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G E O L O G I C A L N O T E S

Gamma Counting on Samples of Tin Ore and Amang Byproducts.

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School of Physics, Universiti Sains Malaysia, Penang.

This note serves as a preliminary report on some work carried out in the overall programme of monitoring radioactivity in tin-mining industry in West Malaysia. Samples of tin ore or amang by-products were obtained from two tin-mines, two amang upgrading plants and one smelting plant for study.

The oven-dried samples were placed in a flat bottom polythene dish which fitted over the top of a GeLi detector (from Philip). The gamma spectra were recorded using a 1024 channel pulse height analyser (model TN 1705, Tracor-Northern). The shielding consisted of 2 inch steel surrounded with 4 inch of lead.

Results and Discussion

The gamma spectra of the samples show varying contribution from thorium-232 and radium-226 (or thereof its parent uranium-238). The specific photopeaks are easily identifiable when compared with the gamma spectra of sealed point sources of thorium-232 and radium-226. The specific intensity (counts/sec/gm sample) of some of the photopeaks for some selected samples are listed in Table 1 without correcting for the response of the GeLi detector. We have listed in the table only all those samples which have significantly high gamma-counts plus a few typical low-count tin-mine samples. The photopeak intensities (in counts/sec) of the point sources of thorium-232 and radium-226 are also listed in the same table for comparison. The figures show the gamma spectra of two high-count samples (viz monazite and zircon). Major gamma energies and the radionuclides are indicated in the figures.

Samples collected at different sites of Hing Fatt Mine and Kinta Kellas Mine show very low gamma activity, excepting samples which were collected from the amang dumps. The slag samples collected from Datuk Keramat Smelting Plant show activities comparable to that of the amang dumps. It is only in monazite, xenotime and zircon constituents of the amang that significantly high gamma-activities are observed. Rough calculation indicates that 100 gm of the monazite sample has a gamma activity which is equivalent to about 20 times that of a 1 μ Ci thorium-232 point source plus about 1/30 times that of a 5 μ Ci radium-226 point source. The xenotime sample shows a relatively higher contribution from radium than from thorium.

Conclusion

This preliminary study indicates that substantial amount of radioactive isotopes of thorium and uranium are found in monazite, xenotime and zircon. The amang upgrading process invariably concentrates one or both of these isotopes in the final byproducts. The byproduct dumps may possibly pose as a radiation hazard to workers who are constantly handling or near the ores. A quantitative measure of doserate will be necessary to determine the degree of hazard.

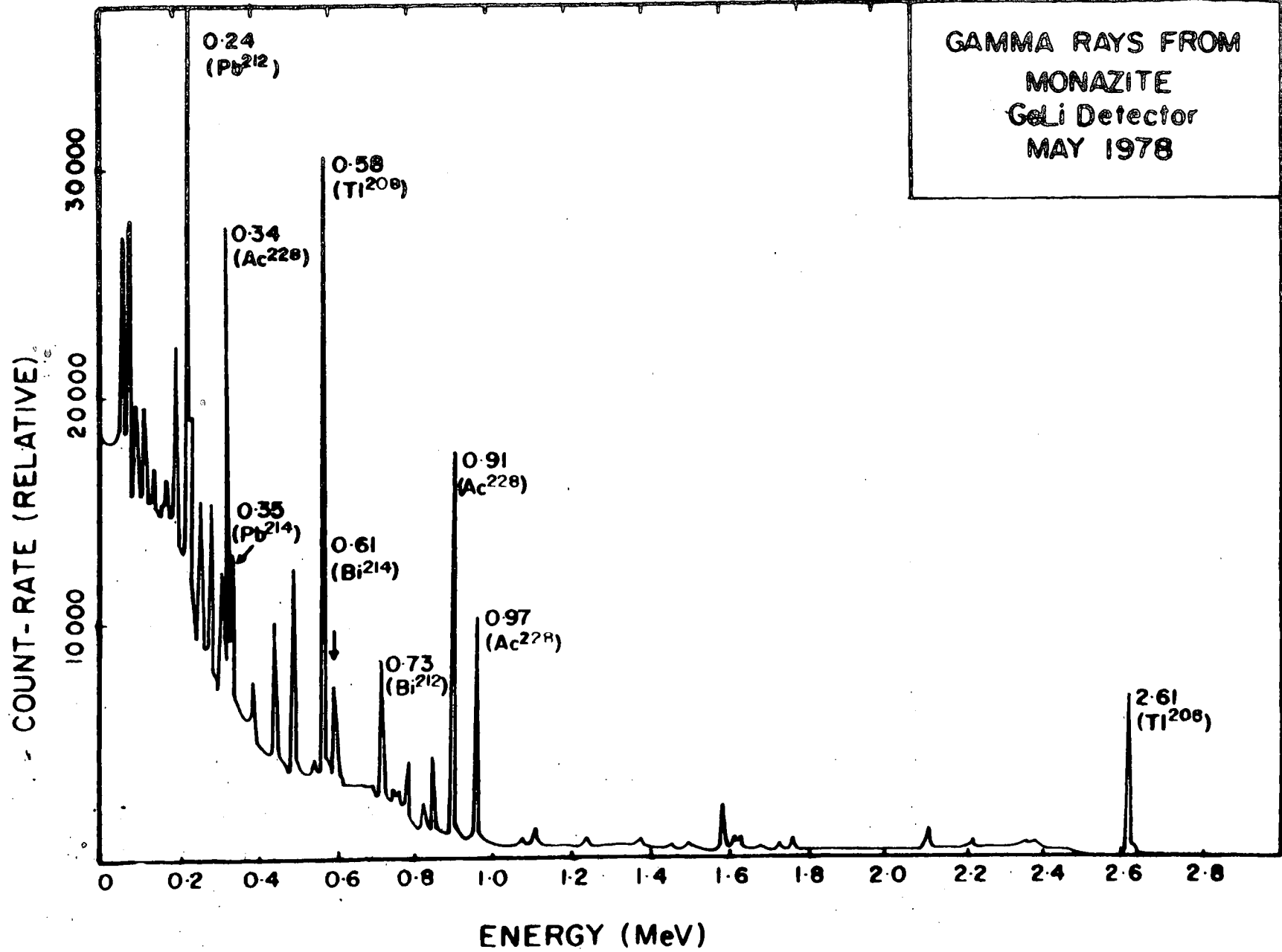
Acknowledgement

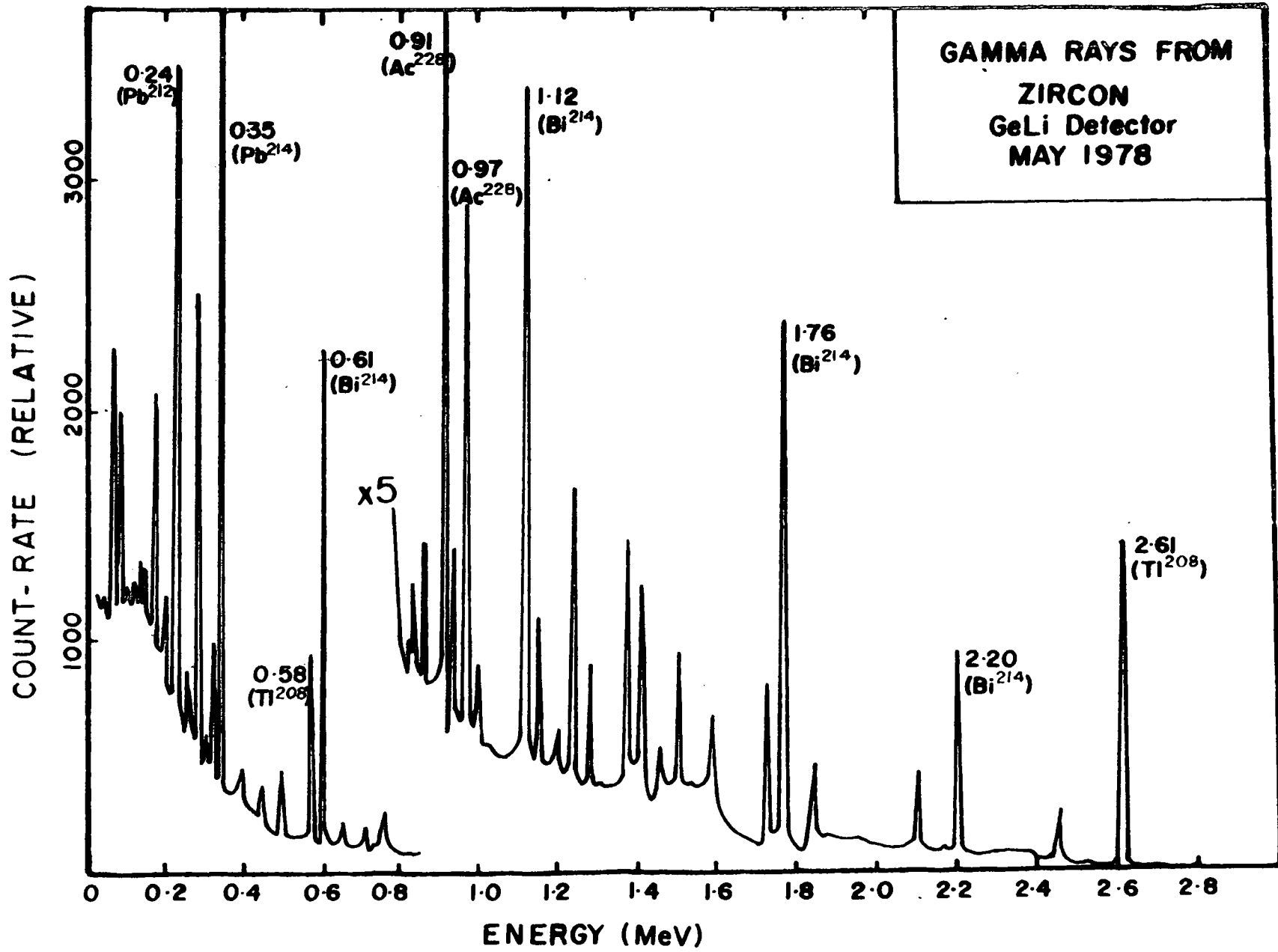
This work was partially supported under a grant from International Atomic Energy Agency. Also, we thank Encik Fong Sew Khuan and Encik Shanmugam for technical assistance.

Table 1: Specific Gamma Photopeak Intensities of Samples of Tin Ore and Byproducts

Sample Location/Description	Specific Photopeak Intensity (Count/sec/gm)			
	Radium-226 Photopeaks		Thorium-232 Photopeaks	
	0.35 MeV	0.61 MeV	0.24 MeV	0.58 MeV
Hing Fatt Tin Mining Kongsi				
Fine amang plus ore mixture	0.021	0.013	0.12	0.029
Ore mixture from palong	0.014	0.0090	0.055	0.013
Loam from pump site	0.0018	0.0010	0.0035	0.0008
Kinta Kellas Mine/ Upgrading Plant				
Sand with cassiterite	0.0086	0.0047	0.029	0.0064
Mixture from top of palong	0.0007	0.0004	0.0017	0.0003
Ilmenite ore	0.0016	0.0009	0.0037	0.0007
Zircon ore	0.107	0.067	0.131	0.025
Monazite	0.44	0.25	2.91	0.82
Xenotime	0.88	0.55	0.81	0.16
B.E.H. Minerals Plant				
Initial zircon ore	0.13	0.076	0.50	0.11
Middle zircon ore	0.16	0.084	0.40	0.090
Final zircon for export	0.099	0.063	0.072	0.012
Datuk Keramat Smelting Plant				
First slag	0.018	0.011	0.026	0.0854
Final slag	0.064	0.039	0.120	0.025
Cassiterite ore	0.0027	0.0018	0.0073	0.0018
Radium-226 source (5 μ Ci)	1280	685	- -	-
Thorium-232 source (1 μ Ci)	-	-	12.5	2.54

GAMMA RAYS FROM
MONAZITE
GeLi Detector
MAY 1978





Fossils at Sri Medan, Johor.

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Locality

When mapping the Parit Sulong area in Johor in early 1977, M. Shahid Ayub, then an honours' year geology student, collected various kinds of marine molluscs and plant remains that occur at the Sri Medan bauxite mine (Fig. 1). Since then, we made several collecting trips to this locality. The mine supervisor at Sri Medan, Encik Kamaluddin bin Abdullah has been very helpful during our visits by guiding us to the specific locality and by relating many details of the occurrence.

The fossils are found on the surface and in the top part of black clay that outcrops in the eastern part of the Sri Medan mining concession (Fig. 2). The black clay resembles swamp clay. The grid reference of the locality is 044 396 on topographic map sheet no. 122. The elevation of the fossil locality was measured with a Wallace & Tiernan surveying altimeter with 10 feet graduation. The altimeter reading was corrected by comparing with readings of known elevations along the road between the Muar resthouse at the coast and Sri Medan. The flat surface of the black clay at the fossil locality was found to be 14.95 meter above sea level. The possible reading parallax of the instrument is less than three feet, or less than a meter.

Fig. 3 depicts a north-south cross section of the fossil locality. The fossils are especially abundant at the bulge and down-slope from this elevation. We interpret that the mine tailings that are composed of blocks, rubble and soil, have depressed the soft swamp deposits beneath them and at the same time have produced the bulge at the toe of the pile.

Palaeontology

Wood fragments are the most abundant fossils seen. The next most common groups are marine gastropod and bivalve molluscs. A single crustacean fragment has been collected. All of the shells which have been found are very highly weathered. It is unlikely that many of these can be identified to the species level. In many cases the family may be the lowest taxonomic level possible. Some of the wood fragments have been permineralized with calcium carbonate. Others have suffered only minor permineralization. Many of the bivalves contain a crystalline calcium carbonate infilling. Many pieces of the wood contain calcareous tubes of boring pholad bivalves. Certain wood fragments have tentatively been identified as mangrove pneumatophores. The flora and fauna indicate that this is a nearshore marine community.

Preliminary faunal and floral list

Mollusca : Bivalvia

Ostreacea

Pholadacea

Veneracea

Mollusca : Gastropoda

Neritidae

Muricidae

Buccinidae

Cerithidae

Arthropoda : Crustacea

Decapoda

Brachiopoda : Articulata

Lingulidae

Plantae :

Mangrove

The fact, that the fossils of Sri Medan occur in the top part of black clay without signs of induration, seems to imply a young age, possibly Quaternary. Therefore, relative sea level during the (?) Quaternary was about 15 meters higher in the Sri Medan area. Considering the tectonic stability of the Peninsula, however, a eustatic, higher sea level seems probable.

Further work on the fossils and their radiometric age will be carried out.

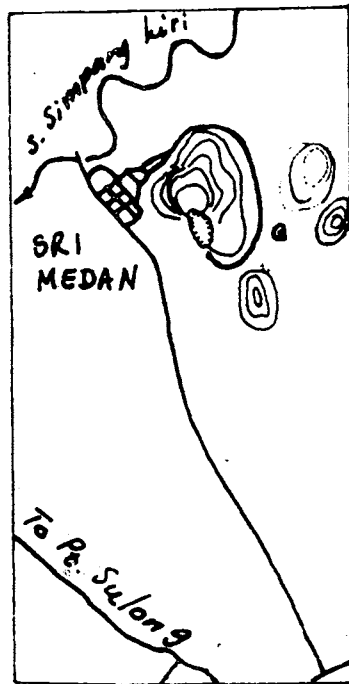


Fig. 1

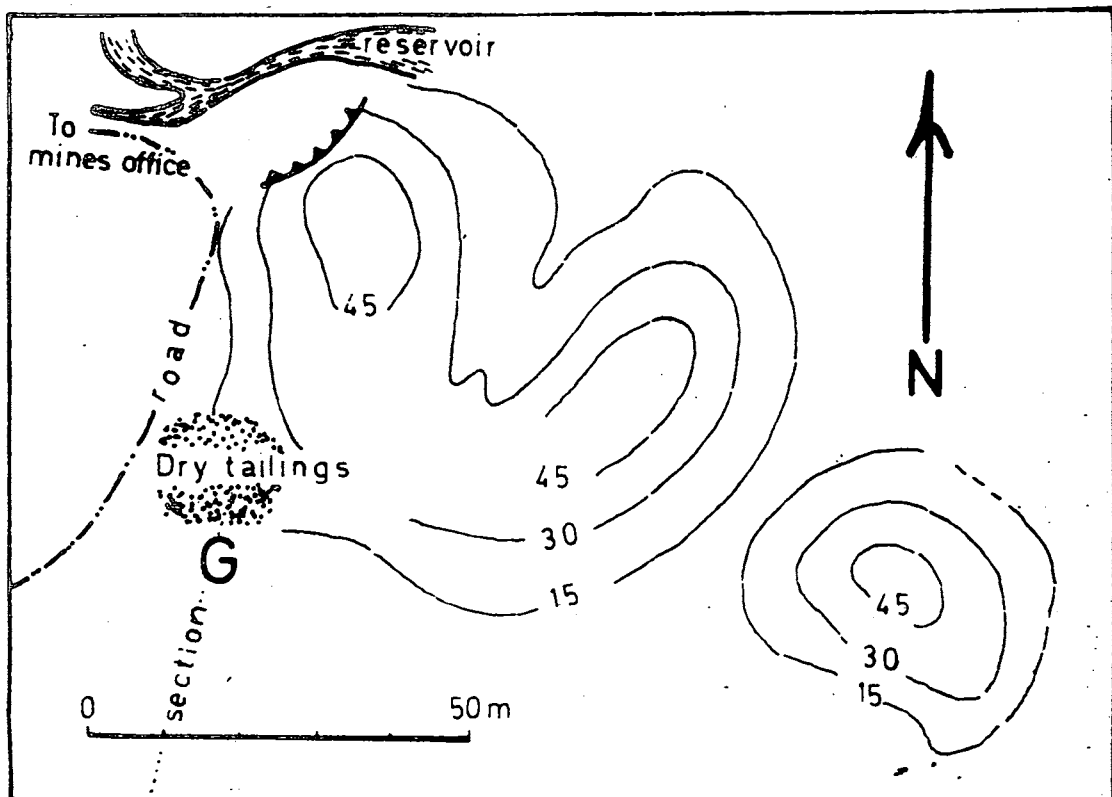


Fig. 2

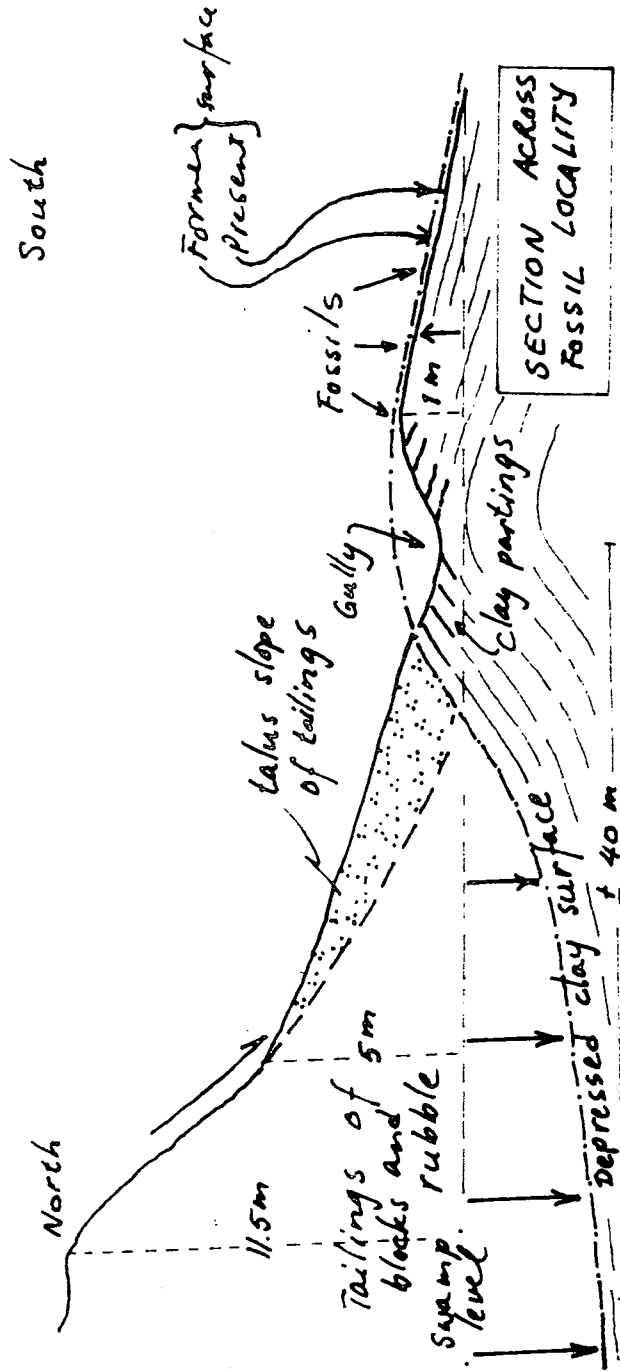


FIG. 3

Chemical Characteristics and Classification of Segamat Volcanics.

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Introduction

The Segamat volcanics include both lavas and shallow intrusive (dykes and sills within the lavas) rocks. The K-Ar minimum age of these rocks as reported by Bignell and Snelling (1977) is 62 ± 2 m.y. The potassic nature of the Segamat volcanics was first pointed out by Grubb (1965), but little work has been done on this interesting suite of rocks. Petrological and chemical studies on these rocks are currently being carried out by the writers. As far as possible, fresh samples have been collected from all the quarries and systematic sampling at regular vertical intervals has been done in two quarries. Twenty five relatively amygdule free samples have been chemically analysed for both major and minor elements. This note is primarily concerned with the classification of these rocks based on their chemical affinities and characteristics.

Chemical Characteristics

The Segamat volcanics are in general characterised by high total alkalis and high alumina. The observed SiO_2 range is 45 - 61%, but mostly in the range of 45 - 53%. $\text{Fe}_2\text{O}_3/\text{FeO}$ ratio is variable and very high for rusty to reddish brown lavas. Systematic upward increase of $\text{Fe}_2\text{O}_3/\text{FeO}$ as observed in one quarry (Fig. 1) suggests post-eruption oxidation. However, even the apparently nonoxidized (dark grey, greenish grey) samples also show rather high $\text{Fe}_2\text{O}_3/\text{FeO}$ ratios implying high P_{O_2} of the magma.

In a total alkali vs SiO_2 diagram, most of the samples plot on the mildly alkaline region as delineated by Saggerson and Williams (1964) (Fig. 2). Significantly, however, $\text{K}_2\text{O}/\text{Na}_2\text{O}$ ratios vary widely in the rocks with comparable SiO_2 and differentiation index, D.I. (Figs. 3 & 4). In $\text{K}_2\text{O}-\text{SiO}_2$ plots (Fig. 5) two contrasting trends are obvious, one with a steep slope and the other relatively flat, indicating two distinct lineages and fractionation trends of the Segamat volcanics. The samples defining the steeper slope are high-potassic with $\text{K}_2\text{O}/\text{Na}_2\text{O}$ ratios > 1 , and the others moderately potassic with $\text{K}_2\text{O}/\text{Na}_2\text{O}$ ratios less than unity but more than 0.5 (with one exception).

Classification

The moderately potassic group is chemically similar to the potassic alkali basalt series (trachybasalt-trachyte series of Coombs and Wilkinson, 1969) of other regions. In fact, in the

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differentiation index vs. normative plagioclase composition diagram, (used by Coombs and Wilkinson for classification of alkali basalt series) rocks of the moderately potassic group fall exactly on the Gough Island trend.

There is no satisfactory system to classify high-potassic rocks, and the Segamat high-potassic rocks do not fit clearly into any modern classification scheme. But they are chemically closely similar to the 'shoshonites', as defined by Joplin (1968), which are characterised by high total alkali, high K_2O/Na_2O and high K_2O/SiO_2 . Accordingly, the high-potassic Segamat rocks are classified as members of the shoshonite series. However, they differ from Joplin's shoshonites in having a slightly lower CaO and a steep rather than flat $K_2O - SiO_2$ slope.

The potassic alkali basalt group (trachybasalt-trachyte) represents a highly differentiated sequence comprising ankaramitic basalt, trachybasalt, trachyandesite, tristanite and trachyte. In contrast, the shoshonitic group is compositionally more restricted and ranges from absarokite to shoshonite. Rock nomenclature is based on chemistry, normative mineralogy and a number of derived indices in accordance with the suggestions given by various workers in recent years*. Chemical analyses of some representative samples are given in Table 1.

Shoshonitic rocks are near saturated to oversaturated (qtz-hy or hy-ol normative) whereas the trachybasalt-trachyte group is mainly undersaturated (ol-ne normative). Petrographically, however, members of these two groups cannot be readily distinguished as they are of comparable mineralogy and texture. Shoshonites and the relatively basic members of the alkali basalt group have phenocrysts of clinopyroxene and altered olivine + plagioclase set in a glassy to holocrystalline groundmass. Phenocryst to groundmass ratio is variable. Groundmass phases in hypocrySTALLINE and holocrystalline varieties are dominated by plagioclase and alkali feldspar with subordinate amount of clinopyroxene, opaques, carbonates, etc. Biotite and hornblende are present in some varieties. Vesicles are mainly filled with carbonate, chlorite, zeolite, prehnite and epidote. Olivine is absent in the more differentiated members of the alkali basalt group.

Nepheline is present in some holocrystalline trachyandesites but no obvious leucite is observed so far in any rock of either group (cf. Grubb, 1965). The analysed rocks are also not leucite normative, although Grubb reports high (up to about 29%) normative leucite. Incidentally, only two of the five analyses given by Grubb have acceptable totals, and Niggli norms of these two analyses given by Hutchison (1973) and CIPW norms calculated by us do not show any leucite. Thus within the limit of our observation and study, we have failed to identify any leucite tephrite as described by Grubb (1965).

* No separate nomenclature is used for the shallow intrusives as they are an integral part of the volcanics.

Concluding Remarks

In this short article, it is pointed out for the first time that the Segamat volcanics comprise rocks of both shoshonite and potassic alkali basalt (trachybasalt-trachyte) series. They appear to be equally dominant at the present level of exposure. Their temporal relation is not yet quite clear, but from one quarry sequence it appears that the earliest phase is shoshonitic and the last phase is the trachytic differentiate of the alkali basalt. The intimate field relations and the similarity in many chemical features (including trace elements, to be discussed in a separate article) suggest a close genetic connection between these two groups.

Shoshonites commonly occur in matured island arcs or in newly stabilized areas. Arc shoshonites seem to have chemical affinity with the calcalkaline or high K-calcalkaline suites (Jakes and White, 1969, 1972; Gill, 1970; Jolly, 1971; Smith, 1972; Jaques, 1976; Peccerillo and Taylor, 1976; Boccaletti, et. al. 1978), because of which their genesis has, in recent years, been related to the subduction processes. The Segamat shoshonites do not show calcalkaline affinity and, in view of their geologic setting, appear to be related to post-orogenic faulting episode. From the tectonic-petrogenetic point of view, therefore, the Segamat shoshonites are different from arc shoshonites.

Acknowledgement

Thanks are due to Mr. Ching Yu Hay who has drawn the diagrams.

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Table 1: Chemical Analyses of Some Segamat Volcanic Rocks

Oxide	1	2	3	4	5	6	7
SiO ₂	46.93	50.18	50.62	50.11	48.70	54.37	60.80
TiO ₂	1.10	0.88	1.05	1.05	1.40	1.20	0.98
Al ₂ O ₃	14.86	15.90	16.43	15.16	16.05	16.08	17.48
Fe ₂ O ₃	2.80	9.56*	5.20	6.88	3.98	7.08	4.39
FeO	6.25	n.d.	4.41	1.72	4.52	1.35	0.24
MgO	9.78	6.57	5.66	9.35	4.48	3.60	0.40
MnO	0.23	0.22	0.17	0.26	0.23	0.20	0.08
CaO	6.44	7.33	6.01	8.56	7.14	3.88	1.55
Na ₂ O	2.20	2.90	1.54	2.64	5.26	5.12	9.27
K ₂ O	3.54	3.37	5.15	2.37	3.80	3.85	2.80
P ₂ O ₅	0.91	n.d.	0.65	1.00	1.20	1.05	1.05
L.I.	4.60	2.40	3.73	1.38	3.02	2.01	1.40
Total	99.64	99.31	100.62	100.48	99.78	99.79	100.44

* - Total iron

n.d. - not determined

L.I. - Loss on ignition

1 = Absarokite

2 = Shoshonite

3 = Shoshonite

4 = Trachybasalt

5 = Nepheline trachyandesite

6 = Tristanite

7 = Trachyte

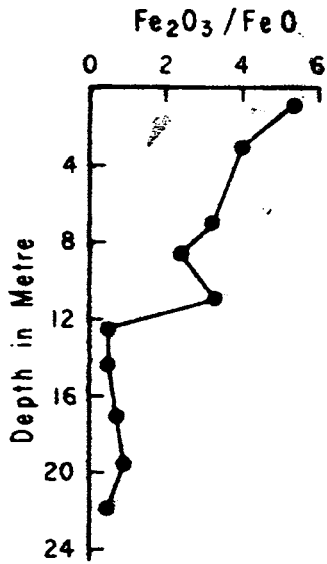


Fig. 1

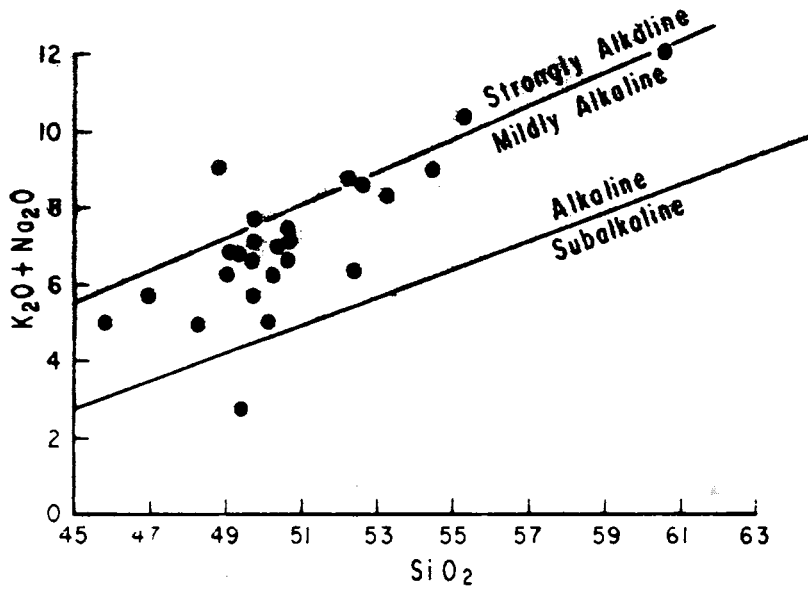


Fig. 2

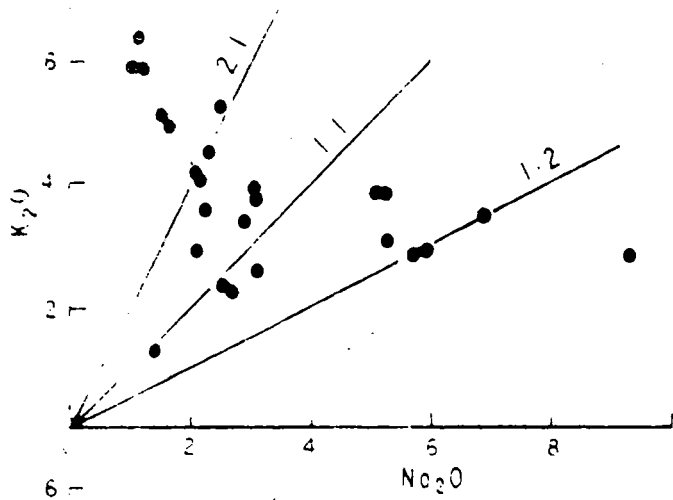


Fig 3

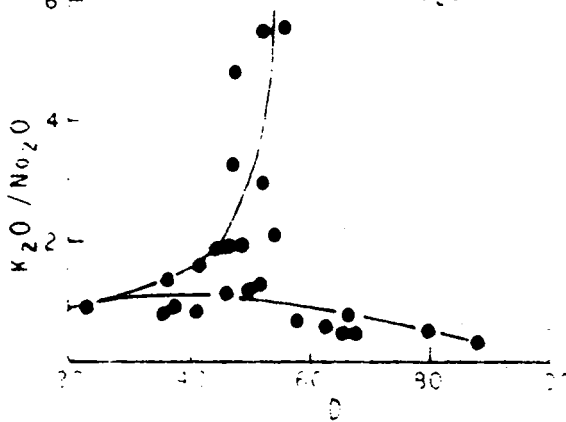


Fig 4

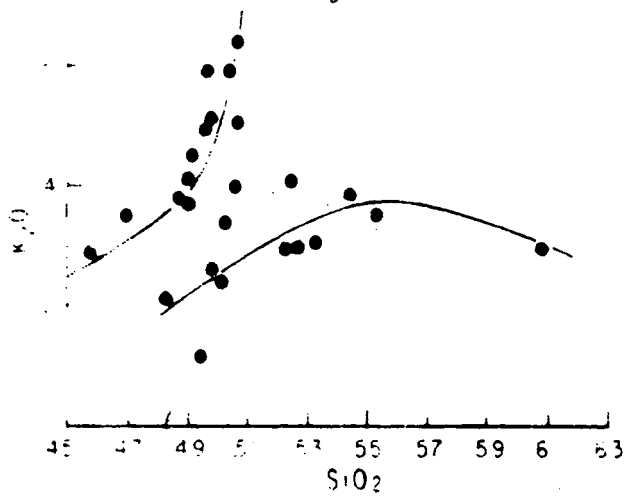


Fig 5

G E O L O G Y O N S T A M P S

7. Rivers, lakes and waterfalls.

N.S. Haile, Jabatan Geologi, Universiti Malaya
(Photographs: Jaafar bin Haji Abdullah).

Geomorphology naturally presents an almost inexhaustible supply of stamps, of which only a few can be illustrated or mentioned here. The Colorado River, with its handiwork the Grand Canyon, is one of the most famous among geologists, and the fine U.S. stamp commemorating John Wesley Powell's Expedition down the Colorado in 1969 (1); this expedition made many geological observations. Other rapids and cascades are shown on the Ruanda stamp of 1966, depicting the Rusumu "Falls" (2), the Latvian 1938 stamp (3), the Liberian stamp (4), and the gorge and rockbridge, Mendoza Puente del Inca, in the Argentine (5).

Straightforward waterfalls are common. An interesting series of stamps showing the Victoria Falls in 1935, 1931, 1937, 1959, 1968 and post-UDI (6, 7, 8, 9, 10, 11) shows political rather than geomorphological evolution. Another famous African waterfall, the Murchison, is shown on an East African stamp, complete with hippopotami (12), whereas the Asiob Falls of Nigeria are shown on the 1969 stamp (13). British Guiana shows the Kaitour Falls (1938:14), and New Zealand the Sutherland Falls, (1960 & 1967: 15). Even Mauritius has a stamp showing the modest Tamarind Falls (16).

Lakes, like waterfalls, are geologically temporary interruptions in a river's course, destined for speedy destruction as the river attains a graded profile. New Zealand has a series showing four lakes: Waikeremoana (17), Hayes (18), Wakatipu (19) and Rotomahana (illustrated in the last *Warta Geologi*); these are (I think!) lakes of volcanic origin, except Lake Hayes which is glacial. Malawi has a very pleasant stamp showing Monkey Bay, Lake Malawi (20), and Finland shows a calm, but unnamed glacial lake (21). Stamps showing lakes seem to include a large number of pale, miserable, wishy-washy examples such as those showing Fist Boca, Trinidad & Tobago, Fresh water Lake, Dominica, and Lake Marion, Tasmania (not illustrated here).

Coastal landforms include the New Zealand set of four stamps issued in 1977, of which Pina Beach (22) and Kaikdura Coast (23) are illustrated here, and the fine Guernsey set of 1976 (24, 25, 26, 27). The white cliffs of Dover are shown on one of the very few British geological stamps (1950-51:28). Broken Bay, Australia (29) is shown in a bold depiction, more suitable for small stamps than is a naturalistic style. What the geology is of the sections depicted (except for the white cliffs of Dover, which I have an idea are Cretaceous chalk) I do not know; doubtless an interesting story could be told concerning these.

To round off this incomplete review of geomorphological stamps, there are a number which show features not classifiable under volcanic, glacial, or coastal landforms, or rivers and lakes. For examples, there is the striking sandstone massif of Ayers Rock, central Australia (30), presumably the result of differential erosion over hundred of megayears, and the limestone karst topography of the "Pines and rocks behind the sea" (31) in the magnificent set of 14 Hwangshan Landscapes, issued by China in 1963. Karst is also shown on the Thai 1972 stamp (32), and (presumably) on the Swiss stamp of the Kreuzberge (33). I have not come across many stamps of caves, but two shown here of the Drach caves in Spain (34), and the Cwihaba Caves of Botswana (35) both show spectacular dripstone formations. The Bulgarian 1964 landscapes set shows several strange landforms, including what appear to be dykes or vertical beds picked out by erosion (36). Remarkable rocky protuberances (volcanic necks?) are shown on the Cameroun stamp (37). The stamp of the Nahal Baraq Canyon, in the Negev (38) is, incidentally, one of the few stamps depicting stratification.



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NEWS OF THE SOCIETY

Petroleum Seminar

A second Petroleum Seminar is to be held in Kuala Lumpur this year some time in December. An Organizing Committee under the chairmanship of Mr. James Lau of PETRONAS, has been formed. Papers that deal with Offshore Petroleum Geology of Southeast Asia in general and Malaysia in particular as well as on exploration techniques are being solicited and financial donations are being sought. It will be a one-day seminar. The First Petroleum Seminar held last year was a great success.

JL

Donations to the Society

The following donations were received by the Society following its appeal for financial assistance to support its activities.

Association of Geoscientists for International Development (AGID)	\$3000 (Canadian)
UNESCO	2000 (U.S.)
Lee Foundation	2000 (Malaysian)
Anglo Oriental (M)	2000 (")
Associated Mines (M)	2000 (")
Conzinc Riotinto (M)	1500 (")
The Tin Industry (Research & Dev) Board	1000 (")
Sarawak Shell Berhad	1000 (")
Selangor Dredging	500 (")
Serem Malaysia	500 (")
Petaling Tin Bhd.	500 (")
Tanjong Tin Dredging	500 (")
Kinta Kellas Tin Dredging	500 (")
Pengkalen Ltd.	500 (")
Gopeng Consolidated	500 (")
Idris Hydraulic Tin	500 (")
Institute of Mineral Engineering, Malaysia	400 (")
Inst. of Mining & Metallurgy (Malaysian Branch)	250 (")
Valdun Mining Consultants	200 (")
Malaysian Scientific Association	100 (")
Beh Minerals	100 (")

All the above donations except for the money donated by Sarawak Shell Berhad, were for the International Symposium/Tin Training Course on Geology of Tin Deposits. The donation from Sarawak Shell Bhd. was made in response to the Society's appeal for funds to finance its publications.

The Society wishes to acknowledge its appreciation to all these organizations for their financial support without which, it would not be possible for the Society to carry out its varied activities and maintain its sound financial position.

BKT

Young Geoscientist Award

This award to stimulate and encourage young geoscientists to publish their findings was mooted by Prof. N.S. Haile, of the Department of Geology, University of Malaya. To start off the fund he has donated M\$1000 and the Society has put up a further M\$1000. It is envisaged that the interest from this sum would be used to finance this award. A subcommittee has been formed to formulate the conditions for the award. Further contributions to the fund are welcome.

Special Offer of Sale of Publications

The Society wishes to inform all readers of the Special Offer of Sale of Bulletin nos. 1-7 and Field Guide 1 as a complete set for the price of M\$10 to student members, M\$20 to members and \$30 to non-members. Please add M\$5.00 for surface mail postage and packing). This special offer offers readers an opportunity to obtain back issues of the Bulletins at specially reduced rates. Please send orders to the Hon. Assistant Secretary, c/o Dept. of Geology, University of Malaya, Kuala Lumpur 22-11, MALAYSIA.

JKR

Letter to Editor

The following letter was received from Dr. C.R. Jones concerning the publication of 'Geology and Mineral Resources of Perlis, north Kedah and the Langkawi Islands'.

Following discussions with Mr. S.K. Chung, Director General of the Geological Survey of Malaysia, at the Colombo meeting of

Commonwealth Heads of Geological Surveys last December I am editing and revising to some extent the draft of the above memoir in readiness for publication.

This memoir has had an unfortunate history. The first draft was completed in 1960 and was based on two years fieldwork accomplished while I was stationed at Kangar between early 1955 and early 1957. Very lengthy delays were experienced in receiving reports from overseas authorities on the large amount of fossil material submitted for identification. In some cases palaeontological data appeared not to agree with the field evidence and in at least two instances faunas were originally completely misidentified which led to considerable confusion in establishing the stratigraphical succession. All this led to the need for repeated revisions of the text. Additional work carried out in the Langkawi Islands in 1963 which was directed towards solving some of the stratigraphical and structural problems led to the identification of areas requiring further enquiry. Some of the findings of the Japanese palaeontological expeditions to the islands in 1963/64 indicated that the text needed major revision and this to some extent was completed by the time I left Malaysia in 1966.

The text not only suffered from repeated revisions but, being the first lengthy work of a young geologist, was too long. This error was not corrected by the supervising staff of the Geological Survey at the time.

In editing the manuscript my objectives are twofold: to cut its length fairly drastically and to bring the geological content to the state of knowledge reached following my investigations of the graptolite faunas of the Langkawi Islands during 1966-68. I am aware that further finds have been made and that additional revision might be justified. However the intention is to remedy as soon as possible the long delay in the publication of a document which can be regarded as (and is in fact quoted in manuscript) a fundamental record of the major changes which occurred in the late 1950's in the understanding of Malaya's Palaeozoic history. I hope to have the edited manuscript with Mr. Chung by the end of the year.

Editor's Notes

After the excitement of the Malaysian elections has settled, it is hoped that some positive action will be taken by the government on the long awaited legislation to regulate the activities of minerals industry in this country. The Society's Committee on the Mineral Engineers Act has been meeting to try and draw up proposals for a new class of membership that will satisfy the requirements of the Act.

Additional members were taken on to help in the Society's editorial matters and in doing so the committee originally set up to review and edit the Special Symposium Bulletin (no. 11) was enlarged and reformed into a new Editorial Board comprising 8 members whose names are given at the back of the cover page. The Board will be in office during the period 1978/79.

No new offers of papers for Bulletin 10 has been forthcoming. However soundings to a few would-be contributors have been made and it is hoped that these will bear fruit.

New Library additions

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

1. IMM Bulletin no. 857, 858, 859, April-June, 1978.
2. Geological Liaison Office Newsletter no 2, 5 & 6, 1978.
3. Journal of Geosciences, Osaka City University, vol 20, 1976.
4. Memoirs of the Ehime University, vol. viii, no. 2, 1977
5. Geology and Palaeontology of Southeast Asia edited by Kobayashi, et. al., vol. 19, 1978.
6. Bulletin of the National Science Museum, Series C (Geol. & Pal), vol. 4, no. 1, 1978.
7. IMM Transaction/Section B, vol. 87, Feb, 1978.
8. Journal of Research of the U.S.G.S., vol. 6, no. 2, Mar-Apr 1978.
9. Oklahoma Geology Notes, vol. 37, no. 4-6, 1977.
10. Bulletin du Bureau de Recherches Geologiques et Minieres, Sect. IV, no. 1, 1978.
11. Early Tertiary Ostracode fauna from the coastal region of Bohai (Nanking Institute of Geology & Palaeontology, Academia Sinica).
12. Geophysical Research Bulletin, vol. 15, no. 3, July 1977.
13. Geosurvey Newsletter, vol. 10, no. 11-13, 1978.

GEOSEA III - 3rd Regional Conference on Geology and Mineral Resources of Southeast Asia.

The response to the Society's circular on the above meeting and the field trip has been very encouraging. To date we have 37 replies. The Society will be finalizing arrangements for this trip in the near future and all those who have indicated their interest to join the party to Bangkok will be informed of further developments. Others who would like to join this party may still be considered if there

are vacant seats on the bus.

BKT

Membership

The following persons have joined the Geological Society of Malaysia:

Full Members

Hila Ludin Abu Hazim
Petronas
P.O. Box 2444
Kuala Lumpur

Khee Kok Kean
Geological Survey Malaysia
P. O. Box 1015
Ipoh, Perak

Dale A. Brunotte
Jabatan Geologi
Universiti Kebangsaan
Jalan Pantai Baru
Kuala Lumpur

Wan Abdul Halim b. Ismail
Malaysia Mining Corp. Bhd.
8th Floor, MOCCIS Bldg.
17 Jalan Melaka
Kuala Lumpur.

Student Members

Boniface Bait
c/o Dept. of Geology
University of Malaya
Kuala Lumpur

Chan Chee Kit
70 Story St.
Parkville, Melbourne
Vic. 3052, Australia

Lai Hoi Kean
3rd Residential College
University of Malaya
Kuala Lumpur

Chan Kek Yau
A4-1 Happy Mansion
Jln. 17/13
Petaling Jaya

Alexander Yan Tze Wah
A4-1 Happy Mansion
Section 17, Petaling Jaya

Yii Siew Sang
A4-1 Happy Mansion
Section 17, Petaling Jaya

Liaw Kim Kiat
7th Residential College
University of Malaya
Kuala Lumpur

Goh Kiat Tze
A4-1 Happy Mansion
Section 17
Petaling Jaya

Lai Chooi May
209 Jln. Bandar
Kuala Lumpur 01-30

Lau Ching Tiung
176 Jln. 17/5
Petaling Jaya

Stanley A. Batok
7th Residential College
University of Malaya
Kuala Lumpur

Goh Juan Hui
A4-1 Happy Mansion
Section 17
Petaling Jaya

Mohd. Zailon b. Ramli
4th Residential College
University of Malaya
Kuala Lumpur

Gordon Tan
Wisma Selangor
Jln. Universiti
Petaling Jaya

Ong Whee Sen
309 Jln. 17/6
Petaling Jaya

Hee Kong Hin
439 Jln. 17/13
Petaling Jaya

Lim Peng Fui
1410 Jln. 17/26
Petaling Jaya

Chow Kok Tho
12, SS2/41
Petaling Jaya

Jalaludin Ismail
7th Residential College
University of Malaya
Kuala Lumpur

Lim Beng Kung
45 Jalan Alpha, SS20/1
Damansara Utama

Wong Keen Ming
34, Jln. 14/40
Petaling Jaya.

Change of address

The following members have informed the Society of new addresses as indicated:

Johnny Pek
Petronas
Wisma Maju
Kuala Trengganu, Trengganu

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

C.T. Tay
221 Lorong Ampang Dua
Kuala Lumpur

Udin Adinegoro
Jabatan Petroleum Engineering
Fakulti Kejuruteraan Jentera
Jalan Gurney, Kuala Lumpur

Richard A.S. Cayzer
c/o Cayzon, Incorporated
P.O. Box 7778
Airmail Distribution Center
M.I.A. 3120, Philippines.

Address wanted

We would like the current address of the following members:

Norman W. Woods
formerly of ENEX of New Zealand
9th Floor, Wisma Perdana
Jln. Dungun, Damansara
Kuala Lumpur 23-05.

Abdul Rashid b. Abd. Mohd.
formerly of Birbeck Court
105 Cathedral Street
Glasgow G4 ONP
Scotland.

Obituary

A member of the Geological Society of Malaysia, Dr. M. Koesmono, Chief Lecturer in Geology, Padjadjaran University, Indonesia passed away on 19th April 1978 owing to cerebral haemorrhage. Dr. Koesmono's work included the mapping of a part of Timor Island and study of tuffs and tektites from the Indonesian islands. He was actively involved in editorial work being Editor in Chief of the journal of Association of Indonesian Geologists and upon retiring from it the Editor of his university's publications.

O T H E R N E W S

Third Regional Conference on Southeast Asia

The second circular from the organisers of the Third Regional Conference on the Geology and Mineral Resources of Southeast Asia has given further information:

- Conference on November 14th and 15th will be held on the campus of the Asian Institute of Technology, which is located 42 km north of Bangkok. On November 16th, the Conference venue will be shifted to the seaside resort of Pattaya.
- About 115 abstracts were received by the February 15th dateline. Final manuscripts of not more than 6,000 words must reach the Conference Secretary not later than July 15th 1978.
- Registrants before 1st September will pay the following fees:

Conference participants	US\$50 (Bahts 1000)
Accompanying persons	US\$20 (Bahts 400)
Student participants	US\$ 5 (Bahts 100)
- Three post-Conference excursions covering Central and North Thailand will be organised.
- Associated activities will be held prior to or concurrently with the Conference. It may interest members to know that there will

be a pre-Conference short course on "Computer Applications in Geosciences" on November 8-12, 1978.

Correspondence to: Dr. Prinya Nutalaya
 Division of Geotechnical & Transportation
 Engineering
 Asian Institute of Technology
 P.O. Box 2754
 Bangkok, Thailand.

UNITAR

The United Nations Institute for Training and Research (UNITAR) in co-operation with the Government of Mexico, announced that the first first International Conference on the Future of Small Deposits and Small Scale Mining which will be held near Mexico City from 26 November to 5 December 1978. It will also be co-sponsored by the United Nations Development Programme (UNDP), the United Nations Department of Technical Co-operation for Development (DTCD), the United States of Geological Survey (USGS), the United States Bureau of Mines, Friends of the Earth, and Fletcher School of Law and Diplomacy, Tufts University.

The Conference will discuss the geology and distribution of small deposits; exploration, mining, processing, as well as marketing, the economics of small scale mining, including taxation and the financing of small scale mines; environmental and safety aspects; institutional factors such as licensing and laws; the training of prospectors and of small scale miners, equipment pools and other technical support and the outlook of small scale mining in the future.

The Conference will include small scale energy resources, metal resources, diamonds and other gemstones, fertilizer material and certain other mineral resources. Participation in the conference is by invitation only.

Fifth Gondwana Symposium

A symposium on the geology of Gondwanaland will be held at the Victoria University of Wellington, New Zealand. The purpose is to allow the presentation of papers and discussion on broad problems of the reconstruction of Gondwanaland, the paleogeography and climate of the region through the Permian and Triassic, and the nature and timing of the fragmentation of the "supercontinent". New Zealand

can be regarded as a part of the leading edge of Gondwanaland, and it is hoped that the meeting will focus attention on the problems that might best be tackled by studying the thick marine time equivalents of the classic Gondwana System.

Intending contributors must submit a title by October 31, 1978, and an abstract by April 30, 1979.

The Symposium address is: Fifth Gondwana Symposium
Victoria University of Wellington
Private Bag
Wellington
NEW ZEALAND.

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.

Geological Society of Malaysia

1978: December : Seminar on 'The Petroleum Geology of the Sunda Shelf', Kuala Lumpur. Secretary, GSM, c/o Dept. of Geology, University of Malaya, Kuala Lumpur 22-11. (Nov-Dec 1977).

Other Events

1978: Jul 2 - 4 : Fifth Southeast Asian Conference on Soil Engineering, Bangkok, Thailand. Dr. A.S. Balasubramaniam, Secretary, 5SEACSE, Asian Institute of Technology, P.O. Box 2754, Bangkok, Thailand. (May-Jun 1977).

Jul 5 - 6 : International Symposium on Soft Clay, Bangkok, Thailand. Dr. R. Peter Brenner, Secretary ISSC, Asian Institute of Technology, P.O. Box 2754, Bangkok, Thailand. (May-Jun 1977).

Jul 18 - 22 : 3rd Inter-Congress of the Pacific Science Association in Appropriate Technology, Bali, Indonesia. Miss Sjamsiah Achmad, Indonesian Institute of Sciences, Tenka Cik Ditiro 43, P.O. Box 250, Jakarta, Indonesia. (May-Jun 1977)

Jul 30 - Aug 4 : Second Circum-Pacific Energy and Mineral Resources Conference, Honolulu, Hawaii, c/o AAPG, P.O. Box 979, Tulsa, Okla., 74101, USA. (May-Jun 1977).

- Sep 18 - 22 : Siamos, International Symposium on Water in Mining and Underground Works, Granada, Spain. Prof. Dr. Eng. Rafael Fernandez-Rubio, Director of the Work Group of Hydrogeology, Universidad de Granada, Apartado de Carreos, 556, Granada, Spain. (Mar-Apr 1978).
- Oct 2 - 9 : Geology and Palaeontology of Southeast Asia Symposium, Tsukuba, '78. Dr. Hisayoshi Igo, GPSEA Symposium Tsukuba, '78, c/o Inst. of Geoscience, University of Tsukuba, Ibaraki, 300-31, Japan. (Jan-Feb 1978).
- Oct 11 - 13 : Gulf Coast Association of Geological Societies (Gulf Coast Section, AAPG and Gulf Coast Section, SEPM) - Annual Meeting - New Orleans, Louisiana (Jules Braunstein, Shell Oil Company, Box 60775, New Orleans, Louisiana 70160). (Jan-Feb 1978).
- Nov 14 - 17 : Third Regional Conference on Geology and Mineral Resources of Southeast Asia, Bangkok, Thailand. Conference Secretary, IIIGEOSEA, Division of Geotechnical & Transportation Engineering, Asian Institute of Technology, P.O. Box 2754, Bangkok, Thailand. (Jul-Aug 1977 & May-Jun 1978).
- Nov 26 - Dec 5 : First International Conference on the Future of Small Deposits and Small Scale Mining, Mexico City. By Invitation only. (May-Jun 1978).
- Dec 14 : Tungsten Meeting of the Institution of Mining and Metallurgy, London. Secretary, Institution of Mining and Metallurgy, 44 Portland Place, London W1N 4BR, England.
- 1979: 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).

- Oct. 8 - 12 : Tenth World Mining Congress, Istanbul, Turkey. Dunya Madencilik Kongresi Turk Milli Komitesi, Ziya Gokalp Cad. No.17, Kat 8, Ankara, Turkey. (Jan-Feb 1978)
- 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).
- Jul. 7 - 17 : 26th International Geological Congress in Paris, France. Secretariat General du 26eme Congres geologique international, Maison de la Geologie, 77-79, rue Claude Bernard, 75005, Paris, France. (Nov-Dec 1977).

**PERSATUAN GEOLOGI MALAYSIA
(GEOLOGICAL SOCIETY OF MALAYSIA)**

Tujuan Persatuan Geologi Malaysia adalah untuk memajukan sains bumi, terutamanya di Malaysia dan tempat-tempat berhapiran. Sesiapa yang ingin menjadi ahli Persatuan sila dapatkan borang-borang daripada Setiausaha Kehormat.

The aim of the Geological Society of Malaysia is to promote the advancement of geological sciences particularly in Malaysia and the nearby areas. Anyone interested in becoming a member of the Society should obtain the necessary forms from the Hon. Secretary.

Annual Dues

The annual dues of Full Members and Associated Members shall be M\$15/- if paid in advance before the first day of each calendar year, M\$16/- if paid between 1 January and 1 March or M\$17/- thereafter. The annual dues for members elected after June 30 shall be M\$7.50 that year. An entrance fee of M\$5/- shall be payable on election.

Some Bahasa Malaysia (Malay) geographical terms

Bukit (Bt)	- hill	Kuala (K)	- mouth of river
Genting (Gtg)	- pass	Pulau (P)	- island
Gunung (G)	- mountain	Sungai (S)	- river
Jalan (Jln)	- road, street	Tanjung (Tg)	- cape
Kampung (Kg)	- village	Teluk (T)	- bay

