

American Arachnology

The Newsletter of the American Arachnological Society



Number 21

June 1980

American Arachnology, Number 21

June, 1980

In this issue of AMERICAN ARACHNOLOGY:

Research notes.....	2
New records and range extensions.....	2
Arachnology courses.....	3
Journal News.....	3
Another AAS!	4
New Research Literature.....	5
New Book.....	8
Arachnoquiz #4.....	10
Biographical sketch of R. F. Lawrence....	13

AMERICAN ARACHNOLOGY is the newsletter of the American Arachnological Society and is sent only to society members. For information on membership, write Dr. Norman Platnick, Membership Secretary, American Arachnological Society, Department of Entomology, The American Museum of Natural History, New York, NY 10024, USA. Members of the Society also receive the JOURNAL OF ARACHNOLOGY three times a year.

Correspondence, submissions and requests for back issues of AMERICAN ARACHNOLOGY should be directed to the editor, William A. Shear, Biology Department, Hampden-Sydney College, Hampden-Sydney, VA 23943, USA.

Notice of a change of address should be sent only to the Membership Secretary (see above). To do otherwise merely delays the change; all mailing for the Society is done from a list maintained by the Membership Secretary.

RESEARCH NOTES

VINCENT LEE of the California Academy of Sciences, Golden Gate Park, San Francisco, CA 94118, reports that the arachnid collection of that institution is now available for research. The collection had been in storage for more than a year to allow for construction of an electronically-controlled space-saving filing system. Requests for specimens should be addressed to the curator, Dr. David H. Kavanaugh.

GARY A. POLIS, Department of Biology, Vanderbilt University, Nashville, TN 37235 is searching out records of invertebrates preying on vertebrates. Information required includes the taxa involved, date, locality and particularly the size (length and/or weight) of the predator and the prey. Gary is also eager to get any information on the predators and parasites of scorpions.

ANTHONY MOORE, 14012 Maple Ave., Los Angeles, CA 90061, would be grateful for reprints or titles of any references on the scorpion genus Pandinus.

JAMES C. COKENDOLPHER, Department of Biological Sciences, Texas Tech University, Lubbock, TX 79409, wants harvestmen specimens for revisionary studies of the genera Leuronychus (west coast of North America) and Homolophus. In the latter genus, James is especially interested in any specimens from Alaska or from the Old World. He is also eager to look at undetermined collections from Alaska, the Aleutian Islands and eastern Siberia, but please write to him first describing the size and nature of the material.

CAY RANDALL, Arizona Commission of Agriculture and Horticulture, 1688 West Adams, Phoenix, AZ 85007, is preparing a key to Arizona spider eggcases. She would appreciate receiving eggcases from this region, and will return specimens if the sender requests.

NEW RECORDS AND RANGE EXTENSIONS

DEVIN CARROLL of Visalia, CA, writes as follows: "Holocnemis pluchei (Scopoli), a long-bodied pholcid spider native to the Mediterranean region, is now established in the Central Valley of California. Collected as early as 1976, and identified by Dr. Gertsch, this spider has undergone a population bloom and now ranks as a dominant web-building domestic spider throughout at least the southern half of the Central Valley. A number of people, both laymen and arachnologists, have observed a remarkable concomitant decline in the number of black widows, among other spiders. Although we have observed H. pluchei feeding on newly hatched black widows, and have ascertained that an adult female black widow tossed into a H. pluchei web may be captured and eaten, the reduction in the black widow population could be as much due to competition for web-sites as to predation. A black stripe on the sternum and venter and a distinct pattern on the abdomen readily distinguishes H. pluchei from the similar looking Pholcus phalangioides, and in addition, the lateral eyes are distinctly separate rather than contiguous as in Pholcus. Further identifying characters may be found in Simon's key to the Pholcids in L'Histoire Naturelle des Araignees."

BRUCE CUTLER of St. Paul, MN, has collected Corythalia delicatula (Salticidae) from Anoka Co., MN. The closest previous records are from Long Island and Texas! G. B. EDWARDS sent Bruce a female of Pellenes captiosus (Salticidae) from Alberta, Canada; this species was not previously known west of 94 degrees west longitude.

ARACHNOLOGY COURSES

DONALD ZEPP, Department of Entomology, Cornell University, Ithaca, NY 14853, is planning to teach a course in Araneology in alternate fall semesters, starting in the fall of 1980. The course will be for two credits and will emphasize the identification and bionomics of local species. Don would like arachnologists from other areas to send him specimens of locally common forms, especially of those families which do not occur in the occur in the northeastern United States, as well as reprints of their papers which would be useful for identifications.

It has been six years since your editor offered a "short term" course five weeks long on arachnids, myriapods and terrestrial crustaceans. For that course, which met every day, morning and afternoon, during the last three weeks of May and the first two weeks of June, I prepared a laboratory book with keys to the important local groups and selected a "book" of readings to supplement my lectures. For most laboratory work, the students used Kaston's "How to Know the Spiders," and ten copies of "The Spiders of Connecticut" were kept available in the laboratory, as was a collection of the pertinent taxonomic literature. A collection of 250 identified specimens was required. The capstone of the course was a five-day field trip to the Highlands Biological Station in Highlands, North Carolina, where the students picked up a number of interesting new records from the families Atypidae, Lyssomanidae and Tetragnathidae. The station staff expressed amazement at the students, who spent all day, every day in the field, and worked in the laboratory until after midnight. Although no professional arachnologists have as yet developed from that group, NORMAN and NANCY PLATNICK were students in a similar course I taught at Concord College in West Virginia. AMERICAN ARACHNOLOGY would be delighted to print the experiences of other teachers who have given Arachnology or Araneology courses. I wonder how many members of the Society have had such courses, and had their interest in arachnids begun by them? FRED COYLE, JOE BEATTY, DAVE GRANT, and myself were students in such a course taught by ANDY WEAVER at the College of Wooster, who had become interested in spiders after meeting HERB LEVI at the University of Wisconsin.

Should we prepare an "intellectual geneology" of American arachnology?

JOURNAL NEWS

B. J. KASTON is the new Associate Editor of the JOURNAL OF ARACHNOLOGY, and will be in charge of manuscripts: receiving them, selecting reviewers and mailing out copies, and in general handling all the paper work in this connection. OSCAR FRANCKE will continue as Managing Editor and will deal with production, printing and the mailing of reprints. BILL PECK will continue to mail individual issues. Authors should now send manuscripts to:

Dr. B. J. Kaston
5484 Hewlett Drive
San Diego, CA 92115

AAS President HERB LEVI writes that "Bill Peck has 10 to 20% of the journals returned because of address changes. Return postage varies from 41¢ to \$1.43, and some come back a second time from corrected addresses. Each initial mailing is 59¢. In the future the publication will only be remailed after a payment of \$1.75 for postage and handling." Address corrections should be sent to Dr. Norman Platnick, AAS Membership Secretary, Department of Entomology, The American Museum of Natural History, New York, NY 10024.

ANOTHER A A S!

We were pleased to find enclosed in a letter from ROBERT RAVEN the first number of AUSTRALASIAN ARACHNOLOGY, a newsletter of the Australasian Arachnological Society (another AAS!). Robert has given us permission to quote some pertinent notes on the new Society from the newsletter:

"At present the aim of this society is that of other arachnological societies - to promote the study of arachnids, in our case especially Australasian arachnids. In time this aim may become more refined. The newsletter is intended as a means of communication between arachnologists-amateurs and professionals."

"I had hoped to produce this newsletter sooner. However, I hoped to have membership up to 50, which would allow us to take advantage of lower postage rates, before sending the newsletter out. We are now at about 40."

"Several aspects of this society are highly unusual, although in time some of these can be remedied. Firstly, we have no officers except myself as newsletter editor. For the present, I believe that the barest minimum is necessary. However, on all points I am open to suggestion. Second, meetings will be at best regional, if at all. But if meetings do occur, the proceedings can be included in the newsletter. It has been suggested that the Australasian Arachnological Society could be a subgroup of an entomological society. Because Australasian entomology is so advanced compared with arachnology this would be generally undesirable."

"One of the things I hope to be able to publish is keys to families, genera and possibly species of the arachnid groups, or to direct interested arachnologists to useful references. From time to time, I hope to include a short section written by professionals giving suggestions as to procedures and problem solving. I also hope to compile a list of Australian spiders from Bonnet's Bibliographia Araneorum. Such a list would have minimal information, owing to the enormous drain on time. For the next newsletter, I hope to produce a list of Australian arachnologists, their interests and their addresses. Consequently, I am open to suggestions as to newsletter contents."

"Membership fees at present need only cover the cost of the newsletter and its postage. The newsletter costs about 5¢ per page. I will be unable to send copies to unfinancial members as I shall bear the brunt of initial costs personally. I expect to produce about 4 newsletters a year, depending upon demand and your submissions, and local support."

"I hope you are interested to go further. If there is something that you wish to see in the newsletter which I have not mentioned, please let me know. Subscriptions: \$2.00 per annum sent to Australasian Arachnological Society, P. O. Box 573, Fortitude Valley, 4006, Q."

NEW RESEARCH LITERATURE

These papers have come to the editor's attention in the past few months. Reprints may be requested from the authors.

Benoit, P. L. G.

- 1978a. Contributions à l'étude de la faune terrestre des îles granitiques de l'archipel des Séchelles. Introduction. Rev. Zool. afr. 92(2):390-404.
- 1978b. Ibid. Araneae Orthognatha. Rev. Zool. afr. 92(2):405-420.
- 1978c. Ibid. Tetragnathidae et Araneidae-Nephilinae. Rev. Zool. afr. 92(3):663-674.
- 1978d. Ibid. Araneae Cribellatae. Rev. Zool. afr. 92(3):675-679.
- 1978e. Ibid. Araneae Sparassidae. Rev. Zool. afr. 92(3):680-689.
- 1978f. Ibid. Oxyopidae, Zodariidae et Selenopidae (Araneae). Rev. Zool. afr. 92(3):690-699.
- 1978g. Ibid. Thomisidae (Araneae). Rev. Zool. afr. 92(4):899-901.
- 1978h. Ibid. Clubionidae, Ctenidae et Pisauridae (Araneae). Rev. Zool. afr. 92(4):940-946.
- 1978i. Hahnidae du Mont Kenya (Araneae). Rev. Zool. afr. 92(3):610-621.
- 1979a. Contributions...faune terrestre...l'archipel des Séchelles. Oonopidae (Araneae). Rev. Zool. afr. 93(1):185-222.
- 1979b. Ibid. Amblypygi et Scorpiones. Rev. Zool. afr. 93(2):458-460.
- 1979c. Études sur les Ctenidae Africains. VIII. Gen. Ctenus Walck.--groupe abidtus. Rev. Zool. afr. 93(2):426-444.
- 1979d. Espèces est-africaines du genre Ctenus Walckenaer. Rev. Zool. afr. 92(2):525-532.

Delle Cave, L., and A. M. Simonetta.

1975. Notes on the morphology and taxonomic position of Aysheaia (Onycophora?) and of Skania (undetermined phylum). Monitore Zool. ital. 9:67-81.

Forster, L. M.

1977. A qualitative analysis of hunting behaviour in jumping spiders (Araneae, Salticidae). New Zealand J. Zool. 4:51-64.
- 1977b. Some factors affecting feeding behaviour in young Trite auricoma spiderlings (Araneae: Salticidae). New Zealand J. Zool. 4:435-443.
1979. Visual mechanisms of hunting behaviour in Trite planiceps, a jumping spider (Araneae: Salticidae). New Zealand J. Zool. 6:79-93.

Gertsch, W. J., and N. I. Platnick.

1979. A revision of the spider family Mecicobothriidae (Araneae: Mygalomorphae). Amer. Mus. Novitates 2687:1-32.

Goodnight, C. G., and M. L. Goodnight.

1980. Metagover philipi, n. sp., a new cyphophthalmid (Arachnida) from Ecuador. Trans. Amer. Micr. Soc. 99(1):128-131.

Grasshoff, M.

1978. A model of the evolution of the main chelicerate groups. Symp. Zool. Soc. London 42:273-284.

Hunt, G. S.

1971. The genus Nunciella Roewer (Opiliones, Laniatores) with a description of a new species from Kangaroo Island, South Australia. Proc. Linnæan Soc. N. S. Wales 96:53-65.

- 1972a. Notes on Australian cave harvestmen. Proc. 8th bienn. Conf. Austr. Speleol. Fed. 1970:76-80.

- 1972b. A new cavernicolous harvestman from Western Australia. Austr. Entomol. Soc. J. 11:232-236.

Jackson, R. R.

1973. Nomenclature for orb web thread connections. Bull. Brit. Arachn. Soc. 2(7):125-126.

- 1978a. The mating strategy of Phidippus johnsoni (Araneae, Salticidae). I. Pursuit time and persistence. Behav. Ecol. Sociobiol. 4:123-132.

- 1978b. Aggregations of Mallos and Dictyna (Araneae, Dictynidae): population characteristics. Psyche 85(1):65-80.

1979. Comparative studies of Dictyna and Mallos (Araneae, Dictynidae). II. The relationship between courtship, mating, aggression and cannibalism in species with differing types of social organization. Rev. Arachnol. 2(3):103-132.

Juberthie, C.

1979. Un cyphophthalme nouveau d'une grotte de Nouvelle-Calédonie: Troglosiro aelleni n. gen., n. sp. (Opilion Sironidae) Rev. Suisse Zool. 86:221-231.

Krafft, B.

1979. Organisation et évolution des sociétés d'araignées. J. Psychol. 1:25-51.

Legendre, R., and A. Lopez.

1978. Présence d'un spermatophore dans le genre Apneumonella (Araneae, Telemidae): valeur systématique et problèmes de biologie sexuelle.

Lehtinen, P. T.

1978. Definition and limitation of supraspecific taxa in spiders. Symp. zool. Soc. London 42:255-271.

Lehtinen, P. T., and H. Hippa.

1979. Spiders of the Oriental-Australian region. I. Lycosidae: Venoniinae and Zoicinae. Ann. Zool. Fenn. 16(1):1-22.

- Lehtinen, P. T., S. Keponen and M. Saaristo.
1979. Studies on the spider fauna of the southwestern archipelago of Finland II. The Åland mainland and the island of Eckerö. Mem. Soc. Fauna Flora Fenn. 55:33-52.
- Manly, B. F. J., and L. Forster.
1979. A stochastic model for the predatory behaviour of naive spiderlings (Araneae: Salticidae). Biom. J. 21(2):115-122.
- Martens, J.
1979. Feinstruktur der tarsal-drüse von Siro duricorius (Joseph) (Opiliones, Sironidae). Zoomorphol. 92:77-93.
- Myffeler, M., and G. Benz.
1979. Zur ökologischen Bedeutung der Spinnen der Vegetationsschicht von Getreide- und Rapsfeldern, bei Zürich (Schweiz). Zeits. angewandte Entomol. 87:348-376.
- Opell, B. D.
1979. Revision of the genera and tropical American species of the spider family Uloboridae. Bull. Mus. Comp. Zool. 148(10): 443-549.
- Peck, W. B., and W. H. Whitcomb.
1978. The phenology and populations of ground surface, cursorial spiders in a forest and a pasture in the South Central United States. Symp. zool. Soc. London 42:131-138.
- Platnick, N. I.
1978. On Australian Eilica (Araneae, Gnaphosidae). Bull. Brit. Arachn. Soc. 4(5):226-227.
- 1979a. A new Symphytognatha from New Guinea (Araneae, Symphytognathidae). Bull. Brit. Arachn. Soc. 4(8):337-338.
- 1979b. Contributions à l'étude de la faune terrestre des îles granitiques de l'archipel des Séchelles. Araneae: Palpimanidae. Rev. Zool. afr. 93(2):462-466.
- Platnick, N. I., and N. Paz S.
1979. On the Cryptocellus magnus group. Amer. Mus. Novitates 2677:1-9.
- Simonetta, A. M.
1976. Remarks on the origin of the Arthropoda. Att. della Soc. Toscana di Sci. Nat. Mem. Ser. b, 82:112-134.
- Simonetta, A., and L. Delle Cave.
1978. Una possibile interpretazione filogenetica degli artropodi paleozoici. Boll. Zool. 45:87-90.
- Soares, H. E. M.
1979. Opera opiliologica varia. X. Opiliones, Phalangodidae. Rev. Brasil Biol. 39(1):161-167.

Suzuki, S.

1978. Three harvestmen (Arachnida, Opiliones) from the Bonin Islands. *Ann. zool. Japon.* 51:179-185.
1979. Metagagrella koyomai n. sp. (Opiliones, Gagrellidae) from India. *Ann. zool. Japon.* 52:142-145.

van der Hammen, L.

1969. Studies on Opilioacarida (Arachnida) III. Opilioacarus platensis Silvestri, and Adenacarus arabicus (With). *Zool. meded.* 44:113-131.
1977. Studies on Opilioacarida (Arachnidea) IV. The genera Fanchaetes Naudo and Salfacarus gen. nov. *Zool. meded.* 51:43-78.

NEW BOOK

A fascinating new book, the first of its kind, has come across our desk. ARANEISM (WITH SPECIAL REFERENCE TO EUROPE) by Zvonimir Maretic and Drago Lebez, has been published by Nolit Publishing House, Pula, Yugoslavia. The 1979 publication is written in English, consists of 255 pages and is available from the National Technical Information Service, U. S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161. Ask for PB 80-141104; the price is \$15.00. We reprint below the prefatory remarks by FINDLAY RUSSELL:

To introduce a book with some personal notation is often more an act of diffidence than of presumption. When one considers that the authors have gleaned the literature of 20 centuries, sifting through 17 languages, a certain amount of humility and a great deal of tolerance can be generated. It is difficult enough today to bring any collection of science into being and the time, is nearly past when anyone can put together a compendium that encompasses as many disciplines as does the subject of arachnidism. When the topic also invades folklore and folk medicine, the task becomes Herculean. The authors are to be complimented on their efforts and this contribution.

Doctors Maretic and Lebez have attempted to review the data on the natural history of spiders (giving particular emphasis to the species of Europe), the anatomy of their venom apparatus, the nature of their venom, the clinical problem of spider venom poisoning, and the uses of spider venoms in medicine and biology. In doing this they are well qualified.

If the reader finds the presentation inconclusive, this may reflect its importance at this time, when there is increasing emphasis on the interdisciplinary approach to the study of toxins. The boundaries between related disciplines often overlap; they are certainly ill-defined. What the authors have tried to do is to present the data from the various disciplines in their historical perspective, rather than in well pigeon-holed boxes of study. This has resulted in some redundancy, which is not necessarily undesirable. The corpus of biomedical knowledge is continually changing and the authors' long exposure to science and medicine puts them in a position to be extremely tolerant of the different ways different scientists say the same thing.

I have not attempted to alter the authors' style. We have reviewed the manuscript together on several occasions along the sunny Adriatic coast and amid the snows surrounding the Jozef Stefan Institute in Ljubljana. Parts were revised, sections rewritten, but insofar as possible I have not interfered with the form of the presentation or with the authors' choices of words, some of which may be unfamiliar to Americans or Britons but are often used by those whose mother language is not English. These words are an integral part of the English used by the Yugoslavs, Germans, Italians and Central Europeans. To change them, though sometimes they are unmentioned in modern English dictionaries, might destroy the meanings of the authors' intent (and these are not words that English speaking people have difficulty in resolving anyway). Here is presented, then, not a homogenous text flowing with smooth continuity but a collection of facts and observations dispersed as the authors resolved them in their own thinking.

To appreciate the authors' achievements in this book I found it useful to remind myself of the terse but rich aphorism that has been attributed to Hippocrates and which has guided physicians of all ages. According to the aphorism the three-fold objectives of medicine are: 1) to understand the disease, 2) to bring relief to the patient and to comfort his friends, and 3) to strive continually to better understand man and his environment. The authors have served these purposes admirably by an admixture of biology, medicine, history and folklore, which have been artfully blended into the text.

Findlay E. Russell
Los Angeles, California
March 1, 1977

We would add to these comments that while the book is indeed well-written and the best compendium of the literature on araneism we know about, the quality of reproduction of the photographs leaves a good deal to be desired. They were evidently done by means of an archaic, very coarse halftone screen. The drawing on p. 26 (supplied by Dr. Russell) is misleading because it shows a female Latrodectus standing upright on her web, rather than hanging beneath threads.

While most of the book is devoted to Latrodectus, other species mentioned are Cheiracanthium punctorium, Hogna tarentula, Steatoda paykulliana and a few others possibly implicated in bites inflicted on humans. Loxocles species, becoming ever more important in episodes of araneism in America, are mentioned only in passing. The several dangerous Ctenus and Phoneutra species found in South America are not covered, nor are the venomous diplurids of Australia. However, the book should be very valuable to the American medical community because the majority of cases of araneism in the United States involve Latrodectus species, and these spiders are undoubtedly the most dangerous as well. Another service the book performs is to emphasize that little is known of the properties of the venoms of various species of spiders, particularly some of the large mygalomorphs and sparassids frequently intercepted at American ports in loads of tropical fruits and fibers. All in all, the book is well worth the price and should be in every arachnologist's library.

Let's hear from AMERICAN ARACHNOLOGY readers as regards any previously unpublished reports of illness resulting from spider bites.

ARACHNOQUIZ #4

This issue's Arachnoquiz jumps back to spiders. The questions were posed by BRUCE CUTLER, with some slight emendations.

1. The "lampshade" is an important part of the web of what spider genus?
2. The family Segestriidae is characterized by having the third legpair directed anteriorly, but what common orbweaving genus has the same arrangement?
3. What is the only spider family in which a few species have the epigynal openings on the dorsal side of the abdomen?
4. Totally blind lycosids are known from two habitats in widely separated parts of the world. Name these habitats and their geographic locations.
5. What mygalomorph spider family contains the smallest "tarantulas"?
6. In which spider family do all the members lack poison glands?
7. What spider family includes the largest number of described species?
8. Name the smallest known spider, and the family to which it belongs.
9. What genus of spiders contains species that commonly spend their nights "sleeping" hanging at the end of a dragline?
10. What North American spider genus has the largest number of described species?

Last issue's quiz on scorpions elicited a fascinating response from scorpion authority OSCAR FRANCKE. Oscar's answers were so interesting that we print them in full below. Because Oscar declined to accept the prize, the runner-up, KATHLEEN BUB of the University of Wyoming will receive a copy of Gonzalez-Sponga's Escorpiofauna del la region oriental del Estado Bolivar, en Venezuela.

1. Euscorpium flavicaudis (DeGeer) -- see Wanless 1977, Bull. British Arachnol. Soc. 4:74-76.
2. The "standard" answer should be Microbuthus pusillus Kraepelin, from Arabia, described from one specimen 13 mm long. Anyway, this is the most oft cited record in the literature. However, both Birula (1917) and Vachon (1952:317) have expressed strong doubts about the mature status of this specimen. Other known adults of this and other species of Microbuthus (e.g., M. fagei Vachon) are 18-19 mm long. There is also some question as to whether Kraepelin included the length of the telson in his measurement (he seldom did for other scorpions). A second candidate might be Typhlochactas silvestris Mitchell & Peck, from Oaxaca, Mexico, based on a single specimen 11.05 mm (telson included) in total length. I have examined the specimen and can't tell whether it is an adult or not. The type is split in half at the level of the third tergite, and I couldn't find traces of the reproductive system. Thus, I consider it immature.

The winner appears to be Microtityus (Parvabsonus) fundorai Armas, from Cuba. Holotype female 14.92 mm and allotype male 11.91 mm (telson included). It is followed by Microtityus (Parvabsonus) jaumei Armas, also from Cuba: holotype female 14.70 mm, allotype 12.50 mm. In third place is a Microtityus (Microtityus) n. sp. (actually in press; Francke and Sissom) from the Virgin Islands; holotype male 13.24 mm. Let's see how many get that one !!!!

3. Fluorescence under U.V. illumination.
4. As you well know, fossils only provide the minimal age for a group. Thus, the oldest scorpion fossils may still be undiscovered and could surpass the age of the oldest known scorpion fossils. They are Silurian in age -- by that time they were quite differentiated, and Ordovician fossils are a distinct possibility (also, their sister group, the eurypterids were present in the Ordovician. The vicariance event could have occurred then, depending on whether eurypterids are monophyletic or not).
5. Buthidae.
6. SPIT -- according to Webster:
 - v.t. (1) to eject from within the mouth. All (?) scorpions engage in "sponge-bathing", using oral secretions for this purpose, thus, theoretically they "spit".
 - (2) to eject, throw out, emit, or utter explosively. Stahnke has described the habit of casting food pellets after predigestion. Ejection of food pellets could mean "spitting" in this sense.
 - v.i. (1) to eject saliva from the mouth. See (1) above.
 - (2) to rain or snow lightly or briefly. This they don't do !!!
 - (3) to make an explosive hissing noise, as an angry cat. Members of at least two families are known to stridulate, producing a rasping or hissing sound.

If Cutler means by "spitting" the ability to eject venom from the telson (at the opposite end from the mouth !!), perhaps suggesting an analogy with spiders (God forbid), then the answer is a little easier. Several species of the genus Parabuthus in southern Africa "squirt their venom in the form a jet or fine spray for distances of up to 1 metre when alarmed." (Newlands, G. 1978. South African Med. J., 54:613-615).

7. The largest known scorpion is an undescribed fossil (Siluro-Devonian) estimated at 6 feet long. (Erik N. K. Waering on the last occasion we talked on the phone - he called me after midnight - to report this seemingly incredible find).

Second to be Brontoscorpio anglicus Waering, also from the Siluro-Devonian. Known from a "free finger" (= the movable finger of the pedipalp chela) measuring 07.5 mm !!! Extrapolation with recent forms led Erik to estimate a total length of 772 - 940 mm. You better be careful where you blacklight these days!

Third is Gigantosclopia willsi Størmer, from the Carboniferous. Free finger 51 mm long. Reconstruction of almost entire scorpion leads to estimates of 390-440 mm.

The small Recent forms most of us deal with are the runts of the order. Heterometrus spp. have been reported at about 200 mm, Pandinus imperator at 180 mm, and it is all downhill from there until you get to Microtityus fundorai.

8. The common answer will be Scorpionidae. However, Diplocentridae also has the same embryology as scorpionids and qualify as an answer. HOWEVER: (a) what is the difference between true and false viviparity ??? (b) the MYTH that most scorpions are ovoviviparous is false. Laurie (1896) described scorpions as having either large ova rich in yolk or small yolkless ova. From here some idiot inferred (albeit erroneously) that large ova rich in yolk had to be tied with ovoviviparity. I have measured mature ova in Centruroides spp., large ova rich in yolk, $\bar{x} = 0.50$ mm (n=20, from 3 females), and the young at birth measure 12-15 mm. If this is ovoviviparity, I will eat a live scorpion !!!!!
9. Buthidae: 45 of about 115 Recent genera, and 600 of about 1200 species.
10. Pectines.

