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The Phycologist

WINTER MEETING PROGRAMME IN THIS ISSUE

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Some notes on collecting sites and field records for marine algae in Ghana

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As a result of an academic link between the University of Newcastle upon Tyne and the University of Ghana, a visit was made to Ghana by five marine biologists (four zoologists and one botanist) from 21st March 1992 until 9th April 1992. As part of the studies carried out during the course of the visit thirteen coastal sites were visited, from Ningo in eastern Ghana to Axim in western Ghana, and the seaweeds present at each site were examined. The results obtained were compared with specimens in the Ghana Herbarium at Legon. Ghana has a dynamic coast subject to continuous and powerful wave action and substantial erosion (Sikiron, 1986). A brief description of each site is given in this paper. It must be realised, of course, that variations occur from one part of a site to another: there may, for example, be a more sheltered area in a generally exposed location. For part of the visit the low tides were not particularly favourable and this, coupled with the narrow tidal range, undoubtedly restricted the number of species found. A table is provided which lists all the species identified at each site (Table 1). Drift specimens are indicated by the letter 'D'. For simplicity, the order and nomenclature used is that of Lawson and John (1987) and no account has been taken of subsequent name changes. Encrusting coralline red algae and blue-green algae were not identified. The results have been analysed in a separate paper (Evans *et al.*, 1993) where estimates of abundance are given. It has been shown by multi-dimensional scaling ordination that the eastern coast (Ningo to Sekondi) and western coast (Dixcove to Axim) support different communities from one another, confirming a suggestion of Lawson (1956). This difference between the 'eastern' and 'western' groups of algal communities was found to be significant ($p<0.01$).

Sites Visited

1 Ningo (visited 4th April, 1992. Low Tide: 0.40m.)

A moderately exposed sandy shore with, immediately to the west of the entrance to the lagoon, a gradually sloping rocky platform. The rocks high on the shore are colonised by *Chaetomorpha linum* and *Bachelotia antillarum*, the top of the platform has *Enteromorpha flexuosa, Ulva fasciata, Bachelotia antillarum* and *Centroceras clavulatum* with some blue-green algae on the upper levels. The platform is eroded into rock pools containing sand and small pebbles, which are distinguished by populations of *Ulva fasciata, Sargassum vulgare* entangled with *Hypnea musciformis and Polycavernosa dentata*, with the pool bottoms lined with *Lithothamnia*. A band of *Padina durvillei* is followed by a zone of algal turf containing *Ulva fasciata, Sargassum vulgare, Polycavernosa dentata, Centroceras clavulatum* and well-developed *Laurencia majuscula*. The rocks adjacent to the entrance of the lagoon are slightly more exposed and bear occasional plants of *Chaetomorpha antennina* with *Chnoospora minima*. Drift specimens were collected of *Sargassum filipendula*.

2 Prampram (visited 25th March, 1992. Low tide: 0.81m.; 7th April, 1992. Low tide: 0.57m).

A moderately exposed sandy shore with rocky outcrops parallel to the shore. To the east of the site the shore becomes more sheltered and areas of rock platform are interspersed with areas of cobbles. *Bachelotia antillarum* is particularly common on the upper shore and there are good growths of blue-green algae high on the shores. Very fine specimens of *Bryopsis pennata* and *Caulerpa taxifolia* are present, the latter particularly common where there is a sandy bottom; *Padina durvillei* is present where there is a rocky bottom. *Chaetomorpha linum* is absent from those areas where the rocky platform is replaced by cobbles. *Fosliella farinosa* is found epiphytically on *Sargassum vulgare*. Drift specimens were collected of *Sargassum filipendula* and of the erect form of *Lobophora variegata*.

3 Chicken Bar Point (Naval Base), between Mokwe Lagoon and Sakumo Lagoon. (visited 23rd March, 1992. Low tide: 0.60m.).

A moderately exposed rocky shore. *Chaetomorpha linum* is dominant in most parts of the upper shore (replaced by *Enteromorpha flexuosa* in some areas). Below this, a zone of *Ulva fasciata* is followed by one of *Centroceras clavulatum*. Further down the shore there is a prominent band of *Dictyopteris delicatula* and *Saragassum vulgare*. *Lithothamnia* are common in rock pools.

4 Teshie (visited 24th March, 1992. Low tide: 0.71m.; 6th April, 1992. Low tide: 0.48m.).

A very exposed rocky shore with a much compressed littoral zone. *Bachelotia antillarum* is present in rock pools in the splash zone, and there are mats of *Struvea anastomosans* high on the shore. *Chaetomorpha antennina*, characteristic of wave-exposed rocks, is common. To the east of the site, where exposure is the greatest, there is much less algal cover than elsewhere. The crustose coralline alga *Fosliella farinosa* is a common epiphyte on *Polycavernosa dentata*.

5 Chorkor (visited 27th March, 1992. Low tide: 0.87m.).

]A steep, sandy shore with considerable scouring by waves, with the occasional rocky outcrops. There is very clear zonation of *Enteromorpha flexuosa*, then *Ulva fasciata* followed by either *Centroceras clavulatum* or *Gelidium corneum*. There are occasional patches of *Chaetomorpha linum*.

6 Kokrobite (visited 8th April, 1992. Low tide: 0.67m.)

An exposed sandy beach, with strong currents, with non-continuous rocky outcrops. Between two such areas there is a sandy bay with cobbles below LWM colonised by small algae. *Bachelotia antillarum* is abundant on sand-covered rocks high on the shore, and below this

is a zone of *Cladophora vagabunda*. Zonation of *Ulva fasciata, Centroceras clavulatum, Basispora africana, Gelidium corneum* is clear on rocks near the top of the shore. As one progresses seawards, *Padina durvillei* becomes frequent and the amount of *Sargassum vulgare* builds up until it is the dominant species. Lower on the shore *Sphacelaria brachygonia* is well developed on the sides of rocks with *Bryocladia thyrsigera*. The shoreward side of rocks low on the shore is colonised by *Ulva fasciata* with *Hypnea musciformis;* the seaweed sides are colonised by *Sargassum vulgare. Ectocarpus breviarticulatus* is frequent on mussels on the seaward side of exposed rocks on the shore.

7 Winneba (visited 26th March, 1992. Low tide: 0.87m.).

An exposed and particularly polluted shore. The commonest species present are *Enteromorpha flexuosa, Bachelotia antillarum* and *Chaetomorpha linum. Jania rubens* is present in deep rock pools.

8 Apam (visited 5th April 1922. :Low tide: 0.42m.).

A sandy beach with isolated rocky outcrops; the western side of the site is exposed, the eastern side more sheltered. The outcrops are pitted with small rock pools containing a lot of sand. Particularly common species are *Bachelotia antillarum, Ralfsia expansa,* and *Sargassum vulgare*. A substantial population of *Codium guineense* is found on rocks in one part of the site. *Cladophora prolifera* is frequent on rocks in the upper part of the littoral zone (populations of this, and of *Dictyota ciliolata*, are greater where there are smaller rocks and lots of sand). *Sargassum vulgare* is absent in the more-sheltered areas.

9 Elmina (visited 2nd April, 1992. Low tide: 0.42m.).

A very exposed sandy beach to the west of St. George's Fort with considerable flat rocky outcrops, liberally covered with sand on the upper parts of the shore. There are large rock pools over the top of the rock surface containing *Bachelotia antillarum*; lower on the shore these pools contain *Padina durvillei, Dictyota ciliolata, Lobophora variegata and Lithothamnia.* A fringe of algae grows around the rocks high on the shore (including *Sargassum vulgare* at a high level on the shore). Lower down the shore the base of rocks are encrusted with *Lithothamnia* and the tops are covered with *Bryocladia thyrsigera* and, below this, *Dictyopteris delicatula*. High on the shore, beneath the Fort, are large shallow rock pools filled with sand, fringed with blue-green algae and densely colonised with *Cladophora vagabunda.*

To the east of the Fort is a much more sheltered sandy bay with small flat outcrops of rock densely covered with *Enteromorpha flexuosa* and a turf of other algal species.

10 Sekondi (visited 29th March, 1992. Low tide: 0.62m.).

A moderately exposed shore with a considerable amount of wave surge scouring the sand. Rocky platforms jut out at 900 to the shore. On an outcrop punctuated with small, very deep, rock pools, there is a considerable population of the long-spined sea urchin *Diadema antillarum* which grazes the rock surface very thoroughly. The surface of the platform is relatively sheltered as compared with the sides which are more exposed. Algal zonation runs from the top of the shore out to sea and from the upper parts of the platform down the sides. In the upper shore *Enteromorpha flexuosa, Ulva fasciata* and *Bachelotia antillarum* are abundant; lower on the shore, grazing has reduced the algal cover to *Lithothamnia* and a few foliose species including *Bryopsis pennata, Bryopsis plumosa* and *Padina durvillei.* Away from areas of urchin grazing on a separate outcrop there are good associations between *Enteromorpha flexuosa* and *Bachelotia antillarum* with a lot of *Gelidium corneum.* A turf of *Corallina pilulifera* and *Jania rubens* is restricted to cracks in the rock where they benefit from a certain degree of shelter. *Chaetomorpha* species are absent.

11 Dixcove (visited 30th March, 1992. Low tide: 0.57m.).

A very interesting site with two contrasting habitats. To the east there is an exposed headland composed of large boulders. A large population of the urchin *Diadema antillarum* means that the sides of these boulders are grazed down to *Basispora africana* at the upper level and *Lithothamnia* at the lower level, whilst the upper surface of the rocks are covered with an algal turf of *Corallina pilulifera* and small species including *Ceramium*. *Bostrychia radicans* is common on overhanging rocks in the splash zone, sometimes mixed with *Rhizoclonium implexum*. Immediately to the west of this is a sheltered bay containing much smaller rocks, covered with a thick mat of silt and supporting populations of *Enteromorpha linza, Cladophora vagabunda, Hildenbrandia rubra* (on the sides of rocks) and *Ceramium*. On several rocks there is a very clear zonation from blue-green algae to *Enteromorpha linza* to filamentous red algae. Drift specimens were collected of *Caulerpa sertularioides* and *Codium guineense*. (The only specimen of *Caulerpa sertularioides* from the locality, Axim, in the Ghana herbarium dates from 1949).

12 Prince's Town (visited 1st April, 1992. Low tide: 0.46m.).

A sandy beach with exposed rocky outcrops with crevices and rock pools. *Bachelotia antillarum* is common on sand-covered rocks high on the shore. The upper surfaces of boulders and of the sides of rocks are covered with *Chaetomorpha linum* with *Ulva fasciata* in the crevices and there is nothing immediately beneath these in the upper shore. On the seaward side of a large outcrop there is a very clear pattern of zonation: snails, then *Chaetomorpha antennina,* then *Chnoospora minima* with *Ralfsia expansa,* followed by red "tufts" (*Gigartina acicularis* is predominant on exposed surfaces, elsewhere *Gelidium* sp., *Gelidiopsis variabilis* and *Lobophora variegata* are predominant), followed by *Lithothamnia* (sometimes covered with a mat of *Lobophora*). At a lower level are found *Boodlea composita, Dictyota ciliolata, Galaxaura marginata* and *Jania rubens*. Below these species, in the sand-covered sublittoral zone, are found large plants of *Asparagopsis taxiformis*.

13 Axim (visited 31st March, 1992. Low tide: 0.51m.).

An exposed rocky headland with large areas of bedrock colonised by *Ralfsia expansa* (at the upper level) and *Lithothamnia* (at the lower level), and with a massive population of the urchin *Diadema antillarum*. There are large populations of *Chnoospora minima* on sloping sides of the rock, with *Chaetomorpha antennina, Bryopsis pennata, Ectocarpus breviarticulatus* (on limpets), *Gelidium corneum* and *Laurencia majuscula*.

Acknowledgements

Special thanks are due to our driver Mr Osei Assibey Agyen whose cheerfulness and help will be long remembered and we look forward to working with him again. The study was supported by the Higher Education Division of the British Council to whom we are most grateful.

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Table 1: List of seaweeds from each locality

Site Locations:

1 Ningo
2 Prampram
3 Chicken Bar Point
4 Teshie
5 Chorkor
6 Kokrobite
7 Winneba
8 Apam
9 Elmina
10 Sekondi
11 Dixcove
12 Prince's Town
13 Axim

	1	2	3	4	5	6	7	8	9	10	11	12	13
Chlorophyta													
Enteromorpha flexuosa	+	+	+	-	+	-	+	-	+	+	-	-	-
Enteromorpha linza	-	+	-	-	-	-	+	-	-	-	-	-	-
Ulva fasciata	+	+	+	+	+	+	+	+	+	+	+	+	+
Ulva lactuca	-	-	-	-	-	-	-	-	-	-	+	+	-
Chaetomorpha antennina	+	-	+	+	-	+	-	+	+	-	+	+	+
Chaetomorpha linum	+	+	+	+	+	+	+	-	-	-	-	+	+
Cladophora prolifera	-	-	-	-	-	+	-	+	-	-	-	-	-
Cladophora vagabunda	-	-	-	-	-	+	-	-	+	-	+	+	-
Rhizoclonium implexum	-	-	-	-	-	-	-	-	-	-	+	-	-
Boodlea composita	-	+	+	-	-	-	-	+	+	+	-	+	-
Struvea anastomosans	+	+	-	+	-	-	-	-	-	-	-	-	-
Bryopsis pennata	+	+	-	+	-	-	-	+	-	+	+	+	+
Bryopsis plumosa	-	-	-	-	-	-	-	-	-	+	-	-	-
Caulerpa sertularioides	-	-	-	-	-	-	-	-	-	-	D	-	-
Caulerpa taxifolia	-	+	-	-	-	-	-	-	-	+	-	-	-
Codium guineense	-	-	-	-	-	-	-	+	-	-	D	-	-
Phaeophyta													
Bachelotia antillarium	+	+	+	+	+	+	+	+	+	+	-	+	-
Ect. breviarticulatus	-	-	-	-	-	+	-	-	-	-	-	-	+
Giffordia mitchelliae	-	-	-	-	-	-	-	+	-	-	-	-	+
Basispora africana	-	+	-	+	-	+	-	+	+	-	+	-	+
Ralfsia expansa	+	+	-	+	D	-	+	+	+	+	+	+	+
Chnoospora minima	+	+	+	+	-	+	D	+	+	+	-	+	+
Colpomenia sinuosa	+	+	+	-	-	-	-	-	-	+	-	-	-
Sphacelaria brachygonia	-	-	-	+	-	+	-	-	-	-	-	-	-
Dictyopteris delicatula	+	+	+	+	D	-	+	-	+	+	-	-	-
Dictyota ciliolata	+	-	+	-	-	+	-	+	+	-	-	+	-

Lobophora variegata	-	*D*	-	-	-	-	-	-	+	-	-	+	-
Padina durvillei	+	+	+	+	-	+	+	+	+	+	-	+	-
Padina tetrastromatica	-	+	+	+	-	+	+	+	+	+	-	-	-
Sargassum filipendula	*D*	*D*	-	-	-	-	-	-	-	-	-	-	-
Sargassum vulgare	+	+	+	+	*D*	+	*D*	+	+	+	-	-	-
Rhodophyta													
Gelidiopsis variabilis	+	-	+	-	-	-	-	-	+	-	-	+	-
Gelidium arbusculum	-	+	-	-	-	-	-	-	-	-	-	-	-
Gelidium corneum	+	+	+	+	+	+	+	+	+	+	-	-	+
Gelidium sp.	-	-	-	-	-	-	-	-	-	-	-	+	-
Galaxaura marginata	-	-	-	-	-	-	-	+	-	-	-	+	-
Asparagopsis taxiformis	-	-	-	-	-	-	-	-	-	-	-	+	-
Hypnea cervicornis	+	-	+	+	-	-	+	+	-	+	-	-	-
Hypnea musciformis	+	+	+	+	*D*	+	+	+	+	+	-	-	-
Gracilaria verrucosa	-	-	-	-	-	-	+	+	-	-	-	-	-
Polycavernosa dentata	+	+	+	+	+	+	+	+	+	+	-	+	-
Gigartina acicularis	+	+	+	+	-	-	-	+	-	-	-	+	+
Corallina pilulifera	-	-	-	-	-	-	-	-	-	+	+	-	-
Jania rubens	+	+	-	-	-	+	+	-	+	+	-	+	-
Fosliella farinosa	-	+	-	+	-	-	-	-	-	-	-	-	-
Porolithon sp.	-	-	-	-	-	-	-	-	-	-	+	-	-
'Lithothamnia'	+	+	+	+	-	+	+	+	+	+	+	+	+
Cryptonemia crenulata	-	+	-	-	-	-	-	-	-	-	-	-	-
Cryptonemia luxurians	-	*D*	-	-	-	-	-	-	-	-	-	-	-
Grateloupia filicina	-	-	-	-	-	-	-	-	+	-	-	-	-
Hildenbrandia rubra	+	+	-	+	+	+	+	+	+	+	+	-	-
Rhodymenia pseudopalmata	+	+	-	-	-	-	-	-	-	-	-	-	-
Centroceras clavulatum	+	+	+	+	+	+	-	+	+	+	-	-	-
Ceramium sp.	-	-	-	+	-	-	-	+	+	+	+	+	+
Bostrychia radicans	-	-	-	-	-	-	-	-	-	-	+	-	-
Bryocladia thyrsigera	-	+	+	+	-	+	-	+	+	+	-	-	-
Laurencia intermedia	-	-	+	-	-	-	-	-	-	-	-	-	-
Laurencia majuscula	+	+	+	+	-	+	-	+	+	+	-	-	+
Polysiphonia ferulacea	-	-	-	+	-	-	-	-	-	-	-	-	-
Cyanophora													
Unidentified sp.	+	+	-	-	+	-	-	+	-	+	-	-	+

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THE BRITISH PHYCOLOGICAL SOCIETY WINTER MEETING LIVERPOOL JANUARY 4-7 1994

The Annual Winter meeting for 1994 will be held in the University of Liverpool's Conference Suite at Derby and Rathbone Hall, Mossley Hill, Liverpool, from the evening of Tuesday 4 January until lunchtime on Friday 7 January. The lecture theatres, domestic and social accommodation are all adjacent in a parkland area near to Penny Lane, which will evoke nostalgia for those of a certain Beatles-acquainted age. Professor Brian Moss is kindly acting as local secretary.

The meeting will start with a poster session, during the evening of Tuesday 4th January. Following the pattern of the last two years, there will be an "applied" day on Wednesday 5th January with invited and contributing speakers on "**Approaches to the monitoring and management of eutrophication in fresh waters**", "**Eutrophication in estuaries**" and both "**Eutrophication and conservation**" and "**Algae and conservation**". The meeting will include the 3rd Founders' Lecture by Dr Klaus Luning (Helgoland, Germany) entitled, "**When do algae grow? Circadian and circannual rhythms of growth in seaweeds**". Other special sessions include "**Algal Biotechnology**" and "**Measuring algal growth in natural populations**".

Posters will be on display for, and authors present at, the poster session on the evening of 4th January.

The abstracts of all papers and posters presented will be collated into a booklet for distribution at the meeting and abstracts of papers and posters given at the meeting will be published in the first part of the Phycologist (Issue 37).

The Irene Manton Prize for the best research student talk

There are 11 entrants for the Irene Manton Prize this year.

Following the death of Professor Irene Manton FRS, of the University of Leeds, on 13th May 1988 money became available from her Estate to fund two annual prizes for young research scientists. The first is for the best PhD thesis in Botany and is administered by the Linnaean Society of London, based on nominations invited from Heads of Departments. The second, awarded for the first time in 1993, is a prize for the best paper delivered by a postgraduate research student at the annual winter meeting of the British Phycological Society.

Council of the society have agreed that a prize in the region of £150, together with a Certificate, will be awarded annually for the best paper delivered at the winter meeting by a research student. The paper should be delivered during the students PhD (or other degree) period, or within one year of the degree being awarded. The prize will be awarded on the evening of the Conference dinner. The following points should be borne in mind:

2) Papers will be judged by a panel of 5 senior members of the Society, and the programme will be organised such that no two contenders speak simultaneously.

Stop Press!!!!!! THE GREAT AUCTION

AUCTION ACTION

Someone, somewhere, must have something that they wish to donate to the **Great British Phycological Society Winter Auction**. Interesting and unusual items would be particularly welcome - but we are seeking to get a lot of lots, so start searching through your immeasurable collections of phycological memorabilia now.

It would help if you could let me know that you will be bringing something to auction with you to Liverpool - but items will be accepted up to the moment of sale!

Dr Gavin Hardy,
Department of Marine science and Coastal Management
The University
Newcastle upon Tyne
NE1 7RU

Tel: 091 222 6661 Fax: 091 222 7891

APOLOGY

I must take this oportunity to apologise to Professor R.N.Pienaar, who wrote the meetings report on "The Biology of the Prymnsiophyta" which appeared in issue 35 of The Phycologist.

Unfortunately it was published without an acknowledgement to Professor Pienaar, an error which I have only just noticed and which Professor Pienaar has been too kind to point out.

I'm very sorry this happened, especially with an unsolicited piece which is just the sort of thing we want to encourage! ------ Robert Edyvean.

BRITISH PHYCOLOGICAL SOCIETY
WINTER MEETING
Derby and Rathbone Hall, Mossley Hill,
LIVERPOOL, 4th-7th January 1994

PLEASE INDICATE ACCOMMODATION AND MEALS REQUIRED

Registration fee (including tea and coffee)			
Whole Meeting - BPS Members		£27.50	£____
Whole Meeting - Non-BPS Members		£37.50	£____
(£10 returned on joining BPS)			
Single day or part day (please state which)		£12.50	£____
Evening buffet (poster session)	Tuesday 4 January	£7.90	£____
Bed and beakfast: night of	Tuesday 4 January	£17.00	£____
Lunch:	Wednesday 5 January	£4.75	£____
Dinner:	Wednesday 5 January	£7.50	£____
Bed and breakfast: night of	Wednesday 5 January	£17.00	£____
Lunch:	Thursday 6 January	£4.75	£____
BPS Conference Dinner:	Thursday 6 January	£18.00	£____
Bed and breakfast: night of	Thursday 6 January	£17.00	£____
Lunch:	Friday 7 January	£4.75	£____
LATE BOOKING CHARGE (postmarked after December 9th)		£10.00	£____
TOTAL (PLEASE DOUBLE CHECK YOUR ADDITION)			£ _____

- Special dietary requirements: Lacto-vegetarian/Vegan/Other (please specify):
- Disabled access required?

Please return this form <u>with full payment</u> by Friday 10 December to:

Miss A. Callaghan, BPS Conference, Department of Environmental and Evolutionary Biology, Derby Building, University of Liverpool, Liverpool L69 3BX.
(Tel. 051-794-5016)

Fax bookings cannot be accepted.

Cheques must be in **STERLING**, must be made payable to 'University of Liverpool', and drawn on a U.K. bank.

PROGRAMME OF THE BRITISH PHYCOLOGICAL SOCIETY WINTER MEETING LIVERPOOL

JANUARY 4-7 1994

Please bring this issue of The Phycologist with you to the Winter meeting. It is the official programme for the meeting and members arriving at Swansea without it will have to pay for another copy.

PROGRAMME

BRITISH PHYCOLOGICAL SOCIETY
Winter meeting 1994 - Programme

Tuesday 4th January 1994

Poster session - 18.30 onwards

BARWELL,C.J. & CUNNINGHAM,E.M. (Pharmacy & Biomedical Sciences, University of Portsmouth)
Isolation and some properties of R-phycoerythrin from *Palmaria palmata*.

BARWELL,C.J., SAKER-SAMPAIO,S.+, ROGERS,D.J., BRAULT,D.* & MABEAU,S.* (Pharmacy & Biomedical Sciences, University of Portsmouth, +Universidade Federale do Ceara, Brazil & *Centre d'Etude et de Valorisation des Algues, Pleubian, France.
Biochemical evaluation of some edible European marine algae.

BHODAY,R., JOHNSON,L.R., RUSSELL,S.J., JOHN,D.M. & GACESA,P. (Dept. of Botany, The Natural History Museum & Dept. of Biochemistry, University of Wales Cardiff)
Genomic variation in *Pseudendoclonium* and *Dilabifilum* (Chaetophorales, Chlorophyta): taxonomic implications concerning accepted species concepts.

BRENCHLEY J.L., RAVEN,J.A. & JOHNSTON,A.M. (Dept. of Biological Sciences, Dundee)
Oxygen exchange and growth rate characteristics of *Himanthalia elongata* during reproductive development, in comparison to non-fertile plants.

CARNE,D., JOHN,D.M., HUXLEY,R. & JOHNSON,L.R. (Dept. of Botany, The Natural History Museum, London)
William and George West: an analysis of their publications, collections and taxa.

CHILDS,K. (Dept. of Botany, The Natural History Museum, London)
Important new acquisitions to the diatom collections and the BMLOC database at the Natural History Museum.

COURSE,P.A., TARRAN,G.A. & GREEN,J.C. (Plymouth Marine Laboratory)
The life history of *Emiliana huxleyi*: Evidence for haploid and diploid stages using flow cytometry.

DELPHIN,E. & FLETCHER,R.L. (The Marine Laboratory, University of Portsmouth)
The influence of substratum surface wettability on algal spore settlement and germination.

GUENEAU,P. & FLETCHER,R.L. (The Marine Laboratory, University of Portsmouth)
Cryopreservation of *Enteromorpha* zoospores: a preliminary study.

HARKER,M., TSAVALOS,A.J. & YOUNG,A.J. (School of Biological & Earth Sciences, Liverpool John Moores University)
Optimization of astaxanthin production in *Haematococcus pluvialis* using response surface methodology.

HEAD,R.M., JONES,R.I. & BAILEY-WATTS,A.E.* (Dept. of Biological Sciences, I.E.B.S., Lancaster University & *I.F.E., Edinburgh .
The role of recruitment from the benthos in the population dynamics of blue-green algae in a mesotrophic lake.

HUTCHINGS,A.J.* & BELCHER,H.+ (*National Rivers Authority, Thames Region & +Cambridge)
A baseline study of the phytoplankton in the River Thames.

KENNAWAY,G.M.A. (Royal Holloway & Bedford New College, London)
Flagellates of the subtropical Atlantic.

KINROSS,J.H., CHRISTOFI,N. & READ.P.A. (Dept. of Biological Sciences, Napier University, Edinburgh)
Growth rate measurement in attached filamentous algae.

KORB,R.E.[1,2], RAVEN,J.A.[1], JOHNSTON,A.M.[1] & LEFTLEY,J.W.[2] ([1]Dept. of Biological Sciences, University of Dundee & [2]Dunstaffnage Marine Laboratory, Oban)
Growth rate and $^{13}C/^{12}C$ discrimination in relation to diatom cell size.

MA,Y., BARWELL,C.J. & BLUNDEN,G. (School of Pharmacy and Biomedical Sciences, University of Portsmouth)
Carotenoids from *Palmaria palmata* and *Halidrys siliquosa*.

MOORE,J.A. (Dept. of Botany, The Natural History Museum)
Collections old and new at the Natural History Museum.

REED,R.H., WRIGHT,P.J.*, CHUDEK,J.A. & HUNTER,G.** (Biomedical Sciences Group, University of Northumbria at Newcastle, *University of Birmingham & **Dept. of Chemistry, Dundee)
Application of ^{13}C nuclear magnetic resonance spectroscopy to low molecular weight carbohydrate metabolism in marine brown algae.

REID,G. (Dept. of Botany, The Natural History Museum, London)
The ecology of edaphic diatom communities from two salt marshes.

SCHMID,R. & DRING,M.J. (School of Biology & Biochemistry, Queen's University of Belfast)
Influence of inorganic carbon supply on stimulation of photosynthesis by blue light in *Ectocarpus*.

SCOTT,C., BREMER,G.B. & FLETCHER,R.L. (School of Biological Sciences, University of Portsmouth)
Observations on attachment mechanisms of marine blue-green algae (Cyanophyceae).

SCOTT,G.W. & HARDY,F.G. (Dept. of Environmental Science, University College Scarborough & Dept. of Marine Sciences & Coastal Management, University of Newcastle upon Tyne)
Observations of the occurrence of hybrids between two sympatric species of fucoid algae.

TAYLOR,R. & FLETCHER,R.L. (The Marine Laboratory, University of Portsmouth)
The effect of heavy metals on the brown alga *Sargassum muticum* (Yendo) Fensholt (Fucales, Phaeophyta).

TSAVALOS,A.J., HARKER,M. & YOUNG,A.J. (School of Biological & Earth Sciences, Liverpool John Moores University)
Pilot scale bioreactor production of carotenoids from microalgae for addition to animal feeds.

YANG,M.-H., FANGLU,H., BLUNDEN,G. & FLETCHER,R.L. (School of Pharmacy & Biomedical Sciences & School of Biological Sciences, University of Portsmouth)
The effects of temperature, irradiance and salinity on the growth of juvenile forms of *Codium* species.

Wednesday 5th January 1994

Session A - Approaches to the monitoring and management of eutrophication in fresh waters

9.00 : BAILEY-WATTS,A.E. (Institute of Freshwater Ecology, Edinburgh)
Freshwater eutrophication: approaches to its assessment, monitoring and management with phytoplankton as the main focus.

9.30 : BRIERLEY,S.J. (National Rivers Authority, Anglian Region)
Eutrophication monitoring and control in lowland reservoirs.

10.00 : GIBSON,C.E., FOY,R.H. & BAILEY-WATTS,A.E. (Dept. of Agriculture, Belfast & Institute of Freshwater Ecology, Edinburgh)
Phosphorus and chlorophyll: effect of enrichment on the annual cycle.

10.40 : Coffee

Eutrophication in estuaries

11.00 : WILKINSON,M. (Dept. of Biological Sciences, Heriot-Watt University, Edinburgh)
Factors affecting productivity of algae in estuaries.

11.25 : RAFFAELLI,D. (Culterty Field Station, University of Aberdeen)
Macro-algal blooming in Ythan Estuary, Scotland, and its ecological effects.

Eutrophication and conservation (1)
11.50 : JOHN,D.M. (Dept. of Botany, The Natural History Museum)
The link between eutrophication, biodiversity and conservation.
12.15 : MOSS,B., JOHNES,P. & PHILIPS,G.* (Dept. of Environmental & Evolutionary Biology, University of Liverpool & *NRA, Eastern Region)
Conservation and the assessment of eutrophication.

12.40 : Lunch

Eutrophication and conservation (2)
14.00 : BARICA,J.M. (National Water Research Institute, Burlington, Canada)
Algae as indicators of ecosystem stability and sustainability.
14.20 : ATKINS,S. & MATHIESON,S. (Scottish Natural Heritage, Edinburgh)
A review of nutrient enrichment in the estuaries of Scotland: implications for the natural heritage.

Session A - Algae & Conservation (1)
14.40 : MITCHELL,R. (English Nature, Peterborough)
Marine macro-algae: protection and introduction control.
15.00 : TITTLEY,I. & *FOWLER,S. (Dept. of Botany, The Natural History Museum & *The Nature Conservation Bureau)
The marine nature conservation importance of chalk coasts.
15.20 : O'MAHONY,J.H.T. (Dept. of the Marine, Fisheries Research Centre, Dublin, Eire)
Shellfish transfers within the EC - Implications for phytoplankton and other species.

Session B - General
14.40 : COURSE,P.A., TARRAN,G.A. & GREEN,J.C. (Plymouth Marine Laboratory)
The life history of *Emiliana huxleyi*: Evidence for haploid and diploid stages using flow cytometry.
15.00 : DAVIES,M.[1,2], GREEN,J.[1] & DIXEY,R.[2] ([1]Plymouth Marine Laboratory & [2]Dept. of Medical Electronics, St. Bartholomew's Hospital, London)
Effects of electromagnetic fields on diatom behaviour.
15.20 : CALDWELL,S.B. & McLEAN,R.O. (Dept. of Biological Sciences, University of Paisley)
Shock and long-term protein induction by heavy metals in filamentous green algae.

15.40 : Tea

Session A - Algae & Conservation (2)
16.00 : TITTLEY,I. (Dept. of Botany, The Natural History Museum)
Seaweed species richness and diversity in the North Atlantic: implications for conservation.
16.20 : MAGGS,C.A. & WARD,B.A. (School of Biology & Biochemistry, Queen's University, Belfast)
Alien seaweeds?
16.40 : HUXLEY,R., TITTLEY,I. & FARNHAM,W.F.* (Dept. of Botany, The Natural History Museum & *University of Portsmouth)
Disturbance effects of an oil terminal on the marine algae of Sullom Voe, Shetland.
17.00 : STEWART,N.
Conservation of charophytes - principle & practice.

Session B - Ecology of eutrophic waters
16.00 : McGOWAN,S. (Depts of Environmental & Evolutionary Biology / Biochemistry, University of Liverpool & IFE, Windermere)
Blue-green algal blooms: a pristine feature of the Shropshire meres?

16.20 : BEKLIOGLU,M. & GENNER,M. (Dept. of Environmental & Evolutionary Biology, University of Liverpool)
Blue-green or green algae, the effects of elevated pH/low CO_2. Preliminary results from an enclosure experiment in Little Mere, Cheshire.
16.40 : WILKINSON,S.B. (DEEB, University of Liverpool)
Patterns of algal colonization in a eutrophic estuarine docks complex.
17.00 : SEN,B., TOPKAYA,B. & AYKULU,G. (Firat University, Elazig, Turkey)
Algae and nutrient loading of the heavily polluted part of a dam lake.

18.30 : Dinner

Thursday 6th January 1994

Session A - Manton Prize presentations (1)
9.10 : L.V.EVANS - Introduction
9.20 : SERRAO,E.[1,2], KAUTSKY,L.[3] & BRAWLEY,S.H.[1] ([1]Dept. of Plant Biology, University of Maine, Orono, USA, [2]U.C.T.R.A., University of the Algarve, Faro, Portugal & [3]Dept. of Botany, Stockholm University, Sweden)
Fertilization ecology of *Fucus vesiculosus* in the Baltic Sea.
9.40 : MANEVELDT,G. & KEATS,D.W. (Botany Dept., University of the Western Cape, South Africa)
Leptophytum foveatum Chamberlain & Keats (Rhodophyta, Corallinales) retaliates against competitive overgrowth by other encrusting algae.
10.00 : KILINC,S. (Dept. of Environmental & Evolutionary Biology, University of Liverpool)
Phytoplankton communities in the West Midland meres.
10.20 : HARRIS,A.S.D.[1,2], LEWIS,J.M.[1] & JONES,K.J.[2] ([1]University of Westminster & [2]Dunstaffnage Marine Laboratory, Oban)
Thalassiosira species (Bacillariophyceae) from a Scottish sea-loch.

Session B - Algal biotechnology
9.00 : SWAIN,L., ROGERS,D.J. & CRITCHLEY,A.T.* (School of Pharmacy & Biomedical Sciences, University of Portsmouth & *Botany Dept., University of the Witwatersrand, Johannesburg, South Africa.
Lectin-type haemagglutinins from *Pseudocodium devreisei*.
9.20 : WU,Y., WHAPHAM,C.A., BLUNDEN,G., JENKINS,T. & HANKINS,S.D. (School of Pharmacy & Biomedical Sciences & School of Bological Sciences, University of Portsmouth,& Maxicrop International Ltd., Corby)
The role of betaines in seaweed extracts in the reduction of *Meloidogyne javanica* infestations of tomato plants.
9.40 : SAMPAIO,A.H. & ROGERS,D.J.* (Dept. of Biochemistry & Molecular Biology, Federal University of Ceará, Brazil & *School of Pharmacy & Biomedical Sciences, University of Portsmouth)
Purification of galactose-binding marine algal lectins on guar gum gel.
10.00 : ROGERS,D.J., SAMPAIO,A.H.*, BARWELL,C.J., GERWICK,W.+ & WISE,M.+ (School of Pharmacy & Biomedical Sciences, University of Portsmouth, *Dept. of Biochemistry & Molecular Biology, Federal University of Ceará, Brazil & +College of Pharmacy, Oregon State University, Corvallis, USA)
Characterisation of the galactose-binding lectins from *Ptilota filicina*, purified by affinity chromatography on guar gum gel.
10.20 : WHISTON,A.J., McAULEY,P.J. & SMITH,V.J. (School of Biological & Medical Sciences, University of St. Andrews).
Removal of heavy metals from wastewater by marine micro-algae.

10.40 : Coffee

Session A - Manton Prize Presentations (2)

11.00 : CARVALHO,L. (Dept. of Environmental & Evolutionary Biology, University of Liverpool)
Factors limiting the phytoplankton population of Rostherne Mere: past, present and future.

11.20 : ASHTON,E.A. (Dept. of Animal & Plant Sciences, University of Sheffield)
The effects of heavy metal contamination on benthic algal communities in flowing waters.

Session B - Phytoplankton

11.00 : DAVIDSON,K., CUNNINGHAM,A. & FLYNN,K.J. (Biological Sciences, University of Wales, Swansea & Department of Physics & Applied Physics, University of Strathclyde)
Mathematical modelling of dinoflagellate nutrient regeneration.

11.20 : KENNAWAY,G.M.A. (Royal Holloway & Bedford New College, London)
The temporal and spatial distribution of phytoplankton in the Irish Sea during May 1993.

11.45 : 3rd Founders' Lecture
LÜNING,K. (Biologische Anstalt Helgoland, Germany) - When do algae grow? Circadian and circannual rhythms of growth in seaweeds.

12.40 : Lunch

Session A - Manton Prize Presentations (3)

14.00 : HITCHINGS,B.R., FERRY,B.W. & FORD,T.W. (Royal Holloway College, University of London)
An ecophysiological study of *Scenedesmus* isolates from water bodies at Dungeness, Kent.

14.20 : YELLOLY,J. & WHITTON,B.A. (Dept. of Biological Sciences, University of Durham)
Phosphorus ecology of intertidal and stream *Rivularia* populations.

14.40 : BARKER,G.L.A., HAYES,P.K., MEDLIN,L.K. & GREEN,J.C. (School of Biological Sciences, University of Bristol, Alfred Wegener Institute, Bremerhaven & Plymouth Marine Laboratory)
Genetic diversity in *Emiliana huxleyi*.

15.00 : KINSMAN,R., WALSBY,A.E. & HAYES,P.K. (School of Biological Sciences, University of Bristol)
Investigating the interaction between GvpA and GvpC.

15.20 : WARD,B.A. & MAGGS,C.A. (School of Biology & biochemistry, The Queen's University of Belfast)
Plastid DNA restriction fragment size analysis demonstrates species complexes in the genus *Ceramium*.

Session B - Taxonomy

14.00 : WILLIAMS,D.M. (Dept. of Botany, The Natural History Museum, London)
Progress in diatom classification? Araphid diatom systematics.

14.20 : DOUGLAS,G., JOHN,D.M. & PURVIS,O.W. (Dept. of Botany, The Natural History Museum)
Some considerations of the lichen algal genus *Trebouxia*.

14.40 : McGREGOR,B.J. & LEWIS,R.I.* (Port Erin Marine Laboratory, University of Liverpool & *School of Biological Sciences, University College of Swansea)
A morphological and biochemical genetic investigation into British *Porphyra* species.

15.00 : BRODIE,J., GUIRY,M.D. & MASUDA,M. (Dept. of Science, Bath College of Higher Education, The Martin Ryan Marine Science Institute, Galway, Eire & Dept. of Botany, Hokkaido University, Japan)
A reassessment of *Chondrus giganteus* (Gigartinaceae, Rhodophyta) from Japan based on morphological evidence.
15.20 : KEATS,D.W.[1] & CHAMBERLAIN,Y.M.[2] ([1]Botany Dept., University of the Western Cape, South Africa & [2]The Marine Laboratory, University of Portsmouth)
Archaeocapensia heydrichii sp. nov.: a new species of crustose coralline alga (Rhodophyta, Corallinales) from western Cape Province, South Africa.

15.40 - Tea

Session A - Freshwaters
16.00 : HAPPEY-WOOD,C.M., BURGESS-WAHL,C. & GASKIN,S. (School of Biological Sciences, University of Wales, Bangor)
Environmental problems in freshwater environments: their impact on algal and picoplankton communities.
16.20 : BENNION,J., JUGGINS,S. & ANDERSON,N.J.* (ECRC, University College London & *Geological Survey of Denmark)
Establishing background TP concentrations in nutrient enriched lakes: the role of diatom-based weighted averaging models. I. Theory.
16.40 : ANDERSON,N.J., BENNION,H.* & JUGGINS,S.* (Geological Survey of Denmark & *ECRC, University College London)
Establishing background TP concentrations in nutrient enriched lakes: the role of diatom-based weighted averaging models. II. Applications.

Session B - Ex situ conservation / macroalgae
16.00 : DAY,J.G. (Culture Collection of Algae & Protozoa, Windermere Laboratory)
Ex situ conservation of microalgae.
16.20 : RUSSELL,G. (Dept. of Environmental & Evolutionary Biology, University of Liverpool)
A Baltic ecotype of *Pilayella littoralis* Agg.
16.40 : BOLTON,J.J. & JOSKA,M.A.P. (Botany Dept., University of Cape Town, South Africa)
Population biology of an unusual southern African carrageenophyte: *Aeodes orbitosa* (Cryptonemiales, Rhodophyta).

17.00 : British Phycological Society AGM

19.00 for 19.30 : British Phycological Society Dinner
(followed by Auction)

Friday 7th January 1994
Session A - Measuring algal growth in natural populations (1)
9.10 : DRING,M.J. (School of Biology & Biochemistry, Queen's University, Belfast)
Measuring seaweed growth in the field: approaches, problems and prospects.
9.30 : STENGEL,D.B. & DRING,M.J. (School of Biology & Biochemistry, Queen's University, Belfast)
Impact of desiccation and high irradiances on photosynthesis and growth in *Ascophyllum nodosum*.
9.50 : JAYASURIYA,P.M.A. & KAIN,J.M. (Port Erin Marine Laboratory, University of Liverpool)
Harvesting experiments on three important seaweeds in Sri Lanka.
10.10 : BIRKETT,D.A. & DRING,M.J. (School of Biology & Biochemistry, Queen's University, Belfast)
Relationship between phosphate uptake and growth in macroalgae.

Session B - Physiology of micro-algae
9.10 : JOHNSTON,A.M. & RAVEN,J.A. (Dept. of Biological Sciences, University of Dundee)
The use of natural abundance $^{13}C/^{12}C$ ratios in the study of inorganic carbon acquisition by *Phaeodactylum tricornutum*.
9.30 : RAVEN,J.A., JOHNSTON,A.M., KÜBLER,J. & PARSONS,R. (Dept. of Biological Sciences, University of Dundee)
The influence of high oxygen concentrations on algae.
9.50 : ROBINSON,P.K. (Dept. of Applied Biology, University of Central Lancashire)
Phosphate uptake kinetics of free and immobilized microalgae.
10.10 : HEATH,C.R., LEADBEATER,B.S.C. & CALLOW,M.E. (School of Biological Sciences, University of Birmingham)
Precipitation of calcium carbonate by freshwater algae.

10.40 - Coffee

Session A - Measuring algal growth in natural populations (2)
11.00 : COX,E.J. (Dept. of Botany, The Natural History Museum)
Success, dominance, optima - are they measurable for natural communities of benthic microalgae?
11.20 : HAPPEY-WOOD,C.M. (School of Biological Sciences, University of Wales, Bangor)
Growth of phytoplankton: elusive, inaccurate or just impossible to assess?
11.40 : SHUBERT,L.E. (Dept. of Biology, University of North Dakota, USA)
Comparison of methods for determining soil algal biomass and growth.
12.00 : JONES,J.I., EATON,J.W. & HARDWICK,K. (Dept. of Environmental & Evolutionary Biology, University of Liverpool)
Interactions between submerged aquatic plants and epiphytic algae - microelectrode investigations of boundary layers.

Session B - Physiology of macro-algae.
11.00 : SCHMID,R. & DRING,M.J. (School of Biology & Biochemistry, Queen's University, Belfast)
Role of blue light in carbon acquisition by *Laminaria saccharina*.
11.20 : KÜBLER,J.E. & RAVEN,J.A. (Dept. of Biological Sciences, University of Dundee)
Consequences of light-limitation for inorganic carbon uptake in red seaweeds.
11.40 : KAIN,J.M. (Port Erin Marine Laboratory, University of Liverpool)
Confusing *Delesseria* with short and long days.
12.00 : PEARSON,G. & DAVISON,I.R. (Dept. of Plant Biology, University of Maine, USA)
Freezing and hyperosmotic stress in *Fucus distichus*: evidence for physiological similarities.

12.40 - Lunch

N.B. This is your only copy of the programme. Please remember to bring it with you to the meeting.

Registrants will receive an abstract booklet on arrival. Abstracts of all papers and posters presented will be published in the next issue of the Phycologist.

Those presenting posters should ensure that these are in place before the start of the evening session on Jan.4th.

THE BRITISH PHYCOLOGICAL SOCIETY 42nd ANNUAL GENERAL MEETING

17.00hrs - 6TH JANUARY 1994

UNIVERSITY OF LIVERPOOL

ANNUAL GENERAL MEETING

AGENDA ON NEXT PAGE

PLEASE NOTE: A REPORT OF THE 41st AGM AND ACCOUNTS IS AVAILABLE IN ISSUE 34 OF THE PHYCOLOGIST PAGES 16-20

NOTE TO ALL MEMBERS

Council will be presenting a number of amendments to the Constitution before the AGM in January. Copies of the current Constitution and the proposed amendments will be circulated shortly to all members, with the accounts for the last financial year and information on paying subscriptions for 1994.

Please read the Constitution and the proposals carefully before attending the AGM.

Eileen J. Cox.
Hon. Secretary.

REQUESTS FROM THE TREASURER

YOU ARE REMINDED THAT THE SUBSCRIPTIONS ARE INCREASED FROM JANUARY 1994.

Please note that the BANK ACCOUNT HAS CHANGED. This means that you MUST up-date your Banker's Order if you pay by this method. A new Banker's Order mandate will be mailed separately in the near future.

Bank charges for cashing US $ cheques are now exorbitant, with charges of £5 per cheque. It would be of great help to the Society if Overseas Members would use the credit card method of payment, since this is considerably cheaper. Again a form will be enclosed with the Banker's Order mandate.

When completing these forms PLEASE make sure that your name and card number are entered very clearly, so that it is obvious who the payment comes from!

Also, as from this year, The Hon. Membership Secretary, Stephen Droop, will be collecting the subscriptions. Payments will be processed more quickly if sent to him rather than to the Hon. Treasurer.
His address is:

Mr. S.J.M. Droop
Royal Botanic Garden,
Inverleith Row,
Edinburgh,
EH3 5LR,
U.K.

British Phycological Society

42nd ANNUAL GENERAL MEETING

Chair: The President, Dr M.J. Dring.

17.00 - 6th January 1994
University of Liverpool.

AGENDA

1. Minutes of the 41st Annual General Meeting, held at University of Wales Swansea on 6th January 1993.
2. Matters arising from the Minutes.

3. Presidential report

4. Reports from Council:
   (a) Report of the Hon.Secretary
   (b) Report of the Hon. Treasurer; presentation of accounts for 1993.
   (c) Report of the Hon. Editor of the European Journal of Phycology.
   (d) Report of the Membership Secretary.
   (e) Report of the Marine Algal Flora Committee.
   (f) Report of the Freshwater Algal Flora Committee.
   (g) Conservation Committee.
   (h) Report of the Hon. Editor of the Newsletter.

5. Election of Members of Council for 1994.
The following nominations have been made for Officers of Council:

Hon. Secretary	**Dr Eileen J. Cox**
Proposed:	Dr M.J. Dring
Seconded:	Dr J.A. Brodie
Hon. Treasurer	**Dr Lynne A. Terry**
Proposed	Dr J.M. Lewis
Seconded	Dr E.J. Cox
Membership Secretary	**Mr Stephen M.J. Droop**
Proposed	Dr D.G. Mann
Seconded	Dr F.G. Hardy

Nominations have been received for 2 of the 3 vacancies for ordinary members:

Dr Judith A. Taylor	Proposed: Dr J.M. Lewis
(Windermere Laboratory)	Seconded: Dr S.C. Maberley
Dr Stephen C. Maberley	Proposed: Dr M.J. Dring
(Windermere Laboratory)	Seconded: Dr A.M. Johnston

6. Constitution - ratification of proposed re-wording.

7. Phycology in Europe.

8. Institute of Biology.

9. Election of auditors for 1994.

10. Any other business.

Please notify the Hon.Secretary **before 9.00 on the 6th Jan.** of any items for consideration.

FORTHCOMING MEETINGS

British Phytoplankton Discussion Group Meeting

Southampton 19-21 April 1994

The tradition of these meetings has in recent years lost some momentum we intend to convene the next meeting in Southampton between 19 and 21 April 1994.

In the past three meetings have been focused on one or two topics of interest to both the marine and freshwater phytoplankton research communities which after a brief introduction have allowed free wheeling discussion. The meetings have been a particularly useful forum for research students and young researchers to present their work as posters and invite comment and discussion from more established phytoplankton workers.

The suggested theme for the meeting next April is:

"New technologies and techniques for studying phytoplankton"

I would welcome comments or other suggestions.

It is also intended to run some practical workshops related to the above topic.

If you are interested in receiving further details of this meeting in due course please write to

Dr Duncan A. Purdie,
Department of Oceanography,
The University, Highfield,
Southampton SO9 5NH. UK.

Seaweed Identification Course

22 - 25 July 1994 - University College, Scarborough, North Yorkshire

The next British Phycological Society Field Meeting will be held from Friday 22nd July to Monday 25th July, 1994 at University College, Scarborough, North Yorkshire.

The field course is intended for professionals, students and amateurs who need or wish to acquire a knowledge of seaweed flora of British shores.

Residential accommodation (dinner, bed and breakfast) will be available at University College, Scarborough at a cost of £50.

Further details will be arranged at a later date. Anyone seeking information on this course should contact one of the following:

Dr Gavin Hardy,
Department of Marine science
and Coastal Management
The University. Newcastle upon Tyne
NE1 7RU

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All articles, reports, notes etc. for THE PHYCOLOGIST, can be submitted on computer floppy disc and by electronic mail. Our publishing system is IBM compatible MS-DOS Microsoft word 5. Both 5.25 and 3.5 inch floppy discs can be handled and it is probable that most common word processing languages are acceptable, but please always include an ASCII file of your article on the disc as well. It would be best if the original is as simple as possible in layout (ie. avoid justification etc. This reduces the amount of editing. Electronic mail can be sent via the UK JANET network to the following.address:
CHE6RGJE@UK.AC.LEEDS.UCS.CMS1
(CHE6RGJE@LEEDS.UCS.CMS1 if sending from within the UK)
Type, pen and ink, tablets of stone are still acceptable!!!

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