

**OKLAHOMA
ACADEMY OF SCIENCE**

Office of the
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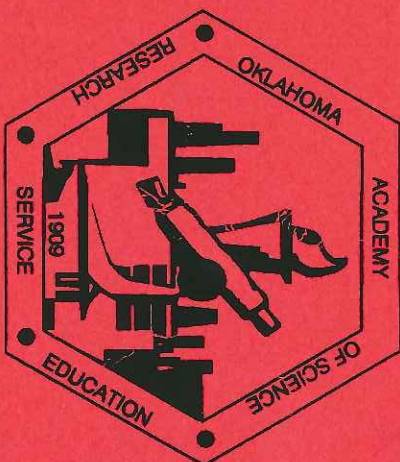


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OFFICIAL PROGRAM
OF THE
83RD ANNUAL TECHNICAL MEETING

**OKLAHOMA
ACADEMY OF SCIENCE**

Affiliated with the
American Association for the Advancement of Science



Saturday
November 12, 1994

The University of Oklahoma
Norman, Oklahoma

83rd ANNUAL TECHNICAL MEETING
OKLAHOMA ACADEMY OF SCIENCE
UNIVERSITY OF OKLAHOMA

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OKLAHOMA ACADEMY OF SCIENCE

Established in 1909

"The purpose of the Academy shall be to stimulate scientific research; to promote fraternal relationship among those engaged in scientific work in Oklahoma; to diffuse among the citizens of the State a knowledge of the various disciplines of science; and to investigate and publicize the human, natural and educational resources of the State."

Article I, Section 2 OAS Constitution

Activities of the Academy

- > Publishes the Proceedings of the Oklahoma Academy of Science, Annals of the Oklahoma Academy of Science and Transactions of the Oklahoma Junior Academy of Science.
- > Hosts the Annual Technical Meeting for the presentation of scientific papers by both professional and collegiate scientists.
- > Sponsors symposia on selected topics of timely and vital interest to the State and Nation.
- > Arranges spring and fall field meetings in varied biogeographic regions of the State.
- > Coordinates and promotes the activities of the Oklahoma Junior Academy of Science
- > Supervises the activities of the Oklahoma Collegiate Academy of Science.
- > Provides research grants and scholarship awards to outstanding proposals submitted by secondary school and undergraduate college students.
- > Provides scientific consultation services to governmental and private agencies throughout the State.



THE OKLAHOMA ACADEMY OF SCIENCE

83RD ANNUAL FALL TECHNICAL MEETING

The University of Oklahoma

Friday, 11 November 1994
Executive Council Meeting Memorial Union Dining Rooms 1 & 2

Saturday, 12 November 1994

7:30 a.m. - 3:00 p.m. Registration for Technical Meeting Dale Hall Foyer
7:30 a.m. - 11:00 a.m. Registration for Junior Academy Workshop Dale Hall Foyer

8:00 a.m. - 8:45 a.m. Committee Meetings As Announced

9:00 a.m. - 11:00 a.m. Concurrent Scientific Paper Presentations See list below

Symposium "Issues and Principles in the Study of Biodiversity." Dale Hall 128

Section A Botany	Dale Hall 107	Section A Zoology	Dale Hall 103
Section B Geology	Kaufman Hall 137	Section C Physical Sciences	Dale Hall 206
Section D Social Sciences	Kaufman 136	Section E Science Education	Kaufman 140
Section F Geography	Kaufman 139	All Sections Posters	Kaufman 134
Section G Fish and Wildlife	Dale Hall 211	Section H Microbiology	Dale Hall 125
Section I Engineering	Kaufman 135	Section J Biochemistry/Biophysics	Kaufman 138
Section K Microscopy	Dale Hall 116	Section L Math/Computer Science	Dale Hall 122
Section M Environmental	Dale Hall 218	Section N Biomedical Sciences	Dale Hall 112
Section Z Junior Academy	Workshop on Student Research		Dale Hall 200

11:15 a.m. - 11:45 a.m. All Academy Business Meeting Dale Hall 200
All OAS members are encouraged to attend and visitors are welcome.

12 noon - 1:15 p.m. OAS BANQUET Memorial Union Ballroom
Admission by ticket only. Limited numbers of tickets available on-site at registration desk.

Featured Speaker
Dr. Howard McCarley
Austin College, Sherman, Texas
"Field Trips I Have Taken and Some That I Should Not Have Taken."

1:30 p.m. - 5:00 p.m. Concurrent Scientific Paper Sessions

GENERAL INFORMATION

Parking: OAS parking at The University of Oklahoma is located at the south end of Van Vleet Oval at its intersection with Lindsey Avenue and behind Dale Hall (enter from Elm Avenue). Parking is free to vehicles displaying an OAS parking permit on the driver's-side dashboard. Any other posted parking area is also available for overflow parking.

Preregistration: Individuals who have preregistered can obtain their registration packets at the registration desk. The desk will be located in Dale Hall Foyer.

On-site Registration Fees: OAS members--\$10; Guests--\$15; Students--\$5; Banquet (if available)--\$12.

1994 and 1995 Dues are Payable: The OAS registration desk will accept dues payments. Professional Dues--\$25; Student Dues--\$5; Family Memberships--\$30; Sustaining Memberships--\$100; Library Memberships--\$27.50; Lifetime Memberships--\$300.

Academy Business Meeting: The 83rd Annual Business Meeting of the Oklahoma Academy of Science will be held in Dale Hall, Rm. 200. All OAS members are encouraged to attend.

Academy and Award Banquet: The annual banquet will be held at noon Saturday in the Memorial Union Ballroom. There will be a speaker and special awards presentation.

Guidelines for paper publication: Papers may be published in the *Proceedings of the Oklahoma Academy of Science*, subject to editorial policies (POAS 73:ii and 88-98, 1993) and review of the Editorial Board. Manuscripts (an original and two copies) should be mailed to: Dr. Franklin R. Leach, Editor, P.O.A.S., Dept. of Biochemistry, Oklahoma State University, Stillwater, OK 74078. Manuscripts received after December 15 will be accepted for publication the following year. OAS members can expect an average charge of \$30 to \$35 per page.

Executive Secretary-Treasurer: Inquiries concerning the OAS should be directed to the Executive Secretary-Treasurer, P.O. Box 701915, Tulsa, OK 74170-1915.

Membership: Membership application forms will be available at the registration desk and/or by contacting the Executive Secretary-Treasurer at the above address.

Refreshments: will be served only in designated rooms in Dale and Kaufman halls from 8:00 to 10:30 a.m. and from 2:30 to 3:30 p.m. for OAS technical meeting registrants. Refreshments for the OJAS participants will be available in the OJAS registration area in Dale Hall.

Motels: The headquarters motel for the 83rd Annual Technical Meeting will be the Ramada Inn, 1-35 and West Lindsey Street, (405) 321-0110. Telephone for reservations and rates and inform the desk that you are an OAS delegate. The quoted rates are \$46 single and \$48 double. Other discounts may apply.

Other fine motels in the vicinity of OU:

Motel	Address	Single	Double	Phone	Distance
Days Inn	609 N Interstate Drive	\$35.00	\$43.00	(405) 360-4380	3.8 mi.
Marriott Residence Inn	2681 W Jefferson	\$55.00*	\$75.00*	(405) 366-0900	2.7 mi.
Norman Inn	4543 W Main Street	\$40.00	\$50.00	(405) 360-1234	3.1 mi.
OU Motel**	2420 S Classen Blvd.	\$28.00	\$32.00	(405) 321-4670	1.8 mi.
Quality Inn	2600 W Main Street	\$44.00	\$53.00	(405) 329-1624	3.1 mi.
Sherraton Inn	1000 N Interstate Dr	\$60.00	\$70.00	(405) 394-2882	4.3 mi.
Stratford House Inn	225 N Interstate Drive	\$24.95	\$45.95	(405) 329-7194	3.2 mi.
Thunderbird Lodge	1439 24th Ave SW	\$34.00		(405) 329-6890	2.0 mi.

* suite with one or two beds, kitchenette, dining area, no per person charge
 **not affiliated with the University of Oklahoma

Assistance or Information: Look for individuals with OAS staff badges. Persons wearing these badges are members of the OU community and will assist you in any way they can.

Name Badge: Name badges, provided upon registration, must be worn by all individuals attending Academy Sectional Scientific Sessions, the business meeting and banquet. Without a registration name badge, you may be asked to leave. Should you lose your badge, please see about a replacement at the registration desk.

Official Program: Bring this program with you. Additional copies will be available at the registration desk for \$1.

1995 Spring Field Meeting: The 1994 Spring Field Meeting is scheduled for April 21-23, 1995, at Beavers Bend State Park in Southeastern Oklahoma near Broken Bow. Dr. Suzanne McAlister, Oklahoma State University, (405) 744-5559, is in charge of organizing this field meeting. Mark these dates on your calendar. If you have any suggestions for field trips or questions about facilities, call Dr. McAlister.

No Smoking: Please, no smoking in any of the buildings on campus. Also, food or drink is not permitted in any meeting room. Thank you.

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Special Symposium
 Sponsored by Oklahoma Biological Survey
 in Conjunction with Oklahoma Academy of Science
**ISSUES AND PRINCIPLES
 OF BIODIVERSITY AND CONSERVATION**

Saturday, 12 November 1994
 Dale Hall, Room 128, University of Oklahoma

9:00 **Introductory remarks.** Gary D. Schnell, Convener. *Okla. Biol. Surv. & Dep. Zool., Univ. Okla., Norman.*

9:10 **KEYNOTE ADDRESS: Ecological perspectives on biodiversity issues.**
 John A. Wiens, *Dep. Biol., Colo. State Univ., Ft. Collins.*

10:15 **Maximizing the value of vertebrate surveys: Amazonian reptiles and amphibians as models.** Laurie J. Vitt & Janalee Caldwell, *Okla. Mus. Nat. Hist. & Dep. Zool., Univ. Okla., Norman.*

10:45 **The Tallgrass Prairie Preserve: Restoring a lost landscape.** Robert G. Hamilton, *The Nature Conservancy, Tallgrass Prairie Preserve, Pawhuska, Okla.*

11:15 Break for section meetings, OAS business meeting, and banquet & awards luncheon.

1:30 **Patterns of extinction, extirpation, and endangerment in mammals.**
 James H. Shaw, *Dep. Zool., Okla. State Univ., Stillwater.*

2:00 **Effects of highly variable flow on decapod communities in the headwaters of the Loquillo Mountains, Puerto Rico.** Alan P. Covich, *Dep. Fish. & Wildl. Biol., Colo. State Univ., Ft. Collins.*

2:30 Coffee break.

2:45 **Is biodiversity a necessary and sufficient criterion for ecosystem preservation?** Linda L. Wallace, *Dep. Bot. & Microbiol., Univ. Okla., Norman.*

3:15 **Cultural landscapes and the conservation of biodiversity.** Michael W. Palmer, *Dep. Bot., Okla. State Univ., Stillwater.*

3:45 Roundtable discussion. Speakers and audience.
 4:15

SECTION A--BIOLOGICAL SCIENCES: BOTANY
Dale Hall 107

Moderator: M. A. B. Mallick

- 8:30 A series of homeotic mutants of *Arabidopsis thaliana* form leafy cotyledons. Todd C. Mickle and David W. Meinke, OSU.
- 8:45 Geophysiological characterization of photosynthesis of a marine cyanobacterium. Yi Yin and William J. Henley, OSU.
- 9:00 Cell-to-cell communication in higher plants. Biao Ding, OSU; William J. Lucas, University of California, Davis..
- 9:15 Isolation of a phytotoxin from microbial metabolite. M.A.B. Mallick and Cleovis Watson, III, Langston University.
- 9:30 Peroxidases of ripening chile pepper fruit. Charles L. Biles, ECU.
- 9:45 BREAK
- 10:00 Silver Nightshade (*Solanum elaeagnifolium*) promotes growth and nodulation of soybean in growth chamber experiments. M.A.B. Mallick and Cleovis Watson, III, Langston University.
- 10:15 Effects of clipping and photosynthetic pathway on compensation and vsm colonization in grasses in different soils. Venkata M. Motethadka and Linda L. Wallace, OU.
- 10:30 Response of *Panicum virgatum* (Poaceae) to nitrate concentration and simulated bison grazing: Implications for plant competition. Robert E. Gropp and Linda L. Wallace, OU.
- 10:45 Seed dispersal by bison. Christine M. Tonielli, Linda L. Wallace, and Gordon Uno, OU.
- 11:00 Biological Sciences, Section A Meeting, Dale Hall 103.
- 11:15-11:45 OAS Business Meeting, Dale Hall 200.
- 12:00 Banquet and Awards Luncheon.
- Moderator: Linda Gatti Clark
- 1:30 Sediment-loading effect on algal response to nutrients in a stream mesocosm. Joan M. Ratzlaff, William J. Henley, and Daniel E. Storm, OSU.
- 1:45 Reconstruction of historical land use effects on a reservoir's trophic status using sub-fossil diatoms. Terry L. Locke, William J. Henley, and Sterling S. Burks, OSU.
- 2:00 Why are there no aquatic macrophytes in Tenkiller Lake? William J. Henley, OSU.

2:15

A Morphometric investigation of *Pappophorum Schreber* (Poaceae: Chloridoideae: Pappophoreae). Linda C. Gatti Clark and Ronald J. Tyr1, OSU.

2:30

BREAK

2:45*

lauraceae phenology in a Cloud Forest Community in Costa Rica. Amy L. Moreland, Southern Nazarene University.

3:00

A Field Guide to the *Carex* Species in Oklahoma. Patricia A. Folley, OU.

3:15

Andropogon gerardii and *Andropogon hallii*: A nomenclatural solution to a taxonomic problem. Ronald J. Tyr1, OSU; James R. Estes. OU.

3:30

Classification of Oklahoma's ferns. Bruce A. Smith, OSU.

3:45

Short Break

3:55

Flora Oklahoma Meeting.

Poster Session, Kaufman Hall 134 9:00-3:00

SECTION A--BIOLOGICAL SCIENCES: ZOOLOGY
Dale Hall 103

Moderator: Kent Smith

- 8:45* Musk ox from western Oklahoma. Amy D. Hoffner, SMOSU.
- 9:00* Miocene camel from Roger Mills County. Charles B. Harris, SMOSU.
- 9:15 A Pleistocene fauna from the Wasatch Plateau, Emery County, Utah. Kent S. Smith, OU.
- 9:30* Recent Mountain Lion records in Oklahoma. Tina K. Tate and Jack D. Tyler, Cameron University.
- 9:45 BREAK
- 10:00 Environmental influences on habitat use and home range of Dipsosaurus dorsalis. Paul J. Gier, OU.
- 10:15 More lost tails of Mexican lizards. Stanley F. Fox, Susana P. Fox, and Ruben Castro-Franco, OSU.
- 10:30 Seasonal changes in the social behavior of adult male Collared lizards, Crotaphytus collaris. Chris L. Sloan and Troy A. Baird, UCO
- 10:45 The genetics of a patchily distributed population of Crotaphytus collaris. John M. Hranitz and Troy A. Baird, UCO
- 11:00 Biological Sciences, Section A Meeting, Dale Hall 103.
- 11:15-11:45 OAS Annual Business Meeting, Dale Hall 200.
- 12:00 Banquet and Awards Luncheon
- Moderator: Stanley Fox
- 1:45 Gene and genotype effects of lead on Drosophila melanogaster populations. Corinne C. McMillen and Stanley F. Fox, OSU.
- 2:00 Natural hybridization and putative introgression between the Western toad (Bufo boreas) and Red-Spotted toad (Bufo punctatus). Michael M. Fuller, OU.
- 2:15 Species composition of aquatic macroinvertebrates and environmental conditions in Cucumber Creek. David Bass, UCO.
- 2:30* Survey of aquatic macroinvertebrates in mitigated wetland ponds. Jessica J. Eddy, ORU.
- 2:45 Updating Range Extensions for the Red River Pup Fish and the Arkansas River Darter in Oklahoma. Jimmy Pigg and Robert Gibbs, Oklahoma Department of Environmental Quality.
- Poster Session, Kaufman Hall 134. 9:00-3:00

SECTION B: GEOLOGY
KAUFMAN HALL 137

No program was submitted by the time the printing of this program had to begin. In the event that you had submitted a paper title to the section chair your paper may still be presented. Work with the section chair to produce a program page. Call the section chair (405) 744-5315 for any additional information you may need.

- Make multiple copies of this program.
- Distribute some at the registration desk.
- Post an enlarged copy on the door of the meeting room.
- Have some copies available in the meeting room.

(JOINT SESSION)
 SECTIONS C AND E: PHYSICAL SCIENCES AND SCIENCE EDUCATION
 DALE HALL, ROOM 206
 MORNING SESSION: MODERATOR: PAUL WESTHOUSE, OSU
 SYMPOSIUM ON TEACHING PHYSICS IN OKLAHOMA HIGH SCHOOLS

- 9:00 Biomedical sciences and health career programs in the Oklahoma City public schools.
 John W. Campbell, NE School of Biomedical Sciences & Health Careers
- 9:20 Improvement of physics teaching in Oklahoma. John Sellars, Fairview High School
- 9:40 A home improved interferometer. Ted C. Harp, Pawnee High School
- 10:00 The summer Biophysics Academy at Oklahoma State University.
 Paul Westhouse, OSU, and David West, Stillwater High School
- 10:20 Environmental studies laboratory exercises.
 Dale A. Williams, St. Cloud State University, MN
- 10:30 Panel Discussion: Philosophy, purpose and format of physics laboratories in Oklahoma high schools and colleges.
 Margaret Gibson, Perkins/Tryon High School, John Sellars, Fairview High School, Penger Tong, OSU
-
- (Poster) Fields of Physics. Margaret Gibson, Perkins/Tryon High School

SECTION C: PHYSICAL SCIENCES
 DALE HALL ROOM 206
 AFTERNOON SESSION: MODERATOR: GEORGE GORIN, OSU

- 1:30 Teaching computational physics to undergraduates at the University of Central Oklahoma. Weldon J. Wilson and David L. Martin, UCO
- 1:50 The string-spring-membrane coupling. Ye Zhu and D. S. Carlstone, UCO
- 2:10 A glucose sensor based on oxygen quenching of fluorescence from gel-encapsulated ruthenium complexes. John A. Guthrie, UCO, Xiaodong Sun and Edward T. Knobb, OSU.
- 2:30 Break and Section Meeting
- 2:50 Gas phase methylation reaction of model biomolecules.
 Mark E. Hatley and R. A. J. O'Hair, UCO
- 3:10 Synthesis of a series of endoheteropeptides and tetrapeptides.
 Loide M. Wasmund, Kent D. Denson and Mary F. Olexon, SEOSU
-
- (Poster) Heterocyclic 2-thiones as ligands for complexes of copper(II)
 Gordon L. Eggleston, John Hairwell and Eric Wall, SEOSU

SECTION D: SOCIAL SCIENCE
 KAUFMAN HALL 136

Morning Session: Moderator Lois E. Albert

- 9:00 a.m. The Percy exposure: A late Pleistocene setting in Dewey County.
 Don Wycoff, et al., OU
- 9:15 a.m. Archeological surveys in northeastern Oklahoma. Lois E. Albert, OU
- 9:30 a.m. Bison hunting and agriculture on the Southern Plains in the 15th and 16th centuries. Richard R. Drass, OU
- 9:45 a.m. The Copper Site: An archeological investigation of a Folsom bison kill
 Lee Bement, OU
- 10:00 a.m. The Certain Site: A late Archaic bison kill in the Southern plains.
 Kent Buehler, OU
- 10:15 a.m. The Lamar Site: A Calf Creek cultural manifestation near the Red River.
 Larry Neal, OU
- 10:30 a.m. Calf Creek foragers: Mobility on the Southern Plains. Marjorie A. Duncan, OU
- 10:45 a.m. Agribusiness and the farm crisis of the 1980's. Thomas Watts, UT-Arlington
- 11:00 a.m. Section D Business Meeting
- 11:15 a.m. OAS Annual Business Meeting, Dale Hall 200.
- 12:00 noon All Academy Banquet and Awards. Memorial Union Ballroom

SECTION G: FISH AND WILDLIFE CONSERVATION

DALE HALL 211

MORNING SESSION

MODERATOR: MELISSA M. NAGEL, TNC

8:45	Prey selection and foraging areas of Least Terns in north-central Oklahoma. Sara H. Schweitzer and David M. Leslie, Jr., Oklahoma Cooperative Fish and Wildlife Research Unit, OSU.	
9:00	Fire and endangered Black-capped Vireo habitat on the Wichita Mountains Wildlife Refuge. Todd M. Greenman and James H. Shaw, OSU.	
9:15	* Abundance and diversity of birds in intensively managed grasslands of southeastern Oklahoma. Kelvin L. Schoonover, Bryon K. Clark, and Brenda S. Clark, SEOSU.	
9:30	History, status, and possible causes of declines of the Eastern Wild Turkey in southeastern Oklahoma. Jason R. Pike, Robert L. Lochmiller, David M. Leslie, Jr., and Ronald E. Masters, OSU.	
9:45	Break	
10:00	Additional records of rare Oklahoma fishes. Jimmie Pigg and Robert Gibbs, Oklahoma Department of Environmental Quality.	
10:15	Investigation of land use, stream habitat, and fish population linkages for the Leopard darter (<i>Percina pantherina</i>). Conrad S. Toepfer and William L. Fisher, Oklahoma Cooperative Fish and Wildlife Research Unit, OSU.	
10:30	Distribution and abundance of <i>Lythrurus snelsoni</i> in the Ouachita Mountains. Christopher M. Taylor, Oklahoma Biological Survey, OU.	
10:45	Oklahoma's stream and river fishery resources: trends from a state and national survey. Craig D. Martin, William L. Fisher, Dean Schreiner, and Eric Kessler, Oklahoma Cooperative Fish and Wildlife Research Unit, OSU.	
11:00	Section G Business Meeting	
11:15	OAS Annual Business Meeting: Dale Hall 200	
12:00	OAS Banquet: Memorial Union Ballroom	
9:00 a.m.	A Geographical Analysis of Three US Environmental Organizations. Thomas Wikle, OSU.	
9:15 a.m.	Cultural Regions of Oklahoma: Using Folk House Types as Indicators. Brian Schultz, OSU.	
9:30 a.m.	Tornado Hazards, Coping Styles and Modernized Warning Systems. Matthew Biddle, OU.	
9:45 a.m.	The Arkansas River, a Geographic Lesson in the History of Water Management. Gina Bloodworth, OSU.	
10:00 a.m.	Tarzan or Tar Sand? Rock Asphalt in Oklahoma. Kent Sanmann, OU.	
10:15 a.m.	Quantifying Landscape Heterogeneity to Implement Spatially Variable Crop Control Systems. Dan Umbach, OSU.	
10:30 a.m.	A GPS Application in Resolving River Boundary Disputes. Andrew Plackner, OSU.	
10:45 a.m.	Section F Business Meeting.	
11:15 a.m.	End of Session. OAS Business meeting and OAS Banquet.	

* Denotes collegiate (undergraduate) paper

SECTION G: FISH AND WILDLIFE CONSERVATION

DALE HALL 211

AFTERNOON SESSION

MODERATOR: KENNETH K. CUNNINGHAM, ODWC

- 1:30 Use of a Geographic Information System for choosing smallmouth bass sampling locations in streams. Paul E. Balkenbush, William L. Fisher, and Mark Gregory, Oklahoma Cooperative Fish and Wildlife Research Unit, OSU.
- 1:45 Effect of the Double-crested Cormorant on Oklahoma's aquaculture industry. Robert L. Simmonds, Jr., Alexander V. Zale, and David M. Leslie, Jr., Oklahoma Cooperative Fish and Wildlife Research Unit, OSU.
- 2:00 * Survey for endangered and candidate bat species in southeastern Oklahoma. Mark A. Radtke, Brenda S. Clark, Bryon K. Clark, Gregory P. Creacy, and Tracey L. Neal, SEOSU.
- 2:15 Post-flood response of small mammals in southeastern Oklahoma. Bryon K. Clark, Brenda S. Clark, and Walter E. Munsterman, SEOSU.
- 2:30 The influence of habitat on cotton rat population dynamics. Tim A. Schetter, Robert L. Lochmiller, and David M. Leslie, OSU.
- 2:45 Break
- 3:00 Is diazinon safe at recommended label rates: evidence from field mesocosm experiments using wild small mammals. Steven R. Sheffield and Robert L. Lochmiller, OSU.
- 3:15 Factors influencing the population of the cotton rat parasite *Protospirocha muris* on a superfund site in southwestern Oklahoma. Brian C. Faulkner and Robert L. Lochmiller, OSU.
- 3:30 Cotton rat hematology - influences of age and environmental variability. Greg L. Robel and Robert L. Lochmiller, OSU.
- 3:45 Interrelationships between immunocompetence and population dynamics in small mammals. Chad S. Boyd, Robert L. Lochmiller, and Brad Pabbert, OSU.
- 4:00 Environmental influences on weight dynamics of the thymus gland in *Sigmodon hispidus*. Elena I. Zhigulina and Robert L. Lochmiller, OSU.
- 4:15 Role of cold stress in the modulation of immune function in Northern Bobwhite populations. Brad C. Dabbert and Robert L. Lochmiller, OSU.

SECTION H: MICROBIOLOGY

DALE HALL 125

MORNING SESSION

MODERATOR: Dr. Joseph Sufita, University of Oklahoma

- 9:15 Genetic diversity of naturally-occurring rhizobia nodulating pigeon pea. Ana-Maria Valle and David Demezas. Oklahoma State University, Stillwater.
- 9:30 Microbial transformation of TNT and related nitroaromatic compounds. Kathleen L. Londry and Joseph M. Sufita. University of Oklahoma, Norman.
- 9:45 Population biology of fluorescent pseudomonads inhabiting the wheat rhizosphere. Li Li and David Demezas. Oklahoma State University, Stillwater.
- 10:00 COFFEE BREAK
- 10:15 Yeast that biologically control gray mold of apple. Alexander Filonow¹, Helen Vishniac¹, Jeffrey Anderson¹, and Wojciech Janisiewicz². ¹Oklahoma State University, Stillwater and ²USDA/ARS, Kearneysville, WV
- 10:30 Fungal infection of chili pepper under differing environmental conditions. Melinda L. Rivas and Charles L. Biles. East Central University, McAlester.
- 10:45 The fate of gasoline oxygenates under anaerobic conditions. Melanie R. Mormile and Joseph M. Sufita. University of Oklahoma, Norman.
- 11:00 Section H Business Meeting. Election of Officers.
- 11:15 All Academy Business Meeting, Dale Hall 200.

SECTION I: ENGINEERING SCIENCE

KAUFMAN HALL 135

MORNING SESSION: MODERATOR: Jess W. Everett, University of Oklahoma

SECTION H: MICROBIOLOGY AFTERNOON SESSION

DALE HALL 125

MODERATOR: Dr. David Demezas, Oklahoma State University

- 1:30 Analysis of Gc4 G protein in spore production during *Dictyostelium* development. Jaishree Srinivasan and Jeffrey A. Hadwiger. Oklahoma State University, Stillwater.
- 1:45 Analysis of mutations in the *recA* gene of *Pseudomonas aeruginosa*. Lorraine G. van Waasbergen and Robert V. Miller. Oklahoma State University, Stillwater.
- 2:00 Analysis of Gc5 G protein in temporal regulation of *Dictyostelium* development. Kanchana Natarajan and Jeffrey A. Hadwiger. Oklahoma State University, Stillwater.
- 2:15 Perchloroethylene dehalogenation by cell-free extracts of *Desulfomonile tiedjei*. Todd G. Townsend and Joseph M. Sufliya. University of Oklahoma, Norman.

- 9:00 a.m. Two Dimensional Heat Flow in a Layered Medium Using ABAQUS. Yusuf Mehrez, OU.
- 9:15 a.m. Bridge Approach Settlement Prediction by a User-Friendly Computer Code. Mozar Rahman, OU.
- 9:30 a.m. Characterization of Stress-Dependent Permeability in Rocks. Puneet Suri, OU.
- 9:45 a.m. Coffee Break
- 10:00 a.m. Potential Use of High Performance Twin Head Anionic Surfactants in Subsurface Remediation. Roland E. Brown, OU.
- 10:15 a.m. Subsurface Chlorinated Solvents Remediation Using Direct Food Additive Surfactants. Bor-Jier (Ben) Shiao, OU.
- 10:30 a.m. * Effects of Unsaturated Hydrocarbon Concentrations on Anionic Surfactant-Enhanced Remediation by Semi-Equilibrium Dialysis. Neil E. Decds, OU.
- 10:45 a.m. Modeling Surfactant Enhanced Subsurface DNAPL Remediation in Two-Dimensional Sand Tank. Yili Chen, OU.
- 11:00 a.m. Engineering Sciences Business Meeting (Vice-President selection)
- 11:00 a.m. All Academy Business Meeting, Dale Hall 200
- 12 noon - 1:15 p.m. OAS Banquet, Memorial Union Ballroom
- * Collegiate

SECTION J: BIOCHEMISTRY/BIOPHYSICS/MOLECULAR BIOLOGY

KAUFMAN HALL, ROOM 138

MORNING SESSION: WILLIAM ORTIZ, OU, MODERATOR

- 9:00 a.m. Loss of transcripts for chlorophyll a-binding proteins, an early lesion during heat-bleaching in *Euplena graciilis*. Eric J. Thomas, Maria Fernández de la Puebla, and William Ortiz, OU.
- 9:15 a.m. Exploration of species specificity and movement of plant tobamo- and caulimoviruses by evaluation of chimeric viruses. Yue Lin Zhang, Robert T. Larey, and Ulrich K. Melcher, OSU.
- 9:30 a.m. Complete nucleotide sequence of turnip vein-clearing virus cDNA: evidence for convergent sequence evolution. Ulrich K. Melcher, Robert T. Larey, and Ty C. Voss, OSU.
- 9:45 a.m. Determination of the cause of different symptoms produced by two strains of tobacco mosaic virus. Shelly A. Carter, Michael H. Shintaku, Peter M. Derrick, Xin Shun Ding, and Richard S. Nelson, S.R. Noble Foundation.
- 10:00 a.m. COFFEE BREAK
- 10:15 a.m. A comparison between the alfalfa phytoalexin (-) medicarpin and structurally related compounds as inhibitors of phytopathogenic fungi. Jack W. Blount, Richard A. Dixon, and Nancy L. Paiva, S.R. Noble Foundation.
- 10:30 a.m. Preparation of probe-modified RNA with 5-mercapto-UTP for analysis of protein-RNA interaction. Bokang He and Michelle M. Hanna, OU.
- 10:45 a.m. Nucleic acid interaction between alpha and nascent RNA in *E. coli* transcription elongation complexes. Kebin Liu and Michelle Hanna, OU.
- 11:00 a.m. Section J Business Meeting
- 11:15 a.m. OAS Annual Business Meeting, Dale Hall 200
- 12:00 noon-1:15 p.m. OAS Banquet, Memorial Union Ballroom

SECTION J: BIOCHEMISTRY, BIOPHYSICS, MOLECULAR BIOLOGY

KAUFMAN HALL, ROOM 138

AFTERNOON SESSION: WILLIAM ORTIZ, OU, MODERATOR

- 2:00 p.m. Expression of active E1 component of *Pseudomonas putida* branched chain keto acid dehydrogenase. Kathryn L. Hester and John R. Sokatch, OUHSC.
- 2:15 p.m. Regulation of the yeast rRNA transcription apparatus and the fractionation of its components. Cheryl L. Peterson, John Q. Wickman, Jean-Christophe Sergere, and Daniel L. Riggs, OU.
- 2:30 p.m. Transcription factor interaction with the yeast rRNA polymerase I promoter. Eileen M. Clarke, Cheryl L. Peterson, and Daniel L. Riggs, OU.
- 2:45 p.m. Purification of δ -cadinene synthase, an enzyme involved in biosynthesis of sesquiterpenoid compounds in cotton tissue. Margaret Essenberg, Edward M. Davis, Jun Tsuji, Gordon D. Davis, and Margaret L. Pierce, OSU.
- 3:00 p.m. Firefly luciferase from Photuris. Franklin R. Leach and Li Ye, OSU.

SECTION J: BIOCHEMISTRY, BIOPHYSICS, MOLECULAR BIOLOGY

POSTER SESSION: KAUFMAN HALL ROOM 134

- NOTE: Posters go on display between 8:30 and 9:00 a.m. and must remain on display at least until 2:30 p.m. Presenters should be at the poster site from 1:30 to 2:00 p.m.
- Lipoic acid modification of pyruvate dehydrogenase. Ronald J. Tate, Lys M. Buck, and Franklin R. Leach, OSU.
- The effects of nitric oxide on electron transfer complexes. Ryan J.P. Weller and Chang-An Yu, OSU.

SECTION K: MICROSCOPY
DALE HALL, ROOM 125
MORNING SESSION: MODERATOR: RAHMONA THOMPSON

- 9:00 Immunogold labeling of clathrin associated proteins from pea (*Pisum sativum* L.) coryledon. Julie Butler, Greg W. Strout, Thomas Kirsch, and Leonard Bevers. O.U. *** Timpano Competition ***
- 9:15 Acquisition of chloroplast through phagotrophic feeding in the freshwater dinoflagellate *Gymnodinium acidulum*. Steven B. Fields and Scott D. Russell. O.U. *** Timpano Competition ***
- 9:30 Improvements in the detection of viral proteins and RNA's in plastic embedded plant tissue. Xin S. Ding, Shelly A. Carter, and Richard S. Nelson. S.R. Noble Foundation.
- 10:00 Break
- 10:15 Electron microprobe analysis of gem stones. Paul Carpenter, Department of Geology, California Institute of Technology
- 11:15 OAS Annual Business Meeting
- 12:00 OAS Banquet
- SECTION K: MICROSCOPY
DALE HALL, ROOM 125
MORNING SESSION: MODERATOR: M. DEAN PHILLIPS
- 1:30 Oklahoma Microscopy Society Business Meeting
- 2:00 A series of homeotic mutants of *Arabidopsis thaliana* form leafy mutant. Todd C. Nickle and David W. Meinke, O.S.U. *** Timpano Competition ***
- 2:15 Structure and ultrastructure of tomato leaf tissue exposed to phytoalexin coronatin. David A. Palmer and Carol L. Bender, O.S.U. *** Timpano Competition ***
- 2:30 Break and OMS Executive Board Meeting
- 2:45 Osmium + thiocarbonylhydrazide in pollen scanning electron microscopy: Enhancement of the secondary electron images and influence in structural stabilization. William F. Chisoe, Edward L. Vezey and John J. Skvarla, O.U.
- 3:00 Ultrastructural characterization of isolated sperm cells from the genus *Plumbago*. Gregory W. Strout, Darlene Southworth, Adonis Reece, Steven B. Fields, and Scott D. Russell. O.U.
- 3:15 Announcement of Timpano Award Winner

Section L: Mathematics, Computer Science and Statistics
Dale Hall Room 122

Morning Session Moderator: John G. McGrew ECU

- 9:00 Application of Scheduling Theory to a Hard Real-Time Multiprocessor System
David S. Kennedy and Luis Vidal, OCU
- 9:20 Conceptual Clustering Techniques and Statistics in Machine Learning
Perpetua V. Ruiz and Luis Vidal, OCU
- 9:40 Development of a Graphical Control Panel Under X Windows
Chad M. Roberts, ECU *** Collegiate Academy ***
- 9:55 Break
- 10:15 Graphing System Activity Using X Windows
Donald W. Weaver, ECU *** Collegiate Academy ***
- 10:30 Visualizing Numeric Data Graphically Using X Windows
Michael A. Adams, ECU *** Collegiate Academy ***
- 10:45 Software Metrics
Tammy J. Kelly, SEOSU *** Collegiate Academy ***
- 11:00 Section Business Meeting, Election of Officers
- Afternoon Session Moderator: Scott P. Randby, SEOSU
- 1:30 Relational Semantics - A New Approach to Operational Semantics
Moisa Derk and Ralph Hostenstine, ECU, OU
- 1:45 Development and Implementation of Portable, Distributed Finite Element Methods on a Workstation Cluster and the Cray T3D Supercomputer
Donald J. Morton, Cameron
- 2:00 Operator Splitting in the Vorticity Transport Equation
John W. McArthur, SEOSU
- 2:15 Fourier-Stieltjes Algebras
Kala J. Ory, SEOSU
- 2:30 On the topological significance of general commutator theory
John Coleman, ECU
- 2:45 Chains of Finite Fields
Vonn Walter, SEOSU
- 3:00 Whence the term "graph"?
Scott P. Randby, SEOSU

SECTION M: ENVIRONMENTAL AND LANDSCAPE
DALE HALL: ROOM # 218

MODERATOR: James T. Blankemeyer, OSU

- 9:00 Using Multimedia in Teaching Landscape Architecture Students. Timothy J. Schmolli, Oklahoma State University
- 9:15 Biomarker Assessment of the Effects of Strip Mine Contamination on Channel Catfish, Larry K. Martin, Oklahoma State University.
- 9:30 Landscape Restoration Plan for Nutuka Mission, Okmulgee County, Charles L. Leider, Oklahoma State University.
- 9:45 Coffee Break.
- 10:15 Seventy Years of Changes in the North Canadian River 1924-1994. Jimmy Pigg, Department of Environmental Quality, Oklahoma City
- 10:30 Interaction of Folic Acid with Plant Glycoalkaloids, Craig F. Burns, Oklahoma State University.
- 10:45 Environmental Science and Landscape Business Meeting.
- 11:15 OAS Business Meeting
- 12:00 OAS Banquet (Purchase tickets at Registration)

SECTION N: BIOMEDICAL SCIENCES
DALE HALL, ROOM 112

MORNING SESSION A: MODERATOR: J. THOMAS PENTO, OUHSC, OKC

- 8:30 MK-801 protects against carbon monoxide induced hearing loss. Ye Liu and Laurence D. Fichter, OUHSC-COP
- 8:45 Design and evaluation of a low energy bioacrosol sampler. Terri A. Pearce and David L. Johnson, OUHSC-COP
- 9:00 Growth of *Naegleria* in *vero*-cell cultures. David T. John and Rebecca A. John, OSU-COM
- 9:15 Adrenergic receptors mediating pupillary changes in amphibians. George M. Brenner, Lisa L. Deason and Craig W. Stevens, OSU-COM
- 9:30 Bee (*Apis Mellifera*) venom melittin causes myonecrosis in mice. * Jennifer R. Powell (Memor, Charlotte Ownby) OSU/Hendrix College
- 9:45 Break

MORNING SESSION B: MODERATOR: DAVID T. JOHN, OSU-COM, TULSA

- 10:00 Effects of oral chemotherapeutic agents in an *in vitro* wound model.* Brandon H. Joe (Memor, John J. Dmytryk) OUHSC-College of Dentistry
- 10:15 *In vitro* wounding: a method for studying the effects of antiestrogen drug treatment on breast cancer cell movement.* Annie C. Mathew (Memor, J. Thomas Pento) OUHSC-COP
- 10:30 Antiestrogen effects on growth factor-mediated invasiveness of human breast cancer cells. Gina M. Hurt and J. Thomas Pento, OUHSC-COP
- 10:45 Effect of antiestrogens on estrogen-induced gene expression. Talitha T. Rajah and J. Thomas Pento, OUHSC-COP
- 11:00 The influence of antiestrogens on the *in vitro* release of type IV collagenases by breast cancer cells. S.M. Abbas Abidi, J. Thomas Pento and Eric W. Howard, OUHSC-COP/COM
- 11:15 Section Business Meeting and Election of Vice Chair for 1994-95.
- 11:30 Academy Business Meeting - Dale Hall, Rm. 200
- 12:00 OAS Banquet - Memorial Union Ballroom
- * Undergraduate Paper

OJAS Research Workshop

for

Science Teachers,
High school, and Junior High students
November 12, 1994
University of Oklahoma (OU)
Dale Hall Rm. 200
Norman, Oklahoma

Schedule

7:30 - 8:00 a.m. Registration and Refreshment, Dale Hall Rm. 200

8:00 - 8:15 a.m. Welcome, Joe D. Ferguson, Director OJAS, Madill H.S.
Luke Word, Pres. OJAS, Lone Grove H.S.
Ella Burkhalter, V.P. OJAS, Lone Grove H.S.
Shawn Payne, Sec. OJAS, Lone Grove H.S.

8:15 - 8:30 a.m. Copper Levels at Salt Plains National Wildlife Refuge, Jason Schmidt, Alva High School.

8:30 - 8:45 a.m. Do Different Soil Types Retain Water Differently?, Ella Mechelle Burkhalter, Lone Grove High School.

8:45 - 9:00 a.m. To Catch A Fish's Eye, Luke Word, Lone Grove High School.

9:00 - 9:15 a.m. A Study On Degradation of Keratin From Gallus domesticus Feathers, Phillip Self, Kiowa Public Schools.

9:15 - 9:30 a.m. Video Presentation on Science Fair techniques.

9:30 - 9:45 a.m. Break

9:45 - 10:00 a.m. Water Quality In Caddo Creek, Shawn Alan Payne, Lone Grove High School.

10:00 - 10:15 a.m. Orange You Interested In Vitamin C?, Lacey Wortham, Lone Grove School.

10:15 - 10:30 a.m. Presentation "To Be Announced At Meeting

10:30 - 10:50 a.m. Open Forum Question and Answer Session with Presentors.

10:50 - 11:10 a.m. OJAS Business Meeting with Student Members and Coordinating Teachers, OJAS Director and Officers.

11:10 - 1:30 p.m. Lunch on your own. There is food service available at the Student Union on campus and fast food outlets just off campus.

1:30 - 5:00 p.m. Students and Teachers are encouraged to attend any of the OAS paper sessions in the areas listed below. Please check your program for titles of interest.

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|--------------------------|----------------------------|
| A. Biological Sciences | G. Geography |
| B. Botany - Zoology | H. Wildlife Conservation |
| C. Geology | I. Microbiology |
| D. Physical Sciences | J. Engineering Science |
| E. Social Sciences | K. Biochemistry/Biophysics |
| F. Environmental Science | L. Electron Microscopy |
| G. Mathematics | K. Computer Science |

Changes to the Program May be announced at the meeting.

OKLAHOMA ACADEMY OF SCIENCE PRESIDENTS

1910	H. L. Lane, OU	1952	V. B. Monnett, OAMC
1911	D. W. Orem, OK City	1953	S. P. Massie, LU
1912	S. W. Reaves, OU	1954	A. N. Murray, TU
1913	C. W. Shannon, OU	1955	R. E. Olson, OU
1914	No meeting	1956	A. M. Stebler, OAMC
1915	C. W. Shannon, OU	1957	D. E. Howell, OAMC
1916	C. N. Gould, OU	1958	G. J. Goodman, OU
1917	L. C. Raiford, Iowa State	1959	Elmer Lucas, OU
1918	No meeting	1960	P. E. Smith, OUMS
1919	No meeting	1961	E. M. Hodnett, OSU
1920	M. M. Wickham, Norman	1962	H. B. Barclay, TU
1921	A. F. Reiter, PU	1963	G. A. Moore, OSU
1922	J. B. Thornburn, OK City	1964	A. D. Buck, NOJC
1923	R. O. Whinton, OAMC	1965	J. E. Webster, OSU
1924	S. Weidman, OU	1966	C. R. Williams, PU
1925	(Spring) C. E. Sanborn	1967	C. D. Riggs, OU
1926	(Fall) H. L. Dodge, OU	1968	E. A. Reynolds, SWSC
1927	I. H. Gould, OAMC	1969	L. V. Scott, OUHSC
1928	C. N. Gould, OU	1970	C. C. Carpenter, OU
1929	O. M. Smith, OAMC	1971	Paul Buck, TU
1930	A. Richards, OU	1972	W. A. Carter, ECSU
1931	Leroy Long, OK City	1973	C. J. Mankin, OU
1932	A. O. Wese, OU	1974	N. N. Durham, OSU
1933	Herbert Patterson, OAMC	1975	Barbara Shirley, TU
1934	J. E. Knowles, PU	1976	G. W. Todd, OSU
1935	F. G. Brooks, OCU	1977	D. E. Kizer, Noble Foundation
1936	C. E. Decker, OU	1978	George Odell, OSU
1937	H. J. Harper, OAMC	1979	Richard Couch, ORU
1938	B. D. Barclay, TU	1980	Gary Wolgamott, SWSU
1939	C. M. Perry, OU	1981	Elroy Rice, OU
1940	H. D. Chase, TU	1982	Everett Grigsby, NSU
1941	G. L. Cross, OU	1983	Jack Sokatch, OUHSC
1942	R. W. Jones, OAMC	1984	Mary Whitmore, OU
1943	H. I. Featherly, OAMC	1985	Jeff Black, OBU
1944	O. F. Evans, OU	1986	Jerry Wilham, OSU
1945	V. G. Heller, OAMC	1987	Manford K. Patterson, Noble Foundation
1946	J. R. Nielsen, OU	1988	Mary P. Carpenter, OU
1947	O. C. Denner, OAMC	1989-1990	Kenneth E. Conway, OSU
1948	J. T. Self, OU	1991-1992	James K. McPherson, OSU
1949	L. S. McLeod, TU	1993-1994	James R. Estes, OU
1950	J. C. Shirley, PU	1995-1996	Jack D. Tyler, Cameron
1951	Howard Taylor, OCW		
	H. W. Larsh, OU		

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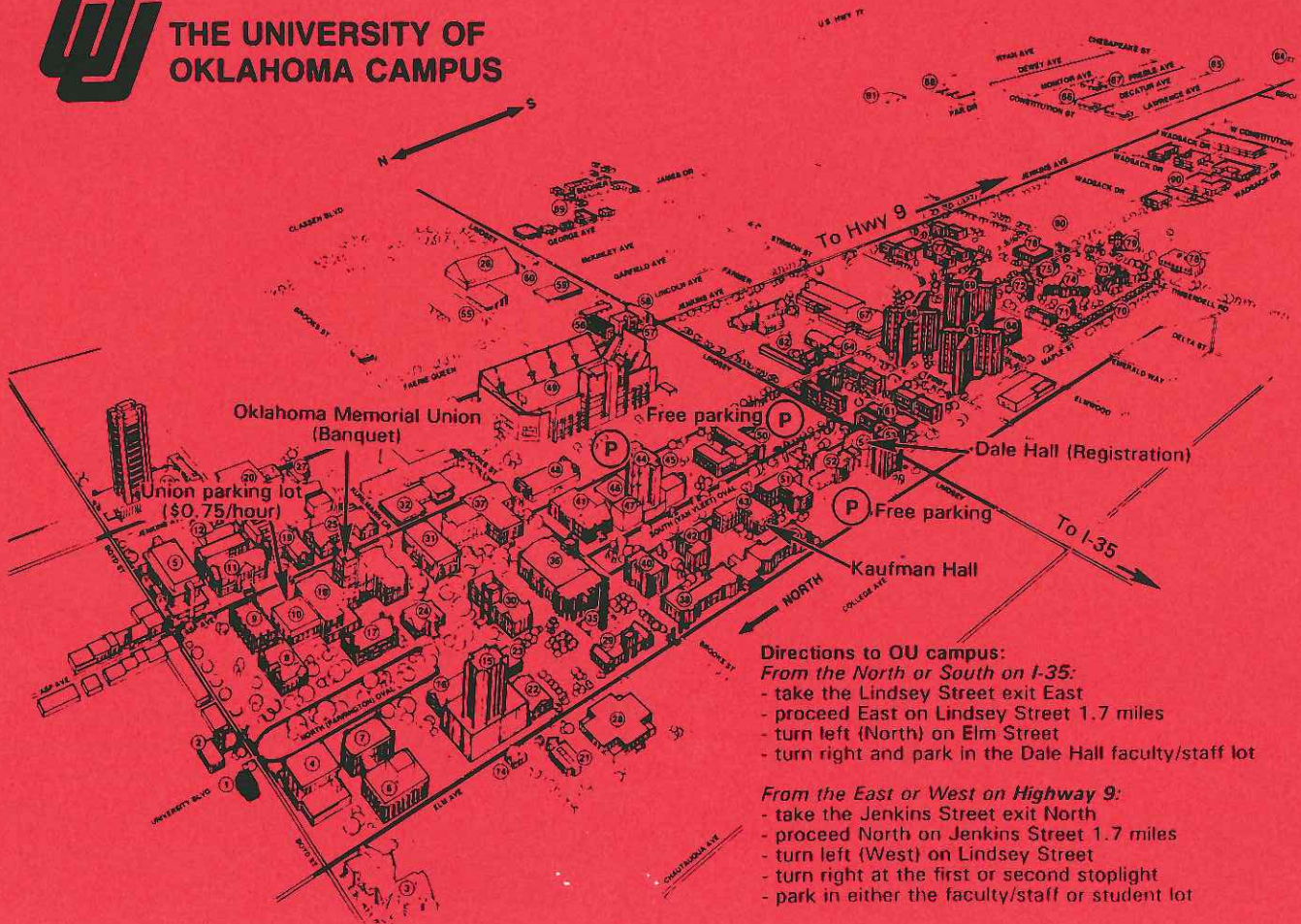
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THE UNIVERSITY OF OKLAHOMA CAMPUS



Directions to OU campus:

From the North or South on I-35:

- take the Lindsey Street exit East
- proceed East on Lindsey Street 1.7 miles
- turn left (North) on Elm Street
- turn right and park in the Dale Hall faculty/staff lot

From the East or West on Highway 9:

- take the Jenkins Street exit North
- proceed North on Jenkins Street 1.7 miles
- turn left (West) on Lindsey Street
- turn right at the first or second stoplight
- park in either the faculty/staff or student lot