

# PERSATUAN GEOLOGI MALAYSIA

# WARTA GEOLOGI

## NEWSLETTER OF THE GEOLOGICAL SOCIETY OF MALAYSIA

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GEOLOGICAL SOCIETY  
OF MALAYSIA

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# PERSATUAN GEOLOGI MALAYSIA

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### About the Society

The Society was founded in 1967 with the aim of promoting the advancement of earth sciences particularly in Malaysia and the Southeast Asian region.

The Society has a membership of about 600 earth scientists interested in Malaysia and other Southeast Asian regions. The membership is worldwide in distribution.

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# CATATAN GEOLOGI

## Geological Notes

### Shallow reflection seismics at the Pekan Quaternary deposits

UMAR HAMZAH, ABDUL RAHIM SAMSUDIN AND ABDUL GHANI RAFEK  
Jabatan Geologi  
Universiti Kebangsaan Malaysia  
Bangi, Selangor D.E.

**Abstract:** The applicability of the seismic reflection method for exploration at shallow depth (< 100 m) has been investigated at Pekan Quaternary deposits. A system comprising of a high-frequency response seismograph and a hammer source was used. The reflection data provides information on the internal structure of the Quaternary deposits. The resolution and accuracy of the reflection data demonstrate the potential of this method in engineering geophysical investigations.

**Abstrak:** Satu kajian untuk melihat kebolehan teknik seismos pantulan di dalam penjelajahan struktur bawah tanah sehingga ke kedalaman di sekitar 100 meter telah dilakukan pada endapan kuaterner di Pekan. Sistem peralatan yang digunakan terdiri daripada seismograf rangsangan berfrekuensi tinggi dan tukul sebagai punca. Data pantulan menghasilkan maklumat struktur dalaman endapan kuaterner. Resolusi dan ketepatan data menunjukkan bahawa kaedah ini berpotensi untuk penyiasatan geofizik kejuruteraan.

#### INTRODUCTION

Recent modification of the seismic reflection technique (Hunter *et al.*, 1984; Knapp and Steeples, 1986a; Pullan and MacAulay, 1987; Ali and Hill, 1991) has improved its applicability for exploration at shallow depths. The modifications include the seismic source (Miller *et al.*, 1992; Meekes, 1992), seismic detectors (Gendzwill and Brehm, 1993) and field techniques (Frappa and Molinier, 1993). The aim is to generate, extract and record high-resolution seismic data and eliminate noise especially low-frequency high amplitude source-generated ground roll.

This paper shows how this method was used to delineate the internal structure within quaternary deposits and the granite bedrock.

#### GEOLOGY

The Pekan area consists of old Quaternary alluvium ranging from Pleistocene to Holocene in age. The thickness of alluvium from drilling data is from 18 to 107 meters overlying granite

bedrock. Lithologic sequence shows interlayering of clay/silt and sand/gravel (Saffeen Baharuddin, 1992).

#### FIELD TECHNIQUE AND PROCESSING

The system used comprised of a high-frequency ABEM 24 channel seismograph with built in data storing facility. An approximately 5 kilogram sledgehammer was used as a source of seismic energy. The 14 Hz Mark products geophones were used to receive the signals. 100 Hz analogue low-cut filters were employed to attenuate low-frequency source generated ground roll and enhance the high frequency content of the signal. One half a kilometer profile with CMP coverage was recorded at Pekan (Fig. 1). The common mid-point 'CMP' geometry (Umar Hamzah and King, 1988) which provides multifold coverage data was used throughout the survey.

The main processes applied to the seismic data included gain recovery, velocity analysis, normal move out correction and common mid

point stacking. Stacking velocities were used in normal move out correction of the data. CMP stacking of all profiles enhanced the quality of the seismic data by increasing the signal to noise ratio. Static correction was not applied since the survey areas are flat.

## INTERPRETATION

### Case 1: Pekan (a)

Seismic horizons which are identified as reflections are marked on the stacked seismic section (Fig. 2). Reflections recognized where the quality of data is good include two continuous and slightly undulating reflections R1 and R2 and continuous to discontinuous R3 and R4 which are generally parallel to earlier two reflections. Besides these reflections there are some short and weak alignments which may be reflections, such as indicated by reflection R5. Geological interpretation is very sensitive to velocities especially in depth conversion. Since interval velocity are not available, depth conversion is carried out by using stacking

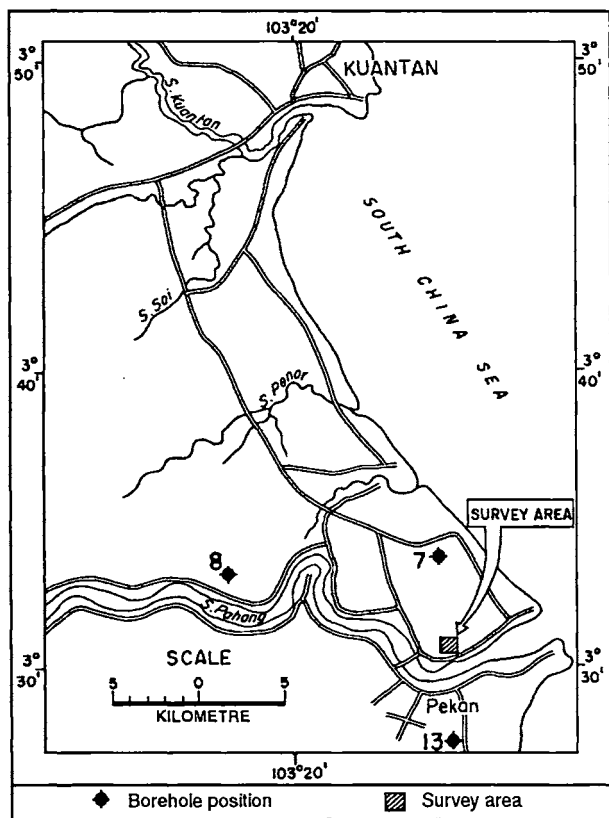


Figure 1. Location of the survey area.

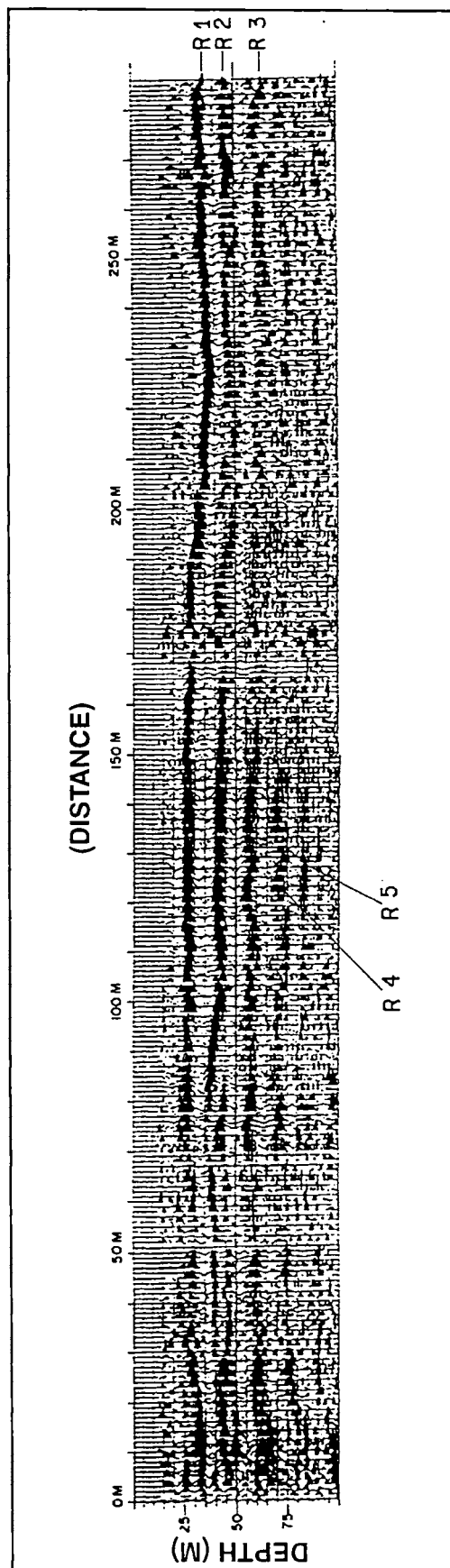


Figure 2. Stacked seismic section.

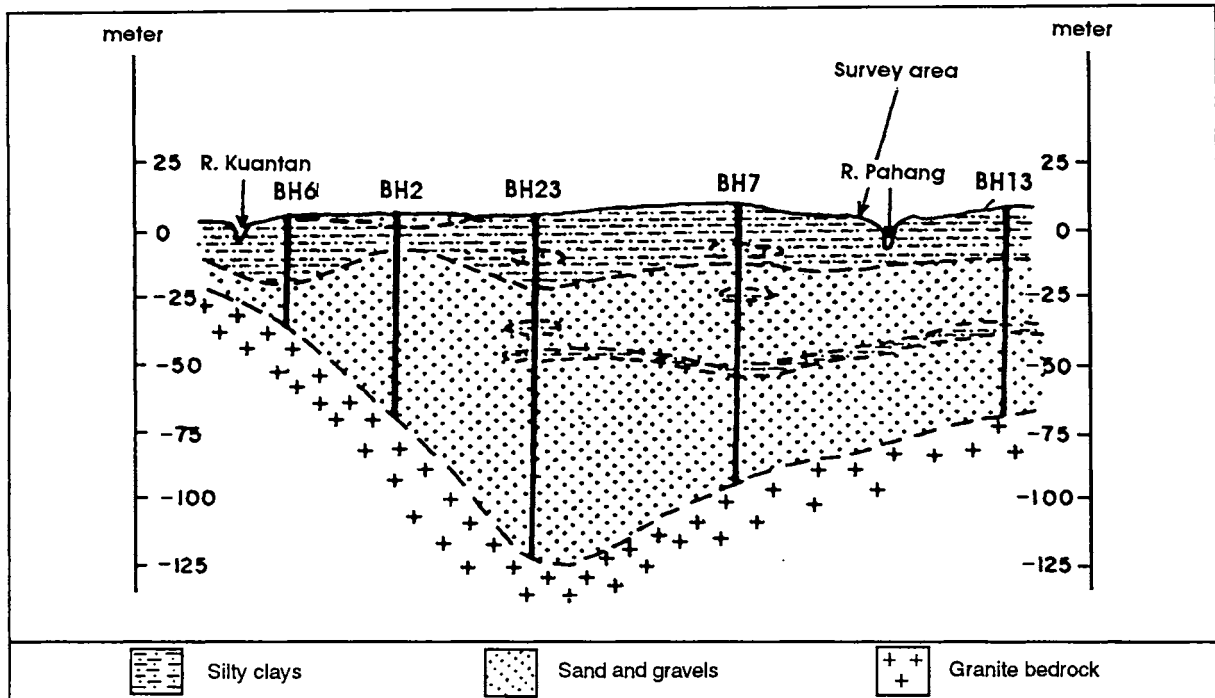


Figure 3. Geological cores section based on boreholes.

velocity obtained from velocity analysis. An estimated value of about  $1,000 \text{ ms}^{-1}$  was used for the conversion and production of stacked section. Boreholes 7 and 13 on the north and south of the profiles (Fig. 3) were used for geological interpretations. Layer above reflection R1 which is approximately 25 m thick correlate with silty clays. Below R1 is sand and gravel of varying thickness, from 25 m in the middle to 75 meters at both ends of the profile. Within the sand layers are thin layers of clay and silt of 5 to 10 meter thickness marked by reflections R2, R3 and R4. Zone of poor alignment in the middle and bottom of the profile is interpreted as granite bedrock at depth approximately 55-60 meters. Figure 4 shows the geological interpretation of the profile.

### CONCLUSION

The results of this study demonstrate the potential of the seismic reflection method for shallow depth applications. The combination of depth resolution and continuous imaging allows more accurate determination of

Quaternary structure especially when correlation with existing borehole data is carried out.

### ACKNOWLEDGEMENT

The authors wish to thank the Malaysian government for the IRPA 4-07-03-03 grant, JKR (IKRAM) for the data processing software (EAVES DROPPER) and to all crew members including Tajul Arus, Mohd. Ali, Zakaria Muda, Abang Casfian, Tosri Amin, Lokman Hakim and Safarudin Tahir.

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- FRAPPA, M. AND MOLINIER, C., 1993. Shallow seismic reflection in a mine gallery. *Engineering Geology*, 33, 201-208.
- GENDZWILL, D.J. AND BREHM, R., 1993. High-resolution seismic reflections in a Potash mine. *Geophysics*,

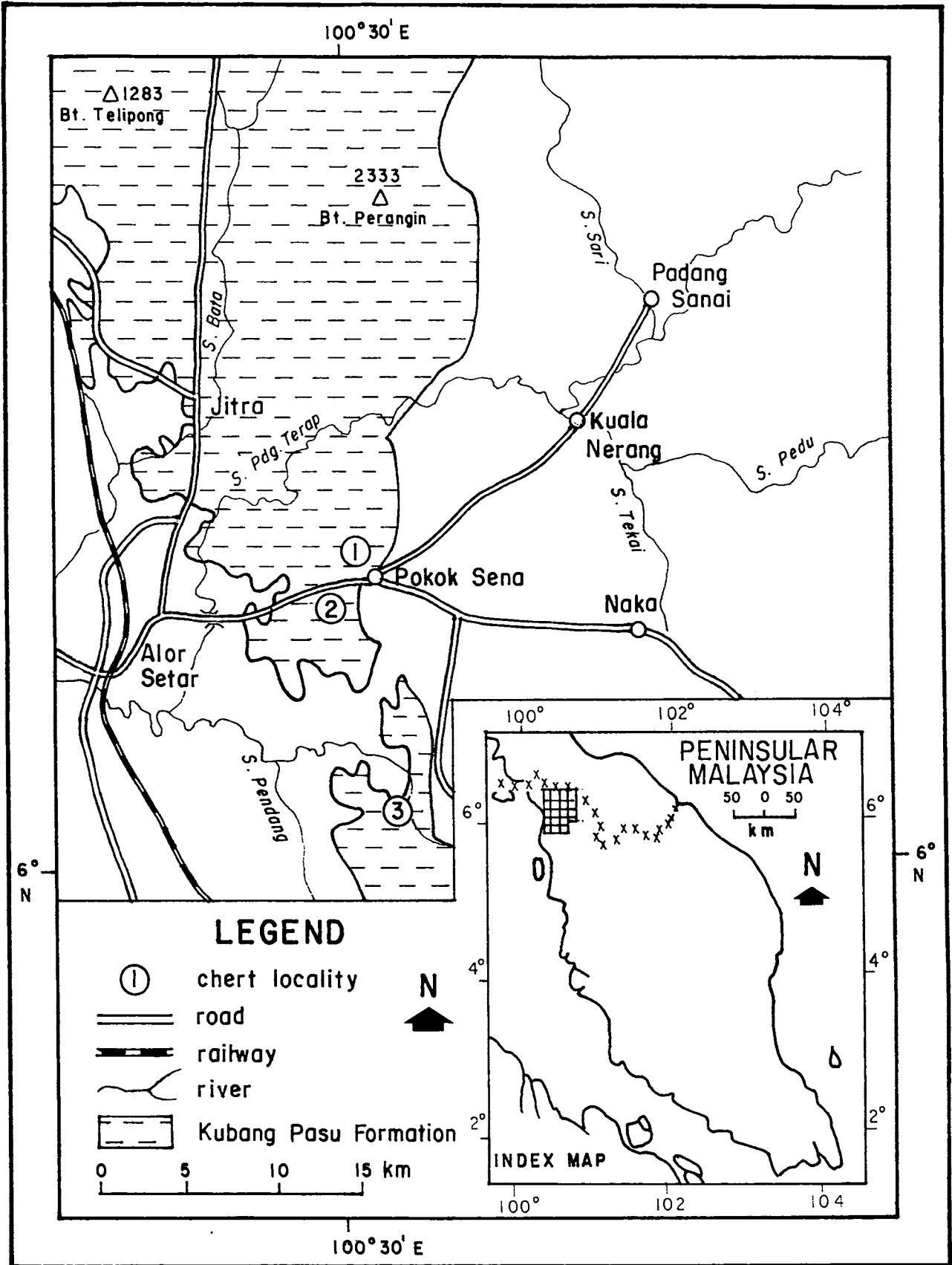


Figure 1. Map showing chert localities. 1. Pokok Sena, 2. Bukit Beringin, 3. Bukit Telaga Jatoh.

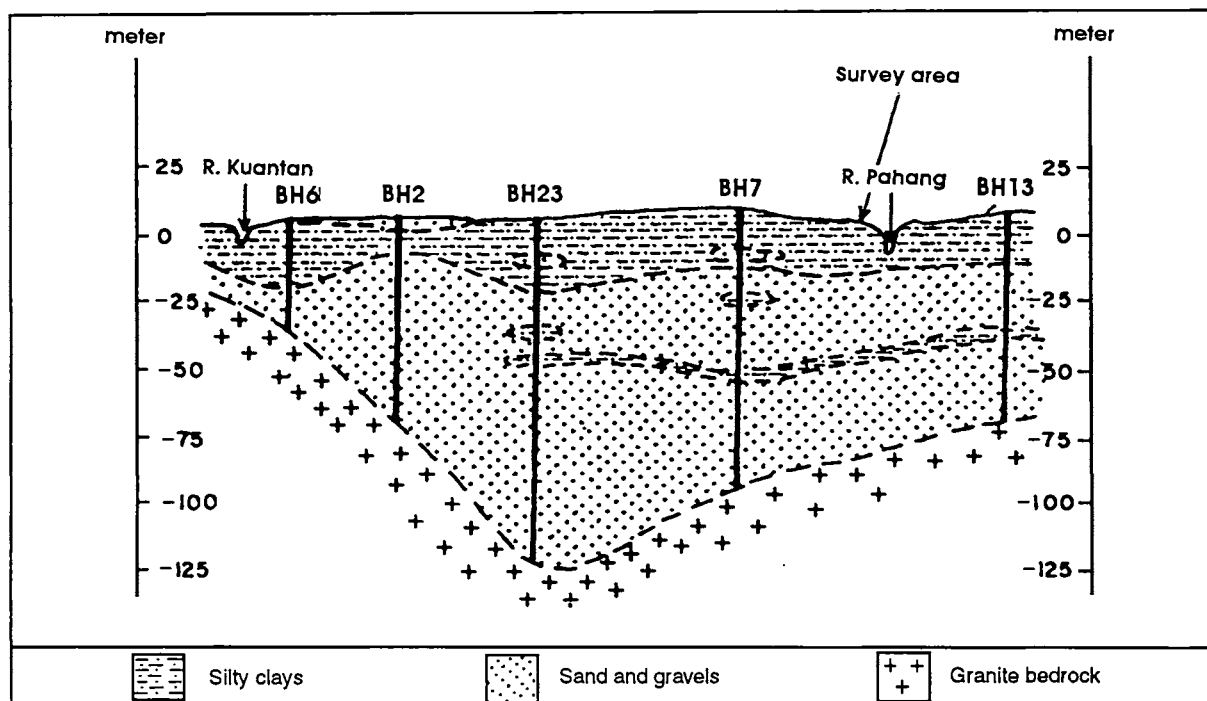


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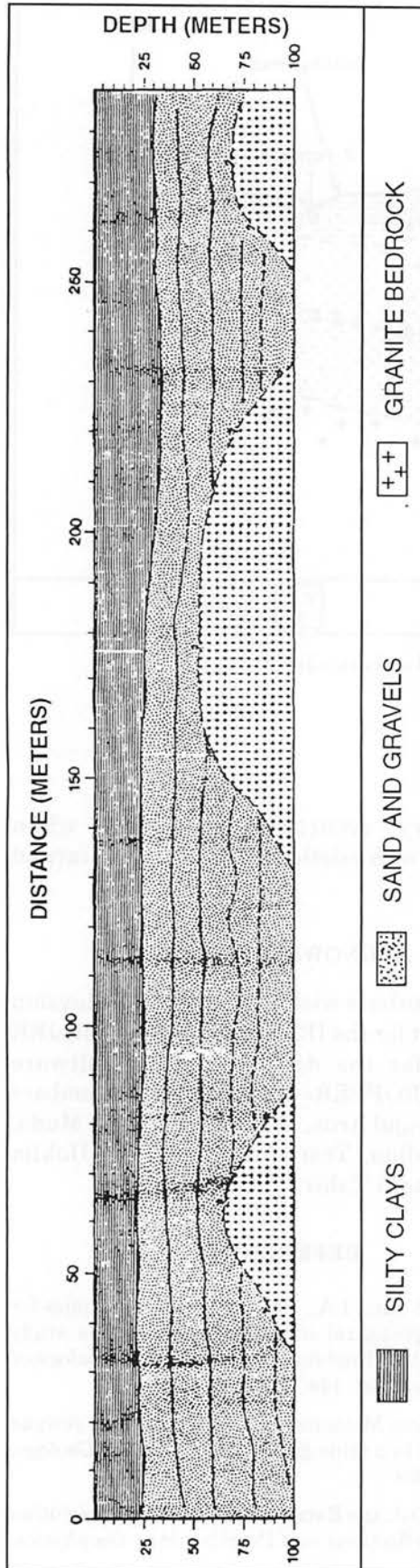


Figure 4. Geological interpretation of the seismic line.

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UMAR HAMZAH AND ROY FARREL KING, 1988. Seismos pantulan cetek bagi skala kejuruteraan. *Sains Malaysiana*, 17(1), 53-65.

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# CATATAN GEOLOGI

## Geological Notes

### Occurrence of bedded radiolarian chert in the Kubang Pasu Formation, north Kedah, Peninsular Malaysia

BASIR JASIN  
Jabatan Geologi  
Universiti Kebangsaan Malaysia  
43600 Bangi

**Abstract:** Bedded radiolarian chert crops out at three abandoned earth quarries near Pokok Sena town, Bukit Beringin and Bukit Telaga Jatoh, Tobiar. The chert consists of mainly biogenic silica of radiolarian shells. The assemblage is dominated by spheroidal spumellaria *Entactinia variospina* and *Callella* sp. which indicates that the age of the chert is Early Carboniferous probably Tornaisian. The rock association in the area represents the continental margin-chert association.

#### INTRODUCTION

The Kubang Pasu Formation outcrops in northwest Kedah and central Perlis. This formation is composed of thick bedded sandstone interbedded with mudstone. Minor chert lenses occur in the formation (Jones, 1981). This formation is gently folded with a general north-south strike. The Kubang Pasu Formation was deposited in various types of environments. In Perlis, the Kubang Pasu Formation was deposited in a shallow marine environment on a continental shelf (Yap, 1991) and became deeper in north Kedah where the lower part of the formation consists of bedded chert overlain by rhythmic sand and shale sequence. The top of Kubang Pasu Formation is dominated by thick sandstone interbedded with mudstone.

#### OCCURRENCE OF BEDDED CHERT

The bedded radiolarian chert is exposed at several localities in north Kedah (Fig. 1). The thickness of the chert varies from 3 m to 11 m. The bedded chert is exposed at three abandoned earth quarries. Approximately 4 m thick of bedded chert is exposed near Pokok Sena town, about 3 m thick of chert crops out

at Bukit Beringin and about 11 m thick of chert is found at Bukit Telaga Jatoh, Tobiar (Fig. 2). The bedded chert strikes 340°-350° and dips 50°-75°. The chert exhibits rhythmically alternating layers of chert and siliceous mudstone. The chert is known as ribbon chert. The thickness of individual chert layer varies from 2 cm to 10 cm thick (Fig. 3). This chert is gray in colour. The bedded chert forms as minor lenticular bodies in the Kubang Pasu Formation. The chert is bounded by well bedded terrigenous clastic sediments. The bedded chert near Pokok Sena is located at the lower part of the Kubang Pasu Formation. The chert at Bukit Beringin is overlying the *Posidonia* rich shale bed.

#### LITHOLOGY OF THE CHERT

The chert layer is composed of mainly cryptocrystalline quartz crystals less than 30 µm in diameter. The source of quartz is mainly from biogenic opal test of silica produced by radiolaria. Some of the chert layers contain abundant grains of radiolarian skeletons inbedded in siliceous matrix (Fig. 3). The grain boundaries between radiolaria and matrix are sometimes very distinct (Fig. 4). The chert

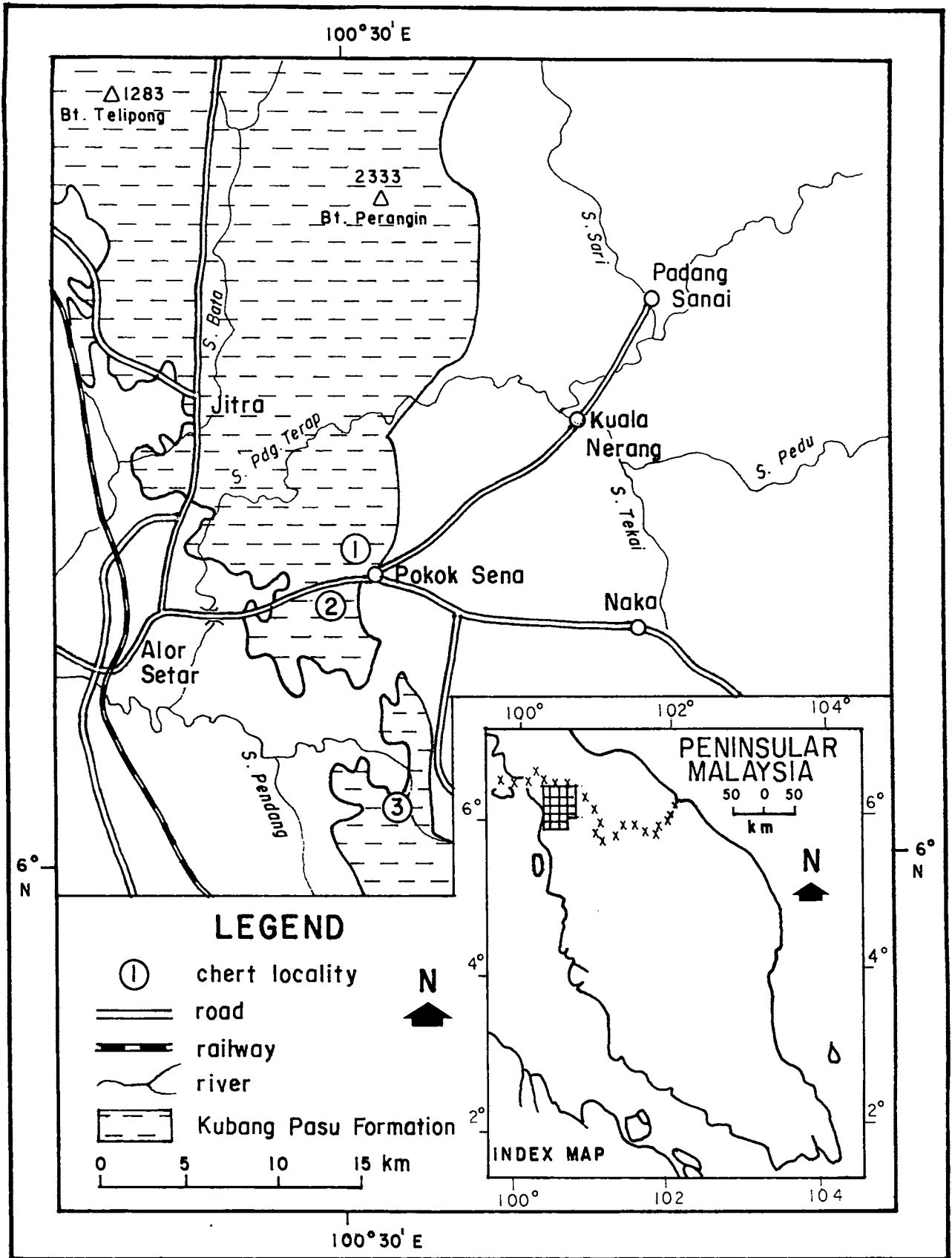
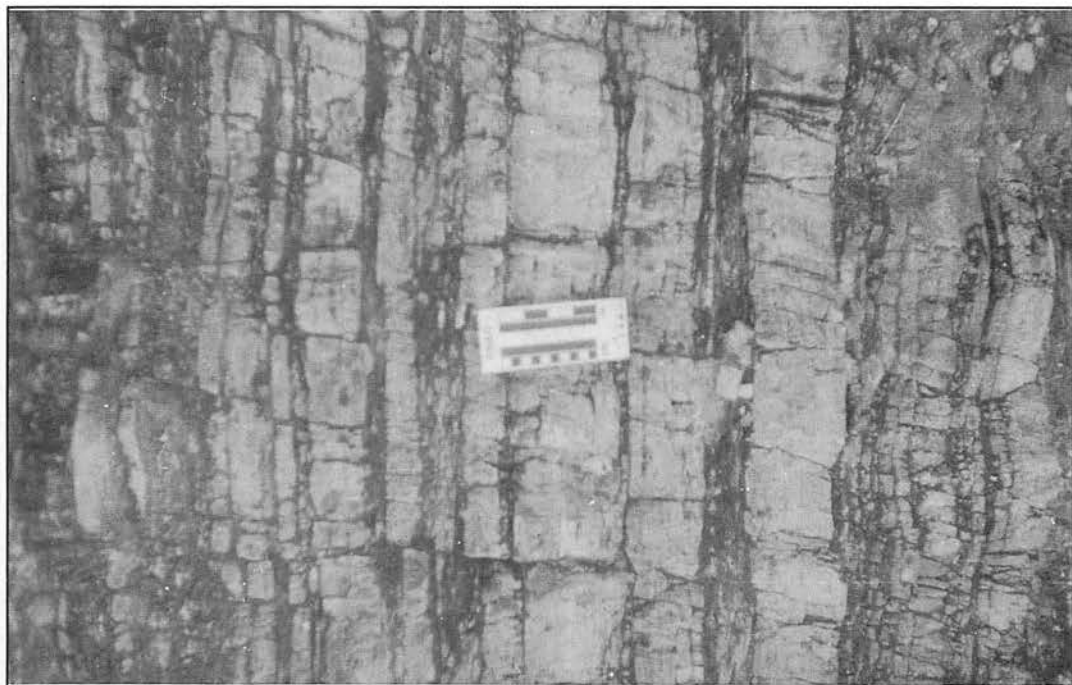


Figure 1. Map showing chert localities. 1. Pokok Sena, 2. Bukit Beringin, 3. Bukit Telaga Jatoh.



**Figure 2.** Outcrop of the chert at Bukit Telaga Jatoh.



**Figure 3.** Bedded radiolarian chert (ribbon chert) at Bukit Telaga Jatoh.

layer is intercalated with siliceous mudstone. The chert has undergone diagenesis, and the majority of radiolaria were destroyed.

#### RADIOLARIA AND THE AGE OF THE CHERT

Fifteen radiolarian chert samples were collected from outcrops at Bukit Beringin, Pokok Sena and Bukit Telaga Jatoh. The samples were treated with hydrofluoric acid for 24 hours to release radiolaria from the matrix. Most of the samples yielded poorly preserved radiolaria. The radiolaria consist of mainly spheroidal spumellaria. Only one sample from Bukit Telaga Jatoh yielded quite well preserved radiolaria. The sample contains very low specific diversity and is dominated by spheroidal forms. Only two species of radiolaria were identified viz. *Entactinia variospina* Won and *Callella* sp. (Plate 1). *Entactinia variospina* was recorded from *Albaellella indensis* Zone (Tournaisian) to *Latentifistula concentrica* Zone (Visean), Early Carboniferous (Braun and Schmidt-Effing, 1993). This suggests that the age of the chert in Kubang Pasu Formation is Early Carboniferous and most probably Tournaisian.

#### DEPOSITIONAL ENVIRONMENT OF THE CHERT

The chert of the Kubang Pasu Formation is interbedded with terrigenous clastic sediments. The occurrence of clastic sediments indicates that the depositional environment was very close to a continental shelf. The rock association is considered as continental margin chert association (Jones and Murchey, 1986). This association is usually found in a basin that is very close to continental margin. The chert was deposited in a deep water environment during high plankton productivity.

#### PALEOGEOGRAPHIC IMPLICATIONS

The low specific diversity and high number of spheroidal spumellaria was probably controlled by paleolatitude. It reflects that the radiolarian assemblage was deposited in high latitude marine environment of the southern hemisphere where the Sibumasu block was attached to the Gondwana during Early Carboniferous (Metcalf, 1986, 1988; Burrett and Stait, 1986). Most of the reported Early Carboniferous radiolaria were deposited at the latitude higher than 30° (Aitchison, 1990).

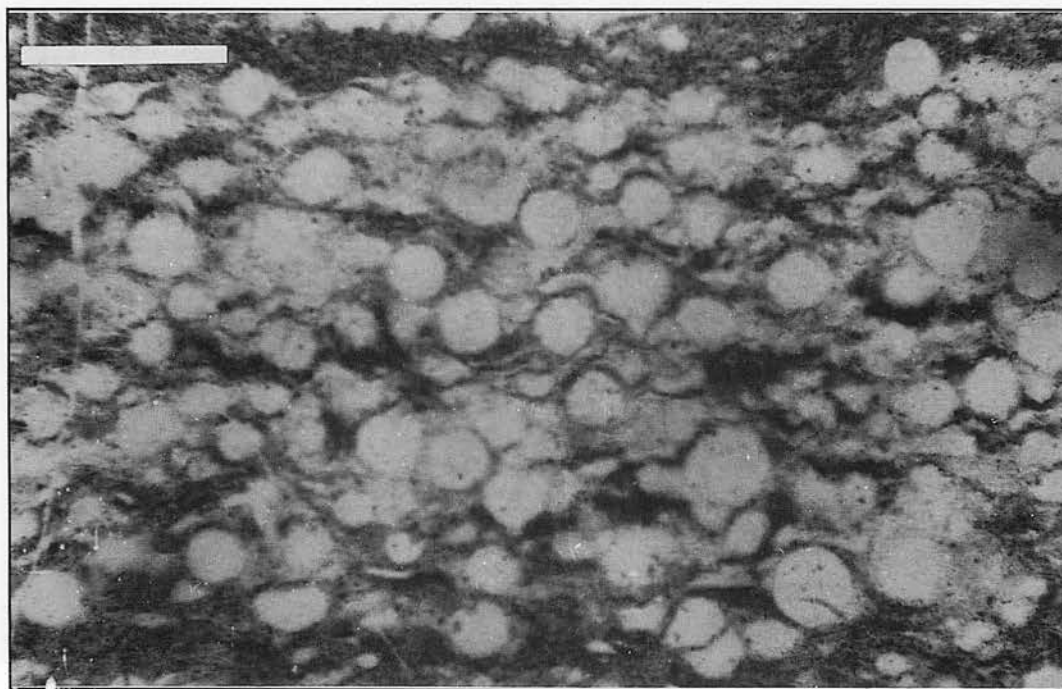
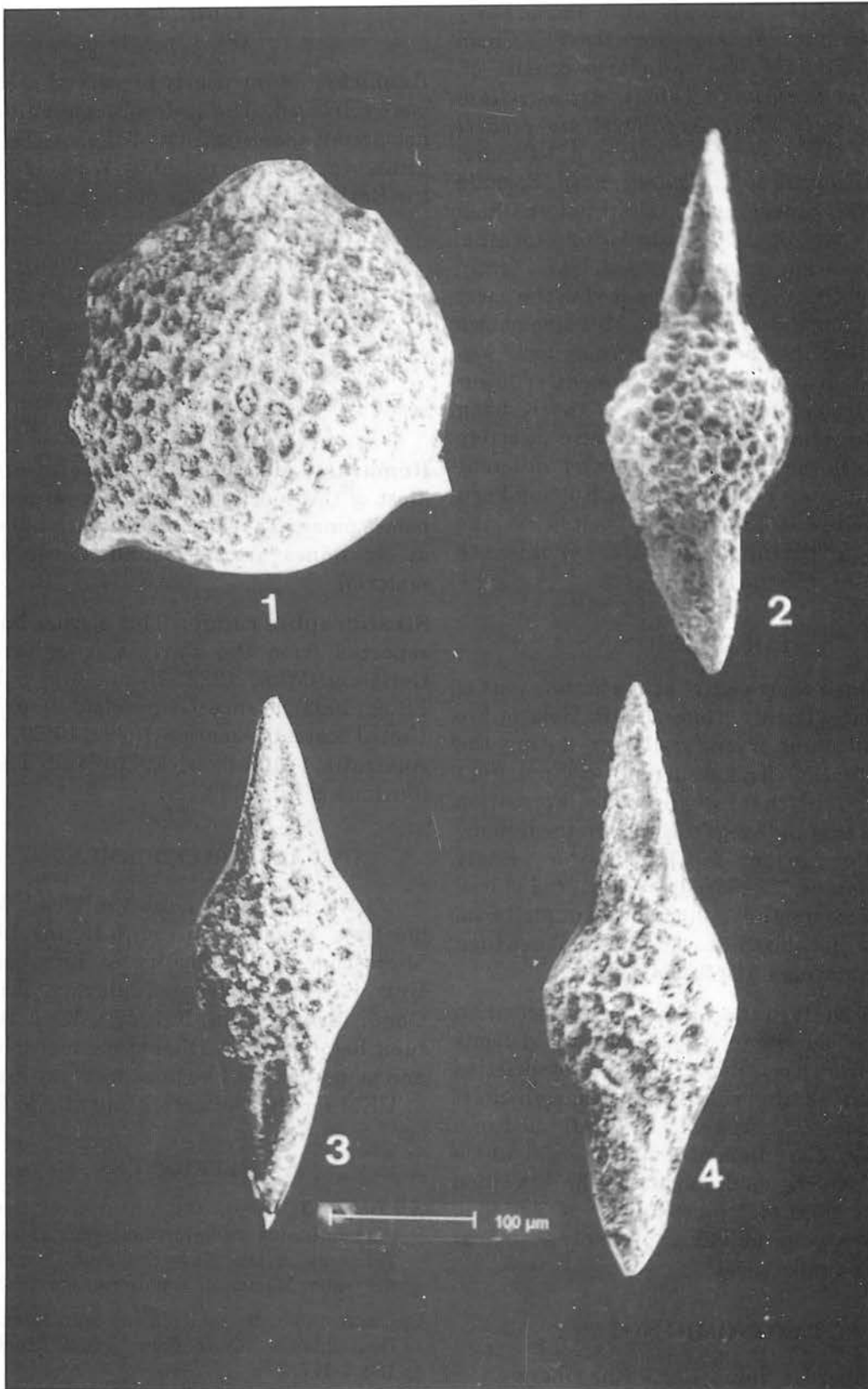


Figure 4. Photomicrograph of radiolarian chert (scale bar = 0.5 mm).



**Plate 1.** (Scale bar = 100 µm)  
1. *Callella* sp.  
2-4. *Entactinia variospina* (Won)

Sashida *et al.* (1993) have identified some Early Carboniferous radiolaria from the Pak Chom area, Thailand. The radiolaria consist of, *Entactinia variospina* (Won), *Archocyrtium coronaesimili* Won, *Archocyrtium riedeli* Deflandre, *Archocyrtium cf. ludicrum* Deflandre, *Archocyrtium* sp. and *Pylentonema* sp. Sashida *et al.* (1993) considered the chert of Pak Chom area was deposited on the Indochina terrane. The radiolarian assemblage exhibits slightly higher specific diversity compared to the chert of the Kubang Pasu Formation. This assemblage reflects that the chert of Pak Chom area was deposited in a marine environment of lower palaeolatitude than the chert of the Kubang Pasu Formation. Both cherts were probably deposited in the same ocean basin but different palaeolatitude. The chert of the Kubang Pasu Formation was probably deposited on the Sibumasu terrane north of Gondwana continental margin.

### CONCLUSION

Bedded chert occurs at the bottom part of the Kubang Pasu Formation. Radiolaria are very important microfossils for dating the siliceous rocks. The occurrence of *Entactinia variospina* in the Kubang Pasu Formation indicates that the age of the chert in the Kubang Pasu Formation is Torniasian, Early Carboniferous. The low diversity of radiolaria, dominated by the spheroidal spumellaria, suggests that the chert was deposited in a high latitude marine environment.

The chert in the Kubang Pasu Formation is interbedded with terrigenous clastic sediments derived from a continent. The rock association is known as the continental margin-chert association. The association was formed in a basin very close to continental margin which supply the terrigenous material. The deposition of bedded chert took place during the period of high plankton productivity probably at or near the upwelling zone.

### TAXONOMIC NOTES

Suborder Spumellaria Ehrenberg  
Family Entactiniidae Riedel 1967  
Genus *Callella* Won 1983

*Callella* sp.  
(Pl. 1, fig. 1)

**Remarks:** Many poorly preserved specimens were retrieved. The state of preservation does not permit identification of the species. This genus was first described by Won (1983) from the Early Carboniferous of Germany.

Genus *Entactinia* Foreman 1963.  
*Entactinia variospina* (Won)  
(Pl. 1, figs. 2, 3, 4)

*Palaeoxiphostylus variospina* Won, 1983,  
156-157, pl. 8, figs. 1-4, 6-22.

*Entactinia variospina* (Won) Braun, 1990  
109-110, pl. 7, figs. 4-6.

**Remarks:** Many specimens were retrieved. Most of the specimens exhibit two prominent polar spines. The specimens which have three or six spines are not found in the present material.

**Stratigraphic range:** This species has been reported from the Early Carboniferous of Germany (Won, 1983; Braun and Schmidt-Effing, 1993), France (Gourmelon, 1986), Texas, United States of America (Noble, 1992), eastern Australia (Aitchison, 1990) and Thailand (Sashida *et al.*, 1993).

### ACKNOWLEDGEMENT

I would like to thank En. Mohd. Yaakob bin Dato' Ismail from the Scanning Electron Microscope Unit, Faculty of Life Sciences, Universiti Kebangsaan Malaysia, En. Abd. Ghani Idris and En. Ibrahim Mohd. Dom for their help in preparation of photograph, plate and map. I would like to express my gratitude to UKM for the research grant (UKM 55/92).

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Manuscript received 22 December 1994

# Souvenirs For Sale

In Response to requests by members, the Society has now prepared several souvenir items for sale as follows:

	Unit Price (RM)
1. Key Chain (brass with epoxy coating and Society Logo)	6.00
2. Tie Clip (with Society Logo)	7.00
3. Cap (dark blue, with Society Logo)	9.00
4. Hat (dark blue, with Society Logo)	10.00
5. Tie (dark blue with Society Logo)	30.00

Members can purchase/order these souvenir items by contacting:

Anna Lim

Geological Society of Malaysia

c/o Geology Department

University of Malaya

59100 Kuala Lumpur

Fax: (603) 7563900

Tel: (603) 7577036



# PERTEMUAN PERSATUAN Meetings of the Society

## Ceramah Teknik (Technical Talk)

**Title 1: Tectonic: Some metallogenic aspects of mineral deposits**

**Title 2: Some geochemical petrological aspects of mineral deposits**

D.F. STRONG

### Laporan (Report)

Prof. D.F. Strong, President and Vice-Chancellor, University of Victoria, Victoria B.C., Canada, gave the above talks on the 13th and 15th March 1995 respectively, at the Geology Department, University of Malaya.

Prof. Strong was in the country as External Examiner, Applied Geology, University of Malaya.

### Abstrak (Abstract)

Granite-related mineral deposits in the Appalachian orogen range from skarns and porphyry-type copper deposits of Gaspe through metal-deficient fluorite veins at St. Lawrence, complex subvolcanic tungsten-molybdenum polymetallic deposits at Mount Pleasant, tin (-copper) at East Kemptville, hydrothermal uranium at Millet Brook, tungsten-bearing quartz veins at Grey River and Burnt Hill, antimony-bearing quartz veins at Lake George, pyrophyllite deposits at Foxtrap, and numerous other deposits with other characteristics. This range in deposit types is also characterized by variations in the host granitoid rocks which are illustrated by rare earth element geochemistry of the bulk rocks (altered, unaltered and mineralized) and by chemistry of the phyllosilicates. The REE geochemistry is dominantly affected by the hydrothermal processes, but the phyllosilicate compositions appear to also exhibit characteristics which relate to the magma types and possibly source rock characteristics.

The aim of this talk is to compare and contrast a range of mineral deposit types associated with granitoid rocks in the Canadian Appalachians and put them into an overall geological context, and provide an indication of some of the geochemical and mineralogical data which are helpful in understanding the processes which control their formation and provide some guides to exploration. Studies of these deposits have ranged through a variety of techniques from isotopic to fluid inclusion studies to whole rock and mineral chemistry. This talk will focus on the available rare earth and phyllosilicate data, as the former provide some indication of the hydrothermal processes involved during deposition, and the latter give an indication of the different source materials from which the granitoid rocks and by implication their mineral deposits were derived.

Granitoid plutons show systematic groupings and patterns of variation across mountain belts, and these have been related to the same plate tectonic processes which explain most large-scale geological phenomena. The apparent success of these interpretations also led

early workers to draw similar conclusions relating Appalachian granites to subduction processes, and this has been done more recently for Caledonian granites of Britain. However recent studies of circum-Pacific granitoid rocks have shown that there is an even more important common thread to their origins, namely that they ultimately reflect compositions of the source rocks from which they were derived.

G.H. Teh

TECHNICAL TALK — D.F. STRONG



## **Preliminary site investigations of the Kuala Lumpur International Airport**

S.N. WERSCHING, MALEK MUSA, P.A. SMITH AND I.G. EDMONDS

### **Laporan (Report)**

The above talk on the on-going development at KLIA (Kuala Lumpur International Airport) was given by a team from the Design Consultants HSSI-HALCROW on 17th March 1995 at the Geology Department, University of Malaya.

HSSI-HALCROW was led by Dr. S.N. Wersching who gave the Introduction and the Geotechnical Investigations, Malek Musa spoke on the Geology, P.A. Smith on Earthworks and I.G. Edmonds on Instrumentation.

The informative talk attracted a large audience of 40 and was a good introduction to the fieldtrip planned for the next day.

### **Summary**

#### **Introduction**

The introduction detailed the location of the site and the relative position of runways, taxiways and terminal building complex in relation to the original topographic features.

A general overview of the nature of the bulk earthworks contracts was presented which outlined the digout, filling and ground improvement techniques used.

The concept of Electronic Data Transfer (EDT) was discussed. This included the use and advantage of a data based Geotechnical Information Management System (GIMS).

#### **Geology**

A brief discussion of the geological formation and structural geology of the site was given. This considered two formations, namely the Kenny Hill Formation and the Quaternary Deposit. The Kenny Hill Formation was discussed in terms of bedding, strike and weathering.

The stratigraphy of the soft clay areas were presented based upon observations made during excavation of the soft deposits. The deposition of the soft clays were considered in relation to clay mineralogy, pore water salinity and correlations with changes in sea level.

#### **Site Investigation**

The site investigation techniques used during the Phase III Investigations were presented. This included details on the mode of operation of the piezocone, and soft ground and residual soil drilling and sampling techniques.

The philosophy behind the location of the exploration holes for the Phase III Investigations was given.

#### **Interpretation: Soft Clays**

Aspects of the data analysis were detailed. Key features of the consolidation test were highlighted and typical parameter profiles presented and discussed.

Correlations between piezocone reading, penetration shear vane test results and laboratory results were shown.

The existence of a secondary valley system infilled with younger marine clay within the main valleys areas was demonstrated from the laboratory and field test results.

#### **Filling Operations**

A brief introduction to the Specification in terms of defining the compaction and suitability requirements for the various types of fill material encountered on site was given.

The quantities and various type of plant on site were discussed together with their advantages and disadvantages as appropriate.

Details of Compaction Controls procedures were presented. These comprised Compliance Testing and Reference Testing. Methods of Compliance Testing were discussed for determining the compacted dry densities of various materials. Discussions on Reference Testing focused on the sampling and testing of both source and fill materials, as well as the testing regime set up adjacent to instrumentation.

A broad outline was given on the methodology adopted to assess self weight consolidation of the fill, including the back analysis of a trial surcharge area and associated laboratory testing.

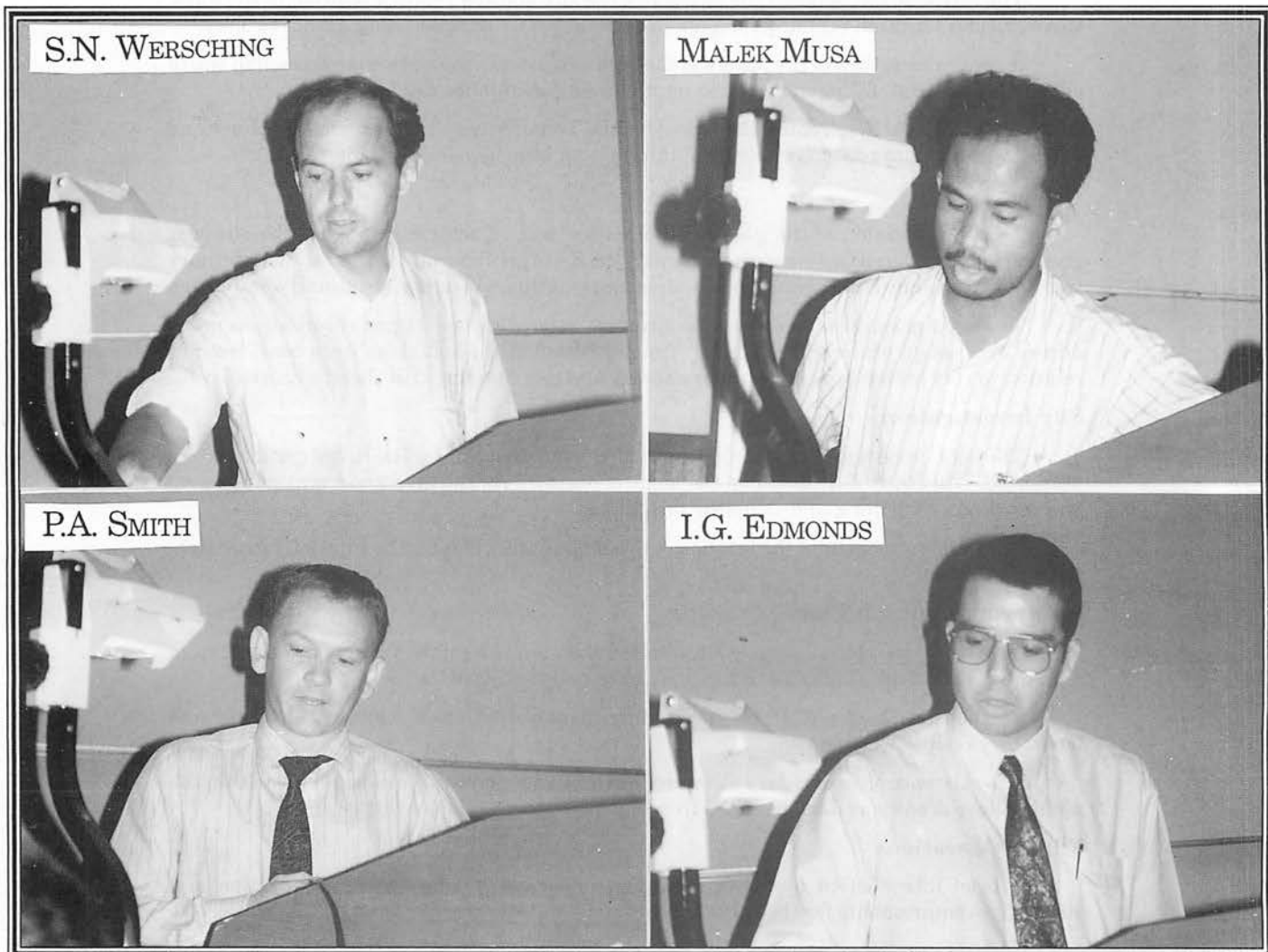
#### **Instrumentation**

The types of instrumentation used on the project were discussed along with their operating principles. The practical aspects of installation and monitoring were presented.

The philosophy behind the layout of instrumentation on both the platform and the perimeter road was outlined.

The process of receiving and reviewing data was discussed. This incorporated the use of EDT and GIMS, along with the application of the results in the context of monitoring performance and back analysis of geotechnical parameters.

G.H. Teh



# Kuala Lumpur International Airport Sepang — Site Visit



## Captions to photos

1. Malek Musa briefing the participants.
2. Observing drainage at the perimeter road.
3. Keen interest on the quartzite at the Satellite Tower site.
4. At the site of the peat occurrence.
5. At the eastern boundary, end of Runway 1.
6. Mining method utilised to remove clay.
- 7-8. Lunch provided at Project Office.
9. At the computer terminal.

## AGM & Annual Dinner 1995 — Report (Laporan)

The Annual General Meeting 1995 was held on the 22 April 1995 at the Malaysian Petroleum Club (MPC) at 6 pm. The last time the AGM and Annual Dinner of the Society was held at the MPC there was a thunderstorm! This year again there was a thunderstorm and heavy downpour and there was again the massive traffic jam that members had to tolerate to make it for the AGM and Annual Dinner.

The AGM was chaired by Fateh Chand, the outgoing President, who ably handled the proceedings in his last official duty as President. Among the items that attracted considerable interest and discussions include the EGM, the amendments to the Constitution.

The Annual Dinner that followed at 7.30 pm, was graced by the Secretary-General of the Primary Industries Ministry, Yg. Bhd. Tan Sri Dato' Dr. Othman Yeop Abdullah.

The 8-course dinner attracted a 15-table crowd. It was heartening to note that Schlumberger sponsored 3 tables for its staff and clients. We hope others will emulate this exemplary gesture of Schlumberger's.

In his maiden speech as the new GSM President, Dr. Khalid Ngah, congratulated the immediate Past President Fateh Chand for so successfully leading the Society for the past 2 years and although it would be a hard act to follow, he will try his best to emulate his predecessor's good work.

After the sumptuous dinner, many members were in no hurry to leave and were seen renewing old acquaintances and making new ones.

G.H. Teh

### Annual General Meeting 1995



## Ucapan Y. Bhg. Tan Sri Dato' Dr. Othman Yeop Abdullah, Ketua Setiausaha Kementerian Perusahaan Utama Di Majlis Jamuan Tahunan Persatuan Geologi Malaysia pada 22 April 1995

Yang Berusaha Tuan Pengerusi Majlis;

Y. Berusaha Encik Fateh Chand,  
Ketua Pengarah Penyiasatan Kajibumi  
Selaku Presiden Persatuan Geologi Malaysia;

Y. Berusaha Dr. Ahmad Tajuddin Ibrahim,  
Setiausaha, Persatuan Geologi Malaysia;

Dato'-Dato', Tuan-Tuan dan Puan-Puan Yang Dihormati Sekalian.

Terlebih dahulu saya ingin menyampaikan ucapan terima kasih Y. Bhg. Tan Sri Dato' Dr. Othman Yeop Abdullah, Ketua Setiausaha Kementerian Perusahaan Utama, di atas penghormatan yang diberi kepada beliau untuk berucap di Majlis Jamuan Tahunan Persatuan Geologi Malaysia pada malam ini. Dengan dukacita beliau tidak dapat hadir di Majlis ini oleh kerana beliau telah ditugaskan oleh YB. Menteri Perusahaan Utama untuk menghadiri Sesi Khas UNCSD di New York. Oleh yang demikian saya ditugaskan mewakili Y. Bhg. Tan Sri Ketua Setiausaha dalam Majlis ini dan menyampaikan ucapan beliau seperti berikut.

I am honoured to be invited to address the members of Persatuan Geologi Malaysia at this dinner in conjunction with your Annual General Meeting.

Ladies and Gentlemen,

As you are aware, our gathering here today comes at a crucial juncture in our country's history. On the economic front, we have certainly progressed from being a producer of mere primary products into a well diversified economy based on manufacturing, tourism and services. Part of the success of our industrialisation programme is that we have used our comparative advantage to develop resource-based industries that produce higher value added primary commodities. We are now an important trading country in the globalised market.

Notwithstanding our success thus far, in our mission to be a fully industrialised and developed country, our task will now become increasingly complex and more challenging. Besides the competitive environment and our own resources constraints, we must now become competent and competitive in certain market niches. In this endeavour geologists can play a constructive role.

Firstly geologists including through institutions such as the Geological Survey Department, can contribute to scientific proprietary knowledge and technology. These can help our national economy in the forthcoming new phase of industrialisation as we move out of industries based largely on contract manufacturing. Geologists can play a particularly important role in developing policy, practices and technology for the optimal usage of

Another important area is the issue of ground water resources. Reportedly some sources of this vital resource are subject to pollution. If preventive measures are not taken to check the pollution, industrial wastes, run-offs and other contaminants may seep into the ground. Such ground water may become an even more precious commodity in coming years especially since some areas of the country depend entirely upon this life giving resource. Thus our expertise and knowledge of our resources on this vital commodity should be continuously upgraded.

I understand that during your Annual Meeting, you would normally review your role as professionals so as to keep abreast of changing times. I presume that besides the aforementioned areas, you have also examined other areas where you can contribute meaningfully.

Given the pace of change and the many new areas of focus, there is a need to ascertain that the geological inputs are acceptable and responsible. Towards this end, the Ministry is considering the need for the geological profession to be brought under the umbrella of a professional institute or a board which would register, monitor and oversee the profession and the conduct of its members. This would also prevent those with no in-depth understanding or proper training in the geological sciences, but who are nevertheless employed as "geologists" by certain quarters, from certifying key project documents.

In the aforesaid context, the Ministry of Primary Industries has received a proposal to review and regulate the activities of all geologists and to bring them under a board. The Ministry has also received proposals to amend the Geological Survey Act (1974) to strengthen it in view of its role in geological and geotechnical inputs for civil works, in the search for and supply of ground water particularly to the rural areas, as well as to be in line with the provisions of the proposed new mineral enactment. The Ministry is studying these matters and will be calling all parties concerned for regular meetings to review these acts.

Now that the Mineral Development Act has been passed and the state mineral enactment is in the pipeline, we need to take early action to undertake the crucial task of attracting the vital private sector investment into the minerals sector. The aims of the national mineral policy to develop a diversified and vibrant mining sector will never be realised if we do not have an effective strategy and programme to attract such investment in pursuing this goal, geologists should work hand in hand with the mining engineers and the private sector. Such cooperation should also be extended to the giving of technical advice and services that would support production of higher value added products based on minerals.

The operating environment both within the country and globally is highly dynamic. I understand the Society has been discussing the rapid changes taking place in the country and how to respond to these challenges. I have also been informed that the Society has also formed a number of technical working groups not only to further improve local geological knowledge but also to address some issues facing the industry. I have no doubt that members of your profession would live up to the forthcoming challenges, and thus contribute effectively towards national development.



## Ucapan Y. Bhg. Tan Sri Dato' Dr. Othman Yeop Abdullah, Ketua Setiausaha Kementerian Perusahaan Utama Di Majlis Jamuan Tahunan Persatuan Geologi Malaysia pada 22 April 1995

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Firstly geologists including through institutions such as the Geological Survey Department, can contribute to scientific proprietary knowledge and technology. These can help our national economy in the forthcoming new phase of industrialisation as we move out of industries based largely on contract manufacturing. Geologists can play a particularly important role in developing policy, practices and technology for the optimal usage of

# Annual Dinner '95



our mineral resources. This optimum exploitation of our limited natural resources will contribute towards our competitiveness and ensure a sustained growth in the downstream sector. Thus whilst geologists should carry out their bread and butter exploration work, they should also place emphasis on compiling a comprehensive inventory of our resources. Based on this, advice should also be given to industries on how to exploit our resources optimally.

Another critical contribution by geologists is the need to find the mineral resources necessary to sustain our industrialisation efforts. We are already importing a considerable amount of minerals and materials to feed our industries which pose a drain on our foreign exchange reserves. An industrialised economy needs continuous sources of supply as well as the security of such supply. As we need more and more metals and materials, the contribution of geologists becomes even more important.

In our progress towards Vision 2020 there are also other non-economic issues which we need to address. Lest we forget, let's remind ourselves that events such as the collapse of the Highland Towers Condominium, various flooding and landslide incidents which have claimed many lives, are surely cases where prevention would have been better than cure.

Geologists obviously have a role to play in the national development process where sustainable development is the name of the game. Thus, there is a need for balance in our development efforts so that growth, public safety, environmental impacts and other quality of life indicators progress in harmonious tandem. Specifically, geologists can contribute in the formulation of stricter procedures and regulations pertaining to geoscientific inputs in the building of dams, roads, high-rise buildings and other infrastructure projects. Such geoscientific inputs can contribute to the safety of engineering structures and to minimise the negative impact on the environment. Such contributions are aimed at preventing possible disasters in the construction industry which is currently booming. Such contributions should not be perceived or made out to be hindrances which hinder in any way an industry which contributes significantly to national development. Your contribution should be positive so that multi-million Ringgit mega projects can be optimally engineered with due cognisance in advance of the presence of geohazards and other underground instability elements. Thus, geological inputs are critical especially in the selection of project sites. Such contributions make both construction more economic while helping to prevent tragedies from recurring.

## Annual Dinner 1995

### Captions to photos

1. Outgoing President, Fateh Chand, with his speech.
2. Tan Sri Dato' Dr. Othman Yeop Abdullah addressing the participants.
- 3-13, 15. The various tables at the Dinner.
14. Incoming President, Dr. Khalid Ngah, with his vision for the Society.
- 16-20. Renewing acquaintances and making new ones.

Another important area is the issue of ground water resources. Reportedly some sources of this vital resource are subject to pollution. If preventive measures are not taken to check the pollution, industrial wastes, run-offs and other contaminants may seep into the ground. Such ground water may become an even more precious commodity in coming years especially since some areas of the country depend entirely upon this life giving resource. Thus our expertise and knowledge of our resources on this vital commodity should be continuously upgraded.

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## Minutes of the Extraordinary General Meeting held on 17 February, 1995

Minutes of the Extraordinary General Meeting held at the Department of Geology,  
University of Malaya, Kuala Lumpur at 5.38 pm on the 17th February, 1995.

**Present:**

Fateh Chand (Chairman)	Jimmy Khoo Kay Khean
Ahmad Tajuddin Ibrahim (Secretary)	Michael Lau
Lee Chai Peng	Choo Mun Keong
Azhar Hj Hussin	K.R. Chakraborty
Nuraiteng Tee Abdullah	Teh Guan Hoe
Ng Tham Fatt	Abdul Ghani Rafek
Ng Chak Ngoon	S. Paramanathan
Effendy Cheng Abdullah	Sandrasagaram (Assoc. Member)

**Proxy received from:** Tan Boon Kong (Azhar Hj Hussin)  
 Chu Ling Heng (Effendy Cheng Abdullah)  
 Noor Ilmi A. Bakar (Abdul Ghani Rafek)  
 Yeap Ee Beng (Choo Mun Keong)  
 Siti Faridah Yusop (Lee Chai Peng)  
 Liaw Kian Kiat (Fateh Chand)  
 Wan Hasiah Abdullah (Ahmad Tajuddin Ibrahim)  
 Mohd. Nazan Awang (Khoo Kay Khean)

**Agenda:** Whether the Society should send the President, or his representative, to the GEOSEA Conference in Manila, 14-18th February 1995, with all expenses to be borne by the Society.

The chairman explained that the Council has agreed to send the President or his representative to the GEOSEA in Manila for the purpose of:

- i) representing the Society at the GEOSEA Union Meeting,
- ii) promoting the next GEOSEA Conference in Kuala Lumpur and to identify important contact persons to ensure its success.

For that purpose, the Council felt justified to sponsor the following cost:

- i) Return airfare (economy fare)
- ii) Hotel accommodation at the Hotel where GEOSEA is held (single standard)
- iii) Daily allowance following official government rate.

The Council felt that the Society can play a role to make GEOSEA more active than it is now and as such GEOSEA Conference must be officially represented by the Society.

After a short discussion the motion was put to a vote and the result was:

In favour of the Council's decision	: 18 votes (6 proxy votes)
Against the Council's decision	: 4 votes (1 proxy vote)
Total votes	: 22 votes

The meeting ended at 6.35 pm.

## Minutes of the 28th Annual General Meeting held on 30 April, 1994

Minutes of the 28th Annual General Meeting held at the Federal Hotel, Jalan Bukit Bintang, Kuala Lumpur at 6.15 p.m. on the 30th April 1994 (Saturday).

### Present:

Fateh Chand (Chairman)	Ali Mohd. Shariff
A. Tajuddin Ibrahim (Secretary)	Leong Lap Sau
Jimmy Khoo Kay Khean	Ibrahim Komoo
Liew Kit Kong	Yunus Abdul Razak
Tan Boon Kong	K.R. Chakraborty
J.J. Pereira	Choo Mun Keong
Raja Kumar	Ng Tham Fatt
Charles S. Hutchison	Mohamad Ali Hasan
Lee Chai Peng	Teh Guan Hoe
Yip Foo Weng	Nik Ramli Nik Hassan
Michael Lau	

### 1. Confirmation of the minutes of the previous AGM (1993/94)

The minutes of the 27th AGM were passed on the proposal of Dr. Ibrahim Komoo and seconded by Dr. Leong Lap Sau with the following amendments:

Page 3, no. 6, para 4, line 3: should read as "under Balance Sheet ..."

Page 4, no. 8.5, line 3: should read as "... these suggestjions will ..."

### 2. Matters Arising

- 2.1. The possibility of presenting duplicates of the winning entries for the last photographic competition to various organisations/universities for permanent display purposes will be decided by the incoming council.
- 2.2. The President informed that a 2-day field guide book on the Langkawi area has already been completed by Dr. Lee Chai Peng and was used for the Pre-Conference Fieldtrip at the Annual Geological Conference '93 held in June at Langkawi.
- 2.3. Geologist's Act — the President informed that a draft of the act has already been given to the Ministry and IGM have also requested a meeting with the Minister.
- 2.4. Professional Members — amendment to the Society's Constitution with regards to the deletion of this class of memberships had already been passed through balloting. Registrar of Societies' reply is awaited on whether the Society is allowed to refund the RM50.00 processing fee.
- 2.5. Certificates for all Life Members — the incoming Council will see that these certificates are sent out as soon as possible.
- 2.6. Exchange of publications with Dewan Bahasa & Pustaka we have already sent our publication. The incoming Assistant Secretary will check whether DBP have sent their's or not. If they have not, the Assistant Secretary will write to ask them to do so.

- 2.7. Young Geoscientist Award — Mr. Choo Mun Keong commented that the standard set for the award may be too high, suggested that the Society consider having 'special mention' for quality nominations that do not meet the standard for the Award. The President informed that a committee has already been set up to review the standard to be set and the terms of reference for the Award.
- 2.8. Exchange of publications with Geological Survey's Headquarters was already done.
- 2.9. The expenditure for 1992 for the telefax which was presented as blank the Treasurer explained that this was because the Society did not have a fax machine then.
- 2.10. Sale of batik shirts - the Treasurer reported that so far only 5 shirts were sold. Some have also been given as souvenirs to speakers at our Seminars or Conferences.
- 2.11. Expansion of the Society's activities — the Secretary informed that more trips are now been organised by the various working groups. The Society had also written to Jabatan Museum, to offer members expertise for their exhibit of geological nature. During the coming Annual Geological Conference '94, a number social activities/spouse programmes are being planned.
- 2.12. Society's souvenirs — the Society have already made and advertised for sale key chain, tiepin, cap and hat. Society's tie also is being designed.

### 3. President's Report

Mr. Fateh Chand presented his report for the 1993/94 session. He highlighted that the Annual Geological Conference '93 and Petroleum Geology Seminar '93 were well attended with quality papers presented. The Society is financially sound. *Warta Geologi* had been brought up to date.

Dr. Ibrahim Komoo congratulated the Society for being able to attract quality papers to its Seminar and Conference. He commented that most of the activities held are inward looking. He suggested we should organise events to publicise the Society widely. The President agreed and will ask the incoming Council to seriously look into this. For workshops and seminars we should invite other professional bodies like IEM, IKRAM etc. to join in.

Mr. Choo Mun Keong commented that we must be more outward looking, must make a conscious attempt to make known that they are such a group of people called geologists. There is a need for a mechanism to pass a message that geologists are the people for the various types of related specific works. The President informed that the Society is continuing to lobby the Ministry in this matter. He commented that recently statements made by various people have confused the public on geologic matters. Expert groups of geologists should be formed to come up with a common stand.

The President's Report was passed on the proposal of Dr. Nik Ramli Nik Hassan and seconded by Mr. Mohamad Ali Hassan.

### 4. Secretary's Report

Dr. Ahmad Tajuddin presented his report for the 1993/94 session. He reported that the Council met 12 times during the session. The current office bearers the status of the Society's membership, sales of publications and exchange of publications were highlighted. Working Groups were very active and they organised a number of forums, seminars and fieldtrips. Activities were also held outside Kuala Lumpur such as in Ipoh, Kota Kinabalu and Kuching.

Dr. C.S. Hutchison suggested that the Society be more aggressive campaigning for memberships especially to recruit members from the petroleum companies. For overseas members whose memberships lapsed the President should send out polite personal notes asking them to renew their memberships.

Mr. Choo Mun Keong suggested that the Society should consider having another Annual Geological Conference in Sabah/Sarawak again in the near future. Mr. Yunus Abdul Razak asked the Society to talk with the Geological Survey Malaysia about the possibility of having a joint conference again.

The Secretary's Report was passed on the proposal of Mr. Mohamad Ali Hassan and seconded by Dr. Nik Ramli Nik Hassan with the following amendments:

No 1, line 2: should read as May, 1993 to 30th April, 1994 ...

No. 4, Para 6, line 1: should read as Fourteen technical talks ...

## 5. Editor's Report

Dr. Teh Guan Hoe in his report stated that the *Warta Geologi* had been brought up to date. Bulletins 33, 34 and 35 should be ready very soon.

Mr. Choo Mun Keong wanted the Society to optimize our fund for publications. The Society should try to cut down unnecessary publications and at the same time save storage space. We should find out what members really want. Dr. C.S. Hutchison warned that we should be careful so as not to 'publish' ourselves out.

Mr. Tan Boon Kong asked the Editor ensure that our publications continue to be up to date.

Dr. Teh Guan Hoe informed that the 1,000 copies per volume published are for economic reasons and we are not in the position to do our own publishing. He also reported that Bulletins 29 and 31 are delayed due to problems at the printer's place.

Dr. C.S. Hutchison wanted more Malaysian current geological related news to be included in the *Warta Geologi*.

The Editor's Report was passed on the proposal of Mr. Tan Boon Kong and seconded by Dr. K.R. Chakraborty.

## 6. Treasurer's and Honorary Auditor's Reports

Dr. Lee Chai Peng reported that the financial position of the Society continued to grow in strength with net assets of RM417,114 as compared to RM473,325 in 1992 with an apparent deficit of RM56,211. This is because RM118,527.11 belonging to the Society is held in the CPCEMR Symposium account which is in the process of being transferred back to the Society's account.

Dr. Lee Chai Peng also expressed gratitude to Mr. Peter Chew who declined to continue as our Auditor. He proposed that this AGM endorse the appointment of our new Auditor, Mr. Law Jack Foo of J.F. Law & Co. This was seconded by Mr. Choo Mun Keong and was adopted unanimously by the AGM.

Mr. Choo Mun Keong suggested that the Treasurer discuss with the Auditor to have accompanying notes to explain the various items in the Balance Sheet and the Income and Expenditure Account.

The Treasurer's Report was passed on the proposal of Dr. Leong Lap Sau and seconded by Mr. Yip Foo Weng.



The Honorary Auditor's Report was passed on the proposal of Dr. Lee Chai Peng and seconded by Mr. Choo Mun Keong.

### 7. Election of Honorary Auditor 1994/95

The meeting recorded the Society's thanks to Mr. Law Jack Foo, Honorary Auditor and re-elected him to continue as Honorary Auditor for the 1994/95 session.

### 8. Other Business

No other business was discussed.

### 9. Announcement of New Council 1994/95

The President, Mr. Fateh Chand, announced the new Council for 1994/95 as follows:

President	: Mr. Fateh Chand (GSD)
Vice President	: Dr. Ibrahim Komoo (UKM)
Secretary	: Dr. Ahmad Tajuddin Ibrahim (UM)
Assistant Secretary	: Dr. Nik Ramli Nik Hassan (Forad)
Treasurer	: Dr. Lee Chai Peng (UM)
Editor	: Dr. Teh Guan Hoe (UM)
Councillors (2-years)	: Mr. Tan Boon Kong (UKM)
	: Dr. Abdul Ghani Rafek (UKM)
	: Dr. Abdul Rahim Samsudin (UKM)
	: Mr. Effendy Cheng Abdullah (Petronas)
Councillors (1-year)	: Mr. Jimmy Khoo Kay Khean (GSD)
	: Dr. Idris Mohamad (SSB)
	: Mr. Choo Mun Keong (Consultant)
	: Mr. Ali Mohd. Shariff (Petronas)
Immediate Past President	: Mr. Ahmad Said (Carigali)

The President thanked the Council for their services during the year 1993/94 and hoped that similar services be extended in the coming session. The 28th AGM of the Geological Society of Malaysia ended at 7.25 pm.

**Ahmad Tajuddin Ibrahim**

Secretary 1994/95

3rd June 1994

## PRESIDENT'S REPORT

### May 1994 – April 1995

During the year 1994/1995, the Society continued its efforts in the advancement of geological sciences through its publications, the holding of conferences, technical workshops, field trips and work group meetings. The Society maintained its strength in terms of membership and finance.

The Society's two main events for 1994, *the Annual Geological Conference '94* and *the 1994 AAPG-GSM International Conference & Exhibition* were successfully held with good attendances and high quality papers.

The Annual Conference, the 9th in the series, was held in Kuala Terengganu on 11th and 12th June 1994 at the Primula Resort. It was declared open by Y.A.B. Dato' Seri Amar Di Raja, Tan Sri Haji Wan Mokhtar Ahmad, Menteri Besar of Terengganu. The conference attracted over 172 participants and a record number of 41 papers were presented by geoscientists from the University of Malaya, Universiti Kebangsaan Malaysia, Geological Survey of Malaysia, Petronas Research and Scientific Services, Petronas-Carigali, and the private sector. There were two pre-conference fieldtrips, the first on gold mineralisation and the second on sedimentology and stratigraphy. There was also a post-conference fieldtrip to Pulau Redang. I wish to thank our supporters and donors for contributing to the success of the Annual Conference, in particular Y.A.B. Menteri Besar Terengganu for declaring the conference open and for hosting a dinner, Malaysia Mining Corp. Bhd., Mamut Copper Mining Sdn. Bhd., and others who have contributed in cash or kind. I also wish to thank the Organising Chairman, Dr. Ahmad Tajuddin, and his committee for a job well done.

The 1994 AAPG-GSM International Conference & Exhibition on '*Southeast Asian Oil Basins: Oil & Gas for the 21st Century*' was held at the Putra World Trade Centre from 21-24 August 1994. The Conference which was declared open by the Minister in the Prime Minister's Department, Y.B. Dato Syed Hamid Albar, attracted 1,108 participants and 66 exhibitors. A total of 120 excellent quality papers were presented. Forty poster presentations were also made. This is the largest conference GSM has hosted. Our thanks are due to PETRONAS who hosted a Malaysian Cultural Evening and Dinner. In addition a student reception was held. Our thanks are also due to the contributions made by the Shell Group of Companies and Esso Production (Malaysia) for their contributions which have enabled numerous students and lecturers to attend the conference. I also wish to thank the General Chairman of the Organising Committee, Dr. Khalid Ngah, and his tireless committee for an excellent job done.

Apart from organising these two main events the Society also organised two forums entitled *Geology and Hillside Development and Soil and Rock Properties* which were well attended by engineers and geologists. I like to thank the Organising Chairman, Mr. Tan Boon Kong, for the successful forums.

The Society also held 15 technical talks, a dialogue with MPKSN to promote earth science (geology) and is preparing a poster with explanatory notes on common rocks and minerals in Malaysia for schools.

The Society's Newsletter is on schedule with the printing of Volume 21, No. 1 issue of the *Warta Geologi*.

The Society's financial position is sound and the Council is optimising the usage of these funds especially in the sponsoring of students to conferences/workshops/seminars/field trips.

The Society also nominated Dr. Hamzah, past president of Persatuan Geologi Malaysia, to represent the Society at the GEOSEA meeting held in Manila, the Philippines. Malaysia has agreed to host the next GEOSEA to be held in 1998.

An EGM was held on 17.2.95 to debate "Whether the Society should send the President, or his representative, to the GEOSEA Conference in Manila, 14-18 February '95, with all expenses to be borne by the Society". The decision of the Council to send a representative to Manila was upheld by the members at the EGM.

The Council agreed to go on an aggressive campaign to uplift the image of the Society by promoting earth science activities through MPKSN.

On behalf of the Society I would like to thank everyone present here today for their attendance. I would also like to thank the Heads of the Departments of Geology of University of Malaya and Universiti Kebangsaan Malaysia and the Geological Survey of Malaysia for the kind support they have given the Society and also the many individuals and organisations who continue to support the Society's activities.

Finally, I wish to thank all the Councillors and members of the Society who have given me their kind cooperation and support during my year as President of the Society.

**Fateh Chand**  
President

## Appendix 4 Society Activities 1994/95

Date	Event/Venue
1. 9 June 1994	: <b>Pre-Conference Fieldtrip:</b> Gold Mineralisation, Marang, Terengganu.
2. 10 June 1994	: <b>Pre-Conference Fieldtrip:</b> Stratigraphy and Sedimentology of Northern Terengganu
3. 11-12 June 1994	: <b>Annual Geological Conference 1994</b> at Primula Resort, Kuala Terengganu.
4. 13-14 June 1994	: <b>Post-Conference Fieldtrip</b> to Pulau Redang, Terengganu.
5. 22 July 1994	: <b>Forum</b> on "Geology and Hillside Development" organised by the Working Group on Engineering Geology/Hydrogeology with Institute of Geology Malaysia and Geological Survey Department Malaysia at the Geology Department, University of Malaya.
6. 21-24 August 1994	: <b>1994 AAPG-GSM International Conference and Exhibition</b> organised by the American Association of Petroleum Geologists (AAPG) with GSM as the host society at the Putra World Trade Centre, Kuala Lumpur.
7. 8 September 1994	: <b>Technical Talk:</b> Uranium deposits in granitic rocks by Dr. Regis Cambon at the Geology Department, University of Malaya.
8. 27 October 1994	: <b>Technical Talk:</b> Contaminated land — assessment and remediation — Australian case histories by Mr. Yin-Kwan Foong at the Geology Department, University of Malaya.
9. 30 November 1994	: <b>Technical Talk:</b> The tectonic interpretation of variations in the gravity field over Southeast Asia as revealed by satellite altimeter measurements by Dr. Clive A. Foss at the Geology Department, University of Malaya.
10. 10 December 1994	: <b>Seminar:</b> Universiti Kebangsaan Malaysia and University of Malaya postgraduate students one-day seminar at the Department of Geology, University of Malaya.
11. 13 January 1995	: <b>Technical Talks:</b> 1. Late Cretaceous environmental change by Andy Gale, and 2. Mudrocks and their diagenesis by Jenny Huggett, both held at the Department of Geology, University of Malaya.
12. 16 January 1995	: <b>Technical Talks:</b> 1. Depositional palaeoenvironment characterisation — an organic geochemical approach (a case study from Spitsbergen) by Dr. Wan Hasiah Abdullah, 2. The on-shore North Sarawak Basin: Stratigraphy, basin evolution

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The Council agreed to go on an aggressive campaign to uplift the image of the Society by promoting earth science activities through MPKSN.

On behalf of the Society I would like to thank everyone present here today for their attendance. I would also like to thank the Heads of the Departments of Geology of University of Malaya and Universiti Kebangsaan Malaysia and the Geological Survey of Malaysia for the kind support they have given the Society and also the many individuals and organisations who continue to support the Society's activities.

Finally, I wish to thank all the Councillors and members of the Society who have given me their kind cooperation and support during my year as President of the Society.

**Fateh Chand**  
President

## SECRETARY'S REPORT

### 1. The Council

Members of the Council of the Geological Society of Malaysia for the period 24th April, 1994 to 22nd April 1995 are as follows:

President	: Fateh Chand (Geological Survey Malaysia)
Vice-President	: Ibrahim Komoo (Universiti Kebangsaan Malaysia)
Secretary	: Ahmad Tajuddin Ibrahim (University of Malaya)
Assistant Secretary	: Nik Ramli Nik Hassan (FORAD)
Treasurer	: Lee Chai Peng (University of Malaya)
Editor	: Teh Guan Hoe (University of Malaya)
Councillors (2-years)	: Abdul Ghani Mohd Rafek (Universiti Kebangsaan Malaysia) Abdul Rahim Samsudin (Universiti Kebangsaan Malaysia) Effendy Cheng Abdullah (PETRONAS) Tan Boon Kong (Universiti Kebangsaan Malaysia)
Councillors (1-year)	: Ali Mohd. Shariff (PETRONAS) Choo Mun Keong (Consultant) Idris Mohamad (Sarawak Shell Berhad) Jimmy Khoo Kay Khean (Geological Survey Malaysia)
Immediate Past President	: Ahmad Said (PETRONAS Carigali)

### 2. Council Meetings

Council Meetings were held almost every month throughout the 1994/95 session. A total of 11 Council Meetings have been held. Attendance of Council Members at these Meeting are shown in Appendix 1.

### 3. Membership

The total membership of the Society as at 31st December, 1994 is 619. There are 271 local members as compared to 86 foreign members. Life members have increased to 72. Details of the various classes of memberships and their geographical distributions are shown in Appendix 2 and membership status since 1984 is given in Appendix 3.

### 4. Society Activities

The Annual Geological Conference 1994 was successfully held at the Primula Resort, Kuala Terengganu on the 11-12th June, 1994. Two one-day pre-conference field trips were held on the 9th and the 10th June, 1994 studying gold mineralisations

and various other outcrops around the Trengganu mainland. A two-day post-conference field trip was also held on the 14-18th June, 1994 to Pulau Redang. A day trip to

Pulau Kapas for the spouses and family was also held on the 12th June, 1994. The Conference was well attended by over 170 registered participants.

The annual Petroleum Geology Seminar was not held in 1994. Instead the Society was the host to 1994 AAPG-GSM International Conference & Exhibition held at the Putra World Trade Centre on August 21-24, 1994. Esso Production Malaysia Inc. and Shell Companies of Malaysia each donated RM20,000.00 which was used to sponsor a total of 135 members and students to the Conference.

Some Working Groups were very active and they organised a number of Forums/Seminars and fieldtrips (Appendix 4).

15 technical talks were held during the 1994/95 session. Details of the Society's activities are shown in Appendix 4.

Various souvenirs were produced for sale as suggested at the AGM 1994.

## **5. Publication Sales**

Publication sales remained steady as in previous years. The remaining stock and sales made during 1994 is as shown in Appendix 5. The Society continued to maintain a publication exchange with various professional bodies and libraries from various parts of the world.

## **6. Extraordinary General Meeting**

An EGM was held on the 17th February, 1995 at the request of seven members to debate "Whether the Society should send to send the President or his representative to the Geosea Conference in Manila 14-18th Feb., 1995 with all the expenses to be borne by the Society". After a short lively discussion a vote was taken. 18 voted for the Council's decision with 4 votes against.

## **7. Acknowledgements**

The Society would like to acknowledge with thanks the generous cooperation received from local and overseas professional societies, universities and institutions; the Head of the Geology Department, University of Malaya where the Society is housed and the numerous individuals and Councillors who have contributed in one way or another to the Society's activities.

**Ahmad Tajuddin Ibrahim**  
Secretary

## Appendix 1 Attendance at Council Meetings 1994/95

Meeting no.	1	2	3	4	5	6	7	8	9	10	11
Fateh Chand	x	x	x	x	x	x	o	x	x	x	x
Ibrahim Komoo	o	x	x	x	o	o	x	x	x	x	x
Ahmad Tajuddin Ibrahim	x	x	x	x	x	o	x	x	x	x	x
Nik Ramli Nik Hassan	x	o	x	x	x	x	x	o	x	o	x
Lee Chai Peng	x	x	x	o	x	o	x	x	x	x	x
Teh Guan Hoe	x	x	x	x	x	x	x	x	x	x	x
Ahmad Said	o	o	o	o	o	o	o	o	o	o	o
Abd. Ghani Mohd Rafek	x	x	o	o	o	x	o	o	o	o	x
Abdul Rahim Samsudin	x	x	x	x	x	o	x	x	o	x	x
Effendy Cheng Abdullah	o	o	x	o	x	o	x	x	o	o	x
Tan Boon Kong	x	x	o	x	x	x	x	x	x	x	x
Ali Mohd. Shariff	x	x	x	o	o	o	o	o	o	o	x
Choo Mun Keong	o	o	o	o	x	o	o	x	x	o	x
Idris Mohamad	x	o	o	o	o	o	o	o	o	o	o
Jimmy Khoo Kay Khean	x	x	x	o	o	x	x	x	o	o	x

x present

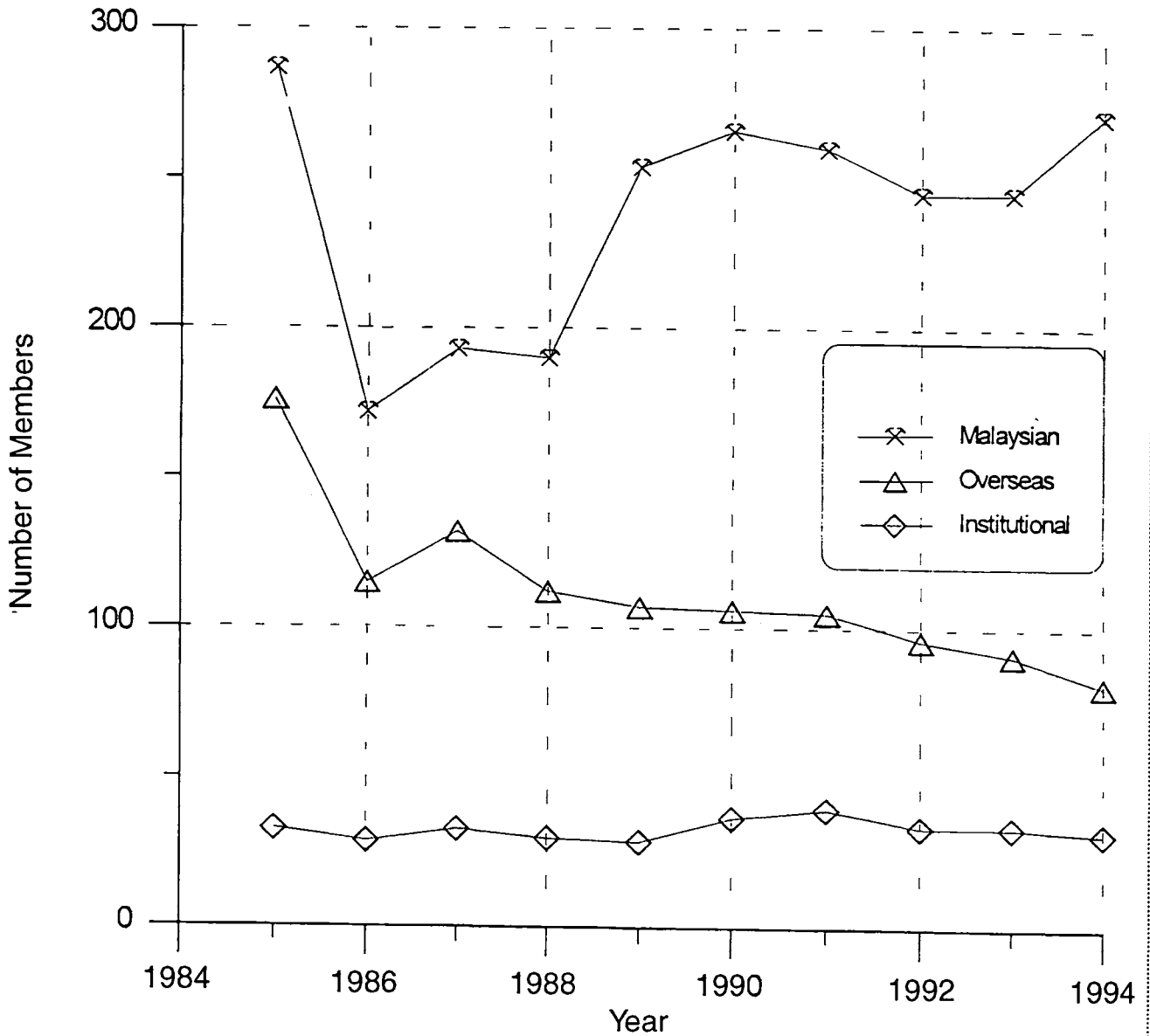
o absent

## Appendix 2 Membership of the Society as at 31.12.1994

	Full	Associate	Student	Institutional	Honorary	Life	Total
Australia	23		1	5		4	33
Brunei			1	1		1	3
Canada	4						4
Europe	17	3	2	3	1	5	31
Hong Kong	1						1
Indonesia	5			2	1	1	9
Japan	5				1		6
New Zealand	5						5
Pakistan	1						1
Philippines	2					1	3
Singapore	5	1		3		3	12
Thailand						1	1
United States of America	18			1		4	23
Malaysia	271	11	132	17	4	52	487
<b>TOTAL</b>	<b>357</b>	<b>15</b>	<b>136</b>	<b>32</b>	<b>7</b>	<b>72</b>	<b>619</b>



### Appendix 3 Geological Society of Malaysia Membership for 1985-1994



## Appendix 4 Society Activities 1994/95

Date	Event/Venue
1. 9 June 1994	: <b>Pre-Conference Fieldtrip:</b> Gold Mineralisation, Marang, Terengganu.
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12. 16 January 1995	: <b>Technical Talks:</b> 1. Depositional palaeoenvironment characterisation — an organic geochemical approach (a case study from Spitsbergen) by Dr. Wan Hasiah Abdullah, 2. The on-shore North Sarawak Basin: Stratigraphy, basin evolution

- and economic potential by Dr. Azhar Hj Hussin, 3. Tectonomagmatic evolution of the Main Range granite of Peninsular Malaysia by Dr. K.R. Chakraborty, all held at the Department of Geology, University of Malaya.
13. 19 January 1995 : **Forum** on Soil and Rock Properties organised by the Working Group on Engineering Geology and Hydrogeology at the Department of Geology, University of Malaya.
14. 23 January 1995 : **Technical Talks:** 1. Geology in environmental impact assessment studies by Dr. J.K. Raj, 2. Collapse of the Block A, Highland Towers, Ulu Kelang: The geological, geotechnical and geomorphological factors and the probable cause/s of the collapse, held at the Department of Geology, University of Malaya.
15. 13 February 1995 : **Technical Talks:** 1. The Hua San (Qinling, China) and Peninsular Malaysia orogens: A comparison by Dr. T.T. Khoo, 2. Hot springs and mineral water development — A Malaysian scenario by Mohd Ali Hassan, held at the Department of Geology, University of Malaya.
16. 13 March 1995 : **Technical Talk:** Tectonic — some metallogenic aspects of mineral deposits by Prof. D.S. Strong at the Department of Geology, University of Malaya.
17. 15 March 1995 : **Technical Talk:** Some geochemical petrological aspects of mineral deposits by Prof. D.S. Strong at the Department of Geology, University of Malaya.
18. 17 March 1995 : **Technical Talk:** Site investigations and earthworks for the Kuala Lumpur International Airport at Sepang by Dr. S.N. Wersching, Mr. Malik Musa, Mr. Philip Smith and Mr. Ian Edwards at the Department of Geology, University of Malaya.
19. 18 March 1995 : **Site visit** to the Kuala Lumpur International Airport site at Sepang.

# GEOLOGICAL SOCIETY OF MALAYSIA PUBLICATIONS

## BULLETIN OF THE GEOLOGICAL SOCIETY OF MALAYSIA

### WARTA GEOLOGI — NEWSLETTER OF THE GEOLOGICAL SOCIETY OF MALAYSIA

#### ADVERTISING SPACE ORDER FORM

RATES:	WARTA GEOLOGI		BULLETIN	
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Inside half page per issue	RM200	RM500	RM500	RM800
Inside full page for 6 issues	RM1,500	RM3,000	—	—
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Artwork and positive films or slides (for colour or black & white) should be supplied by the advertiser.

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The Editor,  
Geological Society of Malaysia  
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University of Malaya,  
59100 Kuala Lumpur, Malaysia.

For further information, please ring 603-7577036 or fax 603-7563900.

The Editor,  
Geological Society of Malaysia  
c/o Dept. of Geology,  
University of Malaya,  
59100 Kuala Lumpur.

We would like to take up advertising space in WARTA GEOLOGI/BULLETIN in the form (please tick as appropriate):

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Designation ..... Fax: .....

\* Please delete as appropriate.

Signature .....

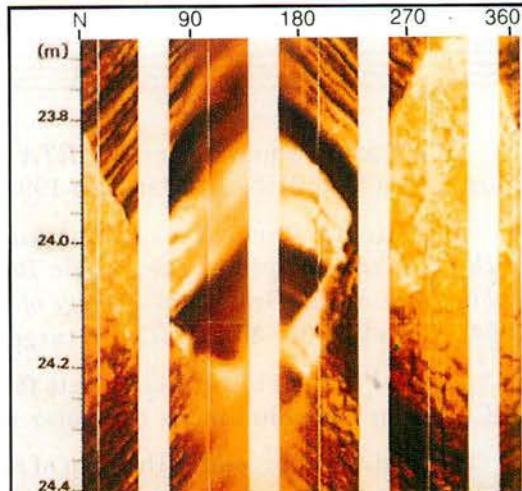
# Fullbore Micro Imager\*

Formation imaging using microelectrical arrays has benefited the oil industry since its introduction in the mid-80s. The FMI\*, Fullbore Formation MicroImager tool, is the latest-generation electrical imaging device. It belongs to the family of imaging services provided by the MAXIS 500\* system with its digital telemetry capability.

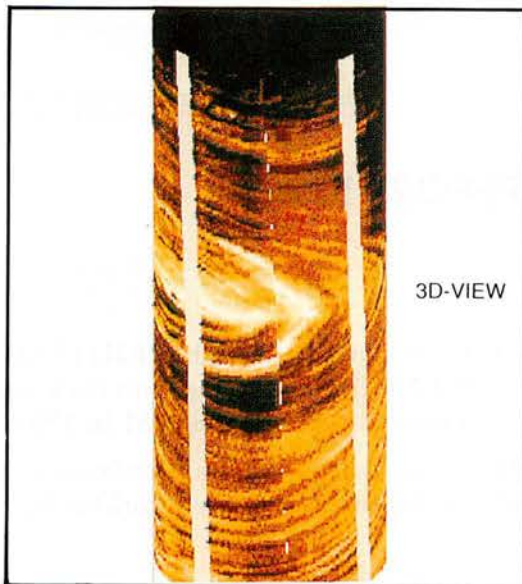
The FMI log, in conductive muds, provides electrical images almost insensitive to borehole conditions and offers quantitative information, in particular for analysis of fractures.

The FMI tool combines high-resolution measurements with almost fullbore coverage in standard diameter boreholes, thus assuring that virtually no features are missed along the borehole wall. Fully processed images and dip data are provided in real time on the MAXIS 500 imaging system.

The tool's multiple logging modes allow wellsite customization of results to satisfy client needs without compromising efficiency.

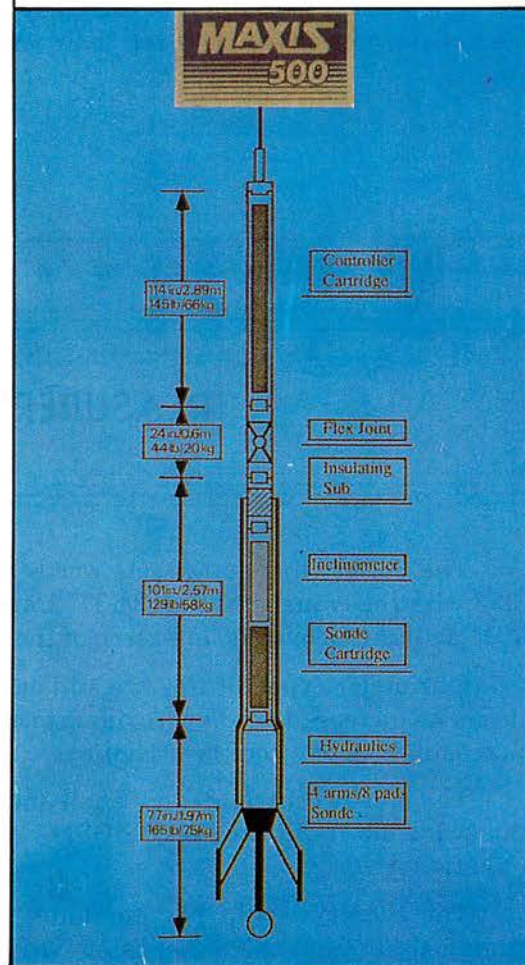


Fault without associated drag



3D-VIEW

"Bullseye" structure



## EDITOR'S REPORT 1994/95

The Society's newsletter, *WARTA GEOLOGI*, has been appearing regularly, the latest being Vol. 21 No. 1 (Jan-Feb 1995).

Bulletin 33 (*Proceedings Symposium on Tectonic Framework and Energy Resources of the Western Margin of the Pacific Basin*) and Bulletin 34 (*Bibliography and Index Publication of the Geological Society of Malaysia 1967-1993*) were ready at the end of 1994. Bulletins 35, 36 and 37 are targeted to be published in 1995.

Special thanks to Ng Tham Fatt for helping in the various editorial processes and A.K. Fan for the voluminous computer input.

The Editor appreciates the help of members of the Editorial Subcommittee in proof-reading, the reviewers and the advice of members of the Editorial Advisory Board.

The Society is grateful to the many authors for their contributions, and in addition the donors and advertisers for their valuable financial contributions to the Society's Funds.

**G.H. Teh**  
Editor

## TREASURER'S REPORT 1994

The Society has nett assets worth RM516,433 in 1994 compared to RM417,114 in 1993 with the transfer of RM124,377 from the CPCEMR Symposium account back to the GSM account. There is an excess of income over expenditure of RM88,281 in 1994.

Our major expenditures are still our publications and the Annual Conference. We have also increased our honorariums to our helpers due to the increased workload in our increasingly active society activities

The money contributed by Shell and Esso to enable the Society to sponsor students and academic staff to the AAPG-GSM Conference was well used to benefit 135 students and staff.

The Society would like to thank its faithful supporters who have contributed generously to fund the Society's activities for the benefit of its members.

The Society wishes to express its grateful thanks as well as extend its deepest condolences to the family of the late Mr. Law Jack Foo, our Honorary Auditor who passes away on 4.1.95.

We welcome our new Honorary Auditor, Mr. Lee Siew Fatt of S.F. Lee & Co. who has been appointed in his place.

**Lee Chai Peng**  
20 March 1995

**AUDITORS' REPORT**  
**to the Council of Persatuan Geologi Malaysia**  
**(Geological Society of Malaysia)**

**Accountant's Declaration**

We have audited the accounts set out in accordance with approved auditing standards.

In our opinion, the accounts give a true and fair view of the state of affairs of the Society as at 31st December, 1994 and of its income and expenditure and receipts and payments for the year ended on that date.

*Signed*

S.F. LEE & CO.  
(AF: 0670)  
PUBLIC ACCOUNTANTS

Kuala Lumpur  
DATED: 25 APRIL 1995

*Signed*

LEE SIEW FATT  
(1179/9/96J)  
PUBLIC ACCOUNTANT

**PERSATUAN GEOLOGI MALAYSIA**  
**(Geological Society of Malaysia)**  
**COMMITTEE MEMBERS' STATEMENT**

In the opinion of the Committee Members, the accounts set out are properly drawn up so as to give a true and fair view of the state of affairs of PERSATUAN GEOLOGI MALAYSIA (Geological Society of Malaysia) as at 31st December, 1994 and of its income and expenditure and receipts and payments for the year ended on that date.

On behalf of the Committee,

*Signed*

LEE CHAI PENG  
Treasurer

Kuala Lumpur  
DATED: 20 APRIL 1995

*Signed*

AHMAD TAJUDDIN IBRAHIM  
Secretary

**PERSATUAN GEOLOGI MALAYSIA**  
(Geological Society of Malaysia)

**Income And Expenditure Account For  
The Year Ended 31st December, 1994**

	1994 RM	1993 RM
<b>INCOME</b>		
Advertisement	9,000	-
AAPG-GSM Conference	17,058	-
Entrance fee	930	840
EIA workshop	1,927	-
Interest on fixed deposit	50,927	9,255
Subscription	22,789	22,252
Sales of publications	10,044	9,703
PGS 93' Donation	1,072	-
Telefax	82	1,152
Transfer from CPCEMR	124,378	-
Xerox	2,260	693
	<u>240,467</u>	<u>43,895</u>
<b>EXPENDITURE</b>		
Audit fee	600	-
Annual dinner	2,166	1,736
Annual Conference '93	15,761	8,819
AAPG	885	-
Best student award	-	3,000
Bank charges	451	375
Honorarium	10,234	7,185
Postage	9,802	7,639
Professional fee	300	300
Printing & stationery:		-
• Miscellaneous	2,411	3,920
• Bulletin	81,020	36,050
• Warta Geologi	16,404	-
• Newsletter	-	16,763
Refreshments	975	859
Refund professional membership	400	-
Study groups	1,494	5,722
Sundry expenses	2,482	920
Speakers' account	2,743	1,913
Sponsorship	-	1,300
Subscription to professional bodies	234	329
Sirim meeting	165	-
Telephone charges	797	640
Depreciation on fixed assets	2,963	2,636
	<u>152,287</u>	<u>100,106</u>
<b>SURPLUS/(DEFICIT) FOR THE YEAR</b>	<u>88,180</u>	<u>(56,211)</u>

The accompanying notes are an integral part of this account.



**PERSATUAN GEOLOGI MALAYSIA**  
(Geological Society of Malaysia)

**Balance Sheet as at 31st December, 1994**

	Note	1994 RM	1993 RM
<b>FIXED ASSET</b>	3	26,663	23,725
<b>CURRENT ASSETS</b>			
Fixed deposit with licensed banks		433,017	354,775
Deposit and prepayment		15,809	11,253
Cash and bank balances		41,453	78,015
		<u>490,279</u>	<u>444,043</u>
<b>CURRENT LIABILITY</b>			
Other creditors & accruals		600	360
<b>NET CURRENT ASSETS</b>		<u>600</u>	<u>360</u>
		489,679	443,683
		<b><u>516,342</u></b>	<b><u>467,408</u></b>
<b>FINANCED BY:</b>			
<b>Accumulated Fund</b>			
Balance brought forward		417,114	473,325
Surplus/(Deficit) for the year		88,180	(56,211)
		505,294	417,114
Student Loan Fund		7,605	6,955
Young Geoscientist Award		3,443	3,313
AAPG (AHH)		-	26
AAPG-GSM Conference		-	40,000
		<u>516,342</u>	<u>467,408</u>

The annexed notes form an integral part of these accounts.

## Appendix 5 Stock of Publications

Bulletin No.	Sales 1994	Stock Remaining
2	14	301
3	15	311
4	14	171
5	15	73
6	16	603
7	15	350
8	13	28
10	14	-
11	10	107
12	32	-
13	4	144
14	28	-
15	4	64
16	4	86
17	5	150
18	9	137
19	8	667
20	8	514
21	8	260
22	6	322
23	3	323
24	3	491
25	6	271
26	7	315
27	9	199
28	10	195
29	610*	190
30	27	298
31	596*	204
32	31	246
33	624*	376
34	624*	176
Field Guide 1	13	-
Abstracts (Bulletin 6)	1	5
Stratigraphic Correlation	24	332

\* inclusive of free copies distributed to Members

**PERSATUAN GEOLOGI MALAYSIA**  
(Geological Society of Malaysia)

**Statement Of Receipts And Payment For  
The Year Ended 31st December, 1994**

	1994 RM	1993 RM
<b>RECEIPTS</b>		
Contribution from members	23,827	23,347
Advertisement	9,000	-
AAPG (AHH)	1,000	800
AAPG	-	300
AAPG-GSM Conference	-	40,000
Annual dinner	951	420
Annual conference	13,342	24,035
Annual Conference 1994	-	20
Bank charges (refund)	381	910
Batik shirts	180	298
EIA workshop	3,040	5,901
Fixed deposit and interest	96,889	69,257
Fax	4,166	2,708
GSM-CPCEMR Symposium	303	17,735
IGCP	235	-
IGM	-	390
PGS 1994 (Donation)	8,944	35,258
Postage	1,727	3,951
Phone	106	-
Sales of publications	10,044	9,703
Study group	4,421	682
Student loan	1,647	300
Souvenirs	1,856	-
Stationary and printing	104	-
Xerox	3,334	2,011
	185,497	238,026
<b>PAYMENT</b>		
Annual conference (partly)	28,596	33,131
Annual conference 1994	-	250
AAPG (AHH)	60	88
AAPG-GSM	22,942	-
Annual dinner	3,117	2,156
Bank charges	832	1,284

## CONT'D .....

	1994 RM	1993 RM
<b>PAYMENT</b>		
Best student award	-	3,000
Cheque refund	108	404
Equipment	5,900	2,700
EIA Workshop	-	7,016
Fax charges	5,393	2,473
Honorarium	10,954	7,185
IGCP	235	-
Refreshments	975	859
Refund: Professional membership	400	-
PGS 1994	3,994	37,812
Postage	11,616	11,492
Petroleum Geology Seminar 1994	600	724
SIRIM meeting	165	-
Stationery and printing	99,990	56,674
Speakers' account	2,743	11,914
Subscription to professional bodies	234	329
Sponsorship	-	1,300
Sundry expenses	2,482	920
Study group	5,804	6,404
Souvenirs	11,905	-
Student loan	996	300
Telephone charges	923	657
Xerox	1,095	1,368
	222,059	190,438
<b>SURPLUS/(DEFICIT) OF RECEIPTS OVER PAYMENTS</b>	(36,562)	47,588
<b>CASH AND BANK BALANCES AT 1ST JANUARY</b>	78,015	20,427
<b>CASH AND BANK BALANCES AT 31ST DECEMBER</b>	41,453	68,015

**PERSATUAN GEOLOGI MALAYSIA**  
**(Geological Society of Malaysia)**  
**(Incorporated in Malaysia)**

**Notes To The Accounts**  
**— 31st December, 1994**

**1. PRINCIPAL OBJECT**

The principal object of the Society is to promote advancement of the geological sciences particularly in Malaysia and nearby areas.

**2. ACCOUNTING POLICIES**

**a) Basis of Accounting**

The accounts are prepared under the historical cost convention and comply with approved accounting standards.

**b) Depreciation**

Depreciation of office equipment is computed on reducing balance basis calculated to write off the cost of the asset over its estimated useful life at the rate of 10% p.a.

**3. FIXED ASSET**

1994	Cost	Accumulated Depreciation	Net Book Value	Depreciation Charge
	RM	RM	RM	RM
Office Equipment	68,449	41,786	26,663	2,963

**FIXED ASSET**

1993	Cost	Accumulated Depreciation	Net Book Value	Depreciation Charge
	RM	RM	RM	RM
Office Equipment	62,549	38,824	23,725	2,636

# SOCIETY'S BATIK SHIRT

Computer-designed and handprinted with the latest technology of handprinting from the East Coast, the Society's batik shirt is of soft, rayon material and comes in a cool, soothing, grey colour.

The Society's logo is craftily concealed in the background so that besides the Society's functions you can even wear your batik shirt anywhere, anytime!

Priced reasonably at MR60, the batik shirt is a real bargain and worth adding to your wardrobe. So place your orders now before stocks run out!

For further inquiries:

GSM Batik Shirt,  
Geological Society of Malaysia,  
Geology Department,  
University of Malaya,  
59100 Kuala Lumpur.

Tel.: (603) 7577036  
Fax.: (603) 7563900

.....Order Form .....

GSM Batik Shirt,  
Geological Society of Malaysia,  
Geology Department,  
University of Malaya,  
59100 Kuala Lumpur.

## GSM Batik Shirt

I would like to purchase ..... GSM batik shirt(s).

The size or sizes are as follows:

S  No. of shirt(s) .....

M  No. of shirt(s) .....

L  No. of shirt(s) .....

XL  No. of shirt(s) .....

Enclosed please find a cash/check/money order/bank draft\* for RM .....  
made to "Geological Society of Malaysia" for the purchase [\* Please delete where applicable].

For overseas orders please write in to indicate ordinary mail or air mail and you will be charged accordingly.

Please mail to: .....

.....

.....

.....

.....

## BERITA-BERITA PERSATUAN News of the Society

### KEAHLIAN (Membership)

The following applications for membership were approved:

#### Full Members

- |   |   |
|---|---|
| 1. Gordon Robertson Taylor<br>c/o SSB, KGR/1, Locked Bag No. 1, 98009<br>Miri.                | 4. Thomas H. Shaw<br>1908 Harold St. Houston, Tx 77098 USA.                                 |
| 2. Sahalan Abd. Aziz<br>No. 6, Jalan 3/7, Taman Melewar, 68100<br>Batu Caves.                 | 5. Sen Siong Choo<br>Geological Survey of Malaysia, Locked Bag<br>2042, 88999 Kota Kinabalu |
| 3. Michael Goey Kee Hoong<br>18 Jalan 5/37, Taman Bkt. Maluri, Kepong,<br>52100 Kuala Lumpur. | 6. Ian Derek Collins<br>5 Tanjong Rhu, No. 07-02 Blk. 5, The<br>Waterside, Singapore 1543.  |

#### Student Members

- |   |  |
|---|--|
| 1. Phakhruddin bin Abdullay @ Kadir<br>Jabatan Geologi, Universiti Malaya, 59100<br>Kuala Lumpur. | 2. Haryati Awang<br>Jabatan Geologi, Universiti Malaya, 59100<br>Kuala Lumpur. |
|---|--|

GSM

### PETUKARAN ALAMAT (Change of Address)

The following members have informed the Society of their new addresses:

- |  |  |
|--|--|
| 1. Ho Chee Kwong<br>5-7-16, Block 5, Meadow Park II, Jalan 1/<br>130, Off Jalan Klang Lama, 58200 Kuala<br>Lumpur.                           | 3. Liaw Kim Kiat<br>Geological Survey Malaysia, P.O. Box<br>11110, 50736 Kuala Lumpur. |
| 2. Abd. Rasid Bin Jaapar<br>Soil Centralab Sdn. Bhd., 3, Jalan P/8,<br>Kawasan Perindustrial MIEL, 43650<br>Bandar Baru Bangi, Selangor D.E. |  |

GSM

## PERTAMBAHAN BAHARU PERPUSTAKAAN (New Library Additions)

The Society has received the following publications:

1. Geological Survey of Malaysia, annual report 1979, 1993, 1992.
2. IMM, Transactions, Section A: Sept-Dec. 1994 and Jan-Apr 1995.
3. Bull. Centres Rech. Explor.-Prod. elf aquitaine, vol. 18, no. 2, 1994.
4. Commonwealth Science Council newsletter, May-June and July-August 1994.
5. Petromin, Jan 1995.
6. AAPG Explorer, March, April 1995.
7. Tin International, vol. 67, no. 11, 1994.
8. Bulletin of the Geological Congress of Turkey, no. 10, 1995.
9. Chronicle of Mineral Research & Exploration, no. 517, 1994.
10. Bulletin of the National Science Museum, vol. 20, nos. 3 & 4, 1994.
11. AAPG Bulletin, vol. 78/12, 1994, vol. 79/2, 1995.
12. Earthquakes & Volcanoes, vol. 24, no. 5 & 6, 1993.
13. Explanatory text of the geologic map of Taiwan, sheet 27; Tayuling 1993.
14. SOPAC: Proceedings of the 23rd Session, 1994.
15. IMM, Bulletin, no. 1022, 1995.
16. Acta Palaeontologica Sinica, vol. 33, nos. 3-5, 1994.
17. Acta Micropalaeontologica Sinica, vol. 11, nos. 1-2, 1994.
18. Palaeontological abstracts, vol. 9, nos. 2-3, 1994.
19. The geology and engineering geology of Pulau Pinang by One Wee Seck, 1993.
20. Geological Survey of Japan, Bulletin, vol. 45, nos. 8-11, 1994.
21. Annual Report, Institute of Geoscience, The University of Tsukuba, no. 20, 1994.
22. Oklahoma Geology notes, vol. 54, nos. 4-6, 1994.
23. U.S. Geological Survey, Bulletin: 1994: 2000-F, 2082, 2091, 2047.
24. U.S. Geological Survey, Professional Paper: 1994: 1470.



## BERITA-BERITA LAIN Other News

### Local News

#### MMC's Indonesian gold ops look very promising

A promising picture of the prospects of Malaysia Mining Corp's Indonesian gold operations is emerging following a recent visit to Kalimantan by a group of Australian journalists.

MMC's Indonesian gold operations are held by Aurora Gold, which was hived off from MMC's 48 per cent diamond associate Ashton Mining two years ago and listed on the Australian stock exchange. Ashton retains 30 per cent in Aurora.

Aurora's Mt Muro mine, located 600 km up the Barito river in Kalimantan, started yielding its first gold last December after a A\$100 million (RM189 million) development programme.

Aurora officials told the visiting Australian journalists that the mine is operating well, and the main problems associated with developing a mine in such an isolated area are over.

The good news is that Mt Muro could be a far richer mine than originally thought.

At the moment Mt Muro is targeted to produce an average 125,000 ounces of gold and 2.35 million ounces of silver a year for eight years.

The mine is made up of four main mining areas containing 16 pits.

Aurora officials are optimistic that there is

gold further down the ground — no work has been carried out below 250 metres — as well as in other parts of the 480 sq km of the concession area.

*"Although the stock exchange disclosure rules prevent Aurora geologists from publicly quantifying recent exploration work until the numbers are ready to be released to the market, Mt Muro reeks of precious metals,"* wrote mining journalist Bruce Hextall in the *Sydney Morning Herald*.

During the visit, the journalists were made aware of the difficulties of operating in such an isolated region, where virtually everything has to be shipped up by barge from the coastal town of Banjarmasin.

But Mt Muro has one big attraction — low labour costs — not to mention the precious metals underground.

Aurora has also partnered an Australian company, Meekatharra Minerals, to explore a part of south Sumatra, another promising area.

Aurora shares are currently trading at around A\$1.35 (RM2.55) compared to its issue price of A\$1.20 (RM2.26).

*Star, 7.3.1995*

#### Karak Highway project to be ready by 1997

The Karak Highway extension project, which began on October 1 last year, is expected to be completed by the end of 1997, 18 months ahead of schedule.

Works Minister Datuk Leo Moggie said his Ministry had initially set a period of four and a half years for the completion of the RM441 million, 60 km project. However, he said the subsidiaries of MTD Capital Sdn. Bhd. — MTD Prime Sdn. Bhd. and MTD Construction Sdn.

Bhd. — had given an assurance it would be completed in three years' time.

*"The Ministry is satisfied with the progress made by the two companies and this shows that there were close co-operation between the Ministry, the Malaysian Highway Authority (MHA), the State Governments of Selangor and Pahang and the two companies,"* Leo said after blasting a portion of the second tunnel at the 35 km KL-Karak Highway, signifying the second tunnel's

ground-breaking ceremony at 12.45 pm today.

The extension project includes the construction of the 800 m second tunnel. Twenty kilogrammes of dynamite were used to blast the lower left portion of the 800 m tunnel.

Leo said there were a couple of glitches involving the reclamation and compensation of the squatter lands beside the highway.

*"There are a few squatters which still remain beside this highway and this matter will all be sorted out by early April.*

*"Those who are eligible for compensation under the provision of the law will be properly compensated.*

*"We are getting the cooperation from the Selangor and Pahang State Governments to solve this issue and the two State Governments have gazetted for the land reclamation last month.*

*"The Gombak district council has also agreed to relocate some of the squatter dwellers which could not be compensated to another place within the district."*

On the delay for the blasting of the second tunnel, he said this was due to the sorting out of security clearance with the police to ensure safety and free flow of traffic.

He said the current glitches would not hinder

the project which would be completed ahead of schedule.

Leo was given two briefings by the executives of the two companies. The first was on the development of the extension of the highway at the Gombak Toll Plaza and the second on the blasting of the second tunnel at Genting Sempah.

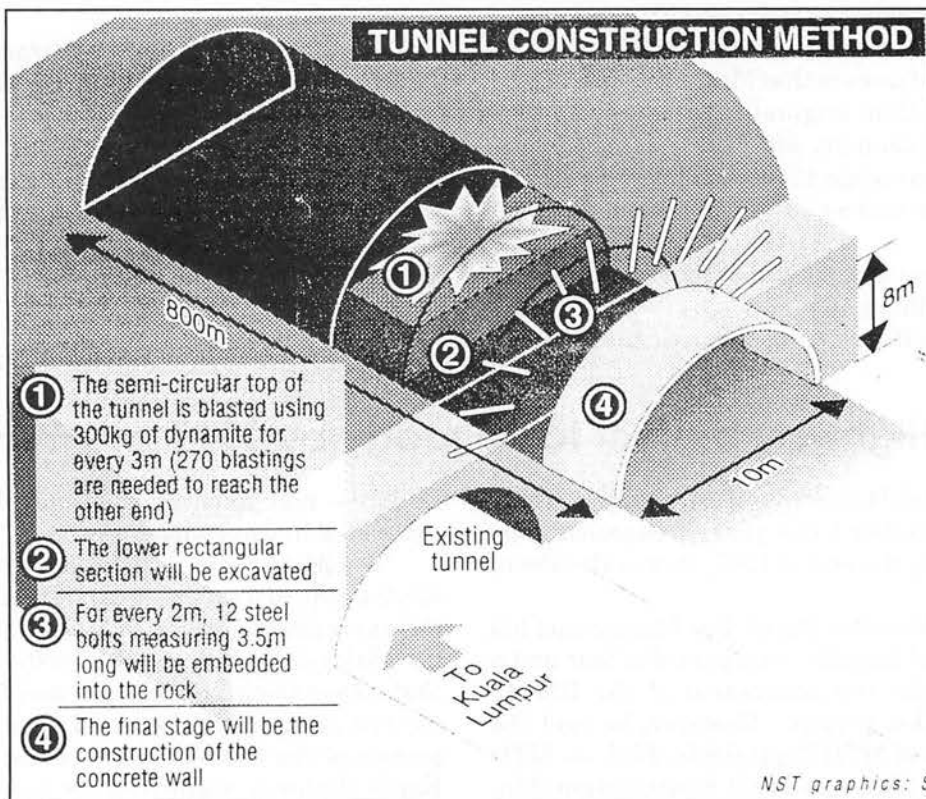
He was accompanied by the ministry's secretary general, Encik Yahya Yaacob, the director of MHA, Datuk Chew Swee Hock, and the chairman of MTD Capital Datuk Dr. Nik Hussein Abdul Rahman.

Meanwhile, the chief executive of MTD Prime, Encik Azmil Khalid, said the construction of the second tunnel will be completed in 30 months' time. It is expected to cost RM50 million which also includes the preparatory work done on the tunnel.

The tunnel will be constructed by Transfield (M) Bhd. which is an Australian-based tunnelling company.

Project manager Dick Wright said the construction will use the most up to date method called the "Austrian shotcrete" where there will be blasts at every three-metre at the semi-circular top portion of the tunnel.

*"As the tunnel will be 800 m long, there will*



be 270 blasts with each blast using 300 kg of dynamite.

*"After each blast the rocks are carried into the Caterpillar 966 machines which can fit in seven tons of rocks.*

*"Later, we will embed 12 3.5 m steel bolts around the tunnel for every two metres of the tunnel and concrete is placed around its surrounding. Then we blast the next three meters,"*

he said.

The drilling of the hole will be made by a RM1.5 million Atlas Copco Jumbo Drilling Machine which was imported from Turkey.

He said this was the latest, cost effective and safer method of constructing the tunnel as the previous method required a bigger amount of concrete and hence cost more.

*Star, 14.3.1995*

## Germany presents 15 million-year-old rock to USM

A 15 million-year-old suevite rock from the Rieskrater Museum of Germany was presented to Universiti Sains Malaysia Museum and Gallery yesterday.

German Ambassador to Malaysia Harald N. Nestroy handed the rock to USM vice-chancellor Tan Sri Musa Mohamad in a simple ceremony.

Nestroy also handed a sample of the suevite rock to National Planetarium representative Sulaiman Michael Young.

USM Museum and Gallery science adviser Prof. Sam Teng Wah said the suevite rock was found in the Alb plateau in present day Germany.

*"These rocks were produced by extremely high temperatures and pressures inconsistent with available internal forces of the earth.*

*"It can only be attributed to a gigantic meteorite impact. Similar rocks have now been brought back from the moon and constitute evidence for many powerful impacts there,"* he said.

Prof. Sam said about 15 million years ago, an almost one km-sized meteorite landed at the Alb mountain plateau close to the site where the city of Nordlingen is today.

It had a velocity of approximately 100,000 kmph and crashed through the crust of the earth down to a depth of about 1,000 m.

Releasing an internal energy of around 250,000 times the Hiroshima atomic bomb, the meteorite produced a transient crater of 12 km in diameter.

*Star, 15.3.1995*

## More areas for gold prospecting

Pahang, spurred by recent significant gold discoveries, approved some 22,700 ha for gold prospecting and plans to open up more areas for gold and base mineral exploration.

Menteri Besar Tan Sri Khalil Yaakob said at a Pan-Asian mining congress here that applications to prospect a further 78,600 ha of gold areas were pending.

Pahang had in July 1990 approved five-year concessions to seven mining consortia including some from Canada and Australia to explore for gold in 12 blocks.

It has also issued five-year leases to 24 licences to prospect for the precious metal. Khalil said several mining licences, valid during the lifespan of the mines, had also been issued.

*"At present, results of exploration works have been very encouraging,"* he said.

Khalil said Canada's Avocet Ventures Inc.

in particular, which had been exploring Block Seven, had made significant discoveries.

Avocet, one of the seven gold concession holders in the state, had applied for a lease to mine 141 ha of gold prospect in the Penjom area.

*"Current indications are that the selected area has an ore reserve of at least 2.5 million tonnes with a grade of 2.7 grams per tonne valued at approximately RM190 million at current prices,"* he said.

Some analysts and company officials put the estimates for the Penjom prospect higher at 3.0 million tonnes, with a grade of 3.4 grams a tonne.

Avocet vice-president David Crisp told reporters the firm's Malaysian subsidiary Specific Resources Sdn. Bhd. plans to apply for 10 more prospecting permits raising the total to 12.

He said the Penjom mine would start operation in 1996. Specific Resources will spend US\$12.5 million to US\$13 million (RM32.0 million to RM33.3 million) in development work and another RM6 million on exploration.

Another major gold prospecting firm

operating in Pahang is Malaysia Mining Corp. which has found extensive gold-bearing quartz zones in Merapoh area.

Analysts said plans to drill in targeted areas have been set for this year.

*Star, 16.3.1995*

## **New rules for kaolin extraction**

---

Extraction of kaolin will come under the new mineral mining regulations being finalised by the Perak Land and Mines Department.

Its director Datuk Haji Abdul Samat Sabri said miners would have to submit operation plans and pay premium at a new rate yet to be determined.

He said the extraction of kaolin was currently governed under the Mining Enactment and mining permits were issued by district land offices.

Under the new regulations, kaolin extraction would come under the purview of the State Industrial Task Force Committee, he said on

Wednesday.

Abdul Samat said the state government encouraged tin miners to switch to kaolin mining.

Tin mining leases would not be renewed unless miners could produce valid reason, he added.

Recently, Menteri Besar Tan Sri Ramli Ngah Talib said new mineral mining regulations were needed to ensure a sustainable production of mineral resources.

According to a Mida report, Perak has 50 million tonnes of kaolin which could be used in the making of ceramic products.

*Star, 17.3.1995*

## **Hazna in joint venture to mine gold**

---

Local mining company Hazna Sdn. Bhd. will go into a joint-venture with an Australian firm to extract gold from a 400 ha in Jempol district.

Hazna, a wholly-owned subsidiary of Diamond Heritage Sdn. Bhd. which is presently involved in mining tin in Jempol district, and Wells Gold Corp N.L. (WGC) would conduct the activities on a site in Bahau owned by Hazna.

Hazna managing director Zulkarnain Ismail said WGC of Subiaco, Perth in Western Australia was a public listed company with worldwide operations in lode-mining using the latest techniques like the carbon in pulp or carbon in leaching methods.

He said the project would be the first of its kind in the country although gold prospecting was already taking place in Kelantan and Terengganu using the alluvial method.

Zulkarnain said the site was first mined in 1897 by a British company. Another group of miners from Australia took over the mining activities in 1937 until the Second World War.

He also said the joint venture company would have its own geology laboratory in Raub, Pahang, to be manned by Australian and local geologists.

*"They will undertake research expected to be completed in two years at a cost of between RM3 million and RM5 million,"* he added.

Zulkarnain said under the joint-venture agreement, WGC would hold a 70 per cent stake and Hazna the remaining 30 per cent.

WGC executive chairman Aird P. Wells and Zulkarnain signed the agreement yesterday in Seremban.

*Star, 18.3.1995*

## Firms to handle more than 20 KLIA projects

A theme park, golf course, shopping centre and hotels are among more than 20 projects to be privatised in the "airport city" at the KL International Airport in Sepang.

KL International Airport Berhad senior general manager A. Narayan said the high-tech and modernised airport would have facilities catering for the aviation industry on a basis of 'build, operate and transfer,' 'build, own and operate,' or leased out.

The facilities to be built in and around the airport area are the air cargo complex, freight forwarders base, ground handling services, MAS administration building, airlines fuelling facilities, car rental facilities, petrol stations, car parks, landside and airside hotels, public transportation and aircraft maintenance base.

Some of those to be leased are flight catering

base, airlines administration building, airmail building, golf course, convention centre, shopping centre, cogeneration plant, theme park and the Tabung Haji complex.

Some of the facilities were expected to be awarded to the various specialised government agencies.

For example, the airline fuelling facilities would be awarded to Petronas, management of the airport to Malaysia Airports Berhad (MAB) and airlines related areas to Malaysia Airlines. MAB will also be responsible for the maintenance of the landing strip and will be operator of KLIA when it is fully completed.

As the cost of the airport is estimated at between RM8 billion and RM9 billion, the various jobs are being privatised in an effort to reduce the government's financial burden.

*Star, 20.3.1995*

## China invited to extract minerals

Malaysia has invited the Chinese private sector to enter into joint-ventures with local prospectors to extract raw minerals and metals using their advanced technical expertise and technology.

Deputy Minister for Primary Industries Tengku Mahmud Tengku Mansor said bilateral co-operation with China was sought as the country was far more advanced in the field of mineral extraction, including gold prospecting.

*"Malaysia has a significant amount of gold reserves in Kelantan, Terengganu and Pahang, but we cannot extract them due to a lack of expertise and technology.*

*"At present, only three to five per cent of such mineral activities are undertaken by the Primary Industries Ministry,"* he said.

He said the ministry wanted modern technology to be introduced to upgrade extraction activities at existing gold mines.

This could be made possible through co-operation between China and Malaysia.

The ministry may send its geologists and mining experts to attend short courses in China or ask Chinese experts to come here to provide training to mining prospectors.

He was speaking after a courtesy call by

Chinese Vice-Minister for the Metallurgical Industry Xa Da Quan and his five-member entourage at his office in Kuala Lumpur yesterday.

Their visit here is to seek bilateral trade opportunities, exchange technical expertise and assist in the transfer of technology here, especially in the metallurgical sector.

Tengku Mahmud added that though bilateral trade between both countries was small, there was still room for expansion.

*"We may also decide to import iron ore from China, once our 10-year agreement with Argentina expires, to save on high transportation costs."*

In 1992, Malaysia's exports to China totalled RM172 million and its imports RM406 million.

The following year, its exports reached RM331 million, while imports decreased to RM346 million.

During the first 10 months of last year, Malaysia's exports decreased to RM119.7 million and its imports also dipped to RM335.3 million.

*"China is an important market for Malaysian commodities because of its large population,"* Tengku Mahmud said.

*NST, 21.3.1995*

## Weak dollar won't hit Petronas income

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124

## Ashton Mining announces find in Ontario, Canada

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Ashton Mining Ltd. announced recently that it has discovered a new kimberlitic pipe in James Bay, Northern Ontario, Canada.

Ashton's Canadian exploration subsidiary, Ashton Mining of Canada Inc., said the find was enhanced by the results of a second hole drilled on Ashton's nearby Lake Kyle kimberlite hit which had significant diamond values.

Ashton, which is 47-per cent owned by the Malaysian Mining Corp., has launched an aggressive worldwide diamond search and it appears it is beginning to pay off.

According to Ashton Canada, a vertical diamond drill hole struck a kimberlite body at 68 metres and was terminated at 383 metres. An intensive follow-up is on the way although the company did not reveal if the kimberlite was diamondiferous.

A drill hole at Lake Kyle had returned 283 kg of kimberlite material which yielded 291 microdiamonds and 79 macrodiamonds (more than 5 mm in diameter).

The company also said it had drilled another two holes into the zone from which about two zones of material had been collected for testing for commercial-sized diamonds.

Meanwhile, a diamond expert Keith Ives, told the recent World Diamond conference in Perth that international demand for gem diamonds was expected to increase from 5 to 9 per cent in the next five years.

Because of the difficulty in bringing significant new mines into production speedily, production growth during the same period would be only about 2 to 3 per cent.

He said in the past 15 years, consumer demand for diamonds had grown in line with the OECD (Organisation of Economic Cooperation and Development) countries' average economic growth rates.

Ives, a former research and marketing director for the Central Selling Organisation, said some of the diamond industry stocks would have to be released to meet international demand.

*Star, 17.4.1995*

## Ashton likely to operate new diamond mine

---

Ashton Mining, the 48 per cent Australian diamond associate of Malaysia Mining Corp., said it expected to be operating at least one new diamond-mine "within the next few years" in view of encouraging exploration results in Australia, Finland and Canada.

The good news was conveyed to shareholders at the company's annual meeting in Melbourne by chairman Nobby Clark.

Clark's optimism is based on the latest results from Ashton's three exploration projects.

In its quarterly report which coincided with the AGM, Ashton said the company's latest exploration in Finland had recovered 62 commercial size diamonds bigger than 0.8 mm from three drill holes in Pipe 21.

The stones ranged up to 1.13 carats in size and weighed a total of 2.89 carats, giving a

weighted average rate of 41.3 carats per 100 tonnes.

"The indicated grade for Pipe 21 is the highest returned from tests conducted to date on the company's 22 kimberlite discoveries in Finland," said Ashton managing director John Robinson.

Ashton has been exploring in Finland for eight years.

Ashton also reported encouraging results from its joint-venture in the James Bay Lowlands area of Northern Ontario in Canada in which it has the right to acquire a 51 per cent interest.

Canadian mining analysts believe that Ashton and BHP of Australia have the best chances of getting a commercial diamond mine started at their tenements compared to many other companies currently exploring for diamonds in Canada.

*Star, 20.4.1995*

## Firms to handle more than 20 KLIA projects

A theme park, golf course, shopping centre and hotels are among more than 20 projects to be privatised in the "airport city" at the KL International Airport in Sepang.

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*Star, 20.3.1995*

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*"At present, only three to five per cent of such mineral activities are undertaken by the Primary Industries Ministry,"* he said.

He said the ministry wanted modern technology to be introduced to upgrade extraction activities at existing gold mines.

This could be made possible through co-operation between China and Malaysia.

The ministry may send its geologists and mining experts to attend short courses in China or ask Chinese experts to come here to provide training to mining prospectors.

He was speaking after a courtesy call by

Chinese Vice-Minister for the Metallurgical Industry Xa Da Quan and his five-member entourage at his office in Kuala Lumpur yesterday.

Their visit here is to seek bilateral trade opportunities, exchange technical expertise and assist in the transfer of technology here, especially in the metallurgical sector.

Tengku Mahmud added that though bilateral trade between both countries was small, there was still room for expansion.

*"We may also decide to import iron ore from China, once our 10-year agreement with Argentina expires, to save on high transportation costs."*

In 1992, Malaysia's exports to China totalled RM172 million and its imports RM406 million.

The following year, its exports reached RM331 million, while imports decreased to RM346 million.

During the first 10 months of last year, Malaysia's exports decreased to RM119.7 million and its imports also dipped to RM335.3 million.

*"China is an important market for Malaysian commodities because of its large population,"* Tengku Mahmud said.

*NST, 21.3.1995*

## Weak dollar won't hit Petronas income

Petronas, the national oil corporation, said the recent weakening of the US dollar is not expected to have an impact on its revenues for the current year.

Chairman Tan Sri Azizan Zainul Abidin said Petronas's ability to service its loans would also not be affected.

*"Both our income and borrowings are in the US dollar. So, there is a natural hedge,"* he told reporters after opening the Asia-Pacific Oil and Gas Conference in Kuala Lumpur yesterday.

Coming close to Petronas' financial year end on March 31, the fall in the value of the greenback since early this month was not worrisome, as the dollar had behaved as predicted in the previous 10 to 11 months, he said.

*"Total earnings may be reduced a bit, but a little upsurge in the US dollar exchange rate should put us back on target."*

Azizan declined to disclose Petronas's revenue projections for the current year ended March 31.

But he said the weakened US dollar would be taken into account in Petronas's revenue projections for the following financial year.

The dollar plunged early this month against the Japanese yen and other foreign currencies, falling to a record low of 89.1 yen. The greenback recovered slightly to around 90 yen, but it touched a low of 88.68 yen to a dollar yesterday.

Asked about plans to boost exploration

activities in the country, Azizan said a different production sharing contract (PSC) that was more progressive and reflective of the economic and price environment might be drawn up.

*"There is a need to discuss it with the major oil companies so that when it (the PSC) is introduced, it will be acceptable,"* he said.

Azizan said the present PSC terms were reasonable but Petronas would continue to monitor and make the necessary changes when needed.

He said any changes in the terms of the PSC would be on making it more attractive in the longer term.

In his *keynote* speech earlier, Azizan said based on the requirement of committed projects, the programme for the upstream sector over the next 20 years would include the development of some 18 gas fields to supply the LNG 2 project, the peninsular gas utilisation project and the proposed LNG 3 project.

In the oil sector, there will be massive investments in the development of two major blocks in Peninsular Malaysia and in the Baram Delta in Sarawak.

He added that the challenges facing the industry were achieving these objectives in the face of soft oil prices, increasing construction and operational costs and eroding margins, and maintaining the highest standards of operation.

NST, 21.3.1995

## Four companies to get East Coast Highway job

A consortium of four parties — United Engineers (Malaysia) Bhd., Malaysia Mining Corporation Bhd. and Lembaga Urusan Tabung Haji — is expected to be awarded the concession to build and manage the toll highway linking, Karak in Pahang to Kuala Terengganu.

The award is expected to be made soon, followed by the signing of the concession agreement between the Government and the consortium.

The 360 km two-lane dual carriageway is estimated to cost between RM2.6 billion and RM3 billion, sources said.

It will be connected to the current Kuala Lumpur-Karak highway, which is being upgraded to the tune of RM441 million by MTD

Capital.

Sources said UEM, MMC and MTD Capital will each have a 30 per cent stake in the consortium and Tabung Haji the remaining 10 per cent.

The highway will be a closed-toll system fashioned along the North South Highway operations. It would also eventually be linked to the North South Highway.

UEM and MMC were in the early stages competing for the job, each leading a consortium of its own.

It is understood that rather than award the contract to either one of them, the Government decided to ask them to form a single consortium.

It was also decided that MTD Capital and



cash-rich Tabung Haji be invited.

MTD Capital is currently upgrading the 68 km Kuala Lumpur-Karak highway, which includes the widening of the road from Kuala Lumpur to the Genting tunnel into a six-lane dual carriageway and the stretch from the tunnel to Karak into two-lane dual carriageway.

The company, which secured a 27-year concession to collect toll for the upgraded Kuala Lumpur-Karak road, would also complete a new 800 metre tunnel parallel to the existing one, and two interchanges.

The Karak-Kuala Terengganu concession and the trunk road from Jabor, Pahang, to Jerangau, Terengganu, will be upgraded into a two-lane dual carriageway.

The whole project is projected to be completed three years after the signing of the concession agreement.

The construction of the highway has been

identified as a priority project to hasten the spread of development along what is known as the eastern corridor of the peninsula.

UEM has been involved in the construction and maintenance of the 900 km North South Highway project, through subsidiary Projek Lebuhraya Utara Selatan Sdn. Bhd. (Plus). It was awarded a 30-year concession for the highway in 1988, before assigning it to Plus.

The company was also awarded the concession to develop the second link between Johor and Singapore.

MMC subsidiary Konsortium Lebuhraya Butterworth-Kulim Sdn. Bhd. has secured a concession agreement for the RM250 million Butterworth-Kulim highway.

It is also aiming to secure a bid to construct a proposed east-west highway linking Butterworth and Kota Baru via Titi Karangan and Grik.

*NST, 21.3.1995*

## M'sians see glitter of diamonds

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De Beers, Britain's largest diamond mining company, has ranked Malaysia as one of the top emerging diamond consumer markets in the East Asia region.

Visiting marketing director Simon Tarrant told *Star Business* in Kuala Lumpur yesterday that despite the country's small population, the purchasing power among Malaysians was "quite high".

More people were also now buying diamonds rather than gold, he said.

Tarrant, who is based in De Beers Hong Kong office, also handles the marketing operations in Singapore, Indonesia, Malaysia and Thailand.

According to statistics from De Beers London headquarters, Malaysia shares sixth position with Singapore in its world customer list.

The biggest diamond consumer markets in East Asia are Taiwan, South Korea and Thailand.

*"De Beers is confident that the East Asia market would make up almost 50 per cent of the world's diamond consumer market in the long term, and be in the same league as the United States and Europe presently."*

Tarrant said in the last two years, the De Beers Diamond Promotion Centre had launched the Modern Woman Campaign targeted at young executive Malaysian women aged between 26 and 34 years old.

*"The response was overwhelming as more Malaysian women begin to realise that diamonds are not the expensive."*

De Beers is also currently looking into the wedding rings market as the company sees it as a "strong division" in Malaysia.

*"The need to own the smallest diamond solitaire ring is every girl's dream especially at an affordable price of between RM750 and RM3,000,"* Tarrant said.

De Beers, which sells rough diamonds to diamond cutters or jeweller manufacturers, sources its diamonds mainly from Australia, Zaire, Botswana, Namibia as well as its own mines in South Africa.

The company would hold sales sights in London every six weeks where world diamond cutters or jewellery manufacturers would gather to purchase among the best diamonds in the world.

*Star, 13.4.1995*

## Ashton Mining announces find in Ontario, Canada ---

Ashton Mining Ltd. announced recently that it has discovered a new kimberlitic pipe in James Bay, Northern Ontario, Canada.

Ashton's Canadian exploration subsidiary, Ashton Mining of Canada Inc., said the find was enhanced by the results of a second hole drilled on Ashton's nearby Lake Kyle kimberlite hit which had significant diamond values.

Ashton, which is 47-per cent owned by the Malaysian Mining Corp., has launched an aggressive worldwide diamond search and it appears it is beginning to pay off.

According to Ashton Canada, a vertical diamond drill hole struck a kimberlite body at 68 metres and was terminated at 383 metres. An intensive follow-up is on the way although the company did not reveal if the kimberlite was diamondiferous.

A drill hole at Lake Kyle had returned 283 kg of kimberlite material which yielded 291 microdiamonds and 79 macrodiamonds (more than 5 mm in diameter).

The company also said it had drilled another two holes into the zone from which about two zones of material had been collected for testing for commercial-sized diamonds.

Meanwhile, a diamond expert Keith Ives, told the recent World Diamond conference in Perth that international demand for gem diamonds was expected to increase from 5 to 9 per cent in the next five years.

Because of the difficulty in bringing significant new mines into production speedily, production growth during the same period would be only about 2 to 3 per cent.

He said in the past 15 years, consumer demand for diamonds had grown in line with the OECD (Organisation of Economic Cooperation and Development) countries' average economic growth rates.

Ives, a former research and marketing director for the Central Selling Organisation, said some of the diamond industry stocks would have to be released to meet international demand.

*Star, 17.4.1995*

## Ashton likely to operate new diamond mine ---

Ashton Mining, the 48 per cent Australian diamond associate of Malaysia Mining Corp., said it expected to be operating at least one new diamond-mine "within the next few years" in view of encouraging exploration results in Australia, Finland and Canada.

The good news was conveyed to shareholders at the company's annual meeting in Melbourne by chairman Nobby Clark.

Clark's optimism is based on the latest results from Ashton's three exploration projects.

In its quarterly report which coincided with the AGM, Ashton said the company's latest exploration in Finland had recovered 62 commercial size diamonds bigger than 0.8 mm from three drill holes in Pipe 21.

The stones ranged up to 1.13 carats in size and weighed a total of 2.89 carats, giving a

weighted average rate of 41.3 carats per 100 tonnes.

*"The indicated grade for Pipe 21 is the highest returned from tests conducted to date on the company's 22 kimberlite discoveries in Finland,"* said Ashton managing director John Robinson.

Ashton has been exploring in Finland for eight years.

Ashton also reported encouraging results from its joint-venture in the James Bay Lowlands area of Northern Ontario in Canada in which it has the right to acquire a 51 per cent interest.

Canadian mining analysts believe that Ashton and BHP of Australia have the best chances of getting a commercial diamond mine started at their tenements compared to many other companies currently exploring for diamonds in Canada.

*Star, 20.4.1995*

## KOI to set up second grinding mill

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Kwong Onn Industries Bhd. (KOI) is set to become one of the major cement manufacturers in the southern region with the acquisition of 2.8 ha adjoining its present grinding mill in Pasir Gudang to build another mill.

Managing director Abdul Rahim Hashim said Johor Port had approved in principle for the land acquisition worth RM6.9 million.

*"Our present capacity for the mill is 100,000 tonnes per annum, and as we foresee a rapid demand for cement in the next five years, we need another grinding mill,"* he told *Star Business* after the announcement of company's financial results.

The second grinding mill was expected to be built on the newly acquired site at an estimated cost of RM30 million to RM45 million, depending on its design, he added.

Rahim said the company would manufacture slag cement by the first quarter of 1996, with a targeted production of 100,000 tonnes in the first year and eventually achieve the maximum capacity of 200,000 tonnes.

The hardy sulphate-resistant slag cement is widely used in the United States, Europe and Singapore for marine projects.

Listed on KLSE second board since 1990, the KOI group registered a pre-tax profit of RM14.9 million for year ended Jan 31, 1995, an increase of 60.9 per cent over the previous year's profit of RM9.3 million.

The higher profit was achieved on the back of group turnover of RM138.3 million against RM87.4 million for the previous year, an improvement of 58.2 per cent, Rahim said.

*"The profit contribution of RM11.3 million from the cement division was a result of a sustained strong demand from the construction industry and also an increase in cement output during the second half of the year with the addition of a pregrinding facility.*

*"The contribution from the timber division, especially moulding products, was also achieved as forecast due to sustained demand in Europe,"*

he said.

For the year under review, group profit attributable to the shareholders increased to RM11.4 million, an increase of RM5 million over the last year's profit of RM6.4 million.

Rahim said at the company's level, the profit attributable to the shareholders increased from RM1.3 million in the previous year to RM3.6 million in the financial year ended January 1995.

Earnings per share also improved to 23 sen per share compared with 16 sen in 1994 while net tangible assets per share increased to 65 sen from 44 sen in 1994.

*"The board of directors has proposed a first and final dividend of 6.5 per cent,"* he said.

Among other expansion plans are a clinker plant in Sabah, a joint-venture manufacturing corrugated boxes and paper bags and transferring listing to the KLSE main board.

*"We are one of the contenders for a clinker plant in Sabah and hopefully by early May we would know the results,"* Rahim said.

He said the plant, with a targeted capacity of between 1.3 million and 1.5 million tonnes per annum, would be located in Balabangan, about 100 nautical miles off Kudat.

*"We hope to minimise clinker imports from Korea, Japan and Thailand through the plant, and hopefully we could cater for the South-East Asia region eventually,"* he said.

Recently, the company signed a joint venture with a local company to manufacture corrugated boxes and paper bags.

*"We have a 40 per cent share and we hope it will contribute to the group earnings by next year,"* Rahim said.

Annual production of the boxes in Nilai and bags in Johor was targeted at 13,000 tonnes and 3,000 tonnes respectively, he added.

On the name change of the company to Tenggara Capital Bhd., he said, *"We hope to receive the certificate from the Registrar of Companies by next week."*

*Star, 22.4.1995*

## Petronas Carigali strikes oil, gas off Sarawak

Petronas Carigali Sdn. Bhd., the exploration and production arm of Petronas, has made a significant oil and gas discovery in the Tanjung Baram prospect in Block SK 15, off Sarawak.

The Tanjung Baram prospect, in water depth of about 12 metres, is located about 22 km north-west of Miri and about seven kilometres from the West Lutong oilfield.

Petronas said in a statement yesterday that Tanjung Baram-1 well was spudded on Feb 10 and was drilled to a final depth of about 3.5 km.

The well flowed at an aggregate daily rate of 4,250 barrels of oil and 9.7 million cubic feet of

gas in three separate tests on four reservoir zones.

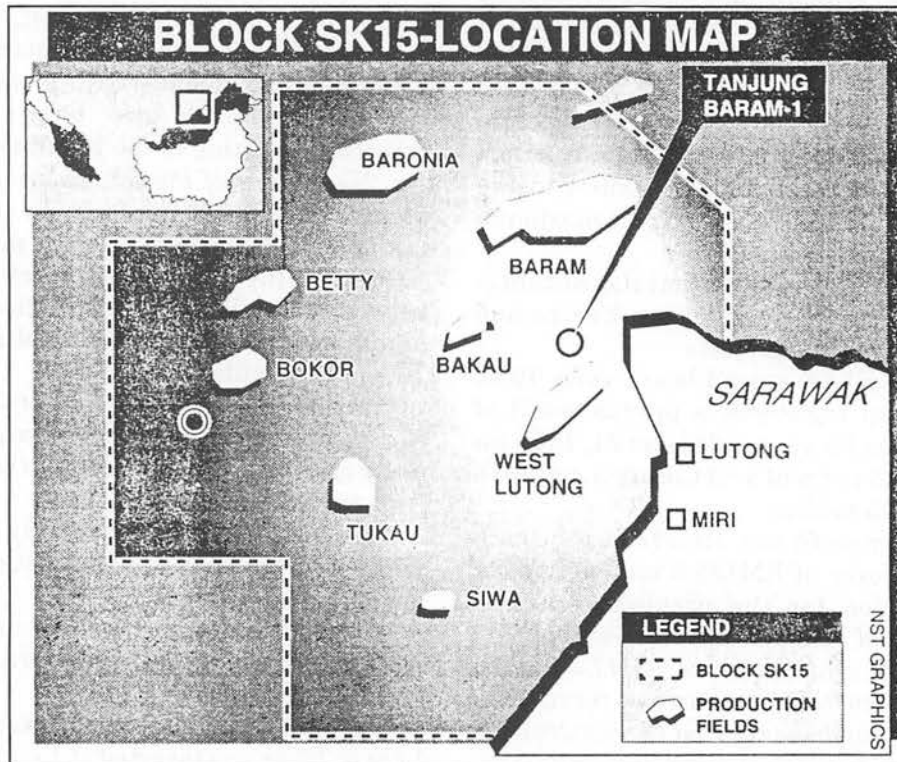
Currently, testing was being carried out in the fifth reservoir zone, it added.

Block SK-15, operated solely by Petronas Carigali, is located in the Baram Delta Province which is a well-known prolific oil area.

It covers the area outside of the nine oil fields for which Petronas Carigali is also the operator with a 50 per cent interest.

The nine oil fields are producing about 100,000 barrels of oil per day.

*NST, 29.4.1995*



## The Gros Morne Declaration: assessing rapid environmental change

*The following statement originated at the international Workshop on Geological Indicators of Rapid Environmental Change, held on July 11-17, 1994, in Corner Brook and Gros Morne National Park, Newfoundland, Canada. It is reproduced here in full for the benefit of members.*

### **Preamble** .....

We, earth scientists from many nations, peoples and cultures, speaking through the Commission on Geological Sciences for Environmental Planning of the International Union of Geological Sciences, urge that governments and other responsible authorities recognize the fundamental importance of understanding natural (see Note 1) and human-induced environmental changes, in which geological processes and geoindicators play a pivotal role. This recognition is a requirement to achieving any kind of sustainable development.

### **We emphasise that:** .....

Change is an inevitable aspect of our dynamic world. So that both natural and human-induced environmental change can be recognized, accommodated and managed, it is necessary to monitor a wide range of Earth-surface processes, both biotic and abiotic. Geological records of past environmental changes provide a major key to understanding on-going processes and to anticipating the future.

It is essential to ensure that long-term datasets are systematically collected and preserved, modifying procedures to take into account new issues and techniques. Applied and basic research, as well as routine study, are required to advance knowledge and understanding of the causes and directions of environmental change.

The public and the scientific community must recognize coordinated, long-term environmental monitoring as a mission of fundamental importance. The results provide the data necessary to assess the effects of environmental policies, legislation and management practices. Policy-makers, planners and the public must be informed of the benefits

of environmental monitoring and the costs of not doing so.

### **Rationale** .....

#### *Natural and human-induced environmental change*

Nature is complex and unstable. Change is the rule, not the exception, and surprises are common. Natural systems rarely remain for long in equilibrium. They adjust continually to new conditions, for example in climate, hydrological flow and sea level. Some changes are sudden, catastrophic and newsworthy, but there is a background of continual, small-scale change, the cumulative impact of which may be of even greater significance. All environmental change cannot, therefore, be blamed on human actions. Nevertheless, distinguishing between natural and human-induced change can be extremely difficult, as in the current debate on climate change.

In the case of some environmental changes, human influences may be inconsequential, as in volcanic eruptions and deep-focus earthquakes. In others, it may not be possible to separate natural from anthropogenic causes, as for example in the switching of river channels, coastal erosion, landsliding and the encroachment of deserts. It is also important to recognize that many changes, such as the contamination of groundwater, permafrost melting, desertification, and the degradation of soils, may be irreversible over time scales of importance to society.

Some changing environments reflect global trends, but it is important not to generalize all local and regional changes to the global scale. All local increases in sea level, for example, are not indicative of global rise.

#### *The record of the past*

All environments at the Earth's surface result from or are affected by the interaction of climate, human and other biological activity, and geological processes. Even if it is not now possible to predict environmental changes with

confidence, data on the recent geological past are fundamental to establishing trends and baselines, both of which are essential for developing new models and concepts. Government, academic institutions and industry must cooperate to provide the data needed to validate and calibrate models and to identify change.

It is essential to continue past efforts at environmental monitoring, to protect existing archives, to maintain and preserve long-term datasets, and to create new databases, such as on global permafrost. Long-term monitoring efforts (e.g. onstream sediment loads) are commonly abandoned as a result of short-term financial and administrative considerations. Irreplaceable information is also being lost because monitoring programs are not in place. Long-term records, for example on tides, stream discharge and water quality, CO<sub>2</sub> and ozone in the atmosphere, provide significant scientific and social benefits that were not anticipated when existing programs were established. These examples underscore the need to select appropriate indicators and begin monitoring immediately so that baselines can be established, and so that the links between natural and human impacts on the environment can be assessed.

### ***Indicators of rapid environmental change***

In order to assess the state of any environment, reliable indicators are needed, just as doctors use blood pressure and body temperature as simple, inexpensive guides to human health. Even if causes cannot be determined, we must be able to detect change and warn of dangerous conditions. Many monitoring tools and techniques required to achieve these goals are already available.

Ge indicators are measures of magnitudes, frequencies, rates and trends of geological processes and phenomena occurring over periods of 100 years or less, at or near the earth's surface, that are subject to variations of significance for understanding rapid environmental change. Geo indicators measure both catastrophic events and those more gradual but evident within a human lifespan. Some are complex and costly, but many are relatively simple and inexpensive to apply.

Examples of useful geo indicators include 1) visual observations of beach profiles and vegetation characteristics, which permit rapid assessment of the current stability of beaches and coastlines; 2) growth patterns of coral reefs, which provide detailed information on changes in ocean temperature and salinity, as well as discharge characteristics of major river systems; and 3) seismic events and ground deformation, which can be used to warn of impending volcanic eruptions. It is possible to utilize certain highly responsive natural settings as 'automated environmental recording stations', whose records can be read for both current and long-term changes. These include corals, cave deposits, water in the unsaturated zone, ground temperature conditions in permafrost areas, tree rings and lichens.

In searching for sustainability, we cannot afford to ignore important environmental indicators and the minimum datasets required to assess changes in erosion, sea levels, river flow, water quality or other earth processes that influence all eco-systems and our own well-being.

*Note 1:* While recognizing that concepts of 'nature' and 'natural' are linked with cultural values, this statement uses the terms to indicate environments uninfluenced by human activities, i.e. nature as wilderness.

*Note 2:* For example, in the absence of long-term records of beach erosion and sedimentation in Ocean City, Maryland, \$45 million was spent on a beach project that was destroyed in a single storm in 1992. In Spain, erosion due to natural processes and to poor land use indicates future declines in agricultural production and, ultimately, desertification. Long-term monitoring results have led to calculations of potential economic losses between 1986 and 2016 of \$8.7 billion, with losses in some areas of over \$2000 per hectare. As a result of these studies, public awareness of these problems has increased greatly, and preventive and corrective measures are now being implemented in many areas.

*Note 3:* Standard seismic indicators, for example, are available for the detection and assessment of earthquakes, though they are not always applied in monitoring projects that can induce earthquakes.

*(Episodes Nos 1 & 2, 1994)*

## 26th Underwater Mining Institute

October 29-31, 1995

Memorial University of Newfoundland  
Centre for Cold Ocean Resources Engineering (C-CORE)  
St. John's, Newfoundland, Canada

The International Marine Minerals Society (IMMS) and the Centre for Cold Ocean Resources Engineering (C-CORE) take great pleasure in cooperating to present the 1995 meeting of the Underwater Mining Institute, which includes the annual General Meeting of the IMMS. The host city, St. John's, is one of the oldest cities in North America and has been in existence for 497 years. It is a very picturesque and appropriate site for the 26th UMI.

The 26th Underwater Mining Institute is seeking presentations in three areas related to marine minerals: (1) aggregates and placer deposits, (2) high latitude problems, and (3) other topics of timely interest to professionals in marine minerals development.

### Technical Sessions:

These will be held in a large lecture theatre on the campus of Memorial University of Newfoundland. It is equipped with dual slide projectors and screens, and large monitors for display of VHS videotapes.

### Accommodations:

A block of rooms in the Holiday Inn have been reserved, where the registration and introductory reception will be held. These rooms, whether occupied by one or two people, will cost \$Can102 including taxes (currently 20%). In addition, accommodation in Bed and Breakfast (B&B) establishments can be arranged. Prices range from \$Can 49 to 78 (\$US 35 to 56) single, and \$Can 63 to 92 (\$US 46 to 67) double, including taxes.

### Fieldtrips:

In local tours we can offer the research facilities of C-CORE (including a 200 g centrifuge with a flying volume of 1 cubic metre), the Institute for Marine Dynamics (Environmental towing tank 200 m by 12 m by 7 m, with generation of waves and ice cover, and sea-state tank 75 m by 32 m by 8.5 m with wind and wave generators, and associated facilities) and the Fisheries and Marine Institute (large-scale hydraulic flume for testing of trawls and fishing gear). The Hibernia Gravity Based Structure (GBS) will be in final stages of construction at Mosquito Cove, a short distance outside St. John's. This massive concrete structure is designed to stand in 80 m of water, several hundred km off the shore of Newfoundland. A day tour of the GBS can be arranged for 1 November, the day following the UMI. For those interested in geology, we can also offer on 1 November, a day tour of the Pleistocene and Recent geology of the Avalon Peninsula. The Avalon is the lump projecting southeast from the main part of Newfoundland.

For submission or for more information, please contact the conference coordinator below:

Ms. Karynne Chong Morgan  
Underwater Mining Institute  
c/o Marine Minerals Technology Center  
811 Olomehani Street • Honolulu, Hawaii 96813-5513 USA  
Tel: (808) 522-5611 • Fax: (808) 522-5618  
INTERNET: 70673.534@compuserve.com • CompuServe: 70673,534

## KALENDAR (CALENDAR)

### 1995

**May 16-18**

**INTERNATIONAL SYMPOSIUM ON SEQUENCE STRATIGRAPHY IN SOUTHEAST ASIA**, Jakarta, Indonesia. (International Symposium on Sequence Stratigraphy in Southeast Asia, Indonesia Petroleum Association, Jl. M. Ikhwan Ridwan Rais 3, Jakarta 10110, Indonesia. Fax: (62-21) 375228)

**May 17-19**

**GEOLOGICAL ASSOCIATION OF CANADA and MINERALOGICAL ASSOCIATION OF CANADA** (Joint Annual Meeting), British Columbia, Canada. (Dr. Chris R Barnes. General Chair, SEOS, University of Victoria, P.O. Box 1700. Victoria, BC V8W 2Y2. Canada. Phone: (604) 721-6120; Telefax: (604) 721-6200)

**May 18-31**

**WORLD GEOTHERMAL CONGRESS**, Florence, Italy, by International Geothermal Association, and others. (IAG, LBL 50C. Rooms for 106-108. One Cyclotron Road, Berkeley, Calif. 94720. Phone: 510/486-4584. Fax: 510/486-4889)

**May 24-26**

**GOLDSCHMIDT GENERAL GEOCHEMISTRY CONFERENCE**, University Park, Pa., by the Geochemical Society, and others. (Suzanne St. Pierre. Phone: 814/865-7557. Fax: 814/865-3749)

**May 28-June 1**

**MINING AND THE ENVIRONMENT — SUDBURY '95**, ann. conf., Sudbury, Canada. (Andrew J. Oliver, Mineral Sciences Laboratory, CANMET, 555 Booth St., Ottawa, Ontario, Canada K1A 0G1. Phone: 613/996-5619; Fax: 613/996-9041)

**May 29-June 2**

**EUROPEAN ASSOCIATION OF EXPLORATION GEOPHYSICISTS** (57th

Annual Meeting and Exhibition), Glasgow, UK. (Evert van der Gaag, Business Manager EAEG, P.O. Box 298, 3700 AG Zeist, The Netherlands. Phone: +31 (0)3404 56997; Telefax: +31 (0)3404 62640)

**June 3-6**

**CARBONATE-HOSTED LEAD-ZINC DEPOSITS**, int'l mtg., St. Louis, by Society of Economic Geologists. (Martin Goldhaber, U.S. Geological Survey, MS 973, Box 25046, Federal Center, Denver, 80225-0046. Fax: 303/236-3200; E-mail: mgold@helios.cr.usgs.gov)

**June 4-7**

**ROCK MECHANICS**, symposium, Lake Tahoe, Nev., by U.S. National Committee for Rock Mechanics. (Jaak Daemen, Mining Engineering, MS 173, University of Nevada, Reno, 89557-0139. Phone: 702/784-4309; Fax: 702/784-1766)

**June 4-10**

**MANAGING THE EFFECTS OF MAN'S ACTIVITIES ON GROUNDWATER** (26th Congress of IAH). Edmonton, Canada. (Solutions 95, 10769-99 Street, Edmonton, Alberta, Canada T5H 4H6. Phone: +403 4245281; Telefax: +403 4245306)

**June 5-12**

**XVIII PACIFIC SCIENCE CONGRESS: POPULATION, RESOURCES AND ENVIRONMENT — PROSPECTS AND INITIATIVES**, Beijing China. (Mr. XIAO Jianzhang, Dept. Exhibition, China International Conference Center for Science and Technology, No. 44 Kexueyuan Nanlu Rd., Shuangyushu, Haidian District, Beijing 100086, China. Tel: (+86)-1-2575672 Fax: (+86)-1-2575691/2546498)

**June 7-9**

**AFRICAN MINING '95**, Windhoek, Namibia. (The Conference Office, The Institution of Mining and Metallurgy, 44 Portland Place, London W1N 4BR. Phone: +44 (0)71-580 3802; Telefax: +44 (0)71-436 5388)



**June 11-16**

**AMERICAN NUCLEAR SOCIETY**, ann. mtg., Atlantic City, N.J. (ANS, 555 N. Kensington Ave., La Grange Park, III. 60525. Phone: 312/352-6611)

**June 12-16**

**ORDOVICIAN SYSTEM** (7th International Symposium), Las Vegas, Nevada, USA. (Dr. Margaret Rees, Dept. of Geosciences, University of Nevada, Las Vegas, 89154-4010 USA. Phone: 702/739-3262. Fax: 702/597-4064)

**June 18-22**

**RAPID EXCAVATION AND TUNNELING**, mtg., San Francisco. (Society for Mining, Metallurgy, and Engineering, Box 625002, Littleton, Colo. 80162-5002. Phone: 303/973-9550. Fax: 303/979-3461)

**June 18-23**

**GEOMORPHOLOGY**, (Conference, International Association of Geomorphologists, SE Asia), Singapore. (Dr. GOH Kim Chuan/NIE Division, Nanyang Technological University, 469 Bukit Timah Road, Singapore 1025. Fax: 65 469 8433)

**June 23-25**

**GRAPTOLITE WORKING GROUP**, by International Palaeontological Association; int'l conf., Long Beach, Calif. (Stan Finney, Dept. of Geological Sciences, California State Univ., Long Beach, 90840. Phone: 310/985-8637; Fax: 310/985-2315; E-mail: scfinney@beach.csulb.edu)

**June 25-27**

**HEAVY OIL**, int'l mtg., Calgary. (Society of Petroleum Engineers, Meetings and Exhibitions Dept., Box 833836, Richardson, Texas 75083-3836; Phone: 214/952-9393; Fax: 214/952-9435)

**June 25-28**

**WATER RESOURCES AND ENVIRONMENTAL HAZARDS IN THE PACIFIC RIM**, mtg., Honolulu by American Water Resources Association. (AWRA, Suite 220, 5410 Grosvenor Lane, Bethesda, Md. 20814-2192. Phone: 301/493-8600; Fax: 301/493-5844)

**June 26-30**

**ACIDIC DEPOSITION: SCIENCE AND POLICY**, int'l mtg., Gothenburg, Sweden. (Peringe Grennfelt, Swedish Environmental

Research Institute, Box 47086, S-402 58 Gothenburg. Phone: +46(0)31 46 00 80; Fax: +46(0)31 48 21 80)

**June 26-July 1**

**EUROPEAN COAL CONFERENCE '95**, Prague, Czech Republic. (ECC '95, Faculty of Science, Charles University, Albertov 6, 128 43 Prague 2, Czech Republic. Phone: 2 24915472; Telefax: 2 296084)

**July 2-14**

**INTERNATIONAL UNION OF GEOLOGICAL SCIENCES** (21st General Assembly), Boulder, Colorado. (IUGG XXI General Assembly, c/o American Geophysical Washington, DC 20009, USA)

**July 2-14**

**INTERNATIONAL UNION OF GEODESY AND GEOPHYSICS**, mtg., Boulder, Colorado, USA (IUGG General Assembly, c/o American Geophysical Union, 2000 Florida Avenue, NW, Washington, D.C. 20009, USA)

**July 3-9**

**COASTAL SEDIMENTOLOGY**, mtg., Niteroi, Brazil. (Cleverson Guizan Silva, Dept. de Geologia/LAGEMAR, Universidade Federal Fluminense, Av. Bento de Maria da Costa 115-a, Charitas, Niteroi, R.J. 24.370-190, Brazil. Fax: 5521-711-9917)

**July 10-12**

**PYROMETALLURGY**, mtg., Cambridge, England. (Conference Office, Institution of Mining and Metallurgy, 44 Portland Place, London W1N 4BR. Phone: +44 71 436 5388)

**July 10-14**

**REEFS AND CARBONATE PLATFORMS IN THE PACIFIC AND INDIAN OCEANS**, Sydney, Australia. (D.D. Bergersen, Department of Geology and Geophysics, University of Sydney, NSW, Australia. Phone: 61 2 692 4050; Telefax: 61 2 692 0184)

**July 10-14**

**APCOM 25: APPLICATIONS OF COMPUTERS AND OPERATIONS RESEARCH IN THE MINERALS INDUSTRIES, BRISBANE, AUSTRALIA**. (Australasian Institute of Mining and Metallurgy, Box 122, Parkville Victoria, Australia 3052. Phone: 03/347-3166. Fax: 03/347-8525)

**July 17-21**

**PELAGIC BIOGEOGRAPHY** (2nd International Conference). Amsterdam, The Netherlands. (S. Vander Spoel Institute of Taxonomic Zoology, P.O. Box 94766, 1090 GT Amsterdam, The Netherlands. Phone: 31 20 525 5402)

**July 18-20**

**COASTAL AND OCEAN ZONE MANAGEMENT** (9th International Symposium), Tampa, Florida, USA. (Dr. Billy Edge, Ocean Engineering Program: Civil Engineering Department. Texas A&M University, College Station, Texas 77843 3136, USA)

**August 7-12**

**6TH INTERNATIONAL KIMBERLITE CONFERENCE**, Novosibirsk, Russia. (Dr. N. Pokhilenko, United Institute of Geology Geophysics and Mineralogy, Russian Academy of Sciences, Siberian Branch, 630090 Novosibirsk-90, Russia. Telex: 133123 KORA SU; Telefax: 007 3832 3526 92; E-mail: chief@diamond.msk.su.

**August 9-10**

**TERRESTRIAL CARBON CYCLE CHANGES DURING THE LAST 150 Ky** (International Symposium, INQUA), Berlin, Germany. (H. Faure, Luminy Case 907, F 13288 Marseille Cédex, 09, France. Telefax 33 91 26 66 38)

**August 13-16**

**CONGRESS ON SEDIMENTARY GEOLOGY**, St. Petersburg, Fla., by Society for Sedimentary Geology. (SEPM, Box 4756, Tulsa, Okla. 74159-0756. Phone: 800/865-9765; Fax: 918/743-2498)

**August 13-18**

**WATER-ROCK INTERACTION** (8th International Symposium), Vladivostok, Russia. (Oleg Chudaev, Far East Geological Institute, 690022 Vladivostok, Russia. Phone: 7 4232 3172567; Telefax: 75098512430; Telex: 213212 FEBAS SU; E-mail: fegi@visenet.iasnet.com)

**August 21-25**

**RESEARCH METHODS IN ANCIENT AND MODERN LACUSTRINE BASINS** (1st International Limno-geological Congress), Copenhagen, Denmark. (Dr. Nanna Noe-

Nygaard, Geological Institute, University of Copenhagen, Øster Volgade 10, Copenhagen 1350 K, Denmark. Phone: 45 35322491; Telefax: 45 35322499)

**August 22-September 1**

**INTERPLATE MAGMATISM IGCP 336**, Duluth, Minn. (Penny Morton, Dept. of Geology, University of Minnesota, Duluth, 55812. Phone: 218/726-7962; Fax: 218/726-8275; E-mail: pmorton@ua.d.umn.edu)

**August 24-September 5**

**OROGENIC LHERZOLITES AND MANTLE PROCESSES** (2nd International Workshop), Granada, Spain. (H.G. Barszczus, Géofluides GBE/ISTEEM, CP 057, Université de Montpellier 2, 34095 Montpellier Cedex 5, France. Phone: 33 6714 3933; Telefax: 33 6714 4774; E-mail: barszczus@dstu.univ-montp2.fr)

**August 27-September 1**

**GEOLOGY OF THE EASTERN MEDITERRANEAN REGION** (2nd International Symposium), Jerusalem, Israel. (P.O. Box 50006, Tel-Aviv 61500, Israel. Phone: 972 3 5140014; Telefax: 972 3 5175674)

**August 28-31**

**MINERAL DEPOSITS: FROM THEIR GENESIS TO THEIR ENVIRONMENTAL IMPACTS** (3rd Biennial SGAM Meeting), Prague, Czech Republic. (Dr. Jan Pasava, Secretary General, Czech Geological Survey, Klarov 131/3, 118 20 Praha 1, Czech Republic. Phone: (42) 2 537011; Telefax: (42) 2 7980965)

**August 28-September 1**

**TECTONIC AND METALLOGENY OF EARLY/MID PRECAMBRIAN OROGENIC BELTS**, Montreal, Canada. (J.A. Percival, Geological Survey of Canada, 601 Booth St., Ottawa, Ontario, Canada, K1A 0E8. Phone: (613) 995-4723; Telefax: (613) 995-9272; E-mail: ipercival@6091C.gsc.emr.ca)

**August 28-September 2**

**CARBONIFEROUS-PERMIAN** (13th International Congress), Krakow, Poland. (XIII ICC-P Secretary General, Prof. dr.hab Sonia Dybova-Jachowicz, Państwowy Instytut Geologiczny, Oddział Córnoślaski, 1 Królowej Jadwigi, 41-200 Sosnowice, Poland. Phone: 48 32 66 20 36; Telefax: 48 32 66 55 22)

**August 28-September 2**

*ORIGIN OF GRANITES* (3rd Hutton Symposium), College Park, Maryland, USA. (Dr. Michael Brown, Dept. of Geology, University of Maryland at College Park, College Park, MD 20742 USA. Phone: 301/405-4082. Telefax: 301/314-9661)

**August 31**

*INQUA*, Berlin, Germany. (E. Derbyshire, Royal Holloway and Bedford New College, London University, Egham, Surrey TW20 0EX, UK. Telefax: +44(0)273-748919)

**September 1**

*BRACHIOPODES ACTUELS ET FOSSILES* (International congress). Sunbury, Ontario, Canada. (M. Gayet and B. Courtinat. Université Claude-Bernard Lyon 1, Centre des Sciences de la Terre, 27-43, boulevard du 11-nov., F-69622 Villeurbanne Cedex, France. Phone: 72 44 83 98 and 72 44 85 72; Telefax: 72 44 84 36)

**September 3-9**

*RADIOACTIVE WASTE MANAGEMENT AND ENVIRONMENTAL REMEDIATION*, mtg., Berlin, by American Society of Mechanical Engineers. (Steven C. Slate, Battelle Pacific Northwest Laboratory, MSIN K1-19, Box 999, 902 Battelle Blvd., Richland, Wash, 99352. Phone: 509/375-3903; Fax: 509/375-5963; E-mail: sc\_slate@pnl.gov)

**September 4-8**

*DYKES* (3rd International Conferences), Jerusalem, Israel. (Dr. Gideon Baer, Geological Survey of Israel, 30 Malkhe Israel Street, Jerusalem 95501, Israel. Telefax: 972 2 3806688)

**September 4-9**

*ASSOCIATION OF EUROPEAN GEOLOGICAL SOCIETIES* (9th Meeting), St. Petersburg, Russia. (Dr. A. Kotov, Institute of Precambrian Geology and Geochronology, Marakova Emb. 2, St. Petersburg, Russia. Phone: (812) 218 4701; Telefax: (812) 218 48 01; E-mail: spire@sovamsu.sovusa.com)

**September 4-9**

*DEVONIAN MICROVERTEBRATE BIOCHRONOLOGY* (Final Meeting of IGCP 328, followed by field meeting in N. France/Belgium, 9-25 September), Paris, France. (Dr. Alan Blicek, telefax: 33 2043 6900)

**September 4-9**

*TERRESTRIAL PLANTS IN GEOLOGIC TIME*, int'l. mtg., Nanjing, China. (ICTPG, Dept. of Paleobotany, Nanjing Institute of Geology and Palaeontology, Nanjing)

**September 10-13**

*AMERICAN ASSOCIATION OF PETROLEUM GEOLOGIST*, int'l conf., Nice, France, by AAPG and Institut Francais du Petrole. (AAPG, Box 979, Tulsa, Okla. 74101. Phone: 918/584-2555). Call for Papers deadline: Nov. 15.

**September 10-14**

*GEOHAZARDS AND ENGINEERING GEOLOGY*, ann. conf., Coventry, England, by the Engineering Group of the Geological Society. (Steve Penn, Coventry University, School of the Built Environment, Priory St., Coventry, CV1 5FB). Abstracts due Nov. 30.

**September 10-20**

*KARST WATER AND ENVIRONMENTAL IMPACTS* (5th International Symposium), Antalya, Turkey. (G. Günay, Karst '95, P.O. Box 357, Kizilay, 06420 Ankara, Turkey. Phone: 90 41312 235 2543; Telefax: 90 41312 235 2862)

**September 18-20**

*REMOTE SENSING FOR MARINE AND COASTAL ENVIRONMENTS*, Seattle, by Environmental Research Institute of Michigan, and others. (Robert H. Rogers, ERIM, Box 134001, Ann Arbor, Mich., 48113-4001. Phone: 313/994-1200, ext. 3453; Fax: 313/994-5123)

**September 18-23**

*FROM RIFTING TO DRIFTING IN PRESENT-DAY AND FOSSIL OCEAN BASINS* (International Ophiolite Symposium). Pavia, Italy. (Dr. R. Tribuzio, Dipartimento di Scienze della Terra, Università di Pavia, via Abbiategrasso, 209, 1-27100 Pavia, Italy. Phone: 382 505874; Telefax: 382 505890)

**September 29-October 2**

*PALEOBIOLOGY AND EVOLUTION OF THE BIVALVIA* (5th Canadian Paleontology Conference and International Symposium — Joint Meeting), Drumheller, Alberta, Canada. (Paul A. Johnston, CPC-V, Royal Tyrrel Museum of Paleontology, P.O. Box 7500, Drumheller, Alberta T0J9Y0. Phone: 403 823 7707; Telefax: 403 823 7131)

**October 9-13**

**GEOLOGY FOR DEVELOPMENT WITHIN A SUSTAINABLE ENVIRONMENT** (10th Conference of the Geological Society of Africa), Nairobi, Kenya. (Secretary GSA 95 Organising Committee, P.O. Box 60199, Nairobi)

**October 10-14**

**AMERICAN ASSOCIATION OF STRATIGRAPHIC PALYNOLOGISTS** (28th Annual Meeting), Ottawa, Canada. (Ms Susan A. Jarzen, Canadian Museum of Nature, P.O. Box 3443, Station D, Ottawa, Ontario, Canada K1P 6P4. Telefax: 613 954 4724)

**October 10-14**

**PALEOCEANOGRAPHY** (International Meeting) Halifax, Nova Scotia. (Larry Mayer, Ocean Mapping Group, Dept. of Surveying and Engineering, Box 4400, Fredericton, New Brunswick, Canada E3B 5A3)

**October 16-20**

**LAND SUBSIDENCE — FISOL '95** (1st International Symposium), La Haye, The Netherlands. (F.H. Schröder, Netherlands Geodetic Commission, P.O. Box 5030, NL-2600 GA Delft, The Netherlands)

**October 17-19**

**SEISMIC ZONATION** (5th International Conference), Nice, France. (5th ICZS, AFPS Domaine de Saint-Paul, BP 1, 78470 Saint Remy Les Chevreuse, France. Telefax: (33-1) 30 52 75 75)

**October 22-25**

**AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS** (International Conference and Exhibition), Cairo, Egypt. (AAPG Convention Department, P.O. Box 979, Tulsa, OK 74101, USA. Phone: (918) 584-2555)

**November 4-6**

**GEOLOGY OF SOUTHEAST ASIA AND ADJACENT AREAS**, Joint Meeting of IGCP Projects 306, 321 & 359, Hanoi, Vietnam. (Prof. Dang Vu Khuc, Geological Museum, 6 Pham Ngu Lao, Hanoi, Vietnam. Phone: 84.4.266.802, Fax: 84.4.254.734)

**November 5-9**

**SOCIETY OF EXPLORATION GEOPHYSICISTS** (Annual Conference), Denver, Colorado, USA. (Society of Exploration Geophysicists. Convention Assistant, P.O. Box

702740, Tulsa, OK 74170, USA)

**November 6-10**

**CURVED OROGENIC BELTS: THEIR NATURE AND SIGNIFICANCE**, Buenos Aires, Argentina. (Dr. Jose Selles-Martinez, COB '95, Dpto. de Ciencias Geologicas, Pabellon 2 Ciudad Universitaria, 1428 Buenos Aires, Argentina. Phone: 54 1 781 8213; Telefax: 54 1 788 3439; E-mail: postmast@lpgfcf.uba.ar)

**November 7-11**

**RIVER SEDIMENTATION** (6th International Symposium), New Delhi, India, (Shri C.V.J. Varma, Central Board of Irrigation and Power, Malch Marg, Chanakyapuri, New Delhi 110021, India. Phone: 91 11301 5984; Telefax: 91 11301 6347; Telex: 31 66415 CBIP IN)

**November 19-22**

**PACRIM** (Congress), Auckland, New Zealand. (Mrs. Charmayne Perera, Congress Secretariat, Australasian Institute of Mining and Metallurgy, P.O. Box 122, Parkville, Vic 3052, Australia. Phone: (03) 347-3166; Telefax: (03) 347-8525; E-mail: j.mauk@auckland.ac.nz)

**December 9-11**

**QUATERNARY DESERTS AND CLIMATIC CHANGE** (JIGCP 349 Meeting), Al Ain, United Arab Emirates. (A.S. Alsharhan, Desert and Marine Resource Center, UAE University, P.O. Box 17777, Al Ain United Arab Emirates. Phone: 971 3 638 150; Telefax: 971 3 620486)

**1996**

**CANADIAN INSTITUTE OF MINING, METALLURGY AND PETROLEUM**, (98th Annual General Meeting), Quebec City, Quebec, Canada. (John Gaydos, Meetings Manager, Canadian Institute of Mining and Metallurgy, 1 Place Alexis Nihon, 1210-3400 de maisonneuve Boulevard West, Montreal, Quebec H3S 3B8, Canada. Phone: (514) 939-2710; Telefax: (514) 939-2714)

**GEOSTATISTICS** (5th International Congress). Wollongong, New South Wales, Australia. (Géostatistique de l'École des Mines de Paris, 35 rue Saint Honoré, 77305 Fontainebleau, France. Phone: (1) 64 69 47 04; Telefax: (1) 64 69 47 05)

**February 19-23**

*GEOSCIENCE IN THE COMMUNITY* (13th Australian Geological Convention and Celebration of the Jubilee of BMR/AGSO), Canberra, Australia. (ACTS, GPO Box 220, Canberra ACT, 2601 Australia)

**February 27-29**

*MYANMAR (BURMA) OIL & GAS EXPO '96* (Downstream & Upstream), Yangon (Rangoon), Myanmar (Burma). (Mr. K.G.E. Kay, CP Exhibition, 2801 Tung Wai Commercial Building, 109 Gloucester Road, Wanchai, Hong Kong. Fax: 852-25119692; Tel: 852-25117427, Tlx: 76270 HX)

**March 6-8**

*VIETNAM OIL & GAS EXPO '96* (3rd Expo) (Upstream & Downstream), Hanoi, Vietnam. (Mr. K.G.E. Kay, CP Exhibition, 2801 Tung Wai Commercial Building, 109 Gloucester Road, Wanchai, Hong Kong. Fax: 852-25119692; Tlx: 76270 HX)

**March 8-15**

*GEOLOGICAL SURVEYS AND SUSTAINABLE DEVELOPMENT* (Conference to mark the Centennial of the Geological Survey of Egypt), Cairo, Egypt. (M. El. Hinnawi, Geological Survey of Egypt, 3 Salah Salem Road, Abbassiya, Cairo, Egypt. Telefax: 002 02 820 128)

**April 24-27**

*NATURAL HAZARDS, LAND-USE PLANNING AND THE ENVIRONMENT* (6th Spanish Congress and International Conference), Granada, Spain. (Clemente Iligaray Fernández, Departamento de Ingenieria Civil, Facultad de Ciencias, Universidad de Granada, Campus Fuentenueva, 18071 Granada, Spain. Phone/Telefax: 34 58 243 367; E-mail: jchacon@ugr.es)

**May 19-22**

*AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS* (Annual Conference), San Diego, California, USA. (AAPG Convention Department, P.O. Box 979, Tulsa, OK 74101, USA. Phone: (918) 584-2555)

**May 27-29**

*GEOLOGICAL ASSOCIATION OF CANADA and MINERALOGICAL ASSOCIATION OF CANADA* (Joint Annual Meeting), Winnipeg, Manitoba, Canada. (G.S. Clark, Department of Geological Sciences, University of Manitoba, Winnipeg, Manitoba, Canada R3T 2N2. Phone: (204) 474-8857; (204) 261-7581)

**June 2-6**

*4TH CONFERENCE ON PETROLEUM GEOCHEMISTRY AND EXPLORATION IN THE AFRO-ASIAN REGION*, Arusha-Tanzania. (The 4th AAAPG Conference Secretariat, Tanzania Petroleum Development Corporation, P.O. Box 5233, Dar Es Salaam, Tanzania, East Africa. Phone: 255-51-29661/2 & 36086; Fax: 255-51-29663/20775; Telex: 41219 Oil Exp. Attn: Mr. Y.S. Mwalyego, Ms. F.K. Mpanju, Mr. E.A. Kilembe)

**June 3-7**

*EUROPEAN ASSOCIATION OF EXPLORATION GEOPHYSICISTS and EUROPEAN ASSOCIATION OF PETROLEUM GEOLOGISTS* (EAEG 58th Annual Assembly and EAPG 8th Annual Congress), Amsterdam, Netherlands. (EAPG, Attention of Mr. E. van der Gaag, P.O. Box 298, NL-3700 AG, Zeist, Netherlands)

**June 9-12**

*NORTH AMERICAN PALEONTOLOGICAL CONVENTION* (6th). Washington, DC, USA. (NAPC-VI, c/o Department of Paleobiology, Mail Stop 121, National Museum of Natural History, Washington, DC, 20560, USA)

**June 17-21**

*INTERNATIONAL SYMPOSIUM ON LANDSLIDES* (7th), Trondheim, Norway. (Norwegian Geotechnical Society, P.O. Box 40, Taasen N-0801, Oslo, Norway)

**June 22-29**

*INTERNATIONAL PALYNOLOGICAL CONGRESS* (9th), Houston, Texas. (Dr. Vaughn M. Bryant, Department of Anthropology, Texas A & M University, College Station, TX 77843, USA. Phone: 409 845 5242; Telefax: 409 845 4070; E-mail: glwrenn@lsuvm.sncc.lsu.edu)

**August 4-14**

**30TH INTERNATIONAL GEOLOGICAL CONGRESS** (30th), Beijing, China. (Prof. Zhao Xun, Deputy Secretary General, 30th IGC, P.O. Box 823, Beijing 100037, P.R. China. Phone: 86 1 8327772; Telefax: 86 1 8328928)

**October 28-31**

**GEOLOGICAL SOCIETY OF AMERICA** (Annual Meeting), Denver, Colorado, USA. (Jean Kinney, GSA Headquarters, Box 9140, 3300 Penrose Place, Boulder. CO 80301, USA. Phone: 303/447-2020. Fax: 303/447-1133)

**1997**

**ASSOCIATION OF EUROPEAN GEOLOGICAL SOCIETIES** (10th Meeting), Karlov Vary, Czechoslovakia. (Geological Society, Burlington House, Piccadilly, London W1V 0JU, UK. Phone: +44 (0) 71 -434 9944)

**CANADIAN INSTITUTE OF MINING, METALLURGY AND PETROLEUM** (99th annual general meeting), Vancouver, British Columbia, Canada. (John Gaydos, Meetings Manager, Canadian Institute of Mining and Metallurgy, 1 Place Alexis Nihon, 1210-3400 de

Maisonneuve Boulevard West, Montreal, Quebec H3Z 3B8, Canada. Phone: (514) 939-2710; Telefax: (514) 939-2714)

**1998**

**CANADIAN INSTITUTE OF MINING, METALLURGY AND PETROLEUM** (100th annual general meeting), Quebec, Canada. (John Gaydos, Meetings Manager, Canadian Institute of Mining and Metallurgy, 1 Place Alexis Nihon, 1210-3400 de Maisonneuve Boulevard West, Montreal, Quebec H3Z 3B8, Canada. Phone: (514) 939-2710; Telefax: (514) 939-2714)

**10TH IAGOD SYMPOSIUM**, Australia. (Professor I.R. Plimer University of Melbourne, Parkville, VIC 3052, Australia. Phone: 613 3446520; Telefax: 613 3447761)

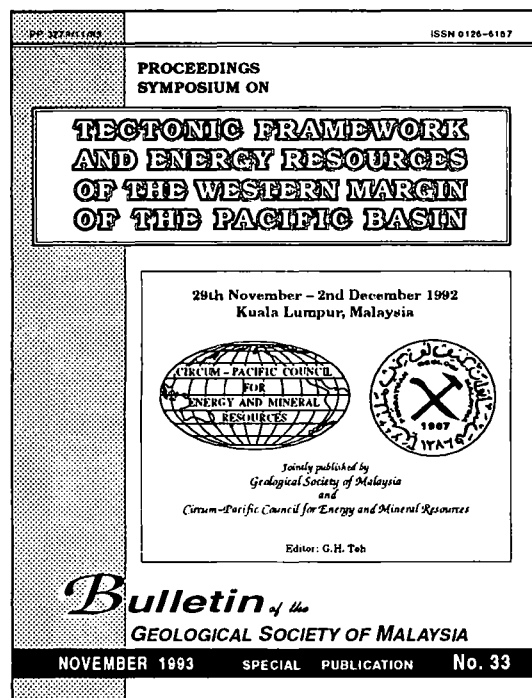
**August 9-15**

**INTERNATIONAL MINERALOGICAL ASSOCIATION: IMA '98** (17th General Meeting) Toronto, Canada. (Professor A.J. Naldrett, Department of Geology, University of Toronto, Canada M5S 3B1. Phone: (416) 978 3030; Telefax: (416) 978 3938; E-mail: ima98@quartz.geology.utoronto.ca)

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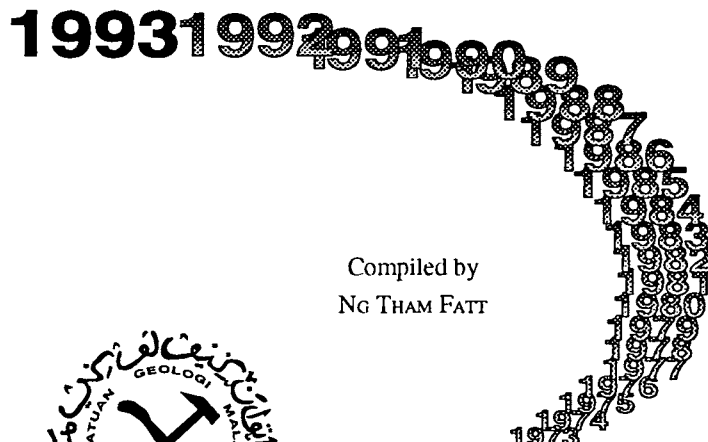
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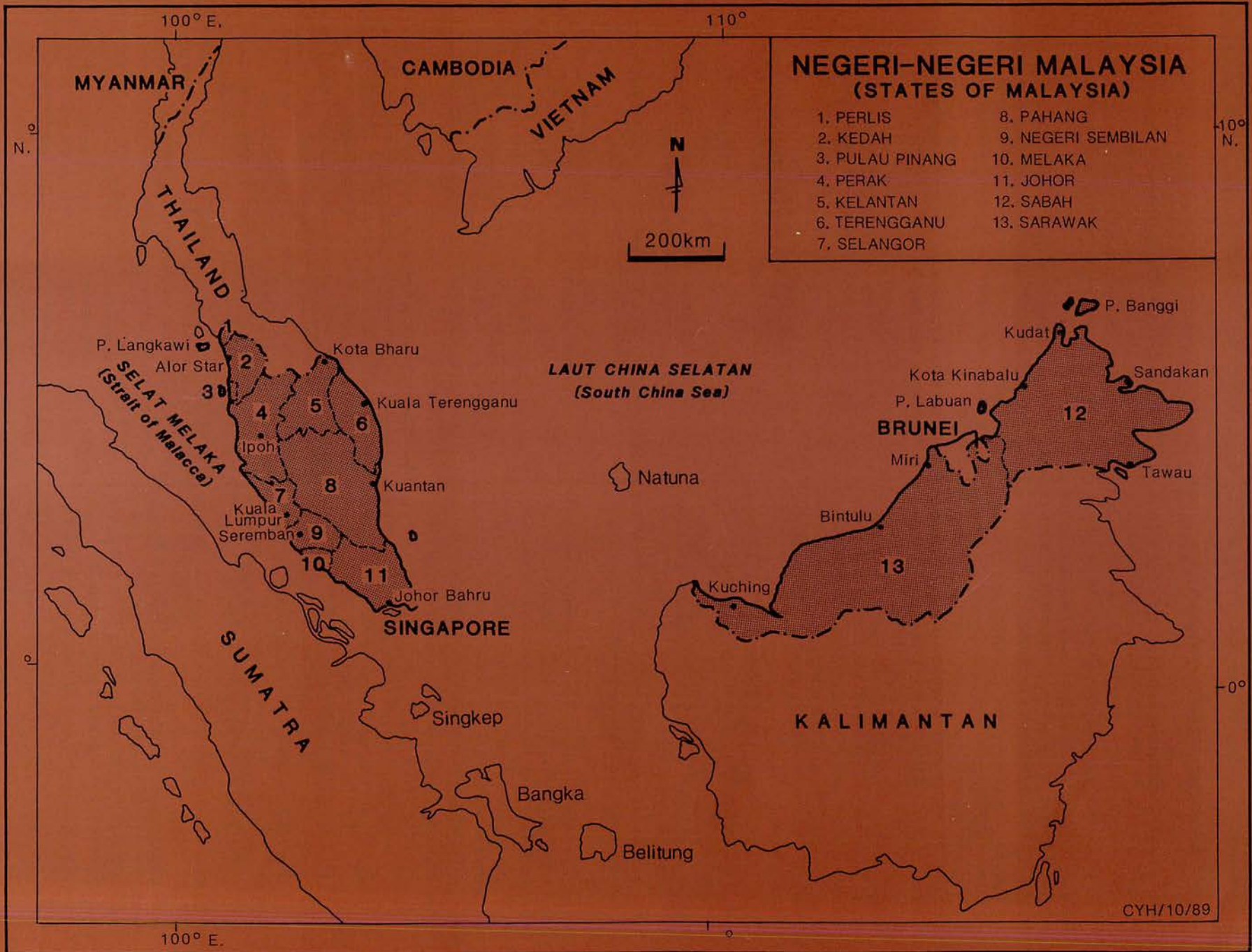
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0°

10° N.

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0°

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