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CATATAN GEOLOGI GEOLOGICAL NOTES

Fosil bivalvia *Daonella* dari Sg. Jentar, Mentakab, Pahang

Daonella bivalve fossils from Sg. Jentar, Mentakab, Pahang

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Abstrak— Fosil bivalvia *Daonella* telah ditemui pada satu singkapan batuan di kawasan Sg. Jentar, Mentakab, Pahang. Fosil ditemui dalam syal bertuf kepunyaan Formasi Semantan yang terletak dalam Zon Batuan Trias Timur. Sebanyak lima spesies *Daonella* telah dikenalpasti iaitu *Daonella pahangensis*, *Daonella sakawana*, *Daonella pectinoides*, *Daonella* cf. *pichleri* dan *Daonella lommeli*. Himpunan *Daonella* ini diletakkan dalam Zon *Daonella lommeli* yang berusia Ladinian Atas (Trias Tengah). Spesies-spesies ini biasa ditemui dalam rantau Tethys di persekitaran samudera dalam.

Kata kunci: Bivalvia, *Daonella*, Mentakab, Ladinian Atas, Trias Tengah, Formasi Semantan

Abstract— *Daonella* bivalve fossils were recovered from an outcrop in the Sg. Jentar area in the vicinity of Mentakab, Pahang. The fossils were found in tuffaceous shale belonging to the Semantan Formation, which is situated in the Eastern Triassic Rocks Zone. Five species of *Daonella* have been identified ie. *Daonella pahangensis*, *Daonella sakawana*, *Daonella pectinoides*, *Daonella* cf. *pichleri* and *Daonella lommeli*. This *Daonella* assemblage is assigned to the *Daonella lommeli* Zone of Upper Ladinian of Middle Triassic age. These species are commonly found in a deep marine environment.

Keywords: Bivalve, *Daonella*, Mentakab, Upper Ladinian, Middle Triassic, Semantan Formation

PENGENALAN

Fosil bivalvia *Daonella* memainkan peranan yang penting dalam membina biostratigrafi Trias Tengah terutamanya bagi unit-unit litologi yang tidak menunjukkan kehadiran fosil indeks seperti ammonoid dan konodon (McRobert, 2010; Lucas, 2010 & Schatz, 2001). Semasa zaman Trias Tengah, bivalvia *Daonella* mendominasi dasar lautan di persekitaran samudera dalam (Kobayashi *et al.*, 1966; Meng *et al.*, 2007) dan hanya terdapat dalam julat usia Anisian Akhir sehinggalah ke usia Ladinian Akhir (McRobert, 2010). Taksa *Daonella* yang bercengkerang nipis ini mempunyai banyak variasi dari segi morfologi yang menyebabkan terhasilnya banyak spesies-spesies *Daonella*. Schatz (2001) menyatakan bahawa terdapat sekurang-kurangnya 120 spesies *Daonella* telah dilaporkan dari serata dunia.

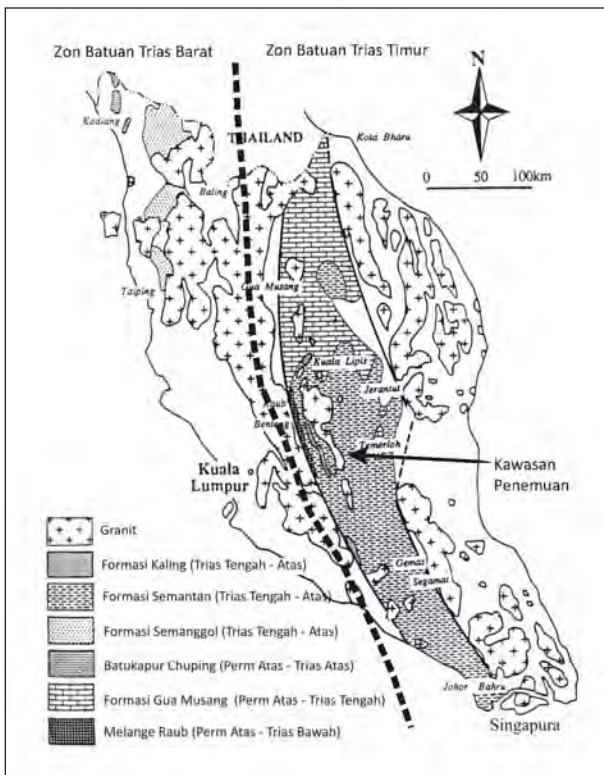
Kobayashi (1964) telah membahagikan strata batuan sedimen Trias di Semenanjung Malaysia kepada dua zon iaitu Zon Batuan Trias Barat yang terletak dalam Jalur Barat dan Zon Batuan Trias Timur yang terletak dalam Jalur Tengah (Rajah 1). Zon Batuan Trias Barat dicirikan oleh kebersekutuan *Daonella* dengan *Halobia* dan *Posidonia* manakala Zon Batuan Trias Timur pula dicirikan oleh kebersekutuan *Daonella* dengan ammonoid

berusia Ladinian atau Anisian (Trias Tengah). Berdasarkan taburan bivalvia, Kobayashi (1964) membahagikan pula Zon Batuan Trias Timur di Jalur Tengah kepada dua biofasies bivalvia iaitu biofasies *Daonella* dan biofasies *Myophoria*.

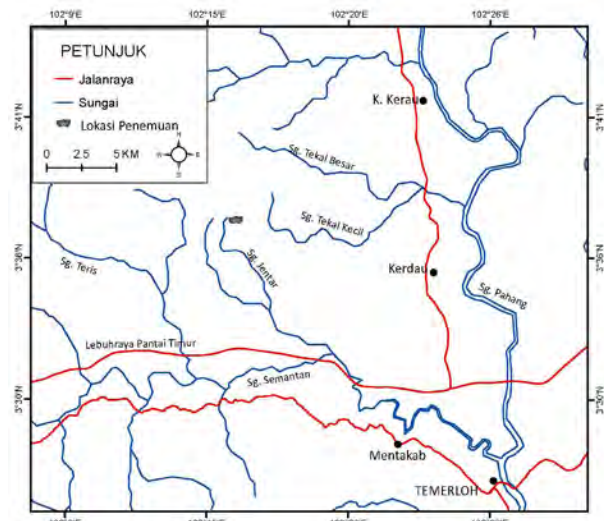
Laporan ini mendokumentasikan penemuan lima spesies fosil bivalvia *Daonella* iaitu *Daonella pahangensis* Kobayashi, *Daonella sakawana* Mojsisovics, *Daonella pectinoides* Kobayashi & Tamura, *Daonella* cf. *pichleri* Mojsisovics dan *Daonella lommeli* (Wissman) dalam strata batuan sedimen Formasi Semantan dari Sg. Jentar, Mentakab, Pahang yang terletak dalam biofasies *Daonella* dalam Zon Batuan Trias Timur di Jalur Tengah, Semenanjung Malaysia.

KAJIAN TERDAHULU

Kawasan Mentakab, Pahang sememangnya mempunyai banyak singkapan batuan berfosil berusia Trias Tengah terutama fosil bivalvia *Daonella*. Pada tahun 1964, Kobayashi telah melaporkan penemuan beberapa spesies *Daonella* yang telah ditemui oleh Procter pada 17 lokaliti di Mentakab, Temerloh, Pahang. Sebanyak lima spesies *Daonella* yang berjulat Anisian hingga Ladinian



Rajah 1: Kedudukan kawasan penemuan yang terletak dalam Zon Batuan Trias Timur. Ubahsuai dari Kamal Roslan Mohamed (1996).



Rajah 2: Peta menunjukan lokaliti penemuan fosil bivalvia *Daonella* di Sg. Jentar, Mentakab, Pahang. Diubahsuai dari Kobayashi, 1964.

telah dikenalpasti oleh Kobayashi (1964) iaitu *Daonella indica* Bittner, *Daonella sakawana* Mojsisovics, *Daonella pahangensis* Kobayashi, *Daonella pichleri* Mojsisovics dan *Daonella lommeli* (Wissman). Fosil-fosil *Daonella* ini biasanya ditemui dalam syal bertuf dan syal berpasir. Kawasan kajian terletak berhampiran dengan lokaliti di mana Kobayashi (1964) pernah merekodkan penemuan spesies *Daonella pahangensis* Kobayashi dan *Daonella sakawana* Mojsisovics di Sg. Tekal Besar (Lokaliti 3 dan 4) seperti yang ditunjukkan dalam Rajah 2.

Manakala pada tahun 1976, Jaafar Ahmad telah menemui dan mengenalpasti empat spesies *Daonella* iaitu *Daonella indica* Bittner, *Daonella pahangensis* Kobayashi, *Daonella kotoi* Mojsisovics dan *Daonella pichleri* Mojsisovics di Sg. Netas, Mentakab. Beliau memberikan usia peringkat Ladinian, Trias Tengah bagi fosil *Daonella* ini berdasarkan penemuan ammonoid *Paratrachyceras* sp. (kini dikenali sebagai *Frankites* sp.). Fosil-fosil *Daonella* ini ditemui dalam syal bertuf dalam Formasi Semantan. Lum (1976) telah melaporkan penemuan *Daonella indica* Bittner, *Daonella kotoi* Mojsisovics, *Daonella pectinoides* Mojsisovics, *Daonella pichleri*(?) Mojsisovics dan *Halobia* sp. di kawasan Lanchang, Temerloh, Pahang dalam lapisan syal berkarbon juga dalam Formasi Semantan. Metcalfe *et al.* (1982) merekodkan penemuan fosil *Daonella lommeli* (Wissman) dan *Daonella sakawana* Mojsisovics di kawasan berhampiran Kilang Batu-bata Golden Age, Mentakab, Pahang yang wujud bersama ammonoid *Arpadites* sp.

Fosil *Daonella lommeli* (Wissman) turut ditemui oleh Sazali Sulaiman (1984) di kawasan Mentakab bersama bivalvia *Posidonia kedahensis* Kobayashi dan ammonoid *Arpadites cf. cinensis* Mojsisovics yang memberikan usia Ladinian Akhir.

Selain di kawasan Mentakab, fosil *Daonella* juga turut dilaporkan penemuannya di beberapa kawasan dalam Zon Batuan Trias Timur seperti di Kelantan dan Negeri Sembilan. *Daonella pahangensis* Kobayashi telah dilaporkan penemuannya dalam strata batuan kepunyaan Formasi Telong di kawasan Aring, Gua Musang oleh Ahmad Rosli Othman & Mohd Shafeea Lemana (2009) dan Yin (1963). Khoo (1998) menemui spesies *Daonella cf. lommeli* (Wissmann) dan *Daonella cf. indica* Mojsisovics dalam jujukan enapan sedimen pelagos Formasi Semantan di kawasan Kuala Pilah, Negeri Sembilan. Loganathan (1993) pula melaporkan penemuan *Daonella* di dalam strata batuan Formasi Semantan iaitu *Daonella lomelli* (Wissmann), *Daonella cf. taramelli* (Mojsisovics) dan *Daonella* sp. di kawasan Durian Tipus, Negeri Sembilan.

Di bahagian Zon Batuan Trias Barat, sebanyak tujuh spesies *Daonella* telah dilaporkan yang diwakili oleh spesies *Daonella indica* Mojsisovics, *Daonella cf. kotoi* Mojsisovics, *Daonella cf. posidoniformis* Kobayashi & Tamura, *Daonella cf. pectinoides* Kobayashi & Tamura, *Daonella burtoni* Kobayashi & Tamura, *Daonella procteri* Kobayashi & Tamura dan *Daonella multilineata* Jones yang ditemui di beberapa kawasan di Kedah seperti Kuala Nerang, Tawar dan Ulu Pedu (Kobayashi, 1963; Kobayashi *et al.*, 1966). Fosil *Daonella* dalam Zon Batuan Trias Barat didapati berasosiasi rapat dengan fosil *Halobia* yang mungkin berusia sehingga Karnian, Trias Akhir. Dari kajian terkini oleh penulis bivalvia *Daonella pichleri* Mojsisovics telah ditemui bersama fosil ammonoid berusia Ladinian Akhir di kawasan Kijai-Binjui, Tawar, Kedah dalam lapisan syal Formasi Semanggol.

GEOLOGI

Lokasi penemuan fosil adalah pada kedudukan koordinat RSO: VK474441 WMR399393 dan terletak di bahagian tengah Negeri Pahang seperti digambarkan dalam Rajah 2 dan 3. Fosil ini ditemui pada serpihan-serpihan syal bertuf dan batu lodak yang terdapat di sekitar singkapan batuan. Namun begitu kedudukan fosil pada satah perlapisan berjurus sekitar 340°-350° dan berkemiringan 25°-30° ke timurlaut tidak dapat ditentukan di lapangan.

Berdasarkan pemetaan geologi yang dilakukan oleh Jaafar Ahmad (1976) di kawasan Temerloh dan Karak, kawasan ini terletak dalam Formasi Semantan yang terdiri daripada jujukan saling lapis syal berkarbon, syal bertuf, batu lodak dan tuf riolit. Formasi ini telah diperkenalkan oleh Jaafar Ahmad sendiri berdasarkan jujukan batuan yang tersingkap di sepanjang jalanraya yang menghubungkan Karak dan Temerloh. Berdasarkan kajian bivalvia, Jaafar memberikan usia Formasi Semantan sebagai Anisian (Trias Tengah) hingga Norian (Trias Atas). Menurut beliau, kewujudan strata bertuf dalam formasi ini menandakan bahawa aktiviti vulkano yang berpusat di bahagian barat laut kawasan Karak-Temerloh adalah serentak dengan proses pengenaan sedimen di persekitaran neritik.

USIA DAN BIOSTRATIGRAFI

Menurut McRobert (2010), Taksa *Daonella* adalah berjulat dari Anisian Awal, Trias Tengah sehingga Karnian, Trias Akhir. Taksa ini didapati berkembang pada kemuncaknya pada usia Ladinian di kawasan Asia Timur dan Asia Tenggara (Kobayashi *et al.*, 1966). Kenyataan ini disokong dengan terdapat banyaknya spesies *Daonella* berusia Ladinian di Semenanjung Malaysia samada dalam Zon Batuan Trias Timur seperti dalam Formasi Semantan dan Formasi Telong mahu pun dalam Zon Batuan Trias Barat seperti dalam Formasi Semanggol.

Kobayashi (1964) berpendapat bahawa kesemua lima spesies *Daonella* yang ditemuinya di beberapa lokaliti di Temerloh adalah berusia Ladinian, Trias Tengah dan diletakkan dalam horizon *Daonella lommeli*. Jaafar Ahmad (1976) juga berpendapat bahawa fosil bivalvia *Daonella* yang ditemuinya di kawasan Temerloh dan Karak adalah berusia Ladinian hingga Karnian. Ahmad Rosli Othman & Mohd Shafeea Leman (2009) telah melaporkan bahawa spesies endemik *Daonella pahangensis* Kobayashi didapati bersekutuan dengan ammonoid dari Zon ammonoid *Frankites regoledanus* berusia Ladinian Atas di kawasan Aring dalam Jajahan Gua Musang, Kelantan. Loganathan (1993) menganggarkan usia fosil *Daonella* yang ditemuinya di Durian Tipus, Negeri Sembilan mewakili usia Ladinian Akhir, Trias Tengah.

Spesies *Daonella lommeli* merupakan spesies bivalvia penanda zon dan boleh dibandingkan dengan pegezonan bivalvia Trias Tengah yang dibangunkan oleh

McRobert (2010). Ia adalah spesies penanda zon bagi Zon *Daonella lommeli* yang berusia Ladinian Atas, Trias Tengah. Walaupun kawasan penemuan tidak menunjukkan kehadiran fosil ammonoid, Zon *Daonella lommeli* adalah yang setara dengan Zon ammonoid *Frankites regoledanus* dan Zon ammonoid *Protrachyceras archelaus* seperti yang ditunjukkan dalam Rajah 4.

KEADAAN PENGAWETAN

Fosil-fosil bivalvia ini banyak ditemui pada satah-satah perlapisan serpihan batuan dalam bentuk tempelan seperti yang ditunjukkan dalam Foto 2. Menurut Kobayashi *et al.* (1966), oleh kerana cengkerang-cengkerang *Daonella* adalah nipis dan pipih, struktur bertindan antara cengkerang-cengkerang sering diperlihatkan pada satah-satah perlapisan batuan terutama pada spesimen-spesimen di kawasan Pahang. Fosil bivalvia *Daonella* ini didapati bersekutuan dengan bivalvia *Posidonia* tetapi tidak ditemui fosil lain seperti ammonoid dan gastropod.



Rajah 3: Foto menunjukkan singkapan batuan yang mengandungi lima spesies fosil *Daonella* di Sg. Jentar, Mentakab, Pahang.

		Tahap	Zon-Zon Ammonoid	Zon-Zon Bivalvia
TRIAS TENGAH	LADINIAN	Atas	Frankites regoledanus	Daonella lommeli
			Protrachyceras archelarus	
		Bawah	Protrachyceras longobardium	Daonella pichleri
			Protrachyceras gredleri	Daonella moussoni
	ANISIAN	Atas	Protrachyceras margaritosum	
			Eoprotrachyceras curionii	
		Tengah	Nevadites sacedensis	Daonella sturi
			Reitziites reitzi	
			Kellnerites falsoensis	
			Paraceratites trinodosus	
		Bawah	Schreverites binodosus	Enteropleura bittneri
			Balatonites balatinicus	
			Nevadisculites taylori	
			Acrochordiceras ismidicus	
			Lenotropites caurus	
			Silberlingites mulleri	
			Pseudokeyserlingites guexi	
			Japonites welteri	

Rajah 4: Rajah menunjukkan kedudukan Zon bivalvia *Daonella lommeli* dalam pegezonan bivalvia dan ammonoid Trias Tengah bagi rantau Tethys. Ubahsuai dari McRobert, 2010.



Rajah 5: Gambar yang menunjukkan serpihan-serpihan cengkerang fosil *Daonella* dalam bentuk tempelan dan struktur bertindan antara cengkerang-cengkerang.

Fosil *Daonella* mempunyai engsel yang lemah menyebabkan cengkerangnya mudah dipisahkan. Secara umumnya kebanyakan cengkerang yang ditemui di kawasan ini berkeadaan baik, menandakan bahawa lapisan lantai lautan kuno mungkin dalam keadaan yang tenang. Kenyataan ini disokong pula oleh pembentukan satahsatah peralapisan sedimen yang jelas peralapisannya. Fosil *Daonella* yang ditemui ini juga didapati tidak mengalami canggaan dan batuan perumah tidak pula mengalami metamorfisme. Keadaan ini adalah serupa dengan kesemua fosil *Daonella* yang telah ditemui di kawasan lain di Pahang dan Kedah selaras seperti yang telah dinyatakan oleh Kobayashi *et al.* (1966). Namun begitu keadaan ini berbeza dengan *Daonella* di kawasan Aring yang telah mengalami canggaan tektonik dan metamorfisme rantau.

PALEONTOLOGI SISTEMATIK

Kesemua spesimen yang diperihalkan ini disimpan di Jabatan Mineral Dan Geosains Negeri Kelantan dan dilabelkan dengan awalan JTR diikuti nombor spesimen. Perbandingan spesimen adalah berdasarkan perbandingan dengan gambarajah dari rujukan yang telah dinyatakan sumbernya.

Superfamili PECTINOIDEA Rafinesque
 Famili POSIDONIIDAE Frech
 Genus *Daonella* Mojsisovics

Daonella pahangensis Kobayashi

Plat 1, Gambarajah 1 dan 2

*. 1964 *Daonella pahangensis* n. sp. - Kobayashi: ms 62, Plat 5, gambarajah 11.

. 2009 *Daonella pahangensis* Kobayashi - Ahmad Rosli & Mohd Shafeea: ms 113, Plat 1, gambarajah 1 dan 2.

Bahan:- Satu spesimen lengkap cengkerang kanan yang mempunyai tempelan acuan dalaman dan acuan luaran diperiksa dan diwakili oleh spesimen JTR-01.

Pemerihalan:- Cengkerang bersaiz besar dan hampir

equilateral. Ukuran ketinggian melebihi panjang cengkerang iaitu 6.3 cm panjang dan 5.6 cm tinggi dengan kepanjangan garis engsel mencapai 3.6 cm. Garis engsel memanjang lurus dan lebih pendek dari kepanjangan cengkerang. Umbo terletak kira-kira setengah daripada garis engsel. Rusukan berjejari lurus dengan rusuk primer bercabang dua sama ada pada kedudukan satu perdua dari umbo atau satu perempat dari umbo. Cabang tiga wujud pada jarak satu perdua dari umbo tetapi tidak melebihi bilangan garis cabang dua (Plat 1 gambarajah 3). Garis pertumbuhan terpusat agak jelas pada kedudukan satu pertiga melingkari umbo. Ruang antara rusuk adalah sempit dengan garis rusukan yang semakin menebal apabila menghampiri sempadan ventral.

Perbandingan dan perbincangan:- *Daonella pahangensis* Kobayashi yang bersifat endemik merupakan spesies bersaiz paling besar daripada spesies-spesies *Daonella* yang lain. Sifat yang unik ini menandakan bahawa *Daonella* telah mencapai tahap perkembangan yang memuncak pada usia Ladinan, Trias Tengah. Dari segi dimensi dan perhiasan cengkerang, spesies ini menyamai spesimen holotip yang ditemui di kawasan Temerloh oleh Kobayashi (1964) dan di Lokaliti QZ467 di kawasan Aring, Gua Musang oleh Ahmad Rosli Othman & Mohd Shafeea Lemman (2009). Garis rusuk bercabang tiga yang wujud pada *Daonella pahangensis* Kobayashi adalah ciri utama yang mencirikan spesies ini (Rajah 5).

Daonella sakawana Mojsisovics

Plat 1, Gambarajah 3

. 1959 *Daonella sakawana* Mojsisovics - Kobayashi & Tamura: ms 17, Plat 2, gambarajah 8.

. 1964 *Daonella sakawana* Mojsisovics - Kobayashi: ms 62, Plat 5, gambarajah 8.

. 1982 *Daonella sakawana* Mojsisovics - Metcalfe *et al.*: ms 113, gambarajah 1, 2, 4, 7-10.

Bahan:- Satu spesimen cengkerang kanan dalam bentuk acuan luaran diperiksa yang diwakili oleh spesimen JTR-02.

Pemerihalan:- Cengkerang bersaiz sederhana, agak oblik dan inequilateral. Ukuran panjang melebihi tinggi cengkerang iaitu 4.6 cm panjang dan 2.8 cm tinggi dengan kepanjangan garis engsel mencapai 3.6 cm. Umbo terletak kira-kira satu pertiga dari dari kepanjangan garis engsel dari hujung anterior. Cengkerang dihiasi oleh garis pertumbuhan memusat bermula berhampiran umbo sehingga pada jarak satu perdua melingkari umbo. Corak rusukan menunjukkan pertambahan garis rusukan lurus bercabang dua yang semakin menyempit bila menghampiri garis engsel. Garis engsel memanjang lurus dan relatifnya lebih pendek daripada panjang cengkerang.

Perbandingan dan perbincangan :- Spesies ini mudah dikenalpasti berdasarkan kewujudan garis rusukan bercabang dua yang dominan serta bentuk kerangkanya yang oblik. Spesimen ini menyamai spesimen yang ditemui oleh Jaafar Ahmad (1976) di Sg. Jenalik di

bahagian barat Temerloh dan spesimen yang diperihalkan oleh Metcalfe *et al.* (1982) dari kawasan Mentakab, Temerloh.

Daonella pectinoides Kobayashi & Tamura
Plat 1, Gambarajah 4

*. 1959 *Daonella pectinoides* n. sp. - Kobayashi & Tamura: ms 20, Plat 2, gambarajah 12 dan Plat 3, gambarajah 6.

? 1966 *Daonella cf. pectinoides* Kobayashi & Tamura - Kobayashi *et al.*: ms 118, Plat 24, gambarajah 14.

Bahan:- Satu spesimen acuan luaran cengkerang kiri hampir lengkap diperiksa yang diwakili oleh spesimen JTR-03.

Pemerihalan:- Cengkerang bersaiz kecil, pipih, sub-bersegi empat dan berkerangka agak equilateral. Ukuran tinggi melebihi panjang cengkerang iaitu 2.5 cm panjang dan 3.5 cm tinggi dengan kepanjangan garis engsel mencapai 1.6 cm, memanjang ke bahagian posteroventral. Garis engsel lurus dan lebih pendek dari kepanjangan cengkerang. Umbo kecil tetapi jelas terletak kira-kira setengah daripada garis engsel. Garis rusuk berjejari hampir lurus dan bercabang dua dari ventral dan menghilang apabila menghampiri umbo dan hanya terdapat di bahagian anterior sahaja. Ruang antara rusuk agak luas di bahagian anterior dan rapat di bahagian posterior. Garis pertumbuhan terpusat jelas pada jarak satu perdua melingkari umbo dan dominan di bahagian posterior sahaja.

Perbandingan dan perbincangan :- Spesimen yang ditemui ini mungkin adalah dalam peringkat matang berdasarkan kewujudan garis-garis rusuk pada bahagian segitiga anterior dan posterior engsel. Dari segi morfologi, spesimen ini menyamai spesimen holotip yang diperihalkan oleh Kobayashi & Tamura (1959) dari segi bentuk cengkerang dan corak rusukan serta corak ruang antara rusukan yang luas di bahagian anterior dan sempit di bahagian posterior. Spesies yang sama juga pernah dilaporkan oleh Lum (1976) di kawasan Lancang, Pahang tetapi tiada pemerihalan spesimen dibuat mengenainya.

Daonella cf. pichleri Mojsisovics

Plat 1, Gambarajah 6

. 1964 *Daonella pichleri* - Kobayashi: ms 62, Plat 5, gambarajah 4-5a-b.

. 1991 *Daonella pichleri* - Vu Khuc *et al.*: ms 59, Plat 8, gambarajah 16.

Bahan:- Satu spesimen cengkerang kiri tidak lengkap, acuan dalaman diwakili oleh spesimen JTR-04.

Pemerihalan:- Cengkerang bersaiz kecil, terserong dan berkerangka equilateral. Ukuran panjang cengkerang melebihi tinggi cengkerang iaitu 3.7 cm panjang dan 3.2 cm tinggi. Garis engsel dan kedudukan garis engsel tidak dapat dicerap. Umbo berkedudukan kira-kira satu pertiga dari kepanjangan cengkerang dari hujung anterior. Garis rusuk berjejari lurus dan bercabang dua

berhampiran umbo. Ruang antara rusuk sempit manakala garis rusuk semakin menebal apabila menghampiri sempadan ventral.

Perbandingan dan perbincangan :- Spesimen yang diperihalkan ini adalah tidak lengkap di mana garis engsel tidak dapat diperhatikan. Namun begitu, morfologi spesimen ini bersesuaian dengan *Daonella pichleri* dari segi corak rusukan dan kedudukan umbo pada jarak satu pertiga dari kepanjangan cengkerang pada garis engsel. Morfologi spesimen JTR-04 didapati menyerupai dengan spesimen yang diperihalkan oleh Vu Khuc *et al.* (1991) dan Kobayashi (1964) terutama kedudukan umbo cengkerang. Spesies ini agak berbeza dari spesies *Daonella pichleri timorensis* yang mempunyai garis-garis rusukan yang banyak, lebih tebal dan mempunyai kerangka cengkerang yang lebih tinggi. Jaafar Ahmad (1976) telah menemui spesies ini di Sg. Kwang Medang, di bahagian timur Karak berhampiran cabang dengan Sungai Semantan. Manakala Kobayashi (1964) melaporkan bahawa Procter menemui spesies ini di Lokaliti 5 di kawasan Mentakab. Spesies seperti ini juga menyerupai dengan spesimen yang ditemui oleh Ahmad Rosli & Mohd Shafeea (2011) di Kijai-Binjui, Tawar, Kedah yang terletak dalam Formasi Semanggol.

Daonella lommeli (Wissman)

Plat 1, Gambarajah 7

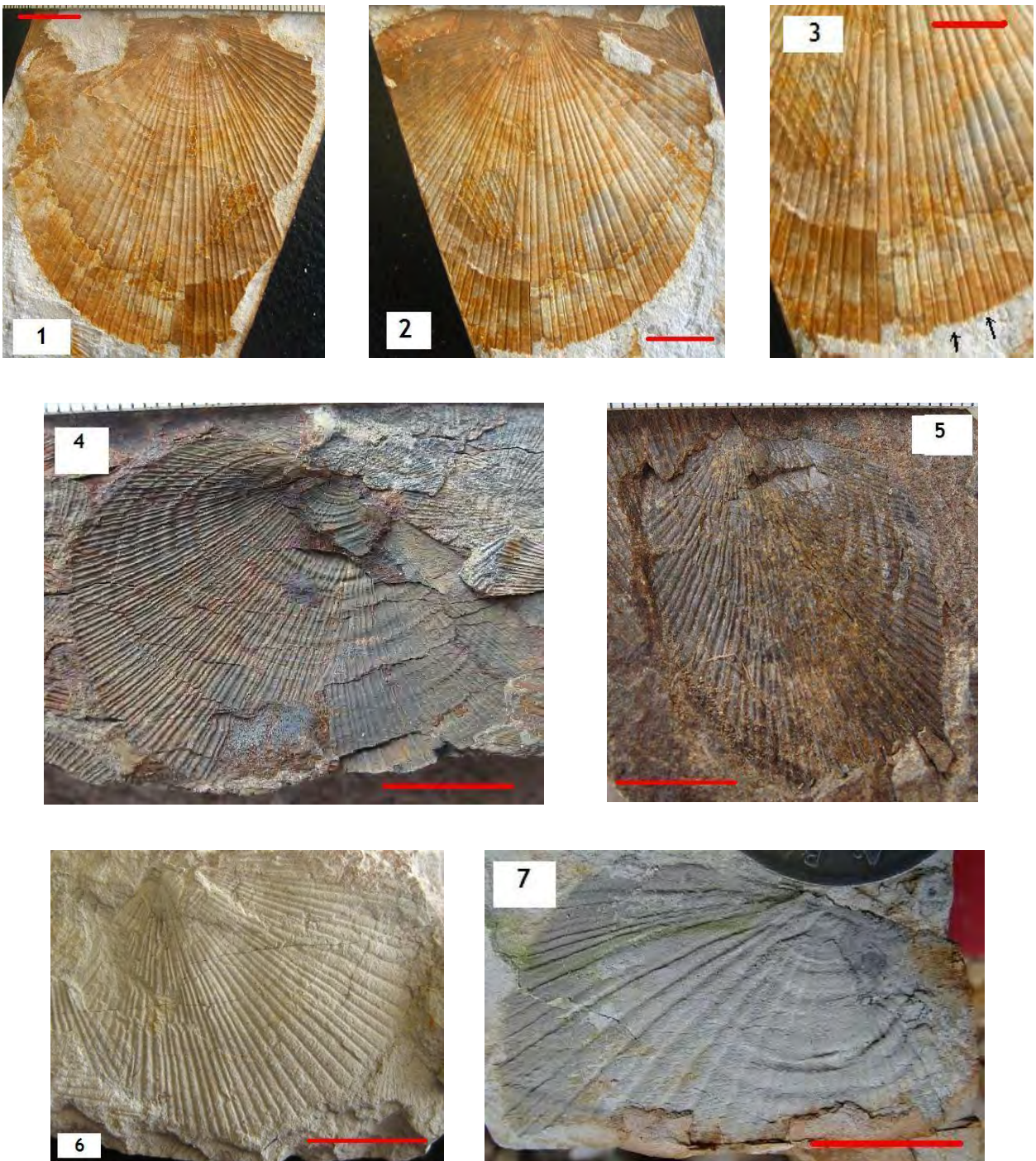
. 1964 *Daonella lommeli* (Wissman)- Kobayashi: ms 61, Plat 5, gambarajah 6

. 1982 *Daonella lommeli* (Wissman)- Metcalfe *et al.* : ms 113, Plat 1, gambarajah 5-6.

Bahan:- Satu spesimen cengkerang kanan, acuan dalaman diwakili oleh spesimen JTR-05.

Pemerihalan:- Cengkerang bersaiz sederhana, sub-segi empat dan hampir equilateral. Ukuran panjang cengkerang melebihi tinggi cengkerang iaitu 4.5 cm panjang dan 3.0 cm tinggi dengan kepanjangan garis engsel mencapai 4.0 cm. Garis engsel lurus dan lebih pendek berbanding kepanjangan cengkerang. Umbo terletak pada kedudukan hampir ke anterior dari garis tengah engsel. Garis pertumbuhan terpusat wujud di bahagian anterior dari umbo hingga ke separuh ketinggian cengkerang melingkari umbo. Rusukan jenis 'fasciculate' iaitu rusukan utama yang mempunyai banyak rusukan kecil yang mencirikan spesies ini dapat diperhatikan pada spesimen. Rusukan kecil ini didapati bercabang tiga dan lebih dominan berbanding bercabang dua.

Perbandingan dan perbincangan :- Spesies ini didapati menyamai dengan spesimen yang ditemui di Mentakab oleh Metcalfe *et al.* (1982) dan spesimen di Lokaliti 11 di kawasan Mentakab oleh Kobayashi (1964) terutama dengan kewujudan rusukan jenis 'fasciculate' yang mencirikan spesies tersebut. Spesies ini juga dilaporkan wujud di Kuala Pilah oleh Khoo (1998) dan di Durian Tipus oleh Loganathan (1993).



Plat 1. Lima spesies fosil bivalvia *Daonella* berusia Ladinian, Trias Tengah yang ditemui di Sg. Jentar, Mentakab, Pahang dalam Formasi Semantan. Skala bar mewakili 1 cm. Gambarajah 1: Bekas bagi cengkerang kanan *Daonella pahangensis*, spesimen JTR01; Gambarajah 2: Acuan luaran bagi cengkerang kanan *Daonella pahangensis*, spesimen JTR01; Gambarajah 3: Cengkerang kanan *Daonella pahangensis* yang menunjukkan rusukan bercabang tiga yang mencirikan spesies tersebut (anak panah hitam), spesimen JTR01; Gambarajah 4: Acuan luaran bagi cengkerang kanan *Daonella sakawana*, spesimen JTR02; Gambarajah 5 : Bekas cengkerang kiri *Daonella pectinoides*, spesimen JTR03; Gambarajah 6: Bekas bagi cengkerang *Daonella cf. pichleri*, spesimen JTR04; Gambarajah 7: Bekas bagi cengkerang kanan *Daonella lommeli*, spesimen JTR05.

KESIMPULAN

Sebanyak lima spesies *Daonella* telah ditemui pada satu singkapan batuan kepunyaan Formasi Semantan di Sg. Jentar, Mentakab dalam Daerah Temerloh, Pahang. Spesies-spesies ini biasa kedapatan dalam Lautan Paleotethys di persekitaran samudera dalam. Kajian penemuan terletak tidak jauh dari beberapa lokaliti di mana Kobayashi (1964) telah menemui dan memperihalkan lima spesies *Daonella*. Berdasarkan kewujudan spesies indeks iaitu *Daonella lommeli* (Wissman), himpunan fauna *Daonella* ini dianggarkan berusia Ladinian Akhir, Trias Tengah. Penemuan ini juga menambahkan lagi maklumat paleontologi dan biostratigrafi bagi Formasi Semantan dalam Zon Batuan Trias Timur di Jalur Tengah yang dikaitkan dengan biofasies *Daonella*.

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The official opening was inaugurated by a speech from the Patron of PGCE, Mr Effendy Cheng Abdullah, Vice President and CEO PETRONAS Exploration. Mr Effendy highlighted the long history of this event and the significant change for 2012 of changing the name from *geology* to *geoscience* symbolizing the broader technical scope of the technical conference. Mr Effendy thanked the attendants for their continuous support of the event. Mr Effendy was followed by the chairman of the organizing committee, Mr Peter Majid, GM Reservoir Geoscience Department at PETRONAS Carigali Sdn. Bhd. Mr Peter Majid outlined the goals for PGCE 2012, which are making the event more international, more green and (even) more fun! He urged all attendees not to miss the new official PGCE Gala Dinner; a themed evening combining business and pleasure in a spectacular setting. The official speeches were followed by a video presentation and a short Q&A session. The response of the launch was overwhelming and first contracts were signed marking a promising start for a very successful event next year. The video presentation and all other details on the event can be found on the official PGCE 2012 website: <http://www.pgcem.com/>

Haizum Nadirah Mohd Zaideen
Secretary, PGCE 2012 Organizing Committee

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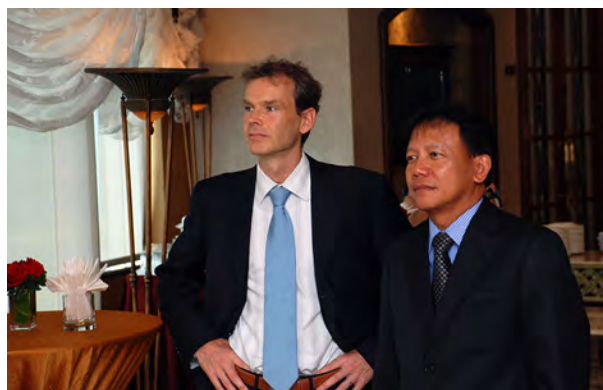




PERTEMUAN PERSATUAN (MEETINGS OF THE SOCIETY)

PGCE 2012
Petroleum Geoscience Conference & Exhibition

Petroleum Geoscience Conference & Exhibition 2012 (PGCE 2012)
Soft Launch, 15th September 2011



PERTEMUAN PERSATUAN (MEETINGS OF THE SOCIETY)

Petroleum Geoscience Conference & Exhibition 2012 (PGCE 2012)
Soft Launch, 15th September 2011



CERAMAH TEKNIK TECHNICAL TALK

SEDIMENTARY BASINS AND CONTINENTAL TOPOGRAPHY: AN INTEGRATED APPROACH

S. Cloetingh

Tectonics Group, VU Amsterdam, The Netherlands

5 July 2011

Department of Geology, University of Malaya



Abstract: Continental topography and sedimentary basins are at the interface of deep Earth, surface and atmospheric processes. Sedimentary basins are mankind's largest resource of geo-energy (hydrocarbons and geothermal heat) and fresh water. Topography influences society, not only as a result of slow landscape changes but also in terms of how it impacts on geohazards and the environment. When sea-, lake- or ground-water levels rise, or land subsides, the risk of flooding increases, directly affecting the sustainability of local ecosystems and human habitats. On the other hand, declining water levels and uplifting land may lead to higher risk of erosion and desertification. In the recent past, catastrophic landslides and rock falls have caused heavy damage and numerous fatalities in Europe. Rapid population growth in river basins, coastal lowlands and mountainous regions and global warming, associated with increasingly frequent exceptional weather events, are likely to exacerbate the risk of flooding and devastating rock failures. Along active deformation zones, earthquakes and volcanic eruptions cause short-term and localized topography changes. These changes may present additional hazards, but at the same time permit, to quantify stress and strain accumulation, a key control for seismic and volcanic hazard assessment. Although natural processes and human activities cause geohazards and environmental changes, the relative contribution of the respective components is still poorly understood. That topography influences climate is known since the beginning of civilization, but it is only recently that we are able to model its effects in regions where good (paleo-) topographic and climatologic data are available.

The present state and behaviour of the Shallow Earth System is a consequence of processes operating on a wide range of time scales. These include the long-term effects of tectonic uplift, subsidence and the development of river systems, residual effects of the ice ages on crustal movement, natural climate and environmental changes over the last millennia and up to the present, and the powerful anthropogenic impacts of the last century. If we are to understand the present state of the Earth System, to predict its future and to engineer our use of it, this spectrum of processes, operating concurrently but on different time scales, needs to be better understood. The challenge to Geosciences is to describe the state of the system, to monitor its changes, to forecast its evolution and, in collaboration with others, to evaluate modes of its sustainable use by human society.

MALAM GEOLOGI KEJURUTERAAN 2011



8 July, 2010, Department of Geology, University of Malaya

1. Tajul Anuar Jamaluddin (Universiti Kebangsaan Malaysia): Geological investigation on an “unusual road heave” at km 53, Jalan Bintulu-Bakun Dam, Bintulu Sarawak.
2. John Kuna Raj (University of Malaya): Excavation of earth materials in Peninsular Malaysia.
3. Ng Chak Ngoon (Subsurface Engineering): Ethics in engineering geology.

Malam Geologi Kejuruteraan 2011 featured three speakers, namely: Sdr’s Tajul Anuar Jamaluddin (UKM), John Kuna Raj (UM), and Ng Chak Ngoon (Subsurface Engineering).

Sdr Tajul presented an interesting case study of unusual road heave at km 53, Jalan Bintulu-Bakun Dam, Bintulu Sarawak. The heave is attributed to slope movement adjacent to the road, most likely in the form of lateral translation along discontinuities/bedding planes in the sedimentary rocks (in contrast to basal heave associated with deep circular slips).

Sdr John gave a comprehensive account of the excavation of earth materials in Peninsular Malaysia, vis-à-vis the excavatability of soils versus rock materials and effects of weathering. The discussions include the various major rock formations in Peninsular Malaysia, encompassing igneous, sedimentary and metamorphic rocks.

Sdr Ng discussed ethics in Engineering Geology, focusing on the practice in Malaysia. This was a repeat of his keynote lecture at the recent NGC in Johor Baru, which was a little bit controversial, to say the least.

As usual, there were very lively discussions on the topics presented for the Malam.

My sincere thanks again to the speakers for their support and contributions to the Society’s activities.

Tan Boon Kong

Chairman,

W/G on Engineering Geology, Hydrogeology & Environmental Geology

CERAMAH TEKNIK TECHNICAL TALK

GEOSCIENCES IN THE DIGITAL AGE: STRATEGIC ROLES IN ADDRESSING MAJOR CHALLENGES OF THE 21ST CENTURY

Ian Lambert^{1,2} & Lesley Wyborn¹

¹Geoscience Australia

²Secretary General, 34th International Geological Congress

15 August 2011

Minerals and Geoscience Department Malaysia,
Jalan Tun Razak, Kuala Lumpur

The talk on “Geosciences in the Digital Age” was presented by Dr. Ian Lambert on Monday, 15 August in the Nilam Room, Minerals and Geoscience Department Malaysia (JMG), Jalan Tun Razak, Kuala Lumpur. The talk was well attended by about 20 JMG staff and academics from the local universities.

Dr Lambert received his Ph.D. in geochemistry from the Australian National University. After post-doctorate research at the University of Chicago, he returned to Australia to take up a position with CSIRO, where he conducted research on mineral deposits and stable isotopes. In the course of his research career, he won several international awards, including a Japanese Government Fellowship for Foreign Specialists, an Academia Sinica Fellowship and an Alexander von Humboldt Fellowship.

Since 1990, Dr Lambert has held a number of senior executive roles in resource and environmental agencies in the Australian Government, most recently as a Group Leader in Geoscience Australia – the national geoscience and geospatial information agency. Ian Lambert is a member of Australia’s National Committee for Earth Sciences and the Australian Geoscience Council. He represents Australia as a Vice Chair of the IAEA-OECD/NEA Uranium Group and the UN Experts Group on Resource Classification.

Dr Lambert is currently focused on his role as Secretary General of the 34th International Geological Congress, which will be held in Brisbane in August 2012.

Abstract: There are many challenges in meeting the needs of societies while sustaining Earth systems. Difficult decisions have to be made and there is increasing scrutiny of their effectiveness and validity. With increasing levels of education, societies are more capable of questioning what they see as poor decisions and policies.

There are emerging opportunities for applications of the geosciences in multidisciplinary systems approaches to underpin important decisions and policies on issues such as mineral and energy resources, groundwaters, soils, competing land uses, geohazards and emergency management. Ongoing advances in web technologies and in data transfer standards are making geological and geospatial data and information much more accessible online and reusable for purposes beyond those they were originally collected for. In parallel, the rapid increases in available computing power and in open source processing algorithms are enabling geoscientists globally to analyse and model these data. In combination, these new developments are rendering multidisciplinary approaches much more effective and transparent.

Government geosurveys and research agencies need to play pivotal roles in ensuring that the geosciences are accepted as important components in integrated approaches to address issues relating to natural resources, land use and hazards, in particular. Universities also need to play vital roles in instilling the importance of high quality multidisciplinary systems science.

This presentation will illustrate, at a high level, how geoscientists in Australia are involved in addressing a number of major challenges faced by the nation. While the challenges facing other countries differ, the principles discussed have universal application.

The presentation will also briefly refer to relevant areas of focus within the scientific program for the 34th International Geological Congress to be held in Brisbane, Australia 5-10 August 2012 (www.34igc.org). While this large and prestigious meeting will cover the whole spectrum of the geosciences, it will feature a wide range of sessions on the influential roles the geosciences can play in the digital age.

Technical Talk “Geosciences in the Digital Age: Strategic Roles in Addressing Major Challenges of the 21st Century” by Dr. Ian Lambert, 15 August 2011.



MALAM GEOLOGI KEJURUTERAAN II 2011

22 September 2010, Department of Geology, University of Malaya

Malam Geologi Kejuruteraan II 2011 featured Sdr. Abdul Rasid Jaapar (Consultant) as the only speaker for the night. He presented two lectures, namely: 1) Idealisation in geotechnical engineering: An essential understanding for practicing geo-professionals in Malaysia, and 2) On offshore geohazards, geophysics and geotechnics.

Abstracts of the two lectures are attached below.

As usual, ample time was allocated for discussions at the end of each presentation, and it was fully utilized. The Chairman records his personal thanks to the speaker for his support and contribution to the Society's activities.

Tan Boon Kong

Chairman,

W/G on Engineering Geology, Hydrogeology & Environmental Geology

1. Abdul Rasid Jaapar: Idealisation in geotechnical engineering: An essential understanding for practicing geo-professionals in Malaysia

Abstract: This presentation will point out the importance of the understanding of idealisation (conceptualisation) process in geotechnical engineering. Any practising geotechnical engineers or engineering geologists should understand this as a prerequisite to be in the industry. Burland (1987, 2000) and Bredehoeft (2003) agreed that the idealisation is a process to simplify the complex reality into relatively simple format for analysis. The successful conceptual model should represent the key properties of the reality. The process of idealisation can introduce uncertainty into mathematical modelling, hence may carry through to uncertainty of performance of engineering structures.

There are two types of idealisations; the geological idealisation and the mechanical idealisation. This presentation will focus on the geological idealisation. It involves the simplification of geological reality into ground profile (including groundwater condition) and properties for analysis, i.e. geological and geotechnical models. Fookes (1997) and Fookes *et al.* (2000) provided an insightful on the geological modelling while Wood (2004) discussed in great details on all possible geotechnical and mechanical modelling.

2. Abdul Rasid Jaapar: On offshore geohazards, geophysics and geotechnics

Abstract: This presentation will cover; typical geohazards in offshore environments; the application of geophysical and geotechnical methods in offshore environments; and the requirements of identification and understanding the implications of geohazards for field developments. It will cover specific hazards and subsea structures and current best practice in the identification of these using geophysical and geotechnical techniques to identify the soil parameters and presence of geohazards that may need consideration for subsequent seabed infrastructure.

The conclusion of this presentation is that an interdisciplinary approach should be formalised for offshore site investigation and the implementation of mitigation measures where geohazards are foreseeable. However, getting the interpretation wrong can incur considerable expense and delays to projects.

CERAMAH TEKNIK TECHNICAL TALK

AN OVERVIEW OF THE PETROLEUM GEOLOGY OF THE NORTHERN DEEP GULF OF MEXICO: TRAPS, RESERVOIRS, AND TECTONO-STRATIGRAPHIC EVOLUTION

Paul Weimer
AAPG President

14 September 2011
Department of Geology, University of Malaya

Prof. Dr. Paul Weimer, the 2011-2012 president of the American Association of Petroleum Geologists gave a lecture to GSM on Wednesday, 14 September in the Geology Department on the University of Malaya campus. The lecture was attended by about 35 faculty, students, and industry and government professionals. Dr. Weimer is a world expert on reservoirs in deepwater settings. The title of his talk was “*An Overview of the Petroleum Geology of the Northern Deep Gulf of Mexico: Traps, Reservoirs, and Tectono-Stratigraphic Evolution*”. Dr. Weimer holds the Bruce D. Benson Endowed Chair in the Geology Department at the University of Colorado, Boulder, USA and also is Director of the Energy and Minerals Applied Research Center at the university. He is the author of two books on deepwater margins, has co-edited nine books, and has co-authored more than 120 papers in professional journals. He was in Kuala Lumpur as part of a Southeast Asian tour of AAPG Student Chapters.



CERAMAH TEKNIK TECHNICAL TALK

ON THE LINK BETWEEN OROGENIC SHORTENING AND “BACK-ARC” EXTENSIONAL COLLAPSE IN LOW TOPOGRAPHY OROGENS

L. Matenco¹ and M. Ducea²

¹Netherlands Research Centre for Integrated Solid Earth Science, VU University Amsterdam

²Department of Geosciences, University of Arizona, Tucson, AZ, USA

19 October 2011

Department of Geology, University of Malaya

Abstract: Classical models of orogenic evolution assume that back arc basins form in the hinterland of orogens, collapsing the upper plate above oceanic subduction zones. This is a common characteristic of all low-topography orogens of Mediterranean type or SE Asia subduction zones, driven by the fast roll-back of subducted slabs. This extension may take place far at the interior of the upper plate, as is the case in various segments of the Carpathians or in the core of the SE Asian domain, but in most cases of the Dinarides, Apennines or Hellenides it take place superposed or far into the foreland of oceanic suture zones. Therefore, the term back-arc extension in many cases is misleading, as exhumation along major detachment zones takes place in the core of the orogen (Rif, Betics), in the accreted crustal material of the lower plate (Apennines, Dinarides) or even in the fore-arc (Aegean, Sunda-Banda arc). In all these subduction zones, collision has largely duplicated crustal blocks from the lower plate and has gradually shifted subduction zone far towards the lower plate. As a result, crustal thickening takes place in the foreland of the orogen, in contrast with the typical crustal roots of the high convergence orogens, such as the Alps or Himalaya. This demonstrate an active shift of the main subduction zone, the position of slabs detected by teleseismic mantle tomography is displaced to the foreland and cannot be connected with the position of the lower plate crust beneath the orogen. This shift is associated with large scale magmatism with unusual large crustal signatures, atypical for subduction related magmas. These observations demonstrate the need for an active reconsideration of existing orogenic models which should include displacements of subduction zones during orogenic shortening and an active investigation of the role of continental subduction and associated magmatism during various phases of mountain build-up.



MALAM JURUTERA 2011

MALAM JURUTERA 2011 was held on 21st October 2011 at the Department of Geology, University of Malaya. It featured 2 speakers, namely: Ir. Yee Thien Seng (Consultant) and Ir. Pan Kok Loong (Consultant).

Ir Yee discussed various issues in slope engineering in Malaysia, such as problems with frequent slope failures, Terzaghi's soil mechanics, checkers versus submitting engineers, reports on post-failure investigations such as for the collapse of the Highland Tower and the Bt. Antarabangsa landslide. He also compared some Hong Kong practice versus the Malaysian practice.

Ir. Pan discussed the practice of geotechnical engineering in Hong Kong and shared his some 10-year work experiences there. The 3 main topics discussed were: foundations, slopes and deep excavations. These were illustrated with numerous examples or case studies in Hong Kong.

As usual, there were very lively discussions on the topics presented for the Malam.

My sincere thanks again to the speakers for their support and contributions to the Society's activities.

Tan Boon Kong

Chairman,

W/G on Engineering Geology, Hydrogeology & Environmental Geology



CERAMAH TEKNIK TECHNICAL TALK

CONTROLS OF COPPER AND GOLD DISTRIBUTION IN THE KUCING LIAR DEPOSIT, ERTSBERG MINING DISTRICT, PAPUA PROVINCE, INDONESIA

Brian T.E. New

General Manager, Penjom Gold Mine

30 November 2011

Department of Geology, University of Malaya



Abstract: Kucing Liar is a large sediment-hosted Cu-Au mineralized system containing some 15 Moz of gold and 5 Mt of copper in ~500 Mt of ore. It is situated in the Ertzberg Mining District in the Central Ranges of New Guinea, in the Indonesian province of West Papua. This study demonstrates that high sulphidation ore is continuous with typical porphyry-skarn style chalcopyrite ore and that both have formed from mixing of magmatic with meteoric waters within a zone of fault offset.

Alteration and mineralization were localised within calcareous shale and thinly bedded limestone adjacent to the Grasberg Igneous Complex where they are zoned around fault offsets. Early phases of alteration are stratiform and are juxtaposed against the Idenberg Fault Zone, which has displaced host stratigraphy at least 600m vertically and possibly up to ~1,500 m laterally. Four principal hydrothermal mineral associations are (1) calcic and magnesian skarn, (2) potassic assemblages including magnetite, (3) quartz-muscovite plus anhydrite and (4) locally massive pyrite. Cu and Au are associated with pyrite and occur discretely either as chalcopyrite ± bornite with an association of Cu-Au-Co (Zn-Pb) or as covellite ± enargite associated with Cu-Au (As-Sb-Hg). $^{40}\text{Ar}/^{39}\text{Ar}$ geochronology shows muscovite (3.18 ± 0.02 Ma) was coeval with potassic-biotite assemblages (3.18 ± 0.02 Ma and 3.20 ± 0.04 Ma). Calcic and magnesian skarn were derived from magmatic fluids ($\delta^{18}\text{O}_{\text{FLUID}} = 9\text{-}6\%$), while potassic and magnetite alteration were derived from high temperature ($>650^\circ\text{C}$), high salinity ($>50\text{wt}\%$ NaClEQUIV.) magmatic fluids ($\delta^{18}\text{O}_{\text{FLUID}} = 6\text{-}12\%$). Quartz infill crystals associated with voluminous silicification contain a variety of fluid inclusions that range from moderate temperature (TH $<420^\circ\text{C}$) high and moderate salinity brines (35-55 and 15-30wt% NaClEQUIV.), to low density - low salinity vapour-rich fluid inclusions. Fluorite-hosted inclusions with lower TH ($<300^\circ\text{C}$) and salinity ($\sim 5\text{wt}\%$ NaClEQUIV.) are also related to quartz alteration. Quartz alteration, muscovite and anhydrite have estimated $\delta^{18}\text{O}_{\text{FLUID}}$ ranging from 0-6‰. δD data from magnesian skarn suggest that the magma source was strongly but variably degassed during skarn formation while clustering of biotite and tremolite δD data may indicate ponding of fluids prior to exsolution, which was preceded by monzonite dyke emplacement that were emplaced during skarn and potassic stage alteration.

Fluid infiltration was controlled by an active fault system characterised by strike-slip deformation overprinting a pre-existing reverse-slip fault. Periodic slip allowed infiltration of the magmatic fluids while a complex structural offset controlled the mixing of magmatic and meteoric fluids. Fluid mixing was augmented by phase separation which gave rise to brine and vapour-rich phases that migrated differently due to density contrasts. Ore deposition was related to mixing of magmatic and meteoric fluids, which resulted in an increase in H_2S relative to SO_2 , causing intense sulphidation of magnetite and precipitation of sulphides, beginning with gold-rich chalcopyrite-dominant mineralization. High sulphidation covellite-style mineralization occurred by contraction of the vapour phase that had separated from quartz-forming brines. Au, As and Sb were partitioned away from the high sulphidation copper mineralization due to higher solubilities of these metals as bisulphide complexes and deposited in distal pyrite along with chloride-complexed Pb and Zn.

CERAMAH TEKNIK TECHNICAL TALK

THE USE OF QUANTITATIVE DIGITAL OUTCROP ANALYSIS TO DEVELOP BETTER ARCHITECTURAL MODELS AND IMPROVE RESERVOIR CHARACTERISATION INPUT TO RESERVOIR MODELS

Jonathan Redfern

University of Manchester, Basin Studies and Petroleum Geoscience

6 December 2011

Department of Geology, University of Malaya



Abstract: Digital outcrop analysis using LiDAR (light detection and ranging), offers a technique to develop a better understanding of depositional systems and the definition of geobodies and architectural elements for input to reservoir models. The presentation will discuss typical workflows and methodologies to improve digital outcrop studies, and present a number of detailed case studies, that highlight the collection of a full suite of sedimentological data and resultant statistical analysis. The results provide improved statistical data of the chosen reservoir intervals and have an impact on reservoir models in these types of systems.

The studies have been carried out using LIDAR, differential global positioning system (DGPS), digital photogrammetry (using multiple digital images to reconstruct three dimensional information) and detailed outcrop logging. The dense dataset allows the mapping of facies, geological object distribution and architecture.

The Manchester Petroleum Geoscience Centre (PGC) has unique facilities and research expertise to form the base for quantitative outcrop data collection, proprietary software available to the group include Polyworks™, Petrel™, GeoFrame®, VoxelGeo®, ArcInfo™ among others. We have also developed student in-house software Virtual Reality Geological Studio (VRGS) which enables rapid integration and interpretation of acquired digital outcrop data, and transfer to Petrel or similar software for mapping and interpretation.

Two recent example studies will be presented; integrated research on the Early Triassic of Morocco and Eastern Canada, to better understand the depositional systems and develop high resolution reservoir models of the fluvial systems; and research on fractured carbonates, using LiDaR data to better quantify fracture orientation, density and address the controls on fracture distribution in Miocene aged limestones from the Sinia of Egypt.

Selected References:

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CERAMAH TEKNIK TECHNICAL TALK

“SIZE & SCALE MATTERS”: NEW PETROPHYSICAL METHODS TO EVALUATE STORAGE AND FLOW CAPACITY OF CONVENTIONAL & UNCONVENTIONAL RESERVOIRS FROM DIGITAL CORE ANALYSIS (DCA) AND PORE NETWORK MODELING (PNM)

Lutz Riepe
Principal Petrophysicist, Petrophysics Department
Petroleum Engineering Division
PETRONAS CARIGALI SDN. BHD.

8 December 2011
Department of Geology, University of Malaya



On Thursday, 8 December 2011, Dr. Lutz Riepe, the Principal Petrophysicist in Petronas Carigali, gave a presentation in the University of Malaya Geology Department main lecture hall entitled “Size & Scale Matter: New Petrophysical Methods to Evaluate Storage and Flow Capacity of Conventional & Unconventional Reservoirs from Digital Core Analysis (DCA) and Pore Network Modeling (PHM)”. Dr. Riepe highlighted the use of important new, emerging technologies for reservoir characterisation, such as Micro-CT based computed tomography to produce true 3D images of pore fabrics, based on results of collaborative efforts between Petronas and Australian National University. Applications and case histories, concerning Malaysian conventional reservoirs, as well as unconventional reservoirs (tight carbonates and fractured basement) from Petronas’ international assets, were presented. The lecture was attended by about 35 faculty, students, and industry personnel.

Abstract: Since the discovery of the mysterious “X-Rays” in 1885 by the German physicist Prof. Wilhelm Conrad Roentgen (for which he received the very first Nobel prize in Physics in 1901), the X-Ray technology has been intensively used in medicine and material sciences to investigate density variations at different scales in 2D and 3D (Computer Tomography, CT).

These medical CT scanners were used in core analysis laboratories for qualitative investigations of full cores and core plugs for the selection of homogeneous suitable samples, e.g. for SCAL, but due to the limited resolution could not be used for any quantitative petrophysical analysis.

In petrophysics the application of X-ray CT technology for the characterization of porosity and permeability started only about 5-10 years ago when new “Micro-CT (MCT)” hardware and computer power was available to generate and evaluate 3D images of the true pore fabrics down to a resolution of 1 μm .

Since 2009 PETRONAS has participated in JIPs with ANU (Australian National University) in the “Digital Core Consortium” and has successfully tested the application of Digital Core Analysis (DCA) and Pore Network Modeling (PNM) technology for clastic rocks from our domestic operations (“LRLC” rock samples from Kumang & Sepat), and some “unconventional” reservoirs in our international assets (“Tight gas” Oman, “Fractured Basement” and “Tight Carbonates” Vietnam). The ongoing DCA/PNM research is now focusing on the characterization and rock typing of carbonates and the quantitative analysis of petrophysical and mineralogical parameters from rock fragments and cuttings, that are not suitable for conventional lab analysis.

CERAMAH TEKNIK TECHNICAL TALK

ARCTIC TECTONICS: THE PALAEOZOIC AND YOUNGER TECTONIC HISTORY OF NORTH-EASTERN CANADA-NORTHERNMOST GREENLAND AND HOW IT IS RELATED TO SEDIMENTARY BASIN AND CRUSTAL ARCHITECTURE

Randell Stephenson
University of Aberdeen

20 December 2011
Department of Geology, University of Malaya



Abstract: The presentation begins with some remarks on Palaeozoic crustal accretion (orogenesis) in Arctic Canada and northernmost Greenland with a view to how the legacy of these events may have later played a role in the Mesozoic and Cenozoic geological history and basin development in the area. Palaeozoic orogenesis was followed by the formation of the Sverdrup basin system. The presumably subsequent evolution of the adjacent Amerasian segment of the Arctic Ocean (Canada Basin) is one of the last “unknowns” in global plate tectonics. The age of this presumed ocean basin has mainly been inferred from structural and stratigraphic relationships observed onshore on its margins though numerous attempts have been made over the years to interpret magnetic anomalies in Canada Basin in terms of Cretaceous sea-floor spreading. Available geophysical (seismic and potential field) data suggest that much of the Canadian polar margin does indeed have the structure of a passive continental margin. The Amerasian basin margin becomes more complicated to the northeast, off Ellesmere Island and northernmost Greenland. The development of the modern North Atlantic-Arctic plate boundary system began in the Cretaceous. This led to the formation of Labrador Sea and Baffin Bay among other things but was aborted in the Palaeogene as a result of intraplate dynamic processes within Eurasia. Consequent changes in the kinematic relationships between Canada and Greenland led to the intraplate Eureka Orogeny in northeastern Canada-northernmost Greenland in the Eocene, the large-scale structure of which is probably intimately related to the legacy of Palaeozoic crustal accretion, ending the presentation where it began.

CERAMAH TEKNIK TECHNICAL TALK

MODIFICATIONS TO THE DESIGN OF SLOPE REMEDIAL WORKS DURING CONSTRUCTION

Affendi Abdullah
Consultant

19 December 2011
Department of Geology, University of Malaya

The talk on “Modifications to the Design of Slope Remedial Works During Construction” was presented by Ir. Dr. Affendi Abdullah on Monday, 19 December in the Department of Geology, University of Malaya. The talk was attended by about 15 practitioners from industry and academics from local universities. In his talk, Ir. Dr. Affendi Abdullah presented an interesting case study of slope remedial works along the new Frasers Hill road. Due to a series of slope failures, the initial design was modified. However, the overall cost of the project was not affected.



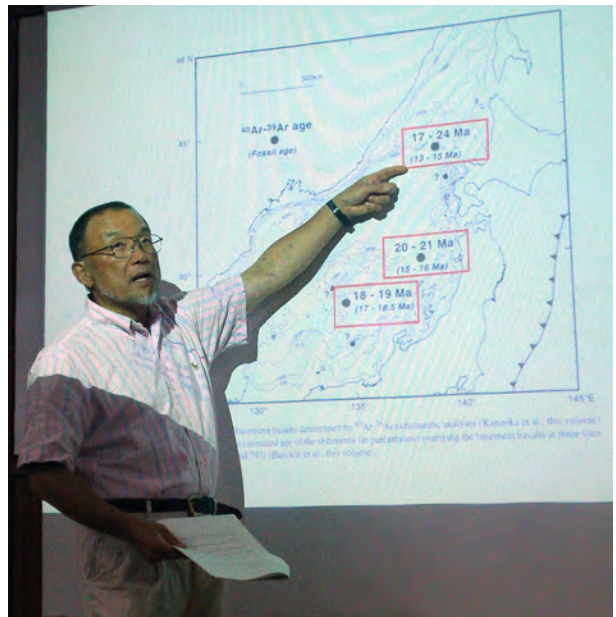
1: TECTONIC DEFORMATION AROUND THE EASTERN HIMALAYAN SYNTAXIS: PALEOMAGNETIC VIEWPOINTS

2: DIFFERENTIAL ROTATION OF NE AND SW JAPAN: OPENING ASPECT OF THE JAPAN SEA

Yo-ichiro Otofujii
Professor, Department of Earth and Planetary Science
Kobe University, Japan

27 December 2011
Department of Geology, University of Malaya

On Tuesday, 27 December 2011, Prof. Dr. Yo-ichiro Otofujii, Kobe University, Japan, gave two presentations in the University of Malaya Geology Department. In his first talk, Prof. Dr. Otofujii highlighted the application of paleomagnetism in the study of deformation of the Shan-Thai Block at the eastern Himalayan Syntaxis. He presented paleomagnetic view that provides visual evidence for southeastward extrusion of Indochina during indentation of India into Asia. In his second paper, Prof. Dr. Otofujii presented results of paleomagnetic research on the opening of the Japan Sea during the drift of the Japanese arc from the Asian continent.

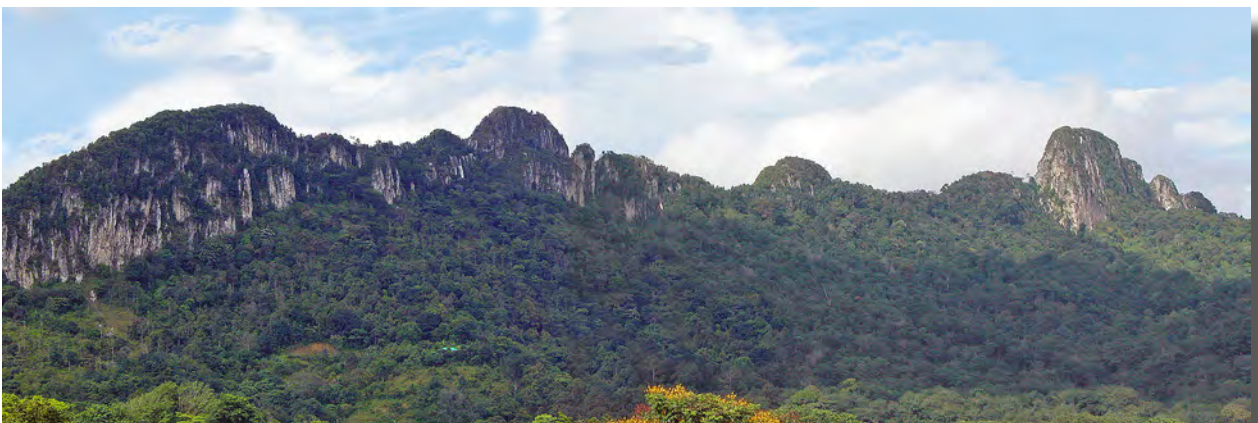


EXPLORE OUR URBAN GEOHERITAGE

The half day trip to Klang Gates Ridge on the 12th of November 2011 was part of the Explore Our Urban Geoheritage programme, jointly organized by Young Earth Scientist (YES) Malaysia Chapter, Institute for Environment and Development (LESTARI), UKM and the Geological Society of Malaysia. The objectives of this awareness programme are to familiarize geologists on the presence of geoheritage sites within urban areas, which need to be protected; and the need to balance development and conservation. The Klang Gates Ridge is within the Selangor State Park. It is about 11.5 km long, making it the longest and biggest quartz ridge in the country and perhaps in the region. The hiking trip brought together 26 participants from University Kebangsaan Malaysia, Minerals and Geoscience Department Malaysia (JMG) and the Department of Heritage. The participants were briefed on the geological formation of the area by the organizer. In addition, they were also provided with leaflets sponsored by Trees, a local NGO, and the Minerals and Geoscience Department. The participants contributed recommendations and suggestions based on their experiences during their visit to this site, such as organizing more awareness programmes for young geologists and local residents on the importance of geological heritage sites in their town; conservation of the Klang Gates Ridge be prioritize for maintaining the balance of the environment and for future generations; and the need to improve the dissemination of scientific information to the general public. The participants also suggested that proper road signs that lead to the ridge should be put in place. LESTARI and JMG are in the process of preparing a proposal to declare the Klang Gates Ridge as a National Heritage to the Department of Heritage.

Tanot Unjah

Chairperson, Working Group on Promotion of Geoscience & Young Geologists



OBITUARY

**CHARLES STRACHAN HUTCHISON**

B.Sc., Ph.D., F.I.M.M., F.G.S.

(17 April 1933 – 18 October 2011)

Charles Hutchison was born in Fraserburgh, Aberdeenshire, United Kingdom, on 17 April 1933. He graduated with First Class Honours in geology from the University of Aberdeen, Scotland, in 1955. After a short stint as a geologist with Apex (Trinidad) Oilfields in the West Indies from 1955 to 1957, he set sail on the *S.S. Reina del Mar* and the *S.S. Canton* to take up the offer of an assistant lectureships as one of the first staff in the new Geology Department at the University of Malaya in Singapore. He worked on his PhD while lecturing at the university and graduated in 1966 with a thesis titled “Tectonic and petrological relations within three orogenic zones in Malaysia”.

He lectured in Singapore from 1957 until 1960, when he moved to Kuala Lumpur and was instrumental in setting up the Geology Department at the University of Malaya in Kuala Lumpur. He continued to lecture at the University of Malaya as Associate Professor till 1977 before he was promoted to Professor of Applied Geology, a post he held from 1977 to 1987 and 1989 to 1992. He also served as the Head of the Geology Department from 1978 to 1982. Although very active and productive in research, he took a keen interest in teaching and mentoring students, encouraging their best. Many kept in touch with him and returned to visit him at the university after graduation.

Hutchison was appointed Professor Emeritus in Geology in August 2004 and Visiting Senior Research Fellow at the Department of Geology, University of Malaya from 4 May 2009 until his death on 18 October 2011. Besides his research and teaching at the University of Malaya, he also taught courses on the Geology and Tectonics of Southeast Asia as visiting professor to the University of Brunei Darussalam and Chulalongkorn University in Bangkok.

He has also served as overall Co-coordinator of the SEATAR (Studies in East Asian Tectonics and Resources) Transects of C.C.O.P. (Committee for Co-ordination of Joint Prospecting for Mineral Resources in Asian Offshore Areas) from 1988 to 1991. He was the Director of the Earth Sciences and Resources Institute (ESRI) of the University of South Carolina responsible for developing training programmes throughout the wider Southeast Asian region.

Prof. Hutchison was an elected fellow of several learned societies, including the Institution of Mining and Metallurgy of London, Mineralogical Society of America, American Association of Petroleum Geologists, and the Geological Society of London. He was a founding member of the Geological Society of Malaysia in the 1960s and served as its President during 1969-1970. The Geological Society of Malaysia awarded him Honorary Membership in 1986 for distinguished services to the geoscience community and for the promotion of interest in the geosciences in Malaysia. He was also awarded the Special Commendation Award of the American Association of Petroleum Geologists in 1994 in recognition of his outstanding contributions to geological research, regional synthesis, tectonic analysis and understanding of the hydrocarbon and mineral deposits of Southeast Asia.

Prof. Hutchison was a prolific writer and authored five books on geology: *Laboratory handbook of petrographic techniques* (1974), *Economic deposits and their tectonic setting* (1983), *Geological Evolution of Southeast Asia* (1989, 1996, 2005), *South-East Asian oil, gas, coal and mineral deposits* (1996), and *Geology of North-West Borneo: Sarawak, Brunei and Sabah* (2005) in addition to more than a hundred scholarly papers in refereed journals. He has also written chapters for and edited eight books, including the *Geology of the Malay Peninsular Malaysia* (1973), co-edited with D.J. Gobbett, and the *Geology of Peninsular Malaysia* (2009), co-edited with D.N.K. Tan, published jointly by the University of Malaya and Geological Society of Malaysia.

Prof. Hutchison was a consultant to the Malaysian Government and led the Malaysian Continental Shelf Committee. He conducted short training courses and consulted for many oil and mining companies. He worked extensively with international geologists on many joint projects. Indeed Charles Hutchison earned the title of “the Grand Old Man of Southeast Asian Geology,” for he has left his imprint on all who have worked with him or came after him in doing research on the geology of this region.

He is survived by two children, Helene Mary Hutchison of Munich, Germany, and Timothy John Hutchison of Petaling Jaya, Malaysia, and several grandchildren and great grandchildren. His wife Ann predeceased him.

Lee Chai Peng & P.H. Stauffer
November 2011

CHARLES S. HUTCHISON SPECIAL MEMORIAL ISSUE

In recognition of Prof. Dr. Charles S. Hutchison's outstanding contributions to geological research of Southeast Asia, we would like to invite interested researchers to submit papers for a special memorial issue of the *Bulletin of the Geological Society of Malaysia*. The submission procedures will be the same as for usual issues of the Bulletin. On submission, you should mark your paper as being for this special memorial issue. We will particularly welcome submissions related to Prof. Hutchison's work and interests in some way; for example, regional geology, tectonics, petrology and hydrocarbon and mineral deposits.

The deadline for first submission of papers is 30th June 2012, with an expected publication date of December 2012. If you have any pre-submission queries about the issue, please contact Dr. Christopher G. Howells (drroxs@yahoo.co.uk), Dr. Ralph Kugler (rikugler@um.edu.my) or Dr. Ng Tham Fatt (thamfatt@gmail.com).



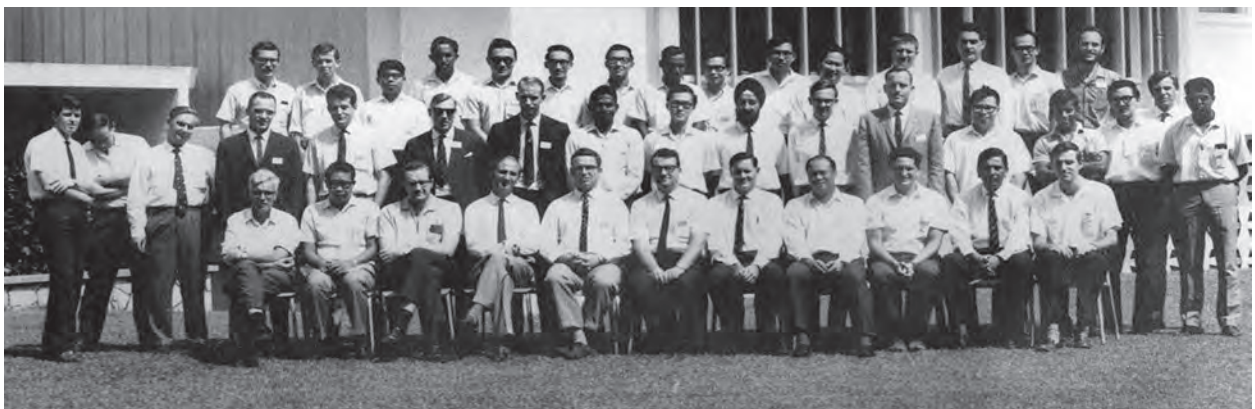
Prof. Hutchison presenting a paper entitled "Oroclines and paleomagnetism in Borneo and South-East Asia" at PGCE2011, 8th March 2011.



Prof. Hutchison presenting a keynote entitled "Tectonic Evolution of South-East Asia" at GEOSEA2009, 9th June 2009.



Prof. Hutchison at GEOSEA2009



Prof. Hutchison (seated, third from left) at the Geological Society of Malaysia Discussion Meeting, 31st January 1967 at University of Malaya.

NEW MEMBERSHIP

Full Membership

1. Abd. Holed bin Ishak
2. Azrul Normi Idris
3. Chan Yih-Hoe
4. Chong Keat Wah
5. Emma Claire Sargeant
6. Hamzah b. Hussin
7. Haslina binti Mohamed
8. Ismail bin Che Mat Zin
9. Ismail bin Tawnie
10. Johannes Ngadan ak Lawrence
11. Juhana binti Mishan
12. Kennedy Hj. Mohd Imran Aralas
13. Mohamad Pauzi ABdulah
14. Mohd Khairil Faidi bin Ismail
15. Mohd Yusop bin Ramli
16. Noor Farahida Ahmad Sharif
17. Rollix Liew @ Dedik bin Jamaran
18. Saraton Kawar
19. Shahrizal bin Abdul Aziz
20. Stephen Molyneux
21. Teh Zhi Xin
22. Yap Siew Jiun
23. Yuniarti Ulfa
24. Zaitul Zahira binti Ghali @ Ghazali

Associate Membership

1. Mohd Mustaqim bin Mohd Nordin
2. Nicholas Chua
3. Nobuyuki Hiruma
4. Shinji Uehara

Student Membership

1. Akmalul 'Aqilah Binte Mohamad Othman
2. Aida bt Ab Wahab
3. Amirruddin bin Rosni
4. Andy Anderson anak Bery
5. Anis Nadiya bt Tumiran
6. Arda Anasha bt Jamil
7. Azmila binti Mohd Kamil
8. Carrissa Lee Meei Queen
9. Eldawaty binti Madran
10. Fauziah Hanis Hood
11. Haylay Tsegab Gebretsadik
12. Iftikhar Ahmad Satti
13. Khor Ka Cheng
14. Ling Hwei Chih
15. Mohamed Ali Yusof b Mohd Husin
16. Mohd Fazoly Mislan
17. Mohd Hazreek bin Zainal Abidin
18. Muhammad Hafifi bin Badrudin
19. Muhammad Zahid bin Zamanshah
20. Ng Cui Yi
21. Noer El Hidayah binti Ismail
22. Nordiana binti Mohd Muztaz
23. Nur Adiah bt Othman
24. Nur Azwin binti Ismail
25. Nur Izzati binti Mohd Asri
26. Raja Diana Madiha bt Raja Mohamood
27. Siti Rahimah binti Samsunanwar
28. Wong Fui Peng 8
29. Zaiton binti Mohd Izham Ng
30. Zulfadzilawati binti Senin

CHANGE OF ADDRESS

1. Abdul Hadi Abd Rahman, Geoscience and Petroleum Engineering Department, Universiti Teknologi Petronas, 31750 Tronoh
2. Cheong Yow Lam, 38 Jalan Anggerik Malaxis 31/173, Kota Kemuning, Seksyen 31, 40460 Shah Alam
3. Christopher G Howells, 22 Jalan Derumun, Bukit Damansara, 50490 Kuala Lumpur
4. Dicie Mama, No.10, Lot 1791, Grace Villa, Jalan Field Force, Batu Kawa, 93250 Kuching,
5. Kamaludin Hassan, Jabatan Mineral dan Geosains Malaysia, Perak, Jalan Sultan Azlan Shah, 31400 Ipoh
6. Mat Niza Bin Abdul Rahman, Bahagian Perkhidmatan Teknikal, Jabatan Mineral & Geosains Malaysia, Jalan Sultan Azlan Shah, 31400 Ipoh
7. Mazlan Madon, Petronas, E & P Technology Centre, Etiqa Twin Tower 1, Level 22, No. 11, Jalan Pinang, 50088 Kuala Lumpur
8. Teh Zhi Xin, 6, Jalan Kemuning Indah 32/143G, Kemuning Utama, 40460 Shah Alam
9. Youventharan Duraisamy, No 2, JLN LEP 1/9, Seksyen 1, TMN Lestari Putra, 43300 Bandar Putra Permai
10. Zainey Konjing, 2-5-3 Kelompok Sri Widuri, Jalan 7/4, Seksyen 7, 43650 Bandar Baru Bangi

Geoscientist Award

Please be informed that nominations for the above award are now invited from all members of the Society. Relevant excerpts concerning the nomination of geoscientists and conditions of the award are listed below:

Eligibility

1. The geoscientist award is open to any individual or group of individuals working on the same project who are members of the Society.
2. The nomination shall be made for geoscientists who have done excellent research and contributed significantly to the development of Malaysian geology.
3. The research work must be original and should have been published before the nomination date.
4. The submission of research works which are known to have been already awarded at national or international levels would be automatically disqualified.

Procedure

1. Nomination for the award must be proposed and seconded by corporate members of the Society
2. The nomination should be on prescribed forms that can be obtained from:

The Secretary
Geological Society of Malaysia
c/o Department of Geology
University of Malaya
50603 Kuala Lumpur, Malaysia
Tel: 603 7957 7036
Fax: 603 7956 3900
Email: geologicalsociety@gmail.com

3. Nominations should be received by the Chairman of the Geoscientist Award Committee before 1st May 2012.

Dr. Gan Lay Chin
Chairperson,
GSM Geoscientist Award

Young Geoscientist Publication Award

Please be informed that nominations of author(s) for the above award are now invited from all members of the Society except Student and Associate Members. Nominations should be of young geoscientist(s) who have published papers in 2011. Relevant excerpts concerning the nomination of young geoscientist(s) and condition of award are listed below:

Eligibility		Procedure	
1.	<p>No person shall be considered for the award unless he satisfies the Board:</p> <p>(a) that he/she is thirty years old or younger at the time of the publication of the paper or acceptance of the paper for publication.</p> <p>(b) that he/she has been a resident of Malaysia for at least 3 years prior to the publication of the paper.</p> <p>(c) that he/she belongs to any one of the membership of the Society.</p> <p>(d) that the paper was published or has been accepted for publication in the previous calendar year, in which case written proof from the publisher must be shown.</p> <p>(e) that the paper has been published in any Malaysian or international scientific publication.</p>	1.	<p>(a) Nominations for an award must be made by a member who is not a Student or Associate Member</p> <p>(b) An author cannot nominate himself for the award.</p> <p>(c) The written consent of the author is required.</p>
		2.	<p>(a) The award, in the opinion of the Board, shall be made to the author of the best paper in geology about Malaysia or the region and/or should be a general interest to the local community of geoscientists.</p> <p>(b) Papers with joint authorship may be considered, if a statement as to the relative responsibility of the authors, signed by all the authors, is attached.</p> <p>(c) In the case of joint authorships, the board may make the award to one author, or to two or more authors, provided these qualify under subsection on eligibility.</p>

Nominations should be on prescribed forms that can be obtained from:

The Secretary

Geological Society of Malaysia
 c/o Department of Geology
 University of Malaya
 50603 Kuala Lumpur, Malaysia
 Tel: 603 7957 7036
 Fax: 603 7956 3900
 Email: geologicalsociety@gmail.com

Nominations should be received by the Chairman or the Young Geoscientist Publication Award before the 1st May 2012.

Dr. Gan Lay Chin
 Chairperson,
 GSM Geoscientist Award

AAPG SHORT COURSE

14th September 2011
Hotel Singgahsana, Petaling Jaya

Concurrent with the AAPG President, Dr. Paul Weimer's Asia Tour in Kuala Lumpur, a workshop entitled 'The Petroleum Industry in the Next Decade – An Overview to the Science, Technology and AAPG' was organized by the AAPG University of Malaya Student Chapter on the 14th September 2011 at Hotel Singgahsana, Petaling Jaya. This workshop which was kindly sponsored by Talisman Energy Inc. and Murphy Oil Co., was free to all students and members of industry. The purpose of this workshop was to give students a strong sense of the spectacular technology which geoscientists work with, the future of the profession, and what can be expected in careers in the oil and gas industries.

The event received great response with an overwhelming number of 200 participants from students of Universiti Malaya, Universiti Kebangsaan Malaysia, Universiti Sains Malaysia and Universiti Teknologi Petronas, including lecturers and some members of industry. The workshop started at 10.00 am and ended at 3.30 pm, with a short lunch break at 1.00 pm.

Dr. Paul Weimer is the current AAPG President and also the Professor Bruce D. Benson Endowed Chair, Director of Energy and Minerals Applied Research Centre and a consulting geologist at the University of Colorado. He divided the workshop into three themes each. In the first exercise, it is themed as 'Rejuvenating Old Fields'. Dr. Weimer talked about conventional and unconventional reservoirs with example of 3D seismic interpretation from a meteorite impact field in North Dakota. The next exercise with the theme 'Frontier Basins: Deepwater Basins' was about the exploration for conventional reservoirs and the identification of deepwater fields in the northern Gulf of Mexico which is characterized by extensive salt features. The various trapping styles of the reservoir were discussed by looking at the seismic profile of the area. Lastly, the final exercise of the workshop was on 'Unconventional Reservoirs: Tight-Gas Sandstone Reservoirs'. A basin-centered gas accumulation in Piceance Basin in northwestern Colorado was used as an example to demonstrate the concepts, using wireline logs.

Before ending the workshop, Dr. Weimer also discussed the future of technology and the demand for unconventional resources. He also inspired the participants on the future career as geologists and what to expect at work. Finally, he emphasized the importance for students joining AAPG and remaining members throughout their careers.



Ling Hwei Chih
Event Secretary of AAPG Short Course
University of Malaya Student Chapter of AAPG



UPCOMING EVENTS

January 17-20, 2012: 10th Anniversary Meeting, The International Consortium on Landslides (ICL). Kyoto, Japan. Symposia on landslides & floods, and the working group meeting to examine the draft of ICL strategic plan for 2012-2021.

January 24-25, 2012: Deepwater Reservoirs: Multi-Disciplinary Exploration & Development, Houston, Texas, USA. American Association of Petroleum Geologists, P.O. Box 979, Tulsa, Ok, USA; email: education@aapg.org

February 1-2, 2012: Gas to Power 2012, London, UK. Contact: Asma Bibi, Tel: +44 20 7827 6736; Fax: +44 20 7827 6737; email: abibi@smi-online.co.uk www.smi-online.co.uk/gastopower201220.asp

February 6-10, 2012: 10th International Kimberlite Conference 2012, Bangalore, India. Tel: +91 9886402487; Fax: +91 080 26613352; email: secretariat@10ikcbangalore.com; www.10ikcbangalore.com

February 8-10, 2012: Workshop on EM in Hydrocarbon Exploration: Challenges & Prospects, Singapore. EAGE Asia Pacific Sdn Bhd., Tel: 603 27195551; Fax: 603 27195511; email: asiapacific@eage.org

February 15-17, 2012: AAPG GTW: Fractured Carbonate Reservoirs, Bali, Indonesia. email: apereira@aapg.org

February 22: IGCP 40TH ANNIVERSARY CELEBRATION — UNESCO and IUGS invite you to join them on 22 February 2012 for a festive celebration of the 40th Anniversary of the International Geoscience Programme (IGCP) at UNESCO Headquarters in Paris with talks, debates, round tables, and cultural events about the relevance and future of Earth Science for Society. Information on the celebration Draft Program can be downloaded at: <http://www.unesco.org/new/igcp40>. If you plan to attend please RSVP by e-mail to: igcp40@unesco.org

March 4-7, 2012: 14th EMPG Meeting (Experimental Mineralogy, Petrology & Geochemistry), Kiel, Germany. Contact: Astrid Holzheid, Institut für Geowissenschaften, Universität Kiel, 24098 Kiel, F.R. of Germany; Tel: +49 (0) 431 880-1451; fax: +49 (0) 431 880-4457; e-mail: holzheid@min.uni-kiel.de; www.empg2012.uni-kiel.de/program

March 5-9, 2012: Basic Geophysics, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

March 5-16, 2012: Exploration and Production Process Basics: Understanding the Petroleum Industry Value Cycle, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

March 7-8, 2012: Wind Farm Development: European Offshore, Edinburgh, UK. ACI's Energy Events, email: jkorfanty@acieu.co.uk

March 7-8, 2012: Deepwater Production Tech, London, UK. ACI's Energy Events, email: jkorfanty@acieu.co.uk

March 12-16, 2012: AVO, Inversion and Attributes: Principles and Applications, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

March 13-14, 2012: Optimising Enhanced Oil Recovery, Abu Dhabi, UAE. ACI's Energy Events, email: jkorfanty@acieu.co.uk

March 25-29, 2012: State of the Art and Practice in Geotechnical Engineering, Oakland Marriott City Center, Oakland, California, USA. <http://content.geoinstitute.org/geocongress2012.html>

March 26-30, 2012: Prospect and Play Assessment, Kuala Lumpur. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

April 2-6, 2012: Reservoir Management, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

April 9-13, 2012: Seismic Acquisition Field Techniques – Theory and Practice, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

April 11-12, 2012: European Biomass to Power, Europe. ACI's Energy Events, email: jkorfanty@acieu.co.uk

April 13-14 June, 2012: European Biodiesel, Krakow, Poland. ACI's Energy Events, email: jkorfanty@acieu.co.uk

April 16-20, 2012: Sequence Stratigraphy: An Applied Workshop, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

April 22-25, 2012: AAPG 2012 Annual Convention & Exhibition, Long Beach Convention & Entertainment Center in Long Beach, California. Theme– Directing the Future of E&P: Starring Creative Ideas and New Technology. <http://www.aapg.org/longbeach2012/>

April 23-24, 2012: Petroleum Geoscience Conference & Exhibition 2012 (PGCE2012), Kuala Lumpur, Malaysia. Geological Society of Malaysia, Tel: 603 79577036; Fax: 603 79563900; email: geologicalsociety@gmail.com; www.pgcem.com

April 23-27, 2012: Basics of Environment, London, UK. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

April 24-26, 2012: IV International Conference on Technology Seawater Intrusion in Coastal Aquifers. III International Symposium on Coastal Aquifers and Desalination Plants, Alicante, Spain. www.igme.es/internet/tiac12/

April 30-May 4, 2012: Gas Reservoir Management, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

April 30-May 4, 2012: Acidizing Applications in Sandstones and Carbonates, Houston, USA. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

May 7-8, 2012: Geomatics: Geodesy and Cartography, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

May 7-11, 2012: Sandstone Reservoirs, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

May 7-11, 2012: Structural and Stratigraphic Interpretation of Dipmeters and Borehole-Imaging Logs (Intermediate), Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

May 8-10, 2012: Applied Rock Mechanics, London, UK. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

May 12-15, 2012: 5th International UNESCO Conference on Geoparks, Unzen Volcanic Area Global Geopark, Japan. Abstract submission, Registration,

Field Excursions, and Hotel information are now on the conference website at: <http://www.geoparks2012.com/>. For information contact Chika MIURA email: c-miura@unzen-geopark.jp

May 14-18, 2011: 3D Seismic Attributes for Reservoir Characterization, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

May 21-25, 2012: Seismic Rock Physics for Exploration and Production, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

May 21-25, 2012: Integrated Reservoir Modeling, London, UK. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

May 28-30, 2012: 2nd International Conference on Performance-based design in earthquake geotechnical engineering, Conference Center, Taormina, Italy. Associazione Geotecnica Italiana, Viale dell'universita, 11-00185 Roma, Italy; Tel: + 39 064465569 – 0644704349; fax: + 39 0644361035; email: agiroma@iol.it; www.associazionegeotecnica.it

June 2-6, 2012: Advanced Seismic Stratigraphy: A Sequence-Wavelet Analysis Exploration-Exploitation Workshop, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

June 2-8, 2012: 11th Annual International Symposium on Landslides and the 2nd North American Symposium on Landslides. Banff Springs Hotel, in Banff, Alberta, Canada. The theme of the symposium “Landslides and Engineered Slopes: Protecting Society through Improved Understanding”. Organised by The Canadian Geotechnical Society, the Association of Environmental and Engineering Geologists, and the Joint Technical Committee on Landslides and Engineered Slopes. More details on the <http://www.ISL-NASL2012.ca>

June 4-8, 2012: Microbial Carbonate Reservoir Characterization, Houston, Texas, USA. American Association of Petroleum Geologists, P.O. Box 979, Tulsa, Ok, USA; email: education@aapg.org

June 4-8, 2012: New Opportunities in Old Fields, London, UK. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

June 11-15, 2012: Naturally Fractured Reservoirs: Geologic and Engineering Analysis, London, UK. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

June 11-15, 2012: Surface Production Operations, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

June 11-22, 2012: Well Design and Engineering, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

June 12-14, 2012: Second International Conference on Integrated Petroleum Engineering and Geosciences (ICIPEG2012), KLCC, Malaysia. www.utp.edu.my/icipeg2012/

June 18-22, 2012: Gas Lift, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

June 18-24, 2012: Deep-water Turbidite Depositional Systems and Reservoirs, Nice, France. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

June 25-29, 2012: Basic Petroleum Engineering Practices, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

June 25-29, 2012: Introduction to Seismic Stratigraphy: A Basin Scale Regional Exploration Workshop, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

June 25-29, 2012: Offshore Risk Management, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

June 25-29, 2012: Reservoir Characterization: A Multi-Disciplinary Team Approach, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

July 2-4, 2012: Basic Petroleum Economics, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

July 2-6, 2012: Expanded Basic Petroleum Economics, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

July 2-6, 2012: Development Geology, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

July 2-6, 2012: Production Logging, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

July 2-6, 2012: Horizontal and Multilateral Wells: Analysis and Design, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

July 9-13, 2012: Basic Petroleum Geology, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

July 9-13, 2012: Basin Analysis Workshop: An Integrated Approach, Singapore. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

July 9-13, 2012: Compressional and Transpressional Structural Styles, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

July 9-13, 2012: Gas Production Engineering, Kuala Lumpur. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

July 9-13, 2012: International Petroleum Contracts, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

July 30-August 3, 2012: Enhanced Oil Recovery with Gas Injection, Houston, USA. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

August 5-10, 2012: 34th International Geological Congress (IGC) in Brisbane, Australia. The primary IUGS conference that is held every 4 years. See the information above, and visit the Congress website at: <http://www.34igc.org/>

August 15-17, 2012: The 10th Symposium on Engineering Geology and the Environment. Villa Carlos Paz City, Cordoba Province, Argentina. Organized by: The Asociación Argentina de Geología Aplicada a la Ingeniería (ASAGAI), Argentina National Group of the International Association for Engineering Geology and the Environment (IAEG). Download the flier from: http://www.iaeg.info/index.php?option=com_content&view=article&id=106:10th-symposium-on-engineering-geology-and-the-environment&catid=44:announcements&Itemid=88. Contact email address for enquiries: simposio@asagai.org.ar

September 3-7, 2012: Coring and Core Analysis, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

September 3-7, 2012: Production Technology for Other Disciplines, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

September 3-14, 2012: Production Operations 1, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

September 7-20, 2012: Primary Cementing – Cementing 1, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

September 10-14, 2012: Seismic Interpretation, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

September 10-14, 2012: Cementing Practices – Cementing II, Perth, Australia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

September 10-14, 2012: Integration of Rocks, Log and Test Data, London, UK. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

September 10-14, 2012: Completions and Workovers, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

September 16-19, 2012: AAPG2012 International Conference & Exhibition. Marina Bay Sands Expo and Convention Center, Singapore. <http://www.aapg.org/singapore2012/>

September 17-19, 2012: Operating Company/Service Company Dynamics: How E & P gets Done, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

September 17-21, 2012: Well Log Interpretation, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

September 17-21, 2012: Petroleum Risk and Decision Analysis, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

September 17-21, 2012: EPEX-World: The E & P Executive Business Simulation, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

September 17-28, 2012: Drilling Practices, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

September 19-20, 2012: European Base Oils & Lubricants Summit, Europe. ACI's Energy Events, email: jkorfanty@acieu.co.uk

September 19-20, 2012: Smart Grids, Europe. Contact: ACI's Energy Events, email: jkorfanty@acieu.co.uk

September 24-28, 2012: Carbonate Reservoirs, London, UK. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

September 24-28, 2012: Structural Styles in Petroleum Exploration, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

September 24-28, 2012: Production Geology for Other Disciplines, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

September 24-28, 2012: Drilling Fluids Technology, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

September 24-28, 2012: Shaly Sand Petrophysics (Intermediate), Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

September 30-October 4, 2012: Oil and Gas Reserves Evaluation, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

October 1-5, 2012: Petroleum Geochemistry: Tools for Effective Exploration and Development, London, UK. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

October 1-5, 2012: Analysis of Structural Traps in Extensional Settings, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

October 1-5, 2012: Basic Drilling Technology, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

October 1-15, 2012: Petroleum Systems: Modeling the Past, Planning the Future, Nice, France. American Association of Petroleum Geologists, P.O. Box 979, Tulsa, Ok, USA; email: education@aapg.org

October 8-12, 2012: Geochemical Techniques for Solving Reservoir Management and Field Development Problems, London, UK. Tel: 603 21684751;

email: ap-enquiries@petroskills.com; www.petroskills.com

October 10-11, 2012: Global Geothermal Energy Summit, Europe. ACI's Energy Events, email: jkorfanty@acieu.co.uk

October 15-19, 2012: Foundations of Petrophysics, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

October 15-19, 2012: Wireline Formation Testing and Interpretation (Specialized), Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

October 15-19, 2012: Reservoir Management for Unconventional Reservoirs, London, UK. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

October 15-19, 2012: Petroleum Project Management: Principles and Practices, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

October 16, 2012: Sustainability Day, Europe. ACI's Energy Events, email: jkorfanty@acieu.co.uk
 October 17-18, 2012: The 2012 Tight & Shale Gas Summit, Europe. ACI's Energy Events, email: jkorfanty@acieu.co.uk

October 22-24, 2012: Capillarity in Rocks, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

October 29-November 2, 2012: Applied Seismic Anisotropy for Fractured Reservoir Characterization, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

October 29-November 2, 2012: Basic Reservoir Engineering (Basic), Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

October 29-November 2, 2012: Well Stimulation: Practical and Applied, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

October 29-November 2, 2012: Performance Analysis, Prediction and Optimization Using NODAL Analysis, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

October 30-November 2, 2012: International Conference on Ground Improvement and Ground Control: Transport Infrastructure Development & Natural Hazards Mitigation, Innovation Campus, University of Wollongong, Australia. ICGI Conference Secretariat, Faculty of Engineering, University of Wollongong, Wollongong. Tel: 02 42215852; Fax: 02 42213238; email: icgi_2012@uow.edu.au

November 5-9, 2012: Formation Damage: Causes, Prevention and Remediation, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

November 6-8, 2012: UNESCO World Heritage Convention 40th Anniversary Celebration. Kyoto, Japan. This final 40th anniversary celebration event will focus on the outcomes of the different workshops and studies undertaken during the celebrations and will reflect on the future of the Convention. For details of the celebration events check the special UNESCO 40th anniversary website at: <http://whc.unesco.org/en/40years>

November 12-13, 2012: Coalbed Methane, Calgary, Canada. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

November 12-16, 2012: Unconventional Resources Completion and Stimulation, London, UK. Contact: Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

November 19-23, 2012: Operations Geology, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

November 20-21, 2012: International Mine Management 2012 Conference (IMM 2012). Melbourne, Australia. Organised under the management of The Minerals Institute (AusIMM). The call for papers has been issued, deadline for submission 20 February 2011. Conference details on the web at: <http://ausimm.com.au/imm2012/>

November 26-30, 2012: Evaluating and Developing Shale Resources, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

November 26-30, 2012: Seismic Velocities and Depth Conversion, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

BERITA-BERITA LAIN (OTHER NEWS)

November 26-30, 2012: Carbonate Reservoirs – Petrophysical Characterization, London, UK. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

November 26-December 7, 2012: Applied Reservoir Engineering, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

December 3-5, 2012: Introduction to Petroleum Business, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

December 3-7, 2012: Basic Petroleum Technology, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

December 3-7, 2012: Mapping Subsurface Structures, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

December 4-6, 2012: Overview of Gas Processing, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

December 5-7, 2012: International Petroleum Technology Conference (IPTC), China World Exhibition Hall in Beijing, China. <http://iptcnet.org/2012/>

December 10-14, 2012: Fundamentals of Casing Design, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

December 10-14, 2012: Reservoir Engineering for Other Disciplines, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

December 10-14, 2012: Streamlines: Applications to Reservoir Simulation, Characterization and Management, Kuala Lumpur, Malaysia. Tel: 603 21684751; email: ap-enquiries@petroskills.com; www.petroskills.com

May 19-22, 2013: AAPG 2013 Annual Convention & Exhibition, Pittsburgh, PA USA. <http://www.aapg.org/meetings/>

40 YEARS OF WORLD HERITAGE 1972-2012

In 2012 UNESCO celebrates the 40th anniversary of the World Heritage Convention which was adopted on 16 November 1972. In the 40 years since then 936 sites have been inscribed on the World Heritage List and 188 countries have committed to preserving this heritage for future generations. Visit UNESCO's new 40th anniversary website (<http://whc.unesco.org/en/40years>) for specific stories of how the World Heritage Convention has made a difference in protecting the world's most valuable cultural and natural sites, and to see the calendar of the anniversary events taking place around the world. The final 40th anniversary celebration event will be hosted by Japan at a 3-day event in Kyoto on 6-8 November 2012, where the outcomes of the different workshops and studies will be presented that will feed the reflection on the future of the Convention.

THE EARTH SCIENCE MATTERS FOUNDATION

The Earth Science Matters Foundation is an outcome of the International Year of Planet Earth (IYPE), proclaimed by the United Nations for 2008 and operational in the period 2007 until mid 2010. The Earth Science Matters Foundation was formed at the request of many of the 80 National and Regional IYPE Committees who have been particularly successful in promoting the contribution made by the Earth sciences to Society during the IYPE Triennium.

Through its subtitle: "Bringing knowledge of the Earth to everyone", the Earth Science Matters Foundation aims to spread such knowledge beyond the professional Earth scientific communities to a wider audience, including politicians, decision-makers, funding organisations, students and to the public at large. This will be realised through publications, events, projects, the media and a variety of other communication tools. National Committees play a crucial role in such outreach campaigns and International Partners provide the institutional and financial basis for the Foundation. The Earth Science Matters Foundation is searching for cooperation with other, well-established, Earth science organisations to realise their ambitions and they invite the geoscientific community join in their activities. For more information visit the Foundation website at: <http://www.earthsciencematters.org>.



34th International Geological Congress (IGC): AUSTRALIA 2012

Unearthing Our Past And Future – Resourcing Tomorrow

Brisbane Convention and Exhibition Centre
Queensland, Australia

5 - 10 August, 2012 | www.34igc.org

34th IGC CIRCULARS

General distribution of this and subsequent Circulars for the 34th IGC is by email.
The latest Circular is always available for download at www.34igc.org.



Conference & Exhibition
21 - 23 February 2012

Kuala Lumpur Convention Center (KLCC)
Kuala Lumpur, Malaysia
www.offshoreasiaevent.com

SUBSEA TECHNOLOGY
TOPSIDES
MULTIPHASE PUMPING
CONSTRUCTION & INSTALLATION
DEEPWATER PRODUCTION
DECOMMISSIONING
FLOWLINES & PIPELINES
RISK MANAGEMENT
LNG
DRILLING AND COMPLETION

DEVELOPING
ASIA'S
ENERGY
RESOURCES

12th Regional Congress on Geology, Mineral and Energy Resources of Southeast Asia

GEOSEA 2012

Wednesday 7th - Thursday 8th, March, 2012
Sofitel Centara Grand Bangkok, Thailand

The Geological Society of Thailand (GST) in cooperation with its geological organization colleagues is honored to hold the 12th Regional Congress on Geology, Mineral and Energy Resources of Southeast Asia (GEOSEA 2012) on 7-8 March 2012, in Bangkok, Thailand. Theme of the conference on "Geoscience in Response to the Changing Earth" is selected to address the geoscientific and strategic issues of common interest in the region and the world.

Our Earth keeps changing all the time with increasing severity especially in the recent decades as evidenced by series of natural changes and hazards in many places around the globe which have caused impacts on human lives and security. Meanwhile, significant population growth, especially in the past century, has led to greater demand of geological resources, such as mineral, groundwater, and energy resources. At present, the world has been encountering severe crises. Problems affecting nations worldwide such as global warming and menacing natural disasters as a consequence of great consumption of natural resources call for immediate actions. In coping with such crises, cooperation from scientists from all disciplines would be the best solution in saving and healing the world.

The 12th GEOSEA conference will provide a forum for geoscientists to share the knowledge and expertise of geosciences through review of case studies and hold discussion on better research and development for the new geological resources and environment based on multi-disciplinary experiences and approaches. The conference will be all means, raise awareness of its relevance to some of today's most pressing societal concerns, in particular global climate change, natural hazards, and securing geological resources for the present and future generations. In addition, it attempts to provide insights into what our geoscientists should do about these current global issues as well as the challenges they face. The conference consists of panel discussions, invited oral presentations, and poster displays.

The following are some challenging issues:

- Current innovations/new findings in geosciences.
- Natural regional and global hazard / disaster.
- Geosciences involvements and their positions and roles with the changing earth.
- Effective sharing / utilizing the geoscience and hazardous knowledges for the public.
- GEOSEA's position and direction to move towards.



Second Circular, June 2011

12th Regional Congress on Geology, Mineral and Energy Resources of Southeast Asia

GEOSEA 2012

Geoscience in Response to the Changing Earth

Wednesday 7th - Thursday 8th, March 2012
Sofitel Centara Grand Bangkok, Thailand

Organizer

Geological Society of Thailand

Co-organizers

1. Department of Mineral Resources
2. Department of Mineral Fuels
3. Department of Groundwater Resources
4. Royal Irrigation Department
5. Electricity Generating Authority of Thailand
6. Department of Geology, Faculty of Sciences, Chulalongkorn University
7. Department of Geological Sciences, Faculty of Science, Chiang Mai University
8. Department of Geotechnology, Faculty of Technology, Khon Kaen University
9. School of Geotechnology, Institute of Engineering, Suranaree University of Technology
10. School of remote sensing, Institute of Science, Suranaree University of Technology
11. Department of Physics, Faculty of Science, Prince of Songkla University
12. Department of Earth Science Faculty of Science, Kasetsart University
13. Geoscience Program, Kanchanaburi Campus Mahidol University
14. Faculty of Gems, Burapha University
15. Coordinating Committee for Geoscience Programmes in East and Southeast Asia (CCOP)
16. School of Engineering and Technology, Asian Institute of Technology

Regional Collaborators

1. Geological Society of Malaysia
2. Geological Society of Philippines
3. Ikatan Ahli Geologi Indonesia



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The conference presentation and display has two subthemes as : followed :

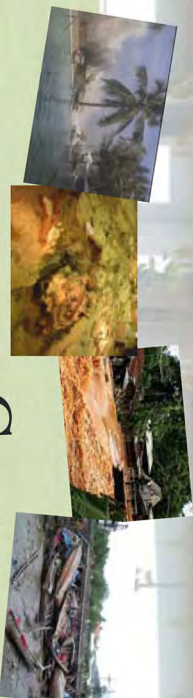
I. Geology and Geological Resources : Geology, Mineral, Groundwater, Fossil Fuel Resources, and Geological Conservation Sites.

Geology, mineral, groundwater and energy resources are vital raw materials for the world's emerging and developing economies. To manage these resources in the sustainable and equitable way requires knowledge about the surrounding geology and a clear focus on development, economic, environmental, and social aspects. Future work will need to document known reserves and resources and update estimates of undiscovered resources regularly. Development of new resource exploration and extraction technologies, sharing of information, transfer of knowledge and technology, international cooperation, communication with relevant stakeholders are key issues to respond to the current geo-resource issues.

II. Environmental Geology and Geological Hazards :

Climate Changes, Global Warming, Natural Disasters, (Earthquakes, Landslides, Coastal Erosion), Site Investigation, Land-Use Planning, Medical Geology, etc.

There is at present, an overwhelming scientific consensus that the global climate is changing and the earth is warming up and this is one of the greatest threats our planet is facing. Recent years show increasing temperatures in various regions with some increasing extremes in weather patterns. Every year, floods, tsunamis, severe storms, drought, wildfires, volcanoes, earthquakes, landslides, and land subsidence claim thousands of lives, injure thousands more, devastate homes, and destroy livelihoods. The impact of such geological hazards on our lives and economy is very great and will never go away. Can geoscientists explain the causes of such hazards, how they are related to the climate change/global warming, and how much or in what extent their impacts are? How can geoscientists/geoscience organizations work together to provide reliable knowledge and information as well as good advice to the public about how to live in harmony with nature with more confidence in safety. Development of new technologies such as environmental monitoring, hazard detection, etc., sharing of information, transfer of knowledge and technology, international cooperation, and communication with relevant stakeholders are key issues.



Geoscience
Response to the Changing Earth

Second Circular, June 2011

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GEOSEA 2012

Wednesday 7th - Thursday 8th March, 2012
Sofitel Centara Grand Bangkok, Thailand

Call For Papers

The technical program of GEOSEA 2012 consists of oral and poster presentation on geosciences and related aspects of the GEOSEA core region of Southeast Asia as well as East Asia. Presentations by invited speakers on topics of relevance to selected themes. Participants are invited to present papers on original research related to the themes below. Authors are required to submit an extended abstract together. Abstracts of accepted papers will be made available at the Congress. Full paper will be reviewed and published in the Journal of Geological Society of Thailand.

Field Excursion

Friday, 9 – Sunday, 11 March 2012
Kanchanaburi, Western Thailand
3 days, 2 nights

The excursion provides participants a good opportunity to visit and investigate an almost complete stratigraphic sequence of Thailand, starting from Inferred Precambrian to Quaternary. A few unconformities and two major fault zones, namely the Three Pagoda and the Sri Sawet, will be visited and investigated. A number of geologic resources and sites, such as Uhong oilfield in Suphanburi (the only on land petroleum production wells in West Central Thailand), Sapphire Deposit in Bo Ploi, Sri Nakharin Dam hydropower plant in Kanchanaburi will also be visited. Kanchanaburi is one of the most popular tourist places in Thailand (Please visit website : <http://www.kanchanaburi.com>)

Registration Fee

Participants	Local	Overseas
Conference	3,000 THB	200 USD
Field Excursion	7,500 THB	250 USD

Venue

Sofitel Centara Grand Bangkok
1695 Phaholyothin Road, Chatuchak
Bangkok, 10900, Thailand
Phone: +66 (0) 2541 1234
Fax: +66 (0) 2541 1087
Email: scgpb@chnr.co.th



Geoscience
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Accommodation

Accommodation is available at the Congress venue at special rates. Please complete the Sofitel Centara Grand Bangkok form and fax it directly to the Hotel Reservation Department (http://www.centarahotelsorts.com/scp/scp_default.asp). Accommodation will be at the participants own expense and hotel bills should be paid directly to the hotel.

Other hotel near to the Congress venue can be booked directly online from various hotel websites such as Miracle Grand Hotel (www.miraclegrandhotel.com) and Rama Gardens Hotel (www.ramagardenshotel.com).

Other Programmes

Spouse programmes and sight-seeing tours are available during the Congress. Bookings can be made onsite during the Congress.

Deadlines and Key dates

Submission of extended abstract	1	December	2011
Acceptance Acknowledgement	6	January	2012
Registration and payment	6	February	2012
Submission of full manuscript	7	March	2012

Contact Persons

GEOSEA 2012 Organizing Committee

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Tel.: 02-794-3435
Fax: 02-794-3428



Second Circular, June 2011



2011 INTERNATIONAL PETROLEUM TECHNOLOGY CONFERENCE (IPTC) RESCHEDULED

The International Petroleum Technology Conference (IPTC) Board of Directors, in consultation with the Host Organisation, PTT Exploration and Production Public Company Ltd. (PTTEP), has decided to postpone the 2011 IPTC due to the current flooding in Thailand.

While we were extremely reluctant to postpone this important conference, our priority is always the wellbeing and safety of our conference delegates, visitors and exhibitors. Floods that have engulfed a third of the country, and much of suburban Bangkok, are moving closer to the centre of the capital city, and are severely disrupting transport, and affecting electricity, water supplies and the availability of local personnel and materials.

After careful consideration, it has been decided that the 5th edition of IPTC will be rescheduled to 7-9 February 2012, but will still be held at the Bangkok Convention Centre at CentralWorld.

We encourage all industry professionals and organisations to actively participate in the newly scheduled event.

IPTC is contacting authors, speakers, exhibitors, sponsors, registered conference delegates, teachers and students individually on the details regarding the rescheduling of the event.

Please direct enquiries, or requests for additional information, to Jenny Chong, IPTC Senior Event Manager, e-mail jchong@iptcnet.org; jchong@spe.org.

GEOLOGICAL SOCIETY OF MALAYSIA PUBLICATIONS

- Bulletin 1** (1968). Studies in Malaysian Geology. 79 p. Edited by P.H. Stauffer. (out of stock)
- Bulletin 2** (1968). Bibliography and Index of the Geology of West Malaysia and Singapore. 152 p. D.J. Gobbett. Price: RM5.00.
- Bulletin 3** (1970). Papers in Geomorphology and Stratigraphy (with Bibliography supplement). 146 p. Edited by P.H. Stauffer. Price: RM5.00.
- Bulletin 4** (1971). Papers in Petrology, Structure and Economic Geology. 100 p. Edited by P.H. Stauffer. Price: RM5.00.
- Bulletin 5** (1973). The Search for Tungsten Deposits. 70 p. K.F.G. Hosking. (out of stock)
- Bulletin 6** (1973). Proceedings, Regional Conference on the Geology of Southeast Asia. A Collection of papers, Kuala Lumpur, March, 1972. 334 p. Edited by B.K. Tan. Price: RM5.00.
- Bulletin 7** (1974). A collection of papers on geology. 138 p. Edited by B.K. Tan. Price RM5.00.
- Bulletin 8** (1977). A collection of papers on geology. 158 p. Edited by T.T. Khoo. (out of stock)
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- Bulletin 11** (1979). Geology of tin deposits. A collection of papers presented at the International Symposium on Geology of Tin Deposits. 393 p. Edited by C.H. Yeap. (out of stock)
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- Bulletins 19** (1986). GEOSEA V Proceedings Fifth Regional Congress on Geology, Mineral and Energy Resources of SE Asia. Vol. I. 652 p. Edited by G.H. Teh & S. Paramanathan. Members: RM30.00; Non-members: RM60.00
- Bulletins 20** (1986). GEOSEA V Proceedings Fifth Regional Congress on Geology, Mineral and Energy Resources of SE Asia. Vol. II. 881 p. Edited by G.H. Teh & S. Paramanathan. Members: RM30.00; Non-members: RM60.00
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- Bulletin 54** (2008). Collection of geological papers. 169 p. Edited by T.F. Ng, Nur Iskandar Taib & Samsudin Hj Taib. Price: RM30.00.
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- Proceedings Annual Geological Conference 2000**. 435 p. Edited by G.H. Teh, Joy J. Pereira and T.F. Ng. Price: RM60.00.
- Proceedings Annual Geological Conference 2001**. 320 p. Edited by G.H. Teh, Mohd. Shafeea Leman and T.F. Ng. Price: RM50.00.
- Geology of Borneo Island (2001) (CD, Map (2 sheets) and explanatory notes**. Compiled by Robert B. Tate. Price: RM60.00.
- Stratigraphic Lexicon of Malaysia (2004)**. By Lee Chai Peng, Mohd. Shafeea Leman, Kamaludin Hassan, Bahari Md. Nasib & Roshidah Karim. 162 p. Price: RM30.00.
- Geological Evolution of Southeast Asia (1996)** Reprinted Edition. By C. S. Hutchison. 368 p. (out of stock)
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- Geology of Peninsular Malaysia (2009)** 479 p. Hardcover. Edited by C.S. Hutchison & D.N.K. Tan. Inclusive of Geological Map of Peninsular Malaysia. Price: Member RM150.00; Student Member RM70.00; Non-Member RM200.00
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- Malaysian Stratigraphic Guide (1997)**. RM5.00
- Warta Geologi** (Newsletter of the Geological Society of Malaysia). Price: RM5.00 per issue from July 1966.

All prices quoted are not inclusive of postage. Please write in for details on postage. Allow 8-10 weeks for delivery. For orders, please write to the Society and you will be invoiced. Cheques, money orders and bank drafts must accompany all orders.

Orders should be addressed to:

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Malaya, 50603 Kuala Lumpur, MALAYSIA
Tel: 603-79577036, Fax: 603-79563900
E-mail: geologicalsociety@gmail.com

IMM OFFERS FREE MEMBERSHIP TO MEMBERS OF THE GEOLOGICAL SOCIETY OF MALAYSIA

Below is an excerpt of a letter from the President of IMM, Dato' Dr. Ong Eng Long to the Society. Members interested in this offer are required to complete and return the application form in the next page, together with one-time payment of RM40 and relevant documents.

The Institute of Materials, Malaysia (IMM), registered under the Societies' Act with the Registrar of Societies in Malaysia in 1987, will be celebrating its 25th Anniversary in 2012. In conjunction with this celebration, the Council of the IMM has approved the offer of free "Ordinary-grade" membership to members of other recognized professional societies globally.

Amongst the objectives of this offer are:-

- (1). To encourage people from all walks of society to participate in matters related to Materials Technology which is relevant to every human being.
- (2). To reduce the burden of members of other societies who already have to pay annual subscriptions to their own societies.
- (3). To generate greater interest and awareness of Materials Technology amongst the public thereby creating greater impact of Materials Technology in nation building.

The Council of the IMM is aware that many of us have been paying annual subscriptions to a number of professional societies as our professions tend to overlap in multiple disciplines. This causes a burden to many of us. IMM is therefore making this sincere offer to encourage participation in the fields of Materials Technology. So long as one has a membership of any professional society in the IMM recognition list, he/she is entitled to join IMM as an Ordinary Member for free. Just fill in the enclosed application form and submit to the IMM Secretariat with a one-time nominal handling fee of Ringgit Malaysia 40.00 or equivalent for the Membership IC Card and Certificate.

Please disseminate this information to your members and we look forward to participation from members of your society.

Dear Members

Please update your contact details by sending your email address, telephone no. and fax no. to :
geologicalsociety@gmail.com





INSTITUT BAHAN MALAYSIA
Institute of Materials, Malaysia
 (ROS-4186/87)

ORDINARY MEMBERSHIP APPLICATION FORM FOR AFFILIATES

The Institute of Materials, Malaysia will recognize various professional institutions and societies for free membership at " Ordinary Grade ". Members of the recognized professional institutions and societies can become Ordinary Members of the IMM without any annual subscriptions. The Council of the IMM approved the proposal in accordance to IMM Rules clause no. 3.2.3 and the members at its 21st Annual General Meeting unanimously approved the proposal on 19th March 2011. **Eligible members will need to fill up the form below and submit a copy of their membership certificate from their institute/society plus a one-time payment of RM40.00 (or USD\$15.00 or £8.00) for the IMM membership certificate and ID card.**

On behalf of IMM,
 Ir. Max Ong
 Honorary Secretary

1st July 2011

AFFILIATE MEMBER'S PARTICULARS

(This form to be sent to IMM secretariat with photograph)

Title : Prof / Dato' / Dr / Mr. / other,		photo here	
Name	:		
IC / Passport No.	:		
Affiliate Institute/ Society Name	:		
Membership no:	:		
Correspondence Address	:		
Office No.	:		Mobile phone No. :
Email Address	:		

PAYMENT MODE

Herewith I enclose payment of RM40.00 (or USD\$15.00 or £8.00) for my IMM Certificate & ID card, payable to: " **Institute of Materials, Malaysia** ".

Cash / Cheque / Money Order / Bank Draft / T-T no:

(Outstation Malaysian cheque bank commission: 50 sen or 0.03%)

Signature :

Date:

Reviewed by:

Approved by:

Name & date:

Name & date:

Please contact the IMM Secretariat office (Mr. Azman Murad iomm@po.jaring.my) if you do not receive your IMM membership certificate & ID Card within 3 months of your submission of this form & payment.

Geological Society of Malaysia Publications

GENERAL POLICY

Papers should be as concise as possible. They may include original results of basic, applied and policy research of national or international significance, current reviews, or discussions on techniques, research programs, organisations, information, or national and international policies in geoscience.

SUBMISSION OF PAPERS

Only papers that have not been published elsewhere will be considered for publication. Authors must agree not to publish elsewhere a paper submitted and accepted. All papers will be subjected to review by two or more reviewers. Authors wishing to include published and unmodified figures or text passages are required to obtain permission from the copyright owner(s). Authors of English papers are strongly urged to have their manuscript edited for language before submission by a person whose first language is English.

The Editor reserves the right to reject all or any part of the paper submitted. The Geological Society of Malaysia assumes no responsibility for statements made by authors.

Three (3) original copies of the paper should be submitted to:

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MANUSCRIPT

The paper can be written in Bahasa Malaysia (Malay) or English. For English papers, use either British or American spelling but not a combination of both. The paper should be checked thoroughly for spelling and grammar. The manuscript must be printed at 1.5 spacing in a single column on one side of A4 paper. All pages should be numbered. Length of paper should be between 3,000 and 6,000 words for the *Bulletin* and between 2,000 and 3000 words for *Warta Geologi*, excluding tables and illustrations. Metric units should be used and all non-standard symbols, abbreviations and acronyms must be defined.

TITLE

Title must be informative and reflects the content of the paper. Title in Malay should include an English translation. It should be concise (less than 20 words). Avoid using abbreviation in the title.

AUTHOR'S ADDRESS

Addresses of all authors must be provided. The addresses should be sufficient for correspondence. Please include email address, telephone and fax of the corresponding author.

ABSTRACT

Abstract in both Malay and English, each in one paragraph and should not exceed 300 words. It should clearly identify the subject matter, results obtained, interpretations discussed and conclusions reached.

KEYWORDS

Please include 3 to 8 keywords that best describe the content of the paper.

REFERENCES

In the text, references should be cited by author and year and listed chronologically (e.g. Smith, 1964; Jones *et al.*, 1998; Smith & Tan, 2000). For both Malay and English paper, all references must be listed in English. Title of non-English articles should be translated to English.

The list of references should only include articles cited in the text. The list should be arranged in alphabetical order. Please ensure that the reference list is complete and the bibliographical details are accurate. The references should be in the following manner:

Journal article:

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

Book:

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

Chapter of book and Symposium volume:

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

Article in Malay:

Lim, C.H. & Mohd. Shafeea Leman, 1994. The occurrence of Lambir Formation in Ulu Bok Syncline, North Sarawak. *Geol. Soc. Malaysia Bull.*, 35, 1-5. (in Malay with English abstract)

TABLES

All tables should be cited in the text and numbered consecutively. Tables should have a title and a legend explaining any abbreviation or symbol used. Each table must be printed on a separate piece of paper. Do not insert the tables within the text. Data in tables should be aligned using tab stops rather than spaces. Avoid excessive tabulation of data.

ILLUSTRATIONS

Please make sure that all illustrations are useful, necessary and of good quality. A maximum of ten (10) illustrations (photographs, graphs and diagrams) are allowed and these should be cited in the text and numbered consecutively as Figures. The papers are usually published in black-and-white but it may sometimes be possible to include colour figures at the author's expense. The scales for maps and photomicrographs should be drawn on the figure and not given as a magnification. Originals should not be greater than A4 size and annotations should be capable of being reduced down to 50 percent. The caption should be listed on a separate piece of paper. Do not insert the illustration within the text.

SUBMISSION OF ELECTRONIC FILES

Authors are required to submit electronic files together with three hardcopies of their papers. Submission should be made using CD-ROM. The CD-ROM should be accompanied with a listing of all files and the software (name and version) used. The file names should reflect the content of the files (e.g. Ali_Fig1.tif). Please make sure that the files and the hardcopies are the same.

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Text: Microsoft Word. Please save in two versions, Word (.doc) and Rich Text Format (.rtf). Do not insert tables and illustration within the text.

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