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The KWI conduit

Karst Waters Institute

The KWI Conduit

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KARST WATERS INSTITUTE BOARD OF DIRECTORS MEETS IN WEST VIRGINIA

The Karst Waters Institute had its Annual Meeting at Charles Town, West Virginia on March 5-7, 1993. Attending were Board members Meg Colgate, Dave Culver, Rane Curl, Dan Fong, Janet Herman, Jack Hess, Bill Jones, Phil LaMoreaux, John Mylroie, Art Palmer, and Will White. Tom Kane and Bob Putz were absent because of prior commitments. Bill Berryhill, Lee Elliot, Bunnie LaMoreaux, Peg Palmer, Bette White, and Carol Wicks were present to assist in the meeting and report on certain KWI projects. After routine introductions and review of the minutes, John Mylroie, KWI President, provided a summary of KWI activities. A detailed report was submitted to the Board, which is summarized below.

The President's Report dealt with activities of the Karst Waters Institute since the last Board of Director's meeting on March 21, 1992. Activities not covered by the report, or not covered in detail, were dealt with by specific Committee reports and other actions as described on the meeting agenda. The **KWI Newsletter**, volume I number 2 (fall 1992) also explored some issues in more detail than was presented in the report.

The KWI is solvent but funds are modest. A key priority, and one that has not been dealt with adequately in the past year, is to develop a firm financial basis for the KWI. A number of options exist, but the difficult national economic situation will continue to be obstacles for KWI fund raising. The KWI has received its permanent not-for-profit status from the IRS. This is a major accomplishment for the KWI.

The KWI has made strides in linking with karst workers in the United States and abroad. The professional mailing list is over 100 names long and includes contacts in Austria, Canada, China, Germany, Great Britain, Greece, Italy, the Netherlands,

Norway, Philippines, South Africa, Yugoslavia [sic], and Vietnam, as well as 30 states in the U.S. The KWI Newsletter has proven to be an efficient way to introduce and explain the KWI to interested people, and to keep in communication with them. The appearance of the KWI press release late last spring in the magazine **EOS** brought in a flurry of inquiries. In the fall, the KWI also developed a logo and letterhead, which has worked out extremely well.

Projects underway include the Karst Hydrology Atlas of West Virginia, the Karst Hydrology and the Cave Biology short courses, and the Geomicrobiology Conference (see below). The KWI is also involved in the planning for the National Cave Research Institute under the auspices of the National Park Service.

The relationship of the National Speleological Society and the Karst Waters Institute is maturing. In March 1991, the NSS Board of Governors passed a general resolution supporting the mission, goals and objectives of the KWI. Jeanne Gurnee, current NSS President, has been asked to review the KWI and open a dialogue on how the KWI and the NSS could benefit each other. The topic of the **Bulletin** specifically mentioned, and contact has been initiated between Tom Rea, the NSS Executive Vice President (the supervising NSS officer for **bulletin** operations) and the Education and the Research Committees of the KWI to see what role the KWI could play in improving the **NSS Bulletin**.

The configuration of the KWI Board of Directors, and the election of Officers was discussed. The KWI needs to continue the process of bringing onto the Board people who can help us make the next step up in viability. Some Board members may rotate off into Officer or Committee positions. To date the KWI has succeeded because a few people have invested large amounts of time and effort. The workload needs to be spread out, not only to prevent burnout of existing personnel, but also so that the KWI can expand the amount of work we are doing.

KWI CONFERENCE ON KARST GEOMICROBIOLOGY AND REDOX GEOCHEMISTRY

The Karst Waters Institute will sponsor a symposium entitled "Breakthroughs in Karst Geomicrobiology and Redox Geochemistry," to be held February 16-19, 1994, at the Hilton Inn in Colorado Springs. David Culver is conference chair. The University of Colorado at Colorado Springs will be the local host, with Louise Hose and Stephen Ellis as coordinators. The Program Committee is chaired by Arthur Palmer, with Janet Herman, Tom Kane and Carol Wicks as members. The Conference Fund Raising Committee is made up of Jack Hess and Phil LaMoreaux.

The conference will bring together some of the top specialists in karst, microbiology, and carbonate sedimentology to discuss the latest advances in their fields. Although the focal point is karst systems that owe their origin to redox geochemistry, and the microbial communities that thrive on the chemical reactions, many of the participants will be in fields that are normally considered beyond the scope of karst science. Yet their work is highly pertinent to the understanding of karst systems, and recent karst research adds an entirely new dimension to these mainline fields that is not generally known outside the karst community.

Among the highlights of the symposium will be workshops that illustrate lab and field techniques, and a field trip to nearby Manitou Springs and Cave of the Winds. The field sites include active and relict features associated with hydrothermal waters and contain evidence of considerable oxidation/reduction activity.

There will be no published symposium volume except for printed two page abstracts. However, Dr. Henry Ehrlich, editor of the ***Geomicrobiology Journal*** and one of the keynote speakers at the conference, has asked that 5-10 participants submit their papers to the journal to summarize the topics discussed at the conference. Conference_reports will be submitted to **EOS** and **Geotimes**. Announcements for_the conference have been sent to **EOS**, **Geotimes**, and **GSA Today**; Tom Kane is submitting to the proper biology sources. The announcement gives subject, date and place, and refers the reader to Dave Culver, who will be able to respond to specifics. The_conference looks like it will be extremely successful, and the issue will not be to find participants, but to limit them.

A preliminary draft of the Program for the conference is given below:

BREAKTHROUGHS IN KARST GEOMICROBIOLOGY AND REDOX GEOCHEMISTRY

Sponsored by the Karst Waters Institute
in cooperation with the
University of Colorado at Colorado Springs

Feb. 16-19, 1994
Colorado Springs Hilton Inn

PROGRAM

February 16, 1994

6-10 p.m. -- REGISTRATION and WELCOMING RECEPTION

February 17, 1994

8 a.m. -- REGISTRATION

8:30 a.m. -- INTRODUCTION

Brief welcoming address: John Mylroie, President, Karst Waters Institute; Louise Hose, University of Colorado at Colorado Springs (UCCS); Stephen Ellis, Director, Center for Continuing Education, UCCS; David Culver, American University, Conference Chair.

9:00 a.m. -- SESSION 1: REDOX ENVIRONMENTS IN KARST

Chairs: Peter Smart, Fiona Whitaker, University of Bristol, UK.

Field examples of karst systems that have been significantly affected by redox reactions. Geology and geochemistry of sulfate/sulfide/carbonate systems. Mixing-zone geochemistry: island systems, seacoast aquifers, brines. Examples: Guadalupe Mountains, New Mexico; Bahamian seacoast aquifers; Black Hills sulfate/carbonate paleokarst; active hydrogen-sulfide caves.

10:30 a.m. -- Break

10:45 a.m. -- SESSION 2: ROLE OF MICROORGANISMS IN KARST PROCESSES

Chair: Henry Ehrlich, Rensselaer Polytechnic Institute.

Microbially mediated geologic processes. Identification of microorganisms; recognition of biogenic features, present and fossil. How do the various groups of microorganisms (bacteria, algae, cyanobacteria, fungi, etc.) differ in their chemical and geological influence?

Keynote address: "Redox Geomicrobiology -- microbial systems, processes, and products," Henry Ehrlich.

12:15 p.m. -- Lunch

1:15 p.m. -- SESSION 3: ENERGY, CHEMOAUTOTROPHY, AND THERMODYNAMICS IN MICROBIAL SYSTEMS

Chairs: Brian Kinkle, Thomas Kane, University of Cincinnati.

The energy balance -- chemoautotrophy and chemical reactions; the food chain; metabolic processes; effect on reaction rates. Microenvironments: to what extent are microorganisms able to influence their chemical environment?

Keynote Address: "Thermodynamics of karst processes," William White, Pennsylvania State University.

2:45 p.m. -- Break

3:00 p.m. -- SESSION 4: SULFATE/SULFIDE/CARBONATE SPELEOGENESIS

Chairs: Alexander Klimchouk, Ukraine Academy of Sciences, Kiev, and Kimberly Cunningham, USGS, Denver.

Redox processes in speleogenesis. Hypogenetic cave origin.
Keynote Address: "Thermal karst systems," Paolo Forti, Istituto Italiano di Speleologia, Bologna, Italy.

5:00 p.m. -- Dinner
7:00 - 10:00 pm -- POSTER SESSIONS and refreshments.
Displays and discussions of current work in an informal atmosphere.

February 18, 1994

9:00 a.m. -- WORKSHOPS -- field and lab techniques: Sampling trategies, preparation, identification, and analysis of microbial forms; statistical validity of samples; instrumentation, microscopy, photomicrography.

Probable workshop leaders to date: Isabelle Cozzarelli (USGS, Reston), identification and preparation of microbial samples; Rick Olson (National Park Service) and Margaret Palmer (Oneonta, NY), microscopy and photomicrography; James Pisarowicz (Montrose State College), sampling theory and statistical methods.

11:00 a.m. -- Lunch

12:00 - 9:00 pm -- FIELD TRIP to Manitou Springs and Cave of the Winds: examples of redox reactions in karst.

Trip Leaders: Fred Luiszer, Louise Hose (Univ. of Colorado); Donald Davis (Denver).

February 19, 1994

9:00 a.m. -- SESSION 5: MICROBIAL MEDIATION OF CARBONATE PRECIPITATION

Chairs: Henry Chafetz, University of Houston, and Robert Folk, University of Texas

Role of microorganisms in precipitation and recrystallization. Crystal forms and chemical variants. Biogenic speleothems. Stable isotopes in biogenic deposits. Economic geology of sulfate/sulfide/carbonate karst.

Keynote Address: "Microbial processes in the precipitation of carbonate minerals," Robert Folk and Henry Chafetz

10:30 a.m. -- Break

10:45 a.m. -- Session 5 (cont.)

11:45 a.m. -- Lunch

12:45 p.m. -- SESSION 6: COMPARISON OF MICROBIAL SYSTEMS IN KARST TO THOSE ELSEWHERE AND IN THE FOSSIL RECORD

Chair: David DesMarais, Ames Research Center, NASA

Can we match what we see in the geologic record with modern analogs? Comparison of karst geomicrobiology with that of other systems.

Keynote Address: "The importance of working in situ: Accessing natural microbial populations in deep-sea vents and chemoautotrophic karst," Norman Pace, Indiana University.

2:45 p.m. -- Break

3:00 p.m. -- SESSION 7: INTO THE LION'S DEN

Chairs: David Culver (American University), Peter Smart (University of Bristol)

Informal presentation of late-breaking ideas yet to be tested, controversial ideas for open

discussion, and open-ended questions to be posed to the entire group.

Examples: Are microorganisms protagonists or opportunists in redox systems? In catalyzing redox reactions, to what degree do microorganisms determine the chemical reactions? Or do they simply take advantage of existing reactions? Are the filamentous features in certain geologic samples biogenic? What role do microorganisms play in the solubility of carbonate rocks? What is their influence on crystal morphology? What are our plans for the future?

Conference Summary: Janet Herman, University of Virginia

5:00 p.m. -- Dinner, followed by informal discussions and refreshments in evening.

For further information, write or call:

David C. Culver, Conference Chair, Dept. of Biology, The American University, 4400 Massachusetts Ave., N.W., Washington, D.C. 20016 (phone 202-885-2194).

Arthur N. Palmer, Program Chair, Dept. of Earth Sciences, State University of New York, Oneonta, NY 13820-4015 (607-432-6024).

Louise Hose, Local Coordinator, Dept. of Geology, P.O. Box 7150, University of Colorado, Colorado Springs, CO 80933 (719-593-3223).

KWI CURRENT ACTIVITIES

Karst Waters Institute Committees - The KWI has an evolving committee structure which is used to execute the activities of the KWI. The reports of the various committees are given below. Any friend of the KWI who is interested in particpating with one or more of the committees is encouraged to contact the appropriate committee chair.

I. Karst Waters Institute Research Committee - Will White, Chair. The main issue at the moment is for the KWI to set its "niche" so that it has a clear focus in how and where it wants to obtain support and conduct research. Specific projects already under investigation:

A. Karst Hydrology Atlas of West Virginia - Bill Jones reported that funding has been sought from the Conservation Fund to support this project, and that matching funds may be available through another agency. Currently on hand is the $450 obtained from the National Speleological Society and the Cave Research Foundation as initial seed money for the Atlas. Most work to date has been in obtaining and dealing with the cave data base. Some dye tests will be run to fill in some major blanks on the map. If all the money comes through, then a GIS computer approach can be done to yield, eventually, a final, camera-ready product. Once that is in hand, then publisher options will be considered (publishers are more responsive when a manuscript is already in hand).

The Atlas will concentrate on the 17 eastern counties where the karst has been most extensively studied and where major carbonate aquifers exist. The Atlas will present the data as a bound series of state and county maps, with accomapnying text and graphics. The state maps will present:

1) Carbonate outcrop area and major geologic structures;
2) Major karst drainage basins and physiographic provinces;
3) Climatological data;
4) Troglobite and endemic species abundances.

The detailed county maps will show:

1) Percent carbonate outcrop and major carbonate aquifers;
2) Distribution of caves and springs;
3) Karst drainage basins and summaries of tracer test results;
4) sinkhole densities;
5) water budgets, spring discharge and storm response, and well yields.

It is anticipated that the Atlas will be printed on 11" x 14" sheets and that the scale for the state maps will be about 1:1,300,000 and about 1:250,000 for the county maps. Photographs of major karst landscapes and graphical plots of statistical data will supplement the maps.

Karst aquifers provide the major source of ground water for the eastern third of West Virginia. Large carbonate springs form numerous "Spring Creeks" which are (or should be) important trout fisheries. Caves and the unique animals associated with them are major natural features of the state. However, carbonate aquifers are easily contaminated by surface activities and the contaminants may travel miles underground in a matter of days. The proposed Atlas will provide planners, hydrogeologists, biologists, and environmentalists a ready reference to identify sensitive karst areas and plan future growth and development to minimize environmental impacts on this important hydrologic resource.

B. Poultry Waste in Karst - Bill Berryhill reported that $600 had been obtained as seed money ($100 from the NSS, $500 from the CCV). Preproposals had been sent out to a number of private foundations, no positive responses as yet.

C. The National Cave Research Institute (NCRI) issue remains uncertain. In November of 1992, John Mylroie reviewed a draft document that summarized the outcome of the August, 1992 meeting held by the Park Service in Albuquerque, New Mexico. The next step will be to develop language that can be converted into a bill for Congress. The funding situation is uncertain, and it may be some time before things get sorted out.

II. Promotional Subcommittee - Janet Herman, Chair.

A. The letterhead is completed and in use.

B. The brochure has moved to the production stage.

III. Education Committee - Dave Culver, Chair

A. Karst Hydrology and Cave Biology Minicamp Program - Dave Culver and Bill Jones, Program Coordinators. All the expenses are covered by a grant from the Cave Conservancy of the Virginias (CCV). The past camps have been successful, and may

be funded on a regular basis.

B. Dave Culver and John Holsinger are in the initial stages of considering a workshop for Natural Area planners.

IV. The Documentation Subcommittee - Rane Curl, Chair. This Committee was changed to the Ad Hoc Committee on Bylaws and Acts. Rane reported that all requests had been filled. He was requested to develop an organizational chart of the KWI, and to consolidate the KWI records into a complete set of Bylaws and Acts that can be distributed to the Board. Rane will also move forward with affiliation requests.

V. Ad Hoc Committee on Planning - Meg Colgate, Chair. The purpose of the committee, made up of M. Colgate, J. Herman, W. Jones, P. LaMoreaux, and J. Mylroie, is to analyze the KWI Mission Statement, Goals, and Objectives to better reflect how the KWI has evolved and where it is going.

VI. Fund Raising Committee, Phil LaMoreaux, Chair. The Committee will develop plans to provide the KWI with a stable financial base that will allow an increase in the scale of KWI operations.

Officers - The KWI officers for 1993 are:

President - John Mylroie
Vice President - Jack Hess
Secretary - Rane Curl
Treasurer - Bill Jones.

The next Board meeting will be in the early fall, as the KWI has developed enough that it cannot function on one meeting a year; too much is going on and these is a need to keep momentum. It was suggested that the KWI meet in late September by teleconference, as allowed by the Bylaws. This technique will also move the meeting procedure more into a Board that acts on previously distributed reports, and spends less time micromanaging every detail in meetings lasting two days, as is currently done.

Additions to the Board - there was much discussion of this issue. The Board needs three types of individuals: scientists to insure the focus of the KWI; money people to raise the financial support for the institute; and "politically connected" people to provide access.

KWI Board of Directors Address and Phone List

Margaret A. Colgate

8591-I Falls Run Road
Ellicot City, MD 21043
(410) 750 1494

Dr. David C. Culver
Department of Biology
The American University
4400 Massachusetts Avenue, N.W.
Washington, D.C. 20016
(202) 885-2194 (office)
(703) 777-5073 (home)
(202) 885-2182 (FAX)

Dr. Rane Curl, KWI Secretary
Department of Chemical Engineering
H. H. Dow Building
The University of Michigan
Ann Arbor, MI 48109-2136
(313) 764-3489 (office)
(313) 994-2678 (home)
(313) 763-0459 (FAX)
Userlb0w@umichum (bitnet)
Rane.Curl@um.cc.umich.edu (internet)

Dr. Daniel W. Fong
Department of Biology
The American University
4400 Massachusetts Avenue, N.W.
Washington, D.C. 20016
(202) 885-2174 (office)
(301) 577-2829 (home)
(202) 885-2182 (FAX)
DFONG@AUVM.american.edu

Dr. Janet Herman
Department of Environmental Sciences
University of Virginia
Charlottesville, VA 22903
(804) 924-0553 (office)
(804) 973-6063 (home)
(804) 982-2137 (FAX)
jsh5w@virginia.edu

Dr. John W. Hess, Jr., KWI Executive Vice President
Executive Director, Water Resources Center

Desert Research Institute
P.O. Box 19040
Las Vegas, NV 89132-0040
(702) 895-0451 (office)
(702) 895-0427 (FAX)
jack@lee.wrc.unr.edu.

William K. Jones, KWI Treasurer
P.O. Box 490
Charles Town, WV 25414
(304) 725-1211 (office)
(304) 725-2872 (home)
(304) 728-7225 (FAX; in town)

Dr. Thomas C. Kane
Department of Biological Science
The University of Cincinnati
Cincinnati, OH 45221-0006
(513) 556-9759 or 9760 (office)
(513) 556-5299 (FAX)

Dr. Philip LaMoreaux
P.E. LaMoreaux and Associates
P.O. Box 2310
Tuscaloosa, AL 35403
(205) 752 5543
(205) 752 4043 (FAX)

Dr. John E. Mylroie, KWI President
Department of Geology and Geography
P.O. Box 5167
Mississippi State, MS 39762
(601) 325-8774 (office)
(601) 324-1272 (home)
(601) 325 2907 (FAX)

Dr. Arthur N. Palmer
Department of Earth Science
State University College at Oneonta
Oneonta, NY 13820
(607) 431-3707 (office)
(607) 432-6024 (home)

Dr. Robert Putz
Freshwater Institute
P.O. Box 1746
Shepherdstown, WV 25443
(304) 876-2815 (office)
(304) 876-6764 (home)
(304) 876-0739 (FAX)

Dr. William White
210 Materials Research Lab
The Pennsylvania State Univ.
University Park, PA 16802
(814) 865-1152 (office)
(814) 237-3187 (home)
(814) 865-2326 (FAX)

Mission Statement of the Karst Waters Institute

To improve fundamental understanding and increase knowledge of karst water systems for more effective management of water resources, and to assist in the education of professionals and the public.

Goals of the Karst Waters Institute

1. Interdisciplinary karst research.
2. Advance scientific knowledge by fostering state-of-the-art karst research.
3. Solution of environmental and land use problems in karst regions.
4. Education.

Objectives of the Karst Waters Institute

1. Establish basin-wide approaches to karst research.
2. Promote collaborative research through a program of resident and visiting scientists.
3. Develop long-term karst studies.
4. Increase karst research funding.
5. Cooperative graduate education with degree-granting institutions.
6. Publication of research in leading journals in each
discipline, as well as in karst journals.
7. Sponsor national and international conferences and symposia, 8. Develop new techniques and methods in karst research.
9. Cooperate with the public and private sector on prevention and solution of karst problems.
10. Develop a National Karst Library and Data Base.

KWI Home