

The PHYCOLOGIST

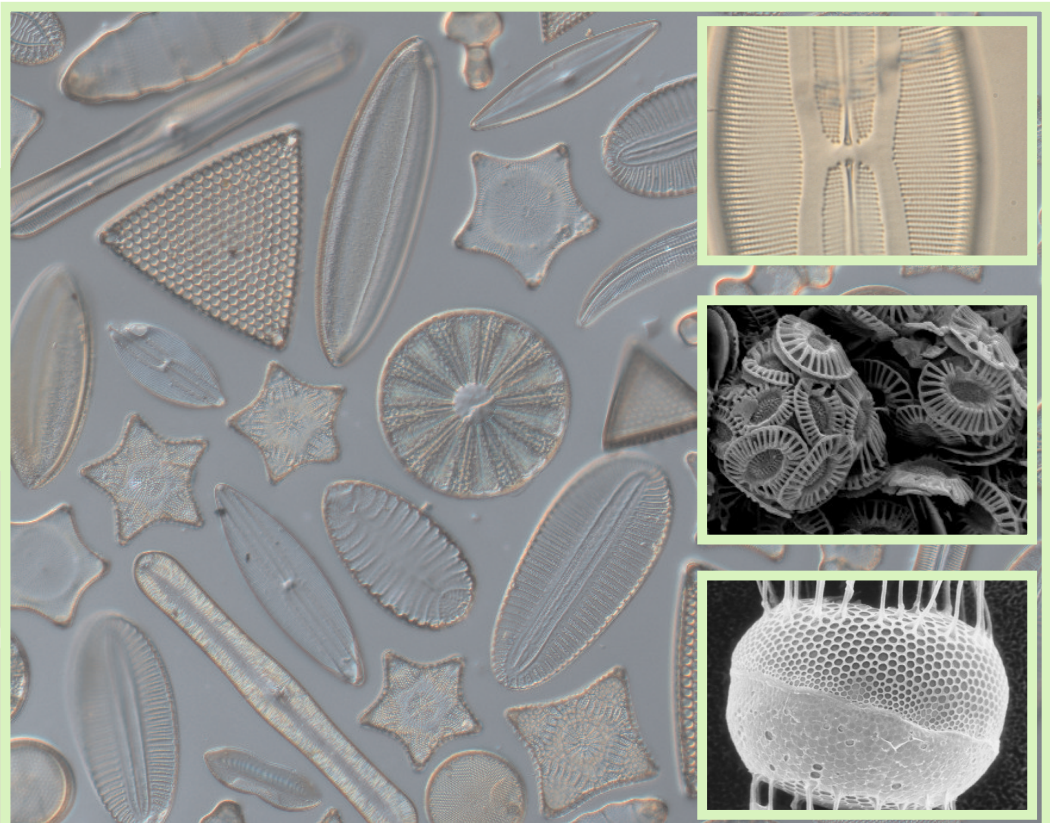


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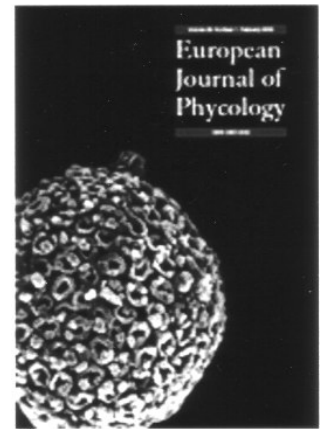
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Front cover images: SEMs (A. Taylor) and light micrographs taken on Optical Techniques Workshop at MBA, Plymouth, April 2005.

Background picture of *Fucus serratus* courtesy of F. Arenas.

European Journal of Phycology Increased Impact Factor

The British Phycological Society is delighted to report that that the Society's flagship journal, *The European Journal of Phycology* (EJP) has scored 2.506 in the ISI 2004 Journal Citation Reports (JCR®). Thanks to the dedicated and tireless efforts of the EJP editors (Christine Maggs, Matt Dring and Eileen Cox) the management team and publisher (Taylor and Francis) the journal is now 3rd highest ranked journal in ISI's 'Marine and Freshwater Biology' subject category and is also ranked 19/38 in the 'Plant Sciences' category.



New resource for cyanotoxin monitoring

A manual has been published by the EU project 'TOXIC – Barriers Against Cyanotoxins in Drinking Water'. The 3-year project focussed on the analysis of cyanotoxins (including microcystins, anatoxin-a and cylindrospermopsin), their removal by water treatment methods and monitoring cyanobacteria in 15 European waterbodies.

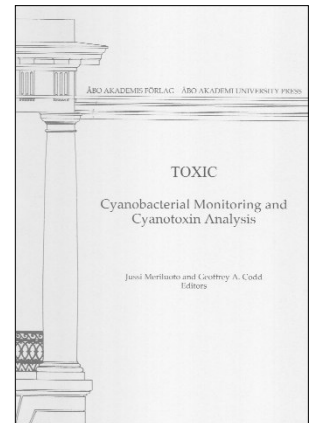
The comprehensive guide named '**TOXIC: Cyanobacterial Monitoring and Cyanotoxin Analysis**' (Eds J. Merilouto and

G.A. Codd, Åbo Akademi University Press, Åbo, Finland, 149 pp, 2005. ISBN 951-765-259-3) contains contributions from the Åbo Akademi, Finland, the University of Dundee, UK, the University of Lodz, Poland and the German Technology Centre for Water, Dresden. Content detailed includes information on the environmental monitoring of potentially toxic cyanobacteria and methods for sampling, extraction and analysis of microcystins, anatoxin-a, cylindrospermopsin, chlorophyll *a* and phycocyanin. The calibration of systems used for cyanotoxin analysis, the interpretation of results, laboratory culture of cyanobacteria and the purification of cyanotoxins are also covered.

Protocols take the form of twenty two Standard Operating Procedures (SOPs) which were used throughout the project and detail practical requirements in a straightforward format which encourages reproducibility.

Copies of **TOXIC: Cyanobacterial Monitoring and Cyanotoxin Analysis** are available from Oy Tibo-trading Ab, PB 33, FIN-21601 Pargas, Finland. Email: tibo@tibo.net

Louise Morrison, University of Dundee





GeneLynx for Algae

a web-based portal to algal genes and genome

Algae have become more and more important for basic scientific questions and for economic and socio-economic considerations during the last 1–2 decades. This is e.g. obvious from the number of genebank entries for algae (Figure 1). From a scientific point of view it is important that algae are an evolutionary very old and diverse group when compared e.g. to land plants. The first 'plant cell', originating from the primary endosymbiosis of a cyanobacterium in a heterotrophic eucaryote perhaps 1600 mio years ago (Yoon et al. 2004) was an alga and ever since the algae have diverged into very heterologous taxa. An early separation led to at least three groups, red algae, green algae and land plants, and Glaucocystophytes (Valentin et al. 1992). Later secondary endosymbioses (McFadden 2001) led to novel groups such as photosynthetic alveolates (including dinoflagellates), stramenopiles (including diatoms, haptophytes and brown algae), cryptophytes, or chlorarachniophytes. This scenario implies that fundamental differences can be expected between red algae, green algae, land plants, and the important algal groups in the phytoplankton, i.e. stramenopiles and alveolates. Nevertheless congruent evolution led to similar organisation structures, the most prominent one being multi-cellularity. Amongst the five lineages producing multi-cellularity independently are three algal lineages: red algae, green algae and brown algae. The aforesaid explains briefly why algae can be regarded as a source of significant scientific discoveries in the future.

The huge evolutionary distance between and within the algae when compared to land plants, fungi, or animals also explains their economic potential. A recently finished genome project for a diatom unravelled new biochemical pathways and the presence of thousands of unknown genes (Armbrust et al. 2004). The same finding comes from

numerous EST projects for algae (e.g. Mock and Valentin 2004, John et al. 2005). We have only begun to understand the range of metabolic pathways of algae and its economic potential. Consequently there is an increasing number of companies exploiting algae. This includes traditional uses by collecting algae and isolating valuable natural compounds, or the culture of micro- and macroalgae for the same purpose, but also genetically engineering and mass-culture of algae for production of e.g. poly unsaturated fatty acids ('PUFAs') or astaxanthin.

From a socio-economic point of view alga play an important role for tourism and the fish or shellfish industry. Namely the increasing occurrence of toxic or harmful algal blooms (HAB) puts a threat to ecosystems and human health (Hallegraeff 1993).

Accordingly there is increasing interest in studying algae or using them for industrial applications, namely at the molecular level. Unfortunately it is also increasingly difficult to retrieve specific data on algal genes from general databases because most of them are overloaded with information from numerous genome or meta-genome (e.g. Venter et al. 2004) projects and many entries for animals. Researchers working with human genes or mice experienced the same problem before for their research area and to solve this GeneLynx was

introduced recently specifically directed to human genes (Lenhard et al. 2001). GeneLynx for mouse and rat followed (www.genelynx.org, Lenhard et al. 2003).

To support molecular studies with algae we present a GeneLynx meta-database for Algae. At the time of submission GeneLynx for Algae collects links from over 426,000 cDNA and genomic sequences of 10 algae-related taxonomic groups (Table 1). These sequences correspond to 97,781 genes from 2,808 species and strains, respectively. GeneLynx regularly accesses a variety of molecular databases (Table 2), filters them for algal entries and cross-links these to the cDNA and genomic sequences.

GeneLynx for Algae is hosted by the Alfred Wegener Institute in Bremerhaven

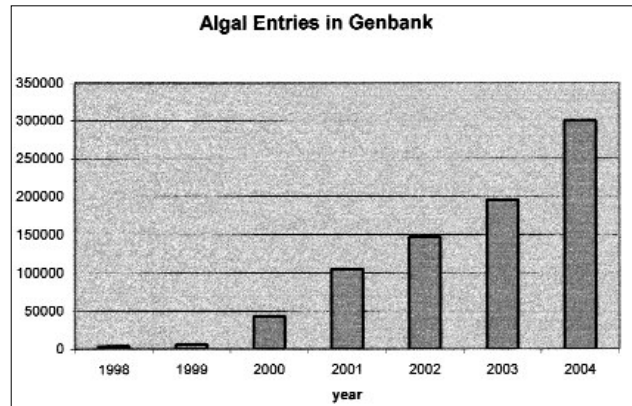


Figure 1. Increasing number of algal sequence entries in GenBank.

Table 1. Taxonomic groups included in GeneLynx for Algae.

Taxonomic group
Rhodophyta
Phaeophyceae
Cryptophyta
Haptophyceae
Stramenopiles
Dinophyceae
Chlorophyta
Chlorarachniophyceae
Glaucocystophyceae
Cyanobacteria

(www.awi-bremerhaven.de/Genelynx) and will be updated four times a year. It consists of a collection of Perl modules running on a Linux server. The system is divided into two parts, the data collection and processing, and the web interface. For a description of the technical details see Lenhard et al. (2001 & 2003). However, GeneLynx for Algae has a different focus than the standard GeneLynx database. The aim of GeneLynx for human, mouse and rat is to crosslink all molecular databases available for these organisms. GeneLynx for Algae only includes a limited number of selected databases, but tries to provide information for all sequences from all known algal species.

GeneLynx for Algae can be accessed in different ways: annotation- or sequence-based search.

In the first case the user can specify any keyword, accession number, species name etc. (Figure 2) and can connect the query words logically by 'AND' or 'OR'. Sequence-based searches are done by pasting a sequence into a query form. GeneLynx then uses BLAST to find similar sequences within the algae database. The results of the search are presented as a list of gene-entries (Figure 3). By clicking on an entry the user gets a comprehensive overview for the gene. The view shows all links to the original databases providing information about this gene. For effective orientation the links are structured into different classes, i.e. species-specific resources, genomic resources, protein structure and domain resources etc. (Figure 4).

GeneLynx for Algae can easily be extended to include further databases of interest for the Algal Research Community. In the near future we will link entries to a central database for Algal Culture Collection developed within the AlgiNet project (<http://www.search-labs.com/Alginet/>). Our database is interactive in the way that users may send comments to the authors which will lead to improvements and further development of the database.

In summary GeneLynx for Algae makes it much easier for scientist or companies who wish to utilise algae to address molecular issues to retrieve data on algal genes than by screening conventional databases. It is aimed to promote algae for scientific and commercial use.

Table 2. Resources included in GeneLynx for Algae.

Database	Content	Link
Blocks	Conserved Regions	http://blocks.fhcrc.org/
EC	Enzyme classification	http://www.expasy.org/enzyme/
GO	Gene Ontology	http://geneontology.org/
HSSP	Homology-derived secondary structure	http://www.embl-ebi.ac.uk/dali/
Interpro	Protein families	http://www.ebi.ac.uk/interpro/
KEGG	Pathways	http://www.genome.ad.jp/kegg/
NCBI Nucleotide Protein Genome RefSeq	Sequence databases	http://www.ncbi.nlm.nih.gov/
PDB	3-D structure data	http://www.rcsb.org/pdb/
PRINTS	Protein fingerprints	http://bioinf.man.ac.uk/dbbrowser/PRINTS/
ProDom	Protein families	http://prodes.toulouse.inra.fr/prodom/current/html/home.php
Prosit	Protein families	http://www.expasy.org/prosit/
Sbase	Protein domain library	http://hydra.icgeb.trieste.it/sbase/
Swissprot	Sequence database	http://www.expasy.org/sprot/
Trembl	Sequence database	http://www.expasy.org/sprot/

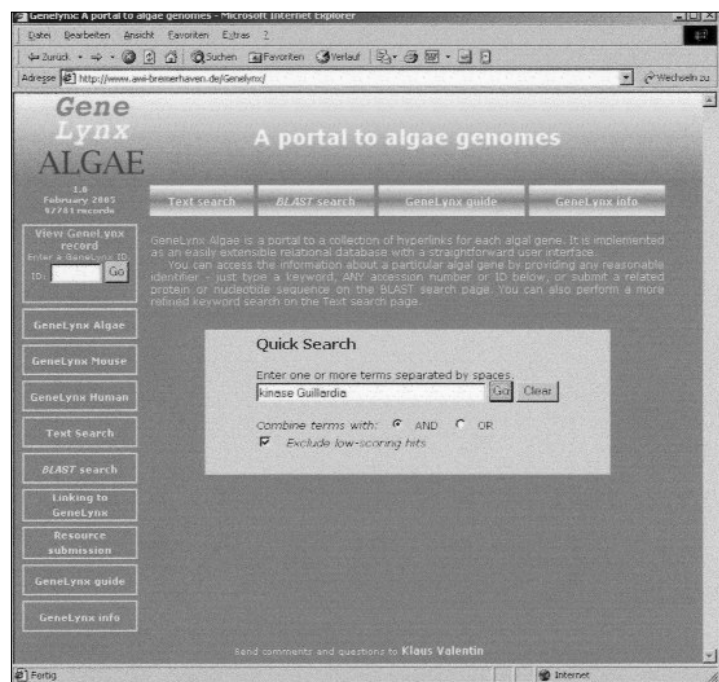


Figure 2. The GeneLynx for Algae home page with the quick search option.

Acknowledgements:

We wish to thank Stephan Frickenhaus for help with establishing GeneLynx for Algae on an AWI Linux cluster, and Linda Medlin for generous support. This work was sup-

ported by the bioinformatic department of the AWI and the EU Thematic Network ALGINET (contract no QLK3-CT-2002-02132).



Hit nr.	Words matched	GeneLynx ID	Description	Species
1	2	4229	SNF1-related protein kinase	Guillardia theta
2	2	4316	AMP-activated protein kinase, beta 2 non-catalytic SU	Guillardia theta
3	2	4320	Putative cdc2 kinase	Guillardia theta
4	2	4381	Heat shock protein 82	Guillardia theta
5	2	4483	DNA gyrase subunit B	Guillardia theta
6	2	4519	Phosphatidylinositol 4-kinase	Guillardia theta
7	2	4520	SNF related kinase	Guillardia theta

Figure 3. List of results from the query shown in Figure 2.

Gene name			
kin(cdc2)			
Description Putative cdc2 kinase			
Species	Guillardia theta		
Source	nucleomorph		
Genomic resources			
Genomic sequences	AF093031		
Protein sequences			
TrEMBL	Q98539		
GenPept	AAK39744.1		
Protein structure and domains			
Pfam	PF00069		
ProDom	IPR000719	IPR002290	IPR008271
InterPro domains	IPR000719	IPR002290	IPR008271
PROSITE	PS00107	PSS0011	PS00108
Closest PDB structure	1BUH		
HSSP	1BUH		
Protein function links			
Gene Ontology (at MGI)	ATP binding kinase activity protein serine/threonine kinase activity transferase activity		

Figure 4. Overview page for a single GeneLynx entry.

Christian Storm^{1,2}, Uta Bohnebeck¹, Bill Wilson³, Boris Lenhard³ and Klaus Valentin⁴

¹, Technology Transfer Centre/BIBIS, Fischkai 1, 27572 Bremerhaven, Germany; ², In Silico Analyse, Jalmer Weg 2, 24963 Tarp, Germany; ³, Center for Genomics and Bioinformatics, Karolinska Institutet Campus, 171 77 Stockholm, Sweden; ⁴, Author for correspondence, Alfred Wegener Institute, Am Handelshafen 12, 27570 Bremerhaven, Germany.

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Kindrogan Field Course

It was a long journey for me to come from Middle East Technical University, Turkey to the Scottish Highlands, not knowing what was waiting for me. At Pitlochry, Elliot welcomed us and drove us to the Kindrogan Field Centre. The Centre has really a good layout. Rooms are comfortable and all the staff members are kind people. I became friends with the other participants, from all corners of the world such as Germany, Netherlands, Ireland, and Italy in a week. Meeting so many people, all interested in algae, was a great experience. We also had a chance to present our studies and to obtain feedback from other participants. It was also possible for someone to work at his/her own speed and get familiar with the most common algae by the end of the week. This course enhanced my professional qualifications.

The day consisted of informal lectures, accompanied by slides and PowerPoint presentations, introducing us to the different algal families. The rest of the time was spent identifying algae from different samples, which we collected from Kindrogan Pond, River Ardlie and other sampling points. It was great to see live algae under light microscopes and learn all their details. The help of our patient, helpful and very knowledgeable tutors motivated us so well that we found hundreds of species in a week and we always wanted to find just one more during the course.

The third day at the Kindrogan Field Centre was an all-day field trip. We collected different samples at Loch Tummel, River Tummel, Loch Rannoch, Carie Burn and Loch Kinardochy. We also had a chance to visit the little touristic town of Pitlochry. Our last port of call was to sample the

water at the smallest Scottish Distillery. We had a chance to taste great Scottish whisky and learn the history of the distillery.

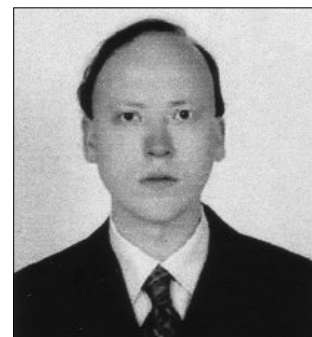
Algal Charades really tested our newly acquired knowledge and identification skills! It also required a good imagination.

Think of a funny

game in which algal species are pantomimed while others guess the meaning. It was really unforgettable and funny game. Moreover, the best thing was our Team was the winner.

I would like to thank Elliot and Eileen for being such polite, fun and beneficent tutors and all the other course participants for making it an unforgettable week.

I would also like to thank the BPS for providing a stipend for me to attend the course. Since attending the course, the skills that I have obtained have been invaluable and I would recommend that other people with an interest in this area to take a trip to Kindrogan. I hope my experience encourages other people to attend the course. I had an unforgettable week.



Arda Özen, Turkey.

Arda Özen

**Research assistant, M. Sc. Student
Turkey**



Rob Wood.

This year I was the grateful recipient of a BPS student stipend which allowed me to attend a Freshwater Algal Identification course at the Field Studies Council's Kindrogan Centre in picturesque Perthshire. My seventeen fellow participants included students, researchers, and water industry professionals, whose academic backgrounds

were in limnology, ecology, marine biology, ecotoxicology, palaeontology and civil engineering. We came from 11 countries, bringing with us varying degrees of experience and expertise, allowing novices like me to be paired with more seasoned phycologists for labwork.

Our days typically mixed lectures, sampling from the pond and river near the centre and an hour or two at the microscope bench. The lectures, given by our course organisers Dr Eileen Cox & Professor Elliot Shubert of the Natural History Museum, encompassed algal morphology, taxonomy and ecology; sampling protocols, the incorporation of algae in environmental monitoring schemes and the advantages of identifying live rather than preserved diatoms.

Having honed our identification skills on the locally available algae, we embarked on an epic, Highlands-wide, collecting excursion which took in 4

lochs, 2 rivers, a pond, a distillery, and a bird-bath, and yielded a record number of new records.

The centre staff fed and watered us well; so well in fact that to burn off a few excess calories a select group of us gave the local roads a pounding they hadn't felt since dinosaurs roamed the glens.

The course managed to be both rigorous and informal, and the long days necessary to get the novices among us up to speed never dragged; in fact I found the microscope work so addictive that I had to be dragged away from my microscope when the bar opened at 9.30 each evening. The only exception was the final evening, when the legendary algal charades proved too much of a draw and I came willingly.

By the end of the week the stockpile of algal samples waiting for me in Sheffield seemed much less daunting and almost an inviting prospect.

Rob Wood



Meeting Reports

Hazardous algae - a problem for modern ecology

This international conference was held at the University of Gdansk, Poland, on 18th–19th May, 2005, under the auspices of the Centre of Excellence for Baltic Development, Education and Research (BALTDER). The conference was attended by over 160 participants from 16 countries which are affected, in various ways, by harmful algal blooms. Presentations included the results of national and local monitoring programmes of toxigenic cyanobacteria, diatoms and dinoflagellates and relations between toxic blooms and eutrophication in fresh, estuarine and coastal waters. Understandably, with so many participants from countries around the Baltic Sea, the regional major bloom-former, *Nodularia spumigena*, and its nodularin toxins, were the subject of many presentations. Molecular tools (e.g. PCR, fluorescent *in situ* hybridization, real time-PCR and microarrays) are being increasingly used to determine and quantify potentially toxic cyanobacterial blooms, although whether genes for toxin production are always expressed in cyanobacteria remains uncertain. The need for actual cyanobacterial and algal toxin analysis, both in early warning systems and in monitoring recreational and potable water quality, remains a central need for the risk management of harmful algal blooms. Requirements were identified to improve analytical method

performance, harmonization and the availability of reference materials and analytical standards. Interest in the natural functions of cyano- and algal toxins is increasing, together with the allelopathic and phagotrophic actions of harmful algal bloom-formers. Films of phagotrophy, showing the ingestion of a cryptophyte alga by *Karlodinium micrum*, and of *Rhodomonas* and red blood cells by *Prymnesium parvum*, were of high interest. The increasing adoption of health guidelines for cyanobacterial blooms and toxins in potable and recreational waters, and the introduction of national legislation on these matters in at least six European countries, were discussed in an interactive session with presentations from Poland, Latvia, the United Kingdom, France, Germany, Finland and Sweden. As befitting an expanding area of phycology, the Gdansk meeting brought people together from both diverse locations and disciplines, to form new links. Congratulations to Professor Marcin Plinski, Dr Hanna Mazur-Marzec and the rest of the University of Gdansk team for hosting this useful and enjoyable conference.

Geoffrey Codd, University of Dundee.
g.a.codd@dundee.ac.uk

First Tropical and Subtropical Cyanoprokaryota Workshop - and a lesson contained

The University of Las Palmas de Gran Canaria in the Canary Islands hosted this meeting from July 11th to 15th, 2005. The meeting was thoughtfully organised by Antera Martel Qunitana, Emilio Soler Onis and their colleagues and was attended by researchers and postgraduate students from 13 countries. Aspects of cyanobacterial ecology, identification, toxicology and biotechnology were presented, with examples from tropical and subtropical locations, worldwide. Aerial, planktonic, benthic and terrestrial cyanobacteria were included. The roles and activities of cyanobacterial culture collections e.g. in India and Las Palmas were also presented. The workshop included a collecting trip to the interior of Gran Canaria and microscopy sessions for the identification of local material, alongside participants' specimens. Recognition and understanding of the extent of cyanobacterial diversity in tropical and subtropical latitudes are both at an early stage, as exemplified by the presentation of undescribed cyanobacteria at the

Workshop. Difficulties commonly encountered in identifications were assisted by among the best available authorities in the field (J. Komarek, J. Komarkova, S. Golubic et al.).

The Workshop agreed on the value of combining knowledge and methods in the phenotypic investigation of cyanobacterial morphology, ecology and physiology, with molecular research into cyanobacterial genomics, to provide a polyphasic approach to cyanobacterial diversity and phylogeny. This heartening combination of traditional and modern molecular methods is perhaps an acknowledgement of something which the cyanobacteria have been trying to tell us for some time. They include highly specialised units, heterocytes, vegetative cells, akinetes (and diazocytes?), with specialist facilities and functions, all integrated successfully to achieve more than the sum of their separate parts.

Geoffrey Codd, University of Dundee
g.a.codd@dundee.ac.uk

10th International Conference for Applied Phycology

Thanks to generous financial support from the Society I was able to present my early PhD research at the 10th International Conference for Applied Phycology hosted in China (24–30 July 2005) under the auspices of the International Society for Applied Phycology. Three hundred delegates representing nearly 30 nations were able to make the journey to the city of Kunming located in Yunnan province, west China. Kunming is known as the 'city of spring' due to its favourable climate, and

other than some heavy downpours on day one, the weather remained splendid throughout.

I presented the paper 'Antibacterial compounds isolated from the marine diatom, *Phaeodactylum tricornerutum*' to an audience of multi-disciplined researchers and was fortunate enough to receive some valuable feedback. In particular, Dr Tatjana Egorova-Zachernyuk (Protein Labelling Innovation, Leiden, Netherlands) provided useful suggestions regarding

final structure determination of proteins using radiolabelled *P. tricornutum*. This is an avenue of collaboration that I will be investigating. Dr David Lewis (University of Adelaide, Australia) offered some advice as he currently has a closely related project on novel compound discovery from blue-green algae. The conference provided a great opportunity to quiz key overseas-based researchers who have studied my organism of choice and discuss the future direction of my work including Professor Michael Borowitzka (Murdoch University, Australia) and Professor Ralph Lewin (Scripps Institution of Oceanography, California). I thank all those people for their thoughtful contributions and will implement suggestions before completing my PhD.

The conference was divided into five sessions ranging from Harmful Algae Blooms to Products and Quality Control. There were one or two keynote speakers for each session. Professor Sammy Boussiba (Ben-Gurion University of Negev, Israel) offered a fascinating insight into his many years of research on the life cycle of *Haematococcus*. Professor Brian Whitton (University of Durham, UK) delivered a thought provoking plenary entitled 'From growth in nature to practical use via the culture collection'. In his talk he emphasised the need to appreciate any selection pressure imposed during isolation of microalgal strains from the field to their subsequent use in laboratory studies. He argued that greater consideration should be paid when comparing results from laboratory cultured organisms to those in the field.

One especially interesting paper was presented by Dr Susan Blackburn (CSIRO, Tasmania, Australia). Dr Blackburn described early progress in the introduction of microalgal omega-3 long-chain polyunsaturated fatty acid synthesis pathways into plants to address the growing demands for such nutrients. Working with *Arabidopsis* the CSIRO group have shown for the first time that docosahexaenoic acid can be produced and incorporated into seed oils.

The conference concluded with a choice of excursions to the surrounding countryside. The first day I opted for a trip to the Stone Forest, the site of an ancient sea floor, now some 6000 feet above sea level. The next day we walked up the



Andrew Desbois, University of St Andrews.

Western mountain that provided a superb view of the algal-bloom affected Diansi Lake.

One of the more enjoyable aspects of my stay was partaking in the local Yunnan cuisine. A diverse selection of restaurants offering authentic Yunnan-style food was selected by the organisers so to expose us to the most interesting dishes possible. It certainly was an experience and it soon became clear that it was best not to enquire as to what we were eating!

Many friends, useful contacts and potential collaborators were made during the course of this excellent meeting. The conference exceeded my expectations in every way. Essential feedback received from the audience will help shape the final year of my studies. This was my first international conference and I thank the organisers and all contributors for making it such an informative and enjoyable meeting. I am most grateful to the BPS and other supporters for their financial assistance providing me with the opportunity to attend.

Andrew Desbois ad53@st-andrews.ac.uk
BBSRC PhD Student
Gatty Marine Laboratory
University of St Andrews

Announcement:

12th International Conference on Harmful Algae

The International Society for the Study of Harmful Algae (ISSHA) is pleased to announce that the 12th International Conference on Harmful Algae will take place **4th-8th September 2006 in Copenhagen, Denmark**. The local host is a joint Danish-Swedish Organizing Committee.

The occurrence of harmful algae is a world-wide problem that affects the environment, fisheries and aquaculture, public health, tourism and the quality of drinking water. The impact of harmful algae has grown with the increasing use of coastal waters for commercial and recreational purposes and the increased need for clean drinking water caused by the world's growing population.

The conference aims at addressing all aspects related to causes and effects of marine and freshwater harmful microalgae, and to serve as a forum for exchange of new research results and ideas among researchers, industry, government and local users, and other interested parties.

Scientific Programme

Topics to be addressed at the conference will include:

- Taxonomy and biogeography of harmful algae
- Genomics
- Genetic diversity of HABs
- Toxin synthesis and toxin isomers/homologs
- Top-down/bottom-up control of HAB population dynamics
- Chemical structure and effect of toxins on the environment
- Allelopathy
- World-wide dispersal of harmful algae; algae and climate change
- Increased occurrence of harmful algae following natural or man-made disasters in the sea
- Monitoring for harmful algae, including observing systems
- Physiology of toxin production

The official language of the congress will be English and the conference will comprise invited lectures on selected subjects, contributed papers, posters and round-table discussions.

For further information see the following website:
<http://www.bi.ku.dk/hab/>



The 54th Annual Meeting of the British Phycological Society

January 4th–7th 2006



The 54th BPS scientific meeting will be held in Plymouth at the University of Plymouth Sherwell Conference Centre and hosted jointly with the Marine Biological Association. The local organiser is Alison Taylor (BPS2006@mba.ac.uk).

The meeting will start with a special symposium: "*Genomics in Phycology: Something for Everybody*" organised by Jim Callow (j.a.callow@bham.ac.uk) and Jeanine Olsen (j.l.olsen@rug.nl). This symposium will run for the first day and a half and start with a series of invited talks followed by a contributed talk sessions (see below). The symposium will provide both general information about genomics in general and examples from developing algal genomics projects—including comparative, functional and ecological genomics. This will be an excellent session with a line up of speakers who are leaders in the field of algal genomics. The session will be especially useful for those wanting to know more about how genomics approaches can be used in their research. The meeting will continue with contributed talks and Manton prize student talk sessions.

The conference dinner will be held in the National Marine Aquarium where delegates will enjoy a wine reception while viewing the displays before taking their seats. Other social and fund-raising activities include the BPS Auction so please bring any psychological donations. Our auctioneer, Elliot Shubert, can be contacted at e.shubert@nhm.ac.uk if you have any questions. There will also be an opportunity to team up with colleagues and enter the BPS 'table quiz' with questions set by our cunning quizmaster, Mike Guiry. There will be a small entry fee with prizes to the teams with the best general and phycological knowledge! All proceeds will go to the BPS student travel fund, so please support this worthy cause.

Full registration and payment are now due with the forms available on the BPS website. The deadline for registration and receipt of payment is **November 15th 2005**.

BPS2006 Provisional Programme

Wednesday 4th January 2006

14:00-19:00 Registration at hotel
16:00-18:30 Council Meeting
19:00-21:30 Wine reception and buffet @ MBA

Thursday 5th January 2006

Genomics Symposium

9:00-9:15 Opening Address
9:15-9:50 INTRODUCTION TO GENOMICS
Jeanine L. Olsen & Wytze T. Stam
9:50-10:25 *ECTOCARPUS* (PHAEOPHYCEAE): CLASSICAL ALGAL MODEL GOES TO THE GENOSCOPE
Akira F. Peters, Dominique Marie, Delphine Scornet, Bernard Kloareg, J. Mark Cock
10:25-11:00 PROGRESS ON THE *ECTOCARPUS* GENOME PROJECT
J. Mark Cock, Nathalie Aiach, Bénédicte Charrier, Susana Coelho, Erwan Corre, Garry Farnham, Yukihiko Kitade, Morgane Ratin, Céline Remblière, Delphine Scornet, Béatrice Segurens, Betina Setterblad, Jean Weissenbach, Patrick Wincker and Akira Peters
11:00-11:30 Coffee
11:30-12:05 FUNCTIONAL GENOMICS, EMBRYOLOGY AND RNAi
Colin Brownlee
12:05-12:40 WHAT CAN DNA MICROARRAYS TELL US ABOUT *ECTOCARPUS* AND ITS VIRUSES?
Declan C. Schroeder
12:40-13:15 EST LIBRARIES – "THE POOR MANS GENOMICS"
Klaus Valentin
13:15-14:15 Lunch
14:15-14:50 GENOMICS AND TRANSGENICS IN THE 'GREEN YEAST', *CHLAMYDOMONAS*
Laura W. Wood, Chloe K. McCann & *Saul Purton*
14:50-15:25 BOUNDARIES OF SHARED GENE POOLS IN CYANOBACTERIA – A GENOMICS APPROACH
Paul K Hayes

15:25-16:00 BERRY-STONE VIRUSES: 30 YEARS OF CLIMATE CONTROL AND FACE CREAM
Willie Wilson
16:00-16:30 Tea

Genomics (contributed papers)

16:30-16:50 FUNCTIONAL CHARACTERISATION OF DIATOM MEMBRANE TRANSPORTERS
Frederic G. Verret, Declan C. Schroeder, Matthew J. Hall, Colin Brownlee & Alison R. Taylor
16:50-17:10 TRANSCRIPTIONAL PROFILING THE COCCOLITHOVIRUS INFECTION OF *EMILIANA HUXLEYI*
Mike Allen
17:10-17:30 SPATIAL PATTERNS OF PROCHLOROCOCCUS DIVERSITY IN THE ATLANTIC OCEAN
Ellie Harrison, Ian Joint, Nicholas H. Mann & Martin Mühling
17:30-19:00 **POSTER SESSION**
19:00-21:00 Dinner (own arrangements) and 'Pub Quiz'

Friday 6th January 2006

Genomics

9:30-9:50 PREDICTING THE FUNCTION OF UNKNOWN GENES USING MICROARRAY DATA: A SUCCESS STORY FROM THE HIGHER PLANT ARABIDOPSIS
Claire M.M. Gachon, Mathilde Langlois-Meurinne, Yves Henry, Patrick Saindrenan
9:50-10:10 A BIOLISTIC METHOD FOR LOADING Ca²⁺ DYES INTO ALGAL CELLS
John H.F. Bothwell, Colin Brownlee, Alistair M. Hetherington, Glen L. Wheeler, Martin R. McAinsh
10:10-10:30 *PORPHYRA* OSMOREGULATION AND THE ISOLATION OF A Ca²⁺ SENSING RECEPTOR
Ira A. Levine, Anthony J. Legee, Zhen-Ming Pei, & Dongdong Kong
10:30-11:00 Coffee

Session 1: Genomics- Molecular Phylogeny

- 11:00-11:20 TAXONOMY OF MONADOID AND COCCOID GREEN ALGAE: CONFLICT OF CLASSIC AND MODERN APPROACHES.
T. Pröschold
- 11:20-11:40 NEW VIEWS ON THE PHYLOGENY OF THE SIPHON- OCLADALES (CHLOROPHYTA) INFERRED FROM nrDNA GENE SEQUENCES
Frederik Lelijaert, Olivier De Clerck, Heroen Verbruggen, Christian Boedeker & Eric Coppejans
- 11:40-12:00 CONTRIBUTION TO THE SYSTEMATICS OF THE ECTOCARPALES (PHAEOPHYCEAE): MOLECULAR PHYLOGENY OF SMALL BROWN ALGAL EPIPHYTES
Marie-F. Racault, Robert L. Fletcher, Bruno De Reviers & Florence Rousseau
- 12:00-12:20 MOLECULAR PHYLOGENETICS OF *THAMNOCLONIUM* (HALYMENIALES, RHODOPHYTA), A REMARKABLE ALGAL-SPONGE CHIMERA
Olivier De Clerck, Tae-Oh Cho & Suzanne Fredericq
- 12:20-12:50 DNA-BARCODING – A NEW TOOL IN THE BOX FOR IDENTIFICATION OF RED ALGAE
Juliet Brodie¹ & Lavinia Robba¹
- 12:50-13:40 Lunch

Session 2: Manton Prize

- 11:00-11:20 THE CELL BIOLOGY OF ULVA ZOOSPORE SETTLEMENT
Stephanie E.M. Thompson, James A. Callow, Maureen E. Callow & Colin Brownlee
- 11:20-11:40 BIOLOGICAL CONTROL OF BIOFOULING ON ARTIFICIAL MARINE STRUCTURES
Anne Marie Mahon, Christine A. Maggs, Mark P. Johnson & M. Basheer
- 11:40-12:00 MOLECULAR CHARACTERISTICS OF INVASIVE AND NATIVE KELP SPECIES
Sarah K. Henkel, Gretchen Hofmann, Allison Whitmer
- 12:00-12:20 THE INFLUENCE OF CURRENT VELOCITY AND WAVE EXPOSURE ON THE MORPHOLOGY OF LAMINARIA DIGITATA
Jonathan Stewart & Graham Savidge
- 12:20-12:40 USING SEAWEEDES AS INTEGRATING BIOMONITORS OF NITRATE AND PHOSPHATE POLLUTION IN COASTAL WATERS
Claire G. Campbell & Matthew J. Dring
- 12:40-13:40 Lunch

Session 1 (continued): Cell Biology

- 13:40-14:00 INORGANIC CARBON FIXATION PATHWAY IN *EMILIANA HUXLEYI*
Maggie Mackay, Karen Brown & John A. Raven
- 14:00-14:20 CHEMOATTRACTION TO BACTERIAL QUORUM SENSING SIGNALS MODULATES THE SETTLEMENT OF ZOOSPORES OF THE MARINE ALGA, *ULVA INTESTINALIS*
Glen L. Wheeler, Karen Tait, Alison Taylor, Colin Brownlee, Ian Joint
- 14:20-14:40 THE WOUND REPAIR MECHANISM IN THE GIANT UNICELLULAR CHLOROPHYTE *DASYCLADUS VERMICULARIS* IS A TWO-STAGE PROCESS
Cliff Ross, Frithjof C. Küpper, Valerie Vreeland, Herbert Waite, Robert S. Jacobs
- 14:40-15:00 TO WHAT EXTENT IS CELL WALL SYMMETRY (OR ASYMMETRY) IN PENNATE DIATOMS UNDER CYTOSOLIC CONTROL?
Eileen J. Cox.
- 15:00-15:20 TBC
- 15:20-15:40 TBC

Session 2 (continued): Manton Prize

- 13:40-14:00 NODULARIN-BASED ELISA FOR THE IMMUNOASSAY OF THE CYANOBACTERIAL HEPATOTOXIN, NODULARIN, IN WATER AND ANIMAL SAMPLES
Deborah L. Barnaby, F.Brian Eddy & Geoffrey A. Codd
- 14:00-14:20 CELL EXTRACTS FROM DIFFERENT MORPHS OF THE MARINE DIATOM, PHAEODACTYLUM TRICORNUTUM, VARY IN THEIR LEVEL OF ANTIBACTERIAL ACTIVITY
Andrew P. Desbois, Andrew Mearns-Spragg & Valerie J. Smith

- 14:20-14:40 OOMYCETE MARINE ALGAL ENDOPARASITES: THEIR BIOLOGY, EVOLUTION, AND PHYLOGENY
Satoshi Sekimoto, Frithjof C. Küpper, Gordon W. Beakes, Dieter G. Müller & Daisuke Honda
- 14:40-15:00 THE GENUS *ACROCHAETE* (CHLOROPHYTA): TAXONOMY, SPECIES DIVERSITY AND DISTRIBUTION AROUND THE UK
Barbara E. Rinke, Juliet A. Brodie & Paul K. Hayes
- 15:00-15:20 MOLECULAR EVOLUTION OF ACTIN GENES IN GREEN ALGAL LINEAGES
Ellen Cocquyt, Frederik Lelijaert & Olivier De Clerck
- 15:20-15:40 PHYLOGENETIC RELATIONSHIPS AMONG SPOROCHNALEAN TAXA INFERRED FROM RUBISCO SEQUENCES AND MORPHOLOGY
Nicholas Yee, Alan J.K. Millar, Adam D. Marchant & Akira F. Peters
- 15:40-16:00 Tea
- 16:00-17:00 British Phycological Society Annual General Meeting
- 17:00-18:00 Founders Lecture: GRAZING INTERACTIONS AND THE STRUCTURE AND FUNCTIONING OF ROCKY SHORE COMMUNITIES.
Steve Hawkins
- 19:00- Depart for National Marine Aquarium Dinner from Moathouse Hotel

Saturday 7th January 2006: Ecology and Applied

- 9:00-9:20 REPRODUCTIVE ECOLOGY AND GENETIC STRUCTURE OF FUCOIDS IN THE INNER BALTIC SEA, INCLUDING *FUCUS RADICANS* (SP. NOV.)
Lena Bergström, Andrei Tatarenkov, Kerstin Johannesson & Lena Kautsky
- 9:20-9:40 GAMETOPHYTIC DOMINANCE IN *MAZZAELLA LAMINARIOIDES* (RHODOPHYTA, GIGARTINALES): DIFFERENTIAL SURVIVAL OF BASAL DISKS IN RELATION TO ENVIRONMENTAL STRESS
Ricardo D. Otaiza & Alvaro G. Sanhueza
- 9:40-10:00 THE BENTHIC MARINE ALGAL FLORA OF WESTERN ICELAND: ADDITIONS AND AMENDMENTS
Karl Gunnarsson, Juliet Brodie, Grethe Bruntse, Svanhildur Egilsdóttir, Ruth Nielsen, Ian Tittley
- 10:00-10:20 40 YEARS OF MARINE PHYTOPLANKTON SAMPLES FROM A COASTAL SITE NEAR PLYMOUTH
Gerald Boalch, Stuart Jenkins, Georgina Budd & Patricia Masterson
- 10:20-10:40 INTER-LABORATORY POST-CRYOPRESERVATION STABILITY TESTING
John G. Day, Julia Müller, Maike Lorenz, Erica E. Benson & Thomas Friedl
- 10:40-11:00 USE OF CORALLINE ALGAE IN MEDICAL CERAMICS
Charmaine Blake, M.J. Dring and C.A. Maggs
- 11:00-11:30 Coffee

Chemical Ecology

- 11:30-11:50 HEALTH GUIDELINES AND LEGISLATION IN THE RISK MANAGEMENT OF CYANOBACTERIA AND CYANOTOXINS IN WATER RESOURCES
Geoffrey A. Codd, Fiona M. Young, Deborah L. Barnaby, Marianne Reilly, Louise F. Morrison and James S. Metcalf
- 11:50-12:10 DETECTION OF MICROCYSTIN AND NON-MICROCYSTIN CYANOPEPTIDES IN ARCHIVED RESCOBIE LOCH BLOOM SAMPLES (1983-2004).
Louise F. Morrison, Matish Nath, Kenneth A. Beattie & Geoffrey A. Codd
- 12:10-12:30 SIGNIFICANCE OF THE NEUROTOXIN BMAA AS A PRODUCT OF CYANOBACTERIA
James S. Metcalf, Louise F. Morrison, Marianne Reilly, Holly E. Johnson, Sandra A. Banack, Paul A. Cox and Geoffrey A. Codd
- 12:30-12:50 UV LIGHT INDUCTION OF VOLATILE ORGANIC HALOCARBON COMPOUNDS, EMISSION BY: *ULVA RIGIDA*, *MAZZAELLA LAMINARIOIDES* AND *LESSONIA NIGRESCENS*
Jorge E. Muñoz, S. Stephen M. Mudge, Ricardo D. Otaiza, Rodrigo H. Loyola, and Marcelo E. Peralta
- 12:50-13:10 VOLATILE ORGANIC HALOCARBON COMPOUNDS, PRODUCED BY *DUNALIELLA SALINA* (TEODOR-ESCO) IRRADIATED WITH UV LIGHT AT DIFFERENT STAGES OF CULTURE PERIOD
Jorge E. Muñoz, Stephen M. Mudge, Rodrigo H. Loyola, Dagoberto F. Arcos and Juan A. Vidal.
- 13:10-14:00 Lunch/Depart
- 14:00 BPS Council Meeting AT UNIVERSITY



Minutes of the 53rd Annual General Meeting of the British Psychological Society

The University of Birmingham
Thursday 6th January 2005, 4.30pm

1. Apologies

None.

2. Minutes of the 52nd AGM held on the 6th January 2004

The minutes were approved: proposed by Matt Dring and seconded by Graham Underwood.

3. Matters arising

There were none.

4. Presidential Report

Barry Leadbeater reported that the Society had lost four members. Tony Chamberlain, Eifion Jones, Norman Hendeby and Don Boney. He had written to the family of all expressing the Society's condolences. He also reported that Tony Fogg had suffered a stroke and asked members to sign a card during the Society dinner.

5. Reports from Officers

a) Honorary Secretary

Jackie Parry opened by thanking Barry Leadbeater and Maureen Callow for hosting the winter meeting at such short notice. The meeting had drawn 85 delegates and the programme comprised 42 oral and 20 poster presentations. She thanked all authors, those who had chaired sessions and the judges of the Manton and Poster prizes. Special thanks went to Johanna Laybourn-Parry and John Anderson for organising the 'Pole to Pole Psychology' session, and Jan Krokowski for organising the 'Biodiversity and Conservation' session. She informed members that the inclusion of special sessions at the winter meeting would continue.

b) Honorary Treasurer

Michelle Tobin reported for the first time as Hon Treasurer and spoke to her annual report. She informed the membership that the Society's financial situation remained good, with current total

funds of £72.8K. The Scientific Meetings Fund had been topped up to a total of £25K to allow the Society to support students with Travel Awards, Summer Bursaries and Summer Field Courses from the interest it receives. The journal had performed reasonably well financially and whilst subscriptions were lower the balance to the Society from Volume 38 was £20K (£15.9K for Volume 37) due to the guaranteed income of £20K from Taylor & Francis. She had set up internet and telephone banking which had made the managing of the account much easier. She thanked Elliot Shubert for all his help and support during the past year and the membership for their patience during the transition.

The Hon Treasurer's report was accepted: proposed by Eileen Cox and seconded by Martin Wilkinson.

c) Honorary Membership Secretary

Graham Scott reported that the total active membership of the Society was 412, with 109 members one year in arrears. This was down considerably on the previous year's total of 539. There had been no problems experienced this year, except payment by standing orders. Barry Leadbeater informed the membership that council were seriously considering the setting-up provision for on-line credit card payments.

Action: On-line credit card payments to be discussed at summer council

The Hon Membership's report was accepted: proposed by Alison Taylor and seconded by Stephen Maberly.

d) Honorary Editors of the Journal & EJPMC

Matt Dring reminded the membership that Chris Maggs had resigned and the new Joint Editor-in-Chief was Eileen Cox. He reported that the Journal had increased in size by 32 pages and that Taylor & Francis had also agreed to this

increase for next year. There had been no problems in publication or distribution this year and one valuable development had been the online publication of all papers as soon as the proofs had been corrected (in 'prEview'). This was particularly welcome as they were experiencing a small backlog in publication. The impact factor stands at 1.446 and the current rejection rate is 60%.

The Hon Editor's report was accepted: proposed by John Raven and seconded by Jan Krokowski.

Barry Leadbeater informed members that Len Evans was standing down as chair of the EJPMC after 10 years. Council had decided that Mike Guiry, the new President, would act as Chair. The EJPMC would now comprise the BPS President, Joint Hon Editors-in-Chief, Hon Treasurer, Hon Membership Secretary, European BPS representative and representatives from T&F.

e) Honorary Editor of *The Psychologist*

Alison Taylor reported that Issues 66 and 67 were published on schedule in April and November respectively, and she thanked all those who had contributed items for both editions. A new feature will be reports from members attending International meetings and she encouraged the membership to submit these to her. An electronic format of each new *Psychologist* is now made available on production and there is a growing archive of past editions on the BPS website.

The Hon Editor's report was accepted: proposed by Geoff Codd and seconded by Elizabeth Howarth.

f) Awards and Training Committee

Eileen Cox reported that there had been 13 applications for support to attend the BPS winter meeting at Birmingham, and 12 had been awarded, based on the usual criteria being met. There would now be four deadlines per year.

The report was accepted: proposed by Dave John and seconded by Brian Moss.

g) Biodiversity and Conservation Committee

Juliet Brodie reported that the *Freshwater Algal Flora of the British Isles* was now almost out of print. Cambridge University Press (CUP) were considering reprinting it at a slightly higher retail price. A contract had been drawn up for the revision of the Chlorophyta volume and this should be finished within two years. Discussions had taken place regarding a book on marine Cyanophyta and this will be followed up in the New Year. Seaweeds of the British Isles Volume 3 Part 2 (second Phaeophyceae book) was apparently progressing but Mike Guiry, as the new President, should write to Bob Fletcher regarding this. Finally, Juliet thanked the BPS for the provision of £3K to support the work on Important Plant Areas (IPAs) for algae. Excellent progress had been made and a report had been submitted to council.

The report was accepted: proposed by John Raven and seconded by Wytze Stam.

h) Communication and Education Committee

JDP reported on the results of the BPS questionnaire. This was completed by 20% of the total membership and 81% of these never, or occasionally, attended a winter meeting. Although the reasons for non-attendance were due to the timing of the meeting, council had considered all possibilities regarding alternative dates but had decided that it should remain within the first week of January. Although most members were happy with the current methods of payment, council had decided that it is time

we had a mechanism for on-line payment. It was considered that this would particularly benefit members outside the UK. We appear to compare well to other, larger Societies, but it was felt that we should play more of a role with policy makers etc. so the BPS is now a full member of the Biosciences Federation.

The report was accepted: proposed by Alison Taylor and seconded by Eileen Cox.

6. Future meetings

Barry Leadbeater informed members that the next winter meeting would be held at Plymouth, 4-6th January 2006 and would be hosted by Alison Taylor. Accommodation had been reserved at the Moat House Hotel. Two themed sessions were envisaged, the first being Post-Genomic Phycology (proposed by Jim Callow) but the second had yet to be decided. Any suggestions from the membership would be welcome and should be directed at Alison or Jim. Further information regarding the meeting would be included in the next issue of *The Phycologist*.

Barry also informed the membership that the winter meeting in January 2007 would be held at Scarborough, hosted by Graham Scott and Michelle Tobin.

7. Nominations to council

Barry Leadbeater informed members that his term of office had ended and he would replace Eileen Cox as Immediate Past President and Chair of the Awards & Training Committee. He thanked Eileen for her efforts over the past two years but reminded members that, as one of the Editors-in-Chief of the Journal, she was still on council. He thanked Jeanine Olsen for her term as Vice President (Overseas) and Mike Guiry for his term as Vice President

Elect. Council had offered these positions to Suzanne Fredericq and Geoff Codd respectively, and both had accepted. The terms of office of two ordinary and one student members had come to an end. He thanked Rod Forster, Graham Underwood and Charmaine Blake for their service on council. For the position of Student member, Sara Marsham had been proposed by Graham Scott and seconded by Michelle Tobin; no other nomination had been received. Six nominations had been received by Jackie Parry for four positions of Ordinary Membership (three for three years and one for two years). Juliet Brodie (proposed by Mary Holmes and seconded by Paul Hayes), Alex Elliot (proposed by Stephen Maberly and seconded by Jackie Parry), Mary Holmes (proposed by Juliet Brodie and seconded by Paul Hayes), Lydia King (proposed by Jackie Parry and seconded by Stephen Maberly), Elliot Shubert (proposed by Graham Underwood and seconded by Jackie Parry) and Martin Wilkinson (proposed by Graham Scott and Michelle Tobin). The membership elected, via a postal vote, Juliet Brodie, Martin Wilkinson and Lydia King for a three year term of office and Elliot Shubert for a two-year term of office.

The membership accepted all nominations.

8. AOB

Barry Leadbeater thanked all members of council for their support during his Presidency. On behalf of Council, Michael Guiry thanked Barry for his sterling services to the Society as President in the last two years.

The meeting ended at 5.45pm.

Jackie Parry

CALL FOR NOMINATIONS FOR BPS COUNCIL OFFICERS

The term of office for four ordinary members have been completed and the BPS Council therefore welcomes nominations for these posts to start in January 2006. Nominations in writing along with confirmation from the nominee that they are willing to stand should be sent to the Council Secretary, Jackie Parry, Department of Biological Science, Lancaster University, Lancaster, LA1 4YQ, UK, email: j.parry@lancaster.ac.uk by December 1st 2005.

Your Society Needs You!

Amendments to the constitution of the British Phycological Society are proposed (see next page) and will be voted on at the next AGM. It is important that as many members as possible have an opportunity to express their views and vote on these proposals. All members are strongly encouraged to attend the next ANNUAL GENERAL MEETING of the British Phycological Society which will take place at the Sherwell Centre, University of Plymouth at 15:45 on Friday January 6th.



Changes to the British Psychological Society Constitution

At the summer Council meeting in 2005, it was agreed that The BPS Constitution required amendment. Council have made suggestions and a new Constitution has been drafted. Approval for the new Constitution will be sought at the next AGM and members are asked to read the old and new Constitutions and make comment.

The main changes proposed are as follows:

- 1) The aims of the Society required alteration, to include the role of the Society in the public understanding of science.
- 2) The make-up of council needed to include the student representative, and the fact that there are now two joint editors-in-chief of the European Journal of Psychology.
- 3) Council decided that rather than having two Vice-Presidents, they should each be identified by an individual title (President Elect and Vice-President Overseas).
- 4) Other changes within the text include

the removal of Honorary within the titles of council officers, removal of "Society Rules" as we do not possess any, removal of "Postal" ballot, so that future ballots may make use of email, and other small typographical alterations.

If you are not able to attend the next AGM, which will held at Plymouth on January 6th at 15:45 pm then please forward your comments to Jackie Parry at j.parry@lancaster.ac.uk before the 15th December 2005.

Original constitution of the British Psychological Society

1. The name of the Society shall be "The British Psychological Society".
2. The aims of the Society shall be to advance education by the encouragement and pursuit of all aspects of the study of algae and to publish the results of this research in a journal, and also in other publications which shall from time to time appear desirable, provided that all publications of the Society shall be available to the general public.

All funds acquired by the Society shall be devoted to the aims detailed in paragraph 2 above or to such associated charitable projects as may from time to time further these aims.

Membership

3. Membership of the Society shall be open to anyone interested in any aspect of the study of algae. Application should be made to the Hon. Membership Secretary, who will supply a form to be completed, signed and returned by the applicant. Applications shall be considered by the Council. A copy of the Constitution and Rules of the Society shall be made available on request from the Hon. Membership Secretary. Applications for Corporate Membership may be considered by Council.
4. Fully paid-up members shall have the following privileges:
 1. To receive all notices pertaining to the activities of the Society and to attend all Meetings and Excursions.
 2. To receive all literature issued by the Society, free or at a reduced rate as the Council may from time to time determine.
 3. To vote in the election of the members of the Council, and to vote in the conduct of the affairs of the Society at any meetings of the Society.
 4. To be eligible for service on the Council and its committees, or as Officers.
 5. To introduce visitors at any meeting of the Society (with the exception of the Annual General Meeting), unless the Council by resolution suspends this privilege for any particular reason.
 6. To subscribe to the European Journal of Psychology at rates determined by Council and ratified at a General Meeting of the Society.
5. Every person on election shall pay to the Hon. Membership Secretary or the Hon. Treasurer, within one month, the annual subscription for the current year, such payment to entitle the member to all privileges of the society for that year. The first subscription paid by any member joining the Society within the

last two months of the calendar year shall also cover the succeeding year.

6. Resignation of membership shall be signified in writing to the Hon. Membership Secretary, but the member so resigning shall be liable for payment of the annual subscription for the current year, together with arrears due.

Annual subscription

7. Annual membership Subscriptions and subscriptions to the European Journal of Psychology (for those members wishing to receive the Journal)z shall be payable in advance and shall be due on the 15 January each year. At the discretion of the Council, reduced subscription may be paid by the following categories of members:-

1. Student members (undergraduate and post-graduate) for a maximum for four years.
2. Members retired from full-time employment.

Changes in subscription must be ratified at a General Meeting of the Society. Subscription rates shall be published in the Journal and in all relevant publications of the Society.

8. If any members shall be in arrears of his/her subscription for six months the Treasurer shall advise the member of the fact and, if payment is not made before the end of the subsequent period of six months, the member's name may be removed from the list of members.

Council

9. The business of the Society shall be conducted by a Council of members consisting of the six officers of the Society, namely: The President, the two vice-Presidents, the Honorary Secretary and the Honorary Treasurer, Honorary Membership Secretary together with the immediate past-President, the Honorary Editors of the "European Journal of Psychology" and the Newsletter (both ex-officio), and not more than nine Ordinary members of the Council; nine to constitute a quorum. All members of the Council, except the immediate past-President, the Hon. Editor and the Membership Secretary shall be elected by postal ballot, the result of the ballot being declared at the Annual General Meeting (see clause 14).
10. Officers and Members of Council
 1. The President and the two vice-Presidents shall be elected annually, and shall be eligible for a second consecutive year of

the same office. The retiring President and the vice-President shall not be eligible for re-election for the same office until an interval of three years from the expiry of the term of office. The immediate past-President shall continue to serve on Council (ex-officio) until succeeded by the next retiring President.

2. The Hon. Secretary, the Hon. Membership Secretary and the Hon. Treasurer shall be elected for a period of three years, and on retiring shall be eligible for re-election for a further three year period up to a maximum of three consecutive three year periods (with effect from January 1964 in the case of the Hon. Treasurer, and from January 1965 in the case of the Hon. Secretary).

3. In the case of the first Council to be elected in accordance with these rules, three Ordinary Members of the Council shall be elected for a period of one year, and three for two years. Thereafter, Ordinary Members of the Council shall be elected, normally in groups of three, for a period of three years. Retiring Ordinary Members elected in this way shall not be eligible for re-election to the same office until after an interval of two years from the expiry of the term of office. An Ordinary Member of Council, if elected to any other office on the Council, shall cease to be an Ordinary Member of Council. Ordinary Members elected for one year to fill a vacancy shall be eligible at the end of the year for immediate re nomination as an Ordinary Member (for the usual three year period).

4. The Hon. Editors of the "European Journal of Phycology" and the Newsletter shall be elected annually by the Council.

11. The Council shall have the power to co-opt any Member of the Society to fill vacancies occurring during the year in Council, the tenure of such co-opted members shall terminate at the Annual General Meeting. No one may be appointed as a co-opted member if, as a result, more than one third of the members of the council would be co-opted members.

12. The Council shall have the power to appoint for any special purposes sub-committees consisting either wholly or in part of Council Members, provided that all acts and proceedings of any such sub-committees shall be fully and promptly reported to the Council.

13. At the request of any three members of the Council, the Secretary shall convene a meeting of the Council, stating the nature of the business to be discussed.

14. Election of Council: Any member of the Society may nominate candidates, who shall be Members of the Society, for the election as President, Vice-President, Hon. Secretary, Hon. Treasurer, Hon. Membership Secretary or Ordinary Members of Council.

All such nominations, with the name of a seconder, and with written consent of the nominee to act if elected, shall be forwarded to the Secretary not later than two months before the Annual General Meeting. If no nominations are received for any of the offices becoming vacant on the council, it shall be the duty of the Council to make such nominations. Voting shall be by postal ballot and for this purpose the Secretary shall circulate to all members of the Society, one month before the Annual General Meeting, a ballot form listing all nominations for vacant offices on the Council. All completed ballot forms shall be returned to the Secretary in a sealed envelope bearing the signature of the member on the outside, before the Annual General Meeting; at that meeting the ballot forms shall be opened and the count made by scrutineers appointed by Council, and the results of the ballot declared. Any problems

arising through nominees for Council receiving the same number of votes will be resolved by a further vote of the members present at the Annual General Meeting.

Meetings

15. The Society shall hold one or more meetings each year, and one of these meetings shall be the Annual General Meeting. Thirty-five members shall constitute a quorum for an Annual General Meeting.

16. Notices of all general meetings shall be sent to each member by the Secretary at the earliest possible date, and the agenda of the meetings shall be sent out at least two weeks before each meeting.

17. At the Annual General Meeting members of the Society present shall consider any business brought before them by the Council, or by any member (of which four weeks' notice in writing has been given to the Secretary).

18. The President, or in his/her absence one of the vice-Presidents, shall be chairman at all meetings of the Society; in the absence of any of these officers another officer or members of the Council. At any meeting of the Society the chairman shall decide as to procedure and the order of business. It shall be within the chairman's discretion to admit communications or other business, other than alterations to the rules not included in the programme.

In the case of equality of votes at any meeting of the Society or of the Council, the chairman may exercise a second or casting vote.

19. Finances: It shall be the duty of the Hon. Treasurer to prepare annual accounts as prescribed by current legislation. The annual accounts shall be examined by an Independent Examiner, who shall be an independent person who is reasonably believed by Council to have the requisite ability and practical experience to carry out a competent examination of the records. Copies of the annual accounts and the Independent Examiner's Report shall be circulated to Members together with the Agenda for the Annual General Meeting. The Independent Examiner shall be elected for the ensuing year at the Annual General Meeting.

20. Minutes: The Council shall cause Minutes to be duly entered in the books for the purpose of recording: all the appointments to the Council; the names of the members present at each meeting of the Council; and the proceedings of these meetings, the proceedings of the Annual General Meeting and any other special meeting.

Honorary membership

21. At any general meeting of the Society, after nomination by the Council, persons who have rendered conspicuous service to the subject of Phycology or to the Society may be elected Honorary Members of the Society. Honorary Members may have all privileges of membership as defined in Clause 4 of this constitution together with free receipt of the Journal.

Alterations to the Constitution

22. No alterations to the constitution and Rules shall be made except at -the Annual General Meeting, or at a special meeting of the Society called by the Council for that purpose. Notice in writing of any proposed alterations shall be given to the Secretary at least six weeks before any such meeting, and the



proposed alterations shall be circulated to members with the agenda for that meeting. No alteration shall be made unless two-thirds of the members voting at the meeting are in favour of it. Notwithstanding the foregoing, no alterations may be made to this constitution that shall cause the Society to cease to be eligible for registration as a charity at law.

Dissolution of the Society

23. The Society may be dissolved, after one year's notice in writ-

ing to all members, by postal ballot in which the majority of all paid-up members who vote, shall be required to affirm the motion to dissolve the Society.

The funds remaining to the credit of the Society at the time of dissolution shall be distributed to one or more other societies being constituted as charities and having similar aims to the British Psychological Society; the selection of these societies being the duty of the Council of the British Psychological Society at the time of its dissolution.

Proposed Amended Constitution of the British Psychological Society

1. The name of the Society shall be "The British Psychological Society".
2. The aims of the Society shall be to advance research and education by the encouragement and pursuit of all aspects of the study of algae and to publish the results of this research in a journal, and also in other publications which shall from time to time appear desirable, provided that all publications of the Society shall be available to the general public. The Society shall also aim to increase public awareness of the importance and applications of algae, and to contribute to public debate on issues involving algae.

All funds acquired by the Society shall be devoted to the aims detailed in paragraph 2 above or to such associated charitable projects as may from time to time further these aims.

Membership

3. Membership of the Society shall be open to anyone interested in any aspect of the study of algae. Application should be made to the Membership Secretary, who will supply a form to be completed, signed and returned by the applicant. A copy of the Constitution shall be made available on request from the Membership Secretary. Applications for Corporate Membership may be considered by Council.
4. Fully paid-up members shall have the following privileges:
 1. To receive all notices pertaining to the activities of the Society and to attend all Meetings and Excursions.
 2. To receive all literature issued by the Society, free or at a reduced rate as the Council may from time to time determine.
 3. To vote in the election of the members of the Council, and to vote in the conduct of the affairs of the Society at any meetings of the Society.
 4. To be eligible for service on the Council and its committees, or as Officers.
 5. To introduce visitors at any meeting of the Society (with the exception of the Annual General Meeting), unless the Council by resolution suspends this privilege for any particular reason.
 6. To subscribe to the *European Journal of Phycology* at rates determined by Council and ratified at a General Meeting of the Society.
5. Every new member shall pay to the Membership Secretary or the Treasurer, within one month, the annual subscription for the current year, such payment to entitle the member to all privileges of the Society for that year. The first subscription paid by any member joining the Society within the last two months of the calendar year shall also cover the succeeding year.
6. Resignation of membership shall be signified in writing to the Membership Secretary, but the member so resigning shall be

liable for payment of the annual subscription for the current year, together with arrears due.

Annual subscription

7. Annual membership subscriptions and subscriptions to the *European Journal of Phycology* (for those members wishing to receive the Journal) shall be payable in advance and shall be due on the 15 January each year. At the discretion of the Council, reduced subscription may be paid by the following categories of members:

1. Student members (undergraduate and post-graduate) for a maximum for four years.
2. Members not in full-time employment.

Changes in subscription must be ratified at a General Meeting of the Society. Subscription rates shall be publicised in the Journal and in all relevant publications of the Society.

8. If any members shall be in arrears of his/her subscription for six months the Treasurer shall advise the member of the fact and, if payment is not made before the end of twelve months, the member's name may be removed from the list of members.

Council

9. The business of the Society shall be conducted by a Council of members consisting of the six officers of the Society, namely: The President, President Elect, Vice-President Overseas, the Secretary, the Treasurer and the Membership Secretary together with the immediate past-President, the Editors of the *European Journal of Phycology* and the Newsletter (ex-officio), and not more than ten Ordinary Members of the Council and one of them should be a Student Member; nine to constitute a quorum. All members of the Council, except the immediate past-President and the Editors shall be elected by ballot if contested, the result of the ballot being declared at the Annual General Meeting (see clause 14).

10. Officers and Members of Council

- a) The President, President Elect and Vice-President Overseas shall be elected biannually. The retiring President, President Elect and Vice-President Overseas shall not be eligible for re-election for the same office until an interval of three years from the expiry of the term of office. The immediate past-President shall continue to serve on Council (ex-officio) until succeeded by the next retiring President.
- b) The Secretary, the Membership Secretary and the Treasurer shall be elected for a period of three years, and on retiring shall be eligible for re-election for a further three year period up to a maximum of three consecutive three year periods.
- c) Ordinary Members of the Council shall be elected, normal-

ly in groups of three, for a period of three years. Retiring Ordinary Members elected in this way shall not be eligible for re-election to the same office until after an interval of one year from the expiry of the term of office. An Ordinary Member of Council, if elected to any other office on the Council, shall cease to be an Ordinary Member of Council. Ordinary Members elected for one year to fill a vacancy shall be eligible at the end of the year for immediate re-nomination as an Ordinary Member (for the usual three year period).

d) The Editors of the *European Journal of Phycology* and the Newsletter shall be elected annually by the Council.

11. The Council shall have the power to co-opt any member of the Society to fill vacancies occurring during the year in Council, the tenure of such co-opted members shall terminate at the Annual General Meeting. No one may be appointed as a co-opted member if, as a result, more than one third of the members of the Council would be co-opted members.

12. The Council shall have the power to appoint for any special purposes sub-committees consisting either wholly or in part of Council Members, provided that all acts and proceedings of any such sub-committees shall be fully and promptly reported to the Council.

13. At the request of any three members of the Council, the Secretary shall convene a meeting of the Council, stating the nature of the business to be discussed.

14. Election of Council: Any member of the Society may nominate candidates, who shall be members of the Society, for the election as President, President Elect, Vice-President Overseas, Secretary, Treasurer, Membership Secretary or Ordinary Members of Council.

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18. The President, or in his/her absence the President Elect or Vice-President Overseas, shall normally chair all general meetings of the Society; in the absence of any of these officers another officer or members of the Council. At any meeting of the Society the chair shall decide as to the procedure and the order of business. It shall be within the chair's discretion to admit communications or other business.

In the case of equality of votes at any meeting of the Society or of the Council, the chair may exercise a second or casting vote.

19. Finances: It shall be the duty of the Treasurer to prepare annual accounts as prescribed by current legislation in England and Wales. The annual accounts shall be examined by an Independent Examiner, who shall be an independent person who is reasonably believed by Council to have the requisite ability and practical experience to carry out a competent examination of the records. Copies of the annual accounts and the Independent Examiner's Report shall be circulated to members together with the agenda for the Annual General Meeting. The Independent Examiner shall be elected for the ensuing year at the Annual General Meeting.

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Dissolution of the Society

23. The Society may be dissolved, after one year's notice in writing to all members, by ballot in which the majority of all paid-up members who vote, shall be required to affirm the motion to dissolve the Society.

The funds remaining to the credit of the Society at the time of dissolution shall be distributed to one or more other societies being constituted as charities and having similar aims to the British Phycological Society; the selection of these societies being the duty of the Council of the British Phycological Society at the time of its dissolution.



Obituary

Gordon Elliot Fogg (1919-2005)

The following obituary appeared in the THE INDEPENDENT, Friday 14th February 2005 and is reprinted with permission.

Professor G.E. Fogg

Botanist who undertook pioneering studies of algae

Cyanobacteria are responsible for a large proportion of the two processes, photosynthesis and nitrogen fixation, that sustain life on Earth. Sixty years ago these organisms were regarded as an underclass of the smallest plants and classified as blue-green algae. Part of the large body of work that has since established their global importance had its foundation in the pioneering studies of G.E. Fogg.

Gordon Elliot Fogg, known as Tony by family and friends, was the son of a Methodist minister. His interests in plants began as a boy when he spent summers collecting herbarium specimens on his grandparents' farm. He was educated at Dulwich College and in 1937 obtained a scholarship to Queen Mary College London to read Botany.

The College was evacuated to Cambridge on the outbreak of war in 1939 and, after graduating, Fogg was registered as a conscientious objector, conditional on undertaking research. He came under the influence of three scientific giants, his supervisor, Professor F.E. Fritsch, author of an encyclopaedic work on algae, the plant physiologist G.E. Briggs, and E.G. Pringsheim, from Prague, who founded the Culture Centre of Algae and Protozoa at Cambridge.

Fogg established pure cultures of the cyanobacterium *Anabaena cylindrica* and, by rigorously excluding ammonia and nitrogen oxides from the air, demonstrated that it obtained nitrogen for growth solely from nitrogen gas in the atmosphere.

Anabaena produces filaments with two cell types: the majority of cells contain the blue and green photosynthetic pigments but at regularly-spaced intervals paler, thick-walled 'heterocysts' occur. As filaments grow, new heterocysts form midway between existing ones, which, Fogg suggested, produce an inhibitor that prevents neighbouring cells from differentiating. He found that ammonia and amino acids inhibited heterocyst formation and suggested that such substances might form the controlling gradients. The resulting one-dimensional pattern later became a model for understanding morphogenesis.

During the Second World War Fogg assisted V.J. Chapman in a national survey of seaweed resources for the Ministry of Supply. Years later Fogg discussed the survey's consequences in a lecture, *A Scientist Examines his Conscience*: red algae were harvested for medicinal culture media; but kelps were gathered to make water-soluble silk for parachutes to drop mines at sea. Scientists cannot control the applications of their discoveries. A Wodehousian account of the survey, *Strictly Marginal*, by the three assistants, Dick Richens, Tony Fogg and Ralph Lewin, was published years later in 1995.

In the closing years of the war, Fogg worked for Pest



G.E. Fogg
Photograph: Professor Ernest Naylor

Control Ltd at Harston where he met Beryl Llechid-Jones, investigating antimalarial drugs: they were married in Colwyn Bay in July 1945.

Fogg was appointed Lecturer in Botany at University College London, in 1945. He resumed work on cyanobacteria and microalgae and wrote a masterly monograph, *The Metabolism of the Algae* (1953). His finding that microalgae released much of their photosynthate as extracellular material, available for growth of other organisms, was factored into estimates of global primary production.

In 1960 Fogg was appointed Professor of Botany at Westfield College London, a women's college expanding with the addition of a science faculty and, shortly after, the admission of men. Aware of the limitations of a small department, he decided it must specialise: of the first eight academics recruited, four were cyanobacteriologists (I was the fourth). A key appointment was William Stewart (later Chief Scientific Adviser in the Cabinet Office) who, together with Peter Fay, a Hungarian refugee, coordinated the research in this area and provided the missing pieces in the heterocyst jigsaw: the heterocyst was the site of nitrogen fixation and this process the source of the heterocyst's ammonia production. The details were subsequently worked out in laboratories of Stewart, when he moved to Dundee, Bob Haselkorn in Chicago and Peter Wolk at Michigan State University, East Lansing.

During the Westfield period Fogg championed investigations of microalgae in cultures for understanding their contribution to the ecology of lakes and oceans. His lectures on this topic in Madison, Wisconsin were published in *Algal Cultures and Phytoplankton Ecology* (1965), which ran to three editions, the

last (in 1987) with Brenda Thake from Westfield. *The Blue-green Algae* (1973) was the swan song of the cyanobacterial group. Fogg also wrote short textbooks, *The Growth of Plants* (1963) and *Photosynthesis* (1968), published in paperback: he thought science books ephemeral and hence disposable. His personal research in this period was confined to visits abroad, at Kerala in India and, more successfully, in the Antarctic where, with acute field observations, he showed that colourful patches of snow algae resulted from growth within the snow pack followed by accumulation at the melting surface.

Fogg was smitten by Antarctica and fascinated by the biological productivity of the frozen seas. He made further visits south and chaired the scientific advisory committee of the British Antarctic Survey for 13 years. He later wrote *The Exploration of Antarctica* (1990), with paintings by David Smith, and the scholarly *A History of Antarctic Science* (1992). His son, Timothy, also worked in the Antarctic; their contributions are commemorated in the naming of the Fogg Highlands.

In 1971, Tony Fogg moved to the Chair of Marine Biology at the University College of North Wales, at Bangor, hoping to do something for the plant side of a subject dominated by zoologists; his wife's Welsh origins were also a factor. The domestic and geographical settings were idyllic but the academic environment was not. Half the scientific accommodation was in dilapidated seaside houses and the purpose-built laboratories were largely under the control of his predecessor, Dennis Crisp, who retained directorship of the NERC (Natural Environment Research Council) Research Unit. Fogg's strategy of negotiating through genteel discussion was tested to the limit. Thirty years later, the School of Ocean Sciences is transformed with excellent facilities and a new research vessel.

Fogg was a formal but highly approachable Englishman,

unruffled, never cross with people, kindly with everyone. He was a gifted speaker: I was mesmerised by his lectures, which he delivered, without notes, sitting on the lecture bench, legs swinging. On committees he was valued for his succinct observations, often sorting out the unresolvable points behind the scenes. His diplomatic skills lead to chairmanships of the Council of the Freshwater Biological Association and the scientific advisory bodies of Kew Gardens and the Culture Centre for Algae and Protozoa, Pringsheim's legacy. He became President of the Institute of Biologists and sat on the Council of NERC and Royal Commission on Environmental Pollution.

In retirement Tony Fogg remained active to the end, producing articles on science and his writing lost none of its wonderful, inimitable style. He was elected FRS in 1965 and appointed CBE in 1985.

ANTHONY WALSBY

Gordon Elliot Fogg, botanist: born Langar, Nottinghamshire, 26 April 1919; Assistant Lecturer, Lecturer, then Reader in Botany, University College London 1945-1960; Professor of Botany, Westfield College London 1960-1971; Professor of Marine Biology, University College of North Wales 1971-1985 (Emeritus); President, British Phycological Society 1961-1962; FRS 1965; Chairman, British Antarctic Survey Scientific Advisory Committee 1971-1984;

Chairman, Freshwater Biological Association Council 1974-1985; Chairman, Scientific Advisory Panel, Royal Botanic Gardens, Kew 1974-1982; President, Institute of Biology 1976-1977; CBE 1985; married 1945 Beryl Llechid-Jones (died 1997; one son, one daughter); died Llandegfan, Anglesey 30 January 2005.



Tony Fogg:

combining courtesy with success

It is hoped that what follows will compliment the obituary of Tony Fogg, adding the viewpoints of those who first knew him at various stages of his career.

Joanna Jones (Kain)

I met Gordon Elliot Fogg in Cambridge when QMC was 'evacuated' there. So did Beryl. Maybe the Scottish name Gordon displeased her as a Welshwoman and she renamed him Tony. For many the name stuck. I think he was the first to axenize a cyanophyte (some would say that he rendered a culture of cyanobacteria free of bacteria - how silly!). From Gordon and his friend S.P. Chu I learned how to use chopsticks. He was the son of a clergyman, and at his wedding in Wales the organ played one of his (and my) favourite hymns - something ovine, perhaps 'Sheep may safely graze'. We were on the seaweed survey together, and later - much later - he edited 'Strictly Marginal', into which he incorporated some of his cartoons (of which he was a good artist). He also excelled in

water-colours. More importantly, he headed a team of cyanophycologists with whom he edited 'The Biology of Blue-green Algae'. His little Methuen monograph 'The Metabolism of Algae' is also a classic. I don't know how he got into British Antarctic research, on which he became an authority. He'd participated in expeditions to the chilly south, and I think latterly gave lectures while on board (I don't remember him as a particularly strong-stomached sailor). Though older than I, he seemed in good health when we attended the Gilbert & Sullivan festival in Buxton a few years back. I believe that he swam daily (I don't). His death has saddened us.

Ralph Lewin

Somehow Tony managed to combine being one of the nicest people around with achieving pre-eminence as a scientist. He did this by doing everything well without stepping on other peoples' toes. In my experience the nearest he got to criticizing anyone was after he had spent a day showing Lily Newton around the UCL department and said that she was 'a little overpowering'.

In an era when most scientists find it necessary to specialize quite narrowly in order to succeed, Tony's expertise encompassed several broad areas of biology during his career. Though already smitten with the blue-greens, he got to know marine algae during the war and never forgot them. At University College London, he was more involved with freshwater algae and their culture. At Westfield College he was able to build a powerful research group specializing on cyanobacteria but at the same time his interest in the excretion of organic substances by algae continued. Professor Nomita Sen was one of his students at that time and describes his excitement when she showed him her results on the

positive effect of one such substance on algal growth. When, at Menai Bridge, he became officially a marine biologist, this interest flowered into a plenary lecture on an extracellular metabolite in the sea at the 1974 International Seaweed Symposium in Bangor. One might think that being chief executive of an International Botanical Congress in Edinburgh (10 years previously) would be enough for anyone but he had taken on the ISS apparently cheerfully and the meeting was a great success. Finally, with his passion for the Antarctic, the wide scope of his expertise came to the fore again as was demonstrated in his last book, *The Biology of Polar Habitats*.

The issue of the British Phycological Journal dedicated to him when he retired - Vol. 21 (2) consisted solely of papers written by his students. The number, 14 (12 papers, 2 co-authored by students) in active research is remarkable as is the range of subjects, testament to the broadness of Tony's expertise. He decided to read the whole issue and write to each author.

He was an excellent lecturer, imparting accurate and interesting knowledge interposed with enough dry wit to keep the attention of the most difficult students. He was a great supervisor, always available with good advice but only when asked. Somewhat surprisingly, because of his reserve, he was also an excellent committee chairman. While accomplishing all this he was able to achieve an international reputation through his research and writing. I don't know how much struggle was involved but good English, compact and to the point but easy to read, flowed from his typewriter. And he had time for continued mentoring as well. He had many students and if one multiplied them by the amount of help he gave me over the years it would be daunting. Again he was always there for advice and support and interested, as a friend, in any family news. Now there is a great hole.

Joanna Jones (Kain)

I first met Tony (then Dr Fogg) early in 1952 when I went for an interview for a place at University College, London. I was soon put at ease when I was shown into his office-cum-laboratory. Dr Fogg cleared away some test tubes and petri dishes on his desk and asked me to sit beside him. I seem to remember that the conversation soon turned to seaweeds and we spent most of the time talking about them.

At UCL I particularly enjoyed his lectures. He did not read from notes but walked to and fro at the front, speaking very

clearly and not too fast. At the end of the first year we went to a field meeting at the UCL field centre at Blakeney Point. Each day we carried out field ecology and once we were really engaged in the day's task Dr Fogg and Professor Pearsall would disappear to various vantage points where they could keep an eye on us while being very busy with their sketchbooks. After the evening meal was cleared away Prof Pearsall and Dr Fogg produced their sketchbooks and exchanged them so that they could criticise each other's work..

Dr Fogg suggested I should stay on for a Ph.D. at UCL. As a supervisor Dr Fogg tended not to interfere but was always around if one was worried or wanted help or advice.

When I was awarded a fellowship at the Plymouth Laboratory I discovered that Dr Fogg had joined the MBA in 1957 and was elected to the Council 1958. This was not his first contact with the MBA at Plymouth because from 1941-43, as a new graduate from Cambridge, he was employed on a wartime survey of the resources of brown seaweeds around the British Isles. This was based at the MBA at Plymouth and Tony Fogg was actually on the pay roll of The Laboratory.

Tony served as an elected member of the Council of the MBA 1958-61, 1964-67 and 1968-71. In 1973 he was appointed Governor for the British Association on the MBA Council

and he held this post until he retired in 1999. He was elected an honorary life member of the MBA in 2000. He regularly attended the Annual Council Meeting and Inspection at Plymouth and nearly always stayed with us during the visit. During the Council Meeting in 1999 Tony planted a holm oak on the Laboratory site. Several years earlier as Bursar of the MBA I had had to give permission for a very diseased holm oak on the site to be cut down and removed. At the time I found a small seedling not far away and I grew it on. I felt that Tony was the right one to plant it not far from where the original one had been removed and it was fitting that the planting was done on his last visit as a member of Council.

Gerald Boalch

Gordon Elliott Fogg, or Tony, had an early interest in plants. After Dulwich College and QMC in London and Cambridge he was part, with Val Chapman, Dick Richards and Ralph Lewin, of the national survey of seaweed resources in Britain. An engaging account of this survey, entitled 'Strictly Marginal' was published five decades later by the British Phycological Society. Fogg's laboratory work in Cambridge was influenced by three significant scientists; his research career benefited from the breadth of phycological vision of F.E. Fritsch, the emphasis on, and expertise in, microalgal cultures of E.G. Pringsheim, and the plant physiological rigour of G.E. Briggs.

At University College London, he was under Professor W.H. Pearsall, whom he considered to be the perfect head of department. After 15 years he was, he claimed, deemed to be sufficiently competent to become Professor of Botany at Westfield College London. He was acutely aware of the limitations of a small department, and knew that focus was needed in the areas of research that

were pursued. The appointment of three further cyanobacteriologists led to very important work on the function of the cyanobacterial heterocyst in nitrogen fixation; this research is what he claims earned him his FRS in 1965. Fogg reported that his time at Westfield was the happiest of his academic life.

By 1971 he was keen to specialize in marine microbiology, and moved to the Marine Science Laboratories at Menai Bridge in the Isle of Anglesey. He found that there were excellent staff and good equipment, including five research vessels, but that the easy relationships at Westfield were not evident, and on the 1980s this was compounded by financial hardships. He worked on the extracellular organic products of organisms in seawater, and the biological significance of tidal fronts in the Irish Sea; later he made major contributions to the study of marine phytoplankton. He claimed that his major achievement at Menai Bridge was to hold the Department together until his retirement in 1985, the year in which he was appointed CBE.

During this time he was involved with

various scientific societies and organisations, including the Freshwater Biological Association, the Institute of Biology, the Society for Experimental Biology, the British Phycological Society, the British Association for the Advancement of Science, the Royal Botanic Gardens, Kew, the British Museum Natural History, the Marine Biological Association, the Culture Collection for Algae and Protozoa, the Council of NERC and the Royal Commission on Environmental Pollution. His great devotion to Antarctic Science involved several trips south; he was Chairman of the British Antarctic Survey Scientific Advisory Committee 1971-1984. Later he wrote two books, 'The Exploration of the Antarctic' and 'A History of Antarctic Science', and visited polar seas as a lecturer on several tourist vessels.

Fogg was rather formal but very approachable, a gifted lecturer and a good friend. He was a scholar and a gentleman; he is missed.

John Raven

I had known Tony Fogg for a long time, primarily from attending BPS meetings, but it was not until he took up his appointment as external examiner to the Botany Department at Liverpool that I came fully to appreciate the extent of his erudition and personal charm. He interviewed our undergraduates with unfailing courtesy, always bringing out the best in them, and his judgements were invariably sound. These virtues were even more evident when he examined doctoral theses submitted by a number of my students over the years. I never heard a word of complaint from any of them and indeed all were lavish in praise of the man and for his genuine interest in

their work. After one such examination, I was walking with him to the railway station for his train back to Bangor when we bumped into his young son, then I think a student at another university but in Liverpool for the day. Each was unaware of the other's presence in the city. Their mutual delight at the unexpectedness of the meeting and their laughter gave a vivid picture of the immense warmth of this rather shy and reserved man. We shall all miss him hugely.

George Russell



Obituary

C.K. Tseng (1909–2005)

Professor Tseng Cheng Kui (Zeng Chengkui in Putonghua) died peacefully in China on 20 January 2005, aged 95, was born on 18th June 1909, in Xiamen, Fujian Province in China's southeast. He obtained his tertiary education at Amoy (now Xiamen) University, graduating in 1930 and immediately being appointed as an assistant in the Department of Botany. In 1928, CK had enrolled in a phycology course given by the Harvard graduate H.H.Chung. This training led to a lifelong interest in algae – plants that CK would research for the rest of his life and become the Chinese and an international authority on.

In Amoy, CK became interested in how local people cultivated *Gloiopeltis furcata*, colloquially called “Chicai”. Intertidal rocks were scraped clean of grazing animals, allowing the *Gloiopeltis* sporelings to settle and grow. After cropping, the weed was exported to Canton (now Guangzhou) where it was used in the sizing of silk. CK published a paper, his first, on this in 1933 with the help of Professor F.A.McClure who was teaching a course on economic botany at Amoy. The two fields of phycology and economics were thus forged and CK's career was on track. In addition to studying *Gloiopeltis*, however, CK also traveled widely throughout southern China, including Hong Kong, collecting algae as part of the summer surveys conducted by members of the newly founded (in 1930) Marine Biological Association of China. The reports of such surveys formed the foundations upon which CK's subsequent career would rest. CK began his postgraduate research in 1932, with the assistance of a Rockefeller Foundation Junior Fellowship, at Lingnan University, in Canton, to study for a M.Sc. on the algae he had collected. The degree was awarded in 1934. Subsequently, CK moved back to Amoy as an instructor, being eventually appointed Assistant Professor of Botany in 1937. Because of the Japanese invasion of China, the university moved to Wanxian, Sichuan Province, in 1938. In that year he became Assistant Professor of Botany

and Curator of the Herbarium at Lingnan University in Canton and Hong Kong. In this first phase of his research, CK published 13 papers on the seaweeds of China, but realized, since he was virtually the only person doing such work, that he needed wider contacts and in 1940 obtained a University fellowship that allowed him to study his growing collection of Chinese algae at Ann Arbor, Michigan State University, registering for a doctoral degree under the supervision of Professor W.R. Taylor. He obtained this degree in 1942.

At the time he obtained his Ph.D, the Pacific War had begun and CK was forced to remain in the USA. To improve his knowledge of marine science and with the support of a Rackham Postdoctoral Fellowship, he decided to undertake courses in oceanography at Scripps Institution. Subsequently, the (Norwegian) director, Dr H. V. Sverdrup, asked him to take on a project to increase the home supply of agar, because Japanese imports had halted, and the material was in short supply. One of CK's most significant contributions to this research was his field study of the growth of the subtidal *Gelidium cartilagineum* using “hard hat” diving gear! CK published some 15 papers on agar and the carrageenin industry, culminating in him writing the Agar section for the 1948 issue of Encyclopaedia Britannica. After six years in the USA where he had become a leading authority on the industrial and food uses of marine algae, and with the Pacific War over, CK decided to return to China, arriving in December 1946. He was immediately appointed Professor and Chairman of the Department of Botany of the National University of Shandong (Province) in Tsingtao and Associate Director of the University's Institute of Oceanography. Later, after Liberation, in August 1949, CK was partly responsible for establishing the Marine Biological Laboratory of Academia Sinica at Tsingtao. This became the Institute of Oceanology in 1959 and CK its first Associate Director. He was effectively in charge of the day-to-day running of the institute



C.K. Tseng in 2001
(Photograph: B.Morton).

but over 70 papers flowed from his laboratory between 1959 and 1966 and he became the leader in the Nation's drive to develop all forms of mariculture. During the “Great Leap Forward” of the 1950's, other industries failed but mariculture continued to expand due in large part to his leadership, dedication, acumen and commitment to his belief that nothing could be successful if it was not based on sound science. But then disaster struck.

The “Cultural Revolution” effectively brought to an end the scientific research of nearly all academics in China so that during the period from 1966-1976 CK published but two papers and, like others, suffered personal humiliation and rejection. For such an active mind, this period must have been a truly terrible experience but, in 1975, in his capacity as Vice-Chairman of a Chinese Delegation for Science and Technology, he was invited to visit the USA and his old workplace at Scripps. A fellow student from his days at Ann Arbor also remembered him and in October 1975 he met President Gerald Ford again.

The years between 1976 and the early 1990's were particularly prolific for CK and he published over 130 papers and six books. In the context of his overall life, Hong Kong was important early on because he published, then, the only taxonomic phycological accounts of the

British Colony. In 1980, however, I organized the First International Marine Biological Workshop on the Marine Flora and Fauna of Hong Kong and Southern China, and CK led the very first delegation of eight Chinese scientists to participate in it. This was the first visit to Hong Kong allowed by the Chinese Government, but it was where he and I struck up a lasting friendship. We jointly edited the workshop's proceedings of 51 original papers and, thereby, laid the foundations for the development of marine science in Hong Kong.

In 1987, aged 78, CK resigned from the directorship of the Institute of Oceanology at Qingdao, but took on the task of heading the Experimental Marine Biological Laboratory of the Open Laboratory for Marine Biology, in Qingdao, and was retained by the now famous Institute of Oceanology as an Emeritus Professor by the Chinese Academy of Sciences. In 1993, the Open Laboratory established a new Marine Biotechnology Development Centre that, in my view, is a fitting testament to the life's work of one man in the field of mariculture. For example, during a Marine Workshop's Reunion Conference that I convened in Hong Kong in 2001, and to which CK was invited as an honoured colleague and friend, he reported that in 1999, seaweed culture in China had attained a production figure of 1,172,838 tonnes. At this conference too, CK, now aged 92, but his mind as active as ever, argued that seaweeds should be cultivated in conjunction with marine animals to utilize the latter's metabolic by-products and thereby reduce nutrient overloading in the sea and mariculture systems. He called this "ecological aquaculture".

CK received many honours throughout his long life, including in 2001 the Award of Excellence from the Phycological Society of America, which he had participated in the foundation of in the 1940's. He was also made an Honorary Life Member of the World Aquaculture Society and the International Phycological Society. He published nearly 300 papers and six books over a writing career that spanned 70 years. Remarkable. When I last met CK in 2001, his secretary told me that he had been recognized by the Government of China as a National Living Treasure. Quite rightly so, and fitting recognition for a man who devoted his entire life to phycology and the economic development of all forms of mariculture in China such that, today, the Nation is the world's leading proponent of marine agronomy. This achievement, however, is matched by CK's immense charm, modesty, friendliness and a remarkable ability to engage in lively debate, and an indefatigable interest in everything and everybody he came into contact with. CK clearly loved life and lived it to the full to our great fortune.

Professor C.K.Tseng is survived by his wife, Zhang Yi-fan, two sons and two daughters but also believes behind him a legacy that will be very difficult for anyone else to follow.

Brian Morton
Department of Zoology
The Natural History Museum,
Cromwell Road,
London SW7 5BD, UK.
(e-mail: prof_bsmorton@hotmail.com)



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Addresses

1. Dr Jackie D. Parry
Dept Biological Science
Lancaster University
Lancaster LA1 4YQ
UK
j.parry@lancaster.ac.uk
Tel: +44 (0)1524 593489

3. Dr Graham Scott
Dept Biological Sciences
University of Hull
Hull HU6 7RX, UK
g.scott@hull.ac.uk
Tel: +44 (0)1482 466424

5. Miss Sara Marsham
Scarborough Centre for
Coastal Studies
University of Hull
Filey Road, Scarborough
YO11 3AZ, UK
s.marsham@hull.ac.uk
Tel: +44 (0) 1723 357223

2. Dr Michelle Tobin
Scarborough Centre for Coastal Studies,
University of Hull
Filey Road, Scarborough,
YO11 3AZ, UK
m.l.tobin@hull.ac.uk
Tel: +44 (0)1723 357290

4. Dr Alison R. Taylor
Marine Biological Association
The Laboratory
Citadel Hill
Plymouth PL1 2PB, UK
arta@mba.ac.uk
Tel: +44 (0)1752 633348



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Copy should be submitted to:

Dr Alison Taylor,
Marine Biological Association of the United Kingdom,
The Laboratory, Citadel Hill,
Plymouth, PL1 2PB
Tel. +44 (0)1752 633348
Fax. +44 (0)1752 633102,
E-mail: arta@mba.ac.uk

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