

## PERSATUAN GEOLOGI MALAYSIA

## WARTA GEOLOGI

## NEWSLETTER OF THE GEOLOGICAL SOCIETY OF MALAYSIA

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DIKELUARKAN DWIBULANAN  
ISSUED BIMONTHLY

**PERSATUAN GEOLOGI MALAYSIA  
(GEOLOGICAL SOCIETY OF MALAYSIA)**

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# CATATAN GEOLOGI

## (GEOLOGICAL NOTES)

### STUDIES ON THE QUATERNARY GEOLOGY OF PENINSULAR MALAYSIA

T. SUNTHARALINGAM, Geological Survey of Malaysia.

#### Introduction

The Quaternary is the most recent period of the earth's history and covers about the last 2 million years of the Geological Time Scale. This period is of prime importance to Peninsular Malaysia because nearly 90 percent of the tin deposits occur within the Quaternary sediments.

The Quaternary deposits of Peninsular Malaysia, which consist mainly of unconsolidated to semi-consolidated gravel, sand, silt and clay, occupy the coastal terrains and floors of some of the inland valleys. They occupy about 20 percent of the land area of the country, as shown in the Geological Map of West Malaysia, 7th edition 1973 (Figure 1).

The Quaternary Geology Division of the Geological Survey of Malaysia was established in 1977 with the aim of mapping the unconsolidated to semi-consolidated sediments and to indicate the areas of economic interest for development. In addition, the division also collects information on non-metalliferous resources, provides basic information on thickness and type of sediments for engineering studies, and also carried out studies on sea-level changes, geomorphology, land use and environmental geology. The importance of studying the Quaternary deposits of Peninsular Malaysia has been outlined by the writer elsewhere (Suntharalingam, 1977).

#### Method of Study

The techniques used in mapping unconsolidated sediments are different from those employed for consolidated sediments (Suntharalingam, 1981). The procedure adopted by the Geological Survey of Malaysia is as follows:-

- (i) Examination of previous work, archives data and study of old and new topographic sheets.
- (ii) Air photograph interpretation to identify geomorphological patterns e.g. beach ridges. It is also useful for locating ancient stream channels.
- (iii) Geophysical studies to determine the depth of bedrock, existence of former river channels and to differentiate the stratigraphic layers. Resistivity and seismic (refraction) techniques are found to be suitable for these purposes.

- (iv) Boring is carried out using shallow and deep drilling equipment. Shallow drilling (less than 20 m depth) is done using various types of augers. The Guts sampling auger, which yields generally undisturbed cores of 3 cm diameter and 0.5 m to 2 m length is the most commonly used. Besides Guts, the Linneman auger and the van der Staay sand pump are used. The Linneman auger is suitable for areas underlain by stiff clay or sandy clay.

For deep drilling (more than 20 m) the Banka hand drill, semi-mechanized Banka and mechanized units are used. The maximum depth reached using a 100 mm (external diameter of casing) hand drill was about 40 metres. With the semi-mechanized Banka drill using casings of 130 mm diameter the maximum depth that could be reached is 180 m.

Two mechanized drills as well as a portable version of a semi-mechanized Banka drill are capable of drilling up to a depth of 50 m. The mechanized drills are the Conrad PP 350 (percussion drill) which can drill up to a depth of 100 m and the Conrad Mini 200 which is a versatile multipurpose drill.

All boreholes are levelled on completion of work.

- (v) In the field the cores are logged according to the scheme adopted by Suntharalingam and Teoh (1977). The scheme explains the details of how to describe the sample, the legend to be used and finally the techniques of preparing the cross-sections.
- (vi) Samples from suitable and lithologically distinct layers are collected for pollen analysis, micro and macrofossil studies, grain size and heavy mineral analyses.

Suitable samples are also sent overseas for radiocarbon dating. The heavy minerals are sent to the chemical laboratory for tin (or any other element) determination in order to assess the tin (or other) potential. Suitability tests are also carried out for clay and sand.

- (vii) From information obtained from the borehole logs and laboratory data various cross-sections are drawn and the Quaternary geology map is prepared. A detailed geological report of the area is written and published as a bulletin.

It is standard practice to plot the tin results per 5 foot (1.5m) section alongside the borehole logs. This will help to indicate the horizons or areas with economic concentrations of cassiterite (Figure 2). Besides this various maps pertaining to palaeodrainage, thickness of alluvium and others are drawn (Figure 3).

### Results of Investigation

Stauffer (1967) suggested that someone will be able to present a review on the Quaternary deposits of West Malaysia. It is premature at the moment to give the general review for the country since

Figure 1. The Relationship between the Quaternary Deposits, Granitoids and Tin Occurrences of Peninsular Malaysia.

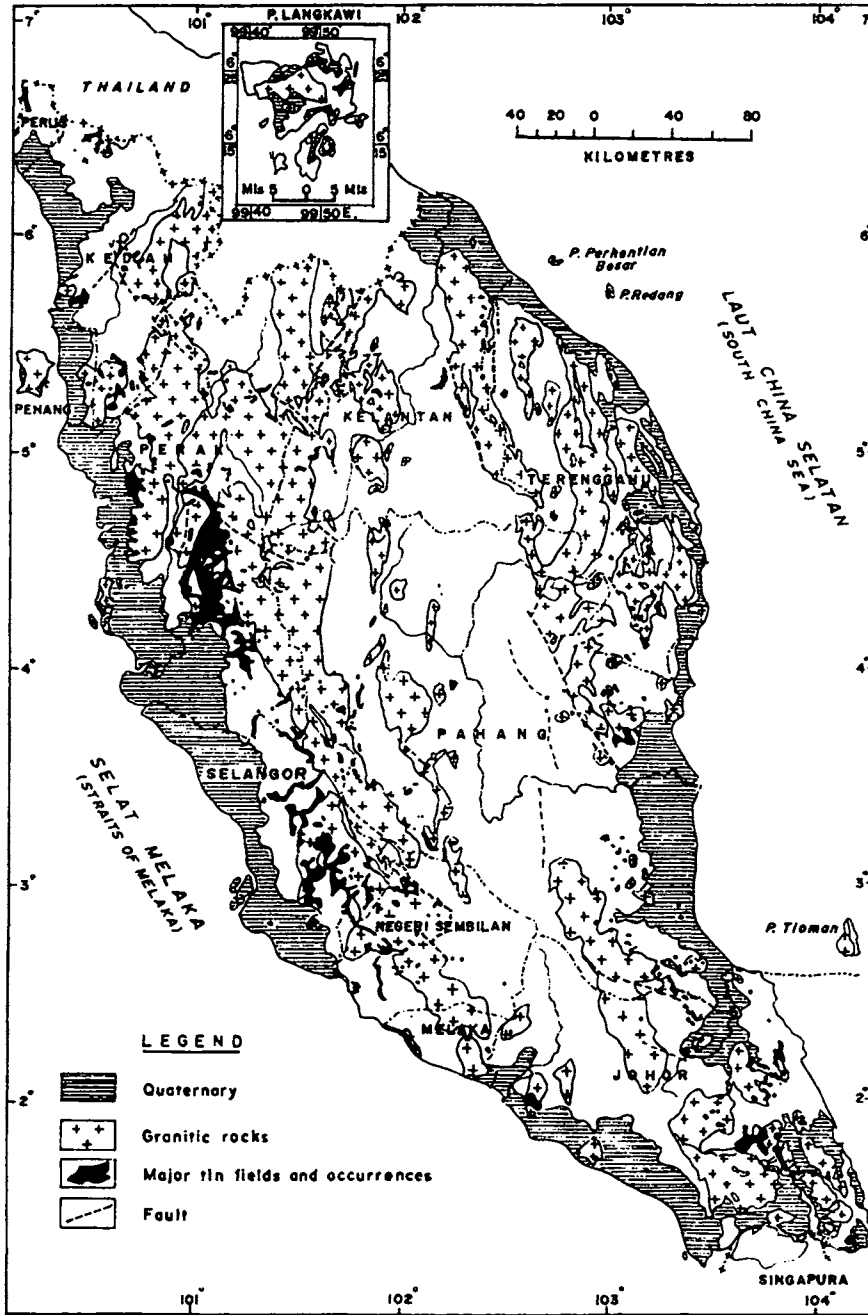


Figure 2.

Geological Section: Ladang Selinsing Selatan—Kamunting Industrial Area.

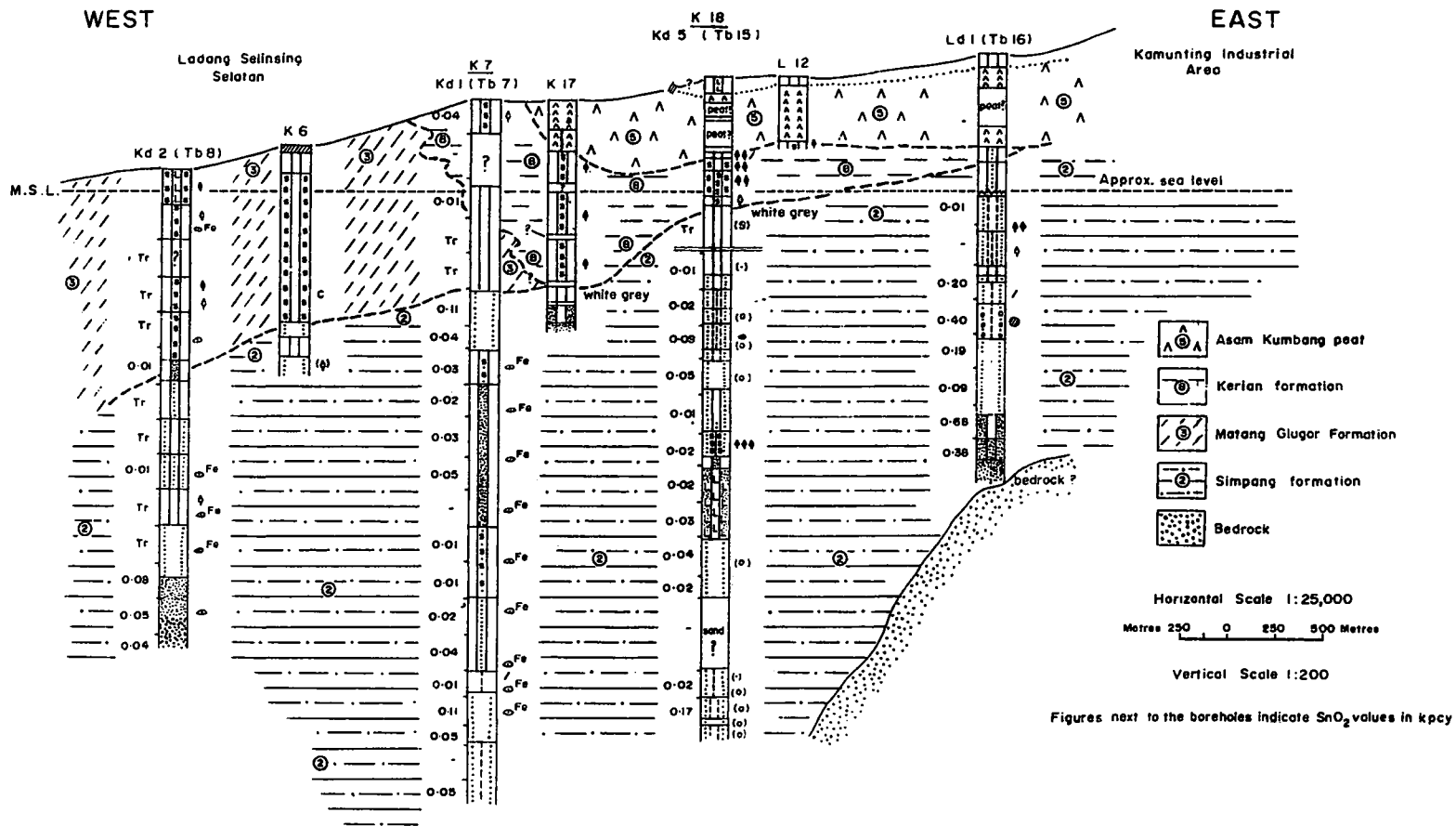
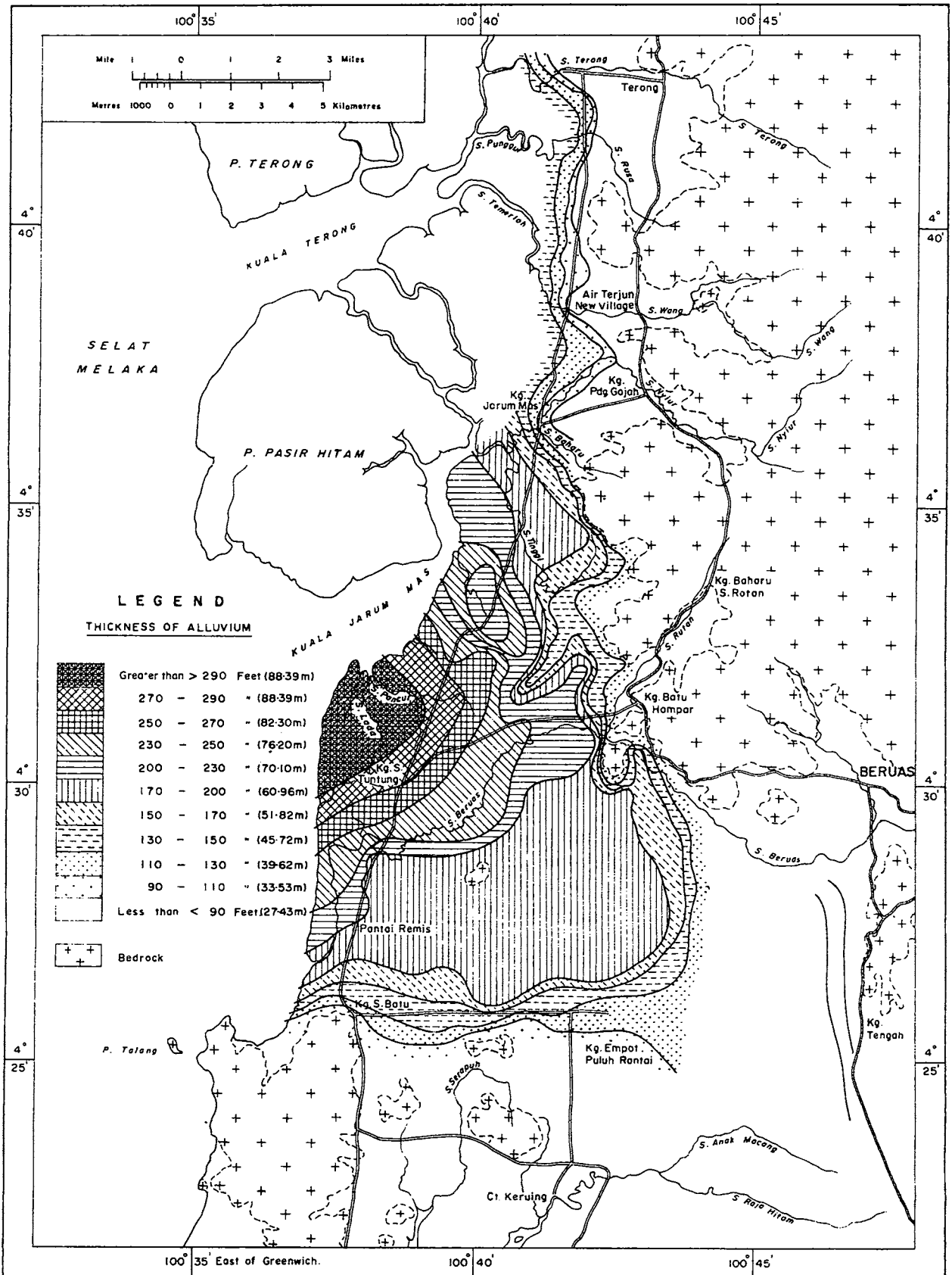


Figure 3. Isopach map showing thickness of alluvium in the Beruas area



systematic investigations on the Quaternary of Peninsular Malaysia have not been completed.

### (1) Status of the Stratigraphy

Systematic mapping of the unconsolidated sediments (1:63,360) in the Taiping to Lumut area in Perak commenced in mid 1976 and to date the Taiping (Sheet 40), Beruas (Sheet 52) and Lumut (Sheet 63) areas have been mapped. Studies show that the lithostratigraphic units which have been classified on the basis of lithology, heavy minerals and to a lesser extent on palaeoenvironment could be used to correlate the various units in the Taiping to Lumut area. Table 1 shows the correlation of these with those of earlier workers. The units are as follows:

#### Beruas Formation

- (i) Pengkalan Member
- (ii) Matang Timbul Member

#### Gula Formation

- (i) Port Weld Member
- (ii) Matang Gelugor Member

#### Simpang Formation (oldest)

- (i) Upper clay member
- (ii) Lower sand member

### Simpang Formation

The term Simpang Formation was introduced by Suntharalingam and Teoh (1977) for a unit made of gravel, sand, silt and clay overlying bedrock in the Taiping area. This unit is equivalent to the 'Old Alluvium' of Walker (1955) which was described as consisting mainly of grey to brown sandy clay with frequent intercalated layers of sand and gravel.

The formation is divided into two members i.e. the lower sand member which is made up of sand and gravel and the upper clay member which is mainly clay.

The thickness of the formation varies from a few metres in the east to more than 50 m in the west. The upper clay member varies from a few metres to a maximum of 10 m while the lower sand member is generally very thick up to 40 m or more.

The gravels of the lower sand member are subrounded to subangular grains of vein-quartz, schist, sandstone, chert, phyllite, quartzite and granite. The sand is generally fine to coarse. Grain size analyses indicate that the sand is unimodal and sorting is poor to very poor. Skewness of the alluvium is fine to strongly fine. Kurtosis for samples in which this parameter can be calculated is generally more than one.

The sand of the lower sand member is brown to light grey in colour but above bedrock it is normally light grey or grey white



TABLE I. LATE CAINOZOIC CORRELATION CHART, PERAK

HOLOCENE		BERUAS <sup>(1)</sup>		TAIPING <sup>(2)</sup>	KINTA VALLEY <sup>(3)</sup>	NORTH KINTA VALLEY <sup>(4)</sup>	LUMUT-Dindings offshore <sup>(5)</sup>	
		Gula Formation Matang Gelugor Member Port Weld Member	Beruas Formation Pengkalan Member	Port Weld formation Kurau formation Kerian formation Matang Timbal formation Asam Kumbang Peat Matang Gelugor formation ↑ ? ↑ Gula clay	Organic mud and peat Young Alluvium	Young Alluvium	Younger Sedimentary Cover	Y O L U N G I U M
P L E I S T O C E N E	Late	Simpang Formation		Matang Timbal formation Asam Kumbang Peat Matang Gelugor formation ↑ ? ↑ Gula clay	? ?	? ?	DISCONFORMITY	
	Middle	(a) Upper clay member (b) Lower sand member					Old Alluvium	Old Alluvium
	Early	↓ ? ↓ ? ↓ ?	Simpang Formation Kulim Granite wash	Old Alluvium	Old Alluvium	DISCONFORMITY		
P L I O C E N E	Late	↓ ? ↓		↓ ? ↓	↓ ? ↓	↓ ? ↓	Alluvium Plain Facies (Old Alluvium)	O L D E R S E D I M E N T A R Y C O V E R
	Early						Piedmont Fan Facies (Boulder beds/ Granite wash)	
LATE MIOCENE							DISCONFORMITY	S R
							Sundaland Regolith	

Source. (1) T. Suntharalingam. (MAMU) (2) T. Suntharalingam and Teoh. L. H. (1980)

(3) Walker. D. (1955)

(4) S. P. Sivam (1969)

(5) Batchelor. B. C. (1979)

in colour. The sediments at the top of the upper clay member are generally light brown to grey and are in places mottled yellow or orange. With depth the clay of the upper clay member becomes white and stiff and is difficult to penetrate using hand drills.

The common heavy minerals found in the lower sand member are ilmenite, tourmaline, pyrite and magnetite. Zircon, rutile, cassiterite and siderite are present in small amounts whereas monazite, xenotime, topaz, rutile, corundum and anatase occur in trace amounts. However, in the upper clay member there are little heavy minerals in the clays. They are mainly pyrite, iron-minerals, ilmenite and tourmaline. Cassiterite is generally absent except in the sandy layers.

The formation is believed to be probably late Pliocene to Pleistocene in age based on the correlation with similar sediments in the Kinta Valley and Kuala Lumpur areas. The deposits are continental and fluvial in nature.

### Gula Formation

The name Gula Formation was introduced by Suntharalingam and Teoh (1977) for a unit made up mainly of grey to greenish grey clay and subordinate sand occurring in the Taiping area. This formation covers the nearly continuous stretch of marine sediments that are present in the coastal plains of Peninsular Malaysia.

Suntharalingam and Teoh (1977) proposed the term Matang Gelugor Member for the subordinate sand of the beach ridges in the coastal areas of Taiping. The name Port Weld Member was introduced for a unit made up of brownish grey to green clay with abundant mangrove and riverine nipah vegetation occurring in the tidal areas.

The clays of the Gula Formation are soft and plastic in nature. Fine humic material occurring randomly or arranged in subparallel layers is common. Plant remains, especially decayed leaves and stem material, occur in small to moderate amounts. Shells are found dispersed or in small amounts in the clay. The heavy mineral content is low and consists mainly of iron-oxides and pyrite with smaller amounts of siderite, tourmaline and ilmenite.

The Matang Gelugor Member is nearly all sand with very rare layers or lenses of clay, sandy clay, peat or wood. The sand ranges from fine to coarse and is always moderately well sorted. The sand is generally white to brown white in colour. Marine shells and humic remains are sometimes present. The heavy minerals present include ilmenite, hydroilmenite, zircon, pyrite, rutile, cassiterite, tourmaline, monazite, xenotime, garnet and iron minerals.

The Port Weld Member is brownish black and brownish grey to greenish grey in colour. The clay generally contains dispersed to abundant humic material arranged or layered in a haphazard manner. Plant remains varying from decaying roots to leaves occur in small to large amounts. The clay is soft and slightly plastic.

The thickness of the formation varies from a metre to about 20 m. The age is Holocene.

The Gula Formation is distinguished from the Beruas and Simpang Formations by its lithology, greenish grey colour, presence of marine fossils and the low heavy mineral content.

### Beruas Formation

Suntharalingam (manuscript) proposed the term Beruas Formation for fluvial-estuarine-lacustrine deposits made up of clay, sandy clay, sandy gravel, silt and peat occurring in the Beruas area. This unit overlies the Simpang Formation and fills channels and depressions. In some places it also overlies the bedrock. It includes the current river forming and other similar deposits and is equivalent to the 'Young Alluvium' of Walker (1955).

The term Pengkalan Member was introduced by Suntharalingam (manuscript) for an inland freshwater swamp deposit which is made up of clay, peat and silt. The term Matang Timbul Member was introduced by Suntharalingam and Teoh (1977) for poorly sorted, slightly gravelly sand to clay occurring as localised deposits around the eastern side of the Semanggol ridge extending from Bukit Merah reservoir in the north to Sungai Sapetang in the south in the Taiping area.

The sand and clayey sand of the Beruas Formation are grey to greyish yellow in colour and the clay is light grey. The sediments are moderately to poorly sorted. Heavy mineral content is low and consists of ilmenite, hydroilmenite, tourmaline and minor amounts of zircon, rutile, pyrite, and iron minerals. Cassiterite is absent or present only in trace amounts.

The formation varies from a metre to less than 10 m in thickness. The minimum age of the formation is the present and the maximum age is Holocene.

The lithology, heavy mineral content, gravel size and colour indicate that the Beruas Formation is mainly a fluvial deposit related to the existing river system.

The formation is distinguished from the Simpang and Gula Formations by its lithology, light grey colour, iron-staining or mottling effects, low heavy mineral content and absence of cassiterite.

### (2) Quaternary Geology Map of Peninsular Malaysia

The three basic lithostratigraphic units discussed have been adopted for the preparation of the first edition of the Quaternary geology map of Peninsular Malaysia (1:500,000). An isopach map on a similar scale with ancient river channels is also being prepared for the benefit of those in the mining and construction industry.

### (3) Economic Geology

Information pertaining to the economic potential of cassiterite and associated heavy mineral placers are compiled from time to time for the benefit of the mining industry.

### Acknowledgements

This paper is published with the kind permission of the Director-General, Geological Survey of Malaysia.

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PERTEMUAN PERSATUAN  
(MEETINGS OF THE SOCIETY)

ANNUAL GENERAL MEETING 1984

The Society's AGM this year was held on Saturday 28 April 1984 at the Geology Department, University of Malaya at 2.30 p.m. and was attended by 30 members. As business for the day could not be completed by 6.30 p.m., the AGM was adjourned to Friday 25 May 1984 at the Merlin Hotel, Kuala Lumpur.

Items of Agenda completed on 28.4.84

1. Confirmation of the minutes of previous AGM
2. Matters arising
3. President's Report
4. Honorary Secretary's Report
5. Honorary Assistant Secretary's Report
6. Editor's Report

Items of Agenda completed on 25.5.84

7. Honorary Treasurer's & Honorary Auditor's Report
8. Election of Honorary Auditor
9. Any other business
10. Announcement of the New Council (1984/85)

The items discussed under 'other business' included, among other things, amendments to the Constitution pertaining to the Nominations Committee and publications, charging members a nominal sum for the Society's future Bulletins, increase in annual dues, publication of GEOSEA V Proceedings and the Society's involvement in the Union of Geoscientists of S.E. Asia.

G.H. TEH

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## FORTHCOMING GSM BULLETIN 16

Once again a collection of undoubtedly interesting articles, the majority of which are on Malaysian geology, will make their appearance in the latest volume of the Society's Bulletin series, Bulletin 16, which will be available soon.

Among the papers appearing in Bulletin 16 are,

1. Observations on the ornamentation and ultrastructure of some well-preserved specimens of *Idiognathoides noduliferus inequalis* Higgins (Pennsylvanian conodont) - Metcalfe, I.
2. Strata-related metallic deposits: their economic past, present and future - Laznicka, P.
3. Metamorphic episodes of the western foothills of Gunung Ledang (Mt. Ophir), Johore-Malacca, with a background account of the geology - Khoo, T.T.
4. Geology of the Bangkok Clay - Rau, J.L. & Nutalaya, P.
5. Interpretation of regional gravity and magnetic data in Peninsular Malaysia - Loke, M.H. et al.
6. On the feasibility of detecting potholes and limestone pinnacles in alluvial mining areas by gravity surveys - Foss, C.A.

7. Negative lineaments in the granitic bedrock areas of NW Peninsular Malaysia - Raj. J.K.
8. Lateritic soils of Peninsular Malaysia - S. Paramanathan & M. Tharmarajan.
9. Subaquatic plants as geochemical samples - Tan, T.H.
10. Proposed calcareous nannofossil zonation scheme for the Miocene to Holocene of Southeast Asia - O. Varol.
11. Palaeomagnetism, geochronology and petrology of the dolerite dykes and basaltic lavas from Kuantan, West Malaysia - Haile et al.
12. Intrabed andalusite abundance variation as an indicator of graded beds at Kuala Kemasik, Terengganu - K. Chakraborty.
13. Potential and properties of some rock aggregates in Sarawak - Denis Tan
14. Observations on the geology of the porphyry copper sub-province of southwest Negros, Philippines - Burton, C.K.
15. Nature of the contact between the Taku Schists and adjacent rocks in the Manek Urai area, Kelantan, and its implications - Khoo, T.T.

G.H. TEH

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## EDITOR'S NOTE - SOCIETY'S PUBLICATIONS & GEOSEA V PROCEEDINGS

At the recently completed AGM, it was decided that after Bulletin 16, members will be charged a nominal sum for future Bulletins. This is due to the rising cost of publications and also because the Society's Bulletins and Warta Geologi take a substantial chunk of the Society's funds annually.

The Society also intends publishing the GEOSEA V Proceedings. Letters have gone out to all authors of papers to submit their manuscripts before 31 August 1984. Authors who have earlier handed in their manuscripts are advised to write in and inform the Editor of the whereabouts of their manuscripts or send in another copy. Those who need more time due to other commitments are also advised to write in.

Letters have also been sent out to various organisations and companies to solicit for funds for the realisation of the GEOSEA V Proceedings. An Advertising Space Order Form can be found on the next page for members to do their part in this fund-raising campaign.

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# PERSATUAN GEOLOGI MALAYSIA

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**FIRST CIRCULAR  
JULY 1984**

# GEOLOGICAL SOCIETY OF MALAYSIA

## PETROLEUM GEOLOGY SEMINAR '84

### SEMINAR OBJECTIVES

The Geological Society of Malaysia is planning to hold its Petroleum Geology Seminar '84 on 3-4th December 1984 at the Hotel Merlin in Kuala Lumpur. The Seminar is the eighth such annual event to be organised by the Society.

This Seminar will bring together a large number of geoscientists and explorationists from various oil, consulting and service companies as well as universities, government and local research organizations and will provide forum for discussions on the various aspects of petroleum geology in this region and new techniques of petroleum exploration in general.

### PAPERS

Many outstanding papers have been presented at the previous Seminars and the Geological Society of Malaysia would greatly appreciate your contribution of a paper to the Seminar this year. Papers on any topic relevant to the understanding of the petroleum geology of the South East Asian region and to petroleum exploration would be most welcomed. Please inform us of your intention to present a paper at this Seminar before **29th September 1984**. Abstracts should be submitted by **31st October 1984**.

### REGISTRATION

All intending participants are advised to register early for the Seminar as a large turnout will again be expected this year. Advance registration for the Seminar will be accepted until **24th November 1984**. Late registration will be accepted at the Registration Desk in Hotel Merlin.

	Advance Registration Fees	Late Registration Fees
Full Members	MR 30.00	MR 40.00
Non Members	MR 60.00	MR 80.00
Student Members	Free	Free
Student Non Members	MR 4.00	MR 5.00

Only speakers at the Seminar will be exempted from payment of registration fees.

Payment by crossed cheques, bank drafts or cashiers orders is acceptable and should be made payable to the Geological Society of Malaysia. Oustation cheques should include sufficient bank charges.

Please send registration fees together with the Registration Form to:

The Treasurer  
Geological Society of Malaysia  
c/o Department of Geology  
University of Malaya  
Kuala Lumpur 22-11  
MALAYSIA

to reach us before **24th November 1984**.

### ACCOMMODATION

Accommodation will be at the participant's own expenses but reservations can be arranged upon request on a first-come-first-serve basis at the Hotel Merlin, Kuala Lumpur at the following discounted rates:

Single: MR 130.00 (approximately US\$55.00)  
Twin: MR 140.00 (approximately US\$59.00)

The rates are exclusive of a 10% Service Charge and 10% Government Tax.

Please indicate in the Registration Form if arrangements for accommodation at the Hotel Merlin will be required. Hotel reservations at Hotel Merlin can only be confirmed if received before **15th November 1984**.

Lunch will be provided on both days for all registered participants except student participants.

For further information, write to:

Mr. Nordin Ramli  
Organising Chairman  
Petroleum Geology Seminar '84  
Geological Society of Malaysia  
c/o Department of Geology  
University of Malaya  
Kuala Lumpur 22-11  
MALAYSIA

## KEAHLIAN (MEMBERSHIP)

The following applications for membership were approved:

Full Members

Janet Vida Watson, Dept. of Geology, Imperial College, Prince Consort  
Consort Road, London SW7, U.K.

Richard W. Hutchinson, Dept. of Geology, Colorado School of Mines,  
Golden, Co. 80401, USA.

De Dapper, Morgan, Geological Institute, State University, Krijglaan,  
281, b 9000-Gent, Belgium.

Zaidi Hassan, Batu 33/4, Jalan Kuala Krai, Kota Bharu, Kelantan.

Student Member

Mogana Sundaram a/l Narayanasamy, Jabatan Geologi, UKM, Bangi, Selangor.

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## PERTUKARAN ALAMAT (CHANGE OF ADDRESS)

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

Daud Batchelor, MMC, P.O. Box 10936, Kuala Lumpur.

Dale Wetherbee, 9319 South Oxford Avenue Tulsa, Oklahoma 74137, U.S.A.

R.L. Pile, White Lodge, 65 Barry Road, Oldland Common, NR Bristol,  
England.

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## PERTAMBAHAN BARU PERPUSTAKAAN (NEW LIBRARY ADDITIONS)

The following publications were added to the Library:

1. Geological Correlation, sp. issur, Sept 1983.
2. Scripta Geologi, 67 & 69, 1983.
3. Memoirs of the Ehime University, vol. IX, no. 4, 1983.
4. Tectonic map of Asia & explanatory notes, '82.
5. Bull. of statistics relating to the mining industry of Malaya, 1980.
6. Episodes, vol. 1983, no. 3, 1983.
7. Jour. of stratigraphy, vol. 7, no. 3 & 4, 1983.
8. Acta Palaeontologica Sinica, v. 22, nos 5 & 6, 1983.
9. Geophysical Research Bull. v. 21, no. 4, 1983.
10. Oklahoma Geological Survey Bull. 135, 1983.
11. Petroleum News, v. 14, no. 10, 1984.
12. Seatrad Bull. vol. IV, no. 4, 1983.
13. IECF Catalogue, 1978-1982, 1983.
14. Proceedings of the Annual Technical Meeting, 1982, Dept. of  
Geological Sciences, Chiang Mai Univ. 1983.
15. Science reports of the Inst. of Geoscience, Univ. of Tsuluba, vol.  
5, 1984.
16. American Museum of Natural History, Bulletin. v. 1751 Article 4,  
1983.
17. American Museum Novitates, Nos. 2770-2774 & 2780.

18. Berliner Geowissenschaftliche Abhandlungen, Band 44-49, 1983.
19. Geological literature of USSR: Bibliographical Yearbook for 1979, vol. I & II, 1983.
20. Geological Survey of India, Bull. no. 45, vol. 2 (1982), vol. 3 (1983); no. 49 (1982); no. 47 (1981)

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## BERITA - BERITA LAIN ( OTHER NEWS )

### SENARAI DISERTASI SESI 1983/84, JABATAN GEOLOGI, UNIVERSITI KEBANGSAAN MALAYSIA (LIST OF DISSERTATIONS SESSION 1983/84, GEOLOGY DEPT., UKM)

1. Ali Abd. Rahim - Geologi dan Permineralan Kawasan Asahan dan Barat Laut Gunong Ledang, Melaka.
2. Arbaen Paimin - Geologi dan Permineralan Kawasan Timur Laut Gunong Ledang, Johor.
3. Ch'ng Soo Chau - Geologi Kejuruteraan Batukapur Kuala Lumpur, Malaysia.
4. Ghazali Ismail - Hidrogeologi Kawasan Batuan Enapan Sekitar Bandar Keluang, Johor.
5. Jasmi Ab. Talib - Geologi Kejuruteraan Lebuhraya Timur-Barat, Km. 23 - Km. 34, Grik, Perak.
6. Kamal Roslan Mohamad - Geologi Struktur Lebuhraya Timor-Barat (km. 10 hingga km. 19.5 Dari Kuala Rui).
7. Kamaruddin Mat Ali - Kajian Geologi dan Geofizik (Kemagnetan) Kawasan Beserah, Kuantan, Pahang.
8. Latif Anwar - Sifat Mekanik dan Batuan Igneus Kawasan Kulai, Johor.
9. Marzuki Mohamed - Analisis Mineral-Mineral Berat Dari Lombong-Lombong di Sekitar Hulu Langat, Selangor.
10. Md. Zaini Madi - Geologi Kejuruteraan Lebuhraya Timur-Barat, Km. 11.5 - Km. 23, Grik, Perak.
11. Mohamad Anuar Mohamad Yusof - Geologi dan Permineralan Pegmatit Di Kawasan Bakri, Muar, Johor.
12. Mohamad Johari Hj. Yaakob - Kajian Semula Geologi Formasi Kajang (?) dan Formasi Bukit Kenny di Kawasan Bangi - Kajang - Serdang, Selangor.
13. Mohamad Sulong - Geologi dan Geofizik (Magnet) Kawasan Jabor Pahang - Temerloh.
14. Mohd. Ashari Muda - Geologi Kejuruteraan Lebuhraya Timur-Barat Km. 0 hingga 12, Grik, Perak.
15. Mohd. Rosly Imas - Geologi Kawasan Baratdaya Peta Syit 96, Jelebu, Negeri Sembilan.
16. Mohd. Zahrullail Mohd. Jaid - Geomorfologi dan Geologi Struktur Di Perbukitan Kodiang, Kodiang, Kedah.
17. Muhamad Amin Zakaria - Geologi dan Permineralan Kawasan Nyalas dan Bukit Senggeh, Melaka.
18. Nazri Abdul Latif - Geologi Kuala Pilah - Jempol, Negeri Sembilan.
19. Noor Linah Gul Mohamed - Geologi dan Permineralan Kawasan Baratdaya Gunong Ledang, Johor.

20. Paulius Godwin @ Paulus - Stratigrafi dan Sedimentologi Kawasan Bandar Temerloh - Kerdau, Daerah Temerloh - Kerdau, Daerah Temerloh, Pahang.
21. Rashidah Hj. Abd. Karim - Geologi, Petrologi dan Geokimia, Batuan Skis Dinding, Daerah Hulu Kelang, Selangor.
22. Sallehuddin Hj. Samiran - Geologi dan Permineralan Kawasan Air Kuning Selatan - Batang Melaka, Negeri Sembilan - Melaka.
23. Tan Yong Phang - Geologi Struktur Lebuh raya Timur-Barat (0.11 Km.) Grik, Perak.
24. Zulkifli Salleh - Geologi Struktur Lebuh raya Timur-Barat (Km. 19 hingga Km. 29 dari Kuala Rui) Perak.

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## WHY SCIENTISTS BELIEVE IN EVOLUTION

The American Geological Institute (AGI) has published a pamphlet, WHY SCIENTISTS BELIEVE IN EVOLUTION, for educator, students, parents and concerned citizens.

Dr. Norman D. Newell of the American Museum of Natural History, an eminent paleontologist, wrote the pamphlet. It explains why scientists believe that the complex living organisms of today evolved from simpler and more primitive ancestors of earlier times.

Single copies of the pamphlet are free upon request. These are prices for bulk orders (postage and handling included):

<u>Quantity</u>	<u>Price per copy</u>
2 - 10	30¢ (U.S.)
11 - 100	25¢
101 - 500	20¢
501 - 1000	15¢
1000 - +	10¢

Write to: Andrew J. Verdon, Jr.  
 Director of Education,  
 American Geological Institute,  
 4220 King Street,  
 Alexandria, VA 22302,  
 U.S.A.

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## CONFERENCE ON GEOLOGICAL ASPECTS OF SITE INVESTIGATION

Organized jointly by The Geological Society of Hong Kong and Department of Geography and Geology, University of Hong Kong.

Dates: 17-19 December 1984

Venue: University of Hong Kong

Call for Papers

Topics to include - geological field mapping  
 soil and rock description  
 borehole logging  
 developments in drilling and testing  
 hydrogeological investigations  
 sedimentological investigations  
 geophysics  
 seismicity and earthquakes  
 aerial photograph interpretation  
 geology of Hong Kong  
 geochemical investigations

Abstracts of papers (300-500 words) should be sent to the Conference Secretary, GSHK, c/o Department of Geography and Geology, University of Hong Kong, Pokfulam Road, Hong Kong. Accepted papers will be required in full by 1st November, 1984.

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## MINING TECHNIQUES FOR ALLUVIAL TIN DEPOSITS - FINAL CIRCULAR

Organised by Southeast Asia Tin Research and Development (SEATRAD) Centre

Dates: 8-11 October 1984

Venue: Hotel Excelsior, Ipoh, Malaysia

Theme

The Southeast Asian alluvial tin industry has been using the same basic mining methods for decades. It is now timely that new innovations and modifications of existing methods be examined to meet the current problems in the tin industry. In the gravel pump sector, 2 major problems stand out namely, declining grades of ore being worked and high costs of energy for the mining operation. In the dredging sector, there is a need to design dredges of high capacity and for deep deposits, in view of the lower grade of ground being worked as well as the discovery of the deep alluvials.

Objective

The objective of the seminar is to provide an ideal international environment to discuss problems, exchange ideas and propose new improvements in dredging, gravel pump mining and other techniques employed in the mining of alluvial tin deposits in Southeast Asia.

Participation

Participants from all countries are invited to attend, especially miners, mining engineers, mine managers, equipment manufacturers, consultants, researchers and students. Each person wishing to attend the seminar should fill in the attached registration form and send it together with the registration fee.

Registration Fee

The registration fee for the seminar is M\$200. Payment of the fee will entitle registrants to:

- \* receive one set of preprints of the papers in one conference bag
- \* attend the technical sessions
- \* attend the mining exhibition
- \* receive the bound volume of the Proceedings

Bona fide students who register through their university professors will pay a subsidized fee of M\$50. The bound volume of the proceedings will not be given to students.

Payment should be made in bank draft in Malaysian Ringgit, payable to SEATRAD Centre. Please use one registration form per delegate only. Photocopied forms for additional delegates are acceptable.

#### Field Trip

Following the seminar a field trip will be organised to visit a dredge and gravel pump mine. The cost of the day trip plus a lunch pack is M\$15 per person.

#### Accommodation

Since all technical sessions and the exhibition will be held at Hotel Excelsior, arrangements for accommodation at the hotel have been made for participants at the following special rates:

Single room: M\$ 88.20 (nett)  
 Double room: M\$106.20 (nett)

#### Technical Papers

Dredge Performance Evaluation - W.K. George, Chow Choon Kung, Lai Kuan Fatt, Onn Peng Lam, R.W. Evans and Mohd. Wafa bin Abdul Rahman, Pernas Charter Management Sdn. Bhd., Malaysia.

Materials and Design Problems Associated with the Development of Larger Bucket Ladder Dredges - Hugh Muir, University of New South Wales, Australia.

Failure and Material Problems in Tin Mining Dredges - H.C. Qua, University of Malaya, Malaysia.

The Design and Use of Rolling Bearing for Bucket Dredgers on Top Tumbler and Ladder Support - Leif-Lewinschal, SKF Goteborg, Sweden and Loo Kee Seng, SKF Southeast Asia (Pte) Ltd., Singapore.

Some Important Problems in Offshore Mining - Sj. Arifin Harahap, P.T. Tambang Timah (PERSERO), Indonesia.

Some Dredging Innovations in Alluvial Tin Mining Operations - W.P. Cross, Malaysia Mining Corporation Berhad, Malaysia.

The Underwater Bucket Wheel Excavator - A Review of its Development at Ellicott and its Application to Tin Mining - A.W.K. McDowell, Ellicott Machine Corporation International, U.S.A.

Hydrological, Geotechnical and Environmental Implications of the use of BWEs in Deep-seated Alluvial Tin Deposits - Rudolf Voigt and Peretti, RHEINBRAUN-Consulting GmbH, Federal Republic of Germany.

Trends in Tin Mining of On-Land Alluvial Deposits in Thailand - Somkiat Pootongchairit and Vinai Khoo-Aroon, Department of Mineral Resources, Thailand.

Some Essential Aspects of the Geological Characters of Various Secondary Tin Deposits - A Guide for Mining Operations - Sutedjo Sujitno and Sundrijo Sunhardi, P.T. Tambang Timah (PERSERO), Indonesia.

- Mining Techniques for Operating a Gravel Pump Mine on Dredged-Out Land - Hew See Tong, All-Malaya Chinese Mining Association, Malaysia.
- Energy Cost in Tin Gravel Pump Mining - Case Study: South Thailand - Pairat Sanguansai, Prince of Songkla University, Thailand.
- Improvement of Efficiency of Gravel Pump Mining Operations By On-line Pulp Density Monitoring - Vichit Boonrasri and Abdullah Hasbi bin Haji Hassan, SEATRAD Centre and Khor Peng Seong, Mines Research Institute of Malaysia.
- Gravel Pump Tin Mining with Various Stripping Methods at P.T. Koba Tin - Tresna Widya, P.T. Koba Tin, Indonesia.
- Time for Adventurous Innovations in the S.E. Asian Alluvial Tin Mining Industry? - John C. Rogers, General Petroleum & Mining Organisation, Saudi Arabia.
- Some Aspects of Ground Stability Design in Gravel Pump Tin Mines - H. Hussin, Mines Research Institute of Malaysia, Malaysia.
- Batu Besi Mechanical Mine - An Overview and Discussion - M. Harsono, P.T. Tambang Timah (PERSERO), Indonesia.
- Pemali Tin Open-Pit Mining, A. Komar - P.T. Tambang Timah (PERSERO), Indonesia.
- Fine Grained Cassiterite Treatment using Spiral Plant - Darusman, P.T. Tambang Timah (PERSERO), Indonesia.
- Some Prospects of Application of Spiral Technology in Alluvial Tin Mining - Hoh Chee Fun and Chan Yew Kee, Malaysia Mining Corporation Berhad, Malaysia.
- Rehabilitation and Management of Mined-Out Lands in Peninsular Malaysia - Mohamad Ali Hasan, University of Malaya, Malaysia and Mohd. Zuhudi Hj. Muda, Malaysia Mining Corporation Berhad, Malaysia.

#### Exhibition

An exhibition on mining equipment and services will be held in conjunction with the seminar at the same venue.

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## EIGHT SOUTHEAST ASIAN GEOTECHNICAL CONFERENCE - BULLETIN 2

Kuala Lumpur, Malaysia.

March 11-15, 1985.

#### Introduction

The Conference, organised by the Institution of Engineers, Malaysia and the Southeast Asian Geotechnical Engineering Society, is the Eighth in the series of Southeast Asian Conferences. The first Southeast Asian Conference was held in Bangkok in 1967; the second in Singapore in 1970; the third in Hong Kong in 1972; the fourth in Kuala Lumpur in 1975; the fifth in Bangkok in 1977; the sixth in Taipei in 1980; and the seventh in Hong Kong in 1982.



The object of the Conference is to provide a forum where engineers and scientists engaged in Geotechnical Engineering may exchange information and ideas.

#### Conference Themes

The conference themes are Nearshore and Offshore Engineering, and Foundation for Highrise Structures. Papers on Foundations in Limestone areas and on other areas of Geotechnical Engineering relevant to the Southeast Asian region will be welcome.

#### Conference Centre

The Conference will be held from March 11th to 15th, 1985 at the Subang View Hotel located along the Federal Highway, approximately 6 km from the Airport and 20 km from Kuala Lumpur city.

#### Official Language

The official language of the Conference will be English.

#### Opening & Keynote Addresses

The opening Address titled: "Site Investigation and Foundation Decisions for Offshore Structures" will be delivered by Prof. V.F.B. de Mello, President I.S.S.M.F.E.

The Keynote Address titled: "The Design and Construction of High Embankments on Soft Clay" will be presented by Tan Sri Prof. Chin Fung Kee, Vice President for Asia, I.S.S.M.F.E.

#### Special Lectures

Five Special Lectures related to Geotechnical practice and problems of the five member nations will be presented:

"Soil Improvement Techniques for Foundation Treatment in Taiwan" by Dr. Za' Chieh Moh

"Landslides in Hong Kong" by Dr. E.W. Brand

"Geotechnical Problems related to Resource Development in Thailand" by Prof. A.S. Balasubramaniam

"Foundation Problems in Limestone Areas" by Dr. W.H. Ting

"Some Developments in Ground Improvement" by Prof. S.L. Lee

#### Papers

About 46 papers have been tentatively accepted. Notes for the preparation of papers and requests for the submission of the final manuscripts have been sent to the authors of selected papers.

#### Registration Fees

Registration fees for the Conference are as follows:\*

##### (a) Conference Participants

Registration before 31st December 1984

M\$400.00 (Four Hundred Malaysian Ringgit) per person;

Registration after 31st December 1984

M\$500.00 (Five Hundred Malaysian Ringgit) per person.

The Participant is entitled to one set of the Conference Proceedings, entrance to all technical sessions, official lunches, dinners and receptions.

- (b) Student Members of the Institution of Engineers, Malaysia  
M\$150.00 (One Hundred and Fifty Malaysian Ringgit) per person.

The Registration fee for Student Members entitles the Student to one set of the Conference Proceedings and entrance to all technical sessions only.

- (c) Accompanying Persons

M\$100.00 (One Hundred Malaysian Ringgit) per person.

The Registration fee for Accompanying Persons entitles the person to attendance at the official receptions and some of the activities of the "Ladies Programme".

### Proceedings

One bound set of papers presented at the Conference (Volume I) will be distributed to the participants at the time of the Conference. A second bound set containing the Opening and Keynote Address, the Special Lectures and discussions at the Conference (Volume II) will be posted to the participants after the Conference by ordinary surface mail.

Additional bound copies of the Proceedings may be purchased for the sum of M\$400.00 (Four Hundred Malaysian Ringgit) per set of the Proceedings comprising Volume I and Volume II inclusive of postage by surface mail. Those wishing to purchase the Proceedings only are to fill Form SEAGC-5.

### Correspondence

All Correspondence relating to the Conference shall be addressed to:

The Hon. Secretary,  
8th SEAGC,  
The Institution of Engineers, Malaysia,  
P.O. Box 223,  
Petaling Jaya,  
Selangor,  
MALAYSIA.

Cable: INSTEM PETALINGJAYA  
Telex: MA 30160  
Telephone Nos: 03-569173, 03-569575

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## 12TH WORLD MINING CONGRESS

New Delhi, India, 19-23 November, 1984.

The 12th World Mining Congress will take place in conjunction with an International Mining Machinery Exhibition, Nov. 21-28. The theme of this year's World Mining Congress is: Optimal Exploitation of Solid Mineral Resources - Challenges and Constraints. The sub-themes are:

1. Transformation of Resources into Reserves through Improvements in Mining Technology and Resources Appraisal Methods;

2. Improved Mineral Resources Recovery through Exploitation Techniques in Coal, Metal and Non-Metal Mining including Mining of Ore-Bodies under Adverse Geological Conditions;
3. Conservation of Mineral Resources including Solid Fuels;
4. International Exchange of Experience in the Development of Mineral Resources through Improvements in Mining Technology and Evolution of a Mineral Policy.

There will also be three round table discussions, in addition to the presentation of the technical papers. The topics of these are:

Education and Training of Mining Cadres;  
 Role of Small-Scale Mining;  
 Special Questions of Mining Technology  
 and Safety in Mines.

Registration fee is U.S.\$300 per Delegate and U.S.\$150 for each accompanying person. In order to submit a paper the applicant must send two copies to the Indian Organizing Committee and one copy to the General Secretariat in Warsaw. The main address of communication is:

Organising Secretary,  
 12th World Mining Congress,  
 The Institution of Engineers (India),  
 8 Gokhale Road, Calcutta 700 020,  
 INDIA.

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## SENARAI EJAAN RUMI BAHASA MALAYSIA DBP

Untuk membantu orang ramai mendapatkan ejaan kata yang betul, Dewan Bahasa dan Pustaka (DBP) telah menyusun dan menerbitkan risalah Senarai Ejaan Rumi Bahasa Malaysia bagi kata-kata yang banyak variasinya dalam ejaan lama, berdasarkan Daftar Ejaan Rumi Bahasa Malaysia (DBP, 1981).

Bersama-sama ini kita mencetak semula Bahagian II buku baru ini untuk anda. Bahagian I mengenai 'Senarai Kata Umum yang sering dieja salah' akan diterbitkan di dalam WARTA GEOLOGI Vol. 10, No. 4.

**GUNAKAN  
 BAHASA MALAYSIA  
 YANG BETUL  
 DALAM SEMUA URUSAN  
 RASMI KERAJAAN**

# SENARAI EJAAN RUMI BAHASA MALAYSIA DBP

## BAHAGIAN II

### EJAAN SALAH → EJAAN BETUL

Berikut ini disenaraikan kata yang sering dieja salah dengan rujukannya kepada ejaan yang betul.

agen (wakil penjual) → ejen	awit → awet
aiduladha → aidiladha	bagini → begini
aidulfitri → aidilfitri	bagitu → begitu
ajenda → agenda	bahru → baharu/baru
ajensi → agensi	bahtera → bahtera
akitek → arkitek	bandar raya → bandaraya
alat tulis → alatulis	barang/barungan → barang/ barongau.
ampang/ampangan → em- pang/empangan	beda → beza
anggerak → anggerik	bengkerap → bankrap
anggrek → anggerik	benteras → banteras/berantas
anggrik → anggerik	berek ( <i>Jg. brake</i> ) → brek
anih → aneh	beruntak → berontak
anika → aneka	bharu → baharu/baru
arina → arena	biar pun → biarpun
atau pun → ataupun	binte → binti
	biologi → biologi
	bolih → boleh

bonos → bonus	dinamis → dinamik
boroh (pekerja) → buruh	disel → diesel
bumiputra → bumi- putera	diwasa → dewasa
buruh → buruh	driber → drebar
busjeket → busjaket	durhaka → derhaka
calun → calon	ejenda → agenda
catet → catat	ejensi → agensi
catit → catat	ekspot → eksport
cemooh → cemuh	estetis → estetik
cendera mata → cen- deramata	faktur → faktor
citak → cetak	fardhu → fardu
coba → cuba	fokas → fokus
cocok (tusuk) → cu- cuk	forum → forum
cokelat → coklat	gabener → gabenor
colek (melarikan) → culik	gabnur → gabenor
cucok (sesuai) → co- cok	garisen → garison
cucok (tusuk) → cucuk	garuda → geroda
cucuk (sesuai) → cocok	gelujuh → gelojoh
dailog → dialog	gelumbang → gelombang
definasi → definisi	gembeleng → gembhng
deligasi → delegasi	gembeling → gembheng
depo → depot	geraf → graf
depoh → depot	gerafik → grafik
deraf → draf	gered → gred
derama → drama	geris → gris
derebar → drebar	gerisen → garison
difinasi → definisi	gulong → gulung
difinisi → definisi	gundul → gondol
	hafal → hafaz
	hafas → hafaz
	heran → hairan
	hewan → haiwan

hidrogen → hidrogen	jenderal → jeneral
hipotisis → hipotesis	jenerasi → generasi
honorarium → honorarium	jeografi → geografi
hurmat → hormat	jeoloji → geologi
idap → hidap	jeometri → geometri
ide → idea	jernal → jurnal
idiladha → aidiladha	jinnasium → gimnasium
idilfitri → aidilfitri	jinmastik → gimnastik
iduladha → aidiladha	jumaah → jemaah
idulfitri → aidilfitri	justru → justeru
igama → agama	kaban → karbon
ilustrasi → ilustrasi	kagit → kaget
imajinasi → imaginasi	kalau pun → kalupun
impot → import	kaling → kaleng
indasteri → industri	kamsin → komisen
industri → industri	karena → kerana
injin → enjin	katrij → kartrij
inspektar → inspektor	kastad → kastard
inspekter → inspektor	katun → kartun
institusi → institut	kawin → kahwin
insuran → insurans	kebel (dawai) → kabel
isiu → isu	keciwa → kecewa
istihar → isyihar	kedet → kadet
istirehat → istirahat	kelasik → klasik
istirihat → istirahat	kelinik → klinik
isya → isyak	kelompok → kelompok
jadwal → jadual	kemarin → kelmarin
jamaah → jemaah	kendara → kendera
jawaban → jawapan	kenekadan → kenekatan
jeket → jaket	keratan → keraton
jembatan → jambatan	kereta api → keretapi
jempul → jempol	kerinting (ikal) → ke- ringing
keritik → kritik	lancung (bersiar-siar) → lancong
kerna → kerana	lapur → lapor
keset → kaset	lebel → label
kewajiban → kewajipan	lembab → lembap
kiju → keju	letrik → elektrik
klas → kelas	lincin → licin
kobes → kubis	lomor → lumur
kobis → kubis	majallah → majalah
komidi → komedi	majisteret → majistret
komini → komunis	maksima → maksimum
komplek → kompleks	mansukh → mansuh
kondakter → konduktor	mantra → mantera
kondaktor → konduktor	margasatwa → mergastua
kongkerit → konkrit	marhain → marhaen
konterek → kontrak	masalah → masalah
kontrek → kontrak	mas'alah → masalah
kontrekter → kontrak- tor	mastika → mestika
kontrektor → kontrak- tor	masyhor → masyhur
kopon → kupon	masyur → masyhur
koram → kuorum	matalamat → matlamat
korum → kuorum	mau → mahu
kota ( <i>Jg. quota</i> ) → kuota	menafaat → manfaat
kreatif → kreatif	menasabah → munasabah
kuayar → koir	mentera → mantera
kuncu → konco	merin → marin
lafal → lafaz	mertabak → martabak
lafas → lafaz	meski pun → meskipun
lakun → lakon	minima → minimum
lalu lintas → lalulintas	mistri → misteri
lalu-lintas → lalulintas	muhibbah → muhibah
	munafaat → manfaat

murtabak → martabak  
 musik → muzik  
 mustika → mestika  
 naskah → naskhah  
 nenas → nanas  
 nitrogen → nitrogen  
 obat → ubat  
 odit → audit  
 auditorium → auditorium  
 oksigen → oksigen  
 oksigen → oksigen  
 olih → oleh  
 opereter → operator  
 organisme → organisma  
 otobiografi → autobiografi  
 otograf → autograf  
 otograf → autograf  
 otomatik → automatik  
 otomatis → automatik  
 otonomi → autonomi  
 overderaf → overdrat  
 paham → faham  
 pampir → pamer  
 pamur → pamor  
 panin → panen  
 pantomin → pantomim  
 paspot → pasport  
 pehak → pihak  
 pelastik → plastik  
 pelatun → platun  
 pelayar → playar

siviks → sivik  
 skandal → skandal  
 statis → statik  
 stesyen → stesen  
 strateji → strategi  
 sutra → sutera  
 suwasta → swasta  
 syed → sayid  
 taligraf → telegraf  
 taligram → telegram  
 talikom → telekom  
 talipon → telefon  
 taliskop → teleskop  
 talivisyen → televisyen  
 tamaddun → tamadun  
 tau → tahu  
 taugeh → tauge  
 taukeh → tauke  
 tauladan → teladan  
 telex → teleks  
 tiket → tiket

pelupur → pelopor  
 pelusuk → pelosok  
 pendita → pendeta  
 penjawaban → penjawapan  
 perabut → perabot  
 peramugara → pramugara  
 peramugari → pramugari  
 perebet → prebet  
 pereksa → periksa  
 perintah → perintah  
 pergawan → peragawan  
 pergawati → peragawati  
 permaidani → permaidani  
 perofail → profil  
 perojek → projek  
 peroses → proses  
 persona → pesona  
 pesaka → pusaka  
 pestol → pistol  
 petroliam → petroleum  
 pikir → fikir  
 plan → pelan  
 plet → plat  
 pletfom → platform  
 polikelinik → poliklinik  
 populer → popular  
 pragawan → peragawan  
 pragawati → peragawati  
 praktik → praktis  
 praktikal → praktis

tekstail → tekstil  
 tempeh → tempe  
 thema → tema  
 teori → teori  
 tiori → teori  
 tisis → tesis  
 trajedi → tragedi  
 trajidi → tragedi  
 tulin → tulen  
 tunton → tuntun  
 tunton (melihat) → tonton  
 uang → wang  
 ugama → agama  
 ujud → wujud  
 urai (tidak terikat) → hurai  
 vokesyenal → vokasional  
 warong → warung  
 yaitu → iaitu  
 yunit → unit  
 zohor → zuhur

premium → premium  
 primiam → premium  
 profail → profil  
 profession → profesion  
 profesyen → profesion  
 profesyenal → profesional  
 putra → putera  
 putri → puteri  
 radin (gelaran) → raden  
 rahasia → rahsia  
 ra'i → rai  
 raksaksa → raksasa  
 rasaksa → raksasa  
 reket → raket  
 republik → republik  
 resmi (sah) → rasmi  
 rihaht → rehat  
 rojok → rujuk  
 romantis → romantik  
 rujok → rujuk  
 rusak → rosak  
 sabersif → subversif  
 subjektif → subjektif  
 sabsidi → subsidi  
 sabversif → subversif  
 sadin → sardin  
 saikologi → psikologi  
 saikoloji → psikologi  
 samsing → samseng  
 samudra → samudera  
 saperti → seperti

sastra/susastra → sastera/susastera  
 sasualu → sesuatu  
 satai → sate  
 satay → sate  
 sateh → sate  
 satria/kesatria → sateria/kesateria  
 sebok → sibuk  
 sehat → sihat  
 sekalian → sekalian  
 sekerip → skrip  
 sekeru → skru  
 sekim → skim  
 selesma → selesema  
 selinder → silinder  
 selsema → selesema  
 semerta → serta-merta  
 semuga/muga-muga → semoga/moga-moga  
 serbanika → serbaneka  
 sertamerta → serta-merta  
 setesen → stesen  
 setesyen → stesen  
 setok → stok  
 setor → stor  
 sibar → sebar  
 sikologi → psikologi  
 sikoloji → psikologi  
 siksa → seksa  
 simak → semak  
 simbolis → simbolik  
 sinarai → senarai

## KURSUS-KURSUS LATIHAN DAN BENGKEL-BENGKEL (TRAINING COURSES AND WORKSHOPS)

July 31 - August 1984

FISSON TRACK DATING (Workshop), Troy, New York, U.S.A. (Donald S. Miller, Department of Geology, Rensselaer Polytechnic Institute, Troy, NY 12181).

August 1984 - June 1986

SOIL SCIENCE AND WATER MANAGEMENT (Wageningen, The Netherlands). Two-year M.Sc. course designed for B.Sc. graduates from developing countries. English. For information: Director of Studies of the M.Sc. course in Soil Science and Water Management, P.O. Box 37, 6700 AA Wageningen, The Netherlands.

August - October 1984

GEOLOGY AND GEOTECHNICS OF THE QUATERNARY SEDIMENTS. Co-sponsored by AGID (Bangkok, Thailand). Training program organized by the Asian Institute of Technology, Bangkok. For information: Dr. Prinya Nutalaya, AGID, Asian Institute of Technology, G.P.O. Box 2754, Bangkok 10501, Thailand.

September 1984 - November 1984

GEOTHERMAL ENERGY (Kyushu, Japan). Annual short course organized by the Government of Japan and sponsored by Unesco. English. For information: Japan International Cooperation Agency (2nd Training Division, Training Affairs Department), P.O. Box 216, Shinjuku Mitsui Building, 2 - 1, Nishi-shinjuku, Shinkuku-ku, Tokyo 160, Japan.

September 1984 - November 1985

MINING EXPLORATION AND EXPLORATION GEOPHYSICS (Delft, The Netherlands). Annual diploma courses organized by the International Institute for Aerial Survey and Earth Sciences and sponsored by Unesco. English. For information: ITC (ME), 3, Kanaalweg, 2628 Delft, The Netherlands.

September 3-7, 1984

CLASTIC TIDAL DEPOSITS, short course, Utrecht, the Netherlands. (Comparative Sedimentology Division, Institute of Earth Science, Budapestlaan 4, 3584 CD Utrecht)

October 1984 - November 1984

TECTONICS, SEISMOLOGY AND SEISMIC RISK ASSESSMENTS (Potsdam, G.D.R.). One-month training course organized annually by East German Academy of Sciences in collaboration with Unesco. English. For information: Prof. Dr. H. Kautzleben, Director, Central Earth's Physics Institute, Academy of Sciences of the German Democratic Republic, Telegraphenberg, DDR 1500 Potsdam, G.D.R.

October 1 - November 2, 1984

REMOTE SENSING: GEOLOGIC APPLICATIONS (Flagstaff, Arizona, U.S.A.). Advanced training program for foreign scientists organized by U.S. Geological Survey. English. For information: U.S. Geological Survey Training Center, 917 National Center, Reston, Virginia 22092, U.S.A.

October 1984 - September 1985

FUNDAMENTAL AND APPLIED QUATERNARY GEOLOGY (Brussels, Belgium). Annually organized training course leading to a Master's degree in Quaternary Geology by the Vrije Universiteit Brussel (IFAQ) and sponsored by Unesco. English and French. For information: Prof. Dr. R. Paepe, Director of IFAQ, Kwartairgeologie, Vrije Universiteit Brussel, Pleinlaan 2, B-1050, Brussels, Belgium.

October 1984 - September 1985

HYDRAULIC ENGINEERING AND HYDROLOGY (Delft, The Netherlands). Diploma courses organized annually by the International Institute for Hydraulic and Environmental Engineering and sponsored by Unesco for professionals from developing countries. English. For information: International Institute for hydraulic and Environmental Engineering (IHE), Oude Delft 95, P.O. Box 3015, 2601 DA Delft, The Netherlands.

October 8 - 12, 1984

BIOGEOCHEMICAL CYCLING OF S AND N IN REMOTE AREAS (NATO Workshop), St. Georges, Bermuda (J.N. Galloway, Environmental Studies Dept., University of Virginia, Charlottesville, VA 220903, U.S.A.).

November 1984 - December 1984

METHODS AND TECHNIQUES IN EXPLORATION GEOPHYSICS (Hyderabad, India). Diploma course organized annually by the National Geophysical Research Institute of the Council of Scientific and Industrial Research, Hyderabad, India, and sponsored by Unesco. English. For information: The Director, International Training Course on methods and techniques in geophysical exploration, National Geophysical Research Institute, Hyderabad, 500 007 (A.P.) India.

November 1984 - December 1984

SMALL MINE POTENTIAL AND TECHNOLOGY (Leoben, Austria). Annual training course sponsored by the Republic of Austria and Unesco. English. For information: Prof. Wolfbauer, Forschungsgesellschaft Joanneum, Roseggerstrasse 15, A-8700 Leoben, Austria.

November 12 - 30, 1984

RURAL HYDROGEOLOGY AND HYDRAULICS IN FISSURED BASEMENT ZONES (Workshop), Roorkee, India. (Prof. B.B.S. Shinghal, Department of Earth Sciences, University of Roorkee, Roorkee 247667, India)

November 15 - 17, 1984

MINERAL POLICY FOR SMALL-SCALE MINING (Workshop), New Delhi, India. Cosponsored by AGID in conjunction with World Mining Congress. (Co-ordinator, Regional Mineral Resources Development Centre, P.O. Box 19, Bandung, Indonesia)

January 1985 - March 1985

REMOTE SENSING APPLICATION AND DIGITAL IMAGE PROCESSING (Enschede, The Netherlands). Certificate courses on techniques for national resources surveys, organized annually by the International Institute of Aerial Surveys and Earth Sciences (ITC). Sponsored by Unesco. English. For information: ITC Student Affairs Office, P.O. Box 6, 7500 AA Enschede, The Netherlands.

February 1985

METALLOGENY (Quito, Ecuador). Annual training course for Latin Americans organized by Central University of Quito, the Autonomous University of Madrid (Spain), and Unesco. Spanish. For information:

Ing. Antonio Salgado, Director, Curso Internacional de Metaloginia, Escuela de Ingenieria en Geologia, Minas y Petroleos, Division de Post-grado, Universidad Central, Quito, Ecuador.

February 1985 - March 1985

GEOCHEMICAL PROSPECTING TECHNIQUES (Tervuren, Belgium). Annual course sponsored by the Royal Museum of Central Africa and UNDP. French. For information: Musee royal de l'Afrique centrale, Steenveg op Leuven, 13, B-1980 Tervuren, Belgium.

February 1985 - June 1985

MINERAL EXPLORATION (Leoben, Austria). Diploma course organized annually by the University of Mining and Metallurgy in Leoben and sponsored by Unesco. English. For information: University for Mining and Metallurgy, Postgraduate course on mineral exploration, Montanuniversitat, Leoben, A-8700, Austria.

February 1985 - November 1985

PHOTOINTERPRETATION APPLIED TO GEOLOGY AND GEOTECHNICS (Bogota, Colombia). Course organized by the Interamerican Centre of Photo-interpretation (CIAF) in cooperation with ITC and Unesco. Spanish. For information: Academic Secretariat of the CIAF, Apartado Aereo 53754, Bogota 2, Colombia.

February 1985 - December 1985

GEO THERMICS (Pisa, Italy). Certificate course organized annually by the Istituto Internazionale per le Ricerche Geotermiche and sponsored by Unesco, UNDP and Italy. English. For information: Dr. Mario Fanelli, Istituto Internazionale per le Ricerche Geotermiche, Via Buongusto 1, 56100 Pisa, Italy.

March 1985 - April 1985

MINERAL EXPLORATION (Paris, France). Short course based on a simulation method organized annually by the Ecole Nationale Superieure des Mines and sponsored by Unesco. French. For information: Prof. H. Pelissonnier, Ecole des Mines, 60 Bd Saint Michel, 75272 Paris, Cedex 06, France.

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## KALENDAR (CALENDAR)

A bracketed date (Mar-Apr 1984) denotes entry in that issue carried additional information.

1984

- September : INTERGLACIAL MARINE DEPOSITS, PAST AND PRESENT (Symposium), Schleswig-Holstein, F.R.G. Sponsored by INQUA. (Dr. H. Streiff, Niedersächs, Landesamt für Bodenforschung, Postfach 51 01 52, D-3000 Hannover 51, F.R.G.)
- Sept 2 - 7 : SNOW AND ICE PROCESSES AT THE EARTH'S SURFACE (Symposium), Sapporo, Japan. (Mrs. H. Richardson, Secretary General, International Glaciological Society, Lensfield Road, Cambridge CB2 1ER, U.K.)
- Sept 3 - 5 : DYNAMIC SOIL STRUCTURE INTERACTION (International Symposium), Minneapolis, U.S.A. (International Symposium on Dynamic Soil-Structure Interaction, Department of Civil and Mineral Engineering, 500 Pillsbury Drive SE, University of Minnesota, Minneapolis, MN 55455, U.S.A.).
- Sept 3 - 6 : JURASSIC STRATIGRAPHY (IUGS Subcommission International Symposium), Erlangen, F.R.G. (Prof. Dr. A. Zeiss, Paläontol. Inst. Univ. Loewenichstrasse 28, D-8520 Erlangen, F.R.G.)
- Sept 3 - 6 : DESIGN AND PERFORMANCE OF UNDERGROUND EXCAVATIONS (International Symposium), London, U.K. (Miss Y. Brooks, ISRM 1984 Symposium Conference Office, Institution of Civil Engineers, Great George Street, Westminster, London SW1 JAA, U.K.)
- Sept 3 - 8 : EVOLUTION OF THE CALEDONIAN-APPALACHIAN OROGEN (Final Symposium of IGCP Project 27), Glasgow, Scotland. (A.L. Harris, The University of Liverpool, Jane Herdman Laboratories of Geology, Brownlow Street, P.O. Box 147, Liverpool L69 3BX, U.K.)
- Sept 6 - 9 : MEDITERRANEAN NEOGENE, MARINE MEGAFUNAL PALAEO-ENVIRONMENTS, AND BIOSTRATIGRAPHY (Interim Colloquium, RCMN), Athens, Greece. (Prof. E. Georgiades-Dikeoulia, Laboratory of Stratigraphy and Palaeontology, Athens University, Panepistimiopolis, Post Office Zografou, Athens 15701, Greece)
- Sept 6 - 11 : MESOZOIC TERRESTRIAL ECOSYSTEMS (Symposium), Stuttgart - Tübingen, F.R.G. Language: English. (Dr. Frank Westphal, Institut und Museum für Geologie und Paläontologie, Sigwartstrasse 10, D-7400 Tübingen 1, F.R.G.)
- Sept 10 - 12 : OCEANS 84 (Conference), Washington, D.C. (Oceans 84 Technical Program Committee, 1730 M St. NW, Suite 412, Washington, D.C. 20036, U.S.A.)
- Sept 10 - 14 : TITANIUM (5th International Conference), Munich, F.R.G. (Deutsche Gesellschaft für Metallkunde EV, Adenaueralle 21, D-6370 Oberursel 1, F.R.G.)

- Sept 11 - 12 : HABITAT OF PALAEOZOIC GAS IN NW EUROPE (Meeting), London, U.K. Geological Society-Petroleum Group (Geological Society, Burlington House, Piccadilly, London W1V 0JU, U.K.)
- Sept 11 - 15 : GEOLOGY OF BOLIVIA (2nd Congress), Cochabamba, Bolivia. Language: Spanish. (Secretary General, II Geological Congress of Bolivia, Casilla 183, Cochabamba, Bolivia)
- Sept 12 - 14 : DEGRADATION, RETENTION, AND DISPERSION OF POLLUTANTS IN GROUNDWATER (Seminar), Copenhagen, Denmark. (Erik Arvin, Department of Environmental Engineering, Building 115C, Technical University of Denmark, DK-2800 Lyngby, Denmark)
- Sept 12 - 14 : ALKALINE IGNEOUS ROCKS (Geological Society of London Symposium), Edinburgh, Scotland. (J.G. Fitton, Grant Institute of Geology, West Mains Road, Edinburgh EH9 33W, Scotland, U.K.)
- Sept 13 - 19 : DYNAMICAL AND CHRONOLOGICAL RELATIONS BETWEEN GLACIAL AND PERIGLACIAL DEPOSITS (Annual Meeting INQUA Subcommission on European Quaternary Stratigraphy), Besancon, France. (Dr. Michel Campy, Labo de Géologie Historique, Institut des Sciences Naturelles, Place Leclerc, F-25030 Besancon, France)
- Sept 14 - 16 : GEOLOGY AND GENESIS OF MINERAL DEPOSITS IN IRELAND (International Conference), Dublin, Ireland. (J. Ashton, Tara Mines Geology Dept., Knockumber, Co. Meath, Ireland)
- Sept 16 - 22 : LANDSLIDES (4th International Symposium), Toronto, Canada. Sponsored in part by IAEG. (Mr. J.L. Seychuk, Chairman, Organizing Committee, ISL/84, P.O. Box 370, Station A, Rexdale, Ont., Canada M9W 5L3)
- Sept 17 - 20 : AQUATECH '84. (12th International Congress), Amsterdam, The Netherlands. Sponsored by the International Association for Water Pollution Research. (IAWPR, Alliance House, 29/30 High Holborn, London WC1V 6BA, U.K.)
- Sept 20 - 25 : RECENT ADVANCES IN PETROLEUM EXPLORATION AND DEVELOPMENT (Meeting), Beijing, P.R. China. Co-sponsored by CPEMRC and Chinese Petroleum Geology Society, (R.J. Foster, BHP Petroleum, G.P.O. Box 1911R, Melbourne, 3001 Australia)
- Sept 23 - 28 : TRANSPORT PROCESSES IN FRACTURE ROCK (Penrose Conference), Park City, Utah. (L.J. Smith, Dept. of Geological Sciences, Univ. of British Columbia, Vancouver, B.C., Canada V6T 2B4)
- Sept 24 - 28 : ASSESSMENT OF SOIL SURFACE SEALING AND CRUSTING (International Symposium), Ghent, Belgium. Language: English. (Organizing Committee, International Conference, Department of Soil Physics, State University of Ghent, Coupure Links 653, 9000 Ghent, Belgium)

- Sept 24 - 28 : ICSU (20th General Assembly), Ottawa, Canada. (K. Charbonneau, Conference Office, National Research Council, Ottawa, Canada K1A 0R6)
- Sept 25 : GLOBAL CHANGE (ICSU Symposium), Ottawa, Canada. (K. Charbonneau, Conference Office, National Research Council, Ottawa, Canada K1A 0R6)
- Sept 25 - 27 : FOSSIL ARTHROPODS AS LIVING ORGANISMS (International Symposium), Edinburgh, U.K. (Royal Society of Edinburgh, 22-24, George St., Edinburgh EH2 2PQ, U.K.)
- Sept 26 - 28 : SEDIMENTATION IN THE AFRICAN RIFT SYSTEM (Geological Society Meeting), London, U.K. (L.E. Frostick, Dept. of Geology, Birkbeck College, 7/15 Gresse Street, London W1P 1PA. U.K.)
- Sept 30 - Oct 6 : LATE QUATERNARY SEA-LEVEL CHANGES AND COASTAL EVOLUTION (International Symposium and Field Meeting), Argentina and Chile. IGCP-200 and INQUA Commission on Quaternary Shorelines. (Dr. Enrique Schnack, International Sea-level Symposium, Casila 722, Correo Central, 7600 Mar del Plata, Argentina)
- Oct 1 - 5 : SCIENTIFIC COMMITTEE ON ANTARCTIC RESEARCH (18th Meeting), Bremerhaven, F.R.G. (G. Hemmen, Scott Polar Research Institute, Lensfield Road, Cambridge, U.K. CB2 1ER)
- Oct 1 - 5 : REMOTE SENSING OF ENVIRONMENT (18th International Symposium), Paris, France. (Environmental Research Institute of Michigan, P.O. Box 8618, Ann Arbor, MI 48107, U.S.A.)
- Oct 1 - 6 : CENTRAL ANDEAN TECTONICS (Symposium), La Paz, Bolivia. (Secretaria, Commission National de Estudios Geofisicos, Casilla 5939, La Paz, Bolivia)
- Oct 5 : WATER RESOURCES PLANNING AND MANAGEMENT (International Conference), Athens, Greece. (Prof. A. Aureli, Via Cimarosa 10, 95124 Catania, Italy)
- Oct 7 - 12 : BUENOS AIRES COASTAL PLAIN - NORTH PATAGONIA COAST (Field Meeting), Mar del Plata, Argentina. INQUA Shorelines Commission. (Dr. Enrique Schnack, Casilla 722, Correo Central, RA - 7600 Mar del Plata, Argentina)
- Oct 8 - 11 : MINING TECHNIQUES FOR ALLUVIAL TIN DEPOSITS (International Seminar), Ipoh, Malaysia. (The Director, SEATRAD Centre, Tiger Lane, Ipoh, Malaysia)
- Oct 8 - 10 : ASSOCIATION OF EARTH SCIENCE EDITORS (Annual Meeting), Portland, Oregon, U.S.A. (Beverly Vogt, Oregon Department of Geology, 1005 State Office Building, Portland, OR 97201, U.S.A.)
- Oct 9 - 14 : IN SITU SOIL AND ROCK REINFORCEMENT (International Conference), Paris, France. (Conference Director, ENPC/DFCAI, 52, rue Madame, 75006 Paris, France)
- Oct 13 - 16 : ORIGIN OF THE MOON (Topical Conference). Kona, Hawaii. (P. Jones, LPI, 3303 NASA Road One, Houston, TX 77058, U.S.A.)

- Oct 14 - 20 : MINERAL PROCESSING AND EXTRACTIVE METALLURGY.  
(International Conference), Kunming, P.R. China.  
(The Secretary, Institution of Mining and Metallurgy,  
44 Portland Place, London W1N 4BR, U.K.)
- Oct 15 - 17 : SINKHOLES (1st Multidisciplinary Conference),  
Orlando, Florida, U.S.A. (College of Extended  
Studies, University of Central Florida, Orlando,  
Fl 32816)
- Oct 15 - 18 : LATIN AMERICAN CONGRESS OF PALAEONTOLOGY (3rd  
Congress), Oaxtepec, Morelos, Mexico. (Dr. Jose C.  
Guerrero, Universidad Nacional Autonoma de Mexico,  
Mexico D.F., Mexico)
- Oct 17 - 20 : AMERICAN ASSOCIATION OF STRATIGRAPHIC PALYNOLOGISTS  
(Annual Meeting and Field Trip), Arlington,  
Virginia, U.S.A. (N.O. Frederiksen, U.S. Geological  
Survey, M.S. 970, Reston, VA 22092, U.S.A.)
- Oct 21 - 25 : SOCIETY OF EXPLORATION GEOPHYSICISTS (54th Annual  
Meeting), Denver, Colorado, U.S.A. (H. Breck,  
Society of Exploration Geophysicists, P.O. Box  
3098, Tulsa, OK 74101, U.S.A.)
- Oct 24 - 26 : NATURE OF THE LOWER CONTINENTAL CRUST (Joint  
Meeting Geological Society of London with 3rd Alfred  
Wegener Conference), London. Co-sponsored by  
ILP. (Prof. J.B. Dawson, Department of Geology,  
The University, Sheffield, S1 3JD, England, U.K.)
- Oct 25 - : GEOLOGY OF TIN DEPOSITS (International Symposium),  
Nov 5 Nanning City, Guangxi Zhuang Autonomous Region,  
P.R. China. (Mr. Zhang Sihui, Chinese Academy of  
Geological Sciences, Baiwanzhuang Road 26,  
Fuchengmenwai, Beijing, People's Republic of China)
- Oct 29 - : INTERNATIONAL WATER SUPPLY ASSOCIATION (15th  
Nov 2 International Congress), Tunis, Tunisia. (R. Clark,  
International Water Supply Association, 1 Queen  
Anne's Gate, London SW1H 9BT, U.K.)
- Oct 31 - : SEISMOLOGY AND PHYSICS OF THE EARTH'S INTERIOR  
Nov 7 (Regional Assembly of the International Association),  
Hyderabad, India. Plus short course for developing  
countries on inversion of geoscience data. Co-  
sponsored in part by ILP. (Organising Committee,  
IASPEI Regional Assembly, National Geophysical  
Research Institute, Hyderabad 500 007, India)
- November/  
December : LAND EVALUATION FOR SOIL EROSION HAZARD ASSESSMENT  
(Meeting), Enschede, Netherlands. (Dr. W.G.  
Sombroek, ISSS, International Soil Museum, 9  
Duivendaal, POB 353, 6700 A.J. Wageningen, The  
Netherlands)
- Nov 5 - 8 : GEOLOGICAL SOCIETY OF AMERICA (Annual Meeting),  
Reno, Nevada, U.S.A. (S.S. Beggs, Geological  
Society of America, P.O. Box 9140, 3300 Penrose  
Place, Boulder, CO 80301, U.S.A.)

- Nov 5 - 9 : ARGENTINE GEOLOGICAL CONGRESS (9th), Bariloche, Argentina. Field trips. Languages: Spanish, English, and French. (IX Congreso Geologico Argentino, Maipu 645 Piso 1, 1006 Buenos Aires, Argentina)
- Nov 13 - 15 : OPHIOLITES THROUGH TIME (Conference), Nancy, France. (J. Desmons, University de Nancy I, Lab. de Petrologie, B.P. 239, F-54506 Vandoeuvre-les-Nancy Cedex, France)
- Nov 19 - 23 : 12th WORLD MINING CONGRESS, New Delhi, India. (Organizing Committee, Institute of Engineers, 8 Gokhale Road, Calcutta 700 020, India)
- Dec 2 - 5 : FUTURE PETROLEUM PROVINCES OF THE WORLD (AAPG W.E. Pratt Memorial Conference), Phoenix, Ariz., U.S.A. (AAPG, P.O. Box 979, Tulsa, OK 74101, U.S.A.)
- Dec 2 - 6 : SOCIETY OF EXPLORATION GEOPHYSICISTS (54th Annual Meeting), Atlanta, Georgia, U.S.A. (J. Hyden, SEG, Box 3098, Tulsa, OK 74101, U.S.A.)

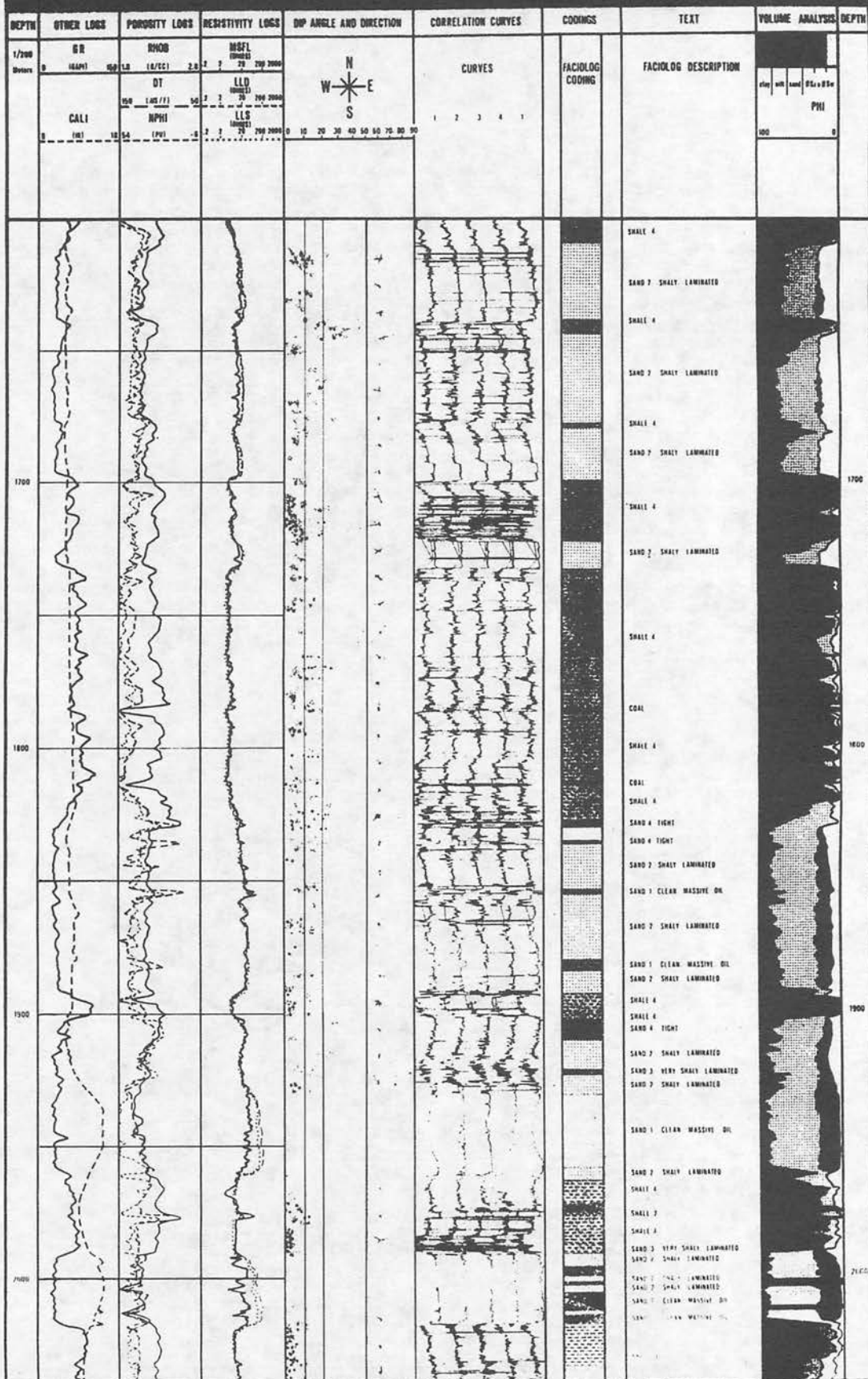
1985

- January : ACID-SULPHATE SOILS (Meeting), Dakar, Senagal. (Dr. W.G. Sombroek, ISSS, International Soil Museum, 9 Duivendaal, POB 353, 6700 A.J. Wageningen, The Netherlands)
- Jan 7 - 10 : HYDROGEOLOGY OF ROCKS OF LOW PERMEABILITY (17th International Congress of IAH), Tucson, Arizona, U.S.A. (Eugene S. Simpson, Department of Hydrology and Water Resources, College of Earth Sciences, The University of Arizona, Tucson, AZ 85721, U.A.A.)
- February : INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION ASSEMBLY (13th Session), Paris, France. (Unesco, 7, place de Fontenoy, 75700 Paris, France)
- Feb 11 - 14 : GEOMECHANICS IN TROPICAL LATERITE AND SAPROLITIC SOILS (1st International Conference), Sao Paulo, Brazil. (Dr. W.C. Hachich, Secretary ISTS-BMS, C.P. 7141, 01000 Sao Paulo, SP, Brazil)
- Feb 11 - 14 : ASIAN MINING '85 (2nd Conference), Manila Philippines. (Meeting Secretary, The Institution of Mining and Metallurgy, 44 Portland Place, London W1N 4BR, U.K.)
- Feb 27 - : GEOLOGY OF THE OCEANS (75th Annual Meeting of the  
Mar 2 Geologische Vereinigung), Kiel, West Germany. Languages: English and German. (M. Sarnthein, Geologisch-Palaeontologisches Institut, Universitaet, Olshausenstrasse, D-2300 Kiel, F.R.G.)
- Mar 11 - 15 : SE ASIAN GEOTECHNICAL CONFERENCE (8th), Kuala Lumpur, Malaysia. Language: English. (The Hon. Secretary, 8th SEAGC, The Institution of Engineers, Malaysia, P.O. Box 223, Petaling Jaya, Selangor, Malaysia).
- Mar 11 - 15 : TUNNELLING 85 (4th International Symposium), Brighton, England. (Tunnelling 85, The Secretary, Institution of Mining and Metallurgy, 44 Portland Place, London W1N 4BR, U.K.)

- Apr 1 - 4 : EUROPEAN UNION OF GEOSCIENCES (Biennial Conference),  
Strasbourg, France. (Organizing Committee,  
Department of Earth Sciences, University of Cambridge,  
Downing Street, Cambridge CB2 3EQ, U.K.)
- Apr 1 - 5 : NUMERICAL METHODS IN GEOMECHANICS (5th International  
Conference), Nagoya, Japan. (Prof. T. Kawamoto,  
Department of Civil & Geotechnical Engineering,  
Nagoya University, Chikusa, Nagoya 464, Japan)
- Apr 9 - 12 : EVOLUTION OF THE EUROPEAN LITHOSPHERE (MEGS 4:  
Meeting of European Geological Societies), Edinburgh,  
U.K. (Dr. S.K. Monro, Institute of Geological  
Sciences, Murchison House, West Mains Road,  
Edinburgh EH9 3LA, Scotland, U.K.)
- Apr 14 - 17 : PROSPECTING IN AREAS OF DESERT TERRAIN (Conference),  
Rabat, Morocco. (Conference Office, IMM, 44 Portland  
Place, London W1N 4BR, U.K.)
- Apr 28 - : GEOCHEMICAL EXPLORATION (11th International AEG  
May 1 Symposium), Toronto, Canada. (Dr. W.B. Coker, Kidd  
Creek Mines Ltd., 357 Bay St., Ste. 300, Toronto,  
Ontario, Canada M5H 1T7)
- May 6 - 17 : NEOGENE PHOSPHORITES OF THE SE UNITED STATES  
(International field workshop and seminar, IGCP 156),  
Greenville, N.C., to Tallahassee, Florida. (W.C.  
Burnett, Dept. of Oceanography, Florida State  
University, Tallahassee, FL 32306, U.S.A.)
- May 13 - 17 : TUNGSTEN (3rd International Symposium), Madrid.  
(Mr. M.R.P. Maby, Secretary, Primary Tungsten  
Association, 280 Earls Court Road, London SW5  
9AS, U.K.)
- May 15 - 17 : TURBIDITE-HOSTED GOLD DEPOSITS (International  
Symposium), Fredericton, New Brunswick, Canada.  
Symposium held with Geological Association of  
Canada Annual Meeting. (Simon J. Haynes, NOVA  
Scotia Department of Mines and Energy, P.O. Box  
1087, 1690 Hollis Street, Halifax, Nova Scotia,  
Canada B3J 2X1)
- May 27 - 31 : AMERICAN GEOPHYSICAL UNION (Spring Meeting),  
Baltimore, Md. (Meetings, AGU, 2000 Florida  
Avenue, NW, Washington, DC 20009, U.S.A.)
- May 27 - : CORAL REEF CONGRESS: Reef and Man (5th International),  
June 1 Papeete, Tahiti. (Antenne Museum Ephe, Congres  
Recifs Coral Liens 1985, B.P. 562, Papeete,  
Tahiti, French Polynesia)
- June 2 - 9 : INTERNATIONAL MINERAL PROCESSING CONGRESS (15th),  
Cannes, France. Languages French and English.  
(International Mineral Processing Congress Secretary,  
BRGM SGN/Mineralurgie, B.P. 6009-45060 Orleans  
Cedex, France)
- June 9 - 15 : WATER RESOURCES (5th World Congress), Brussels,  
Belgium. (Dr. L.W. Debacker, c/o Brussels  
International Conference Centre, Parc des Expositions,  
Place de Belgique, B-1020 Brussels, Belgium)

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# FACIOLOG



Wireline logging data is finding wider applications in sedimentology. This began with the study of log curve shapes to identify different depositional sequences. Recent developments have led to the use of logs to identify "electrofacies"—that is, a set of log responses that characterizes a sediment and distinguish it from others. The objective is to associate a certain type of lithofacies defined by core data with a set of log responses so that such a lithofacies can be identified in other wells without core data. This can also be used to guide the choice of interpretation model and in well to well correlations.

