

# METALEPTEA

SOCIEDAD PANAMERICANA  
DE ACRIDIOLOGIA



PAN AMERICAN  
ACRIDOLOGICAL SOCIETY

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# METALLEPTEA

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SOCIEDAD PANAMERICANA  
DE ACRIDIOLOGIA



PAN AMERICAN  
ACRIDOLOGICAL SOCIETY

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The Pan American Acridological Society, or PAAS, is an international scientific organization with members in 24 different countries. Its purposes are to facilitate communication among those interested in, and concerned with, New World acridology, to encourage collaborative research and control programs in acridology among the countries of the New World, and to disseminate information and to promote, conduct, and foster other activities designed to increase knowledge and understanding of acridology and its implications.

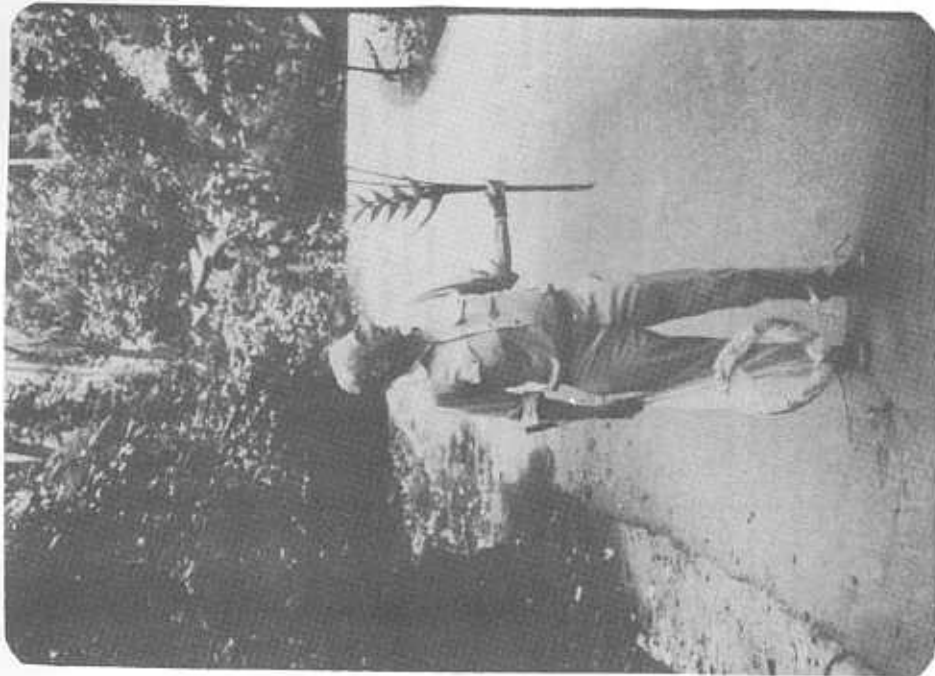
Some 50 interested persons met at San Martin de los Andes, Neuquén, Argentina, in 1976, and planned a society, PAAS, that took its formal inception in 1978 upon the adoption of a Constitution and By-Laws. Since then, PAAS has been engaged in a full range of programs and activities toward the satisfaction of its above-mentioned objectives and was recently accorded tax-exempt status by the United States Government.

Approximately 100 persons representing 10 different countries met at Montana State University, Bozeman, Montana, USA, in 1979, on the occasion of the 2nd Meeting of PAAS. Over 300 persons representing 19 different countries registered at Hararey, Aragua, Venezuela, in 1981, on the occasion of PAAS' 3rd Meeting, held in conjunction with the IVth Latin American Congress of Entomology. Subsequent meetings are to be held on a triennial basis, with the next scheduled for 1986.

The 1981-1984 Governing Board includes President J. E. Henry, of Bozeman, Montana, USA, President-Elect V. R. Vickery, of Ste. Anne de Bellevue, Quebec, Canada, North American Representative G. B. Hukker, of Fargo, North Dakota, USA, Latin American Representative Francisco Cerda, of Hararey, Aragua, Venezuela, Representative-at-Large Herbert C. Knutson, of Manhattan, Kansas, USA, Past President R. A. Ronderos, of La Plata, Argentina, and Executive Secretary and Past President S. K. Gangware, of Detroit, Michigan, USA. D. A. Nichle, of Washington, D. C. USA, is Editor.

The present publications of PAAS include a newsletter entitled *Metaleptes* and a triennial Proceedings.

PAAS membership is open to all persons, professional or amateur, with an interest in New World acridology by virtue of their research, teaching, or other activities.



H. Radclyffe Roberts (1906-1982)  
 In Venezuela, July, 1981.

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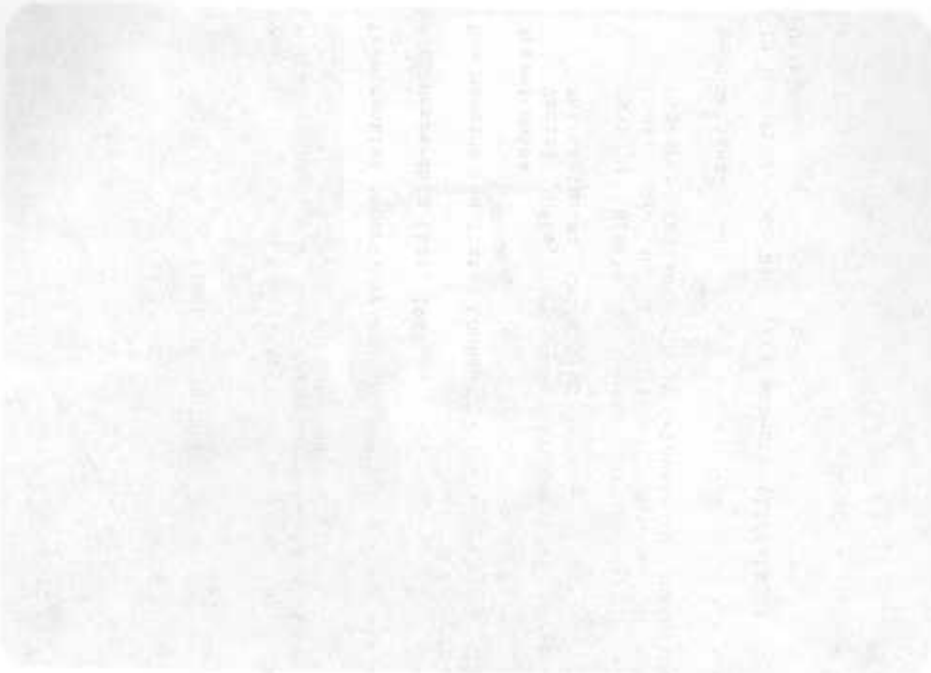
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THE PAN AMERICAN AGRICULTURAL SOCIETY  
LATIN AMERICAN TRAINING PROGRAM OF 1981  
FINAL REPORT

by

S. K. Gangwani



H. Radcliffe Roberts (1906-1988)

In Memoriam, July, 1988

THE PAN AMERICAN ACRIDOLOGICAL SOCIETY  
LATIN AMERICAN TRAINING PROGRAM OF 1981  
FINAL REPORT

by  
S. X. Gangwere

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The Pan American Acridological Society, or PAAS, completed a \$31,082 Latin American Training Program on the occasion of the society's 3rd Triennial Meeting, held in conjunction with the IVth Latin American and Vth Venezuelan Congresses of Entomology, at Maracay, Aragua, Venezuela, in July, 1981. Five promising young Latin American acridologists, or grasshopper and locust specialists, were selected in open competition and trained for three months each under the direction of recognized authorities at various North American acridological centers. This report gives assignments, accomplishments, budget, and other program details and makes recommendations for any future programs of this type that PAAS may undertake.

Funding

The basic grant that made possible the PAAS Latin American Training Program of 1981 was provided through the generosity of the Tinker Foundation, of New York, with the stipulation that the \$15,000 award given be supplemented by matching funds in the amount of at least \$10,000. These matching funds and more were donated by the following alphabetically listed institutions, organizations, agencies, etc.:

- Academy of Natural Sciences, Philadelphia, Pennsylvania, USA
- Agriculture Canada, Saskatoon, Saskatchewan, Canada
- Anonymous private donors
- Central Michigan University, Mt. Pleasant, Michigan, USA
- Children's Hospital of Michigan, Detroit, Michigan, USA
- Fundacion Bunge y Born, Buenos Aires, Argentina
- Macdonald College of McGill University, Ste. Anne de Belleue, Quebec, Canada
- Montana State University, Bozeman, Montana, USA
- Moorman's Travel, Detroit, Michigan, USA
- North Dakota State University, Fargo, North Dakota, USA
- Secretaria de Estado de Agricultura y Ganaderia, Buenos Aires, Argentina
- Society for Invertebrate Pathology
- Texas A & M University, College Station, Texas, USA
- USDA Rangeland Insect Laboratory, Bozeman, Montana, USA
- Wayne State University, Detroit, Michigan, USA
- IV Congreso Latinoamericano de Entomologia
- VI Congreso Venezolano de Entomologia

The 17 sources mentioned or alluded to above gave a grand total tentatively set at \$31,082 (US) for use in the program (See BUDGET). Direct funds were largely administered by Wayne State University, where the PAAS Secretariat is located. Indirect funds were given directly to the grantees by donors. In-kind funds were provided by donors in the form of directly given grantee room, board, or other essential services.

(Chairman of Committee), of Wayne State University. These four individuals, chosen especially for their expertise and diversity of research interest, used essentially the same procedures as were used in the earlier (1979) training program, as follows:

- 1) A February 2, 1981, letter announcing the PAAS training grant competition was mailed to society members and to selected outsiders asking for nominations.
- 2) Advice of selected senior Latin American aridologists was solicited by telephone for additional nominations.
- 3) The competition was formally announced in an enclosure accompanying the winter number of PAAS' newsletter Metaleptea (Vol. 3, No. 1).

4) A list of potential candidates was drawn up and all persons thereon were individually invited to apply.

5) A list of all applicants, invited by nomination or personally submitted, was amassed from the preceding sources.

6) These formal applicants were ranked using professional promise, prior scientific experience, age, and previous foreign travel as criteria. Younger, less experienced candidates of excellence but without prior foreign research experience were favored in the competition. Area of interest and national origin were disregarded. A total of ten highly qualified individuals was identified thereby from among the many applicants.

7) The committee determined that funds available to it were sufficient to support the participation of only five grantees.

8) The committee carefully assigned and scheduled the five top-ranked candidates according to their wishes modified by the committee's opinion as to where these candidates would receive maximal professional benefit. Then, by telephone, the committee chairman coordinated this provisional schedule with the host institutions to arrive at a definitive slate and program.

9) Following an April 20th telephone conversation with Mr. Renato Rennie, Program Director, Tinkar Foundation, and having gained her approval, the committee chairman issued invitations. Two of the five successful candidates were unexpectedly unavailable for the period in question. They declined and were replaced by the next two on the list. Being equally qualified, the replacements occasioned no loss of overall program effectiveness.

**Grantee Composition**

All 1981 grantees are young, relatively inexperienced but promising aridologists with much to gain from a training program in North American aridological centers. Two grantees, Cosenzo and Liljestrom, only recently completed their graduate training, while the other grantees are in final stages of theirs. Grantee Cosenzo (who recently accepted an important new aridological responsibility) and Caetano (who is changing to a new area of aridological interest) were

The sum of direct expenditures in the 1981 program amounted to \$12,211, or an average of \$2,442 per grantee, and the sum of total (direct + indirect + in-kind) expenditures was \$26,913, or \$5,382 per grantee. Average costs per grantee for the earlier (1979) program were \$2,300 direct and \$3,161 total expenditures. These figures reflect strong inflationary pressure but indicate that PAAS kept the 1981 program's direct cost increase minimal, only about 1.06% over the earlier program. Indeed, we controlled direct expenditures so tightly that a surplus of \$4,169 (actually \$2,288 when the society's unreimbursed expenses are deducted) is reported herein, largely attributable to an unanticipated last-minute indirect contribution that relieved PAAS of paying for an airline bill. We ask that this small surplus revert to PAAS for use in publication of grantee papers in the Harcey Proceedings.

**Hosts**

Numerous museums, universities, state and governmental agencies, and other organizations and individuals throughout the United States and Canada welcomed grantees into their midst, and a total of 12 such hosts provided space, equipment, and aridological counsel for one or more grantees for periods of a week or longer. These alphabetically listed major hosts include:

- Academy of Natural Sciences, Department of Entomology, Philadelphia, Pennsylvania, USA
- Agriculture Canada, Research Branch, Saskatoon, Saskatchewan, Canada
- Central Michigan University, Department of Biology, Mt. Pleasant, Michigan, USA
- Children's Hospital of Michigan, Detroit, Michigan, USA
- Macdonald College, McGill University, Lyman Entomological Museum, Ste. Anne de Bellevue, Quebec, Canada
- North Dakota State University, Department of Entomology, Fargo, North Dakota, USA
- Texas A & M University, Department of Biology, College Station, Texas, USA
- Universidad Central de Venezuela, Facultad de Agronomia, Maracay, Aragua, Venezuela
- University of Michigan, Museum of Zoology, Insect Division, Ann Arbor, Michigan, USA
- USDA Rangeland Insect Laboratory, Bozeman, Montana, USA
- Wayne State University, Department of Biological Sciences, Detroit, Michigan, USA
- Wayne State University, Medical School, Department of Pathology, Detroit, Michigan, USA

The Facultad de Agronomia, Universidad Central de Venezuela, deserves special mention for the key role it played during the period when it was the grantees' host during the 3rd Triennial Meeting at Maracay.

**Grantee Selection**

Grantee selection was by a PAAS Committee consisting of Drs. I. J. Cantrall, of the University of Michigan, J. E. Henry, of the USDA Rangeland Insect Laboratory, and Michael Tyrkus and S. K. Gangwere

Invertebrate Pathology, Bozeman, & USDA Rangeland Insect Laboratory, Bozeman; (September) Agriculture Canada & University of Saskatoon. Maracay talk: "Control de Schistocerca gregaria en la Argentina." PAAS award \$3,103; total award \$4,769.

Liljestrom, Getardo, G., D. Sc. Home institution: Consejo Nacional de Investigaciones Cientificas y Tecnicas, La Plata, Argentina. Research interests: grasshopper population dynamics & parasitism. Assignments: (July) 3rd Triennial Meeting, Maracay, & Northwoods Biological Station, Wayne State University, Watersmeet; (August) Department of Biology, Central Michigan University, Mt. Pleasant, & Agriculture Canada & University of Saskatoon; (September) USDA Rangeland Insect Laboratory, Bozeman. Maracay talk: "Relaciones entre dipiteros parasitoides y poblaciones de acrididos en la provincia de Buenos Aires." PAAS award \$3,466; total award \$6,156.

Turk, Sonia, Z., Lic. Home institution: Fundacion Higue Lillo & Universidad Nacional de Tucuman, Argentina. Research interests: systematics of Neotropical acridoids. Assignments: (July) 3rd Triennial Meeting, Maracay, & Northwoods Biological Station, Wayne State University, Watersmeet; (August) Lyman Entomological Museum, McGill University, Ste. Anne de Bellevue, USDA Rangeland Insect Laboratory, Bozeman, & Museum of Zoology, University of Michigan, Ann Arbor; (September) Department of Entomology, Academy of Natural Sciences, Philadelphia. Maracay talk: "Habitos de oviposicion en tucuras de la Argentina." PAAS award \$3,091; total award \$6,160.

#### Grantee Program of Study

Attendance at PAAS Meeting. During the period July 5-10, 1981, over 300 scientists representing 19 different countries assembled at Maracay, Venezuela, on the occasion of PAAS' 3rd Meeting. Held in conjunction with the IVth Latin American and Vth Venezuelan Congresses of Entomology. The five PAAS grantees were among the participants, and each gave the paper listed above for him/her. They participated in the three major symposia scheduled by PAAS (New Tendencies in Grasshopper Systematics, Biogeography of Acrididae, Pure & Applied Ecology of Grasshoppers) and heard a total of 33 major papers in acridology alone. They also attended relevant sessions of other meetings at which many additional papers were read. And, of course, they availed themselves of the opportunity for informal discussion with scientists from many different countries.

Attendance at Northwoods Biological Station. Following the Maracay Meeting, the grantees went by surface vehicle from Florida to Northwoods Biological Station, Wayne State University, Watersmeet, Michigan, and, in doing so, traced a night-seeing transect through eastern United States. At Northwoods, they were registered as graduate students in a formal course, "Biology of Grasshoppers," conducted group research in conjunction with three Wayne State University acridologists (Michael Tyrkua, Steve A. Vix, and S. K. Gangwere), and carried out field work throughout Michigan's biologically interesting Upper Peninsula.

Visits to Acridological Laboratories. Each grantee then visited several additional universities, museums, or other acridological centers throughout the United States and Canada. This acquainted them

particularly in need of additional specialized training such as only the PAAS Training Program could provide.

Three of the grantees are from Argentina; one, currently working in Argentina, is from Yugoslavia; and one is from Brazil. This admittedly skewed distribution is defensible, however, in that 1) the original slate of grantees included a Chilean and a Brazilian who subsequently withdrew; 2) the best-available candidates were chosen irrespective of country; and 3) there are more Argentine candidates than others because there are currently more student acridologists in Argentina than elsewhere in South America. Indeed, many Latin American countries have no acridologists at all and, hence, lack acridological programs and students. Perhaps this deficiency should be addressed by appropriately modified selection criteria in any future training programs.

Turning to discipline, the distribution of grantees was more satisfactory. There was one cytogeneticist, one feeding specialist, one ecologist-chemical control specialist, one ecologist-parasitologist, and one systematist among the grantees. This represents a varied set of interests rather representative of current acridological trends.

#### Grantee Data

The following is a list of the 1981 grantees and their home institution, research interests, assignments, approximate dates of assignment, talks delivered at the 3rd Triennial Meeting, and approximate dollar value (US) of their award, both direct (PAAS funds only) and total (direct + indirect + in-kind).

Bidou, Claudio J., Lic. Home institution: Departamento de Ciencias Biologicas, Universidad de Buenos Aires, Argentina. Research interests: orthopteran cytogenetics. Assignments: (July) 3rd Triennial Meeting, Maracay, & Northwoods Biological Station, Wayne State University, Watersmeet; (August) Department of Pathology, Wayne State University, & Children's Hospital of Michigan, Detroit; (September) Department of Biology, Texas A & M University, College Station. Maracay talk: "Analisis citogenetico de dos poblaciones de Leptyna argentina Bruner." PAAS award \$1,311; total award \$6,449.

Caetano, Flavio H., Lic. Home institution: Departamento de Biologia, Universidade Estadual Paulista Julio de Mesquita Filho, Rio Claro, Brazil. Research interests: grasshopper feeding behavior & adaptations. Assignments: (July) 3rd Triennial Meeting, Maracay, & Northwoods Biological Station, Wayne State University, Watersmeet; (August-September) various institutions in Chicago area. Maracay talk: "Estudo comparativo do trato digestivo de forrageas e estruturas excretoras anexas l. Morfologia." PAAS award \$1,240; total award \$3,379.

Cosenzo, Eduardo, L., Ing. Agron. Home institution: Secretaria de Estado de Agricultura y Ganaderia, Buenos Aires, Argentina. Research interests: grasshopper control. Assignments: (July) 3rd Triennial Meeting, Maracay, & Northwoods Biological Station, Wayne State University, Watersmeet; (August) Department of Entomology, North Dakota State University, Fargo, XIVth Annual Meeting of Society for



with North American insect collections, facilities, and recent developments and research trends and allowed them the opportunity to converse at length with the resident acridologists. These centers that were visited, of which there were 12 principal ones listed under Hosts (p. 2), varied with the grantee and his/her research interests. The individual assignments are listed under Grantee Data (pp. 4-5) and are discussed under Grantee Reports (pp. 7-12).

**Research.** Each grantee carried out personal research of his/her own choosing in the area of interest indicated on his/her application blank. These studies, supervised by host authorities in the discipline in question, are summarized by individual grantee in Grantee Reports (pp. 7-12).

#### Objectives & Accomplishments

Goals of the PAAS Latin American Training Program of 1981 were 1) to make available to the grantees the latest technical information and methods of acridology; 2) to further grantee research; 3) to open lines of communication and further collaboration among the grantees, their hosts, and other acridologists so as to advance acridology and better serve mankind. In our opinion, these aims and more were achieved. The grantees carried out the acridological activities and had the professional experiences outlined in their individual reports (pp. 7-12) which testify eloquently to the intensiveness and quality of the training they received. They have subsequently carried back the benefits gained to their respective countries where, in turn, they will use them and pass them on to their students and associates. But there was another, equally important side to the 1981 program. Not only were the grantees enriched but also their hosts and all other acridologists with whom they came into contact, and surely New World acridology is the richer for it in terms of higher levels of technology and improved international understanding. PAAS proudly offers these results to the Tinker Foundation and other sponsors and hosts as noteworthy contributions of the 1981 program.

#### Recommendations for the Future

Having implemented Latin American Training Programs in 1979 and 1981, the Pan American Acridological Society should logically begin appraisal of its past programs and make recommendations for any future programs that it might undertake. Accordingly, on behalf of the 1981 Selection Committee, I herein suggest that Dr. J. E. Henry, President of PAAS, consider appointing a Training Program Evaluation Committee to which I would offer the following observations:

- 1) Based on input received, the 1979 and 1981 programs were successful, which suggests the desirability of continuing training programs on the occasion of future triennial meetings, subject, of course, to availability of funds.
- 2) Comments from colleagues, numbers of applications received, host organization willingness to receive grantees, and limitations to the Selection Committee's ability to process applications, make recommendations, coordinate assignments, implement the overall program, and other considerations suggest that any further programs should be restricted to no more than 6 - 8 grantees.

3) Based on conversations with prospective South American hosts, it now seems feasible to implement an exchange program involving both Latin American and North American trainees who would assemble at the triennial meeting site and then depart for their respective destinations in North and South America. Such a reciprocal program could be funded like the past Latin American training programs (travel provided by some outside granting agency and housing and subsistence by host institutions or private individuals). The 1981 Selection Committee recommends that this possibility be explored.

4) Grantee selection criteria should be evaluated, particularly with respect to professional areas of interest and country of origin.

#### Grantee Reports

The following section includes reports submitted by each grantee at the conclusion of his/her tenure of award. These are presented essentially as written, except for editing to assure uniformity of style, condensation of longer reports, and translation into English. However, the thanks tendered without exception by each grantee to the Tinker Foundation and other sponsoring institutions, agencies, and individuals and to the many hosts are deleted in favor of a blanket acknowledgment in this paragraph. All are deeply appreciative of, and indebted for, the exceptional study opportunities presented them and ask that their gratitude be conveyed. On their behalf, and that of PAAS, I take this opportunity to say "thanks."

**Bidau, Claudio J.** During the tenure of my award, I had the opportunity of attending the 3rd Triennial Meeting of the Pan American Acridological Society at Maracay, Venezuela, where I delivered a paper on the chromosomal polymorphism of *Leptyna argentina* (Acrididae: Leptyninae). The Maracay meeting was valuable to me because of the high quality of the symposia and research papers presented and because I had an opportunity to meet many eminent acridologists working in different fields. I benefited especially from discussions on grasshopper population cytogenetics, chromosomal evolution, and chromosomal structure with orthopteran cytogeneticists Drs. G. H. Hewitt, A. Ferreira, N. La Fuente, and M. Tyrkus.

My next assignment was at Northwoods Biological Station, Wayne State University, Watermeet, Michigan, where my activities were several. I took field trips throughout the Upper Peninsula and collected large numbers of grasshoppers, including *Camnula pellucida*, *Chorthippus curtipennis*, *Dissosteira carolina*, *Chloasaltis conspersa*, several *Meianoplus* species, and others, all of which I processed for future cytogenetic study. I participated in field and laboratory experiments under the supervision of Dr. S. K. Gangwere on feeding behavior of *Camnula pellucida*. These latter included field sampling of different plants on which grasshoppers were collected, laboratory observations on feeding preferences, analysis of fecal pellets, etc. I particularly benefited from discussions with Dr. Gangwere on grasshopper feeding behavior and with grantee Miss Sofia Turk on grasshopper systematics. I also attended Dr. Gangwere's entomology lectures.

Next, I worked with Dr. Michael Tyrkus at the Wayne State University School of Medicine and Children's Hospital of Michigan, in

Detroit, Michigan. During my stay, Dr. Tyrkus and I put into practice several chromosome banding techniques to obtain longitudinal differentiation of grasshopper chromosomes. One of these techniques, a new kind of G-banding (a powerful tool in cytogenetics and cytogenetics for identifying and comparing individual chromosomes among different species), yielded unusually good results, so Dr. Tyrkus and I are planning future collaborative studies using it on members of the grasshopper genus *Melanoplus*. I also started the chromosomal study of specimens I collected earlier at Northwoods, made field trips in southern Michigan to collect additional species, and photocopied many cytogenetic articles from the School of Medicine Library and Dr. Tyrkus' personal library.

I then visited Dr. Gilbert Schroeter's laboratory at the Department of Biology, Texas A & M University, College Station, Texas. My work there included study of chromosome preparations of *Schistocerca americana* and *Oedalaonotus enigma*, two grasshoppers interesting because of their chromosome polymorphisms which may affect chiasma frequency and, hence, total recombination. I learned additional techniques for chromosome preparation; I made a major collecting trip; and I acquired literature on cytogenetics from the Texas A & M University Library and from Dr. Schroeter's personal library. Above all, I discussed with Dr. Schroeter aspects of grasshopper cytogenetics such as the origin of R chromosomes and supernumerary segments and statistical methods to test differences in chiasma frequency produced by supernumerary material.

Looking at the overall trip I had in the United States, I believe the experiences detailed above extremely valuable because I learned techniques that should prove useful in my future studies on the cytogenetics of Argentine grasshoppers and because I met some distinguished scientists with whom I am planning collaborative work. None of this would have been possible without the PAAS-Tinker-Bunge & Born award given me.

Caetano, Flavio H. During the 3rd Triennial Meeting of the Pan American Acridological Society at Maracaibo, I had an opportunity to take part in the scheduled conferences and symposia; I met many acridologists with whom I discussed different research subjects; and I presented a paper on digestive tract morphology and received much valuable input on it.

After the Maracaibo Congress, accompanied by Drs. S. K. Gangwere, H. Tyrkus, Mr. Steve Vix, and the PAAS grantees, I went, by surface transportation, from Miami to Ann Arbor and then to Northwoods Biological Station in the Upper Peninsula of Michigan, so I was able to sightsee many parts of eastern United States.

At Northwoods, along with the other PAAS grantees, I was involved in the following grasshopper-oriented activities under the guidance of Dr. Gangwere:

- a) I studied methods of collecting, transporting, handling, and preserving grasshoppers.
- b) I studied maintenance of living grasshoppers under laboratory conditions.

c) I learned identification of the common grasshoppers of the region.

d) I made several field trips throughout the northern Great Lakes Region and took part in field and laboratory experiments on the feeding behavior of the grasshopper *Camnula pellucida*. Included among procedures that we used were the study of plants in the field, analysis of grasshopper food preferences, analysis of fecalae, etc.

e) During this period, I discussed many different acridological subjects and read papers on Orthoptera, especially those concerned with feeding behavior and the anatomy, histology, and physiology of the digestive tract, which are subjects of greatest interest to me.

f) I attended Dr. Gangwere's lectures in entomology.

I terminated my grasshopper studies in the Chicago area, where I was engaged in library and other technical entomological work at a number of institutions detailed elsewhere.

Cosenzo, Eduardo L. I spent the first stage of my training grant in Venezuela, where, with the other PAAS grantees, I attended the 3rd Triennial Meeting of the Pan American Acridological Society and the Latin American and Venezuelan Congresses of Entomology. At this meeting, I gave a paper on control of the locust *Schistocerca gossypii* in Argentina, its evolution, and overall perspectives; I heard many interesting reports on the ecology, taxonomy, and control of grasshoppers; I exchanged ideas with countless specialists of other countries; and I was able to propose lines of future collaboration with some of them.

During the second stage of my grant, I was at Northwoods Biological Station of Wayne State University, Waterman, Michigan. Here, I attended the entomology lectures given by Dr. S. K. Gangwere and worked on determination of food habits of the grasshopper *Camnula pellucida*. My studies on the latter involved scientific sampling of vegetation by the grid method, collection of grasshoppers, determination of their feeding on plants with a relatively high frequency index (hence, especially abundant and likely to be eaten), collection and analysis of grasshopper feces, and cytological study of grasshopper food plants. Together with grantee Nias Sonta Turk, I collected and determined the grasshoppers of the local area, and, with Mr. Steve Vix, I collected and determined the local plants. I was also engaged in library work on the ecology and parasitism of grasshoppers.

I spent the third part of my grant at the Department of Entomology, North Dakota State University, at Fargo, North Dakota, where I worked on a study program involving the grasshopper parasite *Entomophaga grylli*. Under the direction of Dr. C. G. Huikern and Mr. D. Nelson, I isolated spores and studied their structure; I collected grasshoppers killed by the fungus and identified the grasshoppers and plants of the infested study areas; I evaluated the comparative attack between the natural collection areas and insecticide-treated cultivated plots; and I analyzed, in the laboratory, distinct phases for spore isolation and became trained in the study methodology and instrumentation. Dr. Huikern also showed me some new methods to determine food habits such as use of keys to identify leaf epidermis.

I spent the rest of my time visiting the USDA Biological Control Laboratories in Fargo to study their mass rearing of insects and irradiation for purposes of sterilization and to see their facilities for tissue culture and electron microscopy.

The next phase of my work took me to Bozeman, Montana, where I attended the XIVth Annual Meeting of the Society for Invertebrate Pathology. At this meeting specialists from throughout the world read papers on the grasshopper parasites *Nosema* spp., *Entomophaga gylli*, and other entomoparasites such as *Bacillus thuringiensis*, discussed certain newly isolated infirmities of insects of agricultural interest, and gave a symposium on the formulation, storage, and application of microbial agents to control pest outbreaks.

However, my main reason for being in Bozeman was to work at the USDA Rangeland Insect Laboratory in that city. There, I discussed aspects of density calculation of grasshopper populations and terrestrial and aerial control measures with Drs. J. Onnager and G. Rees; with Drs. Onnager, J. Henry, and G. Hussagug, I participated in a *Nosema locustae* field program involving evaluation of infestation by hemocytometer and Neuburger chamber, preparation of suitable dilutions, use of *Nosema* spores, and laboratory techniques such as bioassays to estimate spore potentiality; I observed on-going studies on parasitism and hyperparasitism; and I spent time using an extensive bibliography of sarcophagid flies parasitic on migratory locusts.

I spent the final phase of my trip at the Agriculture Canada Research Station at Saskatoon, Saskatchewan, Canada, where I worked with Dr. A. Even on control methods for agriculturally important grasshoppers, especially concentrating on machines of application, insecticides, and toxic lures and their levels of efficiency and conductivity. Simultaneously, under the tutelage of Dr. O. Dift, of Agriculture Canada, and Dr. Lackie, of the Engineering Department, University of Saskatoon, I studied current methods of grasshopper damage estimation on cultivated plants by means of remote sensors, including, for example, use of infrared photography and spectroradiometry.

Liljestrom, Gerardo G. At the 3rd Triennial Meeting of the Pan American Acridological Society, held at Maracay, Venezuela, I was able to read a collaborative paper (with former PAAS grantee Dr. Norma Sanchez) on mortality factors in an Argentine grasshopper population, and I made contacts with acridologists from many different countries.

On my arrival in the United States, I began work at Wayne State University's Northwoods Biological Station, Watersmeet, Michigan. There, under the direction of Dr. S. K. Gangwere, I made extensive collections of grasshoppers and studied different habitats so as to put into practice various techniques of grasshopper food habit study.

I then visited Central Michigan University, Mt. Pleasant, Michigan, where, under the direction of Dr. Roger Bland, I worked on use of electron microscopy to evaluate grasshopper ecto- and endoparasites. In doing so, I carried out all phases of this research from material collection to interpretation of electron micrographs.

I continued my North American studies at the Research Station, Agriculture Canada, in Saskatoon, Canada, where I was assigned to the team of Drs. A. Even and H. Mukerji, who work on grasshopper population dynamics and biological control. In believe my activities in this particular program were unusually useful because I observed sampling, quantifying, analyzing, and interpreting acridid populations, all methods that, on my return to Argentina, I hope to modify and use in my own laboratory.

My last assignment during the PAAS training program took place at the USDA Rangeland Insect Laboratory, Bozeman, Montana, where I worked with Dr. J. Onnager and his team on grasshopper control, carried out field work on dipteran parasites of grasshoppers, and obtained information on the impact of grasshoppers on pasture dynamics.

Turk, Sonia Z. My current research involves bioecological study of northwest Argentine grasshoppers and systematic investigation of Neotropical representatives of one taxonomic group, the Melanoplinae. I am pleased to report that, during the tenure of my PAAS-Inker training award, my knowledge of these two research areas increased significantly at the same time as I acquired a general understanding of the acridofauna of an entirely new area of the world, viz., that of northern United States and Canada.

My specific activities were as follows:

I participated in the 3rd Triennial Meeting of the Pan American Acridological Society, Maracay, Venezuela, where I read a paper dealing with ovipositional habits of certain grasshoppers. While at Maracay, I was impressed by the high level of the works presented and by the numbers of outstanding acridologists from so many different countries with whom I was able to establish professional contact.

At Northwoods, the biological station of Wayne State University, Watersmeet, Michigan, I collected specimens of some important North American species of Acridoidea and studied, in qualitative fashion, some major habitats of this boreal zone of Upper Michigan. By these means, and upon perusal of pertinent literature, I informed myself on the general composition and distribution of the local acridoids. Simultaneously, under the direction of Dr. S. K. Gangwere, I carried out differential feeding experiments, made observations on mouthpart adaptations, and did a comparative study of plant fragments within grasshopper feces to determine the mode of feeding of the grasshopper *Lamula pellucida* (Scudder).

At Lyman Entomological Museum, McGill University, Ste. Anne de Bellevue, Quebec, Canada, I worked with Drs. D. K. McE. Kevan and V. Vickery. My studies there centered on identification of grasshoppers that I had collected at Northwoods and on use of the Lyman collections to analyze the external structure and male and female genitalia of various representatives of the taxonomically difficult genus *Melanoplus*.

At the USDA Rangeland Insect Laboratory, at Montana State University, Bozeman, Montana, I observed methods that Drs. J. E. Henry, J. Onnager, and their staff are using for biological control of grasshoppers; I learned some new methods for rearing grasshoppers in

the laboratory such as will permit me to perfect my own future studies; and I made some collections of insect material for later study.

At the Insect Division, Museum of Zoology, University of Michigan, Ann Arbor, Michigan, I had the opportunity of working with Drs. I. J. Cantrall, T. J. Cohn, and T. H. Rubbell. From fruitful conversations I had with them, I identified all kinds of new research possibilities which I might explore in the future. I worked with the Insect Division's impressive worldwide collections of Orthoptera, paying especial attention to one group of grasshoppers, the South American Melanoplineae.

Then, under the direction of Dr. H. R. Roberts, of the Department of Entomology, Academy of Natural Sciences, Philadelphia, Pennsylvania, I was able to work with the academy's excellent collections of Neotropical acridoids, emphasizing Melanoplineae and Leptysminae, and I photographed many type specimens of the grasshopper genus *Dicroplus*, which I am studying for purposes of my dissertation. Equally important, Dr. Roberts helped me clarify certain concepts and resolve doubts in my mind concerning the biology, ecology, and systematics of the South American grasshoppers with which I am most involved professionally.

Regarding the overall North American trip, I can say that my visit to the foregoing institutions enabled me to consult excellent libraries and acquire publications related to my research. I was given tremendous numbers of separates that reflect the research direction of the various acridological centers I visited, and I made numerous photocopies of other acridologically indispensable publications.

Specimens of various species of Neotropical Leptysminae and Melanoplineae that were kindly donated to me and other grasshopper material that was loaned to me for study will serve as points of reference in my systematic research. These specimens are important to our knowledge of Neotropical melanoplineae because they represent species new to science or serve to widen the known geographical distribution of the South American insects in question. Other specimens that I collected personally in northeastern United States and Canada are important because they give me two institutions, the Miguel Lillo Foundation and the National University of Tucuman, a good representation of the Holarctic acridofauna.

## BUDGET\*

Category	Receipts	Expenditures	Balance
<b>Direct Contributions</b>			
Tinker Foundation**	\$15,000		
Anonymous private donors***	800		
Academy of Natural Sciences***	500		
Moorman's Travel***	80		
Total	\$16,380		
<b>Direct Expenditures</b>			
Adjusted travel, international & local		\$ 7,912	
Subsistence		4,299	
Total		\$12,211	
<b>Direct Fund Anticipated Balance</b>			\$4,169****

**Indirect Contributions\*\*\*\*\***

Bunge & Born Foundation	\$ 3,018
Anonymous donor	1,718
Wayne State University ORSPS	1,200
IVth Latin American & Vith Venezuelan Congr.	694
Wayne State University Biological Sciences	500
Argentine Ministry of Agriculture	464
USDA Rangeland Insect Laboratory	439
Society for Invertebrate Pathology	70
Total	\$ 8,104

**Indirect Expenditures**

\$ 8,104

**Indirect Fund Balance**

\$ 0.00

**In-Kind Contributions\*\*\*\*\***

Total by anonymous donors \$ 6,598

**In-Kind Expenditures**

\$ 6,598

**In-Kind Balance**

\$ 0.00

**GRAND TOTALS**

\$31,082 \$26,913 \$4,169\*\*\*\*

\*All figures given are rounded-off approximations subject to final analysis.

\*\*These funds were administered and audited by Wayne State University.

\*\*\*These funds were administered and audited by PAAS.

\*\*\*\*The request that this surplus, attributable to an unanticipated last-minute indirect contribution, be used to reimburse PAAS for its training program expenditures less reimbursements (\$1,881) and that the remainder (\$2,286) be expended in payment of the grantees' publication costs in the forthcoming Proceedings of the 3rd Triennial Meeting.

\*\*\*\*\*These funds were given by donors directly to the grantees in lieu of total PAAS support so were donor audited.

\*\*\*\*\*This is support given in the form of grantee room, board, or other essential services. No audit in possible in absence of an actual money exchange.

even more important. Virtually all members with whom I have spoken agree that the Society should not undertake publishing a formal journal. However, many members support the concept of publishing occasional papers. We are now undertaking to do that very thing in publishing a paper by Dr. Pender. The policy shall be that Society members will receive free copies while institutions and non-members will be charged nominal prices to cover printing and mailing expenses. Manuscripts must be in the field of orthopterology and of a size that is too large for established journals, possibly in the realm of 40 to 100 pages. Anyone having such manuscripts that might be of interest to PAAS should submit them to Dave Nickle, PAAS publication chairman and newsletter editor.

So you see, we are moving ahead, hopefully in a direction that you approve. We are interested in your concerns and suggestions, so feel free to let committee people and members of the governing board know your feelings. It will help to keep PAAS a viable and prestigious scientific organization.

J. E. Henry, President

#### PRESIDENTIAL REPORT

Much has happened since I last reported to you in *Metalepted*. Some things have occurred that might well have destroyed similar international organizations, while other happenings have demonstrated the desire of the dedicated scientists of PAAS to remain affiliated and even to become a larger international force. It is indeed a pleasure to serve as President of such an outstanding organization.

The political and military confrontation between two nations represented by scientists in our Society was a tragedy. The fact that third countries saw fit to align themselves on either side was an unfortunate consequence of that confrontation. Regardless of what people and governments do to remove the causes of the war, lives have been lost, dreams have been destroyed, and physical, mental, and political wounds have been inflicted so deeply that scars will show for years. But as scientists, dedicated to preserving and enhancing life on this earth, I hope that our members will rise above the situation and reaffirm their moral and professional responsibilities of understanding and cooperation. Only in that way will a society even as small as ours continue to provide a forum for exchange and discussion among citizens of the world. In essence, it is my hope that when we meet again, we all can do so as before, as true friends and colleagues. I am so confident about the character and integrity of the PAAS membership that I know this will happen.

I am pleased to report that the recent vote established that the membership is in favor of both affiliation with the International Union of Biological Sciences (IUBS) and consideration of expansion to a global body. We already are moving to provide the IUBS with the necessary documentation about our Society so that they might consider affiliation at the next session of the world organization. I do not anticipate any problems. In the interest of time, I am appointing the board of directors of PAAS as an *ad hoc* committee to investigate the pros and cons of expansion, to determine the interest of scientists in Europe, Asia, Africa, and Australia for joining our Society, and to devise the various organizational structures by which this might be achieved. We expect to have this prepared by the time of the 1984 meeting so that it might be brought to discussion by the entire membership.

Speaking of the 1984 meetings, I now am ready to appoint a site selection committee for that next session. At this time, both Canada and Mexico appear as prospective sites, but anyone wishing to provide input should present their ideas or suggestions to the committee. Members that I am requesting serve on this committee are Anthony Joern, Al Even, and Francisco Carda.

Many of you will recall that there has been discussion in our group about the Society sponsoring some sort of scientific publication. With the pending demise of *Acridis*, this becomes

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#### NEW MEMBERS AND STATUS CHANGES

*Metazepeta* is pleased to welcome the following to  
 Membership in PAAS:

Mr. John M. Bidochka student  
 University of Regina  
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 CANADA

interests: grasshopper genetics and ecology

Dr. Syril Blondheim active  
 Department of Zoology  
 The Hebrew University  
 91904 Jerusalem  
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 interests: acoustics of Orthoptera; morphology and  
 behavior of mantids

Sr. Pedro Esponda active  
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interests: cytogenetics, spermatogenesis (electron  
 microscopy)

#### TRAVEL NOTES

Dr. Daniel Otte, Academy of Natural Sciences of  
 Philadelphia: Collecting Among Lions, 1980, 1982.

#### Kruger National Park.

Yesterday afternoon we spoke to the scientist second in  
 command for research and arranged to engage an African game  
 guard to accompany us into the bush after dark. We cooked a  
 steak over an open bush fire outside of our comfortable  
 visitors' cottage and at 7:30 arrived at the African village  
 where we were to meet our guard. In the dim light an old  
 African in a torn sleeveless undershirt greeted us. He  
 disappeared into the village for fifteen minutes and upon his  
 return told us that Johann was coming. The old man disappeared  
 again after ten minutes.

When he returned the second time, we were told that Johann  
 had "gone away". We debated whether we should go ahead without  
 the guard, but Rob Toms, a graduate student from the University  
 of Witwatersrand in Johannesburg, advised that we make our  
 excursion legal, since he wished to have good relations with  
 the Parks Board. The old man left a third time, this time  
 returning with a young African in blue coveralls, unbuttoned to  
 his waist.

We asked if he was Johann. He said, "No, German". Was he  
 going to be our guard? "Yes". Didn't he have a rifle? "No". We  
 thought, "Well, this is odd, but let's get on with it".

We climbed into our small, decidedly not elephant-proof  
 Japanese vehicle and headed into the darkness. We crossed the  
 Sabie River and cruised slowly, listening for crickets, along  
 the north bank of the river through the tall yellow grasses.

At our first stop I tape recorded a species of *Platygylius*  
 which is widespread through the thorn scrub. German shone his  
 head lamp into the brush and grass and said, "There are many  
 lions here". We looked at him staring into the night, and I  
 said, "But you will protect us". He said, "Yes". I said, "How,  
 since you don't have a gun?" He asked, "You have a gun?" I  
 said, "no". He asked, "You don't have a revolver?" I said,  
 "No". He shook his head and chuckled. I thought back to the  
 rangers answer to my questions if there were ever any lion  
 fatalities in the Park. He had said, "A few, usually from old  
 or injured lions". I looked into the bush, imagining limping  
 lions.

Ten kilometers down the road I stopped the car next to  
 some *Oenanthus* singing in tall roadside grasses. I recorded  
 three males, and we caught two. German was down in the grass on  
 hands and knees. His keen eyes spotted hard-to-find females and  
 several more males. I wondered if he was guarding us at the  
 same time.

Bill Cade, my colleague from Canada, and German worked  
 gradually away from the road towards a thicket. Rob was

because of a high bank.

Johann became a little concerned over my safety when I was recording the begging noises of three half-grown hyenas following their mother back and forth across the road. This female and another hyena began approaching the car. I felt sure out of curiosity. I was hidden in the shadow of the car lights, and Johann climbed out of the car with his ax at the ready. When he stepped into the car lights, all five hyenas quickly disappeared into the tall grass.

We stayed with Lou and Elaine Taylor one night. They live on a citrus estate bordering the Kruger National Park. A braai (cookout) had been organized, with several other entomologists invited. Before dark the Taylors took us down to the Sable River which marks the border with the game reserve. It is a deep quiet river fringed with large fig trees and full of crocodiles and hippos. Lou told us of a park ranger who, while wading in the river nearby, had been grabbed by a croc, but instead of heading for deeper water as crocodiles usually do, the croc had moved toward the shore, where spears were waiting to kill it. The ranger recovered all right, but has a few pieces of his leg missing.

The hippos are encouraged to enter the citrus groves where they crop vegetation which tends to grow rank without them. A good sized herd of 20 or more lives in the irrigation reservoir a few hundred meters from the village. After dark they wander about, often entering peoples' yards. Lou informed us that we were having hippo steak for supper. A big hippo had been shot a few days before by one of the farm hands, because it had "gone crazy". No one believes this, because it was known that this man desperately wanted to shoot a hippo.

The steaks, marinated in a special sauce, were most delicious, but quite tough. The taste was not quite like pig but not like beef either. We had a good entomological conversation with our colleagues over beer and hippo. Later on, we all went cricket hunting along a road in the nearby bush. We collected a female of the new *Afrogyllopsis*, two species of the wingless grylline, *Cophogyllus*, a songless aneopterine, and a new *Telogyllus*.

Lou runs an experimental prawn farm. He has 5 or 6 large ponds from which he hopes to harvest one and a half to two tons of prawns. This is part of a government program to decentralize industries and to create local economies within tribal homelands. These will in turn relieve unemployment problems in the country and discourage the unmanageable influx of people into overcrowded cities.

#### Hluhluwe Game Reserve.

Bill and I were returning to Hlabisa through the Umfolozi Hluhluwe Game Reserve in Zululand late one night, returning from St. Lucia on the coast. Coming around the bend, we came upon two huge male lions lying in the middle of the road. They walked off and lay down again in the grass near the road. Further up the road we had to wait for a herd of buffalo to

recording another oceanthine and I was walking along the road. Shortly, Bill and German came rushing out of the grass, not running, just walking fast, casting their beams behind them. They burst right through Rob's recording operation and onto the road. Apparently they had been busy looking for *Oecanthus* in the tall grass when German raised his head and announced, "LIE-ONS", and took off like a streak for the road, protected from behind by Bill whose survival urge caused him to stay close to German's heels. Then the real roaring started. "Three kilometers, I think", said Rob. I estimated two kilometers. "One half kilometer", said German. We drove on, leaving the lions roaring among the thick brush along the nearby sandy river bed.

German heard lions again at Orpen Dam when we had stepped out to listen for crickets. I was headed down a small footpath to a lookout point. I saw him cock his head and asked him what was up. He again said, "lie-on". This one was not roaring and could have been much closer. We decided there were no crickets there and returned to the car.

At Tschokwane we heard what we thought was a new *Telogyllus*. I told Rob to ride shotgun with his bright lamp which plugged into the cigarette lighter receptacle. Here we heard elephants crashing about through the underbrush, and Rob, who has been chased at night by elephants in Botswana, was quite wary. He said he could hear them breathing! German found the only singing male cricket, an *Afrogyllopsis*, after we had thoroughly trampled the shrubbery under which he had been singing.

We also met with a large porcupine who in a full defensive display looked quite formidable. Back near camp we saw a pair of courting lions in the middle of the road. Disturbed by our lights, they moved out into some brush and continued their courting.

On the following day we informed the authorities that our guard had not carried a gun. We were told they never carry guns, unlike the game guards in Zululand who are armed with rifles.

In the evening we returned to the African village to pick up our guard for the evening. We expected and hoped that German would assist us again. But this time Johann joined us -- in proper game guard uniform: khaki trousers, polished boots, and green sweater. Johann was armed with an ax! I asked, "Can you protect us with that ax?" He said, "Yes".

Johann spotted a black rhino standing on the side of the road, looking just like a boulder. He spoke Afrikaans, so it took me a second to grasp what he had said. By then, we were almost on top of the rhino, who fortunately moved off into the grass. I have friends in Zululand who have had holes punctured into their cars by rhinos. They had warned us that rhinos become annoyed with lights, just as Rob claims elephants do. Not much farther along the road one of three rhinos seemed quite agitated by our lights, but he could not approach us

cross the road. We finally found a gap in the herd and dashed through.

These two events made us a bit nervous the following evening inside the reserve, where we had been given permission to collect crickets without the aid of game guard. We had to sign a document relieving the Natal Parks Board of all responsibility in the event one of us was eaten or gored. We had heard of no lion deaths, but buffalo and rhino send people and cars to hospitals and garages often enough.

Working first in the shallow sandy ravine, we spotted lion tracks over recent tire tracks. We thought it prudent to move to where we could see better. In the open woodlands we collected two *Oecanthus* species and two gryllines, a *Platygyllus* and a *Scopsipedia*. From there we moved on up a rise where we could hear many cricket sounds coming out of a rhino wallow. We approached this cautiously, watching for suspicious big lumps against the darkness, since rhino eyes do not normally reflect light. Seeing none, we proceeded to work around the wallow, extracting a number of cricket species from deep mud cracks. We had just collected the last species when we heard a deep, throaty WOOOOF! less than a hundred meters from us. We immediately spotted eyes which we presumed belonged to a lion and quickly headed for our car. But we could not find the car and were confused by the sounds of crickets and frogs in the direction we were headed. Obviously we had lost our bearings and were headed in the wrong direction. So we had to return to the wallow to get our directions. We spotted the car and entered it in record time. At our next cricket stop I discovered I had left my dagger back at the wallow. I've had this knife since I was twelve and was not about to lose it now. So once again, we furtively visited the wallow, where the dagger was retrieved in the mud.

#### Serengeti National Park.

I visited the Kirawira area of the Serengeti Plains with Dick Estes, a wildebeast expert. We parked our Toyota Land Cruiser in the middle of a large grassy flat, closely cropped by large herds of wildebeast and zebra. We planned to camp in the middle of this plain to watch the wildebeast and catch crickets. Dick warned me not to stray too far from the car. He would ride shotgun with his Vietnam model night scope. I worked along a slight depression on the grassy plain where some water had gathered from the rains that afternoon. Several crickets were singing and most were caught without much trouble, except for one species, a *Scopsipedia*, which made a single short chirp every 3-4 minutes. I was waiting for one of these to sing when Dick's urgent voice called me to the truck, "Get back here! Don't run, just walk". I flashed my light around and there, not more than several leaps away, was a huge male lion lying in the grass. I reached the car and had a look a him through the scope. We don't know how he got so close without being spotted with so little cover about. In a while he stood up and walked off and then began his territorial roaring. Presumably, he was

already satiated.

I also collected a *Teleogryllus* there, which has one of the oddest calls I have ever heard.

The next morning we collected crickets by turning things over, and the very best places for them seemed to be old wildebeast and buffalo skulls. These were just crawling with crickets belonging to at least three species.

I shall end this little excursion into African game reserve collecting by noting what appear to me to be some interesting patterns: The taxonomic balance seems very different to me from either the United States or Australia. For example, the proportion of field crickets and tree crickets seems especially high, while Memobilineae and Trigonidiinae are rare (compared to Australia). The forests seem to me to be exceptionally quiet, and there does not seem to be a canopy cricket fauna. Also, I have collected only two species of Phalangopinae, even though I've searched in places which would have had many such species in Australia. I also find the encopterine fauna to be poor. Unlike Australia there is not a diurnal encopterine fauna in the grasslands and semi-deserts and there seem to be very few or no songless Fodoscirtini. I believe that my collecting has been extensive enough now that these are not just artifacts of the sampling. It also seems to me that a greater percentage of the field crickets live in burrows and that the species are more reluctant to sing. Many of the species have very long interchirp periods, and occasionally a place can be swarming with crickets but not one singing. A higher proportion of species of Gryllinae are songless. One major difference in the cricket environment which may be connected to some of these patterns is the enormous number of hunting spiders one sees everywhere one collects in Africa. This density was especially noticeable in the Spring. During those months we found essentially no memobilineae. In the fall collecting trip, there were fewer spiders and more memobilineae.

Dr. David A. Nickle, Systematic Entomology Laboratory, USDA, c/o U. S. National Museum of Natural History: Collecting mole crickets in Argentina, 1982.

In January and February I went to Argentina and Brazil to collect mole crickets of the genus *Scaptericus* and record the calling songs of these and other sound producing Orthoptera. With the help of Dr. Ricardo Bonderos, who made most of the arrangements, I made two collecting trips within Argentina, both of which proved to be very successful for my research. The first trip was a 1200 km. loop through Buenos Aires and La Pampa Provinces. It was on this trip that I recorded the calling songs of a species of *Scaptericus* that was thought until recently to be endemic to the United States, *S. acletus*. Recording this species in Argentina demonstrated for me that the source of *S. acletus* in the United States was Argentina.

The collecting trip in Buenos Aires Province yielded more than 1000 specimens, and I am grateful for the help and friendship of Dr. Girardo Liljestrom and Sr. Gustavo Rossi, who accompanied me on the trip and spent most of the evenings preparing the insects that had been collected during the day.

The second collecting trip was made in Tucuman Province, with the help of Sr. Mauricio Barerra and Srta. Sonia Turk. In addition to collecting many of the species of grasshoppers and katydids of that province, I had an excellent taste of Argentine hospitality. I hope to return soon to Tucuman!

From Tucuman I drove through Catamarca, south to La Rioja Province to visit the langosta research district in that Province. I am convinced that *Schistocerca cancellata* is the most intelligent insect in this world, certainly the most difficult to collect. I tried in open fields to collect these grasshoppers for two hours but was able to secure only eight individuals. They have a nasty habit of waiting until one is nearly on top of them before they fly, and then they invariably fly to the other side of any nearby fence. They make certain that they can be seen by the collector on the other side of the fence, a habit which lures the collector to climb the fence, only to watch the delighted grasshopper fly back to his original resting place on the now opposite side of the fence. I shall never cross fences again for a grasshopper.

Leaving Argentina, I flew to Rio de Janeiro, Brazil, for a brief visit to the Museu Nacional at Quinta da Boa Vista. I received a cordial and most helpful welcome by Drs. Carlos Carbonell and Miguel Monne, who assisted me at the Museu. I also had a pleasant and informative conversation with Dr. Luiz Otero, whose interest in the Phanopteridae parallels my own. The highlight of my trip to Rio, however, was the chance to see the magnificent collection of Orthoptera in the home of Dr. Carlos Alberto Campo Seabra. It is the finest collection of regional Orthoptera I have ever seen, and I was equally impressed by the hospitality of Dr. Seabra.

I would like to use this medium to again thank all of my friends and colleagues in Argentina and Brazil for their help and hospitality on my visit.

#### BOOK NOTICES

Otte, Daniel. 1981. The North American Grasshoppers. Volume I, Acrididae: Gomphocerinae and Acridinae. 275 pp., illus. 76 Figs. Harvard University Press, Cambridge, Massachusetts. \$45 hardback.

Rentz, D. C. F. and David B. Weissman. 1982. Faunal Affinities, Systematics, and Biometrics of the Orthoptera of the California Channel Islands. 240 pp., illus. 337 Figs. University of California Publications in Entomology Volume 94. University of California Press, Berkeley, California. \$22 paperback.

IN MEMORIAM  
H. Radclyffe Roberts  
1906-1982

by

Daniel Otte

Academy of Natural Sciences of Philadelphia  
Philadelphia, Pa.

Acridologists have recently lost a wonderful friend and colleague, Dr. H. R. Roberts, known to his closer associates and friends as Rad, passed away in May after an illness due to cancer.

Born in Villanova, Pennsylvania, in 1906, Dr. Roberts called himself a "dyed-in-the-wool Philadelphian". He lived in the Philadelphia area throughout his career, residing for many years in a lovely mansion in Bryn Mawr, Pa. where he and his lovely wife, Hazel, hosted numerous visitors from around the world. Their house came affectionately to be known to friends and family as "Hazel's Hotel". But it was much more than that; to grasshopper specialists who stayed there, it was a charming home away from home, in the grand old style.

Dr. Roberts was without a doubt a genuine lover of grasshoppers. These animals were so dear to him that by comparison even their close relatives scarcely qualified as animals. On many occasions he joked, after one of my cricket collecting expeditions, how I should really get busy on some grasshoppers -- on real animals. He would show people into the Academy's insect collection, saying: "And here are the grasshoppers!" During the course of many years he travelled widely in the New World and contributed greatly to the Academy's large grasshopper collection. Even as he learned the news of his terminal illness he was planning another expedition with Hazel, his son Rad and wife, and several South American colleagues to Brazil.

How did Rad become an acridologist? In a biographical sketch written for the Academy a few years ago he remarked:

"As a child I was interested in all the strange things to be found in the countryside. At college [Princeton University] I found opportunities to go on bird-collecting expeditions to Trinidad, Peru, and the Sudan for the Academy. Then, I decided to get some professional training in graduate school [University of Pennsylvania], where I met a professor [Helwig] working on the chromosomes of grasshoppers, and at the time was encouraged by Morgan Hebard, grasshopperologist at the Academy. However, after World War II, no one was interested in paying the salary of a brilliant grasshopper man, so I fell into the

NOTICE

*Metatleptes* needs articles and news from its members. If you have a paper, report, or information that relates to Orthoptera, please send it to David A. Nickle, Editor, Pan American Acridological Society, c/o U. S. National Museum of Natural History NHB-168, Washington, D. C. 20560.

vicissitudes of administration for 25 years, but with no regrets. Now I must make up for lost time."

Dr. Roberts had been associated with the Academy ever since his undergraduate years at Princeton University, from which he was graduated in 1929. Through field work on many expeditions, his research, experience as a teacher, and as an entomologist with the armed forces during World War II, he came well equipped to his post as Director of the Academy. His Army service led to the rank of Major in the Medical Corps. He was a member of the faculty of the University of Pennsylvania, from which he received his Ph.D. in 1941.

During the war he produced, in collaboration with Dr. Edward S. Ross, now of the California Academy of Sciences, the Mosquito Atlas, which was used by all branches of the Army and Navy in their fight against malaria.

His earlier expeditions and field studies were made in part with Mr. Cadwalader, former Academy president, to study waterfowl and shore birds in the southeastern states; the Egyptian Sudan, to study and collect water birds; Trinidad; Peru; four expeditions to Mexico; and studies in Hawaii, New Guinea, and the Philippines. An outstanding collection of mosquitoes resulted from the trips to the south Pacific.

Rad served as the Academy's Director from 1947 to 1972. Because of his many duties, he did not publish much on grasshoppers during that time, although he continued to collect Orthoptera on several personal field trips. Since 1972 he had indeed made up for lost time, publishing, mainly with Carlos S. Carbonell, nine revisionary studies of neotropical grasshoppers (Leptilaminae, Omatolampinae, and Romaleinae) and initiated a tenth paper which we all hope will be completed by Dr. Carbonell.

I will retain several memorable impressions of Rad: his friendly, unemotional personality; his ability to get to the heart of the matter, whether in politics or grasshopper taxonomy; his uncluttered office where anything could be found; and his willingness to learn new tricks and discuss new ideas even in his last year. He spent several months recently mastering a microcomputer-word processor which he affectionately called his "new toy". His distaste for "nomenclature" and for long entomological descriptions without accompanying comparative drawings was made obvious to all who heard him at recent meetings of the Pan American Acridological Society meetings in Argentina, Montana, and Venezuela.

A grand old acridologist is gone, but his influence will be felt for as long as there are grasshoppers.