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Jan–Feb 2002

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

The Society has a membership of about 600 earth scientists interested in Malaysia and other Southeast Asian regions. The membership is worldwide in distribution.
The *in-situ* river boulder of Kasai

T.T. Khoo
17 Orange St.
Eastwood 2122, Australia

**Abstract:** A syenite river boulder in Sungai Kasai resting on a syenite basement is interpreted to be *in-situ* as a pegmatite sheet in the basement continues into the boulder. It is suggested that this situation may indicate that the Kasai drainage system could be rather young.

Other than corestones embedded in their weathering materials in weathering profiles, boulders in all their forms and occurrences are generally considered to be not *in-situ*. I relate in this communication an unusual river boulder which appears to be *in-situ* from Sungai Kasai, near Kampong Ulu Gali, Raub. The boulder is shown in Figure 1 and 2.

The outcrop located on the western foothills of Gunung Benom and shown in Figure 1, admirably summarizes the magmatic history of the area which is in the Benom Complex of Yong (1997) and Remesh (1998). The basement outcrop on which the boulder is (or was) resting is syenite which has been cut by a later quartzofeldspathic pegmatite which penetrated jointing in the syenite as evidenced by the angular turns of the pegmatite in the foreground of the picture. The boulder is also syenite similar to the basement outcrop. It has a mafic enclave traversed by the pegmatite (Fig. 2). The pegmatite in the boulder is petrographically similar to the pegmatite in the basement and is of the same thickness. The strike of the pegmatite in the boulder is also the same as the strike of the pegmatite in the basement. Also at the outcrop the pegmatite sheet in the basement appears to continue into the pegmatite in the boulder. It would appear that the boulder is *in-situ* as it would be too coincidental for a fugitive boulder having all the necessary features to come to rest on the basement outcrop with the pegmatite in both parts aligned with continuity.

The occurrence of the *in-situ* boulder has some geomorphological significance. It would appear that the boulder is a corestone developed over the syenite basement with only a thin veneer of grus and other weathered material in between. The boulder was once pinned down to the basement by the pegmatite which is more resistant to chemical weathering compared to the ferromagnesian-rich syenite. The pinning by the pegmatite sheet ensured the stability of the boulder until the pegmatite attachment to the basement weathered away and became easily removable.

Under the scenario interpreted above, the implication is that the river has only recently incised into the weathered section of the syenite down to the basement. I estimate that the weathered section above the syenite basement in the area is less than 10 metres thick. Failure of streams to incise into their basements may be for reasons such as slow rate incision arising from a drier climate or that the streams are depositing and building up alluvium rather than incising such as at lower courses of the streams. Streams in upland areas of the Malay peninsula such as the Kasai area, have all generally incised into the basement and thereby exposing the basement as outcrops. However, one of the factors which may cause the failure...
Figure 1. *In-situ* syenite boulder resting on syenite basement. Location: Sungai Kasai, near Kampong Ulu Gali, Raub. Picture looking upstream. Sy = syenite, P = pegmatite, M = mafic enclave (see Figure 2 for details). Person in picture taken in 1967 is local resident, Wook Zaki, a gentleman.

Figure 2. Kasai river boulder of syenite (Sy) with mafic (M) enclave cut by pegmatite (P). Refer to Figure 1 for scale.
of the Sungai Kasai to incise deeper than only up to the top of the basement is time. The Kasai drainage system could be of no great antiquity. If I may be allowed to hazard a guess, maybe the system is no older than the last glacial period.

Slightly more than 30 years later I visited the location on 3 different occasions to check whether the boulder has moved. But on all occasions the boulder was not sighted and probably it has moved away or has been removed to facilitate agricultural activities. The situation described above is a very rare occurrence and field mapping and measurements should persevere with the traditional wisdom of in outcrops we trust.

ACKNOWLEDGEMENTS

This work is completed with the assistance of staff and facilities of the Department of Geology, University of Malaya for which I am thankful. I am grateful to Mr. Y.H. Ching who assisted with the illustrations.

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The seminar was held on 26th January 2002 (Saturday morning) at Program Geologi, Universiti Kebangsaan Malaysia Bangi. It was well attended by about 40 people, made up of students and teaching staff from Universiti Malaya, Universiti Kebangsaan Malaysia and the neighbouring institutions of MINT and PRI.

The seminar began sharp at 8.45 am with opening remarks by the Society's President, Assoc. Prof. Dr. Abdul Ghani Rafek, followed by the presentations. A total of 8 papers were presented with 3 papers on subsurface geophysical investigations, 2 on slope stability and landslides and one each on sedimentologic study of Jelai Formation, petrogenesis of Tioman granite, and structural control of gold mineralization at Lubuk Mandi. Each presentation was followed by a question-answer session. The 9th speaker, scheduled to talk on the limestone erosion in the Kinta and Lenggong valleys did not turn up due to some medical problem. The seminar ended at about 12.15 pm.

**Programme**

8:45 : Presenters, audience took their seats
8:50 : Welcome speech by GSM President
9:00 : Shahid Ayob (UKM)
      *Hidrologi isotop kawasan Olak Lempit: kemungkinan berlaku kebocoran akuifer*
9:20 : Ismail C. Mohammad et al. (UKM)
      *Teknik geofizik dalam kajian akuifer di kawasan Pekan-Rompin, Pahang*
9:40 : Vun Boon Onn (UM)
      *Hydrological analysis of landslide occurrences in Penang Island for the past 20 years (1981–2000)*
10:00 : Phakhuruddin bin Abdullah @ Kadir (UM)
       *Pedogenic influence on the stability of slope cuts in the Kenny Hill Formations*
10:20 : Mohammed Ismael Ibrahim Abu-Shariah (UKM)
       *Evaluation of the environmental and engineering geohazards in karst limestone using geophysical techniques*
10:40 : Tea break
Hidrologi isotop kawasan Olak Lempit: kemungkinan berlaku kebocoran akuifer (?)
MD. SHAHID BIN AYUB

Kawasan kajian terdiri daripada alluvium Kuatern setebal 60 m. Lapisan atas agak nipis, dengan ketebalan kira-kira 5–6 m. Ia diikuti dengan selang seli lempung, lodak dan pasir setebal 35–40 m, di mana keujudan lempung lebih kerap pada bahagian atas. Lapisan terakhir terdiri daripada pasir, kerikil dan sedikit lensa-lempung.


Teknik geofizik dalam kajian akuifer aluvium di kawasan Pekan-Rompin, Pahang
ISMAIL C. MOHAMAD, ABD. GHANI RAFEK DAN ABD. RAHIM SAMSUDIN

Masalah kejatuhan paras air tanah dan peningkatan kemasinan di dalam air tawar akuifer aluvium di kawasan Pekan-Rompin, Pahang telah dikesan daripada kerja-kerja pengawasan air tanah yang dilakukan di kawasan tersebut. Kajian geofizik telah dicadangkan sebagai sebahagian daripada kajian bagi mendapatkan data asas hidrogeologi kawasan.
Sedimentologic study of the Jelai Formation with emphasis on facies analysis, Kuala Lipis, central basin of Peninsular Malaysia

CHARLES MAKOUNDI

A sedimentologic study of the Jelai Formation in the central basin of Peninsular Malaysia indicated that deposition took place in a shallow water environment.

This is supported by the occurrence of Costatoria sp (myophoria facies) which is a bivalve of shallow water marine zone. Field study showed that it was difficult to provide a complete type section of the Jelai Formation on a wider scale due to advanced weathering and urban construction. Scanning electron microscopy of clay samples indicated that quartz (SiO$_2$), orthoclase (KAlSi$_3$O$_8$) and zircon (ZrSiO$_4$) are major components associated with the clay minerals. Fluorine, titanium, carbon are accessory chemical elements. Iron oxide is also present.

X-ray diffraction revealed the following main clay minerals: illite, montmorillonite and kaolinite whereas gypsum and pyrite are also present. Petrographic study of arenite (sandstone) showed two distinct facies:

1. Medium to coarse-grained sandstone, ferruginous, poorly sorted with abundant rock fragments, containing quartz, trace of mica, plagioclase grains which are mostly altered, and trace of orthoclase. Grain size varying from 0.25 to 1 mm.

2. Fine to medium-grained sandstone, argillaceous, moderately to well sorted, containing quartz, muscovite, trace of orthoclase, little amount of plagioclase and biotite, iron oxides, and rock fragments. Grain size varying from 0.12 to 0.5 mm.

Petrographic study of rudite (conglomerate and breccia) indicated two distinct facies:

1. Sheared sedimentary breccia, containing fragments cemented by iron oxides. Mineralogy showed the presence of quartz, feldspar, altered mica, and abundant rock fragments.

2. Conglomerate, containing quartz, altered muscovite, rock fragments cemented by iron oxides. Facies distribution shows that sandstone facies occurs in the central and northeastern part of the study area. Conglomerate appears in the northeastern part whereas breccia is seen in the southwestern part of the study area. Oxidizing conditions prevailed during deposition of the Jelai Formation with variable energy conditions seaward.

Paleocurrent study showed sense of paleoflow as trending WNW-ESE within the study area.

Ciri-ciri geokimia batuan plutonik di Pulau Tioman, Pahang

AZMI AB. RASHID

Batuan igneus plutonik di Pulau Tioman terdiri sebahagian besarnya dari jenis granit, diorit dan gabro. Batuan ini membentuk lebih kurang 70% dari keluasan Pulau Tioman dan sebahagian besarnya terdapat di bahagian timur pulau ini. Kaitan lapangan oleh pengkajian terdahulu membahagikan batuan plutonik di Pulau Tioman kepada 2 badan iaitu badan batuan granitik dan dioritik/gabroik. Julat SiO$_2$ menunjukkan bahawa batuan ini mempunyai julat SiO$_2$ yang luas iaitu dari 55.8% ke 75.43%. Julat yang luas ini pada amnya menyamai assosiasi batuan igneus yang terdapat di Jalur Timur. Mineralogi dan geokimia mencadangkan batuan di sini ialah dari jenis I iaitu asalan igneus. Ini disokong oleh nilai ACNK batuan di mana semua sampel yang dianalisa mempunyai nilai kurang dari 1.1 dan juga nilai Na$_2$O yang tinggi (purata: 3.5%). Hasil analisis pencemaran nilai-nilai oksida-oksida unsur major dan surih mencadangkan terdapatnya tiga kelompok magma. Kajian dimasa hadapan akan menitik beratkan samada ketiga-tiga kelompok magma ini dari asalan punca yang sama atau sebaliknya.
Structural control of gold mineralization in Lubok Mandi area, Peninsular Malaysia

HERU SIGIT PURWANTO

Lubok Mandi Gold Mine is an active gold mine located in the Eastern Belt of Peninsular Malaysia. The area is dominantly covered by volcano-clastic and metasedimentary rocks (slate, phyllite). In some places the rocks are carbonaceous. This rock formation is Middle Carboniferous to Permian in age and is cut by dacitic dyke as well as quartz veins. The major structural trends in the Lubok Mandi area are controlled by WNW-ESE (thrusting fault zones), NNW-SSE (shear or lateral fault zones) and NE-SW (right lateral fault zones). The earlier ductile deformations formed folds, microfolds and cleavages, followed by quartz veins. Brittle deformations formed shear and fault zones which controlled the formation of the mineralization. The mineralization in the quartz veins and the wall rocks is related to intensive alteration such as silicification, argillitization and propilitization (chloritization) especially around the sheared and lateral fault zones. The common minerals observed are native gold, chalcopyrite and arsenopyrite with pyrite being the most dominant. The result of the fluid inclusion analysis from quartz vein gave a temperature of 196.2°C–198.7°C and salinity 3.7%–4.2%WT. The structures which control gold mineralization in the area was studied using all the available slip data of the meso-structures observed on the fault planes. The stress history or paleostresses of the area, which was operating at the time or after the formation of the fault planes, determined the movement or slip, that took place on the fault planes. At the same time it also governed the orientation of the gold-quartz veins which are related to the gold mineralization of the area.

Generally, the mineralized quartz veins are related to and followed the NNW-SSE dextral fault zones but at times they followed the WNW-ESE thrust fault zones. Based on the fault slip data of the meso-structures, three directions of the paleostress were obtained. The first paleostress was related to the brittle-ductile deformation, acting in the NE-SW (σ1 = 08°–09°, N197°–211°E) controlled the folds, cleavages, thrust fault zones and quartz veins. The second direction, NNE-SSW (σ1 = 04°–25°, N194°–220°E) was related to purely brittle deformation that controlled the dextral fault zones and mineralised quartz vein zones. Finally, the compression with σ1 = 18°–19°, N232°–255°E was responsible in the right lateral slip fault zones with NE-SW direction.

The NNW-SSE quartz veins that followed the dextral fault zones are the centre of high-grade gold mineralization, especially those in the quartz breccia.
PETUKARAN ALAMAT (Change of Address)

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

1. Kong Ing Chung  
   S/L 9, Greenwood Park Phase 5, 9½th Mile Penrissen Road, 93250 Kuching, Sarawak.

2. Ting Ching Soon  
   132-2-5 Villa U-Than, Jalan U-Than, 55000 Kuala Lumpur.

3. Prinya Nualaya  
   No. 473, Utane 12, Sri Nakorn Pattana, Navamintr Road, Bung Khum, Bangkok, 10240 Thailand.

4. Johnny Ating Kading  
   Petroleum Development Oman, P.O. Box 81, Postal Code 113, Muscat, Sultanate of Oman.

5. Denis N.K. Tan  
   Asia-Pacific Evaluation Services (EPT-AGP), SIEP Inc., 200 North Diary Ashford, Houston, Texas 77079.

CURRENT ADDRESSES WANTED

The GSM is seeking the address of the following members. Anyone knowing the new address please inform the Society.

1. Malek Musa  
   43, Jalan Impian Jaya, Saujana Impian, 43000 Kajang, Selangor D.E.

2. Scott A. McManus  
   Level 1, Lot 9 & 10, Block H, Taman Sri Jalan Borneo, 93100 Kuching, Sarawak.
The Society has received the following publications:

1. Modeling of volcanic processes edited by Chi-Yu Keng et al.
3. The Rhenish Massif, edited by Andreas Vogel et al.

Results of Election for GSM Council 2002/2003

As nominations were received, election by ballot was carried out for the GSM Council 2002/2003 for the following posts, namely President, Secretary, and Editor.

The Election Officer, Dr. Ismail Yusoff, reported that the ballot count was held on Wednesday, 2 January 2002 at Klompe Reading Room, Geology Department, University of Malaya at 2.30 pm. A total of 88 votes were counted.

The successful candidates are as follows:

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33RD LUNAR AND PLANETARY SCIENCE CONFERENCE, NASA Johnson Space Center, Houston, Texas, USA. (Contact: Cheryl Perry, Conference Administrator, LPI Publications and Program Services Department, 3600 Bay Area Boulevard, Houston TX 77058-1113. Tel: (281) 486-2123; E-mail: perry@lpi.usra.edu)

**March 10-13**

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

**March 19-22**

19TH COLLOQUIUM OF AFRICAN GEOLOGY, El Jadida, Morocco. (Contact: Website: http://www.ucd.ac.ma/geologie/cag19.html)

**March 20-22**

3RD INTERNATIONAL CONFERENCE ON DAM ENGINEERING, Singapore. (Contact: Website: http://perso.club-internet.fr/cfms/manifs-autres.htm)

**March 20-23**

OIL AND GAS THAILAND 2002: The 6th International Oil and Gas Exploration, Production and Processing Technology Exhibition and Conference, Pattaya, Thailand. (Contact: Overseas Exhibition Services Ltd., 11 Manchester Square, London W1M 5AB, Angleterre, UK. Tel: +44 (0) 207 862 200; Fax: +44 (0) 202 862 2078; E-mail: pmckeans@montnet.com)

**March 20-27**

NATIONAL EARTH SCIENCE TEACHERS ASSOCIATION (Annual Convention and Exhibition), San Diego, California, USA. (Contact: NESTA, 2000 Florida Ave., N.W., Washington, D.C. 20009, USA. Tel: +1 202 462 6910; Fax: +1 202 328 0566; E-mail: fireton@kosmos.agu.org)

**March 24-27**

ANCIENT AND MODERN COASTAL PLAIN DEPOSITIONAL ENVIRONMENTS, Aquifer heterogeneity and environmental implications, Embassy Suites, Charleston, SC, USA. (Contact: Mary K. Harris, Westinghouse Savannah River Company, Savannah River Technology Center, P.O. Box 616, Aiken, SC 29808, USA. Tel: +1 803-725-4184; E-mail: mary.harris@rs.gov)

**March 25-29**

INTERNATIONAL GROUNDWATER SYMPOSIUM — Bridging the Gap between Measurements and Modelling in Heterogeneous Media, Berkeley, California, U.S.A. (Contact: Dr. Angelos Findikakis, Bechtel, Mail Stop 333/12/C34, P.O. Box 3965, San Francisco, California, U.S.A. Tel: +1 415 768 8550; Fax: +1 415 768 4898; E-mail: anfindik@bechtel.com)

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**April 14-16**

THE SOCIETY OF ECONOMIC GEOLOGISTS GLOBAL EXPLORATION 2002, INTEGRATED METHODS FOR DISCOVERY CONFERENCE, Denver, Colorado, USA. (Contact: S.E.G., 7811 Shaffer Parkwy, Littleton, CO, U.S.A. Tel: +1-720.981.7882x210; Fax: +1.720.981.7874; E-mail: SEG2002@segweb.org; Website: www.seg2002.org)

**April 15-17**

GEO 2002: THE 5TH MIDDLE EAST GEOSCIENCE CONFERENCE AND EXHIBITION, Bahrain. (Contact: Overseas Exhibition Services Ltd., 11 Manchester Square, London W1M 5AB, Angleterre, UK. Tel: +44 (0) 207 862 2000; Fax: +44 (0) 202 862 2078; E-mail: pmckeans@montnet.com; Website: www.gulfpetrolink.com)
April 24–26
MIS 2002 (Third International Conference on Management Information Systems Incorporating GIS and Remote Sensing), Southampton, U.K. (Contact: Conference Secretariat, MIS 2002. E-mail: gcossutta@wessex.ac.uk; Tel: 44 (0) 238 029 3223; Fax: 44 (0) 238 029 2853; Website: http://www.wessex.ac.uk/conferences/2002/mis02/)

May 5–10
INTERNATIONAL SYMPOSIUM ON THE INTERACTIONS BETWEEN SEDIMENTS AND WATER, Banff, Alberta, Canada. (Contact: Dr. Ellen Petticrew, University of Northern British Columbia, 3333 University Way, Prince George, BC Canada, V2N 4Z9; Tel: +1 250 759 2115; Fax: +1 250 960 4270; E-mail: iasws@unbc.ca)

May 6–8
ENVIRSOFT 2002 (Ninth International Conference on Development and Application of Computer Techniques to Environmental Studies), Berger, Norway. (Contact: Lucy Southcott, Conference Secretariat, Envirosoft 2002, Wessex Institute of Technology, Ashurst Lodge, Ashurst, Southampton SO40 7AA, UK. Tel: +44 (0) 236 029 3223; Fax: +44 (0) 236 029 2853; E-mail: lsouthcott@wessex.ac.uk; Website: http://www.wessex.ac.uk/conferences/2002/env02/)

May 12–14
OCURRENCE AND MECHANISMS OF FLOWS IN NATURAL SLOPES AND EARTHILLS — IW-FLOW2002, Naples, Italy. (Contact: Website: http://www.unina2.it/iwflows2002)

May 20–23
INTERNATIONAL CONFERENCE ON INSTABILITY, Ventnor, Isle of Wight, UK. (Contact: Robin G. McInnes, Centre for the Coastal Environment. Fax: 44 1983 855859; E-mail: conference@iwight.gov.uk)

May 20–24
THE SIXTH INTERNATIONAL SYMPOSIUM ON THE GEOCHEMISTRY OF THE EARTH'S SURFACE (GES-6), Honolulu, Hawaii, USA. Sponsors: The School of Ocean & Earth Science & Technology of the University of Hawaii, and The International Association of Geochemistry and Cosmochemistry (IAGC)

May 26–31
12TH INTERNATIONAL SOIL CONSERVATION, Beijing, China. (Contact: Website: http://www.geotechnique.org)

May 27–30
EUROPEAN ASSOCIATION OF GEOSCIENTISTS AND ENGINEERS (63rd Conference & Technical Exhibition), Florence, Italy. (Contact: Website: http://www.eage.nl/)

May 29–31
GREEN PROCESSING 2002, "International Conference on the Sustainable Processing of Minerals, Cairns, Australia. (Contact: Miriam Way, AusIMM, P.O. Box 660, Carlton South, victoria, Australia 3053. Tel: +61 3 96623166; Fax: +61 3 96623662; E-mail: conference@ausimm.com.au; Website: www.ausimm.com)

June 2–5
43RD WELL LOGGING SYMPOSIUM, Oiso, Japan. (Contact: Ms. Shizu Kobayashi, Schlumberger K.K. Tel: 81 42 759-2115; Fax: 81 42 759-4270; E-mail: kobayss@fuchinobe.skk.slb.com)

June 3–7
ZEOLITE 2002, Aristotle University, Thessaloniki, Greece. (Contact: Website: http://www.chem.auth.gr/activities/zeo2002/)

June 17–20
CALIBRATION AND RELIABILITY IN GROUND WATER MODELLING, Prague, Czech. (Contact: ModelCARE2002, Opletalova, 22, AZ-110 00 Prague 1, Czech Republic. Tel: 420 2 8400 1444; Fax: 420 2 8400 1448; E-mail: modelcare2002@guarant.cz; Website: http://www.guarant.cz/ModelCARE2002)

June 18–20
RECYCLING AND WASTE TREATMENT IN MINERAL AND METAL PROCESSING, Lulea, Sweden. (Contact: E-mail: caisa.samuelsson@km.luth.se)

June 19–21
RISK ANALYSIS 2002 (Third International Conference on Computer Simulation in Risk Analysis and Hazard Mitigation), Sintra, Portugal. (Contact: Conference Secretariat, RISK02, Wessex Institute of Technology, Ashurst Lodge, Ashurst, Southampton, SO40 7AA, UK. Tel: 44 (0) 238 029 3223; Fax: 44 (0)
June 30 – July 5
16TH AUSTRALIAN GEOLOGICAL CONVENTION, Geoscience 2002: Expanding Horizons, Adelaide Convention Centre, Adelaide South Australia. (Contact: the Organising Committee, 16th Australian Geological Convention, c/o The Secretary GSA (SA Division), P.O. Box 295, Kent Town, SA 5071. E-mail: info@16thagc.gsa.org.au; Website: www.16thagc.gsa.org.au)

July 6–10
FIRST INTERNATIONAL PALAEONTOLOGICAL CONGRESS, Sydney, Australia. (Contact: Jophn A. Talent, MUCEP, Earth and Palaeontological Sciences, Macquarie University, NSW 2109, Australia. Fax: +61 2 9850 6053; E-mail: IPC2002@mq.ed.au; Website: www.es.mq.edu.au/mucep)

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July 8–12
GEOLOGY OF THE DEVONIAN SYSTEM, Syktvykar, Russia. (Contact: Website: http://sds.uta.edu/aras-update/russian-academy-of-sciences.htm)

July 21–25
9TH INTERNATIONAL PLATINUM SYMPOSIUM, Billings, Montana, USA. Sponsored by IGCP 427/SEG/SGA. (Contact: Website: http://www.platinumsymposium.org/)

July 22–26
THIRD INTERNATIONAL CONFERENCE ON WATER RESOURCES AND ENVIRONMENT RESEARCH (ICWRER), Water quantity & quality aspects in modeling and management of ecosystems, Dresden, Germany. (Contact: Conference Secretariat ICWRER 2002, Institute of Hydrology and Meteorology, Dresden University ofTechnology, Wuerzburger Str. 46, 01187 Dresden, Germany. Tel: +49-351-463 3931; Fax: +49-351-463 7162; E-mail: icwrer2002@mailbox.tu-dresden.de; Website: www.tu-dresden.de/fghhihm/hydrologie.html)

July 22–26

August 11–15
4TH INTERNATIONAL CONGRESS ON ENVIRONMENTAL GEOTECHNICS, Rio de Janeiro, Brazil. (Contact: Tel: +55 21 290-1730; Fax: +55 21 280-9545; E-mail: 4iceg@pec.coppe.ufrj.br; Website: www.4iceg.ufrj.br)

August 25–30
GONDWANA 11: CORRELATIONS AND CONNECTIONS, Gateway Antarctica, University of Canterbury, Christchurch, New Zealand. (Contact: Tel: +64-3-364 2136; Fax: +64-3-364 2197; E-mail: s.hawtin@anta.canterbury.ac.nz or gateway@anta.canterbury.ac.nz; Website: www.anta.canterbury.ac.nz)

September 1–5
17TH WORLD PETROLEUM CONGRESS, Rio de Janeiro, Brazil. (Contact: Brasoc — Brazilian Organizing Committee, Tel: +55 21 2282 2002; Fax: +55 21 2282 2005; E-mail: brasoc@wpc2002.com; Website: www.wpc2002.com)

September 1–6
MINERALOGY FOR THE NEW MILLENNIUM, Edinburgh, Scotland. (Contact: E-mail: info@minersoc.org; Website: www.minersoc.org/IMA2002)

September 12–22
6TH INTERNATIONAL SYMPOSIUM ON THE JURASSIC SYSTEM, Palermo, Sicily, Italy. (Contact: Dr. Luca Martire, Fax: 39 011 541755; E-mail: martire@dust.unito.it)

September 15–19
INTERNATIONAL CONFERENCE ON URANIUM MINING AND HYDROGEOLOGY, Freiberg, Germany. (Contact: E-mail: umh@geo.tu-freiberg.de; Website: www.geo.tu-freiberg.de/umh)
September 16-20  
INTERNATIONAL ASSOCIATION OF ENGINEERING GEOLOGY AND THE ENVIRONMENT (IAEG), "Engineering Geology for Developing Countries" (9th International Congress), Durban, South Africa. (Contact: South African Institute for Engineering and Environmental Geologists, P.O. Box 2812, Pretoria, 0001, South Africa. E-mail: saieg@hotmail.com; Website: home.geoscience.org.za/saieg/2002.htm)

September 22-27  
SOCIETY OF EXPLORATION GEOPHYSICISTS (72nd Annual Meeting and International Exposition), Las Vegas, Nevada, USA. (Contact: SEG Business Office, Tel: +1-918 497 5500; Fax: +1-918 497 5557; Website: seg.org/)

September 24-28  
URANIUM DEPOSITS: FROM THEIR GENESIS OF THEIR ENVIRONMENT IMPACTS, Prague, Czech. (Contact: Bohdan Kribek, Czech Geological Survey, 152000 Prague 5. Tel: 422 51085 518; Fax: 422 5817 390; E-mail: kribeck@cgu.cz)

October 15-19  
INTERNATIONAL WORKSHOP ON INTEGRATED WATER RESOURCE MANAGEMENT. Organised by the US Bureau of Reclamation, Denver, Colorado, U.S.A. (Contact: International Affairs Team, D-1520, US Bureau of Reclamation, P.O. Box 25007, Denver, CO 80225, U.S.A. Tel: +1 303 445 2127; Fax: +1 303 445 6322; E-mail: lprincipe@do.usbr.gov; Website: http://www.usbr.gov/)

October 21-25  
INTERNATIONAL ASSOCIATION OF HYDROGEOLOGISTS, "Groundwater and Human Development" (32nd International Congress), Mar del Plata, Argentina. (Contact: Dr. Emilia Bocanegra, Centro de Geologia de Costas y del Cuaternario, Facultad de Ciencias Exactas y Naturales, Universidad Nacional de Mar del Plata, Casilla de Correo 722, 7600 Mar del Plata, Argentina; Tel: +54 223 475 4060; Fax: +54 223 475 3150; E-mail: ebocaneg@mdp.edu.ar)

October 27-30  
GEOLOGICAL SOCIETY OF AMERICA (Annual Meeting), Denver, Colorado, USA. (Contact: Meeting Dept., P.O. Box 9140, Boulder, CO 80301-9140, USA. Tel: 1 303 447 2020; Fax: 1 303 447 1133; E-mail: meetings@geosociety.org; Website: www.geosociety.org/meetings/index.htm)

November 20-23  
ROLE OF NATURAL RESOURCES AND ENVIRONMENT FOR SUSTAINABLE DEVELOPMENT IN SOUTH AND SOUTHEAST ASIA, Dhaka, Bangladesh. (Contact: Ms. Afia Akhtar, Convenor, NESDA & Vice President, AGID, Director, Geological Survey of Bangladesh, 153 Pioneer Road, Segunbagicha, Dhaka 1000, Bangladesh. Tel: 880-2-418545 (O), 9337559, 9350412 (H); E-mail: afia@agni.com or mnhasan@agni.com; or Mr. Nehal Uddin, Member Secretary, NESDA, Deputy Director, Geological Survey of Bangladesh, 153 Pioneer Road, Segunbagicha, Dhaka 1000, Bangladesh. Tel: 880-2-9348318; E-mail: nehalu@bttb.net.bd)

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SIXTH INTERNATIONAL SYMPOSIUM ON ENVIRONMENTAL GEOCHEMISTRY, Edinburgh, Scotland. (Contact: John Farmer, Dept. of Chemistry, The University of Edinburgh, Joseph Black Building, Kings Buildings, West Mains Road, Edinburgh EHP 3JJ Scotland. Tel: 0131-650-1000; Fax: 0131-650-4757; E-mail: J.G.farmer@ed.ac.uk)

March 27-30  
NATIONAL EARTH SCIENCE TEACHERS ASSOCIATION (Annual Meeting), Philadelphia, Pennsylvania, USA. (Contact: NESTA, 2000 Florida Ave., N.W., Washington, D.C. 20009, USA. Tel: +1-202 462 6910; Fax: +1-202 328 0566; E-mail: fireton@kosmos.agu.org)

May  
INTERNATIONAL SYMPOSIUM ON KARST AND HARD ROCK FORMATIONS, Esfahan, Iran. (Contact: Dr. A. Afrasiabian, National Karst Study and Research Center, P.O. Box 15875-3584, Tehran, Iran. Tel: +98 21 7520474; Fax: +98 21 7533186)
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**7TH ICOBTE — INTERNATIONAL CONFERENCE ON BIOGEOCHEMISTRY OF TRACE ELEMENTS**, Uppsala, Sweden.  
(Contact: George R. Gobran. Fax: +46 (18) 67 34 30; E-mail: George.Gobran@eom.slu.se or ICOBTE7@slu.se; Website: [http://www.eom.slu.se](http://www.eom.slu.se))

### June 16-18

**5TH INTERNATIONAL CONFERENCE ON THE ANALYSIS OF GEOLOGICAL AND ENVIRONMENTAL MATERIALS**, Rovaniemi, Finland.  
(Contact: Website: [http://www.gsf.fi/geoanalysis2003](http://www.gsf.fi/geoanalysis2003))

### August 18-21

**9TH INTERNATIONAL SYMPOSIUM ON THE ORDOVICIAN SYSTEM, 7TH INTERNATIONAL GRAPTOLITE, AND FIELD MEETING OF THE SUBCOMMISSION ON SILURIAN STRATIGRAPHY**, San Juan City, Argentina.  
(Contact: ISOS: Guillermo L. Albanesi. E-mail: galbanesi@arnet.com.ar or Matilde S. Beresi. E-mail: mberesi@labocricyt.edu.ar; IGC-SSS field meeting: Gladys Ortega. E-mail: gcortega@arnet.com.ar or Guillermo F. Aceñolaza. E-mail: acecha@unt.edu.ar)

### September 15-18

**INDUSTRIAL MINERALS AND BUILDING STONES — IMBS 2003**, Istanbul, Turkey.  
(Contact: Erdogan Yüzer, Maden fakultesi, Ayazaga KampüsÜ, 80626 Maslak/Istanbul, Turkey. Tel/Fax: 90 212 285 61 46; E-mail: yuzer@itu.edu.tr)

### September 22-26

**1ST INTERNATIONAL CONFERENCE — GROUNDWATER IN GEOLOGICAL ENGINEERING**, Ljubljana, Slovenia.  
(Contact: Slovene Committee of IAH, Andrej Juren, Kebetova 24, SI-1000 Ljubljana, Slovenia. E-mail: andrej.juren@siol.net or Nadja Zalar, E-mail: nadja.zalar@siol.net; Website: [http://www.iah.org](http://www.iah.org))

### September 28 – October 3

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

### November 2-5

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

### March 27 – April 4

**NATIONAL EARTH SCIENCE TEACHERS ASSOCIATION (Annual Meeting)**, Atlanta, Georgia, USA.  
(Contact: NESTA, 2000 Florida Ave., N.W., Washington, D.C. 20009, USA. Tel: +1-202 462 69 10; Fax: +1-202 328 0566; E-mail: fireton@kosmos.agu.org)

### August

**32ND INTERNATIONAL GEOLOGICAL CONGRESS**, Florence, Italy. Congress theme: "The Renaissance of Geology: From the Mediterranean area toward a global Geological Renaissance-Geology, Natural Hazards, and Cultural Heritage".  
(Contact: E-mail: 32igc@32igc.org; Website: [http://www.32igc.org](http://www.32igc.org))

### October 10-15

**SOCIETY OF EXPLORATION GEOPHYSICISTS (74th Annual Meeting and International Exposition)**, Denver, Colorado, USA.  
(Contact: Debbi Hyer, 8801 S. Yale, Tulsa, OK 74137, USA. Tel: (+1-918) 497 5500; E-mail: dhyer@seg.org; Website: [meeting.seg.org](http://meeting.seg.org))
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<td><strong>• DECISION ANALYSIS FOR PETROLEUM EXPLORATION (2nd ed.),</strong> by Paul Newendorp &amp; John Schayler. Planning, 2000. 606pp., hardback, USD64.95.</td>
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**General Information**

Papers should be as concise as possible. However, there is no fixed limit as to the length and number of illustrations. Normally, the whole paper should not exceed 30 printed pages. The page size will be 204 x 280 mm (8 x 11 inches).

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**Script Requirements**

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

**Two copies** of the text and illustrations must be submitted. The scripts must be typewritten double-spaced on paper not exceeding 210 x 297 mm (8.27 x 11.69 inches, A4 size). One side of the page must only be typed on.

**Figure captions** must be typed on a separate sheet of paper. The captions must not be drafted on the figures. The figure number should be marked in pencil on the margin or reverse side.

**Original maps and illustrations** or as glossy prints should ideally be submitted with sufficiently bold and large lettering to permit reduction to 18 x 25 cm: fold-outs and large maps will be considered only under special circumstances.

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