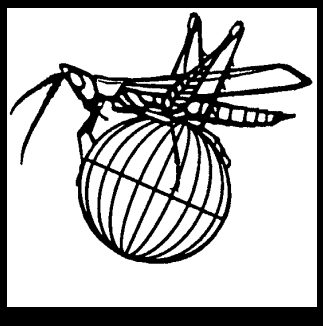

Metaleptea

The ORTHOPTERISTS' NEWSLETTER

Vol. 18, No. 1 THE ORTHOPTERISTS' SOCIETY December 1998

In this Issue . . .

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A MESSAGE FROM THE EDITOR

At long last, I present you with this issue of *Metaleptea*. After all the years I have been Editor of *Metaleptea*, I am finding that the collective input from our membership peaks and wanes. Sometimes I am overwhelmed with articles and news from our readership, other times I receive nothing. This has been one of those periods wherein I have received very little. I would once again try to appeal to all of you to submit information, articles of interest, travel notes, etc., that would appeal to orthopterists. We need such information to keep *Metaleptea* in regular print. I suspect that with the advent of e-mail, many orthopterists pass information on to each other electronically. *Metaleptea*, however, is a format that will allow everyone in our Society, as well as interested nonmembers reading it in our subscribing libraries, to obtain insights into the activities of the Orthopterists' Society. Please send me information for our next issue.

The *Proceedings* of the Seventh International Meeting of the Orthopterists' Society is in press. Those of you who had submitted papers should be receiving galley proofs in the near future. It has been a particularly difficult project for me because of increased responsibilities at the Systematic Entomology Laboratory. I have recently been assigned research and identification responsibilities for yet another group of insects, Thysanoptera! It is a group not even remotely similar to Orthopteroid insects, and I am finding it challenging and time consuming to learn how to identify species of the group. In addition, we at the Natural History Museum are in the process of undertaking a major move of our offices and collections to a new wing of the museum within the next few months. I thank you all for your patience as I have dealt individually with these matters.

In this issue, please be aware that confusion is in the making with the new arrival of a student of orthopterology by the name of Daniel Otto. He is not to be confused with our Past President and current Managing Editor of the Journal of Orthoptera Research, Daniel Otte. "Otto" and "Otte", first name(s) "Daniel"! Good luck in your literature searches in the future.

Please note my current (new) e-mail address. For all of you, have a Happy Holiday Season and a prosperous New Year, 1999.

David A. Nickle e-mail: dnickle@sel.barc.usda.gov
Editor, Orthopterists' Society

*****

FROM THE EXECUTIVE DIRECTOR

THE EXECUTIVE DIRECTOR'S COMMENTS

Jeffrey A. Lockwood

On the Inside Looking Out. . . . . .

As a member of several scientific organizations and a faculty member at a University, I have always wondered what executive directors and administrators did with their time. Although I have never aspired to administration, I must reluctantly admit that this label would seem applicable to my current role in The Orthopterists Society. And so, I presume that the members might be wondering what it is that I do in this capacity. I was tempted to select the most interesting and important things of the last several months, but I am - after all - a scientist so a systematically biased sampling procedure did not seem appropriate. As such, I pulled out from my various stacks of correspondence, emails and other communications a set of letters to and from Society members. Given my file-by-pile organizational system, this approach was haphazard (if not random), so the selected material is a decent representation of "Society business". Sorting through the first ten items my sample, I found:

1. A letter from Simone Berni who decided to join our Society (he was already a member of The Phasmid Study Group). His letter included the description of what was surely going to be a fascinating study trip to South America and a request for information that I might have on appropriate contacts to assist in his venture.

2. An email from our President, Ted Cohn, asking that I write a thank-you letter to a "grand old woman" and close friend of the Society who supported our Foundation through a generous gift.

3. A set of membership applications from orthopterists in Turkey, Czech Republic, United States (Arizona), and Morocco.

4. A letter from Blackwell's Information Services noting a subscription change to include the library at the University of California, Davis.

5. A letter and check from the librarian at the Africana Library of Northwestern University, requesting the Society's Field Guides pertaining to Africa.

6. A note and a check from a member in England who was catching up on payment for the Journal of Orthoptera Research, including the prepayment for a couple of years to assure that he didn't miss any future issues.

7. A letter from a long-standing member in India whose financial conditions has deteriorated to the point that he was requesting a sponsored membership to remain in contact with our scientific community.

8. A $20 bill and a kind note from a member stating that I had forgotten (imagine that?!) to include a bill with a set of Field Guides that I sent to The Netherlands. I had, however, notified him via email that the cost was $16. In a small-but-meaningful act of generosity he noted, "At my bank they didn't have one dollar bills so I send you 20 dollars. Don't bother to refund the four dollars."

9. A warm and sincere letter from a sponsored member in Tanzania updating me on his work and reiterating his deep gratitude for our Society's willingness to help keep in contact with scientific colleagues around the world.

10. A check indicating early (!) payment for dues and a subscription from a US member in Montana.

So, there you have it — a snapshot of the sorts of communications that I deal with on a daily basis (at least when I am not falling behind!). A great deal of being Executive Director is mundane communications,

problem solving, sorting, filing, and record-keeping. But there are those wonderful gems, moments where a small, international scientific society is clearly making a difference to people. Writing a letter of thanks for a gift, welcoming new members from around the world, sustaining a network of communications, sending our publications to libraries where they will be available to students and scholars, and receiving the thanks of our sponsored members — these are the little tasks that make the job of Executive Director fulfilling and rewarding.

Jeffrey A. Lockwood
Executive Director, The Orthopterists' Society

A PLEA FOR MONEY
SPONSORED AND SUSTAINING MEMBERSHIPS

A SPECIAL MESSAGE FROM OUR PRESIDENT, THEODORE J. COHN

With so much of the world in economic turmoil, we would like to remind members of the SPONSORED MEMBERSHIP program. If you know of worthy orthopterists who cannot afford cost of membership or of subscription to the *Journal of Orthoptera Research*, please submit their names to the Executive Director, Jeffrey A. Lockwood. We encourage members to contribute to the fund to support such sponsored memberships, for which there is a line on the dues notice.

We would also like to bring to attention of members the new experimental category of SUSTAINING MEMBERSHIP for those who can afford higher dues in support of the several programs of the Society, especially the new policy of no page charges for publishing in our flagship *Journal of Orthoptera Research*. Sustaining membership dues are currently set at three times regular dues, or $45 (subscription to *JOR* is in addition to this). Each such membership will assure the publication of one or two pages of *JOR*, or several pages of *Metaleptea*, two sponsored members, etc. A line for this has been inadvertently omitted from the dues notice. We hope that members will be generous.

CONGRATULATIONS TO AN HONORED MEMBER OF THE SOCIETY

Stanley K. Gangwere recently retired from active duty at the Department of Biological Sciences, Wayne State University, Detroit, USA, and was named Professor Emeritus, effective I January, 1998. However, he has agreed to serve the university at least one more year as Director of its Fish Lake Biological Program, at Lapeer, Michigan, where he is scheduled to teach general entomology during summer 1999.

Gangwere's personal research and writing on Orthoptera continues actively. A book entitled *The Bionoomics of Grasshoppers, Katydids, and Their Kin* (edited by S. K. Gangwere, M. C. Muralirangan, and Meera Muralirangan), 528 pp., was published by CAB International, Wallingford, Oxon, UK, in February, 1997. Gangwere also completed writing “Entomology in Brief,” a single-authored outline/review of modern entomology that hopefully will serve either as the sole text of a short course or as an inexpensive supplemental text to a full semester or a year course. Publication awaits completion of drawings and other arrangements and selection of a publisher. Two recent reports are in press in the *Journal of Orthoptera Research*. They are "A new species of Wernerella Karny from the Canary Islands, Spain" (by R. G. Bland and S. K. Gangwere) and "Food selection and feeding behavior in selected Acridoidea of the Canary Islands, Spain" (by S. K. Gangwere, J. C. McKinney, M. A. Ernemann, and R. G. Bland).

Gangwere has available reprints of many of his past orthopteran researches, dating from 1958 through 1996, which he would be pleased to send, grati.s, to interested investigators who provide the postage. If interested, kindly write for a list of available reprints and make arrangements to have the selected titles sent.

ARTICLE

Massive Tachinid Parasitization in *Romalea guttata* grasshoppers

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In 1997, eastern lubber grasshoppers, *Romalea guttata* (Houttuyn), in SW Florida were heavily parasitized with maggots of the tachinid parasitoid *Anisia serotina* (Reinhard). To document this parasitism, we isolated 50 adult male and 50 adult female lubber grasshoppers in June, 1997, and subsequently recorded all emerging maggots. We also dissected any surviving grasshoppers at the end of the isolation period (grasshoppers that died during the study were immediately dissected). We found that 92% (46/100) females and 72% (36/50) of males were parasitized; these levels were significantly different (X^2=6.78, df=1, p<0.05). The number of maggots per grasshopper ranged from 0 to 63 and averaged 7.02 (3.3 (SE) (n=100).

In 1998, we returned to south Florida and dissected 166 lubbers. We found that 4.8% (8/166) of dissected lubbers were parasitized with *A. serotina* maggots, with an average of 0.4(0.03(SE) maggots/grasshopper (n=166). We also noted a dramatic reduction in lubber densities between 1994 and 1998. In 1994, the estimated maximum density in the Copeland-Oochopee area was >1100 lubbers/100m^2. By 1997, the lubber density had fallen to 7 lubbers/100m^2 and in 1998, 0.4 lubbers/100m^2. This 99.9% reduction in lubber density is impressive and may have been driven by *A. serotina* parasitization. We believe the 82% parasitization level we observed is the highest level ever recorded for tachinids parasitizing grasshoppers. We also believe that 63 tachinid maggots in a single grasshopper is a record.

Romalea guttata is an interesting species in that it is large (up to 12g), flightless, brightly colored, and chemically defended. However, *A. serotina* is apparently not deterred by lubber toxins; emerging maggots pupated and eclosed to healthy adults in as little as 6 days. Surprisingly, many of the parasitized female lubber grasshoppers were able to lay multiple egg pods. It is possible that this grasshopperíss large size allows some egg production despite the heavy tachinid parasitization.

The dramatic changes we observed in the population levels of both *Romalea* and *Anisia* may have represented a classical parasitoid/host density-dependent interaction. With the high grasshopper densities in years prior to 1997, *Anisia* had abundant resources to exploit. This may have allowed Anisia densities to increase, resulting in the remarkably high parasitization level documented in 1997. High parasitization rates, in turn, may have contributed to the dramatic decline in densities for both species in 1998. Alternatively, unusual weather during winter and spring in 1998 in Florida may have influenced population levels of both species. We hope to separate the effects of weather *vs* population interactions in future studies. Please see full article submitted to *Florida Entomologist* (1999).

The Orthopterists' Society welcomes the following New Members

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Sex can be dangerous: Acoustically-orienting parasitoids on field crickets (Orthoptera: Gryllidae)

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The Orthopterists' Society generously awarded me grants in 1995 and 1997 to conduct research on *Teleogryllus oceanicus* (Orthoptera: Gryllidae) on the Big Island of Hawaii. Here I report results to date from fieldwork conducted in the past few years.

Teleogryllus oceanicus is native to the Pactfic Islands and Australia and has been introduced into Hawaii (Kevan 1990; Otte and Alexander 1983). Like other field crickets, males produce a conspicuous calling song to attract females for mating (Fig. 1). However, in some parts of the cricket's range a singing male risks also attracting the acoustically orienting parasitoid fly *Ormia ochracea* (Diptera: Tachinidae: Ormiini), which parasitizes *Gryllus* species on the mainland USA (Cede 1975; Walker 1986) and *T. oceanicus* in Hawaii (Zuk *et al.* 1993). Ormiines are unique because they have specialized ears that enable them to locate their hosts by their songs (Robert *et al.* 1992; Allen 1995). A gravid *O. ochracea* female locates a cricket and larviposits on and around it; larvae burrow into the host and develop within the host for 7- 10 days before emerging to pupate, killing the host within one day of emergence (Adamo *et al.* 1995a). Although larvae deposited near a male may parasitize female crickets attracted to that male, females have a relatively low parasitoid prevalence compared to males (Zuk et al. 1993, Adamo *et al.* 1995b).

Figure 1. Sonogram of a typical T. oceanicus calling song.

Because the same calling song produced by male crickets to attract females is used by flies to locate hosts (Cede 1975), Hawaii males face a trade-off between producing elaborate songs to attract females and minimizing singing to avoid attracting the fly. Previous studies of the effects of parasitization on cricket song have been confined to comparisons of species that differ in parasitization; such interspecific comparisons may have confounding effects that have nothing to do with the parasitoid (Rotenberry et al. 1996). T. oceanicus offers me the unique opportunity to study the evolution of an acoustic mating display by comparing populations of the same species. Zuk and her colleagues have described T. oceanicus populations varying in parasitoid prevalence from 0% to 31% (Zuk *et al*. 1993; Rotenberry *et al*. 1996). These populations have a corresponding variation in calling song structure, suggesting that selection by the parasitoid has played a role in song evolution (Zuk *et al.* 1993; Rotenberry *et al.* 1996).

The long term goal of my research is to determine how natural selection imposed by the parasitoid fly and sexual selection imposed by female crickets interact to shape the evolution of *T. oceanicus* reproductive biology. My research focuses on the following questions:

1) Does *O. ochracea* influence male cricket reproductive success even before the cricket dies?

Ormiine parasitoids sign)ficantly reduce host lifespan (*e.g*., Lehmann and Heller 1997), and my work on T. oceanicus indicates that parasitization may also have detrimental fitness consequences prior to host death. T. oceanicus males transfer sperm to females in discrete spermatophores. In two separate experiments of spermatophore replacement rates in parasitized and unparasitized males conducted in 1997, parasitized males produced sign)ficantly fewer spermatophores than unparasitized males. An examination of mating behavior in 1998 supported the spermatophore replacement studies and showed that parasitized males copulated sign)ficantly less frequently than unparasitized males. These results suggest that parasitization reduces male cricket reproductive success, and confirm that the fly is an important selective agent for crickets. This research is ongoing and I plan to address whether the fecundity of females mated to parasitized males is lower than that of females mated to unparasitized males.

2) Do female flies and female crickets prefer the same aspects of male song?

Acoustically-orienting parasitoids are generally more likely to find males with high pulse numbers (e.g., long chirp, Fig. 1) in their songs (Wagner 1996; Lehmann and Heller 1998). Zuk et al. (1998) confirmed this by showing that parasitized T. oceanicus males within a population had more long chirp and less short chirp components in their songs than unparasitized males. These differences among individuals were apparent even immediately after infestation, suggesting that differences in calling were not due to parasitization, but rather that flies were more likely to locate a male with a greater proportion of long chirp in his songs (Zuk *et al*. 1998).

If flies prefer the same song structure variables as female crickets, then male crickets may face a compromise between attracting females for mating and also attracting flies (*e.g*., Wagner 1996). In this case, cricket song may either not change much over evolutionary time because of stabilizing natural and sexual selection pressures, or female cricket choice may be relaxed in the parasitized populations such that directional selection by flies is the predominant force affecting song evolution. Alternatively, if flies differ from female crickets in their song preferences, then cricket song is expected to evolve away from what flies prefer and toward what female crickets prefer. Direct tests of fly preference are required to distinguish between these alternative predictions.

In the summer of 1998 I conducted song broadcasts to test for song preferences of parasitoid flies in Hilo, Hawaii. I broadcasted pairs of songs differing in one variable only, and collected flies attracted to each song. A total of 342 flies were collected over 27 nights. I found that flies sign)ficantly preferred songs with many long chirp pulses and few short chirps. In the future I intend to directly test for fly preferences in other parasitized populations, to evaluate the generality of the Hilo results and to determine whether fly preferences vary among populations within the Hawaiian islands. The expectation is that fly preferences will be strongest in Kauai, which has the highest parasitoid prevalence, and weakest in Oahu, which has the lowest parasitoid prevalence (Rotenberry et al. 1996).

Neuroethological studies suggest that female crickets generally also prefer the long chirp (Pollack and Hoy 1981), so that female crickets and flies may converge in their song preferences (*e.g.*, Wagner 1996). However, if a female approaches a male whose song has attracted flies, she risks also becoming parasitized. Therefore, it is possible that females are less choosy in populations with high parasitoid prevalence. For example, female crickets respond differently to male songs depending on the perceived risk of predation (Hedrick and Dill 1993; Csada and Neudorf 1995). I will therefore also conduct laboratory experiments to directly test the song preferences of females from populations varying in parasitoid prevalence, to test the hypothesis that females from heavily parasitized populations are less choosy.

3) Does cricket calling activity correlate positively with female cricket attraction and negatively with parasitoid prevalence?

Calling in *T. oceanicus* and other field crickets is energetically expensive (*e.g*., Hoback and Wagner 1997). Therefore, it is possible that females prefer males who are able to sustain high levels of calling during a night (Walker 1983; Crnokrak and Roff 1998), or that males that call a lot are simply more likely to be calling when a female passes (Zuk and Simmons 1997). The female may then evaluate male quality based on song structure elements such as pulse rate, frequency, and intensity (Pollack and Hoy 1981; Doolan and Pollack 1985). In either case, because calling also attracts flies, calling activity is expected to be negatively correlated with parasitoid prevalence (Cede l 991).

In the summer of 1997 I determined the calling activity of 39 caged males for two to eight consecutive nights in Hilo, Hawaii. Field calling activity was significantly repeatable, which means that a male can be reliably characterized as a high or low caller. Regression analysis showed that calling activity also sign)ficantly predicts female cricket attraction. A comparison of calling activity between the Hilo population and an unparasitized T. oceanicus population studied by Orsak (1988) revealed that Hilo males call sign)ficantly less, supporting the idea that although high calling activity increases the chances of attracting mates, calling activity is reduced in parasitized populations because it also attracts flies. I plan to examine calling activity in the other Hawaiian islands in the future, to examine the question posed above.

4) Do male cricket calling patterns differ among parasitized and unparasitized populations?

In addition to the quantity of calling, when a male calls during the night may have important consequences for his reproductive success. For example, males should peak in calling activity at the same time during the night that receptive females peak in searching activity (Walker, 1983). Orsak (1988) and Loher and Orsak (1985) examined calling patterns in an unparasitized T. oceanicus population in Moorea, French Polynesia, and showed that males peak in calling at dusk and dawn. In contrast, parasitized populations of Gryllus species have a dawn peak but not a dusk peak; this result has been attributed to selection by the parasitoid fly because flies are more active at dusk than at dawn (French and Cade 1987). In 1997 I examined the individual calling patterns of 39 male crickets in Hilo and found a pronounced dusk peak but no dawn peak in calling activity. Data from fly captures showed that the calling activity peak coincides with the peak in fly searching activity, so that males do not appear to have shifted calling to avoid flies. I also intend to examine calling patterns in Oahu and Kauai, to determine whether a shift in the timing of calling has occurred in those populations. I am especially interested in the heavily infested Kauai population, where selection by the fly has potentially resulted in crickets calling more at dawn than at dusk.

This research will increase our understanding of how cricket behavior evolves and, more generally, of how conflicting selection pressures interact to produce phenotypes over evolutionary time (e.g., Andersson 1994: 234).

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BOOK ANNOUNCEMENT

The Bionomics of Grasshoppers, Katydids and Their Kin

Edited by S K Gangwere, Wayne State University, Detroit, USA, M C Muralirangan, G.S. Gill Research Institute, Madras, and Meeru Muralirangan, SDNB Vaishnav College for Women, Madras, India

This book presents a broad review of the biology of grasshoppers and plague locusts, as well as katydids, crickets, mantises and other economically important orthopteroid insects. While grasshopper and locust plagues have decreased recently in North America, they continue unabated in many other parts of the world, including South America, Australia, the Middle East, Africa and western and southern Asia. Similarly, katydids attack cereals, orchards and other cultivated vegetation, and crickets damage tea, coffee and tuber crops among other plants.

There have been considerable advances in our knowledge of these groups since other books addressing this subject were published. These other books have also focused on a more limited range of taxa. This book is written from a broad, comparative biological, behavioural and evolutionary approach best expressed by the neglected term "bionomics". It thus covers systematics, distribution. behaviour, physiology and genetics, as well as pest control and conservation. Written by authorities from the USA, Canada, UK, Spain, Israel, South Africa, India and Russia, it represents a major work for entomologists and those concerned with crop protection from pest Orthoptera.

Contents:

continued on page 8

BOOK ANNOUNCEMENT

Continued from page 7

o **Polyphagy in the Acridomorpha**, R F Chapman, University of Arizona, Tucson, USA and G A Sword, Department of Zoology, University of Texas, USA

o **Acoustic Communication in Orthoptera**, M D Greenfield, Department of Entomology University of Kansas, USA

o **Grasshopper Oviposition**, T W Stauffer and D W Whitman, Department of Biological Sciences, Illinois State University, USA

o **Evolution of Mating in Crickets, Katydids, and Wetas (Ensifera)**, W D Broun, Institut de Zoologie et d 'Ecologie Animale, Lausanne, Switzerland, and D T Gwynne, Department of Zoology, University of Toronto, Canada

o **Endocrine Factors and Female-Male Coadaptations in Reproductive Diapause-Related Strategies of Acridoid Insects**, M P Pener, Department of Cell and Animal Biology, Hebrew University, Jerusalem, Israel

o **Molecular Evolutionary Genetics in Orthopteroid Insects**, W Chapco, Department of Biology, University of Regina, Canada

o **Differentiation of Individuals, Populations, and Species of Orthoptera: The Past, Present, and Future of Chromosome Markers**, J Gosalvez, P L Mason, and C Lopez-Fernandez, Departamento de Biologia, University Autonoma de Madrid, Spain

o **A History of Chemical Control of Grasshoppers and Locusts 1940-1990**, P W Riegert, University of Regina, Canada, A B Ewen, Agriculture Canada, Canada, and J A Lockwood

o **Phytochemicals in Locust and Grasshopper Management Strategies**, T R Govindachari and G Suresh, Southern Petrochemical Industries Corp., India

o **Biological Control of Rangeland Grasshoppers and Locusts**, J A Lockwood and A B Ewen

o **Crop-Centred Integrated Pest Management in Grasshoppers and Other Pest Orthoptera**, N D Jago, Natural Resources Institute, Chatham, Kent, UK

o **Conservation Biology of Orthoptera**, M J Samways

Readership:
Entomologists and those concerned with crop protection from pest Orthoptera.

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[**NOTE from the Editor**: The following article is a summary of the Business Meetings of the Orthopterists' Society Board of Governors, which convened at the Seventh International Meeting of the Orthopterists' Society in Cairns, Australia, in October, 1997. Usually published in the Proceedings, it is published here to get the information to the membership in a more timely manner.]

MINUTES OF THE MEETING OF THE BOARD OF GOVERNORS OF THE ORTHOPTERISTS' SOCIETY, CAIRNS, AUSTRALIA, 26 OCTOBER 1997

Members of the Old and New Board present: María Marta Cigliano, Theodore Cohn, Roger Farrow, Nicholas Jago, Alexandre Latchininskii, Jeffrey Lockwood, David Nickle, Daniel Otte, Paul Pener, David Rentz, Michael Samways. Absent: Roger Bland

President D. Rentz opened the meeting at 1500 hours; the following is the transcription by T. Cohn of the notes taken by N. Jago.

1) President-Elect Cohn presented an analysis of the finances of the Society in the absence of the Treasurer. He reported that the Society is in excellent financial condition with large investments ($55,000, with all major bills paid for the year) and large growth (of 50%/year) in our financial assets over the last several years. On the other hand the income of the Society is very variable because of the almost random payment of dues and subscriptions by the members, and by the variability in contributions. So variable is the dues payment that we are not sure just how many members we have.

The best estimate at the present time is that we have about 200 dues paying members giving us an income from this source of $3,000 per year. The only other regular income (other than from subscriptions) is from our bond fund of about $500 (the figure varies from year to year as this fund is used to pay major expenses; the other two investments are in growth funds in which any income is reinvested).

The fixed expenses of the Society (excluding that of JOR and the grants program) amount to $3,300 and include remuneration of the Executive Director, Treasurer, and Editor of Metaleptea, and the printing of Metaleptea. To this should be added provision to accumulate funds in partial support of officers travel to the Triennial Meeting of about $1,000/year. The Society is therefore running a deficit of about $800 if we assume that we have only 200 paying members.

The income and costs of the Journal of Orthoptera Research, the gem of our Society, are easier to estimate. We have about 210 paying subscribers providing us with $3,150 in subscription income. The cost of printing JOR have varied from $2,400 to 7,400, depending largely on the number of colored plates, and the Editor (starting with the last issue) is paid $10/page. Page and colored plate charges plus subscription fees have exceeded costs in the past few years.

The Research Grant Program is covered entirely by designated contributions matched by an anonymous donor. The Committee has spent approximately $5,000 each but this year we were able to fund all nine applicants for a cost o $6,000. Part of the investments of the Society are in a growth fund (now over $15,000) for the permanent support of the program.

Because of the excellent current state of our finances, Cohn suggested that Society is in the position to enact some initiatives (given at the end of this analysis) that might initially cost the Society some money but which will eventually enhance its stature and probably its income.

Because the low dues and subscription price, neither of these sources of income cover expenditures directly related to them. In addition we may have to assume large costs of mailing and secretarial service now underwritten by the home institutions of the Executive Director and the Editor of Metaleptea. Cohn suggested a three-pronged approach to increasing the Society's income. First, the establishment of an Endowment increase the regular income of the Society, with the principal not to be touched except under unusual circumstances and with special safeguards (see below). Pledges have already been made for contributions to this fund. Second, the establishment of a Sustaining Membership to allow those who can afford it to contribute more on a regular basis. Third to make a strong effort to increase subscriptions, especially by libraries, and to selectively increase our members.

The suggestion was also made to use a yearly budget process to allocate funds to various projects rather than to tie specific sources of income to specific projects. In particular, Cohn wanted to see the JOR expanded, page charges eliminated, and library rates reduced, but our current subscription rates could not support such initiatives. On the other hand by using other sources of funds for the support of the JOR, these new policies and the continued low subscription rate might increase the quality and attractiveness of the journal and therefore attract more subscribers.

Should the Endowment and Sustaining Membership be accepted, then the financial organization of the Society might be envisioned as composed of four compartments: 1) income from membership dues (presently low, variable and possibly fickle), sustaining memberships (which would increase and somewhat regularize our income), and subscriptions; 2) the current Corporate Bond Fund used for major expenses (such as JOR) but which yields about 7-10% per year; 3) the current stock Growth Fund which represents our chance for greatly increasing our net worth and eventually our income (any current income from this fund must must derive largely from sale of part of the fund); and 4) the Endowment, managed so as to give us a steady income, small at first, but which also gives us a chance to increase the capital while safeguarding part of it.

The Research Fund has been run as an entirely separate entity as this is a dedicated fund which can be used only for research grants. However, should the income of the Society greatly increase, Cohn would like to see some devoted to increasing

MEETING INFORMATION

the maximum size of the grants, presently $1,000, and increasing their number. As reported each year, the grants cover a wide range of topics and are restricted only to studies dealing primarily with the basic biology of orthopterans. Feed back was invited concerning the effectiveness of the grants and suggestions for improving the program.

2) A resolution for the Establishment of an Endowment (see appendix) was presented by Cohn, was seconded and unanimously adopted.

3) A resolution for an Investment Policy for the Endowment Fund (see appendix) was offered by Cohn, was seconded and unanimously adopted. This policy is intended to provide the Society with steady income, to be indexed for inflation, to protect the gains of the growth instrument or bonds during times of high stock or other markets, and to provide flexibility in the management of the endowment.

4) A resolution concerning External Subsidies (see appendix) was offered by Cohn, was seconded, and after considerable discussion was passed by a vote of 10-1. Cohn argued that because support from private industry is often not entirely altruistic and is probably usually done for private gain, the Board should consider whether it is acceptable for the Society to at least morally (but not necessarily publicly) endorse the policies and products of a subsidizing company. While some Board members saw little problem and offered the example of other societies accepting industrial subsidies, this resolution does not prohibit acceptance of such subsidies. It is intended to address possible concerns of the membership BEFORE action is taken on subsidies from particular private companies or classes of
companies. While accepting support from even objectionable companies may not be of great significance to either the company or the Society and may not involve public endorsement of the policies or products of the subsidizing company, acceptance of subsidies from some companies may nevertheless be morally repugnant to some members who may also consider the Society to be morally compromised in so doing. Consideration as outlined in the resolution would reduce controversy in the Society.

5) Concerning support of travel by Board Members, the Board decided that allocation of funds for such purposes will be made at the discretion of the Executive Director rather than by a fixed formula.

6) It was suggested that remotely based members receive their Society correspondence by First Class Air Mail.

7) By unanimous vote the Board decided to initiate a reduction or elimination of page charges for the Journal of Orthoptera Research as a means of attracting more and better papers. The mode of such reductions was referred to the editors of JOR who will examine the methods used by other journals. The situation will be reviewed in four years.

8) It was decided that the Society should subsidize variable support for page charges and dues to encourage membership and authorship by those who genuinely cannot cover such costs. However, it was emphasized that external grants received by members should normally include funds for publication.

9) A motion was offered to establish an experimental Sustaining Membership category with dues equalling three times the standard rate, for an interim period of four years and reviewed at the next meeting by the Board. The motion was seconded and carried unanimously. Increased income from such membership might be used to pay for items as page charges.

10) It was proposed that a Board members be chosen on the basis of subject representation but that members so chosen be also geographically representative so as not to increase the numbers of Board members. The motion was seconded and passed unanimously. Subject matter might include Conservation, Biology, Control, Systematics, etc.

11) The Board reviewed the activity in the Rentz Photo Library of Orthoptera marketed by Bruce Coleman, and recommended that it be expanded by contribution of other members. The income to the Society from this Library in the past year was about $400 at no cost to the Society.

12) Because of the Society's admiration from PRIFAS, it was decided to write a letter of commendation to the new interim Director for use in the review of the organization.

13) Editor Otte reported that the printing job for next issue of the Journal of Orthoptera Research is presently out for bid. It will be about 160 pp. without color plates and would probably cost about US$6400. The paper would be the same as that for JOR No. 1 rather than clay paper.

14) Letters of appreciation were authorized for ACTS, the Colonial Club, Dr. Stanley K. Gangwere, Dr. Scott Schell, Norma Hoshor, and the University of Wyoming, the letters to be written by various Board members.

15) The reestablishment of the Orthopterists' Society Training Program was suggested; T. Cohn was directed to explore the situation both in the various countries, to review the previous arrangement, and to investigate the source of suitable students and likely supervisory Society members and institutions.

16) It was noted that several countries were not represented or underrepresented at the present meeting, and it was suggested that methods be found to rectify this situation.

17. The Board noted that there had been few research grant application from Southeast Asia and only one from Africa. T. Cohn was directed to investigate the matter.

18. By unanimous vote the Board authorized the establishment of a Visa account for the Society.

The meeting was adjourned at approximately 1800 hours.

APPENDIX FOR THE GOVERNING BOARD MEETING OF 26 OCTOBER 1997

Resolution for the Establishment of an Endowment for the Orthopterists' Society
(Passed by the Governing Board on 26 October 1997 and the Business Meeting on 27 October 1997 at the Triennial Meeting of the Orthopterists' Society in Cairns Australia)

Resolved that the Orthopterists' Society establish an Endowment Fund, the principal of which shall not be invaded (except as specified hereafter), and that only the interest and dividend income be used to further the goals of the Society as defined in the Constitution. The Endowment Fund shall be managed under the direct supervision of the Governing Board acting as Trustees.

For unusually meritorious projects, the Governing Board of the Society by a one-half vote of the entire Board may authorize that up to one-half of the principal of the Endowment Fund be borrowed for such projects, but only after the Board has approved a plan to return such borrowed amounts to the Endowment within two years after the disbursement of the funds.

Withdrawals of sums of $500 or more must be cosigned by the Treasurer and either the President or the President-Elect.

Investment policy

1) The Endowment Fund of the Society shall be divided into two portions, one invested in relatively safe but high-yielding government or government agency bonds, the second in growth instruments such as growth stocks and/or mutual funds.

2) The two portions of the Endowment Fund shall be maintained within a range of one-third either portion to two-thirds the other portion, at the direction of the Board. (At any one time from one-third to two-thirds of the total endowment may be in either portion.)

3) Enough interest income from the bond portion shall be reinvested approximately yearly so that the value of this portion always keeps up with inflation, except only in times of high inflation when the Board may reduce, but never eliminate, such reinvestment.

4) On 5 January of each year (or as close to that date as is practical) the Board will determine the portion of the capital gains of the previous year (as determined on 5 January) of the growth portion that will sold and the proceeds invested in the bond fund. After such investment the entire remaining growth fund shall be considered the principal upon which capital gains for the following year will be calculated.

RESOLUTION ON EXTERNAL SUBSIDIES

(Passed by the Governing Board on 26 October 1997 and the Business Meeting on 27 October 1997 at the Triennial Meeting of the Orthopterists' Society in Cairns, Australia)

Resolved that the Orthopterists' Society shall seek financial support primarily from its own members, from governments, or from public institutions. When support from private industry is necessary or desirable, the Board shall carefully consider the nature of the products and the policy of the subsidizing company before seeking or accepting subsidies from it, and be prepared to at least morally endorse such policies and products.

MINUTES OF THE BUSINESS MEETING, CAIRNS, AUSTRALIA, 27 OCTOBER 1997

Executive Director J. Lockwood opened the meeting at 1700 hours.

The following motions to accept the resolutions previously passed by the Board (see above) were offered:

1. Reducing or waiving page charges. Passed by a majority vote.

MEETING INFORMATION

2. Establishment of an Endowment Fund and an investment policy for it. Passed unanimously.

3. External subsidies. Passed with one opposed and one abstention.

4. Experimental Sustaining Membership category.. Passed unanimously.

5. Subject representation coupled with regional representation. Passed unanimously.

6. Letters of appreciation and support suggested by the Board were authorized.

7. A plea for E-mail addresses was made.

MINUTES OF THE SECOND MEETING OF THE BOARD OF GOVERNORS OF THE ORTHOPTERISTS' SOCIETY, CAIRNS, AUSTRALIA, 30 OCTOBER 1997

Members of the Old and New Board present: María Marta Cigliano, Theodore Cohn, Roger Farrow, Nicholas Jago, Jeffrey Lockwood, David Nickle, Daniel Otte, Paul Pener, David Rentz, Michael Samways. Absent: Roger Bland, Alexandre Latchininskii.

President-Elect T. Cohn opened the meeting at about 1200 hours; notes were taken by T. Cohn. The following resolutions were offered, seconded and passed unanimously:

1. That US$5,000 from the Endowment Fund be invested in a U. S. Treasury or a U. S. Government Agency bond at an appropriate time by Cohn.

2. That US$2-3,000 worth of Strong Fund shares be sold and invested in the growth instrument match for the Endowment Fund (see Endowment Fund financial policy above) at an appropriate time by Cohn.

3. That US$5,000 worth of Strong Fund shares be sold at an appropriate time to safeguard recent gains made by that Fund. The money realized to be used for Society projects, or invested for income, or held for reinvestment.

Member Thomas Walker was invited to present an analysis of possible electronic publication of Metaleptea and the Journal of Orthoptera Research. He pointed out that there were great advantages to orthopterists in publishing electronically, and that this was clearly the wave of the future. Drawing from his experience in publishing the Florida Entomologist in this manner, he reviewed methods for publishing back issues and current articles, expenses, effect on subscriptions, recovery of lost subscription revenue, use of a server from a well-established research library (probably at no cost to the Society), and generation of indices making articles recoverable through boolean searching. He concluded by pointing out that under his suggestions, 1) authors would retain copyright, 2) their articles would be permanently and freely accessible on the Internet within a few years, and 3) authors would pay a very modest price for making their articles immediately and freely accessible on the Internet.

It was the sense of the meeting (Rentz, Jago, and Farrow were absent) to go forward with electronic publication subject to Board approval. The meeting was adjourned at about 1500 hours.

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MEMOIR SERIES

No. 1. "The Orthopteroid Insects of Quebec and the Atlantic Provinces". V.R. Vickery, D.E. Johnstone and D.K.McE. Kevan: i + 207 pp., published October 23, 1974. Updated 1984. $20.00

No. 2. "The Land of the Grasshoppers, being some Verses on Grigs ...." (i.e., on orthopteroid insects: ancient and modern. D.K.McE. Kevan: i - x + 326 pp. published December 31, 1974. (Out of Print: we can supply unbound photocopies at cost). approx. $35.00

No. 3. "Checklist of the Butterflies of Canada". W.W. Gregory. i + 44 pp. published April 30 1995. $10.00

No. 4. "The Higher Classification of the Orthopteroid Insects". Edited by D.K. McE. Kevan (Papers presented at Section 1 Symposium, XV International Congress of Entomology, Washington, D.C., U.S.A. August., 1976): iv + 52 + (26) pp. published December 29, 1977. $15.00. (Papers by Jago, Kevan, Ragge, Vickery and moderator Rentz). $12.00

No. 5. "The Skipper Butterflies of the Province of Quebec/ Les papillons hesperides de la province du Quebec (Lepidoptera: Hesperiidae)". D.N. Duffy and J.A. Garland. vi + 165 pp. bilingual with 4 colour plates. Published June 12, 1978. $25.00.

No. 6. "The Land of the Locusts, being Verses on Grigs: Part I (up to 450 A.D.)". D.K. McE. Kevan . x + 530 pp. Published June 29, 1979. $35.00.

No. 7. "Studies on Nearctic *Craspedoleptea* Enderlein 1921 (Homoptera: Psylloidea): Taxonomic Revision)". A.R.P. Journet and V.R. Vickery. 164 pp. Published June 29, 1979. $25.00.

No. 8. "The Orthopteroid Insects of the Bermudas". D.K.McE. Kevan. iv + 182 pp. + 1 pl. Published October, 1980. $25.00.

No. 9. "Immature Grasshoppers of Eastern Canada (Orthoptera: Acrididae)". V.R. Vickery, L.M. Crozier and M.O'c. Guibord. v + 745 pp. Published June 1981. $15.00.

No. 10. "The Land of the Locusts, Being Further Verses on Grigs: Part II (between 450 and 1500 A.D.)". D.K. McE Kevan. viii + 554 pp. Published March 28, 1983. (Out of print: we can supply unbound photocopies at cost) approx $40.00.

No. 11. "The Sphecoidea of Southern Quebec (Hymenoptera). A.T. Finnamore. ix + 348 pp., 144 illustrations. Published July 7, 1982. $25.00.

No. 12. "Revision of the American Species of *Mimesa* (Hymenoptera: Pemphredonidae: Pseninae)". A.T. Finnamore. vi + 171 pp. 365 illustrations. Published March 30, 1983. $20.00.

No. 13. "A Monograph of the orthopteroid insects of Canada and adjacent regions". V.R. Vickery and D.K. McE. Kevan. Two volumes; 1: xxii + 679 pp; 2: iv + 680 - 1462 pp., 7 coloured plates, 6 black and white plates, 824 text illustrations, 237 maps. Published August 17, 1983. A few copies of an updated corrected version are still available. $110.00.

No. 14. "Revised Checklist of Butterflies and Skippers of Canada". W.W. Gregory (Replaces Memoir 3, 1975). xviii + 39 pp. Published February 25, 1985. $12.00

No. 15. "The Brown Lacewing Flies of Canada and Alaska (Neuroptera: Hemerobiidae) Part I: The Genus *Hemerobius* Linnaeus: Systematics, Bionomics and Distribution". J. Klimaszewski and D.K. McE. Kevan. 119 pp., 95 figs., 11 maps. Published February 25, 1985. Out of Print (but republished, lacking field data, under the title of " The Hemerobiidae of Canada and Alaska. Genus *Hemerobius*L. D.K. McE. Kevan and J. Klimaszewski. *In* Giorn. Ital. Ent. 16: 306-369. Some copies are available on request.

No. 16. "The Land of the Locusts, Part III (The Sixteenth to Eighteenth Centuries)". D.K. McE. Kevan. i-iv + 466 pp. Published October 8, 1985. $40.00.

No. 17. "A Synopsis of the Thysanoptera (Thrips) of Canada". Helene Chaisson. i-vi + 152 pp. Published August 7, 1986. $20.00.

No. 18. "The Land of the Locusts, Part IV (The Nineteenth Century)". The late D.K. McE. Kevan (assisted by V.R. Vickery). Volume 1: iv + 466; Volume 2: 467-804. Published November 1998. (Price to be determined).

NOTES SERIES

No. 1. "Information regarding the Genus *Atractomorpha* Serville (Orthoptera: Acridoidea: Pyrgomorphidae)". D.K. McE. Kevan. 3 pp. Published September, 1973. (Out of print - we can supply photocopies).

No. 2. "Superfamilial Classification of Orthopteroid and Re-

PUBLICATIONS

lated Insects, Applying the Principles of Symbolic Logic -- A Draft Scheme for Discussion and Consideration". (XV International Congress of Entomology, Washington, D.C., U.S.A., August 1976). (Out of print, revised edition, 1977 included in Memoir 4)

No. 3. "Taxon Ranking in Grylloidea and Gryllotalpoidea". V.R. Vickery. 20 pp. Published August 1986. (Also included in Memoir 4).

No. 4. "The Lyman Entomological Museum and Research Laboratory - A History to 1978". D.K. McE. Kevan. 35 pp. Published October, 1978. (Out of print).

No. 5. "The Department of Entomology, McGill University - A History to 1978. 88 pp. Published April, 1979. (Out of Print).

No. 6. Parasitoids and Hyperparasitoids of the Gypsy Moth, *Lymantria dispar* (Linnaeus) (Lepidoptera: Lymantriidae) in Quebec". F.J. Madrid and R.K. Stewart. ii + 29 pp. Published October 1980. $8.00.

No. 7. "Students" Guide to the Recognition of the families of the Class Collembola (Arthropoda: Hexapoda)". D.K. McE. Kevan. 10 pp. Published November 1980. $5.00.

No. 8. "Notes on Two African Species of Pyrgomorpha (Orthoptera: Pyrgomorphidae) Reared in the Laboratory". W.J.A. John, D.K.McE. Kevan and C.-C. Hsiung. 44 pp. Published May 1981. $10.00.

No. 9. "Utamaro's "Insect Book", 1788". Edited with Kyoka Translations". D.K. McE. Kevan. 37 pp. Published June 1981. $6.00

No. 10. "The Orthopteroid Insects of Yukon". V.R. Vickery. 42 pp. Published January, 1984. $10.00.

No. 11. "The Lyman Entomological Museum and Research Laboratory of McGill University". D.K. McE. Kevan. Reprinted from Bulletin of the Canadian Society of Zoologists. 4 pp. Published February, 1984. (no charge, cost of postage only).

No. 12. "Some Insect Books for Children" (In English). C.-C. Hsiung. 20 pp. Published February, 1984. $4.00

No. 13. "A Tabular Check-list of Canadian Orthopteroid Insects". G.G.E. Scudder and V.R. Vickery. 20 pp. April, 1985. $4.00.

No. 14. "A Computer Compatible Key to the Genera of the Tubulifera (Thysanoptera) of Canada". Helene Chaisson. ii + 34 pp. Published May 1985. $ 6.00.

No. 15. "Recorded localities for tropical and southern African species of *Pyrgomorpha* (Orthoptera: Pyrgomorphidae)". D.K. McE. Kevan and C.-C. Hsiung. 15 pp. Published May 1987. $6.00.

No. 16. "An annotated list of Adventive and Captive Alien Orthopteroid Insects in Canada". D.K. McE. Kevan. 51 pp., Published July 1990. $10.00.

No. 17. "Douglas Keith McEwan Kevan, 1920-1991, The Man and His Publications". Compiled by V.R. Vickery. 68 pp. Published October, 1993 (updated version 1994: 73 pp.). $15.00.

No. 18. "The Chinese Stink Bugs *Cyclopelta parva* Distant and Coridus chinensis (Dallas) (Heteroptera: Dinidoridae): Use in Traditional Medecine.î. 10 pp. Published 1996. $6.00.

No. 19. "Primary Types and Type Designations of Insects in the Lyman Entomological Museum and Research Laboratory". V.R. Vickery. 11 pp. Published 1996. $6.00.

No. 20. "Names for Taxa [illegible] by the late D. Keith McE. Kevan (and taxa named to honour Kevan)". V.R. Vickery. 23 pp. Published 1996. $12.00.

No. 21. "The Chinese stink bug *Cyclopelta parva* Distant (Heteroptera: Dinidoridae): use in traditional medecine and chemical comparison with the Nearctic *Acrosternum hilare* (Say) (Heteroptera: Pentatomidae). C.C. Hsiung and V.A. Yalayvan. 8 pp. Published 1997. $4.00.

No. 22. "Timema monikensis, Species Nov. (Phasmatoptera: Timematodea): Timematidae) a New Parthenogenetic Species in California". V.R. Vickery and C.P. Sandoval. 3 pp. Published October 8, 1998. $4.00.

No. 23. "Notes on Grylloblattidae (Notoptera), with particular reference to the Neartic Region". V.R. Vickery. 12 pp. Published October 8, 1998. $6.00.

No. 24. "Curriculum Vitae and Publications of Vernon Randolph Vickery, Professor, Curator and Emeritus Curator (1961-1998)". V.R. Vickery. 26 pp. Published October 8, 1998. $12.00.

No. 24. ìJean-Henri Fabre - Yet Another Biographyî. D.Keith McE Kevan (Edited by Vernon R. Vickery). 71 pp. Published November 25, 1998.

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THE ORTHOPTERISTS' SOCIETY *FIELD GUIDE* SERIES

The *Field Guides* are pocket-sized publications intended for use in the field by workers concerned with pest species of locusts or grasshoppers, in English, French or Spanish, or combination of these, as appropriate for the intended region.

The series originally was arranged in four parts: Introduction; General Topics; Specific Pests; and Pest Species of a Region. It was set up as an open-ended series in each of the latter three categories so that other *Field Guides* could be added in any of them should this become desirable.

Field Guides are not intended to be sold; they are for free distribution by FAO, CIRAD/PRIFAS, or other organization in a region where they will be useful.

All manuscripts are subject to peer review (after general editing) and may be returned to authors for revision; all pages from the printing firm will be sent to authors for checking before final printing. [I was unable to have authors make final checks before printing in 1991, due to unexpected deadline imposed on funding so that all *Guides* had to be printed and printing firms paid by that date. Some errors exist in 4 of the printed *Field Guides]*.

Only one paper was written in the B series, that by Dr. S.K. Gangwere and published as B4E. It might have been better to dispense with the B series. I deliberately shelved the Introductory (A) series, although these were ready for printing in all three languages. It seemed pointless to pay for printing the introductory *Guides* unless funds were available for publication of the entire series. Also, I decided not to print the *Field Guide* on North American pest species because other parts of the world have problems that are more serious than in that region. I have shelved the four *Field Guides* that I have written at a cost of considerable personal time and effort. I may eventually have the North American guide printed at personal cost but the introductory ones are permanently shelved.

If the project has to be discontinued, Dr. Gangwere has undertaken to publish the manuscripts at hand in a single volume, provided that I supply him with the completely edited manuscripts.

Should another source of funding be found, I am prepared to continue working on the *Field Guides* on behalf of the Society. I thought there would be no difficulty in obtaining funding once the quality of the original 12 *Field Guides* was seen, but so much for day dreams. This has not happened, except in the case of the *Guide* on pests of Australia for which the cost was underwritten by The Biological and Chemical Research Institute, Entomology Branch, New South Wales Agriculture. This guide was published and has been sent to Australia.

Lists showing the intended topics and the results to date can be obtained from:

V. R. Vickery
Editor, Field Guide Project
102 Souvenir Drive
Pinecourt, Quebec J7V 3N8
CANADA

NOTICE

Lyman Entomological Museum and Research Laboratory Note 17
Publications by the late Dr. D.K.McE. Kevan

The list of publications by Keith Kevan has been compiled by V.R. Vickery to the end of 1992. The list, together with a brief profile of Kevan, has been published by the Lyman Entomological Museum, 68 pages. As the museum is in financial difficulty, there is a small charge ($5.00) per copy. In addition Canadian postal rates have been increased recently so that the following postage charge has to be added:

within Canada – $1.50; U.S.A. – $2.35; foreign – $5.00

Order from:
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BOOKS AND NOTICES

THE ORTHOPTERISTS' SOCIETY

The Orthopterists' Society (formerly *Pan American Acridological Society*) is an international scientific organization devoted to facilitating communication among those interested in Orthoptera and their allies. Research and publication are fostered in all aspects of the biology of these insects from ecology and taxonomy to physiology, endocrinology, cytogenetics, and control measures.

HISTORY. The Society was founded in 1976 by some 35 orthopterists meeting at San Martin de los Andes, Argentina. Its constitution and by-laws were adopted in 1977, and it was accorded tax-exempt status by the United States government in 1978. The meetings held since San Martin have been at Bozeman (United States), Maracay (Venezuela), Saskatoon (Canada), Valsain, Segovia (Spain), and Hilo, Hawaii (USA). The last meeting was held in Cairns, Australia (1997).

MEETINGS. Symposia, round table discussions, and research papers presented at the Society meetings are published in the *Proceedings of the Orthopterists' Society,* and a newsletter, *Metaleptea*, is issued semi-annually. Information regarding these publications can be obtained from the editor, Dr. D. A. Nickle, USDA, c/o National Museum of Natural History, MRC-168, Smithsonian Institution, Washington, D.C. 20560, USA.

GOVERNING BOARD The 1997-2000 Governing Board comprises President Theodore J. Cohn (USA), President-elect (USA), Past President David C. F. Rentz (Australia), Treasurer Roger Bland (USA), Regional Representatives Maria-Marta Cigliani, Michael Samways, and Alexandre Latchininskii, J. A. Lockwood (USA), and Paul Pener (Israel), Executive Director Jeffrey A. Lockwood (USA), Editor, D. A. Nickle (USA),Editor of the *Journal of Orthoptera Research*, N. D. Jago (United Kingdom), and Managing Editor, Daniel Otte (USA).

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MEETINGS: Meetings of the Orthopterists' Society are held every three or four years, rotated among different locations worldwide.

MEMBERSHIP: Membership is open to anyone interested in Orthoptera and related orders. Annual dues for members are US $15 for Active Members, US $7 for students and US $25 for institutions. Members receive *Metaleptea.* and, upon payment of an additional charge, *Journal of Orthoptera Research* (currently $15 per year).

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BACK ISSUES

Back issues of most of the publications of the Society are still available from the Executive Director, Jeffery A. Lockwood Jeffrey A. Lockwood, Department of Plant, Soil and Insect Sciences, University of Wyoming, Laramie, WY 82071, USA. Members needing copies of past PAN AMERICAN ACRIDOLOGICAL SOCIETY or ORTHOPTERISTS' SOCIETY publications are reminded that a small number of virtually all volumes and numbers is on hand at the Directorate. Prices (in US currency) are as follows: *Journal of Orthoptera Research* @ $15 per number, *Metaleptea* @ $1.50 per number or $3.00 per volume of 2 (two) numbers, separately published *Proceedings* (2nd, 3rd, and 4th International Meetings) *Proceedings* @ $10.00 per volume, and *Occasional Papers* No. 1 @ $4.40.