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Published by the Geological Society of Malaysia, Department of Geology, University of Malaya, Kuala Lumpur 22-11 (Tel. 03-577036) - 30 July, 1984.
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.

**LEGEND**

- Quaternary
- Granitic rocks
- Major tin fields and occurrences
- Fault
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

<table>
<thead>
<tr>
<th>Period</th>
<th>BERUAS</th>
<th>TAIPING</th>
<th>KINTA VALLEY</th>
<th>NORTH</th>
<th>LUMUT - Dindings offshore</th>
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<tr>
<td>Simpang Formation</td>
<td>Gula Formation</td>
<td>Port Weld formation</td>
<td>Organic mud and peat</td>
<td>Young Alluvium</td>
<td>Younger Sedimentary Cover</td>
</tr>
<tr>
<td></td>
<td>(a) Upper clay member</td>
<td>(b) Lower sand member</td>
<td>Kerau formation</td>
<td>Young Alluvium</td>
<td>DISCONFORMATION</td>
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<td>Kulim Granite wash</td>
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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 fluviatile 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 fluviatile-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 fluviatile 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.
References


Manuscript received 1 November 1983.
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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BERITA PERSATUAN
(NEWS OF THE SOCIETY)

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Penolong Setiausaha Kehormat
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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.  
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.


11. Palaeomagnetism, geochronology and petrology of the dolerite dykes and basaltic lavas from Kuantan, West Malaysia - Haile et al.


13. Potential and properties of some rock aggregates in Sarawak - Denis Tan


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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GEOSEA V PROCEEDINGS

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MALAYSIA

GEOLOGICAL SOCIETY OF MALAYSIA
PETROLEUM GEOLOGY
SEMINAR '84
3–4th DECEMBER 1984

Please tick appropriate boxes.

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☐ I intend to present a paper at the above Seminar. The provisional title of the paper is

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Business Address: .........................................................

Type of Membership: ....................................................

PERSATUAN GEOLOGI MALAYSIA
Geological Society of Malaysia

PETROLEUM GEOLOGY
SEMINAR '84

Hotel Merlin, Kuala Lumpur
3–4th December 1984

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.

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. Outstation 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

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The following applications for membership were approved:

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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.

PERTAMBAHAN BARU PERPUSTAKAAN (NEW LIBRARY ADDITIONS)

The following publications were added to the Library:
4. Tectonic map of Asia & explanatory notes, '82.
 Geological Sciences, Chiang Mai Univ. 1983.
  5, 1984.
16. American Museum of Natural History, Bulletin. v. 1751 Article 4,
   1983.

*****

BERITA-BERITA LAIN
(OTHER NEWS)

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

3. Ch'ng Soo Chau - Geologi Kejuruteraan Batukapur Kuala Lumpur, Malaysia.
5. Jasmi Ab. Talib - Geologi Kejuruteraan Lebuhraya Timur-Barat, Km. 23 - Km. 34, Grik, Perak.
6. Kamal Roslan Mohamad - Geologi Struktur Lebuhraya Timur-Barat (km. 10 hingga km. 19.5 Dari Kuala Rui).
10. Md. Zaini Madi - Geologi Kejuruteraan Lebuhraya Timur-Barat, Km. 11.5 - Km. 23, Grik, Perak.
14. Mohd. Ashhari Muda - Geologi Kejuruteraan Lebuhraya Timur-Barat Km. 0 hingga 12, Grik, Perak.
20. Paulius Godwin @ Paulus - Stratigrafi dan Sedimentologi Kawasan Bandar Temerloh - Kerbau, Daerah Temerloh - Kerbau, Daerah Temerloh, Pahang.
23. Tan Yong Phang - Geologi Struktur Lebuhraya Timur-Barat (0.11 Km.) Grik, Perak.
24. Zulkifli Salleh - Geologi Struktur Lebuhraya 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):

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

*****

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
g eo l o g y o f H o n g K o n g
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:

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<td>M$ 88.20</td>
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Technical Papers


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.


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.


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.


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.

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;


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**


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.
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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, Rensselar 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 1984 - 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

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
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


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 Ingeniería en Geología, Minas y Petróleos, División de Post-grado, Universidad Central, Quito, Ecuador.

February 1985 - March 1985

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
GEOTHERMICS (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

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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 - 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 MEGAFAUNAL PALEOENVIRONMENTS, AND BIOSTRATIGRAPHY (Interim Colloquium, RCMN), Athens, Greece. (Prof. E. Georgiades-Dikeoulia, Laboratory of Stratigraphy and Palaeontol-, Athens University, Panepistimiopolis, Post Office Zografou, Athens 18701, Greece)

Sept 6 - 11 : MESOZOIC TERRESTRIAL ECOSYSTEMS (Symposium), Stuttgart - Tübingen, F.R.G. Language: English. (Dr. Frank Westphal, Institut und Museum fur Geologie und Paläontologie, Sigwartstrasse 10, D-7400 Tübingen 1, F.R.G.)


Sept 10 - 14 : TITANIUM (5th International Conference), Munich, F.R.G. (Deutsche Gesellschaft fur Metallkunde EV, Adenaueralle 21, D-6370 Oberursel 1, F.R.G.)

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 3SW, 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 Colombia, 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)
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<th>Date</th>
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<tr>
<td>Sept 24 - 28</td>
<td>ICSU (20th General Assembly), Ottawa, Canada. (K. Charbonneau, Conference Office, National Research Council, Ottawa, Canada K1A OR6)</td>
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<td>Sept 25</td>
<td>GLOBAL CHANGE (ICSU Symposium), Ottawa, Canada. (K. Charbonneau, Conference Office, National Research Council, Ottawa, Canada K1A OR6)</td>
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<tr>
<td>Sept 30 - Oct 6</td>
<td>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, Casilla 722, Correo Central, 7600 Mar del Plata, Argentina)</td>
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<td>Oct 1 - 5</td>
<td>SCIENTIFIC COMMITTEE ON ANTARCTIC RESEARCH (18th Meeting), Bremerhaven, F.R.G. (G. Hemmen, Scott Polar Research Institute, Lensfield Road, Cambridge, U.K. CB2 1ER)</td>
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<td>Oct 1 - 5</td>
<td>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.)</td>
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<td>Oct 1 - 6</td>
<td>CENTRAL ANDEAN TECTONICS (Symposium), La Paz, Bolivia. (Secretaria, Commission National de Estudios Geofisicos, Casilla 5939, La Paz, Bolivia)</td>
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<td>Oct 5</td>
<td>WATER RESOURCES PLANNING AND MANAGEMENT (International Conference), Athens, Greece. (Prof. A. Aureli, Via Cimarosa 10, 95124 Catania, Italy)</td>
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<td>Oct 7 - 12</td>
<td>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)</td>
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<td>Oct 8 - 11</td>
<td>MINING TECHNIQUES FOR ALLUVIAL TIN DEPOSITS (International Seminar), Ipoh, Malaysia. (The Director, SEATRAD Centre, Tiger Lane, Ipoh, Malaysia)</td>
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<td>Oct 8 - 10</td>
<td>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.)</td>
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<tr>
<td>Oct 9 - 14</td>
<td>IN SITU SOIL AND ROCK REINFORCEMENT (International Conference), Paris, France. (Conference Director, ENPC/DFCAI, 52, rue Madame, 75006 Paris, France)</td>
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<tr>
<td>Oct 13 - 16</td>
<td>ORIGIN OF THE MOON (Topical Conference). Kona, Hawaii. (P. Jones, LPI, 3303 NASA Road One, Houston, TX 77058, U.S.A.)</td>
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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


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 - Nov 5 : GEOLOGY OF TIN DEPOSITS (International Symposium), 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 31 - Nov 7 : SEISMOLOGY AND PHYSICS OF THE EARTH'S INTERIOR
(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, 8700 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)


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.)


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)

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<th>Date Range</th>
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<tr>
<td>Apr 1 - 4</td>
<td>EUROPEAN UNION OF GEOSCIENCES (Biennial Conference), Strasbourg, France. (Organizing Committee, Department of Earth Sciences, University of Cambridge, Downing Street, Cambridge CB2 3EQ, U.K.)</td>
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<td>Apr 1 - 5</td>
<td>NUMERICAL METHODS IN GEOMECHANICS (5th International Conference), Nagoya, Japan. (Prof. T. Kawamoto, Department of Civil &amp; Geotechnical Engineering, Nagoya University, Chikusa, Nagoya 464, Japan)</td>
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<tr>
<td>Apr 14 - 17</td>
<td>PROSPECTING IN AREAS OF DESERT TERRAIN (Conference), Rabat, Morocco. (Conference Office, IMM, 44 Portland Place, London W1N 4BR, U.K.)</td>
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<td>Apr 28 - May 1</td>
<td>GEOCHEMICAL EXPLORATION (11th International AEG Symposium), Toronto, Canada. (Dr. W.B. Coker, Kidd Creek Mines Ltd., 357 Bay St., Ste. 300, Toronto, Ontario, Canada M5H 1T7)</td>
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<td>May 6 - 17</td>
<td>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.)</td>
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<td>May 13 - 17</td>
<td>TUNGSTEN (3rd International Symposium), Madrid. (Mr. M.R.P. Maby, Secretary, Primary Tungsten Association, 280 Earls Court Road, London SW5 9AS, U.K.)</td>
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<td>May 15 - 17</td>
<td>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)</td>
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<tr>
<td>May 27 - 31</td>
<td>AMERICAN GEOPHYSICAL UNION (Spring Meeting), Baltimore, Md. (Meetings, AGU, 2000 Florida Avenue, NW, Washington, DC 20009, U.S.A.)</td>
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<td>May 27 - June 1</td>
<td>CORAL REEF CONGRESS: Reef and Man (5th International), Papeete, Tahiti. (Antenne Museum Ephe, Congres Recifs Coral Liens 1985, B.P. 562, Papeete, Tahiti, French Polynesia)</td>
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<td>June 2 - 9</td>
<td>INTERNATIONAL MINERAL PROCESSING CONGRESS (15th), Cannes, France. Languages French and English. (International Mineral Processing Congress Secretary, BRGM SGN/Mineralurgie, B.P. 6009-45060 Orieans Cedex, France)</td>
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<td>June 9 - 15</td>
<td>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)</td>
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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 distinguishes 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.