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CECIDOLOGY

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Journal of the
BRITISH PLANT GALL SOCIETY

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NOTES TO CONTRIBUTORS

Recommended guide-lines, when writers have the facilities:
Type in double spacing on one side of the paper only. Give margin of 2 cm at upper and left-hand margins.
Include a second (e.g. carbon) copy; a third copy is useful, and writers should also keep a copy.
Give sketches on a separate sheet, in black and white. Indication of scale and any other writing at least 5 cm. clear of sketch(es).
Underline scientific names, and nothing else; use a separate sheet to indicate any other special printing instructions.

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CECIDOLOGY

Vol. 1, No. *2* Autumn 1986

Journal of the British Plant Gall Society
Editor — F.B. Stubbs

EDITORIAL

It is heartening to be able to record the success of the Society's 1986 Programme, with an average attendance of about thirty at the meetings. Thanks are due to the Regional Co-ordinators and others who made arrangements, and to the organisations in several areas sharing these occasions with us. Their hospitality extended to the use of premises, so that lunch could be taken in surroundings conducive to conversation, with tables set to take the displays of specimens which led to lively and informative discussions.

There was never the temptation to rush for shelter, as the dates contrived to coincide with the brief spells of fine weather during a rather dismal summer. Members travelling from a distance found some examples which were unfamiliar on their home ground, but perhaps the most fruitful result was the opportunity for members to meet one another personally. We see now that cecidologists are ready to talk over their common interests and to offer a welcome to beginners. Let 1987 bring an even wider programme of practical activities for the BPGS.

The editing of this journal has its difficult moments, but is usually fairly straightforward. Contributions arrive and during refereeing and checking, few amendments have been needed. Complacency was shattered when the Keys came on the scene. Consistent tabulation and lay-out were required, although styles would quite properly vary in a team project. Indexing presented problems of nomenclature; we lost count — and patience! — after tracing eighteen synonyms for one humble creature. It was pointed out that many readers would have no easy access to works on basic principles, so a few more pages were added.

Some of the gaps which were noticed could not be overlooked. Then came appeals to contributors to deal with an extra host genus or to produce a few more sketches. We could not hide too blatantly behind the term "provisional" and it was a great relief when "Finis" was agreed.

All orders, with remittance payable to B.P.G.S., for the Keys should be addressed to the Editor, F.B. Stubbs, and will be met in rotation.

Subscriptions should be sent separately to the Treasurer, W.S. Plant.

SUMMARY OF THE FIRST ANNUAL GENERAL MEETING OF THE BRITISH PLANT GALL SOCIETY

In the early stages in the development of any society, there is a tendancy to seem preoccupied with matters relating to the mechanics of setting up the Society.

Much discussion centres around the Society's Constitution, the election and role of the Society's Officers, setting subscription rates etc. For the majority of members such issues are a distraction from the main reason they joined the

Society. Nevertheless, most would accept that if the BPGS is to fulfil its objective of promoting the study and understanding of plant galls it will only do so by being properly organised. We make no excuse, therefore, for using part of this early edition of Cecidology in discussing issues of organisation. We anticipate, however, that as the Society matures such discussions will become a less predominant part of our thoughts.

The Society's first AGM was held at Monks Wood Experimental Station on 12th July 1986, when the 31 members present contributed to a discussion on a wide range of organisational and financial matters. Unratified minutes of the AGM, taken by Mr. T. Higginbottom are lodged with the Secretary. Here we provide a summary of these discussions and comment upon the likely outcome of some of the decisions taken.

The Constitution

The vigour and diversity of discussion of the Constitution led to the realisation that many issues needed to be resolved before a finalised version could be produced. The consensus was that to produce a finalised version at this early stage in the Society's development may be inhibitory. It was agreed, therefore, that the Draft Constitution, circulated to Full Members during June as part of Newsletter No. 2, together with amendments tabled at the AGM, be accepted until the 1987 Annual General Meeting. In effect this means that, with some important provisos, the Society will continue to be managed in the manner of its first six months of existence.

This Draft Constitution begs a number of questions which need to be addressed before the next AGM; the idea being that a more-or-less final version of the Constitution be presented to the members for comment well in advance of the 1987 AGM. Amongst the issues are:

i)should there be a separate "family" membership subscription?
ii)should full members, unable to attend the AGM, have a proxy vote?
iii)for committee meetings, what is an appropriate quorum?

On this later point, since Officers and Committee members live so far apart, it is difficult to visualise them being able to get together for regular meetings to discuss matters as they arise. The cost to members or the Society would be prohibitive. The Society's business is, however, an on-going activity and requires decisions to be made from day to day. Perhaps it is more realistic to organise a system in which decisions would be arrived at by postal/telephone contact between committee members. Thus, if a decision needs to be reached concerning, for example, the format of Cecidology, the views of the committee members would be elicited by post and the consensus view adopted.

If you have any views on this, or any other **matter arising from** the Constitution, please let us know.

Subscriptions for 1987

Readers will note from item 4 of the Draft ('Constitution **that** "**Rates** of subscription shall be determined annually at an Annual General **Meeting".** This was interpreted at the 1986 AGM as meaning that **subscriptions should be** fixed by **members** at the AGM and accordingly. **subscription rates were** fixed for 1987. First the good news –Full Member% **rates will remain the same** at £5. Next, the not so good news Subscribers' rates **are also set at £5**

It is worthwhile describing how **this latter figure was arrived at and** to explain

its likely outcome. The Treasurer indicated to the meeting that the present (1986) Subscriber's rate of £2 was rather generous, particularly in view of an anticipated expansion of Cecidology. It was also pointed out that many (but not all) Subscriber members were institutions (Museums, Libraries etc.) in which several individuals might read each copy of the journal — the argument being that such institutions ought to pay more. After much discussion (there is nothing like money in raising the temperature), the decision was reached that Subscribers should pay £5/annum. We can all instantly recognise that, since there is now no cost differential between the two types of members, everyone wishing to remain with the Society will elect Full Membership and receive Newsletters, concessionary rates, voting rights etc. as well as Cecidology. If this decision is retained, and at the moment there is no mechanism for changing it without calling a Special General Meeting, it would appear pointless to offer a Subscriber membership.

This is quite a fundamental matter since 1987 will be an important year for recruitment (see Publicity below) and pamphlets will need preparing before the end of the year. In forming the Society, the Chairman and others present at the early meetings had seen a need to distinguish between `active' cecidologists and those to whom galls were of only peripheral interest. Hence the two levels of membership were established. Maybe the participants at the AGM came, by a circuitous route, to an alternative position by essentially producing a unifying level of membership. The danger is that the Society may lose some Subscriber members although it must be said that, however, peripheral galls are to one's main interest, £5 per year for membership is, in terms of the 1980's , a small sum to find. The officers would undoubtedly find a single membership much easier to administer. Your comments on this are welcomed.

Finally, on the matter of subscriptions, the Draft Constitution puts the control of setting rates in the hands of members at the AGM. Would it be more appropriate for the subscription rate(s) to be fixed by the committee? This would perhaps avoid the type of lurches in policy, intentional or otherwise, described above. Hopefully a Committee armed with the financial facts and involved in the forward planning of the Society's activities would be best placed to make judgements on subscription rates as well as providing some continuity in the development of the Society.

Publicity and Recruitment

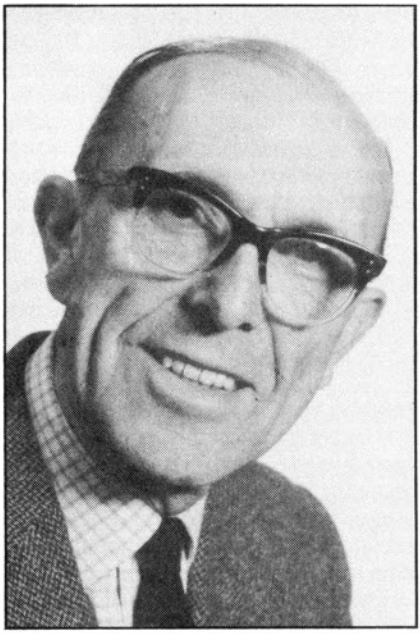
Since its formation at the beginning of the year, the Society's membership has grown steadily mainly thanks to the enthusiasm of founder members in spreading the news. Thus gentle growth has allowed us to establish rudiments of organisation such as finding publishers, organising mailing lists etc. We can now look forward to expanding our membership during 1987 in such a way that we are able to (and I paraphrase another commercial) refresh cecidologists that other Societies cannot reach. It would be rewarding to believe that everyone within the U.K. who had an interest in plant galls was aware of the existence of the BPGS, or, better still, was a member. We ask all members to use their influence to bring news of the Society's existence to others with an interest. For those who wish for publicity materials (pamphlet and/or posters) please contact the Secretary. We are confident that the production of the Provisional Keys will do much to further the cause by bringing the Society to the attention of Natural Historians and providing a basic tool required for the study of galls. In addition, a proposed national survey of galls amongst the readers of BBC Wildlife will do much to

enhance the standing of the Society. We again welcome members' suggestions for publicising the Society.

Check-List of British Plant Galls

During the course of the AGM, a working party comprised of Colin Plant, Eric Philp, Brian Spooner and Jerry Bowdrey was elected with a view to producing a check-list of plant gall causers. Their intention is to meet the requirements of both amateur naturalists and specialist researchers by including all(?) synonyms, fully cross referenced to published illustrations of the galls themselves. They envisage that the check-list would be arrangements in taxonomic sequence and would be fully indexed alphabetically by species and genus. This is an enormous task and we wish the team success. They would be grateful for any help you can offer. All communications should, at this stage, be directed through Colin W. Plant (British Plant Gall Society) at Passmore Edwards Museum, Romford Road, London. E15 4LZ. (tel. 01 470 4525 –office hours).

C.K.L.



ARNOLD DARLINGTON
(1912-1986)

Soon after Arnold Darlington was born, his family moved from Lancashire to Cambridge. Here he attended Perse School, and in due course graduated from Trinity Hall.

From among the biographical details kindly offered by those who knew him over the years, we learn that he began his teaching career in Friends' schools. Here he had the freedom to develop Natural History in the field as well as formal Biology in the laboratory. He always maintained that it was at Sibford School that he devised the methods which laid the foundation for his future teaching.

He was appointed as Head of the Biology Department at Bishop's Stortford College in 1950 and fifteen years later at Malvern College. His laboratories were full of living things. He had no use for gimmicks; the plants and animals were there to encourage the boys to study them for serious scientific work which resulted in some remarkable and original projects for their A-level examinations.

The Natural History Societies flourished under his enthusiastic guidance, often providing a hobby for the non-scientists. He livened the community with his

talented acting; he was a skilled artist, and with his interest in History and Criminology he was never at a loss for a subject to attract the boys.

In 1965, he was seconded to the Nuffield Foundation. As one of the team leaders of the Nuffield Biology Project, his ideas on teaching, particularly in ecology, have influenced biology courses throughout the country.

Years of research resulted in books written by Arnold on various subjects. These included "A Pocket Encyclopaedia of Plant Galls", "The World of a Tree", "The Ecology of Refuse Tips", and "The Ecology of Walls". He also produced a series of books for junior children — "Fun with a Magnifying Glass", "A Zoo in Your Home" and "Jam jar and Saucer Gardens".

In retirement he took the opportunity to travel and was interested in everything which added to his knowledge of the world. He enjoyed lecturing, and teaching in Preparatory Schools in the Malvern area.

More personal recollections are of one whose conversation was always lively and stimulating, and who was at the same time a courteous listener. Arnold's scientific approach was meticulous but far removed from dogmatism, for he encouraged and discussed any worth-while line of thought.

It would be no exaggeration to say that to all of us his standing as an exponent of gall studies was unique. When his "Plant Galls in Colour" appeared nearly twenty years ago, it led many naturalists to see for the first time the fascination of the topic. That marked the emergence of cecidology from the virtual eclipse which had left the subject in obscurity for over half a century, and it was the most cogent factor in establishing a happier situation. We remember Arnold Darlington with respect as a most eminent foundation member of the British Plant Gall Society.

He had further lecturing and writing planned at the time of his sudden death at the age of 73 on February 16th. He is survived by his wife, to whom we offer our kindest thoughts.

F.B.S.

BOOK REVIEW

Collins Guide to the Insects of Britain and Western Europe. Michael Chinery. £6.95: The British Isles can claim over 20,000 species of the Insecta, and this number soon doubles as we look across the Channel and southwards. This Guide aims to make it possible to trace any insect at least as to its family, and very few indeed have escaped that net. The text is supported throughout by numerous coloured illustrations.

The author's earlier *Guide to the Insects ofBritain and Northern Europe* offers a much smaller selection, but with fuller details of each. The two books are best regarded as complementary to one another, not as alternatives, and both will be used by many naturalists. Members of the BPGS will be pleased to find that the gall causing groups are given that fair share of attention which their specialised ways would merit.

F.B.S.

MICROBES & INSECT GALLS — OBSERVATIONS & SPECULATIONS

C.K. LEACH

(School of Life Sciences, Leicester Polytechnic)

The association between microbes, particularly bacteria, and insects has long been recognised. Even giving the matter scant attention, it becomes immediately obvious that there is a multitude of such affiliations. We are conscious of the fact that insects may act as vectors of human and animal diseases including malaria and sleeping sickness caused by protozoans, and typhus and plague caused by bacteria. Insects are also frequently implicated in the transfer of numerous plant diseases including pathogenic fungi, bacteria and viruses. In addition to those associations with obvious social and economic significance, there are many which are manifestly beneficial to the carrying insects. The composition of the microflora of insects is however, highly variable between members of the same species. Inevitably they pick up a variety of microbes from their environments. Many of these organisms will not find the external surface of the insect a suitable habitat but others will grow and become established as part of the `normal' micro-flora of the insect. These, largely adventitious, microbes will reflect the nature of the insects' environment and activities. In the case of highly motile insects, such as house-flies, which frequent decomposing materials, their external microflora is forever changing and can be substantial in number. Three to four million bacteria per insect are frequently present. Even greater numbers may be found within insects. This internal microflora may be extracellular, living in the insect's gut and blood, or intracellular residing in selected cells within the insect body. The common housefly may, for example, harbour 20-40 million internal bacteria. Some of these may, of course produce the symptons of disease within their hosts but others may assist their hosts to digest food or to provide their hosts with essential nutrients.

The impact of microbial infections on insect galls has rarely been commented upon apart from cases of spoilage of materials pinned out for display purposes or for the damage caused to galls being incubated for purposes of breeding out. Cecidologists have often encountered these problems even with the more woody galls. Softer galls are even more difficult to store or incubate without deterioration. We know however, that galls are produced in a world inhabited by teeming hordes of microbes capable of taking advantage of almost any situation in which there is a source of nutrition. During the act of ovi-positioning, the egg becomes contaminated by microbes carried by the adult gall-inducer and by the receiving plant. From that moment on, it will receive a continual input of new microbes carried in by the air through the aperture produced during egg-laying until the aperture is sealed. Microbes, therefore, become incarcerated in the gall chambers along with the gall inducing larvae.

The interest of the author in the activities of these microbes came through examining the micro-flora on the over-wintering spangle galls induced on oak by *Neuroterus quercus-baccarum.* These small galls spend the winter buried in the leaf litter around the base of the parent trees. The leaf litter in woodlands provides a suitable habitat for the growth of a multitude of micro-organisms, particularly

fungi. Oakwoods (mainly *Quercus petraea* and *Quercus robur)* produce, on average, about two and a half thousand leaves per square meter every year (quoted by Hudson, 1980) which represents approximately 400 g dry weight of leaf material per square meter. The numbers and variety of organisms within this ground cover are tremendous; Wilkins, Ellis and Harley (1937), for example, demonstrated the presence of over 500 fungal species in the microflora of oak-woods. It is in the midst of this diverse microflora that the spangle galls spend the winter. A feature of these over-wintering galls is their apparent resistance to microbial degradation until the wasps have emerged in spring. Thus, although some galls might succumb to the degredative activities of these microbes, many survive through to the spring while the leaves from which they originated, are almost invariably degraded.

In the author's study a wide range of different fungi including Ascomycetes and Basidiomycetes were detected in the leaf litter, although identification to species level was not attempted since the differences in frequency of occurrence on the surfaces of galls and leaves was considered of more importance. A much more restrictive range of microbes was found on the surface of galls than on leaves. There was inevitably considerable variation between samples and the nature, diversity and abundance of the various types of fungi found showed marked temporal and geographical differences. However, the microflora of these spangle galls was largely composed of Ascomycetes, predominantly *Londarium* spp. and *Venturium spp.* with periodic increases in an unidentified species and *Cladosporium* spp. Also present in vacated or diseased galls were substantial numbers of a member of the Peronsporales which produced enormous numbers of absorbative sac-like haustoria.

It was particularly noticeable that the fungi attached to leaves had deeply penetrated the tissue whereas those attached to galls were restricted to the epidermis and erinia. Microscopic examination of sectioned galls revealed little penetration of the fungal hyphae into the gall tissue. Premature death of the gall inducing larvae either through natural causes or artificially induced by heat or by mechanical means, led to the fungal hyphae rapidly extended into the gall tissue. It appeared, therefore, that the resistance extended into the gall tissue. It appeared, therefore, that the resistance to fungal invasion is dependent upon the presence of viable insect larvae rather than on the gall tissues. These observations led to the demonstration of a low molecular weight, labile antifungal activity associated with these galls (Leach 1981 a,b) which was lost from the galls soon after they were vacated by the mature imagines, or after the untimely death of the larvae. Either way, of course, the gall would have fulfilled its biological function and its degradation would be of little consequence to tree or gall inducer. Turning our attention to bacteria and insect galls Steinhaus (1967) relates that a survey of the insects associated with willow trees led to the implication of the larvae of the gall midge *Rhabdophaga saliciperda* and the sawfly *Euura atra* were largely responsible for the transmission of "water mark" disease. This disease, common in British willows, is caused by the bacterium *Erwinia salicis.*

Another aspect of insect: bacterial associations is the transmission of bacteria capable of inducing galls by non-gall inducing insects. Infection of Olive trees, particularly in California, Italy and other southern European countries, by the bacterium *Xanthomonas savastoni* gives rise to "knot"-like galls. The spread of this bacterium appears to be closely linked with the Olive fly *Dacus oleae.* Petri

(1909, 1910) demonstrated the presence of this organism in the blind appendages of the middle stomach of the *D. oleae* larvae. The bacteria are transmitted through the egg and persist in the pupa (Buchner, 1930). Petri suggested that this bacterium, together with another isolate he called *Ascobacterium lutem,* perform a physiological role in the larvae. The larvae of this insect have to ingest very large quantities of oil in order to extract enough nitrogenous material for their development and Petri indicated that these bacteria were important in the digestion of the olive oil. Galls induced *by Xanthomonas savastonipseudotsugae* on Douglas fir *(Pseudotaxi folia)* also appear to be dependent upon an insect *(Chermes codeyi)* for their transmission (Hansen and Smith, 1937).

The suggested role of *Xanthomonas savastoni* in the gut of the larvae of the Olive fly may be pertinent to the occurrence of *Azotobacter vinelandii* in the spangle galls of *Neuroterus quercus-baccarum.* The analysis of the microflora of over-wintering spangle galls, described above, led the author to isolate a nitrogen-fixing bacterium identified as a strain of *Azotobacter Vinelandii* from spangle galls (Leach 1978). After its initial isolation from homogenised spangle galls, it was also isolated from spangle galls, currant galls, agamic and gamic female wasps and, intermittently, from male wasps of widely different geographical situations (Norfolk, Leicestershire, Cheshire and Cumbria). Attempts to isolate this organism from surface washings of galls and oak leaves were usually unsuccessful. The ability of this organism to use atmospheric dinitrogen gas (N1/2) as a source of nitrogen was confirmed using the acetylene reduction assay procedure.

The wide occurrence of this organism, together with the inability to routinely isolate it by surface washing intact galls and its absence from normal leaf tissues, indicates that this organism may be indigenous *(autochthanous)* to the wasp *Neuroterus quercus-baccarum* responsible for the induction of spangle and currant galls. What, then, is the physiological significance of this association? It may be that the bacterium has an important role in the nutrition of the wasp in a manner analogous to that suggested by Petri for Xanthomonas savastri in the nutrition of the Olive fly. Consider the developing larvae of any of the cynipid gall inducing wasps. They spend their growth phase cocooned within their larval chambers, surrounded by a so called nutritive layer ensheathed within a tough schlerenchymous shell. Within this chamber, they are forced to accpet whatever nutrients the host plant supplies. Furthermore, their blind alimentary tracts and their failure to produce frass indicates that they not only willingly accept such nutrients as the plants produce but are also capable of completely, or almost completely, digesting it. This is quite obviously untrue of most phytophagic organisms, be they cows, horses, caterpillars, greenfly or snails. What, therefore, is so special about the nutrition of gall-wasp larvae?

There is very little recorded data concerning the composition of the nutritive layers of cynipid galls. Analysis of intact galls reveal that they are rich in carbohydrates (mainly starch and cellulose) and tannins but poor in proteins. In summary, these galls are, in general, rich in energy components but are poor sources of the nitrogenous materials necessary for the synthesis of the proteins and nucleic acids of the feeding larvae although the nutritive layers of these galls may, have broadly different compositions to those of the intact gall.

The ingestion of these layers by the gall larvae poses a number of metobolic problems. The nutritive tissue's cell walls, although only thin, are composed of

cellulose which is not an easy material to hydrolyse. They do not, however, appear to contain any deposits of the even more recalcitrant lignin, and hydrolysis of these cell walls does not present insurmountable biochemical problems. This cellulytic material, together with the oils, sugars, is not a good nitrogen source for the feeding larvae. It is possible, therefore, that these larvae are presented with a dietary imbalance in which the energy required to drive biosynthesis is in plentiful supply but in which nitrogen, required to make the building blocks of cell synthesis, is deficient. The association of nitrogen-fixing bacteria (i.e. capable of converting elemental nitrogen into a combined form) with these larvae might alleviate this deficiency. The matter has, however, yet to be proven.

Is there any evidence that similar relationships occur in other cynipid galls? Close examination of the microflora of silk button galls (caused by *Neuroterus numismalis),* smooth spangle galls *(Neuroterus albipes)* and cupped spangle galls *(Neuroterus tricolor)* of oak by the author have failed to lead to the isolation of similar bacteria. Examination of thin sections of these galls and larvae, however, revealed the presence of bacteria. It may be that some of these are capable of fixing atmospheric nitrogen but that suitable conditions to cultivate them outside the galls have not been established. Whether or not nitrogen fixation occurs in these other galls remains unanswered.

How are the azotobacters in spangle galls transmitted from generation to generation? Again *Xanthomonas savastoni* may provide a model. This bacterium occurs in the intestinal tract of the olive fly *Dacus oleae* throughout all stages of development of the insect. In the adult fly, the hind part of the gut and vagina fuse to form a common opening and the eggs thereby become contaminated by gut organisms as they pass along the vagina and ovipositor. However, no such connection has been demonstrated in the imagines of *Neuroterus quercusbaccarum.* It could, of course, be that in this gall wasp the ovipositor and vagina become infected during the considerable restructuring which occurs during metamorphosis. The question of transmission remains unanswered.

The presence of bacteria within the larval cavities of cynipid galls has also been reported by Kostoff and Kendall (1929). These authors believed that the presence of bacteria in the vicinity of the developing larvae was largely responsible for the formation of the galls. In their hypothesis, it was the bacteria which induced gall formation and the associated insects acted principally as vectors. A strong argument against Kostoff and Kendall's hypothesis comes from the vast structural and physiological differences between galls known to be induced by bacteria and those associated with gall-wasps. Galls induced by bacteria (e.g. *Agrobacterium tumefaciens)* are simple cellular masses lacking the ordered spacial patterns of tissues characteristic of cynipid galls.

From the above description it should be self-evident that many exciting and fascinating discoveries are still to be made. Past work in this area of cecidology has barely scratched the surface and this aspect of the topic awaits further attention from both professional and amateur biologists. If this article serves to stimulate interest it will have fulfilled its purpose.

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ABNORMAL KNOPPER GALLS

Three oak trees examined recently (in squares SW 53, 63 and 72) have had a real invasion of small and quite atypical Knopper galls. They are much smaller than usual, only 0.5-1.5 cms. across and sometimes four on one cupule which means quite a lot of overlapping. In the case of one tree the usual barnacle-shape of the gall was quite absent and most of the galls showed as a frill of bright red spiky rays. If this is what happened in 1983 in Europe it is not surprising their jays fled here, and one wonders what the effect may be this year if this is widespread, though we do not have many jays so far west as a rule.

Ruth M. Phillips 17.9.86
Goldsithney, Penzance.

CHRYSOMELIDS AS GALL USERS

While collecting insects from willows *(Salix fragilis* L.) infested with *Pontania* galls in Montgomery and Shropshire I have observed Chrysomelids using galls which appeared to be eaten out. *Chalcoides aurata* (Marsham) and C. *fuluicarnis* (Fabricuis) were taken in this way at the Wern Claypits, near Arddlin, Powys (VC 47) and C. *aurata* at Rodington, Shropshire (VC 40). It was not clear whether the beetles had excavated the galls or were using those damaged by other insects, or if they were feeding or sheltering. I would be interested to hear of any other observations which could help to clear this point up.

J.A. Hollier,
Montgomery Canal Ecological Survey, Preston Montford Field Centre,
Montford Bridge, Shrewsbury. SY4 1DX.

SOMERSET PLANT GALL RECORDS

A list of plant galls from Somerset, most of the records from 10km. grid square ST 03 were from the environs of the Leonard Wills Field Centre, Nettlecombe Court (1982)85).

On Oak *(Quercust spp)*

Andricus fecundator ST 03
Andricus kollari ST 03
Andricus quercuscalicis ST 03
Biorhiza pallida ST 03
Neuroterus quercus-baccarum ST *03*

On Beech *(Fagus sylvatica)*

Hartigiola annulipes ST *03*

On Lime *(Tilia* sp)

Eriophyes tilae typicus ST *03,* ST 04

On Nettle *(Urtica dioica)*

Dasyneura urticae ST *03*

On Germander Speedwell *(Veronica chamaedrys)*

Jaapiella veronicae ST *03*

On Ground Ivy *(Glechoma hederaceae)*

Dasyneura glechomae SS 92, ST *03*

On Ragwort *(Senecio jacobaea)*

Contarinia jacobeae ST *03*

On Rose *(Rosa sp)*

Diplolepis rosae ST *03*
Diplolepis eglanteriae ST *03,* ST 04

On Ash *(Fraxinus excelsior)*

Eriophyes fraxinivorus SS 84, ST *03*

On Yew *(Taxus baccata)*

Taxomyia taxi ST *03*

On Nectarine *(Prunus persica nectarina)*

Taphrina deformans ST *03*

On Holly *(Ilex aquifolium)*

Phytomyza ilicis ST *03*

On Blackthorn *(Prunus spinosa)*

Taphrina pruni ST 04
Eriophyes similis ST 04

On Dogwood *(Cornus sanguinca)*

Craneiobia corni ST 04

On Field Maple *(Acer campestre)*

Eriophyes macrorhynchus cephalodes ST 04

MARK WILSON
Penn Fields, Wolverhampton, WV3 ODY.

TEPHRITID FLIES IN THISTLES

The following records have been received from Dr. Margaret Redfern (Cliff Bungalow, The Compa, Kinver, Stourbridge). The *Urophora* species form galls in thistles; the remaining species are not gall-causers but feed inside thistle and knapweed heads. The records of *Urophora cardui* from Ipswich and Kidderminster are the most northern ever described for this species.

Urophora cardui on *Cirsium arvense* (galls)

Waldringfield marshes	Ipswich 1" map 150 GR. 286442	October 1984
Cookley, waste ground	Kidderminster 1" map 130 GR.842808	November 1983
Juniper Hall, Dorking Surrey		1981, September 1985
Telegraph House, waste ground	Chichester 1" map 181 GR. 811174	1967, 1971

Urophora stylata onCirsium vulgare (galls)

Kingley Vale NNR downland scrub	Chichester 1" map 181 GR. 823103	1971, 1972
West Marden Meadowland	Chichester 1" map	1971
Bedhampton waste ground	Chichester 1" map 181 GR. 69-06-	1967
Aldsworth pasture	Chichester 1" map 181 GR. 766088	1969
Alvecote Pools nature trail, waste ground	near Tamworth, Staffs.	1978
Chaverley	Kidderminster 1" map 130 GR. 792939	November 1983
Wolverley pasture	Kidderminster 1" map 130 GR. 825727	November 1981
Waldringfield marsh/pasture	Ipswich 1" map 150 GR. 825787	November 1982 October 1983 October 1984
Juniper Hall, Dorking, Surrey garden		September 1985

Terellia serratulae on *Cirsium vulgare* (larvae in heads)

Alvecote Pools nature trail, near Tamworth, Staffs.		1978
Wolverley pasture	Kidderminster 1" map 130 GR. 825787	November 1981
Waldringfield	Ipswich 1" map 150 GR. 286442	November 1982 October 1983 October 1984

Orellia ruficauda and *Xyphosia miliaria* on *Cirsium arvense* (larvae in heads)

Wolverley pasture	Kidderminster 1" map 130 GR. 825787	September 1983
Six Ashes, Bobbington wide road verge	Kidderminster 1" map 130 GR. 794885	September 1983
Kinver pasture	Kidderminster 1" map 130 GR. 848831	September 1983

Chaetostomella onotrophes on *Centaurea nigra* (adults)

Juniper Hall Field Centre, Dorking, Surrey chalk grassland		September 1985

The attention of readers is also drawn to the extensive study on the natural history of spear thistle-heads conducted by Dr. Redfern and published in Field Studies *vol.* 2, No. 5,p669-717. This study not only provides a fascinating insight into the interactions between insects, associated with thistle-heads, but also includes data on the distribution and frequency of galls caused by *Urophora stylata.* Some of these data are summarised in Table 1. Note that a record of the absence of galls is just as important as recording its presence; recording the frequency of galling gives some guidance as to its abundance. If only we had more data of this type on a wide range of gall causers and geographical locations then perhaps we really could begin to believe we knew something about cecidia!! For more information on both *Urophora* species, and on other insects associated with thistles, see her *Insects and Thistles* published by C.U.P., 1983.

TABLE 1 OCCURRENCE OF THE GALLS OF *UROPHORA STYLATA*

		No. of Thistle-Heads Examined		No. and Percentage of Thistle-Heads with Galls			
					1964		1965
Site	Grid Reference	1964	1965	No.	%	No.	%
Flatford Mill	TL 074332	160	35	37	23.1	21	60.0
Preston Montford	SJ 432142	157	50	53	33.7	11	22.0
Orielton	SR 955992	162	39	77	47.5	8	20.5
Slapton Ley	SX 818441-3 SX819441 SX 822446 SX 824449	186	28	6	3.2	8	28.6
Juniper Hall	TQ 175529 TQ175528	80	43	1	1.2	3	7.0
Malham Tarn	SD 892674	41	30	0	-	0	-
Hampsfell	SD 394786	65	36	0	-	0	-
Lancaster	SD 494606	NS	100	NS	-	0	-
Coombs Dale	SK 228748	NS	50	NS	-	0	-

NS = No Sample taken

ADDITIONAL RECORDS OF ORKNEY GALLS

B. M. SPOONER

Since preparation *of* a preliminary account *of* Orkney Plant Galls (Spooner, 1986), I have located a few additional early published records *of* gall-causing Diptera from the islands. These include three midge galls, *of* which two are undetermined, reported by Trail (1888) in his account *of* gall-making Diptera in Scotland, and two potential gall causers recorded by Grimshaw (1905). These records are listed below.

Dasineura urticae. On *Urtica dioica,* Orkney (Trail, *1888)*

Oscinella flit. Kirkwall (Grimshaw, 1905, as *Oscinis) Urophora solstitialis.* Orkney, 2 males (Grimshaw, 1905)

Undetermined:
On *Galium verum.* Green, smooth, laterally flattened, obliquely conical, beaked thin-walled gall containing a white larva.
Trail (1888) reported this gall as common in Orkney, Sutherland, Moray, Aberdeen, Kincardine, Forfar, Perth and Glasgow but was unsuccessful in rearing the causer. Following Buhr (1964) this may key either to *Dasineura galiicaulis, a* species apparently unknown in Britain, or to an undetermined Cecidomyid. If the gall is still as common, it should be easy to refind for further study.
On *Senecio jacobaea.* Flower heads swollen, containing gregarious orange-red larvae in a cavity over the receptacle . Trail (1888) reported this gall from Orkney, Sutherland, Caithness, Moray, Aberdeen, Kincardine, Forfar and Perth, and initially referred it to *Contarinia jacobaeae.* However, it was later shown by Low (see Trail 1888) that the larvae of this species live amongst the achenes rather than inside a cavity, and cause little swelling. The causer may instead have been *C. aequalis* Kieff. but, again, fresh collections of this gall would be desirable for further study.

REFERENCES:

Buhr, H. (1964) Bestimmungstabellen der Gallen (Zoo-und Phyticecidien) an Pflanzen Mittel-und Nordeuropas. Vol. 1. Gustav Fischer, Jena.

Grimshaw, P.H. (1905) Diptera Scotia: IV — Orkney and Shetland. Annals of Scottish Natural History 1905: 22-35.

Spooner, B.M. (1986) A Preliminary Account of Plant Galls from Orkney.

Cecidology 1: 15-16.
Trail, J.W.H. (1888). The Gall-making Diptera of Scotland.
Scottish Naturalist 9: 309-328.

PLANT GALLS RECORDED IN BARNHAM, W. SUSSEX (1955-1984)

Galls on oak

Andricus kollari — marble galls
Biorhiza pallida — oak apple galls
Neuroterus quercus-baccarum — spangle galls *Andricus ostreus* — oyster galls

Galls on wild rose

Diplolepis rosae — bedeguar gall
Diplolepis eglanteriae — smooth pea gall *Diplolepis nervosus* — spiny pea gall

Galls on field thistle

Euribia cardu — stem gall

Galls on dewberry

Diastrophus rubi — stem gall

Mr. M. Venables, Chichester, W. Sussex.

NORFOLK RECORDS OF TWO GALL MIDGES (DIPTERA : CECIDOMYIIDAE) DERIVED FROM FUNGI

Mrs. L. EVANS
Welborne, East Dereham, Norfolk.

MYCOCECIS OVALIS Edw.

Larvae hatch from eggs laid on the stroma of *Hypoxylon rubiginosum* pers. ex. fr. They construct black canopies beneath which they live until adult. These canopies are not galls as originally described but consist of melanic substances.

A bright yellow hyphal growth around the canopies is produced by larval stimulation. This is a gall tissue and is only found in association with the larvae.

Emergence of the adult midge is effected by pupal extrusion through the side of the canopy.

Collections

Wheatfen	30.4.76	Swanton Novers	12.4.76
Wayland Wood	10.3.78	Warren Wood	10.10.76
Lenwade Pits	25.1.81	Warren Wood	1.7.78
Thompson Common	7.10.83	Felbrigg Wood	7.10.79
Lollymour Fen	28.6.84	Hockering Wood	20.9.84
Honingham Fen	14.3.76		

BRACHYNEURINA PENIOPHORAE Harris & Evans

The larva of this gall midge forms reddish brown galls on the surface of the resupinate fungus *Peniophera cinerea (Fr.) Cooke.*

These galls are irregular in size, of a soft spongy texture, up to 2-3 cms. in diameter and in contrast to the ash grey colour of the fungus.

It is usual for each gall to contain several larvae. Just before midge emergence the pupae move to the surface and protrude from the gall.

Collections

Honingham Fen	24.8.76	Felbrigg Wood	7.10.79
Warren Wood	10.10.76	Hockering Wood	20.9.84
Warren Wood	1.7.78	Lollymoor Fen	24.3.80
Wayland Wood	10.3.78		

These two gall midges appear to require similar habitats on fallen or low branches in damp areas.

They are probably widespread and locally common.

References

Evans, R.E. Observations on the development of mycolecis ovalis (Diptera: Cecidomyiidae) on the fungus *Hypoxylon rubiginosum* pers. ex. fr. Pro. R. Ent. Soc. London (A) pp 156-159, 1970.

Harris K.M. & Evans R.E., Gall development in the fungus *Peniophora cinerea (Fr.)* Cook. Induced by *Brachyneurina peniophorae* Sp. Nov. (Diptera: Cecidomyiidae).
Entomologists Gazette vol. 30, pp 23-30, 1979.

WYRE FOREST MEETING

The following galls were identified by members of the Society attending the B.P.G.S. meeting held at the Frank Chapman Centre on 14th June 1986.

Map Reference: SO (42) 7773

Host	Gall Causer
Corylus avellanae (Hazel)	**Eriophyes avellanae (mite)**
Crataegis monogyna (Common Hawthorn)	**Eriophyes goniothorax (mite) typicus**
Ilex aquifolium (Holly)	**Phytomyza ilicis (dipteran)**
Quercus (Oak)	**Andricus albopunctatus tf (cynipid)**
	Andricus curcator (bud) `(cynipid)
	Andricus kollari (cynipid)
	Andricus lignicola iS (cynipid)
	Andricus quercuscorticis tf (cynipid)
	Andricus quercus radicis ' (cynipid)
	Biorhiza pallida T (cynipid)
	Neuroterus albipes f(cynipid) (catkin)
	Neuroterus numismalis S' (cynipid).
	Neuroterus quercusbaccarum ((cynipid)
	Neuroterus tricolor (cynipid) Trigonaspis megaptera (cynipid)
Rubus fruticosus (Bramble)	**Diastrophus rubi (cynipid)**
Salxi (caprea?) (Goat Willow)	**Iteomyia capreae (dipt)**
	Pontania vesicator (sawfly)
Sorbus aucuparia (Mountain Ash)	**Eriophyes sorbi (mite)**
Taxus baccata (Yew)	**Cecidophyopsis psilaspis (dipt)**
	Taxomyia taxi (dipt)

Members of the group noted the absence of galls on nettle and maple.

A condition of *fasciation* , of unknown cause, was found on oak. No one present could recall seeing this condition on Quercus before and a subsequent literature search has failed to detect any earlier reports.

P.R.S.

ADVANCE NOTICE
Saturday, 12th September, 1987.
Plant Gall Workshop — Leeds.

ISSN 0268—2907

QUESTIONS ON GALLS

The Secretary has received the following questions about galls and is soliciting your thoughts on the issues raised.

1. During September, I observed small (2-3 mm) yellow larvae feeding in the space between oak leaves and the upper surface of the spangle galls caused by *Neuroterus quercus-baccarum.* There was only a single larva per gall and each larva seemed to confine its grazing to the upper surface of the gall producing a slightly groved circle around the gall stalk. Apart from this, there appeared to be little obvious damage to the gall itself. The leaf surface was untouched and I found no evidence of these larvae elsewhere on the leaf. I could only find them by lifitng the gall away from the leaf. On some trees virtually all the galls harboured larvae while on other trees in the same locality I could find none".

Comment: Clearly here is another excellent example of an insect gaining shelter from galls albeit in a rather unusual manner. Exo-phytophagons insects with a predilection for galls are a rarity. Indeed the opposite appears to be more frequently true since we often see caterpillar damage to oak leaves while portions of the leaves bearing galls are left uneaten. Has anyone else observed this phenomenon or does anyone know the identity of the little yellow larvae?

2. "Can anyone direct me to suitable texts which will help me identify insects which emerge from cynipid galls? I currently use Eady & Quinlan C. 1963". Handbooks for the Identification of British Insects "Vol VIII" to identify the gall causers but I do not know where to start to identify the parasites and inquilines" Comments: Help please!

3. "For several years I have tried to breed out the inhabitants from a variety of galls with varying degrees of success. Some like the Marble Galls from Oak are easy, while others either dry out or go mouldy and few, if any, insects emerge. What advice can you offer to improve my success rate?"

Comment: Questions along this line are common amongst aspiring cecidologists. Unfortunately there is not a simple universal answer. It seems that each gall type requires its own particular conditions. As a general rule, however, the conditions to aim for are those closely related to the conditions under which the galls would normally find themselves if they had not been collected. Thus marble galls which normally persist on twigs require reasonably dry and airy conditions while the common spangle galls which normally over-winter under leaf litter prior to insect emergence require wet, cool conditions. In this latter case the insects may be successfully raised from galls kept on a bed of sterilized sand and peat (approximately!!!) and covered with a centimeter or so of peat. They do, however, need to be kept moist and cool. It is best, therefore, to keep them outside.

There is, however, help at hand. The Society is planning a full day work-shop for early next year (1987) to cover a wide range of practical issues arising from the study of galls. Any offers from experienced cecidologists would be gratefully received by the Secretary. Remember that it is just as important for us to know what *not* to do as it is to know what to do!

BRITISH PLANT GALL SOCIETY

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Please note dates applicable to Cecidology and the Newsletter: these items may appear in either, according to timing.

Early advice: Date, Place, Purpose/Topic, Speaker/Leader.

Approaching the date, the following details as appropriate: Date, Time (start and approx. finish). Food/drink to be carried? Meeting place with directions; 6-figure Grid Ref. useful. Type of meeting, purpose or topic. Speaker or Leader. Book in advance? Visitors can be accommodated? Charge for expenses? Address/ Telephone No. for enquiries.

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Please address correspondence to the Secretary, OR, for specific purposes, to the officer concerned.