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CONTENTS

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GEOLOGIC NOTES

Geology of Southeast Langkawi

D.J. Gobbett, Sedgwick Museum, Cambridge, England

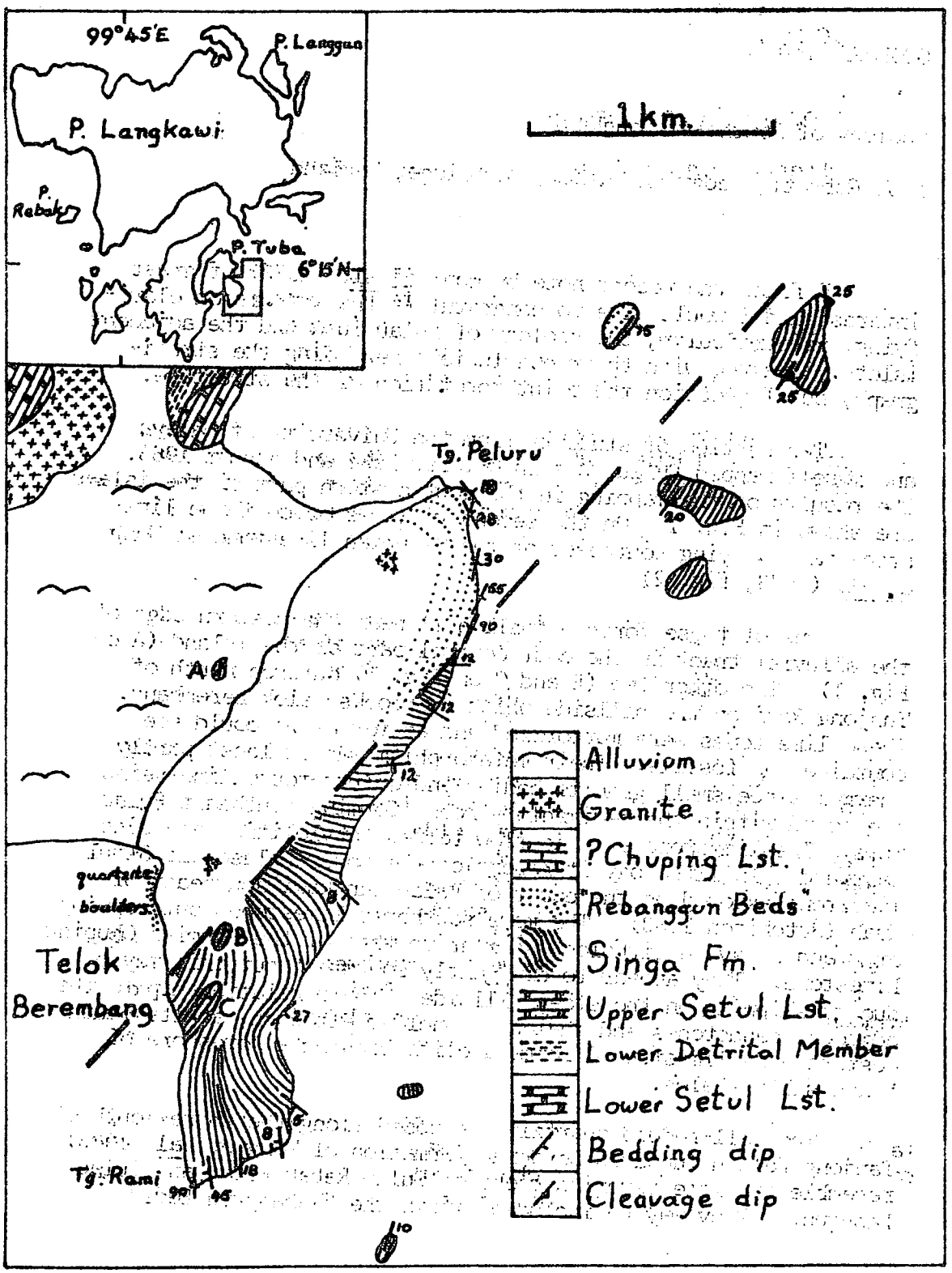
I found the recent note by Wong et al. (1973) of great interest and I would like to congratulate the authors on clarifying, in particular, the geology of Pulau Tuba and the adjacent islets. I agree with their conclusions regarding the stratigraphy but I question their interpretation of the structure.

Two parties of students from the University of Malaya and myself mapped Pulau Tuba in October 1962 and August 1963. The results of the mapping in the southe stern part of the island are shown in Fig. 1. On the second visit we noted three limestone masses lying southeast of the Silurian limestone of Wong et al. (1973, fig. 2).

One of these forms a small hill near the eastern edge of the alluvial tract in the east central part of the island (A on Fig. 1). The other two (B and C on Fig. 1) outcrop north of Tanjong Rami on the hillside which overlooks Telok Berembang. These limestones were marmorized and as far as we could see contained no fossils. Their metamorphism was at least partly thermal since small granite bodies and quartz-tourmaline veins are found within the sedimentary rocks forming southeast Pulau Tuba. The limestone at A is flow folded, stylolitic, and dips eastward. In lithology it resembles the Lower Palaeozoic Setul limestone exposed on the coast of Pulau Langkawi southeast of Kuah (Hutchison 1963). The more southerly limestones outcropping at B and C have a lithology similar to that of the Permian Chuping Limestone. They appear to dip gently southwest but this may be due to slipping on the steep hillside. Their relationship to the adjacent sandstones and shales is unclear although, at its southwestern end, limestone C forms a cliff backing a foreshore of black silty shales.

The well-bedded quartzites exposed along the shore south of Tanjong Peluru (unnamed Devonian formation of Wong et. al. 1973) resemble the late Devonian rocks of Pulau Rebak Besar and Pulau Langgun. They may be included within the "Rebanggun Beds"

Fig. 1 Geological Sketch Map of Southeastern Langkawi Islands



(Gobbett 1972). However further field work may be necessary before this name can be formalised. These beds have an open anticlinal structure and are probably faulted against the less competent phyllitic shales and siltstones of the Singa Formation (Fig.1) which is itself overlain possibly by remnants of the Chuping Limestone (limestones B and C).

As Wong et al. (1973) point out, the evidence presented by Koopmans (1965) for a mid Palaeozoic 'Langkawi folding phase' was based on his assumption that all the sedimentary rocks of southeast Pulau Tuba were of Lower Palaeozoic age. The strong probability that these rocks include strata as young as Middle Permian is a major blow to his argument. It would seem that, although the intense cleavage folding present in southeastern Pulau Tuba differs in style from the more gentle deformation of the area to the northwest, it does not differ significantly in age. Both deformations are post-Middle Permian. However, palaeontological evidence for the uplift and erosion of Langkawi in the mid Palaeozoic is still sound. The break in the succession on Pulau Langgun lies between the Lower Devonian and uppermost Devonian (Jones 1968); and in west Langkawi a much greater unconformity probably exists between the Upper Devonian "Rebanggun Beds" and the Cambrian Machinchang Formation (Gobbett 1972).

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Wong, P.K., Fuad Hassan and Yancey, T.E. 1973. Newly recognised structural and stratigraphical features in the eastern part of the Langkawi Islands, West Malaysia. Newsl. geol. Soc. Malaysia, 43, 5-10.

The extension of Tethyan Lower Cretaceous to Sarawak, East Malaysia

S.S. Sarkar, Department of Geology, University of Malaya

In course of supervision of a thesis work in Geology of the University of Malaya, I visited Sarawak and Borneo in the April 1973 and did some field work there. I collected some Ammonite pieces, impressions and shells which were not completely preserved, from the Pedawan Shales of the Bau Series, from the Kuching-Serian road. So far permitted by the state of preservation of the fossils collected, the ammonites could be identified as follows: Berriasella sp., Micracanthoceras sp./ indt., Thurmanniceras sp. indt.

The ammonites show Tethyan aspect. Previously I have drawn a Tethyan correlation of ammonites between South France and South India in Aptian and Albian (International Symposuum on the Boreal Lower Cretaceous, London, 1972). The probable age of the Pedawan Shales should be from Upper Tithonian to Lower Valanginian, basing on these ammonites. Next comes the question of correlation. The Spiti shales have produced Thurmannia, Neocomites, Spiticeras, which have been assigned to Upper Tithonian to Valanginian. The Clay and Limestone beds of Madagascar (Malagasy) have also Thurmannites, Spiticeras, of Berriasian and Infra-Valanginian age. Until detailed further studies are possible on this account which depends on the availability of the literatures concerned; a sound correlation cannot be drawn. The Antsohihy series of Madagascar has produced Berriasella and Spiticeras which have been placed in the Infravalanginian. The possible Tethyan connection might have been between Madagascar and East Malaysia in the Lower Cretaceous. Micracanthoceras has been reported from Cutch, India, as M. brightoni Spath, but my specimen does not show any resemblance to the figures given by Spath. The ammonite horizons of the Mansalay formation of Southern Mindoro, Philippines, have been attributed to Pacific genera and assigned to the Japanese Upper Oxfordian as it has been assumed that the sea linked Japan to Timor-East Celebes Geosyncline by the intermediate Mindoro Island. Berriasella cf. absisa Oppel. has been reported by R. Rivera from Mansalay. No Cretaceous ammonite has been reported from Philippine. It may be added that Spath has has drawn resemblance of the Micracanthoceras figured by him from Cutch to Lower Cretaceous types even. It may not be out of place to mention that I have drawn a direct link between

Madagascar and Southeast Asia (Indonesia) in the Eocene (vide Lutetian Transgression, Sarkar, 1969, Proc. Nat. Inst. Sc. India, Vol. 35 A, no. 6, pp 763-770).

Acknowledgement:

The officers of the Geological Survey of Malaysia, Sarawak (Kuching) extended to me free transport and field-guidance. Special thanks are due to Mr Victor Hon and to the Principal Geologist, Mr C.H. Kho for showing me their fossil collection. My thanks also go to the Director of the Geological Survey Malaysia, for this cordial cooperation.

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Palaeontology of the Philippines by W. Hashimoto, pp 293-329, Geol. Pal. SE Asia, Vol. 6, 1969.

Revision of the Jurassic Cephalopod fauna of Kachh (Cutch) by L.F. Spath, Pal. Ind. N.S. Vol. IX, memoir no. 2, pp 279-549.

The Quaternary mammals of Malaysia

S.S. Sarkar, Department of Geology, University of Malaya

The rise and dispersal of mammals commenced about 200 million years ago when the Mesozoic supercontinents were breaking up. A comprehensive list of mammals of Malaysia includes a number of species and genera under Proboscidea, Artiodactyla, Perissodactyla, Carnivora, Primates (except the cosmopolitan rodents and bats). Although historical biogeography is at present in a continuous revision to follow the lead of geological and geophysical research, a curiosity naturally arises as to if Malaysia has drawn any mammals from the vast stock of Indian Siwalik fauna. At different times the radiation of the Siwalik fauna took place in different directions. Apart from some identical species which occurred in both the Siwalik and the Malaysian quaternary, a number of genera as mentioned below occur in both the formations of the two countries.

List of genera and species common between Indian Siwalik and the Malaysian Quaternary:

Proboscidea: Archidiskodon planifrons.
Mastodon,
Stegodon,
Elephas hysudrindicus (Malaysia), hysudricus (Siwalik)

Artiodactyla: Merycopotamus
Hippopotamus sivalensis sivajavanicus.
Sus.
Cervus (eldi).
Bos.
"Antelope"
Leptobos
Bubalus (palaeokerabau).
Sus (verrucosus).
Sus (namadicus).
Sus (brachygnathus).
Hippopotamus sivalensis soloensis.

Perissodactyla: Nestoritherium sivalense. Rhinoceros (sondaicus).

Carnivora: Lutra, "Felis", Hyaena, Meganteron sp. Felis bengalensis. Viverra sp., Mustela, Lutra (sumatrana).

Primates: Macaca, Presbytis.

Rodents: Rhizomys cf. sumatrensis. Hystrix brachyurus.

Considering their different geological ranges, the Siwalik system lasting from Middle Miocene to Pleistocene and the Malaysian Quarternary comprising the Pleistocene and Holocene and also considering the geographical distance separating Malaysia and the Siwalik Himalaya, it is not natural to expect always identical species. Detailed studies might establish a closer faunal affinity between the two countries. The new sub-generic names mentioned in brackets are the geographic variations in Malaysia.

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Holocene radiocarbon dates on the 3 meter wave-cut notch in Northwestern Peninsular Malaysia

T.E. Yancey, Department of Geology, University of Malaya

In the coastal parts of Perlis, Langkawi, and north Kedah in the northwestern part of peninsular Malaysia there is a very widespread wave-cut notch on the sides of limestone cliffs which is marine in origin, and stands about 3 meters above present sea level. The notch has been established as marine in all three areas by the occurrence of boring marine bivalves and attached marine oysters. The oysters are most common, and have been found in growth position at this level, well above their present life range, in at least four scattered locations throughout the area. Although observations have not been made in adjacent areas of southern Thailand, the notch is expected to be similarly present in the limestone districts there.

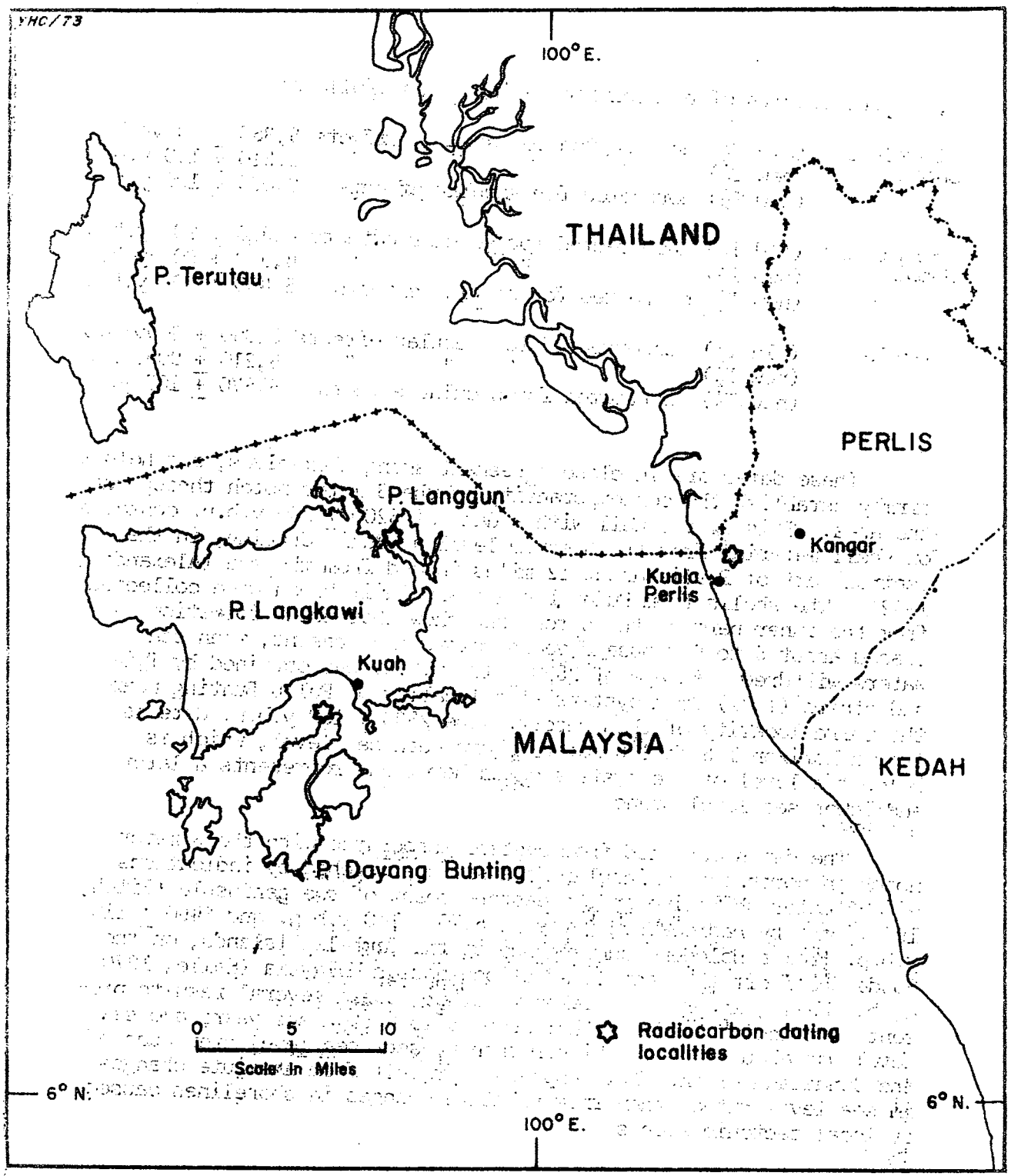
Oyster shells associated with this notch were collected at three localities during 1972, with the help of P.H. Stauffer, Nik Mohamed, and E.S. Yancey. These have been dated by the radiocarbon method by the Institute of Nuclear Sciences of New Zealand in conjunction with the INQUA Quaternary Shorelines Commission program.

The localities are:

1) South end of Bukit Papan, 1 mile east of Kuala Perlis, Perlis, on the east side of the ridge just north of the quarry. Oysters from the deep inner part of the notch. 2.3 meters above standing fresh water in adjacent fields, which is about ½ meter above mean sea level.

2) Center of the west side of Pulau Langgun, Langkawi, at the north end of a pocket beach on the north end of Selat Peluru. Grid coordinates 594,500 y. N.; 244,000 y.E. Oysters from small grotto at notch level. Approx. 3 meters above mean sea level.

3) Beside the road at the main marble quarry on the north end of Pulau Dayang Bunting, Langkawi. Grid coordinates 577,300 y.N; 237,100 y. E. Oysters covering fallen boulders, subsequently covered with soil. 2.0-2.1 meters above mean sea level.


YHC/73
100° E.
THAILAND
P. Terutau
PERLIS
P. Langgun
Kangar
Kuala Perlis
P. Langkawi
Kuah
MALAYSIA
KEDAH
P. Dayang Bunting
0 5 10
Scale in Miles
Radiocarbon dating localities
6° N.
100° E.
6° N.

The results of radiocarbon dating are as follows:

Sample 1:	(old $T_{\frac{1}{2}}$)	uncorrected for secular effects	5,350 ± 90 yr.b.p.
	(new $T_{\frac{1}{2}}$)	" " " "	5,510 ± 100 y.b.p.
	(new $T_{\frac{1}{2}}$)	corrected for secular effects	6,060 ± 100 y.b.p.
Sample 2:	(old $T_{\frac{1}{2}}$)	uncorrected for secular effects	4,810 ± 90 y.b.p.
	(new $T_{\frac{1}{2}}$)	" " " "	4,950 ± 90 y.b.p.
	(new $T_{\frac{1}{2}}$)	corrected for secular effects	5,460 ± 90 y.b.p.
Sample 3:	(old $T_{\frac{1}{2}}$)	uncorrected for secular effects	5,060 ± 90 y.b.p.
	(new $T_{\frac{1}{2}}$)	" " " "	5,210 ± 90 y.b.p.
	(new $T_{\frac{1}{2}}$)	corrected for secular effects	5,870 ± 100 y.b.p.

These dates are in close agreement among themselves, and help to firmly establish the contemporaneity of the 3 meter notch throughout the area. This agrees well with a date of 5200 ± 200 y.b.p. contained on shell material from the 3 meter level at Bukit Chuping, in the central part of Perlis about 12 miles inland from the sea (Alexander, 1962). The shells from Pulau Langgun and Bukit Papan were collected from the inner part of the notch, and show that notch formation ceased about 5 to 6 thousand years before the present, when sea waters withdrew. An age of 2590 ± 100 y.b.p. was obtained by Tjia and others (1972) from oysters at a locality on Pulau Bunting near the third locality of this report. The 2590 ± 100 y.b.p. date is from a horizon 1.5 to 1.8 meters above mean sea level, which is below the level of the oysters dated here, and represents a later and lower sea level stand.

The dates obtained from oysters associated with the 3 meter notch in northwest peninsular Malaysia are matched by indications of a 3 meter shoreline on the eastern coast of the peninsula (Fitch, 1952), and by radiocarbon dates of 5270 ± 110 y.b.p. and 5460 ± 110 y.b.p. from a Holocene submergence on the Tambelan Islands, on the Sunda Shelf off the east coast of peninsular Malaysia (Haile, 1970 a, b; Haile, in press). Taken together, these several results present convincing evidence that about 5 to 6 thousand years ago sea level was about 3 meters higher than present sea level over much of the Sundaland block. This appears to result from absolute changes in sea level rather than from relative changes in shorelines caused by local tectonic events.

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MEETINGS OF THE SOCIETY

Meetings of 23rd October and 20th November 1973

Dr C. Karanakaran, Dy. Director General, Geological Survey of India gave a talk entitled "Minerals in Human Environment" to members of the Society on Friday, 12th October 1973 in the Department of Geology, University of Malaya, Kuala Lumpur.

Dr Arata Sugimura, a research associate of the Geological Institute, University of Tokyo delivered a lecture on "Evidence of Active Faulting in Central Japan on Tuesday 20 November 1973 in the Department of Geology, University of Malaya, Kuala Lumpur.

Cancellation of Meeting

The proposed December discussion meeting in Ipoh has been cancelled due to a poor response from members with regard to paper contribution. This is the second successive year that this Meeting, which had a fairly successful early run, had to be cancelled.

NEWS OF THE SOCIETY

Officials of the Council 1974

No additional nominations were received from members for the various positions comprising the Council for 1974. The election officer has therefore ruled that the 1973 Council's nominees for next years Council would take office after the next AGM.

Additions to the GSM Library Holdings:

BOOK:

56(59) Kob: Kobayashi, T.: Geology and Palaeontology of South-east Asia, vol. 10-11, 1972-1973.

PERIODICALS RECEIVED FROM SISTER SOCIETIES AND OTHER ORGANISATIONS:

GSM AMNHB: American Museum of Natural History, Bulletin;
vol. 141, Art. 2, 1969
vol. 142, Art. 6, 1970
vol. 143, art. 2 & 4, 1970
vol. 144, art. 1 & 2, 4 & 5, 1971
vol. 145, art. 2, 1971
vol. 146, art. 1 & 4, 1971
vol. 147, art. 1 & 2, 5 & 6, 1972
vol. 148, art. 1, 1972

GSM AMN: American Museum Novitates: no. 2466, 2486, 2488, 2490, 2501, 2506, 2499, 2495, 1971-1972.

GSM AMCPR: Asia Mining Construction and Petroleum Review,
Oct- Nov., 1971
Feb- Mar., 1972
April - May, 1972
June - July, 1972
Aug - Sept., 1972

GSM B: Billiton: Publications, (Miscellaneous items).

GSM BCRP: Bulletin du Centre de Recherches de Pan, vol. 3, no. 1.

GSM BRGM: Bulletin de Recherches Geologiques et Mineres, Section IV (Geologie Generale), no. 1-4 (1971), no. 1-2 (1972).

GSM CF: The Commonwealth Foundation: Occasional Paper, no. XIII, 1971.

GSM CIGPTU: Contributions from the Institute of Geology and Palaeontology, Tohoku University:

no. 5, 1953
no. 1, 1950
no. 2, 1950
no. 3, 1951
no. 4, 1952
no. 70, 1969
no. 71, 1971
no. 72, 1971
no. 73, 1972

GSM ECAFE: Economic Commission for Asia and the Far East:

1. Mineral resources Development Series, no. 36
2. Report on the 7th Session, 1970
3. Technical Bulletins vols. 4 & 5

GSM GN: Geological Newsletter: vol. 1972, no. 3, 1972.

GSM GSLP: Geological Society of London, Proceedings:

nos. 1652 - 1657, 1659 (1969)
nos. 1660 - 1663 (1970)
nos. 1664, 1664B & 1664A (1971)

GSM GSPJ: Geological Society of the Philippines, Journal:

vol. XXI, no. 2, 1967
vol. XXII, no. 4, 1968
vol. XXIII, nos. 2-3, 1969
vol. XXIV, nos. 2 & 4, 1970

GSM GSI: Geological Survey of India:

1. Memoirs: vol. 100 (1969)
2. Misc. Publications: no. 21 (1972)
3. Records: vol. 101, pt. 2, (1971)

GSM GSK: Geological Survey of Korea:

1. Bulletin: no. 13 (1971)
2. Report of Marine Geology & Geophysics: no. 2 (1971)
3. Report of Geophysical and Geochemical Exploration: vol. 5, no. 1 (1971)

GSM GSP: Geological Survey of Pakistan:

1. Memoirs: nos. 5 & 6 (1969)
2. Geonews: vol. I, no. 3 (1969)
   vol. II, no. 1 (1972)
3. Newsletter: vol. 1, no. 1, (1968)
4. Records: vol. 15, pt. 3 (1969)
   vol. 18 (1969)
   vol. 20, pt. 2 (1970)

GSM GN: Geosurvey Newsletter (Berita Direktorat Geologi) 1971-1973 (Miscellaneous numbers)

GSM IAGI: Ikatan Ahli Geologi Indonesia:

vol. I, no. 1, 1962
vol. II, no. 1, 1965

GSM IMA: International Mineralogical Association:

1. Minutes of the Meeting in Montreal, Aug. 1972
2. 8th General Meeting, Aug. 1973
3. Classification of sulfosalts

GSM ITB: Institute of Technology, Bandung. Contributions from the Department of Geology, no. 36-37, 39-40, 42, 43, 45, 47, 52-53, 54-58, 63.

GSM ITC: International Tin Council: Annual Report (1966)

GSM JFS: Journal of the Faculty of Science, Hokkaido University, series IV: Geology & Mineralogy, vol. XIV, no. 3

GSM LT: Laporan Tahunan, Indonesia, 1960 & 1961

GSM MEU: Memoirs of the Ehine University, vol. VI, 2 & 4, 1969 & 1971

GSM NAM: National Archives of Malaysia: Malaysian National Bibliography, 1967.

GSM NGRI: National Geophysical Research Institute, Hyderabad, India. (MISC. collections).

GSM PAL: Palaeontologi - Publikasi Tekni., no. 1 & 2, 1960 - 1961.

GSM PBUM: Pusat Bahasa, Universiti Malaya, Istillah Geologi, 1972.

GSM SRTU: Science Reports of the Tohoku University, Sendai, Japan. 2nd Series (Geology).

vol. 40, no. 1 - 3, 1968
vol. 41, no. 1 - 2, 1969
vol. 42, nos. 1 - 3, 1970/71
vol.43, no. 1, 1971

GSM SA: Scientific American, Sept, 1971.

GSM UBJST: Union of Burma Journal of Science and Technology,

vol. 1, no. 1 - 3, 1968
vol. 2, no. 1- 3, 1969.

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Field Guide No. 1

All members would be receiving a complimentary copy of the recently published Field Guide together with this Newsletter. Members may purchase additional copies at M$2.50 each. Price for non-members is M$5.00. Both prices include postage and packing.

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