
PERSATUAN GEOLOGI MALAYSIA

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PERSATUAN GEOLOGI MALAYSIA
(GEOLOGICAL SOCIETY OF MALAYSIA)

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NOTA GEOLOGI (GEOLOGICAL NOTES)

Rotation of Borneo microplate completed by Miocene: Palaeomagnetic evidence.

(Putaran kepingan-mikro Borneo selesai pada Miosen: Bukti paleomagnetan).

N.S. Haile, 53 Nyewood Lane, Bognor Regis, Sussex PO21 2SQ, England.

Abstract

Samples from the Tertiary, probably Oligocene or Lower Miocene, Upper Silantek Beds show reversed magnetism close to the direction of the present dipole field ($D = 178$, $I = -1$), and yield a south palaeomagnetic pole at $88^{\circ}S$, $190^{\circ}E$. This indicates that the 50° anticlockwise rotation for Borneo since the late Cretaceous was completed by the Miocene.

Contoh-contoh dari Lapisan Silantek Atas berusia Tersier, mungkin Oligosen atau Miosen Bawah, menunjukkan kemagnetan songsang hampir kepada arah medan sekarang ($D = 178$, $I = -1$), dan menghasilkan kutupan paleomagnet menseselatan pada $88^{\circ}S$, $190^{\circ}E$. Ini menunjukkan bahawa putaran lawan-jam 50° bagi Borneo sejak akhir Kapur itu selesai pada Miosen.

Introduction

Redbeds from the Plateau Group (Late Cretaceous - ? Miocene) in three areas of West Sarawak show very stable magnetism, and are reversedly magnetized. Two sites are in the Upper Silantek Formation (formerly Upper Kantu Beds) in the Undup headwaters (site A) and at Bukit Begunan (site B), which are Upper Eocene or younger, probably Oligocene or early Miocene (Haile, 1957; 1969). The third site, C, (from which only one of three samples received proved drillable) is in the Penrissen Sandstone of the Bungoh Range, where the Plateau Group starts in the Late Cretaceous and continues into the Early Tertiary (Wilford & Kho, 1965).

The orientated handsamples from the Bungoh Range and Undup headwaters were sent respectively by Mr. James Lau and Mr. Dennis Tan, of the Malaysian Geological Survey. The Bukit Begunan site was sampled by the writer using a portable field drill.

Cylinders 25 mm diameter and 25 mm long were cut from the field cores, or cores drilled from handsamples. These were measured in the laboratory of the Geology Department, University of Malaya using a DIGICO spinner magnetometer. Pilot specimens were thermally demagnetized step by step to 600° and is the best demagnetizing temperature for the main collection selected by use of the Briden stability index (Briden, 1972).

Results

Results are shown in Table 1. All samples were found to be very stable magnetically, pilot samples showing little change in magnetic direction even to $600^{\circ}C$. Initial intensities ranged from 4

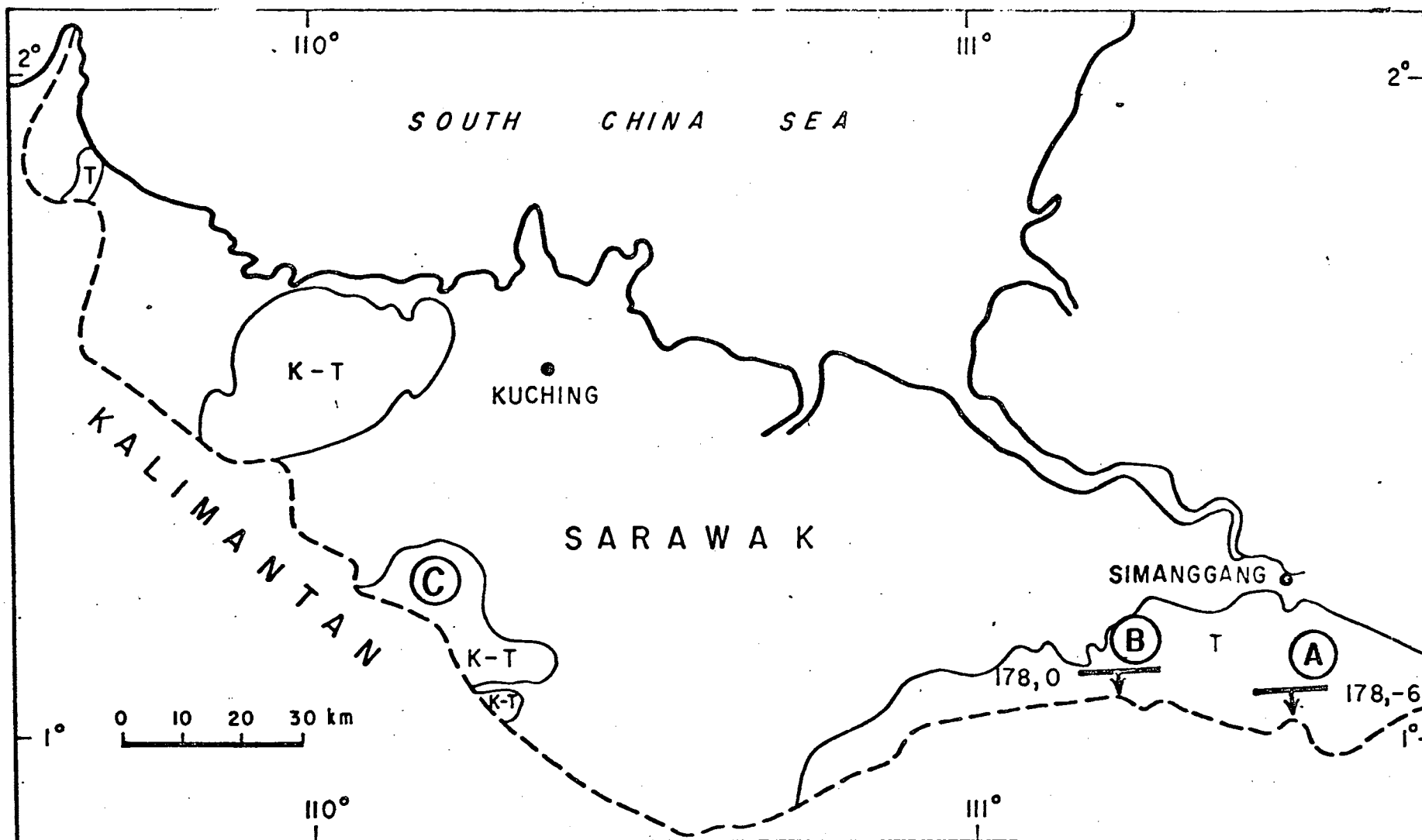


Fig. 1. Sketch map showing Lower Tertiary palaeomagnetic site in West Sarawak.

A,B,C, = palaeomagnetic sites; arrows show direction of mean site vectors with declination, inclination; T = Lower Tertiary strata, K-T = Upper Cretaceous to Lower Tertiary strata.
 Note: site vector is not plotted for site C, since only one sample was measurable from there.

to 44 mA m^{-1} .

The mean magnetic direction of cleaned samples from the Upper Silantek Beds is $D = 178$, $I = -1$, implying that the rocks were magnetized during a reversed epoch, and that they occupied a position similar to the present. Only a single sample, of three sent from the Bungoh Range, was drillable; so it can only be stated that this is also reversely magnetized.

West Kalimantan (Borneo) has been shown to have rotated anti-clockwise about 50° since the Late Cretaceous (Haile, McElhinny, & McDougall, 1977) and the present results indicate that, assuming West Sarawak was coupled to West Kalimantan, this rotation was completed by the time of deposition of the Upper Silantek Beds, i.e. the Oligocene, or Miocene at the latest.

Acknowledgements

The field and laboratory work was funded by the University of Malaya. The Malaysian Geological Survey in Kuching, Sarawak, provided transport and other assistance; Mr. Dennis Tan and Mr. James Lau provided orientated hand-samples from the Bungoh Range and Undup headwaters. Mr. T.H. Lee assisted in the laboratory and field work.

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- _____, McElhinny, M.W., & McDougall, I., 1977. Palaeomagnetic data and radiometric ages from the Cretaceous of West Kalimantan (Borneo), and their significance in interpreting regional structure. Quart. Jour. Geol. London, 133, 641-645.
- Wilford, G.E., & Kho, C.H., 1965. Penrissen area, West Sarawak, Malaysia: explanation of sheets 1-110-13 and 1-110-14. Brit. Borneo Geol. Sur. Report, 2.

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Table 1. Palaeomagnetic data from the Plateau Group, West Sarawak

Locality	Formation	Age	D,	I	n	\underline{k}	α_{95}	R
A Bukit Begunan (Sungai Kepit, SW side 1.15° N, 111.25° E)	Upper Silantek Beds	Late Eocene to Early Miocene, prob. Oligocene	178,	0	8	140.0	4.6	7.95003
B Undup headwaters (Sungai Tandok, S. of Sungai Tenyungan 1.04° N 111.48° E)	do	do	178,	-6	2	175.1	18.9	1.99429
C Bungoh Range (Sungai Ma'ah, tributary Sungai Semban 1.25° N, 110.20° E)	Penrissen Sandstone	Late Cretaceous to Early Tertiary	164,	-5	1	-	-	-
Mean of samples from A & B			178,	-1	10	145.1	4.0	9.93800
Mean of VGP's from A & B	Lat. 88°S; Long. 190°E; n = 10; \underline{k} = 169.2; A_{95} = 3.7							

Note: Samples cleaned thermally (at 200°C for A, 450°C for B & C). Directions corrected for tilt of beds. D, I = declination east of true north, inclination positive downwards; R = length of resultant of n unit vectors; \underline{k} = precision parameter; α_{95} = radius of circle of 95 percent confidence about the mean.

Tin deposits that may be classified as exceptional by virtue of their location

(Endapan timah yang bolih di jeniskan sebagai luar-biasa di pandang dari segi lokasinya).

K.F.G. Hosking, Calle Isla de Cuba, 23, 1^o, 3, Sitges, (Barcelona), Spain.

"Everybody notices as a fact an exception when it is striking and frequent, but he had a special instinct for arresting an exception. A point apparently slight and unconnected with his present work is passed over by many a man almost unconsciously with some half considered explanation which is in fact no explanation. It was just these things he seized on to make a start from".

(Written about Charles Darwin by Lisson. See DARWIN, F., 1888. Life and letters of C. Darwin. John Murray, London).

Economically viable tin deposits are becoming progressively more difficult to find, and it is a glimpse of the obvious that the more we can discover about why known tin deposits are where they are the better will we be equipped to search for further tin deposits. If the long-embraced tin is where you find it philosophy is not yet quite dead, we should take immediate steps to ensure its early demise.

Whilst every ore deposit is an exceptional geologic unit and therefore meriting the closest study, I am concerned now only with those tin deposits, which by virtue of these location alone, may be classified as exceptional. It seems to me we need to develop the Darwinian characteristic noted in the above quotation and to try to discover, and in a much more thorough manner than has often been the case in the past, why, for example, a given tin mine is vastly richer than all the other mines in the field and why a tin deposit, not necessarily one of direct economic importance, should occur, apparently in splendid isolation, in a region that no one would classify as a tin province. Often, such phenomena have been dismissed with explanations that are but half explanations or no real explanations at all. Most of us, and probably all of us who have written about primary tin deposits, are guilty on that score in that to account for the disposition of a given deposit we have used such vague statements as the deposit is where it is because of the unusual tectonic setting, or because the granite there was a tin granite, or because the original morphology of the granite there was conducive to the development of lodes, or because the granite happened to penetrate a tin-bearing stratum there and promoted the local reorganisation and concentration of tin of the stratum. Clearly, such statements do not provide anything like a completely satisfactory answer to the questions, although they may contain the major elements of the complete answer, or provide one or more clues to the complete answer. A good example of the latter is the factually supported statement that there is a spatial relationship between the pre-granite fluorite deposits and the post-granite tin deposits of the Bushveld Igneous Complex (South Africa), (Wilson, et al., 1978).

I should like to know, for example, why there appears to be a far greater concentration of tin in the Sungei Lembing deposits of the Pahang Consolidated Company Limited than anywhere else in the Eastern Tin-Belt of Peninsular Malaysia. Why are these deposits unique as far as this Belt is concerned? Or are they unique? Why, as far as one can judge, are the lodes of Kelapa Kampit (Belitung) vastly richer, and in other respects different, from all the other known hard-rock tin deposits of the island? The magnitude of these particular questions is well known to me, and we may never reach satisfactory solutions to them however hard we may try, in part because mining has probably removed valuable clues and portions of the old workings are unlikely to become accessible again.

Then there is the great and as yet unsolved question as to why one finds isolated occurrences of cassiterite and/or other tin species in regions that are not regarded as tin provinces. Thus, although no workable tin deposits have been discovered in Scotland, in East Ross-shire there is a tin occurrence of scientific interest. There, according to Jones (1925, p. 140) 'small stringers, chiefly of magnetite and cassiterite, traverse garnetiferous albite gneisses Biotite is not uncommon within the stringers, in flakes lying parallel to the sides. It is probable, on the whole, that these garnetiferous albite gneisses represent basic segregations of an unusual type, or else peculiar veinstones formed in the granite gneiss. the black streaks from three different localities gave 3.22 per cent of tin oxide'. Thomas and MacAlister (1920, p. 56) further note that the stanniferous streaks and veins are 100 - 150 yards in length and 10 - 15 yards wide. They further mention that 'the relation of the ore masses to the rest of the gneiss is obscure on account of the shearing and faulting which the district has undergone; and although magnetite occurs disseminated through the country rock, cassiterite has as yet not been detected'. Thomas and MacAlister also express the opinion that 'although the ore is most probably a segregation, we must not lose sight of the possibility that these veins might have belonged to the sediments of the Moine Series; which, as the result of profound metamorphism, have been converted into granulitic gneisses'. This latter suggestion forestalls, by many years, similar thoughts presented by Routhier (1969) to account for certain stanniferous deposits occurring elsewhere in metasediments.

Geological views have advanced somewhat since Jones and the other workers were writing about this Scottish tin occurrence about a half a ago, and now we should be asking questions that were not asked then. Now we should want to know why there is this isolated occurrence of cassiterite in East Ross-shire and from where the tin came, for example. I don't know if this deposit has been examined in detail recently or if the deposit has been drilled. Without much more investigation of it that I am aware of I do not think it can be written off as a deposit of no economic importance. Could there not be richer and more extensive tin deposits below the surface there? Why are so many still imbued with the quite illogical view that unless a strong tin deposit outcrops or suboutcrops in a given area the area is unlikely to hold hard-rock tin deposits of economic merit?

In Ireland, an island that has not generally been regarded as a likely place to find economically important deposits of tin, diamond

drilling, by Northgate Exploration, at its Aclare Prospect, County Sligo, intersected a 6 ft. 6 in. wide zone that assayed 0.37 per cent Sn. This, it is claimed in Tin International of January, 1978 (p. 20) is the first significant tin find in the area. I don't know if the Group was searching specifically for tin, and if so, what led it to the area. Perhaps it was located as a result of a geochemical survey. But one would like to know why this concentration of tin is there.

Jones (1925, p. 141) notes that up to the time of writing his book, cassiterite has been found in four localities in Ireland and that 'the finds are of no economic importance whatsoever'. It would, of course, be of great value to all those concerned with the search for further tin deposits were it known why there is so little tin in each of these localities, and if these deposits and their host rocks might provide further clues as to how one might generally and rapidly differentiate between a stanniferous area that has no economic potential and an area that does have one. Of the four Irish stanniferous deposits that Jones mentions perhaps the one most likely to provide useful clues to the solution of the problem with which I am concerned here is a lode, at Dalkey, County Dublin, which contains a little cassiterite associated with galena. Granite outcrops in the neighbourhood. If this is the only tin-bearing lode in Dalkey, what was it that made a single site of deposition qualify for such mineralogical stardom? Was the neighbouring granite the source of the tin and, if so, how does it differ, if it differs at all, from those granites of the tin-rich provinces of the world? And when one is presented with a Dalkey situation what does one do? Should one abandon the area or should one recommend that it be subject to a detailed and, doubtless, expensive three-dimensional examination? This last question is one that one would like to be able to answer with a great deal more confidence than one can do at present. It is a question that certain Alaskan tin showings are prompting now (Dr. Bruce Reed, private communication).

In the south of Wales, at the Nant Mine, near Carmarthen, beneath the barite zone that is being exploited, a mixed sulphide zone has been located which, according to Thomas (1972) has been 'shown to contain appreciable evidence of tin mineralisation'. As far as I am aware, tin mineralisation has not been discovered elsewhere in Wales. So why is there a concentration of tin in the Nant deposits? Is the area a geologically unique one as far as Wales is concerned? Is the deposit a displaced part of the tin province of the Southwest of England? Is it likely to prove a useful source of tin? Should one look for further stanniferous deposits in south Wales? Still more questions might be asked. We know that certain massive sulphide deposits, particularly in Canada, are tin-bearing but we still know little enough about why some are and some are not. We are also all too prone to forget that most of the major hard-rock tin deposits of the world contain a far greater quantity of heavy metals other than tin and that they mostly occur as sulphides. Collectively, for example, the lodes of Dalcoath Mine, Cornwall's major tin mine, yielded far more copper than they did tin. Considerable quantities of such metals as Cu, Fe, Zn, Pb, as sulphides, occur in the tin lodes of Pahang Consolidated Mines, Kelapa Kampit, the Japanese and Bolivian mines, and Rooiberg (South Africa). The amount of tin in the porphyry deposit of Mount Pleasant, New Brunswick, is small by comparison with the total amount of these other heavy metals that occur as sulphides there. When discussing a tin

province we are, in fact, commonly concerning ourselves with a multi-metallic province in which heavy metals other than tin dominate the scene from a quantitative point of view. When this fact is appreciated a number of papers that are concerned with possible relationships between plate tectonics and the generation of mineral deposits immediately become suspect. Probably a comprehensive survey would reveal that a series of hard-rock tin deposits exists, the one end-member of which is characterised by the presence of tin, as cassiterite, unaccompanied by any sulphides whilst the other is characterised by an abundance of sulphides with which tin, as oxide or sulphide, is associated in very minor amounts. Possibly were the data presently available assembled, we might find that the ratio of tin to the other heavy metals in the suitably investigated hard-rock tin deposits of the world collectively would tend towards a lognormal or normal distribution. If this should turn out to be the case then the question is 'why is this so?'

As this article is written for a Malaysian publication it is pertinent to refer to certain reports of cassiterite occurrences in south and south-east Asia in regions in which no viable stanniferous deposits are known. Belcher (1848, p. 24) when describing the gold mines of Selingok, Sarawak, notes that 'the gold is obtained by washing from a very loose disintegrated granite debris, containing detached crystals of quartz (dodecahedrons and 6-sided pyramids, base to base), pyrites, antimony, and traces of tin'. (I suppose that he means traces of cassiterite). The content of this statement suggests that Belcher was not a good crystallographer and so, possibly not particularly good at mineral identification; so, immediately, we must wonder if he really did confirm the presence of cassiterite. I do not think this is a particularly likely place to find cassiterite, but would it not be worthwhile reinvestigating these deposits, or the debris left behind by the miners, in order to try to check Belcher's statements? Were cassiterite shown to be present at Selingok, it might, at least, throw some more light on the geology of Sundaland.

In a curious and most entertaining book containing data on the occurrences of gold, gems and pearls in Ceylon (Sri Lanka) and Southern India, that had been culled from many sources, and were compiled and published by the newspaper men (Ferguson and Ferguson, 1888), there are a few interesting references to the occurrence (real or imaginary, I cannot tell) of tin on the island. They include (p. 105) an extract from Sir Emerson Tennent's "Ceylon" (for which no complete reference is provided) in which it is stated that in 1847 the government commissioned a Dr. Gygax 'to proceed to the hill district of Adam's Peak, and furnish a report on its products'. He claims to have established the existence of tin in the alluvium along the base of the mountains to the eastward towards Idalgashena; but so circumstanced, owing to the flow of the Wellaway river, that, without lowering its level, the metal could not be extracted with advantage. The position in which it occurs is similar to that in which tin ore presents itself in Saxony; and along with it, the natives, when searching for gems, discover garnets, corundum, white topazes, zircon and tourmaline. How much of this is fact and how much is fiction? I don't know, nor do I know enough of the geology of the island to make any useful observations about what appears above. Jones (1925), when writing his 'Tinfields of the World', was either unaware that 'tin' had been reported to occur in Sri Lanka or thought it was so unlikely that he did not bother to mention it. Still, for a whole lot of reasons, Gygax's observations should be checked.

Perhaps the Geological Survey of Sri Lanka might be able to throw some light on the matter, or, lacking further information, it might be prepared to investigate this intriguing question.

There are many more tin deposits which are exceptional by virtue of their location that I might cite and discuss, but those that I have mentioned will, I hope, serve to make the point that it is by studying such deposits with a view to discovering why they are where they are that we may arrive at better ways and means of differentiating rapidly and with a high degree of certainty between areas that possess but academically interesting amounts of tin species and those that are likely to contain tin deposits that might be exploited. I hope, also that it will be seen that studies of such abnormal tin deposits are likely to throw further light on the genesis and nature of the normal ones, just as psychiatrists' investigations of the behaviour of abnormal people have provided a better understanding of the so-called normal individuals.

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- Ferguson, A.M., & Ferguson, J., 1888. Gold, gems and pearls in Ceylon and Southern India. A.M. & J. Ferguson, Colombo. 428 p.
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- Thomas, A.M., 1972. The mineral industry in Wales - a review of production trends, resources and exploitation problems. Proc. Geol. Assoc., 83, pt. 4, 365-383.
- Thomas, H.H., & MacAlister, D.A., 1920. The geology of the ore deposits. Ed. Arnold, London, 416 p.
- Wilson, J.G., & Loxton, R.F., 1978. The major controls of tin mineralisation in the Bushveld Igneous Complex, South Africa. P. 17-18 of the Abstracts of papers presented at an international symposium on the Geology of Tin Deposits, at Kuala Lumpur, Malaysia, during 23-25 March 1978. Annex to Warta Geologi, 4, no. 2, Mar-Apr. 1978. Pub. Geol. Soc. Malaysia, Kuala Lumpur.

MESYUARAT PERSATUAN (MEETINGS OF THE SOCIETY)

Mesyuarat Agong Tahunan

The Annual General Meeting of the Society for 1979 was held in the Geology Lecture Hall, University of Malaya, commencing at 5.00 p.m, April 20 1979. Regretfully, only 24 members attended the meeting. Due to a poor response to the request for papers, the Discussion Meeting scheduled to be held on the same evening was postponed. Tea was served prior to the meeting.

The agenda included presentation of reports by the President, Hon. Secretary, Hon. Asst. Secretary, Editor, Treasurer and the Auditor and the announcement of the Council for 1979/80.

The President high-lighted the Society's activities of the year; these were:

- a. The International Symposium and Training Course on the Geology of Tin Deposits.
- b. The Society's participation in GEOSEA III.
- c. The Second Petroleum Seminar.
- d. The establishment of the Young Geoscientists Award.

From the Hon. Treasurer, the meeting learnt of a financially successful year for the Society.

The Council for the year 1979/80 is:

President	:	Tan Bock Kang
Vice President	:	Khoo Teng Tiong
Honorary Secretary	:	Wong Yoke Fah
Honorary Assistant Secretary:		Khoo Kay Khean
Treasurer	:	Gan Ah Sai
Editor	:	Ahmad Jantan
Councillors	:	James Lau
		Mohd. Ali Hassan
		Abdul Aziz Hussin
		Tan Loong Keat
		Tan Bonn Kong
		S.S. Subramanium
		Khalid Ngah

The meeting ended at about 5.50 p.m., followed by the screening of two documentary films.

Perbincangan (Discussion Meeting)

M.H. Kamal: The discovery and development of Southeast Asia's Minas Oil field.

Mr. Kamal of P.T. Caltex Pacific Indonesia delivered a talk at the Society's discussion meeting at the Geology Department, University of Malaya on April 4th. The attendance was moderate.

During the talk, Mr. Kamal briefly touched the exploration and development history of the oil field and went at some length into its geologic setting, hydrocarbon occurrences and production history.

The history of exploration of the Minas oil field dates back to 1938 when a young American geologist, Wallace Nygren, resorted to using the 'hand auger'. Production began at an initial rate of 15,000 b/d and increased steadily, reaching a rate of 400,000 b/d in early 1969.

BERITA BERITA PERSATUAN (NEWS OF THE SOCIETY)

Bahan baru di Perpustakaan (New library additions)

The following journals have been added to the Society's Library and are available to members at the Klompe Reading Room at the Department of Geology, University of Malaya, Kuala Lumpur.

1. American Museum Novitates, no. 2658 & 2655, 1978.
2. American Museum of Natural History, Bulletin, v. 161, art. 3, 1978.
3. IMM, Bulletin no. 868 & 869, 1979.
4. Grondboor & Hamer, no. 6, 1978 and no. 1, 1979.
5. Staringia no. 5, 1979.
6. Geophysical Research Bull., v. 16, no. 4, 1978.
7. Memoirs of Nanjing Inst. of Geol. & Pal. Academica Sinica, no. 12, 1978.
8. Acta Palaeontologica Sinica, v. 17, no. 4, 1978, & v. 18, no. 1, 1979.
9. Commonwealth Geol. Liaison office, Newsletter 3, 1979.
10. Institute of Geoscience, The University of Tsukuba, annual report no. 4 for the Academic year 1977, 1978.
11. AGID news, nos. 16, 17 & 18, 1978 & 1979.
12. Bulletin of the National Science Museum, v. 4, (n. 4), 1978.
13. Malaysian Society of Soil Science, annual report, 1978/79.
14. Teen talk, 1979. Young People's Service, National Library Singapore.
15. Acta Stratigraphica Sinica, v. 2, no. 2, 1978.
16. Commonwealth Geological Liaison Office, Sp. Liaison report, 1979.
17. Imm Transactions/Sect. A, v. 88, 1979.
18. National Library Singapore: adult reference collections accession list, 1979.

Keahlian (Membership)

The following persons have joined the Geological Society of Malaysia:

Ahli Penoh (Full members)

1. Sally Lim, Sekolah Men. Zainab, Kota Bharu.
2. J.R. Paten, AAR Ltd., GPO Box 880, Brisbane, Australia.
3. Tan Aik Min, Sg. Way Enterprise Sdn. Bhd.
4. P.C. Cranfield, Fairmont State Ltd., Bangkok.
5. M.G. Sharma, Dept. of Geology, University of Otago, N.Z..

Ahli Bersekutu (Associate Member)

1. S.J. Jones, GEOMEX Surveys Ltd., Singapore.

Ahli Pelajar (Student members)

1. Ong Hock Thye, 336 Jln 17/6, P.J.
2. Radzali Othman, Sheffield University, England.

Ahli Institusi (Institutional member)

1. Minerals Exploration Co., P.O. Box 54945, Los Angeles, Ca., USA.

Pertukaran Alamat (Change of Address)

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

1. Jagjit Singh, 60, Jalan SS2/55, Petaling Jaya.
2. Tee Ai Teng, (Rm. 2.01), Dept. of Geology, Imperial College of Science and Technology, Prince Consort Road, London SW7 2BP, England.
3. R.B. Tate, c/o New House Farm, Hatton, Warrington, Cheshire, U.K.
4. Abdullah Hasbi b. Jh. Hassan, SEATRAD Centre, 14 Tiger Lane, Ipoh, Perak.
5. Mohd. Tahir b. Mohd. Kassim, 35 Jalan Tempinis Kanan, Lucky Garden, Bangsar, Kuala Lumpur.
6. Tan Loong Keat, 6, SS2/97, Sungei Way Subang.

Alamat dikehendaki (Address wanted)

We would like the current address of the following member:

1. Mahzan Bakar, formerly of 19E Jalan Raja Syed Saffi, Kangar, Perlis.

BERITA BERITA LAIN (OTHER NEWS)

Law of the Sea Institute: Thirteenth Annual Conference

The Thirteenth Annual Conference of the Law of the Sea Institute will be held in Mexico City from October 15 to 18 1979. Topic to be presented is "State Practice in Zones of Special Jurisdiction" and will cover the following: the exclusive economic zone, living resources, non-renewable resources on the continental shelf, scientific research and transfer of technology, pollution, delimitation of the EEZ, enforcement and customary international law. Further information is obtainable from LAW OF THE SEA INSTITUTE, UNIVERSITY OF HAWAII, 2540 Dole Street, Holmes 401, Honolulu, HI 96822, USA.

National and International Management of Mineral Resources

A joint meeting of the Institution of Mining and Metallurgy, the Society of Mining Engineers of AIME and the Metallurgical Society of AIME will be held in London from 27 to 30 May 1980, covering topics on 'National and International Management of Mineral Resources'. General information on the conference, the papers that are to be presented at the plenary and simultaneous technical sessions, the post-conference tours, the social events and the ladies' programme is given in its First circular, which is obtainable from The Secretary, Institute of Mining and Metallurgy, 44, Portland Place, London W1N 4BR, U.K.

Its plenary sessions aim to examine the problems of consumer countries and companies in relation to shortages in world supplies in mineral raw materials and fuels, to consider where and how they are most vulnerable, and in regard to which minerals, to hear the problems that producers face in meeting such shortages, and to discuss the role of governments in equating demand and supply.

Kalender (Calendar)

Under this column the Society will note coming events on meetings, courses and symposia of interest to members. Date in parentheses gives the issue of Newsletter containing more information pertaining to the event:

Other events1979

1979 : 14th Congress of the Pacific Science Association USSR. B.G. Gafurov, Chairman of the Soviet National Pacific Committee, Academy of Sciences of the USSR, Moscow. (Jul-Aug 1977).

- May 10 - 26 : Ninth International Congress of Carboniferous Stratigraphy and Geology, Washington, USA. President or Secretary-General IX-ICC, 1979, Museum of Natural History, Washington, D.C., 20560, USA. (Sep-Oct 1977).
- May 29 - Jun 9 : 22nd Plenary Meeting of the Committee on Space Resources, Bangalore, India. COSPAR Secretariat, c/o Organising Committee, XXIInd COSPAR - 79, ISRO Headquarters, Cauvery Bhavan, District Office Road, Bangalore 560009, India. (Jan-Feb 1979).
- Jun 5 - 6 : Eighth Annual Convention of the Indonesian Petroleum Association. I.P.A. Lecture Committee, Jalan Menteng Raya 3, Jakarta, Indonesia. (Nov-Dec 1978).
- Jul 24 - 27 : Sixth Asian Regional Conference on Soil Mechanics and Foundation Engineering, Singapore. Dr. Tan Swan Beng, c/o Institution of Engineers, Singapore, Suite 1306, 13th Floor, International Plaza, Anson Road, Singapore 2. (Sep-Oct 1978).
- Jul 28 : International Symposium on Soil Sampling, Singapore. Mr. Hioshi Mori, Kori Geotechnique Inc., Room 1005, Sunheim Tamachi, 3-2-9, Kaigan, minato-ku, Tokyo, Japan.
- Sep 18 - 21 : CCOP/SOPAC Symposium on 'Petroleum Potential in Island Arcs, Small Ocean Basins, Submerged Margins, and Related Areas, Suva, Fiji'. CCOP/SOPAC Technical Secretariat, c/o Mineral Resources Dept., Private Mail Bag, GPO, Suva, Fiji. (Jan-Feb 1979).
- Oct 15 - 18 : Law of the Sea Institute: Thirteenth Annual Conference. Law of the Sea Institute, University of Hawaii, 2540 Dole Street, Holmes 401, Honolulu, HI 96822. (Mar-Apr 1979).
- Oct 28 - Nov 2 : ICOLD XIII Congress on Large Dams, New Delhi. C.V.J. Varma, Organising Secretary, XIII Congress on Large Dams, c/o Central Board of Irrigation and Power, Kasturba Gandhi Marg, New Delhi, 110001, India.
- Nov 17 - 21 : X World Mining Congress, Istanbul. The Turkish National Committee of the World Mining Congress, Ziya Gokalp Caddesi, No. 17, Kat 8, Ankara, Turkey.

1980

- Feb 11 - 16 : Fifth Gondwana Symposium, Wellington, New Zealand. Secretary, Fifth Gondwana Symposium, Victoria University of Wellington, Private Bag, Wellington, New Zealand. (May-Jun 1978).
- Apr 7 - 11 : International symposium on landslides 'ISL 1980', New Delhi. Dr. R.K. Bhandari, Organising Secretary, I.S.L. 1980, P.O. Central Road Research Inst., New Delhi, 110002, India.

- Apr 10 - 15 : 8th International Geochemical Exploration Symposium, Hannover, Fed. Rep. Germany. Dr. H. Gundlach, Organising Committee, 8th Int. Geochemical Exploration Symposium, Federal Institute for Geosciences and Natural Resources, P.O. Box 510, 153, D-3000 Hannover 51, W. Germany. (Jul-Aug 1978).
- May 27 - 30 : National and International Management of Mineral Resources. The Secretary, Institute of Mining and Metallurgy, 44, Portland Place, London W1N 4BR, U.K. (Mar-Apr 1979).
- Jul 7 - 17 : 26th International Geological Congress in Paris, France. Secretariat General du 26 eme Congress geologique international. Maison de la Geologie, 77-78 rue Claude Bernard 75005, France. (Nov-Dec 1977).
- Aug. 4 - 9 : Second European Conodont Symposium, Vienna and Prague. ECOS II, c/o Geological Survey of Austria, P.O. Box 154, Rasumofsteygasse 23, A-1031, Vienna. (Jan-Feb 1979).
