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GEOLOGICAL NOTES

The First Major Discovery of Stannite ($Cu_2S.FeS.SnS_2$)

K.F.G. Hosking, Jabatan Geologi, Universiti Malaya

Introduction

Because stannite has now been found in a considerable number of places in Peninsular Malaysia the writer thinks the following note concerning the first major discovery of stannite in the world, together with something of the character of this particular stannite, may be of local interest.

History of the discovery

The first major discovery of stannite was made at Huel (footnote 1) Rock, St. Agnes, in the west of Cornwall in the late eighteenth century. This discovery was recorded by Henry Martin Klaproth in his book, in German, entitled "Observations relative to the mineralogical and chemical history of the fossils (footnote 2) of Cornwall": the book, was in due course, translated into English by John Gottlieb Groschke, and was published, in London, in 1787.

Klaproth (pp. 21-22, footnote 3) describes the character, and discovery of the stannite under review as follows:-

"At Huel Rock, in Saint Agnes, there has been found a metallic vein, nine feet wide, and twenty yards beneath the surface. The constituent parts of this ore, although experiments had been made

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Footnote .. 1. Huel is the 'early' Cornish word for mine. At about the beginning of the 19th century the spelling was changed to wheal.

2. Fossil is here used in the archaic sense to indicate "any rock, mineral, or mineral substance dug out of the earth" (see "The Shorter Oxford English Dictionary", 1962).

3. All references refer to Groschke's English translation.

upon it, were still unknown. Mr Raspe (footnote 4), who now lives in Cornwall, is the first who discovered this unknown ore to he sulphurated tin.

The first, and, until now, the only instance of a native sulphurated tin, is mentioned by Mr Bergmann (footnote 5). He received it under the name of antimony from Siberia, and the specimen was only of the size of a hazel-nut. As sulphurated tin-ores then are so very scarce, an account of the existence of a large vein in Cornwall cannot fail to be agreeable to mineralogists.

Footnote: 4. Rudolf Erich Raspe (1737-1794), who was the author of the Adventures of Baron Munchausen, had a very chequered career which is summarised as follows in the Encyclopaedia Britannica, 1962, (8, p. 988): He .... was born in Hanover in 1737, and studied at Gottingen and Leipzig. In 1767 he was appointed professor in Cassel, and subsequently librarian. In 1775 he went to Italy to buy curios for the landgrave of Hesse, to whom he was keeper of the gems, and sold the landgrave's valuables for his own profit. On orders being issued for his arrest, he decamped to England. Later he found a patron in Sir John Sinclair of Ulbster, whom he deceived by pretending to discover valuable and workable veins on his estates; but Raspe had 'salted' the ground himself, and on the verge of exposure he absconded. He betook himself to Ireland, and died at Muckross in 1794. His authorship of Munchausen was only revealed in 1824, by the biography of its translator Burger.

That Raspe was regarded as a rogue is indicated by the fact that he was used as a 'model', by Sir Walter Scott, for an undesirable character in the novel "The Antiquary". However, Mr Embrey, of the British Museum, Natural History, told the writer that in the unpublished notes of the late Sir Arthur Russell there was evidence that, in fact, Raspe did find a sizeable barite/galena deposit on the property of Sir John Sinclair and that the Sinclair family much enjoyed Raspe's company during his stay with them: so perhaps he was not as black as he has been painted.

5. The statement of Mr Bergmann is probably to be found in his book, written in Latin, and entitled 'Dosimasia via humida'. Klaproth refers to this book on page 17, but the present writer has no knowledge of it.

Klaproth then goes on to mention that the ore is bluish-white, approaching steel-gray, that its density is variable and that, 'excepting copper-pyrites, which is interspersed in small particles through it, no foreign body is mixed'. He also mention that the 'cohesion' of the stannite 'is in several places interrupted by cracks, often scarcely perceptible, filled with a very thin layer of yellowish and greenish clayey earth .... .' This earth was in all probability varlamoffite: unfortunately the stannite from this deposit which the present writer has examined was recovered much later and from well below the zone of oxidation so that to date there is no definite record of varlamoffite from Wheal Rock.

Klaproth further mentions (p. 23) that Mr Raspe proposes to name this ore bell-metal ore - --' and, obviously disapproving of the suggestion, continues 'which denomination would be more just if there were a larger proportion of copper to the tin'. In spite of this, Raspe's suggestion was accepted and 'bell-metal ore' is still to be found in the mineralogy text-books as an alternative to 'stannite'.

Klaproth (pp. 58-59) analyzed both the lighter and the darker portions of Huel Rock stannite, and found that the darker contained 8 percent iron, and a 'very trifling mark of arsenic ....' that 'deserves no notice', and that only in these respects did its composition differ markedly from that of the lighter portion whose analysis is given below. As an indication of the quality of Klaproth's analysis the percentages of the various components in theoretical tetra-stannite ($Cu_2S.FeS.SnS_2$) are also included.

	Klaproth's analysis	Theoretical tetra stannite
Cu	36 per cent	29 per cent
Fe	3	13
Sn	34	28
S	25	30
Insol.	2	-
	100	100

It is of interest to note that the Cu:Sn ratios are almost the same in both analyses and that the low S of Klaproth's analysis accords with his low iron. It must also be remembered that Klap-

roth's material may have been a little altered by supergene processes and that, in any event, examination of 'fresh' Huel Rock material in polished section demonstrates that it is not a monomineralic substance.

Examination of the Huel rock stannite in polished section

Ramdohr (1944) having prepared polished sections of some of Klaproth's original material examined them and described his findings in great detail. In essence the specimens examined by him consist, for the greater part, of large lamellae of chalcopyrite-rich stannite in chalcopyrite-poor stannite. Sometimes the lamellae are orientated in two directions and in such a way as to indicate that the original stannite 'host' had a cubic structure; on other occasions their place is taken by stannite/chalcopyrite myrmekite. Locally in some of the lamellae a pinky-brown mineral was seen which Ramdohr termed hexastannite. This species, which has a lattice very similar to wurtzite, and whose formula is probably $Cu_3Fe_2SnS_6$ was the original component to be exsolved on the Huel Rock material; later it converted to chalcopyrite and tetrastannite.

Material collected much later from the Huel Rock lode where it is exposed on Wheal Kitty, and called there the Wheal Kitty lode, provides similar textures (Figs. 1 and 2) to those described and figured by Ramdohr. In addition, in some of them there is cassiterite often rimmed by chalcopyrite, and embedded in the stannite (Fig. 1). Also, on occasion, exsolved bodies of a highly anisotropic, galena-white mineral are seen (Fig. 3). This mineral was first recorded by Ramdohr (1969, p. 54-6) as occurring in some of the stannites that he had examined, although he does not mention that he saw it in his Huel Rock material. The writer has found it in several Malaysian stannites but neither Ramdohr nor he is yet aware of its identity.

In the writer's sections narrow veins of chalcopyrite are occasionally to be seen cutting the stannite: associated with these are patches of minute acicular crystals of cassiterite (Fig. 3). This well-known phenomenon, which results from the decomposition of stannite, is probably due, as Ramdohr remarks (op. cit., p. 547) to the action of late hydrothermal agents moving along fractures.

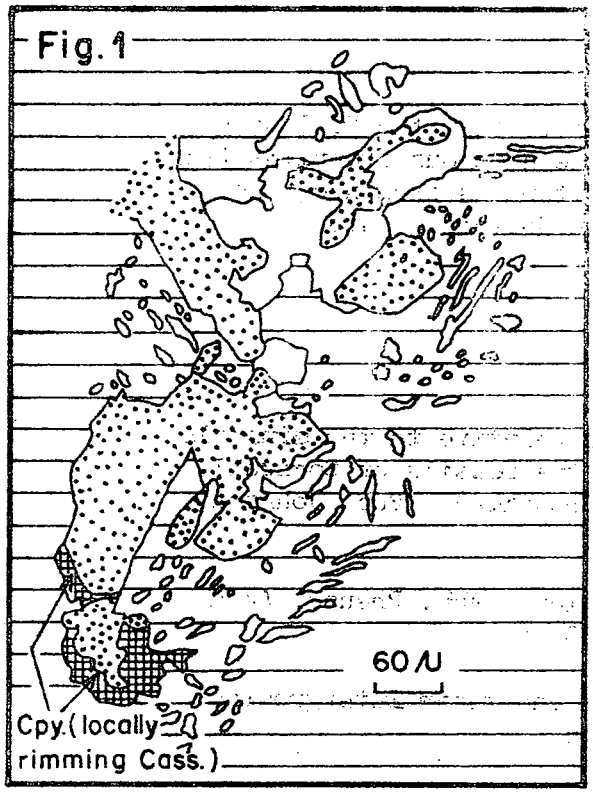


Fig. 1
60 μ
Cpy. (locally rimming Cass.)

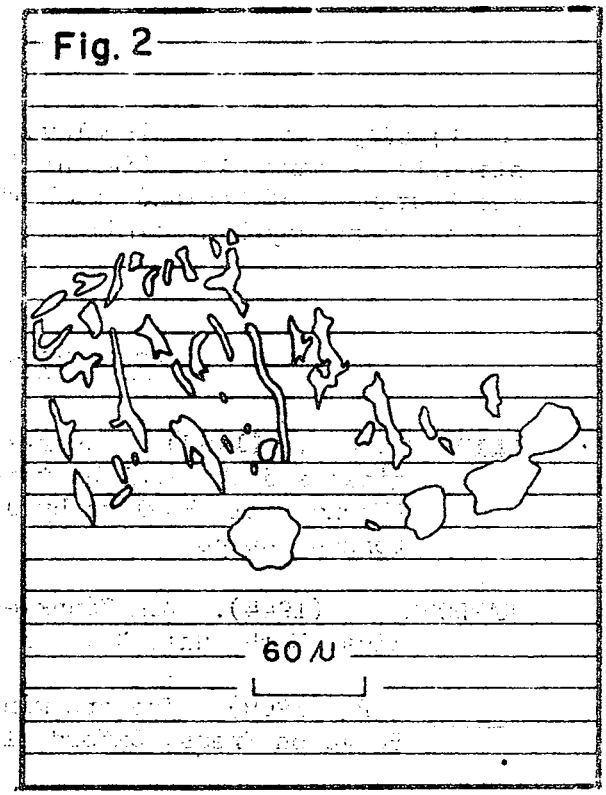


Fig. 2
60 μ

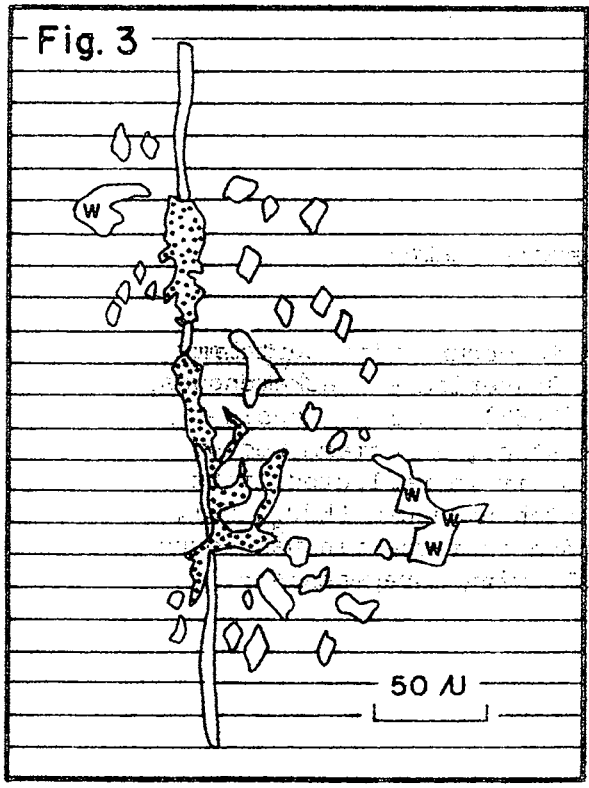
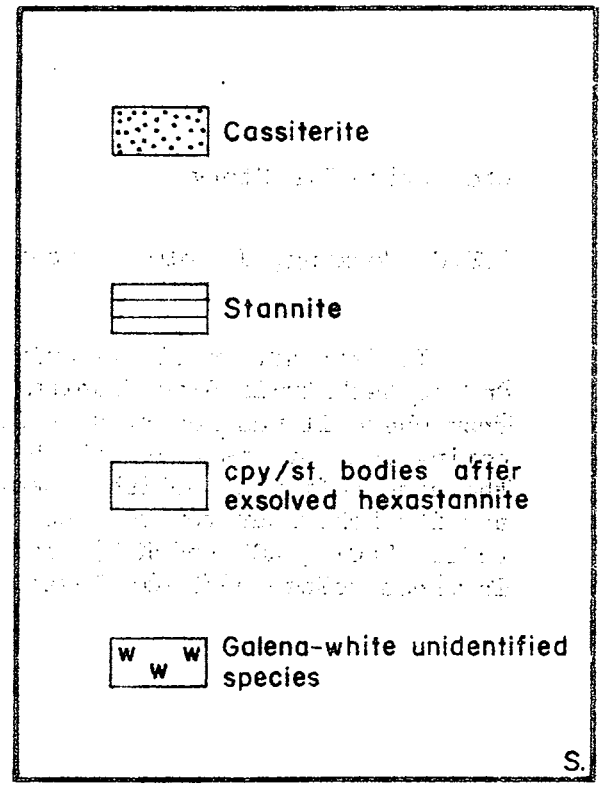


Fig. 3
W
W
W
W
50 μ


Cassiterite
Stannite
cpy/st. bodies after exsolved hexastannite
W W W
Galena-white unidentified species
S.

Finally, it is not irrelevant to note that the Huel Rock stannite is markedly different from the numerous stannites from the Southwest of England which the writer has examined; nor has he found anything similar to it in Southeast Asia.

REFERENCES

KLAPROTH, M.H., (1787). Observations relative to the mineralogical and chemical history of the fossils of Cornwall (Trans. into English by J.G. Groschke). Pub. Johnson, London. 84 pp.

RAMDOHR, P. (1944). Zum Zinnkiesproblem. Abh. Preuss. Akad. Wiss. Math: Nat. Kl., Nr. 4, 30 pp.

_____, P. (1969). The ore minerals and their intergrowths. Pergamon Press, Oxford, 1174 pp.

The Native Tin Story

K.F.G. Hosking, Jabatan Geologi, Universiti Malaya

To date native tin is only known to occur, with certainty, in the Nesbitt-La Bine Uranium Mines, Beaverlodge, Saskatchewan, from where it was reported by Silman (1954). Silman, besides noting some of its physical characteristics, as determined by the examination of polished sections of it in reflected light, and its behaviour towards the common etch reagents (HNO_3, HCl, $FeCl_3$, $HgCl_2$, KCN and KOH) also recorded that the tin was found in three veins which displayed the following paragenesis:-

Early :- (i) calcite and quartz, haematite, pitchblende and pyrite;

(ii) calcite and haematite;

(iii) chalcopyrite, bornite, chalcocite, sphalerite, and galena;

(iv) native tin;

Late and (v) calcite.

To discuss the factors leading to the development of native tin in this deposit would be without merit: sufficient is it to say that perhaps one should expect native tin to occur on occasion in certain primary ore deposits, and/or in the portions that had been subjected to supergene alteration, as its Periodic Table associates, germanium and lead, are both known in the native state, as are the elements zinc and iron, which are just above tin in the electro-chemical series, although it must be admitted that only on very rare occasions have native zinc and iron been recorded, and then not in what would be generally regarded as a primary, or supergene-altered orebody (Footnote).

Whilst there is only the above solitary record of native tin in hard-rock deposits there are a number of reports of the mineral being found in superficial ones.

One very interesting report, under the heading of 'Native tin and its origin', that does not seem to have found its way into the textbooks, appeared in the Mining Journal of April 13th., 1912. It runs as follows:- Native tin is found in Russia, in the Urals, and in Siberia. In the Urals it is found in the gold placers of the Perm and Orenburg governments. In the South Urals and Miask gold placers native tin is not uncommon, but generally it is considered as having been put there by man. In the neighbourhood of the Miask works tin is found with osmiridium, sometimes together with gold (in combination), and it contains lead. In the Tomsk government of Siberia native tin is found in Altai-Peisas gold placer on the Peysas river, a tributary of the Lower Tersi river. It is also to be found in the Kuznetsky district

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Footnote:- Boyle (1961) records native zinc at Keno Hill (Yukon) together with partly oxidised siderite, limonite and oxides of manganese, in a lens of ice. The occurrence of native iron will be referred to later in the note.

in gold placers. In the Tzachevo-Nikolaievak placers on a tributary of the Orton River (in the basin of the Urassa River) and on the Kaouchak river (in the system of the river Bie) in the Marnisk district it is found in gold placers along with platinum. The conditions of the appearance of native tin in placers exclusively leads to the supposition of its formation in these places. Native tin is separated here from tin salt by natural processes - e.g., vegetation and forest fires. It is also easy to confuse it with tin occurrences in placers due to human agency. But this is contradicted by the wide distribution of the tin, which is found not infrequently in the wild uncultivated districts, in placers where man's products could not reach. Apparently, native tin is formed from cassiterite (SnO_2) at a high temperature, say, with combustion of vegetation".

Fawns (1905, p.1) records that native tin occurs in Bohemia, Bolivia, New South Wales, and that "in Banca and Selangor small isolated specimens have been found". He also provides the following information that he culled from A. Liversidge's "Minerals of New South Wales" concerning the occurrence of the element in the state:-

Native tin in New South Wales was first discovered in the washings from Aberfoil River about 15 miles from the town of Oban, N.S.W. Native tin exists in the form of irregular grains or aggregations of such grains; they are distinctly crystalline from 0.1 or rarely over 1 mm. in size. When magnified 60 diameters they appear to be of an uneven surface, ... they are greyish white and of metallic lustre. It was impossible to select enough of the purest grains to make a quantitative analysis, or to determine their specific gravity. A portion treated with hydrochloric acid dissolved readily with disengagement of hydrogen, leaving fine scales of iridosmine behind; not a trace of any other metal than tin could be found in the solution.

Fawns (op. cit., p. 1) also records that some irregular grains of tin, varying in size from 0.1 mmm to about 3 mm, were discovered in Northern Nigeria. Whilst these were at first thought to be native tin, there is (according to Fawns) "no doubt that it came from native smelting furnaces".

Jones (1925, p. 41) notes that 'a few grains of metallic tin have been reported to occur in one or two tin fields, but on investigation such occurrences have generally proved to be nothing

more than ancient smelted products .... Irregular rounded grains of native tin have been reported from some of the gravels of the Aberfoil and Sam rivers of New South Wales, but the tin may have been a thin film on the surface of the grains, due to natural reduction in the presence of dilute sulphuric acid (from decomposing pyrite, etc.) and a metal .... . The native tin was said to occur in association with platinum, iridosmine, gold, silver copper, cassiterite and corundum, but if it did occur it was in such minute quantities that not any of it appears to have found its way to our national museums".

Some others, for example, Mantell (1970, p. 63) and Lindgren (1933, p. 241) simply repeat some of the above data provided by Jones concerning the occurrences of native tin. Palache et al. (1944, p. 126) add a little to the information, noted above, re the N.S.W. occurrences by recording that according to Howell, (1885, p. 30) the native tin was found in sands of the Aberfoil and Sam rivers (headwaters of the Clarence River) near Oban ....

Conclusions

A number of stannides of the platinum group elements (P.G.E.) are known and have been recorded from Insizwa and Driekop (South Africa) and Noril'sk and Talnakh (U.S.S.R.) (see Cabri, 1972). So, in the above instances in which P.G.E. were recorded as occurring with the 'native tin' it seems likely that the so-called 'native tin' was, in fact, one or more of the P.G.E. stannides. The P.G.E. stannides originate in sulphide deposits (such as the Merensky reef, the Insizwa sulphide body, etc.) that are associated with mafics and ultramafics. However, the recent find by Clark (1972) of a Cu-Sn alloy in oxidized tin ores from Panasqueira, Portugal, demonstrates that the stannides are not confined to mafic/ultramafic environments, though it is probable that they are much more common in the latter than elsewhere. Although native tin has not yet been recorded from the deposits of the Merensky type it is premature to state that it does not occur in them because the mineralogy of these deposits is still only imperfectly known.

It seems reasonable to believe that native tin could be generated in superficial environments. A forest fire could, I think, reduce cassiterite to tin metal. It also seems likely

that, on occasion, basalt flowing over a vegetated area containing, say, residual or alluvial cassiterite, might reduce the latter to metal. In support of this contention, one can cite the occurrence of native iron in basalts, in the vicinity of tree-moulds at Mt. Fuji, Japan (Kanehira and Shimazaki, 1971). According to those who reported this occurrence, the iron was due to the reduction of the basalt by carbonaceous matter. The suggestion of Jones (noted above) that native tin might be the product of a natural 'tinning' process is barely tenable as either native zinc or native aluminium would be required for the proposed reaction (Hosking, 1974) and, as mentioned earlier, the former metal is very rare whilst the latter does not occur in the native state.

It is also of some interest, from the psychological point of view, to note that Jones, a firm believer in the granite/tin relationship, did not record, as Fawns did, the proved intimate relationship between tin and iridosmine in at least one N.S.W. fragment!

Finally, there can be no doubt that particularly in tin-fields, elemental tin, of all shapes and sizes, may be found. This is certainly so according to my experience, in Peninsular Malaysia and in Cornwall, and such tin, when in the form of small particles (globules, etc.) is that lost during smelting operations which range in age from the old to the near modern.

REFERENCES

BOYLE, R.W. (1961) Native zinc at Keno Hill (Yukon). Canad. Mineral., 65, pp. 682-684.

CABRI, L.J. (1972). The mineralogy of the platinum-group elements. Minerals Sci. Engng., 4, no. 3, pp. 3-29.

CLARK, A.H. (1972). A copper-tin alloy (ζ'-Cu_6Sn_5) from Panasqueira, Portugal. Neues. Jahrb. Min., Mn., 108-111.

FAWNS, S. (1905). Tin deposits of the World. The Mining Journal, London.

HOSKING, K.F.G. (1974). Practical aspects of the identification of cassiterite (SnO_2) by the "tinning test". Geol. Soc. Malaysia, Bulletin 7, pp. 17-26.

HOWELL (initials?) (1885). See Genth, Am. Phil. Soc. Proc., 23, 30. (This incomplete reference is provided by Palache et al. (1944, p. 127): I have not read this paper).

JONES, W.R. (1925). Tin-fields of the world. London: Mining Publications Ltd.

KANEHIRA, K. and SHIMAZAKI, Y. (1971). Native iron in basalt surrounding tree-molds at Mt. Fuji, Japan. Neues. Jahrb. Min., Mh., pp. 124-130.

LINDGREN, W. (1933). Mineral deposits. McGraw-Hill Book Co., Inc., N. York.

MANTELL, C.L. (1970). Tin its mining, production, technology, and applications . Hafner Publishing Co., Inc., N. York.

PALACHE, C., BERMAN, H., and FRONDEL, C. (1944). The system of mineralogy of J.D. Dana and E.S. Dana, 7th edn., 1, John Wiley and Sons Inc., N. York.

SILMAN, J.F.B. (1954) Native tin associated with pitchblende at Nesbitt-La Bine Uranium Mines. Amer. Min. 39, pp. 529-530.

Coralline coquina from Pulau Tioman, Pahang

T.T. Khoo, Jabatan Geologi, Universiti Malaya

Recently the writer visited coastal exposures occurring at Tanjong Berhala south of the Merlin Samudra Hotel in Pulau Tioman. The rocks occurring there were found to be pink hornblende-biotite adamellite invaded by numerous sheets (up to 15 cm thick) of leuco-microgranite. Some of the microgranite sheets have been preferen-

tially eroded. Joints in the adamellite have often been widened by wave action.

In some of the widened joint cavities, cavities caused by the removal of microgranite sheets and cavities of other origins was found an unusual coquina. The rock is white, riddled with numerous small cavities and breaks with sharp edges. It is composed mainly of coralline fragments and subordinate amounts of gastropod and bivalve shells and quartz sand grains. The organic debris and sand grains are firmly cemented by calcareous matter. The coquina filling joints and microgranite sheet cavities forms sheet-like bodies 'cutting' the adamellite.

The coquina occurs, at about 1-2 metres above the present sea level and is believed to be of quite recent origin. The rock could be formed in the following way.

(a) Organic debris and sand grains were brought by unusually large or storm waves and deposited in any cavity occurring in the adamellite.

(b) In poorly drained cavities 'stagnant' pools of water would be formed and some calcareous matter from the organic debris would go into solution.

(c) On evaporation of the pools of water the dissolved material would be deposited cementing the organic debris and sand grains.

(d) Repetition of steps (b) and (c) resulted in the formation of more cementing materials.

M E E T I N G S O F T H E S O C I E T Y

2 August 1974

Dr M.W. McElhinny, Senior Research Fellow in the Department of Geophysics and Geochemistry, School of Advanced Studies, Australian National University, Canberra gave a talk at 4.45 p.m. on 'Palaeomagnetism and plate tectonics'. About 25 members attended the talk.

In the talk, Dr McElhinny gave in very simple and clear language the principles of palaeomagnetism and the application of palaeomagnetism results to plate tectonics. He also presented some interesting palaeomagnetism results from Malaysia.

(TTK)

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14 August 1974

Professor J.J. Frankel, Professor of Applied Geology, School of Applied Geology, University of New South Wales, Australia gave an illustrated talk at 4.45 p.m. on "Silcretes in southern Africa and Australia". About 20 members attended the talk. A resume of the talk written by Professor Frankel is given below:

Silcretes in Southern Africa & Australia

During the Tertiary over vast areas of the southern continents (Eastern South America, Southern Africa and particularly Australia) rock types formed in the soils and subsoils

at or near surface: the processes involved in their formation were essentially chemical migration and cementation - leaching and precipitation.

These chemical concentrations more or less horizontal in disposition, are variable in thickness (up to 10 metres or so) and fairly continuous over wide stretches. Because of their relative greater resistance, erosion has produced a topographic style of residual table topped hills (buttes and mesas) that stand above later erosion surfaces.

Lamplugh at the turn of the century, coined the names ferricrete for iron and aluminous concentrations, calcrete for lime-enriched layers and silcrete for silicified materials.

It was demonstrated in Southern Africa that Silcrete which includes silicified soils or subsoils, silicified crusts and multi-layered concentrations in clay-sand profiles, bears close resemblance in texture and heavy mineral content with those of the underlying rock types. The implication is that these silicified materials formed in situ. Silicretes are dominantly siliceous (α - quartz with chalcedony and opal at times) and consisting of two fractions: the allogenic grains derived from the source rocks and the introduced silica, the authigenic fraction.

Usually the silcrete profile contains a zone of intensely leached bed-rock which grades into the overlying silcrete. This would indicate the removal of silica from the subsoil and concentration at or near surface. In certain instances the silcrete grades into brecciated bed-rock in which fragments are fresh - this suggests that the overlying silcrete might in fact, be later silicified leached zone.

Conditions for silica migration and concentration were outlined and it was suggested that a temperate climate with marked wet and dry seasons would enable a fluctuating water-table to move silica upwards. However, multi-layered silcrete profiles in the southern coastal belt of South Africa and along the South coast of New South Wales have furnished evidence that silica may migrate laterally along the more pervious zones and a series of nodular bodies could coalesce to form a fairly uniform layer.

Illustrations were shown of several examples of silcrete on a variety of igneous, sedimentary and metamorphic bed-rock and the silicified relicts of bed-rock minerals and of textures preserved in the silcretes.

Ideas prevalent among some workers in Australia that much silcrete in New South Wales was due to siliceous solutions associated with overlying Tertiary basalts is disproved.

It is considered that inland and coastal silcretes at different altitudes could have formed under similar climatic conditions.

On the basis that the silcrete as well as certain ferricretes (laterites) and perhaps calcrete retain palimpsest textures it is proposed that surficial deposits may be used as a mineral exploration tool, and examples of this possibility were given. The surficial deposits indicate the nature of the bed-rock from which the possibility of hidden ore deposits being present can be assessed and together with some geophysical studies would eliminate much unnecessary expenditure in exploration.

Features common to silcretes in Southern Africa and Australia were shown in selected pairs of illustrations. These included the leached profile, nodular silcrete, Liesegang phenomenon, inclined silcretes on original sloping surfaces and tilted silcretes indicating post-formation tectonic movement.

NEWS OF THE SOCIETY

Mineral Engineers Act Sub-committee

The Council has accepted with much reluctance the resignation of Dr S.H. Chan as Chairman of the sub-committee and thanked him for his services. Another member will be appointed to be Chairman of the sub-committee soon.

New Councillor

Dr Mohammad Ayob of the Department of Geography, University of Malaya has been coopted to the councillor post vacated by Mr S.C. Toh (see Newsletter No. 49).

Circum-Pacific Energy and Mineral Resources Conference, Hawaii, August 26-30, 1974

Mr R.W. Murphy represented the Society at the Conference.

Circum-Pacific Plutonism Project Meeting, San Diego, 5 September 1974

The President, Mr Santokh Singh, represented the Society at the meeting and presented a paper, written jointly with Professor K.F.G. Hosking, Dr Jaafar Ahmad and Mr C.H. Yeap, on "The granitic intrusives of Peninsular Malaysia with special reference to their trace element content and their relationship to the primary tin deposits".

Nominations Committee

A nomination committee consisting of Dr Mohammad Ayob (Chairman), Mr C.H. Yeap and Mr W.H. Mah has been formed to nominate members for the 1975/76 Council.

Publications

The price of Bulletin 7 will be (Malaysian)$6/$3 (U.S.) to members and (Malaysian) $12/$6 (US) to non-members.

New Members

The following applicants were elected to the Society:

Full members

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Union Oil Co.
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Bangkok, Thailand

Joginder Singh Dhillon
Pahang Consolidated Co. Ltd.
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Petaling Jaya

G E N E R A L N E W S

Thailand's Tungsten

The following is part of a report by Norman Peagam which appeared in the Far Eastern Economic Review (9 August 1974):

'In the past eleven years Thailand's tungsten output has jumped from 190 metric tons, worth Baht 1.7 million (US$85,000), to 5,000 tons worth more than Baht 300 million, making the

country the second biggest non-communist producer of this valuable metal. While tungsten prices have done well from the recent commodities boom, the country's future production is threatened by the lack of a national mining policy.

The sharp rise in production followed the accidental discovery of large tungsten deposits in remote parts of northern and southern Thailand. Thousands of people armed with hammers and chisels swarmed into these areas and started random digging despite the fact that exclusive Government concessions had already been granted. Attempts to drive the miners off were forcibly resisted; and Government officials were unable to take action for fear of provoking violence or losing the population's political allegiance.

As a result, tungsten mining in Thailand is for the most part disorganised and uncontrolled. Techniques and conditions are primitive and fatal accidents occur regularly. Ore is sold to the highest bidder - sometimes a local Chinese middleman, sometimes the legal owner of the mining concession in that area - who generally offers them a very low price and then sells for a large profit to foreign buyers.

(TTK)

Scanning Electron Microscope at the University of Malaya

The Geology Department of the University of Malaya has recently received delivery by air of its new Cambridge S4-10 Scanning electron microscope. It is hoped to be in operation by mid October after it has been set-up by the engineer from Cambridge Scientific Instruments. This will be the first scanning electron microscope in Malaysia. Although primarily

established for the research of staff of the University of Malaya, it is foreseen that, once fully operational, work may be undertaken for outside organizations. The instrument includes a complete Link Systems energy dispersive and a Cambridge wavelength crystal spectrometer, which together will allow complete analysis of specimens for all elements heavier than oxygen. The computer will allow for the rapid correction of Xray intensity ratios between specimen and standard to give weight percentage analysis in a matter of minutes.

The staff of the geology department of the University of Malaya plan to make use of this new electron microscope and microanalysis facility for mineralogical study of silicate and ore-bearing rocks, for sand grain studies, and for micropaleontology. Biologists of the University already have several plans for using it in their research.

Any enquiries regarding this new Scanning electron microscope facility should be directed to Professor C.S. Hutchison of the Geology Department, University of Malaya, Kuala Lumpur.

(CSH)

N O T I C E S

First International Congress of the Committee on Pacific Neogene Stratigraphy

The First International Congress of the Committee on Pacific Neogene Stratigraphy (CPNS), IUGS Commission of Stratigraphy, will be held in Tokyo from 16-21 May 1976.

The main themes are:

(a) Presentation of the regional chronostratigraphy of some important regions of the Pacific Neogene

(b) Discussions on datum-levels of the Pacific Neogene and

(c) Correlations within the Pacific region and with the European Neogene.

There will also be pre- and post-Congress excursions to some standard Neogene sequences in Japan.

Further information can be obtained from:

Dr Y. Takayanagi
Institute of Geology and Paleontology
Tohoku University
Sendai, Japan.

13th Pacific Science Congress, British Columbia, Canada
August 18-29, 1975

Geodynamics of the Pacific area will be discussed at the Congress. The following themes have been selected:

a) Interaction of sedimentation, tectonism, magnetism and metamorphism

b) Metallogenic problems as related to ocean floor geodynamics

c) Circum Pacific Plutonism

d) The nature of the Mohorovicic discontinuity and/or geochemical and isotopic evidence on material exchanges.

For further information write to:

The Secretary General
Congress Organizing Committee
13th Pacific Science Congress
University of British Columbia
2075 Westbrook Place
Vancouver, V6T 1W5
CANADA

P A P E R S O F I N T E R E S T

Rudakova, Zh. N. (1973)

Tin-bearing granites in south-west Transbaikalia. Nedra Publisher Moscow. 191 pp. (in Russian)*

In this book the author gave a very interesting account on the geology and tin mineralisation of the south-western part of the Palaeozoic-Mesozoic of Transbaikalia. Based on geological, structural, mineralogical, petrological and geochemical criteria, she concluded that tin deposits of all types in the area are genetically associated with leucocratic granites, granite porphyries, effusive quartz porphyries and derivatives of ultra-acid magmas.

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* Available in GSM library.

The age of the tin-bearing granitic rocks and tin deposits in the area is believed to be closely similar (beginning of Late Jurassic) and coincides with the age of final consolidation and uplift of the Palaeozoic-Mesozoic belt.

The tin-bearing granitic rocks are found to be emplaced at various depths. She determined the depth of emplacement of the rocks by considering the

(a) petrology (e.g. form and structure of the body, textural-structural relationship of components of the rock, metamorphism of xenoliths, etc.)

(b) mineralogy (e.g. degree of ordering of the potash-feldspars, variation in the morphology of zircon and xenotime crystals, etc.) and

(c) geochemistry (variation in composition of the rock, the $Fe^{3+}/Fe^{2+} + Fe^{3+}$, Mn/Fe, Ti/Fe, Tl/K and Rb/K ratios of rock-forming minerals).

Using these criteria she is able to distinguish moderate-depth, hypabyssal and near-surface intrusives and tin-bearing effusives in the area. She found that moderate-depth intrusives are emplaced at a depth not less than 5-6 km, hypabyssal - not less than 1 km and near-surface-not less than 0.2-0.6 km.

She discovered that granitic rocks emplaced at different levels are associated with different types of tin deposits. She found that

(a) moderate-depth intrusions are associated with tin deposits of the silicate-quartz type

(b) hypabyssal intrusions with deposits of the low sulphide-silicate type

(c) near-surface intrusions with deposits of the silicate-sulphide type and

(d) effusive rocks with wood tin deposits.

She said that the morphology and structure of the tin deposits, and the composition of cassiterite and tourmaline in these deposits varies with depth. The Mn/Fe ratio of cassiterite is

0.4 - 0.03 in moderate-depth deposits,
0.03- 0.01 in hypabyssal deposits
<0.01 in near-surface deposits

and the Ti/Fe ratio of cassiterite is

4 - 0.1 in moderate-depth and hypabyssal deposits, and
<0.1 in near-surface deposits.

(TTK)

Zonenshain, L.P., Kuzmin, M.J., Kovalenko, V.I., and Saltykovsky, A.J. (1974)

Mesozoic structural-magmatic pattern and metallogeny of the western part of the Pacific belt. Earth Planet Sci., Letters, vol. 22, pp. 96-109.

The distribution of magmatism and related metallogeny within short intervals of geological time displays strong lateral zonal pattern governed by the positions of contemporaneous eugeosynclines, i.e. previous oceanic basins. This pattern includes:

1) the eugeosyncline with ultramafics and mafics, and with Cu, An, Cr, Pt; (2) the amagmatic back troughs filled by clastic sediments; (3) a zone of granite-granodiorite batholiths with An, Mo; (4) a zone of diorite-monzonite with Pb-Zn; (5) a zone of standard and Li-F granites with Sn, W, Mo and (6) a zone of alkaline plutons.

The zones (3) - (5) correspond to calc-alkaline volcanism, and the zone in (6) to alkaline volcanism. The zonal pattern is related to the activity along fossil Benioff-Zones-Corest transversal faults displaced structural-magmatic and metallogenic zonality far inside continents. They are interpreted as transform faults. The existence of a zonal pattern is discussed in terms of plate tectonics.

(authors' abstract)

N E W P U B L I C A T I O N

SEAPEX Proceedings volume No. 1

The Southeast Asia Petroleum Exploration Society (SEAPEX) will publish a proceedings volume in October, 1974. The book is expected to contain at least (11) papers and several abstracts from among those given at SEAPEX meetings in Singapore over the last year. A list of authors and their papers include:

"The Changing Exploration Scene in Australasia" by L.R. Beddoes;

"How Flowline Mud Temperature Plotting Can Predict Transition Zones" by M.A.G. Bunter;

"Time-Measurement of Geological Time and Precision in Correlation" by A. Lloyd;

"The Geology of the North West Europe Marine Area" by W.B. Cline;

"Diversity of Island Arcs: Japan, Philippines, Northern Moluccas" by R.W. Murphy;

"Understanding the United States Energy Dilemma" by A.G. Hatley;

"Deep Diving in Offshore Oil Exploration" by F. Healy;

"Structure-Related Traps Expected to Dominate World-Reserve Statistics" by H.D. Klemme;

"Financial Evaluation of Undeveloped Acreage" by P.D. Gaffney, Gaffney, Cline & Associates, Ltd.

"The ERTS-EROS Program" by J. Seitz, USGS.

"The Petroleum Geology of the Moluccas" by E. Gribi;

"Petroleum Microbiology-An Abstract" by G.H. Evans.

The proceedings volume will cost (Singapore Dollars) $20.00 or (US Dollars) $8.50 to members of the SEAPEX and (Singapore Dollars) $25.00 or (US Dollars) $11.00 or the equivalent in other currencies. Airmail rate available upon request. To obtain the above proceedings volume, send your order to: SEAPEX, P.O. Box 99, Tanglin Post Office, Singapore 10.

G E O - F U N

Geology in a Nutshell

The following essay, published in the Western Miner and Oil Review (date?), was written by a Canadian elementary school student.

Geology is the thing that tells you all about stones and rocks before they're dug out of their native haunts. It also tells us about fossils which are supposed to be the remains of big fierce animals that were supposed to be turned into stone in the Stone Age. The biggest of these animals is called the Dinnasour and there is one in a park in Calgary that was turned into concrete and remained there to this day along with other fear-

some beasts of the time. This is no lie for I seen them with my own eyes. The dinnasour is as long as from here to goodness knows where and about three times as high as our sealing. There was no people in those distant times except a few bible characters. One of them was called Mrs. Lot and she was turned into salt.

People who study geology are called geologists. Much of their time is spent searching for samples to put in museums for to encourage others to study geology and keep the business going. A lot of their time is also spent in looking for better jobs and for oil, and going to conventions and things like that. My pop says they're just like doctors. They put a lot of letters after their names and look wise and tell you nuthing and charge you plenty for it. All the mines are found by a kind of geology labourer called prospectors. These poor prospectors have no book learning. but make use of their thumb in a secret way called the rule of thumb. When they discover a good thing the geologists and their pals called promoters swindle him out of it. This kind of swindling is supposed to be fair game and it is called litigation or something like that. My pop wasn't sure.

(KFGH)

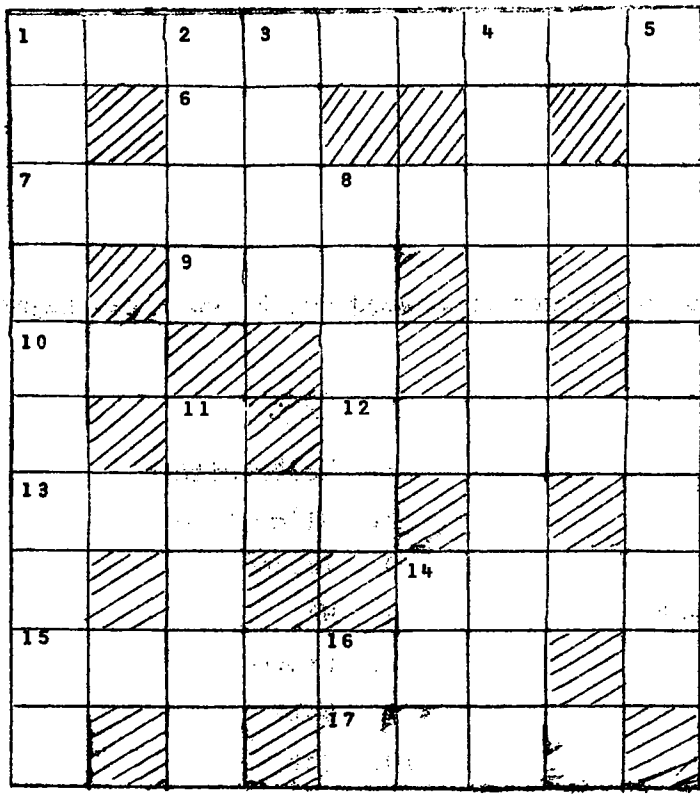
GEO-CROSSWORD

The winner of the prized GSM geo-crossword No. 2 competition is Mr Mah Weng Hong of the Geological Survey Malaysia. He is the only person to send in an all-correct entry and will be awarded the prize consisting of GSM Bulletins 1-3.

Answers to GSM geo-crossword No1 2 are given below:

Across	Down
1. wood tin	1. Wolframite
6. Agate	2. Oligoclase
8. Leiden	3. Treppen
9. Roof pendant	4. NA
12. Melanite	5. Fenite
16. Test	7. Gold
18. Strike	10. Net
19. EV	11. Aa
	13. ICSG
	14. Egre
	15. Rake
	17. TV

Geo-crossword No. 3 is made by Professor N.S. Haile (Universiti Malaya). Members are invited to send their entries to the Editor not later than 20th November 1974. The first all-correct entry to be drawn from a hat will receive a prize again consisting of Bulletin 1, 2 and 3. In case there is no all-correct entry, the best entry will receive the prize.



GSM GEO-CROSSWORD No. 3 NSH

ACROSS

1. 110, for example (9)
6. Diamond, garnet and fluorite have only one, in short. (2)
7. Their impact may start a cycle of erosion .... (9)
9. ... but eventually they end up here. (3)
10. Shortly, the non-calcic end member of a well-known series (2)
12. Add ancient measure of length to drinking vessel and obtain a dish to try precious metals. (5)
13. Lithiferous? Mrs Marciano's boy(5)
14. This fish, out of water, is not at all like "a fish out of water" (4)
15. Oscillations in a basin- can result from earthquakes or from other sources such as i.e. chess (7)
17. Orange-, banana-, or acetate-? (4)

DOWN

1. Reform taps reform. It never melts. (10)
2. Stop! Flag! rainbow quartz. (4)
3. The y-coordinate of any point except the vertex on the terminal side of an angle divided by the distance between the vertex and the point, the vertex coinciding with the origin of a plane rectangular coordinate system and the initial side of the angle coinciding with the positive x-axis; this function is to write one's name, we hear. (4)
4. So put a rope yields the boundary between two atmospheric layers (10)
5. Universal study (9)
8. If you have one cubic centimetre of fluid of one centipoise viscosity flowing in one second under a pressure of one atmosphere through a porous medium having an area of cross-section of one square centimetre and a length of one centimetre - if you have that, you have one, and good luck! (5)
11. Like the fumes from 12 across? Dirac could make it. (5)
14. Overturn snake-like fish away from the weather side (3)
16. 550 foot pounds of work per second; sauce! (2)