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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GEOLOGICAL SOCIETY OF MALAYSIA

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GEOLOGIC NOTES

Radiocarbon dates in the Kinta Valley

S.P. Sivam
University of Malaya

Three samples of wood from alluvium exposed in tin mines of the Kinta Valley have been dated by Isotopes, Inc. of Westwood, New Jersey, U.S.A., using the Carbon-14 method. This work was supported by a grant from ESSO Exploration to the Department of Geology, University of Malaya.

Results were as follows:

(a) Wood from Sui Sum Tin Mine No.3, Kampong Bercham, Perak (Grid ref. 942 785). This was from a layer of peat and wood about 20 ft below the top of stratified alluvium and about two feet above the flat surface of the limestone bedrock.

Age: >39,000 B.P.

(b) Wood from a large log in South Kinta Tin Mine, Batu Gajah, Perak. This was from a layer of peat and wood below the top of stratified alluvial deposits. The top of the layer was flush with the tops of erosional pinnacles in the limestone bedrock.

Age: >39,900 B.P.

(c) Wood from a log in the Yuen Wan Hin Tin Mines, Batu Gajah, Perak, from a horizon about 10 feet below the top of a stratified alluvial sequence.

Age: 3070 $\pm$ 100 B.P.

The results demonstrate the existence of fluviatile deposits older than 39,900 years in the Kinta Valley. The two samples giving minimum ages of 39,000 and 39,900 years were both collected from "Older Alluvium", whereas the one giving the age of 3070 $\pm$ 100 years was collected from "Younger Alluvium". The results are therefore consistent with the hypothesis that the "Older Alluvium" is Pleistocene and the "Younger Alluvium" Holocene, but more dates are needed before any definite conclusion can be made. Further samples have been collected to be sent for dating.

Preliminary note on occurrence of copper minerals in rhyolitic rocks, Genting Sempah area, Pahang

N.S. Haile
Univeristy of Malaya

Rhyolitic rocks (rhyolite, dacite, and rhyolitic and dacitic tuff breccias) form part of the Main Range watershed between Selangor and Pahang in the Genting Sempah area. They are exposed intermittently along the new road north from Genting Sempah to Gunong Ulu Kali, from Genting Sempah to Mile $3\frac{3}{4}$, and from Mile $5\frac{1}{2}$ to Mile 7. They are also exposed in the headwaters of streams draining part of the ridge. Eastwards they pass into porphyritic microgranodiorite.

Slight mineralization (abundant pyrite, some fluorite and specular haematite) in dacite tuff breccia at Mile 3 along this road was observed by P.H. Stauffer and the writer in 1967, and copper mineralization was suspected, but a spectroscopic test for copper on a sample was negative. In August of this year, the writer discovered undoubted chalcopyrite in the dacite tuff breccia at Mile 3, and a green secondary mineral, possibly malachite. The visible disseminations only occur in small patches in one or two places along an exposure which is being quarried.

Whereas these occurrences are only slight, and there is no indication of an economic ore deposit, the occurrence of copper minerals in part of a substantial body of porphyritic dacite, with porphyritic microgranodiorite nearby, is interesting, since many of the world's major copper deposits (the so-called "porphyry coppers") are disseminations in porphyritic rocks. Rhyolitic rocks, "quartz porphyries" and porphyritic microgranite are widespread in West Malaysia, and geochemical and petrological studies on them should give results of scientific and economic interest. It is planned to publish a fuller account of some aspects of the geology of the Genting Sempah area at a later date.

The Kuala Lumpur fault zone: a proposed major strike-slip fault across Malaya

P.H. Stauffer
University of Malaya

Examinations of the latest geologic map of Malaya (Alexander, 1965) reveals a conspicuous alignment of lineaments and truncations extending all the way across the Malay Peninsula at an orientation of about 105 and

passing very near Kuala Lumpur. It is the purpose of this note to call attention to this alignment, to suggest that it is a major fault zone of strike-slip movement which may be termed the "Kuala Lumpur fault zone", and to appeal for information on these features from field geologists.

Features along this alignment which suggest such a fault zone include:

(1) Klang Gates quartz ridge: A prominent vertical "dyke" of quartz at the north edge of Kuala Lumpur, the Klang Gates quartz ridge exhibits pervasive shearing and re-sealing by growth of quartz. The ridge is very linear and over 15 km long.

(2) Lithologic boundaries in the K.L. area (Gobbett, 1964) often trend in the same direction and appear to imply left-lateral offset if due to faulting. This is especially clear in the Ulu Langat area, about 10 km south of Klang Gates, where another quartz ridge is aligned with a 5-km left-lateral offset in the limestone-granite contact, both trending about 105.

(3) The Foothills Formation on the east side of the Main Range is abruptly truncated on the south, and the granite edge makes a large left-lateral jog at this point.

(4) Several areas of granite farther east have prominent segments of boundary along this 105° trend, at least one of which again suggests left-lateral offset.

(5) Prominent stream alignments near the east coast (west of Endau) continue the trend. These stream alignments are extremely striking on the 1:63360 topographic maps.

(6) Tasek Berah, a large swamp in south Pahang, has its southern end exactly on this lineament. This "lake" may possibly represent a place where the Pahang River was defeated and forced to back up to the north and find a way out to the east. Since lakes and inland swamps are so ephemeral, particularly in tropical climates, this feature suggests quite recent, perhaps even Holocene movement on the K.L. fault zone.

(7) The Tertiary basin at Batu Arang is grazed at its north end by the extension of the lineament westwards from K.I. Not only is the north edge the site of the steepest dips in the Tertiary beds, but the Batu Arang sequence is capped by a great wedge of boulder beds which have a maximum thickness of over 300 meters and both thin and fine to the south. This peculiar mass of boulders, which is probably Pliocene or Pleistocene in age, may best be explained by erosion of fault scarps, and again suggests possible Quaternary movement on the fault zone.

Elsewhere in Malaya, especially rather north in the Main Range, one sees prominent stream alignments and vertical shear zones and planes in the same general direction as the features detailed above, suggesting a pervasive set of faults along this orientation. Indeed, the K.L. fault zone itself is likely to consist of an anastomosing net faults - in the K.L. area at least three strands are indicated.

Left-lateral offset on the K.L. fault zone may clarify some of the Lower Paleozoic facies relations shown by Jones (1968), in particular the anomalous "shelf-facies" of the Kuala Lumpur Limestone adjoining on the north (across the line of the K.L. fault zone) rocks of supposed "eugeosynclinal" facies.

This interpretation is essentially a map-exercise. It is hoped that field geologists with information relevant to the possible existence and nature of the "Kuala Lumpur fault zone" will bring it to our attention.

References: Alexander, J.B., 1965. Geological Map of Malaya, 6th edition. 1:500,000. Survey Dept., Kuala Lumpur.

Gobbett, D.J., 1964. The Lower Palaeozoic Rocks of Kuala Lumpur, Malaysia. Fed. Mus. J., 9, 67-79

Jones, C.R., 1968. Lower Palaeozoic rocks of Malay Peninsula. Bull. Am. Assoc. Pet. Geol., 52, 1259-1278

SOCIETY PUBLICATIONS

Progress in "The Geology of the Malay Peninsula"

Many manuscript chapters have now been received in their revised form. In a work of this nature, in which several authors take part, there are the inevitable difficulties, late submissions, etc., which make the work of the editors a difficult task. Dr. Gobbett is now compiling a colour geological map for inclusion in the book. The editors feel reasonably confident that the final book manuscript can go to the publishers, John Wiley in London, by the middle half of next year.

Presidential Address

Distributed with this Newsletter is the Presidential address given to the Annual General Meeting earlier this year. This is the first of what we hope will become a regular and valuable series, distilling the wisdom of the Society's successive Presidents.

Bulletin Series

The Society's second Bulletin (D.J. Gobbett's"Bibliography and index of the geology of West Malaysia and Singapore") is now being printed and should be ready for distribution some time in December. This volume should prove to be a particularly welcome and useful work.

Several manuscripts are in hand for future Bulletins, and several more are in prospect, but more material is still needed. Papers in any area of geology are welcome, though works in petrology and in paleontology-straigraphy are especially solicited, as these appear likely to be the foci of the next two Bulletins.

Bulletin No.1 ("Studies in Malaysian geology") is still available from the Society, at M$ 3.00 a copy (M$ 2.00 for GSM members). Air mail postage is extra.

NEWS FROM THE UNIVERSITY OF MALAYA

Research grant to the Department of Geology

At a brief ceremony held in the lecture theatre of the geology department of the University of Malaya at 3:30 p.m. on Monday 30th Septemeber, the U.S. Army grant (DA-CRD-AFE-S92-544-69-G128, Project FE-400), which has been described in Newsletter 13 (July), was officially presented by Colonel Charles Cook of the U.S. Army and accepted on behalf of the University by the acting Vice Chancellor, Professor Chin Fung Kee. Colonel Cook made a special visit to Kuala Lumpur from his headquarters in Tokyo to meet Dr. Charles S. Hutchison, who is the investigator in charge of the research programme.

Actual research will not begin until the differential-thermal-analysis apparatus, valued as US$ 13,000, arrives in Kuala Lumpur. In the meantime money has been received by the geology department of the University to cover technician services (US$ 2400), expendable supplies (US$ 500.), travel (US$ 1860) and publication costs (US$ 1100.).

It is estimated that actual research may begin in April or May of 1969, and Dr. Hutchison hopes to include one or more post-graduate students in this project.

- CSH

New lecturer in geology

Dr. H.D. Tjia has joined the Department of Geology as a Lecturer, on a short term appointment. Dr. Tjia holds three degrees from the Institut Teknologi Bandung, and has done graduate study in Columbia University, New York. His interests include all types of Structural

Geology and Geomorphology, and he is at present compiling information on the Quaternary Geology of the Indonesian Archipelago.

- NSH

Professor Haile's Inaugural Lecture

It is a tradition at the University of Malaya that each new Professor give an 'Inaugural Lecture' to introduce himself to the community. After a 'settling-in period' of roughly five years (also becoming a University of Malaya tradition!), Dr. N.S. Haile, Professor of geology, delivered his Inaugural Lecture on the evening of 25th October, in the Faculty of Science Lecture Theatre at the University. The Vice Chancellor, Professor Ungku A. Aziz, in introducing the speaker, called him a scholar "who has come to us from the East", a reference to Professor Haile's many years' service in Borneo.

Professor Haile's topic was "The Earth Beneath the Sea: a Review of Progress in Marine Geology." In his address he have a graphic and well illustrated survey of the development of marine geology, from the slow and painfully difficult winning of facts in the early days to the explosive and exciting growth of the present. It is a field in such rapid change just now that many fundamental questions in geology may soon be answered, while many accepted 'truths' are being challenged and will have to be examined critically and perhaps abandoned.

The speaker emphasized the scientific and economic importance of marine geology for South East Asia. An understanding of the Sunda Shelf is not only essential for understanding the on-shore geology, but may also yield valuable deposits of tin, petroleum, and other items not yet suspected. The University of Malaya will be involved in the exploration of the seas around Malaysia. Staff members have already participated in several oceanographic expeditions in this region, and plans for next year involve two major cruises, both using local vessels.

Professor Haile's address is to be published by the University.

Visit of Professor C.S. Pichamuthu

Professor Charles S. Pichamuthu, D.Sc. (Glas.), Ph.D. (Glas.), F.R.S.E., F.G.S., F.G.M.S., F.A.SC., F.N.I., now professor emeritus in the department of mines and geology at the University of Bangalore, Mysore, India, visited Kuala Lumpur from the 23rd to the 26th October. Professor Pichamuthu was the first professor of geology at the University of Malaya. He founded the department in Singapore in 1956 and held the chair in geology until the department was

transferred and established in Kuala Lumpur. It was by a rare chance that his visit to the University of Malaya coincided with Professor Haile's inaugural lecture on the evening of the 25th. On the 23rd, Professor Pichamuthu delivered a lecture to the Society on "charnockites", a subject which has been and continues to be his major research interest. He is also an acknowledged expert on the pre-Cambrian of India, and in the recently published (1968) volume 3 of Rankama's "Pre-cambrian", published by John Wiley, Professor Pichamuthu has written two major chapters, on the pre-Cambrian of India and of Ceylon.

His visit to Kuala Lumpur was part of a round-the-world tour, the highlight of which was his attendance at the abortive Geological Congress in Prague. His souvenirs from this attendance were a remarkable set of eye-witness photographs which he took of the Russian invasion, and a particularly gruesome one of a bullet which had lodged in the window of his hotel bedroom. His visit to Britain on this tour was sad because his two close friends of past years, Professor Arthur Holmes and Sir Edward Bailey, are no more on the scene. Elsewhere on the trip he was able to meet again the members of his widely dispersed family - in Illinois, Hawaii, and Singapore.

By this time, Professor Pichamuthu will have returned to Bangalore, but the staff of the geology department of the University of Malaya and especially those who were his former colleagues, will retain happy memories of his visit.

- CSH

MEETINGS OF THE SOCIETY

Field meeting, 13 October: Genting Sempah

A good field excursion was held on Sunday, the 13th of October, to the Genting Sempah area ("Gombak Pass") near Kuala Lumpur. The excursion was led by Prof. N.S. Haile of the University of Malaya, who has been studying the rocks of the area.

Driving up the Gombak Road, we passed cuts in granite, some of it apparently much altered, and then a sequence of contorted schist and quartzite (informally called the "Gombak beds"). Walking upstream from the old Youth Hostel at Mile 19¾ we examined good outcrops of bedded black chert, quartzite, and faulted and sheared sandstone and phyllite. About 1 km from the road the group examined a problematical outcrop in which sheared sandstone and phyllite are overlain by much younger looking boulder conglomerate. The group discussed whether this was the basal conglomerate of

a bedrock sequence (upstream from here only rhyolitic rocks crop out) or merely unusually well-cemented colluvium, opinion favoring the latter.

Somewhat farther up the main road (near Mile 22), the contact between the metasediments and the rhyolitic sequence can be bracketted by outcrops a few dozen meters apart. Here it appears to be a major unconformity, with bedded cherts below and conglomeratic mudstone (giving way upwards to rhyolite) above.

Turning off from the main road at the top of the pass, the party drove along the new Genting Highlands road as far as Mile 8. To Mile 3½ exposures are of bluish and reddish rhyolite, which at about Mile 3 includes blocks of other non-volcanic rocks and shows local mineralisation (see 'Geologic Note' by N.S. Haile in this Newsletter). Prominent vertical shear zones here are mostly oriented at about 280°, and several show horizontal slickensides.

At Mile 3½ the road again passes through the basal conglomerate of the rhyolitic sequence down into strongly folded cherts of the "Gombak beds". Past Mile 5½ the contact is again crossed and the road is back in rhyolitic rocks and stays there till the saddle at Mile 7½. Both these contacts are unclear in detail.

The saddle at Mile 7½ marks the site of the Tanglir Fault Zone, and on the northeast side of it exposures are of porphyritic and partly cataclastic granitic rocks.

To end the trip, the group drove back out to the pass summit and a short way down the east side. Outcrops of what appears to be porphyritic microgranodiorite were examined, but C.S. Hutchison pointed out that pyroxene had been found in a thin section from similar rocks nearby, making the status of these rocks very problematical.

At a sharp gully the Tanglir Fault Zone comes through again, and on the east side of it are exposures of more normal porphyritic granite, crushed close to the fault itself.

The picture which is emerging of the geology of this area shows an older series of sedimentary rocks ("Gombak beds"), mainly bedded cherts, sandstones and shales, now more or less altered and tectonized, overlain (almost certainly along a major unconformity) by a conglomeratic and partly tuffaceous mudstone ("Sempah conglomeratic mudstone") forming the basal part of a dominantly rhyolitic sequence. This rhyolite may be the higher level (extrusive) equivalent of the hypabyssal (?) microgranodiorites and the deep granites. If so, then the rhyolites which are in sedimentary contact with the "Gombak beds" may be contemporaneous and equivalent to the granites which intrude those sediments.

After thanking Professor Haile for a stimulating and interesting excursion, the group adjourned and returned to Kuala Lumpur. About a dozen members attended.

- PHS

Ordinary meeting, 30 September: J. Katili

The meeting was held in the Geology Lecture Hall, University of Malaya, at 5:15 p.m. N.S. Haile introduced the speaker, Dr. J. Katili of the Bandung Institute of Technology, Indonesia. Dr. Katili was on his way back to Bandung after attending what there was of the Geological Congress in Prague, and he consented to give a series of lectures at the University of Malaya, as well as addressing the Society. Dr. Katili spoke on the topic "Geotectonic problems, with special reference to Southeast Asia". A synopsis of his talk follows.

There are many problems associated with attempts to understand the origin and development of continents and oceans. Southeast Asia is a critical area for the study of the concepts of continental accretion, continental drift and oceanization (that is, the conversion of continental to oceanic areas). These topics are all related to vertical and horizontal displacements in the earth's crust.

Regional epeirogenic uplifts and tilting are now widely accepted, but most geologists distinguish between the uplift of continents and the uplift of diapirs. Diapiric uplift includes the uplift of basement domes and mountain chains. Domal uplifts have been described from Australia, South Africa, and Rhodesia. Domal uplift preceding rifting has been suggested for the Rhine and African rift systems. Is there any connection between mountain uplift and domal uplift?

Byelussov and other geologists in the U.S.S.R. believe that continental masses can sink to become the floor of oceans. This concept is supported by the Japanese, who believe that the Japan Sea provides some evidence for this process. In the North Mariana Sea some continental rocks have been found in what is now an oceanic area.

It has been found that three fourths of large earthquakes are associated with predominantly horizontal movements and now large transcurrent faults have been reported from many areas. (Professor Katili provided those present with a compilation of large transcurrent faults by J. Tuzo Wilson).

Geosutures are major faults which mark divisions between regions of different suites of rocks such that no correlation can be made across the faults. It has been suggested that these may mark the boundaries between formerly separate continents.

There is some suggestion that periods of mountain uplift and periods of ocean floor spreading may be related. Can the ocean floor and mantle rocks be thrust up to the surface? Gilluly has suggested that ultrabasic rocks in the Franciscan 'Formation' of California and in Corsica may be mantle material at the surface. How can one prove this?

Southeast Asia is a critical area for the study of many geotectonic phenomena. Vertical movements in East Indonesia have resulted in the uplift of Pleistocene coral reefs by as much as 1,200 meters. Some of the basins between the islands in East Indonesia are believed to be associated with faulting, and others with folding. These basins, including the Celebes Basin and the North and South Banda Basins may be up to 5,000 meters deep. The date of formation of these basins is not known but may possibly be quite recent. Further work is needed.

Earthquake patterns indicate a zonal structure for Japan, the Celebes, and West Indonesia, earthquake epicenters being shallow below the outer portion of the island arcs and deeper as one moves inward. The depth of epicenters is related to the depth of origin of magma, a zonal arrangement of magma types being found. The Japanese interpret this in terms of different magma chambers, while the Dutch interpret this in terms of different structures, shallow epicenters of the outer arc being associated with the active belt, and the deeper with the hinterland. The zonal arrangement of granites in West Indonesia supports the idea of continental growth, where the orogenic areas have moved away from Malaya with time.

Th. F. Klompe believed that Asia and Australia were growing toward each other.

A large fault can be traced for about 1,300 km along the length of Sumatra. The fault zone is often marked by volcanoes, and evidence from offset streams and historical movements indicates that at present it is acting as a dextral transcurrent fault. The Mesozoic granites and the fold axes of Sumatra appear to be distorted by drag along the fault.

Sinistral transcurrent faults, paralleling peridotite bodies, are known from dentral Celebes, while dextral movements have been found in north Celebes. Sinistral faults are found in the Philippines and it is postulated that Southeast Asia is being pushed to the southeast, dextral movements occurring in the west, sinistral ones in the east and differential movements in the middle. A sinistral fault runs east-west along the north of New Guinea, but this may be an old fault.

In the discussion that followed the talk, N.S. Haile pointed out that Van Bemmelen's zonal growth hypothesis was

not based on good evidence. Dr. Katili acknowledged this but pointed out that some form of zonal arrangement does exist.

Various members discussed the major faults in Malaya. The extension of the Bok Bak Fault into southern Malaya was criticized on grounds of poor evidence. A major transcurrent fault running near Kuala Lumpur with a bearing of about 100° was postulated. P.H. Stauffer said there was some evidence of recent displacement along this fault and suggested that this fault should replace the Bok Bak fault in southern Malaya (see 'Geologic Note' by P.H. Stauffer in this Newsletter). Some evidence of east-west faulting existed in Borneo.

J.H. Leow proposed a vote of thanks to the speaker. The meeting was attended by 32 members and guests.

- JDB

Ordinary meeting, 18 October: Paul Piazza

The meeting was held at 5:00 p.m. in the Geology Lecture Hall, University of Malaya. S.S. Rajah introduced the speaker, Mr. Paul Piazza, a photogeologist who has been for two years on secondment to the Geological Survey of Malaysia under the Canadian Colombo Plan programme. Mr. Piazza spoke on the topic "The application of photogeology in West Malaysia". A synopsis of Mr. Piazza's talk follows.

Photogeology is concerned with (i) the extraction of geologic data from aerial photographs, (ii) the compilation of the derived data in the form of maps, and (iii) the interpretation of the data.

Aerial photographs on a scale of 1:25,000 are available for the whole of West Malaysia and for certain areas photographs on a scale of 1:50,000 are also to be had. Photos are M$ 2.00 per print, but security clearance is required. Under certain circumstances they may be borrowed. There is a delay of from four to six weeks between ordering photographs and obtaining them.

Photogeology is used to greatest advantage as a preliminary 'tool' prior to field work. It will provide an outline plan of the major geologic units, will provide data on the accessibility of the area, and by delimiting areas with the greatest mineral potential it effects a subsequent saving in time and money.

Personal interpretation, of course, enters into the work of photo-interpretation. A great advantage of the method is that the work can be carried out with great speed. Thus it took the speaker three weeks to compile and interpret the data covering a new Malaysian topo-

graphical map sheet, that is, an area of 467 square miles. In two years the speaker has prepared, by photogeologic methods, 'preliminary' geological maps for about 29% of West Malaysia.

Photogeology enables facts to be gathered together which could not be so gathered by any other means.

Generally, photogeology helps the geologist particularly when he is concerned with the following:

(i) The revision of pre-existing maps
(ii) The extension of the geology from known to unknown areas
(iii) The preliminary mapping of unknown areas
(iv) Preparation prior to field work

Naturally, during the geologic interpretation of aerial photographs any relevant information is made use of. Geologists should, as far as possible, do their own photogeology so that they can integrate the photo-interpretation with other information.

The following criteria are used when interpretating the geology from aerial photographs:

(i) Geomorphology - particularly drainage patterns, faults and joints (always the assumption is that what is seen at the surface is a reflection of what lies below)
(ii) Photographic tone
(iii) Form and size of features
(iv) Relationships between associated features
(v) Colour (e.g., to pick out zones of rock alteration) when colour photographs are employed

The amount and type of information obtained from a photo-geologic study will depend on the type of terrain, the climate, and the stage of the geomorphic cycle.

Lithological and structural interpretation: During such interpretations, an attempt should be made to indicate the degree of certainty of any given piece of interpretation which finds its way onto a map.

Sedimentary rocks are revealed primarily by their lineation, igneous rocks by their non-directional topography, and volcanics by characteristic landforms. Sedimentary rocks are the most easily recognized, whilst metamorphic rocks are the most difficult to interpret.

The structure is 'read' by recording contacts (which may not coincide with the rock contacts seen in the field), structural dips, faults, etc.

During lithological-structural interpretation it is often the combination of a number of different observations which permits meaningful deductions to be made.

Whilst some believe that 30 feet of alluvium masks, in an aerial photograph, the underlying geologic features, the speaker thought that in West Malaysia about 50 feet was the limiting value.

The degree of success attending a photogeologic study is limited by the following:

(i) Limitation of knowledge of the person making the interpretation
(ii) Equipment (e.g., an indifferent stereoscope)
(iii) Topographic relief (flat topography is the least satisfactory)
(iv) Soil and forest cover. This is a real problem in West Malaysia, although the photogeologist is assisted on occasion by the fact that there is sometimes a close relationship between the type of forest cover and the underlying rocks

Mineral exploration: In West Malaysia photogeology has much to offer to those searching for mineral deposits in that it enables a mineral potential map to be constructed with great rapidity. Thus for the Gemas-Mersing area such a map was constructed on which igneous intrusives, volcanic flows, major faults and alluvium on and derived from granitic areas were plotted. This map enabled 54% of the area to be eliminated before prospection on the ground commenced.

After some discussion of the topics raised in Mr. Piazza's talk, P.H. Stauffer proposed a vote of thanks to the speaker, and the meeting adjourned. Approximately 30 members and guests attended.

-- KFGH

Ordinary meeting, 23 October: C.S. Pichamuthu

The speaker was introduced by Mr. J.H. Leow, who recalled the early days of the University of Malaya geology department, founded in Singapore by Professor Pichamuthu. The holder of Ph.D. and D.Sc. degrees from Glasgow University, and a Fellow of the Royal Society of Edinburgh, Professor Pichamuthu came to Malaya from the University of Bangalore, where he has also been Professor Emeritus of geology since retiring here in 1961. He spoke on the topic of "The Pre-Cambrian of India, with special reference to charnockites". A synopsis of his talk follows.

India can be divided geologically into three main parts: the Himalayas, an enormous and complex fold mountain chain; the Indo-Gangetic alluvial plain; and to the south, Peninsular India, a triangular mass of Pre-Cambrian basement, with local basins of younger rocks.

The southwest part of Peninsular India is the so-called Archean nucleus, composed of "Peninsular Gneiss", with northwest trending bands of metamorphic rocks known as the Dharwar Schists. It was formerly thought that the Dharwars overlay the gneiss, but more recently intrusive relations have been found, so that now it is not known on what "basement" the Dharwars were laid down. The age of this Archean nucleus, from radiometric determinations, seems to be about 2600 million years.

On the east side of the Archean nucleus, along the east coast of Peninsular India, are the Eastern Ghats, a metamorphic complex with an age around 1600 million years. To the north, truncating the Dharwar trend with a more east-west one is the Satpura, with an age of about 1000 million years.

The Dharwar Schists seem to form an anticlinorium plunging to the north, and the metamorphic grade increases to the south; at the contact with the Eastern Ghats the granulite facies has been reached, and it is here that charnockites occur.

The name 'charnockite' has a curious history. When Director Holland of the Indian Geological Survey wished to study the odd and beautiful rocks found in the Madras area, he found it simpler to collect a specimen from a Calcutta tombstone than to make a special trip, since this rock was widely used for this purpose in Calcutta. It so happened the sample was from the tombstone of a Mr. Job Charnock, a man credited with having "founded Calcutta"! Holland discovered hypersthene in the rock, and recognized this mineral as the characteristic feature of charnockites, which may range from acid to ultrabasic composition.

It was first thought that the charnockites of Madras were an igneous sequence, but Holland's careful observations, including his division into "granitic" and "granulitic" types, the former sometimes intrusive into the latter, can now be interpreted as metamorphic features of the granulite facies. The local intrusive relations are thought to represent local melting.

The type charnockites of Madras contain garnet and quartz; the former is common in charnockites of a range of compositions. Hypersthene-bearing igneous rocks (dolerites, etc.) are excluded from the category charnockite.

Radiometric ages in India seem to show four main concentrations at about 3000, 1750, 1350, and 500 million years. A similar four-fold pattern appears in Madagascar and also in Antarctica.

After the talk there was considerable discussion of the clouded plagioclase found in the rocks of Peninsular India, which has been interpreted as evidence of regional metamorphism, since the degree of clouding correlates with the grade of the metamorphism.

After a vote of thanks to the speaker proposed by C.S. Hutchison, who was also a colleague of Professor Pichamuthu in the early days of the University of Malaya geology department, the meeting adjourned. About 45 members and guests attended.

- PHS

NEWS OF MEMBERS

C.R. Jones: Formerly Principal Geologist with the Geological Survey of Malaysia (Malaya), Dr. C.R. Jones recently completed his Ph.D. degree at the University of Birmingham, and has accepted a post with the Overseas Division of the Institute of Geological Sciences in London. His thesis research concerned the Malayan Siluro-Devonian graptolite faunas, and the thesis is titled "Malayan early to mid-Paleozoic Stratigraphy and the Siluro-Devonian graptolite faunas of the Malay Peninsula". In his new post he is proceeding to Iran under an MOD scheme of assistance to the Geological Survey of Iran. He writes that the project comprises a three-man team and has the task of mapping a large area of northwest Iran bordering the Caspian Sea and forming the westerly extension of the Elburz Mountains. The work is expected to take at least three years to complete. During the project, Dr. Jones' address will be:

c/o Geological Survey of Iran
P.O. Box 1555
Tehran, Iran (w.e.f. 2 November 1968)

S.H. Chan: Mr. Chan, a lecturer in the Department of Geology, University of Malaya, is currently on a three-year leave in order to study for his Ph.D. at the Missouri School of Mines in Rolla, Missouri, U.S.A. His thesis research concerns the interpretation of resistivity data in geophysical exploration. He writes that has recently successfully completed the formulation of the mathematical theory, and is now carrying out numerical computations to verify the formulas. The computations are performed with the aid of an IBM 360 computer, and the initial results seem to be favorable.

Mr. Chan also reports that life in the U.S.A. has been fairly exciting during this Presidential Election year.

NEW MEMBERS

The Council of the GSM, at its meeting on 9th October, elected the following persons to membership in the Society (H=Honorary; A=Associte; S=Student; others are Full Members):

Abdullah bin Ismail (A)	T.K. Leong (S)
R.F. Allbrook	R.P.C. Morgan
M.I. Butland	T. Narasimhan
F.G. Caldini	S.S. Ong (S)
M.K. Choo (S)	K.J. Pocock
W. Hashimoto	S.P. Sivam (formerly S)
R.B.H. Hazelhoff	M. Tamura
G. Jacobson	D. Taylor
J. Katili (H)	H.D. Tjia
K.M. Leong	F.L. Yap
	F.S. Yong (S)

The election of Dr. J. Katili marks the first election of Honorary Member to the Society. Dr. Katili was accorded this honor by the Council for his many contributions to the geology of Southeast Asia, and especially for his efforts to promote cooperation in geologic efforts between Indonesia and Malaysia and in this region generally.

AFFILIATION TO THE INTERNATIONAL MINERALOGICAL ASSOCIATION

Returns of the questionaire with Newsletter 13 show the following results:

1. Agree that the GSM affiliate to the IMA and wish to be affiliated themselves 14
2. Agree that the GSM affiliate to the IMA but do not wish to be affiliated themselves.... 4
3. Do not agree that the GSM affiliate to the IMA...0

Council at its meeting on October 9th resolved that the part of its members interested in mineral science be affiliated to the IMA and has nominated Mr. J.H. Leow to be its pro-tem co-ordinator. Council further resolved those members who answered in category 1 above be automatically members of this group. Those members who are not among these 14 but who are interested in being part of the affiliated group (and receiving information from IMA regularly) should indicate so by writing Mr. J.H. Leow at the Department of Geology, University of Malaya, Kuala Lumpur, if possible by December 15th before action is taken on the affiliation.

- JHL