

# METALEPTEA

SOCIEDAD PANAMERICANA  
DE ACRIDIOLOGIA



PAN AMERICAN  
ACRIDOLOGICAL SOCIETY

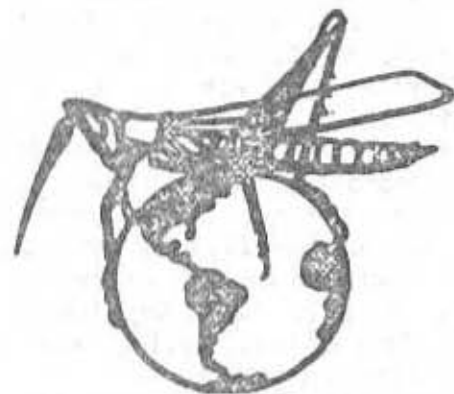
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Volume 2

Number 1

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The Pan American Acridological Society, or PAAS, is an international scientific organization with members in 23 different countries. Its purpose is to facilitate communication among those interested in, and concerned with, New World Acridology; to encourage collaborative research and control programs in Acridology among the countries of the New World; and to disseminate information and to promote, to conduct, and to foster other activities designed to increase knowledge and understanding of Acridology and its implications.

Some fifty persons interested in forming PAAS met at San Martin de los Andes, Neuquen, Argentina, late in 1976. A Constitution and By-Laws were prepared and approved in 1978. The Society is now engaged in a full range of programs and activities toward the satisfaction of its above-mentioned objectives.

The present governing Board consists of President S. K. Gangwere, of Detroit, Michigan, U.S.A., President-Elect R. A. Ronderos, of La Plata, Argentina, North American Representative J. E. Henry, of Bozeman, Montana, U.S.A., Central American Representative C. Marquez Mayaudon, of Mexico City, Mexico, South American Representative C. S. Carbonell, of Montevideo, Uruguay, Executive Secretary I. J. Cantrell, of Ann Arbor, Michigan, U.S.A., and Co-Editors H. Latuente Indo, of Valparaiso, Chile, and M. Tyrkus, of Detroit, Michigan, U.S.A.

PAAS membership is open to all persons, professional or amateur, who have an interest in New World Acridology by virtue of their research, teaching, or other activities. Inquiries may be addressed to Prof. S. K. Gangwere, Department of Biology, Wayne State University, Detroit, Michigan 48202, U.S.A.

HISTORY AND PHYLOGENY OF THE NEOTROPICAL  
ACRIDID FAUNA

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The material collected by Dr. Descamps during his fifteen expeditions in tropical America allowed the realization of a study dedicated to the "Catantopinae"<sup>1</sup> in which are included about 60 percent of the species known so far. In order to complete this study, the genital parts of nearly all the genera of neotropical Acrididae and the related families have been examined.

It is now possible to speak about phylogeny and history.

**Information Given by the Study of the Genitalia**

The comparative anatomy of the genitalia allows us to establish the phylatic sequence of the families, subfamilies, and tribes. The old "Catantopinae" are thus separated into several groups:

The Tristiridae (andopatagonian), an extremely ancient intermediate group between the Chasmosacci and Cryptosacci, the two important groups among Acridoidea.

The Romaleidae that include several elements of different evolutionary degree. Among them are the Bactrophorinae (from Central and South America), with genitalia of a general type not

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<sup>1</sup>C. Amedegnato 1977. - Etude des Acridoidea centre et sudaméricains (Catantopinae sensu lato), anatomie des genitalia, classification, répartition, phylogénie. Thèse de Doctorat.

very greatly elaborated (no aedeagus or an aedeagus without any differentiated dorsal sclerites, tubular seminal receptacle with a single terminal dilatation), which are the most primitive, and the Romaleinae (from North and South America), which include the most advanced types within the family, with the formation of upper sclerites of the aedeagus and sometimes the outline of an inferior sclerite, not yet autonomous.

The Acrididae (world-wide distribution). They are composed of two groups.

Group A. This group is mainly made up of the Ommatolampinae, a subfamily which includes numerous forms that vary in type from archaic to highly developed. The Leptysminae derive from this subfamily by ecological segregation in damp, grassy environments, and the Rhytidochrotinae by geographical isolation (Northern Andes). This group is highly characteristic and differs from the rest of the Acrididae except for the most primitive elements of the Ommatolampinae. Nearly all the insects of this group have endophallic sclerites whose apodema tends to become flat dorso-ventrally. The various subfamilies are characterized by a divergent evolution of the copulatory mechanism together with that of the way of life. The spermatheca is, in most cases, not very complex.

Group B. The second group, made up of the Copiocerinae and the Proctolabinae, is not very far removed from the Melanoplinae and, consequently, from the forms of the Old World (the Melanoplinae being the nearest relatives to paleotropical Catantopinae, sensu stricto).

In this group, the endophallic sclerites are essentially flattened laterally and show a tendency to spread themselves into the

spermatophore. It is in this group that the inferior sclerites of the aedeagus show the greatest tendency to become autonomous. The autonomy is complete in the Melanoplinae. The spermatheca acquires a more complex structure.

#### Information Given by the Study of Distribution

The study of the distributions of the various families, subfamilies, and tribes allows us to define the centres of differentiation or origin and the grounds of dispersion and to recreate the phylogeny and succession in the course of time of the insects studied. This is achieved by a crosschecking with what is known of the paleogeography of the American continent. The elements obtained confirm the results derived from the study of the genitalia.

The main types of distribution observed are:

- 1) An andopatogonian distribution, with a reduction of the population towards the north, primitive and derived types being mixed; ex.: Tristiridae.
- 2) A South American distribution with vicariant amazonian and subtropical tribes; ex.: Ommatolampinae.
- 3) A Northern Andean distribution; vicariant tribes and subfamilies of groups mostly amazonian; ex.: Rhytidochrotinae.
- 4) A panamerican distribution with North American (Copiocerinae) or panamerican (Ommatolampinae) primitive relictual types and South American recent derived types.
- 5) A Panamerican distribution with South American primitive and derived types, arising both from Northern and Southern America; ex.: Romaleinae.
- 6) A Panamerican distribution with non-relictual primitive types (very widely

distributed and highly varied in North America and in the Palearctic region) and newly derived types (strong speciated but not greatly diversified structurally) in Andean and subtropical areas; ex.: Melanoplinae.

7) A tropical variant of the above distribution, with primitive and derived types from Central America and derived types from the Amazon basin (strong speciation and hypertely around one structural theme); ex.: Proctolabinae.

#### An Attempt at Synthesis

I. Settlement seems to have taken place in the following way:

a) Mesozoic: From an old stock of Acridoidea: Cryptosacci probably coming from the North after the immigration into Southern America in the course of the secondary period are differentiated on the Meridional Continent, most of the Romaleidae: Romaleinae, and on the Caribbean lands, the Bactrophorinae, an archaic stock of Romaleidae, probably close to the original stock.

b) Cenozoic to the Pliocene:

1) At the moment of the Paleocene intercontinental joining of Northern and Southern America a movement of the Romaleinae takes place northward. Some tribes adapt to geophilous life during the elevation of the high American plateau at the end of the Tertiary period and still exist in the Sonoran region.

Following in the opposite migration, the Bactrophorinae of the Caribbean lands move toward the South. Some elements stay isolated on the Andean islands whereas, afterwards, a few others reach the Amazonian basin where they take hypertelic forms.

The Acrididae from the North invade South

America. After the Tertiary rupture of communication, they develop into four subfamilies (Onmatolampinae, Leptysminae, Rhytidochrotinae, Copiocerinae) and into numerous tribes exhibiting various ecological adaptations.

2) It is also at the beginning of the Cenozoic that the Tristiridae, which apparently populated the Antarctic, came to colonise the Meridional Andes and Patagonia where their adaptation to cold climates henceforth restricts them.

3) On the Caribbean lands and in North America the Proctolabinae (tropical) and the Melanoplinae (from subtropical and temperate climates) evolve apart from stocks coming from the Old World, gradually replacing the autochthonal Acrididae, now relictual. With the fall in temperature and the extension of the herbaceous biotope, the Acridinae, Oedipodinae, and Gomphocerinae, of Asiatic origin, invade Northern America in their turn.

c) After the Pliocene:

During the Pliocene and Pleistocene, when communication is reestablished, the newly constituted fauna of North America and of the Caribbean lands migrates toward the South where the groups undergo extensive modification (hypertelic forms in Proctolabinae in the Amazonian Basin, in the Melanoplinae in the Andes, and in the subtropical region).

Simultaneously there is some northern movement of the South American subfamilies, but this migration is of slight amplitude and does not go further than the tropical area of Central America, along the coastal plains, except for two graminaceous Leptysminae and a euryapt Romaleinae.

The autochthonal groups in South America were

adversely affected by the climatic variations of the Pleistocene.

II. The acridid fauna of South America, once derived in the above manner, took on the following composition:

The Acridid population of South America seems to be constituted by the superposition of various faunistic strata corresponding to various evolutionary stages and geological periods.

The first faunistic stratum (6 percent of the fauna), a very archaic one, is represented by the Tristiridae, which have South African affinities. This stratum would consequently be of gondwanian origin.

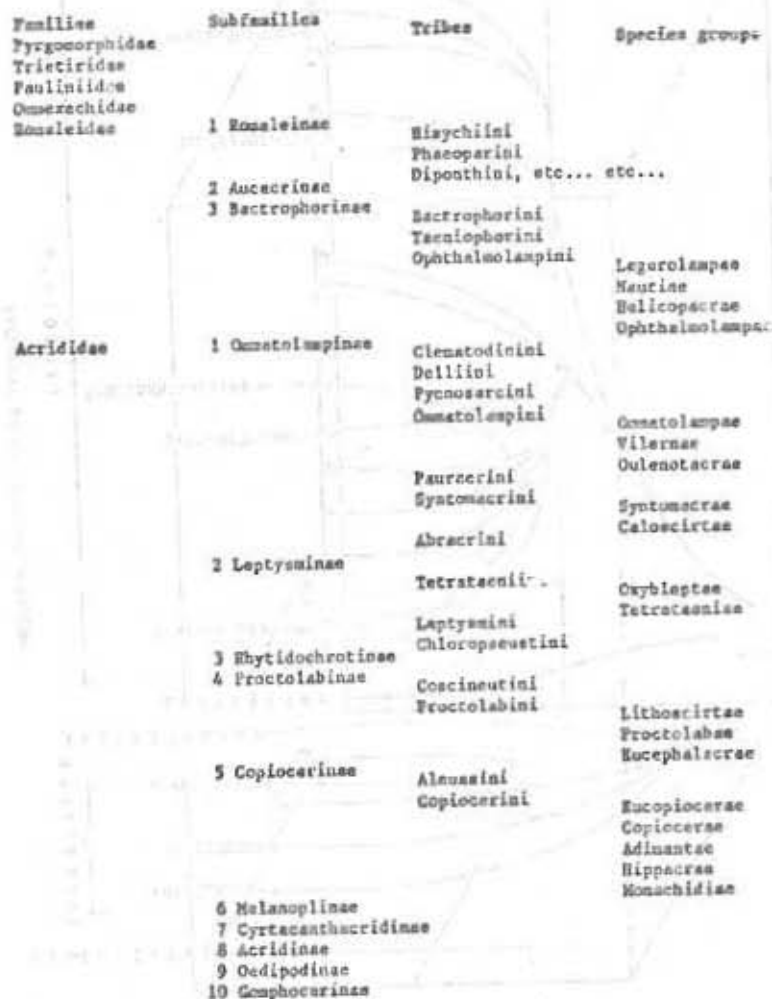
The second faunistic stratum (26.6 percent) is represented by the Romaleidae and the Ommexechidae. This fauna is found in Central and in South American regions and probably dates from the Cretaceous.

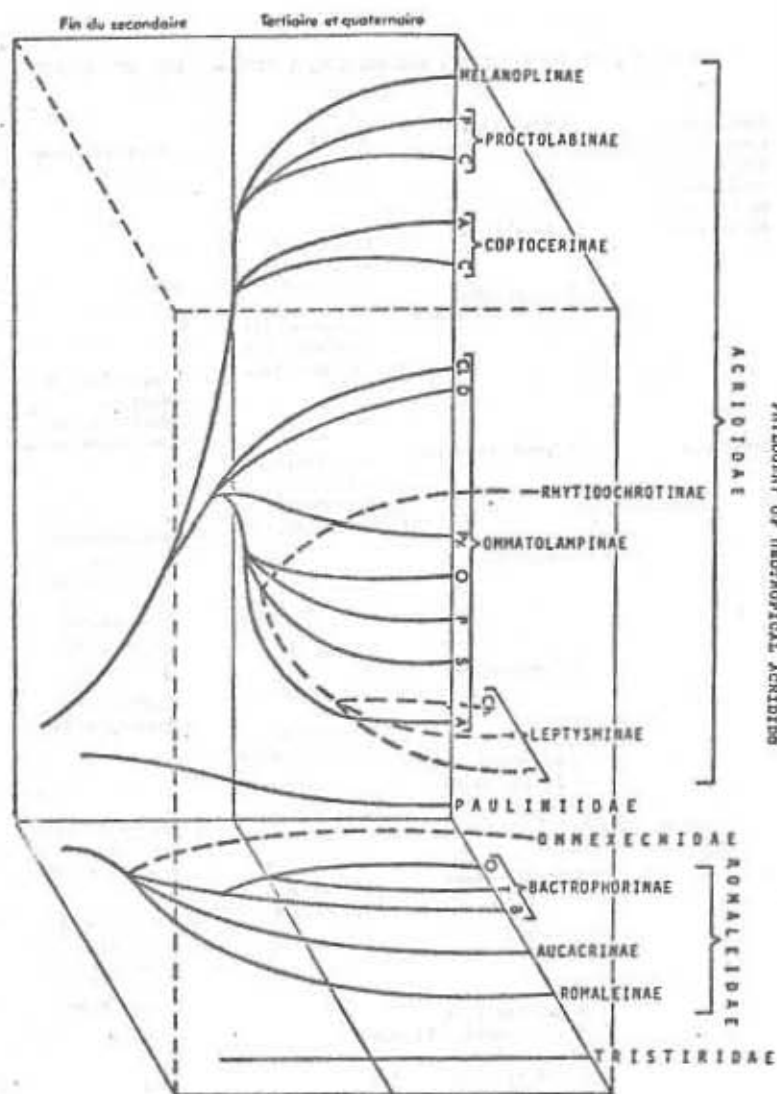
The third stratum (34 percent) is formed by modern Acrididae. They are the insects of group A (Ommatolampinae, Rhytidochrotinae, and Leptysminae) along with the Copiocerinae, of group B (see above). These acridid stocks introduced themselves into Southern America at the moment of the first continental bridge (a bit later, perhaps, for the Copiocerinae stock) and developed during the Tertiary.

The last faunistic stratum (31.2 percent) is composed of the subfamilies which recently penetrated during the Pleistocene. They are, firstly, the Central American Proctolabinae; then the North American and Asiatic Melanoplineae, and, finally, the Acridinae, Oedipodinae, and Gomphocerinae, widespread in the Old World. Only the last three subfamilies are not considered as Catantopinae.

The Pyrgomorphidae (1.6 percent) can be

SOUTH AMERICAN FAMILIES, SUBFAMILIES, TRIBES AND SPECIES GROUPS





considered of the same date as the fourth stratum.

The Pauliniidae (0.6 percent), still an enigma, probably belong to the third stratum and should probably be considered as Acrididae.

The South American acridid fauna thus includes about 70 percent autochthonal elements developed before or during the Tertiary and 30 percent elements resulting from a recent Pliopleistocenic immigration.

With the exception of the more recent immigrants, also paleotropical, there is no close link between the South American and the Ethiopian faunas. The only relationship, a remote one, affects the Chasmossacci-Tristiridae affinities. Whereas the former are highly diversified in Africa, the latter seem to be of meridional (Antarctic) origin.

Most of the fauna (more than 67 percent) is of septentrional origin. With regard to the insects of the second stratum, the close relationship of the septentrional Acrididae with the persisting archaic elements from Central America leads us to give them the same origin, all the more as they do not show any kinship with the African fauna. Consequently, it is the quasi totality of the South American acridid fauna which would be constituted from septentrional stock.

It is, consequently, with the vertebrate population of South America that the acridid population of this continent shows the most numerous analogies. The only differences observed are connected with the nature of the phyla.

Inasmuch as research concerning the American tropical faunas has been insufficient, it is difficult to compare the acridid population with



that of the other insects. It seems, however, that there are important differences particularly with respect to Coleoptera, whose origin in Southern America would be at least 80 percent gondwanian, with a preponderance of South-Northward migration. These differences cannot be ascribed to differences in age or in geographical origin for the considered groups.

**Editor's Note:**

Metaleptea is honored and privileged to have Professors M. Descamps and C. Amedegnato as contributors to this issue. The quality of their article upholds the excellent standard of lead articles established by previous authors.

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**POLIMORFISMO ECOLÓGICO EN DICHROPLUS  
DEMOCRATICUS (BLANCHARD)  
(ORTHOPTERA, ACRIDIDAE, CATANTOPINAE)**

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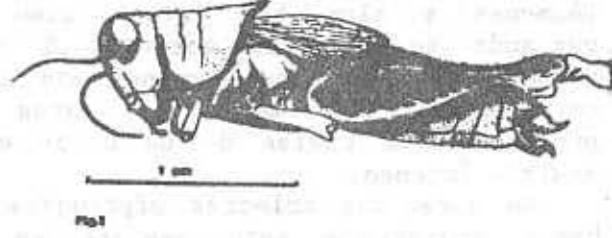
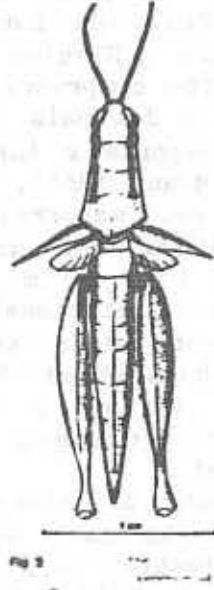
Dichroplus democraticus (Blanchard), es un acridido común a Chile y Argentina. En ambos países se encuentra en zonas hidrófilas de praderas cercanas a bosques. En Chile la hemos colectado desde Talca por el norte y Valdivia por el sur. Esto es entre 35° 27' S. y 39° 49' S.

En 1967, Carbonell y Ronderos, hacen la

redescripción de la especie, por lo tanto no entraremos a detallar aspectos morfológicos. Diremos sólo que se trata de un dicroplino de coloración café y tamaño regular. Su longitud del cuerpo varía entre los 16 mm y 26 mm. Tégmenes y alas tan largos como el abdomen variando su longitud entre 14,8 mm y 13 mm respectivamente. Sus tégmenes son de coloración café claro uniforme. Sus patas posteriores presentan las tibias de un color azul o verde azulado intenso.

En sucesivas colectas efectuadas desde 1975, hemos encontrado esta especie en localidades bastante al norte de su distribución original: San Sebastián, Prov. de Santiago (33° 32' S); Puente Alto, Prov. de Santiago (33° 38' S) y Rapel, Prov. de O'Higgins (33° 58' S). Estas localidades están comprendidas dentro de la zona árida del centro del país (Di Castri 1968). San Sebastián corresponde a las comunidades amófilas de litoral (Mann 1964). Es esta una zona caracterizada por matorrales bajos que crecen cerca del litoral marino. Estos matorrales fluctúan entre 1 m y 2 m de altura. Existe un estrato gramíneo estacional, seco de diciembre adelante. Puente Alto corresponde al típico ambiente de sabana (Mann 1964) caracterizado por ser seco en verano y el estrato herboso, preferentemente gramíneo. Semejante es el habitat de Rapel.

Los ejemplares colectados con similares a los descritos para la zona sur. La longitud del cuerpo varía entre 14,5 mm y 24,7 mm. Su coloración es también café claro. Todos los ejemplares recolectados en este ambiente, muestran un notable braquipterismo (Fig. 1 y 2). Caracterizado en este caso, por tégmenes cortos, foliaceos, relativamente estrechos y terminados



Dichroplus democraticus (Blanchard) medidas en mm

Machos

Localidad	long. del cuerpo	long. pronoto	long. femur post.	long. tibias post.	ancho cabeza (genas)	ancho tegmen	largo tegmen	ancho tegmen
Rapel	16,5	3,5	9,6	8,3	2,5	4,1	1,8	
San Sebastian	14,5	3,6	9,4	7,4	2,8	4,5	2	
Puente Alto	16,5	3,8	11	9	3,1	3	2,1	

Hembras

Localidad	long. del cuerpo	long. pronoto	long. femur post.	long. tibias post.	ancho cabeza (genas)	ancho tegmen	largo tegmen	ancho tegmen
Rapel								
San Sebastian	17,4	4,5	11,2	10	3,5	5	2,2	
Puente Alto	24,7	4,1	14	11,6	4	6,2	3,1	

en punta, de 4,5 mm de largo en promedio. Su coloración es café claro sin manchas. El segundo par de alas presente, hialinas, lobuliformes, de tamaño muy reducido, a lo más de 4,5 mm de largo. Esta nueva forma no presenta ningún otro elemento morfológico que la diferencie de la del sur.

Material examinado: 1M, Rapel (Prov. O'Higgins) A. Rivas col.; 4F y 1M, San Sebastián (Prov. Santiago), 20 febrero 1975, S. Zapata col.; 2F, San Sebastián (Prov. Santiago), 5 febrero 1975, P. Moyla col.; 10F y 1M, Puente Alto (Prov. Santiago), 8 marzo 1976, O. Fuentes col.; 11F y 1M, Puente Alto (Prov. Santiago), 14 marzo 1976, S. Zapata col.

#### Bibliografía

- Carbonell, C. & R. Ronderos. 1967. Redescrición de un interesante acridio andino-patagónico (Orthoptera, Catantopinae). Revista del Museo de La Plata (Nueva Serie), Zoología, 10:83-95.
- Di Castri, F. 1968. Esquisse ecologique du Chili. Biologie de L'Amérique Australe. 4. Editions du Centre National de la Recherche Scientifique. Paris.
- Liebermann, J. 1942. Sobre la importancia económica de las especies chilenas del género Dichroplus Stal (Orthop.: Acrid.: Cyrtacanth.) con algunas consideraciones acerca de su biogeografía. Revista Chilena de Historia Natural 46:241-247.
- Liebermann, J. 1945. Los Acridoideos de Chile. Revista Chilena de Historia Natural 48:158 pp.
- Liebermann, J. 1945. Noticia preliminar sobre los acridoideos de la Patagonia. Anales del Museo de la Patagonia 1:185-194.
- Liebermann, J. 1958. Zoogeografía, Sistemática

y Economía de los Acridoideos de la Patagonia. Institute de Patología Vegetal. Publicación técnica N° 6:60 pp.

Liebermann, J. 1968. Lista alfabética preliminar de las tucuras de la tribu Dichroplini de la región Neotropical (Orth. Acrid.). Revista Sociedad Entomológica Argentina. 30(1-4):27-36.

Mann, G. 1964. Compendio de Zoología. 1. Ecología y Biogeografía. 66 pp. Centro Investigaciones Zoológicas.

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#### GRASSHOPPERS OF BALUCHISTAN AND THEIR DISTRIBUTION-I\*

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#### Abstract

During a survey of the grasshopper fauna in the northwestern areas of Baluchistan, Pakistan, during 1976-77, 42 species were collected, 11 of which were new records for these areas. Distribution and incidence of grasshopper species in the surveyed areas at district level and important host plants are considered.

#### Introduction

The grasshopper fauna of Baluchistan, with its intermingling of Oriental and of Palearctic elements, is of great importance. Baluchistan is

the largest province of Pakistan, covering an area of 3,470,000 km.<sup>2</sup> The climate of this province is generally arid with subregional and local microclimatic variation. Precipitation is usually about 200 mm per annum, as the region falls outside the influence of the southwestern monsoon. Elevation ranges from sea level to over 2,000 m.

The grasshopper fauna of Baluchistan is less explored than that of other regions. There are, however, some references in the literature concerning grasshopper distribution in the area, notably by Kirby (1914), Uvarov (1943), Janjua (1959), Bei-Bienko and Mischenko (1963 & '64), and Ghani (1974). In view of the paucity of information on the occurrence, distribution, and host plants of grasshoppers in Baluchistan, survey expeditions were undertaken during 1976-'77 in northwestern areas of the province in an attempt to fill this gap in the literature. The results of these survey expeditions are briefly reported herein.

#### Methods and Material

The survey was carried out for two consecutive years (1976-'77) during May to July (mean temp. 30.5°C) on different dates in the Chagai, Sibbi, Quetta, Lorali, and Zhob Districts of Baluchistan, an area of some 30,000 km.<sup>2</sup> (Fig. 1.). The elevation of surveyed areas varies from 1,000-2,500 m.

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The incidences of grasshopper species were studied by taking on an average 25 catches/sweep with a hand net of 30 cm in diameter. It was decided that a "sweep" should consist of 10 strokes completed within three min.

The identification of some species of grasshopper was confirmed by the British Museum, London, England, for which we are indebted. The material thus collected was preserved by conventional means and deposited in the laboratory.

#### Results and Discussion

As a result of the survey both in hilly and in plains areas a total of 42 species of grasshopper was collected. The distributions of the grasshopper species at the district level are shown in Table 1. These data indicate that the Oedipodinae are a dominant subfamily. Oedipodines were recorded from all districts, whereas the Pamphaginae were restricted to the districts of Zhob and Quetta. It can be seen from the table that Acrida exaltata Wlk. and Acrotylus humbertianus Sauss. were generally distributed, whereas most other species were restricted to given districts. The species of the genus Sphinanonotus shown at Sr. no. 24 to 29 in the table were recorded at higher altitudes, ranging from 1,200 to 2,500 m above sea level.

In regards to host plants, most grasshopper species were collected from wild grasses and desert shrubs, with the exception of Acrida exaltata Wlk., Phlaeoba panteli Bol., Acrotylus humbertianus Sauss., Aiolopus simulatrix Wlk., A. thalassinus thalassinus F., and Oedaleus sp., which were comparatively more abundant on cultivated crops like maize, sorghum, and wheat in the plains areas, where they can be regarded

(Total number of nymph/adult collected)

Species	Chagai	
	N	A
Acridinae.		
1. <i>Acrida exaltata</i> (Wlk.)	2	-
*2. <i>Inciastaurus apicalis</i> Wlk.	-	-
3. <i>Daroniella laevicens</i> Uv.	-	-
4. <i>Ochrilidia geniculata</i> Bol.	-	-
5. <i>O. gracilis gracilis</i> (Krauss.)	-	-
6. <i>Phlaeoba panteli</i> Bol.	-	-
7. <i>Truxalis conspureata conspureata</i> Klug.	-	-
8. <i>T. fitzgeraldi</i> Dirsh.	-	-
Catantopinae.		
9. <i>Anacridian aegyptium rubrispinum</i> B. Bianco.	-	12
*10. <i>Oxya velox</i> (P.)	-	-
Oedipodinae.		
11. <i>Acratylus humbertianus</i> Sauss.	-	2
12. <i>A. insubricus</i> (Soap.)	-	-
13. <i>Acratylus longines subfasciatus</i> B. Bianco.	-	-
14. <i>Aiolopus simulatrix simulatrix</i> (Walk.)	-	-
15. <i>A. thalassinus thalassinus</i> (F.)	-	2
*16. <i>Hyalorhipis canescens</i> Sauss.	-	1
17. <i>Heliopteryx humeralis</i> Kuth.	-	-
18. <i>Locusta migratoria migratoria</i> L.	-	1
*19. <i>Mioscirtus wagneri rogenheferi</i> (Sauss.)	-	2
*20. <i>M. wagneri wagneri</i> (Ritt.)	-	2
21. <i>Oedaleus</i> sp.	-	-
22. <i>O. sanagalansis</i> (Krauss.)	4	24
*23. <i>Oedipoda germanica</i> (Latr.)	-	-
24. <i>Sphingonotus</i> sp.	-	-
25. <i>S. coarulans exornatus</i> Ned.	-	-
*26. <i>S. nebulosus discolor</i> Uv.	-	-
27. <i>S. nebulosus persa</i> Sauss.	-	-
*28. <i>S. nebulosus violascens</i> Uv.	-	-
*29. <i>S. predtutschanski</i> Mist.	-	-
30. <i>S. rubescens</i> Walk.	7	73
31. <i>S. rubescens rubescens</i> (Wlk.)	-	66
32. <i>S. savignyi</i> Sauss.	-	8
33. <i>Trilophidia annulata</i> Thunb.	-	-
Pamphaginae.		
*34. <i>Eremoposa afghana</i> Uv.	-	-
35. <i>Eremocharis granulosa</i> (Wlk.)	-	-
Pyrgomorphae.		
36. <i>Atractomorpha cranulata</i> P.	-	-
37. <i>Chrotogonus</i> sp.	-	-
38. <i>C. homalodemus</i> Blanch.	-	-
39. <i>C. robertsi</i> Kirby.	-	-
40. <i>C. trachypterus</i> Blanch.	-	8
41. <i>Pyrgomorpha conica</i> Olive.	-	-
*42. <i>Tenuitarsus angustus</i> Uv.	-	-

Average 23 districts

	D I S T R I C T S							
	Sibbi		Quetta		Loralai		Zhob	
	N	A	N	A	N	A	N	A
17	50	134	186*	90	5	-	14	
2	8	-	-	-	-	-	-	
-	5	31	70	5	18	-	-	
-	-	6	2	-	-	-	-	
14	6	-	-	-	-	-	-	
8	21	43	125	-	15	-	-	
-	3	4	41	-	-	-	-	
-	1	2	22	-	-	-	-	
-	-	-	-	-	-	-	-	
6	28	3	31	14	24	-	-	
2	335*	9	107*	2	46	-	9	
-	42	-	161	-	-	-	-	
-	7*	-	12*	-	-	-	4	
7	44	35	98	-	4	-	-	
2	14	17	58	-	-	-	-	
-	-	-	-	-	-	-	-	
-	-	-	26*	-	-	-	-	
-	-	9	7*	-	-	-	-	
-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	
3	1*	4	71*	16	53	4	7	
-	-	-	-	-	-	-	-	
-	-	-	4	2	5	-	-	
-	-	-	4	-	-	-	33	
-	-	27	51*	-	-	-	-	
-	25*	-	-	-	-	-	-	
-	6*	-	-	-	-	-	-	
-	19*	-	-	-	-	-	-	
-	-	-	7	-	-	-	-	
-	49	12	126	-	-	-	-	
-	-	-	-	-	-	-	-	
-	-	14	150	-	-	-	-	
2	59	8	50	-	-	-	-	
-	-	-	-	-	-	-	-	
-	-	-	2	-	-	-	3	
-	-	-	-	-	-	-	-	
3	30	6	18	4	35	-	-	
-	-	2	13*	-	-	-	3	
-	29	8	36	2	38	-	-	
-	-	5	114*	-	-	5	3	
-	22	-	10	9	18	-	-	
4	49	-	4	-	11	-	-	
-	-	-	5	-	-	-	-	

Indication:

N = nymph; A = adult.

\* at serial number = species not previously reported.

^ in district column = species collected during 1976 & 1977.

as minor pests. The majority of the collected species of *Sphingonotus* were geophilous, but *Sphingonotus rubescens* Wlk. and *S. savicavi* Sauss. were more common in orchards. *Chrotogonus trachypterus* Blanch. was found damaging the seedlings of wheat and other fodder crops in Quetta.

Table 1 also indicates the combined 1976-'77 incidence of grasshopper species both in adult and in nymphal stages in particular districts during the survey expeditions (only 30 species were collected in 1977). It can be seen that the numbers of *Hyalorrhapis canescens* Sauss., *Mioscirtus wagneri rogenhoferi* Sauss., *M. wagneri wagneri* Kitt., and *Eremocharis granulosa* Wlk. present were comparatively low (3 nos.) and pending further investigation should be considered rare species.

The grasshopper species collected during our survey expeditions and not reported previously from these areas include:

*Doclostaurus apicalis* Wlk., *Oxya velox* F., *Hyalorrhapis canescens* Sauss., *Mioscirtus wagneri rogenhoferi* Sauss., *M. wagneri wagneri* Kitt., *Oedipoda germanica* Latr., *Sphingonotus nebulosus discolor* Uv., *S. nebulosus violascens* Uv., *S. pradtetschenski* Mist., *Eremopeza afghana* Uv., and *Tanuitarsus angustus* Uv.

The present study thus adds 11 species to the known grasshopper fauna of Baluchistan.

#### References

- Bei-Bienko, C. Y., & L. L. Mischenko. 1963. Locusts and Grasshoppers of the U.S.S.R. and adjacent countries. Pt. I: 400 pp. Israel Prog. Sci. Translation, Ltd.  
 ----- 1964.  
 Ibid. Pt. II: 291 pp.

Fig 1 Map showing the surveyed areas of Grasshopper fauna in prov Baluchistan (Pakistan)



- Ghani, M. A. 1974. A study of the parasites of grasshoppers in Pakistan. Final Rep. C.I.B.C. (Pakistan): 26 pp.  
 Janjua, N. A. 1959. Insects of Baluchistan and their distribution. An anthropological reconnaissance in West Pakistan. Peabody Museum Papers 52:231-264.  
 Kirby, W. P. 1919. The Fauna of British India including Ceylon and Brusa - Orthoptera (Acridida), London: 276 pp.  
 Uvarov, B. P. 1943. The tribe Thrinchini of the subfamily Pamphaginae and the interrelation of the acridid subfamilies (Orthop.). Trans. R. ent. Soc. Lond. 93:1-72.

REPORT FROM THE PRESIDENT'S DESK  
THE 1978-1979 ANNUAL REPORT

It seems that just a few months have passed—actually it has been 5 years—since Ricardo Ronderos and I, meeting in Ann Arbor, talked of the possibility of a New World Acridological Conference such as had been suggested to us by officials in Washington. The conference we discussed that day was eventually held and, in 1976, culminated in the formation of our Society, the Pan American Acridological Society. PAAS is today a functioning organization well into its third year of operation and engaged in a full range of programs and activities toward the satisfaction of its stated goals.

It is useful to stop and reflect from time to time on what has been accomplished, by whom, and where to go next. Certainly, there is no more appropriate time to do so than now on this, the occasion of my final report to you as President. However, because of space limitations I shall restrict my remarks to the first two subjects and leave the last to be conveyed to the Society in the form of informal recommendations to be given later to the new President and his Board.

#### Officers and Committees

I must acknowledge at the outset the unstinting help of the 1977-1979 officers of the Society and that of certain other individuals who served on the several committees that did much of the Society's work during this critical interval in the growth of the organization. These individuals include:

Board Members—President-Elect Ricardo Ronderos, Board Representatives Carlos Carbonell, John Henry, and Carlos Marquez Mayaudon.

Executive Secretary Irving Cantrall, Co-Editors Nelly Lafuente Indo and Michael Tyrkus.

Bozeman Meeting Committee—John Henry, Organizer, Vera Christie, George Hewitt, Elaine Oms, Phil Mazuranich, Jerome Onsager, and Norman Rees.

Elections Committee—Irving Cantrall, Chairman, John Henry, and S. K. Gangwere.

Latin American Training Program Committee—S. K. Gangwere, Chairman, Irving Cantrall, and John Henry.

Publications Committee—Roger Bland, Chairman, Irving Cantrall, Nelly Lafuente Indo, and Michael Tyrkus.

Membership Committee—Michael Tyrkus, Chairman, and S. K. Gangwere.

Audit Committee—T. H. Hubbell, Chairman, and S. K. Gangwere.

Special Fund Committee—T. J. Cohn, Chairman.

T-Shirt Committee—Jacqueline Gangwere, Chairman, Michael Tyrkus, and S. K. Gangwere.

Mailing Committee—Steve Vix, Mario Gross, Anthony Dajnowicz.

I want to thank these individuals and many others not mentioned for a job well done and to express especial indebtedness to the following: Irving Cantrall and Michael Tyrkus, who worked closely with me in handling much of the day-to-day business of the Society; John Henry, who worked tirelessly on behalf of the Society making ready for the Bozeman Meeting; former Clerical Secretary Sue Hicks and my wife Jacqueline, who, between them, carried out in exemplary fashion all of the Society's clerical functions; and Dr. John Taylor and the Department of Biological Sciences of Wayne State University, who throughout this period were most supportive of PAAS.

I shall now attempt to detail some of the business we accomplished and the progress we made.

#### **San Martin Meetings**

The Proceedings of the First Triennial Meeting, based on the conference held at San Martin de los Andes, Argentina, December 6-11, 1976, recently went to press as a separate volume of the Revista de la Sociedad Entomologica Argentina (tomo 36, nos. 1-4, 175 pp.). This volume, dated 1977 but released late in 1978, was edited by Irving Contrall, Ricardo Ronderos, and S. K. Gangwere, and Ricardo then supervised its assembly. The Proceedings have already been mailed to those members involved in the San Martin Meetings as well as to NSF and CONICET, thus formally terminating our financial commitment to those individuals and agencies. Anyone wishing information on the Proceedings should address his inquiry to Ricardo at La Plata.

Proposal no. 8 of the Dec. 10, 1976, Business Session at San Martin instructed PAAS to communicate the conference resolutions, including resolution no. 1 (relative to certain important collections of Orthoptera with whose fate the membership was concerned), to relevant individuals, authorities, and governments. I am pleased to report that, possibly in part owing to our intervention, the Orthopterist position left vacant by Ashley's retirement at the United States National Museum is being filled. The future of the Orthopterist position left vacant by the retirement of Irving from the University of Michigan Museum of Zoology is still undecided. This vacancy is being filled, too, though there is a possibility it will not go to an Orthopterist.

#### **Bozeman Program**

Meeting Organizer John Henry and his staff have developed an excellent program of activities about which you have already been informed. I shall not comment upon it further except to urge you to attend and represent your institution.

#### **Latin American Training Program**

We expect an excellent registration at Bozeman including investigators from many different countries. The preliminary registration has, thus far, supported these high expectations. We were concerned initially, however, that many of the junior Latin American workers and some senior ones without access to university, governmental, or other subsidy would be unable to attend. We tied this concern to a wish that, in particular, something be done to help the professional development of young research workers. Therefore, the Society applied to the Tinker Foundation for funds to implement a program of travel and research for Central and South American investigators to be selected on an open basis.

I am delighted to inform you that the Tinker officials approved our request in the amount of \$25,000 (U. S.), and we have recently received the required matching funds from a combination of institutions and organizations including the Academy of Natural Sciences of Philadelphia, Boersma Travel, Montana State University, North Dakota State University, Union Carbide, the University of Michigan, and Wayne State University. A number of individuals also contributed funds for the same purpose, and T. J. Cohn, who is chairing the fund drive, is still looking for additional donors. Kindly let him know if you wish to contribute. A full list of



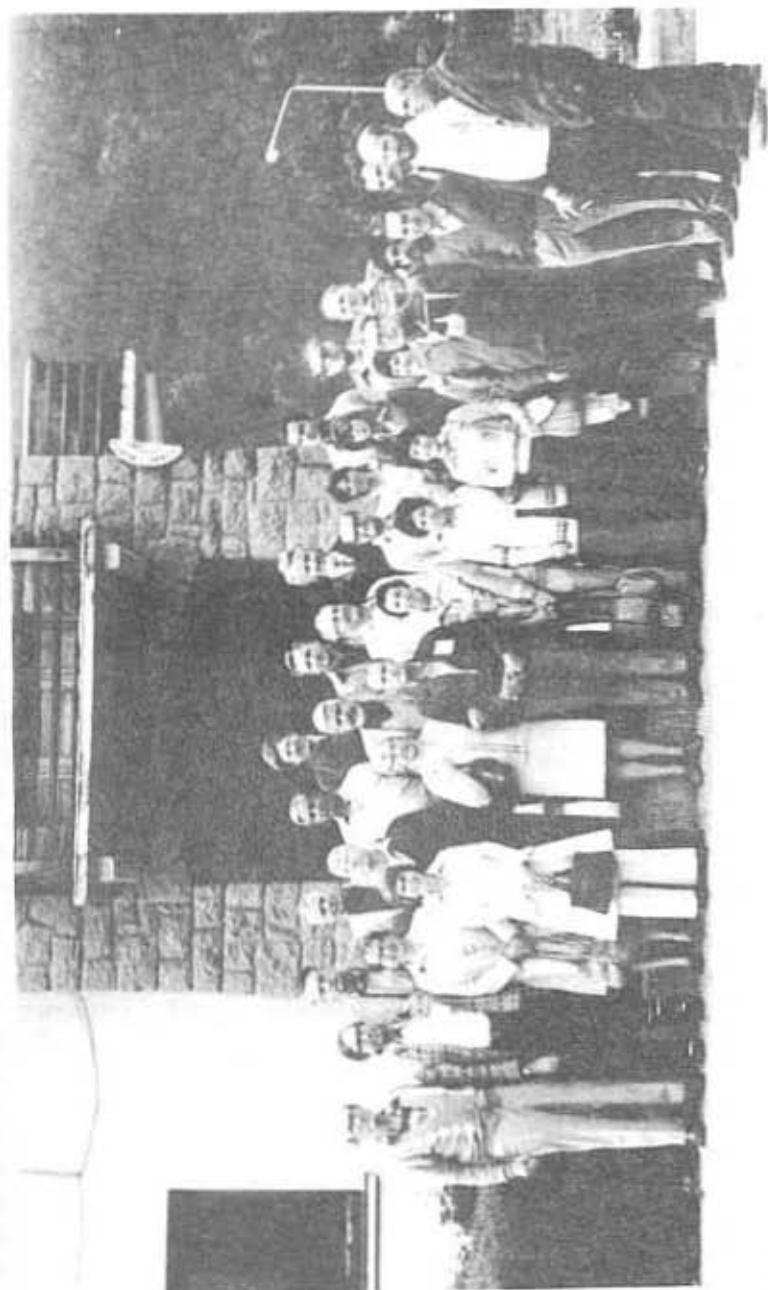
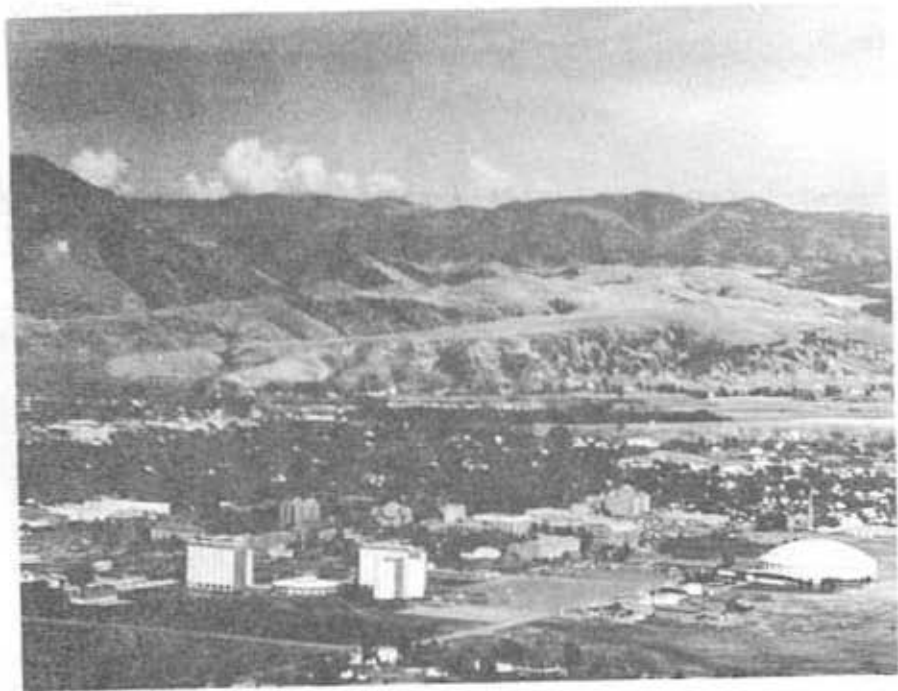
all donor organizations will be presented later when the final report of the project is prepared. Individual contributions will be listed on an anonymous basis.

We expect that our projected budget is sufficient to support, in large part, the travel and research of 13 grantees, a larger number than we originally anticipated. I have already tendered offers to these 13 applicants and am awaiting their response. The first grantees should begin arriving in this country about the time this number of Metaleptea goes to press.

#### Membership

My concern upon taking office was to build membership in order to put together an effective constituency. I think we have done this. Since San Martin our "membership" has increased fivefold. We currently have on our rolls about 150 "members" from 24 countries, but, as of this date, only slightly more than half of these are paid-up. Therefore, starting with this mailing, we are forced to give a third, or final, notice to those individuals who, by their failure to pay, indicate that they prefer not to become actual members. We are giving second notice to a number of others. We take this action reluctantly, but our Society mailing expenses are excessively high during these days of worldwide inflation.

We already number among our members most of the active New World Acridologists and Orthopterists. However, our goal is to reach all interested persons, amateur and professional, and particularly those just beginning their career who stand to gain most from association with us. To reach them, the Membership Committee has amassed an extensive list of educational and



#### EXPLANATION OF FIGURES

A panoramic view of the 1979 Bozeman meeting site of the Pan American Acridological Society.

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Society "models" Paula Johnston and Leslie Ann Gangwere wearing the new PAAS T-shirts. Paula is holding a newly captured specimen, doubtless a new species. Photograph courtesy of Mr. George Johnston, of Eastern Michigan University.

\*\*\*\*

First Triennial Meeting of PAAS, San Martin de los Andes, Neuquén, Argentina, December, 1976.

Left to right, 1st row: Dr. H. R. Roberts, Dr. T. J. Cohn, Mrs. Jean Cohn, Mrs. G. B. Mulkern, Mrs. I. J. Cantrall, Dr. I. J. Cantrall, Mrs. M. Horton, Srta. R. L. Guerra, Dra. N. Lafuente Indo, UTE,\* Int. R. H. Santoro, Dr. Amilton Ferreira, UTE; 2nd row: Dr. Herbert Knutson, Dr. S. K. Gangwere, Dr. G. B. Mulkern, Ing. Carlos S. Carbonel, Dr. A. B. Gurney, UTE, UTE, Sra. Leonor de Villalobos, UTE, UTE, Sr. Mario Gentili; 3rd row: Dr. R. A. Ronderos, Dr. Dan Otte, Dr. John Henry, Dr. N. D. Jago, Ing. A. S. Paravano, Ing. Leopoldo Esquivel, Dr. V. R. Vickery.

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\*Members whose name is unknown to Editors. PAAS respectfully requests assistance in determining the identity of these persons who will be listed correctly in the next number. In the meantime apologies for this unintentional slight.

research institutions throughout the New World and has prepared an attractive, folded flier, or pamphlet, on colored stock. This flier, bearing the names of the 1979-1982 officers, is to be mailed as soon as the new President and Board of Governors take office at Bozeman and the next meeting site is determined.

#### **Dues**

Some time ago I recommended to the Board of Governors that PAAS levy dues of \$5.00 (U. S.) for Active Members, \$2.00 (U. S.) for Student Members, with gratis membership for Honorary and Emeritus Members. This fee schedule was adopted by mail ballot of the membership and has been in effect since September of last year. I can report that, thanks to individual contributions and to the continuing support of Wayne State University in the form of secretarial services, etc., these fees have, so far, proven adequate for our purposes. No increase in dues need be contemplated, at least in the near future.

#### **Tax-Exempt Status**

Motivated by the need to hold grants and to manage our limited financial resources efficiently, the Society applied in September of last year for United States tax-exempt status under provisions of section 501 (c) (3) of the Internal Revenue Code. Since then I have been in touch with Mr. D. Clifford, of IRS, who tells me that our petition has been approved on a 2-year provisional basis after which time the status may be reviewed and made permanent. I have not, as yet, received the formal documents. However, in the meantime, through its association with Wayne State University, a tax-exempt body, PAAS is covered.

#### **Constitution and By-Laws**

These documents, formally adopted on August 1, 1978, have been in use long enough to disclose possible deficiencies. A number of sections seem in need of minor modification and one or two sections should be added to provide a more adequate legal basis for the Society. I was unable to address myself to the changes needed because of insufficient time. It takes well over one year to approve even the simplest change! However, Irving Cantrall and I shall make appropriate recommendations to the new Board of Governors early next autumn.

#### **Emblem**

We had a number of entries in our competition for the Society emblem, or logo. That of Dan Otte was selected and eventually approved by the Board of Governors. Dan's entry graces our Metaleptea cover and also appears on the Society stationery. Our thanks go to him for an excellent design.

#### **Publications**

With the appearance of this issue of Metaleptea the Editorial Office has begun publication of Vol. 2. All comments I have had, and my own personal feelings, are to the effect that Metaleptea is already the informative newsletter we intended it to be. Our congratulations to the Editorial Office. The Editorial Office already has ideas toward its improvement and will implement them when it becomes possible to do so. We urge you to help toward this end by offering your suggestions and, above all, by submitting the materials needed to fill its pages and keep it vital.

The Proceedings of the Second Triennial Meeting will be published by PAAS itself and are

expected to be printed at Wayne State University. We are equipped to give good copy with justified margins and need only go to a photo-offset printing method. Publication will be by page charge, but the cost to individual contributors will be relatively low owing to the internal method of publication chosen. All submitted papers, invited and contributed, and all abstracts will be considered for publication, at the authors' option.

The Publication Committee examining the advisability of instituting a research journal will present its report to the membership at Bozeman.

#### 1979-1982 Officers

I wish to take this opportunity to congratulate the 1979-1982 elected officers of the Society who will take office with President-Elect Ronderos at Bozeman. I will not mention them by name inasmuch as they are announced in the Executive Secretary's report, below. These officers will be joined by a number of appointive officers whom Ricardo will announce at Bozeman. In the meantime, all I can say is that the Secretariat will remain at Wayne State University.

In closing, I would like to thank the membership for the honor of serving as your President, and I resolve to continue serving PAAS to the extent that I am able. Best wishes to you and yours until we meet at Bozeman. Bon voyage!

Respectfully submitted,

  
S. K. Gangwere

#### REPORT FROM THE EXECUTIVE SECRETARY

John E. Henry (President-Elect), Carlos Márquez Mayaudon (Central American Board Representative), and Gregory B. Mulkern (North American Board Representative) were almost unanimously elected in the balloting for Society officers for the 1979-1982 Term. The race between Carlos S. Carbonell and Amilton Ferreira for South American Board representative was very close, with the choice going to Carlos. These individuals will take office in Bozeman along with Ricardo Ronderos.

At the present time the Society is made up of 63 Active, 12 Student, 4 Honorary, and 6 Emeritus Members in good standing.

#### Financial Statement:

August 1 to December 31, 1978.

#### RECEIPTS

Dues . . . . .	\$213.00
Contributions, gifts, etc. . . . .	271.01
Total . . . . .	\$484.01 (U.S.)

#### DISBURSEMENTS

Stationery, printing, and mailing of <u>Metaleptea</u> . . . . .	\$302.01
Total . . . . .	\$302.01 (U.S.)

#### BANK ACCOUNT BALANCE as

of December 31 . . . . .	\$182.00 (U.S.)
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A report on the financial condition of the Society as of the time of the Bozeman Meeting will be presented in Bozeman.

Respectfully submitted,

  
Irving J. Cantrall

## EDITORIAL

The stated purpose of PAAS is to facilitate communication among those interested in, and concerned with, New World Acridology and Orthopterology. As a partial means of fulfilling this purpose the Editorial Office recognizes that a single publication vehicle received by all interested individuals is highly desirable. To these ends it was announced in the last issue of Metaleptea that a new publication format would be adopted with the appearance of Volume 2. To reiterate the appropriate statement of the last issue, Metaleptea is now accepting short research reports and scientific notes of a suitable nature dealing with the Orthopteroid insects in general.

In the opinion of the Editorial Office suitable reports are those of valid scientific merit that are of specific interest to the amateur and professional Orthopterists of the New World, as well as any of general interest on a global basis.

Guidelines for acceptable topics can be taken from the Members' Area of Interest list as found in Vol. 1, No. 2, of this publication. Hence, reports dealing with behavior, general biology, biogeography, control, ecology, evolution, genetics and cytogenetics, history, morphology, migration, pathology, physiology, population dynamics, rearing, and, of course, systematics at any taxonomic level are encouraged.

More extended reports that lend themselves to serialization over a number of issues will also be considered for publication.

Again, we must stress that Metaleptea will only become as good, interesting, and complete as the contributions of the membership make it. Consequently, consideration of the use of

Metaleptea as a publication outlet for research as well as for the dissemination of announcements and news items can only serve to strengthen PAAS and its public image.

## 1978 LOCUST OUTBREAKS

As the 1979 field season draws near, the Editorial Office would like to share the following two articles describing the locust incidence in 1978

### Kenya, Tanzania Get Warning

Dar es Salaam, Tanzania -- (UPI) - The swarms of locusts devastating hundreds of square miles of Ethiopia and Somalia threaten to do the same to Kenya and Tanzania, the chairman of the East African locust control organization warns.

John Malerela, who is also Tanzania's agricultural minister, issued his warning yesterday after touring stricken areas in Ethiopia.

"It was frightening," he said. "At times the locusts were so thick our pilot could not see out the wingscreen of the plane, and in areas which had been sprayed I saw millions of dead locusts."

There are at least 41 swarms of locusts in Ethiopia and 17 in Somalia, each blanketing an area of 10 to 40 square miles.

The locusts were devouring between 8,000 and 34,000 tons of vegetation every day.

"Now is the breeding season and millions of new locusts will hatch in August and September," Malerela said. "Then toward the end of the year, when the monsoon winds start blowing north, it will be very easy for the locusts to be brought

into Kenya and northern Tanzania. We must get international aid within the next two months in order to prevent this."

"The situation is really dangerous and cannot be controlled by our organization alone."

Malerele said the locusts entered the horn of Africa 12 months ago from Saudi Arabia and North Kenya, but routine control procedures were not carried out because of the war between Ethiopia and Somalia.

He said the locusts were poised yesterday just north of Ethiopia's main grain producing area. "Should they escape into this grainery it will be disastrous," he said.

Malerele asked for urgent international aid, including communications and camping equipment, four-wheel-drive vehicles, heavy trucks.

"If we don't control the locusts today," he said, "we may have to feed hundreds of thousands of people in the Horn of Africa tomorrow."

Each locust, weighing less than an ounce, eats his weight daily. Multiply that by 20 or 30 million over an area of 300 square miles or more, and a nation's food crop can be consumed in a matter of days.

Desert locusts can damage hundreds upon hundreds of farmland acres in minutes. They can level scrub forests like buzz saws. As they move on to another fertile area their powerful wings push them along at 25 m.p.h. for up to 20 hours a day - there will be no plant life left where they have dined.

In 1958, when East Africa suffered its worst locust plague in memory, a swarm of 40 million locusts swept through 600 square miles of Somalia a day, devouring an estimated 80,000 tons of food daily. That same year locust damage in the north African nation of Morocco was estimated at \$9

million, and in Ethiopia locusts consumed the grain supply of a million people. In India, they laid bare vast fields of cotton.

The world locust population has been in decline for 16 years, partly because of drought of many African regions and partly because of continuous control measures carried out by nations with the help of the UN Food and Agriculture Organization.

(Reprinted by permission of UPI)

### Grasshoppers Threaten Plains States

Denver -- (AP) - Like the biblical plague, or the onslaught that cost farmers upwards of \$60 million in the late 1950's, millions of grasshoppers are moving through the wheat fields and rangelands of the American high plains.

In Kansas and Nebraska, farmers are demanding that the federal government allow them to use Aldrin and Dieldrin - pesticides that now are banned.

In southeastern Colorado, the grasshopper count has reached 55 per square yard. Eight to 10 per square yard - a number sufficient to eat as much grass in a day as a cow and calf - is considered a serious infestation by the U.S. Department of Agriculture.

More than 160,000 acres in Wyoming are being sprayed with pesticides, and it is not a particularly bad year there - yet.

But it is a bad year in Colorado. The Legislature will meet in special session Monday to consider setting up a \$7.2 million emergency aerial spraying program on 1.3 million acres in 19 eastern Colorado counties.

Gov. Richard Lamm warned Friday that the spraying has to be done quickly because another

grasshopper hatch is due to begin Thursday. Without spraying, damage to rangelands alone could exceed \$4.5 million, the state Department of Agriculture said.

There is no overall estimate of the damage caused by grasshoppers this year, but they are moving through fields of corn and wheat in Colorado, Kansas and Nebraska before the combines reach them.

It was the end of the long lasting western drought that probably triggered the grasshopper assault, agriculture experts said. It happened in the 1930's and again in the late 1950's when drought followed by rain produced major grasshopper outbreaks that helped make dust bowls out of rangeland and farms.

The outbreaks have not been limited to the plains. Hordes of grasshoppers are chomping their way through fields of alfalfa in southeast lower Michigan and swarming over the desert cities of Phoenix, Tuscon and Tempe in Arizona.

But the most severe infestations are in the counties on either side of the border that separates Kansas and Nebraska from Colorado.

In southeastern Colorado, farmers and county extension agents report that 2-inch-long grasshoppers have eaten the bark off trees and the paint off houses, cleaned out vegetable gardens and are working their way through fields of irrigated corn and sugar beets, as well as wheat.

Ralph Hallack, who farms 1,000 acres of wheat, barley, milo and corn in southeastern Colorado, says he is looking at a \$40,000 loss.

(Reprinted by Permission of AP)

SECOND TRIENNIAL MEETING OF THE PAN AMERICAN  
ACRIDOLOGICAL SOCIETY

at  
Montana State University  
Bozeman, Montana, U.S.A.

Program

Monday, July 23, 1979

- |              |                  |
|--------------|------------------|
| 1:00-5:00 pm | Registration*    |
| 2:00-4:00 pm | Board Meeting    |
| 4:00-6:00 pm | Opening Session  |
| 6:30-8:30 pm | Mixer and Buffet |

\*Registration fees have not been firmly established but are not expected to exceed \$10.00 (U.S.).

Tuesday, July 24, 1979

- |                |  |
|----------------|--|
| 8:00-8:30 am   | Registration   |
| 8:15-11:00 am  | Symposium: "Biogeography and Speciation of Acrididae" ...<br>Dr. T. Cohn, Convener                             |
| 11:00-12:00 pm | Submitted Papers<br>Roundtable Discussion:<br>"Economics of Control of Acrididae" ... Dr. J. Onsager, Convener |
| 3:30-5:00 pm   | Submitted Papers   |
| 7:30-9:00 pm   | Popular Acridology Papers - open to the public.  |

Wednesday, July 25, 1979

- |                |  |
|----------------|--|
| 8:15-10:15 am  | Roundtable Discussion:<br>"Evaluation of Taxonomic Characters" ... Dr. V. R. Vickery, Convener |
| 10:30-12:00 pm | Submitted Papers   |



- 3:00-5:30 pm Workshop - Poster Session:  
"Behavior of Acrididae" ...  
Dr. R. Willey, Convenor
- 7:00-pm Banquet

Thursday, July 26, 1979

- 8:15-10:15 am Symposium: "Population and  
Community Ecology" ...  
Dr. D. Otte, Convenor
- 10:30-12:00 pm Submitted Papers
- 1:30-5:30 pm Submitted Papers: "Cytogenetics  
of Acrididae" ... Dr. M. Tyrkus,  
Moderator
- 11:00-4:30 pm Open House, Montana State Univer-  
sity Insect Collection ...  
Ms. Sharon Rose, Hostperson.

Friday, July 27, 1979

Field Trip - Montane Habitat

Saturday, July 28, 1979

Field Trip - Grasshopper Glacier

Sunday, July 29, 1979

Tour: Yellowstone National Park

Monday, July 30, 1979 - Friday, August 3

Field Trip: Grasshopper habitats, research and  
central programs in Montana and adjacent states.

**Official Languages of Meeting**

Spanish or English (attempts will be made to  
have abstracts read in the opposite  
language).

**Publication**

All papers, invited and contributed, will be  
considered for publication at the authors'  
option and expense. Abstracts of all papers  
will be published. Abstracts are due by June  
30 in order that they be available prior to  
the opening of the meetings.

**Housing**

1. University housing in student dormitories  
(high rise):  
Single occupancy: \$5.50/day;  
Double occupancy (2 single beds):  
\$4.50/day/person.
2. Commercial Motels - all 15- to 40-minutes  
walk from the University;  
\$15.00 - \$22.00 single occupancy;  
\$19.00 - \$30.00 double occupancy  
(Transportation will be available prior to,  
after, and at noon of each daily session.)
3. Camping facilities:
  - a) 3 commercial campgrounds within 3 to 11 km  
of the University
  - b) Public campgrounds - several within 25 km  
of the University on Forest Service lands.

**Meals**

1. Cafeteria service available throughout day at  
the Student Union (meeting site).
2. Restaurants (4-5) adjacent to the University.
3. Numerous restaurants and dining establish-  
ments within 20- to 40-minutes walk from the  
University.

### Transportation

1. Air: Northwest Airlines for east-west travel; Frontier Airlines for north-south travel.
2. Railroads - daily Amtrak service.
3. Highways - excellent throughout region. Interstate 90 is the main east-west highway.

### Field Trips

1. Montane collecting site: All-day trip within 150 km of Bozeman. Transportation will be via state or private vehicles. Nominal fee will be charged for prepared lunch and possibly transportation. This should not exceed \$6.00/person. Habitat will be lush mountain vegetation inhabited by various species of Melanoplus (some of which are brachypterous), many slant-face species, and numerous species of cricket. Excellent general insect collecting. Dry ice for freezing insects will be available.
2. Grasshopper Glacier (Pending report of a scouting trip prior to day of trip): Full-day trip. Montane habitat, 13,000 m elevation. The Glacier holds frozen specimens from past grasshopper and locust flights. Specimens of Melanoplus spretus, which was the only true migratory locust in North America and which now is extinct (since 1890's), have been taken from the Glacier, but only rarely. Within the past 2 years the wilderness area border has been extended, and now in order to reach the Glacier it will be necessary to travel by foot the final 7 km on an excellent and easy trail. Attempts are being made to have saddle horses from a local dude ranch available for those who might not be

able to hike that distance. Cost is expected to be \$7.00 - \$10.00 per person for bag lunch and transportation. Cost for horses will be additional. There will be excellent general collecting along the trail to the Glacier. The trip also will feature Mammoth Hot Springs, a geothermic formation that will not be seen on the tour to Yellowstone Park the following day.

3. Yellowstone National Park: Full-day trip. Commercial tour bus transportation to the major geothermic and scenic attractions of the park. Cost will be \$8.00 - \$10.00/person depending on number of people per bus (maximum 41/bus). Lunch and snacks will be available along route at additional personal expense. This is a must for those who have not seen the park. Collecting is absolutely prohibited in the Park.

4. Extended field trip (5 days): Depart from Bozeman Monday morning, returning Friday afternoon. Transportation is pending but is expected to be by private auto or state vehicles, both of which will necessitate a per person average travel cost that should not exceed \$7.00/day. Food and lodging will be at additional personal expense. The trip will feature different grasshopper habitats where collecting will be varied and interesting, visits to ongoing research sites, and observation of a large-scale grasshopper control program involving large multi-engine aircraft. Dry ice will be available for freezing the insects. This will be a worthwhile trip for anyone who has not seen the intermountain and northern great plains regions of western United States.

### Accompanying Persons Program

Organized activities for family members and friends will include daylong excursions to Virginia City (a Resort and Gold Mining Center) and to Lewis and Clark Caverns. Also planned are shopping sprees to downtown Bozeman.

Montana State University is making available to conference participants and families swimming facilities, game rooms, and other recreational materials.

### MEMBERS NEWS AND ACTIVITIES

**Christiane Amedegnato**, Laboratoire d'Entomologie, Museum National d'Histoire Naturelle, Paris, France, has received the 1979 Prix Reaumur de la Société Entomologique de France. Dr. Amedegnato completed her doctoral studies on the classification, phylogeny, and genital anatomy of the Neotropical Acridoidea (*Cantantopinae sensu lato*) in 1977.

**Lic. Claudio Bidau**, of the Laboratorio de Genética, Departamento de Ciencias Biológicas, Facultad de Ciencias Exactas y Naturales, U.B.A., Ciudad Universitaria, Argentina, has published on the chromosomes of the genus *Berosus* (Hydrophilidae: Coleoptera). He recently became an associate of the Colegio de Graduados Universitarios en Ciencias Biológicas de Buenos Aires. In Nov.-Dec. (1978) Dr. Bidau was a grantee of the Organization of American States at the Instituto de Investigaciones Biológicas "Clemente Estable" (Montevideo, Uruguay) where he addressed the problem of techniques in the study

of insect chromosomes.

**Marius Descamps**, of the Museum d'Histoire Naturelle, Paris, France, is continuing his studies into the taxonomy, biogeography, and phylogeny of Eumastacoidea and Acridoidea. Dr. Descamps has amassed data for these studies during 15 expeditions to the American Tropics, including visits to Colombia, Peru, Brazil, Mexico, Paraguay, Uruguay, Argentina, and other countries. These studies have resulted in numerous publications including most recently: 1) "Etude des Ecosystemes guyanais," III. *Acridomorpha dendrophiles* (*Ann. Soc. Ent. Fr.* 14:301-344), and 2) "La Faune dendrophile neotropicale," II. *Reuvedes Taeniophorini et Ophthalmolampini (Romaleidae)* (*Bull. Mus. Nat. d'Hist. Nat.*, Paris).

**Rosa Luisa Guerra Muñoz**, Departamento de Biología, Facultad de Matemáticas y Ciencias Naturales, Valparaíso, Chile, is currently Auxiliary Professor in the section of cellular biology and is co-investigator of a project entitled "Remodelaciones cromosómicas en Ortópteros y Vertebrados." She recently published on the cytogenetics of *Dichroplus* and is now looking into the cytogenetics and cytotaxonomy of the genus *Trimerotropis*. In November, 1978, she presented "Individuos heterologos en una población de *Trimerotropis ochraceipennis*" to the Sociedad de Biología de Chile. In addition, her current investigations include continuation of studies on "La citotaxonomía y comportamiento de los cromosomas durante la meiosis y estudiar las remodelaciones cromosómicas que han ocurrido para hacer estudios filogenéticos de los Acrididos chilenos. This investigation is in part funded

by the Oficina Tecnica de Desarrollo Cientifico y Tecnologico de la Universidad de Chile.

**D. K. McE. Kevan**, Department of Entomology and Lyman Entomological Museum, McGill University, was the Lyman Memorial Lecturer this April. He is, in May, attending the Royal Entomological Society Meetings in London. Dr. Kevan recently received a NRC of Canada grant for his continuing studies on Orthoptera. His recent publications include: 1) "The Lyman Entomological and Research Laboratory, a history to 1978" (Notes of Lyman Ent. Mus. & Res. Lab. 4: 35 pp.) 2) "The American Pyrgomorphidae" (Rev. Soc. Ent. 36:3-28), 3) "Proposal to Conserve Blatta germanica Linnaeus," and 4) "Land of the Locust," Mem. Lyman Ent. Mus. Res. Lab. 1977). His busy schedule also includes teaching several courses at MacDonal College of McGill University.

**Herbert Knutson**, of Kansas State University, Manhattan, has just received word of the approval of his grant entitled "The Chemical and Physical Bases of Grasshopper-Host Plant Interactions." His proposal was approved by the National Science Foundation (N. S. F.) in the amount of \$65,430 for two years research.

**Alan Roy McCaffery**, Centre for Overseas Pest Research, London, is currently Senior Research Scientist of Physiology and Endocrinology. His recent investigations resulted in the following reports: 1) "Factors influencing the production of long-winged Zonocerus variegatus" (J. Insect Physiol. 24:465-472) and 2) "Utilization of food by Zonocerus variegatus (L.) (Orthoptera: Pyrgomorphidae)" (Bull. Ent. Res. 68:589-606). At

the 192nd Meeting of the Society for Experimental Biology he presented a paper entitled "Evidence for an oviposition attractant in Zonocerus variegatus (1978)."

**Barnabos Nagy** is Scientific Councillor at the Zoology Department of the Research Institute for Plant Protection, Budapest, Hungary. He is now vice-president of the Hungarian Entomological Society and Chairman of the Commission for Genetic Control (IOBC-EPS, Moscow). His present investigations include studies on the ecofaunistics of Hungarian Orthoptera as well as establishing a collection of Orthoptera from the Carpathian Basin and Penticton (British Col., Canada). He hopes to receive a fellowship to the German Free Republic (June-July) under the auspices of the Deutscher Akademischer Austauschdienst. His recent publications include: 1) "Presence and use of natural food sources of the codling moth, Laspeyresia pomonella L., in Hungary" (Coll. Intemot. du CNRS, No. 265) and 2) "Synoecologia Zoologica" (In: Soo: Bibliographia Synoecologica Hungarica 1900-1972, Budapest, Akad. Kiado, 1978).

**Mark Nelson**, of Wayne State University, Detroit, and of George Washington University, Washington, D. C., has recently co-authored with S. K. Gangwere a report entitled "A key for the cytological determination of orthopteran food plants based on anatomical features." This paper has been submitted to the Michigan Botanist. Nelson's research interests are in acridid cytogenetics and systematics. He is a member of the Entomological Society of America and of the Michigan Entomological Society as well as a member of PAAS.

Luiz Soledade Otero is Professor of Entomology at the National Museum of Brazil at Rio de Janeiro where he is continuing research on the taxonomy and biology of the Neotropical Tettigoniidae.

Suresh Kumar Raina, of the Canada Agriculture Research Station, is continuing his research on the tissue culture of insect cells. He addressed the International Conference on Tissue Culture in Lucerne, Switzerland (April, 1979) on the "In vitro infection of fat body cells of the grasshopper Melanoplus sanguinipes (Fab.) by the microsporidian Nosema locustae Canning."

Wilda E. Virla de Arguella, Catedra de Entomologia of the Facultad de Ciencias Exactas, Cordoba, Argentina, is revising the genus Sinipta Stal (Orth.: Acrid.). She has completed her doctoral dissertation entitled "Estudio sistemático y bionómico del genero Dichroplus Stal. (Orth.: Acrid.: Melanoplinae) en la Provincia de Cordoba, R. A. She has recently become Profesora adjunta de la Catedra de Zoología Invertebrados, Jefa de Trabajos prácticos, de la Catedra de Entomología. Her most recent studies resulted in a report, "Estudio de las mandíbulas y análisis de las heces en 15 especies de tucuras colectadas en alfalfares de Cordoba, R. A. (Orth.: Acrid.)," which is now in press (Soc. Ent. Arg.).

Saralee Neumann Visscher, of Montana State University, is teaching insect morphology, insect development, medical and veterinary entomology, and freshman biology. She is pursuing studies into the role of maternal factors on fecundity and embryonic viability in the grasshopper, Aulocara elliotti. She is President Elect of the

Montana Academy of Sciences and recently served as Organizer-Moderator of the Symposium for Insect Embryology and the XVth International Congress of Entomology, Washington, D.C., and as Plenary Speaker at the Meeting of the Japanese Society for Arthropodan Embryology, Gamagori, Japan. Her recent publications include a coauthored report entitled "Host plant growth temperatures and insect rearing temperatures influence reproduction and longevity in the grasshopper Aulocara elliotti (Orthoptera: Acrididae)" (In Press: Environ. Biol.) as well as an edited text Aspects of the Embryonic Physiology of Insects. (Big Sky Press, Montana State University, Bozeman, Montana, 260 pp.) (In Press).

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#### RESEARCH REQUEST

Wanted Any information on the biology and ecology of the Proscopiidae. Contact: Sr. Dn. Claudio Juan Bidau, Facultad de Ciencias Exactas y Naturales, Universidad de Buenos Aires, Ciudad Universitaria, 1,428 Nunez, Capital Federal, ARGENTINA.

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## LETTERS TO THE EDITOR

Dear Sirs:

I visited Rio de Janeiro the last two weeks of this past October to examine the private collection of Acrididae in the home of Dr. C. A. C. Seabra. My visit turned out to be a happy gathering with Dr. Marius Descamps, of the Paris Museum, Dr. Carlos S. Carbonell, who came up from Montevideo, Dr. Miguel A. Monné, of the Museum Nacional in Rio, and Dr. Seabra as host. For a number of years Dr. Seabra has been assembling a large Brazilian collection of long-horned beetles (Cerambycidae) with the aid of professional collectors. More recently he has had his collectors bring in all Acrididae encountered. This has resulted in an important collection of several thousand, well-mounted, labeled acridids, many of which are neither named nor described. This collection will eventually be given to the National Museum in Rio. Dr. Descamps examined many of the groups associated with tropical forest conditions and selected many specimens for further study in Paris. With the help of Dr. Carbonell, I identified species of the subfamily Leptysminae and also selected specimens for further study. The group was given a welcoming reception at the Museum Nacional which was followed on another day by an informal seminar given by the group on their research objectives. For the last five days of my visit we went in a minibus, generously provided by Dr. Seabra, to Linhares, some 600 km north of Rio, in order to do some collecting in the nearby rain forests. Either the grasshoppers were not very cooperative or they were out of season, but, regardless, it was a most enjoyable expedition.

Sincerely,  
H. Radclyffe Roberts

Dear Sirs:

In my opinion, the logo of Vol. 1, No. 2, is much better than that of the previous Vol. 1, No. 1. I think that the square around the grasshopper does not belong.

Sincerely,  
Richard Lamb

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## PUBLICATION OF BOZEMAN PROCEEDINGS

As the Bozeman meeting draws near, the Editorial Office is readying itself for the influx of manuscripts to be included in the Proceedings.

Symposium papers and all other papers presented during the symposia will be published in their entirety at the authors' discretion. A page charge will be levied, but all possible efforts will be made to keep costs to an absolute minimum. Those papers not published in their entirety will be published in abstract form.

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## PAAS T-SHIRTS AND WIND-BREAKERS

In honor of the Bozeman meetings, PAAS is making available for a modest fee lightweight wind-breaker jackets and T-shirts emblazoned with the PAAS emblem. They will be available in a variety of sizes and colors.

### THANK YOU

PAAS is deeply indebted to Dr. Daniel Otte, Academy of Natural Sciences, Philadelphia, Pennsylvania, who designed the globally perched Metaleptea that now adorns the cover of this publication and the society's stationery. It has been formally adopted by the Board of Governors as the official PAAS logo.

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### OPEN APOLOGY TO MEMBERSHIP

In Vol. 1, No. 2 of Metaleptea, the Editorial Office ran a list of members organized by area of interest. Inadvertently, some names were omitted or misclassified. Our apologies are extended to: 1) Professor Ernest Tinkham for our not noting his valuable contributions as a systematist and insect ecologist, 2) Professor Irving J. Cantrall for not placing him with other systematists, and to 3) Professor William Chapco and others for listing them under cytogenetics rather than Genetics and Cytogenetics, as the title was meant to read.

The information used in compiling the aforementioned list was gleaned from the original membership applications, some of which specify limited or no areas of interest.

If any members desire either a change or additions to their listing, the Editorial Office will be happy to comply. Please let us know.

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### NEW MEMBERS AND ADDRESS CHANGES

Metaleptea is pleased to welcome the following to membership in PAAS.

Dr. Christiane Amédégnato \*e  
Laboratoire d'Entomologie  
Muséum National d'Histoire Naturelle  
45 rue Buffon  
P5005 Paris, FRANCE

Sr. Carlos Alberto Campos Seabra \*s  
Alvaro Alvim 48  
Rio de Janeiro, BRAZIL

Mr. Kenneth J. Goeden \*e  
Oregon Department of Agriculture  
P.O. Box 723  
Hermiston, Oregon 97838

Mr. Keith B. Gover  
15560 Meadowbrook  
Redford, Michigan 48239

Sr. Dn. Esteban Rubén Hasson \*s  
Laboratorio de Genética  
Departamento de Biología  
Facultad de Ciencias Exactas y Naturales  
Universidad de Buenos Aires  
Ciudad Universitaria, 1,428 Nuñez  
Capital Federal, ARGENTINA

Mr. Taysir A. Jabr \*\*e  
Growth and Development Center  
Children's Hospital of Michigan  
3901 Beaubien  
Detroit, Michigan 48201

Dr. J. Anthony Joern \*e  
School of Life Sciences  
University of Nebraska  
Lincoln, Nebraska 68588

Mr. David Carleton Lightfoot \*\*e  
Department of Entomology  
Oregon State University  
Corvallis, Oregon 97331

Mr. Joseph Alan Pounds \*\*e  
Department of Biology  
University of Southwestern Louisiana  
Lafayette, Louisiana 70504

Dr. Vinayak Keshavrao Thakare \*e  
Department of Zoology  
Nagpur University  
Nagpur, Maharashtra, INDIA

Dr. David B. Weissman \*e  
Department of Entomology  
California Academy of Sciences  
Golden Gate Park, San Francisco 94118

- \* Active Member
  - \*\* Student Member
  - s Spanish Language Preference
  - e English Language Preference
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#### FAREWELL

The Editorial Office of PAAS has suffered a loss. Ms. Sue Hicks, who has been our able right hand through the initial issues of Metaleptea, has accepted a position elsewhere in Wayne State University. Our loss is her new employer's gain. She will undoubtedly be as valuable an asset to her new office as she was to us.

Farewell, Sue, and thanks!

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#### HELLO

With this, the first number of Vol. 2, Metaleptea is proud and delighted to welcome Ms. Pat Wynn to the Editorial Office staff. Ms. Wynn is to serve as Clerical Secretary for PAAS.

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PAAS is deeply indebted to Chairman John D. Taylor, Ms. Pat Wynn, and Ms. Eileen Koglin, of the Department of Biology at Wayne State University, for gracious assistance in the preparation of this issue of Metaleptea.