

# WARTA GEOLOGI

PERSATUAN GEOLOGI MALAYSIA

NEWSLETTER OF THE GEOLOGICAL SOCIETY OF MALAYSIA



GEOLOGICAL  
SOCIETY OF  
MALAYSIA

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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

### A geologist's reflection on World Environment Day

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43600 Bangi, Selangor Darul Ehsan

Throughout its geological history the face of the earth has been constantly changing; mountains have been levelled and bottoms of oceans have emerged to become peaks of the highest mountains today; some land is being destroyed and new land is being created. The forces that have engineered these changes are natural geological processes. They occur everywhere and all the time. Some of them are *active* while some are *passive*.

In Japan, Indonesia and Philippines, where active events such as volcanism and earthquakes are common, the society is well adapted to disasters and their cultures, attitudes and actions embrace the risks and dangers. A very high awareness of the consequences of their interaction with the land is already inborn: the Japanese construct their buildings to withstand the severest earthquakes; Indonesians cultivate slopes of active volcanoes with the clear distinction that while they live off this land, they do not settle there.

In most other countries the geological processes change the earth's surface much more gently in the forms of weathering, erosion and slope movements. These passive processes are not dramatic or spectacular, as in a volcanic eruption, which is why it is hard to believe that they also threaten humans. This complacency has led to defiance — some people think that as long as he has money he can build anywhere, including steep slopes and karstic topography. Many buildings in Kuala Lumpur today exemplify this arrogance and sometime in the future someone will pay for it.

Throughout human civilisation major disasters triggered by passive events have occurred where thousands of people have died. In total more people have died from these causes rather than from sensational volcanic eruptions. Slope movements, especially landslides and slope failures, are prime events leading to disaster. The figures are alarming: the 1962 debris avalanche at the slope of Mt. Huascaran, Peru, killed about 5,000 people; the 1963 landslide at Vaiont Dam in Italy killed 3,000 people; the 1970 debris avalanche at Yungay, Peru, killed about 18,000 people! And the list goes on. When lives are not lost, the cost to the community is still great in terms of property damage and inconveniences to their daily lives.

Some disasters occur because people are ignorant of the risks of these passive events: while most people would avoid living near an active volcano, they settle in valleys of mountainous areas without thinking twice. But once an event occurs, they then live in fear for their lives.

Passive events hazards are not confined to slope movements. In Malaysia, erosion and siltation that lead to flash floods are more pressing problems. Huge amounts of material removed from large tracts of land accumulate and choke the drainage system. The flash floods that ensue become commonplace events even under normal rainy conditions. They represent cumulative effects which are difficult to remedy once they occur. Kuala Lumpur is strained to the limit by this unending trouble and in all likelihood will in the near future

become unbearable, as it is already an acute problem.

Passive events pose low risk to humans as long as humans are fully aware of their potential hazard and take steps to avoid it. In Malaysia, the big problem is that not only do we ignore the risks of passive events occurring naturally, we aggravate the situation by indiscriminately clearing and cutting slopes. The risk is now increased from a hundred to a thousand fold. In fact, under these circumstances where changes start to occur very rapidly, the geological processes that take place can now be termed 'active'.

Clear examples of passive-turned-active disaster events in Malaysia are the 1993 Highland Towers collapse, the 1995 Genting Sempah sliproad debris flow and the 1996 Gua Tempurung slope failure. These events were essentially caused by the lack of understanding of the earth's behaviour when it is disturbed. The earth's character is generally assumed to be simple, with quickfix solutions applied without due caution. Debris flow events had already occurred several times in the Genting Sempah area but because none had affected human lives or property, human beings, in their folly, kept hoping that this situation would persist. A perverse coincidence of events led to the disaster: a flash flood had closed off the tunnel to traffic, forcing all vehicles to use the sliproad. A minor landslide on this sliproad caused a traffic jam at a crucial time and place where a huge debris flow suddenly occurred, sweeping everything in its way and causing 21 deaths.

Many less-publicised events have led to property damage. Over the last ten years hundreds of failures occurred at highways, residential areas, hillside stations, hillside roads, limestone hills, and ex-mining areas. Rehabilitation and maintenance have cost the country billions. The agony we face is that repairs need to be carried out continually — something we remedy at great cost today becomes a problem again in just a few years. This unending cycle of restoration can be seen in the sad state of affairs of the east-west highway.

Greed, egoism, arrogance and materialism are some of the human follies responsible for augmenting natural perils. The human intellect, technological capability and the human endeavouring spirit have brought mankind to the pinnacle of civilisation it is today. But, untempered, these very strengths can become vexing and are the root causes of most man-induced disasters.

Man's innate desire to rise to a challenge has made him a very successful species on the earth's surface today. We are elated by the bridges that we build, the planes that we fly to conquer the skies, and the ships that we navigate to explore the oceans. We think we can overcome all of nature's obstacles. But she works in strange and mysterious ways — we can only make predictions based on past knowledge which in itself is incomplete. Because of this avoidance is better than mitigation and should be the basic philosophy underlying our desire to flourish.

Technology explosion has also contributed to man's contempt for nature. Excavation works which used to take several years to do and, thus unfeasible, today are reduced to mere weeks or months. Hence hills are flattened, forests are ravaged and slopes cut without due consideration. Techniques have also been developed to stabilise slopes which can be used as 'bandaids' to solve problems whenever they arise. Hence the need to understand slopes is obliterated, so much so many ground testing and measurement undertakings have become 'window dressings'. Suitability is no longer an important criterion and safety is translated into cost through overdesign.

Greed, the omnipresent evil, is nature's greatest enemy. In the obsession to make profit, rules and regulations are pushed aside, loopholes are exploited and risks are ignored. In many instances construction is done with poor materials and does not conform to specification. Speed becomes the order of the day and, even more dangerous, the reality is covered-up through cosmetics, such as beautiful sketches and photography and thick glossy reports. The gullible and uninformed consumer is persuaded that everything is rosy all along the way. He

is then surprised when foundations fail, slopes collapse, drains choke and his whole neighbourhood becomes flooded.

In Malaysia, although some disasters that have occurred were due to natural causes, many, indirectly or directly, were due to human folly. This arose because we have not fully understood the natural processes taking place, we made bad choices or we presumed that such events would not occur in our backyard. However, what is even worse is that when something did happen, we did not recognise that we had made a mistake, instead we pointed our finger to

nature's caprice.

Our experience has shown that the grave consequences of natural disasters are immediately attended to. In this concern for human safety and well-being, work is done to set up rescuer operations or clean up the mess. While these are important considerations, what is equally vital is to study each disaster thoroughly and learn from our mistake because each disaster has a lesson to teach us. Only by understanding nature can we then appreciate her better and learn to adapt to her powers and caprice.

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*Manuscript received 28 June 1996*

# Common Rocks of Malaysia

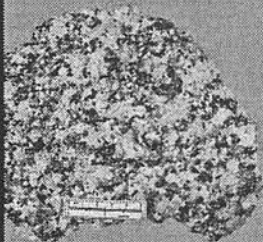
A full colour poster illustrating 28 common rocks of Malaysia. With concise description of the features and characteristics of each rock type including common textures of igneous, sedimentary and metamorphic rocks.

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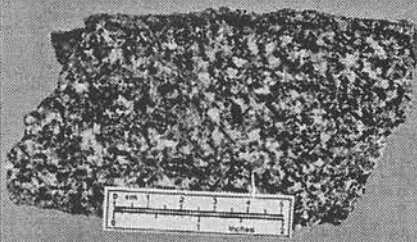
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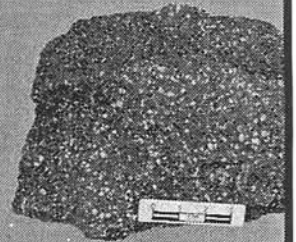
# COMMON ROCKS



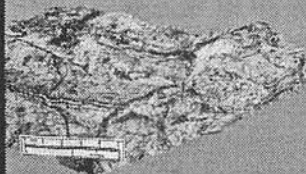
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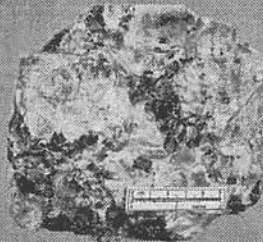
5. Diorite (Kg. Kemahang, Kelantan)



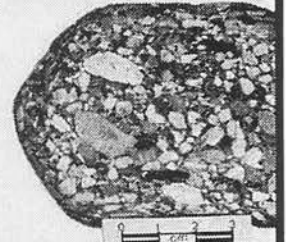
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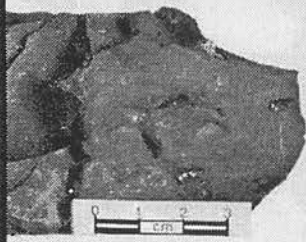
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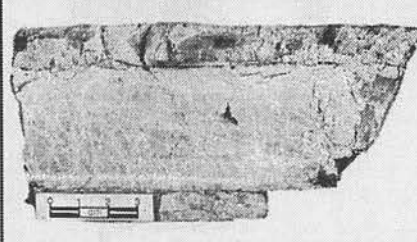
12. Pegmatite (Bukit Mox, Johor)



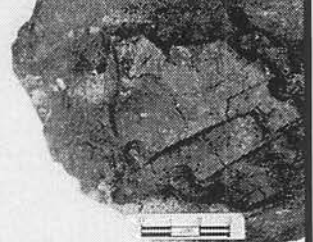
13. Conglomerate (Pulau Redang, Terengganu)



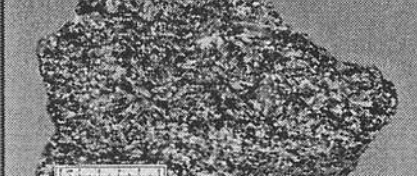
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# CATATAN GEOLOGI

## Geological Notes

### Discovery of Early Jurassic Radiolaria from the tuff sequence, near Piching, west Sarawak

BASIR JASIN, UYOP SAID AND ANG DUEN WOEI

Jabatan Geologi

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**Abstract:** A total of seventeen taxa of Early Jurassic Radiolaria were identified from a siliceous tuff sequence exposed near Piching, Sarawak. The Radiolaria consist of *Archaeocenosphaera* sp., *Bagotum* sp., *Canoptum anulatum* Pessagno and Poisson, *Canoptum rugosum* Pessagno and Poisson, *Canoptum* sp., *Canutus indomitus* Pessagno and Whalen, *Canutus izeensis* Pessagno and Whalen, *Canutus* sp., *Droltus* sp., *Katroma* sp., *Pantanellium sanrafaelense* Pessagno and Blome, *Parahsuum simplum* Yao, *Parahsuum takarazawaensis* Sashida, *Perispyridium* sp., *Praeconocaryomma decora* Yeh, *Praeconocaryomma media* Pessagno and Poisson, and *Praeconocaryomma* sp. This assemblage indicates that the age of the chert is late Pliensbachian to early Toarcian, Early Jurassic. This is the first Lower Jurassic sediments-bearing Radiolaria being recorded in Sarawak.

#### INTRODUCTION

Mesozoic radiolarian cherts have been reported to occur in west Sarawak. Some of the cherts occur as a minor part of a formation such as in the Sadong Formation (Wilford, 1965a), the Bau Limestone (Wilford, 1955), and the Pedawan Formation (Wilford, 1965a). Major chert occurrence was also reported from the Sejingkat Formation (Wilford, 1965b). Blocks and fragments of Mesozoic chert were also reported from the Serabang Formation (Wolfenden, 1963) and the Lubok Antu Melange (Haile, 1957; Tan, 1979). Radiolaria were also reported to occur in dacitic tuff of the Kedadom Formation (Wilford, 1965).

Earlier studies of the radiolarian faunas (prior to 1974), from these formations were based on thin sections. Many taxa could not properly be identified. Most identifications were made up to generic level. Recently, studies of Radiolaria in Sarawak have been carried out based on the whole radiolarian specimens retrieved from the chert by using hydrofluoric acid (Tumanda *et al.* 1993; Basir Jasin and Haile, 1993; Basir Jasin, 1996). The taxa are

better identified and subsequently the better age of the chert were obtained.

#### GEOLOGICAL SETTING

The area is composed of the Sadong, Serian Volcanics, and Kedadom formations. The Kedadom Formation unconformably overlies the Sadong and Serian Volcanic Formations. The basal part of the Kedadom Formation and the Serian Volcanics are now well exposed at several road-cuts along the new road to Tebedu. The basal part of the Kedadom Formation consists of basal conglomerate, carbonaceous sandstone and shale with thin beds of dark grey fine-grained limestone, dacitic radiolarian tuff and conglomerate (Wilford, 1965).

More than 50 m thick tuff sequence is exposed at a road-cut 2.5 km west of Piching (Fig. 1). The sequence is composed of interbedded radiolarian tuff and tuffaceous mudstone. The sequence dips 45°–55° towards southwest. The tuff is moderately fractured perpendicular to the bedding plane. The thickness of the individual tuff layers varies from 2 cm to 25 cm. The tuff sequence overlies the Serian



Volcanics and is overlain by thick conglomerate. It seems that the tuff belongs to the basal part of the Kedadom Formation.

**MATERIAL AND METHOD**

Five samples of radiolarian tuff and tuffaceous mudstone were collected. Each

sample was crushed into chips of 1 cm in diameter. The sample was soaked in 5% hydrofluoric acid for 24 hours. The sample was then washed and sieved through a 53  $\mu$ m sieve. The residue was dried and examined under a binocular microscope. Radiolaria were picked by a thin paint brush. The well-preserved specimens were photographed by using a

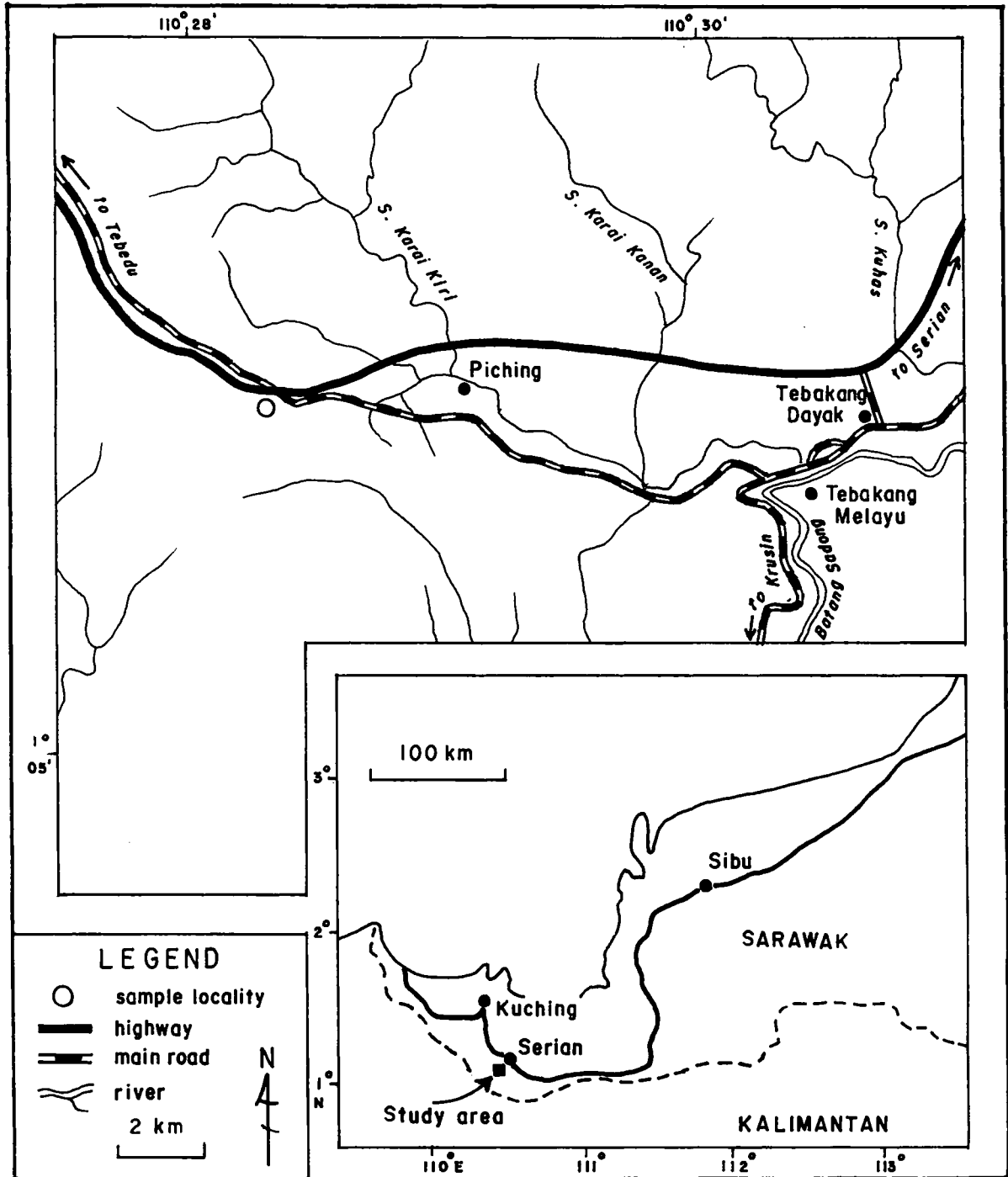


Figure 1. Map showing sample locality.



scanning electron microscope.

## RESULT AND DISCUSSION

Only two chert samples (Samples S1 and S2) yielded quite well-preserved radiolarian faunas. Sample S1 yielded a high diversity radiolarian fauna which are assigned to seventeen taxa (Plate 1):-

*Archaeocenosphaera* sp.  
*Bagotum* sp.  
*Canoptum anulatum* Pessagno and Poisson,  
*Canoptum rugosum* Pessagno and Poisson  
*Canoptum* sp.  
*Canutus indomitus* Pessagno and Whalen  
*Canutus izeensis* Pessagno and Whalen  
*Canutus* sp.  
*Droltus* sp.  
*Perispyridium* sp.  
*Katroma* sp.  
*Pantanellium sanrafaelense* Pessagno and Blome  
*Parahsuum simplum* Yao  
*Parahsuum takarazawaensis* Sashida  
*Praeconocaryomma decora* Yeh  
*Praeconocaryomma media* Pessagno and Poisson  
*Praeconocaryomma* sp.

Only three taxa were identified from sample S2. They are *Canoptum anulatum* Pessagno and Poisson, *Canoptum rugosum* Pessagno and Poisson and *Parahsuum* sp.

The presence of *Praeconocaryomma media*, *Praeconocaryomma decora*, *Pantanellium sanrafaelense*, *Canutus indomitus*, *Canoptum anulatum*, *Canoptum rugosum* in the samples indicates the age of the chert is late Pliensbachian to early Toarcian, Early Jurassic (Pessagno and Poisson, 1981; Pessagno and Whalen, 1982; Yeh, 1987). This is the first lower Jurassic rock ever recovered in west Sarawak. Tan (1986) indicated that there are no Rhaetian to Bathonian sedimentary rocks known in west Sarawak. The age of the Kedadom Formation was previously thought to be restricted to Late Jurassic is now extended to the Early Jurassic.

A widespread volcanic activity was recorded during the latest Triassic (Pimm, 1965) and this activity might have extended to the Early Jurassic. The association of radiolarian tuff and tuffaceous mudstone suggests that the

radiolarian tuff was deposited during the period of high productivity of radiolarian faunas which was associated with the supply of the siliceous material from the volcanic activities. Jones and Murchey (1986) interpreted the chert-silicic volcanic association as an island-arc chert association. Since the silicic volcanism is also found in the rift environments (Williams and McBirney, 1979), the interpretation of this lithologic association should include rifted basins along continental margins or wrench basins along transform faults that intersect continental margins (Karl, 1989). A detailed study is being carried out on the tuff sequence in the area to interpret its depositional environment.

## CONCLUSION

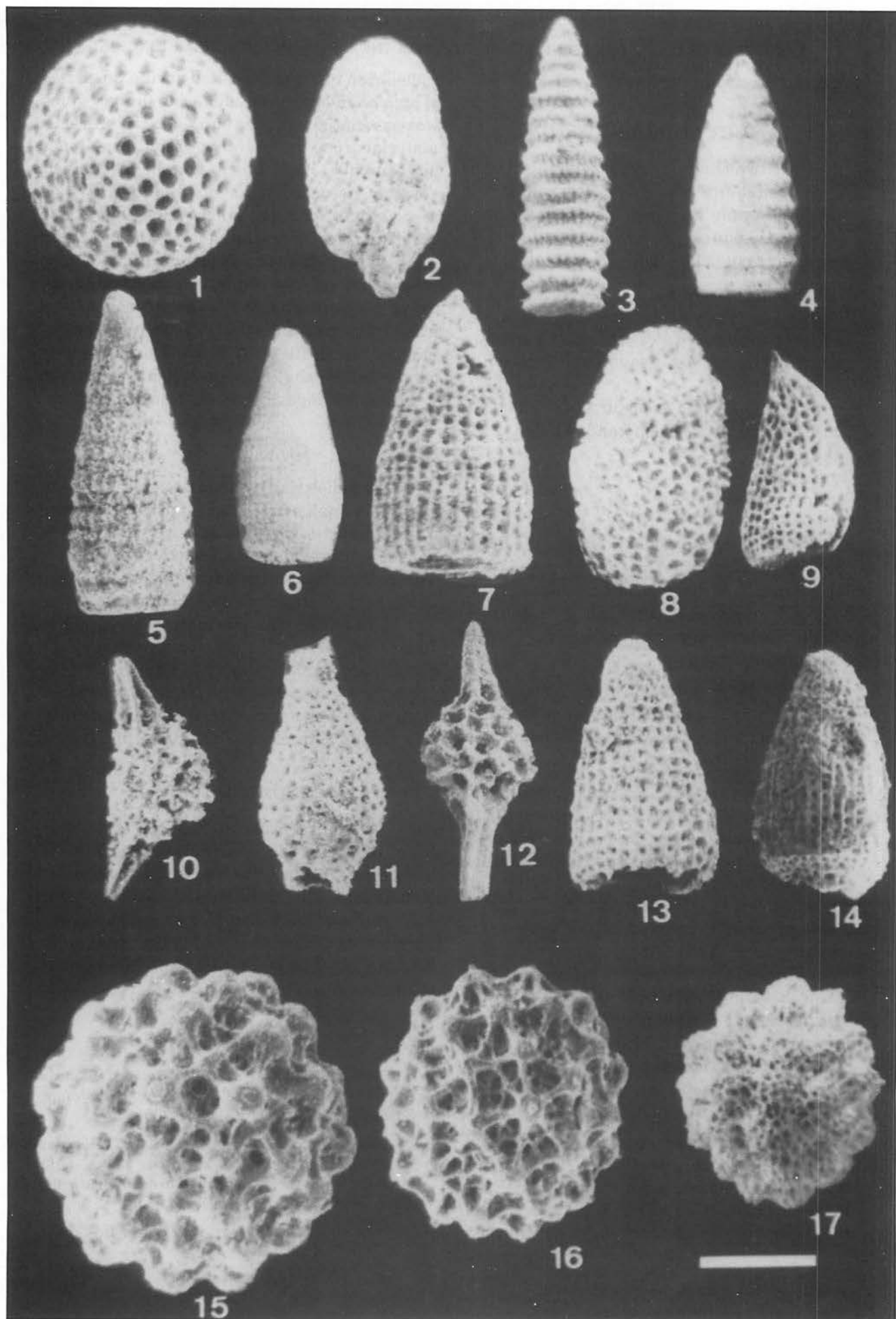
The radiolarian assemblages retrieved from the tuff samples collected near Piching have proven the existence of Early Jurassic sediments which was previously unknown in this area. The radiolarian tuff sequence represents the basal part of the Kedadom Formation. The age of the Kedadom Formation now ranges from Early Triassic to Late Triassic. The occurrence radiolarian tuff and tuffaceous mudstone indicates that the depositional environment was very close to a volcanic arc or in a rifted basin along continental margin.

## ACKNOWLEDGEMENTS

We would like to thank Encik Yaakob bin Dato' Ismail for his assistance in taking the SEM photograph. We thank Encik Ibrahim Mohd. Dom and Abdul Ghani Idris for their help in the preparation of the map and plate. This research project is funded by Universiti Kebangsaan Malaysia (S/18/96) and this is gratefully acknowledged.

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Manuscript received 12 September 1996

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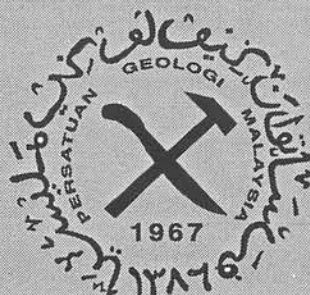
**Plate 1.** Lower Jurassic Radiolaria from the Sadong Formation (bar scale in  $\mu\text{m}$  is indicated in the parenthesis).

1. *Archaeocenosphaera* sp. (100  $\mu\text{m}$ )
2. *Bagotum* sp. (100  $\mu\text{m}$ )
3. *Canoptum anulatum* Pessagno and Poisson (100  $\mu\text{m}$ )
4. *Canoptum rugosum* Pessagno and Poisson (100  $\mu\text{m}$ )
5. *Canoptum* sp. (100  $\mu\text{m}$ )
6. *Canutus indomitus* Pessagno and Whalen (100  $\mu\text{m}$ )
7. *Canutus izeensis* Pessagno and whalen (80  $\mu\text{m}$ )
8. *Canutus* sp. (80  $\mu\text{m}$ )
9. *Droltus* sp. (80  $\mu\text{m}$ )
10. *Perispyridium* sp. (80  $\mu\text{m}$ )
11. *Katroma* sp. (80  $\mu\text{m}$ )
12. *Pantanellium sanrafaelense* Pessagno and Blome (80  $\mu\text{m}$ )
13. *Parahsuum simplum* Yao (80  $\mu\text{m}$ )
14. *Parahsuum takarazawaensis* Sashida (100  $\mu\text{m}$ )
15. *Praeconocaryomma decora* Yeh (100  $\mu\text{m}$ )
16. *Praeconocaryomma media* Pessagno and Poisson (100  $\mu\text{m}$ )
17. *Praeconocaryomma* sp. (160  $\mu\text{m}$ )

**NEW**

# Geological Evolution of South-East Asia

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c/o Dept. of Geology, University of Malaya  
50603 Kuala Lumpur, MALAYSIA*



## PERTEMUAN PERSATUAN Meetings of the Society

### Ceramah Teknik (Technical Talk)

#### **Investigation, monitoring and control of landslides in Japan**

MASAKAZU TAKAHASHI

#### **Laporan (Report)**

Dr. Masakazu Takahashi, General Manager, OYO Corporation Japan, gave the above talk on 10th September 1996, at the Geology Department, University of Malaya. Dr. Takahashi obtained his Ph.D on Soil Mechanics (Civil Engineering) from Imperial College in 1981 and has been with OYO since then working mainly on Earthquake Engineering and Consultancy on Infrastructure Development, Disaster Prevention and Environment & Geotechnical Engineering.

Dr. Takahashi began his talk by giving a slide-show on landslides, mudflows and rockfalls in Japan. Next he gave a case study on removing passing (traffic) control on a highway following a disaster. This was followed by reviewing the Investigation Techniques, Monitoring Techniques and Slope Protection Measures.

He then gave another case study which involved identifying slopes, improving slopes and removing passing control. Precipitation (rainfall) conditions were recorded. A total of 66 slopes and 23 streams were studied with primary and secondary evaluation and remedial measures taken into account. Basic items of slope study included height, cut, cracks and boulders. Counter measures were selected purely to strengthen the slopes.

On the Investigation Techniques, Dr. Takahashi stressed the use of stereoscopic photography to obtain 3D topography, digitising topography and the use of Planet Sampler especially in investigating shear zones. On monitoring, sensors, transducers and computers were used to monitor water-levels and pore pressures. Finally on Slopes Protection Measures various methods were discussed including anchors and bolts.

Technical talks on Engineering Geology and Slope Failures usually are well attended. The talk by Dr. Takahashi was no exception. The audience of 70 responded by coming forward with comments and queries which Dr. Takahashi gladly entertained and answered.

G.H. Teh

Ceramah Teknik (Technical Talks)



MASAKAZU TAKAHASHI



STEVE PHILLIPS



## Accumulation of organic rich sediments in a dendritic fluvial/lacustrine mire system at Tasik Bera, Malaysia: Implications for coal

STEVE PHILLIPS AND R. MARC BUSTIN

### Laporan (Report)

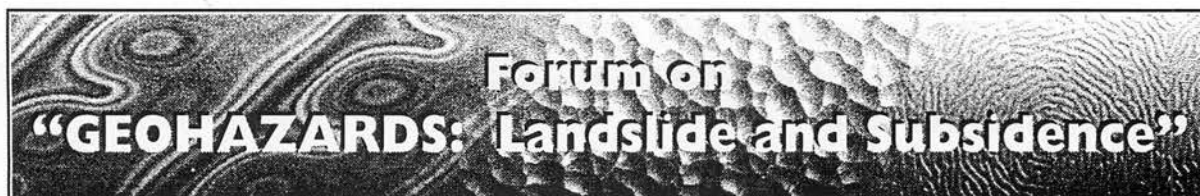
About thirty people turned up for the talk on Tasik Bera by Dr. Steve Phillips and Prof. Marc Bustin from the Department of Earth and Ocean Sciences, The University of British Columbia, held at the Department of Geology, University of Malaya on October 7, 1996. Prof. Bustin started off by introducing how their interest in studying freshwater peat and coal deposits, some of which are of commercial value, was developed at UBC. A search for modern analogues brought Steve out to Malaysia about a year ago to conduct some preliminary field studies and sampling of the peats and sediments of Tasik Bera with Dr. Wan Hasiah Abdullah and Dr. Lee Chai Peng of the Department of Geology, University of Malaya. This talk is based on the results of the initial analyses carried out on the few samples obtained during that first trip. Steve and Marc were accompanied by Raphael Wüst, a post-graduate student interested in working on the Tasik Bera sediments on this trip.

### Abstrak (Abstract)

The Tasik Bera mire system represents deposition of peat and peaty sediments within a dendritic fluvial drainage basin in the humid tropics. As such, it serves as an analogue for the earliest stages of coal deposition in low-relief topogenous coal swamps. Peaty sediments have been accumulating for at least 4,500 years in the lowest part of the basin, but accumulation rates and hence the thickness and lateral extent of the mire underwent a rapid increase and expansion beginning at about 660 years B.P. The sediments are highly variable, both vertically and laterally, the variations principally controlled by the type of vegetation dominant. Vegetation in turn is related to the degree of wetness of the site. Three distinct environments of deposition contribute peat with physical characteristics which can be related to coals. The limnetic environment, dominated by algae and easily degraded aquatic macrophytes, contributes very fine hemic peaty sediment with high fine silt content and a large algal component. The littoral environment is dominated by sedges and the woody shrub *Pandanus*, both of which have a large sub-aqueous biomass, and are quite resistant to degradation. Sediment from this environment is woody, hemic to coarse hemic, with a moderate to high very fine silt content and a much smaller algal element. Forest swamps, which occupy most of the mire area, contribute woody, fibric to hemic peaty sediments with low to moderate mineral matter content in the form of clays and very fine silt. Succession from both limnetic to forest swamp, and the reverse, is recorded in cores from different sites. In coals these transitions would be manifest as both brightening-upward (algae-dominated peat to woody peat) and dulling-upward (the reverse sequence) trends, the first in the topographically lower part of the basin, the second in the middle reaches. No part of the mire yet studied is approaching oligotrophic conditions. Allowing for a compression ratio of 5:1, thin, stony coals from the Tasik Bera mire would be laterally discontinuous and would vary from about 1 m in thickness at channel margins, tapering out to nothing as they onlap the interfluves.

C.P. Lee

GSM



**Forum on  
"GEOHAZARDS: Landslide and Subsidence"**

The above forum held on 22nd October 1996, is the 8th in the series of such forums that have been actively organised, since 1992, by the Working Group on Engineering Geology & Hydrogeology under the able chairmanship of Mr. Tan Boon Kong. The Proceedings available at all these forums have also proved to be popular reference materials.

**PROGRAMME**

2:00–2:25 pm : Registration and Sales of Proceedings

2:25–2:30 pm : Opening Remarks

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**SESSION I (Subsidence)**

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2:30–3:00 pm : Gue, S.S. and Lee Peng Seng (*Geo-environment*)  
Investigation into a ground subsidence in limestone formation in Kuala Lumpur

3:00–3:30 pm : Raj, J.K. (*University of Malaya*)  
Coal mining and ground surface subsidence at Batu Arang, Negeri Selangor Darul Ehsan

3:30–4:00 pm : Pereira, J.J., Ibrahim Komoo and Maziah Sulaiman (*Universiti Kebangsaan Malaysia*)  
Geohazards and the urban ecosystem

4:00–4:30 pm : COFFEE BREAK

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**SESSION II (Landslide)**

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4:30–5:00 pm : Takahashi, M. (*OYO Corp.*)  
Prediction of slope failures — methods currently used and their applications

5:00–5:30 pm : Chow, W.S., Mior Sallehuddin Mior Jadid and Sazali Yaacob (*Geo-Survey*)  
Geological and geomorphological investigations of debris flow at Genting Sempah, Selangor

5:30–6:00 pm : Tan Boon Kong (*Universiti Kebangsaan Malaysia*)  
Geologic factors contributory to landslides — some case studies

6:00–6:10 pm : Closing Remarks

Like all the previous forums, the turnout for this forum was again most encouraging, a 100 odd participants packed the Lecture Hall, Geology Department, University of Malaya to listen and participate in discussions on the 6 papers presented.

Geohazards, especially on landslides and subsidence, whether locally or overseas (like in Japan), are pretty popular and current events, and as such attracted keen participation of the enthusiastic audience during question time.

G.H. Teh



# Forum on "GEOHAZARDS: Landslide and Subsidence"



## *Captions to photos*

### Forum on Geohazards: Landslide and Subsidence

- |   |  |
|---|--|
| <p>1. S.S. Gue receiving momento from Organising Chairman.</p> <p>2. J.K. Raj on subsidence at Batu Arang.</p> <p>3. J.J. Pereira on geohazards and the urban system.</p> | <p>4. M. Takahashi on prediction of slope failures.</p> <p>5-10. Sections of the large audience.</p> <p>11-12. Tea time, discussion time.</p> <p>13. W.S. Chow on Genting Sempah debris flow.</p> <p>14. Tan Boon Kong on landslides case studies.</p> |
|---|--|



## Investigation into a ground subsidence in limestone formation in Kuala Lumpur

GUE SEE SEW AND LEE PENG SENG  
Geo-environment

A ground subsidence of about 25 m diameter and maximum depth of depression of 1.5 m occurred at a site near Dewan Bandaraya Kuala Lumpur's road. It caused structural damage to the adjacent single storey bungalow which was scheduled for redevelopment and also threatened the safety of an adjacent 6-storey apartment.

SSP Geotechnics Sdn. Bhd. was appointed by Dewan Bandaraya Kuala Lumpur (DBKL) to investigate the causes of the subsidence and to advise DBKL on the effect of the subsidence on the adjacent properties and to recommend appropriate remedial measures.

The desk study included analysing the geology, its previous and present land use topography and the activities at the site as well as its surrounding areas. The site geology consists of Kenny Hill formation overlying the Kuala Lumpur limestone/marble.

A layer of sandy of silty alluvium to a thickness of up to 16 m was found above the Kenny Hill residual soil. The Kenny Hill residual soil consists of medium dense clayey silty sand and gravel, with occasional gravel and clayey silt of up to 45 m thickness. A 13 m cavity in limestone without in-fill was found in one of the four boreholes drilled during this investigation.

This cavity confirmed the hypothesis that the subsidence occurred due to the collapse of voids or arching of soils above the limestone. The voids or arching of soils formed over the cavities or subterranean channels in the limestone bedrock due to loss of soils into the cavities, when the cavities or channels collapsed or extended to soil-rock interface. The voids enlarged with time and arched over the limestone until the collapse of the arch. In this site the collapse of voids or arched soils was likely to have been triggered by the boring activities a few metres away from the subsidence.

In view of the close proximity of the adjacent structure to the cavities, it was recommended the DBKL direct the developer, especially of the recently completed 6-storey apartment, to appoint an independent engineering consultant to assess the safety and recommend precautionary measures if needed. DBKL only needs to backfill the subsided area and rehabilitate the road since the road is considered to be low risk as compared to the adjacent building.

## **Coal mining and ground surface subsidence at Batu Arang, Negeri Selangor Darul Ehsan**

**J.K. RAJ**

Jabatan Geologi  
Universiti Malaya  
50603 Kuala Lumpur

Coal mining has been carried out at Batu Arang for some 45 years, from 1915 to 1960, with both surface and underground workings. The coal was mined from two main seams; the Upper Seam (some 15 m thick) and the Lower Seam (about 8 m thick). These seams, which are stratigraphically some 65 m apart, are interbedded with shales, clays, siltstones and sandstones of a Late Oligocene to Miocene age that have been termed the "Coal Measures". These gently dipping sedimentary rocks outcrop in the form of a plunging syncline and unconformably overlie meta-sedimentary rocks of mainly quartzites and phyllites of an Upper Palaeozoic age. The "Coal Measures" are unconformably overlain by a probable Pleistocene sequence of boulders, pebbles and subangular fragments of quartzite in a sandy to gravelly matrix that have been termed the "Boulder Beds". The strata of the "Coal Measures" are cut by a few normal faults and contain closely spaced joints that are mostly developed perpendicular to bedding.

Mapping of past and present features of ground surface subsidence, including depressions and sinkholes (pits), and their effects on man-made structures, shows that their development is closely related to the underground coal workings. Depressions have developed as a result of the gradual down-warping (or convergence) of overburden into underground openings, whilst sinkholes have formed where the caved overburden material has been able to move laterally into adjacent openings.

The most recently occurring depressions and sinkholes have developed over the shallower, earliest underground coal workings, as well as those made during the Second World War, and in a few cases, over some post-war workings. Depressions and sinkholes developed in earlier periods also show a similar relationship and this is to be expected in view of the limited roof support and stowage in the underground workings. In some cases, depressions and sinkholes have developed over bricked or timbered workings.

Several factors are responsible for the development of the depressions and sinkholes, though the most important factor has been the decrease (with time) of the strengths of the coal seams and overburden materials. In view of this temporal relationship, it is considered that several sites in the area will continue to be affected by the development of depressions and sinkholes.



### **Geohazards and the urban ecosystem**

**JOY J. PEREIRA, IBRAHIM KOMOO AND MAZIAH SULAIMAN**

Institute for Environment and Development (LESTARI)  
Universiti Kebangsaan Malaysia  
43600 Bangi

The urban ecosystem comprises the natural, built and human components. Urban ecosystems play an important role in nation building as urban-dwellers in developing countries are expected to contribute 80% of the Gross Domestic Product in this decade. Given their importance, better assessment and management strategies of urban ecosystems are required to stave off serious environmental problems due to rapid development. The prevalence and severity of environmental problems in an urban ecosystem are influenced by the structure and location of the economic activities within it, and certain problems can generally be linked to the level of wealth in this ecosystem, as reflected by the per capita income.

Environmental problems that occur in the urban ecosystem are declining air and water quality, land pollution and increased frequency of geohazards, especially in developing countries. The higher occurrences of geohazards in developing countries is a manifestation of poor planning and many of these problems in urban areas are often exacerbated by human activities.

Uncontrolled development contributes to the occurrence of geohazards and have resulted in damage, loss of property and lives. The risk is increased when people knowingly or unknowingly settle in risk prone areas such as floodplains, unstable slopes and seismic fault lines, among others. Some of the recorded geohazards that have occurred in Malaysia are floods, erosion, landslides and subsidence. In the past five years, over 100 occurrences of floods and flash-floods, about 20 cases of river bank erosion and 20 cases of landslides, and at least 8 cases of subsidence have been reported in the Klang Valley alone. Planning responses to minimise the effects of geohazards is proposed utilising the newly amended Town and Country Planning (Amendment) Act, 1995 (Act A933) that has recently been enacted, and by provision of adequate geological information for planners and decision-makers.

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## **Prediction of slope failures — methods currently used and their application**

MASAKAZU TAKAHASHI

International Consulting Department  
OYO Corporation

Prediction of slope failure, namely its location, time and scale, is a formidable task for geologists and geotechnical engineers. This paper presents some of the prediction methods currently used in practice; the rating system of slopes (location), empirical relationships between time to failure and rate of slope movement (time) and correlations of configuration of slide mass (scale). An application of the rating system for geohazard mapping is also given.

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## **Geological and geomorphological investigations of debris flow at Genting Sempah, Selangor**

CHOW WENG SUM, MIOR SALLEHUDDIN MIOR JADID

AND SAZALI YAACOB

Geo-Survey

In the afternoon of 30th June 1995, heavy rainfall in the Genting Sempah area caused the Karak Highway Tunnel to be flooded; traffic was diverted via the slip road linking the Kuala Lumpur-Karak Highway to Genting Highlands Resort. The heavy downpour triggered a series of landslides, followed by a debris flow which swept away 19 vehicles, resulting in the loss of 20 lives with one missing and 23 others injured. Investigations showed that the thunderstorm had caused another 72 landslides between km 1 and km 8 along the access road to Genting Highlands Resort.

The investigations revealed that, in the Genting Sempah area, the residual soil on the hillslopes is thin, with a thickness averaging 0.5 metre whereas at the tops and the toes of the hills, the soil cover is thicker, reaching 4 metres. Underlying the soil is slightly to moderately weathered, impermeable bedrock of granite, rhyolite and metasediments. As such, the infiltrated water would flow along the weathered bedrock-soil interface which is thus a potential slip plane.



The disastrous debris flow occurred along a stream near the faulted contact between rhyolite and metasedimentary rocks at km 0.4 of the Kuala Lumpur-Genting Highlands slip road. The residual soil in the debris flow area consisted mainly of silty sand or sandy clay containing mainly quartz or quartz and illite/kaolinite. This type of quartzose soil has very low cohesion, is often loose and can easily move under gravity, when water-logged, as a flow. Illite, which has the capability to absorb and retain water would have also contributed to the mass movement.

The debris flow was the culmination of three landslides occurring near the headwaters of the stream. Debris from two landslides, with one on the western bank near the middle reaches of the stream and the second occurring near the headwaters of the stream, were deposited on the valley floor, causing an impounding of the stream waters. It was debris from the third landslide at the headwaters of the stream which breached these two debris barriers on the valley floor, causing a debris flow of water, mud, boulders and fallen trees.

As rainfall of high intensity may cause similar landslides, it is recommended that Genting Highlands Resort Berhad should install electronic rain gauges linked to a warning system along the slip road and access road to prevent recurrence of similar disaster.

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## **Geologic factors contributory to landslides — some case studies**

TAN BOON KONG

Universiti Kebangsaan Malaysia  
Bangi, Selangor

Landslides occurrences are rather common in Malaysia. They are associated with development on hilly terrains, construction of highways, mining activities, river bank instability, etc. Materials involved range from soft soil deposits to hard rocks. This paper presents several case studies on landslide occurrences and investigations in Malaysia, with emphasis on the geological factors contributory to the landslide incidence. The case studies are chosen from various projects involving hillside development, highways, mining activities, and river bank instability studies from various localities in Malaysia. Geological factors of relevance include: lithology/rock type, grade of weathering, rock discontinuities (joints, faults, bedding planes, foliations, etc.), superficial or soil deposits. Alluvial, colluvial and man-made fill (loose tips and mine tailings) are particularly treacherous as slope deposits. In addition, surface morphology (geomorphology) and drainage (surface and sub-surface) can also be contributory to landslide incidence.

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## BERITA-BERITA PERSATUAN News of the Society

### KEAHLIAN (Membership)

The following applications for membership were approved:

#### Full Members

- |   |  |
|---|--|
| <p>1. Mona Sulaiman<br/>Crest Petroleum, 4th Floor, Tower 2, Faber Towers, Jalan Desa Bahagia, Taman Desa, 58100 Kuala Lumpur.</p> <p>2. Freddy AK Heward Chinta<br/>Jabatan Penyiasatan Kajibumi Malaysia, Sarawak, Peti Surat 560, 93712 Kuching.</p> | <p>3. Renggan Gendang<br/>Asia Lab (M) Sdn. Bhd., Lot 122, 2nd Floor, Lutong Bazaar, Jalan Pasar, 89100 Lutong.</p> <p>4. Tai Say Ann<br/>CPOC, 13th Floor, Menara Berjaya Prudential, Kuala Lumpur.</p> |
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#### Student Members

- |   |  |
|---|--|
| <p>1. Yun Boon Onn<br/>Jabatan Geologi, Universiti Malaya, 50603 Kuala Lumpur.</p> <p>2. Kho Joo Wei<br/>Jabatan Geologi, Universiti Malaya, 50603 Kuala Lumpur.</p> <p>3. Tan Siang Fei<br/>Jabatan Geologi, Universiti Malaya, 50603 Kuala Lumpur.</p> <p>4. Rasidah bt Husain<br/>Jabatan Geologi, Universiti Malaya, 50603 Kuala Lumpur.</p> <p>5. Norzita Mat Fiah<br/>Jabatan Geologi, Universiti Malaya, 50603 Kuala Lumpur.</p> <p>6. Haslina Mohamed<br/>Jabatan Geologi, Universiti Malaya, 50603 Kuala Lumpur.</p> <p>7. Zalina Zainal<br/>Jabatan Geologi, Universiti Malaya, 50603 Kuala Lumpur.</p> | <p>8. Nor Azlina Mohd Azham<br/>Jabatan Geologi, Universiti Malaya, 50603 Kuala Lumpur.</p> <p>9. Agnello A/L Alphonse<br/>Geophysics Laboratory, School of Physics, Universiti Sains Malaysia, 11800 Minden.</p> <p>10. Swee Lee Chui<br/>Geophysics Laboratory, School of Physics, Universiti Sains Malaysia, 11800 Minden.</p> <p>11. Ng Yang Leng<br/>Geophysics Laboratory, School of Physics, Universiti Sains Malaysia, 11800 Minden.</p> <p>12. Chong Wee Chen<br/>Geophysics Laboratory, School of Physics, Universiti Sains Malaysia, 11800 Minden.</p> <p>13. Kwee Sien Kong<br/>Geophysics Laboratory, School of Physics, Universiti Sains Malaysia, 11800 Minden.</p> <p>14. Jesu Jruthaya Nathan A/L Joseph Gratian<br/>Geophysics Laboratory, School of Physics, Universiti Sains Malaysia, 11800 Minden.</p> |
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|--|---|
| 15. Murali Shankar s/o Gnanaganesan<br>Geophysics Laboratory, School of Physics,<br>Universiti Sains Malaysia, 11800 Minden. | 21. Lee Fah Hean<br>Geophysics Laboratory, School of Physics,<br>Universiti Sains Malaysia, 11800 Minden. |
| 16. Syahzelen Abdul Ghani<br>Geophysics Laboratory, School of Physics,<br>Universiti Sains Malaysia, 11800 Minden.           | 22. Yong Seet Li<br>Geophysics Laboratory, School of Physics,<br>Universiti Sains Malaysia, 11800 Minden. |
| 17. Yee Ah Chim<br>Geophysics Laboratory, School of Physics,<br>Universiti Sains Malaysia, 11800 Minden.                     | 23. Tan Yik Yee<br>Geophysics Laboratory, School of Physics,<br>Universiti Sains Malaysia, 11800 Minden.  |
| 18. Chan Gwo Yann<br>Geophysics Laboratory, School of Physics,<br>Universiti Sains Malaysia, 11800 Minden.                   | 24. Tan Geok Pin<br>Geophysics Laboratory, School of Physics,<br>Universiti Sains Malaysia, 11800 Minden. |
| 19. Prabakaran A/L Gobaloo<br>Geophysics Laboratory, School of Physics,<br>Universiti Sains Malaysia, 11800 Minden.          | 25. Lim Teo Hee<br>Geophysics Laboratory, School of Physics,<br>Universiti Sains Malaysia, 11800 Minden.  |
| 20. Leong Wee Kong<br>Geophysics Laboratory, School of Physics,<br>Universiti Sains Malaysia, 11800 Minden.                  |   |

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## PETUKARAN ALAMAT (Change of Address)

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

- |   |  |
|---|--|
| 1. Johnny Ating Kading<br>IPC (M) Ltd., Level 37, Menara Lion, 165<br>Jalan Ampang, 50450 Kuala Lumpur. | 2. E.F. Durkee<br>E.F. Durkee and Associates, Inc., No. 4<br>Saturn Street, Bel-Air 2, Makati, Metro<br>Manila, Philippines. |
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## CURRENT ADDRESSES WANTED

The GSM is seeking the addresses of the following members. Anyone knowing the new addresses please inform the Society.

- |   |   |
|---|---|
| 1. Ir. Baddrul H.M. Taib<br>57 Jalan Satu, Changkat Minden, 11700<br>Gelugor, Penang. | 2. Baddrul H.M. Taib<br>57 Jalan Satu, Changkat Minden, 11700<br>Gelugor, Penang. |
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## PERTAMBAHAN BAHARU PERPUSTAKAAN (New Library Additions)

The Society has received the following publications:

1. AAPG Explorer, Aug. 1996
2. Buletin Sukutahun, Jan-Mac 1996
3. Bulletin of the Central Geological Library, no. 10, 1995
4. Malaysian Standard: MS 30: parts 3, 5, 7, 8, 13, 15, 16, 17 (1995)
5. Geological Literature of USSR: Bibliographical Yearbook for 1990 Year vols. I & II, 1995
6. Oklahoma Geology Notes: Vol. 56, nos. 1-3, 1996
7. Monthly Statistics on Mining Industry in Malaysia, June & July 1996
8. Geological Survey of Japan Bulletin 1995: vol. 46, nos. 11-12 and 1996: vol. 47, nos. 1-4.
9. American Museum Novitates, nos. 3161, 3163, 3164, 3165, 3168, 3171, 3173, 3175, 3176, 3178, 3179 (1996)
10. Journal of Geosciences, Osaka City University, vol. 39, 1996
11. AAPG Bulletin, vol. 80/8 & 80/9, 1996
12. The Science Reports of the Tohoku University, vol. 63, no. 2, 1996
13. Geological Report of the Hiroshima University, no. 28, 1996
14. Journal of Science of the Hiroshima University, vol. 10, no. 4, 1996
15. Memoirs of the Geological Survey of Belgium, no. 41, 1996
16. U.S. Geological Survey Bulletin: 1996: nos. 2154, 2132, 2059-A, 2152
17. U.S. Geological Survey Circular: 1996: no. 1136
18. U.S. Geological Survey Professional Paper: 1996: 1404-I, 1416-D, 1568, 1556, 1422-B, 1416-G

# GEOLOGICAL SOCIETY OF MALAYSIA

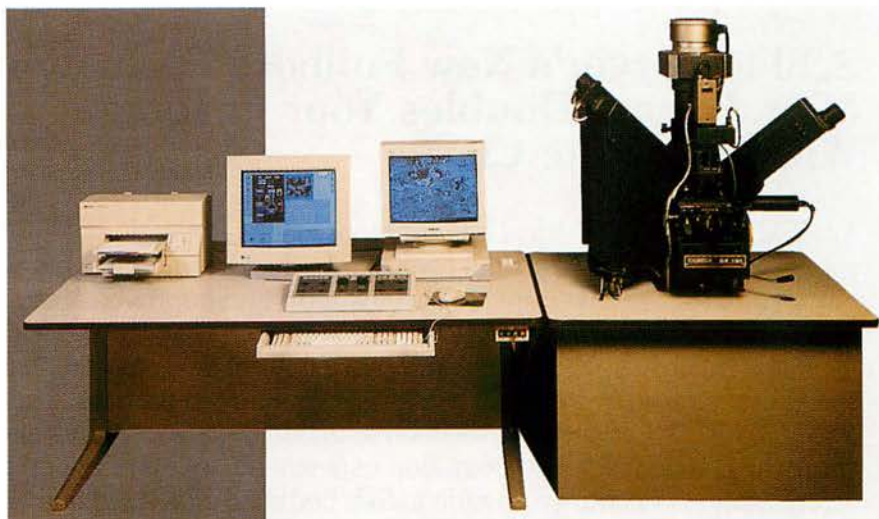
## List of Publications for Sale

Bulletin No.	Name of Publication	Year of Publication	Price (RM)
1.	Studies in Malaysian Geology	1968	-
2.	Bibliography and Index of the Geology of West Malaysia and Singapore	1968	5.00
3.	Papers in Geomorphology and Stratigraphy	1970	5.00
4.	Papers in Petrology, Structure and Economic Geology	1971	5.00
5.	The Search for Tungsten Deposits	1973	5.00
6.	Proceedings, Regional Conference on the Geology of Southeast Asia (Hardcover)	1973	5.00
7.	A collection of papers on geology	1974	5.00
8.	A collection of papers on geology	1977	5.00
9.	The relations between granitoids and associated ore deposits of the Circum-Pacific region	1977	-
10.	A collection of papers on geology of S.E. Asia	1978	-
11.	Geology of Tin Deposits	1979	20.00
12.	A collection of papers on geology	1980	-
13.	A collection of papers on geology of Malaysia and Thailand	1980	5.00
14.	A collection of papers on geology of S.E. Asia	1981	-
15.	A collection of papers on geology	1982	10.00
16.	A collection of papers on geology	1983	10.00
17.	A collection of papers on geology	1984	10.00
18.	Special Issue on Petroleum Geology	1985	15.00
19.*	GEOSEA Proceedings Vol. I, Fifth Regional Congress on Geology, Mineral and Energy Resources of Southeast Asia, Kuala Lumpur, 9-13 April 1984.	1986	30 (member) 60 (non-member)
20.*	GEOSEA Proceedings Vol. II, Fifth Regional Congress on Geology, Mineral and Energy Resources of Southeast Asia, Kuala Lumpur, 9-13 April 1984.	1986	

\* *Bulletins 19 and 20 sold as a package.*



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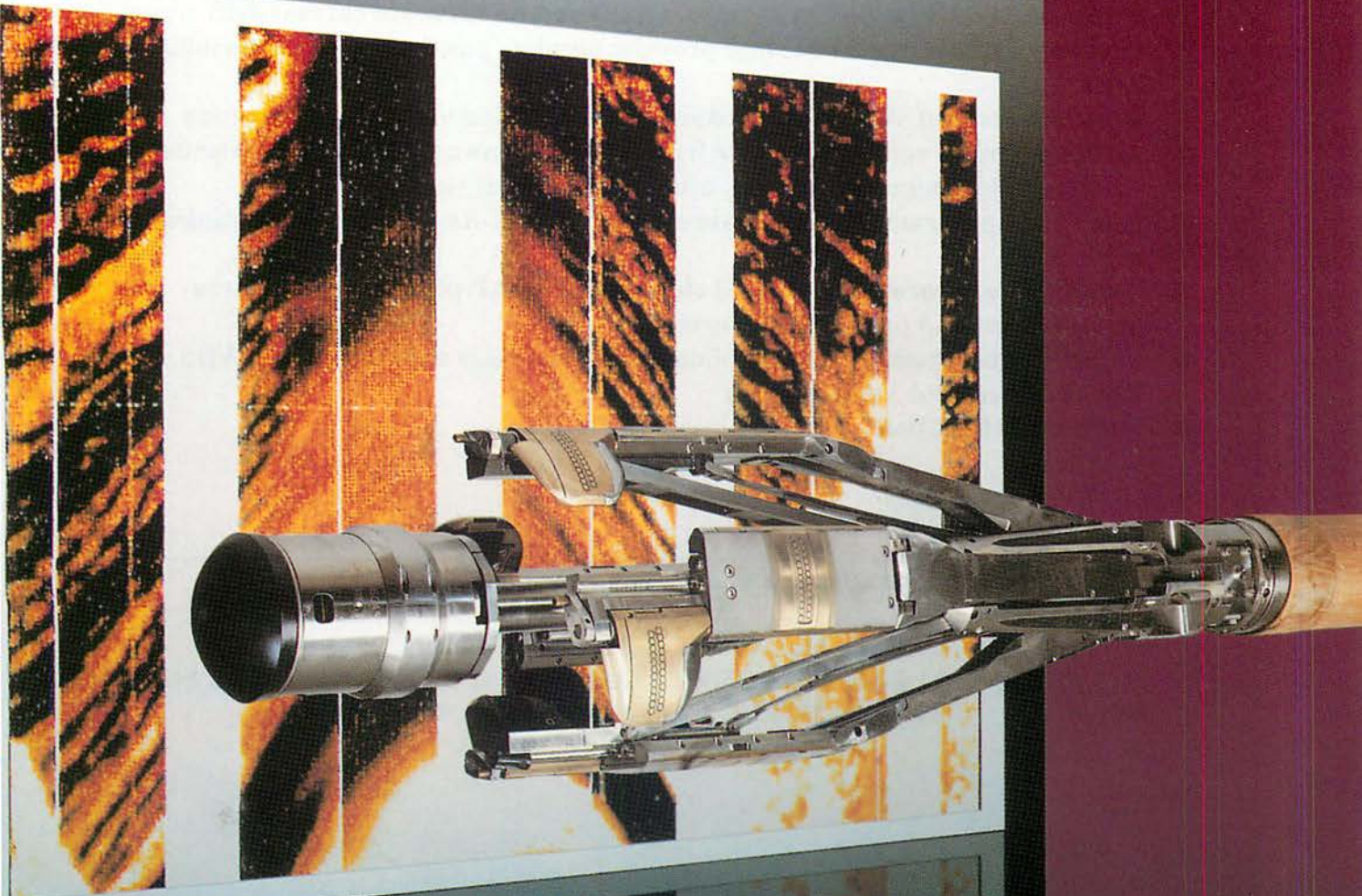
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Talk to your Schlumberger representative about detecting openhole problems and fractures acoustically, even in oil-base muds. What UBI images show you could save you time, expense or possibly your well.

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# GEOSEA '98

## ANNOUNCEMENT

### **Ninth Regional Congress on Geology, Mineral and Energy Resources of Southeast Asia**

**Kuala Lumpur, Malaysia • 17–19 August 1998**

The Geological Society of Malaysia is organising the GEOSEA '98 in Kuala Lumpur from 17 to 19 August 1998. The GEOSEA Congress is held triennially in Southeast Asia and it offers an excellent opportunity to exchange scientific and technical information and advancement in geology, mineral and energy resources among geoscientists from within and outside the region. The GEOSEA Congress is a premier geoscientific event in the region and has been well attended by the geoscientific community world-wide.

The technical program of GEOSEA '98 consists of oral and poster presentations on geology and related aspects of the GEOSEA core region – Brunei, Cambodia, Indonesia, Hong Kong, Laos, Malaysia, Myanmar, Papua New Guinea, Philippines, Singapore, Thailand and Vietnam. A scientific and technical exhibition will run concurrently with GEOSEA '98, displaying the latest state-of-the-art products and systems.

Other related activities include pre- and post-conference workshops, short courses and geological fieldtrips. Social events and tours for delegates are also available.

Make a note in your diary and join us in Kuala Lumpur for GEOSEA '98.

For further information, please contact:



The Organising Secretary,  
GEOSEA '98  
Geological Society of Malaysia  
c/o Department of Geology,  
University of Malaya,  
50603 Kuala Lumpur  
Malaysia  
Tel: +(603) 757 7036  
Fax: +(603) 756 3900  
Email: [geologi@po.jaring.my](mailto:geologi@po.jaring.my)



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MALAYSIA

**Look out for the First Circular**  
due to be out in January 1997



**GEOLOGICAL SOCIETY OF MALAYSIA**  
**List of Publications for Sale (cont'd)**

<b>Bulletin No.</b>	<b>Name of Publication</b>	<b>Year of Publication</b>	<b>Price (RM)</b>
21.	Special Issue on Petroleum Geology Vol. II	1987	20.00
22.	Special Issue on Petroleum Geology Vol. III	1988	20.00
23.	A collection of papers on geology of Malaysia, Thailand and Burma	1989	10.00
24.	A collection of papers presented at GSM Annual Geological Conference 1987 and 1988	1989	10.00
25.	Special Issue on Petroleum Geology Vol. IV	1989	20.00
26.	A collection of papers presented at GSM Annual Geological Conference 1989 and others	1990	10.00
27.	Special Issue on Petroleum Geology Vol. V	1990	20.00
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33.	Proceedings Symposium on Tectonic Framework and Energy Resources of Western Margin of the Pacific Basin	1993	40.00
34.	Bibliography and Index — Publications of the Geological Society of Malaysia 1967–1993	1993	20.00
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**GEOLOGICAL SOCIETY OF MALAYSIA**  
**List of Publications for Sale (cont'd)**

<b>Bulletin No.</b>	<b>Name of Publication</b>	<b>Year of Publication</b>	<b>Price (RM)</b>
	Field Guide 1	1973	—
	Abstracts of Papers — GEOSEA	1972	2.00
	Proceedings of the Workshop on Stratigraphic Correlation of Thailand and Malaysia, Vol. 1	1983	5.00 (member) 15.00 (non-member)
	Geological Evolution of Southeast Asia (Reprinted Edition)		30.00 (student) 50.00 (member) 100.00 (non-member)
	Common Rocks of Malaysia (coloured poster)	1996	7.00 (student) 8.00 (member) 10.00 (non-member)



# GEOLOGICAL SOCIETY OF MALAYSIA

## Package Deals

Proposed Package	Publications Included	Total Cost Revised Price (RM)	SPECIAL SALE PRICE (RM)			
			Student Member	Student Non-Member	Member	Non-Member
A. General Geology/ Malaysian Geology	Bull. 3, 4, 7, 15, 16, 17, 24, 26, 29, 31 (10 books)	85	40	50	60	75
B. Bibliography	Bull. 2, 30, 34 (3 books)	25	10	15	20	25
C. Southeast Asia	Bull. 6, 13, 19/20, 23, 33, Stratigraphic Correl. (7 books)	95/125	30	40	60	100
D. Petroleum Geology	Bull. 18, 21, 22, 25, 27, 28, 32 (7 books)	165	80	100	120	150
E. Economic Geology	Bull. 5, 11 (2 books)	25	5	10	15	20

on one side and when it reached the halfway point, the workers began blasting from the other side.

Transfield, an Australian-based firm given the task of constructing the tunnel, is using the "Austrian shotcrete method" which involves controlled blasting and drilling.

Transfield project manager Richard Wright said this was the first time the method was being used for primary and final lining in Malaysian tunnel construction.

The blasting of decomposed granite was done in two stages. First, the top half was blasted and then the bottom (bench). The top half can be blasted for as far as two metres and the bottom for as far as three metres.

The workers had used 75 kilogrammes of emulex explosives to blow out the last 200 tonnes of rock about two metres thick.

All blasting work has been completed and what is left is 10 to 15 metres of bench at the base of the tunnel.

Wright said excavation of the bench would be completed in two to three days.

"Once that is done, work on the pavement and tunnel lining will begin," he said. The

primary lining of the tunnel is made up of 100 millimetres of shotcrete and grouted rock bolts are used to strengthen the wall. It is then lined with 50 mm of wire mesh, followed by 100 mm of shotcrete.

"After the lining is done, the mechanical and technical equipment will be installed, such as sufficient lighting and ventilation systems, television circuits and a carbon monoxide monitor," Wright said.

Architectural finishings will be done after the mechanical details are complete.

The upgrading of the six-lane highway from Kuala Lumpur to the tunnels and the four-lane highway from the tunnels to Karak began in October 1994.

The new tunnel is 800 metres long, 10 metres wide and eight metres high and is meant for all east-coast bound traffic via Kuantan.

It will be less of a hazard to motorists as traffic will only move in one direction. This will make it kinder to the environment and the motorist's health because in a two-way tunnel, the opposing traffic keeps the carbon monoxide and oxygen stagnant, preventing the air from circulating.

NST, 7.9.1996

## Shell MDS expects RM400 m turnover

Shell MDS (Malaysia) Sdn. Bhd. has projected a RM400 million business turnover for this year from its Bintulu plant in Sarawak, said managing director Saw Choo Boon.

He said the plant would also increase its current annual production capacity of 400,000 tonnes of synthetic hydrocarbon to 500,000 tonnes in two years' time.

The RM2 billion plant is the first of its kind in the world that produces transport fuels and special products including wax, directly from natural gas and started operation in 1993.

"Our hard wax **Sarawak 100**, currently has 30 per cent of the world's 40,000-tonne market and aims to raise this to 50 per cent by the year 2000," Saw told reporters in Kuala Lumpur yesterday.

The company is a joint venture between Shell Gas BV (60 per cent), Diamond Gas, a

subsidiary of Mitsubishi Corp. (20 per cent), Petronas and Sarawak State Government (10 per cent) each.

The US Food and Drug Administration (FDA) also recognises the product for its purity, environmentally-friendly, bio-degradable product with no sulphur, nitrogen or aromatic compounds.

It is a highly versatile product with multiple applications such as in the manufacture of hot melt adhesives, printing inks, coatings, food packaging and PVC extrusion lubricants.

He said the company produced five per cent of the world's two million tonnes wax priced at US\$500 (RM1,250) per tonne and would increase the share to 10 per cent by the end of the century, adding that the company exported 80 per cent of its product to America and Europe and 20 per cent to the Asia-Pacific, mainly to Japan.

Star, 7.9.1996

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### Other Package Deals Available to Students

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## BERITA-BERITA LAIN Other News

### Local News

#### RM7 bil steel plant proposed in Sarawak

The country's biggest steel project has been proposed in Sarawak with a consortium of British firms undertaking a feasibility study.

A site is said to have been identified for the construction of a hot briquetted iron plant.

The project has been estimated at US\$2.5 billion (RM7 billion), making it the country's largest steel investment yet.

The plant will be able to annually produce about three million tonnes of direct reduced iron (DRI) which will be hot briquetted. The long-term production target is five million tonnes per year.

The output, which will be bigger than Perwaja Steel's 1.2 million tonnes per year, will make Malaysia a major source of DRI in Asia.

The Asia-based *Metal Bulletin*, in a recent report, identified British engineering consultants McLellans & Partners as one of the parties involved in the feasibility study.

The respected weekly also said former Perwaja managing director Tan Sri Eric Chia is coordinating the studies.

An aide to Chia confirmed Chia's involvement, adding that Chia had had several rounds of discussions with the Sarawak Government on the project.

The aide said additional infra-structure,

including more power supplies and a new port, would be built to sustain the new plant in Sarawak and related industries would also be located near the site.

"We have already inspected several overseas DRI plants, including the one in Mexico, as part of our preparations. The Sarawak DRI plant will be among the largest in the world," he added.

The project was scheduled to begin next year, he said, adding the hot briquetted iron would be exported.

It is understood that if the project is given the green light, it will be undertaken on a joint-venture basis between the state government and several foreign firms.

Officials said Prime Minister Datuk Seri Dr. Mahathir Mohamad had chosen Sarawak as the site of the project to spur its industrial growth.

In Malaysia, hot briquetted iron is currently only produced by Sabah Gas in Labuan at about 600,000 tonnes per year.

DRI is a pure form of metal used to produce billets and blooms which is the raw material for steel items.

Hot briquetted iron is processed from DRI and is normally produced for export purposes as it is safer than DRI which is hazardous and easily flammable.

*Star, 4.9.1996*

#### New Genting Sempah tunnel to be ready by next April

The new Genting Sempah tunnel parallel to the old two-way tunnel on the Karak-Kuala Lumpur highway will be completed in April 1997, six months ahead of schedule.

Workers from Transfield Holdings (Asia)

Sdn. Bhd. conducted the last explosion to break through the tunnel at kilometre 17 of the highway today.

Work on the tunnel was broken up into two sections to save time. The blasting work began

on one side and when it reached the halfway point, the workers began blasting from the other side.

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NST, 7.9.1996

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Star, 7.9.1996

## Penang all for second bridge project

The state government is in favour of building another bridge rather than expanding the existing Penang Bridge.

State infrastructure committee chairman Datuk Dr. Hilmi Yahaya said it is better to build another link as expanding the present bridge to six lanes will cause massive traffic jams for three years.

*"Penang Bridge's full daily capacity is 50,000 vehicles while the current volume is 36,000 so we can expect to reach full capacity by 2002."*

*"The agreement between the bridge's operator, Mekar Idaman Sdn. Bhd., and the federal government is that Mekar can build additional lanes to meet traffic demands."*

However, Hilmi said, the state planning committee found that the bridge will have to be closed partially for three years which the state feels is not viable.

*"The prospect of having traffic jams on the bridge and its connecting roads has prompted the state to prefer building another link between Batu Kawan and Bayan Baru."*

*"We have seen the initial new bridge proposal by Mekar which consists of part bridge and tunnel,"* Hilmi said, adding that the proposed second link will be 14 km long.

He added that the state has instructed Mekar to conduct a study on the RM2 billion link that will also include light rail transit passageways.

Sun, 9.9.1996

## Guthrie can cash in on marble and granite

Plantation giant Kumpulan Guthrie Bhd. which is on a massive diversification trail has unearthed a new source of earnings — marble and granite.

Hidden deposits discovered at some of its plantations in five states are large enough to make the group a "big brother" in the country's quarry industry.

Realising the new potential business, a subsidiary Guthrie Dimensional Stones Sdn. Bhd. was set up to undertake quarrying operations.

According to Guthrie Dimensional Stones controller Lee Chan Wa, the sites include the Kamuning Estate in Sungai Siput, Perak, which is rich in granite and black and grey marble.

*"A large deposit of granite has been found at our estate in Jerai, Tampin, Tangkak and Tanah Merah."*

*"With such a large deposits, we believe no other quarry operator in this country can match us in becoming the largest player,"* he said.

During a visit to the Sungai Siput quarry recently, Lee told *Star Business* the Kamuning Estate black marble deposits were believed to be of the highest quality in South East Asia.

*"We believe the Sungai Siput black marble is comparable with the Brazilian black marble,*

*which is the world's best,"* he said.

The black marble is valued for its pure black colour and its amazingly shiny surface after cutting and polishing.

Lee said Guthrie Dimensional's black marble deposits in Sungai Siput, approved by the government for excavation, covered 80.8 ha.

The area consists of six black marble-rich hills. Approval had been given for only three hills.

The first hill it will start excavating in the next few weeks would keep the company busy for at least 10 years.

On its granite deposits, Lee said the group's Tanah Merah 202 ha estate at the border of Malacca and Negri Sembilan had been identified as having the largest reserves.

Kumpulan Guthrie has recently signed an agreement to supply 1.2 million tonnes of aggregate granites from the Tanah Merah Estate to the KL International Airport project in Sepang.

Lee said the next site that would be exploited was Kumpulan Guthrie's Tampin Estate of which 40.4 ha had been identified as being rich in granite.

*"Excavation is expected to start by mid-1997 and the deposits are expected to keep us busy for about 15 years."*

Star, 9.9.1996



## Developers told to study mineral potential of land first

Developers should consider exploiting the mineral potential of their land before developing it, Primary Industries Minister Datuk Seri Dr. Lim Keng Yaik said yesterday.

He suggested they liaised with authorities such as the Geological Survey Department or the Mines Department to carry out proper studies on the proposed land for development or infrastructure projects.

*"Once the projects begin, the prospects of extracting these mineral reserves would be reduced as these resources would remain intact underground"* after construction was completed, he said.

State Governments must also play their role by conducting such studies and consider exploiting the mineral potential of land.

*"Apart from tin, the country is also rich in both metallic and non-metallic minerals like copper, gold, bauxite, iron ore, limestone, granite,*

*silica, clay and kaolin."*

Dr. Lim said this after officiating a seminar by the Geological Survey Department at Nikko Hotel in Kuala Lumpur on "Opportunities in the Clay-based Industries".

On the clay-based industry, he said the GSD had undertaken a survey to identify deposits to meet increasing demand.

The survey has discovered 23 deposits with a total reserve of 230 million tonnes of ball clay and 193 tonnes of mottled plastic clay nationwide.

Dr. Lim called on Malaysians to give priority to using local products like tiles, sanitary and table ware, as they were on par — if not better — than those overseas. Citing architects and interior decorators who preferred to use imported products in their building or redecorating plans, he said by emphasising local products, it would help improve the country's balance of payments.

*NST, 11.9.1996*

## Research to find better uses for marine clay

Geological Survey Department and Standards and Industrial Research Institute of Malaysia recently carried out two joint research projects to evaluate the suitability of marine clay as a source of light-weight aggregate.

Geological Survey Director-General Fateh Chand said the projects were under the Intensification of Research in Priority Areas programme.

*"The results of the research component on the characterisation and suitability of Malaysian granite rocks as a source of feldspar are encouraging.*

*"The extracted feldspar was found to be suitable for making ceramic items and glaze."*

*"Under the IRPA programme, the research projects were allocated about RM50,000 for the first year. This amount will be raised to RM2 million within two years,"* he told reporters after the opening of a geological seminar by Primary Industries Minister Datuk Seri Lim Keng Yaik in Kuala Lumpur yesterday.

Organised by the Geological Survey Department, the one-day seminar on "Opportunities in the Clay-based Industries", is aimed at, among others, promoting investment in the clay-based industry so as to maximise its contribution to the country's economy.

*NST, 11.9.1996*

## Island runs low on sand supply

Penang, which has resorted to reclamation to overcome land shortage, is now running short of sand for such activities.

It is learnt that the state would have to "import" sand from other states for future reclamation as it has almost exhausted its supply

from the seabed here.

A major developer shortlisted for the mega Central District Development (CDD) project here is believed to have begun negotiations for sand excavation from the sea off Lumut.

The project, involving the reclamation of

120 ha on the eastern foreshore, includes land reclamation for a coastal highway linking Weld Quay to the Penang Bridge and another 80 ha for commercial-cum-residential development.

*"Land reclamation contractors have found it increasingly difficult to obtain suitable sand and have been moving further out into the sea,"* said a source.

Only sand of a certain aggregate — which can withstand pressure for building purposes — is suitable for reclamation activities.

The source said the prices of reclaimed land were expected to increase in view of the additional costs incurred to transport the sand from other states.

About 20 million cubic metres of sand have

been dredged from the seabed over the last nine years since the Penang Development Corporation began reclaiming land on the island's south-eastern foreshore for industrial purposes.

A recent ruling by the state government barring reclamation work within a 1.5 km radius from the Penang Bridge has also limited areas for sand excavating activities.

State Infrastructure and Public Amenities committee chairman Datuk Dr. Hilmi Yahaya had said the ruling was to ensure the stability of the 13.5 km bridge.

With more control over hill-cutting, contractors have also lost an alternative avenue of sand supply for reclamation purposes.

*Star, 12.9.1996*

## DOE agrees to carry out two-year study on haze

The Department of Environment has agreed to the proposal submitted by Australia's Commonwealth Scientific and Industrial Research Organisation to carry out a two-year study on haze.

The proposal was accepted after examining the technical and financial report submitted by CSIRO's senior principal research scientist Dr. Greg Ayers at a meeting on Aug 11.

Following the acceptance, DOE deputy director-general Rosnani Ibrahim said the department had prepared a paper on the proposal and has submitted it to the Treasury for approval last week.

*"This is a procedure. We will be able to start the study as soon as the Treasury gives it approval. We do not want to delay the study any longer,"* she said.

Among those who were involved in scrutinising the proposal were officials from the DOE and Science, Technology and Environment Ministry, experts from local universities and members of the Technical and Financial Negotiation Committee which comprised representatives from the Finance Ministry, Implementation Co-ordination Unit of the Prime Minister's Department, Economic Planning Unit and the Public Works Department.

Science, Technology and Environment Minister Datuk Law Hieng Ding had said last month that Malaysia would engage consultants from Australia to conduct a study on haze due to

the severity of the problem.

Haze has become a cyclical problem over the years with the latest incident reported between July and last month.

Several States in the country, including the Federal Territory, Selangor, Penang and Johor were enveloped in haze for three weeks.

The study is expected to cost about RM500,000 and will be concentrated in the central area of Peninsular Malaysia particularly in the Klang Valley.

Rosnani said the aim of the study was to pinpoint the source of the haze which previous studies had failed to do.

She said experts would be using the "fingerprinting" method entailing the use of two new monitoring stations and sophisticated equipment during the study.

The method zeroes in on the specific sources and details concerning the haze.

The ability to determine the exact source of the haze means the department will be able to enforce the law effectively.

This is because the technology used will be transferred to DOE and the Meteorological Services department. Local officials will also benefit in terms of gaining knowledge as the Australian experts will be working closely with them during the study.

Rosnani said two new stations would be set up at separate locations in the Klang Valley to monitor haze during the course of the study. The

location have yet to be identified.

The Science, Technology and Environment Ministry is also commissioning another study on haze. This second study, to be financed under

the Danish Co-operation for Environment and Development programme, will focus on the damage caused by haze to the environment.

*NST, 22.9.1996*

## Johor sludge plant set to open soon

The country's most viable sludge treatment plant located at Teluk Kilok in the south-eastern tip of the peninsula, about 140 km from here, will begin operations soon now that power supply is available.

Spokesman for Insedecor Petroleum Technology Sdn. Bhd. Samsuddin Ibrahim said the company was gearing to complete the installation of three reactors for the treatment of sludge using boiler steam now that Tenaga had set up a power substation to supply enough electricity to run the plant's 250 hp boiler.

The company is a joint venture between Perisind Holdings (PH) (the economic arm of the Johor State Islamic Development Corporation) and Petroleum Technology Research Corporation (PTRC) of the Philippines which has 20 years'

experience in recycling petroleum by-products.

About three vessel-load of sludge had already been put into the storage pit since April last year and were awaiting treatment, Samsuddin said.

Vice-president of PTRC Henry Tan said the plant was an extension of a pilot plant set up in the Philippines to study the viability of the project.

The open pit would not accumulate toxic gases, he said. It has a specially designed drainage system that would allow only water to flow out and be filtered by a seven-stage filtering system making the effluent "clean".

*"The sludge will be converted into fuel oil for industrial use and when the plant begins operation, no sludge will be left in the storage pit without being treated,"* Tan said.

*Star, 23.9.1996*

## New ceiling prices fixed for cement

In a bid to check profiteering, the Government has fixed the distributor and retail prices of cement, thus setting the amount of profit made by retailers to between 25 sen and 30 sen per 50 kg bag.

The new ceiling price for distributors and retailers, which will take effect from Oct 1, will also mean that the retail price will be reduced by 70 sen per 50 kg bag — from the current RM10.60 a bag to RM9.90.

In announcing this today, Domestic Trade and Consumer Affairs Minister Datuk Abu Hasan said in a move to control the price of cement and to ensure adequate supply at retail outlets, the Government has decided to fix the distributor and retail prices.

He said the move would allow retailers to make marginal profits and would prevent them from selling above the Government approved price.

Speaking at a seminar on *The Challenges and Opportunities in the Malaysian Building Materials Industry* at the Hilton Hotel here, he said at present, the prices were negotiated between distributors and retailers.

In conjunction with the seminar organised by Budimex Sdn. Bhd., an exhibition displaying the various products and materials used in the construction industry was held.

Abu Hassan said the move was to control the price of cement, ensure adequate supply and prevent irregularities.

He said the ministry had fixed the profit margin at between 25 sen and 30 sen for every 50 kg bag of cement.

He said the retail price of a 50 kg bag of cement in Kuala Lumpur was fixed at RM9.90 and the price at distributor level RM9.65.

*"The price of cement at distributor level at other major cities and towns has also been fixed*

at 25 sen or 30 sen below the retail price fixed by the Government. This means that each retailer will get a commission of between 25 and 30 sen per bag," he said.

He said the Government would continue to allow the import of cement as long as there was a shortage and added that at the same time, steps were being taken to establish more cement plants in the country to meet the demand.

He said the building industry played a key role in national development and therefore the

Government was committed to providing the necessary infrastructure and facilities to ensure its progress.

He added that RM200 billion had been allocated for the building industry under the Seventh Malaysia Plan from 1996 to 2000.

Abu Hassan said it would be beneficial for those in the building industry to set up an information centre to provide data on the various types of building materials and products available in the country.

NST, 27.9.1996

## KMB, Sungai Long in quarry deal

Kumpulan Melaka Bhd. and Sungai Long Industries Sdn. Bhd. yesterday signed an agreement to jointly develop a quarry in Bukit Panchor, Alor Gajah.

KMB holds 30 per cent of the new company, KM Quarry Sdn. Bhd., with Sungai Long holding the balance. The signing ceremony was held before Malacca Chief Minister Datuk Seri Mohd Zin Abdul Ghani.

KM Quarry is given a 30-year lease for the quarry for which 70 per cent of proceeds from the first 10 years of operation would go to Sungai Long. After that, the proceeds would directly go to KMB.

"KMB benefits from the transfer of technology gained from this project while Sungai Long would receive a good return from their investments," said Mohd Zin, who is also KMB chairman.

Meanwhile, Sungai Long chairman Tan Sri Talha Mohamad Hashim said the company would be investing RM20 million in the project, of which RM7 million would be for the lease of land while the remainder is for the purchase of

equipment.

"The project will be located on 36 hectares in Bukit Panchor and the first output is expected early next year upon getting the Environmental Impact Assessment report approved," he said.

Talha added that he expected the quarry to produce 100 million tonnes annually.

"Besides this, the company would engage in other related quarry industries such as making cement blocks."

He added that his company and KMB would also engage in the construction and maintenance of roads in the State through the formation of a joint-venture company, KM Road Specialist Sdn. Bhd.

"Sungai Long would own a 49 per cent of the company while KMB would own 51 per cent."

"It is only natural for both of us to be involved in the road construction and maintenance business due to our venture in the quarry," he said.

NST, 2.10.1996

## Tremor that hit nation originated off Sumatra

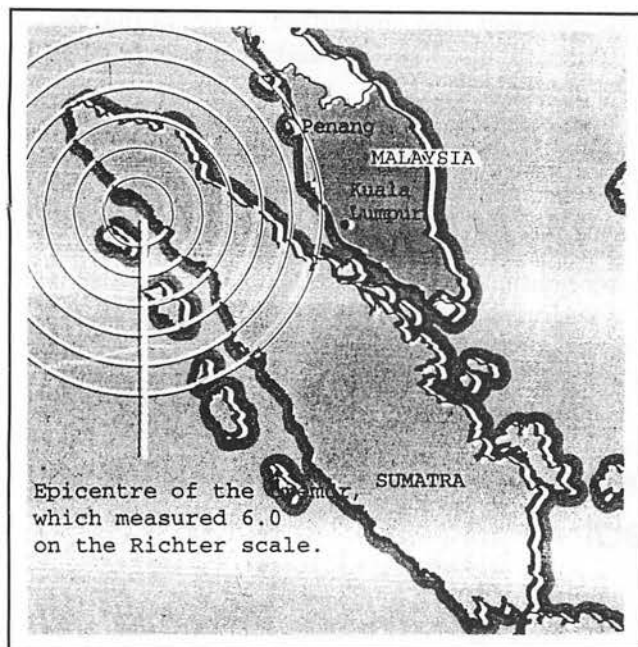
The Tremor that jolted the western part of Peninsular Malaysia and sent residents of several high-rise building buildings fleeing late last night was centred in the Indian Ocean off the coast of Sumatra, about 1,500 km from Jakarta.

Indonesia's Meteorological and Geophysics Office reported the tremor measured 6.0 on the Richter scale at its epicentre.

There were no reports of injuries or damage, although officials from the International Islamic University said during a Press conference today that the Abu Bakar Hostel at its Petaling Jaya campus sustained minor damage.

Director of Meteorological Services Department's seismology division, Lim Tow Kim, said the tremor began at 10.22 pm and lasted six





minutes.

"Sumatra has tremors once or twice a year on the average so we usually experience its spillover effect," he said.

Tremors are caused by movement along fault lines or fissures in the earth's crust. Malaysia lies outside the earthquake belt running down from Myanmar to the west coast of Sumatra.

Reports of tremors are common, especially in East Malaysia. The last recorded incident took place in October last year when a tremor measuring 7.0 on the Richter scale in central Sumatra shook Johor and Singapore.

Meanwhile, *Reuter* reports that the tremor was also felt in Hong Kong and Australia.

Residents in major north Sumatran cities including Medan, Banda, Aceh, Tapaktuan and Kutacane said they felt the tremors but had not heard of any casualties.

NST, 12.10.1996

## Move to establish disposal sites for radioactive waste

With the integrated scheduled waste management plant at Bukit Nanas already in operation, the Government is now working on establishing repositories or disposal sites for radioactive waste.

This is to protect the people and the environment, Science, Technology and Environment Minister Datuk Law Hieng Ding said today.

He said there was also a need to formulate a policy for its management because radioactive waste, particularly the by-products of mining and oil exploration activities, was becoming a serious problem which needed to be addressed before it got out of hand.

"However, we need to get public consensus and co-operation from non-governmental organisations," he said after launching the Second Seminar on Radioactive Waste Management for Regional Nuclear Co-operation in Asia at Crown Princess Hotel.

The three-day seminar is jointly organised by the Malaysian Institute for Nuclear Technology Research, the Science Technology Agency, Japan and the Japan Atomic Industrial Forum.

Improper disposal of radioactive waste can

be hazardous as it can cause ground and water contamination. On human health, exposure to radioactivity can cause cancer and sexual or reproductive organ disorders, among others.

Radioactive waste management has always been a touchy subject both in Malaysia and in developing countries. Public apprehension over issues, including the location of disposal sites and transportation of the waste to the sites, has often led to emotional debate.

At present, the country does not have a radioactive waste disposal policy. It has only one radioactive waste management facility set up by the Malaysian Institute for Nuclear Technology Research in Bangi.

The facility accepts low-level radioactive waste from hospitals, universities and industries for treatment and storage. The country does not generate high-level radioactive waste.

Meanwhile Mint research officer Syed Abdul Malik said today research on radioactive waste management must be carried out continuously so that safer and cost-effective methods can be adopted.

He said studies were needed because the hazardous nature of radioactive waste called for improvement in all aspects of its management

and final disposal.

In Malaysia, the main use of radioactive or related materials are in industrial, medical and research or educational applications. These include hospitals, universities and radiography. There are basically two types of waste in the country.

They are waste produced from usage of radioactive materials for industrial, medical, agricultural, research and educational purposes; and waste from technologically enhanced naturally occurring radioactive material resulting from tin-mining activities, processing of materials containing natural radioactive materials and from petroleum and gas industry.

*NST, 16.10.1996*

## IJM in coal mining joint venture

IJM Corporation Bhd., through its wholly-owned Malaysian Rock Products Sdn. Bhd. (MRP), has subscribed to a 50 per cent stake in DML-MRP Resources (M) Sdn. Bhd. pursuant to a shareholders' agreement with DML Resources (M) Sdn. Bhd.

DML-MRP is a joint venture between MRP and DML Resources, a wholly-owned subsidiary of DML Resources Ltd. of New Zealand.

In a statement last Saturday, IJM said the joint-venture company would undertake the coal mining contract at the Merit-Pila Coalfield in central Sarawak.

The contract worth US\$25 million (RM62.5 million) will be for a four-year period to extract 300,000 tonnes of coal in the first phase during the first year and 745,000 tonnes of coal per year in the second to the fourth year under phase two.

*Star, 21.10.1996*

## Quarry operations projected to grow 15 pc a year

Quarry operations are projected to grow by more than 15 per cent per year in line with the rapid infrastructure development in Malaysia, said Institute of Quarrying Malaysia (IQM) chairman Sim Quan Seng.

He said recent findings indicated that quarry operations in Malaysia were worth more than RM1.3 billion.

*"Quarries in Malaysia are more technologically developed and we have the expertise in the field compared to others in the region except Australia. Labour is not a problem in quarry operation,"* he said.

The problems faced by the industry include no proper planning of quarry sites which results in air pollution and poor coordination at the state and national level in the approval of land for quarry operations.

Sim said another problem was the delay in approving megazines (storage explosives) by the police. This will affect or slow down the operations.

He said most of the 300 licensed quarry operators were small with an annual production capacity of 40,000 to 50,000 tonnes.

IQM was established in 1989 as a branch of the Institute of Quarrying United Kingdom.

Its main objectives are to promote education and training within the industry and to design and conduct courses, seminars, technical talks and dialogue sessions with relevant government agencies.

The institute is organising the *Kuari Asia 97* exhibition in Kuala Lumpur from April 7-11 next year.

More than 80 exhibitors from 20 countries are expected to participate in the show to be held on 4.04 ha of exhibition area.

IQM also is organising the International Symposium on Limestone in collaboration with Universiti Sains Malaysia's School of Materials and Mineral Resources Engineering. The symposium will be held in Subang Jaya from Nov 13 to 15.

*Star, 21.10.1996*

## RM500 m cement plant MoU

Asia Pacific Land Bhd., together with Bintang Tower Sdn. Bhd. and the Pahang State Government, is embarking on a RM500 million cement manufacturing plant project in Pahang.

AP Land will hold a 40 per cent interest in the project while Bintang Tower and the Pahang Government — through State Agricultural Development Authority — will each have a 30 per cent stake.

The three parties yesterday signed a memorandum of understanding for the equity participation in the project, which will be located in Merapoh in Pahang's Lipis district.

Speaking to reporters after the MoU signing ceremony, Mohd Khalil said the cement manufacturing plant would have a capacity of 1.2 million tonnes of cement a year.

However, it would initially produce about 600,000 tonnes of the product when it comes onstream in 1999. The bulk of the production will be consumed by AP Land, which is engaged in property development and investment.

The rest of the cement will be sold mainly to

the East Coast States, Johor and Selangor.

Bintang Tower, which is owned by the Low family, who also controls AP Land, will set up and manage the plant, while SADA would contribute land and would assist in securing more land required by the project in the future.

Bintang Tower has also identified the consultants to manage and oversee the project, whose implementation is targeted for next year.

Mohd Khalil said the Pahang Government had earmarked over 800 ha around the project area to be developed into a township, consisting residential and commercial units.

The plant, he said, would use the latest in the cement production technology to ensure minimal impact on the environment.

The land allocated to the project, he added, had adequate reserves of raw material to last over 50 years. The area is also well-connected via road and rail.

AP Land will finance its share of the RM500 million initial investment in the project from internal funds and borrowings.

*NST, 29.10.1996*

## First Circular

International Symposium on the occasion of  
the 50th Anniversary of  
the Geological Society of Korea

# TECTONIC EVOLUTION OF EASTERN ASIAN CONTINENT

Symposium

*September 24–25, 1997*

Field Excursion

*September 26–29, 1997*

Organized and hosted by:  
**The Geological Society of Korea**

## Invitation

All persons who are interested in tectonics of the eastern Asian continent are cordially invited to attend the International Symposium on the Tectonic Evolution of Eastern Asian Continent in Seoul, Korea, September 24–29, 1997. This 1997 meeting will be a special one held on the occasion of the 50th anniversary of the Geological Society of Korea. The Symposium will provide a forum for the exchange and discussions of information and opinion on all aspects of tectonic evolution of eastern Asian continent.

The Symposium will include two days of technical sessions and one four-day field trip. The meeting will be held at the Korea Federation of Science and Technological Societies conveniently located in the southern heart of Seoul City. The large modern facilities will permit a single venue for the oral sessions and will also provide for several poster sessions.

The field trip will comprise a traverse of the Korean Peninsular from northwest to southeast. This geotraverse will cover the geologic age from the Pre-Cambrian to the Tertiary.

## Accommodation

On-campus guest housing at the Seoul National University (Hoam Guest House) will provide low-cost accommodations from September 23 to 25, 1997. Transportation will be provided from the Hoam Guest House to the meeting place. A complete range of hotel accommodations are available in Seoul; however, public transportation would be required to reach the meeting site for most of them.



## Registration and Fees

All participants will be required to register and pay the fees.

The registration fee is US\$120. The registration fee will include admission to sessions, the printed conference program, proceedings volume, and lunches for the two days (Sept. 24 and 25) of technical sessions.

Accommodation information of the Hoam Guest House, Seoul National University will be announced in the Second Circular.

The field trip will cost US\$400, which includes a guide book, meals, lodging and transportation.

## Call For Papers

The proceedings volume will be published for this symposium. Participants who are interested in presenting papers are requested to submit (a) short paper(s) up to 4 A4-size pages including figures before May 31, 1997.

The guideline for a short paper will be informed in the Second Circular.

## Important Dates

- Reply to First Circular : Dec 31, 1996
- Distribution of Second Circular : March 1, 1997
- Paper Deadline : May 31, 1997
- Registration Deadline : August 15, 1997

## Correspondence

Please send all correspondence to:

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 Fax: 822-371-3269  
 Tel: 822-880-6736  
 E-mail: lee2602@plaza.snu.ac.kr

## KALENDAR (CALENDAR)

### 1996

#### November 6-8

*THE 18TH NEW ZEALAND GEOTEHRMAL WORKSHOP*, Auckland, New Zealand. (Professional Courses, Centre for Continuing Education, The University of Auckland, Private Bag 92019, Auckland, N.Z. Phone: 64-9-373 7599 ext. 7050; Fax: 64-9-373 7419; E-mail: professional.courses@auckland.ac.nz)

#### November 10-15

*A WORKSHOP ON TUFFS — THEIR PROPERTIES, USES, HYDROLOGY, AND RESOURCES*, Santa Fe, New Mexico. (Grant Heiken, Earth and Environmental Sciences Division, EES-1, Los Alamos National Laboratory, Los Alamos, New Mexico, 87545 USA. Phone: 505-667-8447; Fax: 505-665-3285; E-mail: heiken@lanl.gov)

#### November 17-22

*HYDROLOGY IN THE HUMID TROPICAL ENVIRONMENT* (International Symposium), Kingston, Jamaica. (A.I. Johnson, Water and Soils Consulting, 7474 Upham Court, Arvada, CO 80003, USA. Phone and telefax: 303 425 5610)

### 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)

#### January

*DROUGHT, GROUNDWATER POLLUTION AND MANAGEMENT* (International Workshop), Dindigul, India. (Managing Director, Tamilnadu Water Supply and Drainage Board, TWAD House, Chepauk, Madras 600 005, India)

#### January 6-8

*INTERNATIONAL CONFERENCE ON LAND MANAGEMENT*, London, UK. (Dr. Richard K. Bullard, School of Surveying, University of East London, Longbridge Road, Dagenham, Essex, RM8 2AS, UK. Tel: +44 (0181) 590 7722; Fax: +44 (0181) 849 3618; E-mail: Bullard@UEL.AC.UK)

#### April 6-9

*1997 APPG ANNUAL MEETING — FUTURE LEGENDS* (Annual Convention), Dalas, Texas. (AAPG Convention Department, P.O. Box 979, Tulsa, OK 74101-0979 USA or 1444 S. Boulder Ave., Tulsa, OK 74119-3604 USA.)

#### April 14-18

*GEODYSSSEA (GEODYNAMICS OF S. AND S.E. ASIA)* (International Symposium), Penang, Malaysia. (Dr. Peter Wilson, GeoForschungZentrum Potsdam, Telegrafenberg A17, D-14473 Potsdam, Germany. Fax: (49)-331-288 1111; E-mail: wilson@gfz-potsdam.de)

#### May 14-16

*GEOTECHNICAL ENGINEERING IN ASIA: 2000 AND BEYOND* (Third Asian Young Geotechnical Engineers Conference), Singapore. (Dr. T.S. Tan, Department of Civil Engineering, National University of Singapore, 10 Kent Ridge Crescent, Singapore 119260. Phone: (65) 772-2160; Fax: (65) 779-1635; E-mail: cvetants@nus.sg)

#### May 21-23

*PETROLEUM SYSTEMS OF S.E. ASIA & AUSTRALASIA* (International Conference), Jakarta, Indonesia. (Dr. Ron Noble, ARCO Indonesia Inc., PO Box 260888, Plano TX 75026. Phone: 62-21-521-9028; Fax: 62-21-521-9063; E-mail: rnoble@is.arco.com)

**May 25-30**

*GEOCHEMICAL EXPLORATION* (18th International Symposium of AEG), Jerusalem, Israel. (IGES Secretariat, P.O. Box 50006, Tel Aviv, 61500 Israel. Telefax: 972 3 5140000; E-mail: iges@mail.igs.gov.il)

**June 15-21**

*CLAY CONFERENCE*, Ottawa, Canada. (J.B. Percival, Geological Survey of Canada, 601 Booth St., Ottawa, Ontario, K1A 0E8. Phone: 613/992-4496; Fax: 613/943-1286; E-mail: percival@gsc.emr.ca)

**June 22-25**

*ROCK SUPPORT — APPLIED SOLUTIONS FOR UNDERGROUND STRUCTURES* (International Symposium), Lillehammer, Norway. (Mrs. Siri Engen, Norwegian Society of Chartered Engineers, P.O. Box 2312, Solli, N-0201 Oslo, Norway. Fax: +47 22 94 75 02)

**June 23-27**

*ENGINEERING GEOLOGY AND THE ENVIRONMENT* (International Symposium of IAEG), Athens, Greece. (Symposium Secretariat, P.O. Box 19140, GR-117 10 Athens, Greece. Telefax: 301 381 3900; 301 924 2570)

**July 28 – August 1**

*LEARNING ABOUT THE EARTH AS A SYSTEM* (Second International Conference on Geoscience Education), University of Hawai'i, Hilo. (Dr. M. Frank Watt Ireton, GeoSciEd II Local Arrangements Coordinator, American Geophysical Union, 2000 Florida Avenue, NW, Washington, DC 20009. E-mail: fireton@kosmos.agu.org)

**August 28 – September 3**

*GEOMORPHOLOGY* (4th International Conference of International Association of Geomorphologists), Bologna, Italy. (Planning Congressi, srl Via Crociali 2, I-40138 Bologna, Italy)

**September 1-5**

*GEOLOGY AND ENVIRONMENT* (50th Geological Congress of Turkey), Istanbul, Turkey. (Secretary GEOENV '97, PK 464, Kizilay, 06424 Ankara, Turkey. Phone: 90 312 4343691; Telefax: 90 312 4342388; E-mail: jdogan@et.cc.hun.edu.tr)

**September 2-6**

*GEOLOGY AND ENVIRONMENT* (Int'l. Symposium), Istanbul, Turkey, by the Chamber of Geological Engineers. (I. Yilmazer, GEOENV '97, P.K. 464 Kizilay, 06424 Ankara, Turkey. Phone: 9-0-312-4343601; Fax: 9-0-312-4342388; E-mail: jdogan@et.cc.hun.edu.tr)

**September 21-27**

*GROUNDWATER IN THE URBAN ENVIRONMENT* (27th IAH Congress) (Professor J.D. Mather, Geology Dept., Royal Holloway and Bedford New College, Egham, Surrey TW20 0EX, UK. Telefax: 784 471780)

**September 30 – October 3**

*CONCEPTS AND MODELS FOR SUSTAINABLE WATER RESOURCES MANAGEMENT* (FRIEND '97 Conference on Regional Hydrology), Postojna, Slovenia. (Dr. M. Brilly, FGG Hydraulics Division, Hajdrihova 28, 6100 Ljubljana, Slovenia. Phone: (386) 61 1254 333; Telefax: (385) 61 219 987; E-mail: mitja.brilly@uni-lj.si)

**November 30 – December 3**

*PERMIAN OF EASTERN TETHYS: BIOSTRATIGRAPHY, PALAEOGEOGRAPHY & RESOURCES* (International Conference), Melbourne, Australia. (The Secretariat, Permian of Eastern Tethys Conference, School of Aquatic Science & Natural Resources Management, Deakin University, Rusden Campus, 662 Blackburn Road, Clayton, Victoria 3168, Australia. Phone: 61-3-9244 7429; Fax: 62-3-9244 7480; E-mail: asnrm@deakin.edu.au)

**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)

**June 29 - July 18**

*8TH INTERNATIONAL PLATINUM  
SYMPOSIUM* (IAGOD/CODMUR),  
Johannesburg, South Africa. (Dr. C.A. Lee,  
P.O. Box 68108, Bryanston, South Africa. Phone:  
2711 411 2253; Telefax: 2711 692 3693)

**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: (461) 978  
3030; Telefax: (416) 978 3938; E-mail:  
ima98@quartz.geology.utoronto.ca)

**August 17-19**

*GEOSEA '98* (Ninth Regional Congress on  
Geology, Mineral and Energy Resources of  
Southeast Asia), Kuala Lumpur, Malaysia. (The  
Organising Secretary, GEOSEA '98, Geological  
Society of Malaysia, c/o Department of Geology,  
University of Malaya, 50603 Kuala Lumpur,  
Malaysia. Phone: +(603) 757 7036; Fax: +(603)  
759 3900; E-mail: geologi@po.jaring.my)

**October/November**

*PHYSICAL, CHEMICAL AND BIOLOGICAL  
ASPECTS OF AQUIFER-STREAM  
SEDIMENT INTERRELATIONS* (28th IAH  
Congress) (Dr. J. Rosenschein, USGS MS 414,  
National Center, Reston Va 22092, USA;  
Telefax: 703 648 5722)



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Editor: G.H. Teh

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## GEOLOGICAL SOCIETY OF MALAYSIA

JULY 1994

No. 35

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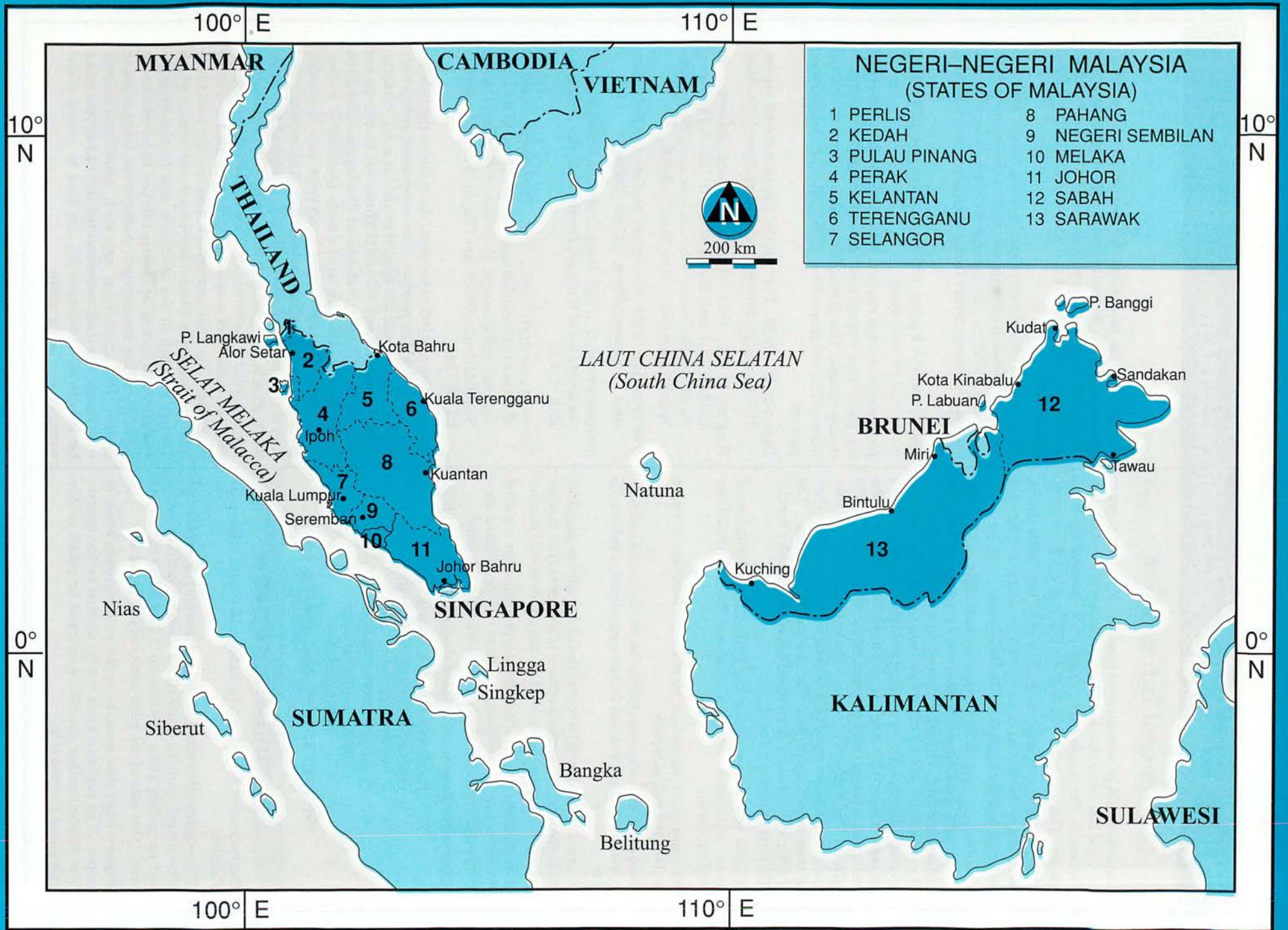
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