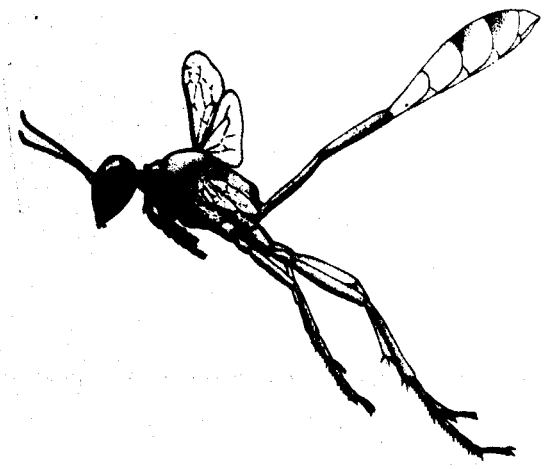
SPHECOS



A Newsletter for Aculeate Wasp Researchers
Arnold S. Menke, editor

Number 1 - October 1979

Dear Colleague:

For some time I have wanted to establish a newsletter for aculeate wasp workers so that all of us could be kept up to date on current research, publications, and news items that are not particularly appropriate for scientific journals. Such awareness should encourage cooperation and make it easier to offer help, and at the same time avoid duplication of research efforts. Sphecos can serve as a forum for ideas, notes, progress reports and needs. It can make graduate student research known to professionals, and it can bridge the bibliographic gap which has resulted in the backlog at Zoological Record.

I envision Sphecos as covering research on aculeate or stinging wasps, that is the traditional groups Chrysidoidea (= Bethyloidea), Scolioidea, Vespoidea, Pompiloidea and Sphecoidea, but excluding the ants, and of course, bees. I hope that two issues can be produced each year, at least initially. Some may object to the name Sphecos for the newsletter because it suggests the family Sphecidae, but the word is Greek for wasp and any other connotation is in the mind of the reader.

Several other specialized Hymenoptera newsletters are already being produced, and I list them here for your information:

Proctos edited by Lubomir Masner, Biosystematics Research Institute, Agriculture Canada, Ottawa, Canada K1A 0C6 (proctotrupoid research news).

Ichnews edited by M. G. Fitton and I. D. Gauld, Dept. of Entomology, c/o British Museum (Nat. Hist.) and Commonwealth Institute of Entomology, c/o British Museum (Nat. Hist.), respectively (ichneumonid research news).

Polistine Information Bulletin edited by C. K. Starr and J. W. Krispyn, Dept. of Entomology, Univ. of Georgia, Athens, Ga. 30602 (research news on social vespids of the subfamily Polistinae).

I am also aware of two sources for current literature in Hymenoptera. One is a yearly list of literature on the Sphecidae produced by and available from W. J. Pulawski, Zoological Museum, Sienkiewicza 21, 50-335 Wroclaw, Poland. The other is a yearly survey of Hymenoptera literature broken down by superfamilies. It is compiled by K. Tsuneki and is published in occasional issues of Hymenopterist's Communication, a Japanese journal available from Tsuneki (Asahigaoka-Danchi 4-15, Mishima, Shizuoka Pref., Japan 411.

This first issue of Sphecos gives an idea of the type of information that can be disseminated, and the style and format. Since Sphecos is informal almost anything that someone wants to send to me can be included. Some of the more obvious general subject areas are: editor's comments; news items (research progress reports, special items of interest, etc.); help needed (specimens, literature, etc.); people in the news (new addresses, deaths, new positions, etc.); nomenclature (recent ICZN actions, new petitions, important name changes, etc.); collections and types (museum profiles, new acquisitions, discovery of lost material, etc.); travel and collecting reports; meetings (summaries, announcements); profiles of workers (autobiographical sketches of scientists); exchanges (literature, specimens); current literature.

A preliminary survey of about 40 people around the globe elicited the following suggestions on content: "current research projects, museum news, job opportunities, current literature, exchange of material, field observations, reports of field work, list of subscribers and their interests (what about a short biography with photo of each specialist?), reviews, biological notes, collecting techniques, new prey records, new introductions, range extensions, autobiographies, dates of publication, points of view a la Systematic Zoology, biographical sketches of early workers, curatorial techniques, obituaries, a nude on each fourth page, reports of meetings, feature articles, any items that enliven the minds of wasp afficionados: problems, who is doing what, who needs what, etc."

From here on the success or failure of Sphecos will depend largely on YOUR contributions - this newsletter is a joint responsibility. It is not my desire or intention to make Sphecos a personal sounding board. My employment with the United States Department of Agriculture and location at the National Museum of Natural History keeps me closely in touch with many workers and their research, as well as with three of the best libraries in the world. Hence I have a better than average awareness of who is doing what and a good familiarity with current literature. Thus I am well suited to serve as editor of Sphecos. It is my intention to compile the "current literature" section of Sphecos, but the rest of the contents of the newletter must come from the readers.

When submitting material for inclusion in Sphecos PLEASE WRITE IT IN FINAL FORM, that is, ready for me to insert into the next issue without editing. I do not have the time to rewrite poor English (except in the case of foreign correspondents) or to clarify or interpret your statements. Essentially that means that submitted material will be reproduced as is. Embarrassments will remain your responsibility, not mine. Material can be submitted in languages other than English, but the latter is preferred. I will probably reject outright anything submitted that will require a great deal of rewriting.

Finally I would like to acknowledge the help of a number of people in producing this first issue. Pat Espenshade handled a large amount of the preliminary typing. Sue Hevel helped with the literature section, and Eric Grissell was of considerable help in the organization of this first issue. The newsletter logo, a species of Ammophila in flight, was drawn by Linda Lawrence.

EDITOR'S COMMENTS

This first issue of Sphecos is being sent to as many specialists around the world as possible, the mailing list being derived from my own

as well as those of several colleagues and other sources. Most of you, especially in the Old World and Latin America, should be able to provide me with additional names and addresses of scientists and students who should receive Sphecos, and provision has been made on the questionnaire at the end of this first issue for this information. After these sheets have been returned to me it should be possible to produce a list of the names and addresses of all scientists and students receiving Sphecos, along with a brief summary of their specific interests and research areas. This DIRECTORY will be distributed with a future issue of Sphecos. Several colleagues have suggested that the directory of aculeate wasp workers include photographs and short biographies. This would allow many of us to see what our correspondents look like and to learn something about their background. Whether or not the directory can be expanded to include this information will depend upon you. You will be reminded to send in photos and biographical data on the questionnaire. Sufficient quantities of this first issue of Sphecos have been printed so that I can send it to all researchers subsequently brought to my attention by recipients of the initial mailing.

For those of you that have wanted to obtain a copy of the long out of print book "Composition of Scientific Words" by Brown I have good news. The Smithsonian Institution Press has reprinted this extremely useful name coining tool and is selling it for only $12.50. Copies can be obtained by writing to: Publications Sales, Smithsonian Institution Press, 1111 North Capitol Street, Washington D C 20560.

A. P. Rasnitsyn's Russian book on the "Origin and Evolution of the Lower Hymenoptera" published in 1969 (Trudy Paleon. Inst., vol. 123) has been translated into English. Those of you wishing to have a copy (free) should write to Sue Gorman, SEA-IPS-USDA, Room 400 CB-1, Hyattsville, Md. 20782. Simply give her the author and title, and you must also give her the following code number: TT 75-52148 and mention that this is a Russian translation. Please do not request this translation unless you genuinely can use it. It is over 300 pages and the USDA cannot supply endless copies.

"The genus Tiphia of the Indian Subcontinent" by Harry W. Allen: anyone that has need for this 1975 paper should contact Menke. Several hundred copies of the work are stored outside my office. They are free for the asking.

I also have a fairly large supply of two of F. X. Williams' sphecid papers and will provide copies of "The wasps of the genus Plenoculus" (1960), and "The wasps of the genus Solierella in California" (1950) to anyone that can make good use of them.

Inaccurate dates on journals is a serious problem that still persists today. Certain scientific journals (Psyche, Bull. Rech. Agron. Gembloux, Boll. Mus. Civ. Stor. Nat. Venezia, and some South American journals, for example) are sometimes issued with the incorrect year of publication on their covers. In some cases this is because the last issue for a particular year (say 1972 for example) is not printed until the succeeding year (1973), but the previous year (1972) is usually found on the cover. The problems this poses in nomenclature are obvious because of the law of priority. Although some journals eventually print the true dates of issue for the numbers of a volume in the first issue of the next volume, this information may not be available or easily obtained by a person who simply receives a reprint or separate from an author.

Often such reprints bear the same erroneous year of publication, or in some cases, a compound year, 1972-1973, for example. I have seen cases where the true date of publication for a volume bearing a compound date was a year beyond the second one listed (see Rubio in current literature for an example). Author's of papers usually are aware of the true year of publication. It requires very little effort and time to write the correct date of issue on reprints before they are distributed, and I urge all authors that have taxonomic papers published in journals that are erroneously dated to take the time to insure that the true date of issue is indicated on their reprints. Authors should send one copy of such reprints to the editors of Zoological Record so that the correct year of publication can be included in that index. I would also urge editors that read this message to consider having the true date of issue printed on author's separates, as is now standard practice with many U.S. journals such as Proc. Ent. Soc. Washington. Another step that journals can take, at least those that are issued quarterly, is to publish the numbers in January, April, July and October, rather than March, June, September, and December. This allows plenty of time at the end of the year to get out the last issue so that it does not run over to the next year.

NEWS REPORTS

Karl Krombein, U. S. National Museum of Natural History, Washington DC 20560, has announced publication of Volumes 1 and 2 of Catalog of Hymenoptera in America North of Mexico by the Smithsonian Institution Press (Congratulations Karl!!). The Catalog is a collaborative undertaking by Krombein, P. D. Hurd, Jr., and C. F. W. Muesebeck of the Smithsonian, B. D. Burks, R. W. Carlson, E. E. Grissell, and P. M. Marsh of the U. S. Department of Agriculture, and G. Gordh, University of California, Riverside. Volume I (pp. 1-1198) contains Symphyta and Apocrita (Parasitica), and Volume 2 (pp. 1199-2209) contains Apocrita (Aculeata). This revised edition features much more extensive coverage than the 1951 Catalog. It contains complete lists of hosts, prey, parasites of Aculeata, pollen and nectar sources, and predators; most references to biological or taxonomic literature are annotated as to content. It is anticipated that Volume 3 (pp. 2211-2735) will be published later this year; it will contain separate indexes to the taxa of Hymenoptera, and to their hosts, prey, parasites, predators, and pollen and nectar sources.

Distribution of Volumes 1 and 2 to hymenopterists has been delayed until several imprinting errors or omissions on the binding have been corrected. In spite of these defects the Government Printing Office distributed the first two volumes to 825 Government depository libraries during June and July. Many of the depositories, such as law libraries, will have no use for the publication. Krombein suggests that Museum and University entomology libraries ascertain the location of Government depository libraries in their areas and try to have these sets of the Catalog transferred so they will be readily available to specialists.

Krombein has begun publication of a series of biosystematic studies of certain groups of Ceylonese wasps. Contributions on Scoliidae, Ampulicidae, Sclerogibbidae, and Amiseginae have been completed (see current literature), and Karl is working currently on Tiphiidae and Philanthidae (Philanthus and Cerceris). He would welcome the loan of specimens from Sri Lanka or South India only in any of the groups men-

tioned.

Arnold Menke has completed a review of the genera and species of the sphecid tribe Scapheutini with the help of Colin Vardy, British Museum (Natural History), Cromwell Road, London SW7 5BD. A paper by Menke on the species of the Australian sphecid genus Larrisson is due out shortly in the Australian Journal of Zoology.

The privately published papers of A. A. Girault are being reprinted along with a biography and index to all taxa in a 400 page volume in the Mem. Amer. Ent. Institute series. It should be available in mid October. Although these 64 papers deal primarily with parasitic Hymenoptera, Girault did describe a few aculeate wasps in them. This volume was prepared by Gordon Gordh and Jack Hall, University of California, Riverside, Ted Dahms, Queensland Museum, Brisbane, and Arnold Menke.

Hal C. Reed (graduate student), Dept. of Entomology, Washington State Univ., Pullman, Wash. 99164, is studying the colony behavior of Vespula acadica and its obligate social parasite, V. austriaca. Hal's masters thesis dealt with the nesting ecology of Polistes wasps in an urban area, including such factors as nest microhabitat, nest site selection and brood parasites. This research is now in press.

Henry Townes, 5950 Warren Road, Ann Arbor, Mich. 48105, is revising the Plumariidae.

Mark F. O'Brien (graduate student), Dept. of Entomology, SUNY College of Environmental Science and Forestry, Syracuse, N.Y. 13210, is studying the comparative behavior of ground nesting sphecids. He is also studying trap nesting wasps in the northern New York area.

Roger Akre, Dept. of Entomology, Washington State University, Pullman, Wash. 99164, is "engaged in trying to locate the possible source of the queen pheromone of yellowjackets (specifically Vespula). We have some evidence that the pheromone may be produced in on of the many glands of the head and are using crude aqueous extracts of queen heads fed to larval and adult wasps to determine if worker ovariole development is inhibited. If so, we will try to further identify the specific gland producing ;the pheromone, and it temporal activity."

"Other studies include the study of mauling (social dominance?) in colonies of V. vulgaris and several other species to determine the possible function of this behavior (inhibit worker ovariole development?). We have data from 3 years of study and hope to publish this information sometime in the fall of 1979".

"We have found the host of Vespula austriaca, and intend to study interactions between this social parasite and its hosts. Other studies on social parasitism being pursued include studies of Dolichovespula arctica and the possible function of the large Dufour's gland in this social parasite".

"We are also gathering biological and behavioral data on D. maculata to supplement Al Greene's study at the University of Maryland (to keep him honest)."

Akre is also revising a paper on the ultrastructure of several vespine glands (V. pensylvanica queens) which will be submitted to the Ann. Ent. Soc. Amer., and is currently working on a social wasp chapter

for H. Hermann's 3 volume work on the social insects. Akre's handbook, "Yellowjackets of America North of Mexico" went to press earlier this year as a USDA publication. This handbook contains illustrated keys to pest species, sections on biology, economic and medical importance, control, and treatment of stings. Availability date unknown.

Jim Carpenter (graduate student), Dept. of Entomology, Cornell University, Ithaca, N.Y. 14850, is working on the systematics of the eumenid genus Ancistrocerus of the world. Jim is also studying the nesting ecology and behavior of twig nesting aculeates in the Ithaca area, primarily eumenids in the genera Ancistrocerus, Euodynerus, Parancistrocerus and Symmorphus. Currently he is studying temporal changes in mortality and resource partioning.

Paul Freytag, Dept. of Entomology, Univ. of Kentucky, Lexington, Kentucky 40546, is presently working on the biological control of Graminella nigrifrons (Cicadellidae) using the dryinid Gonatopus bicolor.

Gordon Gordh, Division of Biological Control, Univ. of California, Riverside, Calif. 92521 has the following projects underway: 1) Scanning Electron Microscope studies of microsculpture in the Hymenoptera (about 900 micrographs have been prepared); 2) biology of two species of Goniozus.

K. Tsuneki, Asahigaoka-Danchi 4-15, Mishima, Shizuoka pref., Japan 411, is continuing his studies on the taxonomy of the Oriental species of Trypoxylon. He has just completed the species of Sri Lanka, and is now working on the Javanese and Sumatran forms.

Eric Grissell, Systematic Entomology Laboratory, USDA, c/o U. S. National Museum of Natural History, Washington DC 20560, has submitted the following paper for publication in the Journal of the Kansas Entomological Society: "Nesting behavior of Prionyx 'thomae' (Fabricius) (Hymenoptera, Sphecidae)."

Wojciech ("Woj") Pulawski, Museum of Natural History, Sienkiewicza 21, 50-335 Wroclaw, Poland, is continuing his revision of the North American species of the sphecid genus Tachysphex. He is also working on a revision of the sphecid genus Gastrosericus, and spent two weeks in Leningrad this summer studying type specimens. Woj also spent a month in Tadzhik SSR collecting Hymenoptera (maybe we can get him to give us a collecting report for the next issue of Sphecos - edit.)

Alex Rasnitsyn, Palaeontological Institute, USSR Academy of Sciences, Maranovsky 26, Moscow, 117049, sends the following notes on two recently published Russian books of interest to wasp workers: Origin and Evolution of Hymenoptera by A. P. Rasnitsyn, published by Nauka, Moscow, 1979. This book presents a new system and scheme of evolution of insects in general and Hymenoptera in particular using palaeontological, morphological and ecological data. Insects are treated mostly at the cohort and superorder level, but Hymenoptera are discussed at the family level. Origin of sociality in insects is also discussed. Historical Development of Insects, B. B. Rodendorf and A. P. Rasnitsyn, editors, published by Nauka, Moscow, 1979. This is a phylogeny of insects written by 12 authors emphasizing palaeontological data, including undescribed

fossils. Insect history is discussed from both the taxonomic and biocoenological viewpoints. Nomenclature follows that proposed by Rodendorf (1977, Paleont. J., Moscow, no. 2:14-22).

Albert Greene (graduate student), Dept. of Entomology, Univ. of Maryland, College Park, Md. 20742, is conducting a broad based study of the baldfaced hornet, Dolichovespula maculata, which includes nest architecture, colony dynamics, and behavioral interactions within the nest.

David L. Vincent (graduate student), Dept. of Entomology, Univ. of Maryland, College Park, Md. 20742, is conducting a revisionary study of the species of Liris (Sphecidae) of South America, and would welcome the loan of any New World material. In addition, Vincent is collaborating with Menke on a review of the sphecid genus Polemistus. Several new species of this genus have been discovered in the southwestern U.S.

Ole C. Lomholdt, Zoological Museum, Dept. of Entomology, Universitetsparken 15, DK-2100 Copenhagen, Denmark, has a paper in press in Entomonographs dealing with the Miscophini (Sphecidae) of Southern Africa and Madagascar. This work includes a reclassification of the tribes of the Larrinae. One of his next projects will be the taxonomy of the endemic Australian sphecid genera Sphodrotes and Sericophorus, and he would welcome the chance to study material of these genera.

John D. McLaughlin (graduate student), Dept. of Entomology, Univ. of California, Davis, Calif. 95616, is working on revisions of Symmorphus (Eumenidae) and Lestica (Sphecidae) for North America, and is studying the nesting behavior of several species of Ammophila (Sphecidae).

Richard M. Bohart, Dept. of Entomology, Univ. of California, Davis, Calif. 95616, has the following papers in press: A generic revision of the North American Chrysididae; A revision of the Ectemnius of North America (Sphecidae); A revision of the Stenodynerus of Mexico (Eumenidae); and The Dienoplus of North America (Sphecidae). Current projects include revisions of Stictiella and related genera for North America with the collaboration of James E. Gillaspy, Dept. of Biology, Texas A & I University, Kingsville, Texas 78363; a revision of the species of Spintharosoma (Chrysididae); and a revision of Pterocheilus for North America (Eumenidae).

A collaborative research group at Howard University is studying the chemistry of exocrin glands and their roles in the behavior patterns of aculeate wasps. The group consists of R. Duffield (Zoology), J. W. Wheeler (chemistry) and their students. At present, chemical investigations and behavioral studies focus on a variety of eumenid genera, Tiphia species, sphecids in the following genera: Ammophila, Isodontia, Prionyx, Sceliphron and Sphex. The procedures encompass the initial collection of live material, isolation of the exocrine source (mandibular gland and/or poison gland), chemical analysis of these glandular extracts by combined gas chromatography-mass spectrometry and laboratory and field behavioral studies of glandular extracts or comparable synthetic compounds.

The long term goals of this research are as follows: 1) to survey the exocrine glands of aculeate wasps and identify the glandular

compounds; 2) to investigate the possible application of these chemical compounds to the systematics of these groups; 3) to answer questions concerning the evolution of exocrine glands, their chemistry, and the use of these natural products in the behavior patterns of these wasps. We would like to correspond with colleagues interested in this area of research. Persons interested in possible collaborative projects please contact R. M. Duffield, Dept. of Zoology, Howard University, Washington DC 20059.

Robert W. Matthews, Dept. of Entomology, University of Georgia, Athens, Georgia 30602 is studying the behavior of sand wasps of St. Catherine's Island, Georgia, especially Crabro and Pluto, and hopes to be able to return to the Neotropics to resume studies on Microstigmus. Anyone knowing of populations of Microstigmus is invited to correspond.

A recently published paper "A re-examination of the Mallia insect pendant" discusses a famous gold jewelry piece from Crete (2nd. Millennium) which depicts the basic life history of Polistes wasps, not "bees" as most classics scholars have thought. It is available from R. W. Matthews (see current literature).

Joan W. Krispyn, Dept. of Entomology, University of Georgia, Athens, Georgia 30602 has just completed her doctoral dissertation "The nesting biology of the paper wasp Polistes annularis" and has accepted a post-doctoral position at the Department of Entomology and Fisheries, Coastal Plain Experiment Station, Tifton, Georgia 31794, for next year.

Robert S. Jacobson, Dept. of Entomology, Univ. of Georgia, Athens, Georgia 30602 is working on the systematics of Vespula of the World and would appreciate the opportunity to study additional material.

Christopher O'Toole, Hope Entomological Collections, University Museum, Oxford OX1 3PW, England, is revising the Oriental species of Timulla (Mutillidae), and analysing (or trying to!) mimicry complexes among the females. He is also studying nesting distributions of fossorial aculeates in relation to dune succession in west coast British dunelands. In collaboration with R. T. Aplin, Dyson-Perrins Laboratory, Oxford, England, O'Toole is studying the scent glands of British aculeates.

Norman J. Smith (graduate student), Dept. of Entomology, Univ. of California, Davis, Calif. 95616, is working on the taxonomy and biology of the sphecid subtribe Ammoplanina. Future projects include Xysma and Spilomena.

Laszlo Moczar, Zoological Institute, University of Szeged, 6722 Szeges, Egyetem u. 2, Hungary, is preparing catalogs of the Ceropalidae, Mesitiinae, and Cleptidae of the world for the Catalogus Hymenopterorum. He would appreciate receiving any publications on these groups.

Colin Vardy, Dept. of Entomology, Natural History Museum, London SW7, England, is engaged in a taxonomic study of the pompilid genus Pepsis in the Neotropical Region.

William Overal, Chefe do Depto. de Invertebrados, Museu Goeldi, C.P. 399, Belem-Para, Brasil, has initiated a taxonomic review of the sphecid genus Bothynostethus.

J. van der Vecht, Burg. Vermeerlaan 4, Putten (Gld.), The Netherlands, is compiling a catalog of the Neotropical Eumenidae for the Catalogus Hymenopterorum.

J. M. Cumming (graduate student), Dept. of Entomology, University of Alberta, Edmonton T6G 2E3, Canada, is revising the North American species of the eumenid genus Symmorphus as a thesis problem. (The conflict of interest between Cumming and McLaughlin on this genus has apparently been resolved, with Cumming doing a major revision, and McLaughlin doing a more restricted study.)

Fred Gess, Albany Museum, Grahamstown, South Africa, is now completing his Ph. D. thesis (Rhodes University), based on a ten year study of the nesting behavior of aculeate wasps and bees in the Grahamstown area.

John Alcock, Arizona State University, Tempe, Arizona, is a visiting lecturer at Monash University, Melbourne, Australia. His interests are in the reproductive behavior of aculeate wasps and bees, and in March 1979 he returned from a three month study and collecting trip in New South Wales.

Jorge F. Genise, Instituto Entomologico San Miguel, 1663 San Miguel, Avda. Mitre 3100, Argentina, is studying the nesting behavior of neotropical Sphecidae, and has several papers in press.

Denis J. Brothers, Dept. of Entomology, University of Natal, P.O. Box 375, Pietermaritzburg, 3200 South Africa, is reaching the final stages of a revision of the mutillid subfamily Rhopalomutillinae, which is being carried out in collaboration with Guido Nonveiller, Nusiceva 2a, 11080 Zemun, Yugoslavia. The subfamily is distributed in the Afrotropical and Oriental Regions, through most of tropical and subtropical Africa and from India eastward through Thailand and the Malay peninsula to Java. A major problem has been the paucity of material since specimens tend to be fairly small and inconspicuous, especially the females. A considerable advantage has been the fact that the females are carried by the males for long periods of time during copulation, so that when females are collected they are generally directly associated with the males. This means that it has been possible to correlate the sexes for all species for which females are known, a situation which is unusual for Mutillidae. Nevertheless, for many species only one or two specimens are known and additional material would be very helpful.

Specimens of Rhopalomutillinae may be recognized as follows: Males are generally entirely black (but sometimes with red on the mesosoma or yellowish legs and/or tegulae) and fairly slender with the first metasomal segment petiolate, no felt lines on the second metasomal segment, reniform eyes and a deep notch in the posterior margin of the last metasomal sternum, this notch usually being flanked by a pair of ventral projections. The females are much smaller than the males and are brown with short thick antennae, very small eyes, the thorax fairly abruptly narrowed posteriorly, the first metasomal segment with a long

dorsal surface and no felt lines on the second metasomal segment. If any readers have specimens of this group which they would be willing to lend for this study they may be sent to Brothers. If there is likely to be a problem with the mail in sending the specimens directly to South Africa (e. g. from various Eastern Bloc or African countries) because of politics, they should be send to Brothers, c/o M. C. Day, Dept. of Entomology, British Museum (Nat. Hist.), Cromwell Road, London SW7 5 BD, England, who has very kindly agreed to readdress such material.

In addition to revisionary work on various groups of Mutillidae, Brothers is also attempting to build up a general reference collection of Mutillidae on a worldwide basis. The ultimate aim is to have sufficient material available to enable a more detailed assessment of the phylogeny of the family to be made than was possible for his 1975 revision of the higher classification and phylogeny of the Aculeata. If anyone has specimens of Mutillidae which they would be willing to donate or exchange for this purpose, they should write to Brothers who would be very appreciative. It may be mentioned that Brothers and his colleagues have been running a program of Malaise trapping in various regions in South Africa and have accumulated a considerable amount of material in alcohol. Unfortunately, the lack of assistance means that this material cannot easily be sorted, but it is possible that exchanges for specimens from this material could be arranged.

As an additional aspect of his research on Mutillidae (and also Bradynobaenidae, some groups of which were long included in the Mutillidae), Brothers is attempting to compile a listing of all records of host associations and other aspects of the biology of these groups. A major problem is that many papers dealing with other groups of insects (and in particular Hymenoptera) may include incidental mention of host or other associations, information which is not reflected in the title of the paper and which is generally not picked up by the abstracting services, so that the relevance of such papers to Mutillidae is never picked up. This means that a significant part of the information that has been gleaned by others on the biology of mutillids is likely to be lost to those interested in Mutillidae. It would thus be greatly appreciated if copies of papers which include even the briefest reference to Mutillidae (or Bradynobaenidae) could be sent to Brothers. Even isolated references to such citations would be extremely useful since the amount of biological information on the group is very small considering its size.

Lionel Stange, Florida State Collection of Arthropods, Box 1269, Gainesville, Florida 32602, is working on the taxonomy of Zethus (Eumenidae) in Argentina, Venezuela and the Bahamas Is.

Syun'ichi Makino (graduate student), Entomological Institute, Hokkaido University, Sapporo, 060 Japan, is studying the biology of the Japanese species of vespine wasps, principally Dolichovespula.

Dale Kirkbride (graduate student), Dept. of Biology, Northern Arizona University, Flagstaff, Arizona, completed his master's thesis The Sphecine Wasps of Idaho at the University of Idaho earlier this year. His thesis includes keys to Idaho species, synonymies, descriptions based on in-state material, distributional maps, collecting and locality data, comparative illustrations and scanning electron micrographs of various anatomical features, and host plant preferences for adult wasps. Dale's

thesis will be published by the Dept. of Entomology, University of Idaho sometime in 1980. Dale has transferred to Flagstaff for his Ph.D. training.

Allan Hook (graduate student), Dept. of Zoology and Entomology, Colorado State University, Fort Collins, Colo. 80523, has been studying the nesting and reproductive behavior of Oxybelus sericeus. His thesis research at Fort Collins involves the comparative ethology of cicada killer wasps and other communal nesting sphecids.

HELP NEEDED

Karl V. Krombein is assembling material of the subfamily Amiseginae (Chrysididae) to update his generic reclassification (1957). He is particularly anxious to see additional specimens from the Neotropical, Ethiopian and Indo-Australian Regions. His extensive collecting of this of this group in Sri Lanka demonstrates that there is a much larger fauna of these small phasmatid egg parasites than was known previously. Collectors should be aware that brachypterous females are to be found on and beneath leaf litter, and that their fully winged males fly an inch or so above the leaf litter searching for females. The genera in which both sexes are winged are to be found usually on foliage where the females apparently search for walking stick eggs on foliage and twigs.

Krombein is also working on the Ceylonese Cerceris, Philanthus, Bembix and Tiphiidae, and he would welcome the loan of material in these groups, as well any of those on which he has already published (see current literature - editor)

Arnold Menke is working on a revision of the Neotropical species of the sphecid genus Pison and would appreciate the opportunity to study additional material.

Has anyone ever seen a copy of Spinola's 1805 paper titled "Faunae Liguriae fragmenta"?? Mick Day of the British Museum and Menke have both searched many libraries and museums for this early work without finding it. Earlier attempts to find a copy have also been fruitless (see Dalla Torre, 1888, Wiener Ent. Zeit. 7:249). Apparently most (all??) copies of this 21 page paper were destroyed in a fire (see Spinola's remarks in the introduction to his 1806 "Insectorum Liguriae", etc. p. xi). If no copies exist, then the new species contained in it (cited in Spinola, 1806 and 1808) do not exist either, at least with the date 1805. Menke and Day would appreciate hearing from anyone having information on this obscure work.

Roger Akre would like to receive nests of V. consobrina to analyze, also data on colony composition, etc. He eventually hopes to combine this with behavioral information in a report on this species.

Specimens are needed for a microsculpture survey of the Hymenoptera. Students of the Sphecidae who have specimens with unusual surface sculpture are requested to send representatives to Gordon Gordh, Division of Biological Control, Dept. of Entomology, University of California, Riverside, Calif. 92521. These specimens will be used in a scanning electron microscope study of variation in the microsculpture found in Hymenoptera. The specimens will be dissected and mounted on stubs and

subsequently coated with gold. Therefore, unique material should not be sent for study. Workers interested in participating in this project should contact Gordon for further details.

Seiki Yamane (graduate student), Entomological Institute, Faculty of Agriculture, Hokkaido University, Sapporo, 060 Japan, is attempting a new classification of the social vespids using a broad data base: morphology, ecology, behavior, nest architecture, etc. Yamane is anxious to receive embryo nests of any species for study, but particularly Vespula vulgaris and germanica. Detailed accounts of embryo nest structure are scarce and Yamane wants to make comparisons of pedicel shape, manner of envelope construction, shape and number of envelope sheets, etc. between species and subspecies. Descriptive data on nests, published or unpublished, are also solicited.

Carll Goodpasture, Beneficial Insect Introduction Lab., bldg. 417 BARC-east, Beltsville, Md. 20705 asks: "does anyone know of a buffer system to use in sphecid electrophoresis work?"

SCIENTIFIC NOTE

T. D. Galloway, Dept. of Entomology, University of Manitoba, Winnipeg, Manitoba, Canada R3T 2N2, sends the following data on the "Nocturnal foraging activity of Vespula vulgaris (L.)":

"Physical factors such as temperature and light intensity usually restrict foraging in vespids to daylight hours, though Vespa crabro (L.) has been observed flying on moonlit nights. I recently had the opportunity of observing actively foraging workers of a Vespula sp. under somewhat artificial conditions between 2300 and 2400 hours on 12 August 1978. I had been collecting various insects attracted to the electric lights about washrooms at Pine Grove Halt in the Sandilands Provincial Forest (about 60 miles east of Winnipeg) when a wasp was noted on the wall beneath one of the lights. This individual dashed repeatedly back and forth capturing leafhoppers, caddisflies, chironomids and microlepidoptera. Each prey item was masticated and the wings were removed. After capturing several insects, the wasp flew off into the night. Over the next hour, numerous individuals were observed exhibiting similar behavior patterns. As many as three wasps occupied positions beneath the light at any given time. Unfortunately, it was impossible to determine the nest location because of difficulties in tracing their flight into the darkness. The nest must have been uncomfortably close by."

"Identification of specimens collected specified that all were workers of Vespula vulgaris (L.). Presumably light intensities produced by the electric light surpassed flight threshold levels for this species. It is interesting to note that the wasps capitalized on a readily available protein source. Many prey species which would have otherwise been largely unavailable were taken from a small area where high prey densities had been created."

PEOPLE IN THE NEWS

Lionel A. Stange joined the entomology staff at the Division of Plant Industry, Florida Department of Agriculture, Gainesville, Florida, in February, 1978, after spending 12 years in Argentina. In Argentina he was Professor of Entomology at the University of Tucuman in San Miguel

de Tucuman where he taught various entomological courses, and conducted research on bees, wasps, antlions, and the Subandean Creosote Bush Desert. While in Tucuman he helped build up the Hymenoptera Collection at the Fundacion Miguel Lillo which is especially strong in Vespidae (Weyrauch Collection), Mutillidae (Casals Collection), and Formicidae (Kuzenov Collection). Lionel will be glad to answer questions about this collection and collecting in southern South America. In his new position in Gainesville Lionel is in charge of the Hymenoptera and Neuroptera (and snails!), and would welcome exchanges with anyone. He continues his research on anthidiine bees and zethine wasps, and is also gathering data for a paper on the Neuroptera of Florida.

Ivica Radovic, Institute of Zoology, University of Belgrade, Yugoslavia, and his family, will have arrived in Washington DC by the time this newsletter is distributed. Ivica will spend several months at the Smithsonian studying the family Sphecidae and consulting with Menke, Krombein and others.

Jan Pieter van Lith of Rotterdam, the Netherlands, passed away May 4, 1979, at the age of 66. Jan was a specialist in the sphecid subfamily Pemphredoninae, and he published many carefully done and well illustrated papers of a revisionary nature. He had just begun to tackle the North American species of the tribe Psenini and his loss to us leaves a void that will not soon be filled. We hope to be able to include a comprehensive biography of Jan in the next issue of Sphecos.

Dr. G. van Rossem, Plantenziektunkundige Dienst, Wageningen, Geertjesweg 15, The Netherlands, kindly sent us the following obituary of the late P. M. F. Verhoeff:

On the 28th of October, 1978, Pieter Marius Francois Verhoeff died at precisely 70 years of age. He was a notary by profession at Utrecht and he lived for many years at den Dolder (labels), a nice country village. Piet Verhoeff was the son of a notary and it is therefore not so surprising that he choose the same profession. His interest in Hymenoptera was perhaps influenced by an uncle in Switzerland who was an amateur Hymenopterist, and with whom he visited as a young boy. In any case, Verhoeff was a first class entomologist. Personally I think that the work of a notary means the strict rendering of an important context and here perhaps the notarial profession is somehow closely bound up with taxonomic entomology.

Verhoeff was also an excellent collector and it may be that here some deeper character trait played a role. Verhoeff undoubtedly suffered from certain qualities of character brought on by complicated circumstances in his youth. It is not astonishing that a man is eager to go out on long trips just to forget certain sources of trouble. Insect collecting was probably an escape for him. I remember him eagerly waiting for early spring so he could set off on his first trip to the south of France. The names of two villages are intimately linked with Verhoeff: Carpentras and Dieulefit. Carpentras, not far from the famous Mont Ventoux, is a center of fruit culture, surrounded by old olive orchards and ideal for Hymenoptera Aculeata. He loved that place. Dieulefit is not much more than a couple of derelict houses, near the foothills of the Alps, a very lonely spot. We used to camp there in an old sweet chestnut orchard. Verhoeff worked with a couple of Malaise traps, standing in a line. I told him that wasps would notice that and

he laughed like an old general in the last battle. We discussed the name of the hamlet, meaning "given by God", but he did not fall in with deep seated questions and made clear that "God" was beyond discussion.

I recall an evening when we noticed a man with a gun in his hands walking toward us, a rather disagreeable event. Within some minutes Verhoeff was having a friendly talk, in fluent French, with the chap. He had become a notary and was a good entomologist, but he would also have taken to a military job. He had a "cool head" and he was difficult to intimidate. During the war he escaped the "Gkrune Polizei" (German Police) through a shop.

It is a pity that he did not publish more of his knowledge of Aculeata. He wrote a paper on Oxybelus ("Systematisches Verzeichnis der niederlandischen Oxybelus-Arten, mit Berucksichtigung mehrerer palaearktischen Arten und Rassen", Tijdschr. Ent. 89:158-208, 1948). A second interesting paper was on Astata ("Notes on Astata Latreille", Zool. Meded. 31:149-164, 1951).

His very important collection of Aculeata was given to the Rijksmuseum van Natuurlijke Historie at Leiden. It comprises a large western Palaearctic material, including the Mediterranean area. Verhoeff also did some collecting in South Africa.

His death is a severe loss to Dutch and international entomology, and I regret to lose a very good friend.

Wageningen, 22 June, 1979, G. van Rossem.

PROFILE

Under this heading autobiographical sketches of aculeate wasp workers will be presented from time to time depending on availability. I, as editor, will be soliciting profiles from various scientists for inclusion in Sphecos, especially from older, well established people, particularly those who have retired, but I urge any of you that would like to share a glimpse of your interests, training, and career with the readers to send me a page or two (or more) about yourself. The following examples provide some ideas for those of you so inclined (please don't be shy!!).

Hippolyte Janvier

I was born March 6, 1892, at Lalleu, near Rennes, Brittany. The Janvier's had been millers since 1815. My father died in 1898 at the age of 32, leaving my mother to raise me and my 2 year old brother. She passed away in 1904 and I was sent to live with my father's parents. After 3 years with them I lived with my mother's parents.

At the age of 18 I entered the Normal School directed by the Christian Brothers Institute. I was sent to Spain, Belgium and Bordeaux where I was trained to teach chemistry, physics and natural science. Early in 1914 I was sent to Chile by the Christian Brothers to teach these three subjects. I taught at Colegio de la Salle, Santiago; Instituto de la Salle, Tobalaba; and Colegio San Jose, Temuco, the last a village in the central Araucania. I was Professor of Science at Temuco from 1926 to 1932, and there became interested in the local indians and their culture, especially silver work, costumes, and dwellings. I eventually published articles on these subjects in the Anales de la Universidad de Chile.

In my spare time between the years 1918-1932 I made 5000 plant collections from the Cordillera, duplicates of which were sent to the

Smithsonian. About 1920 I also became interested in the solitary bees that were attracted to flowers, and in other insects, especially wasps. I excavated nests, observed nest architecture, cell contents, and made many notes and illustrations. With the help of colleagues in Santiago I received money from France so that I could publish my early observations on Chilean insects. Many of these early studies were published under the pseudonym Claude Joseph, a name given to me while a member of the Christian Brothers. It was common practice in those days to give pseudonyms to members teaching in various countries. I made 38 drawings of the nests of bee species, sphecids, eumenids, pompilids and other Hymenoptera which were sent to several museums including those in Paris and Washington DC. After seeing my work, Prof. Bouvier, who was editor of the Annales des Sciences Naturelles, decided to publish my larger manuscripts; these appeared in 1926, 1928, 1930, 1933 and 1935. I received a prize from the Academy of Science in 1929.

Disagreeable administrative duties and worries caused me to leave Chile in 1933 for France. There I directed an experimental laboratory for a secondary school at the College of La Salle, studied medicine, and also the life cycle of Hypoderma bovis. From 1949 to 1964 I was employed in the research program of the European Parasite Laboratory of the U. S. Department of Agriculture, Paris, where I conducted considerable field work on the parasites of the European Chafer, the Alfalfa Weevil, and the Clover Seed Chalcid.

Upon my retirement in 1964 I began biological control studies at my property (an area of about 20 hectares) at Bazin, in the Toulouse region. I attempted to use beneficial insects rather than pesticides to control harmful insects on fruits, grains, forage crops and vegetables.

Now in my 88th year I live in retirement on the island of Oleron on the coast of France. I have been publishing papers on various aculeates based on notes made during many years of observations with French species. In October of 1977 20 copies were printed of my two volume work "Comportement des Crabroniens" (see current literature - edit.). Copies were sent to several libraries including the British Museum and the Museum d'Histoire Naturelle, Paris, and various specialists. The initial printing is exhausted and a new edition of 20 copies is in preparation at my laboratory to satisfy the eventual demands of libraries and entomologists that my want it. These volumes can be obtained for 480 Francs (includes postage) by writing to me (Villa "Les Iris", 48, rue de la Foret, 17370 Saint Trojan-les-Bains, France). I will soon have available my "Comportements d'Abeilles Colletidae", a 330 page work with over 150 illustrations. It will be pubished at my laboratory in an edition of 30 copies. (Janvier's text was translated by Ray Gagne for Sphecos).

Arnold S. Menke

I was born in Glendale, California, November 22, 1934, and spent my youth in the Los Angeles area. I have had a life long interest in nature and began collecting insects before I was 10 years old. My early insect interests were butterflies and beetles. The first professional entomologist that I met was W. Dwight Pierce who was curator of entomology at the Los Angeles County Museum. I had collected a tenebrionid beetle in the San Gabriel Mountains which the 16 year old novice entomologist Menke regarded as unusual. Pierce told me that it was a "cast iron beetle" (Phlaeodes pustulosus LeConte) and that I would

experience difficulty in pushing a pin through it. He was right on both counts of course. The one thing I remember about Pierce's office were the dried tarantulas he had hanging on strings in the room. The high school that I attended was a few blocks from the museum, and I spent many after school hours there as a "helper" under the direction of Fred S. Truxal, Pierce's successor. It was at this time (1952) that I met Lionel Stange who was also a student helper. During the 50's and early 60's Stange and I made many joint collecting trips into the California deserts and mountains and several forays into Arizona and Mexico. We were like brothers and I have many fond memories of those trips. The earliest of these expeditions were made in a very used 1942 Ford coupe which freqently provided us with unpleasant past times such a replacing a fuel pump in the desert heat or a rear axle wheel bearing scrounged in a desert junk yard. A later vehicle was a 1947 Studebaker which once lost a wheel when the front axle snapped on a hairpin curve in the San Gabriel Mountains. Occasionally we would drive all night to reach a distant collecting area such as Warm Springs near Las Vegas, Nevada. Lionel did all of the driving since I didn't have a driver's license. Sometimes we would smoke cigars in an effort to keep each other awake. Some of our collecting localities were chosen simply because they had unusual place names like Earp or Zyzzyx Springs.

Under Fred Truxal's influence I became deeply interested in aquatic Hemiptera, and my first research area was the systematics of the Giant Water Bugs (Belostomatidae). This interest was nurtured by Robert L. Usinger while I was an undergraduate at the University of California, Berkeley, where I received my B.S. degree in 1957. My first publication, the North American species of Belostoma, was the result of a special problem course under Usinger's supervision in my senior year at Berkeley.

My interest in sphecid wasps was initiated by R. M. Bohart, who was my research advisor during my graduate years at the University of California, Davis. I first met Bohart during a summer field course on insects in 1956. Although my master's degree thesis was the taxonomy of the belostomatid genus Abedus, I chose the sphecid genus Ammophila for the Ph. D. thesis problem. I received the latter degree in 1965. In January of that year Bohart and I began work on what was to be about a 10 year project culminating in the book "Sphecid Wasps of the World". After three years in the postdoctoral position at the University of California, Davis, I joined the Systematic Entomology Laboratory, U. S. Department of Agriculture, in Washington DC (1968). My responsibilities in my current position include identification of aculeate wasps, cynipoid wasps and hymenopterous larvae.

My broad research interests center on world studies of genera and higher taxa in an effort to establish firm foundations for species level studies. The Sphecidae receives most of my attention and a lifetime goal is a complete revision of the subfamily Sphecinae, but especially the genus Ammophila. Because of my broad identification responsibilities I may expand my research into world generic studies of one or more of the included families at some future date. I also maintain my interest in the Belostomatidae and other water loving Hemiptera and hope someday to publish keys to species of various genera.

Aside from my familiarity with the southwestern U.S. I have made several collecting trips into Central and South America: Costa Rica (1957), Venezuela (1958, 1976), Mexico (1958, 1959, 1961). In Venezuela I concentrated on collecting wasps in the xeric northwestern portion of the country, and collected generally in the eastern part of Venezuela,

including the delta of the Orinoco River.

I have made two trips to Europe (1964, 1965) to study material in museums in Paris, Genoa, Turin, London, Munich and Leiden. The private collections of Jean Leclercq and J. de Beaumont were also visited.

COLLECTIONS

Under this heading information concerning collections will be presented: new acquisitions of importance, new discoveries, histories, etc. The following notes were submitted by Bill Overal, Instituto Nacional de Pesquisas da Amazonia, Museu Paraense Emilio Goeldi, Belem, Brasil.

The A. Ducke Collection

"Adolf Ducke (1876-1959) spent his years as an entomologist at the Museu Paraense Emilio Goeldi in Belem, Para State, Brasil, where he assembled an important collection of over 30,000 Hymenoptera, wrote all but 4 of his 64 entomological papers, and described 271 new species and 118 new genera of Hymenoptera. Unfortunately, Ducke's collection, to which he gave so much attention, was neglected after 1917. That it exists today in a studiable condition is more than could be expected."

"The Ducke collection was stored in paste-board Schmitt boxes until it was brought into an air conditioned room and remounted in 1976. Original labels were retained and old pins were mounted in balsa wood or Polyporus. Reconditioning of the collection was supervised by Sra. Therezinha Pimentel."

"The social wasps of the collection were studied by Overal (1978) who designated 11 lectotypes. Moure and Michener (1955) reviewed the bees and designated lectotypes, as did Boucek (1974) for the Leucospidae. Vardy (1978) revised Trigonopsis (Sphecidae) of the collection. Willink studied Monobia (Eumenidae) and Bohart and Stange (1965) studied Zethus (Eumenidae). Nascimento (in press) prepared a type catalogue of the collection. Mutillidae are being studied by Brothers, and Bothynostethus (Sphecidae) by Overal. Nascimento and Overal (1979) presented a list of new taxa of insects described by Ducke and his entomological bibliography. Egler (1963) published an obituary of Ducke".

"Ducke did not specially label his type material, and he sent what may be type material to the British Museum (Nat. Hist.), Paris Museum, Turin Museum, Museu Paulista (now Museu de Zoologia of the University of Sao Paulo) and the Museu Nacional in Rio de Janeiro (some Ducke material is at Pomona College, Claremont, Calif.; California Academy of Sciences, San Francisco; and other California institutions - editor). The Ducke collection in Belem and these other collections provide the pieces for whomever wants to put the puzzle together."

Bohart, R. M. and L. A. Stange, 1965. A revision of the genus Zethus Fabricius in the Western Hemisphere. Univ. Calif. Public. Ent. 40:1-208.

Boucek, Z. 1974. A revision of the Leucospidae of the World. Bull. Brit. Mus. Nat. Hist. (Ent.) Suppl. 23:1-241.

Egler, W. A. 1963. Adolpho Ducke - tracos bibliograficos, viagens e trabalhos. Bol. Mus. Paraense Emilio Goeldi, n. s. Bot. 18:1-129.

Nascimento, P. T. 1979. Catalogo dos tipos entomolgicos do Museu Paraense Emilio Goeldi. Bol. Mus. Paraense Emilio Goeldi Zool. (in press).

Nascimento, P. T. and W. L. Overal. 1978. As contribuicoes entomologicas de Adolpho Ducke. Bol. Mus. Paraense Emilio Goeldi, n. s., Zool. 96:1-22.

Overal, W. L. 1978. Designacao de lectotipos de onze especies de vespas sociais descritas por Adolpho Ducke, e notas sobre a colecao Ducke. Bol. Mus. Paraense Emilio Goeldi, n. s., Zool. 94:1-14.

Vardy, C. R. 1978. A revision of the Neotropical wasp genus Trigonopsis Perty. Bull. Brit. Mus. Nat. Hist. (Ent.) 37:117-152.

The University of California, Davis, Insect Collection (UCD)

"The UCD Museum is still growing at a steady pace, about 10-15,000 insects per year. Most informed people know of its existance but not all realize that it is becoming more 'international' all the time. For example, in the last two years small to medium accessions of 'stinging' wasps have been made from the Philippines, Korea, Hong Kong, New Guinea, Australia, Samoa, Nepal, Norway, Dominican Republic, Colombia, Peru, Virgin Islands, Trinidad, Costa Rica and Panama." (submitted by R. M. Bohart).

The Schrottky Collection

Some confusion still exists concerning the Schrottky Collections (which is probably more than one collection anyway). According to Schrottky (as cited in Townes and Townes, 1966, Mem. Amer. Ent. Inst. 8:6-7), his collection was burned by revolutionary fighters who broke into his home in Paraguay. Townes and Townes stated that "the collection of C. Schrottky is no longer in existance" but that a few types "have found their way into other collections." I recently wrote to Dr. L. De Santis (La Plata, Argentina) who reported seeing some Schrottky chalcidoid types in the Museum of Zoology, University of Sao Paulo. His reply is translated as follows: "I have often read that the Schrottky collection was destoyed in Paraguay, but I have seen much of the material studied by that entomologist in Sao Paulo, Brasil, including types." According to Dr. Paul Hurd (Smithsonian Institution), Schrottky worked at Sao Paulo, and any material not taken to Paraguay is probably still extant (this is the case at least for the bees). The state of Schrottky types, then, would seem to depend on when and where particular material was collected, described and stored. Material collected during his stay in Paraguay (dates ??) is probably no longer extant for the most part. Perhaps other types collected previously and moved to Paraguay were destroyed. The problem in trying to trace Schrottky's movements over the years is that little biographical information is available. The short notes by Sachtleben (1938, Arb. Morph. Taxon. Ent. Berlin Dahlem, 5:295), Lizer y Trelles (1947, Curso de Entomologica 1:28-29), and Carpenter (1953, Amer. Midl. Nat. 50:331) offer few clues to Schrottky's whereabouts at any particular time in his life. Lizer Y Trelles visited with him in Paraguay in 1915, and noted later that little biographical material was available due perhaps to Schrottky's "reclusive life". Do any readers have information they would like to pass along concerning this subject? -- E. E. Grissell.

TRAVEL AND FIELD WORK REPORTS

Marius Wasbauer, Division of Plant Industry, California Dept. of Agriculture, 1220 N Street, Sacramento, Calif. 95814, sends the following notes on a recent collecting trip to Baja California:

"I have just returned from six weeks in Baja. The trip took in the entire peninsula but with concerted collecting only in a few areas. These were San Quintin (Norte), Playa Cerritos, near El Pescadero, just south of Todos Santos (Sur), Los Arriles (Sur), and an area at the foot of the Sierra de la Laguna near Miraflores (Sur). The period of the collecting was essentially the middle of April to the middle of May. We used Malaise traps in each area as well as net collecting and blacklighting (pit traps were used only at El Pescadero). Baja Sur was very dry and had been without rain for five months but during late winter and spring, Baja Norte, especially in the more northern portions had received unusual amounts of rain. The road between Ensenada and Guerrero Negro was in poor condition so there ± 180 miles of slow driving although road repair was being done. We have been told that the best collecting is in June through September, but there was considerable insect activity in April-May and the Malaise traps accounted for a large variety of Hymenoptera. The fluorescent black light collecting was very slow and we took few nocturnal Hymenoptera. Because of the rain, the collecting in Baja Norte should be exceptionally good this year."

Ed Callan, 13 Gellibrand Street, Campbell, Canberra ACT, 2601 Australia, visited South Africa in March and April of 1979. He was based at Rhodes University and the Albany Mueum, Grahamstown in the eastern Cape Province. Considerable time was spent in field work at Port Alfred, mainly studying aculeate wasps to augment earlier work on the insects associated with coastal sand dunes. Numerous Scoliidae, Mutillidae and Sphecidae were collected. Useful discussions were held with Charlot Jacot-Guillarmod (Scoliidae) and Fred Gess (Sphecidae) at the Albany Museum, and with Denis Brothers (Mutillidae) at the University of Natal, Pietermaritzburg.

Arnold Menke and Eric Grissell spent 5 days collecting Hymenoptera in the lower Rio Grande Valley (McAllen - Brownsville area) of Texas at the beginning of December, 1978. This southernmost toe of Texas represents the northernmost limit for many tropical insects. At one time there was extensive subtropical palm-thorn scrub forest in the Brownsville area (Cameron Co.), but now because of agriculture (citrus, sugar cane, etc.) only a few narrow vestiges of this native vegetation are left between croplands. The largest remnant in Cameron Co., "Sabal Palm Grove Sanctuary", is owned and maintained by the Audubon Society; this area is about 1/4 mile square and in general is a dense tangle of vines, scrub and palms. We did not collect there but were told by the caretaker that people can get permission to do so from the Audubon Society in Washington DC. There is a large house on the property and possibly one could stay in it.

Many people have made collections in this area of Texas over the years, the earliest specimens usually labelled "Brownsville". Often this old material represents the only US records for many insects and we hoped to obtain long series of fresh material. One Malaise trap was taken along. Our first two days were spent at Bentsen-Rio Grande State Park, a 500 acre tract of native subtropical thorn scrub interspersed with

gallery forest and water hole communities, a few miles southwest of McAllen (Hidalgo Co.). This area is about 60 miles west of Brownsville. Like the Brownsville area most of the surrounding valley has been converted to agriculture. The park borders on the river. Permission must be obtained from Mr. David Riskind, Texas Parks and Wildlife Department, Austin, to collect in the park. There is an excellent campground with hot showers, etc. and motels are a few minutes away in McAllen. The park contains a number of trails and roads which allow easy access for collecting. We found the best collecting on the trail that goes to the river.

Temperatures were in the 80's both days and in spite of the lateness of the season we had excellent collecting. Menke took a good series of Ammophila centralis Cameron, Liris spp., Crabro sp., Trypoxylon sp., Zethus sp. and observed the nesting behavior of Trachypus mexicanus Saussure. Grissell collected a large number of chalcids as well as many of the aculeates. The Trachypus were nesting in the river bank and two females were found in one nest. All of the Crabro were taken on a tall canelike grass growing on the river bank.

The next 3 days were spent in the Brownsville area. Following the advice of C. D. Michener we looked for a collecting site in the Southmost area, which is about 5 or 6 miles southeast of the Brownsville International Airport. The first day was warm and we had excellent results but a cold front dropped temperatures into the 60's the next two days; this with the accompanying strong winds made collecting poor. Southmost does not occur on most maps of Texas, and it consists of a few scattered farm houses on Farm Road 1419. Anyone wanting to explore this area should take along U.S.G.S. topographic map quadrangles "Fort Brown, Tex." and "Southmost, Tex." The latter is in larger scale (7.5 min. series). These maps fairly accurately indicate the remaining areas of native vegetation in green. Sabal Palm Grove Sanctuary is given only as "Palm Grove" on these maps. The area in which we collected mostly was in the narrow portion of the large green area southeast of "Southmost Ranch" on these topo maps. A dirt road bisected this neck of forest thus creating a natural insect flight path and also a privacy screen for us and possible unfriendly farmers. Access to this and other sites was by driving onto the levee shown just north of "Southmost Ranch" and taking a dirt road south from the levee (the elevation number 30 appears at this intersection on both maps) to the forest remnant. By following the maze of dirt farm roads it is possible to reach the southernmost part of Texas on the river. Collecting there was good also. Generally we obtained the same insects in the Southmost area that we got at Bentsen-Rio Grande State Park but the bad weather made a true comparison impossible. Nowhere in the Brownsville-Southmost area is there a section of native subtropical forest comparable in size to the Bentsen-Rio Grande park tract. Anyone wishing to collect insects at "Brownsville" had better do so soon. There is no telling how much longer the few remnants of forest will remain, except for the Sabal Palm Grove Sanctuary, who's future seems secure.

NOMENCLATURE

Recent Opinions by the ICZN

The sphecid generic name Rhopalum Stephens has been conserved and the name Euplilis Risso has been suppressed in Opinion 1106 issued in 1978.

The sphecid generic name Nysson Latreille has been declared a justified emendation of Nysso Latreille, and the latter has been rejected in Opinion 1115 issued in 1979.

The vespid generic name Rhopalidia Lepeletier has been suppressed in Opinion 1051 issued in 1976.

Cases still pending

Huber (1975) has asked for suppression of the chrysidid generic name Elampus Spinola in favor of Notozus Forster. Objections to Huber's petition have been published by Pulawski (1976) and Bohart (1976).

Betrem (1963) requested various actions on names of scolioid wasps (Bull. Zool. Nomencl. 20:238-240) which remain unresolved. Menke in an unpublished letter to the Commission has objected to various points of Betrem's proposals.

Far too many Opinions are rendered without or with very little input from concerned scientists. Please take the time to write a paragraph or two to the International Commission on Zoological Nomenclature, c/o British Museum (Nat. Hist.), London, England, and present them with your thoughts, pro or con, on petitions dealing with your areas of interest. It makes it much easier for the Commissioners if they have some idea of the feelings of the scientific community with respect to various issues when it comes time for them to vote yes or no to any particular petition. Also, authors of petitions should send copies to as many scientists as possible so that all are made aware of actions that are under review by the Commission. Not all of us have easy access to the Bull. of Zoological Nomenclature.

Important changes in generic names:

Priocnemioides Radoszkowski, 1888, is a junior synonym of Entypus Dahlbom, 1843. See Day, 1974, Ent. News 85:92-94.

Calicurgus Lepeletier, 1845, is a junior homonym of Calicurgus Brulle, 1833, and must be replaced by Caliadurgus Pate, 1946. (see Day (1979) in current literature).

Swept under the carpet department:

Scleroderma or Sclerodermus?? It is well known that the original spelling of this bethylid genus is Sclerodermus (see Evans, 1978, for example), but Scleroderma, an invalid subsequent emendation under the Code, is always used. Considering common usage the spelling Scleroderma should probably be conserved via a petition to the ICZN. Who is going to make the effort?

Superfamily names:

The name Chrysidoidea has priority over Bethyloidea according to Day, 1977, Cimbebasia 4:176.

CORRECTIONS

Corrections of errors and omissions in "Sphecid Wasps of the World" by Bohart and Menke (1976) have been published by Menke and Bohart (1979). Anyone finding additional mistakes or names left out that were published before 1976 should send such information to Menke. If the book is reprinted it should be possible to include corrections and omissions.

Since the errata paper was published a few additional items have come to our attention:

p. 178, RC, L 50: powelli is correct
512, RC, L 15: 27 known is correct
513, LC, insert after L 16: amatorius (Smith), 1875 (Gorytes); India. Also insert in index.
576, RC, L 45: albopicta is correct. Move to bottom of column.
665, RC, L 69: 573 is correct

The following errors in the errata paper should be corrected:
p. 275: RC is correct, not LC
449, RC, L 24: (Geoffroy) in Fourcroy is correct
587, LC: delete entire entry. schariniensis is already in the checklist and index.
656: MC, L 72 should be RC, L 72

RECENT LITERATURE

Under this heading I will attempt to list all recent publications on aculeate wasps. Zoological Record is now releasing to subscribers, on an experimental basis, the author-title index in advance of the rest of the yearly index. This provides access to the literature sooner than would otherwise be possible. The literature on Hymenoptera for 1974 was issued earlier this year, and in this first issue of Sphecos I have decided to include literature dating as far back as 1975. However, this retroactive listing is not comprehensive. Future issues of Sphecos will contain literature primarily from the preceeding year. I would like to remind readers that they should, whenever possible, send me copies of their papers as they appear. TWO copies would be appreciated. One will be deposited in the U.S. Department of Agriculture Hymenoptera literature file at the U.S. National Museum of Natural History where they will be available for use by visitors and staff. The other copy will be deposited in the editor's file.

Akre, R. D. and A. L. Antonelli
1979. Yellowjackets and paper wasps. Washington St. Univ. Ext. Bull. 643, 10 pp.
Akre, R. D. and H. G. Davis
1978. Biology and pest status of venomous wasps. Ann. Rev. Ent. 23:215-238.
Akre, R. D., W. B. Garnett, J. F. MacDonald, et al.
1976. Behavior and colony development of Vespula pensylvanica and V. atropilosa. J. Kansas Ent. Soc. 49:63-84.
Akre, R. D., W. B. Hill, J. F. MacDonald, et al.
1975. Foraging distances of Vespula pensylvanica workers. J. Kansas Ent. Soc. 48:12-15.
Al-Ali, Aziz S.
1977. Phytophagous and entomophagous insects and mites of Iraq. Nat. Hist. Rech. Ent., Publ. no. 32, 143 pp.

Alayo, Pastor
1976. Introduccion al estudio de los Himenopteros de Cuba. Superfamilia Sphecoidea. Acad. Cien. Cuba, Instit. Zool. Serie Biol. (67):1-46. (Keys to Sphecidae of Cuba).

Alcock, J.
1975. The nesting behavior of Philanthus multimaculatus Cameron. Amer. Midl. Nat. 93:222-226.
1975. The behavior of western cicada killer males, Sphecius grandis (Sphecidae Hymenoptera). J. Nat. Hist. 9:561-566.
1975. Social interactions in the solitary wasp Cerceris simplex (Hymenoptera: Sphecidae). Behaviour 54(1-2):142-152.
1975. The behavior of some bembecine wasps of southern Arizona (Hymenoptera: Sphecidae, Microbembex, Glenostictia, Xerostictia). Southwest Nat. 20(3):337-342.
1975. Notes on the behavior of three Argentine Sphecids (Microbembex uruguayensis, Tachytes fraternus, and T. amazonus) Pan-Pac. Ent. 51(3):195-200.
1975. Male mating strategies of some philanthine wasps (Hymenoptera: Sphecidae). J. Kansas Ent. Soc. 48(4):532-545.
1975. Territorial behaviour by males of Philanthus multimaculatus (Hymenoptera: Sphecidae) with a review of territoriality in male sphecids. Anim. Behav. 23:889-895.
1976. Courtship and mating in Hippomelas planicosta (Coleoptera: Buprestidae). Coleopt. Bull. 30(4):343-348. (Notes on Cerceris grandis).

Alcock, J., E. M. Barrows, G. Gordh, et al
1978. The ecology and evolution of male reproductive behaviour in the bees and wasps. Zool. J. Linnean Soc. 64:293-326.

Alcock, J. and G. J. Gamboa
1975. Home ranges of male Cerceris simplex macrosticta (Hymenoptera, Sphecidae). Psyche 81(3 & 4):528-533.
1975. The nesting behavior of some sphecid wasps of Arizona, including Bembix, Microbembex, and Philanthus. J. Ariz. Acad. Sci. 10(3):160-165.

Allen, H. W.
1975. The genus Tiphia of the Indian Subcontinent. U.S. Dept. Agric. Tech. Bull. No. 1509, 95pp.

Anonymous
1977. Verzeichnis der an den Insekten Mitteleuropas arbeitenden Taxonomen und Faunisten. Polskie Pismo Ent. 47:507-574 (Names and addresses of scientists of middle European countries broken down by country and specialty).

Ault, S. K.
1976. Observations on the nesting behavior of Belomicrus columbianus Kohl. Pan-Pac. Ent. 52(1):29-32.

Baerends, G. P.
1976. The functional organization of behaviour. Anim. Behav. 24:726-738.

Baltzo, C. H.
1975. Alaskan wasp explosion. Pacific Discovery. 28:28-30.

Banaszak, J.
1977. Blonkowki spotykane na debach rogalinskich. Badania Fizjogr. nad Polska Zach. (C)30:109-115.

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1979. Utilization of trap nests by the Pipe-Organ Mud-Dauber, Trypargilum politum. Ann. Ent. Soc. Amer. 72:260-262.

Barbier, J.
1976. Note sure le parasitsme de Clytrinae par des Mutillidae. Entomologiste 32:163-165.

Barron, J. R.
1975. Provancher's collections of insects, particularly those of Hymenoptera, and a study of the types of his species of Ichneumonidae. Nat. Can. 102(4):387-591. (Excellent history of Provancher & his collections).

Barron, J. R. and H. E. Bisdee
1976. The species of Vespoidea described by Provancher. Nat. Canad. 103:501-512.

Barrows, E. M.
1978. Male behavior in Evagetes subangulatus (Hymenoptera: Pompilidae). Great Lakes Ent. 11(1):77-80

Barrows, E. M., P. L. Lebau, and C. E. Eckstein
1978. Behavior at a nesting site and prey of Crabro cribrellifer (Hymenoptera: Sphecidae). Great Lakes Ent. 11(3):175-176.

Barth, R. H. et al
1975. Juvenile hormone promotes dominance behavior and ovarian development in social wasps (Polistes annularis). Experim. 31:691-692.

Bauman, T. R., L. L. Glenbaski, A. E. S. Mostafa, and E. A. Cross
1978. Respiratory rates of the organ-pipe mud-dauber Trypoxylon politum (Hymenoptera: Sphecoidea). Ann. Ent. Soc. Amer. 71:869-875.

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1975. Specific structure and pollen gathering of hymenopterous visitors of blooming seed onion fields and their food plant relationships. Folia Ent. Hung. 28:249-261.

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1977. De verspreiding van Argogorytes en hun respektievelijke koekoekswespen (Nysson) in Nederland (Hymenoptera: Sphecidae: Nyssoninae). Ent. Berich. 37:153-156.

Bohart, R. M.
1976. A review of the Nearctic species of Crabro (Hymenoptera: Sphecidae). Trans. Amer. Ent. Soc. 102:229-287.
1976. Comment on the application concerning Notozus Forster, 1853 Z. N.(S.)2109. Bull. Zool. Nomencl. 33:72.
1979. Tachytes of South America (Hymenoptera, Sphecidae, Larrinae). Trans. Amer. Ent. Soc. 104:435-505.

Bohart, R. M. and E. E. Grissell
1975. California wasps of the subfamily Philanthinae. Bull. Calif. Insect Surv. 19:1-92. (Coverage is broader than title suggests. Keys are provided for all North American species except in Cerceris and Eucerceris; only California forms are keyed for these two genera).

Bohart, R. M. and L. S. Kimsey
1978. A revision of the New World species of Hedychridium (Hymenoptera, Chrysididae). Proc. Biol. Soc. Wash. 91(3):590-635.

Bohart, R. M. and J. D. McLaughlin
1979. Evidence indicating Ammophila as host of Spintharosoma. Pan-Pac. Ent. 54:310.

Bohart, R. M. and A. S. Menke
1976. Sphecid Wasps of the World, a generic revision. Univ. of California Press, Berkeley. X+695 pp. (Keys to subfamilies, tribes and genera, with descriptions of each. Synonymic species checklists given for each genus. Biological summaries. Chapters on morphology, biology, taxonomy etc.).

Bohart, R. M. and N. J. Smith
1977. A revision of Nearctic Ammoplanops (Hymenoptera. Sphecidae). J. Kansas Ent. Soc. 51(1):75-90.

Bohart, R. M. and L. Stange
1977. Liogorytes joergenseni (Brethes), a cicada killer in Argentina. Pan-Pac. Ent. 52:314-320.

Bohart, R. M. and B. Villegas
1977. Nesting behavior of Encopognathus rufiventris Timberlake. Pan-Pac. Ent. 52(4):331-334.

Bohm, M. K. and K. A. Stockhammer
1977. The nesting cycle of a paper wasp, Polistes metricus (Hymenoptera: Vespidae). J. Kansas Ent. Soc. 50(2):275-286.

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1976. Osservazioni eto-ecologiche sugli Imenotteri Aculeati dell'Etiopia. Atti Accad. Roveret. Agiati (6)14-15:225-234.

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1978. Brachynemurus nebulosus (Neuroptera: Myrmeleontidae): a possible Batesian mimic of Florida Mutillid wasps (Hymenoptera: Mutillidae) Ent. News 89(7 & 8):153-156.

Bradley, J. C.
1975. Scolia (Clypeiscolia, n. subg.) clypealis, n. sp. (Hymenoptera: Scoliidae). Ent. News 85(5 & 6):186.
1975. Dates of publication of Westwood's Arcana Entomologica. Proc. Biol. Soc. Wash. 88:91-93.

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1975. Phylogeny and classification of the aculeate Hymenoptera, with special reference to Mutillidae. Univ. Kansas Sci. Bull. 50(11):483-648. (A landmark cladistic study of the classification of aculeate wasp families, especially the tiphid-mutillid complex).
1976. Modifications of the metapostnotum and origin of the 'propodeal triangle' in Hymenoptera Aculeata. Syst. Ent. 1:177-182.
1978. Biology and immature stages of Myrmosula parvula. J. Kansas Ent. Soc. 51:698-710. (New data support assignment of Myrmosinae to Mutillidae).

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1979. Survey of social insects in the fossil record. Psyche 85:85-133.

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1976. Notes on Ampulicinae with special reference to African species and prey. Rev. Zool. Afr. 90(1):228-234.
1977. Observations on the nesting behavior and prey of gorytine wasps in Trinidad (Hymenoptera, Sphecidae). Psyche 83(3-4):324-335.

1977. Observations on Centris rufosuffusa Cockerell (Hymenoptera: Anthophoridae) and its parasites. J. Nat. Hist. 11:127-135.

1977. Macrosiagon diversiceps (Coleoptera: Rhipiphoridae) reared from a sphecid wasp, with notes on other species. Aust. Ent. Mag. 4(3):45-47.

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1977. The nest of Zethus otomitus (Hymenoptera: Eumenidae). Fla. Ent. 60(2):135-137.

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1979. The hind tibiotarsal and tibial spur articulations in bees. (Hymenoptera: Apoidea). J. Kansas Ent. Soc. 52(1):123-137.

Casolari, C. and R. Casolari Moreno

1978. Catalogo della collezione imenotterologica di Massimiliano Spinola, 1st. Parte. Boll. Mus. Zool. Univ. Torino (5):27-75. (This contains list of species of sawflies and ichneumonoids only but introductory material of general interest).

Cazier, M. A. and E. G. Linsley

1975. Bee and wasp visitors to Kallstroemia grandiflora after two years of drought. Pan-Pac. Ent. 51:248-253.

Chmurzynski, J. A.

1977. Stimuli eliciting sexual pursuit in the digger wasp Bembex rostrata (L.) males (Hymenoptera, Sphegidae). I. The choice of an adequate method for the ethometry survey. Acta Neurobiol. Exp. 37:27-56.

Coke, J. L. and A. B. Richon

1976. Synthesis of optically active gamma-n-hexadecalactone, the proposed pheromone from Vespa orientalis. J. Org. Chem. 41:3516-3517.

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1977. The solitary wasps. Maryland Conservationist 53(3):8-11.

Corbet, S. A. and M. Backhouse

1975. Aphid-hunting wasps: a field study of Passaloecus. Trans. R. Ent. Soc. Lond. 127(1):11-30.

Coville, R. E.

1976. Predatory behavior of the spider wasp, Chalybion californicum. Pan-Pac. Ent. 52:229-233.

1979. An extra midtibial spur in an island population of Trypoxylon tridentatum Packard. Pan-Pac. Ent. 55:73.

Cross, E. A., M. G. Stith, and T. R. Bauman

1975. Bionomics of the organ-pipe mud-dauber. Trypoxylon politum (Hymenoptera: Sphecoidea). Ann. Ent Soc. Amer. 68(5):901-916.

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1977. Evolutionary genetics of the Hymenoptera. Ann. Rev. Ent. 22:263-288.

Currado, I.

1976. Nuovo genere e nuovo specie di Gonatopodinae della Spagna: Acrodontochelys bouceki (Hymenoptera: Dryinidae). Boll. Mus. Zool. Univ. Torino 2:13-26.

Currado, I. and M. Olmi

1975. Un nuovo gonatopodino Italiano: Agonatopoides johannae sp. n. (Hymenoptera, Dryinidae). Boll. Mus. Civ. Stor. Nat. Venezia 27:27-38.

1976. Una specie di Gonatopodinae nuova per l'Italia: Plectrogonatopus richardsi Moczar 1965. Doriana 5(224):1-5.
1977. Descrizione di Haplogonatopus pacei sp. n. d'Italia. Boll. Mus. Civ. Stor. Nat. Verona 4:317-320.

Cushman, R. A. and G. Gordh
1976. Biological investigations of Goniozus columbianus Ashmead, a parasite of the grapeberry moth, Parolobesia viteana (Clemens) (Hymenoptera: Bethylidae). Proc. Ent. Soc. Wash. 78(4):451-457.

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1976. La formation d'une nouvelle colonie de Polybioides tabidus Fabr. C. R. Acad. Sci. Paris (D)282:457-459.

Davis, E. J., W. S. Robinson, C. F. Roush, R. D. Akre, et al
1978. Impact of chemical control applications for the Douglas-fir tussock moth on beneficial insects including biological studies of bees, yellowjackets, and flesh flies. Melanderia 30:1-7.

Day, M. C.
1977. A new genus of Plumariidae from Southern Africa, with notes on Scolebythidae (Hymenoptera, Chrysidoidea). Cimbebasia (A) 4:171-177. (Note on priority of superfamily name Chrysidoidea over Bethyloidea).
1977. Notes on some Pompilidae (Hymenoptera) of incorrectly reported type-locality. Ent. Monthly Mag. 112:71-74.
1979. The affinities of Loboscelidia Westwood (Hymenoptera: Chrysididae, Loboscelidiinae) 4:21-30. (Loboscelidiidae reduced to subfamily in Chrysididae).
1979. Nomenclatural studies on the British Pompilidae (Hymenoptera). Bull. Brit. Mus. Nat. Hist. (Ent.) 38(1):1-26.

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1977. Discovery in the Linnaean collection of type-material of insects described by Johann Reinhold Forster, with notes on the Hymenoptera. Biol. J. Linn. Soc. 9:31-43.
1978. Re-curation of the Linnaean Hymenoptera (Insecta), with a reassessment of the taxonomic importance of the collection. Biol. J. Linn. Soc. 10:181-198.

De Santis, L. and J. A. V. Sarmiento
1977. Nuevos embolemínos de la Republica Argentina. Comision Invest. Cient. La Plata, Informe #18, 12 pp.

Dew, H. E. and C. D. Michener
1978. Foraging flights of two species of Polistes wasps (Hymenoptera: Vespidae) J. Kansas Ent. Soc. 51(3):380-385.

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1976. Nesting of Stizus iridis at the type-locality (Hymenoptera: Nyssonidae). Proc. Ent. Soc. Wash. 78(1):65-66.

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1977. Morphology and behavior in the taxonomy of Microstigmus wasps. Proc. Eighth Internat. Union Study Soc. Insects, pp. 123-125.
1977. The establishment of reproductive dominence in social wasp colonies. Proc. Eighth Intern. Cong. Intern. Union Study Social Insects, pp. 223-227.
1978. Temporary queens in Metapolybia wasps: nonreproductive helpers without altruism? Science 200:441-443.

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1976. The world distribution pattern of the German wasp, Paravespula germanica. Ent. Germanica 3:269-271.

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1978. The occurrence of Philanthus triangulum F. in Sweden (Hym., Sphecidae). Ent. Tidsk. 99:131-134.

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1978. Structure of the acoustic signals of larvae of the wasp Dolichovespula silvestris and the hornet Vespa crabro. J. Evol. Biochem. Physiol. 13:2327-231. (English translation of Russian).

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1975. Nesting behavior of Philanthus albopilosus with comparisons between two widely separated populations. Ann. Ent. Soc. Amer. 68(5):888-892.
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1975. Social parasitism of a common yellowjacket. Ins. World Digest. 2(1):6-13.
1975. The nest and larva of Diploplectron brunneipes (Cresson)(Hymenoptera: Sphecidae). Great Basin Nat. 35(1):123-125.
1976. A revision of spider wasps of the genus Ctenostegus (Hymenoptera: Pompilidae). Aust. J. Zool., Suppl. Ser. (43):1-107.
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1976. Nesting behavior of Microbembex hirsuta Parker, with notes on related species (Hymenoptera: Sphecidae). Proc. Ent. Soc. Wash. 78:185-189.
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1977. Further studies on the North American species of Pristocera (Hymenoptera: Bethylidae). Ent. News 88(3&4):57-60.
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1977. Bembicini of Baja California Sur: notes on nests, prey, and distribution. Pan-Pac. Ent. 52(4):314-320.
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1978. The Bethylidae of America north of Mexico. Mem. Amer. Ent. Instit., 27:1-332. (Keys all of the North American genera and species).
1978. Observations on the nests and prey of Eumenid wasps (Hymenoptera, Eumenidae). Psyche. 83(3-4):255-259.
1979. A solitary wasp that preys upon lacewings (Hymenoptera: Sphecidae; Neuroptera: Chrysopidae). Psyche 85:81-84.
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1975. The sand wasps of Australia. Sci. Amer. 233:108-113.

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1976. Notes on the nests and prey of four Australian species of Tachysphex Kohl, with description of a new species (Hymenoptera: Sphecidae). J. Aust. Ent. Soc. 15:441-445.

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1978. A new species of Pseudogonatopus from Kentucky (Hymenoptera: Dryinidae). Ent. News 89(5 & 6):137-141.

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1975. Ethological studies of Bembecinus cinguliger (Smith) and B. oxydorcus (Handl.) (Hymenoptera: Sphecidae), two southern African turret-building wasps. Ann. Cape Prov. Mus. (Nat. Hist.) 11(2):21-46.

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1977. A method for rearing various species of social wasps of the genus Polistes (Hymenoptera: Vespidae) under controlled conditions. Can. Ent. 109:1013-1015.

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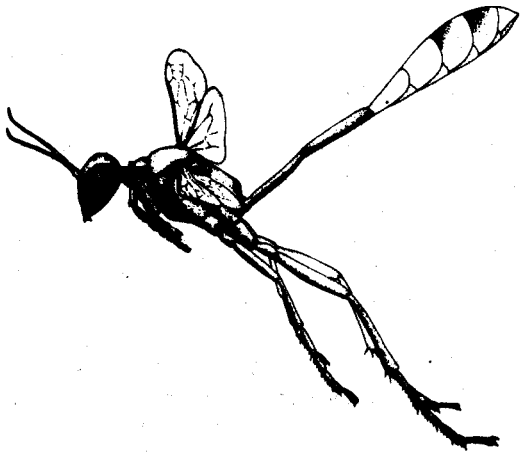

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