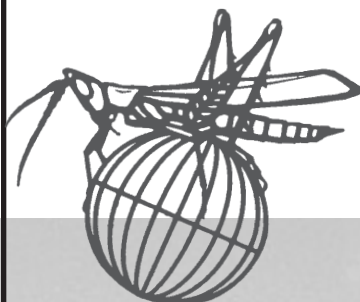


THE NEWSLETTER OF THE ORTHOPTERISTS' SOCIETY



Metaleptea

VOL. 25, NO. 1

March 2005

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WELCOME BACK from the Ninth International Meeting of the Orthopterists' Society

Back from Canmore! I am very envious as I at the last minute could not make the trip. Take time to extend your experience by visiting the meeting website and enjoying the pictures that will be published there. I know that those of use who could not make the trip will visit often. <http://people.uleth.ca/%7Edan.johnson/orthoptera.htm> Also, take this time to visit the society's website and consider the excellent publications found there available to member at low cost. http://140.247.119.145/OS_Homepage/

Please contribute to Metaleptea

Please send a note on some of your experiences at the meeting. I know those of us unable to attend would enjoy reliving those experiences with you. Or perhaps if you find one of society's publications useful in the near future you should consider a note documenting such to this newsletter. This newsletter is about communications between members. So please share your Orthopteran "moments". The contributions need not be long or formal, however, we will publish short reports (see pg. 8 of this issue) and preliminary findings for comment by other members. You can however send an interesting story (see page 6 of this issue), report on a successful or unsuccessful research endeavor (see "Catching grasshoppers: a technique to avoid" by K. Vahed) or even send a picture of your favorite Orthop.

This newsletter costs the Society quite a bit to publish and mail. Because this issue was lost before a move and then lost in limbo (packaged up, safe but unavailable) during a lengthy departmental move that took most of the summer, it is very late getting to you. Just before its resurrection, I added a press release and information on new members and was dismayed that I could do so easily, given all the white space in the original issue. In other words, very little new material had been sent to me in the eight months since I started this issue, and this mailing.

I would in particular like to encourage the contributions of graduate students to this newsletter. This issue contains a joint project conducted by an undergraduate on a summer internship to NCSU and myself. The purpose of these internships is to acquaint students with "real" research. What better way to start a research project than to become acquainted with the pertinent literature (although we did stretch the definition of pertinent a

bit)? In truth, the survey took a good part of the summer, but Nat enjoyed reading some of the papers treating some of the more "untraditional" topics and certainly developed an appreciation for what Orthopterists do. Please consider submitting similar material (book review, etc.) I am sure will be of interest to the membership. For example, have the perfect picture of one Orthop feeding on another? It belongs here. I am very sorry I did not have my camera the night I watched an *Atlanticus testaceus* female busily munching on the backside of a *Neoconocephalus ensiger* signing his heart out. No matter what data I have had the pleasure of collecting what would better than that picture convey the evolutionary importance of attracting a mate? So let your "first" publication be in Metaleptea. I can as incentive produce a small number of "reprints" (just print-outs of the page on similar paper) for you.

Again, please contribute. This is the only publication of the society that every member receives and so the primary communication that unites the membership.

Mailing Address Changes

We usually get changes on the Annual Statements that are returned with dues and subscription payments, and can post them shortly thereafter on the membership rolls. We would appreciate it if you would ALSO change your address on the Membership Database on the Website, and upgrade and expand what you have written about your expertise. The latter is most useful for members or other biologists seeking help or information about particular subjects or groups. At the present time we do not have the database linked to the rolls so that changes in one are not automatically recorded in the other. So please be sure to change your address or information on the database when you send in an address change to the Executive Director or to the Treasurer, and vice versa. If you do not wish to have your name appear on this database, please let us know.

Thank You for your Contributions

I wish to thank all members who have contributed to our various programs. The Grants program and Sponsored Memberships are supported entirely by contributions. Some of the undesignated contributions are usually used to help defray the deficit that JOR always incurs because of our desire to keep the subscription as low as possible.

T. J. Cohn

from a Press Release

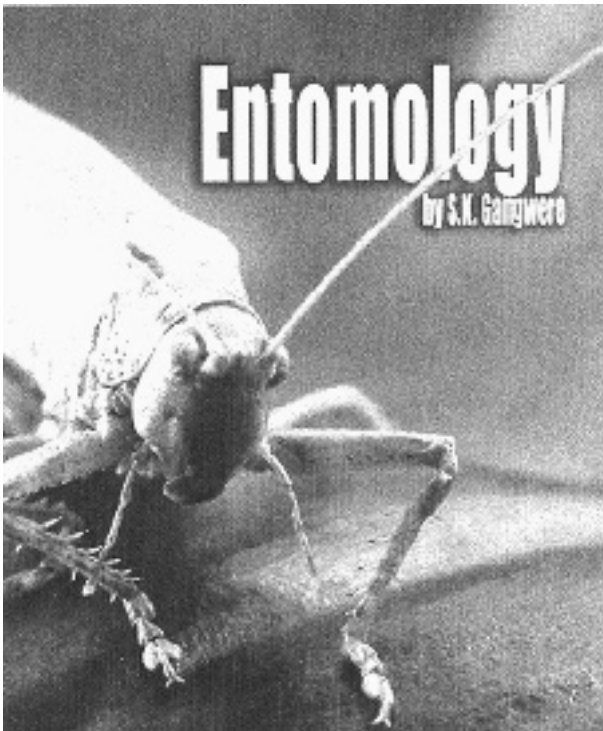
JOR 13 (1) Mailed

by First Page Publications

If you have not received your copy, please let me know so that I can send another copy immediately. We are using a "Unit Packager" to do our mailing, and as they send these by some kind of bulk mail in the US, there is sometimes a delay whenever a million unit shipment of Sears Catalogs are deposited at the post office before ours. Non-US mail goes to an international "accumulator" who ships it when a sufficient number of packages are have accumulated for a particular country. I would particularly like to know if there have been unreasonable delays with this method. To send JORs individually would take an inordinate amount of our time.

T. J. Cohn

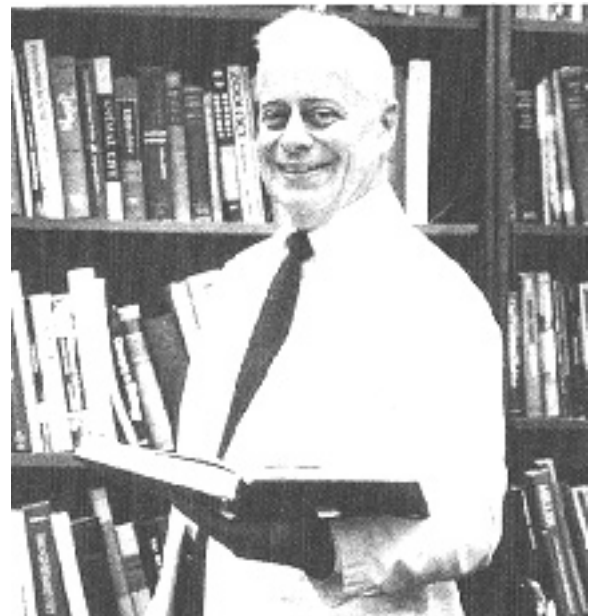
*A new text in entomology by
S. K Gangwere*



This excellent guide to insect biology may be used as a sole text or as a supplementary work source for students enrolled in a formal entomological course. It lends itself to use by those in need of a review of the "essentials," as well as agriculture and veterinary students, teachers at the elementary and secondary school level and others wishing to avail themselves to the opportunity to study insects.

This most current resource on entomology is competitively priced at \$24.95.

(365 Pages, Soft Cover)



S.K. Gangwere

S.K. (Stan) Gangwere is Professor Emeritus, Wayne State University in Detroit. He has traveled worldwide as a researcher and guest lecturer on the topics of ecology, biogeography, and the behavior of orthopteroid insects. He is involved in numerous entomological societies and lives in Ann Arbor, MI.

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First Page

Publications directly at 1-800-343-3034.

Orthopterists' Society 2003 Financial Report (p. 1)
(In US Dollars)

Operating Income

Membership Dues	5,170.00
Publications (subscriptions, publications, page charges).....	11,242.34
Non-Designated Contributions	1,311.00
Sponsored Membership Contributions	330.00
Research Grant Contributions (including \$785 to match membership contributions)	5,785.00
Credit Card Fees	170.00
Investment Income (including interest on checking acc't.)*	1,154.90
Miscellaneous**	170.00

* does not include income from restricted OSF2 Endowment (all reinvested) but is part of Fund Balances below.

** unidentified deposit

Total..... 25,333.24

Expenditures

Officer's Remuneration.....	1,090.00
Editorial Assistant	14,400.00
Printing.....	7,917.79
Research Grants*	1,600.00
Charges by Credit Card Company for handling our account.....	398.53
American Express Credit Card charges (cancelled in 2003)	35.00
Secretarial Services.....	40.00
Miscellaneous**	1,844.25

* Research grant expenditures are unusually low because most 2003 grants were paid in early 2004.

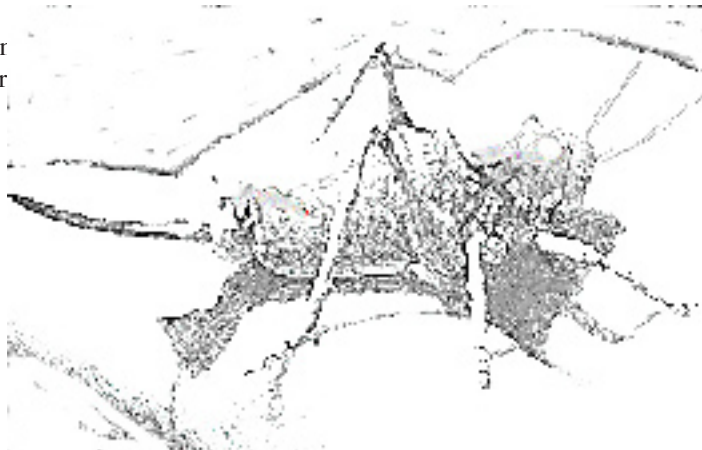
** Bank wire fees, miscellaneous bank fees, postage and secretarial assistance (for billing notices), AIBS dues, deposit for 2005 Canmore meeting.

Total..... 27,325.57

Deficit (1,992.33)

This deficit was covered by sellir
ments (bonds, preferred stock or

No other invest-



*Orthopterists' Society 2003 Financial Report (p. 2)***Fund and Checking Account Balances**

	<u>31 Dec. 2002</u>	<u>31 Dec. 2003</u>
<u>OPERATING FUND</u>		
Strong Blue Chip Fund (restricted to Research Grants Program) (no income this year).....	9,472.87	12,220.22
Strong Growth & Income Fund (all income reinvested)	21,994.70	27,370.75
Morgan Stanley Dean Witter (Preferred Stock, Money Market Fund).....	10,276.68	5,722.35
\$5,000 from Money Market Fund transferred to to checking account for current expenses.		
Interest Checking Account.....	3,253.90	6,326.62
Total Operating Fund	44,998.15	51,639.94
<u>ENDOWMENT ACCOUNT</u>		
Morgan Stanley Dean Witter. (Preferred Stock, Index Fund, Money Market Fund)	15,911.42	16,944.50
\$1,200 of investment income transferred fom Money Market Fund to checking account for current expenses. Income from Index Fund reinvested		
<u>OS 2 DATABASE ACCOUNT</u> (Restricted) (All income reinvested)		
Vanguard Total Stock Market Index Fund	185,773.52	244,020.58
Vanguard Prime Money Market Fund.....	7,526.62	7,594.09
Total Database Account	193,300.14	251,614.67
TOTAL NET WORTH OF THE SOCIETY	254,209.72	320,199.11

The increase in the total net worth of the Society resulted almost entirely from the recovery of the US stock market from a greatly depressed condition at the end of 2002. Our investments in stock funds are still below the level at which we can extract profits under the policies adopted at Cairns (half of each 10% increase over the last 10% increase so as to keep our investments growing).

Fashionable grasshopper marking

Jean-François Voisin

In the summer 1974, I was looking for a good method for marking grasshoppers in the field. After several tests, I found out that high quality nail varnish was the thing, and that I needed substantial quantities of it. At the end of a hot August afternoon, I entered a fashion shop in the centre of the small town of Alès, in the south of France, in order to buy what I needed. I had just been working in the field for one week, sometimes camping, and did not look like quite fresh. I wore old field shoes, my shirt and short trousers were creased, a sight quite in contrast with the elegant ladies who came to meet me.

- Bonjour, Monsieur, what would you like ?” said one of them.

- I just would like to buy high-quality nail varnish with striking and contrasting colours, whatever the price”, I answered, still lost in my thoughts. The elegant ladies looked somewhat surprised.

- What is that for ?” they asked.

- That’s just to put on grasshoppers, I answered.

Now, the ladies gazed at me with round, astonished eyes – and I suddenly recalled that the French word “sauterelle” does not only mean “grasshopper”, but also, in a somewhat oldish slangue, a kind of painted lady that you find more often in bars and dance halls than in prairies and meadows! Some explanations later, the ladies had recovered and we had a good burst of laughter. Those charming ladies were delighted too. I bought from them about a dozen small bottles expensive nail varnish, and came several times back during the following weeks (and the three following summers too) in order to buy more.

We became quite good friends.



Documentation of Infestation by the Grasshopper Dendrotettix quercus in east Texas

Dr. John R. Hilliard & Dr. John G. Himes

In mid-June, 2004, JRH was contacted by Dr. Mike Quinn of the biodiversity branch of the Texas Parks and Wildlife Department (TPWD). He stated that one of their biologists observed hickory trees near Palestine, Texas, being defoliated by a grasshopper. He was requesting help in identification of the grasshopper species. He mailed JRH a specimen sent to him by Dr. John Himes, Research Biologist for the Middle Trinity River Ecosystems Project at Gus Engeling Wildlife Management Area (GEWMA) 22 miles NW of Palestine, Texas. The specimen was *Dendrotettix quercus*. On 12 July, 2004, Dr. Himes and I toured the GEWMA, collected specimens, and saw the extent of the infestation. My (JRH) only prior observation of an infestation of *D. quercus* in oak trees was on 31 May, 1970, when I collected specimens from post oak trees in Gonzales County, Texas., 7.2 miles South of Luling, State Highway 80.

During the summer of 2003, a prediction of an outbreak of *D. quercus* was made by Ed Riley, Associate Curator of Insects at Texas A and M University. Based upon observations and collections made in May and June, 2003, Ed Riley, in a newsletter of the Department of Entomology, predicted an outbreak of *Dendrotettix quercus* in the Bryan-College Station, Texas area. From personal correspondence, Ed Riley stated that he observed large numbers of nymphs feeding on oak trees at Camp Howdy near Bryan in May, 2003, and also at Lick Creek Park, at the south edge of College Station on 01 June 2003. He found the species “feeding upon the leaves of water oak, (*Quercus nigra*), post oak, (*Quercus stellata*), and black-jack oak, (*Quercus marilandica*).” He also reported on a series of specimens brought to the Entomology Department collected in Robertson County, Texas, 4 mi North of OSR (Old Spanish Road) on County Road 302, 29 May 2003.

GEWMA is located in the Post Oak Savannah Ecoregion of east-central Texas and contains three major land types: uplands (approximately 60% of total area), bottomlands (30%), and waterways and wetlands (10%). The uplands contain deep sandy soils and rolling hills with a canopy consisting primarily of post oak (*Quercus stellata*), black-jack oak (*Quercus marilandica*), and white ash (*Fraxinus americana*), and hickories (*Carya* spp.). The midstory consists of numerous species of trees, including flowering dogwood (*Cornus florida*), bluejack oak (*Quercus incana*),

redbud (*Cercis canadensis*) and hawthorns (*Crataegus* spp.). Several spring-fed creeks run through the uplands, where red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), black cherry (*Prunus serotina*), and river birch (*Betula nigra*) are the predominate canopy species, and possumhaw (*Ilex decidua*) and yaupon (*Ilex vomitoria*) form thickets along the creek bottoms. A number of grasslands are also scattered across the uplands, and consist primarily of bluestems (*Andropogon* spp.), panicums (*Panicum* spp.), bahia grasses (*Paspalum* spp.), rosette grasses (*Dichanthelium* spp.), and love grasses (*Eragrostis* spp.).

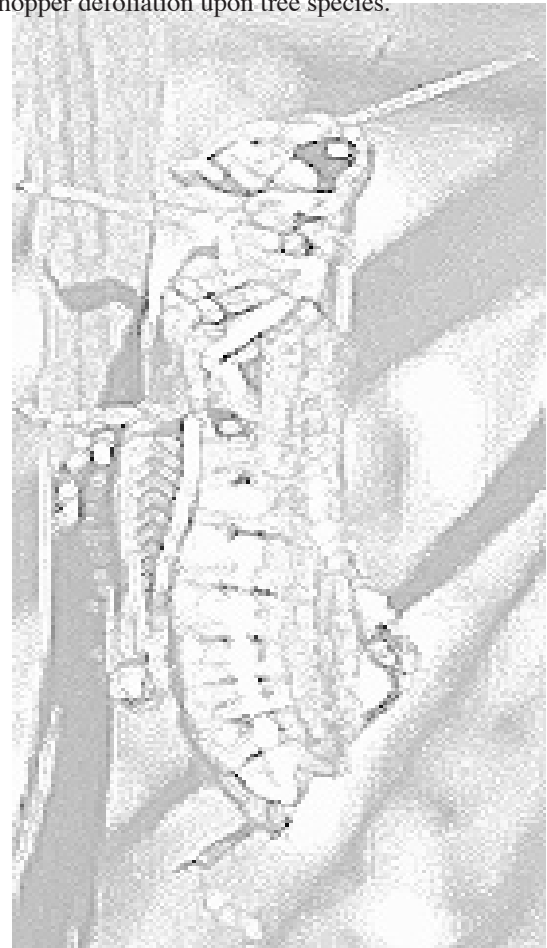
The *D. quercus* infestation was heavily concentrated in the forested uplands. During the week of May 2, 2004, *D. quercus* was not observed. However, during a few hours of casual observation the following week (May 9), dozens of *D. quercus* were observed feeding primarily on the post oak, blackjack oak, white ash, flowering dogwood, and bluejack oak. By the next week (May 16), hundreds of *D. quercus* were observed during a few hours of deliberate observation, and by the week after (May 23), the grasshoppers were ubiquitous across the forested uplands. By the beginning of June, most of the upland and midstory canopy trees were noticeably infested. By the beginning of July, several hours of foot travel through the uplands, accompanied by careful observation, revealed that the white ashes and flowering dogwoods had lost up to an estimated 80% of their foliage due to the grasshoppers, and the post oak, blackjack oak, red maple, and sweetgum had lost up to an estimated 50% of their foliage.

Creek side, understory, and shrub species were generally not as heavily infested during the first few months of the infestation. However, while the grasshoppers continued to defoliate the upland trees through the middle of July in large numbers, some individuals appeared to have shifted to the creek side, understory, and shrub species as they presumably began depleting their food source from upland canopy and midstory trees. During the first week of August, a two-hour effort to locate additional specimens yielded only 27 individuals, most of which were clustered around a small patch of young white ash and thus probably represented a late hatching. In addition, dozens of exoskeletons of recently deceased *D. quercus* were found scattered on the ground in less than 30 minutes of casual searching, so it appears that the grasshopper infestation has nearly run its course. Aside from very minor and localized leaf consumption by katydids (Tettigoniidae), as well as walkingsticks (Phasmidae), no other species of orthopterans have been observed defoliating the trees in the uplands, and defoliation from other insects (e.g., larval lepidopterans) was not observed.

An intensive study of *Dendrotettix quercus* in Wisconsin was done by Douglas Valek and Harry Coppel, Department of Entomology, University of Wisconsin. It was published in 1972 in *Annals of the Entomological*

Society of America vol. 65, pp. 310-319. The research, published as: "Bionomics of an oak defoliating grasshopper, *Dendrotettix quercus* in Wisconsin," formed a part of the Ph.D. dissertation of D. Valek. There were several interesting findings: (1) *D. quercus* in Wisconsin required two years before hatching, with infestations in different areas occurring every other year. (2) They found 3 color phases. (3) They found brachypterous specimens were the most common; a low percentage of specimens had non-functional long wings, and a lower percentage of specimens had wings of intermediate length. (4) They found grasshoppers fed upon: white oak (*Quercus alba* L.), bur oak (*Q. macrocarpa* Michx.), red oak (*Q. rubra* L.), black oak, (*Q. velutina* Lam), and northern pin oak (*Q. ellipsoidalis* E.J. Hill). In Wisconsin, feeding also occurred on the hazelnut (*Corylus americana* L) and only rarely on raspberry, (*Rubus* spp.). *D. quercus* was not found in areas devoid of oak.

Specimens collected on GEWMA are a little smaller than the specimens collected by JRH in 1970 in central Texas. The GEWMA specimens have the three forms of wings: brachypterous, long, and intermediate. Further study of this interesting and invasive species could compare Texas populations with Wisconsin populations. Also, studies could be made of the long term effects of varying degrees of grasshopper defoliation upon tree species.



Orthopterology in the 21st century: A New Survey

It has been two years since Dr. Jeffrey Lockwood published his last literature survey in *Metaleptea* (Vol. 23, No. 1). Therefore, your editor and a research intern undertook the daunting task of recreating Dr. Lockwood's efforts, for papers published during the years of 2002 and 2003. Three databases: AGRICOLA, Zoological Record and Science Citation Index Expanded (NCSU), were used. All search engine yielded similar relevant results. Zoological Records was deemed the more comprehensive engine because of the larger number of appropriate citations found. Orthoptera and truncations of that term (such as Orthopter*) were the main keywords used. Common names such as grasshopper, cricket, and katydid were also used in AGRICOLA initially to err on the side of completeness but yielded no unique citations for Orthopterans and many inappropriate citations. As expected a number of studies were recovered that did not deal with Orthopterans per say (such as those dealing with the game of cricket). We extend the same apologies Jeff Lockwood did to those who study subjects not of interest to the Society bearing one of same common names used as keywords or unrelated species with related names, for not extending their studies more than a passing glance. .

Table 1: Taxonomic groups of Orthoptera investigated in scientific papers.

Taxon	Number of papers	Percent of papers
Acrididae (grasshoppers, locusts)	196	38.2
Gryllidae (crickets)	96	18.7
Tettigoniidae (katydids, etc.)	60	11.7
Other Orthopterans	92	17.9
Phasmids	25	4.9
Subject not specifically Orthoptera	44	8.6

Of our final count of 513 papers, 44 (8.58%) had included Orthopterans in their research in some way, though the research itself may not have specifically focused on Orthoptera. A number of these papers were ecological surveys of the arthropod or insect fauna in a region ("Insect fauna associated with sugarcane plantations in Sri Lanka," Kumarasinghe, *Journal of Environmental Biology* 24 (4): 359-368), or the reactions of such fauna to traumatic ecological events ("Responses of a riparian forest-floor arthropod community to wildfire in the middle Rio Grande Valley, New Mexico," Bess *et al.*, *Environmental Entomol* 31 (5): 774-784). Other such papers focused on Orthopteran parasites and still others on Orthoptera as food sources for non-orthopteran species. Because such papers might be of interest to other Orthopterists, it was decided to include these papers in a division of papers by taxon (see Table 1). The search also resulted in citations that treated stick insects, and, because Phasmids were included in the original survey published, they are included in this table. Phasmids were not included in the other analyses of the citations recovered. So, tables on numbers of authors, their affiliations, fields of study and sites of research were compiled using only the 444 papers that did focus on Orthoptera species.

Table 2: Number of authors of scientific papers on Orthoptera

Number of Authors	Number of Papers	Percent of Papers
1	133	30.0
2	154	34.7
3	96	21.6
4	32	7.2
5	12	2.7
>5	17	3.8

As demonstrated by Table 1, studies on Acrididae continue to dominate the work done on Orthoptera probably because of the status of many species as significant pests in many parts of the world. The percentage of papers, 38% treating Acrididae is much lower in 2002-3, than

that reported for Acrididae, 61%, in 2001. The percentages of papers on crickets and katydids have changed little since the last survey. However, the percentage of papers on other Orthopterans has increased greatly from the last reported percentage of three percent. This may be due to an increase in studies on Wetas and Grouse locusts, since a third of the other 92 papers (12 papers on Wetas and 22 on Grouse locusts) treated these animals.

A difference was also recorded in the common numbers of authors (see figure 2) for a paper. Papers with four, five or more than five authors decreased from their last reported numbers (11%, 5% and 8% respectively). Meanwhile, papers with only one author increased from 2001's 17%. Papers with two authors continue to dominate, though at a slightly lower percentage than recorded previously (38% in 2001).

It is believed that this shift is related to the shift in fields of study (see table 3). In examining the references for the number of authors, it was found that most physiology papers had more than two authors, while ecological or taxonomic studies usually had fewer than three authors. In 2001, it was reported that physiology was the most frequent field of study with 39% of the papers, while ecology, taxonomy and control were all below 20%. However, papers on Orthopteran physiology only make up 20% of the last two years' publications

Table 3: Disciplines of investigation reported in scientific studies of Orthoptera.

Field of Study	Number of Papers	Percent of Papers
Physiology	90	16.5
Behavior	75	13.7
Ecology	130	23.8
Control	22	4.0
Morphology	31	5.7
Taxonomy	188	34.4
Evolution	10	

Taxonomy emerged as the subject of main (42%) focus. We did not have papers that studied the genetics of orthopterans per say, but many papers did use genetic techniques as tools. For example, many of the taxonomic studies used cytogenetic variation to distinguish species. Because of this we did not have a category as Dr. Lockwood had in 2001 for genetics. It should be noted that some of the papers that had more than one field of study (104 of the 444, about 23%) were counted once in each field of study. As a result, the total number of papers considered in Table 3 is greater than 444.

In this study, the location of the study and researchers affiliation were also considered. The latter was considered in previous surveys of the literature by J. Lockwood. Most of these data again come from the Science Citation Index Expanded as it is difficult to determine affiliation from the other two data bases. We used as prior surveys have done first author address. If an author had more than one paper, they were counted as many times as they had papers. Nations with four or fewer references were grouped by continent. Table 4 shows that most authors are as previously reported in other surveys from the United States, followed by the United Kingdom. However, the number of countries represented attests to the continuing global interest in Orthopterology.

The site descriptor (Table 5) of course is only valid for field and museum studies. We did our best to determine the study site from titles and abstracts. The study site most represented is the People's Republic of China. The majority of the papers from China were on taxonomic research, in which the location of the species in question would be specified. Many ecological and control studies are also

N. Grubbs, Biology, Mount Olive College & M. Niedzlek-Feaver, Zoology, NCSU

Table 4: Number of authors of scientific papers on Orthoptera

Country of Affiliation	Number of Papers	Percent Papers
United States	138	31.0
United Kingdom	47	10.6
Germany	42	9.5
Japan	29	6.5
Canada	21	4.7
France	20	4.5
Australia	17	3.8
Argentina	13	2.9
Spain	12	2.7
Russia	10	2.3
South Africa	9	2.0
Switzerland	8	1.8
Sweden	7	1.6
China	6	1.4
Italy	6	1.4
Brazil	5	1.1
New Zealand	5	1.1
Hungary	4	0.9
Israel	4	0.9
Mexico	4	0.9
Austria	3	0.7
Belgium	3	0.7
Poland	3	0.7
Turkey	3	0.7
Czech Republic	3	0.7
Other European	7	1.6
Other Asian	6	1.4
Other African	5	1.1
Other South American	3	0.7
TOTAL	444	100.0

Table 5: Study site for scientific papers on Orthoptera

Continent	Country	Number Papers	Percent of Papers	
Africa	Morocco	3	1.3	
	South Africa	4	1.8	
	Others	9	4.0	
	Total	16	7.1	
Asia	China	49	21.7	
	Japan	13	5.8	
	India	4	1.8	
	Korea	4	1.8	
	Russia	3	1.3	
	Turkey	7	3.1	
	Others	5	2.2	
	Total	85	37.7	
	Europe	Austria	3	1.3
		France	13	5.7
Germany		18	8.0	
Hungary		3	1.3	
Italy		3	1.3	
Spain		4	1.8	
Others		17	7.5	
Total		61	26.9	
North America		Caribbean	5	2.2
		Mexico	3	1.3
	United States	23	10.2	
	Other	4	1.8	
Total	35	15.5		
Oceania	Australia	2	0.9	
	Indonesia	3	1.3	
	New Zealand	12	5.3	
	Total	17	7.5	
South America	Argentina	3	1.3	
	Brazil	4	1.8	
	Other	5	2.2	
	Total	12	5.3	
TOTAL	226	100.0		

Errors in last edition: The editor apologizes to D. Gwynne. Dr. Gwynne submitted an abstract of interest to the general membership and in my efforts to acknowledge his contribution, I mistakenly indicated him as the author of the article. My apologies also to P. Naskrecki. I wanted to acknowledge that I used his excellent photos to produce my ghost images in the last issue, but did not realize my choice of white print on a gray background camouflaged most of my words of appreciation. .

We welcome these new members

Dr. Abdalla M. Abdalla
 University of Kordofan
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Locust and grasshopper management

Mr. Olusegun F. Adeoti
 C/o Dr. S.E. A Torimiro
 Department of Pediatrics
 College of Medicine
 Obafemi Awolowo University
 Ile-Ife Osun State Nigeria
Insect ecology with interest in grasshoppers

Mr. Roberto Battison
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*Systematics, ecology, and ethology of
 European and world mantids*

Stephanie Boucher
 Lyman Entomological Museum
 Macdonald Campus, McGill University
 Ste-anne-de-Bellevue, Quebec, Canada
 H9X 3V9
Phasmatodea-Biology

Dr. Easton R. Emmett
 Research Scientist
 46-130 Kiowai Street #2714
 Kaneohe, HI 96744
*Grasshoppers of Macao, South China (Acridi-
 dae, Gryllidae, Tettigoniidae, Pygomorpaid)*

Dr. Esteban Gutierrez
 Museo Nacional de Historia Natural
 Obispo #61 e/oficios y Baratillo
 La Habana Vieja
 C. Habana, 10100 Cuba

Mohsen Mofidi-Neyestanak
 Department of Biological Sciences
 Imperial College London at Silwood Park
 ASCOT Berks, SL5 7PY UK
*Systematics and phylogeny of Ensifera, espe-
 cially that of Tettigoniidae*
 Laura Pais

Olvidius University
 Str. Al. Murelor Nr. 4
 Bl. P1, Sc.C Ap46
 Constanta, Romania 900427
Romanian Orthoptera

Mario A. Poot-Pech
 Colegio de Postgraduados, Instituto de Fitos-
 anidad
 Calle 20 s/n, C.P. 24920
 Dzitbalche, Campeche. Mexico.
*Microbial control, aggregation behavior, and
 antiacridian propection in the Central Ameri-
 can Locust Schistocerca piceifrons piceifrons
 (Walker)*

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