THE PHYCOLOGIST

The Newsletter of the British Phycological Society

Editor: **Bruce Osborne**

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Editorial

Just recently I finished a lecture with the quotation by Arthur Conan Doyle; 'It is a capital mistake to theorise before one has data'. Not a particularly original quotation, perhaps, but one with wide applicability in science. How often, for instance, have we extended our own pet ideas or preconceptions beyond the realms of experimental proof? 'I know I have', is certainly not a statement restricted to a Monty Python sketch, nor is it restricted to one or two honest individuals. The fact is, almost all of us have done this at one time or another, to various degrees. Speculation is, however, not fabrication and informed speculation does serve as the basis for further experimentation. The point is not to allow such speculation to cloud our interpretation of experimental results. Without ideas we will have no basis for experimentation and really good ideas do not arise that often, believe me! Without realising it the quotation was presented in the shadow of the portraits of two men, Charles Darwin and Alfred Wallace, who probably shared in one of the greatest ideas in science, the 'theory' of evolution. Much of what they proposed, even speculated on, and based on limited experimental evidence, has largely turned out to be true and provided the basis for much of contemporary scientific thinking. Modern science is, however, in my view, becoming more restrictive and not as amenable to new ideas as it probably once was. Even if these ideas turn out to be wrong, they can result in new and important advances, so let's not be too critical of speculative, but interesting, ideas that don't always appear to fit the data, or provide alternative explanations for some previously 'accepted' observations. Where would we be, for instance, without any new ideas that challenged existing dogma? Surely this is the way that science progresses?

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THE STATE OF WHOLE ORGANISM BIOLOGY AND SYSTEMATICS

Most of us are acutely aware of the decrease in emphasis on whole organism biology, both in research and teaching. In response to this several learned societies, including the BPS, represented by Professor **Chris Gibson**, signed a joint letter, which was sent to Professor King, at the Office of Science and Technology, expressing their joint concerns at this decline and indicating that this matter should be addressed with some urgency. The letter is reproduced below for the benefit of all the members.

The Botanical Society of the British Isles
The Botanical Society of Scotland
The British Bryological Society
The British Lichen Society
The British Mycological Society
The British Phycological Society
The British Pteridological Society

Professor David King
Office of Science and Technology
Albany House
94-98 Petty France
London SW1H 9ST

Dear Professor King

The state of whole organism biology and systematics in the UK

Several learned societies in botany and mycology wish to express their concern about the progressive loss of expertise in 'whole-organism' biology within the United Kingdom. By expertise we mean professionals in permanent posts who specialise in some aspect of the biology (including systematics) of a plant/fungal group and who have a good general understanding of the overall biology of that group.

Whole-organism biologists in our fields are now rarely appointed to university posts, and in the museums research on whole organisms has declined substantially. Current expertise resides in an ageing population, predominantly (and in several fields entirely) over fifty years of age. Furthermore, there are very few young scientists being trained to replace them. This means that the resident knowledge in many areas of plant and fungal biology will approach zero in 10 to 15 years time. Casual enquiries suggest that there is a comparable decline in expertise in animal groups.

We are greatly concerned by this trend, and strongly of the view that it should be addressed by makers of science policy. We consider it in the national interest to have a minimum baseline of expertise in the biology of plant/microbial/animal groups to meet the **needs of science and industry, including our obligations to national and international biodiversity and conservation initiatives.** Moreover, such a baseline is essential to underpin biological research as a whole, including its molecular aspects.

We recognise that the decline in whole-organism research is partly a natural development driven by the emergence of new fields - molecular biology above all others. We are not "knocking" molecular biology; the advent of molecular methods has allowed considerable advances to be made in all our fields. However, shifts in research emphasis have been accentuated by changes in funding

for universities and museums, changes that have imposed great pressures on staff to get research grants. In this economic climate, it would not be considered prudent to appoint a whole-organism biologist in such an institution given the modest funding opportunities to support whole organism research. However, we wish to stress that our concern is not at the level of the average university or museum department but rather at the level of **the research base as it impinges on the welfare and prosperity of the United Kingdom** as a whole. We are aware of past initiatives (e.g. the NERC Taxonomy Initiative) but consider that these have done little to help establish permanent posts.

We would be interested to know whether the problem is recognised by policy makers, and whether any remedial measures have been, or are to be, put in place.

Yours sincerely

Dr Geoffrey Halliday
President
Botanical Society of the British Isles

Professor Stefan Buczacki
President
British Mycological Society

Dr G.C.G. Argent
President
Botanical Society of Scotland

Professor C.E. Gibson
President
British Phycological Society

Mr T.L. Blockeel
President
British Bryological Society

Mr M. H. Rickard
President
British Pteridological Society

Dr P.D. Crittenden
Retiring President
British Lichen Society

cc. Professor Sir Robert May

THE ANNUAL WINTER MEETING

The Annual Winter Meeting was held this year at the University of Liverpool and organised by **Brian Moss**. Despite a somewhat lower attendance than in previous years, due to a combination of factors including the late distribution of information in *The Phycologist*, the weather, a postal strike, the proximity of the meeting to the New Year celebrations and continuing transport problems. However, there was still a very diverse range of presentations, with something for everyone. There were special sessions on ecology and population genetics, algae, nature conservation and European legislation, applications of flow cytometry to examining phytoplankton populations and symbioses, as well as the usual mixed bag of more general phycological topics. Brian, along with all of his helpers, is to be congratulated for all of the hard work required to run such a successful meeting.

One notable omission from the programme, which has now reached almost cult status, was the auction. It was decided that donations for the auction would be held over so that there could be a bumper event during the jubilee celebrations (see below).

THE BPS JUBILEE MEETING

The 50th Annual Winter Meeting of the British Phycological Society will be held from 2-4 January 2002 at the University of Greenwich, Greenwich and the Natural History Museum, London. Accommodation has been arranged at the Ibis Hotel and Holiday Inn Express, which are situated near the meeting venue in Greenwich. To commemorate our Jubilee special symposia with invited speakers are being organised by a committee chaired by **Paul Hayes**. But we will also be encouraging members to submit poster presentations and these will be given ample time during the meeting. On Thursday, sessions will be held at the newly restored historic Royal Naval College (now the University of Greenwich). On Friday, we will be coached to the Natural History Museum in central London for an all-day session and the opportunity for some "behind the scenes" tours. Afterwards, we will be coached back to Greenwich in time to get ready for a gala Jubilee dinner and dance in the 18th century Painted Hall.

Due to special arrangements for the accommodation and the meeting venues, the winter meeting notice and booking form will appear in the summer issue of ***The Phycologist.*** We request your co-operation in adhering to the deadlines. We promise that the 50th annual winter meeting of the BPS will be memorable.

☆ A NEW LOGO! ☆

Well if you haven't seen it already we have a new logo (and a new colour scheme)! After much deliberation on the part of the Council Officers a new logo design was approved. The design owes much to **Eliot Shuberts** efforts and he is to be thanked for all the work that he has put in on this project.

The new BPS logo is a stylised image of *Emiliania huxleyi*, the most abundant coccolithophore in modern oceans. (Original SEM photo provided by Jeremy Young, NHM)

Coccolithophores, discovered by Hehrenberg in 1936, appeared in the early Jurassic, and reached their greatest abundance towards the end of the Cretaceous. Coccolithophores are autotrophic unicellular algae that produce calcium carbonate plates called coccoliths. These organisms are an important component of the marine phytoplankton community and contribute to up to 80% of the $CaCO_3$ of deep-sea oozes and chalks in the open ocean. Satellite data has shown that in the modern ocean, coccolithophore populations are cosmopolitan, but the large scale, seasonal blooms are confined to high latitudinal distributions and are well suited to oligotrophic and semi-oligotrophic regions. On geological time scales, precipitation of calcium carbonate can be an important process for altering atmospheric CO_2 concentrations and thus, coccolith abundance in the sediment can be a useful proxy to reconstruct paleotemperatures, paleo CO_2, and paleoproductivity. On ecological time scales, coccolithophores play key roles in the global carbon, carbonate and sulphur cycles. Blooms of coccolithophores can influence global climate by altering the carbonate system through the carbonate pump, and by the emission of dimethyl-sulphide (DMS). Coccolithophores have a sophisticated inorganic carbon concentrating mechanism that enables the cell to utilize both carbon dioxide and bicarbonate as a source of carbon for photosynthesis and to create their calcium carbonate plates. Coccolithophores are also prodigious producers of dimethylsufonlyl proprionate, a precursor of DMS, and blooms of these organisms may increase marine stratus cloud albedo. The long-term transport of coccoliths to the ocean floor over millions of years, resulted in the formation of limestone rocks, an example of which are the white cliffs of Dover, England, which consist of 80% coccoliths.

(Narrative by M. Debora Iglesias-Rodriguez, School of Biological Sciences, University of Bristol)

HISTORICAL CORNER

The 'New Botany' and the Teaching of the Algae

Part 1

Whenever H. Marshall Ward, Professor of Botany at Cambridge (1885 - 1906), wrote to his professorial friends in Britain and referred to 'The cause' they would all have recognised the connotation. For them it was linked to T. H. Huxley and South Kensington in the 1870's and the origins of the 'New Botany'. Amongst its many implications the latter was to have a marked effect on the teaching of Phycology in Britain.

Marshal Ward's professorial friends included I. Bayley Balfour (Glasgow 1879 - 1884, Oxford 1884 - 1888, Edinburgh 1888 - 1922); F. O. Bower (Glasgow 1885 - 1925); S. H. Vines (Oxford 1888 - 1919); F. W. Oliver (University College London 1890 - 1929). There were some shared experiences, including periods of study in Germany and some connection with T. H. Huxley. They would all have agreed that the principal instigator of the 'New Botany' was W. T. Thiselton Dyer, who was working with Huxley. Thiselton Dyer was to spend most of his working life at Kew, first as Assistant director to Sir Joseph Hooker (1875 - 1885) and then as Director (1885 - 1905). His time with Huxley was limited but the after effects of his teaching were long - lasting.

This concept of the 'New Botany', also called 'Botanical Renaissance' in the reminiscences of those named above, calls for some explanation. A 'Botanical Renaissance' in Europe has been described for the 16th and 17th centuries as recorded in the herbals of the period, with more accurate drawings of plants as seen in nature, and with descriptions, where applicable, of their medicinal properties. Professorships of Botany in England and Scotland date from the late 17th century (Oxford and Edinburgh) and the early and mid - 18th century (Glasgow and Cambridge). All had associated Physic gardens. Research into plamt anatomy and physiology had begun in the 17th century and continued into the 18th, and these advances were included in some professorial lectures. John Hope (Edinburgh 1761 - 1786) devoted about one third of his annual 65 lectures to plant anatomy and physiology as then known, and William Hamilton (Glasgow 1781 - 1789) with 58 lectures devoted one third in a similar fashion. Hope included lectures on algae, fungi, mosses and ferns, and Hamilton gave three lectures on 'Cryptogamia'. With both the lectures were mainly for medical students. The notes of Glasgow students, Robert Cowan, from Hamilton's lectures in 1788 show that the Botany course was for the time broad based and up to date, and not restricted to medicinal plants. Attempts were made to present a scientific interpretation of plant life.

In Britain during the 17th century botany showed more of a one - sided development. The imperialist tradition and the accompanying increase in overseas dependencies and possessions resulted in the work of the main Botanic gardens, (Kew, Edinburgh and Glasgow) becoming concentrated on collections from the new territories. This one sidedness became increasingly reflected in the universities. In the 9th edition of *Encyclopedia Brittanica* (1876) the entry under Botany occupied 80 pages in double columns, almost entirely devoted to the structure, morphology and taxonomy of flowering plants. The author was J. Hutton Balfour, father of Bayley Balfour. The breadth of approach attempted in the 18th century lectures was missing. In his later years F. O. Bower described botany at Cambridge during his student days in the mid - 1870's as 'moribund in the summer and actually dead in the winter'. Aspiring young botanists who could afford to do so sought further training in Germany.

Botany in Germany at the time was in a much stronger position. There were more professors and lecturers in botany in Germany than in any other country, with the subject recognised as an independent discipline. The growth of the optical industry there made available relatively cheap and reliable microscopes. Young

facilities and with his duties occupying half the year he returned to London and was introduced to Huxley. He observed the first course for teachers in 1871 and in 1873 he took over the botanical side of the course when Huxley suffered a breakdown in health. Whilst his lectures covered the same ground as in Dublin the greater challenge lay with the practical classes - two session each of two hours accompanying a lecture. As he explained in later years, he and his assistant, M. Lawson from Oxford, '.....were generally up half the night rehearsing the demonstrations for the following day...the upshot was that we succeeded in showing loads of things that had never been seen before', meaning of course not seen in Britain before. His demonstrations included freshwater and marine algae and *Chara*. The demonstration of the spermatozoids of the latter actually attracted the attention of some senior botanists as well!

(To be continued)

Don Boney

TWO VIEWS OF THE FRESHWATER ALGAL FIELD COURSE

Most of you are familiar with the freshwater algal field course run jointly by **Eileen Cox** and **Elliot Shubert** every year in Scotland. Here are two views from recent participants.

"If you are looking for a stimulating, hands-on experience, then I can highly recommend the Freshwater Algae course run by Eileen Cox and Elliot Shubert at the Kindrogan Field Centre. The atmosphere was relaxed and informal, providing an ideal environment for acquiring new skills and discussing ideas with fellow participants.

Identification of freshwater algae was the course's focal point, and the local environment certainly threw up a plethora of different species on which to feast our eyes. Techniques for collecting algae from different habitats were discussed and put into practice in the field - plankton, epiphyton, epipelon, epilithon, epibirdbath(!) - you name it, we collected it!

It's all very well collecting lots of algae, but identification is a bit more tricky - and that was the reason behind most of us attending the course. Many of us had bottles of preserved algae that just sit in our research labs; collected during over-optimistic field seasons and waiting patiently for some attention.

We were mainly 'algal freshers', with only limited experience of algal identification. If we did have experience, our knowledge was largely restricted to one algal group. My specialism was in diatoms, but since I mainly look at dead specimens, it was a great opportunity to try my hand at live identification, as well as furthering my knowledge to encompass many other algal species.

We were encouraged to make use of identification keys - not just look at pictures, which is always tempting, especially when the terminology is difficult to understand. It's only now that I wish I'd taken up Latin at school! Luckily, Eileen and Elliot were always on hand to provide assistance and point us in the right direction when confusion set in. Their enthusiasm and knowledge was considerable - I couldn't fail to come away inspired.

Alongside identification, short lectures were given by the course tutors on each of the main algal groups and their differing characteristics and lifecycles. This was particularly useful since most species reproduce rapidly and are often seen at different stages in their lifecycle, which can create identification dilemmas if you don't know what is going on! Photomicrography and algal culture techniques were an additional bonus in the course programme.

My aspirations for the course were to gain skills in the identification of different algal species, with the aim of interpreting my current research in a broader context. I have certainly improved my ability to identify algae. An expert I am not - that will take many years of dedication - but

my learning curve has been exponential over the last week. Now what is needed is some consolidation. Application of these new skills to my own samples will be the real test.

Although I was looking forward to the opportunity to discuss and exchange ideas with the course tutors and fellow course participants, I never expected to gain quite so much as I did. Everyone made a short presentation about their research, which generated considerable positive feedback from other participants. This discussion has stimulated the development of further research avenues for my PhD, as well as providing valuable contacts and possible research collaborators for the future.

To round it off, our new found knowledge was put into practice with a game of 'algal charades'...I'll say no more!

A fantastic course! Thank you BPS for supporting me - it was greatly appreciated. I hope that many others have the opportunity to benefit from BPS support to attend the course in future years."

Amy Burgess, Department of Geographical Sciences, University of Plymouth.

"Just returned from an excellent week at Kindrogan identifying algae. I went with a rudimentary knowledge of the basic algal groups and a bit more of an insight in the cyanobacteria. The course was structured into lectures, field sampling and observations. We collected from a broad range of habitats and found a great diversity of algal life. I am now aware of many of the features which distinguish between algal groups and I can identify to species level in some cases. The support and expertise of the tutors drove the learning process. I will always remember and be astounded by the diversity we found in the puddle!"

Katie Harper, Department of Biology, University of Lancaster, Lancaster, UK

PHYCOLOGICAL TIPS

Hints for optimising the performance and resolution of microscopes
III. Further measures for enhancing the resolution of images

b. Improving and maximising resolution

It is a very simple fact that the microscope's performance can virtually not be influenced by measures applied above the plane of the stage, the addition of a polarizing filter and additions necessary for contrast methods excepted.

At the plane of the stage the most important means is the use of mounting media with high refractive indices (1.7 or higher at 20°C, e.g. Hyrax, Naphrax, Pleurax). It is very important, however, that the applied mountant be clear and colourless. During my investigations I often met with slides on which the Styrax or Hyrax had turned yellowish or sometimes even almost brown. These posed much more of a problem than did mountants of low refractive index. Therefore slides, when not used, have to be protected from daylight. When working with synthetic media, much care should be taken to completely and thoroughly wipe off the immersion oil when finished. This is because some media, e.g. Hyrax, will react with the immersion oil and release elemental sulphur which turns the media opaque. I remember that a holotype of Hustedt's was lost in this way after trials to remount the slide were unsuccessful.

Below the stage comes the condenser, and here is one of the most important places where the resolution can be improved. We have to remember that Abbe`s equation equates microscope resolution to the wavelength divided by 2x the numerical aperture. But this applies only to very oblique light. With a normal brightfield condenser, even of high correction and aperture (which must be stopped down) there are a great many central straight light rays that will obscure the finer details. The experienced microscopist avoids this by

excluding these disturbing rays by moving a finger into the light passage or by placing another obstacle there. A colleague keeps a toothpick for this purpose. In an extreme case the result is then a unilateral darkfield illumination. This was formerly obtained by the so-called "Abbe Condenser" which permitted its aperture diaphragm to be moved out of the optical axis.

The impression of a rather drastic increase of resolution will be experienced by the application of a cardioid darkfield condenser. I met with this extremely useful method by accident about 45 years ago and first mentioned it in my *Denticula* paper with Kanaya in 1961. In the meantime several colleagues have adopted this method after I had shown them its advantages. The darkfield condenser should have an exterior aperture as high as possible, at least 1.3. The interior aperture, which is important for obtaining a good darkfield is, in our case, of less importance because the objective used, generally a 63-100x oil immersion of high numerical aperture, is not stopped down. Its full aperture is needed. When properly focussed on the view field diaphragm which is stopped to just outside the field of view, the result is a mixed dark and brightfield, because some of the light of the condenser's hollow light cone will enter the front lens of the objective. In this way all of the central light beams which are so disturbing when a normal brightfield condenser is used, are excluded and the contrast is extremely high, enabling us to discern details that are otherwise obscured. We are therefore not dealing with a darkfield but with an omnilateral oblique illumination. The first sentence of this paragraph can therefore be misunderstood: in reality the resolution is not increased but optimised.

When the darkfield condenser is in proper focus and centred, the image (or resolution) can sometimes be improved by occluding part of the path of the rays or by decentering the condenser, even by slightly refocusing the condenser. It is often well worth "playing" or experimenting here a little.

The use of a darkfield condenser is by no means advantageous in all cases. This applies especially to the investigation of thicker objects or some structures that have a certain extension in the direction of the optical axis. In such cases there is much danger of interference which may give rise to incorrect interpretations. This latter applies quite generally when using a darkfield condenser and particular caution is always called for.

Below the condenser are the filters and the light source. Both depend on one another and must be treated together. For visual and routine work it is quite sufficient to have a low-voltage or halogen lamp combined with a blue-green filter, e.g. a Schott glass filter BG18 or an interference filter with a transparency peak at 546nm plus a daylight blue filter. This colour is fairly pleasant to the human eye, which is allegedly particularly sensitive to this greenish light.

For photomicrography and also for more critical work I have used separate light sources with special filters for a long time. Remembering Ernst Abbe`s equation of resolution, the numerator, i.e. the light colour in our case, is of critical importance. The shorter the wave-length used, the higher will be the resolution. This means in our case that blue to violet light should be used. Here again it is worthwhile looking at what users of fluorescence have. The filters used for fluorescence excitation are of primary importance, they are almost all made to let through the shorter wave-lengths. Depending on which light source is used, there is the choice of two glass filters, the blue BG12 and the BG3 for violet and long-wave UV, the latter being more desirable for our purpose. Unfortunately, the average filament lamps produce mainly light of longer wavelengths, the amount of blue light being comparatively small. If a filament lamp is the only choice, a BG 12 filter might be tried with definite advantage over green illumination. This will warrant long exposure times, however.

Regarding lamps, I can very strongly recommend the use of arc lamps for more critical work and particularly for photomicrography. The choice here is between Xenon and Mercury vapour lamps. I have always used the latter, their advantage for our purpose being their discontinuous spectral emission. With them one is able to select well-defined and rather narrow parts of the visual

spectrum. We are particularly interested in the emission peak at 435.8nm (blue) and in the violet maximum at 404.7nm. Both can be used with the glass filters mentioned above. If it can be afforded, an eye should be kept on the interference filters offered for these particular wavelengths. They are very expensive but their light transparence is much higher than that of glass filters. The price depends also on the width of spectral fraction that the filter permits to pass; narrow-pass filters are more expensive than those allowing a wider passage. The wide-passage filters are quite sufficient for our purposes because the spectral maxima emitted by the Mercury lamp are already very narrow.

With the arc lamp working, one might have the idea of switching to UV illumination, e.g. at the longer-wave 365nm Hg maximum. It has been suggested that one might properly focus with violet light and then change over to UV. Unfortunately the objectives calculated for 550nm have a certain focus shift so that the photographs will be out of focus, i.e. not sharp. I never had the opportunity to use a video camera. It may be worth trying to use it for focussing on the UV-lit object and then to take a picture. This applies also to digital cameras which are certainly the image recording devices of the future, provided they have the necessary spectral range.

It must be said here that the blue-violet light is not very "pleasant" to the eye and should not be used for routine work. There is, however, apparently no danger to the eye by UV radiation, because the light, if properly filtered, passes through so many glass lenses that no harm will be done. If there is any such fear, a UV filter is readily procured in any photo shop. It must be remembered that the Mercury lamps are relatively short-lived, some lasting not much longer than a week's average working time. A lamp blowing up is quite a memorable experience. I recommend that operating time counters are built into the transformers or that at least exact track of operating time is kept. The instructions of the manufacturers must be very thoroughly followed here.

The visual effect of the blue-violet microscopic image is quite impressive. A normal brightfield illumination already affords a noticeably higher resolution with excellent contrast. The addition of DIC even enhances the effect, and darkfield condenser illumination permits even finer structures to be made out with the eye. If a structure of a diatom cannot be resolved with this illumination, I would assume that *it* cannot be resolved, and that it is not that *I myself* cannot resolve it. Of course there are diatom species in which the interstriae are of very little difference in depth of thickness compared with the striae and if these are both delicate, there will be little hope of making them visible to the eye even though their density might not be very extreme. Then there are the slides that are less suitable for investigation with short-wave light. By that I mean slides where the mountant has turned yellowish or even brown. In this context one should mention the high-refracting realgar, the use of which has been made obsolete by interference contrast and Pleurax, which has its own merits as an alcohol-soluble mountant.

One thing must be made clear at this point. The statement "resolved" does not imply that the microscopic image of the structure being "resolved" shows the true shape of this structure. The term "resolved" means, by definition, that two diffraction maxima must form a microscopic image in order to separate two distinct structures. Only the addition of further maxima will reveal the true nature of some structure, and this is the case only at something like an order of magnitude above the possible limit of resolution. But being able to resolve the density and direction of striae in, e.g. some *Nitzschia* species is certainly a very valuable addition for an easier identification, independent of what the striae are composed of. When working on Hustedt's diatom types, I was amazed at the comparatively small number of species in which the striae could not be made visible.

I stated at the beginning of this note that I consider only a micrograph as the final product of microscope work. An interesting question has often been the magnification of the final prints. I have always advocated that the final magnification should be in round hundreds or thousands in order to permit measurements from the published figure. Contrary to what one sees these days in publications, this is so simple to achieve by once photographing a micrometer with each objective and then by starting each darkroom session with an adjustment of the

corresponding negatives. Although the "useful magnification", as Abbe termed it, does not exceed 1000x the used N.A. then it may be surpassed in a printed micrograph, provided that the print allows this. The printing process has its own limits in reproducing very fine details. If there are important fine details present in a micrograph, they should be sufficiently enlarged to make sure that the book printer will not cause them to disappear. In such cases, "over-magnification" must be tolerated. A certain amount of magnification beyond the "useful" value will probably not be noticed, e.g. the standard x2000 magnification I used for the Hustedt types can hardly give the impression of over-magnification.

I hope that the studies of some of my colleagues will benefit from these lines.

Dick Crawford kindly corrected me po' English for which I am very grateful. The author regrets the numerous misprints and omissions in earlier parts of this series which slipped in without his knowledge and control.

Reimer Simonsen, Norderbergweg 5, **D** – 25875 Schobüll, Germany

2001 MANTON PRIZEWINNER

The winner of the Manton Prize this year for the best student oral presentation at the winter meeting in Liverpool was Lynn Browne, a PhD. student supervised by Professor Matt Dring, from Queens University Marine Laboratory in Portaferry, Northern Ireland. The title of Lynn's paper was 'Cultivation of *Palmaria palmata*'. Born and educated near Belfast, Lynn graduated with a BSc. (Hons) in Biological Sciences from Queens University Belfast in 1997 after completing an Honours project on bioremediation of waste water by macroalgae. After graduating from Queens, Lynn then spent a short spell working under the supervision of Dr. Jaimie Dick on ecotoxicology and pollution monitoring using small fresh water amphipods. In autumn 1997, she returned to Portaferry to begin postgraduate work with Professor Dring on the cultivation of *Palmaria palmata*, part of an EU FAIR Project involving partners from universities in Ireland, Norway and Spain. A Research Infrastructure grant enabled Lynn to carry out some of her research in Trondheim, Norway where she combined cultivation work in the sea and in 9000 litre tanks with lab work on the chemical constituents of *Palmaria*. Oral presentations have included papers at the BPS meeting in Dundee, EPC 2 in Montecatini and a recent poster presentation at ISS in Cape Town. She has also presented results at EU meetings of the partners in the *'Palmaria project'*. The applied nature of the project has also generated interest in the media both locally and nationally and Lynn and her colleagues have been involved in productions for Ulster Television, RTE and Radio 4. Lynn hopes to finish her thesis entitled 'Mariculture of the edible red alga, *Palmaria palmata*' in May 2001.

MICROBIAL INTERACTIONS IN AQUATIC ENVIRONMENTS

University of East Anglia 10th-13th September 2001
Joint Symposium Organised by the Society of General Microbiology and the British Phycological Society

The Environmental Microbiology group of the SGM is organising a symposium (supported by the British Phycological Society) on the topic of *Microbial Interactions in Aquatic Environments.* The symposium will take place during the SGM's 149th Ordinary meeting at the University of East Anglia, Norwich, 11th- 12th September 2001.

The *Microbial interactions in Aquatic Environments* symposium will consist of a number of invited contributions (see below) and offered papers and posters, emphasising interactions between dissolved organic material and exoenzymes and viral, bacterial, algal and protozoan components of aquatic assemblages. The invited speakers have been chosen to cover both water column and benthic processes, and illustrate the interactive and dynamic nature of the aquatic microbial environment.

Offers of papers and/or posters are invited (provisional deadline 11 May 2001). If you want to know more about the meeting, please contact me (gjcu@essex.ac.uk)

Invited speakers

J. Furhman (University Southern California, U.S.A) - Marine viruses and bacterial diversity - are they connected?

N. Mann (University of Warwick, U.K.) - Genetic diversity in the marine picophyoplankton and its relationship to bacteriophage infection

P.J. le B. Williams (University of Wales, Bangor, U.K.) - Microbial interactions in marine plankton

R. Benner (University of South Carolina, U.S.A.) - Dissolved organic matter: the microbial nectar of the sea

G. Malin (University of East Anglia, U.K.) - Marine Microbial Interactions and DMS production

G.J.C. Underwood (University of Essex, U.K.) - Nitrogen fluxes from land to sea: the key role of algal-bacterial interactions in estuarine biofilms.

F. C. van Duyl (Netherlands Institute for Sea Research, Texel, NL.) - Relations between bacterial ectoenzyme activities and polymeric algal exudates in sediments

C. Turley (Plymouth Marine Laboratory, U.K.) - Manna from heaven: algal-bacterial coupling in the deep-sea

B. J. Finlay (CEH Windermere, U.K.) - Microbial ubiquity and ecosystem function in the aquatic environment

The Society for General Microbiology (SGM) holds two main meetings annually at different venues throughout the UK. Each meeting consists of a main symposium, other symposia and workshops, offered oral and poster paper sessions and a trade exhibition. Details of the other sessions being held at the meeting can be found at http://www.sgm.ac.uk/MTGPAGES/uea.htm

NEW OVERSEAS VICE PRESIDENT

On reflection, I suppose I was fortunate after all to be born in England (1941). Thereafter nurtured in Wales (Pontypridd), educated in England (Wycliffe College) and qualified in Wales (Cardiff). It conditioned me to a life of comparison and reciprocal illumination, both within science and in life generally. I have certainly been lucky at a number of crucial times in my life. To start with I had very supportive parents and then, Katherine Benson-Evans at Cardiff stimulated an interest in the aquatic environment, bryophytes and the algae (though the diatoms were definitely not on the list after I had seen the bewildering variety of forms at the back of Baxter's translation of Van Heurck's Synopsis!). I remember we spent so many hours out in the field on the coasts and hills of South Wales that it has ever since been impossible to think about the algae without their environment. A year in Menai Bridge, being one of the first two M.Sc. students in Marine Botany (Bill Farnham was the other), under Eifion Jones was remarkable for two reasons. I was in God's country, looking out on the island of Mon, the Irish Sea and the mountains of Eryri and we spent the whole year getting a feel for the algae, mostly large. By the end of this year I was again lucky with the chance to get into electron microscopy at a relatively early stage with John Dodge at Birkbeck College in London. The day of my interview was memorable for the wrong reason

though. Relaxing in the evening at the "Samuel Whitbread" in Leicester Square - sadly gone, I picked up the Evening Standard to read about a coal waste tip crushing the school in Aberfan with appaling loss of young life. With another move across Offa's Dyke in prospect, the moment was extremely poignant.

Soon, three very stimulating years of discovery (mostly) inside the cells of dinoflagellates followed. Barry Leadbeater had done much of the pioneering work with fixatives etc. before he skipped up North to work with Irene Manton. Virtually every species had something new and even today, there are many questions still to be answered. But then Frank Round walked in one day and asked me if I would like to come and work on diatoms - lucky again. "Not really" was my silent answer but the research assistantship at Birkbeck was not allowing me to study for a Ph.D so I said "yes please" and took off West again for something like 22 years within sight of the Severn Bridge. For the first few years I was doubling up as an assistant to Alan Beckett, sectioning Pyrenomycetes. More excellent experience here but lots of hard work. The diatoms finally took their hold as I learned more about them and eventually I came to the conclusion they were just as fascinating as the dinoflagellates. (Being colour-blind, it was fortunate for me that the EM image is black and white but what a happy quirk of physics that the diatom cell wall is transparent to light yet opaque to electrons or, conversely, if you happen to be a diatom!).

Frank put me onto the genus *Melosira* on account of its needing "sorting out" taxonomically; a proper can of worms that turned out to be too! *Melosira,* as it then was, differed from most other genera in that it contained freshwater and marine species. The genus *sensu stricto* still does, and this suits me as it encourages one to skip between the two environments and to pose interesting questions particularly regarding the relationship between silica cell wall morphology and the biology of the diatom. (More reciprocal illumination here as Frank, David Mann and I were forever thinking of the phylogeny of the genera and we all three had lots of fun kicking ideas around for many years). I grant that this is mostly deductive science but the diatoms, showing such a fantastic variation on a theme, are better than most groups for this kind of work.

Sometime in the 70's, Frank Round did a summer course on marine algae in Hawaii, Linda Medlin was one of his students, immediately became hooked on the diatoms, left high school teaching, studied with Greta Fryxell, came to a diatom meeting in Antwerp, we met, again hooked, and several meetings later, eventually married. Ten years after that Linda had retrained in molecular biology and we moved to Germany. The main reason for doing so was that we could both have a position in the same town. There are many drawbacks of course. There is no Marmite in the shops (truest test of being abroad) and no British Diatomists meetings but it is good to feel in the middle of Europe and the German diatom meetings are a lot of fun anyway. The research here at the Alfred Wegener Institute is extremely well-funded and we have the chance to indulge our scientific interests. In my case this has allowed me to get back to the *Melosira* work in the form of the freshwater *Aulacoseira* with a connection to Lake Baikal and also to explore the wonders of the marine *Corethron* which continues to remind me how much fun science can be. There are parallels and differences among these two planktonic genera that may well add up to something before retirement.

INTERNATIONAL SEAWEED SYMPOSIUM

Cape Town, South Africa 28 January-2 February 2001

This year's Seaweed Symposium provided a rare opportunity for phycologists to visit South Africa in high summer, and six of us set off from Belfast with high expectations. Exchanging a bright winter's day just above freezing for an even brighter day at 33°C was a bit of a shock, and we were glad that we had allowed ourselves the best part of two days to acclimatise. Part of this time was spent in a visit to Robben Island, where Nelson Mandela and so many other African nationalists were imprisoned and, at times, forced to harvest kelp *(Ecklonia maxima)* from the bitterly cold (even in summer) waters of the Benguela Current.

The Symposium proper started with a reception at the University of Cape Town, at which the 325 scientific delegates (and their accompanying persons) were treated to an elaborate and extensive buffet, plied with quantities of South African beer and wine, and finally persuaded to become members of a band demonstrating the musical properties of dried kelp stipes! The reception also showed off the superb location of the Upper Campus of the University, which clings to the slopes of Devil's Peak at the eastern end of Table Mountain, and commands an impressive view of the extensive plain stretching from False Bay in the east to the Atlantic in the west.

The scientific programme was arranged in the now standard pattern of early morning plenary lectures, followed by symposia, contributed papers and/or poster sessions. The first plenary lecture by Erik Ask (USA) dealt with the human factor in the *Eucheuma* cultivation industry, and was followed by a memorial lecture for Arne Jensen, which was given by his widow and co-worker, Prof. S. Liaaen-Jensen, on the versatility of the fucoxanthin molecule. On the second day, Bernard Kloareg (France) used his plenary lecture to introduce and open up what he suggested should be a new branch of phycology - phycopathology. This was a fascinating review of novel and exciting work on the biochemical and molecular interactions between seaweeds and agents of disease, both epiphytes and endophytes, and set the scene for a number of important contributed papers later in the Symposium.

After two days, delegates were given a day off for good behaviour and went scattering around Cape Town or the Cape Peninsula on mid-Symposium excursions. Several of these excursions gave us a chance to wander around the Cape Peninsula National Park, and to correct misconceptions from school geography lessons that the Cape of Good Hope was the turning point for the voyages of so many early sailors - the Cape of Good Hope is a rather minor headland at the side, and some distance short, of the true tip of the Peninsula, Cape Point. The Peninsula is also home to a substantial colony of Chacma Baboons *(Papio ursinus)*, and several of us got first-hand demonstrations of the superfluousness of the notices "Do not feed baboons"; they simply help themselves!

Returning to science, the plenaries on the last two days were by Rob Anderson (South Africa) and Peter Salling (Spain) on seaweed utilisation in Southern Africa and the latest developments in the seaweed colloid industry, respectively. The latter in particular was a source of valuable and up-to-date information on the quantities and values of the various products, and the shifting story of the companies involved in their production. The main themes for the contributed papers and posters were mariculture of seaweeds, particularly involving integrated aquaculture and bioremediation, the chemistry of seaweed colloids, and developments in biotechnology, especially in relation to genetic engineering and the diseases of seaweeds. The UBC awards for the best student papers reflected these themes; they were won by Adam Mellor (Belfast) for a paper on heavy metal uptake by *Fucus*, and by Declan Shroeder (Cape Town) and Fritz Küpper (Roscoff), whose papers both dealt with aspects of phycopathology.

The social programme for the Symposium was particularly well organised; delegates were given - perhaps deliberately - very little time to wander around on their own. On the first night, we were bussed through Cape Town and half way down the Cape Peninsiula to a beach (the Oudekraal Picnic Spot) where a traditional fish "braai" (barbecue) was arranged. There we were serenaded with live music and liberally watered while we watched the sun go down and light up the cliffs of the Twelve Apostles above our heads. As the moon took over from the sun, several tables were loaded with salads, and these kept us occupied while queuing for the fish. Eventually, the trickle of fish turned into a massive shoal of grilled yellowtail, and the feeding of the phycologists was complete. The next night, the phycologists got to see what they had eaten during a visit to the impressive new Two Oceans Aquarium on the Waterfront at Cape Town. In addition to a large "predators" tank with ragged tooth sharks and yellowtail, there is a second tank with a dense forest of 8 m high kelp plants, whose gentle undulations, backwards and forwards, were most unsettling!

A second barbecue on the campus of UCT provided an opportunity for delegates to swap stories about their experiences with baboons or penguins or seals (or even, for the real fanatics, kelp factories and seaweeds!) during their mid-Symposium excursions, and the final evening was occupied by the Symposium Banquet at the Groot Constantia Wine Estate. This left those of us from Belfast with just enough energy to take the cable car up to the top of Table Mountain on Saturday before jumbo-jetting back into winter, while reflecting on a superbly organised meeting (thanks to John Bolton and Rob Anderson) in a very memorable region.

Matt Dring

STATEMENT OF ACCOUNTS

The British Phycological Society Registered Charity No: 246707

Annual Report for the Year ended 30 September 2000

The Society is an unincorporated association governed by its constitution and administered by its Council (trustees). The addresses of the current office bearers are set out in the European Journal of Phycology.

Membership of the Council of the Society:

Executive Members:

President:	Prof. CE Gibson	Hon. Membership Scty:	Dr MT Brown
Vice President:	Dr EJ Cox	Hon. Treasurer:	Dr JA Berges
Overseas Vice President:	Prof. H Preisig	Hon. Ed. (Eur. J. Phycol.):	Dr CA Maggs
Immediate Past President:	Prof. B Moss	Hon. Ed. (Phycologist):	Dr BA Osborne
Hon. Secretary:	Dr J Brodie		

Ordinary Members:

Dr G Pearson	Prof MD Guiry	Dr FG Hardy
Dr B Leadbeater	Dr L Medlin	Dr D Iglesias-Rodriguez
Dr J Lewis	Dr G Scott	

Principal Bankers:	Bank of Scotland, 39 Albyn Place, Aberdeen
Solicitors:	Wolferstans, 60/64 North Hill, Plymouth
Independent Examiner:	Flannigan Edmonds and Bannon, 2 Donegal Square East, Belfast

This is the fourth annual report presented by the current Hon. Treasurer. It is made in this form to meet the requirements of the Statement of Recommended Practice (SORP), issued by the Charity Commission and serves as an annual record of the resources entrusted to the Society and the activities it has undertaken.

The Society has continued to give financial support to activities that promote phycological research, disseminate phycological knowledge and assist young phycologists to present their findings at scientific meetings. The annual winter meeting and AGM were held at University of Birmingham. The standard of presentations were very high and congratulations go to the Manton Prize winner Jacqui Wong, and to Mark Clegg, who received the annual Poster Prize. Fifteen Student Members received support to attend this meeting from the Scientific Meetings Fund (SMF) (sixteen in 1999). The auction raised £589, thanks in large part to the enthusiasm and initiative of Dr E Shubert. These funds were transferred to the SMF; the meeting was well-managed and returned a surplus of £154. Grants to support preparation of a Freshwater Flora totalled £700.00; this came from General funds. The Summer Studentships programme (allowing promising undergraduates to undertake research) supported one student at Queen's University. The Society provided £1 500 to support three students at a specialist Freshwater Algal Field Course in Scotland. Furthermore, the BPS made contribution towards the running of two conferences: Microbial Interactions in the Aquatic Environment (£500) and Determinants of Aquatic and Terrestrial Productivity (£500).

Honoraria were paid to Executive members for whom it was felt the time commitment of the positions was exceptional. The Hon. Membership Secretary and Hon. Treasurer received £750 each, while the Secretary and Hon. Editor of the Phycologist each received £500.

The Society's financial situation remains good. At the beginning of the fourth quarter of this year, as decided at the last AGM, the Scientific Meetings Fund was topped up to a total of £25 000. This amount should allow the fund to support Travel Awards, Summer Studentships and Summer Field Courses from the interest it receives.

The Journal has continued to perform well financially. The balance to the Society from Volume 34 was £9, 751.56 (£16, 293.75 for Volume 33; this was unusually high and resulted from fewer pages being published than were forecast).

The British Phycological Society

Statement of Financial Activities for the Year ended 30 September 2000

	Note	Unrestricted Funds General £	Unrestricted Funds S.M.F. £	Restricted Funds Manton £	Restricted Funds F.W.F.F £	Total 2000 £	Total 1999 £
Income and Expenditure							
Incoming Resources							
Subscriptions		15,181.80				15,181.80	13,779.38
Surplus from Journal		9,751.56				9,751.56	16,293.75
Surplus from Winter Meeting			500.64			500.64	4,468.64
Auction proceeds			589.00			589.00	565.00
Donations			300.00			300.00	0.00
Credit card charges recovered		372.00				372.00	332.50
Interest		2,807.40	766.84	375.25		3,949.49	3,559.36
Total Incoming Resources		**28,112.76**	**2,156.48**	**375.25**	**0.00**	**30,644.49**	**38,998.63**
Resources Expended							
Grants, studentships & awards	2	1,825.00	4,091.18	250.00		6,166.18	7,708.54
Publications expenditure	3	17,450.46				17,450.46	18,280.09
Publicity - New recruitment leaflets		230.00				230.00	
Meetings & Committee Expenses	4	2,958.12				2,958.12	2,899.35
Administration Costs	5	3,604.07				3,604.07	2,329.38
		26,067.65	**4,091.18**	**250.00**	**0.00**	**30,408.83**	**31,217.36**
Net Incoming Resources for the Year		**2,045.11**	**(1,934.70)**	**125.25**	**0.00**	**235.66**	**7,781.27**
Fund at 1 October 1999		46,976.05	7,853.59	5,799.92	0.00	60,629.56	52,848.29
Transfer (General to SMF)		(17,993.51)	17,993.51				
Fund at 30 September 2000		**31,027.65**	**23,912.40**	**5,925.17**	**0.00**	**60,865.22**	**60,629.56**

The British Phycological Society

Balance Sheet as at 30 September 2000

	Note	2000 £	1999 £
Current Assets			
Debtors	7	2,531.64	2,179.49
Short term deposits		60,640.68	57,761.02
Cash at bank		12,945.40	16,004.55
		76,117.72	75,945.06
Liabilities: amounts falling due within one year	8	15,252.50	15,315.50
Net Assets		60,865.22	60,629.56
Funds			
Unrestricted		31,027.65	46,976.05
Restricted		5,925.17	5,799.92
Designated		23,912.40	7,853.59
		60,865.22	60,629.56

Signed on behalf of the British Phycological Society

John A Berges

Dr John A Berges
Hon. Treasurer
30 October 2000

The British Phycological Society

Notes to the Accounts for the Year ended 30 September 2000

1 Accounting Policies

The accounts have been prepared in accordance with applicable Accounting Standards and the SORP - Accounting by Charities issued in October 1995. The comparative figures have been restated in accordance with the revise format. A summary of the more important policies, which have been applied consistently, is set out below:

Basis of Accounting
The Accounts are prepared in accordance with the historic cost basis of accounting.

Subscriptions
Subscriptions include amounts received from members during the year. No amount is included in respect of subscriptions outstanding at the year end. Subscriptions received in advance for future years are included in deferred income.

Funds
Restricted funds comprise unexpended balances of donations and interest to be applied for specific purposes. At 30 September 2000 the Society's only restricted fund was the Manton Fund.

Designated funds are those set aside out of unrestricted funds for specific purposes. At 30 September 2000 the designated fund of the Society was the Scientific Meetings Fund ("S.M.F.").

Cash Flow Statement
The Society has taken advantage of the exemptions provided in FRS 1 "Cash Flow Statements" for small entities and has not prepared a cash flow statement.

	Unrestricted Funds General £	S.M.F. £	Restricted Funds Manton £	F.W.F.F. £	Total 2000 £	Total 1999 £
2 Grants, Studentships & Awards						
S.M.F. awards for 2000 Winter Meeting		2,091.18			2,091.18	3,625.41
S.M.F. awards for courses, studentships		2,000.00			2,000.00	675.00
Manton Prize			250.00		250.00	253.00
Poster prize at Winter Meeting	125.00				125.00	125.00
Grants for Freshwater Flora work	700.00				700.00	2,019.13
Meeting Sponsorships	1,000.00				1,000.00	1,011.00
	1,825.00	**4,091.18**	**250.00**	**0.00**	**6,166.18**	**7,708.54**
3 Publications expenditure						
Journal	11,612.50				11,612.50	13,785.50
Hon. Editor's Honorarium	1,500.00				1,500.00	1,500.00
E.J.M.C. Expenses	382.56				382.56	1,157.24
Phycologist	3,955.40				3,955.40	1,837.35
	17,450.46	**0.00**	**0.00**	**0.00**	**17,450.46**	**18,280.09**
4 Meetings & Committee Expenses						
Expenses of Council Meetings	1,366.51				1,366.51	2,543.85
Flora Committee Expenses	1,512.61				1,512.61	315.50
Freshwater Flora Committee Expenses						40.00
Expenses of members representing the Society	79.00				79.00	
	2,958.12	**0.00**	**0.00**	**0.00**	**2,958.12**	**2,899.35**
5 Administration Costs						
Executive expenses	238.12				238.12	29.00
Subscription to Institute of Biology	223.00				223.00	223.00
Subscription to Foundation for Science & Technolog	47.00				47.00	45.00
Public liability insurance	157.50				157.50	156.00
Data Protection Act Renewal						75.00
Independent Examiner's Fee	125.00				125.00	125.00
Credit Card Charges	313.45				313.45	415.88
Bank Charges						10.50
Executive Honoraria	2,500.00				2500	500.00
BPS database update						750.00
	3,604.07	**0.00**	**0.00**	**0.00**	**3,604.07**	**2,329.38**

The British Phycological Society

Notes to the Accounts for the Year ended 30 September 2000 (cont)

6 Reimbursment of Council members' expenses

Nine (1999: Twelve) Council members received £1,366.51 (1999: £2543.85) as reimbursment of travel and overnight accommodation for expenditures incurred during the year on Society business. No monies were paid to any Council member in respect of subsistence.

7 Debtors	**2000 £**	**1999 £**
VAT		20.18
Interest receivable	2,531.64	2,159.31
Prepayments		
	2,531.64	2,179.49

8 Liabilities: Amounts falling due within one year		
Accruals	125.00	125.00
Deferred Income	465.00	990.50
Provisions for the Journal and the Phycologist	14,662.50	14,200.00
	15,252.50	15,315.50

9 Analysis of Net Assets between Funds

	Unrestricted Funds £	**Restricted Funds £**	**Designated Funds £**	**Total Funds £**
Fund balances as at 30 September 2000 are represented by				
Current assets	46,280.15	5,925.17	23,912.40	76,117.72
Current liabilities	(15,252.50)			(15,252.50)
Total Net Assets	**31,027.65**	**5,925.17**	**23,912.40**	**60,865.22**

Report of the Independent Examiner to the Members of the British Phycological Society

I have carried out an independent examination of the accounts for the year ended 30 September 2000 set out on pages 2 to 4.

Respective responsibilities of the Society and the Independent Examiner
Charity law requires the Society to maintain proper accounting records in respect of the charity and to prepare accounts for each year. It is my reponsibility to conduct an independent examination of the accounts and report my opinion to you.

Basis of opinion
My work was conducted in accordance with Section 43 of the Charities Act 1993 and the Directions given by the Charity Commissioners. These procedures provide only the assurance expressed in my opinion.

Opinion
In my opinion:

(a) the accounts are in agreement with the accounting records kept by the charity under section 41 of the Charities Act 1993; and
(b) the accounts have been prepared in accordance with The Charities (Accounts and Reports) Regulations 1995; and
(c) no supplementary information requires to be included in my report to enable a proper understanding of the accounts to be reached.

Flannigan Edmonds & Bannon

Flannigan Edmonds and Bannon Chartered Accountants
Belfast, Northern Ireland November 2000

2001
British Phycological Society
Council Officers

President

Dr E. J. Cox (2001 - 2003)

President Elect

Dr B. Leadbeater (2001 - 2003)

Immediate Past President

Professor C. E. Gibson (2001 - 2003)

Vice Presidents

Dr B. Leadbeater

Dr R. Crawford (Overseas; 2001-2003)

Hon. Secretary [1]

Dr J. Brodie (2000-2002)

Hon. Treasurer [2]

Dr L. E. Shubert (2001 - 2003)

Hon. Membership Secretary [3]

Dr M. T. Brown (1999-2001)

Editor of The Phycologist [4]

Dr B.A. Osborne (1998-2001)

Webmaster

Prof. M. D. Guiry (2000-)

Editors of The European Journal of Phycology

Dr C. Maggs (1994-)/Matt Dring (2000-)

Members of Council

Dr E. J. Cox
Dr B. Leadbeater/Dr R. Crawford

Dr E. Shubert	Dr M. D. Iglesias-Rodriguez (2000-2002)	Dr L. Medlin (2000-2002)
Dr J. Brodie	Prof. C. E. Gibson	Dr B.A. Osborne
Dr M. Dring	Dr J. Lewis (1999-2001)	Dr G. Scott (2000-2002)
Prof M. D. Guiry (2000-2002)	Dr C. Maggs	Dr P. Hayes (2001 - 2003)
Dr M. Callow (2001 - 2003)	Dr J. Parry (2001 - 2003)	Dr M. T. Brown

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Instructions for Contributors

Copy which is submitted for publication in 'The Phycologist' should be concise and informative. Articles should be scientifically sound, as jargon free as possible and written in a readable scientific magazine style. **Unless absolutely essential references should not be included**. All types of relevant material will be considered, these include job advertisements, scientific reports, book reviews, news items of topical interest, meeting announcements, grant awards, promotions, appointments, profiles of eminent phycologists and obituaries. If you are interested in submitting material that does not fall within any of these broad categories, or you are unsure of the appropriateness of a potential article, then contact the editor. Suggestions for future articles or a series of articles are welcomed.

Copy should be submitted, preferably, on disc (ms word for windows) and the editor reserves the right to edit the material before final publication.

Submission of Copy and Deadlines

Copy should be submitted to: Dr Bruce Osborne, The Phycologist, Botany Department, University College Dublin, Belfield, Dublin 4, Ireland, Tel. +35317062249, Fax. +35317061153, E-mail: Bruce.Osborne@ucd.ie.

Deadlines are January 31 for the April issue, May 31 for the August issue and September 30 for the November issue

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botanists from Britain found an environment in which research was in the very atmosphere, with lectures covering all aspects of plant life, and with accompanying laboratory work of a supervised, investigatory nature. The most popular laboratories were those of J. von Sachs at Wurzburg and A. de Bary at Strasbourg. D. H. Scott, the distinguished palaebotanist, after two years (1880 - 1882) under Sachs regarded the opportunity for a young botanist to study in Germany as being equivallent to a journey to Mecca. Vines and Bower studied under Sachs and de Bary and Marshall Ward under Sachs, all for shorter periods than Scott. Whilst Bayley Balfour had studied under his father at Edinburgh the somewhat restricted approach there had been counterbalanced by the young Balfour's time under Sachs and de Bary. For them all the broader and more enlivening approach to the subject was to have a lifelong influence on their teaching and research.

As already mentioned, T. H. Huxley was to play a key role in the emergence of this 'New Botany'. Following the Education Act of 1870 the need for more science teachers was recognised. In 1871, with financial support from the Science and Art Department, Huxley organised a six week summer vacation course for teachers using temporary accommodation in South Kensington. In 1872 the course was housed in a new building there with adequate laboratory space and lecture facilities. Forward planning had to take account of the amount of knowledge that could be assimilated by the students in the time available and in its depth and width. He devised a course in biology - a balanced study of plants and animals. A Sunday evening discourse given in Edinburgh in November 1868, entitled 'The Physical basis of Life' later appeared as an article in the journal *Fortnightly.* His underlying theme in both was protoplasm and its similarity in plants and animals. In an evening lecture in 1876 under the title 'On the Study of Biology' Huxley underlined his approach, namely '....a fundametal uniformity of structure pervades the animal and vegetable worlds ..... plants and animals differ from one another simply as diverse modifications of the same great general plan'. In stressing the vital importance of practical work he scornfully dismissed those 'paper - philosophers' whose biological knowledge came solely from books. Whilst there was a vast number of animals and plants, there were also 'types of form' and in order to learn what constitutes the leading modifications of plant and animal life a small number could be studied, each being representative of a group of organisms. Hence the development of the 'type system', with 'types' following an evolutionary sequence. In consequence algae, unicellular animals and moulds were included in Huxley's lectures. In his 1876 lecture he acknowkledged that the title ' Biology' had been proposed by Lamark in 1801 and Treviranus in 1802. He also quoted from correspondence with a Dr Field, a leading classicist, who objected to the prefix 'bios' being used for anything other than human life. Field proposed that for plants and animals 'zootocology' would be more suitable. *Practical Elementary Biology,* jointly authored by Huxley and H. N. Martin, was published in 1875.

Huxley's summer courses for teachers were in addition to his work as Professor of Natural History at the Royal School of Mines, which occupied cramped quarters in Jermyn Street. The 1872 move of Natural History, Chemistry and Physics to South Kensington was the first phase in Huxley's dream of a central school of science. Geology, metallurgy and mining were to follow in the move from Jermyn Street. Huxley regarded his teachers going forth as his 'Scientific Missionaries'. Not only the teachers, his demonstrators were to give similar service.

W. T. Thiselton Dyer, the mainspring of the 'New Botany' was to become an influential figure in the botanical world whilst lacking any formal qualification in the subject as a student. He had graduated from Oxford in Chemistry and Mathematics but had been an enthusiastic field botanist since schooldays, and had carried out a survey of the Middlesex flora with school colleagues. This survey was published in 1869. In 1868 his decision on his future was '....teaching seemed the only choice and botany my vocation'. In 1870 he was appointed Professor of Botany in the Royal College of Science in Dublin. Here he delivered a course of lectures covering the whole of the plant kingdom, later claiming that at the time this was a new departure for the teaching of botany in Britain and Ireland. There were no laboratory

A second barbecue on the campus of UCT provided an opportunity for delegates to swap stories about their experiences with baboons or penguins or seals (or even, for the real fanatics, kelp factories and seaweeds!) during their mid-Symposium excursions, and the final evening was occupied by the Symposium Banquet at the Groot Constantia Wine Estate. This left those of us from Belfast with just enough energy to take the cable car up to the top of Table Mountain on Saturday before jumbo-jetting back into winter, while reflecting on a superbly organised meeting (thanks to John Bolton and Rob Anderson) in a very memorable region.

Matt Dring

STATEMENT OF ACCOUNTS

The British Phycological Society Registered Charity No: 246707

Annual Report for the Year ended 30 September 2000

The Society is an unincorporated association governed by its constitution and administered by its Council (trustees). The addresses of the current office bearers are set out in the European Journal of Phycology.

Membership of the Council of the Society:

Executive Members:

President:	Prof. CE Gibson	Hon. Membership Scty:	Dr MT Brown
Vice President:	Dr EJ Cox	Hon. Treasurer:	Dr JA Berges
Overseas Vice President:	Prof. H Preisig	Hon. Ed. (Eur. J. Phycol.):	Dr CA Maggs
Immediate Past President:	Prof. B Moss	Hon. Ed. (Phycologist):	Dr BA Osborne
Hon. Secretary:	Dr J Brodie		

Ordinary Members:

Dr G Pearson	Prof MD Guiry	Dr FG Hardy
Dr B Leadbeater	Dr L Medlin	Dr D Iglesias-Rodriguez
Dr J Lewis	Dr G Scott	

Principal Bankers:	Bank of Scotland, 39 Albyn Place, Aberdeen
Solicitors:	Wolferstans, 60/64 North Hill, Plymouth
Independent Examiner:	Flannigan Edmonds and Bannon, 2 Donegal Square East, Belfast

This is the fourth annual report presented by the current Hon. Treasurer. It is made in this form to meet the requirements of the Statement of Recommended Practice (SORP), issued by the Charity Commission and serves as an annual record of the resources entrusted to the Society and the activities it has undertaken.

The Society has continued to give financial support to activities that promote phycological research, disseminate phycological knowledge and assist young phycologists to present their findings at scientific meetings. The annual winter meeting and AGM were held at University of Birmingham. The standard of presentations were very high and congratulations go to the Manton Prize winner Jacqui Wong, and to Mark Clegg, who received the annual Poster Prize. Fifteen Student Members received support to attend this meeting from the Scientific Meetings Fund (SMF) (sixteen in 1999). The auction raised £589, thanks in large part to the enthusiasm and initiative of Dr E Shubert. These funds were transferred to the SMF; the meeting was well-managed and returned a surplus of £154. Grants to support preparation of a Freshwater Flora totalled £700.00; this came from General funds. The Summer Studentships programme (allowing promising undergraduates to undertake research) supported one student at Queen's University. The Society provided £1 500 to support three students at a specialist Freshwater Algal Field Course in Scotland. Furthermore, the BPS made contribution towards the running of two conferences: Microbial Interactions in the Aquatic Environment (£500) and Determinants of Aquatic and Terrestrial Productivity (£500).

Honoraria were paid to Executive members for whom it was felt the time commitment of the positions was exceptional. The Hon. Membership Secretary and Hon. Treasurer received £750 each, while the Secretary and Hon. Editor of the Phycologist each received £500.

The Society's financial situation remains good. At the beginning of the fourth quarter of this year, as decided at the last AGM, the Scientific Meetings Fund was topped up to a total of £25 000. This amount should allow the fund to support Travel Awards, Summer Studentships and Summer Field Courses from the interest it receives.

The Journal has continued to perform well financially. The balance to the Society from Volume 34 was £9, 751.56 (£16, 293.75 for Volume 33; this was unusually high and resulted from fewer pages being published than were forecast).

The Symposium proper started with a reception at the University of Cape Town, at which the 325 scientific delegates (and their accompanying persons) were treated to an elaborate and extensive buffet, plied with quantities of South African beer and wine, and finally persuaded to become members of a band demonstrating the musical properties of dried kelp stipes! The reception also showed off the superb location of the Upper Campus of the University, which clings to the slopes of Devil's Peak at the eastern end of Table Mountain, and commands an impressive view of the extensive plain stretching from False Bay in the east to the Atlantic in the west.

The scientific programme was arranged in the now standard pattern of early morning plenary lectures, followed by symposia, contributed papers and/or poster sessions. The first plenary lecture by Erik Ask (USA) dealt with the human factor in the *Eucheuma* cultivation industry, and was followed by a memorial lecture for Arne Jensen, which was given by his widow and co-worker, Prof. S. Liaaen-Jensen, on the versatility of the fucoxanthin molecule. On the second day, Bernard Kloareg (France) used his plenary lecture to introduce and open up what he suggested should be a new branch of phycology - phycopathology. This was a fascinating review of novel and exciting work on the biochemical and molecular interactions between seaweeds and agents of disease, both epiphytes and endophytes, and set the scene for a number of important contributed papers later in the Symposium.

After two days, delegates were given a day off for good behaviour and went scattering around Cape Town or the Cape Peninsula on mid-Symposium excursions. Several of these excursions gave us a chance to wander around the Cape Peninsula National Park, and to correct misconceptions from school geography lessons that the Cape of Good Hope was the turning point for the voyages of so many early sailors - the Cape of Good Hope is a rather minor headland at the side, and some distance short, of the true tip of the Peninsula, Cape Point. The Peninsula is also home to a substantial colony of Chacma Baboons *(Papio ursinus)*, and several of us got first-hand demonstrations of the superfluousness of the notices "Do not feed baboons"; they simply help themselves!

Returning to science, the plenaries on the last two days were by Rob Anderson (South Africa) and Peter Salling (Spain) on seaweed utilisation in Southern Africa and the latest developments in the seaweed colloid industry, respectively. The latter in particular was a source of valuable and up-to-date information on the quantities and values of the various products, and the shifting story of the companies involved in their production. The main themes for the contributed papers and posters were mariculture of seaweeds, particularly involving integrated aquaculture and bioremediation, the chemistry of seaweed colloids, and developments in biotechnology, especially in relation to genetic engineering and the diseases of seaweeds. The UBC awards for the best student papers reflected these themes; they were won by Adam Mellor (Belfast) for a paper on heavy metal uptake by *Fucus*, and by Declan Shroeder (Cape Town) and Fritz Küpper (Roscoff), whose papers both dealt with aspects of phycopathology.

The social programme for the Symposium was particularly well organised; delegates were given - perhaps deliberately - very little time to wander around on their own. On the first night, we were bussed through Cape Town and half way down the Cape Peninsiula to a beach (the Oudekraal Picnic Spot) where a traditional fish "braai" (barbecue) was arranged. There we were serenaded with live music and liberally watered while we watched the sun go down and light up the cliffs of the Twelve Apostles above our heads. As the moon took over from the sun, several tables were loaded with salads, and these kept us occupied while queuing for the fish. Eventually, the trickle of fish turned into a massive shoal of grilled yellowtail, and the feeding of the phycologists was complete. The next night, the phycologists got to see what they had eaten during a visit to the impressive new Two Oceans Aquarium on the Waterfront at Cape Town. In addition to a large "predators" tank with ragged tooth sharks and yellowtail, there is a second tank with a dense forest of 8 m high kelp plants, whose gentle undulations, backwards and forwards, were most unsettling!