PERSATUAN GEOLOGI MALAYSIA

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CONTENT



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PERSATUAN GEOLOGI MALAYSIA

(GEOLOGICAL SOCIETY OF MALAYSIA)

## Majlis (Council) 1976/77

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Tujuan Persatuan Geologi Malaysia adalah untuk memajukan sains bumi, terutamanya di Malaysia dan tempat-tempat berhampiran. Sesiapa yang ingin menjadi 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.

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### 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 |

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# GEOLOGICAL NOTE

## Enapan Gunungapi Muda di Trengganu

H.D. Tjia
Jabatan Geologi, Universiti Kebangsaan Malaysia.

Abstract: At Sungai Bekok, a tributary of the Sungai Besut, Trengganu, is exposed below 3 - 7 m thick alluvium an altered, fine-grained tuff deposit of silicic composition (quartz, biotite, kaolinite, bentonite, and meta-bentonite). The tuff occurs at an approximate altitude of +30 m which may represent a former Pleistocene shoreline. Carbonized plant remains seem to be concentrated at the lower parts of the 1.5 to at least 3.5 m thick tuff bed.

Semasa menyelia pemeta tahun kenujian geologi universiti ini di lembah Besut, Trengganu, pada awal tahun 1976, penulis menjumpai di berbagai cawangan Sungai Besut suatu enapan lodak hingga tanahliat berwarna kelabu cerah. Laporan ini merekodkan salah satu enapan di Sungai Bekok, kawasan Kampung La, lembar peta 24e (rajah 1) sedangkan kajian lebih mendalam baik di makmal maupun di lapangan sedang diteruskan dan diharapkan kesimpulannya dalam sedikit masa lagi.

Sepanjang Sungai Bekok tersingkap di sana-sini sebidang lapisan kelodak-tanahliat berwarna kelabu cerah pada garis kontur sekitar 30 m (100 kaki) di atas paraslaut. Sedimen tersebut bersifat plastik dan selalu tertimbun aluvium yang berketebalan tidak kurang dari 3 meter; di suatu tempat aluvium penimbun itu berketebalan sampai 7 meter. Aluvium umumnya pasir kuats berbutiran sederhana hingga kasar dengan butiran bersudut separa (subangular). Tebal lapisan kelabu cerah berkisar antara 1.5 hingga 3.5 meter, tetapi belum pernah dijumpai alas lapisan ini dalam singkapan. Pada lapisan tersebut tidak nampak laminasi atau struktur lain tetapi ia mengandungi baki tumbuhan, seperti ranting, daun dan barangkali rumput, yang terkarbonisasi ke darjah lignit. Setakat ini tidaklah dapat dipastikan apakah di antara baki tumbuhan ada yang in situ atau tegasnya mewakili tumbuhan-tumbuhan yang tertimbun hidup-hidup. Sebaliknya dapat ditentukan di satu dua tempat bahwa baki tumbuhan didapati lebih banyak di bagian bawah daripada lapisan dibanding dengan yang terkandung pada bagian lapisan lebih tinggi. Salah satu kajian makmal yang di lakukan ialah dengan pancaran difraksi sinar-X oleh Dr. Kardinal Kusnaeny daripada jabatan ini juga. Ujian tersebut menunjukkan sedimen mengandungi kuats, kaolinit, bentonit dan metabentonit dan biotit. Sebagaimana diketahui am maka bentonit adalah bahan ubahan tuf akibat penyahkacaan (devitrification) dan ubahan kimia yang berkaitan daripada bahan ignias kaca.

Scrivenor (1931, ms. 117) merekod untuk pertama kalinya tuf bersifat riolit di Semenanjung, iaitu di ladang Tanjung Perak sebelah utara Kuala

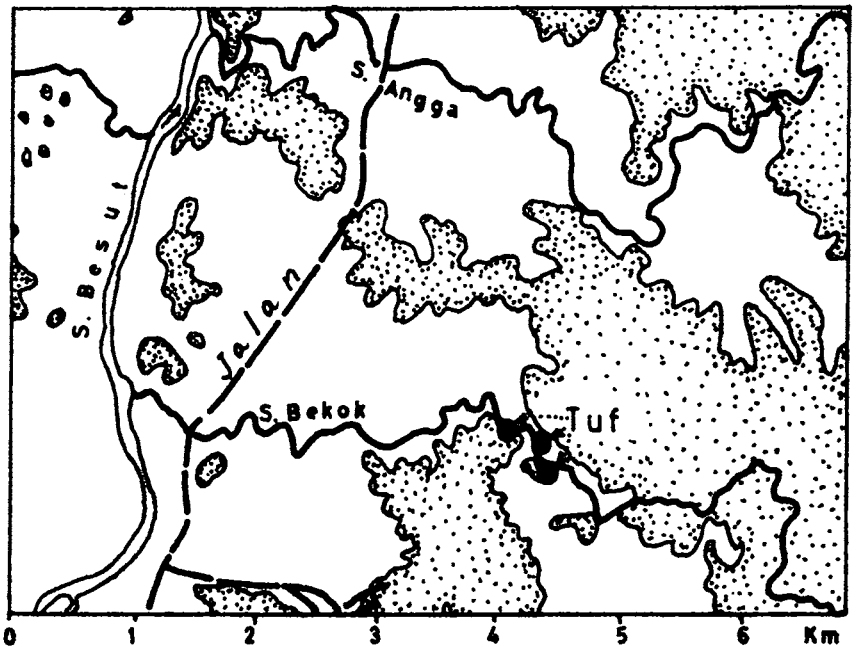
Kangsar. Alexander (1968) menemukan bahan seruna di Pahang; saiz butiran tuf Pahang ada yang sekasar pasir sederhana. Selain itu ada beberapa tempat lain di bagian barat Semenanjung di mana tuf bersifat riolit dijumpai, tetapi belum pernah dicatit dari pantai timur. Semua penyelidik bersetuju enapan debu riolit yang hingga kini dijumpai mungkin berasal dari suatu letupan besar di Sumatra yang menghasilkan lembangan Toba dan papisan ignimbrit di sana, barangkali pada Pleistosen. Walaupun tidak didapati perlapisan dalam tuf Sungai Bekok, dipercayai enapan itu berusia muda kerana ditimbuni langsung oleh aluvium dan kerana kandungannya bersifat silisik serupa dengan enapan tuf lainnya di Semenanjung. Jika tuf Trengganu berasal dari kawasan Toba, ia telah menempuh jarak 500 km atau 175 km lebih dibanding dengan tuf di Perak.

Kedudukan tuf Sungai Bekok di sekitar garis kontur 30 m dan taburan baki tumbuhan di bagian bawah lapisan mungkin dapat ditafsirkan sebangai suatu pemendapan dalam lagun tepilaut di mana biasanya terdapat tumbuhan yang cukup lebat. Umumnya para pakar Kuater percaya bahwa paraslaut semasa salah satu tempoh antarglasical pernah mencapai ketinggian sampai 50 m di atau paras sekarang.

Rujukan:

Alexander, J.B., 1968. The geology and mineral resources of the neighbourhood of Bentong, Pahang and adjoining portions of Selangor and Negeri Sembilan. Memoir Geol. Surv. Dept. West Malaysia No. 8.

Scrivenor, J.B. 1931. The Geology of Malaya. London, Macmillan.




Rajah 1: Peta penunjuk tempat-tempat tuf di Sungai Bekok. Sempadan antara dataran dan perbukitan didapati pada garis kontur 30 m. Permukaan di atas 30 m ditandai titik-titik.

# MEETING OF THE SOCIETY

## Ipoh Discussion Meeting

The meeting was held on Friday, 10 December 1976 in the conference hall of the Geological Survey of Malaysia, Tiger Lane, Ipoh. The theme of the meeting was on the "Geology of the South China Sea area including its continental rim". Fifteen papers were presented and about 120 participants from the Society, Geological Suevey, SEAPEX, IME, IMM, SIRIM, DMR Thailand and the Prince of Songkhla University, Thailand were present.

The meeting was divided into 4 sessions. They were

Session 1: General Geology - Peninsular Malaysia (Chairman - W.K. Lee, The President)

Session 2: Continental Mesozoic of Peninsular Malaysia (Chairman - S.K. Chung, Geological Survey Malaysia).

Session 3: Structures of Peninsular Malaysia (Chairman - M. Ayob, Petronas).

Session 4: Geology of Sabah and Sarawak (Chairman - D. Santokh Singh, Geological Survey Malaysia).

For the titles of papers and the speakers refer to the programme attached to the Abstracts of Papers available to all members.

In his opening remarks the President welcomed all the participants and thanked the Geological Survey Malaysia and Encik S.K. Chung, the Director-General for allowing the Society to hold the meeting in the Survey's premises and for cooperation. He also thanked Encik P.C. Aw of the Geological Survey for his help in organizing the meeting and also the Annual Dinner. The Dept. of Geology, University of Malaya was also thanked for its cooperation.

## Session 1-

In this session 5 papers were presented; 4 on Upper Cenozoic to Holocene geology and one on calc-silicate mineralogy.

In his paper, T.T. Khoo presented evidence (raised coral reef) for a higher sea-level about 6000 years ago at the Juara area, eastern part of Pulau Tioman and also he described a peculiar type of stream, the Keliling-type, which he believed could be formed as a result of fluctuations of sea-levels during the Holocene. H.D. Tjia asked the speaker whether the higher former shoreline was due to tectonic uplift or eustatic sea-level changes. He replied that it could not be

The next paper was presented by J.K. Raj. He showed in a series of excellent Landsat 1 (ERTS A) imagery photographs covering the coastline from Kelantan to Johore, the direction of sediment movement. At some places the sediments move northwards and at some other places the movement is towards the south. S.K. Chung asked the speaker whether he could explain why sometimes the direction of movement is northwards and sometimes southwards. The speaker gave some ways by which the movement could be in opposite directions but from the photographs he could not find any evidence to explain the directions of sediment movement.

B.C. Batchelor presented data on the stratigraphy of young sediments occurring in Indonesian tin islands bordering the South China Sea and compared the stratigraphy with that of Lumut-Dindings in Perak. He showed how the studies could be used as an aid in tin placer exploration. Several questions were asked from the floor regarding his work.

S.B. Tan found than the seafloor sediments in the Pulau Aur - Pulau Pemanggil - Pulau Tioman area gave very low values for tin and other base metals. Minute amounts of cassiterite were found in heavy concentrates panned from a beach in Pulau Aur. To a question by S.K. Yong, he replied that the cassiterite grains he found were of fine sand size. H. Sawata wanted to know how he located the boat in the high seas. It was replied that the boat was located by sighting prominent landmarks in adjacent islands and triangulation.

The last paper of the session was by K. Ganesan who described calc-silicate minerals found in Pelepah Kanan mines in Johore. Axinite and garnet were found to be slightly stanniferous by X-ray fluorescene.

## Session 2

After tea, E.H. Yin in his joint paper with P.C. Aw reviewed the studies of continental Mesozoic rocks by earlier workers and presented new data from areas such as Sungai Tekai. They pointed out that the Tembeling Formation which is folded is comparable in age to the not folded Gagau Group from palaeontological evidence. The earlier belief that the Tembeling Formation is older than the Gagau Group based on structure should be discarded.

F.L. Yap followed by giving a review of radiometric ages of granitoids in Peninsular Malaysia and their implications for the upper Mesozoic in the country. He was followed by Y.K. Shu who described the structures of Upper Mesozoic rocks based on photogeology.

P.H. Stauffer warmly contratulated the paper presented but objected to the dropping of the word 'Tembeling' as suggested by Yin and Aw. C.S. Hutchison gave some comments on the radiometric ages of Malayan granitoids

to the dropping of the word 'Tembeling' as suggested by Yin and Aw. C.S. Hutchison gave some comments on the radiometric ages of Malayan granitoids and mentioned his studies of the petrography of the Eastern Belt granitoids which are found to be high level granitoids emplaced in a rather stable area. T.T. Khoo pointed out that more radiometric age determinations of metamorphics should be done as their ages could be useful in resolving the continental Mesozoic problem. Santokh Singh did not believe that there was no significant thermal event affecting the Eastern Belt during the Upper Mesozoic. He pointed out the presence of volcanics in the Gagau Group, the occurrence of young basalts in the Kuantan area, and also a Cretaceous K-Ar age determined from a granitoid retrieved from a drill hole in the Exxon concession off Trengganu.

Session 3

After lunch, T.T. Khoo presented a paper written jointly with S. P. Lim on the structure and metamorphism of the Taku Schists and adjacent rocks in the Manek Urai area, Kelantan. They examined the structural and petrographic evidence for an unconformity between the Taku Schists and the adjacent rocks in the light of new data gathered from the Manek Urai area. They believed that an unconformity does not exist and that the Taku Schists are not gently folded but have suffered at least 2 periods of folding. They also presented evidence for the existence of a fault, named the Anor fault and pointed out the lack of evidence for the Lebir fault in the area. After the talk, P.C. Aw asked several questions and commented on the Taku Schists from work he has done north of the Manek Urai area. The speaker was asked to comment on the lack of marble in the Taku Schists. The speaker replied that the Carboniferous - Lower Triassic rock trinity in the Central Belt - acid volcanics, pelites and limestones is different from the rock assemblage in the Taku Schists - basic rocks, pelites and an occurrence of sepentinite. The rocks of the Taku Schists could therefore be Devonian or older at the present level of erosion and may be similar to the rocks bordering the eastern side of the Main Range granite.

H.D. Tjia followed with a paper on the structural style of the east coast of Peninsular Malaysia and interpreted the deformation history of the rocks since the early Carboniferous.

L.S. Yap spoke on the structures found in Tanjong Gelang, Pahang. He interpreted the structures there to be mainly due to slumping and gravity sliding. His interpretation of the structures were different from that given by H.D. Tjia. To a question by T.T. Khoo, the speaker said that palaeocurrent directions indicate a direction of slumping and transport from the northwest of the area.

The next paper, by B.K. Tan, interpreted that the Central Belt of Peninsular Malaysia was an aborted rift graben. The uplifted blocks on both eastern and western sides caused the development of slump structures

syenitic rocks and metamorphics could be accomodated in the model. C.S. Hutchison commented that the fit between the Western Belt and Eastern Belt was unconvincing and that the granitoids in both belts are different. P.J.C. Ryall asked where is the possible location of the hot spot from which the grabens were generated. The speaker suggested it could be in the Gulf of Thailand.

The last paper of the session was by P.J.C. Ryall who presented preliminary data on a gravity traverse from Kuala Selangor to Kuantan, mainly along the Rawang - Kuala Kubu - Gap - Bentong - Karak - Kuantan highway. The results indicate a relatively thinner 'granite' crust underlying the Central Belt than the Main Range. Various models could be proposed to fit the data and he invited geologists to put forward suggestions.

## Session 4

After a short tea break as the speakers in session 3 had taken up some of the tea time, C.S. Hutchison talked on the basement of Sabah. He proposed that the basement could be drifted from Southeast China. Plate tectonic model was used to explain the geology of Sabah and adjacent area.

C.P. Lee spoke on the structure of Labuan island. He interpreted that the structure of the area could be caused by underlying mud which rose in a diapir - like manner due to load pressure of overlying arenaceous deposits. D.T.C. Lee pointed out that such idea was proposed by several early workers in the Borneo region. The speaker agreed but said that nobody has put forward a similar model for Labuan.

A. Unya who presented his joint paper with S.K. Lam outlined the geology of the Lupar Valley area in Sarawak. A plate tectonic model was used to explain the rock associations and structures. Several questions were asked by skeptics of the plate tectonics model but the speaker answered quite convincingly based on plate tectonics.

The last speaker, P. Jagasthasparan, showed slides of foraminifers and interpreted their palaeoecological significance. A question was asked about how his study throws light on a fault in the area. The speaker replied that the fault is nowhere near his area!

The meeting broke up at about 6 p.m. It was a long day of conference but every moment of it was rewarding.

# E X C U R S I O N S

## BEH Minerals and MAREC, Lahat, Perak

On the morning of Saturday, 11 December 1976, about 35 members visited the plants of BEH Minerals and MAREC at Lahat, Perak. The participants were led to see the various parts of the BEH Minerals plant by Encik Tan Chong Heng and others.

At the BEH Minerals plant participants were shown how 'amang' containing monazite, ilmenite, zircon, xenotime, cassiterite, tourmaline and other heavy minerals were separated and concentrated by wet and dry vibrating tables, magnetic separators, electrostatic separators and other methods. In the laboratories the participants were shown how the concentrates were analysed, separated and evaluated.

At the MAREC plant, the former senior geochemist of the Geological Survey Malaysia, Encik Leong Pak Cheong told the participants how ytrrium was extracted from xenotime in the plant and showed the participants the plant and its laboratory. Encik Leong told the participants the interesting information that Malaysia supplies half the world's demand for ytrrium which is used for the making of colour television tubes. Ytrrium gives a much more brilliant red than other phosphors. It appears that in addition to being the leading producer of tin, natural rubber and palm oil, Malaysia is also the leading producer of ytrrium and helping to make this world a much paver and more colourful place to live on.

## Ipoh Granite and Marble Works, Chemor, Perak

After visiting the BEH Minerals and MAREC, the participants visited the workshop and showroom of the Ipoh Granite and Marble Works, Chemor. At the showroom the participants were met by Dato Leow Yan Sip, Chairman of the company and also a member of our Society for many years.

Dato Leow showed the participants the workshop where local and imported marbles were sawn, polished and cut into required slabs. At the handicraft section the participants saw how delicate and artistic lamp-stands, vases, pots, ash-trays and other objects were made from local marbles.

Three varieties of local marbles were used. They are
(a) coarse-grained saccharoidal white marble
(b) white marble with black streaks and patches on and
(c) a pink cataclastic (?) marble.

Varieties (a) and (b) are obtained from a quarry from the workshop and variety (c) comes from Keramat Pulai, south of Ipoh. All of them are

very beautiful stones and give a very good shine after polishing. Dato Leow pointed out that the local marbles are as good if not better than the more well-known and dearer Italian marbles. All the participants, Malaysians and non-Malaysians alike, agreed with Dato Leow after comparing the products.

Just before leaving most of the participants could not resist the temptation of buying some of the beautifully cut, sculptured and polished marble objects and Dato Leow was kind enough to give generous discounts for the purchases.

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## N E W S  O F  T H E  S O C I E T Y

### Annual Dinner 1976

The Annual Dinner was held in Lee How Fook Restaurant, Ipoh at 7.30 p.m. on Friday 10 December after the Discussion Meeting. About 80 members and their guests participated. Staff of the Geological Survey Malaysia turned up in force for the Dinner.

Compared to last year's Annual Dinner, this year's Dinner was an informal one and just as enjoyable. It is quite difficult for so many geologists spread out throughout the country to get together and the joy of the get-together was reflected in the beer stock of the restaurant. Half an hour after the commencement of the Dinner, the waitresses were heard to apologise that the restaurant had ran out of some brands of beer. About 20 geologists stayed back for more drinks after the Dinner and it was uncertain whether they managed to deplete the whole beer stock of the restaurant.

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The Society is also trying to arrange a few talks on the geology of north Sumatra and mineral exploration activities there by a member of the IGS team working in the area.

## Pacific Science Association

The Council has decided that the Society join as an associated member of the Pacific Science Association in the coming year.

## Membership

The following have been elected:

### Full membership

J.W.E. Lau
Petronas
P.O. Box 2444
Kuala Lumpur

L.S. Leong
Seismological Unit
Box 517, S-751 20
Uppsala 1
Sweden

M.A. Woollands
B.P. Petroleum Dev. Ltd.
Tanglin P.O. Box 288
Singapore 10.

### Student membership

1. Ramly Khairuddin)
2. Gerald Robert )
3. Tuan Kob Tuan Dir)
4. S.W. Yeap )
5. S.M. Yu )

all from Jabatan Geologi,
Universiti Malaya
Kuala Lumpur

6. H.C. Lau, Dept. of Appl. Geology, Royal Melbourne Inst. of Technology, 124 La Trobe, St., Melbourne, Vic. 3000. Australia.

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# N E W S  O F  M E M B E R S

## New Addresses

The following members have changed their addresses

1. J.H. Dayvault, P.O. Box 32061, Oklahoma City, Oklahoma 73132, USA.
2. O.O. Fox, Esso Exploration, P.O. Box 146, Houston, Texas 77001, USA.
3. E.G. Gallatin, Exxon Co., P.O. Box 2180, Houston, Texas 77001, USA.
4. R.F. Goninon, Australian-Thai Tin Ltd., Room 604, Dusit Thani Office Bldg., 946 Rama IV Road, Bangkok, Thailand.
5. H.K. Lim, 39 Lorong Seratus Tahun, Penang.
6. W.C. Presley, Esso Exploration, P.O. Box 146, Houston, Texas 77001, USA.
7. H. Sawata, Prince of Songkhla University, Haatyai, Songkhla, Thialand.

# OTHER NEWS

## Council of Fellows, MSA

We have been informed by the Malaysian Scientific Association (MSA) that the inauguration of the Council of Fellows of Science has been postponed to early 1977. The reason for the postponement is that many distinguished Malaysian who are keen to participate will not be available till early next year.

Members will be informed on any further development in due course.

## CCOP Symposium on Quaternary Geology - A Report

The Symposium held in Equatorial Hotel, Kuala Lumpur on 29 November 1976 was chaired by Dr. Jaafar Ahmad, Asst. Director-General Geological Survey of Malaysia. Numerous members of our Society who were all invited to participate (Warta Geologi, vol. 2, 112-113) were present.

Six papers were presented. They were by Encik T. Suntharalingam, Prof. H.D. Tjia and others. Dr. P. Haseldonckx, Dr. F. Hehuwat, Encik K.Y. Foo and Dr. Surendra Singh. Dr. E.A. van de Meene gave an introduction of the aims and plans of studying the Quaternary Geology of the region.

Encik T. Suntharalingam in his paper outlined plans of the Geological Survey Malaysia, which has established a Quaternary Geology Section, to study the Quaternary of Malaysia. Initially all available data relevant to the Quaternary of Malaysia will be collected and examined and later there are plans to carry out systematic drilling of Quaternary deposits.

Prof. H.D. Tjia in his joint paper with Prof. S. Fujii and Prof. K. Kigoshi outlined possible causes for sea-level changes. He pointed out that various lines of evidence indicate that the Sunda Shelf region developed into an orogenically stabilized area by the beginning of the Cenozoic. He presented numerous instances of former higher sea-levels and radiocarbon ages of raised organic remains. He interpreted that the shorelines within the last 11,000 years to be eustatic on account of the tectonic stability of the region. However, he believes that diastrophically influenced shorelines are present near the edges of the Sunda Land e.g. the Langkawi Islands.

Dr. P. Haseldonckx presented a paper on palynology and its applications. Pollens and spores from samples of a few boreholes in Perak were studied and their significance discussed.

D. F. Hehuwat presented a paper on Quaternary stratigraphy and recent sedimentation in the north Java coastal plain. Very interesting data were presented on studies of several deltas in Indonesia especially the Cimanuk in Java.

Encik K.Y. Foo talked on the Quaternary geology of the coastal plain west of Taiping, Perak from data collected from 30 boreholes. Sedimentological and palaeontological studies of several samples show that heavy minerals were derived mainly from the east, the environment of deposition was shallow water, marine and tropical to subtropical, and also there are indications of genral transgression and regression of the sea during the period of deposition of the marine sequence.

Dr. Surendra Singh discussed the advantages of geophysical methods in the study of the Quaternary and suggested a seismic method found to be workable on Penang Island.

## Third Regional Conference on the Geology of S.E. Asia

The First Regional Conference was successfully hosted by our Society in 1971 and the Second Conference was also successfully hosted by the Ikatan Ahli Geologi Indonesia in 1974. At the Second Conference in Jakarta, representatives of several Geological Societies in S.E. Asia met and agreed that it would be desirable to hold the conference regularly in S.E. Asia. It appears that there is going to be a Third Conference in 1978(?) and the Geological Society of Thailand is keen in hosting it. Members will be kept informed about the Conference periodically.

## Sixth Annual Convention, IPA

The Indonesian Petroleum Association will hold its Sixth Annual Convention in the Jakarta Convention Hall on 23 - 24 May 1977. In previous Conventions papers on exploration, production, refining, economics and environmental aspects of the petroleum industry were presented and it is hoped by the organizers that the 1977 Convention will also cover a broad range of subjects.

Members wishing to present papers or to participate should write for further information from

I.P.A. Lecture Committee
Jalan Menteng Raya 3
Jakarta, Indonesia.

## International Geodynamics Conference, Japan

An International Geodynamics Conference will be held
at the Science Council of Japan, Tokyo
from 13 to 17 March 1978.

The themes of the conference are:
Part I: Geodynamics in the Western Pacific-Indonesia Region.

Present and palaeo-movements of the plates in the Western Pacific-Indonesian Region and their tectonic implications related to the origin and development of the subduction zones and marginal seas and many other problems relevant to the global geodynamics.

Part II: Physics and Chemistry of Magma Genesis.

The genesis of magmas in the crust and the upper mantle and their ascent to the earth's surface and the related volcanic activity. Experimental petrology will play an important role in this part of the conference.

A field excursion to study the volcanoes in the Izu-Hakone District and Oshima Island will be held from 18 to 20 March 1978.

Registration fee is US$40.00.

If you wish to have more information or to receive the Second Circular in June 1977, write to:

Prof. K. Kobayashi
Secretary-General of Organising Committee
International Geodynamics Conference
Ocean Research Institute
1-15-1, Minami-dai
Nakano-ku, Tokyo 164
Japan.

# B O O K  R E V I E W

Walker, W. (Editor). Metallogeny and global tectonics. Benchmark papers in geology (29). Dowden, Hutchison & Ross Inc., 413 p. US$27.00. 1976.

According to the General Editor, Rhodes W. Fairbridge, the Philosophy behind the "Benchmark papers in Geology" is one of "collection, sifting and rediffusion". In other words, a benchmark papers book should represent a well edited collection of reprints that might have been accumulated by a research worker who is actively engaged in the field of the book title. This particular volume will be useful for someone entering the field of metallogenesis and distribution of mineralization in space and time. It is a rapid self-tuition book on the subject which would rapidly fill in the necessary background to make the reader conversant with up-to-date metallogenesis. However it is an expensive way of obtaining a collection of relevant reprints. The US$27 might be better spent on a xerox machine and the relevant journals. The cost per page of the book is Malaysian 16 cents. Xerox copies may be obtained in the University of Malaya library at only 10 cents a page.

I have several criticisms of the book and the selection of papers included:

1. Paper 1 by L. de Launay (1900) is worthy of inclusion but surely it would have taken little trouble by the editor to have it translated into English.

2. The outstanding paper, now classic in this field "metallogenic provinces and metallogenic epochs" by Y.A. Bilibin (1968) in English translation by E.A. Alexandrov, appears quite rightly in full.

   However I found it hard to accept that an equally classic paper "Essays on metallogeny" by V.I. Smirnov, also translated by Alexandrov, should have been omitted from this volume. This field has been led by Russian geologists and the exclusion of a paper by Smirnov is inexcusable.

3. Some papers included have no reference whatsoever to metallogenesis and the philosophy of their inclusion is not obvious. Examples in this category are "Geosynclines" by J. Aubouin, and "A plate tectonic model of the Paleozoic tectonic History of New South Wales" by E. Scheibner. There are others. These are significant papers, but hardly significant in the field of metallogenesis.

4. The printing is not always of an acceptable quality. For example, the figures of the excellent paper by Zoneshain et al. "Mesozoic

structural-magmatic pattern and metallogeny of the western part of the Pacific Belt" are completely illegible, and hence of little value. This forces the reader to go to the original in Earth Planetary Science Letters 22, (1974) p. 96-109. The conclusion from this is that the book falls short of its aim and does not obviate the need for reference to the original papers.

Unfortunately the book has been published before and could not include "Mineralization at Plate Boundaries" by Mitchell and Gason (Minerals Sci. Engineering Vol. 8 No. 2 April 1976) because this paper really succeeds in bringing the subject up-to-date.

The Benchmark Papers Book is of great interest to readers from this region because a large part (pp. 267-292) is given to papers by Prof. K.F. G. Hosking on the tin belt of S.E. Asia. It is gratifying to have this distinguished erstwhile colleague honoured by the editor by inclusion of his work in this volume.

I am uncertain to whom to recommend this book. Certainly it is not a textbook, and is probably of little use to the serious economic geologist concerned with metal deposits because he undoubtedly will already be aware of the papers and have his own larger collection of reprints. Perhaps the book will appeal most to a field economic geologist who has fallen behind in the bewildering output of new literature, but is an expensive penalty (US$27) to pay for such a demeanour.

C.S. Hutchison

# EXAMINATION HOWLERS

Examination howlers made by students of geology have appeared in several publications including in our Newsletters. However, very little has been heard of howlers on geology made by students of civil engineering. A selection of some interesting howlers made by some potential William Smiths is given below.

1. Cancerous igneous body.

   A laccolith is a sill-like body with lumps.

2. The Transformist-schistization.

   The carbonate rocks in the area were metamorphosed to schists with relics occurring as limestone hills.

3. Sound experience.

   Sound may also be a good indication for mineral identification for experienced geologists.

4. The ashes did a phoenix.

   Tuff flown up from the upper mantle .....

5. What light thro' yonder window shines.

   Scheelite gives out light at night.

6. Enlighten - with scheelite?

   Shadow-seated igneous intrusions.

7. Seen a ghost before?

   Malachite is ghostly green in colour.

8. Muscle power.

   To get the streak colour of a mineral, place the specimen on a firm support and hammer it with a hammer or any suitable tool. This test can also be performed at the site.

9. On talc and talcum.

   Some minerals exhibit distinctive forms, e.g. talc is powdery.

10. One valve, two valves and bivalve.

$F_4$ is a bivalve, $F_1$ is a valve.

11. Confirmatory fall-out.

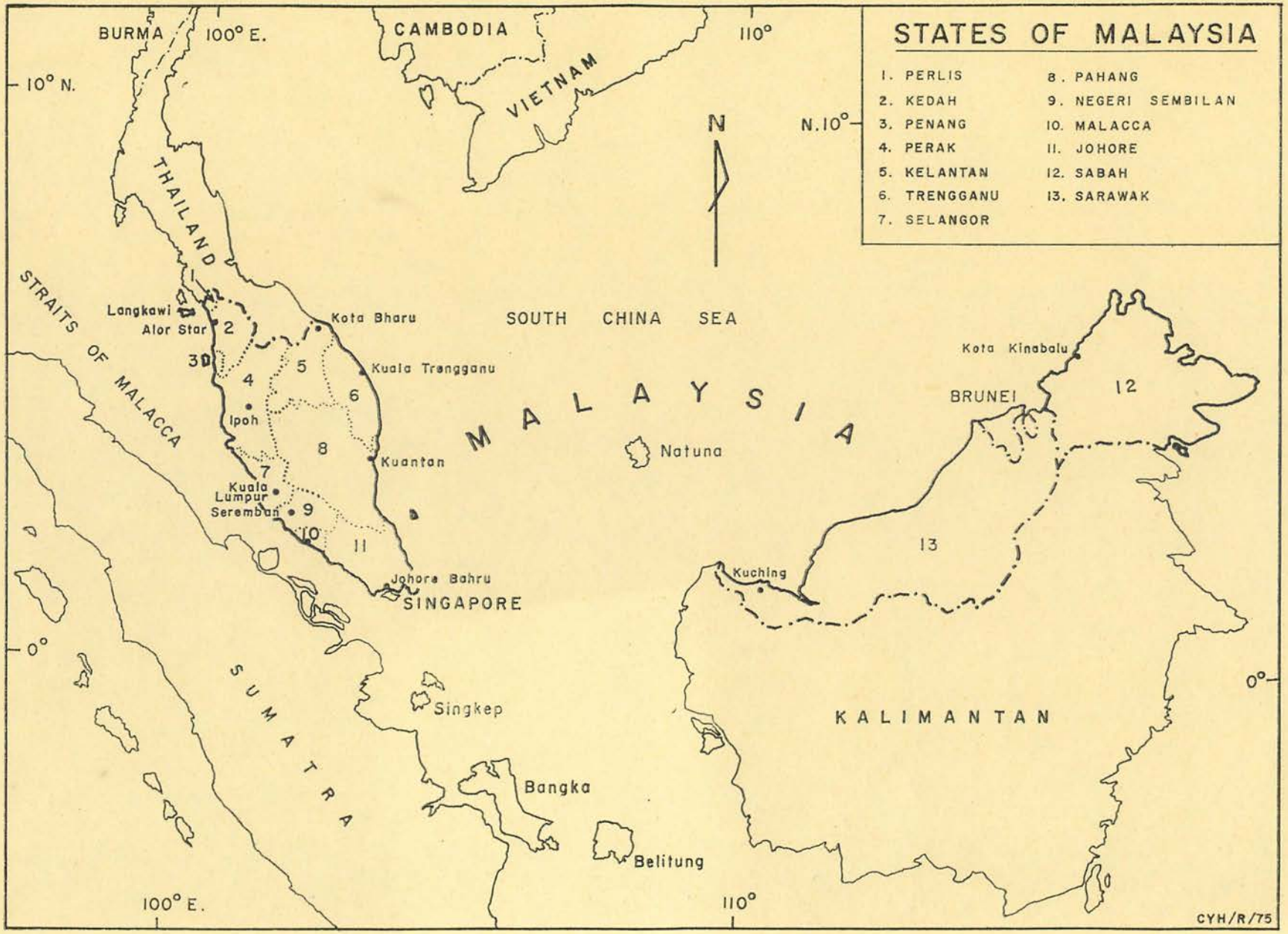
As I am writing this, flakes of muscovite and biotite fall off from the specimen confirming my identification.

12. Rabbits as weathering agents.

Occurence of rabbit burrows in rocks aids penetrative weathering.

13. Consequences of bending with the wind.

The swaying and bending of trees by strong winds will help to loosen underlying bedrock.


STATES OF MALAYSIA
1. PERLIS
2. KEDAH
3. PENANG
4. PERAK
5. KELANTAN
6. TRENGGANU
7. SELANGOR
8. PAHANG
9. NEGERI SEMBILAN
10. MALACCA
11. JOHORE
12. SABAH
13. SARAWAK
BURMA
100° E.
10° N.
CAMBODIA
VIETNAM
110°
N
N.10°
THAILAND
STRAITS OF MALACCA
SOUTH CHINA SEA
MALAYSIA
Langkawi
Alor Star
Kota Bharu
Kuala Trengganu
Ipoh
Kuantan
Kuala Lumpur
Seremban
Johore Bahru
SINGAPORE
Natuna
Kota Kinabalu
BRUNEI
Kuching
KALIMANTAN
SUMATRA
Singkep
Bangka
Belitung
0°
100° E.
110°
CYH/R/75