

PERSATUAN GEOLOGI MALAYSIA

WARTA GEOLOGI

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About the Society

The Society was founded in 1967 with the aim of promoting the advancement of earth sciences particularly in Malaysia and the Southeast Asian region.

The society has a membership of about 600 earth scientists interested in Malaysia and other Southeast Asian regions. The membership is worldwide in distribution.

Note on fossil locality of crabs and cuttlefish bone in Pleistocene marine sandy clay at Sungai Kolok, southeast-most Thailand

H. SAWATA

Geological Research Project, Prince of Songkhla University, Thailand

On 23 June 1977, Prof. N.S. Haile, head of the Department of Geology, University of Malaya at that time, sent a letter to the writer enclosing a photostat copy of a photograph showing the location of fossil crabs and fossilized cuttlefish bone. He guessed the deposit containing fossils is Pleistocene or perhaps Pliocene and considered it would be interesting to see whether there are any foraminifera or other fossils there.

The British Museum studied the samples of these fossils sent by Prof. Haile and determined the cuttlefish is *Sepia bandensis* Adam (identified by Dr. M.K. Howarth) and the crabs are *Macrophthalmus (Venitus) latreillei* (Desmarest) (identified by Dr. S.F. Morris) (Figs. 1, 4-6). Dr. Morris writes that it ranges from Pleistocene to Recent and usually lives in estuaries or mangrove swamps. This species is known from the Pleistocene of Sabah and Ceylon; it is common as a sub-fossil from the Chinese coast and northern Australia. Its geographical range as an extant species covers most of southeast Asia, from the Gulf of Bengal to Japan and northern Australia

(Dr. Morris' letter dated 14th July 1977 to Prof. Haile). Prof. Haile also suggested dating of suitable samples from the locality, since this would give an estimation of the rate of build out of the coast, as the crabs plus cuttlefish would seem to indicate a shore line; he suspected the age was about 5,000 years.

On 22 October 1978, the writer had a chance during his holiday trip to visit the fossil locality with the kind guidance of Miss Patcharin Phannanukul, chief of Japanese course of this university and her brother-in-law.

The attached sketch map (Fig. 2) shows the locality (loc. 1 in Fig. 3). Unfortunately, the high level of water in the Muno Canal prevented him from doing any geological study of the outcrop of locality itself, and only small amounts of imperfect fragments of crab fossils and white stone – cuttlefish bone fossil? – were shown to him by local inhabitants and one fragment of crab fossil was presented by one of them. The local people related that one or two years before about a thousand pieces of fossil were found in the canal, and a buyer from Bangkok exhausted all the collection. These local people seemed to believe these fossils are valuable as medicine, and that might be the reason why the price of fossils is so high and

Material submitted by N.S. Haile and extracted with permission from Prince of Songkhla University Geological Research Project Publication No.4 (1979).

the people are not so willing to offer their fossil collection to non-merchants.

The level of surface of the formation with these fossils is unknown and only be presumed at around 5 m above sea-level.

On the northern extension of Muno Canal, at the crossing point with the road from Sungai Kolok to Tak Bai/Narathiwat, ca. 14.5 km from Sungai Kolok (loc. 2 in Fig. 3), under and around the road bridge in the canal, there are found several outcrops of mud. Dark-grey mud 50 cm plus thick is covered by a black woody layer 5 cm thick. There is one independently standing trunk around 10 cm in diameter and 50 cm in height which may be natural wood stem or artificial post. This wood is black in its outer part and more brownish at the centre. No macrofossil was found at the outcrop. It was told that sometime before, a boat with a

buddha image of Indian style was found near the locality of fossils in the Muno Canal.

About 2 km west-northwest of the fossil locality, the road cuts through a hill 33 m high and exposures of decomposed bedrock of possibly Palaeozoic are seen. The presumed geology of the area is shown on Figure 3.

It is hoped that a geological study of the fossil locality in the Muno Canal will become possible in the not too distant future when lowering water level in the canal may expose the fossil-bearing formation above water, and its stratigraphy may then become clarified and more fossils be collected for age determination.

The writer wishes to specially express his gratefulness to Prof. N.H. Haile for his kind information, valuable suggestions and improvement of this report.

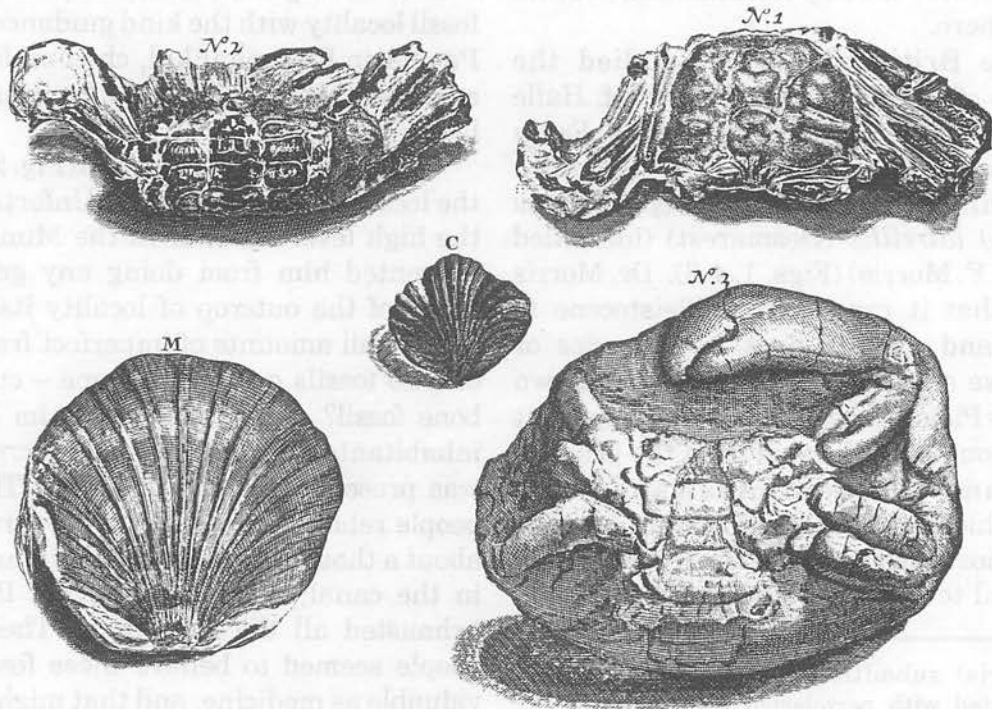


Figure 1. Part of plate LX of Rumphius' "D'Amboinsche Rariteitkamer" 1741, showing fossil *Macrophthalmus* (No.1 and No.2).

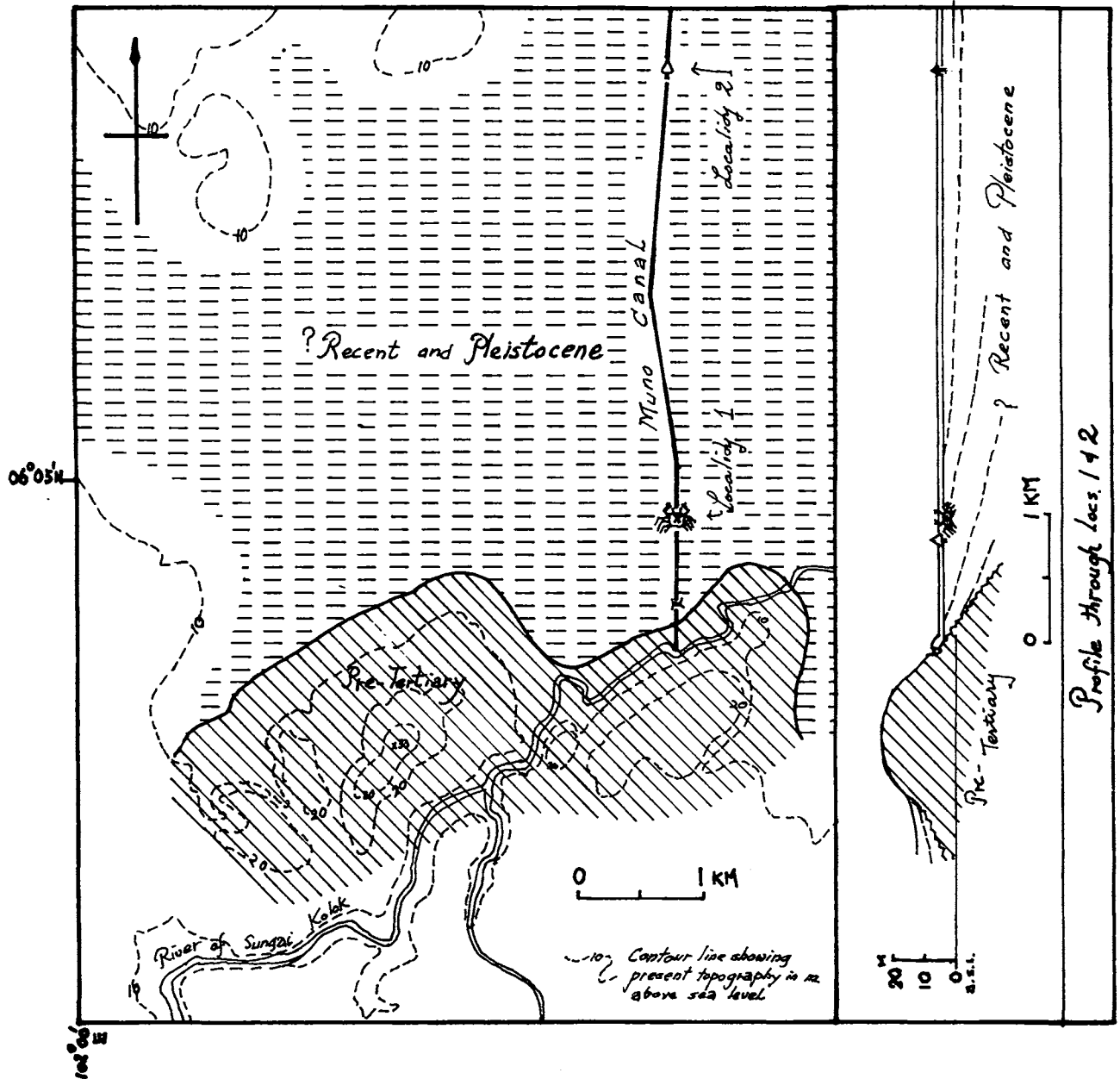
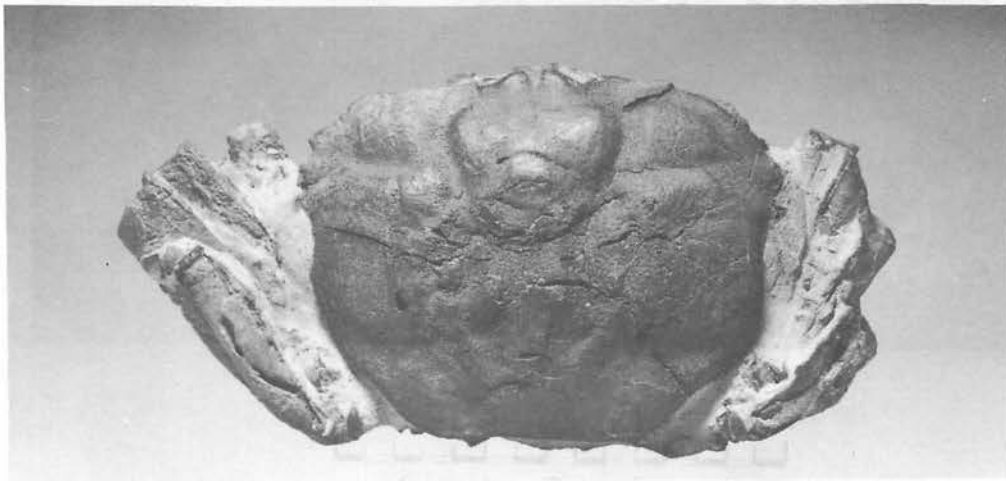
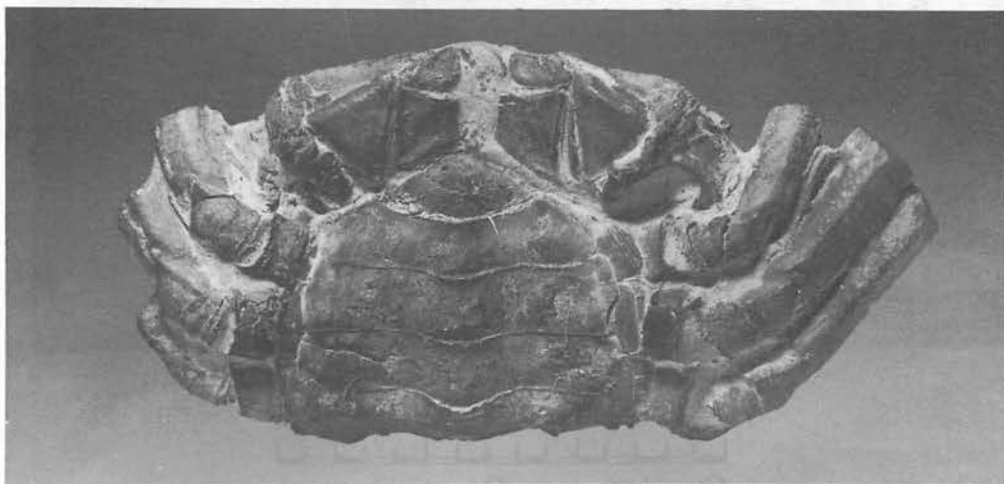


Figure 3. Presumed geological map at sea-level of the area around the Muno Canal fossil locality, Sungai Kolok district, southeastern-most Thailand, by Geological Research Project, Prince of Songkhla University, Thailand, October 22, 1978; revised July 2, 1979.



0 1 2 3
Scale in Centimetres



0 1 2 3
Scale in Centimetres

Figure 4. *Macrophthalmus (Venitus) latreillei* from Muno Canal, Sungai Kolok, southeastern-most Thailand; collected by Prof. Haile at Kuala Lumpur; photo : courtesy of Department of Geology, University of Malaya.



0 1 2 3
Scale in Centimetres



0 1 2 3
Scale in Centimetres

Figure 5. *Sepia bandensis* from Muno Canal, Sungai Kolok, southeastern-most Thailand; collected by Prof. Haile at Kuala Lumpur; photo : courtesy of Department of Geology, University of Malaya.

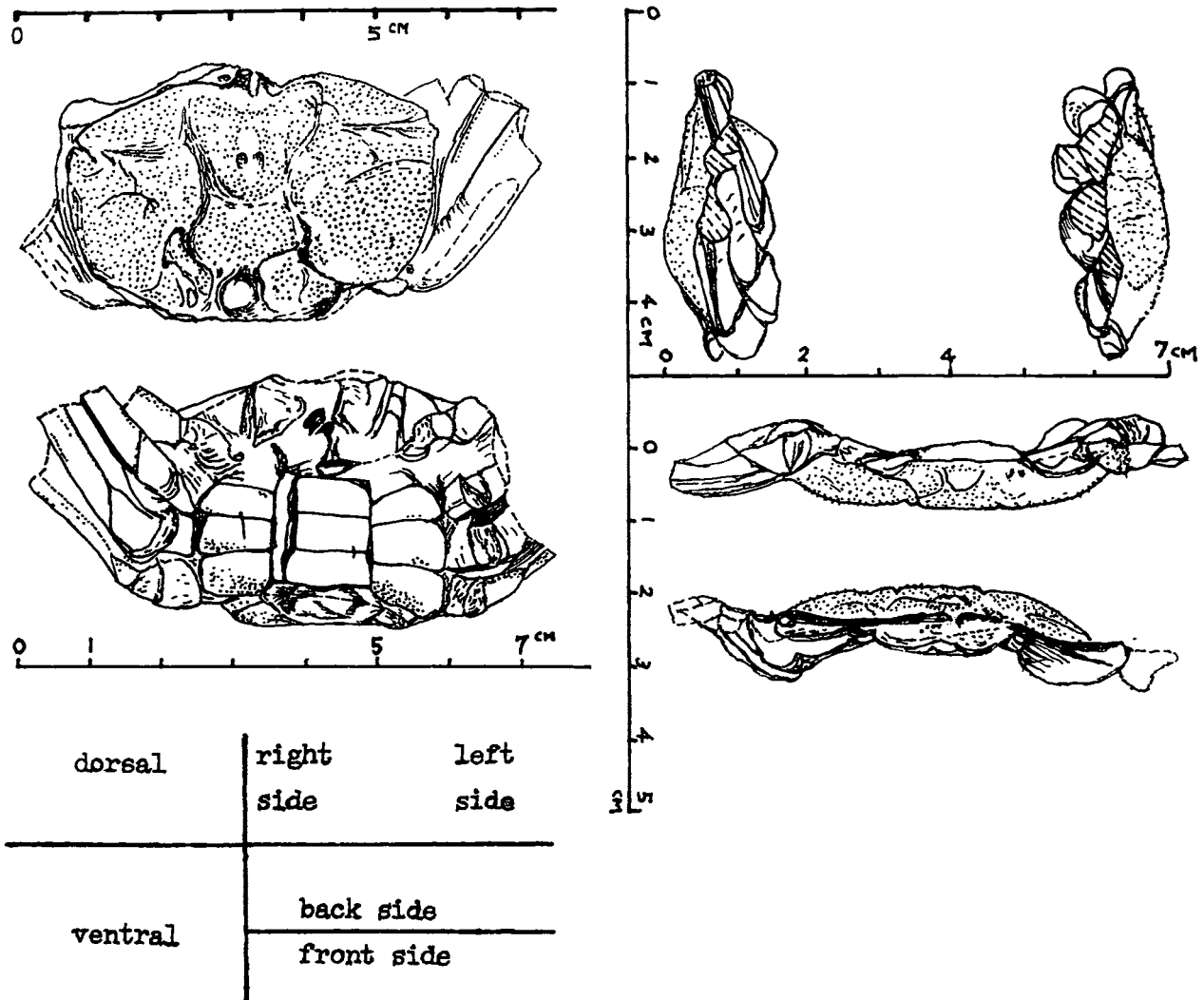


Figure 6. *Macrophthalmus (Venitus) latreillei* from Muno Canal, Sungai Kolok, southeastern-most Thailand; sample presented by Muno Canal Office to Geological Research Project, Prince of Songkhla University.

Additional note on fossil locality of crabs and cuttlefish bones in Pleistocene clay at Sungai Kolok, southeast-most Thailand

Geological Research Project, Prince of Songkhla University, Thailand.

After the note of 25 October 1978 was prepared, on 1 July 1979, the Geological Research Project team of the Prince of Songkhla University finally managed to see the fossils locality of Muno Canal and collected a considerable amount of fossil crabs and cuttlefish bones, nodules containing fossils, semi-carbonized wood and the clay and sandy mud accompanying.

The occurrence of the fossils is as follows from top to bottom:

Unit No.	Description	Thickness in cm
1.	White clay with limonitic stain.	100 +
2.	Carbonized wood	5
3.	Greyish white sandy mud with worm tubes ? 5 mm in diameter and sand pipes of similar size.	100
4.	Light bluish grey sandy mud with two producing crab and cuttlefish bone fossils.	50
5.	Light bluish grey clay with limonitic stain, 30 cm thick of which being above water and the rest under water of canal. In water, at the canal bottom crab and cuttlefish bone fossils are collected.	100 +

Most of fossils are forming nodules in clay and reveal no or a part of fossils.

Around 100 m south of the locality, carbonized and semi-carbonized wood is

found in light grey clay. This unit seems to form top horizon-present surface beside the canal. Exact relation between this and the units 1-5 above is unknown but presumably this covers the unit 1 with conformable ? boundary. Sample of the woods of this unit and the unit 2 are also collected.

One of the crab fossils presented through the kindness of the Muno Canal Office was sent to the British Museum to be determined as *Charybdis* (*Charybdis*) aff. *sinhaleya* (identified by Dr. S.F. Morris) (Figs. 7-9). Dr. Morris tells that the genus *Charybdis* belongs to the family Portunidae, which is a group of predatory, swimming crabs, living in very shallow inshore waters; together with the *Macrophthalmus* (an inshore form) – mentioned in the note of 25 October 1978, it suggests that these specimens lived on relatively soft sandy muds ranging from littoral to 20 m in depth (Fig. 10); the age of the fauna is almost certainly Pleistocene, but crabs do not enable us to sub-divide this period in any way.

A nodule sent to the New Zealand Geological Survey for radiocarbon dating however, showed the absence of carbon. Micropalaeontological study of sediments containing fossils is being sought.

As the shortest distance from the fossil locality to the present sea shore is around 17.5 km, it may be presumed the sea shore advanced for this distance during the time of Pleistocene to Recent with a mean value of advancement of shore line at around 0.01 - 2 m/year.

* * * * *

Manuscript received 29 December 1990

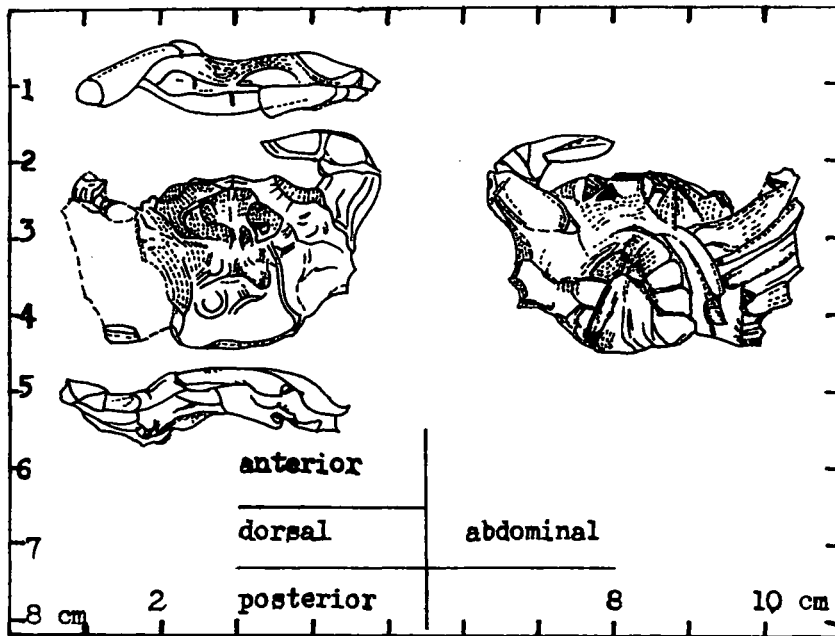


Figure 7. *Charybdis (Charybdis) aff. sinhaleya* from Muno Canal, Sungai Kolok, southeastern-most Thailand; sample presented by Muno Canal Office to Geological Research Project, Prince of Songkhla University.

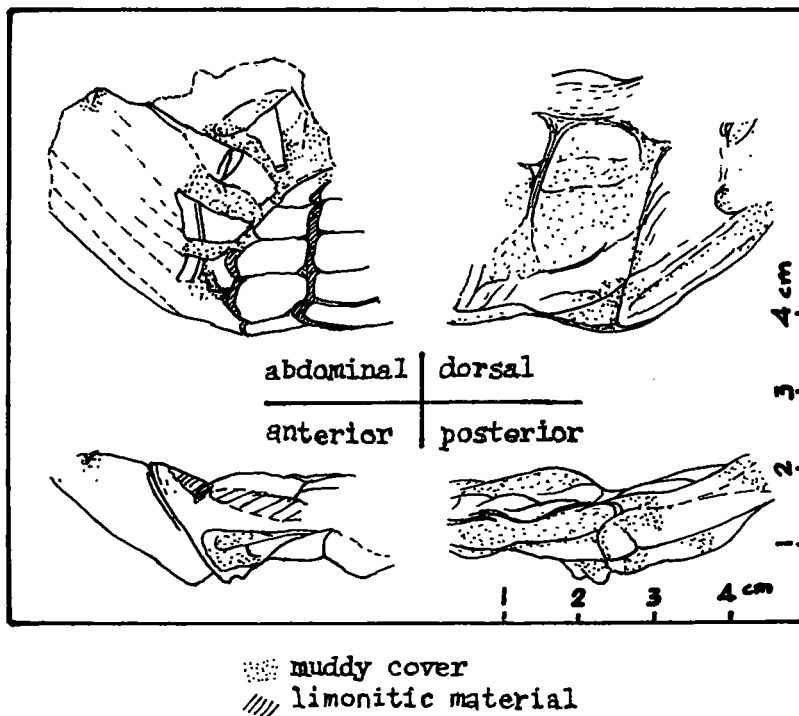


Figure 8. A fragmental sample of fossil crab of Muno Canal, Sungai Kolok, southeastern-most Thailand.

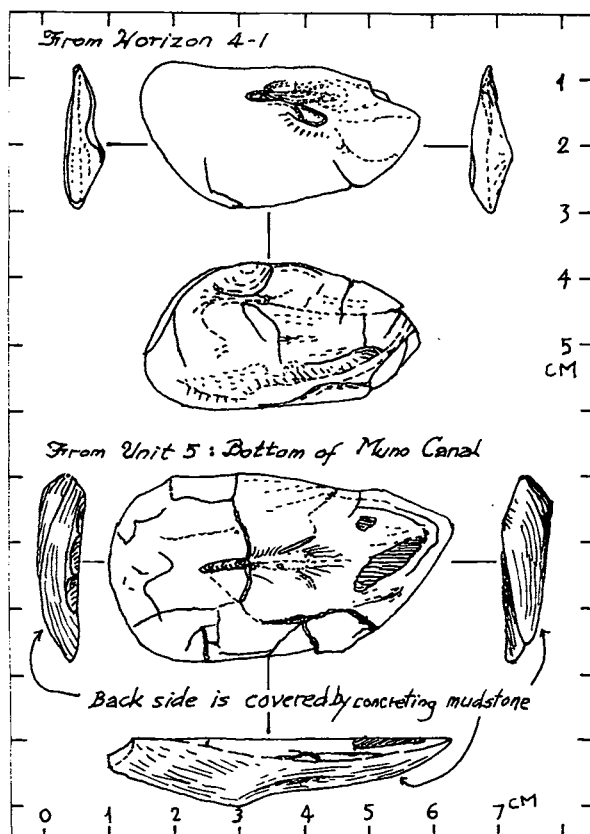


Figure 9. Cuttle-fish bone from Muno Canal, Sungai Kolok, southeastern-most Thailand.













unit and horizon no.	thickness in cm		wood possibly from this horizon; relation with the following units unknown
1	100+		white clay with limonitic stain
2	5		carbonized wood
3	100	 	greyish white sandy mud with worm tubes? 5 mm in diameter and sand pipes of similar size
4 4-1 4-2	50	 	light bluish grey sandy mud with two horizons producing crab and cuttle-fish bone fossils
5	100+	 	light bluish grey clay with limonitic stain, 30 cm thick of which being above water and rest under water, at the canal bottom, crab and cuttle-fish bone are collected
		 wood	 sand pipe
		 cuttle-fish bone	 crab fossil

Figure 10. Geological columnar section at the fossil locality, Muno Canal, Sungai Kolok, southeastern-most Thailand.

Geological observations at the Seng Mines, Sungai Way, Selangor, in July 1972

PETER H. STAUFFER,
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Abstract : The main opencast pit at the Seng Mines, active in 1972, exposed a complex section of unconsolidated sediments overlying bedrock of metamorphic (marble) and plutonic (granitic) rocks. The surface of the marble was eroded into rounded pillow shapes; this morphology is consistent with solution under saturated alluvium, and the jagged microkarst topography commonly seen on carbonate rocks in alluvial mines is probably formed subaerially. A mass of organic material (peat and wood) more than 20 m thick indicates long-term persistence of local swamp conditions; alluvial bedding dipping down toward the mass supports its origin by progressive solution of the underlying marble, facilitated by acids from the organic material itself. Fractures formed in the mass during subsidence are filled by veins of vitrain-like coaly material derived from the peat and similar to those described earlier from Perak. Bedding layers in alluvial sediments on part of the granitic bedrock surface are steeply folded in conformity with irregularities in the granite surface. The inference that this geometry resulted from subsidence consequent on total removal by solution of intervening carbonate bedrock is supported by the presence of a boulder of reddish, cemented cave earth typical of solution cavity fillings.

These several features document in instructive ways the complex interactions of bedrocks, alluvial sediments, and water in this geologic environment, and they provide clues that can be used to interpret the history of events in other similar environments.

INTRODUCTION

Just north of the junction of the old Subang road with the Federal Highway, behind the row of old Sungai Way shophouses, there was a series of opencast tin-mining pits active in the early 1970's. In July 1972, while I was Senior Lecturer in the Department of Geology, University of Malaya, I went out to visit the large and deep pit of the Seng Mines, just behind those shophouses. The visit was part of the course of instruction in Honours Sedimentology at U.M., and I was accompanied by the four students in the class: Kumar Khuttan, Lim Tee Peng, Tai Say Ann, and Tan Jee Theng.

The features seen in the mine pit were of such interest that I have thought it worthwhile to put them on record from my notes and memory, even at this late date. They had much to say about the interrelated

evolution of bedrock and overlying sediment, and these instructive features cannot be seen again: not only are the mine pits long since filled, but the stratigraphy and structures of the unconsolidated sedimentary section have of course been totally destroyed during mining.

GEOLOGY OF THE MINE

The Seng Mines at Sungai Way lay in the lower Klang valley, a flat tract formed by Quaternary sediment, mainly terrestrial, covering eroded pre-Cenozoic bedrock (Fig. 1). The general geology of this area has been described by Tharmarajan (1970). Regional geologic maps (Gobbett, 1972; Chung, 1973) show the mine site as being on the boundary between a unit of recrystallized sedimentary

carbonate rocks, probably continuous with the lower Paleozoic Kuala Lumpur Limestone (Gobbett, 1964), on the west and an area of granitic intrusive rocks, apparently an offshoot of the early Mesozoic Main Range (Hutchison, 1973), on the east. Indeed, both marble and granitic rocks were exposed in the mine pit in 1972 (Figs. 2, 3). The bedrock in the Seng Mines and its mineralization have been described by Goh (1975).

Above these bedrocks was exposed a section of Quaternary sediment approximately 25 m (75 ft) thick. The lower part of this section, directly on the bedrock, consisted, wherever it could be seen, of fairly pervasively weathered fine-to coarse-grained

bedded clastic sediment that fit the characteristics of the Old Alluvium (Sivam, 1969; Stauffer, 1973). On the north side of the pit, such alluvial material, varying from white clay to grey, weathered gravel, was the only Quaternary sediment type visible (Fig. 2). Broken and slumped masses of this material formed the upper walls of the pit on the north side and most of the west side.

One area of Old Alluvium lying on the granite bedrock that underlay all the northern half of the pit (Fig. 2) showed particularly interesting features (Fig. 4). Here the bedding layers in the alluvium followed the shape of the underlying granite surface, even though this put them in a tight

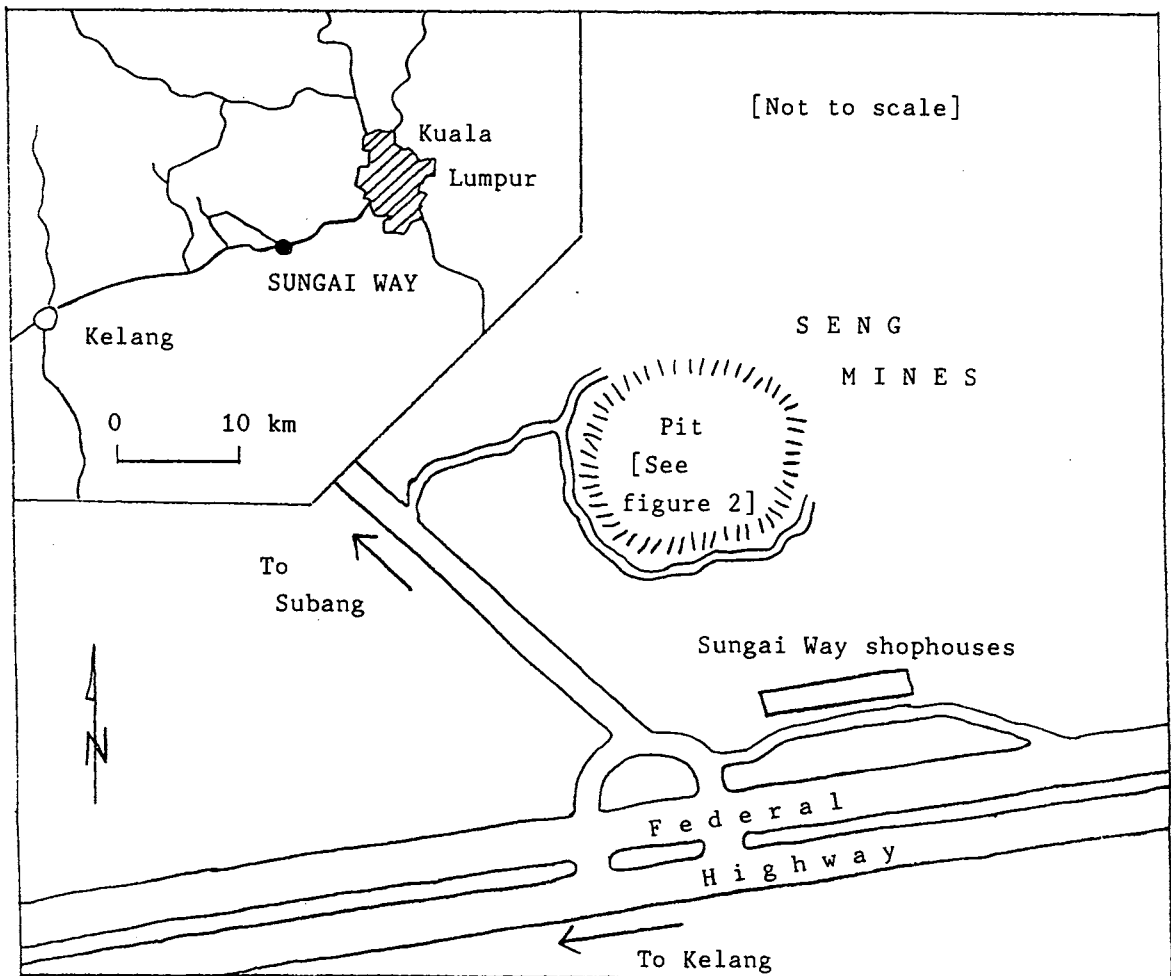


Figure 1. Location of the Seng Mines pit that was active in 1972, at the time of the observations described in the text, in relation to the Federal Highway and the old Sungai Way shophouses. Although the map is not to scale, the pit was no more than about 100 m from the shophouses.

synclinal fold with nearly vertical limbs. The implications of this will be discussed later.

On the south and southeast sides of the pit the alluvial section had quite a different character (Fig. 2). Above the basal sequence, only a few meters thick, of clastic sediment similar to that in the other parts of the pit, the section here consisted of a deep mass, at least 20 m thick, of dark peat, rich in wood fragments and pieces of damar (solidified resin from forest trees). Layering in the Old Alluvium at the base of this section dipped south or southeast, toward the peaty mass, at about 45 degrees. One can infer, therefore, that the section of peat thickens in that direction, and the total maximum thickness is not known.

At the southern edge of the mine pit, on the exposed upper surface of the peat mass, could be observed numerous thin, vertical, black, tabular bodies, arranged in two orthogonal sets more or less east-west and north-south and mostly a few millimeters to about 1 cm thick. These dark veins consisted of hard, brittle coaly material, and there seems little doubt that they correspond to the "coal veins" described by Fermor (1939) and Richardson (1941) from localities in the Kinta Valley and noted also by Fitch (1952, P. 46) in the Kuantan area of Pahang. Specimens of these veins were collected and are now in the University of Malaya Department of Geology collection.

FEATURE OF INTEREST

The geology of the Seng Mines pit as described here and as seen in July 1972 included several significant and instructive features. These features tell us some interesting things about the evolution of the Quaternary section at this site and particularly about the role of the bedrock in that evolution.

Morphology of the marble surface

Carbonate bedrock, in the form of marble representing metamorphosed bedded limestone, was exposed by the removal of the overlying unconsolidated sediment in the southwestern corner of the pit (see Fig. 2). The surface of this bedrock had the form of rounded pillows resembling stacks of disks having rounded edges (Fig. 3). The smoothness of this morphology contrasts starkly with the rough erosional morphology we come to expect from carbonate rocks, especially in the tropics. Many mines in the Kinta Valley have exposed deeply etched carbonate rocks showing microkarst topography of sharp, irregular ridges and pinnacles separated by clefts and hollows (see, for example, Stauffer, 1973, Figs. 6.13, 6.14). I have often assumed that such topography could and did form beneath unconsolidated sediment through the action of percolating groundwater. However, the very different morphology seen in the Seng Mines pit (Fig. 3) is actually more consistent with solution while immersed in saturated alluvium. Under such conditions, all parts of the surface would be constantly in contact with water, the water in deeper cracks and embayments would become saturated and solution there stop, projections would tend to be rounded back as they are most exposed to unsaturated water, and stratigraphic differences in susceptibility would result in the etching out of certain bedding planes or intervals preferentially. This is exactly the results seen in the carbonate bedrock in the Seng Mines. If this is the normal product of suballuvial solution of carbonates, then should we perhaps suspect a previous period of subaerial exposure whenever we see buried microkarst? Alternatively, could a microkarst topography form under alluvium not continually saturated? The association of the Seng Mines smooth morphology with a thick peat accumulation indicates a swampy condition of probably continual and long-term saturation of the sediment.

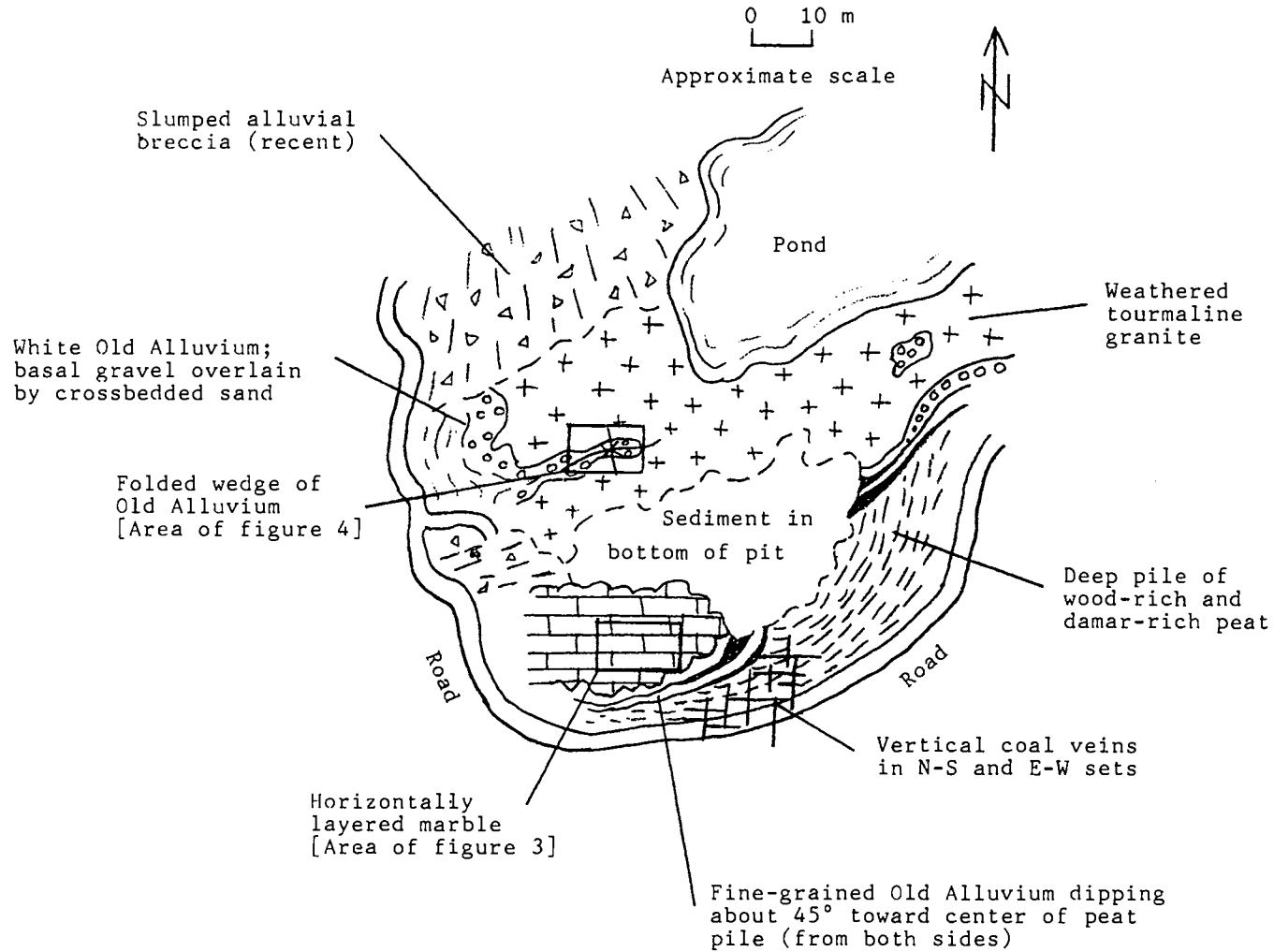


Figure 2. Sketch geologic map of Seng Mines pit in 1972, drawn from original in field notes. Vertical relief from perimeter road down to bottom of pit about 25 m.

Deep peat accumulation and associated coal veins

The southern and southeastern walls of the mine pit were made up of very dark organic sediment richly studded with wood fragments of all sizes and with pieces of damar. It was clear that considerable quantities of such organic sediment had already been removed in the process of excavating the mine pit. This deep accumulation must be the deposits of a stagnant swamp or lake that was present over a considerable period of time. Persistence of such a water body was probably maintained by continuing subsidence of the substrate – the carbonate bedrock – through subsurface solution. Organic acids derived from the living and dead vegetation would, in turn, have facilitated solution of the carbonate bedrock by percolating groundwater, thus providing for further subsidence and therefore maintenance of the surface depression holding the stagnant water body that was producing the acids. This is a good example of an unstable system whose instability becomes self-perpetuating through positive feedback. Such a system

can continue to evolve until stopped by exhaustion of one or another of the elements involved in the feedback loop – in this case possibly the removal of all carbonate rock down to insoluble bedrock (granite) over much of the area of the surface water body, thus inhibiting further subsidence and allowing the water body to be destroyed by infilling with sediment.

During the active subsidence of the organic sediment, differential displacement of parts of the mass would give rise to stresses that result in fracturing, faulting, and offset. At the same time, disintegration and decay of the organic matter would produce concentrated solutions and colloidal suspensions of organic substances. These fluids could in turn be injected into the cracks formed during the uneven subsidence and compaction of the sediment sequence. In this way the organic material could inject upwards (and downwards) into the cracks, and squeezing out of the water from repeated or prolonged injections would leave behind an organic residue that eventually hardened to form the coal veins.

Like the similar veins reported in Perak (Fermor, 1939; Richardson, 1941), the veins

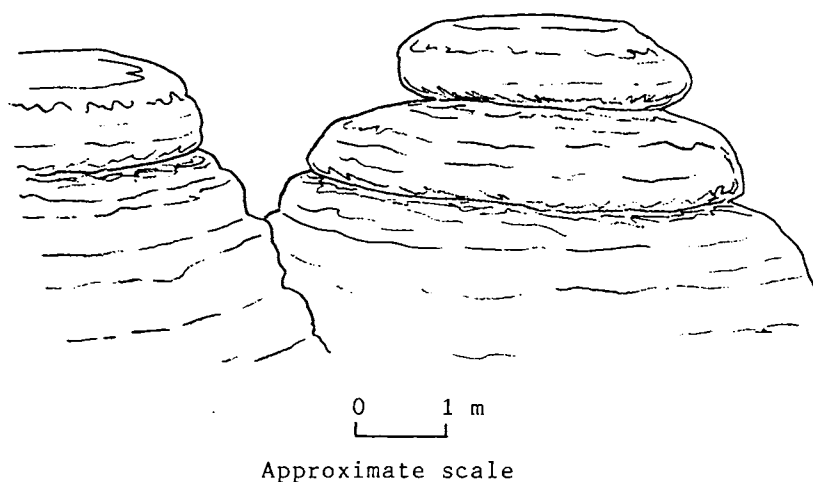


Figure 3. Sketch of exposed marble bedrock in Seng Mines pit in 1972, showing smooth rounded shapes resembling stacks of discoid pillows. Drawn from original in field notes. For location see Figure 2.

at the Seng Mines consisted of jet-black vitrain-like material having the smooth texture of a hardened gel. Exposed to the air, it tended to break into small blocky fragments having subconchoidal surfaces.

The veins at the Seng Mines, as were the others reported in the Malay Peninsula, characteristically had vertical or near-vertical dips, different from the typical dips of normal faults or slump structures. This may be because, in contrast to the usual case in normal faulting, there was here no horizontal relief. If essentially vertical subsidence were combined with isotropic shrinkage compaction, this combination might produce just such sets of orthogonal, vertical, open cracks, analogous perhaps to the orthogonal joints normal to bedding so common in thick structureless sandstone beds.

Folded alluvium on granite

In the northwestern part of the pit floor, the clastic deposits of the Old Alluvium showed in one area an interesting relation to the granitic bedrock (Fig. 4). The bedded deposits conform to the shape of the granite surface, the individual layers being parallel to that surface. This configuration produces a steep, nearly isoclinal fold in the alluvium, filling a trough-like reentrant of the granite surface. These folded beds had a fold width of about 2 m and could be traced vertically for about 1.5 m, the bottom of the synclinal fold not being visible.

It is clearly impossible for the alluvial beds to have been deposited in this configuration; they must have subsided into the fold structure, much as has been interpreted for similar features in the Kinta

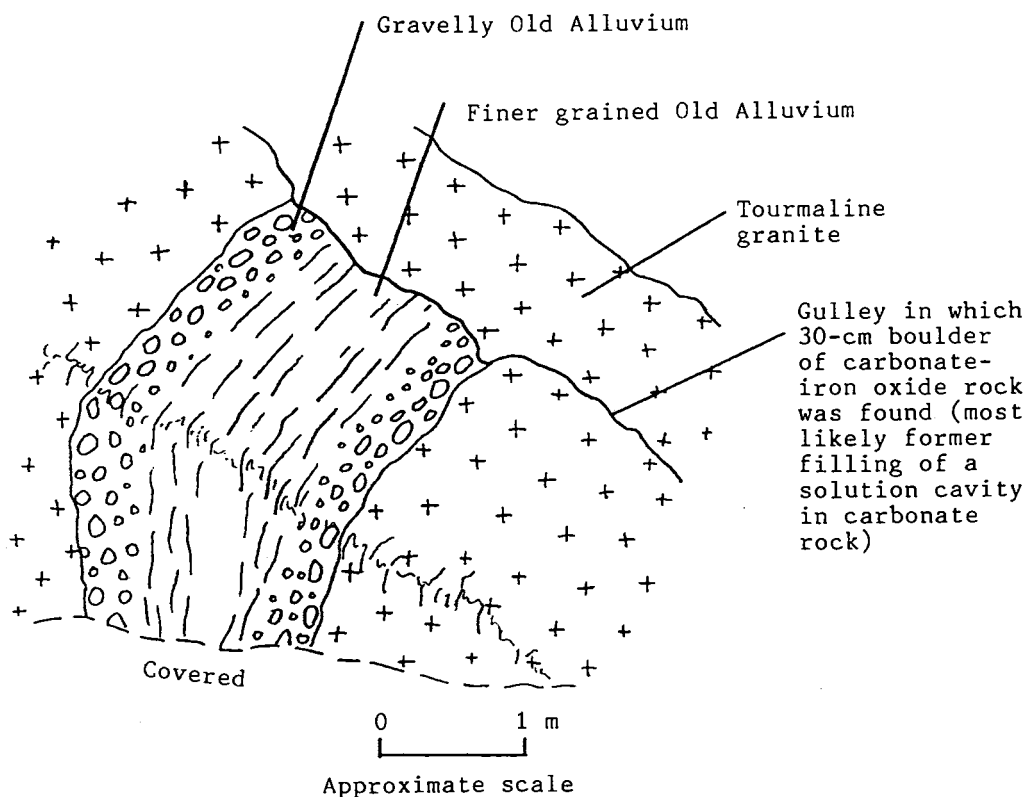


Figure 4. Sketch of folded section of alluvial sediments occupying trough-like hollow in surface of granitic bedrock, as seen in Seng Mines pit in 1972. Drawn from original in field notes. Probable origin of this feature discussed in text. For location see Figure 2.

Valley (Ayob, 1970, Fig. 4). However, in such previously reported examples, the bedrock beneath the alluvium has been of carbonate rocks, and suballuvial solution of the carbonate provides a convenient explanation for the subsidence of the clastic deposits. Here at the Seng Mines the bedrock was granite, and such rock is not susceptible to solution as are carbonate rocks. However, carbonate bedrock was present elsewhere in the mine pit, and the mass of peaty sediment provides indirect evidence that much carbonate rock has been removed by solution (see above).

It is not unreasonable, therefore, to infer that the contact of granite and folded alluvium seen in the northern part of the mine pit was originally a contact between granite below and carbonate rocks above, that is, that carbonate bedrock overlies the granite in at least that area. Solution then gradually removed the carbonate rock, and the overlying alluvial deposits were let down onto the insoluble granite. This process must have continued until no carbonate rock at all remained over considerable areas. Where the original granite-carbonate contact was in the shape of a trough, the alluvial beds would have been distorted as they were let down and ended up in a tight syncline.

Some support for the inferred former presence of carbonate rocks above the granite in the northern part of the mine pit was provided by the presence of a boulder observed during the 1972 visit (see Fig. 4). This boulder, which was found lying on the granite surface a few meters from the folded alluvial beds, was composed of a red-brown mixture of carbonate and iron oxides such as is commonly found filling solution cavities in limestone hills. Being only partly of carbonate mineral (and that sometimes siderite), such material is less soluble than the carbonate bedrock and so commonly survives as residual boulders and fragments where the latter has been extensively dissolved. This particular boulder was about 30 cm across, larger than the clasts in the alluvial section, and it lay at an elevation

above the carbonate bedrock exposed elsewhere in the mine. Therefore it was most likely a residual boulder let down onto the granite surface by solution of its surrounding carbonate material.

DISCUSSION

The features seen in the Seng Mines and described above indicate the complex interaction of bedrock and alluvium in areas where soluble carbonate rocks occur, and they provide clues we can use to interpret other exposures, particularly where the carbonate rock has totally disappeared.

The interrelated evolution of alluvium and bedrock is best seen in the feedback loop of the peat swamp over carbonate bedrock. Here the acids released in the swamp help dissolve the underlying carbonate rocks, causing surface subsidence that in turn perpetuates the swamp conditions at the surface. This feedback loop operated here long enough to build up a thick mass of peaty sediment and possibly to remove all carbonate bedrock, down to the contact with insoluble bedrock, underneath most of the swamp.

The nature of the bedrock, therefore, has here influenced or determined the nature of the sediment deposited above it, even after that bedrock was already buried. The nature of the sediment has, in turn, promoted the continued solution of the bedrock.

The folded alluvium on the granite surface also is a product of the interrelation of bedrock and unconsolidated sediment. In this case, deformation of the alluvium has resulted because of the irregularity of the original contact between soluble and insoluble bedrocks. Because the soluble bedrock has been entirely removed by solution in that area, this interpretation must be inferred from indirect clues. Fortunately, exposures elsewhere in the mine pit gave much evidence of the story. If the granite-alluvium contact had not, however, been exposed, interpreting the fold structure

in the alluvium would have been very problematical.

If the interpretation is correct that the rounded morphology of the marble surface in the mine pit formed under saturated alluvium, that alluvium (already removed by mining at the time I visited the mine pit) must have subsided and deformed to accommodate the evolving shape of the bedrock surface. The resulting structures formed in the sediment should have had the form of irregular, wrinkled synforms separated by smooth, arching, domelike antiform. Their shape in plan view would depend on any pattern of preferred orientation of solution depressions in the bedrock (following joints, perhaps).

Finally, consider the boulder of red-brown cave deposit. Recognition of the nature and origin of this rock provided an important clue to the complex history of this area. Had no carbonate bedrock been visible in the mine pit, would this boulder have been overlooked? Would it have been recognized but dismissed as a fluke or a boulder somehow introduced during mining operations? Would it have been regarded as irrelevant? If there is one main lesson to be learned from all these observations, it is this: do not overlook anything, no matter how seemingly trivial or irrelevant. Geologic histories are usually more complex than we would like to think, and the more obscure parts of those histories may have left only few and very indirect clues.

REFERENCES

- AYOB, MOHAMMAD, 1970. Quaternary sediments at Sungei Besi, West Malaysia. *Geological Society of Malaysia Bulletin*, v. 3, p. 53-61.
- CHUNG, S.K., 1973. Geological map of West Malaysia, seventh edition (1:500,000). Federation of Malaysia, Geological Survey Department.
- FERMOR, L.L., 1939. Coal veins in Malaya. *Geological Magazine*, v. 76, p. 465-472.
- FITCH, F.H., 1952. The geology and mineral resources of the neighborhood of Kuantan, Pahang. Federation of Malaya, Geological Survey Department Memoir, v. 6, 114 p.
- GOBBETT, D.J., 1964. The Lower Palaeozoic rocks of Kuala Lumpur, Malaysia. *Federation Museums Journal*, v. 9, p. 67-79.
- GOBBETT, D.J., 1972. Geological map of Malay Peninsula (1:1,000,000). Kuala Lumpur, Geological Society of Malaysia.
- GOH YOK LENG, 1975. *Bedrock geology and mineralisation of the Seng Mines, Sungei Way, Selangor*. University of Malaya B.Sc. (Hons.) thesis, 62 p.
- HUTCHISON, C.S., (1973). Plutonic activity. Chapter 8 in Gobbett, D.J., and Hutchison, C.S., eds., *Geology of the Malay Peninsula (West Malaysia and Singapore)*. New York, Wiley-Interscience, p. 215-252.
- RICHARDSON, J.A., 1941. The coal veins of British Malaya. *Geological Magazine*, v. 78, p. 451-462.
- SIVAM, S.P., 1969. *Quaternary alluvial deposits in the north Kinta Valley, Perak*. University of Malaya, M.Sc. thesis, 170 p.
- STAUFFER, P.H., 1973. Cenozoic. Chapter 6 in Gobbett, D.J., and Hutchison, C.S., eds., *Geology of the Malay Peninsula (West Malaysia and Singapore)*. New York, Wiley-Interscience, p. 143-176.
- THARMARAJAN, N., 1970. *Studies in geology and Quaternary sediments of the Sg. Way - Sg. Buloh area, Selangor, West Malaysia*. University of Malaya B.Sc. (Hons.) thesis, 125p.

Original draft completed December 14, 1988.
Revised February 27, 1989; December 31, 1990. Final revision February 1, 1991.

* * * * *

Manuscript received 4 March 1991

PERTEMUAN PERSATUAN
Meetings of the Society

CERAMAH TEKNIK (Technical Talks)

M. Yogeswaran : Hydrogeology of Sarawak with some aspects on groundwater development

Laporan (Report)

The above talk was held on the 21 January 1991 at Geology Department, University of Malaya. What follows is a synopsis of the talk as prepared by the speaker, Yogeswaran Mailvaganam, who is with the Geological Survey of Malaysia in Kuching.

Sinopsis (Synopsis)

Sarawak is endowed with abundant surface water resources contributed by the large surplus of over 2 m of rainfall over evapotranspiration. However, the distribution of the rainfall in time and space have resulted in limited availability of water of acceptable quantity and quality for existing and proposed Water Supplies in some parts of the State. This has, in the recent years, forced water-resource professionals to explore and exploit alternative sources, including groundwater.

The distribution of groundwater in Sarawak is illustrated in the Hydrogeological Map of Sarawak, 1986, and this represents the first concerted effort to record the overall groundwater resources of Sarawak; the map, on a scale of 1:500,000 was based on information available as at 1983, and, since its publication, a wealth of new information has been obtained necessitating the updating and, in some cases, revision of the map.

The Quarternary alluvial deposits in the coastal plains form the most important aquifers, with the shallow coastal sands fringing the coast being the most extensively exploited aquifers. The development of these coastal sand aquifers takes into consideration that they are, in most cases, surrounded and underlain by saline water and that the flow of water in these sands is slow with hydraulic conductivities ranging from 5 to about 15 m/d. The two types of well and well-field designs which have been adopted to tap water from these aquifers cater for the transient nature of the flow of groundwater and thus reduce the danger of saline intrusion particularly by upconing. These well designs consist of:

1. a large number of low-yielding wells which are arranged either singly or in arrays of 4 wells or 8 wells which are evenly spaced at predetermined locations over the catchment area.
2. a series of horizontal wells which are installed parallel to the groundwater flow front or along the crest of a groundwater mound.

Connate saline water are not uncommon in these coastal aquifers; mixing of waters from the fresh water portion of the aquifers and the connate water has enlarge the useable size of the aquifers in some of groundwater supply schemes.

The deeper sand aquifers in the coastal plains are multi-layered and are brackish to saline towards the coast, but are of acceptable quality towards the inland areas.

Peat, which underlies about 1.6 million hectares of the coastal plain and some inland valleys is also considered an important source of water. They contribute to the base flow of the coastal streams and also to water wells, particularly the low-humified woody peat. The concept of utilising the water directly from peat aquifers involves the abstraction of water from the peat and allowing for a predetermined drop in the overall natural water-level during the dry spell. This is to prevent an accelerated subsidence normally expected when peat is drained or when oxidizing rainwater is allowed to infiltrate deeper into the peat profile.

Several major sedimentary basins with good groundwater potential occur in Sarawak and notable among them are the late Tertiary rock formations in northwest Sarawak. These formations include the Tunku, Lambir, Miri and Belait Formations; the wells of the large groundwater scheme which supplements the Miri water supply is located within the sandy facies of the Tunku Formation. The rocks of the Nyalau Formation, which has a wide distribution in the Bintulu and Nanga Merit areas are also noteworthy. The Silantek Formation and Kayan Sandstone are criss-crossed by numerous sills and dykes, and these have a tendency to reduce the transmissivities of the rock aquifers.

Fractured rocks occupy more than half of the State of Sarawak, and these include the igneous, metamorphic and the older sedimentary rocks; the aquifers located in these rocks are seldom extensive and are only locally important. These aquifers are being increasingly tapped in the recent years for industrial and agricultural uses.



M. Yogeswaran

M. Fuller : Tertiary paleomagnetism of regions around the South China Sea

Laporan (Report)

The above talk by Dr. M. Fuller (Department of Geological Sciences, University of California, Santa Barbara, California) was sponsored by the Geological Society of Malaysia in collaboration with the Geology Department, University of Malaya. It was held at the Geology Department, University of Malaya on 30 January 1991 and attracted a crowd of about 45. The speaker has kindly supplied an abstract of the talk.

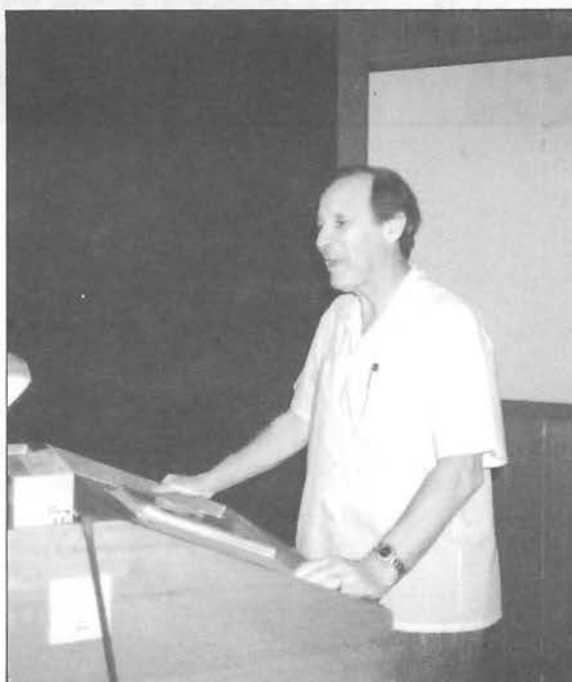
Abstrak (Abstract)

Paleomagnetic data from the Philippine Sea Plate reveal a history of clockwise (CW) rotation and northerly translation, since the late Eocene, which appears to be plate wide. The results imply a pole of rotation to the east. The motion generated left lateral oblique convergence between the Philippine Sea Plate and SE Asia.

Late Miocene paleomagnetic data from the Philippines show CW rotation in the northern island of Luzon, while to the south in the Central and Southern Philippines no rotations are seen. This defines the North and the Central and South Philippines Paleomagnetic Domains (NPPD and SCPPD). In the Miocene, the NPPD exhibits rapid counterclockwise (CCW) rotation, but the SCPPD shows CW rotation. There are indications of pre-Miocene CCW rotation from Zambales, the Visayans and the Celebes Sea.

In Borneo, a history of Tertiary CCW rotation has been found in Sarawak, Sabah and West Kalimantan. In central Kalimantan, there are conflicting results, some of which show no rotation with respect to stable Eurasia, while others give CCW rotations consistent with those seen elsewhere.

M. Fuller



In the Malaysian peninsula, the Segamat basalts, of late Cretaceous Early Tertiary age show CCW rotations similar to those seen in Sarawak. To the north in the Thai peninsula, CW rotations have been found in two Tertiary basins. Late Tertiary basalts from Central Thailand have given similar results, but on the Khorat plateau comparable basalts are unrotated.

The tectonic implications of the results remain controversial. In particular, the relative importance of true plate rotations and localized rotation of upper crustal blocks in distributed shear zones is unclear. The CW rotations seen in Thailand are consistent with, though do not require, propagating extrusion tectonics. The substantial region of CCW rotation in Borneo and the Philippines is consistent with the broad features of the Holloway model. However, the eastern boundary of SE Asia has experienced left lateral oblique convergence, since the late Eocene, and the effect of interaction with the Philippine Sea Plate must be added to the Holloway model.



Peter Gutteridge : Carbonate sand bodies at the northern margin of the Darbyshire Carbonate Platform (Lower Carboniferous) U.K.

Laporan (Report)

Dr. P. Gutteridge (22 George Street, Cambridge, CB4 1AJ, U.K.) presented the above talk on 7 February 1991 at the Geology Department, University of Malaya. What follows is a Summary of the talk prepared by the speaker.

Ringkasan (Summary)

The Darbyshire carbonate platform is one of the numerous carbonate platforms which were present over much of northern England during the Lower Carboniferous. Two main types of carbonate sands are present at the northern margin of this platform: a sand-body complex developed on the shelf-top in the immediate vicinity of the platform margin, and a submarine carbonate fan or apron draped over the lower platform margin slope. Trace resedimented carbonates were derived from the shelf margin sand body.

The shelf margin carbonate sand body complex was built-up by repeated basinward progradation and abandonment of large-scale carbonate bedforms in response to minor sea-level fluctuations. The presence of occasional foresets within these bedforms composed of micritised grains and marine cements suggests that the migration of these bedforms was episodic. The large-size suggests that the bedforms were active only during periods of storms.

The bedforms show a consistent basinward migration. The predominant direction of sand transport at this margin of the carbonate platform was thus basinward. The carbonate sands transported offshore accumulated in a submarine fan or apron deposit which was draped over the lower slope and base of slope of the platform as are series of high and low density turbidites and probable grain-flow deposits.

* * * * *

GEOLOGICAL SOCIETY OF MALAYSIA PUBLICATIONS

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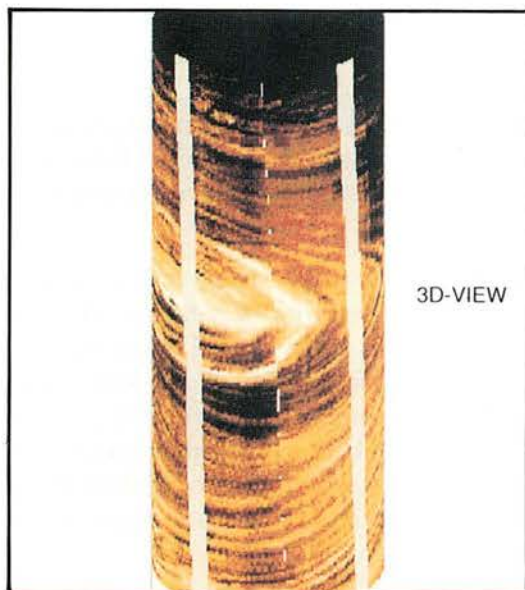
Fullbore Micro Imager*

Formation imaging using microelectrical arrays has benefited the oil industry since its introduction in the mid-80s. The FMI*, Fullbore Formation MicroImager tool, is the latest-generation electrical imaging device. It belongs to the family of imaging services provided by the MAXIS 500* system with its digital telemetry capability.

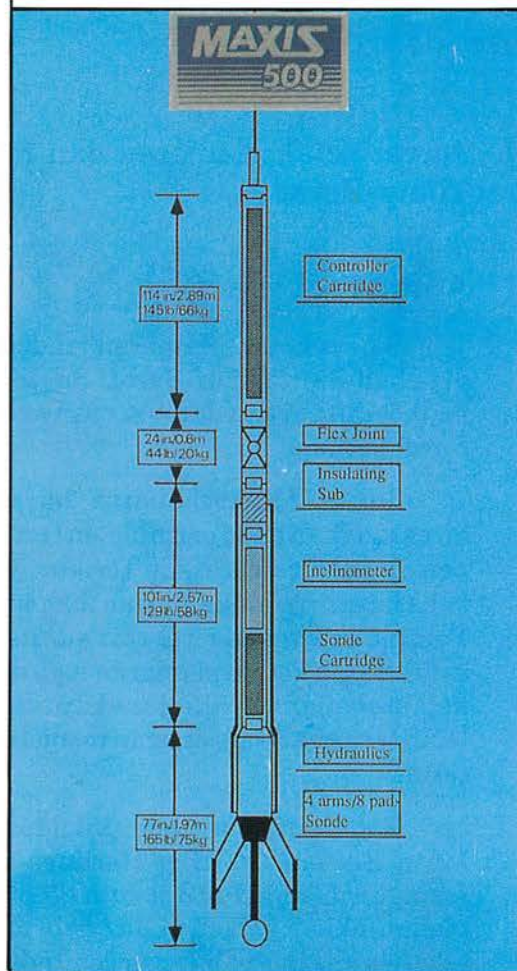
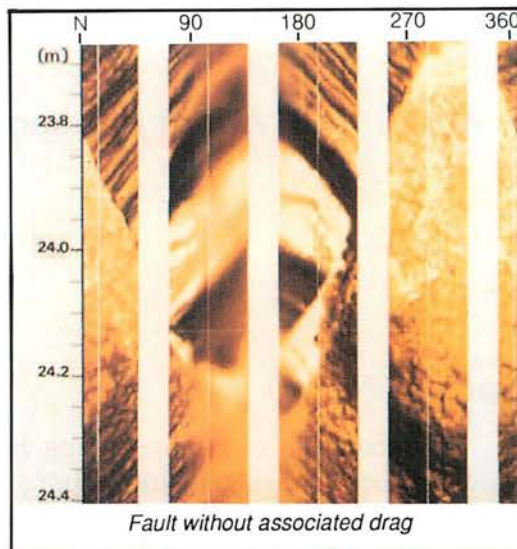
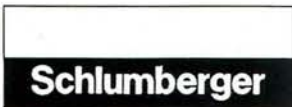
The FMI log, in conductive muds, provides electrical images almost insensitive to borehole conditions and offers quantitative information, in particular for analysis of fractures.

The FMI tool combines high-resolution measurements with almost fullbore coverage in standard diameter boreholes, thus assuring that virtually no features are missed along the borehole wall. Fully processed images and dip data are provided in real time on the MAXIS 500 imaging system.

The tool's multiple logging modes allow wellsite customization of results to satisfy client needs without compromising efficiency.



"Bullseye" structure



-) **Tajul Anuar Jamaluddin** : Survei ketakselanjaraan dan ragam kegagalan cerun batuan di Lebu Raya Timur-Barat
- 2) **Abdul Hadi Abdul Rahman** : The use of wireline logs and cuttings for the prediction of subsurface sedimentary facies – A case study from the Northumberland Trough, Northern England

Laporan (Report)

To encourage our new, young lecturers to present their findings, the Society in collaboration with the Geology Dept., University of Malaya sponsored the talks by Tajul Anuar Jamaluddin and Abdul Hadi Abdul Rahman on the evening of 20 February 1991 at the Geology Department, University of Malaya. The 2 speakers have kindly supplied the abstracts to their talks.

- 1) Survei ketakselanjaraan dan ragam kegagalan cerun batuan di Lebu Raya Timur-Barat

Abstrak (Abstract)

Survei ketakselanjaraan telah dijalankan pada 14 buah cerun potongan batuan di Lebu Raya Timur-Barat. Survei ini bertujuan untuk menjelaskan kehadirannya pada jasad batuan dan seterusnya digunakan untuk meramalkan ragam kegagalan cerun batuan.

Survei ketakselanjaraan ini menggunakan teknik garis pengimbasan yang direntangkan pada permukaan cerun. Setiap ketakselanjaraan yang menyilangi garis pengimbasan dicatatkan berikut: jenis, jarak pisahan, orientasi, panjang, bukaan, kekasaran permukaan dan bahan pengisi ketakselanjaraan serta kehadiran air. Parameter bentuk serta saiz purata blok batuan yang terbentuk akibat persilangan satah-satah ketakselanjaraan juga diambil kira untuk menjelaskan kepadatan relatif ketakselanjaraan pada jasad batuan. Panjang ketakselanjaraan dijelaskan secara lebih terperinci lagi dengan menjelaskan keterusan dan pendedahannya pada muka cerun.

Data daripada survei ini dapat digunakan untuk menentukan nilai Penanda Mutu Batuan (PMB). Hasilnya menunjukkan jasad batuan pembentuk cerun mempunyai nilai PMB sekitar 65-85%. Plot stereografi kutub satah ketakselanjaraan menunjukkan kebanyakan cerun memperlihatkan ragam kegagalan baji, satah dan tebalikan, atau gabungan lebih daripada satu ragam kegagalan tersebut. Ujian Markland digunakan untuk mengecam satah ketakselanjaraan 'genting' dan meramalkan kestabilan cerun batuan.

- 2) The use of wireline logs and cuttings samples for the prediction of subsurface sedimentary facies: A case study from the Northumberland Trough, Northern England.

Abstrak (Abstract)

Four 280 metre boreholes have been drilled through a cyclical sequence of sandstones, shales and carbonates in Whitchester, in the Northumberland Trough region, Northern England. Two of the holes, Whitchester Boreholes 1 and 2 have been fully cored and have cuttings samples collected during borehole enlargements.

This study on the use of basic and advanced wireline logs and cuttings for the prediction of subsurface sedimentary facies has been carried out on the well data of Whitchester Boreholes 1 and 2 of Northumberland basin, west of Newcastle-upon-Tyne.

The analysis of wireline log cross-plots of NGS (Natural Gamma-ray Spectrometry) Tool revealed some important relationships between the different lithofacies and their K, Th and U content. These are:-

- a. The claystone facies which overlies the limestone units, which was interpreted as prodeltaic, show low uranium content and fairly high thorium and potassium content;
- b. The mudstone facies which overlies the coals show high uranium content and high thorium content but slightly lower potassium content compared to the claystone. This lithofacies has been interpreted to be lagoonal or bay pelagic mud.

From the analysis of cuttings samples of BH-1, five important observational features were noted:-

- i. A major facies – a lithofacies – is broken down into several different sub-facies in the cuttings. These have been referred to here as the “*cuttings facies*”.
- ii. Each “*cutting facies*” consist of cuttings chips of distinctive “*lithology*” and *shape*.
- iii. There seem to be a preference in the size of the cuttings. Greater amount of cuttings were collected in the intermediate size classes – 1.00 and 2.36 cm, 2.36 to 3.35 cm and 3.35 to 4.75 cm.
- iv. The siderite/ironstone facies picks out well in size classes 1.00 to 2.36 cm and 2.36 to 3.35 cm, but not in the larger classes. They seem to show greater depth lag in the larger classes. This could probably be related to the density of the cuttings facies.
- v. The distribution of coal cuttings seem to be fairly erratic and independent of the coal zones.

From the overall investigations that have been carried out, the following conclusions have been drawn:-

1. The prediction and interpretation of subsurface lithology by the analysis of wireline logs prove to be very useful and reliable method for subsurface analysis. In the case of the cyclic deltaic sequence of Whitchester, the Natural Gamma-ray Spectrometry (NGS) Tool logs in particular is very useful in that it reveals the distribution of potassium, thorium and uranium in different lithofacies, and thus became very useful in the characterisation and correlation of the various facies.
2. Cuttings analysis can be utilized to improve the characterisation of subsurface sedimentary facies. The cuttings samples need to be separated into several different size classes before they can be usefully analysed and be able to give meaningful results. This is because the arrival of drill cuttings to the surface is influenced by its size, density and also the annular velocity. The presence of cuttings of a particular lithology – “cuttings facies” – in all the different size classes improves the reliability of its correlation with subsurface lithology.
3. Cuttings of size ranging from 1.00 mm to 4.70 mm are the most representative of the lithology of their recorded collection depth in the case of the cuttings samples of the Whitchester Boreholes.
4. Cuttings breaks down a major lithofacies into several different “cuttings facies” of distinctive lithology and shape. The understanding of the association of the different “cuttings facies” that derives from a major lithofacies is important in utilizing the cuttings to improve and enhance subsurface lithological and facies interpretations by wireline logs.



Tajul Anuar Jamaluddin and Abdul Hadi Abdul Rahman

BERITA-BERITA PERSATUAN
News of the Society

Jawatankuasa Pencalunan (Nominations Committee)

The Council nominated the following members to form the Nominations Committee:

Fateh Chand (Chairman)
S. Paramanathan
Azhar Hj. Husin

The Committee Chairman, Fateh Chand reported to the Council that three nominations were received before the closing date of 3 December 1990.

Taking into account the nominations, the Nominations Committee then presented its list of nominations for GSM Council 1991/92.

President :	Ahmad Said
Vice-President :	Khalid Ngah
Hon. Secretary :	Jimmy Khoo
Hon. Asst. Secretary :	Ahmad Tajuddin Ibrahim
Hon. Treasurer :	Lee Chai Peng
Hon. Editor :	Teh Guan Hoe

Councillors (2-year term) :	Abdul Ghani Mohd Rafek Mazlan Madon Nik Ramli Nik Hassan Tan Teong Hing
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Councillors (1-year term) :	Andrew Spykerman Cheong Kok Keong Chin Lik Suan Fateh Chand
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Appointment of New Councillor & Chairman of Engineering Geology Working Group

The Council in its January 1991 meeting co-opted Dr. Ghani Rafek to replace Dr. S. Paramanathan as Councillor for 1990-91.

Dr. Ghani Rafek has also taken over as Chairman, Engineering Geology Working Group.

* * * * *

Kecahlian (Membership)

The following applications for membership were approved:

Full Members

1. Danny Soo
Core Lab., Lot 10B, Jalan 51A/223,
46100 Petaling Jaya, Selangor.
2. Yusni Mohamed Yusuf
Syed Mohammad, Hooi & Binnie, P.O.
Box 12610, 50784 Kuala Lumpur.
3. Samsudin Hj. Taib
Dept. of Geology, University of Malaya,
59100 Kuala Lumpur.
4. P.A. Comet
Geochemical & Environmental
Research Group, 833, South Graham
Road, College Station, TX 77845,
U.S.A.
5. Ivan Kok
WMC Petroleum, 12 Floor, Bangunan
Getah Asli, 148 Jalan Ampang, 50450
Kuala Lumpur.
6. Lim Heng Gaul
405 Blk. A2, Seksyen 4, Bandar Baru
Wangsa Maju, 53300 Kuala Lumpur.

7. Jonathan Redfern
Petrofina Far East, 138 Cecil St., 12-
01, Cecil Court, S'pore 0106.

Student Members

1. Kung Soo Hui
School of Physics, 11800 USM,
P.Pinang.
2. Sulaiman Salleh
Dept. of Geology, University of Malaya,
59100 Kuala Lumpur.

Institutional Members

1. Total CFP
Attn: Jacques Marie, 435 Orchard
Road, 17-01/03 Wisma Atria, S'pore
0923.

* * * * *

Perukaran Alamat (Change of address)

The following members have informed the Society of their new addresses:

1. Parameswaran Suppiah
Petronas Carigali Sdn., P.O. Box
12407, 50776 Kuala Lumpur.
2. Leow Sui Fan
83, Persiaran Wira Jaya Timor 42,
Taman Dato Leow Yan Sip, 31350 Ipoh,
Perak.
3. Cheah Tik Wah
Mainline Resources Ltd., Suite 206/
207, Setiabudi 2 Bldg., Jl. H.R. Rasuna
Said Kuningan, Jakarta 12920,
Indonesia.
4. Zainol bin Hj. Husin
Geological Survey of Malaysia, P.O.
Box 1015, 30820 Ipoh, Perak.

5. Engku Nasir syed Mohamad
MMC Bhd., 4129-A, Jalan Tongku
Ismail, Off Jalan Telipot, 15150 Kota
Bharu, Kelantan.
6. A.J. Burley
Flat 7H, Grove End House, Grove End
Road, London NW8 9HL, U.K.
7. Chan Foo Khee
Mamut Copper Mining Sdn. Bhd., P.O.
Box 5, 89307 Ranau, Sabah.
8. James K. Blake
Petroconsultants (Far East) Pte. Ltd.,
Afro-Asia Building #07-12, 63
Robinson Road, Singapore 0106.
9. Tan Yong Phang
c/o BHP Minerals Ltd. No. 76, 2nd
Floor, Block C, Kompleks KUWASA,
88000 Kota Kinabalu.
10. Mohd. Badzran bin Mat Taib
Pejabat Penyiasatan Kajibumi,
Seberang Jalan Putera, 05150 Alor
Setar, Kedah Darulaman.
11. Triton Energy Corporation
6688 North Central, Suite 1400, Dallas,
TX 75206. Attn: G.M. Smart.

* * * * *

Wanted: Current Address of the Following People :

1. Dale C. Beeson
formerly of 1517 West 3rd Street,
Irving, Tx. 75060, U.S.A.

Perambahan Baru Perpustakaan (New Library Additions)

The Society has received the following publications:

1. U.S.G.S. Bulletin, 1990: 1730-D, 1751-O, 1752, 1753-B, 1839-E, F, 1745-C, 1757-J, 1915, 1857-E, 1857-F, 1911, 1922, 1936, 1944, 1891, 1717-D, 1857-H, 1908, 1756-F.
2. Chronique de la Recherche Miniere, no. 501, 1990.
3. AAPG Explorer, Jan, Feb 1991.
4. Bulletin Centres Rech. Exploration-Production Elf Aquitaine, vol. 14, no. 2, 1990.
5. Mem. Expl. Cartes Geologiques et Minieres de la Belgique, no. 28 & 29, 1990.
6. Geological literature of USSR. Bibliographical Yearbook for 1985 year, vols. I & II, 1990.
7. U.S. Geological Survey Circular, 1990: 1053, 1036, 1052, 1049, 1000.
8. U.S. Geological Survey Professional Paper, 1990: 1370-H, 1403-E, 1468, 1504.
9. Gazetteer of the Antarctic, 1989.
10. Seatrad Bulletin vol. XI, nos. 2, 3 & 4, 1990.
11. A history of the water resources divisions, U.S. Geological Survey: vol. V, July 1, 1947 to April 30, 1957.
12. Berliner Geowissenschaftliche Abhandlungen, 1989: Band 111, 114, 115; 1990: Band 119, 121, 122, 123.
13. 28th International Geological Congress, abstracts: 3 vols. 1989.

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BERITA-BERITA LAIN
Other News

Geological Survey of Malaysia - Annual Report & Proceedings of Annual Geological Conference

For 1988, the Geological Survey of Malaysia has changed the format of its Annual Report. It now comes in two separate volumes. One volume is the Annual Report proper and the other volume is called the Proceedings of the Annual Geological Conference and carries the Technical Papers.

The Annual Report Geological Survey of Malaysia now deals only with the various achievements and regional activities dealing with geological mapping, mineral exploration, hydrogeology, engineering geology and geoscience services. Included too are co-operation with international agencies and institutes and lists of latest publications and reports available. An overview of the regional geology and mineral resources for Malaysia is described in considerable details. The inside front cover carries a 2-page coloured map of Peninsular Malaysia based on the 8th Edition

Geological Map 1985 while the inside back cover carries a 2-page coloured map of Sarawak and Sabah based on the 4th Edition Geological Map 1986.

The second and separate volume consists of technical papers presented during Annual Geological Conferences, the 20th Geological Conference held in Cameron Highlands in January 1989 and the 21st Geological Conference held in Pulau Pinang in January 1990. The progress and technical findings for the year are deliberated, complete with maps and statistics.

Each volume, in soft cover, is priced at M\$20.00 and obtainable from Ibu Pejabat Penyiasatan Kajibumi, Tingkat 20, Bangunan Tabung Haji, Peti Surat 11110, Jalan Tun Razak, 50736 Kuala Lumpur

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29th International Geological Congress

Kyoto, Japan

24 August - 3 September, 1992

The Congress site, Kyoto International Conference Hall, is located in the northern part of Kyoto City, the ancient capital of Japan.

Registration

According to the Statutes of the Congress, no professional qualifications are required in order to register for the Congress. In filling the quotas for the geological excursions organized before and after the Congress, however, priority will be given to persons engaged in geological studies or in the practice of a branch of the earth sciences.

Registration fees

	Pre-regis- ration	On-site registration*
Participating member	¥45,000	¥55,000
Accompanying member	18,000	22,000
Student in 1992	15,000	18,000
Non-attending member	15,000	—

* Currently exchange rate as of March 1990 is US\$1.00 = ¥150.

The fees include the rights to attend scientific events associated with the Congress, to receive Congress publications, and to take part in social events especially organized for the Congress.

Scientific program

— From Origin of the Earth to Human Survival

The scientific program of the 29th IGC consists of Special Symposia A, B and C, Symposia I, Symposium II and Lecture Series. Special Symposium A, which includes 6 sessions, will deal with the history of the Earth, from its origin to the evolution of island arcs and active continental margins. A session on the origin and evolution of the biosphere will also be included. Special Symposium B, which includes 5 sessions, will deal with frontier geoscience studies for human survival, including research on energy, resources, natural hazards and the environment. These two Special Symposium will be conducted during each morning of the Congress and will constitute the mainstream of the entire scientific program. Special Symposium C will deal with the highlights and progress of several major international geoscience projects.

Special Symposium A

— History of the Earth with Special Emphasis on the Evolution of Arcs

- A1. Early history of the solar system and origin of the Earth.
- A2. Early history of the Earth: Birth of continents, oceans and the atmosphere.
- A3. Dynamics and evolution of the mantle and core.
- A4. Evolution of oceanic and continental crust.

- A5. Evolution of island arcs and active continental margins.
- A6. Origin of life and evolution of the biosphere.

Special Symposium B --- ---

- **Frontier Studies for Human Survival**
- B1. Global climatic change and future environment.
- B2. Prediction of natural hazards and environmental protection.
- B3. Mineral and energy resources in the 21st century.
- B4. Geological disposal of radioactive and hazardous wastes.
- B5. Human survival in the 21st century: A panel discussion.

Special Symposium C --- ---

- **Summary, Highlights and Progress of International Geoscience Projects.**
- C1. Ocean Drilling Program (ODP)
- C2. International Lithosphere Project (ILP)
- C3. Kaiko Project (Oceanic trench exploration project)
- C4. International programs on global changes (IGBP and others)
- C5. Continental deep-drilling projects
- C6. International Decade for Natural Disaster Reduction (IDNDR)
- C7. STARMER Project (Exploration project of marginal sea rifts)
- C8. Circum-Pacific Map Project: Tectonics, energy and mineral resources.
- C9. Activities of International Geological Correlation Program (IGCP)

Abstracts --- ---

All abstracts must reach the Organizing Committee by 1 January 1992. The abstracts must be written in English.

Publications --- ---

All abstracts will be published in a series of Abstract Volumes, distributed to all participants. Complete papers will not be published by the Congress.

Fieldtrips --- ---

Geological fieldtrips have been planned for the 29th IGC to examine and understand the evolution of island arcs and plate boundary geological phenomena. Most of the trips will be held in the Japanese Islands with two overseas trips (one in Korea and the other in the Philippines).

Pre-Congress Fieldtrips

- Cretaceous arc-trench systems in Hokkaido
- Cenozoic volcanism in southwestern Hokkaido
- Hydrothermal ore deposits in southwestern Hokkaido
- Paleozoic and Mesozoic sequences in the Kitakami Mountains
- Transverse of Quaternary volcanoes in Northeast Japan
- Kuroko and epithermal gold mineralizations in northeastern Honshu
- Transect of the Kanto Mountains
- Stratigraphy and tectonics of the Kanto Basin
- Plio-Pleistocene forearc basin-fill in the Boso Peninsula
- Taphonomy and paleoecology of the plio-Pleistocene molluses in the Boso-Miura area

- Management of environmental resources and the development of the Kanto submarine basin
- Metropolitan urban geology
- Arc-arc collision in the South Fossa Magna, central Japan
- Cenozoic systems and petroleum accumulation in the Niigata Basin
- Hida metamorphic complex
- Geochronology and isotope geology of igneous and metamorphic rocks in Japan
- Late Mesozoic accretionary complex: Mino Terrane, central Japan
- Transect of central Japan: from Maizuru to Sanbagawa
- Transect of western Honshu
- Paired metamorphic belts: Ryoke and Sanbagawa
- Continental margin tectonics in Kyushu, Southwest Japan
- Quaternary volcanic rocks in central Kyushu
- Transect of the Ryukyu Arc
- Geotraverse across the Southwest Japan Arc
- Sedimentary history of the paleo-Lake Biwa in Iga-Ueno, the southern Lake Biwa
- Pleistocene sequence of the Lake Biwa sediments on its west shore
- Sedimentary facies of the Pleistocene Osaka Group
- Evolution of Lake Biwa: A boat tour
- Quaternary basaltic volcanism, northern Kinki District
- Kansai International Airport and Honshu-Shikoku Bridge
- Permian Tethyan biota and sedimentary facies of the Akasaka Limestone Group
- Triassic and Jurassic sequences of the Mino Terrane in central Japan
- Atera and Neodani Active Faults in central Japan
- Mylonites along the Median Tectonic Line (MTL) in central Japan
- Miocene sequences and the fossil museum of Mizunami, northeastern Nagoya
- Tonomine gallery (Tsukiyoshi deposit) and Shomasama hydrological test site

During-Congress Fieldtrips

- Kamenose landslide, geology and control works
- Active faults, deep weathering and disaster
- Low to medium grade Ryoke metamorphic rocks in the Watsuka area, southern Kyoto
- Late Cretaceous Ibaraki zoned granitic complex, southwestern Kyoto
- Mesozoic accreted terranes in northwestern Kyoto
- Cretaceous strike-slip basin along the Median Tectonic Line

Post-Congress Fieldtrips

- Collision-related and high- and low-P/T metamorphic belts in Hokkaido
- Litho- and biofacies of the Cretaceous Yezo Supergroup in Hokkaido
- Cenozoic volcanism in southwestern Hokkaido
- Manganese and manganese iron deposits in bedded chert in Hokkaido
- Spreading tectonics of the Sea of Okhotsk
- Cenozoic geology of the Northeast Honshu Arc
- Tanakura Tectonic Line: its movement and the opening of the Japan Sea

- Abukuma and Sanbagawa metamorphic belts in Kanto District
- Asama and Kusatsu-Shirane Volcanoes
- Mesozoic melanges and associated rocks in the Kanto Mountains
- Neotectonics around Sagami Bay
- Tephrochronological history of Mt. Fuji
- Izu-Oshima and Hakone Volcanoes
- Volcanic and tectonic history of the Izu Peninsula
- Boninite and related rocks in the Bonin Islands
- Geologic hazards in the northern Fossa Magna
- Late Cenozoic forearc basin filling: Kakegawa group
- Ryoke metamorphic belt and the Median Tectonic Line, central Japan
- Transect of central Japan: from Hida to Shimanto
- Mineral deposits and magmatism in the Hida and Hida marginal belts, central Japan
- In-situ and engineering R&D facilities for high level radioactive waste management
- Yakuno ophiolite complex
- Transect of the Outer Zone of the Southwest Japan Arc in the Kii Peninsula
- Sanukite and alkalic basalt of Southwest Japan
- Paired metamorphic belts in Southwest Japan
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* * * * *

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 - b) the owner has filed for patent or registration;
 - c) the owner has been granted patent or registration;
 - d) the owner has commercialised the article; in any part of the world.
4. Inventors, innovators and designers who are in the process of filing their applications for Letters of Patent or Certificate of Utility Innovation or Registration of Designs may submit
 5. All inventions must comply with Malaysian laws and regulations currently in force.

For Rules of the Award, application forms and enquiries, please write to :-

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 petroleum Research Institute, PETRONAS
 Lot 1026, PKNS Industrial Estate
 54200 Hulu Kelang
 Selangor Darul Ehsan
 Tel : 03-4071022 Fax : 03-4087471

Closing date for submission is by 4.30 pm, 31 October 1992

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- Bulletins 19 & 20** (1986). GEOSEA V Proceedings Vols. I & II, Fifth Regional Congress on Geology, Mineral and Energy Resources of Southeast Asia, Kuala Lumpur, 9–13 April 1984. Edited by G.H. Teh & S. Paramanathan. Price for both Bulletins 19 & 20: Members — M\$50.00 (US\$21.90), Non-members — M\$125.00 (US\$53.20).
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BULETIN PERSATUAN GEOLOGI MALAYSIA

BULLETIN OF THE GEOLOGICAL SOCIETY OF MALAYSIA

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Editor
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NOVEMBER 1990

No. 27

Kursus-kursus latihan & bengkel-bengkel (Training Courses & Workshops)

1992

August 1992–July 1993

AEROSPACE SURVEYS FOR: GEOLOGICAL SURVEY; WATER-RESOURCES SURVEY; AND APPLIED GEOMORPHOLOGY (Delft, The Netherlands). Annual postgraduate diploma and MSc degree courses organized by the International Institute for Aerospace Survey and Earth Sciences (ITC). Language: English. For Information: ITC Student Registration Office, P.O. Box 6, 7500 AA, Enschede, The Netherlands.

September 22–24

GROUND-WATER GEOCHEMISTRY (San Antonio, Texas). Short course. For Information: National Ground Water Association, Education Department, 6375 Riverside Drive, Dublin, Ohio 43017. Phone: 614/761-1711. Fax: 614/761-3446)

September 28–October 2

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GROUND-WATER HYDROLOGY (Clearwater, Fla.). Short course. For Information: National Ground Water Association, Education Department, 6375 Riverside Drive, Dublin, Ohio 43017. Phone: 614/761-1711. Fax: 614/761-3446)

November 1992–December 1993

REMOTE SENSING APPLICATIONS FOR EARTH SCIENCES (Enschede, The Netherlands). Annual short course organized by the International Institute for Aerospace Survey and Earth Sciences (ITC). Language: English. For Information: ITC Student Registration Office, P.O. Box 6, 7500 AA, Enschede, The Netherlands.

GEOLOGICAL TECHNIQUES (London, UK). Course designed to teach modern techniques to those technicians or trainee technicians who are or wish to become engaged in the geoscientific industry. Course aimed at those from the developing countries. For Information: J.R. Blount, Department of Geology, Royal School of Mines, Imperial College, Prince Consort Road, London SW7 2BP, UK.

HYDROLOGY (Brussels, Belgium). One-year diploma course and two-year Master's degree course under Inter-university Postgraduate program. Fellowships available. Language: English. For Information: Prof. A. Van DerBeken. Programs in Hydrology, Free University, Pleinlaan 2, B-1050 Brussels, Belgium.

CONTINUING EDUCATION SEMINARS FOR ENGINEERS, MANAGERS, AND TECHNICIANS OF OIL, OIL-CONCERNED, AND RELATED INDUSTRIES. Conducted by the Petroleum Exploration Center, ENSPM-Formation Industries. For Information: ENSPM-Centre d'Exploration Petroliere, ENSPM-Formation Industries, 4 Avenue de Bois-Preau, 92500 Rueil-Malmaison, France.

October 14–18

GEOLOGY OF SANDSTONE FORMATIONS (Spanish Pyrenees). Language: French.

October 21–25

CASED HOLE LOGGING (Rueil-Malmaison). Language: French (English, if number of participants allows).

November 4–8

INTRODUCTION TO THE PRACTICE OF FORMATION EVALUATION (Rueil-Malmaison). Language: French (English, if number of participants allows).

November 18-22

GEOLOGY AND GEOPHYSICS FOR THE RESERVOIR ENGINEER (Rueil-Malmaison). Language: French (English, if number of participants allows).

December 2-13

WELL LOG ANALYSIS (Rueil-Malmaison). Language: French (English, if number of participants allows).

MINING MANAGEMENT (Kensington, New South Wales, Australia). Master's and graduate diploma degrees in Mining Management, as well as individual short courses. (Courses may be presented at other locations by arrangement.) For Information: Dr. Mike Katz, Associate Director, International Key Center for Mines, University of New South Wales, P.O. Box 1, Kensington NSW 2033, Australia.

PROFESSIONAL DEVELOPMENT SEMINARS IN MINERAL ENGINEERING AND MINERAL ECONOMICS. Conducted by the Department of Mining and Metallurgical Engineering, McGill University. Language: English. For Information: Lorna McFadden, Department of Mining and Metallurgical Engineering, McGill University, 3480 University Street, Montreal, Quebec H3A 2A7, Canada.

SHORT COURSES IN PETROLEUM GEOLOGY AND RELATED DISCIPLINES. Conducted by IHRDC. Language: English. For Information: IHRDC Instructional Programs, 535 Boylston Street, Boston, MA 02116, USA.

SWEDISH INTERNATIONAL UNIVERSITY CONSORTIUM (Stockholm, Sweden). Master's degree programs lasting three semesters, including a Master's thesis project. Courses in applied Geophysics and Geochemistry at Lulea. Language: English. For Information: Dr. Bjorn Ohlander, Economic Geology, Lulea University of Technology, S-951 Lulea, Sweden.

TWAS ITALIAN AWARDS SCHEME. A series of grants for developing-country geoscientists of proven ability to work and study for periods up to 10 months at the following Italian universities: Florence, Milan, Padua, Pisa, Rome, Trieste, Turin, and CNR Pisa. For Information: Executive Secretary, Third World Academy of Sciences, International Centre for Theoretical Physics, P.O. Box 586, Strada Costiera 11, I-34100 Trieste, Italy.

WEDC (Water, Engineering and Development Centre). Concerned with urbanization and urban infrastructure. Courses offered range in duration from 6 weeks to 12 months, deal with a wide variety of water, engineering, developmental, environmental, and management topics, and lead to certificates, diplomas, or MSc degrees. For Information: Professor John Pickford, WEDC, Loughborough University of Technology, Leicestershire LE11 3TU, UK. Phone: 0(44) 509 222390; telex: 34319 UNITECG; fax: 0(44) 509 610231.

THE ROBERTSON GROUP plc, Llandudno, Gwynedd, UK, attention: Dr. C.J. Burgess, Manager, Petroleum Training Centre. Phone: 44(0) 492 581811; fax: 44(0) 492 583416; telex: 61216 ROBRES G.

U.S. GEOLOGICAL SURVEY, Office of International Geology, Training Section, 917 National Center, Reston, Virginia 22092. USA.

KALENDAR (CALENDAR)

1992

August 24–September 3

INTERNATIONAL GEOLOGICAL CONGRESS (29th), Kyoto, Japan. (Dr. Tadasahi Sato, Chairman, Japanese National Committee on Geology, Inst. of Geoscience, The University of Tsukuba, Ibaraki 305, Japan)

August 31–September 2

LARGE METEORITE IMPACTS AND PLANETARY EVOLUTION (International Conference), Sudbury, Ontario, Canada. (Sudbury 1992, c/o B. Dressler, Ontario Geological Survey, 77 Grenville St., Toronto, Ontario M7A 1W4, Canada. Phone: (416) 965-4817; telefax: (416) 324-4933)

September 11–20

GERMAN MINERALOGICAL SOCIETY, anniversary meeting, Tübingen, Germany. (P. Metz, Petrographisches Institut der Universität Tübingen, Wilhelmstrasse 56, 7400 Tübingen, Germany)

September 12–15

ASSOCIATION OF EARTH SCIENCE EDITORS, ann. mtg., Glacier National Park, Whitefish, Mont. (H.L. James, Montana Bureau of Mines and Geology, Butte, 59701. Phone: 406/496-4175)

September 13–18

DOLOMITES, mtg., Banff, Alberta, by University of Alberta and Canadian Society of Petroleum Geologists. (Pat Larlham, Faculty of Extension, University of Alberta, Edmonton, Alberta T6G 2G4. Phone: 403/492-5038. Fax: 403/492-1857)

September 13–18

GEOSTATISTICS, mtg., Troia, Portugal. (Amilcar Soares, Centro de Valorizacão de Recursos Minerais, IST Av. Rovisco Pais, 1096 Lisbon, Portugal. Fax: 351/1-8486935)

September 21–25

PALEOCEANOGRAPHY-GLOBAL CHANGE (4th International Conference), Kiel, FRG. (ICP IV Organizing Committee, c/o GEOMAR, Wischhof-strasse 1-3/Bldg., 4, D-2300 Kiel 14, FRG)

September 22–28

MODERN CLASTIC DEPOSITIONAL ENVIRONMENTS, field mtg., Columbia, S.C., Charleston, S.C., and Wilmington, N.C. (American Association of Petroleum Geologists, Education Department, Box 879. Tulsa, Okla. 74101-0979. Phone: 918/584-2555. Fax: 918/584-0469) Fee: \$1,685 (includes guidebook, transportation, and some meals).

September 25–30

LOW-K SILICIC MAGMAS IN SUBDUCTION SETTINGS, a GSA Penrose Conference, Chelan, Wash. Games S. Beard, Virginia Museum of Natural History, Martinsville, Va. 24112. Phone: 703/666-8611)

September 27–October 1

AMERICAN INSTITUTE OF PROFESSIONAL GEOLOGISTS, ann. mtg., Lake Tahoe, Nev. (Jon Price, MPG, Box 665, Carson City, Nev. 89702. Phone: 702/784-6691)

September 28–30

PETROLEUM-INDUSTRY DATA EXCHANGE, mtg., New Orleans. (American Petroleum Institute, 1220 L St. N.W., Washington D.C. 20005. Phone: 202/682/8000)

October 2–6

SUDBURY-NORIL'SK NICKEL CAMPS, symposium, Sudbury, Ontario (A.J. Naldrett, Dept. of Geology, University of Toronto, Toronto, Ontario, M5S 3B1. Fax: 416/978-3938)

October 2–9

ASSOCIATION OF ENGINEERING GEOLOGISTS, ann. mtg., Long Beach, Calif. (John W. Beyer, 444-A E. Broadway, Glendale, Calif. 91205. Phone: 818/549-9959. Fax: 818/242-2442)

October 4–7

SOCIETY OF PETROLEUM ENGINEERS, ann. mtg., Washington, D.C. (SPE, Box 833836, Richardson, Texas 75083-3836. Phone: 214/669-3377. Fax: 214/669-0135)

October 4–9

FLUID/VOLCANO INTERACTIONS, GSA Penrose Conference, Warm Springs, Ore. (Steve Ingebritsen, USGS, MS 439, 345 Middlefield Road, Menlo Park, Calif. 94025. Phone: 415/329-4422. Fax: 415/329-4463)

October 14-30

DAMSAFETY, int'l. seminar and tour, Denver, Las Vegas, Nev., and Phoenix, Ariz., by American Water Foundation, and U.S. Bureau of Reclamation. (AWF, 1616 17th St. Denver, 80202. Phone: 303/628-5516. Fax: 303/628-5469) Fee: members, \$1,700; non-members, \$1,800.

October 17-22

HYDROLOGY AND HYDROGEOLOGY, mtg., Portland, Ore. (American Institute of Hydrology, 3416 University Ave. S.E., Minneapolis, 55414-3328. Phone: 612/279-1030)

October 18-23

LATE PRECAMBRIAN TECTONICS AND THE DAWN OF THE PHANEROZOIC, GSA Penrose Conference, Death Valley, Calif. (Ian W.D. Dalziel, Institute for Geophysics, University of Texas, Austin, 78759-8345. Phone: 512/471-6156. Fax: 512/471-8844)

October 19-21

BIO-LEACHING MINERALS AND MINERAL-LAND RECLAMATION, mtg. and workshop, Sacramento, Calif. (Yung Sam Kim, Nevada Institute of Technology, Box 8894, Campus Station, Reno, Nev. 89507. Phone: 702/673-4466)

October 25-30

IN-SITU MINERALS RECOVERY, mtg., Santa Barbara, Calif. (Engineering Foundation, 345 E. 47th St., New York, 10117. Phone: 212/705-7835. Fax: 212/705-7441)

October 26-28

EXTRACTIVE METALLURGY OF GOLD AND BASE METALS, int'l. mtg., Kalgoorlie, Western Australia. (V.N. Misra, Kalgoorlie Metallurgical Laboratory, Box 881, Kalgoorlie, 6430, Australia. Phone: (090) 220 120. Fax: (090) 912 762) Papers invited.

October 26-29

GEOLOGICAL SOCIETY OF AMERICA (Annual Meeting), Cincinnati, Ohio, USA. (Jean Kinney, GSA Headquarters, P.O. Box 9140, Boulder, Colo. 80301, USA. Phone: (303) 447-2020).

November 8-13

WATER RESOURCES AND ENVIRONMENTAL ENGINEERING, mtg., Santa Barbara, Calif. (C.V. Freiman, Engineering Foundation, 345 E. 47th St., New York, 10017. Phone: 212/705-7835. Fax: 212/705-7441)

November 29-December 2

TECTONIC FRAMEWORK AND ENERGY RESOURCES, mtg., Kuala Lumpur, Malaysia. (Secretariat, c/o Dept. of Geology, University of Malaya, 59100 Kuala Lumpur, Malaysia)

November 30-December 3

OFFSHORE SOUTHEAST ASIA, mtg., Singapore. (Society of Petroleum Engineers, Box 833836, Richardson, Texas 75083-3836. Phone: 214/669-3377. Fax: 214/669-0135)

December 28-31

GEODYNAMICS OF THE ARABIAN LITHOSPHERE, int'l. mtg., Baghdad. (Sahil Alsinawi, Dept. of Geology, College of Science, University of Baghdad, Jadiryah, Iraq)

1993

April 17-20

EXPLORATION AND DISCOVERY, mtg., Denver, by Society of Economic Geologists, Society of Exploration Geophysicists, and others. (J. Alan Coope, SEG Conference '93, Box 571, Golden, Colo. 80402. Phone: 303/837-5819. Fax: 303/837-5851)

April 25-28

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, ann. mtg., New Orleans. (AAPG, Box 979, Tulsa, Okla. 74101-0979. Phone: 918/584-2555. Fax: 918/584-0469)

May 16-20

ENVIRONMENTAL HYDROLOGY AND HYDROGEOLOGY, mtg., Washington, D.C. (Secretariat, American Institute of Hydrology, Second USA/USSR Conference, 3416 University Ave. S.E., Minneapolis, 55414-3328. Phone: 612/379-1030. Fax: 612/379-0169)

May 17-19

GEOLOGICAL ASSOCIATION OF CANADA/ MINERALOGICAL ASSOCIATION OF CANADA (Joint Annual Meeting), Edmonton, Alberta, Canada. (J.W. Kramers, Alberta Geological Survey, P.O. box 8330, Station F, Edmonton, Alberta T6H 5X2, Canada. Phone: (403) 438-7644; telefax: (403) 438-3644)

May 25–June 15

BASIN TECTONIC AND HYDROCARBON ACCUMULATION, mtg., Nanjing, People's Republic of China, by Nanjing University. USGS, Society of Petroleum Geology of China, and others. (David G. Howell, MS902, USGS, 345 Middlefield Road, Menlo Park, Calif. 94025. Phone: 415/329-5430. Fax: 415/354-3224)

June 1–5

GEOTECHNICAL ENGINEERING, int'l. mtg., St. Louis. (Norma R. Fleming, 119 ME Annex, University of Missouri, Rolla, 65401-0249. Phone: 314/341-6061; 800/752-5057. Fax: 314/341-4992)

June 7–11

EUROPEAN ASSOCIATION OF EXPLORATION GEOPHYSICISTS (55th Annual Meeting and Exhibition), Forum, Stavanger, Norway. (Evert van der Gaag, Business Manager, European Association of Exploration Geophysicists, Utrechtseweg 62, NL-3704 HE Zeist, The Netherlands. Phone: (03404) 56997)

June 20–27

ZEOLITES, int'l. mtg., Boise, Idaho, by International Committee on Natural Zeolites. (F.A. Mumpton, Dept. of Earth Sciences, State University of New York, Brockport, 14420. Phone: 716/395-2635; 716/637-2324. Fax: 716/395-2416)

June 21–25

ROCK ENGINEERING, mtg. and workshop, Lisbon, Portugal, by International Society for Rock Mechanics. (Luis Ribeiro e Sousa, Portuguese Society for Geotechnique, Laboratorio Nacional de Engenharia Civil, Av. do Brasil, 101, 1799 Lisboa Codex Portugal. Phone: 848 21 31. Fax: 89 76 60)

July

ENVIRONMENTAL CONTEXT OF HUMAN EVOLUTION (International Scientific Congress and Exhibition), The Netherlands and Indonesia. (Dr. Hans Beijer, Geological Survey of The Netherlands, P.O. Box 157, NL-2000 AD Haarlem, The Netherlands. Telefax: 31 23 351614)

July 18–23

CLAY CONFERENCE (10th International Conference in conjunction with Commission VII of the International Soil Science Society), Adelaide, South Australia. (Dr. Tony Eggleton, Geology Department, ANU, GPO Box 4, Canberra, ACT 2601, Australia)

August 23–29

GEOMORPHOLOGY (3rd International Conference), Hamilton, Ontario, Canada. (3rd International Conference on Geomorphology, McMaster University, Hamilton, Ontario L8S 4K1, Canada. Phone: (416) 525-9140, ext. 4535; telefax: (416) 546-0463; telex: 061-8347)

August 23–29

COASTAL SEDIMENTOLOGY, mtg., Hamilton, Ontario. (William F. Tanner, Dept. of Geology B-160, Florida State University, Tallahassee, 32306. Phone: 904/644-3208)

September 25–October 1

INTERNATIONAL ASSOCIATION OF VOLCANOLOGY AND CHEMISTRY OF THE EARTH'S INTERIOR, mtg., Canberra, Australia. (IAVCEI ACTS, GPO Box 2200, Canberra ACT 2601, Australia. Phone: 61/6/257-3299. Fax: 61/6/257-3256)

1994

June 6–10

EUROPEAN ASSOCIATION OF EXPLORATION GEOPHYSICISTS (56th Annual Meeting and Exhibition), Austria Center, Vienna, Australia. (Evert Van der Gaag, Business Manager, European Association of Exploration Geophysicists, Utrechtseweg 62, NL-3704 HE Zeist, the Netherlands. Phone: (03404) 56997; telefax (03404) 62640; telex: 33480)

1995

May 29–June 2

EUROPEAN ASSOCIATION OF EXPLORATION GEOPHYSICISTS (57th Annual Meeting and Exhibition), Glasgow, UK. (Evert van der Gaag, European Association of Exploration Geophysicists, Utrechtseweg 62, NL-3704 HE Zeist, The Netherlands. Phone: (03404) 56997; telefax: (03404) 62640; telex: 33480)

GEOLOGICAL SOCIETY OF MALAYSIA PUBLICATIONS

General Information

The Society publishes the *Buletin Geologi Malaysia* (Bulletin of the Geological Society of Malaysia) and the bimonthly *Warta Geologi* (Newsletter of the Geological Society of Malaysia).

Papers of general interest or on the geology of the Southeast Asian region (South China, Burma, Thailand, Indochina, Malaysia, Singapore, Indonesia, Brunei and the Philippines) and also marine areas within the region are welcome for publication in the *Buletin*. Short notes, progress reports and general items of information are best submitted to the *Warta Geologi*.

Papers should be as concise as possible. However, there is no fixed limit as to the length and number of illustrations. Therefore, papers of monograph length are also welcome. Normally, the whole paper should not exceed 30 printed pages and it is advisable that authors of papers longer than 30 printed pages should obtain the consent of the Editor before submission of the papers.

The final decision of any paper submitted for publication rests with the Editor who is aided by an Editorial Advisory Board. The Editor may send any paper submitted for review by one or more reviewers. Scripts of papers found to be unsuitable for publication may not be returned to the authors but reasons for the rejection will be given. The authors of papers found to be unsuitable for publication may appeal only to the Editor for re-consideration if they do not agree with the reasons for rejection. The Editor will consider the appeal together with the Editorial Advisory Board.

Unless with the consent of the Editor, papers which have been published before should not be submitted for consideration.

Authors must agree not to publish elsewhere a paper submitted to and accepted by the Society.

Authors alone are responsible for the facts and opinions given in their papers and for the correctness of references etc.

Twenty-five reprints of each paper are free-of-charge. Contributors should notify the Editor of extra reprints (which are of non-profit costs) required.

All papers should be submitted to the Editor, Geological Society of Malaysia, c/o Department of Geology, University of Malaya, 59100 Kuala Lumpur, MALAYSIA.

Script Requirements

Scripts must be written in Bahasa Malaysia (Malay) or English.

Two copies of the text and illustrations must be submitted. The scripts must be typewritten double-spaced on papers not exceeding 21 × 33 cm. One side of the page must only be typed on.

Figure captions must be typed on a separate sheet of paper. The captions must not be drafted on the figures.

Original maps and illustrations or as glossy prints should ideally be submitted with sufficiently bold and large lettering to permit reduction to 15 × 22 cm: fold-outs and large maps will be considered only under special circumstances.

Photographs should be of good quality, sharp and with contrast. For each photograph, submit two glossy prints, at least 8 × 12 cm and preferably larger. Use of metric system of measurements (ISU) is strongly urged wherever possible.

Reference cited in the text should be listed at the end of the paper and arranged in alphabetical order and typed double-spaced. The references should be quoted in the following manner:

Suntharalingam, T., 1968. Upper Palaeozoic stratigraphy of the area west of Kampar, Perak. *Geol. Soc. Malaysia Bull.*, 1, 1 – 15.

Hosking, K.F.G., 1973. Primary mineral deposits. In Gobbett, D.J. and Hutchison, C.S. (Eds), "*Geology of the Malay Peninsula (West Malaysia and Singapore)*". Wiley-Interscience, New York, 335 – 390.

The name of the book or publication must be *underlined* and will be later printed in italics.

A concise and informative *abstract* in English is required for each paper written in Bahasa Malaysia or English. A paper written in Bahasa Malaysia must have an abstract in Bahasa Malaysia as well.

For format, kinds of subheadings and general style, use this and the previous *Buletins* as a guide.

The final decision regarding the size of the illustrations, sections of the text to be in small type and other matters relating to printing rests with the Editor.

If authors have trouble over the script requirements, please write in to the Editor.

