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CONTENTS

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GEOLOGICAL NOTES

Preliminary note on the dolomitisation of the limestone in the Simpang Pulai Area, Kinta District, Perak*

W.S. Ong, Geological Survey Malaysia, Ipoh, Perak.

This note is a result of systematic investigations carried out by the writer on the limestone hills of Gunung Keroh, Gunung Merawan, Gunung Karang Besar and Gunung Karang Kechil (Fig. 1) in the Simpang Pulai Area, Kinta District, Perak (Ong, 1977). Traverses were made along the foot of the limestone hills using tape and compass. Rock samples were collected at 50 metres interval. A total of ninety eight rock samples were collected. Some were chemically analysed while the rest were subjected to staining by the method of Keller and Moore (1937) for rapid differentiation of dolomite and calcite. The rocks were then classified according to the classification of Frolova (1959). For petrographic studies, the thin sections were stained by the method of Dickson (1965).

It was found that large portions of Gunung Karang Besar and Gunung Keroh are composed of limestone and dolomite with minor areas of intermediate composition. On the other hand, Gunung Merawan and Gunung Karang Kechil are composed mainly of rocks that are intermediate in composition between limestone and dolomite with only small areas that are limestone or dolomite. The composition of the limestone hills is given in Table 1.

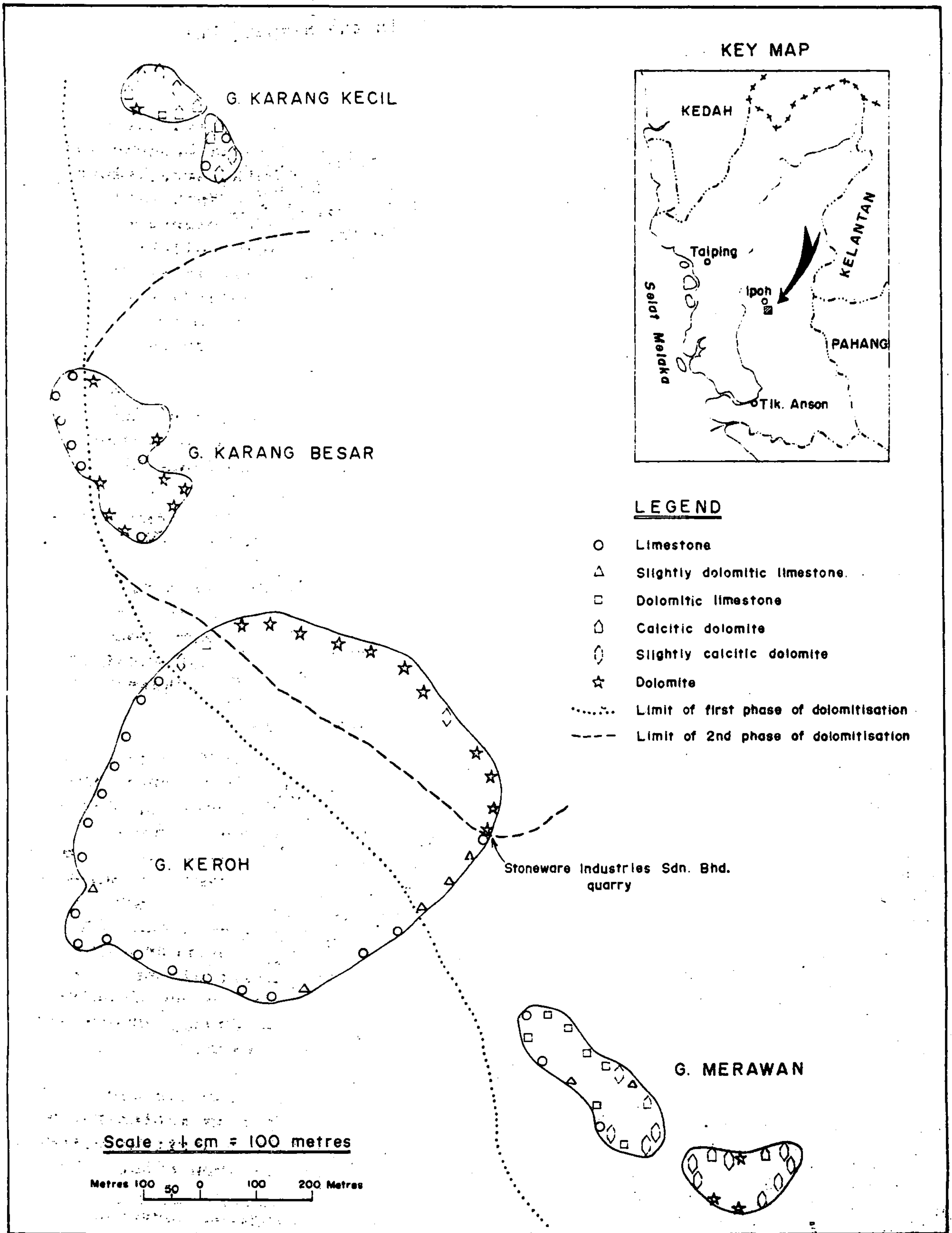
In hand specimen the rocks can be roughly classified according to their colour and texture. Limestone is generally medium-grained (1-5 mm) and light greyish-white in colour. The "intermediate carbonate" rocks are generally fine-grained ($<$ 1 mm) and with a slight pinkish tinge, while the dolomite is generally medium-grained, heavily fractured and dark reddish-brown in colour.

From field and laboratory studies, it is evident that the limestone of this area has undergone two phases of dolomitisation. The first phase of dolomitisation resulted in the formation of clear equigranular, subhedral to anhedral fine-grained dolomite. They are relatively poor in Fe as indicated by staining (Dickson, 1965). In some thin sections, the dolomite has been observed to have almost completely replaced the original medium-grained calcite leaving only small irregularly shaped remanent grains of calcite. The first phase of dolomitisation is probably diagenetic. The affected rock is massive and dolomitisation does not seem to be fracture controlled. The area affected is wide and the eastern limit of it is shown as a dotted line in Fig. 1. The area covered by the first phase of dolomitisation includes the whole of Gunung Karang Kecil and Gunung Merswan and the eastern portions of Gunung Karang Besar and Gunung Keroh.

The rock has further undergone a second phase of dolomitisation. The dolomite formed during the second phase of dolomitisation is medium-grained and subhedral to euhedral in shape. They generally have a dirty appearance as they contain numerous small reddish dust particles of iron oxide. These

* Publication authorised by the Director-General, Geological Survey of Malaysia.

FIGURE 1. LIMESTONE / DOLOMITE OF THE SIMPANG PULAI AREA, KINTA DISTRICT, PERAK



PKB. (D) 78-32

Table 1. Composition of the limestone hills as classified after Frolova (1959), based on 98 rock samples.

Hill	Rock Type (Classification after Frolova, 1959)						No of samples
	Limestone (%)	Slightly dolomitic limestone (%)	Dolomitic limestone (%)	Calcitic dolomite (%)	Slightly calcitic dolomite (%)	Dolomite (%)	
G. Keroh	45.9	13.5	2.7	2.7	5.4	29.7	37
G. Merawan	10.3	6.9	24.1	6.9	41.4	10.3	27
G. Karang Besar	35.0	-	-	-	25.0	40	20
G. Karang Kecil	14.3	-	7.1	35.7	35.7	7.1	14

impart a reddish colour to the rock in hand specimen The second phase dolomite is relatively rich in Fe as indicated by staining (Dickson, 1965) and chemical analyses (Table II) Under the microscope the second phase dolomite was observed to occupy fractures within the first phase dolomite and it has replaced the first phase dolomite along the fractures. At the quarry face of the Stoneware Industries Sdn. Bhd. the second phase dolomite was also observed to replace the original limestone preferentially along the fractures. The second phase of dolomitisation is invariably fracture controlled and may be described as epigenetic. The area affected by the second phase of dolomitisation is restricted to a smaller area compared to the area covered by the first phase of dolomitisation (Fig 1) The eastern portion of Gunung Karang Besar and the north-eastern portion of Gunung Keroh are covered by the second phase of dolomitisation. Smaller localised areas affected by it also occur at Gunung Karang Kecil and Gunung Merawan.

The final composition of the rock depends on the intensity and number of phases of dolomitisation the rock has undergone. Rocks which have undergone only the first phase of dolomitisation generally have compositions varying from slightly dolomitic limestone to slightly clacitic dolomite. The second phase of dolomitisation has further enhanced the dolomitisation process. Rocks which have undergone both phases of dolomitisation have attained the composition of dolomite.

Further investigations have to be carried out as several questions remain unanswered. The nature of the environment during the two phases of dolomitisation is still unknown. Neither is the nature and origin of the agents causing dolomitisation.

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Table II. Chemical composition of selected rocks from the limestone hills of the Simpang Pulai Area, Kinta District, Perak

Sample No.		% CaO	% MgO	% SiO_2	% Fe_2O_3	First phase dolomitisation	Second phase dolomitisation
OMn 1	limestone	54.4	1.0	0.09	0.02	-	-
OKB 17	limestone	54.6	1.0	0.03	0.08	-	-
OMn 5	dolomitic limestone	52.0	3.35	0.08	0.03	+	-
OKK 1	calcitic dolomite	42.2	11.4	0.12	0.30	++	-
OMn 17	slightly calcitic dolomite	34.3	18.5	0.10	0.08	+++	-
OKB 13	dolomite	30.9	21.3	0.06	0.35	+++	+
OKB 5	dolomite	30.7	21.1	0.48	0.96	+++	++

Intensity of dolomitisation as observed under the microscope.

Symbols:
- `-` no dolomitisation
- `+` traces of dolomitisation
- `++` moderate dolomitisation
- `+++` intense dolomitisation

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Trace element characteristics of Segamat Volcanics.

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K.R. Chakraborty, Dept. of Geology, University of Malaya, Kuala Lumpur.

Introduction

The volcanics and shallow intrusive rocks of Segamat belong to shoshonitic and potassic alkali basalt (trachybasalt-trachyte) groups (Chakraborty & Kamineni, 1978). These two groups have been distinguished on the basis of major element chemistry, in particular K_2O - SiO_2 relationship and K_2O/Na_2O ratio. In this article, we report briefly some trace element characteristics of these rocks. Rb, Ba, Sr, Ni, Co and V abundance have been determined for all the twenty five samples analysed for the major elements. The mean and range of the trace element abundances are summarized in Table 1.

Trace element chemistry

Segamat volcanics are, in general, characterized by rather high abundance of these trace elements. K/Rb ratio is also high. Ni/Co is more than unity and V/Ni less than 10. It is also noteworthy that the abundances of these elements, whether on absolute basis or on the basis of equivalent solidification indices, are comparable for both the rock groups.

Rb, Ba and Sr

In conformity with their potassic nature, Segamat volcanics have high Rb content. The shoshonitic rocks show a larger spread of Rb and a smaller spread of Sr compared to the rocks of the alkali basalt (trachybasalt-trachyte) group. But the average Rb and Sr contents of these two groups are very close (Table 1). The mean Ba content of the shoshonite group is significantly higher. The range as well as the mean of Rb/Sr and Rb/Ba ratios are closely similar for these two groups.

The shoshonitic rocks do not show any systematic variation of Rb, Ba, Sr and Rb/Sr with differentiation. Their plots against Solidification Index (S.I.) are irregular (Figs. 1a, b, c). In contrast, in the alkali basalt group Sr decreases, and Ba and Rb/Sr increase systematically with decreasing Solidification Index i.e. increasing differentiation (Figs. 1b, c and 2). The Rb distribution pattern in the alakli basalt group is not very regular, but it is apparent that the late differentiates are significantly more enriched in Rb (Fig. 1a).

The range as well as the mean of K/Rb ratio are noticeably higher in the shoshonitic group (Table 1). Rb shows positive correlation with K_2O for both the groups (Fig. 3). But while K/Rb decreases with increasing K_2O in the shoshonitic rocks, there is no apparent relationship between K/Rb and K_2O in the alkali basalt group (Fig. 4). The variation of K/Rb with the Solidification Index is irregular for both the groups (Fig. 5).

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Table 1. Trace Element Abundances in Segamat Volcanics

	Shoshonite Group Range	Shoshonite Group Mean	Alkali Basalt Group Range	Alkali Basalt Group Mean
Rb (in p.p.m.)	20 - 125	62	25 - 90	60
Ba (")	200 - 650	336	200 - 340	281
Sr (")	400 - 655	528	220 - 785	551
Ni (")	50 - 180	83	5 - 100	61
Co (")	20 - 65	37	0 - 55	32
V (")	60 - 500	312	50 - 460	309
K/Rb	425 - 1470	769	285 - 750	436
Rb/Sr	0.04 - 0.30	0.13	0.04 - 0.25	0.13
Rb/Ba	0.10 - 0.26	0.18	0.10 - 0.29	0.21
Ni/Co	1.75 - 2.8	2.20	1.7 - 6.0	2.46
V/Ni	1.78 - 7.67	4.19	3.15 - 10.0	5.65

The variations in the abundances of Rb, Ba and Sr in the shoshonitic group appear to be due mainly to the variation in the degree and type of crystal accumulation whereas in the alkali beasalt group they are primarily differentiation controlled.

Ni, Co and V

The mean Ni content of the shoshonites is relatively higher than that of the alkali basalt group There is no significant difference between the two groups with respect to Co, V, Ni/Co and V/Ni. In both these groups, Ni and Co systematically decrease with increasing differentiation, but the variation of V is irregular (Figs. 6a, b and c). There is a good positive correlation between Ni and Mg (Fig. 7) implying a strong influence of olivine fractionation.

Concluding remarks

From the data presented here, it is quite apparent that there is a large compositional overlap in the trace element abundances among the members of the shoshonitic and alkali basalt groups. A similar compositional overlap also exists in their major element concentration (Chakraborty and Kamineni, 1978) suggesting a strong genetic connection between the two groups

In recent years, shoshonitic rocks have been described from many island arcs or from similar settings (Jakes and White, 1969, 1972; Jakes and Smith, 1970; Gill, 1970; Jolly, 1971; MacKenzie and Chappel, 1972; Keller, 1974; Jaques, 1976; Peccerillo and Taylor, 1976; Boccaletti et al 1978). Their overall trace element abundances have been summarized by Jakes and White (1972). In many trace element characteristics, such as low Ni and Co, Ni/Co less than unity, V/Ni more than 10, as well as in the REE patterns, the arc shoshonites appear to have close affinity with calcalkaline or high

K-calcalkaline series (Smith, 1972, Peccerillo and Taylor, 1976; Boccaletti et al. 1978) Accordingly, their genesis has been related to the subduction processes.

The Segamat shoshonites differ significantly from arc shoshonites in many trace element features, particularly in having lower Sr and Ba, higher Ni, higher K/Rb and lower V/Ni. These features apparently do not suggest any calc-alkaline affinity. Thus, the petrogenetic models suggested for the evolution of arc shoshonites are evidently not applicable for the Segamat shoshonites.

Acknowledgement

We would like to thank Mr. Roslin Ismail for drawing the diagrams

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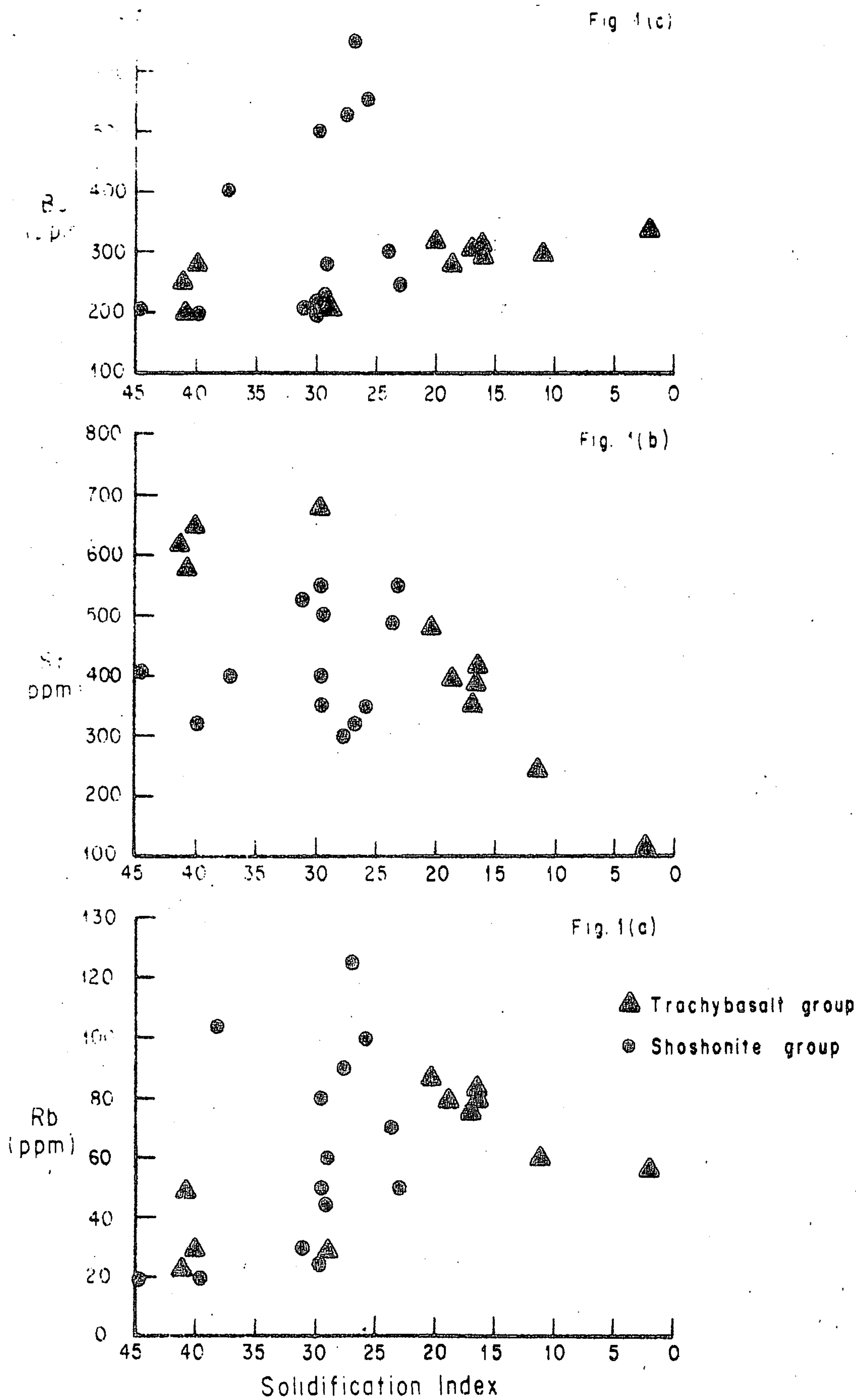


Fig 1(c)
Fig. 1(b)
Fig. 1(a)
Sr ppm
Rb (ppm)
Trachybasalt group
Shoshonite group
Solidification Index

Fig 2

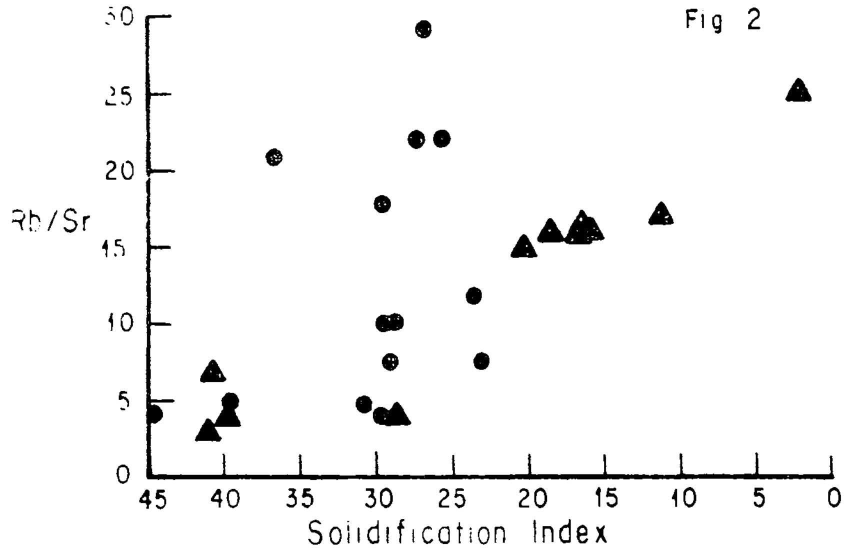
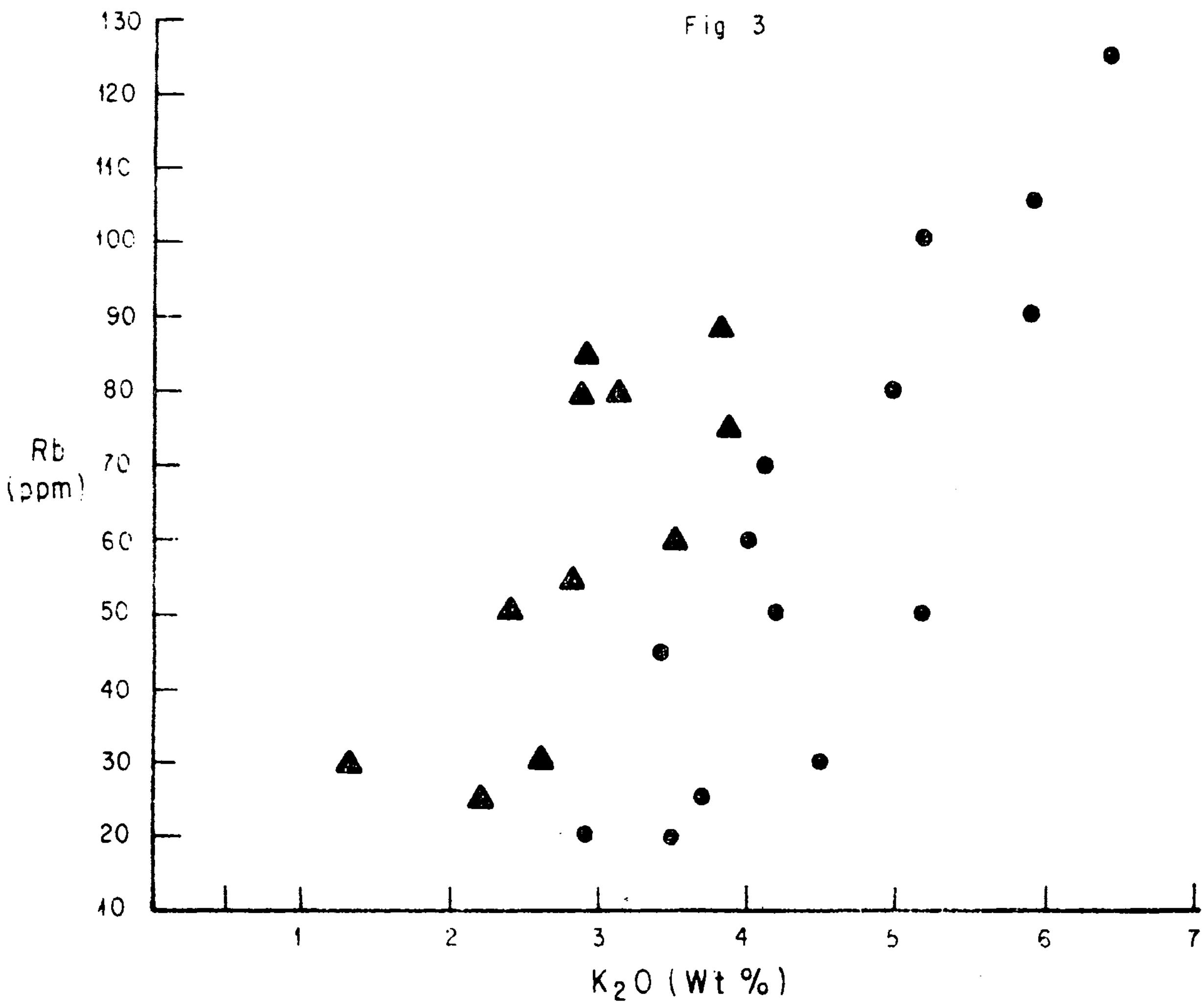

Rb/Sr
30
25
20
15
10
5
0
45
40
35
30
25
20
15
10
5
0
Solidification Index

Fig 3


Rb
(ppm)
130
120
110
100
90
80
70
60
50
40
30
20
10
1
2
3
4
5
6
7
K_2O (Wt %)

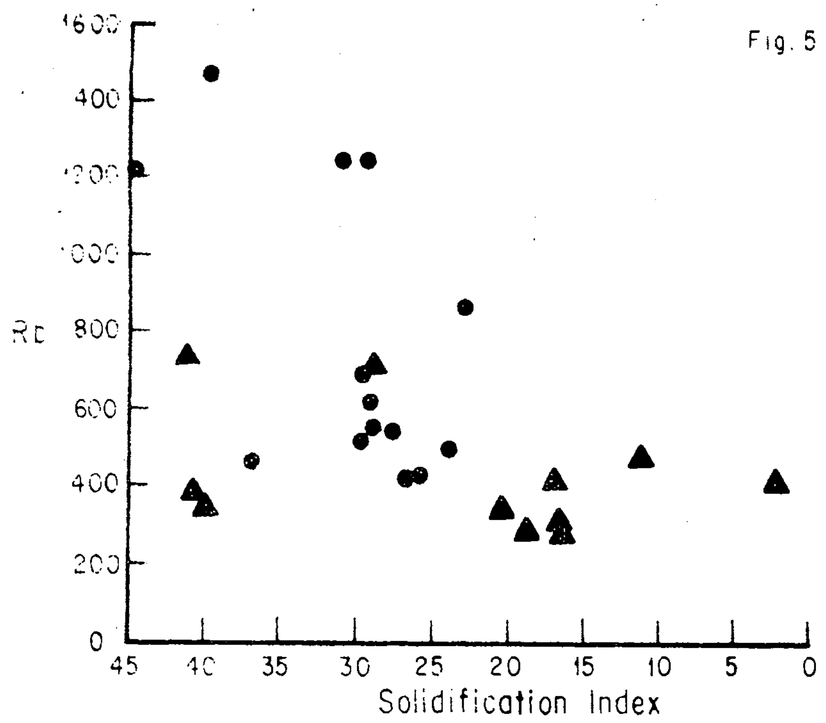


Fig. 5
Rb
1600
400
1200
1000
800
600
400
200
0
45
40
35
30
25
20
15
10
5
0
Solidification Index

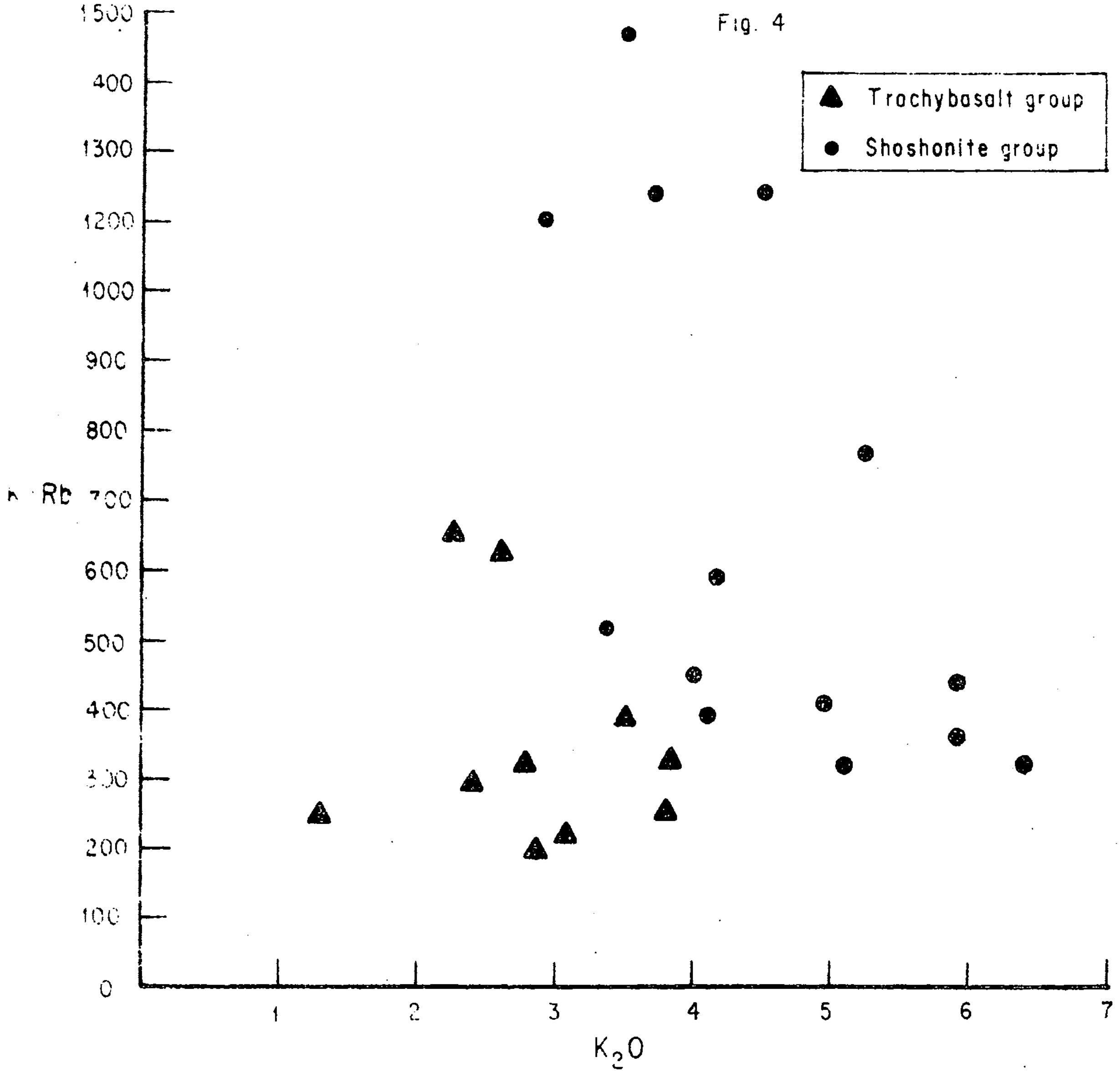


Fig. 4
Trachybasalt group
Shoshonite group
Rb
1500
400
1300
1200
1000
900
800
700
600
500
400
300
200
100
0
1
2
3
4
5
6
7
K_2O

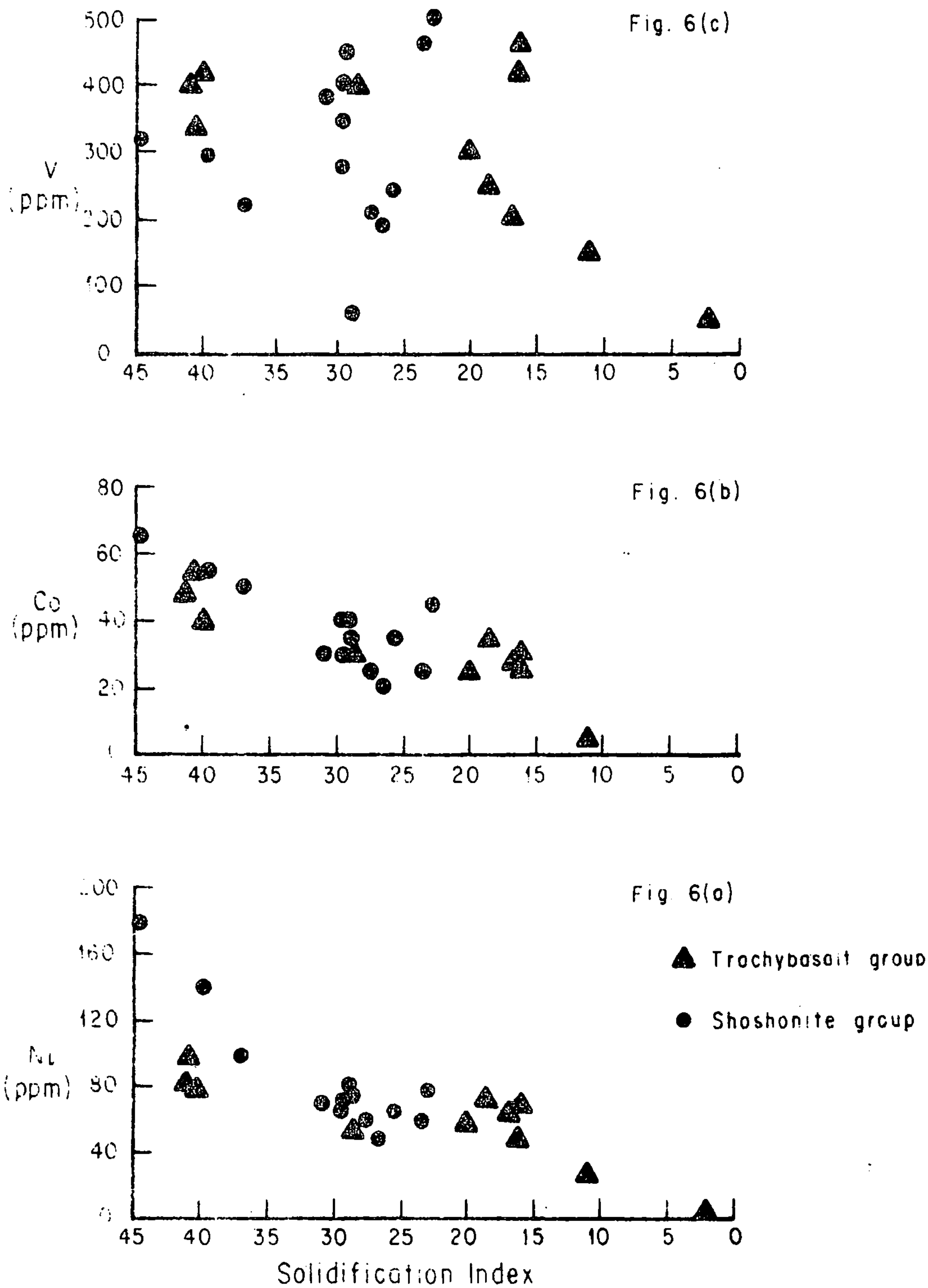


Fig. 6(c)
V (ppm)
500
400
300
200
100
0
45 40 35 30 25 20 15 10 5 0
Fig. 6(b)
Co (ppm)
80
60
40
20
45 40 35 30 25 20 15 10 5 0
Fig. 6(a)
Ni (ppm)
160
120
80
40
45 40 35 30 25 20 15 10 5 0
Trachybasalt group
Shoshonite group
Solidification Index

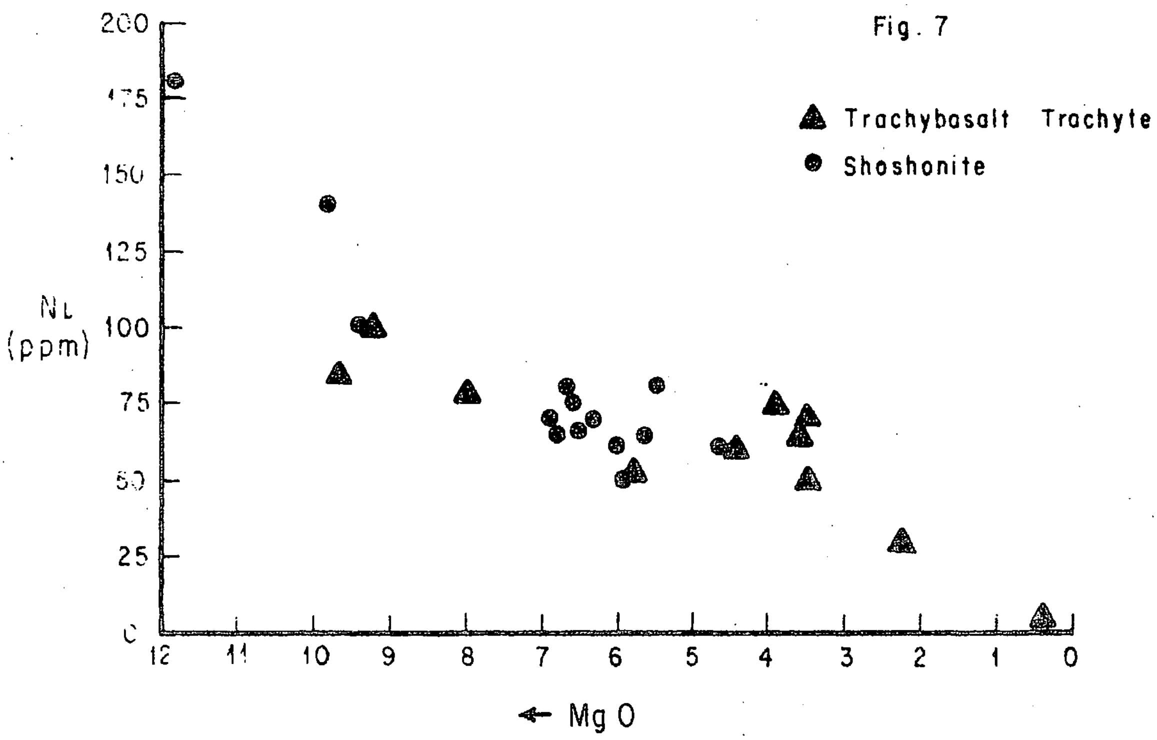


Fig. 7
Trachybasalt Trachyte
Shoshonite
Ni (ppm)
200
175
150
125
100
75
50
25
0
12
11
10
9
8
7
6
5
4
3
2
1
0
← Mg O

GEOLOGY ON STAMPS

8. Geologists on Stamps

N.S. Haile, Dept. of Geology, University of Malaya, Kuala Lumpur.
(Photographs: Jaafar bin Haji Abdullah)

Few geologists have appeared on stamps. The noble geologist shown on the "Geology Day" Soviet stamps has already been illustrated (Geology on Stamps, 3). China, in a set on "Industrial Development" (1954), has a "Geological survey team", as the highest value (1). Russia shows an anonymous glaciologist on its 1969 stamp (Geology on Stamps, 5). The USA showed John Wesley Powell on the centenial of his expedition down the Colorado River and Grand Canyon in 1868, but it is clear he is honoured as an explorer (Geology on Stamps, 7).

Named geologists on stamps are few. Norway has a set (1974) honouring four geologists: J.H.L. Vogt, V.M. Goldschmidt, Th. Kjerulf, W.C. Brøgger (2,3,4,5). Colombia, for the International Geophysical Year produced three stamps (of identical size) honouring Fransisco Jose de Caldas for his discovery of hypsometry (the determination of altitude by the depression of the boiling point of water with height) in 1799 (6). New Caledonia depicts Jules Garnier, after whom garnierite, the important ore of nickel, on a handsome stamp which also shows a nickel mine and lumps of garnierite (1967:7).

The earliest geologist to be shown is depicted (not surprisingly) by China, and is Shen Ko, shown on two stamps of the set "Scientists of Ancient China"issued in 1962 (8, 9). Shen Ko (or Shen Kua) lived in the 11th century A.D. and was an astronomer, engineer and high official, as well as a geologist. His major work, the Meng Chhi Pi Than, appeared around 1070 A.D. He addressed himself to various topics, including erosion. Needham and Wang Ling give a number of interesting quotations (Science and Civilization in China, 1959, vol. 3, p. 603 ff).

Now I myself have noticed that Yen-Tang Shan is different from other mountains. All its lofty peaks are precipitous, abrupt, sharp and strange; its huge cliffs, a thousand feet high, are different from what one finds in other places. Its peaks are hidden by foothills so that from outside one cannot see much, but when you get near the peaks themselves, they seem to pierce the sky. Considering the reasons for these shapes, I think that (for centuries) the mountain torrents have rushed down, carrying away all sand and earth, thus leaving the hard rocks standing alone.

In places like Ta Lung Chhiu, Hsiao Lung Chhiu, Shi Lien, and Chhu Yueh Ku, one can see in the valleys whole caves scooped out by the force of water. Standing at the bottom of the ravines and looking upwards, the cliff face seems perpendicular, but when you are on the top, the other tops seem on a level with where you are standing. Similar formations are found right up to the highest summits. So also we find even in small waterways that the banks become scooped out like a rounded shrine or oratory (khan) wherever the force of the swirling water strikes against them. This is the same thing happening. Now in the large gorges of Chheng Kao and Shensi we can see the earth standing straight up as much as a hundred feet (loess canyons). They *are, indeed, a small model of Yen-Tang Shan though this is simply earth while Yen-Tang Shan is hard rock.*

Shen Kua also described sedimentary deposition:
When I went to Hopei on official duties I saw that in the northern cliffs of the Thai-Hang Shan mountain-range, there were belts (strata) containing whelk-like animals, oyster-shells, and stones like the shells of birds' eggs (fossil echinoids). So this place, though now a thousand li west of the sea, must once have been a shore. Thus what we call the 'continent' (ta lu) must have been made of mud and sediment which was once below the water. The Yu Mountain, where Yao killed Kun, was, according to ancient tradition, by the side of the Eastern Sea, but now it is far inland.

Now the Great Rivers i.e. the Yellow River, the Chang Shui, the Hu Tho, the Cho Shui and the Sand Chhien, are all muddy silt-bearing rivers. In the west of Shensi and Shansi the waters run through gorges as deep as a hundred feet. Naturally mud and silt will be carried eastwards by these streams year after year, and in this way the substance of the whole continent must have been laid down.

Needham comments that these passages show that Shen Kuo in the 11th Century fully understood those conceptions which, when stated by James Hutton in 1802, were to be the foundation of modern geology. Shen Ko also wrote on petroleum, fossil plants, fishes, and stone-crabs.

Other geologists, geochemists, geophysicists, or mineralogists to be shown on stamps are Agricola (German D.R., 1955), Brongniart (France, 1950), David (Australia, 1968), Domeyko (Chile, 1954; Poland, 1973), Fersman (USSR, 1966), Karpinskiĭ (USSR, 1966), Kulik (USSR, 1958), Obruchev (USSR, 1963), Stensen, (Denmark, 1969) and Vernadskii (USSR, 1963).

It can be seen that the coverage of famous geologists on stamps is very uneven. A particularly glaring omission is any depiction of British geologists - centenaries of James Hutton, William Smith, Charles Lyell, have come and gone, without any commemorative stamp. But then what can one expect when Britain has not even depicted Darwin or Newton, but leaves them to be honoured by numerous other countries? As a matter of interest I made an analysis of British stamps which honour individuals. Up to the beginning of 1977, of a total of 83 such stamps, three show scientists: two honour Joseph Lister (discoverer of antiseptic spray for operations), one William and John Herschel and Francis Birley (astronomers). This compares with 19 for novelists, poets and playwrights, 18 for painters and designers, and 10 for explorers. Musicians are the only group who do worse than scientists, only Ralph Vaughan Willams (1 stamp) being depicted. Not even the 250th anniversary of Isaac Newton's death in 1977 was marked by the British Post Office although several other countries, including Mongolia, which issued nine handsome and instructive stamps, did so.

This marks the end of the present series of articles on Geology on Stamps, but I hope to write a few more, on new sets, or interesting stamps which I have not yet illustrated, after a decent interval.


3200

1


NORSKE GEOLOGER
J·H·L·VOGT
1858–1932
NORGE 65

2


NORSKE GEOLOGER
V·M·GOLDSCHMIDT
1888–1947
NORGE 85

3


NORSKE GEOLOGER
TH·KJERULF
1825–1888
NORGE 100

4


NORSKE GEOLOGER
W·C·BRØGGER
1851–1940
NORGE 140

5


$1
CORREOS DE COLOMBIA
$1
HIPSOMETRIA
FRANCISCO JOSE
DE
CALDAS
1799
AÑO GEOFISICO MUNDIAL 1957-58

6


NOUVELLE-CALEDONIE ET DEPENDANCES
70F
CENTENAIRE DE LA GARNIERITE
POSTE AERIENNE
RF
JULES GARNIER

7


10


10

8 9

MEETINGS OF THE SOCIETY

Three lectures were given by Prof. G.H. Moh* on July 14, 28 and August 11 on experimental and applied mineralogy with special reference to ores. The short notes given below on these lectures were prepared by the speaker himself at the Society's request.

a) At first, attempts were made to introduce the students to a simple way of low-hydrothermal experimentation or to simple sulfide syntheses. Pyrite-type minerals were taken into consideration e.g., pyrite, FeS_2; vaesite, NiS_2; cattierite, CoS_2; and a high pressure phase, CuS_2, which does not occur as a mineral. Between some of these minerals, either complete or limited solid solution series occur in nature or can be produced by laboratory experiments. Bravoite, $(Fe, Ni)S_2$, with or with nearly a Fe : Ni = 1 : 1 ratio, is definitely a low temperature mineral and the range of its thermal and compositional stability can be investigated via hydrothermal experiments. The mineral villamaninite has an ideal $(Ni,Cu)S_2$ composition with a Ni : Cu = 1 : 1 ratio. However, the natural ores contain also Fe and Co, thus, a Pa_3-type disulfide occurs with an approx. $(Ni,Cu,Fe,Co)S_2$ formula.

b) At some elevated temperatures but still within a temperature range of hydrothermal to pneumatolytic deposition temperatures, most of the sulfide-type ore deposits have been formed. Depending on the conditions and on the history of the ore bodies in which the minerals occur, various types of textures can be observed by microscopical investigations. These textures include myrmekites, oriented intergrowths, mutual exsolutions of solid solution series, twinnings caused by inversions into an other polymorphic modification, etc. These textures can be understood only if we know the reactions and the sequence of reactions. Numerous laboratory experiments were undertaken to produce similar ore textures under controlled temperature and pressure conditions and a "scheme of mineral systems" can be used to express and/or to decipher these textures which have been explained and demonstrated by micrographs on various sphalerite-chalcopyrite-type minerals.

c) Finally, a number of natural occurring minerals have a very large temperature stability range before melting. Some of these high temperature resistant minerals are sulfides and a few of those are characterised by slow reaction rates, even at temperatures above 1000°C. The highest melting temperatures were found of molybdenite, MoS_2, and tungstenite, WS_2, both minerals melt far above 2000°C. These layered structure type of minerals have been used as lubricants, e.g. for bearings operating at elevated temperatures. However, at some elevated temperatures corrosion starts suddenly because the typical lubricant characteristics of these disulfides changes. Some experimental studies within the Cu-Mo-S and the Fe-Mo-S systems demonstrate the reactions. In both cases ternary phases become stable at increased temperatures. These phases at high temperature have different properties and after cooling to very low temperatures, were found to be super conductive.

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* Prof. G.H. Moh is the Head of the Experimental Mineralogy Laboratory at the University of Heidelberg, W. Germany. From June to August, Prof. Moh was at the Department of Geology, University of Malaya as a visiting Professor.

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

GEOSEA III - Bangkok, November 1978

About 40 members have indicated their interest to join the GSM party for this Third Regional Conference on the Geology of Southeast Asia and the field trips following the meeting. It is likely that some of these members may now be unable to make the trip and in this event, space may still be available for other members to join this party. Those interested can write in for more information. This trip is partly subsidised by the GSM and the organizers of GEOSEA III and the cost to the participants is very much less than it would have been otherwise.

Room reservation at the AIT student dorms will be made for all members of the party except for those who have written in to inform us of their separate bookings. These rooms are all single rooms and are perfectly adequate.

The organizers have agreed to let the GSM collect the registration fee for members of the party at pre-September 1st rate and pay on arrival in Bangkok.

The party would most likely leave Kuala Lumpur on 11th November 1978 and the trip will end at Haadyai on 27th or 28th November 1978.

BKT

Petroleum Seminar - December 1978

The organizing committee for this seminar, under the Chairmanship of Mr. James Lau have received encouraging response from several invited speakers for papers to be presented at this seminar. The GSM has also received a donation of 1000 ringgit from Petronas to meet part of the cost of this meeting. It is planned to have a maximum of 8 scientific papers for this one-day seminar in order to give more time for discussion. The venue will be in one of the leading hotels in Kuala Lumpur. A circular giving full particulars regarding this meeting will be posted to all members as soon as the arrangements are finalised.

BKT

Editor's Notes

The committeesto draw up constitutional amendments to cater for a new class of Professional Members acceptable under the proposed Mineral Engineers

Act and to formulate rules and procedure for the Young Geoscientist Award have completed their work. The proposed constitutional amendments and the rules and regulations for the award will be circulated to members soon.

Prof K.H. Loke has proposed that the Malaysian Scientific Association and other scientific societies get together to form a Malaysian Federation (or Association) of Scientific Societies. All participating societies are to retain their individual entities and there will be no dominance of one over the others. This proposal merits support since such an Association will give the scientific societies a stronger voice on scientific matters.

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. Oklahoma Geology Notes, vol. 38, nos. 1-3, 1978.
2. Contributions from the Institute of Geology & Paleontology, Tohoku University, no. 78 & 79, 1978.
3. The Science Reports of the Tohoku University, Second Series (Geology), v. 48, nos. 1-2, 1977-8.
4. Geological literature of USSR for 1972, vols. 1 & 2.
5. Bulletin of the National Science Museum, Series C, v. 4, no. 2, 1978.
6. Scripta Geologica, no. 45, 1978.
7. National Library Singapore: Adult Reference collections accessions list, June & July 1978.
8. Books about Singapore, 1977.
9. Journal of Research of the U.S.G.S. vol. 6, no. 5, 1978.
10. Journal of Geosciences, Osaka City University, vol. 21, 1978.
11. The University of Kansas, Paleontological Contributions Papers 90, 91, & 92, 1978.
12. Institution of Mining & Metallurgy, Transactions/Section C, vol. 87, 1978.
13. Institution of Mining and Metallurgy Bulletin no. 860 & 861, 1978.
14. Commonwealth Geological Liaison Office, Newsletter, July, 1978.
15. American Museum Novitates, nos. 2645 & 2647, 1978.
16. Geosurvey Newsletter, vol. 9, no. 14, 1977 and vol. 10, no. 15, 1978.
17. Acta Palaeontologica Sinica, vol. 17, no. 2, 1978.

Membership

The following persons have joined the Geological Society of Malaysia:-

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University of Malaya
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Zaidi Zolkipli-Zuckipli
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Kuala Lumpur

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Zainol b Hj Husin
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Universiti Kebangsaan Malaysia
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Kuala Lumpur

Sahura Abu Samah
Komsis Sains
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Sanudin Hj Tahir
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Kuala Lumpur

Tew Sea Kia
Jabatan Geologi
Universiti Kebangsaan Malaysia
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Ismail b Che Mat Zin
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Zakaria Hussain
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Kuala Lumpur

Che Ghani bin Che Ambak
Flat-J, Komsis Sains
Universiti Kebangsaan Malaysia
Jalan Pantai Baru
Kuala Lumpur

Change of address

The following members have informed the Society of new addresses:

A.H.G. Mitchell
c/o F.G. Mitchell
c/o Cornerways
Nell Road
Robertsbridge, Sussex, England.

Tang Ming Keong
c/o Box no. 1
Alexandra
Singapore 3.

Address wanted

We would like the current address of the following member:

William Jauncey
formely of Champlin Petroleum Co
400-639 Fifth Avenue, S.W
Calgary, Alberta T2P OM9, Canada.

OTHER NEWS

A Science Centre in Kuala Lumpur

A proposal was made in 1976 for the setting up of a Science Centre in Kuala Lumpur. It called for the founding of a centre that would complement the efforts of the government, the universities and industry in education and research. The Centre would disseminate scientific knowledge and technology to the people of Malaysia. It would be a venture based on private initiative drawing on local as well as foreign contributions. The Centre will include a Natural Science Display Section, a Planetarium and an Applied Science Display Section.

The Malaysian Scientific Association has been active in promoting this formation of the Science Centre. In their Annual Report for 1976/77 they report that the government is receptive to the formation of the proposed Science Centre. Favourable response on financial contributions have been received and a donation of a piece of land has been promised.

Wolfram Hill, Thailand

They call it Wolfram Hill and every day thousands of illegal miners scurry to dig it up hoping to find a fortune in scenes more reminiscent of a Wild West gold rush than rural Asia.

Since Doi Ngom Hill - its real name - was discovered to harbour rich deposits of wolfram ore two months ago, people have swarmed to the remote site 375 miles north of Bangkok, from all over northern Thailand.

But the wolfram rush could soon be over. The Thai Government has decided to put a stop to it before the fighting, intimidation and claim-jumping that has marred wolfram mining in other parts of the country, comes to Doi Ngom Hill.

This fears of violence appears to be the biggest factor behind the Government's plans to stop mining on Wolfram Hill.

It already has examples of what illegal wolfram mining can lead to, particularly the example of Khao Soon, in the southern province of Nakhon Si Thammarat near the Malysian border.

Since wolfram was discovered at Khao Soon eight years ago, gangs armed with modern rifles and grenades, local security forces and communist guerillas have fought intermittent battles for control of the mines and the considerable wealth they represent.

Khao Soon was included in the Government plans to clamp down on illegal mining, but because of the situation there the first step in bringing mining under control is to be an army inspection tour designed to persuade the illegal miners to give up.

On Wolfram Hill the Government has decided to impose a temporary ban on all mining, declaring it off-limits, and to evict the illegal miners within a specified time limit, which has not yet been set.

Extracted from Malay Mail, 26.8.78
from a Reuter report.

AAPG Offshore Technology Conference

The AAPG Sub-committee of the 1979 Offshore Technology Conference Committee is soliciting papers to be given at the OTC in Houston, Texas April 30 to May 3 1979. Papers covering all facets of offshore exploration, development and applied research are desired. Topics of special emphasis in 1979 for which papers are particularly encouraged include: regional assessment of offshore areas; field studies of offshore oil and gas fields; high-latitude sediments; geology of frontier areas; applied geochemistry in offshore areas; geology of non-petroleum offshore resources; seismic stratigraphy; and the influence of the geological environment on offshore operations.

For further information please write to: AAPG/OTC Program Subcommittee Chairman William A. Fowler, Jr., Phillips Petroleum Company, P.O. Box 1967, Houston, Texas 77001, or from OTC Headquarters, 6200 North Central Expressway, Dallas, Texas 75206.

8th International Geochemical Exploration Symposium
Hannover, Federal Republic Germany, April 10-15, 1980

The Federal Institute for Geosciences and Natural Resources (Geological Survey of the Federal Republic of Germany) will be organizing the 8th International Geochemical Exploration Symposium in Hannover, Federal Republic of Germany.

Preliminary suggestions for the main topics of the Symposium are:

1. Geochemical prospecting in well populated areas (with respect to contamination by old mine workings and modern industrial operations);
2. Geochemical exploration surveys for mineral development in industrially less developed countries (results from United Nations and other programs), case histories;
3. Geochemical and combined geochemical and geophysical methods for exploration of hydrocarbons;
4. Advances in the methods of the evaluation of geochemical exploration data;

5. Analytical problems with elements which are useful in exploration work but are normally found only in minor concentrations

For further information please write to: Dr. H. Gundlach, Organizing Committee, 8th International Geochemical Exploration Symposium, Federal Institute for Geosciences and Natural Resources, P.O. Box 510 153, D-3000 Hannover 51, W. Germany.

Review: Tunguska: cauldron of hell by Jack Stoneley, with scientific editor A.T. Lawton, F.R.A.S. London: W.H. Allen & Co., Ltd. (a Star Book paperback), 198 pages. Price: £0.75.

The awesome event that took place near the Tunguska River in Siberia in June 1908 and the attempts of men to study and understand it have all the elements of a story to appeal to the popular imagination: the exotic setting of the frozen North, the tantalizingly garbled early reports, the heroism of a lonely scientist (Leonid Kulik) battling a skeptical scientific establishment, the hardships and adventures of the successive expeditions into the remote reaches of Siberia, the hair-raising accounts of the few herdsmen who were near the site, and of the first awed scientists to reach the area - and most of all the enduring mystery of exactly what happened at Tunguska in 1908, a mystery unresolved to this day. Was it simply a meteorite which exploded and totally vaporized? or the head of a comet colliding with the earth? or a small 'black hole' passing into the earth? or a piece of extraterrestrial antimatter annihilating in the atmosphere? or even an alien spacecraft which went out of control and exploded?

Clearly in this story there are the makings of a superb and gripping popular book. I regret to report that Stoneley's book is not it. He starts out well enough - the first 55 pages, which mainly give the historical account and liberally quote contemporary sources and eyewitness descriptions, are interesting reading, marred only by a condescending sensationalism in the author's language (he seems to assume the reader will fall asleep unless frequently jarred by words such as *monster*, *satanic*, *holocaust*, *mammoth*, *immense*, *giant*, *cruel*, *tortuous*, *bitter*, and so forth - the language in the quoted contemporary sources is by contrast generally direct, simple, and compelling).

The rest of the book is meant to be a discussion of possible explanations of the Tunguska event. The amount of space devoted to each is roughly in inverse proportion to its likelihood. The author does write reasonably carefully, trying to label unverified claims as such and to differentiate between fact, interpretation, and pure speculation. But, in spite of the scientific editor, there are errors and inconsistencies. On page 65 the head of a comet is described as being "composed of a tough, stony silicate outer surface protecting volatile gases inside", yet having a density of only "half an ounce per cubic mile". On page 86 a 'black hole' gives off "crackling and hissing sounds as particles of matter are sucked in and then blasted out again at extreme velocities." There is a persistent confusion between the size and shape of the *light phenomenon seen* and the size and shape of the *object* which produced it. And there are other errors.

But the serious flaw in the book is simply that the author soon runs out of things to say about Tunguska, and starts to add padding. One gets the impression that the author and publishers are victims of a belief that a paperback book should have 200 pages (despite all the padding, and seven appendices, the author doesn't quite make that quota in the end, but the publishers have thoughtfully provided a few pages of advertisements for their other books). One can almost hear the author groan "Oh Lord, I'm still short! What can I stick in now?" The first obvious padding is a chapter which starts by pointing out that *if* the Tunguska object had arrived on earth a few hours later (and at a conveniently more southern latitude!) it could have exploded over the city of London, and then proceeds to describe, in excruciating detail, what *might have happened* if that had been the case. A second wad of padding is a totally irrelevant chapter on volcanic eruptions ("Though the Tunguska Event is unique in recorded history, we can compare its effects with ...."), complete with lengthy quotes from eyewitnesses.

After page 133, the author seems to give up, and Tunguska is more or less forgotten, except for a ritual mention in the first paragraph of each chapter ("In considering the exploding spaceship theory in the search for the answer to the Tunguska Event, one must inevitably bring in the tantalizing controversy of Unidentified Flying Objects ....."). Stoneley then really gets down to writing another book - about the possibility of intelligent life elsewhere in the universe and all the ramifications of that idea. This topic seems to be what really interests the author, and he and his scientific editor Lawton have written other books on it. As a result, this second book, which grows out of the Tunguska one like a malignant tumor, is better written and more satisfying reading - but it isn't Tunguska. The tumor kills the host.

So this book fails, as did another recent one on Tunguska, The fire came by: the riddle of the great Siberian explosion by John Baxter and Thomas Atkins, Doubleday, New York, 1976. That is a somewhat better book than Stoneley's (its authors stopped after 148 pages without evident embarrassment), and parts of his seem patterned after it. But The fire came by is similarly spoiled by uncritical acceptance of the alien spacecraft hypothesis.

There are a number of good books on Tunguska in Russian, and Krinov's Giant meteorites (Pergamon, 1966) includes a lengthy discussion of the subject. People interested in this topic are advised to read Krinov or start learning Russian: they will probably be fluent readers of that language before a good popular book on Tunguska appears in English.

PHS

Review: Volcanic hazard map Merapi volcano, Central Java, scale 1:100,000 by L. Pardyanto, L.D. Reksowirago, F.X.S. Mitrohartono and S.H. Hardjowarsito; Text by K. Kusumadinata (1978).

The Geological Survey of Indonesia has published its first volcanic hazard map, which is probably also the first of its kind in the world. The map covers the active Merapi volcano near Yogyakarta and the Borobudur monument in Central Java and depicts an area measuring 30 minutes by 35 minutes. Conventional map colours indicate contours (contour interval is 100 metres) and water bodies. Symbols and other colours describe the various degrees of hazards around the volcano (Fig. 1).

Since 1920, the Geological Survey has entrusted the task of observing, investigating, and in a few cases of "managing" the many active volcanoes in Indonesia to its special division that is generally known as the "Volcanological Survey". Seventy-five of the 128 active volcanic centres have erupted at least once since 1600 A.D. Crater morphology and/or fumarolic activity characterize the remaining volcanic centres. On account of the frequency of catastrophic eruptions and the dense population in the surrounding areas, three Indonesian volcanoes have been identified as being "very dangerous" (Merapi and Kelut in Java; Awu in the Sangir islands) and twenty-two other as "dangerous" (Hadikusumo, 1961).

The hazards faced by the population living near or upon very dangerous and dangerous volcanoes are of primary and secondary nature. Primary dangers include lava flows, eruptions of pyroclastics, glowing avalanches and glowing ash clouds (nuées ardentes) and gases. Most Indonesian volcanoes are of the orogenic type and produce slow-moving andesitic flows. However, danger from falling volcanic fragments produced by eruptions is real. Larger bombs fall in the vicinity of the crater which is generally uninhabited, but smaller, still-glowing volcanic projectiles have been known to produce fatalities and to set fire to wood up to 8 km from its source. The nuées ardentes reach velocities of 150 km/hour and are 400°C or hotter. Its high fluidity causes ash clouds to surmount topographic barriers and to reach distances of 15 km. Crater lakes on active volcanoes constitute an additional hazard. Eruptions cause the water mixed with debris to rush down the slopes as mudstreams or hot lahars. Rain lahars are secondary hazards on active volcanoes. These mudflows are created by rain falling on and mixing with freshly deposited pyroclastics in the summit region of the volcano. Such lahars have been known to develop months after the actual eruptions ceased. The high density of lahars enable them to transport large blocks far down slope. The blocks may be used as battering rams against bridge-supports and the like, or may cause dams that force the lahar to overtop the valley banks and to flood the country side. Another secondary danger consists of tidal waves that may develop when island- or coastal volcanoes erupt.

The "Volcanological Survey" has now constructed six volcanic hazard maps (including the published item) and more than sixty preliminary volcanic hazard maps for active volcanoes. The information is contained in a seven-volume, unpublished compilation "Data dasar gunungapi Indonesia, April 1969 - Maret 1974".

The hazard maps were constructed basing on the location of eruption centres, the behaviour of the eruptions and morphology of the volcano. The maps serve as basis for various measures taken by authorities in the evacuation of the population and often also in relocating villages. The volcanic hazard map of Merapi also includes a short explanation on the eruption history in two languages (Indonesian and English). The map delineates around and including the summit a Prohibited or Closed Zone, a

First Danger Zone around the former one, and Second Danger Zones which form 1 to 3 km wide strips along seven major valleys and which extend up to 40 km from the summit (Fig 1) The Second Danger Zone includes areas that are prone to flooding by lahar This zone may be further subdivided into an Abandon Zone and an Alert Zone Alert zones are thus designated if high ground is available in the vicinity. The First Danger and Prohibited zones are roughly concentric but are eccentric with respect to the eruption point. These zones cover a 75-degree sector between south and west. The eccentric distribution is dictated by the topography. Nuées ardentes may affect the Prohibited Zone, while the First Danger Zone was affected by previous eruptions although without the accompaniment of glowing ash clouds. The map also indicates the distribution of nuées ardentes by eruption in 1969, 1972, and November 1976, and the location of the present lava dome below the summit at elevations between 2100 and 2500 metres.

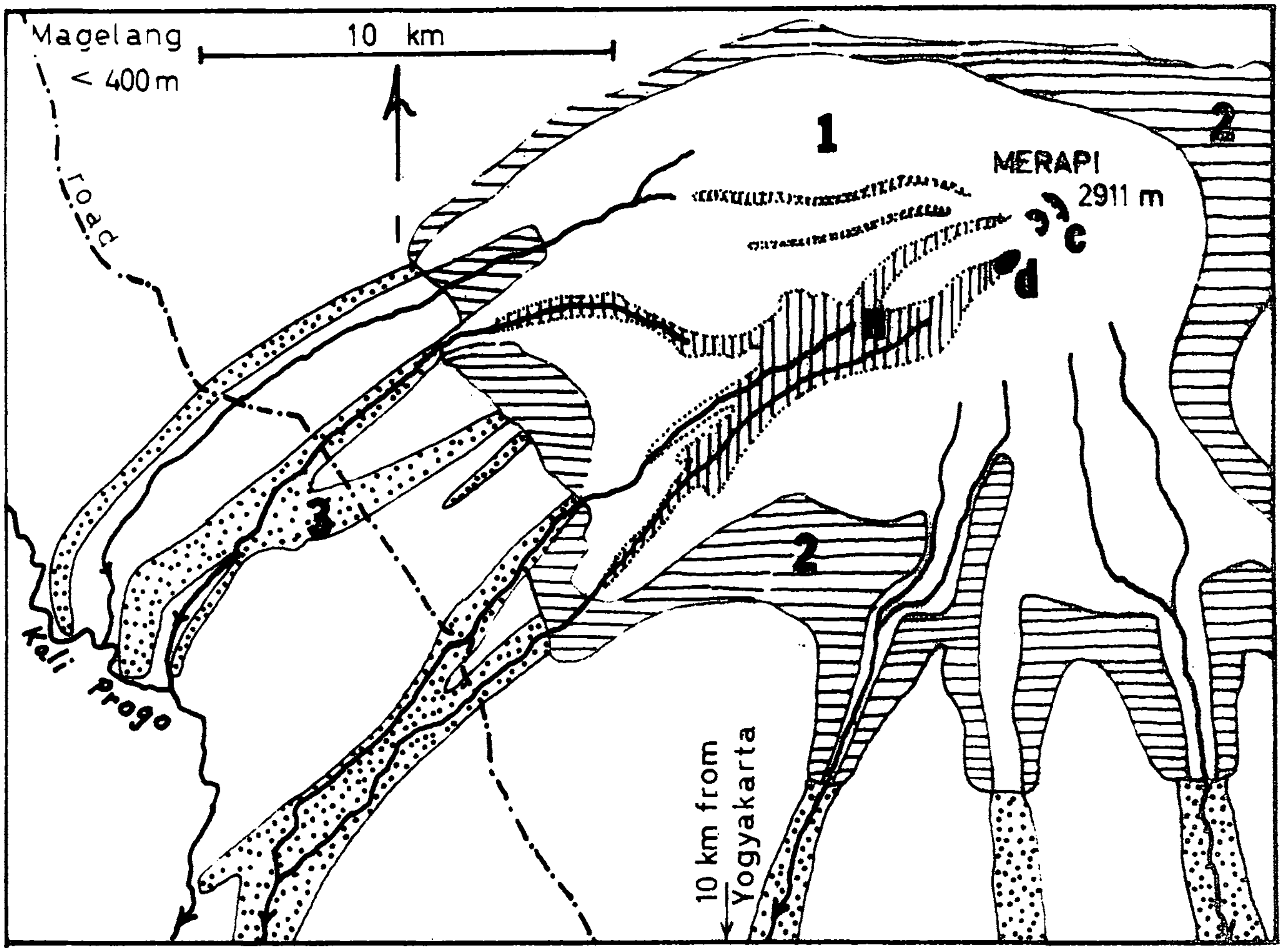
References

Hadian, R., S. Hamidi, L D. Reksowirogo and K. Kusumadinata, 1974. Data Dasar gunungapi Indonesia, April 1969 - Maret 1974: Bandung, Dinas Volkanologi, Direktorat Geologi (Geological Survey), 7 volumes (unpublished).

Hadikusumo, D, 1961. On the classification of dangerous volcanoes in Indonesia: Laporan Pertemuan Ilmiah Geol. I, MIPI, Publ 2, 177-182

HDT

Fig. 1 Sketch map of a fragment of the volcanic hazard map, Merapi volcano. Key: 1 = Prohibited Zone; 2 = First Danger Zone; 3 = Second Danger Zone; c = crater walls; d = lava dome, n = nuées ardentes of 1969, 1972 and 1976.



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

Sep 18 - 22 : Siamos, International Symposium on Water in Mining and Underground Works Granada, Spain. Prof Dr. Eng Rafael Fernandex-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, Tsukaba, '78 Dr. Hisayoshi Igo, GPSEA Symposium Tsukaba, '78, c/o Inst of Geoscience, University of Tsukaba, 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).

Apr 30 - May 3 : 1979 Offshore Technology Conference, Astrohall, Houston, Texas. OTC Headquarters, 6200 North Central Expressway, Dallas, Texas 75206, USA. (Jul-Aug 1978).

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, Instanbul, 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, Victorial University of Wellington, Private Bag, Wellington, New Zealand. (May-Jun 1978)
Apr 10 - 15	:	8th International Geochemical Exploration Symposium, Hannover, Fed. Rep. Germany. Dr. H. Gundlach, Organizing Committee, 8th Int. Geochemical Exploration Symposium, Federal Institute for Geosciences and Natural Resources, P.O. Box 510 153, D-3000 Hannover 51, W. Germany
Jul 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.

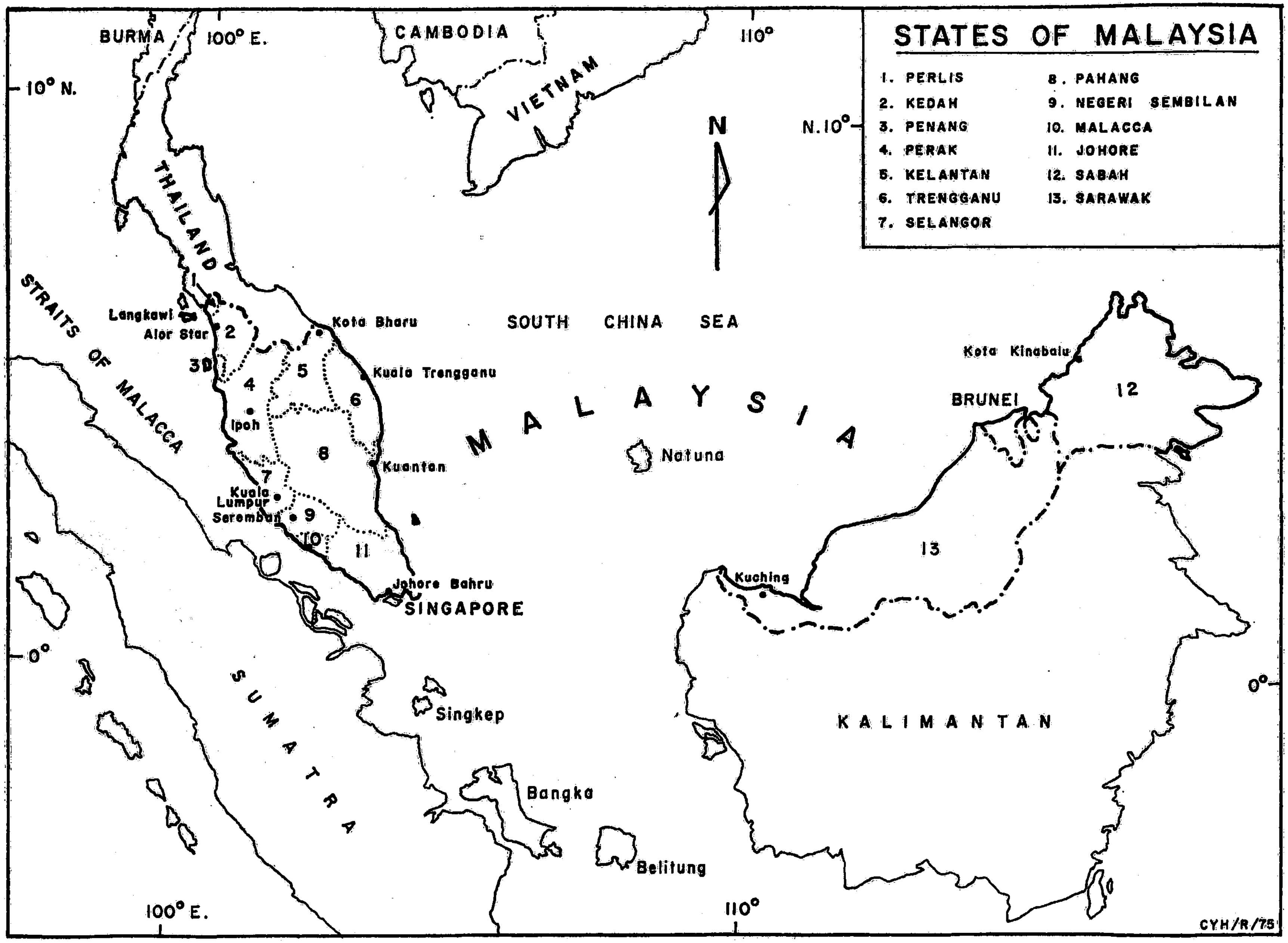
The aim of the Geological Society of Malaysia is to promote the advancement of geological sicences particularly in Malaysia and the nearby areas. Anyone interested in becoming a member of the Society should obtain the necessary forms from the Hon. Secretary.

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


STATES OF MALAYSIA
1. PERLIS
2. KEDAH
3. PENANG
4. PERAK
5. KELANTAN
6. TRENGGANU
7. SELANGOR
8. PAHANG
9. NEGERI SEMBILAN
10. MALACCA
11. JOHORE
12. SABAH
13. SARAWAK
BURMA
100° E.
CAMBODIA
110°
10° N.
VIETNAM
N
N.10°
THAILAND
STRAITS OF MALACCA
Langkawi
Alor Star
Kota Bharu
SOUTH CHINA SEA
Kuala Trengganu
Ipoh
MALAYSIA
Kuantan
Natuna
Kota Kinabalu
BRUNEI
Kuala Lumpur
Seremban
Johore Bahru
SINGAPORE
Kuching
0°
SUMATRA
Singkep
KALIMANTAN
Bangka
Belitung
100° E.
110°
CYH/R/75