

I A S **INTERNATIONAL ASSOCIATION OF SEDIMENTOLOGISTS**

NEWSLETTER

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IAS
6th
REGIONAL MEETING
LLEIDA - SPAIN

EDITORIAL LETTER
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SOME THOUGHTS ABOUT CLASSIFICATION IN SEDIMENTOLOGY

Recently I received a manuscript for review from one of the major sedimentologic journals. It was a paper proposing a classification scheme for mixtures of clastic quartz and carbonate particles and suggested a tetrahedral scheme, with the tetrahedron subdivided along regular percentage boundaries. The paper was well written, I could not recall any existing classifications of such materials, and interest in quartz-carbonate mixtures does seem to have increased in recent years. Should I recommend publication? Clearly, an infinite number of classificatory schemes are possible for mixtures of particles based on mineralogy, grain size, mode of origin, grain shape, and many other criteria. How does one decide which classification schemes serve the interests of science and our profession and which ones are simply clutter and detract from what must be our major objective: the search for understanding of Father Nature's processes and mechanisms?

I believe that the best classification schemes satisfy three essential criteria.

1) Science aims at knowledge that is objective in the sense of being verifiable among observers, independently of individual opinion or preference, on the basis of data obtainable by suitable experiments or observations. This requires that the terms used for description have clearly specified meanings and be understood in the same sense by all who use them. Examples of widely accepted and satisfactory terms include those in the Wentworth grain size scale; "medium grained sand" and "coarse grained silt" have the same meaning to us all. Similar acceptance has been accorded terms such as pyrite, limestone, and porosity. Examples of linguistic disasters include "subangular", "friable", and the ever-popular "gray-wacke". The reasons these latter three terms fail in usefulness are several. Visual descriptions of angularity are inherently subjective because of variations in human psychology and physiology, and recent ideas concerning the quantification of roundness have

relied on machine determinations and mathematical analysis. Friability determinations depend on machoness and probably correlate as well with one's ability to collapse an empty beer can as on the percentage of cement in the rock specimen. The nefariousness of graywacke usage is too painful for me to even discuss. Breathes there a man with soul so dead, who never to himself hath said "Lord, I wish that term would disappear" ?

2) Classifications should attempt to "carve nature at the joints". Such discontinuities are not always present, of course, because most natural processes are a continuum. But at least we should avoid needless terminology. For example, as several studies have shown, carbonate rocks have a strong tendency to be composed of more than 90 % calcite or more than 90 % dolomite; subequal mixtures of the two minerals are quite uncommon. Surely we do not need terms for each 10 % change in the amounts of these two minerals. Thankfully, none has been proposed. Another useless term is "ankerite". It seems to me that "ferrous dolomite" is entirely adequate.

3) A new classification should be based on a concept different from preceding classifications of the objects being described. For example, Folk's 1959 classification of limestones and Dunham's 1964 effort were excellent because they both guided our thoughts about these rocks into new and productive channels. Krynine's 1946 paper introducing a sandstone triangle with mineralogic poles is another example. Examples of classifications that are non productive include the many different internal carvings of sand-silt-clay triangles and the mineralogic triangles that differ mainly in whether an "arkose" should contain 10 % or 25 % feldspar and concurrently introduce a new set of terms. The concepts used in our classifications will change with advances in sedimentologic understanding. If a proposed classification scheme lacks a new concept its value is suspect.

Classification, ideally, is a yes-or-no, an either-or choice. A class is determined by specific defining characteristics, and a given object falls either into this class or outside, depending on whether it has or lacks the defining characteristics. In scientific practice, however, gradations between adjacent classes are common and when the gradations are uniform, internal subdivision is unjustified. The essential features of a new classification should be 1) an objectively verifiable grouping; 2) internal carvings at discontinuities or natural minima in a continuum; 3) based on a new concept resulting from progress in the discipline.

(from H. Blatt, USA)

A S S O C I A T I O N N E W S

INDIA

(from S.M. Casshyap, A.M.U. Aligarh)

REPORT ON VARIOUS CONFERENCES OF SEDIMENTOLOGICAL
INTEREST IN INDIA DURING 1983-84

1. Symposium on Petroliferous Basins of India, Dehra-
dun, Nov. 21-24, 1983.

The Keshav Deva Malviya Institute of Petroleum Exploration (KDM-IPE), Oil and Natural Gas Commission (ONGC) organized a symposium on Petroliferous Basins of India at the headquarters in Dehradun from Nov. 21-24, 1983. The symposium got an enthusiastic response from within the country and overseas, and some 450 delegates participated including some from US, UK and other countries. The main thrust of the papers was on the likely potentials of oil bearing basins on land and off shore. The papers presented at the symposium, after the editorial review, will form a part of the proceedings which are under publication by the Organizers of the symposium at KDM-IPE. One of the features of the symposium was a special volume on "Petroliferous Basins of India" which was brought out by the Petroleum Asia Journal. The volume includes topical contributions incorporating reviews and analysis of different basins in terms of their hydrocarbon potential. This publication costing US \$ 50.00 can be obtained from the Himachal Times Group of Newspapers, Himachal Times Building, 57-B, Rajpur Road, Dehradun, India.

2. International Symposium on Recent Advances in Quan-
titative Stratigraphic Correlation and a Short
Course on New Concepts and Methods in Stratigraphy,
IIT Kharagpur, Dec. 12-17, 1983.

An International Symposium on Recent Advances in Quantitative Stratigraphic Correlation followed

by a Short Course on New Concepts and Methods in Stratigraphy were held at the Department of Geology and Geophysics, Indian Institute of Technology, Kharagpur from Dec. 12-17, 1983. The symposium which was the final meeting of the International Geological Correlation Programme (IGCP Project 148) and the Short Course were co-sponsored by the IGCP, IIT Kharagpur, Geological Survey of India, Oil and Natural Gas Commission and, Coal India Limited.

Some 150 delegates participated in the symposium and presented papers on the following themes :

- 1) quantitative bio-stratigraphic correlation;
- 2) quantitative lithostratigraphic correlation;
- 3) problems of economic stratigraphy;
- 4) quantitative stratigraphy.

The Short Course which lasted from Dec. 14-17, 1983 comprised of elaborate lectures and discussions by eminent biostratigraphers and quantitative sedimentologists including Dr. F.P. Agterberg, Dr. G.S. Watson, Dr. W. Schwarzacher, Dr. J.C. Brower, Dr. F.M. Gradstein, Dr. J.E. Van Hinte, and Dr. B.K. Ghose.

The papers presented at the symposium shall be published in a special issue of the India Journal of Earth Sciences. The information regarding Abstract volume and the forthcoming publication can be had from Dr. B.K. Ghose, IIT Kharagpur.

3. Fourth Convention, Indian Association of Sedimentologists, AMU Aligarh, Feb. 20-22, 1984.

The Fourth Convention of the Indian Association of Sedimentologists was held from Feb. 20-22, 1984 at the Department of Geology, Aligarh Muslim University, Aligarh. The convention aimed at discussing papers on "Current researches in pure and applied sedimentology", with special reference to energy resources, and sedimentary rocks and sedimentary basins of India. This convention was co-sponsored by the Atomic Minerals Division of the Department of Atomic Energy, Govt. of India, and supported by the Oil and Natural Gas Commission, University Grants Commission, Council of Scientific and Industrial Research, and the Department of Science and Technology.

The convention attracted 102 registrants, of whom some 60 came from various Indian Universities and several Government organizations including Geolo-

gical Survey of India, Oil and Natural Gas Commission, Atomic Minerals Division, State Directorates of Geology and Mining, and National Research Laboratories. 76 abstracts were published covering the following themes :

- 1) sedimentary basins and energy resources;
- 2) sedimentary facies, depositional environments, and ecology of Phanerozoic rocks;
- 3) stratification, bed forms and texture of sedimentary deposits - recent and ancient;
- 4) petrology and diagenesis of clastic and non-clastic sedimentary rocks;
- 5) statistical models of sedimentary facies;
- 6) Precambrian sedimentology and sedimentary ore deposits.

The convention discussed as many as 15 papers on the genesis, occurrence and problems associated with atomic mineral deposits, oil and gas bearing sedimentary basins, and coal. Many ideas were presented and debated regarding our resources and limitations in these strategic mineral deposits. There was a great rush of papers dealing with modern and ancient sedimentary environments and their clastic, non-clastic and mineral deposits. There were some thought provoking papers with far reaching implication on local and regional stratigraphic correlation in the lesser Himalayan Belt.

The proceedings of the convention shall be published in the next two issues of the Journal, Indian Association of Sedimentologists. The above publication and copies of Abstract Volume can be obtained from :

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National Correspondent I.A.S.
c/o Department of Geology
Aligarh Muslim University
Aligarh
INDIA

ISRAEL
(from A. Bein)

The Israel Geological Society held its annual meeting on 24-27 of April in the desert town of Arad. The meeting, which was attended by 205 members of the society included oral presentation, poster exhibits and field trips. Of the 61 topics discussed at

the meeting, 17 were dedicated to sedimentological related subjects. Others concentrated on hydrology, tectonics and hard rocks. Sedimentologic studies included the application of trace element and isotope ratios to solve questions regarding depositional environments, paleotemperatures and burial diagenesis. Other studies discussed depositional regimes as deduced from petrographic and sequence analysis, and water-rock interaction.

Many presentations focussed on various aspects regarding phosphorite composition and origin, following the increased importance of this ore in the country's economy. Topics on phosphorites, discussed at the meeting, included phosphorite deposition at the front of a transgressing sea, oxygen isotope ratio in apatite of fossils and other rock particles, and the role of cyanobacterial mats in upgrading of phosphorites. These topics complement several detailed studies completed recently on organic matter composition, trace element distribution and isotope ratios in apatites, carbonates and organic matter associated with phosphorites.

One of the field trips was dedicated to the newly discovered Arad phosphate field and to the nearby Hatrurim feature which represent a complex mineralogical record of a self combustion event of oil shales found on top of the phosphorites. Two field trips focussed on the Dead Sea fault escarpment and on related tectonic and sedimentological features. These include evidence for strike slip movements, young fluviatile and lacustrine deposits and epigenetic dolomitization. The tectonic evolution of the Negev monoclines as observed in their erosional cirques; Jurassic and Eocene stratigraphy and depositional regimes and Quaternary terraces and prehistoric sites were visited and discussed in other field trips.

The meeting was very lively and concentrated; participants benefitted from the scientific and friendly atmosphere and enjoyed the convenient accommodations and facilities.

The proceedings of the meeting (in English) including abstracts of all presentations and the field trip guides may be obtained upon request from the Library, the Geological Survey of Israel, 30 Malkhe Yisrael Street, Jerusalem 95 501, Israel (please add \$ 6.00 to cover cost and mail expenses).

U.K.
(from P. Allen)

EUROPEAN DINANTIAN ENVIRONMENTS. First meeting, Manchester, April 11-13, 1984

Conference report written by G. Walkden, Aberdeen University.

As judged by numbers of participants and diversity of papers, this international first meeting of Dinantian devotees was not before time. Fuelled partly by renewed economic interest, Dinantian research has been a conspicuous growth area over the last decade, but its specialist needs have been served hitherto only by the Palaeontological Association's Carboniferous Group annual field meetings.

This new conference, brought to fruition by organizers Tony Adams, Trevor Burchette, John Miller, and Paul Wright, galvanised many into completing or contemplating topics that might otherwise have languished. Even tried set pieces were garnished with new ideas.

Of the 120 participants, nearly one third were from non-British institutions, including welcome delegates from Eastern Europe. Topics covered during the two and a half days included tectonic frameworks, palaeogeography, basin and platform development, regional and case studies, facies models, cyclicity, diagenesis, palaeontology, and economic prospects. Abstracts were compiled well beforehand and published for the conference as a softback volume. A few found it difficult to stick to what was said in abstract by the time their papers were finalised, but abstracts are a welcome aid to digestion and memory.

It is impossible to identify objectively the most valuable contributions but three appealed to me, representing synthesis on three orders of magnitude from international down to local. These concerned the tectonic framework of the European Dinantian (Mike Leeder); the evolution of two Middle European geosynclines (Jaroslav Dvorak); and shallow water sediments in Bower, South Wales (Tony Ramsay). Buzzwords included "hummocky", "packets", "signatures", "palaeokarsts", "tiltblocks", and "plays". Field excursions were organized by Ian Somerville and Dave Grey (North Wales) and by Gordon Walkden and Murray Mitchell (Derbyshire).

A conference volume entitled "European Dinantian Environments" containing a selection of contributions is being edited by Adams, Miller and Wright. It will be published early next year both in hardback and paperback by Shiva Publishing, Nantwich, Cheshire, CW5 5RQ. The volume of abstracts is available now (Eur. Dinant. Envir. 1st Mtg. 1984 Abstr., Dept. Earth Sciences, Open University) from Tony Adams, Dept. Geology, University of Manchester, M13 9PL.

This was a friendly and productive conference, organized with efficiency and the minimum of fuss. Personalities took a backseat whilst ideas came to the front. The Dinantian has been broken of its unfair image as the province of a few high-ranking cogniscenti. The next meeting is likely to be in Germany in 1988.

(G. Walkden, Univ. Aberdeen)

A N N O U N C E M E N T S

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IGCP PROJECT NR. 219

COMPARATIVE LACUSTRINE SEDIMENTOLOGY IN TIME AND SPACE

At their February 1984 Paris meeting, the International Geological Correlation Project executive committee approved Project 219 to run from late 1984 to late 1987. IGCP Project 219 will be an informal group linked by common interests in the geologic record of lacustrine deposits and their significance. The goal is to define and compile the facies distribution of large systems according to time slices and paleotectonic reconstructions. It will require the input and exchange of a large number of colleagues, many of which may have hitherto worked in local areas or in lesser developed regions.

There is an increased interest in lake deposits, both from their economic potential as hydrocarbon source beds or mineral deposits, and from their high resolution record of local climate or events. Because of

the variability of lacustrine depositional environments which range from pure chemical to biological to clastic, and the difficulties of telecorrelation of regional deposits, there is meagre literature available which views lacustrine deposition uniformly on a global scale and through geologic time.

The goals of compilation require that we rethink the criteria with which to recognize extent, water chemistries and tectonic setting of such ancient deposits. Progress will be necessary in a number of critical problems concerning dating and correlation. The project should encourage the application of newer methods from stable isotope geochemistry, paleoaltimetry, paleomagnetism, paleoceanography and dating but also has ample room for contributions from solid field sedimentology. An IGCP project focused on lacustrine deposits will help increase the awareness of many geologists to the valuable record they contain, and perhaps clarify misconceptions which are a result of the fragmented approach to lacustrine deposition common in geologic literature.

In order to compile the occurrence of lacustrine complexes, better models of facies distribution must be developed from the study of modern environments. These must take into account the rate of changes possible for lakes and what simple criteria might be derived from the record in order to make paleoenvironmental reconstructions which differentiate according to some categories such as :

- water budget : open or closed
- depth : shallow or deep, littoral or basinal
- salinity : fresh, dilute, brackish, penehaline, saline, hypersaline
- chemistry : alkaline, carbonate, sodium chloride, acid, ...
- stratification : biota, mineralogy, organic matter, diagenesis
- tectonics : rift, plateau, warp, meteor, paleolatitude

GOAL : A GLOBAL VIEW OF LACUSTRINE GIANTS BASED ON
PLATE-RECONSTRUCTED GEOLOGICAL TIME SLICES

- Their facies and sequence
- Their paleoenvironmental record
- Their paleoclimate record
- Their tectonic significance
- Their economic significance

PROBLEMS :

- Methodology for facies and sequence analysis
- Criteria for depth, chemistry, salinity, size
- Significance of lacustrine carbonates
- Rates of environmental change
- Correlation tools and dating resolution

APPROACH :

- RECENT LAKES : Actualistic Process Models
- QUATERNARY LAKES : Tests of High Resolution Criteria
Diagenesis
- TERTIARY :
MESOZOIC : Compilation/Application
PALEOZOIC : Geologic History
PRECAMBRIAN :

If the proposal strikes a chord of interest and you would like to be a member of IGCP WG Nr. 219, write to :

Dr. Kerry Kelts
Geological Inst.
ETH-Z
CH 8092 Zurich, Switzerland

(Project Leader IGCP WG 219)
tel. (41) (1) 256-3703
telex 53178 ethbi CH

GROUP ON GRAINSIZE ANALYSIS

The IUGS Committee on Sedimentology has established a Working Group on Grainsize Analysis, convened by Dr. J.P.M. Syvitski (Atlantic Geoscience Centre, Box 1006, Dartmouth, N.S., Canada B2Y 4A2). The decision to establish the Working Group came as a result of responses received to a request for expression of interest circulated in 1983. A major concern of the Working Group will be inter-callibration of various automatic systems used for grainsize analysis.

FUTURE MEETINGS

October 26-28, 1984

MOROCCO (Rabat)

MEETING ON SEDIMENTARY BASINS OF MOROCCO

- presentation of papers and posters
- fieldtrip in the Paleozoic of Central Morocco

Contact : Ms. Naima Hamoumi
Département de Géologie
Faculté des Sciences de Rabat
B.P. 1014
Rabat
Morocco

November, 1984

INDIA (Lucknow)

The Indian Association of Palynostratigraphers (IAP) are organizing a symposium on "Gondwana of India" in November 1984 at Lucknow. Prospective contributors may contact :

Dr. R.S. Tiwari, Convener
c/o Birbal Sahni Institute of Paleobotany
P.O. Box 70
Lucknow - 226 007
INDIA

January 3rd, 1985

INDIA (Lucknow)

The 70th meeting of the Indian Science Congress will be held at Lucknow from Jan. 3rd, 1985. The Section of Geology and Geography will be chaired by Prof. V.K. Verma, Department of Geology, Delhi University, Delhi - 110 007, INDIA.

February, 1985

INDIA (Hyderabad)

The Fifth Convention of the Indian Association of Sedimentologists will be held at Hyderabad in February 1985. The convention will discuss papers on fundamental and applied sedimentology,

modern and ancient sediments and sedimentary environments, tectonics and sedimentation and quantitative sedimentology. Interested contributors may contact :

Prof. B.E. Vijyam
Department of Geology
Osmania University
Hyderabad (A.P.)
India

May 9-10, 1985

BELGIUM (Brussels)

PRE-PERMIAN EVAPORITES OF WESTERN EUROPE

The recent discovery of relatively thick evaporitic deposits in the Dinantian and Devonian of Western Europe (Belgium and France, U.K.), joined to outcrop indices of vanished or pseudo-morphosed sulfates have triggered considerable interest, about the sedimentological, paleogeographical and tectonic meaning and implications of such deposits in this part of the world. As scientific results are still fairly scattered, we felt it necessary to organize a 2-day meeting in order to up date our understanding of the related phenomena.

This meeting, co-organized by french group on evaporites GRECO 52 , the Société Belge de Géologie and the Belgian Sedimentological Group, will be held in Brussels, May 9-10, 1985.

Those of you who would like to join the meeting and present a paper should write to :

C.L.V. MONTY
Secrétaire du Groupe de Contact Sédimentologie
C.A.P.S.
Laboratoire de Paléontologie Animale
Université de Liège
7 place du Vingt-Août
4000 Liège
BELGIUM

so as to receive the second circular.

August 7-9, 1985

U.S.A. (Colorado)

THIRD INTERNATIONAL FLUVIAL SEDIMENTOLOGY CONFERENCE

Will be held at Fort Collins, Colorado.

Contact :

Conference Services
Colorado State University
Fort Collins
Colorado 80523
U.S.A.

Tel. : (303) 491-6222

August 19-24, 1985

CHILE (Antofagasta)

IVTH CHILEAN GEOLOGICAL CONGRESS

The Department of Geosciences of the Universidad del Norte-Antofagasta/CHILE is organizing the IVth Chilean Geological Congress, event to be held in Antofagasta during August 19th to 24th 1985.

Persons interested on the subject should refer to :

Organizing Committee
IVth Chilean Geological Congress
Department of Geosciences
Universidad del Norte
Casilla (Box) 1280
Antofagasta - CHILE
Phone : 222040-205

September 16-20, 1985

GERMANY (Jülich)

12TH INTERNATIONAL MEETING ON ORGANIC GEOCHEMISTRY

For information, write :

KFA Jülich GmbH
Conference Secretariat
P.O. Box 1913
D-5170 Jülich - Germany
Tel. : (02461) 61-6144
Telex : 833 556-70 kf d

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