H Scheider

NEWS BULLETIN

ENTOMOLOGICAL SOCIETY OF QUEENSLAND

PRICE 40c

Registered for Posting as a Periodical Category B.

FEBRUARY 1981 VOL 8 NO 8

TABLE OF CONTENTS

* * * * * * * * * *

GENERAL MEETING

Minutes of the General Meeting of the Entomological Society of Queensland Inc. held at Griffith University on Monday, 8th December,, at 8.00 p.m.

ATTENDANCE

P.J. McFadyen (President), B. Cantrell, E. Dahms, M. De Baar, M. Evans, J. Grimshaw, C. Hagan, M. Harris, A. Hill, M.J. Hockey, R.E. McFadyen, E.N. Marks, D. Merritt, G.B. Monteith, E.J. Reye, D. Sands, M. Schneider, P. Sinclair, E. Sinclair, F. Swindley, G. White, M. Zalucki.

VISITORS

G. De Baar, J. Graff, N. Harris, D. Hill, J. Hockey, J. Lamy.

APOLOGIES

P. Boreham, G. Daniels, I. Fanning, I. Galloway, B. Kay, P. Room, K. Walker, R. Wylie.

MINUTES

The Minutes of the last two meetings held at the University of Queensland on Wednesday 22nd October and Monday 10th November, were circulated in News Bulletin Vol 8. No. 7. It was moved Ted Dahms, seconded Rachel McFadyen that they be accepted. CARRIED

ELECTION

The following nomination was received at the last meeting and was circulated in News Bulletin Vol 8. No. 7, for associate membership.

Ms Natalie Newman
'Bunyula'
Kerry 4285

Ms Natalie Newman was elected to the Society by a show of hands.

GENERAL BUSINESS

The President made the following announcements:-

(1) The next meeting of the Society will be the Annual General Meeting on 9th March 1981. Nomination forms for election of office bearers for 1981 will be posted out in the near future. Completed nomination forms should be in the hands of the Secretary by 20th January, 1981.

(2) Fee slips have been included in the current News Bulletin (Vol 8. No. 7). The President pointed out that the Society runs on a calendar year and that early payments will help the Society's financial situation.

(3) The Society cards are on sale at the meeting at $1.50 per pack of the new ones and $1.00 per pack for the old ones.

Geoff Monteith, the Queensland Regional Councillor for the Australian Entomological Society informed the meeting the venue for the coming A.G.M. of the Australian Entomological Society would be held at SURFAIR and not Wayamba as stated on the Registration Forms.

MAIN BUSINESS

Notes and Exhibits.

A comparison of the tracks of the male & female Danaus plexippus L.

Meron Zalucki

Male and female D. plexippus were tracked around an experimental milkweed (Asclepias) patch using the method outlined in Zalucki et al., (1980). Representative tracks are presented and a full statistical analysis of these tracks provided. Males move with an average step size of about 2m (per 0.75s). Step sizes in the open (2.95m) are larger than those around a patch (1.12m). Moves of similar length tend to occur in runs which extend back at least 2 moves. Turns are symmetrical about the zero direction and males maintain their "present" heading under all local conditions (directionality > 0). Turn signs for successive moves are independent of each other. Females have an average step size of 1.2m, but this varies from 1.8m in the open to 0.8m around patch plants. Moves of similar length also occur in runs extending back up to 2 moves. Turns are symmetrical about the zero direction, females being directional in the open but turn much more within patches and around single plants (i.e. less directional). Subsequently, the distribution of turn sizes around patches has two modes, one at zero and the other around ± 180°. Turn sign is again independent of previous sign.

This class of information can be used to simulate monarch movement paths, and when combined with observation on egg laying, we can predict egg dispersions under any specified dispersion of plants.

M. Zalucki
School of Australian Environmental Studies
Griffith University
NATHAN. Q. 4111.

Zalucki, M.P., R.L. Kitching, D. Abel and J. Pearson, 1980. A novel device for tracking butterflies in the field. Ann. Ent. Soc. Amer. 73: 262-265.

DISCUSSION

Mr. Dave Merritt: You talked about an edge. Was it visual or olfactory?

Mr. Meron Zaluchi: I assumed it was a visual edge. I suspect olfactory cues become important at a very short distance i.e. when alighted.

Casting Meat Ant nests & Magnetic Termite mounds for Museum display

Geoff Monteith

At a Notes and Exhibits meeting last year I spoke of preliminary experiments with polyester resin as a material for casting the internal structure of nests of the meat ant, Iridomyrmex detectus (News Bulletin Vol 7, No.4, pp.47-49). Tonight I want to exhibit a

photographic record of our subsequent operation using the method to cast an entire colony of this ant for museum display purposes. I shall also illustrate, with colour slides and an actual finished cast, our trip to Cape York Peninsula to obtain display casts of giant mounds of the Queensland "magnetic" termite, Amitermes laurensis.

For the meat ant job a medium-sized, well formed nest in the Braemar State Forest on the western Darling Downs was chosen. Because the pebble-strewn surface of a meat ant's nest, with its regularly-spaced, prominent entrances, is so characteristic of this ubiquitous Australian ant, it was felt that any museum display illustrating its nest structure should present not only the subterranean configuration of galleries but also their relation to this striking surface landscape. For this reason the job was done in two stages: firstly a latex mould was taken of the whole external nest surface, and secondly the galleries were poured full of polyester resin and excavated after solidification of the resin.

The nest was first killed by rapidly sealing off all entrances after the ants returned to the colony at sunset and then injecting both chloroform and vapona aerosol into each entrance. Liquid latex was then sprayed over the whole nest surface using a compressor powered spray-paint apparatus. After the first couple of sprayed layers had solidified, additional layers of latex, reinforced with cheese cloth, were painted on until the latex layer was about 3 mm thick. This latex is then allowed to cure overnight into rubber. It can then be peeled off the ground in one large piece which has adhering to it a thin layer of the soil and pebbles of the original nest surface. Back at the Museum this piece of latex was then used to form the negative mould in casting a fibreglass positive image of the nest surface. When the latex is peeled off the final fibreglass cast the soil and pebbles lifted from the original nest remain adhering in their precise original pattern on the surface of the cast. This final cast is a low, domed structure 3 metres long and 2.2 metres wide perfectly resembling a meat ant nest complete with entrance holes.

After removal of the latex from the nest in the field the internal galleries of the nest were then filled with catalysed polyester resin by the simple method of placing funnels in the entrances and pouring it in. To illustrate the fact that each entrance hole of a meat ant nest leads to an independent complex of subterranean galleries different coloured pigments were added to the resin poured down each entrance. To our amazement (and dismay!) the ten gallons of resin we had brought for the job disappeared into the nether regions without any sign of filling the nest. A fortnight hiatus in the pouring then took place while additional resin was acquired from Sydney; after resumption of pouring we finally declared the nest full at almost 35 gallons.

The resin solidifies into hard, slightly flexible plastic within hours of pouring so excavation of the completed internal cast could commence almost immediately. This proved to be a massive task and occupied four men for a full 5 days. First a deep, circular trench was dug around the nest using picks and electric jack-hammers. This left a large block of soil containing the galleries standing as a raised island in the centre. Initial exposure of the resin galleries was undertaken using an "Aquablast" high-pressure water jet, but this proved damaging to the cast after the resin began to stand free of the soil. Thereafter, the excavation was carried out, Michaelangelo-fashion, by sweating men crouched in the trench wielding hammers and screwdrivers to pare away the clay from the complex convolutions of the gleaming, coloured resin cast. In the latter stages of excavation a Dexion frame with a steel mesh top was constructed around the nest. To this was wired the exposed portions of the resin cast, using numerous support points to spread the load on the frame. More anchor points were made to the frame as the last of the soil was dug away until, finally, the entire resin cast hung suspended in space beneath the frame. This whole unit was then winched from the crater-like pit remaining, loaded on to the back of a truck and carefully (9 hours for 300km) driven back to Brisbane.

At the Museum the resin cast was cleaned of remaining soil and reattached to a permanent metal support frame by concealed wire suspensions imbedded in the resin. With the nest surface cast in position above the resin cast of the subterranean galleries we can now display the complete external and internal features of an entire colony of the meat ant.

Our second job involved casting giant termite mounds for display. In selecting the type of mound to display it seemed obvious to choose the famous "magnetic" mounds. This phenomenon, where the mounds have a strongly flattened shape and all line up with their long axes running north/south, is only known from tropical Australia. Two species of Amitermes are involved. One of them, meridionalis, is restricted to the Darwin region, while the other, laurensis, occurs both in Cape York Peninsula and eastern Arnhemland. Outstanding examples of laurensis mounds occur in vast numbers on the grassy plains of the newly-declared Lakefield National Park on the southern shores of Princess Charlotte Bay in eastern Cape York Peninsula. At this locality our party of four spent ten days in June 1980, taking external casts of three separate mounds under permit from the Queensland National Parks and Wildlife Service.

The technique used on the termite mounds was basically the same as that used for the nest surface of the meat ants as described above. The whole mound is first sprayed and painted with latex reinforced with cheesecloth. To preserve the gross shape of the mound a rough fibreglass "jacket" is formed over the latex-covered mound. When set this is removed as two half shells after making a single incision in it running up one side and down the other. Then the latex is removed in two pieces, much like skinning a beast, after making one long cut along the same line as the jacket was cut. The two latex halves are then laid out upside down inside their respective halves of the fibreglass jacket, and in this position they can be transported safely by behicle. Considering the fact that the largest mound we cast was a little over 5 metres high it can be appreciated that a good deal of aerial agility on 12-foot ladders was required in the field during the latex operation.

Back at the Museum fibreglass halves were cast from each pair of latex halves and these were joined together to give display replicas of whole mounds. Due to transfer of surface material from the nest which adhered to the latex the replicas present the identical patterns and textures of new and old termite workings as seen on the surface of the original nests.

Using these methods we are now in possession of items which will enable the Queensland Museum to exhibit in a novel and effective way the size and complexity of structures made by social insects in Australia. The basic techniques are by no means new and have been used for years by Museums for display replicas of a great range of objects and substrates. However, we believe this is the first time it has been applied, on such large scale, to social insects. For their enthusiasm, skill and ingenuity during the various field work I am greatly indebted to preparators Terry Tebble, Rudy Kohout, Vince Salanitri, Howard Bowman and Bruno Hofer.

Dr. G.B. Monteith
Queensland Museum
Gregory Terrace
HERSTON. Q. 4006.

DISCUSSION

Mr. Chris Hagan: Do the nails ever split the fibreglass?

Dr. Geoff Monteith: No. We have not had this happen.

Mrs. Penny Sinclair: How do the termites react to this process?

Dr. Geoff Monteith: Termites were alive and well when the mound was unsealed after 3 days.

Mr. Chris Hagan: Did you have to do any finishing to the fibre glass?

Dr. Geoff Monteith: Very little. The mound came out almost perfect except for the occasional patch where the latex air pockets ruptured.

Mr. Fred Swindley: Have you tried the same process on the interior of the nests?

Dr. Geoff Monteith: The way the latex runs causes several problems which would make the process very difficult.

Practicalities of humidity control in experiments

Everything you never wanted to know and were afraid to ask!

Graham White

I have been investigating the effects of temperature and humidity on the biology of Tribolium castaneum. An experimental disaster resulting from difficulties with humidity control has made me aware of practical problems that the published literature does not deal with. These considerations may be of use to anyone about to start on similar work.

The two most widely used means of humidity control are by potassium hydroxide (Solomon 1951) or saturated salts (Winston and Bates 1960). The advantages of KOH are:

(i) constant humidity with temperature;
(ii) absorption of carbon dioxide; and
(iii) continuous range of humidities available.

The advantages of saturated salts are:

(i) constant concentration of solution, so continuous checking is unnecessary
and (ii) most are not corrosive.

SATURATED SALTS

The saturated salt method was chosen initially to avoid continuous monitoring of solution concentrations. The salts chosen from the data of Winston and Bates (1960) for their temperature stability were:

$NaNO_2$	60 - 65% RH
$Na_2Cr_2O_7$	50 - 55% RH
CrO_3	45% RH
$MgCl_2 \cdot 6H_2O$	32 - 33% RH
KCH_3COOH	20 - 22.5% RH

In a pilot trial at 22°C and 30°C using $NaNO_2$, CrO_3, and KCH_3COOH results were satisfactory. However, the full scale experiment using these salts under a range of temperatures from 20°C to 37.5°C went badly wrong because:

(i) grain moisture determinations indicated that the variation in humidity with temperature may have been greater than published data indicated;

(ii) in the dry humidity of an incubator, water was rapidly lost through the plastic container and required frequent replenishment;

(iii) some KCH_3COOH solutions were not saturated (the physical properties of this solution alter greatly near its saturation point making the preparation of a saturated solution difficult);

(iv) the CrO_3 solutions may not have been saturated as it was not possible to see the salt through the intense colour of the solutions, and the CrO_3 reacted with the wire mesh platform which held the insects out of the solution.

POTASSIUM HYDROXIDE

KOH humidity control has been used in a repeat of the major experiment, mainly because of the temperature stable humidity properties of the KOH. The biological results to date are satisfactory. The difficulties encountered have been in:

(i) Determination of concentration. This procedure is time consuming. The volumetric methods suggested by Solomon (1951) have not been sufficiently accurate - variation due to experimental error has been as much as the equivalent of 3% RH. Titration against HCl has been used satisfactorily.

(ii) Changes due to CO_2 absorption. The CO_2 and water released by the insects may alter the KOH concentration and thus the equilibrium humidity. Calculations of CO_2 and H_2O released by the 50 T. castaneum used in the experiments over 250 mls of KOH would result in a humidity change of less than 1% RH. This has been confirmed by titration of KOH on completion of development in some treatments - the change in KOH concentration has been the equivalent of a 0.5% to 1% change in RH.

(iii) Measurements of humidity. Humidity has been estimated using cobalt thiocyanate papers. However, these are considered accurate only to within a range of 5%. They have confirmed that humidities have been of the required order. A more reliable but indirect test has been through determination of moisture content of grain samples in the containers.

CONCLUSIONS

If humidity control within a broad range is required, the extra effort needed to use KOH would not be justified. However, if precise humidity control over a range of temperatures is required, then KOH would give the best results.

REFERENCES

SOLOMON, M.E. (1951). The control of humidity with KOH, H_2SO_4, and other solutions. Bull. Ent. Res. 42: 543-559.

WINSTON, D.W., and BATES, D.H. (1960). Saturated solutions for the control of humidity in biological research. Ecology. 41: 232-237.

G. White
Entomology
Dept. of Primary Industries
Meiers Road
INDOOROOPILLY. Q. 4068.

Modelling *Sitophilus oryzae* populations

Eric Sinclair

Among the projects in the Stored Products section of the Queensland D.P.I. are those to construct computer simulation models of stored products pests on grain farms (me), and in central grain stores (Graham White). These models are to summarize existing data, to direct future work, and to assist in the evaluation of various management strategies. Naturally a useful model must simulate realistic development and behaviour in the insect under consideration. Therefore one small part of the grain farm model is to fit together a suitable set of parameters to ensure that model insects are similar to their real world counterparts.

Through a process of trial and error, resulting in ever increasing complexity the following factors were included:- Adult and larval survival, oviposition rate, emigration rate percentage females in the population. These factors are modified by temperature and/or density. Temperature is included in the input data, and density of adults and larvae calculated by the computer nine times during each generation. The carrying capacity of the food source is constantly modified according to the number of insects that have used it. Surprisingly few of the published data on the species is directly applicable so much of the development has been involved with comparisons of model output with data observed for a population of *S. oryzae* in a 27 kg wheat bulk held at ambient conditions (Figure 1A). During this process it is important to ensure that model output for known parameters (eg. total migrants) is consistent with observed data. Unknowns are then varied, but in a way that is thought to be biologically possible.

One of the better versions of output is shown in Figure 1B. The general population development pattern is reasonable and as this aspect is only a small part of the total model it would be tempting to leave the work at this point. However, emigrant numbers are only 50-70% of those observed, and these are very important to the overall model. With the present parameters it is not possible to raise emigrant numbers by, for example, the simple expedient of increasing emigration rate or oviposition as these have quite marked density dependent effects on the source population. Whilst more work is required, especially a series of experiments to clarify some of the interactions, great care is needed not to fall victim to the modeller's disease of runaway complexity. This usually results in an enormous unrunable model derived after enormous monetary and temporal outlay.

Dr. E. Sinclair
Entomology
Dept. of Primary Industries
Meiers Road
INDOOROOPILLY. Q. 4068.

DISCUSSION

Mr. G. White: Are you not over-optimistic in expecting to refine the model further given that you have limited time to spend on it?

Dr. E. Sinclair: Yes - but as emigrant numbers are so important to farm populations some attempt to increase their numbers is necessary.

Dr. E. Reye: Do the population peaks correspond with generation periods.

Dr. E. Sinclair: Broadly they do. After the population stages has reached a maximum, generations are not seen as peaks however.

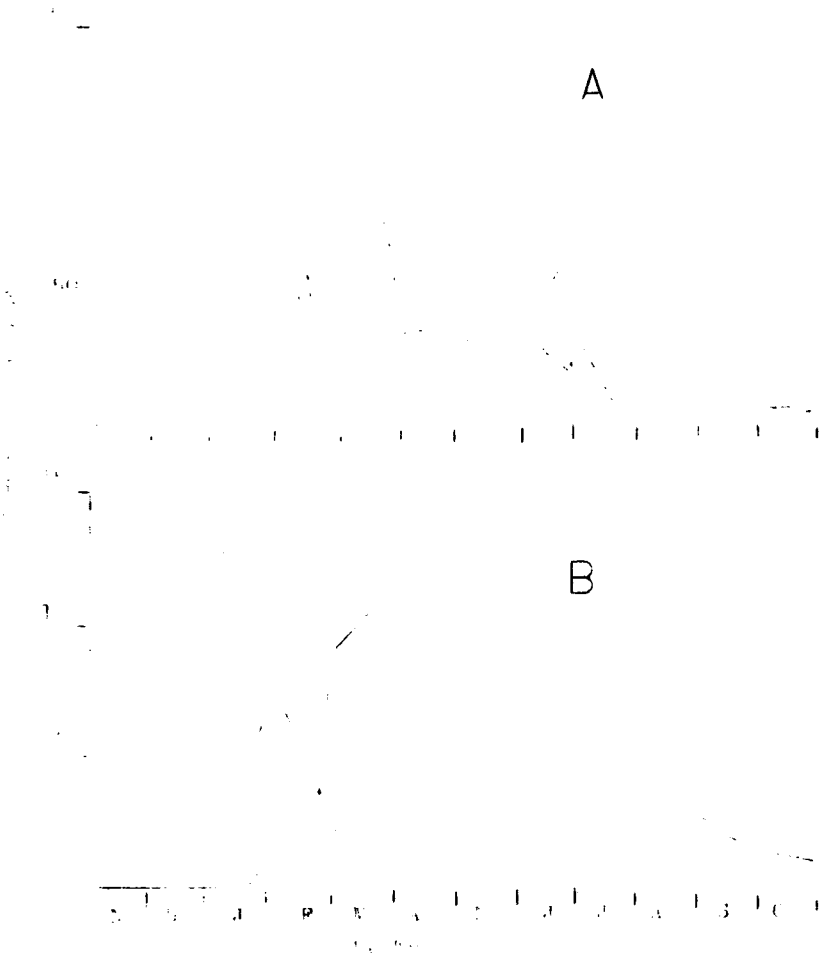

FIGURE 1: Adult Sitophilus oryzae numbers through one year; ·· source population, ------ emigrants. A observed, B modelled.

A Mexican Invasion

Rachel McFadyen

Parthenium hysterophorus, an annual composite plant, native to Mexico and the adjacent U.S.A., has become a serious weed in central Queensland since the early 1970's. The Alan Fletcher Research Station has a programme of biological control against Parthenium, including a 3 year study of insects attacking the weed in South America, carried out by Clyde Wild of the Alan Fletcher Research Station and terminating earlier this year. Concurrently, the British Commonwealth Institute of Biological Control under contract to the Department of Lands is studying the insects attacking Parthenium in Mexico and this project has been extended to 5 years, terminating in 1983. At present, we have 3 Parthenium insects at Sherwood, one of which, a stem boring weevil Listronotus setosipennis from Brazil, is still in quarantine. The other two, both from Mexico, are cleared for release in the field and are being shown here tonight.

Of the two Mexican invaders, the most colourful and the only one as yet loose in Queensland is the leaf-eating chrysomelid Zygogramma bicolorata Pallister. This was collected in Mexico by Dr. A. McClay, who did the preliminary host-specificity tests there and after permission was granted by the Commonwealth Department of Health, sent 2 shipments of beetles to Sherwood in August and September this year. The life history of the beetle is very simple; small yellow eggs in groups of 1 to 5 are stuck onto leaves, flowers and stems and hatch in 5 to 6 days. The larvae are rather slug-like, pale grey-green in colour and fairly well camouflaged. They feed at night on the leaves and spend the day in the leaf axils, among flower buds and similar protected sites. There are 4 instars and development is rapid, with larvae reaching full size in 16-20 days. Mature larvae enter the soil to pupate and may reach a depth of 20-25 cms before pupating inside a small chamber. In 10 to 14 days, the emerging adults burrow up through the soil and immediately search for Parthenium and begin feeding. Teneral adults cannot survive more than 3 days without feeding, but if well fed, mating and oviposition begins in 6 to 14 days. Adult longevity is not known but is at least 3 months and fecundity seems to be fairly high, about 1000 eggs per female (McClay unpublished report 1980 and McFadyen unpublished data).

As far as is known, development is continuous through the summer. During autumn, adults descend into soil below the plants, remaining there until higher temperatures together with spring rains, induce re-emergence and re-commencement of feeding and oviposition. It is hoped that in years such as 1980, when there is no spring rain, the adults will remain in the soil until there is rain, otherwise adults emerging when there is no Parthenium present will starve.

Host testing in Sherwood was completed quickly, but a requirement for further tests on sunflower delayed permission to release the insects, which was only granted on December 1st. The first releases were made near Emerald and further releases in Central Queensland are planned throughout the summer.

The second Mexican invader is much less conspicuous and is not yet out of the immigrant hostel at Sherwood. This is a small flower-feeding weevil Smicronyx lutulentus Dietz. Once again, preliminary testing was done by Dr. McClay in Mexico and the detailed host-specificity tests took place in Quarantine at Sherwood. Because of a long pre-pupal period in the soil and consequent high mortality, although the first shipment was received in December 1979, testing was not completed till September 1980 and although permission to release has been granted, we don't yet have enough beetles to make a release. However we hope to do so later in the summer.

Adult Smicronyx are very small, less than 2 mm, and feed on leaves and flower buds of Parthenium. Their longevity is not known, but is at least 3 months and after a pre-oviposition period of 14-20 days, females lay about 9 eggs a day. The eggs are inserted singly into unopened flower buds and the larvae feed initially among the disc florets and then inside a developing achene. Each larva destroys one achene, but may damage others and there appears to be a metabolic sink effect on the flower, so that loss to the plant exceeds the apparent damage. The mature larvae remain in the achene until this is shed from the plant, when they enter the soil to pupate. In Mexico, there are 2 generations a year and winter is passed as pre-pupal larvae which enter the soil in September-December, but do not pupate until March or April. Adult emergence occurs 9-10 days after pupation. The summer generation is more rapid, with larvae entering the soil in May-July and pupation occurring when heavy rain in September moistens the soil. At present, it is thought that the long pre-pupal period is temperature-dependent, taking 8-10 weeks at high temperatures and up to 6 months over winter, and that pupation of mature pre-pupal larvae then requires moist soil. (McClay unpublished report 1979, McFadyen unpublished data). In Monterrey, Mexico, the summer is very hot but fairly dry, with heavy rains in April and September, but in the wet summers of central Queensland, it is possible that there may be more than 2 generations a year. Smicronyx is unlikely to control Parthenium on its own, but if large populations can reduce seed production, this will complement the effect of other agents such as Zygogramma.

As the Mexican programme still has 2½ years to run, we hope to be introducing and releasing several more insects for Parthenium. Watch this space for further developments!

Dr. R.E. McFadyen
Dept. of Lands
SHERWOOD. Q. 4075

DISCUSSION

Dr. G. Monteith: If Parthenium hysterophorus comes from Mexico, why was Clyde Wild in Brazil?

Dr. R. McFadyen: When Clyde went to Brazil in 1977, there were 3 species of Parthenium recorded from South America, 2 native and endemic species and P. hysterophorus, which was thought to be also native. However, Clyde and other Lands Department staff concluded that the species from northern Argentina previously identified as P. hysterophorus, is not in fact P. hysterophorus, but is a closely related undescribed species. In this case, true P. hysterophorus would be native to Mexico and only present in South America as a recent introduction. However, some at least of the insects from the closely related South American species could be expected to attack true P. hysterophorus.

VOTE OF THANKS

The vote of thanks was proposed by Margaret Schneider who referred to the various topics as excellent value for time spent in gaining a first hand account of some of the problems which beset our colleagues. The vote of thanks was carried by acclamation.

The President thanked the organizers, in particular Meron Zalucki, for a very enjoyable Bar-b-cue before the meeting. He then closed the meeting and invited all present to coffee.

THE ENTOMOLOGICAL SOCIETY OF QUEENSLAND INC.

Annual Report for the year 1980

The Council of the Entomological Society of Queensland takes pleasure in presenting its Annual Report for the year 1980.

The Society's 58th year was an active one with attendance at monthly General Meetings fairly high although there was a noticeable drop in November - examination time? In October, Entomology and Plant Pathology held a joint meeting which was preceded by an informal gathering and fork dinner. The occasion was well attended and proved to be a most interesting evening.

During the year Council, once again, had to face the problem of rising costs which in the past had been offset by employing cheaper techniques in the production of the news bulletin. However, it has reached the stage where costs can no longer be absorbed by the Soc v and fees must rise to allow for inflation. The new fees for 1981 are:-

Associate	$ 5.00	Joint Membership	
Ordinary	$10.00	Ordinary	$15.00
Country	$ 8.00	Country	$12.00

The Entomological Society of Queensland awarded a prize this year in the Senior section of the Queensland Science Teachers Association Science Contest. A bursary of $25 was awarded to Miss Geraldine Tyson of Fairholm College for her exhibit entitled "Backyard Transects and Insect Life".

The resignation of Dr. E.N. Marks as Chairman of the Expert Committee on Mosquito Control prompted Council to review the activities of the committee. As the committee achieved its objectives early and has not met since November 1973 Council decided to disband the committee until such time as a similar need may arise.

Details of the year's activities together with reports by the Treasurer and Convenor of the Publications Committee follow.

(a) Membership

The number of members declined slightly despite the election of 16 new members during the year. There were 5 resignations and 25 terminations of membership under Clause 4(f) of the Constitution. Currently, there are 314 members representing 106 Ordinary members, 132 Country members, 49 Associate members, 10 Joint members, 5 Life/Honorary members and 12 Unfinancial members.

We deeply regret the death of Honorary Life Member, Dr Ian Mackerras and Mr John Weddell.

(b) Council Meetings

There have been seven Council meetings during the year at which the attendance was as follows:-

Dr. P. McFadyen	4	Miss J.F. Grimshaw	6
Mr. E. Dahms	5	Mr. B. Sabine	4
Mr. R. Wylie	6	Dr. R. McFadyen	4
Miss M.A. Schneider	7	Dr. E. Sinclair	6
Mrs. M.M. Harris	6		

(c) General Meetings

Eight General Meetings and a combined meeting with Plant Pathology were held during the year with an average attendance of 35 members and visitors. The Main Business of these meetings were as follows:-

March 10 — Presidential Address, Mr. R. Wylie - 'Eucalypt Dieback - A Disaster in the Making?'

April 14 — Dr. P. Boreham - 'Medical Entomological Safaris'.

May 12 — Dr. V.E. Davies - 'Taxonomy of Australian Spiders - a historical account'.

June 9 — Notes and Exhibits as follows:-
(a) Dr. B. Kay and Dr. P. Boreham - 'The Feeding Patterns of some Brisbane mosquitoes'.
(b) Eric Reye - 'A storage and retrieval system for small vials'.
(c) Eric Reye - 'An improvised New Jersey light trap'.
(d) Mrs. J. King - 'First record of Ascosphaera in Queensland'.
(e) Mr. R. Raven and Mr. B. Cantrell - 'An interesting case of parasitism of spider egg by a fly'.

August 11 — Mr. H. Standfast - 'Vectors of Bluetongue virus in Australia'.

September 8 — Dr. R.W. Taylor - 'Application of Modern Techniques in Descriptive Taxonomy of Insects'.

October 22 — Joint Meeting of Entomology and Plant Pathology
(a) Mr. J. Rogers - 'Developing Plant Resistance to Pests'.
(b) Dr. J. Irwin - 'Potential and Problems of Developing Plants for Disease Resistance'.

November 10 — Dr. A. Arthington and Miss D. Conrick - 'The effects of Sewage Effluents on the Insect Community of Bulimba Creek, Queensland'.

December 8 — Notes and Exhibits at Griffith University as follows:-
(a) Mr. M. Zalucki - 'A comparison of the tracks of the male and female Danaus plexippus L.'.
(b) Dr. G. Monteith - 'Casting Termite Mounds for Museum Display'.
(c) Mr. G. White - 'The practicalities of Humidity Control in Experiments OR Everything you never wanted to know and were afraid to ask'.
(d) Dr. E. Sinclair - 'Modelling Sitophilus populations'.
(e) Dr. R. McFadyen - 'A Mexican Invasion'.

TREASURER'S REPORT

The Society's financial situation improved significantly during 1980 principally as a result of the successful changes made during 1979 in the method for publication of the Society News Bulletin. In addition there has been a much appreciated increase in the promptness of members to pay subscriptions and this is reflected in the significant increase in subscriptions paid in advance i.e. those paid by 31.12.80 for 1981. Despite these improvements Council has reluctantly considered it necessary to increase some subscription rates for 1981 to offset expected cost increases due to inflation. Country membership rates remain the same at $8.00 and $12.00 joint membership but it was considered that those members who can more easily attend meetings have more opportunity to benefit from their membership and that an increase of $1.00 in fees for ordinary members and $2.00 for associate members would not be too burdensome. On current membership numbers these increases will provide an additional income of $220.00.

In February a further $500.00 was withdrawn from the General Account and placed in an Interest Bearing Deposit Account. In June one of the other two $500.00 Interest Bearing Deposits was transferred to a Savings Investment Account currently earning 9% per annum with money more easily obtainable on one month's notice.

The assets of the Society which cannot be expected to be realised have been closely examined and as a result, all the copies of 'Changing Patterns in Entomology' held and previously listed as worth $972.50 have been written off the accounts as have $507.60 worth of back issues of the News Bulletin. A maximum of 20 of any single issue of the News Bulletin is now included in the Society's assets. Similarly the high value of unfinancial members' subscriptions previously included in the assets has been greatly reduced by cancellation of membership of those members more than one year in arrears. These changes have markedly reduced the value of the Society's assets below that listed for the previous year but at the same time have made the figure a lot more realistic.

M.A. Schneider - Hon. Treasurer. 20.1.81.

Financial Statement for year ended 31st December 1980

GENERAL ACCOUNT

Balance 1/1/80	802.51	Aust.ent.Soc. Subscriptions	30.00
Subscriptions	2541.55	Transfer to Interest Bearing Deposit	500.00
Sales - Bulletins	1.00	Bulletin envelopes	343.35
Binders	7.50	Bulletin printing	1026.18
Cards	56.65	Bulletin Compiling, Stapling	134.00
Cape York Pen. Report	2.00	Bulletin Typing	155.50
Payment from Refreshment Fund for glasses	18.00	Public.Comm. Petty Cash	315.61
Interest - S.E.Q.E.B.	231.32	Address labels for Bulletins	61.20
Bank	99.86	Secretary's Petty Cash	63.99
		Treasurer's Petty Cash	19.18
		Bank Charges	27.48
		Duty Stamps	7.90
		Science Contest 1979, 1980	50.00
		December Barbeque Expenses	13.00
		Balance 31/12/80	1013.00
	3760.39		3760.39

LIABILITIES		ASSETS	
Subscriptions paid in advance	673.00	Subscriptions owing	108.50
		SEQEB Stock	2201.00
Accounts outstanding	71.00	Interest Bearing Deposits	100[illegible]
		Savings Investment Account	500[illegible]
Excess of Assets over Liabilities	6140.16	C.S.B. (General A/c & Perkins A/c)	1147.80
		Petty Cash	48.90
		Refreshment Fund	14.26
		Duty Stamps on hand	8.50
		Binders on hand (37)	92.50
		Journals on hand (336)	672.00
		Cards	151.50
		Crockery & Glassware	65.00
		Stationery on hand	300.00
		News Bulletins on hand	573.20
		Index to Minutes on hand	1.00
	6884.16		6884.16

Publication Committee Account

Balance 1/1/80	8.89	Postage	290.58
From General ACcount	315.61	Cash on hand 31/12/80	35.00
Sale of Bulletins	1.00		
	325.58		325.58

Secretary's Petty Cash Account

Balance 1/1/80	3.28	Suppers	39.70
From General Account	63.99	Postage	11.22
		Photocopying	2.45
		Balance 31/12/80	13.90
	67.27		67.27

Refreshment Fund

Balance 1/1/80	30.30	Refund to Perkins A/c for Crockery and Cutlery	32.58
Surplus	34.54	Refund to General A/c for glasses	18.00
		Cash on hand 31/12/80	14.26
	64.84		64.84

Treasurer's Petty Cash Account

Balance 1/1/80	0.78	Postage Stamps	4.18
From General Account	18.40	Duty Stamps	10.00
		Rubber Stamp	5.00
	19.18		19.18

Perkins Memorial Fund Account

Balance 1/1/80	31.22	Balance 31/12/80	63.80
Payment from Wine Fund	32.58		
	63.80		63.80

Publications Committee Report

1980 has been a hectic year. During its passage 8 issues of the News Bulletin have been produced. This apparent decrease in production is a result of the timing of the October meeting. As members may recall, the October meeting was on the fourth Wednesday (a slight change from the second Monday) and consisted of a joint meeting with the Plant Pathology Society and the Australian Institute of Agricultural Science. Since the Meeting was so late in the month, the October and November News Bulletins were combined as one issue, Vol. 8 No. 7.

However, not only were there fewer issues than usual, there was also a decrease in the number of printed pages, falling from 132 in 1979 to 108 in 1980. Part of this could be due to a shrinkage of the about people section. This shrinkage may be a reflection of funding cut backs, resulting in fewer visiting entomologists. Part also could be a result of poor detection work on the part of the convenor - or lack of reportage by the membership.

Another cause of 'thin' Bulletins is the decrease in the number of articles submitted, this resulting in only 9 being printed this year, compared with 14 in 1979. However, much pleading by the convenor has resulted in a late 'windfall' of articles at the year's end, and these will appear in the News Bulletins of 1981.

Material presented at the notes and exhibits meetings has been of a high standard and its broad range reflects the varied entomological interests of our members. It is rewarding to see the News Bulletin being used as a medium to unite this wide field of study.

I would like to thank those people who have contributed material to the News Bulletin (even if it hasn't been printed yet), and at the same time encourage others to do likewise. Remember! It costs us extra to print photographs, so these will only be run when there are sufficient to make up 'one plate'. However, drawings are more than welcome, even graphs, as these do relieve the boredom of a full page of small print, and result in no extra charges from our friendly printer.

I wish also to thank Eric Sinclair and Murdoch De Baar, who have helped with the distribution of the printed News Bulletin.

NOMINATIONS FOR 1981 OFFICE BEARERS

The following nominations for members of the Council and Publications Committee have been received by the secretary.

POSITION	NOMINEE	NOMINATED	SECONDED
President	Mr. E.C. Dahms	Miss M.A. Schneider	Mrs. M. Harris
Snr. Vice President	Mr. D.P.A. Sands	Mr. E.C. Dahms	Dr. G. Monteith
	Dr. L. Hassan	Mr. J. Shuttleworth	Mr. I. Fanning
Hon. Secretary	Mrs. M. Harris	Dr. P. Boreham	Dr. B. Kay
Hon. Treasurer	Miss M.A. Schneider	Dr. P. McFadyen	Mr. G. White
Councillors	Mr. B.N.E. Sabine	Mr. E.C. Dahms	Mrs. M. Harris
(3 positions)	Dr. R. McFadyen	Mr. E.C. Dahms	Mrs. M. Harris
	Dr. V.E. Davies	Mr. E.C. Dahms	Dr. G.B. Monteith
Publications Committee			
Convenor	Miss J.F. Grimshaw	Dr. R. McFadyen	Mr. E.C. Dahms
Members	Dr. E. Sinclair	Miss J.F. Grimshaw	Dr. I.D. Galloway
(2 positions)	Mr. M. De Barr	Miss M.A. Schneider	Mr. E.C. Dahms
Hon. Auditor	Mr. K.G. Cantrell	Mrs. M. Harris	Dr. B. Kay

Since there are two nominations for the position of Snr. Vice President there will be an election at the A.G.M. on March 9th. Election will be by ballot of members present at the meeting. Any member unable to attend may appoint, in writing to the Hon. Secretary before the meeting, a proxy to vote on his behalf. Such proxy must also be a member of the Society.

ABOUT PEOPLE

Ian Fanning of QIMR went on the Australian and New Zealand Schools Exploring Society Expedition to the Mt. Windsor Tableland N.Q. from mid-December to mid-January as deputy leader.

Also in the group, as leader, was Peter Johns from the Department of Zoology, University of Canterbury, N.Z. who, besides looking at Birds and Reptiles, is interested in the activities of ground-dwelling insects, especially the spacing and boundary interactions between ant or termite colonies.

Naomi Pierce a Ph.D. student from Harvard has been studying ant-lyccsid relationships, particularly on Jalmenus evagoras colonies near Brisbane. She is based at Griffith University. She will later study other colonies around Canberra in March, before returning to the USA in June.

Dr. Peter Mackay, lecturer in Biology at Capricornia Institute Rockhampton, recently visited Brisbane where he called in at the CSIRO Long Pocket Labs to discuss biocontrol of aquatic weeds with Mr. Don Sands, the DPI labs at Indooroopilly to see Dr. Ian Galloway and Bryan Cantrell to check the identification of the more common Queensland insects. He also visited Prof. Gordon Hooper at U of Q St. Lucia and Dr. Geoff Monteith and Ted Dahms at the Queensland Museum.

Meron Zalucki has submitted his Ph.D. on egg-laying movements in Danaus plexippus at Griffith University, and is now employed as a temporary assistant at the Alan Fletcher Research Station at Sherwood.

Craig Eisemann is now back at the University of Queensland working on a Ph.D. on the olfactory responses of the sheep blowfly, with a grant from the Australian Wool Corporation.

We welcome Natasha Riding (nee Rose) back in Brisbane after 18 months in Melbourne. Natasha is now employed in a temporary capacity at the Alan Fletcher Research Station, looking after Groundsel insects from Brazil.

Ted Fenner (previously in New Guinea) is now a Science Adviser (plant quarantine) with the Div. of Agriculture and Stock, Dept. of Primary Production in Darwin.

COMING ENTOMOLOGICAL SOC. OF QUEENSLAND MEETINGS

March 9th	Annual General Meeting and outgoing President's address by Dr. Paul McFadyen - 'The Biological Control of Weeds'.
April 13th	Don Sands. 'Biogeography & speciation in the Lycaenid butterfly tribe Lucini'.
May 8-10th	Annual Conference Aust. Entomological Society at Surfair.
May 12th	Perkins Memorial Lecture given by Dr. E. Evans. 'Recollections of a restless Naturalist'.
June 8th	Notes and Exhibits.
August 10th	Dr. David Rentz. No title yet.

APPEALS FOR EXCHANGE OF MATERIAL

COLEOPTERA

Aldon I.B. Spencer of 20 West Virginia Avenue, West Chester, Pennsylvania 19380 U.S.A. has a large collection of Coleoptera but lacks any material from Australia. To fill this gap he would be happy to exchange material for even the commonest "Aussie Beetle", his terms being that the specimens be entire and correctly pinned and labelled. He is particularly interested in Cicindelidae (Cicindelinae), Carabidae, Buprestidae, Coccinellidae, Tenebrionidae, Scarabaeidae, Lucanidae, Passalidae, Cerambycidae, Chrysomelidae and Curculionidae. When communicating with him he suggests that you state which families you are interested in then he can say what material he has to offer.

LEPIDOPTERA

A.R. Spokas, Jr. of 225 White Horse Pike, Atco, New Jersey 08004 U.S.A. has written to the Society seeking someone who will exchange Saturniidae with him. He can offer most North American and Mexican species in exchange.

Members interested in replying to the above are asked to write direct to the enquirer, not the Society, and are reminded of the restrictions of regulation 13A on the movement of insect material.

APPEAL FOR BULLETIN MATERIAL

While I have, at present, a little mound of material to put into forthcoming Bulletins, this can be rapidly depleted so if you have anything to tell us, let's hear from you. Notes for the about people section would be most welcome too. When material is typed, use A4 paper with margin widths of 1 cm and 0.5 cm.

BOOK REVIEW

W.M. Maskell's Homoptera: species-group names and type material by Lewis L. Deitz and Margaret F. Tocker. 1980. New Zealand DSIR Information Series No. 146, 76pp. ISSN 0077-9636; ISBN 0-477-06665-8.

Price N.Z.$3.00 (plus postage to Australia and Pacific $1.50). Available from the Publications Officer, Science Liaison Officer, Entomology Division, DSIR, Private Bag, Auckland NZ.

William Maskell was an Englishman who arrived in New Zealand in 1860 and remained there for the rest of his life. Firstly a farmer, he later became Registrar of the University of N.Z., a post he held when he died. He had a spare time fascination with microscopy and his interest in scale insects arose from this. He ultimately became one of the leading scale insect specialists of the 1800's.

Between 1879 and 1898, Maskell described over 300 scale insects, mainly from N.Z. and Aust. Unfortunately he never designated holotypes, so that much lectotype designation needs to be done. However this task is complicated by the fact that he often exchanged material with colleagues, so that his syntypic series are often widely scattered. This handbook was prepared in response to an obvious need to clarify this situation.

The book begins with a very interesting biographical section, followed by a section dealing with his collection. In the major section, all his species are listed by their specific epithet under the family to which they are presently assigned. The entry for each species provides a reference to the original description, type locality (if any), present location of material and a full bibliography. Lectotype designations are given for 28 species of Coccidae and new combinations for 8 Diaspididae. As such it no doubt unravels many of the knotty problems generated by Maskell.

Apart from the early parts, this book is unlikely material to fill a rainy afternoon, but its scientific content will no doubt be very useful to coccid taxonomists, and the authors are to be congratulated on the painstaking care that has obviously gone into its preparation.

* * * * * * * * * *

INSURRECTION

Beware all you coming taxonomists who
May never be knowing the troubles you brew.
You name all the insects with scrupulous care
While thinking your efforts are justified there.
You study and publish, and comes then the day
When names you concocted bring others dismay
The names are accepted for not very long
With other taxonomists claiming them wrong.
A deuce of a trouble, those rules that you breed.
We'll look at your labours, decide as we need.
You keep your views and your rules or decrees,
We'll follow our way and will act as we please.

G.H. Hardy
'Karambi', Letita St.,
KATOOMBA. N.S.W.

reprinted from "The Entomologist's Monthly Magazine" Vol.xcii, Nov.26, 1956

PRODUCTION OF A BACTERIUM AND A VIRUS FOR INSECT CONTROL

Bob Teakle

I recently had the opportunity to visit the small town of Wasco near Bakersfield in the fertile San Joaquin Valley of California where Sandoz Inc. produces the microbial insecticides, "Thuricide" and "Elcar". It is also the centre of the U.S. rose industry, and it was intriguing to see vast paddocks planted to grafted rose stock. There was also the occasional pump for extracting oil in the midst of the crops looking like a huge nodding orthopteran.

"Thuricide" and "Elcar" are now commercially available in Australia for caterpillar control. "Thuricide" and a similar preparation known as 'Dipel' are preparations of the bacterium, Bacillus thuringiensis and are effective against a variety of lepidoptera. "Elcar", on the other hand is based on a virus and is specific for Heliothis species.

The Bacillus thuringiensis bacterium is grown in a liquid medium in sealed 15,000 ga tanks with appropriate aeration and stirring. The bacterium multiplies by elongating and dividing, and eventually oval-shaped spares and diamond-shaped protein crystals form within the ageing bacteria. These are released when the cells break down and are harvested at the end of the fermentation. Water is extracted and the material formulated to produce a liquid or powder formulation for spraying on plants. The protein crystals are the essential ingredient and cause gut paralysis and break-down of the gut when eaten by susceptible insects. Cessation of insect feeding is rapid, and this and its non-toxicity to humans (and beneficial insects) has led to its widespread use as a pre-harvest treatment on cabbages and related crops in the United States.

The Heliothis virus for "Elcar" is produced in live H. zea larvae grown on an artificial diet in the laboratory. Working at capacity they can produce 200,000 larvae per day. At the appropriate stage of larval development virus is injected onto the diet and dead and dying, virus-infected larvae harvested several days later. The virus in the insects is formulated into a wettable powder which is standardised by bioassay using H. zea larvae and checked for undesirable contaminants. "Elcar" is mainly used on cotton where its specificity for Heliothis larvae means conservation of predators and parasites and minimal disruption to natural control on the crop.

Sandoz have produced other pathogenic microorganisms, including viruses and a protozoan, for experimental use. Some of these may also eventually become available for highly selective and environmentally non-harmful pest control.

R.E. Teakle
Entomology Branch, D.P.I.
INDOOROOPILLY. Q. 4068.

ANZAAS MEDAL NOMINATION

The Council of the Entomological Society of Queensland has, this year, nominated Dr. E. Marks as their candidate for the ANZAAS Medal. The recipient of the medal will be decided at the Annual General Meeting of ANZAAS at the 51st Congress in Brisbane. The Congress runs 11-15th May.

The grounds for the award are services in the advancement of science in Australia and/or New Zealand. Not only is significant contribution within the scientific field required, but also contributions beyond the usual professional activities. Last year's medal recipient was Frank Fenner (microbiology/virology).

NOTICE OF NEXT MEETING

The next meeting of the Entomological Society of Queensland will be held at 8.00 pm on Monday, March 9th, 1981 in room 323 of the Hartley Teakle Building, University of Queensland, St. Lucia, Brisbane. The evening's business will be as follows:

(i) Presentation of the Annual Report for 1980.
(ii) Presentation of the Financial Statement for 1980.
(iii) Election and induction of the President, Council and Publications Committee for 1981.
(iv) Presentation of the Presidential Address by the retiring President Dr. Paul McFadyen entitled "Biological Control of Weeds".

THE SOCIETY

The Entomological Society of Queensland is an association of over 300 people with a professional or amateur interest in Entomology. It is dedicated to the furtherance of Pure and Applied Entomological Science and, since its inception in 1923, has promoted liaison amongst entomologists in academic, private and governmental institutions. It has a concern for the conservation of Queensland's natural resources. Further information is available from the Honorary Secretary at the address given above.

MEMBERSHIP

Membership is open to anyone interested in Entomology and entitles the member to attend monthly Society meetings, held on the second Monday night of the month and to receipt of the News Bulletin. There are three classes of subscription membership:
Ordinary: persons residing in the Brisbane area ($9.00 p.a.)
Country: persons residing outside Brisbane ($8.00 p.a.)
Associate: persons not in receipt of a full salary ($3.00 p.a.)

THE NEWS BULLETIN

The monthly News Bulletin reports on the Society's monthly meeting, keeps members informed of Society events and news, and provides a vehicle for debate and discussion. Contributions in the form of articles, notes, letters, news clippings and photographs are always welcome, and should be sent to the Convenor of the Publication Committee at the address given above. The deadline for contributions is the Wednesday following the monthly Society meeting.