

PERSATUAN GEOLOGI MALAYSIA

WARTA GEOLOGI

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DIKELUARKAN DWIBULANAN
ISSUED BIMONTHLY

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CATITAN GEOLOGI (GEOLOGICAL NOTES)

Occurrences of *Paleodictyon*, a graphoglyptid burrow, from the Upper Paleozoic of the Maran Area, Pahang.

YAP KOK THYE, Jabatan Geologi, Universiti Malaya.

Abstract: Occurrences of *Paleodictyon imperfectum* SEILACHER 1977 indicate that the Upper Paleozoic flysch-type interbedded sandstones and shales to the east of Maran town, Pahang, were deposited as a deep marine turbidite sequence.

The Maran area, Pahang (Fig. 1) is made up of continental sediments of the Tembeling Formation of mainly Jurassic age underlain by sandstones, shales and volcanics of Triassic age to the west and Permo-Carboniferous tuffs, tuffaceous sandstones and shales to the east (Ayob, 1968). The Upper Paleozoic rocks crop out along the Maran-Kuantan Road at about 2 km, 3 km and 3.2 km east of Maran town. They consist of a sequence of flysch-type thinly interbedded (ranging from 1 to 40 cm thick but generally less than 10 cm), graded bedded, white to grey tuffaceous sandstone and shale, and pale green tuff (up to 7 m in bed thickness), steeply dipping (60 to 70 degrees) in a north-easterly direction (Fig. 2).

On the soles of the sandstone beds (less than 10 cm thick) in the last mentioned locality are found poorly preserved specimens of *Paleodictyon* in positive relief. This graphoglyptid burrow is made up of a network of honeycomb-like, 5 to 8 sided polygons of about 3 to 6 mm across and 1 to 1.5 mm in tunnel diameter. The meshes are slightly elongated and are generally unequal in size and incomplete (Figs. 3a, 3b). The networks are quite similar to the relatively larger holotypic specimen of *Paleodictyon imperfectum* SEILACHER 1977 from the Silurian of the Scottish Uplands (Seilacher, 1977a, Fig. 14b).

Paleodictyon, which is cosmopolitan in distribution, is a trace fossil typical of and confined to deep marine flysch deposits of Ordovician to Miocene age (e.g. Seilacher, 1967, Ordovician of Maine, U.S.A.; Wood and Smith, 1959, Lower Silurian of Aberystwyth Grit in Wales; Webby, 1969, Silurian of New South Wales in Australia; Chamberlain, 1971, Mississippian-Pennsylvanian of Oklahoma, U.S.A.; Książkiewicz, 1970, Tithonian to Oligocene of the Polish Carpathians; Albrecht, 1946, Upper Cretaceous to Eocene flysch in Kalimantan; Gregory, 1969, Miocene of New Zealand; Yap, 1980, Lower Miocene of Sabah). Because graphoglyptids are mud burrows that became uncovered and rapidly sand-casted by low velocity turbidity currents (Seilacher, 1977a, Fig. 1), it is inferred that the flysch sediments of the Maran area were deposited as a deep marine turbidite sequence.

Remarks: *Paleodictyon* is very rarely observed in epirelief due to factors of erosion and exposure. One of the networks recovered from the Maran area was found preserved in two complementary relief forms, as sand-mould in positive hyporelief and as negative epirelief in the shale below the turbidite sand (Department of Geology, University of Malaya reference collection number A469 and A470).

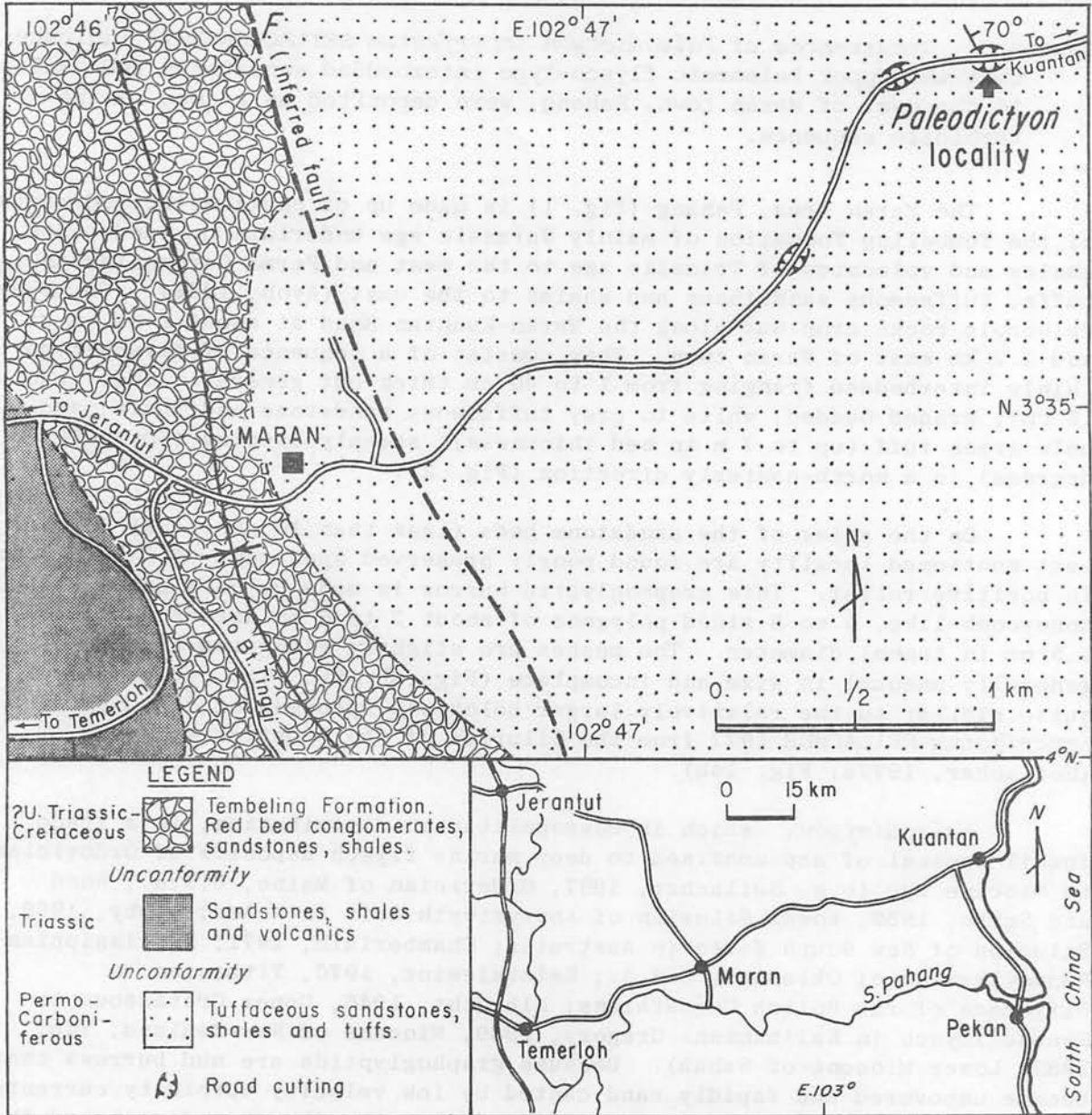


Fig. 1. Geologic Map of the Maran Area
(After Ayob, 1968)

Seilacher (1974, 1977b) observed an evolutionary diminution in the size of graphoglyptid burrows throughout Paleozoic to Tertiary. It is interesting to note that *Paleodictyon* specimens from Maran are relatively small in size compared to similar trace fossils of Paleozoic age from other parts of the world. For instance, the two forms from the Carboniferous of southern Oklahoma, U.S.A. are 6 to 7 mm across and about 2 to 3 mm in tunnel diameter and 14 to 18 mm across and 2 mm in tunnel diameter. The size of the Maran materials is similar to that of the more regular forms found in Upper Mesozoic and Tertiary.

Acknowledgement

I am grateful to Encik S.P. Sivam and Professor A. Seilacher who first drew my attention to the occurrence of *Paleodictyon* in the Maran area, Professor P.H. Stauffer for reviewing this manuscript and Encik Jaffar Abdullah for printing of photographs.

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Yap, K.T., 1980. Trace fossils from Tertiary deposits of Labuan Island, Sabah, Malaysia. Unpublished M.Sc. thesis, Universiti Malaya, 345 pp.

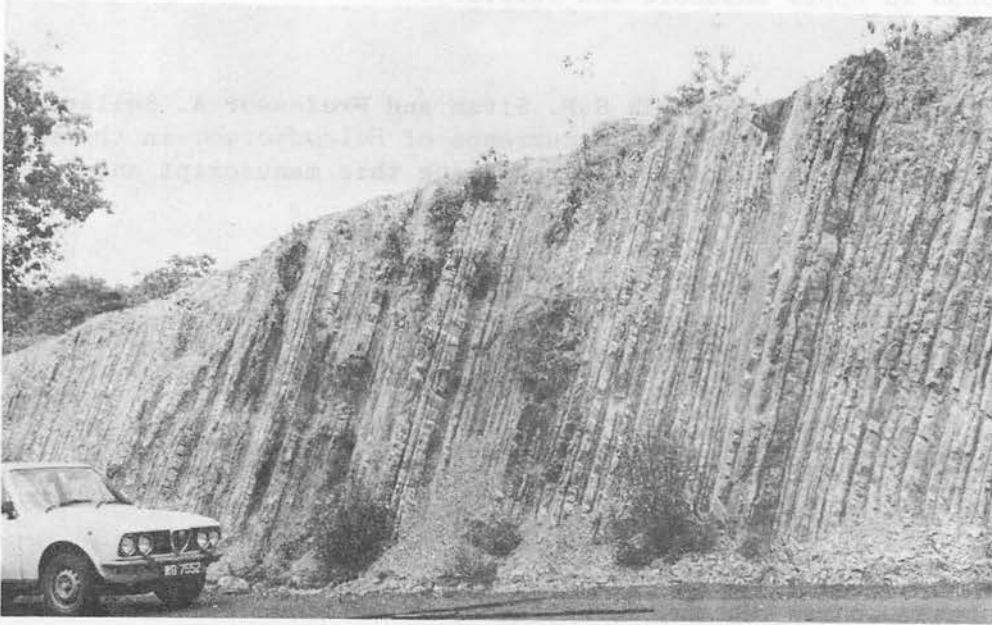


Fig.2 : Road cutting at about 3.2 km east of Maran town along the Termeloh-Kuantan highway exposing approximately 60 m thick of flysch-type, thinly interbedded tuffaceous sandstone and shale.

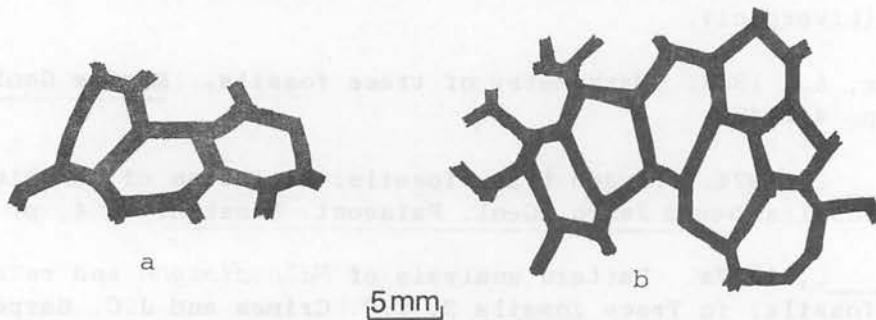


Fig.3 : *Paleodictyon imperfectum*. Permo-Carboniferous, Maran area, Pahang. (Department of Geology, Universiti Malaya reference collection number a. A471 and b. A472.)

Satellite magnetic anomalies over Southeast Asia.

G. van KLINKEN, C.Y. LEE & M.H. LOKE, Pusat Pengajian Sains Fizik, Universiti Sains Malaysia.

Abstract: A simplified and preliminary magnetic anomaly map of Southeast Asia based on the POGO satellite data is presented. Its main features appear to be geologically significant, and call for further study.

Introduction

Since the mid-1960's, NASA has been running a series of three satellites in a polar orbit. They are known as POGO (Polar Orbiting Geophysical Observatory) satellites and one of their objectives was to measure the earth's magnetic field.

Regan, *et al* (1975) constructed a world magnetic map from these data. Many of the anomalies of this map had an origin within the lithosphere, according to the authors. In the Southeast Asian region, the map is rather featureless. Nevertheless, a set of POGO data for this area was obtained to see if they could show anything of interest when examined on a larger scale. If they could, then data with very much better resolution from a very recent satellite named MAGSAT, would be obtained for further study.

The POGO Data Set

The area covered is bounded by 10°S - 15°N , and 90°E - 130°E . This area, however, does not extend far enough to see the complete pattern particularly in the south and east. The set consists of a series of almost north-south profiles. Data points occur at intervals of slightly less than $\frac{1}{2}$ -degree (30 km) and altitudes vary from 400 - 700 km. In order to reduce external magnetic effects arising in the magnetosphere and ionosphere the data set has been significantly trimmed and corrected in a manner described by Regan, *et al* (1975).

In addition, a linear least-squares fit has been removed from every profile to reduce the influence of the core-field.

Preliminary Southeast Asian Map

Average corrected total magnetic field values were computed in $\frac{1}{2}$ -degree squares (i.e. about 30 x 30 km) - these are presented in Figure 1. Some squares incorporate as many as 10 data points whilst some others, particularly east of 122.5° , have none. There is also a marked difference in average elevation from one meridional strip to another and this gives rise to the "streaky" appearance in the north-south direction. A much smoother map would result if each data point were projected onto a uniform surface. We hope to do this as part of further work described below. However, even without more computer processing certain trends emerge. By recontouring Figure 1 in a way designed to smooth out the field these become more obvious (Figure 2). The contour values chosen are not symmetrical about zero but they serve to highlight the trends.

Figure 2 is not ready for quantitative interpretation because the magnetic inclination varies significantly across the map. Nevertheless it is presented as "something to ponder upon."

What does it mean?

More than 40 years ago Vening Meinesz produced a regional isostatic gravity anomaly map of Indonesia's seas (Vening Meinesz, 1948). This map is reproduced here as Figure 3. It shows a general correspondence with Figure 2 - the belt of negative gravity which swings around the island arc also has a negative magnetic expression. (An important discrepancy occurs between Java and Sumatra - the positive magnetic anomaly here is part of a larger one to the southwest which also appears on the world map of Regan, *et al*).

The South China Sea shows a generally negative magnetic anomaly, with some interesting irregularities in Sabah and Sarawak, and across the Malay Peninsula. The Borneo anomalies made us wonder if they are connected with Hutchison's (1975) ophiolite zones which could represent old crustal sutures. The Peninsular anomaly has an unusual trend direction which warrants closer study. The tremendously complex plate interactions east of Borneo apparently express themselves in a series of flows and highs which suggest an east-west trend.

Two conclusions seem clear - the map has more real structure than anticipated, and the structure has geological significance, probably of crustal origin.

Further Work

Bhattacharya (1977) has demonstrated a procedure for reducing satellite total field magnetic data to the form of a map on a uniform datum surface and having a constant magnetic field direction. Only a map like this can be interpreted quantitatively. We hope to apply this technique to the Southeast Asian area, preferably with new MAGSAT data.

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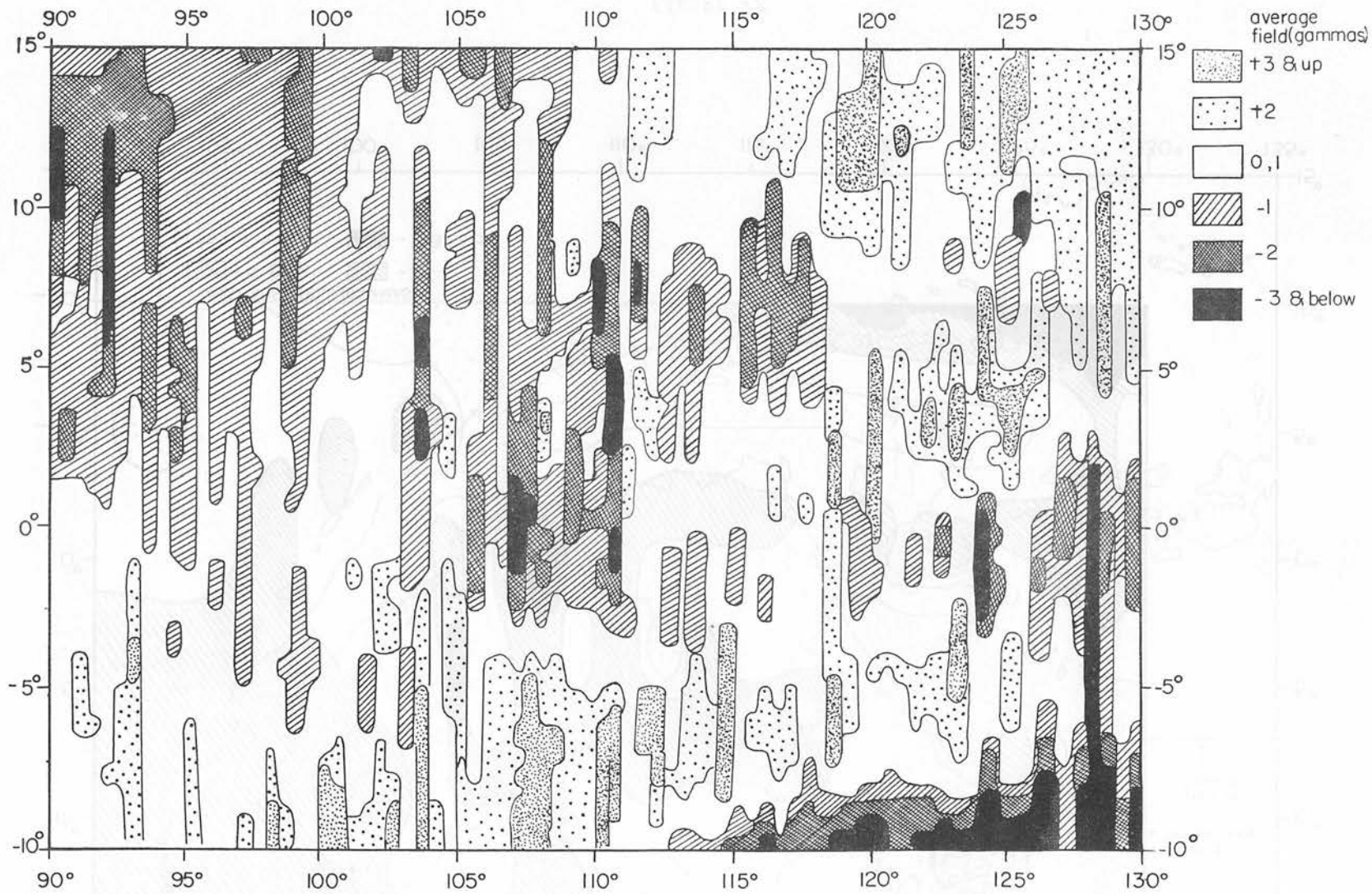


FIGURE 1

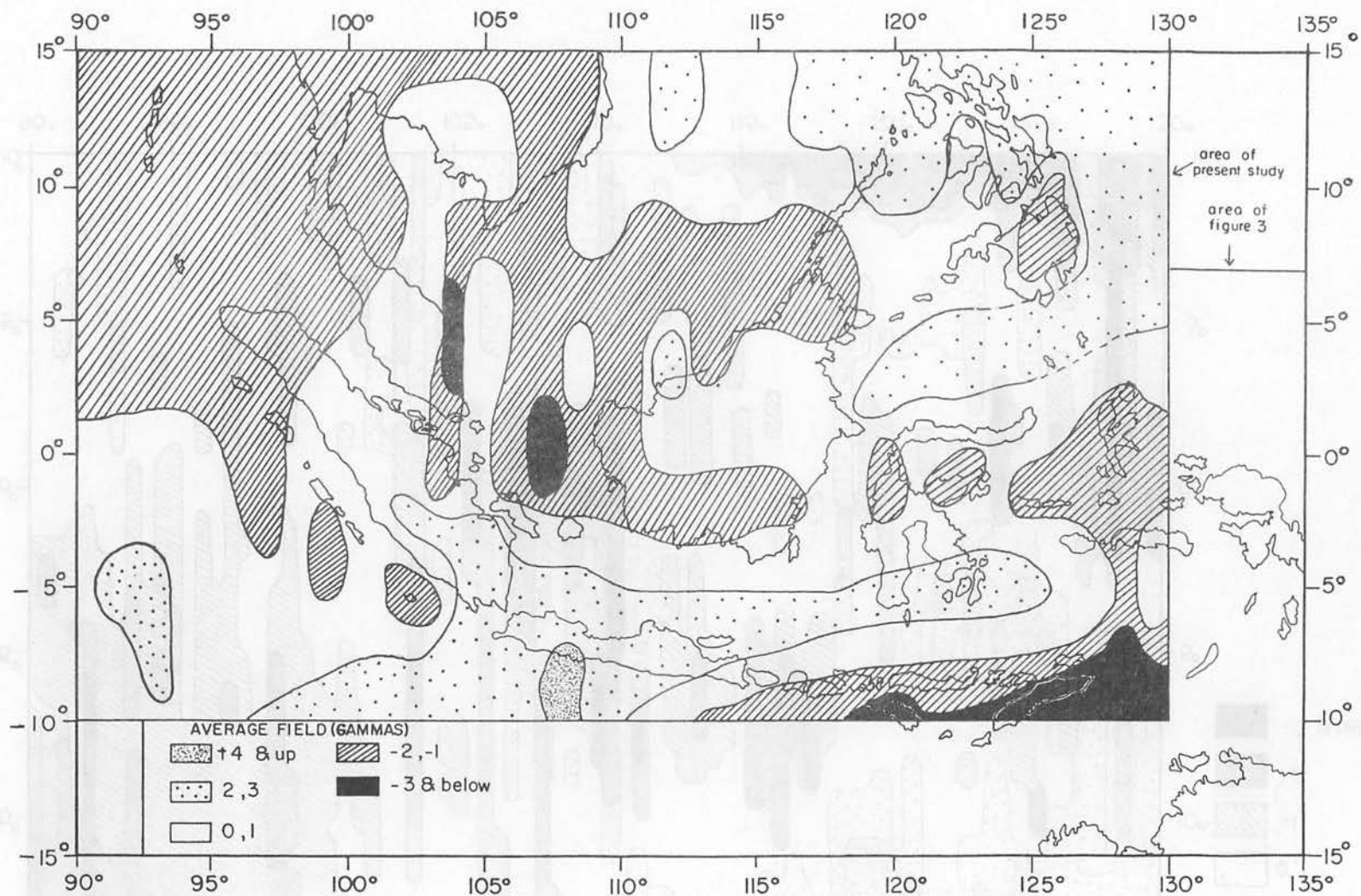


FIGURE 2

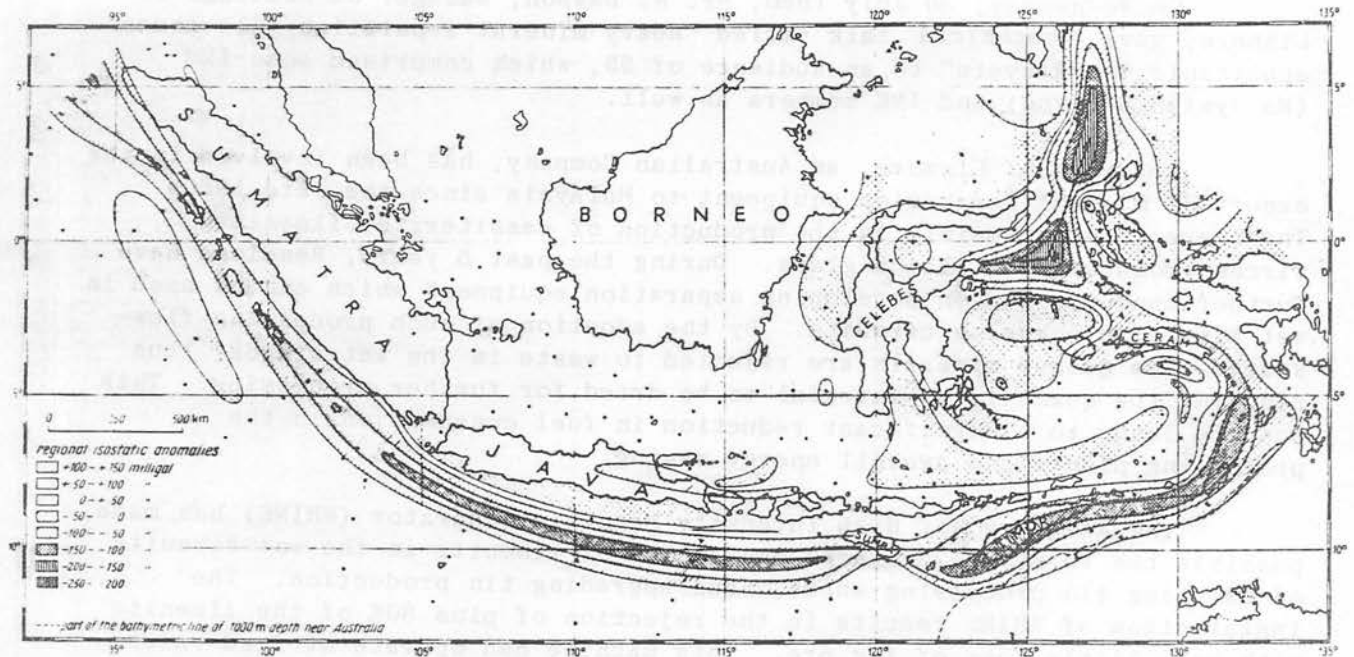


Fig. 3.

Figure Captions

Figure 1: Preliminary satellite magnetic anomaly map of Southeast Asia. The distortion arises because the contouring was done directly on a computer printout (not shown).

Figure 2: Smoothed and simplified magnetic anomaly map of Southeast Asia.

Figure 3: Isostatic gravity anomaly map of Indonesia (after Vening Meinesz, 1948).

MESYUARAT PERSATUAN (MEETINGS OF THE SOCIETY)

N. DAWSON: Heavy Mineral Separation Techniques applicable to Malaysia.

On Wednesday, 30 July 1980, Mr. N. Dawson, Manager of Readings of Lismore, gave a technical talk titled "Heavy mineral separation techniques applicable to Malaysia" to an audience of 55, which comprised some IMM (Malaysian Section) and IME members as well.

Readings of Lismore, an Australian Company, has been involved in the export of mineral separation equipment to Malaysia since the late 1960s. These are involved mainly in the production of cassiterite, ilmenite, zircon, monazite and silica glass. During the past 5 years, Readings have further concentrated on developing separation equipment which can be used in wet mineral processing circuits. By the adoption of such processing flow-sheets, the gangue minerals are rejected to waste in the wet stages, thus reducing the quantity of material to be dried for further processing. This concept leads to a significant reduction in fuel consumption in the processing plants and overall energy saving.

The Readings Wet High Intensity Magnetic Separator (WHIMS) has made possible the rejection of large quantities of ilmenite in the wet circuits of existing tin processing sheds, thus upgrading tin production. The installation of WHIMS results in the rejection of plus 80% of the ilmenite with very little loss of tin ore. This machine can operate at feed rates up to 10 t.p.h. of Malaysian dredge tin concentrate. Other capabilities include the differentiating of ilmenites based on different magnetic susceptibilities.

The Wright Impact Plate Concentrator is a gravity separator of Australian design which is gaining acceptance in the Malaysian Mineral Processing Industry. The unit, which is of simple design and associated with low operating and maintenance cost, is currently being used to re-treat tin dumps at high feed rates and produce a high grade heavy mineral concentrate for feed to existing tin sheds.

In summing up, Mr. Dawson stressed that to develop economic mineral processing flowsheets, a basic understanding of the mineralogy of a deposit is essential. This also include a knowledge of such physical properties as grain size, specific gravity, magnetic susceptibilities, electrical conductivity and surface characteristics of the different minerals. With effective geological interpretation of deposits, the metallurgist will then have a sound basis for processing flowsheet design.

Mr. S.S. Subramaniam of Killinghall Tin was on hand to propose a vote of thanks to Mr. Dawson for a most informative talk.

GHT

D. TAYLOR and E. TOH: Conzinc Riotinto Malaysia's mineral exploration in Pahang Tenggara.

The technical talk by Dr. Dennis Taylor and Mr. Eric Toh of Conzinc Riotinto Malaysia on "Conzinc Riotinto Malaysia's mineral exploration in Pahang Tenggara," (postponed from last February) was presented at 5.00 p.m. on August 8th in the Lecture Hall, Geology Department of the University of Malaya. Mr. Eric Toh delivered the talk to about 50 members,

which included some IMM (Malaysian Section) and IME members.

In the well-illustrated talk, Mr. Toh outlined the 2½-year exploration programme carried out by CRM in a joint venture base metals investigation in an area of ½ million acres in Pahang Tenggara with the Pahang State Development Corporation (DARA). Areas of interest were delineated through preliminary studies of aerial magnetic data, aerial photography and reconnaissance geochemical stream sediment and soil surveys. From this initial investigation, an area called the Chini Anomaly Area was delineated for further study. Detailed soil sampling supplemented by deep augering and pitting revealed geochemical anomalous areas for the elements copper, lead, zinc, molybdenum and manganese.

Consequently, geophysical surveys were carried out, using a fluxgate magnetometer for the vertical field intensity, a proton magnetometer for the total field intensity and induced polarisation for the presence and distribution of sulphides. Anomalous geophysical areas were defined but were found not to coincide with the geochemical anomalous areas. Based on the geophysical and geochemical data of the anomalous areas, a diamond drilling programme to drill 12 holes (about 2580 m) was carried out. 1800 m of core was logged and rock samples encountered include garnet skarn with massive Pb/Zn mineralisation, massive magnetite with chalcopyrite and pyrite veins, gossan with chalcocite, acid to intermediate tuffs, hornfels, quartz monzonite porphyry and granodiorite porphyry with molybdenite in quartz veins and as disseminations. The results indicated deposits of porphyry and skarn mineralisation but are not economical enough to be mined. Copper and molybdenum are associated with the porphyry deposits while lead and zinc with the skarn deposits.

In concluding his talk, Mr. Toh noted that the \$2.1 million spent was not wasted. He said that if there is mineralisation of any significance within the prospecting license area, it is the Chini Anomaly Area and no where else. The Chini Anomaly area will be reserved as a potential minerals area while other areas can be used for development schemes like oil-palm plantations, factories, new townships, etc.

After some questions from the floor, Mr. S.S. Subramaniam of Killingham Tin proposed a vote of thanks to the speaker for the informative, well-illustrated and interesting talk.

KLL

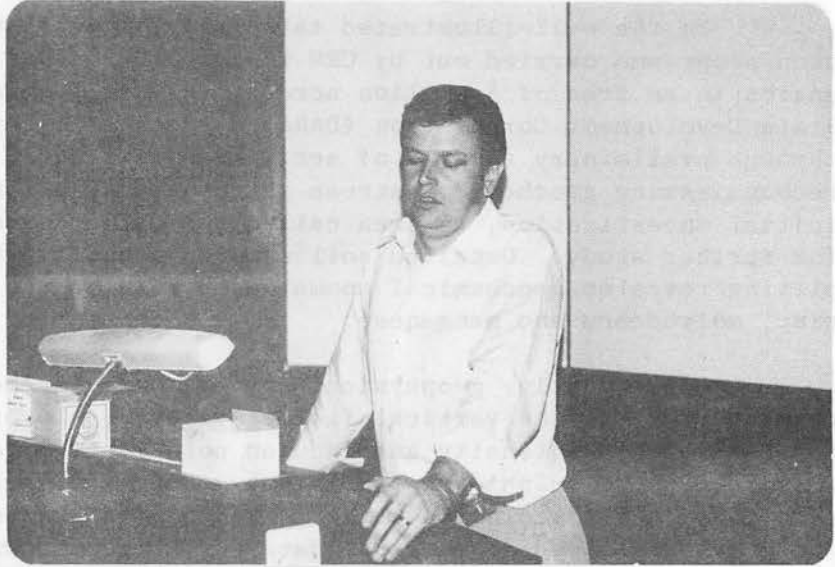
B. CHAROY: Fluid inclusion studies and their interpretation in hydrothermal problems (porphyry copper, tin and tungsten deposits).

Dr. B. Charoy from the Centre de Recherches Petrographiques et Geochimiques, Nancy, France, gave a talk titled "Fluid inclusion studies and their interpretation in hydrothermal problems (porphyry copper, tin and tungsten deposits), at 5.00 p.m. on 15 August 1980 at the Lecture Hall, Department of Geology, University of Malaya. Despite the late notice and Hari Raya holidays, about 25 members were present to listen to the talk.

The importance of the fluid phase in petrogenic processes is evident and also most hydrothermal deposits cannot be genetically understood and explained without the knowledge of the tiny fluid inclusions being involved in the transport of the metals. Fluid inclusion studies when

TECHNICAL TALKS

N. DAWSON



E. TOH



B. CHAROY



performed together with chemical and mineralogical ones will yield alot of data on the significance of the fluid phase in different geological surroundings and also provide new insight in experimental research.

The speaker then dealt on the direct application of fluid inclusion investigation in the study of porphyry copper and tin-tungsten mineralisations.

In porphyry copper deposits, generally 3 types (L, V and S types) of inclusions are recognised in quartz veins of the stockwork and quartz megacrysts of the host rock, The relative abundance of these 3 types vary significantly from one sample to another in accordance with the nature of the mineralisation and alterations. Interpretations of homogenisation temperatures of the fluids are, generally, more complicated than envisaged, however, they agree well with geochemical data on the distribution of copper and alteration around a porphyry copper deposit.

In the case of tin and tungsten mineralisation in veins, the interpretation is more complicated and also less literature is available. Dr. Charoy then went on, to illustrate specific alterations associated with tin-tungsten deposits that have been studied and these include greisenisation at Cligga Head, Cornwall, tourmalinisation at Cape Cornwall, near Land's End and reference to some occurrences all along the Hercynian Orogeny. At Cligga Head, greisenisation, mineralisation and the precipitation of the quartz veins seem to be synchronous and appear to be complementary expressions of a single process. At Cape Cornwall, evolution involving two periods of unmixing is predicted, one giving rise to the tourmaline granite and a second to the shorl rock and monofeldspathic segregation. Tin is not involved in this evolution but appears later with green tourmaline in veinlets crosscutting the shorl rock and in vugs of the syenitic rock.

In conclusion, Dr. Charoy stressed the importance of the characteristics of hydrothermal solutions through fluid inclusion investigation for a better comprehension of the numerous geological problems. Inclusions must be taken for what they are - an intrinsic part of the rock which has to be studied just as all the other minerals.

Prof. C.S. Hutchison, in proposing a vote of thanks on behalf of the Society, complimented the speaker for a stimulating talk on a most interesting topic.

GHT

BERITA PERSATUAN (NEWS OF THE SOCIETY)

1981/82 Council Nominations

On the recommendation of the Nominations Committee, the Council's list of nominees for the 1981/82 Council is as follows:

President:	Mohd. Ayob, Petronas, Kuala Lumpur
Vice President:	Khoo Teng Tiong, Jabatan Geologi, Universiti Malaya, Kuala Lumpur
Hon. Secretary:	Tan Boon Kong, Jabatan Geologi, Universiti Kebangsaan Malaysia, Kuala Lumpur

Hon. Asst. Sec.: Mohd. Ali Hasan, Jabatan Geologi, Universiti Malaya,
Kuala Lumpur

Treasurer: Chin Lik Suan, Datuk Keramat Smelting, Kuala Lumpur

Editor: Teh Guan Hoe, Jabatan Geologi, Universiti Malaya,
Kuala Lumpur

Councillors: Abdul Malik Abdul Rani, Esso Exploration Malaysia,
(2-years) Kuala Lumpur

Ahmad Said, Petronas, Kuala Lumpur

Choo Mun Keong, Pernas Charter Management, Kuala Lumpur

Gan Ah Sai, Geological Survey Malaysia, Kuala Lumpur

The following 2-year Councillors will continue to serve in the 1981/82 Council:

Abdul Aziz Hussein, Jabatan Kejuruteraan Petroliaam,
Universiti Teknologi Malaysia, Kuala Lumpur

Khoo Kay Khean, Geological Survey Malaysia, Kuala Lumpur

Leong Khee Meng, Carigali-BP, Kuala Lumpur

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

All Corporate Members are reminded that further nominations using the prescribed forms should reach the Society by 30 September 1980.

Economic Geology Seminar '80 - Industrial Minerals

The Seminar will be held at Hotel Merlin, Kuala Lumpur on Friday, 10 October 1980 from 0900 hours. Registration will begin at 0830 hours.

In response to the first circular announcing the Seminar, we have received very encouraging replies from members as well as non-members wishing to participate in the Seminar and the field trip to be held on Saturday, 11 October 1980. A second and final circular will be sent to all those interested in late September.

To date, the following papers have been offered.

1. P.C. Aw (Geological Survey Malaysia)
Present exploitation and future prospects of industrial minerals in Peninsular Malaysia.
2. A.P. Ng (SIRIM)
Uses and specifications of limestones.
3. E.U. Kidav (APMC)
The cement industry in Malaysia.
4. S.M. Sedalia (Kraftangan)
Minerals in Malaysia for the ceramic industry.
5. MIDA staff
The role of MIDA in promoting and encouraging the setting up of resource-based industries.
6. B.H. Kiew (Universiti Malaya)
The exploitation and conservation of natural resources.
7. K.N. Murthy (Geological Survey Malaysia)
Occurrence and quality of gem and ornamental stone materials in Peninsular Malaysia.

In addition, it is possible that there will be more papers on topics such as kaolin industry, the glass industry, lime products and others.

On the field trip, it is tentatively proposed to visit places of interest in and around Kuala Lumpur. Places of interest include quarries and manufacturing plants. As the field trip appears to be well-supported it is believed that the trip will also provide an excellent opportunity for participants to meet and discuss matters of interest as well.

As usual, the Society will try its best to keep the registration fees reasonably low like in all major meetings organized by the Society. Furthermore, there may be other surprises, pleasant ones you can be assured, for those members participating. So if you have not decided to participate we hope you will decide to come and let us know your intention by replying to the circulars.

TTK

GSM Petroleum Geology Seminar '80 - Call for Papers

The Geological Society of Malaysia is planning to hold the Petroleum Geology Seminar '80 on 12 - 13th December 1980 at the Hotel Merlin in Kuala Lumpur. The seminar is the fourth such annual event to be organised by the GSM and it is anticipated that with the continued enthusiastic participation and support from members, the seminar will be another success.

This annual seminar will bring together geoscientists from local and foreign oil service and consulting companies and also local government and research organisations and universities for discussions on the petroleum geology of this region and related techniques of petroleum exploration.

Many significant papers were presented at the first 3 seminars and the Geological Society of Malaysia would again appreciate your contribution to this 1980 Seminar. Papers on any topic relevant to the understanding of the petroleum geology of the South East Asian region and to the search for hydrocarbons would be most welcome.

To date the following papers have been tentatively offered for presentation:

1. Palaeofacies development in the Lower Miocene to Pliocene of Western Offshore Sabah (Sarawak Shell Berhad)
2. Baram Delta geology and hydrocarbon occurrence (Sarawak Shell Berhad)
3. Review of principal hydrocarbon-bearing basins around the South China Sea - Ernest P. Du Bois (CCOP Project Office, Bangkok)
4. Oil source bed hydrocarbon analysis - some methods and interpretations - S. Thompson (Robertson Research, S'pore)
5. Stratigraphic nomenclature of the Mekong Basin (Deminex, Germany).

Please let us know of your intention to submit a paper before 25th October 1980. Abstracts should be submitted by 15th November 1980.

All correspondence on this Seminar to be addressed to:

The Organising Chairman		Mr. Ahmad Said
GSM Petroleum Seminar '80		Petronas
Dept. of Geology	or	P.O. Box 2444
University of Malaya, Kuala Lumpur		Kuala Lumpur

TTK

GSM Geotechnical Engineering Seminar '81 - Preliminary announcement

Following its first Geotechnical Engineering Seminar held on 6th October 1979 at Universiti Malaya, Kuala Lumpur, the Geological Society of Malaysia now announces the holding of "Geotechnical Engineering Seminar '81" scheduled for Friday, 13th February, 1981 at Hotel Merlin, Kuala Lumpur.

Papers are invited from members and non-members of the Society in any of the following fields:

1. Engineering Geology
2. Soil Mechanics
3. Rock Mechanics
4. Hydrogeology
5. Environmental Geo-engineering
6. Engineering Geophysics.

Potential contributors are kindly requested to inform us of their intentions before 31st December 1980, and send in a short abstract of their papers by 8th January 1981.

Please direct all correspondence to:
 The Organising Chairman
 GSM Geotechnical Engineering Seminar '81
 Dept. of Geology
 University of Malaya, Kuala Lumpur.

TTK

GSM Regional Geology Seminar '81 - Preliminary announcement

Following the success of the first Seminar (Geology of NW Peninsular Malaysia), the Society announces a second seminar to coincide with its Annual General Meeting to be held some time in April 1981.

The theme of this Regional Geology Seminar '81 will be "Geology of the Central Belt of Peninsular Malaysia".

It will be a full-day seminar with two coffee breaks followed by a Society dinner for the speakers and co-authors. Authors will get the chance of having their papers published in the Society's Bulletin Series.

So keep a look-out for this column in the next WARTA for further details. Meanwhile, for the potential speakers, it is never too early to start preparing your papers.

All correspondence on the Seminar to be addressed to
 The Organising Chairman
 GSM Regional Geology Seminar '81
 Dept. of Geology
 University of Malaya, Kuala Lumpur.

JK

GSM Lake Toba Field Trip

Date: Early 1981 (Tentatively: 16th March - 21st March 1981)

Participants: ca. 20

Cost: M\$500 per person (inclusive of return air tickets Kuala Lumpur - Medan, hotel accommodation in Sumatra, meals and local transport Medan-Parapat).

Tentative itinerary:

1st day: Leave Kuala Lumpur for Medan. Accommodation at Medan Hotel.

2nd day: Medan - Parapat on the shores of Danau Toba. Accommodation at Parapat Hotel. Afternoon: local geology (Triassic and Quaternary) near Parapat. Evening: cultural show.

3rd day: Boat ride to Samosir island. See various eruption products of Toba volcanoes and visit Sigura-gura falls. Accommodation at Parapat Hotel.

4th day: Brastagi and up Sibayak or Sinabung volcano, active crater. Sight-seeing in Brastagi.

5th day: Drive back to Medan.

6th day: Leave Medan for Kuala Lumpur.

Members who are interested in participating, please write in to:

Mr. Tan Boon Kong
 Hon. Secretary
 Geological Society of Malaysia
 c/o Dept. of Geology
 Universiti Kebangsaan Malaysia
 Jalan Pantai Baru
 Kuala Lumpur 22-12.

CCOP Publication Review - Geology of Tin Deposits

The Geological Society of Malaysia brought together at its International Symposium on Geology of Tin Deposits (held in Kuala Lumpur, 23-25 March 1978) a remarkable group of tin geologists. The resulting collection of papers is likewise remarkable. The 18 papers included cover all major and several minor tin regions. Tin distribution patterns, by the *doyen* of tin geologists, K.F.G. Hosking, is a comprehensive review based on the author's long experience in many parts of the world. C.S. Hutchison and K.R. Chakraborty discuss the source of tin, and reject mantle or subducted oceanic lithosphere (as proposed in some recent theories) in favour of continental crust. A.H.G. Mitchell discusses rift, subduction, and collision in relation to tin belts and concludes that there is as yet little evidence that the type of tin mineralization is determined directly by the tectonic setting. Ishihara and his Japanese and Thai co-workers report on a study of 140 granitoids in the southern half of the Malay Peninsula and find that major tin fields are related to ilmenite-series granitoids (mostly Late Palaeozoic to Early Mesozoic) and the generally younger (Cretaceous to Palaeocene) magnetite-series granitoids have no connexion with tin mineralization.

Since most of the world's tin is won from placer deposits, one might

expect several papers dealing with this aspect; however, the topic is covered well by B.C. Batchelor in a comprehensive review of the geological characteristics of placers in the Malaya and Indonesian region, containing many original observations.

The remaining papers review specific tin fields on a world wide basis, including the Kinta tin field, Malaysia (S.S. Rajah), Thai tin fields (P. Nutalaya and others), Bolivia (S. Rivas), Australia (R.G. Taylor), Cornubia (S.W. England) (N. J. Jackson), the Bushveld (J.G. Wilson), Broken Hill (M.B. Katz and K.D. Tuckwell), N.W. Thailand (S. Pitragool and S. Panupaisal).

Papers also describe aspects of exploration for tin in Thailand (S. Puwakool), the Amazon region of Brazil (M.R. Borges and others), S.W. Nigeria (G. Matheis), and the Tekka area of Peninsular Malaysia (G.H. Teh). The collection concludes with a paper on rapid methods of tin determination in geochemical prospecting (W.W. S. Yim).

The Bulletin is a unique collection which will probably be a standard source book on the topic for years to come. The editor, C.H. Yeap, has done a fine job; printing errors are few. A few illustrations (notably on pages 61, 169, 173, 243, 325) have been reduced to near or below the level of legibility, and the authors' should have been asked to redraft them but the great majority of illustrations are clear.

This publication is strongly recommended for students of tin deposits, and should be in the libraries of all Universities, Geological Surveys, Departments of Mines, and companies, that have any interest in tin mineralization.

NSH

(CCOP Newsletter, vol. 7, no. 1, Mar 1980)

Young Geoscientist Award

The Award Nominations Board, established by the Council, comprises the following:

Dr. T.T. Khoo (Universiti Malaya), Chairman
 Dr. Ismail Mohd. Noor (Universiti Kebangsaan Malaysia)
 Dr. Lee Chong Yan (Universiti Sains Malaysia)
 Mr. S. Senathi Rajah (Geological Survey Malaysia)
 Mr. C.H. Yeap (Pernas Charter Management).

A circular dated 15 July 1980 has been sent to all members asking for nominations which will close by 30 September 1980. Members who wish to make nominations are advised to note the closing date and the eligibility as given in the Rules and Regulations of the Award. As stipulated, the Board will give its recommendations to the Council not later than 31 December 1980.

TTK

Letters to the Editor

24.7.80

Hon. Editor
Warta Geologi

Dear Sir

Your account in WARTA GEOLOGI 6(2) of Dr. Meyerhoff's interesting and amusing restatement of his views in his talk on 1 March 1980 reports that Dr. Meyerhoff "strongly discredited" the palaeomagnetic evidence offered so far in favour of the plate tectonic theory. This could possibly be misleading to readers who did not have the pleasure of attending the meeting.

In his talk Dr. Meyerhoff did not mention the increasingly consistent palaeomagnetic evidence in favour of plate movements, such as the correlation between the magnetic stripe pattern of ocean-floor anomalies and the history of magnetic reversals as determined from dated rocks on land, and in deep-sea cores.

In answer to a question as to how he explained this evidence he merely stated (as your report correctly reports) how he had failed to obtain consistent palaeomagnetic results from a study of some lavas. This he offered as a sufficient reason for dismissing all palaeomagnetic evidence.

It is, of course, well known that it is not possible to isolate the primary magnetism in all rocks. Many lavas, for example, contain coarse magnetite, and are magnetically unstable, i.e. they rapidly acquire secondary magnetization, which cannot always be removed by partial demagnetization. This is possibly the explanation for Dr. Meyerhoff's failure to obtain sensible results in his study. It is also true that some rocks, apparently magnetically stable, give wild directions, for which the explanation is not always apparent.

However, many rock formations do give remarkably consistent directions, and this consistency, in most areas which have been intensively sampled, extends to rocks of differing composition. This is why geophysicists place no weight on results from a single sample, and increasing results on larger numbers of samples, spread over a reasonably thick stratigraphic interval, and preferably including different rock types and both normally and reversely magnetized rocks. Such results are available from many parts of the world, although much remains to be done.

The fact that palaeomagnetic measurements do not give consistent results with every sample or collection, is no more a reason for rejecting the method than the fact that some igneous rocks give spurious ages when dated by radiometric methods discredits that technique.

In my opinion progress in reconstructing tectonic history is made neither by uncritical acceptance of every line of evidence nor by sweeping dismissal of a method that happens to give results inconsistent with one's own favourite hypothesis.

Yours faithfully

N.S. Haile
5 First Turn
Upper Wolvercote
Dxford OX2 8AG, England

New Library Additions

The following publications were added to the Society's collection:

1. AAPG Explorer, July 1980
2. IMM Bull. 884 and 885, 1980
3. Bull. de Bureau Recherches Geologiques et Minières, Section IV, no. 2, & no. 3/4, 1979.
4. Jour. of Geosciences, Osaka City University, v. 23, 1980.
5. Contributions from the Institute of Geology and Palaeontology, Tohoku University, no. 81, 1980.
6. The Science Reports of the Tohoku University, Sendai, Japan, Second series (Geology), vol. 50, no. 1-2, 1980.
7. Cargelligo-Narrandera, 1:250,000, metallogenic map S1 55-6, S1 55-10, 1980.
8. Geosurvey Newsletter, v. 12, nos. 5 & 6, 1980.
9. National Library, Singapore, adult reference collections, accessions list, June & July, 1980.
10. Oklahoma Geology Notes, v. 40, nos. 1 & 2, 1980.
11. IMM/Trans. Section C, v. 89, June 1980.
12. IMM/Trans. Section B, v. 89, Aug. 1980.
13. Jour. of the Geological Society, v. 137, pt. 3, 1980.
14. Commonwealth Geological Liaison Office, no. 5 & 8, 1980.
15. Veröffentlichungen des Zentralinstituts für Physik der Erde, nr. 43, 54 & 55, 1980.
16. IMM/Trans. A, v. 89, July 1980.
17. Bull. National Science Museum, series C, v. 6, no. 2, 1980.
18. Geosciences, vol. 3, no. 1, 1980.

Membership

The following people have joined the Society:

Full Members

1. Zainuddin bin Che Soh @ Zainuddin bin Yusoff, 14, Jln. Kijing, Kg. Pandan, Kuala Lumpur.
2. Alastair J. Winchester, 39 Rebecca Rd., S'pore 1026.
3. Jean F. Aubert, 6 Hyderabad Rd., S'pore 0511.
4. Marett Graham, 11, Jln. Mayang, Kuala Lumpur.
5. Awang Kasumajaya b. Awang Mahran, Sarawak Shell Bhd. Lutong, Sarawak.
6. Hussein bin Aman, Sarawak Shell Bhd., Lutong, Sarawak.

Student Members

1. Thomas K. Anak Nyanat, 23, Jln. 17/21-I, Petaling Jaya.
2. Shahrudin bin Abd. Aziz, Kg. R.K.T., Sg. Merab, Kajang, Selangor.
3. Tong Pow Mun, 10, Jln. 4/52, Petaling Jaya.
4. Hamidon b. Mohamed, Sg. Nibong, Semerah, Batu Pahat, Johor.
5. Bahari b. Md. Nasib, TBG 1056, Kapar, Kelang.
6. Jeffrey Lee Hin Leong, 203-F, Kg. 8 Bachang, Melaka.
7. Yusoff Mohd. Kamari, 620 Nam Yong Garden, Ujung Pasir, Malacca.
8. Abdul Jalil Muhamad, 6, SS21/44, Damansara Utama, Petaling Jaya.
9. Roslant Abu, AH-19, Setapak Garden, Kuala Lumpur.
10. Richard M. Bandak, Sg. Meramat, Nyelong, Sarikei, Sarawak.
11. Mansor Ahmad, 187, Batu Satu, Jln. Temerloh, Mentakah.
12. Rohaiyah Ismail, Jabatan Geologi, Universiti Malaya, Kuala Lumpur.
13. Manoharan s/o Govindasamy, Jabatan Geologi, Universiti Malaya, K.L.
14. Awalludin bin Harun, Jabatan Geologi, Universiti Malaya, K.L.
15. Alias Hj. Salleh, Jabatan Geologi, Universiti Malaya, K.L.

Institutional Member

1. Tricentrol Oil Corporation Ltd., Capel House, 62 New Broad St., London EC2M 1JS, England. Attn: O.A.C. Karlsen.

Change of Address

The following members have informed the Society of new addresses as indicated:

1. Mustapha K. Shahrom, Pernas Charter Management, P.O. Box 936, K.L.
2. Ahmad Dalimi b. Kasir, 16-G, Tingat 7, Flat PKNS, Kampung Baru, K.L.
3. Clive R. Jones, Gower Lodge, Spring Back Way, Uppingham, Rutland, Leics LE15 9TT, England.
4. Peter J. Walls, 34 Miles Road, Toronto, Ontario M8V 1V3, Canada.
5. G.M. Dow, Amoco Indonesia Petroleum Co., P.O. Box 4557, Jakarta, Indonesia.
6. Lim Peng Fui, 969, Lorong Sena 3, Pekan Sari, Banting, Selangor.
7. John N. Grant, c/o Mineracao Rio Xingu, Praia de Botatogo 370/4^o Andar, Rio de Janeiro, - R.J., CEP 22250, Brazil.
8. John M. Clema, 35 Grandview Gr. Taorak Gdns., South Australia 5065.
9. Md. Wakif Sukahar, No. 34, Jln. AU 5C/3 (PKNS), Bt. 8, Ulu Kelang, Selangor.
10. J.H. Bennie, c/o Offshore Exploration for Tin and Heavy Minerals (THA/78/008), Office of Regional Representative, UNDP, GPO Box 618, Bangkok, Thailand.

Address sought

The Society would like the present address of

1. Robert A. McTavish, formerly of Continental Oil Co., 116 Park Street, London W1Y 4NN, England.

BERITA-BERITA LAIN (OTHER NEWS)

Demonstrators needed, Department of Geology, University of Malaya

Vacancies exist for demonstrators in practical classes at the University of Malaya Geology Department. Any person possessing a recognized degree in geology is eligible to apply for such a post. The work is part-time and, since there are many different classes, the hours can often be arranged to suit personal convenience. Practical classes of 2-hour and 3-hour length are involved. Most are conducted in Bahasa Malaysia.

Demonstrators are paid by the hour at the rate of \$12.50 per hour. Persons holding full-time jobs elsewhere must have the written permission of their employer before being offered a demonstrator's post.

Interested persons may inquire from the Head, Department of Geology, or obtain the application forms directly from the Registrar, University of Malaya.

PHS

New Geological Survey of Malaysia PublicationsAnnual Report, Geological Survey of Malaysia, for 1978

This Report is now available from the Geological Survey of Malaysia. The price is M\$20.00 per copy. The contents include the following reports:

Progress reports: Peninsular Malaysia

Geology of the Gemas area, Sheet 105, Negeri Sembilan.
 Brief geology of the southeastern part of the Gunung Tahan area, Sheet 58.
 Ma'Okil formation - an outlier of the Central Belt, Peninsular Malaysia.
 Feldspar reserves of Tanjung Jaga, Kedah.
 Preliminary investigation of barite in the Sungei Mentiga area, Pahang.
 Preliminary experimental tests in the usage of local raw materials in ceramic ware.
 Preliminary investigation of kaolin in Tapah-Bidor area, Perak.
 Clay deposits in the Bahau area, Negeri Sembilan.
 Clay deposits in the Taiping area, Perak.
 Use of slimes as ball clay.
 Some aspects of the Matang Timbal sand-clay deposit, Taiping, Perak.
 Interpretation of geochemical data, Tanjung Malim area, Sheet 76.
 Detailed magnetometer investigation and exploratory drilling of aeromagnetic anomaly 47A, Kota Tinggi area, Johore.
 Preliminary groundwater investigation at Pulau Langkawi, Kedah.
 Engineering classification of *in situ* rocks.
 A scheme for chemical analysis of glass sand.
 Interference of antimony in the titrimetric determination of tin in stibiotantalite by KI-KIO₃ method.

Progress reports: Sarawak and Sabah

Evaluation of the Bukit Punda iron deposit - a preliminary note.
 Feasibility study of the proposed Batang Ai hydroelectric project.
 Geochemical prospecting in the Wullersdorf area.
 Preliminary notes on the major element chemistry and chemical affinity of the Semporna volcanics.

Geological Survey of Malaysia, Map Bulletin A. This Map Bulletin titled "Geology and Mineral Resources, Benta Area, Pahang" by W.D. Procter is now available from the Geological Survey of Malaysia. The price is M\$15.00 per copy and includes one coloured geological map 1:63,360 of Benta Sheet 2N/16 (part of New Series Sheets 67 & 68).

Obtainable from: The Director-General
 Geological Survey of Malaysia
 2nd Floor, Survey Building
 Jalan Gurney, Kuala Lumpur 15-01.

News on the Malaysian Mining and Oil IndustryLabuan sponge iron project

The Federal Government has decided to take up a substantial stake in the sponge iron project initiated by the Sabah State Government. The move alters significantly the proposed equity structure of the \$325 million project.

It is understood that the Federal Govt. will now take up 40% of the shares of the project leaving Sabah Govt. and Daewoo (M) Sdn. Bhd. the remaining 60% which they will share equally.

The government is looking at various possibilities for securing supplies of raw material for the plant. One likely source is the Kudremukh iron ore company of India.

Business Times
Friday, 22 Aug 1980.

Malaysian Petroleum and Gas Production

The following are extracts of what Petronas Chairman, Tan Sri Abdullah Salleh said as reported by the Press at the National Conference on Energy held in Kuala Lumpur on 21 Aug. 1980.

"The production of LPG from Trengganu and Sabah alone will add more than 10,000 tons a month to the country's existing capacity of 3,800 tons a month, he added.

This will meet the nation's consumption needs of LPG which is now 7,000 tons a month, and which is expected to increase at a rate of more than 10 per cent a year to 1990.

With the coming on stream of Petronas' West Coast refinery in 1985, an additional 10,000 tons of LPG a month will become available.

He also affirmed that with the Central Luconia gas in Sarawak committed for export to Japan as LNG, gas from other fields, in particular from offshore Trengganu, will be utilized for domestic consumption. This will also help support the government's industrialisation programme.

Petronas plans to land natural gas from offshore Trengganu by 1984 to feed the proposed LLN power station in Paka and other industries in Trengganu, thereby opening a 'tremendous' opportunity for investment in the state.

At a later stage, Petronas plans to pipe the gas across the peninsula to Port Klang, Prai, Port Dickson and Johore Bahru.

In May, Petronas notified its contractors to adjust their production levels accordingly. As a result the average production for the whole of 1980 is estimated at 270,000 barrels per day - down from 280,000 barrels per day last year and 290,000 barrels per day from January to May this year.

For two months since the depletion policy was implemented on June 1, daily production is said to have averaged 278,000 barrels per day."

Business Times
Friday, 22 Aug 1980

Oil finds in straits

Oil reserves of nearly 40 million barrels and some 15 billion cu. feet of natural gas have been discovered in Indonesia this year, Energy Minister Subroto said in Jakarta yesterday. The Minister told reporters that the biggest discovery so far this year was of an estimated nine million barrels of oil in the Straits of Malacca.

Business Times
Friday, Aug 29 1980

Ceramic investment

Franklin Mint, a well-known ceramics manufacturer is looking into

the possibility of setting up manufacturing operations in Malaysia to take advantage of the availability of raw materials like kaolin.

Business Times
Saturday, 30 Aug 1980

Bintulu aluminium smelting project

On the 'long-standing plan' by Reynolds International Metals to set up an aluminium smelter in Bintulu, Dr. Mahathir said its outcome hinges on the gas price Petronas is prepared to offer.

With the plan for a similar project in Labuan having been shelved and recently substituted by a sponge iron plant, the Reynolds proposal is left without a competitor.

Dr. Mahathir explained that Malaysia "is certainly not going to provide gas at rock-bottom prices but as the country is interested in promoting heavy industries using gas, it will not be so unreasonable as to change the market price for the gas used domestically."

Business Times
Saturday, 30 Aug 1980

TTK

GEOSEA IV - Geology, Mineral and Energy Resources of Southeast Asia
18 - 23 November 1981, Philippine International Convention Center, Manila, Philippines.

Results of recent studies on the geology and mineral/energy resources of Southeast Asia appear to have untangled the complex patterns of metallogenesis, hydrocarbon genesis and distribution of energy resources in relation to the geology and tectonics of the region. Recent advances are also demonstrated in the fields of hydrogeology and engineering geology.

The Fourth Regional Conference on the Geology, Energy and Mineral Resources of Southeast Asia attempts to collate the current information on these advances and innovations in the application of new techniques in mineral/energy resources exploration in the region. This conference follows those held in Kuala Lumpur (1972), Jakarta (1975) and Bangkok (1978).

In conjunction with the Conference, field excursions to areas of geological interest to take place on November 21-23, 1981 will be organized.

Original papers on the following topics are invited: General Geology, Energy Resources, Mineral Resources, Engineering Geology and Geotechnics, Structural Geology and Tectonics, Stratigraphy and Sedimentology, Paleontology and Biostratigraphy, Marine Geology, Geochronology, Petrography, Petrology and Mineralogy, Hydrogeology, Geochemistry, Quaternary Geology and others.

Authors are requested to submit abstracts of not more than 300 words not later than 15 November 1980 to: The Secretary, Geological Society of the Philippines, Bureau of Mines Bldg., Pedro Gil St., Malate, Manila, Philippines.

Authors will be informed of the acceptance of their abstract by January 15, 1981. Completed manuscripts of accepted papers will be required by 15 April 1981.

Papers accepted for presentation in the Conference will be published in a *Proceedings* which will be distributed to registered participants prior to the Conference.

English will be the official language of the Conference.

Further details of the Conference will be given in the Second Bulletin which will be distributed by 15 November 1980.

Geological Survey of Malaysian Tender for Geoelectrical Survey

The Geological Survey of Malaysia has issued a tender inviting local and foreign Geophysical Companies to undertake the Geoelectrical Survey, using Electromagnetic Induced Polarisation and Charged Potential Methods, to cover an area of 0.4 sq km in the Ulu Sokor area, Kelantan, Peninsular Malaysia.

The Survey is expected to begin in Feb/Mar 1981. Companies, with extensive experience to this type of geophysical exploration method, who wish to tender should apply to: THE DIRECTOR-GENERAL, GEOLOGICAL SURVEY OF MALAYSIA, 2nd FLOOR, SURVEY BUILDING, JALAN GURNEY, KUALA LUMPUR, MALAYSIA, for the tender documents which can be purchased at M\$50 each. An additional M\$25 for postage fees should accompany tender documents from overseas.

The completed tender documents should be deposited in the tender box at the Geological Survey Headquarters, 2nd Floor Survey Building, Kuala Lumpur. The tender will be closed at 12 noon on 7 Nov. 1980.

United Nations Conference on new and renewable sources of energy
August 1981 - Nairobi, Kenya

Objectives of the Conference include elaborating measures for concerted actions designed to promote the development and utilization of new and renewable sources of energy, with a view to contributing to meeting future overall energy requirements especially those of developing countries, particularly in the context of efforts aimed at accelerating the development of developing countries.

The rapid depletion of conventional energy resources and the growing demand for energy by countries throughout the world has made the search for new and renewable energy sources imperative. The conference and its preparatory process will provide the opportunity for countries to examine closely what can be expected from alternative sources of energy in the next decade and enable governments to make policy decisions concerning their energy requirements.

The conference will deal with 14 energy sources. Eight panels of international specialists nominated by governments and appointed by the Secretary-General on the basis of equitable geographical distribution are studying, respectively: solar; geothermal; wind; tidal, wave and thermal gradients of the sea; biomass conversion; fuelwood and charcoal; oil shale and tar sands; and hydropower. Two consultant studies, one carried out by the Government of Finland and the other by a distinguished Indian specialist, will examine, respectively, peat and draught animal power.

For further information, please contact:

Information Officer
United Nations Conference on New and
Renewable Sources of Energy
DESI/DPI - Room 1072-C
United Nations, New York, N.Y. 10017, USA.

XIth Congress and General Assembly - International Union of Crystallography
August 16-25, 1981 (Carleton University, Ottawa, Canada)

The XIth Congress and General Assembly of the International Union of Crystallography will be held in Ottawa at Carleton University from Aug. 16-25 1981 under the sponsorship of the National Research Council of Canada.

The scientific programme will include invited general lectures, invited oral papers and open Commission meetings. Most contributed papers will be presented in poster sessions. Commercial and non-commercial apparatus will be exhibited and crystallographic data file demonstrations are planned.

The Congress will cover recent advances in all aspects of crystallography. It is anticipated that the following areas will be represented:

General Topics: Atomic scale mechanisms of physical, chemical or biological properties
Applied crystallography
Computing and statistics
Crystal chemistry
Crystal physics
Crystal growth & morphology
Diffraction theory
Education and data retrieval
Electron density studies
Electron diffraction
EXAFS and near-edge spectroscopy
Instrumentation & apparatus
Lattice dynamics
Methods of structure determination
Neutron diffraction
Phase transitions
Powder diffraction
Real and ideal crystals
Small angle scattering
Synchrotron radiation & applications
Symmetry and related topics
Techniques

Structural Studies: Biological materials (proteins, viruses, membranes, drugs, etc)
Coordination compounds
Glasses and amorphous materials
Industrial materials
Inorganic and intermetallic compounds
Liquid crystals
Magnetic structures
Minerals
Organic compounds
Organo-metallic compounds
Polymeric materials
Surfaces, interfaces and films.

For more details contact: Mr. K. Charbonneau, Executive Secretary
XIth I.U. Cr. Congress
National Research Council of Canada
Ottawa, Ontario, Canada K1A 0R6.

Calendar

A bracketed date, e.g. (Mar-Apr 1979), denotes entry in that issue carried additional information.

1980

- Sep 6 : Congress on Science and Technology in Resource Development. Secretary, Jubilee Science Congress, c/o Malaysian Scientific Association, P.O. Box 911, Kuala Lumpur. (Nov-Dec 1979).
- Sep 8 - 13 : World Conference on Earthquake Engineering, Istanbul, Turkey, A. Gurpinar, Secretary, 7 WCEE, Yuksel Caddesi 7/B, Ankara, Turkey.
- Sep 10 - 26 : International Course on Applied Mineral Economics for Developing Countries. Sponsored by AGID in cooperation with the Govt. of State of Braiba and CPRM. Dr. Elisen D'Angelo Visconti Neto, CPRM/DAF, President of Organizing Committee, Ave. Pasteur no. 404- Rio de Janeiro, 22.292 Rio de Janeiro, Brazil.
- Sep 16 - 19 : Eurotunnel '80, Basle, Switzerland. Conference on Tunnelling in Europe. (Secretary, Institute of Mining and Metallurgy, 44 Portland Place, London W1N 4BR, U.K.). (Mar-Apr 1980).
- Oct 5 - 8 : Complex sulphide ores, Rome, Italy. Organized by IMM in association with Consiglio Nazionale delle Ricerche (Laboratorio per il Trattamento de Minerals). The Secretary, IMM, 44 Portland Place, London W1N 1BR, U.K.
- Oct 6 - 10 : Second International Tinplate Conference, London, England. Conference Secretariat, International Tin Research Institute, Fraser Road, Perivale, Greenford, Middlesex UB6 7AQ, England. (Mar-Apr 1980).
- Oct 6 - 13 : Workshop on Age Dating by the Unesco Geosciences Network. Prof. B.K. Kim, Executive Secretary, Geoscience Network, Seoul National University, Seoul, South Korea. (Mar-Apr 1980).
- Oct 9 - 11 : UNESCO - International Symposium on Metallogeny of Mafic and Ultramafic Complexes: The Eastern Mediterranean-Western Asia area, and its comparison with similar Metallogenic Environments in the world, Athens, Greece. Prof. S.S. Augustithis, UNESCO International Symposium-Project No. 169, National Technical University, Dept. of Mineralogy-Petrography-Geology, P.O. Box 1482, Athens, Greece. (Mar-Apr 1980).
- Oct 13 - 17 : Second International Conference of Scientific Editors, Amsterdam, Holland. (J.L. Heller, U.S. Geological Survey, M.S. 303, Box 25046, Federal Center, Denver, Co. 80225, USA).
- Oct 26 - 30 : Fundamentals of Computer Processing of offshore mineral and other geological data, (Seminar/Workshop), Bangkok, Thailand. Sponsored by Dept. of Mineral Resources, Asian Inst. of Technology and CCOP. (Pisoot Sudasna, Dept. of Mineral Resources, Ministry of Industry, Rama VI Road, Bangkok, Thailand).

- Nov 23 - 28 : Mining of Copper Porphyries, Santiago, Chile. (L. B. O'Higgins, 1170 9^o piso, Casilla 14668, Correo 21, Santiago, Chile). (May-Jun 1980).
- Dec 1 - 5 : Symposium on Problems and Practice of Dam Engineering, Bangkok, Thailand. Prof. A.S. Balasubramaniam, Division of Geotechnical & Transportation Engineering, Asian Institute of Technology, P.O. Box 2754, Bangkok, Thailand. (May-Jun 1980).
- 1981
- Mar - Apr : SEATRAD Seminar on "Complex Tin Ores and Related Problems", Ipoh, Malaysia. The Director, SEATRAD Centre, 14 Tiger Lane, Ipoh, Perak, Malaysia. (May-Jun 1980).
- Mar 29 - Apr 4 : International Conference on Arid Soils - Properties, Genesis and Management, Jerusalem, Israel. International Conference on Arid Soils, P.O. Box 3054, 122 Hayarkon St., Tel Aviv, Israel. (May-Jun 1979).
- May : International Symposium on "Concept and Method in Paleontology", Barcelona. Dr. Jordi Martinell, Departament de Paleontologia, Facultat de Geologia, Univ. Barcelona, Gran Via de las Corts Catalanes, 585, Barcelona-7, Spain (May-Jun 1980).
- May 13 - 15 : Industrial Minerals (Forum), Albuquerque, New Mexico, USA. (G.S. Austin, New Mexico Bureau of Mines & Mineral Resources, Campus Station, Socorro, N.M. 87801, USA. Tel. 505-835-5125).
- May 18 - 22 : Fourth International Coral Reef Symposium, Manila, Philippines. Marine Sciences Center, Univ. of Philippines, P.O. Box 1, Diliman, Quezon City, Philippines. (May-Jun 1980).
- Jun 24 - 26 : ICAM 81 - International conference on Applied Mineralogy in the mineral industry, Johannesburg, South Africa. Pre- and post-conference field excursions. (L.F. Haughton, ICAM 81, Nat. Inst. for Metallurgy, Private Bag X3105, Randburg, 2125 South Africa). (Jan-Feb 1980).
- Aug 7 - 16 : 4th International Conference on basement tectonics. (Conference with field excursions), Oslo, Norway. Major theme: origin, propagation and significance of basement fractures. (I.B. Ramberg, Dept. of Geology, University of Oslo, Box 1047, Blindern, Oslo, 3, Norway).
- Aug 9 - 14 : Second international symposium of the Cambrian system, Golden, Colorado, USA. Sponsored by the Cambrian Sub-commission of the IUGS Commission on Stratigraphy and the U.S. Geological Survey. (The Cambrian Symposium, Paleontology and Stratigraphy Branch, U.S. Geological Survey, Box 25046, Mail Stop 919, Denver Federal Center, Co. 80225, USA).
- Sep 1 - 6 : Second International Conference, Graptolite working group of the International Palaeontological Association, (Conference and field excursions), Cambridge, U.K. (P.R. Crowther, Dept. of Geology, University of Cambridge, Sedgewick Museum, Downing Street, Cambridge CB2 3EQ, U.K.).

- Sep 7 - 12 : 7th International Clay Conference, Bologna and Pavia, Italy. Conference with pre- and post-meeting field trips. (F. Veniale Istituto di Mineralogia e Petrografia, Universita di Pavia, Via Bassi 4, 27100 Pavia, Italy).
- Oct 7 - 9 : ASEAN Council on Petroleum (Meeting), Manila, Philippines. (ASCOPE '81 Organizing Secretariat, Philippine National Oil Co., 7901 Makati Ave., Makati, Metro Manila, Philippines, Telex: 63667 PNOC PM).
- Nov 23 - 26 : Asian Mining 81, Singapore. The Secretary, IMM, 44 Portland Place, London W1N 4BR, England. (May-Jun 1980).

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- May 12 - 14 : 9th International Geochemical Exploration Symposium, Saskatoon, Canada. (L.A. Clark, Saskatchewan Mining Development Corp., 122 3rd Ave. North, Saskatoon, Sask., Canada S7K 2H6).
- Aug 20 - 23 : IV International Symposium on the Ordovician System, Oslo, Norway. One pre-meeting excursion in Norway and three post-meeting excursions in Sweden. (D.L. Bruton, Paleontologisk Museum, Sars gate 1, Oslo, 5, Norway).
- Aug 22 - 28 : Circum-Pacific Energy and Mineral Resources Conference, Honolulu, Hawaii, USA. (M.T. Halbouty, 5100 Westheimer Road, Houston, Texas 77056, USA).

PERSATUAN GEOLOGI MALAYSIA
(GEOLOGICAL SOCIETY OF MALAYSIA)

Tujuan Persatuan Geologi Malaysia adalah untuk memajukan sains bumi, terutama sekali di Malaysia dan negara negara jiran. Barang siapa yang ingin menjadi ahli Persatuan adalah dipersilakan mendapatkan 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 the neighbouring countries. Anyone interested in becoming a member of the Society should obtain the necessary forms from the Hon. Secretary.

