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CATATAN GEOLOGI (GEOLOGICAL NOTES)

PENKAOLINAN TELERANG KUARZA: SATU CONTOH DARI SEREMBAN (KAOLINIZATION OF QUARTZ VEIN: AN EXAMPLE FROM SEREMBAN)

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Abstrak

Pengkaolinan telerang kuarza di kawasan tropika boleh terjadi melalui proses pengkayaan dan pengurangan relatif unsur reaktif in-situ. Cerapan di kawasan Seremban menunjukkan larutan luluhawa batuan dinding yang kaya dengan Al bertindakbalas dengan silika dalam telerang membentuk kaolinit.

Abstract

Kaolinization of quartz vein in tropical area may involve in-situ relative enrichment and depletion of weathering reactive elements. Observation from Seremban area indicates that Al rich weathering solution from wall rock reacts with silica in the quartz vein to form kaolinite.

Pengenalan

Mineral kuarza telah diterima umum merupakan kumpulan mineral silika yang paling tahan terhadap luluhawa sehingga hasilan luluhawa yang dijumpai sering mencirikan lapisan tanah yang kaya dengan butiran kuarza. Umpamanya hasilan luluhawa daripada batuan granit menunjukkan mineral alumino-silikat (felspar, mika dan amfibol) telah berubah menjadi mineral lempung sedangkan mineral kuarza masih mengekalkan mineraloginya dalam bentuk hablur kuarza tulin. Beberapa telerang kuarza yang besar, umpamanya korok kuarza yang merejah batuan granit di kawasan Gombak, utara Kuala Lumpur menunjukkan perbezaan jasad timbul yang ketara, dan ini jelas menggambarkan ketahanannya terhadap kadar luluhawa.

Semasa berkerja di lapangan, kami telah menemui beberapa 'telerang kaolin' yang bersaiz antara beberapa mm hingga beberapa cm, di bahagian tengah Semenanjung Malaysia, terutama di dalam Formasi Semantan, di beberapa lokaliti sepanjang lebuh raya Kuala Lumpur - Karak dan Timur - Barat, dan baru-baru ini di kawasan Seremban. Kehadiran telerang kaolin pada beberapa lokaliti yang ditemui merupakan satu fenomena yang menarik dan kurang biasa dari segi kedudukan geologi. Di kawasan Seremban kami berpeluang membuat cerapan terperinci, dan daripada bukti lapangan didapati telerang ini telah terbentuk daripada perubahan telerang kuarza hasilan proses luluhawa.

Telerang kaolin di Seremban

Telerang kaolin yang dijumpai di barat bandar Seremban berasosiasi dengan satu kompleks korok kuarza berkelebaran antara 20 hingga 30 m, berjurus sekitar 130° , dan dipercayai mempunyai kaitan dengan jalur sesar Kuala Lumpur - Mersing. Kedudukan kawasan cerapan dan deratan rentas korok kuarza ini ditunjukkan pada Rajah 1.

Berdasarkan sifat potong-memotong dan cirian lain di lapangan, kompleks korok kuarza ini terbentuk daripada sekurang-kurangnya tiga generasi rejahan. Keseluruhan badan korok kuarza terbentuk daripada rejahan kuarza generasi pertama (K1). Korok ini mempunyai kelebaran sekurang-kurangnya 15 m dan berjurus sekitar 135° . Korok ini bersifat masif, berwarna putih-kelabu kemerahan, berbutir halus dan berkandungan bendasing yang relatif tinggi. Pada beberapa bahagian K1 menunjukkan tanda ricihan sehingga membentuk zon kuarza terbreksi.

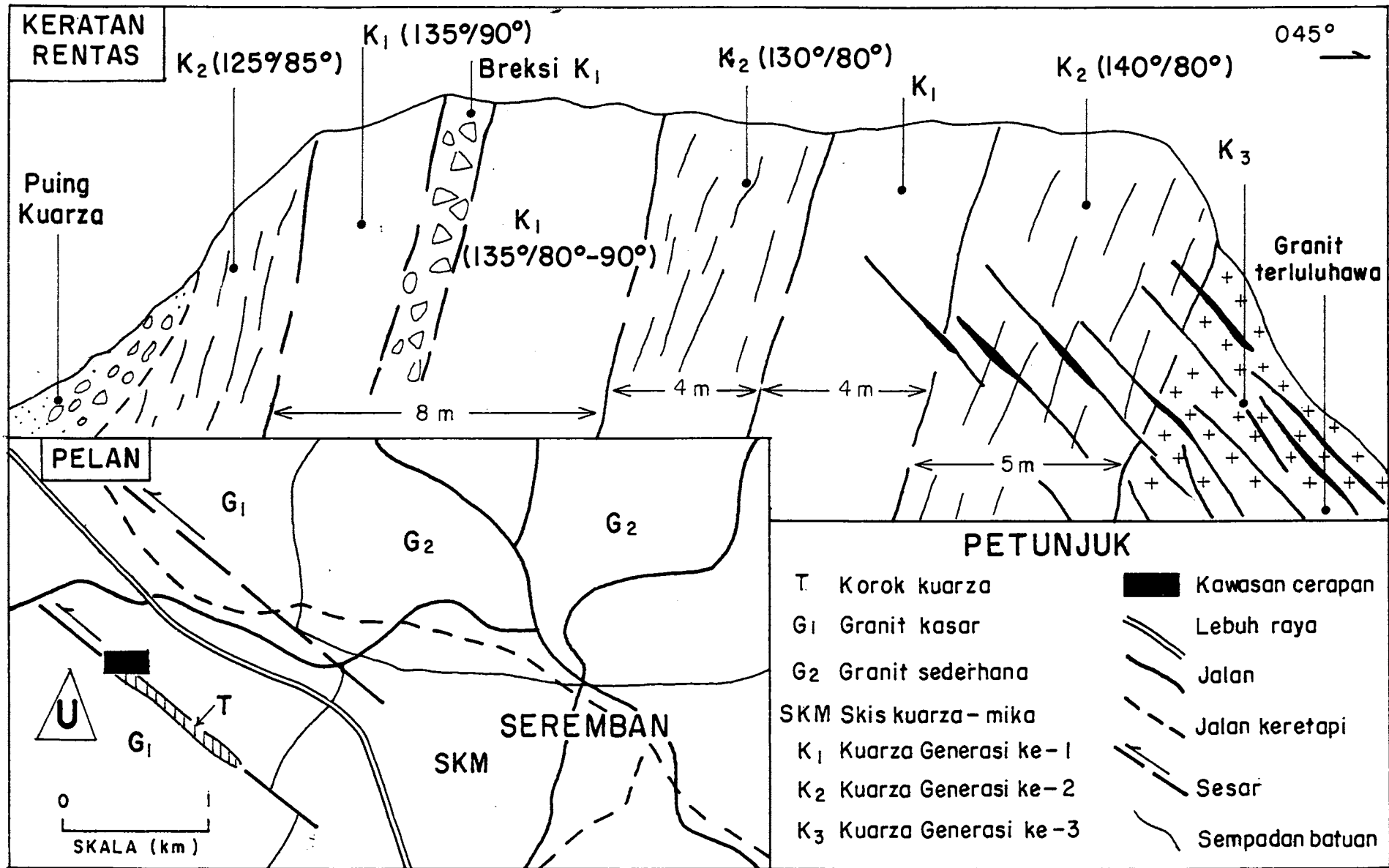
Korok kuarza generasi kedua (K2) umumnya merejah korok K1 pada beberapa bahagian yang berasingan. Korok ini berjurus antara 120° hingga 145° , dan setiap satunya berketebalan boleh mencapai 5 m. Korok K2 berekahan sederhana, berwarna putih cerah, berbutiran kasar dan kurang kandungan bendasing. Telerang kuarza generasi ketiga (K3) merejah kedua-dua korok K1 dan K2 pada berbagai arah. Bagaimanapun, ia menunjukkan satu arah dominan berjurus dan kemiringan $280^{\circ}/70^{\circ}$, dan umumnya bersaiz nipis (beberapa mm hingga beberapa cm). Pada bahagian sisi kompleks korok kuarza, korok K3 turut merejah batuan dinding dalam bentuk korok tunggal atau bercabang mengikut arah tidak menentu. Korok ini bersifat kriptohabluran, berwarna putih sebam dan kelihatan lebih tulin. Batuan dinding yang bersentuhan dengan kompleks korok kuarza ini terdiri daripada granit biotit berbutir kasar dan telah terluluhawa ke peringkat sederhana hingga tinggi.

Pengkaolinan

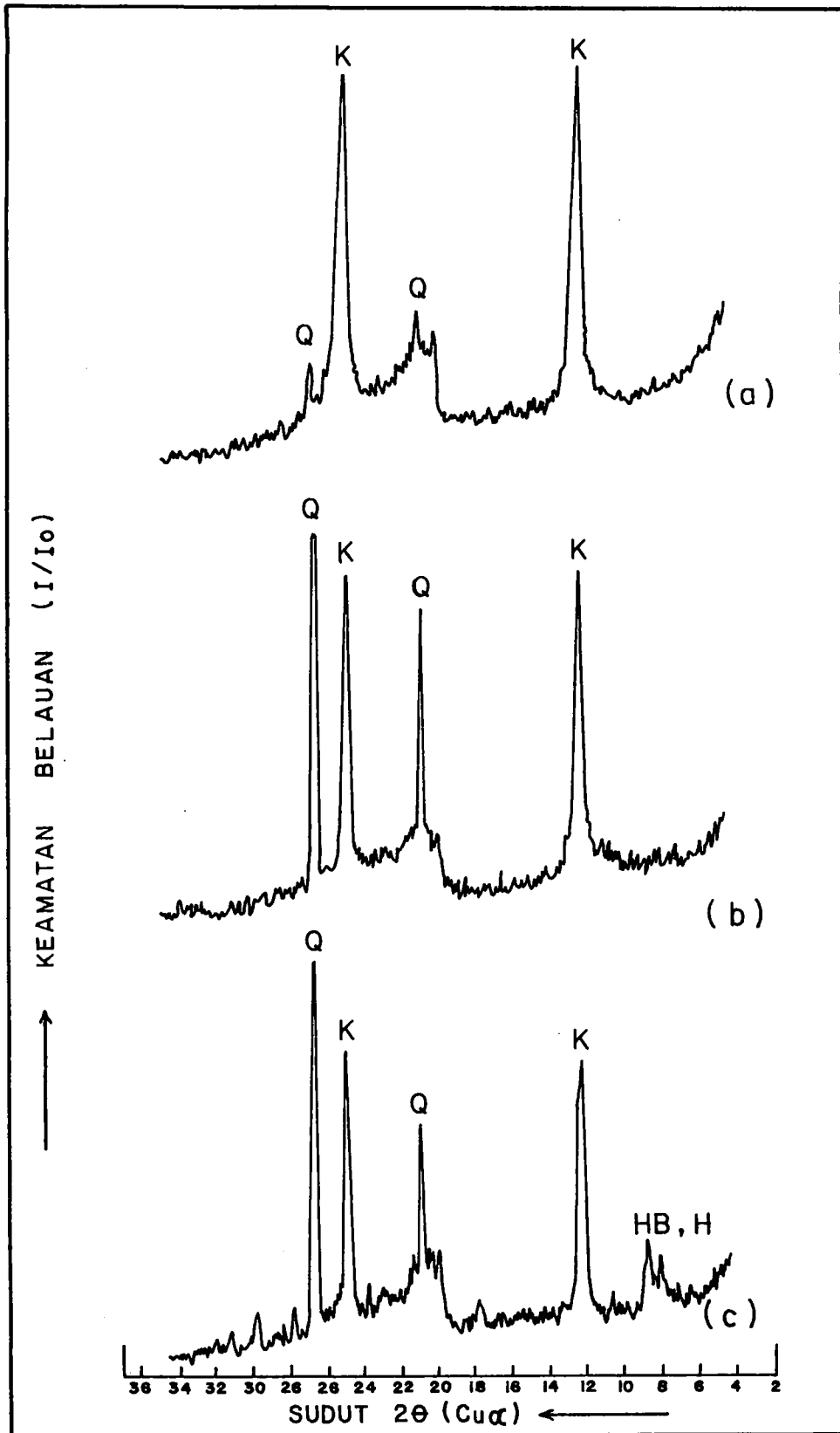
Kebanyakan telerang kaolin yang ditemui di sekitar kompleks korok kuarza ini tertumpu kepada hasil proses luluhawa telerang kuarza generasi ketiga yang bersentuhan dengan batuan dinding. Di lokaliti ini juga, cerapan dapat dilakukan mengenai peringkat perubahan dari telerang kuarza tulin ke kaolin.

Beberapa sampel bahan hasil luluhawa telerang K3 dan batuan dinding terluluhawa telah dikaji sifat mineralogi dengan kaedah belauan sinar-X. Sampel hasil luluhawa telerang K3 menunjukkan hampir keseluruhan komponen mineralnya terdiri daripada kaolinit. Kuarza wujud dalam jumlah yang sangat kecil dan boleh dianggap sebagai mineral surihan. Sampel batuan dinding (granit terluluhawa) pula menunjukkan kuarza dan kaolin sebagai komponen mineral utama, dengan gipsit sebagai mineral surihan (lihat Rajah 2a dan b).

Berdasarkan hasil di atas, satu perubahan kimia boleh berlaku seperti yang telah diringkaskan dalam Jadual 1. Perubahan kimia yang terjadi pada hasil luluhawa telerang kuarza ialah pertambahan Al dan air serta pengurangan kandungan silika. Perubahan pada batuan dinding pula tidak menunjukkan perubahan cirian penambahan unsur-unsur yang ketara, atau dengan lain perkataan perubahan yang terjadi mengikut satu trend



Rajah 1. Peta lokaliti dan keratan rentas kompleks korok kuarza di Seremban.



Rajah 2. Keamatan puncak pada 7.13A dan 3.57A untuk kaolinit (K) dan puncak 3.43A dan 4.26A untuk kuarza digunakan untuk menentukan kelimpahan relatif kaolinit dan kuarza hasilan luluhawa. Hidromika (HB) dan haloisit (H) merupakan mineral surihan yang terdapat dalam satu sampel. (a) hasilan luluhawa telerang kuarza, Seremban, (b) hasilan luluhawa batuan dinding, Seremban, dan (c) hasilan luluhawa korok kuarza, Gombak, utara Kuala Lumpur.

Jadual 1. Perbandingan kandungan kimia mineral utama dalam batuan dinding dan telerang kuarza sebelum dan selepas proses luluhawa.

Bahan induk	Kandungan Kimia bahan induk utama	Kandungan Kimia hasilan luluhawa
Telerang kuarza	SiO ₂	Si ₂ O ₅ Al ₂ (OH) ₄
Batuan dinding (granit biotit)	SiO ₂ KAlSi ₃ O ₈ NaAlSi ₃ O ₈ CaAl ₂ Si ₂ O ₈ K(Fe, Mg) ₃ AlSi ₃ O ₁₀ (OH) ₂	SiO ₂ Si ₂ O ₅ Al ₂ (OH) ₄

proses luluhawa kimia yang lazim pada batuan granit di kawasan tropika (lihat Kardinal Kusnaeny, 1973). Keadaan ini menjelaskan, pengkaolinan telerang kuarza hanya boleh berlaku dengan kemasukan Al dan air dari sekitaran luarnya, dalam kes ini batuan dinding.

Proses pengkaolinan boleh berlaku dengan beberapa cara. Pertama, proses yang terjadi melibatkan pengisian rekahan oleh larutan yang kaya dengan bahan pembentuk kaolinit. Larutan membentuk kaolinit ini boleh berpunca dari proses eksogen (hasilan nyahlarut proses luluhawa), atau berpunca dari proses endogen (cairan hidroterma). Kedua, proses yang melibatkan pengkayaan dan pengurangan relatif unsur reaktif *in-situ*. Daripada bukti lapangan dan kajian mineralogi, pengkaolinan di kawasan cerapan menunjukkan keadaan yang terjadi lebih bersesuaian dengan proses yang kedua ini.

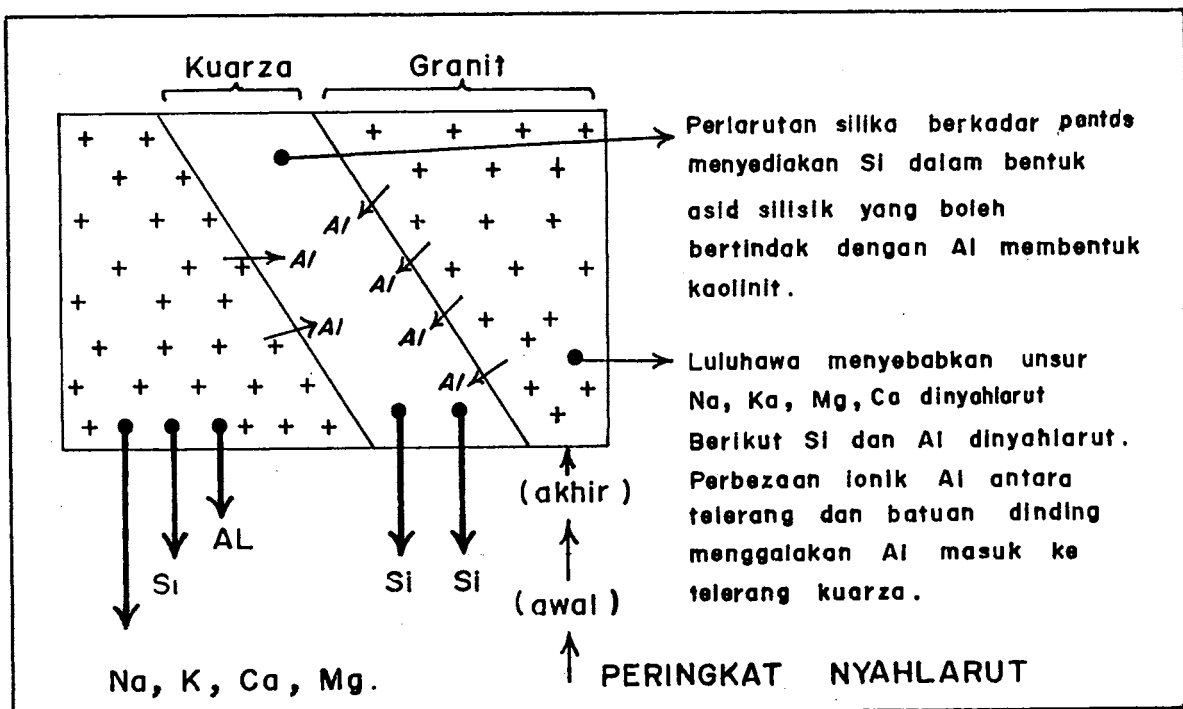
Penjelasan mengenai proses pengkayaan dan pengurangan relatif unsur reaktif *in-situ* diringkaskan pada Rajah 3. Di peringkat awal proses luluhawa, penguraian mineral melibatkan proses pertukaran ion dan nyahlarut unsur alkali (Na, K, Ca, Mg). Pada peringkat berikutnya, dengan keadaan pH yang lebih rendah berlaku pula pelarutan silika dan membentuk asid silisik (Jenny, 1980). Proses pelarutan ini tidak sahaja berlaku pada batuan dinding tetapi aktif terjadi pada telerang kuarza. Proses ini penting kerana perubahan silika kepada asid silisik boleh menyediakan medium silika yang aktif untuk bertindakbalas.

Sebahagian daripada silika dalam bentuk asid silisik akan dinyahlarut, dan keadaan ini membolehkan pengkayaan relatif Al berbanding dengan kandungannya pada batuan asal (batuan dinding). Pembentukan asid silisik dalam system (telerang kuarza dan batuan dinding) akan menurunkan pH sistem, dan keadaan ini menggalakkan Al masuk ke dalam larutan luluhawa. Oleh kerana kandungan asal telerang kuarza tidak terdapat Al, perbezaan keupayaan ion Al di antara telerang dan batuan dinding menjadi tinggi. Keadaan ini membolehkan sebahagian besar Al dari batuan dinding memasuki telerang. Memandangkan kedua-dua Al dan silika dalam bentuk yang aktif, tindakbalas selanjutnya cenderung menghasilkan kaolinit.

Fenomenon pembentukan kaolin daripada telerang kuarza juga dapat dikesan di korok kuarza di kawasan Gombak, utara Kuala Lumpur. Kajian mineralogi terhadap satu sampel hasil luluhawa korok kuarza di sini mendapati, di samping kaolinit dan kuarza, surihan mineral-mineral seperti hidromika dan haloisit turut dijumpai (lihat Rajah 2c). Kehadiran beberapa mineral lempung ini menjelaskan bukan sahaja unsur Al, tetapi unsur seperti Mg dan K turut sama memasuki telerang.

Kesimpulan

Kajian ini menunjukkan 'telerang kaolin' yang dijumpai di kawasan Seremban terbentuk dari hasil telerang kuarza melalui proses pengkayaan dan pengurangan relatif unsur reaktif *in-situ*. Proses ini melibatkan pengkayaan Al dalam telerang melalui kemasukan dari batuan dinding, dan pengurangan Si melalui nyahlarut. Al dan Si dalam larutan luluhawa ini bertindakbalas membentuk kaolinit.



Rajah 3. Ringkasan proses pengkayaan dan pengurangan unsur reaktif dalam pengkaolinan telerang kuarza.

Cerapan di kawasan Seremban dan jumpaan di beberapa tempat lain menunjukkan pembentukan kaolin daripada telerang kuarza boleh terjadi akibat proses luluhawa kimia di kawasan tropika. Kajian ini menunjukkan beberapa syarat perubahan diperlukan. Pertama, telerang kuarza harus bersifat kriptohabluran untuk mudah dilarutkan membentuk asid silisik. Kedua, batuan dinding perlu mengandungi kuantiti Al yang tinggi. Ketiga, keadaan pH yang sesuai untuk membolehkan berlakunya pelarutan silika dan seterusnya membolehkan Al masuk ke dalam larutan luluhawa.

Rujukan

Jenny, H., 1980. *The soil resources. Origin and behaviour*, Ecological Studies 37. Springer-Verlag, 95-110.

Kardinal Kusnaeny, 1973. Profil luluhawa batuan granit. *Sains Malaysiana*, 2(2), 105-149.

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THE SAN ANDREAS FAULT SYSTEM, CALIFORNIA

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Abstract

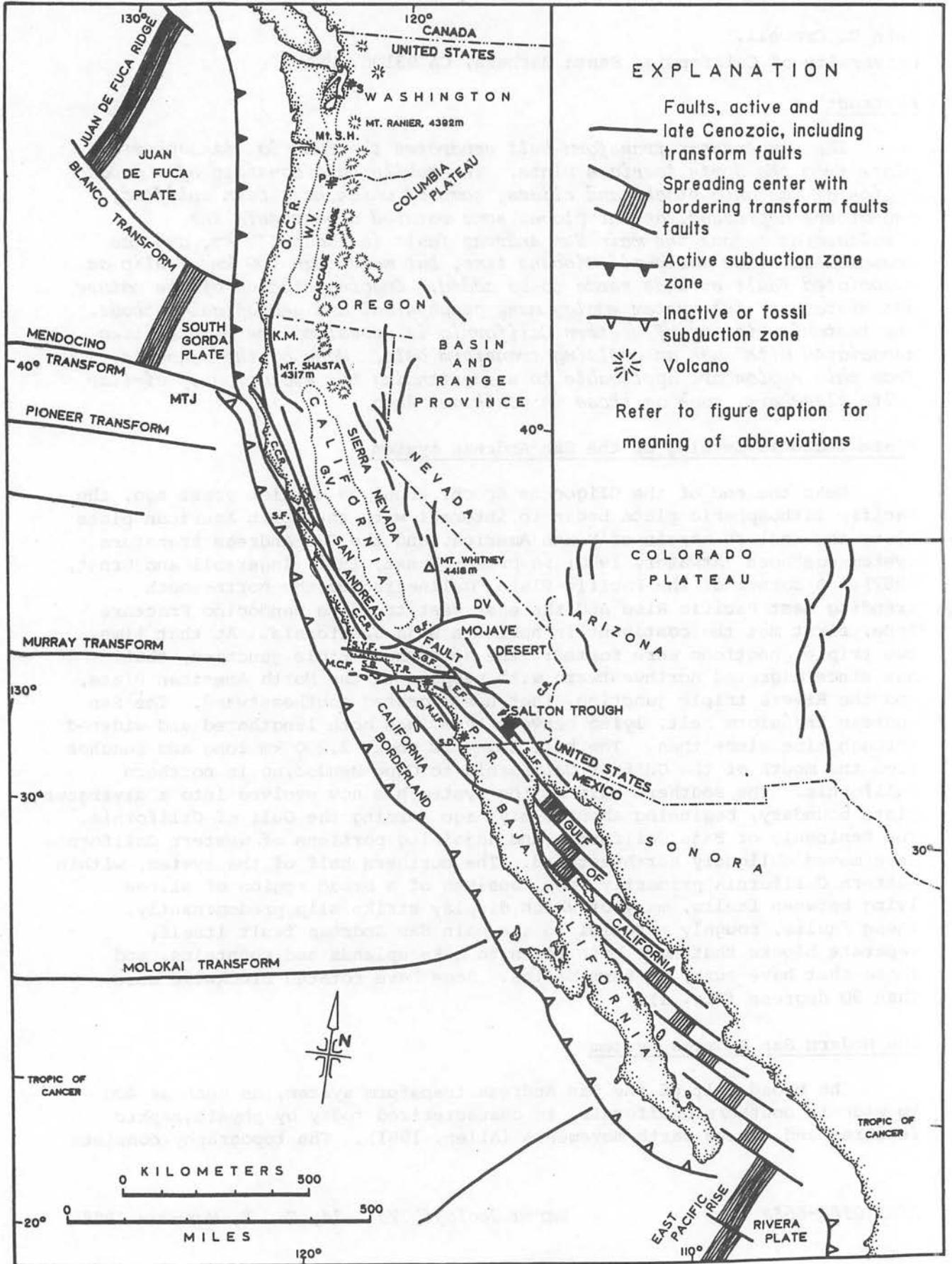
The San Andreas transform belt separates the Pacific lithospheric plate from the North American plate. The mobile belt consists of a broad region of tectonic blocks and slices, some of which have been uplifted, and others depressed, and at places some rotated clockwise. The displacement across the main San Andreas fault is about 330 km, and has accumulated since early-mid-Miocene time, but more than 100 km of slip on associated fault strands needs to be added. Ongoing studies of the nature and history of the system employ many geophysical and geological methods. The tectonic history of western California is revealing the complexities associated with such an evolving transform belt. Many of the concepts from this region are applicable to understanding the evolution of similar belts elsewhere, such as those in southeast Asia.

Plate tectonic setting of the San Andreas system

Near the end of the Oligocene Epoch, about 29 million years ago, the Pacific lithospheric plate began to interact with the North American plate along the western margin of North America, and the San Andreas transform system was born (Atwater, 1970; *in press*; Ernst, 1981; Ingersoll and Ernst, 1987). A corner of the Pacific Plate, delineated by the north-south trending East Pacific Rise and the east-west trending Mendocino Fracture Zone, first met the continent in northern Baja California. At that time, two triple junctions were formed: the Mendocino triple junction, that has since migrated northwestward with respect to the North American Plate, and the Rivera triple junction, that has migrated southeastward. The San Andreas transform belt, lying between them, has both lengthened and widened through time since then. The belt today is about 2,200 km long and reaches from the mouth of the Gulf of California to Cape Mendocino in northern California. The southern half of the system has now evolved into a divergent plate boundary, beginning about 5 m.y. ago forming the Gulf of California. The Peninsula of Baja California and adjoining portions of western California have moved obliquely northwestward. The northern half of the system, within western California primarily, now consists of a broad region of slices lying between faults, many of which display strike slip predominantly. These faults, roughly parallel to the main San Andreas fault itself, separate blocks that have both risen to make uplands and mountains, and those that have sunk, to form basins. Some have rotated clockwise more than 90 degrees (Fig. 1).

The Modern San Andreas System

The broad belt of the San Andreas transform system, as much as 400 km wide in southern California, is characterized today by physiographic features and active earth movements (Allen, 1981). The topography consists



Caption for Fig. 1. Tectonic sketch map of the westernmost United States and adjoining Mexico and Canada. Abbreviations: CCR = California Coast Ranges; CR = Colorado River; DV = Death Valley; EF = Elsinore Fault; GF = Garlock Fault; GV = Great Valley of California; KM = Klamath Mountains; LA = Los Angeles; MCF = Malibu Coastal Fault System; MTJ = Mendocino Triple Junction; Mt. SH = Mount St. Helens; NIF = Newport-Inglewood Fault; OCR = Oregon Coast Ranges; PR = Peninsular Ranges; S = Seattle; SB = Santa Barbara; SD = San Diego; SF = San Francisco; SGF = San Gabriel Fault; SJF = San Jacinto Fault; SYF = Santa Ynez Fault; TR = Transverse Ranges ; WV = Willamette Valley - Seattle Lowland. Map base simplified from Drummond, K.K., and others, 1981. Reproduced here courtesy of Editor, *Episodes*.

of high elongate mountain ranges, reaching up to elevations above sea level of 3,500 m, and continental areas with the surface at 68 m below sea level within the Salton Trough. The floors of offshore basins within the continental borderland beneath the Pacific Ocean, and part of the broad San Andreas belt, reach subsea depths of 2,000 m or more. Active tectonics determine the topography today, and the character of these tectonic land movements can largely be inferred from the shape of the landforms; these have been only slightly modified by erosion and deposition. At many places along the San Andreas fault proper, and other faults of the system, stream courses and landforms display right-lateral offsets. At places, the recurrence interval of these offsets has been investigated using carbon-14 dating of sequentially disturbed layers within sag ponds and alluvial deposits. North of Los Angeles, for example, 12 earthquakes have been identified with an average recurrence interval of about 145 years (Sieh, 1984).

The tectonic activity along the San Andreas belt is also shown by earthquakes and geodetic movements. California is earthquake country. The San Francisco Earthquake of 1906 is the most notable, but not a year goes by without some damage someplace along the belt from ground shaking. The Parkfield Earthquake of 1966 occurred on the San Andreas fault on its central reach, and another earthquake along this stretch of the fault is anticipated during the next year or so. As a consequence of this expectation, geoscientists are monitoring the region carefully, so that when the earthquake occurs, measurements of geophysical parameters and rock properties leading up to the earthquake, taking place during it, and following on after it, will provide a modern documentation of these changes. These data will help in understanding earthquake generating processes in general, and aid in eventual efforts to forecast earthquakes elsewhere.

Many of the earthquakes along the San Andreas system can be related to movements of the walls on identifiable faults that crop out at the surface. Others, however, occur on faults at depth that are not exposed. The Coalinga Earthquake of 1983, for example, resulted from displacements on hidden faults at depth, with first motions athwart those of San Andreas displacements discerned at the surface from offset geomorphic features and geodetic movements. At present, compression exists across the San Andreas fault along its central stretch as shown by growing folds and thrust faults

which are oriented nearly parallel to the fault. Stress measurements at depth within the Cajon Pass deep well, drilled for scientific purposes 3.6 km from the San Andreas, reveal very low shear strength along the fault and slightly convergent relative motion between the Pacific and North American plates (Zoback and others, 1987). In addition, the San Fernando Earthquake of 1971 occurred on a north-dipping thrust near the southern margin of the Transverse Ranges. These ranges, in turn are conceptually related to the impingement northward of the Peninsular Ranges at the marked bend in the San Andreas fault. The bend is viewed as a restraining bend with regard to major lithospheric plate movements accompanied by local compression in upper crustal layers.

Continuity of deformation and sedimentation

Deformation has gone on continuously since the birth of the San Andreas system. As regions have been elevated, they have shed debris into nearby basins. Sedimentation has therefore accompanied deformation, so that facies intertonguings are complex and display rapid changes from coarse strata into fine. During the deformation, not only uplift and depression have gone on, but tectonic rotation of blocks, including sedimentary and volcanic sequences, has taken place (Luyendyk and others, 1985).

The history of displacements along strands of the San Andreas system remains a subject of investigation. The active San Andreas fault today was born in mid-Miocene time and has acquired a displacement of about 330 km since its origin (Stanley, 1987; Crowell, 1979; Stewart and Crowell, *in press*). Much of its displacement is younger, however, and developed in the last 5 m.y. or so coincident with the opening of the Gulf of California. These post-mid-Miocene-displacements and their timings are shown by the offset of Miocene conglomerates from identifiable basement-rock source areas across faults, as well as by the offset of older stratal units, facies lines, and thickness lines. Portions of faults are interpreted as reactivated strike-slip faults that originated in Paleocene and Eocene time when oblique plate convergence prevailed along the margin of North America. Their original orientation and basic plate-tectonic cause are therefore not related to the meeting of the Pacific plate with the North American plate.

In recent years evidence from paleomagnetic investigations supplemented by geological studies (Luyendyk and others, 1985; Link and others, 1984; Crowell, 1985), show that tectonic blocks within the southern Coast Ranges, Transverse Ranges, California Borderland, and adjacent regions to the southeast, have been significantly rotated in a clockwise fashion. Apparently these blocks are caught in a gross simple-shear scheme and are rotated as the Pacific plate moves northwestward with respect to the North American plate. A tectonic picture is emerging in which tectonic blocks of the brittle upper crust are dislodged from the crust below upon low-angle discontinuities. Much of the ongoing research in western California is focussed on gathering data to understand such a picture. In these studies, deep reflection and refraction seismology is employed, and joined to data from teleseismic, paleomagnetic, borehole, and other geophysical and geological studies. In view of the wealth of data coming from these many approaches, California geoscientists hope to contribute significantly to the tectonic understanding of similar broad and complex transform belts elsewhere.

Reference

- Allen, C.R., 1981. The modern San Andreas fault. In Ernst, W.G., (ed.), *The geotectonic development of California*. Prentice-Hall, Inglewood Cliffs, New Jersey, p. 511-534.
- Atwater, Tanya, 1970. Implications of plate tectonics for the Cenozoic tectonic evolution of western North America. *Geological Society of America, Bull.* 81, p. 3513-3536.
- Atwater, Tanya, *in press*. Plate tectonic history of the northeast Pacific and western North America. In Winterer, E.L., Hussong, D.M., and Decker, R.W. (eds.), *The Eastern Pacific Ocean and Hawaii*, Boulder, Colorado, Geological Society of America, "The Geology of North America," v. N-3, *in press*.
- Crowell, J.C., 1979. The San Andreas fault system through time. *Geological Society of London, Journal*, v. 136, p. 293-302.
- Crowell, J.C., 1985. The recognition of transform terrane dispersion within mobile belts. In Howell, D.G. (ed.), *Tectonic terranes of the circum-Pacific region*: Circum-Pacific Council for Energy and Mineral Resources, Earth Science Series, no. 1, p. 51-62.
- Drummond, K.J., and others, 1981. Plate-tectonic map of the circum-Pacific region, northeast quadrant, *American Association of Petroleum Geologists Map*, Tulsa, Oklahoma.
- Ernst, W.G. (ed.), 1981. *The geotectonic development of California*, Prentice-Hall, Inglewood Cliffs, New Jersey, 706 p.
- Ingersoll, R.V., and Ernst, W.G. (eds.), 1987. *Cenozoic basin development of coastal California*. Prentice-Hall, Inglewood Cliffs, New Jersey, 496 p.
- Link, M.H., Squires, R.L. and Colburn, I.P., 1984. Slope and deep-sea fan facies and paleogeography of Upper Cretaceous Chatsworth Formation, Simi Hills, California. *American Association of Petroleum Geologists Bulletin*, v. 68, p. 950-873.
- Luyendyk, B.P., Kamerling, M.J., Terres, R.R. and Hornafius, J.S., 1985. Simple shear of southern California during Neogene time suggested by paleomagnetic declinations. *Journal of Geophysical Research*, v. 90, p. 12454-12466.
- Sieh, K.E., 1984. Lateral offset and revised dates of large pre-historic earthquakes at Pallett Creek, southern California. *Journal of Geophysical Research*, v. 89, p. 7641-7670.
- Stanley, R.G., 1987. New estimates of displacement along the San Andreas fault in central California based on paleobathymetry and paleogeography. *Geology*, v. 15, p. 171-174.

Stewart, J.H. and Crowell, J.C., *in press*. Strike-slip tectonics in the Cordilleran region, western United States. In Burchfiel, B.C., Lipman, P.W. and Zoback, M.L. (eds.), *The Cordilleran Orogen; Conterminous United States*: Boulder, Colorado, Geological Society of America, "The Geology of North America", v. G-3, *in press*.

Zoback, M.D., Zoback, M.L., Mount, V.S., Suppe, J., Eaton, J.P., Healey, J.H., Oppenheimer, D., Reasenber, P., Jones, L., Raleigh, C.B., Wong, I.G., Scotti, O., and Wentworth, C., 1987. New evidence of the state of stress of the San Andreas fault system, *Science*, v. 238, p. 1105-1111.

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PERTEMUAN PERSATUAN
(MEETINGS OF THE SOCIETY)

THE STRATIGRAPHY AND SEDIMENTOLOGY GROUP - REPORT ON THE
JERAM AND TUAN MEE ESTATE FIELDTRIP HELD ON 3RD APRIL, 1988

The trip to Jeram was attended by 12 members and 2 student members. Transport was made available by the Geology Department, University of Malaya van and the Geology Department, Universiti Kebangsaan Malaysia jeep. The group departed from the Geology Department, University of Malaya at 9.00 am and arrived in Jeram at about 10.00 am.

The group was rather lucky as the weather in Jeram was bright and sunny throughout the time the group was there.

Among the features studied by the group were the sedimentary characteristics of the "storm-beds" - a 0.5 metre thick shell bed, purported to be initiated by the 1920 storm event. Other features include various organic trails made by different organisms and ripple morphologies and their controls. Numerous organic build-ups were also observed, caused by the upward dwelling habit of some work species in shell-lined tubes.

The group was certainly an enthusiastic one with a lot of on-the-spot discussions, withstanding the rather searing mid-day coastal heat. On the whole, it was certainly an interesting trip (which resulted in a missing sample tin and one case of lost shoes) as it gave the chance for the members to observe, first hand, the sedimentological aspects of a modern-day tidal flat.

The group departed from Jeram at about 12.45 pm. Lunch-break was at 1.00 pm at Simpang Tiga.

The next stop by the group was the outcrop exposed at the road from Tuan Mee Estate to Batu Arang town. The group arrived at about 2.00 pm. Here, the group observed the "gravel beds" - thought to overlie the Oligocene-Miocene coal-bearing sequence in Batu Arang. The sedimentary features, bedding characteristics, clast-type and overall structure of the gravel beds were observed. The group also discussed the significance of these gravel beds and their relationship to the Tertiary history of Peninsular Malaysia.

The field-trip ended at about 3.30 pm.

Ann Yasmin,
Secretary,
GSM Stratigraphy & Sedimentology Study Group



Fig. 1. Mazlan (left) and Azim braving the current (and the mud!) in Jeram.

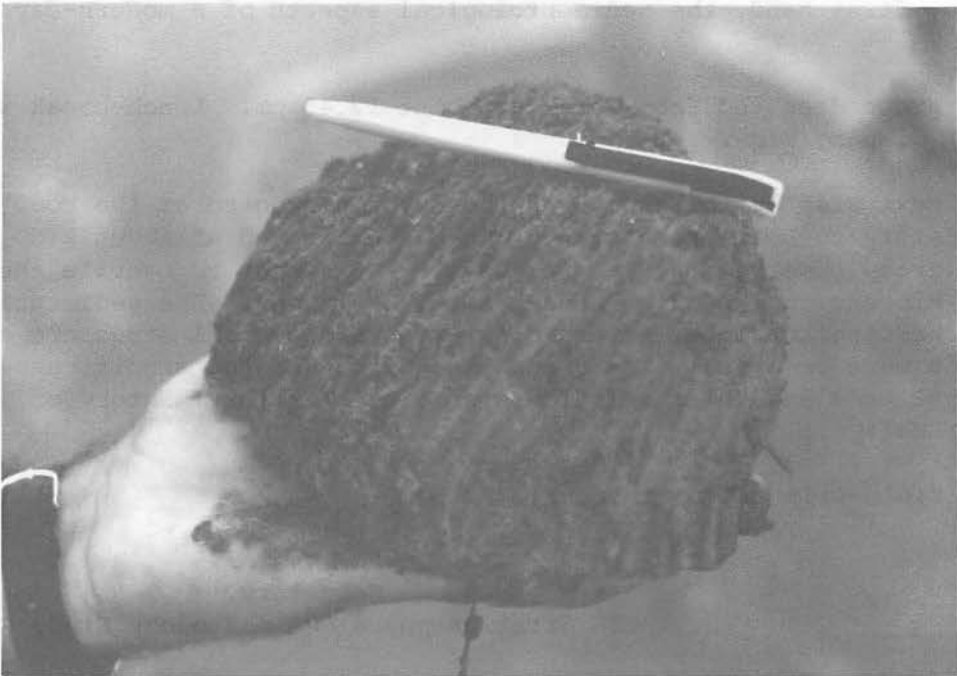


Fig. 2. A small specimen of a build-up caused by the upward dwelling habit of some worm-species, in Jeram.



Fig. 3. 'Gravel beds' outcropping at the Tuan Mee Estate, near Batu Arang.

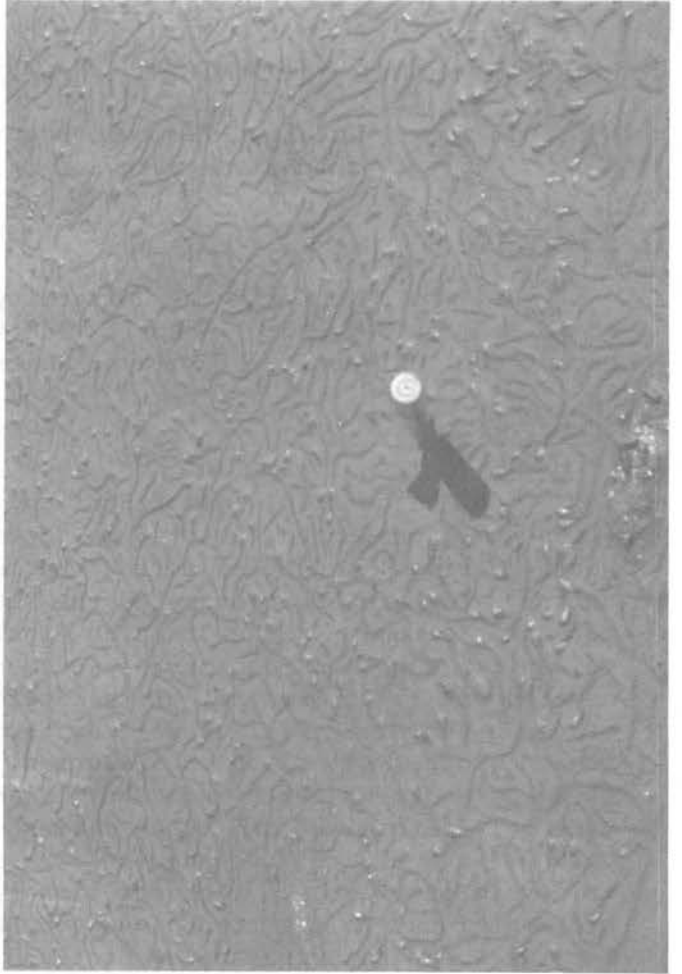
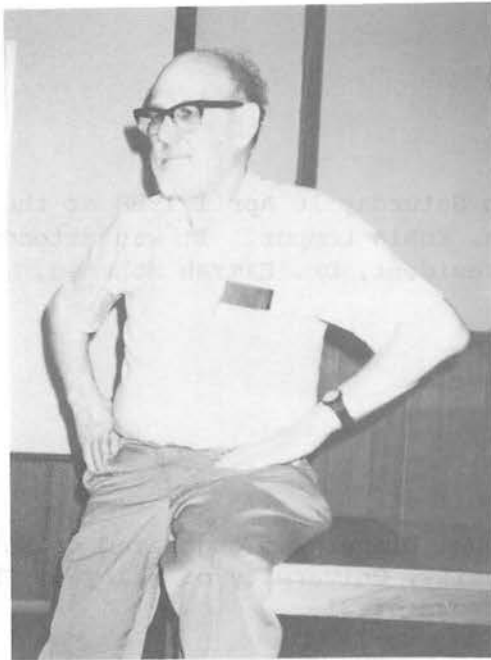


Fig. 4. Grazing trails exhibited by a group of high-spired gastropods (Jeram).



W.S. MCKERROW

CERAMAH TEKNIK (TECHNICAL TALK)

W.S. McKerrow: Silurian Tectonic setting of the Southern Uplands (and its comparison with Burma)

Report

Dr. Stuart McKerrow of University of Oxford, England, presented the above talk on Wednesday 13 April 1988 to a crowd of about 15 at the Geology Department, University of Malaya, Kuala Lumpur.

Summary

The Southern Uplands of Scotland consists of an accretionary prism which had a prolonged (over 45 Ma) development off the SE coast of ancient North America (Laurentia) during the late Ordovician and Silurian. To the north, a forearc basin occupied the Midland Valley. An arc massif of older metamorphic rocks in the Grampian Highlands, and capping calc-alkaline volcanics, supplied much of the sediment to the trench. In its early development (late Ordovician) the accretionary complex incorporated slivers of ocean-floor material as well as thick turbidites into a steep lower trench slope. Later, in the Silurian, a trench slope break emerged shedding sediment north into the Midland Valley forearc basin. By that time only turbidites and black shales were being accreted. The Southern Uplands is dominated by coherent strata, and, despite intense imbrication, is devoid of melange. The accretionary prism was the result of high sediment input to the trench and very slow, oblique, subduction of the Iapetus Ocean eastwards below Scotland. Decollement Surfaces developed during accretion preferentially utilised a highly incompetent black shale layer near the base of the subducting sequence. Prior to the inception of accretion (in the Caradoc), sediment subduction is postulated, and possibly subduction erosion, during the Cambrian and early Ordovician.

Azhar Hj. Hussin

ANNUAL GENERAL MEETING 1988

The Society's AGM 1988 was held on Saturday 16 April 1988 at the Geology Department, University of Malaya, Kuala Lumpur. It was attended by 18 members, and was chaired by the President, Dr. Hamzah Mohamad.

ANNUAL DINNER 1988

In conjunction with the AGM, an Annual Dinner was organized on Saturday 16 April 1988 at 7.45 pm at Rumah University, University of Malaya. The buffet dinner was attended by sizeable crowd of 31.

Geological Society of Malaysia

Annual Dinner 1988



PERSATUAN GEOLOGI MALAYSIA
(GEOLOGICAL SOCIETY OF MALAYSIA)

Minit Mesyuarat Agung Tahunan ke-21 telah diadakan di Jabatan Geologi, Universiti Kebangsaan Malaysia, Bangi pada jam 5.30 petang, Isnin 30hb Mac. 1987.

Mesyuarat Agung ini telah dijemput oleh Presiden Persatuan Geologi Malaysia, Dr. J.K. Raj.

Ahli yang hadir:

A. Aziz Hussin	Sayyadul Arafin
Ahmad Tajuddin Ibrahim	Seet Chin Peng
Anizan Isahak	Siti Zaayah Darus
Aw Peck Chin	Syed S. Almashoor
Azhar Hussin	Tan Boon Kong
Cheang Kok Keong	Tan Teong Hing
Chow Weng Sum	Tan Yong Phang
Hamzah Mohamad	Teh Guan Hoe
C.H. Hutchison	Teoh Lay Hock
Ibrahim Abdullah	Uyop Said
Ibrahim Komoo	Wahid Abd. Rahman
Jamaludin Othman	Wan Fuad Wan Hassan
Jasmi Ab. Talib	Zainol Eusof
Albert Loh	Zakaria Hussain
I. Metcalfe	Ismail M. Noor
Mohd. Yamin Ali	K.R. Chakraborty
Muhad Salah A.B.	H.D. Tjia
Nik Ramli	K. Ganesan
J.K. Raj (Pengerusi)	Ramly Khairuddin

1. Pengesahan Minit Mesyuarat Agung Tahunan ke-20

Minit Mesyuarat Agung Tahunan ke-20 telah diluluskan tanpa sebarang pindaan. Kelulusan Minit dicadangkan oleh Dr. Ahmad Tajuddin dan disokong oleh Dr. Azhar Hussin.

2. Perkara-perkara Berbangkit

Tiada perkara-perkara yang dibangkitkan atau sebarang pandangan.

3. Laporan Presiden

Dr. J.K. Raj membentangkan laporan 1986/87. Menurut beliau Persatuan dalam tahun 1986/87 telah mencapai kejayaan cemerlang. Banyak ceramah teknik telah dapat dianjurkan dan sambutan daripada ahli menggalakkan.

Persidangan Tahunan Geologi yang berlangsung selama 2 hari sempena Mesyuarat Agung juga mendapat sambutan di luar dugaan. Oleh itu amat wajar kedua-dua aktiviti Persatuan ini terus dianjurkan bersama di masa-masa akan datang.

Mengenai Seminar Geologi Petroleum 1986 menurut beliau, kejayaan cemerlang dicapai terutamanya dengan sokongan padu oleh pihak Industri Petroleum. Beliau ingin mengucapkan berbilang terima kasih kepada En. Ahmad Said, dan ahli jawatankuasanya kerana menggalakkan seminar dengan jayanya. Malangnya Buletin Khas Seminar Petroleum 1986 masih belum dapat dikeluarkan kerana kelewatan pihak Petronas meluluskan penerbitan kertas kerja yang berkaitan.

Mengenai Penerbitan, Persatuan masih berjaya mengeluarkan Warta Geologi secara berkala dan Buletin 19 walaupun mengalami sedikit

kelewatan. Buletin 20 mungkin dapat dikeluarkan secepat mungkin. Memandangkan hanya 200 naskah Buletin 19 yang terjual. Presiden merayu kepada ahli supaya dapat membelinya bagi menampung belanja pencetakan.

Jawatankuasa pro-tem 'Professional Geologist's Act' telah ditentukan. Jawatankuasa ini termasuk wakil dari Sabah dan Sarawak. Selepas ini, Jawatankuasa ini akan bekerja secara berasingan untuk membentuk 'Malaysian Institute of Geologist' tetapi akan melaporkan kegiatan penubuhannya kepada majlis Persatuan Geologi Malaysia.

Presiden juga membangkitkan mengenai jumlah simpanan tetap Persatuan yang banyak. Mengikut Undang-undang Cukai yang baru, faedah daripada simpanan tetap akan dikenakan cukai, dan ini akan merugikan Persatuan. Oleh itu, ahli diminta memikirkan bagaimana masalah ini dapat diatasi. Akhirnya Presiden ingin mengucapkan terima kasih kepada Ketua, Jabatan Geologi, UKM dan UM yang telah banyak memberikan sokongan kepada aktiviti Persatuan. Beliau bagi pihak Majlis juga mengucapkan terima kasih kepada individu atau pertubuhan yang telah menyokong kegiatan Persatuan.

En. Teoh Lay Hock bertanya mengapa tiada penghargaan khas kepada Jabatan Penyiasatan Kajibumi. Presiden menjelaskan terlalu panjang untuk menyatakan penghargaan untuk setiap pertubuhan, memadai dengan penghargaan keseluruhan.

Prof. C.S. Hutchison bertanya bahagian mana organisasi Petronas yang meluluskan penerbitan kertas kerja. Presiden menjelaskan walaupun kelulusan dari peringkat tertinggi tetapi ia perlu melalui beberapa pegawai tertentu.

En. Tan Boon Kong bertanya apakah Majlis tidak boleh memecat Past-President sekiranya beliau tidak menghadiri Mesyuarat Majlis. Presiden menjelaskan oleh kerana ia tidak dilantik oleh ahli, jadi tidak boleh dipecat sekiranya tidak menghadiri mesyuarat.

En. Aziz Hussein bertanya mengenai pelajar yang telah menggunakan kemudahan Tabung Pinjaman Pelajar. Presiden menjawab setakat ini hanya seorang pelajar sahaja yang telah diluluskan pinjamannya.

Laporan Presiden telah diterima oleh cadangan En. Tan Boon Kong dan disokong oleh Dr. Ahmad Tajuddin.

4. Laporan Setiausaha Kehormat

Laporan Setiausaha Kehormat telah dibentangkan oleh Presiden Dr. J. K. Raj. Laporan ini menggariskan semua aktiviti utama Persatuan sambil menjelaskan kedudukan keahlian dan penerbitan Persatuan.

Prof. C.S. Hutchison bertanya apakah pembelian Buletin yang lembap oleh ahli sebagai tanda tidak puas hati mengenai dasar Buletin dijual kepada ahli. Hal ini tidak dapat dipastikan tetapi penjualan ini perlu untuk menampung kos percetakan yang terlalu tinggi.

Dr. Nik Ramli pula mencadangkan supaya Buletin PGM diiklankan ke Universiti di Eropah, atau dinaikkan harganya untuk Perpustakaan Tempatan. Editor Kehormat menjelaskan usaha mengiklankan Buletin telah dilakukan di beberapa tempat, umpamanya dalam Episode dan Explorer.

Prof. C.S. Hutchison menambah adalah elok jika satu bentuk review dibuat di dalam jurnal terkemuka supaya diketahui ramai. Hal ini dapat menggalak penjualan.

Laporan Setiausaha Kehormat telah diterima dengan cadangan yang dikemukakan oleh Dr. Abdul Ghani Rafek dan disokong oleh Dr. Azhar Hussin.

5. Laporan Editor Kehormat

Laporan Editor Kehormat telah disampaikan oleh Dr. G.H. Teh. Beliau menjelaskan Buletin 19 (Proceedings GEOSEA V, Vol. 1) telah dikeluarkan pada April 1986. Buletin 20 (Proceedings GEOSEA V, Vol. II) mengalami sedikit kelewatan dan akan cuba dikeluarkan secepat mungkin. Buletin 22 (Seminar Petroleum Geologi) tidak dapat dikeluarkan kerana beberapa kertas masih belum diluluskan percetakannya oleh pihak Petronas. Beliau menjelaskan walaupun terdapat kelewatan Warta Geologi beberapa jilid akhir 1986, pengeluaran Warta Geologi ini akan cuba diperkemas dan diterbitkan mengikut jadualnya. Akhir sekali beliau ingin merakamkan ucapan terima kasih kepada penulis kertas di atas sumbangannya dan kepada pengiklan dan penderma yang telah menjayakan penerbitan Persatuan.

Dr. Abdul Ghani Rafek bertanya mengapa Buletin yang mengandungi kertas Persidangan Tahunan 1986 masih belum dikeluarkan. Editor menjelaskan kertas daripada Persidangan Tahunan 1986 akan dimasukkan ke dalam Buletin 21. Kesemuanya ada 12 kertas dan akan cuba dikeluarkan seberapa cepat yang mungkin. Kertas-kertas Seminar Petroleum Geology 1985 dan 1986 akan dimuatkan ke dalam Buletin 22.

Dr. Nik Ramli mencadangkan supaya disediakan buletin PGM mengikut bidang tertentu. Presiden menjelaskan buat masa ini perkara ini masih belum sesuai dijalankan.

Prof. H.D. Tjia pula bertanya mengapa Buletin 21 telah begitu lama tidak diterbitkan, sedangkan Buletin ini tidak berkaitan dengan kelulusan pihak Petronas. Beliau menambah sekiranya kelewatan ini berterusan, penyumbang kertas mungkin merasa bosan menunggu dan akhirnya tidak akan memberikan kerjasama untuk penerbitan Persatuan. Editor Kehormat berjanji akan mengeluarkannya secepat yang mungkin.

Dr. Cheang Kok Keong pula menyarankan agar untuk Persidangan Tahunan akan datang kertas kerja disediakan terlebih dahulu sebelum persidangan. Presiden menjelaskan walaupun perkara ini baik tetapi sukar untuk dilaksanakan.

Laporan Editor Kehormat ini telah diterima dengan cadangan yang dikemukakan oleh Dr. K.R. Chakraborty dan disokong oleh Dr. I. Metcalfe.

6. Laporan Bendahari Kehormat dan Auditor Kehormat

Bendahari Kehormat telah membentangkan kedua-dua Laporan ini. Beliau menjelaskan pendapatan melebihi penggunaan yang tinggi ia itu M\$50,199.85 berbanding dengan tahun 1986. Peningkatan pendapatan terutamanya hasil daripada faedah simpanan tetap dan derma semasa Seminar Geologi Petroleum. Bagaimanapun, yuran ahli sedikit menurun. Belanja percetakan meningkat kerana Buletin 18 dan 19 umumnya lebih tebal. Secara keseluruhan keadaan kewangan Persatuan sangat kukuh iaitu Persatuan mempunyai wang simpanan tetap sebanyak M\$226,847.17. En. Chow ingin merakamkan penghargaan kepada penderma dan kepada En. Peter Chew, Auditor Kehormat kerana tugasnya yang cemerlang.

Prof. C.S. Hutchison menyampaikan penghargaan kepada Persatuan kerana mempunyai kewangan yang kukuh.

Dr. K.R. Chakraborty menyarankan agar Majlis yang baru dapat mempertimbangkan kemungkinan Persatuan membeli sebuah bangunan (rumah) untuk kegunaan Persatuan. Cadangan ini akan dipertimbangkan.

En. Teoh Lay Hock bertanya mengapa memilih simpanan tetap dalam jangka masa yang panjang (15 bulan). Bendahari Kehormat menjelaskan simpanan untuk jangka masa 15 bulan mendatangkan faedah yang tinggi.

Dr. Nik Ramli pula mencadangkan supaya Persatuan dapat mempertimbangkan pembelian tanah sebagai harta simpanan Persatuan. Bagaimanapun, Prof. C.S. Hutchison mencelah, sama ada Persatuan ingin membeli bangunan atau tanah, kajian yang terperinci harus mempertimbangkan masalah-masalah yang mungkin dihadapi, umpamanya susut nilai, kejatuhan harga dan penjagaannya.

Kedua laporan ini telah diterima dengan cadangan oleh Dr. Ahmad Tajuddin dan disokong oleh Dr. Azhar Hussin.

7. Perlantikan Auditor Kehormat

Mr. Chow Weng Sum memaklumkan kepada ahli bahawa Mr. Peter Chew bersejaja untuk menyumbang perkhidmatan beliau sebagai Auditor Kehormat Persatuan. Mr. Chow seterusnya mencadangkan supaya beliau dilantik semula, dan cadangan ini disokong oleh Dr. I. Metcalfe dan seterusnya diterima oleh ahli mesyuarat.

8. Hal-hal Lain

- a) Kebanyakan ahli Mesyuarat merasakan Majlis yang akan datang dapat melihat dengan teliti kemungkinan penggunaan kewangan Persatuan yang banyak. Umpamanya kemungkinan membeli harta yang bersesuaian.
- b) Mr. Teoh Lay Hock menyatakan rasa tidak puas hati mengenai kebanyakan aktiviti. Persatuan dijalankan di kawasan Kuala Lumpur. Beliau merayu agar Persatuan dapat mempertimbangkan beberapa aktiviti dilakukan di luar Kuala Lumpur. Mesyuarat mengambil ingatan terhadap cadangan ini.

9. Pengumuman Majlis 1987/88

Presiden mengumumkan anggota Majlis 1987/88 adalah seperti berikut:

Presiden	:	Hamzah Mohamad (Universiti Kebangsaan Malaysia)
Naib Presiden	:	Ahmad Said (Petronas)
Setiausaha Kehormat	:	S. Paramanathan (Universiti Pertanian Malaysia)
Penolong Setiausaha Kehormat	:	Ibrahim Komoo (Universiti Kebangsaan Malaysia)
Bendahari Kehormat	:	Ahmad Tajuddin Ibrahim (Universiti Malaya)
Editor Kehormat	:	Teh Guan Hoe (Universiti Malaya)
Ahli Majlis (2-tahun)	:	Albert Loh (Malaysia Mining Corp) Tai Say Ann (Petronas Carigali) Azhar Hj. Hussin (Universiti Malaya) Fateh Chand (Geological Survey Malaysia)
Ahli Majlis (1-tahun)	:	Wan Fuad Wan Hassan (Universiti Kebangsaan Malaysia) Idris Mohamad (Universiti Malaya) Khee Kok Kean (Esso) Chin Lik Suan (Berkat Untungan)
Immediate Past President	:	J.K. Raj (Universiti Malaya)

10. Penghargaan

Dr. K.R. Chakraborty bagi pihak ahli Mesyuarat merakamkan ucapan terima kasih kepada anggota PGM 1986/87 kerana menjalankan tugas dengan jayanya.

Oleh kerana tiada hal-hal lain yang dibangkitkan, mesyuarat ditangguhkan jam 6.40 petang.

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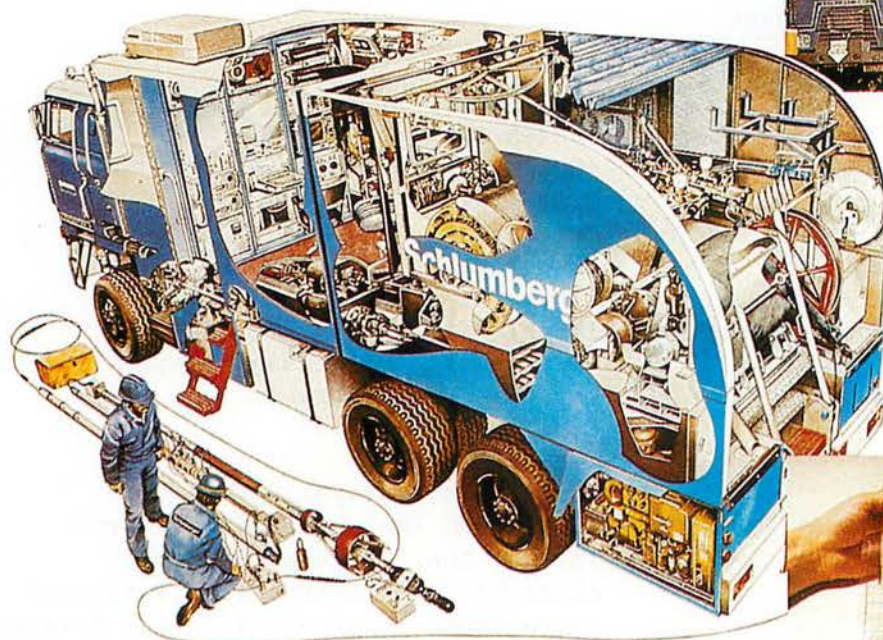
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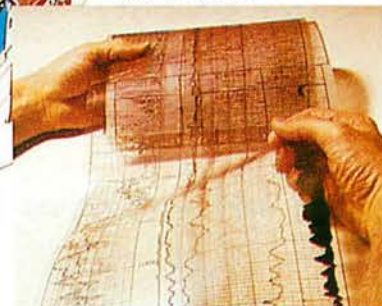


Cyber Service Unit on location.



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LAPORAN PRESIDEN SIDANG 1987/88

Seperti sidang sebelumnya, sidang 1987/88 bolehlah dianggap sebagai sidang yang berjaya memenuhi objektif Persatuan iaitu '.... to promote advancement of the geological sciences, particularly in Malaysia and nearby areas'. Kewangan Persatuan juga terus kukuh.

Persatuan berjaya menganjurkan dua kegiatan besar yang pada masa ini sudah boleh dianggap sebagai kegiatan tradisi bagi Persatuan, iaitu Seminar Geologi Petroleum Kali Sebelas (7-8 Disember, 1987) dan Persidangan Tahunan Kali Ketiga 1988 (4-5 January, 1988). Kedua-dua pertemuan di atas telah mendapat sambutan yang memuaskan daripada ahli dan peserta luar. Seminar Petroleum kali ini menarik 240 peserta dengan 21 kertaskerja dibentangkan. Bantuan kewangan yang diterima daripada syarikat-syarikat minyak dan yang berkaitan dengan industri carigali minyak terus menggalakkan dan kekal sebagai salah satu punca pendapatan Persatuan. Persatuan ingin merakamkan penghargaan khusus kepada Pengerusi Jawatankuasa Penganjur Seminar Geologi Petroleum kali ini iaitu Encik Hila Ludin Abu Nazim.

Tiga puluh kertaskerja telah dibentangkan dalam Persidangan Tahun 1988, yang dihadiri oleh 143 peserta. Persidangan kali ini mencatatkan sejarah kerana diadakan serentak dengan Persidangan Tahunan Kali Ke-19 Jabatan Penyiasatan Kajibumi Malaysia. Pertemuan ini tidak syak telah mendekatkan ahli-ahli geologi di Malaysia dengan ahli-ahli geology yang berkhidmat di Jabatan berkenaan, khususnya dari segi bertukar-tukar maklumat penyelidikan. Persatuan merakamkan penghargaan khusus kepada Ketua Pengarah Jabatan Penyiasatan Kajibumi yang memberi jalan kepada terlaksananya persidangan bersama ini. Budi baik MMC yang sudi menjadi pembiaya 'makan malam persidangan' ini amat disanjung tinggi.

Persatuan terus menyediakan forum bertukar pendapat dan maklumat penyelidikan sesama ahli dan dengan saintis luar. Sebanyak 13 pertemuan bagi ceramah teknik di anjurkan; dua daripadanya merupakan simposium kecil iaitu Tektonik dan Geologi Sekitaran (7 kertaskerja) dan Pagi Siswazah (4 kertaskerja). Jumlah tajuk ceramah teknik dalam 13 pertemuan tersebut ialah 22 buah - 9 daripada 22 pembentang kertas tersebut datang dari luar Malaysia. Persatuan berterima kasih banyak kepada Ketua Jabatan-Jabatan Geologi, Universiti Malaya dan Universiti Kebangsaan, serta Timbalan Pengarah Penyiasatan Kajibumi Ipoh kerana bermurah hati menyediakan ruang dan kemudahan bagi pertemuan-pertemuan ini.

Bagi faedah ahli di sektor petroleum khususnya, Persatuan telah menganjurkan kursus dua hari AAPG bertajuk Tectonics, structure and sedimentation along strike-slip and oblique-slip mobile belts, yang diketuai oleh Dr. J.C. Crowell dari University of California pada 12-13 Oktober, 1987. Kursus ini dihadiri oleh 40 peserta. Persatuan juga menjadi penganjur bersama Asian Mining '88 (7-11 Mac. 1988).

Jawatankuasa Penaja Professional Geologists Act yang dipengerusikan oleh Encik Fateh Chand telah berjaya mendrafkan Perlembangan Akta berkenaan. Permohonan rasmi pendaftaran telah dibuat dan jawapan rasmi daripada Pendaftar Pertubuhan sedang ditunggu.

Satu daripada lima Kumpulan Kerja (Study Group) yang ditubuhkan pada sidang lalu iaitu kumpulan 'Stratigraphy/Sedimentology' telah menubuhkan Jawatankuasa masing-masing dan telahpun memulakan kegiatan. Kumpulan 'Engineering Geology/Hydrology' telah mengumpul maklumat mengenai ahli yang berminat dan akan menubuhkan Jawatankuasa tidak lama lagi.

Di sebalik usaha bersungguh-sungguh Persatuan, pengeluaran penerbitan masih berada dalam fasa lembap. Isu terkebelakang yang sedang diberi perhatian khusus ialah Jilid II GEOSEA V (Bull. 20), bahagian ketiga Petroleum Geologi (Bull. 23), dan WARTA GEOLOGI 1987. 'Backlog' di atas dijangka dapat diselesaikan pada separuh pertama 1988.

Penjualan isu kebelakangan juga masih lembap walaupun publisiti yang meluasa telah diberikan. Secara purata, dalam tahun 1987 Persatuan hanya berjaya mengurangkan 5% stok penerbitannya, lebih lemah daripada kemampuan 1986, iaitu 7%. Ahli-ahli diseru sekali lagi supaya membantu Persatuan dengan membeli penerbitan-penerbitannya yang tidak diedarkan dengan percuma.

Majlis telah memikirkan dua pendekatan bagi memanfaatkan sepenuhnya wang Persatuan dalam simpanan tetap, yang pada 31 Disember, 1987 berjumlah \$275,817.80. Pertama ialah melihat kemungkinan menubuhkan Tabung Amanah - pendekatan ini masih dalam siasatan lanjut. Kedua ialah memberli bangunan. Sayangnya, dalam keadaan ekonomi dan pasaran harta yang tidak stabil sepanjang 1987, Majlis masih belum berani membuat sebarang keputusan.

Sejajar dengan hasrat kebangsaan, dalam sidang 1987/88 ini Bahasa Malaysia telah digunakan dengan lebih meluas dalam urusan-urusan Persatuan dan mesyuarat, malah dalam pertemuan-pertemuan teknik.

Akhirnya saya ingin mencadangkan supaya Persatuan menubuhkan Gran Penyelidikan Bagi Seswazah Geologi. Tujuannya ialah supaya siswazah geologi yang bekerja dalam bidang lain selain geologi tetapi masih berminat melakukan penyelidikan geologi boleh mendapat sedikit bantuan bagi kerjalapangan dan seumpamanya. Dengan cara ini pengetahuan mereka tidak akan terbazir begitu sahaja di samping meneruskan perkembangan ilmu. Dalam keadaan sekarang, adalah dijangkakan bilangan ahli yang akan mendapat faedah daripada gran ini agak besar.

Sebagai penutup, saya ingin merakamkan ucapan terima kasih kepada semua pihak yang belum disebut yang telah terlibat dalam menjayakan kegiatan-kegiatan Persatuan sepanjang sidang 1987/88, baik secara individu atau berkumpulan. Kejayaan sesebuah Persatuan, seperti yang telah kita capai, memerlukan ahli yang sanggup meluangkan masa lapang dan tenaga mereka. Saya berharap kesediaan ini akan berterusan di sidang 1988/89 supaya dengan itu Persatuan dapat bergerak lebih aktif dalam mencapai objektifnya.

9 April 1988

HONORARY SECRETARY'S REPORT
(April 1987 - March 1988)

1. Council

The Council of the Geological Society of Malaysia (GSM) for the 1987/1988 term was as follows:

President:	Hamzah Mohamad (Universiti Kebangsaan Malaysia)
Vice - President:	Ahmad Said (Petronas)
Honorary Secretary:	S. Paramanathan (Universiti Pertanian Malaysia)
Asst. Honorary Secretary:	Ibrahim Komoo (Universiti Kebangsaan Malaysia)
Honorary Treasurer:	Ahmad Tajuddin Ibrahim (Universiti Malaya)
Honorary Editor:	Teh Guan Hoe (Universiti Malaya)
Council Members (2-year)	Albert Loh (Malaysia Mining Corp.) Tai Say Ann (Petronas-Carigali) Azhar Hj. Hussin (Universiti Malaya)
(1-year)	Fateh Chand (Geological Survey Malaysia) Wan Fuad W. Hassan (Universiti Kebangsaan Malaysia) Idris Mohamad (Universiti Malaya) Khee Kok Kean (Esso Production Malaysia) Chin Lik Suan (Berkat Untungan Sdn. Bhd.)
Immediate Past President:	John Kuna Raj (Universiti Malaya)

2. Council Meetings

The GSM Council 1987/88 met twelve (12) times over the last year. Meetings were normally held on the first Friday of the month whenever possible. As required the Council established a number of Sub-Committees such as Nomination, Young Geoscientist Publication Award, etc.

3. Membership

The total membership of the Society as of 31st December 1987 was 464. A breakdown of the membership is given in Table 1.

4. Activities of the Society

The GSM continued to be active during the year. Once again a very successful Petroleum Geology Seminar was held in December 1987. Another successful activity was the Annual Conference held on 4th and 5th January 1988 at Fraser's Hill. The activities of the GSM for period from April 1987 to March 1988 are listed in Table 2. The Society has also established a number of study groups on various aspects of geology.

5. Publications

The sales of the publications of the Society remained comparatively slow. Sale of the special issues such as GEOSEA continue to remain slow. The support of members when Bulletins are sold continues to remain poor. The stock as at 31st December 1987 and sales in 1987 are given in Table 3.

LAPURAN SETIAUSAHA KEHORMAT
(April 1987 - Mac 1988)

1. Majlis

Majlis Persatuan Geologi Malaysia (PGM) bagi tempoh laporan ini adalah seperti berikut:-

Presiden:	Hamzah Mohamad (Universiti Kebangsaan Malaysia)
Maib Presiden:	Ahmad Said (Petronas)
Setiausaha Kehormat:	S. Paramanathan (Universiti Pertanian Malaysia)
Pen. Setiausaha Kehormat:	Ibrahim Komoo (Universiti Kebangsaan Malaysia)
Bendahari Kehormat:	Ahmad Tajuddin Ibrahim (Universiti Malaya)
Pengarang Kehormat:	Teh Guan Hoe (Universiti Malaya)
Ahli Majlis (2 tahun):	Albert Loh (Malaysia Mining Corp.) Tai Say Ann (Petronas Carigali) Azhar Hj. Hussin (Universiti Malaya)
(1 tahun):	Fateh Chand (Jabatan Kajibumi Malaysia) Wan Fuad W. Hassan (Universiti Kebangsaan Malaysia) Idris Mohamad (Universiti Malaya) Khee Kok Kean (Esso Production Malaysia) Chin Lik Suan (Berkat Untungan Sdn. Bhd.)
Presiden Berlalu:	John Kuna Raj (Universiti Malaya)

2. Mesyuarat Majlis

Majlis PGM 1987/88 telah bermesyuarat dua belas kali pada tahun yang sudah. Mesyuarat-mesyuarat ini biasa diadakan pada hari Jumaat pertama bulanan yang mana boleh. Seperti perlu, Majlis telah menubuhkan beberapa jawatankuasa kecil, misalnya Pencalunan, Anugerah Penerbitan Geosaintis Muda dll.

3. Keahlian

Jumlah ahli Persatuan pada 31hb Disember 1987 adalah 464. Butir-butir keahlian ini diberi dalam Jadual 1.

4. Aktiviti-aktiviti Persatuan

PGM menurus beraktif dalam tahun yang lepas. Sekali lagi Seminar Geologi Petroleum yang sangat berjaya telah diadakan pada Disember 1987. Satu lagi aktiviti yang telah berjaya diadakan pada 4hb dan 5hb Januari 1988 adalah Persidangan Tahunan di Bukit Fraser. Aktiviti-aktiviti PGM untuk masa April 1987 sehingga Mac 1988 disenaraikan dalam Jadual 2. Persatuan juga telah menubuhkan beberapa Kumpulan Kajian didalam beberapa bidang geologi.

5. Penerbitan

Jualan penerbitan Persatuan masih lemah. Jualan terbitan khas seperti GEOSEA juga masih lemah. Sokongan ahli apabila Buletin dijual adalah rendah. Stok pada 31hb Disember 1987 dan jualan dalam tahun 1987 diberi dalam Jadual 3.

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6. Regional Representatives

The following Members were appointed as the GSM's Regional Representatives:

- a) Aw Peck Chin (Ipoh)
- b) Chen Shick Pei (Sarawak)
- c) Lim Peng Siong (Sabah)
- d) Leong Lap Sau (Pulau Pinang)
- e) Teoh Lay Hock (Kota Baru)

7. Young Geoscientist Award

No nomination has been received for this award. Hence no award has been made this year.

8. Professional Geologists Act

The Protem Committee has completed all the preliminary requirements of the Registrar of Societies and an application for registration was submitted on 15th March 1988.

9. Summary

In general, the GSM has had a relatively active and successful year. The Council could like to take this opportunity to thank all sponsors/organisations/organisers who assisted in the seminars/talks, etc. Thanks are also due to the many donors who have continued to support the Society with financial assistance.

The Society wishes also to place on record the appreciation and thanks for the support given by many organisations (in particular Departments of Geology of Universiti Malaya and Universiti Kebangsaan Malaysia) and individuals without whose support the Society could not carry out its activities successfully. Last but not least, thanks are also due to all members of the GSM who have continued to support the activities of the Society.

Dr. S. Paramanathan
Hon. Secretary

10 Feb. 1988

6. Wakil-wakil Kawasan

Ahli-ahli berikut dilantik sebagai wakil PGM Kawasan:

- a) Aw Peck Chin (Ipoh)
- b) Teoh Lay Hock (Kota Baru)
- c) Leong Lap Sau (Pulau Pinang)
- d) Chen Shick Pei (Sarawak)
- e) Lim Peng Siong (Sabah)

7. Anugerah Geosaintis Muda

Tiada penamaan diterima untuk anugerahan tahun ini.

8. Akta Ahli Geologi Profesional

Jawatankuasa Protem Ahli Profesional telah selesai semua keperluan awalan Pendaftaran Persatuan. Permohonan untuk daftaran pertubuhan Institusi ini telah dihantar pada 15hb Mac. 1988.

9. Ringkasan

PGM secara amnya sangat aktif pada tahun yang lepas. Majlis ambil kesempatan ini supaya merakamkan ucapan terima kasih kepada semua organisasi/penanjur yang telah menolong dalam seminar/ceramah dll. Ribuan terima kasih juga kepada beberapa penderma yang menuruskan sokongan kepada Persatuan dengan bantuan kewangan.

Persatuan juga akan merekodkan penghargaan kepada sokongan diberi oleh beberapa organisasi (khususnya Jabatan-jabatan geologi Universiti Kebangsaan Malaysia dan Universiti Malaya) dan individu-individu tanpa sokongan siapa Persatuan tidak dapat menjalankan aktiviti-aktiviti dengan kejayaan. Akhirnya PGM juga akan ucapkan terima kasih kepada ahli-ahli Persatuan untuk menyokong aktiviti-aktiviti Persatuan.

Dr. S. Paramanathan
Setiausaha Kehormat

10 Feb. 1988

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Table 1: Membership of the Society

Country	Full	Associate	Student	Institutional	Honorary	Life	Professional/ Life	Professional/ Full
Africa				1				
Australia	24			2			1	5
Brunei	2							
Canada	7		1					
Europe	24		1	7	2	2		
Hong Kong	4							
Indonesia	8			1	1			
Japan	12			1	1			
New Zealand	2							
Singapore	14		2	4				
Taiwan	1							
Thailand	8			1		1		
Turkey	1							
United Arab Emirates	1							
United States of America	24		1	3		1		2
Malaysia	193	12	28	13	3	7	4	31
Total	325	12	33	33	7	11	5	38

Table 2. Activities of the Geological Society of Malaysia (April 1987 - March 1988)

Date	Activity	Organisers/Speakers	Place
1. 26 June 1987	1) Rb/Sr and Sm/Nd isotope studies on granites of Southeast Asia	D.P. Fiona Darbyshire British Geological Survey	Universiti Malaya
	2) Geochemistry of the Tin Islands granites of Indonesia in relation to those of Peninsular Malaysia	Peter E.J. Pitfield British Geological Survey	Universiti Malaya
2. 8 Aug. 1987	'Tektonik dan Geologi Sekitaran' - Seminar		Universiti Kebangsaan Malaysia
3. 14 Aug. 1987	Unresolved problems of Malaysian Geology	Charles S. Hutchison Universiti Malaya	Universiti Malaya
4. 13 Oct. 1987	St. Andreas System	John C. Crowell University of California	Hotel Merlin, Kuala Lumpur
5. 17 Oct. 1987	Uranium Exploration in Peninsular Malaysia	James Taylor	Geological Survey Malaysia Ipoh, Perak
6. 4 Dec. 1987	Applied Quaternary Geology in the Netherlands	F. Schokking Geological Survey, Netherlands	Universiti Malaya
7. 7 & 8 Dec. 1987	Petroleum Geology Seminar 1987		Ming Court, Kuala Lumpur
8. 10 Dec. 1987	Advanced Electro-Magnetic Exploration Techniques	Ruediger Karmann Metronix/Geometra	Universiti Malaya
9. 14 Dec. 1987	Method of fluid inclusion study and its application to the Bujang Melaka Pluton, Kinta Valley	Michael Schwartz Federal Institute for Geoscience & Natural Resources	Geological Survey Malaysia Ipoh, Perak
10. 17 Dec. 1987	- ditto -	- ditto -	Universiti Malaya
11. 4 & 5 Jan. 1988	Annual Conference 1988		Merlin Resort, Fraser Hill
12. 14 Jan. 1988	Coal exploration by the Geological Survey in Sarawak	Chen Shick Pei, Kelter & Liaw Kim Kiat, Geological Survey of Malaysia, Kuching	Universiti Malaya
13. 18 Jan. 1988	Metallogeny of Circum-Atlantic Orogenic Terrain with emphasis on granite related deposits	D.F. Strong Memorial University, Canada	Universiti Kebangsaan Malaysia
14. 6 Feb. 1988	'Pagi Siswazah' - Seminar		Universiti Kebangsaan Malaysia

Table 3: Stock of Publications

Bulletin No.	Sales 1987	Stock remaining
1	12	156
2	13	469
3	12	508
4	12	473
5	12	215
6	13	840
7	13	614
8	12	215
9	7	145
10	14	123
11	7	400
12	17	247
13	8	161
14	14	243
15	10	190
16	10	192
17	16	245
18	23	178
19	11	840
21	544*	456
Field Guide 1	15	184
Abstracts (Bulletin 6)	-	36
Stratigraphic Correlation	12	667

* inclusive of free copies distributed to Members

Honorary Editor's Report

The second volume of the GEOSEA V Proceedings (Bulletin 20) which encountered some printing and editorial problems should be out soon.

The Second Special Issue on Petroleum Geology (Bulletin 21) was published in time for the Annual Petroleum Geology Seminar 1987. The volume contains 13 papers that were presented at the Annual Petroleum Geology Seminar 1985. The 3rd Special Issue on Petroleum Geology (Bulletin 23) is in preparation and contains 9 papers, the majority from the Annual Petroleum Geology Seminar 1986.

Bulletin nos. 22 and 24, which contain most of the papers from the Society's Annual Conference will also be available in 1988. The Society's Bulletins are now published by the computerised desktop publishing technique.

The 1987 issues of the WARTA GEOLOGI should be out around the time of the AGM. The delay is due to some unforeseen circumstances. The Editor will endeavour to bring things up to date as soon as possible.

The Society is grateful to all authors for their valuable contributions, the advertisers for their support and the reviewers and members of the Editorial Advisory Board for their excellent cooperation.

Dr. G.H. Teh
Honorary Editor

14 March 1988

HONORARY TREASURER' REPORT

1987/88

The excess of income over expenditure for the year 1987 is \$71,375.79, which represent a considerable increase in revenue compared to 1986. However the Society has committed \$33,392.28 for expenditure on the AAPG Course and Bulletin 21. There is a decrease in income from the fixed deposit interests partly due to the lower interests rates given. Income from the Petroleum Geology Seminar also shows a decrease compared to 1986. The expenditure from the items on refreshments, sundries and speakers' account is lower but is higher for the items on GEOSEA V, Farewell Dinner and Annual Conference when compared to 1986.

On the whole the Society is financially sound with a total of \$275,817.80 placed in fixed deposits.

On behalf of the Society, I would like to thank all donors and members who have supported the Society's activities for the year.

The Society wishes to express its profound gratitude to the Honorary Auditor, Mr. Peter Chew, for his excellent services in keeping track of the accounts of the Society.

Dr. Ahmad Tajuddin Hj. Ibrahim

Hon. Treasurer

2 March 1988

REPORT OF THE AUDITORS TO THE MEMBERS
OF THE GEOLOGICAL SOCIETY OF MALAYSIA

To Members of the Geological
Society of Malaysia

We have obtained all the information
and explanations necessary for the
purpose of this audit and in our
opinion the accounts for the year
ended 31st December 1987 give a true
and fair view of the state of the
Society's financial affairs.



CERTIFIED PUBLIC ACCOUNTANTS
AUDITORS

Date: 23 February 1988

Kuala Lumpur

PERSATUAN GEOLOGI MALAYSIA
(GEOLOGICAL SOCIETY OF MALAYSIA)

PERSATUAN GEOLOGI MALAYSIA
(GEOLOGICAL SOCIETY OF MALAYSIA)

INCOME AND EXPENDITURE ACCOUNT FOR
THE YEAR ENDED 31 DECEMBER 1987

BALANCE SHEET AS AT 31 DECEMBER 1987

<u>INCOME</u>	<u>1986</u>	<u>1987</u>
Entrance fee	\$ 506.91	\$ 547.99
Subscriptions	20,744.89	19,313.15
Fixed deposits interest	21,963.02	18,006.28
Sales of publications	18,715.58	16,868.59
Petroleum Geology Seminar 1986	39,525.72	31,205.13
Xerox	1,289.11	-
Advertisements/donations	9,000.00	-
Printing & Stationary:		
Miscellaneous	-\$1,127.62	-
Newsletters	605.10	-
Bulletin 20	56.76	-
Bulletin 21	1,545.00	-
	<u>\$111,745.23</u>	<u>\$87,020.38</u>
 <u>LESS EXPENDITURE</u>		
Bank charges	\$ 675.90	\$ 323.93
Depreciation on office equipment	2,467.00	3,026.00
Honorarium	4,059.00	3,763.00
Postage	2,484.79	1,612.69
Printing & Stationary: Miscellaneous	1,456.00	-
Newsletters	4,844.50	-
Bulletin 18	14,662.00	-
Bulletin 19	24,830.92	-
Refreshments	517.85	261.00
Subscription to professional bodies	472.75	100.00
Sundry expenses	765.00	504.73
Annual General Meeting/GEOSEA VI	68.50	1,155.10
Telephone expenses	463.81	407.44
Speakers' Account	1,891.36	1,874.04
Annual Dinner/Farewell Dinner	360.00	466.05
Annual Conference	1,526.00	1,888.25
Xerox	-	252.36
	<u>\$ 61,545.38</u>	<u>\$15,644.59</u>
 EXCESS OF INCOME OVER EXPENDITURE	 <u>\$ 50,199.85</u>	 <u>\$71,375.79</u>

<u>FIXED ASSETS</u>	<u>1986</u>	<u>1987</u>
Office equipment	\$ 24,672.62	\$ 30,262.87
Less: Accumulated depreciation	18,668.00	21,694.00
	<u>\$ 6,004.62</u>	<u>\$ 8,568.87</u>
 <u>CURRENT ASSETS</u>		
Fixed deposits	\$226,847.17	\$275,817.80
Expenses prepaid:		
Telephone deposit	300.00	300.00
Cash at bank	61,564.84	91,253.03
Petty cash	25.06	333.73
	<u>\$288,737.07</u>	<u>\$367,704.56</u>
	<u>\$294,741.69</u>	<u>\$376,273.43</u>
	=====	=====
 Represented by:		
 <u>CAPITAL FUND</u>		
Balance as at 1.1.87	\$191,413.03	\$241,612.88
Add: excess of income over expenditure	50,199.85	71,375.79
	<u>241,612.88</u>	<u>312,988.67</u>
Student Loan Fund	10,101.91	7,904.91
Petroleum Geology Seminar 1987	40,703.22	33,388.60
Young Geoscientist Award	2,323.68	3,068.64
AAPG Course	-	18,922.61
	<u>\$294,741.69</u>	<u>\$376,273.43</u>
	=====	=====

Committed expenditures: a) AAPG Course - \$12,562.28
b) Bulletin 21 - \$20,830.00

BERITA - BERITA PERSATUAN
(NEWS OF THE SOCIETY)

KEAHLIAN (MEMBERSHIP)

The following applications for membership were approved:

Full Members

1. Rodziah Daud, Petronas Laboratory, Lot 1026 PKNS Industrial Area, 54200 Ulu Kelang.
2. Sahat Sadikun, Jabatan Sains Bumi, UKMS, Beg Berkunci 62, 88996 Kota Kinabalu, Sabah.
3. Md. Sayyadul Arafin, Universiti Sains Malaysia, Jalan Bandaraya, 30000 Ipoh, Perak.
4. Jon M. Poort, DeGolyer & MacNaughton, 400 One Energy Square, Dallas, Tx. 75206, USA.
5. K. Murthy, B5-6, Jalan 17/13, 46400 Petaling Jaya, Selangor.
6. Dale C. Beeson, 1517 West 3rd Street, Irving, Texas 75060, USA.
7. V.R. Vijayan, Geological Survey Malaysia, P.O. Box 1015, 30820 Ipoh, Perak.

Student Members

1. Rafa'ie Kipli, Jabatan Geologi, Universiti Malaya, 59100 Kuala Lumpur.
2. Zakaria Marzuki, No. 16, Kampung Bahru, 96800 Kapit, Sarawak.
3. Salmah Ahmad, Jabatan Geologi, Universiti Malaya, 59100 Kuala Lumpur.
4. P. Nesamalar, Jabatan Geologi, Universiti Malaya, 59100 Kuala Lumpur.
5. Beram Khan Hj. Tambi Khan, FKKKKSA, UTM, Jalan Gurney, 54100 Kuala Lumpur.
6. Mirza Arshad Beg, P.O. Box no. 9, Parit Satu, Jalan Taiping, 34300 Bagai Serai, Perak.

Institutional Member

1. Hamilton Oil Corp., 1560 Broadway, Suite 2000, Denver, Co., 80202, USA.

PERTUKARAN ALAMAT (CHANGE OF ADDRESS)

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

1. Che Wan Roslan C.W. Ahmad, c/o Delcom Services Sdn. Bhd. (Caw. Kemaman), Lot 6415, Taman Sri Geliga, 24000 Kemaman.
2. Dr. Daud A.F. Batchelor, Jalan Penumbang Jaya No. 5, Ciumberluit, Bandung, Indonesia.
3. Hilrey J. Watson, 306 Maverick Ct., Lafayette, Ca 94549, USA.
4. Jagroop Singh, EB3, Sungei Lembing Mines, Sungei Lembing, Pahang.
5. Au Yong Mun Heng, P.O. Box 327, 97008 Bintulu, Sarawak.
6. Antonio Francisco Represas de Almeida, 5th 219 Nanking E. Rd., Sec. 3, Taipei, 10410, Taiwan.
7. Geoffrey Wee, 94 (Lot 197) Tabuan Laru, 93350 Kuching, Sarawak.
8. Tunyow Huang, Central Geological Survey, P.O. Box 968, Taipei, Taiwan, R.O.C.
9. C.H. Yeap, 3440 Park Place, 666 Burrand Street, Vancouver, BC, Canada V6C 2X8.

PERTAMBAHAN BARU PERPUSTAKAAN (NEW LIBRARY ADDITIONS)

The Society has received the following publications:

1. Journal of Hebei College of Geology, vol. 10, no. 3, 1987.
2. IMM Bull. 974, 1988.
3. Episodes, vol. 10, no. 4, 1987.
4. National Science Museum, Bull. vol. 13, nos. 2-4, 1987.
5. CCOP/SOPAC, Proceedings of the 15th session, 1986.
6. Chronique de la recherche miniere, no. 489, 1987.
7. CCOP/SOPAC, Proceedings of the 13th session, 1984.
8. IMM Bulletin 975, 1988.
9. AGID news, no. 54, 1988.
10. Asean Journal on Science & Technology for development, vol. 4, no. 1, 1987.
11. Faculty of Science, U of Tokyo, Journal. vol. 31, no. 4, 1987.
12. Asian Mining '88. 1988.
13. Scripta Geologica. no. 85 & 86, 1987.
14. Sesama kita, no. 20, 1988.
15. IMM Bulletin 976 & 977, 1988.
16. IMM Transactions A, vol. 97, Jan 1988.
17. Bulletin Science & Technology Malaysia, vol. 6, no. 1, 1987.
18. The National Council for Scientific Research & Dev. Annual Report 1986.
19. Oil & Gas News, 1988.
20. Petromin, March 1988.
21. Oklahoma Geology Notes, vol. 47, nos 4-6, 1987.
22. Memoirs of the Ehime University, vol. X, no. 4, 1987.
23. Oklohoma Geological Survey, Bull. 143, 1988.
24. AGID news, no. 55, 1988.
25. Commonwealth Sc. Council, Jan-Feb 1988.
26. Episodes, vol. 10, no. 4, 1987 & vol. 11, no. 1, 1988.
27. Geological Survey of India, News. vol. 18, no. 3, 1987.
28. Indian Geoscience abstracts, 1980.
29. National Geophysical Research Institute, annual report 1986-1987.

BERITA - BERITA LAIN
(OTHER NEWS)

SENARAI DISERTASI SEMESTER II SESI 1987/88, JABATAN GEOLOGI,
UNIVERSITI KEBANGSAAN MALAYSIA

1. Geologi Am Kawasan Kota Belud, Sabah - Mat Niza Abdul Rahman
2. Geologi Am Kawasan Merapok-Sipitang-Weston Malaysia Timur
- Lee Yuen Piau
3. Geologi Kawasan Utara Semenanjung Klias, Sabah - Ng Kee Seong
4. Geologi Am Kawasan Utara Segamat - Felix Jules
5. Geologi Kawasan Membakut-Beaufort-Weston Sabah - Chin Choo Yang
6. Geologi Kawasan Kota Gelanggi Jerantut, Pahang Darulmakmur
- Jelod Jetoony
7. Geologi Kawasan Lebuhraya Senawang-Ayer Keroh - Anne S. Rajaratnam
8. Geologi Am Kawasan Barat Semenanjung Kudat Sabah - Chow Kit Yeen
9. Geologi Kawasan Pandasan-Beturai, Sabah - Lim Peng Seng
10. Geologi Am Kawasan Chuping, Perlis - Salmah Abdul Rashid
11. Geologi Am dan Pemineralan di Kawasan Tasek Chini Pahang Tengah-Selatan
- Azmi Ismail
12. Geologi Kawasan Batu Arang-Rawang Selangor Darul Ehsan
- Mohd. Azizi Ibrahim
13. Geologi Am Kawasan Bahagian Selatan Semenanjung Klias, Sabah
- Tay Sing Ui
14. Geologi Kawasan Seremban Negeri Sembilan - Goh Cheok Weng

INTERNATIONAL SYMPOSIUM ON GOLD GEOLOGY AND EXPLORATION

June 26-30, 1989, Shen-Yang, China

Organized by The Chinese Society of Metals

Co-sponsors: Commission on Ore Mineralogy, International Mineralogical Association, The Australian Institute of Mining and Metallurgy

General Information

The International Symposium on Gold Geology and Exploration (ISGGE) will be held on June 26-30 1989, Shenyang, China.

Ever since the founding of the People's Republic of China, this is the first time for such a meeting to be held. We consider this Symposium a big event not only in the field of technology, but also in the development of gold industry.

China is rich in gold resources and has favourable metallogenetic conditions in this respect. China has been one of the earliest countries in the globe in excavating and utilizing gold for more than 5,000 years. At present, hundreds of gold prospects and deposits have been found and a nationwide 'gold rush' has surged forward in all parts of the country.

The aim of this Symposium is to find the possibility of exploring these resources for mankind and also to promote an interchange of viewpoints concerning both theoretical problems and pragmatic experience of gold geology and exploration. Many world prominent experts are expected to take part in this Symposium for presentations as key-note speakers.

Topics of Symposium

1. Metallogenesis of Gold Deposits
2. Advanced exploration techniques; geophysics, geochemistry and remote sensing for gold deposits
3. Mining geology of gold deposits
4. Geological features of typical gold belts (Provinces) and gold deposits

Call for Papers

Submitted papers should describe current, unpublished studies in one or more of the themes mentioned above. Authors are asked to submit an abstract of about 500 words. All abstracts will be reviewed and then a final selection will be made. Acceptance of abstracts will be notified not later than May 31, 1988.

Working Language

The official languages of the Symposium will be both Chinese and English.

Preprints

- All papers accepted by the Symposium will be published into a pre-printed volume which will be available at the Symposium.

Optional Geological Excursion

Two optional geological excursions are planned:

1. Shenyang - Heavenly Lake (Crater Lake at Changbaishan Mt. Nature Reserve) - Jiapigou Gold Belt - Changchun;
2. Shenyang - Dalian - Yantai - Zhaoyuan Gold Belt - Penglai Scenic Spot - Yantai.

Abstracts (250-300 words) should be submitted to the Conference Office, The Institution of Mining and Metallurgy, 44 Portland Place, London W1N 4BR, England.

Technical Visits

Technical visits to shaft sinking sites are planned.

General

Enquiries about the conference should be addressed to: The Conference Office, The Institution of Mining and Metallurgy, 44 Portland Place, London W1N 4BR, England. (Tel: 01 580 3802; Telex: 261410 IMM G).

INTERNATIONAL CONFERENCE ON ENGINEERING GEOLOGY IN TROPICAL TERRAINS

June 26-29, 1989, Universiti Kebangsaan Malaysia, Bangi, Selangor Darul Ehsan, Malaysia
organised by the Department of Geology, Universiti Kebangsaan Malaysia, and co-sponsored by the Geological Society of Malaysia, Institution of Engineers Malaysia and the International Association of Engineering Geology

Objective

The objective of the conference is to highlight various engineering geologic aspects and problems specifically related to tropical terrains. The meeting would provide a forum for engineering geologists, geotechnical engineers and researchers working in tropical areas to share their knowledge and experiences, thus fostering closer cooperation amongst them.

Submission of Papers

Papers relating to the following themes are being invited:

- * investigation, characterization and classification of earth materials in tropical terrains
- * Engineering geologic properties and engineering geologic mapping in tropical terrains
- * method and approach of site investigations in tropical terrains
- * Landslides, stability of slopes and excavations in tropical terrains
- * application of geophysical methods and remote sensing in engineering geologic investigations
- * case histories on dams, tunnels, roads, air fields, harbours, building foundations and land reclamation in tropical terrains
- * Urban and environmental geology

Deadlines

Intended authors please note the following deadlines for submissions

Receipt of abstract	June 1, 1988
Notification of acceptance of abstract	Aug 1, 1988
Receipt of final manuscript	Jan 1, 1989
Final programme	Apr 1, 1989

Language

The official language of the Conference will be English and papers must be written and presented in English.

KURSUS-KURSUS LATIHAN & BENGKEL-BENGKEL (TRAINING COURSES & WORKSHOPS)

1989

September 1989 - October 1989

REMOTE SENSING AND DIGITAL IMAGE ANALYSIS (Sioux Falls, South Dakota, U.S.A.). U.S. Geological Survey training course for non-U.S. natural scientists on manual interpretation and digital analysis of remotely sensed data. For Information: Training Section, Office of International Geology, U.S. Geological Survey, 917 National Center, Reston, VA 20092, U.S.A.

September 1989 - November 1989

DRILLING OF GEOTHERMAL WELLS (Mexicali, Mexico). Annual 12-week seminar organized for Latin Americans by the Latin American Organization for Energy with financial assistance from Unesco. Language: Spanish. For Information: Organizacion Latino-americana de Energia (OLADE), P.O. Box 119, Quito, Ecuador.

September 1989 - November 1989

GEOTHERMAL RESERVOIR ENGINEERING (Mexicali, Mexico). Annual 9-week course organized for Latin Americans by the Latin American Organization for Energy with financial assistance from Unesco. Language: Spanish. For Information: Organizacion Latino-americana de Energia (OLADE), P.O. Box 119, Quito, Ecuador.

September 1989 - November 1989

GEOTHERMAL ENERGY (Kyushu, Japan). Annual short course organized by the Government of Japan and sponsored by Unesco. Language: English. For Information: Japan International Cooperation Agency (2nd Training Division, Training Affairs Department), P.O. Box 216, Shinjuku Mitsui Building, 2 - 1, Nishi-shinjuku, Shinkuku-ku, Tokyo 160, Japan.

September 1989 - July 1990

PETROLEUM EXPLORATION GEOLOGY (Headington, Oxford, U.K.). An annual diploma course designed by Oxford Polytechnic to prepare post-graduate geologists for the duties of geologists in oil exploration teams. For Information: M. Hoggins, Department of Geology and Physical Sciences, Oxford Polytechnic, Headington, Oxford OX3 0BP, U.K.

September 1989 - August/November 1990

AEROSPACE SURVEYS FOR: 1) GEOCHEMICAL SURVEY; 2) WATER RESOURCES SURVEY; 3) APPLIED GEOMORPHOLOGY AND ENGINEERING GEOLOGY (Enschede, The Netherlands). Annual post-graduate courses, organized by the International Institute for Aerospace Survey and Earth Sciences (ITC), with Unesco. Language: English. For Information: ITC Student Registration Office, P.O. Box 6, 7500 AA Enschede, The Netherlands.

September 1989 - August 1990

MINERAL EXPLORATION AND EXPLORATION GEOPHYSICS (Delft, The Netherlands). Annual diploma courses organized by the International Institute for Aerospace Survey and Earth Sciences with Unesco. Language: English. For Information: ITC Student Registration Office (ME), P.O. Box 6, 7500 AA Enschede, The Netherlands.

October 1989 - August 1989

HYDROLOGY AND HYDROGEOLOGY (Belgium). Language: French. For Information: Professeur Dr. ir. A. Monjoie, Directeur des Laboratoires de Géologie de l'Ingénieur, d'Hydrogéologie et de Prospection géophysique - Batiment B19, Faculté des Sciences Appliquées, Université de Liège - SART TILMAN, B-4000 Liege, Belgium.

October 1989 - November 1989

TECTONICS, SEISMOLOGY AND SEISMIC RISK ASSESSMENTS (Potsdam, D.D.R.). One-month training course organized annually by East German Academy of Sciences in collaboration with Unesco. Language: English. For Information: Prof. Dr. H. Kautzleben, Director, Central Earth's Physics Institute, Academy of Sciences of the German Democratic Republic, Telegraphenberg, DDR-500 Postdam, German Democratic Republic.

October 1989 - July 1990

ENGINEERING HYDROLOGY (Galway, Ireland). Annual diploma and post-graduate courses organized by the Dept. of Engineering Hydrology, University College, Galway, Ireland. Sponsored by Unesco-IHP and the World Meteorological Organization. For Information: Prof. J-E. Nash, Department of Engineering Hydrology, University College Galway, Galway, Ireland.

October 1989 - September 1990

WATER AND WASTE ENGINEERING FOR DEVELOPING COUNTRIES (Loughborough, England, U.K.). Twelve-month MSC. programme organized annually for engineers and scientists from developing countries by WEDC. For Information: John Pickford, WEDC, University of Technology, Loughborough, Leics, LE11 3TU, U.K.

October 1989 - September 1990

HYDRAULIC ENGINEERING AND HYDROLOGY (Delft, The Netherlands). Diploma courses organized annually by the International Institute for Hydraulic and Environmental Engineering and sponsored by Unesco for professionals from developing countries. Language: English. For Information: International Institute for Hydraulic and Environmental Engineering (IHE), Oude Delft 95, P.O. Box 3015, 2601 DA Delft, The Netherlands.

October 1989 - September 1991

FUNDAMENTAL AND APPLIED QUATERNARY GEOLOGY (Brussels, Belgium). Annually organized training course leading to a Master's degree in Quaternary Geology by the Vrije Universiteit Brussel (IFAQ) and sponsored by Unesco. Language: English. For Information: Prof. Dr. R. Paepe, Director of IFAQ, Kwartairgeologie, Vrije Universiteit Brussel, Pleinlaan 2, B-1050, Brussels, Belgium.

November 1989 - December 1989

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

November 1989 - June 1990

GEOTHERMICS (Pisa, Italy). Certificate course organized annually by the Istituto Internazionale per le Ricerche Geotermiche and sponsored by Unesco, UNDP and Italy. Language: English. For Information: Istituto Internazionale per le Ricerche Geotermiche, I Via Buongusto, 56100 Pisa, Italy.

November 1989 - October 1990

ENGINEERING GEOLOGY (Delft, The Netherlands). Annual post-graduate 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.

1990

January 1990 - July 1990

GENERAL AND APPLIED HYDROLOGY (Madrid, Spain). An annual, 6-month course sponsored by Unesco. Language: Spanish. For Information: Centro de Estudios y Experimentacion de Obras Publicas y Urbanismo, Alfonso XII, Num. 3, Madrid 7, Spain.

January 1990 - July 1990

GROUNDWATER HYDROLOGY (Barcelona, Spain). An annual 6-month, post-graduate course sponsored by Unesco. Language: Spanish. For Information: Curso Internacional de Hidrologia Subterranea, Calle Beethoven, 15, 3^o, 08021 Barcelona, Spain.

February 1990

METALLOGENY (Quito, Ecuador). Annual 3-week training course for Latin Americans organized by Central University of Quito, the Autonomous University of Madrid (Spain), and Unesco. Language: Spanish. For Information: Director, Curso Internacional de Metalogenia, Escuela de Geologia, Minas y Petroleos, Division de Post-grado, Universidad Central, Apartado Postal 8779, Quito, Ecuador.

February 1990 - March 1990

GEOCHEMICAL PROSPECTING TECHNIQUES (Tervuren, Belgium). Annual course sponsored by the Royal Museum of Central Africa and UNDP. Language: French. For Information: Musée royal de l'Afrique centrale, Steenvog op Leuven, 13, B-1980 Tervuren, Belgium.

February 1990 - April 1990

INTRODUCTION TO DIGITAL IMAGE PROCESSING (Enschede, The Netherlands). Annual course organized by the International Institute for Aerial Survey and Earth Sciences, Enschede, The Netherlands, with Unesco. Language: English. For Information: Student Registration Office, ITC, P.O. Box 6, 7500 AA Enschede, The Netherlands.

February 1990 - June 1990

MINERAL EXPLORATION (Leoben, Austria). Diploma course organized annually by the University of Mining and Metallurgy in Leoben and sponsored by Unesco. Language: English. For Information: University for Mining and Metallurgy, Post-graduate course on mineral exploration, Montanuniversität, Leoben, A-8700, Austria.

February 1990 - July 1990

HYDROLOGY (Budapest, Hungary). An annual six-month, post-graduate course organized by the Research Centre for Water Resources Development (Budapest) and sponsored by Unesco. Language: English. For Information: VITUKI International Post-Graduate Course on Hydrology, H-1453 Budapest, Pf. 227 Hungary.

February 1990 - August 1990

HYDROLOGY (Padova, Italy). An annual, 6-month, postgraduate course sponsored by Unesco. Language: English. For Information: Professor A. Ghetti, Centro Internazionale di Idrologia "Dino Tonini," via sette Chiese, 35043 Monselice, Italy.

October 1990 - September 1992

GEOLOGICAL EXPLORATION METHODS (Nottingham, U.K.). Two-year MSc course starting every other year with emphasis on applied methodology, data acquisition and interpretations). For Information: Dr. M.A. Lovell, Department of Geology, University of Nottingham NG7 2RD, U.K.

December 1990 - January 1991

METHODS AND TECHNIQUES IN EXPLORATION GEOPHYSICS (Hyderabad, India). Diploma course organized every second year by the National Geophysical Research Institute of the Council of Scientific and Industrial Research, Hyderabad, India, and sponsored by Unesco. Language: English. For Information: The Director, International Training Course on Methods and Techniques in Geophysical Exploration, National Geophysical Research Institute, Hyderabad, 500 007 (A.P.) India.

KALENDAR (CALENDAR)

1989

May 8-12, 1989

ENGINEERING GEOLOGY PROBLEMS IN RESIDUAL SOILS (International Symposium), Abidjan-Yamassoukro, Ivory Coast. Languages: French and English (Ing. Dr. Gérard Cougny, Laboratoire du Bâtiment et des Travaux Publics, 04 Bp 3 Abidjan 04, Ivory Coast).

May 8-12, 1989

GLOBAL CHANGES IN SOUTH AMERICA DURING THE QUATERNARY: PAST-PRESENT-FUTURE (International Symposium), Sao Paulo. (K. Suguio, Inst. Geociencias, USP CP 20.899, CEP 01498, Sao Paulo, Brazil).

May 9-11, 1989

SEA-LEVEL CHANGES AT ACTIVE PLATE MARGINS (Meeting BSRG and IAS), London, U.K. (D.M.I. McDonald, British Antarctic Survey, High Cross, Madingley Road, Cambridge CB2 0ET, England, U.K.).

May 14-17, 1989

GAC/MAC (Annual Meeting), Montreal, Canada. (C. Stearn, Dept. Geological Sciences, McGill University, 3450 University Street, Montreal, Quebec, Canada H3A 2A7) Also includes IMAGE ANALYSIS IN MINERAL AND EARTH SCIENCES (CANMET/GAC/ MAC Workshop) (Dr. Paul Mainwaring, MPL, CANMET, 555 Booth Street, Ottawa, Ontario, Canada K1A 0G1).

May 15-17, 1989

ENVIRONMENTAL GEOTECHNOLOGY (2nd International Symposium), Shanghai, China. (Secretary, ISEG, c/o Box 415, Bethlehem, PA 18016, U.S.A.).

May 22-27, 1989

PALAEONTOLOGY AND STRATIGRAPHY (International Meeting), Messina and Taormina, Italy. Languages: Italian, French and English. (Centenario di G. Seguenza, Istituto di Scienze della Terra, Università degli Studi, 98100 Messina, Italy).

May 23-25, 1989

GOLD IN EUROPE (International Conference), Toulouse, France (R.P. Foster, Department of Geology, University of Southampton, Hants. SO9 5NH, U.K.).

May 28 - June 3, 1989

HYDROGEOLOGICAL MAPS - A TOOL FOR ECONOMIC AND SOCIAL DEVELOPMENT (International Symposium), Hannover, F.R.G. (Hydrogeological Maps Symposium, BGR Organising Unit, Postfach 510153, D-3000 Hannover 51, F.R.G.).

June 5 - June 9, 1989

RIVER SEDIMENTATION (4th International Symposium), Xi'an, China. (Dr. Ding Lianzhen, IRTCES, P.O. Box 366, Beijing, P.R.C.).

June 6-10, 1989

RHENOTHERCYNIAN AND SUBVARISCAN FOLD BELTS (International Workshop), Boppard/Rhein, F.R.G. Language: English. (Dr. Andreas Vogel, Mathematical Geophysics Group, Free University of Berlin, Podbielskiallee 60, D-1000 Berlin 33).

June 25 - July 1, 1989

IAVCEI (General Assembly), Santa Fe, New Mexico, U.S.A. (Dr. M.A. Dungan, Department of Geological Sciences, Southern Methodist University, Dallas, TX 75275, U.S.A.) Will also include IGCP 257: Precambrian Mafic Dyke Swarms (Meeting) (John W. Geissman, Department of Geology, The University of New Mexico, Northrop Hall, Albuquerque, NM 87131, U.S.A.).

June 26-29, 1989

ENGINEERING GEOLOGY IN TROPICAL TERRAINS (International Conference), Selangor Darul Ehsan, Malaysia. Co-sponsored by IAEG. (Dept. Geology, Universiti Kebangsaan, 43600 Bangi, Selangor Darul Ehsan, Malaysia).

June 26-30, 1989

GOLD GEOLOGY AND EXPLORATION (International Symposium), Shenyang, China. Co-sponsored by IMA. (Professor Zhu Fengsan, Secretariat of ISGGE, Chinese Society of Metals, 46 Dongsixi Dajie, Beijing, P.R.C.).

July 5-8, 1989

CHAROPHYTES (International Colloquium), Montpellier, France. Languages: French and English. (Colloque Charophytes, Laboratoire de Paleobotanique, U.S.T.L., Place E. Bataillon, F-34 060 Montpellier, France).

July 9-19, 1989

INTERNATIONAL GEOLOGICAL CONGRESS (28th), Washington, D.C., U.S.A. (International Geological Congress, P.O. BOX 1001, Herndon, VA 22070, U.S.A.).

July 12-15, 1989

NEW MINERAL RAW MATERIALS (4th International Symposium), Karovy Vary, Czechoslovakia. (NEMIRAM, Geological Survey, Malostranske nam. 19, 11821 Praha 1, Czechoslovakia).

July 17-19, 1989

MINING IN THE ARCTIC (International Symposium), Fairbanks, Alaska. (Dr. Sukumar Bandopadhyay, 108 Brooks Building, Department of Mining and Geological Engineering, University of Alaska Fairbanks, Fairbanks, Alaska 99775, U.S.A.).

July 22-24, 1989

TECTONOTHERMAL EXPRESSION OF TERRANE ACCRETION WITHIN THE APPALACHIAN OROGEN (IGCP-233 International Conference), Athens, Georgia, U.S.A. (R.D. Dallmeyer, Department of Geology, University of Georgia, Athens, GA 30602, U.S.A.).

- July 24 - August 4, 1989
INTERNATIONAL ASSOCIATION OF GEOMAGNETISM AND AERONOMY (6th Scientific Assembly), Exeter, U.K. (Dr. Roy Jady, IAGA 1989 Organizing Secretary, Department of Mathematics, University of Exeter, Exeter EX4 4QE, U.K.).
- July 31 - August 3, 1989
EROSION AND VOLCANIC DEBRIS FLOW TECHNOLOGY (International Symposium), Yogyakarta, Indonesia. (Mr. Hartono Pramudo, Tromol Pos 23/KBT Kebayoran Baru, Jakarta Selatan, Indonesia).
- August 1-3, 1989
PLATINUM (5th International Symposium), Espoo, Finland. Co-sponsored by IAGOD. (Prof. H. Papunen, Department of Geology, University of Turku, SF-20500 Turku, Finland).
- August 2-4, 1989
PREPAREDNESS, MITIGATION AND MANAGEMENT OF NATURAL DISASTERS (Symposium), New Delhi, India. Language: English. (Dr. R.C. Agrawal, Symposium PMMD, c/o Dept. of Earthquake Engineering, University of Roorkee, Roorkee-247667, India).
- August 3-12, 1989
WATER-ROCK INTERACTION (6th IAGC International Symposium), Malvern, England. (Dr. W.M. Edmunds, British Geological Survey, Wallingford, Oxon OX10 8BB, U.K.).
- August 7-10, 1989
PACIFIC NEOGENE STRATIGRAPHIC, PALEOCEANOGRAPHIC AND ANDEAN EVENTS (IGCP-246 Meeting), Vina del Mar, Chile. (IGCP-246, Pacific Science Association, VI Inter-Congress, Box 14187, Suc. 21, Santiago, Chile).
- August 13-18, 1989
SOIL MECHANICS AND FOUNDATION ENGINEERING (12th International Conference), Rio de Janeiro, Brazil. (Organizing Committee, XII ICSMFE, Caixa Postal 1559, 2000 Rio de Janeiro PJ, Brazil).
- August 14-17, 1989
PRECAMBRIAN GRANITOIDES: Petrogenesis, Geochemistry, and Metallogeny (IGCP 217 and 247 Symposium), Helsinki, Finland. (Precambrian Granitoids Symposium, Department of Geology, University of Helsinki, P.O. Box 115, SF-00171 Helsinki, Finland).
- August 14-29, 1989
SPELEOLOGY (10th International Congress), Budapest, Hungary. (10th International Congress of Speleology, c/o Magyar Karszt -'es Barlangkutatas Tarsulat, Anker köz 1, H-1061 Budapest, Hungary).
- August 21-25, 1989
INTERNATIONAL ASSOCIATION FOR HYDRAULIC RESEARCH (23rd Congress), Ottawa, Canada. (IAHR Secretariat, National Research Council, Building M-58, Montreal Road, Ottawa, Ontario, Canada K1A 0R6).
- August 21 - September 1, 1989
IASPEI (25th General Assembly), Istanbul, Turkey. Co-sponsored by ICL. (Dr. Otkay Ergunay, Earthquake Research Division, Ministry of Public Works and Settlement, Yuksel Cad No. 7/F, Ankara, Turkey).
- August 22-25, 1989
CLASTIC TIDAL DEPOSITS (2nd International Research Symposium), Calgary, Alberta, Canada. (Ray Rahmani, Canadian Hunter Exploration Ltd., 435 - 4th Avenue S.W., Calgary, Alberta, Canada T2P 3A8).
- August 28 - September 2, 1989
AIPEA (9th International Clay Conference), Strasbourg, France. (Prof. Dr. Yves Tardy, Institut de Géologie, 1 rue Blessig, 67084 Strasbourg, France).
- August 30 - September 2, 1989
ROCK AT GREAT DEPTH (Symposium), Pau, France. (Symposium, Elf Aquitaine, CSTCS, Bat. L5, 64018 Pau Cedex France).
- August 31 - September 6, 1989
PALEOLIMNOLOGY (5th International Symposium), Ambleside, Cumbria, U.K. (Prof. Frank Oldfield, Department of Geography, University of Liverpool, P.O. Box 147, Liverpool L69 3BX, U.K.).
- September 3-9, 1989
GEOMORPHOLOGY (2nd International Conference), Frankfurt/Main, F.R.G. (Prof. Dr. Arno Semmel, Institut für Physische Geographie, Universität Frankfurt, Senckenberganlage 36, Postfach 11 19 32, D-6000 Frankfurt/Main, F.R. Germany).
- September 4-7, 1989
CHALK (International Symposium), Brighton, U.K. (Dr. R.N. Mortimore, Department of Civil Engineering, Brighton Polytechnic, Moulsecoomb, Brighton BN2 4GJ, U.K.).
- September 4-8, 1989
NON-METALLIC MINERALS (2nd World Congress), Beijing, China. (Prof. Xu Changyou, Wuhan University of Technology, Wuhan, Hubei Province, P.R. China).
- September 4-8, 1989
COASTAL EVOLUTION, MANAGEMENT AND EXPLORATION IN SOUTHEAST ASIA (IGCP-274 International Symposium), Ipoh, Malaysia. (Dr. H.D. Tjia, Jabatan Geologi, Universiti Kebangsaan Malaysia, 43600 Bangi, Selangor, Malaysia).
- September 4-9, 1989
ANALYSIS OF SEISMICITY AND SEISMIC RISK (4th International Symposium), Bechyne, Czechoslovakia. (Dr. Z. Schenkova, Geophysical Institute, Bocni II, 14131 Prague 4, Czechoslovakia).

- September 4-13, 1989
MICROPALAEONTOLOGICAL COLLOQUIUM (26th), Budapest, Hungary. IPA. (Dr. A. Nagymarosy, Department of Geology, "Eötvös L." University, Budapest VIII, Muzeum krt. 4/A H-1088, Hungary).
- September 10-14, 1989
QUATERNARY ENGINEERING GEOLOGY (Conference), Edinburgh, U.K. Cosponsored by IAEG. (Dr. J.A. Little, Dept. of Civil Engineering, Heriot-Watt University, Riccarton, Edinburgh EH14 4AS, Scotland, U.K.)
- September 10-15, 1989
GEOLOGY AND RESERVOIR HETEROGENEITY (Symposium), Banff, Alberta, Canada. (Mrs.) Pat Larlham, Faculty of Extension, University of Alberta, Edmonton, Alberta, Canada T6G 2G4).
- September 10-16, 1989
PALAEOCEANOGRAPHY (3rd International Conference), Cambridge, U.K. (N.J. Shackleton, Department of Earth Sciences, University of Cambridge, Downing Street, Cambridge CB2 3EQ, U.K.).
- September 11-22, 1989
ARCHEAN - PROTEROZOIC TRANSITION (Field Conference), Harare, Zimbabwe. Co-sponsored by IGCP and IUGS. (Apt 89, Geological Society of Zimbabwe, P.O. Box 8427, Causeway, Harare, Zimbabwe).
- September 12-15, 1989
COAL: Formation, Occurrence and Related Properties (International Meeting), Orléans, France. (P. Bertrand, Unité de Recherche en Pétrologie, Organique, Université d'Orléans, 45067 Orléans, Cedex 2, France).
- September 14-19, 1989
EDITING INTO THE 90's (Joint CBE, EASE, AESE Meeting), Ottawa, Canada. (Conference Office, National Research Council of Canada, Ottawa, Ontario, Canada K1A 0R6).
- September 17-24, 1989
AGGLUTINATED FORAMINIFERA (3rd International Workshop), Tübingen, F.R.G. (Dr. C.H. Leben, Geologisches Institut der Universität, Sigwartstrasse 10, D-7400 Tübingen, Federal Republic of Germany).
- September 17-24, 1989
ENERGY (14th World Congress), Montreal, Quebec, Canada. (World Energy Conf., 34th St. James's Street, London SW1A 1HD, U.K.).
- September 18-22, 1989
ORGANIC GEOCHEMISTRY (14th International Congress), Paris, France. (Ms. Yolande Rondot, Institut Français du Pétrole, B.P. 311, 92506 Rueil-Malmaison cedex, France).
- September 24-30, 1989
CARBONIFEROUS STRATIGRAPHY (IUGS Subcommittee Biennial Field and General Meeting), Utah/Nevada, U.S.A. (Walter L. Manger, Department of Geology, University of Arkansas, Fayetteville, AK 72701, U.S.A.).
- September 25-28, 1989
MINING LATIN AMERICA (IMM Conference and Exhibition), Rio de Janeiro, Brazil. (The Institution of Mining and Metallurgy, 44 Portland Place, London W1N 4BR, U.K.).
- October 1-4, 1989
SINKHOLES AND THE ENGINEERING AND ENVIRONMENTAL IMPACTS OF KARST (3rd Multidisciplinary Conference), St. Petersburg, Florida, U.S.A. (Conference, Florida Sinkhole Research Institute, University of Central Florida, Orlando, FL 32816, U.S.A.).
- October 1-6, 1989
GEOCHEMICAL EXPLORATION (13th International Symposium) and BRAZILIAN GEOCHEMICAL CONGRESS (2nd), Rio de Janeiro, Brazil. Co-sponsored by AEG. Languages: Symposium - English; Congress - Portuguese. (D.C. Bruni, 13th IGES, P.O. Box 2432, 20010, Rio de Janeiro, R.J., Brazil).
- October 2-4, 1989
FLUVIAL SEDIMENTOLOGY (4th International Conference), Barcelona, Spain. (C. Puigdefàbregas, Servei Geològic de Catalunya, carrer Diputació 92, 08015 Barcelona, Spain).
- October 2-5, 1989
GROUNDWATER MANAGEMENT: QUANTITY AND QUALITY (International Symposium), Benidorm, Alicante, Spain. Language: English. (Secretary General, IAHS, Institute of Hydrology, Wallingford, Oxon. OX10 8BB, U.K.).
- October 16-20, 1989
EARTHQUAKE PROGNOSTICS (4th International Seminar). Beijing, P.R. China. Language: English. (Prof. Wu Yilin, Crustal Deformation Department, Institute of Seismology, State Seismological Bureau of China, Xiao Hong Shan, Wuhan, P.R. China).
- October 16-20, 1989
MATHEMATICAL METHODS IN GEOLOGY (IAMG Symposium), Příbram, Czechoslovakia. Sekretariat symposia, Hornická Příbram ve Vede a Technice, post. schr. 41,261 02 Příbram, Czechoslovakia).
- October 18-20, 1989
STRUCTURAL AND TECTONIC MODELLING AND ITS APPLICATION TO PETROLEUM GEOLOGY (Meeting), Stavanger, Norway. (Norwegian Petroleum Society, P.O. Box 1897 - Vika, 0124 Oslo, Norway).
- October 22-25, 1989
WORLD GOLD '89 (Meeting), Reno, Nevada, U.S.A. (Society of Mining Engineers, P.O. Box 625002, Littleton, CO 80162, U.S.A.).

October 23-27, 1989
COAL SCIENCE (International Conference), Tokyo, Japan. Language: English. (Secretariat for ICCS, Coal Conversion Department, New Energy Development Organization (NEDO), Sunshine 60 Building, 1-1, Higashi-Ikebukuro 3-chome, Toshima-ku, Tokyo 170, Japan).

October 29 - November 2, 1989
SOCIETY OF EXPLORATION GEOPHYSICISTS (Annual Meeting), Dallas, Texas, U.S.A. (Convention Assistant, SEG, P.O. Box 3098, Tulsa, OK 74101, U.S.A.).

November 6-9, 1989
GEOLOGICAL SOCIETY OF AMERICA (Annual Meeting), St. Louis, Missouri, U.S.A. (Meetings Department, GSA, P.O. Box 9140, Boulder, CO 80301, U.S.A.).

November 13-15, 1989
MINERAL EXPLORATION PROGRAMME '89 (Symposium), Madrid, Spain. (MEP '89, 4 Brandon Road, London N7 9TR, England, U.K.).

November 14-16, 1989
WORLD WATER (Conference), Wembley, London, U.K. (World Water '89, Conference, Office, Institution of Civil Engineers, 1 - 7 Great George Street, Westminster, London SW1P 3AA, U.K.).

November - December 1989
PETROLEUM GEOLOGY SEMINAR '89, Kuala Lumpur, Malaysia. (c/o Organizing Chairman, Geological Society of Malaysia, Geology Department, University of Malaya, 59100 Kuala Lumpur, Malaysia).

December 4-8, 1989
AMERICAN GEOPHYSICAL UNION (Fall Meeting), San Francisco, Calif., U.S.A. (AGU Meetings, 2000 Florida Avenue NW, Washington, DC 20009, U.S.A.).

1990

January, 1990
ANNUAL CONFERENCE '90, GEOLOGICAL SOCIETY MALAYSIA (Organising Chairman, Geological Society of Malaysia, c/o Geology Dept., University of Malaya, 59100 Kuala Lumpur, Malaysia).

January 15-27, 1990
OMAN OPHIOLITE, STRUCTURE, PETROLOGY, STRATIGRAPHY (International Symposium), Muscat, Sultanate of Oman. (Secretary, Hilal Azry, Ministry of Petroleum and Minerals, P.O. Box 551, Muscat, Oman).

February 5-9, 1990
BRACHIOPODS (2nd International Congress), Dunedin, New Zealand. (J.D. Campbell, Geology Department, University of Otago, P.O. Box 56, Dunedin, New Zealand).

April 18-20, 1990
OROGENESIS IN ACTION: Tectonics and Processes in the West Equatorial Pacific Margin (Meeting), London, U.K. (R. Hall, Department of Geological Sciences, University College London, Gower Street, London WC1E 6BT, U.K.).

May 6-12, 1990
PACIFIC RIM 90 (International Congress), Gold Coast, Queensland, Australia. (The AusIMM-Pacrim 90, P.O. Box 731, Toowong Qld 4066, Australia).

May 14-18, 1990
WORLD MINING (14th Congress), Beijing, P.R. China. (China Organizing Committee, 14th World Mining Congress, 54 Sanlihe Road, Beijing, People's Republic of China).

May 29 - June, 1990
EUROPEAN ASSOCIATION OF EXPLORATION GEOPHYSICISTS (52nd Annual Meeting), Copenhagen, Denmark. (J. Tychsen, Miljøministeriet, Amaliegade 13, DK-1265, Copenhagen K, Denmark).

June 1990
GEOCHEMISTRY OF WEATHERING (2nd International Symposium), Aix-en-Provence, France. Sponsored by IAGC. (B. Hitchon, Alberta Research Council, Box 8330, Station F. Edmonton, Alberta, Canada T6H 5X2).

June 3-6, 1990
AAPG/SEPM (Annual Meeting), San Francisco, California, U.S.A. (Convention Department, AAPG, Box 979, Tulsa, OK 74101, U.S.A.).

June 25-30, 1990
GEOSCIENCE INFORMATION (4th International Conference), Ottawa, Canada. (A. Bourgeois, Geological Survey of Canada, 601 Booth Street, Ottawa, Ontario, Canada K1A 0E8).

June 28 - July 3, 1990
INTERNATIONAL MINERALOGICAL ASSOCIATION (15th General Assembly), Beijing, P.R. China. (Prof. Huang Yunhui, c/o Institute of Mineral Deposits, Chinese Academy of Geological Sciences, Baiwan-zhuang Road 26, Fuchengmenwai, Beijing, P.R. China).

July, 1990
CAMBRIAN SYSTEM (3rd International Symposium), Novosibirsk, U.S.S.R. (Dr. J.W. Cowie, Department of Geology, University of Bristol, Queen's Building, University Walk, Bristol BS8 1RJ, England).

July 19-28, 1990

INTERNATIONAL UNION OF CRYSTALLOGRAPHY (15th Congress), Bordeaux, France. (Stefan S. Hafner, University of Marburg, 3550 Marburg, F.R. Germany).

July 29 - August 3, 1990

CIRCUM-PACIFIC ENERGY AND MINERALS RESOURCES (Conference), Honolulu, Hawaii. (Mary Stewart, Circum-Pacific Council on Energy and Mineral Resources, 5100 Westheimer Road, Houston, TX 77056, U.S.A.).

August, 1990

IGES (13th International Geochemical Exploration Symposium), Rio de Janeiro, Brazil. Sponsored by AEG. (Sherman Marsh, USGS, Federal Center MS 973, Denver, CO 80309-0250, U.S.A.).

August 6-10, 1990

IAEG (6th International Congress), Amsterdam, The Netherlands. Language: English and French. (Dr. L. Primel, L.C.P.C., 58 Boulevard Lefebvre, 75732 Paris Cedex 15, France).

August 12-18, 1990

INTERNATIONAL ASSOCIATION ON THE GENESIS OF ORE DEPOSITS (8th Symposium), Ottawa, Canada. (Dr. R.W. Boyle, 601 Booth Street, Ottawa, Canada K1A 0E8).

August 15-17, 1990

ARCTIC GEOLOGY AND PETROLEUM POTENTIAL (Meeting), Troms, Norway. (Norwegian Petroleum Society, Box 1897-Vika, 0124 Oslo 1, Norway).

August 26 - September 1, 1990

SEDIMENTOLOGY (13th International IAS Congress), Nottingham, U.K. (I.N. McCave, Department of Earth Sciences, University of Cambridge, Downing Street, Cambridge CB2 3EQ, U.K.).

August 26 - September 8, 1990

LATIN AMERICAN CONODONT SYMPOSIUM, La Paz, Bolivia and San Juan, Argentina. (Mario Hunicken, Academia Nacional de Ciencias, Casilla Correo 36, 5000 Cordoba, Argentina).

August 27 - September 1, 1990

WATER RESOURCES IN MOUNTAINOUS REGIONS (International Symposium and IAH 22nd Congress), Lausanne, Switzerland. (Dr. A. Parriaux, Laboratory of Geology EPFL (GEOLEP), CH-1015 Lausanne, Switzerland).

September 1990

GEOCHEMICAL EXPLORATION (13th International Symposium), Prague, Czechoslovakia. Joint IAGC and ABG meeting. (B. Hitchon, Alberta Research Council, P.O. 8330, Station F. Edmonton, Alberta, Canada T6H 5X2).

September - October 1990

IPA GRAPTOLITE WORKING GROUP (4th International Conference), Nanjing, P.R. China. (Chen Xu, Nanjing Institute of Geology and Palaeontology, Academia Sinica, Chi-Ming-Sau, Nanjing, P.R. China).

September 3-8, 1990

VOLCANOLOGY (International Congress), Mainz, F.R.G. (G. Brey, Max Planck Institut für Chemie, Abtl. Kosmochemie, Saarstrasse 23, 6500 Mainz, Federal Republic of Germany).

September 4-7, 1990

DEEP SEISMIC REFLECTION PROFILING OF THE CONTINENTAL LITHOSPHERE (4th International Symposium), Bayreuth, F.R.G. (C. Reichert, DEKORP, NLFb, Postfach 510153, D-3000 Hannover 51, F.R. Germany).

September 17-21, 1990

ARCHAEN (Symposium), Perth, Australia. (D.I. Groves, Department of Geology, University of Western Australia, Nedlands, Western Australia 6009).

September 23-27, 1990

SOCIETY OF EXPLORATION GEOPHYSICISTS (Annual Meeting), San Francisco, U.S.A. (Convention Assistant, SEG, P.O. Box 3098, Tulsa, OK 74101, U.S.A.).

September 24-29, 1990

GEOCHRONOLOGY, COSMOCHRONOLOGY AND ISOTOPE GEOLOGY (7th International Conference), Canberra, Australia. (Organizing Committee, ICOG 7, Research School of Earth Sciences, Australian National University, GPO Box 4, Canberra, ACT 2601, Australia).

September 28 - October 2, 1990

BENTHIC FORAMINIFERA (4th International Symposium), Sendai, Japan. (Dr. Yokichi Takayanagi, Institute of Geology and Paleontology, Tohoku University, Sendai, 980 Japan).

October 29 - November 1, 1990

GEOLOGICAL SOCIETY OF AMERICA (Annual Meeting), Dallas, Texas, U.S.A. (GSA, P.O. 9140 Boulder, CO 80301, U.S.A.).

November 1990

MEDITERRANEAN NEOGENE (9th International Congress), Barcelona, Spain. Cosponsored by IUGS. (Prof. Jordi Martinell, Fac. de Geologia, Univ. de Barcelona, Zona Universitaria de Pedralbes, 08028 Barcelona, Spain).

GEOLOGICAL SOCIETY OF MALAYSIA PUBLICATIONS

General Information

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

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 *Bulletin*. 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.

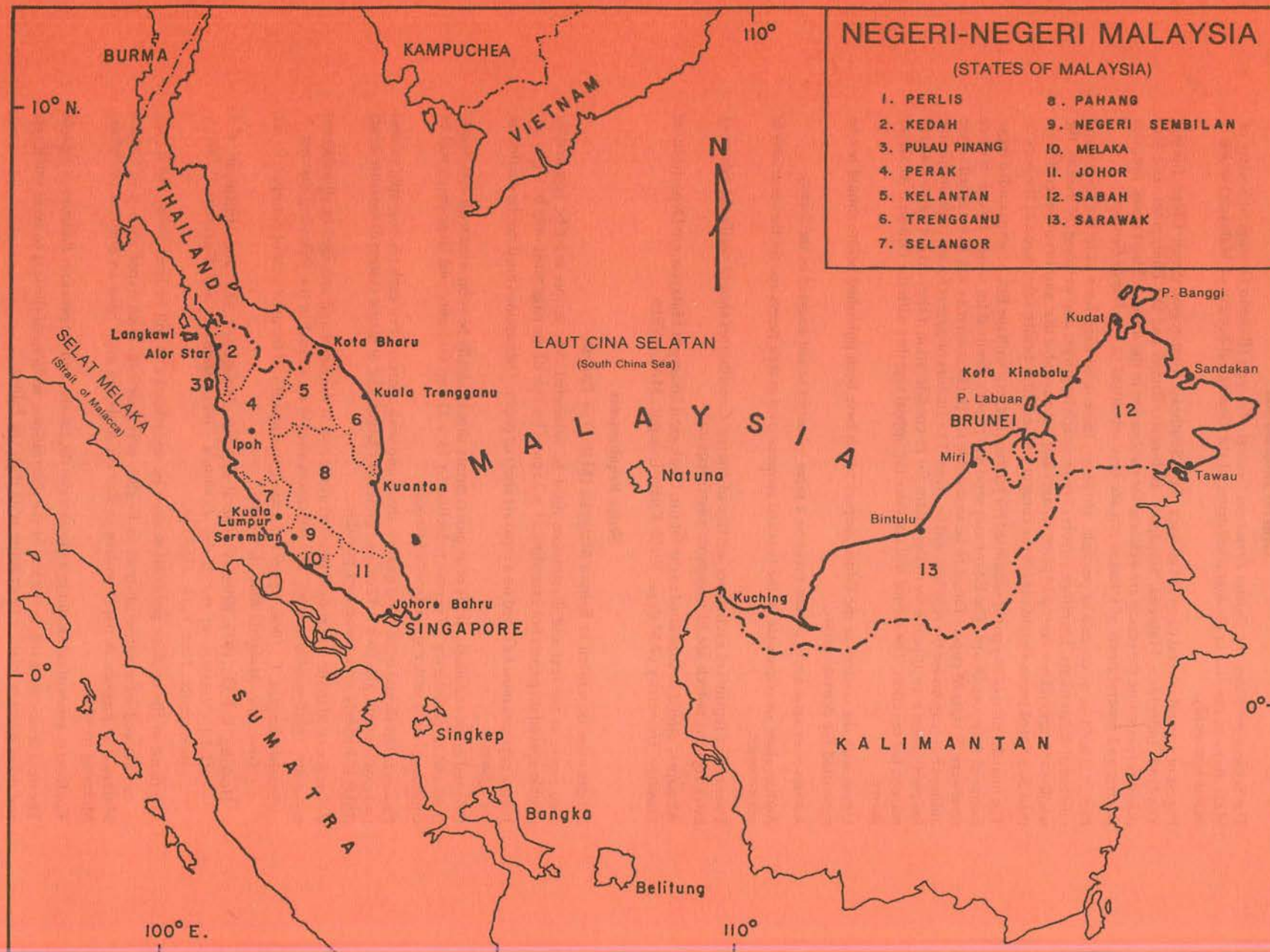
The name of the book or publication must be underlined and will be later printed in italics.

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 *Bulletins* 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.



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