

PERSATUAN GEOLOGI MALAYSIA

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

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CATATAN GEOLOGI

Geological Notes

Compositional variation of biotites from a peraluminous magma: example from the Kuala Lumpur granite

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Abstract: This work presents new biotite analyses from the Kuala Lumpur granite. The biotites have been analysed from three different samples namely equigranular normal biotite muscovite granite (NBMG), deformed biotite muscovite granite (DBMG) and porphyritic biotite muscovite granite (PBMG). Geochemistry of the biotite is similar to the biotites crystallising from a peraluminous melt, characterised by high Al_2O_3 content. The compositions of the biotites under study were defined by fO_2 near to that of the SiO_2 - Fe_2SiO_4 - Fe_3O_4 buffer.

Abstrak: Kajian ini mempersempahkan analisa baru biotit daripada granit Kuala Lumpur. Biotit-biotit telah dianalisa dari tiga sampel yang berlainan iaitu granit biotit muskovit samabutiran (NBMG), granit biotit muskovit terdefom (DBMG) dan granit biotit muskovit porfiritik (PBMG). Geokimia biotit ini adalah sama dengan biotit yang mengablur dari cecair peralumina, dicirikan oleh kandungan Al_2O_3 yang tinggi. Komposisi biotit yang dikaji boleh didefinisikan oleh fO_2 dekat dengan bufer SiO_2 - Fe_2SiO_4 - Fe_3O_4 .

INTRODUCTION

The Kuala Lumpur granite is located on the west side of the Main Range batholith. It was emplaced into schists, phyllites and limestones of Silurian and Devonian age. In general, the granite consists of two lobes, that is a smaller lobe to the west of Kuala Lumpur city and the main body to the east of the city. It consists of fine to coarse grained muscovite to biotite granite. Ng (1994) distinguished the Kuala Lumpur granite into four different units that is megacrystic biotite granite (unit 1), megacrystic muscovite-biotite granite (unit 2), equigranular tourmaline-muscovite granite (unit 3) and pegmatite, aplite and microgranite (unit 4). In the granite, biotite is the most important mafic phase and crystallised in wide range of rock types ranging from pegmatite and microgranite to biotite granite. This study will examine the compositions of the biotites from different facies of the Kuala Lumpur

granite. Biotites were analysed from three different samples, namely (1) Equigranular biotite-muscovite granite (NBMG) (2) Deformed biotite-muscovite granite (DBMG) collected within the Kuala Lumpur fault zone and (3) porphyritic biotite muscovite granite (PBMG) located within the contact zone (< 10 m) with pelitic rocks. Geochemically the Kuala Lumpur granites are peraluminous with average ACNK value of 1.11 (Ahmad Kamal Sani, 1982). The aims of this paper is to highlight some of the geochemical characteristics of the biotites that crystallized from a peraluminous magma as well as to geochemically differentiate the three samples.

PETROGRAPHY

All three samples have similar mineral contents, that is alkali feldspar, plagioclase, biotite, muscovite, quartz, Fe-Ti oxide and tourmaline. A summary of the petrographic

features of the three samples are shown in Table 1. Biotite occurs as subhedral to anhedral plates up to 4 mm across. Majority of the biotites are brown in colour except those from the porphyritic biotite-muscovite granite where most of the biotites are reddish in colour. Slight bending and kinking of the plates sometimes occur, especially the biotite from the deformed muscovite granite. Pleochroism scheme range from Y = light brown yellow to pale brown and X = dark brown to foxy red. Incipient replacement by chlorite, along with the secondary epidote and magnetite, is common along crystal margins and cleavages.

WHOLE ROCK GEOCHEMISTRY

Before discussing the chemistry of biotite from the Kuala Lumpur granite, it is necessary to briefly discuss the whole rock geochemistry of the Kuala Lumpur granite. The major and trace elements data for the Kuala Lumpur granite are taken from previous work (Cobbing *et al.*, 1992; Ahmad Kamal Sani, 1982; Azman, unpublished data). The Kuala Lumpur granite is very felsic with $\text{SiO}_2 > 71\%$. The rocks are peraluminous with average ACNK value of 1.11. They are also corundum normative (average C = 1.5). The geochemistry of the granites indicate

Table 1. Mineralogical and petrological characteristics of the three samples described in this paper.

	PBMG (Contact)	NBMG (Normal)	DBMG (Deformed)
Mineralogy	Kf, Plag, Qtz, Bio, Musc, tour, Zir, Opaque, Apa.	Kf, Plag, Qtz, Bio, Musc, Tour, Zir, Opaque, Apa.	Kf, Plag, Qtz, Bio, Musc, Tour, Zir, Opaque, Apa.
General Texture	Porphyritic.	Equigranular.	Equigranular, deformed.
Biotite	X = black brown, Y = foxy red brown. Small crystal (< 1.5 mm). Chloritised, pleochroic haloes.	X = olive, Y = dark brown, 0.5 to 2 mm. Chloritised.	X = olive, Y = dark brown, 0.5 to 3 mm in size. Highly chloritised (pale green).
Plagioclase	2 phases, small euhedral as inclusion in Kf (< 0.5 mm) and large euhedral to subhedral (up to 6 mm). Zoning — well developed.	Subhedral to anhedral (up to 4 mm).	Small subhedral to anhedral (< 2 mm).
K-feldspar	Microcline-microperthite.	Microcline-microperthite.	Microcline-microperthite.
Accessory Mineral	Opaque, Zir (inclusion in Bio), Apa.	Opaque, Zir (inclusion in Bio), Tour (euhedral-anhedral).	Opaque, Zir (inclusion in Bio), Tour (anhedral).
Muscovite	Skeletal grains in Plag/Kf. Small inc. in Plag is less common (secondary).	Subhedral to anhedral shape, large (0.5–3 mm), clot up to 5 grains (primary). Small Musc grains (0.1 mm) in Plag or as an alteration product along grain boundary (secondary).	Secondary skeletal, replace Plag and main component of the foliation.

Kf: K-Feldspar; Plag: Plagioclase; Qtz: Quartz; Bio: Biotite; Musc: Muscovite; Zir: Zircon; Apa: Apatite; Tour: tourmaline, Opaque: Opaque phases.

that they are evolved granites which is evident from Rb/Sr ratio (average = 20; Cobbing *et al.*, 1992).

BIOTITE GEOCHEMISTRY

Representative biotite analyses of the Kuala Lumpur granite is given in Table 2. Structural formulae have been calculated on a basis of 22 oxygens. Range of the biotite compositions from all samples are (1) NBMG: SiO₂, 34.53–35.66; TiO₂, 2.77–3.52; Al₂O₃, 18.68–19.06; FeO (total), 21.39–22.95; MgO, 5.53–5.64; Na₂O, 0.19–0.41; K₂O, 8.88–9.55 and BaO, 0.25–0.55. (2) DBMG: SiO₂, 35.03–36.77; TiO₂, 1.68–2.25; Al₂O₃, 18.02–18.72; FeO (total), 24.44–26.71; MgO, 3.41–3.81; Na₂O, 0.22–0.45; K₂O, 8.81–9.27 and BaO, 0–0.17 and (3) PBMG: SiO₂, 32.28–35.07; TiO₂, 2.6–7.54; Al₂O₃, 17.06–17.6; FeO (total), 22.97–23.98; MgO, 5.88–6.19; Na₂O, 0.20–0.41; K₂O, 6.03–9.43 and BaO, 0.03–0.43. For classification purposes, all the biotites from the Kuala Lumpur granite are plotted in the Mg vs Al^{vi} + Fe³⁺ + Ti vs Fe²⁺ + Mn diagrams (Fig. 1). In general the biotites are all Fe biotite and siderophyllite and lepidomelane in composition (Foster, 1960). The biotites from DBMG plot near to siderophyllite and lepidomelane whereas the biotites from NBMG and PBMG plot nearer to Fe biotite. On a XMg vs Si (Fig. 2), the biotites from the Kuala Lumpur granites plot in the annite and siderophyllite field. The biotites from DBMG have low XMg and the majority of the samples plot in the annite field.

The biotite compositions have a slight deficiency in the Y site (5.38–5.71 based on the 22 p.f.u.) compared to the ideal value (6) in the end members of trioctahedral members. Biotites from the PBMG have low Al^{iv} (0.34 to 0.68 based on the 22 p.f.u.) and those from the DBMG have high Al^{vi} (0.94–1.09, 22 p.f.u.), Fe³⁺ (0.36–0.38, 22 p.f.u.) and Fe²⁺ (2.87–3.11, 22 p.f.u.) compared to biotites from the other facies. The X site for the all three facies also varies; PBMG (1.34–2.001, 22 p.f.u.), NBMG (1.86–2.01, 22 p.f.u.) and DBMG (1.89–1.94, 22 p.f.u.). Variation within crystals also occur, thus biotite from the DBMG, from core to rim TiO₂, Al₂O₃ and FeO decreases whereas MgO increases. Those from the PBMG show an increase of MgO, FeO

and BaO from core to rim.

Biotite composition also depends largely upon the nature of the magma (calc-alkaline, peraluminous or alkaline) Abdel Rahman (1994) showed that using several discriminant diagrams (e.g. FeO* vs MgO-Al₂O₃, FeO* vs MgO, Al₂O₃ vs MgO) where FeO* = [FeO + (Fe₂O₃ x 0.89981)], biotite crystallised from different magmas i.e. calc-alkaline, alkaline and peraluminous suites, can be distinguished. Those crystallising from calc alkaline magma is enriched in MgO content whereas biotite crystallising from a peraluminous magma has high Al₂O₃ content. Whole rock geochemical data of the Kuala Lumpur granites (e.g. Cobbing *et al.*, 1992; Liew, 1983) show that majority of the data plot in peraluminous field in ACNK vs SiO₂ diagram. The biotites from the Kuala Lumpur granites also plot in the peraluminous field on MgO-Al₂O₃ diagram (Abdel Rahman, 1994). Average trend exhibit a negative MgO-Al₂O₃ correlation (Fig. 3). The trend suggest that the 3Mg – 2Al substitution is effective in producing Al-rich biotite crystallising from peraluminous melts (Abdel Rahman, 1994). The plot also show that the biotites from the DBMG sample have the lowest MgO (3.41–3.81%) content compared to those from NBMG (5.53–5.64%) and PBMG (5.88–6.19%) samples.

ESTIMATED OXYGEN FUGACITY ON BIOTITE COMPOSITION

Wones and Eugster (1965) carried out the main investigation of the stability of biotite. They discussed the variations in composition of biotite along the phlogopite-annite join with changing temperature, oxygen fugacity (fO₂) and pressure. The oxygen fugacities were defined by a number of oxygen buffers which included the Fe₂O₃-Fe₃O₄ (HM), Ni-NiO (NNO) and SiO₂-Fe₂SiO₄-Fe₃O₄ (QFM) buffers. The estimated position of the biotite solid solutions for each of these buffers is shown in Figure 4 together with the composition of the biotite from the Kuala Lumpur granite. As the Fe³⁺ contents were not determined separately, the Fe³⁺ in the biotites were recalculated so that Fe³⁺/(Fe²⁺ + Fe³⁺) = 0.11 (Mason, 1985). The general trend shown by the biotite from the Kuala Lumpur granite is parallel to the estimated

Table 2. Representative compositions of the biotites from the Kuala Lumpur granite.

Sample Loc Facies	PBMG Core Contact	PBMG Rim Contact	PBMG Core Contact	PBMG Rim Contact	NBMG Core Normal	NBMG Rim Normal	NBMG Core Normal	NBMG Rim Normal	DBMG Core Deform	DBMG Rim Deform	DBMG Core Deform	DBMG Rim Deform
SiO ₂	34.90	32.28	35.07	34.90	34.57	34.53	35.53	35.66	35.03	35.22	36.77	36.30
TiO ₂	3.17	7.54	3.25	2.60	3.52	3.01	2.77	3.08	2.25	2.08	1.69	1.68
Al ₂ O ₃	17.30	17.60	17.06	17.18	18.68	18.76	19.06	18.89	18.72	18.60	18.23	18.02
Cr ₂ O ₃	0.08	0.06	0.13	0.14	0.20	0.07	0.00	0.11	0.02	0.04	0.00	0.00
FeO	23.98	22.97	23.06	23.54	22.74	22.95	21.63	21.39	26.71	26.25	25.25	24.44
MgO	6.09	6.19	5.88	6.18	5.60	5.53	5.55	5.64	3.41	3.52	3.81	3.79
CaO	0.00	0.20	0.00	0.00	0.00	0.06	0.00	0.03	0.00	0.01	0.00	0.10
Na ₂ O	0.41	0.32	0.40	0.20	0.41	0.19	0.27	0.35	0.32	0.45	0.22	0.33
K ₂ O	9.13	6.03	9.33	9.43	9.24	8.88	9.28	9.55	9.27	8.91	9.20	8.81
BaO	0.03	0.43	0.15	0.14	0.31	0.35	0.55	0.25	0.00	0.00	0.00	0.17
Total:	95.19	93.45	94.55	94.45	95.28	94.32	94.64	94.94	95.73	95.19	95.41	93.63
Structural formulae based on 22 oxygens												
Si	5.46	5.08	5.51	5.50	5.37	5.39	5.48	5.51	5.48	5.52	5.71	5.73
Al ^{iv}	2.54	2.92	2.49	2.50	2.63	2.61	2.52	2.49	2.52	2.48	2.29	2.27
Z site	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00
Al ^{vi}	0.65	0.34	0.67	0.68	0.79	0.85	0.98	0.95	0.94	0.96	1.05	1.09
Cr	0.01	0.01	0.02	0.02	0.03	0.01	0.00	0.01	0.00	0.01	0.00	0.00
Fe ³⁺	0.35	0.33	0.33	0.34	0.33	0.33	0.31	0.30	0.38	0.38	0.36	0.36
Fe ²⁺	2.79	2.69	2.70	2.76	2.63	2.67	2.50	2.46	3.11	3.07	2.95	2.87
Mg	1.42	1.45	1.38	1.45	1.30	1.29	1.29	1.30	0.80	0.82	0.88	0.89
Ti	0.37	0.89	0.38	0.31	0.41	0.35	0.32	0.36	0.27	0.25	0.20	0.20
Y site	5.58	5.71	5.47	5.56	5.49	5.50	5.40	5.38	5.50	5.47	5.44	5.41
Ca	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.02	0.00	0.02
Na	0.12	0.10	0.12	0.06	0.12	0.06	0.08	0.11	0.08	0.14	0.07	0.10
K	1.82	1.21	1.87	1.89	1.83	1.77	1.84	1.88	1.85	1.78	1.82	1.78
Ba	0.00	0.03	0.01	0.01	0.02	0.02	0.03	0.02	0.00	0.00	0.00	0.01
X site	1.95	1.34	2.00	1.95	1.97	1.86	1.96	2.01	1.93	1.94	1.89	1.90

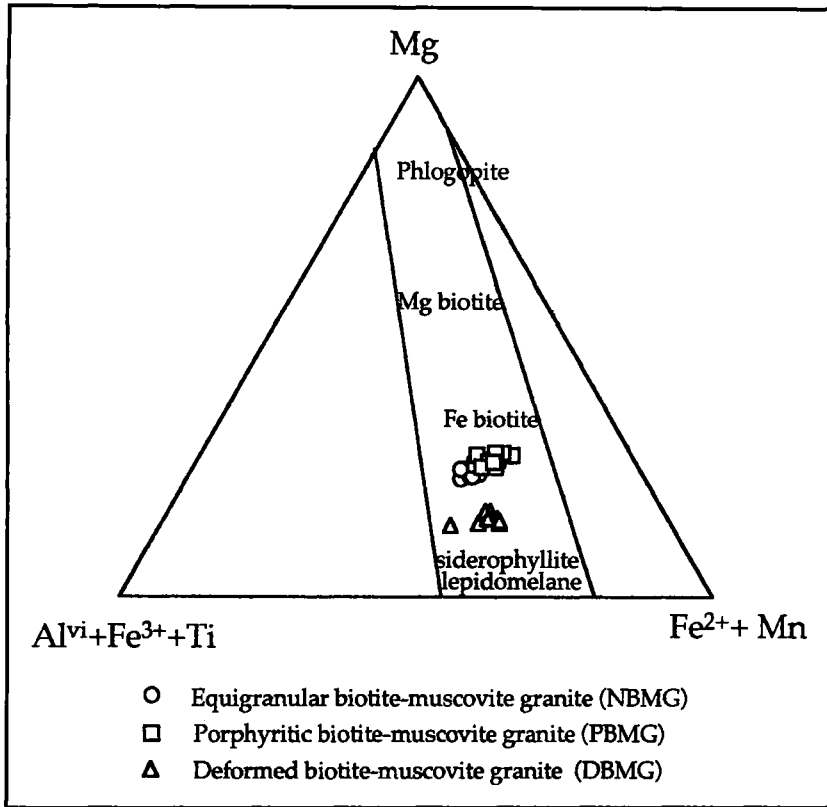


Figure 1. Mg vs Al^{vi} + Fe³⁺ + Ti vs Fe²⁺ + Mn diagram (Foster, 1960) for biotites from the Kuala Lumpur granite.

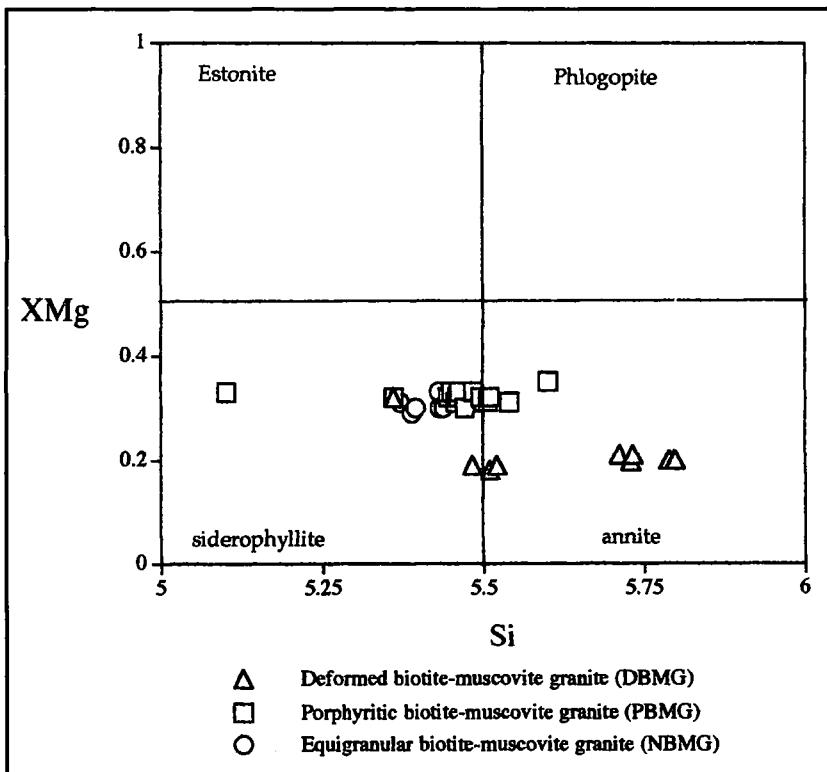


Figure 2. XMg vs Si diagram for biotites from the Kuala Lumpur granite.

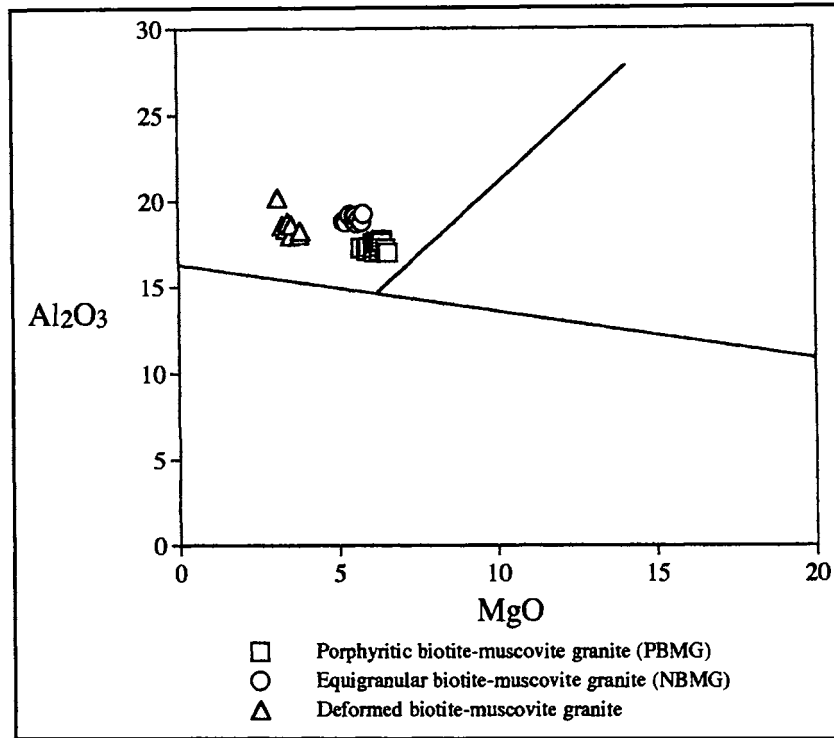


Figure 3. Al₂O₃ vs MgO diagram (after Abdel Rahman, 1994) for biotites from the Kuala Lumpur granite.

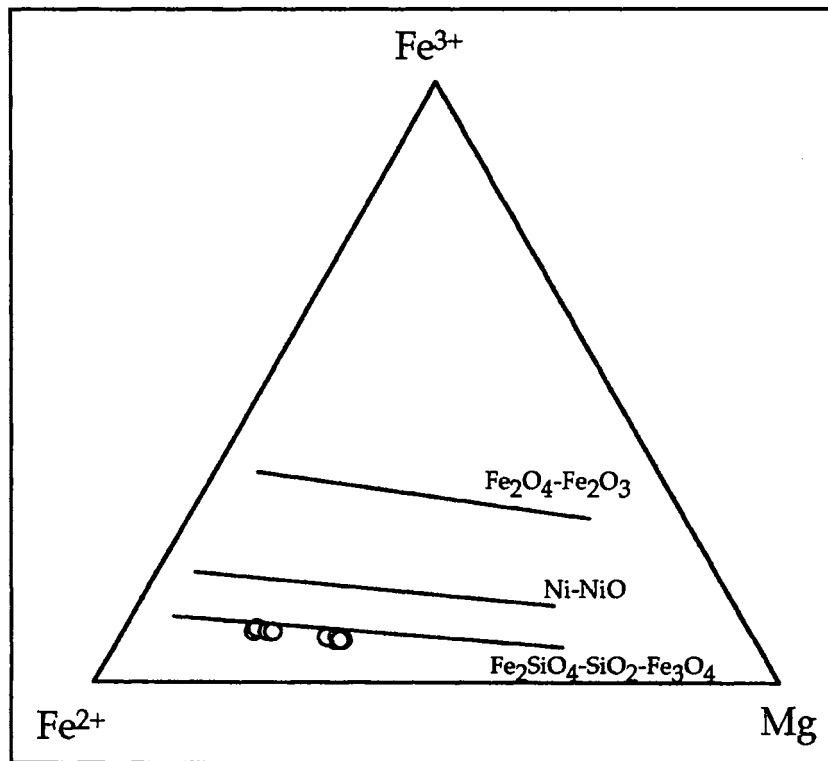


Figure 4. The relationship between Fe³⁺-Fe²⁺-Mg contents of biotites from the Kuala Lumpur granite (Fe³⁺: calculated values). The estimated position of biotite defining the HM, NNO and QFM oxygen buffer are shown in heavy lines (Wones and Eugster, 1965). All biotites from the three samples use the same symbol.

composition of biotite solid solution for individual buffers. This trend suggests that consanguineous granitoids were buffered during crystallisation, fO_2 increasing with decreasing temperature. The plot shows that the compositions of the biotites under study were defined by fO_2 near to that of the SiO_2 - Fe_2SiO_4 - Fe_3O_4 buffer (Fig. 4).

CONCLUDING REMARKS

In general, chemistry of the biotite from Kuala Lumpur is similar to the biotite crystallising from a peraluminous melt (Phillips *et al.*, 1981; Speer, 1981; Pattison *et al.*, 1982; Pichavant, 1988). They are characterised by high Al_2O_3 (wt.%). This may suggest that the chemistry of the biotites in the Kuala Lumpur granitic rocks depends largely upon the nature of the magma i.e. peraluminous (cf. Cobbing *et al.*, 1992). However the biotites also show some intersamples variation. Biotites from the DBMG have low TiO_2 , Cr_2O_3 and BaO and high FeO content compared to those from the NBMG and PBMG and those from the PBMG have low Al_2O_3 , low Al^{VI} and high Al^{IV} and MgO.

Comparison of the biotites from the Kuala Lumpur granites with the biotites from Caledonian granites (British Isles) and Cordilleran granites (North American) show that the biotites from the Kuala Lumpur granite have low Mg and high Fe compared to those from Cordilleran and Caledonian granites. Compared to other trioctahedral mica (e.g. Stone *et al.*, 1998) the biotites from the Kuala Lumpur granite have high FeO and slightly low K_2O contents.

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PERTEMUAN PERSATUAN Meetings of the Society

Ceramah Teknik (Technical Talk)

MALAM AIR TANAH *Groundwater Night*

21 March 2001

Laporan (Report)

This Malam Air Tanah/"Groundwater Night" was held on Wednesday 21 March 2001 at the Geology Department, University of Malaya, from 5.00 –7.00 pm and attended by 70 participants.

The Groundwater Night turned out to be very successful judging by the large turnout and lively discussions and this goes to show how water has turned out to be a 'hot' commodity these days.

Programme

- 5.00 – 5.30 pm : Tea
- 5.30 – 6.00 pm : Some studies on groundwater contamination of the shallow aquifer in the Kelantan River Basin
Mohammed Hatta Abd. Karim (DMG)
- 6.00 – 6.30 pm : Hydrogeology of the Nenas/Pekan area, Pahang
Ismail Yusoff (UM) & Ismail C. Mohamad (DMG)
- 6.30 – 7.00 pm : Groundwater issues & challenges — the Malaysian scenario
Saim Suratman (DMG)

G.H. Teh

Some studies on groundwater contamination of the shallow aquifer in the Kelantan River Basin

MOHAMMED HATTA ABD. KARIM

Abstrak (Abstract)

The shallow aquifer system in the Kelantan River delta area constitutes an important source of water supply for domestic purposes and agricultural uses. With increasing human activities and urban development on the surface coupled with the absence of protection zones may risk the aquifer of anthropogenic pollution.

In 1994 a preliminary groundwater contamination study of this shallow aquifer system covering 1,040 square kilometers was initiated to find out the concentration and potential sources of nitrate and other relevant chemical parameters. A total of 605 localities of groundwater samples from dug wells were collected and analysed. The types of land use, types of soil material and well parameters were also recorded in the field.

Further study in 1998 was done to determine the level of organic chemical parameters such as pesticide, phenolic compounds, oil and grease, anionic detergent and other selected inorganic chemical constituents. A total of 101 samples were collected from the tube wells of the Department of Minerals and Geoscience's monitoring network and selected shallow dug wells previously having high nitrate content.

The earlier study showed that the shallow aquifer of the Kelantan River basin is somewhat contaminated locally with nitrate. The background nitrate value from 300 dug wells is 8 mg/l. Thirty five percent of those wells have nitrate higher than background value but only two percent have nitrate greater than 45 mg/l (World Health Organisation's allowable limit for drinking water). In 1998 nitrate content locally increased in some areas along the coast but not in the Kota Bahru town area. The 1998 result did not detect the presence of pesticides (organo-chlorine and organo-phosphorus). However, phenolic compounds, oil and grease and anionic detergents have been detected in the groundwater of the shallow aquifer system. Values of phenolic compounds range between 0.03 mg/l to 0.98 mg/l, oil and grease between 1.3 mg/l to 8.1 mg/l and anionic detergent between 0.25 mg/l to 0.73 mg/l.

Hydrogeology of the Nenasi/Pekan area, Pahang

ISMAIL YUSOFF AND ISMAIL C. MOHAMAD

Abstrak (Abstract)

Aquaculture activities have numerous impacts on water quality and vice versa. In the Pekan and Nenasi Districts of Peninsular Malaysia, excessive pumping of groundwater for aquaculture activities may result in higher risk of seawater intrusion. The land-ward movement of saltwater generally influences the overall water quality of such coastal aquifer. This presentation concentrations on the results of part of the baseline study on geology and hydrogeology of the area. Water quality data comparison shows evidence of seawater intrusion. Proposed work plan for the next phase of the study including a groundwater model development of the area is also presented. Any constructive comments and suggestions are greatly appreciated.

Groundwater issues & challenges — the Malaysian scenario

SAIM SURATMAN

(No Abstract)

MALAM AIR TANAH

Groundwater Night



Annual General Meeting & Annual Dinner 2001 — Report

The Annual General Meeting 2001 was held at Eastin Hotel, Petaling Jaya at 6.30 pm on the 27th April 2001. It was attended by 26 members.

The Annual Dinner 2001 that followed, was held at the popular Swez Brasserie Coffee House of the hotel.



Minutes of the 34th Annual General Meeting (1999/2000)

Minutes of the 34th Annual General Meeting held at the Geology Lecture Hall, Department of Geology, University of Malaya, Kuala Lumpur at 6.30 pm on the 28th April 2000.

Present:

Abdul Ghani Rafek (Chairman)	Liew Kit Kong
Ahmad Tajuddin Ibrahim (Secretary)	S. Paramanathan
Che Noorliza Lat	Ng Tham Fatt
Abd. Rasid Jaapar	Hamdan Hassan
Zamry Mohamad Yunus	Abdul Rahim Samsudin
C.S. Hutchison	Teh Guan Hoe
Mohd Shafeea Leman	Goh Lueng Yan
Damian Lee	Eugene Lee
Nik Ramli Nik Hassan	Ng Ping Ping
Azhar Hj Hussin	Abdul Aziz Hussin
Lee Chai Peng	Joy J. Pereira
Chu Ling Heng	Tan Boon Kong
Azman Abdul Ghani	Tajul Anuar Jamaluddin
Gan Lay Chin	Selvarajah M.
Yeap Ee Beng	Saim Suratman
Peter Lloyd	Chen Shick Pei

1. Confirmation of the minutes of the previous AGM (1999)

The minutes of the 33rd AGM were passed on the proposal of S. Paramanathan and seconded by Tan Boon Kong with the following amendments:

Page 3, item 6, line 1: ...net ... is corrected to ... nett ...

2. Matters Arising

Geologist's Act — Dr. J.J. Pereira (IGM Secretary) informed the meeting the Bill has reached the Attorney General's Chamber for the first time. The Ministry of Primary Industries will take up the Bill as the Ministry's Bill. She anticipates that it would be presented to the Parliament before the end of this year.

3. President's Report

Dr. Abdul Ghani Rafek presented the 1999/2000 report on behalf of the Prof. Dr. Ibrahim Komoo, the president who was overseas.

He congratulated and thanked Dr. Tajul Anuar Jamaluddin, the organising chairman of the Annual Geological Conference 1999 and his committee members for their hard work to ensure the success of the Conference. The Society also successfully organised the Petroleum Geology Conference 1999. On behalf of the Society he congratulated Mr. Barney Mahendran and his able committee members for their sincere hard work in organising the Conference. The Society also cooperated with IAEG Malaysian National Group, IGM and LESTARI-UKM to organise the 2nd Asian Symposium on Engineering Geology and the Environment.

He thanked those who were involved in organising the various activities but voiced his concern that this active participation is limited to a very small number of members only. He also pointed that memberships has declined and asked members to think of practical ways and means to overcome this decline. He stressed that the *Warta* and *Bulletin* should be as scheduled and the various Working Groups should be more active. He suggested that the Society should also think of opening its memberships to the non-geologist and for that the identity of the Society would have to be reoriented.

Overall, the 1999/2000 Council has carried out the activities entrusted to them satisfactorily and the Society is very healthy financially due its cautious management of its finances.

Finally he expressed gratitude to all companies, agencies and individuals for their generous sponsorships, donations and support given.

The President's Report was passed on the proposal of Mr. Ng Tham Fatt and seconded by Mr. Liew Kit Kong.

4. Secretary's Report

Dr. Ahmad Tajuddin Ibrahim presented his report for the 1999/2000 session. Two amendments was recorded:

Item 4, Society Activities, para 4, line one: "*The Working Groups ...*" is amended to "*Some of the Working Groups ...*".

Item 5, Membership, line 4: "*...Robert Tate's Ph.D. thesis ...*" is amended to "*...Robert Tate's M.Sc. thesis ...*".

He reported that the council met almost every month (11 meetings) throughout the 1999/2000 session.

Besides the three major Conferences held as already mentioned in the President's Report, there were 13 technical talks, 2 forums, 1 dialogue, 1 seminar, 1 workshop and 3 fieldtrips/site visits organised throughout the session.

He also reported that the Society have also agreed to cooperate with KEJORA and the Johor State Government to initiate a geologic gallery at the Muzium Nelayan Tg. Balau, Johor with Dr. Tajul Anuar Jamaluddin chairing the project committee.

He also reported that the Stratigraphic Lexicon is still being completed and the publication of Robert Tate's M.Sc. thesis in the form of a monograph delayed. Dr. C.P. Lee informed the meeting this thesis is already in the finalised form in CD.

Dr. C.S. Hutchison commented on the non-attendance of one Council Member at its meetings and as his term continues for another year he should be replaced immediately.

The Secretary's Report was passed on the proposal of Dr. J.J. Pereira and seconded by Mr. Abd Rasid Jaapar.

5. Editor's Report

Dr. G.H. Teh reported that the *Warta Geologi* is almost up-to-date with the latest *Warta* (Mar-Apr 2000) already with the printers.

He reported with regret that the *GEOSEA Bulletin (43)* could not come out by this AGM as promised. He also reported that the problems with the computer have been sorted out.

Dr. C.S. Hutchison suggested that the computers be replaced rather than upgraded to avoid unnecessary complication.

Mr. S.P. Chen asked why are we doing the formatting ourselves when normally the printers do this? The Editor replied that Ms. Fan is doing the formatting especially the geological part. Dr. J.J. Pereira added that the formatting of maps and diagrams are better done ourselves for better quality control.

Dr. S. Paramanathan asked when can everything be brought up to date? The Editor replied that this would be done in the next few months.

The Editor's report was passed on the proposal of Dr. S. Paramanathan and seconded by Mr. Hamdan Hassan.

6. Treasurer's and Honorary Auditor's Reports

Dr. C.P. Lee presented his report. Members corrected the following in the report:

- i) Para 2, line 2: RM156,642.99 is corrected to RM163, 642.99,
- ii) Para 4: RM38,062.88 is corrected to RM45,215.21.
- iii) Statement of income and expenditure, expenditure: Study groups is corrected to Working groups.

The Treasurer reported a drop in nett current asset from RM630,425.97 in 1998 to RM566,940.78 in 1999 and the large drop in expenditure from RM178,499.12 in 1998 to RM118,580.11 in 1999 is due to the prepayment of printing bulletin in 1998.

The Treasurer's Report and the Honorary Auditor's Report were passed on the proposal of Dr. S. Paramanathan and seconded by Dr. B.K. Tan.

7. Election of Honorary Auditor 2000/2001

The meeting reelected Mr. Lee Siew Fatt of S.F. Lee & Co., on the proposal of Dr. C.P. Lee and seconded by Dr. C.S. Hutchison as Honorary Auditor for the 2000/2001 session.

8. Other Matters

a) Proposal for Society's own building

After a long discussion the meeting agreed that the incoming Council make a proper study of the pros and cons of this issue and requested that the incoming Council come with the proper recommendation at the next AGM.

b) AAPG

Mr. Peter Lloyd who represented the Society at the last AAPG Delegate meeting brought greetings from AAPG and other affiliates of AAPG to the Society. He briefed the meeting on the regionalisation of AAPG and currently he is the President of AAPG Asia Pacific. AAPG support formation of student local chapters. He suggested the formation of a local chapter involving students from UKM and UM and his wife will be sponsoring it.

c) Young Geologist

Mr. Abd Rasid Jaapar brought up the problems faced by young geologists especially in the engineering sector. The meeting agreed that the incoming Council should look into this problem

d) Members Participation in Society Activities.

The President brought the problem of lack of active participation by members in the various activities organised and urged members especially the younger ones be actively involved.

9. Announcement of New Council (2000/2001)

The Council for 2000/2001 shall be as listed below:

President	:	Abdul Ghani Rafek (<i>Universiti Kebangsaan Malaysia</i>)
Vice-President	:	Mohd. Shafeea Leman (<i>Universiti Kebangsaan Malaysia</i>)
Secretary	:	Ahmad Tajuddin Ibrahim (<i>University of Malaya</i>)
Assistant Secretary	:	Nik Ramli Nik Hassan (<i>Consultant</i>)
Treasurer	:	Lee Chai Peng (<i>University of Malaya</i>)
Editor	:	Teh Guan Hoe (<i>University of Malaya</i>)
Councillors (2-years)	:	Abdul Rahim Samsudin (<i>Universiti Kebangsaan Malaysia</i>) Tajul Anuar Jamaluddin (<i>University of Malaya</i>) Azmi Yakzan (<i>PETRONAS Research & Scientific Services</i>) M. Selvarajah (<i>Mineral & Geoscience Department</i>)
Councillors (1-year)	:	Liew Kit Kong (<i>PETRONAS Carigali</i>) Mogana Sundaram (<i>Consultant</i>) Hamdan Hassan (<i>Consultant</i>) Tan Boon Kong (<i>Universiti Kebangsaan Malaysia</i>)
Immediate Past President	:	Ibrahim Komoo (<i>Universiti Kebangsaan Malaysia</i>)

Laporan Presiden (President's Report)

Assalamualaikum dan salam sejahtera,

Terlebih dahulu, izinkan saya merakamkan penghargaan saya dan semua ahli majlis, Persatuan Geologi Malaysia atas kepercayaan tuan-tuan dan puan-puan untuk menguruskan Persatuan bagi sesi 2000-2001. Boleh dilaporkan di sini bahawa Persatuan Geologi Malaysia telah dapat melaksanakan beberapa kegiatan sepanjang tahun lepas untuk mempertingkatkan fahaman geologi di kalangan ahli dan mempromosikan dan memperkenalkan Geologi pada masyarakat umum.

Dua persidangan yang dianjurkan oleh Persatuan, iaitu Persidangan Tahunan Geologi 2000 dan Persidangan Geologi Petroleum 2000 merupakan kemuncak kegiatan Persatuan pada sesi lepas. Persidangan Tahunan Geologi 2000 yang diadakan pada 8-10 September 2000 di Pulau Pinang mendapat sambutan yang luarbiasa dan merupakan kali pertama Prosiding Persidangan diterbitkan. Sebanyak 63 kertas kerja penuh dimuatkan dalam Prosiding tersebut dan diedarkan pada semua peserta persidangan. Saya bagi pihak Persatuan ingin mengucapkan tahniah dan terima kasih kepada pengerusinya, Dr. Joy J. Pereira dan jawatankuasa beliau atas usaha mereka. Persidangan Geologi Petroleum 2000 yang seperti biasa diadakan di Kuala Lumpur pada 22-23 November 2000, juga mendapat sambutan yang baik. Sebanyak 29 kertas kerja dibentangkan secara lisan bersama dengan 10 kertas poster. Tahniah dan terima kasih diucapkan kepada En. Yusof Johari dan jawatankuasa beliau atas kejayaan menganjurkan Persidangan tersebut.

Tradisi penganjuran kegiatan keilmuan diteruskan sepanjang tahun lepas. Satu kumpulan kerja yang baru ditubuhkan, iaitu Kumpulan Kerja Geologis Muda. Bersama dengan kumpulan kerja yang sedia ada, sebanyak dua seminar, dua forum, satu kerjalapangan dan 16 ceramah teknik dilaksanakan. Sambutan ahli Persatuan bagi kebanyakan aktiviti adalah menggalakkan. Peraduan Fotografi juga mendapat sambutan yang agak baik. Persatuan juga telah menganjurkan kuliah umum, pameran dan peraduan penulisan esei geosains di peringkat sekolah menengah untuk mempertingkatkan kesedaran geologi di kalangan pelajar sekolah menengah. Sungguhpun penyertaan peraduan penulisan esei agak terbatas, usaha seumpama ini adalah penting dan diharap dapat diteruskan. Saya ingin mengucapkan terima kasih dan penghargaan kepada semua pengerusi kumpulan kerja dan setiausaha Persatuan yang telah berkerja keras untuk menjayakan semua kegiatan ini.

Memandangkan banyaknya kegiatan yang dijalankan oleh Persatuan, adalah sukar untuk difahami mengapa keahlian Persatuan masih menurun pada tahun ini. Usaha mengekalkan keahlian Persatuan masih merupakan cabaran besar yang perlu diberi perhatian yang lebih khusus. Cadangan membina tuan-tuan dan puan-puan untuk mengatasi cabaran ini amatlah dialu-alukan.

Secara keseluruhan, Persatuan Geologi Malaysia ada dalam keadaan yang baik. Persatuan berjaya menganjurkan pelbagai kegiatan pada sesi 2000-2001 dengan sokongan padu tuan-tuan dan puan-puan. Sekali lagi saya mengucapkan terima kasih dan merakamkan penghargaan kepada semua yang terlibat dalam menjayakan aktiviti Persatuan. Sokongan tuan-tuan dan puan-puan adalah penting dan akan mempertingkatkan imej geologis di negara kita.

Sekian, terima kasih.

Dr. Abdul Ghani Mohd. Rafek
Presiden, Persatuan Geologi Malaysia

Secretary's Report

1. The Council

Members of the Council of the Geological Society of Malaysia for the period 28th April 2000 to the 27th April 2001 are as follows:

President	: Abdul Ghani Rafek (Universiti Kebangsaan Malaysia)
Vice President	: Mohd Shafeea Leman (Universiti Kebangsaan Malaysia)
Secretary	: Ahmad Tajuddin Ibrahim (University of Malaya)
Assist Secretary	: Nik Ramli Nik Hassan (Consultant)
Treasurer	: Lee Chai Peng (University of Malaya)
Editor	: Teh Guan Hoe (University of Malaya)
Councillors (2-years)	: Abdul Rahim Samsudin (Universiti Kebangsaan Malaysia) Tajul Anuar Jamaluddin (University of Malaya) (resigned 17.4.2001) Azmi Yakzan (PETRONAS Research & Scientific Services) M. Selvarajah (Mineral & Geoscience Dept.) (resigned 8.1.2001) Chow Weng Sum (Mineral & Geoscience Dept.) (co-opted 9.1.2001)
Councillors (1-year)	: Liew Kit Kong (PETRONAS Carigali) Mogana Sundaram (Consultant) (resigned 16.5.2000) Abd Rasid Jaapar (Consultant) (co-opted 17.5.2000) Hamdan Hassan (Consultant) Tan Boon Kong (Universiti Kebangsaan Malaysia)
Immediate Past President	: Ibrahim Komoo (Universiti Kebangsaan Malaysia)

2. Council Meetings

Council Meetings were held almost monthly throughout the 2000/2001 session. A total of 11 Council Meetings have been held. Attendances of Council Members at these meetings are as shown in Appendix 1. Three elected Council Members, M. Selvarajah, Mogana Sundaram and Tajul Anuar Jamaluddin resigned. Two of the vacancies created have already been filled up by Abd Rashid Jaafar and Chow Weng Sum. The next Council will take action on the other vacancy. The Council would like to thank M. Selvarajah, Mogana Sundaram and Tajul Anuar Jamaluddin for their services.

3. Memberships

The total membership of the Society as at 31st December 2000 is at 409, showing a substantial decrease from the previous year's total of 468. There are now only 73 members from outside Malaysia, a decrease of 24 from the previous year's total of 97.

Life memberships have increased by 14 to 146. Details of the various classes of memberships and their geographical distributions are shown in Appendix 2.

4. Society Activities

The new session was initiated by the official launching of the National Level Geoscience GSM-DBP Essay Competition on the 29th April 2000 at the Sekolah Alam Shah, Jalan Cheras, Kuala Lumpur. The event was officiated by the Deputy Director General of the Mineral and Geoscience

Department and organised by the Committee on the Promotion of Geoscience to the Public under the chairmanship of Prof. Hamzah Mohamad. A public lecture and a small exhibition were also held in conjunction with the occasion. A similar promotion was also organised at the Maktab Rendah Science MARA, Taiping, Perak on the 8th July, 2000.

The Annual Conference 2000 was successfully held on the 8–10 September in Penang, officiated by the Y.B. Deputy Chief Minister of Penang on behalf of the Y.A.B. Chief Minister. For the first time the Conference proceeding was published and distributed at the Conference itself. The Annual Petroleum Geology Conference 2000 which was also a success, was held on the 22–23 November, 2000 in Kuala Lumpur. This Conference was well supported by the petroleum and the related service companies.

The Society with the help of the various Working Groups were able to organise a total of 2 seminars, 2 forums, one fieldtrip and 16 technical talks throughout this session besides the event already mentioned above. The Society regret that attendance at many of the technical talks organised are very poor with most of the audience made up by students only. This is rather embarrassing especially when a foreign speaker gives the talk. A Photographic Competition was also held which received many quality entries including from students. Details of the Society's activities are shown in the Appendix 3.

5. Publications

The Society regrets that the scheduled annual Bulletins have not been coming out accordingly for a number of years now and the *Warta Geologi* have also suffered some hiccups. The Council wishes to apologise for this delay which will be explained by the Editor.

Sales of the publications remain sluggish as in previous years. Rocks and Minerals poster is depleting very fast with most of them given away free to secondary schools. Works is still in progress to get the Stratigraphic lexicon finished. The offshore part of this lexicon is yet to be completed. Work to get Robert Tate's monograph published is still proceeding. The Society has also started work to publish a new field guide for Langkawi which will be in an illustrative brochure form. The remaining stock and sales made during the session is as shown in Appendix 4. The Society still continued to maintain a publication exchange with the various professional bodies and libraries from various parts of the world.

6. Acknowledgements

The Society is indeed very much indebted to the generous sponsorships and cooperation received either in kind or otherwise from the many companies, professional societies, government departments, universities, institutions and individuals. We would like to record our special thanks to the Head of the Department of Geology, University of Malaya where the Society's is housed and where most of the activities were held. To all involved, the Society would like to record our sincere appreciation and would hope for continued support to help us continue to promote geoscience as a profession and to the public.

Appendix 1. Attendance of Council Members at Council Meetings

No.	Name	16/5	13/6	18/7	15/8	19/9	17/10	14/11	9/1	13/2	20/3	17/4
1	Abdul Ghani Rafek	X	X	X	X	X	X	X	X	X	X	X
2	Mohd Shafeea Leman	X	X	O	X	X	X	X	X	X	X	X
3	A. Tajuddin Ibrahim	X	X	X	X	X	O	O	X	X	X	X
4	Nik Ramli N. Hassan	O	X	X	O	X	X	O	X	X	O	X
5	Lee Chai Peng	X	X	X	X	X	O	X	X	X	X	X
6	Teh Guan Hoe	X	X	X	X	X	O	X	X	X	X	X
7	Abdul Rahim Samsudin	X	X	O	X	X	X	X	X	X	X	X
8	Tajul Anuar Jamaludin (resigned 17.4.2001)	X	X	O	O	O	O	X	O	O	O	#
9	Azmi Yakzan	X	O	X	O	O	X	O	O	O	O	O
10	M. Selvarajah (resigned 8.1.2001)	O	X	X	X	X	X	X	#	#	#	#
11	Chow Weng Sum (co-opted 9.1.2001)	*	*	*	*	*	*	*	X	X	X	O
12	Liew Kit Kong	O	O	X	O	X	X	X	X	X	O	X
13	Mogana Sundaram (resigned 16.5.2000)	#	#	#	#	#	#	#	#	#	#	#
14	Abd Rasid Jaapar (co-opted 17.5.2000)	*	X	X	X	X	X	X	X	O	O	X
15	Hamdan Hassan	O	O	X	X	O	X	X	X	X	O	O
16	Tan Boon Kong	X	O	X	X	X	X	X	X	X	X	X
17	Ibrahim Komoo	O	O	O	O	O	O	X	O	O	O	O

X – present

O – absent

– resigned

* – not co-opted yet

Appendix 2. Memberships for 2000

Country	Full	Life	Institutional	Student	Associate	Honorary	Total
Australia	1	21	1				23
Brunei		1		1			2
Canada		2					2
Europe	4	8				1	13
Hong Kong	1						1
India	1						1
Indonesia	2	4					6
Japan	1	1			1		3
Middle East	1	2					4
New Zealand	1						1
Philippines		1					1
Singapore	1	4	1				6
Thailand	2	2					4
USA	1	5					6
Malaysia	134	94	6	91	8	3	336
TOTAL	150	146	8	92	9	4	409

Appendix 3. Society Activities 2000/2001

No.	Date	Event/Speaker/Venue
1	29 April 2000	Majlis Perancangan Peraduan Menulis Essei Geosains Peringkat Kebangsaan PGM-DBP by Mr. Chu Ling Heng, Deputy Director Mineral & Geoscience Department of Malaysia at the Sekolah Alam Shah, Jalan Cheras, Kuala Lumpur organised by the Committee on the Promotion of Geoscience to the Public.
2	29 April 2000	Public Lecture 1: <i>"myGEO & SAINS – geosains, saya dan kerjaya"</i> by Dr. Kadderi Md Desa, Universiti Kebangsaan Malaysia at the Sekolah Alam Shah, Jalan Cheras, Kuala Lumpur organised by the Committee on the Promotion of Geoscience to the Public.
3	29 April 2000	Exhibition: <i>"Peranan Geosains dalam Pembangunan Negara"</i> at the Sekolah Alam Shah, Jalan Cheras, Kuala Lumpur organised by the Committee on the Promotion of Geoscience to the Public.
4	13 May 2000	Seminar 1: <i>"Dynamic Stratigraphy and Tectonics of the Central Belt"</i> organised by the Stratigraphy/Sedimentology Working Group at the Department of Geology, University of Malaya, Kuala Lumpur.
5	15 May 2000	Technical Talk 1: <i>Measurement of Shrinkage Limit</i> by Peter Hobb at the Department of Geology, University of Malaya, Kuala Lumpur.
6	24 May 2000	Technical Talk 2: <i>Malam Geologis Muda</i> organised by the Engineering Geology/Hydrogeology Working Group at the Department of Geology, University Malaya, Kuala Lumpur.
7	13 June 2000	Seminar 2: <i>"Penggunaan Geofizik dalam Kajian Geoteknik"</i> organised by the Geophysics Working Group at the Mineral & Geoscience Department, Ipoh.
8	19 June 2000	Technical Talk 3: <i>DLIS and Archival of Interpreted Petrophysical Data</i> by Peter Boles of Paradigm Geophysical, Australia jointly organised by the Petroleum Geology Working Group, SPE and SPWLA at the PETRONAS, KLCC.
9	8 July 2000	Promotion of "Peraduan Menulis Essei Geosains Peringkat Kebangsaan PGM-DBP" and Geoscience Exhibition organised by the Committee on the Promotion of Geoscience to the Public at the Maktab Rendah Sains MARA, Taiping Perak.
10	13 July 2000	Formation of the "AAPG Malaysian Students Chapter" organised by the Petroleum geology Working Group sponsored by Mrs. Peter Lloyd.
11	12 August 2000	Fieldtrip 1: <i>Simpang Pulai Highway</i> jointly organised by the Economic Geology Working Group and Structure/Tectonic Working Group.
12	11 October 2000	Technical Talk 4: <i>Malam Geologis Muda IV</i> jointly organised by the Young Geologists Working Group and Engineering Geology & Hydrogeology Working Group.
13	8-10 September 2000	Conference 1: <i>Annual Geological Conference 2000</i> at the Hotel Shangri-La, Pulau Pinang.

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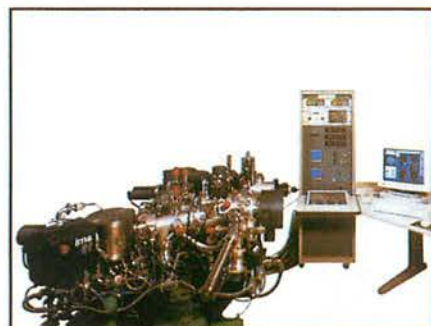
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Focused Ion Beam System (FIB)

Optical Defect Inspection and Review Stations (DRT)

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Electron Probe Microanalysis (EPMA)

Vacuum Technology (Pumps, Leak Detectors, Components)

Cytogenetic and Material Workstations

Imaging Processing and Analysis (IA)



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The fullbore images enable direct structural analysis and characterization of sedimentary bodies even in extremely complex sequences. The fine detail provided by FMI images allows determination of paleocurrents and rock anisotropy, including the recognition of permeability barriers and paths. And determination of net-to-gross ratio in thin bed sand/shale sequences is automatic.

Understanding the internal structure of the rock can confirm hypotheses regarding its geological evolution and can provide valuable clues to geologists and engineers regarding local porosity and permeability changes. This is possible with the enhanced textural analysis from the new high-resolution sensors, as well as detailed evaluation of fracture networks and other secondary porosity.

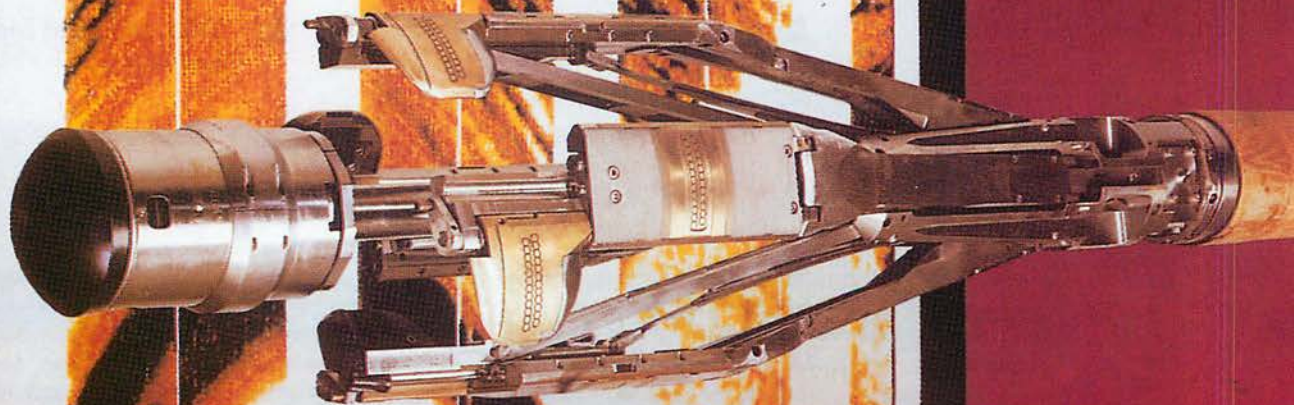
Ask to see an example of the new FMI log. You'll be looking at the clearest, most complete picture of the rock available today.

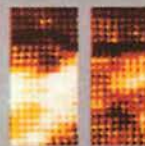
Schlumberger (Malaysia) Sdn Bhd., 7th & 8th Floor, Rohas Perkasa
No. 8, Jalan Perak, 50450 Kuala Lumpur.
Tel: (03) 2667788. Fax: (03) 2667800.

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Value is the difference.

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The Schlumberger Ultrasonic Borehole Imager Detects Openhole Problems and Fractures, Even in Oil-Base Muds.

Accurate, high-resolution, acoustic measurements by the UBI* Ultrasonic Borehole Imager let you examine an openhole for stability problems, deformation and fractures when nonconductive, oil-base muds prevent resistivity measurements. On the same trip, the UBI rotating transducer can check for corrosion and mechanical wear of the internal surface of the casing as the tool is pulled out of the hole.

No other borehole measurement gives you the thin-bed resolution you get with the UBI tool. The images, cross-section plots and pseudo-3D "spiral" plots generated from UBI measurements also reveal keyseats, breakouts, shear sliding and shale alteration to help you avoid the added drilling costs that result from stuck pipe and lost time or equipment. In addition, you get horizontal stress information for mechanical properties evaluations to predict breakouts and perforation stability in unconsolidated sands.

Talk to your Schlumberger representative about detecting openhole problems and fractures acoustically, even in oil-base muds. What UBI images show you could save you time, expense or possibly your well.

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No. 8, Jalan Perak, 50450 Kuala Lumpur.
Tel: (03) 2667788. Fax: (03) 2667800.

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Suite 702A, 7th Floor
See Hoy Chan Plaza
Jalan Raja Chulan
50200 Kuala Lumpur
MALAYSIA

Telephone : 603-20266641/2/3
Facsimile : 603-20266640
e-mail : Malaysia.kl@geosrv.com



People, Knowledge & Technology

Appendix 3. Society Activities 2000/2001

No.	Date	Event/Speaker/Venue
14	21 September 2000	Technical Talk 5: <i>Research Opportunities in Ocean Drilling: Ocean Drilling for the 21st Century — Integrated Ocean Drilling Project</i> by Dr. Hajimu Kinoshita & Dr. Kiyoshi Suyehiro of the Japan Marine Science & Technology Centre at the Department of Geology, University of Malaya, Kuala Lumpur.
15	27 September 2000	Technical Talk 6: <i>Magnetotelluric Technique: A New Geophysical Tool for Geological Prospecting</i> by Dr. T. Harinarayana of the National Geophysical Research Institute, Hyderabad, India at the Department of Geology, University of Malaya, Kuala Lumpur.
16	28 September 2000	Technical Talk 7: <i>Deep Crustal Studies Using Magnetotelluric Technique</i> by Dr. T. Harinarayana of the National Geophysical Research Institute, Hyderabad, India at the Department of Geology, University of Malaya, Kuala Lumpur.
17	25 October 2000	Technical Talk 8: <i>Ordovician and Silurian Global Geography</i> by Dr. Robin Cocks and <i>The Life Habits and Distribution of Trilobites</i> by Dr. Richard Fortey of the British Museum of Natural History, London at the Department of Geology, University of Malaya, Kuala Lumpur.
18	7 November 2000	Technical Talk 9: <i>Groundwater Study for the Langat Basin</i> by Dr. Masakazu Takahashi of JICA Study Team at the Department of Geology, University of Malaya, Kuala Lumpur.
19	11 November 2000	Forum 1: <i>The Roles, Responsibilities and Challenges of Geologists in The Private Sector</i> organised by the Young Geologists Working Group at the Department of Geology, University Malaya, Kuala Lumpur.
20	15 November 2000	Forum 2: <i>"Malam Consultancy Practice: Independence, Ethics & Professionalism"</i> organised by the Working Group on Engineering Geology/Hydrogeology at the Department of Geology, University Malaya, Kuala Lumpur.
21	22-23 November 2000	Conference 2: <i>Petroleum Geology Conference 2000</i> at the Shangri-La Hotel, Kuala Lumpur.
22	30 November 2000	Photographic Competition 2000
23	21 December 2000	Technical Talk 10: <i>The World of Jade</i> by Mr. Lau Yin Leong of GINN-M Corporation Sdn. Bhd. At the Department of geology, University of Malaya, Kuala Lumpur.
24	10 January 2001	Technical Talk 11: <i>Slope Failures vs Material Types</i> by Tan Boon Kong of the University Kebangsaan Malaysia at the Department of Geology, University of Malaya, Kuala Lumpur.
25	30 January 2001	Technical Talk 12: <i>Isotopic Age and Tempo of the Permian-Triassic Boundary and Mass Extinction, New Data From China and Problems of Accuracy VS Precision</i> by Dr. Ian Metcalfe at the Department of Geology, Bangunan Geologi, UKM Bangi, Selangor D.E.

Appendix 3. Society Activities 2000/2001

No.	Date	Event/Speaker/Venue
26	16 February 2001	Technical Talk 13: <i>The Mystery of Paleocene-Eocene Boundary — Examples from Austrian Alps</i> by Dr. Hans Egger of the Geological Survey of Austria at the Department of Geology, University of Malaya, Kuala Lumpur.
27	16 February 2001	Technical Talk 14: <i>Corundum — Rubies & Sapphires</i> by Mr. Lau Yin Leong of the GINN-M, Corporation Sdn. Bhd. at the Department of Geology, University of Malaya, Kuala Lumpur.
28	20 February 2001	Technical Talk 15: <i>Malam Air Tanah</i> co-organised by the Engineering Geology/Hydrogeology Working Group and the Environmental Geology Working Group at the Department of Geology, University of Malaya, Kuala Lumpur.
29	28 February 2001	Technical Talk 16: <i>Development of the Caledonian Nappes of the Southern Highlands of Scotland</i> by Prof. A.L. Harris of the Dept. of Earth Sciences, The University of Liverpool at the Department of Geology, University of Malaya, Kuala Lumpur.
30	10 January 2001	Technical Talk 17: <i>Geology and Resources of the Malayan Peninsula</i> by Prof. A.L. Harris of the Dept. of Earth Sciences, The University of Liverpool at the Department of Geology, University of Malaya, Kuala Lumpur.
31	21 December 2000	Technical Talk 18: <i>The Role of the GINM Corporation Sdn. Bhd. at the Department of Geology, University of Malaya, Kuala Lumpur.</i>
32	20 November 2000	Photographic Competition 2000
33	22-27 November 2000	Conference on Environmental Geology and Hydrogeology at the Department of Geology, University of Malaya, Kuala Lumpur.
34	17 November 2000	Forum 2: <i>Water Quality and Quantity</i> organised by the Working Group on Engineering Geology at the Department of Geology, University of Malaya, Kuala Lumpur.
35	17 November 2000	Forum 1: <i>The Role of Geology in the Development of Malaysia</i> organised by the Working Group on Engineering Geology at the Department of Geology, University of Malaya, Kuala Lumpur.
36	7 February 2000	Technical Talk 19: <i>Geology and Resources of the Malayan Peninsula</i> by Prof. A.L. Harris of the Dept. of Earth Sciences, The University of Liverpool at the Department of Geology, University of Malaya, Kuala Lumpur.

Appendix 4. Stock of Publications

BULLETIN NO./PUBLICATION	SALES 2000	STOCK REMAINING
2	2	247
3	3	247
4	3	112
5	1	21
6	4	463
7	3	286
8	2	8
11	1	46
13	2	87
16	3	26
17	4	84
18	2	67
19	2	620
20	3	464
21	2	237
22	1	297
23	2	296
24	2	471
25	1	249
26	2	290
27	2	167
28	2	168
29	2	163
30	1	236
31	10	178
32	2	211
33	3	326
34	4	133
35	6	138
36	6	171
37	81	423
41	7	88
Abstracts (Bulletin 6)	0	4
Stratigraphic Correlation	1	227
Rocks and Minerals Poster	89	350
Geological Evolution of SEA (CSH)	16	397
Malaysian Stratigraphic Guide	6	773
Annual Conference 2000 Proceedings	406*	394

* inclusive of free copies to members.

Editor's Report 2000/2001

The hard disc of the Society's computer crashed last year and we nearly lost all our data. However, most of the files managed to be saved and we have managed to submit most of the material for the Bulletins and *Warta Geologi* to the printer.

The Society's delayed publications should be coming out in the next two months.

The first proceedings for the Society's Annual Geological Conference was brought out for the 2000 Conference in Penang. The Society appreciates the effort put in by the Conference Chairperson Dr. Joy P. Periera and her team for the accomplishment.

Each member, again, was given a free, colourful table-top calendar which contained photos from the Society's previous Photographic Competitions.

The Society is grateful to the many authors for their valuable paper contributions, and the donors and advertisers for their valuable financial contributions to the Society's Funds.

Special thanks are due to Ng Tham Fatt and A.K. Fan for assistance in the various editorial processes. The contributions of members of the Editorial Subcommittee and reviewers and advice of members of the Editorial Advisory Board are greatly appreciated.

G.H. Teh
Editor

Honorary Treasurer's Report 2000

There is an increase in the Society's nett current asset from RM573,959.11 to RM630,171.03. With the prepaid printing cost of RM100,000 with Art Printing still unused, the actual nett current asset of the Society is RM730,171.03. Our fixed assets have increased from RM31,283.06 to RM44,132.45 because of the purchase of a new computer and printer.

Although there is a drop in income from RM163,795.32 to RM117,421.76, the Society still has an excess of income over expenditure of RM53,011.92 because of the lower expenditure of RM64,409.84. The large drop in expenditure for year 2000 is mainly because we did not pay for any printing cost for bulletin (RM42,000 in 1999) and also had a reduction in the printing of the *Warta Geologi* (RM6,160.00 compared to RM18,702.20) during the year compared to 1999.

The Society's finances can continue to increase only because of the generous contributions received from our donors to the Petroleum Geology Conference and Annual Geological Conference. We thank them for their continuous support. The Society would also like to thank our Hon. Auditor, Mr. Lee Sia Fatt, for auditing our accounts.

Lee Chai Peng
Hon. Treasurer
20 March 2000

Notes on Accounts 2000

1. Fixed Deposits

Our Fixed Deposits totalling RM495,734.99 are in Standard Chartered Bank (RM157,811.23), Public Bank (RM172,062.38) and Mayban Finance (RM165,861.38).

2. Deposit and prepayment is for deposits for telephone (RM300), Telefax (RM300), Student Loan (RM434.64), Geological Evolution of SEA (RM3,215.91), Petroleum Geology Conference 2000 (RM29,819.11), Annual Geological Conference 2001 (RM3,770.14) and Sunto compass (RM5,670).

***Auditors' Report to the Members of Persatuan
Geologi Malaysia (Geological Society of Malaysia)***

We have audited the accounts in accordance with approved auditing standards.

In our opinion, the accounts give a true and fair view of the state of affairs of the Society as at 31st December 2000 and of its income and expenditure and receipts and payments for the year ended on that date.

Signed

S.F. LEE & CO.

(AF: 0670)

Public Accountants

5-3, Udarama Complex

Jalan 1/64A, Off Jalan Ipoh

50350 Kuala Lumpur

Signed

LEE SIEW FATT

(1179/9/00J)

Public Accountant

Kuala Lumpur

Date: 25/4/2001

PERSATUAN GEOLOGI MALAYSIA
(Geological Society of Malaysia)

Income and Expenditure Account
for the year ended 31 December 2000

INCOME	1999	2000
	RM	RM
Entrance fees	560.00	500.00
Interest on fixed deposits	40,462.65	23,101.35
Subscriptions	15,013.01	13,653.69
Sales of publications	6,134.29	2,588.62
PGC '99/GEOSEA '98: Donation	100,718.97	67,666.34
Xerox	866.40	1,434.68
Annual Geological Conference '99	-	8,050.00
Printing & Stationery: © Bulletin	-	60.00
Bank charges	-	349.08
Souvenirs	40.00	18.00
	<hr/>	<hr/>
	163,795.32	117,421.76
 EXPENDITURE		
Audit fee	500.00	500.00
Annual dinner	1,351.00	1,360.40
Annual Conference	13,707.45	14,230.53
Bank charges	230.23	-
Honorarium	11,765.00	10,570.00
Postage	6,117.10	2,120.57
Geoscience Promotion	-	3,880.40
Printing and Stationery:		
— Miscellaneous	10,391.50	12,977.60
— Bulletin	42,000.00	-
— Warta Geologi	18,702.20	6,160.00
Refreshments	889.57	1,252.00
Working groups	2,535.58	2,118.42
Sundry expenses	760.36	887.70
Speakers' account	4,553.80	2,145.48
Subscription: Professional bodies	191.50	-
Telephone	727.67	738.71
Telefax	681.26	564.42
Depreciation on fixed assets	3,475.89	4,903.61
	<hr/>	<hr/>
	118,580.11	64,409.84
 EXCESS OF INCOME OVER EXPENDITURE:		
Transfer to capital fund	45,215.21	53,011.92
	<hr/> <hr/>	<hr/> <hr/>

PERSATUAN GEOLOGI MALAYSIA
(Geological Society of Malaysia)

Balance Sheet as at 31 December 2000

	1999 RM	2000 RM
FIXED ASSET	31,283.06	44,132.45
CURRENT ASSETS		
Fixed Deposits with licensed banks	495,734.99	495,734.99
Deposit and prepayment	16,911.05	43,509.80
Cash and bank balances	30,030.01	46,793.79
	<u>542,676.05</u>	<u>586,038.58</u>
NETT CURRENT ASSETS	<u>573,959.11</u>	<u>630,171.03</u>
FINANCED BY:		
ACCUMULATED FUND		
Balance brought forward	525,601.07	570,816.28
Surplus for the year	45,215.21	53,011.92
	<u>570,816.28</u>	<u>623,828.20</u>
Young Geoscientist Award	3,142.83	3,142.83
Evaluation Formation Working Group	-	3,200.00
	<u>573,959.11</u>	<u>630,171.03</u>

Resolutions

1. **Society's Building**

This meeting resolved not to continue with the proposed plan to suggest and pay for the construction of another floor above the Klompe Reading Room, Department of Geology, University of Malaya due to the uncertainty in the ownership of the said floor and the high cost involved.

2. **Society's Webpage**

This meeting resolved to have and maintain our very own (selfpaid) webpage.

Council for 2001/2002

President	:	Abd. Ghani Rafek (UKM)
Vice-President	:	Mohd Shafeea Leman (UKM)
Secretary	:	Ahmad Tajuddin Ibrahim (UM)
Assistant Secretary	:	Ismail Yusoff (UM)
Treasurer	:	Lee Chai Peng (UM)
Editor	:	Teh Guan Hoe (UM)
Councillors (2-years)	:	Tan Boon Kong (UKM)
		Liew Kit Kong (PETRONAS Carigali)
		Abd Rasid Jaapar (Consultant)
		Wan Fuad W Hassan (UKM)
Councillors (1-year)	:	Abdul Rahim Samsudin (UKM)
		Azmi Yakzan (PRSS)
		Chow Weng Sum (JMG)
		Vacant
Immediate Past President	:	Ibrahim Komoo (UKM)

PHOTOGRAPHIC COMPETITION 2000 EXHIBITION



BERITA-BERITA PERSATUAN News of the Society

Geological Society of Malaysia **PHOTOGRAPHIC COMPETITION 2000**

An encouraging total of 38 entries were received. There was clearly an overall improvement in the quality of the entries. The 3 judges on 17 January 2001 agreed on the following prize winners:

1st Prize (RM1,000)	—	Lee Chai Peng
2nd Prize (RM500)	—	Lee Chai Peng
3rd Prize (RM300)	—	Azman A. Ghani

Consolation Prize (RM100 each):

1. Askury Abd. Kadir
2. Tan Boon Kong
3. Mervyn Onong
4. Ros Fatimah Hj. Mohammad
5. Yeap Soon Wui
6. Siti Aishah bt. Osman

An exhibition of all entries for the GSM Photographic Competition 2000 was held in the Museum, Geology Department, University of Malaya from 10th February till 10th March 2001. To add interest to the exhibition, a competition to match the best 3 entries with that of the judges was held. It turned out to be very popular and the lucky winners of hampers are the following:

1. Ng Ping Ping
2. Ansari Mohd Noh
3. Asmaliah bt. Ahmad
4. Abdul Hadi Abd. Rahman

G.H. Teh

KEAHLIAN (Membership)

The following applications for membership were approved:

Full Members

- | | |
|---|---|
| <p>1. Mohamad Fairus Hassan
Terra Geotechnics Sdn. bhd., B1-3, Plaza
Dwitasik, Bandar Sri Permaisuri, 56000
Cheras.</p> | <p>5. Engku Nasir Syed Mohamad
Expro Group (UK), A-8-4 Megan Phileo
Promenade, 189 Jalan Tun Razak 50400
Kuala Lumpur.</p> |
| <p>2. Yusri Yusop
Ceramic Research Co., Lot 7110, Batu 5½,
Jalan Kapar, 42100 Klang.</p> | <p>6. Aziman Madun
Terratech Consultants (M) Sdn. Bhd., No.
76278, Jalan SBC 3, Taman Sri Batu Caves,
68100 Batu Caves.</p> |
| <p>3. Hairunnizam Mohammed Salleh
8-3-9 Vista Angkasa, PT-12, Bukit Kerinci,
59200 Kuala Lumpur.</p> | <p>7. Lau Yin Leong
Ginn-M Corp Sdn. Bhd., Lot 1-55, 1st Floor,
Amcorp Mall, 46050 Petaling Jaya.</p> |
| <p>4. Emeliana Rice-Oxley
Sarawak Shell Bhd., EPS-WSI, Sarawak
Shell Berhad.</p> | |

Student Members

- | | |
|--|--|
| <p>1. Chok Pit Yuen
Jabatan Geologi, Universiti Malaya, 50603
Kuala Lumpur.</p> | <p>8. Edwin anak Akien
Jabatan Geologi, Universiti Malaya, 50603
Kuala Lumpur.</p> |
| <p>2. Mohamad Sharir Mustafa
Jabatan Geologi, Universiti Malaya, 50603
Kuala Lumpur.</p> | <p>9. Joinod Oswald
Jabatan Geologi, Universiti Malaya, 50603
Kuala Lumpur.</p> |
| <p>3. Johari Jurid
Jabatan Geologi, Universiti Malaya, 50603
Kuala Lumpur.</p> | <p>10. Nor Kartini Suriati Mansor
Jabatan Geologi, Universiti Malaya, 50603
Kuala Lumpur.</p> |
| <p>4. Iswardi Abu Bakar
Jabatan Geologi, Universiti Malaya, 50603
Kuala Lumpur.</p> | <p>11. Moniessa Joeharee
Jabatan Geologi, Universiti Malaya, 50603
Kuala Lumpur.</p> |
| <p>5. Hamzah Harun
Jabatan Geologi, Universiti Malaya, 50603
Kuala Lumpur.</p> | <p>12. Amirulhizad Bahari
Jabatan Geologi, Universiti Malaya, 50603
Kuala Lumpur.</p> |
| <p>6. Nur Chitra Dewi Mohamad Noor
Jabatan Geologi, Universiti Malaya, 50603
Kuala Lumpur.</p> | <p>13. Siti Suhana Che Mohamed Sukri
Jabatan Geologi, Universiti Malaya, 50603
Kuala Lumpur.</p> |
| <p>7. Amri Samin
Jabatan Geologi, Universiti Malaya, 50603
Kuala Lumpur.</p> | |

PETUKARAN ALAMAT (Change of Address)

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

- | | |
|---|---|
| <p>1. Ian D. Collins
Genting Oil & Gas Ltd., 22nd Flr., Wisma
Genting, Jalan Sultan Ismail, 50250 Kuala
Lumpur.</p> | <p>3. Cheong Yaw Peng
Curtin University of Technology,
Department of Petroleum Engineering,
P.O. Box U1987, Perth, Western Australia
6845, Australia.</p> |
| <p>2. Ralf Oppermann
c/o Shell Todd Oil Services Limited, Private
Bag 2035, New Plymouth, New Zealand.</p> | |

GSM

PERTAMBAHAN BAHARU PERPUSTAKAAN (New Library Additions)

The Society has received the following publications:

- | | |
|--|--|
| <p>1. AAPG Explorer, February & March, April
& May 2001.</p> <p>2. Monthly statistics on mining industry in
Malaysia, August & September 2000.</p> <p>3. International Mining Quarterly Review,
no. 1, 2001.</p> <p>4. AAPG Bulletin vol. 85, no. 1 & 3, 2001.</p> <p>5. Tin International, March 2001.</p> <p>6. Scripta Geologica, no. 121, 2000.</p> <p>7. Acta Palaeontologica Sinica, vol. 39, no. 4
(2000) & vol. 40, no. 1 (2001).</p> <p>8. Acta Micropalaeontologica sinica, vol. 17,
no. 4 (2000) & vol. 18, no. 1 (2001).</p> <p>9. Palaeontological Abstracts, vol. 151 no. 4,
2000.</p> <p>10. Geological Bulletin of Turkey, vol. 43 no. 2,
2000.</p> <p>11. Berliner geowissenschaftliche
Abhandlungen, Band 199–202 & 204 (1999)
& 205 (2000).</p> | <p>12. Bulletin of the National Science Museum,
vol. 26, nos. 3 & 4, 2000.</p> <p>13. Tin International, vol. 73, no. 8, 2000 & vol.
74 no. 1 & 3, 2001.</p> <p>14. Proceedings of the 29th session, 26
September – 4 October 2000.</p> <p>15. Episodes vol. 24, no. 1, 2001.</p> <p>16. The University of Tsukuba, Institute of
Geoscience, no. 26, 2000.</p> <p>17. Geological Survey of Japan, Bulletin, vol.
51 nos. 10–12, 2000.</p> <p>18. A list of the Mamaev's Collection, 2000.</p> <p>19. Museum of Nature & Human Activities,
Hyogo, Bulletin no. 5, 2000.</p> <p>20. Museum of Nature & Human Activities,
no. 11, 2000.</p> <p>21. 1998 Malaysian Science & Technology
Indicators Report 2000.</p> <p>22. U.S. Geological Survey: Circular 2000:
nos. 1199, 1208, 1212, 1203, 1215, 1206.</p> |
|--|--|

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Geological Society of Malaysia

December 1997

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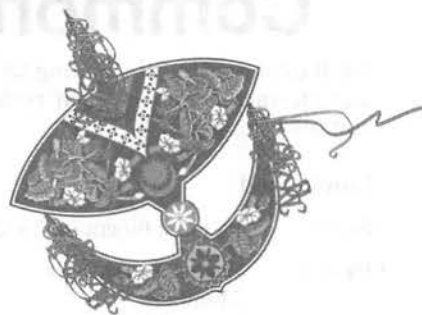
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PROCEEDINGS AAPG-GSM International Conference 1994



Southeast Asian Basins: Oil and Gas for the 21st Century

August 21-24, 1994
Kuala Lumpur, Malaysia

Published by:
Geological Society of Malaysia

Editor: G.H. Teh

Bulletin of the
GEOLOGICAL SOCIETY OF MALAYSIA

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Common Rocks of Malaysia

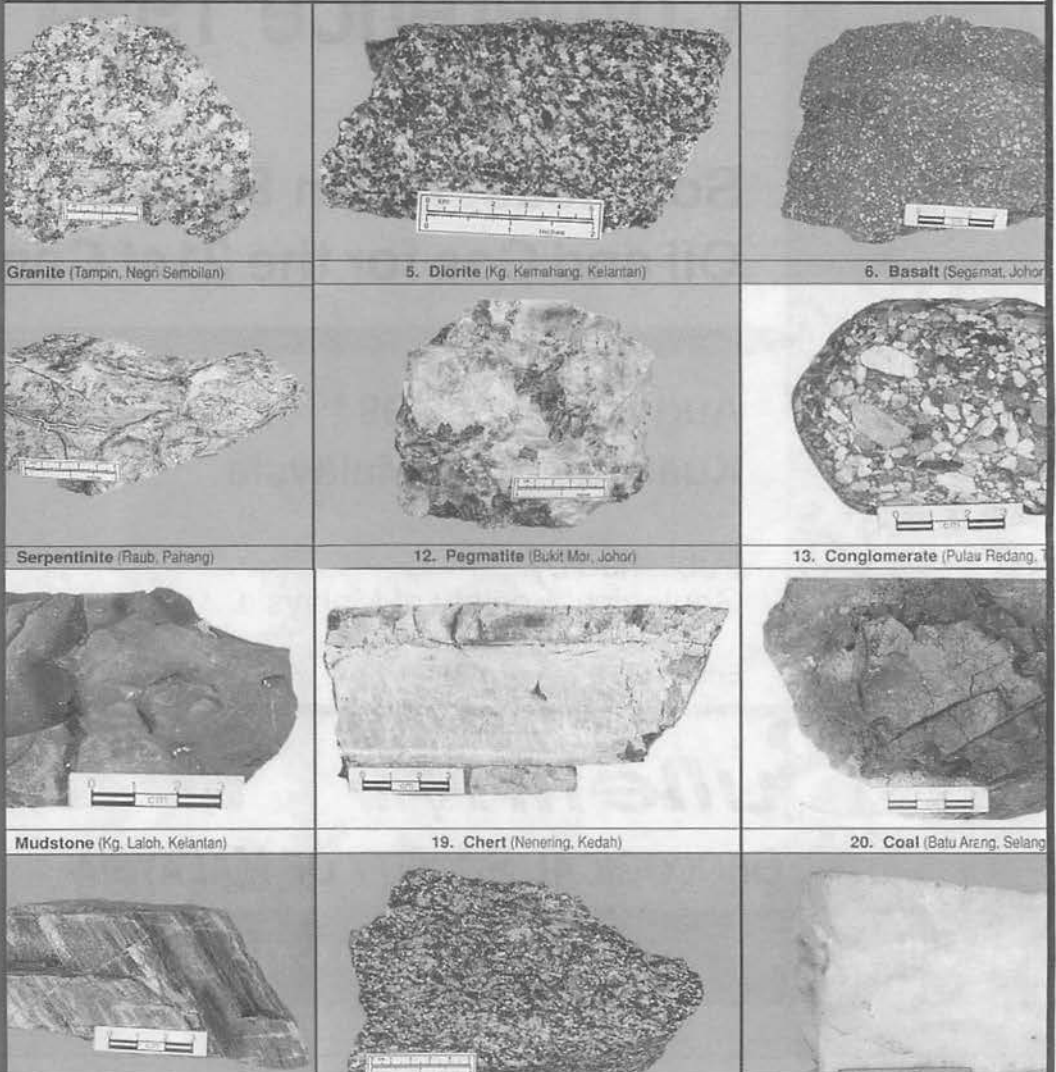
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 50603 Kuala Lumpur, MALAYSIA

GEOLOGICAL SOCIETY OF MALAYSIA PUBLICATIONS

- Bulletin 1** (Feb 1968). 79 p. Studies in Malaysian Geology. Edited by P.H. Stauffer. A collection of papers presented at a meeting of the Geological Society on 31st January 1967. **Out of Stock.**
- Bulletin 2** (Dec 1968). 152 p. Bibliography and Index of the Geology of West Malaysia and Singapore by D.J. Gobbett. Price: RM5.00.
- Bulletin 3** (Mar 1970). 146 p. Papers in Geomorphology and Stratigraphy (with Bibliography supplement). Edited by P.H. Stauffer. Price: RM5.00.
- Bulletin 4** (Jun 1971). 100 p. Papers in Petrology, Structure and Economic Geology. Edited by P.H. Stauffer. Price: RM5.00.
- Bulletin 5** (Feb 1973). 70 p. The Search for Tungsten Deposits by K.F.G. Hosking. Price: RM5.00.
- Bulletin 6** (Jul 1973). 334 p. Proceedings, Regional Conference on the Geology of Southeast Asia. A collection of papers, Kuala Lumpur, March, 1972. Edited by B.K. Tan. Price: RM5.00.
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- Bulletin 10** (Dec 1978). 95 p. A collection of papers on the geology of Southeast Asia. Edited by C.H. Yeap. **Out of stock.**
- Bulletin 11** (Dec 1979). 393 p. Geology of Tin Deposits. A collection of papers presented at the International Symposium of 'Geology of Tin Deposits', 23-25 March 1978, Kuala Lumpur. Edited by C.H. Yeap. Price: RM20.00.
- Bulletin 12** (Aug 1980). 86 p. A collection of papers on geology. Edited by G.H. Teh. **Out of stock.**
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- Bulletin 17** (Dec 1984). 371 p. A collection of papers on geology. Edited by G.H. Teh. Price: RM10.00.
- Bulletin 18** (Nov 1985). 209 p. Special Issue on Petroleum Geology. Edited by G.H. Teh & S. Paramanathan. Price: RM15.00.
- Bulletins 19** (Apr 1986) & **20** (Aug 1986). GEOSEA V Proceedings Vols. I & II, Fifth Regional Congress on Geology, Mineral and Energy Resources of SE Asia, Kuala Lumpur, 9-13 April 1984. Edited by G.H. Teh & S. Paramanathan. Price for both Bulletins 19 & 20: Members: RM30.00; Non-Members: RM60.00.
- Bulletin 21** (Dec 1987). 271 p. Special Issue on Petroleum Geology Vol. II. Edited by G.H. Teh. Price: RM20.00.
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- Bulletin 28** (Nov 1991). 292 p. Special Issue on Petroleum Geology Vol. VI. Edited by G.H. Teh. Price: RM20.00.
- Bulletin 29** (Jul 1991). 255 p. A collection of papers presented at GSM Annual Geological Conference 1990 and others. Edited by G.H. Teh. Price: RM10.00.
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- Bulletin 31** (Jul 1992). 176 p. A collection of papers presented at GSM Annual Geological Conference 1991 and others. Edited by G.H. Teh. Price: RM10.00.
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- Bulletin 33** (Nov 1993). 419 p. Proceedings Symposium on Tectonic Framework and Energy Resources of the Western Margin of the Pacific Basin. Edited by G.H. Teh. Price: RM40.00.
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- Bulletin 35** (Jul 1994). 174 p. A collection of papers presented at GSM Annual Geological Conference 1992 & 1993. Edited by G.H. Teh. Price: RM20.00.
- Bulletin 36** (Dec 1994). 186 p. Special issue on Petroleum Geology Vol. VIII. Edited by G.H. Teh. Price: RM50.00.
- Bulletin 37** (Jul 1995). 506 p. Proceedings AAPG-GSM International Conference 1994. Southeast Asian Basins: Oil and Gas for the 21st Century. Edited by G.H. Teh. Price: RM60.00.
- Bulletin 41** (Dec 1997). 165 p. Papers from Petroleum Geology Conference 1996 and others. Edited by G.H. Teh. Price: RM50.00.
- Field Guide 1** (1973). 40 p. A 7-day one thousand mile, geological excursion in Central and South Malaya. By C.S. Hutchison. **Out of stock.**
- Abstracts of papers** (1972). Regional Conference on the Geology of Southeast Asia, Kuala Lumpur, 1972. 64 p. 8 figs, 3 tables, many extended abstracts. Edited by N.S. Haile. Price: RM2.00.
- Proceedings of the Workshop on Stratigraphic Correlation of Thailand and Malaysia Vol. 1**. (1983). 383 p. Technical Papers. Price: Member: RM5.00; Non-member: RM15.00.
- WARTA GEOLOGI** (Newsletter of the Geological Society of Malaysia). Price: RM5.00 per bimonthly issue from July 1966.
- Geological Evolution of Southeast Asia** (1996) (Reprinted Edition) by C.S. Hutchison. 368 p. Price: Member: RM50.00; Non-member: RM100.00; Student: RM30.00.
- Common Rocks of Malaysia (Colour Poster)**. Price: Member: RM8.00; Non-member: RM10.00; Student: RM7.00.
- Malaysian Stratigraphic Guide** (Dec 1997). 30 p. Price: Member: RM5.00; Non-member: RM10.00; Student Member: RM2.00.
- Proceedings Annual Geological Conference 2000**. 435 p. Edited by G.H. Teh, Joy J. Pereira and T.F. Ng. Price: RM60.00.
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ANATOMY OF CARBONATE BODIES, Marseilles, France. (Contact: M. Floquet and J.P. Masse, Centre de Sédimentologie-Paléontologie, Université de Provence, Case 67, 13331 Marseilles Cedex 03, France. E-mail: reef@newsup.univ-mrs.fr)

May 2001

GEOCHEMICAL EXPLORATION (20th International Symposium). (Contact: Association of Exploration Geochemists. Website: www.aeg.org/)

May 5-12

PHODOPE GEODYNAMIC HAZARDS, LATE ALPINE TECTONICS AND NEOTECTONICS, International Conference with extensive field trip in SW Bulgaria. Sofia, Bulgaria. (Contact: Website: http://www.geology.bas.bg/Rhodope_conference/; E-mail: Zagor@router.geology.bas.bg)

May 11-21

MID-PALAEOZOIC BIO- AND GEODYNAMICS: THE NORTH GONDWANA-LAURUSSIA INTERACTION, Joint meeting of the 'International Geological Correlation Program (IGCP) 421' and the 'Subcommission on Devonian Stratigraphy (SDS)' hosted by the 'Senckenbergische Naturforschende Gesellschaft', Frankfurt am Main at the 'Forschungsinstitut und Naturmuseum Senckenberg' Frankfurt am Main, Germany. (Contact: G. Plodowski, Forschungsinstitut Senckenberg, Senckenberganlage 25. D-60325 Frankfurt am Main. Tel: ++49-69-97075127; Fax: ++49-69-97075137; E-mail: gplodows@sngkw.uni-frankfurt.de)

May 27-30

GEOLOGICAL ASSOCIATION OF CANADA-MINERALOGICAL ASSOCIATION OF CANADA (Joint Annual Meeting), St. John's, Newfoundland, Canada. (Contact: Newfoundland Geological Survey, E-mail: dgl@zeppo.geosurv.gov.nf.ca; Website: www.geosurv.gov.nf.ca/)

June 3-6

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS (Annual Meeting), Denver, Colorado, USA. (Contact: AAPG Conventions Department, P.O. Box 979, 1444 S. Boulder Ave., Tulsa, OK 74101-0979, USA. Tel: +1 918 560 2679; Fax: +1 918 560 2684; E-mail: dkeim@aapg.org)

June 6-8

SEDIMENT 2001, Jena, Germany. (Contact: Organisationskomitee Sediment 2001, Institut für Geowissenschaften, Universität Jena, Burgweg 11, D-07749 Jena, Germany. Tel: +49 3641 948 621; Fax: +49 3641 948 622; E-mail: sediment2001@geo.uni-jena.de; Website: <http://www.uni-jena.de/chemie/geowiss/tagungen/tagungen.html>)

June 10-15

WATER-ROCK INTERACTION (10th International Symposium, Sponsored by Working Group of the International Association of Geochemistry and Cosmochemistry), Sardinia, Italy. (Contact: Rosa Cidu, Dipartimento di Scienze della Terra, via Trentino 51, I-09127 Cagliari, Italy. E-mail: cidur@unica.it)

June 11-16

63RD EUROPEAN ASSOCIATION OF GEOSCIENTISTS AND ENGINEERS CONFERENCE & TECHNICAL EXHIBITION, Amsterdam, The Netherlands. (Contact: EAGE Conference Dept., P.O. Box 59, 3990 DB Houten,

The Netherlands. Tel: +31 30 6354055; Fax: +31 30 6343524)

June 18–21

GROUNDWATER QUALITY 2001. NATURAL AND ENHANCED ATTENUATION OF GROUNDWATER POLLUTION. Organised by IAHS, Sheffield, U.K. (Contact: David Lerner, University of Sheffield, Tel: +44 114 222 5743; Fax: +44 114 222 5701 or 5700; E-mail: d.n.lerner@sheffield.ac.uk)

June 24–28

EARTH SYSTEM PROCESSES (International Meeting sponsored by the Geological Society of America and the Geological Society of London), Edinburgh, Scotland. (Contact: Ian Dalziel, University of Texas at Austin; E-mail: ian@utig.ig.utexas.edu)

June 25–27

3RD INTERNATIONAL CONFERENCE OF FUTURE GROUNDWATER RESOURCES AT RISK, Lisbon, Portugal. (Contact: FGR'01 International Conference, CVRM Geosystems Center, Instituto Superior Técnico, Av. Rovisco Pais, 1049-001 Lisbon, Portugal. Tel: +351 21 841 72 47; Fax: +351 21 841 74 42; E-mail: fgr@alfa.ist.utl.pt; Website: www.alfa.ist.utl.pt/~cvrm/FGR)

July 3–8

CLIMATE AND BIOTA OF THE EARLY PALEOGENE, Plowell, Wyoming, USA. (Contact: Scott Wing, Dept. of Paleobiology, Smithsonian Inst., Washington, DC 20560, USA. Tel: (202) 3578 2649; E-mail: wing-scott@nmnh.si.edu)

July 17–20

OIL AND GAS MALAYSIA 2001: THE 9TH MALAYSIAN OIL, GAS AND PETROCHEMICAL ENGINEERING EXHIBITION, Kuala Lumpur, Malaysia. (Contact: Overseas Exhibition Services Ltd., 11 Manchester Square, London W1M 5AB, Angleterre. Tel: +44 (0) 207 862 2000; Fax: +44 (0) 2028622078; E-mail: pmckean@montnet.com)

July 29 – August 2

BIOGEOCHEMISTRY OF TRACE ELEMENTS (6th International Conference, University of Guelph, Guelph, Ontario, Canada. (Contact: ICOTBE Secretariat, Department of Land Resource Science, University of Guelph,

Guelph, Ontario, Canada N1G 2W1. Tel: +1-519 829 4120 ext. 2531; Fax: +1-519 823 1587; E-mail: icobte@lrs.uoguelph.ca; Website: icobte.crle.uoguelph.ca)

July 29 – August 4

12TH INTERNATIONAL CLAY CONFERENCE, Bahía Blanca, Argentina. (Contact: Fernanda Cravero, Secretary-General 12 ICC, Departamento de Geología, Universidad Nacional del Sur, 8000 Bahía Blanca, Argentina. Tel: +54 291 459 51 01 ext. 30 41; Fax: +54 291 459 51 48; E-mail: 12icc@criba.edu.ar; Website: <http://www.12ICC.criba.edu.ar>)

July 30 – August

INTERNATIONAL ASSOCIATION OF ENGINEERING GEOLOGY AND THE ENVIRONMENT (IAEG), "Engineering Geological Problems of Urban Areas" (International Symposium), Ekaterinburg, Russia. (Contact: Secretariat, "EngGeolCity-2001, UralTISIZ 79, Bazhov str., Ekaterinburg, Russia 620075. Tel: +7 3432 559772; Fax: +7 3432 550043; E-mail: UralTIS@etel.ru)

August 6–10

7TH INTERNATIONAL CONFERENCE ON FLUVIAL SEDIMENTOLOGY, University of Nebraska-Lincoln, USA. (Contact: Mike Blum, Department of Geosciences, 214 Bessey Hall, University of Nebraska-Lincoln, Lincoln, NE 68588-0340, USA. Tel: +1 402 472 78 72; Fax: +1 402 472 49 17; E-mail: mblum@unl.edu; Website: <http://www.unl.edu/geology/icfs.html>)

August 6–10

AGGREGATE 2001 — ENVIRONMENT AND ECONOMY, Helsinki, Finland. (Contact: Tampere University of Technology, Lab. of Engineering Geology, P.O. Box 600, FIN-33101 Tampere, Finland. Fax: +358 3 3652884; E-mail: kuulavai@cc.tut.fi or pekka.ihalainen@luyvi.fi)

August 10–13

THE INTERNATIONAL SYMPOSIUM ON THE GLOBAL STRATOTYPE OF THE PERMIAN-TRIASSIC BOUNDARY AND THE PALEOZOIC-MESOZOIC EVENTS, Changxing, Zhejiang Province, China. (Contact: Dr. Tong Jinnan, Faculty of Earth Science, China University of Geosciences, Wuhan 430074, China. Tel: +86-27-8748 2031; Fax: +86-27-8780 1763; E-mail: jntong@public.wh.hb.cn)

August 20-24

PALEOFORAMS 2001 (International Conference on Paleozoic Benthic Foraminifera), Middle East Technical University, Ankara, Turkey. (Contact: Demir Altiner, Department of Geological Engineering, Middle East Technical University (ODTÜ), 06531 Ankara, Turkey. Tel: +90-312-2102680, +90-312-4275195; Fax: +90-312-2101263; E-mail: <altiner@tubitak.gov.tr><demir@metu.edu.tr>)

August 23-28

INTERNATIONAL CONFERENCE ON GEOMORPHOLOGY (5th), Tokyo, Japan. (Contact: Prof. K. Kashiwaya, Dept. of Earth Sciences, Kanazawa University, Kanazawa, 920-1192 Japan. E-mail: kashi@kenroku.kanazawa-u.ac.jp)

August 24-27

1ST INTERNATIONAL CONFERENCE ON SUSTAINABLE DEVELOPMENT IN KARST REGIONS, Beijing, China. (Contact: Prof. Yuan Daoxian, E-mail: dxyuang@osmanthus.gxnu.edu.cn)

August 27-29

SOCIETY FOR GEOLOGY APPLIED TO MINERAL DEPOSITS "Mineral Deposits at the Beginning of the 21st Century" (6th Biennial Meeting), Kraków, Poland. (Contact: 6th Biennial SGA Meeting, Dr. Wojciech Mayer, University of Mining and Metallurgy, Faculty of Geology, Geophysics & Environmental Protection, av. Mickiewicza 30; 30-059 Kraków, Poland. Tel: +48-12 617 2385; Fax: +48-12 633 2936; E-mail: wmayer@geol.agh.edu.pl; Website: <http://galaxy.uci.agh.edu.pl/~sga>)

September 3-5

21ST IAS MEETING OF SEDIMENTOLOGY, Davos, Switzerland. (Contact: Haruko Hartmann, IAS-2001, Institute of Geology, ETH-Zentrum, 8092 Zurich, Switzerland. Fax: +41 1 632 1080; E-mail: info@ias-2001.ethz.ch; Website: <http://www.ias-2001.ethz.ch>)

September 6-12

IAMG2001 (THE ANNUAL CONFERENCE OF THE INTERNATIONAL ASSOCIATION FOR MATHEMATICAL GEOLOGY), Cancún, Mexico. (Contact: IAMG2001 Conference Secretariat, c/o Jorgina A. Ross, Kansas Geological Survey, 1930 Constant Avenue, Lawrence, KS 66047-3724, USA. Tel: +785-

864-3965; Fax: +785-864-5317; E-mail: aspiazu@kgs.ukans.edu; Website: <http://www.kgs.ukans.edu/Conferences/IAMG/index.html>)

September 8-15

MAEGS-12 (12TH MEETING OF THE ASSOCIATION OF EUROPEAN GEOLOGICAL SOCIETIES), "Carpathians Palaeogeography and Geodynamics: Multidisciplinary Approach", Kraków, Poland. (Contact: Polish Geological Society, MAEGS-12, Oleandry 2a, PL 30-063 Kraków, Poland. Fax: +48 12 6332270; E-mail: ptg@ing.uj.edu.pl)

September 9-14

SOCIETY OF EXPLORATION GEOPHYSICISTS (71st Annual Meeting and International Exposition), San Antonio, Texas, USA. (Contact: SEG Business Office, Tel: +1-918 497 5500; Fax: +1-918 497 5557; Website: seg.org/)

September 9-15

INTERNATIONAL ASSOCIATION OF HYDROGEOLOGISTS, "New Approaches to Characterising Groundwater Flow" (31st International Congress), Munich, Germany. (Contact: Munich 2001, Institute of Hydrology, GSF National Research Centre of Environment and Health GmbH, Ingolstädter Landstr. 1, D-85764 Neuherberg, Germany. Tel: +49 89 3187 2585; Fax: +49 89 3187 3361; E-mail: seiler@gsf.de; Website: agh.iaag.geo.uni-muenchen.de/)

September 17-21

7TH INTERNATIONAL CONFERENCE ON PALEOCEANOGRAPHY, Sapporo, Japan. (Contact: Prof. Helmut Weissert, Geological Institute, ETH-Zurich, CH-8092 Zurich, Switzerland. Tel: +41 (0)1 632 37 15; Fax: +41 (0)1 632 10 30; E-mail: helmi@erdw.ethz.ch; Website: <http://www.ijnet.or.jp/jtb-cs/icp7/>)

September 24-26

ARCHEAN SYMPOSIUM (4th International), Perth, Western Australia. (Contact: Website: redback.geol.usa.edu.au/~ias/)

September 25-29

SIXTH INTERNATIONAL SYMPOSIUM ON LAND SUBSIDENCE (SISOLS 2000), Ravenna, Italy. (Contact: Dr. Laura Carbognin, CNR-ISDGM, S. Polo 1364, 30125, Venezia, Italy. Tel: +39-041 5216826; Fax: +39 041 5216892; E-mail: jane@isdgm.ve.cnr.it)

November 5-8

GEOLOGICAL SOCIETY OF AMERICA (Annual Meeting), Boston, Massachusetts, USA. (Contact: GSA Meetings Dept., P.O. Box 9140, Boulder, CO 80301-9140, USA; Tel: +1 303 447 2020; Fax: +1 303 447 1133; E-mail: meetings@geosociety.org; WWW: <http://www.geosociety.org/meetings/index.htm>)

2002**March 10-13**

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS (Annual Meeting), Houston, Texas, USA. (Contact: AAPG Conventions Dept., P.O. Box 979, Tulsa, OK 74101-0979, USA. Tel: +1-918 560 2679; Fax: 1-918 560 2684; E-mail: convене@aapg.org; Website: <http://www.aapg.org/>)

April 7-10

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS (Annual Meeting), Houston, Texas, USA. (Contact: AAPG Conventions Department, P.O. Box 979, 1444 S. Boulder Ave., Tulsa, OK 74101-0979, USA. Tel: +1 918 560 2679; Fax: +1 918 560 2684; E-mail: dkeim@aapg.org)

May 27-30

EUROPEAN ASSOCIATION OF GEOSCIENTISTS AND ENGINEERS (63rd Conference & Technical Exhibition), Florence, Italy. (Contact: Website: <http://www.eage.nl/>)

July 7-12

16TH INTERNATIONAL SEDIMENTOLOGICAL CONGRESS, Auckland Park, Gauteng, South Africa. (Contact: Bruce Cairncross, Department of Geology, Rand Africans University, P.O. Box 524, Auckland Park, 2006, South Africa. Tel: +27 11 489 23 13; Fax: +27 11 489 23 09; E-mail: bc@na.rau.ac.za; Website: <http://general.rau.ac.za/geology/announcement.htm>)

September 16-20

INTERNATIONAL ASSOCIATION OF ENGINEERING GEOLOGY AND THE ENVIRONMENT (IAEG), "Engineering Geology for Developing Countries" (9th International Congress), Durban, South Africa. (Contact: South African Institute for Engineering and Environmental Geologists, P.O. Box 2812,

Pretoria, 0001, South Africa. E-mail: saieg@hotmail.com; Website: home.geoscience.org.za/saieg/2002.htm)

September 22-27

SOCIETY OF EXPLORATION GEOPHYSICISTS (72nd Annual Meeting and International Exposition), Las Vegas, Nevada, USA. (Contact: SEG Business Office, Tel: +1-918 497 5500; Fax: +1-918 497 5557; Website: seg.org/)

October 21-25

INTERNATIONAL ASSOCIATION OF HYDROGEOLOGISTS, "Groundwater and Human Development" (32nd International Congress), Mar del Plata, Argentina. (Contact: Dr. Emilia Bocanegra, Centro de Geología de Costas y del Cuaternario, Facultad de Ciencias Exactas y Naturales, Universidad Nacional de Mar del Plata, Casilla de Correo 722, 7600 Mar del Plata, Argentina; Tel: +54 223 475 4060; Fax: +54 223 475 3150; E-mail: ebocaneg@mdp.edu.ar; or download Circular)

October 28-31

GEOLOGICAL SOCIETY OF AMERICA (Annual Meeting), Denver, Colorado, USA. (Contact: GSA Meetings Dept., P.O. Box 9140, Boulder, CO 80301-9140, USA; Tel: +1 303 447 2020; Fax: +1 303 447 1133; E-mail: meetings@geosociety.org; Website: <http://www.geosociety.org/meetings/index.htm>)

2003**28 September - 3 October**

SOCIETY OF EXPLORATION GEOPHYSICISTS (73rd Annual Meeting and International Exposition), Dallas, Texas, USA. (Contact: SEG Business Office, Tel: +1-918 497 5500; Fax: +1-918 497 5500; Fax: +1-918 497 5557; Website: seg.org/)

November 2-5

GEOLOGICAL SOCIETY OF AMERICA (Annual Meeting), Seattle, Washington, USA. (Contact: GSA Meetings Dept., P.O. Box 9140, Boulder, CO 80301-9140, USA. Tel: +1 303 447 2020; Fax: +1 303 447 1133; E-mail: meetings@geosociety.org; Website: <http://www.geosociety.org/meeting/index.htm>)

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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 paper not exceeding 210 x 297 mm (or 8.27 x 11.69 inches, A4 size). 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. The figure number should be marked in pencil on the margin or reverse side.

Original maps and illustrations or as glossy prints should ideally be submitted with sufficiently bold and large lettering to permit reduction to 18 x 25 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 x 12.5 cm and preferably larger. Use of metric system of measurements (SI) is strongly urged wherever possible.

An abstract in English which is concise and informative is required for each paper.

References cited in the text should be listed at the end of the paper and arranged in alphabetical order and typed double-spaced. The name of the book or journal must be in *italics*. The references should be quoted in the following manner:

HAMILTON, W., 1979. Tectonics of the Indonesian region. *U.S. Geological Survey Professional Paper 1078*, 345p.

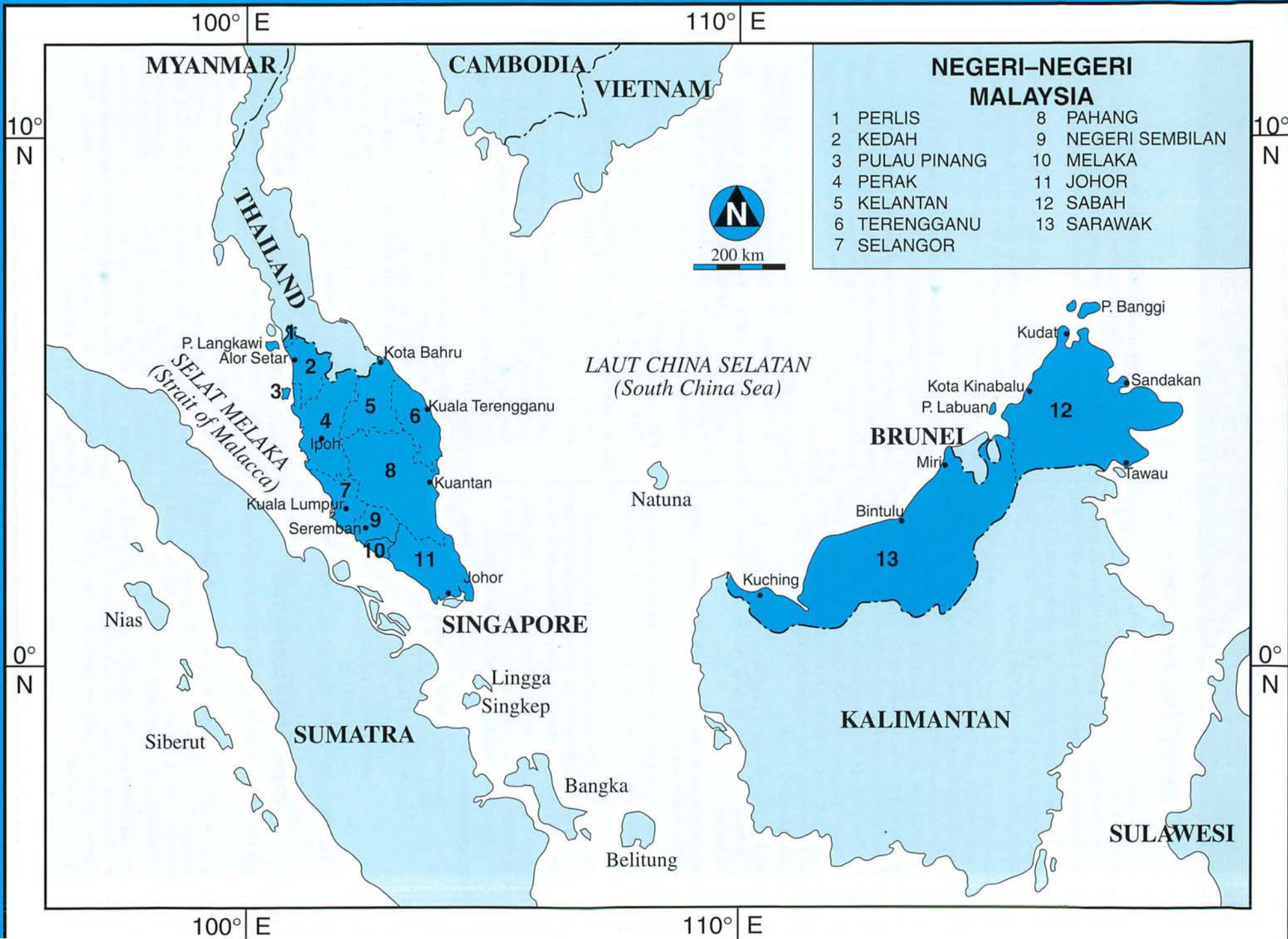
HOSKING, K.F.G., 1973. Primary mineral deposits. In Gobbett, D.J. and Hutchison, C.S. (Eds.), *Geology of the Malay Peninsula (West Malaysia and Singapore)*. Wiley-Interscience. New York, 335-390.

HUTCHISON, C.S., 1989. *Geological Evolution of South-east Asia*. Clarendon Press, Oxford. 368p.

SUNTHARALINGAM, T., 1968. Upper Paleozoic stratigraphy of the area west of Kampar, Perak. *Geol. Soc. Malaysia Bull. 1*, 1-15.

TAYLOR, B., AND HAYES, D.E., 1980. The tectonic evolution of the South China Sea basin. In: D.E. Hayes (Ed.), *The Tectonic and Geologic Evolution of Southeast Asian Sea and Islands, Part 2. Am. Geophy. Union Monograph 23*, 89-104.

Submission of electronic text. In order to publish the paper as quickly as possible after acceptance, authors are requested to submit the final text also on a 3.5" diskette. Both Macintosh and PC (DOS/Windows) platforms are supported. Main text, tables and illustrations should be stored in separate files with clearly identifiable names. Text made with most word processors can be readily processed but authors are advised to provide an additional copy of the text file in ASCII format. Preferred format for illustration is Encapsulated PostScript (EPS) but authors may submit graphic files in their native form. It is essential that the name and version of softwares used is clearly indicated. The final manuscript may contain parts (e.g. formulae, complex tables) or last-minute corrections which are not included in the electronic text on the diskette; however, this should be clearly marked in an additional hardcopy of the manuscript. Authors are encouraged to ensure that apart from any such small last-minute corrections, **the disk version and the hardcopy must be identical**. Discrepancies can lead to proofs of the wrong version being made.



MYANMAR

CAMBODIA

VIETNAM

NEGERI-NEGERI MALAYSIA

- 1 PERLIS
- 2 KEDAH
- 3 PULAU PINANG
- 4 PERAK
- 5 KELANTAN
- 6 TERENGGANU
- 7 SELANGOR
- 8 PAHANG
- 9 NEGERI SEMBILAN
- 10 MELAKA
- 11 JOHOR
- 12 SABAH
- 13 SARAWAK



200 km

THAILAND
 SELAT MELAKA
 (Strait of Malacca)

LAUT CHINA SELATAN
 (South China Sea)

BRUNEI

13

12

SINGAPORE

SUMATRA

KALIMANTAN

SULAWESI

Nias

Siberut

Lingga
 Singkep

Bangka

Belitung

Natuna

Kuching

Bintulu

Miri

Kota Kinabalu
 P. Labuan

Kudat

P. Banggi

Tawau

Sandakan

Kota Bahru

Kuala Terengganu

Kuantan

Johor

Kuala Lumpur

Seremban

Ipoh

P. Langkawi
 Alor Setar

10° N

10° N

10° N

0° N

0° N

100° E

110° E

100° E

110° E