Compliments of

Home Federal Savings And Loan Association

Knoxville, Tennessee

Best Wishes to the TENNESSEE ACADEMY OF SCIENCE

THANKS—to the hundreds of University, College, and High School biology teachers who have helped us to become a successful Biological Supply Co.

OUR GUARANTEE

"If our living and preserved materials do not HIGHLY PLEASE you, you are fully authorized to adjust the invoice to your complete satisfaction."

TRY US FOR IMMEDIATE SHIPMENTS OF LIVING AND PRESERVED ZOOLOGICAL MATERIAL

SOUTHERN BIOLOGICAL SUPPLY CO.

McKenzie, Tennessee Phone: Area Code 901; 352-3000

SERVICE is our Trademark

Printing is our Business

CURLEY PRINTING COMPANY

1307 Laurel Street

Phone CH 2-6594

Nashville, Tennessee

Turtox Biology Catalog No. 65

This new revised and fully illustrated catalog of more than 1000 pages of biological teaching aids is being printed. It will be ready for mailing about August 20. Write now to reserve your free copy. Send your school address where mail will reach you on or about September 1.

General Biological Supply House



8200 South Hoyne Avenue Chicago 20, Illinois

The Sign of the Turtox Pledges
Absolute Satisfaction

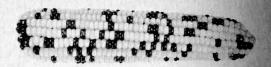
- LABORATORY SUPPLIES
- MICROSCOPES & ACCESSORIES
- DISSECTING INSTRUMENTS
- CHEMICALS
- REAGENTS AND SOLUTIONS

Distributors for Clay-Adams, Bausch & Lomb and other Importers and Manufacturers

NASHVILLE SURGICAL SUPPLY COMPANY

1911 Church Street
NASHVILLE 3, TENNESSEE

Genetics Materials



Chosen for today's emphasis on this increasingly important life science

Genetic Corn Mormoniella
Drosophila Taste Papers
Irradiated Seed Soy Bean
Tobacco Seed and Seedlings

Fine products for better teaching

Carolina Biological Supply Company
Burlington, North Carolina

and

Powell Laboratories Division
Gladstone, Oregon

CITIZENS BANK

Serving the Growing Upper Cumberland



COOKEVILLE, TENNESSEE

Branches:

Algood and Baxter

JOURNAL

OF THE

Tennessee Academy of Science

VOLUME XXXVIII

NUMBER 4

AUSTIN PEAY STATE COLLEGE LIBRARY CLARKSVILLE, TENNESSEE

CONTENTS

| | rage |
|---|------|
| Experimental Hydrocephalus. Thomas M. McCutchen, Jr., M.D. | 119 |
| G. H. Lundberg, Editor of the Journal of the Tennessee Academy of Science | 121 |
| News of Tennessee Science | 121 |
| Summary of Ground-Water Levels in Tennessee, 1952-'61. Roy H. Bingham | 126 |
| The Number of Planes Contained in the Complement of a Quadric in an Affine Galois Space. Eckford Cohen | 133 |
| The Eighteenth Tennessee Science Talent Search and The Twenty-first Tennessee Junior Academy of Science. James L. Major and James B. Delano | 134 |
| The Sunflowers (Genus Helianthus) in Tennessee. Janice C. Beatley | 135 |
| Some "Lost" Tennessee Mineral Localitics. Robert A. Laurence | 156 |

JOURNAL

OF THE

Tennessee Academy of Science

EDITORIAL STAFF

G. H. I UNDBERG, Editor, Vanderbilt University, Nashville

RICHARD STEVENSON, News Editor, East Tennessee State College, Johnson City

Frank H. Barclay, Botany Editor, East Tennessee State College, Johnson City

E. D. Eaves, Mathematics Editor, University of Tennessee, Knoxville

ROBERT J. FLOYD, Geology-Geography Editor, Tennessee Division of Geology, Nashville

RAYMOND G. WYMER, Chemistry Editor, Oak Ridge National Laboratory, Oak Ridge

MRS. BURT FRANCIS, High School Science Mathematics Editor, Isaac Litton High School, Nashville

WENDELL G. HOLLADAY, Physics-Astronomy Editor, Vanderbilt University, Nashville

WILLIAM G. DOWNS, Jr., Medical Sciences Editor, Tennessee Polytechnic Institute, Cookeville

James T. Tanner, Zoology Editor, University of Tennessee, Knoxville

J. D. Womak, Engineering Editor, University of Tennessee, Knoxville

All articles and communications for publication, books, and publications for review, should be addressed to the Editor.

New subscriptions, changes of address and applications for membership should be addressed to the Secretary. Personal items, news of events in the scientific world, and other notes suitable for the "News of Tennessee Science" department should be addressed to the News Editor.

Published quarterly, in January, April, July and October, by the Tennessee Academy of Science at Station B, Box 1522 Vanderbilt University, Nashville, Tennessee.

The JOURNAL is sent to all members not in arrears for dues. The subscription price is \$4.00 a year, invariably in advance. Single copies \$1.00.

Second Class Postage Paid at Nashville, Tennessee.

THE TENNESSEE ACADEMY OF SCIENCE

(Founded 1912, at Nashville, Tennessee)
Affiliated with the American Association
For the Advancement of Science

AFFILIATED SOCIETIES

Tennessee Ornithological Society, Nashville, Tennessee Barnard Astronomical Club, Nashville Tennessee Science Teachers' Association Tennessee Psychological Association

OFFICERS

HENRY C. ALLISON, *President*, University of Tennessee, Martin Branch

James W. Ward, President-Elect, Vanderbilt School of Medicine, Nashville

G. H. LUNDBERG, Editor, Vanderbilt University, Nashville JAMES L. WILSON, Secretary, Belmont College, Nashville

WM. G. Downs, Jr., Treasurer, Tennessee Polytechnic Institute, Cookeville

CLINTON L. BAKER, Director, of the Reelfoot Lake Biological Station, Southwestern University, Memphis

EXECUTIVE COMMITTEE

HENRY C. ALLISON, University of Tennessee, Martin Branch
CLINTON L. BAKER, Southwestern University, Memphis
NORMAN CAMPBELL, University of Tennessee, Martin Branch
WM. G. DOWNS, JR., Tennessee Polytechnic Institute, Cookevil
G. H. LUNDBERG, Vanderbilt University, Nashville
WILLARD B. JEWELL, Vanderbilt University, Nashville
MYRON S. McCay, University of Chattanooga, Chattanooga
ALBERT L. MYERS, Carson-Newman College, Jefferson City
ELSIE QUARTERMAN, Vanderbilt University, Nashville
RICHARD STEVENSON, East Tennessee State College, Johnson Cit
JAMES W. WARD, Vanderbilt School of Medicine, Nashville
JAMES L. WILSON, Belmont College, Nashville

NOTICE TO AUTHORS

Papers submitted for publication in the JOURNAL may be set to any member of the editorial staff. Manuscripts must be a proved by the Editor and the appropriate Section Editor before publication. Manuscripts should be typewritten, double or trip spaced, with wide margins, and with legends for figures typed of a separate page. Recent issues should be consulted with regar to matters of style. Each table should be placed on a separate sheet. Footnotes should not be used except very rarely. Gree letters and symbols should be avoided as much as possible.

The style for the list of references should conform to the sty used in recent issues of the JOURNAL. This list should be headed Literature Cited. The following example illustrates the property to be used for references:

W. E. Snow and Eugene Pickard, 1954. Observations on the seasonal activity of some night-biting Diptera. J. Ten. Acad. Sci. 29:17-22.

Photographs (black and white glossy prints) may be accepted as illustrations; however, line drawings and diagrams are preciable. Drawings should be made in India ink on white paper Bristol Board. An article containing more than 2 or 3 illustrations can be published only with the financial cooperation of the author.

A per page charge of \$10.00 will be made to industrial contributors

A blank form for ordering reprints from the printer is eclosed with the galley proof. The cost of reprints is as follows:

| 100 copies | 2 pages | 4 pages | 8 pages | 12 pages | 16 page |
|-------------|---------|---------|---------|----------|---------|
| | \$12.00 | \$20.00 | \$38.00 | \$47.00 | \$56.0 |
| Ea. add. 10 | 0 2.00 | 3.00 | 8.50 | 12.25 | 16.0 |

The Tennessee Academy of Science is very anxious to include in its membership all teachers and professor of science, research workers in science both in educational institutions and industrial establishments, and a others who are interested in some phase of science. Winvite you to join our organization and take part if our activities.

The annual dues are \$4.00 for members except teachers below the college level, whose dues are \$2.00 and \$10.00 for sustaining members. They may be ser direct with your application for membership to the Secretary.