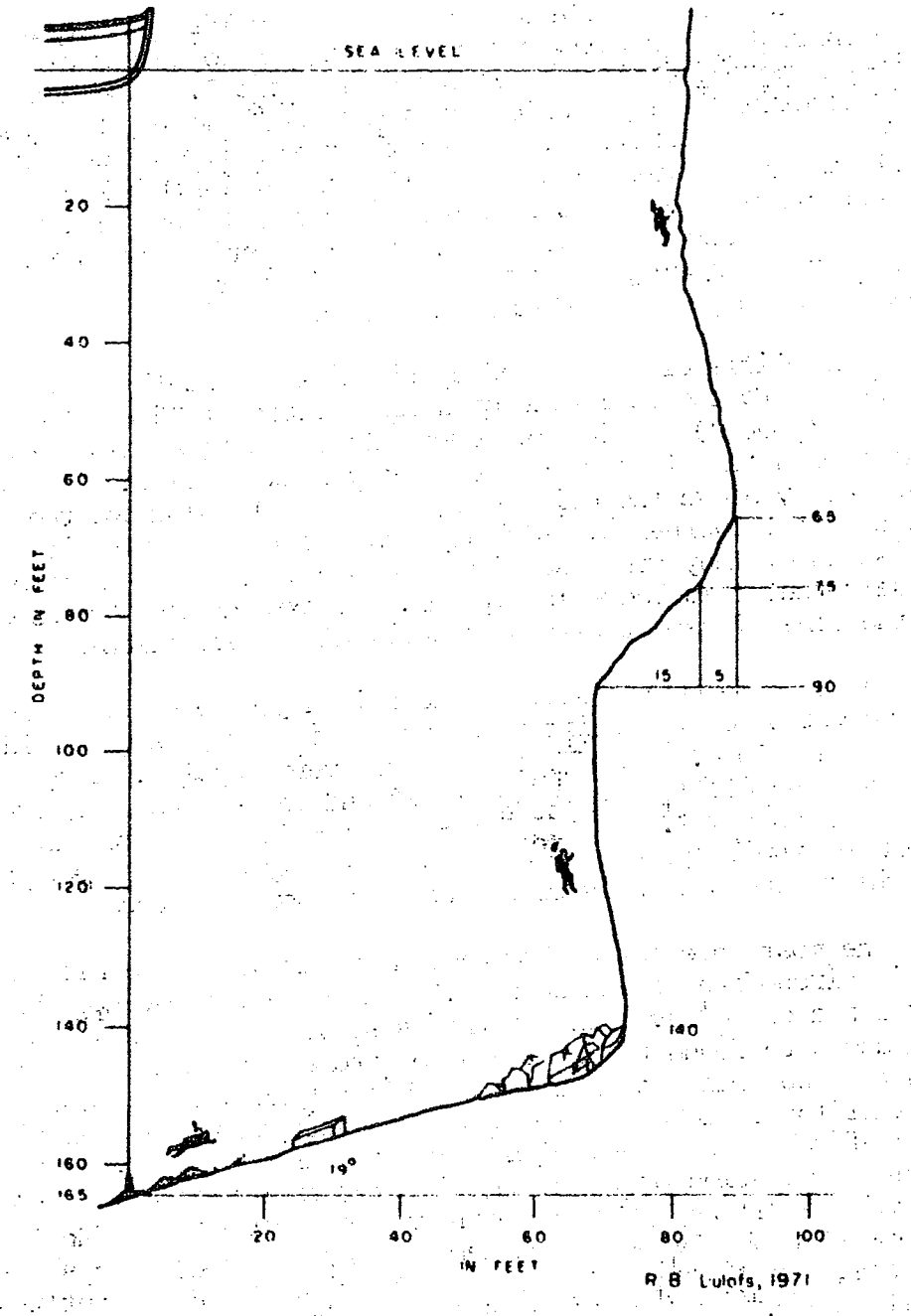

98° 56 5 E
SKETCH MAP OF PULAU PERAK
MALACCA STRAITS
100
100
142
128
70
150
155
378 feet
631000 M
NORTH
105
150
Line of possible
underwater cove
110
DEPTH IN FEET
FEET
0
200
400
600
0
100
200
METRES
R B Lulofs, 1971

The top of the island is covered by boulders of various sizes, with infrequent gravelly patches a metre or so across of loose rock. A sketch map of the island is shown on page 2. The dotted line marks the direction of a probable underwater cave running through that section of the island. The cleft above the surface ends in a shallow cave, but at between 12 and 18 m (40 and 60 feet) below the surface it widens out into an opening of perhaps 6 m (20 feet) and extends to a depth of perhaps 24 m (80 feet). A very distinct movement of water can be felt either going into, or out of the cave, depending on the tide. This area was not fully explored.

The cliffs of the island continue down beneath the sea almost vertically to the beginning of a sandy slope at 43 m (140 feet). The profile (page 4) which is drawn without vertical exaggeration, shows a step or notch of about 6 m (20 feet) between 20 and 27 m (65-90 feet). Immediately above the cliff bottom (at 43 m) and above the 20 m level, are distinct overhangs. Although this profile is definite at the point we ascended, many other sections would have to be made before it could be said that this ledge is typical. It extends 10-12 m on either side of the line of ascent with some vertical gutters running through it.

At 43 m below the surface there is a jumble of boulders and rocks at the bottom of the cliff face and few isolated large boulders farther out on the slope. All these rocks are very angular. The bottom slopes off from the cliff face at about 19° and the sea bed consists of sand and shell material. We reached 50 m (165 feet) and for as far as we could see the slope continued down uniformly at the same angle. From our charts the bottom is marked as going down to around 91 m (300 feet).

The most interesting bottom feature at 50 m were hillocks, roughly 1 m in circumference and about 0.6 m high, which covered the slope. They appeared to have none of the usual vents or depressions at their apex and were found to be made up of broken shells and coral debris. From the appearance of samples of this debris brought to the surface these hillocks had been unused and undisturbed for a long time for each piece of rubble was covered in a red calcareous algae. Unfortunately closer examination of the mounds was restricted by the 5 minutes of bottom time allowed at this depth and the accuracy of any observation would most probably have been hampered by the beginnings of nitrogen narcosis, which not only befuddles the mind at depth but tends to result in mild amnesia on surfacing. No adequate explanation could be offered as to what had made mounds so large and in such numbers.



UNDERWATER PROFILE OF PULAU PERAK
(Dimensions in feet ; horizontal and vertical scales equal)

Observations on the geology (N.S. Haile)

The following observations are based on photographs taken and specimens collected by R.B. Lulofs. The island appears to be fairly homogenous and may be entirely formed of siliceous tourmalinized metasedimentary rocks. On the photograph taken from the southeast vertical banding is noted, and is probably caused by foliation along the original bedding of the sedimentary rocks.

The island was visited briefly by C.R. Jones of the Geological Survey of Malaya in 1956. From his field records (kindly made available by the Director, Geological Survey of Malaysia) he described the rocks as closely bedded, light-grey, to yellow indurated siltstones with average strike 070° and dip 340° at an angle of 20° (340/20). Jones recorded profuse quartz veins up to 1 inch thick. Primary veins strike 160°, dip 85°W, and strike 100°, vertical; secondary veins strike 110°, dip 80°S, and 025°, dip 80°W.

Four specimens (UM7871 to 7874) collected by R.B. Lulofs are very hard, fine-grained, brownish-grey rocks, veined by quartz. Brief examination of thin sections shows that the rocks are tourmalinized meta-arenites and meta-siltstones. The rocks contain a large percentage (estimated to be as much as 50) of small tourmaline crystals, mostly less than 0.05 mm long, with quartz, mostly of fine sand size. A few opaque minerals, and unidentified fibrous isotropic alteration material are present. Veinlets are of quartz, and include tourmaline, and, in UM7874 (from 65 feet below the sea on the southwest side) ?prehnite. Two specimens (UM7872; UM7873) were analysed for tin; UM7872 showed 0.1 percent Sn, whereas tin was not detected in UM7873.

White encrustations occur on the specimens collected above sea level, and are presumeably phosphatic material derived from guano. In places the encrustations have grown into crystalline form (UM7875).

The rocks examined were probably originally finely bedded sandstones and siltstones, which have been thermally metamorphosed and metasomatised with the introduction of boron, leading to intense tourmalinization. Evidently a granite mass lies not far below the surface at this place. Tourmalinization in granites and associated metasedimentary rocks is quite common along the west coast of the Malay Peninsula, for example, in the Klang to Port Klang area, at Pulau Jarak in the Malacca Straits, in the Taiping area, and in the Langkawi Islands.

Why this island should occur where it does, rising almost vertically from comparatively deep water (50 m deep) is not known. Possibly the tourmalinization and metamorphism were only local, and

produced a rock far more resistant than those of the surrounding area, so that the island owes its existence to differential erosion. The notch from 20-27 m might represent marine erosion during a former lowered sea level, and this would seem likely if the notch is found to continue same level on other sides of the island. The rock is so hard that marine erosion is extremely slow, particularly in that there are no beaches and so waves do not move any rocks or pebbles against the face, and hence there is no corrasion.

Reference

GIBSON-HILL, C.A. 1950 Pulau Perak: Malayan Nature Jour., vol. 5, 1, p 1-4.

The Truth concerning Daubree's work on the genesis of cassiterite

K.F.G. Hosking, Department of Geology, University of Malaya

This note stems from the fact that recently the writer read in yet another paper, one by Hesp and Rigby (1972), that Daubree, in the middle of the last century, "succeeded in making cassiterite in the laboratory from tin-fluoride and steam" in accordance with the reaction expressed by the following equation:

$$SnF_4 + 2H_2O = SnO_2 + 4HF$$

In 1967 (pp. 318-319) Sainsbury and Hamilton made essentially the same statement and added that "this classic experiment has been quoted repeatedly in explaining the genesis of cassiterite deposits." How true!

Jones (1925, p. 56) in his famous "Tinfields of the world", remarks that "it is interesting to note that Daubree long ago showed by experiment that tin oxide was deposited as a result of the reaction between tin fluoride and water vapour ....! In fact, Daubree never did carry out this synthesis which has been so often accredited to him! The true story is as follows:- In 1841 Daubree drew attention to the fact that commonly primary cassiterite is associated with fluorine-bearing minerals, (fluorite, lepidolite, topaz, etc.), boron-containing ones (tourmaline and axinite) and ore-minerals in which tungsten, molybdenum

arsenic and iron are essential components. He, therefore, arrived at the conclusion that the geneses of the species mentioned above were inter-related, and supposed that the Sn, W, Mo, B, P and some of the Si ascended to the sites of deposition from a deep-seated source, via fissures, as fluorides.

Later, Daubree (1849) carried out a series of experiments aimed at testing this hypothesis, but instead of employing fluorides he used chlorides, as the latter were generally much more easily prepared and managed. He believed that as there were many similarities between chlorides and fluorides, any results obtained when the former were used would allow one to deduce the results which would be obtained were the latter employed instead.

Perhaps the most important experiment Daubree carried out consisted of passing stannic chloride vapour, together with steam, through a red-hot porcelain tube. Aggregates of minute crystals, with some well-defined faces, were deposited within the tube. These crystals, whose habit could not be definitely established, were colourless, brownish or greenish, had a specific gravity of 6.72, scratched glass, and could be reduced by the usual blow-pipe method to metallic tin. It is probable that these crystals were cassiterite.

For those who do not have access to Daubree's original papers, or are unable to read French, a good "potted" account of his work has been made in English by Philips and Louis (1896, pp.145-147).

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HESP, W.R. and RIGBY, D., 1972. The transport of tin in acid igneous rocks. Pacific Geology 4, 135-152

JONES, W.R., 1925. Tinfields of the World. Mining Publications, Ltd., London.

PHILLIPS, J.A. and LOUIS, H., 1896. A treatise on ore deposits. MacMillan and Co. Ltd., London.

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Natrojarosite in acid sulphate soils of Malaysia

R.F. Allbrook, Faculty of Agriculture, University of Malaya

The occurrence of soils showing high acidity in coastal clays of West Malaysia was first noted by Dennet (1932). Wilshaw (1940) observed that when these coastal clays were sampled a change in colour from blue-grey to black occurred and the pH fell on drying. The change in colour of these acid soils was also noted by Coulter (1952) who also recorded a sulphurous smell and that the sulphur content varied from 1 to 6.8 percent. These soils he termed gelam because gelam (Melaleuca leucodendron) an acid tolerant tree, was a characteristic plant. The name Kampong Gelam is frequently found in coastal clay areas and is likely to indicate an acid sulphate area.

Thus the connection between high acidity and sulphur content was established. These soils are often closely associated with marine deposits and sea water is then the primary source of the sulphur (Watts, 1960). In a review, Moorman (1963) mentions the yellow colour often found in these soils. It is this colour that lead to the alternative name, cat clay, (kat klei) because of its similarity in appearance to the excrement of a cat, being applied to these soils by Dutch soil scientists (Bemmelen, 1886).

These yellow mottles or incrustations have been observed in Malaysia by Coulter (1952), Chow (1968) and by the author in Malacca, Negri Sembilan, Selangor and in coastal area of Sarawak.

Chow (1968) quoting Bloomfield, and Slager et al (1970) have suggested that these yellow mottles are jarosite. In Canada Clark et al (1961) identified jarosite in acid sulphate soils in British Columbia.

Jarosite, a basic ferric sulphate is said to form in oxidising conditions following the oxidation of pyrite to sulphuric acid which is then neutralised and diluted to form the basic salt. Unless dilution occurs the basic salt will not be formed, and, depending on the cations in the leaching solution, either jarosite (potassium) or natrojarosite (sodium) will be formed (Warshaw, 1956). Since acid sulphate soils are often close to the sea, sodium rather than potassium is likely to be dominant.

A sample of the yellow incrustation from Pasir Panjang, Negri Sembilan, was examined by X-ray diffraction and chemical analysis. The incrustation was bright yellow, 5 Y 6/6 (Japanese Soil Colour Charts).

The X-ray diffraction chart showed that the incrustation consisted of quartz and a substance with the following d spacings (table 1). d spacings for jarosite (Warshaw, 1956) and natrojarosite (Mitchell and Giaminini, 1958) are included for comparison.

TABLE 1

hkl	jarosite	Pasir Panjang	natrojarosite
101	5.94	5.95	5.94
003	5.74	5.62	5.57
012	5.09	5.07	5.06
110	3.65	3.67	3.71
104	-	-	3.49
021	3.11	3.12	3.12
113	3.08	3.07	3.06
202	2.98	2.96	2.96
006	2.87	2.79	2.78
024	2.53	2.53	2.53
107	2.29	2.25	-
300	-	-	2.13
018,303	1.98	1.99	1.98

It can be seen that the lines for jarosite and natrojarosite are very similar. Where they are different, 003, 006, 104, 300, either the test sample takes up an intermediate position or the line is obscured by the quartz, 104 and 300. Nevertheless, the sample from Pasir Panjang is nearer to natrojarosite.

Chemical analysis showed five times the weight of sodium as potassium (8.5 times the equivalent weight). Mitchell and Giaminini (1958) found in their specimen of natrojarosite the ratio of sodium to potassium to be 3:1.

Clearly therefore the chemical analysis indicates the incrustation to be natrojarosite.

Acknowledgement

I wish to acknowledge the suggestion of Professor Hosking that these yellow incrustations should be investigated.

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WATTS, J.C.D., 1960. Sea water as a primary source of sulphate in tidal mangroves of Sierra Leone. Nature (Lond) 186, 308-9

WILSHAW, R.G.H., 1940. A note on the development of high acidity in certain coastal clays in Malaya. Malayan Agric. J. vol. 28 352-357.

LETTER TO THE EDITOR:

Dear Sir,

A fossil "Portuguese Man-of-War" (Velellidae) from the Palaeozoic of the Raub area, Pahang, West Malaysia

I refer to your Newsletter No. 33 of December 1971 in connection with the above subject and wish to point out that the fossil locality reported in Raub, Pahang is not "a new fossil locality". In fact, it was discovered by the writer in October, 1964 during routine geological work in the environs of Sungei Cheroh and Sungei Chembatu, Raub. Besides jelly-fish, others including brachiopods, gastropods, crinoic stems, and plant remains collected from this locality were sent to Japan by the Geological Survey of Malaysia for expert identification. These fossils were registered as Nos. IF 225 to IF 229A in the fossil register of the Geological Survey.

Unfortunately they were lost, perhaps enroute. Besides this locality, five other fossil localities were also discovered during that time.

(K.N. Murthy)
Geological Survey
Bentong, Pahang.

CONFERENCES

Regional Conference on the Geology of Southeast Asia, March 20-25, 1972 - Donations to the Society

The response to the Society's appeal for funds for the Regional Conference on the geology of Southeast Asia has been extremely good. Donations were received from the following:

Mobil Malaysia Exploration Co.	500.00
Osborne and Chappel Sdn. Bhd.	500.00
Messrs. Hew Chai Kee and Sons	100.00
Vallentine Dunne and Co.	200.00
Sarawak Shell Bhd.	1,000.00
Associated Mines (M) Sdn. Bhd.	1,000.00
Offshore Drilling Services Ltd.	142.50
Delta Exploration Co. Inc.	50.00
Reading and Bates Singapore	500.00

GSI Division of Texas Instruments	295.00
Aquitaine Petroleum Company (S.E.A.)	500.00
Western Geophysical Co.	500.00
Exploration Logging International Inc.	100.00
Ray Geophysical Div.	350.00
Digicon Nederland N.V.	500.00
Santa Fe-Pomeroy Services	100.00
Pacific Tin Consolidated Bhd.	200.00
Straits Trading Co. Ltd. Butterworth	500.00
Genting Highlands Hotel Ltd.	200.00
AGIP Indonesia Branch	289.50
Eastern Smelting Bhd.	500.00
Conzinc Riotinto Malaysia	2,000.00
Anglo Oriental (M) Sdn. Bhd.	1,000.00
Esso Exploration (M) Inc.	500.00
Continental Oil Co. of Malaysia	500.00
Gulf Oil Co. of Southeast Asia	1,000.00
INC Drilling Mud Corp.	300.00
Halliburton	150.00

Financial support to cover the travel and accommodation expenses of earth scientists from Southeast Asia was given by the United Nations Economic and Social Council (UNESCO).

The Society is grateful for these donations which ensure that the Society's plans for the publication of most of the papers presented at the Conference would not be hampered by lack of finance.

International Geological Congress, Montreal, Canada, August 1972 - International Mineralogical Association.

Appeal for (1) any member willing to represent the Society at and (2) comments to be communicated to the International Geological Congress, Montreal, Canada, August 1972.

The Society is represented on the I.M.A. (International Mineralogical Association) by the following elected members:

Dr C.S. Hutchison - Commission on Abstracts
Dr C.S. Hutchison - Commission on Mineral Data
Dr C.S. Hutchison - Commission on Teaching
Mr J.H. Leow - Commission on Ore Microscopy

The Society has been asked to send its representatives to the next meeting of each of these Commissions, which will be held as follows:

Commission on Abstracts: Tuesday, 22 August 1972, 1400 hours, Mount Royal Hotel, 1455 Peel Street (Gaspe Room) Montreal

Commission on Mineral Data: Wednesday, 23 August, same hotel (Totem Room) 1400 hours

Commission on Teaching: Friday, 25 August, 1400 hours. Same hotel (Quebec Room).

Commission on Ore Microscopy: Wednesday, 23 August, 1400 hours Same hotel (Arctic Room).

Unfortunately both Dr Hutchison and Mr Leow will not be able to attend the meetings.

The Council of the Society therefore makes an appeal to any member who may be attending the International Geological Congress in Montreal in August 1972, and who is interested to volunteer to represent the Society on any one or more of these Commissions.

Could volunteers please contact the Secretary of the Geological Society of Malaysia, c/o Geology Department, University of Malaya, Kuala Lumpur, before the 20th June 1972 so that arrangements for representation may be made.

All members of the Society and especially members of the Mineralogical Sub-group are invited to send in to the Secretary before June 20th:

Proposals for the agenda :

Comments, and other remarks regarding any of these Commissions which you would like to see communicated to the International Mineralogical Association.

NEWS OF THE SOCIETY

The First Five Years of the Society

Earlier this year the Geological Society of Malaysia passed the fifth anniversary of its founding in January of 1967. It is a good

time, perhaps, to look back over these first five years and see how the Society has fared.

The record of these years is in general one in which the Society can find considerable satisfaction: the membership has grown from roughly one hundred at its start to a very healthy figure about three times that; the publications of the Society are well launched and have gained respect and recognition internationally; frequent meetings of the Society provide opportunities to meet and discuss geology. Dennis Taylor, the previous President of the Society, and Chairman of the Organizing Committee for the highly successful Regional Conference in March, has observed that this Conference marked a kind of "coming of age" for the Geological Society of Malaysia. Indeed it is so, for the Conference showed that the Society is a going concern, able to organize ambitious and successful undertakings, and capable of serving the geologic profession and the public in varied and substantial ways.

These achievements are certainly real, and members can take pride in them. But I think a closer look at these first five years of the Society will show that there are ways in which the GSM has fallen short of its aims or its hopes. This may be a good time to face frankly some of the shortcomings and see if improvements can be made.

Does the Society adequately represent the geological profession in Malaysia? I know there are geologists who feel unrepresented or under-represented in the Council and in the way the Society is run. Specifically, the officers and Councillors of the Society have been largely dominated by the staff of the University of Malaya Geology Department. The reasons for this are not simple, and I am sure it is not the result of conspiracy. To some degree the very fact that the Society is based in Kuala Lumpur and uses the Geology Department of the University of Malaya as its mail address has given geologists there more immediate and direct access to the Society. Certain of the officers must be based in Kuala Lumpur or nearby, and the Society can only run efficiently if a high proportion of the Council are available for meetings. In addition, the University geologists (now including the Universiti Kebangsaan) have shown a keen interest in the Society and have found that the Society's activities serve their needs. Regardless of the reasons, however, the resulting imbalance in the Council of the Society is not a healthy situation. It was partly for this reason that the pending Constitutional amendments were proposed: it is hoped that the new Nominations Committee will be able to secure a more balanced representation.

The Society could perhaps do more for its members who are resident outside of Kuala Lumpur, especially those not able to come to even the occasional meeting in Kuala Lumpur. How could these outlying members

participate more fully in the Society's activities? We have in the past held some meetings in other towns, but perhaps other things could be done.

The Society has not yet achieved the full involvement of young Malaysian geologists in its activities and particularly in its management. This is probably a matter of time, as new graduates find their feet and gain some confidence. But it is worrying to see so many of the Council positions in the hands of expatriates, in spite of slow improvement (last year's Council had at least, for the first time, a majority of Malaysians). Until a considerable shift in these proportions has occurred, it will be cause to worry. In the long run, the Geological Society of Malaysia must be guided and controlled by local geologists. Without such a solid core, the future of the Society remains problematical.

A final falling short of the Society has been, I feel, in its service to the public, to the Malaysian society at large. One of the aims of the Society is to further the public awareness and appreciation of geology and to assist those for whom geology is an avocation. The category of 'Associate Member' is partly intended to cater to such persons, but little else has been done by the Society for such amateur geologists or the public. One member of Council has recently suggested that the Society publish some simple, non-technical guides to geological features of Malaysia (Malaysian minerals, rocks, landscapes, fossils); I am sure these would be warmly received. Perhaps some of our members have other, even better ideas for furthering this important goal.

I think, then, that this sixth year of the Geological Society of Malaysia is best spent not in self-congratulation but rather in sober reflection on these shortcomings and in a search for ways to make the Society better and more effective. The Council will certainly be giving these matters attention, and suggestions or comments by members would be much appreciated. We hope to make some progress during the course of this year, and perhaps we can make new beginnings that will allow the GSM to grow and prosper in the next five years as well as it has in these first five, 1967-1971.

P.H. STAUFFER
President

Additions to the GSM Library Holdings

The following book, reprints and journals have been added to the GSM Library holdings since March 1970. All GSM books and periodicals are housed in the Klompe Reading Room of the Department of Geology, University of Malaya, where they may be referred to by members.

BOOK

56(59)KOB : Kobayashi, T.: Geology and palaeontology of Southeast Asia, vol. 8-9, 1970-1971.

REPRINTS:

1. Kobayashi, Teiichi : On the orogenies of the Burmese-Malayan geosyncline XXII. International Geological Congress, India, 1964. Part XI: Proceedings of Section II.

2. Kobayashi, Teiichi : Stratigraphy of the chosen group in Korea and South Manchuria and its relation to the Cambro-Ordovician formations of other areas. Section D: the Ordovician of eastern Asia and other parts of the continent. Jour. Fac. Science, Univ. Tokyo, Sec. II, vol. XVII, pt. 2, pp.163-316, 1969

3. Kobayashi, T. and Homada, T. : Silurian Trilobites from the Langkawi Islands, West Malaysia, with notes on the Palmanitidae and Raphiophoridae. Geology and Palaeontology of Southeast Asia, vol. IX, pp. 87-134,, 1871

4. Kobayashi, T. and Homada, T.: Agnostoid Trilobites in a Devonian Formation in West Malaysia. Proceedings of the Japan Academy vol. 47, no. 4, pp. 396-400, 1971.

PERIODICALS RECEIVED FROM SISTER SOCIETIES AND OTHER ORGANISATIONS:

55(06) BRGM : Bureau de Recherches Geologiques et Minieres (Paris), Bulletin, Section IV (Geologie Generale) 1970, No. 1-4

(Open shelf): American Museum Novitates: No. 2433, 2443-2444 , 2455, 2459, 2461, 1970-1971.

Membership

New Members:

1. Dr J. Van Veen
Brunei Shell Pet. Cy Ltd.
Seria, Brunei

2. Dr Kurt P. Grasmueck
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Singapore 9

5. Mr Spencer F. Fine
c/o Texfel Pacific Corp.
23-B Orchard Road, Room 5
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6. Mr Thomas W.C. Hilde
Institute of Oceanography
National Taiwan University
Taipei, Taiwan, Rep. of China

7. Dr Jovan Stocklin
United Nations
P O Box 1555, Teheran, Iran

8. Dr Andrew H.G. Mitchell
Geology Department, Parks Road
Oxford, England, U.K.

9. Mr Kaset Pitakpaivan
1506 Sukhumvit Road
Phrakanong, Bangkok, Thailand

10. Mr J. Abdullah
Afghanistan Geological Survey
Darlaman, Kabul, Afghanistan

11. Mr Allen U. Tamura
Global Mining Res. Inc.
P O Box 1147, Makati
Rizal, Philippines

12. Mr G.E. Kelley
BUMC Bldg. c/o Tenneco
144 Sukhumvit Road
Bangkok, Thailand

13. Mr Don Wolcott
U.S. Geological Survey
SID/ENGR, American Embassy
Djakarta, Indonesia

14. Dr John E. Frost
P O Box 1415, Houston
Texas 77001, USA

Resignation

1. Mr J.O. Zehnder
Unocal Corp., Ming Court
Office Block, Tanglin Road
Singapore 10

2. Mr J.R. Fletcher
Quaker Lodge, Milverton
Taunton, Somerset
U.K.

Change of address

The following members have informed the Society of their change of address as noted:

1. Dr K.J. Pocock
11 Jalan Taman
Petaling Jaya
Malaysia

2. Mr D.A.C. Clark
Gaffney, Cline & Associates
G.C.A. International Bldg.
Rosemount Ave, Surrey, England

3. Mr V.C. Childs
Gaffney Cline & Associates Ltd.
G.C.A. International Building
Rosemount Ave, Surrey, Eng.,UK

4. Mr Lee Chong Yan
c/o Killinghall Tin Ltd.
Puchong, Selangor
Malaysia

5. Miss Rafek Mahillah Bibi
c/o Goethe Institut
78 Freiburg I M Breisgau
Wilhelmstrasse 17, W. Germany

6. Mr Yee Kok Cheong
c/o The Laboratory
Sharikat Eastern Smelting
P O Box 280, Penang

7. Mr Lee Tuck Chew
Vallentine, Dunne & Co.
P O Box 119, Ipoh, Perak
Malaysia

8. Prof. I. Douglas
Department of Geography
University of New England
ARMIDALE, NSW 2351, Australia

9. Mr E.J. Schwing
c/o Continental Oil.Co. of Chad.
Boite Postale 694, FORT LAMY
Chad.

10. Mr B.R. Yates
247 Coode Street, Como
Perth, Western Australia 6152
Australia

11. Inche Masli Arman
Billiton N.V.
2nd Floor, Wisma Damansara
Kuala Lumpur

12. Mr W.E. Bush
Geophoto Resources
30, Herschell Street, Brisbane
Queensland 4001, Australia

13. Dr W.R. Cotton
15B Jalan Berjaya
Singapore 20

14. Mr Chan See Chin
288 Happy Gardens
Off Jalan University, P. Jaya

15. Mrs M.E. Stauffer
36C Lorong Universiti
Section 15, Petaling Jaya

16. Mr P. Muthu Veerappan
Conzinc Lab. Supt.
P O Box 20, Ipoh, Perak

17. Mr R.P.B. Pitt
c/o UNOCAL, 3rd Floor,
Ming Court Hotel
Singapore 10

18. Mr E.C. Salmon
Orchard Hill Lane, Greenwich,
Connecticut 06830, USA

19. Dr R.E. Wegmann
Shell Development (Aust.) Pty.
155 William Street
Melbourne, 3000, Australia

20. Mr R. Barton
Geophoto Resources
30 Herschell Street
Brisbane, Australia

The Secretary would like to be notified of any other changes of address as soon as possible as he is at the moment compiling a new list of members with their addresses.

Addresses Unknown

The Secretary has been unable to contact the following members whose present addresses are unknown. He would be grateful for any information on how to reach these people:

1. Mr R. Canpourcy
2. Mr R.H. Cook
3. R. van Leempoel
4. Mr D.E. Bird
5. Mr S.J. Derksen
