

1976

## 60th Annual Meeting, 1976. Program

Academy Editors

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# PROGRAM

## Arkansas Academy of Science

Sixtieth Annual Meeting

UNIVERSITY OF ARKANSAS  
at Little Rock

Meeting concurrently with sessions of:

The Collegiate Academy of Science  
The Junior Academy of Science  
Arkansas State Science Fair

*Friday, 9 April*

SENIOR, COLLEGIATE, JUNIOR ACADEMIES -- Registration

INDUSTRIAL EXHIBITS\*

SENIOR ACADEMY -- Executive Committee

SENIOR ACADEMY -- Business Meeting

JUNIOR ACADEMY -- Westinghouse Talent Search Paper  
Presentation

SENIOR, COLLEGIATE ACADEMIES -- Papers (Concurrent  
Sessions):

    Physics - Mathematics  
    Geology  
    Biology I (Cytology - Biochemistry)  
    Biology II (Zoology)

JUNIOR ACADEMY -- Papers (Biological and Physical Sciences,  
Concurrent Sessions)

JUNIOR ACADEMY -- Executive Committee

PLANETARIUM SHOW

SENIOR, COLLEGIATE, JUNIOR ACADEMIES -- Banquet

*Saturday, 10 April*

INDUSTRIAL EXHIBITS\*

SENIOR, COLLEGIATE ACADEMIES -- Papers (Concurrent  
Sessions):

    Chemistry  
    Environmental Science  
    Biology III (Botany)  
    Biology IV (Zoology)  
    Anthropology

JUNIOR ACADEMY -- Business Meeting

JUNIOR ACADEMY -- Awards Presentation

COLLEGIATE ACADEMY -- Business Meeting

SENIOR, COLLEGIATE ACADEMIES -- General Business Meeting

\*INDUSTRIAL EXHIBITORS:

    American Optical Company  
    Corning Glass Company  
    Preiser Scientific Company  
    Sargent-Welch Company  
    Southern Biological Company  
    The Gene Sweepston Company  
    of Little Rock

## SECTION PROGRAMS

[Papers marked with \* are presentations by Collegiate Academy members.]

### PHYSICS AND MATHEMATICS SECTION

Chairman: Charles Harbison

\*USE OF SOLAR ENERGY IN THE HOME.

G. Hook, N. Kemper, W. Priddy, J. Hancock, and T. Ngo

A NEW PROOF THAT THE DERIVATION INERTIA  $\Delta [b]$  OF AN ELEMENT  $b$  OF V-RING  $R$  IS THE LARGEST EXPONENT  $s$  IN AN INERTIAL REPRESENTATION OF  $b$ .

Thomas F. Peter

A PROOF OF EULER'S THEOREM.

Charles Harbison

### GEOLOGY SECTION

Chairman: Phil Kehler

THE CAMBRIAN-ORDOVICIAN BOUNDARY IN NORTH AMERICA: A SUGGESTED REVISION.

Raymond W. Suhm

LOWER MISSISSIPPIAN LITHOSTRATIGRAPHY, NORTHERN ARKANSAS.

Jack L. Shanks and Walter L. Manger

PATCH CORALS IN A MISSISSIPPIAN SHOALING ENVIRONMENT.

Michael W. Hansen

SEASONAL VARIATION OF DISSOLVED AND SUSPENDED CHEMICAL LOADS OF THE BUFFALO RIVER, ARKANSAS.

George H. Wagner and Kenneth F. Steele

REGIONAL CARBONATE DEPOSITION OF THE PITKIN LIMESTONE (CHESTERIAN), WASHINGTON AND CRAWFORD COUNTIES, ARKANSAS.

Robert E. Tehan

ALGAL-BRYOZOAN CARBONATE BUILDUPS WITHIN THE PITKIN LIMESTONE (MISSISSIPPIAN-CHESTERIAN), NORTHWEST ARKANSAS.

A. T. Warmath

THE ZUNI SEQUENCE IN THE SOUTHWESTERN UNITED STATES.

P. L. Kehler

### BIOLOGY I SECTION (Cytology/Biochemistry)

Chairman: Hugh Johnson

HORMONE RECEPTOR SITE MATURATION IN THE SECONDARY SEX ORGANS OF IMMATURE MALE AND FEMALE RATS.

K. J. Thomas

A COMPARATIVE STUDY OF THE ESTERASE OF *DROSOPHILA VIRILIS* AND *DROSOPHILA EZONA*.

Russell Webster and William C. Guest

METAPHASE CONFIGURATIONS IN *DROSOPHILA*, A COMPARISON OF ENDEMIC HAWAIIAN SPECIES AND NON-ENDEMIC SPECIES.

Frances E. Clayton

IODINATION OF PROTEINS WITHIN THE STOMACH OF DOGS.

Jerry R. Hershey and L. Van Middlesworth

ROLE OF GASTRIN AS RELATED TO BIOCHEMICAL PROFILE OF STOMACH MUCUS.

Roger Baker and Jerry R. Hershey

ENZYMES IN *HELODERMA HORRIDUM* VENOM.

S. Murphy, D. H. Sifford, and B. D. Johnson

EFFECTS OF ESTROGEN ON UTERINE TISSUE UTILIZATION OF PYRUVATE FOR LIPID SYNTHESIS.

J. W. Harris

ELECTROPHORETIC PATTERNS OF SERUM PROTEINS IN TWO SUBSPECIES OF *ODOCOILEUS VIRGINIANUS*.

Greg Jackman and P. J. Garnett

\*THE STUDY OF ULTRAVIOLET INDUCED CHROMATID AND CHROMOSOME TYPE ABERRATIONS AS A FUNCTION OF DOSE IN G1 PHASE VERTEBRATE TISSUE CULTURE.

Troy Orr and H. Gaston Griggs

DIETARY FAT-CARBOHYDRATE COMBINATIONS: THEIR EFFECT ON LIPID METABOLISM IN ESTROGEN TREATED RATS.

Beverly Clevidence

INFLUENCE OF DIETARY FATS AND CARBOHYDRATES ON LIPID METABOLISM IN MALE AND FEMALE RATS.

Marjorie Ellen Fitch

### BIOLOGY II SECTION (Zoology)

Chairman: Edmond Bacon

RESISTANCE TO STRESS ULCERS IN ADRENALECTOMIZED RATS.

Jerry R. Hershey

A CHECKLIST OF THE CAVE FAUNA OF ARKANSAS - PART I.

Kenneth L. Smith and V. Rick McDaniel

POPULATIONS AND MOVEMENTS OF *PEROMYSCUS* ON CROWLEY'S RIDGE IN NORTHEASTERN ARKANSAS.

Gary W. Stephenson and V. Rick McDaniel

COMMENTS ON THE KARYOLOGY AND NATURAL HISTORY OF *SYNAPTOMYS COOPERI* IN ARKANSAS.

James A. Huggins and V. Rick McDaniel

THE RECENT DISTRIBUTION OF BATS IN NORTHCENTRAL AND NORTHEASTERN ARKANSAS.

David A. Saugey and V. Rick McDaniel

CHARACTERISTICS AND BEHAVIOR OF GUINEAFOWL AND DOMESTICATED CHICKEN HYBRIDS.

Earl L. Hanebrink

\*THE SEASONAL OCCURRENCES OF SHOREBIRDS IN LONOKE COUNTY, ARKANSAS.

Gary R. Graves

\*COMPARISON OF BICYCLING, RUNNING, AND TREADMILL WALKING FOR DEVELOPING PHYSICAL FITNESS IN COLLEGE-AGE FEMALES.

Phillip Goad, Bob Corbin, Carroll Smith, and Harry Olree

FOOD SHARING BEHAVIOR IN PRIMATES.

Charles G. Wilson

## Arkansas Academy of Science

BEHAVIORAL INTERACTIONS BETWEEN THE CALIFORNIA SEA LION (*ZALOPHUS CALIFORNIANUS*) AND RHESUS MACAQUE MONKEY (*MACACA MULATTA*) AT THE LITTLE ROCK ZOO.

Sidney Yeider and Gary Heidt

A CONTINUATION OF MOURNING DOVE STUDIES IN CLARK COUNTY, ARKANSAS, WITH EMPHASIS ON CYCLICAL BEHAVIOR PATTERNS.

Thurman Booth, Fred Burnside, Jan Burnside, and Peggy Rae Dorris

DISTRIBUTIONAL RECORDS OF AMPHIBIANS AND REPTILES IN ARKANSAS.

Edmond J. Bacon and Zane M. Anderson

#### CHEMISTRY SECTION

Chairman: F.L. Setliff

\*THE USE OF A SHIFT REAGENT IN AN NMR STUDY OF CARVONE.

Ricky Stamps

\*ARYNE INTERMEDIATES: 2,3-DEHYDROTHIOPHENE.

Michael T. Crimmins

\*ISOTOPE EFFECTS IN DIFFUSION.

Stephen A. Lachowsky

\*THE QUANTITATIVE EVALUATION OF LEAD-210 IN SPRING WATER.

Laura Ballard

CORRELATION ENERGY OF SMALL POLYATOMICS.

M. Fillmore Bowen and Neil S. Ostlund

SYNTHESIS AND DEHYDROCHLORINATION OF 1-<sup>14</sup>C LABELED SUBSTITUTED DDT COMPOUNDS.

Scott Crook and Arthur Fry

SYNTHESIS OF p-SUBSTITUTED 1-<sup>14</sup>C-RING-LABELED DIAZOACETOPHENONES.

Lee Netherton and Arthur Fry

STUDIES IN BALLING-ACID RATIO IN ARKANSAS GRAPES.

Cameron D. Jones, Dominic T.C. Yang, and Thomas O. Whitley

QUANTITATIVE INFRARED ANALYSIS OF DIKETONES AND ANHYDRIDE IN MIXTURE.

D.T.C. Yang, F.H. Watson, and J.O. Lay

#### ENVIRONMENTAL SCIENCE AND SCIENCE EDUCATION SECTION

Chairman: Mel Fuller

SOIL SALINITY MEASUREMENT BY THE FOUR-PROBE TECHNIQUE.

K. Sriyotai and J.T. Gilmour

THE SWIMMING ABILITY OF LARVAL AND JUVENILE GIZZARD SHAD AND THREADFIN SHAD AS RELATED TO THEIR ENTRAINMENT BY POWER WATER INTAKE SYSTEMS.

Manuel Barnes

THE EFFECT OF SOIL BUFFER CAPACITY ON THE LONGEVITY OF SOIL REACTION (pH) MODIFICATION AND THE SUBSEQUENT EFFECT ON PLANT GROWTH AND NUTRIENT UPTAKE.

P.E. Pope and R.B. Vasey

AN EXPERIMENTAL TESTING PROGRAM IN ELEMENTARY CHEMISTRY.

Billie Broach and Howard L. Hodges

PRACTICAL ILLUSTRATIONS OF GENETIC PRINCIPLES USING COAT COLORS OF CATTLE.

C.J. Brown

OUACHITA BIOLOGICAL STATION — AN OPPORTUNITY FOR FIELD BIOLOGISTS.

Richard K. Spears, Jr.

A PLANETARIUM — WHY?

Paul C. Sharrah and Carl T. Rutledge

#### BIOLOGY III SECTION (Botany)

Chairman: William R. Bowen

PRIMARY PRODUCTIVITY, WATER QUALITY, AND LIMITING FACTORS IN LAKE CHICOT.

Edmond J. Bacon

THE VASCULAR PLANT FAMILY BORAGINACEAE IN ARKANSAS.

Gary Tucker

A SCANNING ELECTRON MICROSCOPE STUDY OF BRACHYSCLERIDS OF PEAR (*PARUS COMMUNIS* L.).

Clarence B. Sinclair

AERATION, PHOSPHORUS, AND LIME EFFECTS ON NITROGEN MINERALIZATION IN IMPERFECTLY DRAINED FOREST SOILS.

M.S. Bhangoo, D.J. Albritton, and E. Shoulders

\*NEW LOCALITY RECORDS FOR *CLAYTONIA CAROLINIANA* AND *DROSERA CAPILLARIS* IN ARKANSAS.

LeRoy Poff

\*A PRELIMINARY STUDY OF THE ACRASIOMYCOTA NATIVE TO ARKANSAS SOILS.

Ron Rosen

TEMPORAL AND SPATIAL DISTRIBUTION OF ALGAE ON THE BUFFALO NATIONAL RIVER.

Laura Lee Rippey

AN OCULAR POINT FRAME FOR VEGETATIONAL SAMPLING.

Michael I. Johnson

RE-ESTABLISHMENT OF A PRAIRIE IN NORTHWEST ARKANSAS.

James Gibbons and Edward E. Dale, Jr.

FOREST VEGETATION OF THE BUFFALO RIVER AREA, ARKANSAS.

Stephen Bailey and Edward E. Dale, Jr.

EVALUATION OF STAND AND SITE CHARACTERISTICS ASSOCIATED WITH SOUTHERN PINE BEETLE INFESTATIONS.

Timothy T. Ku and James M. Sweeney

A SEASONAL SYMBIOSIS INVOLVING DAMSELFLY NYMPHS AND A EUGLENOID ALGA.

William R. Bowen

Program

**BIOLOGY IV SECTION (Zoology)**

Chairman: George Harp

FISHES OF THE FOURCHE RIVER IN NORTHCENTRAL ARKANSAS.

Steve M. Bounds and John K. Beadles

A SURVEY OF THE FISHES OF CANE CREEK.

Bruce E. Yeager and John K. Beadles

A NEW SPECIES OF *NOTROPIS* (CYPRINIDAE) FROM THE MISSISSIPPI VALLEY.

Henry W. Robison

DIFFERENTIATION OF LARVAL GIZZARD SHAD, *DOROSOMA CEPEDIANUM*, AND THREADFIN SHAD, *DOROSOMA PETENENSE*, AIDED BY THE USE OF A POLARIZING FILTER.

Manuel Barnes

ODONATE UPDATE.

John D. Rickett

AN ANNOTATED LIST OF ARKANSAS COCCINELLIDAE.

Joan B. Chapin and E. Phil Rouse

\*TOXICITY OF COPPER AND ZINC TO *GAMBUSIA AFFINIS* (POECILIIDAE).

Julia Louann Taylor

\*SURVEY OF THE COLEOPTERA OF THE NORTH FORK OF CADRON CREEK.

Chris Cartton

\*AN EXTENDED STUDY OF THE TREMATODE FAUNA FOUND WITHIN ARKANSAS AMPHIBIANS.

Ron Rosen

\*FEEDING HABITS OF *AMBYSTOMA TEXANUM* IN CRAIGHEAD COUNTY, ARKANSAS.

Gary Meador

SCANNING ELECTRON MICROSCOPY OF THE RAINBOW TROUT (*SALMO GAIRDNERI*) SPERMATOZOON.

James H. Fribourgh and Bernard L. Soloff

*LAMPSILIS* (PELECYPODA: UNIONIDAE), BEAUTY OF THE STREAM BENTHOS: HAVE MEN AND *CORBICULA* USURPED ITS FUTURE?

Louise Russert Kraemer

MACROBENTHOS POPULATION CHANGES IN CRYSTAL LAKE, ARKANSAS, SUBSEQUENT TO CAGE CULTURE OF FISH.

James C. Adams, Raj V. Kilambi, William A. Wickizer, and Arthur V. Brown

**ANTHROPOLOGY SECTION**

Chairman: Timothy C. Klinger

THE USE OF FRESHWATER MUSSEL SHELLS AS INDICATORS OF SEASONAL OCCUPATION OF ARCHEOLOGICAL SITES.

Robert H. Ray

TROPHY SKULLS AND LOOSE TEETH FROM THE CRENSHAW SITE (3MI6).

Mary Lucas Powell

THE MACHISMO SYNDROME: A RESIDENTIAL CORRELATE OF ITS EXPRESSIONS IN A SOUTH MEXICAN COMMUNITY.

Judith M. Brueske

THE SMITHSONIAN COLLECTIONS FROM ARKANSAS AS A RESOURCE FOR ARCHEOLOGISTS.

Michael P. Hoffman

IS ARCHEOLOGY REALLY ANTHROPOLOGY?

Robert L. Brooks

THE PROBLEM OF SITE DEFINITION IN CULTURAL RESOURCE MANAGEMENT.

Timothy C. Klinger

USING GLO (GOVERNMENT LAND OFFICE) LAND SURVEY NOTES IN AN ENVIRONMENTAL RECONSTRUCTION OF THE VILLAGE CREEK BASIN: A RESEARCH DESIGN.

Ronald Wogaman

A PRELIMINARY INVESTIGATION OF CHERT RESOURCES ALONG THE OZARK ESCARPMENT IN NORTHEAST ARKANSAS.

Mark A. Mathis

# Arkansas Collegiate Academy of Science

Patricia Alexander  
President

Kathleen Shankle  
Secretary

Curtis Shankle  
Treasurer

Sponsor: Dr. John F. Bridgman  
Co-sponsor: Dr. E.W. Wilson

## MINUTES OF THE BUSINESS MEETING, 10 APRIL 1976

The business meeting of the Arkansas Collegiate Academy of Science was called to order by the presiding president, Patricia Alexander. The minutes of the last meeting were approved as read. The financial report was submitted by Curtis Shankle. The Collegiate Academy's account contained \$172.11 which was to be refunded to the Senior Academy. Dr. Bridgman suggested that \$175.00 be requested from the Senior Academy. It was so moved and passed.

The following officers were elected for 1976-77.

President	- Phillip Goad, Harding College
President-Elect	- William Casson, UAM
Secretary	- Susan Brady, Harding College
Treasurer	- Jim Hall, Harding College
Sponsor	- Dr. Edmond W. Wilson, Harding College
Co-Sponsor	- Dr. Joe Guenter, UAM

The new president, Phillip Goad, took charge and a discussion of the experimental merger of the Collegiate Academy with the Senior Academy in regard to paper presentations followed. The general opinion was that, although it was not the intention of the Executive Council to eliminate the Collegiate Academy, a certain amount of identity loss occurred. A motion was made and carried that Dr. Wilson should bring this problem to the attention of the Senior

Academy in the General Business Meeting, and that Dr. Wilson should suggest that the President of the Collegiate Academy or his proxy attend the Executive Meeting of the Senior Academy. A motion was made and carried that schedules should continue to merge Academy and Collegiate Academy presentations.

Awards were made for the winning presentations at this meeting. In the Biological Science Section, the first place certificate was awarded to Ron Rosen. The second and third place certificates were awarded to Gary Graves and Julia Louann Taylor, respectively. In the Physical Science Section, the first place certificate was awarded to Laura Ballard. The second place certificate was awarded to Stephan Lachowsky. The meeting was adjourned by the new president.

Respectfully submitted,

Susan Brady  
Secretary

*Editor's Note:* Several Collegiate Academy members distinguished themselves by presenting scholarly papers before appropriate meeting sections of the Senior Academy on 9 and 10 April 1976. Titles of papers presented by these Collegiate Academy members are identified in the preceding Section Programs by \*.