CD Publications of interest to Diatomists

All titles available from Savona Books

	Author/Company	Title/Description	UK£
M3	*Griffith and Henfrey*	Micrographic Dictionary 4th Edition. 1883. Plates from this classic work	£8
M4	*Flatters & Garnett* 1929	Microslide Catalogue includes images of slides.	£10
M7	*P. T. Cleve*	Diatoms from the West-Indian Archipelago 1878. 20 Text Pages, 5 Tafels.	£10
M8	*J. Brun et J. Tempere*	Diatomees fossiles du Japon 1889. 73 Pages, 9 Plates.	£10
M9	*Peragallo et Peragallo*	Diatomees marines de France. 1897-1908. 137 Plates and Plate text only (with hyperlink indices)	£15
M10	*F. T. Kutzing*	Synopsis diatomearum. 1834. 93 Pages, 7 Plates.	£8
M16	*Hilmar von Schonfeldt*	Die Deutschen Diatomeen des Susswassers und des Brackwassers - 1907. 19 Plates.	£8
M17	*Adolf Schmidt* Atlas der	Diatomaceenkunde - first 268 plates with hyperlink Index.	£35
M19	*G. Leuduger-Fortmorel*	Diatomees Marines de la Cote Occidentale d-Afrique (Plates and hyperlink Index) 1898. 39 Pages, 8 Plates.	£6
M20	*Alfredo Truan Y Luard and Dr. Otto N. Witt*	Die Diatomaceen der Polycystinenkreide von Jeremie in Hayti. 1888. 25 Pages,7 Plates.	£5
M35	*Arthur Scott Donkin*	The Natural History of the British Diatomaceae	£10
M36	*Jacob Whitman Bailey*	Notes on New Species of microscopical Organisms	£5
M37	*Charles Pooley*	The Diatomaceae of Weston-super-Mare	£15
M43	*Rev. William Smith*	List of the Diatomaceae in the British Museum 1859	£5
M44	*William Gregory*	On New forms of Marine Diatomaceae found in the Firth of Clyde and in Loch Fine 1857 (this CD only available to purchasers of other Diatom related CDs	£4
M45	*Otto Muller*	Kammern und Poren in der Zellwand der Bacillariaceen 1899-1901	£5
M47	*C. Henry Kain and E. A. Schultze*	On a Fossil Marine Diatomaceous Deposit from Atlantic City, N.J. 1889	£5
M48	*Dr. József Pantocsek*	A FERTŌ TÓ KOVAMOSZAT VIRÁNYA (Bacillariae Lacus Peisonis) 1912	£5
M49	*Dr. Josef Pantocsek*	BESCHREIBUNG und ABBILDUNG der FOSSILEN BACILLARIEN des ANDESITTUFFES von SZLIÁCS in UNGARN 1903	£5
M50	*E. G. Grahn M.D.*	Diatomaceae found in the neighborhood of Brookville, Indiana, 1885	£4
BD1	*Little Imp*	A Checklist of British Diatoms	£4

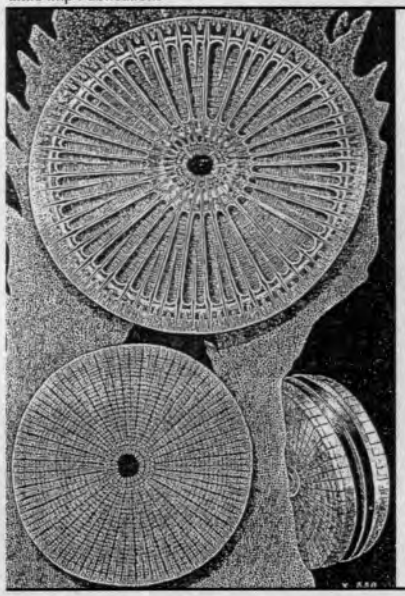
Send copy for publication to: The Amateur Diatomist
c/o D. S. Gill
123 The Longshoot,
Nuneaton,
Warwickshire
CV11 6JQ
Email:- steve@microcat.demon.co.uk

Printed by 1st impression design & print, nobles place, maude street, kendal, cumbria LA9 4QD Tel.: 01539 732660

The Amateur Diatomist

Vol. I. No. I. March 2002

Little Imp Publications



In this Issue:-

The primary aim of this new publication is to further the interest in diatoms amongst the amateur naturalist. This amateur-centric approach has been much neglected, though a few hardy individuals have plugged away and contributed substantially to present day understanding of and distribution of the Diatoms.

The publishers welcome contributions to the content of the publication, including articles, letters, photographs, etc. These may be submitted by post in electronic or hard copy format or by email (address details on the back cover).

We would encourage the readership to provide feedback concerning the acceptability, or otherwise, of this publication.

Advertising in this publication is free to both non-commercial individuals and commercial organisations. A small contribution towards costs would be appreciated from commercial entities but our philosophy is that if it is related to the study of diatoms and is of interest to our readership, then it should be included.

There is no strict editorial policy.

A Checklist of British Diatoms - Version 1.0

Now available from Little Imp Publications!

This CD provides a British Diatom Checklist in HTML format.
It requires a frames enabled Browser.
Order through Savona Books. (see advertisement).

Cover picture: Arachnoidiscus japonicus by R. Beck, from The Microscope by Dr. Carpenter.

As true now, as it was then!

We thought that the reproduction of a small article that appeared in Vasculum (the organ of the Northern Naturalists Union) in the mid 1960s would be a fitting beginning to this new venture. The impressions expressed in the tract are as true today as they were then. The paper was written by none other than the talented amateur diatomist John R. Carter. The full version of the text may be examined in Vasculum Vol. LVI. No. 3.

Diatoms, the forgotten family.

"In the heighday [sic] of the amateur naturalist nearly everyone who possessed a microscope, however humble the instrument, treasured in his cabinet of slides a few diatom specimens. .....

With the decline of the amateur microscopist in the last few decades the popularity of these fascinating little plants has waned. It could be that the amateur has retired from the scene because work in this branch of science has got more and more involved and he, the amateur, feels that nothing he can do is of real value. This is not only a defeatist attitude but is palpably a false one too. ..... Much of the work associated with finding and preparing diatoms is done and can continue to be done by amateurs. As one cannot say that diatom work can normally be a commercial proposition I feel that there will always be room for the amateur worker who is prepared to spend time in this field.....

Perhaps one of the things which has kept many people from the study of diatoms has been the difficulty of finding literature about them. Unfortunately this is only too true for much that is written about diatoms exists in rather obscure journals and when it does come on the market it is expensive. However, in these days of the Xerox copying machine, it is now possible to get copies made at minimum prices. Lastly one might say, speaking from long experience, that I have never met a diatomist who was not prepared to go to almost any lengths to help his not so experienced colleague."

Editors Note:- We have an on-going publication schedule of literature pertaining to diatoms. A list of currently available CDs of major works is printed on the back cover of this publication.

John R. Carter

What is a Diatom?

Diatom, *n.* one of a class of microscopic unicellular algae with flinty shells in two halves, fitting like box and lid. – *adj.* Diatomaceous.

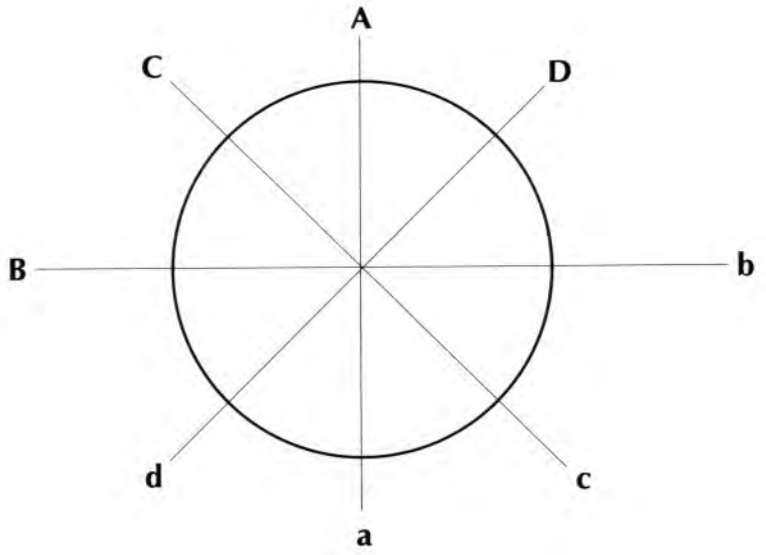
It is probably quite useful to know where the diatom sits within the five kingdoms that taxonomists have created to define the relationships between organisms.

Diatoms are actually classed – Bacillariophyta, which term is derived from one Latin and one Greek word – bacillus(L.) meaning 'small stick', and phyton(G.) which means 'plant'. The hierarchy below is not complete by today's or yesterday's taxonomy but serves to indicate the position of most of the major groups. This was a popular structure until relatively recently/

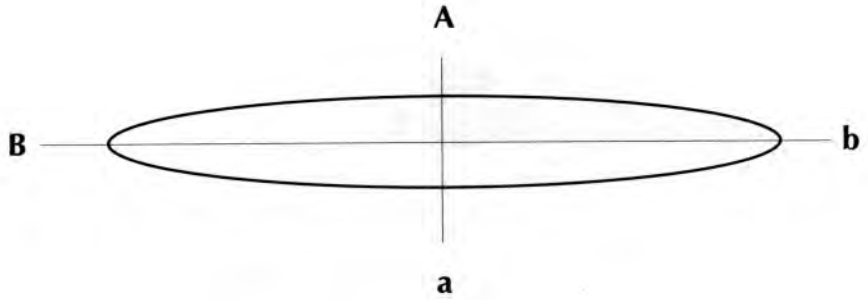
Kingdom::Prototista *(protos[G.] meaning 'the first' and kristos[G.] meaning 'established'.)*
Division: Bacillariophyta *(Note: Botanists often call the Phylum - Division.)*
Class: Diatomatae
Order: Centrales
Suborder: Discineae
Family: Coscinodiscaceae
Family: Actinodiscaceae
Family: Eupodiscaceae
Suborder: Soleniineae
Family: Soleniaceae
Family: Chaetoceraceae
Family: Biddulphiaceae
Family: Anaulaceae
Family: Euodiaceae
Order: Pennales
Suborder: Araphidineae
Family: Fragilariaceae
Suborder: Raphidoidineae
Family: Eunotiaceae
Suborder: Monoraphidineae
Family: Achnanthaceae
Suborder: Biraphidineae
Family: Naviculaceae
Family: Epithemiaceae
Family: Nitzschiaceae
Family: Surirellaceae

Centrales are so called as they comprise the Centric diatoms. These diatoms have a radial symmetry, that is, more than two planes bisecting the centre of the frustule where the two halves are a mirror image – (see illustration on next page).

i.e.



Pennales are generally classified 'boat shaped' though this may encompasSs distinctly un-boat-like shapes. They will have only one or two planes of symmetry (illustration below). i.e.

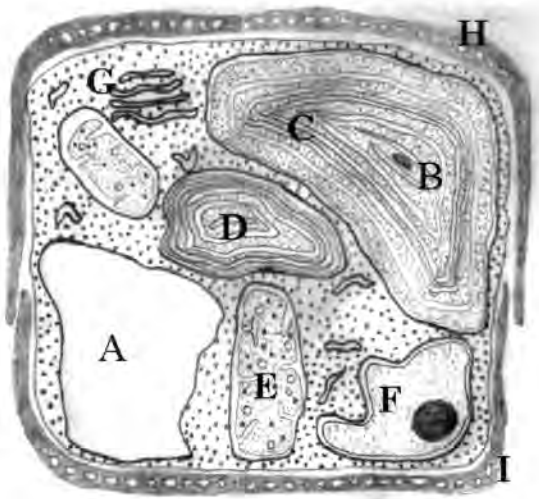


Though Centric diatoms are not motile there are many pennate diatoms that live in colonies and also appear not to move, and some centric forms that form linear colonies often appear to be pennate forms as their discs form the adjacent faces in the colony.

So a diatom is an alga. Algae occur in multifarious forms, seaweed, red, green and brown, filamentous algae like Spirogyra and many more.

All diatoms have a hard external structure called a frustule. This frustule, made of Silica (SiO_2) is of three component parts. The two major elements are the lid and box. These two structures are usually called valves but also called tests. They are joined by another component called a girdle. These valves and sometimes the girdle are elaborately ornamented, the valves providing the major identification features of a species.

The cell (the frustule will be dealt with elsewhere) has a characteristic structure which may be seen (but not in this case with a light microscope) in many other phyla (divisions) within this Kingdom.



A =Vacuole
B = Nucleoid
C = Xanthoplast (Brown Chloroplast)
D = Plastid
E = Mitochondrion
F = Nucleus
G = Golgi body
H = Upper Valve
I = Lower Valve

Study of diatoms has, in the main, concentrated on identification by means of the frustule. It has been proposed that identification of living material is possible using xanthoplast (chloroplast) numbers, location and shape. This is very much a subject that is likely to crop up in articles in the future. The terms xanthoplast and chloroplast will often crop up. A chloroplast is a structure that contains green chlorophyll and a xanthoplast the same type of structure but which contains the brown xanthophyll. Both compounds are used in the process of photosynthesis. Some authors continue to use the term chloroplast, others will use xanthoplast, you may effectively regard them as the same.

Where to find Diatoms and what to look for.

Diatoms seem to be almost everywhere there is water, in small or large quantities, it seems to make no difference. The only criterion seems to be 'mostly damp, most of the time'.

This includes freshwater, both acid and alkaline, marine and brackish water in estuaries and lagoons. Some diatoms are tolerant of polluted environments but most are used as indicators of clean habitats.

Many diatomists adopt their own, sometimes quite bizarre, specialisation when it comes to collecting diatoms. Known to us are the following:-

Under aqua-ducts
Temporary puddles
Bird baths
Tractor tracks
Horse troughs
Anchor lines
Aquarium filters
Moss squeezing

When you do find diatoms you generally find millions.

In freshwater habitats you should initially look where there are low light conditions, under bridges is a good place, in deep glades another. The diatoms will appear as a dark brown/golden brown/reddish brown film on rocks and submerged stones (epilithic) and also on mud banks (epipelic and endopelic). They may also appear in this guise on any material within a splash zone. The film has a slimy texture and usually no smell. Collecting this film has taxed many in the past. These days, however, modern technology has come to our aid in the form of credit cards and those white plastic disposable spoons (48p for 20 at Wilko). With these a film on mud may be skimmed using the plastic credit card and that on rocks scraped with the plastic spoon. The advantage of the credit card is its slimness. You can collect the film with only the smallest volume of extraneous mud. The beauty of the spoon is that it is easy to see what you have collected. Collecting in fast running water is more problematical as anything you scrape off is whisked away by the current before you have a chance to transfer it to a suitable receptacle. If you can, remove the object from the water, scrape off what you require and replace the object back from whence it came. If you are unable to remove the item then you must place your receptacle just downstream of the object and scrape into it. Keep your thumb over the mouth of the bottle leaving enough space to admit some of the sample but not enough to allow admittance of a large volume of water which will just as quickly evacuate the container taking all the sample with it. You may also use a net or muslin bag to catch any material that you scrape off.

These thin brown films may also be found on submerged weeds (epiphytic) and reed stems (a favourite hunting ground for many of the larger species). Weeds may be taken up by the handful, squeezed quite tightly to express most of the water and the remainder (when it starts to become slightly discoloured) wrung into your collecting bottle (wide-mouth bottles are best for this purpose). Reed stems and the like may be

drawn between thumb and forefinger and the resultant glutinous residue saved for examination. Alternatively, if you collect the material in a plastic bag with a little water you may then work this is your hands until the water is quite discoloured and discard the remaining stems. Some species form little colonies that appear free of any attachment. These may manifest themselves as what appears to be a long discarded and thoroughly macerated Farley's Rusk. These are probably tube-dwellers, living separately but communally in a mucilaginous sheath.

Where there are waterfalls and weirs one is often confronted by flecks of foam or froth with a light brown tinge. This should be examined as it quite often contains a myriad of Naviculoid forms.

Marine diatoms present a somewhat different appearance as one would expect in such differing conditions. Their colour is often much paler and most that you are able to collect are epiphytic (growing on another plant). Eels grass is a favoured haunt but many rock pool seaweed growths have their own little communities. Occasionally clouds of Diatoms are blown into the shore and may be collected at the wave margins and in the foam created when such an event occurs. Sea walls and breakwaters are another lucrative hunting ground and here the scraping techniques described above may usefully be employed.

Should you be adventurous and not prone to sea-sickness you might usefully trawl for your quarry. An article on suitable trawl techniques will appear in a later volume.

Brackish water locations such as lagoons should be treated much like inland lakes where stones and weeds provide a home.

Estuaries offer acres of mud on which (and in which) diatoms eke out an existence. In fact such environments are very rich in diatoms. Estuarine mud may often take on an olive hue as diatoms that have spent time buried in the mud rise to the surface en mass. A scraping here will provide material for you and all your colleagues.

Mounting techniques **Part I – No processing required!**

Over the years a number of techniques have been tried to mount material in order to preserve the chloroplast (xanthoplast) structure of the individual cell. In the case of diatoms, in my experience, this has not been achieved with any measure of success. The techniques have all failed in one respect or another.

Chloroplast shrinkage
Cell disintegration (cytoplasm/intra-cell structures)
Fluid mounts drying out and fungal encroachment

I may just have been unlucky or perhaps, inept. Whichever, the case, I was pleased to read, in 'Identification of Freshwater Diatoms from Live Material by Eileen J. Cox' of a method in which all cellular information will be retained. This method involved the fixation of the sample using dilute Lugol's Iodine*, dehydration through an ethanol series and eventual mounting in Pleurax. This method produced, for me, some quite reasonable results, that is until I examined them some time later when it became obvious that the cell contents had disintegrated and although the contents were visible they were just an amorphous mass. I tried again, a number of times with the same result.

Eventually I had done with experimenting, and anyway there was always so much detritus in my collections that examining live diatoms with a view to determining the shape of their chloroplasts gave me a headache.

For quite a while I had been mounting specimens to show their relationships one to another, as in life, retaining their colonial context. This was done using a well-documented technique of incineration. This method (mentioned in Mike Samworth's article) had provided me with a number of acceptable slides, many minor burns, numerous cracked coverslips. What struck me most about the Cox-Pleurax method was the retention of the context, no cracked frustules, no cracked coverslips and no minor burns. There was still, however, an element of processing and quite honestly I'm not the most patient of souls. I liked the colours retained on the mounted specimens, I liked the way they remained in colonies or filaments, I liked the fact that you could see the frustule detail, I just didn't like the cell contents all mixed up, having gone brown and the cloudiness when you hadn't thoroughly dehydrated. So, I set about getting rid of all the unnecessary processing.

Fixing – Don't need it!
Dehydration – Need it!
Mounting in High Refractive Index Mountant – A must!

No fixing - out with the Lugol's Iodine!
Dehydration – drive the water of by heating the slide!
Mount in Pleurax** or other High Refractive Index mountant***.
Result – Colour, Context and Visibility.

Photograph by B. Hartley

The whole process takes about 30 seconds, from sample bottle to permanent slide. It is true that finishing a slide properly with rings and label takes a little longer, but there it is – NO PROCESSING REQUIRED!

* Lugol's Iodine: 2gms Potassium Iodide, 1gm Iodine + 300ml distilled water.
** Limited stocks of Pleurax are available from Klaus Kemp.
*** Naphrax is available from NBS, Northern Biological Supplies, 3 Betts Avenue, Martlesham Heath, Ipswich IP5 7HR

Favourite locations.

No. 1. Berrow Beach

By K.D. Kemp

Berrow beach (called Berrow Flats in days gone by) lies between Burnham-on-Sea and Weston-super-Mare, Somerset and forms part of the Severn estuary, the area is influenced by the second largest tide in the world said to be in excess of 40 feet.

The beach is a gently sloping one, being mainly sandy at the top end of the beach, giving way to extensive mud flats. Salinity of the waters varies greatly due to the influx of the River Parrett, which drains a substantial amount of the Somerset "Wetlands".

The sample that is the subject of this article was collected in November 1980.

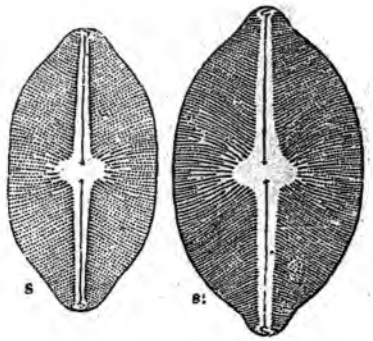
Brean Down from Berrow Beach *Photograph by M. Samworth*

Upon reaching the beach it was seen that there was an extensive growth along the length of the sands, visible as a brown discoloration of the sand and it was quite evident where cars had travelled along the beach as the colour of the substrate was quite different and gave the first hint of the discoloration being due to an abundant growth of Diatoms. With an Open University Microscope a small sample was examined and it was immediately clear that there was a very rich gathering to be had.

After cleaning in the traditional manner, (boiling in Hydrochloric Acid followed by prolonged heating in Sulphuric Acid and bleached with Potassium Chlorate) the samples were stored in 1% Phenol.

Examination of the material when mounted in Hyrax, showed an abundance of ***Navicula humerosa*** (de Brebisson in Wm. Smith).[Fig. 1. *Schmidt's Atlas der Diatomaceenkunde Tafel 6/8,8(I)].*

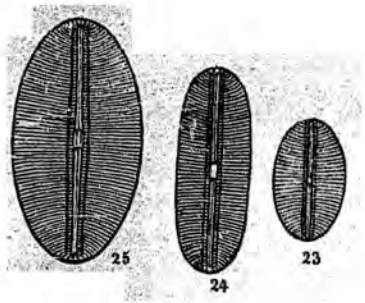
N. I. Hendey in 'An Introductory Account of the smaller Algae of the British Coastal Waters 1964' states –



"This is a common and widely spread littoral species on all European Coasts, avouring clean water and high salinity".

The clean water in the Severn Estuary I would be inclined to question these days, however, the high salinity would have been possible if the Somerset levels had been drained and therefore a high tide movement may have caused such a condition. The species on the slide exhibited a large degree of variation in outline the main waisted form is as would be expected and indeed figured often, oblong elliptical forms being less frequent. Measurements given for this species are Length 50µ to 80µ Breadth 28µ to 40µ Striae strongly radiate 9 in 10µ.

The next most frequently occurring species was ***Diploneis littoralis*** (Donkin) Cleve. [Fig. 2. *Schmidt's Atlas der Diatomaceenkunde Tafel 8/23-25]*



The forms in this sample are much as figured in many publications. It is said to favour sandy beaches. Size Length 30-65µ Breadth 15-28µ, Striae 10-14 in 10µ, the species on the slide being at the smaller end of the quoted range.

After this, in terms of abundance came ***Navicula cancellata var. apiculata*** (Gregory) Peragallo. [Fig. 3. *Peragallo et Peragallo Planche XIII/9]*

This species seems not to have been figured in many of the books on British Diatoms. Reported by Peragallo Plate 13/9 from the Normandie Coast, Schmidt's Atlas 46/66-8 gives a good series of figures for this species. Easily confused with *N. cancellata* but is much smaller and has the distinctive stauros in the central area. I am sure this specimen will cause a great deal of debate!

Less frequent species are :-

Navicula rostellata Kützing, [Fig. 4. Schmidt's Atlas der Diatomaceenkunde Tafel 46/51-53] Length 40µ-75µ Breadth 10µ Striae 10-11 in 10µ.

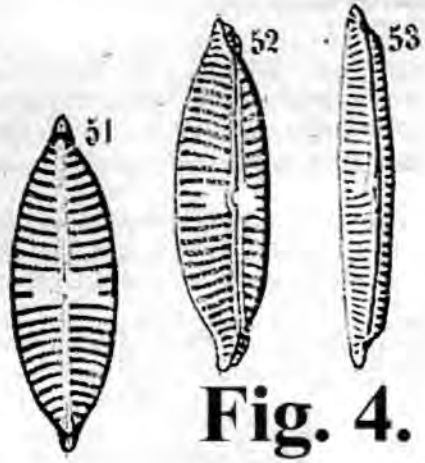


Fig. 4.

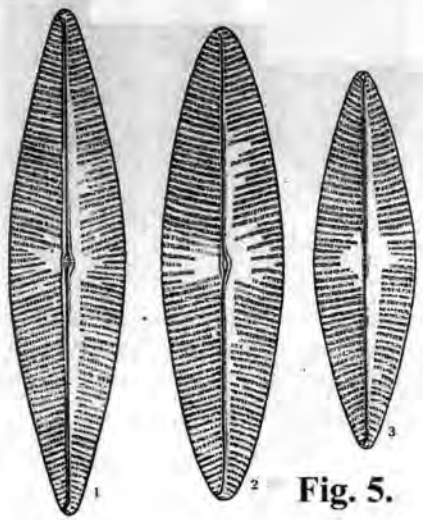


Fig. 5.

Hantzschia distincte-punctata (Hustedt) Hustedt. The diatom in question is not very often found on our shores (or is it that it is often not recognised?). From the slide it was seen that the outline varies greatly and if one were to see only a few specimens it could easily be misidentified.

Navicula digito-radiata. Hendey. [Fig. 5. Schmidt's Atlas der Diatomaceenkunde Tafel 259/1-3] B.C.W. quotes this as preferring muddy shores, this is at variance with the rest of this sample which is clearly a psammic collection. Length 44µ - 84µ Breadth 16µ- 20µ.

Observations on any other species would be gratefully accepted.

Note: Strews slides from this location are available from Klaus Kemp. Refer to advertisement for contact details.

Cleaning Diatoms

by Mike Samworth

Part 1.

Introduction.

In this short series of articles, I hope to cover a number of cleaning techniques for diatoms. I do this as much a beginner as anything else, since I have only been cleaning material for about two years. However, in trawling through the literature, it became quickly apparent to me that there are a number of methods documented over the many years that diatomists have been collecting and cleaning material. This is somewhat confusing, and so I want to set out some of these methods, give full references to them, and hopefully to stir up some interest in the readership. This will hopefully be of two sorts; firstly in encouraging others to clean material that they collect, secondly, for more experienced readers to share their tips and expertise.

There is something quite special about carrying through the process from collection of material to mounting a slide of cleaned diatoms. My first slides are rather poor quality, but they have a place in my collection, and those that are now much better, give much pleasure as they remind me of time spent outdoors collecting. A couple of years back I was fortunate enough to watch a very expert and experienced diatomist clean a small sample I collected in August 1999. The sample was predominantly Cymbella, and the resulting strews really stand out when looked at under the microscope.

Diatoms are well worth looking at whilst in the living state, and this of course is best done as soon as possible after collection. There has been increased interest recently in the use of features other than frustule structure in classification, but for me there is also a beauty in the living organism, especially in the way that cells may be arranged. Some workers have made fluid mount preparations, though often these have not passed the test of time too well. The arrangement of cells is also kept to some extent when using some kind of incineration method, but chemical treatment destroys this.

To my mind there are two categories of treatment then: incineration and chemical treatment. I haven't tried incineration a great deal, but basically it amounts to putting the living diatoms on a cover slip, which is then placed upon a small square of metal foil which is thereafter heated very strongly, the idea being to incinerate everything but the silex frustule. Platinum (foil) seems to be the favoured metal, but brass also serves the purpose. Aluminium foil certainly does not!

There are many methods of chemical cleaning. They range from the use of quite a mild oxidising agent such as hydrogen peroxide to the rather drastic application of concentrated acids. Very mild chemical treatment can keep some frustules or colonies intact. This would include, for example, putting the material into 30% hydrogen peroxide at room temperature for 24 hours, though this can be enhanced by raising the temperature. I have tried this with some success, but only really with delicate samples, and even then, somewhat pure samples. A discussion of more drastic methods will have to be left until next time.

Over the next issues we will print a list of Genera.
The list contains the naming authority and the date when it was first described.

Diatom Genera List – A and B

Genus	Described by	Date
Acanthoceras	H. Honigmann	1910
Acanthodiscus	J. Pantocsek	1892
Achnantella	B. Gaillon	1833
Achnanthepyla	M. Peragallo	1921
Achnanthes	J. B. M. Bory de Saint-Vincent	1822
Achnanthidium	F. T. Kützing	1844
Achnanthosigma	L. Reinhard	1882
Actinella	F. W. Lewis	1864
Actiniscus	C. G. Ehrenberg	1838
Actinoclava	O. Müller	1912
Actinocyclus	C. G. Ehrenberg	1837
Actinodictyon	J. Pantocsek	1889
Actinodiscus	R. K. Greville	1863
Actinogonium	C. G. Ehrenberg	1847
Actinogramma	C. G. Ehrenberg	1873
Actinoneis	P. T. Cleve	1895
Actinophaenia	G. Shadbolt	1854
Actinoptychus	C. G. Ehrenberg	1843
Actinosphaenia	G. Shadbolt	1854
Actinostephanos	G. K. Khursevich	1989
Adoneis	G. W. Andrews & P. Rivera	1987
Ailuretta	P. A. Sims 1986 Alloeoneis J. Schumann	1867
Allonitzschia	A. Mann	1925
Alveoflexus	N. I. Hendey & P. A. Sims	1984
Alveolophora	A. I. Moisseeva & T. L. Nevretdinova	1990
Alveus	I. Kaczmarska & G. A. Fryxell	1996
Ambistria	K. E. Lohman & G. W. Andrews	1968
Amblypyrgus	R. Gersonde & D. M. Harwood	1990
Amphicampa	(C. G. Ehrenberg) J. Ralfs in A. Pritchard	1861
Amphicampa	L. Rabenhorst	1864
Amphidiscus	C. G. Ehrenberg	1839
Amphipentas	C. G. Ehrenberg	1840
Amphipleura	F. T. Kützing	1844
Amphiprora	C. G. Ehrenberg	1843

Genus	Described by	Date
Amphiraphia	J. -Y. Chen & H.-Z. Zhu	1983
Amphitetras	C. G. Ehrenberg	1840
Amphitrite	P. T. Cleve	1878
Amphitropis	L. Rabenhorst	1868
Amphora	C. G. Ehrenberg ex F. T. Kützing	1844
Anaulus	C. G. Ehrenberg	1844
Ancoropsis	N. I. Hendey & P. A. Sims	1984
Ancylopyrgus	R. Gersonde & D. M. Harwood	1990
Aneumastus	D. G. Mann & A. J. Stickle in F. E. Round, R. M. Crawford & D. G. Mann	1990
Angulopyxidium	A. G. Vologdin	1962
Anisodiscus	A. Grunow in J. Pantocsek	1886
Anisoraphe	R. E. Norris 1971	
Annellus	Jean-Clodius Tempère in Jean-Clodius Tempère & H. Peragallo	1908
Anomoeoneis	E. Pfitzer	1871
Anorthoneis	A. Grunow	1868
Antelminellia	F. Schütt	1893
Anthemodiscus	J. W. Barker & S. H. Meakin	1944
Anthodiscina	P. C. Silva	1970
Anthodiscus	E. Grove & G. Sturt	1887
Anuloplicata	(Z. I. Glezer) Z. I. Glezer	1992
Aporidiscus	Rattray in A. Grunow	1889
Aporodiscus	J. Rattray in Adolf Schmidt et al.	1890
Arachnoidiscus	H. Deane ex G. Shadbolt	1852
Arachnoidiscus	J. W. Bailey ex C.G. Ehrenberg	1849
Archaegladiopsis	V. A. Nikolaev & D.M. Harwood	1997
Archepyrgus	R. Gersonde & D.M. Harwood	1990
Archimedea	J. B. M. Bory de Saint-Vincent	1824
Arcocellulus	G. R. Hasle, H.A. von Stosch & E.E. Syvertsen	1983
Arcus	A. P. Olshtynskaja	1978
Ardissonea	G. De Notaris in G. De Notaris & F. Baglietto	1870
Argonauta	G. Karsten in A. Engler & K. Prantl	1928
Aristella	F. T. Kützing	1834
Arthrodesmus	C. G. Ehrenberg	1838
Arthrogyra	C. G. Ehrenberg ex Ralfs in Pritchard	1861
Asterionella	A. H. Hassall	1850
Asterionellopsis	F. E. Round in F.E. Round, R.M. Crawford & D.G. Mann	1990
Asterodiscus	A. S. Johnson	1852

Genus	Described by	Date
Asterolampra	C. G. Ehrenberg	1844
Asteromphalus	C. G. Ehrenberg	1844
Asteroplanus	C. Gardner & R.M. Crawford in R.M. Crawford & C. Gardner	1997
Attheya	T. West	1860
Aulacocystis	A. H. Hassall	1845
Aulacodiscus	C. G. Ehrenberg	1844
Aulacoseira	G. H. K. Thwaites	1848
Auliscus	C. G. Ehrenberg	1843
Auricula	A. F. Castracane	1873
Auriculopsis	N. I. Hendey	1964
Australodiscus	V. Porguen & M.J. Sullivan	1997
Azpeitia	M. Peragallo in Jean-Clodius Tempère & H. Peragallo	1912
Azpeitiopsis	P. A. Sims	1994
Bacillaria	J. F. Gmelin	1788
Bacteriastrum	G. Shadbolt	1854
Bacterosira	H. H. Gran	1900
Bactryllium	O. Heer	1853
Baculites	J. Gruss	1928
Baileya	C. S. Boyer	1927
Bangia	H. C. Lyngbye	1819
Banquisia	T. B. B. Paddock	1988
Basilicostephanus	R. Gersonde & D.M. Harwood	1990
Baxteria	H. Van Heurck	1896
Baxteriopsis	G. Karsten in A. Engler & K. Prantl	1928
Bellerochea	Henri-Ferdinand van Heurck	1885
Belonastrum	E. Lemmermann	1900
Belonidium	C. G. Ehrenberg	1854
Benetorus	G D. Hanna	1927
Bennettella	R. W. Holmes	1985
Bergonia	Jean-Clodius Tempère in J. Brun et al.	1891
Berkeleya	R. K. Greville	1827
Berkella	R. Ross & P.A. Sims	1978
Biblarium	C. G. Ehrenberg	1843
Biddulphia	S. F. Gray	1821
Biddulphiopsis	H. A. von Stosch & R. Simonsen	1984
Bifibulatia	H. Takano	1983
Bilingua	R. Gersonde & D.M. Harwood	1990
Bipalla	Z. I. Glezer	1992

Genus	Described by	Date
Biremis	D. G. Mann & E.J. Cox in F.E. Round, R.M. Crawford & D.G. Mann	1990
Bleakeleya	F. E. Round in F.E. Round, R.M. Crawford & D.G. Mann	1990
Bogorovia	A. P. Jousé 1974	
Bonea	R. Ross & P.A. Sims	1978
Botellus	F. Schütt	1900
Brachybaculites	J. Gruss	1928
Brachysira	F. T. Kützing	1836
Brasiliella	C. Zimmermann S.J.	1918
Brebissonia	A. Grunow	1860
Brenneckella	H. Lohman	1912
Briggera	R. Ross & P.A. Sims	1985
Brightwellia	J. Ralfs in A. Pritchard	1861
Brockmanniella	G. R. Hasle, H.A. von Stosch & E.E. Syvertsen	1983
Brunia	Jean-Clodius Tempère ex G.B. De Toni	1894
Bruniella	Henri-Ferdinand van Heurck	1896
Bruniopsis	G. Karsten in A. Engler & K. Prantl	1928

Old Papers - Revisited

In this series of articles we will reproduce hard to find papers from years gone by.

The Diatomaceae of Weston-super-Mare

By Charles Pooley 1863

The accompanying list of the Diatomaceae which have been found on this coast, and in the neighbourhood, has been published with a view to meet the wishes of many lovers of scientific research, who require a guide to this department of our local microscopic Flora. The catalogue is necessarily incomplete, but the number it contains is, perhaps, sufficient to serve as a fair nucleus, to which future discoveries may hereafter be added. At the present day so much interest attaches to the study of these minute organisms, that a few prefatory remarks on their nature may not be inappropriate.

The word Diatom, from the Greek, *disseco,* was originally applied to a class of minute cellular water plants, growing zigzag, as if a ribbon had been snipped into squares, but not entirely divided, and the fragments left cohering by the alternate angles of contact. Although, strictly speaking, the term has reference to this type only, it has become the recognised symbol of all the orders of which the Diatoma is the representative, how great soever may be the difference in their external form. Thus, the beautiful areolated valves of *Triceratium,* the discoid *Coscinodiscus,* the zigzag fronds

of *Grammatophora*, and the symmetrical double curved *Pleurosigma;* the splendid *Campylodiscus* and the globose filaments of *Melosira*, have no sort of alliance, judging superficially from their outward form alone; yet a closer acquaintance with their history discovers characteristics common to each, on which naturalists found a unity of classification.

Diatomaceae are chiefly distinguished from other organised beings by the possession of a skeleton, so to speak, composed entirely of silex *(Editors Note: the term silex in this context is interchangeable with Silica)*, a substance which, as it is indestructible by ordinary chemical agencies, has been the means of preserving these atoms in all their integrity through countless ages in a fossil state. And it is astonishing, when we consider the exceeding minuteness of these bodies, of which 100,000,000 hardly weigh a grain, what a vast and important part they play in the physical history of the earth. Not only are certain stratified rocks composed wholly of these siliceous shields, but even the beds of some rivers and estuaries are almost entirely made up of them; and so generally distributed are they, that in the profoundest depths of the Atlantic, and on the loftiest accessible points of the Himalayas and Andes; in the frozen zone of the Antarctic Circle, and in the burning craters of volcanoes; in the Geysers of Iceland, and in the still lakes of Switzerland, these delicate epiderms are met with: while in the Cainozoic or Tertiary deposits, evidences of their existence are afforded in abundance and variety.

The Diatomaceae are divided into two classes, founded on their respective habits, namely those which frequent fresh water, and those which are denizens of salt water; to which might be added a third, those which love brackish water. As the exchange from one element to another is followed by death to the individual, the true fluviatile are never found in salt water, nor the marine in fresh water.

One of the most remarkable features connected with the Diatomaceae, is the power of spontaneous motion which some species exhibit. The inexperienced observer, witnessing for the first time the movements of a group of recent Pleurosigmata or free Schizonema frustules under a microscope, could not fail to be impressed with the conviction that they were not only endowed with a high degree of vitality, but with volition also, since their peculiar movements are indicated by change of place, progression and retrogression, and moreover continue during the vitality of the organism, without any mechanical or other cause that can be detected by the most powerful lenses in the hands of the most acute and experienced observers.

Such movements have naturally given rise to considerable speculation and discussion amongst naturalists as to the nature of these Diatoms. Some, amongst whom are ranked names of Continental and British celebrity, affirm, on this ground, that they are animals, whilst others of equal reputation consider them as true vegetables; the difficulty of arriving at a conclusion being increased by having to deal with forms so small as to be invisible to the naked eye, and of so low an order in the scale of life, as to be verging on the boundary line of the organised world. It would be unadapted to this paper to enter on the various arguments which have been adduced in support of the respective hypotheses; suffice it to say, that by the concurrent assent of the majority of naturalists, both at home and abroad, the Diatomaceae are now placed under the head of the Vegetable Kingdom.

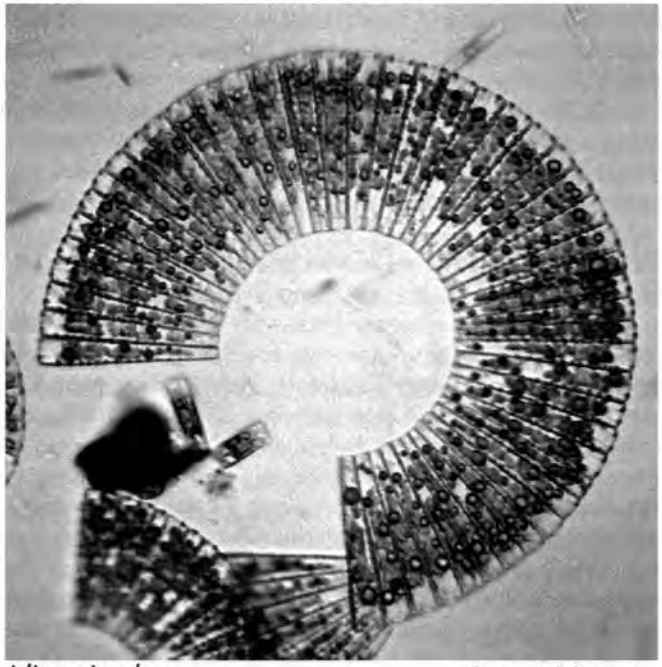
The origin of movements, however, still remains in obscurity. The late Professor W. Smith, in his lucid, laborious, and most valuable Monograph on the British Diatomaceae, suggests in explanation that the phenomena of Endosmose and Exomose constitute the exciting cause. But why endosmotic action should take place at one end, and synchronous with the motion being reversed, become exosmotic, is a question to try the ingenuity and patience of naturalists. An objection to this theory occurs also in the fact, that in order for Endosmose and Exomose to be sustained, we must suppose the fluids within and without the body of the Diatom, to be of a different specific gravity, and the change from a denser to a lighter medium, and *vice versa*, to be constantly and rapidly effected - a state of things that would presuppose the existence of a power in the Diatom, associated with a more complex organisation than any heretofore known to exist. Other causes have been assigned to account for these motions, as the presence of Ciliae, &c., but the observations have not been confirmed. There can be no doubt that the phenomenon of motion is due to the generation of a vital force in the Diatom, which force is largely influenced by the accessories of light and heat, and that it does not spring from anything approaching to an act of volition. But how the force is induced is a mystery.

The surface of the siliceous frustules of the Diatomaceae is generally exquisitely sculptured, and as the markings assume a definite arrangement, the observation of them sometimes becomes a comparatively easy means for identifying the different species. No mere verbal description can give an adequate idea of the extreme beauty and delicacy of these sculpturings. For example, the *P. Hippocampus,* which measures in its long axial diameter 1/200th part of an inch only, has 32 longitudinal and 40 transverse striae, in a space not exceeding 1/1000th part of an inch. This species is often used as a test object for the defining power of objectives. In others, as the *Isthmia nervosa,* the markings are reticulated. In *Grammatophora*, they appear like lines of written characters. In *Actinocyclus undulatus,* as alternate segments of hexagonal areolation, forming six rays, and so on. Any one tolerably familiar with the use of the microscope, and possessing the essential qualifications of patience, industry, and a power of delicate manipulation, may soon acquire, with a little practice, sufficient skill to enable him to fill his cabinet with a collection of gems, than which it is impossible to conceive anything more lovely or wonderful. If he is a beginner, it may be some time before his eyes are gladdened with a clear view of the beautiful *Triceratium*, or *Coscinodiscus*; but having once obtained and mounted either of these, or indeed any other specimen in a workmanlike manner, fit to be seen, his difficulties will rapidly vanish, and he will have obtained the knowledge of an art, which will amply reward him for the time and trouble expended in its acquisition.

To the microscopic observer, what wonders are thus disclosed to view. A new world of organisms - a universe of microcosms - obedient to the immutable laws of Divine order - of a character that makes us feel we are approaching the confines of the finite. Manifestations of life in organisation, so elementary and yet so beautiful, as to emphatically call forth our highest admiration at the Divine Wisdom that could conceive, and the Divine Power that could execute such marvellous productions. Nor can we rise from the contemplation of these receptacles of life, endowed as they are with all the functions which subserve the purpose of their existence, without the

conviction, that the life which is here manifest in these primary forms, is only a degree of that ONE LIFE which vitalizes all creation; that is the same Life which in its descent from the Supreme Highest to the lowest, is an emanation from Him, who in His providence preserves the boundless expanse of the infinite, and these humble microscopic organisms of the vegetable world.

In enumerating the species of Diatomaceae found on this Coast and in the neighbourhood, it may be well to state that my researches have been confined to a comparatively limited area, many spots not having been yet explored. At intervals I



Meridion circulare. *Photograph by M. Samworth*

have dredged the Bay, particularly the Brean-down side, but failed to obtain any species different from those to be met with nearer home. The nomenclature of the following list, and the classification, are adopted from Professor W. Smith's Synopsis.

To Edward H. Day, Esq., and the Rev. W. Pippet, I am indebted for the names of several specimens which they have procured, and which I have verified.

Surirella spiralis [=Campylodiscus spiralis] *Photographs by M. Samworth*

PhotographbyM.Samworth

Editors Note:- At the time of Pooley, Knightstone was a rocky outcrop reached by a causeway. On it was Knightstone Baths, which was still standing (the rather magnificent building on the left) when we visited (1999) but was due to be demolished and was inaccessible. In modern times a walkway has been built between the Knightstone Rock itself and Anchor Head thus enclosing the bay (the photograph above was taken from this walkway, looking South, with the bay on the left), which is now a marine boating lake.

Name	Habitat	Remarks
EPITHEMIA		
E. TURGIDA	Streams at Banwell;	abundant in Pottery Ponds, at Uphill
E. SOREX	Locking-road	
AMPHORA		
A. OVATA	Estuary of the Axe	
A. AFFINIS	Estuary of the Axe	
COCCONEIS		
C. PEDICULUS	Uphill - River Axe	Growing with Synedra on Euteromorpha
C. PLACENTULA	Banwell	
C. SCUTELLUM	Banwell	
COSCINODISCUS		
C. RADIATUS	Birnbeck Bay	Frequently attached to Ulva, as well as free in the mud.
ACTINOCYCLUS		
A. UNDULATUS	Birnbeck Bay	Not uncommon.
TRICERATIUM		
T. FAVUS	Anchor-head	Not common, but with assiduity discoverable. I have obtained some specimens with four layers of valves.
T. ALTERNANS	Birnbeck	I give this comparatively rare species from a description only, furnished to me by W. Doson, Esq., of Bath, who discovered the specimen, but was unfortunate in mounting it.
CYCLOTELLA		
C. KUTZINGIANA	Uphill	Somewhat rare.
CAMPYLODISCUS		
C. SPIRALIS	Brackish water at E. end of Brean-down	Sparingly also on the N. side of Knightstone.

Name	Habitat	Remarks
SURIRELLA		
S. GEMMA	Uphill	In a gathering I made at Uphill in May 1860, all the specimens were armed with exquisitely delicate threads, radiating from the fissure of the valves, symetrically arranged on each side. I was not aware at the time that Ehrenberg had drawn special attention to a similar appendage occurring in the same species of Diatom, which came under his observation. I could not observe the slightest motion in them.
S. OVATA	Brackish pool near Estuary of Axe	
S.MINUTA	Brackish pool near Estuary of Axe	
S. OVALIS	Pond at Montpelier	
S. STRIATULA	Uphill	
TRYBLIONELLA		
T. MARGINATA	Estuary of Axe	
T. PUNCTATA	Bleadon	
T. ANGUSTATA	Bleadon	
CYMATOPLEURA		
C. SOLEA	Banwell	
C. ELLIPTICA	Banwell	
NITZSCHIA		
N. BILOBATA	Estuary of Axe	
N. ACICULARIS	Estuary of Axe	I have some doubt as to this species, as the beaks are more than usually prolonged.
N. LINEARIS	Birnbeck	Few frustules only
N. SIGMOIDEA	Pond at Montpelier	
N. CLOSTERIUM	Uphill	

Name	Habitat	Remarks
G. MARINUM	Birnbeck Stakes and Uphill	
G. OLIVACEUM	Uphill	
G. DICHOTOMUM	Uphill-River Axe	
G. CURVATUM	Uphill	
G. ACUMINATUM	Uphill	
PODOSPHENIA		
P. JURGENSII?	Birnbeck Cove	Found growing on Schizonema Grevillii.
RHIPIDOPHORA		
R. DALMATICA	Birnbeck	
MERIDION		
M. CIRCULARE	Banwell, behing water-wheel	
BACCILLARIA		
B. PARADOXA	Marshes - Brean-down	
HIMANTIDIUM		
H. ARCUS	Banwell	
ODONTIDIUM		
O. PARASITICUM	Banwell	Parasitic on Surirella
FRAGILARIA		
F. CAPUCINA	Uphill	
ACHNANTHES		
A. LONGIPES	Rocks behind Claremont	This species is met with fringing in rich luxuriance the fronds of Ulvaceae that are in process of decay. I have also found a species extremely abundant in one spot on the north side of Knightstone, but as it certainly differs in several essential points from either of the four I have named, I have refrained from recording it until I have determined its specific character.
A. BREVIPES	In rocky pools behind Claremont (Page 15 of original)	
A. SUBSESSILIS		
A. EXILIS	Banwell	

Name	Habitat	Remarks
A. ?	Knightstone	Species alluded to above
RHABDONEMA		
R. ARCUATUM	Birnbeck Cove	
R. MINUTUM	Birnbeck Cove	
DIATOMA		
D. VULGARE	Uphill	
D. ELONGATUM	Uphill	
D. MINIMUM	Uphill	
GRAMMATOPHORA		
G. MARINA	Birnbeck	
G. SERPENTINA	Rocks at Anchor-head	
PODOSIRA		
P. MONTAGNEI	Birnbeck	
MELOSIRA		
M. NUMMULOIDES	Birnbeck Stakes	
M. SUBFLEXILIS	Birnbeck Stakes	
M. BORRERII	Birnbeck Stakes	
ORTHOSIRA		
O. MARINA	Birnbeck	
O. ARENARIA	Uncertain where gathered	
SCHIZONEMA		
S. CRUCIGER		
S. GREVILLII	Birnbeck	
S. IMPLICATUM	Brackish Water, Uphill	
S. HELMINTOSUM	Birnbeck	
ODONTIDIUM		
O. VARIABILE	Banwell	
O. MARINA	Birnbeck	

Note: Strews slides from the locations mentioned in the old paper are available from Klaus Kemp. Refer to advertisement for contact details.

Books

The list below details the books 'currently available' which have a reference to the Diatoms in their title or synopsis. We are sure that some of these, though classified as 'in print' are almost impossible to get hold off. Bearing this in mind, we hope you find the list useful.

There is one particular volume that we hope to do a review of, but we're going to have to save up first.

Algal Toxins in Seafood and Drinking Water. (Falconer, Ian R (Ed)) 23cm 240 Cloth. Academic P : Sep 1993 £56.95(at 04/01) 0-12-247990-4

International Review of Cytology : A Survey of Cell Biology. v.150 Ed. R. Gordon & BC Goodwin (Gordon, Richard (Ed) etc) 23cm 445 Cloth. Academic P : Apr 1994 £76.95(at 04/01) 0-12-364553-0

Illustrated Catalogue of the Type Specimens in the Greville Diatom Herbarium. (Williams, David M) Botany Bulletins 25cm.148. Ill Paperback. Brit. Museum (Nat. Hist.) : Jul 1988 £28.00(at 04/95) 0-565-08019-9

Some Cretaceous and Palaeogene Trinacria (Diatom) Species. (Sims, Patricia A & Ross, Robert) Botany Bulletins 25cm.47. Ill. Paperback. Brit. Museum (Nat. Hist.) : Oct 1988 £9.10(at 04/95) 0-565-08022-9

Twelfth International Diatom Symposium : Proceedings of the Twelfth International Diatom Symposium, Held at Renesse, The Netherlands, August 30-September 5,1992. (Dam, Herman van (Ed)) Developments in Hydrobiology S v.90 23cm 560 Cloth. Kluwer Acad. Publrs. : Nov 1993 £312.50(at 05/01) 0-7923-2484-6

Guide to the Morphology of the Diatom Frustule, with a Key to the British Freshwater Genera. (Barber, H G & Haworth, E Y) 22cm 112 Cloth. Freshwater : Sep 1981 £8.00(at 08/95) 0-900386-42-8

Proceedings of the Thirteenth Diatom Symposium. 13th. Maratea, Italy, 1st-7th September, 1994. (Marino, Donato (Ed) etc) 25cm. 600. Ill. Cloth. Biopress : Nov 1995 £65.00(at 01/97) 0-948737-35-2

Surface Waters Acidification Project Palaeolimnology Programme: Modern Diatom/ Lake-water Chemistry Data Set. (Stevenson, A C, etc.) 28cm.86. Paperback. ENSIS Publishing : Apr 1991 £7.00 1-871275-05-9

Review of Methods for the Use of Epilithic Diatoms for Detecting and Monitoring Changes in River Water Quality. (Environment, Dept. of) Methods for the Examination of Waters & Associated Materials S 30cm Paperback. HMSO : Dec 1993 £9.00(at 09/00) 0-11-752771-8

Shape and Form in Plants and Fungi. (Ingram, David S (Ed) etc) 23cm 404 Cloth. Academic P : Jun 1994 £76.95(at 04/01) 0-12-371035-9

Identifying Marine Phytoplankton. (Tomas, Carmelo R (Ed)) 23cm 850 Ill.(some col.). n.e.of "Marine Phytoplankton: Guide to Naked Flagellates and Cocclithophorids" AND "Identifying Marine Diatoms and Dinoflagellates" Paperback. Academic P : Feb 1997 £55.95(at 04/01) 0-12-693018-X (Whitaker UK)

Identification of Freshwater Diatoms. (Cox, E J) 25cm 168 36ill. Cloth. Chap. & H : Aug 1996 £66.75(at 05/01) 0-412-49380-2

Diatoms, The : Applications for the Environmental and Earth Sciences. (Stoermer, Eugene F (Ed) etc) 24.7cm 482 3ill.84d.12tabs. Paperback. Camb. UP : Jul 2001 £29.95 0-521-00412-8

Diatoms, The : Biology and Morphology of the Genera. (Round, F E, etc.) 25cm 747 500ill. Cloth. Camb. UP : Jun 1990 £170.00(at 11/01) 0-521-36318-7

Diatoms, The : Applications for the Environmental and Earth Sciences. (Stoermer, Eugene F (Ed) etc) 25cm 481 3ill.84d.12tabs. Cloth. Camb. UP : Apr 1999 £80.00(at 09/01) 0-521-58281-4

Freshwater Algal Flora of the British Isles : An Identification Guide to Freshwater and Terrestrial Algae. (John, D M & Whitton, B A) 29.7cm 720 11ill.150d. Cloth. Camb. UP : Mar 2002 £75.00 0-521-77051-3 (forthcoming (UK))

Some Genera of the Biddulphiadae (Diatoms) with Interlocking Linking Spines. (Ross, Robert & Sims, Patricia A) Botany Bulletins 25cm.104 Paperback. Brit. Museum (Nat. Hist.) : Jun 1985 £6.00(at 04/95) 0-565-08006-7

Further Genera of the Biddulphiadiae (Diatoms) with Interlocking Linking Spines. (Ross, Robert & Sims, Patricia A) Botany Bulletins 19cm.42. 13ill Paperback. Brit. Museum (Nat. Hist.) : Nov 1987 £8.00(at 04/95) 0-565-08017-2

Diatoms of North America. (Vineyard, W C) 22cm.119. d Paperback. Mad River P, US : Feb 1981 £12.50(at 10/96) 0-916422-15-1

Atlas of British Diatoms. (Hartley, B & Sims, Patricia A (Ed) etc) 25cm. 601. 290ill. H.G.Barber & J.R.Carter Cloth. Biopress : Aug 1996 £65.00(at 04/97) 0-948737-45-X

Illustrated Guide to the Diatoms of British Coastal Plankton. (Sykes, J B) Jnl. Offprints S 28cm.50. 35ill Paperback. Field Studies Cncl : Dec 1981 £4.75(at 03/95) 1-85153-140-8

Coded Checklist of British Diatoms. (Williams, David M, etc.) 29cm.74 Spiral. ENSIS : Oct 1988 £6.00 1-871275-01-6

Iceman and His Environment : Palaeobotanical Results. Palaeobotanical Results (Bortenschlager, S (Ed) etc) Man in the Ice BD S No.4 23cm x,166 108col.figs. Cloth. Springer-Verlag : Jul 2000 £57.50(at 10/01) French Franc 558.00; Swiss Franc 135.00; DM 148.00; Austrian Schilling 1036.00; Italian Lira 163450.00(at 06/2000) 3-211-82660-2

Microbial Sediments. (Riding, Robert (Ed) etc) 23cm 345 149figs.(15col.).12tabs. Cloth. Springer-Verlag : Jan 2000 £134.00(at 05/00) French Franc 1315.00; Austrian Schilling 2548.00; Swiss Franc 315.00; DM 349.00; Italian Lira 385450.00(at 05/2000) 3-540-61828-7

Diatoms and Lake Acidity. (Smol, J P, etc. (Ed)) Development in Hydrobiology 22cm 307 Ill.d.tabs.ch. Cloth. W Junk : Apr 1986 £226.95(at 05/01) 90-6193-536-9

Diatoms of the Ribble Valley

By William Marshall

Editors Note:- It is unfortunate that this first issue has to record the passing of Mr. William Marshall of Clitheroe. Mr. Marshall was a founder member of Clitheroe and District Naturalists Society and spent all his life around the area where he was born. Shortly before his death we were offered some of his own recordings. As a North West Electricity Board inspector he had ample opportunity to collect. He mounted selected species and indeed turned his hand to small arrangements. It is a tragedy that we did not have an opportunity to meet Mr. Marshall or benefit from his wealth of experience. Perhaps had we had an organ of communication when he was alive we would have been honoured by his contributions. We would like to dedicate this first issue in memory of Mr. Marshall and perhaps we may all visit some of his favourite collecting sites

This list (compiled in the late 1950's) represents only a fraction of the numerous forms to be found in the Ribble Valley, many of which I have not yet been able to identify with certainty and so have not been included in the list.

Trough in Greenbanks Lane, Grindleton. (August 29th 1957)
- Synedra radians
- Gomphonema acuminatum
- Amphora ovalis
- Synedra pulchella [Kutz.]

Pond – Halton West Road., Bolton-by-Bowland (Observations taken at various times)
- Pleurosigma attenuatum [Smith]
- Gomphonema acuminatum [Smith]
- Cocconema lanceolatum [Wm. Smith]
- Nitzschia sigmoidea [Wm. Smith]
- Epithemia turgida [Wm. Smith]
- Synedra radians [Wm. Smith]
- Synedra pulchella [Kutz.]
- Epithemia gibba [Kutz.]
- Many more yet to be identified.

Grindleton Fell (Observations taken at various times)
- Pinnularia major [Wm. Smith]
- Pinnularia viridis [Wm. Smith]
- Navicula, many species not identified
- Surirella biseriata
- Himantidium, Unidentified

Chorley House, Clitheroe
- Navicula nodosa [Pritch.]
- Meridion circulare [Wm. Smith]
- Synedra, Many species

Mearly Woods
- Odontidium mesodon [Wm. Smith]
- Epithemia gibba [Wm. Smith]
- Eptithemia turgida [Wm. Smith]
- Meridion circulare [W. Smith] (Editors note:- see illustration in Pooley article)
- Cymbella,
- Amphora ovalis [Wm. Smith]
- Navicula, Many species not identified

Bolland Lane, West Bradford, Yorks.
- Gomphonema olivaceum [Wm. Smith]

River Ribble

Campylodicus spiralis [Wm. Smith] (Editors note:- see illustration in Pooley article)

Ribble Head, Yorks.

Gomphonema geminatum [Wm. Smith]

The Diatom Frustule

There are many terms used to describe features of the frustule. We will start with some simple terms and proceed to the more scientific.

The frustule is the term used for the complete silica (silex) shell of a diatom. It is in fact made up of three major components. Two valves and the girdle band(at least two girdle bands). Because of the way these two valves slot together, a lid and a box, one is necessarily larger than the other. In scientific circles the upper, larger valve (the lid) is termed the *epitheca.* This is used to encompass the girdle elements associated with the upper valve and which separately are called the *epivalve* (the valve) and the *epicingulum* (the girdles) The lower, smaller valve (the box) is termed the *hypotheca* and here again this term is used to include the girdle elements associated with the lower valve, which independently are called the *hypovalve* (the valve) and the *hypocingulum* (the girdles). To make matters worse the valves may also be called tests, particularly in older publications. If you look at some cleaned, but unfiltered, diatom material you will see lots of thin outlines which are the same shape as your diatoms but have no internal structure. These are the girdle bands (epicingulum and hypocingulum) that have been displaced from the 'connective zone' between the valves. Most of the older literature refers to valves and girdle bands.

Girdle bands are not generally complete in that they are actually open at one end (there are exceptions to this, e.g. Arachnoidiscus ornatus where the girdle band forms a complete circle). It is this particular feature that can prove useful when cleaning diatoms (more of this in later articles).

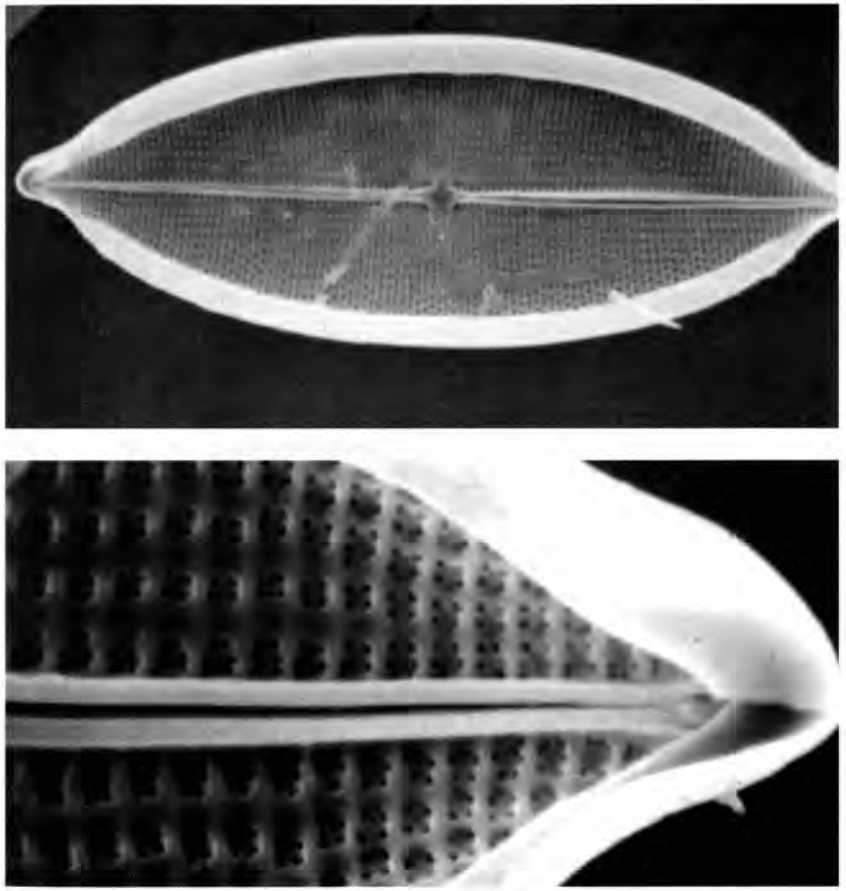
We then come to the markings on the valves themselves. Much more information and detail has come to light, so to speak, since the advent of Electron Microscopes and their cousins. This tends to mean that these structures are mentioned in relation to their function rather than to their appearance as was the case in the old days. We will try to blend the two.

Let us begin with a structure called the *raphe.* Firstly not all diatoms have a raphe. The raphe is a line that you will see, normally running from one apex of the valve to the other. In reality the raphe is a slit and with a light microscope what you usually see are the raphe ribs on either side of the slit. You can see this on the Electron micrograph reproduced on the next page. Quite often this raphe doesn't run in a continuous line without being 'broken' somewhere along its length. This juncture is often marked by a structure called the central nodule, which is an area of thickened silica. This central nodule might be extensive even joining up with the valve margins, in which case it is called the *stauros.* If the valve has a raphe it is called *raphid* and if a raphe is not present then it is termed *araphid.*

Running at an acute angle from the raphe are a series of lines. These lines are termed *striae,* plural, and a *stria,* singular. It is the distance between these lines or the number in a given linear measurement that may be used to distinguish one species from another. Although these striae might look like lines, they are in fact formed of rows of small structures called *punctae.*

What we have thus far described is a silica shell which actually has a whole load of holes in it. The frustule is effectively acting as a sort of framework for the cell cytoplasm, both in terms of containment but perhaps more importantly as a means of access to the world outside.

Take a look, now, at the electron micrographs below and pick out those features we have discussed. (Take note that the micrographs are of the underside of a valve.)



Electron micrographs of Mastogloia sp. Taken looking into the valve from below.
(Courtesy of K.D.Kemp)

You can see from these photographs that the rows of punctae are actually small areas of thickened silica and each puncta bears a number of holes, called areolae (singular – areola).

What appears to be structure is often the absence of material!

In the next article we will discuss shapes and the terminology used to describe them. Until then, at least you can understand some of what is being said!

Useful Notes

In this section we will be publishing those ephemera that we all compile when pursuing one line of interest or another. These snippets get filed away in the drawer designated 'things that will come in useful', never to see the light of day again. The very fact that it was necessary to compile them meant that either they had not been done before or were generally unavailable. Many others must have these hoards of 'Useful Information'. Rather than leave them gathering dust and book mites why not have them printed here for others to use.

The first of these is something that has been useful when trying to marry an old and modern description of a specific diatom. Overleaf is a conversion table of 'Striae in a thousandth of an inch' to 'Striae in 10 microns'.

There are 25,400 microns to the inch so it is a relatively simple calculation to do. However, it is so much more convenient to have a table of the values to hand.

Whilst we are at it, it is probably useful to cite some other, related, old linear, volumetric and weight measurements and their modern day metric equivalents.

These are useful to our overseas readers and younger readers at home when reading older articles and instructions from the UK.

0.1 of an inch = One Tenth of an inch
0.01 of an inch = One Hundredth of an inch
0.001 of an inch = One Thousandth of an inch.

Linear Measurements. 1 Inch = 2.54cm (actually 25.39954 mm)
1 foot (12 inches) = 0.30479 metres
1 yard (36 inches or 3 feet) = 0.91438 metres
1 Fathom (72 inches or 6 feet or 2 yards) = 1.82877 metres
1 Mile (1760 yards) = 1.60931 km

Imperial weights 1 Grain = 0.06479895 grams
1 Dram = 1.77185 grams
1 Ounce (16 drams or 437.5 grains) = 28.34954 grams
1 pound (16 oz or 256 drams or 5760 grains) = 0.45359 Kg.

Troy Weights 24 Grains = 1 pennyweight (dwt)
20 pennyweights = 1 ounce
12 ounces or 5760 grains = 1 pound

Apothecaries Weight 20 Grains = 1 Scruple
3 Scruples (60 grains) = 1 Drachm
8 Drachms (480 Grains) = 1 ounce

Note: All Grain weights are the same whether Imperial, Troy or Apothecaries.

No. of Striae in 1/1000 inch	No. of Striae in 10 microns	No. of Striae in 1/1000 inch	No. of Striae in 10 microns	No. of Striae in 1/1000 inch	No. of Striae in 10 microns	No. of Striae in 1/1000 inch	No. of Striae in 10 microns	No. of Striae in 1/1000 inch	No. of Striae in 10 microns	No. of Striae in 1/1000 inch	No. of Striae in 10 microns	No. of Striae in 1/1000 inch	No. of Striae in 10 microns
1	0.394	1.1	0.433	1.2	0.472	1.3	0.512	1.4	0.551	1.5	0.591	1.6	0.630	1.7	0.669	1.8	0.709	1.9	0.748
2	0.787	2.1	0.827	2.2	0.866	2.3	0.906	2.4	0.945	2.5	0.984	2.6	1.024	2.7	1.063	2.8	1.102	2.9	1.142
3	1.181	3.1	1.220	3.2	1.260	3.3	1.299	3.4	1.339	3.5	1.378	3.6	1.417	3.7	1.457	3.8	1.496	3.9	1.535
4	1.575	4.1	1.614	4.2	1.654	4.3	1.693	4.4	1.732	4.5	1.772	4.6	1.811	4.7	1.850	4.8	1.890	4.9	1.929
5	1.969	5.1	2.008	5.2	2.047	5.3	2.087	5.4	2.126	5.5	2.165	5.6	2.205	5.7	2.244	5.8	2.283	5.9	2.323
6	2.362	6.1	2.402	6.2	2.441	6.3	2.480	6.4	2.520	6.5	2.559	6.6	2.598	6.7	2.638	6.8	2.677	6.9	2.717
7	2.756	7.1	2.795	7.2	2.835	7.3	2.874	7.4	2.913	7.5	2.953	7.6	2.992	7.7	3.031	7.8	3.071	7.9	3.110
8	3.150	8.1	3.189	8.2	3.228	8.3	3.268	8.4	3.307	8.5	3.346	8.6	3.386	8.7	3.425	8.8	3.465	8.9	3.504
9	3.543	9.1	3.583	9.2	3.622	9.3	3.661	9.4	3.701	9.5	3.740	9.6	3.780	9.7	3.819	9.8	3.858	9.9	3.898
10	3.937	10.1	3.976	10.2	4.016	10.3	4.055	10.4	4.094	10.5	4.134	10.6	4.173	10.7	4.213	10.8	4.252	10.9	4.291
11	4.331	11.1	4.370	11.2	4.409	11.3	4.449	11.4	4.488	11.5	4.528	11.6	4.567	11.7	4.606	11.8	4.646	11.9	4.685
12	4.724	12.1	4.764	12.2	4.803	12.3	4.843	12.4	4.882	12.5	4.921	12.6	4.961	12.7	5.000	12.8	5.039	12.9	5.079
13	5.118	13.1	5.157	13.2	5.197	13.3	5.236	13.4	5.276	13.5	5.315	13.6	5.354	13.7	5.394	13.8	5.433	13.9	5.472
14	5.512	14.1	5.551	14.2	5.591	14.3	5.630	14.4	5.669	14.5	5.709	14.6	5.748	14.7	5.787	14.8	5.827	14.9	5.866
15	5.906	15.1	5.945	15.2	5.984	15.3	6.024	15.4	6.063	15.5	6.102	15.6	6.142	15.7	6.181	15.8	6.220	15.9	6.260
16	6.299	16.1	6.339	16.2	6.378	16.3	6.417	16.4	6.457	16.5	6.496	16.6	6.535	16.7	6.575	16.8	6.614	16.9	6.654
17	6.693	17.1	6.732	17.2	6.772	17.3	6.811	17.4	6.850	17.5	6.890	17.6	6.929	17.7	6.969	17.8	7.008	17.9	7.047
18	7.087	18.1	7.126	18.2	7.165	18.3	7.205	18.4	7.244	18.5	7.283	18.6	7.323	18.7	7.362	18.8	7.402	18.9	7.441
19	7.480	19.1	7.520	19.2	7.559	19.3	7.598	19.4	7.638	19.5	7.677	19.6	7.717	19.7	7.756	19.8	7.795	19.9	7.835
20	7.874	20.1	7.913	20.2	7.953	20.3	7.992	20.4	8.031	20.5	8.071	20.6	8.110	20.7	8.150	20.8	8.189	20.9	8.228
21	8.268	21.1	8.307	21.2	8.346	21.3	8.386	21.4	8.425	21.5	8.465	21.6	8.504	21.7	8.543	21.8	8.583	21.9	8.622
22	8.661	22.1	8.701	22.2	8.740	22.3	8.780	22.4	8.819	22.5	8.858	22.6	8.898	22.7	8.937	22.8	8.976	22.9	9.016
23	9.055	23.1	9.094	23.2	9.134	23.3	9.173	23.4	9.213	23.5	9.252	23.6	9.291	23.7	9.331	23.8	9.370	23.9	9.409
24	9.449	24.1	9.488	24.2	9.528	24.3	9.567	24.4	9.606	24.5	9.646	24.6	9.685	24.7	9.724	24.8	9.764	24.9	9.803
25	9.8432	25.1	9.882	25.2	9.921	25.3	9.961	25.4	10.000	25.5	10.039	25.6	10.079	25.7	10.118	25.8	10.157	25.9	10.197
26	10.236	26.1	10.276	26.2	10.315	26.3	10.354	26.4	10.394	26.5	10.433	26.6	10.472	26.7	10.512	26.8	10.551	26.9	10.591
27	10.630	27.1	10.669	27.2	10.709	27.3	10.748	27.4	10.787	27.5	10.827	27.6	10.866	27.7	10.906	27.8	10.945	27.9	10.984
28	11.024	28.1	11.063	28.2	11.102	28.3	11.142	28.4	11.181	28.5	11.220	28.6	11.260	28.7	11.299	28.8	11.339	28.9	11.378
29	11.417	29.1	11.457	29.2	11.496	29.3	11.535	29.4	11.575	29.5	11.614	29.6	11.654	29.7	11.693	29.8	11.732	29.9	11.772
30	11.811	30.1	11.850	30.2	11.890	30.3	11.929	30.4	11.969	30.5	12.008	30.6	12.047	30.7	12.087	30.8	12.126	30.9	12.165
31	12.205	31.1	12.244	31.2	12.283	31.3	12.323	31.4	12.362	31.5	12.402	31.6	12.441	31.7	12.480	31.8	12.520	31.9	12.559
32	12.598	32.1	12.638	32.2	12.677	32.3	12.717	32.4	12.756	32.5	12.795	32.6	12.835	32.7	12.874	32.8	12.913	32.9	12.953
33	12.992	33.1	13.031	33.2	13.071	33.3	13.110	33.4	13.150	33.5	13.189	33.6	13.228	33.7	13.268	33.8	13.307	33.9	13.346

No. of Striae in 1/1000 inch	No. of Striae in 10 microns	No. of Striae in 1/1000 inch	No. of Striae in 10 microns	No. of Striae in 1/1000 inch	No. of Striae in 10 microns	No. of Striae in 1/1000 inch	No. of Striae in 10 microns	No. of Striae in 1/1000 inch	No. of Striae in 10 microns	No. of Striae in 1/1000 inch	No. of Striae in 10 microns	No. of Striae in 1/1000 inch	No. of Striae in 10 microns	No. of Striae in 1/1000 inch	No. of Striae in 10 microns	No. of Striae in 1/1000 inch	No. of Striae in 10 microns	No. of Striae in 1/1000 inch	No. of Striae in 10 microns
34	13.386	**34.1**	13.425	**34.2**	13.465	**34.3**	13.504	**34.4**	13.543	**34.5**	13.583	**34.6**	13.622	**34.7**	13.661	**34.8**	13.701	**34.9**	13.740
35	13.780	**35.1**	13.819	**35.2**	13.858	**35.3**	13.898	**35.4**	13.937	**35.5**	13.976	**35.6**	14.016	**35.7**	14.055	**35.8**	14.094	**35.9**	14.134
36	14.173	**36.1**	14.213	**36.2**	14.252	**36.3**	14.291	**36.4**	14.331	**36.5**	14.370	**36.6**	14.409	**36.7**	14.449	**36.8**	14.488	**36.9**	14.528
37	14.567	**37.1**	14.606	**37.2**	14.646	**37.3**	14.685	**37.4**	14.724	**37.5**	14.764	**37.6**	14.803	**37.7**	14.843	**37.8**	14.882	**37.9**	14.921
38	14.961	**38.1**	15.000	**38.2**	15.039	**38.3**	15.079	**38.4**	15.118	**38.5**	15.157	**38.6**	15.197	**38.7**	15.236	**38.8**	15.276	**38.9**	15.315
39	15.354	**39.1**	15.394	**39.2**	15.433	**39.3**	15.472	**39.4**	15.512	**39.5**	15.551	**39.6**	15.591	**39.7**	15.630	**39.8**	15.669	**39.9**	15.709
40	15.748	**40.1**	15.787	**40.2**	15.827	**40.3**	15.866	**40.4**	15.906	**40.5**	15.945	**40.6**	15.984	**40.7**	16.024	**40.8**	16.063	**40.9**	16.102
41	16.142	**41.1**	16.181	**41.2**	16.220	**41.3**	16.260	**41.4**	16.299	**41.5**	16.339	**41.6**	16.378	**41.7**	16.417	**41.8**	16.457	**41.9**	16.496
42	16.535	**42.1**	16.575	**42.2**	16.614	**42.3**	16.654	**42.4**	16.693	**42.5**	16.732	**42.6**	16.772	**42.7**	16.811	**42.8**	16.850	**42.9**	16.890
43	16.929	**43.1**	16.969	**43.2**	17.008	**43.3**	17.047	**43.4**	17.087	**43.5**	17.126	**43.6**	17.165	**43.7**	17.205	**43.8**	17.244	**43.9**	17.283
44	17.323	**44.1**	17.362	**44.2**	17.402	**44.3**	17.441	**44.4**	17.480	**44.5**	17.520	**44.6**	17.559	**44.7**	17.598	**44.8**	17.638	**44.9**	17.677
45	17.717	**45.1**	17.756	**45.2**	17.795	**45.3**	17.835	**45.4**	17.874	**45.5**	17.913	**45.6**	17.953	**45.7**	17.992	**45.8**	18.031	**45.9**	18.071
46	18.110	**46.1**	18.150	**46.2**	18.189	**46.3**	18.228	**46.4**	18.268	**46.5**	18.307	**46.6**	18.346	**46.7**	18.386	**46.8**	18.425	**46.9**	18.465
47	18.504	**47.1**	18.543	**47.2**	18.583	**47.3**	18.622	**47.4**	18.661	**47.5**	18.701	**47.6**	18.740	**47.7**	18.780	**47.8**	18.819	**47.9**	18.858
48	18.898	**48.1**	18.937	**48.2**	18.976	**48.3**	19.016	**48.4**	19.055	**48.5**	19.094	**48.6**	19.134	**48.7**	19.173	**48.8**	19.213	**48.9**	19.252
49	19.291	**49.1**	19.331	**49.2**	19.370	**49.3**	19.409	**49.4**	19.449	**49.5**	19.488	**49.6**	19.528	**49.7**	19.567	**49.8**	19.606	**49.9**	19.646
50	19.685	**50.1**	19.724	**50.2**	19.764	**50.3**	19.803	**50.4**	19.843	**50.5**	19.882	**50.6**	19.921	**50.7**	19.961	**50.8**	20.000	**50.9**	20.039
51	20.079	**51.1**	20.118	**51.2**	20.157	**51.3**	20.197	**51.4**	20.236	**51.5**	20.276	**51.6**	20.315	**51.7**	20.354	**51.8**	20.394	**51.9**	20.433
52	20.472	**52.1**	20.512	**52.2**	20.551	**52.3**	20.591	**52.4**	20.630	**52.5**	20.669	**52.6**	20.709	**52.7**	20.748	**52.8**	20.787	**52.9**	20.827
53	20.866	**53.1**	20.906	**53.2**	20.945	**53.3**	20.984	**53.4**	21.024	**53.5**	21.063	**53.6**	21.102	**53.7**	21.142	**53.8**	21.181	**53.9**	21.220
54	21.260	**54.1**	21.299	**54.2**	21.339	**54.3**	21.378	**54.4**	21.417	**54.5**	21.457	**54.6**	21.496	**54.7**	21.535	**54.8**	21.575	**54.9**	21.614
55	21.654	**55.1**	21.693	**55.2**	21.732	**55.3**	21.772	**55.4**	21.811	**55.5**	21.850	**55.6**	21.890	**55.7**	21.929	**55.8**	21.969	**55.9**	22.008
56	22.047	**56.1**	22.087	**56.2**	22.126	**56.3**	22.165	**56.4**	22.205	**56.5**	22.244	**56.6**	22.283	**56.7**	22.323	**56.8**	22.362	**56.9**	22.402
57	22.441	**57.1**	22.480	**57.2**	22.520	**57.3**	22.559	**57.4**	22.598	**57.5**	22.638	**57.6**	22.677	**57.7**	22.717	**57.8**	22.756	**57.9**	22.795
58	22.835	**58.1**	22.874	**58.2**	22.913	**58.3**	22.953	**58.4**	22.992	**58.5**	23.031	**58.6**	23.071	**58.7**	23.110	**58.8**	23.150	**58.9**	23.189
59	23.228	**59.1**	23.268	**59.2**	23.307	**59.3**	23.346	**59.4**	23.386	**59.5**	23.425	**59.6**	23.465	**59.7**	23.504	**59.8**	23.543	**59.9**	23.583
60	23.622	**60.1**	23.661	**60.2**	23.701	**60.3**	23.740	**60.4**	23.780	**60.5**	23.819	**60.6**	23.858	**60.7**	23.898	**60.8**	23.937	**60.9**	23.976
61	24.016	**61.1**	24.055	**61.2**	24.094	**61.3**	24.134	**61.4**	24.173	**61.5**	24.213	**61.6**	24.252	**61.7**	24.291	**61.8**	24.331	**61.9**	24.370
62	24.409	**62.1**	24.449	**62.2**	24.488	**62.3**	24.528	**62.4**	24.567	**62.5**	24.606	**62.6**	24.646	**62.7**	24.685	**62.8**	24.724	**62.9**	24.764
63	24.803	**63.1**	24.843	**63.2**	24.882	**63.3**	24.921	**63.4**	24.961	**63.5**	25.000	**63.6**	25.039	**63.7**	25.079	**63.8**	25.118	**63.9**	25.157
64	25.197	**64.1**	25.236	**64.2**	25.276	**64.3**	25.315	**64.4**	25.354	**64.5**	25.394	**64.6**	25.433	**64.7**	25.472	**64.8**	25.512	**64.9**	25.551
65	25.591	**65.1**	25.630	**65.2**	25.669	**65.3**	25.709	**65.4**	25.748	**65.5**	25.787	**65.6**	25.827	**65.7**	25.866	**65.8**	25.906	**65.9**	25.945
66	25.984	**66.1**	26.024	**66.2**	26.063	**66.3**	26.102	**66.4**	26.142	**66.5**	26.181	**66.6**	26.220	**66.7**	26.260	**66.8**	26.299	**66.9**	26.339

No. of Striae in 1/1000 inch	No. of Striae in 10 microns	No. of Striae in 1/1000 inch	No. of Striae in 10 microns	No. of Striae in 1/1000 inch	No. of Striae in 10 microns	No. of Striae in 1/1000 inch	No. of Striae in 10 microns	No. of Striae in 1/1000 inch	No. of Striae in 10 microns	No. of Striae in 1/1000 inch	No. of Striae in 10 microns	No. of Striae in 1/1000 inch	No. of Striae in 10 microns	No. of Striae in 1/1000 inch	No. of Striae in 10 microns	No. of Striae in 1/1000 inch	No. of Striae in 10 microns	No. of Striae in 1/1000 inch	No. of Striae in 10 microns
67	26.378	**67.1**	26.417	**67.2**	26.457	**67.3**	26.496	**67.4**	26.535	**67.5**	26.575	**67.6**	26.614	**67.7**	26.654	**67.8**	26.693	**67.9**	26.732
68	26.772	**68.1**	26.811	**68.2**	26.850	**68.3**	26.890	**68.4**	26.929	**68.5**	26.969	**68.6**	27.008	**68.7**	27.047	**68.8**	27.087	**68.9**	27.126
69	27.165	**69.1**	27.205	**69.2**	27.244	**69.3**	27.283	**69.4**	27.323	**69.5**	27.362	**69.6**	27.402	**69.7**	27.441	**69.8**	27.480	**69.9**	27.520
70	27.559	**70.1**	27.598	**70.2**	27.638	**70.3**	27.677	**70.4**	27.717	**70.5**	27.756	**70.6**	27.795	**70.7**	27.835	**70.8**	27.874	**70.9**	27.913
71	27.953	**71.1**	27.992	**71.2**	28.031	**71.3**	28.071	**71.4**	28.110	**71.5**	28.150	**71.6**	28.189	**71.7**	28.228	**71.8**	28.268	**71.9**	28.307
72	28.346	**72.1**	28.386	**72.2**	28.425	**72.3**	28.465	**72.4**	28.504	**72.5**	28.543	**72.6**	28.583	**72.7**	28.622	**72.8**	28.661	**72.9**	28.701
73	28.740	**73.1**	28.780	**73.2**	28.819	**73.3**	28.858	**73.4**	28.898	**73.5**	28.937	**73.6**	28.976	**73.7**	29.016	**73.8**	29.055	**73.9**	29.094
74	29.134	**74.1**	29.173	**74.2**	29.213	**74.3**	29.252	**74.4**	29.291	**74.5**	29.331	**74.6**	29.370	**74.7**	29.409	**74.8**	29.449	**74.9**	29.488
75	29.528	**75.1**	29.567	**75.2**	29.606	**75.3**	29.646	**75.4**	29.685	**75.5**	29.724	**75.6**	29.764	**75.7**	29.803	**75.8**	29.843	**75.9**	29.882
76	29.921	**76.1**	29.961	**76.2**	30.000	**76.3**	30.039	**76.4**	30.079	**76.5**	30.118	**76.6**	30.157	**76.7**	30.197	**76.8**	30.236	**76.9**	30.276
77	30.315	**77.1**	30.354	**77.2**	30.394	**77.3**	30.433	**77.4**	30.472	**77.5**	30.512	**77.6**	30.551	**77.7**	30.591	**77.8**	30.630	**77.9**	30.669
78	30.709	**78.1**	30.748	**78.2**	30.787	**78.3**	30.827	**78.4**	30.866	**78.5**	30.906	**78.6**	30.945	**78.7**	30.984	**78.8**	31.024	**78.9**	31.063
79	31.102	**79.1**	31.142	**79.2**	31.181	**79.3**	31.220	**79.4**	31.260	**79.5**	31.299	**79.6**	31.339	**79.7**	31.378	**79.8**	31.417	**79.9**	31.457
80	31.496	**80.1**	31.535	**80.2**	31.575	**80.3**	31.614	**80.4**	31.654	**80.5**	31.693	**80.6**	31.732	**80.7**	31.772	**80.8**	31.811	**80.9**	31.850
81	31.890	**81.1**	31.929	**81.2**	31.969	**81.3**	32.008	**81.4**	32.047	**81.5**	32.087	**81.6**	32.126	**81.7**	32.165	**81.8**	32.205	**81.9**	32.244
82	32.283	**82.1**	32.323	**82.2**	32.362	**82.3**	32.402	**82.4**	32.441	**82.5**	32.480	**82.6**	32.520	**82.7**	32.559	**82.8**	32.598	**82.9**	32.638
83	32.677	**83.1**	32.717	**83.2**	32.756	**83.3**	32.795	**83.4**	32.835	**83.5**	32.874	**83.6**	32.913	**83.7**	32.953	**83.8**	32.992	**83.9**	33.031
84	33.071	**84.1**	33.110	**84.2**	33.150	**84.3**	33.189	**84.4**	33.228	**84.5**	33.268	**84.6**	33.307	**84.7**	33.346	**84.8**	33.386	**84.9**	33.425
85	33.465	**85.1**	33.504	**85.2**	33.543	**85.3**	33.583	**85.4**	33.622	**85.5**	33.661	**85.6**	33.701	**85.7**	33.740	**85.8**	33.780	**85.9**	33.819
86	33.858	**86.1**	33.898	**86.2**	33.937	**86.3**	33.976	**86.4**	34.016	**86.5**	34.055	**86.6**	34.094	**86.7**	34.134	**86.8**	34.173	**86.9**	34.213
87	34.252	**87.1**	34.291	**87.2**	34.331	**87.3**	34.370	**87.4**	34.409	**87.5**	34.449	**87.6**	34.488	**87.7**	34.528	**87.8**	34.567	**87.9**	34.606
88	34.646	**88.1**	34.685	**88.2**	34.724	**88.3**	34.764	**88.4**	34.803	**88.5**	34.843	**88.6**	34.882	**88.7**	34.921	**88.8**	34.961	**88.9**	35.000
89	35.039	**89.1**	35.079	**89.2**	35.118	**89.3**	35.157	**89.4**	35.197	**89.5**	35.236	**89.6**	35.276	**89.7**	35.315	**89.8**	35.354	**89.9**	35.394
90	35.433	**90.1**	35.472	**90.2**	35.512	**90.3**	35.551	**90.4**	35.591	**90.5**	35.630	**90.6**	35.669	**90.7**	35.709	**90.8**	35.748	**90.9**	35.787
91	35.827	**91.1**	35.866	**91.2**	35.906	**91.3**	35.945	**91.4**	35.984	**91.5**	36.024	**91.6**	36.063	**91.7**	36.102	**91.8**	36.142	**91.9**	36.181
92	36.220	**92.1**	36.260	**92.2**	36.299	**92.3**	36.339	**92.4**	36.378	**92.5**	36.417	**92.6**	36.457	**92.7**	36.496	**92.8**	36.535	**92.9**	36.575
93	36.614	**93.1**	36.654	**93.2**	36.693	**93.3**	36.732	**93.4**	36.772	**93.5**	36.811	**93.6**	36.850	**93.7**	36.890	**93.8**	36.929	**93.9**	36.969
94	37.008	**94.1**	37.047	**94.2**	37.087	**94.3**	37.126	**94.4**	37.165	**94.5**	37.205	**94.6**	37.244	**94.7**	37.283	**94.8**	37.323	**94.9**	37.362
95	37.402	**95.1**	37.441	**95.2**	37.480	**95.3**	37.520	**95.4**	37.559	**95.5**	37.598	**95.6**	37.638	**95.7**	37.677	**95.8**	37.717	**95.9**	37.756
96	37.795	**96.1**	37.835	**96.2**	37.874	**96.3**	37.913	**96.4**	37.953	**96.5**	37.992	**96.6**	38.031	**96.7**	38.071	**96.8**	38.110	**96.9**	38.150
97	38.189	**97.1**	38.228	**97.2**	38.268	**97.3**	38.307	**97.4**	38.346	**97.5**	38.386	**97.6**	38.425	**97.7**	38.465	**97.8**	38.504	**97.9**	38.543
98	38.583	**98.1**	38.622	**98.2**	38.661	**98.3**	38.701	**98.4**	38.740	**98.5**	38.780	**98.6**	38.819	**98.7**	38.858	**98.8**	38.898	**98.9**	38.937
99	38.976	**99.1**	39.016	**99.2**	39.055	**99.3**	39.094	**99.4**	39.134	**99.5**	39.173	**99.6**	39.213	**99.7**	39.252	**99.8**	39.291	**99.9**	39.331

Correspondence

Since this is the first issue there is no correspondence as such.
An open letter from the editors:-

Dear Reader,

It is with great relief that we finally go to print with a periodical that has been some years in consideration. We looked at various ways of funding this project and embarked upon a series of enterprises which would release sufficient funds to cover a couple of issues and then to provide enough income over the intervening period to pay for the next. This first issue is free, for the next we anticipate levying a small charge as a contribution to cost. We have no intention of, nor will we, make a profit. If, however, advertisers contributions cover the costs then the publication will continue to be free.

The Editors

Clubs, Societies & Organisations

The following list of Clubs, Societies and Organisations are those known to us at present. If you would like your own club or organisation added/removed then please communicate such to the editors.

American Microscopical Society - AMS Secretary Editor, Department of Biology, Bryn Mawr College, Bryn Mawr, PA 19010, USA
Freshwater Biological Association - The Ferry House, Ambleside, Cumbria LA22 0LP
Historical Microscopical Society of Canada - (Secretary / Editor), RR#2, Priceville, ON, N0C 1K0
International Society for Diatom Research - Secretary, School of Biological Sciences, University of Bristol, Bristol BS8 1UG, U.K
Kernow Microscopical Society - Publicity Officer, Tel: 01209 214638
Leeds Microscopical Society - 25 West Lea Drive, West Ardsley, Wakefield WF3 1DH
Manchester Microscopical and Natural History Society - Honorary Secretary MMS, 7 Hall Lee Drive, Westhoughton, Bolton, BL5 3EQ

Microscopical Society of Southern California - 11815 Indianapolis Street Los Angeses CA 90066-2046
Microscopy Society of America - Bostrom Corp., 230 East Ohio, Suite 400, Chicago, IL 60611
New York Microscopical Society - 30 North Mountain Avenue, Montclair, New Jersey 07042
North Western Naturalists' Union - Hon. Treasurer N.W.N.U., Collection Services, Bolton Museums, Art Gallery & Aquarium, Le Mans Crescent, Bolton BL1 1SE
Northamptonshire Natural History Society - The Humfrey Rooms, 10 Castillian Terrace, Northampton, NN1 1LD
Postal Microscopical Society - 86, Haymoor Road, Poole, Dorset, UK. BH15 3NU.
Quekett Microscopical Club - Subscription Manager, Quekett Microscopical Club, 90, The fairway, South Ruislip, Middlesex, HA4 0SQ
Ray Society - Honorary Secretary, The Ray Society, c/o The Natural History Museum, Cromwell Road, London SW7 5BD, U.K.
Reading Microscopical Club - The Hon. Sec., Flat 2, 63 South Street, Reading, RG1 4RA
Royal Microscopical Society - 37/38 St Clements, Oxford, OX4 1AJ, Tel: +44 (0)1865 248 768
Sorby Natural History Society - General Secretary, 9 Rosslyn Avenue, Aston, Sheffield, S26 2DE
Yorkshire Naturalists' Union – Treasurer, Stonecroft, 3 Brookmead Close, Sutton Poyntz, Weymouth, Dorset DT3 6RS

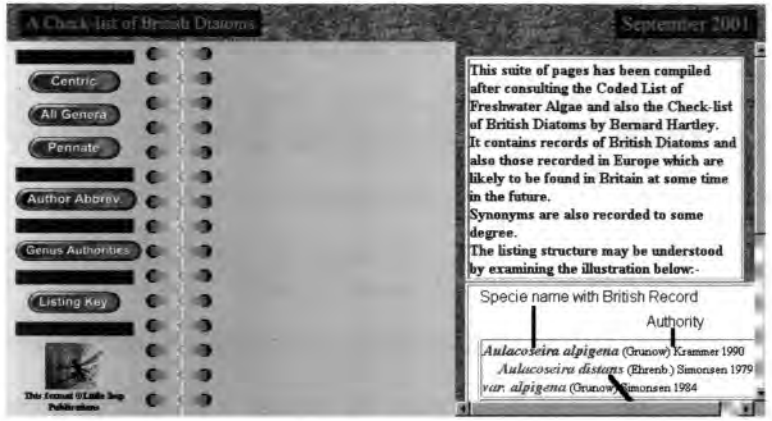
We will be pleased to publish any details, of interest to Diatomists, communicated to us by the above, subject to availability of space.

Policy Statement - Names, Synonyms and Taxonomy

The editors of this publication will not presume to alter names to 'conform to the current taxonomy'. Taxonomists maintain a state of flux and what might be correct today will be wrong tomorrow. Where a species name is given you should, where possible, state the authority you are using when naming. This simply means that if someone else has subsequently renamed the species or re-categorised it in some fashion the basis for the identification will be clear.

A Checklist of British Diatoms

We have produced a checklist on CD suitable for most frames enabled browsers. The lists are easy to navigate and have been compiled from various printed sources and also current lists on the World Wide Web. The CD is available via Savona Books.



Initial page

Centric Genera List and Alacoseira species list

If there is sufficient interest we could produce a similar CD for Central North America.

Sales, Wants and Exchanges

Exchanges should be described accurately and fully. They should be FAIR.

Diatomaceous Earth – from Oamaru. Small samples exchanged for similar from other locations. D. S. Gill Tel. 024 76 327989 with details before sending.

Peragallo et Peragallo etc. – Little Imp CDs exchanged for well mounted diatoms. See publications list for offerings. Contact the publishers to discuss exchange.

Material from exotic locations - wanted. Contact Klaus Kemp (see advertisement). Exchange for slides of material supplied.

Old diatom mountants wanted. - Particularly Hyrax and Aroclor. Any condition. Contact Steve Gill. Tel. 024 76 327989. Diatom strew slides in exchange.

Filter material – Does anyone know of a supply of material suitable for diatom filters? If so contact the publishers, or contact the supplier and get them to contact the publishers.

Postcards – The publishers have printed a set of six colour postcards, 4 depicting diatoms and two polarising objects

These are available direct from Mike Samworth 07801 819954 @ £2.50/set. Postage extra.

Field Studies Council

Malham Tarn Field Centre

The editorial team have, over the years spent a large number of hours enjoying the hospitality to be found at the various Field Studies Centres, and in particular the base at Tarn House, Malham Tarn.

The Malham Tarn operation allows, for a small fee, the use of their laboratory facilities on a daily basis, subject to their being available of course. The centre makes an ideal base from which to go collecting and the provision of the laboratory means that microscopes and cleaning equipment can be set up and left in a secure room ready for the Diatomists return. Coffee making facilities are also provided. Friendly staff ensure a pleasant day out or perhaps a weekend break.

We have absolutely no hesitation in recommending them to our friends.

Malham Tarn Field Centre is one of fifteen residential Centres in Britain run by the Field Studies Council, an independent educational charity, which promotes a better understanding of our environment.

The Centre is situated on the north shore of Malham Tarn at an altitude of 381m, set in the magnificent limestone scenery of the Yorkshire Dales National Park. The estate is owned by the National Trust who lease the Centre to the FSC.

The area is of outstanding interest for its geology and landscape and the Tarn – a shallow lake fed by springs from the surrounding limestone – is the focus of an internationally important National Nature Reserve, a Ramsar site and three SSSIs. There is an astonishing variety of plant and animal habitats for the altitude, ranging from woodlands and grasslands to a fascinating complex of wetlands and open water. A long sequence of human occupation has left its mark on this distinctive landscape.

Malham Tarn Field Centre is an ideal place to study a wide range of topics and we offer courses at all levels for schools, colleges and universities as well as special interest and leisure courses for adults.

Groups wishing to use the facilities for their own research, courses or conferences, whether on a residential or daily basis, are also welcome.

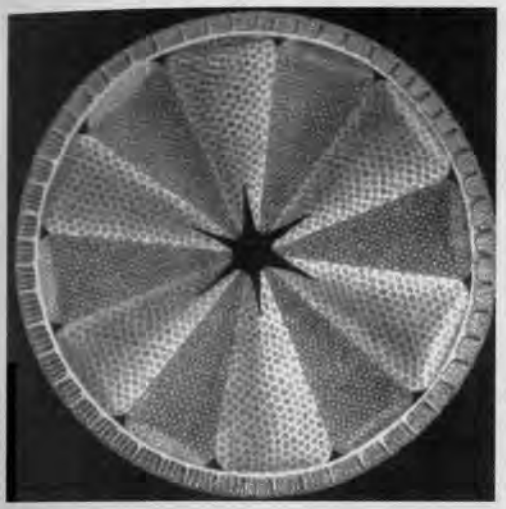
For more details please contact: FSC Malham Tarn Field Centre
Settle, North Yorkshire, BD24 9PU
Tel: 01729-830331 Fax: 01729-830658
Email: fsc.malham@ukonline.co.uk
Web: - www.field-studies-council.org

For further information about FSC Field Centres and other FSC services, please contact: FSC Head Office, Preston Montford, Shrewsbury SY4 1HW
Tel: 01743-852100 Fax 01743-852101
Email: fsc.headoffice@ukonline.co.uk
Website: www.field-studies-council.org

The FSC is a limited company, No 412621 and a charity, No. 313364

The next issue of

The Amateur Diatomist



In the next Issue:-

Notes for contributors.

Since this is not intended as a scientific publication and the editing and compilation tasks are performed by volunteers, we have no real rules concerning copy.

With the application of technology we are able to take practically any format of contribution, electronic or otherwise. Pictures may be prints, photocopies, negatives, slides, line drawings – basically anything. Material submitted should be your own copyright. Quotes and small extracts from other documentation are acceptable but wholesale plagiarism is unacceptable. Text may be type-written, hand-written, or word-processed. Mounted slides may accompany your article and we will endeavour to produce illustrations from these. We cannot, however, guarantee their safety or safe return so only send duplicates.

If you wish to name anyone then get their permission first as seeing your name in print, and perhaps associated with something you would rather was forgotten, can come as something of a shock.

We hope that by adopting this relaxed approach to the submission of copy you will all break out the notepads and begin writing. What you have to say concerning Diatoms, mounting and Microscopy is of interest to us all.

"No one of us know all there is to know, and yet we do not know what we do not know." – Anon.