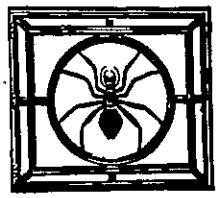
AMERICAN ARACHNOLOGY

THE NEWSLETTER OF THE AMERICAN ARACHNOLOGICAL SOCIETY

No. 37 **April 1988**



American Arachnological Society
1988 Annual Meeting

New Mexico State University
Las Cruces, New Mexico 88003
28-30 June 1988

Hosts:

Dr. David Richman, Department of Entomology, Plant Pathology and Weed Sciences. Phone (505)-646-3541.

Dr. Marsha Conley, Dept. of Biology. Phone (505)-646-5666.

Calendar

27 June: Registration, 4-8 PM; Mixer, 7-9 PM
Campus housing available

28 June: Registration, 8-10 AM
Paper Sessions - Morning and Afternoon

29 June: Paper Session - Morning
Symposium - Afternoon
"Ecology and Behavior of Jumping Spiders"
Banquet - 7-9 PM

30 June: Paper Sessions - Morning and Afternoon

1 July: Field Trip - USDA Jornada Experimental Range and Organ Mountains ($7)

2 July: Field Trip - White Sands National Monument and Lincoln National Forest ($14)

Transportation: Las Cruces Municipal Airport is serviced by a regional airline (Mesa Air) with connections to major carriers in Albuquerque and Denver. Free transportation to campus housing will be available to guests arriving by Mesa. Las Cruces is also accessible via a reasonably-priced shuttle van (approximately a 1 hour ride) from El Paso International Airport.

Accomodations: Air conditioned housing will be available in NMSU dormitory facilities. A cafeteria and snack bars are available on campus, and there are several cafes and restaurants within walking distance of the campus.

Local: Las Cruces is located in the valley of the Rio Grande, adjacent to the Organ Mountains (elevation about 9000 ft.) and approximately 50 miles north of the Mexican Border. Historic Old Mesilla, a settlement dating from the 1600's, borders Las Cruces to the west. The area is Chihuahuan Desert; and weather in June is hot and dry, with day time maxima near 100 degrees F. and night time minima near 60 degrees F.

Bea Vogel Invites You To Montana

All are invited to a post meeting field trip at East Rosebud Lake in the Beartooth mountains of Montana, northeast of Yellowstone Park. Some of you may have seen the slides I showed at Cambridge of my cabin on East Rosebud Lake. The lake is at 6200', adjacent to the Beartooth National Wilderness, and the mountains rise to over 12000'. The habitats vary from prairie to alpine in the space of a few miles. Tundra habitats are accessible by car on the Cooke City Highway, Yellowstone's northeast entrance.

To reach East Rosebud Lake from New Mexico, drive north through Colorado and Wyoming, perhaps Yellowstone Park, aiming for Red Lodge, Montana. Consult your road maps. From there drive to Roscoe (on paved roads). From Roscoe head south (up the Rosebud River) for about 15 miles, to East Rosebud Lake, marked Alpine on many maps. If you feel uncertain, stop for directions at the Grizzly Bar in Roscoe. I will be at the cabin July 1st through July 11th. The cabin can sleep 10, limited tenting is possible in the yard, and a Custer National Forest campground is not far away. There is a grocery store at the lake, but bring your own sleeping bags. It is a collectors' paradise and a wonderful place for families. Response not required - just appear.

Bea Vogel, 46 S. Howie, Helena, MT 59601
(406) 442-1514

* *

IN THIS ISSUE

SOCIETY ELECTIONS

This year a new member of the Board of Directors and the Society Secretary are to be elected. Brief curriculum vitae for each of the candidates appear below. A ballot is provided in the center of this newsletter. Please mark your ballot and return it to **Ann L. Rypstra** at the address indicated on the enclosed ballot.

Candidates for Director

James E. Carrel

Education:

A.B., with honors in Biology, Harvard Univ., 1966
Ph. D. Behavioral Biology, Cornell Univ., 1971

Job Experience:

Cornell University, Graduate Teaching Assistant, 1967-70.
University of Missouri - Columbia, Assistant Professor, 1971-77; Associate Professor, 1977-present; Associate Director, 1978-79 & 1985 - present
Manchester University, Visiting Lecturer, 1979-80.
Florida State University, Visiting Associate Professor, 1981-82.

Professional Societies:

American Arachnological Society, American Association for the Advancement of Science, American Society of Zoologists, British Arachnological Society, Entomological Society of America, International Society of Chemical Ecology, Missouri Academy of Science, C.V. Riley Entomological Society, Sigma Xi

Awards and Honors:

Bausch and Lomb Science Award, 1962; Harvard College Book Award, 1962; Harvard College Scholarships, 1962-66; Cornell University Graduate Research Fellowship, 1966-67; Cornell Sigma Xi Graduate Research Fellowship, 1967-68; NIH Predoctoral Fellowship, 1968-71; Citizens for Ecological Action Award for establishment of Congressional Science Fellows Program, 1970; National Academy of Sciences Grant, 1975-76; NSF Undergraduate Research Participation Grants, 1975-77; Department of Energy Research Contract, 1975-82; USDA Research Grant, 1976-79; HEW Institute of Museum Services Grant, 1979-80; NASA Research Grant, 1980-85; NIH Research Grant, 1982-89; Evans Biocontrol Research Grant, 1986-87; American Men and Women of Science, 1986; Phi Kappa Phi; Sigma Xi. Nominations Committee, American Arachnological Society, 1986, 1987 (Chairman).

Selected Publications in last 5 years:

Carrel, J.E. 1982. The nonteaching of evolution. BioScience 32: 836.

Carrel, J.E. 1984. Defensive secretion of the pill milliped Glomeris marginata. I. Fluid production and storage. J. Chem. Ecol. 10:41-51.

Carrel, J.E., and T. Eisner. Spider sedation induced by defensive chemicals of milliped prey. Proc. Natl. Acad. Sci. USA 81:806-810.

Carrel, J.E., J.P. Doom, and J.P. McCormick. 1985. Arborine and methaqualone are not sedative in the wolf spider Lycosa ceratiola Gertsch and Wallace. J. Arachnol. 13:269-271.

Carrel, J.E., J.P. Doom, and J.P. McCormick. 1985. Quantitative determination of cantharidin in biological materials using capillary gas chromatography with flame ionization detection. J. Chromatog. Biomed. Appl. 342:411-415.

Carrel, J.E., J.P. Doom, and J.P. McCormick. 1986. Identification of cantharidin in false blister beetles (Coleoptera, Oedemeridae) from Florida. J. Chem. Ecol. 12:741-747.

Carrel, J.E., J.P. Doom, and J.P. McCormick. 1986. Inhibition of cantharidin biosynthesis in a blister beetle by 6-fluoromevalonate causes chemical disarmament. Experientia 42:853-854.

Carrel, J.E. 1986. Heart rate and physiological ecology. In: Ecophysiology of Spiders (W. Nentwig, ed., Springer-Verlag, Berlin) pp. 95-110.

McCormick, J.P., J.E. Carrel, and J.P. Doom. 1986. Origin of oxygen atoms in cantharidin biosynthesized by beetles. J. Amer. Chem. Soc. 108: 8071-8074.

McCormick, J.P., and J.E. Carrel. 1987. Cantharidin biosynthesis and function in meloid beetles. In: Pheromone Biochemistry (G. Prestwich and G. Blomquist, eds, Academic Press, New York) pp. 307-350.

Carrel, J.E., M.F. Haskins, and Z. Yang. 1987. Distributional ecology of two Geolycosa species in Florida. Amer. Arachnol. 436:4.

Haskins, M.F., J.E. Carrel, and Z. Yang. 1987. Natural History of a funnel-web building wolf spider. Amer. Arachnol. 36:6.

Jonathan A. Coddington

Education:

B.S., Biology, Yale University, 1975
M.A., Biology, Harvard University, 1978
Ph.D., Biology, Harvard University, 1984

Job Experience:

1979-83, Harvard University Teaching Assistant.
1979-1986, Organization for Tropical Studies
Teaching Asst., Visiting Faculty, Co-cordinator on various OTS courses
1984-88, Asst. Curator and Research Entomologist, Department of Entomology, Smithsonian Institution.

Awards and Honors:

1979 U.S. Fish and Wildlife Service Achievement Award. 1981 Student Paper Award, AAS International Meeting, Knoxville. 1983 Ernst Mayr Award, Society of Systematic Zoology. 1984-88 Collaborating Scientist, USDA. 1984-88 Research Associate, Museum of Comparative Zoology, Harvard University. 1985-88 Director, Willi Hennig Society. 1985-88 Editorial Board for Cladistics, Journal of Evolutionary Biology. 1986 Exceptional Service Award, Smithsonian Institution. 1986-88 Arachnology liaison to the National Biological Survey. 1986-88 U.S. CIDA correspondent. 1987-88 Director, Society for Systematic Zoology. 1987-88, Adjunct Professor, University of Maryland at College Park.

Selected Publications in last 5 years:

Coddington, J.A. in press. Notes on spider natural history: the webs and habits of Araneus niveus and cingulatus (Araneae: Araneidae). J. Arachnology.

Coddington, J.A., and C. Sobrevila. in press. Web manipulation and two stereotyped behaviors in an Ogre-Faced spider Dinopis subrufus Marx (Araneae: Dinopidae). J. Arachnology.

Coddington, J.A.. in press. Cladistic tests of adaptational hypotheses. Cladistics. 35 ms. pages.

Coddington, J.A., Horner, M., and Soderstrom, E.A. in press. Mass aggregrations in tropical harvestmen (Opiliones, Gagrellidae: Prionostemma spp.).

Coddington, J.A. 1986. The monophyletic origin of the orb-web. in W.A. Shear, ed. Spider Webs and Spider Behavior,, pp. 319-363. Stanford Univ. Press.

Coddington, J.A. 1986. The genera of the spider family Theridiosomatidae. Smithsonian Contributions to Zoology 422: 1:96.

Coddington, J.A. 1986. Orbs webs in "non-orb weaving" ogre faced spiders (Araneae: Dinopidae): a question of genealogy. Journal of Cladistics. 2: 53-67.

Levi, H.W., and J.A. Coddington. Progress Report on the Phylogeny of the Orb-Weaving Family Araneidae and the Superfamily Araneoidae. Verh. naturwiss. Ver. Hamburg. NF (26): 151-154.

Secretary

James W. Berry

Education:

Post-Doctoral Fellow, University of Miami Marine Laboratory, 1966-67
Ph. D., Duke University, 1966
M.S., Virginia Polytechnic Institute, 1958
B.S., East Tennessee State University ,1957

Employment:

Butler University, Asst. Professor of Zoology, 1965-66; 1967-72; Assoc. Professor of Zoology, 1972-77; Professor of Biological Sciences, 1977-present.

Professional Societies:

Indiana Academy of Science; Sigma Xi; British Arachnological Society; American Arachnological Society (Secretary of the Society, 1987-88).

Recent Awards:

Lilly Endowment, 1983; Holcomb Research Institute Awards, 1985, 1986, 1987. Indiana Academy of Science, 1986.

Recent publications:

Beatty, J.A., and J.W. Berry. The spider genus Paratheuma (Araneae: Desidae) from the Pacific. Journal of Arachnology (in press).

Berry, J. W. 1987. Notes on the life history and behavior of the communal spider Cyrtophora moluccensis (Doleschall) (Araneae: Araneidae) in Yap, Caroline Islands. Journal of Arachnology. 15: 309-319.

Berry. J.W. and J.A. Beatty. Four new species of Paratheuma (Araneae: Desidae) from the Pacific. Journal of Arachnology (in press).

****

International Distribution of Subscribers

We have censused the subscribers to the Journal of Arachnology. The numbers below indicate the number of subscribers, by country, to our journal.

Argentina	6	Israel	2
Australia	17	Italy	3
Austria	3	Japan	18
Belgium	1	Korea	1
Brazil	6	Mexico	4
Canada	22	Netherlands	2
Canary Islands	1	New Guinea	1
Colombia	1	New Zealand	4
Costa Rica	1	Norway	3
Cuba	1	Panama	1
Czechoslovakia	1	Paraguay	1
Denmark	4	Singapore	1
Egypt	1	South Africa	7
Finland	3	Spain	3
France	11	Sweden	5
Germany (West)	16	Switzerland	5
Great Britain	27	Uruguay	4
Greece	1	United States	334
Grenada	1	USSR	1
India	2	Yugoslavia	1
Indonesia	1		

Conference on Status of Systematics Collections

In October of 1988, the Association of Systematics Collections and the NSF will hold a conference on the status and future of systematics collections in America. One of the areas that will be represented is arachnology. Curators of selected collections have been asked to complete a short data form which will be used to assess "where we are" in terms of resources for systematics research. I will be representing arachnology at this conference. If curators who received letters have not yet responded, I hope they will do so at once. If you did not receive a letter but curate a research collection of arachnids in the United States or Canada, please contact me by phone at (804) 223-4381.

Bill Shear
Hampden-Sydney College
Hampden-Sydney, VA 23943

****

New
AUSTRALIAN ARACHNOLOGY

Australian Arachnology brings together eleven scientific papers which were presented at the first symposium on arachnology in Australia, held as part of the Seventeenth Conference of the Australian Entomological Society, at Tununda, South Australia, during May 1986. Several invited papers review the systematics, ecology and behavior of major arachnid groups, as they relate to the Australian environment. These papers will be particularly useful to those who have a general interest in Australian arachnids, to research students, and to teachers of senior invertebrate biology courses. The remaining papers are reports on specific research projects which represent the areas of arachnology currently being investigated in Australia. Published by the Australian Entomological Society, Brisbane, 1988. 137 pages. Cost is Australian $30.00, including postage. Order from: Business Manager, Australian Entomological Society, C/-Dept Primary Industries, Meiers Road, Indooroopilly, Queensland, 4068 Australia.

****

List of California Spiders

A 200-page list of California spiders (a guide to genera) is available for $10.00. Postage for the list is $2.40 for first class and $1.80 for third class. It is available from either:

Blaine Hebert
Department of Biology
California State University
Northridge, California 91330

Dr. Jack Fraser
2187 Broadmore
San Pablo, CA 94806

****

Status of Chelifer Geoffroy

Chelifer Geoffroy, 1762 (Arachnida, Pseudoscorpionida): **Proposed conservation.**

M.S. Harvey (Environmental Records Section, Museum of Victoria, 71 Victoria Crescent, Abbotsford, 3067, Victoria, Australia)

Abstract. The purpose of this application is to conserve the name of the pseudoscorpion genus Chelifer Geoffroy, 1762. Although a common name it is at present unavailable because the work in which it was published did not adhere to the principle of binomial nomenclature.

Comment or advice on this application is welcomed for publication in the Bulletin of Zoological Nomenclature and should be sent to the Executive Director, ICZN, c/o British Museum (Natural History), Cromwell Road, London SW7 5BD, U. K.

A Computerized Bibliography of Spider Literature Since 1940

Jonathan Coddington

Partly as a result of preparing the annual CIDA list, I have assembled a sizeable, computerized bibliography of spider literature. It currently has about 10,000 references, most of them since 1940. The included references are perhaps 90-95% of all spider references published since 1940. I would like to make a bibliography available to other workers, and to propose the improvement and completion of the bibliography as a communal project and resource. I would be willing to serve as editor for the project, and envision it as an ongoing, multi-year project.

Sources have included everything from Norm Platnick's catalog supplement and Vince Roth's Genera of North America to on-line Zoological Record and Biosis (thanks to everyone who so generously supplied bibliographies). The file is probably the best compendium of spider literature available, but it is still not complete. It should be exhaustive, covering all topics, and citing every reference in which spiders are a major topic. At present, the bibliography exists as 24 ASCII files on an IBM PC, totalling about 1.5 megabytes.

The file has many uses. A search for information on web spinning spiders yielded 785 references. Information on spiders in crops or agroecosystems gave 350; toxicology yielded 313; Deinopidae gave 37 references. It is particularly useful to students or when one is first investigating a topic.

I would like to link distribution of the file with improvement of the database. Obvious immediate goals are to include Bonnet's Bibliographia Araneorum, and to keyword all citations, thus creating a searchable on-line database to all spider literature. For example, if one supplies a portion of Bonnet in a specified format on disk, one gets the file, and presumably the subsequent annual updates. Alternatives might be to keyword all references dealing with a broad subject (e.g. physiology, ecology, or taxonomy), to proof all references in a foreign language, or to verify that all Japanese or Russian literature has been included.

In you are interested in participating in this project, please write me at Smithsonian Institution, NHB 164, Washington, DC 20560. Inquiries from foreign workers are also welcome, not just from the United States (BITNET address MNHEN008@SIVM). Please tell me (1) what you think of the plan (suggestions welcome, especially from computer geniuses on maximizing portablity), (2) if you would like to participate, and (3) if you have such a file yourself and would like to merge resources. Because space doesn't permit description of technical details, such as software used to search the database, file formats, information about annual updates, and various computer techicalities, a longer description will be sent out to interested parties. I am interested in anyone's ideas, and welcome input from anyone that would like to help. If enough AAS members would like to make it a communal project, the idea could be discussed at the meeting in Las Cruces this summer.

****

Back Issues of American Arachnology

Back issues of most numbers of American Arachnology are available at U.S.$2.00 per copy via surface mail ($3.00 via air). Send requests and payment in U.S. currency to

James W. Berry
Department of Biological Sciences
Butler University
Indianapolis, Indiana 46208

Company Wants Live Spiders

BioActives of Salt Lake City is investigating the potential use of spider venoms and other natural products for human therapeutic, agrichemical, and non-human research applications, and they are currently interested in expanding their survey of spider venoms. They are interested in obtaining whatever live specimens are available, with the exception of Lactrodectus and Loxosceles. They want live spiders in batches of not less than 25 individuals per species, preferably in the later instars. Payments average $0.70 per specimen arriving alive, with less paid for the smaller species (e.g. Dictynidae) and more for larger individuals or for those that are more difficult to collect (e.g. mygalomorphs). Higher prices are also paid for those specimens with egg cases.

Specimens should be sent via Federal Express or other mailing service. They will pay shipping costs and will return your vials to you. Locality information and identification must be included since they have evidence for ectopic variation in spider venoms. They need specimens year-round. If you are interested in supplying spiders to this company, you can contact Dr. Hunter Jackson, President, BioActives, Inc., P.O. Box 8327, Salt Lake City, Utah 84108.

Ed. note: Their letter of Oct. 1, 1987 indicated that they were interested in hiring an individual to oversee maintenance and breeding of their spiders. Preference will be given to candidates at the Ph.D. level.

****

Clarence J. Goodnight (1914-1987)

Clarence J. Goodnight, Professor of Biology at Western Michigan University, Kalamazoo, died on August 9, 1987. Dr. Goodnight was the Chairperson of the Division of Invertebrate Zoology in 1961 and Secretary of The American Society of Zoologists, 1973-75. His publications were numerous, including three textbooks and laboratory manuals. The subjects he covered were varied, but most were on the opilionids and problems of water pollution. He was a member of the Graduate Record Examination Board for several years, he directed several summer institutes sponsored by the NSF, and he was most active in several conservation organizations. In recent years he worked most closely with foreign students and visited Saudi Arabia and Libya with them to further their research interests. After retirement in 1984, he traveled extensively furthering his interest in conservation and natural resources.

****

Arthropod Jewelry Available

Bill Peck has found an artisan who can cast your favorite arthropod in gold or silver using the lost-wax technique. He can cast anything if the legs aren't too delicate (not likely to be satisfactory are pholcids and scytodids), and he charges by the weight of the metal used. Gold comes out much better and does not tarnish. The Mexican artisan speaks little or no English, but Bill Peck lives near him and is willing to help anyone who may want to contact him. Contact either:

Bill Peck	Juan S. Valdez
337 Xanthisma	J and M's Jewelry
McAllen, Texas	1402-A N. 23rd St.
78504	McAllen, Texas 78501

Bill has an anthrodiaetid cast in gold which has such good spination and palps that he thinks that it could be identified. He wonders if a gold holotype is acceptable in case it is an undescribed species!

****

LEELANAU SPIDER COURSE

Dr. Allen Brady has again been asked to offer a course in the biology of spiders at the Leelanau Center for Education, Glen Arbor, Michigan. The course is designed to acquaint participants with the significant biological features of spiders. Emphasis will be upon the behavior and ecology of species in the field, and identification in the laboratory.

The course will begin with orientation on Sunday evening, July 23 and conclude with a field trip on Friday, July 29. Enrollment will be limited to 6-8 people. Past participants have included beginning araneologists (high school teachers) and professional biologists (spider ecologists, museum curator).

Lecture topics will explore interesting aspects of spider biology, such as the evolution of web-building behavior, and various aspects of reproductive behavior. Half-day field trips will be the order of the day by mid-week and an all day excursion to Sleeping Bear Dunes will be undertaken. The size of the course will permit individual instruction and personal help in identification of spiders.

For those who wish, one hour of college credit will be offered through Central Michigan University. Tuition costs are $180 for the week (including lunch). A variety of housing accommodations can be arranged. These include cabin ($170), and single ($270) or double ($220) dormitory rooms. For further information contact The Leelanau Enrichment Programs, Glen Arbor, Michigan 49636 (616-334-3072) or Allen R. Brady, Hope College, Holland, Michigan 49423 (616-394-7712).

****

Highlands Biological Station Spider Course

A new spider course will be offered in the summer of 1988 at the Highlands Biological Station in Highlands, North Carolina. This 12 day field course will run from July 18-29. It is designed for upper level undergraduate and graduate students who may be interested in pursuing research problems involving spiders. It should also interest serious amateur naturalists, biology teachers and others who would simply like to learn more about spiders. The syllabus includes:

1. External structure of spiders; their relations to other chelicerates
2. Maintenance Functions: digestion, respiration, etc.
3. Reproduction: physiology and life history
4. Development and Life History
5. Neurobiology and Behavior
6. Ecology
7. Systematics and Phylogeny

There will be 12 days of classes: 10 three-hour lab sessions, 10 four-hour field trips, and 10 two-hour lecture/discussion sessions for a total of 55 lecture-hours equivalent. Three semester-hours credit will be awarded through the University of North Carolina, or Western Carolina University. Persons interested should write immediately to Dr. Richard Bruce, Director, Highlands Biological Station, PO Box 580, Highlands, NC 28741. Scholarship funds are available for qualified students.

****

Graduate Training in Systematics at the Maryland Center for Systematic Entomology

The Maryland Center for Systematic Entomology is a consortium for research and training in the systematics of arthropods. Participating institutions are the University of Maryland (College Park), Department of Entomology; the Smithsonian Institution, National Museum of Natural History, Department of Entomology; and the United States Department of Agriculture, Biosystematics and Beneficial Insect Institute. Graduate students are enrolled at the University of Maryland, with a Smithsonian or USDA scientist as co-advisor.

Research interests of the Center's more than 40 scientists include tropical biology, ecology, evolutionary biology, behavior, molecular systematics and systematic methods, in addition to the systematics of virtually all major groups of terrestrial arthropods.

Students become part of Washington's large and diverse research community, with access to the National Collections and associated research facilities, and the superb libraries of the Smithsonian and National Agricultural Libraries. The world-wide research programs of the Smithsonian provide extensive opportunities for fieldwork in tropical and other areas. Interaction is encouraged with other Washington-based institutions active in the international biological community, such as the World Wildlife Fund, the Nature Conservancy, US AID, The World Bank, National Research Council, the National Geographic Society, and Conservation International. The program emphasizes objective, quantitative analysis of taxonomic data, and this goal is facilitated by the Center's maintenance of comprehensive computer program packages, and its joint support of a resident taxonomic theorist.

Fellowships and assistantships to support a full graduate career are available. For further information, please contact Jonathan A. Coddington, Department of Entomology, National Museum of Natural History, Smithsonian Institution, Washington, DC 20560.

****

Call for Papers Published or in Press During 1988

Jonathan A. Coddington

I am in the process of compiling the 1988 CIDA list and would like to ask anyone who knows of or who has such works to send the citations to me at the address below by November, 1988. For those who don't know about the CIDA list, the "Liste des Traveaux Arachnologiques" is published annually by CIDA in Paris. Current and past lists since 1966 are available from CIDA, Museum National d'Histore Naturelle, 61 rue de Buffon, 75005 Paris, France. Each year the CIDA correspondents compile the lists of works on non-acarine arachnids published or in process by workers in their country. Although CIDA members get a request from me directly, anyone who knows of or has such works published or in press during 1988 can send the citations to me also. Works omitted in the 1987 list are especially important to include in the next year's list. The more complete the list is, the better bibliographic tool it becomes. Thanks.

Jonathan A. Coddington
Smithsonian Institution, NHB 164
Washington, DC 20560

A Post Jaca, Spain Odyssey

Vincent D. Roth

After the International Arachnological Meetings (1986) at Jaca, Barbara and I collected spiders in France, Spain, Morocco, Egypt, Israel, Sinai, Germany and returned home via Boston for the 1987 A.A.S. meetings.

Six weeks spent in Paris at the Museum National d'Histoire Naturelle with Simon's collection and library at hand was the best vacation for a systematic arachnologist. Evidence of Simon, our greatest arachnologist, was everywhere: labels, notes, photos, collections, types, his library, etc. The collection, overseen by the pseudoscorpion specialist Mme. J. Hertault, is divided. The types and identified material are at 61, Rue de Buffon and the larger, unidentified and unsorted (even to families in many cases) collection is safely underground in the "Zootheque". The former contains numbered jars with genera and species in numbered vials, indexed in a file cabinet and incompletely numbered in a book. Unfortunately Simon did not designate types in most cases, and many vials contain syntypes plus many specimens he seemed to have added later. For instance, in vial 5235, jar 1983, out of 64 specimens were 2 genera and 5 species. Evidently it was common practice, reportedly caused by a shortage of vials, to add specimens of one species to a vial as long as the locality (Washington Territory was a large area) and species were apparently the same. Many errors in identification among North American Agelenidae were noted. Simon's measurements of types seemed to be consistently high, and after an examination and recalculation of his ocular micrometer it was discovered to read about 12% high. By multiplying the size given in his description by 0.85, a correct measurement is obtained.

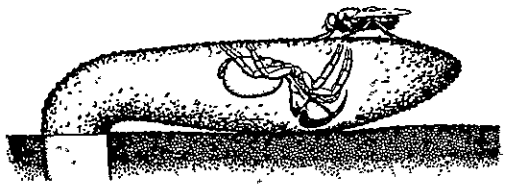
The Zootheque provided many surprises such as miscellaneous types, possibly some of Nicolet's types from Chile, many valuable old collections, some made in the late 1800's, many from Africa, some in perfect condition, many poorly labeled and even some dry. The most interesting discoveries will be published.

Collections from Morocco, Egypt, Sinai and Israel produced several families or subfamilies new or rare to us in the USA. These include Eresidae, Palpimanidae, Hersiliidae, Zodariidae, Cithaeronidae, Zoropsidae, Uroctiinae (Oecobiidae) and the unusual Prodidomid "Prodidomus" sp., possibly gulosus Simon. The latter has the abdomen truncated with very large and stout spinnerets.

Three and a half months were spent in Israel, the best place for collecting all of the above families within a very short distance. The country is like California but concentrated into a 160 mile long area from desert and beach to a snow capped mountain. Collecting spots are everywhere, bus transportation excellent (or hitch-hiking), open country and almost everyone speaks English. A January to April spider survey was made at the Blaustein Institute, Dept. of Ecology at Sede Boqer at the edge of the Negev Desert where Yael Lubin is located, and at Ma'agan Michael at the coast. Each place produced nearly 130 species with only part time collecting.

Several ant-feeding Zodariids were collected including the igloo maker, Zodarion sp.?, a 6-eyed Tragetes sp., and Palestinea sp. We collected 54 males and 4 females of them in 40 minutes where they were mixing with ants in the courtyard of St. Katherine's monastery on the Sinai. A species of Laches (or Lachesana) was collected in burrows on sand dunes in Morocco and Israel. This species has long spinnerets which are retracted into the abdomen when not in use and covered with curved hairs. Upon preservation the spinnerets are extruded. It appears that the zodariid Lutica of the U.S. west coast also retracts its spinnerets. These are the only cases I know of where spinnerets of spiders are retracted.

We left our collections at Ma'agan Michael Field Center Laboratory and at Sede Boqer in the hands of Yael Lubin and some with Gershom Levy at the University of Israel in Jerusalem. Gershom has a well curated collection, mainly Israeli spiders.



Wills for Arachnologists

Vincent D. Roth

Have you considered the importance of making a will for your family? Have you considered including in this will provisions for your other lifetime efforts, your collections, research notes, unfinished manuscripts and/ or your professional library?

Every once in a while a colleague passes away without making such provisions and the fate of his or her collection, notes, library and borrowed material remains in question. One hesitates to inquire too soon or too late of the survivors who often either have no idea of the scientific importance of this material or equate scientific value with monetary value and thus make these items inaccessible to the majority of the scientific community except to wealthy institutions - not many of these.

In one case I know of, no one, not even a collaborator, was allowed to touch the collection. This was very unfortunate since some specimens were on loan and the rest were lost to science. In another case a card file was held, only to become useless over the years, just because it was assumed valuable.

We'll all die sometime and anytime so one should consider a will now, at least for scientific materials. It will help our survivors handle our collections as we would want them to be. In my own case my will allows for the deposition of the spiders and files in a museum and for the sale (through the Society) of my scientific equipment and literature. All the profits of such a sale could go as a direct gift to the Society, or the survivor(s) could receive a percentage of the sales. In either case, a substantial part of the donations could be used as a tax deduction.

Recently the collection of a well known arachnologist went to a dealer who made it available at greatly inflated prices. It would have been as profitable to have the books sold privately to arachnologists (a la Stone) via a printed offering or through the Society by means of bids. In this way, both the donor and the Society could profit and literature would go directly into the hands of those who need it most, the active arachnologists. Even better, a direct donation to the Society should be considered. Gifts to libraries are often essentially lost to arachnological workers, and the same books are often duplicated. For instance, some rare arachnological volumes are duplicated two and three times in the library of the University of California at Berkeley.

Give these ideas some consideration and support our Society.

****

CONSTITUTION AND BY-LAWS

Changes approved at the annual meeting at Harvard University in June, 1987 are underlined.

CONSTITUTION

ARTICLE I Name

Section 1: The name of the organization shall be: The American Arachnological Society Corporation.

Section 2: Similar groups or organizations which are willing to abide by and uphold the Constitution and By-Laws of the Society may be incorporated as branches of the organization.

ARTICLE II Purposes and Objectives

Section 1: To promote the study of the Arachnida.

Section 2: To achieve closer cooperation and understanding between amateur and professional arachnologists.

Section 3: To publish the Journal of Arachnology.

Section 4: The general purposes and powers are to have and to exercise all rights and powers conferred on nonprofit corporations under the laws of California, including the power to contract, rent, buy or sell personal or real property, provided, however, that this corporation shall not, except to an insubstantial degree, engage in any activities or exercise any powers that are not in furtherance of the primary purposes of this corporation.

Section 5: No substantial part of the activities of this corporation shall consist of carrying on propaganda, or otherwise attempting to influence legislation, and the corporation shall not participate or intervene in any political campaign (including the publishing or distribution of statements) on behalf of any candidate for public office.

ARTICLE III Membership

All persons interested in the objectives of the Society shall be eligible for membership.

Article IV Meetings

There shall be an annual meeting open to all members.

ARTICLE V Officers

Section 1: The elective offices shall consist of President, President-Elect, Secretary, Treasurer and a three member Board of Directors.

Section 2: The officers shall be elected by a majority of votes cast. In case of no majority (a tie), the Executive Committee will choose between (among) the tied nominees.

Section 3: Officers appointed by the President, with the approval of the other members of the Executive Committee, shall include the Editor, Membership Secretary, and the Archivist.

ARTICLE VI Amending the Constitution

Section 1: The Constitution or any part thereof may be amended, suspended or repealed by a two-thirds majority of those voting in a mail ballot, provided there is a two months notice of the proposed change.

Section 2: Any member in good standing may propose, in writing, an amendment to the Constitution to the Executive Committee. Such a proposal, if approved by a majority of the Executive committee, shall be submitted with a recommendation to the members. A proposed change to the Constitution not recommended by the Executive Committee must be submitted to the members of the Society if five or more members re-submit it.

ARTICLE VII Non-Profit Purposes

This corporation is organized pursuant to the General Non-Profit Corporation Law of the State of California, and does not comtemplate pecuniary gain or profit to the members thereof and it is organized for non-profit purposes.

ARTICLE VIII Dissolution

The property of this corporation is irrevocably dedicated to arachnological purposes and no part of the net income or assets of this organization shall ever inure to the benefit of any director, officer or member thereof or to the benefit of any private individual. Upon the dissolution or winding up of the corporation, the assets remaining after payment of all debts and liabilities of this corporation shall be distributed to a non-profit fund, foundation or corporation which is organized and operated exclusively for arachnological purposes and which has established its tax exempt status under Section 501 (c) (3) of the Internal Revenue Code. The non-profit fund, foundation or corporation which is organized and operated exclusively for arachnological purposes shall be named at the time of the dissolution by the Executive Committee or vote of the membership. If this corporation holds any assets in trust, or corporation is formed for charitable purposes, such assets shall be disposed of in such a manner as may be directed by decree of the superior court in the county in which the corporation has its principal office, upon petition therefore by the Attorney General or by a person concerned with the liquidation, in a proceeding to which the Attorney General is a party. The purposes contained in this paragraph are limited to those meeting the requirements for welfare exemption under Section 214 of the Revenue and Taxation Code.

BY-LAWS

ARTICLE I Membership

Section 1: Membership shall be open to all persons who make formal application and pay the prescribed dues, and who are willing to abide by and uphold the Constitution and By-Laws of the Society.

Section 2: Institutions may not become members, but may subscribe to publications.

Section 3: Dues shall be paid upon receipt of an annual bill.

Section 4: All members in good standing shall have the right to vote.

Section 5: Any member in good standing is eligible to hold office.

Section 6: A member whose dues have not been paid within a reasonable period of time will forfeit the privileges of membership. Such members may be reinstated upon payment of delinquent dues.

Section 7: The services and privileges of membership shall include the following --

1. Subscriptions to all publications
2. Vote in accordance with the By-Laws
3. Participation in all activities and functions of the Society.

continued on next page

Section 8: A class of Honorary Memberships shall be established to acknowledge arachnologists who have achieved a high level of eminence on the basis of significant research contributions. After being nominated, an individual may be elected by a two-thirds vote of the Executive Committee. The number of Honorary Members is not to exceed 5% of the total membership. A list of these Honorary Members is to be published in each issue of The Journal of Arachnology.

ARTICLE II Officers

Section 1.: The elective offices shall consist of: President, President-Elect, Secretary, Treasurer, and a three member Board of Directors.

Section 2: The elected officers, Membership Secretary, Editor and Board of Directors shall serve as the Executive Committee. Fifty percent of the Executive Committee represents a quorum.

Section 3: The officers and Board of Directors of the Society shall be elected by a majority of votes cast in a mail ballot.

Section 4: Officers and Directors shall serve for two years, or until their successors are elected. Beginning in 1977 and every other year thereafter, the incumbent President-Elect shall assume the presidency, and the incumbent President shall continue on the Executive Committee as one of the Directors. A new President-Elect, the Treasurer and one Director shall be elected in these, the odd-numbered years. On the alternate, even-numbered years, beginning in 1978, the Secretary and one Director shall be elected.

Section 5: An elected officer or member of the Board of Directors may be renominated, but only the Secretary and Treasurer may serve for more than two consecutive terms in the same office.

Section 6: The President shall preside at business meetings of the Society and Executive Committee. He shall appoint all committee chairpersons as the need arises. The Executive Committee shall appoint all committees.

Section 7: The President-Elect shall assume the duties of the President in his absence at business meetings, and shall become President in the event of death, resignation or disability of the President. In the event of the absence of both President and President-Elect at a business meeting, any member of the Society duly chosen by the members present ought to preside.

Section 8: The Secretary, or his delegate, shall keep minutes of the proceedings of all Society business meetings, conduct official correspondence and maintain an on-going record of Society affairs.

Section 9: The Treasurer shall keep the financial records, accept monies, issue bills, pay bills and maintain the bank account. The account shall be subject to annual audit by a committee appointed by the Executive Committee. An annual financial statement shall be published in the newsletter of the Society.

Section 9a: The Membership Secretary shall be appointed by the Executive Committee, and shall serve until replaced. The Membership Secretary shall keep membership records, issue dues renewal notices, and accept dues and transmit them to the Treasurer for deposit. Starting in 1985 the complete membership of the Society shall be published in the newsletter of the Society every five years.

Section 10: Publication policy shall be the responsibility of the Executive Committee, which shall also appoint the Editor of the Journal. An Editorial Board shall be appointed by the Editor of the Journal under consultation with the Executive Committee. The purpose of the Editorial Board is to assist in the review process.

ARTICLE III Meetings

Section 1: There shall be a general meeting of the Society open to all members. The date, time and place are to be determined by the host(s) and coordinated by the President-Elect.

Section 2: The membership shall be informed of the date, time and place of the annual general meeting at least three months prior to the meeting.

Section 3: Special meetings of the Executive Committee may be called by the President.

Section 4: An annual business meeting open to all members will be held in conjunction with the general meeting at a time to be designated by the President.

Section 5: Additional meetings may be called by the Executive Committee or by request of twenty or more members.

ARTICLE IV Dues

Section 1: Annual dues for regular members shall be an amount fixed by the Executive Committee and duly announced to the membership.

Section 2: Institutional subscriptions shall be an amount fixed by the Executive Committee and duly announced to the membership. Journal subscriptions may be exchanged with other professional societies that publish a journal.

Section 3: Student membership shall be an amount fixed by the Executive Committee and duly announced to the membership.

Section 4: Honorary Memberships will be gratis and must be bestowed by a two-thirds vote of the Executive Committee.

Section 5: Associate Membership for low income workers or for countries where it is not possible to send money will be gratis and must be bestowed by the vote of the Executive Committee.

Section 6: Records pertaining to Society funds shall be open to inspection to any member at any time.

ARTICLE V Amending the By-Laws

By-Laws may be adopted, amended, suspended or repealed by a two-thirds majority of those voting in a mail ballot, provided there is two months notice of the proposed change.

ARTICLE VI Parliamentary Authority

If not contrary to the Constitution or By-Laws, procedures to be followed in business meetings of the Society shall be those established in "Robert's Rules of Order Revised", seventy-fifth or later editions.

Section 11: Election of Officers and the Board of Directors shall be provided for in Article II, Section 4 of these By-Laws. Appointment of a three-member Nominating Committee shall be made by the President and announced at the annual business meeting. The nominees must indicate to the Nominating Committee their willingness to serve if elected. Mail-in ballots which shall be included in the following year's Spring issue of the Newsletter, shall be returned to the Nominating Committee for counting. Write-ins on ballots will be permitted. Election results will be announced at the annual business meeting. Newly elected officers shall take office on the first day of September of the year in which they are elected.

Section 12: Procedural matters shall be passed by a default system. If less than 10% of the membership send negative remarks to the Secretary within one month of mailing, the motion will pass. If 10% or more reply with negative comments, a general mail vote will be taken, with a majority of votes cast determining the issue.

RESEARCH REPORTS

HIEBER, CRAIG S.
DEPARTMENT OF BIOLOGY
ST. ANSELM COLLEGE
MANCHESTER, N.H. 03102

I am now into my second year here at St. Anselm's and it seems that all I have been doing lately is either setting up new courses or improving existing ones (anyone know how long it takes to get them perfect?) and teaching biology to the non-majors (a reluctant group at best). Added to that is the combined craziness of our first child, a new job for my wife Sherry, and a new house. It seems like we have done everything we could in the last two years to have a nervous breakdown, and yet.... Actually, amongst all this frenzying, I have managed to either get started or continue a few spider projects.

I am still very interested in the parasites of spiders, and my biggest research project continues to be my summer collaboration with George Uetz on the egg-sac parasites of the cocoons of (surprise!) colonial spiders in the genus Metepeira. Our work so far has focused on the spiders M. incrassata (a tropical forest species) and M. atascadarta (a desert species). The summers of 1986 and 87 were spent establishing the taxonomic composition and abundance of the parasite fauna attacking the cocoons, the relationship between parasite load and colony size, and started work on the importance of cocoon position within a colony with regard to attack. We now have a good idea of the parasites attacking the cocoons and have a clearer picture of the relationship between colony size and parasitism for the two habitats. This summer (1988) we plan to continue our research by focusing on a number of problems. First, we want to continue exploring the relationship between cocoon position in the colony and the risk of parasitism. This will be examined with regard to female reproductive output and the way females distribute their cocoons within a colony. Recent observations suggest that the best place to be in terms of food is at the edge of the colony, but this places egg-laying females at greater danger from predators and egg parasites so it seems likely there are trade-offs occurring. Secondly, we want to start exploring the effect of maternal guarding on protecting individual cocoons. To do this we are going to examine a number of behaviors the spiders may be using both individually and at the whole colony level to interfere with the detection and utilization of egg-sacs by the parasitoids.

As an aside to the work on parasites in Mexico, I have also been doing some work on the thermoregulatory behavior of the two species mentioned above and M. spinipes. Currently, I have laboratory generated data on the upper thermal limits these spiders can tolerate, and the behaviors of these spiders when presented with high thermal loads. This summer in Mexico, I plan to collect data on ambient conditions at the colony sites, the role that shade from the plants providing web supports plays, the body temperatures of spiders in their retreats and in the sun, and the upper limit to body temperature that spiders might attain. I am collecting these data to understand how colonial living might affect thermoregulation, and how spiders in colonies are solving this problem if they are constrained. With the limited data I have collected, it currently looks like colonial living is not a constraint (i.e., retreat space is not a problem). Rather it is the type of vegetation used for web or colony support, or lack thereof, which is most influencing thermoregulatory behavior in these spiders.

I have just initiated some research here in New Hampshire this year. Along with my senior seminar students, we have started to look at the criteria Achearanea tepidariorum is using to make decisions on when to leave a foraging site after the food stops. This first year has been primarily occupied with getting equipment built, the setting up of cultures, and the scouring of the literature. However, we did manage to run a few spiders on feeding regimes and the limited results are promising, indicating that under some feeding schedules A. tepidariorum makes decisions in accord with current models of risk sensitive foraging. Future work (this summer and fall, and into the years!) will concentrate on testing a number of foraging models, trying to determine both the role of "prior experience" in decision making in spiders and exactly what information constitutes experience, and looking at cues that this spider may use to evaluate the prey availability of potential web-sites prior to constructing a web.

I am also planning to do some initial work on the thermoregulation strategies of crab spiders. Many of the members of this family are sit-and-wait predators and, as such, should have problems similar to the orb-weavers. I am initially interested in looking at color and behaviors to control insolation, and potential conflicts between controlling thermal input and the temporal availability of prey. At the very least it will be an excuse to wander about in the old fields of New England in the sun!!!!

****

PALMER, JACKIE
MUSEUM OF COMPARATIVE ZOOLOGY
HARVARD UNIVERSITY
CAMBRIDGE, MA 02138

Although it may seem like I've been a student for 100 years, actually I am only now a fourth year graduate student with Dr. Herb Levi. The primary focus of my research is the comparative biology of silk production in spiders with a particular interest in the mygalomorphs. It amazes me that we don't know more about spider silks, certainly from a textile standpoint or even more interestingly, from the aspects of cell biology, evolution and biochemistry. But we don't, and that's the purpose of my work. I am surveying the diversity of silk producing systems in the more generalized spiders hoping to uncover some patterns in the evolution of silk. I feel an urgency to complete this "homework" in order to allow accurate investigations on a molecular level.

For the most part, my thesis work involves tedious histochemical examinations of far too many mygalomorph representatives. This work is designed to reveal different gland types based on morphology as well as product chemistry. Of the more interesting silk glands, I am looking ultrastructurally at some unique (and perhaps quite powerful) secretory specializations. I have nearly completed a scanning electron micrographic survey of the external spinning apparatus of representatives from all but a few mygalomorph families (thanks to Jonathan Coddington and the Smithsonian Institution!).

For a few weeks this spring, my husband David, and I will be traveling with Dr. Fred Coyle and Robb Bennett to Peru to look for tropical mygalomorphs and observe their use of silk first hand. This summer I hope to attend the spider biology and scientific illustration courses at the Highlands Biological Station in North Carolina. And, if all goes as planned, I'll spend some time next year in Paris with Dr. Jacqueline Kovoor. We intend to combine and extend our compatible work on the evolution of spider silk production to include further ultrastructural and possibly some developmental studies.

continued on next page

In addition to my thesis, I have several other projects in the workings. Dr. Betty Hay (Harvard Medical School) and I are trying to replace the standard collagen matrix used in cell culture media with spider silk. So far we have preliminary results of some limited migration of fibroblasts on silk which may eventually disprove an accepted mandatory biochemical interaction between these cells and collagen fibers. I am interested as well in spider silk and folklore and find myself side-tracked in the archives more often than I like to admit. Currently, I have been trying to spin enough Ischnothele (Dipluridae) silk to crochet into lace. Fiberarts magazine recently carried a short article in which I introduced the textile artist to spider silk.

As research histologist for Dr. Bert Holldobler (MCZ-social insects), we are finishing up two more studies on abdominal exocrine glands in certain ants. While these glands produce pheromones and not silk, they are derived from similar epidermal precursors. In the process, I am developing a reliable technique for sectioning whole-bodied, strongly sclerotized insects and arachnids.

When I graduate (someday), I might like to postdoc in cell biology somewhere with an emphasis on the molecular mechanisms and regulation of secretion. More permanently, it would be nice to find a academic job in a small institution in the South which would permit me to continue working with spiders and the secretion of natural fibers, and where I could find my own time again to weave and spin.

****

SIERWALD, PETRA
INDIAN RIVER COASTAL ZONE MUSEUM
HARBOR BRANCH OCEANOGRAPHIC INSTITUTION
5600 OLD DIXIE HIGHWAY
FT. PIERCE, FL 34946

My present research concerns the systematics of the family Pisauridae, currently comprised of approximately 60 genera. Simon (1898) recognized three groups within the Pisauridae: Dolomedeae, Thalassieae and Pisaureae; Lehtinen (1967) placed the genera in two different families (Dolomedidae and Pisauridae), each in a different superfamily; and Carico (1983) proposed a separate family for South American genera. None of these groupings have been defined by synapomorphies. Since my special interest is the comparative anatomy of copulatory organs, I attempt to define groups on the basis of synapomorphic features of their copulatory organs. A major obstacle in this task is the identification of homologous structures. [We all label our drawings of copulatory organs in the spider groups we study, but we usually admit that the terms we use do not imply homology when comparing different spider genera or spider families.]

My research concentrates on three main projects: (1) Study of the copulatory organs of 29 pisaurid genera, including the name-bearing palearctic genus Pisaura. Most species of this group occur in Africa. In the genera studied to date, distinct and complex synapomorphies in male and female copulatory organs have been discovered. (2) Continuation of the study on ontogeny of female copulatory organs, including members of Agelenidae, Oxyopidae, Lycosidae and Sparassidae. The basic method here is very simple: I rear spiders from young juveniles to adulthood and collect their exuviae. The anlagen (primordial stages) of the female copulatory organs are well preserved in the body wall and can be studied with the SEM. These studies allow the identification of homologous structures especially the spermathecae, which are often reduced and functionally replaced by a secondary structure or modified in other ways. (3) A faunistic study of the spiders on Bermuda. In May 1988, I will continue these studies on a second collecting trip, following an invitation by the Department of Agriculture of Bermuda. This project also includes a study of the specimens in "historic" collections of Bermudian spiders, made by Heilprin, Marx and Banks.

In the future, I plan (1) to revise several genera of the family Pisauridae on species level (Pisaura, Perenethis, Tetragonophthalma), study the phylogenetic relationship between the African clade and other pisaurid genera, and redefine the family on the basis of synapomorphies in the copulatory organs; (2) to continue the study of ontogeny of female copulatory organs, including additional families; and (3) to work on the systematics of the Lycosoidea as defined by Homann (including 10 families, clade based on the grate-shaped tapetum of the secondary eyes). This will keep me busy, I guess.

****

STOCKWELL, SCOTT A.
DEPARTMENT OF ENTOMOLOGY
UNIVERSITY OF CALIFORNIA
BERKELEY, CA 94720

I continue to describe scorpions of the genus Diplocentrus and to slowly revise the scorpions of Central America. While many species of Diplocentrus from northern Mexico are well represented by museum specimens, those from southern Mexico and Central America are most often represented by one or a few incomplete or juvenile specimens. This has made it difficult to evaluate the interspecific variation and relationships in this large genus. If anyone has material from the Yucatan Peninsula or Central America, I would greatly appreciate the opportunity to have a look at it.

I have also undertaken a revision of the genus Centruroides for my Ph.D. dissertation. This is only in its preliminary stages, so the only item that I have to report is that Dr. H. W. Levi and I have submitted a petition to the ICZN to designate a neotype for Buthus vittatus that follows the accustomed usage of Centruroides vittatus. While there is no shortage of Centruroides material from museums, I would be happy to identify material anyone would like to send me. As part of my analysis, I have been looking at the chromosomes of Centruroides and other species. I'm not expecting too much from this line of research, but the few species of Centruroides that I have looked at have had different chromosome numbers. In addition, large differences are apparent between North American Iuridae and Yeajovidae.

The inability of systematists and others to accurately class scorpions as to their familial status, in my opinon, has been one of scorpiology's great shortcomings. To remedy this state of affairs, I have been working on the phylogeny and systematics of the higher categories of the Scorpiones. Using cladistic methods, I have discovered that the family Yaejovidae, as currently comprised, is polyphyletic, and that the family Chactidae is paraphyletic. I think that the complementary systematic changes that I will propose will enable anyone to confidently identify any scorpion to at least the family level. I will present the results of this research at the meeting in Las Cruces.

continued on next page

Partly as a result of the phylogeny research, I have been working on fully illustrated, annotated keys to the families and genera of New World Scorpions with checklists of the species, as well as a study of scorpion hemispermatophores and their importance in the systematics of the order.

I am looking for anybody who might like to study the function, ecology, evolutionary significance, etc. of the mating plugs of some vaejovid scorpions. As far as I know, the mating plugs of vaejovids have never been properly described. These structures have been illustrated or described as complex "capsules" or sperm ducts of the spermatophore. However, complete dissections reveal that they are not directly attached to the sclerotized parts of the spermatophore proper. Examination of many female specimens of Yaejovis, Uroctonus, and Serradigitus have revealed the presence of a mating plug inserted into the genital aperture that is concealed under the genital operculi. The plugs are produced in left and right halves within their respective hemispermatophores. The plugs undergo some distortion during joining of the halves and/or deployment. I have not personally observed the deployment of the mating plug, nor do I have any knowledge of its effectiveness. A preliminary examination of many species indicates that the morphology of these mating plugs, either from the hemispermatophore (hemi-mating plugs) or from the female (after deployment), is often species specific and may be taxonomically useful. All Paruroctonus and Yejovoidus, as well as a few species of Yaejovis and Uroctonus, lack sclerotized mating plugs. All Serradigitus, Syntropis, and Paravaejovis examined possess pating plugs.

As always, I greatly enjoy making determinations for anyone who needs them. I can't always promise to return ID's immediately, especially with unfamiliar genera, but I will do my best to accomodate your particular requests. Feel free to contact me concerning any scorpion-related subjects.

****

TILLINGHAST, EDWARD
ZOOLOGY DEPARTMENT
UNIVERSITY OF NEW HAMPSHIRE
DURHAM, NH 03824

It must be a common occurrence among those of us who have sought an answer to a particular scientific question to conclude the study with yet more questions. It must be equally common to gain an almost unexplainable (to others) affection for the animal of inquiry. These two factors have, for better or worse, governed much of my activity in science.

Beginning with the simple question as to whether the spider could or could not digest its own web, I have been drawn ever more closely to the chemical composition of the web itself. Recollecting my thoughts of 12 years ago: I thought the orb web to be pure protein and each of the products of the silk glands, a single protein. But as the work of Fischer and Brander (1960) had already demonstrated, the first assumption was false and as the papers of Mullen (1969), Kovoor (1972), Palmer (1985) and Work (1984) revealed, so also was the second. And whereas I believed initially that my first paper (Tillinghast and Kavanagh, 1977) clearly demonstrated that the spider could digest all of the components of the orb web (with the possible exception of the minor ampullate silk), with the passage of time, strong reservations began to trouble me.

In the Silk Symposium of this past summer I presented evidence, largely gathered by my student, Mr. Mark Townley, that indeed the spider can digest all the major components of the orb web, with the possible exception of the minor ampullate silk. These studies confirmed that the adhesive spiral is more susceptible to digestion than the radial fibers.

Since the Silk Symposium we have begun studies on the adhesive spiral, a product of the aggregate and flagelliform glands. These studies include the analysis of the aggregate gland secretions of the black widow spider for comparison. The aggregate secretions of both the orb weavers and black widow consist of a complex of several proteins as well as a high molecular weight glycoprotein. The molecular weight patterns of proteins from individual black widows are highly reproducible yet vary somewhat between spiders. As we have been lax in recording the state from which we received the black widows, we have yet to make a connection between the geographical origin and the electrophoretic pattern. Should the reader have any knowledge of the taxonomy of black widows, my students (Mark Townley and Sean Kelly) and I would be pleased to welcome you to join us in this study.

More recently I have become interested in comparing the chemistry of the low molecular weight components of the webs of orb weavers which live in widely different environments to ultimately explain the significance of the compounds. Should the reader have a favorite orb weaver, I would welcome his or her collaboration in this research.

****

A Tip For Collecting Trogloneta and Mysmena

Jon Coddington and I are working on a little paper on Trogloneta hypsigaster (= Parogulnius) in which we will mention a technique for collecting Trogloneta and Mysmena. Sift litter through medium mesh (about 5 mm) and examine the debris which passes the sifter with strong, warm light such as an ordinary incandescent floodlight. Care must be exercised, obviously, to prevent desiccation of animals. Look for the tiny spiders that climb up onto the larger particles and spin strands of silk to other particles. Such spiders as Leptoneta are not collected best this way, and they are often killed rather quickly if they don't run away in time. Erigonids will run madly about, and like Leptoneta, will try to hide under the debris or escape. The ones that I use the technique for are Trogloneta and Mysmena. It is curious that these tiny spiders are attracted to light, heat, or a combination. They may be so small that the radiation they receive is negligible, and their best bet is to get their feet off the hot ground, so to speak, since they cannot run very far on their very short legs, anyway. It would be interesting to know how other related species respond to attempts to collect them with this method.

Cole L. B. Benton, Jr.
Department of Biology
Jacksonville State University
Jacksonville, Alabama 36265

Abstracts of the

Spider Silk Symposium

Presented at the Cambridge Meeting

June, 1987

Arthropod Silk Production: Are Spiders Really Special?

PALMER, JACQUELINE M.
MUSEUM OF COMPARATIVE ZOOLOGY
HARVARD UNIVERSITY

A wide variety of arthropods make silk. Depending on your definition, silks can be categorized by composition, conformation, taxonomy, function and/or by silk producing structures. This presentation is intended as a review: to give perspective regarding the importance of silk production, to clarify some terminology and to emphasize just how special spiders really are.

****

Observations on Some Properties of Spider Silks.

PETERS, HANS M.
TUBINGEN, WEST GERMANY

The paper deals with a series of quite different phenomena and problems. Many of the observations were made occasionally during differently directed studies, others were conceived as initiations to further study.

The topics are: 1) composition of threads, simple cases, 2) more complex combinations of silks, 3) how fibers are bound together, 4) special forms of fiber binding, 5) fusion of fibers, 6) fibers keeping distance from one another, 7) on the variation of the diameters of fibers, 8) what determines the shape of a fiber's cross-section? 9) on the viscosity of silks, and 10) a tentative approach to the molecular architecture of spider silks.

****

Testable Historical Hypotheses Versus Speculative Historical Narratives: Another Look at the Origin of the Spinning Apparatus in Spiders.

SHULTZ, JEFFREY W.
DEPARTMENT OF ZOOLOGY
OHIO STATE UNIVERSITY

When faced with an incomplete fossil record or the absence of an appropriate method of historical reconstruction, evolutionary biologists sometimes resort to speculation or story-telling to bridge those gaps in the history of life that science cannot readily fill. Scenarios for the origin of silk in spiders frequently take the form of speculative historical narratives; they rely heavily on conjecture and typically offer no criteria for objective evaluation. This paper reviews the literature pertinent to the origin of spinning in spiders with the goal of replacing speculative historical narratives with testable historical hypotheses. Information concerning three interrelated historical problems (the origin of spinnerets, the origin of silk glands, the original selective pressures favoring the evolution of silk) is examined from three frames of reference (ingroup analysis, outgroup analysis, convergence analysis) and integrated within the historical framework provided by recent reconstructions of arachnid phylogeny. The results of this procedure strongly suggest that silk originated in the spider ancestor for use in reproduction. Two hypotheses are derived from this conclusion (the spermatophore-sperm web and egg sac hypotheses) and criteria sufficient for their rejection are discussed.

****

Main Trends of Evolution in the Spider Silk Gland System

KOVOOR, JACQUELINE
LABORATOIRE DE ZOOLOGIE-ARTHROPODES
MUSEUM NATIONAL D'HISTOIRE NATURELLE
PARIS, FRANCE

Hypothetically, primitive spiders had 8 functional spinnerets derived from appendages of the 4th and 5th abdominal segments; spinnerets bore numerous simple spools of one kind, on wide fields of every article; the acinous single gland type secreted a mucoprotein. From this schema, different evolutionary lines could be traced at the three correlative levels; spinnerets, spools and silk glands. Spinneret evolution comprises 1° variations of their localization in the abdomen 2° regressive trends, the orientation of which is characteristic of each major group of spiders and, 3° variations of the spools: their fields became less extensive and more distal until an apical plate was formed on the tip of the spinneret. These trends are correlated with a morphological diversification from two kinds in Liphistiomorphae, three at the most in Mygalomorphae to nine in certain Araneomorphae, when several kinds might form different functional areas on each pair of spinnerets. A more elaborated evolution of the silk glands appeared as changes in their number, morphology and histological structure, as well as in the structure and histochemical characteristics of their secretory products. Combinations of different modifications occurred either on one part or, differently, on several parts of the silk gland set giving rise to a more or less extensive apomorphic diversification. Primitive acinous glands tend to become tubuloacinous, tubular or globular while increasing in size and decreasing in number.

In Mesothelae, silk glands are not morphologically much diversified, but two lines could be distinguished from the histochemical characters of the proteins secreted; a functional differentiation appeared between the anterior and posterior spinnerets. Mygalomorphae showed more differentiation in the shape of the glands than in the histochemical characters of the proteins secreted. The evolution of silk glands in Araneomorphae is related to the colonization of an aerial environment. Differentiation of glands corresponds to the elaboration of fibers specialized in one of the three main functions: drag-line, capture threads, and egg-case construction. The first distinctive and general character was the emergence of the ampullate gland type, correlated with the use of a drag-line; ampullate glands appeared as numerous tubes (Eresidae) or reduced to four similar pairs (Lycosidae), all secreting the same product; only one pair of large tubes opening on the ALS might develop (Dysderidae). A slight differentiation between ampullate glands of the ALS and those of the PMS appeared in some unrelated families; it is more obvious in Filistatidae or in Araneoidea. Ampullate glands opening on the ALS were generally accompanied by small pyriform glands producing a glycoproteinic glue. From the muco-serous secretion of the small acinous cribellar glands, composite capture threads were spun with the cooperation of the PMS and PLS, and the

continued

development of paracribellar (Dictynidae) or/and pseudoflagelliform glands (Zoropsidae, Uloboridae). In Ecribellate spiders, capture threads originated from modified acinous glands of the PLS and PMS (Agelenidae, Hersiliidae); further, Araneoidea developed large aggregate and flagelliform glands of the PLS from which their sticky capture threads are spun. Differentiation of tubuliform glands whose fibers were used for the construction of egg cases was an apomorphic character of females; it started as slightly modified aciniform glands (Telemidae). Such glands were numerous and tubular (as in Lycosidae or Uloboridae), restricted to four pairs (Agelenidae) or three pairs in Araneoidea, and further differentiation occurred between the median and the lateral ones. The most elaborate silk gland system belongs to an araneid or an uloborid spider. Silk glands of eresid, dysderid and dictynid spiders provide some early steps of the evolutionary process leading to this complex system.

****

Orb Weaver Spinneret and Spigot Morphology: An SEM Survey

CODDINGTON, JONATHAN A.
USNM-ARACHNIDS AND MYRIAPODS
SMITHSONIAN INSTITUTION

If Deinopoidea (Uloboridae and Deinopidae) are the outgroup to the other orb weaving spiders (Araneoidea), the silk-spinning apparatus must have undergone considerable change and evolutionary derivation. The cribellum was lost, and the aggregate and flagelliform glands, with their associated spigots, evolved. One expects a consistent spigot pattern in all araneoids that have lost the orb web, precursors of that pattern in the Deinopoidea, and little evidence of the pattern in the potential, probably cribellate, outgroups to Deinopoidea and Araneoidea. Scanning electron micrographs mostly confirm these predictions, and also provide synapomorphies for subsidiary groups within the Araneoidea (e.g. Theridiidae and Nesticidae). Overall results of the SEM survey are summarized in a preliminary cladogram.

****

Birefringence as Related to Formation of Major Ampullate Silk

WORK, ROBERT W.
DEPARTMENT OF TEXTILE CHEMISTRY
NORTH CAROLINA STATE UNIVERSITY

Slides will illustrate several stages in the continuum between the highly aqueous polypeptide leaving the ampulla and the major ampullate silk (MAS) emerging from the spigot. It is hypothecated that at the stretching step in this continuum the protofiber is formed. This entity is structurally organized at the molecular level into crystalline and amorphous domains (X-ray defraction definitions), with the summated spatial vectors of segments of the molecular chains in both domains exhibiting an axial orientation. It is further hypothecated that this protofiber is similar to MAS when water immersed and fully supercontracted (SC). It follows that when MAS is SC and then restretched while wetted, this may to some degree duplicate in vitro what the spider does in vivo. Such stretching produces additional molecular orientation, which results in increasing birefringence. Experiments have been initiated in order to examine the validity of the above hypotheses. MAS fibers having different "as sampled" birefringences and SC ratios have been stepwise allowed to shrink to SC and restretched, with birefringences measured in both the wetted and dry conditions after each such step. When the SC fibers (the zero energy state) are taken as reference standards, these otherwise differing MAS are found to differ considerably less. This suggests that birefringence may be a tool to estimate the prior history of the orb web MAS fibers, and, in turn, contribute to the understanding of spider behavioral patterns.

****

Molecular Design of Dragline Silk

GOSLINE, JOHN M.
DEPARTMENT OF ZOOLOGY
UNIVERSITY OF BRITISH COLUMBIA

Spiders produce a variety of fibrous protein secretions that have interesting and unusual mechanical properties. The dragline, frame and radial elements of the orb web of Araneus diadematus are constructed from a nylon-like, crystalline polymer with high stiffness and strength. The strength, in fact, appears to be about twice that of the cocoon silk from the silkworm. The spider's frame and dragline silk, is quite exceptional in its ability to absorb energy when loaded to failure because it combines high stiffness with a high extensibility. This makes the silk extremely tough, and we have been attempting to understand the molecular basis for these functionally important mechanical properties.

When frame silk is immersed in water it absorbs water, swells and shrinks to about half its initial length, a phenomenon Robert Work has called supercontraction. Thermoelastic studies of water-swollen, supercontracted dragline silk indicate that the elastic properties are due to changes in the conformational entropy of random protein chains, and accordingly we believe that a rubber-like random-network structure provides a good model for the molecular structure of this silk. We have been investigating the mechanical and optical properties of water-swollen frame silk, using non-Gaussian network models, to develop an understanding of the network structure. Our analysis indicated that frame silk is a short-chain, rubber network that is filled with and crosslinked by high stiffness crystals. The network chains have an average molecular weight of approximately 1300 (i.e. 14 to 15 amino acids long), and the amorphous network occupies approximately 70% of the volume of the dry silk fiber. When dried, this amorphous network enters its glass transition and provides one of the major mechanisms that contributes to the extreme toughness of the material.

****

Evolution of Alternative Foraging Modes: Spiders Spin Silks and Weave Webs that Deceive Prey.

CRAIG, CATHERINE L.
DEPARTMENT OF BIOLOGY
and
BERNARD, GARY D.
DEPARTMENT OF OPHTHALMOLOGY AND VISUAL SCIENCE
YALE UNIVERSITY

Some spider webs attract insects. Evolutionary diversification of optical properties of silks and design of aerial nets is influenced strongly by insect vision and learning.

****

Effects of Silk Supply in Different Glands on Orb Web Construction by Leucauge mariana and Micrathena sexspinosa

EBERHARD, WILLIAM G.
ESCUELA DE BIOLOGIA
UNIVERSIDAD DE COSTA RICA

Comparisons of webs spun 1) when both sticky and non-sticky silk supplies were complete, 2) when both were recently depleted, and 3) when only non-sticky supplies were depleted show that spiders vary designs of their orbs in response to changes in the amounts of both sticky and non-sticky silk that they have available.

****

The Recycling of the Orb Web by Araneus cavaticus.

TILLINGHAST, E.K. and TOWNLEY, M.A.
DEPARTMENT OF ZOOLOGY
UNIVERSITY OF NEW HAMPSHIRE

Results from previous in vitro studies have provided evidence for the ability of Argiope aurantia digestive fluid to solubilize all orb web elements except minor ampullate fibers (Kavanagh and Tillinghast, 1979, J. Morph. 160:17-32). Concerns regarding the reliability of the method used to make this determination, coupled with Peakall's (1971, J.Exp. Zool. 176:257-264) report of extremely high efficiency web recycling, led us to reexamine orb web digestion in vivo. In these studies Araneus cavaticus were fed known amounts of ^{14}C-labeled conspecific whole orb webs, pulled major ampullate silk, or, to a lesser extent, pulled minor ampullate silk with known specific activities. The radioactive samples were either placed in the caged spiders' cold orb webs or offered to pinioned spiders, with no significant difference in results.

As observed in vitro (Tillinghast and Kavanagh, 1977; J. Exp. Zool. 202:213-222), in no instance was whole orb web completely digested, at least not during the time in which the spider was actively attempting digestion (typically 15-35 min). However, many of the spiders retained the undigested remnant (a conglomeration of web material with embedded hairs loosened from the endites' scopulae, presumably) between their endites (maxillae), rather than discarding it with fangs or pedipalps. Spiders taken freshly from the field have also been found to sometimes be in possession of such remnants. Thus, it is possible that the undigested web component(s) is actually digestible, but only slowly, and as it comprises only a small percentage of the orb (0.01-4.5%, as determined by total radioactivity remaining in remnants), it may be energetically more, or essentially as, economical to simply discard the remnant or continue its digestion while digesting a later orb or prey item. From spiders fed major ampullate silk alone it is apparent that this fiber type is solubilized much less readily than adhesive spiral components. Nevertheless, complete liquefaction of major ampullate silk was most often observed and, therefore, probably does not contribute significantly to the remnants. More limited observations feeding minor ampullate silk alone were in keeping with the earlier in vitro studies. It is even less readily solubilized than major ampullate silk and, although we have evidence that some part of this composite fiber is digestible, the majority (approx. 80%) was not; again, that is, within the time the spider actively attempted external digestion. Thus, minor ampullate silk is a good candidate for comprising at least a large portion of the remnants.

The rate of orb web digestion in vivo differed dramatically from that in vitro, such that more digestion occurred in vivo within 30 min. than occurred in vitro within 24 hr. This difference reflects, at least in part, the importance of mastication and enzyme replenishing to orb web digestion. Spiders were observed to rotate and compress the web mass using fangs and endites and frequently ingested the digestive fluid already surrounding the web, only to regurgitate more digestive fluid immediately thereafter. Presumably, these actions exposed the web to additional fresh enzyme.

Preliminary results indicate that ingested GABamide (4-aminobutyramide), a water soluble component of orb webs, appears more quickly in new web than ingested web protein residues. The first web built by spiders fed radioactive whole web contained isotope which was present predominantly in GABamide, as demonstrated by autoradiographs prepared from two-dimensional thin layer chromatograms of web hydrolysates. In addition, the highest specific activity was usually present in the first web constructed by spiders fed hot whole web, whereas the specific activity of webs built by spiders fed hot major ampullate silk peaked with the second web built. Certainly, in the recycling of webs, GABamide and other low molecular weight web compounds are of considerable importance.

In contrast to the findings of Peakall we have never observed recycling to exceed 32% (n=30), and this even when taking into consideration the total radioactivity present in all webs built by a spider fed hot web. We are currently investigating the possibility that this discrepancy is due to the timing of feeding, a factor considered critical to recycling by Peakall. Finally, when spiders are fed major ampullate silk isotope appears in all web elements. Thus, there does not appear to be any selective recycling of a given web protein back into the same protein.

****

AMERICAN ARACHNOLOGY is the newsletter of the American Arachnological Society and is sent only to members of the Society. For information on membership, write: Dr. Norman I. Platnick, Membership Secretary, The American Arachnological Society, Department of Entomology, The American Museum of Natural History, Central Park West at 79th Street, New York, New York 10024, USA. Members of the Society also receive the **Journal of Arachnology.**

Submission of items for **AMERICAN ARACHNOLOGY** or other correspondence concerning the newsletter should be directed to the editor, Dr. James W. Berry, Department of Biological Sciences, Butler University, Indianapolis, Indiana 46208, USA. Deadline for receipt of material for the fall issue is 24 September and for the spring issue, 24 March.

THE AMERICAN ARACHNOLOGICAL SOCIETY

Gail E. Stratton, Treasurer
Department of Biology, Albion College, Albion, MI 49224

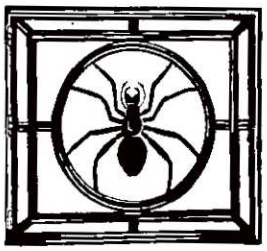
FINANCIAL STATEMENT
APRIL 13, 1988

Balance from 31 December 1987		$17192.49
DEPOSITS		
Membership	$9424.50	
Donation	200.00	
Sales		
back issues	80.00	
Guide to Genera + notecards	213.00	
Harvard U. Surplus from 1987 AAS meeting	975.58	
Foreign checks (membership, 4 checks)	142.00	
Interest	256.36	
	11291.44	
Subtotal		$28483.93
EXPENSES		
Texas Tech Reprints of "Instructions"	$19.44	
Texas Tech JA 15(2)	7513.05	
Jerry Rovner, expenses as Associate Ed.	107.28	
expenses paid to Ohio Univ.	38.71	
Bill Peck, final expenses as Assoc. Ed.	163.45	
Jim Berry, Newsletter expenses	506.08	
Jon Relskind, Publ. of Linyphiid book + mailing expenses	324.90	
Maria Luisa Jimenez, travel award	200.00	
	8872.91	
Total Assets		$19611.02

Gail Stratton

Gail Stratton, Treasurer

AMERICAN ARACHNOLOGY
DEPARTMENT OF BIOLOGICAL SCIENCES
BUTLER UNIVERSITY
INDIANAPOLIS, INDIANA 46208
U. S. A.



Vogel, B. R.
46 S. Howie
Helena MT 59601