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(Geological Society of Malaysia)

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Tujuan Persatuan Geologi Malaysia adalah untuk memajukan sains bumi, terutamanya di Malaysia dan tempat-tempat berhampiran. Sesiapa yang ingin menjadi ahli Persatuan sila dapat 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 nearby areas. Anyone interested in becoming a member of the Society should obtain the necessary forms from the Hon. Secretary.

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

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

Limitations of vibratory sieving machines

G.S. Gibbons, Research Associate, Jabatan Geologi, Universiti Malaya
(Present address: Dept. of Geology, N.S.W. Inst of
Technology, Broadway, N.S.W., Australia)

Abstract

Controlled tests on a sieving machine of the type with continuous vibratory motion shows that small quantities of clay can cake on the finer-mesh sieves, producing inaccurate size-distribution data. In some cases, dry sieving was inaccurate for all grades finer than 2ϕ (0.250 mm). If accuracy to 3ϕ , should be used with a wet-sieving attachment. Results are relevant to analysis of most on-shore tin-bearing sands in Malaysia.

Introduction

Various sieve-shaking machines are available for grading sands or soils through a nest of sieves. A wide variety of motions are used, but most machines fall into one of two categories: a jarring motion, usually with some kind of rocking or tilting action; and a continuous, rapid vibration. The first is exemplified by the Ro-Tap machine, which is recommended in most standard tests. The second group has advantages in cost, weight, and relatively quiet operation, and is equally efficient for coarser grain-sizes.

A comparison was made between two machines in Jabatan Geologi, Universiti Malaya. The first type was an "Endecott Endrock" (Jarring) machine, the second a "Retsch Retac 3D" (Vibratory). No special steps were taken to optimize performance of either machine. Each is considered to be a well-made representative of its type, and to be adjusted equally well as most machines used for routine work in a good laboratory.

Method of study

The sample used was the <2 mm fraction of a granite-outwash sample from Sungei Besi tin mine (base of Pit 3-5, eastern workings: February 1976). Median grain-size was approximately $\frac{1}{2}$ mm, and the

sample contained approximately 2½ percent silt plus clay, and approximately 5 percent total fines (<0.1 mm).

The sample was dried at 105° and disaggregated by gentle crushing. Only the coarsest sizes (>1 mm) contained aggregate grains; these were only broken to a very small extent during the series of sieving operations.

Two types of sieving operation were undertaken; a single-stage operation in which the sample was passed through a coarse bank for 15 minutes, and the pan fraction then passed through a finer bank for 15 minutes. The other type of operation was a double-stage one; the sample passed through the two banks for 10 minutes each, then the fractions were removed, weighed and replaced in the respective sieves, and shaken for a further five minutes. Again, the pan fraction from the coarse bank was added to the top of the finer bank before its second shaking operation.

All sieving was at ½Ø intervals.

Tests undertaken

1. Retsch 2-stage, setting 70 cycles/sec.
2. Endrock 2-stage.
3. Retsch 2-stage, 70 cycles/sec.
4. Retsch 1-stage, 70 cycles/sec. (twice).
5. Endrock 1-stage.

Sample was then heated for 2 hours at 40°C, and cooled in laboratory atmosphere.

6. Endrock 1-stage.
7. Retsch 1-stage, 80 cycles/sec.
8. Retsch 1-stage, 90 cycles/sec.

Results (see Fig. 1)

- a) Very little grain-breakage occurred during the tests.
- b) The Endrock results were consistent throughout.
- c) Endrock results are only marginally different for 10 minutes shaking or 15 minutes shaking.

- d) Results on both Endrock and Retsch were unaffected by the re-heating of the sample; thus humidity appears not to have affected the tests.
- e) At setting 70 cycles/sec, there is little difference in results for 10 minutes and for 15 minutes single-stage shaking on the Retsch. However, the two-stage sieving gave distinctly better results.
- f) None of the Retsch results was satisfactory in the fine grades. Efficiency increased considerably from 70 cycle/sec through 80 cycles/sec to 90 cycles/sec.
- g) It was noted that caking of fine clay occurred on the finer sieves when the Retsch was used.

Conclusions

- a) The tests indicate that a jarring-motion machine is superior to a vibratory machine for dry-sieving of samples containing material finer than $3\frac{1}{2}\phi$ (about 100 μm).
- b) The particular vibrating machine used was adequate only to 2ϕ at setting 70, to 3ϕ at setting 80, and to $3\frac{1}{2}\phi$ at setting 90.
- c) Beyond these limits, caking of fine clay occurs in the finer-mesh sieves.
- d) Most on-shore Malaysian tin deposits contain considerable clay in the granite wash in which the cassiterite is found. Unless individual study shows that caking of clays does not occur, such samples should not be analysed by dry sieving on a vibratory shaker.

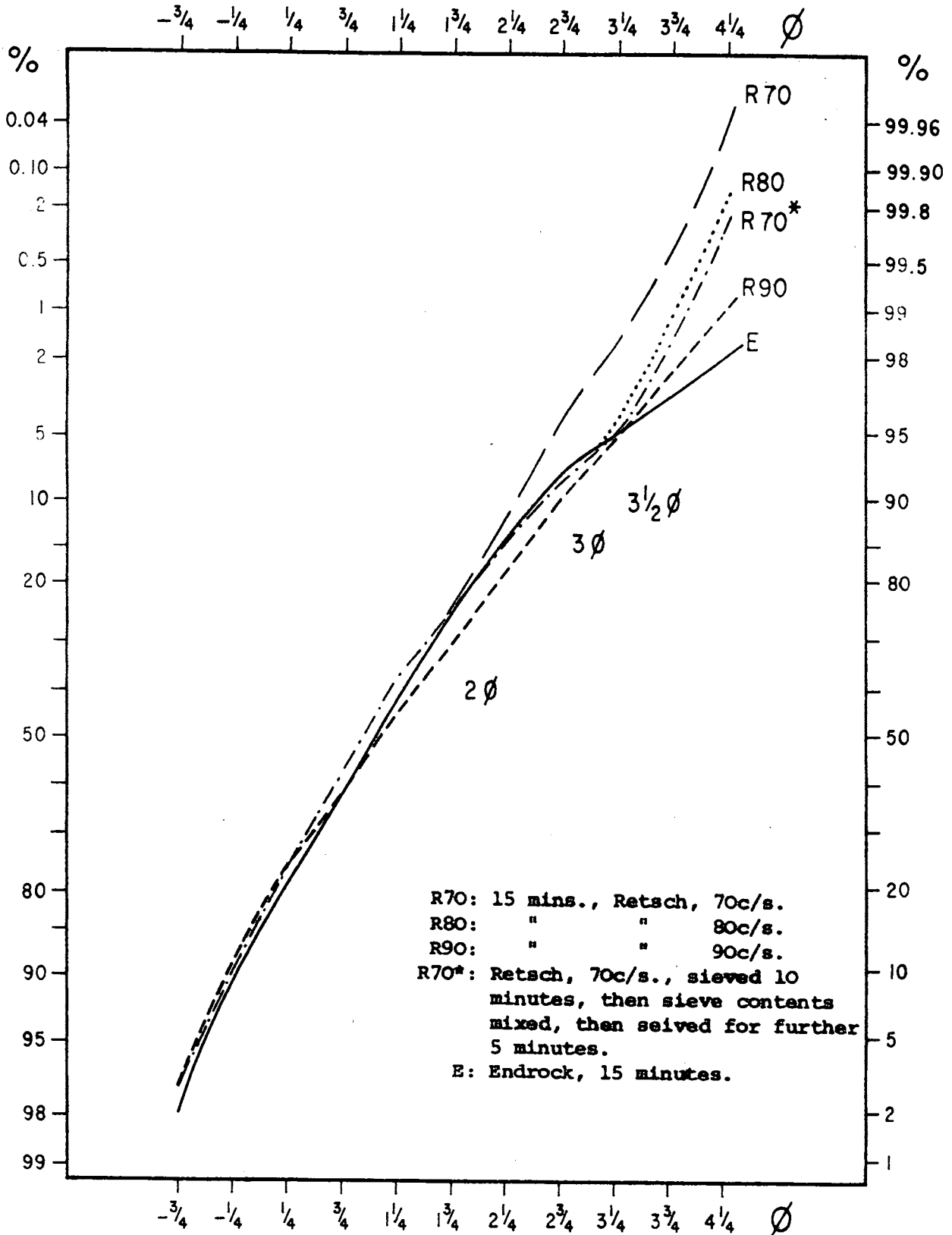


Fig. 1: Plot of size-distribution curves for the various tests.

Pegmatites from the southern part of the western foothills of Gunung Benom, Pahang

T.T.Khoo, Jabatan Geologi, Universiti Malaya, Kuala Lumpur

Introduction

The southern part of the western foothills of Gunung Benom is underlain by a variety of rocks such as metasediments, the hybrid igneous rocks of Richardson (1939) and the Benom granite (Fig. 1). In the area the western margin of the Benom granite batholith borders the hybrid rocks. The hybrid rocks in the area, however, appear to have a metamorphic imprint as the rocks are traversed by numerous amphibolite sheets.

The pegmatites

The rocks in the area are traversed by numerous pegmatite veins. Base on mineral assemblage, 5 types of pegmatites can be distinguished in the area. The mineralogical composition of the various types are shown in Table 1.

Type 1 is monomineralic and is made up wholly of pink thumb-size microcline crystals. This type of pegmatite has only been seen at one locality - at Sungei Klau Kecil in coarse-grained biotite granite. The thickness of the vein is about 1 metre.

Table 1: Mineralogical compositions of various types of pegmatite from the southern part of the western foothills of Gunung Benom

Type	Mineral assemblage		
	Major amount	Subordinate amount	Accessory amount
I	Microcline	-	-
II	Oligoclase	-	Quartz
III	Microcline, quartz	Biotite	Plagioclase
IV	Microcline, oligoclase	-	Quartz, pyrite, opaque minerals
V	Microcline, oligoclase, quartz	Muscovite	garnet(?) or spinel (?)

Type II contains large white oligoclase crystals and small quartz grains. It has been found as veins (< 1 metre thick) in coarse-grained biotite granite at Sungai Keloi.

Type III contains anhedral quartz crystals measuring 1.5 cm across to tiny grains, large pink microcline and biotite plates. This type has been found as a vein (\approx 1 metre thick) cutting the hybrid rocks at Sungai Klau Kecil.

Type IV consists essentially of large pinkish microcline and white oligoclase crystals. This type of pegmatite is widespread in the area. It occurs commonly at Sungai Ngiang, Sungai Kasai, Bukit Redan, Bukit Kasai, Bukit Lebak, the headwaters of Sungai Teping and the unnamed tributary of Sungai Keloi just north of Sungai Teping. The host rocks of this type of pegmatite are the hybrid rocks and metasediments. Thickness of this type of pegmatite is usually less than 1 metre and sometimes the veins are lenticular or podiform.

Type V consists predominantly of large white euhedral microcline and oligoclase and large equant quartz grains. The microcline is more abundant than oligoclase. Muscovite occurs as conspicuous books. This type of pegmatite characteristically contain accessory amounts of tiny spherical grains which are isotropic and have very high relief. It is thought that these grains are spinel but Dr Jaafar Ahmad (personal communication) has found them to be garnets. This type of pegmatite is most common in the Sungai Teping-Sungai Klau area and some also occur near the top of Bukit Kluang. At the 400 metres stretch of Sungai Teping just north of its confluence with Sungai Klau Kecil, more than 10 outcrops of this type of pegmatite occur. This type of pegmatite has only been found in the hybrid rocks and the thickness of the veins varies from 1-5 metres.

The contacts of all the mentioned pegmatites with the host rocks are always sharp. Sometimes partially digested host rocks such as hornblende syenites and pyroxenites occur in type IV pegmatite veins. The pegmatites are sometimes sheared especially those occurring in the Sungai Teping-Sungai Klau valley which has been found to be a fault zone with mylonite (Khoo, 1968; Tjia, 1972). Some type IV pegmatites have been found filling earlier shear planes of the hybrid rocks.

Discussion

The mineralogy of the pegmatites is relatively simple. Types III and V are acid pegmatites which are not uncommon in and adjacent to granitic terrains in Peninsular Malaysia. Types I, II and IV are syenitic to dioritic. Syenitic and dioritic pegmatites are generally rare and some are known to contain rare minerals which, however, have not been

found in those from the western foothills of Gunung Benom.

Types I and II which occur in the granite appear to be genetically related to their host rock. It is more difficult to suggest the origin of types III, IV and V pegmatites. These pegmatites do not appear to be of metamorphic origin as the metamorphic imprint does not appear to be of very high grade from the petrography of rocks in the area such as the amphibolites and also they do not resemble the zoned pegmatite pods of tectonic-hydrothermal origin described by Gresens (1967) who showed that such pegmatites can occur even in low grade rocks. However, the field relations weakly suggest that types IV and V pegmatites are also genetically related to and coeval with the granite and not with the hybrid rocks. The genetic and age relation of type III pegmatite with the granite or hybrid rocks cannot be suggested.

In 1968 I helped Dr J.D. Bignell to collect some specimens of rocks from the area for age determination. Muscovite from a type V pegmatite occurring in Sungai Klau Kecil gave a K-Ar age of 169 ± 5 m.y. (M. Jur.) and biotite from a granite nearby gave a K-Ar age of 199 ± 5 m.y. (U. Trias.) These ages are mentioned in Bignell (1972). However, these ages do not invalidate the suggestion that type V pegmatite may be genetically related to and coeval with the granite. In 1970, I revisited the pegmatite outcrop from which the muscovite was obtained for dating with Dr H.D. Tjia and it was found that the part of the outcrop normally submerged by the river water shows evidence of shearing. The outcrop in fact occurs in the fault zone already mentioned. In the light of this evidence it is highly possible that the age of the pegmatite could be at least older than M. Jurassic.

References

- Bignell, J.D. 1972. The geochronology of the Malayan granites. Unpubl. D.Phil.thesis, Univ. of Oxford, 334 p.
- Gresens, R.L. 1967. Tectonic-hydrothermal pegmatites - the model. *Contr. Mineral. and Petrol.*, 15, 345-355.
- Khoo, T.T. 1968. A petrological study of the Sungai Ruan area, Raub, West Malaysia. Unpubl. B.Sc. (Hons) thesis, Univ. of Malaya, 134 p.
- Richardson, J.A. 1939. The geology and mineral resources of the neighbourhood of Raub, Pahang, Federated Malay States, with an account on the geology of the Raub Australian Gold Mine. *Mem. Geol. Surv. Dept. Fed. Malay.* No. 3, 166 p.
- Tjia, H.D. 1972. Strike-slip faults in West Malaysia. 24th IGC, Section 3, 255-262.

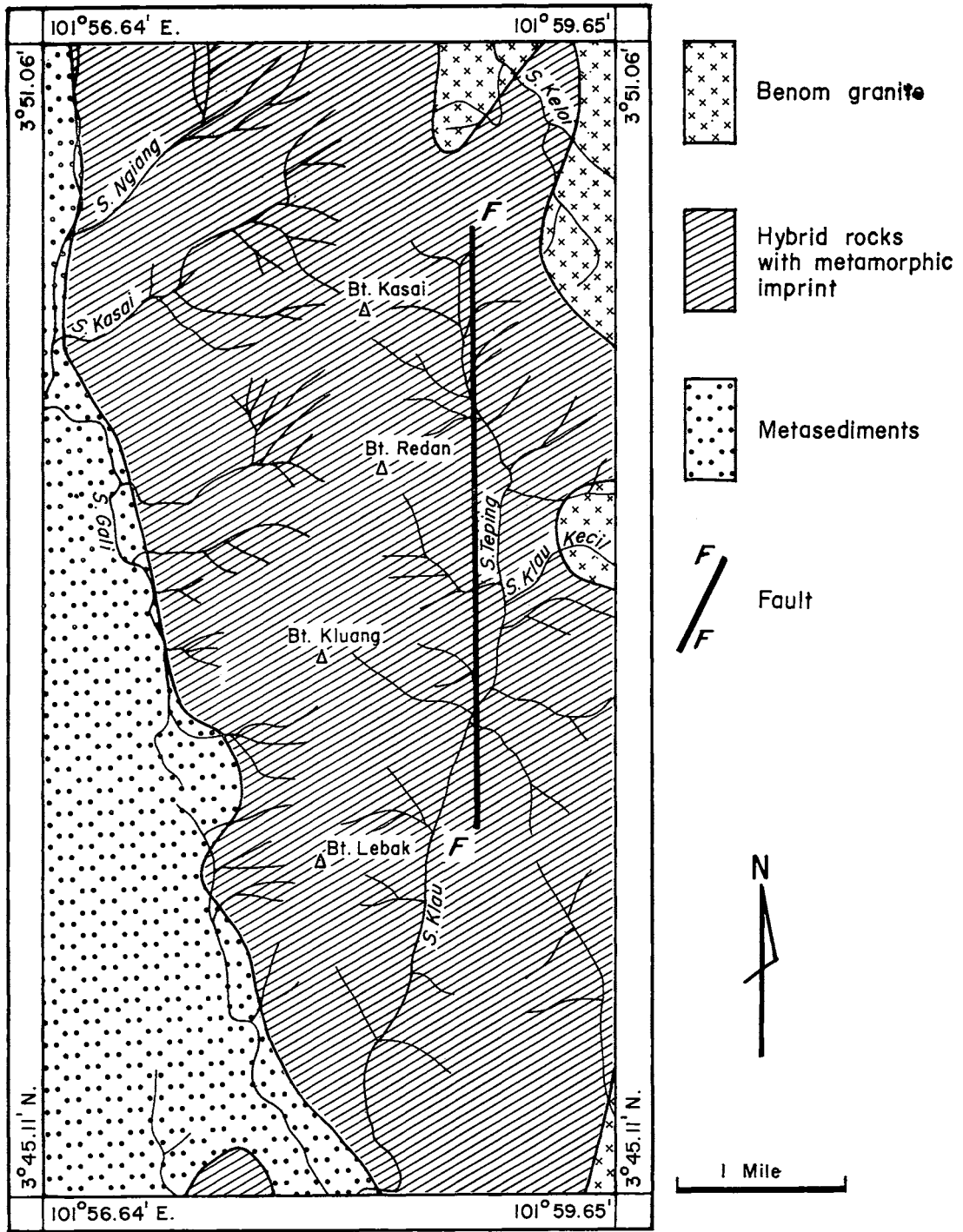


Fig. 1. Simplified geological map of the southern part of the western foothills of Gunung Benom.

E R R A T U M

S.H. Chan: A procedure for computing the lattice constants of some crystal systems (Warta Geologi, vol. 2, No. 1, p. 15-26)

Please note that the following statements should be added to the FORTRAN program in Appendix I.

MA = 1 (to be inserted after statement no. 1)

90 CALL EXIT
 END (replace statement no. 90 at the end of the program by these two statements).

N E W S O F T H E S O C I E T Y

Honorary Membership

At a Farewell Dinner organized by the Society for Prof. and Mrs K.F.G. Hosking (see News of Members), the President announced that the Council has decided to elect Prof. K.F.G. Hosking to Honorary Membership of the Society in recognition for his distinguished service to the Science of Geology.

Prof. Hosking is well-known for his contributions to the knowledge of the geology and mineral deposits, particularly that of tin, of south-west England and also the mineral deposits and mineralogy of Malaysia. For his work on south-west England he was awarded the Bolitho gold medal by the Royal Cornwall Geological Society and the silver medal of the Polytechnic Society of Cornwall. He has written not less than 120 papers.

Prof. Hosking is also a pioneer in the application of geochemical methods to mineral exploration. One of his numerous contributions to the geochemical method is that he is the first person to demonstrate that applied geochemical methods of prospecting for mineral deposits could be used successfully in Southeast Asia. This stemmed from work carried out in Trengganu in 1955.

Another great contribution of Prof. Hosking particularly to Malaysian geology is his training and stimulation of generations of Malaysian geologists and mining engineers in Camborne School of Mines, where he served with distinction for 20 years, and in the University of Malaya where he has taught since 1968. His efforts to establish the Applied Geology course in the University of Malaya are also praiseworthy.

Prof. Hosking has guided our Society as its 4th President and has contributed greatly to our Society's publications. He has also served as President of the Royal Cornwall Geological Society and is a Fellow or Member of numerous other scientific societies.

Prof. Hosking is the third person to be elected to Honorary membership of our Society. Prof. T. Kobayashi and Prof. J.A. Katili were elected to Honorary membership earlier.

Nominations committee

A nominations committee has been formed to nominate members for the next Council (1977/78). The Chairman of the committee is Dr S.H. Chan.

N E W S O F M E M B E R S

Retirement of Prof. K.F.G. Hosking

Prof. K.F.G. Hosking, Professor of Applied Geology, University of Malaya will be retiring from 1st July 1976. His address after retirement will be:

Calle Isla de Cuba 23, 1^o, 3
Sitges
(Barcelona)
SPAIN

New addresses

Lim Loong Shin
145-B Jalan Birch
P.O. Box 827
Kuala Lumpur

Syed S. Almashoor
228 Duke
Dept. of Geosciences
Pennsylvania State Univ.
University Park
PA 16802, U.S.A.

J.E. Nelson
c/o Continental Oil Co.
Conoco Tower Building
5 Greenway Plaza East
Houston, Texas 77001
U.S.A.

O T H E R N E W S

Twentieth Anniversary of the Dept. of Geology, University of Malaya

The Department of Geology of the University of Malaya, will be 20 years old this August.

It came into existence when the University of Malaya occupied the Bukit Timah road campus in Singapore, and the first permanent building was in Dalvey Estate. Professor C.S. Pichamuthu was the first and only staff member and Dr C.S. Hutchison was the second to join the Department. He is still with the department. We are sorry that Professor K.F.G. Hosking will retire to Spain in July and will not be present at the anniversary.

In 1960 the department was transferred to the present Pantai Valley campus of the University of Malaya when the original University bifurcated into a University of Malaya in Singapore. Since then the Kuala Lumpur branch has maintained the name of the parent institution and the University in Singapore appropriately became renamed the University of Singapore.

To celebrate the 20th anniversary the department will be open to the public on Friday 13 and Saturday 14 th August 1976. There will be special exhibitions of petrographic techniques including the scanning electron microscopy. There will be continuous film and slide shows and exhibits of geological specimens, maps and airphotographs.

A photographic exhibition of items of geological interest is being organized. Readers are invited to submit their entries to the department as soon as possible. The winners will be judged during the open days.

CSH

Monstrous Malaysian "meteorite"

Below is a reader's letter which appeared in the New Straits Times of 2 June 1976.

"In the course of prospecting for minerals in the State of Trengganu in 1961, I came across a meteorite in deep jungle measuring approximately 8 ft wide, 8ft long, and about 7ft high, standing alone like a monument surrounded by secondary growth. How many more feet of this monster below ground is anybody's guess. But what can be seen of it must weigh more than one hundred tons.

I did scout-boring over a radius of half a mile or so, and found smaller pieces buried in the earth to depths varying from three to eight feet.

Within this half-mile radius, there was not a single tree, although this is a rich timber-bearing forest. But beyond the half mile radius, hardwood of all kinds abound. Apparently the intense heat burnt everything to cinder when this meteorite came down.

Kuala Lumpur"

C.S.Y.

First Indonesian Carbonate Seminar

The Professional Body of the Indonesian Petroleum Association has appointed a Carbonate Committee to organise a seminar on aspects of carbonate geology and sedimentology in Indonesia. The seminar is scheduled for September 12th-19th, 1976 and will be centred in Jakarta.

The seminar will take the form of talks and discussions on various carbonate topics pertinent to Indonesia. Its main aims will be to bring together persons working in, or interested in, carbonates in Indonesia to exchange views and pinpoint the main problems associated with carbonate sediments and sedimentation in the area in order to clarify lines for further investigation in the future. The seminar will be led by one or more prominent authorities on carbonates. It will take the form of two days of talks, discussion and demonstrations in Jakarta, followed by two days work and observation of some modern patch reefs in the Java Sea and then two days examining limestone outcrops in West Java.

For further information write to:

Indonesian Petroleum Association
Jln Menteng Raya 3
Jakarta
INDONESIA.

Norwegian stamps

The Norwegian government recently issued a set of 4 stamps honouring famous geochemists/petrologists. They are:

J.H.L. Vogt (0.65 kr)
V.M. Goldschmidt (0.85 kr)
Th. Kjernulf (1.00 kr)
W.C. Brøgger (1.40 kr).

The stamps may be purchased from:

Postens Filatelitjeneste
Kirkegata 20, Oslo 1
NORWAY

CSH

P U B L I C A T I O N O F I N T E R E S T

St. John, Spenser. 1974. Life in the forests of the Far East. Oxford University Press. In 2 volumes. Vol. 1 - 400 pages, Vol. 2 - 420 pages, both hardbound.

Spenser St. John was the British Consul-General in Borneo in the middle of the 19th century. This book was first published in 2 volumes in 1862 and according to Tom Harrison, who gave an introduction to the new edition, it ranks in the same class as Wallace's "The Malay Archipelago".

The book contains interesting accounts of forests, journeys and people of Sabah, Sarawak and Brunei. In addition there are interesting accounts on various aspects of geology of the places he explored such as Mt. Kinabalu. Readers will find that the author had a remarkable knowledge of external processes and geomorphology. Occurrences of ox-bow lakes and raised fluvial terraces were described and the mechanisms for their formation clearly given. One cannot but feel that the author was rather modest when he said in page 384 of Volume 1 - "I will add a few remarks on the geology of these districts, premising them, however, by the observation that I am ignorant of the science". Some passages from the book which our members will find interesting are given below.

Geology of the Mt. Kinabalu area - case of forceful intrusion?

Wherever the rocks protruded through the hills, we noticed they were decomposing sandstone and this character continued until we reached the great mountain The country presents the appearance of having been originally of sedimentary rocks, through which the granite has forced its way, upheaving the sandstone to an angle of 80

Pigs and the environment - a possible conference theme?

I think that the thousands of pigs which inhabit this jungle contribute to the discoloration of the water: every night they descend to the banks and rout up the soft mud into heaps, which are easily washed away by rain or the rise of the river.

Origin of salt springs - a head-hunter's hypothesis

Japer adds that, when head-hunting round the great mountain of Tilong, in the centre of Borneo, he saw a salt spring that burst from the ground in a volume of about 15 inches in diameter, rising 3 feet, and then spreading in a shower around He thinks there must be a passage all the way from the sea to cause this salt spring.

Labuan's oil springs - is Japer around?

I may add that petroleum is found in considerable quantities floating on the surface of water in the jungle; but I think no examination has been made as to the probable yield of these oil springs.

Borneo's coal - has the great day arrived?

The coal-fields of Borneo are as extensive as the island. It is reported in Maludu Bay; found in Gaya Island; is everywhere discoverable on the mainland opposite Labuan; has been traced in Baram, in Bintulu, through the Sarawak districts to Banjarmasin on the southern coast. They must some day prove of greatest importance.

Borneo's diamonds - factual and hatched up

Borneo, however, has always been famous for its diamonds, which are worked at the present time by the Chinese and Malays at Landak, a country lying farther inland than Sambas; and there are two streams in Sarawak, the Santah and a branch of the Quop, where diamonds of a very fine water have been found but those places have not yet been regularly explored. Occasionally very pretty diamonds are brought over from the Dutch territories to Sarawak It is never safe to trust to reports respecting diamonds; for instance, I was once informed that a noble in Brunei had a very large diamond which he wished to part with but when we came to examine it we found it was a pinkish topaz, as large as a pullet's egg, and he asked a thousand pounds for it.

Busu's antimony - from high and low

We found there upwards of fifty Chinese apparently working at the rock on the steep face of a hill, burrowing here and there in the limestone we found two or three Chinese scattered here and there picking out lumps of antimony from the crevices of the limestone, or perfectly imbedded in it, and requiring much labour to procure.

Just at the foot of the hill in the forest we came upon two Malays who had just discovered a lump of antimony weighing several tons which was but a few feet below the surface, and having cleared away the superincumbent earth, were now covering it over with dry wood, in order to split the metal, by first raising the temperature by fire, and then suddenly reducing it by water.

Bau's golden landslip - something for everybody

That there is an abundance of gold to be found there I verily believe, and as an instance, I may notice that in November 1848, a great landslip took place, and the face of the Trian mountain was laid bare. Some Malays, observing small pieces of gold mixed with clay, began a strict search, and having great success, the news soon spread, and several thousand people flocked to the spot, where they worked till the heap of earth and stone was cleared away. All had fair success, and we heard of none who got less than an ounce and a half per month. The work lasted about six weeks. I saw one nugget picked up which weighed about seven ounces.

TTK

(The 2 volumes are available in our Society's Library. They were donated by Oxford University Press, Kuala Lumpur. Thanks are also due to Oxford University Press for giving permission to quote the passages above.)

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