

K E S A T U A N      K A J I B U M I      M A L A Y S I A  
GEOLOGICAL SOCIETY OF MALAYSIA

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N E W S L E T T E R

Number 2

September 1966

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Contents

Report on 11th Pacific Science Congress	page	1
Recent visits, in and out Hornibrook; Hutchison		4
Forthcoming visits Lalanne de Haut; Piazza		5
Geology symposium and 1st annual general meeting		6
Staff vacancies at University of Malaya Geology Department		6
Competition for Society emblem		7
Membership list		7
Wrench faulting in Malaya: a review		8
Great moments from the geological literature: I		9

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REPORT ON 11TH PACIFIC SCIENCE CONGRESS, TOKYO, 22 AUGUST  
TO 3 SEPTEMBER 1966

by N.S. Haile, Dean of Science, University of  
Malaya

The 11th Pacific Science Congress has been described as the most impressive, colourful and largest academic conference in history. A gathering of 5,900 scientists and other scholars, of whom 2,166 were foreign, attended the 60 symposia and 43 group meetings covering 113 fields under 12 major sections.

The sections included population and food problems, public hazards and industrial nuisance, meteorology, agriculture, geology, geophysics, biology, oceanography, fishery science, anthropology, medicine, nutrition and social science.

It was symbolic of the importance placed on science in Japan that the Congress was opened by H.I.H. the Crown Prince, and that receptions for delegates were given by the Emperor, the Prime Minister, the Governor of Tokyo, and the President of Tokyo University, as well as by various Embassies.

The symposia and divisional meetings in the earth science section included:

Symposia:

- Sea level changes and crustal movements of the Pacific during the Pliocene and Post-Pliocene (15 papers; 2 days)
- Mineralogenetic provinces and epochs in the Pacific Belt (15 papers; 3 days)
- Age and nature of the circum-Pacific orogenesis (22 papers; 3 days)
- Tertiary correlation and climatic changes in the Pacific (16 papers; 2 days)

Divisional meetings:

- Major and minor geo-tectonics (33 papers; 5 days)
- Palaeontology (12 papers; 2 days)
- Petrology (13 papers; 2 days)
- Sedimentation (7 papers; 1 day)
- Solid earth physics I (geodesy and seismology) (46 papers; 5 days)
- Solid earth physics II (geomagnetism, geothermy, volcanology, and geochemistry) (45 papers; 5 days)

As several symposia and meetings were held concurrently it was (mercifully) not possible to attend all the papers, but by changing from one lecture room to another one could

attend a selection of those of most interest. It is obviously not possible in a short account to report on all the papers I attended, but I will mention a few of the more interesting.

Dr Katili, of Indonesia, presented a paper with Dr Hehuwat on the Semangko fault-zone, which extends for 1300 kilometers, parallel to the axis of Sumatra. It was concluded that recent movements along the zone are predominantly transcurrent, but that there is evidence for older vertical movements. Tremendous amounts of Cenozoic welded tuff occur along the fault and may be ascribed to fissure eruptions in the upper part of the Sumatra geanticline.

R.F. Dill described erosion by sediment transport of submarine canyons off California which has occurred in the past 8000 years, when sea level rose rapidly from 75 feet below its present stand. The conclusions were supported by many careful measurements. Even more convincing, however, were two cine films taken by scuba divers and from a diving saucer within the canyons, showing a river of sand flowing down the canyon during a storm, and other evidence that vigorous erosion of the canyons by sediment flow is continuing today. No classical turbidity currents have been observed.

While only a few papers dealt directly with continental drift, the hypothesis was touched on in many of the papers dealing with structural and regional geology. The controversy seems in many ways similar to its condition in the 1920's, with the drifters moving continents about with gay abandon with no proved mechanism, while their opponents (notably most of the Soviet geologists and Professor Glaessner) picking holes in the evidence and saying 'It can't be done.' The main difference now is, of course, the new evidence of paleomagnetism, and the fact that a little is beginning to be known about the ocean basins. Much new evidence favours a geologically young age for the Pacific and other oceans, and indicates crustal growth along the mid-ocean rises. Results of seismic reflection profiling in the Pacific, presented by M. and J. Ewing, indicate that the circum-Pacific oceanic trenches are not the location of a dragging down of the crust by convection currents, since undisturbed sediment layers have been found extending down the ocean-side slopes with no sign of crumpling at the bottom. Other important conclusions from this work are that the oceanic trenches and the equatorial current system in the Pacific did not exist before late Mesozoic, but that the equatorial current system has been in existence in its present position for a long time, probably from the late Mesozoic or early Cenozoic.

The origin of the Japanese archipelago was discussed. Three general hypotheses were presented. Uyeda advanced the idea that the archipelago was formed by the folding up of the earth's crust by convection currents in the upper mantle, and was supported by Vacquier, who stated that paleomagnetic evidence indicated 35 seamounts near Japan had moved as much as 2000 kilometers northwards during the Cenozoic. Murauchi, however, favoured an origin by drift of a section of continental crust away from the Asian mainland, based on seismic studies of the Japan Sea. Belousov, stern repudiator of drift and related frivolities, argued for foundering and "oceanization" of a section of continental crust previously joining Japan to the mainland, in the area of the present Japan Sea.

Geothermal data, presented by Uyeda and Vacquier, show a high heat flow in the eastern Pacific, but uniformly sub-normal heat flow in the northwest Pacific. The Japan Sea, however, has a high heat flow, although other evidence indicates that the sea is underlain by normal oceanic crust.

Evidence and speculations about the origin of the Japan Sea may have a relevance to the Malaysian region. The writer suspects that the South China Sea Basin may have originated in the same way as the Japan Sea, though as yet hardly any data are available.

A one-day field trip was made under the leadership of Professor Kuno to visit the extinct Hakone volcano, which is a complex strato-volcano. The history of the volcano has been reconstructed in detail by Professor Kuno, who has investigated the area since 1930. Professor Kuno's lucid explanation of the exposures, geomorphology, and petrology made this trip very rewarding and instructive.

The Soviet geologists displayed a number of beautifully printed regional tectonic maps, which could be of great value in teaching. Tentative exchange arrangements have been made between the relevant Soviet institutions (Institute of Oceanology, Moscow, Professor G.B. Udintsev; Geological Institute of the Academy of Sciences of USSR, Professor Y.M. Pushcharovsky) and the Department of Geology, University of Malaya.

An exhibition of Japanese oceanological equipment was held during the Congress, and particulars of various types which would be useful in Malaysian marine geology were obtained.

It is conventional in reports of this nature to say that useful contacts were made with colleagues from other countries. Contacts made at this Pacific Science Congress

however, are likely to be of particular value and, I hope, will bring practical benefits to the University of Malaya and to the Geological Society of Malaysia, in the years ahead. Several participants expressed to me their good wishes for the Society and one, Professor Kobayashi, still more practically handed me his application for membership, with subscription.

In spite of its mammoth character, the division into many groups enabled a reasonably intimate atmosphere to be established. It is pleasant to record that a spirit of friendly but serious scientific enquiry pervaded all the sessions which the writer attended, and political or ideological differences were not evident. Much of the credit for this must go to the Japanese hosts, whose generous and gracious hospitality was outstanding.

The next (12th) Congress will be held in Canberra, Australia, in 1971, and will be smaller in number and scope, with about 750-1000 foreign participants. An inter-congress meeting of the Council and some of the standing committees is planned for 1969, and it is hoped to hold this in a developing country, if an appropriate invitation is received. The possibility of this meeting being held in Malaysia is being looked into, and comments from members of the Society would be welcome.

#### RECENT VISITS, IN AND OUT

In: Hornibrook. During early August, 1966, Dr N. Hornibrook of the New Zealand Geological Survey paid a short visit to Malaya, on his way to the ECAFE meeting in Bangkok and the Pacific Science Congress in Tokyo. While in Kuala Lumpur, Dr Hornibrook addressed a special meeting of the Geological Society, on 5th August, at the Faculty of Science, University of Malaya. His interesting talk, entitled "The Tertiary of New Zealand", was illustrated with slides. Focusing his attention on the stratigraphy of a few well-exposed sections of largely calcareous shelf-facies sediments, Dr Hornibrook demonstrated the usefulness of glauconitic sand layers in unraveling problems of correlation.

Out: Hutchison. Mr C.S. Hutchison of the Geology Department of the University of Malaya presented a paper entitled "Ages of tectonic events in the Malayan orogen based on the thermoluminescence of limestones" at the NATO-USAF sponsored Advanced Research Institute on Applications of Thermoluminescence to Geological Problems, held at Spoleto, Italy, from 5 to 16 September, 1966. The papers contributed at this meeting will be published as a book edited by Professor D.J. McDougall of Loyola College, Montreal. While in

Europe, Mr Hutchison also attended the International Mineralogical Association meeting at Cambridge University from 30 August to 3 September.

#### FORTHCOMING VISITS

Lalanne de Haut: Visiting Kuala Lumpur from 3rd to 6th October, 1966, will be Dr J.P. Lalanne de Haut of Brunei Shell Petroleum Co., Seria, Brunei. Dr Lalanne de Haut is a sedimentologist and has been studying the recent sediments in the offshore areas of East Malaysia. He will address a meeting of the Geological Society on Wednesday, October 5th, in Lecture Theatre 1 (LT1) of the Faculty of Science, University of Malaya. The topic of his talk will be "Sedimentology of the Recent in northwest Borneo and its application to subsurface work in oil geology." The talk will be at 5.00 p.m. and tea will be served shortly before.

While at the University, Dr Lalanne de Haut will also meet with staff and advanced students in a seminar, and address the First Year Geology class.

Piazza: Coming on a longer "visit" - to work with the Geological Survey Department in Ipoh - is a Canadian photogeologist, Mr Paul E. Piazza, who is coming under the auspices of the Colombo Plan.

Mr Piazza received a degree (B.S.) in geology from the City College of New York, in 1958, and followed this with one year of post-graduate training at New York University. He joined Gulf Oil Corporation as a photogeologist, interpreting areas in Alaska, Sicily, and the Bahama Islands. In 1959 he joined the Lockwood Survey Corporation, for whom he has done extensive photogeological and geomorphological studies in western Canada, the Canadian Shield, southern Chile, the Argentine Cordillera, and East Pakistan (under the Colombo Plan).

It is expected that Mr Piazza will, while he is with the Survey, do photo-interpretation to coordinate with ground mapping already under way in various parts of West Malaysia. If time and interest allow, he may work on other projects, including perhaps interpretation of geomorphology and drainage history in the alluvial areas.

## GEOLOGY SYMPOSIUM AND FIRST ANNUAL GENERAL MEETING

The Society is planning to hold a symposium on the Geology of Malaysia in early February, 1967, concurrently with the Second Symposium on Scientific and Technological Research in Malaysia and Singapore (STREMS II), sponsored by the University of Malaya and the Singapore Polytechnic. The symposia will be held in the University of Malaya; the proposed dates (subject to later confirmation) are 1st to 4th February. The Society Symposium will probably be held on 1st February.

Members of the Society are invited to submit titles and, if possible, abstracts or full typescripts of papers on Malaysian geology which they would like to present, to the Hon. Secretary, if possible by 31st October, 1966.

The theme of the STREMS II symposium is Natural Resources Research, so that papers on economic geology may be read at a joint session of the Geological Society and STREMS. Those who have already replied to the STREMS circular need not take any further action.

- N.S.H.

## STAFF VACANCIES AT UNIVERSITY OF MALAYA GEOLOGY DEPARTMENT

Applications are now being invited for appointment as Lecturer/Assistant Lecturer in the Department of Geology, University of Malaya. Applicants should have a degree in Geology with post-graduate research experience, and should be prepared to teach in a fairly wide field. Experience in one or more of the following would be an advantage: Structural petrology, Quaternary sedimentology, Applied geology, Marine geology, Clay mineralogy. Details may be obtained from The Head, Department of Geology, University of Malaya, Kuala Lumpur. Official closing date for applications is 31st October, but extensions may be made.

In addition to this present vacancy, it is probable that there will be two additional staff positions open next year. It is hoped to expand the size of the Department then and to establish a sub-department in Applied Geology, starting with at least two Lecturers. The new geology building, which will be completed early in 1967, will have ample space for the projected enlarged staff.

## COMPETITION FOR SOCIETY EMBLEM

At present the Geological Society of Malaysia has no official emblem, but it is planned to adopt one. Ideas and proposed designs will be welcome, and the designer of the emblem eventually selected will receive some sort of prize. All members are invited to participate in this competition. The emblem should be appropriate and symbolic, and preferably rather simple and attractive. Emblems of other Geological Societies may serve as a starting point.

## MEMBERSHIP LIST

At a meeting of the Pro-Tem Committee of the GSM on 9th September, 1966, the following were elected to membership in the Society (L = Life Member; A = Associate Member; S = Student Member; others are Full Members):

Ahmad, J. b.	Hall, H.H.	Murphy, R.W.
Allen, A.W.	Harris, J.	Panton, W.P.
Ayob, M. b.	Hutchison, C.S.	Rajah, S.S.
Brooksbank, K.M.C.	Igo, H.	Rexworthy, S.R.
Burton, C.K.	Ishii, K.	Reynolds, W.
Carter, J.O.	Ives, D.W.	Salmon, E.C.
Chan, S.H.	James, P.M.	Sandrasagaram,
Chand, F.	Kho, C.H.	S. (A)
Chong, F.S.E.	Khoo, C.S.	Selliah, P.
Chung, S.K.	Kirk, H.J.C.	Seymour, R.W.
Collenette, P.	Kobayashi, T.	Shu, Y.K.
Eyles, R.J.	Koopmans, B.N.	Singh, D.S.
Fitch, F.H.	Lambert, J.F.	Srilenawat, R.
Fletcher, J.R.	Lee, T.C.	Stauffer, P.H.
Foo, K.Y.	Lee, W.K.	Subramaniam, S.S.
Fraser, R.B.	Leow, J.H.	Sweet, M.J.
Ganesan, K. (S)	Lewis, D.E. Jr.	Tay, C.T.
Gobbett, D.J.	Lulofs, R.B. (A)	Temple, P.G.
Gopinathan, B.	Luna, S. de	Wagner, T.W.
Grubb, P.L.C.	McCorquodale, S. (A)	Wong, P.Y.N.
Haile, N.S. (L)	McLean, C.A.	

Applications received too late will be dealt with at the next meeting of the Pro-Tem Committee in October.

The membership of the Pro-Tem Committee of the GSM consists of: N.S. Haile (Chairman), D.J. Gobbett (Hon. Sec'ty), S.K. Chung, J. bin Ahmad, J.H. Leow, W.D. Procter, S. Singh, P.H. Stauffer, and J.F. Lambert.



## WRENCH FAULTING IN MALAYA : A REVIEW

In a recent article ("Wrench faulting in Malaya": Journal of Geology, v. 73, 1965, p. 781-798), C.K. Burton describes the presence of wrench faulting in the Baling area, Kedah. The largest NW-SE trending fault, the Bok Bak fault, has been mapped by him over a distance of 51 miles. On geological and morphological grounds he traces its continuation northwards into Thailand and southeastwards across the Malayan Peninsula to where it intersects the east coast near Mersing. In total the inferred length is about 650 miles.

This contribution to Malayan geology is a very stimulating one. Although not everybody might agree with the full interpretation given by Burton, it stresses the importance of deformation by faulting during orogenic periods affecting the Malayan Peninsula. If one considers that no fault is shown on the last published Geological Map of Malaya (6th edition, 1963), nor on the Thai-Malay Peninsula Tectonic Map (1958), it becomes evident that such a paper drawing attention to faulting in West Malaysia was long overdue.

Wrench faults mapped by Burton in the Baling area are oriented in a pattern which would result from a N-S stress field. Horizontal displacements along these faults - sinistral along the NW and dextral along the NE directed faults - would originate, however, from an E-W directed stress field. To explain this discrepancy Burton accepts a compressional N-S directed stress field, which has defined the fracture pattern in the area, referring to the theory of a universal wrench fault system of Moody and Hill (1956). A later Jurassic-Cretaceous (?) E-W stress field caused development of the N-S trending fold structures and a subsequent reactivation of the faults. Movement along the faults was now in an opposite direction; the sinistral displacement measured along the Bok Bak fault is about 36 miles.

In an aerial photograph interpretation of areas in Pahang and Johore with subsequent field work, I have not found any evidence for the continuation of the Bok Bak fault in these two states as postulated by Burton. This does not imply that wrench faulting is absent. A wrench fault of over 36 miles long has been traced in the area northwest of Kuala Lipis. This fault trends  $345^{\circ}$ , compared to the  $320^{\circ}$  trend of Burton's postulated fault. In the Benom granite a large number of fault lineations are present, but all are rather restricted in length and are a result of local strain. In Johore the Bok Bak fault is supposed to intersect the coast near Mersing. However, strike ridges of the

Carboniferous (?) meta-sediments can be traced from aerial photographs in this coastal area, only interrupted by the alluvial valley of the Mersing River. A NW-SE directed fault cannot possibly run through this valley, which follows a WSW-ENE trend. On the other hand, a fault with dextral movement has been interpreted by Agocs (1958 - Airborne magnetometer and scintillation counter survey over parts of Johore and Pahang, area 4 : Geol. Survey Econ. Bull.No. 1.4, Ipoh) in the direction of this valley, based on displacement of magnetic trends.

A wrench fault or fault zone of the length postulated by Burton is not present, and several of the faults mentioned by him may be normal faults. The value of his paper is that attention has been drawn to this style of deformation in West Malaysia.

- B.N. Koopmans

#### GREAT MOMENTS FROM THE GEOLOGICAL LITERATURE: I

"Between Pukeiwaitai and Mount Vulcan the beds above and immediately below the coal form a syncline. On the west side of this the beds have the high dip already mentioned, while on the east side the dip is more moderate, not being over  $30^{\circ}$ , and is to the westward. They thus form a syncline. To illustrate a syncline, and to better show what, in a geological sense, is meant by the term, an onion is required - at least, this vegetable is very suitable for the purpose. Having procured a bulb - one as round as it is possible to get - cut vertically into two equal parts. Then, at right angles to the plane of the first intersection, and at any point between the equatorial and polar regions of the hemisphere selected, make a second cut in a latitudinal direction, and by carefully examining the section exposed by the last application of the knife the meaning of syncline, and what is to be understood by it, will be apparent. This would be a regular syncline. Synclines are of various kinds, regular and irregular, and so are onions, especially shallot onions; and there is hardly any kind of syncline that may not be illustrated by some kind of onion."

- Extracted from "On the prospects of finding coal on Rowley's farm, near Shag Point railway-station." by Alexander McKay, F.G.S., 1891. According to legend, this report was written soon after complaints had been made in the New Zealand Parliament that Geological Survey publications were too technical and difficult to understand. (with acknowledgements to the New Zealand Journal of Geology and Geophysics).