

PERSATUAN GEOLOGI MALAYSIA

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CATATAN GEOLOGI

Geological Notes

Iron rich conglomerate of Ma'Okil Formation at Bukit Lop, Chaah, Johor

MOHD SHAFEEA LEMAN AND YUSRI ZAKARIAH
Jabatan Geologi
Universiti Kebangsaan Malaysia
43600 UKM Bangi, Selangor

Abstract: Matahari Mining Sdn. Bhd. which operate at the southeastern spur of Bukit Lop, near Chaah, exposed about 40 m thick of conglomerate which belongs to the continental Upper Mesozoic Ma'Okil Formation. The conglomerate unit overlies a massive andesitic volcanic rock. The lowest bed of the conglomerate is essentially made of angular to subrounded pebbles and cobbles of hematite derived from the nearby primary hematite ore body. The clasts of this conglomerate are poorly sorted and the matrix is made of very fine-grained hematite. Iron clasts are also present in the overlying conglomerate, the percentage and size of which decrease toward the top of the conglomerate unit. This *in situ* nature of iron conglomerate deposition suggests that the iron clasts were deposited as an alluvial fan deposit along the foot of a fault scarp. The paleoslope is directed toward the northwest. The farthest distribution of the iron pebbles is about 50 m from the centre of the fan. This fault might represent part of the Ma'Okil wrench fault mentioned by Burton (1965) along which Bean (1968) recognised several iron ore deposits. The absence of goethite cement or matrix suggests that the depositional environment of the conglomerate was not very much influenced by water.

INTRODUCTION

The operation site of the Matahari Mining Sdn. Bhd. is located on the southeast corner of Bukit Lop, about 10 km southwest of Chaah Town (Fig. 1). The mine was reopened in 1985 after its last closure in 1965. Iron and baryte were mined from several primary hematite-baryte ore bodies emplaced parallel or subparallel to the flow bedding of the andesitic volcanic host rock. Part of the mining history and geology related to this iron mineralization was published by Bean in 1968.

Recently, while studying the geology of the iron mine and the surrounding area, the present authors noted the occurrences of iron rich conglomerate overlying the andesitic volcanic rock. This conglomerate which obtains much of its source material from the underlying volcanic rocks and the primary iron ore body

immediately southeast of the basin, is believed to be part of the basal (continental origin) conglomerate of the Upper Mesozoic Ma'Okil Formation.

GEOLOGICAL SETTING

Bukit Lop is situated in northwest Johor, about 10 km southwest of Chaah Town. The Ma'Okil Formation is the youngest rock formation exposed in the area west of Chaah Town. On the southeastern part of Bukit Lop (southwest of Chaah) this formation unconformably overlies the oldest rock formation of the area, i.e. the Upper Permian Lop Formation (Fig. 1). In the area west and northwest of Chaah Town, the Ma'Okil Formation overlies the Middle to Upper Triassic Gemas Formation, unconformably. Primary iron and baryte mineralization emplaced within

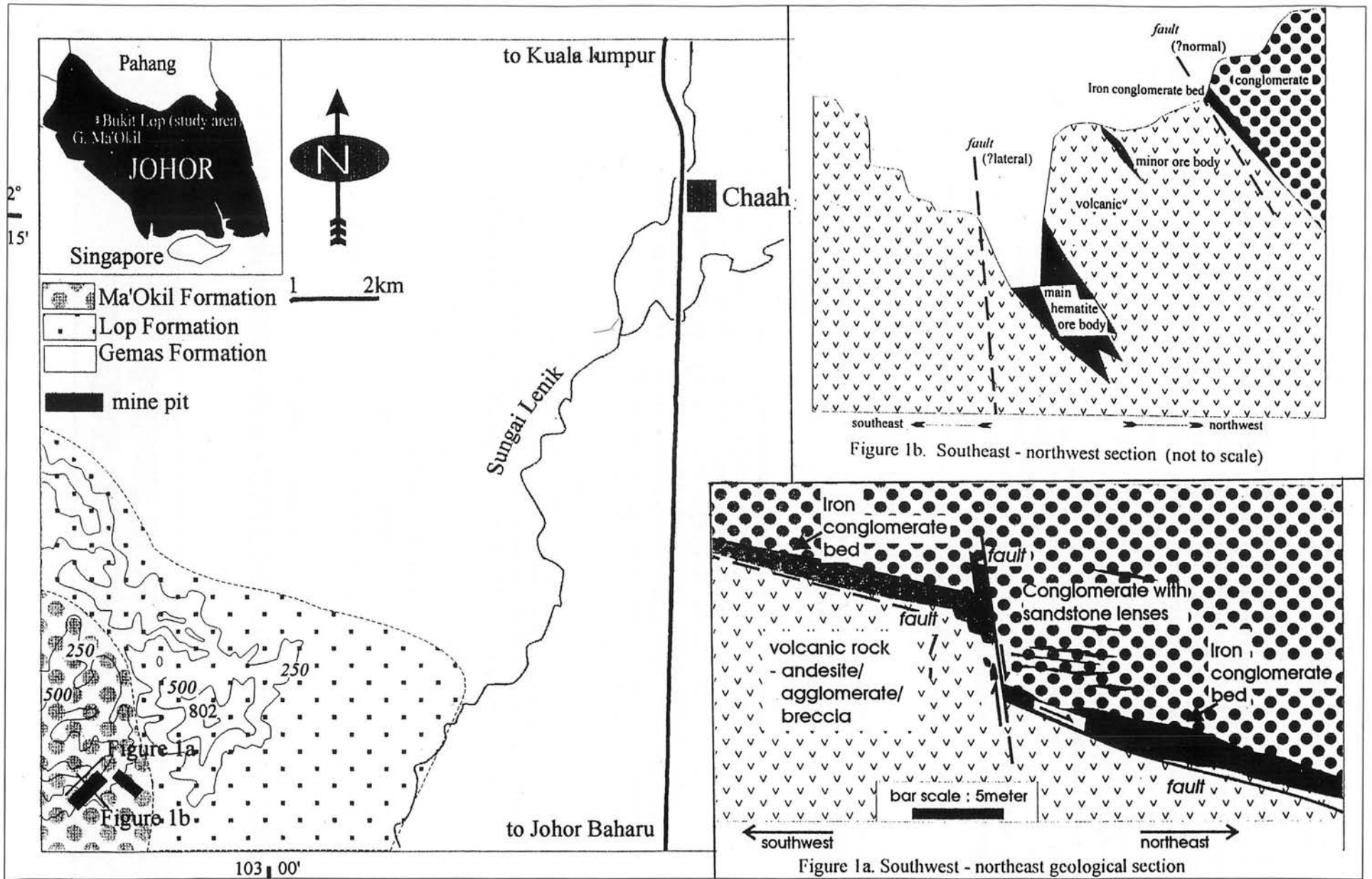


Figure 1. Geological setting and geological section of the study area.

the volcanic unit of the Ma'Okil Formation played a very important role in the development of mining in this area.

THE MA'OKIL FORMATION

The name Ma'Okil Formation was introduced by Loganathan (1978) for the continental Upper Mesozoic rock unit which is largely exposed within the vicinity of Ma'Okil Forest Reserve. Loganathan (1978) noted many similarities between the Ma'Okil continental sequence and other Mesozoic continental deposits described in Pahang as Tembeling Formation by Koopmans (1968) and Burton (1973), as Tekai Group by Khoo (1977) and as Tembeling Group by Koopmans (1977) and Khoo (1983). Similar continental deposits were described in Kelantan as the Gagau Group by Rishworth (1974). In Johor, continental Mesozoic rocks have been described under various stratigraphic units from different areas including the Ulu Endau Bed in Mersing area (Chong *et al.*, 1968), Tebak Formation in Gunung Belumut area (Rajah, 1968), Panti Sandstone in Ulu Sedili area (Suntharalingam, 1973) and the Paloh Bed in Bekok-Paloh area (Zakaria Hussain, 1986, 1987). Loganathan (1978) noted that all these continental deposits have many similarities between them and thus he concluded that all of these formations were contemporaneously deposited. Loganathan (1978) considered that the Ma'Okil Formation was developed as an outlier of the Tahan Supergroup of Yin and Aw (1975). Comprehensive compilation of works on these various Upper Mesozoic rock formations can be obtained from Loganathan (1978) and Khoo (1983).

According to Loganathan (1978), the Ma'Okil Formation comprises a 200 m thick rudaceous unit overlain by a 300 m thick arenaceous unit, which in turn was overlain by about 6,200 m thick argillaceous unit. Volcanic flows of trachytic to andesitic composition are commonly found interbedded with other sediments in the rudaceous and the argillaceous units.

THE IRON RICH CONGLOMERATE

About 40 m thick of conglomerate is exposed on the northwestern face of the mine pit at

Bukit Lop. The mine pit excavation work was made to follow the trend of the primary hematite lode which is roughly trending northeast-southwest. There is no conglomerate found in the southeastern face of the mine pit. The conglomerate unit overlies the andesitic volcanic rock which hosted the iron mineralization (Fig. 1). This volcanic rock probably belongs to one of those volcanic units described earlier by Loganathan (1978) from the conglomerate unit of Ma'Okil Formation.

The conglomerate is thickly bedded to massive in nature. The clasts of the conglomerate range in size from pebble to cobble, and angular to subrounded in shape. The size of the clasts generally decreases toward the top of the conglomerate unit.

The clasts in the lowest bed of the conglomerate unit are very poorly sorted and they are almost entirely made of hematite pebbles and cobbles, embedded in matrix made of very fine-grained iron oxide (Figs. 2, 3). X-ray diffraction analysis shows that both clasts and matrix are almost entirely made of hematite with traces of quartz present (Fig. 4). Neither the clast, nor the cement shows any trace of goethite or any other iron hydroxide minerals. The iron matrix occurs only in the lowest bed of the conglomerate unit which is closest to the primary iron ore body.

This iron conglomerate bed has a lenticular shape (a lobe with rather planar base) with maximum thickness of about 3.7 m and maximum diameter of about 100 m. There are at least 3 iron conglomerate unit laterally developed in this area. Towards the northeast of the main iron conglomerate unit, the bed thins gradually to about 0.5 m before it merges into another iron conglomerate unit. Meanwhile, towards the southwest, the main iron conglomerate unit thins gradually and disappears for about 20 m before another iron conglomerate unit appears.

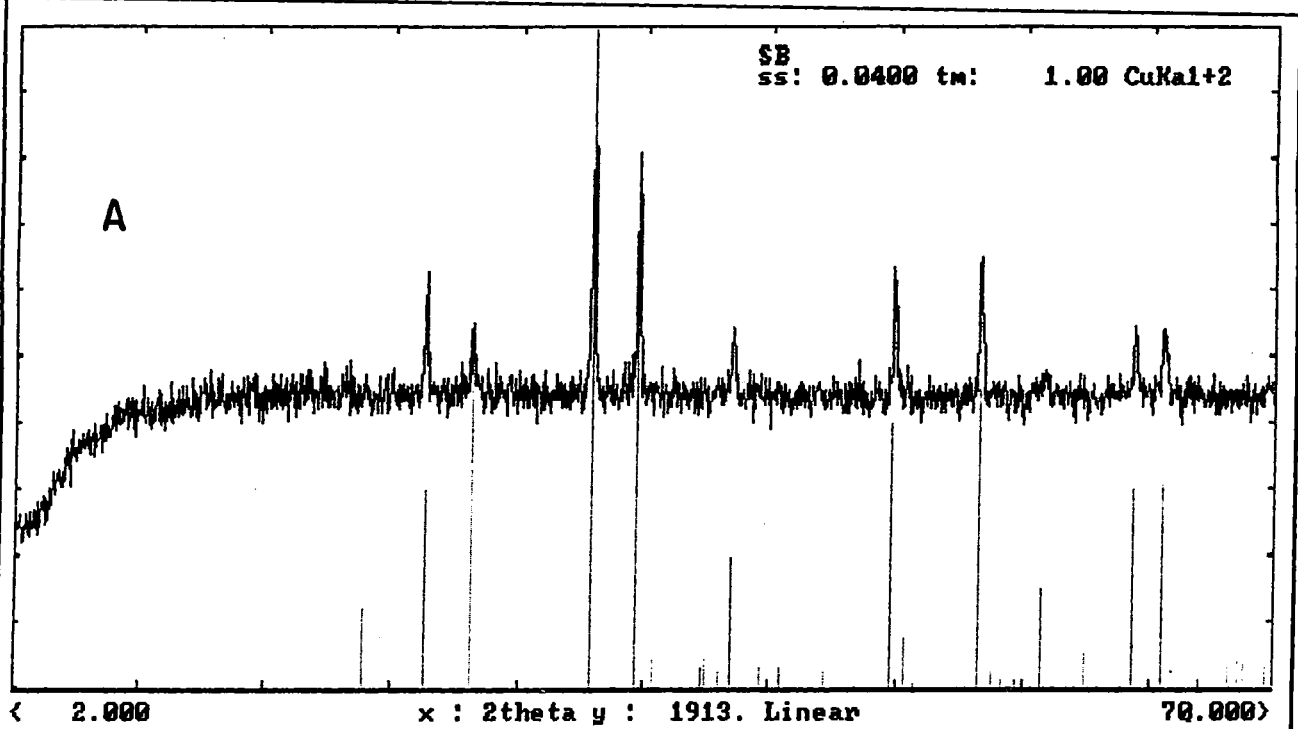
Towards the top of the conglomerate unit the sorting of the sediment grains improves gradually. Iron pebbles also occur in thin lenticular bed (channel-filled) (Fig. 1a) or rarely as scattered clasts in the top conglomerate unit. The conglomerate unit also contains several lenticular beds of sandstone also with channel-



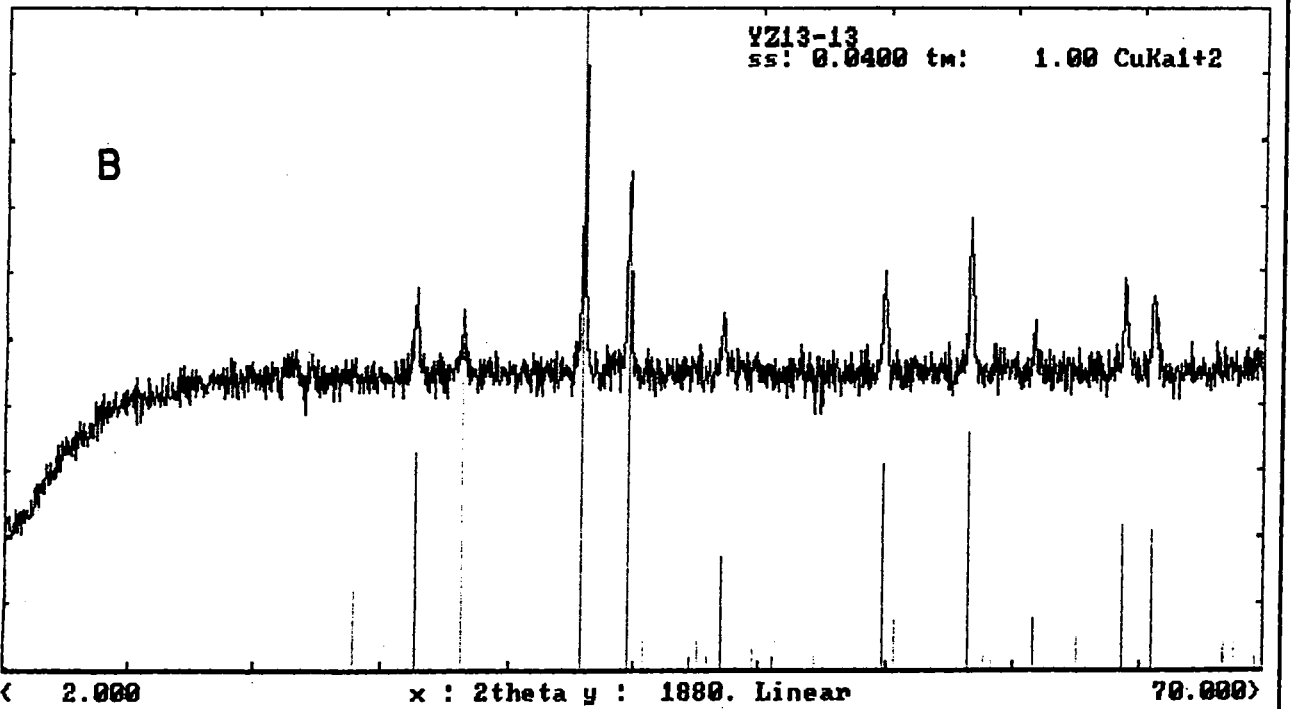
Figure 2. Iron Conglomerate bed from Bukit Lop, Chaah (V = volcanic rock ; IC = iron conglomerate bed; C = conglomerate)



Figure 3. Closed up view of the iron conglomerate showing angular to subrounded pebbles of hematite in matrix of fine grain hematite.



33-0664 I Fe₂O₃ Hematite syn
33-1161 * SiO₂ Quartz syn



24-0072 D Fe₂O₃ Hematite
33-1161 * SiO₂ Quartz syn

Figure 4. X-ray diffractogram of clast (a) and matrix (b) of the iron conglomerate showing the domination of hematite with traces of SiO₂.

filled shape, some of which has a diameter of up to 20 m and thickness of about 2.3 m. Toward the top, the conglomerate unit is gradually overlain by pebbly sandstone.

The conglomerate and the overlying pebbly sandstone unit is moderately dipping (40° to 50°) towards the northwest. The general strike is trending towards northeast-southwest, a trend very similar to the main trend of the iron mineralization. At the same sector of the mine pit, a nearly vertical normal fault can be seen cutting the conglomerate and sandstone units almost at a right angle to the bedding strike. The base of the conglomerate unit on the northeastern side of the fault has been displaced about 8 m downward (Fig. 1a). The fault only cuts the lower part of the conglomerate unit and the underlying volcanic rock. Perhaps, it is a series of similar trending faults which later influence the present day lineament of the Bukit Lop ridge and other ridges within the Ma'Okil Forest Reserve. The Bukit Lop ridge and other ridges within the Ma'Okil Forest Reserve is trending toward northwest-southeast.

DISCUSSION AND CONCLUSION

The presence of conglomerate at this locality have been mention by Bean (1968) and Zakaria Hussain (1987). Zakaria Hussain (1987) considered that this continental deposit belong to the Paloh Formation. However, the present study shows that this continental unit represents the southernmost extension of the Ma'Okil Formation described by Loganathan (1978) from the Ma'Okil area. The iron rich conglomerate at the basal conglomerate unit of the Ma'Okil Formation is perhaps only a local phenomenon. This conglomerate might be equivalent with many other Upper Mesozoic continental conglomerates found in other parts of Peninsular Malaysia such as the Paloh Formation (Zakaria Hussain, 1987), Murau Conglomerate (Suntharalingam, 1973), Lanis Conglomerate (Khoo, 1973), Badong Conglomerate (Rishworth, 1974) and many others.

The iron conglomerate which is essentially made of *in situ*, angular to subrounded pebbles and cobbles of iron ore (mostly hematite) might represent an alluvial fan deposit formed on the

downthrown block of a normal fault. The sedimentary depositional environment of this iron conglomerate can be interpreted as a proximal alluvial fan lobe, and the iron oxides were brought down mainly by gravitational force. The absence of goethite or any other iron hydroxide mineral indicated that water did not play an important role in the deposition of this conglomerate. The paleoslope is directed very gently toward the northwest with the iron source coming from the northeast-southwest trending hematite mineralization lode. The Ma'Okil basin might have been developed as a half graben on the northwestern sector of the iron mineralization zone. This fault plane appeared to be coincide with mineralization lineament mentioned by Burton (1965) as the ?Ma'Okil wrench fault. Bean (1968), suggested that the Bukit Lop and Sri Medan iron mineralizations are related to this ?Ma'Okil wrench fault. Stratigraphically, the conglomerate unit conformably overlies the massive andesitic volcanic rock and it is overlain by thick pebbly sandstone. The conglomerate and the pebbly sandstone units at this locality have been faulted probably by a series of similar trending faults which influence the development of present day lineation of the Bukit Lop ridge and other ridges in this area.

ACKNOWLEDGEMENT

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CATATAN GEOLOGI

Geological Notes

Located: The extension of Bok Bak fault in north Kedah and Perlis, Peninsular Malaysia

SYED SHEIKH ALMASHOOR
Jabatan Geologi
Universiti Kebangsaan Malaysia
43600 UKM Bangi

Abstract: A 52 kilometre long segment of Bok Bak fault in north Kedah and Perlis has been recognized and is hereby defined. The location of this northwest-directed left-lateral fault differs from that as postulated by Burton three decades ago. This information increases the acknowledged extension of Bok Bak fault by 82 kilometres long. In north Kedah, between Pokok Sena and Jitra, the fault zone is recognized from the pattern of sedimentary-rock ridges which have been configured by the fault drag. In Perlis, the identification of Bukit Ngulang limestone mogote as belonging to the Setul formation leads to the recognition that Bok Bak fault defines the contact between Setul (limestone) formation and Chuping (limestone) formation. The fault-contact lies near the southernmost tip of the approximately north-south directed limestone mogotes. Other features that identify the location of the fault zone are a lake, a spring locality, a distorted watershed line, a coincident 4½ kilometre long river tributary and significant bend of a section of a river's traverse.

INTRODUCTION

Bok Bak fault was first named by Burton (1965) to a northwest directed sinistral slip fault which crosses his assigned-map area in Baling, south Kedah (Fig. 1). Bok Bak fault in the Baling area is strongly expressed on topographic maps in the form of linear rivers and straight valleys.

Although 30½ kilometres of fault traces was recognized by Burton (*ibid.*), by inference and postulations, he extended it beyond the Baling area i) by about 450 km northward into north Kedah and Perlis, initially northwestwards in an arcuate manner, then straight northwards to near Surat Thani, south Thailand, and ii) by about 500 km southeastwards up to the east coast of Peninsular Malaysia, in Johor. The postulations were doubted by Procter and Jones (1967). However, Abdul Majid Sahat (1987) reported the presence of fault signatures in the Sungai Siput area, Perak. This information verifies the extension of 70 km to Bok Bak

fault southeastwards of the Baling area.

In addition, Asminah Rajuli (1992) and Teoh (1992) have seen fault markings of Bok Bak fault at the west margin of Bukit Perak granite massif, central Kedah. Their observations substantiate the generally accepted inference of the extension of Bok Bak fault for 31½ kilometres northwest of the Baling area up to the west margin of Bukit Perak (see for example Geological Survey Map, 1985, Lai, 1987 and Tjia, 1989). An inference of 51 km by Burton (1965) for this fault segment is, apparently, an overjudgement.

Thenceforth north of Bukit Perak the fault trace is not easily discernible. The land is masked by superficial deposits and surfaced by weak topography. There is also a prominent change in lithology, i.e. from a wholly or partially granitic area (from Bukit Perak southwards) to an almost wholly sedimentary origin (north of Bukit Perak). These features are illustrated in Figure 1.

west margin of Bukit Perak are found to juxtapose dextrally by about six kilometres. From my observations, I believe that the juxtaposition has been caused by a crossing dextral fault that runs in the 50° direction, and located close to the northwest margin of Bukit Perak (Number 8 in Fig. 1).

This paper has put in perspective the longest segment of Bok Bak fault so far defined. Together with earlier reports of field signatures seen elsewhere, the total acknowledged length of Bok Bak fault now stands at 215 kilometres. That Bok Bak fault is a major fault in Peninsular Malaysia is now established.

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I thank Dr. Ahmad Jantan whose suggestions helped to improve this paper's presentation. I acknowledge help rendered in the field by En. Zakaria Muda, En. Ibrahim Md Dom (cartographic work as well) and En. Tajudin Ujang. This research was supported by Universiti Kebangsaan Malaysia under grant No. 96/92.

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CATATAN GEOLOGI

Geological Notes

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INTRODUCTION

Bok Bak fault was first named by Burton (1965) to a northwest directed sinistral slip fault which crosses his assigned-map area in Baling, south Kedah (Fig. 1). Bok Bak fault in the Baling area is strongly expressed on topographic maps in the form of linear rivers and straight valleys.

Although 30½ kilometres of fault traces was recognized by Burton (*ibid.*), by inference and postulations, he extended it beyond the Baling area i) by about 450 km northward into north Kedah and Perlis, initially northwestwards in an arcuate manner, then straight northwards to near Surat Thani, south Thailand, and ii) by about 500 km southeastwards up to the east coast of Peninsular Malaysia, in Johor. The postulations were doubted by Procter and Jones (1967). However, Abdul Majid Sahat (1987) reported the presence of fault signatures in the Sungai Siput area, Perak. This information verifies the extension of 70 km to Bok Bak

fault southeastwards of the Baling area.

In addition, Asminah Rajuli (1992) and Teoh (1992) have seen fault markings of Bok Bak fault at the west margin of Bukit Perak granite massif, central Kedah. Their observations substantiate the generally accepted inference of the extension of Bok Bak fault for 31½ kilometres northwest of the Baling area up to the west margin of Bukit Perak (see for example Geological Survey Map, 1985, Lai, 1987 and Tjia, 1989). An inference of 51 km by Burton (1965) for this fault segment is, apparently, an overjudgement.

Thenceforth north of Bukit Perak the fault trace is not easily discernible. The land is masked by superficial deposits and surfaced by weak topography. There is also a prominent change in lithology, i.e. from a wholly or partially granitic area (from Bukit Perak southwards) to an almost wholly sedimentary origin (north of Bukit Perak). These features are illustrated in Figure 1.

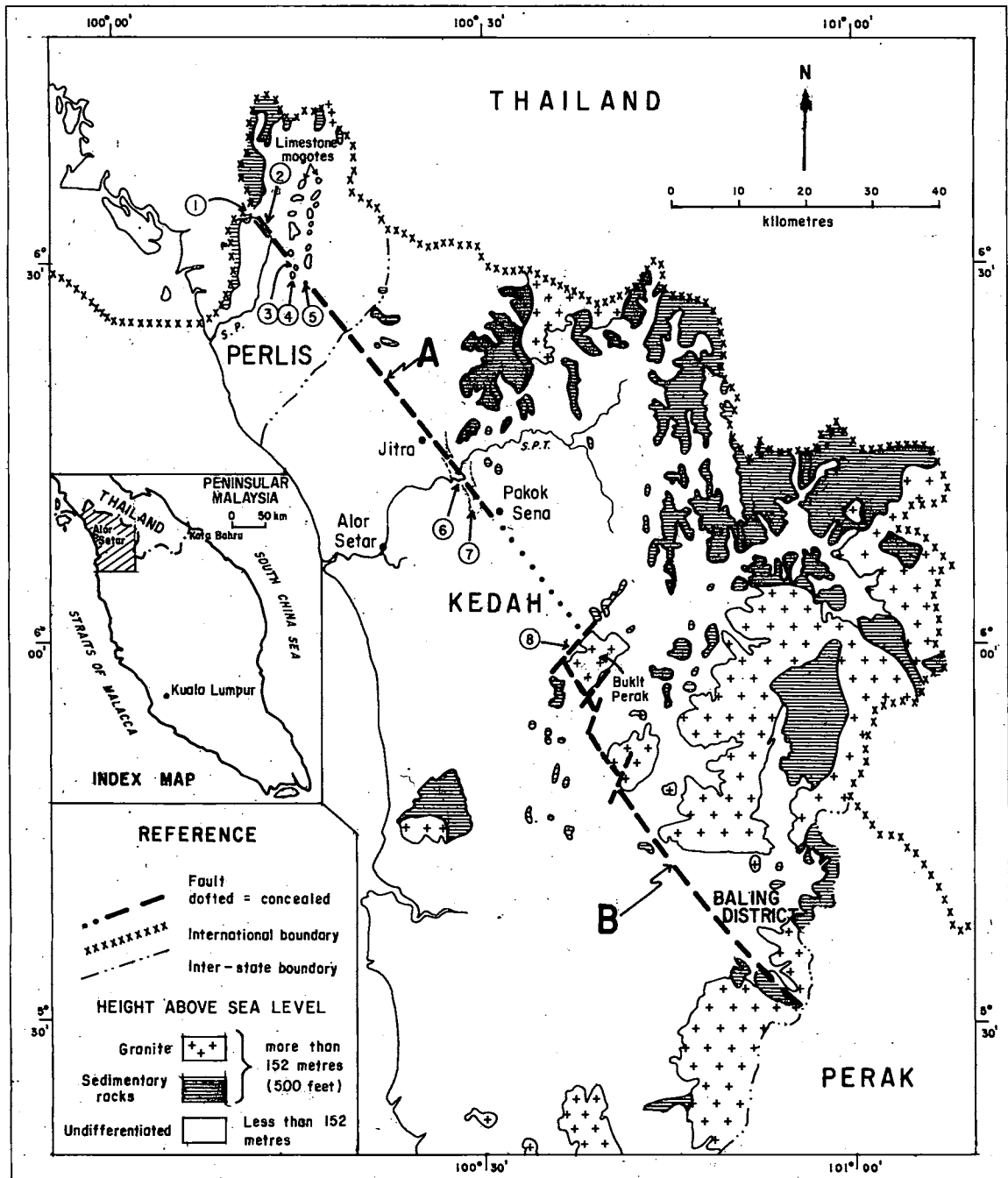


Figure 1. Bok Bak fault in Kedah and Perlis. A is the segment or the fault defined in this paper. B consists of a segment of the fault which was first recorded by Burton (1965) in Baling District and a later-substantiated extension up to Bukit Perak. The extension of the fault southeastwards in the state of Perak is not shown. Guide to the numbers in circles: 1 = distorted watershed line, 2 = location of Sungai Abi which is a tributary of Sungai Perlis (S.P.), 3 = Tasik Melati, 4 = Bukit Ngulang, 5 = spring locality near the township of Mata Ayer, 6 = significant bend in the traverse of Sungai Padang Terap (S.P.T.), 7 = curvilinear broken lines to signify drag ridges, and 8 = see discussion in text. Based on maps by Jones (1978), Director-General of Geological Survey Malaysia (1985) and Director of National Mapping Malaysia (1971).

In fact, Jones (1978) whose mapped area covers Kedah and Perlis and Ibrahim Abdullah *et al.* (1989) whose field coverage includes north Kedah, did not report finding any field signature of the Bok Bak fault. Senior undergraduates of Universiti Kebangsaan Malaysia and Universiti Malaya (for example see Abdullah Haron, 1978; Jaswant Singh, 1990; Nik Adlin, 1987; Rozita Said, 1992), whose field mapping exercises cover areas transected by the Bok Bak fault in north Kedah and Perlis, also did not manage to locate the fault. Neither could a regional gravity survey by Burley and Jamaludin (1990) detect the fault.

It is my privilege to report here the outcome of an exercise to locate the Bok Bak fault in north Kedah and Perlis. The located trace does not commence immediately from Bukit Perak, but from a point near Pokok Sena in north Kedah, to the Perlis/Thailand boundary (see Fig. 1). Its direction is 320° and, altogether, it covers a total distance of 58 kilometres.

FAULT FEATURES

In this communication I will identify several features that help to define Bok Bak fault in north Kedah and Perlis. These features or their locations are indicated in Figure 1. One significant feature (or structure, rather) is derived from a study of the topographical expressions between Pokok Sena and Jitra (see maps by the Director of National Mapping 1970, 1971, 1973 and 1974). The study revealed a prominent group of strike ridges that exhibit an arrangement which implies that they had been configured by a fault drag. The drag-trace defines a fault zone approximately 800 metres wide that runs in the 320° direction. Follow-up field visits located two exposures within the fault zone that possess confirmatory fault signatures. One of the signatures indicates that a left-lateral slip had taken place.

It is interesting to note that the fault had posted an effect on Sungai (River) Padang Terap. There is a comparatively significant (and lopsided) bend in the general course of the Sungai Padang Terap over the section where it crosses the fault zone.

The next significant feature is in Perlis.

It consists of a fault contact between Chuping limestone formation and Setul limestone formation. This contact is located near the southern end of the row of north-south directed Chuping limestone hills in central Perlis. These tower-karst limestone hills, or mogotes, was mapped as Chuping formation (Jones, 1978). But I discovered that Bukit Ngulang, which is the last and southernmost mogote, belongs to the Setul formation. It has the characteristics of Setul limestone (dark grey and massive), unlike all the other Chuping limestone hills to its north (white or light brown and banded).

The actual fault or contact is not exposed as it is covered by alluvium. Its existence is supported by the presence of a lake (Tasik Melati) and two adjacently-located spring points at the township of Mata Ayer. This fault is located exactly on the extension of the Jitra-Pokok Sena fault mentioned above. Therefore they should be one and the same fault.

The extension of this fault-line northwestwards to the Perlis/Thailand political boundary coincides with the upper reaches of Sungai Abi over a length of $4\frac{1}{2}$ kilometres. One manifestation of the fault at the Perlis/Thailand boundary is to cause a distortion in the watershed line which is expressed by a prominent bend (of the boundary).

DISCUSSION AND CONCLUSIONS

The features mentioned above are fault indicators, both confirmatory and supportive in nature, when taken in entirety, point to the existence of a northwest-directed sinistral strike-slip Bok Bak fault in north Kedah and Perlis. Although a distance of 58 km is defined, i.e. from Pokok Sena to the Perlis/Thailand political boundary, the total proven extension of the fault is actually 82 km. The 82 km length includes a 24-kilometre segment, between Bukit Perak and Pokok Sena, which is believed to be covered under a fairly thick soil cover. The geomorphic expression within this segment is too weak to enable one to decipher any likely fault lineament.

Extensions within the above-mentioned interval of the newly-defined fault-segment (this paper) and the inferred fault segment at the

west margin of Bukit Perak are found to juxtapose dextrally by about six kilometres. From my observations, I believe that the juxtaposition has been caused by a crossing dextral fault that runs in the 50° direction, and located close to the northwest margin of Bukit Perak (Number 8 in Fig. 1).

This paper has put in perspective the longest segment of Bok Bak fault so far defined. Together with earlier reports of field signatures seen elsewhere, the total acknowledged length of Bok Bak fault now stands at 215 kilometres. That Bok Bak fault is a major fault in Peninsular Malaysia is now established.

ACKNOWLEDGEMENTS

I thank Dr. Ahmad Jantan whose suggestions helped to improve this paper's presentation. I acknowledge help rendered in the field by En. Zakaria Muda, En. Ibrahim Md Dom (cartographic work as well) and En. Tajudin Ujang. This research was supported by Universiti Kebangsaan Malaysia under grant No. 96/92.

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Manuscript received 9 March 1995

PERTEMUAN PERSATUAN Meetings of the Society

Ceramah Teknik (Technical Talk)

Continent-island arc collision: The Australia-Banda Arc collision zone

A.J. BARBER

Laporan (Report)

Dr. A.J. Barber (Geological Research in Southeast Asia, Department of Geology, Royal Holloway, University of London, Egham, Surrey, TW20 OEX, UK), who needs no introduction, gave the above talk on 15 September 1995, at the Geology Department, University of Malaya, Kuala Lumpur.

Abstrak (Abstract)

The NNE-moving Indian Ocean Plate is being subducted beneath the western and southern margins of Sundaland, to form the Sunda Arc in Sumatra and Java. All the eastern end of the arc the northern margin of the Australian continent is currently colliding with the Banda Arcs in the vicinity of Timor. In the collision zone Australian continental shelf deposits are being transferred from the Australian to the Southeast Asian Plate to be folded, thrust and uplifted forming the island of Timor. The earliest sediments in Timor are of Early Permian age. Permo-Triassic deposits occur as two distinct sequences. One a carbonate platform sequence; the other a predominantly clastic sequence. Lower to Middle Jurassic deposits are clays with more varied sandstone units in the Late Jurassic. Pelagic radiolarites and calcilutites follow in the Early Cretaceous, continuing up into the Tertiary. This sequence can be correlated with that explored by boreholes on the Australian shelf, with Permo-Triassic basin formation, followed by break-up in the Late Jurassic and subsidence as a passive continental margin with a prograding carbonate wedge to form the present continental shelf. The highest mountains in Timor are composed of metamorphic and ophiolitic rocks, interpreted as the uplifted hanging wall of the subduction zone, underthrust by the Australian margin. The latest phase of the collision occurred in the Early Pliocene, followed by phases of uplift at 2 Ma and very rapid uplift during the last few hundred thousand years, which continues at the present day. It appears that collision commenced in the region of East Timor and has proceeded furthest in this region. Recent deep-seismic reflection profiling across the collision zone to the east of East Timor shows that the whole collision zone has become attached to the leading edge of the Australian Plate and is being thrust northwards over the Banda Sea, in a reversal of subduction polarity.



A.J. BARBER

G.H. Teh

Geological history of the Earth's crust: the Malaysian perspective

HAMZAH MOHAMAD

As solid and unchangeable as it may seem, the Earth is in reality a dynamic construction of layers that constantly shift, drift apart, or collide into one another.

Professor Hamzah Mohamad from Universiti Kebangsaan Malaysia's Geology Department, said today that scientists have been finding more and more evidence to support this theory and it has now become an accepted geological belief.

"Hundreds of millions of years ago, the continents were much closer together than they are now and have only attained their present conditions through the process of continental drift," he said at a seminar entitled *Geological history of the Earth's crust: the Malaysian Perspective* at the National Planetarium here.

He was speaking to 200-strong crowd comprising students and members of both the Malaysian Geological Society and the Persatuan Pencinta Alam Malaysia. *"There is a lot of evidence that points to the idea that the continents have drifted apart."*

"Geological mapping and dating, which breaks down areas by rock type and age, have shown for example that eastern South America and the southern region of Africa might have once been joined up."

"Also, the configuration of the continents suggest that they may have once been together, like a jigsaw puzzle," he said.

A phenomenon called "sea floor spreading" was another indication of the activities of the Earth's crust.

"Dating samples from the ocean floor show areas of new crust surrounded by older parts, suggesting that there are ridges on the floor that expand when magma from the Earth's core comes to the surface."

"There is no need to worry about such movements however, at least not in our lifetime. There is usually only between one centimetre and 17 cm of movement a year." The seminar was organised by the Space Science Studies Division of the Science, Technology and Environment Ministry and the Malaysian Geological Society.

NST, 24.9.95



HAMZAH MOHAMAD

Some aspects of modern rock slope engineering

R.M. SPANG

Laporan (Report)

Dr. Raymund M. Spang managing director of Geoplan, Geotechnical Consultants, Witten, Germany presented the above talk at 2.30 pm on 6.10.95 at the Geology Department, Universiti Kebangsaan Malaysia. The talk was attended by more than 50 participants. In his one and half hour presentation, Dr. Spang showed many slides of examples of rock slope stability case histories based on his over 20 years of professional experience. After his talk there was a lively discussion with several questions from the audience.

The following is an abstract of Dr. Spang's presentation.

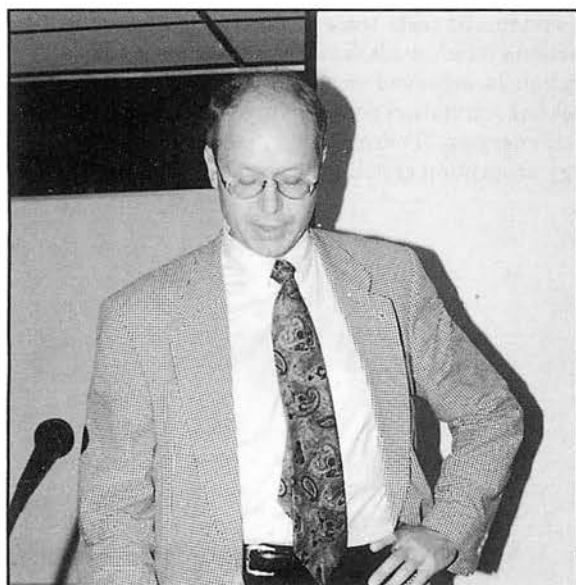
Abstrak (Abstract)

The basic differences between soil and rock as for their mechanical behaviour are that (a) soil in general is a continuum with constant properties in all directions of space. Furthermore it is assumed that soil is homogenous and isotropic. (b) In contrast, rock is considered a discontinuum, i.e. inhomogenous and anisotropic.

There are also further differences in mechanical behaviour of soil and rock due to loading of saturated soils and rock with respect to total stress concept, consolidation theory, seepage and hydrostatical pressure. The influence of fractures on the behaviour of rock masses is shown by a comparison between stress distribution below footings in homogeneous, isotropic material and in anisotropic (bedded) material, as well as by variation in uniaxial compressive strength with changing angles between a pre-existing fracture and the loading direction. Finally it is shown that rock as a broken material has considerable residual strength as an important condition for construction activity in rock.

Failure mechanisms commonly observed in rock slopes are sliding, topping, buckling and some combined modes of failure. Usual steps and means of stability analysis of rock slopes mentioned include field investigations like joint survey, laboratory and field tests backed by aerial photography and mountaineering.

Several examples of rock stabilisation show the size and specific nature of the encountered problems and the stabilisation methods such as wire mesh, rock-bolts, shotcrete, concrete structures, pre-stressed anchors or a combination of these. By using wire mesh it



R.M. SPANG



The audience at Spang's talk.

distinguishes between rock slopes with a high or a low frequency of small scale rockfalls. High frequency rockfall requires nets with a certain distance between the slope surface and the net to prevent debris accumulation behind the net, whereas in the case of low debris generation, nets may be placed directly on the slope surface.

Rock-bolts are used after clearing the loose material from the slope surface, either for local instabilities or for systematic reinforcement. Deep seated instabilities have been stabilised by prestressed rock anchors with lengths up to 40 m. In some cases the unstable mass had to be removed by mechanical excavation or by blasting.

For load distribution in fractured rock either reinforced shotcrete, prefabricated concrete beams or even massive concrete walls have been used. It is emphasized that drainage is a very important point in rock slope stabilisation and has to be planned and executed very carefully.

For the dimensioning of rockfall protection, systematic tests were conducted to determine the energy absorption capability of each protection system, such as rail and tie walls, and different wire rope net systems. Energy absorption is achieved mostly by deformation elements or friction brakes. A newly developed rockfall simulation program presented deals with the determination of rockfall paths and kinetic energies. These results lead directly to the required retaining structure heights and energy absorption capabilities and can be used to optimise their location.

Abdul Ghani Rafek

Pergau Dam Site Visit**16-17 September 1995**

The above visit was a collaborative effort of the Society's Engineering Geology/Hydrogeology and the Structural Geology/Tectonics working groups.

A good turnout of 23 participants left the Geology Department, University of Malaya on Saturday 16th September 1995 at 7.45 am in four FWDs for the long journey along the N-S Highway to Kuala Kangsar, Grik and then the E-W Highway to Jeli in Kelantan.

After lunch at Grik, 2 stops were made along the E-W Highway (about 166-158 km KB) to investigate the landslides and the remedial work being carried out.

On arrival at the Rumah Rehat Pusat Serenti Jeli, due to some miscommunication, the 4 ladies in the group were adequately accommodated in one bungalow while the men sportingly roughed-it-out in the simple dormitories instead of the air-conditioned rooms that were confirmed.

It was rise-and-shine at 7.00 am the next morning in time for a quick breakfast and the briefing at 8.00 am at the Project Office. The Engineering Manager, Mr. Rohit Patel gave a briefing on the 600 MW Pergau Hydroelectric project, then Mr. Ishak Awang gave details on the tunnelling and geological aspects while Daniel briefed on some engineering aspects. There was enthusiastic response during question time. The first site visit was conducted at the Tailrace Tunnel and Re-Regulating Pond at 9 am. The participants were briefed on the choice of the location of the tunnel and pond and the material being used in their construction. The participants then took a walk into the tunnel to observe its construction and geology. The project is a major engineering undertaking as it has 33 km of tunnels, shafts and caverns of varying size. The dominant rock type in the project area is granite with schist, limestone and metasediments at the Tailrace Tunnel area.

Next the participants were driven uphill to the Kuala Yong Main Dam area where workers were busy preparing the floor of the earthfill dam. From the vantage point it was possible to get a breath-taking view of the reservoir, dam and spillway. Next the participants were driven down into the reservoir and then to observe the Diversion Tunnel and Intake Structure.

The next site was the underground Powerhouse Complex. Here the participants were briefed on the location of the turbine generators and the transformers and the need for 3 different types of tunnel lining and grouting when pressure water posed a problem.

It was a most comprehensive and informative site visit and when it was time for discussion at the Project Office, there were many queries which were ably answered by Mr. P.G. Davies, the Project Manager.

A most welcomed lunch was provided courtesy of Kerjaya Balfour Beatty Cementation Sdn. Bhd. (KBBC). At 2.00 pm, the vehicles were ready to begin the long journey make to Kuala Lumpur.

The Society would like to thank Tenaga Nasional Berhad (TNB) for granting permission for the visit, KBBC for the kind hospitality and especially to Mr. Ishak Awang for his painstaking co-ordination and planning of the site visit.

G.H. Teh
Organiser

Pergau Dam Site Visit



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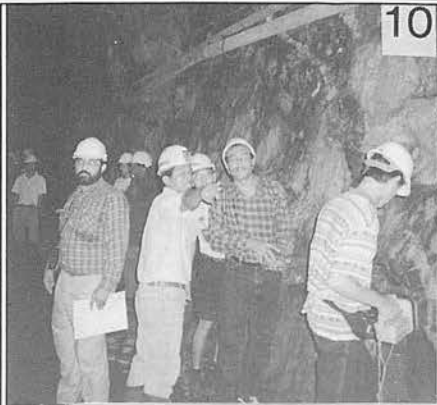
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Captions to photos

- 1,2. Everyone pleased with the important stop at K. Kangsar exit, N-S Highway.
 3. Viewing and discussing remedial work along E-W Highway.
 4. Discussing how the road disappeared!
 5. Arrival at Jeli, a group photo.

6. All in good spirits at the dormitory.
 7. Mr. Rohit Patel briefing the participants.
 8. Daniel elaborating on the Re-Regulating Pond.
 9. Participants making the grand entry into the Tailrace Tunnel.

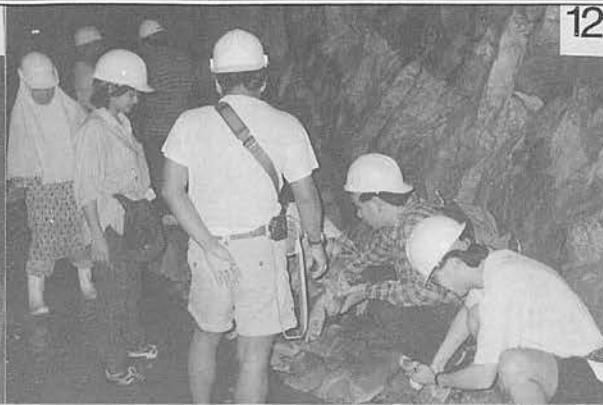
Pergau Dam Site Visit



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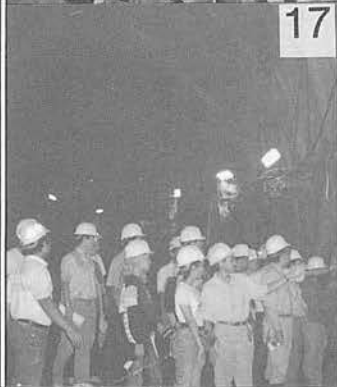
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Captions to photos

10, 11. Ishak showing the contact in the Tailrace Tunnel.
12. Collecting samples of granite and dike rock.
13. A memorable group photo in the Tailrace Tunnel.
14. Ishak explaining the Spillway at the Kuala Yong Dam.
15. Daniel elaborating on engineering aspects in the reservoir.

16. Ishak clarifying on the Intake Structure.
17, 18. At the underground Powerhouse Complex.
19. Mr. P.G. Davies answering queries after the site visits.
20. A welcomed lunch from the host.

Forum on "Environmental Geology & Geotechnics"
 24 October, 1995, University of Malaya, Kuala Lumpur
 — Report

The above forum was held on Tuesday, 24th October 1995, at the Department of Geology, University of Malaya, Kuala Lumpur.

The Programme for the Forum is listed below:

PROGRAMME

- 2:00–2:30 pm : Registration and Sales of Proceedings
 2:30–2:45 pm : Welcoming Address, President, Geological Society of Malaysia
 2:45–3:00 pm : Opening Address, Director-General, Department of Environment Malaysia
 3:00–3:30 pm : COFFEE BREAK

Session I

- 3:30–4:00 pm : Joy J. Pereira *et al.*, (UM)
 Gold mining and tailings disposal systems — Impacts on the physical environment
 4:00–4:30 pm : Ng Tham Fatt *et al.*, (UM)
 Study of dustfall in the Labu-Nilai-Pajam area
 4:30–5:00 pm : Tjia Hong Djin (USM/PRSS)
 Terrain and geohazard maps of Negeri Pulau Pinang and Seberang Perai
 5:00–5:30 pm : COFFEE BREAK

Session II

- 5:30–6:00 pm : Neoh Cheng Aik (JKR)
 Environmental problems in piling works
 6:00–6:40 pm : David Turberfield (*Asia Pacific Institute of Environmental Assessment*)
 Developments in environmental management
 6:40–6:45 pm : Closing Remarks, Organising Chairman

In addition, the following paper is also included in the Proceedings:

- : Tan Boon Kong (UKM)
 Environmental geology: case histories

The five papers presented were on different aspects of environmental geology and tectonics and therefore proved to be very informative to the participants.

The President, Dr. Khalid Ngah, was not able to attend, due to prior engagements. In his speech, read out by G.H. Teh, Dr. Khalid emphasized the need for doing things together (especially GSM and IEM) to create the competitive edge, reduce cost and offer better business opportunities.

Ir. M.L. Tan, in his speech, noted the Forum to be timely as environmental geology and geotechnics are essential components of environmental impact assessments (E.I.As). He emphasized that thorough studies on environmental geology and geotechnics in the early stage of project planning can help to identify and forewarn potential environmental problems, so that appropriate preventive and remedial measure can be taken to alleviate or at least reduce some of the problems.

G.H. Teh

Forum on "Environmental Geology & Geotechnics"



Captions to photos

- | | | | |
|-------|---|-----|---|
| 1. | Tan Boon Kong getting the proceedings underway. | 10. | Joy J. Pereira with her paper. |
| 2. | G.H.Teh, reading the President's Welcoming Address. | 11. | T.F. Ng on dustfall. |
| 3, 5. | The audience. | 12. | H.D. Tjia on terrain and geohazard maps. |
| 4. | Opening Address by Ir. M.L. Tan. | 13. | Take a coffee break. |
| 6. | Ir. M.L. Tan with participants at tea. | 14. | C.A. Neoh on piling works. |
| 7-9. | Discussions and discussions at tea time. | 15. | D. Turberfield on environmental management. |

*Welcoming Address by Dr. Khalid Ngah,
President Geological Society of Malaysia, at the
Forum on "Environmental Geology & Geotechnics"
24 October, 1995, University of Malaya, Kuala Lumpur*

Yang Berbahagia Ir. Tan Meng Leng, Director-General, Dept. of Environment, Malaysia; Mr. Tan Boon Kong, Organising Chairman; fellow members of the Geological Society of Malaysia and the Institution of Engineers Malaysia; Ladies and Gentlemen.

Assalamualaikum and good afternoon.

I have met many traditional geo-scientists either individually, in groups and even in big conferences before, but really this is the first time that I am meeting geologists and geotechnical-engineers as a group. I must admit that seeing you, gentlemen, here trying to understand the common issues in geo-sciences, and hopefully to provide solutions together to these issues, tantamount to "finishing a meal with a burp". What I am saying is that we cannot live and do "things" in isolation. What we do will affect the others. In this scenario, getting involved and doing things together leads to creating "competitive edge, cost reduction, and certainly better business opportunities".

On behalf of the Geological Society of Malaysia, I wish to welcome all of you to this Forum on "Environmental Geology & Geotechnics". This is indeed a very "hot" issue, and I said it so because last Tuesday, October 17, 1995, our Deputy PM, YB Datuk Seri Anwar Ibrahim stressed the importance of sustaining and maintaining the environment, and advised us that in the process of enriching ourselves, it should not be done so at the expense of environment. I have always believed in maintaining the quality of living, and in the process of our building a quality society, we have a duty to play: **Let it be known that while we strive for excellence, be it economic, social or cultural, we will continue to sustain and maintain the eco-systems that we are in.**

We belong to this generation that concerns quality and value-adding, and certainly this importance is expressed by the presence of Ir. Tan here, the Director General himself. He has taken time from his busy schedule to be with us here this afternoon.

In the past, environmental issues have not been examined on an integrated manner: engineers believed that they could handle these issues by themselves, and likewise geologists. We all know pretty well that (i) both groups deal with the same things, and (ii) both know of their handicap. This forum, the 7th organised by the Working Group on Engineering Geology & Hydrogeology, attempts to bring together the engineers and geologists to examine issues which warrant collective examinations.

I do not want to spend too much time on this speech. I just wish to note that this forum marks one of many significant events of the society, and will form a strong platform for integration between the Geological Society of Malaysia and the Institution of Engineers Malaysia. The five papers to be presented this afternoon cover a wide area, and a paper on environmental management and environmental auditing should be of particular interest to all of you.

I wish that you will have a productive day and an equally fruitful discussion; I also wish to see that a follow-up workshop could be generated so that an action plan on the "Roles of Geologists and Engineers in meeting Vision 2020" could be developed. I therefore wish you all success.

Thank you.

*Opening Address by Dr. Tan Meng Leng,
Director-General Department of Environment Malaysia, at the
Forum on "Environmental Geology & Geotechnics"
24 October, 1995, University of Malaya, Kuala Lumpur*

*Dr. Khalid Ngah,
President, Geological Society of Malaysia*

*Mr. Tan Boon Kong,
Organising Chairman*

*Members of the Geological Society of Malaysia
Fellow engineers from the Institution of Engineers Malaysia*

Ladies and Gentlemen

I would first like to thank the Organisers for inviting me to officiate at this Forum on "Environmental Geology & Geotechnics".

I am given to understand that this Forum is the 7th in the series of such forums organised by the Geological Society of Malaysia, in its continuing effort to provide healthy interactions between engineers and geologists.

This Forum on "Environmental Geology & Geotechnics" is most timely as environmental studies, with increased environmental consciousness and awareness Environmental Impact Assessments (E.I.As) etc. are now more widely practiced, spurred on by demands for better management input for development projects, and of course the more stringent requirements of environmental laws and regulations.

Environmental geology and geotechnics form essential components of E.I.As which are of necessity multi-disciplinary in nature. Environmental geology and geotechnics form some essential components of E.I.As since they deal with topics like basic site geology, hydrogeology (groundwater), geohazard (erosion, landslides, subsidence, etc.), soil, water, air and noise pollution, etc.

"Site characterization", is an essential basic study of environmental geology and geotechnics. It incorporates detailed studies of the distribution, nature and properties of the various rock formations soil strata and water (surface and subsurface) regime at and around a project site.

In addition, the prediction of potential impacts on the physical environment as a result of project implementation, generally classified under geohazards (e.g. landslides, subsidence, induced seismicity, pollution) is another important aspect of environmental geology and geotechnical studies. I would like to propose some future work which would benefit the nation. Please help to identify erosion prone areas and mapping using Geographical Information System (GIS) so that early warning and alert can be initiated during high risk period to minimise loss of life and properties.

May I urge your society to promote professionalism: Accountability for your work: Has the society a Code of Practice to encourage your members in this area?

Gentlemen, thus, thorough studies on environmental geology and geotechnics in the early state of project planning can help to identify and forewarn potential environmental problems, so that appropriate preventive and remedial measures can be taken to alleviate or at least reduce some of the problems. With those brief remarks, I wish you all success in the deliberations of the technical papers this afternoon.

It is now my pleasure to declare this Forum open.

Forum on "Environmental Geology & Geotechnics"

24 October, 1995, University of Malaya, Kuala Lumpur

— Abstracts of Papers

Gold mining and tailings disposal systems — Impact on the physical environment

J.J. PEREIRA¹, E.B. YEAP² AND S.L. TONG³

¹Institute of Advanced Studies
University of Malaya

²Department of Geology
University of Malaya

³Department of Chemistry
University of Malaya

In Peninsular Malaysia, both primary and secondary gold deposits are being mined by the opencut method. It is important to study the practice of the opencut method and the tailings disposal system within the gold mines as well as the characteristics of the tailings produced, in order to determine the impact of the gold mining operation on the physical environment. Exploitation of a primary gold deposit at Selinsing has caused the denudation of a 150 m high hill, exposed large areas susceptible to surface erosion, produced derelict land as well as tailings with anomalous amounts of As, Cd and Pb. However, no acid mine drainage is detected here. Exploitation of an alluvial deposit at Tersang extends laterally, leaving shallow mined-out pits less than tens of meters in radius, generally aligned along the wide alluvial plain. This has also resulted in the production of derelict land throughout the life of this mine, permanent modification of the original river, siltation and discolouration of the river downstream of the mine, production of tailings with high Pb contents as well as localized acid mine drainage.

Study of dustfall in the Labu-Nilai-Pajam area

NG THAM FATT¹, YAP SIAW YANG¹ AND YEAP EE BENG²

¹Institute of Advanced Studies
University of Malaya

²Department of Geology
University of Malaya

Fugitive dust from rock quarries is a contentious issue. It is often regarded as a significant contributor to ambient particulate levels and a potential air pollutant. A standard method of monitoring dust deposition has not been formulated by the local regulatory authorities, and data on the dustfall and characteristics of dust emitted by quarrying operations are scarce.

Concerns about dust pollution in the vicinity of rock quarries has prompted this on-going research project, commissioned in October 1994. A simple and economical dust deposit gauge was developed based on the ASTM standard dust deposit gauge with some modifications. This paper presents some initial findings of this project. This include the level of dustfall obtained

from 20 monitoring sites covering an area of over 100 km² in the Labu-Nilai-Pajam area. The study area has 7 operating quarries producing crushed rock aggregate from granitic rocks, and 2 more are in the pipeline. The field efficiency between the dust gauge used and the British Standard dust deposit gauge as well as the dry inverted Frisbee gauge will be discussed. The mineralogy and granulometry of the dust are studied using X-ray powder diffraction analysis and microscopy. Some aspects of dust characterization will be presented.

Terrain and geohazard maps of Negeri Pulau Pinang and Seberang Perai

H.D. TJIA

Universiti Sains Malaysia, Pulau Pinang
now at: Petronas Research & Scientific Services Sdn. Bhd.
Lot 1026 PKNS, 54200 Hulu Kelang

Essential for EIAs is the recognition of terrain or geomorphological units and potential geological hazards. For the State of Pulau Pinang and Seberang Perai, analysis of geological information produced by the Geological Survey of Malaysia supplemented by photo-interpretation and field studies resulted in a terrain-unit map that show slopes, pedislopes, cliffs, lowland and upland flats, valley shapes, beachridges and their map patterns. The interpreted terrain units were combined with rock types and rock structures in the construction of a geohazard map. On this map are delineated areas of potential rock falls or other types of mass movements/landslides, of flooding and intensely fractured rock. Long-term coastal stability is also suggested by certain types of terrain units. The final maps are at scale of 1:75,000, but the work sheets are at larger scale of 1:25,000 and these may be used as base maps for detailed planning purposes.

Environmental problems in piling works

NEOH CHENG AIK

Jabatan Kerja Raya

This paper briefly discusses the Environmental Impact Assessments and the related problems in various commonly adopted piling systems in Malaysia. In addition to technical and economical factors, environmental factors affecting in pile selection are discussed. Extent of ground vibration, ground heave and emission of smoke and noise in driven piling systems are assessed. Pile selection chart with particular emphasis on environmental considerations to determine the most suitable piling system in the light of various typical pile design considerations are presented with several case histories.

Developments in environmental management

DAVID TURBERFIELD

Asia Pacific Institute of Environmental Assessment

Since the implementation of the environmental impact assessment (EIA) system in Malaysia in 1998, the field of environmental management has evolved significantly. No longer is concern limited to the assessment of the environmental effects of new development projects. Increasingly attention is being drawn to the environmental impacts of existing sites, operations and activities.

This shift in focus is manifest in the increasing national and international pressures being levied upon organisations of all kinds to improve their environmental performance and to demonstrate that improvement through independent verification. Such pressures include increasingly stringent legislation, financial and insurance institutional requirements, share holder pressure, environmental pressure groups; green consumerism and greater public awareness of environmental issues world wide.

The initial response of organisations has been to carry out environmental reviews or environmental audits to evaluate their environmental performance (i.e. the impact of their activities on the environment). However, to be truly effective an environmental audit should be part of a full environmental management system (EMS) leading to reduced costs and increased market share.

The Environmental Management Standard ISO14000 is one such environmental management system. This paper looks at the history of the standard and its implications to business and industry in the Asia Pacific Region. It examines environmental management activity and developments in Indonesia and Malaysia; qualification of environmental auditors and likely certification and accreditation requirements. It concludes with a summary of the issues and a number of potential scenarios for future development of EMS in the Asia Pacific.

Environmental geology: Case histories

TAN BOON KONG

Department of Geology
Universiti Kebangsaan Malaysia, Bangi

This paper presents four case histories related to various aspects of environmental geology. The first case history concerns river water pollution by a mine waste dump in Sabah. The second case history deals with siltation problem arising from a housing scheme in Pahang. The third case history relates to an E.I.A. (Environmental Impact Assessment) study for a new resettlement scheme in Selangor. The fourth "case history" is an experimental study on the adsorption characteristics of a clay soil in Canada for possible use as a clay liner in waste disposal.

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BERITA-BERITA PERSATUAN News of the Society

KEAHLIAN (Membership)

The following applications for membership were approved:

Full Members

1. Edy Tonizam b. Mohamad
1, Jalan Permas 8/10, Permas Jaya,
Plentong, 81750 Johor Bahru.
2. Philip Merfyn Magor
1633, Jalan Tebu, Ukay Heights, 68000
Kuala Lumpur.
3. Azimah bt. Hussin
Jabatan Geologi, Universiti Kebangsaan
Malaysia, 43600 UKM, Bangi.
4. Michael Joseph Fitzgerald
12506 Pleasant Valley Drive, Dallas, Texas
75243.
5. Lim Teng Chye (Sonny)
188, Taman Bukit Koman, 27600 Raub.

6. Khairuddin b. Kassim
31, Lengkok Aminuddin Baki, Taman Tun
Dr. Ismail, 60000 Kuala Lumpur.

Student Members

1. Balamurali A/L Ratnam
Jabatan Geologi, Universiti Malaya, 59100
Kuala Lumpur.
2. Ng Ping Ping
Jabatan Geologi, Universiti Malaya, 59100
Kuala Lumpur.

Associate Member

1. Takeshi Sagae
B-8-2, Bayu Angkasa Condo., No. 4 Jalan
Medan Kapas, Bukit Bandaraya, Bangsar,
59100 Kuala Lumpur.

GSM

PETUKARAN ALAMAT (Change of Address)

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

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Mohd Asbi Bin Mohd Zin
Pejabat Kajibumi Negeri Johor, Tingkat 5,
Blok A, Wisma Persekutuan, 80000 Jalan
Air Molek, Johor Bahru, Johor Darul
Tadzim. 2. Larry S. Grubbs
Texaco China B.V., 3614 China World
Tower, 1 Jianguomenwai Dajie, Beijing
100004, People's Republic of China. | <ol style="list-style-type: none"> 3. Hamka Istamar
Ranhill Persekutu S/B, Wisma Ranhill, 2-
12 Jalan Setiawangsa 10, Taman
Setiawangsa, 54300 Kuala Lumpur. 4. Daniel Lewis Thein Win Sue
Soiltech Engineering Laboratory S/B
Teknobumi S/B, 18, Jalan Selera Satu,
Taman Bukit Indah, Off Jalan Klang Lama,
58200 Kuala Lumpur. |
|--|---|

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PERTAMBAHAN BAHARU PERPUSTAKAAN
(New Library Additions)

The Society has received the following publications:

- | | |
|---|--|
| 1. AAPG Explorer, Sept, Oct 1995. | Malaysia, June & July 1995. |
| 2. Tin International, vol. 68, no. 7, 1995. | 12. IMM Bulletin 1026, 1995. |
| 3. Journal of Geosciences, vol. 38, 1995. | 13. Journal of Science of the Hiroshima University, vol. 10, no. 3, 1995. |
| 4. AAPG Bulletin, vol. 79/7 & 79/8, 1995. | 14. Journal of Hebei College of Geology, vol. 17, nos. 6, 1994 & vol. 18, nos. 1 & 2, 1995. |
| 5. AGID, no. 1 (1994), no. 2 (1995). | 15. Acta Geoscientia Sinica, vols. 1 & 2, 1995. |
| 6. Bulletin de la Societe belgede la Geologie, vol. 103, nos. 1-4, 1994. | 16. SOPAC Newsletter, vol. 12, no. 2, 1995. |
| 7. American Museum Novitates, nos. 3122, 3124, 3126, 3127, 1995. | 17. U.S. Geological Survey: Professional Paper: 1994: 1554, 1528. 1995: 1547, 1538-O, 1538-I, 1538-L, 1408-C. |
| 8. BRGM Annual Report 1994. | 18. U.S. Geological Survey Bulletin: 1995: 2090, 2131, 2105, 2098, 1988-H, 2094-C, 2115-A, 2021-E, 1989-F. 1994: 2103. |
| 9. IMM, vol. 104, Sept-Dec 1995. | 19. U.S. Geological Survey Circular: 1995: 1109, 1122, 1130. |
| 10. Berliner Geowissenschaftliche Abhandlungen, Reih A, Band 161, 163, 165 & 168. | |
| 11. Monthly statistics on mining industry in | |



ECONOMIC GEOLOGY AND TECTONICS OF MALAYSIA AND THE SOUTHEAST ASIAN REGION

**PERSIDANGAN TAHUNAN GEOLOGI
1996
Annual Geological Conference 1996**

8 & 9 June 1996

*Shangri-La's Tanjung Aru Resort
Kota Kinabalu, Sabah*



First Circular

December 1995

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would be increased by 20 and 30 per cent later.

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Meanwhile, Yahya said Cima would cooperate with Halla to complete the factory as early as possible.

Chung said Halla had already stationed 300 of its workers to construct the cement factory.

NST, 5.9.1995

Pahang Cement aims to export its product

Pahang Cement Sdn. Bhd., which will own the only cement plant in the east coast of Peninsular Malaysia once it comes onstream in mid-1997, aims to eventually export the commodity to neighbouring countries.

Pahang Menteri Besar Tan Sri Mohd Khalil Yaakob, who is also Pahang Cement chairman, said the move was necessary to ensure good returns from the RM672 million project.

"Where the supply is concerned, priority for use would be given to the east coast States including Pahang. We will export through the Kuantan port," he said.

Pahang Cement is a 50:50 joint venture between the State Government of Pahang through State entities Pasdec Corporation Sdn. Bhd. and Perbadanan Setiausaha Kerajaan Pahang, and YTL Industries Bhd.

Mohd Khalil added that the plant was part of the State Government's move to rely less on forestry and more on other sectors.

The plant situated in Bukit Sagu, Pahang, will have a nominal capacity of 3,500 tonnes per day of clinker equivalent to about one million tonnes per annum of cement.

Construction has already commenced. It is being undertaken by a consortium comprising YTL Corporation Bhd. construction arm Syarikat Pembinaan Yeoh Tiong Lay Sdn. Bhd., and German-based KHD Humboldt Wedag Aktiengesellschaft and Simens Aktiengesellschaft.

"We expect to produce about 1.2 million tonnes in its first year of operations. Although technically it is a million-tonne plant, we can do 1.2 million without adding a single nut and bolt." Pahang Cement managing director Datuk Francis Yeoh said in Kuala Lumpur yesterday after signing

loans to finance the plant.

Yeoh, also managing director of YTL Corporation Bhd., said there were a lot of manufacturing capabilities to be tapped in Malaysia as its per capita consumption of cement was one of the lowest in this region.

He said it was better for Malaysia to have a surplus of cement than a shortage as was the scenario now.

A Ministry of International Trade and Industry report has stated that in addition to existing producers in the country, five major projects have been approved and are expected to come onstream by 1998.

Once these and existing expansion programmes are implemented, production capacity will increase to 29.4 million tonnes. This will meet the demand of 24 million tonnes by the year 1998 with possibility of some surplus cement for export.

A surplus, Yeoh said, would allow Malaysian cement manufacturers to export their products, making them more competitive against other producers in the region when the Common Effective Preferential Tariff scheme comes into force.

Asean countries have vowed to reduce tariffs to a maximum five per cent by January 2003 through CEPT.

Yeoh was speaking to reporters after signing agreements to secure two loans totalling RM560 million to finance the project.

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PERSATUAN GEOLOGI MALAYSIA GEOLOGICAL SOCIETY OF MALAYSIA

c/o Department of Geology, University of Malaya, 59100 Kuala Lumpur
Tel: (603) 757 7036 Fax: (603) 756 3900

Young Geoscientists Publication Award

Please be informed that nominations of author(s) for the above award are now invited from all members of the Society except Student and Associate Members. Nominations should be of young geoscientist(s) who have published papers in 1995. Relevant excerpts concerning the nomination of young geoscientist(s) and conditions of award are listed below:

Eligibility

1. No person shall be considered for the award unless he satisfies the Board:
 - (a) that he is thirty years old or younger at the time of the publication of the paper.
 - (b) that he has been a resident of Malaysia for at least 3 years prior to the publication of the paper.
 - (c) that he belongs to any one of the membership of the Society.
 - (d) that the paper was published or has been accepted for publication in the previous calendar year, in which case written proof from the publisher must be shown.
 - (e) that the paper has been published in any Malaysian or international scientific publication.

Procedure

1. (1) Nominations for an award must be made by a member who is not a Student or Associate Member.
 - (2) An author cannot nominate himself for the award.
 - (3) The written consent of the author is required.
2. (1) The award, in the opinion of the Board, shall be made to the author of the best paper in geology about Malaysia or the region and/or should be of general interest to the local community of geoscientists.
 - (2) Papers with joint authorship may be considered, if a statement as to the relative responsibility of the authors, signed by all the authors, is attached.
 - (3) In the case of joint authorships, the Board may make the award to one author, or to two or more authors, provided these qualify under subsection on eligibility.

Nominations should be on prescribed forms that can be obtained from the Honorary Secretary of the Society. Nominations should be received by the Chairman of the Young Geoscientist Publications Award Committee before the **1st February, 1996**.

Abdul Rahim Samsudin
Chairman,
Young Geoscientist
Publications Award
24th October 1995

BERITA-BERITA LAIN Other News

Local News

Iron, steel industry needs development

Malaysia needs to further develop its iron and steel industry to realise its aim of becoming a regional manufacturing centre for capital-intensive, high-technology based and value-added industries, Deputy Minister of International Trade and Industry Kerk Choo Ting said yesterday.

He said the industry's increasing significance and contributions to Malaysia's industrial and economic growth was reflected by the massive investments in the sector.

"To be a regional manufacturing centre, Malaysia's industry must have the ability to support the increasing demand of other manufacturing sectors," he said, adding that this was also one of the vital factors in sustaining the country's economic growth.

"The iron and steel industry has emerged as an important sector of the economy by supplying basic inputs to several industries," Kerk said today in his keynote address during the opening of the Asean Steel Wire Conference at Shangri-La's Rasa Sayang Resort in Penang.

The two-day conference, organised by the Malaysian Iron and Steel Federation, brought together over 100 participants from Asean countries, India, Japan, Korea, Europe and South Africa.

Kerk said from 1990 to 1994, 174 projects were approved with a total proposed capital investment of RM22.7 billion.

"Of this, 56.6 per cent (RM22.7 billion) was from local investment and RM12.89 billion came from foreign sources," he said.

Kerk said the iron and steel industry had recorded an average production growth of 10 to 12 per cent over the last five years.

He also said steel consumption was expected to remain strong for at least three years, owing to the massive economic development in Malaysia.

He said although domestic production had increased to satisfy local demand, Malaysia was still importing a large amount of steel products.

"In 1994 imports were valued at RM6.2 billion."

NST, 5.9.1995

RM606 m cement plant to be constructed in 32 months

Negri Sembilan Cement Industries Sdn. Bhd. (NSCI), the Malaysian-South Korean joint venture company, will expedite the construction of its RM606 million cement factory in Jempol, near here, in less than 32 months.

Menteri Besar Tan Sri Mohamad Isa Abdul Samad said today the early completion of the factory would help ease the cement shortage faced by the country.

NSCI is jointly-owned by the Negri Sembilan State Development Corporation (PKNNS), public-listed company Cement Industries

Malaysia Bhd. (Cima) and the Halla Group of Korea.

PKNNS and Cima controls 35 per cent share each while Halla holds the remaining 30 per cent in NSCI.

Mohamad Isa said the three partners of the joint-ventures company, especially Cima and Halla, would share their technical expertise to expedite the construction of the factory before 1998.

Speaking after launching the plant's ground breaking ceremony held here, he said the acute

cement shortage faced by the construction industry would be solved once the factory commenced production.

Present during the function were Cima chairman Datuk Dr. Yahya Ismail, Hall chairman Dr. Chung In Yung and PKNNS general manager Mohamad Yusof.

"The factory will produce 1.2 million tonnes of cement or 15 per cent of the country's cement demand," he said, adding that its production

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NST, 5.9.1995

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The floating rate loan is fully underwritten by BBMB and the bank guarantee is

underwritten by its subsidiary, BBMB International Bank (L) Ltd.

The Employees' Provident Fund is providing

the second loan, a fixed rate loan of RM300 million at nine per cent interest secured by BIBL's bank guarantee.

NST, 5.9.1995

Building a cushion against earthquakes

An inter-agency committee is studying the need to incorporate safety factors into the country's building by-laws to minimise possible earthquake damage in all future construction projects.

Minister of Science, Technology and Environment Datuk Law Hieng Ding said today that the Earthquake Risk Management Inter-Agency Committee was headed by the ministry's secretary-general, V. Danabalan.

"Since present building by-laws were patterned after Great Britain's and were established when Malaysia was thought to be stable and free from earthquake risks, they do not consider such safety factors," Law said.

"Geologically, Malaysia is in a low-risk seismic area and is considered quite stable. There have been, however, some local earthquakes, mostly in Sabah and Sarawak."

"There is relatively scant record of such events because people did not report damages and many affected areas in the two States were unpopulated at the time," he said.

Recorded incidents include a 1994 tremor measuring 5.5 on the Richter scale which was reported over a wide area in Sabah and which caused people from high-rise buildings in Kota Kinabalu, Sandakan and Tawau to evacuate their homes and offices.

The worst incident took place on July 26, 1976, when a tremor measuring 5.8 on the Richter scale damaged concrete buildings in Tawau, Lahad Datu and Kunak in Sabah.

The frequent tremors in the State have been attributed to it being in an area known as the "Ring of Fire", which also affects the Philippines, Japan, New Zealand and other Pacific countries.

The need for earthquake provisions in building by-laws is also increasing with the growing number of high-rise buildings and the fact that Malaysia is situated between 300 and 400 kilometres from the earthquake-prone Sumatra Fault, which runs along the entire length of Sumatra Island.

Law said there was also a risk of indirect

effects from more seismically-active nearby countries like Indonesia and the Philippines.

Government agencies like the Meteorological Services Department (MSD) and the Geological Survey Department, local universities and engineering institutions are involved in the committee.

Established in 1994, its duties revolve around assessing earthquake risks in the country and lowering their impact through projects like updating seismic maps which would help land planners, building designers and other agencies to incorporate earthquake risks in their projects.

Law revealed the results of the committee's work today, an updated edition of the seismotectonic map of Malaysia, which reveals which areas are most likely to be seismically active.

The map, available upon request from the Meteorological Services Departments, was initially released in 1985 and has been revised and updated based on the latest seismic information obtained through more modern equipment.

At the ceremony, Law also opened a seminar and dialogue between the MSD and private sector agencies that use its services.

"Climate and weather influences socio-economical activities. Heavy rains, for example, cause floods and affect fishing activities while hot weather affects domestic, commercial and agricultural water supplies," said Law.

"The MSD monitors all these factors throughout the year and is a source of advice and information. This dialogue session will help to give the department a deeper understanding of the needs of all agencies which use its services."

In his speech, MSD director-general Cheang Boon Khean said the one-day seminar, which attracted over 20 participants, would also benefit users of MSD services by instilling a greater awareness of the services available to them.

Also present at the launching ceremony were Danabalan and the Geological Survey Department's director-general Fateh Chand and deputy director-general Chen Shick Pei.

NST, 5.9.1995



Schlumberger's New Fullbore Formation MicroImager Doubles Your Coverage With Core-Like Clarity

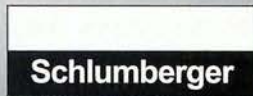
The FMI* fullbore electrical imaging tool makes evaluation of complex reservoirs simpler and quicker than ever before. Its 192 microelectrical sensors give you twice the coverage of previous tools and improved spatial resolution, to 0.2 inches.

The fullbore images enable direct structural analysis and characterization of sedimentary bodies even in extremely complex sequences. The fine detail provided by FMI images allows determination of paleocurrents and rock anisotropy, including the recognition of permeability barriers and paths. And determination of net-to-gross ratio in thin bed sand/shale sequences is automatic.

Understanding the internal structure of the rock can confirm hypotheses regarding its geological evolution and can provide valuable clues to geologists and engineers regarding local porosity and permeability changes. This is possible with the enhanced textural analysis from the new high-resolution sensors, as well as detailed evaluation of fracture networks and other secondary porosity.

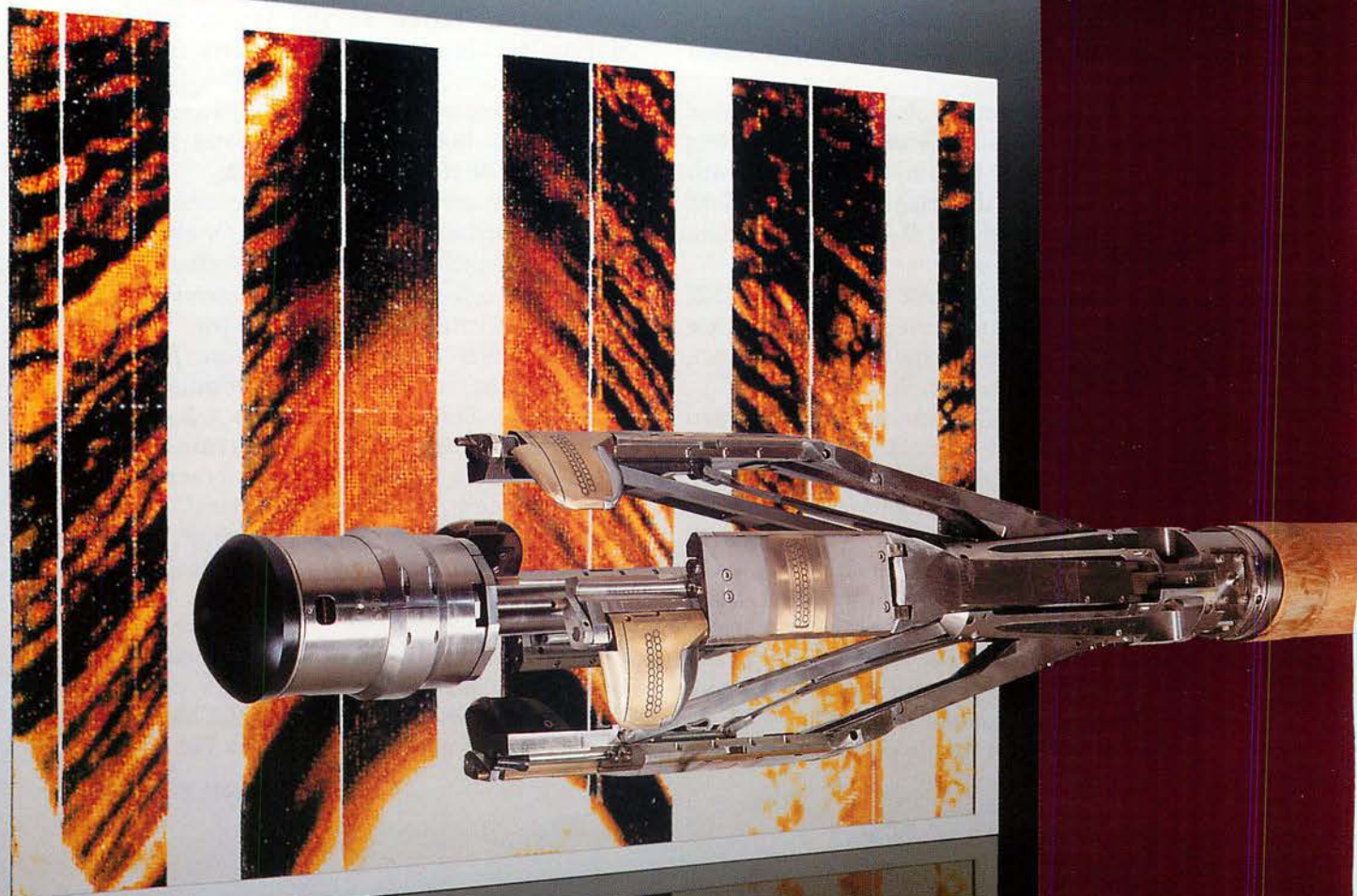
Ask to see an example of the new FMI log. You'll be looking at the clearest, most complete picture of the rock available today.

Schlumberger (Malaysia) Sdn. Bhd., 32nd Floor, Menara Promet
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Value is the difference.

Mark of Schlumberger—the FMI tool is a MAXIS 500 tool.





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Accurate, high-resolution, acoustic measurements by the UBI* Ultrasonic Borehole Imager let you examine an openhole for stability problems, deformation and fractures when nonconductive, oil-base muds prevent resistivity measurements. On the same trip, the UBI rotating transducer can check for corrosion and mechanical wear of the internal surface of the casing as the tool is pulled out of the hole.

No other borehole measurement gives you the thin-bed resolution you get with the UBI tool. The images, cross-section plots and pseudo-3D "spiral" plots generated from UBI measurements also reveal keyseats, breakouts, shear sliding and shale alteration to help you avoid the added drilling costs that result from stuck pipe and lost time or equipment. In addition, you get horizontal stress information for mechanical properties evaluations to predict breakouts and perforation stability in unconsolidated sands.

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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MMC: East Coast Highway project financially viable ---

Construction of the East Coast Highway, estimated at between RM2 billion and RM 3 billion, may commence early next year, Malaysia Mining Corporation (MMC) Bhd. group chief executive Tan Sri Ibrahim Menudin said yesterday.

"We submitted a proposal to the Government a few months ago and are still negotiating," he stated.

MMC leads a consortium which was awarded the concession to build and manage the 360 km two-lane dual carriageway linking Karak in Pahang to Kuala Terengganu.

Ibrahim, who told reporters a financial package to fund the highway had not been worked out, stressed that the project was financially viable.

MTD Capital Bhd. executive chairman Datuk Dr. Nik Hussein Abdul Rahman had said in April that estimated toll revenue would be insufficient to service loans to finance the project. MTD Capital is said to be one of the parties in the consortium to build the highway.

MMC has a 40 per cent stake in the consortium, United Engineers (Malaysia) Bhd. 30 per cent, while MTD Capital and Lembaga Urusan Tabung Haji jointly hold the remaining 30 per cent.

MTD Capital is currently upgrading the

Karak-Kuantan Highway. This includes widening the road from Kuala Lumpur to the Genting Tunnel into a six-lane dual carriageway.

MMC subsidiary Konsortium Lebuhraya Butterworth-Kulim Sdn. Bhd., meanwhile, has secured a concession for the RM250 million Butterworth-Kulim Highway.

Ibrahim was speaking to reporters in Kuala Lumpur after an investor relations presentation on its four Australian associate companies.

MMC is the biggest Malaysian investor in Australia with investments worth between RM1.2 billion to RM1.6 billion.

He expressed satisfaction with the performance of its Australian associates.

"Mining now contributes 40 to 45 per cent to the MMC group's profits. We don't plan to acquire new mining companies. Our three existing ones are good enough as they have good growth potential."

Earlier, Ibrahim said MMC intended to venture into mining in Laos, Burma, Indonesia and the Commonwealth of Independent States (CIS).

Ashton Mining Ltd., in which MMC has a 45 per cent interest, contributes one sixth of the world's diamond production. Aurora gold Ltd. and Plutonic Resources Ltd. are both engaged in gold mining.

NST, 6.9.1995

Jakarta to remain in tin panel ---

Indonesia would remain a member of the Association of Tin Producing Countries (ATPC), despite seeking to scrap the body's export quota scheme, director-general of mining, Kuntoro Mangkusubroto, told Reuters.

"We don't want to quit as a member. There is no point for it," Kuntoro said.

"The Indonesian Government has an interest to know statistics and research through ATPC," he added.

"However, we will not interfere in the business side of PT Tambang Timah. We will leave it to the private sector. We don't want to limit Timah production at a certain level. We want Timah to produce freely," Kuntoro said.

State-owned Tambang Timah, the world's

biggest integrated tin mining company, is slated to go public late in October.

The ATPC, grouping Australia, Bolivia, China, Indonesia, Malaysia, Nigeria, Thailand and Zaire, will meet in Bolivia in mid-September, Kuntoro said.

Timah has said it plans to boost production capacity to 50,000 tonnes a year from 1996, from 42,400 tonnes at present. It would add a seventh furnace at its smelter on Bangka Island, South Sumatra.

Timah said it expects to produce 36,700 tonnes of tin in 1995 compared with 34,000 tonnes last year.

The figure is above Indonesia's ATPC export quota of 30,500 tonnes.

NST, 6.9.1995

Dams to turn Sarawak into a 'powerhouse'

Bakun will be the forerunner of a series of dams in the upper Rajang basin which can produce about 5,000 Mw of energy and make Sarawak the hydro "powerhouse" of Malaysia.

The RM15 billion Bakun project will also propel the State to greater industrial heights as it will attract major energy-hungry industries.

Chief Minister Tan Sri Abdul Taib Mahmud said this when addressing about 2,000 Parti Pesaka Bumiputera Bersatu (PBB) youth and women delegates at the party's triennial delegates conference at Damai Lagoon near here, about 32 km from Kuching.

Taib said with massive energy resources from the upper Rajang basin from Bakun (2,400 Mw), Murum (900 Mw), Pelagus (770Mw) and Baleh (770 Mw), the Government would be able to enhance the quality of life of the Orang Ulu.

He said Sarawak would be at par with industrialised Selangor, Penang and Johor before the year 2020.

"We will be able to attract investors to set up an aluminium plant which will bring benefits worth thousands of millions of ringgit. We will also draw people to set up a pulp and paper plant. We can build an integrated steel mill plant and possibly build the world's biggest such plant in Sarawak after the turn of the century," he said.

Taib reiterated that the Bakun hydroelectric project's gains out-weighed its disadvantages. He said the project was an environmental-friendly power resource compared to alternatives such as nuclear energy or coal.

Hydro power is also cheaper to produce than energy derived from oil which has limited reserves and whose sales revenue could be used to bring greater development to many other sectors.

He said instead of being condemned, Sarawak should be thanked for providing a solution to Malaysia's energy needs.

NST, 9.9.1995

Oil firms unable to use new Malaysian finds

Over the past 10 years, foreign oil prospectors have found the equivalent of 2.4 billion barrels of oil and natural gas in Malaysia, more than one-fifth of the country's remaining recoverable petroleum reserves.

But none of the newly found oil and gas has been put into production, even though Malaysia's thirst for oil is climbing rapidly as its economy booms, according to a study published by Edinburgh-based oil consultants Wood Mackenzie.

State oil company Petroliam Nasional Bhd. (Petronas) stipulates not only output levels, but also which fields should be developed.

"Undoubtedly, such a problem will have long-term effects on the risk associated with investment in Malaysia, since if contractors feel they cannot commercialise what they discover, they may as well look elsewhere," the study said.

The 2.4 billion barrels in new petroleum finds were discovered by 16 companies. But since Malaysia offered its first production-sharing contracts to foreign companies in the mid-1970s, only the original two contractors have actually gone into production, Royal Dutch Shell and Esso Production Malaysia, a division

of Exxon.

Of the 16 companies, 10 have closed their offices in Malaysia, in most cases relinquishing their blocks to Petronas, oil industry sources say.

Those who have left include Enron of the United States, France's Elf Aquitaine, Italy's AGIP, Japan's Idemitsu, Australia's Western Mining, Britain's Laslo, Sun of the United States and Japan's JTOC.

The sources say the 10 companies left either because the contract terms that Petronas gives foreign oil were too harsh to make commercialising and fields worth-while or because of the long wait for approvals.

"The industry has voted with its feet," said one manager with years of experience in dealing with Petronas. *"They have gone to greener pastures."*

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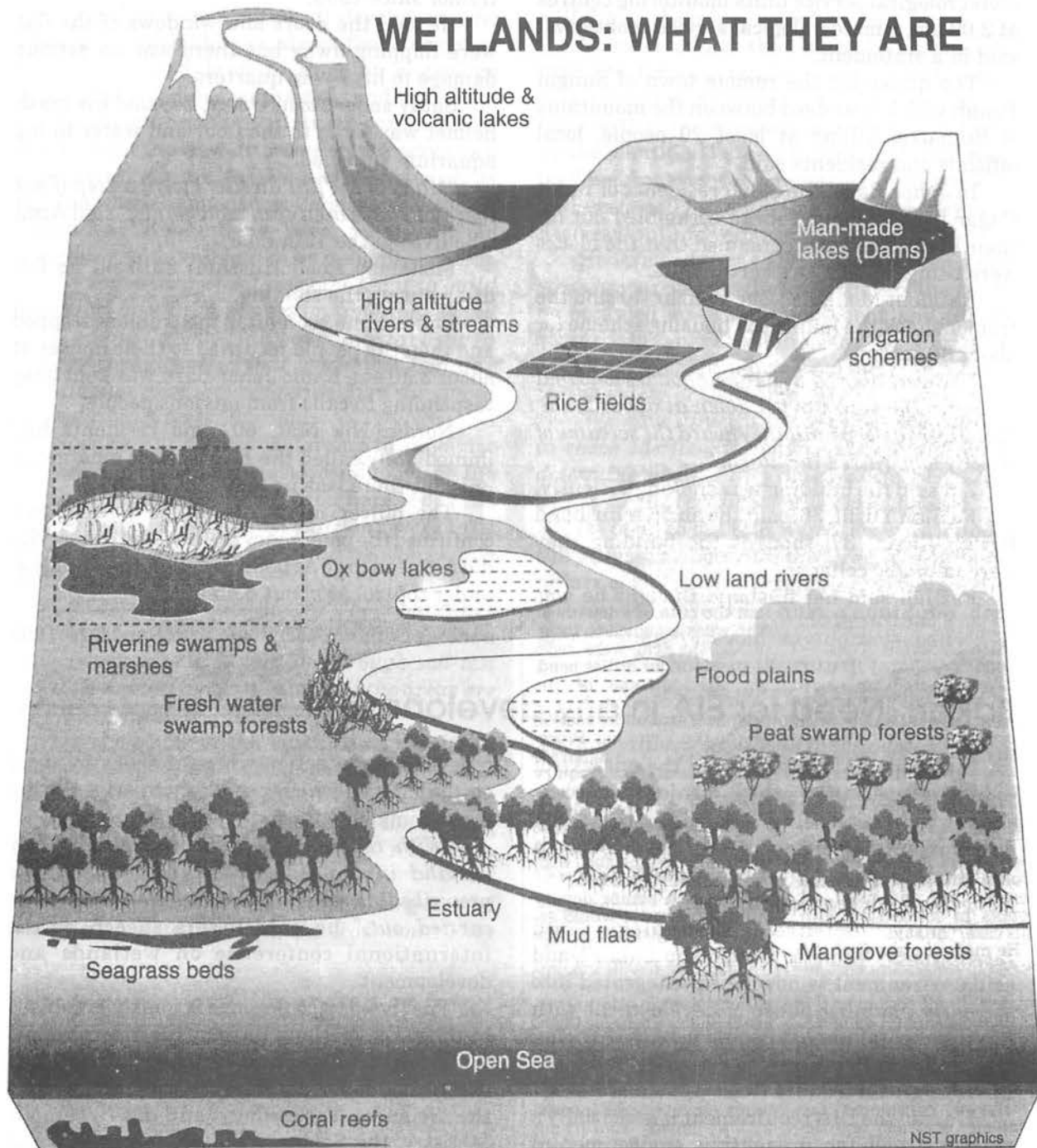
Institute of Advanced Studies, University of Malaya. The *New Straits Times* is the official newspaper.

Also present were the Ministry's secretary-general V. Danabalan and Selangor State Executive Councillor Ch'ng Toh Eng.

He said wetland is one of the important productive ecosystem which provide many benefits including groundwater recharge, flood

control measure, fish spawning ground, important sites for migratory waterbirds as well as aesthetic value. The protection of wetland was tantamount to the conservation of these waterbirds since without it their flyway may be disrupted and life cycle would be threatened resulting subsequently in the birds becoming extinct.

He said the conference was timely as there



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Tioxide to go into by-products business

Tioxide (Malaysia) Sdn. Bhd., the subsidiary of ICI Paints (Malaysia) Sdn. Bhd., is spending RM70 million in a five-year plan to establish its titanium dioxide by-products business.

Tioxide's core product, titanium dioxide, is a white pigment which is used by a wide range of industrial users to add colour, opacity and durability to products, replacing toxic pigments based on lead and zinc. It is used in toothpaste, paints and printing inks.

The by-products of titanium dioxide are iron salts, carbon dioxide, red gypsum and white gypsum.

The first of the by-products to be produced by the Tioxide Malaysia plant in Teluk Kalung, Terengganu, would be iron salts, executive director and general manager for operations Mike Cottingham said in an interview in Kuala Lumpur.

Iron salts are used in the manufacture of products for the water treatment industry to purify drinking water, treat sewerage and eliminate phosphate contamination from reservoirs. They are also used to overcome soil deficiencies in agriculture.

"Apart from Malaysia, we are also optimistic of making inroads into the water treatment sector in Thailand and Japan," Cottingham added.

The production facility for the iron salts would be built adjacent to the existing plant by next year. The plant would, by then, increase its production capacity substantially from the

current 50,000 tonnes per annum.

After iron salts, Tioxide Malaysia plans to produce white gypsum which is widely used by cement manufacturers as part of the ingredients for cement. At present, the product is imported from Thailand.

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The Tioxide group started commercially developing the by-products in 1993. Sales of the by-products have grown from 336,000 tonnes in 1993 to 580,000 tonnes in 1994.

NST, 23.10.1995

Tin miners happy with new deadline

The decision of the Association of Tin Producing Countries (ATPC) to extend the tin production export quota system to June next year would facilitate an orderly return to free market.

This was stated in a joint statement by the All-Malaya Chinese Mining Association president Chin Lean Choong and the Perak Chinese Mining Association president Datuk hew See Tong in Ipoh yesterday.

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They were responding to the recent announcement by Bolivia's Mining Secretary, Teddy Cuentas, that the current system of quotas would be maintained until June 1996 and a new evaluation of the quota system would be made in June.

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According to some estimates, Malaysia will have to import oil by 2002 at current production rates if new discoveries are not developed.

Petronas declined to answer written queries. Officials said privately the subject was a sensitive one.

A Petronas official who did not want to be identified said part of the problem was that finds are not located near existing pipeline and export-processing facilities.

Malaysia produces 650,000 barrels a day (bpd), of which 400,000 bpd is exported. Petroleum exports earned US\$2.6 billion

(RM6.52 billion) in 1994, 4.2 per cent of Malaysia's total exports, central bank statistics show.

"Bottom line? They don't need the oil and they don't need the income from oil," said one foreign contractor whose company provides oil field services for Petronas.

"They can afford to keep these finds off the market," he added.

The country's economy can boast of one of the fastest growth rates in the world, expanding at an annual rate of eight per cent for the past eight years on the back of manufactured exports.

Star, 9.9.1995

Kedah Cement's second plant

Kedah Cement Holdings Bhd. expects to see the full impact of its second integrated cement production plant in Langkawi, Kedah, by 1997.

"The second line is expected to give a favourable impact to the group," chairman Tan Sri Jamil Mohd Jan said after the company's annual meeting at Hotel Equatorial in Kuala Lumpur yesterday.

The new plant is expected to contribute 32 per cent of the total local cement production.

The optimism is also buoyed by the 10 per cent hike in cement price announced by the Government last month.

"A 10 per cent increase in price means that

cement now cost RM18 per tonne," he said, adding that the adverse effect of the price increase would be small.

"It's not the cement price that affects the house price as a whole because if five per cent of the cost consists of cement, it will only mean a 0.5 per cent increase in price," said Jamil.

On the addition production line, Kedah Cement is expected to increase its production capacity to 3.3 million tonnes per year from the present 1.5 million tonnes per year.

The RM800 million new plant, which is expected to be fully operational by year-end, will be commissioned this month.

NST, 9.9.1995

Key tin producers hold crucial talks

Key world tin producers begin meetings in Bolivia today to decide on what could spell the demise of the Association of Tin Producing Countries' (ATPC) role as industry regulator, industry sources said yesterday.

At the heart of the crucial Sept 12-19 talks in Santa Cruz will be the eight-member group's export quota scheme — something Indonesia, the world's second largest producer after China, wants scrapped despite opposition from fellow members.

The scheme, which caps amounts member nations can export in a bid to bolster prices and cut stocks, is considered the most important function of the ATPC, which links Australia, Bolivia, China, Indonesia, Malaysia, Nigeria, Thailand and Zaire.

"We want the quota system to be lifted. We want our demand on the revocation of the quota system to be put on the agenda of the ministerial meeting of the ATPC (in Bolivia)," Indonesia's director-general of mining Kuntoro Mangkusubroto said.

Indonesia's tough stand is aimed at ensuring a free hand for state-run PT Tambang Timah, the world's largest integrated tin miner, due to be listing on the London and Jakarta stock exchanges next month.

Timah is poised to boost production capacity to 50,000 tonnes from 1996, compared with the present 42,400 tonnes. Timah president-director Erry Riana said it was forecast to produce 36,700 tonnes this year, compared with 34,000 tonnes last year.

Indonesia fired its first salvo against the ATPC scheme by exporting 34,000 tonnes in 1994 — well above its limit of 30,500 tonnes. Industry sources said exports this year were expected to be about the same or marginally higher.

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Tin stocks had fallen to about 37,000 tonnes early this year but are still above the ATPC's goal of 20,000 tonnes.

The quotas limit members' exports at 90,600 tonnes in 1995, down from 98,000 tonnes in 1994. Their exports totalled 103,220 tonnes in 1994, 5.3 per cent above the quota limit.

NST, 12.9.1995

Repair works on highway slopes soon

Corrective works along the Karak highway are expected to start soon with several contracts being awarded to local firms directly without going through the tender process.

Working Ministry's director for roads Datuk Paul Chua said the contracts were for areas judged most likely to pose landslip dangers, following the Genting landslide tragedy on June 30, which claimed 20 lives and injured 22 others.

"The awarding of contracts for these stretches was made directly, given the urgent need to avoid any further landslips," he said. However, he declined to reveal the names of the firms involved.

One of the areas to be rectified is the danger spot spilling over from the old Gombak road down the Karak highway, about 200 metres from the tunnel which was highlighted by the *New Straits Times* recently.

Other danger spots to be addressed are mainly highland catchment areas, which need to have proper drainage facilities to avoid the surrounding earth becoming water-logged and washing down in a landslide.

Such a highland catchment spot was blamed for the Genting landslide, where tonnes of water-logged earth came down from a spot over one kilometre from Karak highway.

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"We are ready to work with the PWD to correct any landslip dangers which could affect the Karak highway," MTD Capital project director Steve Roger said.

Gombak district PWD engineer Zainal Rashid Zakaria said the old Gombak-Kuala Lumpur road, which runs parallel to and about 50 m above the Karak highway, will soon be reinforced.

Tioxide to go into by-products business

Tioxide (Malaysia) Sdn. Bhd., the subsidiary of ICI Paints (Malaysia) Sdn. Bhd., is spending RM70 million in a five-year plan to establish its titanium dioxide by-products business.

Tioxide's core product, titanium dioxide, is a white pigment which is used by a wide range of industrial users to add colour, opacity and durability to products, replacing toxic pigments based on lead and zinc. It is used in toothpaste, paints and printing inks.

The by-products of titanium dioxide are iron salts, carbon dioxide, red gypsum and white gypsum.

The first of the by-products to be produced by the Tioxide Malaysia plant in Teluk Kalung, Terengganu, would be iron salts, executive director and general manager for operations Mike Cottingham said in an interview in Kuala Lumpur.

Iron salts are used in the manufacture of products for the water treatment industry to purify drinking water, treat sewerage and eliminate phosphate contamination from reservoirs. They are also used to overcome soil deficiencies in agriculture.

"Apart from Malaysia, we are also optimistic of making inroads into the water treatment sector in Thailand and Japan," Cottingham added.

The production facility for the iron salts would be built adjacent to the existing plant by next year. The plant would, by then, increase its production capacity substantially from the

current 50,000 tonnes per annum.

After iron salts, Tioxide Malaysia plans to produce white gypsum which is widely used by cement manufacturers as part of the ingredients for cement. At present, the product is imported from Thailand.

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The Tioxide group started commercially developing the by-products in 1993. Sales of the by-products have grown from 336,000 tonnes in 1993 to 580,000 tonnes in 1994.

NST, 23.10.1995

Tin miners happy with new deadline

The decision of the Association of Tin Producing Countries (ATPC) to extend the tin production export quota system to June next year would facilitate an orderly return to free market.

This was stated in a joint statement by the All-Malaya Chinese Mining Association president Chin Lean Choong and the Perak Chinese Mining Association president Datuk hew See Tong in Ipoh yesterday.

In welcoming the decision of the ATPC Ministerial meeting in Santa Cruz, Bolivia, last month they said:

"With the continuing improvement of the tin market fundamentals, we believe the six-month extension from January to June next year will facilitate an orderly return to free market after June 1996."

They were responding to the recent announcement by Bolivia's Mining Secretary, Teddy Cuentas, that the current system of quotas would be maintained until June 1996 and a new evaluation of the quota system would be made in June.

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Gombak district PWD engineer Zainal Rashid Zakaria said the old Gombak-Kuala Lumpur road, which runs parallel to and about 50 m above the Karak highway, will soon be reinforced.

"This old road was built using methods best known in the 1930s. That the road has survived quite well until now testifies to how well it was built," Zainal Rashid said.

He added that the PWD had cleared many of the minor landslips which had occurred along the old road and the recent Genting tragedy had highlighted the need to resurface the old Gombak road.

"It is an important alternative route for the Karak highway, and attempts will be made to preserve it," Zainal Rashid said.

"But, in the meantime, any attempt to close the old road to allay fears of landslide dangers can only be temporary since existing laws allow the PWD to close the road for only up to 30 days."

Work Minister Datuk Seri S. Samy Vellu, when asked if the ministry lacked the funds to undertake corrective measures along the Karak highway, conceded that money could be a problem.

"There is only so much money available with a lot more required for the nation's road systems," he said.

"However, when necessary, the ministry can apply for special funds from the Finance Ministry to undertake repair works at highly dangerous spots after the annual budget allocations are made."

"Even so, all the money in the world cannot help avoid wear and tear."

NST, 12.9.1995

12 designated as research institutes

The Finance Ministry has designated 12 local research bodies as approved institutions, whereby the private sector may be allowed double tax deduction should they use their services.

Companies or organisations could also be rewarded with tax incentives should they contribute to these institutions, said Deputy Finance Minister Datuk Wong See Wah yesterday.

The institutions are the Malaysian Agriculture Research and Development Institute (Mardi), Fisheries Research Institute, Veterinary Research Institute, Palm Oil Research Institute of Malaysia (Porim), Mineral Research Institute, Standards and Industrial Research Institute of Malaysia (Sirim), Nuclear Technology Research Institute, Institute of Medical Research (IMR), Malaysian Institute of Microelectronics System (Mimos), Rubber Research Institute (RRI), Forest Research Institute of Malaysia (Frim) and National Remote Sensing Centre (Macres).

Wong said the ministry had spent some time to identify the 12 institutions and had only solved the ambiguity pertaining to the status entitlement recently.

He urged the private sector, especially those without in-house research and development (R&D), to utilise their services and facilities.

"Companies giving generous donations or making use of the approved research facilities are entitled to the double tax deduction incentive provided by the Government under the Budget 1991 and 1994," he said at the official opening of

Taylor-Wharton Asia (M) Sdn. Bhd.'s second plant in Shah Alam, Selangor.

He added that a unit or faculty in the local university, particularly those conducting research programmes, courses or activities within the definition of R&D contained in Investment Promotion Act, 1986 could also apply for "approved research institutions" status.

Commenting on operations carried out by foreign companies in the countries, Wong said: *"Direct foreign investment has contributed significantly to the accelerated growth in the manufacturing sector."*

In view of the Government's effort to promote direct foreign investment especially in capital-intensive and high-technology industries, Wong said the country had attracted 40 large capital-intensive projects to be located here.

He added that these projects had proposed investments totalling about RM100 million.

"Promotional efforts and the favourable investment environment have also attracted 11 foreign companies to set up their R&D facilities in the country."

For the first six months of this year, the Government has received 453 applications for manufacturing projects with a total proposed investment of RM11.51 billion.

"The almost double increase in investments come from the United States during the first six months with 27 applications and proposed investment of RM413.7 million."

NST, 13.9.1995

Coastal erosion due to strong winds, waves

The erosion at several stretches along the Malacca shore has been attributed to strong winds and waves.

Initial observation by officers from the State Drainage and Irrigation Department (DID) at Kampung Balik Bukit, Tanjung Keling and Kampung Balik Batu in Tanjung Bidara, Masjid Tanah, revealed that strong winds blew big waves against the shore, causing the erosion.

Its deputy director, Soong Sin Onn, who visited the areas with three engineers, said these factors were the main reasons for the serious erosion.

"The sudden changes in the weather pattern might have resulted in strong winds and waves which hit the coastal areas of Malacca, particularly at these two spots and also at Kampung Tanjung Dahan in Kuala Linggi."

He said that through their observation, waves and winds were stronger than usual at this time of the year.

"These conditions are relatively similar to those in the East Coast and it is quite strange that it is happening in Malacca now," he said.

Soong said that although the south-west monsoon season was here, the winds were not expected to be very strong.

The department will ask a specialist from the National beach Erosion committee to investigate the erosion problem and determine ways of preventing it.

Soong said that the DID had noticed severe erosion in the last three months and were taking the necessary preventive measures, like placing

boulders at Kampung Tanjung Dahan.

"We will decide on what to do in the case of Kampung Balik Batu and Kampung Balik Bukit after further investigation," he said.

The *New Straits Times* has reported that several areas were facing serious erosion and that big waves had caused several wooden structures and trees to fall into the sea.

Meanwhile, a spokesman for the Meteorological Services Department in Kuala Lumpur said they had no data to indicate accurately strong wind and wave patterns in the coastal areas of Malacca.

"We have to rely on information given by ships plying the Straits of Malacca and so far there is no indication of strong waves caused by the winds."

One factor that people had to take into consideration was that conditions out at sea might differ to that of the coastal areas and, therefore, it was not a good indicator," he said.

"The authorities should also take into consideration the changing contours of the beach. I understand there is a lot of reclamation work in Malacca which uses the soil from the seabed," he said.

Fishermen in the affected areas believe that sand dredging activities have removed sandbanks and bars that once served as natural wave-breakers.

Hamka Jais, 26, from Kampung Balik Batu, said the situation had deteriorated since the dredging activities.

NST, 13.9.1995

Another petroleum complex in Marang

Terengganu will have another petrochemical complex, bigger than the ethylene and polyethylene complex in Kerteh, before 2000.

To be built in Marang, which is the petrochemical complex, known as Terengganu Integrated Petrochemical Complex (TIPC), it will be located on a 400 hectare site in Pulau Kerengga.

Menteri Besar Tan Sri Wan Mokhtar Ahmad said the RM3 billion project will be the single largest investment for a petrochemical project in the country.

"It will be able to process 100,000 barrels of oil per day," he told reporters after opening the Umno Marang divisional meeting here today.

Wan Mokhtar declined to reveal the details of the joint venture but said the State Government would have a fair share in the project.

He said the parties involved were conducting soil tests but in certain areas tests had to be delayed until land acquisition was completed.

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"In fact, the district office has identified the landowners who will be given compensation based on the current market value."

Wan Mokhtar advised those who own land fringing the project not to sell their property.

He said the price per hectare had already

risen from about RM5,000 to more than RM50,000.

"The land fringing the project site can be developed into residential areas as more than 1,000 people are expected to be employed by the company."

NST, 16.9.1995

Soil tests for tall buildings on limestone based land **=====**

City Hall has directed all developers who wish to build buildings above five-storeys on limestone-based land to appoint a geology consultant to advise on the soil condition.

Its director-general, Datuk Noordin Abdul Razak, said the new directive would serve as a long-term measure to avoid incidents such as the one which happened at Persiaran Lidcol, off Jalan Yap Kwan Seng here, where an old bungalow sank and had to be demolished.

"It is necessary for those who want to build buildings above five storeys on limestone-based land, within the City Hall boundary, to engage a geology consultant so that a suitable building foundation can be recommended to avoid untoward incidents," he said.

Speaking at a Press conference to announce the results of the soil tests conducted at the Persiaran Lidcol sinkhole area here today, he said some areas with limestone land were to be found around Jalan Ampang, Jalan Kelang Lama and jalan Bangsar.

"We also advise developers whose buildings are erected on limestone-based land to appoint a geology consultant so that a thorough soil test could be carried out to ascertain if the areas are safe for occupation," he said.

On the cause of the sinkhole at Persiaran Lidcol, Noordin said based on the initial findings conducted by Geo-Environment Sdn. Bhd., a consultant appointed by City Hall, the sinking land was caused by the formation of a cavity in the limestone beneath the ground.

"Efforts to identify the cavity are being carried out by geologists from Geo-Environment. They

will fill up the cavity soon," he said.

Noordin added that since limestone was prone to forming cavities, which could cause sinkholes, it was necessary to conduct early soil tests so that remedial measures, such as filling up the identified hole with earth and sand could be done, to save the properties from cracking and eventually being demolished, if they were declared unfit for occupation.

He stressed that City Hall had given a one-week grace period to the developers of the yet-to-be occupied six-storey apartment and the 20-storey Mayang Condominium at Persiaran Lidcol, to submit findings from their consultants on the safety of the buildings.

"We have directed the developers concerned to check the foundations of their buildings to determine whether they are safe before City Hall will issue the certificate of fitness," he said.

He pointed out that if cavities were found in the limestone beneath the ground where the pillars of the two buildings were situated, then efforts to close the hole should be done immediately, to avoid any damage caused by possible sinkholes in the future.

"Sinkholes are a normal phenomenon in areas where limestone is found underneath the land. The formation of cavities in limestone takes about 1,000 years to one million years," he said.

He explained that buildings could be built on limestone-based land, provided there were no cavities (in the limestone) and if there were any, the cavities should be filled up to prevent the occurrence of sinkholes.

NST, 20.9.1995

JB shaken by Sumatra quake

Parts of Johor Baru shook and trembled about 2 am today from the effects of a powerful earthquake centred around southwest Sumatra.

The tremors were especially felt in highrises and flats whose residents panicked and ran out of the buildings.

The earthquake, measuring 6.3 on the Richter scale, was recorded on all five meteorological service units monitoring centres at 2.09 am, a meteorological service spokesman said in a statement.

The quake hit the remote town of Sungai Penuh which is wedged between the mountains of Sumatra, killing at least 70 people, local officials and residents said.

In Johor Baru, the 5,000 residents of Bukit Cagar flats in jalan Tebrau scrambled out for their lives after a boy screamed that the blocks were being jolted by an earthquake.

Resident Mohamed Zin Mohsin, 40 said the tremor shook the four-block housing scheme for about 30 seconds.

"We were alerted by our neighbours who told us to use the stairs to get down at about 2 am. Many were asleep until they heard the screams of the boy who raised the alarm."

Zin said the building was shaking violently.

Fazilah Yusuf, 36, said she and her husband Roslan Ripan, 37, thought the building they were in might collapse.

Fazilah said her husband thought he was

having a bad migraine until their neighbours hurried pass their unit telling them the building was being hit by a tremor.

Another resident, C. Rama Krishna, 60, of 16th floor Block A said the water tank in his unit shook violently, spilling water in the bathroom.

"The scoop in the pail rocked like a boat," Rama said, adding this is the first time he felt a tremor since 1990.

He said the doors and windows of the flat were flapping away but there was no serious damage to his living quarters.

Satay seller Azmi Omar, 27, said his crash helmet was flung to the floor and water in his aquarium splashed.

"Many of the flat dwellers were asleep if not there will have been even more panic," said Azmi who lives in the 12th floor.

Mohamed Rosli Hussain, 32, said he felt dizzy during the shaking.

Police came soon after the tremors stopped and then the people returned to their houses at about 3.30 am, Radio Johor Baru was kept busy responding to calls from anxious people.

Nordin Nik Mat, 60, said residents had immediately called the Fire Service emergency unit but there was no response.

The officer in charge of the Larkin unit confirmed the emergency call but said the service did not need to go as police brought the situation under control at about 4.45 am.

Sun, 8.10.1995

Bakar: Need for EIA in any development

Malaysia, in trying to avoid the mistake of industrial countries which achieved success through irreparable damage to their environment, is placing greater emphasis on a sustainable development approach towards achieving high economic growth.

Deputy Science, Technology and Environment Minister Datuk Abu Bakar Daud said environment is now being integrated into the early planning phase of development with Environmental Impact Assessment (EIA) being mandatory to 19 prescribed activities under the Environmental Quality Act.

He said the EIA requirement is essentially a planning tool for preventing environmental

problems to an action where it seeks to avoid costly damage which are likely to arise during project implementation.

"With regard to this, development of any wetland in Malaysia falls under one of the prescribed activities which requires EIA to be carried out," he said in his speech at the international conference on wetlands and development.

The five-day conference is jointly organised by the Asian Wetland Bureau, the International Waterfowl and Wetland Research Bureau and the Wetlands for Americas in conjunction with the Science, Technology and Environment Ministry, the Selangor State Government and

Tioxide to go into by-products business

Tioxide (Malaysia) Sdn. Bhd., the subsidiary of ICI Paints (Malaysia) Sdn. Bhd., is spending RM70 million in a five-year plan to establish its titanium dioxide by-products business.

Tioxide's core product, titanium dioxide, is a white pigment which is used by a wide range of industrial users to add colour, opacity and durability to products, replacing toxic pigments based on lead and zinc. It is used in toothpaste, paints and printing inks.

The by-products of titanium dioxide are iron salts, carbon dioxide, red gypsum and white gypsum.

The first of the by-products to be produced by the Tioxide Malaysia plant in Teluk Kalung, Terengganu, would be iron salts, executive director and general manager for operations Mike Cottingham said in an interview in Kuala Lumpur.

Iron salts are used in the manufacture of products for the water treatment industry to purify drinking water, treat sewerage and eliminate phosphate contamination from reservoirs. They are also used to overcome soil deficiencies in agriculture.

"Apart from Malaysia, we are also optimistic of making inroads into the water treatment sector in Thailand and Japan," Cottingham added.

The production facility for the iron salts would be built adjacent to the existing plant by next year. The plant would, by then, increase its production capacity substantially from the

current 50,000 tonnes per annum.

After iron salts, Tioxide Malaysia plans to produce white gypsum which is widely used by cement manufacturers as part of the ingredients for cement. At present, the product is imported from Thailand.

Cottingham said the white gypsum production facility would be built in a joint venture with a cement manufacturer at a site to be chosen by the latter.

"We expect this to materialise in 1997," he added.

After white gypsum, Tioxide Malaysia would produce carbon dioxide and red gypsum. Carbon dioxide is used in the beverage industry while red gypsum, another by-product is used in soil conditioners, plaster board and cement.

The Malaysian plant would be the first among the 10 plants in the Tioxide group worldwide to have the facility to commercially produce all the four by-products of titanium dioxide.

The Tioxide plant at its headquarters in the UK produces two types of the by-products, namely iron salts and white gypsum. Tioxide's other plants are in South Africa, Europe, Canada, the US and Australia.

The Tioxide group started commercially developing the by-products in 1993. Sales of the by-products have grown from 336,000 tonnes in 1993 to 580,000 tonnes in 1994.

NST, 23.10.1995

Tin miners happy with new deadline

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This was stated in a joint statement by the All-Malaya Chinese Mining Association president Chin Lean Choong and the Perak Chinese Mining Association president Datuk hew See Tong in Ipoh yesterday.

In welcoming the decision of the ATPC Ministerial meeting in Santa Cruz, Bolivia, last month they said:

"With the continuing improvement of the tin market fundamentals, we believe the six-month extension from January to June next year will facilitate an orderly return to free market after June 1996."

They were responding to the recent announcement by Bolivia's Mining Secretary, Teddy Cuentas, that the current system of quotas would be maintained until June 1996 and a new evaluation of the quota system would be made in June.

The Bolivian decision meant that the export scheme, set up after the collapse of the

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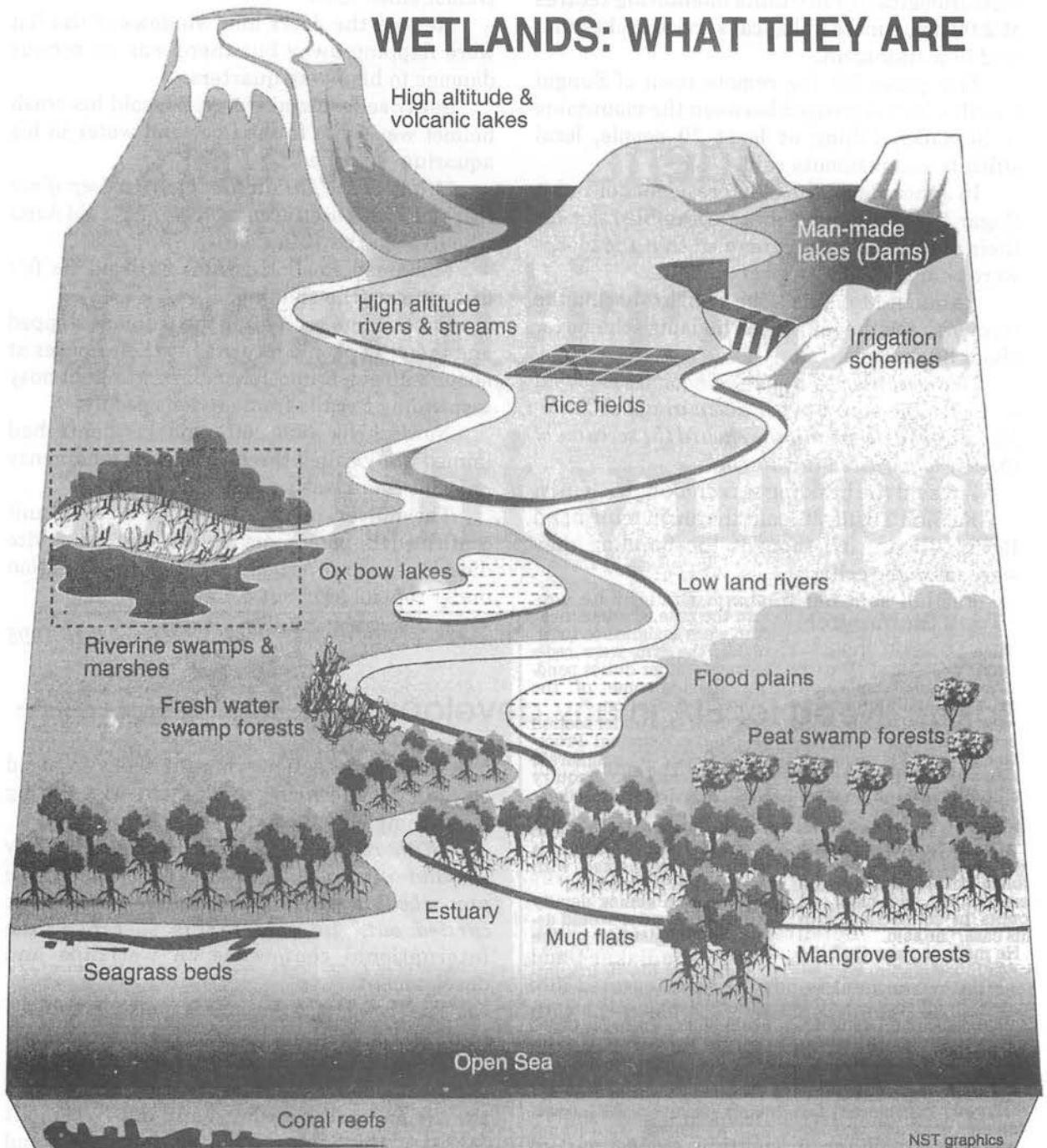
Institute of Advanced Studies, University of Malaya. The *New Straits Times* is the official newspaper.

Also present were the Ministry's secretary-general V. Danabalan and Selangor State Executive Councillor Ch'ng Toh Eng.

He said wetland is one of the important productive ecosystem which provide many benefits including groundwater recharge, flood

control measure, fish spawning ground, important sites for migratory waterbirds as well as aesthetic value. The protection of wetland was tantamount to the conservation of these waterbirds since without it their flyway may be disrupted and life cycle would be threatened resulting subsequently in the birds becoming extinct.

He said the conference was timely as there



were many areas of wetland being threatened either under the pressure of development or being used as dumping ground by irresponsible element of the society.

"This conference aims to make the public more aware of the importance of wetland and also come out with constructive suggestion to

enhance and protect this important ecosystem.

"We recognise that man in his pursuit of development is the cause of pollution and the degradation of environment. We cannot stop development altogether but we can at least minimise pollution caused by it."

NST, 11.10.1995

Expert: Landfill method hazardous

The traditional method of waste disposal using landfills is becoming less acceptable as it is hazardous to health and the environment.

Bernd Lezenik, from the Power Generation Group of Siemens AG, Germany, said this and the increasing amount of waste generated have resulted in a heightened interest in the search for sound and long-term waste treatment methods.

"Many countries are confronted with increasing amounts of waste requiring treatment and disposal.

"Waste has doubled or even trebled in a single decade in countries undergoing rapid development, increase in population, rising standard of living or industrial and economic growth."

Lezenik said this in his paper *"Thermal Waste Recycling Programme: An Advanced and Environmentally Sound Solution to Problems of Waste Disposal"*.

The paper, jointly written with K.W. May and R. Ahrens-Botzong from Siemens AG, was presented at the Global 500 Forum International Conference held at the Kuala Lumpur Hilton.

Jointly organised by Global 500 Forum and Golden Hope Plantations Bhd., the conference was held in conjunction with Asean Environment Year 1995. *Business Times* is the official newspaper.

Lezenik said the traditional way of waste disposal using landfills was without long-term environmental control and would therefore be unacceptable in future.

He said landfills required large areas and could adversely affect the natural and human environment.

Furthermore, natural resources and the public's health are threatened by uncontrolled

emissions into the air as well as underground releases.

"Materials dumped in a landfill decompose over many years, producing noxious gases and fouling groundwater. Toxic substances are released and carried into the ground and the ground water.

"In addition, many diseases are spread from open landfills," said Lezenik.

Therefore, he said, waste management systems which combined sound recycling with suitable treatment and long-term stabilisation of residual products were needed.

He said the systems should be based on a "4-R concept" — reducing, reusing, reprocessing and recycling waste.

All residual waste should be treated using advanced technologies based on the 4-R concept, allowing all organic materials, including traces of toxic substances, to be destroyed, mainly by the thermal processes.

From this, he said some energy in the form of electricity could be recovered while inorganic components like metals could be cleaned and separated to obtain secondary raw materials.

Lezenik said Siemens's Thermal Waste Recycling Process (TWRP) fulfilled these requirements, providing the following features:

- Only a small amount of residue was left for disposal;
- All non-recycled organic substances are destroyed, including toxic traces;
- Metal scraps and grit are separated as clean secondary raw materials; and
- About 15 per cent of the waste energy is recovered.

He said the thermal process converted waste into pyrolysis gas and fine carbon residue through high temperature combustion.

NST, 20.10.1995

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They were responding to the recent announcement by Bolivia's Mining Secretary, Teddy Cuentas, that the current system of quotas would be maintained until June 1996 and a new evaluation of the quota system would be made in June.

The Bolivian decision meant that the export scheme, set up after the collapse of the

International Council in 1985, had come to an end in June.

After that the issue will only come up again at the next conference of ATPC Ministers which will be in October. Then they will decide how to stabilise the market if necessary.

The ATPC decision to relieve the market of supply/demand constraints by mid-1996 is very much in line with the Malaysian tin industry's position since 1987 that the tin market should be free to determine its own level without the necessity of imposing economic constraints.

Its decision followed improving market fundamental with supply/demand moving towards equilibrium with available commercial stocks standing at nearly 20,000 tonnes — a level considered manageable.

ATPC said it set January-June export quotas for its eight current members at a total of 50,900 tonnes.

The two Chinese mining associations also welcomed Brazil to be a full fledged member of the ATPC.

"We also like to appeal to Peru, Portugal, Vietnam and other tin producing countries to join the ATPC so that they could determine the fate of the scarce and non-renewable resource.

"In view of the improving market fundamentals, we would like to join in the appeal made by the Malaysian Chamber of Mines and the Bumiputera Chamber of Mines to the State Governments to renew all mining lands which are deemed viable and to make available of more land for exploitation.

"This is to ensure a constant supply of tin to the country's rapid industrialisation."

The associations also appealed to the Federal Government to expedite the formulation and implementation of the Mineral Development Policy so as to induce more investment in exploration and extraction of minerals.

"We believe with the right incentives, the vast pool of mining expertise available in the country could again be exploited," they added.

NST, 23.10.1995

100 danger hill slope roads detected

The Works Ministry has identified at least 100 hill slope roads along the East-West Highway that could pose a danger to motorists as their structures are bound to collapse.

Works Minister Datuk Seri S. Samy Vellu said as an immediate remedial measures, the ministry has asked the Finance Ministry for urgent allocations so that the roads could be strengthened and make them safe for travel.

Speaking at his Deepavali open house at the Chung Hwa Independent High School in Jalan Ipoh here today, he said the ministry and owners of the roads were now taking steps to ensure that the soil conditions permitted the flow of heavy traffic.

"We are also looking into areas where we can control garbage disposal along the stretches as the garbage can also cause soil erosion."

Samy Vellu said of the 100 over roads identified as potential dangers, 30 of them needed immediate repairs and added that a report had been submitted to the Economic Planning Unit on the potential dangers.

He said the Economic Planning Unit would then recommend that funds be allocated from the Finance Ministry for remedial measures to be taken.

Samy Vellu said the East-West Highway linking Grik in Perak to Jeli in Kelantan would eventually become an important stretch as it would have to accommodate a large flow of traffic from the north once the Baling-Butterworth highway was completed.

On investigations into the recent collapse of the sliproad leading to Genting Highlands, Samy Vellu said the road would eventually be reopened to the public.

He said investigations were still being carried out and as soon as the investigating committee had completed its report, it would be submitted to the Cabinet for its recommendations.

He said the committee would also propose recommendations for the proper maintenance of the road.

NST, 24.10.1995

Silica sand rich Sarawak woos glass industries

Sarawak Chief Minister Tan Sri Abdul Taib Mahmud said glass manufacturers should set up their plants in the state to take advantage of its vast amount of top quality silica sand.

Silica sand, which is used in the manufacture of glass, can be found all along the State's long coastline.

The State also has huge gas reserves, especially around the Bintulu region.

"If anybody has ambitious plans about manufacturing glass-based products, they will find that Sarawak is the right place (to invest)," he said.

Taib said this after opening the 20th Asean Glass Conference at the Kuching Hilton in the State capital yesterday.

The annual three-day affair, which is organised by the Glass Manufacturers Association of Malaysia, was attended by about 300 people from Southeast Asia, Europe, United States, Africa, India and Australia.

Taib also said that a glass manufacturing plant would be opened in Kota Samarahan next month. Products from this plant would be for domestic use only.

Taib told the gathering that the glass industry faced an optimistic future especially in the Asean region.

With a combined population of about 300 million in a fast-growing economic region, Asean offered a great opportunity for future investments.

"With robust growth of the building industry, there is no reason why the glass industry cannot benefit from it," he said.

Along those present at the function were Industrial Development Minister Datuk Abang Johari Tun Abang Openg, Assistant Ministers, Glass Manufacturers Association of Malaysia chairman Leslie Struys and chairman of the Asean Federation of Glass Manufacturers (AFGM) Lubin Nepomuceno.

Nepomuceno said the glass industry in Asean

was in a favourable position because of the region's growth.

The container glass industry in Thailand, for instance, was expected to achieve a 17 per cent growth this year, compared with the original target of 13 per cent.

"The flat glass industry (in Thailand) will also see double-digit at 13 per cent."

"Unlike the container sector, however, flat glass supply is still well over demand, thus providing them excess capacity to export," he said.

Malaysia's glass industry is enjoying double-digit growth over the past year.

Flat glass and related products output grew by 20 per cent and the container sector grew by 10 per cent last year.

The container glass sector in the Philippines, Nepomuceno said, was expected to grow by 10 per cent this year while the projection for the flat glass sector was 30 per cent growth.

Despite this rosy scenario, Nepomuceno said the industry must constantly keep pace with increasing consumer expectations and competition from substitute packages.

"It will not be surprising if there were to be a sudden shift in consumer preferences and lifestyles which, when not projected, can turn our strategic plans and budgets upside down," he said.

To counter this possibility, he called on all AFGM members to be more proactive.

He said they must identify more areas of co-operation, share information in areas such as sourcing of raw materials, exchange of best manufacturing practices, and programmes to address labour safety, productivity and environmental issues.

"We need to close ranks to ensure the survival of glass against emerging substitutes by re-emphasising the unique advantages of glass in its various applications." he said.

NST, 26.10.1995

Academy of Sciences Malaysia — Inauguration Ceremony, 8 September 1995

The Academy of Sciences Malaysia was launched on 8 September 1995 by the Prime Minister Datuk Seri Dr. Mahathir Mohamad in an inauguration ceremony at Hotel Istana, Kuala Lumpur. Certificates of appointment were presented to 50 foundation fellows of the academy, representatives from the various sciences. On hand to receive his certificate as the sole representative of the geological sciences was Mr. Fateh Chand, Director-General, Geological Survey Department, Malaysia, and Immediate Past President of the Geological Society of Malaysia.

In his speech the prime minister said that Malaysia must generate its own home-grown technology to a level comparable with Europe, Japan and North America.

And in order to ensure that we keep pace with technology, Datuk Seri Dr. Mahathir Mohamad added, a priority is to increase the number of students in the science stream from the present 25% to a minimum of 50% in the near future.

He said that technology developed in this country must be used for the betterment of mankind and not for destroying man and his civilisation.

He said the government has planned for this through long-term research under the intensified

research in the priority areas (IRPA) programme.

To ensure the success of IRPA, he added, the government has been allocating funds under several Malaysia plans.

The prime minister said the government will continuously re-examine and revise the allocation of funds in accordance with the latest trends.

Mahathir said industries must realise that their task is to develop products and processes that sell.

Investments in applied research and technological innovations, he said, must be accorded top priority at all times.

He said that basic research may not be seen to have commercial value today but may yield great economic benefits later.

He said it is for the academy to assess research and guide the country on what would best benefit it.

Mahathir reminded scientists gathered at the launch that they have the ethical responsibility that their research does not have negative effects either in the form of potential environmental degradation, invasion of privacy or violation of human rights.

G.H. Teh



Fateh Chand receiving certificate of appointment from the PM.

30TH INTERNATIONAL GEOLOGICAL CONGRESS

China World Trade Centre
Beijing, China

4-14 August 1996

The 30th Session of the International Geological Congress (IGC) will be held in Beijing, the People's Republic of China from 4 to 14 August 1996, in collaboration with, and under sponsorship of, the International Union of Geological Sciences (IUGS). The 30th IGC is co-hosted by the Geological Society of China, the Ministry of Geology and Mineral Resources of China, and the relevant Chinese governmental agencies, scientific institutions and industrial organizations.

SCIENTIFIC PROGRAMME

Outline of the Programme

According to the suggestions made at the Council Meetings of both the 28th and the 29th Sessions of the IGC and those by the IUGS, the 30th IGC will focus on continental geology with emphasis on the continent-related tectonics and structures, energy and mineral resources, environmental protection, and geological hazards reduction as well as their interrelationship with human survival and sustainable development. The Scientific Programme Committee paid special attention to enhancing comprehensive and multi-disciplinary discussions on the important problems faced by the geological sciences, and strove to choose topics for the scientific sessions that reflect the interdisciplinary nature of today's science and emphasize the importance of geological sciences to the civilization of human society. The Programme is planned to highlight the themes of the Congress, the frontier subjects and hot spots of international geoscientific research, in association with the unique geological conditions of China and the progress made by Chinese geoscientists.

The Scientific Programme of the 30th IGC consists of Colloquia, Special Symposia, Symposia, Poster Sessions, Short Courses, and Workshops. Colloquia papers will be invited by the Organizing Committee.

Colloquia (Congress-wide)

Colloquia will focus on new advances in continental geology, changes and protection of global environment, energy and mineral resources for the 21st century, and the interrelationship between geological sciences and human survival and sustainable development.

Special Symposia

- A. Origin and History of the Earth
- B. Geosciences and Human Survival, Environment, and Natural Hazards
- C. Global Changes and Future Environment
- D. Structure of the Lithosphere and Deep Processes
- E. Contemporary Lithospheric Motion
- F. Global Tectonic Zones
- G. Orogenic Belts
- H. Basin Analysis
- I. Energy and Mineral Resources for the 21st Century
- J. New Technology for Geosciences
- K. Progress of International Geoscience Projects

Symposia

1. Stratigraphy
2. Palaeontology and Historical Geology
3. Sedimentology
4. Marine Geology and Palaeoceanography
5. Structural Geology and Geomechanics
6. Igneous Petrology
7. Mineralogy
8. Precambrian Geology and Metamorphic Petrology
9. Geology of Mineral Deposits
10. Geology of Fossil Fuels
11. Mineral Economics
12. Geochemistry
13. Geophysics
14. Seismogeology
15. Quaternary Geology
16. Hydrogeology

17. Engineering Geology
18. Environmental Geology
19. Mathematical Geology and Geoinformatics
20. Comparative Planetology
21. Geological Education
22. History of Geosciences

==== **Poster Sessions** =====

The Scientific Programme Committee will arrange a part of the Congress papers and maps for presentation in Poster Sessions. Poster presentation and discussion should be in English.

== **Short Courses and Workshops** ==

In Short Courses, specialists will summarize the state of knowledge in areas of scientific and technological interest in an instructional format. Short Courses are commonly attended by those who either find the specialized information useful in their own work or wish to broaden their general knowledge.

In Workshop sessions, knowledge of new researches will be shared among participants who are generally specialists in the subject area. Workshops are commonly attended by those who have research results to share.

Pre-Congress Short Courses

- SA01. Application of ichnology to petroleum exploration and sequence stratigraphy
- SA02. Problems and achievements of methodology of sampling in regional geochemical prospecting for gold and other noble metals and their mineral exploration
- SA03. Rock dynamics
- SA04. Cyclostratigraphy
- SA05. Planning geologic and hydrologic projects and reports
- SA06. Application of geographic information systems to mineral potential mapping
- SA07. An introduction to applied geostatistical methods
- SA08. Concept of structural systems and its application in exploration of oil and gas
- SA09. Sequence stratigraphy: concepts and applications
- SA10. Natural gas geology and exploration opportunity in China

During-Congress Short Courses

- SB01. Prognostic method of hydrothermal deposits based on ore-, water- and heat-sources

- SB02. Seismic tomography: application techniques and software
- SB03. Procedures and applications of granulometric analysis of ore minerals
- SB04. Methodology of seismic risk assessment
- SB05. Magma fluid dynamics
- SB06. Quantitative lithofacies palaeogeography
- SB07. Diffusion processes in minerals and applications to geochronology
- SB08. Palaeoseismology
- SB09. High pressure and high temperature fluid experimental studies
- SB10. Comparative study of minerals-indicators of ultra high pressure action of different types: shock (impactites) and quasi-static (UHP-metamorphic rocks)
- SB11. Natural gas hydrate distribution and origin
- SB12. The influence of geologic and petrophysical factors on distortion and cavernosity of superdeep holes
- SB13. Acoustopolariscopy of rocks as applied to the assessment of core elastic properties, ancient and modern stresses across the section of super deep holes
- SB14. Legal geology: application of principles of law to geological sciences

Post-Congress Short courses

- SC01. Techno-economic evaluation techniques in petroleum exploration.
- SC02. Surface and subsurface water drilling and recharging wells
- SC03. Numerical estimation of geological time scales
- SC04. Automated sequencing of stratigraphic events and correlation.

Pre-Congress Workshops

- WA01. Global tectonic evolution and stress field since the late Palaeozoic
- WA02. Environmental geochemistry in relation to human health.
- WA03. Ecological biogeochemistry in health and diseases prophylaxis.
- WA04. Thermoluminescence techniques and applications in geology
- WA05. The deeper crust structure and rheological evolution of the Qinling-Dabie orogenic belt
- WA06. Mining and Environment

During-Congress Workshops

- WB01. Origin and evolution of the Tan-Lu fault system, eastern China
- WB02. Mineral deposit models of superlarge ore deposits of China
- WB03. Mineralization and alkaline magmatism in the Deccan igneous province and in other parts of the world
- WB04. East Asian activated zones
- WB05. Precambrian of Russia
- WB06. Laurentia-Gondwana interactions during Neoproterozoic to Palaeozoic times
- WB07. Palaeostress, neotectonics and geodynamics in circum-Pacific regions and natural hazard studies
- WB08. Fluid effects on seismic, volcanic and faulting activities
- WB09. Trace fossils in sedimentology and basin analysis
- WB10. The geodynamic processes involved in lode gold mineralizations.
- WB11. Fluid Inclusions
- WB12. Fluoride in water sources and human health
- WB13. Continental rifting, hydrocarbon resources and earthquake hazards
- WB14. Turbidites in Neoproterozoic rifts and aulacogens at the Siberian platform and Karatau
- WB15. Biological aspects of studying tectonic-activity zones
- WB16. Underground EM waves method (radio image method) and its applications
- WB17. Plate tectonics and evolution of major petroliferous basins in China
- WB18. The shallow Tethys
- WB19. The methods of researching into concealed faults and their role in the metallogeny of Southeast Asia
- WB20. Modern studies of thermal convection and their applications to geodynamics

Field Trips

A programme of field trips has been planned for the 30th International Geological Congress to show the characteristic features of continental geology in China. It highlights the major orogenic belts, large-scale sedimentary basins, metallogenic belts, and a great variety of geological attractions. The trips cover most of the provinces (regions) of China.

Pre-Congress Trips

- T101. Volcanic landforms in Wudalianchi, Heilongjiang, and Changbaishan, Jilin
- T102. Precambrian geology and mineral deposits of eastern Liaoning Province
- T103. The Bayan Obo Nb-REE-Fe deposit in Nei Mongol (Inner Mongolia)
- T105. Precambrian continental crust profile from eastern Hebei to Jixian, Tianjin
- T106. Geology of the Yangtze Gorges area
- T107. W-Sn-Pb-Zn polymetallic ore deposits in southern Hunan and karst landscape in Guilin, Guangxi
- T108. Geomorphic landscapes of sandstone peak forest and karst in Wulingyuan, western Hunan
- T110. Structural geology across the Qinling orogen, Shaanxi
- T111. Rare metals- and gem mineral-bearing pegmatites in Koktohay of Altay, Xinjiang
- T112. Geology along the Kuqa River and Kalpin sections of the Tarim Basin
- T113. Structural geology and stratigraphy along the Sino-Pakistan highway in the west Kunlun Mountains
- T114. Karst geology and geohazards in the Huanglong-Jiuzhaigou region, western Sichuan
- T115. Jurassic dinosaur fossils of Sichuan and their taphonomic conditions
- T116. Geology and tectonics of the Kangding-Batang-Nyingchi region in the northern sector of the Hengduan Mountains
- T117. Karst Geology of the Yunnan-Guizhou Plateau
- T118. The Sinian-Cambrian boundary section and the Meishucun and Chengjiang faunas in Yunnan
- T119. Structural geology of the central sector of the Hengduan Mountains
- T120. Geology of plateau lakes in Yunnan
- T121. Geology of the Yarlung Zangbo suture zone, Xizang (Tibet)
- T122. Hydrocarbon resources and geology in the Junggar Basin, Xinjiang

During-Congress Trips

- T201. Proterozoic sedimentary facies and their depositional environments in the Ming Tombs District, Beijing
- T202. Sequence stratigraphy of Cambro-

- Ordovician carbonates in the Western Hills, Beijing
- T203. Palaeoanthropological relics and Quaternary speleostratigraphy in Zhoukoudian, Beijing
- T204. Quaternary glacial vestiges in the Western Hills of Beijing
- T205. Proterozoic anorogenic rapakivi granites and related plutonic and potassic alkaline volcanic rocks in eastern Beijing
- T206. Karst landforms and caves around the Western Hills of Beijing
- T207. Magmatic thermodynamic structures of the Zhoukoudian granodioritic intrusion, western Beijing
- T208. Regional and thermodynamic metamorphism in the Western Hills of Beijing
- T209. The Huairou ductile shear zone, Beijing
- T210. Extensional tectonics and metamorphic core complex of the Western Hills, Beijing
- T211. Deformation zone of the 1679 Sanhe-Pinggu M-8.0 earthquake and buried active fault
- T212. Active faults and palaeoseismology in the Yanqing-Huailai basin-range structure
- T213. Comprehensive utilization of geothermal resources in Beijing
- T214. Tectonic and petrological characteristics of the Neo-Archaean in the Beijing area
- T215. Cretaceous non-marine sequences in the Western Hills, Beijing
- T216. Anorthosite and vanadic-titanomagnetite deposits of Damiao, Hebei Province
- T217. Mesozoic stratigraphy and faunas in the Luanping-Chengde region, Hebei Province
- T218. Structural features and stratigraphy of the Ming Tombs-Great Wall area (Badaling), Beijing
- T219. Geology of the Dagang Oil Field
- T220. Development and utilization of geothermal resources in Tianjin
- T221. Urban groundwater and water supply in Beijing
- T223. Geology of the Jinchangyu gold deposit in Qianxi, Hebei Province
- T224. Cambrian sedimentary facies and high-frequency cyclic sequences of carbonate platform, Beijing
- Heilongjiang and Changbaishan, Jilin
- T302. Petroleum geology of the Daqing Oil Field
- T303. Precambrian geology and mineral deposits of eastern Liaoning
- T305. Diamondiferous kimberlites in Liaoning and Shandong Provinces
- T306. Geology of the Jungar-Dongsheng coal basin, Nei Mongol and the Shenfu coal basin, Shaanxi
- T307. Precambrian geology and mineral deposits of the Daqing-Wula Mountains in Nei Mongol
- T308. The Bayan Obo Nb-REE-Fe deposit in Nei Mongol
- T309. Precambrian Geology and mineral deposits in Eastern Hebei Province
- T313. Deposuite-sequence evolution of formation sequences of North China-type carbonate platform
- T314. Neotectonics, ground fissures and palaeoseismology of the Fen-Wei rift system in Shanxi and Shaanxi Provinces
- T315. Early Precambrian geology of the Wutai-Hengshan Mountains in Shanxi Province
- T316. Tectonic features of the middle part of the Tan-Lu fault zone
- T317. Industrial minerals and rocks on the Shandong Peninsula
- T318. Geology of Shengli Oil Field of Shandong Province
- T319. Geology of gold deposits in Shandong Province
- T320. Mesozoic and Cenozoic biota in Shandong Province
- T321. Geology of the Fuxin and Fushun Mesozoic and Cenozoic coal basins
- T324. Volcanic geology and ore deposits in Jiangsu and Zhejiang Provinces
- T325. Nonmetallic deposits around the Taihu Lake
- T326. Stratigraphy and palaeontology of the Nanjing Hills and its adjacent areas
- T327. Environmental geology along the Yangtze delta
- T328. Structural geology and ultra-high pressure metamorphic belt of the Dabie Mountains in Anhui Province
- T329. Geology and landscape of the Jiuhua-Huangshan Mountains, Anhui Province
- T332. Quaternary glaciations in the Lushan Mountain area and Quaternary stratigraphy of the Poyang Lake
- T333. Geology of U, Au, Ag ore deposits related to Mesozoic volcanic rocks in Jiangxi

Post-Congress Trips

- T301. Volcanic landforms in Wudalianchi,

- Province
- T334. Tectono-metamorphic belt along the southeast coast of Fujian Province
- T335. Precambrian tectonic evolution of the Songshan Mountain area, Henan
- T337. Groundwater experiment, exploitation and utilization in the North China Plain
- T339. Structural geology and high-ultrahigh pressure metamorphism in the Tongbai-Dabie orogenic belt
- T340. Geology of the Yangtze Gorges area
- T341. Middle-Late Proterozoic geology of the Shennongjia area in western Hubei
- T342. W-Sn-Pb-Zn polymetallic ore deposits in southern Hunan and karst landscape in Guilin, Guangxi
- T343. The Xikuangshan antimony ore deposit and Woxi gold-tungsten-antimony ore deposit, Hunan Province
- T346. Quaternary geology and tropical landscape along the coast from Guangzhou to Zhanjiang
- T347. Karst and geomorphologic landscape in the Guilin area
- T348. Devonian and Carboniferous stratigraphy, sedimentary facies and palaeontology of Guangxi
- T349. Karst hydrogeology in Guangxi
- T351. Geology of mineral resources, volcanoes, wave-cut landforms on Hainan Island
- T354. Quaternary geology and palaeoenvironment of desert and loess plateau in northern China
- T355. Holocene active faults and M 8.6 earthquake vestiges in Ningxia
- T356. Seismic and Quaternary geology along the northern margin of the Qinghai-Xizang (Tibet) Plateau
- T358. Cu-Ni and Pb-Zn sulfide deposits in Gansu Province
- T359. Geology of saline lake of the Qaidam Basin
- T361. Rare metals and gem mineral-bearing pegmatites in Koktohay of Altay, Xinjiang
- T363. Structural geology and stratigraphy along the Sino-Pakistan highway in the West Kunlun Mountains
- T364. Geological structures of the Middle Tianshan Mountains along the Dushanzi-Kuqa highway
- T366. Transect across the thrust-nappe belt of the Longmen Mountains in Sichuan
- T368. Triassic sequence stratigraphy and sea-level changes in Mount Emei area
- T369. Environmental and engineering geology of the Yangtze Gorges area
- T370. Geologic features and vanadotitaniferous magnetite deposits in the Panxi rift
- T372. Glacial and Quaternary geology in the Gongga Mountains, Sichuan
- T374. Tectonic framework of the Songpan-Garzê orogenic belt
- T375. Geological hazards along the Chengdu-Kunming railway
- T376. Geology and tectonics of the Kangding-Batang-Nyingchi region in the northern sector of the Hengduan Mountains
- T381. Sinian-Cambrian boundary section and the Meishucun and Chengjiang faunas in Yunnan
- T382. Volcanoes and geothermal geology of the Tengchong area, Yunnan
- T386. Super-large Tertiary Pb-Zn deposits in the Lanping area, Yunnan
- T387. Geology of the Himalayas, Xizang
- T388. Geothermal geology of Xizang
- T389. Observation and study of the great Early-Pleistocene ice sheet and active structures of the Qinghai-Xizang Plateau
- T390. A geologic-geophysical excursion from Golmud to Lhasa, Xizang
- T391. Tectonics, metamorphism, magmatism, and mineral deposits of the Yunkai Mountains, western Guangdong and southeastern Guangxi
- T392. Metamorphic geology of blueschists, eclogites, and ophiolites in the North Qilian Mountains
- T393. Saline lakes and epithermal deposits on Xizang (Tibet) Plateau
- T394. Permian and Triassic sequences of continental facies in the Dalongkou area, Jimsar and the Turpan Basin of Xinjiang
- T395. Palaeoecological environment of nested dinosaur eggs in Xixia, Henan Province

All other inquiries and general correspondence concerning the Congress should be addressed to:

Prof. Zhao Xun
Deputy Secretary General
30th International Geological Congress
P.O. Box 823
Beijing 100037
P.R. China

Telephone: 86-10-8327772, 86-10-8323188
Fax: 86-10-8328928
E-mail: zhaox@bepc2.ihep.ac.cn

FIRST CIRCULAR NOW AVAILABLE

Minerals, Metals and the Environment II Conference

**September 1996
Prague**

The aim of this second Minerals, Metals and the Environment Conference is to present, through solution-orientated contributions from all stakeholders with an interest in the minerals industry, how the industry is successfully tackling environmental problems and meeting the challenge of environmental stewardship.

The conference programme is designed to inform policy-makers and regulators, central and local government authorities, industry, environmental groups and the academic community. Papers will address current and future practice relating to the minerals industry in areas of regulation, planning, operations management, research strategies, design for control, audit, risk assessment and the impact on the receiving environment. The economic and strategic implications and the availability and access to relevant information will be considered.

The conference will demonstrate the degree to which the minerals industry continues to recognize environmental issues and has established a responsible and, in some cases, pre-eminent approach to these through high-quality implementation of best practice and competent management. This will lead to increased public confidence in essential and sustainable development of mineral resources for the future.

For further details, please contact:

**The Conference Office
Institution of Mining and Metallurgy
44 Portland Place
London W1N 4BR, England
Tel: 0171-580 3802 Fax: 0171-436 5388**

THE FIFTH ASIA/PACIFIC MINING CONFERENCE & EXHIBITION



Mineral Development in Asia Pacific — Challenges in the 21st Century

October 16–19, 1996

Jakarta Convention Center, Indonesia

About AFMA

The ASEAN Federation of Mining Associations (AFMA) is a non-profit making body consisting of the Indonesian Mining Association (IMA), the Malaysian Chamber of Mines, the Chamber of Mines of the Philippines, and the Mining Industry Council of Thailand, *which represents the mineral producers in these countries. Because of its membership and links with other national mining bodies, AFMA has access to leading professionals in mining, metallurgy, geology and mineral economics in and outside the region. Special efforts are made to establish close working relations with mining associations in the Asia/Pacific region and to involve them fully in AFMA activities. AFMA is establishing a long-range programme to monitor the changes in the industry and to facilitate the harmonious promotion and development of the mineral wealth of the region with a view to optimize the contribution of the minerals to economic development. The Asia/Pacific Mining 96 which is being organized by AFMA in cooperation with the mining associations of countries in the region is a step in this process.

The emerging economies of the two biggest countries, China and India, as well as the ex-Russian Asian states, all important mining countries, will also participate in and contribute to the conference.

The timing of the event will be opportune to review the impacts of the coming global economic changes and challenges. The impact of liberal trade, investment and expertise exchange, into the next century will be featured. So far many mining businessmen, experts, scholars and economists are looking forward to this event. AFMA hopes to see you then, to participate in and have the benefit of the conference and exhibition.

(*Vietnam will shortly join AFMA as well)

Call for papers to cover the tentative program

Day 1, Wednesday, October 16, 1996

- 09:00 – 10:00 Opening Ceremony
- 10:00 – 10:30 Coffee Break
- 10:30 – 12:30 Plenary session
Regional and National papers
- 12:30 – 14:00 Lunch
- 14:00 – 17:30 3 Parallel sessions on Investment, Exploration, Mining, Technology, Environment.
- 19:00 – 21:30 Dinner Party

Day 2, Thursday, October 17, 1996

- 09:00 – 12:30 Plenary session
Regional and National Papers
- 14:00 – 17:50 3 Parallel sessions on all mining aspects

Day 3, Friday, October 18, 1996

- 09:00 – 12:30 Plenary session
World Mining Challenges
- 14:00 – 16:00 3 Parallel sessions on all mining aspects
- 16:30 – 17:30 Plenary panel discussion and closing

Day 4, Saturday, October 19, 1996

- Visit to the exhibition center
- Business meeting
- Visit to Pongkor

Conference and Registration Fee

	Payment received before 31st August 96	Payment received after 31st August 96
AFMA members	US\$600	US\$650
Non-AFMA members	US\$650	US\$700

*Conference fee is inclusive of Coffee breaks, Lunches, Dinner party, proceedings, conference papers, attendance at all sessions, visit to exhibition.

Registration Address

Oriental-Western Promotions Ltd.
(Formerly: SHK International Services Ltd.)

6/F., China Harbour Building
370 King's Rd., North Point
Hong Kong

Tel: (852) 2807 7633

Fax: (852) 2570 5917, 2570 05903

Jakarta Office:

(Pacto Convex)

Lagoon Tower, Jakarta Hilton Int'l

Jl. Gatot Subroto

Jakarta 10002, Indonesia

Phone: (62-21) 570 5800

Fax: (62-21) 570 5798

Ctc: Mr. Anas Muljana

Indonesian Mining Association (IMA)

Jl. Prof. Dr. Supomo SH. No. 10

Jakarta 12870, Indonesia

Tel: (62-21) 830 3632, 828 0763

Fax: (62-21) 830 3632, 828 0763

A WORKSHOP ON TUFFS —

THEIR PROPERTIES, USES, HYDROLOGY, AND RESOURCES

Santa Fe, New Mexico

November 10–15, 1996

First Circular

Tuffs underlie many of the world's largest cities and we need to know more about their hydrogeologic properties because of the amount of domestic and industrial waste now residing within these deposits.

Tuffs, composed of volcanic ash and pumice and bonded by natural cements or natural welding, also make excellent building materials and have been proposed as a medium for industrial and nuclear waste storage.

Many large cities in volcanic regions (especially in western Latin America, where many cities are underlain by tuff) have serious problems with industrial waste; where it is, how much there is, and locating the pathways by which wastes enter water supplies. There is little published information on the hydrology of tuff deposits, applied either to evaluation of water resources or to the remediation of wastes. There are 37 large industrial cities in 24 nations that are underlain or partly underlain by tuffs, including two megacities.

Tuffs are often hundreds of meters thick and cover hundreds to thousands of square kilometers. The most common tuffs used for building stone are ignimbrites (pyroclastic flow deposits). When used for building stone, ignimbrite blocks, with enough strength for multiple-story buildings, stone walls, and other structures, are resistant to weathering, are light-weight, and have good insulating properties — better than many other natural building stones.

The Purpose of A Workshop

Tuff is being studied by engineers and scientists in many disciplines, mostly in isolation from one another. The purpose of this workshop

is to bring this diversity of interests together for discussion and exchange of information on all aspects and uses of tuffs. The workshop will also serve as a vehicle for future interdisciplinary work on the topic.

The importance of tuff as a construction material, as a medium for water supplies, or waste storage is often overlooked, even though it is commonly used in many parts of the World.

Indigenous architects use the materials at hand for shelter and have produced some interesting (and long-lasting) structures and habitats with tuff; however, some advice is needed to make these structures more resistant to earthquakes.

Workshop participants will include volcanologists, hydrologists, civil engineers, architects, environmental chemists, and archeologists. They will be from industry, academia, international organizations, and government.

The immediate tangible product of the workshop will be a low-cost handbook, distributed to users in every country where tuffs are an important part of the infrastructure.

Organization of the Workshop

The workshop will have one active session. The following subtopics will be covered:

- Distribution, physical variations in the deposits related to their genesis and deposition, and extent of useful resources (Geology and volcanology).
- Hydrology and groundwater quality of tuffaceous aquifers (Hydrology).

- Tuff as a medium for industrial and nuclear waste storage (Mineralogy, Chemistry, Nuclear Engineering).
- Physical and chemical properties of tuff as a building stone (Civil Engineering and Architecture).
- Cost-effectiveness and earthquake-resistance of construction using tuff; indigenous housing in developing countries. This topic matches one of the goals of the International Decade for Natural Disaster Reduction (Architecture, Civil Engineering).
- Uses of tuff in the past (Anthropology, Archeology).

Workshop Products

We will not publish a proceedings. Instead, the papers presented by attendees will form the basis for a handbook on tuffs. Future studies generated by the workshop will expand on such topics as evaluating industrial waste in tuffs and more efficient ways of using tuff in earthquake-resistant housing. In addition,

because of the potential for discovery in any workshop, a concerted effort will be made to identify other promising applications not covered at this meeting.

Venue

The Workshop will be held at the Eldorado Hotel, Santa Fe, New Mexico, November 10–15, 1996.

Workshop Costs

The registration fee for the workshop has yet to be determined and will be based on financial support from sponsors.

Correspondence

Grant Heiken

Earth and Environmental Sciences Division,
EES-1

Los Alamos National Laboratory
Los Alamos, New Mexico, 87545 USA

Ph: 505-667-8447

Fax: 505-665-3285

e-mail: heiken@lanl.gov

KALENDAR (CALENDAR)

1996

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

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

February 19-23

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

February 27-29

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

March 6-7

BIOGEOGRAPHY AND GEOLOGICAL EVOLUTION OF SE ASIA, London. (Prof. Robert Hill, Department of Geological Sciences, University College London, Gower Street, LONDON WC1E 6BT, U.K. Tel: 0171 387 7050 ext. 2386; Fax: 0171 387 1612; Email: robert.hall@ucl.ac.uk)

March 6-8

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

March 8-15

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

March 27-29

METAL BULLETIN'S 4TH INTERNATIONAL TIN CONFERENCE, Miami, Florida, USA. (Jackie Gregson, Metal Bulletin Conferences, Park House, Park Terrace, Worcester Park, Surrey, KT4 7HY, UK. Tel: +44 (0)171 827 9977; Fax: +44 (0) 181 337 8943)

April 24-27

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

May 19-22

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

May 27-29

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

June 2-6

4TH CONFERENCE ON PETROLEUM GEOCHEMISTRY AND EXPLORATION IN THE AFRO-ASIAN REGION, Arusha-Tanzania. (The 4th AAPG Conference Secretariat, Tanzania Petroleum Development Corporation, P.O. Box 5233, Dar Es Salaam,

Tanzania, East Africa. Phone: 255-51-29661/2 & 36086; Fax: 255-51-29663/20775; Telex: 41219 Oil Exp. Attn: Mr. Y.S. Mwalyego, Ms. F.K. Mpanju, Mr. E.A. Kilembe)

June 3-7

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

June 6-8

ASIAN CONFERENCE ON X-RAYS AND RELATED TECHNIQUES IN RESEARCH AND INDUSTRY, Tronoh, Malaysia. (The Secretariat, ACXRI '96, School of Materials and Mineral Resources Engineering, Universiti Sains Malaysia, Perak Branch Campus, 31750 Tronoh, Perak, Malaysia, Attn: Dr. Zainal Arifin Ahmad. Tel: (605) 3676901 ext. 5545/5501; Fax: (605) 3677444; Email: mrzainal@kcp.usm.MY)

June 8-9

ECONOMIC GEOLOGY AND TECTONICS OF MALAYSIA AND THE SOUTHEAST ASIAN REGION (Annual Geological Conference '96), Kota Kinabalu, Sabah, Malaysia. (The Organising chairman, Annual Geological Conference 1996, Geological Society of Malaysia, c/o Department of Geology, University of Malaya, 59100 Kuala Lumpur, Malaysia. Phone: (603) 757 7036; Fax: (603) 756 3900)

June 9-12

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

June 17-21

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

June 22-29

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

June 27-28

MINERALISATION IN THE CALEDONIDES (The Mike Gallagher Memorial Meeting), Royal Museum of Scotland, Edinburgh. (The Conference Office, The Institution of Mining and Metallurgy, 44 Portland Place, London W1N 4BR. Phone: +44-(0)171-580 3802; Fax: +44-(0)171-436 5388)

August 4-14

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

September

MINERALS, METALS AND THE ENVIRONMENT II CONFERENCE, Prague. (The Conference Office, Institution of Mining and Metallurgy, 44 Portland Place, London W1N 4BR, England. Phone: 0171-580 3802; Fax: 0171-436 5388)

October 16-19

MINERAL DEVELOPMENT IN ASIA PACIFIC — CHALLENGES IN THE 21ST CENTURY, Jakarta, Indonesia. (Indonesian Mining Association (IMA), Jl. Prof. Dr. Supomo SH. No. 10, Jakarta 12870, Indonesia. Phone: (62-21) 830 3632, 828 0763; Fax: (62-21) 830 3632, 828 0763).

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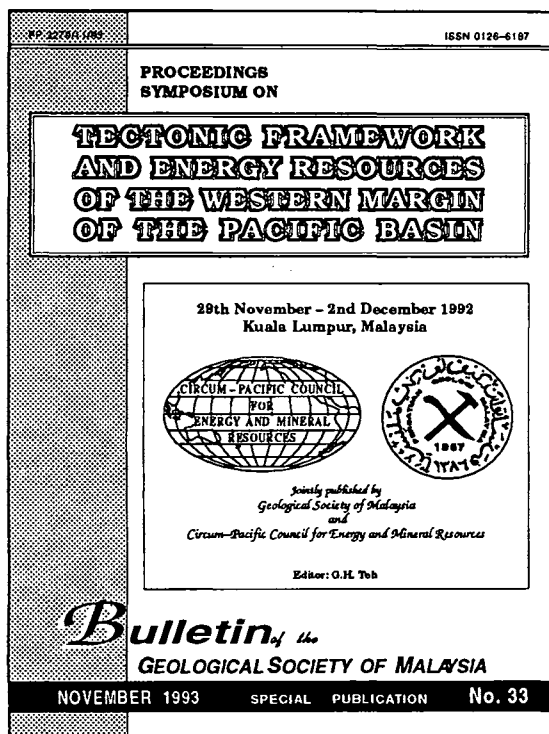
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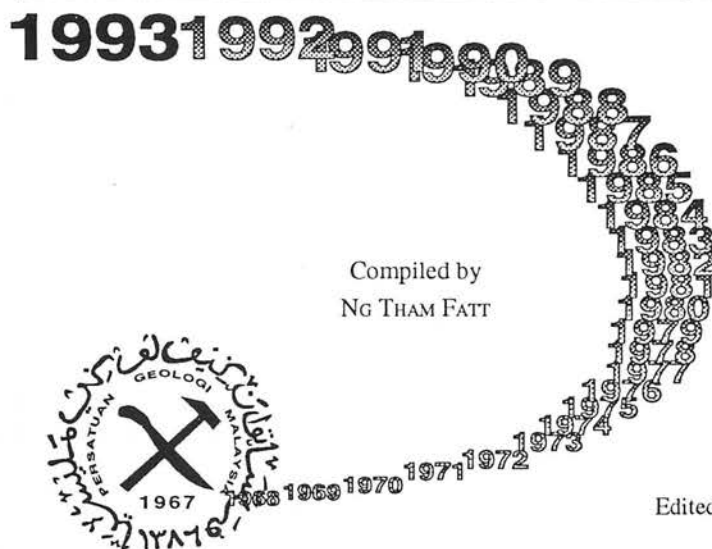
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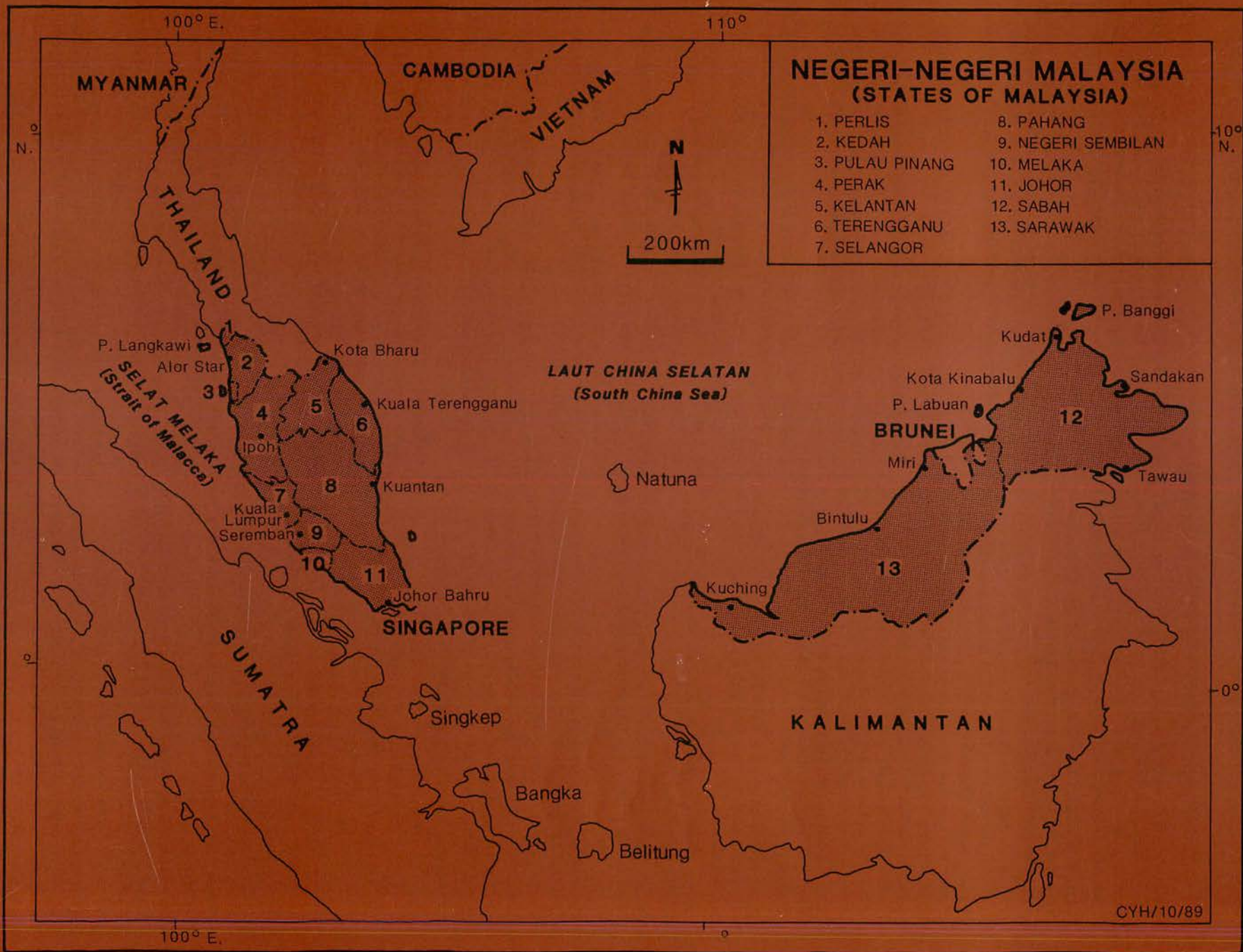
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| 6. TERENGGANU | 13. SARAWAK |
| 7. SELANGOR | |