

# METALEPTEA

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A News Forum for Acridologists  
and Orthopterists

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## Message from the Editor

Since the first issue of *Metaleptea* in the Summer of 1978, the role of the editor has been to compile information and news of the members of PAAS and to report that information in a biannually circulated newsletter. The format originally adopted for this purpose was a small booklet with a colorful hard paper cover displaying the logo and emblem of the PAAS. The first six issues were mimeographed at Wayne State University under the editorial expertise of Dr. Michael Turkus. When I became editor, the printing mode was changed to a reduction Xerox of a printout from our WANG word processor at the USDA. Recently, however, this method has become too expensive to use, and we have had to develop an alternative method for producing *Metaleptea*. Personally, I am glad for the opportunity to change our format. The new *Metaleptea* is easier to read, easier to produce, and provides more space to deliver information to our readers.

I welcome suggestions, and I offer an appeal to you to keep sending news, information, biological notes, short articles, anecdotes...anything you think our membership could use or enjoy.

I am particularly anxious to hear from our colleagues in Middle and South America. Often too much is presented about North American acridology, but I know for a fact that Latin American research in acridology is extensive, relevant, and newsworthy. In a forthcoming issue of *Metaleptea* I intend to focus our attention specifically on the research activities of the acridologists/orthopterists of Middle and South America.

David A. Nickle, Editor  
PAAS

## Presidential Report

As most members now have been informed, it was necessary to postpone the planned PAAS meetings because of the conflict with the International Congress of Entomology in Germany. The PAAS by-laws state that our meetings are not to be scheduled during the same calendar year as the Congress, the reason being due to the difficulty of members obtaining financial support for both meetings during the same year.

Because of this conflict, the next meetings of the PAAS have been rescheduled for July, 1985, to be held in Saskatoon, Canada. An exact date as well as details concerning the meetings appear elsewhere in this issue of *Metaleptea*. We anticipate that housing and meals will be available on the campus of the University of Saskatchewan at a very reasonable price. There also will be field trips for collecting under a variety of ecological situations. We are planning at least 3 symposia which will include some aspect of acridid systematics, rearing of Orthoptera, and endocrine control of reproduction. We certainly are open to suggestions regarding other topics.

One of the most serious concerns regarding the Saskatoon meetings is the difficulty that some members, particularly in South America, will have in obtaining the necessary travel support. I am aware that a number of countries are unable to provide travel funds for scientists, particularly for international travel. We are making inquiries to prospective granting institutions about possible funding of a training program such as those in the past. However, these funds also are hard to find and it does not look promising. Therefore, I urge each of you to begin planning now for the Saskatoon meetings and to try to arrange your own travel support. Incidentally, if anyone knows of a possible funding source for a training program or something similar, we certainly would like to know.

We have been moving ahead with the expansion of the Society to a global posture. Executive Secretary Gangwere has sent brochures and other literature to about 450 persons throughout the world who might be interested in joining the PAAS. Many of these acridologists previously were affiliated with the former Association d'Acridologie. Should there be a sufficient response, it may be necessary that we consider changing the name of the PAAS to reflect the expanded membership. However, I am sure we can wait to discuss this at Saskatoon.

I am sorry to report that our first effort with the *Occasional Papers* was less than expected. The problem was not the quality of the publication or the topic, for both were considered excellent. Rather, the difficulty was with distribution. Aside from our own membership, it was difficult to contact other prospective recipients, particularly those willing to purchase the publication. Accordingly, we are losing money on the project. However, we have made good use of a large number of copies by enclosing them in the material sent by Dr. Gangwere to prospective members. In any event, we definitely must give the project an indepth review before we take on another similar publication. Incidentally, we still have a number of that issue of *Occasional*

Papers, should anyone have further use for them.

Finally, you are now aware that the format for *Metaleptea* has been changed. This became necessary when our editor, Dr. David Nickle, was forced to modify the format in order to reduce publication costs. Any comments you have regarding the newsletter would be greatly appreciated. Your comments would be particularly beneficial because we must continue to make *Metaleptea* a significant means of communication within our Society.

Again, start now to plan for Saskatoon. It is a great place for a meeting, and we hope to see many of you there.

J. E. Henry, President  
PAAS

## Executive Secretary's Report

The period just passed has been busy at the Secretariat, so it is time that I bring you, the members, up to date on some things that have engaged our attention on your behalf.

I am pleased to report completion of a membership solicitation to over 400 prospective member individuals and organizations. The package we mailed out included a letter, a PAAS brochure, a list of publications (newly prepared for this purpose), and a sample publication. This first formal membership drive attempted by the Society now over, we must not rest; our need continues to recruit colleagues and institutions with an interest in acridology/orthopterology. Accordingly, I ask that you help by showing our brochure to colleagues whenever the opportunity presents itself and by bringing to my attention names of any individuals, institutions, or libraries that you think should receive a formal membership solicitation from the Secretariat. Only in this way can PAAS reach its goal of assuming the full global (rather than purely Pan American) status that the membership recently voted to implement.

President John Henry, his Site Committee, and the Chairman of that Committee, Dr. Al Ewen, have settled on a site for the 1985 Society meeting, as is announced elsewhere in this issue of *Metaleptea*. In line with their decision, Dr. Ewen and I are exploring possibilities for grant support such as will enable PAAS to carry out a 3rd Training Project for promising young acridologists/orthopterists. Hopefully, our efforts will lead to preparation of a formal proposal to one or more granting agencies or foundations. Please inform Dr. Ewen or me of any support possibilities that occur to you, the members, based on your extensive professional contacts.

I am sure you realize that publication and mailing constitute PAAS' single greatest expense and are taking an ever-increasing share of our limited financial resources. It follows that we must strive to make our operation increasingly cost effective at the same time as we guard against compromising the quality of the publication and other services we render. Driven by this

need, and because of other considerations that I shall not detail, Editor Dave Nickle has been discussing with his agency of the U. S. government (U. S. D. A.), in conjunction with us, means of more effective publication and mailing. I am pleased to report one result of his negotiations with USDA, viz., the new *Metaleptea* format unveiled with this issue. This new format presents a number of advantages over the earlier format (as Dave discusses elsewhere in this issue) offset by only one disadvantage, viz., loss of the booklet format with which we have become comfortable. I think Dave deserves a vote of thanks for helping us "streamline" our newsletter operation. I urge you to support him in his publication efforts by providing him with the articles, news notes, and comments that he must have to make *Metaleptea* an even more vital force in international acridology/orthopterology than it has been in the past. Remember, a nesletter is only as good as its content (not its format).

In mid May, I shall make my annual trek northward to my university's biological station in the Upper Peninsula of Michigan, far from the Secretariat in Detroit. I shall continue handling as always all vital society responsibilities that are mine. Necessarily, however, some less important PAAS business must rest unattended until my return to campus in September. I trust this will work no hardship with you in any of your dealings with the Secretariat. I urge you to be in touch with me by mail (S. K. Gangwere, Northwoods Biological Station, c/o Cisco Lake Resort, Box 42, Watersmeet, MI, 49969, USA) or by telephone (906 358-4370) if I may be of service on any items that should not wait.

The current (May 1, 1984) bank account balances are \$1,312.24 (checking account) and \$1,095.79 (savings account), for a total of \$2,408.03. There are no outstanding liabilities.

Stanley K. Gangwere, Executive Secretary  
PAAS

## IMPORTANT

### Preliminary Notice

The IVth Triennial Meeting of the PAAS will be held in Canada on the campus of the University of Saskatchewan at Saskatoon. The meetings are scheduled for Tuesday, July 31 to Thursday, August 2, 1985, inclusive. Delegates should plan to arrive on Monday, July 30 and leave during the morning of Friday, August 3. Extension of residence at the University can be arranged for those who desire it.

Accommodation (incl. maid service) and meals will be available on the campus at the approximate cost of \$43.50 Canadian funds per person/day for a single room and three meals. Double (sharing) accomodation will cost approximately \$38.25 per person/day. All meeting sessions will be held on campus.

Collecting trips will be organized during the conference (one afternoon

- river and stream and pasture/rangeland areas near Saskatoon) and following the conference (two-day trip to the Big Muddy valley area - species and habitat diversity) if enough delegates express interest.

Saskatoon is a beautiful city of approximately 160,000 persons. It is served daily by two national airlines (Air Canada and Pacific Western) with flights from all major cities in Canada. Also there is a daily flight from Denver, CO, U. S. A., via Frontier Airlines. Expect the weather to be warm and dry during July and August.

There will be three general symposia, tentatively arranged as follows:

- 1) Endocrine aspects of reproduction in grasshoppers and locusts
- 2) Stability and diversity of grasshopper species in grassland communities
- 3) Some aspect of acridid systematics

Also, if there is enough interest, there will be a round table discussion on acridid rearing methods and techniques.

The symposia will be held during the mornings of Tuesday, Wednesday, and Thursday. Submitted papers will be presented during two of the afternoons and one collecting trip will be scheduled for the third afternoon.

Deadline for submitted papers has been set for June 1, 1985. Please consider this notice as the first call for submitted papers.

Please address all correspondence to:

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Local Chairman, PAAS  
Research Station, Agriculture Canada  
107 Science Crescent  
SASKATOON, Sask. S7N 0X2  
Canada

# Acridological Research in the United States and Canada

## Part I

This is the first of a series of news articles highlighting research in acridology on a regional basis. The accounts of the following institutions do not reflect all of the research in progress in the region. Several persons have not had time to respond in time for this issue of *Metaleptea*, but they will be included in future issues. Coming soon: acridological research in Middle and South America.

### Agriculture Canada, Lethridge, Alberta

Research into the ecology, behavior, and control of grasshoppers has been carried out at the Lethridge Research Station since the 1920's. Grasshoppers continue to receive research attention since, in addition to being fascinating research subjects, they are the primary pests of crops in Alberta.

Recent research includes detailed studies of feeding biology (D. S. Smith) and a Leslie Matrix population model (J. M. Hardman). Present studies of Dan L. Johnson (Research Scientist, Rangeland Insects) are concerned with a) the control of grasshoppers with protozoan and fungal pathogens, b) feeding rates, preferences, and consequences, c) the effects of weather on diapause and survival, d) the efficacy of new insecticides, and e) comparison of several models of grasshopper population dynamics. Facilities for acridological research include one experimental lab, two greenhouses, one rearing lab, and field substations in two grassland areas: shortgrass prairie and the foothills of the Rocky Mountains.

### Central Michigan University, Mt. Pleasant, MI

The Department of Biology of Central Michigan University has a scanning electron microscope/transmission microscope; biological field station on a Lake Michigan island; and a small collection of local acridid species. All research on acridids is conducted by Dr. Roger G. Bland, whose areas of research include habitat and host plant selection, parasite effects on populations, survival and food detection by immatures, and morphology of sense organs on antennae and mouthparts.

### North Dakota State University, Fargo, ND

Research is a cooperative approach by W. D. Valovage, R. D. Frye, G. B. Mulkern, and R. A. Bohls on the development of the fungal pathogen, *Entomophaga grylli*, for grasshopper control.

*Entomophaga grylli* is a common, widespread fungus disease of grasshoppers which was first reported over 120 years ago. This beneficial organism kills grasshoppers by invading internal body tissues. The disease has characteristic symptoms and is easy to recognize. Infected grasshoppers climb to the top of vegetation and die with their legs wrapped tightly around the

stalks and their heads pointing upward.

Outbreaks of the disease, when they occur, are quite spectacular, killing large numbers of grasshoppers. Unfortunately, natural epizootics (outbreaks) are usually sporadic and localized, and thus do not efficiently control the insect when needed.

A program was started in 1980 to develop this pathogen into a reliable control agent for grasshoppers either as a microbial insecticide or as an integrated pest management tool. Cooperating institutions include the North Dakota Agricultural Experiment Station, South Dakota State University, Kansas State University, and the Insect Pathology Research Unit at the Boyce Thompson Institute. Current work is focusing on the basic biology of the fungus, with field trials planned later.

To date, several methods have been developed to infect laboratory-reared grasshoppers. Outbreaks of the disease have been successfully triggered on a small scale in field cages. A bioassay is currently being developed to test different strains of the fungus against economically important species. Thirteen species of grasshoppers are currently known to be susceptible.

We would appreciate receiving infected specimens with the location and date from anyone who spots a field epizootic. Specimens are best mailed dry, in a well-cushioned container.

W. D. Valovage, R. D. Frye, G. B. Mulkern and R. A. Bohls  
Department of Entomology  
North Dakota State University  
Fargo, ND 58105  
Ph. (701) 237-7582

## Rangeland Insect Laboratory, USDA, Bozeman, MT

The Rangeland Insect Laboratory is a Federal research facility supported by the United States Department of Agriculture's Agricultural Research Service (ARS). It has broad responsibility for research on insects, both beneficial and destructive, on a heterogeneous commodity that is comprised of about 650 million acres in the western half of the United States. While the laboratory headquarters are at Bozeman, Montana, its scientists have recently conducted field research in 11 of the 17 western states. Historically, the majority of the research effort has involved a combination of basic and applied research on biology and control of grasshoppers and Mormon crickets. Recently, research has been initiated on exotic insects for biological control of rangeland weeds.

The current professional staff consists of a team of six scientists, with an additional new position that is still vacant. Insect pathology research is led by John E. Henry, whose work has ranged from isolation and characterization of undescribed pathogens to development of a pathogen (*Nosema locustae*) for commercial production and sale. Other members of the pathology unit are Elaine A. Oma, a microbiologist, and Ronald H. Goodwin, whose expertise is in virology and tissue culture. Research on general biology

and ecology has been led by George B. Hewitt, whose primary contributions have been in the areas of grasshopper feeding behavior and preferences, plus host plant resistance. Norman E. Rees has studied parasites and predators of grasshoppers plus biological control of weeds with exotic insects. He recently was reassigned to full-time work on the weed project, and the grasshopper portion of his former project has been incorporated into a new position that will require an insect community ecologist with expertise in biological control and modeling. Jerome A. Onsager is responsible for chemical control research and also contributes expertise in population dynamics, biometrics, and experimental design.

### University of Idaho, Moscow, ID

The University of Idaho conducts grasshopper research in the Department of Plant, Soils and Entomological Sciences. Survey, taxonomy and pathology of acridids has been investigated actively since 1964. Research has been centered primarily on Idaho rangeland which constitutes over half of the state. Drs. William F. Barr, now retired, and Merlyn Brusven, along with a number of graduate students, have been responsible for most of the survey and taxonomy work on Idaho grasshoppers. Together, they have been responsible for describing endemic species, for surveying the Oedipodinae and documenting the ecology and differentiation of common members of the Melanoplineae, Cyrtacanthacridinae, Gomphocerinae and Oedipodinae in Idaho and adjacent areas.

Presently, Dr. Leslie Kish and his students conduct a major research program dealing with the biology of *Entomophaga grylli* and the epizootiological relationship that exists between that pathogen and its hosts, primarily *Melanoplus* species, on Idaho rangeland.

### University of Nebraska, Lincoln, NE

Anthony Joern, School of Biological Sciences and Department of Entomology: Three general ecological research projects are ongoing: 1) host plant selection, 2) dynamics of organization of assemblages of coexisting grasshopper species, and 3) population biology of *Phoetaliotes nebrascensis*. All studies are concerned with grasshopper populations located in the Nebraska sandhills which is an extensive grassland used primarily for cattle grazing.

Host plant use by grasshoppers has now been documented by a sufficient number of different individuals from a variety of habitat types to provide an adequate picture of overall feeding patterns. Since these emergent patterns are sufficiently different from typical patterns observed for many other insect groups, commonly proposed explanations for the degree of host specialization probably do not hold for grasshoppers. A top priority presently includes explaining preferences among grass-feeding species and secondly, why forb-feeding species tend to be such generalist feeders. Preliminary studies to examine whether it is feasible to study detoxification in the forb-feeding group are also underway.

Coexistence of grasshopper species has been documented along with microhabitat and food plant use in hopes of determining what produces such



patterns. Headway has been made but much remains to be explained. Although many competing explanations for these patterns exist, present work is emphasizing the role of predators--birds and robber flies (Asilidae). Birds have been shown to take 35% of the adult grasshoppers from mid-July to mid-August and also to decrease the species diversity; populations of grasshoppers were at intermediate densities for the site. Robber flies also have a tremendous impact in some years and further studies are underway to clarify this relationship.

*Phoetaliotes nebrascensis* is a common range grasshopper in the Nebraska Sandhills. Populations are typically composed of flightless individuals although flying forms occasionally compose up to 20-25% of the population. Wing morph (flight ability) may be related to dispersal, and if so, may be a key to understanding intrinsic factors affecting the population dynamics of this species. Experiments are underway to determine what species cues are responsible for the switch in the proportion of long-winged forms in the population and to study life history characteristics which may be correlated. Current studies are examining the effect of density, photoperiod, quality of the host plant, and genetic influences.

Kenneth P. Pruess, Department of Entomology: Past research on grasshoppers has dealt primarily with feeding relationships in range grasshoppers. Extensive studies of grasshoppers from the north central Great Plains were documented in this work as part of a large collaborative effort including Greg Mulkern, Herb Knutson, Art Hagen, Jack Campbell, and J. D. Lambley. In addition, specific studies were undertaken to understand host plant preferences in *Phoetaliotes nebrascensis* and *Ageneotettix deorum* as well as developing techniques for examining assimilation efficiency.

Ongoing long-term studies of population changes of grasshoppers in mixed grassland (North Platte, Nebraska) are in their fourteenth year. Attempts to model population dynamics of certain species based on physiological parameters have had only mixed success in terms of predicting subsequent population behavior. However, yearly sampling continues.

Grasshopper research is no longer the primary emphasis, however. Recent projects have revolved around insect population modelling and presently, the ecology and biology of aquatic insects.

Arthur F. Hagen, Panhandle Experiment Station, Scottsbluff, Nebraska: Research in grasshopper host plant use was studied in conjunction with the north central Great Plains project described above. Grasshoppers from western Nebraska were examined in this phase of the research. Taxonomic and distribution studies of Nebraska grasshoppers have also been performed.

## University of Saskatoon

Two institutions are involved in grasshopper research and, although housed in separate locations on the campus of the University of Saskatchewan, there is ongoing cooperation and collaboration among researchers.

1) Agriculture Canada Research Station (107 Science Cres., Saskatoon, Sask. S7N 0X2):

Grasshopper research is part of the Integrated Pest Management Program and currently emphasizes ecology, control, population management, toxicology, pathology, and residue chemistry. A non-diapause strain of *Melanoplus sanguinipes* was selected at the Station some 15 years ago; it has proven to be an exceptionally useful laboratory animal and has been used by researchers all over the world.

Dr. Mukul Mukerji is working towards development of a management system for grasshoppers on cereals. This involves a holistic approach to the understanding of population mechanisms of both grasshoppers and crops and their interactions. Models are being developed for prediction of biological phenomena and events and also for decision-making processes in crop protection optimization.

Dr. Chris Hinks is working on toxicity of pyrethroid insecticides with particular reference to their negative temperature coefficient. This study embraces an investigation into various aspects of this problem, including volatilization, penetration, distribution, and metabolism; the interaction of pesticides and pathogens, especially that between pyrethroids and *Malameba locustae*; analysis of the sensory modalities involved in location and feeding of grasshoppers on bran-based baits.

Dr. Owen Olfert has been involved in the evaluation of grasshopper damage potential and the economic assessment of control measures. These studies are geared towards a comprehensive grasshopper management system for the prairie provinces.

Dr. Neil Westcott's research in acridology is related to studies on the chemistry of insecticides. Specific topics include: metabolism and/or disappearance of insecticides from insects treated topically or by feeding; and the relationship between the chemical residues detected and the toxicity of treated feed to grasshoppers.

Dr. Al Ewen currently is working on the ecological importance of grasshopper pathogens and their interaction with chemical and cultural control methods. Special reference has been given to two protozoans, *Nosema locustae* and *Malameba locustae*, and studies have included examination of: pathogenicity and infectivity in the lab and the field: effects on grasshopper feeding and reproductive physiology; life histories in the host insect (incl. electron microscopy); *in vivo* propagation; environmental impact on the soil ecosystem.

2) Department of Biology, University of Saskatchewan (W.P. Thompson Building, Saskatoon, Sask. S7N 0W0):

Dr. Cedric Gillott, in collaboration with graduate students and post-doctoral fellows, has studied the physiology of reproduction in *Melanoplus sanguinipes*. Initially, research concentrated on female reproduction, especially its endocrine control, but soon developed a different

focus, namely the physiology of the mating act. Discovery of the importance of mating in enhancement of fecundity led to studies of the male reproductive system, especially the structure, development, and functions of the accessory reproductive glands

Dr. Bob Randell has been working on *Trimerotropis agrestis*, one of a very small number of grasshoppers capable of surviving on sand dunes. Separation of this species into subspecies has been based largely on the shape of the pronotum in lateral view. This species has been chosen as a test case for shape analysis based on the convenience of measurement of the structure in question and the discontinuous nature of its distribution and the fact that Saskatoon appears to form a northern limit record for its distribution. It is hoped that quantitative analysis of material from various parts of the range will indicate the degree to which the species forms a cohesive breeding unit.

## Wayne State University, Detroit, MI

The Department of Biological Sciences is both the host of the PAAS Secretariat and the center of acridological/orthopterological activity at Wayne State University. WSU is an urban, liberal arts institution with about 30,000 students located in the heart of Detroit, Michigan. As such, we have no formal acridological program, and we lack extensive insect collections, the large numbers of entomologically trained personnel, and the numerous entomological courses that characterize agricultural and entomologically oriented schools. Instead, we have a generalized teaching and research mission established within the framework of distinct molecular, regulatory, and environmental divisions. These three divisions (each like a small department) allow for unusually extensive interaction among an especially diverse faculty.

We have equipment and facilities appropriate for both classical and modern studies. Among our state-of-the-art items are spectrophotometers, chromatographs, scintillation counters, ultracentrifuges, an electron microscopy unit (with one scanning and three transmission microscopes), a magnetic resonance facility, and a microcomputer suite (with one Sage and five Apple computers linked with terminals elsewhere in the department and with the University Computing Center). Among our more traditional facilities are a greenhouse, natural history museum, herbarium, animal care facility, and environmental control rooms.

Though WSU is an urban university, we carry out field work both in the local area of southeastern Michigan and at our 1000-acre field station, Northwoods Biological Station, located in the Upper Peninsula of Michigan. Along with its environs, Northwoods encompasses an unusual diversity of biological community including virgin cedar bogs, lakes and streams, meadows, and forests. The heart of the Northwoods facility is its lodge, with laboratories, library, lecture room, and other accommodations for up to 30 students and supporting staff. We offer 8-10 formal natural history courses and about a dozen research-investigative courses every summer, and orthopterological studies are always among them.

Acridological activities at WSU revolve around the laboratory of S. K.

Gangwere. Gangwere teaches courses in environmental biology and entomology, serves as Northwoods Director, and carries out research on the ecology, behavior, (especially feeding), biogeography, and faunistics of the orthopteroid insects of the Mediterranean Subregion. His current projects include "A Red Book of Iberian Orthoptera" (with M. G. de Viedma) and various faunal studies.

Other acridological research at WSU is varied and includes studies on the ultrastructure of eggs of Michigan Orthoptera (Steven A. Vix, graduate student), neurophysiological bases of food perception in cockroaches (Charles N. Lietzau, graduate student), studies on aspects of grasshopper microbiology (Kerry J. Vesco, graduate student), and cytogenetics of Orthoptera, chiefly grasshoppers and crickets (Dr. Michael Tyrkus).

## University of Wyoming

Research of grasshoppers by the Wyoming Agricultural Experiment Station, University of Wyoming began in 1940 prompted by the request of the Wyoming Stock Growers Association. Stock growers had experienced devastating populations of range grasshoppers from 1934 to 1936 and were anxious to have a way of preventing damage to their range and disruption of their industry.

Five faculty have conducted research of grasshoppers: C. C. Burkhardt, Robert J. Lavigne, Fred A. Lawson, John E. Lloyd, and Robert E. Pfadt. The latter is the only member whose work is primarily concerned with grasshoppers. Most projects have been done in the field principally on rangeland. Some research has been done in laboratory and in greenhouses. Facilities include three laboratories equipped with temperature cabinets and walk-in rearing rooms, one toxicology laboratory, one laboratory with electron microscope, and two greenhouses. An insect museum at the University contains a large collection of grasshoppers and other Orthoptera from the state and region and the most complete collection of grasshoppers from Afghanistan.

Current research by Pfadt is concerned with monitoring three biological control trials (*Nosema locustae*) of range grasshoppers in Platte County, Wyoming. Burkhardt is conducting chemical control tests with Pydrin.

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## James Denham White - A Personal View

20 August 1910 - 16 December 1983

By

David C.F. Rentz

Michael White died on 16 December 1983 after a short bout with liver cancer. He had returned from a sojourn to his beloved Italy in October and felt ill believing he had hepatitis.

Most biologists are familiar with Michael White from his writings, especially his book *Animal Cytology and Evolution* which is one of the most cited texts in biology. The book was a milestone in many respects, not the least of which was his idea that the numerous chromosomal rearrangements occurring in phylogeny tend to be of the same type in individual lineages, although of different types in other lineages. Michael used Orthoptera as his research subjects but also worked on gall midges early in his career. Michael's main theme in his research seemed to be that there is not one universal mechanism of speciation but several, depending on the way of life of the organisms and their vagility. The stasipatric speciation model applied to flightless insects, land molluscs, and animals of restricted vagility in fragmented populations. He was a critic of his friend Ernest Mayr who is a proponent of the geographic mode of speciation. They must have had some interesting personal conversations during their many visits with one another. Many of M. J. D. White's ideas are still controversial - some have not been accepted by the *Drosophyla* geneticists and the vertebrate evolutionists. But he has stimulated a lot of thought and discussion on evolutionary topics which will be debated for years to come. One of his major contributions has been to stimulate people to think and debate.

Anyone who met Michael White or heard him speak never forgot him. His English accent and peculiar drawl (which disappeared only on rare occasions) was a delight. He affected his speech especially when he was relating one of his countless stories and when he had a bit of an audience. His darting eyebrows and warm smile added to the hilarity of his stories. The bigger the audience, the funnier the stories - all of which centered around people well-known or otherwise and generally associated with science. His stories are known to everyone who knew him personally, but unfortunately none have been recorded.

Michael White came to Australia in 1953 and eventually became Professor of Genetics at Melbourne University. On his retirement, Professor B. John, Australian National University, offered him an Emeritus position. Michael accepted, and his years were spent in close association with students and staff at ANU and his many colleagues at nearby CSIRO.

Michael had warm feelings for Italy - he grew up there. He spoke and read Italian, and he returned frequently in later years to visit his old haunts and friends. One of his most precious awards is the Honorary Doctorate, University of Siena which he received in 1979. His last field trip was to Italy in association with L. Bullini. They were working on a cytologically interesting group of stick insects (Phasmatodea). Simultaneously, he was studying an Australian genus of the same group of insects. This, perhaps, was the most complex cytological situation he had faced, and he really seemed perplexed with what he saw. It is a pity he couldn't have lived long enough to understand the phenomenon.

Michael White was one of the great men of modern biology and possessed an appealing array of delightful excentricities. He was, at times, unpredictable and irascible. He hated administrative work. At Melbourne at head of the Department of Genetics he was disturbed that the buildings were locked on weekends. He made appeals to the administration but to no avail. The story has it that one weekend when he wanted to get in, the doors were locked. A few well-placed bricks rectified the situation, and the doors were never locked on weekends again. He virtually never watched television and enjoyed telling people that the last program he watched was the first walk on the moon. One night in a Chinese restaurant in Boulder, Western Australia, I warned him that his record was in jeopardy because there was a TV set directly facing him. He moved his chair around so his back was to the TV and no more was said on the subject.

My first extensive Australian field trips were with Michael White - the first, and most memorable, within 3 weeks of my arrival in 1977 to south-central Queensland. Michael had a procession of colleagues and post-graduate students from the U. S. A., all of whom joined him on pilgrimages to Western Australia. The tedious 5 days' drive with his peculiar "whiplash" form of driving and primitive camping style were always the same. His home-made camp and "worktable" and "Sydney Opera House-style" tent will bring a grin to all of his former campmates. His camping lunches were generally standard. A tree was selected along the roadside. The table and folding chairs were thrown out of the vehicle, and there one would sit eating sardine sandwiches and sweltering in the 100°F temperatures. Michael never complained about the temperature.

Students and younger colleagues who came to work with Michael often became frustrated. Michael's strong personality and forceful views were generally so overpowering that the person felt superfluous or that his ideas were not being considered. But this was far from the truth. Michael heard and considered everything and frequently extolled the virtues of some theory or technique, although not often the originator himself. His "fault" was that he always considered himself the teacher.

As a taxonomist working with insects in a collection, I came to know Michael White from his specimens years before I met him personally. The largest Orthoptera collection in the world is at the Academy of Natural Sciences of Philadelphia and contains hundreds of specimens collected by Michael during his years in America. His material is always accurately

labelled and cross-referenced to cytological preparations. Many of these paraffin blocks are now deposited in the Australian National Insect Collection, CSIRO, Canberra, which contains thousands of specimens collected by Michael. Once I noticed that the heads of the "minute pins" he used to pin delicate morabine grasshoppers were crimped. I joked with him that they looked like they had been pinned using a pair of pliers. On our next field trip I observed that he was indeed using a pair of pliers to pin the grasshoppers. Later I provided him with the proper pinning equipment, which were accepted without comment. All subsequent specimens were still received on "crimped" pins.

One doesn't meet greatness or genius often in his life, but I believe M. J. D. White came very close to this. He was all of the above plus a thoughtful and sensitive person. He was equally at home discussing the weather with a bartender in outback Australia or chairing a symposium at an international meeting. We are all the better for having known him.

Following his death, his wife Sally and children decided to hold a celebration of Michael's life. This occurred on 24 January 1984 in the Australian Academy of Science, Canberra. About 200 people attended and speakers presented glimpses of Michael's life. It was a wonderful occasion and one that Michael himself would truly have enjoyed.

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## Members' News

Robert E. Bellinger: I would like to receive information on the number of instars and number of generations known for any grasshopper species. My present research is on the population dynamics of the red-legged grasshopper, *Melanoplus femurrubrum*, especially on development and reproduction.

Lorraine Braun: I am presently enrolled in a part-time Master's program at the University of Saskatoon. I am a full-time technician in Integrated Pest Management at Canada Agriculture, Research Station, Saskatoon, working in biological control.

Bill Chapco: Reprints are available for the following paper: Chapco, W. 1983. Genetics and Population Genetics of Grasshoppers and Locusts - a Bibliography. *Bibl. Entomol. Soc. Amer.* 2:11-16.

Eduardo Rivera Garcia: Desde 1980 a la fecha, estudio faunístico de los Acridoidea de la Reserva de la Biosfera de Mapimi, Dgo., Mexico, cubriendo aspectos sobre la ecología de este grupo principalmente.

Rebecca Goldberg: I am a graduate student of the University of Minnesota. My thesis is on the influence of adult resources (goldenrod flowers) and larval resources (grasshopper egg pods) on the distribution of the meloid beetle, *Epicauta pennsylvanica*. I work at Cedar Creek Natural History Area in Minnesota.

Chia-Chi Hsiung: I recently compiled a bibliography, "Some Insect Books for Children" (in English) [in Notes from the Lyman Entomol. Museum & Res. Lab. No. 12, Feb. 1984]. Also completed paper entitled: Behavioural analysis of *Eurycantha calcarata* Lucas (Phasmatodea: Phasmatidae). *Entomol. Month. Mag.* [in press].

D. Keith McE. Kevan: I have resumed studies on Pyrgomorphidae, notably on Baja California and tropical Africa. Am also involved in some investigations on Coccinotinae (Tettigoniidae) of Venezuela, Trinidad, etc. I have been appointed Associate Editor, *Canadian Journal of Zoology*. Will be an invited speaker at the "symposium on Faunal Influences on Soil Structure" in Edmonton, Alberta, June, 1984; and will attend the International Congress of Entomology in Hamburg, August, 1984. As usual, I repeat my request for anything of a non-scientific nature (artifacts, literature, ephemera), no matter how trivial, on orthopteroid insects of all kinds (including Dermaptera and Isoptera).

Herb Knutson: I retire June, 1984, after 30 years in the Department of Entomology, Kansas State University, 23 of the 30 years as Head of the Department. My post-retirement activities will include the history of the Department since 1866, compilation of a list of some 2500 publications, and bringing the Orthoptera collection up to date.

David A. Nickle: I have completed revisions of the mole cricket genus



Scapteriscus and the phaneropterine katydid genus *Monlezumina* and am nearly finished a key to the termites of Mexico and Central America which will feature figures (many of them scanning electron micrographs) of all 117 species of termites of that region.

Dan Otte: I recently collected Gryllidae in New Caledonia, Fiji, and Hawaii; I have completed vol. II of *The North American Grasshoppers* (in press).

M. P. Fener: I recently published a critical review on "Endocrine aspects of phase polymorphism in locusts" as a chapter in a textbook *Endocrinology of Insects*, R. G. H. Downer and H. Laufer, eds., 1983, Alan R. Liss Inc., N. Y. A limited number of reprints are available on request.

R. E. Pfadt: I am conducting trials with *Nosema locustae* for the control of range grasshoppers. I am teaching a course this Semester on Insect Population Biology. At the joint meeting of the Entomological Society of America and Entomological Society of Canada and Entomological Society of Ontario, Nov. 30, 1983 in Toronto, I presented a paper entitled "species richness and density of grasshoppers in favorable habitats of mixed grass prairie" (information to be published soon in *Canadian Entomologist*). At the annual meeting of the Entomological Society of America in Detroit, Michigan, Dec. 1983, I presented a paper entitled "dry diets for rearing the migratory grasshopper *Melanoplus sanguinipes* (F.)."

Juan Jose Presa: Actuales investigaciones: sistematica y faunistica de los Caelifera Ibericos; relaciones entre las comunidades de Acridoidea y la vegetacion. Publicaciones recientes: Los Pamphagidae de la Peninsula Iberica. I. Gen. *Prionotropis* Fieb. y *Acinipe* Ramb. (Orthoptera). *Eos* 58: 271-302; Inventario preliminar de los Pamphagidae de la Region Palearctica (Orthoptera) *Anales de la Universidad de Murcia* 42: 3-42; Tipificacion de poblaciones de saltamontes (Orthoptera; Acrididae) en relacion con la altitud, pisos y tipos vegetacion en la Sierra de Guadarrama. *Bol. Asoc. Esp. Entomol.* 6: 249-265.

David C. F. Rentz: I was on a collecting trip to Norfolk Island, 20 March to 10 April 1984, to survey insects for the Australian National Parks and Wildlife Service and to make suggestions on management and reclamation procedures. I collected about 20 species of Orthoptera and 7 species of Blattodea. The dominant group was the crickets, with about 9 species. One endemic apterous phalangopsine taken from nearby Philip Island was associated with noddy tern rookeries. No Blattids were taken on Philip Island.

Klaus Riede: I am studying acridid behavior in Ecuador and Argentina. Recent publication: Influence of the courtship song of the acridid grasshopper, *Gomphocerus rufus* L., on the female. *Behav. Ecol. Sociobiol.* 19: 21-27. 1983.

Rafik Skaf: I have been involved in various meetings on locust control and grain-eating bird control, and am involved in coordination of activities on migrating pests.

Sherilyn G. F. Smith: My research is on grasshopper-host plant interactions, distribution, and microhabitat preferences. I recently accepted a position of Assistant Professor in Biology at Skidmore College. I would like

to contact any other investigators involved in research on distribution, population dynamics, or host plant relationships among grasshoppers in northeastern U. S. (New York, New England).

Recent publication: Smith, S. G. F. and G. U. Grodowitz. 1983 Effects of nonglandular trichomes of *Artemisia ludoviciana* Nutt. (Asteraceae) on ingestion, assimilation, and growth of the grasshopper *Hypochlora alba* (Dodge) and *Melanoplus sanguinipes* (F.) (Orthoptera: Acrididae). Environ. Entomol. 12: 1766-1772.

V. R. Vickery: I am involved in taxonomy of Orthoptera of the Yukon and in the mantids and stick insects of Baja California. I am doing a comparative study of Leptysminae and Oxyinae.

David B. Weissman: My research includes revisionary studies of Jerusalem crickets (*Stenopelmatus*, *Ammopelmatus*); field crickets of western North America (*Gryllus*); revisionary studies of *Neduba* decticine katydids; and Orthoptera of Baja California. I recently received a grant from the National Geographic Society to study Orthoptera of Baja California Islands.

## New Members

The Pan American Acridological Society is pleased to welcome the following new members:

Mr. Ulf Carlberg\*\*            e  
Atlasvagen 53  
S-131  
34 Nacka  
SWEDEN

Mr. Carlberg is a student in biology at the University of Stockholm. His research interest is walkingsticks (Phasmida=Phasmatodea).

Srta. Viviana A. Confalonieri de Lovadina\*            s  
Bauness 2509, 5° A  
Buenos Aires  
Capital Federal 1431  
ARGENTINA

Srta. Confalonieri de Lovadina is at the Lab de Genetica, Depto. de Cs. Biologicas, Universidad de Buenos Aires, and is interested in cytogenetics of Orthoptera.

Profesora Maria D. Garcia Garcia\*            s  
Departamento de Zoologia  
Facultad de Biologia  
Universidad de Murcia  
Murcia,  
SPAIN

Profesora Garcia is interested in faunistics and systematics of Acridoidea.

Sr. Eduardo Rivera Garcia\*    s  
 Instituto Regional Norte Arido  
 Apdo. Postal 263, Suc. B  
 35070 Gomez Palacio, Dgo.  
 MEXICO

Ms. Philippe J. Grandcolas\*\*    e  
 3 rue Baillet Lervion  
 F.78,000  
 Versailles,  
 FRANCE

Mr. J. Lloyd Harris\*\*    e  
 3085 Albert Street  
 Regina,  
 Saskatchewan S4S 0B1  
 CANADA

Mr. Harris is a pest control specialist interested in insect population control.

Mr. L. K. Hazarika    e  
 Dept. of Entomology, Cook College  
 Rutgers University  
 P. O. Box 231  
 New Brunswick, NJ 08903  
 USA

Dr. Dan Johnson\*    e  
 Research Station  
 Agriculture Canada  
 Lethridge T1S 4B1  
 CANADA

Prof. Giovanni Stranne\*    s  
 Instituto de Zoologie  
 V L Borsari 46  
 Ferrara  
 ITALY

Dr. John C. Schultz  
 Department of Biological Sciences  
 Dartmouth College  
 Hanover, NH 03755  
 USA

## Change of Address

Please note the following changes in address of our membership:

Mr. C. N. Lietzau\*        e  
962 Marvell Place  
Pontiac, MI 48054  
USA

Srta. Rosa Guerra Munoz\*    s  
Depto. Biol., Fac. Medicina  
Universidad de Valparaiso  
Casilla 130-V  
Valparaiso,  
CHILE

Dr. Darryl Gwynne\*        e  
R. R. #10  
Brampton  
Ontario L6V 2N2  
CANADA

Dra. Nelly LaFuente Indo\*    s  
Lab. Citogenetica Experimental  
Fac. Odontologia, Casilla 1903  
Universidad de Chile  
Santiago,  
CHILE

Dr. Klaus Riede  
MPIV  
Abt. Muber  
8131 Seewiesen  
WEST GERMANY

Mr. James A. Whellan\*\*\*\*    e  
56 Cassia Street  
DEE WHY  
NSW 2099  
AUSTRALIA

## Recent Deaths

Vitaly Mikhailovich Dirsh, 78, died 19 December 1982, after many years of poor health. for a more detailed account, see article by D. R. Ragge and N. D. Jago in *Antenna* 7: 186-7, 1983.

John W. H. Rehn, 12 October 1983, suddenly of a heart attack. Dr. Rehn, son of James A. G. Rehn, published several papers relating to Orthoptera systematics in the 1950's.

Michael J. D. White, 16 December 1983, following a brief illness [see article by D. C. F. Rentz in this issue].

## For Your Information

If your studies involve the acoustic behavior of any animals the National Sound Archive's collection of wildlife sounds can probably help you. With over 10,000 well-documented tape recordings of some 2,500 species, and a duplicate of the entire BBC Sound Archives collection of natural history recordings, the Archive may have just what you need. Although the largest proportion are bird sounds, other classes of animals, from insects to mammals, are quite well represented. The scope is world-wide, but with particular emphasis on the Western Palearctic. The Antarctic, Oriental, Australasian and Afro-tropical regions are also well represented. There are interesting special collections held separately as complete copies:

- . Underwater mammal recordings by the late Prof. Poulter of California
- . Anatidae chick recordings by Dr. Janet Dear of the Wildfowl Trust
- . The European Orthoptera recordings of the British Museum (Natural History) made by Dr. Ragge and Jim Reynolds
- . The Papua New Guinea frog recordings of Prof. J. I. Menzies
- . The Chaffinch and other bird song recordings used by Prof. W.H. Thorpe for his classic study of bird song learning.

The deposit of other research collections is invited. Copies of nearly all the recordings can be supplied for research, subject to the signing of an agreement limiting use and protecting copyright and to the payment of a modest service charge.

The Archive also holds a collection of over 1,000 published wildlife sound discs and cassettes from all over the world which can be listened to by appointment free of charge between 10.30 and 17.30 Monday to Friday, with late opening to 21.00 on Thursdays.

Discographies of mammal, amphibian, insect and some regional bird sounds have been published in the Archive's journal, *Recorded Sound*, and are available as reprints or back numbers. Other articles on wildlife sound recordings which have appeared from time to time in the journal and a few issues entirely devoted to the subject are also available.

A small library of books on bio-acoustics and wildlife sound recording is maintained for consultation.

Enquiries on any aspect of wildlife sounds are welcome and should be addressed to:

The Curator of Wildlife Sounds  
The British Library National Sound Archive  
29 Exhibition Road  
London SW7 2AS, ENGLAND  
Telephone no. (01) 589-6603 Ex. 209

SUMMARY OF INSECT RECORDINGS IN BLOWS March 1984

1. Total no. of different species held in the collections (BBC, tape & published material) = 305\* Broken down as follows: \*excludes BM(NH) collect

Coleoptera	26	Lepidoptera	14	
Diptera	27	Odonata	1	
Dictyoptera	1	Orthoptera -Acridoidea	36	Almost 60% of species are Orthoptera
Hemiptera	33	Orthoptera -Grylloidea	86	
Hymenoptera	27	Orthop. -Tettigonioidae	52	
Isoptera	1	Unidentified spp.	1	

2. BBC discs and tapes: over 70 species, mostly British.  
Includes detailed series of recordings of Honey Bee, *Apis mellifera*.  
Limited selection of recordings for other species.

3. Tapes  
163 recordings of 92 species, mostly European. Includes 100 recordings of  
47 Orthoptera species. Many are well documented. Breakdown:

<u>Group</u>	<u>Recordings</u>	<u>Species</u>	
Coleoptera	13	11	
Diptera	8	8	
Hemiptera	14	14	60% are Orthoptera recordings
Hymenoptera	28	12	
Orthoptera: Acridoidea	44	16	
Grylloidea	17	6	
Tettigonioidae	39	25	

4. Published discs, tapes & cassettes: 75 contain insect recordings.  
Over 540 recordings of 240 species from all over the world. Some discs are  
devoted entirely to insects (see discography in Recorded Sound 85  
(1984), particularly Japanese publications. On some discs the insect is  
not identified at species level. Most recordings are Orthoptera (70%)  
but also Coleoptera, Cicadidae (Hemiptera), Hymenoptera, Lepidoptera and  
Diptera.

5. British Museum (Natural History) collection of European Orthoptera: 383  
recordings in total (filed in 3 batches); 377 recordings of Orthoptera,  
one recording of a cicada (Hemiptera), and 5 recordings of 4 beetle  
(Coleoptera) species.

Breakdown of Orthoptera:	cuts	spp.
Acrididae	225	42
Gryllidae	18	7
Tettigoniidae	138	37
Gryllotalpidae	<u>1</u>	<u>1</u>
	377	87

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**RECENT PUBLICATION:**

Knutson, H., S. G. F. Smith, and M. H. Blust. 1983. Grasshoppers, identifying species of economic importance. Coop. Ext. Serv., Kansas St. Univ., Manhattan, KS. S-21. 9pp. This pamphlet contains a pictorial key and color pictures of 22 economically importance grasshoppers of central United States.

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**CORRECTION:**

In the last issue of *Metaleptea* it was implied that Dr. James A. Whellan was the only editor of *The Locust & Grasshopper Agricultural Manual*. Without detracting from the fine efforts made by Dr. Whellan, we add here that others made significant editorial contributions to its completion. Much work was also performed by Ms. Judith Child, Ms. Jackie McDonald, Miss Joan Salter, and Dr. N. D. Jago.