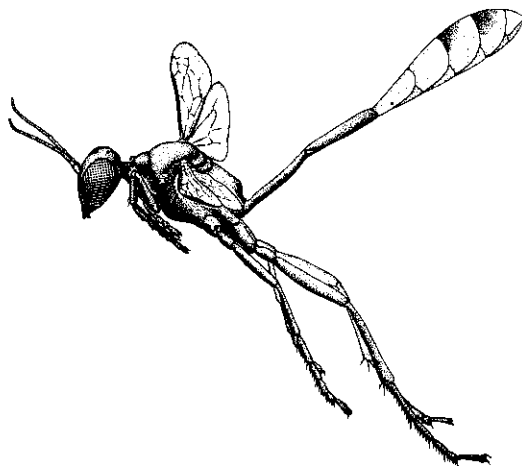


SPHECOS

Number 6 - November 1982

A Newsletter for Aculeate Wasp Researchers

Arnold S. Menke, editor
Systematic Entomology Laboratory, USDA, ARS
c/o U. S. National Museum of Natural History
Washington DC 20560



Notes from the Editor

This issue contains a lot of research news, quite a few travel reports, two obituaries, information on the Oxford Museum Collection, and a variety of other material. Please keep sending me reports of your activities for inclusion in the next issue or else Sphecos will gradually diminish in size.

There will be a gathering of hymenopterists from all over North America at the Annual Meeting of the Entomological Society of America at Toronto, Canada, this December. The purpose of this meeting is to establish a society and journal for hymenopterists. Your editor will attend; a summary of the meeting will appear in the next issue of Sphecos.

In the last issue I listed the names of approximately 100 people who had not returned the Sphecos questionnaire, noting that they had been dropped from the active mailing list as a result. The response to this list was underwhelming - only a handful of people listed sent in the questionnaire - so my task of putting issues in envelopes and affixing mailing labels has been reduced by quite a bit.

I would like to thank Vivian Spriggs for typing most of this issue of Sphecos.

Research News/Help Needed

O. W. Richards (89 ST. Stephen's Road, Ealing, London W13 8JA), has four papers in preparation dealing with the following: vespine larvae, Arabian Masaridae, Arabian Vespidae, and corrections and additions to his "Social Wasps of the Americas".

Severiano F. Gayubo (Dept. de Zoologia Facultad de Biología, Universidad de Salamanca, Salamanca, Spain), is revising the Palearctic species of the sphecine genus Nysson. He would like to borrow material for his study from anyone having Palearctic Nysson.

Jeff Cumming (Dept. of Entomology, Univ. of Alberta, Edmonton, Canada T6G 2E3), writes: "I have now expanded my study of the North American species of Symmorphus (Eumeninae) to a world-wide revision. The genus appears to include approximately 45 species, distributed throughout the Holarctic and Oriental regions, with possible extensions into the Neotropics. If anyone suspects they have specimens of Symmorphus from the latter 2 regions, I would certainly appreciate receiving these

on loan. Currently, I am preparing a manuscript with Dr. J. van der Vecht describing a few of the Oriental species. In addition to revisional work, I am investigating the functional significance of the foveae found on the vertex of females of many eumenine species."

Karl V. Krombein (Smithsonian Institution, Washington D.C. 20560) has in press revisionary studies of the Ceylonese Tiphidae, Amiseginae and Loboscelidiinae, and a paper describing three new African Amiseginae including one new genus. He is also working on a revision of the Ceylonese Bembecinus. He would like to see additional material of African Amiseginae or of Ceylonese and South Indian Bembecinus.

Jorge F. Genise (Departamento de Ciencias Biologicas, Facultad de Ciencias Exactas y Naturales, Ciudad Universitaria, (1428) Buenos Aires, Argentina) [new address], is now in charge of cataloging the Brethes types of Hymenoptera housed in the Museo Argentino de Ciencias Naturales. When completed the catalog will be published. Jorge is also studying the neotropical Anthoboscinae, and is preparing papers on the biology of Hemidula singularis, Zyzyx chilensis, Trichostictia vulpina & Spheg mendozanus (all Sphecidae). He has papers in press on the larvae of the Bembini, and the biology of Stictia flexsa & citripes, and Tachypompilus erubescens and mendozae.

Hermann Dollfuss (Dr. Gortgasse 120, A-3240 Mank, Austria), is working on a revision of the palaearctic species of the genus Spilomena Shuck. (Sphecidae). He is very interested in borrowing as many specimens as possible from the palaearctic region. If anyone has specimens of Spilomena please send them on loan to: Univ. Doz. Dr. Max Fischer, Naturhistorisches Museum Wien, 2. Zoolog. Abtlg., Burgring 7, A - 1014 Wien, Austria. Later on Hermann will turn his attention to the species of the neotropic region.

Ole Lomholdt (Zoologisk Museum, Universitetsparken 15, DK 2100 Copenhagen, Denmark) writes: "During my work on "A Revision of Sphrodotes Kohl, 1889 (Hymenoptera, Sphecidae)" I got stuck in a problem which is quite new to me. Three very closely related species, viz. S. marginalis, nemoralis, and an undescribed one, occur sympatrically in the surroundings of Brisbane (S.E. Queensland). S. marginalis has a rather limited distribution-area, whereas nemoralis is distributed very far toward the north. The undescribed species is scattered practically all over Australia. Samples of these species show an increasing degree of morphological similarity the closer you get to the area of common occurrence in which they sometimes can be almost impossible to separate. Male genital sclerites provide good characters to ensure the correct identity of this sex, but females become more and more alike the closer you get to the Brisbane area. As far as I can see there are two possibilities in handling this problem: 1. To present a new term: Character convergence, or 2. to consider the area to overlap a "center of origin". The last possibility implies the existence of a very recent common ancestor of the species in question and cline-formation radiating from the Brisbane area. This hypothesis is contradicted by the presumption that Sphrodotes represents a very early offspring of the Miscophini, which can be dated back to at least late Cretaceous times. The reason why this is presented in SPHECOS is that I hope some readers will have useful comments."

Richard C. Miller (see new address p. 6) is reported by Woj Pulawski to be working on crabronine wasps again. Reprints of Miller's 1976 paper on the Hilaris group of Crabro are available from R. M. Bohart, Dept. of Entomology, Univ. of California, Davis, Calif. 95616.

Peter Landolt (see new address p. 5) is presently working for USDA at Miami, studying the biology of fruit flies. He is still an avid collector of sphecs and vespids, and is currently accumulating preserved specimens of various Polistes spp.

and hopes (before too long) to make a survey of Polistes exocrine glands similar to that done for Vespa queens (Annals Ent. Soc. Amer. 72:141-148).

Guido Pagliano (Corso Corsica 6, 10134 Torino, Italy) studies Sphecidae and other wasps and is interested in exchanging Hymenoptera reprints. He would be grateful to anyone sending him their available papers. In return he will send his papers on Pompilidae & Sphecidae.

Jean Leclercq (Zoologie générale & Faunistique, Faculté des Sciences Agronomique, B-5800 Gembloux, Belgium) requests help with "Le mystère du Crabro tabanicida Fischer, 1929": Crabro tabanicida Fischer fut décrit du Brésil, São Paulo, dans le Boletim Biologico da Fac. de Medicina, São Paulo, fasc. 15, pp. 43-46 et, avec des notes éthologiques très précises, dans les Archivos do Instituto Biologico, São Paulo, vol. 2, 1929, pp. 141-162. Ce second article est accompagné de trois planches, la première présentant bien colorés, l'insecte entier femelle et male, leur tête, leurs antennes, leurs mandibules, le gaster femelle; les deux autres planches, en photos noir et blanc, les nids faits dans des branches d'Enterolobium timbouva Mart. et les Tabanides trouvés comme proies dans ces nids.

La planche en couleur est extraordinairement belle et précise. On voit immédiatement qu'il s'agit d'un Ectemnius avec des marques jaunes très développées sur les segments 2-6 du gaster, comme chez les Ectemnius (Apoctemnius) flavipennis (Lepelletier & Brullé, 1835), carinatus (Smith, 1873) et centralis (Cameron, 1891) dont j'ai vu des dizaines d'exemplaires provenant de territoires très grands de l'Amérique Latine.

Cependant le male de tabanicida diffère de tous ceux qu'on connaît du riche genre Ectemnius par un caractère remarquable : 13 et non 12 articles aux antennes! Fischer a bien insisté à ce sujet car non seulement il a donné un dessin d'une antenne o parallèle au dessin d'une antenne femelle mais il a numéroté les articles depuis le scape = 1 jusqu'au dernier article = 12 pour la femelle, 13 pour le male. Ce caractère m'a paru si important que j'ai jugé opportun de classer le Crabro tabanicida dans un sous-genre à part (Protoctemnius Leclercq, 1951, 1954).

Mais voilà 25 ans que je vois des Ectemnius sud-américains, que j'en décris de nouveaux, que j'essaie d'élaborer une clé résumant ce que je sais, et que je cherche en vain un o du genre qui aurait 13 articles aux antennes. C'est toujours 12! Depuis la rédaction de mes premières clés (Ann.Soc.Ent.France, 4, 1968, 299-328; Bull. Soc. R. Sci. Liège, 41, 1972, 195-226), j'ai regardé souvent, très attentivement et perplexe, les beaux dessins de Fischer - je ne peux pas croire qu'ils sont fautifs, et pourtant?

Naturellement j'ai tenté de savoir quoi en écrivant à l'Instituto Biologico de São Paulo. D'abord à l'auteur, Carlos R. Fischer qui m'avait si gentiment envoyé son article avec une dédicace calligraphiée "Homagem do autor 15-5-1950", mais cela m'a seulement appris que Fischer est décédé. Ensuite, à deux reprises, à la direction de Instituto Biologico de São Paulo, ceci m'ayant fait recevoir finalement, le 21 septembre 1971, la réponse suivante de M. M.A.Vulcano: "unhappily in our collection there is no Type of the mentioned species...". J'ai demandé alors que l'Instituto s'inquiète du sort de la collection personnelle de C.R. Fischer qui devait comporter au moins une partie du matériel typique, mais l'affaire en est restée là.

Je voudrais bien avoir une conclusion finale avant de terminer la rédaction de jà très avancée d'une nouvelle clé des Ectemnius de l'Amérique Latine. Qui peut enquêter mieux que moi sur les types de Crabro tabanicida trouvables ici ou là à São Paulo?

Mon impression est de plus en plus que le male de Crabro tabanicida a 12 et non 13 articles aux antennes, comme tous ses congénères. Dès lors mon sous-genre Protoctemnius n'a aucune signification, et il faut faire rentrer tabanicida dans le sous-genre Apoctemnius Leclercq. Là, je pense qu'il serait seulement un synonyme de plus de l'espèce carinatus (Smith, 1873) que je sais présente dans de vastes territoires du Brésil. Mais je ne peux rien décider sans que les types soient ou

bien retrouvés et examinés, ou bien déclarés perdus et remplaçables par un néotype. So, please help!

Richard M. Bohart (Dept. of Entomology, University of California, Davis, California 95616) and James Gillaspay (Dept. of Biology, Texas A & I Univ., Kingsville, Texas 78363) are working jointly on a review of the stictielline genera (Bembicini, Sphecidae) for a California Insect Survey Bulletin.

Arnold Menke and David Vincent (Beneficial Insect Introduction Lab., USDA, Beltsville, Md. 20705) completed a review of the New World species of the sphecid genus Polemistus. Six species are recognized including 3 new ones.

Josef Banaszak (Dept. of Agrobiology and Forestry, Polish Academy of Sciences, Swierczewskiego 19, 60-809 Poznan, Poland) is conducting a faunistic study of the Chrysidoidea and Scolioidea of Poland and he intends to compile catalogs of them for the "Catalogus faunae Poloniae".

William T. Weislo (101 N. Elm St., Mt. Prospect, Ill. 60056) is studying the nesting behavior of an aggregation of over 300 nests of Crabro cribrellifer in northern Michigan. He has observed nest sharing.

Kevin Bateman (Zoology Department, Victoria University, Private Bag, Wellington, New Zealand) is currently working on the feeding behavior of Vespula germanica with emphasis on the change of arthropod species preyed upon by this wasp. He says that germanica utilizes a large variety of insects in the early part of the season, but changes over to an almost totally carbohydrate diet in the autumn as drones are produced.

Jeanne Sullivan (8729 Ft. Hunt Rd., Alexandria, VA. 22308) has begun a study of the mating behavior and parental investment in members of the subgenus Trypargilum of Trypoxylon (Sphecidae).

Mark Parrish (Dept. of Entomology, Rutgers Univ., New Brunswick, N.J. 08903) is studying the interspecific and intraspecific relationships between Vespula maculifrons, V. germanica, V. flavopilosa, and V. squamosa from an optimal foraging point of view including such parameters as aggression, social facilitation and resource manipulation.

James Perkins (1225 E. Richard, Kingsville, Texas 78363) is studying pollination by Polistes wasps to ascertain their importance.

Alberto Ugolini (Istituto di Zoologia dell'Universita, Via Romana 17, 50125 Firenze, Italy) writes: "I have shown the existence of a correct initial homeward orientation in foundresses and auxiliaries of Polistes gallicus and am now studying the same capacity in workers and males, as well as the mechanisms of orientation in this species. An extension of this research to other species is foreseen."

M. K. Giri (Dept. of Entomology, Univ. of Kentucky, Lexington, Ky.) writes: "I have completed my research for my dissertation and the information is being published in several journals. The title of my dissertation is "Bionomics of Dicondylus americanus (Perkins) (Hymenoptera: Dryinidae) and its host Delphacodes lutulenta (Van Duzee) (Homoptera: Delphacidae) in Kentucky."

Gordon Frankie (Dept. of Entomological Sciences, Univ. of California, Berkeley, Calif. 94720) writes: "For the past several months I have been working toward the establishment of a reserve for wild bees and other organisms in Guanacaste, Costa Rica - "The Lomas Barbudal Reserve". This is a dry forest region. The prospects for its creation look promising at this point. We'll know more about the official

position of the Costa Ricans in another few weeks (months?) - anyway before the end of 1982."

"My point in bringing this to your attention is that the area also contains a fine wasp fauna. I was advised not to bring up other organisms in the proposal unless I knew something unique about each taxonomic group. However, based on a preliminary look at the wasps over the years the diversity and abundance looks to be very good. How good - I cannot say. Perhaps some of the Sphecos readers would like to sample the area for themselves, which I could help to arrange."

"Let me know if I can give you more information on the site. The future hope is that the area will be set aside for scientific research only. That means there must be scientists who are willing to work at the site."

Mike E. Schauff (Smithsonian Postdoctoral Fellow, Museum of Natural History, Washington DC, 20560) and Arnold Menke are undertaking a Wagner analysis of the higher categories of the Sphecidae based primarily on data in Sphecid Wasps of the World by Bohart and Menke, 1976, but also taking into consideration recent cladistic studies in aculeates by other workers. We have two goals: 1, to see if a cladistic approach will corroborate Bohart's and Menke's classification, and 2, to investigate the possible relationships between sphecids and bees.

Mick Day (British Museum, Natural History, London) writes: "I went to Brunei in February and March, with a week in Hong Kong on return. I visited Raymond Wahis in August, and sorted out some problems with him. I am writing a paper on certain species of Cryptocheilus which have strongly dimorphic or polymorphic males, for which his material was very helpful. Also, I am in correspondence with Jack van der Vecht about some Eustenogaster that I took in Brunei. There seem to be two coexistent sibling species with radically different nest structures. I think the new one merits description, but Jack is reticent."

"My biggest project at the moment, which I am struggling to get on paper, is an account of a new exocrine gland system ["Day's Organ" - editor] in the dorsum of the abdomen of male Pompilidae. It is usually in the intertergal membrane between T2 & T3, but sometimes (particularly in Ageniellini) its in the anterior tergal surface of T4, T5 and T6. At least half the Poms seem to have it. Sometimes it is a very stable generic character, in other groups it can be present or absent between species. I have looked at a couple of hundred species, more than fifty with the SEM:."

"John Noyes and I hope to visit Madagascar for two months early next year, and that is now beginning to loom large. My main concern is to get to the right localities at the right time, but it is difficult to get any solid indications save for the driest regions. We are banking on the period mid-March - mid-May, in the belief that following the rains will give us the most productive collecting if not the most diverse fauna."

Address Changes

Manfredo Fritz, Casilla Correo 539, 4400 Salta, Argentina.

Harold G. Fowler, Dept. of Entomology, Univ. of Florida, Gainesville, Florida 32611.

Jim Cane, Dept. of Entomology, Univ. of California, Berkeley, Calif. 94720.

Dewey M. Caron, Dept. of Entomology and Applied Ecology, Univ. of Delaware, Newark Delaware 19711.

Peter J. Landolt, Subtropical Horticulture Research Station, USDA, 13601 Old Cutler Rd., Miami, Florida 33158.

Richard C. Miller, General Delivery, N. San Juan, California 95960.

Don Horning, The Macleay Museum, The University of Sydney, Sydney, N.S.W., Australia 2006.

Thomas Schluter, Department of Geology, University of Dar es Salaam, P.O. Box 35052, Tanzania.

American Entomological Institute Collection to Florida

The latest word from Henry Townes on this widely rumored move is that as soon as building space is available the collection will be transferred to the University of Florida, Gainesville, where it will become part of the Department of Entomology and Nematology. It will become a special section in the department for the study of parasitic Hymenoptera. Virendra Gupta was recently hired as the first of three projected positions in research on parasitic Hymenoptera. He is already in Gainesville. His responsibility will be the Ichneumonidae. A braconid specialist and a chalcidoid specialist will complete the trio of research scientists.

The Townes collection contains a lot of aculeate material which will also go to Gainesville, but this section will receive no research emphasis.

Larra bicolor Established in Florida

As reported by Reece Sailer in Sphecos 5:4, this sphecid wasp was liberated in Florida in 1981 to aid in the control of mole crickets. In June, 92 females were released at Tampa, 86 at Fort Lauderdale and 33 at Gainesville. These females were collected in Puerto Rico. It is believed that 3 generations of wasps occurred at the 3 sites between June and November. Evidently the Gainesville & Tampa populations did not survive the winter, but the one at Fort Lauderdale did, the first adults being seen in mid-April, 1982. (abstracted from the Annual Report, Mole Cricket Research 81-82, Univ. of Florida, Gainesville).

In a letter dated Sept. 20, 1982, Reece says "Jim Reinert of our Fort Lauderdale Research Center continues to report favorably on progress of the Larra bicolor population established there. It has been increasing steadily from the initial 1 or 2 [wasps] of last May up to an excess of 30 when I talked to him about 10 days ago. These [counts] are of wasps seen on 10 small clumps of Spermacoce (= Borreria) during a 30 minute observation period. We are expecting a population surge in November. At least that was when the largest numbers were seen last year."

Vespula germanica in Washington

Roger Akre (Dept. of Entomology, Washington State University, Pullman, Washington 99164) reports that this wasp is apparently established at Puyallup, Washington. Many workers were taken there in September, 1982.

Scientific Notes

ATTRACTION OF MUD-BUILDING WASPS TO A WET MUD PATCH

by

Edward McC. Callan

(13 Gellibrand Street, Campbell, Canberra, A.C.T. 2601 Australia)

Various aculeate wasps use mud in the construction of their nests, and I have recently been attracting several species to a wet mud patch in Canberra, Australia. The mud was simply a bare area of soil about 2 m² on the edge of the lawn in my garden and was kept moist by watering it from time to time with a sprinkler or hand hose. Observations were made during late summer in February and March, when the mud patch was in the full sun for some 6 hours daily from about 1100 to 1700 at this time of year. Most wasps were seen actively collecting mud between 1200 and 1500 during the hottest part of the day. No wasps were noticed after the end of March when nesting presumably ceased.

The following species were observed collecting mud:-

Sceliphron (2 species - one common and nesting nearby, the other a rarer more northern species not previously recorded in Canberra)

Pison (4 species - 2 commonly nesting nearby)

Trypoxylon (1 rare northern species not previously recorded in Canberra)

Auplopus (1 species - commonly nesting in the vicinity)

Wasps collecting mud were of course invariably females, and no males were seen at any time near the mud patch. All the species observed build free mud nests or exploit pre-existing cavities, which they partition with mud, and all of them provision their nests with spiders. It is not known if wasps are similarly attracted earlier in the summer, but the attraction to the wet mud patch is no doubt greater during hot dry weather in late summer.

FOOD SOURCE COMMUNICATION IN SOCIAL WASPS

by

Chris Starr

(Visayas State College of Agriculture, Baybay, Leyte 7172, The Philippines)

It seems clear by now that vespine foragers lack any ability to communicate the location of rich food sources to nest-mates (Kalmus 1954, Maschwitz et. al. 1974), such as has been well known in honey bees for decades. Aside from experimental evidence of its absence, such an ability would rapidly make itself obvious in any of the well studied Vespula and Dolichovespula spp. And if Vespa had such an ability I am fairly certain that profitable beekeeping would be impossible in many parts of the world, including all of Japan, Taiwan and the Philippines.

There are some quite modest indications, though, that some of the polistines can convey food-sources information. The best such indication comes from Lindauer (1971:85) on Polybia scutellaris in Brasil. He observed that after a feeder was first discovered by wasps new foragers arrived fairly quickly. You may recall that it was just this type of observation which first showed that some sort of communication was taking place in Apis. Other suggestions of food-sources communication in polistines, all less direct than Lindauer's are discussed by Holldobler (1977:441).

I have reason to suspect that at least some Stelopolybia have food-source communication, based on fortuitous observations on S. pallipes and S. panamensis in Costa Rica. I regret that the press of other work didn't allow me to properly follow up on these observations, and I have no plans to be in the neotropics in the

next years. If anyone, then, is in a position to look into the matter and inclined to do so, please feel free to write to me for a copy of my notes on Stelopolybia, as I am very eager to see the matter pursued. My observations, while indicative, are by no means solid enough that they may be cited as a personal communication, especially as the subject is of sufficient importance that a quite rigorous treatment is called for.

In his book, Lindauer stated that more complete experiments were to be undertaken, but he has been unable to do them, and he won't be able to do them in the foreseeable future (pers. comm.). Such an investigation seems to me well worth doing, and I hope someone will consider the matter seriously. To emphasize this, let me quote from Karl von Frisch (1967:316), who said with regards to Lindauer's results on P. scutellaris, "Zoologists who get such an opportunity in the tropics could still find out a great deal with this and other species of wasps".

Frisch, K. von. 1967. The dance language and orientation of bees. Cambridge: Harvard U. P. 566 pp.

Holldobler, B. 1977. Communication in social Hymenoptera. pp. 418-71, in:

T. A. Sebeok (ed.), How animals communicate. Bloomington: Indiana U. P.

Kalmus, H. 1954. Finding and exploitation of dishes of syrup by bees and wasps. Brit. J. Anim. Behav. 2: 136-39.

Lindauer, M. 1971. Communication among social bees. 2nd edition. Cambridge: Harvard U. P. (See same page if looking in 1st edition, 1961).

Maschwitz, U., W. Beier, I. Dietrich & W. Keidel. 1974.

Futtermittelsvermittlung bei Wespen der Gattung Paravespula. Naturwissenschaften 61:506 (Authors claim their results do demonstrate food-source communication, contrary to my interpretation).

ON COLLECTING AMMOPLANINES

by

Norm Smith

(Fresno Dept. of Agriculture, 1730 S. Maple, Fresno, CA 93702)

What is an Ammoplanine? I have been asked this question more than once since beginning my research on them six years ago. Ammoplanines are predaceous sphecids in the subfamily Pemphredoninae. They are cosmopolitan and include seven genera; Pulverro, Ammoplanops, Ammoplanus, Parammoplanus, Ammoplanellus, Timberlakena, and one new genus in manuscript. They are the smallest of all sphecids, rarely exceeding 3 mm in length and are often mistaken for chalcidoids. Most are ground nesters but some are opportunistic nesters in preexisting cavities. They take thrips, aphids or immature leafhoppers as prey.

Ammoplanines are not particularly rare but there is a scarcity of them in most major collections. One reason for this is likely due to their small size. A net with large mesh allows many to escape before they can even be put into a killing vial. While sorting through sweepings they may be easily or purposefully overlooked and their superficial resemblance to some chalcidoids may get them lumped with that group, forever buried in many public, university or private collections.

Admitting that many hymenopterists could care less about collecting ammoplanines, there may be a substantial number of you who have tried or would genuinely like to collect this fascinating little group, but do not know how to go about it. Since there have been so few in collections I have had to go out and collect my own material, and during the past six years I have learned much about collecting ammoplanines. The fact that they are sometimes difficult to find may also be another good reason for there being so few in collections.

Following is a brief outline of what I have learned about collecting Ammoplanines.

1. Location

Mostly arid regions of the U. S. and other parts of the world.

2. Habitat

Desert washes or oases; riparian habitats close to streams; mountainous areas with native vegetation in open or disturbed habitats; high altitude rocky slopes.

3. Nesting substrate

Various - often found in sandy soil such as washes and dunes or recently disturbed soil that has settled. Those that are opportunistic nesters will be more numerous in areas that provide small holes for nesting - old oak galls, dead trees with bark beetle holes, etc.

4. Host plants

Mostly native annuals and perennials though perennials are often best due to better reliability of annual bloom. Some of these perennials are: Larrea tridentata (Creosote bush), Heteromeles arbutifolia (Toyon or Christmas berry), Chilopsis linearis (Desert Willow), Prosopis chilensis (Mesquite) and various species of Ceanothus. The larger the plant the better - they usually have a correspondingly greater number of specimens. Try to find plants that are at peak nectar production or produce resin. Desert willow, a resin producer, has provided large numbers of ammoblanines even when not blooming.

5. Spatial distribution

Sweep low on plant - most specimens stay lower flowers. Some species seem to have a preference for the groundhugging, flat Euphorbia mats of the southwestern deserts that are rarely visited by larger wasps.

6. Prey

Plants with numerous prey will probably be better. Look for large numbers of thrips or aphids.

7. Time of year

Usually at warm times of the year during late spring and early summer. There are some early spring species, and in the southwestern deserts the more common species will have second brood in September and October. Many seasonal variations do occur though, such as in Arizona when many species become active in August after summer rains.

8. Time of day

Approximately between 10:00 AM and 3:00 PM depending upon temperature. Peak collecting is usually around noon but on a very hot day specimens may not fly after 11:00 AM.

9. Collecting techniques

Use small meshed net. Sweep first and look later (not likely to see any before they are caught).

10. Future techniques (those not yet tried)

Malaise trapping; stick traps or the equivalent. Naturally, the aforementioned techniques do not have to apply solely to ammoblanines. Other tiny wasps or bees with similar habits may be collected also in much the same way and under the same conditions. Undoubtedly, some of you have made these same observations and may know of some conditions and techniques that I have not mentioned.

Hopefully I have enlightened some of you on the art of ammoblanine collecting. There are undoubtedly many more new species to be collected in the U. S. The number of species yet to be collected and described in South America, Europe and Asia makes this an excellent group for foreign hymenopterists.

New Entomological Institute in Argentina

Manfredo Fritz, formerly of the Instituto Entomologico San Miguel in San Miguel, Argentina, has been transferred to the newly established Instituto de Investigaciones Entomologicas Salta "INESALT", which is located in the middle of the small city of Rosario de Lerma, Salta Province. The new institute is housed in a building of 800 sq. meters which gives the personnel plenty of research space. Behind the building is 2000 sq. meters of parkland. Staff consists of four entomologists and their

assistants. The institute plans to have its own journal, and is also developing an entomological library. Manfredo requests your help in establishing the library by sending him your available reprints. Also, he would like to encourage visits by researchers, and says the institute can accommodate the needs of those who would like to spend some time with him & his colleagues. Manfredo lives 30 kms away in the city of Salta (see Address Changes, p. 5). The address of the new institute is:

Instituto de Investigaciones Entomologicas Salta
9 de Julio 14
Casilla de Correo 3
4405 Rosario de Lerma
Salta, Argentina

Hope Entomological Collections - University of Oxford

In 1849 the Rev. Fredrick William Hope presented his entomological collections to the University. For the first ten years they were housed in the Taylor Institution, then moved to the new University Museum in 1861, forming the nucleus of the Hope Department of Zoology (Entomology). J.O. Westwood was appointed the first Hope Professor (1861-1893). He was succeeded by E. B. Poulton (1893-1933) and G. Hale Carpenter (1933-1948), a period characterised principally by the study of Lepidoptera and by substantial additions to the original collections. G.C. Varley (1948-1978) initiated a reorganization of the British collection and the oak survey. In 1978, the Department ceased to exist as a separate entity. The Hope chair is now one of the two chairs in the Department of Zoology with D. Spencer Smith (1980-) as the current Hope Professor. The collections, now known as the Hope Entomological Collections, form part of the Scientific Collections in the University Museum.

Within Britain, the collections are second only in size and importance to the national collection in the British Museum (Natural History) and comprise three major components.:

(1) British Collections arranged synoptically, with a reference collection followed by the main holdings in each group following, as far as possible, Kloet and Hincks check list (either 1st or 2nd eds.). Individual collections include the Dale, a unique collection from the early nineteenth century accompanied by original notebooks and letters. The Verrall-Collin Diptera collection is also unique, almost every drawer of the British material containing syntypic specimens. The Verrall-Collin Palearctic collection contains material from Kowarz, Bigot, Maquart and others; again including many types. Other important historical collections include those of F. Smith (Hymenoptera), F. Walker (aphids) and Crawley (ants), and bionomic collections such as the Hamm collection of insects and their prey (Empids and Hymenoptera), insects from oak leaf mines, and insects with ascomycete fungi.

(2) Foreign Collections. These contain 20,000 types, especially of Lepidoptera (F. Walker), Hymenoptera (including the Morice collection of Palearctic material and the Saunders collection, mainly collected by A.R. Wallace), Coleoptera, Phasmatoidea, Blattoidea etc. The extensive butterfly collections are especially strong in African material. There is also a special collection of butterflies with bird beak marks on their wings.

(3) Collections of Arachnids and other Arthropods. The spider collections, including the Blackwall and Pickard-Cambridge collections are also extensive with 100,000 species, including over 300 type specimens.

The Hopeian Library of Entomology includes many very old and rare books on entomology, modern books and periodicals, and unique section on the Arachnida, and a number of original manuscripts of taxonomic importance such as Jones "Icones" hand-painted illustrations of over 1000 species of butterflies, many of which were described by Fabricius. Slide sets, made of the "Icones" are available for purchase.

As a part of the University Museum the Hope Entomological Collections are administered by the Committee for Scientific Collections. The Hope Professor is

charged by statute with responsibility for "superintending and arranging the entomology collection", and a Curator (who is also a University Lecturer in Zoology) is charged with the "custody and care of the collections". When Professor Varley retired in 1978, the Hope Professorship and the academic staff of the Hope Department were transferred to the Department of Zoology. The present staff of the Hope Entomological Collections are:

Hope Professor of Zoology (Entomology): David Spencer Smith, M.A., Ph.D.

Curator of the Hope Collections: Martin C. Birch, M.A., D. Phil.

Librarian (Administrator): Mrs. Audrey Z. Smith

Museum Technicians (Entomology): Ivor Lansbury, M. Phil. Christopher O'toole

Secretarial and Library Assistant: Mrs. Ruth Wickett, M.A.

Staff of the Museum Court and of the four collections interact closely. The Curator of the Museum, who is responsible for overall day to day administration, is elected from among the members of the Committee for Scientific Collections. In practice, one of the four curators of the individual collections serves as Curator for a period of three years, and is assisted by an administrator (Miss Jocelyn Allard).

A large number of entomological loans to other scientific Institutions are processed each year and many visitors come to work on various groups in the collections.

All requests for loans, to arrange visits, etc. should be addressed to the Curator:

Dr. M.C. Birch

Hope Entomological Collections

University Museum

OXFORD OX1 3PW

HYMENOPTERA IN THE HOPE ENTOMOLOGICAL COLLECTIONS

by

Chris O'toole

1. British Hymenoptera

The collection of British Hymenoptera occupies 500 drawers and is particularly rich in sawflies and aculeates. With the exception of the Parasitica, which are still under rearrangement, the collection follows the first (1945) edition of the Kloet and Hincks Checklist of British Insects, although it will shortly be brought into line with the second edition and its amendments.

The collection comprises two sections, a Reference series and a General series. It contains mid-19th century material derived from collections made or purchased by Rev. W. Hope, founder of the Department and J. O. Westwood, the first Hope Professor of Entomology. There is also much material purchased from the Entomological Club. But the nucleus of the British Hymenoptera holdings is the extensive and very fine collection assembled by R.C.L. Perkins. In addition to this, we have large amounts of material collected by A.H. Hamm, E.B. Nevinson and A.J. Chitty. There is a bionomic series comprising 10 drawers of hunting wasps and their prey and we also have the Perkins collection of stylotized bees.

The historic Frederick Smith collection of British Hymenoptera is housed separately and Smith's original arrangement is maintained. Separate housing is also maintained for the Dale Collection, which contains much early 19th century material.

Recent Acquisitions

The L. H. Woollatt bequest to the Hope Collections largely comprises sawflies and aculeates. This has been incorporated into the main collection, as has another recent arrival, the E.S. Brown Collection. There is a steady input of Hymenoptera collected during faunistic survey work by L.J. Losito and C. O'Toole.

2. Exotic Hymenoptera (180 drawers at present)

Hope-Westwood Collection

This contains much historical material, including substantial numbers of types of species described by Hope, Westwood, Latreille and F. Smith. It is notably rich in pompilids, sphecids and xylocopine bees.

W. W. Saunders Collection

A world collection of all groups of Hymenoptera, including material collected by A. R. Wallace in the neotropics and the oriental region, with some material collected by H. W. Bates. The collection was bought by Saunders and arranged by F. Smith at the BMNH. The latter described many species and the collection is rich in types, including that of the largest known bee, Megachile (= Chalicodoma) pluto. The collection also contains much of the Hymenoptera in Smith's possession at the time of his death in 1879. The rehousing of the whole collection was completed this summer.

S. S. Saunders Collection of Greek and Albanian Hymenoptera

Occupying 16 drawers, this collection was named by Edward Saunders and F. W. Morice, both of whom had a hand in arranging it. The collection contains many bramble stem nests and the wasps, bees and associates reared from them.

J. Rothney Collection

A large collection (40 drawers) of Indian and Australian Hymenoptera of all groups, named and arranged by P. Cameron, who described many species; rich in Cameron types.

Balearic Islands Collection

A collection of aculeates made by Sir Edward B. Poulton, second Hope Professor, and his assistant, A. H. Hamm. Particularly rich in Halictidae.

F. W. Morice Collection

An extremely large collection of a least 100,000 Palearctic Hymenoptera, comprising sawflies and aculeates, mostly from the Mediterranean region. The Rev. Morice, a classics master at Rugby School, was a contemporary and friend of all the great Hymenopterists of his day: Friese, Perez, Schmiedeknecht, du Buysson and Edward Saunders. He exchanged specimens with these entomologists on a large scale and the collection is well-endowed with the types of species described by them and Morice. Morice was ahead of his time in that he understood the importance of studying and illustrating the male genitalia of aculeates. He also pioneered the use of the sawfly ovipositor as a source of taxonomic characters.

The Morice Diaries are housed in the Hope Library and are of great interest not only for their entomological content, but also for the insight they give into the social attitudes of a Victorian, Anglican cleric travelling in Catholic southern Europe.

The Morice Collection is still partly stored in the original cartons and is being rehoused in modern cabinets as these become available.

The 'General' Collection

The use of temporary summer help, recruited from the student body, has, at long last, enabled the large collections of Hymenoptera in store boxes to be transferred to cabinets. This 'accessions' material, mostly unidentified, now comprises: 12 drawers of Scoliidæ, 42 of Pompilidæ, 27 each of vespoids and Sphecidae and 30 of bees (Apoidea); the vespines have been named by M. E. Archer.

The Bionomic Collection

During the tenure of Prof. Sir Edward Poulton, much bionomic material was accumulated from Africa. It includes many interesting and unique lycaenid/ant associations, mimetic associations between a wide variety of insects and mutillids, vespoids and bees, all assembled by W. A. Lambourn. He also collected nests and reared occupants and associates, as did S. A. Neave and C. A. Wiggins, whose collections are also at Oxford.

The type collection

There are types of approximately 4,500 species of Hymenoptera. They are housed separately and those which have been catalogued (about 35%) are arranged numerically, with an alphabetical index to species names. Many type series, especially those of F. Smith and P. Cameron were split between the OUM and BMNH and both collection have to be consulted as cataloguing proceeds.

Recent acquisitions

In 1979, Fr. F. L. Wain SSJE Donated his collection of Indian bees, which occupies 10 drawers.

Research on Hymenoptera by Hope Collections personnel

F. W. Hope } Miscellaneous descriptions of new species
J. O. Westwood } in all groups.

A. H. Hamm } Bionomic studies of British pompilids,
O. W. Richards } sphecids and their prey.
B. M. Hobby }

G. C. Varley } Population dynamics of oak-feeding Lepidoptera
G. R. Gradwell } and their hymenopterous parasitoids.
& students }

M.W.R. de Vere Graham: Major revisionary work on Palearctic Chalcidoidea, especially Pteromalidae.

C. O'Toole: Nesting biology of British Andrenidae and Colletidae; taxonomy of Palearctic Colletes and Oriental Mutillidae.

A comprehensive history of the Hope Entomological Collections is being written by the former Curator, Dr. M.W.R. de Vere Graham and the Hope Librarian, Mrs. A. Z. Smith.

Collecting Reports

COLLECTING THE GENUS EDITHA AND OTHER BEMBICINI - Manfredo Fritz (Casilla Correo 539, 4400 Salta, Argentina)

The Bembicini are insects for which I have great fascination. Almost all of the Neotropical species are represented in my large collection. About 30 years ago, specimens of the genus Editha, which has the largest and most spectacular species in the group, were rarely collected, and I thought my collection would never contain large numbers of these wasps. My good friend Mateo Zelich surprised me with 50 specimens of E. integra (Burm.) which he collected at Palmar Colon, Entre Rios in March 1978. I also collected some specimens of E. adonis (Handl.) at the Botanic Garden of Santa Cruz de la Sierra in Bolivia in Dec. 1971, and I have obtained some specimens of E. fuscipennis (Lep.) from different collectors in recent years.

Three years ago I went to Paraguay, where I collected more than 35 specimens of E. magifica (Perty). The name of this species is appropriate because it is a real beauty, and it flies at a high speed. The first specimen was seen doing circles around an inaccessible flower. Leaving aside all the precautions that one has to take when collecting in a wild forest (snakes, spiny plants, swamps, etc.) I ran and finally caught the specimen. I think only an entomologist might know how wonderful it is to capture such a species for the first time. Fortunately, the same scene was repeated several times during that day. A day before going back, I collected another species of Editha which I later identified as E. caesarea

(Handl.). Bohart and Menke (1976) erroneously listed caesaria under the genus Rubrica, but the species belongs in Editha as pointed out by Araujo, 1939, who described the unknown male.

At the beginning of March, 1982, I traveled to Ituzaingo, in the Province of Corrientes, and I thought that I would not find these wasps because only one species was known from Argentina. The day before coming back to Buenos Aires it was cloudy and cold, the sort of weather that makes for poor collecting. However, because our flight was scheduled for the afternoon I decided to try to do some collecting. Luckily the sun came out and the temperature went up to 25C, and I could see some Bembicini flying. I was worried because of the time but I continued walking along the pathway parallel to the river Parana. The place had trees and pasture, and some plants with flowers. The pathway was narrow, but the area had been deforested some time ago to plant some trees. Because of previous trips to that area I knew that I could find Bemicini. In fact I collected about 30 more specimens of Editha (E. adonis, E. caesarea and E. integra), and also the following species: Stictia pictithorax Schrottky, S. trifasciata Parker, S. signata (L.), Selman notata (Tasch.), Microbembex uruguayensis (Holmb.), Bicyrtes tricolorata Parker, B. angulata (Sm.), B. discisa (Handl.), B. variegata (Ol.), B. anisitsi (Strand), B. odontophora (Handl.), Rubrica gravis (Handl.), R. nasuta (Christ) and Bembix citripes (Tasch.). A great amount of Hymenoptera belonging to other groups were collected also.

(Translation to English by Magally Quiroz)

THE GAMBIA - L. A. Janzon

(Swedish Museum of Natural History, S-104 05 Stockholm, Sweden)

From 3 to 16 November 1981 my colleagues from the Swedish Museum of Natural History, Stockholm, Karl-Johan Hedqvist, Bert Gustafsson and myself, had the opportunity of collecting in The Gambia, West Africa. Karl-Johan collected parasitic Hymenoptera and Bert Nepticulidae, Lepidoptera, while I gathered tephritid flies and their parasitoids which were found in flower-heads of the plant family Asteraceae, but I also collected aculeate bees and wasps. We also, to some extent, collected other insects, mostly Lepidoptera and Diptera. Our collecting site was mainly near our base at the Sunwing Hotel at Cape St. Mary, outside the village Bakau, about 15 kms. W of the capitol Banjul. We also made some excursions by taxi to nearby places like Kotu Stream, Abuko and Banjul N'Ding. Due to curfew during the nights we were not allowed to be outside the hotel area.

The Gambia is situated in the westernmost part of Africa and is, except the Atlantic, bounded by Senegal in all directions. The small country follows the Gambia river on both sides which extends about 320 kms. inland from the Atlantic coast. The area is about 10367 kms².

The Gambia lies in the tropical summer-rain region with semi-evergreen forest where the soil type is red earth. The original vegetation is in most parts a type of savanna, called the guinea-savanna, and the original tropical deciduous forest has in many places been replaced by anthropogenic savannas. The guinea-savanna is a kind of open "forest" with low trees, where the field layer mainly consists of about 2 m tall grasses. In coastal areas this "forest" becomes more dense and the trees grow higher. More than 2/3 of the savanna is strongly affected by cultivation (mostly peanuts and millet). "Banto Faros", a local name for flooded lowlands, surround the rivers. On these areas rice is cultivated. Mangroves (Rhizophora spp., Avicennia nitida and rarely Laguncularia racemosa) are found in the tidal zone in saltwater.

The Abuko Nature Reserve lies about 15 kms. SW of Banjul. The area is small, only 500 x 1200 m. The most important part is a strip of evergreen gallery forest along the Lamin Stream. There are good opportunities just outside the Reserve to collect insects. Many birds can be heard, but seldom seen. One you may see is for example, the giant kingfisher.

Outside the village Banjul N'Ding, a few kms. S of Abuko, there is a small area

with original forest, mainly kapok trees (Ceiba pentandra). When we were there the ground was covered by a white plant (Lamiaceae) which was very attractive to flower-visiting insects. Notable birds are here Senegal wood-hoopoes and grey hornbills.

Kotu Stream, about 4 kms. SW of Bakau, was often visited. The stream is surrounded by swamps and rice fields. On higher ground there are cultivated palm trees, and cows graze here now and then, but they leave many attractive plants for insects of the family Lamiaceae. Spectacular birds in this area were little bee-eaters, red bishops, Senegal coucals and blue-bellied rollers.

The Sunwing Hotel is surrounded by sandy shore formations where sand plants like Ipomoea pes-caprae and Canavalia rosea could be found. Behind the sand there were small thickets and a few baobabs (Adansonia digitata). Crotolaria retusa (Fabaceae) was a common sight here. Typical birds in this area were the beautiful long-tailed sunbird, pied kingfisher, grey hornbill, pied crow, bearded barbet, barbary shrike, long-tailed glossy starling, common garden bulbul and red-cheeked cordon-bleu.

Due to high humidity (98-99%) and heat you could only collect successfully a few hours in the mornings. During this trip the coldest night we met with was +29C. Though we could not collect many hours per day, many insects were netted. The fauna was so rich and diverse that it was possible to catch different species in numbers if you remained at a small good spot for many hours. The numbers of specimens collected are as follows:

Chrysidoidea 8 (now with Prof. Bohart for identification),
Vespoidea 125, Apoidea 200, Sphecoidea 50, Pompiloidea 20 and
Scolioidea 50.

If anybody is interested in seeing parts of the material just let me know.

NORTHERN THAILAND - Ole Lomholdt

(Zoologisk Museum, Universitetsparken 15, DK 2100 Copenhagen, Denmark)

I participated in a small entomological expedition to northern Thailand Sept.-Oct. 1981. We collected about 10.000 specimens of especially diplopods, dragon-flies and aculeate Hymenoptera, but numerous other insect orders are present in the material. I concentrated on Sphecidae and single other aculeate groups, but because of relatively bad weather conditions on the highest mountains (Doi Inthanon, Doi Suteh, Doi Chiang Dao etc), I returned to Denmark with only about 300 specimens of Sphecidae. This tiny material includes - apparently - undescribed species within Lyroda, Stigmus, Carinostigmus, Nitela, and perhaps also Crossocerus.

We searched for palearctic elements, and the appearance of two Bombus-species in the heights made us feel "at home". The presence of Pemphredon and Alysson in the mountains underlined this feeling.

From my experiences in habitually similar rainforests in eastern Africa I hoped to find many Trypoxylon. The result was only 22 specimens despite intensive searching. The catch of 3 specimens of Pison (Krombeiniellum) partly compensated for this. I have 12 Tachysphex for Woj if he is interested and too many Liris! Perhaps Tsuneki is willing to name some of the material. Please write to me if you have certain interests in Hymenoptera aculeata from northern Thailand.

ADVENTURES IN PANAMA, OR LIFE AMONG THE FUNGI - Lynn S. Kimsey

(Department of Entomology, University of California Davis, California 95616)

Panama has a remarkably rich fauna for a country of its size. The Panamanians call it the "Puente del Mundo", bridge-of-the-world, which is certainly the case for the Western Hemisphere. This region has been submerged several times in geologic history, forming an effective barrier to the holarctic and transantarctic/South American faunas. Once the isthmus of Panama completely connected Central and South America it became a zone of mixing between the two faunas. As far as insects are concerned it is a marvelous place to see representatives of many, if not most, of

the neotropical families.

My husband, Bob, and I left Davis in mid-March, 1981, to stay in Panama for 9 months. Traveling to Panama from California at almost anytime of year can be traumatic. The change in humidity, from 10-20% to 80-100%, is overwhelming when you arrive in Tocuman Airport near Panama City.

To reach the field station on Barro Colorado Island, where we were going to stay, takes 1 1/2 hrs by train and boat. The old, narrow gauge train runs from Panama City, on the Pacific (south) side of the isthmus, along the Panama Canal to Colon on the Atlantic (north) side. We managed to get to the train depot in Panama City in time to catch the last train. After an hour we arrived in the now non-existent town of Frijoles and were picked up by the boat from the field station.

Barro Colorado Island, run by the Smithsonian Tropical Research Institute (STRI), is a large, 5 km diameter island, in the middle of Gatun Lake. The Panama Canal runs through the Lake around the north east shore of the island. The island is almost entirely forested, except for a small clearing containing a Canal lighthouse and the one containing the field station buildings. Many miles of trails criss-cross the island. On the field station side of Barro Colorado the forest is mostly young, about 70 yrs old. The remainder of the island is covered with forest over 150 yrs old. This forest is classified as lowland tropical semideciduous forest, and during the dry season many of the trees lose their leaves completely.

We had fairly diverse funding for this trip. Bob's research on the ecology of lizard malaria was funded by NSF. My stay on the island was supported in part by STRI in return for my helping to build a synoptic collection of insects for the field station. Inadvertantly we discovered that one way to get out of paying taxes, although this has obvious drawbacks, is to have no income for a year.

I had planned to continue my work on male euglossine bee behavior, and to study the functional morphology of nectar feeding in these bees. Fortunately I did manage to gather a fair amount of data on this using Euglossa imperialis, Eulaema meriana and Exaerete frontalis. However, the weather precluded much of the work I had planned to do. One thing about working in the tropics - you never know what you will or will not see. As it turned out I got some very interesting data on the argid sawflies, Sericoceros, Manaos and Didymia and the tenthredinids Erythraspides and Adiaclema.

There is a definite seasonal progression in this part of Panama. The dry season lasts from approximately mid-December to mid-April. During this time it rarely rains and the trade winds blow across the isthmus. The rains begin in mid-April or so and continue until August when there is a dry period of several weeks to a month, called the "veraneo". After this dry period the rains return with a vengeance. Average rainfall for Barro Colorado Island is 2.8 m, and the previous record was 3.6m. However, 1981 was record-setting by all standards; by the end of August we passed the 3.6 m level and when the rains finally stopped in December the island had received nearly 5 m of rain! North Americans have been complaining about unusual weather but this seems to have been a world-wide phenomenon.

In the transition period between dry and wet seasons, from April to June or July, there is a tremendous increase in insect numbers and diversity, which correlates with the flowering of a large number of plant species. Certain wasps make their appearance during this period. The most obvious are some of the larger ground-nesting sphecids: Astata gigas, Sagenista sp., Cerceris binodis and Chlorion viridicoeruleum. This species of Chlorion is in fact only active during June and July.

Leaf flush begins a month or so after the rains begin. Correlated with leaf flush is the appearance of a wide variety of sawflies and the chrysidid, Cleptidea buyssoni. Cleptidea is probably a parasite of sawflies.

Relatively low numbers of bees and Sphecidae were present this year, relative to other years we have been in Panama. This was probably due, at least in part, to the weather. However, parasitic Hymenoptera appeared to have taken their toll as well. We saw large numbers of mutillids and managed to collect at least 26 different types. The parasitic bees, particularly Osiris and Exaerete, were also very abundant.

There never was much of a dry period in August and by the end of October we rarely saw a sunny day. By August the numbers of insects had declined dramatically, and so did the collecting. In November, even when I braved the downpour, there was little to see. The numbers of male euglossines at baits declined from about 150 in June in a 2 hr period, to 6 in November.

One of the less pleasurable aspects of living on Barro Colorado Island is the large population of blood-feeding arthropods. This population is apparently due to the high mammal density on the island (including researchers!). During the dry season one gets to enjoy ticks and chiggers, often by the 1000's. Later, when the rains start, the populations of these two decline and are replaced by tabanid horseflies and a large array of mosquitos. The only redeeming feature of the mosquitos is that some of them are so beautiful, metallic blues, greens and silver, that it is not quite so painful to be bitten by them.

We left Panama in Mid-December, during the worst downpour of the season. So much rain fell that the train tracks and transisthmian highway were temporarily closed by mudslides. At one point it was unclear whether we would be able to make it to the airport at all. Once we got back to California we looked forward to drying out a bit - getting rid of the mould and mildew - both personal and on our equipment. However, it has been raining in California ever since we got back, so we are only now drying out. I must admit that every time I open one of my field notebooks from Panama and smell the aroma of mildew I feel nostalgic.

WESTERN CHINA IN 1982 - Scott & Pamela Miller

帕美拉·米勒 史卡特·米勒

(Museum, of Comparative Zoology, Harvard University, Cambridge, Mass. 02138)

After returning from three weeks in the People's Republic of China, we are excited by the opportunities that exist for research on their fascinating fauna. With support from the Smithsonian Institution, Museum of Comparative Zoology, and Natural History Museum of Los Angeles County, we were able to join The Conservation Agency's Western China Expedition. The goals of TCA'S China trips are to investigate the status of little known and rare species and to develop contacts for ongoing research projects with Chinese biologists. We visited research facilities in three cities, and were cordially hosted at all: Beijing (= Peking): Academia Sinica, Beijing Botanic Garden; Chengdu, Sichuan: Sichuan University, Chengdu Institute of Biology; Guangzhou (= Canton), Guangdong: Guangdong Institute of Entomology, South China Botanical Garden. We also contacted personnel of the Institute of Plant Protection, Sichuan Academy of Agriculture, Chengdu and Museum of Natural History, Shanghai.

Our main objective was Emeishan (= Mount Omei), a 3100 m mountain located 160 km southwest of Chengdu. Emeishan rises out of the Chengdu Plain as an isolated outpost of the high mountains of southwest Sichuan. It has been famous for centuries as a Buddhist religious retreat and in this century as a collecting locality. The largest Emeishan collections made by non-Chinese are those of the missionary David C. Graham, who travelled throughout Sichuan in the 1920s and 1930s collecting for the Smithsonian Institution.

Emeishan has been a religious shrine for hundreds of years, climbed annually by thousands of devout pilgrims and curious visitors. It still is, but with less religious significance than before the 1949 revolution. After so much use, it is not surprising that vertebrates are not abundant; their use as food and medicine is well known. Vegetation near the steep trails (which are actually rock stairs) has been trampled and removed, and forests near the many temples and guest houses have been lumbered, but because of the steep terrain and dense vegetation, most of Emeishan's forest cover is intact. Agriculture has penetrated to above 1000 m. From there to above 2000 m, warm-temperate mixed evergreen deciduous forest, with some conifers, dominates. Above this, cool-temperate deciduous forest, again with some conifers, takes over. At about 2800 m, coniferous boreal forest appears, with the peak capped

by dwarf bamboo. Eastern China and low elevations of western China are densely populated and intensively cultivated, resulting in the extirpation of most of the native biota, but the high mountains of Sichuan and other western provinces still support rich habitats which are still very poorly known, especially outside of China.

Chinese entomologists are working hard to overcome the damage of the cultural revolution, which halted research, training and publication. The Chinese insect fauna has been estimated at over 150,000 species of which some 25,000 are presently described, some 1800 having been described since the founding of the PRC in 1949 (figures from Chou & Lu, 1979, Entomotax. 1:1-3).

Twenty six fascicules of the Economic Insect Fauna of China have been published by the Academia Sinica, treating over 3300 species. Most are entirely in Chinese (except Latin names), but are well illustrated, often in color. The main PRC journals for insect systematics are Acta Entomologica Sinica, Acta Zootaxonomia Sinica (both Institute of Zoology, Academia Sinica, Beijing), and Entomotaxonomia (North West Agricultural College, Wugong, Shaanxi). Some entomology papers also appear in Acta Zoologica Sinica (Institute of Zoology, Beijing) and Zoological Research (Kunming Institute of Zoology, Academia Sinica), and other publications. Systematics studies are oriented toward economic taxa and substantial research is devoted to biology of pests and their predators and parasites. Although we saw indications of heavy pesticide use in most places visited, we also saw substantial biological control research underway (e.g. Guangdong Institute of Entomology).

SOUTHERN UTAH - Arnold Menke

My son, Kurt, and I spent the last week of July in Southern Utah where we again joined Frank Parker for some wasp collecting. Frank was accompanied by his wife Joannie & his assistant Terry Griswold. We spent 2 days in the San Rafael Desert (see Sphecos 5:23-24) near Wild Horse Butte, but collecting was only fair; perhaps we were there too early in the season. Sphecids were not as common as they were two years ago. A species of Clypeadon was abundant as was Prionyx foxi. Frank discovered an isolated grove of cottonwood trees (Populus) which had honey dew produced by stem infesting aphids. Sweeping the leaves of these trees turned up tremendous quantities of tiny wasps, including such goodies as Trichogorytes, Belomicrus, Bothynostethus, Plenoculus, Metanysson, Hoplisoides and various pemphredonines, crabronines and astatines. As usual, Frank ("The Vacuum Cleaner"), got much more than I did. Kurt and I spent part of the 3rd day collecting along the Fremont River in Hanksville. Here we got lots of small wasps sweeping clover, especially Tachysphex and pemphredonines. Later we drove west through Capitol Reef National Park and then south to Calf Creek Canyon (near Escalante). Enroute we drove through a really intense thunderstorm. The Fremont River was a churning muddy torrent and the hail was so heavy that the ground looked as if it had snowed. Many normally dry washes were flowing. Several days later we returned to our first campsite to find that a 20 foot high flood had raged through Wild Horse Creek (normally a nearly dry wash) and over our campsite!! One reads about these sudden desert floods, but rarely do we get a first hand look at their awesome destruction. We spent two days at Calf Creek and had excellent collecting along the 3 mile trail leading to Calf Creek Falls, a beautiful 126 foot cascade with an inviting pool at its base. The water was icy cold. Ammophila cleopatra and unita were common along the trail. Leaving Calf Creek we again drove over Boulder Mountain toward Capitol Reef, collecting at several places around 9000'. Here Passaloecus, chrysidids & other small wasps were taken on fallen tree trunks, mostly aspens. Our last day of collecting was spent back in the San Rafael Desert near Wild Horse Butte where we concentrated on those wasp-rich cottonwood trees.

THE HIGH COUNTRY OF THE SIERRA NEVADA MTNS., CALIFORNIA - Arnold Menke

Kurt and I left Utah for California where we were to spend 10 days backpacking

in the Sierras, mostly in the upper Kern River Basin of Sequoia National Park. We planned to do a lot of trout fishing, especially for the endemic golden trout, but we also took insect nets along. We entered the high country via Kearsarge Pass west of the town of Independence. From there we headed south going up Bubb's Creek and eventually crossing over 12,300' Forester Pass. It was here, at the 12,000' level, that we did our first wasping. A dozen specimens of Pseudomasaris zonalis were taken on Phacelia. We reached upper Tyndall Creek in the Kern River Basin the afternoon of the third day, and camped at 11,500 feet. From this point we took day hikes during the next 5 days. Great wasping was had along Tyndall Creek where Kurt and I took such things as Tachysphex, Diploplectron, Crabro, Miscophus (Niteloapterus), Solierella, Ectemnius, Podalonia, and various eumenids and chrysidids. One day on a barren looking talus slope near Lake South America I took large numbers of Pseudomasaris zonalis on Phacelia, again at 12,000'. Ammophila were not seen until the last day of our hike, and not until we had crossed over 12,000' Shepherd Pass & were heading down to Owen's Valley. At 7000' along Symmes Creek Ammophila were very abundant and many species were represented. These and a variety of other wasps were visiting a yellow flowered Eriogonum. The Symmes Creek area is one that others should visit in mid August.

My parents picked us up at the Symmes Creek trailhead, and we then drove up into the White Mountains, home of the Bristle Cone Pine, the oldest living thing. We had two days there, but unfortunately clouds from a Sierra storm kept the sun hidden most of the time. As a result collecting was poor. However, by sweeping a mat-like Baccharis at Campito Meadow (11,000') I obtained large numbers of microhymenoptera including a very dark colored chrysidid, Tachysphex, pemphredonines, etc.

SURINAME and TRINIDAD 1982 - Jim Carpenter
(Dept. of Entomology, Cornell University, Ithaca, N.Y. 14850)

January and February of this year I was fortunate in being able to visit Suriname. This was during my participation in the Second Cornell Suriname Expedition, which consisted of myself and Debbie Smith Trail, a spider behaviorist from Cornell (for details of the first CU expedition see Bradley 1975). We were both there specifically to do general collecting, and thanks to the Explorers Club, Sigma Xi and the Griswold Fund of the CU Entomology Dept., we were actually funded to do just that.

Pepper Trail, yet another Cornell grad student, was studying the Guinean cock-of-the-rock at this time, and he put us in contact with STINASU. This is the Foundation for Nature Conservation in Suriname (Stichting Natuurbehoud Suriname, if you wanna know) and they handle nearly all Suriname's tourism, as well as running the nature reserves. Suriname has a fairly advanced program of park land acquisition, although the future of STINASU is not certain in the current political instability prevailing in that country. "Tourism" signifies North American bird tours and Dutch visitors in quest of adventure, as Suriname has no beaches to speak of, and the limpid cafe com leche complexion of the rivers deters the sensitive sunbather. This contributes to the general neglect of Suriname as a collecting stop, even for those interested in the Guyana Shield. It is fortunate for the undisturbed interior, and probably for the wonderful cultural blend of Paramaribo. However, it is pity from the standpoint of knowledge of the insect fauna, for STINASU can arrange travel to and accomodation throughout Suriname, encompassing all types of habitat and the most isolated areas in the country (e.g. the Sipaliwini savannah near the Brazilian border).

Accordingly, when we arrived in Paramaribo things went smoothly. We came into Zanderij airport at 4 AM local time (!) and obtained lodging at the YWCA (much cheaper and probably more pleasant than the businessman's hotels, but I dislike Plastic Nouveau decor anyway). We visited Henk Reichert, the STINASU director, that day and arranged permits (they are necessary for collecting in the reserves) and transport. we spent a few days in Paramaribo shopping for supplies and indulging in

some excellent Javanese and Indian food, then spent 3 weeks in the Raleigh Vallen - Voltzberg Reserve on the Coppename River (about 90 m elev.-this is low land rainforest). We also spent 4 days at Brownberg Nature Park (further east and about 500 m), which is a favorite birder's spot overlooking the famous "Brokopondo" Reservoir. Accomodation and transport for both places came to about \$120.

Raleigh Falls was much the more exciting. A long journey by bus from Parbo through vast white sand forest and scrub brought us to Bitagron, a small Bush Negro village on the Coppename. The Bush Negroes are the "Maroons", escaped slaves from the coastal plantations in the eighteenth century who made their way to the interior and began an independent existence. They were never subdued by the Dutch, and so West African cultural traditions were transplanted into the New World. From Bitagron it was a four hour ride upriver to the Reserve, and STINASU rangers (who are Bush Negroes) piloted motorized canoes for us. The ranger station (and village) is on Foengoe Eiland, which is where the river starts to get rocky. I spent about 2 weeks on the island, running the various traps and bulk collecting. The guesthouses were comparatively luxurious, considering the isolation (the nearest settlement was a small village near Bitagron): bunks, kerosene refrigerator, 5 hours of electricity per night (enough to do early evening blacklighting and a few Berlese samples), running water with showers - although the river provided for bathing. Food had to be transported in, so rice and beans and sardines was the cuisine, but they did sell beer!

The island is rather small (about a mile and a half long) but the collecting was excellent. We were there during the beginning of a very wet part of the dry season, and there was a great deal of nesting activity. A Malaise and a flight-intercept near the airstrip, as well as yellow pans and sweeping, yielded large amounts of Parasitica and certain aculeates (at least until a Cecropia fell on the Malaise). Best collecting for wasps was on a boraginaceous plant near the rangers' huts (these could lead you to believe you were in West Africa, with their decorative motifs) and the airstrip. On this plant the eumenines outnumbered the sphecids and bees. One had to occasionally dodge macaws and toucans here, however, and screaming peahas made an unbelievable racket.

I also spent about a week in "camp", where Debbie spent most of the 3 weeks. This is the rest camp at the foot of the Voltzberg, one of the massive granite sugarloafs that are a fascinating feature of the shield in central Suriname. The Voltzberg is the object of the tours (7 km hike in from the river to camp, and then a 150 m climb up), but the camp is also a resarch station, with various primate groups (researchers, not the monkeys overhead!), ornithologists such as the cock-of-the-rock group, and botanists using it as a base camp. About the only amenity was a drinking/washing stream, which tended to accumulate caimans and snakes. Also the clearing in which the huts for the hammocks were situated tended to attract falling trees, which didn't make for peaceful sleep. But the area attracted in spite of all (I should mention the occasional jaguar?). The vegetation on the granite plates and bergs was intriguing, with sclerophyllous species such as some Clusia and various euphorbs and cacti on the granite and at the edges, emerging from the rainforest. Also bromeliads, and we were able to harvest many pineapples on the Voltzberg. Around camp, "high" forest and "mountain savannah" predominated, but south was "swamp" forest. This was aptly named, as we discovered when we decided to visit Van Stockumberg a few km away. It took us much of a day to hack through the wet valley, and we were supposedly following a trail (unused for a year). One really comes to value woodcutting machetes. Also at the foot of the Voltzberg was some "liana" forest, which was where the cock-of-the-rock was lekking. 40-50 of these magnificent birds at once makes a spectacular sight: vivid red-orange splashes against the dark forest. The trip would have been worth it just for that.

Entomologically speaking, the trip was a great success. Partly this was due to the general collecting and the bulk methods. Naturally, while netting I concentrated on vespids among the Aculeata, or dotoso waswasi in taki-taki. I also obtained the nests of several eumenines (Montezumia, Omicron) and polistines (mostly young nests of Polybia and Stelopolybia, but also Brachygastra and Metapolybia).

Pachymenes, Omicron and Pachodynerus predominated among eumenines, and I took some interesting Zethus, Cyphomenes, Minixi, Pseudodynerus and Pararhaphidoglossa. Polybia, Stelopolybia and Polistes comprised much of the diurnal catch, but there were numbers of Mischocyttarus, Synoeca and others. Many Apoica came to the UV light; the Guianas seem to be a diversity center for this genus.

Among other wasps, sphecids and pompilids were taken in great numbers in the traps. Interesting in the sphecids were a few Eremnophila, Penepodium, Scapheutes and Zanysson. Trachypus and Cerceris predominated on flowers; Spheg, Tachytes and Liris in the traps. A few nests of Trypoxylon were also collected, and some Stictia and Bicyrtes dug. I caught few other aculeate wasps: chrysidids (Holopyga, Chrysis, Trichrysis), tiphids (Tiphia and one anthoboscine) and mutillids (mostly Ephuta and Timulla, a Calomutilla and Pseudomethoca).

Brownsberg was quite different; the higher elevation has a forest more "typically" Caribbean coastal. Also it is accessible by road. Most impressive about the park is the enormous "Brokopondo" Reservoir which the guesthouses overlook. Besides the stumps of many trees killed 15 years ago by the Afobaka Dam, many birds are easily seen (even an occasional harpy eagle). Entomologically, many of the wasps were the same as Raleigh Falls.

I visited Trinidad in June and July of this year for a few weeks, along with Janice Edgerly of Cornell who is studying webspinners. We stayed at Simla Research Station in the Arima valley, but managed to visit various places in the Northern Range (including climbing El Tucuche, the highest peak on the island) and along the edge of Nariva Swamp on Cocos Bay. Despite much of the island having been cleared, Trinidad remains an excellent place to collect, especially for the large showpieces such as harlequin beetles and morphos. Perhaps a small area concentration effect. The Hymenoptera collecting was good; it was the rainy season but dry all but a few days with profuse bloom in disturbed areas. I took several eumenines not seen in Suriname, including some Monobia, a Parancistrocerus and Hypalastoroides. However, the most interesting specimens were some sclerogibbids, Probethylus. Jan found 3 females in some colonies of Clothoda urichi she was studying. They are apparently callani, however they are much larger than any reported previously (ranging from about 3.1-4.8 mm), somewhat darker and the largest specimen has 26 antennal segments.

We also ran some yellow pan traps near embiid colonies, but the only chrysidoids found therein were Amisega males (of which there was a tremendous number, correlated I suppose with the ubiquitous phasmids about).

Errata

CHRYSIDIDAE IN AMERICAN NORTH OF MEXICO - Bohart & Kimsey

R. M. Bohart (Dept. of Entomology, Univ. of Calif., Davis, Calif. 95616) submitted the following corrections for the 1982 book that he and Lynn Kimsey produced.

- p. 17, line 6 - in females is common.
- P. 38, line 9 - parens around Fabricius in heading.
- p. 45, line 38 - parens around Aaron
- p. 47, line 20 - insert (Diplorrhous) after Omalus.
- P. 52, line 42 - Hedychridium Abeille de Perrin 1878:3.
- p. 55, 56 - second couplet 25 should be 26 and all following numbers should be moved up one.
- p. 70 - Hedychridium politum Bohart 1978:624.
- p. 86, line 16: it should be "(fig. 461)".
- p. 87, line 9: it should be "p. 182"
- p. 87, line 12: it should be "p. 165"
- p. 148, line 40: insert: "(fig. 320)"
- p. 148, line 42: it should be "(fig. 320)"

- P. 158, line 33: underline Sphex cyanea.
- p. 167, after line 9: insert second half of couplet 8:
"Malar space in female less than 1.5 MOD, in male 1.0
MOD or less (figs. 374, 381)-----9"
- p. 167, after line 48: insert second half of couplet 15:
"Female frons finely punctured, T-III sometimes entire
apically, body length less than 7 mm-----16"
- p. 179, line 3 - underline Ceratochrysis nearctica.
- p. 219, fig. 2: blank indicator line in upper left: should
read, "LID"
- p. 219, fig. 2 at bottom: should read "Figs. 2-4,"
- p. 250 - transpose legend to p. 255
- p. 255 - transpose legend to p. 250
- p. 262, line 30, rt: should read: "carinata (Trichrysis) 160"
- p. 262, line 46, right column: carinata (Trichrysis) 160

FURTHER GENDER CORRECTIONS —
CATALOG OF HYMENOPTERA IN AMERICAN NORTH OF MEXICO
by
George Steyskal
(Systematic Entomology Laboratory, USDA,
c/o U.S. National Museum, Washington, DC 20560)

- p. 2006 Heriades should be masculine (Code 30.a.ii); therefore: H. crucifer,
H. texanus, H. variolosus, H. carinatus.
- p. 2011 - Proteriades should be masc.; therefore P. nanula sparsus (nana, nanus and
their diminutives nanula, nanulus are nouns); P. nigrellus attonitus,
P. pygmaeus, P. reductus, P. seminiger, P. semiruber, (p. 2012)
P. xerophilus, P. remotulus, (p. 2013) P. laevibullatus, P. rufinus.
- p. 2076 - Coelioxys should be masculine (cf. Trioxys, Dioxys, both masc.); therefore,
C. hirsutissimus, C. immaculatus, C. insitus, C. moestus, (p. 2078)
C. novomexicanus, C. octodentatus (p. 2079) C. salinarius, C. apertus, C.
editus, C. funerarius, (p. 2080) C. alternatus, C. texanus, (p. 2081) C.
mexicanus, C. germanus, C. angelicus, C. floridanus, C. modestus, C. scitulus.
- p. 2087 - Oreopasites vanduzeei melanantha should be O. v. melananthus
- p. 2087 - Epeoloides should be masc.; therefore E. obscurus, (2088) E. pilosulus.
- p. 2088 - Epeolus arciferus should E. arcifer.
- p. 2095 - Triepeolus penicilliferus should be T. penicillifer
- P. 2136 - Xenoglossodes should be masc.; therefore X. albatus, X. arizonicus,
(p. 2137) X. spissus.
- p. 2139 - Melissodes should be masc.; therefore M. bimaculatus, (p. 2140)
M. b. nullus, M. blandus, M. colliciatus, (p. 2142) M. tepidus,
M. tessellatus, (p. 2143) M. apicatus, M. fimbriatus, M. desponsus,
(p. 2044) M. dugosus, (p. 2145) M. appressus, M. bicoloratus, M.
cerussatus, (p. 2146), M. confusus, M. denticulatus, (p. 2147) M.
expolitus, M. fasciatellus, M. fumosus, M. gelidus, (p. 2148) M.
illatus, M. lupulentus, (p. 2149) M. microstictus, M. montanus,
M. niveus, M. ochraeus, M. pallidisignatus, (p. 2150), M. paucipunctus, M.
paululus, M. perlusus, M. perpolitus, M. personatellus, M. pexus, M.
pilleatus, M. pullatellus, M. rusticus, (p. 2151) M. semilupinus, (p. 2152)
M. subillatus, M. tinctus, (p. 2153) M. velutinus, (p. 2154) M. intorta,
M. ablus, M. compositus, (p. 2155) M. lupinus, M. minusculus,

M. plumosus, (p. 2156) M. americanus, M. intermedius, M. pennsylvanicus,
M. philadelphicus, M. maurus, M. pullatus.

THE PHYLOGENETIC RELATIONSHIPS AND NATURAL CLASSIFICATION OF THE VESPOIDEA

Jim Carpenter (Dept. of Entomology, Cornell Univ., Ithaca, N.Y. 14850) submitted the following corrections to his 1981 paper published in Syst. Ent. 7:11-38.

- p. 20, Character 32, line 2 from the bottom. Delete "Gayellini".
- p. 26, Gayellini. Delete "(32b) Hind coxa with dorsal carina."
Change "(33) Claws simple (Gayella) or toothed
(Paramasaris). " to: (33) Claws toothed.
- p. 34, Provespa barthelemyi is the correct spelling.
- p. 35, Change "Polistes canadensis costaricensis Bequaert" to:
Polistes erythrocephalus Latreille.
- p. 36, Change Nortozumia to Acarozumia.
- p. 37, Delete "(Spinipes)" from Odynerus melanocephalus, O. rotundigaster,
and O. spinipes.

Obituaries

PAUL D. HURD, JR.
(1921-1982)

Dr. Paul D. Hurd, Jr., 60, a Senior Scientist at the Museum of Natural History, Smithsonian Institution, and an entomologist of international stature, died March 12, 1982 from a massive heart attack just after reaching the museum early that morning.

Paul was born April 2, 1921, in Chicago, Illinois. During World War II, he served in the Navy in the South Pacific as chief pharmacists' mate. Paul was educated at the University of California, Berkeley, where he received his Ph.D. in 1950. His thesis was a revision of the nearctic species of Pepsis (Pompilidae). Paul was closely associated with the California Insect Survey, and in 1950 he became its first full time employee. He was leader of the Survey until he left in 1970 to assume his new position of Curator of Apoidea at the Smithsonian. He served as Chairman of the Department of Entomology at the Smithsonian from 1971 to 1976. He was promoted to Senior Scientist in 1980, and also elected a Fellow of the American Association for the Advancement of Science that same year. He served as an associate program director for the National Science Foundation for two years, and at one time was president of the Association for Tropical Biology.

Paul's research centered on bee biology and taxonomy, and he published more than 100 papers. He was an authority on squash and gourd bees and their important economic roles in pollination. Two of his largest taxonomic works were his 1963 classification of the large carpenter bees (with J. Moure) and his 1978 catalog of western hemisphere carpenter bees. He was also co-editor of the monumental new Catalog of Hymenoptera in America North of Mexico, published in 1979-80, and contributed the section on Apoidea.

Many projects were under way at the time of Paul's death. Karl Krombein, of the Smithsonian Institution, has outlined the status of these for readers of Sphecos:

"Each of you is aware of the invaluable contributions Paul has made in his field. You will wish to know the status of various projects in press or in preparation."

"Two manuscripts have been edited for publication and are expected to be in print later this year. The first is a joint paper with D. Gerling and A. Hefetz on the behavioral biology of two Middle Eastern carpenter bees; the other with E. G. Linsley is an extensive biographical sketch of P. H. Timberlake."

"A catalog of the new World Halictidae with J. S. Moure is well along toward completion. The catalog proper is already in the computer and has been proofed. Initial computer runs have been made on the indexes to halictid taxa, pollen and nectar sources, parasites, predators and hosts. Mrs. Sandra Gingras, our competent and careful research assistant, will add page numbers to the indexes when page proof is available."

"Another project nearing completion is a joint effort with E. G. Linsley and T. J. Zavortink on the bee pollinators of desert trees and shrubs. Dr. Linsley has committed himself to finishing this manuscript. It lacks principally the tables to be prepared by Dr. Linsley, and a few additional illustrations to be made by our gifted artist, Mrs. Elaine Hodges.."

"A list of the type depositories of bees described from America North of Mexico is almost complete. We anticipate submitting this for publication during 1983."

"Paul had been working for several years on a revision of Triepeolus, a large genus of cleptoparasitic Anthoporidae. He had sorted all of the material into species including clearly identified new species, and had several artists prepare a number of illustrations. So far as we can ascertain, he had not written up anything, so this will have to be completed in coauthorship with a competent collaborator."

"He and J. F. Mello had frequently discussed the preparation of a field guide type of manual to North American bees. The Apoidea data base in the computer would have been used for this, and some illustrations had been prepared. However, the project otherwise was still in the conceptual stage, and prospects for its completion are questionable."

"Paul's early death deprives the Smithsonian Institution of a valued and respected colleague, and the scientific community of a wealth of contributions that he could have made during a normal life span. Nevertheless, we realize and we appreciate that Paul persevered through 17 months of deteriorating health since the earlier severe heart attack to accomplish all of the completed work mentioned above."

Karl Krombein and Gort Linsley are working on a biography of Paul which they intend to submit to Pan-Pacific Entomologist for publication.

JOSEPH CHARLES BEQUAERT
(1886-1982)

Dr. Joseph C. Bequaert, an Agassiz Professor of Zoology Emeritus, at Harvard University, died on January 19, 1982, at the age of 95 in Amherst, Massachusetts.

He was born May 24, 1886, in Belgium and educated there, receiving his doctorate from the University of Ghent in 1908. He travelled extensively in Africa and Central and South America for botanical, entomological, and medicinal research. In 1916 he migrated to the United States, becoming a naturalized citizen in 1921.

He was married in 1927 to the former Frances Alice Brown. The couple had two children. His wife died on June 29, 1981.

From 1916 to 1922 he was a Research Associate at the American Museum of Natural History in New York City. In 1923 he received an appointment at Harvard University where he remained for 31 years, first at the Medical School as Assistant Professor of Tropical Medicine, and later (1945) at the Museum of Comparative Zoology as Curator of Recent Insects. In 1951 he was appointed Agassiz Professor of Zoology.

On retirement in 1956 he and his wife moved to Texas where he was Visiting Professor at the University of Houston. In 1960 the couple moved to Tucson, Arizona, where he was Visiting Entomologist and later Visiting Scholar at the University of Arizona. In 1980 they moved to Amherst, Massachusetts.

Bequaert's research interests were exceptionally far-ranging. As a botanist he conducted extensive research and field exploration on the taxonomy and ecology of the mosses and flowering plants at the Belgian Congo. He was an authority on medical entomology, on the taxonomy of ticks, on the taxonomy and ethology of the Hymenoptera, especially the social wasps, and on the systematics of the horseflies and related families.

Dr. Bequaert published over 350 scientific papers, singly and in collaboration, in four languages, covering a variety of subjects in the fields of natural history and tropical medicine. In 1973 he published jointly with Professor Walter Miller of the University of Arizona a book, The Mollusks of the Arid Southwest. On his many expeditions abroad he was a avid collector of plants, insects, and mollusks, the bulk of these collections being deposited in the Museum of Comparative Zoology at Harvard. He was a member of 23 scientific societies in this country and abroad, including the Belgian Royal Academy of Colonial Science.

[Our thanks to Helen Bequaert Holmes for most of this - edit.]

Necrology

Clarence E. Mickel passed away August 29, 1982.

Profiles

ALESSANDRO MOCHI

Italian, born 1920 in Cairo (Egypt), lived there until 1938. After service in WW II and graduation in Medicine in Rome, have worked with the World Health Organization from 1949 to 1979, travelling widely. Now retired in Rome and still professionally active as consultant in public health planning and programming.

Initiated in young age in entomology by my Father, also a physician, this has remained an important hobby which somehow never merged with my professional activities. We began in Cairo a collection of Aculeata (mainly Chrysidae, Sphecoidea, Pompilidae & other allied groups) which I have been continuing bringing it to sizeable proportion. Much of the original Egyptian material was published by my father in 1936-39. Subsequent Palearctic additions were identified by well known experts, i.a. Prof. J. de Beaumont, from Lausanne, and Dr. A. Giordani Soika from Venice.

During service with WHO I have managed to collect widely, though often occasionally only in places such as Egypt, Syria, Turkey, Tunisia, the Cameroun, Congo, Ethiopia, Kenya, Somalia, Sudan, North Yemen, Burma, the Philippines and Jamaica, i.e whenever place and season were right and time permitted it.

Altogether just an amateur interested mostly in taxonomy and in perfecting my collection, I hope to publish some day but just now am still too occupied professionally and feel too young to limit myself to sedentary work only.

(address: v. Ombrone 12/B, 00198 Rome (Italy))

JOZEF BANASZAK

I was born on March 19, 1947 in Lednogora near Poznan, Poland. I grew up in a rural environment in Wielkopolska region among fields, mild hills and pine forest. Through early and the continuous contact with nature I developed my love and fascination to it. My interest in insects began early in the high school received from reading wonderful book by Polish naturalists, J. J. Karpinski, "In the marvel land of Jean Henri Fabre". In this time I began to dream of becoming a biologist, and when I finished high school in 1965, my dream become reality. I entered the Faculty of Biology and Earth Sciences of the A. Mickiewicz University of Poznan. My first mentor in zoology was Professor J. Rafalski, a specialist in Arachnida. Thanks to his help and benevolence I can do my first student articles, concerning the bee fauna. Also my graduate thesis concerning bees: "The Apoidea of Middle Wielkopolska region" (West Poland)(1970). After graduation I decided to work in the Department of Investigation of the Useful Insect Diseases, Inst. Veterinary in Swarzedz near Poznan. During five years (1970-1975) I worked on parasites and pests of the honey bee which resulted in a D.S. Thesis "Studies on the fauna associated

with inhabited bee hives (1975). In 1975 I start work in the Department of Agrobiology, Polish Academy of Sciences in Poznan where I am currently.

Most of my papers and articles concern Apoidea. In the first stage of my investigation I was conducting a faunistic study on bees in my country. I think that estimation of state of the fauna is the duty of each generation of naturalists. In recent years my investigations concern, among others, ecology of bees in agroecosystems and natural habitats. Independently of mention investigations I collect all faunistic data concerning wasps and in particular the Chrysididae and Scolioidea.

ABRAHAM WILLINK

Although born in the Netherlands (1920) and of Dutch parents, I was brought to Argentina when I was only a few months old. I became a naturalized Argentine citizen in 1938. I did my primary and secondary school in Mendoza, and got my doctoral degree in Natural Sciences at the University of La Plata (1947). In 1944 I started to work at the Miguel Lillo Institute of the University of Tucuman, and have remained at this institution. There I started to organize the insect collection, to study the neotropical wasp fauna, and taught general and special entomological courses at the Faculty of Natural Sciences. For eight years (1958-66) I was Director of that Institution and from 1975 to 1977, and again in 1978, I was named Dean of the Natural History Faculty of the University of Tucuman.

During my career I twice had the opportunity to stay for a year doing research in the United States with a Guggenheim Fellowship, first at the University of Cornell (Ithaca, N.Y.) in 1949, and later at the University of California at Davis, in 1964. I specialized with several entomologists: Dr. V.S.L. Pate (Cornell), Dr. Joseph Bequaert (Harvard), Dr. Karl V. Krombein (Washington) and Dr. Richard M. Bohart (Davis). Then with a British Council scholarship I worked for a year at the British Museum of Natural History in 1954, with Prof. O. W. Richards. In 1970 with a fellowship from our National Council of Scientific Research I worked for a year at the Natural History Museum in Leiden, the Netherlands, with Prof. J. van der Vecht.

Other institutions where I worked for shorter periods are, in the United States: University of California, Berkeley; California Academy of Sciences, San Francisco, Carnegie Institution of Pittsburgh; Chicago Natural History Museum; Museum of Comparative Zoology, Harvard; American Museum of Natural History, N.Y., and the National Museum in Washington. In Europe: Paris National Museum of Natural History; Museum of Natural History of Geneva; Natural History Museum in Torino; Civic Museum of Natural History in Genoa and Venice; Museum of Natural History of Vienna; Bayerische Zoological collection at Munich; Natural History Museum of Berlin. In South America: National Museum of Buenos Aires; Museum of La Plata; Museum of Zoology of the Sao Paulo University, Brasil; Goeldi Museum in Belem; National Museum at Rio de Janeiro and the Zoological collection of the University of Parana in Curitiba.

President of the Association for Tropical Biology (1968-69) in Washington; President of the Permanent Commission of Latin American Congresses of Zoology (1974-77) and of the organizing committee of the VIIth Latin American Congress of Zoology held in Tucuman in 1977. Member of the International Commission of Zoological Nomenclature since 1972. Member of the National Academy of Sciences in Cordoba, Argentina. Member of several Argentina and foreign societies.

Since 1944 I have travelled through most of Argentina studying and collecting insects, specially wasps, to build up our collections. I took part in many International meetings in the United States; Puerto Rico; Belem, Brazil; Santiago, Chile; Caracas, Venezuela; Mexico, D.F.; Montevideo, Uruguay and some other local and foreign cities.

As Professor at the Faculty of Natural Sciences of the University of Tucuman, I directed several doctoral thesis and research projects of post graduate students and young scientists. My field of research has always been the systematics and zoogeography of Neotropical Hymenoptera: Vespidae, Eumenidae, Masaridae and Sphecidae, on which I published several papers including some revisions, my first publication appearing in 1947.

With my wife Lila, we have had the opportunity to host many zoologists and specially entomologists from all over the world which have visited Tucuman, and we hope we will go on doing so in the future. We have three children, two married, and seven grand children, all living in Tucuman, Argentina. My son and daughter-in-law are also both entomologists.

TIMOTHY PALMER

Born into the biological world view espoused by my father, I have been watching, touching, tasting and squeezing all manner of life forms since the beginning of sensory and manipulatory competence. Under Dad's tutorage the world of words opened up at age three and by five I had the Golden Book of Science under my arm. This gave way to a love for science fiction that continued until university study (and apparent lack of great SF) took over.

In between were all manner of pets--herptiles of North (and South) America, mammals, hand raised native and domestic birds and, always there glowing in the background, the communities of the freshwater aquaria. These were fantasy window worlds where life and death, even sex and interspecific relationships were exposed to the eye of the child.

School was relatively easy except for handwriting (gosh, I was so glad to leave those "D's" behing in elementary school) and math (which was for a long time a wizened and frightening spinster/teacher). Bicycles and target shooting were fascinations in junior high. In the 9th grade I took a Blue Ribbon at the Montgomery County Science Fair [Maryland] for a photographic essay of rats upon which I had performed homo and heterografts. High school was Gambrill State Park, the beginning of the battle with Authority and the continuous, restless, painful and sometimes ecstatic wrestling with sexuality. It was also the Bausch and Lomb Award for Scientific Achievement--a perfect surprise for having established the Culture Center from which I supplied the county school system with protozoan monocultures. The prize crop was large, lovely clusters of Amoeba proteus.

Study at the University of Maryland was different things at different times--a casting about, a confusion, a suspension of direction. The world was intellectually and physically far more vast than I had imagined and, after a home with 25,000 acres of unspoiled, mountainous public lands as a backyard, incredibly populous. This world of human issues, of human impact and responsibility left me undecided as to major. There was a commitment to the new Dept. of Anthropology and then a dropping out for a year and a half into the world of salesmanship, labor and carrying of mail. All of which served to lead me back to university as a major in Botany. Plants. Those were those staid organisms which softened the glare of the aquarium lights and which, or so I had heard, make all of these fascinating faunal forms possible. Graduation was in '73 and again in a surprise. At the panicked insistence of my advisor I postponed a backpacking trip and attended, receiving an award as the Department's outstanding undergrad. Incredible!

Equally incredible was the colony of honeybees that I set up that summer on the porch roof of my suburban Maryland apartment. Ripped from a shed wall in a sudden downpour, it barely survived. It is doing well today.

A desk job at Interior and an urge to do field work led me out to the Beltsville Agricultural Research Station. Five years flashed by doing a wide variety of technical field and lab projects relative to the use of human sludge as a soil amendment to croplands. Spare time was sometimes spent taking courses, often from the U of M Dept. of Entomology. This and ornithology, beekeeping, tropical botany (in the form of "houseplants") emerged as hobbies during this period.

A wonderful relationship with a beautiful woman, a felt need for self exploration and for service plus a restless desire for change led to the North Country of the Adirondacks. While obtaining a B.S. in Nursing I discovered many, many things. One was that I could (almost) make a living collecting Vespinae for venom production.

For three years I have intensively collected, observed and studied these incredible insects. Most recently relationships with entomologists at Cornell, the

University of Georgia and the Smithsonian have begun to develop. It has been as exciting to discover that there are people willing to share time and fascinating ideas about social insects as it has been to discover the insects themselves! It is a deeply felt hope that as a professional Vespist I can combine a loving involvement with Nature with the need to understand self and mankind as social entities and, perhaps, to generate enough of substance to justify and satisfy creative and financial needs.

BRAULIO F. S. DIAS

I was born in Ithaca, New York, U.S.A. on 25 July 1953, but soon came to Brasil. I have double citizenship as a consequence. My father, Domiciano Dias, also an entomologist, was finishing his post-graduate studies at Cornell at the time (he studied with Pate and Bradley and did his M.Sc. thesis on the nervous system of Bumblebees). Later on, 1959-1963, he went back to the States to study the population dynamics and allometry of Bumblebees with Michener in Lawrence, Kansas, and I went along. Now he works mainly with the population dynamics, caste polymorphism and allometry of leaf-cutting and army-ants, while still doing some work on the nesting biology of euglossine and anthophorid bees. I give all this information about my father as this helps to understand how I was brought up in an entomological environment which gave me a profound and solid interest and understanding in ecological and behavioral disciplines and stimulated my early start in the scientific study of insects. I have always been very keen on out-doors activities like camping, hiking, etc, and very early started to go out to collect insects. My early interest was on the study of the life cycle of beetles found in rotten wood, dung beetles, and butterflies, but I eventually moved to sphecid wasps as they had a much richer behavior. My first scientific paper (still unpublished) was "Studies on the life cycle and habits of a bembecid, Bicyrtes variegata Olivier (Hym., Sphecidae)" (in portuguese) which I presented in 1969 at the 4th Congress of Young Scientists of Sao Paulo State. I was then 15 years old. After that I moved with my family to Brasilia wher I continued to observe the biology of sphecid wasps, and was a bit disappointed as I could never find large nesting colonies of sand wasps as reported by Evans in his book and the North American Bembix! But I managed to obtain much information on the nesting biology of several species. With a work on the nesting behavior or Tachysphex brasilianus Pul. I won the National Competition of Tommorrow's Scientists of 1970 and was awarded a scholarship for my undergraduate studies at the University. I soon got interested also in solitary bees and made several studies on the nesting biology of species of Oxaea, Ptilotrix, Centris, Xylocopa, Eulaema, Euglossa and several others. All these observations are still awaiting publication (hopefully in the coming years). During this period I entered the University of Brasilia and graduated in Zoology (B.Sc.) in 1975. There I helped to curate the Insect Collection at the Zoology Department. While at the University I got involved with another interesting group of Hymenoptera, the sawflies. My studies on the behavior and ecology of argid sawflies led to my Ph.D. thesis on these insects. My post-graduate studies were at Edinburgh University, Scotland, under Professor Aubrey Manning, where I had a great opportunity to get acquainted with the recent theories on sociobiology and insect-plant relationships. The field studies were done in Brasilia. I finished my Ph.D. last March and returned to my job as a research ecologist at an Ecological Field Station near Brasilia, in the Department for Ecological Studies of the IBGE Foundation. Here I conduct a survey of the insects, Hymenoptera especially, associated with the different types of natural plant communities of the Cerrado (a type of Savanna) Biome of Central Brasil. I am also putting much effort to build up a reference collection of the local insect fauna, with emphasis on Hymenoptera, and continuing my observations on the nesting biology of the local wasps and bees and on the biology of argid and pergid sawflies. I am specially interested in all types of

social behavior displayed by the so-called presocial insects, particularly larval gregariousness and parental care, from an evolutionary point of view. For two years after graduation I also worked in the research Department of the Parks and Gardens Dept. of Brasilia studying the biology and control methods of some of the major local pests of ornamental trees, shrubs and grasses. There I also got involved (and still am) in projects to protect and recover places of ecological importance, specially sanctuaries for birds and other vertebrates, in the vicinity of Brasilia, to provide refuge for animals that can act as biological control of urban pests. I am very interested in all aspects concerning the conservation of the endangered Brazilian fauna and flora.

NORMAN WALTER RODD

Born 27th March 1913. Graduated from Sydney Technical College 1936 with degree in chemistry. Worked as Industrial Chemist in the field of oils and fats and in foods from 1936 to 1973. Returned to present address in the Blue Mountains of N.S.W. and in 1977 presented my early (1947-1953) collections, consisting mainly of bees and wasps, to the Australian Museum. My earlier interest in the Apoidea was stimulated and maintained by close collaboration and friendship with the late Tarlton Rayment. In addition to many bee specimens supplied to Rayment I also provided him with several species of Sericophorus, hence an early but more or less incidental interest in the acueate wasps.

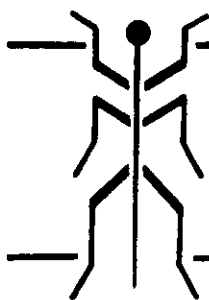
Now that I am once more very actively engaged in the collection and classification of Hymenoptera I have become increasingly interested in the Sphecoidea an interest which has been much stimulated by having acquired a copy of Bohart's & Menke's generic revision. This has become a much used bible along with Michener's "Classification of Bees of the Pacific Region". So you will see that I have really become involved with the sphecids in a rather devious way. As an Associate of the Australian Museum all of my present collections are destined for eventual lodging with that institution.

JAMES H. PERKINS

Born October 9th 1953 in Corpus Christi, Texas. I spent some time in the Navy and afterwards I decided to attend school at Del Mar College in Corpus Christi. I moved to Beeville, Tx and attended Bee County College under the influence of John D. Mclean professor of biology. Later I transferred to Texas A&I University and studied under Dr. James E. Gillaspay, Dr. Carl Wood and Dr. George Willeges. I worked as student curator in the Herbarium and Entomology depts. My wife was also curator of the Entomology dept. and did research in wasp venom with Dr. Gillaspay. My wife, Blanca, and I are interested in pollination ecology and especially in Polistes as important pollinators. We both were lab instructors in the biology dept. We have a little girl, Hannah Stephanie. Later because of the situation of jobs being scarce we plan to open our own nursery and landscaping business. I plan to continue my own research in pollination ecology and other fields of entomology and botany. Presently I am employed at the Texas Agricultural Experiment Station-The Texas A&M University System at Corpus Christi, Texas; Department of Entomology. I am also studying landscaping part time until I am proficient.

THOMAS SCHLUTER

Born 21-7-49 in West-Berlin, collecting as young boy insects, especially Coleoptera and Hymenoptera, but studying Geology, 1976 Diplom-Geologist, 1978 Ph.D. with a work on mid-cretaceous Insects of fossiliferous resin from NW-France. Now assistant in the Paleontological Institute of West-Berlin. Current research interests: Paleoentomology, especially mesozoic Odonata, Neuroptera and Hymenoptera.



ENTOMOGRAPHY

AN ANNUAL REVIEW FOR BIOSYSTEMATICS

Announcing the coming of **ENTOMOGRAPHY**, a new publication outlet and scientific resource for studies pertaining to the biosystematics of insects or related arthropods.

This annual periodical will provide a medium for intermediate-sized papers (i.e. about 10-300 printed pages). It will appear at least once a year (totalling about 500 pages) or more often, depending on the amount of publishable material submitted and total of annual subscriptions received. Every submission will be refereed by appropriate and qualified reviewers to establish and maintain the highest professional and scientific standards.

ENTOMOGRAPHY is to be a privately managed journal, relying on institutional and private subscriptions, plus a nominal charge per published page to authors (institutions) to cover publication costs, handling and mailing. Turnover time for any given manuscript should be only about six months. The first 25 reprints will be supplied to authors at no cost; additional reprints will be available and can be ordered separately prior to publication.

The Journal's size will be 6 x 9 inches, formatted into a single column, 4½ inches wide. We encourage authors to enhance their articles with high quality illustrations whenever possible and applicable.

The editors and publishers are committed to presenting valuable taxonomic and biologic contributions in Entomology to the scientific community in an accurately portrayed, thoughtfully and pleasantly designed publication. You will want **ENTOMOGRAPHY** available to you and your colleagues; so, instruct the appropriate purchasing agent to write for subscription information immediately.

Plan now for publishing that monograph or revision by providing for funds for publication expenses in your upcoming institutional budget, or write the costs of publishing your findings directly into your research grant requests. More details will be forwarded upon request. Send your manuscript for consideration now or address inquiries to:

ENTOMOGRAPHY
2015 J St Suite 32
Sacramento, CA 95814

NEW JOURNAL!

Recent Literature

Abraham, Rudolf

1982. Zur Biologie von Trypoxylon attenuatum Smith, 1851 und T. figulus (Linnaeus, 1758) (Hymenoptera: Sphecidae). Ent. Mitt. 7:137-147.

Agren, Lennart and Bo G. Svensson

1982. Flagellar sensilla of Sphecodes bees (Hymenoptera, Halictidae). Zool. Scripta 11:45-54.

Akre, Roger D.

1982. Social wasps, pp. 1-105 in: Herman, Social Insects, vol. 4, Academic Press. (fine review of Vespidae and Sphecidae).

Akre, Roger D., Hal C. Reed, and P. J. Landolt

1982. Nesting biology and behavior of the Blackjacket, Vespula consobrina (Hymenoptera: Vespidae). J. Kansas Ent. Soc. 55:373-405.

Alcock, J.

1982. Nest usurpation and sequential nest occupation in the digger wasp Crabro monticola (Hymenoptera: Sphecidae). Canadian J. Zool. 60:921-925.

Allen, Jerry L., Kate Schulze-Kellman, and George J. Gamboa

1982. Clumping patterns during overwintering in the paper wasp, Polistes exclamans: effects of relatedness. J. Kansas Ent. Soc. 55:97-100.

Alm, Steven R. and Frank E. Kurczewski

1982. Antennal sensilla and setae of Anoplius tenebrosus (Cresson) (Hymenoptera: Pompilidae). Proc. Ent. Soc. Wash. 84:586-593.

Anonymous

1982. Joseph Charles Bequaert 1886-1982. MCZ Newsletter (Harvard University), 11(2):unnumbered page. (obituary with photograph).

Archer, M. E.

1981. Ectemnius dives (Lepeletier & Brulle) (Hym., Sphecidae) in Yorkshire and elsewhere. Ent. Monthly Mag. 117:138.

1982. Further records of Ectemnius borealis (Zett.) (= nigrinus (H.-S.)) (Hym., Sphecidae). Ent. Monthly Mag. 117:208.

1982. A revision of the subgenus Rugovespula nov. of the genus Vespula (Hymenoptera, Vespidae). Kontyu 50:261-269.

1982. Ancistrocerus gazella (Panzer) (Hym., Eumenidae) recorded from the north of England. Ent. Mon. Mag. 118:176.

Archer, M. E. and John D. Phipps

1982. A late colony of Vespula germanica (Fab.) (Hym., Vespidae) at Pilham, nr. Gainsborough, Lincolnshire. Ent. Monthly Mag. 117:71-73.

Axelsson, Rune

1982. Sphecid wasps (Hymenoptera) caught in windon traps in central Sweden. Ent. Tidskr. 103:78-80.

Belavadi, V. V. and R. Govindan

1981. Nesting habits and behaviour of Ropalidia (Icariola) marginata (Hymenoptera: Vespidae) in south India. Colemania 1:95-101.

Benoit, P. L. G.

1982. Bethyridae africains. II. (Hymenoptera). Le genre Kathepyris Kieffer. Rev. Zool. Afr. 96:185-192.

Birch, Martin C.

1982. The other museum: Victorian fantasy, the Dodo, the brick the bishop dropped, and ... the Hope Entomological Collections. Antenna 6:248-250. (a brief history of the Hymenoptera holdings is given)

Bohart, R. M.

1982. Leucodynerus, a new genus of solitary wasps from western North America (Hymenoptera: Sphecidae). J. Kansas Ent. Soc. 55:442-446. [Eumenidae is correct family].

1982. New species of Stictiella (Hymenoptera, Sphecidae). J. Kansas Ent. Soc. 55:593-597.
- Bohart, R. M. and Lynn S. Kimsey
1982. A synopsis of the Chrysididae in America north of Mexico. Mem. Amer. Ent. Soc. 33:1-266. [mailed March 8. A landmark taxonomic review of this family. All subfamilies, genera and species are keyed, described and illustrated].
- Brian, M. V.
1979. Caste differentiation and division of labor. pp. 121-222 in Hermann, Social Insects, vol. 1, Academic Press.
- Brunson, Marvin H.
1982. Harry Willis Allen 1892-1981. Bull. Ent. Soc. Amer. 27:290. [obituary]
- Bunn, D. S.
1982. Usurpation in wasps (Hym., Vespidae). Ent. Mon. Mag. 118:171-173.
- Caetano, Flavio Henrique and Vera Ligia Letizio Machado
1982. Morfologia e histologia do trato digestivo de Protopolybia exigua (Hym., Vespidae) e suas estruturas excretoras anexas. Papeis Avulsos Zool. 34:283-296.
- Cameron, P. J., E. W. Valentine and C. F. Butcher
1979. Prospects for biological control of pasture Scarabaeidae (Coleoptera) in New Zealand. pp. 213-216 in Crosby and Pottinger, Proc. 2nd. Australasian Conf. Grassland Invert. Ecol., Wellington, N. Z. [discusses attempts to introduce tephritid wasps for control]
- Carpenter, F. M. and H. R. Hermann
1979. Antiquity of sociality in insects. pp. 81-89 in Hermann, Social Insects, vol. 1, Academic Press.
- Castellon, E. G.
1980. Preproducao e dinamica de populacao em Synoeca surinama (Hymenoptera: Vespidae). Acta Amazonica 10:679-690.
- Chandra, Girish
1980. Taxonomy and bionomics of the insect parasites of rice leafhoppers and planthoppers in the Philippines and their importance in natural biological control. Philipp. Ent. 4:119-139.
- Cobb, Neil, E. Gruber, E. Heske, et al
1981. An ecological study of the Alvord Basin Sand Dunes, southeastern Oregon. Final Technical Report, Oregon State University, NSF Grant No. SP-7905328. 142 p. [includes lists of insects].
- Coville, Rollin E.
1982. Biological observations on three Trypoxylon wasps in the subgenus Trypargilum from Costa Rica: T. nitidum schulthessi, T. saussurei, and T. lactitarse (Hymenoptera: Sphecidae). Pan-Pac. Ent. 57:332-340.
1982. Wasps of the genus Trypoxylon subgenus Trypargilum in North America (Hymenoptera: Sphecidae). Univ. Calif. Public. Ent. 97:1-147.
- Crozier, R. H.
1979. Genetics of sociality. pp. 223-286 in Hermann, Social Insects, vol. 1, Academic Press.
- Delfino, G. S. Turillazzi and C. Calloni
1982. Secretory cycle of the van der Vecht organ glands in foundresses of Polistes foederatus (Kohl) (Hymenoptera Vespidae). Monitore Zool. Ital. (N.S.) 16:161-175.
- Delmotte, C.
1982. Polistes gallicus L. (Hymenoptera, Vespidae) en Belgique. Bull. Ann. Soc. Roy. Belge Ent. 118:35-37.
- Dessart, Paul
1982. Sclerogibba transitoria, n. sp., male de Somalie (Hymenoptera Bethyloidea Sclerogibbidae). Bull. Ann. Soc. Roy. Belge Ent. 118:45-48.

- Dicker, G. H. L.
1982. Observations on Passaloecus eremita Kohl (Hym., Sphecidae) recently recorded from Britain. Ent. Mon. Mag. 118:117-119.
- Dollfuss, Hermann
1982. Spilomena peruensis n. sp., a sphecid wasp from Peru (Hymenoptera, Sphecidae). Zeitschr. Arbeitsgem. Osterr. Ent. 33:77-78.
- Donath, H.
1982. Beitrage zur Hymenopteren-Fauna des Bezirkes Cottbus, I. Uberfamilie Scolioidea. Ent. Nachr. Berichte 26:30-32.
- Durkis, Thomas J. and R. Marcel Reeves
1982. Barriers increase efficiency of pitfall traps. Ent. News 93:8-12.
- Edwards, Mike
1982. Crossocerus exiguus (Vander Linden) (Hym., Sphecidae) in Sussex, with comments upon the identification of females. Ent. Monthly Mag. 117:19-21.
- Eickwort, George C.
1981. Presocial insects. pp. 199-280 in Hermann, Social Insects, vol. 2. Academic Press.
- Evans, Howard E.
1982. The anxius group of the genus Rhabdepyris Kieffer (Hymenoptera: Bethyridae: Epyrinae). J. Australian Ent. Soc. 21:55-61.
1982. The genus Cerceris in eastern Australia (Hymenoptera: Sphecidae). Trans. Amer. Ent. Soc. 107:299-380.
1982. Nesting and territorial behavior of Philanthus barbatus Smith (Hymenoptera: Sphecidae). J. Kansas Ent. Soc. 55:571-576.
1982. The "collaris" complex of Australian mimetic Pompilidae (Hymenoptera). Pac. Insects 24:151-155.
- Evans, Howard E., Mary Alice Evans and Allan Hook
1982. Observations on the nests and prey of Australian Bembix sand wasps (Hymenoptera: Sphecidae). Aust. J. Zool. 30:71-80.
- Evans, Howard E. and Allan W. Hook
1982. Communal nesting in the digger wasp Cerceris australis (Hymenoptera: Sphecidae). Aust. J. Zool. 30:557-568.
1982. Communal nesting in Australian Cerceris digger wasps. In: The biology of social insects. Proc. Ninth Congr. Internat. Union Stud. Soc. Insects, Boulder, Colo., Aug. 1982. pp. 159-163.
- Evans, Howard E., Allan W. Hook, and Robert W. Matthews
1982. Nesting behaviour of Australian wasps of the genus Sphex (Hymenoptera, Sphecidae). J. Nat. Hist. 16:219-225.
- Falks, S. J.
1982. Dolichovespula media (Retzius) - a new British social wasp. Proc. Trans. Brit. Ent. Nat. Hist. Soc. 15:14-16. (includes key to British species of Dolichovespula).
- Felton, J. C.
1981. The vice-county distribution of Psenini (Hym., Sphecidae, Pemphredoninae) in Britain, with comments on Kentish species. Ent. Monthly Mag. 117:83-86.
- Ferguson, George R.
1982. Descriptions, synonymy and sex associations in the genus Eucerceris (Hymenoptera: Philanthidae). J. New York Ent. Soc. 90:147-160.
- Finnamore, Albert T.
1982. The Sphecoidea of southern Quebec (Hymenoptera). Lyman Ent. Mus. Res. Lab. Mem. 11. x + 348 p.
- Forsyth, Adrian
1981. Swarming activity of polybiine social wasps (Hymenoptera: Vespidae: Polybiini). Biotropica 13:93-99.
- Gadagkar, Raghavendra and N. V. Joshi
1982. Behaviour of the Indian social wasp Ropalidia cyathiformis on a nest of separate combs (Hymenoptera: Vespidae). J. Zool. 198:27-37.

- Galloway, T. D. and W. B. Preston
 1982. Distribution and occurrence of yellowjackets (Hymenoptera: Vespidae: Vespula spp.) in Manitoba. Can. Ent. 114:79-80.
- Garcia A., Renan J.
 1978. Cuatro estudios sobre avispa sociales del Peru (Hymenoptera: Vespidae). Rev. Peruana Ent. 21:1-22. [posthumus paper].
- Gayubo, S. F.
 1982. Gorytes africanus Mercet, 1905, nueva especie para la fauna Europea (Hymenoptera: Sphecidae). Nouv. Rev. Ent. 12:107-109.
- Genise, Jorge Fernando
 1980. Seleccin de presas en Rubrica nasuta (Christ) (Hymenoptera, Sphecidae). Ecosur 7:15-18.
 1981. Estudios sobre el comportamiento de Bembicini neotropicales II. Selman notatus (Tasch.), Trichostictia guttata (Tasch.) y Editha integra (Burmeister) (Hymenoptera, Sphecidae). Rev. Soc. Ent. Argentina 40:249-262.
 1981. Influencia de factores meteorologicos en la actividad de Prionyx bifoveolatus (Tasch.) (Hymenoptera: Sphecidae). Physis (Secc. C) 39:19-24.
 1981. Observaciones sobre el comportamiento de nidificacion de Stictia arcuata (Burmeister) (Hymenoptera, Sphecidae). Physis (Secc. C) 40:15-17.
 1981. Observaciones sobre el comportamiento de nidificacion de Eremnophila eximia (Lep.) (Hymenoptera, Sphecidae). Ecosur 8:47-49.
 1981. Utilizascion de excrementos de herbivoros en la nidifacion de Penepodium fumipenne (Tasch.) (Hymenoptera, Sphecidae). Ecosur 8:51-52.
 1982. Estudios sobre el comportamiento de Bembicini neotropicales. 1. Bicyrtes simillima (Smith) y Bicyrtes discisa (Tasch.) (Hymenoptera, Sphecidae), con una revision de los tipos de aprovisionamiento den Bembicini. Physis (Secc. C) 40:93-99.
 1982. Comportamiento de desecho de presas en Rubrica nasuta (Christ) y revision de esta actividad en Sphecidae (Insecta, Hymenoptera). Physis (Secc. C) 40:101-109.
- Giri, M. K. and P. H. Freytag
 1982. A new generic placement for Haplogonatopus americanus Perkins (Hymenoptera: Dryinidae). Ent. News 93:121-124.
- Gollner-Scheiding, U.
 1981. In memoriam Dr. Eberhard Konigsmann (1930-1980). Mitt. Zool. Mus. Berlin 57:187-191. [obituary].
- Gorbatovsky, V. V.
 1981. On systematics of Palaearctic Myzininae (Hymenoptera, Tiphidae). Rev. Ent. URSS 60:380-393. [in Russian; new spp. of Meria, Myzinella, Mesa; new synonymy, distribution data].
- Greene, Albert
 1982. Comparative early growth and foraging of two naturally established vespine wasp colonies. pp. 85-89 in: The Biology of Social Insects (Proc. Ninth Congr. Internatl. Union Study Soc. Insects), edit. M. D. Breed, C. D. Michener and H. E. Evans.
- Gusenleitner, J.
 1981. U.-Fam.: Vespoidea, pt. 16k, 13 p. in Catalogus Faunae Austriae.
 1982. Monodynerus gen. n., eine neue Eumenidae-Gattung aus Zentral asien (Hymenoptera, Eumenidae). Entomofauna 3:279-284.
 1982. Revision of palearctic Stenodynerus (Hymenoptera, Eumenidae). Polskie Pismo Ent. 51:209-306.
- Gyorffy, Gy. and L. Moczar
 1981. Malaise trap investigations in inundation, sodic and sandy areas II. Quantitative relations. Acta Biol. Szeged 27:181-193.

Haeseler, Volker

- 1981. Über weitere Hymenoptera Aculeata von der Nordfriesischen Insel Amrum. Schr. Naturw. Ver. Schlesw.-Holst. 51:37-58.
- 1981. Ein von Dolichovespula adulterina (du Buysson) infiziertes Dolichovespula saxonica (Fabricius)-Nest aus Norddeutschland (Hymenoptera: L. Vespidae: Vespinae). Zeitschr. Angew. Zool. 68:437-452.
- 1982. Ameisen, Wespen und Bienen als Bewohner gepflasterter Bürgersteige, Parkplätze und Strassen (Hymenoptera: Aculeata). Drosera 82:17-32.
- 1982. Solitare Wespen und Bienen als Transporteure der Wandernymphen von Uropodiden. Mikrokosmos 8:227-229. [Ectemnius sexcinctus]

Hall, Jack C.

- A new species of Lepidophora Westwood (Diptera: Bombyliidae) from Costa Rica reared from Trypoxylon Latreille (Hymenoptera: Sphecidae). Ent. News 92:161-164.

Hansell, M. H.

- 1982. Brood development in the subsocial wasp Parishnogaster mellyi (Saussure) (Stenogastrinae, Hymenoptera). Insectes Soc. 29:3-14.

Hathaway, Mary A.

- 1982. Polistes gallicus in Massachusetts (Hymenoptera: Vespidae). Psyche 88:169-173.

Heppner, John B. and Gerardo Lamas

- 1982. Acronyms for world museum collections of insects, with an emphasis on neotropical Lepidoptera. Bull. Ent. Soc. Amer. 28:305-315.
- 1982. Dates of selected Lepidoptera literature for the Western Hemisphere fauna. J. Lepid. Soc. 36:87-111.

Hermann, H. R.

- 1979. Insect sociality - an introduction. pp. 1-33 in Hermann, Social Insects, vol. 1, Academic Press.

Hermann, H. R. and Murray S. Blum

- 1981. Defensive mechanisms in the social Hymenoptera, p. 77-197 in: Hermann, Social Insects. Vol. 2, Academic Press.

Hook, A.

- 1982. Notes on nesting behavior of Ectemnius centralis (Cameron) (Hymenoptera: Sphecidae). Ent. News 93:75-76.

Hung, Akey C. F., H. C. Reed, and S. B. Vinson

- 1981. Chromosomes of four species of Polistes wasps (Hymenoptera: Vespidae). Caryologia 34:225-230.

Ishay, J. S., E. Rosenzweig, and V. A. Paniry

- 1982. The genesis of hexagonal cells and the frugality in comb and cell building by social Vespinae (Hymenoptera). Insectes Soc. 29:34-43.

Ishay, Jacob S. and Tamar B. Shimony

- 1982. Changes in the yellow pigment of the oriental hornet, Vespa orientalis, induced by aging, mutations and allopurinol (Hymenoptera: Vespidae). Ent. Gen. 7:317-325.

Jeanne, Robert L.

- 1980. Observacoes sobre limpeza e reutilizacao de celulas em ninhos de vespas sociais (Hymenoptera: Vespidae). Bol. Mus. Paraense Emilio Goeldi, Zool. (101):1-8.
- 1981. Alarm recruitment, attack behavior, and the role of the alarm pheromone in Polybia occidentalis (Hymenoptera: Vespidae). Behav. Ecol. Sociobiol. 9:143-148.
- 1981. Migracao de enxames de vespas sociais: demonstracao de um caminho quimico. Acta Amazonica 11:153-156.

Jellison, William L.

- 1982. Concentrations of mutillid wasps (Hymenoptera: Mutillidae). Ent. News 93:23-24.

Kasuya, Eiiti

- 1981. Nest foundation by a single worker of the Japanese paper wasp Polistes chinensis antennalis (Hymenoptera: Vespidae). Insectes Soc. 28:341-342.

1981. Interdidal drifting of workers in the Japanese paper wasp Polistes chinensis antennalis (Vespidae; Hymenoptera). *Insectes Soc.* 28:343-346.
 1981. Male mating territory in a Japanese paper wasp, Polistes jadwigae Dalla Torre (Hymenoptera, Vespidae). *Kontyu* 49:607-614.
- Khalifman, I. A.
1982. [The flying brigands], 2nd. Edition. *Detskaya Literatura*, Moscow. 319 p. [entirely in Russian. See review of first edition in *Sphecos* 5:27].
- Kimsey, Lynn Siri
1982. A new North American chrysidid genus and redescription of the genus Pseudolopyga Krombein (Elampinae, Hymenoptera). *Pan-Pacific Ent.* 57:351-358. [issued March 15, 1982].
- Kirkbride, Dale M.
1982. A new species of Ammophila from North America (Hymenoptera: Sphecidae). *Pan-Pan. Ent.* 57:457-460.
- Kistner, David H.
1982. The social insects' bestiary. pp. 1-244 in Hermann, Social Insects, vol. 3, Academic Press.
- Kojima, Jun-ichi
1982. Taxonomic revision of the subgenus Icarielia of the genus Ropalidia (Vespidae) in the Philippines. *Kontyu* 40:108-124.
- Krombein, K. V.
1981. The Smithsonian insect project in Sri Lanka 1969-1975. *Spolia Zeylanica* 35:119-135.
 1982. Biosystematic studies of Ceylonese wasps, IX: a monograph of the Tiphidae (Hymenoptera: Vespoidea). *Smithsonian Contrib. Zool.* 374:1-121.
- Kurczewski, Frank E.
1982. An additional study on the nesting behaviors of species of Miscophus (Hymenoptera: Sphecidae). *Proc. Ent. Soc. Wash.* 84:67-80.
- Kurczewski, Frank E. and David J. Peckham
1982. Nesting behavior of Lyroda subita (Say) (Hymenoptera: Sphecidae). *Proc. Ent. Soc. Wash.* 84:149-156.
- Leclercq, Jean
1981. A propos de etiquettes de provenance dans les collections d'insectes. *Natura Mosana* 33:187-189.
 1981. Crabroniens du genre Crabro Fabricius trouves en Amerique latine (Hymenoptera, Sphecidae). *Bull. Rech. Agron. Gembloux* 16:77-78.
 1981. Podagrirus (Chilichuca) brieri n. sp. et 27 autres especes de Podagrirus de l'Amerique du Sud (Hymenoptera, Sphecidae, Crabroninae). *Ann. Soc. Roy. Zool. Belgique* 111:65-88. [includes key to species].
 1981. Deux autres crabroniens du genre Isorhopalum Leclercq (Hymenoptera, Sphecidae). *Bull. Ann. Soc. Roy. Belge Ent.* 117:177-178.
 1982. A propos de la guepe fousseuse evoquee par Marcel Proust. *Mitt. Schweiz. Ent. Ges.* 54:321-324.
- Legner, E. Fred, Gordon Gordh, A. Silveira-Guido and Max Badgley
1982. New wasp may help control navel orangeworm. *California Agric.* 36:4-5. (Goniozus legneri Gordh discussed)
- Lelej, A. S.
1982. Wasps of the genus Pseudophotopsis Andre, 1896 (Hymenoptera, Mutillidae) from the USSR and neighboring countries. *Ent. Rev.* 59:112-127. [English translation of Russian article].
- Lomholdt, Ole
1982. On the origin of the bees (Hymenoptera: Apidae, Sphecidae). *Ent. Scandinavica* 13:185-190. [Suggests one superfamily, Sphecoidea, for bees and sphecids; suggests one family, Apidae, for bees, and two families, Sphecidae and Larridae, for the sphecids - see review on p.].
- Makino, Shun'ichi
1982. Nest structure, colony composition and productivity of Dolichovespula media media and D. saxonica nipponica in Japan (Hymenoptera, Vespidae). *Kontyu* 50:212-224.

- Makino, Shun'ichi and Shigeyuki Aoki
1982. Observations on two polygynic colonies of Polistes biglumis in Hokkaido, northern Japan (Hymenoptera, Vespidae). Kontyu 50:175-182.
- Matthews, Robert W., Kenneth G. Ross, and Roger A. Morse
1982. Comparative development of queen nests of four species of yellowjackets (Hymenoptera: Vespidae) reared under identical conditions. Ann. Ent. Soc. Amer. 75:123-129.
- Matthey, Robert
1982. Prof. Dr. Jacques de Beaumont: Quelques souvenirs. Mitt. Schweiz. Ent. Ges. 54:313-315. [Some biographical remarks on the occasion of de Beaumont's 80th birthday].
- McCarthy, Joyce
1982. Insect sting poses serious threat to those allergic to venom. NIH Record, July 20, 1982, p. 4.
- Mikkola, Kauri
1982. Diagnostic insect pins: some problems of the Linnaean insect collection solved. Linnean Soc. London "News Items Summer 1982", pp. 3-6.
- Moczar, L.
1981. New Sulcomesitius and Heterocoelia species from SE Asia (Hymenoptera: Bethyridae). Acta Zool. Acad. Sci. Hungaricae 27:355-367.
- Moczar, L. and Gy. Gyorffy
1981. Malaise trap investigations in inundation, sodic and sandy areas I. Qualitative relations. Acta Biol. Szeged 27:169-179.
- Nambu, T.
1982. On the nests of Argogorytes nipponis Tsuneki. Spec. Publ. Japan Hymen. Assoc. (22):22-23, 21.
- Nascimento, Paulo T. R. and W. L. Overal
1980. Catalogo da colecao entomologica do Museu Goeldi. Hymenoptera: Sphecidae. Bol. Mus. Paraense Emilio Goeldi (n.s.) Zool. (99):1-14. (lists of sphecids in collection)
- Nazarova, Sh. and Sh. B. Baratov
1982. The predatory wasps (Hymenoptera: Sphecidae, Vespidae) of Tadzhikistan and their role in regulating the numbers of Tabanidae. Ent. Rev. 60:95-101. [English translation of Russian article published in 1981].
- Ndoye, M.
1980. Goniozus procerae Risbec (Hymenopteres, Bethyridae) ectoparasite larvaire d'Acigona ignefusalis Hampson (Lepidopteres, Pyralidae, Crambinae). Bull. Inst. Fondam. Afrique Noire 42:394-400.
- Nelson, J. M.
1981. Further observations on aculeate Hymenoptera from the Isle of Man. Ent. Monthly Mag. 117:145-146.
- Nelson, John M.
1982. External morphology of Polistes (paper wasp) larvae in the United States. Melanderia 38:1-29.
- Nixon, G. E. J.
1982. Colony failure in the hornet (Vespa crabro L.) (Hym., Vespidae). Ent. Monthly Mag. 117:241-244.
- O'Brien, Mark F. and Frank E. Kurczewski
1982. Nesting and overwintering behavior of Liris argentata (Hymenoptera: Larridae). J. Georgia Ent. Soc. 17:60-68.
1982. Further observations on the ethology of Alysson conicus Provancher (Hymenoptera: Sphecidae). Proc. Ent. Soc. Wash. 84:225-231.
- Oda, T., A. Mori, K. Fujita, L. Monkada, T. Tachikawa, and S. Tanaka
1981. A case of the sting of a parasitic wasp, Sclerodermus sp. (Hymenoptera: Bethyridae). Trop. Med. 23:213-216. [in Japanese with English summary].
- Oehlke, J.
1981. Zu entomologischen Sammelergebnissen im Bezirk Cottbus (Hymenoptera). Biol. Stud. Kreis Luckau 10:58-59.

1982. Dr. sc. nat. Eberhard Konigsmann (1930-1980). Ent. Nach. Bericte 26:46-47. (obituary with photo).
1982. Zur Unterscheidung der Arten Mimesa caucasica Maidl und tenuis Oehlke (Hym. Specidae, Psenini). Ent. Nach. Berichte 26:57-58.
- Overall, W. L.
1982. Acoustical behavior and variable nest architecture in Synoeca virginea (Hymenoptera, Vespidae). J. Georgia Ent. Soc. 17:1-4.
- Packer, L.
1981. Crossocerus distinguendus (Morawitz) (Hym., Sphecidae), a crabronine wasp new to Britain. Ent. Monthly Mag. 117:97-98.
- Pamilo, P., A. Pekkarinen, and S.-L. Varvio-Aho
1981. Phylogenetic relationships and the origin of social parasitism in Vespidae and in Bombus and Psithyrus as revealed by enzyme genes. pp. 37-48 in: Howse and Clement, Biosystematics of social insects. System. Assoc. Spec. Vol. 19.
- Pardi, L. and S. Turillazzi
1981. Behavior and social organization of Parischnogaster nigricans serrei (du Buysson) (Hymenoptera, Vespoidea). Monitore Zool. Ital. 15:322-323.
- Parrish, M. D.
1982. Success of an immigrant yellow-jacket Vespula germanica and its relation to the eastern yellow-jacket Vespula maculifrons (Hymenoptera, Vespidae). Bull. New Jersey Acad. Sci. 26:58.
- Parrish, Mark D. and Radclyffe B. Roberts
1982. Successful establishment of the german yellowjacket in urban New Jersey indicated by relative abundance of Vespula germanica and V. maculifrons (Hymenoptera: Vespidae). J. Kansas Ent. Soc. 55:272-276.
- Pekkarinen, Antti
1982. Eumenes species in eastern Fennoscandia (Hymenoptera, Eumenidae). Not. Ent. 62:43-50.
- Petit-Wonek, J.
1981. Chronique de la Montagne Saint-Pierre, VI. Chrysis immaculata R. du Buysson, une espece nouvelle pour la faune belge (Hymenoptera - Chrysididae). Rev. Vervietoise Hist. Nat. 38:26-30.
- Ponomarenko, N. G.
1981. Dryinidae (Hymenoptera) of the fauna of Sri Lanka. Rev. Ent. URSS 60:879-882. [in Russian, contains new species].
- Post, David C.
1981. Observations on female nesting and male behavior of Stictia signata (Hymenoptera, Sphecidae) in Brazil. Rev. Biol. Trop. 29:105-113.
- Post, David C. and Robert L. Jeanne
1982. Sternal glands in three species of male social wasps of the genus Mischocyttarus (Hymenoptera: Vespidae). J. New York Ent. Soc. 90:8-15.
- Pratte, M., C. Strambi, J. Gervet and A. Stambi
1982. Parametres physiologiques et ethologiques dans un guepier de Polistes gallicus L. Insectes Soc. 29:383-401.
- Pulawski, Wojciech J.
1982. New synonyms in Old World Sphecidae (Hymenoptera). Mitt. Schweiz. Ent. Ges. 54:363-366.
1982. New species of North American Tachysphex wasps (Hymenoptera, Sphecidae). Proc. Calif. Acad. Sci. 43:27-42.
- Rack, G.
1980. Eine neue Milbe (Acarina, Pygmephoridae) von Priocnemis apogonus (Hymenoptera, Pompilidae) aus Chile. Folia Ent. Hungarica 41:329-332.
- Radovic, Ivica T., Miloje D. Krunic, and Miloje M. Brajkovic
1982. New and little-known species of digger wasps (Sphecidae, Hymenoptera) in the fauna of Yugoslavia. Bull. Acad. Serbe Sci. Arts, Classe Sci. Math. Nat. 80:27-34.

Richards, O. W.

1982. A revision of the genus Belonogaster de Saussure (Hymenoptera: Vespidae). Bull. Brit. Mus. (Nat. Hist.), Ent. 44:31-114.

Roig, Arturo Alsina

1981. Revision del genero Entypus Dahlbom en la Argentina (Hymenoptera: Pompilidae). Rev. Soc. Ent. Argentina 40:311-336. [possibly published 1982]

Ross, Kenneth G.

1982. Gastral vibrations in laboratory Vespula vulgaris and V. maculifrons colonies (Hymenoptera: Vespidae). Fla. Ent. 65:187-188.
1982. Pedicel breakage and secondary initiations in laboratory yellowjacket queens (Hymenoptera: Vespidae). Fla. Ent. 65:189-190.
1982. Atypical yellowjacket nests initiated in the laboratory (Hymenoptera: Vespidae). J. Kansas Ent. Soc. 55:563-567.

Ross, Kenneth G. and Robert W. Matthews

1982. Two polygynous overwintered Vespula squamosa colonies from the southeastern U.S. (Hymenoptera: Vespidae). Fla. Ent. 65:176-184.

Ross, Kenneth G., Robert W. Matthews and Roger A. Morse

1981. Laboratory culture of four species of yellowjackets, Vespula spp. Foundress nest initiation. Ann. Ent. Soc. Amer. 74:247-254.

Rubink, W. L.

1982. Spatial patterns in a nesting aggregation of solitary wasps: evidence for the role of conspecifics in nest-site selection. J. Kansas Ent. Soc. 55:52-56.

Saini, Malkiat S., Surjit S. Dhillon and Satwant Kaur

1981. Comparative morphology of the poison apparatus in some apocritan families of Hymenoptera. Rev. Brasil. Biol. 41:371-377.

Sanborne, P. M.

1982. Ptychoneura (Diptera) eggs on the thorax of adult Rhopalum clavipes (Hymenoptera: Sphecidae) in North America. Can. Ent. 114:279-280.

Schembri, Stephen P.

1980. Vespoidea from the Maltese Islands. Boll. Soc. Ent. Italiana 112:90-93.

Schmidt, Justin O.

1982. Biochemistry of insect venoms. Ann. Rev. Ent. 27:339-368.

Schmidt, Konrad

1981. Materialien zur Aufstellung einer Roten Liste der Sphecidae (Grabwespen) Baden-Württembergs. III. Oxybelini, Larrinae (ausser Trypoxylon), Astatinae, Sphecinae und Ampulicinae. Veroff. Naturschutz Landschaftspflege Bad.-Württ. 53/54:155-234.

Shcherbakov, D. E.

1981. Morphology of pterothoracal pleura in Hymenoptera. 2. Modifications of the groundplan. Zool. Zhurnal 60:205-213. [in Russian with English summary].

Skytte, Toke

1982. Giftbrodhvæpse og myrer. Natur og Museum 21(2):20-22.

Snelling, Roy R.

1981. Systematics of social Hymenoptera. pp. 369-453 in Hermann, Social Insects, vol. 2, Academic Press.

Soika, A. Giordani

1982. Revisione del genere Pseudodontodynerus Bl. (Hym., Eumenidae). Mitt. Schweiz. Ent. Ges. 54:415-420.

Starr, C. K.

1979. Origin and evolution of insect sociality: a review of modern theory. pp. 35-79 in Hermann, Social Insects, vol. 1, Academic Press.

Steiner, Andre L.

1981. Digger wasp predatory behavior (Hymenoptera, Sphecidae). IV. Comparative study of some distantly related Orthoptera-hunting wasps (Sphecinae vs. Larrinae), with emphasis on Prionyx parkeri (Sphecini). Z. Tierpsychol. 57:305-339.

1982. Anti-predator strategies. II. Grasshoppers (Orthoptera, Acrididae) attacked by Prionyx parkeri and some Tachysphex wasps (Hymenoptera, Sphecinae and Larrinae): a descriptive study. *Psyche* 88:1-24.
- Suzuki, Tadashi
1981. Male production by foundresses of Polistes chinensis antennalis (Hymenoptera, Vespidae) in the founding stage. *Kontyu* 49:519-520.
 1981. Effect of photoperiod on male egg production by foundresses of Polistes chinensis antennalis Perez (Hymenoptera, Vespidae). *Jap. J. Ecol.* 31:347-351.
- Takamizawa, Kesao
1981. Ecological notes on Vespula schrencki Radoszkowski (Hymenoptera, Vespidae) in Minamisaku, Nagano-pref. *New Entomologist* 30:55-61.
 1981. Mass hibernation of Polistes snelleni (Hymenoptera: Vespidae). *New Entomologist* 30:61.
 1981. Data for nests of Vespula shidai Ishikawa, Sk. Yamane et Wagner taken mid September and early November, Nagano-pref. (Hymenoptera, Vespidae). *New Entomologist* 30:62-63.
 1981. Notes on the nesting habits of Dolichovespula media sugare Ishikawa (Hymenoptera, Vespidae). *New Entomologist* 30:89-93.
- Townes, Henry and Marjorie
1982. A description of the Townes Collection of Hymenoptera. Pamphlet published by Townes, Ann Arbor, Mich. [American Entomological Institute] 12 p. [interesting general history and composition of this important Hymenoptera collection, including numbers of holotypes in each family and their authors].
- Tsuneki, K.
1981. Revision of the Trypoxylon species of Japan and northeastern part of the asiatic continent, with comments on some species of Europe (Hymenoptera, Sphecidae). *Special Public. Japan Hymen. Assoc.* (17):1-92. [includes key to species].
 1981. Tentative grouping of the Trypoxylon species based upon the structure of the male genital organs with appendix of the distribution table (Hymenoptera, Sphecidae). *Special Public. Japan Hymen. Assoc.* (18):1-100. [discussion of species groups with keys to them].
 1982. Sphecidae collected by the Noona Dan Expedition to the Bismarck and Solomon Archipelagoes (Hymenoptera). *Special Public. Japan Hymen. Assoc.* (19):1-58. [includes key to Liris species of Pacific islands].
 1982. Sphecidae from North Korea (II) with the list of the species of the family known from the Korean Peninsula (Hymenoptera). *Special Public. Japan Hymen. Assoc.* (20):1-22. [includes list of species known from Korea].
 1982. Successive observation on the nest constructing activities of the solitary diplopterous wasp, Eumenes decoratus F. Smith, with its later process (Hymenoptera). *Spec. Publ. Japan Hymen. Assoc.* (21):1-17.
 1982. Successive observations on the life of Gorytes tricinctus Perez with special reference to the cocoon building behaviour of the larval wasps. *Spec. Publ. Japan Hymen. Assoc.* (22):1-21.
 1982. Two new species of Cleptes from Thailand and Formosa (Hymenoptera, Chrysidae). *Spec. Publ. Japan Hymen. Assoc.* (23):1-2.
 1982. A new species of Scoliidae from Japan (Hymenoptera). *Spec. Publ. Japan Hymen. Assoc.* (23):3-5.
 1982. Sphecidae of the Sauter's Formosa Collection preserved in the Ubersee-Museum at Bremen, with taxonomic notes on some species (Hymenoptera). *Spec. Publ. Japan Hymen. Assoc.* (23):6-14.
 1982. Studies on the new material of Sphecidae, Chrysidae and Mutillidae of Formosa and the southern Ryukyus (Hymenoptera). *Spec. Publ. Japan Hymen. Assoc.* (23):15-45.

1982. Sphecidae and Scoliidae collected by Dr. K. Baba in the southern Ryukyus (Hymenoptera). Spec. Publ. Japan Hymen. Assoc. (23):46-52.
 1982. A referenced list of the species of the Sphecidae, Chrysididae, Scoliidae and Mutillidae hitherto known from the Ryukyu Archipelago, with the distribution table (Hymenoptera). Spec. Publ. Japan Hymen. Assoc. (23):53-77.
 1982. Cerceris yuwanensis sp. nov. from the island Amami-Oshima, the Ryukyus (Hymenoptera, Sphecidae). Spec. Publ. Japan Hymen. Assoc. (23):77-78.
- Turillazzi, S. and R. Cervo
1981. Territorial behavior in male Polistes nimpha (Christ) (Hymenoptera, Vespidae). Monitore Zool. Ital. 15:325-326.
 1982. Territorial behavior in males of Polistes nimpha (Christ) (Hymenoptera, Vespidae). Z. Tierpsychol. 58:174-180.
- Turillazzi, S. and A. Conte
1981. Temperature and caste differentiation in laboratory colonies of Polistes foederatus (Kohl) (Hymenoptera, Vespidae). Monit. Zool. Ital. 15:275-297.
- Turillazzi, S., M. T. Marino Piccioli, L. Hervatin and L. Pardi
1981. Differences in the reproductive potential of associated and solitary Polistes gallicus (L.) foundresses (Hymenoptera, Vespidae). Monit. Zool. Ital. 15:326.
- Urbani, Cesare Baroni
1979. Territoriality in social insects, pp. 91-120 in Hermann, Social Insects, vol. 1, Academic Press.
- van der Vecht, J.
1981. Studies of Indo-Australian solitary wasps (Hymenoptera, Vespoidea, Eumenidae). Proc. Konink. Nederl. Akad. Wetensch. (C)84:443-464. [includes key to species of Oriental Alastor].
 1982. Paraliris, an Oriental genus of mite bearing larrine wasps (Hym., Sphecidae, Larrinae). Mitt. Schweiz. Ent. Ges. 54:357-361.
- Vaskov, E. L.
1981. On ecology of Scleroderma turkmenicum Mam. et Krav. (Hymenoptera, Bethyridae) parasitizing trunk pests. Rev. Ent. URSS 60:761-764. [in Russian with English summary].
- Verdcourt, B.
1981. Cerceris arenaria (L.) (Hym., Sphecidae) on Kew Green, Surrey. Ent. Monthly Mag. 117:30.
 1982. Gorytes bicinctus (Rossius) (Hym., Sphecidae) at Kew. Ent. Mon. Mag. 118:99.
- Vestergaard, D. A.
1981. Waarnemingen van interessante Hymenoptera in Nederland. Ent. Berich. 41:113-116.
- Walther, Joachim R.
1981. Cuticular sense organs as characters in phylogenetic research. Mitt. Deutsch. Ges. Allg. Angew. Ent. 3:146-150.
- Ward, Gertrude L.
1971. The comparative ethology of coexisting mud dauber species (Hymenoptera: Sphecidae). Ph.D. thesis, Purdue University, ix + 102 p. University Microfilms facsimile #71-2708.
- Wheeler, G. C. and J. Wheeler
1979. Larvae of the social Hymenoptera, pp. 288-338 in Hermann, Social Insects, vol. 1, Academic Press.
- Wheeler, J. W., F. O. Ayorinde, A. Greene, and R. M. Duffield
1982. Citronellyl citronellate and citronellyl geranate in the European Hornet, Vespa crabro (Hymenptera, Vespidae). Tetrahedron Letters 23:2071-2072.
- White, K. M.
1982. Ectemnius borealis (Zetterstedt) (Hym., Sphecidae): 1938 first true occurrence in Britain. Ent. Mon. Mag. 118:109.

- Willink, A. and Maria del V. Ajmat de Toledo
1980. Una nueva especie de Gayella (Hym., Masaridae: Gayellinae). Acta Zool. Lilloana 35:427-434.
- Wilson, S. W. and J. E. McPherson
1981. Life histories of Acanalonia bivittata and A. conica with descriptions of immature stages. Ann. Ent. Soc. Amer. 74:289-298. [mentions dryinids as parasitoids].
1981. Life histories of Anormenis septentrionalis, Metcalfa pruinosa and Ormenoides venusta with descriptions of immature stages. Ann. Ent. Soc. Amer. 74:299-311. [mentions dryinids as parasitoids].
- Wolf, Heinrich
1981. Wegwespen (Hymenoptera: Pompilidae) aus der Mongolei. Mitt. Zool. Mus. Berlin 57:193-211.
1982. Eine neue Art der Gattung Claveliocnemis Wolf, 1968 (Hym., Pompilidae). Mitt. Schweiz. Ent. Ges. 54:341-343.
- Yamane, Seiki
1981. Notes on eumenid wasps from Japan and its adjacent regions (Hymenoptera: Vespoidea) (V). Trans. Shikoku Ent. Soc. 15:221-225.
1982. Notes on eumenid wasps from Japan and its adjacent regions (Hymenoptera: Vespoidea) (IV). New Ent. 31:9-14. (in Japanese, includes key to Japanese genera of Eumenidae).
- Yamane, Seiki and Jun-ichi Kojima
1982. Pseudonomadina new genus, with a description of a new species from the Philippines (Hymenoptera, Trigonalidae). Kontyu 50:183-188. [parasitization of Ropalidia flavobrunnea discussed.]
- Yamane, Seiki and Takao Okazawa
1981. Mature larvze of some polistine wasps from Papua New Guinea and Fiji, with notes on larval characters of the Old World and Oceanian Polistinae (Hymenoptera: Vespidae). Repts. Fac. Sci. Kagoshima Univ. (Earth Sci. Biol.) (14):65-75.
- Yukinari, Masaaki
1981. Notes on biology of Archippus semistructus Meyrick (Lepidoptera: Tortricidae) and its parasites in Tokushima Prefecture. Jap. J. Appl. Ent. Zool. 25:127-129. [Bethyloid parasitoid - Goniozus].

