AMERICAN ARACHNOLOGY

THE NEWSLETTER OF THE AMERICAN ARACHNOLOGICAL SOCIETY

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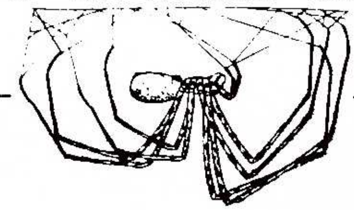

1985 and 1986 MEETING DATES →

All future meetings of the A.A.S. will be national or international -- eastern and western divisional meetings are a thing of the past. The next two national meetings will be held in Los Angeles (1985) and St. Louis (1986), both in late June.

The Los Angeles meeting will be held at the Natural History Museum of Los Angeles County. The Arrangements Committee includes Blaine Hebert, Lowell Herbrandson, and Charles Hogue. Tentative dates are 24-28 June (Monday -Friday) with registration on Monday and a field trip on Friday. A symposium on "Biology of Scorpions" is being considered for this meeting with Gary Polis as organizer.

The St. Louis meetings will be held at nerby Lindenwood College. William Tiejen will be the host. This meeting will occur more than two months prior to the X International Arachnological Congress in Spain.

BRITISH ARACHNOLOGY SOCIETY NEWSLETTERS REPRINTED

Under the editorship of John R. Parker, the British Arachnological Society recently published a 426 page, indexed, facsimile collection of their newsletters numbers 1 - 30 (July 1971 -March 1981). Like recent issues of the newsletter, these back issues contain articles on arachnological history, notes on spider natural history, accounts of members' field experiences, taxonomic commentary, and suggestions for new or improved research and curatorial techniques. Such articles make for useful and interesting browsing. Thanks to the efforts of John Dalingwater, the volume also has a 40 page index that permits it to be effectively used as a reference. The first part of this index lists titles, topics, and key words of articles and the second part consists of a phylogenetic listing of spider families, under which genera are alphabetically listed. The cost of this volume is approximately $25.00. Those interested in purchasing a copy should contact Dr. John E. Dalingwater, Tresurer of the British Arachnological Society, Department of Zoology, The University, Manchester M13 9PL, England, to obtain current information about availability and price.

GUILD OF NATURAL SCIENCE ILLUSTRATORS

The following information sent by James Cokendolpher may be of interest to the many arachnologists who do their own illustrations. The Guild of Natural Science Illustrators, Inc. is a non-profit organization for "those earning a living in part or whole by the rendering of scientific illustrations." Membership dues are currently $23.00 per year and entitle one to 10 issues of the organization's newsletter and attendance at 9 monthly meetings held in the Washington , D.C. area. Further information about the organization may be obtained by writing GNSI, P.O. Box 652, Ben Franklin Station, Washington, D.C., 20044.

IN THIS ISSUE --

Several "Studio Tips" about pen care that appeared in the organization's September 1984 newsletter may be of interest to readers.

1. After cleaning a pen, or when replacing a worn point section, oil all exposed parts with baby oil. Using a cotton tipped swab, oil the rings of the point section before screwing into the pen sleeve, then put a drop of oil into the back section of the pen and shake gently to lubricate the inner workings of the pen. Place an oily Q-tip into the ink cartridge reservoir and coat the inside thoroughly before filling with ink. This also enables you to always see the ink level in your pen. Ink does not stick to oil and the pen works wonderfully for a much longer period of time as well as being much easier to clean the next time. -- Cheri Ziebart.
2. If your technical pen has clogging problems, try adding one drop of ammonia to your ink bottle. This makes for slightly sudsy ink, but the ammonia will help it flow smoothly and help prevent it from caking inside the pen. -- Laura Dassow.

NOTE FROM THE EDITOR

As I put the final touches on this, my first, issue of American Arachnology, I am encouraged by the willingness of the society's members to provide reports and items of interest. I welcome comments on the newsletter and suggestions for new features. George Uetz has volunteered to write an arachnological gossip column. However, after looking over a sample of his entries, I have decided to table this idea unitl we really run short of material -- an action that will please the many members whose behavior George has observed during the society's last ten meetings. I am continuing the "Reports on Ongoing Research" feature started by Bill Shear in the past issue. Each of the next several newsletters will profile the research programs of six or seven arachnologists, with an attempt being made to achieve a balance among areas of research. As always, requests for specimens and information and reports of travels and observations are welcome.

For me, this summer has involved more than my usual share of travel. Before the New Orleans meetings, I paid a short visit to Jonathan Coddington at the Smithsonian Institution where I was able to view our nation's nascent spider collection. August began with a return to the familiar library and collections of the Museum of Comparative Zoology and a relaxing visit with Herb and Lorna Levi at their home in Pepperell. It ended with my first visit to the American Museum's Southwestern Research Station near Portal, Arizona. Thanks to the help of Vincent Roth, I was able to locate and study the uloborid _Siratoba_ _referena_, first described from this region by Gertsch and Muma. As if this weren't exciting enough, I had an opportunity to talk with both Willis Gertsch and Martin Muma who live near Portal. John Cooke was also at the field station photographing and studying tarantulas and tarantula hawks, making this the largest assemblage of arachnologists since the June meetings.

Attending meetings and visiting other arachnologists is always an opportunity to renew friendships, meet new workers, learn about ongoing research, and recharge one's enthusiasm. I hope that this newsletter will continue to achieve these same ends. -- Brent Opell

ERIGONINAE & LINYPHIINAE CATALOGS

A catalog and synonymy of the Erigoninae of America north of Mexico has just been completed in rough form with about 100 genera and 680 species. No plans are being made to publish this, but xeroxed copies will be available at cost when typing is completed.

Tentative plans are being made for a similar catalog of the Linyphiinae. Anyone who has a catalog started, completed, or is interested in cooperating on this project should contact Vincent Roth, Southwestern Research Station, Portal, Arizona 85632.

HANDBOOK FOR SPIDER IDENTIFICATION

Vincent Roth's _Handbook for Spider Identification_, providing illustrated keys to the families and genera of North American spiders, is available from the American Arachnology Society, Department of Zoology, University of Florida, Gainesville, Florida 32611. The cost if pre-paid is $10.00, if billed, $12.00 per copy.

REPORTS ON ONGOING RESEARCH

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At the present time I am writing the revision of the new spider genus _Gladicosa_ (formerly _Glycosa_) after completing drawings, measurements, descriptions, and distribution maps. This is the second part of a series of revisions of the many large spiders in North America included in the genus _Lycosa_. In the next installment of this series (already underway) I plan to illustrate, redescribe, and elucidate the relationships of a number of species in what I have tentatively called the _Lycosa_ _helluo_ group. North American species in this group appear to be related to the European species _Lycosa_ _radiata_ Latreille, which is the type species for the gneus _Hogna_ Simon, 1885. Thus, one of the largest components of the North American species of _Lycosa_ will become _Hogna_ when properly placed.

Nomenclatural matters are complicated by the fact that _Lycosa_ _tarentula_ Latreille of Europe, the type species of _Lycosa_ does not appear to have any close North American relatives (nor European ones either for that matter). Also Roewer (1954, 1958, 1959) established 51 new generic names in the Lycosinae, based in many instances upon trivial characters (e.g. number of posterior cheliceral teeth). These names, of course, must be considered when separating out valid genera from the melting pot of North American _Lycosa_. For example, _Rabidosa_ Roewer seems to be a legitimate name for the group of species including _Lycosa_ _rabida_, _L._ _punctulata_, _L._ _carrana_, _L._ _sanrita_, _L._ _hentzi_ and at least one new species.

In a project related to the study of North American _Lycosa_, two Hope College students examined statistically certain features of the widespread species _Lycosa_ _carolinensis_ Walckenaer. They found concurrence between color pattern, leg length, and dimensions of eye rows in selected populations (adequate numbers) that distinguished geographically separated populations from one another. More information is needed to determine whether or not these populations simply reflect clinal trends or if reproductive isolation is present.

My continuing interest in the lycosid genus _Sosippus_ led me this summer to return to a collecting site of some 12 years ago, near the northern boundary of the Okefenokee Swamp, where I had found two very distinct specimens. Gary and Pat Miller provided transportation and good company to the locality near Waycross, Georgia. We found another 20 specimens near the Swamp, enought to establish the spider as _Sosippus_ _janus_. Although not a new species, this finding extends the range of _S._ _janus_ about 100 miles northward. During the past 10 years scattered specimens of _Sosippus_ (or close relatives) have been collected or sent from Mexico, Costa Rica, Bolivia, Ecuador, and Peru. An up-date of this group is a project for early in 1985.

Students in my research laboratory have also been working with a large collection of lycosids from the Delta

Region of Mississippi. These specimens were collected primarily in pitfall traps by Tim Lockley and cover all seasons of the year. This collection and a collection on loan from the Mississippi State Entomological Museum have provided a view of the lycosid fauna between Florida (well-collected) and east Texas (not-so-well collected). Among the specimens were two dozen males of Gladicosa bellamyi (the first males that I've seen) together with several females (known only from type specimens). I mention this because it underscores the need for adequate regional collections from areas outside of the northeastern United States

Another small project involves an update of the genus Trochosa. I have collected one new species in the avara group from Texas. The new species is represented by 6-8 specimens and needs to be illustrated and described. Another species Lycosa apothetica Wallace also belongs to the avara species group. It too will be illustrated and re-described.

Longer range plans are to continue with systematic revision of the "species-groups" that have been tentatively separated from what is now known as Lycosa. Once these species groups or genera (as they may prove to be) have been established, an overview of their evolutionary relationships will be presented.

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My current research on spiders includes two behavioral investigations. One is a laboratory study of vibrations in spider webs, primarily those of orb-weavers. Using a photodiode to detect light deflected from the web, we are developing methods to record and analyze web vibrations and to investigate the transmission of vibrations by orb-webs. The questions I hope to investigate with this system conern communication via vibrations on the web, especially signalling within a species. The system is designed to record vibration frequencies up to a few kilohertz, and observations so far indicate that low frequency vibrations up to 100 Hz are most significant. Transmission effectiveness appears to change with web tension, web structure, and position of the spider.

In a continuing study of web aggregation and social behavior in spiders, I have been measuring the variability in web building, aggressive behavior, and site tenacity in spiders that build their webs in groups. Orb-weaving spiders that live in groups modify their web structure, while solitary spiders tend to build more individually distinctive webs consistently from day to day. In colonial spiders, individual variability in web construction and activity appears to increase with spider density and higher food levels.

A separate part of my research position involves interdisciplinary work between biology and geophysics. As an outgrowth of this work, I have become interested in biogeography and phenology of spiders, particularly in Texas, Central America, and the Caribbean, as they are related to climatic and geological history.

JAMES E. CARICO
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My principal research interest, as it has been for a number of years, is in the systematic revision of the Pisauridae of the Western Hemisphere. This effort has led to a number of generic revisions, i.e. Dolomedes, Pisaurina, Tinus, Architis, and Staberius.

It became clear to me early in this review of the western pisaurids that a group of genera did not fit our concept of the family and represented a distinct group. This group is comprised of eight named genra (13 names are available) plus about four additional new genera and approximately 67 valid species (32 of which are not described). These are all clearly monophyletic, and limited to the New World, primarily in Central and South America but with a single species, Trechalea gertschi, extending northward into Arizona. Simon published a family name in 1899, Trechaleidae, in which he included only the tyge genus, Trechalea, and immediately abandoned. This name will eventually be redefined and will include the several genera anot previously included by Simon. I am in the process of revising the Trechaleidae, genus by genus.

To work out a definition of the family, it is necessary to develop a cladistic scheme incorporating the behavioral and anatomical character states. The search for sister groups has led to the Lycosidae and to the Pisauridae. Recently, Charles Dondale and I discovered that our pursuits were overlapping, i.e. he is attempting to define the Lycosidae using the Pisauridae as a sister group while I am attempting to define the Pisauridae and Trechaleidae using each as the sister group of the other and considering Lycosidae as well. This has led to a collaborative effort with a pooling of our collected data from our respective families.

The only remaining genus in the traditional Pisauridae in the western hemisphere is Thaumasia. This seems to be a relatively complex group with several species, especially in South America. Its range is from Southern Mexico southward into southern South America.

On a worldwide scope, I maintain a keen interest in studying Dolomedes, which is the only Pisaurid (or Dolomedid) found with such a wide distribution. I am studying Dolomedes from New Zealand and Papua New Guinea now and hope to extend the effort further in the future.

Another project in systematics, is a revision of a group of stridulating orbweavers distributed in New Zealand, Australia, and Papua New Guinea. This is done in collaboration with Ray Forster, and eventually a new family may be named for this very distinctive group.

My other interests are in the behaviour of various spiders fround locally. Serendipity is the main component in this work because casual observations in the field, usually at night, have led to small projects on such topics as prey capture in Euryopis, orb web removal strategies, and use of the old orb to cover eggsacs by Mecynogea. Presently I am pursuing the mating behavior of Neoscona hentzi (which has an unusual use of the scape), mating in Pisaurina mira (which mates suspended from a dragline with the female wrapped in silk by the male), prey capture by Argyrodes fictilium (which is an ACTIVE predator of other web-building spiders), and others.

I would be very interested in seeing any pisaurids collected from the area of Mexico southward. Identifications will gladly be made with the understanding that any interesting specimens would be borrowed for use in the research project.

JEROME S. ROVNER
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Currently I am investigating how ground-dwelling spiders survive floods resulting from heavy rain or overflow of streams. While some wandering spiders are known to climb vegetation or seek higher ground to escape rising water, what of those spiders inhabiting silken retreats at or beneath ground level? Do they have behavioral or morphological adaptations enabling them to resist drowning when submerged? (I leave possible physiological adaptations to John Anderson or Ken Prestwich.) Although considerable interest has been directed toward coastal (intertidal) species and toward the freshwater Argyroneta aquatica in this regard, inland terrestrial spiders have not been the primary subject of such studies previously.

Two species have received much of my attention: members of Dysdera crocata often build sacs, especially for molting; individuals of Ariadna bicolor build a tubular web. I've been comparing survival times between individuals without vs. within their silken construction after the spiders' submersion in aerated water (20-25°C). Outside the retreat they drown within 18-36 hr, while those in retreats survive for a number of days. The highest figures for D. crocata (10 days) and A. bicolor (7 days) may not be maximal, but may reflect the spiders' "decision" to leave the safety of the retreat. Bouts of activity at intervals, immediacy of response to my tapping the silk wall, and rapid locomotion if forced to leave the retreat--all indicate a non-diapause state during submergence. Initially the nest provides an air store. Subsequently, by preventing the silk-trapped bubble's collapse, which would otherwise result from the Ege effect, the silken structure probably enables the spider to extract oxygen from the water via the gas-water interface--a physical gill.

To test the physical gill hypothesis, I am using an oxygen electrode to measure changes in the dissolved oxygen level of water surrounding empty vs. inhabited retreats placed in a sealed vessel. Oxygen saturation decrease in the tests involving inhabited retreats indicates that oxygen is diffusing into the retreat, which, in turn, could be taken up by the spider. These data, along with those above on survivorship in aerated water, demonstrate that some silk constructions of spiders not associated with an aquatic life-style can function like the web of Argyroneta aquatica, heretofore the only spider examined specifically in regard to the use of silk for maintaining an air store and a physical gill.

I've begun to look at other spiders that occur beneath stones, logs, or debris to see how they react to submergence. These spiders include not only some that build sac or tubular retreats (e.g., Clubiona spp.) but also some that build snares (e.g., Amaurobius spp.) and some not associated with any such use of silk (e.g., Lycosa and Xysticus spp.).

In regard to Lycosa spp. I'm particularly interested in the responses of females and of the young they carry. When I forcibly submerge the mother, the spiderlings remain attached. Tested as separate individuals, as well as when clustered on the mother, spiderlings endure submergence much longer than the female. Thus, they have no difficulty remaining attached for whatever duration the female may survive under water.

Planned work on ground spiders will include studies of "bubble morphology." My preliminary observations show that just after these spiders submerge, the adhering air bubble ranges from a rather voluminous, elongate structure enclosing most of the body (with extensions into the legs) in Amaurobius sp. to a roughly spherical bubble attached to the ventral region and centered near the book lungs in Xysticus. I plan to compare such species with members of their respective families that inhibit higher strata to see if the ground-dwellers have greater capacities for securing air bubbles. If so, a study of the morphology and distribution of setae will follow.

Since we arachnologists prefer not to observe or collect spiders beneath the water in flooded areas, the possibility that inland terrestrial species have evolved various means of resisting drowning has not been explored previously. Yet, those ground-dwelling spiders that have no tendency to climb above rising water during floods must have adaptations that permit survival under water, even if only used for brief periods during their life. This is probably so for many of the primitive spiders--liphistiids and mygalomorphs--whose silk-lined burrows are little changed in basic structure from those of ancestral spiders. Perhaps one of the original functions of the evolutionary precursor to spider silk was to enable the spider's ancestor to maintain an air store and a physical gill during floods.

Presently, I have one M.S. student in my laboratory, Jeffrey Shultz, who brought his thesis research topic and methodology with him from his senior undergraduate work at Michigan State University. Using high-speed cinematography and other techniques, Jeff has been examining locomotion in the semi-aquatic pisaurid Dolomedes triton. He found that during terrestrial locomotion this spider shows the typical "alternating tetrapod" coordination of arachnids (alternating movements of intrasegmental and adjacent ipsilateral legs). However, on water D. triton uses synchronized movements of the leg pairs (rowing), and the phase of adjacent ipsilateral legs approaches synchronization. As a result of this change in the ipsilateral phase, the terrestrial stepping pattern 4231 becomes -321 on water. Leg 4 is not used for aquatic propulsion but functions in yaw correction through lateral kicks. Timing of these kicks suggests that these movements may have evolved from the protractions of terrestrial locomotion. For comparison with a non-aquatic but morphologically similar spider, Jeff examined Lycosa rabida. His preliminary analysis shows that on water L. rabida continues to use basic elements of the terrestrial gait and posture but uses ipsilateral coordination similar to that of D. triton. During turns, L. rabida exhibits synchronization of intrasegmental legs. His observations suggest to Jeff a scenario for the evolution of surface film locomotion in Dolomedes which also may be applied to other secondarily aquatic arthropods.

Deborah Smith
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The most satisfying piece of news I have to report is that I have a new, and relatively permanent address. I have a Michigan Fellows' post-doc which will keep me employed for the next three years.

Since I've just moved to Michigan, a description of my research will be largely in the future tense (not to mention the conditional -- that is funding); but, here goes. I've begun a new project on population genetics of the South American cooperative theridiid, Anelosimus eximius. I'm interested in the influence of inbreeding within colinies on social behavior, and the effect of A. eximius social system on the species' population genetic structure. The questions I want to answer are: Are colonies highly inbred, and thus made up of genetically similar individuals? and, if colonies are inbred, isolated lines, does this lead to division of the species into genetically isolated populations?

I will be carrying out field observations on colony foundation in Suriname this summer, and collecting animals from Suriname, Panama, Trinidad and Ecuador. These animals will be used in protein electrophoretic studies of genetic variation among populations, and (hang on to your hats!) studies of mitochondrial DNA variation within local populations and within colonies.

I did a pilot electrophoretic study this past year, using A. eximius I'd collected form Panama and Suriname. The results of this pilot study will come out in the issue of J. Arachonology containing the papers's presented in George Uetz's symposium on social spiders. The results of this pilot lead me to believe that colonies are highly inbred, and that migration by adult males among colony clusters is rare or non-existant. Also, the Panama and Suriname populations that I sampled did show fixed differences indicative of possible genetic isolation (but see below).

Now, I would like to know if colonies are founded by single female lineages or by several unrelated females; and if the fixed differences I found between Panama and Suriname populations are an indication of sibling species, isolated conspecific populations, or just a result of small sample size. The latter is best approached with further protein electrophoresis studies, in which I will try to examine genetic variation in the species by sampling as much of the species' range as possible over the next few years, and partitioning genetic variation into the components due to subdivision of the population into colonies, colony clusters, local populations and geographic regions. The pilot suggest that most variation can be attributed to subdivision of the population into colony clusters and geographic regions.

But because the species is genetically very uniform at the level of the local populations, I cannot use protein electrophoresis to study colony foundation. I'm going to try to use mitochondrial DNA studies for this. (Here I must thank Dr. David Macauley at Vanderbilt University for suggesting this line of research to me). Animal mtDNA typically evolves 5-10 times faster than nuclear DNA (the stuff that produces the proteins studied in protein electrophoresis), it's maternally inherited (all your mitochondrial DNA comes from your mother), and it doesn't undergo recombination. As a result, it is inherited intact (except for mutations) along maternal lines. I hope to be able to detect more variation within local populations by looking at mtDNA variants, and to be able to determine if colonies are typically made up of individuals descended from a single maternal lineage. This electrophoretic and mtDNA work will be carried out in collaboration with Dr. Wesley Brown, here at the University of Michigan.

I'm also getting interested in sex rations in cooperative spiders. I will with getting primary sex rations of social species (that is, A. eximius) and related solitary and subsocial species, by karyotyping eggs. I've received much needed help on this from Wayne Maddison (Harvard), Judy Brown (Midwestern State University) and Dr. William L. Brown (Cornell).

I'm also prepared to argue that there are far more Browns than Smiths in the scientific community.

CARLOS E. VALERIO
Escuela de Biologia
Universidad de Costa Rica
Ciudad Universitaria Rodrigo Facio
Costa Rica

I keep my interest in the mygalomorph spiders of Costa Rica and adjacent areas. I have four new species ready to be described, to add to a now long list of 33 species from this area. These new ones are mostly small-sized tarantulas except for one handsome Brachypelma. I also know of the existence of three more species, represented in our collection by females only, which make generic placemnts uncertain and I am waiting for the males to show up (this is almost literally true, working with tropical tarantulas with low population densities).

I have also been interested in a group of five species of diurnal ctenids, small forest-floor dwellers that behave pretty much like lycosids and occur sometimes in high densities. They key out as Cupiennius based on available keys and descriptions, but I found them very different from the typical species of that genus (large nocturnal and arboreal), also common in the forests here. It seems that one would have to solve the confusion at generic level before this interesting group is finally studied.

Bill Eberhard (my next-door neighbor in the Escuela de Biologia) and I are planning to teach a tropical spider course, sometime in 1985. We will let you know details in case somebody wants to join us. I have been accumulating data on the reproductive biology of the curious Sicarius rugosus from the dry Pacific lowlands in Costa Rica (other species in South America are from high altitudes), and I think I have enough for a paper now.

I am planning to dedicate most of my spider time next year to do curatorial work with our growing arachnid collection in the Museo de Zoologia, since we have been accumulating large numbers of ctenids, lycosids, gnaphosids and, the toughest job, forest-litter miniatures. I have to admit that I have been splitting my research time between spiders and pollination ecology during the last two years. I have worked mainly with aroids, published three papers (genera Anthurium and Dieffenbachis) and, presently, am working on the large, showy Monstera. This is an exciting field! I am also working on a couple of orchid species and the pollination strategies in a herbaceous community, involving 200 species of herbs and over 100 insects.

BOARD OF DIRECTORS ELECTION

BOARD OF DIRECTOR'S ELECTION

G. B. Edwards	61
Yael Lubin	47
Al Cady	22
Abstentions	5
George Uetz (write-ins)	11

G. B. Edwards is our new Member of the Board of Directors.

CHANGES IN THE BYLAWS

All changes passed with a maximum of 9 dissenting votes of the 146 total. However, as was correctly pointed out by several persons, the suggested change in article 4, sectrion 6 is redundant with that in article 2, secton 9. The wording had therefore been deleted in 4, 6. REVISIONS 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 Bylaws 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 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.

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 contemplate 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, its 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 dissolution by the Executive Committee or vote of membership. If this corporation hlds any assets in trust, or corporation if formed for charitable purposes, such assets shall be disposed of in such manner a may be directed by decree of the superior court of the county in which the corporation has its principal office, upon petition therefore by the Attorney General or by a person concerned in the liquidation, in a preceeding 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 toall persons who make formal application and pay the prescribed dues, and who are willing to abide 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 i good standing have the right to vote.

Section 5: Any members 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.

Section 8: A class of Honorary Membership shall be established. An individual may be elected at the annual business meeting by the proposal 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 annually in the newsletter of the Society.

ARTICLE II Officers

Section 1: The elective officers 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 also 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 Officer or Board of Directors member may be renominated but may not 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: This 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 int he newsletter of the Society every 5 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.

Section 11: Election of Officers and Board of Directors shall be held as provided for in Art. II, Sec. 4 of these By-laws by a mail-in ballot. The ballots shall be counted by three members appointed by the President. The nominees for each office shall be selected either by a nominating committee or may be nominated by any member in good standing. Write-ins on ballots will be permitted. Nominees must state, in writing, to the Nominating Committee their willingness to serve if elected. 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 a 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.

ARTICLE III Meetings

Section 1: There shall be an annual general meeting of the Society open to all members. The date, time and place 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 the 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 Membership will be gratis and must be bestowed by the 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 thee 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 "Roberts Rules of Order Revised," seventy-fifth or later editions.

REPORTS ON THE 1984 MEETINGS

AMERICAN ARACHNOLOGICAL SOCIETY

NEW ORLEANS, 1984

Report by Louis Sorkin

The World's Fair opened in New Orleans this past summer and so did the international meetings of the American Arachnological Society at the campuses of Loyola and Tulane. Our host this season was Terry CHRISTENSON and both he and his assistants did much to make these meetings successful. About 100 members and guests attended.

The arachnophiles came from the United States, South Africa, Costa Rica, France and Panama to partake of the sixty presented paper, including a symposium on spider social behavior organized by George UETZ and a poster session about two students' research interests. The registration packet supplied to all attendees contained details of meetings, abstracts of papers, and listed highlights of the city's tourist attractions for the uninitiated. It also contained an abbreviated glossary of New Orleans lingo to assist the visitor on his or her travels through the Crescent City.

The papers dealt with many aspects of arachnid systematics, behavior, genetics and ecology, a few choice ones are listed here: "Studies on the host-parasitoid relationships of the mygalomorphs and their internal dipterous parasitoids, the Acroceridae" (Evert SCHLINGER); "the simple-eye of the spider -- another perspective" (Nancy HEISS); "life history studies of Paruroctonus mesaensis (Scorpiones, Vaejovidae)" (Oscar FRANCKE) "spider nests maintain a physical gill: flooding and the evolutionary origin of silk" (Jerome ROVNER); "Achaearanea wau" (Yael LUBIN) and a paper entitled, "on the Gallieniellidae" (Norman PLAINICK). (Yes, it's spelled correctly!).

Social get-togethers occurred spontaneously; one such event centered around an informal slide presentation on Friday evening, hosted by various salticidologists (Wayne MADDISON, Charles GRISWOLD, Dave RICHMAN and others). Scheduled events included a social at the Christenson home on Wednesday evening and a cajun-style banquet dinner on Thursday. At the latter, three guest speakers primed the audience for upcoming field trips by lectures and slide presentations depicting the bayou flora and avian and herptile fauna that one should keep an eye out for while looking for spiders.

Those attending the meetings were also treated to southern-style downpours, which occurred like clockwork at the end of every day's paper sessions. Fortunately, this did not wet the appetites of those who were on their way to the Wolf Den for a dressed Po-Boy, a mug of Dixie, and an araneological discussion with other rain-soaked arachnologists.

Meeting Field Trips

Report by Wayne Maddison

The field trip on Saturday to the Hebert Nature Center attracted a couple dozen of us. Some, with sticks and sheets, scattered along the paths and into the woods immediately upon arrival. Others walked along calmly, photographing or just peering into the bushes. The fauna was not remarkable, but different habitats produced a variety of spiders. In the woods, Nephila, Marpissa, and Eris were to be found, and Anelosimus colonies received Debbie Smith's attention. Habronattus were hopping on the ground in disturbed clearings. Some lycosidiophiles (Dondale and Stratton) had luck in the muddy areas along the shores of the Mississippi. Many other discoveries no doubt occured beyond my vision. The organization and weather were good; rain came only when the excursion was nearly complete.

On Sunday only a handful came to Jean Lafitte National Historic Park, where we had a pleasant walk amongst the green of the partly drained bottomlands, whose understory was taut with Nephila and Micrathena webs. Charles Griswold found a tree supporting several Sphodros tubes along the path. Herb Levi found a Chrysso with babies. I found few salticids, but having been disoriented by the entangling Nephila in the flat, uniform forest, I spent much of the time trying to return to civilization.

STUDENT PAPER AWARDS

This year's award for the best student paper presentation was shared by two students. Leticia Aviles of the Museo Ecuatoriano de Ciencias Naturales was recognized for her paper entitled " Aebutina binotata: A new quasisocial spider" and Karen Cangialosi of the University of Cincinnati for her paper entitled "The effect of juvenile experience on the social structure of Metepeira spinipes."

ABSTRACTS FROM THE 1984 MEETINGS

ABSTRACTS: SYMPOSIUM

BUSKIRT, Ruth E.
VARIABILITY IN WEB-BUILDING AND FORAGING IN COLONIAL ORB SPIDERS
University of Texas

Orb-weaving spiders that live in groups modify their web structure and activity periods, in contrast to solitary araneids which build more individually distinctive orbs. Individually marked spiders (n=62) of the colonial Metabus gravidus (Araneidae) in Costa Rica were monitored for 5-day periods during which all webs spun were measured. Variation in web characters (particularly web angle and viscid spiral) within an individual was related to density of spiders, feeding history, and time of day. Some web measures differed by over 60% within a 24-hour period. In a model that appears to explain both within-species and between-species comparison, long-term factors such as patchy web-attachment sites, food distribution and climatic protection account for increased success of aggregated spiders. In the short term, individual variability in web construction increases with both spider density and food supply. Species with greater ability to modify individual foraging strategies are more likely to be facultatively social.

DARCHEN, Roger and DARCHEN, Bernadette
LEVELS AND SCHEMES OF EVOLUTION IN SOCIETIES OF SPIDERS COMPARED TO THE SOCIETIES OF INSECTS
Universite de Paris, France

Since the beginning of studies on the social behaviour of spiders, the structures discovered in these invertebrates have often been compared with those already known for a long time in insects.

A preliminary conclusion might be that the degree of "evolution" of spider societies is significantly lower than that found in insects.

However, we may wonder whether the problem has been correctly posed? With the experience gained from the social behaviour of insects, we may think that the social evolution in spiders has developed along an original track, which has rarely been followed in the animal kingdom (insects, birds, mammals, etc.).

This approach, which excludes the dominance and hierarchy of individuals, actually seems to correspond to a human ideology, and is paradoxically catalogued among inferior societies. It would seem that this type of egalitarian society is difficult to achieve in nature, because it is quite rare; and spiders, whose societies are based on this principle, represent in fact very few species.

KRAFFT, Bertrand, Jean Michel JULITA, and Andre HOREL
SOCIALIZATION PROCESS IN SPIDERS: INFLUENCE OF TROPHIC FACTORS ON THE LENGTH OF THE GREGARIOUS PHASE IN COELOTES TERRESTRIS
Universite de Nancy, France

In spiders the modes of organization range from solitary to social state. "Subsocial" spiders represent intermediate steps where young disperse before being adults, after a gregarious phase whose length varies according to the species. Why does social life stop in these species? Several arguments in literature lead us to imply trophic factors and to formulate the following hypothesis: food requirements increasing together with the young's growth, the resources of the environment exploitable by the colony get locally insufficient, thus making the spiderlings' emigration necessary.

In natural conditions, the spiderlings of Coelotes terrestris cluster with their mother for about one month. The rearing of this species in the laboratory gave the following results:

-Prey consumption increased along with the young's development.

-Ad-libitum fed clutches showed a gregarious phase twice as long as that of less fed clutches.

These results are discussed in the hypothesis of an intervention of trophic factors in the evolution of spiders' societies.

LUBIN, Yael
COURTSHIP AND MATING BEHAVIORS IN A SOCIAL SPIDER: WHAT IS THE FUNCTION OF COURTSHIP?
Smithsonian Tropical Research Institute, PANAMA

There are three ways for males to attain copulations with females in the social spider, Achaearanea wau Levi (Theridiidae). Males may court females on display arenas near the center of the colony, they may attempt to mount females without prior courtship, or they may attempt to "rape" molting or recently-molted females. Males also engaged in ritualized fights and displaced one another from the display arenas. Observations of successful matings following courtship displays were rare; there were, however, numerous instances of rape. Females molted in locations and at a time of day that suggests that they attempted to minimize the likelihood of being discovered by a male.

The probabilities of obtaining copulations with and without courtship were calculated from observations of males in several colonies and at different stages of the reproductive season. These figures are used to estimate the overall expected utilities of mating with and without courtship as a function of the probability of "survival" of a male between activity bouts.

RIECHERT, Susan
THE COSTS AND BENEFITS OF COOPERATIVE BEHAVIOR
University of Tennessee

The cost/benefits of cooperative versus competitive behavior were assessed for the central african spider, Agelena consociata (Agelenidae). In this species, group living appears to limit both individual energy intake and consequent reproductive output. It is favored, however, 6 months of the year when damaging rains necessitate web construction an average of 2 out of every 5 days. On these days, energy expenditure by solitary Agelena is far in excess of energy consumed. Since efficient trap area is a curvilinear function of spider numbers, individual spiders living in cooperative groups need expend significantly less energy in web-building activities than individuals maintaining solitary webs. Potential cheating and the loss of individual reproductive success are of no consequence in this case of cooperative behavior, since A. consociata within colonies are, for the most part, genetically identical.

RYPSTRA, Ann L.
THE ROLE OF PREY ABUNDANCE IN THE EVOLUTION OF SPIDER SOCIALITY
Miami University

Prey abundance is frequently considered important to the early stages of social evolution in spiders. In a series of enclosure experiments conducted with non-social spider species, normal spacing mechanisms such as territories disappeared when an excessive number of insect prey were supplied. Although the number of aggressive actions observed remained fairly high, the proportion of those actions that resulted in cannibalism dropped to zero. In those experiments non-social spiders could be maintained at densities characteristic of highly social species. In another study the formation and maintenance of natural aggregations of Nephila clavipes (L.) (Araneae: Araneidae) were shown to be prey dependent. No cannibalism was observed in this species, however individuals with the lowest capture rates within a colony stepped up their aggression levels prior to dispersing out of the group. In some cases sufficient prey is necessary to reduce the need for cannibalism in hungry spiders so that other kinds of interactions can develop.

SMITH, Deborah R. R.
EFFECT OF SOCIAL BEHAVIOR ON THE POPULATION GENETICS OF ANELOSIMUS EXIMIUS (THERIDIIDAE)
Cornell University

Anelosimus eximius is a cooperative group-living spider found in Neotropical rainforest habitat. Colonies may contain up to 1000 or more individuals, and several colonies may occur together in close proximity, forming a "colony cluster". These colony clusters are patchily distributed, often separated by 2-5 km or more. Observations by previous workers suggest that 1) a new colony is founded by a single mated female or a small group of mated females; 2) a colony cluster forms from a single colony which grows and fissions; and 3) there is little or no exchange of either adult males, or of other age-sex classes among colony clusters, although it is possible that individuals move freely among colonies within a cluster. If these hypotheses are correct, one expects to find 1) a high degree of genetic similarity within colonies and colony clusters; 2) some degree of genetic differentiation among colony clusters due to founder effects and drift; and 3) pronounced differentiation among geographically distant populations, perhaps to the extent of the formation of cryptic species. These hypotheses are tested using horizontal starch gel protein electrophoresis of individuals collected form Panama in August 1983, and from Suriname in April and May 1984.

TIETJEN, William James
STATISTICS OF SPATIAL DISTRIBUTION
Lindenwood College

Simulations of spatial distributions and data on the distributional patterns of the social spider _Mallos gregalis_ and the solitary spider _Frontinella pyramitela_ are compared using several statistics of dispersion (variance to mean ratio, block size analyses, Morisita's index, nearest neighbor analysis, mean animal distance, circular statistics of concentration, Fourier analysis, and others). Some were greatly affected by arena shape and/or distributions characterized by a toridal configuration to simulate positive thigmotaxis. Others were overly-sensitive to data sets characterized by more than a single clump of animals within a container. All but the Fourier analysis were insensitive to internal distributions within clumps while the circular statistics of concentration are most useful as a measure of the utilization of space within an arena.

UETZ, George
GENETIC DIFFERENCES IN SOCIAL SPACING IN _METEPEIRA SPINIPES_, A COMMUNAL TERRITORIAL ORB WEAVER
University of Cincinnati

Metepeira spinipes, a communal/territorial orb-weaver from Mexico, shows considerable geographic variation and temporal flexibility in group size and social spacing. A series of laboratory studies was conducted to test whether the variation observed in the field is the result of behavioral platicity, or the result of genetic mechanisms inherent in different populations. Spiders from source populations in desert and moist tropical habitats were collected as eggs and raised in the laboratory under identical controlled conditions. Measurements of three-dimensional spacing parameters in laboratory colonies (nearest neighbor distance, within-colony density) have shown significant differences in spatial organization between populations that can only be attributable to differences in genetic makeup. Behavioral observations confirm that there are several behavioral ecotypes within this species, with levels of sociality adapted to the regions in which they occur.

VOLLRATH, Fritz
SOCIALITY AND SEX RATIOS
Oxford University, England

The theridiid _Anelosimus eximius_ is a social spider: individuals of all stages inhabit one web, tolerant of one another; they hunt together and share the prey; generations overlap. It appears that the reproduction in a colony is generally by inbreeding and that outbreeding is a very rare occurance. Dispersal of colony genes, by fertilised females, is infrequent. The closely related look-alike _A. jucundus_ is subsocial, the young leave the maternal web as soon as they reach maturity and disperse. It appears that they outbreed, mating after they have left the maternal web.

Colonies of _A. eximius_, like other social spiders, produce more females than males. Primary and tertiary sex ratios are skewed heavily, around 1:10. The sex ratio in _A. jucundus_ is 1:1. A combination of several factors might have contributed to the selection for uneven sex ratios, mainly: (i) inbreeding and (ii) participation at work. (i) Few males can inseminate many females; if brothers mate with sisters reproductive effort can be maximised if more females are produced. (ii) Males live shorter lives and, as adults, do not contribute to colony labour. Increased production of females allows larger colonies to be constructed and maintained. The larger the colony the better its chances of survival. The mechanism by which the skew is achieved is of particular interest since _A. eximius_, like other spiders, appears to be diploid in both sexes.

ABSTRACTS: PAPER AND POSTER SESSIONS

ALI, A. D. AND T. E. REGAN
SPIDERS IN LOUISIANA SUGARCANE ECOSYSTEMS
Louisiana State University

Sixteen families represented by 39 genera and at least 40 species were captured in sugarcane fields over a 2-yr period. Sampling was with pitfall traps, D-Vac, and whole plant visual observation. Spiders, together with the imported fire ant, _Solenopsis invicta_ Buren, form the major predator complex of _Diatraea saccharalis_ (Fabricius), the key insect pest in Louisiana sugarcane ecosystems.

AVILES, Leticia _AEBUTINA BINOTATA_: A NEW QUASISOCIAL SPIDER
Mueso Ecuatoriano de Ciencias Naturales, Quito

Aebutina binotata Simon, a species probably belonging to the Dictynidae, has been found to live in aggregations that show a degree of tolerance, cooperation and interaction that would place this spider among the few ones that have attained the highest degree of social behavior known in spiders. Aggregations of this spider are found inhabiting the undersurface of leaves in the Amzaonian tropical rainforest. Through a cooperative effort this spider turns up the leaves it inhabits in mortal snares for any insect landing on them. Several spiders participate in prey capture and feeding on the prey is communal. Brood care is also cooperative. Colonies are composed by a number of females that have laid each one a single egg sac and that remain together as their offspring grow. As during this process most adult females disappear (die?), the offspring are raised by females not necessarily their own mother. It has not been observed whether reproduction occurs exclusively among the members of the same colony, though the presence of female biased sex ratios suggests this to be so. Several other similarities with other quasisocial spiders, despite few differences, show that we are faced again with the interesting problem of quasisociality in spiders for which we are still insearch of an answer.

AYYAGARI, L. Rao and TIETJEN, W. J.
DOES THE JUVENILE _PARDOSA MILVINA_ (ARANEAE, LYCOSIDAE) SPIDER CONTAIN AN INACTIVE PRECURSOR TO THE ADULT SEX PHEROMONE?
Lindenwood College

In some arthropods the immature females release a sex pheromone. Immature spiders may release such a pheromone or wait until the final molt. At the biochemical level, pheromone systhesis most likely involves the synthesis of a precursor by juveniles followed by minor chemical modifications to produce an active compound upon molting to the adult stage. This hypothesis is tested on juvenile and adult _Pardosa milvina_. Pheromone was extracted from silk deposited on filter paper by immersion in hexane for 15 min and fractionated on a florisil column. Hydrocarbons and oxygenated compounds were eluted with hexane and diethyl ether respectively. The hydrocarbon fraction was further separated on a florisil column impregnated with silver nitrate into saturated and unsaturated components. Each compound in the isolation was tested using bioassay techniques (adult males only). Further characterization of the active pheromone components will be presented and the presence or absence of a precursor in juveniles will be discussed.

BENNETT, Robert G.
THE PALPUS OF MALE _WADOTES_ CHAMBERLIN SPIDERS (ARANEAE: AGELENIDAE)
Western Carolina University

The structure of the palpus of male spiders of the genus _Wadotes_ is discussed. A cladogram of species relationships for the genus is erected based upon a study of male palpal characters. Homologous characters in the palpi of species of _Coras_ Simon are used to determine the relative plesiomorphic or apomorphic status of the _Wadotes_ character states.

BRADY, Allen R.
A COMPARISON OF THE NEW GENUS _GLYCOSA_ WITH OTHER LARGE NORTH AMERICAN LYCOSIDS
Hope College

The new lycosid genus _Glycosa_, most of whose member species were formerly described under _Lycosa_, is distinguished by its distinct color pattern, structure of the male palpus and female genitalia, eye arrangement, and proportion of leg length compared to carapace length. An ingroup comparison of species has been made, as well as outgroup comparisons of _Glycosa_ with representatives of other clearly defined species groups now placed in _Lycosa_. The purpose in establishing taxonomic characters in addition to structural features of the male palpus and female epigynum is _not_ in order to provide another means of separating species within a group (e.g. identifying species of _Glycosa_). Instead its primary objective is to provide evidence for establishing generic boundaries. In some practical applications these additional characteristics may provide a means for recognizing species placed in the wrong genus. Examples are seen in Oxyopes and Trochosa. In addition to color pattern and morphological features certain members of the genus Glycosa are distinguished by pecularities in their ecology and behavior. Glycosa pulchra is often found resting on the lower trunk of trees. Information concerning behavior and habitat ecology of G. bellamyi and G. euepigynata are needed.

BROWN, Judy D. and Norman V. HORNER
KARYOTYPING TECHNIQUES ADAPTED TO SPIDERS WITH PRELIMINARY RESULTS FOR COMMON SPECIES
Midwestern State University

Various spiders were karyotyped using Tokagid Oshimura's air-drying technique with slight modifications. Preliminary results are available on some species of theridiids, salticids, araneids, and lycosids.

CADY, Alan B.
THE INFLUENCE OF INTER-AND INTRASPECIFIC RELATIONSHIPS ON SPIDER COMMUNITY STRUCTURE
Lindenwood College

A four-year study of interrelationships between three syntopic spider species coexisting on sandstone cliffs indicate that inter- and intraspecific interactions shape their spatial distributions, diets, and population dynamics. Initial niche analyses showed that Achaearanea tepidariorum, Coelotes montanus, and Hypochilus thorellii had large overlaps along spatial, food and time niche axes. Community matrix evaluation of Achaearanea and Coelotes found them to be generalists in their use of cliff space, while Hypochilus is a non-equilibrium species. Results from an experiment where only Achaearanea or Coelotes were removed form cliffs indicated that Achaearanea limits the Coelotes population while the latter species limits the number of Hypochilus. Coexistence of these three species appears to be mediated by interspecific competition between Achaearanea and Coelotes, predatory activities of us Coelotes$ on Hypochilus, Achaearanea on Coelotes, and intraspecific interactions within Achaearanea. How these inter- and intraspecific relationships combine to influence community structure and coexistence among predators are discussed.

CANGIALOSI, Karen
THE EFFECT OF JUVENILE EXPERIENCE ON THE SOCIAL STRUCTURE OF METEPEIRA SPINIPES
University of Cincinnati

Metepeira spinipes, a communal orb-weaving spider found in central Mexico, shows varying degrees of social behavior in different geographical regions. Group size and spacing vary geographically, primarily in response to prey availability and environmental conditions. However, behavioral mechanisms affecting tolerance of conspecifics may also contribute to differences in spacing patterns and social organization. For example, tropical spiderlings hatch out onto webs with other spiders of varying ages already present, whereas desert spiderlings are more likely to hatch out alone. To test for the effect of experience on tolerance, nearest neighbor distance and density were measured in experiments rearing tropical spiderlings in isolation and in communal groups. In cages of spiders put together after isolation, density and nearest neighbor distance varied, but over time showed patterns similar to those seen in the communally reared group. These results suggest that juvenile experience has an initial effect on tolerance of conspecifics that may eventually be modified by adult experience.

CARICO, James E.
MATING BEHAVIOR OF AMAUROBIOIDES MARINUS O. P. -CAMBRIDGE (ANYPHAENIDAE: ARANEIDAE) WITH A PROPOSED MODEL OF THE MECHANISM OF HEMATODOCHAL EXPANSION
Lynchburg College

The mating behavior of Amaurobioides marinus is described and its implications concerning the family placement of this species is discussed. On the basis of the type II position used by this species, the current placement by Platnick into Anyphaenidae appears to be confirmed.

Additionally, some activities relating to the hematodochal expansion phase of copulation suggest a modification of the model of this mechanism suggested by Rovner. Specifically, the dorso-ventral muscles of the opisthosoma appear to play a significant role in supplying hydrodynamic pressure required to expand the hematodocha.

CARREL, James E.
SPIDER SEDATIVES: DRUG EVALUATION OF METHAQUALONE AND THREE NATURAL QUINAZOLINONES
University of Missouri, Columbia

Four quinazolinone compounds were evaluated as sedatives in wolf spiders (Lycosa spp.) from south Florida. Glomerin and homoglomerin, both of which are present in the defensive secretion of the European milliped, Glomeris marginata, induced sedation of slow onset and prologed duration at doses of 1-7 ug/spider. In contrast, neither methaqualone (=Quaalude), a synthetic drug widely used as a human sedative/hypnotic, nor arborine (=Glycosine), a plant natural product sedative to mammals, produced behavioral abnormalities at doses of 1-50 ug/spider. These results illustrate the limitations of using spiders in pharmacological evaluations of psychoactive drugs designed for human medicine. More importantly, they also illustrate the great potential for discovery of novel chemical interactions between spiders and other organisms, especially arthropod prey.

COYLE, Frederick A.
TWO-YEAR LIFE CYCLE AND LOW PALPAL CHARACTER VARIANCE IN A GREAT SMOKY MOUNTAIN POPULATION OF THE LAMP-SHADE SPIDER (ARANEAE, HYPOCHILIDAE, HYPOCHILUS)
Western Carolina University

Size-frequency histograms and other data generated from four samples (totaling 926 specimens) collected during a complete year show that a Hypochilus population in the Great Smoky Mountains has a two-year life cycle with the following schedule: spiderlings emerge from egg sacs and construct their first webs in late May; 15 to 18 months later, during their second autumn, these spiders mature, mate and lay eggs. The growth rate and adult body size variances of this population are very large. The coefficients of variation of three palpal dimensions in a sample of 38 males are significantly smaller than those of tibia I length or carapace length. It is suggested that such relative constancy of palpal characters within a population may be common in spiders and may result from stabilizing selection in one or both of the following forms: selection for the mechanical compatability necessary for effective sperm placement during copulation and sexual selection by female choice.

CRAIG, Catherine L.
THE USE OF MATERIAL AND MECHANICAL PROPERTIES OF ORB-WEBS TO DETERMINE PATTERNS OF EVOLUTION AMONG THE ARANEOIDEA
Cornell University

Orb-webs are tensile structures that approximate minimum volume (perfect) designs. Through studying web architecture, web materials and their interactions, I have shown a range of independent, but restricted evolutionary pathways along which orb-webs differ. The lack of possible variation in web designs demonstrates that the orb-web is an evolutionary dead-end.

Behavioral and physiological research shows that spiders have evolved under conditions of limited food resources. Selection for small body size and subsequent rapid sexual maturation (progenesis) allows the retention of ancestral characteristics of juvenile webs by descendent adults. The evolution of derived web designs within the Araneoidae allows these spiders to utilize new food resources and habitats. By blending research on spider ecology, life history strategies and systematics, it is possible to outline the transitions between web designs as well as the mechanisms driving spider evolution.

CRAIG, Catherine L. and Akira OKUBO
ENHANCEMENT OF PREY CAPTURE DUE TO ORB-WEB AND INSECT OSCILLATIONS
Cornell University

Orb-webs displace and oscillate at characteristic frequencies and amplitudes as do the insects that webs snare. Web oscillations are independent of the spider and induced by non-steady airflow of surrounding winds. Insect oscillations are under insect behavioral control.

We measured web and insect movement patterns to determine if oscillations significantly affect prey capture. We found that the oscillatory behavior of low-impact webs greatly enhanced capture of slow-flying prey. However, oscillations of high-impact webs only slightly enhanced prey capture. The effect of insect oscillations on prey capture was small compared to the effect of web oscillations on capture enhancement.

FRANCKE, Oscar F.
LIFE HISTORY STUDIES ON PARUROCTONUS MESAENSIS (SCORPIONES, VAEJOVIDAE): INDIRECT METHODS YIELD IRREPRODUCIBLE RESULTS
Texas Tech University
There have been two previous studies on the post-embryonic development of Paruroctonus mesaensis Stahnke, both of which relied upon indirect methods to determine the number of molts to maturity. Indirect methods are based on the presumed ability of the investigator to recognize discrete size classes, and by implication age classes in field samples or populations. The methodology and results of these two studies have been critically examined and found to be scientifically unacceptable because they lack objectivity and yield equivocal and irreproducible results. Additional reports on the "ecology" of P. mesaensis based upon the recognition of size classes (=cohorts) have been also critically examined and found to be incorrect. Paruroctonus mesaensis normally attains sexual maturity at the seventh and eighth instars, there is no evidence of post-maturation molts, and maturity is attained not in three years but in five or more.

FRITZ, Debbie
PARENTAL CARE, JUVENILE DEVELOPMENT, AND NESTMATE RECOGNITION IN MALLOS GREGALIS
University of Cincinnati

Spiderlings of Mallos gregalis, the Mexican social spider, were reared in colonies with and without adults present, and observed throughout pre- and post-embryonic development. These studies have revealed that although there is apparently no parental care of the egg sacs, fewer egg sacs hatched in the colonies where the adults were absent. Desiccation of the unhatched egg sacs is the main cause of hatching failure, and the presence of adults probably contributes to improved hatching success through maintenance of the humidity of the interior of the nest. Juveniles emerging from the egg sacs participate immediately in communal prey capture and feeding, and survive equally well in the presence or absence of adults. Experiments have shown that spiders reared separately will join together in web-building and prey capture with no evidence of nestmate (or kin?) recognition. These findings suggest that Mallos has evolved along the parasocial route to sociality, instead of through prolonged parent/juvenile association, as in other social spiders.

GILLESPIE, Rosemary G.
FORAGING STRATEGIES AS RISK RESPONSES IN A SINGLE SPIDER SPECIES
University of Tennessee

The long jawed orb weaving spider Tetragnatha elongata has been found to exhibit markedly different foraging strategies under different ecological conditions. Where prey availability is low, they adopt a "sit and wait" strategy; where high they are much more active. I have applied Caraco's (1980) model of risk sensitivity in a variable environment to explain the phenomenon:- Where the prey availability is less then the spider's physiological requirement, it should exploit the variability of the habitat and remain for extended periods at a suitable site ("sit and wait"). Where prey availability is above the spider's physiological requirements; it should exploit the average by a mechanism of continual sampling ("active search"). This idea is shown to be capable of explaining not only the foraging strategy that an individual should adopt in a given situation, but also many specific behavioral/ecological correlates.

GREENSTONE, Matthew H.
SPIDER BALLOONING: DEVELOPMENT AND EVALUATION OF TRAPPING PROTOCOLS
Biological Control of Insects Research Laboratory, Columbia, Missouri

Sticky wire traps and three types of flat sticky panel traps (mylar and half and quarter inch hardware cloth substrates) were operated for twenty-three weeks in a Central Missouri soybean field to see which produces the largest and most representative samples of the aeronaut fauna. Weekly counts were subjected to multi-way analysis of variance of trap type, trap height, compass direction and sampling date. There were significant main effects for all factors except compass direction, but all factors were also involved in significant interactions. Nevertheless there is a clear numerical disadvantage for mylar panels in the fall, probably due to opacity of the adhesive on cold days. There is a significant correlation between the numbers of spiders caught on the wire and panel traps, but the wire traps consistently underrepresent the numbers of the lightest animals (less than 0.4 mg). Preliminary data on mass- and family- frequency distributions of Missouri aeronauts, and of ballooning mygalomorhs, are presented.

GRISWOLD, Charles E.
A REVIEW OF THE AFRICAN MICROSTIGMATIDAE (ARANEAE: MYGALOMORPHAE)
Natal Museum, South Africa

The African members of the Microstigmatidae are small mygalomorphs occurring in forest or dense bush. They are found in wet leaf litter, rotting logs, or beneath stones. Their bodies are usually encrusted with dirt. They have not been observed to build webs. Six species of Microstigmata are known from Africa. The characters used by Platnick and Forster (1982) to construct a cladogram for the family have been examined and found true for all six species. This cladogram is accepted and used as the basis for out group comparison for Microstigmata. This genus is known only from South Africa. The distribution of Microstigmata is discussed in the context of concepts of "paleogene" and "afromontane" biotas in Africa.

HEISS, John S.
A PRELIMINARY REPORT ON SPIDERS ASSOCIATED WITH RICE IN ARKANSAS
University of Arkansas

A preliminary investigation of spiders associated with rice fields in Arkansas was made to provide a foundation to evaluate spiders as predators of rice insect pests and mosquitoes. Using aquatic dip net and metal dipper, 1201 spiders specimens were collected over four seasons, resulting in a checklist including 12 families, 30 genera and 41 species. Four new species records for Arkansas were recorded: Eperigone banksi Ivie and Barrows, Erigone dentigera O.P. Cambridge, Ozyptila creola Gertsch, and Zygoballus rufipes Peckham and Peckham. The composition of the spider population in rice fields was broken down into three guilds based on method of prey capture: web spinners, ambushers, hunters. The dominant guild was the hunting spideres (67.5%). The web spinners and ambushers constituted 32.1% and 0.4% of the total, respectively. The most abundant individual species of spiders were Pardosa milvina (Hentz), Glenognatha foxi (McCook) and Tetragnatha laboriosa Hentz. The population of spiders in rice fields treated with carbofuran insecticide was compared with populations from untreated fields. Carbofuran seems to have little effect on spider populations in general but may decrease species diversity. The investigation suggests several avenues for future research.

HEISS, John S.
THE GENUS CALYMMARIA NORTH OF MEXICO (ARANEAE: AGELENIDAE)
University of Arkansas

The genus Calymmaria comprises 32 species of nearctic spiders traditionally placed in the family Agelenidae. Twenty-nine species occur west of the Rocky Mountains in the Sierra Nevada, Coast and Cascade ranges, and three species are known from the Appalachian region of the eastern United States. In the mountainous regions of western North America Calymmaria inhabit cool, damp forests. Webs are placed beneath and between bark, beneath moss on rocks, and living trees, beneath fallen tree trunks, along streams, and in caves. In the Appalachian region webs are placed in leaves, dirt cavities, among mossy rocks along streams, beneath overhanging rocks, beneath Rhododendron webs, and behind water falls. The web is atypical of Agelenidae, consisting of a "basket" anchored above and below by thick supporting lines, and a thin "platform" over the basket beneath which the spider hangs inverted. Prey capture appears typical for Agelenidae. Calymmaria shares the patellar fracture line with Willisus, Cybaeota, Cybaeina, Cybaeozyga, Yorima, Elaborma, and Ethobuella, possible suggesting that these genera should form a group separate from traditional agelenids.

HEISS, Nancy M.
THE "SIMPLE EYE" OF THE SPIDER--ANOTHER PERSPECTIVE
University of Arkansas

The purpose of this study is to challenge the concept that all of the eyes of the spider are "simple eyes" by definition. In order to study the importance of the eyes in foraging, behavioral observations, as well as ultrastructural studies consisting of transverse serial sections and scanning electron micrographs of Schizocosa sp., were made. By definition, an ocellus or "simple eye" serves merely to concentrate light, and no image is formed. Further investigation by various workers has shown that the principal eyes have a structure suited for image perception, and preliminary observations indicate that the wolf spider may be able to recognize stationary objects as prey from a distance of over 5 cm. Studies seem to indicate that the principal eyes of the spider are not as "simple" as thought previously.

HIEBER, Craig S.
THE AVOIDANCE OF EGG PREDATORS BY THE SPIDER MECYNOGEA LEMNISCATA
University of Florida

The short reproductive period, the rate of cocoon production, the spacing between web sites, and rate of egg development of Mecynogea lemniscata (Araneidae) were examined as tactics to avoid egg predations by Tetrastichus nr. basnksii (Hymenoptera: Eulophidae). The life cycle of this wasp is timed to the appearance of the host, and it apparently has no trouble penetrating the cocoon to lay its eggs. However, the level of parasitism (7-8%) is constant, and relatively low when compared to the known rates for other spiders (25-75%).

The major deterrent against egg predation by this wasp is the rate of cocoon production. This limits the number of cocoons in a string available for attack by wasps or their emerging progeny. This timing, in combination with a limited developmental window for parasite attack, forces the wasps off of the cocoon string in search of a new host. The search for new hosts is hampered by the short length of the reproductive period, which limits the number of parasite generations, and the large number of web sites which must be searched for cocoons in the proper stage for attack. The spacing of web sites plays a limited role.

HIGGINS, Linden
NOTES ON THE NOCTURNAL BEHAVIOR OF NEPHILA CLAVIPES (LINNEAUS) IN TEXAS
University of Texas

The activity of Nephila clavipes was surveyed at half-hour or hourly intervals for two nights in July, 1982, in Brazoria County, Texas. The primary difference between nocturnal activity (272 spider-hours) and diurnal activity (221 spider-hours) was that web removal for rebuilding or relocation occurred at night. The rate of prey capture (insects per spider per hour) was much greater in the noctural observations. Records were also made of the type of prey captured, some family identifications were possible. Courtship and copulation was also observed during nocturnal surveys. Web removal behavior preparatory to respinning strongly resembles web removal by males in courtship of some araneids and linyphiids, and the orb removal done by the females in response to rainfall. Some alterations in the barrier webs and frames are made at this time, and respinning is initiated at once. During web removal, predatory behavior continued until the orb was gone or web building behavior started.

HODGE, Maggie
TERRITORIAL BEHAVIOR AND RELATED RESOURCE ASSESSMENT STRATEGIES IN FEMALE BOWL AND DOILY SPIDERS, FRONTINELLA PYRAMITELA (LINYPHIIDAE)
University of Georgia

Field experiments were conducted to determine if territorial behavior is involved in maintenance of regular spacing patterns in bowl and doily spiders. Stereotypic behavioral displays were observed in induced encounters between penultimate and adult females at natural web sites. Spider weight, web ownership status and web volume were examined as possible assessment parameters influencing the intensity and/or outcome of the interactions.

KRONESTEDT, T., C. D. DONDALE, and B. N. Anne HUDSON
DISTINGUISHING BETWEEN TWO CLOSELY RELATED SPECIES OF PARDOSA (ARANEAE: LYCOSIDAE) BY ELECTROPHORESIS AND MALE COURTSHIP BEHAVIOR
Naturhistoriska Riksmuseet, Stockholm

Pardosa fuscula (Thorell) of North America and P. atrata (Thorell) of Eurasia, traditionally distinguished only by geographic origin, are shown to differ as well in electrophoretic and male courtship characters. It is concluded that the two forms should be treated as a closely related but allopatric species-pair rather than a single Holarctic species.

LEVI, Herbert W.
THE SPIDER GENUS MICRATHENA
Harvard University

There are 104 species of Micrathena in the Neotropical region, of which 29 species are new. In Central America there are 34 species, equal to the number in the Amazon area. While species in one area are usually easily separated, many species are widespread with geographical variation. Some may hybridize.

Adult females may have fewer or more spines that immatures; the males lack spines on the abdomen. It is not known in which instar sexes differentiate. All species hang in an unusual position in the web. They do not attack-wrap. Most species stridulate when disturbed. Perhaps the spination makes it difficult for predators to form a search image.

MAHLER, Anne E.
THERMOREGULATORY POSTURING IN A POPULATION OF ARGIOPE ARGENTATA
University of Miami

Graded behavioral thermoregulatory posturing was observed in a population of tropical orb-weaving Argiope argentata in a clearing on Barro Colorado Island, Panama. Body orientation of 25 individuals was measured hourly throughout 9 days in Sept. and Oct. Hourly angles of the spiders' longitudinal axes to vertical were calculated and compared to angles of incident sunlight calculated for that location and time. Spiders on western surfaces of webs showed large angles early in the day and then a gradual decrease. Angles of elevation of spiders on eastern surfaces were negative in early morning and then gradually increased in size. The angles between the longitudinal spider axes and incident sun light decreased toward mid-day and were less than 90° througout the day.

MEISTER, J. S. and W. H. WHITCOMB
LIFE HISTORY OF CORYTHALIA CANOSA (WALCK.) (ARANEAE: SALTICIDAE)
University of Florida

Field-collected Corythalia canosa in late instar stages were reared to maturity in the laboratory. Newly matured spiders were allowed to mate and their progeny were reared to maturity, mated, and maintained to death. Approximately 30 days elapsed between copulation and the first oviposition. An average of 24 days separated each successive oviposition. Eggs required 7-11 days from oviposition to reach the 1st post embryo or rupture of the chorion. Duration of the 2nd post embryo, from the rupture of the vitelline membrane to the first molt, required 10-11 days. Males matured earlier, passed through fewer molts, reached smaller adult size, and had lesser adult longevity than females. Males typically reached maturity in the sixth instar (approximately 127 days from oviposition); females required seven instars (151 days). Spiders reached maturity at all months of the year in the lab. At least three instadia measurements of carapace width were made for each individual. Instadia growth was observed but was not statistically significant. Carapace width of lab-reared adult males averaged 1.53 mm and 1.69 mm for females. Fifty-four females reared and mated in the lab produced a total of 180 egg sacs containing 941 eggs. Each egg sac averaged 5.18 eggs. Each female laid an average of 4.17 egg sacs containing an average of 17.43 viable eggs in her reproductive life. Observations were made on courtship, copulation, sperm induction, aggression, ecdysis, oviposition, brood care, egg eclosion, early development, and feeding.

OPELL, Brent D.
FORCE EXERTED BY ORB-WEB AND TRIANGLE-WEB SPIDERS OF THE FAMILY ULOBORIDAE
Virginia Polytechnic Institute

Differences in web structure and cephalothorax features suggest that Hyptiotes cavatus should exert more force while monitoring its vertical, triangle-web than Uloborus glomosus exerts while hanging beneath the hub of its horizontal orb-web. When this hypothesis was tested by measuring the force instars of each species exert on a horizontal thread, Hyptiotes cavatus exerted significantly more force throughout development than did Uloborus glomosus. This relationship holds when either first femur length or body weight is used as an index of size.

OPELL, Brent D. and Paula E. CUSHING
VISUAL FIELD OF ORB-WEB AND SINGLE-LINE-WEB SPIDERS OF THE FAMILY ULOBORIDAE
Virginia Polytechnic Institute

In the family Uloboridae, web reduction is accompanied by reduction of anterior eyes, by positional shifts in posterior eyes, and by the appearance of posterior lateral eye tubercles. The purpose of this study was to determine the visual implication of these changes by comparing the optical properties of the orb-weaver Octonoba octonaria and the single-line-weaver Miagrammopes sp. This was done by determining the visual angles of each eye from optical and physical measurements and plotting these angles on carapace diagrams. Despite loss of the anterior eye row, Miagrammopes retains its visual coverage. This results from expansion of each eye's visual angle and from ventral shifts of the posterior lateral eye's axes. The effect of these changes is to give the posterior median eyes of Miagrammopes visual coverage comparable to that of the posterior eye row of Octonoba and the posterior lateral eyes of Miagrammopes coverage comparable to the anterior row of Octonoba. As Miagrammopes rest and monitor their webs from twigs or moss and are not protected by an orb-web, this visual coverage, particularly its ventral component, may be important in detecting potential predators.

PENNIMAN, Andrew J.
CLADISTIC RELATIONSHIPS OF SOME "CLUBIONID" SPIDERS
Ohio State University

Examination of 20 characters in 35 genera and arrangement of the genera in a cladogram has shown the traditional family Clubionidae to be polyphyletic. Presence of precoxal triangles separates a clade containing Anyphaenidae, Clubionidae, Gnaphosidae, and Corinnidae from the functional out-group. Curvature of the anterior eye row and lateral compression of female posterior median spinnerets (PMS) separate Gnaphosidae plus Corinnidae from Anyphaenidae and Clubionidae. Anyphaenidae is defined by the advanced position of the tracheal spiracle and presence of a fixed tegular apophysis; no synapomorphy has been found for Clubionidae. Gnaphosidae is defined by the anterior spinnerets, which are cylindrical and separated, and depression of the ventral surfaces of the endites. Loss of the median apophysis and presence of dorsal scuta are synapomorphies of Corinnidae. Corinninae and Castianeirinae have a "3+2 arrangement" of spigots on the PMS of females; Trachelinae have lost their macrosetae; six characters, spigots of female PMS in two rows, male palpal femur with ventral apophysis, tibiae and basitarsi I and II with many ventral macrosetae, tarsal claws without teeth, and tarsal scopulae absent, define Phrurolithinae.

PLAGENS, Michael J.
AERIAL DISPERSAL BY SPIDERS AND THEIR OCCURANCE IN AGRICULTURAL FIELDS
University of Florida

A simple trap design utilizing a single fine steel wire coated with Tac-Trap is described. Such traps were used during 1983 and 1984 to monitor ballooning spiders over several cornfields in conjunction with weekly surveys of spiders in those fields. Results showed that with few exceptions, all species common in the cornfield were also taken on the sticky wire traps. However, not all species collected on the traps became established in the cornfields. Common cornfield spiders are a subset of aerially dispersing spiders that possess habitat requirements matched by a field corn monoculture.

RAPP, William F.
SOME OBSERVATIONS ON THE BIOLOGY OF TIBELLUS OBLONGUS (ARANEAE: PHILODROMIDAE)
Crete, Nebrasks

Tibellus oblongus (Walckenaer) is distributed throughout the Holarctic Realm. Its specific ecological niche is the grass and herbaceous vegatation at the edges of ponds, lakes, and rivers. It would appear that the species needs a habitat which has a fairly high moisture. This study is based upon the study of 142 specimens mainly collected in the Grassland biome of North America. The principal objective of this study was to determine how this species overwintered and when sexually mature adults were present. Of the specimens studied, 89 or 62.7% were immature and 53 or 37.3% were adults. Of the mature specimens, 10 or 18.9% were males; 43 or 81.1% were females. Adult females were collected from May through September with the highest numbers from July 3 to August 23. Males were present from June 1 until August 23. Immatures were taken as early as May 15 and as late as October 15. There was no period when immatures could not be found.

Mikulska in 1962 and 1963 studied this species on the Polish Baltic Coast and found that in early spring and late autumn all specimens were mature. Large numbers of immatures were taken in May and June.

Based upon my study and Mikulska's, it appears that this species overwinters as an immature.

REISKIND, Jonathan
A FOSSIL LYSSOMANES IN THE ANTILLANUS GROUP
University of Florida

A male Lyssomanes, well preserved in Dominican amber (Oligocene), is described and compared to the two members of the Antillanus species-group: L. antillanus Peckham & Wheeler and L. portoricensis Petrunkevitch. While clearly a member of this group it is a distinct species exhibiting traits of both its closest relatives. The relatively minor morphological changes in this "advanced" group over the last 30 million years is discussed.

RICHMAN, David B.
PRELIMINARY STUDIES ON THE GENUS HENTZIA MARX 1883 (ARANEAE: SALTICIDAE)
New Mexico State University

The genus Hentzia ranges from southern Ontario to northern South America and from the Lesser Antilles to Sonora. The genus contains nearly 20 species, including several apparently undescribed species from the Bahamas and the Caribbean. One described species, Wala (=Hentzia) noda Chamberling from Peru, does not belong in the genus.

ROLAND, Chantal, Alain PASQUET, Raymond LEBORGNE, and Bertrand KRAFFT
INTERATTRACTION BETWEEN FEMALES OF ZYGIELLA X-NOTATA: INFLUENCE OF A SILKY SUBSTRATE
Universite de Nancy

On windows of our University, Zygiella x-notata shows an aggregated type of distribution. The environmental factors, i.e. climatic, physical factors, potential prey, don't seem sufficient to explain this aggregation. Therefore these clumpings could depend partly on interactions between individuals.

According to the important role of silk structures in spiders, we tested their influence in interactions by using a T-maze technique. Previously this one allowed us to study the sexual and social attraction mechanisms in several species.

Forty-eight females of Zygiella x-notata were tested. In T-maze, they moved significantly towards the arm containing a silky substrate of a conspecific female. Furthermore, they spent more time and they were more active on this substrate than anywhere else in the maze.

These results show that silky substrate can play a role in interactions between individuals, which could influence the conspecific placement and activity.

ROVNER, Jermone S.
SPIDER NESTS MAINTAIN A PHYSICAL GILL: FLOODING AND THE EVOLUTIONARY ORIGIN OF SILK
Ohio University

I examined resistance to drowning in two spiders that build nests beneath stones. Submerged 10 cm in aerated water at 20-24°C, Ariadna bicolor and Dysdera crocata (various instars) gradually lost their air film and drowned within 18-36 hr. However, if allowed to remain in their nests, A. bicolor survived up to 7 days and D. crocata up to 10 days. These were not upper limits, but reflected the spiders' "decision" to eventually leave the safety of the nest. Submerged nest-dwellers did not enter a diapause-like state but showed occasional activity; and they moved rapidly when I opened the nest after it was underwater for days. Following an initial decrease, the volume of the entrapped bubble remained constant. Thus, silk provides a mechanical structure that prevents the Ege effect from reducing the bubble—a physical gill—and insures continued uptake of oxygen from the water.

Such use of silk to survive rain-caused flooding leads me to speculate: Just after the transition from an aquatic to a terrestrial form, the spider's ancestor may have dwelt in burrows along shores, a frequently flooded habitat. The evolutionary precursor of silk may have had the adaptive value of providing a means of maintaining a kind of plastron, enabling the animal to respire under water during floods.

SCHLINGER, Evert I.
STUDIES ON THE HOST-PARASITOID RELATIONSHIPS OF THE MYGALOMORPHAE AND THEIR INTERNAL DIPTEROUS PARASITOIDS, THE ACROCERIDAE
University of California, Berkeley

During the past thirty years the author has been fortunate to have studied and reared spiders and their parasitoids from many parts of the world, especially North America, Central America, South America, New Zealand and Australia.

This discussion summarizes the above relationships, selected biological facts, and certain rearing and distributional problems encountered during these studies.

STIETENROTH, Cheryl and Norman HORNER
THE JUMPING SPIDERS (SALTICIDAE) OF THE VIRGINIA PENINSULA
Midwestern State University

Thirty-one species representing 18 genera of Salticidae are recorded from the Virginia Peninsula. Habitat and natural history information for each species is presented. Habitat distributions for salticids on the Peninsula show an obvious diversity for some species while others appear to confine themselves to more restricted environments. The most abundant salticid collected was Hentzia palmarum (Hentz). Metaphidippus galathea (Walckenaer) and Metacyrba undata (DeGeer) were the most widely distributed species. Salticids reported for the first time in Virginia by this study are Lyssomanes viridis (Walckenaer), Phidippus obscurus (Peckhams), P. princeps (Peckhams), P. pulcher (Walckenaer), Thiodina sylvana (Hentz), Sitticus fasciger (Simon) and Zygoballus sexpunctatus (Hentz).

SUTER, R., G. RENKES, and A. HIRSCHEIMER
CHEMICAL COMMUNICATION IN BOWL AND DOILY SPIDERS, FRONTINELLA PYRAMITELA (LINYPHIIDAE)
Vassar College

Bowl and doily spiders communicate with each other primarily via tactile (vibrational) and chemical signals. Chemical signals borne on the silk are sex-specific and serve several identifiable functions: female-produced chemicals on whole webs elicit gravity oriented search behavior and courtship when perceived by males; draglines bearing the same chemicals also elicit courtship behaviors but are not followed by males; male-produced chemicals identify F. pyramitela webs to both sexes. Chemicals borne on the female cuticle identify the female by sex to courting males in the absence of vibrational cues to the female's identity. Apparently the signal repertoire of bowl and doily spiders is rich in chemicals, of which not one has been identified, and of which many are probably yet to be discovered.

THOMS, E. M.
SOUND PRODUCTION BY THERAPHOSA LEBLONDI (ARANEA: THERAPHOSIDAE)
Virginia Polytechnic Institute

The morphological, behavioral, and acoustical characteristics of sound production by Theraphosa leblondi were investigated. When disturbed, T. leblondi raise the pedipalps and legs I and move these appendages against one another to produce a hissing-like sound. Modified (stridulatory) setae are located on opposing surfaces of the femur, trochanter, and coxa of the pedipalps and legs I and on opposing coxal surfaces of legs I and II. Adult males, females, and nymphs (beginning at instar 5) possess stridulatory setae. T. leblondi can not produce sound after these setae are removed. Scanning electron microscopy reveals unusual modifications of the stridulatory setae including long, filamentous projections on the central 65% of the shaft and modification of the terminal 15% of the shaft into a file and scraper. The terminal file and scraper tapers to a point and has longitudinal rows of short, tooth-like projections with curved tips.

TIETJEN, W. J. and L. R. AYYAGARI
SYMBIONTS ASSOCIATED WITH THE WEB OF THE SOCIAL SPIDER MALLOS GREGALIS (ARANEAE: DICTYNIDAE): THE ROLE IN PREY ATTRACTION
Lindenwood College

Unlike most social spiders, Mallos gregalis do not clean the prey from their webs, but rather incorporate the remains directly into the nest matrix. The presence of prey remains in the web affect the microbial populations associated with the nest. Under laboratory and field conditions, webs have a characteristic heavy-sweet odor. Behavioral tests indicate that the primary prey of M. gregalis (muscid flies) is attracted to the sweet-smelling web. Examination of the web and debris associated with the silk indicate that two species of yeast are responsible for the odor of the nest and that the microflora develop within the carcasses of the fed-upon flies. Flies not fed upon by M. gregalis have a rancid odor when cultured in nutrient media. Two-choice experiments indicate that flies are attracted to yeast cultures. Culture techniques which select for yeasts at the expense of other microorganisms suggest that the yeasts are part of the normal flora of the flies and that the process of feeding by M. gregalis affects the final species composition of microflora such that the yeasts out-compete bacterial species.

VALERIO, Carlos E.
MYGALOMORPH SPIDERS IN THE BARYCHELIDAE AND PARATROPIDAE (ARANEAE) FROM COSTA RICA
Universidad de Costa Rica

The following species are described: Psalistops venadensis (Barychelidae), Paratropis lanthanis, Anisaspoides argus and A. maculatum (Paratropidae).

The barychelid, from the northern plains, is the first record for the family in Central America. P. lanthanis and A. maculatum inhabit the Central Valley, and P. argus is found in the Atlantic lowlands. The specimen identified by Reimoser (1940) as Anisaspis tuberculatus is an immature female of Paratropis sp.

Types are deposited in the Museo de Zoologia, Universidad de Costa Rica.

VIJAYALAKSHMI, K. and S. SIVARAMAN
PREDATORY POTENTIALITY OF THE SPARRASSID SPIDER HETEROPODA VENATORIA - A LABORATORY BIOCONTROL ESTIMATE
Loyola College, Madras, India

The giant crab spider Heteropoda venatoria is a recognized predator of household insect pests. Their flattened body enables them to fit into cracks and crevices, in particular the habitat of prey cockroaches. Their attack gesture and strength enhances their predator efficiency on the active prey cockroaches.

The functional response trials with varied prey types and size classes indicate their deviation from the typical type II response of Holling (1959) with reference to attack rate (a') and handling time (T_h). This may be attributed to the probable prey size class selection and palatability. Besides, the full range of instars show maxima and minima with reference to the selection and handling of varied types and size classes of prey. The optimal allocation of predator searching effort increases the overall rate of predator encounter.

The variation of subcomponents of a', and T_h, influence of prey densities, types and size classes are statistically correlated. It has been suggested that the variation in T_h might be due to the prey encounter either killed or fed.

Analysis of the population fluctuation of prey and predator over a period in the field indicates the predator's quantitative biocontrol potential. A model predicting the optimum predator-prey ratio has been evolved for use in field biocontrol measures.

WEAVER, Jan C.
THE INFLUENCE OF PRAIRIE FIRES ON SPIDER NUMBERS, SPECIES, AND BIOMASS
University of Missouri, Columbia

High plant species diversity can be maintained in prairies by burning them at 2 to 5-year intervals, which approximates the natural incidence of fire that the plants are believed to have evolved under. My data suggest that spiders may also respond positively to such schedules. Tucker Prairie Research Station in central Missouri has maintained permanent experimental plots since 1958 -- a control, and plots burned on an annual, 2-year and 5-year schedule. All 4 plots were burned in 1982 when a fire in a nearby field escaped. In 1983 I sampled spiders in the vegetation by sweeping at two week intervals from late May to Sept. 1. In spite of similar recent burn histories, the plots showed significant differences in numbers of spiders in August when spider populations peaked. The 2-year plot had the most (86), followed by the 5-year (65), control (64) and annual plots (35). Although not significant, species numbers and biomass tended to be higher in the 2 and 5-year plots. The 2 and 5-year plots had the most species (13) followed by the control (9) and annual plots (7). The control had the greatest biomass (fresh weight), 944.654 mg (3 spiders = 70% mass). Next, the 5-year plot had 668.879 mg (1 spider = 22% mass), the 2-year plot had 486.023 mg (1 spider = 25% mass) and the annual plot had 256.904 mg (2 spiders = 50% mass). There were also significant differences in the way the two most abundant species were distributed between plots. One species of Metaphiddipus, and salticids generally, were more abundant in the control plot. Araneus pratensis, and araneids generally, were more common in the 2-year plot.

WEGER, Wendy and W. J. TIETJEN
A PRELIMINARY STUDY OF THE BEHAVIORAL ECOLOGY OF SPATIAL DISTRIBUTION IN THE BOWL AND DOILY SPIDER FRONTINELLA PYRAMITELA
Lindenwood College

Most spiders are solitary and show random or dispersed distributions. However, Fontinella pyramitela exhibits a clumped distribution under natural conditions suggesting either an interaction among animals or between the animals and features of the habitat. Field studies indicate that temperature, light, prey availability, and hedge structural features were of little significance in explaining the observed distribution. Field data concerning website selection vs. substrate complexity are backed by laboratory studies. Both field observations and laboratory studies indicate that F. pyramitela are tolerant of other members of their species and may occupy the same web. It is suggested that F. pyramitela exhibit their clumped distribution due to behavioral interactions among neighbors, however the mechanisms responsible for the observed distribution were not determined.

WHEELER, G. S., J. P. MCCAFFREY AND J. B. JOHNSON
LABORATORY AND FIELD STUDIES OF THE BIOLOGY OF DICTYNA COLORADENSIS CHAMBERLIN AND D. MAJOR MENGE IN IDAHO
University of Idaho

Dictyna coloradensis and D. major are potentially important predators of insects imported and released for the biological control of weeds in Idaho. As such, they may be antagonists to these biological control efforts.

Laboratory and field studies were undertaken to provide basic biological information necessary for evaluating impact of these spiders on the biological control of weed programs. Of particular interest were laboratory rearings to determine the number and duration of instars and studies of the spiders in the field to evaluate spatial and temporal aspects of the spider/prey relationships.

Laboratory studies indicated that on the average, D. coloradensis required more molts and a longer duration in time to reach maturity than did D. major.

Field studies conducted in spotted knapweed infested sites showed that these species are sympatric, but it appears that adult D. coloradensis are present for a shorter duration of time than D. major. Also preliminary studies indicate that D. coloradensis constructs its web higher in the plant canopy than D. major.

WILSON, Graeme
COLOR VISION IN SALTICIDAE
University of Alabama, Birmingham

The literature strongly suggests that jumping spiders use their anterior median eyes to make color discriminations. This conclusion is reached from behavioral and electrophysiological studies. Yet one important experiment is still missing. It remains to be demonstrated that color discrimination is possible when the brightness of two colors is equal. To do this requires knowledge of the relative brightness of different colors when viewed by the salticid's anterior median eyes.

One experimental method of addressing the problem is suggested. It requires training spiders to run a T maze. Preliminary experiments with Maevia inclemens show that the method is inexpensive in materials, but places extreme time demands on the experimenter.

WISE, David and Paul REILLO
FREQUENCIES OF COLOR MORPHS IN SOME ENOPLOGNATHA OVATA POPULATIONS IN THE EASTERN UNITED STATES
Unversity of Maryland, Baltimore County

The theridiid Enoplognatha ovata exhibits a conspicuous color polymorphism characterized by three morphs: lineata (yellow abdomen), redimita (two red stripes) and ovata (solid red band). European researchers have found that local populations often differ substantially in morph frequencies, and that average frequencies differ between geographic regions. We found evidence of similar variability in North American populations of E. ovata. We recorded the phenotype of 1107 spiders from several local populations, 50 m to several km apart, in each of four areas: Mt. Desert Island, Maine; western Massachusetts; eastern New York; and central New York. In Maine, the most intensively sampled region, the frequency in local populations of the yellow form, lineata, varied from .70 to .96. The overall frequency of lineata was .70 in Massachusetts and close to .80 in the other three regions. The most striking geograhic differences in frequency were of the solid red morph, ovata. This form was absent from all New York populations sampled, but occurred in all but two local populations in Massachusetts and Maine. Overall frequencies of ovata in the Massachusetts and Maine samples were .03 and .06, respectively. Frequencies of ovata in the local populations in these two areas ranged from 0 to .15.

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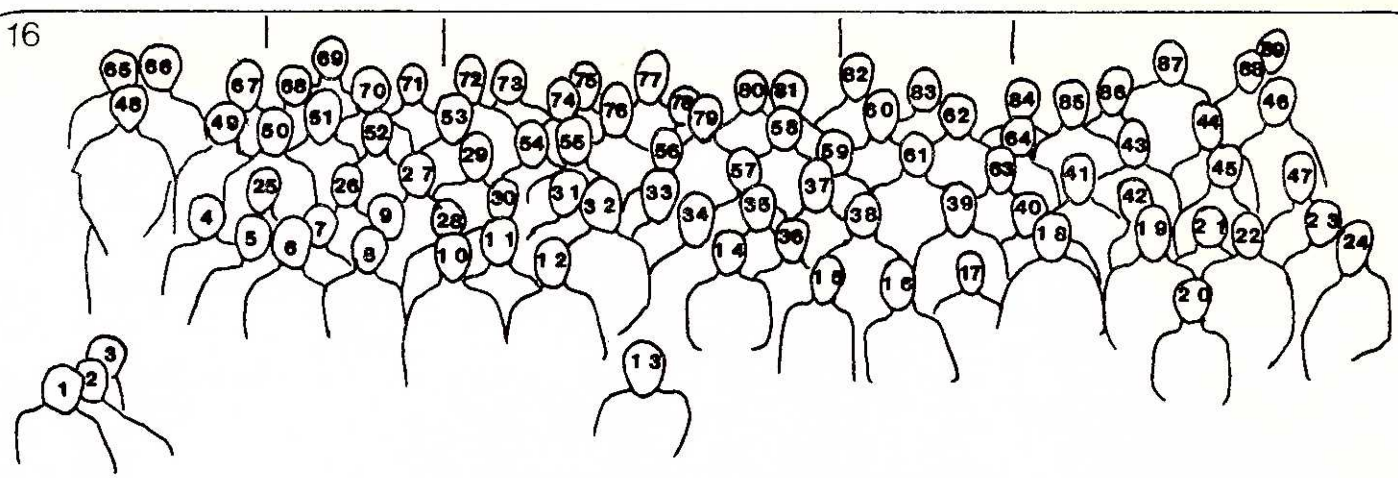

KEY TO 1984 MEETING PHOTOGRAPH

Linden Higgins has provided the following key to arachnologists attending the 1984 New Orleans meeting. If there are any corrections or additions please send them to B. Opell and they will appear in the next newsletter.

1. Jerome Rovner, 2. Maggie Hodge, 3. Chantal Roland, 4. Deborah Smith, 5. Anne Mahler, 6. Sam Marshal, 7. K. Vijayalakshmi, 8. Ellen Thoms, 9. Lorna Levi, 10. Louis Sorkin, 11. Barbara Abraham, 12. Ute Grimm, 13. Terry Christenson, 14. Timothy Lockley, 15. Diane Coyle, 16. Rosemary Gillespie, 17. John Heiss, 18. B. J. Kaston, 19. Michael Plagens, 20. 21. Judy Brown, 22. Norman Horner, 23. Cheryl Stietenroth, 24. Gregory Zolnerowich, 25. Linden Higgins, 26. Mrs. Schlinger, 27. Hebert Levi, 28. Paula Cushing, 29. Ruth Buskirk, 30. Leticia Aviles, 31. Cay Craig, 32. Rob Bennett, 33. R. G. Breene, III, 34. Graeme Wilson, 35. Carlos Valerio, 36. L. R. Ayyagari, 37. Joe McCaffrey, 38. Nancy Heiss, 39. Charles Dondale, 40. Norman Platnick, 41. Gail Stratton, 42. Lisa Williams, 43. Ann Rypstra, 44. Andy Penniman, 45. Arthur Decae, 46. A. D. Ali, 47. Nollie Hallenleben, 48. Wayne Maddison, 49. Nancy Regan, 50. Fritz Vollrath, 51. James Cokendolpher, 52. Jonathan Reiskind, 53. Matthew Greenstone, 54. Juanita Peaslee, 55. Stephen Skinner, 56. William Peck, 57. Yael Lubin, 58. Robert Sherman, 59. Oscar Francke, 60. David Mask, 61. Fred Coyle, 62. Willard Whitcomb, 63. Leslie Bishop, 64. Karen Cangialosi, 65. , 66. Craig Hieber, 67. George Uetz, 68. Jim Berry, 69. Al Cady, 70. David Glaser, 71. Allen Dean, 72. Robert Suter, 73. Evert Schlinger, 74. Bill Rapp, 75. Jim Carico, 76. Bill Tietjen, 77. Jonathan Coddington, 78. Sabara Roth, 79. B. Krafft, 80. Brent Opell, 81. David Richman, 82. Allen Brady, 83. David Wise, 84. Roger Darchen, 85. Blaine Hebert, 86. G. B. Edwards, 87. Vince Roth, 88. Jan Weaver, 89. Jim Carrel