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KANDUNGAN (Contents)

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ISSUED BIMONTHLY

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

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

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CATATAN GEOLOGI
Geological Notes

Coal geology and coal resources of Japan: past and future

TAKASHI MIKI
Department of Earth and Planetary Sciences
Kyushu University
Hakozaki, Fukuoka
812-8581 Japan

INTRODUCTION

The use of natural resources as a source of energy to support or enhance human life presents various problems in the contemporary world. Coal has historically served as a main source of energy though its importance has begun to wane in the face of alternative sources such as nuclear, wind, and solar energy. These alternatives, however, cannot substitute for coal. Coal has long been regarded, as an inexhaustible energy source, and will no doubt return to the forefront over time. This paper presents a short historical review of coal geological research and coal mining activities in Japan, and views the future prospect of coal as an energy source.

GEOLOGICAL BACKGROUND

Coal in Japan was accumulated in four periods: the Triassic, Cretaceous, Paleogene, and Neogene; the Paleogene coal accounts for the majority of total reserves in this country. Coal-bearing formations are geographically dispersed all over the land mass (Fig. 1), while Tertiary coals are concentrated in Kyushu and Hokkaido, and the Mesozoic coals in the western portion of Honshu and Shikoku.

The coal-bearing formations vary in thickness from several hundred meters to several thousand meters, and coal seams vary from ten centimeters to several meters. The Triassic coal is anthracite, the most Neogene lignite. Paleogene coal changes the ranks from lignite to semi-anthracite from basin to basin, and generally corresponds to sub-bituminous and bituminous coals. Tertiary coals and coal-bearing formations show some characteristics different from those of Paleozoic coals in the continental regions, including the following: lateral variations in thickness and lithology, complicated geological structures formed by a lot of faults and foldings, high ranks of coals for their young age, occurrence of silicified woods accompanying coal seams, etc. These characteristics are ascribed to depositional, tectonic, and paleogeothermal peculiarities of basins found in the mobile belts at the continental margin, and have sometimes handicapped mining operations.

Geological studies of coal and coal-bearing formations in Japan based on a modern European concept of coal geology have seen rapid progress since the early 20th century. Research has been performed by geologists employed by the government, universities, and private coal mining companies. Early research concentrated on examination of stratigraphy, fossils, and geological structures in respective coal basins, and elucidated the occurrence and distribution of coal seams. After World War II, petrographic, chemical, and sedimentologic techniques were introduced, and various characteristics of Japanese coals differentiating it from continental coals, such as a high content of vitrinite and scarcity of inertinite, the presence of high volatile matter, and its hydrogen contents were made known. These characteristics may be ascribed to the depositional environment of

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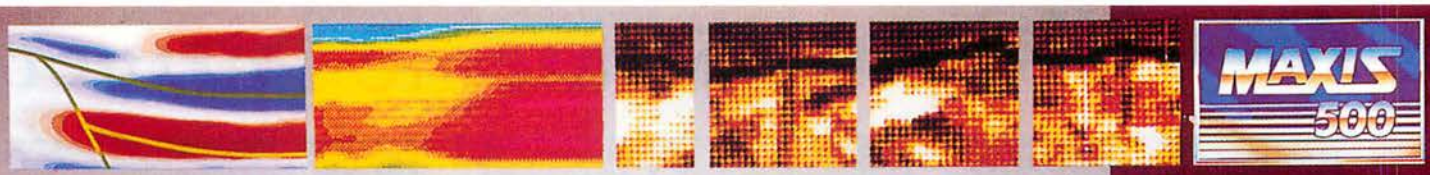

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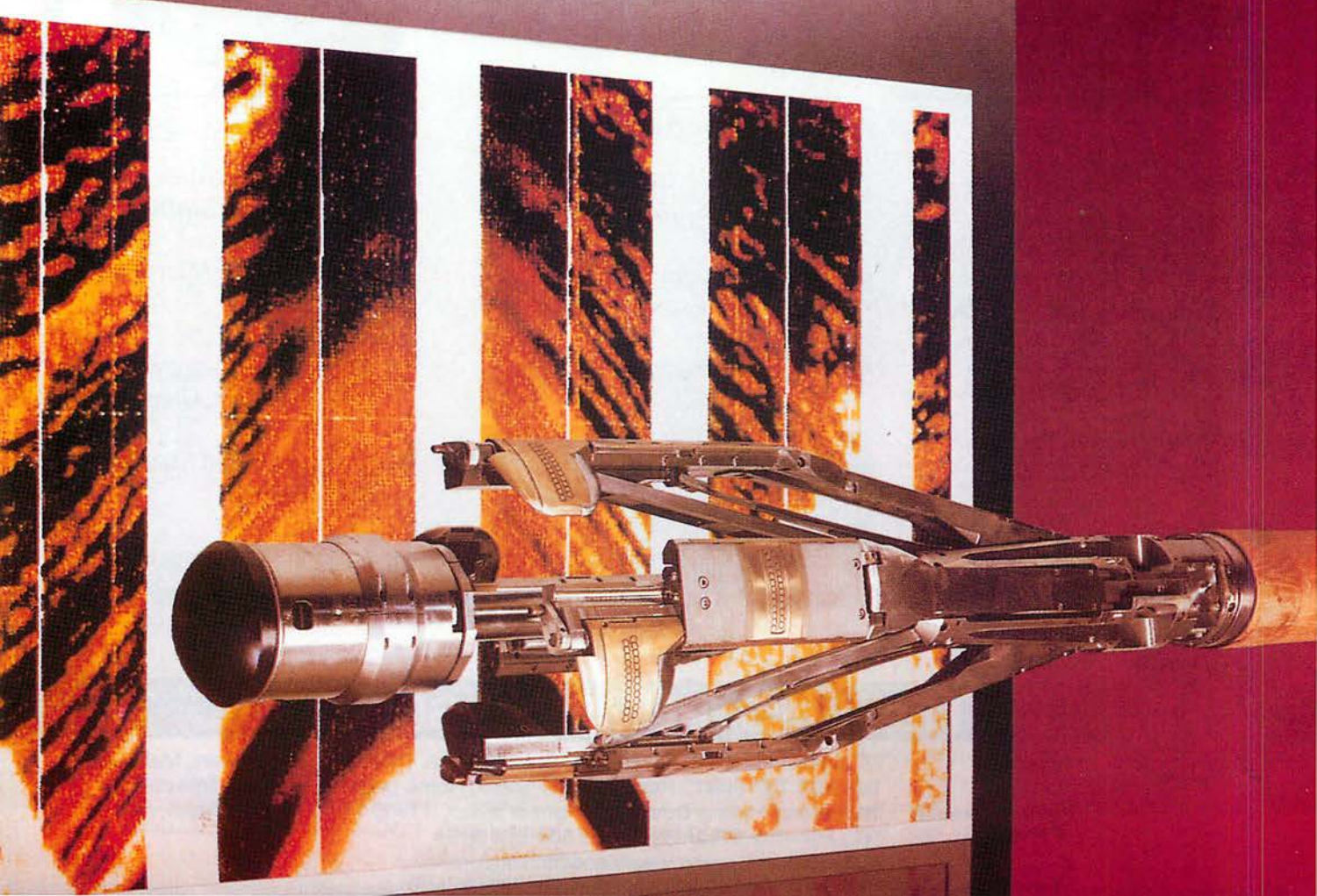

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Japanese coal under wet conditions at a tectonically active continental margin.

During the past two decades, the study of diagenesis of coal and coal-bearing formations (coalification) from the combined viewpoints of sedimentary mineralogy and coal petrology has rapidly developed. This approach has provided new information important to a discussion of the burial history of sediments. The degree of coalification, which is influenced by overburden thickness, igneous intrusions, paleogeothermal gradients, etc., changes from basin to basin, reflecting the high paleogeothermal situation of the area in the island arc region. This kind of study is expected to see future progress.

UTILIZATION OF COAL AS AN ENERGY SOURCE: PAST AND PRESENT

History suggests that coal was discovered in the 3rd century in Japan, and has been utilized as a fuel resource in some regions of the country since the 15th century. The modern coal mining industry developed in the 19th century, when Japan opened the doors to foreign trade after revoking a national isolation policy. Since then, coal has contributed to the progress

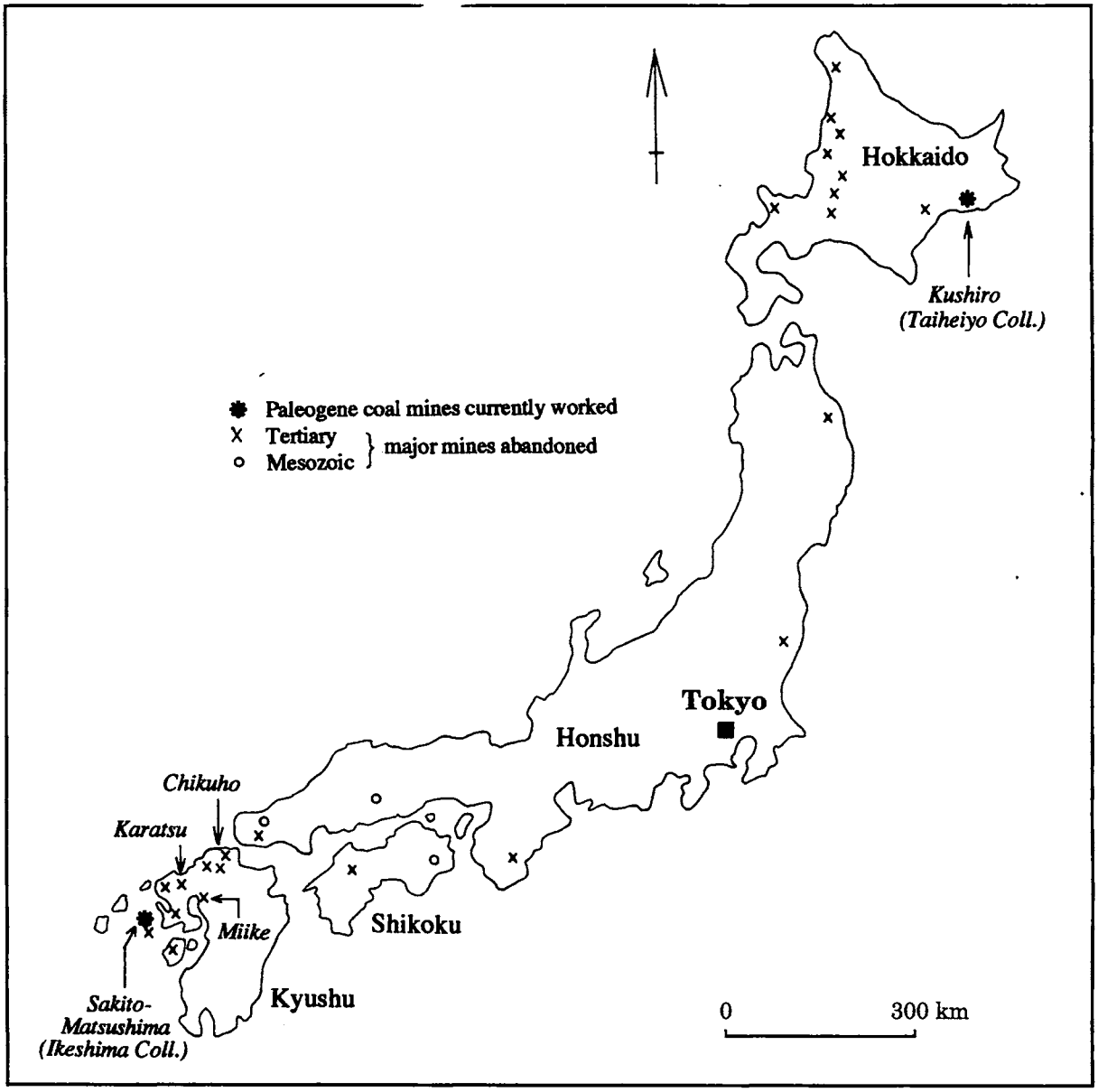

Figure 1. Distribution of major coal fields in Japan.

of modern Japanese industry and economics as a main energy resource. In recent years, however, coal mining activity has declined as the energy supply system dramatically shifted from coal to oil in the 1960's. Coal production of more than 50 million tons from more than 400 coal mines (large-scale underground mines and small-scale open-cut mines) in 1962 (The Fuel Society of Japan, 1963) has decreased to less than 10 million tons from about 10 mines in the past several years (The Japan Institute of Energy, 1993-1998). On March 30, 1997, the Miike coal mine in Kyushu, the largest mine in Japan, abandoned its mining activities, and, at present, large-scale coal mining is only undertaken in two underground mines: one in Kyushu, another in Hokkaido (Fig 1). Mining operations in Japanese coal mines have been abandoned as a result of the great depth of the underground colliery, the disappearance of coal seams over short distances, tectonic disturbances of the seams, and, finally, the higher cost of mining coal compared to that of importing it.

Japan is now one of the largest coal-importing countries in the world. Coal production in Japan reached 6.8 million tons in 1997, although 129 million tons of this were imported (Japan Institute of Energy, 1998) from Australia, Canada, and other Pacific-rim countries. In Japan today, approximately 15% of the nation's energy needs are met by coal, and 95% of this is imported (Japan Institute of Energy, 1998).

FUTURE PROSPECT

Coal exists in a huge amount of reserves and has a geographically wide distribution throughout the world. In light of the forecasted exhaustion of oil and gas reserves in the near future, coal is expected to play an increasing role as an alternative energy source not only in Japan but globally. From a macrocosmic viewpoint, it seems vital that each country maintain its own coal production. Varying the regions from which coal is imported is also important in order to avoid a tight economical relationship of demand and supply.

In the Pacific-rim countries, coal mining operations have shifted from open-cut mines to underground mines. The Japanese mining technology accumulated thus far can be successfully applied in these foreign mines.

It is vitally important that coal consumption be undertaken in harmony with the environment. From the standpoint of promoting a healthy environment for the earth and the human population, methods of coal purification should be promoted. The development of Japanese technologies to remove pollution resulting from coal combustion will contribute to the prevention and resolution of environmental problems in the world.

CONCLUSIONS

Attention is likely to turn again to coal as a main energy source in the face of depleted oil resources and still developing new energies. International cooperation regarding the exchange of knowledge and technologies on mining and the prevention of pollution will become increasingly important.

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Manuscript received 28 February 2000

PERTEMUAN PERSATUAN
Meetings of the Society

Laporan Ringkas

Majlis Ceramah Kerjaya Geosains, Promosi Peraduan Menulis Esei Geosains Peringkat Kebangsaan PGM-DBP Dan Pameran Geosains

Maktab Rendah Sains MARA, Jalan Bukit Larut, Taiping, Perak
8 Julai 2000

1. ACARA-ACARA UTAMA

1.1. Ucapan Alu-aluan

Telah disampaikan oleh Prof. Dr. Hamzah Mohamad bagi pihak PGM dan oleh Pengetua MRSM Taiping En. Shahein Mohamud bagi pihak tuan rumah.

1.2. Ceramah Umum Kerjaya

Prof. Madya Dr. Abdul Ghani Rafek telah menyampaikan, melalui persembahan LCD yang menarik, ceramah bertajuk "myGEO & SAINS — geosains, saya dan kerjaya".

1.3. Promosi Peraduan Menulis Esei Geosains

Upacara menekan papan kunci memulakan persembahan LCD mengenai Peraduan telah disempurnakan oleh En. Shahein Mohamud, Pengetua MRSM.

1.4. Penyampaian Poster dan Borang Penyertaan

Upacara ini telah disempurnakan oleh En. Shahein Mohamud, Pengetua MRSM Taiping. Sebanyak sebelas (11) orang guru pengiring mewakili 11 buah sekolah yang hadir telah menerima poster dan borang Peraduan ini.

1.5. Pameran Geosains

Pameran ini telah diadakan dari jam 10.30 pagi hingga 1.00 tengahari. Sebanyak 100 eksebit telah dipamerkan, dengan bantuan 10 poster. Pameran yang bertemakan "Peranan Geosains dalam Pembangunan Negara" ini dibahagikan kepada enam konponen, iaitu:

- Geosains? Geologi?
- Kerjaya geosaintis

- Bahan bumi asas peradaban
  - — Bahan bumi sebagai sumber logam/semi logam
  - — Bahan bumi sebagai sumber industri
  - — Bahan bumi sebagai bahan binaan
  - — Bahan bumi sebagai punca tenaga
  - — Bahan bumi sebagai sumber keperluan harian
- Unsur estatik dalam geosains
- Geosains dan anda (pameran interaktif dengan pengunjung)
- Jualan cenderamata (Kelab Geologi UKM/PGM)

1.6. Jamuan Ringan

Selamat diadakan untuk tetamu kehormat, tetamu, guru dan pelajar, berjumlah 400 orang.

2. KEHADIRAN

Seramai lebih kurang 400 orang telah menghadiri Majlis ini dengan pecahan seperti berikut:

Tetamu kehormat (PGM, MRSM)		3
Ahli Majlis PGM/Pengendali Pameran dan Pembantu		8
Dr. Ahmad Tajuddin Ibrahim		
En. Mohd Rozi Umor		
En. Goh Swee Heng		
Sdr. Syahrul		
Sdri. Siti Aishah		
Sdri. Siti Rashidah		
Sdri. Siti Sarini		
Sdri. Suraya Tulot		
Guru-guru pengiring (termasuk tuan rumah)		12
Pelajar (selain MRSM Taiping)		132
1. SM Sains Sultan Tun Azlan Shah, Taiping	44	
2. SMK Sri Kota, Taiping	10	
3. SMK St. George, Taiping	10	
4. SMK Simpang, Simpang	10	
5. SMK Tat Beng, Trong	18	
6. SMK Batu Lapan, Changkat Jering	8	
7. SMK Jelai, Batu Kurau	8	
8. SN Sains Tun Syed S. Shahabuddin, B. Mertajam	10	
9. MRSM PDRM, Kulim	10	
10. MRSM Langkawi	4	
Pelajar MRSM Taiping (Tingkatan 5)		245
Jumlah		400

Nota: 1. Seramai 200 orang pelajar MRSM Tingkatan Tingkatan 4 melawat pameran sahaja kerana dewan penuh.
2. Jumlah sekolah dan maktab yang dijemput ialah 35 buah.
3. Tiga (3) sekolah menjawab tidapa dapat hadir.

3. PERBELANJAAN

Majlis di atas menelan belanja sebanyak RM2,003.60 dengan perincian seperti berikut:

Logistik		RM721.80
Penginapan di Hotel Panorama Taiping pada 7 Julai 2,000 bagi 10 orang, RM69.00 x 6 bilik (resit 1)	RM414.00	
Sewa van 1 1/2 hari, RM120 sehari (resit 2)	RM180.00	
Petrol untuk van (resit 3–5)	RM70.00	
Tol bagi van (resit 6–11)	57.80	
Persediaan Pameran		RM332.80
Membuat 25 penegak keterangan eksebit (resit 12)	RM50.00	
Membuat 6 board poster (resit 13)	RM25.00	
Pelbagai barang (resit 14–19)	RM107.80	
Sagu hati kepada pelajar, RM30 x 5 (tanpa resit)	RM150.00	
Majlis di MRSM		RM949.00
Jamuan 400 orang, RM2.00 seorang (resit 20)	RM800.00	
Fotokopi 300 leflet aturcara (resit 21)	RM45.00	
Persiapan pentas (resit 22)	RM84.00	
Rozek, 10 buah (resit 23)	RM20.00	
Jumlah Besar		RM2,003.60

4. PENUTUP DAN CADANGAN

1. Secara umumnya, jika dilihat dari segi bilangan tetamu dan pelajar yang hadir serta acara-acara utama yang dapat dijalankan mengikut aturcara yang telah dirangan, bolahlah dikatakan Majlis ini telah berjaya mencapai sebahagian besar daripada matlamatnya.
2. Pameran Geosains mendapat sambutan yang sangan menggalakkan.
3. Daripada pemerhatian sangat jelas bahawa:
   (a) hampir tiada kesedaran di kalangan pelajar mengenai peranan bidang geologi dan pernan geologis dalam pembangunan negara,
   (b) tersangan kurang maklumat tentang bidang geologi sebagai satu profesyen.
4. Satu cara melobi supaya geologi dimasukkan ke dalam kurikulum sekolah menengah sebagai mata pelajaran elektif perlu dirancang oleh Persatuan.
5. Kegiatan mempromosikan geosains ke sekolah-sekolah perlu lebih dipergiatkan.

Hamzah Mohamad
18.7.2000

Ceramah Teknik (Technical Talk)

Techniques to optimise history matching

ANDREW CARNEGIE

Laporan (Report)

Dr. Andrew Carnegie, a Reservoir Engineer with Schlumberger, gave the above talk to the Malaysian Chapter of the SPWLA and the Petroleum Group of the Geological Society of Malaysia on Thursday 13th July 2000, at 11.45 am at the 40th Floor Twin Tower 1, Kuala Lumpur City Centre.

Abstrak (Abstract)

The talk will be on a Case Study of a History Match of a complex, heterogeneous carbonate field, located offshore India. The emphasis will be on the strategies and techniques used to optimise the efficiency of this process. These will be discussed under the following sections: (a) the application of analytic engineering techniques, such as material balance and well performance plots, (b) utilisation of advanced simulation technology such as Flux Boundaries, Local Grid Refinements and Parallel Processing, (c) uses of reservoir monitoring data, such as that from through casing nuclear tools and production logging tools.

In many carbonate fields, including the one described in the case study, flow is significantly influenced by high permeability conduits, which usually cannot be located by static reservoir data alone. It will be explained that a simple new method and associated PC software, which integrates both dynamic and static reservoir data, was developed during the history match to efficiently incorporate such conduits into the simulation model. A stochastic distribution scheme for the prediction phase of the study will be suggested, which explores the uncertainty surrounding the high permeability conduits identified during the history match.

Finally, basic guidelines derived from the experiences of this study, will be suggested for optimising the efficiency history matching. The application of geostatistics to history matching will be discussed as part of this.

Guidelines for the requirement of geological (geology, geotechnics and hydrogeology) inputs for the preparation of EIA report

SAIM SURATMAN

Laporan (Report)

Dr. Saim Suratman of the Department of Mineral & Geoscience and currently chairman of the Working Group on Environmental Geology, gave the above talk on Thursday, 3rd August 2000 at the Geology Department, University of Malaya.

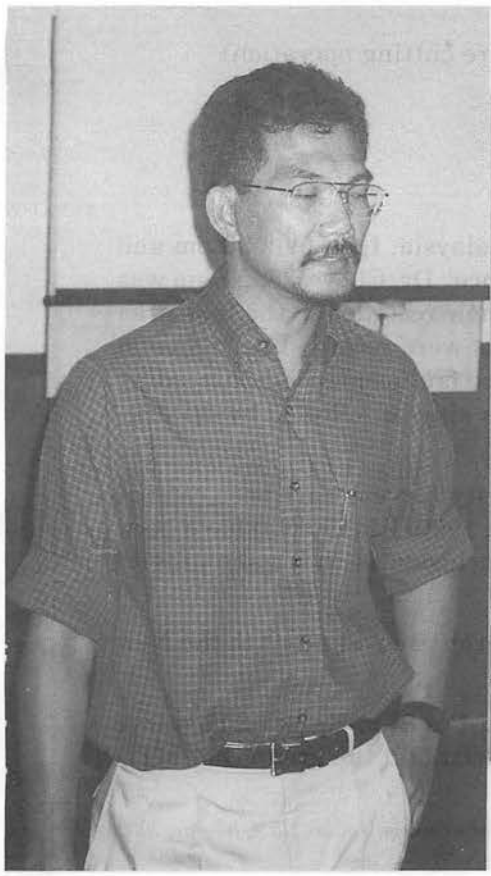
In his talk to an audience of 25, he highlighted the necessary geological input for EIA reports.

Abstrak (Abstract)

The objectives of an Environmental Impact Assessment (EIA) are stated in the Handbook of EIA as follows:

i. To identify and incorporate into the project plan appropriate abatement and mitigating measures
ii. To predict significant residual environmental impacts
iii. To determine the significant residual environmental impacts predicted, and
iv. To identify the environmental costs and benefits of the project to the community.

Currently the geological aspects are included as a small part in the existing environment. It is often divided into two categories of (i) geology, and (ii) soil. Topography is also included, as one of the aspects needed to be considered, normally as part of the geology in the EIA's. However, geological inputs in a number of EIA's are often inadequate to give appraisal on the environmental impacts of the proposed project. In order to address the aspects of geology and mitigate the predicted impacts in the EIA's adequately, this review provides guidelines for preparing geological inputs in EIA reports.



SITE VISITS

11 & 12 August 2000

Jointly organised by

the Economic Geology, Engineering Geology/Hydrogeology & Structural Geology/Tectonics Working Groups

1. **Sinkholes at Bukit Merah**
2. **Simpang Pulai-Pos Slim-Kg. Raja Highway**
3. **Marble Dimension Stone Industry**

Itinerary

Friday, 11 August 2000

9.00 am	Depart from Geology Department, University of Malaya (two 4WDs)
11.30 am	Check in at Hotel Seri Malaysia, Ipoh
3.00 pm	Briefing on *sinkholes* by Dr. Chow Weng Sum (Mineral & Geoscience Labs., Ipoh)
4.00 pm	Visit to sinkhole sites

Saturday, 12 August 2000

8.00 am	Depart from Hotel Seri Malaysia
9.00 am	Arrival at Simpang Pulai-Pos Slim-Kg. Raja Highway site Briefing & Visit conducted by MTD
1.00 pm	Lunch
2.30 pm	Visit Marble Quarry at G. Terundum (diamond-wire cutting operation)
3.30 pm	Visit dimension stone factory at Simpang Pulai
4.30 pm	Depart for Kuala Lumpur

Laporan (Report)

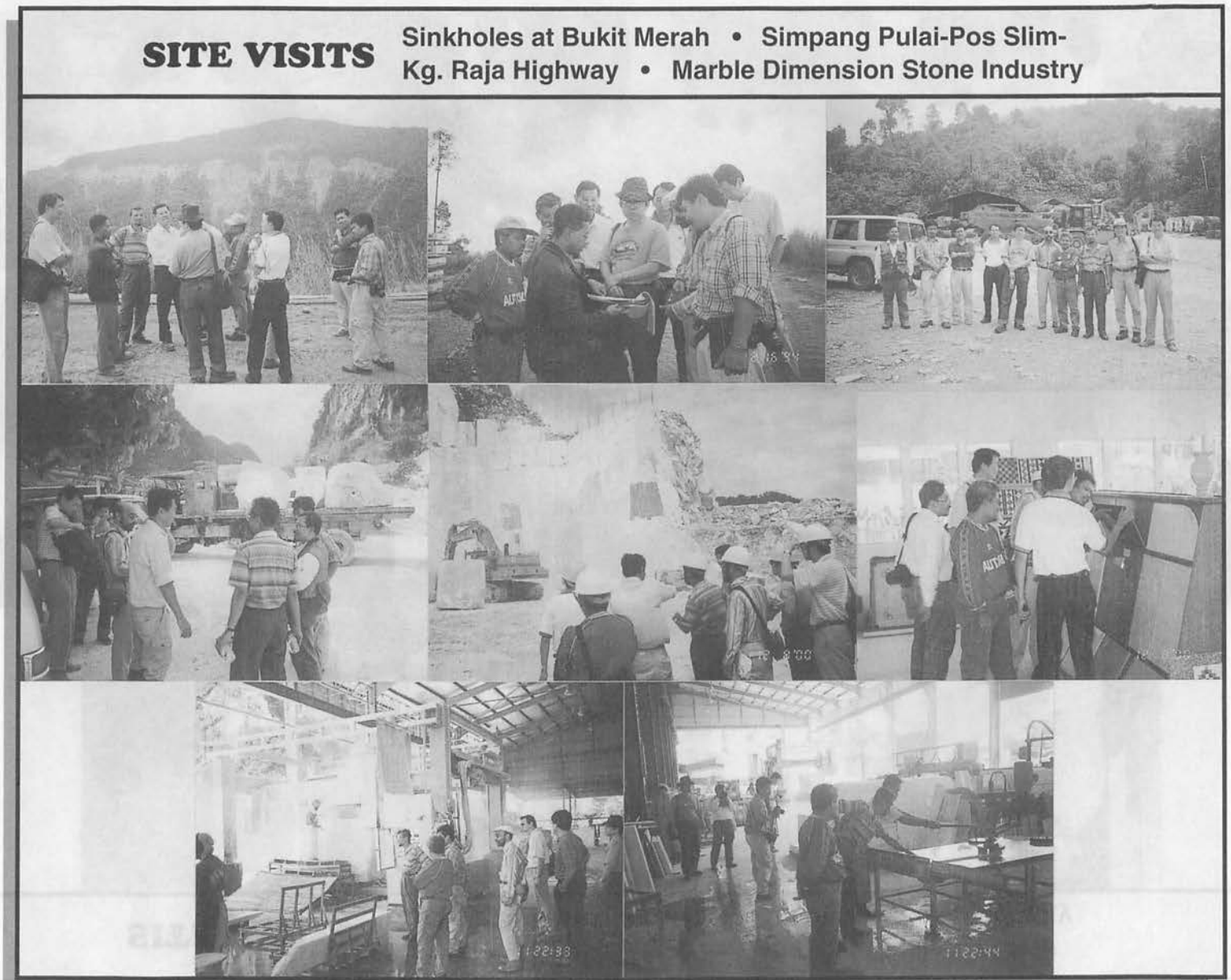
The group of 10 participants checked in at the Hotel Seri Malaysia, Ipoh by 2.30 pm and at 3.00 pm we were ready at the Department of Mineral & Geoscience. Dr. Chow Weng Sum was at hand to brief the group on sinkholes. Apparently the first sinkhole recorded in the Ipoh area was in 1955, the first at the New Lahat Mine in 1972 and others were recorded in 1982 and 1986. Statistics show that the occurrences of the sinkholes could be fault controlled. According to him initial investigations should include site mapping and this may be followed by drilling, geo-radar or microgravity surveys.

Next En. Sukri Ghazali informed the group that 22 microgravity surveys have been carried out in Perak and Selangor, six of which were in sinkholes. Since 1990, RM190,000 have been spent on microgravity, resistivity and TEM surveys and the conclusion is that microgravity surveys are best for sinkholes.

Next the group were shown recent sinkholes in the Bukit Merah area adjacent to the New Lahat Mine which has recently closed down.

After a good night's rest, the group was at the Simpang Pulai-Pos Slim-Kg. Raja Highway site for a briefing at 9.00 am by MTD. In his presentation, En. Azizi told the group that MTD


SITE VISITS
Sinkholes at Bukit Merah • Simpang Pulai-Pos Slim-
Kg. Raja Highway • Marble Dimension Stone Industry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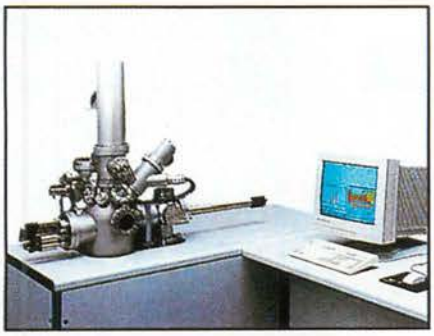

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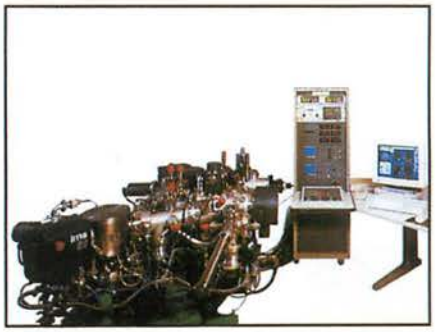

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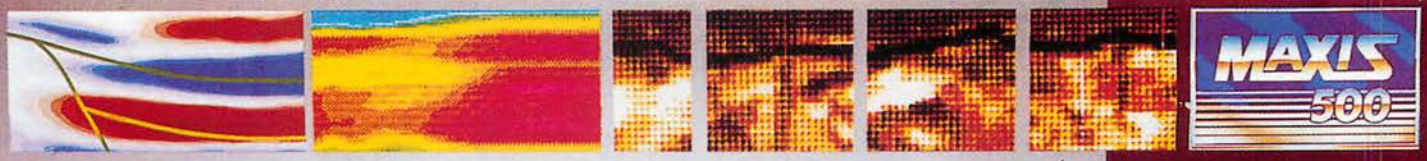

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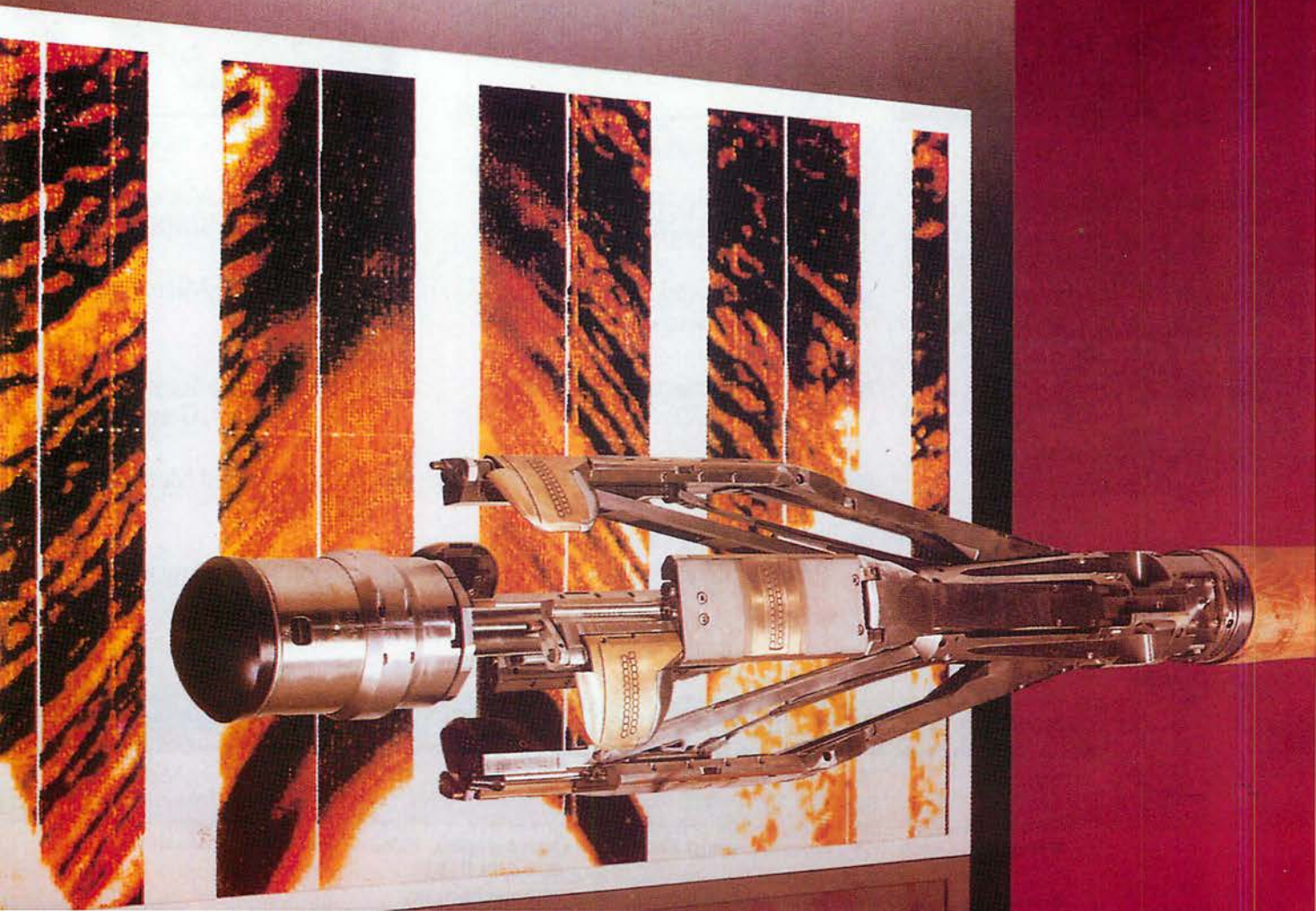

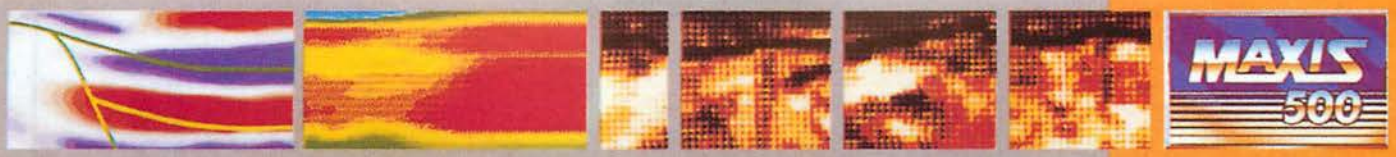

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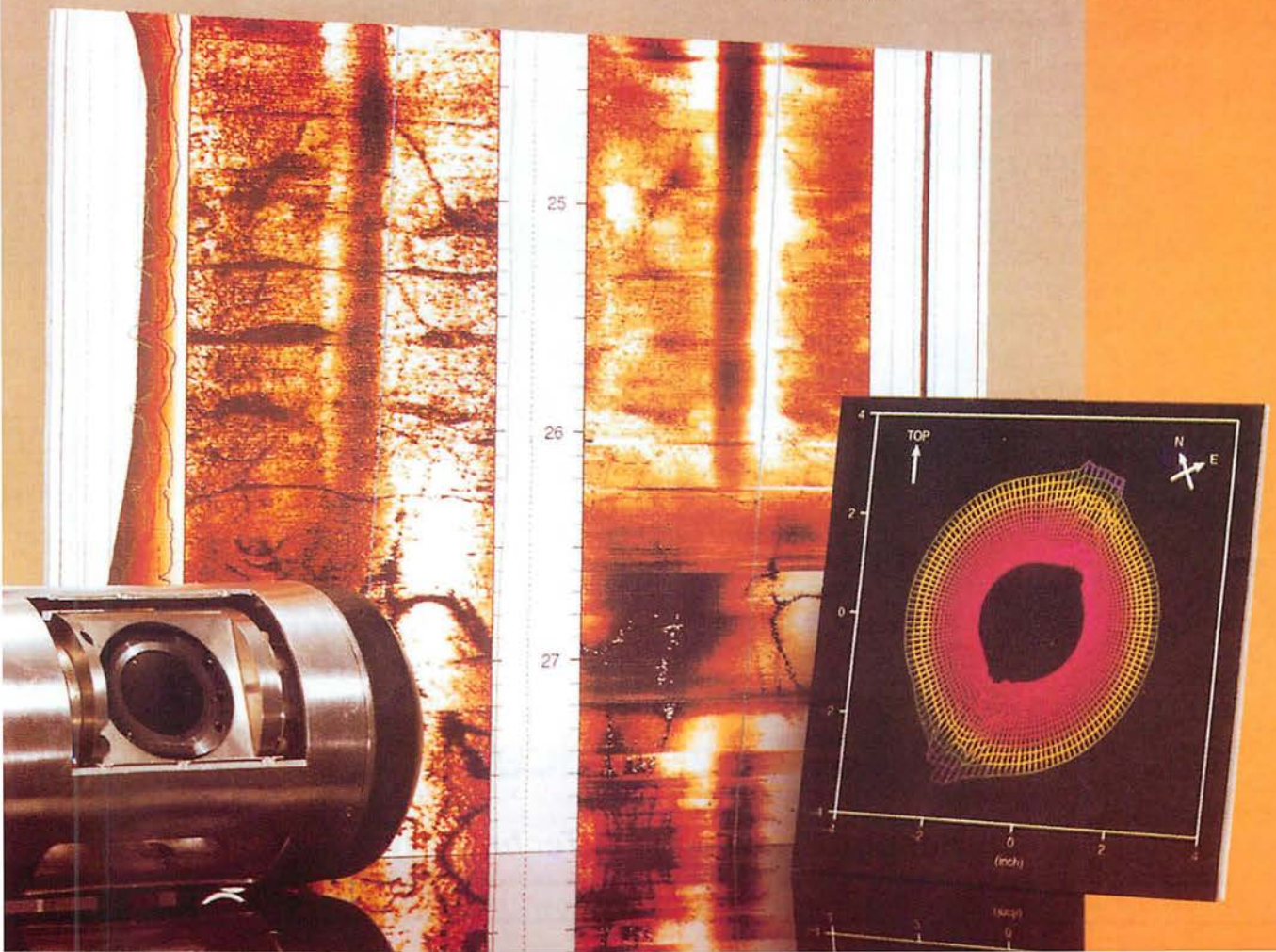

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People, Knowledge & Technology

is involved in the construction of Package 2 of the highway from Pos Slim to Ladang Blue Valley at Cameron Highlands, a distance of 35 km. The main problems in the project are the tough terrain, adverse geological factors and environmental problems as there are 3 water catchment areas involved namely, Sg. Rain, Sg. Kinta and Sg. Terla.

Next En. Khairuddin, the Project Engineer briefed on the EIA studies which were centred on water quality, resettlement and flora and fauna. The alignment of the highway begins at Pos Slim at 496 m elevation and traverses over mountainous terrain for 27 km to an elevation of 1,440 m at the Perak/Pahang border before terminating at Ladang Blue Valley at 1,402 m elevation.

The highway traverses through granitic terrain (63%) and schist areas (37%). The granite is a coarse grain biotite (fine, medium grained and porphyritic varieties were also found). The schist is a quartz-mica-schist. The granite usually weathers to a thicker residual soil compared to schist.

At least 30 slope failures were encountered during construction due mainly to geology, joints, faults on the weathering profile.

After the briefing the group was shown the various localities of the highway under construction, including areas where failure had occurred and remedial work been carried out. Towards the area where the present highway construction was being carried out, the area is really mountainous and the steep slopes are not for one with a weak heart to look down to. Thankfully, there was rain clouds rolling in and we were told to clear out immediately. Lunch was courtesy of MTD.

After lunch and a group photo, we said 'thank you' to the MTD people and headed for the marble quarry site of Rock Chemical Industries to view the methods used to cut and extract the marble. After that the group visited the S.R. Marble Factory to view the cutting and polishing of cut slabs in the dimension stone industry.

At 4.30 pm, everyone suddenly realised that it had been a very eventful day, which they all thoroughly enjoyed and got ready to head back home.

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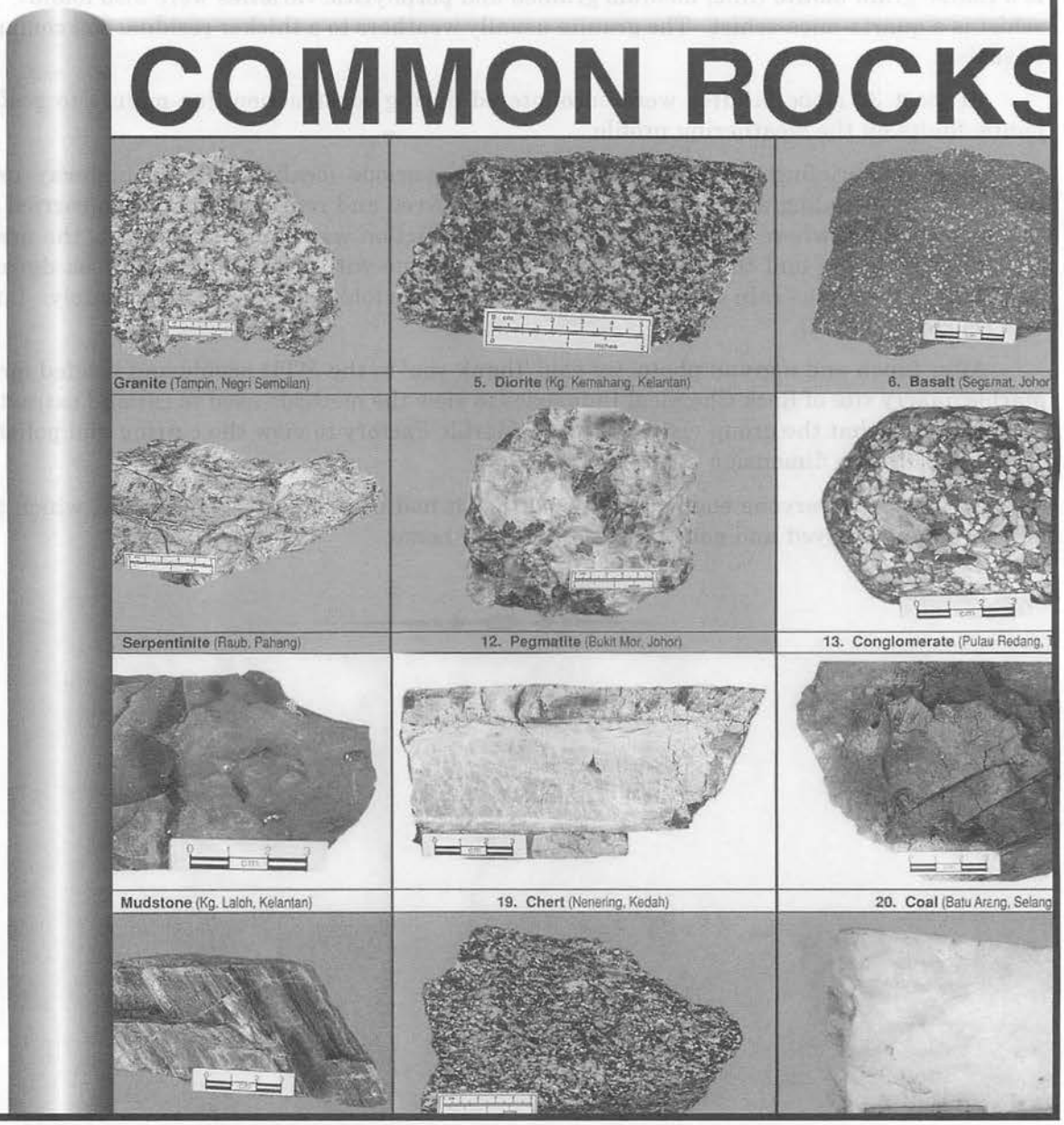

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BERITA-BERITA PERSATUAN
News of the Society

KEAHLIAN (Membership)

The following applications for membership were approved:

Full Members

1. Keith Myers
Exploration Services, Asia Pacific, Level 2,
207 Adelaide Terrace, East Perth, WA 6004.

Student Members

1. Khasnor Binti Kamdi
Jabatan Geologi, Universiti Kebangsaan Malaysia, Bangi.

2. Norhafizah Mohamed
Jabatan Geologi, Universiti Kebangsaan Malaysia, Bangi.

3. Noorul Syifa Mohd Isa
Jabatan Geologi, Universiti Kebangsaan Malaysia, Bangi.

4. Che Siti Noor bt. Koh Poh Lee @ Che Mamat
Jabatan Geologi, Universiti Kebangsaan Malaysia, Bangi.

5. Tan Han Bin
Jabatan Geologi, Universiti Kebangsaan Malaysia, Bangi.

6. Salina Yahya
Jabatan Geologi, Universiti Kebangsaan Malaysia, Bangi.

7. Roziah bt. Che Musa
Jabatan Geologi, Universiti Kebangsaan Malaysia, Bangi.

8. Leong Lai Cheong
Jabatan Geologi, Universiti Kebangsaan Malaysia, Bangi.

9. Yong Cheng Yeu
Jabatan Geologi, Universiti Kebangsaan Malaysia, Bangi.

10. Barry anak Igai
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11. Suzana binti Ismail
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12. Kalsom binti Mohamad
Jabatan Geologi, Universiti Kebangsaan Malaysia, Bangi.

13. Ng Cheong Keat
Jabatan Geologi, Universiti Kebangsaan Malaysia, Bangi.

Fadhlina bt. Abdul Rahman
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15. Puspawangi @ Rafidah binti Adnan
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18. Rohana binti Derahim
Jabatan Geologi, Universiti Kebangsaan Malaysia, Bangi.

19. Nurita binti Ridwan
Jabatan Geologi, Universiti Kebangsaan Malaysia, Bangi.

20. Kalai Vani a/p M Govindasamy Naidu
Jabatan Geologi, Universiti Kebangsaan Malaysia, Bangi.

21. Noorul Farani bt. Mohamed Suttan
Jabatan Geologi, Universiti Kebangsaan Malaysia, Bangi.

22. Arshnah Durrah bt Hj Arshad
Jabatan Geologi, Universiti Kebangsaan Malaysia, Bangi.

23. Goh Leong Kee
Jabatan Geologi, Universiti Kebangsaan Malaysia, Bangi.

24. Nursyamsiah binti Abdul Majid
Jabatan Geologi, Universiti Kebangsaan Malaysia, Bangi.

25. Ismazura bt. Ismail
Jabatan Geologi, Universiti Kebangsaan Malaysia, Bangi.

26. Siti Zubaidah bt. Abdul Manaf
Jabatan Geologi, Universiti Kebangsaan Malaysia, Bangi.

27. Kumalini a/p Selvaraja
Jabatan Geologi, Universiti Kebangsaan Malaysia, Bangi.

28. Eng Boon Keong
Jabatan Geologi, Universiti Kebangsaan Malaysia, Bangi.

29. Yap Siew Fong
Jabatan Geologi, Universiti Kebangsaan Malaysia, Bangi.

30. Dalila Rokhida binti Ahmad
Jabatan Geologi, Universiti Kebangsaan Malaysia, Bangi.

31. Rasanubari Asmah Rahmah Abdul Hamid
Jabatan Geologi, Universiti Kebangsaan Malaysia, Bangi.

32. Lee Beng Chong
Jabatan Geologi, Universiti Kebangsaan Malaysia, Bangi.

33. Intan Baiduri bt Abu Bakar
Jabatan Geologi, Universiti Kebangsaan Malaysia, Bangi.

PETUKARAN ALAMAT (Change of Address)

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

1. Osama Abu-Libda
P.O. Box 126, Safut 19378, Amman, Jordan.

2. Michael Lau
Suite 6.3, 6th Floor, Menara CSM, Section 14, Jalan Semangat, 46100 Petaling Jaya, Selangor D.E.

3. Ian Metcalfe
Asia Centre, University of New England, Armidale NSW 2351, Australia.

4. Pieter J. Rebel
85 Jalan Pudina Bukit Bandaraya, Bangsar, 59000 Kuala Lumpur.

5. Liza Jimmy
No. 9, Jalan Abang Ain, Tanjung Kidurong, 97000 Bintulu, Sarawak.

PERTAMBAHAN BAHARU PERPUSTAKAAN
(New Library Additions)

The Society has received the following publications:

1. Geological Congress of Turkey: Abstracts, 2000.
2. AAPG Explorer, July & August 2000.
3. Geological Survey of Japan, vol. 5, nos. 1–3, 2000.
4. Tin International, vol. 73, no. 6, 2000.
5. The University of Kansas, Paleontological contributions, nos. 12, 13, 2000.
6. Science Reports of the Institute of Geoscience, University of Tsukuba, vol. 21, 2000.
7. AAPG Bulletin, vol. 84, nos. 4, 5 & 6, 2000.
8. Monthly Statistics: February, March & April, 2000.
9. Episodes, vol. 23, no. 3, 2000.
10. Geological Survey of New South Wales, Bulletin 32(4), 2000.
11. Geological Bulletin of Turkey, vol. 43, no. 1, 2000.
12. CCOP Technical bulletin, vol. 27, 2000.
13. Bulletin of the Geological Survey of Japan, vol. 51, no. 4, 2000.
14. Geoscience, vol. 14, nos. 1 & 2, 2000.
15. Earth Science Frontier, vol. 7, nos. 1 & 2, 2000.
16. 1998 National Survey of Research & Development, 1999.
17. Journal of the Natural History Museum & Institute, Chiba, sp. issues no. 3, 2000 & vol. 6, no. 1, 2000.
18. Natural History Research, vol. 6, no. 1, 2000.
19. USGS Water Supply Paper: 1999: nos. 2465-B, 2465-C, 2492, 2498. 2000: nos. 2427.
20. USGS Bulletin: 1999: nos. 1995-y, z.
21. USGS Prof. Papers: 1999: 1413-A, 1608. 2000: 1622, 1600.
22. USGS Circular: 1999: nos. 1182. 2000: nos. 1195, 1191.

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ISSN 0126-6187

BULETIN PERSATUAN GEOLOGI MALAYSIA

GEOLOGICAL SOCIETY OF MALAYSIA

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Editor: G.H. Teh

Bulletin of the GEOLOGICAL SOCIETY OF MALAYSIA

JULY 1994 No. 35

NEW

MALAYSIAN STRATIGRAPHIC GUIDE

Prepared by

Malaysian Stratigraphic Nomenclature Committee

Geological Society of Malaysia

December 1997

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Bulletin 1 (Feb 1968). 79 p. Studies in Malaysian Geology. Edited by P.H. Stauffer. A collection of papers presented at a meeting of the Geological Society on 31st January 1967. Price: RM3.00. **Out of Stock.**

Bulletin 2 (Dec 1968). 152 p. Bibliography and Index of the Geology of West Malaysia and Singapore by D.J. Gobbett. Price: RM10.00 - Softcover, M$15.00.

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Bulletin 5 (Feb 1973). 70 p. The Search for Tungsten Deposits by K.F.G. Hosking. Price: RM10.00.

Bulletin 6 (Jul 1973). 334 p. Proceedings, Regional Conference on the Geology of Southeast Asia. A collection of papers, Kuala Lumpur, March, 1972. Edited by B.K. Tan. Price: RM22.00 – hardcover only.

Bulletin 7 (Jun 1974). 138 p. A collection of papers on geology. Edited by B.K. Tan. Price: RM12.00.

Bulletin 8 (Dec 1977). 158 p. A collection of papers on geology. Edited by T.T. Khoo. Price: RM12.00.

Bulletin 9 (Nov 1977). 277 p. The relations between granitoids and associated ore deposits of the Circum-Pacific region. A collection of papers presented at the IGCP Circum-Pacific Plutonism Project Fifth Meeting. 12-13 November 1975, Kuala Lumpur, Edited by J.A. Roddick & T.T. Khoo. Price: RM25.00. **Out of stock.**

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Bulletin 12 (Aug 1980). 86 p. A collection of papers on geology. Edited by G.H. Teh. Price: RM20.00.

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Bulletin 16 (Dec 1983). 239 p. A collection of papers on geology. Edited by G.H. Teh. Price: RM30.00.

Bulletin 17 (Dec 1984). 371 p. A collection of papers on geology. Edited by G.H. Teh. Price: RM35.00.

Bulletin 18 (Nov 1985). 209 p. Special Issue on Petroleum Geology. Edited by G.H. Teh & S. Paramananthan. Price: RM30.00.

Bulletin 19 (Apr 1986) **& 20** (Aug 1986). GEOSEA V Proceedings Vols. I & II, Fifth Regional Congress on Geology, Mineral and Energy Resources of Southeast Asia, Kuala Lumpur, 9-13 April 1984. Edited by G.H. Teh & S. Paramananthan. Price for both Bulletins 19 & 20: Members – RM50.00, Non-Members – RM125.00.

Bulletin 21 (Dec 1987). 271 p. Special Issue on Petroleum Geology Vol. II. Edited by G.H. Teh. Price: RM40.00.

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Bulletin 29 (Jul 1991). 255 p. A collection of papers presented at GSM Annual Geological Conference 1990 and others. Edited by G.H. Teh. Price: RM40.00.

Bulletin 30 (Apr 1992). 90 p. Annotated bibliography of the geology of the South China Sea and adjacent parts of Borneo by N.S. Haile. Edited by G.H. Teh. Price RM20.00

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Bulletin 33 (Nov 1993). 419 p. Proceedings Symposium on Tectonic Framework and Energy Resources of the Western Margin of the Pacific Basin. Edited by G.H. Teh. Price: RM60.00.

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Field Guide 1 (1973). A 7-day one thousand mile, geological excursion in Central and South Malaya (West Malaysia and Singapore). 40 p. by C.S. Hutchison. Price: RM5.00. **Out of stock.**

Abstracts of papers (1972). Regional Conference on the Geology of Southeast Asia; Kuala Lumpur, 1972. 64 p. 8 figs, 3 tables, many extended abstracts. Edited by N.S. Haile. Price: RM6.00.

Proceedings of the Workshop on Stratigraphic Correlation of Thailand and Malaysia Vol. 1. (1983). Technical Papers. 383 p. Price: RM25.00 (Members: RM12.00).

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September 11–15

8TH INTERNATIONAL NANNOPLANKTON ASSOCIATION CONFERENCE, Bremen, Germany. (Contact: Prof. Helmut Willems, FB-5-Geowissenschaften, Universität Bremen, Postfach 330 440, 28334 Bremen, Germany. Tel: +49 421 21 82 198; Fax: +49 421 21 84 451; E-mail: willems@micropal.uni-bremen.de; Website: http://uni.bremen.de/-micropal/ina8.html)

September 17–21

7TH INTERNATIONAL CONFERENCE ON PALEOCEANOGRAPHY, Sapporo, Japan. (Contact: Prof. Helmut Weissert, Geological Institute, ETH-Zurich, CH-8092 Zurich Switzerland. Tel: +41 (0)1 632 37 15; Fax: +41 (0)1 632 10 30; E-mail: helmi@erdw.ethz.ch; Website: http://www.iijnet.or.jp/jtb-cs/icp7/)

September 17–26

KARST'2000: 6TH INTERNATIONAL SYMPOSIUM AND FIELD SEMINAR ON PRESENT STATE AND FUTURE TRENDS OF KARST STUDIES, Marmaris, Turquie. (Contact: Hacettepe University, International Research and Application Centre for Karst Water Resources (UKAM), Beytepe Campus, 06532 Ankara, Turquie. Fax: 90 312 299 213; E-mail: ukam@naim.jeo.edu.tr)

September 25–29

12TH INTERNATIONAL SYMPOSIUM ON PLACER AND WEATHERED ROCK DEPOSITS, Moscow, Russia. Pre-congress and post-congress workshops and field excursions. Abstract deadline: May 1, 2000. (Contact: Prof. Patyk-Kara N.G., Secretary General, IGEM RAS, 35. Staromonetny Per., 109017 Moscow. Tel: 7 (095) 230-8427; Fax: 7 (095) 230-2179; E-mail; rkv2000@igem.ru; Website: http://www.igem.ru/symp/rkv2000/)

October

INTERNATIONAL MILLENNIUM CONGRESS ON GEOENGINEERING, Melbourne, Australia. (More information soon)

October 11–13

RISK ANALYSIS 2000, Second International Conference on Computer Simulation in Risk Analysis and Hazard Mitigation, Bologna, Italy. Organised by Wessex Institute of Technology (WTT), Ashurst Lodge, Ashurst, Southampton SO40 7AA, UK. (Contact: Karen Savage, RISK 2000/1479. Tel: +44(0)238 029 3223; Fax: +44(0)238 029 2853; E-mail: ksavage@wessex.ac.uk; Website: www.wessex.ac.uk/conferences/2000)

October 15–18 (Provisional)

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS (International Meeting), Bali, Indonesia. (Contact: AAPG Conventions Dept., P.O. Box 979, Tulsa, OK 74101-0979, USA. Tel: 1 918 560 2679; Fax: 1 918 560 2684)

October 23–27

9TH INTERNATIONAL CORAL REEF SYMPOSIUM, Bali, Indonesia. (Contact: Secretariat of the International Coral Reef Symposium, c/o COREMAP, Jl. Raden Saleh 43, Jakarta 10330, Indonesia. Tel: +62 21 314 30 80; Fax: +62 21 327 958; E-mail: coremap@indosat.net.id; Website: http://www.coremap.or.id)

October 23–27

INTERNATIONAL ASSOCIATION OF HYDROGEOLOGISTS (30th Annual Meeting), Cape Town, South Africa.

November 13–16

GEOLOGICAL SOCIETY OF AMERICA (Annual Meeting), Reno, Nevada, USA. (Contact: GSA Meetings Dept., P.O. Box 9140, Boulder, CO 80301-9140, USA. Tel: +1 303 447 2020; Fax: +1 303 447 1133; E-mail: meetings@geosociety.org; WWW: http://www.geosociety.org/meetings/index.htm)

November 19–24

GEOTECHNICAL AND GEOLOGICAL ENGINEERING — GEOENG 2000 (International Conference), Melbourne, Australia. (Contact: GeoEng2000, ICMS Pty. Ltd., 84 Queensbridge Street, Southbank, Vic 3006, Australia. Tel: +61 3 9682 0244; Fax: +61 3 9682 0288); E-mail: geoeng2000@icms.com.au; Website: http://civil-www.eng.monash.edu.au/discipl/mgg/geo2000.htm)

December 3–6

DEEP WATER RESERVOIRS OF THE WORLD (Gulf Coast Section of Society of Economic Paleontologists and Mineralogists Foundation Research Conference), Houston, Texas. (Contact: GCSSEPM Foundation, 165 Pineburst Rd., West Hartland, Conn. 06091-0065. Tel: 800/436-1424; Fax: 860/738-3542; E-mail: gcssepm@mail.snet.net; Website: http://www.gcssepm.org)

December 11–16

INTERNATIONAL SYMPOSIUM AND FIELD WORKSHOP ON GEODYNAMIC EVOLUTION OF HIMALAYA-KARAKORAM-EASTERN SYNTAXIS (INDO-BURMA RANGE)-ANDAMAN NICOBAR ISLAND ARC AND ADJOINING REGION, Lucknow, India. (Contact: Prof. A.K. Sinha, Director/Dr. Anil Chandra, Organizing Secretary, Birbal Sahni Institute of Palaeobotany, 53 University Road, Lucknow 226 001, India. Tel: 0091-0522-333620/32491/323206/325822/325945; Fax: 0091-0522-381948/374528; E-mail: bsip@bsip.sirnetd.ernet.in)

December 15–19

AMERICAN GEOPHYSICAL UNION (FALL MEETING), San Francisco, California, USA. (Contact: AGU Meetings Department, 2000 Florida Avenue, NW, Washington, DC 20009 USA. Tel: +1 202 462 6990; Fax: +1 202 328 0566; E-mail: meetinginfo@kosmos.agu.org; Website: http://www/agu.org)

2001

May 11–21

MID-PALAEOZOIC BIO- AND GEODYNAMICS: THE NORTH GONDWANA-LAURUSSIA INTERACTION, Joint meeting of the 'International Geological Correlation Program (IGCP) 421' and the 'Subcommission on Devonian Stratigraphy (SDS)' hosted by the 'Senckenbergische Naturforschende Gesellschaft', Frankfurt am Main at the 'Forschungsinstitut und Naturmuseum Senkenberg' Frankfurt am Main, Germany. (Contact: G. Plodowski, Forschungsinstitut Senckenberg, Senckenberganlage 25. D-60325 Frankfurt am Main. Tel: ++49-69-97075127; Fax: ++49-69-97075137; E-mail: gplodows@sngkw.uni-frankfurt.de)

June 3–6

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS (Annual Meeting), Denver, Colorado, USA. (Contact: AAPG Conventions Department, P.O. Box 979, 1444 S. Boulder Ave., Tulsa, OK 74101-0979, USA. Tel: +1 918 560 2679; Fax: +1 918 560 2684; E-mail: dkeim@aapg.org)

June 11–16

63RD EAGE CONFERENCE & TECHNICAL EXHIBITION, Amsterdam, The Netherlands. (Contact: EAGE Conference Dept., P.O. Box 59, 3990 DB Houten, The Netherlands. Tel: +31 30 6354055; Fax: +31 30 6343524)

July 30 – August

INTERNATIONAL ASSOCIATION OF ENGINEERING GEOLOGY AND THE ENVIRONMENT (IAEG), "Engineering Geological Problems of Urban Areas" (International Symposium), Ekaterinburg, Russia. (Contact: Secretariat, "EngGeolCity-2001, UralTISIZ 79, Bazhov str., Ekaterinburg, Russia 620075. Tel: +7 3432 559772; Fax: +7 3432 550043; E-mail: UralTIS@etel.ru)

August 23–28

INTERNATIONAL CONFERENCE ON GEOMORPHOLOGY (5th), Tokyo, Japan. (Contact: Prof. K. Kashiwaya, Dept. of Earth Sciences, Kanazawa University, Kanazawa, 920-1192 Japan. E-mail: kashi@kenroku.kanazawa-u.ac.jp)

September 6–12

IAMG2001 (THE ANNUAL CONFERENCE OF THE INTERNATIONAL ASSOCIATION FOR MATHEMATICAL GEOLOGY), Cancún, Mexico. (Contact: IAMG2001 Conference Secretariat, c/o Jorgina A. Ross, Kansas Geological Survey, 1930 Constant Avenue, Lawrence, KS 66047-3724, USA. Tel: +785-864-3965; Fax: +785-864-5317; E-mail: aspiazu@kgs.ukansedu; Website: http://www.kgs.ukans.edu/Conferences/IAMG/index.html)

November 5–8

GEOLOGICAL SOCIETY OF AMERICA (Annual Meeting), Boston, Massachusetts, USA. (Contact: GSA Meetings Dept., P.O. Box 9140, Boulder, CO 80301-9140, USA; Tel: +1 303 447 2020; Fax: +1 303 447 1133; E-mail: meetings@geosociety.org; WWW: http://www.geosociety.org/meetings/index.htm)

2002

INTERNATIONAL ASSOCIATION ON THE GENESIS OF ORE DEPOSITS (11th International Symposium), South Africa. (Contact: Dr. Erik Hammerbeck, Geological Survey, Department of Mineral and Energy Affairs, 280 Pretoria Street, Private Bag X112, Silverton, Pretoria 0001, South Africa. Tel: +012 841 1130; Fax: +012 841 1203; E-mail: ehammerb@geoscience.org.za)

April 7–10

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS (Annual Meeting), Houston, Texas, USA. (Contact: AAPG Conventions Department, P.O. Box 979, 1444 S. Boulder Ave., Tulsa, OK 74101-0979, USA. Tel: +1 918 560 2679; Fax: +1 918 560 2684; E-mail: dkeim@aapg.org)

July 7–12

16TH INTERNATIONAL SEDIMENTOLOGICAL CONGRESS, Auckland Park, Gauteng, South Africa. (Contact: Bruce Cairncross, Department of Geology, Rand Africans University, P.O. Box 524, Auckland Park, 2006, South Africa. Tel: +27 11 489 23 13; Fax: +27 11 489 23 09; E-mail: bc@na.rau.ac.za; Website: http://general.rau.ac.za/geology/announcement.htm)

September 16–20

INTERNATIONAL ASSOCIATION OF ENGINEERING GEOLOGY AND THE ENVIRONMENT (IAEG), "Engineering Geology for Developing Countries" (9th International Congress), Durban, South Africa. (Contact: The Technical Committee, 9th IAEG Congress, P.O. Box 1283, Westville 3630, South Africa)

October 28–31

GEOLOGICAL SOCIETY OF AMERICA (Annual Meeting), Denver, Colorado, USA. (Contact: GSA Meetings Dept., P.O. Box 9140, Boulder, CO 80301-9140, USA; Tel: +1 303 447 2020; Fax: +1 303 447 1133; E-mail: meetings@geosociety.org; WWW: http://www.geosociety.org/meetings/index.htm)

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HAMILTON, W., 1979. Tectonics of the Indonesian region. *U.S. Geological Survey Professional Paper 1078*, 345p.

HOSKING, K.F.G., 1973. Primary mineral deposits. *In* Gobbett, D.J. and Hutchison, C.S. (Eds.), *Geology of the Malay Peninsula (West Malaysia and Singapore).* Wiley-Interscience. New York, 335-390.

HUTCHISON, C.S., 1989. *Geological Evolution of South-east Asia*. Clarendon Press, Oxford. 368p.

SUNTHARALINGAM, T., 1968. Upper Paleozoic stratigraphy of the area west of Kampar, Perak. *Geol. Soc. Malaysia Bull. 1*, 1-15.

TAYLOR, B., AND HAYES, D.E., 1980. The tectonic evolution of the South China Sea basin. *In:* D.E. Hayes (Ed.), The Tectonic and Geologic Evolution of Southeast Asian Sea and Islands, Part 2. *Am. Geophy. Union Monograph 23*, 89-104.

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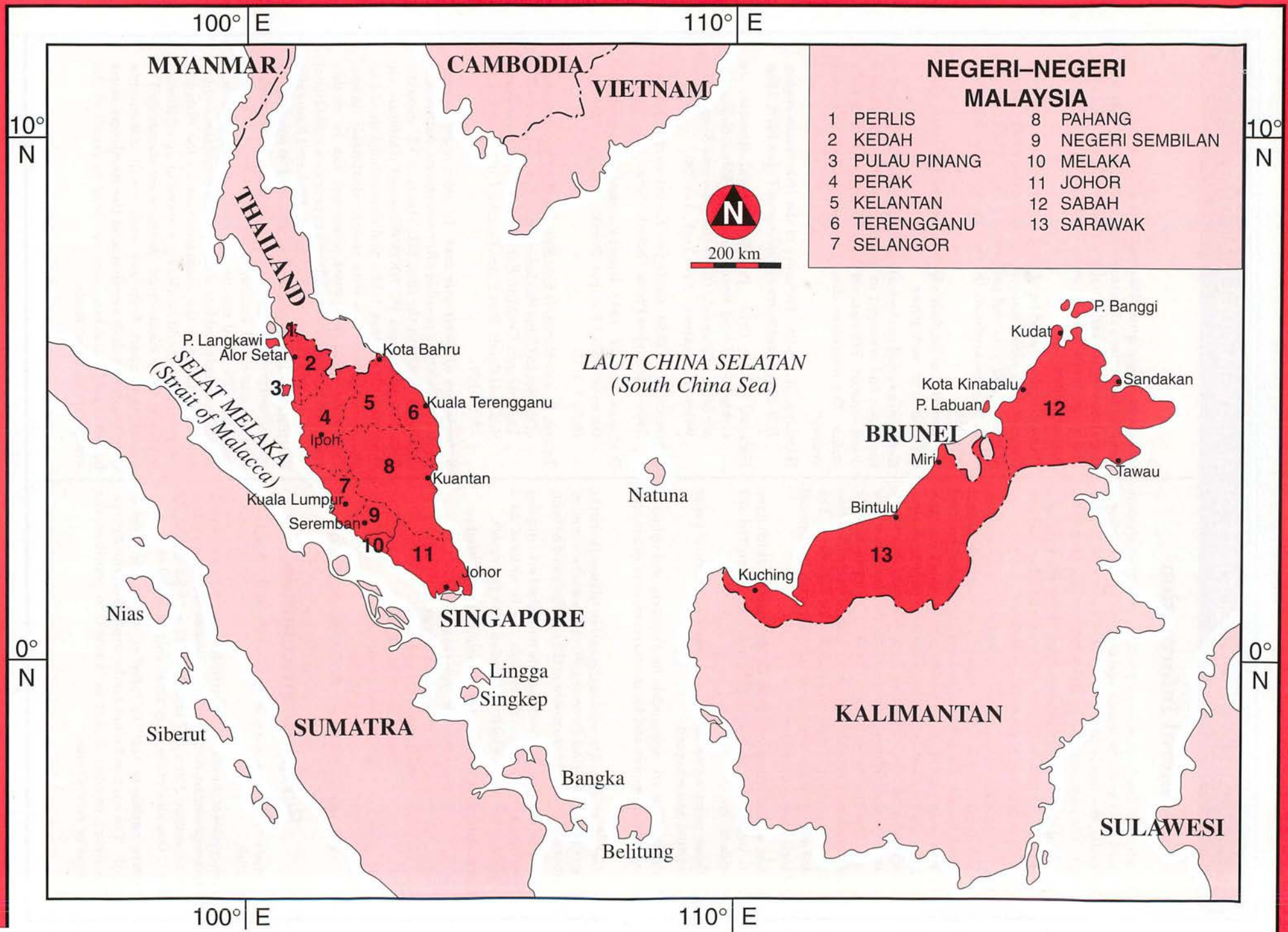
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