

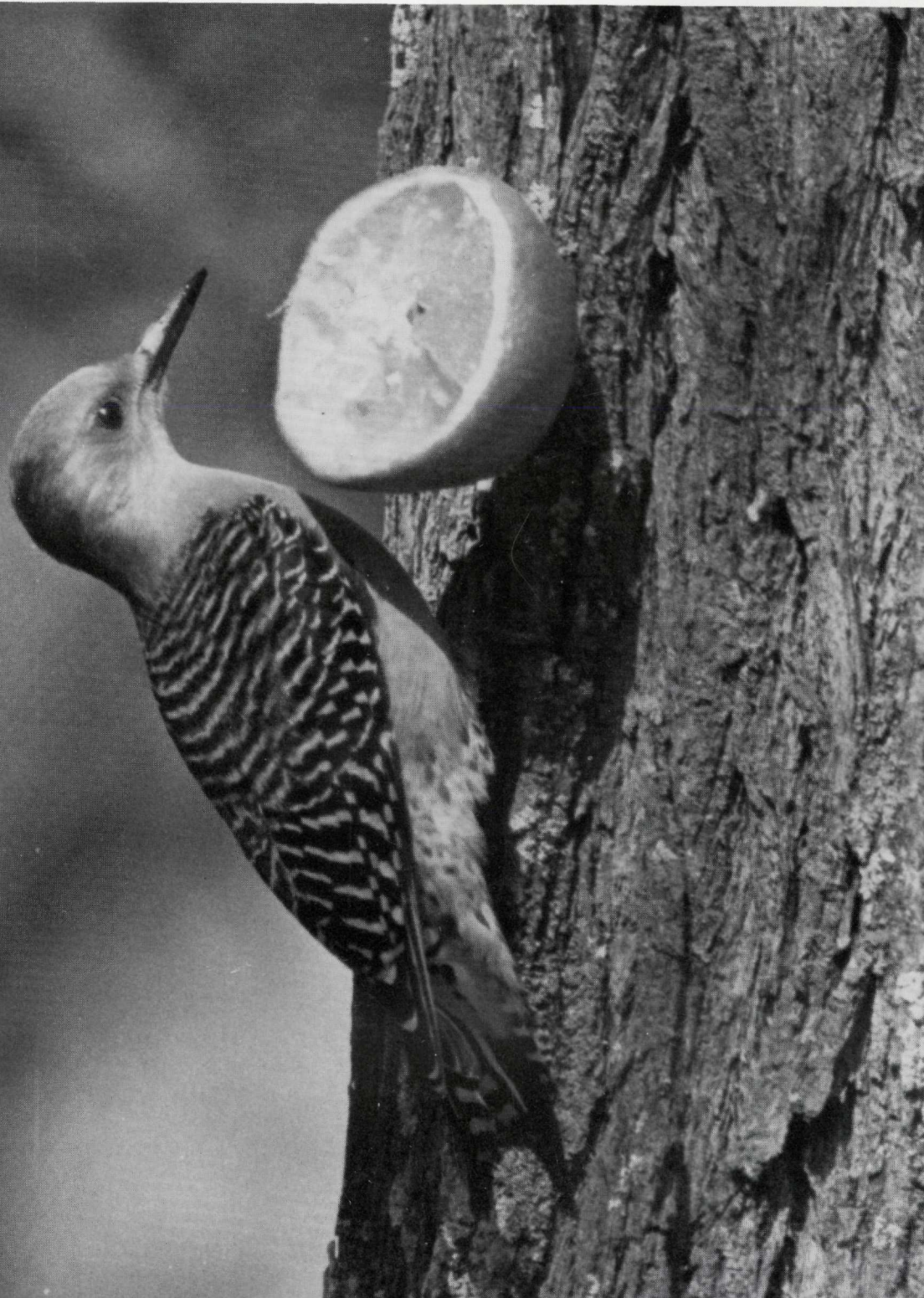
THE OHIO JOURNAL OF
SCIENCE

Volume 94

March 1994

Number 1

MR. DANIEL WILLIAM HEHR
FINDLAY UNIV. - HAZARDOUS MAT
1000 N. MAIN ST.
FINDLAY OH 45840-3695



THE OHIO JOURNAL OF SCIENCE
ISSN 0030-0950

Editorial Policy:

General:

THE OHIO JOURNAL OF SCIENCE considers original contributions from members and non-members of the Academy in all fields of science. While special consideration will be given to manuscripts concerned with Ohio subject matter, other reports with scientific merit will be reviewed for publication. Submission of a manuscript is understood to mean that the work is original and unpublished, and is not being considered for publication elsewhere. All manuscripts considered for publication will be peer-reviewed. The opinions expressed by reviewers are their own, and do not represent the views of the Ohio Academy of Science or *THE OHIO JOURNAL OF SCIENCE*. Manuscripts and illustrations should be prepared in **triplicate** in accordance with current guidelines published in *THE JOURNAL* at least once a year, and submitted to:

Dr. Lee A. Meserve, Editor
THE OHIO JOURNAL OF SCIENCE
Department of Biological Sciences
Bowling Green State University
Bowling Green, OH 43403-0212

Page Charges:

Publication of *THE OHIO JOURNAL OF SCIENCE* requires that authors assist in meeting publication expenses. These costs will be assessed at \$70 per page for members of the Academy and \$105 per page for non-members. Papers which exceed 12 printed pages may be charged full production costs. A bill for page charges will be sent to the communicating author by the Ohio Academy of Science at the time of publication.

Failure to Receive *THE JOURNAL*:

Any claim of failure to receive subscription issues of *THE JOURNAL* must be submitted to the Ohio Academy of Science within six months of date of issue of the missing number, to be recognized.

Listing Services:

THE OHIO JOURNAL OF SCIENCE is listed or abstracted in several sources including:

- Bibliography of Agriculture
- Biological Abstracts
- Chemical Abstracts
- Current Advances in Ecological Sciences
- Current Contents (Agriculture, Biology & Environmental Sciences)
- Deep Sea Research and Oceanography Abstracts
- Environment Abstracts
- Environmental Information Center
- Forest Products Abstracts
- Forestry Abstracts
- Geology Abstracts
- GeoRef
- Helminthological Abstracts
- Horticulture Abstracts
- Nuclear Science Abstracts
- Review of Plant Pathology
- Selected Water Resources Abstracts
- World Agricultural Economics and Rural Sociology Abstracts

FUTURE ACADEMY MEETINGS

- 1994 Medical College of Ohio
April 22, 23, and 24
- 1995 Otterbein College
April 28, 29, and 30

Date of issue—December 1994
Typesetting—Ardella Pierce
Copyright © 1994 by The Ohio Academy of Science
Printing—Leshner Printers, Inc., Fremont, Ohio 43420 U.S.A.



Statement of Ownership, Management and Circulation
(Required by 39 U.S.C. 3685)

1A. Title of Publication	1B. PUBLICATION NO.		2. Date of Filing
The Ohio Journal of Science	0 0 3 0 0 9 5 0		Oct. 14, 1993
3. Frequency of Issue	3A. No. of Issues Published Annually	3B. Annual Subscription Price	
March, April, June, Sept., Dec.	5	\$ 50.00 Domestic \$ 55.00 Foreign	
4. Complete Mailing Address of Known Office of Publication (Street, City, County, State and ZIP+4 Code) (Not printer)			
1500 W. Third Ave. Ste. 223, Columbus OH 43212-2817 - Franklin County			
5. Complete Mailing Address of the Headquarters of General Business Offices of the Publisher (Not printer)			
Same as item #4			
6. Full Names and Complete Mailing Address of Publisher, Editor, and Managing Editor (This item MUST NOT be blank)			
Publisher (Name and Complete Mailing Address)			
The Ohio Academy of Science, 1500 W. Third Ave. Ste. 223, Columbus OH 43212-2817			
Editor (Name and Complete Mailing Address)			
Dr. Lee Meserve			
Bowling Green State University, Dept. of Biological Sciences, Bowling Green OH 43403			
Managing Editor (Name and Complete Mailing Address)			
NONE			
7. Owner (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual must be given. If the publication is published by a nonprofit organization, its name and address must be stated.) (Item must be completed.)			
Full Name	Complete Mailing Address		
The Ohio Academy of Science	1500 W. Third Ave. Ste. 223 Columbus OH 43212-2817		

8. Known Bondholders, Mortgagees, and Other Security Holders Owning or Holding 1 Percent or More of Total Amount of Bonds, Mortgages or Other Securities (If there are none, so state)

Full Name	Complete Mailing Address
NONE	

9. For Completion by Nonprofit Organizations Authorized to Mail at Special Rates (DMR Section 434.12 only). The purpose, function, and nonprofit status of this organization and the exempt status for Federal income tax purposes (Check one)

(1) Has Not Changed During Preceding 12 Months (2) Has Changed During Preceding 12 Months (If changed, publisher must submit explanation of change with this statement.)

10. Extent and Nature of Circulation (See instructions on reverse side)	Average No. Copies Each Issue During Preceding 12 Months	Actual No. Copies of Single Issue Published Nearest to Filing Date
A. Total No. Copies (Net Press Run)	3,183	2,957
B. Paid and/or Requested Circulation		
1. Sales through dealers and carriers, street vendors and counter sales	--	--
2. Mail Subscription (Post and/or express)	2,311	2,450
C. Total Paid and/or Requested Circulation (Sum of 1B1 and 1B2)	2,311	2,450
D. Free Distribution by Mail, Carrier or Other Means (Samples, Complimentary, and Other Free Copies)	--	--
E. Total Distribution (Sum of C and D)	2,311	2,450
F. Copies Not Distributed		
1. Office use, left over, unaccounted, spoiled after printing	872	507
2. Return from News Agents	--	--
G. Total (Sum of B, F1 and F2—should equal net press run shown in A)	3,183	2,957

11. I certify that the statements made by me above are correct and complete

Signature and Title of Editor, Publisher, Business Manager, or Owner
Signature: S. Elper
Publisher

The Ohio Journal of Science

Volume 94

March 1994

No. 1



The Ohio Journal of Science

Department of Biological Sciences
Bowling Green State University
Bowling Green, OH 43403 U.S.A.
Ph: 419/372-2291 Fax: 419/372-2024

Editor Lee A. Meserve
Associate Editor Robert C. Romans
Assistant Editor Ardella Pierce

Editorial Board

Barbara K. Andreas
Anna Bellisari
Kelly J. Kohls
Mary Anne Swardson
John P. Szabo
Edward Weilant

The Ohio Academy of Science

1500 West Third Avenue Suite 223
Columbus, OH 43212-2817 U.S.A.
614/488-2228

President—Richard W. Janson
Past-President—John Schaff
President-Elect—Ronald L. Stuckey
Secretary—Helen R. Churella
Treasurer—Michael S. Herschler
Junior Academy Director—Lois A. Cook
Senior Academy Director—Isadore Newman
Ohio Industrial and Business Council—R. Lynn Gilliland
Chief Executive Officer—Lynn Edward Elfner

The Ohio Journal of Science (ISSN 0030-0950) is published in March, April (Annual Meeting Program Abstracts Issue), June, September, and December by The Ohio Academy of Science, P.O. Box 12519, Columbus, OH 43212-0519. Second class postage paid at Columbus, OH. Individual membership and subscription: \$50. Domestic institutional subscription: \$50. Foreign institutional subscription: \$55. Single issues for Academy members and subscribers: \$10; others \$12. © 1994 by The Ohio Academy of Science. All Rights Reserved. Printed in U.S.A.

POSTMASTER: Send address changes to The Ohio Journal of Science, 1500 West Third Avenue Suite 223, Columbus, OH 43212-2817 U.S.A.

ARTICLES

- 2
Nest-Site Characteristics of Red-bellied and Red-headed Woodpeckers and Northern Flickers in East-Central Ohio
by D. J. Ingold
- 8
Overwintering Behavior of Adult Bullfrogs, *Rana catesbeiana*, in Northeastern Ohio by J. Stinner, N. Zarlenga, and S. Orcutt
- 14
Generation of Immunoprotection Against Squamous Cell Carcinomas by *In Vitro* Cultivation and a Possible Mechanism of Action by R. J. Jamasbi
- 24
History and Computerization of the Kent State University Herbarium by M. K. Cooperrider and T. S. Cooperrider
- 29
Additions to the Flora of Cedar Bog, Champaign County, Ohio
by J. S. McCormac

DEPARTMENTS

BOOK REVIEWS

- 31
Lake Erie and Lake St. Clair Handbook edited by S. J. Bolsenga and C. E. Herdendorf Reviewed by K. Krieger
- 32
Full Circle: Restoring Your Habitat to Wilderness by B. Prater and K. McNeal Reviewed by L. Mitchell
- 33
Once Upon a Tree written and illustrated by J. B. Nardi
Reviewed by E. Ezell
- 33
Foundations without Foundationalism: A Case for Second-order Logic by S. Shapiro Reviewed by R. Butrick

List of Reviewers — p. 35

INSTRUCTIONS TO AUTHORS — inside back cover

COVER PHOTO: Female red-bellied woodpecker feeding at an orange. Ingold has characterized nest sites for this species, for red-headed woodpeckers, and for northern flickers in east-central Ohio, and has compared them to nest sites in neighboring states (p. 2-7).
Photo provided by Dr. Jerome A. Jackson, Mississippi State University.