

# British Phycological Society Newsletter



## Editorial

This is my first issue of the Newsletter as editor and I realise that I have a very high standard to maintain. I would like to take this opportunity, on behalf of the Society, to thank George Russell who devised the new format and conjured and coerced you to contribute over the last three years. He has established the newsletter as an eagerly awaited and interesting forum for news, views and articles and it is only with your help that I can hope to continue his excellent work. The power of the editor is, of course, absolute; he writes a note, or makes a phone call, and, by return post, there on his desk is the copy he asked you for. This, together with the dozens of unsolicited articles, ditties, conference reports and news items he has to sift through leaves him spoilt for choice of what to include. Seriously though, this is a newsletter for all the members of the BPS, and I want to encourage all of you to contribute (including those from overseas). I would especially like to hear from those of you who are not necessarily in the main stream academic areas of phycology and cannot get to the annual meetings. Perhaps a series of articles on a week in the life of..... would be interesting

(pinched that idea from the Biologist!). I have been very lucky in the quality of the contributions for this issue and I am sure readers will find plenty of interest.

### TWO FOR THE PRICE OF ONE!

Free with your BPS newsletter this summer!!! Your own copy of PLANT PRESS, plant conservation news from CABS. This is a fascinating and eye-opening publication for anyone who takes a broad interest in preserving our environment. For example, I was astounded at the reports in a previous issue of the thefts of rare orchids from protected sites. CABS is explained in our main article by David John.

Finally, it has become tradition for the editor to, somewhat belatedly, express the thanks of the Society to the organiser of the January Annual Meeting. I have no hesitation in continuing this tradition and praise Tony Chamberlain and his team for all his hard work which made the Guildford meeting such a success.

## CABS - The Conservation Association of Botanical Societies

CABS was formed in July 1985 to coordinate and represent the views of the national botanical societies on plant conservation in the British Isles. Our Society was one of the founding members along with the Botanical Society of the British Isles, the Fauna and Flora Preservation Society, the British Lichen Society, the British Pteridological Society, the British Bryophyte Society, and the Botanical Society of Edinburgh. The fledgling Association achieved funding from the Nature Conservancy Council (NCC) and the Heinz 'Guardians of the Countryside' Scheme through the World Wildlife Fund to set up an office at the South London Botanical Institute and to employ a full-time Conservation Officer. This officer, Nick Stewart, was appointed on 1 January 1986. In 1986-87 the Conservation Office was supported by a full-time assistant. CABS is now in its third year with funding presently provided by the NCC and the Vincent Wildlife Fund.

The Conservation Officer has, on behalf of the member societies, carried out the following:

### LIAISON

- entered into discussion with the NCC on the general principles of wildlife conservation and on action to meet immediate threats to sites of botanical interest; in this connection he has continued to press for the appointment to the NCC Chief Scientist's Team of a full-time officer concerned solely with lower plants.
- taken an active part in the Wildlife Link organisation, discussing conservation issues with other voluntary organisations associated with it, and commenting in detail on Wildlife Link reports that have particular relevance to plants.
- liaised with a variety of bodies (eg. the Forestry Commission), including the submission of written memoranda for consideration.
- fully consulted with the conservation officers and conservation committees of member societies on issues affecting their particular interests (he attended our Society's AGM last January and met with some of our officers).

## REPORTS

- prepared reports on conservation issues. The following are those to which members of our society have contributed information:

North Sea Forum. The first report ('plants') dealt with the conservation of plant habitats on the North Sea Coast, whereas the second one ('Ecological effects of plant introductions') discussed habitat losses due to human activities, the threats posed by introduced plants, and included a number of recommendations.

The Water Environment - The next steps. This was a Government Green paper on the proposal to privatise the Water Authorities. In this report titled 'The Utilization of Natural Waters' stress was placed on the need to conserve freshwater habitats and concern expressed on the vagueness of the proposals covering the control of the privatised Water Authorities.

Royal Commission on Environmental Pollution. This report entitled 'Eutrophication' was submitted to assist the Commission in its study on freshwater quality. It was a collation of information on the effects of eutrophication on aquatic plants with suggestions made as to ways of reducing nutrient enrichment. NCC. A report entitled 'Use of Plant Criteria in Selecting Wetland Sites' was prepared for this body and contained a number of proposals concerning the criteria, based on plant populations, to be used for assessing the international importance of wetland sites for designation under the RAMSAR Convention.

### THREATENED HABITATS AND SITES

- gave support to a wide range of local and countryside groups in drawing attention to, or trying to protect, threatened sites and habitats (e.g. In relation to the Channel Tunnel, Kent: he organised, conjointly with the Kent Field club, a public meeting to focus on plants of all groups threatened by operations concerned with the tunnel; The Pegwell Bay Public Enquiry: our Society was represented by Bob Fletcher who presented an objection to the proposed road development on the grounds that it would seriously affect unusual and scientifically interesting algal communities on the chalk cliffs (see extract from Plant Press No.2 below).

### PROJECTS AND CASE WORK

- undertook projects and casework (e.g. National Water Lily Survey: carried out in the summer of 1987 to provide data on habitat loss, damage from boats and dredging, and water pollution; Orchid Warden Scheme: co-ordinated this scheme in 1987; Lower plant Site Register: a computer database prepared with information supplied by the associate societies.

### PUBLICITY

- publicised plant conservation through press releases and the newsletter PLANT PRESS; the CABS newsletter is distributed to members of associate societies by courtesy of those societies.

Much of the success of CABS is due to the Conservation Officer being able to make use of the wide range of expertise on the conservation, ecology and distribution of British plants possessed by members of its associate societies. Often CABS has only become aware of important issues through the good offices of members of its societies either contacting it direct or through conservation committees. Sometimes it is able to take action on behalf of the Society concerned, on occasion publicising the issue in the pages of Plant Press. The Newsletter not only contains short articles on plant conservation, reviews publications and advertises forthcoming meetings, but allows CABS to report on its own activities. It also keeps member societies informed of its activities by periodically sending them reports.

CABS speaks for the national botanical societies whose combined membership is over 8,000. It thus represents the conservation interests of all plant groups and I believe that our Society should fully support its activities. Anyone aware of a conservation issue affecting algae is encouraged to contact its conservation officer. Also its newsletter editor (Clive Jermy) is always willing to consider publishing articles dealing with any aspect of plant conservation. All correspondence should be addressed to CABS, 323 Norwood Road, London SE24 9AQ.

### FUTURE OF CABS

A corporate plan has been drawn up identifying priorities for the next three years. One of the more radical proposals it contains is the possibility of enlarging CABS by allowing for individual membership. The document is currently being circulated for comment to the councils of the member societies.

### SYMPOSIUM

'Is Nature Conservation Working for Plants?' was the theme of a symposium jointly organised by CABS and the FFPS (Fauna and Flora Preservation Society) held on Saturday 5th March at the Meeting Room of the Zoological Society of London, Regent's Park, London.

The symposium aimed to bring together those concerned with the British flora and the conservation of plants. It covered all plant groups, contentious planning and pollution problems, and a whole host of plant conservation issues. The symposium got off to a good start with David Bellamy speaking to the theme of the meeting. He began with a worldwide review of the state of play of conservation and the world of plants, but later went on to national issues. Dave was his usual outspoken self, giving a personal and hard-hitting review of the problems besetting plant conservation in this country and the way forward as he saw it. Mark Seaward of the Lichen Society followed and explored the threat of acid rain on the lichen flora of Britain. The disastrous effects of commercial forestry and agriculture on plants was considered jointly by Derek Ratcliffe (British Bryological Society) and Alan House (NCC). Frank Perring (Botanical Society of the British Isles) considered proposals to build up populations of rare and endangered species in the urban and rural environment.

Our society was represented by Ian Tittley and David John and abstracts of their talks on the state of our freshwater environment and Britain's changing coastal habitat are reproduced below.

The chairman of CABS, Max Wade, ended the meeting by briefly reviewing the achievements of the Association over its first two years and went on to consider its future. There followed a general discussion chaired by Barry Thomas, the representative of the British Pteridological Society and FFPS. The debate was lively and at times passionate with many members of the audience expressing strong views on the future direction of CABS and of plant conservation. At the end of the day the consensus of opinion amongst those present was that plant conservation in the British Isles would be best served by a society purely representing the interests of plants. There was also general agreement that greater effort was needed to promote and develop the public image of plants. This was a highly successful meeting to judge from the large turn out (over 160 registered) and provided an opportunity for algae to be considered in the context of conservation.

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Abstracts of papers presented at the symposium 'Is Nature Conservation Working for Plants?'

## ARE FRESHWATERS STILL FRESH?

Nigel Holmes and David M. John

Many aquatic habitats have disappeared since the last Ice Age due to sedimentation, the encroachment of fen and marsh on lakes, and to drainage. Others have been lost as a result of 'river engineering', canalization, embankment and piling to reduce flooding of the original flood plain. Often gone unnoticed has been the piecemeal drainage and dereliction of small ponds, swamps and marshes. To some extent, the balance has been redressed with traditional agriculture and early industry and transport adding vastly to open water habitats in central and southern England. More recently, enormous reservoirs have been formed and many worked out gravel pits have been flooded to create sites for water recreation. These man-made habitats are usually not so diversified or interesting wildlife sanctuaries as those already lost or threatened by land use changes in the catchment that result in the influx of dissolved nutrients derived from agricultural, industrial and domestic sources, or pesticides, herbicides or chemicals from agriculture.

Unproductive aquatic habitats in upland areas have, in the past, been considered to be relatively free from pollution, but there is evidence to show that they are becoming increasingly affected by acid deposition where the buffering capacity of the water is poor. Afforestation is exacerbating the problem by significantly increasing the level of acidification and causing episodes of acid-shock. Another way man has brought about changes is to introduce alien plant species, with marsh stonecrop (*Crassula helmsii*) the most recent of these introductions. Discussed are the causes and the control measures used to combat the undesirable biological changes taking place in such habitats as spring-fed pools, marl-rich lakes (Bosherston Lily ponds, Midland Lakes of Ireland) and the Norfolk Broads.

The classification of rivers in Britain, using plants, highlights the differences in regional resources and the changes which occur from source to mouth. The significance of the classification will be discussed in relation to natural processes, river quality, river engineering and land management and how all aspects require consideration for effective plant conservation.

The ecological integrity and wildlife of many aquatic habitats in this country are under threat despite considerable effort and increased public awareness of the need to ensure a rational exploitation as well as conservation of the whole freshwater environment. Deterioration in water quality is one of the main reasons for the degradation and other progressive, often irreversible, changes observed.

## BRITAIN'S CHANGING COASTAL HABITAT, THE NEED FOR CONSERVATION

Bob Earl and Ian Tittley

The United Kingdom possesses a long coastline (approx. 8,500Km.) with a wide range of differing habitats. Despite the high botanical interest of coastal habitats, conservation of plants has not been of high priority in marine matters. This is in part because marine conservation lags behind conservation of terrestrial sites and species.

Probably the principal threat to the coastline is habitat destruction through agriculture, industrial and urban sprawl necessitating reclamation and coastal protection on a large scale. Domestic and industrial pollution have also had deleterious effects on coastal plant communities. Sensitive planning, balanced development and careful management can be seen in the environmental improvement of the tidal Thames, and the construction of Europe's largest oil terminal in Sullom Voe, Shetland with minimum disturbance to plant communities. Other causes for concern arise from the exploitation of coastal resources both directly (seaweed farming and harvesting; marl extraction; introduction of commercially important alien species) and indirectly (fish-farming; extraction of energy from the sea).

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## Plant Press

The CABS newsletter was not available for distribution at the time of mailing of our last issue. Therefore, it has been decided to abstract from Plant Press No. 2 items which might be of interest to members of our Society. - editor.

### PLANT PROTECTION

CABS is putting together a booklet to help all concerned in plant protection laws. It will show passport photos (in colour) of all schedule 8 species, ie. those fully protected under the WL & C Act. Good photographs are needed; anyone who thinks they can help should contact Clive Jermy who can provide a list of the species wanted.

### NORTH SEA FORUM

In November 1987, government ministers from countries around the North Sea met to discuss problems affecting this sea and, in particular, review the effectiveness of resolutions made at the Bonn Conference in 1984.

In a joint initiative with other voluntary conservation organisa-

tions CABS has been involved in the writing of a report on matters affecting the wildlife of the North Sea and its coastline. The document, called 'the Report of the North Sea Forum' is 200 pages long and is available for £10.00 from Edwina Milesi, CoEnCo, 80 York Way, London, N1 9AG.

The meetings resulting from the development of this report have proved very useful as a forum for discussing marine conservation problems and the North Sea Forum will be continuing under the name of the MARINE FORUM, with the wider remit that its new name implies.

### PEGWELL BAY PUBLIC ENQUIRY

In June, Nick Stewart presented evidence for CABS to a proposed road development in the Grade 1 SSSI at Pegwell Bay. The road, if allowed, would cause further loss of chalk cliff and foreshore on Thanet, and destruction of an algal site of international importance. CABS proof (supporting the NCC case) considered the botanical importance of Pegwell Bay in the context of the loss of natural habitat generally in south-eastern England. It was pointed out to the Inspector that such habitat loss is one of the major threats to the littoral environment of the North Sea.

Dr. Bob Fletcher (for the British Phycological society) presented

a more detailed objection dealing with the unusual and scientifically interesting algal communities on the chalk cliffs. It was pointed out that less than 20% of the Thanet chalk remains in a natural state, and of this only a small proportion bear algal communities. The importance of the Pegwell Bay site is enhanced by its being the type location for the genus *Chrysotila* and several species. The other type locality on Thanet is similarly threatened by coastal development.

Despite convincing the Inspector of the scientific and botanical importance of Pegwell Bay chalk cliffs at a previous Public Inquiry (Feb.1986) objecting to sea-wall construction, the future outlook is gloomy. Recently (Sept.1987) new plans were announced for a Brighton-Marina-style development at Ramsgate Harbour, again requiring road access. More worrying are plans for the re-development of Pegwell Bay Hoverport, in a wetland area of outstanding importance, with serious implications for bird, invertebrate and plant communities.

On a positive note, the loss of chalk foreshore communities in east Sussex has been reduced through the designation of the Seven Sisters voluntary Marine Nature Reserve. CABS acknowledges the considerable efforts of the Marine Conservation Society in achieving this.  
(report by Ian Tittley)

#### CONSERVATION OF IRISH PEATLANDS

In 40 years over 90% of the once wildest and untouched part of the Irish landscape, the peatlands, has been modified by man. The extinction date has been calculated at 1990 if the present rate of loss continues. The IRISH PEATLANDS CONSERVATION COUNCIL (IPCC) is a voluntary organisation which is work-

ing to identify interesting sites, to increase public awareness and lobby national and international agencies in an effort to conserve a mere 3.8% of our original bogland. Anyone interested is invited to become a "Friend of the Bog" for a minimum subscription of £5. Further information from IPCC, c/o Botany Department, Trinity College, Dublin.

#### THE BROADS BILL

Over the past seven years much activity has been generated to avert the decline of the Norfolk and Suffolk Broads. Extensive consideration has been given to problems of water quality and its effect upon sedimentation and insects, fish and plant life, and also to the effects of boat speed, wash and hull design, upon the banks and reed beds. The importance of the area and habitat has been recognised in a national context by the introduction of the Broads Grazing Marsh Conservation Scheme, the designation of Environmentally Sensitive Area status and lately the Broads Bill which is progressing through parliament.

In 1987 the Broads Authority, whose composition and duties are the subject of the new bill, published a substantial plan\* which reviewed the resources, involvement of the local community, monitoring and projects being carried out by the Authority in the context of the wildlife, landscape, history, tourism and recreation. Under the Bill the three duties of the Authority will be: -

1. To conserve and enhance the natural beauty of the Broads (defined to include wildlife)
2. To promote the enjoyment of the Broads by the public.
3. To protect the interests of navigation.

# MAJOR NEW TEXTBOOK

## Experimental Phycology

A Laboratory Manual

Edited by C. S. LOBBAN, D. J. CHAPMAN and B. P. KREMER

This exciting textbook consists of a series of experiments suitable for use in undergraduate and graduate laboratory courses in phycology or general botany. Each experiment illustrates an important aspect of the life history, physiology or biochemistry of the algae, using only basic equipment and readily available specimens.

Includes:

- instructions on how to grow and maintain algal cultures
- specific guides and advice to the instructor on preparing and troubleshooting each experiment
- notes on writing a meaningful laboratory report
- a selection of over 30 experiments
- endorsed by the Phycological Society of America

295 pp. 0 521 34333 X Hc £30.00 net

0 521 34834 X Pb £10.95 net

Forthcoming (May/June)

For further information please write to Shelby Howe at the address below.

**Cambridge University Press**

The Edinburgh Building, Shaftesbury Road, Cambridge CB2 2RU

While the government has stressed a balance of interests, the composition of the new authority, with only one of the thirty five members specifically appointed to represent nature conservation, in no way reflects this equality. The Norfolk Naturalists Trust is monitoring the situation closely and the RSPB is pressing for stronger provision in the control of pollution and in land drainage.

\*BROADS STRATEGY AND MANAGEMENT PLAN. Broads Authority 1987, Thomas Harvey House, 18 Colegate, Norwich NR3 1BQ. £6.50 incl. postage.

### CAMPAIGN TO SAVE WETLANDS

In a letter to members of the WWF-UK, George Medley, the UK Director, made the plight of British and international wetlands sound pretty desperate. The WWF has done much both in press-

ing government and the policy makers and in helping to purchase land. They need as much help as they can get. If you want to know more about the Wetlands Campaign and support it, write to World Wildlife Fund, 11-13 Ockford Rd. Godalming, Surrey GU7 1QU.

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Wheatfen Broad, the estate of the late Ted Ellis, mycologist, broadcaster, naturalist and elder statesman of East Anglian conservation for many years, is being managed as a nature reserve in his memory by Friends of the Ted Ellis Trust.

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## Culture Collection of Algae and Protozoa.

### CCAP 'Special' for Schools

A hint was given in the December issue of the Newsletter that new developments are afoot at the Culture collection of Algae and Protozoa. It is now possible to announce the first of these.

From September 1988 CCAP will supply a special package of cultures and protozoa to schools at a very reasonable price. This has been made possible as a result of generous sponsorship from Shell U.K., the Society for General Microbiology (SGM) and, of course, the British Phycological Society. The Society for Applied Bacteriology (SAB) has made the generous offer to provide financial assistance to schools wishing to buy the package.

You may wonder why there should be so much support for the supply of cultures of algae and protozoa to schools. The main reason was that Shell Education Service and the Societies considered that there is a need to encourage practical microbiology in schools instead of watching the all pervasive video. Moreover, with greater problems with health and safety aspects of teaching microbiology, algae and protozoa introduce interesting, safe and beautiful organisms which can easily be cultured by schools for the development of skills in microbiology.

The package will be available as a CULTURE KIT FOR APPLIED MICROBIOLOGY AND BIOTECHNOLOGY. It will contain: -

- 8 cultures in tissue culture flasks, comprising 6 algae and 2 protozoa.
- Concentrated stock solutions sufficient for preparing several litres of algal culture media.
- The booklets by Drs. Belcher and Swale on identifying and culturing algae.
- A completely new booklet by Drs Finlay, Rogerson and Cowling on collecting, identifying and culturing protozoa.
- Illustrated workcards for simple experiments aimed at applied microbiology and biotechnology.
- A guide for teachers, giving advice on use of the cultures, preparation of media, information on experiments on the workcards and suggestions on the use of cultures for projects.

The kit will come in a strong box with a cover design containing beautiful colour photomicrographs by Dr. Hilda Canter-Lund. Teachers ordering the set will be sent the Guide for Teachers and workcards a month in advance of the box containing the cultures and booklets. This is so that they can be ready for the cultures when they arrive and know how to handle them to maximum advantage. The price will be £22 + VAT + postage. We hope to give details of the financial support from the SAB to schools purchasing the kit when it is fully advertised in the spring edition of 'Shell Education News' and in the 'Biologist'.

During the winter a prototype of the kit was provided to 30 schools for trial and, where possible, their comments have been incorporated. An interesting and diverse range of organisms will be provided, eg. cyanobacteria, green algae, an amoeba and a ciliate. Workcard experiments include cell immobilization, nitrogen fixation, phototaxis, production of valuable pigments and grazing. The experiments use simple, normal laboratory materials and care has been taken to provide media which are simple to prepare. It is not expected that schools will make use of all the experiments provided but it is hoped that they will dip into them for ideas as their teaching schedule allows. There is a great deal of scope for teachers to use the kit as a reservoir of material for many aspects of biology syllabuses.

Besides the financial support received for this kit, CCAP is grateful to Dr. Paul Wymer of the National Centre for School Biotechnology, who has helped more than he realised in getting the idea off the ground; Professor Ken Goulding and Dr. Peter Robinson of Lancashire Polytechnic; and Trevor Furnass of FBA. We hope you will spread the word around your school teacher friends and let them know CCAP has moved and where the culture kit can be ordered from.

Ivan Heaney  
Culture Collection of Algae and Protozoa  
The Freshwater Biological Association  
Ambleside  
Cumbria LA22 0LP

A kit will be available for inspection at the next BPS winter meeting.

# CCAP News update.

## CCAP CATALOGUE

CCAP wishes to apologise to those who have ordered the new CCAP catalogue and had a long wait for it. Unfortunately, after receiving the copy, the printers moved premises with the resulting delay in publication.

## OLD ALGAE NEVER DIE - THEY JUST BECOME DISPOSABLE

### PROPOSED CULL OF MARINE STRAINS

In the past, though at infrequent intervals, strains of algae which had been aquired and rendered axenic by the Scottish Marine Biological Association were sent to CCAP at Cambridge. The last occasion on which a large consignment of cultures from SMBA was donated to CCAP was in 1983. They included most

of the strains listed below. In 1986 these strains were returned to SMBA at Dunstaffnage during the course of the relocation of the culture collection. Unfortunately, many of them had become contaminated and it is our intention to replace them with extant and still axenic SMBA material.

If any readers have a particular requirement for the Cambridge material listed below under CCAP No. they should contact the Curator who will be pleased to send them samples, at cost, prior to disposal of the stock on 1st. August 1988.

M.F.Turner  
CCAP  
Dunstaffnage Marine Research Laboratory,  
P.O.Box 3,  
OBAN  
Argyll PA34 4AD,  
Scotland, U.K.

### SMBA/CCAP DUPLICATE STRAINS

NAME	CCAP No.	SMBA No.
Brachiomonas submarina	7/1A	42
Brachiomonas submarina	7/1B	43
Brachiomonas submarina var. pulsifera	7/2A (=7/3)	44
Brachiomonas submarina var. pulsifera	7/2B (=7/4)	45
Chlamydomonas pulsatilla	11/105	152
Chlorella sp.	211/53	253
Nannochloropsis oculata	849/1	66
Isochrysis galbana	927/1	58
Pavlova lutheri	931/1	60
Hymenomonas elongata	961/3 (=961/6)	62
Hemiselmis virescens	984/7	297
Fragilaria pinnata	1029/2	241
Oxyrrhis marina	1133/5	18
Porphyridium purpureum	1380/3	70
Rhodella maculata	1388/2	207
Mantoniella squamata	1965/1	285

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## Algae and Fungi, Kingdoms and Trees.

As phycologists, it behoves us occasionally to think about the definition of the word 'alga'. Specifically, we should consider whether the word comprises an evolutionarily coherent and phylogenetically related group of organisms (like, for instance, horse-tails or flowering plants) or whether it is just a term of convenience (like, for instance, trees or phytoplankton). Reconsideration of this subject now is prompted by the accumulation of data which, we believe, provide objective indications of relationships on the basis of comparisons among nucleotide and amino-acid sequences in DNA, RNA and certain ubiquitous proteins. Recent publications (Hori, Lim and Osawa, 1986; cf. Wolters and Erdmann, 1986) dealing chiefly with cytoplasmic 5S rRNA nucleotide sequences, provide nice examples of such new information as it may relate to plant evolution. (A comparable article, mainly on animal relationships, is that of Bergstrom, 1986). On the basis of information from sequence data obtained from 28 different kinds of plants, we find indications that organisms with flagella (9 double-microtubule structures) are indeed related phylogenetically. These include most eukaryotic plants, and apparently all fungi and animals.

The chlorophytes, *sensu lato*, comprise green plants at all levels

of organization: unicellular and multicellular algae, bryophytes and tracheophytes. Brown algae, including diatoms and thalloid phaeophytes, constitute yet another evolutionary branch. The evidence also indicates, as some (eg. Taylor, 1978) have long suspected, that rhodophytes branched off, as it were, before the evolution of the eukaryotic flagellum. Indeed, the red algae seem to have had two distinct origins; they may have evolved by symbiogenesis as unions of hitherto apochlorotic ancestors with some photosynthetic prokaryotes like cyanophytes (evidence based on 16S rRNA nucleotide sequence data of Bonen and Doolittle, 1975).

Now, in view of all this, can we consider the algae as in any way a phylogenetically coherent group? I think not. Time, or more data, will tell, but it already seems best to regard the algae merely as photosynthetic plants which have failed to reach the degrees of specialization achieved by land plants (bryophytes and tracheophytes). The word 'alga' is useful, nevertheless, as are words such as cryptogams (which include the fungi), or trees (among tracheophytes assuredly heterophyletic) or plankton. We should not even pretend that the word has any absolute scientific objectivity.

This brings us to the notion, now propounded by many bacteriologists, that algae must, by definition, be eukaryotic. But why? The word 'eukaryote' was defined, if not coined, by Stanier and van Niel (1941) to include bacteria and blue-green algae (BGA). Only more recently did Stanier (1975) propose calling the latter blue-green bacteria because, since they are not eukaryotic, they should not be considered as algae. (Note the logical non-sequitur here). This has had the undoubtedly beneficial consequence of permitting bacteriologists and other microbiologists, with pure cultures, refined laboratory techniques, clear consciences and relatively liberal financial support, to study BGA as well as 'eubacteria' - but it has also led to muddles. Do photosynthetic bacteria (sensu Stanieri) include oxygen-evolving types like BGA? Can these be obtained in bacteria-free culture? Do many lichens contain nitrogen-fixing bacteria? Does phytoplankton include BGA? Should the Cyanophyta ('blue algae') be formally renamed the Cyanobacteria? By the same token, should the Actinomycetes ('star-fungi') be renamed Actinobacteria because they are not eukaryotic, and therefore not fungi? Many people have adopted such changed definitions. This is in order, so long as we realise that such changes relate just to the meaning of words, which are not subject to scientific confirmation or refutation. For the elementary textbooks, it may be handy to consider algae in one chapter (or kingdom) and fungi in another, but let us recognise that the class distinctions are mainly verbal and thus subjective.

Green algae (even green flagellates) may prove to be more closely related to vascular plants than to brown algae, as the electron microscopists and molecular biologists now indicate, and green and brown algae may be more closely related to one another, and to certain fungi, than they are to red algae. However, such indicated affinities need not worry us unduly. We can surely continue to regard the algae simply as plants which are generally capable of photosynthesis and the evolution of oxygen but which are patently not bryophytes or tracheophytes

(cf. Silva, 1982). This is a sort of negative definition, but at least it is convenient.

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#### REFERENCES

- BERGSTROM, J. 1986. Metazoan evolution - a new model. *Zool. Scripta* 15, 189-200.
- BONEN, L. & DOOLITTLE, W.F. 1975. On the prokaryotic nature of red algal chloroplasts. *Proc. Nat. Acad. Sci. USA.* 72, 2310-2314.
- HORI, H., LIM, B-L. & OSAWA, S. 1985. Evolution of green plants as deduced from 5S rRNA sequences. *Proc. Nat. Acad. Sci. USA.* 82, 820-823.
- SILVA, P.C. 1982. Taxonomic classification of algae. In O.R. Zabor-sky (ed.) *CRC Handbook of Biosolar Resources* 1(1), 523-567.
- STANIER, R.Y. 1975. The Cyanobacteria. In *Bergey's Manual of Determinative Bacteriology*, 8th edn. (eds. R.E. Buchanan & N.E. Gibbons), p.22.
- STANIER, R.Y. & VAN NIEL, C.B. 1941. The main outlines of bacterial classification. *J. Bact.* 42, 437-466.
- TAYLOR, F.J.R. 1978. Problems in the development of an explicit hypothetical phylogeny of the lower eukaryotes. *BioSystems* 10, 67-89.
- WOLTERS, J & ERDMANN, V.A. 1986. Cladistic analysis of 5S rRNA and 16S rRNA secondary and primary structure - the evolution of eukaryotes and their relation to Archaeobacteria. *J. mol. Evol.* 24, 152-166.

Comments and discussions on this piece would be welcome for the next newsletter. (I am particularly intrigued by the concept of logical illogicalities) - editor.

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## Along the 'golden-yellow' brick road

Once upon a time..... A band of about 80 hopeful adventurers assembled in Plymouth on a fine week in early April in a quest for enlightenment. Their goal was to understand the relationship and origins of an assemblage of lowly organisms which constitute the lesser known Kingdoms (super-kingdoms / Divisions/ Orders\* (\*delete as you think appropriate)) of earthly organisms - which inhabit the land of the CHROMOPHYTE / HETEROKONT. On the first day we strode 'Over the Rainbow' through a bewildering maze of chlorophylls (C3 or not C3, that is the question), xanthins and LHC's (light harvesting complexes); which gave us our glorious rainbow of red, brown golden-brown, yellow, grass-green and blue-green. Even after the plastid genes were laid bare in a plethora of super-folded base sequences (which look like every boy's dream design for a fantastic train set layout), the question still remained of who ate whom and when (and how many times!).

On the second day of our adventure we entered a fantastic picture gallery of flagella, glowing ghost-like or covered in elaborate hairs, with their basal roots enmeshing the audience as they left in 3D array from the screen. We wandered into a fungal 'Wonderland' before skirting a chasm of separating DNA, as we learnt how Chromophytes had devised ever more ingenious and

perplexing patterns of nuclear division. After light refreshment we moved into the land of King Dodge and his voracious Dino's; which seem to have gobbled up any 'phyte' going - chromo, chloro or cyano! We also learnt of the libertarian Dinoflagellate inhabitants of a Durban beach, which were risking permanent incarceration for having both BROWN and BLUE Cryptosymbionts cohabiting in ONE host.

Before moving onto our poster session we were transported into an unscheduled Vaucherian 'time warp' as Dennis Greenwood described some of the earliest serial sections ever prepared. The configuration of their 3 ply plastids was revealed as he conjured a giant model of a Xanthophyte plastid from a lurking carrier bag!

On the last day of our quest, the band of plucky adventurers wandered into the land of the Phaeophytes, where we were treated to a Freddy Mercury impression as psychaedelic computer reconstructions of zoospores flashed in front of our eyes (courtesy Charlie O'Kelly) and the links between Phaeophytes and 'mainstream' Chrysophytes were rudely swept away. We were nearing the end of our trail, but not before we were showered with flying splinters of diatom frustules. The final goal was ahead as we passed through the provinces of the protozoan

philosopher (who promptly rechristened the chromophytes STRAMATOPILES - straw hair organisms), the plastid Queen and the Tree-maker extraordinaire. Here, the guru Cavalier-Smith introduced us to the Kingdom CHROMISTA, with their distinctive RETRONEMES, and bombarded us with the speculative worlds of the ARCHEZOA and PROTOZOA from which he suggested all other Kingdoms had sprung. At last we reached the wise ROUND Wizard of the West. Would all be revealed? We waited to see if the wizard would distill the knowledge we had accrued on our journey into the simple answer we all sought. Alas no, the wizard instead chastised us for presenting too much data too quickly and threatened that on our next journey he would banish the carousel projector and OHP to the WASTELAND and leave us only with some CHALK and BLACKBOARD with which to convey our thoughts! Horror of horrors! However, he did promise to retreat to his castle with the manuscripts, so all may yet be revealed. As we followed the golden-yellow road away from the land of the Stramatopiles we were left bursting with ideas of exciting things to do - all we need now is to find the pot of gold to enable us to continue this great adventure (Research Councils please note).

The Symposium, the brainchild of Barry Leadbeater (Birmingham) and John Green (MBA, Plymouth), was well organized and very enjoyable. Much credit for this must go to the local secretaries, John Green and Will Diver (Plymouth Polytechnic) and their spouses who cheerfully manned the symposium desk throughout the meeting. The food was excellent and we enjoyed both a splendid conference dinner and a lovely evening at Cothele House; where Northern participants were staggered to see the rhododendrons and camelias in full bloom! One cautionary episode (all overseas visitors to Britain please note) was that Sally Gibbs discovered, to her cost, the curious microbiology of the Cornish Pastie and was laid low by food poisoning for nearly two days! Her dynamic presence was sadly missed.

(I can't allow this slur on the true Cornish Pasty to go unchallenged. Obviously, bought the wrong side of the Tamar, there can be no guarantees of origin or authenticity, especially if it is called a pastie!!! --ed (who, as you may gather, has Cornish origins))

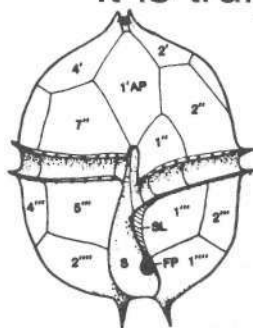
Many of the keynote papers will be published in a Symposium volume edited by the organizers, which judging by the high standard of all the contributions should be well worth reading. The Chromophytes are a group of varied, beautiful and as the meeting revealed, ultimately perplexing, but fascinating organisms. Our thanks must be extended to the Systematics

Association under whose umbrella this meeting was held. Lets hope that, when the next meeting devoted to these organisms is held, the powerful new tools available to us will help clear, rather than muddy, the complex phylogenetic water which surrounds them.

Gordon Beakes  
Department of Biology  
Newcastle University

The Reviews say it all:

"It is truly a bargain"



Dodge, J. D.  
Atlas of  
Dinoflagellates.

London 1985  
ISBN 1 85083 004 5  
Binding: case pp.120 + viii  
STILL £15.00 & \$35.00

"Each photomicrograph is accompanied by a short explanation, including the species name with author citation, collection location, size of specimen, and general distribution. The Atlas itself is preceded by an introductory section on dinoflagellates. The information value of each photomicrograph is enhanced by the accompanying text. Each time I look at the Atlas I notice some feature of a species that I had previously missed...Do I recommend that phytoplankton systematists and ecologists buy a copy of this atlas? The answer is yes. I bought three copies, two for colleagues." *The Quarterly Review of Biology*

"...a treat for anybody who has marvelled at the beauty of scanning electron micrographs and more so for those of us interested in the microscopic world of dinoflagellates...John Dodge and his publishers are to be congratulated on their splendid book which at some 12p. per photograph must be extremely good value (and hard back into the bargain)" *Circular of the Palaeontological Association.*

From: FARRAND PRESS, 50, Ferry Street, London E14 9DT

In the Americas from: Blackwell Scientific Publications Inc., 667, Lytton Avenue, Palo Alto, California 947301, U.S.A.



L. Alexander

# A birthday celebration for Peter Kornmann

October 1987 gave German botanists the opportunity to celebrate the 80th birthday of one of the outstanding phycologists of our time. Peter Kornmann's contribution to our knowledge of algal systematics and life histories has been immense. His publications, always elegantly written and beautifully illustrated, are so immediately identifiable that the presence of the authors name is virtually superfluous. His style was, and remains, truly original.

The Festkolloquium was held in Hamburg, partly in the headquarters of Biologische Anstalt Helgoland, and partly in the handsome new Botany building of Hamburg University. Approximately 60 people were present including several from Denmark, England, France, Netherlands, Scotland, Sweden and the U.S.A. The festivities began on the evening of October 29 with an informal supper at Biologische Anstalt Helgoland, where Klaus Luning gave a fascinating and highly entertaining account of the career and times of Peter Kornmann, illustrated with slides of the many distinguished German and overseas scientists who have worked at the Helgoland laboratory. It was a salutary reminder to all of the sheer quality and quantity of marine research which has been carried out at that remarkable establishment.

Friday 29 and Saturday 30 October were given over to scientific papers covering an exceptionally broad range of marine algal topics. Phytobenthos, phytoplankton, epilithic, epiphytic and parasitic algae; life-histories, morphogenesis and systematics all featured in the programme. On Friday evening we gathered at Restaurant Ostermann where an excellent and convivial supper was greatly enjoyed.

The proceedings ended at midday on Saturday with a buffet lunch in the Botany Department and it was there that Mats Waern added his tribute to the many which Peter had received over the preceding days; this he did in a characteristically witty and charming speech. The meeting was, for everyone, an occasion of great happiness. The affection and regard for Peter and Frau Kornmann was evident throughout, as was the warmth and kindness of this gentle couple. It was a joyful celebration of a marvellous and continuing career.

G.Russell,  
Department of Botany,  
The University,  
Liverpool.

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## New Publications

### PROCEEDINGS OF THE THIRD BIOGEOGRAPHY WORKSHOP

Klaus Luning wrote in January to tell me that papers presented at the third biogeography workshop have been published in *Helgolander Meeresuntersuchungen*, Vol. 41, No.3; 150 pages. and can be ordered for a price of DM 34 (postage included) from:-

The Librarian  
Biologische Anstalt Helgoland  
Notkestrasse 31  
D-2000 Hamburg 52  
West Germany.

Having received a copy of the volume, I can recommend it to anyone interested in the area of evolutionary and ecological aspects of seaweed distribution. It contains twelve interesting papers and I quote the following from the preface:-

'It is seaweed distribution and its possible causes that serve to unify the papers in the workshop. The initial impact of vicariance biogeography and phylogenetic systematics is evident from the papers presented by Garbary and Lindstrom, whereas van den Hoek point out the importance of long-distance dispersal, as evident from seaweed floras of mid ocean islands. South's overview of the possible history of the North Atlantic seaweed flora profits from a checklist recently accomplished by South and Tittley. Ecological biogeography is represented first by three papers reporting on the basic question of ecotype differentiation (Guiry et.al. Luning et.al. tom Dieck), and these papers are in part a fruit of the cooperation experienced at the former workshop at Groningen. Further contributions to ecological biogeography are the papers by Yarish et.al. and Cambridge et.al., both exhibiting

the importance of temperature for distribution. The paper by Kain gives insight into photoperiodic and temperature control in a larger red alga, beyond a size that lends itself to cultivation in petri and crystallizing dishes. The modifying action of salinity on temperature behaviour in *Fucus vesiculosus* is stressed by Russell.

Just as the series of papers was opened by examples showing the introduction of new taxonomic and phylogenetic concepts to seaweed biogeography, so were the papers treating the experimental ecological aspects finally complemented by another, probably revolutionary, approach: the paper by Olsen et.al. The latter may open the curtain onto a new stage scenery by introducing molecular genetics to seaweed biogeography. This paper is the fruit of a tenacious and long-term battle to adapt methods developed for other organismic groups to seaweeds'. (K.Luning)

### THE PROBLEMS OF TOXIC DINOFLAGELLATE BLOOMS IN AQUACULTURE.

Proceedings of an international conference and workshop held at Sherkin Island Marine station 8-13th June 1987. Contributors:- B.Dale, D.G.Baden, B.McBary, L.Edler, S.Fraga, I.R.Jenkins, G.M.Hallegraeff, T.Okaichi, K.Tangen, F.J.R.Taylor, A.W.White, C.M.Yentsch and C.S.Yentsch.  
Cost £12 Sterling - surface post.  
Orders to: Matt Murphy, Sherkin Island Marine Station, Sherkin Island, Co. Cork, Ireland.

## THE BIOLOGY OF ALGAE AND DIVERSE OTHER VERSES – RALPH A. LEWIN

Revised and Expanded edition (191 pages, 1987).  
Containing such delights as 'Lead Kindly, Stromatolite', 'The Biology of Algae' and 'Le Fermentation' is now available from the Boxwood press (183 Ocean View Blvd. Pacific Grove, CA 93950). (ISBN 0-940168-11-1).

No one has given me a review copy but it comes recommended by Professor G.E.Fogg and the following review (undoubtedly biased!) has been received. – editor.

'Since THE BIOLOGY OF ALGAE AND OTHER VERSES by Ralph A.Lewin (published by the Boxwood Press, and later reprinted by the University Press of America) is again out of print, the Boxwood Press has now published a new, expanded edition entitled THE BIOLOGY OF ALGAE AND DIVERSE OTHER VERSES, containing all the old items (and with the same old photograph of the author as a young man on the cover) together with an equal number of new verses. This double volume is now on sale, and should be available in all university bookstores (If it isn't, they should order it forthwith.) All those who seek a brilliant exposition of the wonders of modern psychology cannot fail to be disappointed.'  
(R.A.L.)

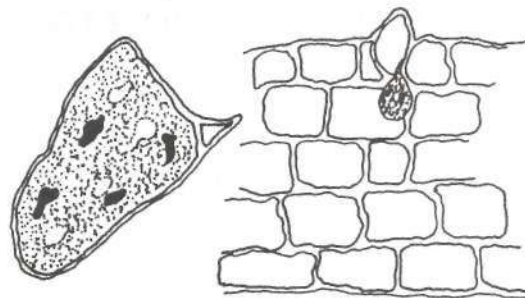
However, this is a very mysterious book and the publishers obviously have every intention of limiting its distribution to the West Coast of the USA. I tried my university bookstore who had no record of it, its price, or a European distributor and ended up by telling me that it would take 4 to 6 months at unknown cost to get it from the States. So - If you are reading this Ralph, perhaps we should sort out a European distribution deal! – editor.

## COASTLINE – BRITAINS THREATENED HERITAGE

by Kate Baillie, pp 200. ISBN 0-86272-213-6. Kingfisher Books for Greenpeace Environmental Trust, 1987. £14.95.

In 1986 the Greenpeace research ship, *Beluga*, carried out an environmental survey of the coastline of Britain, and arising from this the present work was compiled. There are 14 sections, each relating to a particular stretch of coast, lavishly illustrated with photographs by Dennis Gilbert, and a 'regional summary'. The latter consists of three 'profiles', a 'physical' one dealing with the geology and climate, a 'human' one dealing with settlement past and present, industry and famous personalities, and a 'natural' one describing habitats and wildlife and including a list of attractions. There is also a paragraph for 'causes of concern', which are mainly threats from pollution of various kinds. The book is mainly concerned with scenery and directed at the general reader, so naturally the wildlife species illustrated are mainly birds and other animals. Two or three plants are included in each section, however; these include two cryptogams, *Porphyra umbilicalis*, as might be expected for Wales, and *Fucus vesiculosus* rather surprisingly for the Isle of Man, but the rest are flowering plants, e.g. *Mertensia maritima*. It was pleasing to see CABS in the list of organisations actively concerned with preserving the coastline.

(review by Frank Brightman in CABS 2)



L. Alexander

## RED TIDE NEWSLETTER.

Published quarterly with details of algal bloom outbreaks worldwide and bibliographical references. Subscription rates covering printing and postage will be £8 Sterling of \$12 US annually (4 issues).

Orders to: Matt Murphy, Sherkin Island Marine Station, Sherkin Island, Co. Cork, Ireland.

## BIORECOVERY – A NEW INTERNATIONAL JOURNAL OF BIOTECHNOLOGY APPLIED TO MATERIALS RECOVERY AND HANDLING

In recent years there has been an increasing interest in the use of living organisms to collect and concentrate, directly or indirectly, metals, oil and toxic chemicals. At present publication of such work is spread throughout the scientific literature. BIORECOVERY: the International Journal of Biotechnology Applied to Materials Recovery and Handling provides a forum for high quality contributions on all aspects of the use of living organisms and their products in the extraction, recovery and processing of metals, minerals, oils chemicals and other materials.

Topics covered within the scope of the journal include:

- Biohydrometallurgy ('microbial mining')
- Petroleum microbiology (enhanced oil recovery from traditional reservoirs as well as shale and tar sands)
- Bioaccumulation and separation of valuable/important elements.  
Bioaccumulation applied to pollution control and effluent treatment (eg advanced waste water treatment)
- Microbial coal desulfuration
- Biorecovery of energy from waste materials.

BIORECOVERY will be of interest to those in the fields of mining, the petroleum industry, the chemical process industry, pollution control, biotechnology, applied microbiology, phycology and general biology.

Manuscripts and submission enquiries to the Editor. Dr.Robert G.J.Edyvean, School of Materials, University of Sheffield, Mappin St. Sheffield. S1 3JD UK.

Order, sample copy and general enquiries: AB Academic publishers, PO Box 97, Berkhamsted, Hertfordshire. HP4 2PX. UK.

# Forthcoming Events

## LAST CALL FOR ASCB SUMMER RESEARCH CONFERENCE !!!

ALGAL EXPERIMENTAL SYSTEMS IN CELL BIOLOGICAL RESEARCH Airlie House Conference Centre, Airlie, Virginia, June 25-29 1988.

The American society for Cell Biology is sponsoring this summer conference to bring together investigators and students to discuss basic cell biological phenomena being studied with algal models. A major purpose of the meeting is to promote exchange of information on techniques and materials to the mutual benefit of researchers now working in diverse areas. The numerous advantages of using appropriate algal models for basic research should become more apparent to the research community from the proceedings and subsequent publication.

Further information from ASCB Summer Research Conference, National Office, 9650 Rockville Pike, Bethesda, MD 20814 Tel.(301) 530-7153.

## LAST CALL FOR AUSTRALIA!!!

Anyone still wishing to arrange travel packages to the Third International Phycological Congress in Melbourne August 14-20 1988 should contact the official travel agents as soon as possible: -

Sue Davies  
Avon Events  
22 St. John St.  
Manchester M3 4EB UK  
Tel. 061-834 6070

## PHYCOLOGY 88

The Phycological Society of America will hold its annual meeting, PHYCOLOGY 88, on 24-29 July at the Asilomar Conference Centre, Pacific Grove, California. Asilomar is located on the Pacific Coast along the Monterey Peninsula about 125 miles south of San Francisco. In addition to a full programme of oral presentations and poster sessions, there will be three symposia: 'Cladistics in Studies of Algal Evolution', 'Applied Phycology - Strain Selection and Improvement', and 'Molecular and Cellular Biology of Algae-Selected Topics'. Professor Kenneth Thimann of the University of California at Santa Cruz will offer the Distinguished Lecture on 'Creativity in Science' after the banquet.

Detailed information and forms for registration and housing contact: Dr.Norma J.Lang, Department of Botany, University of California, Davis, CA 95616.

## FIRST CALL FOR PITLOCHRY!!!

### SORTING IN EUKARYOTIC CELLS

ASCB/EMBO conference,  
Atholl Palace Hotel, Pitlochry, Scotland. September 11-15, 1988.  
Organisers:

William E.Balch, Yale University, New Haven, USA.  
Alan Colman, Birmingham University, UK.  
Suzanne R.Pfeffer, Stanford University, Stanford, USA.  
Graham B.Warren, University of Dundee, Scotland.

Studies of the movement of proteins between intracellular organelles, the redistribution of organelles during cell division to daughter cells, and the striking spatial organization of proteins, mRNAs, chromosomes and other cellular structures, have led to the realization that sorting of macromolecules is critical for cellular function and development. In this conference, jointly sponsored by the American Society for Cell Biology and the European Molecular Biology Organization, we hope to bring together developmental and cell biologists to identify key questions for future investigation. Participants other than already proposed speakers will have the opportunity to present posters.

Information from:-  
ASCB/EMBO Conference,  
ASCB National Office  
9650 Rockville Pike  
Bethesda,  
Maryland 20814  
Tel. (301) 530-7153

## BPS WINTER MEETING, SHEFFIELD, JANUARY 4-6 1989.

While not, as usual, precluding other contributions, we propose to hold two special sessions at the next annual meeting of the British Phycological Society:

### 1. ORGANELLES AND INCLUSION BODIES OF ALGAE AND CYANOBACTERIA

Anyone wishing to contribute a paper or poster on fine structure or physiology relating to this topic should contact one of the following: -

Cyanobacteria: Dr.G.A.Codd, Department of Biological Sciences, The University, Dundee DD1 4HN

Macroalgae:....Dr.L.V.Evans, Department of Biology, The University, Leeds, LS2 9JT

Microalgae:....Dr.B.S.C.Leadbeater, Department of Plant Biology, The University, Birmingham B15 2TT

### 2. ALGAL FOULING IN FRESHWATER, MARINE AND TERRESTRIAL ENVIRONMENTS

Please notify Dr. Maureen Callow (Department of Plant Biology, The University, Birmingham, B15 2TT) if you are interested in contributing to this session or can suggest possible contributors.

Details of the meeting will be sent to members, as usual, in September/October.

## FIRST CALL FOR SHERKIN!!

Mat Murphy's Marine station on Sherkin Island, Co Cork seems to be going from strength to strength (see also under New publications). My own memories of Sherkin make me happy to include the following announcements in the Newsletter. Those of you who have not yet sampled the splendid environment (and Guinness) of Sherkin have a treat in store - editor.

2nd SHERKIN INTERNATIONAL WORKSHOP AND CONFERENCE - TAXONOMY AND BIOLOGY OF TOXIC DINOFLAGELLATES AND OTHER HARMFUL PLANKTON. To be held at Sherkin Island Marine Station, Co. Cork, Ireland 9-16th June 1989.

Details from: Matt Murphy, Sherkin Island Marine Station, Sherkin Island, Co. Cork, Ireland.

## FIRST CALL FOR VANCOUVER!!!

### XIIIth INTERNATIONAL SEAWEED SYMPOSIUM

The XIIIth International Seaweed symposium will be held from the 13th-19th August 1989 at the University of British Columbia in Vancouver, Canada. The Symposium is under the auspices of the International Seaweed Association, an affiliate of the International Association of Biological Oceanography.

The Symposium will consist of plenary lectures, special sessions for invited presentations ('mini-symposia'), contributed papers, posters and workshops. The biology of economically important macro- and micro-algae, and the exploitation and utilization of these algae and their products will be considered. The results of the Symposium will be published in the 'Proceedings of the International Seaweed Symposium' and all registrants will receive a copy.

Special programmes for accompanying persons will be available. Post Symposium tours of both scientific and scenic interest will be arranged to various areas in the Pacific Northwest. Mid-Symposium tours within the vicinity of Vancouver will also be available.

Further information can be obtained from:-  
The Secretariat.  
XIIIth International Seaweed Symposium  
801-750  
Jervis Street  
Vancouver,  
British Columbia  
CANADA V6E 2A9

# News and Announcements

## Subscriptions

Many members have still not paid their subscriptions for 1988 and a number of others who pay by Standing Order have failed to up-date their mandates and have, therefore, paid at the old rates. Members are respectfully reminded that until the correct payments are received, their Journals will not be despatched; the Society is charged for all copies distributed and considerable losses would be incurred.

The subscription rates for 1988 are:

Full .....	£15
Student/retired .....	£10
Associate .....	£5

Subscriptions should be sent to Dr.J.C.Green, The Laboratory, Citadel Hill, Plymouth PL1 2PB, UK. Cheques and money orders should be payable to 'The British Phycological Society' and be in Sterling or US Dollars. If paying in dollars, please add \$2 to cover handling charges.

If your subscription is outstanding, please do give the matter your URGENT attention; the distribution of reminders is expensive - and time consuming!

### GRADUATE FELLOWSHIP

A limited number of graduate fellowships are available in 1988-89 for qualified MS and Ph.D. students interested in pursuing studies on the application of protoplast, tissue culture and genetic engineering techniques to seaweeds. Interested students should contact:

Donald P. Cheney  
Department of Botany  
University of Nottingham  
Nottingham  
NG7 2RD. UK  
or (After August 1988)  
Department of Biology  
Northeastern University  
Boston MA, 02115,  
USA

### SALES AND WANTS

It has been suggested to me that many members, and others, may have books, journal runs, etc. that they no longer require (perhaps through change in emphasis of research, retirement etc.) and that other members may have a need for a particular book, journal or reprint that is difficult to acquire. This newsletter would be an ideal outlet for such sales and wants and to start the ball rolling I include one want (from me and rather esoteric).

#### WANTS - BOOKS

Ellis, D. Iron Bacteria, 179pp. pub 1919.  
Ellis, D. Sulphur Bacteria 261pp. pub 1932?  
Contact the Editor.

### Editorial address

**R.G.J.Edyvean, School of Materials, University of Sheffield, Mappin Street, Sheffield. S1 3JD.**

**N.B. COPY FOR INCLUSION IN NEXT ISSUE MUST REACH THE EDITOR BY OCTOBER 1st 1988**