

The Ohio Journal of Science

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April Program Abstracts

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The Ohio Journal of Science

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99TH ANNUAL MEETING THE OHIO ACADEMY OF SCIENCE HOSTED BY WRIGHT STATE UNIVERSITY DAYTON

APRIL 27, 28 AND 29, 1990

Registration	ii
Registration Form	Last page
Parking	ii
Meals	ii
Housing	ii
Maps	viii
General Schedule	ii
All-Academy Lecture	iv
Presidential Address	v
Workshops	v
Field Trips	v
Abstracts of Technical Sections	1
Index to First Authors of Abstracts	51
Meeting Planning Form	52
Preparation of Manuscripts	Inside Back Cover

April Program Abstracts issue Edited by Lynn Edward Elfner

Cover: Scenes from Wright State University

Registration

Registration, required for all meeting participants, is in the lobby of the Physical Education Building.

Use registration form on last page.

Access to meeting rooms by name tag only

Pick up name tag at Registration Desk before attending sessions.

Parking

Friday, April 27, 1990

Please use Pacesetter Lot next to Physical Education Building or Visitor Lots.

Saturday, April 28, 1990

Please use any lots except A and H

Wright State University

Smoking Policy

Smoking in buildings is permitted only in identified areas with "designated smoking area" signs. Smoking is permitted in: 1) all outdoor areas, 2) private offices and, 3) identified areas of the University Cafeteria, the main section of the Rathskeller, and a portion of the Bicycle Shop.

Non-smoking areas include: 1) classrooms, laboratories, and conference rooms, 2) restrooms, 3) hallways and tunnels, 4) Faculty/staff dining room, 5) all lounges, including Allyn Hall lounge, 6) Bookstore, 7) libraries, 8) stairwells and elevators, 9) office reception and waiting areas, and 10) the Rathskellar alcove.

Meals

Friday Lunch - on your own. Tables will be reserved in the Faculty Dining Room.

Friday Dinner \$11.00

Saturday Lunch 8.00

Saturday Banquet 13.00

Restaurants near campus (across Colonel Glenn Highway) include: Arby's, Bob Evans, Chi Chi's, Flying Pizza, Frisch's, Holiday Inn Restaurant, McDonald's, Sal & Yogi's Yogurt & Deli, Shiro (Japanese/Sushi), Taco Bell, and Video Deli

Housing

April 27-29 is "Hamvention" weekend, the biggest weekend of the year for Dayton Hotels. Some rooms

have been placed on hold for OAS Annual Meeting attendees at the following locations:

Comfort Inn (20 rooms at \$38.95 per night)

616 North Broad Street

Fairborn, Ohio 45324

513/879-7666

Patterson Inn (40 rooms at \$48.00 per night)

800 North Broad Street

Fairborn, OH 45234

513/879-3920

Rooms at both locations will be held without a guarantee until 12 April 1990. When calling, identify yourself with the Academy's meeting. Both motels are near Wright State and fairly easy to reach from I-675.

General Schedule

FRIDAY, APRIL 27, 1990

8:00 AM -

3:00 PM Registration in Lobby - Physical Education.
Coffee will be available.

9:00 AM Section S - Library & Information Sciences
in Rooms 315-316 University Library

10:00 AM -

12:00 AM OAS Executive Committee Meeting
in 155A University Center

12:00 noon -

1:30 PM Lunch in Faculty Dining Room

1:00 PM Section H - Science Education.

Brassica "FAST PLANTS"

Teacher Workshop in 019 Biological Sciences

1:30 PM Section S - Library & Information Sciences
in Rooms 315-316 University Library

2:00 PM -

4:00 PM OAS Council Meeting in 155B/C
University Center

2:00 PM Section H - Science Education.
Micro-chemistry Teacher Workshop
in 017 Biological Sciences

3:00 PM Section H - Science Education.
Protein analysis Teacher Workshop
in 011 Biological Sciences

- 2:30 PM -
- 4:30 PM Ohio Biological Survey Executive Committee Meeting in 155A University Center
- 4:30 PM Hospitality Hour in Upper Hearth Lounge - University Center
- 5:30 PM -
- 7:00 PM Joint OAS/OBS Dinner in the Faculty Dining Room

**Special Guest Presentation
by
The Hon. Charles F. Horn**

Chairman, Ohio Senate Committee on
Economic Development, Science and Technology

**THE OHIO ADVANCED
TECHNOLOGY CENTER**

From the Wright Flyer in 1903 to the National Aerospace Plane of the 21st century, this tradition of invention and spirit of innovation continues to be Ohio's hallmark.

Across the nation the story of our ingenuity, of our practical approaches to problem-solving, and of our emerging leadership in the transfer of technologies to business and industrial communities is being told.

It's a story about dedication, hard work and cooperative ventures.

It's a story about the people of Ohio... from government, from business and from education, working together -- sharing new ideas and exploring new technologies.

It's about searching for answers to old problems and embracing the challenges of a new century as we move toward the year 2000.

It's a story about building new businesses, creating new jobs and successfully competing in the world marketplace. It's a story that began over seventy years ago... at

WRIGHT-PATTERSON AIR FORCE BASE...

A CATALYST FOR INVENTION...

A PARTNER IN INNOVATION...

A RESOURCE FOR THE FUTURE OF ALL OHIOANS.

Wright-Patterson Air Force Base is much more than just a military airport. As far back as 1918 it served as a supply depot and engineering repair center. What began as a single purpose supply depot has become the headquarters for the Air Force Logistics Command, responsible for the logistical support of all the major equipment and weapons systems of the Air Force.

As early as 1927, the Air Field became a major site for aerospace science and engineering research. It was also a primary center for technical education -- the forerunner of what is known today as the Aeronautical Systems Division and the Air Force Institute of Technology.

Wright-Patterson Air Force Base is a potent economic force in the state of Ohio. With employment in excess of 35,000, Wright-Patt is the largest single-site employer in the state. In fact, it employs more people than any other Air Force base in the world.

Wright Patterson organizations manage over \$63 billion annually.

Wright-Patterson accounts for most of the \$13.3 billion in economic impact that the Air Force has on Ohio.

This impact reaches throughout the state. Approximately one third of the expenditures occur within a fifty mile radius of the base, while the majority, two thirds, are outside this area. Every part of the state benefits from Wright-Patterson spending. New obligations of funds include over \$110 million in the Cleveland-Akron area.

In the Toledo-Lima area, Wright-Patterson's contracts amounted to almost \$17 million in the most recent fiscal year. Columbus organizations received over \$40 million dollars. Cincinnati firms, led by contracts for jet engines, received over \$1.8 billion from Air Force contracts.

Wright-Patterson Air Force Base is an increasingly valuable Ohio resource, one that will enable businesses across this state to translate technological innovations into commercially viable assets.

These technological applications have impacted every sector of the economy. From aviation systems in general to such specifics as better methods of assuring fuel quality for our Nation's commercial jet fleets, Wright-Patt has provided new business opportunities which continue to flourish across Ohio: Basic research on powerful, low-weight magnets has yielded an unexpected commercial application -- specifically, the development of high quality, light-weight stereo headsets for the consumer electronics industry.

The Base is much more than just a technology incubator -- it's a combination think tank and brain trust. It's a place not only of new inventions, but of new ideas and new methods. The logistics Management System stands as a prime example of brain power in action.

The BDM Corporation, working with the Air Force Logistics Command, has developed a state of the art information management system. Just recently, BDM in a joint venture with Mead Data Central, has been awarded a contract to develop a similar information management and retrieval system for the Securities and Exchange Commission.

The challenge for Ohio in turning this technological opportunity into a competitive advantage lies in our commitment to education at all levels. The tradition of innovation at Wright Patterson Air Force Base can best be assured through the continued development and strengthening of post secondary and graduate level programs in the sciences, engineering and computing.

The history of Ohio is the story of invention, of innovation, and of competitive advantage. Now, as we embrace the new challenges of the 21st century, that next chapter in this on-going story waits to be written. The theme is set, the outline has been sketched. The time has come to write this chapter.

Wright-Patterson and Ohio -- partners in innovation: The potential is great... The opportunities are legion... The benefits are real.

SATURDAY, APRIL 28, 1990

8:00 AM -

3:00 PM Registration in Lobby Physical Education Building. Coffee will be available.

9:00 -

5:00 PM General Poster Sessions in Lobby Physical Education Building

Section Meetings. See Contents for specific section programs.

10:15 AM Invited Lecture in Section K.
Genetics and Cell Biology

**A REVIEW OF ANIMAL
CYTOGENETICS**

Nathan S. Fecheimer, Ph.D.
Professor of Genetics
The Ohio State University

11:15 AM All Academy Lecture in
Medical Sciences Auditorium.

**“WILL INTEGRATIVE SCIENCE DEVELOP
WITH SUFFICIENT RAPIDITY TO
MITIGATE GLOBAL ENVIRONMENTAL
DEGRADATION?”**

by

Dr. John Cairns, Jr.

Distinguished Professor and
Director of the Center for Environmental Studies
at Virginia Polytechnic Institute

Dr. John Cairns, Jr. is University Distinguished Professor in the Department of Biology and Director of the University Center for Environmental and Hazardous Material Studies at Virginia Polytechnic Institute and State University, Blacksburg. He received his PhD and his MS from the University of Pennsylvania and an AB from Swarthmore College, and completed a postdoctoral course in isotope methodology at Hahnemann Medical College, Philadelphia. He was Curator of Limnology at the Academy of Natural Sciences of Philadelphia for 18 years, and has taught at various universities and field stations.

Among his awards are the Presidential Commendation in 1971; the Charles B. Dudley Award in 1978 for excellence in publications from the American Society for Testing and Materials; the Founder's Award of the Society for Environmental Toxicology and Chemistry in 1981; the Icko Iben Award from the American Water Resources Association in 1984; the B. Y. Morrison Medal in 1984; Fellow, American Academy of Arts and Sciences, 1988; and the American Fisheries Society Award of Excellence in 1989. A member of many professional societies, he is a member of the Science Advisory Board of the International Joint Commission (U. S. & Canada). Dr. Cairns has been consultant and researcher for the government and private industries, and has served on numerous scientific committees. His most recent publications are *Rehabilitating Damaged Ecosystems* (CRC Press, 1988) and *Functional Testing of Aquatic Biota for Estimating Hazards of Chemicals* (ASTM, 1989). His nearly 1,000 publications include 30 books with two currently in press. Over one-fourth of all publications are sole authored. Cairns presently serves on seven editorial boards, is Trustee of Rene Dubos Foundation for Human Environments, and is chair of the National Research Council Committee on Restoration of Damaged Ecosystems.

12:00 Noon -

1:30 PM Lunch in University Cafeteria

1:30 PM Section Business Meetings.

See contents page for specific sections.

- 2:00 PM Afternoon Poster Sessions
and Section Meetings.
- 5:00 PM OAS Annual Business Meeting
in 116 Health Sciences
(Members of The Ohio Academy
of Science only)
- 5:30 PM -
6:30 PM Hospitality Hour in Upper Hearth Lounge -
University Center
- 6:30 PM Annual Banquet and Awards Ceremony
in University Center Cafeteria
(Reservations required)
- 8:00 PM **Presidential Address by**

Dr. Allen G. Noble

Chairperson, Department of Geography
The University of Akron

**MATERIAL CULTURE: STUDYING THE
CULTURAL LANDSCAPE**

Dr. Allen G. Noble, the 1989-90 President of The Ohio Academy of Science, received his B.A. from Utica College of Syracuse University, an M.A. from the University of Maryland and a Ph.D. from the University of Illinois. He has been at The University of Akron since 1964 with previous professional employment in the United States Foreign Service as a U.S. Vice Consul in India and Brazil.

He is a Fellow of The Ohio Academy of Science and has served as Vice President of Section F. Geography. In 1977, on behalf of the Academy, he organized and led a delegation of American geographers to the People's Republic of China. The following year he chaired an international symposium on the environment involving his American and Chinese colleagues at the Johnson Foundation's Wingspread Conference Center in Racine, Wisconsin.

An extensive traveler, lecturer and an active author, he has received numerous academic and service awards including the Ohioana Library Association Award and the Honors Award from the Association of American Geographers.

In addition to membership in The Ohio Academy of Science, he belongs to the Association of American Geographers, National Council for Geographic Education, American Geographical Society, Sigma Xi, Pioneer America Society, American Association of University Professors and the Canadian Association of Geographers. As Academy President, he serves as a Trustee of The Ohio Historical Society.

Workshops

Friday, April 27, 1990

1:00 - 3:00 PM

019 Biological Sciences

NOTE: Teachers are encouraged to attend this workshop and the one that follows at 3:00 p.m. on protein gel electrophoresis.

**TEACHING SCIENCE WITH RAPID CYCLING
BRASSICAS (FAST PLANTS).**

Pablo S. Jourdan, Department of Horticulture, The Ohio State University, 2001 Fyffe Ct., Columbus OH 43210

The Rapid Cycling Brassicas (also known as Wisconsin FAST PLANTS) are recently developed educational tools that provide a unique opportunity for an integrated approach to science teaching using a single live organism as the model system. With this approach, the plant material can be used to illustrate fundamental molecular and cellular processes which involve parameters such as enzyme activity, isolation of DNA, characterization of pigments, cell structure and physiology (e.g., osmosis), cellular manipulation (cell and tissue culture), etc. The same plant material can be used to illustrate fundamental processes at the organismal level where whole plants are used to demonstrate basic growth and development, physiology, genetics, ecology, and population structure.

At the more elementary level, the Rapid Cycling Brassicas are ideal materials for the integration of science with other disciplines (humanities, geography, history, arts) because the plants are closely related to important foods in our and other cultures (especially the Far East). This relationship also permits a discussion of environmental and economic issues related to agriculture and provides an excellent opportunity to discuss biotechnology applications of modern molecular biology.

Key attributes of these plants educational activities include their short life cycle (35-40 days from seed to seed), ease of cultivation in a typical classroom, availability of well-characterized mutants, and general responsiveness to cellular manipulations. The workshop will demonstrate how the rapid cycling brassicas can be used for exciting and inexpensive teaching.

Friday, April 27, 1990
3:00 - 5:00 p.m.
011 Biological Sciences

USING PROTEIN GEL ELECTROPHORESIS TO INFUSE BIOTECHNOLOGY CONCEPTS INTO THE SECONDARY CURRICULUM

Spencer E. Reames, Assistant Project Director
for Biotechnology, The Ohio Academy of Science, 445
King Ave., Columbus, Ohio 43201

High resolution gel electrophoresis is a powerful tool that is used on a routine basis in molecular biology and biotechnology labs. The participants in this workshop will gain hands-on experience with the Gelteach system which is a low cost, polyacrylamide electrophoresis system used in the separation of proteins and peptides. This system will allow teachers to easily introduce their student to this powerful tool. This workshop will include an overview of biotechnology and a discussion of how this tool can be integrated with the use of the rapid cycling Brassica which will be discussed in the workshop conducted by Dr. Pablo Jourdan.

Friday, April 27, 1990
1:00 - 3:00 p.m.
017 Biological Sciences

MICROSCALE EXPERIMENTS IN CHEMISTRY: A HANDS-ON WORKSHOP FOR TEACHERS.

Rebecca Stricklin, Oak Hills High School,
3200 Ebenezer Road, Cincinnati, OH 45248 and Ginger
Tannenbaum, Fairfield High School, 1111 Niles Road,
Fairfield, OH 45014.

Microscale Chemistry is becoming a more widely accepted technique for chemistry experiments due to the smaller amounts of materials which results in a smaller cost and a more advantageous insurance package. It also offers a chance to do experiments not possible at the macro level. This workshop will offer participants a chance to use micro equipment, practice various lab experiments, and to evaluate differences between scaled down micro experiments and ones originally written for the ordering equipment, ordering lab manuals, and sources of new experiments.

Field Trips

Sunday, April 29, 1990

9:00 AM FIELD TRIP TO THE BEAVER CREEK WETLANDS
James P. Amon, Presiding

Participants in this field trip will visit a fen system associated with a buried river valley only a few minutes from Wright State University. Several different communities along the 11 mile 1,000 acre narrow wetland-corridor will be visited. This is a conservation project of the Ohio Division of Wildlife, The Nature Conservancy, Greene County Parks, and the Beaver Creek Wetlands Association. No established trails exist, so rugged clothes and boots are needed. No collecting will be permitted. Sign up at registration. There is no charge for this trip. For information contact Jim Amon, Department of Biological Sciences, Wright State University, Dayton, Ohio 45435 or 513/873-2632.

9:00 a.m THE GEOLOGY OF GLEN HELEN,
JOHN BRYAN AND CLIFTON GORGE
Drs. Raphael Unrug and
Benjamin Richard, Presiding

The area between Yellow Springs and Clifton, Ohio, affords the opportunity to study Silurian rocks, glacial erosion, travertine deposition and fracture controlled erosion. The field trip will be a walk through Glen Helen to study travertine deposition of the Yellow Spring, the Silurian rock section from the Osgood Shale through the Cedarville Dolomite and erosion. The afternoon trip will be a walk from John Bryan State Park to Clifton Gorge along the Little Miami River. In this area fracture zones are controlling the location of springs and travertine mounds. The active karst processes are thus structurally controlled. The Clifton Gorge was eroded by glacial meltwater. The trip will start at Wright State University at 9:00 a.m. and end at John Bryan at 2:30 p.m. One hour will be allowed for lunch where participants can eat in the towns of Yellow Springs or Clifton.

Local Arrangements

Jerry H. Hubschman, Chairperson
Wright State University

Joyce Corban, Academic Coordinator
Regina Borum, Director, Conferences
and Continuing Education

Wright State Section Hosts

- | | |
|---------------------|---------------------------------------|
| A. Zoology | Mike Swift
Biological Sciences |
| B. Plant Sciences | Iain Miller
Biological Sciences |
| C. Geology | Byron Kulander
Geological Sciences |
| D. Medical Sciences | H. Ira Fritz
Biological Chemistry |

E. Physics & Astronomy	Merrill Andrew Physics
F. Geography	Kenji Oshiro Geography
G. Chemistry	David Dolson Chemistry
H. Science Education	Ben Leake Education and Human Services
I. Anthropology and Sociology	Ann Belisari Anthropology
J. Natural Resources	Wayne Carmichael Biological Sciences
K. Genetics & Cell Biology	Barbara Hull Biological Sciences
L. Mathematics and Computer Sciences	David Miller Mathematics and Statistics
M. Psychology	Marty Moss Psychology
N. Junior Academy	Lois Cook Science and Mathematics
O. Engineering	Billy Friar Engineering
Q. Economics	Carole Endres Economics
R. Ecology	Jim Runkle Biological Sciences
S. Information and Library Science	Margaret Roach University Library

Our Host Institution

WRIGHT STATE UNIVERSITY, located about twenty minutes from downtown Dayton, is a state-assisted university offering to a student population of nearly 17,000 more than a hundred undergraduate majors, over thirty master's degree programs, and programs of study for the M.D., Psy.D., Ed.S., and Ph.D. degrees, as well as certification programs. We've reached this state in our growth just twenty-six years after opening our doors in 1964 as the Dayton Campus of the Miami and The Ohio State Universities. These schools had been offering classes in borrowed facilities in our area for many years, giving rise in the 1950's to the idea of a joint branch campus. A community fund-raising effort in 1961 generated three million dollars, which financed the purchase of 645 acres for a campus near Dayton, and the construction of Allyn Hall,

our first building.

In 1965, we became Ohio's twelfth state-assisted university, known as the Wright State Campus. A major turning point came in October 1967, when we became a fully accredited, independent state institution--Wright State University. In those few short years we had grown from a faculty of fifty-five and a student population of 3,200 to a university with 5,000 students registered in ninety-six different programs and concentrations, master's degree programs in five disciplines, and 206 faculty members. Three new buildings had been constructed, completing Founders Quadrangle in the center of campus.

Since that time, our history has continued to be characterized by phenomenal growth and change. The residence hall opened in 1970, followed by the completion of the University Center and the president's house in 1971. In 1973, we celebrated the openings of the Creative Arts Center, the University Library, the Physical Education Building, and the Brehm Laboratory. Facilities for the biological sciences were completed in 1975 and 1976, and the Medical Sciences Building was dedicated in 1976. New offices, bringing together student services in one central location, were completed in 1977.

The creation of the Wright State University School of Medicine in 1974 marked our first professional doctorate and indicated our commitment to providing resources for primary health care. The first class of medical doctors graduated in 1980. In 1977, we received authorization to establish a School of Professional Psychology, and planning approval was granted for a Ph.D. program in biomedical sciences. Both programs admitted their first students in 1979. In 1986, the first students were admitted to the Ph.D. program in computer science and engineering.

In 1981, construction was completed on Rike Hall, housing the College of Business and Administration, and the Frederick A. White Center, which is both a leading facility and a center for health care services. Our newest buildings are the Health Sciences Building, which houses the School of Professional Psychology and animal laboratories, and the Engineering and Mathematical Sciences Building, with a new building planned for the College of Engineering and Computer Science. Opening in fall 1990 is the Ervin J. Nutter Center, the largest multipurpose sports/entertainment complex in the region, housing an arena that can seat 10,000 for basketball, convocation, and a host of community entertainment events.

Since our beginning in 1964, we have continually expanded and responded to community needs. We have grown from a branch campus to a fully independent, comprehensive university with programs of study leading to baccalaureate, graduate, and professional degrees. Through the Colleges of Business and Administration, Education and Human Services, Liberal Arts, Engineering and Computer Science, and Science and Mathematics; the Schools of Graduate Studies, Medicine, Nursing, and Professional Psychology; and our branch campus, we offer a fully balanced university program, committed to excellence and community service.



Wright State University

Campus Map

