

P E R S A T U A N G E O L O G I M A L A Y S I A

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G E O L O G I C A L N O T E S

Early views of the genesis of the South African diamond deposits

K.F.G. Hosking. Calle Isla de Cuba 23, 1^o, 3, Sitges (Barcelona), Spain.

Those who are interested in mineral deposits will know that the diamond occurs in kimberlite pipes and other forms of ultra-basic intrusives and that denudation may effect the release of diamonds from such deposits and their accumulation in placers. They are also likely to be aware of the present views of the origin of diamonds. If they are not then a little library research will provide the data, so the latter need not be dealt with here. However, even considerable library research may not reveal some of the early views about the origin of the diamonds in the South African 'hard-rock' deposits. These views, which appear below, are to be found in a little-known paper published in 1892, by William Hambly who had earlier been the Government Inspector of Mines, Kimberley, and who, therefore, had a unique opportunity of obtaining all sorts of information about diamonds and the diamond-mining industry of South Africa when it was still very young. The paper in question, that is packed with interesting things, and is entitled "The discovery of diamonds and diamond mining in South Africa", was read to members of the Mining Institution and Institute of Cornwall on October 24th, 1889.

The relevant extract is as follows:- "The question may be asked: "how did diamonds get into these mines or craters?". For me to attempt to answer this would be treading on very delicate ground, since so many geologists and theorists, whose speculative minds go frequently beyond the range of practical men, differ. Some have said there must have been meteoric showers in the early history of the world and diamonds were rained down from Heaven. The 11th. verse of the 10th chapter in the book of Joshua is quoted in support of this (footnote). Others say that all diamonds have been brought to the diamond fields from a higher level by the agency of water, and others that they were floated on icebergs from other lands at the time of some great deluge. I cannot however accept such theories. I would rather believe that the diamonds were formed in these mines by a kind of lava of volcanic origin. We might go to some length of speculation, but one proof that they come from below might be noticed. All the fissures or cracks in

Footnote: The verse referred to reads: "And as the enemy was racing down the hill to Beth-horon, the Lord destroyed them with a great hailstrom". No mention of diamonds!

the hard rock are filled with the blue ground in which have been found diamonds, and this to my mind shows most clearly that it was pushed up from below by great force.

Now suppose the crater was made, and that the diamonds, and other precious stones were washed down into this crater, would not the heavy pebbles, diamonds and other stones, because of their specific gravity, go to the bottom, and the lighter matter rise to the top? Surely this light stuff would get up into the fissures, but such is not the case. The diamonds are very equally distributed throughout the entire mass."

I do not propose to comment on these views except to say that they are not more strange than some of the theories of ore-genesis that have been proposed during the past twenty years. One thinks, for example, of Dietz' (1964) view that the Sudbury igneous complex owes its origin to meteoric impact and that the nickel sulphides may have come from extra-terrestrial sources.

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The Geology of the Republic of Singapore: A Comment on alleged late Cainozoic high sea levels in Johore.

N.S. Haile. Jabatan Geologi, Universiti Malaya, Kuala Lumpur.

The publication of The Geology of the Republic of Singapore (hereafter referred to as GRS) reviewed in *Warta Geologi* 3, 4, p. 92-93 is indeed a welcome event.

The anonymous authors, however, appear to have perpetuated an error in regard to the "Old Alluvium" (also referred to as "Older Alluvium" and "High-level Alluvium") in Johore. On p. 54 they state "The top of the unit in Singapore lies at 46 m but in Johor is recorded up to 70 m with marine beds occurring at this height and doubtfully to 138 m" (my italics). They also refer on p. 67 (quoting Burton, 1973) to "marine incursions in Johore up to 70 m, or possibly higher" and state that "thus it can be assumed that the sea stood at that height or higher during the deposition of the Old Alluvium".

Burton does indeed suggest (1973, p. 54) that a marine incursion of approximately + 250 feet (i.e. + 76 m) occurred during the deposition of his "Older Alluvium" in Johore, but does not give any evidence for this, merely repeating his statement (1964) that "a few shell fragments, such as echinoid spines, and doubtful otoliths" have been found in the "Older Alluvium" of Johore.

This discovery was apparently taken by him to indicate the marine nature of the "Older Alluvium" and subsequent compilers (namely Tjia, 1970, table 1; 1973, table 2.1 and the authors of GRS) drew the conclusion that marine fossils had been found at + 76 m. I questioned this assumption in 1970, and later pointed out (Haile, 1975) that Burton has since clarified (personal communication) that the only marine fragments found by him came from a few metres above sea level, near the present sea coast. They may come from a slightly raised beach or coastal swamp deposit, younger than the "Older Alluvium". In fact, the lithological character of the "Older Alluvium", from Burton's description, and that of Kumar (1972), seems (as its name of alluvium i.e. river deposit, implies to be fluvial, as is recognized by the authors of GRS who state (p. 54) that the "Old Alluvium" is "dominantly a terrestrial deposit".

Thus it is clear that there is a considerable weight of evidence that the "Older Alluvium" is fluvial, and no evidence has been put forward that any part of it, except for a deposit near sea level (which may not even be related to the "Older Alluvium") is marine.

I would earnestly hope that the mistaken view that high-level marine deposits in Johore have been established can now be jettisoned, once and for all.

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Review: Geology of the Republic of Singapore

The Editor apologise for inadvertently leaving out the name of the reviewer who was Professor C.S. Hutchison.

G E O L O G Y O N S T A M P S

3. Skulls, Fossils, and Geophysics

N.S. Haile, Jabatan Geologi, Universiti Malaya, Kuala Lumpur

The skull on the 4 penny Gibraltar stamp (1973) was found when excavating the fortifications in 1848. It was only later, when similar skulls and a skeleton had been found elsewhere, notably at the Neander



valley near Dusseldorf, Germany, that the Gibraltar skull was recognised as belonging to a widespread type of early man, now regarded as a variety of our own species, named as Homo sapiens neanderthalensis, who flourished in the Riss-Würm interglacial, about 150 000 years ago. Once again Thomas Huxley (Darwin's champion) featured in a controversy, in contradicting the view of the eminent Professor Dr Rudolf von Vichow, who maintained that the remains at Neanderthal were those of a feeble-minded man, not a distinct early variety. It is pleasant to know that, if one misses a centenary, one can always issue a set of stamps to commemorate the 125th anniversary.

The Tanzanian stamp depicts the skull of "Nutcracker man" named Zinjanthropus boisei by Louis Leakey, who discovered it in the Olduvai gorge in 1959. It is now regarded as an Australopithecine ape-man, and assigned to the genus Paranthropus (or Australopithecus by some authors).

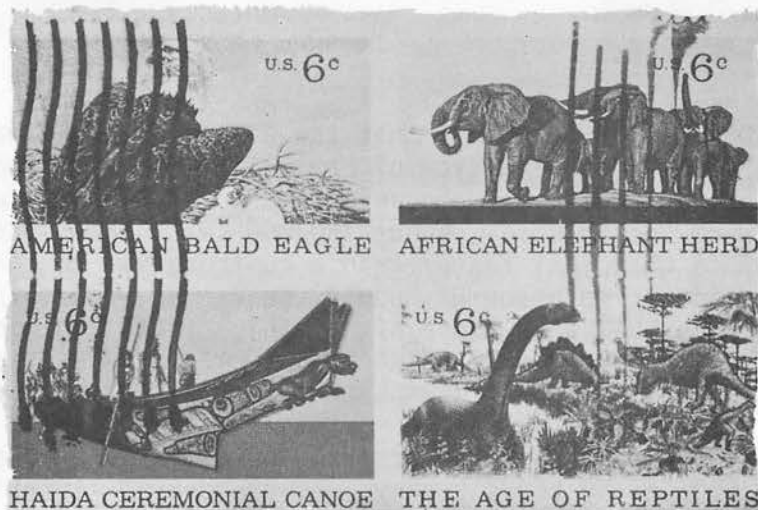


In southeast Asia, a close relative is Paranthropus palaeojavanicus from Sangiran in Java. The Olduvai find was dated radiometrically by potassium-argon in associated volcanic ash at 1.7 to 1.6 million years (Lower Pleistocene) far older than previously thought possible for Australopithecines. As well as the reconstructed skull, the stamp depicts a scene in Olduvai gorge with scientists working on the excavations.

The Chinese set of 1958 shows a trilobite, a dinosaur, and a deer. They are referred to as "Trilobite of Hao Li Shan", "Dinosaur of Lufeng", and "Sinomegoceras pachyspeus". The U.S. stamp "The age of Reptiles" is one

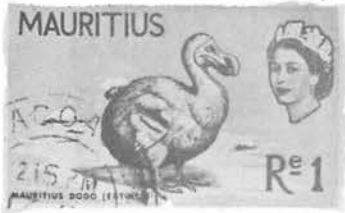


issued for the centenary of the American Natural History Museum in 1970. The stamp is part of the famous mural painted by Zallinger in 1943 for the Peabody Museum, Yale University, a print of which is on view in the Museum of the Department of Geology, University of Malaya. It shows some Jurassic forms, notably the inescapable Brontosaurus (two specimens),



with Stegosaurus under the neck of one, and Allosaurus (= Tyrannosaurus) at top right (two specimens). At lower right Camptosaurus appears, and in the right lower corner a chicken-sized Compsognathus, can just be seen. Two Rhamphorynchus are flying overhead, and two Archaeopteryx are in the foreground, of which one can just be made out under the Stegosaurus. All these are common on other sets of stamps, except for the ornithopod ('bird-footed') Camptosaurus, and the tiny carnivorous Compsognathus, a contemporary of the primitive bird Archaeopteryx in the Bavarian slates. Compsognathus strongly resembles a bird in form, and Huxley stressed this in emphasizing the probable derivation of birds from reptiles. Compsognathus still continues to be cited by those who suggest that dinosaurs are incorrectly classified as reptiles as among other reasons they were probably warm blooded, and should be grouped with birds in a new Class, Dinosauria. (An account of this is given on Adrian Desmond's fascinating book, The hot-blooded dinosaurs, Blond and Briggs, 1974). The Austrian

stamp, showing a fossil ammonite, was likewise issued in 1977 for the Vienna Natural History Museum, Jubilee Exhibition of 1978.



The Mauritius stamps (60c, 1953; 1 Re, 1965) show the Dodo, an extinct bird of which several skins and skeletons survive; these are not fossils as they have never been buried, and so the Dodo stamps are only honorary members of a geological thematic collection.



Geophysics, compared to dinosaurs, has not been very thoroughly explored on stamps. But then, few geological themes have. The Soviet set issued for "Geology Day" in 1968 (figure 2) is one of the few exceptions. On the 4 kopeck stamp ("Prospecting for minerals") a noble-looking geologist grasps his hammer in his right hand, and holds out his left, apparently to see whether it is still



raining. I have no idea what the five pentagonal shapes are, unless they are cushion starfish or forms of some new crystallographic system. The attached "se-tenant" label shows a hammer, a compass and some quartz. The 10 kopeck stamp shows an oil rig. The 6 kopeck stamp with more imagination shows seismic reflection prospecting, although most of the wave paths seem to be going everywhere but near the seismophones: an aeroplane is flying overhead emitting some sort of pulse. Not a great set, but full marks to the Soviets for having a "Geology Day", (and stamps to match). The U.S. 3-cent stamp (1958) for the International Geophysical Year shows the sun's surface, and two arms drawn after Michelangelo's "The Creation of Adam". Not very geophysical, but an imaginative fusion of science, art, and religion.



The Hungarians were rather late (1959) in their set of six stamps for the I.G.Y. of which the three shown depict the Eötvös torsion



balance for gravimetry (10 filler), a ship using an echo-sounder (20 filler), and the "Northern lights" with a polar scene (30 filler). The remaining stamps (not illustrated) show a Russian antarctic camp, a solar observatory, and Russian and U.S. artificial satellites.

All these stamps are upstaged by the Chinese 800 yuan stamp (1953; reproduced at twice size) showing the famous seismoscope invented by the brilliant mathematician, astronomer, and geographer Chang Heng in 132 A.D. Joseph Needham and Wang Ling (Science and Civilisation in China, Cambridge, 1959, vol. 3) call this the ancestor of all seismographs, and give a translation of an account from the Hon Han Shu (History of the Later Han Dynasty, by Fan Yek, around 450 A.D.):

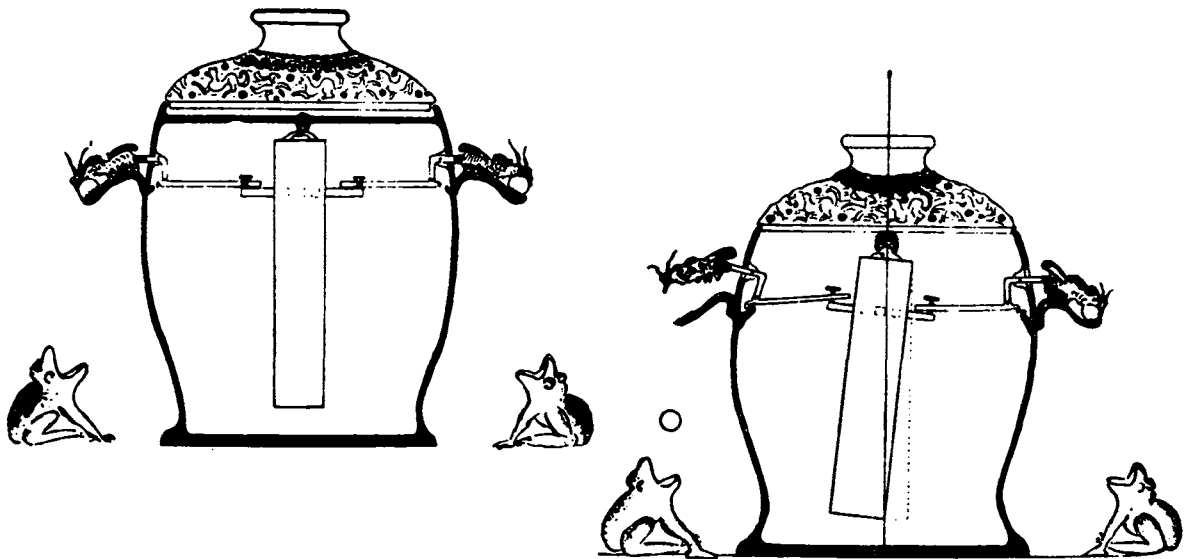
"In the first year of the Yang-Chia reign-period (+ 132) Chang Heng also invented an 'earthquake weathercock' (i.e. a seismograph). It consisted of a vessel of fine cast bronze, resembling a wine-jar, and having a diameter of eight chhieh (i.e. 6 feet). It had a domed cover, and the outer surface was ornamented with antique seal-characters, and designs of mountains, tortoises, birds and animals.



"Inside there was a central column capable of lateral displacement along tracks in the eight directions, and so arranged (that it would operate) a closing and opening mechanism. Outside the vessel there were eight dragon heads, each one holding a bronze ball in its mouth, while round the base there sat eight (corresponding) toads with their mouths open, ready to receive any ball which the dragons might drop. The toothed machinery and ingenious constructions were all hidden inside the vessel, and the cover fitted down closely all round without any crevice.

"Now although the mechanism of one dragon was released, the seven (other) heads did not move, and by following the (azimuthal) direction (of the dragon which had been set in motion), one knew (the direction) from which the earthquake (shock) had come (lit. where the earthquake was). When this was verified by the facts there was (found, an almost miraculous agreement (i.e. between the observations made with the apparatus and the news of what had actually happened). Nothing like this had ever been heard of before since the earliest records of the Shu (Ching).

"On one occasion one of the dragons let fall a ball from its mouth though no perceptible shock could be felt. All the scholars at the capital were astonished at this strange effect occurring without any evidence (of an earthquake to cause it). But several days later a messenger arrived bringing news of an earthquake in Lung-Hsi (Kansu). Upon this every one admitted the mysterious (power of the instrument). Thenceforward it became the duty of the officials of the Bureau of Astronomy and Calendar to record the directions from which earthquakes came."



Various reconstructions have been suggested of which one by Wang Cheng-To, in 1936, is shown.

Photos: by Jaafar b. Abdullah

M E E T I N G S O F T H E S O C I E T Y

Report on Field Trip to Pulau Redang, Trengganu.

The trip was held from 27 August to 1 September 1977. Members who participated in the trip were N.K. Chan, A.S. Gan, K.K. Khoo, T.T. Khoo, H.T. Ong, B.K. Tan and B.S. Yaw. They travelled to Kuala Trengganu on 27 August and sailed for P. Redang together with a group of biologists led by Dr. J. Green (University of Malaya) on board the Uji, a Trengganu Fisheries Department boat on 28 August. However, the trip back to Kuala Trengganu was made in a small and slow fishing boat.

Some of the interesting localities visited by the party are given below (see Fig. 1 for localities mentioned).

T. Dalam Besar

The headland on the western side of the bay is made up by a microgranite with quartz phenocrysts. On the eastern margin of the bay the microgranite can be seen invading another granite as sheets. The granite is commonly fractured.

Mak Simpan

Conglomeratic rocks are exposed on the southern margin of this bay and granitic rocks along its northern margin. The contact can be seen in the stream flowing into the bay. Along the coast, near the contact, there are plentiful xenolithic granite boulders. Further away, the granite is again invaded by the microgranite which is sometimes miarolitic. The microgranite is also intruded into sheared granite. The granite is commonly sheared and fractured.

The conglomeratic rocks which are mostly quartzose show no evidence of contact metamorphism other than recrystallization. Some oyster shells were seen attached to the conglomeratic rocks at a height of about 2 metres above the sea-level. It is uncertain whether this is an evidence for former higher sea-level.

Locality F

At this locality, conglomerates, conglomeratic clastic rocks and black slaty rocks are interbedded. The slaty rocks developed andalusite probably due to contact metamorphism. In these andalusite-bearing rocks are also found abundant plant fossils - mainly leaves of a fern. The coarser rocks show cross-bedding and graded bedding.

Kuala Redang area

The rocks bordering the western side of the river mouth consist mainly of conglomerates with minor interbeds of black andalusite-bearing slaty rocks. The pebbles and cobbles in the conglomerates are mainly quartzite and less commonly, quartz. The conglomerates form lensoid bodies which are much fractured (including the phenoclasts).

Kampung Pinang

The few small islets off the northern coast of Pulau Pinang are made of granitic rocks which are probably extensions of the main Redang granitic mass. However, at the northern tip of Pulau Pinang, hornblende-bearing tonalitic rocks are exposed. Bordering the tonalitic rocks are hornfelsic and garnetiferous thermal metamorphics. The tonalitic rocks are intruded by a dolerite sheet with chilled boundaries. It appears that the tonalitic rocks are the marginal facies of the granitic mass similar to those described by MacDonald (1967) in the Boundary Range and Maras/Jerong Granites.

Tg. Genting - Ayer Raja area

Metamorphosed fine sandstones and mudstones (some with andalusite) are exposed in this area. The clastics are invaded by common graphitic microgranite sheets probably originating from the main granitic mass. The clastics beds also show soft sediment deformation.

Pasir Tenggara

Conglomerates are exposed on the western side of this bay. Overlying the conglomerates are iron-oxides cemented beach pebbles and rock blocks. The highest level of this young deposit is about 2 metres above present sea-level. This may indicate a former higher sea-level.

The eastern side of the bay is bordered by sandstones and finer clastics sometimes showing soft sediment deformation. The more graphitic sediments occasionally developed well-formed pyrite cubes measuring about 1 cm across.

It was an enjoyable trip. When the participants milled round the village well for their daily bath they wished more members should have participated in the trip. For making our trip an interesting and enjoyable one we should thank Mr. Seow Kuan Tow, the Director of Fisheries Trengganu and Dr. J. Green for all their help.

T.T. Khoo

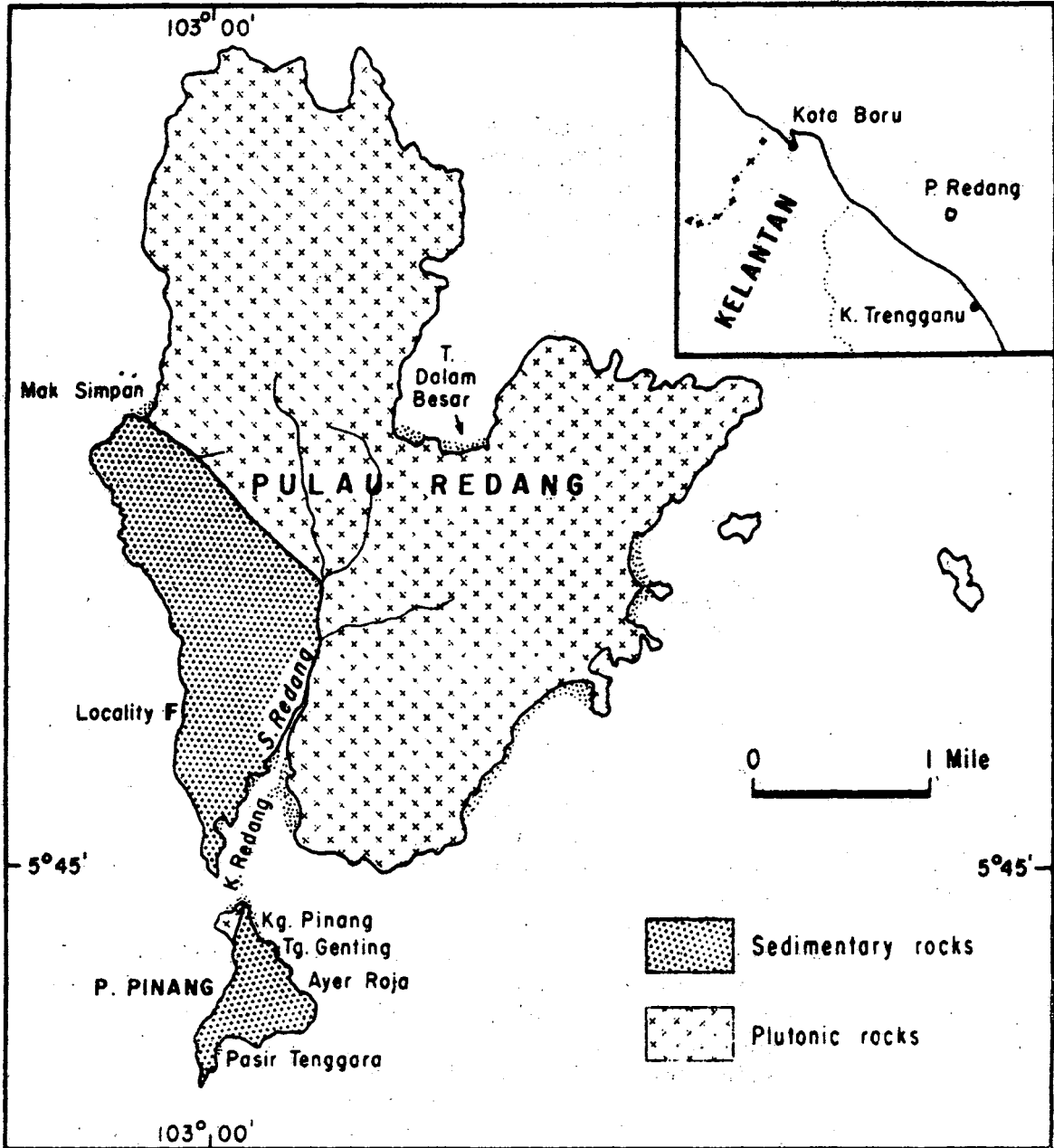


Fig. 1. Pulau Redang. Geological boundaries after MacDonalld (1967).

C.S. Hutchison & D. Taylor: A review of the mineralization of Southeast Asia.

The Society organised a talk "A review of the mineralization of Southeast Asia" on 9th September 1977. Professor C.S. Hutchison read the paper and the co-author, Dr. D. Taylor participated later during discussion time. The paper was very interesting and generated quite a lot of discussion amongst members. A summary of the talk by the authors is given below.

"Southeast Asia may be subdivided into three distinct metallogenic provinces - (a) peripheral Cenozoic volcanic arc, (b) Mesozoic Sundaland core, and (c) cratonic China north of the Red River Suture. a is a major producer of copper with minor gold and silver. b is the World's foremost producer of tin with subordinate tungsten and antimony. c is the World's premier tungsten and antimony province, with subordinate tin and mercury.

Ophiolites, obducted since the Paleocene from Pacific and marginal basin lithosphere, yield substantial chromite, increasing amounts of nickel from residual laterite, and massive Cyprus-type sulphides.

Paleocene to Miocene dioritic stocks, within the ensimatic arcs of the Philippines and north Sulawesi, contain important porphyry coppers. Gold and silver are important associates, but molybdenum is rare. Kuroko-type sulphides and mesothermal copper-gold vein deposits are important in the Philippines and Taiwan. Epithermal gold-silver telluride vein deposits are more widespread throughout the Cenozoic volcanic arc.

Tin mineralization, spacially related to acid granitoids of Permo-Triassic age in Indonesia and the Malay Peninsula and of Cretaceous age in Phuket and Tenasserim, is widespread in province b. Important lode deposits are confined to Billiton and the East Coast Belt of the Peninsula, emplaced within the zone of fracture around high level granitoids. Some stratiform iron-tin deposits characterize this Eastern Belt. Other tin fields, which yield the bulk of the region's production, contain few worthwhile lode deposits. Huge amounts of tin have been produced from the contact zones of large deep-seated batholiths in Bangka, along the Main Range of the Malay Peninsula, and in the Phuket region of Thailand. The tin has been concentrated in Quaternary placers by the favourable combination of climate and topography.

In the Southern Shan States and north Thailand, the deposits are associated with Triassic granites and have yielded more tungsten than tin, as well as significant amounts of antimony. Major tungsten and less important tin deposits are associated with Mesozoic granitoids in the Caledonian Foldbelt of southeastern China.

The important antimony and mercury occurrences lie on the continental side of the tungsten-tin belt.

Gold, antimony and mercury mineralization is associated with Tertiary igneous rocks in West Borneo, and mercury occurs in Palawan island.

Iron contact metasomatic and sedimentary ore deposits are associated with the Mesozoic igneous rocks in China and Sundaland, and with Cenozoic dioritic rocks in the Philippines.

The metallogenic zonation of China may be related to subduction of oceanic material beneath a continental margin, persistent since the early Mesozoic. In Southeast Asia, more complex patterns of subduction have resulted in less well defined metal zonation in the continental regions. Cenozoic mineralization in the Philippines and Indonesia resulted from convergent tectonics of great complexity involving both continental and oceanic crust of diverse origins".

P.G. Cooray: The Geology of Sri Lanka

Prof. Cooray gave his talk on the Geology of Sri Lanka to members of the Geological Society of Malaysia after being introduced by Dr. B.K. Tan. In brief, the stratigraphy of Ceylon comprises the old Archaean group and the younger Aryan group, both of which have equivalents in the Indian subcontinent. The former is the Dharwar System, which is an extension of the oldest rocks of the same name in southern India. There are three series of rocks in this system: the Vijayan series (mostly gneisses), the Charnockite series (acid to ultrabasic pyroxene-bearing granites) and the Khondalite series (garnetiferous quartz-sillimanite gneisses which are sometimes graphite-bearing).

The oldest member of the Aryan group is the Jurassic-age Gondwana system made up of sedimentary Tabbova series which include fossiliferous shales. These are overlain by Miocene age Jaffna series represented by extensive fossiliferous marine limestone conspicuous along coastal areas. The last member of the Aryan group are the Ratnapura Pleistocene gravels, sands and clays which yield a rich assemblage of Hippopotamus and Elephas maximus fossils.

Structurally, the island of Sri Lanka is regarded as a synclonorium of the Archaean group which include high grade metamorphic rocks. The major series of rocks mentioned above are shown to occupy the island

in four bands striking north-east to south-west. After summarising the geology, the speaker briefly touched upon the gem-mining industry in Sri Lanka.

Prof. Cooray's lucid talk was illustrated by slides, some of which were rather unique, and was followed by an interesting discussion.

Prof. C.S. Hutchison proposed a vote of thanks.

E.V. Gangadharam

NEWS OF THE SOCIETY

Symposium/Training Course: Geology of Tin Deposits

The response to our call for papers for the symposium has been very encouraging. Up to the end of October, 32 papers have been offered. A list of speakers and papers offered is given below. It is expected that about 25 of the papers offered will be presented at the symposium. Numerous well-known experts on the topic will be presenting papers (see list). As the number of papers offered has exceeded our expectations there has been a change in the date of the symposium. The date and venue of the symposium are:

Date : 23rd - 25th March 1978

Venue : University of Malaya, Kuala Lumpur

The training course will be held following the end of the symposium to 15 April 1978. To date we have received applications from more than 30 interested geoscientists for the course. This number is more than the number of participants we planned to have for the course and so some of the interested applicants will have to be disappointed. We have received applications from every continent. The training course will consist of lectures, practical classes, field excursions and courses.

The symposium/training course have the support of the Ministry of Primary Industries Malaysia and the cooperation of the Geological Survey Malaysia, the Department of Mines, Malaysia, the Southeast Asia Tin Research and Development Centre, the Department of Mineral resources Thailand and local mining companies. In addition financial support has been obtained from AGID and the Lee Foundation and financial support has been promised by the UNESCO and the Tin Industry (Research and Development) Board. It is hoped that the mining industry will provide more financial support in the near future.

The composition of the Organizing Committee for the Symposium/Training Course is as follows:

Dr. B.K. Tan (Chairman)	Encik W.K. Lee
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Encik C.H. Yeap (Editor)	Encik Wong Yew Choong
Dr. S.H. Chan	Encik Y.F. Wong
Encik A.S. Gan	Encik E.B. Yeap.

List of papers offeredAUSTRALIA

1. M.B. Katz : Structural-tectonic control of the tin-bearing pegmatites in the Australian Pre-Cambrian of Broken Hill, Australia.
2. R.G. Taylor : Review paper on the Australian Tin Field.
3. P.J.M. Ypma : The application of laboratory and field XRF techniques in alluvial tin exploration-comparison with mineral processing results.

BELGIUM

4. P.J. Goosens : The Burmese tin and wolfram belts, distribution and types of deposits and presentation of the new metallogenic map of Burma.

BRAZIL

5. M.S. Adusumilli: Tin-bearing minerals in pegmatites of N.E. Brazil - a review.
6. M.R.C. Borges : A paper on Brazilian tin deposits.
7. O.J. Marini & R.A. Fock : Granitic domes of central Goias, Brazil and their tin mineralization.
8. A. Bhaskara Rao: Brazilian tin deposits - a review.
9. A. Bhaskara Rao: Tin in granitic pegmatites from N.E. Brazil. & others

BURMA

10. A.H.G. Mitchell: Rift, subduction and collision - related tin mineralization.

CANADA

11. S.A. Kissin : a) A reinvestigation of the stannite-kesterite pseudobinary system.
b) Stannite and its relatives in the light of the new data.

CZECHOSLOVAKIA

12. M. Stemprok : Genesis of primary tin deposits in the Central European tin province.

HONG KONG

13. W.W.S. Yim : The geochemical determination of tin for prospecting.

INDONESIA

14. Sutedjo Sujitno : Offshore exploration of tin in Indonesia.

MALAYSIA

15. B.C. Batchelor : On and offshore cassiterite placers in Lumut, Perak, Malaysia.
16. C.S. Hutchison & S. Lerdthusnee : The tin belt granites of Thailand and Malaysia - a petrologic and tectonic comparison.
17. V.T. Pun & Joginder Singh : Sungei Lembing tin deposit, Pahang, Malaysia.
18. V.T. Pun : Lode tin exploration by diamond drilling.
19. S. Senathi Rajah : The Kinta Tin Field - a short review.
20. E.B. Yeap : c) The Kuala Lumpur Tin Field.
d) Localization of the carbona- type tin deposits in the Sungei Besi Mines No. 2 opencast.

NIGERIA

21. G. Matheis : Geochemical exploration around the pegmatitic Sn-Nb-Ta mineralization of S.W. Nigeria.

SPAIN

22. K.F.G. Hosking : A keynote paper.

THAILAND

23. P. Aranyakanon & P. Nutalaya : A paper on the Thai Tin Field.
24. S. Pitragool : Tin and tungsten mineralization of the Mae Lama Mine and the surroundings, Thailand.
25. S. Ishihara, H. Sawata, S. Arpornsuwan & others : The magnetite-series and ilmenite-series granitic rocks in Southern Thailand and their bearing on tin mineralization.

UNITED KINGDOM

26. C. Halls, R.H. Sillitoe, J. Angus & N. Grant : The tin deposits of the Eastern Cordillera of Bolivia : genetic aspects.

27. N.J. Jackson : The geology of the Cornubian tin field - a review.
28. N.J. Snelling : Geochronology of the tin granites of Southeast Asia.

UNITED STATES OF AMERICA

29. W.C. Kelly : a) Panasqueira tin-tungsten deposits, Portugal.
- b) Comparison of selected bedrock tin deposits - Cornwall, Bolivia, Panasqueira.

Seminar on 'The Petroleum Geology of the Sunda Shelf'

As a result of an earlier circular, positive responses were received from geoscientists in oil companies, petroleum consultant firms, universities and other individuals, indicating their willingness to attend and in some cases to present papers at the Seminar. The venue for the Seminar originally planned to be held in Ipoh immediately following the Annual Senior Officers' Conference of the Geological Survey of Malaysia has been rescheduled to Kuala Lumpur. The reason is because the Geological Survey of Malaysia will not be holding the conference in Ipoh but instead in Penang in late December. As Kuala Lumpur is considered more convenient for members, the Seminar is now planned to be held at Hotel Equatorial in Kuala Lumpur, on 16th December 1977.

The Organizing Committee would like to emphasise that the main purpose of the Seminar is to promote a better understanding of petroleum geology and petroleum exploration amongst geologists and other interested individuals including students in this country. The Seminar is therefore open to everyone.

Papers are still being accepted for the Seminar. If you intend to present a paper, please contact:

Mohammad Ayob
 Chairman, Organizing Committee on Petroleum Geology
 Seminar,
 c/o Dept. of Geology
 University of Malaya, Kuala Lumpur 22-11.

MembershipFull Members

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Student Member

Wong Hong Weng
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Student Loan Fund

The Society have not been able to contact the following recipients of student loan regarding the repayment of their loans. Letters from the Society have either been unanswered or returned due to change in address.

1. Mr. Harpajan Singh
2. Mr. Mohd. Yusop b. Abd. Mutalib
3. Mr. Abdul Rashid b. Abd. Mohd.
4. Mr. Mohd. Zahari b. Abu Bakar
5. Mr. Abdul Hanif Hussein
6. Mr. Ong Tiam Hoe
7. Mr. Mahzan b. Bakar.

Anyone able to assist the Society by either informing any of these former students that their loans are overdue or giving the present addresses of the loan recipients to the Society's Secretary are kindly requested to do so.

Loan note: Of 38 loans due for repayment before 30.9.77, 26 have been repaid in full, 5 partially and 7 still outstanding.

O T H E R N E W S

Country Report on Malaysia

Prof. H.D. Tjia recently presented a country report on Malaysia to a conference in Seoul on October 1977. Because of its historical information the text is reproduced below:-

"Malaysia consists of two separate land areas, the tectonically stable Malaysian Peninsula (Malaya) and the largely mobile East Malaysia that forms the northern part of the island of Borneo (Kalimantan).

In Peninsular Malaysia geological investigations began in the early nineteenth century. The first published accounts appeared around 1825. During the later part of that century studies were restricted to tin-mining activities. Systematic investigations only began after the establishment of the Geological Survey in 1903. Its headquarters were located near the tin-rich Kinta Valley. At present its main working facilities are in the valley at Ipoh. Slightly more than fifty percent of Peninsular Malaysia is covered by published or completed geological maps at one-inch-to-the-mile scale.

Integrated geological investigations in East Malaysia, that comprises Sarawak and Sabah states, began with the establishments of the state's geological surveys in 1949. In 1968 both surveys were integrated with that of Peninsular Malaysia into one single organization, the Geological Survey of Malaysia. Oil companies have been active since 1910 and many of their findings have been published. The entire land area of East Malaysia is covered by geological reconnaissance maps of a scale 1:125,000 or smaller. To date several 1:50,000 geological maps of selected areas have also been completed.

Education

Education in geology and/or geophysics is now the responsi-

bility of the University of Malaya (which moved from Singapore to Kuala Lumpur in 1959), The National University of Malaysia (established in 1970 in Kuala Lumpur), and the Science University of Malaysia (Geophysics group was established in 1972 in Penang). In the past few years between 20 and 30 geologists with at least B. Sc. honours degrees have graduated annually from the University of Malaya and from The National University of Malaysia. The three universities further offer graduate education in geological sciences leading to M. Sc. and Ph. D. degrees. This report estimates that at present about 200 Malaysian geologists have B. Sc. with honours or higher degrees.

Basic geology is further instructed as complimentary courses at the Agricultural University of Malaysia at Serdang near Kuala Lumpur, and at the Technological University of Malaysia in Kuala Lumpur. At the latter, geology courses are read by students in petroleum engineering, geodesy, and civil engineering.

The Mara Institute of Technology at Shah Alam near Kuala Lumpur offers a three-year diploma-course in geology with supporting science subjects to form-five holders. Diploma-holders have been admitted to the second-year level at the National University of Malaysia.

Employment

Among about 150 Malaysian geologists who are members of the Geological Society of Malaysia, 32% are directly employed by petroleum and mining companies, 25% have found work in supporting agencies (consultants, etc.) or in the Malaysian Soil Survey, 22% work for the Geological Survey, while 21% work in the various institutions of higher learning. This report further estimates that a total of 250 to 275 geologists are actively employed in the country.

At present it is not yet possible to estimate the future manpower needs of geologists and geophysicists for the country. From the above mentioned percentages it is clear that half of the geoscience manpower depends on the activities of petroleum and mining companies. The development of these activities depends on some factors which may be beyond the control of a single country. It is also envisaged, however, that many more geoscientists will find employment in the environmental field such as engineering geology, hydrogeology, and urban geology, which is at present in its infancy in most developing countries.

Research and Other Activities

Beside subjects for the generally performed geoscience researches, Malaysia offers excellent opportunities for specialized studies in alluvial tin-placer development and primary tin

mineralization (Peninsular Malaysia), copper mineralization (Mamut, Sabah), weathering behaviour of rocks in a tropical environment, engineering properties of various clays, Quaternary sea level changes in Peninsular Malaysia on account of its relative tectonic stability.

The foundation of the Geological Society of Malaysia in 1967 has been an excellent catalyst in promoting geological activities. The Society publishes a bimonthly newsletter and produce a bulletin at the average rate of one per year. An annual discussion meeting and several technical sessions per year are usual events.

The latest published comprehensive information on the geology of the country is found in Bulletin 3 of the Geological Survey (for East Malaysia, P. Liechti, 1960) and "The Geology of the Malay Peninsula" (Published by John Wiley, New York, 1973)".

Tenth INQUA Congress

The tenth congress of the International Union for Quaternary Research (INQUA) took place at the University of Birmingham, United Kingdom, on 15 - 24 August 1977. About fifteen hundred participants discussed five major groups of topics: (a) Quaternary environments and processes (147 papers); (b) Present environments as Quaternary analogues (41); (c) Quaternary flora and fauna (71); (d) Quaternary stratigraphy (97); (e) Man and the Quaternary (23). Several Symposia include "Antarctic glacial evolution and world palaeo-environment", "Mapping and modelling Quaternary climates". A number of IGCP (International Geological Correlation Program) projects pertains to the Quaternary and were given exposure, like "Late Cenozoic magnetostratigraphy" and "Sea level movements during the last 15,000 years". The impact of the latest project, begun in 1975, is demonstrated by the 40 odd papers on shorelines that were presented in six separate sessions. This IGCP project has now compiled an atlas of sea level curves (obtainable for US\$6.00 from Prof. A. L. Bloom, Cornell University, Ithaca, N.Y.) known from places throughout the world (including West Malaysia). One of the highlights of the meeting which I personally find interesting include the detailed studies on freshwater-lake sediments by geologists, geophysicists, geochemists, limnologists, palinologists, etc. Apparently, suitable lakes should have continuous sedimentation of very fine-grained matter during the Quaternary and a thickness of a few hundred meters. Interest was expressed by the strong Japanese Lake-Biwa group to study a lake close to the equator.

Attempts at world wide correlations of shorelines should be

abandoned, even between stable regions. Nils-Axel Mörner's (Sweden) concept of "geoidal eustasy" indicates that the changing geoid (having a cyclic pattern that resembles the precession cycle of the last 150,000 years) precludes such comparisons. INQUA has begun to take the applied aspect of Quaternary research into consideration. A group of persons is now studying the feasibility of creating a special commission on the subject. B.P. Hageman (Geological Survey, Netherlands) highlighted this aspect in "Quaternary geology and environmental planning".

With regret I have to report that the proverbial hand and number of fingers were several times too large to include participants from, as well as papers on the Quaternary of our part of the world.

H.D. Tjia

INQUA - Call for correspondents

A. INQUA Subcommittee of Shorelines of the Indian and Pacific Oceans (1977 - 1982).

President : Prof. T. Yoshikawa, Univ. Tokyo, Japan.
 Vice-President : Mr. J.C. Schofield, N.Z. Geol. Survey, Otara, New Zealand.
 Secretary : Prof. H.D. Tjia, The National University of Malaysia, Malaysia.

The objectives of this subcommittee are explained by its designation. Any one in the Indian and Pacific regions who are interested in becoming correspondents and to receive circulars are requested to write in.

B. INQUA Commission on the Study of the Holocene (1977 - 1982).

President : Prof. L-K. A. Kønigsson, Uppsala, Sweden.
 Vice-Presidents: Prof. H.D. Tjia, UKM, Malaysia.
 Dr. M. Sall, Université de Dakar, Senegal.

The vice-presidents have been entrusted to publicize the work of the Holocene Commission in their various regions and to promote participation in the program. The commission and its sub-commissions (Euro-Siberian, Mediterranean - Near East, North America and Greenland) are involved in three projects of IGCP:

- Project 61 : Sea level movements during the last 15,000 years.
- Project 146 : River flood and lake level changes.
- Project 158 : Palaeohydrology of the temperate zones.

One important objective of the commission is to reconstruct global climatic developments. Another is the establishment of a type locality of the Holocene - Pleistocene boundary. The general feeling is that 10,000 years should be adopted as the boundary.

Persons from all disciplines interested to participate and contribute in Holocene research are requested to write to the contact address in order to establish a communication network and eventually to launch regional research projects.

Contact address: Prof. H.D. Tjia
 Vice-President Holocene Commission
 Department of Geology
 Universiti Kebangsaan Malaysia
 Peti Surat 1124
 Kuala Lumpur, Malaysia.

Regional Network of Geoscience Cooperation

The Department of Geology, Universiti Kebangsaan Malaysia, has been asked by Unesco to act as the national link in a regional network of geoscience cooperation. The network was formally established at a meeting in October at Seoul, South Korea. Cooperation covered education, research, application, and the gathering and dissemination of pertinent information. Malaysia's national link has on its mailing list the following addresses as interested parties. Other agencies or institutions that are interested in receiving (and giving) information and support are requested to write to the contact.

The present list includes:

1. Jabatan Penyiasatan Kajibumi, Malaysia, Kuala Lumpur.
2. Petronas, Kuala Lumpur.
3. Jabatan Geologi, Universiti Malaya, Kuala Lumpur.
4. Pusat Pengajian Fizika, Universiti Sains Malaysia, P. Pinang.
5. Fakulti Pertanian, Universiti Pertanian Malaysia, Serdang.
6. Fakulti Kejuruteraan, Universiti Teknologi Malaysia, Kuala Lumpur.
7. Institut Teknologi Mara, Shah Alam, Selangor.

Contact address : Prof. H.D. Tjia
 Department of Geology
 Universiti Kebangsaan Malaysia
 Peti Surat 1124
 Kuala Lumpur, Malaysia.

Ninth International Congress of Carboniferous Stratigraphy and Geology

The Ninth International Congress of Carboniferous Stratigraphy and Geology is meeting during 1979 in the United States. This is the first time in the fifty year history of this Congress that it will leave Europe and travel elsewhere.

Broad themes of the Congress, directed toward the Carboniferous, include: Stratigraphy; Economic Geology of solid and fluid fuels; Geochemistry of sedimentary rocks; Non-metallic and metallic deposits; Paleontology; Radioactive age determinations; Coal petrology; Engineering Geology; Sedimentology; Theoretical and Applied Geophysics; Paleogeography; Geotectonics; Paleoclimatology; and Paleocology.

The technical sessions of IX-ICC will provide the opportunity for geologists interested in coal to meet with those interested in oil and natural gas. The Congress program will be theoretical as well as applied. All phases of geology that concern rocks of Carboniferous age will be explored. Coal deposits of all ages will be discussed.

Inquiries concerning the Congress should be addressed to:

the President, Mackenzie Gordon, Jr.
 or
 the Secretary-General, Ellis L. Yochelson,
 both at:
 IX-ICC, 1979
 Museum of Natural History
 Washington, D.C. 20560, USA.

New ASTM Subcommittee on Soil and Rock Pollution organized

Increased regulation of waste disposal has raised many new problems of surface and subsurface contamination. As a result, the American Society for Testing and Materials' Committee D-18 on Soil and Rock for Engineering Purposes has organized a new Subcommittee

(D-18.14) on Soil and Rock Pollution. The new subcommittee held its first meeting early this year in Bethesda, Maryland. Under the chairmanship of Professor Thomas F. Zimmie, Rensselaer Polytechnic Institute, this first meeting resulted in (1) a draft of a scope statement, (2) guidance as to future directions for standards development, and (3) plans for a future symposium on assessment of pollution from leaching of solid wastes.

AGID News, July 1977

Publications

Geology of Indonesia: Publications 1958 - 1975 and a few earlier publications

This bibliography compiled by H.D. Tjia and published by the Geological Survey of Indonesia was made to continue the series of publication lists on the geology of Indonesia that appeared in 1912 with Verbeek's bibliography and in 1957 with Klompé's work in 1963. This bibliography repeats the author's earlier compilation of 1958 - 1962 publications and brings the list to 1975, including some pre-1958 publications that were not included by Klompé.

Calendar

Under this column the Society will note coming events on meetings, courses and symposia of interest to members. Date in parentheses gives the issue of Newsletter containing more information pertaining to the event.

Geological Society of Malaysia1977

- Dec 16 : Seminar on "The Petroleum Geology of the Sunda Shelf". Kuala Lumpur. Mohammad Ayob, Chairman, Organizing Committee, c/o Petronas, P.O. Box 2444, Kuala Lumpur. (Sept-Oct 1977).

1978

- Mar 23 - Apr 15 : Geology of Tin Deposits: An International Symposium and Training Course. Secretary, Organizing Committee, Symposium/Training Course on Tin Deposits, c/o Dept. of Geology, University of Malaya, Kuala Lumpur 22-11, Malaysia. (Jan-Feb 1977).

Other Events1978

- Mar 5 - 10 : Oceanology International 78 Conference and Exhibition, Brighton, England. Conference Organisers, BPS Exhibitions Ltd., 4 Seaford Court, 220-222, Great Portland Street, London W1N 5HH. (Jul-Aug 1977).
- April 14 - 20 : Seventh international geochemical exploration symposium to be sponsored by the Association of Exploration Geochemists in Golden, Colorado, USA.

M.A. Chaffee, U.S. Geological Survey, 5946
McIntyre Street, Golden, Colorado 80401, USA.

- May 6 - 12 : Eleventh Commonwealth Mining and Metallurgical Congress in Hongkong. Secretary, The Institution of Mining and Metallurgy, 44 Portland Place, London W1N 4BR, England. (Mar-Apr 1977).
- May 8 - 11 : Offshore Technology Conference, Houston, USA. 6200 N. Central Expressway, Dallas, Texas 75206, USA.
- June 23 - 28 : International Symposium on World Oil and Gas Occurrence, sponsored by Canadian Society of Petroleum Geologists: Facts and Principles of World Oil and Gas Occurrence. Calgary, Alberta. Information: J. Bronwing, General Chairman, International Symposium '78, c/o 612 Loughheed Building, Calgary, Alberta T2P 1M7, Canada.
- Jul 2 - 4 : Fifth Southeast Asian Conference on Soil Engineering, Bangkok, Thailand. Dr. A.S. Balasubramaniam, Secretary, 5SEACSE, Asian Institute of Technology, P.O. Box 2754, Bangkok, Thailand. (May-Jun 1977).
- Jul 5 - 6 : International Symposium on Soft Clay, Bangkok, Thailand. Dr. R. Peter Brenner, Secretary ISSC, Asian Institute of Technology, P.O. Box 2754, Bangkok, Thailand. (May-Jun 1977).
- Jul 18 - 22 : 3rd Inter-Congress of the Pacific Science Association in Appropriate Technology, Bali, Indonesia. Miss Sjamsiah Achmad, Indonesian Institute of Sciences, Tenka Cik Ditiro 43, P.O. Box 250, Jakarta, Indonesia. (May-Jun 1977).
- Jul 30 - Aug 4 : Second Circum-Pacific Energy and Mineral Resources Conference, Honolulu, Hawaii, c/o AAPG, P.O. Box 979, Tulsa, Okla. 74101, USA. (May-Jun 1977).
- Nov 14 - 17 : Third Regional Conference on Geology and Mineral Resources of Southeast Asia, Bangkok, Thailand. Conference Secretary, IIIIGEOSEA, Division of Geotechnical & Transportation Engineering, Asian Institute of Technology, P.O. Box 2754, Bangkok, Thailand. (Jun-Aug 1977).

1979

- 1979 : 14th Congress of the Pacific Science Association
USSR. B.G. Gafurov, Chairman of the Soviet
National Pacific Committee, Academy of Sciences
of the USSR, Moscow. (Jul-Aug 1977).
- May 10 - 26 : Ninth International Congress of Carboniferous
Stratigraphy and Geology, Washington, USA.
President or Secretary-General, IX-ICC, 1979,
Museum of Natural History, Washington, D.C.
20560, USA. (Sept-Oct 1977).

PERSATUAN GEOLOGI MALAYSIA
(GEOLOGICAL SOCIETY OF MALAYSIA)

Tujuan Persatuan Geologi Malaysia adalah untuk memajukan sains bumi, terutamanya di Malaysia dan tempat-tempat berhapiran. Sesiapa yang ingin majadi ahli Persatuan sila dapatkan borang-borang daripada Setiausaha Kehormat.

The aim of the Geological Society of Malaysia is to promote the advancement of geological sciences particularly in Malaysia and nearby areas. Anyone interested in becoming a member of the Society should obtain the necessary forms from the Hon. Secretary.

Annual Dues

The annual dues of Full Members and Associate Members shall be M\$15/- if paid in advance before the first day of each calendar year, M\$16/- if paid between 1 January and 1 March, or M\$17/- thereafter. The annual dues for members elected after June 30 shall be M\$7.50 that year. An entrance fee of M\$5/- shall be payable on election.

Some Bahasa Malaysia (Malay) geographical terms

Bukit (Bt)	- hill	Kuala (K)	- mouth of river
Genting (Gtg)	- pass	Pulau (P)	- island
Gunung (G)	- mountain	Sungai (S)	- river
Jalan (Jln)	- road, street	Tanjung (Tg)	- cape
Kampung (Kg)	- village	Teluk (T)	- bay

