Geological Society of Malaysia

KESATUAN KAJIBUMI MALAYSIA

NEWSLETTER

Number 38 September 1972

CONTENTS

Issued bi-monthly by the

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

Price to non-members: M $1/copy. Back issues M $0.50 to members.

GEOLOGICAL SOCIETY OF MALAYSIA

Officers - 1972

President	:	P.H. Stauffer Department of Geology University of Malaya Kuala Lumpur
Vice-President	:	S. Sartono Jabatan Kajibumi Universiti Kebangsaan Kuala Lumpur
Secretary	:	C.H. Leigh Department of Geography University of Malaya Kuala Lumpur
Assistant Secretary	:	K.R. Chakraborty Department of Geology University of Malaya Kuala Lumpur
Editor	:	B.K. Tan Department of Geology University of Malaya Kuala Lumpur

Councillors

Choy Kam Wai
Conzinc Riotinto
Bangunan Getah Asli
150 Jalan Ampang
Kuala Lumpur

C.S. Hutchison
Department of Geology
University of Malaya
Kuala Lumpur

David Lee Thien Choi
Geological Survey
Kota Kinabalu
Sabah

R.W. Murphy
Esso Exploration Inc.
170 Grange Road
Singapore 10

Address of the Society:

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

The unique character of the Segamat mineral deposits

K.F.G. Hosking, Department of Geology, University of Malaya, Kuala Lumpur, MALAYSIA

In this note the writer does not set out to describe in any detail the mineral deposits of the Segamat basalt of North Johore, as others have prior rights to do so. Such descriptions as will appear below are only given in sufficient detail to demonstrate the major characteristics of the deposits and to permit these deposits to be compared with other similar ones.

Grubb (1965) in his fairly detailed account of the Segamat volcanics, notes that they are probably Tertiary in age and that they "comprise three gravitatively differentiated lava flows of leucite tephrite, leucite basanite, and potassic ankaramite composition ...". He is also of the opinion that these rocks may well be the products of hybridisation of peridotite by granite, and thus admits that he supports "the partially discredited hybridisation hypothesis of Holmes and Harwood (1937)". In addition, Grubb, in a brief mention of the mineralisation occurring in the volcanics, states that it "is chiefly in the form of copper and lead sulphides, (and) was largely synchronous with vesiculation, yet unlike similar deposits in Michigan ... there was, despite evidespread late autometasomatism, little redistribution of the primary sulphides".

Teng (1970), after considerably more detailed study of the mineralisation in question, recorded the presence of chalcopyrite, bornite, galena, epidote, fluorite, zeolites (one of which is probably apophyllite) and calcite. He further observed that chalcopyrite was deposited before galena but that bornite locally replaced both these species and was, therefore, probably the product of supergene processes. In addition, he recorded that strong sulphide mineralisation was confined to fractures and to the vesicles and wall-rock immediately adjacent to them. His hard-rock geochemical studies demonstrated that several of the "ore elements" tended to accumulate in the uppermost horizons of the various flows. These findings, in combination, led Teng to disagree with Grubb's views, and to state that the mineralisation was epigenetic (and of the epithermal type).

Although Teng did not recognize the presence of either barium or strontium species in the Segamat deposits, the fact that his geochemical studies revealed that locally both the volcanics and the overlying soils contained high concentrations of both the elements in question, leads one to suppose that minerals in which Ba and Sr are essential components probably occur there. (In the rock the maximum values, in ppm, for Ba and Sr are 1,625 and 1,520 respectively).

whilst in the minus - 80 - mesh (B.S.S.) fraction of the soil's B horizon they are 1,650 and 880 respectively). That a strontium species is, indeed, present has been established. In the Annual Report (1969, p. 16) of the Geological Survey of Malaysia it is stated that "minor amounts of sulphides of lead, iron and copper and a sulphate of strontium have been recorded from the Segamat Basalt".

The work to date, then, demonstrates that the Segamat deposits are not as similar to the Michigan (Lake Superior) ones as Grubb's remark, noted above, might suggest. They are similar in that they occur in basalt at Segamat and locally in this rock type in Michigan and that in both localities the deposits contain epidote, zeolites, calcite and copper. However, there are marked differences. In Michigan the copper is mainly present as the element and is associated with arsenides (but not sulphides), native silver and rare barite and anhydrite. Strontium sulphate is absent and there are other differences in the mineralogy of the two localities.

It is of further interest to note that a number of well-known textbooks dealing with mineral deposits (e.g., Lindgren (1933) and Bateman (1950)) make no mention of mineral deposits that closely match the Segamat ones. The nearest match known to the writer is a deposit in Siberia which has been described by Bondar (1959). The abstract of this paper in Mineralogical Abstracts (1960, 14, no. 5, p. 329) reads as follows:- Intrusive dolerite sills belonging to the Siberian Traps formation have produced a new type of hydrothermal deposit. It is formed in the tuffs adjoining the intrusion, and is composed of celestite with which galena, pyrite, marcasite, and chalcopyrite and associated".

Whilst the Segamat and Siberian deposits show marked similarities they are not identical and so it seems reasonable to claim that the Segamat deposit is a new type of hydrothermal one.

Finally, one cannot but wonder if the incipient visible mineralisation at Segamat is but the product of "leak away" solutions from a site of major mineralisation beneath impounding basalts, as such deposits are known in Japan. The author of 'Geology of Mineral Resources of Japan' (Geol. Surv. Japan, 1956) mentions that 'the deposits of Hanaoka Mine, Akita Prefecture, one of the representatives of the Kuroko 'black ore' deposits (footnote) are believed to have been well developed under cap rocks of basaltic andesite' (p. 173). He also quaintly observes that 'the Kamikita mine, Aomori Prefecture, is noted for having won the success of prospecting for hidden deposits which are covered by thick lava flow of pyroclastics and have no outcrops' (p. 173).

Footnote: Black Kuroko ore consists of 'black or grey masses of sphalerite, galena and barite with more or less chalcopyrite and pyrite'.

REFERENCES

BATEMAN, A.M., 1950. Economic Mineral Deposits. New York.

BONDAR, V.G., 1959. On the deposit of celestite connected with the hydrothermal activity of traps on the territory of the Siberian platform. Mem. All-Union Min. Soc., 88 (2), 177-180.

GRUBB, P.L.C., 1965. Undersaturated potassic lavas and hypabyssal intrusives in North Johore. Geol. Mag., 102, 338-346.

HOLMES, A. and HARWOOD, H.F., 1937. The petrology of the Volcanic area of Bufumbira. Geol. Surv. Uganda, Mem. 3, pt. 2.

LINDGREN, W., 1933. Mineral Deposits. N. York.

TENG, HAU CHONG, 1970. General geology and geochemical study of the Segamat volcanics area, Segamat, Johore, West Malaysia. Unpub. B.Sc. (Hons.) Geol. thesis, University of Malaya.

REPORT ON MEETINGS

Discussion meeting, 21st July, 1972: Lower Mesozoic stratigraphy and associated structural events in West Malaysia and their relations to the termination of sediment deposition in the region.

This meeting of the Society, the second in its new series of evening discussion meetings was held at 8.00 p.m. on the evening of Friday, 21st July 1972 in the Department of Geology, University of Malaya, Kuala Lumpur.

The objective of this discussion was to assess current knowledge of the Triassic and Jurassic formations in Malaya, and their implications for the geologic history. This is particularly important because the Triassic deposits are the most widespread depositional sequence in Malaya and are represented in great thickness along the Malaya Peninsula from Southern Thailand to Singapore.

The topic was introduced by E.H. Yin who had brought along the latest copy of the Geological Survey's Geologic Map of West Malaysia (Scale: 1:500,000, to be published later this year), for display and discussion

at the meeting.

Present knowledge of the Triassic stratigraphy indicate that a complete sequence from Lower Triassic up to possibly Noric is present in West Malaysia. The sequence is mainly arenaceous and argillaceous with local intercalations of calcareous and volcanic rocks. Structurally, the lower part of the Mesozoic is difficult to distinguish from the Paleozoic but from the Middle Triassic, it is easier to distinguish the rocks from the older Paleozoic rocks on structural grounds. Regional metamorphism has affected all the Triassic rocks but its effect is more marked in the Lower Triassic sequence, especially those in the northern half of the Malay Peninsula. Three main facies are represented in the Triassic, a marine Lower Triassic, a mixed facies in the Middle Triassic and a continental facies from Upper Triassic upwards. This continental facies also include rocks of the Jurassic and Cretaceous Tembeling and Gagau Formations.

The main problem concerning the stratigraphy of the Mesozoic rocks is the relationship between the Permian and the Triassic and that between the Triassic and Jurassic. In Kelantan for example, the succession appears to be continuous from the Permian up to the end of the Triassic with no stratigraphic breaks. However it is known from places like the Jengka Pass that stratigraphic breaks do occur in this succession. It is likely that orogenic phases during the L. Triassic and U. Triassic are responsible for this disruption in the sedimentation. At this stage, the speaker called on Y.K. Shu to elaborate on the structural aspect of the problem.

Y.K. Shu displayed the Geological Survey's unpublished Tectonic Map of West Malaysia. He pointed out that the extend of the Mesozoic rocks defined by B.N. Koopmans as the Tembeling Formation was mainly mapped using aerial photographs. Aerial photographs to the east and south of this Tembeling Formation also showed well defined structures similar to those in the Tembeling. In fact, areas as far apart as those in Kedah/Perlis and in Johore show similar folding styles as the Tembeling rocks and the problem arises as to whether or not to group all these rocks into the same formation as their folding style looks very different in aerial photographs from those in the older and younger rocks. The difficulty of finding unconformities in the field also adds to the problem of defining clearly marked structural breaks in the Mesozoic sequence.

The chairman, P.H. Stauffer then called on T.E. Yancey and S.S. Sarkar to give their views on the stratigraphy and paleontology. T.E. Yancey felt that the change in the environments of the Mesozoic sediments from a stable platform type to a basinal type could be related to some tectonic phases and that the sedimentation in the two major basinal areas during the Mesozoic correlates very well in time with the granite emplacement. S.S. Sarkar drew the audience attention to the fact that different types of fossils were found in the different formations and that about

30% of the fauna have shown Himalayan affinity.

A lively discussion followed these formal presentation with several members from the floor commenting on various aspects of the topic. It was pointed out by E.H. Yin in reply to a question from the floor that Smiley's correlation of the Gagau with the Tembeling on paleobotanic grounds was based on long ranging plants and that the strong structural evidence for their different ages could not be ignored.

D. Taylor informed the audience of the recent discovery of a well exposed unconformity in Maran, Pahang, between the older metasediment of presumably Carboniferous age and a younger sedimentary sequence very similar to the Tembeling Formation.

In reply to quiries from members of the audience, E.H. Yin said that the term Group would be used only for a number of formations, all of which would be properly defined according to standard stratigraphic principles. Considerable interest was also shown in the structural aspect of the problem. The opinions expressed tended to favour a more cautious attitude to the use of folding style as a criteria for differentiating the various lithologic formation and delineating their boundaries. The possibilities of some of the so-called unconformities being pseudo-unconformity or even thrust faults was also raised.

The meeting was attended by about 40 members and ended at approximately 9.20 p.m.

BKT

Meeting of 26th September 1972: N.S. Haile

A meeting of the Society was held at 5.15 p.m. on the evening of 26th September 1972 in the Department of Geology, University of Malaya. The speaker for the evening was Professor N.S. Haile of the University of Malaya who spoke on his recent helicopter field trip to Kalimantan (Indonesian Borneo). A synopsis of the talk entitled "Geology of West Kalimantan" follows.

The standard work on the geology of this area is by R.W. van Bemmelen whose account and geologic map published in 1939, is based on the examination of approximately 1,500 hand specimens collected by L.H. Krol. Van Bemmelen divided the region south of the Kapuas into two zones: (1) The Schwaner Range Zone, extending east from Pontianak and (2) the Southern region (between the Schwaner Range zone and the Java Sea). This region has been commonly referred to as the "basement complex" as the rocks here are older than those in the adjacent sedimentary basins but before the present investigation no fossils have been found and no

radiogenic ages are available. Van Bemmelen considered this basement zone as being the southward extension of a zone running down from Thailand into West Malaysia and into Borneo. The speaker in one of his publication has postulated that this "basement complex" in Borneo is not connected to West Malaysia but could be related to the Anambas Island area. Followers of plate tectonics have also suggested that Borneo has rotated clockwise in relation to Southeast Asia.

The main purpose of the visit to West Kalimantan was to collect samples for paleomagnetic and radiometric work. From these samples, it is hoped to determined the natural remanent magnetism vector in various rocks whose ages are known or which can be dated in order to define paleolatitudes and virtual pole positions in the geologic past. This visit was at the invitation of P.T. ALCOA Minerals of Indonesia who are undertaking exploration work in this region for aluminous laterite.

Most of the Schwaner range zone is of igneous rocks mainly granitic in composition. Van Bemmelen thought that most of these granites are late Permo-Carboniferous or early Triassic in age. The sedimentary rocks consists of a few occurrences of dynamo-metamorphic quartzites and phyllites of possibly Upper Triassic age. In the southern zone, the stratigraphy according to Van Bemmelen is as follows: a) Ketapang Complex made up of flysch-like alternation of shale and sandstones of probable Permo-Carboniferous age, b) Matan Complex volcanic rocks either of the same age as the Ketapang Complex or younger but mostly older than the granite batholith and c) the Crystalline Schists of which only two doubtful occurrences are known. The general impression from the available literature is that the rocks in West Kalimantan are fairly old, mainly of Paleozoic age with only some of Mesozoic and Tertiary ages.

During the two weeks in the area, general geological observations were also made in addition to the collection of samples for paleomagnetic and radiometric work. The most important new finding is the discovery of the first fossil reported from the area. These fossils were found in unmetamorphosed shale of the Ketapang Complex and consists of plant remains and rare small fossil fern like fronds. The shale was examined by Mr H.J. Barton, chief Palynologist, Brunei Shell Petroleum Co., Seria, Brunei who assigned an upper Albian-Cenomanian age to the shale. Most probably the microflora encountered belongs to the Caytonipollenites Zone. This age pushes up at least part of the Ketapang Complex into the Cretaceous and it is likely that the volcanics of the Matan Complex which surrounds these sediments are also of the same age. It is hoped that confirmation for this date would be forthcoming from radiometric age determination.

For the palaeomagnetism investigation, rocks of suitable composition such as lavas, dykes, basic and intermediate intrusive rocks, shales and sandstones (especially one with primary red colour) were collected.

An indication of the intensity of magnetization of the sample was obtained in the field by use of Geo-Cal Model 70 portable Fluxgate Magnetometer and a rough measurement of the MRN Vector was made on some of the samples for comparison with the more accurate test which would be done in Canberra. In all, about 50 orientated samples which may be suitable for this study was collected. Most of these samples show a larger intensity of magnetism than the samples collected by the speaker from West Malaysia. This more intense remnant magnetism is probably due to the fact that the rocks collected in W. Kalimantan are mostly younger than those in West Malaysia and that remanent magnetism decays with time. About 30 samples were collected for radiometric age determination.

The speaker showed several slides both of the local geology as well as the local scenery. Considerable attention was given to the sacred mountain Batu Daya which is believed to be the largest exposed volcanic neck in the world. This volcanic neck is made up of volcanic breccia. A 8 mm cine film of the helicopter field trip was then shown.

The meeting was attended by about 50 members and adjourned at 6.30 p.m.

BKT

NEWS OF THE SOCIETY

Donation to the Society's Publication Fund

The Society gratefully acknowledges a donation of $5,600.00 from Esso Exploration Malaysia Inc. In a simple ceremony held in the Geology Department, University of Malaya, Kuala Lumpur, the Chief Geologist, Esso Exploration Malaysia Inc., Mr W. Emerson handed over the cheque to the Society's President, Dr P.H. Stauffer.

Membership

New Members - Student Member

Mr Chow Weng Sum
20 Timau Road
Ipoh, Perak

NEWS FROM MALAYSIAN UNIVERSITIES

Geology thesis, 1970-71, University of Malaya. Author and title of thesis

Ang Num Kiat: The geology and mineralisation of the Gagak and Gagak creek area, Sungei Lembing, Pahang, West Malaysia. 129 p. 11 figs. B.Sc. (Hons.), 1971.

Chan See Chin: Geology of the Sungei Besi area with special reference to its primary tin mineralisation. 101 p. 4 figs., B.Sc. (Hons.), 1970.

Chu Ling Heng: The geology, mineralisation and geochemical studies of the Bukit Payong area, Rompin, Pahang, West Malaysia. 97 p. 7 figs., B.Sc. (Hons.), 1971.

Chong Nai Hooi: The geology and mineralisation of Batu Tiga Old pit, Bukit Besi, Trengganu, West Malaysia. 115 p. 3 figs., B.Sc. (Hons.), 1970.

Khoo Kay Khean: The Geology and mineral resources of the Hong Kong-Killinghall opencasts, Puchong, Selangor. 124 p. 2 figs., B.Sc. (Hons.), 1970.

Kong Shou Chong: Geology of the Matang area, Sarawak, East Malaysia. 98 p. 2 figs., B.Sc. (Hons.), 1970.

Khoo Teng Tiong: Thermoluminescence of carbonate rocks in West Malaysia and its variation in the neighbourhood of primary ore deposits. M.Sc., 1971.

John Kuna Raj: The geology and geomorphology of the Tambunan region, Sabah, East Malaysia. 93 p. 2 maps, B.Sc. (Hons.), 1971.

Kwan Tai Seong: The geology and mineral resources of the Kledang Range area in the vicinity of Ipoh, Perak, West Malaysia. 79 p. 5 figs. B.Sc. (Hons.), 1971.

Lee Ah Kow: Geology of the Kerdau-Mentakah-Temerloh area, Central Pahang, West Malaysia. 128 p. 1 fig., B.Sc. (Hons.), 1970.

Lee Chong Yan: Geology, mineralisation and some geochemical aspects of the Chenderiang area, Perak, West Malaysia. 129 p. 5 figs., B.Sc. (Hons.), 1971.

Lee Kim Woon: The geology, mineralisation and geochemical studies of the Bukit Lentor area, Trengganu, West Malaysia. 137 p. 8 figs. B.Sc. (Hons.), 1971.

Leong Lap Sau: Geology and mineralisation of the Western Hill area, Batu Tiga, Bukit Besi, Trengganu, West Malaysia. 123 p. 3 figs., B.Sc. (Hons.), 1970.

Lim Teong Hua: Geology, mineralisation and geochemical studies of the western Gambang area, Pahang, West Malaysia. 136 p. 4 figs., B.Sc. (Hons.), 1971.

Loganathan s/o S.K. Ponnambalam: Geology and geochemical study of the Templer Park area, Selangor, West Malaysia. 93 p. 10 figs., B.Sc. (Hons.), 1970.

Loh Chiok Hoong: Geology and geochemical studies of the Bukit Tulis area, Ulu Paka, Trengganu, West Malaysia. 134 p. 3 figs., B.Sc. (Hons.), 1971.

Ng Chak Ngoon: Geology of the area south of Bahau (in the districts of Bahau, Rompin and Juasseh), Negri Sembilan. 67 p. 1 map. B.Sc. (Hons.), 1970.

Ong Wee Seck: Geology of the central coastal portion of Malacca with special reference to the beach deposits. 118 p. 7 figs., B.Sc. (Hons.), 1971.

Ong Yeoh Han: Geology and mineralisation of the Tambun-Ampang area, Perak. 143 p. 3 figs., B.Sc. (Hons.), 1971.

Rafek, Mahillah Bibi bt. Mohd.: Klang-Langat delta, Selangor, West Malaysia: Quaternary sediments, clay minerals and Foraminifera. 72 p. 2 m^{2}ps. B.Sc. (Hons.), 1971.

Syed Sheikh Almashoor: Geology and some aspects of geochemical studies of the Sungai Gow area, Pahang, West Malaysia. 141 p. 9 figs. B.Sc. (Hons.), 1970.

Joginder Singh: A study of the distribution of tin and related elements in certain superficial deposits of North Pahang, West Malaysia. 204 p. 14 figs. M.Sc. 1970.

Tan Ngoh Kiat, Denis: Geology of the Singgai/Moi area, West Sarawak, East Malaysia. 129 p. 4 figs., B.Sc. (Hons.), 1971.

Teng Hau Chong: General geology and geochemical study of the Segamat volcanics area, Segamat, Johore, West Malaysia. 113 p. 3 figs., B.Sc. (Hons.), 1970.

Tharmarajan, M.: Studies in geology and quaternary sediments of the Sungei Way - Sungei Buloh area, Selangor, West Malaysia. 125 p. 6 figs. B.Sc. (Hons.), 1970.

Wong Chau Bin: Geology and pedology of the Quoin Hill olivine-basalts and associated volcanic areas, Sabah, East Malaysia. 87 p. 2 figs., B.Sc. (Hons.), 1970.

Wong Kuan Sing: The geology, mineralisation and some aspects of geochemical studies of the Salak South area, Selangor, West Malaysia. 145 p. 4 figs., B.Sc. (Hons.), 1970.

Wong Ting Woon: Geology of the Rawang area, Selangor, West Malaysia. 107 p. 5 figs., B.Sc. (Hons.), 1970.

Yeow Yew Heng: Geology and bauxite deposits of the Pengerang area, 109 p. 3 figs., B.Sc. (Hons.), 1971.

Yew Chee Cheong: The geology and mineralisation of the eastern Kuala Lumpur area, West Malaysia. 111 p. 3 maps., B.Sc. (Hons.), 1971.

Some Wise Words from the Examination Papers

First Year:

The earth magnetic field is true north and south of the earth, while the geographical magnetic field is oblique or slanting a bit to the east in the north.

The earth magnetic field is in evidence because of ships going north-south in direction always tend to be magnetised.

The line of contact in which one plate is absorbed into the asthenosphere is called the seduction zone.

Second Year Stratigraphy:

Chronolithologic units are datable by nucliometric means.

William Smith, while digging the Suez Canal ...

Tidal flat sediments tend to be deposited in a tidal flat environment.

Second Year Geomcrphology:

In the old age stage the area is reduced almost to ground level.

All areas, whether aerial, subaerial, marine, or submarine, are subjected to erosion and deposition all the the time.

(for good karst topography), the limestone should be of carbonate type.

For a limestone area to undergo geomorphological evolution it must be pure.

PHS

---oooOOooo---