

British Phycological Society Newsletter

EDITORIAL

Having just sent a previous Newsletter to press, in which I congratulated Professor Wm Randolph Taylor on his forthcoming 95th birthday, it was with great shock and sadness that I learnt of his death on 11 November 1990 only 40 days short of that birthday. The news was all the more poignant as I had received a letter from him only a few weeks before. A full obituary is to appear in the British Phycological Journal, as it is many phycological journals and newsletters. In the mean time I would like to take this opportunity to convey the thoughts of all our membership to his family.

Onto lighter things, the next Winter meeting of the Society is to be held in Birmingham with Dr. B.S.C. Leadbeater acting as local secretary. All

the fun of the fair (and Disco) will be there, including some real SCIENCE (see pages 2 and 3)

DON'T FORGET THE AUCTION!

A particular attraction of the Birmingham meeting will be the Trade exhibits and special sessions on applied aspects of Algae and Water Quality. These aim to bridge the gap between the academic and industry interests with special sessions on Algae and pollution, Algal toxins, Methods of Algal control and Algae and Water Treatment. A must for the water industry - so tell your friends.

Editor.

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

NOTE: COPY DEADLINE FOR THE NEXT ISSUE IS MARCH 1 1992

WINTER MEETING

BIRMINGHAM, JANUARY 6-9 1992

The winter meeting of the Society is to be held at Birmingham University under the local organisation of Dr. B.S.C. Leadbeater. It promises to be a classic with a strong emphasis on pollution and algae in relation to the water industry as well as other special sessions on Molecular and cell biology and Algal systematics. (see panel).

Of course, one of the great institutions of winter meetings is the after-dinner auction (since all of last year). This is fun and successful and helps boost the society's coffers and, thus, the promotion of phycology and phycological research. Of course much of the credit must go to that reticent and nameless, yet flamboyant

auctioneer but even more credit must go to our current President, Brian Whitton, who thought up the idea and persuaded so many to part with phycological possessions. This year he will be assisted by Gavin Hardy WHO HAS ALL YOUR PHONE NUMBERS. So, before he phones you, dig out a book, some papers, photos, drawings, specimens, seaweed tea, laver bread etc. etc. and either bring it or give it to someone who will be there. Unusual objects and momentos with a phycological connection are especially welcome. You must have something - persuade yourself that you can afford to part with it - if you change your mind you can always bid and buy it back!

REMEMBER THE AUCTION

SECOND FOUNDERS LECTURE

The second founders lecture will be given by DR. P.A.TYLER, (TASMANIA).

SPECIAL TOPIC SESSIONS

MODERN APPROACHES TO ALGAL SYSTEMATICS.

Organised by CHRISTINE MAGGS AND MATT DRING (BELFAST).

Mike Guiry (Galway) has been invited to discuss the role of culture studies in sorting out the taxonomy of the Rhodophyta, Peter Gacesa (Cardiff) to describe recent progress in utilising nuclear and plastid DNA analysis in the taxonomic debate concerning Gracilaria and Callithamnion and Linda Medlin (Bristol) to explain the connection between rRNA sequences and the evolution and taxonomy of diatoms.

The organisers would welcome contributions concerning these and other algal groups. Please contact the organisers before October if you would like to discuss the form or suitability of a contribution, or send your paper/poster title to the secretary in response to the First Circular indicating this topic area.

MOLECULAR AND CELL BIOLOGY

Organised by PHIL WRIGHT (BIRMINGHAM) AND PAUL HAYES (BRISTOL).

Please contact the above to submit titles of papers and posters. Details in the first circular documentation.

ALGAE AND WATER QUALITY

Organised by BARRY LEADBEATER

Again all contributions welcome - see page 4.

MEETING PROGRAMME

**JAN 6TH - PM REGISTRATION, EVENING
BUFFET, TRADE EXHIBITS AND POSTER
SESSION**

**JAN 7TH - FOUNDERS LECTURE AND
ALGAE AND WATER QUALITY SPECIAL
SESSION, EUROPEAN FEDERATION OF
PHYCOLOGICAL SOCIETIES FOUNDATION
MEETING, DISCO.**

**JAN 8TH - SPECIAL SESSIONS AND
OFFERED PAPERS, AGM, BPS DINNER
AND AUCTION**

**JAN 9TH - SPECIAL SESSIONS, OFFERED
PAPERS AND DISCUSSIONS**

**SPECIAL SESSIONS
ALGAE AND WATER QUALITY
MODERN APPROACHES TO ALGAL
SYSTEMATICS
MOLECULAR AND CELL BIOLOGY**

British Phycological Society

THE UNIVERSITY OF BIRMINGHAM

ALGAE AND WATER QUALITY

Posters and Trade Exhibits Monday 6th January 1992

Special Sessions Tuesday 7th January 1992

The aim of the British Phycological Society is to promote all aspects of the study of algae. The annual meeting takes place in early January at a University or Polytechnic in Britain. The meeting is attended by 150-200 delegates from the U.K. and overseas and traditionally starts with an evening poster and trade display session during which a buffet is served.

The next annual meeting will take place from January 6th-9th 1992 at the University of Birmingham. A Special Topic at this meeting will be 'Algae and Water Quality'. A poster and trade display session has been arranged for the evening of January 6th and the one-day Session will be on Tuesday January 7th.

The object of this Session is to bring together interested parties from academic and research institutions and professional scientists working in research laboratories and industry all of whom have a major interest in the impact of algae on water quality.

Sessions are planned as follows:

Algae and Pollution introduced by Dr. Brian Whitton, University of Durham

Algal Toxins introduced by Prof. Geoff Codd, University of Dundee

Methods of Algal Control introduced by Prof. Brian Moss, University of Liverpool

Algae and Water Treatment introduced by Dr. Barry Leadbeater, University of Birmingham

We hope that your company/institution will participate in this meeting. If you would like further information please contact Dr. B.S.C. Leadbeater at the address below. Full details of the programme will be available in the autumn.

Please return the accompanying form.

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Journal of Applied Phycology

A supplement to *Hydrobiologia*

Editor:

B. A. Whitton, *Dept. of Biological Sciences, University of Durham, UK.*

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The Journal of Applied Phycology publishes work on the rapidly expanding subject of the commercial use of algae.

The journal accepts submissions on fundamental research, development of techniques and practical applications in such areas as algal and cyanobacterial biotechnology and genetic engineering, tissues culture, culture collections, commercially useful micro-algae and their products, mariculture, algalization and soil fertility, pollution and fouling, monitoring, toxicity tests, toxic compounds, antibiotics and other biologically active compounds.

Each issue of the *Journal of Applied Phycology* also includes a short section for brief notes and general information on new products, patents and company news.

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Journal
Highlight

**KLUWER
ACADEMIC
PUBLISHERS**



THE RALPH A. LEWIN PAGE(S)

The following piece was originally printed as.....
'The (Relatively) Complete Snorkeller and Swamp Stalker' in the 'Underwater Naturalist, Bulletin of the American Littoral Society'.

If you are a SCUBA diver, turn the page; this article is not for you. But if you're too old or too young, too weak or too timid - or perhaps even too poor - for SCUBA, but still want to poke around in the shallows, read on. As one of humble nature, a potterer on rocks and over reefs, off jetties, and in mangrove swamps, I've put together a few simple ideas over the years and have compiled a list of items that you, too, might find useful. To the best of my knowledge, nobody in our timid tribe has been bold enough to publish a check list of this sort before. So here goes.

Before I start, I should perhaps explain why I enjoy pottering around seashores. I'm a biologist, and so is my wife. My special interests are seaweeds and marine microbes: hers is in those unusual insects which (whatever the text books may tell you) do occur in marine habitats. In the past decade or two we've found not only lots of pretty shells and appealing lumps of coral, but all sorts of unusual biological specimens and unsuspected phenomena. A green marine slug that, when irritated, wags its tail until it drops off and, at the same time secretes a poisonous milky slime that can kill a fish in ten minutes. A flightless mouthless, gutless midge; the females are legless, too, and can do little but float, mate and lay eggs, while the male seeks them out by skating over the water surface, using their oar-like wings as propellers. A predaceous bug that hides under coral rocks near the low water level, and only comes out to hunt for a few hours every day at ebb tide. Barnacles that blow bubbles and build foam floats, which sometimes wash ashore. A kind of green algal cell without a nucleus. A corkscrew-shaped bacterium, without flagella, that glides to and fro by a mechanism still wholly unknown. And so on. Seashores, especially tropical ones, are full of such wonders, many still waiting to be discovered. As far as I know, there are no books on this subject, which is all the more reason to go exploring. So why not join us in the noble but sparse ranks of surf-snorkellers?

To start with, you'll probably need a mask and snorkel. I keep mine loosely tied together with a couple of rubber bands which, along with the mask straps and buckles, I check periodically. You may need an underwater camera, too. Here again, check straps and buckles; it hardly improves a camera to be clunked on a concrete dock, even if it doesn't bounce off the edge and get lost in the briny deep.

As for clothing, I generally wear as much under water as I do on shore, partly for protection but largely for pockets. A drip-dry suit, consisting of a shirt and shorts, serves to shield my shoulders from the sun and much of the rest of my body from accidental encounters with jagged branches and spiky or stinging corals. (We had the suit made in Singapore, relatively cheaply, from some drip dry material we bought in the USA.) Both shirt and shorts have loops at the waist, to which I attach, with nylon string, a small folding knife and a rustproof magnifying glass. These then go into pockets, along with other items listed below. I've four pockets in the shirt and four in the shorts, and I generally use all of them every snorkelling day. They have button-over flaps or rust-proof plastic zippers, and have to be kept closed so that treasures don't slip or float out. I keep with me at all times a small plastic bottle of insect repellent; many bloodthirsty midges and mosquitoes breed in salt marshes and saline swamps, too close to the sea for my comfort. A few zip-top polyethylene bags and plastic vials with screw-on or press-on caps serve to hold small specimens of various sizes and shapes. As I fill the bags and vials, I move them from left-side to right-side pockets. I also keep with me a small supply of rubber bands, some looped around the tip of my snorkel for easy access; a couple of feet of nylon string; and some plastic sheathed copper wire for when I have to attach a bucket to the side of a boat, say, or a lamp to a ring on a jetty. Being long-sighted, I also generally take with me a pair of cheap plastic spectacles, in a plastic case. (The need for all those pockets is now becoming clear, I imagine.) I always wear sneakers; even the cleanest sandy beach may have broken glass, and the occasional sting-ray is certainly a hazard to be avoided. The kind of shoe that comes up over the ankles is better than the shallower variety. Nylon laces are best, because cotton ones tend to disintegrate with constant

immersion. And I always wear socks, preferably knee-high, partly to protect my calves, shins and ankles, but also to stop the pebbles and bits of shell that slip into the tops of my shoes from abrading the skin of my feet. I keep two pairs of socks alternating, one in use and one drying at the land base. For expeditions of more than a week or two, I recommend two pairs of sneakers, too. (You can always beg, borrow or buy a shirt or shorts which, even if they don't fit, can serve at least in an emergency. But if you lose a shoe in the mud, or overboard, or if the sole and upper part company after a few days of stumbling through coral rubble, you may have difficulties in walking, at least until you can make your way to the nearest store - maybe dozens of miles away.)

I almost always wear gloves when snorkelling. I recommend good ones. I find best a synthetic leathery type which is more or less porous. (Rubber rips; cotton tears and rots too easily.) I keep the pair joined by a length of rubber tubing long enough to give me the freedom to reach or swim but short enough so that they don't easily entangle with things. About two metres is a good length, loosely looped around the back of the neck. (You can colour-code the gloves - red for left, green for right, like ship's lights - to save time and confusion when you have to don and doff them in the surfy shallows where things swirl to and fro confusingly.)

In my plastic bucket, or in a rucksack that can be soaked without being spoiled, I keep a smallish plastic bottle of drinking water. Waiting on a hot beach for that Boston whaler to come and pick you up can be a thirsty business. Oranges, which are waterproof, can also be refreshing on such hot days. I take a roll of adhesive paper tape which for minor cuts and scratches seems to be much better than the Band-aids which get soggy under water.) And, in a watertight vial, I keep 2-3 antihistamine tablets, to take in case I get stung by mangrove wasps or noxious jellyfish, I've saved myself a lot of discomfort by this expedient, but you should check with your own doctor about such things. You'll probably need a prescription from him, anyway.

A couple of dollars in a plastic envelope can come in handy when you want to buy a can of pop, or a lovely shell offered by a little boy. I've waded ashore more than once in places where I found myself embarrassingly penniless, so I now try to keep solvent for such occasions. A small flashlight, in another watertight plastic bag, is a reassuring thing to have if there's any chance of

your finding yourself on a remote beach at dusk, waiting for the pick-up boat which has been for some reason delayed. A plastic-paper notebook is handy, too, not so much for underwater as for keeping notes legible in spite of the occasional, inevitable fall in the water. And a pencil, its tip sheathed in plastic, is of course needed for the occasional note ('Joe: waited till 5, walked south along shore to ruined shack under palm; see you there'.) For shells too big for pockets, or bits of seaweed or driftwood that I want to take back, I keep a couple of those plastic shopping bags that they give one at supermarkets or at the duty-free stores in airports. They pack up very small, yet open out strong and capacious if and when needed. Since my wife is a marine entomologist, we also carry a net or two, a small bottle of 70% alcohol (for preserving specimens, of course), a pair of forceps, and a few extra screw-cap vials. You may have other interests and may think of other items that you might need. But this list should provide a good start for your Complete Snorkellers Kit.

Editors note - While some of the advice Ralph Lewin gives may sound obvious, as one who has lost many snorkels, flippers, etc. etc., his words come as a timely reminder. Perhaps I should also add a few comments for those who work in more northerly climes, where a wetsuit is virtually essential for any, even temporary immersion, especially in the winter. For rock pools and 'following the tide' (which can be very wet), several layers of clothing covered in good (and brightly coloured) waterproofs and either wellingtons or waders (with the waterproof trousers outside the wellingtons !) are recommended. I also find that warm (and spare) socks, gloves and windproof headgear essential. This can make one look a little like a luminescent Michelin man but the winds around the UK coast make it well worth it. I have often noticed that I am still wearing all this when holiday-makers have been sunbathing nearby in almost (or entirely) nothing (and I still feel I need it). Another wind and wave problem, is taking and keeping records. Pencils can write even when wet and personal tape recorders are good as long as they are protected from the elements. Another point to remember is safety. A northern (or even Cornish) rocky shore can be a desolate place in winter and it is easy to slip on the rocks with dire, if not fatal, results. So always go to the shore with a companion, check the weather forecast, and leave an itinerary with someone responsible back at base. A flashlight is useful for find your way to the pub on Sherkin as well!

FIELD MEETINGS/WORKSHOPS

There has been some feeling in recent times that it would be a good idea to reinstate field meetings and workshops. It would be helpful to hear from people as to their thoughts on this matter. We would be very pleased if you could do so by completing the following questionnaire. (Photocopy this page if you like).

Dr. Juliet Broadie,
Bath College of Higher Education,
Newton Park, Newton St. Loe,
Bath BA2 9BN

Please send replies, together with any other comments to:

1. Would you like there to be field meetings?
2. Would you like there to be workshops?
3. Would you like to attend field meetings/workshops?
4. Are you willing to pay costs to attend?
5. Please indicate the sort of sums of money you would be prepared to pay.

- 1-10
- 11-50
- 1-100
- 101-200
- over-200

6. At which times of the year would you be able to attend?

7. How long would you like to spend on a field trip?
- Half Day
 - One Day
 - Two Days
 - longer

8. Would you be willing to run/help run a field trip or workshop

9. Comments and suggestions

.....

.....

.....

10. Name

Address

.....

A.A. KORSHIKOV

1989 was the centenary of the birth of this famous Ukrainian phycologist. Through the kindness of Professor A. M. Matvienko I have received personal information about him and an article about his life and work (Matvienko and Shvalb 1989), including the fact that he did not die sometime before 1942 as I had been told and so erroneously stated in my introduction to the English translation (Lund and Tylka 1987) of his book on palmelloid and coccoid Chlorophyta (Korshikov 1953).

Korshikov was born in November 1889. He took his first degree at the University of Kharikov and remained there until the German invasion of 1941. In 1926 he was appointed professor and was Head of the Department of Plant Morphology and Systematics and in 1935 that of lower plants. From 1930 he was Director of the University's Botanical Science Research Institute, heading the section on lower spore-plants.

In a little over 25 years he described 75 new genera and 356 new species and subspecific taxa, apart from enlarging or correcting our knowledge of many other algae. A number of these were described later but published before his major work (Korshikov 1953), completed in 1941, was itself published. The war devastated Ukraine was the reason for the 12 year delay in the book's publication. A complete list of his publications and lists of new genera, species and subspecific taxa are given in Matvienko and Shvalb (1989) and an article in honour of the 100th anniversary of his birth by Matvienko and Prokudin (1989).

If his masterwork (Korshikov 1953) had been published in 1941 or 1942, it would have been something of a phycological bombshell; nor, apart from many important papers, should his book on volvocine algae be forgotten (Korshikov 1983). Korshikov was outstanding for the exactitude of his observations and illustrations.

In 1941, the University of Kharikov was evacuated but, because of family commitments, Korshikov could not go with it. He went to the Mirgorod region in the Poltav province where in 1942 and for part of 1943 he was director of the Zootechnikum. In the latter year, he was

arrested because of his connection with the partisan movement and sent to Buchenwald. In 1944, he was transferred to the "Great Dora" concentration camp, whose inmates had to work in an underground munitions factory. In the April 1945, the retreating Germans evacuated the camp, blowing up the underground factory and so killing Korshikov and the other workers.

Korshikov's last years were spent in the horrors of life in concentration camps. A final tragedy is that he was only 55 when he was killed and that his death occurred at a moment when the war was almost over.

References

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Korshikov, O. A. (1953): *Pidklas Protokokovi (Protococcineae): Viznachnik Prsnovodnikh Vodorostei Ukrayin'skoyi RSR* 5, Kiev.

Lund, J.W.G. & Tylka, W., (1987): English translation of Korshikov 1953. B.S.M.P. Singh and Koeltz Scientific Books, Dehra Dun and Koenigstein.

Matvienko, A. M. & Prokudin Yu. M. (1989): Oleksandr Arkadiiovich Korshikov: 100-nichchya z dnya narodzhennya. *Ukr. bot. Zh.*, 47, 88-89.

Matvienko, Am. M. & Shvalb, M. G., (1989): Aleksandr Arkad'evich Korshikov, professor Kharkovskogo Universiteta: bibliograficheskii ukazatel. Kharkov Gos. University, Kharkov.

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SYSTEMATICS AND SCIENCE

Dr Mann's letter in the last issue drew attention to the current plight of systematics. I would like to offer some further comments.

It should come as no surprise that the most popular justification for "good" taxonomy is that to name something is to know it. For my own part, however, reading a paper published two decades ago has shaped many of the views I now hold on both systematics and science. The paper in question was written by Gareth Nelson (G. Nelson, 1970, *Outline of a theory of comparative biology. Systematic Zoology*, 19: 373-384). Nelson's paper outlined a proposal for unifying the different facets of systematic enquiry (morphology, embryology, palaeontology and biogeography) into a single research programme which he called "comparative biology", a method applicable to all groups of organisms. As such, systematists are faced with a clear goal, contributing to the wider aspects of biology rather than being seen as something of an outdated handmaiden providing the names for other "serious" scientists. As such, systematics is more than a just the provider of names for ecologists, physiologists and other biologists. It is a scientific discipline. It never fails to amaze and exasperate me that some practising, professional systematists promote the belief that systematics is conceptually closer to art than science. If one promotes this belief then the value of systematics need not be questioned too closely; like art, its value is in its contribution to the quality of our lives - but is it necessary? We have a choice: take it or leave it. And some leave it. It is thus vital that the scientific nature of systematics is stressed so that it too is not just left. But therein lies another problem.

There appear to be two commonly held beliefs about the nature of science. To some it is a body of factual information waiting to be discovered, collected and then ordered; to others it is a method which sets about explaining parts of the universe through general hypotheses. The former view implies that, given time, we will have done everything and the job will be finished; the latter view suggests a dynamic process of change and challenge. I naturally prefer the latter view.

I see the fundamental goal of systematics as the discovery of homology (characters which diagnose taxa) and at which level in the taxonomic hierarchy the homologies are

appropriate. In this view discovery of species is interconnected with the discovery of taxa at all levels and one generates hypotheses not "products". For instance, monographic studies usually describe taxa at the species level. Yet, the "species problem" is conceptual, amenable only through consideration of particular methods of classification. Species are not discovered simply through observation but by analysis of available information with a valid method for their effective discovery. Therein lies the core of our science. To some this may resemble "ivory tower" science. Yet I believe that science cannot be divorced from the environment in which it operates. Questions are posed to resolve problems. That appropriate questions are asked is another matter; and that appropriate forms of data gathering are undertaken to tackle these questions yet another. Consequently, I see no such thing as "ivory tower" science. For me systematics should be front line research because it is capable of attacking and resolving front line biological problems. My real concern, however, is that systematists do not promote one form of data gathering over another - be that data ecological, morphological, or molecular. In the final analysis the method underlying the results is what is at stake, and whether that method is sufficient to tackle different sorts of problems with different sorts of data. Our task is not simply to catalogue the world's biota so that others have labels to attach to their specimens but to recognise real biological problems and solve them. In addition, we have to convince those who are still yet to take systematics seriously that it has something more valuable to contribute other than just collecting and assembling information and donating names. How we achieve success is largely dependent upon how we collectively approach and identify the urgent and challenging problems that demand systematists' input.

This letter is not intended as a contribution for or against recent changes in the Natural History Museum but with my personal concern and frustration that systematics is not always portrayed as the vibrant and exciting scientific discipline that it surely is.

DAVID M. WILLIAMS
Botany Department The Natural History Museum
Cromwell Road London SW7 5BD

TOXIC BLUE-GREEN ALGAE REPORT

The actions of blue-green algal toxins as causes of animal poisonings and their adverse effects on human health are rapidly becoming more widely understood. Poisoning incidents in several countries over the past decade and particularly in the UK in 1989 and 1990 have contributed to the increased interest in these toxins and their widespread presence in European fresh and brackish waters, as elsewhere in the world, is well established.

The National Rivers Authority (NRA) of the UK has published a report which reviews the properties of some of the toxins and associated poisoning incidents. Factors affecting the incidence and development of toxic blue-green algal blooms and the impact of such blooms on wildlife, farm livestock and humans are

discussed. The immediate consequences of poisoning incidents in the UK in 1989 are summarised together with actions for monitoring blooms and their toxicity. Approaches to controlling blue-green populations are discussed and management and research needs identified.

Toxic Blue-Green Algae. A report of the National Rivers Authority, Water Quality Series No. 2, September 1990, 125 pp.

Obtainable from the National Rivers Authority, Anglian Region, Kingfisher House, Goldhay Way, Orton Goldhay, Peterborough PE2 OZR; Price £15 incl. p&p.

Geoffrey A. Codd, University of Dundee.

SOCIEDAD FICOLOGICA DE AMERICA LATINA Y EL CARIBE

(Phycological Society of Latin America and the Caribbean)

As a result of two meetings during the II Latin American Congress of Marine Phycology held in Lima Peru and during the V Latin American Congress of Botany held in Havana, Cuba, the SOCIEDAD FICOLOGICA DE AMERICA LATINA Y EL CARIBE was formed. It will function as a federation of the national societies of the region. The first Executive Committee, presided over by Prof. Jorge Gonzalez, is that of the recently formed SOCIEDAD FICOLOGICA DE MEXICO. This committee will also be in charge of organising the III Latin American Congress of Phycology to be held in Mexico City during the last trimester of 1993.

The aims of the federation are the following:

- To find out the current state of affairs in the science, its degree of development in the different countries, and geographic regions and

to make an organized effort to promote its harmonious advancement.

- To link academically the different regional and national centres in Latin America by way of an extensive network of communication and information centres; to promote Latin America scientific journals and to make agreements to publish in them as first priorities.

- To establish an academic structure, coordination and consultancy by way of permanent academic committees.

- To promote the training of professional phycologists in Latin America and to improve the teaching of this discipline.

- To increase the exchange of students and professors by way of the mechanisms offered by each country.

For further information about either or both of the Society and the III Congress please write to:-

Jorge Gonzalez-Gonzalez (Presidente), or Eberto Novelo (Coordinador General)
SOCIEDAD FICOLOGICA DE AMERICA LATINA
Y EL CARIBE

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FIRST ASIA-PACIFIC CONFERENCE ON ALGAL BIOTECHNOLOGY

29 - 31 JANUARY, 1992, UNIVERSITY OF MALAYA, KUALA LUMPUR

A symposium concerned with the full spectrum of algae and covering all aspects of algal biotechnology from taxonomy to commercialisation and bioreactors to pollution.

Kenote lectures will be given by Isabella Abbot, Gavino Trono Jr., Miriam Polne-Fuller, Michael Borowitzka, Lesley Borowitzka and Brian Whitton.

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For further information contact:

12TH INTERNATIONAL DIATOM SYMPOSIUM

30 AUGUST - 5 SEPTEMBER 1992, RENESSE, THE NETHERLANDS

The programme will cover the whole field of diatom research and contributions are expected spanning a broad range of subjects including:

Marine and freshwater ecology
Palaeoecology
Stratigraphy
Taxonomy and morphology
Water Quality and pollution.

Details from and submission of paper or poster titles from:

The Conference Secretariat,
AquaSense,
PO Box 41125,
1009 EC Amsterdam, The Netherlands
Tel. (31) 20 5922244
Fax (31) 20 5922249

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