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

N E W S L E T T E R

Number 20 September 1969

Contents Page

GEOLOGICAL SOCIETY OF MALAYSIA

Officers - 1969

President	:	C.S. Hutchison University of Malaya Kuala Lumpur
Vice-President	:	S.S. Rajah Geological Survey Kuala Lumpur
Secr./Treas.	:	K.J. Pocock University of Malaya Kuala Lumpur
Editor	:	P.H. Stauffer University of Malaya Kuala Lumpur
Councillors	:	C.H. Yeap Associated Mines Kuala Lumpur
		P.Y.N. Wong Geological Survey Kota Kinabalu, Sabah
		S.P. Sivam (co-opted) University of Malaya Kuala Lumpur

Address of the Society:

Geological Society of Malaysia
c/o Department of Geology
University of Malaya
Kuala Lumpur, MALAYSIA

GEOLOGIC NOTES:

A Brief Note on Ignimbrite in Johore[1]

S. Senathi Rajah, Geological Survey of Malaysia

During the course of field investigations in Sheet 130, south Johore, Burton (1962) first recorded the presence of ignimbrite, of a crystal-lithic variety, in the Gunong Pulai area. The writer when he mapped Sheet 125 (Gunong Blumut) in central Johore during 1966-67 noted widespread occurrences of ignimbrite in the Gunong Chemendong and Sungei Ulu Sedili areas (Rajah, 1969). More recent fieldwork by the writer's colleagues in areas north of Sheet 125 towards the Pahang border has also revealed the presence of a large extent of similar rock-type (Cook and Suntharalingam 1969; Chong and Evans, 1969).

As a consequence of these findings in Johore there emerges the probability of widespread occurrence of ignimbrite elsewhere in the States of West Malaysia (which may have been overlooked in the past). To date, however, the first published account on ignimbrite was by Aw (1967), who described it as occurring in the form of a dyke or sillar in the Temangan area, central Kelantan.

The term ignimbrite is applied here to all pyroclastic flow deposits in which welding ranges from poor to dense, but is more often dense. Ignimbrites have been extensively described from other areas of the world (see Cook, 1966; Carozzi, 1960). Typical ignimbrites generally grade imperceptibly into crystal, lithic, and ashy varieties of tuff, in which welding may be present or absent; when present it is feeble to moderate, and the rock may lack flow characteristics.

In Johore the most abundant variety of ignimbrites are the welded tuffs. They show a range of composition from rhyolite to dacite, but are mainly rhyolitic. These rocks are quite often intimately intercalated with other pyroclastic and volcanic rocks. They are generally massive, structureless, well-jointed and, in places, stratified. Fine-grained to strongly porphyritic varieties occur and when fresh they are hard and tough. Generally the ignimbrites are dark grey to greenish-grey, but locally are pale grey, pinkish-grey, light maroon, black, and buff.

The most densely welded variety of ignimbrite occurs in the basal part of the volcanic sequence. The characteristic eutaxitic structures of such rocks can be recognised only in thin sections in which the particles are plastically deformed and welded together. In hand specimens the rocks cannot be distinguished from flow-banded lavas. Under the microscope, the ignimbrite is often a crystal-vitric type containing mainly fairly large corroded and deeply embayed and fractured quartz crystals and an approximately equal amount of phenocrysts of poorly corroded plagioclase and K-feldspar. K-feldspar is mainly sanidine with subordinate orthoclase. The accessory minerals frequently

[1]Publication authorised by the Director, Geological Survey of Malaysia.

present include sericite, clay minerals, carbon dust, chlorite, epidote, calcite, tridymite, ilmenite, magnetite, hematite, leucoxene, limonite, and pyrite. Amphibole, pyroxene, biotite and tourmaline occur in some of the intermediate rocks. Although signs of welding are generally visible, in the more welded part it has often an irregular banded texture in which the afore-mentioned minerals when present may be set in a matrix composed of minute fragments of the same constituents and glass shards, which are usually squeezed and flattened. Most of the glass shards are devitrified or passed into a crystalline condition, and quite frequently they buckle around the phenocrysts. Generally broken fragments of crystals are to be seen. In some instances, "fiamme" or flame structures consisting of brown to black vitreous inclusions are seen in plane polarized light in the matrix. Also in some specimens considerable lithic fragments, mainly of volcanics and rare flattened, relict pumice were found to occur. Generally the groundmass of most of the ignimbrites is fluidal. The completely random distribution of phenocrysts, and lapilli as well, lends to some of these rocks a 'chaotic' texture.

The fieldwork during the course of which the discoveries were made forms part of the general programme of the Geological Survey. This brief note is written as a preliminary announcement to a more detailed paper which is being prepared by the department.

References:

Aw, P.C., 1967: Ignimbrite in central Kelantan. Geol. Mag., v. 104, p. 13-17

Burton, C.K., 1962: The geology and mineral resources of the Johore Bharu area, Johore (Sheet 130). Malaysia Geol. Survey Memoir (in manuscript)

Carozzi, A.V., 1960: Microscopic sedimentary petrography. John Wiley and Sons, New York and London.

Cook, E.F., 1966: Tufflavas and ignimbrites - a survey of Soviet studies. American Elsevier Publ. Co., New York

Cook, R.H., and Suntharalingam, T., 1969: The geology and mineral potential of north Johore and south Pahang - Area C. Malaysia Geol. Survey Report (in manuscript).

Chong, F.S., and Evans, G.M., 1969: The geology and mineral potential of north Johore and south Pahang - Area B. Malaysia Geol. Survey Report (in manuscript).

Rajah, S.S., 1969: The geology and mineral resources of Gunong Blumut (Sheet 125), Johore. Malaysia Geol. Survey Memoir (in manuscript)

A Magnetite-Cassiterite-Polysulphide Skarn vein at Bukit Besi Mine, Trengganu, W. Malaysia

K.F.G. Hosking, J.H. Leow and F.E. Haser, University of Malaya.

During a recent visit of the Third Year Applied Geology students of the University of Malaya to Bukit Besi opencast iron/tin mine in Trengganu, a poly-metallic vein was found of a type which has not hitherto been described from this mine and which, from a mineralogical point of view, is a type new to W. Malaysia and probably to Southeast Asia.

Briefly, this vein, which is from one to two inches thick, occurs in a belt of coarsely crystalline marble that is at present exposed in the main pit. In the hand specimen the vein appears to consist almost entirely of galena and pyrrhotite with the former species in greater abundance. The galena crystals vary from about 1/16 in. across, to a small fraction of an inch., and the crystals of different sizes are so disposed that the vein displays a crudely banded texture. The walls of the vein are somewhat ragged due to invasion of the marble by sulphides along intercrystalline boundaries.

Examination of thin and polished sections of the ore under the microscope indicates that its mineralogy is far more complex than an inspection of the hand specimens would suggest. It is quite clear that the vein has developed by replacement, probably in the vicinity of micro-fractures which afforded passage ways for incoming mineralising solutions, and which were periodically rejuvenated, or new ores were developed, during the whole phase of mineralisation. Such movements, however, were very slight, as although some of the early vein components have been fractured, they have not been severely fragmented.

The host-rock is marble containing minor amounts of anthophyllite and sericite mica.

It has not been possible to establish the whole of the mineral paragenesis with certainty, but magnetite and cassiterite were the two earliest 'vein' minerals to be formed and these were followed by arsenopyrite, pyrrhotite, sphalerite, chalcopyrite, tetrahedrite and galena. A little quartz was deposited during the phase of mineralisation, as small aggregates of this species and occasional doubly-terminated crystals appear in the pyrrhotite and galena. It is not known precisely when the quartz was introduced nor is it known if there is more than one generation of this mineral. Small and rare grains of maghemite occur, but these, in common with the little covellite that is present, are certainly secondary.

The magnetite occurs as isolated crystals: some of these are clearly octahedral whilst others are almost elliptical in section and so appear to have been in part resorbed. The cassiterite, although slightly fragmented, shows no sign of chemical attack, and judging from

somewhat similar deposits elsewhere it probably post-dates the magnetite. Arsenopyrite is present as small isolated crystals, or crystal fragments, but is a minor member of the lode: it pre-dates the pyrrhotite in which it is sometimes embedded: elsewhere it occurs in carbonate gangue.

The hexagonal pyrrhotite, which is a major component, is commonly intimately associated with appreciable quantities of sphalerite. These two species show most complex relationships and it is difficult not to arrive at the conclusion that they were developed simultaneously from a common parent. The broad distribution pattern exhibited by these two species is one in which irregularly shaped, and commonly large masses of sphalerite, containing bodies of pyrrhotite of a great variety of shapes and sizes, occur in pyrrhotite. However, this pattern has been further modified by the subsequent deposition of galena which locally places pyrrhotite and/or sphalerite. The original texture would seem to be the product of unmixing of a pyrrhotite/sphalerite system in which the iron sulphide was present in considerable excess.

This sulphide mixture was clearly developed by replacement of the marble which was invaded particularly along inter-crystalline boundaries. The rather common occurrence of pyrrhotite triple junctions at which the angles are all c. 120 degrees suggests that sometime after this phase of sulphide deposition, the deposit was subject to sufficient stresses to affect an annealing of this mineral at least. Although triple junctions involving pyrrhotite and other sulphides, or solely other sulphides, are to be seen, they are not particularly common, so it is reasonable to think that metamorphic processes have not caused a complete reorganisation of the components of the deposits but they have, perhaps, effected a slight modification of the body. In other words, it is in order to discuss the paragenesis of this deposit and not to regard the various minerals present as members of a crystalloblastic series (see Stanton, 1964).

The little chalcopyrite that is present in the section is in close association with pyrrhotite but the sphalerite is quite devoid of exsolution bodies of this mineral. It would appear to have been deposited either simultaneously with the pyrrhotite and sphalerite or immediately after.

A limited amount of tetrahedrite was next deposited, but whether this involved simply the replacement of carbonate has not yet been resolved. This, the writers believe, is the first occurrence of tetrahedrite from W. Malaysia to be recorded.

The deposition of galena in substantial amounts was the final episode. This sulphide readily replaced carbonate along grain boundaries but it was unable to replace the anthophyllite, which appears as curious thread-like inclusions in it. It is an interesting fact almost the whole of the anthophyllite seen in polished section is in the galena: a very little, however, does occur in the pyrrhotite. Relicts of slightly digested sericite also occur in the galena. The galena depositing

agents also had a distinct penchant for pyrrhotite, sphalerite and tetrahedrite, and locally most interesting mottled textures have resulted from such replacements.

The polished sections were scanned by an X-ray fluorescence analyzer and all the elements revealed are accounted for by the species recognised under the microscope.

The vein may be classified as a magnetite-cassiterite-polysulphide skarn deposit. Whilst this small vein is clearly of no value as a source of ore, it is, nevertheless, of some economic importance as it represents yet one more type (mineralogically speaking) of deposit which occurs in Southeast Asia. A detailed account of this body will be published elsewhere.

Reference:

Stanton, R.L., 1964: Mineral interfaces in stratiform ores. Trans. Instn. Min. Metall., Lond., 74, 45-79

Tin mineralization and faults in the Kuala Lumpur region

P.H. Stauffer, University of Malaya

Recent notes in this Newsletter by Stauffer (No. 15) and Shu (No. 17) have discussed the evidence for major faulting, especially wrench faulting, in the region around Kuala Lumpur and to the east. Stauffer proposed a major wrench fault trending about 105° (the "Kuala Lumpur fault zone"), while Shu pointed out several systems of faults which have been mapped, prominent sets trending NW-SE (130°-140°), N-S, and WNW-ESE (105°-115°). Shu interprets the faults at 130°-140° as the most important, especially the prominent one he calls the Bukit Tinggi Fault Zone, and regards the faults trending WNW as merely associated tension fractures of a minor and discontinuous character. Yet Shu himself points out that a major wrench fault is normally a many-stranded feature covering a rather broad zone, and "it is unlikely that any individual fracture of outstanding continuity, or on which a large displacement has occurred, can be found," The existence of substantial mapped offsets of geologic boundaries on faults trending WNW (e.g. the Ampang Fault, see Gobbett, 1964) indicates that these are not simply tension fractures.

The purpose of this Note is to draw attention to a further piece of information which may have a bearing on the problem. The accompanying map (fig. 1) shows the distribution of areas of tin mineralization, taken from the Mineral Distribution Map of Malaya (1966), in the Kuala Lumpur area and to the east. The proposed "Kuala Lumpur fault zone" and the

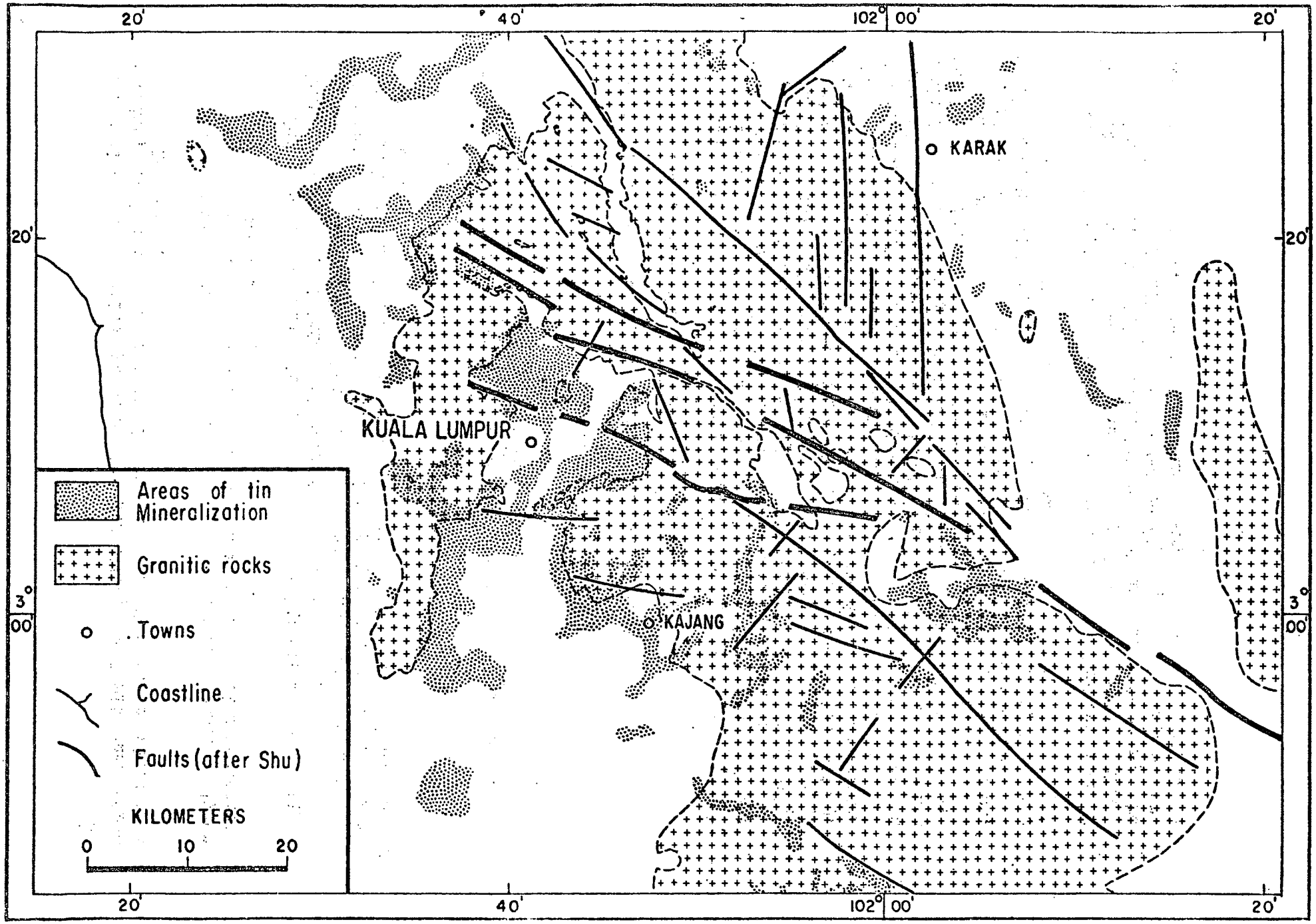

FIG. 1. GRANITE AND TIN AREAS FROM MIN. DIST. MAP OF MALAYA (1966); FAULTS AFTER SHU (NEWSLETTER NO. 17); POSSIBLE STRANDS OF "K. L. FAULT ZONE" SHOWN HEAVY.

other faults shown by Shu have also been plotted. Inspection of this map suggests that the present distribution of tin mineralization is related to these structures, and especially to the faults trending WNW. Tin-rich areas covering a broad east-west zone are abruptly terminated on the north along one strand of the "Kuala Lumpur fault zone" (the Ampang Fault and extensions). North of this the tin occurs in the Kuala Lumpur valley and to the west, while to the north of another strand of the fault zone (in the area of the Klang Gates quartz dyke), the tin deposits are found even farther west.

The relationships shown on the map suggest that the primary tin lodes in the Kuala Lumpur region have been offset left-laterally along faults trending WNW. The offset appears to be progressive and step-like on different strands of the fault zone, and the cumulative total offset may amount to about 70 km (45 ml). The time of the offset would have to be after the mineralisation had occurred, but probably prior to the development of the placer deposits.

Other interpretations of the spatial relations of the tin distribution and fault systems are possible. What is needed at this stage is information on the structure of the tin lodes themselves, particularly their strikes, as well as determination of the nature and amount of offset on the various faults.

Resolution of the meaning of these relationships between tin mineralisation and fault systems has obvious importance, not only for determining the regional structure, but also in future prospecting for tin.

Reference:

Gobbett, D.J., 1964: The Lower Palaeozoic rocks of Kuala Lumpur, Malaysia. Fed. Museums Jour., 9, p. 67-79

BIBLIOGRAPHY OF WEST MALAYSIAN AND SINGAPORE GEOLOGY: SUPPLEMENT - 1968

The following is a draft (without the eventual annotations) of a 1968 supplement by D.J. Gobbett to his Bulletin 2. This is designed to include both (a) pre-1968 items omitted from Bulletin 2, and (b) items published or issued in 1968.

Any omissions you can point out will be gratefully noted. Please give as full a reference as possible, preferably with a note pointing out the content and importance of the publication.

ALEXANDER, J.B., 1968: The geology and mineral resources of the neighbourhood of Bentong, Pahang and adjoining portions of Selangor and Negri Sembilan, incorporating an account of the prospecting and mining activities of the Bentong district. Mem. geol. Surv. Dep. W. Malaysia 8, 150 p.

COULTER, J.K., 1950: Peat formations in Malaya. Malay agric. J., 33, p. 63-81

DOUGLAS, IAN, 1968: Erosion in the Sungei Gombak catchment, Selangor, Malaysia. Jour. Tropical Geogr., 26, p. 1-16

DOWDEN, C.B., 1882: The Malay Peninsula: its mineral wealth, with a citation of authorities for identifying it with the Ophir of Jewish history and the Golden Chersonese of classical writers. London: Effingham Wilson, 20p.

ELLIOT, G.F., 1968: Three new Tethyan Dasycladaceae (calcareous elgae). Palaeontology, 11, p. 491-7

EYLES, R.J., 1968: Stream net ratios in West Malaysia. Bull. geol. Soc. Amer., 79, p. 701-711

GARNETT, R.H.T., 1966: Distribution of cassiterite in vein tin deposits. Trans. Inst. Min. Metall., Lond., 75, B. p. 245-73

GARNETT, R.H.T., 1968a. : (discussion of Garnett, 1966) Ibid. 77 B, p. 46-8

GARNETT, R.H.T., 1968b.: The underground pursuit and development of tin lodes. Papers tech. conference on tin, London 1967, 1, p. 139-202

GOBBETT, D.J., 1968a.: The Permian System in Malaya. Bull. geol. Soc. Malaysia, 1, p. 17-22

GOBBETT, D.J., 1968b: Bibliography and index of the geology of West Malaysia and Singapore. Bull. geol. Soc. Malaysia, 2, 152p.

GRUBB, P.L.C., 1968: Geology and bauxite deposits of the Pengerang area, Southeast Johore: Mem. geol. Surv. Dep. W. Malaysia, 14, 125p.

HAILE, N.S., and AYOB, MOHAMMAD, 1968: Note on radiometric age determination of samples of peat and wood from tin-bearing Quaternary deposits at Sungei Besi Tin Mines, Kuala Lumpur, Selangor, Malaysia. Geol. Mag., 105, p. 519-20

HAMADA, T., 1967: Devonian of east Asia. Proc. Int. Symp. Dev. Syst., Calgary 1967, 1, p. 583-96

HAMADA, T., 1968: Ambocoeliids from red beds in the Malayan Peninsula. in Kobayashi, T., and Toriyama, R. (ed.) Geology and Palaeontology of Southeast Asia, 5, p. 13-25

HEWITT, B.R., 1967a.: Highlands peat of the Malayan peninsula. Proc. Linn. Soc. N.S.W., 91, p. 231-2

HEWITT, B.R., 1968: The composition of tropical lowland peat sampled at Klang, Selangor, Malaysia. Proc. Linn. Soc. N.S.W., 92, p.266-72

HUTCHISON, C.S., 1968a.: Physical and chemical differentiation of west Malaysian limestone formations. Bull. geol. Soc. Malaysia, 1, p. 45-56

HUTCHISON, C.S., 1968b.: Invalidity of the Billiton granite, Indonesia, for defining the Jurassic/Upper Triassic boundary in the Thai-Malayan Orogen. Geol. en Mijnb., 47, p. 56-60

HUTCHISON, C.S., 1968c.: Dating tectonism in the Indosinian-Thai-Malayan Orogen by thermoluminescence. Bull. geol. Soc. Amer., 79, p. 375-86

HUTCHISON, C.S., 1968d.: The dating by thermoluminescence of tectonic and magmatic events in orogenesis. in McDougall, D.J. (ed.) Thermoluminescence of geological materials, p. 341-358. London: Academic Press.

IGO, H. and KOIKE, T., 1968a.: Ordovician and Silurian conodonts from the Langkawi Islands, Malaya, Part II. in Kobayashi, T. and Toriyama, R. (ed.) Geology and Palaeontology of Southeast Asia, 4 p. 1-21

IGO, H. and KOIKE, T., 1968b.: Carboniferous conodonts from Kuantan, Malaya. in Kobayashi, T. and Toriyama, R. (ed.) Geology and Palaeontology of Southeast Asia, 5, p. 26-30

JONES, C.R., 1968: Lower Paleozoic rocks of Malay Peninsula, Bull. Amer. Ass. Pet. Geol., 52, p. 1259-78

KOBAYASHI, T. and TAMURA, M., 1968a: Myophoria (s.l.) in Malaya with a note on the Triassic Trigoniacea. in Kobayashi, T. and Toriyama, R. (ed.) Geology and Palaeontology of Southeast Asia, 5, p. 88-137

KOBAYASHI, T. and TAMURA, M., 1968b: Upper Triassic pelecypods from Singapore. in Kobayashi, T. and Toriyama, R. (ed.) Geology and Palaeontology of Southeast Asia, 5, p. 138-150

KON'NO, E., 1968: Addition to some younger Mesozoic plants from Malaya. in Kobayashi, T. and Toriyama, R. (ed.) Geology and Palaeontology of Southeast Asia, 4, p. 139-155

KOOPMANS, B.N., 1966: (should now read 1966a)

KOOPMANS, B.N., 1966b.: Palaeozoic orogeny in north-west Malaya - a reply. Geol. Mag., 103, p. 565-7

KOOPMANS, B.N., 1968.: The Tembeling Formation - a litho-stratigraphic description (West Malaysia). Bull. geol. Soc. Malaysia, 1, p.23-43

MACDONALD, S., 1968: The geology and mineral resources of north Kelantan and north Trengganu. Mem. geol. Surv. Dep. W. Malaysia, 10, 202p.

MALAYSIA, GEOLOGICAL SURVEY DEPARTMENT, 1968: Work and problems on tin in western Malaysia. Papers tech. conference on tin, London, 1967 2, p. 611-15, London: Int. Tin Council

MULLER, K.J., 1967: Devonian of Malaya and Burma. Proc. Int. Symp. Dev. Syst., Calgary 1967, 1, p. 565-8

NOGAMI, Y., 1968: Trias-Conodonten von Timor, Malaysian und Japan (Palaeontological study of Portuguese Timor, 5). Mem. Fac. Sci. Kyoto Univ. geol. min. ser., 34, p. 115-36

NOSSIN, J.J. and LEVELT, Th. W.M., 1967: Igneous rock weathering on Singapore Island. Z. Geomorph., 11, p. 14-35

PIMM, A.C., 1967: Triassic volcanic rocks in East and West Malaysia. Bull. geol. Surv. Dep. Borneo Region, Malaysia, 8, p. 36-40

SERRA, G., 1968: Sur quelques empreintes Mesozoique de Malaisie. Archs. geol. Viet-Nam, 11, p. 43-51

SINGH, D.S., 1968: Tables for the microscopic identification of tin minerals in Malaysia. Papers tech. conference on tin, London, 1967 2, p. 479-99

SINGH, D.S. and BEAN, J.H., 1968: Some general aspects of tin minerals in Malaysia. Papers tech. conference on tin, London, 1967, 2, p. 457-78

SNELLING, N.J., BIGNELL, J.D., and HARDING, R.R., 1968: Ages of Malayan granites. Geol. en Mijnb., 47, p. 358-9

SUNTHARALINGAM, T., 1968: Upper Palaeozoic stratigraphy of the area west of Kampar, Perak. Bull. geol. Soc. Malaysia, 1, p. 1-15

TAMURA, M., 1968: Claraia from north Malaya, with a note on the distribution of Claraia in southeast Asia. in Kobayashi, T. and Toriyama, R. (ed.) Geology and Palaeontology of Southeast Asia, 5 p. 78-87

YOCHELSON, E.L. and JONES, C.R., 1968: Teiichispira, a new early Ordovician gastropod genus. Prof. Pap. U.S. geol. Surv. 613-B 15p.

Appendix II: Geological Maps

A. GENERAL GEOLOGICAL MAPS

1968 Ma Geological map of northeast Malaya, 1:250,000. Compiled by S. MacDonald. One sheet in colour.

D. GEOLOGICAL SHEETS, 1:63,360

1968 Mb New series sheet 135 (Pengerang). Compiled by P.L.C. Grubb. One sheet in colour.

DJG

24TH INTERNATIONAL GEOLOGICAL CONGRESS

A preliminary notice concerning the 1972 Geological Congress has been received from Dr C.G. Winder of the Organizing Committee. This notice states:

"The 24th International Geological Congress will be held in Montreal, Canada during August, 1972. The program will include 13 sections of technical papers and at least 3 symposia. Over 50 field excursions, most scheduled both before and after the conference, will cover all of Canada, including the Arctic Islands. The FIRST CIRCULAR will be available for distribution about November, 1969. Communications and information should be directed to the Secretary-General, 24th IGC, 601 Booth Street, Ottawa, Canada."

IPOH DISCUSSION MEETING IN DECEMBER

In conjunction with the Geological Survey of Malaysia, the Geological Society will hold a discussion meeting at the Headquarters of the Geological Survey, Scrivenor Road, Tiger Lane, Ipoh, on the afternoon of Friday 19th December from 2 till 5 p.m., and on Saturday morning 20th December from 9 a.m. till 12 noon. The general subject will be Faulting in Malaysia. It is hoped that papers will be presented by Mr Shu Yeoh Khoon and Mr T. Suntharalingam of the Geological Survey, Dr H.D. Tjia, Mr Choy Kam Wai and Mr Yeap Ee Beng of the University of Malaya. Mr C.W.E.H. Smith of Associated Mines, Mr Pun Vun Tat of Bahang Consolidated Company, and by a member of the Geological Survey of East Malaysia on faulting in Borneo. All members are invited to attend and to participate in the meeting. Abstracts of papers, or intention to contribute short notes or exhibits should be sent to the President by the 30th October.

Immediately after the meeting, field excursions will be organized to show something of the geology of the Kinta Valley, and a visit to the Cameron Highlands Hydro-electric scheme is being planned for Sunday morning 21st December.

This is the first meeting which the Society will organize outside of Kuala Lumpur, so it is hoped that there will be a large membership in attendance. The Headquarters of the Geological Survey is an appropriate venue for such an occasion, and time will be made available on the Saturday morning for conducted tours of the building to illustrate the work of the Survey.

– CSH

DONATION TO THE SOCIETY

The Society gratefully acknowledges a donation of $500 from Associated Mines towards its publications fund.

– CSH

NEWS OF THE COUNCIL

Mr Senathi Rajah, Vice President, has left Malaysia to pursue M.Sc. studies at the Imperial College in London. The best wishes of the Society are extended to him in his two years of absence from the country. The Council has appointed Professor K.F.G. Hosking to replace him as Vice President until the end of the current year.

– CSH

NEW MEMBERS

At the Council Meeting of 23rd September, the following were elected to membership in the GSM:

Full Members: Robert H. Cook
c/o Geological Survey Office
Johore Bahru, Johore

John C. Hazzard
c/o King Resources Int'l
Room 632, 714 W. Olympic Blvd.
Los Angeles, Calif., USA

Teoh Kah Tin
McMahon & Partners (S.E.A.)
Chase Manhattan Bank Bldg., 3rd Floor
Jalan Gereja, Kuala Lumpur

Stanley G. Wissler
4245 Chestnut Ave
Long Beach, California
90807, USA

Associate Member:
Liew Sing Yoon
Langkawi Marble Quarry
c/o Post Office, Pulau Langkawi
Perak

Student Members: (All at the Department of Geology, University of Malaya, Kuala Lumpur)

Syed Sheikh Almashoor
Chan See Chin
Chen Shick Pei
Chong Nai Hooi
Gan Ah Sai
Kannapiran Sabapathy
Jimmy Khoo Kay Khean
Lee Ah Kow
Leong Lap Sau
Ng Chak Ngoon
Ponnambalam Loganathan
Teng Hau Chong
M. Tharmarajan
Wong Chaw Bin

Correction: Mr Herman Terwogt, who was elected a ~~Full Member of the~~ Society, was erroneously listed ~~as an Associate Member~~ in the last Newsletter.