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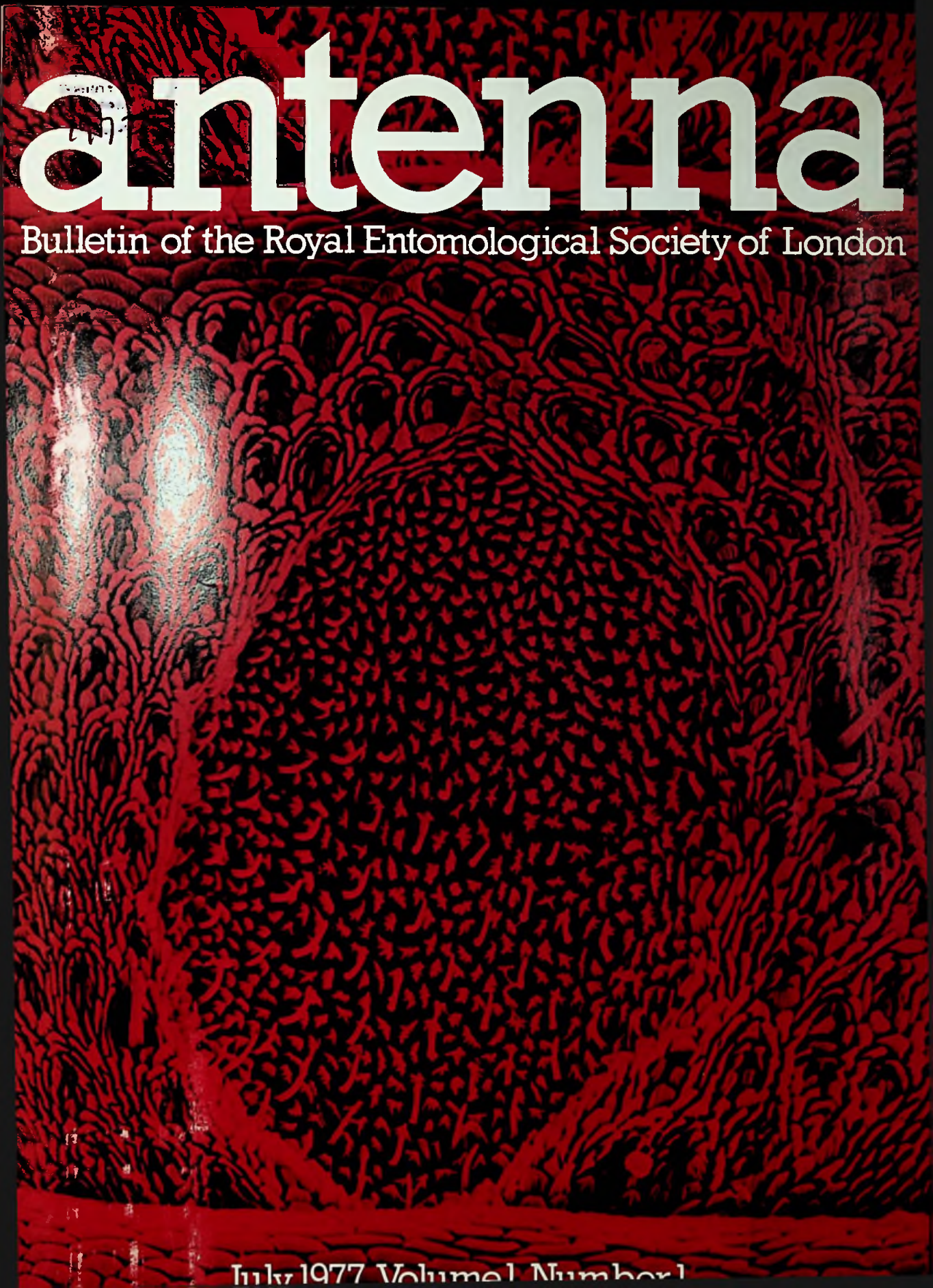
Bulletin of the Royal Entomological Society of London



July 1977 Volume 1 Number 1

Royal Entomological Society of London

Patron: Her Majesty The Queen

The Royal Entomological Society of London is a scientific Society founded in 1833 and incorporated by Royal Charter in 1885 for the improvement and diffusion of Entomological Science exclusively.

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Journals of the Royal Entomological Society of London

Ecological Entomology continues from *Transactions of the Royal Entomological Society of London*, founded in 1834. Published quarterly at an annual subscription of £15.00 (U.K.), £17.50 (overseas), $47.50 (North America), post free. Topics covered by the journal include: field biology and natural history of terrestrial and aquatic insects; inter-relationships between insects and host plants, other animals and pathogens; insects and weather; migration and dispersal; adaptations for survival in unfavourable seasons and habitats; the size and natural regulation of field populations; specific diversity and spatial disposition; rhythmic behaviour of populations; field responses to behaviour-controlling chemicals; environmental and integrated control of pest populations; description of ecological methods and apparatus; ecological aspects of insect archaeology.

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Subscriptions and correspondence concerning back numbers, offprints and advertising for the three principal journals of the Society should be sent to the publishers Blackwell Scientific Publications, P.O. Box 88, Oxford.

Antenna (Bulletin of the Society) continues from the *Proceedings*. Published quarterly at an annual subscription of £4.00 (£2.00 for 1977), post free. This journal contains entomological news, comment, reports, reviews and notice of forthcoming meetings and other events. While emphasizing the Society's affairs, *Antenna* aims at providing entomologists in general with a forum for their views and news of what is going on in entomology.

Subscriptions and correspondence concerning advertising in *Antenna* should be sent to its Business Manager, the Registrar, 41 Queen's Gate, London SW7 5HU. All other correspondence concerning *Antenna* should be addressed to the Editor of *Antenna*, at 41 Queen's Gate.

Additional publications (details from the Registrar, 41 Queen's Gate, London SW7 5HU.)

Symposia. Nos. 1–3 were published by the Society; Nos. 5–8 are published by Blackwell Scientific Publications.

Handbooks for the Identification of British Insects. This series now covers many families of various Orders. Each Handbook includes illustrated keys, together with concise morphological, bionomic and distributional information. A full list of Handbooks and Order Form is available.

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Volume 1 Number 1, July 1977

Editor: Peter Hammond
Assistant Editors:
A.E. Stubbs and R.I. Vane-Wright

Bulletin of the Royal Entomological Society of London

Contents

Not only a House Journal . . .

When founded in 1833 the Royal Entomological Society of London was one of very few societies devoted specifically to the science of entomology. Today, it is one of many. Although not the only entomological society in Britain, it now, like the larger societies in other countries, plays an important national role. It is undoubtedly British. Nevertheless, by tradition stemming from its long history, the RES continues to be an international society.

Perhaps more directly than its other publications, *Antenna*, the new Bulletin of the RES, will convey an impression of where the Society stands today. We expect it to reflect the Society's vitality, and the broad scope of its activities, both national and international. It will provide opportunity to advertise these activities and will hopefully, by the way, attract new membership.

The name of the new journal—*Antenna*—a name with what we hope will be appropriately vibrant overtones, symbolizes its function as an organ of communication, among entomologists. We expect *Antenna* to fulfil most of the functions of the former *Proceedings*; certainly, it will contain all important news (meetings, new publications, etc.) of the Society's affairs. Beyond this, although based in London and responsive to the local interests of a large British membership of the RES, we wish to place no particular geographical or other limitations on contents. We shall simply aim to inform and entertain our readership with news of what is going on in entomology. Where possible we intend our 'style' to be light. There will be room for the humorous, if the humour is not strained for, and the idiosyncratic. Although designed to treat the topical (in as much as this can be achieved in a quarterly publication), we shall not only deal with the strictly ephemeral. Indeed, we hope that the average reader will find it useful to keep his latest *Antenna* handy, on his desk, or in his brief-case. When overtaken by a new issue, we hope that those contents which are to be referred to rather than read will help in finding the previous *Antenna* a place on the shelf, rather than in the waste-paper basket.

However inevitable, we lament the increasing compartmentalization, within entomology, of professional studies, where those in different 'disciplines' operate independently from and largely unaware of each others efforts. We hope, and not just in our *Society News* and *Diary* sections, to provide some common ground. For example, one area where many entomologists (professional and amateur) meet is at the frontier between ecology and taxonomy; this area forms the basis for our section on the *British Insect Fauna*.

In this issue of *Antenna*, Fellows of the RES will find their opinions canvassed in various ways. We hope that views concerning the Society's role will receive some airing in our pages: Should the RES do more to cater for the interests of applied entomologists? Is the Society decisive enough in its stance on conservation issues? Are the Handbooks too esoteric? We hope that advantage will also be taken of the forum which *Antenna* provides to express views on more general entomological 'issues' of the day. We expect that the space occupied in this issue by an editorial and by the 'Presidential remarks', will normally be devoted to correspondence.

The topicality of *Antenna*'s news, and the quality and range of its contributed letters and articles will depend very largely on the response of its readership. Its editors, in their turn, will do their best to establish *Antenna* as not only a 'House Journal' but a periodical which entomologists will look forward to reading.

Peter Hammond: Editor
1 June 1977

Correspondence: From the President

It is difficult to understand the urge to travel to other planets in the hope of finding those little green men, when we have perfectly good candidates here on Earth, antennae and all. I refer, of course, to the insects, those strange beings so different from ourselves and our fellow vertebrates, that were already a going concern long before we intruded. The insects, with their external skeletons and complex mouthparts, their six legs, one or two pairs of wings and, above all, the unorthodox way in which many of them grow up, are far stranger than anything that could ever be thought up by man, even in his most imaginative flights of fancy.

These strange fellow inhabitants, green or not, are found almost everywhere: they inhabit the surface and burrow deep within the soil; they live both on and in fresh waters and, above all, they are present in the air, actively flying or drifting even over the oceans. Hardly a plant in the garden or field, scarcely a tree in the forest is without its associated insects. Human habitations too provide shelter and food for insects, some conspicuously flying round the light, others less conspicuously chewing away at our precious books or even the very structure of houses themselves. Yet others, with seeming consummate skill, pushing infinitely refined hypodermic needles into the very lumen of our capillaries and getting away with a drink of fresh warm blood.

Insects are everywhere from the high arctic to the tropics. J.B.S. Haldane once described the weevil as God's favourite animal, so many variations are there on the curculionid theme. But for sheer numbers of individuals and exploitation of every habitat, I often think that ants must be counted a close rival. Over much of the world it is almost impossible to touch any vegetation, whether the limb of an isolated tree in open savanna or a blade of grass at the edge of a tiny island, without a column of ants immediately invading one's arm.

Insects, then, are ubiquitous, with vast numbers of individuals in the cooler regions and vast numbers of species in the tropics. Their strangeness has invited our curiosity and attention from earliest times. They are the ideal subjects for studies on behaviour, cytology, development, ecology, endocrinology, flight, genetics, growth, physiology, population dynamics, sociology . . . and so on. But insects can be creatures of great beauty in themselves, both in form and function: butterflies are surely unsurpassed by anything in nature, not even among plants or birds; and what could be more fascinatingly beautiful than the movements of a dragonfly hawking over a summer pond.

Insects, however, have their dark side: they compete with us for our food. They bring about such gigantic losses of the crops we cultivate as to threaten our livelihood, not only during the growing period of these crops, but also during storage after harvesting. And these problems multiply as we intensify our effort. Insects, too, still bring disease and suffering to untold millions; it is sobering to reflect that, apart from starvation (also largely an entomological problem) malaria alone still ranks as the most important killer of mankind, destroying about one and a half million people every year, and bringing misery to countless others.

If the appalling economic and medical problems resulting from these rivals are somewhat daunting let us not forget for a moment the benefits that insects also bring. These are not marginal; our very existence depends on them: flowering plants, or at least a very high proportion of them, would not be present today were it not for the activity of insects. Quite apart from its economic importance this unlikely association between two such disparate groups of living creatures is a never ending source of wonder.

It was to foster the study of these strange, sometimes beautiful, sometimes sinister but always interesting and often informative fellow beings that the Entomological Society of London was founded nearly 150 years ago. And it is to further these studies that the Society continues to flourish today. But the Society was also created to bring together those of us who share these interests, whether in our spare time or as paid professionals. Today, with an increased number of Fellows, many of whom live and work abroad, this aspect is even more important. *Antenna* seeks to fulfil this want.

Antenna replaces the former *Proceedings*; it is a bulletin aimed not only to cover the regular meetings of the Society, but also to bring matters of entomological interest to the attention of Fellows wherever they may be. It will serve as a link between Fellows, providing correspondence columns for those who wish to air their views or bring certain matters to the attention of others. It will also provide news of Fellows and act generally as a vehicle of communication and exchange of ideas. I congratulate the editor, Peter Hammond and his able assistants, Alan Stubbs and Dick Vane-Wright, and all who have had a share in the planning of this new venture, and wish *Antenna* the success it clearly deserves.

J.D. Gillett: President

NEED WE BE SUCH UNMITIGATED BORES?

Miriam Rothschild Ashton, Peterborough, England

My children used to ask me how science differed in *my day* from theirs. After reflection I decided that in the 'twenties we still wrote papers for other people to read, whereas today we write them for ourselves, with one eye hopefully on the citation index and the other on tenure. Not unnaturally journals have become reference books and have ceased to provide reading matter. Furthermore it is much easier to sift through one's notebooks and compile tables, graphs and provide mass spectrographs than to write readable, let alone polished, English. (True some editors find it difficult to fit the correct captions to the graphs in question—but apart from the author only the chosen few are capable of spotting such transpositions.) Moreover, with the co-operation of the BBC, we now get our natural history thrills via an ingenious tank in the studios of Oxford Scientific Films.

When I was a student at the Plymouth Marine Laboratory, that superb protozoologist, Sister Monica, once remarked during the tea break that her Mother Superior was so tolerant and broadminded that she even allowed her to read *Nature* in bed. Dear Sister Monica! Today, unless she suffered from an uncomfortably masochistic streak, she would scarcely select *Nature* for bed time reading. Maybe that distinguished journal is now well above our heads, but is it really necessary to edit out every trace of individuality from the 1977 scientific papers and produce something equivalent to that variety of homogenized milk served up in American hotels? I doubt it. Editors underestimate their readers. On this point I find myself in constant conflict with authority. Thus, for instance, when the proofs of a flea article arrived from the States I noticed the deletion of 'genesis' from the phrase 'The genesis of parasitism is opportunity' and the substitution of the word 'basis'. Quite apart from the Editor's questionable interpretation of this apparently inadmissable term, I was annoyed at the inherent implication behind this blue pencil. I therefore cabled: 'Even atheistic American physicists must have heard of genesis'. The offending word was then put back. More recently I noticed that 'the perambulating habits and catholic tastes' of the larvae of *A.caja* had been deleted by a British editor—because of suspected secular undertones? —and a sober '. . . encounter during feeding' substituted. But with time I have lost some of my fighting spirit and, grieving for the dreary level to which the Woolly Bear was reduced—for who has not marvelled at the turn of speed displayed by this versatile animal galloping across the motorway?—I refrained from further action.

The attitude of the modern editor on style and presentation was summed up for me by an admonitory note I received rejecting one of my own contributions. I quote verbatim: 'Certainly it does not seem to have occurred to the author that a sober, monosyllabic and pedestrian representation of one's data is a courtesy'. How right he or she was! It is now quite impossible to recognize a writer by his or her individual style, although this is so agreeable—like recognizing a long lost friend in a crowd! I once counted five 'indeeds' on the first page of the conclusions of a brilliant scientific exposé. I cherished every one of them. Today, of course, all would have been wearily deleted by a cost-conscious editor.

Abuse, as well as individuality, has been expunged from formal scientific writing and with it has gone much of the liveliness of the proceedings. It was not unusual a hundred years ago to find one's classification described as 'utterly unscientific hotchpotch' and the text as 'weak, rambling and inaccurate'. Entomologists in those days had a fine flow of invective motivated by enthusiasm, conviction and righteous indignation. Today abuse and personal animosity can seep through only if carefully camouflaged. I noticed that one geneticist categorized another as a middle-class butterfly hunter. The bitter implications probably escaped the editor, but I had once been brought face to face with the New Invective in Paris. After a collision between two taxi cabs my rightly incensed driver, searching for the worst insult in the vocabulary of the proletariat, yelled 'You species of *architect*!' Today, enlightened, he would probably change this to 'Lepidopterist!' But in the older journals there was no need to be so subtle or restrained. Even the paternalistic president of the Entomological Society, Professor Poulton, was occasionally outspoken: 'It is unfortunate that Dr Gerould's fine memoir should be marred by hasty criticism . . . based on an imperfect knowledge of the subject.'

Nothing, as we know, is as aggravating as censorious misquotation of one's own papers. Today, we accept this tamely enough, and even wonder uncertainly if our original presentation may have been a trifle obscure. Authors in the good old days had no such misgivings. Dr Dixey, incensed by Guy Marshall's dubious pronouncements on Müllerian mimicry commented: 'Mr Marshall has—I am sure quite unintentionally—given so complete a misrepresentation of my published statements that I can only suppose him to have omitted to make himself fully acquainted with them." He continued in this hard hitting vein for about ten pages '. . . his remarks in this connection hardly seem worth the making . . . are valueless as a support for his

position . . . admissions which utterly undermine his case . . . is laboriously under the error of which he accuses his opponents' and so on, until he sums up: 'Mr Marshall has now shot his bolt: it has failed.' The subject of mimicry invariably roused passions in the Edwardian breast, and it is curious that even today it is an emotive subject. But now authors content themselves by damning with faint praise, while studiously avoiding adequate reference to their rivals' publications.

Sentiment, and the profound love of nature which characterize the rather naïve and ebullient entomologist of the Victorian era is also banned. It is too embarrassing: 'Our *scripta* is all pink and quaker grey—a lovely blossom tossed loose from the spray of spring. *Scripta* is the *deresa* we all hope to catch in paradise'. The writer of that period mixed up his shrewd and penetrating observations with amused sympathy for the insect world: 'It seems that to get ants properly intoxicated with spirit for experimental purposes is no easy matter, some recovering too quickly and other remaining so thoroughly drunk as to come under the rank of incapables. The sober individuals seem puzzled at finding their friends in such a condition. As a rule they picked them up and carried them to the nest, while strangers they threw into the water and drowned.'

The human aside can be the salient point which sticks in your mind—the peg on which to hang the factual information. Dr Longstaff, whose wife seems to have accompanied him on many arduous collecting trips, frequently consulted her and records her reactions. Strangely enough he does not comment on a hint of sexual dimorphism in their mutual appreciation of butterfly scents. Here are some of their observations:

	Scents recorded	
Species	*Dr Longstaff's opinion*	*Mrs Longstaff's opinion*
Tirumala septentrionis (Ceylon)	Stephanotis	Ginger
Colaenis cillene (Jamaica)	Tar, Canada balsam pure carbolic acid	Jasmine
Nepheronia ceylanica (Ceylon)	Freesia	Frangipani
Ornithoptera darsius (Ceylon)	Cinnamon	Rose scented hair oil
Papilio polydamus (Trinidad)	Musty hay or straw	Rue
Terias euterpe (Jamaica)	Clove pink	Very slight sweet Jasmine or syringa
Dione vanillae (Jamaica)	Like a stable	Offensive

I notice, however, that (with the exception of *D.vanillae*) he gallantly avoids asking her opinion on those species smelling of horse urine, pigs, acetylene, cow dung or the kitchen sink. . . .

The old journals also reveal, apart from the sheer talent and perspicuity of the writers, the sacrifices and hardships endured by the Empire entomologists, who arouse both our respect and admiration. Their letters to fellow collectors at home were, fortunately, often printed at length. One long epistle from that unluckiest of men, P.A. Buxton, brought home the point: 'Early in the morning when the natives dig up their crops the butterflies come in thousands for the first half hour, they are more like a swarm of bees than anything else . . . There is another side to all this. I went out myself with as fine a constitution as any man ever had. I lived perfectly temperately and the result is for the last eight weeks I have been laid on my back on the borders of eternity. Let anyone count the cost.' Dollman, even more unfortunate, sailed home after his wife died in Africa, to battle with sleeping sickness and attempt to arrange his massive collections in the little time left to him. These communications add another dimension to the description of new species and the bionomics of butterflies.

Nothing, of course, dates so lamentably as humour. But I doubt if this justifies the severe attitude of the 1977 editor, even if the gentle pleasantry of 1901 leaves a look of blank incomprehension on our faces. I like Aristotle's fleas which 'skipped so merrily in victualling houses' and also their 'speculative jumping' which, so Waterston reflected several hundred years later, played an important role in their brief lives.

I cannot think of any journal which would today print Lord Walsingham's first entomological observation: 'I have found out that the caterpillar's hind feete are different from its frount ones'.

I am prejudiced perhaps, as in addition to my florid style, I often find myself in editorial hot water for introducing the odd joke . . . On one occasion I tried to enliven a particularly dreary paragraph on museum mislabelling by citing the substitution of fornicarium for formicarium. The editor was not amused. Out! (However, years later I guessed that N.D. Riley would let it slip by.) This intransigent attitude to light heartedness in even semi-semi-scientific articles is a little puzzling. One of my children (then aged twelve), aided and abetted by her mother, once submitted a contribution titled: 'Romance and the Rabbit Flea' to an entomological magazine. The nonsense tone of the article was set by the caption to one of the plates

depicting sperm waving synchronously and gloriously in the testis of a rabbit flea: 'Advert for mermaid's hair tonic?'. In this instance the editor accepted our contribution without hesitation, but the referee was appalled and wrote a sternly reproving letter. 'I have no doubt the author's humour will be much appreciated, but have you considered the effect of this type of article on non-English readers? In my view the picturesque phrase "cutting off the tongues of fleas" is discourteous—consider the trouble it will cause the average German or Italian reader'. Truly the mind boggles at the thought! At this moment the referee's self-confidence apparently faltered, for he sought support for his views elsewhere and added, 'I have consulted Professor X and Dr Y and they both agree'.

Of course the complaint that entomological publications are unspeakably dull is not new. Seventy years ago Canon Fowler was rumbling and grumbling because 'we are suffering from a plethora of facts' and 'a damping down of our speculative faculties'. Today when we are so harassed, and so brain-washed, and so deflated by the sheer weight of printed matter which descends upon us, how could we possibly find time to read the philosophical maunderings of our peers? The idea is ridiculous and anachronistic. We have no choice but to stick to the hard facts, presented tersely, impersonally and unambiguously, and to choose our key words with the care and respect due to the computer. Nevertheless, I for one, would dearly love to find the occasionally inebriated ant lubbocking its way through the pages of Environmental Entomology.

ENTOMOLOGY AT FURZEBROOK RESEARCH STATION, DORSET, ENGLAND

M.G. Morris Furzebrook Research Station (Institute of Terrestrial Ecology), Wareham, Dorset, England

In 1975 Furzebrook celebrated its twenty-first birthday as an ecological research station. It is now one of eleven research stations of the Institute of Terrestrial Ecology formed from the Research Branch of the Nature Conservancy when that body was 'split' in November 1973. ITE is one of the component institutes of the Natural Environment Research Council.

Furzebrook House was acquired by the Nature Conservancy in 1952, altered to provide laboratories, and first occupied in June 1954. Dr M.V. Brian was Officer-in-Charge from that time until April 1976. Furzebrook is situated on the edge of the Isle of Purbeck, three miles south of the small town of Wareham. The location owed much to the Nature Conservancy's first Director-General, Captain Cyril Diver, CB, CBE, whose well-known research at Studland Heath was carried out during the 1930s. A 'Diver Room' in his memory was erected at Furzebrook in 1971, through the generosity of Mrs Diver. The room houses Captain Diver's manuscript records, diaries, collections and library and is of great value to ecologists working in the Purbeck area of Dorset.

Dr M.V. Brian has been studying the ecology of heathland ants since 1954. The number of workers in his team has varied, but is currently three. In addition, Dr G.W. Elmes works independently on the ecology of *Myrmica* species, and Dr Brian currently supervises two research students. Work began originally on the distribution of the ants *Lasius niger*, *L.alienus* and *Tetramorium caespitum* on Hartland Moor National Nature Reserve. It was found that *L.niger* tends to live in low, wet, cool, grassy heathland and *L.alienus* in the higher, drier, warmer and more sparsely vegetated areas. *T.caespitum* tends to live in the zone with intermediate characteristics and to exclude both species of *Lasius* from this area.

Investigation of the autecology of the different species showed that *T.caespitum* is well adapted for life on southern English heaths. It is predominantly a seed-feeder, particularly on seeds of heather (*Calluna vulgaris*), which it stores underground. *Lasius alienus* feeds mainly on soil insects and aphides. It survives in competition with *T.caespitum* through its mobility and the ability to found colonies in less favourable habitats, in particular those with sparse vegetation. *L.niger* is also an insect feeder but is more tolerant of cold and wet weather; it is an aggressive species and one which is well-adapted to the British climate and can exist in areas too wet for the other two species.

More recent work has investigated the population structure of different ant species, with particular emphasis on caste determination and the effects of queens. *Myrmica rubra* has been studied intensively. The effects of burning on the distribution of colonies and on competition, both intra- and inter-specific, have been investigated. Currently Mr A.M. Abbott is working on the feeding biology of ants and Mr B. Pearson on their isoenzyme systems, both under Dr Brian's general supervision.

Dr Elmes has been investigating the comparative ecology and population structure of different species of *Myrmica*. He is particularly interested in the occurrence of miniature queens in certain nests of some species. These 'microgynes' have intriguing implications in the evolution of social parasitism amongst ants. The work links with that of Mr Pearson.

The ecology of *Myrmica* species is also extremely relevant to the work of Dr J.A. Thomas, on the ecology and conservation of the Large Blue butterfly, *Maculinea arion*. Dr Thomas began studying the butterfly in 1972 from Monks Wood Experimental Station, where he had previously investigated the population ecology of the Black and Brown Hairstreak butterflies (*Strymonidia pruni* and *Thecla betulae*). The Large Blue is now so rare in Britain that it was reduced to less than 40 adults in 1976. Working in part under contract to the Nature Conservancy Council, Dr Thomas has confirmed that the larvae feed on the brood of *Myrmica sabuleti* and (probably less satisfactorily) on that of *M.scabrinodis*, and has shown that these two species of ants flourish mainly in very short, grassy turf. He has also shown, from detailed population studies, that the most significant mortality of the species occurs when the larvae are in the ants' nests. In collaboration with the owners of the site and the Nature Conservancy Council he is currently advising on the management of the site and adjacent ground to which it is hoped the Large Blue will spread eventually. In the long term it is hoped to rehabilitate sites where the butterfly previously occurred and to reintroduce the species there.

Mr M.J.L. Skelton is currently undertaking identification of macrolepidoptera in an extensive survey of Scottish coastal sites undertaken under contract for the Nature Conservancy Council, but he is expected to start work shortly on a joint project with Drs Thomas and Elmes on the ecology of *Myrmica sabuleti* and *M.scabrinodis*.

Heathland studies, always a feature of research at Furzebrook, were strengthened by the appointments of Dr P. Merrett (1961) and Dr N.R. Webb (1967) to work on the

[*Continued at foot of p. 8*]

ENTOMOLOGY AT LIVERPOOL POLYTECHNIC

I.D. Hodkinson Dept of Biology, Liverpool Polytechnic, Liverpool, England

Teaching

Since 1966 the Department of Biology has been offering a four-year sandwich degree course with Honours in Applied Biology. The course is organized on a modular basis with students in their last two academic years selecting their programme of study from four main areas, namely Crop Protection, Ecology, Microbiology or Biochemistry. A range of secondary subjects serve to link the main modules and to broaden their themes.

A large part of the undergraduate Entomology teaching is contained within the Crop Protection course, which aims at providing a firm basis of study in the classification, biology and control of pest species. However, Entomology figures significantly in other main or secondary modules, including Ecology, Population Dynamics, Biocide Science, Soil Science and Resource Management.

An integral part of the degree programme is the 'industrial training' period during which students spend a year working in laboratories away from the Polytechnic. Students are placed according to their subject interest and work full time for an industrial or Government institution. A resumé of last year's placements serves to illustrate the wide range of entomological work the students can be asked to undertake. Three students were employed by the Pest Infestation Control Laboratory at Slough, working on problems associated with stored products pests while another, much to his delight, spent the year building up his immunity to bee stings with ADAS. Freshwater biology also figures strongly in the list of placements. The Anglian Water Authority employed one student on a study of aquatic insects as indicators of pollution, whilst another spent a year in the idyllic setting of the Freshwater Biological Association's River Laboratory in Dorset, working on the ecology of chalk stream chironomids. In less salubrious contrast perhaps, a study, with the Welsh Water Authority, of invertebrates associated with experimental sewage filter beds, provided another stalwart with a fund of anecdotes to brighten his later years. The students enjoy and benefit greatly from their work experience and subsequently approach their finals examinations with a much greater scientific maturity. Many are keen to continue the work for the extended one year project which they undertake during their final year.

In addition to the full time degree course the department also offers an equivalent part-time Honours degree which attracts mature students on a day-release basis. Of necessity the syllabus is more restricted but students interested in Entomology are catered for in a 'Pestology' course.

Research

The 'Entomological' research interests of the department can be grouped under four broad and loosely defined headings: soil invertebrates, herbivorous insects, insect control and aquatic invertebrates. The quotation marks indicate a wide interpretation of the word Entomology to include collembola and mites.

The Department of Biology has a strong tradition in the study of soil animals stemming from the initial appointment of Dr W.G. Hale as Head of Department. Dr Hale maintains an active involvement in the taxonomy and ecology of Collembola, although his interests appear to be straying somewhat in the direction of the class Aves. The Department is renowned for tall ecologists working on microscopic animals. To the forefront of this movement are Drs Malcolm Luxton and Mike Thomas. Dr Luxton is a world authority on the taxonomy and ecology of oribatid mites who maintains a keen interest in the feeding ecology and energetics of all soil animals. Dr Thomas' research interests centre on the energetics of oribatid mite populations, with particular emphasis on respiration studies. A number of post-graduate students are currently associated with this research group. Fil Moore is investigating the colonization of colliery spoil by Collembola, Maureen Hatton has just completed her thesis on the population energetics of *Tomocerus* spp. (Collembola) and David Dennison, when not inventing apparatus in the style of Heath Robinson, is engaged in a study of the community structure of litter-dwelling beetles in a woodland soil.

Moving from the soil to the vegetation, Dr Philip Smith has worked extensively on the energetics of defoliating caterpillars, although now much involved in practical aspects of nature conservation. Dr Ian Hodkinson is involved in the taxonomy and ecology of the Psylloidea (Homoptera), and his current interests include the ecology of the psyllids on the North Slope of Alaska. Together with Ian White he has just completed the *Handbook to the British psyllids*. Mr White has recently started his PhD work on the systematics of nymphal psyllids.

While some members of the Department delight in the aesthetic qualities of living insects, others are inevitably involved in their destruction. Dr John Carter and his research assistant Liz Green are investigating the potential of a nuclear polyhedrosis virus for controlling larvae of economically important species of *Tipula* while Dr Phil Margham and his student Carole Peacock are studying the genetics of insecticide resistance in the yellow fever mosquito *Aedes aegypti*, with particular emphasis on the

role of circadian rhythms of larval activity. Over in the Chemistry Department Dr R. Hamilton, with his student Mick Rowe, are looking at the chemical basis of host plant selection by frit fly *Oscinella frit*.

Finally, but by no means out of the main stream, Dr Ian Hodkinson maintains a continuing interest in the role of aquatic insects in plant litter decomposition.

Continued from p. 6

spiders and mites respectively. Dr Merrett's work has included studies on the phenology and distribution of heathland spiders and the response of different species to burning, either as a method of management or as an accidental occurrence. He has been assisted by Mr R.G. Snazell, who has also taken part in the Scottish coastal survey already mentioned.

Dr Webb has been interested in heathland litter, particularly the ecology and energetics of its fauna and the role of mites in its decomposition. He has also investigated the effects of burning on this fauna. He has studied intensively the ecology of the mite *Steganacarus magnus*, the juvenile stages of which live within fallen cones of Scots Pine (*Pinus sylvestris*). He also supervises the mercury vapour light-trap run every night of the year at Furzebrook. Analysis of the catches is giving insights into the phenology of various species.

Dr M.G. Morris was appointed Senior Officer of Furzebrook in April 1976, in part to free Dr Brian for his research. Dr Morris is responsible for most of the work done on invertebrates in ITE, but is also expected to undertake some research himself. His interests are in the effects of management of grasslands on invertebrate populations and he is particularly interested at the moment in Auchenorrhyncha (leafhoppers).

Although changes have occurred, Furzebrook appears to have an assured future as one of the two main centres in ITE for invertebrate research (the other being Monks Wood). Increased diversification of the research effort generally seems to be favoured currently, whilst the needs of contract research will understandably affect the deployment of staff, though probably not too drastically. Possibly the greatest need in the future is to exploit the Station's unrivalled position as a centre for research on a wide range of invertebrates with southern distributions in Great Britain.

DIARY

Abbreviations: *RESL*, Royal Entomological Society of London; *RESL(QG)*, RESL Rooms, 41 Queen's Gate, London SW7, England; *BENHS*, British Entomological and Natural History Society; *BENHS(AC)*, BENHS meeting at Rooms of the Alpine Club, 74 South Audley St., London W1, England; *I*, information from.

July 6 — **Termites, decomposition processes and nutrient cycling in west African savanna.** T.G. Wood, N.M. Collins and C. Longhurst (Centre for Overseas Pest Research, London, and Chemical Entomology Unit, Southampton University).
Termites feed on living, dead, partly or completely decomposed plant material. The most abundant savanna species consume living or freshly dead tissues. In Nigerian savanna, populations of Macrotermitinae and other termites may consume more than one third of the annual litter fall. The Macrotermitinae have an inefficient digestive system, but use their faeces to construct fungus combs, where a symbiotic fungus (Termitomyces) degrades complex plant polysaccharides prior to reingestion. In contrast, many Termitinae and Nasutitermitinae degrade the polysaccharides by means of symbiotic intestinal bacteria. The decomposition processes and nutrient cycling within the two groups will be compared and discussed.
RESL(QG), tea 17.00, meeting 17.30.

21–24 — *Lepidopterists' Society annual meeting.* Boulder, Colorado, U.S.A. *I:* J.P. Donahue, Natural History Museum of Los Angeles County, 900 Exposition Blvd, Los Angeles, Calif. 90007, USA.

27–Aug. 4 — *7th international congress of arachnology.* Exeter, Devon, England. *I:* J.M. Anderson, Dept. Biology, University of Exeter, Hatherly Laboratories, Prince of Wales Rd, Exeter EX4 4PS, England.

28 — *Photographing lepidoptera at home and abroad.* M. Tweedie. *BENHS(AC)*, 18.00 for 18.30.

Aug. 7–14 — *20th congress International Association of Theoretical & Applied Limnology.* Copenhagen, Denmark. *I:* DIS Congress Svc, Knabostade 3, DK-1210 Copenhagen K, Denmark.

10–19 — *15th international congress of the history of science.* Edinburgh, Scotland. *I:* E.G. Forbes, Congress Secretary, Royal Society of Edinburgh, 22 George St, Edinburgh EH2 2PQ, Scotland.

22–24 — *Entomological societies of Canada and Manitoba, annual meeting.* Winnipeg, Canada. *I:* J.C. Conroy, University of Winnipeg, 515 Portage Ave., Winnipeg, Manitoba R3B 2E9, Canada. Meeting includes *7th annual insect photosalon*, *I:* Ms H.S. Herbert, Research Station, Kentville, N.S. B4N IJ5, Canada.

27–Sep. 3 — *Survey of Raasay*—a field trip to study the entomology of a Scottish island. *I:* G. Gill, Dept. Adult Education, 23A High St, Inverness, Scotland.

29–Sep. 2 — *8th international congress of developmental biologists.* Tokyo, Japan. *I:* J. Terayama, Zoological Institute, University of Tokyo, Hongo, Bunkyo-ku, Tokyo 113, Japan.

31–Sep. 2 — *Cell-cell recognition.* Symposium, Society for Experimental Biology. Oxford, England. *I:* P.C. Newell, Dept. Biochemistry, University of Oxford, S. Parks Rd, Oxford, England.

Sep. 5–10 — *8th international congress on social insects.* Wageningen, The Netherlands. *I:* J. Beetsma, Agricultural University, Binnenhaven 7, Wageningen, The Netherlands.

8 — *The Leckford survey.* W. Gilchrist, A.E. Stubbs & A. Williams. *BENHS(AC)*, 18.00 for 18.30.

10–16 — *2nd international congress on ecology.* Jerusalem, Israel. *I:* Intecol, Harvest House, 62 London Rd, Reading RG1 5AS, England.

13–16 — *1st European ecological congress on coastal ecosystems.* British ecological Society. Norwich, England. *I:* A.J. Davy, School Biological Sciences, University of East Anglia, University Plain, Norwich, England.

20–21 *Social behaviour and the control of animal populations.* Symposium, Institute of Biology. London, England. *I:* General Secretary, Institute of Biology, 41 Queen's Gate, London SW7 5HU, England.

22 *A lepidopterist in Hawaii.* K.S.O. Sattler. *BENHS(AC)*, 18.00 for 18.30.

22–23 **Diversity of insect faunas.** Symposium, *RESL*, Imperial College, Mechanical Engineering Lecture Hall, Exhibition Rd, London SW7, England.
Speakers: L.R. Taylor, *Bates, Williams, Hutchinson: a variety of diversities;* T.R.E. Southwood, *The components of insect faunal diversity;* O. Halkka, *Influence of spatial and host-plant isolation on polymorphism in* Philaenus spumarius; R.I. Vane-Wright, *Ecological and behavioural origins of diversity in butterflies;* V.F. Eastop, *Diversity of the Sternorrhyncha within major climatic zones;* L.E. Gilbert (title not yet fixed); J.H. Lawton, *Host-plant influences on the isolation of phytophagous insect faunas in space and time;* B.N.K. Davis, *Effects of urbanization on insect faunal diversity;* D.S. Simberloff, *Colonization of islands by insects; immigration, extinction and diversity;* W.D. Hamilton, *Evolution in rotting trees;* G.R. Coope, *Specific constancy and environmental inconstancy during the Quaternary Period;* R.M. May, *The dynamics and diversity of insect faunas.* Registration Fee: Fellows RESL, £10; Undergraduates, £4; Others, £16.00. Lunch on 23 Sep., £2.07. Registration Form and information: The Registrar, at the Society's Rooms.

22–23 *The function of local natural history collections.* Conference, Biological & Geological Curator's Groups, and Systematics Association. Liverpool, England. *I:* E.F. Greenwood, Merseyside County Museums, William Brown St, Liverpool L3 8EN, England.

Oct. 1 *Amateur Entomologists' Society annual exhibition.* University College School, Frognall, London NW3, England, 12.00–16.00. *I:* P.A. Sokoloff, 4 Steep Close, Orpington, Kent, England.

5 **The influence of plant odours on host-plant selection by the cabbage root fly.** S. Finch (National Vegetable Research Station, Wellesbourne).
In recent years much effort at Wellesbourne has been concerned with finding methods of insect control to supplement insecticides, since many pests are now resistant to certain insecticides, and are likely to become resistant to others in the near future. This contribution will be concerned mainly with how certain plant odours attract an insect to its host-plant, and how such attractants might be used for trapping insects. Most of this work has been carried out on the cabbage root fly, a serious pest of cruciferous vegetables in the temperate zone, though many of the results are applicable to other pest species. The difficulties encountered and the possible ways in which they can be overcome will be discussed.
RESL(QG), tea 17.00, meeting 17.30.

13 *British harvest spiders.* J.H.P. Sankey, *BENHS(AC)*, 18.00 for 18.30.

22 *Irish natural history before 1800.* Society for the Bibliography of Natural History. Dublin, Eire, 14.00. *I:* E.C. Nelson, National Botanic Gardens, Glasnevin, Dublin 9, Eire.

28 *Annual dinner, BENHS.* London, England. *I:* G. Prior, 23 Manor Way, N. Harrow, Middx, England.

29 *Annual exhibition, BENHS.* London, England. *I:* G. Prior, 23 Manor Way, N. Harrow, Middx, England.

Nov. 2 Speaker and title to be announced (see next issue of *Antenna*).
RESL(QG), tea 17.00, meeting 17.30.

7–10 *Endocrinologie*. Symposium, France. *I:* Conférences INSERM, 101 rue de Tolbiac, 75645 Paris Cedex 13, France.

9–10 **Ant biology.**
Two-day meeting, *RESL(QG)*. *I:* J.P. Edwards, Pest Infestation Control Laboratory, London Rd, Slough, Berks, England.

12 *Diptera Recording Schemes annual meeting*. London, England. *I:* A.E. Stubbs, 19 Belgrave Sq, London SW1X 8PY, England.

12 *Dipterists' Dinner*. London, England (evening). *I:* A.C. Pont, British Museum (Natural History), London SW7 5BD, England.

21–24 *Pests and diseases*. 9th British insecticide and fungicide conference. Brighton, England. *I:* W.F.P. Bishop, F. Bishop (Conference Planners) Ltd, 4 London Rd, Croydon CR0 2TB, England.

23–25 *Medical entomology centenary*. Symposium, Royal Society of Tropical Medicine and Hygiene, London, England.
Organized to commemorate the centenary of the 'Birth of Medical Entomology', Manson's discovery that a mosquito was a vector of filariasis. Seventeen papers will be read by British and overseas specialists, and there will also be entomological demonstrations. The Registration Fee (£8.64 incl. VAT) covers attendance, summaries, teas, coffees, and lunch at Manson House on 23rd. Lunch available on 24th at LSHTM, £1.50. Meetings will be at the RSTMH, London W1, and the London School of Hygiene and Tropical Medicine, London WC1. The sessions will be chaired by S.G. Browne (President, RSTMH), T.R. Odhiambo, D.S. Bertram, J.D. Gillett (President, *RESL*), P.C. Garnham and W.W. Macdonald. Speakers: P.E.C. Manson-Bahr, *Patrick Manson—the man;* M.W. Service, *Patrick Manson and the story of Bancroftian filariasis;* G.S. Nelson, *Mosquito-borne filariasis;* M.T. Gillies, *Highlights in the history of anopheline control;* A.J. Haddow, *Mosquito borne viruses—the need for a balanced team;* T.A.M. Nash, *A review of mainly entomological research which has aided the understanding of human Trypanosomiasis and its control;* H. Hoogstraal, *Tickborne diseases of humans—a history of environmental and epidemiological changes;* K. Mellanby, *Changes in methods of control of ectoparasites of humans since 1877;* W.W. Macdonald, *Advances in the ecology and control of urban mosquito populations;* R. Le Berre, *Control of Onchocerciasis: medical entomology—a necessary prerequisite to socio-economic development;* A.M. Jordan, *Recent developments in techniques for Tsetse control;* D. Minter, *Triatomine bugs and household ecology of Chagas disease;* D.J. Lewis, *Phlebotomine sandfly research;* L.Molineaux, *Entomological parameters in the epidemiology and control of vector-borne diseases;* J.R. Busvine, *Future of insecticidal control for medically important insects;* G. Davidson, *Prospects of genetic control for medically important insects;* A. Noguer, *Cost of vector-borne disease control programmes with particular reference to malaria.* *I:* M.W. Service, Liverpool School of Tropical Medicine, Liverpool L3 5QA, England.

27–Dec. 1 *Entomological Society of America*, 1977 general meeting. Washington, D.C., U.S.A. *I:* Entomological Society of America, Box AJ, 4603 Calvert Rd, College Park, Md. 20740, USA.

Dec. 7 **Insect jumping: a question of power, engineering and economics.** H.C. Bennet-Clark (Dept Zoology, University of Oxford).
RESL(QG), tea 17.00, meeting 17.30.

8–9 *Natural selection and behaviour*. Symposium, Association for the Study of Animal Behaviour. London, England *I:* J. Krebs, Dept Zoology, University of Oxford, S. Parks Rd, Oxford, England.

14 **The ecology and evolution of butterflies.** One-day workshop, *RESL(QG)*. *I:* J. Thomas, Furzebrook Research Station, Wareham, Dorset BH20 5AS, England.

27–30 *Phenetic and phylogenetic approaches to classification* (Willi Hennig memorial); *Numerical taxonomy; Primate phylogeny: a confrontation of methods*. Annual meeting and three symposia, Society of Systematic Zoology.Toronto, Canada. *I:* M.C. McKenna, American Museum of Natural History, Central Park West at 79th St, New York, N.Y. 10024, USA.

1978

Jan. 26–27 *The biochemical functions of terpenoids in plants*. Symposium, Royal Society. London, England. *I:* Mrs P.B. Carter, The Royal Society, 6 Carlton House Terr., London SW1Y 5AG, England.

Feb. 22–23 *Light scattering in physics, chemistry and biology*. Symposium, Royal Society. London, England. *I:* Mrs P.B. Carter, The Royal Society, 6 Carlton House Terr., London SW1Y 5AG, England.

June 4–9 *4th international symposium on insects and host plants*. Slough, Berks, England. *I:* E.A. Bernays & R.F. Chapman, COPR, College House, Wright's Lane, London W8 5SJ, England.

July 24–28 *4th international congress of pesticides chemistry* (IUPAC). Zurich, Switzerland.

Aug. 6–12 *5th international congress of acarology*. East Lancing, Michigan, U.S.A. *I:* J.G. Rodriguez, University of Kentucky, Lexington, Ky. 40506, USA.

Sep. 10–16 *2nd international working conference on stored-product entomology*. Ibadan, Nigeria. *I:* T. Ajibola Taylor, PMB 5029, Moor Plantation, Ibadan, Nigeria.

'SENSILLA'

NEWS

Symposium on insect diversity

The Royal Entomological Society's next symposium on the Diversity of Insect Faunas, takes place in London on 22/23 September (for details, see 'Diary').

Historically, considerations of the diversity of faunas stem from the giants of biology—Darwin, Wallace and Bates—but within the last decade the topic has received a new stimulus. It has been reinvigorated by experimental ecologists, and by the critical examination of the relevant mathematical models by theoretical biologists. Pioneering work on the colonization of small islands in the United States has opened up a new field of experimental biogeography, while new ideas generated by theoretical biologists are challenging the long held views that diversity begets stability.

The subject of the symposium is of direct interest to entomologists, since about 75% of the million or more described animal species are insects. Moreover, the extraordinary diversity of terrestrial faunas is clearly linked with the diversity provided by terrestrial plants. This topic will be discussed by several contributors.

The scope of the subject of diversity of insect faunas is wide, and embraces such disciplines as ecology, palaeoecology, biogeography, taxonomy, genetics, evolutionary biology and bio-mathematics. The symposium will form a review of the current ideas and field studies on this rapidly expanding theme. Drs L.A. Mound and Nadia Waloff, the convenors of the meeting, expect the papers read to be published early next year, as the Society's Symposium number 9, *Diversity of Insect Faunas*.

Unique butterfly paintings photographed

The unique and unpublished butterfly paintings known as '*Jones*' *Icones*', bound in six volumes, are shortly to be made available to entomologists in the form of 35 mm colour transparencies (in roll form).

William Jones, who died in 1818, lived in Chelsea and was a close friend of J.E. Smith, founder of the Linnean Society. Among many talents, Jones was an excellent artist and natural historian, specializing on the Lepidoptera. His paper in the *Transactions* of the Linnean Society for 1794 pioneered the use of wing venation in the classification of butterflies. But probably Jones' most important contributions to entomology were his exquisite paintings of butterflies, well over 1000 of them from all parts of the world. These paintings formed the basis for a large number of species described by Fabricius. As few of the original specimens have survived, Jones' original watercolours represent vital taxonomic information for hundreds of early described species.

The paintings, as *Jones' Icones*, finally passed to the University of Oxford. Now the property of the Hope Department of Entomology, they have recently been interleaved with special paper and rebound. Whilst this was being done, the opportunity was taken to photograph them for record purposes.

Enquiries concerning purchase of a copy of this work should be sent to Mrs Audrey Smith, Librarian, Hope Department of Entomology, University Museum, Oxford, England.

Symposium: Medical Entomology Centenary

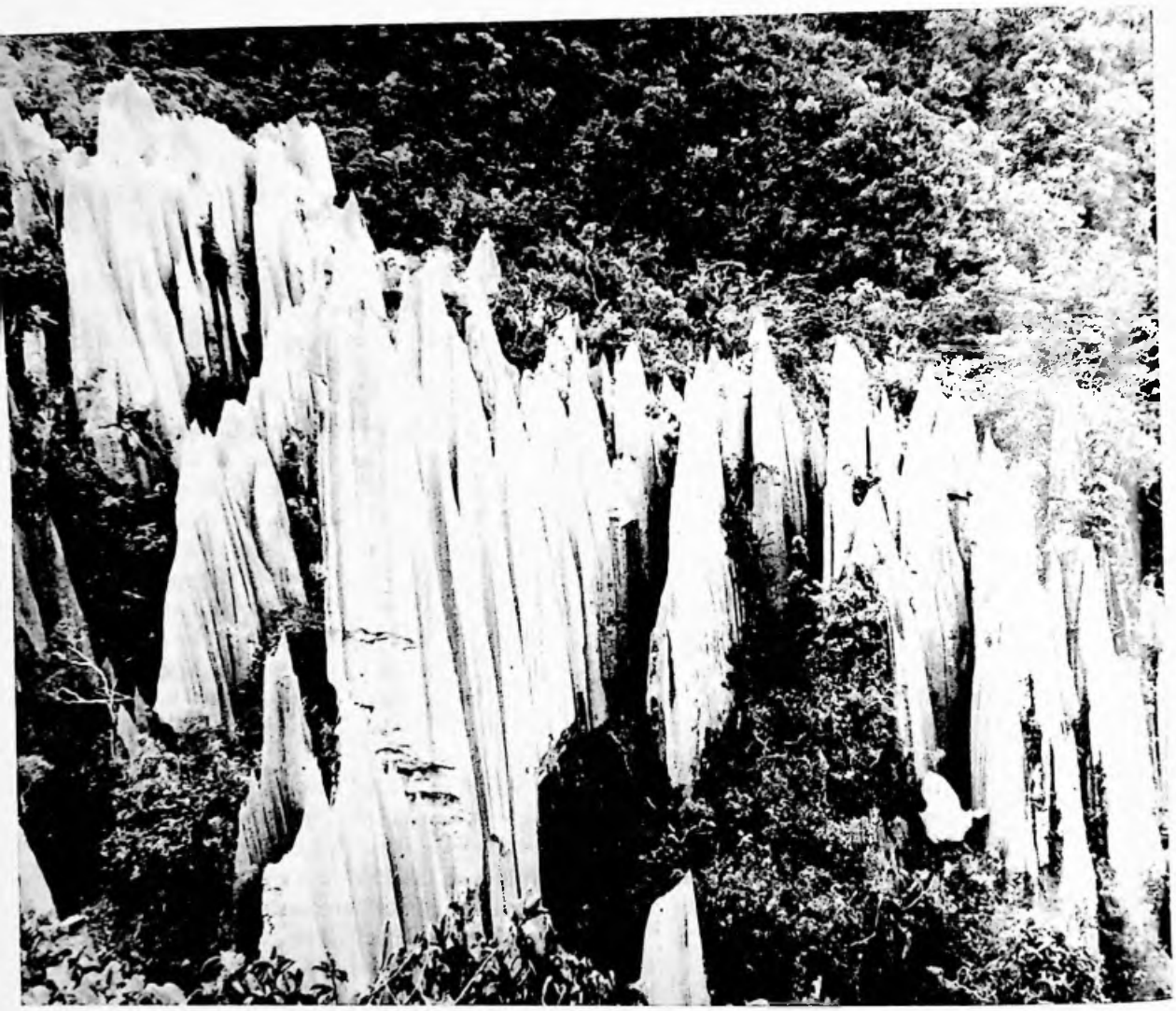
On 27 November 1877 Dr Patrick Manson working in Amoy, China, wrote to Spencer Cobbold, President of the Linnean Society, to inform him that he had discovered that a mosquito (*Culex p. fatigans*) was a vector of bancroftian filariasis (*Wuchereria bancrofti*) to man. This historic discovery was the first real evidence that a pathogen of man underwent obligatory development in an insect, pre-empting the discovery that malaria was transmitted by mosquitoes by about 20 years, and this can rightly be regarded as representing the 'Birth of Medical Entomology'.

The *Royal Society of Tropical Medicine and Hygiene* is anxious to commemorate this most important discovery and is therefore organizing a Symposium in London this November to celebrate this Centenary of Medical Entomology. Distinguished entomologists and parasitologists from home and abroad will be presenting papers concerning past, present and future achievements in medical entomology. All papers and summaries of entomological demonstrations will be published in a special Symposium publication of the Society.

Expedition to Gunong Mulu

Recent estimates suggest that the world's tropical rain forests will have disappeared through felling by the end of this century, thus removing one of the earth's most valuable natural resources. Apart from playing a major role in the earth's atmospheric balance and precipitation patterns, rain forests support an enormous diversity of plant and animal species.

In natural conditions these forests are very stable and have probably persisted in their present state for many thousands of years. However, they usually grow on very poor soils, store most of their nutrients in the vegetation, and are thus



Gunong Mulu National Park—Sarawak. Unusual limestone pinnacles rising 100 ft above the forest canopy.

sensitive to even minor interference. Modern logging techniques quickly convert rain forests into wastelands.

In 1975 the Sarawak Government decided to set aside an area of rain forest of approximately 200 square miles in the north east and designate it as a National Park. The area ranges in altitude from 30 m above sea level to 2371 m at the summit of Gunong Mulu, from which mountain the Park gets its name. The area covers very varied terrain, including several miles of limestone cliffs 950 m high and spectacular limestone pinnacles soaring out of the lowland forest (see photo). At the Sarawak Government's invitation the Royal Geographical Society is mounting a year-long multidisciplinary expedition to Gunong Mulu National Park under the leadership of Alan Hanbury-Tenison.

The main research projects of the expedition will be aimed at investigating the mechanism of energy flow and nutrient cycling in forest ecosystems on contrasting soil types and at different altitudes, to conduct experiments on the rates of erosion and formation of the land forms in the Park over an altitude range of 2000 m, and to provide a plan for the future management of the Park.

There is considerable entomological interest in the tropical rain forests of south-east Asia, and it is hoped that at least four entomologists will be joining the expedition at various

times. Mark Collins (COPR) will be spending several months in the Park studying the ecology and diversity of humus feeding termites; Jeremy Holloway will be light-trapping to make comparisons with collections of moths previously made on Mount Kinabalu in Sabah. Barry Bolton (BMNH) will be collecting ants and, using a Tullgren funnel, taking samples of soil and litter inhabiting insects; and David Hollis (BMNH) intends to collect phytophagous insects, especially Homoptera, Thysanoptera and Acridoidea, and will be running Malaise traps to collect Diptera and Hymenoptera. It is intended that this work will provide information on the role of invertebrate herbivores in affecting tree species abundance and distribution in the forest mosaic, and on the stability and constancy of the tropical rain forest environment.

River blindness in Colombia

An expedition to study the only known Colombian focus of river blindness (onchocerciasis) will start in September 1978. The disease, which affects over 20 million people in the world, may cause blindness in over 20% of adult males in hyperendemic regions. In Colombia it only occurs 120 km south of Buenaventura, 60 km upstream from the mouth of the Rio Micay, a river which drains the Western Cordillera of the Andes through the dense tropical rain forest of the Pacific coastal plain.

A previous expedition in 1965 suggested that the disease had been brought over from Africa with slaves, who, while panning for gold in the rivers, were bitten by black-flies (*Simulium* sp.) which then transmitted the filarial worms. Their preliminary investigations also suggested that the apparent uniqueness of the focus was due partly to poor exploration and partly to the absence there of equines and bovines. In another area the suspected vectors had preferred these animals to humans, thus hindering any transmission of filariae. In order to understand the complex epidemiology of the disease in Colombia a multidisciplinary approach is required.

The 1978 expedition includes seven scientists, covering the fields of entomology, ophthalmology, parasitology, immunology, nutrition and socio-economy. The entomologist will concentrate on confirming the identity and reproductive condition of the vectors, by dissection for filariae and other features, finding their breeding sites, and obtaining details of their biting habits by diurnal trapping with human and animal baits.

Further information may be obtained from: Richard H.A. Baker, Hope Dept of Entomology, University Museum, Oxford, England.

A bibliography of bibliographies

Due to be published in 1977 by the British Museum (Natural History) is a new entomological reference work* likely to contain material of interest to all readers of *Antenna*.

Essentially a bibliography of published biographies, obituaries, bibliographies and portraits of past entomologists up to and including 1977, it contains the names of some 7500 entomologists and about 17 000 references. Names of entomologists are listed alphabetically and, where possible, given in full, with their complete dates.

Included are all those (where information is available) who have *published* in the field of entomology, but early naturalists and travellers whose collections were significant to entomology also find a place. Together the seven and a half thousand names reflect every shade of contribution to entomology, and include every kind of entomologist: dedicated or dilettante, amateur or professional, academic or applied, famous or (in certain cases) infamous!

International insect trade

In 1976 the Trade Specialist Group (Trade Records Analysis of Fauna and Flora in Commerce—TRAFFIC) was established under the Chairmanship of John A. Burton. TRAFFIC, along with many other specialist groups (such as the Lepidoptera Group under Dr R. Pyle), forms part of the Survival Service Commission (SSC) of the International Union for the Conservation of Nature and Natural Resources (IUCN), with headquarters in Morges, Switzerland.

In the summer of 1976 the Convention in Trade in Endangered Species of Fauna and Flora (CITES) came into force, and its secretariat was contracted by the United Nations Environment Programme (UNEP) to IUCN. The first meeting of the parties to CITES was held in Berne, Switzerland in November 1976; among amendments made to the Convention was the addition of Ornithoptera to its schedule.

As its name implies, the function of TRAFFIC is to gather data on wildlife involved in international trade. Invertebrates pose special problems. Some, such as marine molluscs and crustaceans are extensively traded as food

* *Compendium of the biographical literature on deceased entomologists.* By P. Gilbert.

items. The rarer species of mollusc and insect may have high commercial values, but unlike vertebrates—such as spotted cats or crocodiles—rarity may not be at all closely related to collecting pressures. This problem TRAFFIC has to grapple with in the immediate future.

Although it seems fairly certain that some species, such as Ornithoptera, could be endangered by collecting for trade purposes, we have little information as to which species of butterfly (let alone other insects) are likely to be adversely affected by trade. These problems need further discussion, but meanwhile TRAFFIC is seeking *any* data on the species, numbers and monetary value of insects, particularly Lepidoptera, in trade. We would also like to know of any species which entomologists consider need monitoring because of possible danger from collecting or trade.

John Burton

IUCN/SSC Traffic Group, c/o Fauna Preservation Society, Zoological Gardens, Regents Park, London NW1 4RY.

New European Lepidopterological Society

The Societas Europaea Lepidopterologica (SEL) held its inaugural meeting in Bonn in September 1976. Information on the aims, plans for the future and membership of this new society may be obtained from Dr P. Sigbert Wagener, Hemdener Weg 19, 429 Bochalt, W. Germany.

Severn Estuary—appeal for information

As part of the work of the Scientific sub-committee of the Severn Estuary Conservation Group, a list of the rare macroinvertebrates in the coastal area around the estuary (including wetland areas such as the Somerset and Monmouthshire levels) is being compiled. Information and enquiries to Peter Clare, Dept of Applied Biology, UWIST, King Edward VII Avenue, Cardiff CF1 3NU.

Reports

Two approaches to insect conservation

Consecutive meetings at 41 Queen's Gate highlighted contrasting approaches to the problems of conservation, linked by a common concern—butterflies.

Dr Jeremy Thomas (Furzebrook Research Station) described recent autecological studies on rare British species in *The conservation of rare butterflies* (16 Feb.). Emphasis was on the need to monitor populations accurately and discover the controlling factors at each stage of the life cycle, to form a scientific basis for management.

Inevitably, the Large Blue (*Maculinea arion*) occupied much time, but I found the work described on the Black Hairstreak (*Strymonidia pruni*) more fascinating—no doubt because it is less familiar. The cryptic adaptations of the early stages, beautifully illustrated by Dr Thomas' photographs, left one wondering why so brilliant a disguise artist needs protection at all! Questions opened with the corporate entomological conscience—were collectors a danger? Dr Thomas thought this depended very much on the species—for the Large Blue and some some of the rare fritillaries, they almost certainly were a threat. One brave entomologist then dared suggest that the Large Blue was destined to die out, victim of its own complex, 'imbecile evolution'. This brought instant retribution from the Establishment, who were not prepared to let this stab at the heart of Darwinism (never mind the butterfly) go unanswered. All 8000 lycaenids probably owed their evolutionary existence to association with ants, cried one. Dr Thomas responded by admitting that although modern farming was unfavourable for the insect, management was possible; the Large Blue was not doomed to extinction. 'Human evolution' rather than butterfly evolution was next blamed for Arion's plight. Another claimed there was no decline of the insect in Europe—what was peculiar about the British colony?

This last point was discussed in terms of encouraging *Myrmica* ants, and the effects of grazing. The discussion wheeled on—education, legislation, IUCN . . . before the President finally thanked Dr Thomas for his paper and the contributors from the audience (J.P. Edwards, G. Prior, J. Heath, R.I. Vane-Wright, N. Waloff, E.P. Wiltshire, J. Whellan, J.A. Freeman, R.M. Pyle).

In contrast, *The eco-geographic basis for the conservation of Lepidoptera* (Dr R.M. Pyle, Yale University, 6 April) presented a different two-stage approach to conservation. This was based on an initial analysis of biotic provinces, followed by advising or lobbying local authorities to establish adequate reserves within each important zone so identified. This was exemplified by Dr Pyle's work on the butterfly fauna of Washington State, USA. A simple, but remarkable technique for analysis, the 'spaghetti map' of species range limits, was clearly effective in showing up these faunal provinces and the boundaries between them. Simple statistical techniques were applied to check the significance of the differences.

Discussion ranged widely: the function of conservation in a fluctuating environment, questions of conflict between conservation and amenity, methods for presenting similarity/dissimilarity data, the possibility of former extinctions, the significance of species density in addition to distribution limits alone . . . in drawing the meeting to a close, the President thanked Dr Pyle for his stimulating paper, and those who entered the discussion (who included J. Waage, J. Brady, T.R.E. Southwood, R.I. Vane-Wright and C.H. Bell).

Together the two papers gave valuable insight into modern approaches to the problems of insect conservation. But inexorable habitat destruction remains the single major threat—a political rather than an entomological difficulty.

R.I. Vane-Wright.

Meeting of British Mapping Scheme Organizers

On 5 February the RES was represented at the annual meeting arranged by the Biological Records Centre for organizers of national mapping schemes. Previous meetings have been more strongly addressed to Society representatives, since the schemes for molluscs, spiders, and the various groups of plants and vertebrates are Society-based. However, the growing number of insect schemes mostly lack stimulus from national societies. At this meeting particular emphasis was laid on the methods of setting up and organizing schemes. Organizers were informed of the growing role of local record centres and the European, and, indeed prospective world structure of record centres.

There are two options available for organizing schemes in the future. Firstly schemes may continue to be promoted by individuals in isolation, who then seek to set up their own network of recorders. However, the second option of Societies taking an active role was seen as preferable. In this context it was made clear that there will be a phasing out of direct BRC organization of schemes such as that for Lepidoptera. This action will release resources to meet the growing demand for map production as well as

to channel data to conservation bodies such as the Nature Conservancy Council (who fund British BRC operations).

A number of basic considerations are necessary when setting up a scheme. The available literature on identification may need to be supplemented by notes on critical species. Training programmes through field courses can develop the self-sufficiency and reliability of recorders (it may also be noted that some schemes run field meetings to record in sparsely worked areas). Publicity might be required to seek recorders or people to send in material for identification; generally this publicity is best confined to entomologists, though the mass media can be used if one can cope with large quantities of insects which catch the imagination of the public, such as fleas or social wasps. Having found recorders, a newsletter is needed to maintain interest and active involvement. Lastly, some sort of regional structure may be advantageous. Although beyond the resources of most small schemes such an arrangement may be feasible for a group of schemes.

Recording has produced national maps on a 10 km square grid as one of its primary aims. However, both BRC and others at the meeting saw a need for emphasis on accurately localized data. On the one hand, distribution patterns can best be interpreted in the context of such local features as geology or soil (by no means always apparent at the 10 km square level).

Secondly, if there is to be an effort to recognize localities of importance for rarities or significant assemblages of species, the conservation bodies will need to have the exact locality data. Some invertebrate recording schemes are placing a heavy emphasis on habitat data, since by this means one can interpret a map, and infer probable presence or absence in underworked areas. There is no particular need to aim for an unattainable 100% blanket coverage, mapping projects frequently being worthwhile even with a low density coverage of squares.

Some schemes have operated almost solely on the basis of voucher material (e.g. ticks, fleas and bumblebees), but this is not practicable with most large and popular groups such as Lepidoptera.

In future, map production at BRC may become a very much quicker procedure, once the present equipment problems are overcome and 'opscan' is introduced. It was reported that BRC hope to increase their staff and equipment resources although this did not imply that clerical assistance in dealing with record cards would be limitless.

Publication of maps by scheme organizers can be on a small scale via BRC, through an independent commercial publication, or by inclusion in other works, such as taxonomic monographs. Schemes are cheap to run. Various types of record cards, including a species list card for each scheme, can be issued free by BRC, providing they have access to the data. Postage costs are the main item of expenditure, but these can be minimized where distribution is through existing Society circulations. It was suggested that the 'job creation scheme' could be viewed as a means of boosting recording activity. Conferences of recorders have proved popular and there was scope for developing such events.

Access, and use of data held by organizers was a problem at present, but the ideal which might be achieved in the forseeable future was that headquarters of societies (such as the RES) should hold copies of data for the schemes in their own fields.

Local Record Centres are seen as a keystone in the future organization of recording. There are now 41 such centres, their rapid creation and expansion offering the prospect that most counties will have their own centre, normally based on a museum. These centres will hold all localized site data for their area, and pass to BRC all data on nationally rare species, and all new square records. The links with recording scheme organizers will be through BRC, though it would be hoped that larger schemes might directly foster interest and recording at a local level. Entomologists stand to benefit if they can encourage the processing of data through local Record Centres; local centres may well provide a contribution by extracting insect records from their local literature, assisting arrangements for the identification of local collections, and helping to encourage and develop the interest of local entomologists.

The European Invertebrate Survey is producing maps on a 50 km UTM grid by collating national distribution mapping on a 10 km square basis from each country. Practically all countries in Europe now have their own centre, and in the eight years since the seeds of EIS were sown, some 4000 national maps of invertebrates have been produced. Momentum is growing fast, especially since EIS has become recognized by the International Union of Biological Sciences (under the umbrella of UNESCO), which opens channels for prospective government and international financial support. EIS has now been asked to draw up proposals for a world network of centres for mapping invertebrates.

Insect mapping and recording on the BRC system is a field of growing

interest and support among entomologists. Much that was said at the meeting made it clear that the RES (as a natural focus) could readily play a major role in the development of insect recording in Britain. The subject is relevant to all levels of field worker, including the 'academic' ecologist, as well as those concerned with pests (a British and European project has made a good start in mapping plant nematodes of economic interest). As the subject develops into one with a world wide involvement of entomologists, the interest of a Society with international membership such as the RES becomes all the more relevant.
A.E. Stubbs

Biochemical aspects of plant and animal co-evolution

This international symposium of the European Phytochemical Society held at Reading University (4–6 April 1977) was of particular interest to entomologists, and numerous members of the Royal Entomological Society of London could be recognized among the 100 participants. Overseas contributors included Dr G. Bergstrom (Sweden) on volatile chemicals in bee-orchid interactions; Prof D. Janzen (USA) on secondary plant substances in relation to bruchid attack on seeds in the tropics, Prof T. Mabry (USA) on sesquiterpene lactones, and Prof T. Swain (USA) on Palaeozoic and Mesozoic co-evolution of plants and animals; this last mentioned paper was delivered by a colleague.

Over half the papers were entomological, yet only three speakers had contributed to the Royal Entomological Society symposium on Insect Plant Relationships held in 1972. Thus hardly any overlap could be detected between the two meetings. The entomological papers covered the general plant nitrogen relationships of insects (McNeill & Southwood), secondary compounds in general (Bernays & Chapman, Bell, Janzen, van Emden) and in particular (carotenoids—Feltwell, Rothschild; sesquiterpene lactones—Mabry). But there were many other places in the programme where entomologists could pick up new ideas. The writer was left with the impression that members of the Phytochemical Society were really interested in the problems entomologists come across, and appreciated the ecological emphasis of many of the presentations without feeling starved of benzene rings. The conference also gave plenty of social opportunities for getting to know future potential collaborators better.

The main points I took away from the conference were things that I probably should have thought of before—that producing secondary substances is not without metabolic cost to the plant, that damage by one insect may let another through the plant's defences, that a substance 'toxic' (if you'll pardon the use of this word, Prof. Janzen) to humans need not be so to insects, and that insects seem to dispose of substances that are toxic with comparative ease. I was left increasingly with the conviction that substances are only 'secondary' because of our ignorance of the role they play in the plant's metabolism and that any defensive function they perform is more likely to be against larger herbivores than insects.

Workers in the field of insect plant relationships who did not hear about the conference or who were unable to attend missed a particularly informative meeting with a consistently high standard of presentation. Still, there's always the chance to buy the symposium volume when it appears if you want to know why it may be in bad taste to give your wife orchids, if you are intrigued by the thought of *Spodoptera* as a pest of presentation chocolates, or you fancy doing secondary compound analysis on someone else's back—that is, if Prof. Harborne, who must be congratulated on the success and interest of this meeting, doesn't edit out the 'funnies'.
H.F. van Emden

Pollination biologists confer at Newcastle

The rapidly expanding field of pollination biology was the subject of a well-attended international conference entitled 'The Pollination of Flowers by Insects' held under the aegis of the Linnean Society and the Botanial Society of the British Isles at the University of Newcastle from 14–17 April.

Knut Faegri opened the conference with a wide-ranging and masterly survey of trends in research in pollination ecology. He paid particular attention both to improvements in technique (for example UV-sensitive television cameras, photomultipliers for observation of nocturnal pollinators, SEM studies of pollen and pollen-stigma interactions, tape recording of hymenopteran wingbeats during pollen-seeking) and to our increased understanding of the ethology and sensory apparatus of insects and other pollinators. Other active and fascinating topics that he mentioned included the importance of the energy budget of pollinators, territoriality, competition between different pollinators, the relative timing of flowering periods and pollinator life-cycles, and the biology of micromyophilous (midge-pollinated) flowers.

Progessor Faegri concluded by point-

ing out that the emphasis in pollination research had changed from pollination biology to pollination ecology; we would soon hear of pollination ethology, and the newest trend in pollination research was the study of insect ethology.

In his paper on sensory responses to flowers in night-flying moths, N.B.M. Brantjes of the University of Nijmegen proceeded to demonstrate the correctness of Knut Faegri's conclusions. Brantjes' precise observations of moth behaviour have shown how both scent trails and positive anemotaxis in the presence of scent lead moths to flowers. His work on *Hadena bicruris* and other European *Hadena* spp., which have a relationship with plants in the Caryophyllaceae similar to but less specific than the relationship between *Tegeticula* and *Yucca*, was particularly fascinating. *H.bicruris* females finish their visits to female *Silene alba* (White Campion) flowers by laying an egg, but invariably seek nectar from the flower first, thus usually pollinating the flower and ensuring the presence of seeds for the larvae to eat.

Sarah Corbet described her careful and illuminating studies of diurnal changes in the volume and concentration of the nectar of *Echium vulgare*, showing the importance of energy budgets in the relationship between flowers and pollinators; and Stanley Woodell's observation of the strong directionality (upwind) of pollinating flights by *Bombus* spp. visiting *Armeria maritima* drew attention to an extraordinarily neglected factor which may significantly influence gene-flow. The role of pollinator behaviour in relation to gene-flow and the breeding structure of plant populations was also covered by Donald Levin's thoughtful paper, by Andrew Beattie, and by John Richards and Halijah Ibrahim. The role of flower colour was discussed by Peter Kevan, and the behaviour of pollinators visiting plants that show flower-colour polymorphisms was described by David Mogford and Quentin Kay; all stressed the importance of precise and objective measurements of flower colour. Both Mogford and Kay discussed discrimination between flower-colour morphs by bees, and Kay described the extraordinarily strong discrimination between white and insect-purple morphs of *Raphanus* that is shown by *Pieris* and *Eristalis* spp.

Evolutionary trends and adaptive syndromes in insect-pollinated flowers were discussed by Michael Proctor, Stephan Vogel and Leendert van der Pijl. Professor Vogel's outstanding paper on the evolution of deception in pollen flowers raised a number of questions about the energy budgets and ethology of insects visiting deceptive flowers—for example female *Begonia* flowers.

The pollination ecology of plants of new or extreme habitats, and the genetic changes that may take place in these sites, were covered by David Valentine's paper on introduced *Impatiens* spp. in Britain and by Daniel Eisikowitch's paper on pollination of coastal plants in Israel. B.J.D. Meeuse of the University of Washington described his work on the physiology of flowering in the arum lily *Sauromatum guttatum*. A.D.J. Meeuse of the University of Amsterdam discussed the relative roles of wind and insect pollination in *Salix*, and P. Stelleman, also from the University of Amsterdam, described his work on the same problem in *Plantago lanceolata*. Stelleman has demonstrated, elegantly and extremely thoroughly, that small syrphids (e.g. *Melanostoma mellinum*) visit *P.lanceolata* plants and transfer quantities of pollen between them, with a peak of activity between 5 a.m. and 7 a.m.

The conference, which was attended by more than 120 participants, was ably organized by Dr John Richards of the University of Newcastle, to whom thanks must go for a successful and productive interdisciplinary meeting.

Q.O.N. Kay

Butterfly drinking party

There is clearly a niche for scientific meetings intermediate between the symposium in its modern sense, and its old, literal meaning of a drinking party. The Society's recent one-day workshop, *Current research on the evolution and genetics of butterflies* (41 Queen's Gate, 20 April), demonstrated the value of organized discourse coupled with a free map of local hostelries.

In a tight schedule, there were nine papers, each with 25 min. for presentation and 15 min. for discussion. Speakers gave accounts of their recent progress, or outlined plans for future work, on a range of genetic topics. Ecological aspects were included by Paul Brakefield (Liverpool) on *Maniola*, by David Smith's (Eton) challenging studies on sex-ratio in *Danaus chrysippus*, and Austin Platt's (Maryland) beautiful hybridization work on Nearctic *Limenitis*. Trevor Bigger (MRC, Harwell) described advances in butterfly cytogenetics, and R.M. Pyle (Yale) and R.I. Vane-Wright (BMNH) discussed the need for phylogenetic work on studying post-glacial evolution in N. American satyrids, and the transspecific evolution of colour patterns in *Appias*, respectively. Advances in classical genetics of *Pieris napi* were reviewed and applied to problems of subspeciation, by Sydney Bowden

(Redbourn). In a true *tour de force*, Sir Cyril Clarke (Liverpool) discussed just about everything in a remarkable lightning tour of his current butterfly interests. Finally, Allister Smith (Keele) produced a forceful reminder that not all polymorphisms are controlled by genetic switch mechanisms, with his comprehensive account of environmental influences on pupal coloration.

Differences of philosophy, of technique, of personal interest were considerable, but special mention must be made of two papers. Paul Brakefield's work on *Maniola jurtina*, surely the most elegant paper of the day, was important in bringing a fresh viewpoint to this old warhorse. That jurtina's spots may really *do* something after all is a relief to at least one entomologist. Trevor Bigger's paper was outstanding in its significance, confirming the absence of crossing-over in females and demonstrating that Lepidoptera chromosomes do have centromeres. He showed that by employing banding techniques true karyotypes can be recognized and compared, and that many butterflies also have B-chromosomes (just like so many of the plants they feed on!). At last we can do more than just count. But it is unjust to concentrate on the speakers alone. Credit for a large part in making the meeting a success must go to the 80 strong 'audience', many of whom joined in the lively and varied discussions. Participation is without doubt the essence of such workshop meetings. Another essential is enthusiasm. Cyril Clarke became so enthusiastic at one point, that he promised we would soon catch up with the *Drosophila*-people! To that end, there was broad agreement that the Society should arrange further meetings on the evolution, ecology and genetics of butterflies. That decided, the maps came into their own.

J. Huxley & R.I. Vane-Wright

Functional Morphology of Insect Wings

Dr R.M. Wootton's paper (RES Meeting, 4 May 1977) comprised preliminary results and hypotheses arising from his work on the functional morphology of insect wings. Primarily a palaeontologist, Dr Wootton became interested in wing structure when first attempting to re-construct the phylogeny of certain fossil Hemiptera, but was frustrated in his attempts by the total lack of published information on the significance of structures to be found in *extant* insects. Using slides, cine-film and models, the speaker showed some of the basic deformations that occur in wings, and the conditions necessary for flight. He demonstrated the particular importance of the deformable and non-deformable areas, and the strengthening structures adjacent to, and delimiting, these areas on the wing.

The discussion was opened by the President, who asked Dr Wootton to explain to Fellows present the phenomenon termed 'clapping' that occurs on take-off. Later, a questioner referred to the cine-film showing the 'clap' action of the muscid *Dasyphora*, and asked whether insects that launch themselves by jumping before taking flight have different wing deformations, and whether they need to clap. Evidence, again from high-speed cine-film, suggests that jumping insects undergo almost the same deformations and clap at the end of the jump. Dr C. Ellington, in an amusing reference to his own observations, warned the audience that some observed wing deformations of flies may, in fact, be due to collision with the glass sides of their observation cages.

Dr J.F. Vincent drew an analogy between the cutting of cloth on the bias to maximize stiffness, a practice of clothing designers in the 1920s, and the fluting of the wing membrane at an angle to the long axis of the wing. The structural stability of the wing in the 'Z' profile had been noticed during work at COPR. This configuration, it was suggested, is a safety valve, to prevent permanent damage to the wing during periods of high stress. Further to this point, it was stated that there is a gradation of stiffness across a locust wing.

A question on the function of hair fringes on the trailing edge of the wings of sandflies, initiated a number of comments on the flight of small insects. It was suggested that the fringes may be similar in function to the trailing-edge wing-feathers of birds, particularly soaring birds. A suggestion that the fringe of close-set hairs may act as a large deformable surface provoked comment on recent experiments showing that the boundary layers over small wings are thinner than generally accepted; as a consequence, with air flowing through, the fringe would not act as a surface. It was suggested that ecological parameters may influence the size of hair fringes, but Dr V.F. Eastop mentioned that the length of the fringe on the forewings is used to distinguish the genus *Encarsia* from *Prospatella*, and both may be reared from their aleurodid hosts on the same leaf.

As a final point, there was a plea that the morphology of the entire insect be considered when interpreting flight data. Mr R.P. Lane noted that, in Diptera, the combination of narrow wings and long slender legs has evolved independently on a number of occasions; it was thought that the legs were widely spread during flight and used as stabilizers.

The meeting was well attended, and from the range of questions asked, it was obvious that the subject of the paper was both of interest and value to a majority of those present. Contributors to the discussion included J.P. Edwards, D.J. Lewis, G. Robinson and J. Whellan.

B.H. Cogan & R.P. Lane

Doctoral Dissertations

The meeting of the Society on 1 June presented work by two PhD students nearing completion of their dissertations.

Mr P.M. Collins (Dept. of Genetics, University of Nottingham) outlined his work on genetic polymorphism in the Seaweed Fly (*Coelopa frigida*). In a general survey, 11 out of 32 enzyme systems studied were apparently polymorphic. Three of the polymorphic loci were shown to be closely associated with an inversion of chromosome 1. Laboratory studies revealed excesses of the inversion heterozygotes, particularly at high larval densities. Field work showed that, despite large environmental fluctuations, the frequency of the chromosome inversion types was remarkably constant (0.37–0.43:0.63–0.57). A computer simulation using laboratory data for fecundity, fertility, adult longevity, larval viability, and development rate, coupled with realistic regimes for tidal deposition and destruction of the wrack beds in which the larvae feed, gave a very close fit to the observed field frequencies. It was concluded that the inversion polymorphism was subject to and maintained by strong selection pressures affecting *Coelopa* populations. Despite the undoubted complexity of the system, manipulations of variables in the computer model suggested that the interaction between heterozygote excess and differing development rates were the principal factors maintaining the polymorphism. There was a varied discussion of Mr Collins' paper, including contributions from R.F. Chapman, A.W.R. McCrae, C.E. Dyte, M. Daker and T.H. Day.

Mr R.H.A. Baker (Hope Dept. of Zoology, Oxford) presented aspects of his work on field and laboratory studies of hymenopterous parasites of *Drosophila*. The main emphasis was on the avoidance of, or adaptation to competition for hosts. By extensive trapping, interactions between seven different parasites had been investigated on 12 *Drosophila* species. The field technique was designed to investigate relationships to temporal, spatial and host food-substrate variation throughout the year. Host ranges were determined by the identification of cast larval mandibles of the parasites found within the dipterous puparia. Two major divisions of parasites were recognized: species attacking larvae (*Pseudeucoila bochei*, *Asobara tabida*, *Tanycarpa punctata* and *Kleidotoma* sp.), and species attacking pupae (*Pachycrepoideus vindemiae*, *Spalangia erythromera* and *Ashmeadoporia* sp.). The latter group seemed non-specific, parasitizing all *Drosophila* studied. The larval parasites were more restricted. A remarkable degree of immunity by larval *Drosophila melanogaster* and *D. obscura* to attack, through encapsulating parasite eggs or larvae, was revealed. But no effective defence against pupal parasites was apparent. Marked differences in the fecundity and egg-laying behaviour between larval and pupal parasites were demonstrated. The significance of the study was related to aspects of biological control.

The discussion (G.C. Varley, O.W. Richards, P.M. Hammond, A.W.R. McCrae, M.J. Samways) included a question from Dr R.C. Fisher on larval parasite competition within the host. In a superparasitized host, had parasite larvae been observed in the act of biting each other? Replying, Mr Baker said that Dr van Lentren (Leiden) had recorded this in *Pseudeucoila bochei*. The large mandibles of all the larval parasites seem to be an adaptation for 'fighting', as the host provided food sufficient for only one parasite.

P.M. Collins, R.H.A. Baker & R.I. Vane-Wright.

Butterfly sexhibits

(RES meeting 1 June 1977)

Dr M. Daker (Paediatric Research Unit, Guy's Hospital Medical School) exhibited a technique for sexing living larvae of *Hypolimnas* butterflies. Single larval spines can be cut off, without apparent injury to the insect, and the contents squeezed into a drop of orcein stain. Squash preparations usually contain giant polyploid cells, together with normal cells. In female larvae, sex chromatin (Smith) bodies may be seen in most of the nuclei. Although attempts to use cells from exuded haemolymph were unsuccessful for *Hypolimnas*, other work suggests it may be possible to do sex chromatin analysis of *Papilio* haemolymph cells.

Mr R.I. Vane-Wright (British Museum (Natural History)) exhibited a prototrophonius-like female of *Papilio dardanus dardanus* from 1400 m. in Rwanda, recently presented to the BMNH by Dr P. Werner of Switzerland. The possible evolutionary significance of such female forms was commented upon.

The British Insect Fauna

The Society already plays a major role in studies of the British insect fauna through publication of its *Handbook* series. As a further contribution to this field where the interests of many Fellows converge, *The British Insect Fauna* column of *Antenna* will endeavour to keep its readers informed of changes in the British check list and new publications concerning the identification and natural history of insect species to be found in the British Isles. One of the base line references will be the revised edition of the valuable *Bibliography of Key Works for the Identification of the British Fauna and Flora*, shortly to be published for the Systematics Association by Academic Press. We hope that a particularly useful function will be served by drawing attention to relevant work published in non-British journals. Selected publications of ecological and biogeographical interest will also be noted, with emphasis on synecological studies, structure of communities, and monographic treatments of single species, especially where life histories, habitat preferences and feeding habits are detailed. In view of the wide involvement of British entomologists, current news of national recording schemes and some mention of similar schemes in other European countries will be given. As the recording of distributional and other data on a systematic basis, pioneered in Britain, has led to an increasingly substantial basis for studies on the 'best-known' of all insect faunas, news of recording schemes will hopefully be of interest to entomologists in other countries who are now becoming involved in this type of study.

In the case of certain insect Orders there is a backlog of check list changes to be dealt with. January 1977 will be regarded as the starting point for current news and we hope to treat as much of the backlog as possible in successive parts of *Antenna*.

Within the inevitable limits of space it is hoped that every entomologist working with the British and neighbouring faunas, whether amateur or professional, will find this column an essential point of reference. The degree to which this aim can be achieved will, in turn, be a reflection of the extent to which our readers are able to assist in contributing information related to their special fields of interest. Our readers are particularly invited to regard this column as a useful place to disseminate information relating to the identity of British insect species in those frequent instances where a separate publication is wasteful or inappropriate. Our present plans are not, however, to publish material with *original* taxonomic content, e.g. descriptions of new taxa, previously unrecorded synonymies or new combinations.

At the request of the Editor copy for this British Fauna section will be collated and edited by the undersigned. Please contact directly or leave notes for collection either at the Society's rooms or with Peter Hammond at the British Museum (Natural History).

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CHECK LIST

Names of species to be added to check lists and names replacing others which are invalid or result from misidentification are in bold type. The name regarded as valid is given first in each entry. References, where not given in full, are to be found under 'Key Works' below.

Hemiptera

Alebra coryli Le Quesne, 1977 [Cicadellidae] (Le Quesne, 1977).

Euceraphis betulae (Koch, 1855) [Aphididae] (Blackman, 1977).

Lepidoptera

Lobesia botrana (Denis & Schiffermüller, 1775) [Tortricidae] (D. Agassiz, 1977 *Entomologist's Gaz.* 28: 21–22).

Caryocolum huebneri (Haworth, 1828) = *knaggsiella* (Stainton, 1866) [Gelechiidae; *Handbook* **11** (2): 23] (B.V. Ridout, 1977, *Entomologist's Gaz.* 28: 38).

Caryocolum kroesmanniella (Herrich-Schäffer, 1854) = *huebneri* sensu auct. not (Haworth, 1828) [Gelechiidae; *Handbook* **11** (2): 23] (B.V. Ridout, 1977).

Phyllonorycter sagitella (Bjerkander, 1790) = *tremulae* Zeller, 1846 [Gracillariidae] (L. Price, 1977, *Entomologist's Rec. & J. Var.* 99: 106–107).

Coleoptera

Laccobius obscuratus Rottenberg, 1874 [Hydrophilidae] (Gentili & Chiesa, 1975).

Laccobius [simulator d'Orchymont, 1932] s. sculptus d'Orchymont, 1936 [Hydrophilidae] (Gentili & Chiesa, 1975).

Apion afer Gyllenhal, 1833 = *platalea* sensu auct. not Germar, 1817 [Apionidae] (Dieckmann, 1975).

The revisor of the new edition of Kloet and Hincks *A Check List of British Insects* Part 3: Coleoptera & Strepsiptera,

Mr R.D. Pope, has advised us of the following minor corrections:

1. The publication date for 'Gmelin *in* Linnaeus' (throughout) should read **1790** *not* 1789.
2. '*Bolitobus*' (p. 32) is an error for **Bobitobus**.
3. *Trichius zonatus* (p. 46): the synonym should read *abdominalis* **sensu auct. partim not** Ménétriés, 1832.
4. CLERIDAE (p. 55): *Tillus unifasciatus* is transferred to the genus **Tilloidea** and the genera are not in the correct sequence. The order should be *Tillus*, *Tilloidea*, *Thaneroclerus Opilo*, *Thanasimus*, *Trichodes*, *Paratillus*, *Tarsostenus*, *Korynetes*, *Necrobia*.

Hymenoptera

Peckelachertus anglicus Graham, 1977 [Eulophidae] (Graham, 1977).

Diptera

Anatella dampfi Landrock, 1924 [Mycetophilidae] (Chandler, 1977).

Anatella gibba Winnertz, 1863 [Mycetophilidae] (Chandler, 1977).

Anatella lenis Dziedzicki, 1923 [Mycetophilidae] (Chandler, 1977).

Exechia sororcula Lackschewitz, 1937 [Mycetophilidae] (Chandler, 1977)

Exechiopsis dumitrescae (Burghele-Balacesco, 1972) [Mycetophilidae] (Chandler, 1977).

Allodia angulata (Lundström, 1913) (Mycetophilidae] (Chandler, 1977).

Mycetophila autumnalis Lundström, 1909 [Mycetophilidae] (Chandler, 1977)

Mycetophila lubomirskii Dziedzicki, 1884 [Mycetophilidae] (Chandler, 1977).

Mycetophila lunata Meigen, 1804 [Mycetophilidae] (Chandler, 1977).

Mycetophila dziedzickii Chandler, 1977 = *obscura* Dziedzicki, 1884 nec Walker, 1848 [Mycetophilidae] (Chandler, 1977).

Mycetophila confusa Dziedzicki, 1884 = *affluctata* Edwards, 1941 [Mycetophilidae] (Chandler, 1977).

Diptera Check List Supplement

These notes update the Calyptratae section of the revised edition of Kloet and Hincks *A Check List of British Insects*, Part 5: Diptera and Siphonaptera, revised by K.G.V. Smith, 1976. The changes follow advice from R.W. Crosskey (Tachinidae), J.P. Dear (Calliphoridae and related families) and A.C. Pont (Anthomyiidae and Muscidae).

p. 102. **ERYNNIA Robineau-Desvoidy, 1830** [Insert between *Elodia* and *Eumea*].

p. 102. **Erynnia ocypterata (Fallén, 1810)** = *nitida* Robineau-Desvoidy, 1830.

p. 106–7. **Sarcophaga vulgaris Rohdendorf, 1937,** a good species, not a form of *S.carnaria* (Linnaeus, 1758).

p. 106–7. **Sarcophaga anaces Walker, 1849** = *setipennis* Rondani, 1862.

p. 107. **Melinda cognata (Meigen, 1830)** = *caerulea* (Meigen, 1826) preocc. = *anthracina* (Meigen, 1838) (from *Bellardia*).

p. 107. **Bellardia unxia (Walker, 1849)** = *biseta* (Kramer, 1917) = *pandia* (Walker, 1849).

p. 107–8. *Protocalliphora azurea* (Fallén, 1817) = ?*reviso* (Harris, 1780) = *carnarida* (Stephens, 1829) [nomen nudum] = *sordida* (Zetterstedt, 1838).

p. 108. **Cordilura hyalipennis Ringdahl, 1936** = *ustulata* sensu auct. not Zetterstedt, 1838.

p. 109. *Chiastocheta rotundiventris* Hennig, 1953 = *lativentris* Collin, 1954 [unavailable].

p. 109. *Chiastocheta setifera* Hennig, 1953 = *genitalis* Collin, 1954 [unavailable].

p. 110. *Lasiomma infrequens* Ackland, 1965 = *laricicola* sensu auct. not (Karl, 1928).

p. 110. *Lasiomma melania* Ackland, 1965 = *anthracinum* sensu auct. not (Czerny, 1906).

p. 111. *Phorbia nuditibia* Fonseca, **1966**, not '1965'.

p. 111. *Delia brassicae* (**Wiedemann**, 1817) (not 'Hoffmannsegg in Wiedemann', 1817).

p. 115. *Morellia hortorum* (Fallén, 1816) = *importuna* (Haliday, 1836).

p. 127. **Cinochira** (not '*Clinochira*').

p. 130. **Haematobia** (not '*Haemotobia*').

NEW HANDBOOKS

Thysanoptera, Vol. I (11), 1977 [Includes a revised check list].

Homoptera Aphidoidea (Part), Vol. II(4a), 1977.

Check List of British Insects, 2nd edit., Pt. 3: Coleoptera and Strepsiptera, Vol. XI (3), 1977.

OTHER KEY WORKS

Dermaptera

Brindle, A. 1977. British Earwigs (Dermaptera). *Entomologist's Gaz.* **28**, 29–37. [Biology, key, species discussion].

Psocoptera

New, T.R. 1977. Notes on the Identification of Nymphs of the British Psocoptera. *Entomologist's Gaz.* **28**, 61–71. [Key to families].

Hemiptera

Blackman, R.L. 1977. The existence of two species of *Euceraphis* (Homoptera: Aphididae) on birch in Western Europe, and a key to European and North American species of the genus. *Systematic Entomology* **2** (1), 1–8.

Le Quesne, W.J. 1977. A new species of *Alebra* Fieber (Hem., Cicadellidae). *Entomologist's mon. Mag.* **112**, 49–52. [Key to the 3 British spp.].

Trichoptera

Fisher, D. 1977. Identification of adult females of *Tinodes* in Britain (Trichoptera: Psychomyiidae).

Wallace, I.D. 1977. A key to larvae and pupae of *Sericostoma personatum* (Spence) and *Notidobia ciliaris* (Linné) (Sericostomatidae: Trichoptera) in Britain. *Freshwater Biology* **7**, 93.

Lepidoptera

Giehsler, H. von 1977. Beitrag zur Kenntnis der Puppen-Cremaster mitteleuropäischer Noctuiden-Arten (Lep. Noctuidae) 2 Teil. *Entomologische Berichte* 1976, 112–134. [Illustrations of pupal cremasters for 56 spp.]

Coleoptera

Dajoz, R. 1977. Coléoptères: Colydiidae et Anommatidae paléarctiques. *FAUNE de l'Europe et du Bassin Méditerranéen*, **8**. 280 pp. Paris: Masson.

Dieckmann, L. 1975. Revision der *Apion platalea*-Gruppe (Coleoptera, Curculionidae) *Ent. NachrBl., Wien* **20** (8 117–128. [Key to 5 spp.].

Gentili, E. & Chiesa, A. 1975. Revisione dei *Laccobius* paleartici (Coleoptera Hydrophilidae). *Memorie Soc. ent. ital.* **54**, 5–187. [Figs. of male genitalia and distribution maps for most spp.; key in English (pp. 179–184)].

Morris, M.G. 1977. The British species of *Anthonomus* Germar (Col., Curculionidae). *Entomologist's mon Mag.* **112**, 19–40.

Hymenoptera

Gauld, I.D. & Mitchell, P.A. 1977. Nocturnal Ichneumonidae of the British Isles: Genus *Alexeter* Foerster. *Entomologist's Gaz.* **28**, 51–55. [Key to 2 spp.].

Diptera

Chandler, P.J. 1977. Studies on some fungus gnats (Diptera: Mycetophilidae) including nine additions to the British list. *Systematic Entomology* **2**, 67–93. [Includes key to *Anatella* spp.].

Lindner, E. 1977. *Fliegen palaearkt. Reg.* IV (5), 29 Dolichopodidae: 347–386.

HANDBOOK CORRECTION

Volume IV, Part 2, Coleoptera Carabidae, 1974, by C.H. Lindroth. An error in the key to genera has recently come to the notice of the author. The present couplet 55 (p. 14) is misplaced. This should be renumbered **48** (leading to **49** or **69**). The existing couplets **48** to **54** should be changed to **49** (leading to **50** or **52**), **50** (leading to **51**), **51**, **52** (leading to **53**), **53** (leading to **54** or **55**), **54**, and **55** (leading to **56**), respectively.

A slip with these corrections will be inserted in copies for future sale.

ECOLOGY & DISTRIBUTION

BENGSTON, S.-A. & HAGEN, R. 1977. Melanism in the two-spot ladybird *Adalia bipunctata* in relation to climate in western Norway. *Oikos* **28**, 16–19.

CHALMERS-HUNT, J.M. 1977. The 1976 invasion of the Camberwell Beauty (*Nymphalis antiopa* L.). *Entomologist's Rec. & J. Var.* **99**, 89–105.

CHALMERS-HUNT, J.M. 1977. Migrant Lepidoptera in Britain in early March 1977. *Entomologist's Rec. & J. Var.* **99**, 125.

CHANDLER, P.J. 1977. The larval foodplants of the Tipulid genus *Ula* Haliday (Diptera). *Entomologist's Gaz.* **28**, 57–58.

COPLAND, M.J.W. & ASKEW, R.R. 1977. An analysis of the chalcidoid (Hymenoptera) fauna of a sand dune system. *Ecological Entomology* **2** (1), 27–46.

EMMET, A.M. 1977. The influence of the hot summer of 1976 on leaf-mining Lepidoptera. *Entomologist's Rec. & J. Var.* **99**, 123–124.

GLEN, D.M. 1977. Ecology of the parasites of a predatory bug, *Blepharidopterus angulatus* (Fall.). *Ecological Entomology* **2** (1), 47–55.

LORIMER, R.I. 1977. Orkney Lepidoptera 1970–1975. *Entomologist's Gaz.* **28**, 23–26.

MASON, C.F. 1977. Populations and production of benthic animals in two contrasting shallow lakes in Norfolk. *J. Anim. Ecol.* **46**, 147–172.

SERVICE, M.W. 1977. Ecological and biological studies on *Aedes cantans* (Meig.) (Diptera: Culicidae) in Southern England. *J. Appl. Ecol.* **14**, 159–196.

TREHERNE, J.E. & HUBBARD, S.F. 1977. Diel activity of an intertidal beetle, *Dicheirotrichus gustavi* Crotch. *J. Anim. Ecol.* 46, 127–138.
WARD, L.K. 1977. The conservation of juniper: the associated fauna with special reference to southern England. *J. Appl. Ecol.* 14, 31–120.
WARD, L.K. 1977. The conservation of juniper: the fauna of food plant island sites in southern England. *J. Appl. Ecol.* 14, 121–135.

RECORDING SCHEMES

The following insect recording schemes for the British Isles are registered with the Biological Records Centre. Enquiries may be addressed to J. Heath, BRC, Monks Wood Experimental Station, Abbots Ripton, Huntingdon PE17 2LS.

Odonata	
Orthoptera	
Dermaptera	
Trichoptera (not fully operational)	
Lepidoptera	
Diptera	Tipulidae (incl. Trichoceridae, Anisopodidae & Ptychopteridae)
	Dixidae
	Larger Brachycera (Tabanoidea & Asiloidea)
	Syrphidae
	Conopidae
	Sepsidae
	Sciomyzidae
Hymenoptera	Ants
	Bumblebees
	Solitary Bees and Wasps
Siphonaptera	
Coleoptera	Carabidae
	Staphylinidae
	Coccinellidae

Current News

Odonata Mapping Scheme Newsletter 1. The scheme is now organized by D.G. Chelmick, 6 Gander Hill, Hayward's Heath, Sussex. He seeks further recorders and draws attention to a new identification work to appear shortly (Hammond, C.O., *Dragonflies of Great Britain and Ireland*, Curwen: London). The Newsletter includes a situation map of records received; species maps are also included in Mr Hammond's book.

Orthoptera The new organizer is C. Haes, 36 Abbotsbury, Pagham, Bognor Regis, Sussex PO21 4RT.

Lepidoptera Distribution Maps Scheme Newsletter 10. It is intended to produce a complete atlas of British Butterflies in 1980. Recorders are asked to visit the listed 10 km squares without post-1960 records in England (14), Wales (3) and Scotland (230). Three visits between May and September in a range of habitats is an ideal for each square. (BRC)

Butterfly Distribution Maps Scheme Newsletter 2. 140 Irish 60 km squares without post-1960 records are listed and shown on a map. (BRC)

Carabidae Recording Scheme Newsletter 1. Progress report with situation map and preliminary maps of *Carabus* species, with discussion notes on each species. (Dr M. Luff, Dept Agricultural Zoology, The University, Newcastle-upon-Tyne NE1 7RU).

Coccinellidae Recording Scheme. Progress report with situation map and maps of two species, *Entomologist's Gaz.* 27, 269 (J. Muggleton, Dept Zoology, University Park, Nottingham, NG7 2RD).

Diptera Recording Schemes Bulletin 3. Report of annual meeting with items on Mosquitoes, Calliphorids and 1976 Drought. Cranefly Recording Scheme situation map with 1300 post-1960 10 km squares recorded. Announcements of 1977 field meetings. 17–23 July is to be National Fish Skin Week—entomologists are asked to put a fish skin on their lawn/window box for say 20 min and catch all greenbottles, bluebottles and other Calliphorids; these random samples to be sent to J.P. Dear at the British Museum (Natural History)—Scandinavian work has shown interesting ecological and distribution results. (A.E. Stubbs, Nature Conservancy Council, 19 Belgrave Square, London SW1X 8PY).

Recording Field Meetings

The Diptera Recording Schemes have been holding field meetings since 1972, with an attendance of up to 20 in such areas as Sussex and North Wales. The purpose has been to gain records for 10 km square distribution maps and in particular to focus effort on site recording so that there is some basis for interpreting the ecological aspects of distri-

bution. The parties have been a mixture of specialists and less experienced workers in Diptera; the principle of learning from one another has worked well. So far, primary training meetings have not been held, but this remains desirable as a means of increasing the expertise of the recorders in field craft and identification.

Contact has recently been made with the BRC invertebrate recording scheme organizers to sound out the possibility of holding multi-Order field meetings for recording purposes. Since most of the recording schemes run on relatively low numbers at present, there is an advantage in joining forces to raise viable field parties.

The views of Fellows would be welcome in order to test opinion and the scale of interest. There are various alternative approaches—a Society field meeting, training meetings to cover one or more aspects of recording identification, meetings to concentrate on one Order where the element of training is a spin-off as in the Diptera meetings, or multi-Order field meetings. The latter may entail self-sufficiency as regards identification ability of participants with a particular interest. If there is a demand for field meetings with an entirely different purpose from recording then I am happy to collate views for *Antenna*.

A.E.S.

Migration news

In 1976 some 250 Camberwell Beauty, *Nymphalis antiopa* L., were recorded in the British Isles, the greatest migration year since 1872. The weather pattern for the period of maximum sightings equates with easterly winds from an anticyclone, backtracked projectories indicating the source as Scandinavia. This invasion has been documented in detail by Mr Chalmers-Hunt. He has also commented upon sightings of *Cynthia cardui* in early March of 1977 in Hampshire, Cornwall and South Wales; these may be related to exceptional migratory weather with an airstream from western Spain, the Canaries and N.W. Africa (references above under 'Ecology and Distribution'). At least two *N.antiopa* have been seen, following hibernation, in April 1977 (Chalmers-Hunt, Brit. Ent. & Nat. Hist. Soc. Communication).

SOCIETY
News and Notices

Society presents painting to Queen

To mark the occasion of Her Silver Jubilee, the Society has presented to its Patron, Her Majesty the Queen, a water-colour painting depicting some of the insects to be found, in the heart of London, in the gardens of Buckingham Palace. Six species of butterfly known to occur in the gardens (Peacock, Comma, Small Tortoiseshell, Red Admiral, Holly Blue and Small Copper) are shown on flowers of Giant Hogweed (*Heracleum mantegazzianum*) and other plants in the foreground of a view of the Palace, looking across the lawns from Grosvenor Place in the west. The painting, reproduced opposite, is 10 in. × 8 in. and is by the Lepidoptera artist Brian Hargreaves, a Fellow of the Society.
Photograph by Peter York.

New and forthcoming Handbooks

Recent additions to the *Handbooks for the Identification of British Insects* series are:

Vol. I, Part 11. Thysanoptera. By L.A. Mound, G.D. Morison, B.R. Pitkin and J.M. Palmer. 79 pp. Price £5.30 (£3.97 to Fellows).
Vol. II, Part 4(a). Homoptera: Aphidoidea (part). By H.L.G. Stroyan. 130 pp. Price £9.75 (£6.19 to Fellows).
Vol. XI, Part 3. Kloet and Hincks A Check List of British Insects, 2nd edition. Part 3: Coleoptera and Strepsiptera. Revised by R.D. Pope. Price £8.25 (£6.19 to Fellows).

Prices include postage. A full list of available Handbooks, with current prices and order form may be obtained from the Registrar.
Parts to be published in 1977:

COLEOPTERA V 1(b). Buprestidae. By B. Levey.
COLEOPTERA V 5(a). Rhizophagidae. By E.R. Peacock.
HYMENOPTERA VI 1. Introduction & Key (New edition). By O.W. Richards.
HYMENOPTERA VII 2(b). Ichneumonidae: Orthopelmatinae, Anomaloninae. By I.D. Gauld & P.A. Mitchell.

RES tie

An official Society necktie, incorporating the *Stylops* motif on a variety of background colours, will shortly be available for purchase by Fellows.

Workshops and Joint Meetings

One-day 'Workshop' meetings, inaugurated during the past year, are clearly proving a success, both in providing an opportunity for relatively informal but concentrated scientific exchange and in making fuller use of the Society's facilities at 41 Queen's Gate (see 'Butterfly Drinking Party'). More Workshops have been arranged (see 'Diary'); suggestions (to the Secretary) are invited for further Workshops, or of Societies with whom joint meetings might be arranged.

Bye-Law revision

The Bye-Laws of the Society are being reviewed. Comments and suggestions welcomed, to the Registrar as soon as possible. Copies of the Bye-Laws are available from the Registrar, sae please.

Benefaction

1977. By the Royal Society: £821 from the Libraries Grant-in-Aid Fund.

Calendar of Society Meetings

With the advent of the new quarterly Bulletin of the Society, containing a 'Diary' section, the usefulness of the traditional pocket calendar listing dates of the Society's meetings may diminish. The 'Diary' in each part of *Antenna* will include the dates for Society meetings for the ensuing six months. We hope that the latest number of *Antenna* will find a place on many desks or be carried in a briefcase for ready reference. With this in mind, some expense could be avoided by no longer printing the pocket calendar. Pleas for its retention, if any, should be addressed to the Secretary who would also be glad to receive suggestions concerning dates for Ordinary Meetings. Rather than the first Wednesday in every month, some arguments have been raised in favour of a later date, perhaps the second Wednesday of the month.

Library

The Society's *Proceedings* have traditionally included lists of all additions to the Library and have detailed donations of separates. Unless a reasonable demand for this information is forthcoming from the readership of *Antenna*, the Editors expect to omit such news. We shall list donors to the Library annually. New books are, of course, exhibited in the Library where a list of additions (on a quarterly basis) will also be available. This list may also be obtained by written application.
The Library Committee expects to spend much of its

limited budget for the coming year on a few relatively expensive books, on the principle that these are the ones that Fellows are least likely to buy for themselves. Suggestions as to *which* expensive (or other) books should be purchased are invited.

The Library has the Insecta parts of the Zoological Record from 1924 to date only and intends buying the missing parts. Before doing so the Registrar would be pleased to know if any Fellows have duplicates or spare copies from 1864–1923 that they would be willing to give (or sell) to the Society.

Subscriptions—some words from the Registrar

'The Registrar shall demand all arrears of payment of the annual subscription of Fellows'—so reads Sec. 3 of Chap. XIV of the Bye-Laws. This is pretty strong stuff, but the Victorian drafters of that Bye-Law perhaps envisaged that successive Registrars might encounter a bit of difficulty when trying to collect arrears.

For example, looking at the situation today we find that there are 424 Fellows, or about one Fellow in four who is in subscription arrears. No less than 279 owe for 1977; 126 for 1976; and 19 for 1975. I have written separately to the Fellows owing for 1976 and 1975, but I would like to address the following paragraph to those who have not yet paid this year's subscription.

The £2790 which you owe to the Society might well mean the difference between the Society operating at a loss or breaking even this year. If the money had been received on the 1st January, as it should have been, it would have been invested and would by now have appreciated to *c.* £3000. You will also perhaps appreciate that the £2790 represents about half of the total which is owed to the Society.

All 'delinquent' Fellows will receive this first issue of *Antenna*, but it is regretted that no further issues will be sent unless and until outstanding subscriptions are received. May I now please invite your co-operation, and ask all Fellows who have any outstanding contributions to forward a cheque to me without any further delay? It really would be very much appreciated.

G.G. Bentley

New Fellows

Names of candidates for election to the Fellowship are posted on the Society's noticeboard and are read at two Ordinary Meetings prior to consideration at a Council Meeting.

Elected April 1977:

Baloch, Umar Khan, Senior Entomologist (Ngala), Chad Basin Development Authority, P.M.B. 1130 Maiduguri, Nigeria.

Bland, Mrs Dorothy Ann, Glen Road, Moorehill, Tallow, Co. Waterford, Eire.

Clark, Peter, Department of Primary Industry, Bainyik Station, P.O. Maprik, East Sepik Province, Papua New Guinea.

Cull, Steven Bernard, Trevenna Cottage, Harlyn Road, St. Merryn, Padstow, Cornwall.

Hill, Michael N., 28 Elm Grove Road, Salisbury, Wilts SP1 1LF.

Iwuala, Dr Moses Onwukwe Edom, Department of Zoology, University of Nigeria, Nsukka, Nigeria.

Murphy, Sean, Imperial College Field Station, Silwood Park, Ascot, Berks SL5 7PY.

Porter, Keith, 29 Snebro Road, Mirehouse, Whitehaven, Cumbria, CA28 8DT.

Thangavelu, Kandhasamy, Entomology Division, Central Institute for Cotton Research, Coimbatore—641003, India.

Gopal, Dr Veerasicku, M.Sc., Ph.D., FAZ., Division of Neurophysiology & Behaviour, Department of Zoology, Madras University P.G. Centre, Coimbatore—641004, India.

Elected May 1977:

Collins, Nicholas Mark, Imperial College Field Station, Silwood Park, Ascot, Berks.

Jegede, Oluwafunmilayo, Medical Microbiology Department, University of Ibadan, Nigeria.

McKillop, Ian Gordon, 58 Park View, Hatch End, Middlesex.

Nash, Susan Hazel, 115 The Grove, Ealing, London W5.

Pant, Dr Narendra Chandra, Director, Commonwealth Institute of Entomology, 56 Queen's Gate, London SW7.

Elected June 1977:

Ali, Abdul baki Mohamed hussien, Zoology Department, University College, Cardiff.

Cassidy, Michael David, Department of Zoology, The University, Newcastle-upon-Tyne, NE1 7RU.

Cox, Dr Patrick Denzil, Biology Department, Pest Infestation Control Laboratory, London Road, Slough, Berks.

Lyal, Christopher Henry Coutts, 104 Harpenden Road, St Albans, Herts AL3 6DA.

Port, Gordon Robert, Imperial College Field Station, Silwood Park, Sunninghill, Ascot, Berks SL5 7PY.

Stiling, Peter David, Department of Zoology, University College, Cardiff.

Watts, Dr Elaine, Dept of Zoology & Applied Entomology, Imperial College Field Station, Ashurst Lodge, Silwood Park, Ascot, Berks.

Wijeyaratne, Dr Panduka Mahendra, Dept of Community Medicine, Ahmadu Bello University, Zaria, Nigeria.

Willet-Whittaker, Timothy, 14 Clydesdale Road, Royston, Herts.

Wilson, David Ian, 57 Ashcroft Avenue, Shavington, Crewe, Cheshire.

New Honorary Fellow

Professor H.E. Hinton, F.R.S., a former President of the Society.

Death

The Society has learned with regret of the death, on 26 October 1976, of Peter Waller Hanney (elected 1957).

Current contents of the Journals

Physiological Entomology

Volume 2, Number 2, June 1977

R.J. Bartell and L.A. Lawrence. Reduction in responsiveness of male light-brown apple moths, *Epiphyas postvittana*, to sex pheromone following pulsed preexposure to pheromone components.

E.S. Binns. Take-off and the 'tarsal reflex' in *Aphis fabae*.

Mieczysława J. Bogus and Bronisław Cymborowski. Daily changes in the sensitivity of wax-moth larvae, *Galleria mellonella*, to cooling stress.

D.C. Cull and H.F. van Emden. The effect on *Aphis fabae* of diel changes in their food quality.

P.R. Hughes and J.A.A. Renwick. Neural and hormonal control of pheromone biosynthesis in the bark beetle, *Ips paraconfusus*.

A.R. Jutsum and G.J. Goldsworthy. The role of the glandular lobes of the corpora cardiaca during flight in *Locusta*.

L.G. Mukwaya. Genetic control of feeding preferences in the mosquitoes *Aedes* (*Stegomyia*) *simpsoni* and *aegyptii*.

Ian Seath. Sensory feedback in the control of mouthpart movements in the desert locust *Schistocerca gregaria*.

S. Bradleigh Vinson, Carl S. Barfield and Rodger D. Henson. Oviposition behaviour of *Bracon mellitor*, a parasitoid of the boll weevil (*Anthonomous grandis*). II. Associative learning.

Systematic Entomology

Volume 2, Number 3, July 1977

Keith S. Brown. Geographical patterns of evolution in Neotropical Lepidoptera: differentiation of the species of *Melinaea* and *Mechanitis* (Nymphalidae, Ithomiinae).

Ginter Ekis. Classification and evolution of the Central American beetle genus *Colyphus* (Cleridae).

Laurence A. Mound. Species diversity and the systematics of some New World leaf-litter Thysanoptera (Phlaeothripinae, Glyptothripini).

R.N.B. Prior and H.L.G. Stroyan. A new species of *Aphis* from *Potentilla palustris* with a discussion of related species.

T.E. Woodward. The occurrence of Almeidini (Hemiptera: Anthocoridae) in Australia, with the description of a new genus.

Ecological Entomology

Volume 2, Number 3, August 1977

D. Blumberg. Parasitoid egg encapsulation in soft scales (Homoptera: Coccidae).

E. Kapatos, M.W. McFaddan and S. Pappas. Sampling techniques and preparation of partial life tables for the Olive Fly Dacus oleae, in Corfu.

M. Ladle. Observations on the ecology of Simuliidae from the River Frome, Dorset.

Arthur M. Shapiro. Phenotypic induction in *Pieris napi*; role of temperature and photoperiod in a coastal California population.

J.P. Spradbery. The oviposition biology of siricid woodwasps in Europe.

R.C. Steward. Industrial and non-industrial melanism in the Peppered Moth *Biston betularia*.

B. Taylor. Ant mosaic on cocoa and other tree crops in Western Nigeria.

A.A.G. Thomas, A.R. Ludlow and J.S. Kennedy. Sinking speeds of falling and flying *Aphis fabae* Scopoli.

1. THE ENTOMOLOGIST'S RECORD AND JOURNAL OF VARIATION

A monthly illustrated journal founded in 1890 by J.W. Tutt, devoted mainly to Lepidoptera, though other Orders are not neglected. Papers on Genetics, Distribution, Immigration and descriptions of new species. We circulate in 47 countries.

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2. THE BRITISH ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY

(formerly the South London Entomological and Natural History Society)
Founded 1872

Ordinary meetings are held twice a month on Thursdays at 18.00 hours at the Society's rooms at the Alpine Club, 74 Audley Street, London W1 5FF, except in August. Field meetings are held between March and October most weekends. The Proceedings are published in two double parts annually at about 6-monthly intervals. (The price of single copies may vary if bought by non-members.) Annual subscriptions for full or corporate members: £4.00; country members £2.25; junior members (under 21) £1.25. (Other publications include: *A Guide to the Smaller British Lepidoptera*, by L.T. Lord, B.A., £2.50; supplement, £0.50; *The Natural History of the Garden of Buckingham Palace* (compiled by a team of specialists), £1.00.) The Society's collections and library may be consulted by members. For details apply to: Hon. Secretary, G. Prior, F.L.S., F.R.E.S., 23 Manor Way, North Harrow, Middx.

3. THE AMATEUR ENTOMOLOGISTS' SOCIETY

Volume No. 7. *The Hymenopterist's Handbook*. Originally published 1943, facsimile reprint 1969. A comprehensive guide to collecting, rearing and study of ants, bees, wasps, gall-wasps and parasitic Hymenoptera. Keys to all the British families. 160 pp., 183 figs, 2 pls.

11. *A Coleopterist's Handbook*. Originally published 1954, revised edition 1975. Describes the tools and methods of collecting, habitats, commensals and pre-adult stages, recording, personal collections and conducting a local survey. 142 pp., 62 figs, 18 pls.

12. *A Silkmoth Rearer's Handbook*, by W.J.B. Crotch. Originally published 1956, facsimile reprint 1970 without colour plates. How to breed 120 exotic species in Britain, including substitute foodplants and early stages. Systematic section refers to 1400 species. (Does not cover Mulberry Silkworm for which there is A.E.S. Leaflet No. 3). 165 pp., 26 figs, 24 pls.

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