CD Publications of interest to Diatomists

All titles available from Savona Books

	Author/Company	Title/Description	Price UK Pounds
M3.	Griffith and Henfrey	Micrographic Dictionary 4th Edition. 1883. Plates only	£8
M4.	Flatters & Garnett	1929 Microslide Catalogue includes images of slides.	£10
M7.	P. T. Cleve	Diatoms from the West-Indian Archipelago 1878. pp20 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 v. 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.	Leuduger-Fortmorel	Diatomees Marines de la Cote Occidentale d-Afrique (Plates and hyperlink Index) 1898. 39 Pages, 8 Plates.	£6
M20.	Luard and 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	£4
M45.	Otto Muller	Kammern und Poren in der Zellwand der Bacillariaceen 1899-1901	£5
M47.	Kain and Schultze	On a Fossil Marine Diatomaceous Deposit from Atlantic City, N.J. 1889	£5
M48.	Dr. József Pantocsek	A FERTÕ 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
M69.	Little Imp	A Checklist of British Diatoms	£4
M71.	Little Imp	Diatomaceae on Magic Lantern Slides V.1.0.	£3
M72.	Alfredo Truan y Luard	Diatomeas de Asturias 1844	£5
M73.	Little Imp	A Checklist of Diatoms of the Central U.S.A.	£3
M74.	Little Imp	DiatCode - List of Diatom Species with Int. codes	£3
M76.	Various Authors	Practical Direction for collecting, Preserving, Transporting, Preparing and Mounting Diatoms	£4
M78.	Rev. Eugene O'Meara	Report on the Irish Diatomaceae	£6
M80.	William Smith	A Synopsis of the British Diatomaceae	£10
M81.	J. D. Moller	Diatomaceen Typen-Platte 335	£4

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Little Imp Publications

In this Issue:-

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).

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There is no strict editorial policy.

March Diatom Bloom by Steve Gill

GBI Laboratories Ltd
- Pre-1970 Catalogue - Diatom Slides

The Formation of GBI

The Catalogue Extract.

DIATOMS MICROSLIDES DIATOMS 57

LOCALITY SLIDES - These are spread preparations from the following localities and include many different species. Mounted in Hyrax.

Auckland N.Z.	Palos Verde, Cal. U.S.A.
Ongarato Valley, N.Z.	Lake Forest, Mich. U.S.A.
Loch Cuither, Skye.	Lompoc, Cal. U.S.A.
Toome Bridge, N. Ireland	Reedsmere, Cheshire, G.B.
Kamischev, U.S.S.R.	Kentmere, Westmoreland, G.B.
Pilling, Lancs, G.B.	Lewes, Sussex, G.B.

B.M.	Set of 12 slides	£2. 2. 0
	Single slides available at	£0. 3. 9

NAMED DIATOMS - 1, 2 or 3 Diatoms of a named species mounted in various aspects, within a marked circle in Hyrax.

Climacosphenia moniligera	Epithemia turgida
Actinoptychus undulatus	Stephanodiscus astrea
Rophalodia gibba	Surirella robusta
Pinnularia nobilis	Surirella elegans
Stephanopyxis grunowii	Gomphonema geminatum
Pinnularia cardinalis	Coscinodiscus robustus

B.L. Set of 12 slides £2.15. 0
Single slides available at £0. 4. 9

TEST DIATOMS - 2 or 3 named test diatoms, mounted on measured slides and cover slips, to allow use of immersion lens. Dry or in Hyrax.

Cymatopleura solea	Pleurosigma angulatum
Surirella gemmae	Navicula serians
Diatoma vulgare	Pleurosigma attenuatum
Hantzschia amphioxus	Synedra ulna
Nitxschia sigmoidea	Cymbella lanceolate
Stauroneis phoenocenteron	Frustulia saxonica

B.T. Set of 12 slides £3. 0. 0
Single slides available £0. 5. 6

TEST PLATES - Selected test diatoms mounted on measured slides and covers, to allow use of immersion lens. Mounted in rows, supplied with list.

1590 B	8 forms	each	£0.15. 6
1591 B	12 forms	each	£1. 3. 6

TYPE SLIDES - Different diatoms mounted in rows with list supplied. Many interesting forms.

1555 B	12 forms	each	£0. 9. 0
1556 B	20 forms	each	£0.18. 0
1557 B	30 forms	each	£1. 6. 6
1558 B	40 forms	each	£1.18. 0
1559 B	50 forms	each	£2. 0. 0

GENUS TYPE SLIDES - Five species of one genus mounted in a row and supplied with a list of names.

1564 B	Navicula	each	£0.10. 6
1565 B	Pinnularia	each	£0.10. 6
1566 B	Pleurosigma	each	£0.10. 6
1567 B	Surirella	each	£0.10. 6
1568 B	Triceratium	each	£0.10. 6

EXHIBITION SLIDES

Circle Slides - Selected specimens mounted as a circle.

1596 B	50 forms	each	£1.14. 0
1597 B	100 forms	each	£2.19. 6

Star Slides - Diatoms mounted in a star pattern.

1598 B	25 forms	each	£1. 6. 0

MARINE DIATOMS - 12 typical marine forms as a set of 12

1550 B	Set of 12 slides	each	£2.15. 0

FRESHWATER DIATOMS - 12 typical marine forms as a set of 12

1551 B	Set of 12 slides	each	£2.15. 0

FOSSIL DIATOMS - 12 typical marine forms as a set of 12

1552 B	Set of 12 slides	each	£2.15. 0

The list has been reproduced exactly as originally printed. There are a couple of errors in this original. "Nitxschia" instead of "Nitzschia". Also the last three sets of 12 slides, though they have different titles, all are described as "12 typical marine forms".

NORFOLK DIATOMS. Series I-IV, numbers 1-100. 1885.

By Frederic G. Kitton (1828-1895)

In 1885 Frederic Kitton produced a series of four slide sets, each set comprising 25 slides – 100 in total together with a handwritten catalogue of the species entitled "F. Kitton, Hon. F.R.M.S. Norfolk Diatomaceae"

There are some discrepancies between the slides and the catalogue, though this may be due to the slide set and the catalogue being from different issues. Where there is a discrepancy this is noted in square brackets [ ].

Also some of the place names appear to have been abbreviated and where we believe this to be the case we have included the extra information in parentheses ( ) after the place name.

Notes pertaining to a slide or species are included in braces { } after the entry.

Authorities are given as smaller text bold entries.

Locations are indented and underlined.

Preferred habitat has been added thus <Fw> - Freshwater, <M> - Marine,
 - Brackish.

Small point notes in italic are notes provided by Klaus Kemp

Norfolk. 1845 Drawn and Engraved by J.Archer. Pentonville, London for Dugdale's "England and Wales Delineated"

Slide No. 1

Gomphonema geminatum [*in catalogue*] <Fw>
Gomphonema ventricosum [*on slide label*] <Fw>
Heacham

Slide No. 2

Cocconema cistula <Fw>
Cymbella cistula <Fw>
Gomphonema constrictum <Fw>
Gomphonema ventricosum <Fw>
Heacham

Slide No. 3

Achnanthes brevipes <M>
Brebissonia boeckii <M>
Colletonema neglectum <Fw>
Cyclotella punctata <Fw>
Synedra affinis <M>
Synedra pulchella <Fw>
Breydon (*Water*)

Slide No. 4

Melosira orichalcea <Fw>
Ormesby

Slide No. 5

Melosira arenaria <Fw>
Hellesdon

Slide No. 6

Amphiprora alata <M>
Navicula westii <M>
Scoliopleura westii **W. Smith** – {*identified by Wm. Smith*} <M>
Yarmouth

Slide No. 7

Campylodiscus clypeus
Navicula bohemica *Ehrenberg = Anamoeoneis costata (Kuetz) Hustedt* <Fw>
Navicula sculpta <Fw>
Franzenbad, Bohemia.

Slide No. 8

Isthmia nervosa <M>
Cromer

Slide No. 9

Rhabdonema arcuatum <M>
Cromer

Slide No. 10

Rhabdonema minutum <M>
Cromer

Slide No. 11

Amphiprora plicata <M>
Mastogloia dansei
Mastogloia smithii <Fw>
Navicula ovalis <Fw>
Navicula peregrina
Navicula sculpta <Fw>
Navicula subsalina *(Donkin) = Caloneis subsalina (Donkin) Hendey*
<M>
Navicula tumens **W. Smith**
Stauroneis salina <M>
Breydon (*Water*)

Slide No. 12

Epithemia sorex <Fw>
Epithemia zebra <Fw>
Flordon

Slide No. 13

Bacillaria paradoxa
Melosira juergensii
Nitzschia paradoxa
Synedra affinis <M>
Breydon (*Water*)

Slide No. 14

Surirella striatula <M>
Breydon (*Water*)

Slide No. 15

Nitzschia hungarica
<Fw>
Breydon (*Water*)

Slide No. 16
Nitzschia circumsuta
Breydon (*Water*)

Slide No. 17
Eupodiscus argus <M>
Yarmouth Harbour

Slide No. 18
Triceratium favus <M>
Yarmouth Harbour

Slide No. 19
Actinoptychus splendens <M>
Yarmouth Harbour

Slide No. 20
Cocconema lanceolatum <Fw>
Heigham

Slide No. 21
Cyclotella punctata <Fw>
Nitzschia bilobata
Nitzschia circumsuta
Surirella constricta {*identified by Wm. Smith*}
Surirella striatula (?) var. <M>
Breydon (*Water*)

Slide No. 22
Surirella ovata <Fw>
King's Lynn

Slide No. 23
Cymatopleura solea <Fw>
Horning

Slide No. 24 - dry
Navicula serians <Fw>
Edgefield Heath

Slide No. 25
Navicula serians <Fw>
Edgefield Heath

{*Note in catalogue: "All of the above forms are mounted in Styrax excepting Nos. 8, 17, 18, and 25."*}

Slide No. 26
Cocconema lanceolatum {*fine*} <Fw>
Cymatopleura elliptica <Fw>
Cymatopleura solea <Fw>
Navicula major {*side 'poles'*} <Fw>
Navicula nobilis <Fw>
Navicula oblonga var. <Fw>
Nitzschia sigmoidea <Fw>
Stauroneis acuta <Fw>
Stauroneis phoenicenteron <Fw>
Acle

Slide No. 27
Surirella spiralis <Fw>
Surirella splendida <Fw>
Acle 'Doles'

Slide No. 28
Campylodiscus clypeus [*in catalogue*]
Scoliopleura tumida [*on slide label*] <M>
Lynn [*on slide label*]
Breydon (*Water*) [*in catalogue*]

Slide No. 29
Campylodiscus clypeus {*fine*} [*on slide label*]
Scoliopleura tumida [*in catalogue*] <M>
Lynn [*in catalogue*]
Breydon (*Water*) [*on slide label*]

Slide No. 30
Navicula cyprinus <M>
Lynn

Slide No. 31
Eunotia pectinalis var. undulata <Fw>
Fragilaria capucina <Fw>
Tabellaria flocculosa <Fw>
St. Faiths

Slide No. 32
Navicula westii <M>
Pleurosigma balticum <M>
Surirella gemma <M>
Yarmouth

Slide No. 33
Achnanthes coarctata <Fw>
Navicula appendiculata <Fw>
Nitzschia sinuata *(Thwaites in Wm. Smith) Grunow in Cleve and Grunow* F/W
Surirella ovalis <Fw>
Moss, Heigham

Slide No. 34
Navicula formosa var. hibernica **Grunow** <M>
Pleurosigma hippocampus
Pleurosigma scalprum <M>
Pleurosigma strigilis
Yarmouth

Slide No. 35
Actinoptychus undulatus <M>
Biddulphia aurita <M>
Biddulphia baileyi <M>
Campylosira cymbelliformis <M>
Yarmouth

Slide No. 36
Campylodiscus costatus **W. Smith** <Fw>
Campylodiscus hibernicus <Fw>
Tittleshall

Slide No. 37

Navicula formosa <M>
Pleurosigma strigosum <M>
Wells

Slide No. 38

Pleurosigma balticum <M>
Breydon (*Water*)

Slide No. 39

Pleurosigma strigosum <M>
Breydon (*Water*)

Slide No. 40

Pleurosigma formosum <M>
Pleurosigma speciosum <M>
Breydon (*Water*)

Slide No. 41

Pleurosigma elongatum <M>
Wells

Slide No. 42

Navicula elegans <M>
Navicula peregrina
Yarmouth

Slide No. 43

Pleurosigma angulatum {*type*} <M>
Pleurosigma scalprum <M>
Stauroneis gregorii
Breydon (*Water*)

Slide No. 44

Navicula cuspidata <Fw>
Navicula cymbula *Donkin* <M>
Navicula humilis <Fw>
Navicula mesotyla *sensu ? Various ones have had this name I opt for Pinnularia polyonca (Breb) Wm. Smith* <Fw>
Pleurosigma acuminatum **Kutzing** <M>
Pleurosigma lacustre **W. Smith** <Fw>
Pleurosigma spenceri **W. Smith** <Fw>
Ormesby

Slide No. 45

Synedra splendens **Kutzing** <Fw>
Synedra ulna **W. Smith** var. {*gamma*} <Fw>
Synedra ulna <Fw>
Ormesby

Slide No. 46

Cymbella americana *Not recognised by V.Landingham, probably is C. acuta (Schmidt) Cleve* <Fw>
Cymbella ehrenbergii <Fw>
Navicula ampliata **Ehrenberg** = *Neidium iridis var ampliata (Ehr) Cleve* <Fw>
Navicula firma **W. Smith** <Fw>

Navicula firma var. subampliata <Fw>
Nitzschia sigmoidea <Fw>
Stauroneis anceps var. amphicephala <Fw>
Castleacre

Slide No. 47

Amphora ovalis <Fw>
Cymbella ehrenbergii <Fw>
Lynn

Slide No. 48

Achnanthes longipes <M>
Wells

Slide No. 49

Licmophora abbreviata *Agardh* <M>
Synedra investiens <M>
Scratby

Slide No. 50

Navicula pectinalis
Hunstanton

Slide No. 51

Cocconeis scutellum <M>
Cocconeis scutellum var. stauroneiformis <M>
On Zostera. Yarmouth [*in catalogue*]
Cromer [*on slide label*]

Slide No. 52

Pleurosigma intermedium <M>
Lynn

Slide No. 53

Epithemia turgida <Fw>
Gomphonema acuminatum var. coronata <Fw>
Navicula cryptocephala **Kutzing** <Fw>
Navicula oblonga var. acuta <Fw>
Navicula radiosa <Fw>
Navicula rhynchocephala <Fw>
Nitzschia linearis <Fw>
Nitzschia sigmoidea <Fw>
Pleurosigma attenuatum <Fw>
Stauroneis anceps **Ehrenberg** <Fw>
Ormesby

Slide No. 54 {*in Styrax*}

Epithemia turgida <Fw>
Gomphonema acuminatum var. coronata <Fw>
Navicula cryptocephala **Kutzing** <Fw>
Navicula oblonga var. acuta <Fw>
Navicula radiosa <Fw>
Navicula rhynchocephala <Fw>
Nitzschia linearis <Fw>
Nitzschia sigmoidea <Fw>
Pleurosigma attenuatum <Fw>

Stauroneis anceps **Ehrenberg** <Fw>
Ormesby

Slide No. 55
Coscinodiscus radiatus <M>
Stomachs of Cockles. Brancaster

Slide No. 56
Melosira borreri <M>
Breydon (*Water*)

Slide No. 57
Schizonema grevillei <M>
Yarmouth

Slide No. 58
Amphitropis vanheurckii *No such name in V. Landingham but most if not all are marine to brackish*
Chaetoceros wighami <M>
Epithemia turgida var. ventricosa <Fw>
Navicula sculpta <Fw>
Nitzschia tryblionella <Fw>
Pleurosigma strigilis
Breydon (*Water*)

Slide No. 59
Chaetoceros armatum <M>
Yarmouth Sands

Slide No. 60
Surirella brightwellii <Fw>
Titchwell

Slide No. 61
Donkinia recta <M>
Hantzschia amphioxys <Fw>
Hantzschia marina <M>
Hantzschia virgata <M>
Navicula barklayana <M>
Navicula granulata <M>
Navicula humerosa <M>
Navicula northumbrica <M>
Navicula palpebralis <M>
Navicula pectinalis
Hunstanton Sands

Slide No. 62 {*dry*}
Donkinia recta <M>
Hantzschia amphioxys <Fw>
Hantzschia marina <M>
Hantzschia virgata <M>
Navicula barklayana <M>
Navicula granulata <M>
Navicula humerosa <M>
Navicula pectinalis
Hunstanton Sands

Slide No. 63
Actinocyclus roperi <M>
Hunstanton Sands

Slide No. 64
Cymbella amphicephala <Fw>
Fragilaria undata <Fw>
Navicula ambigua <Fw>
Navicula bacillaris <Fw>
Navicula bacillum <Fw>
Navicula biceps *Ehrenberg = Anamoeoneis sphaerophora (Kuetz) Pfitzer* <Fw>
Navicula laevissima **W. Smith** <Fw>
Navicula mesolepta <Fw>
Stauroneis anceps **Ehrenberg** <Fw>
Stauroneis gracilis <Fw>
Stauroneis phoenicenteron <Fw>
Hickling Broad

Slide No. 65
Navicula cardinalis <Fw>
Navicula gigas
Hickling Broad

Slide No. 66
Achnanthes lanceolata <Fw>
Gomphonema acuminatum var. coronata <Fw>
Hantzschia amphioxys <Fw>
Hantzschia amphioxys var. <Fw>
Hantzschia rupestris *Grun in V.H. = Hantzschia amphioxys var rupestris Grun in Cleve et Grun* <Fw>
Navicula anglica <Fw>
Navicula anglicum <Fw>
Navicula elginensis *(Gregory) Ralfs in Pritchard = N. dicephala var elginensis (Gregory) Cleve* <M>
Navicula elliptica <Fw>(*Kutzing – N. Ovalis*)
Navicula gastrum <Fw>
Navicula leptostoma *Grunow in V. Heurck = Pinnularia leptosoma (Grun) Cleve* <Fw>
Navicula pupula <Fw>
Navicula rhynchocephala <Fw>
Navicula seminulum <Fw>
Navicula viridis <Fw>
Nitzschia amphibia <Fw>
Stauroneis gracilis <Fw>
Heigham, moss washing

Slide No. 67
Navicula limosa <Fw>
Navicula sphaerophora <Fw>
Nitzschia angustata <Fw>
Whissonsett

Slide No. 68
Ceratoneis arcus <Fw>
St. Faiths

Slide No. 69

Achnanthes brevipes <M>
Actinocyclus subtilis <M>
Navicula didyma <M>
Rhabdonema minutum <M>
Cromer

Slide No. 70

Amphiprora paludosa <Fw>
Amphora arcus
Nitzschia apiculata
Nitzschia constricta <M>
Nitzschia hybrida *Grunow in Cleve and Grunow* <M>
Nitzschia punctata
Nitzschia sigma **W. Smith** <M>
River Bure

Slide No. 71

Staurosira harrisonii *Roper = Fragilaria leptostauron (Ehrenberg) Husted*
Hellesdon

Slide No. 72

Amphora salina
River Bure

Slide No. 73

Amphiprora alata <M>
Amphiprora constricta **W. Smith** <M>
Amphiprora paludosa <Fw>
River Bure

Slide No. 74

Gomphonema kamschatica *Grunow* <M>
Synedra affinis <M>
Cromer

Slide No. 75

Synedra gaillonii <M>
Cromer

Slide No. 76

Surirella elegans <Fw>
Horning Fen

Slide No. 77

Isthmia enervis <M>
Cromer

Slide No. 78

Melosira dickiei <Fw>
Cave, Aberdeen

Slide No. 79

Melosira spiralis *(Ehr) Kuetz = M. islandica var curvata f. spiralis (Ehr)Otto Mueller* <Fw>
Moss from Cottage. Penzance. ex. coll. J. Ralfs

Slide No. 80

Hantzschia virgata <M>
Hunstanton Sands

Slide No. 81

Homoeocladia martiana <M>
Stomach of oyster. Brancaster

Slide No. 82

Campyloneis grevillei <M>
Cocconeis binotata *Grunow = Mastogloia binota (Grunow) Cleve.* <M>
Cocconeis scutellum <M>
Grammatophora serpentina <M>
Synedra fulgens <M>
Cromer

Slide No. 83

Navicula rhomboides <Fw>
Whissonsett

Slide No. 84

Navicula rhomboides <Fw>
Whissonsett

Slide No. 85

Fragilaria parasitica {*type*} *(Wm. Smith) Hustedt* <Fw>
Fragilaria parasitica var. constricta *Mayer Not recognised by V.Landingham Probably F. parasitica var subconstricta* <Fw>
Fragilaria parasitica var. trigona *Grunow in V. Heurck = Fragilaria construens var exigua (Wm. Smith) Schulz* <Fw>
Staurosira construens <Fw>
Synedra delicatissima <Fw>
Triceratium exiguum **W. Smith** <Fw>
Ormesby Broad 1863

Slide No. 86

Fragilaria parasitica {*type*} *(Wm. Smith) Hustedt* <Fw>
Fragilaria parasitica var. constricta *Mayer Not recognised by V.Landingham. Probably F. parasitica var subconstricta* <Fw>
Fragilaria parasitica var. trigona *Grunow in V. Heurck = Fragilaria construens var exigua (Wm. Smith) Schulz* <Fw>
Staurosira construens <Fw>
Synedra delicatissima <Fw>
Triceratium exiguum **W. Smith** <Fw>
Ormesby Broad 1863

Slide No. 87

Fragilaria tenuicollis {*filaments*} <Fw>
Ormesby Broad 1874

Slide No. 88

Cyclotella comta <Fw>
Cyclotella kuetzingiana <Fw>
Diatoma elongata <Fw>
Encyonema caespitosum <Fw>
Encyonema prostratum <Fw>
Fragilaria tenuicollis {*valves*} <Fw>
Navicula scutelloides <Fw>
Stephanodiscus astraea *(Ehr) Grunow = S. rotula (Kuet) Hendey* <Fw>

Surirella pinnata **W. Smith** <Fw>
Ormesby Broad 1874

Slide No. 89
Eunotia diodon **W. Smith** <Fw>
Eunotia papilio = *E. obesa Cleve* <Fw>
Odontidium hiemale <Fw>
Docking

Slide No. 90
Navicula brebissonii var. <Fw>
Navicula varians *Gregory = Navicula gastrum (Ehrenberg) Kuetzing* <Fw>
Stauroneis smithii <Fw>
Surirella angusta **Kutzing** <Fw>
Surirella linearis **W. Smith** <Fw>
Parish drain, Ormesby

Slide No. 91
Meridion circulare {*filaments*} <Fw>
Colney

Slide No. 92
Pleurosigma hippocampus
Pleurosigma strigilis
Runham

Slide No. 93
Pleurosigma affine **W. Smith** <M>
Breydon (*Water*)

Slide No. 94
Tetracyclus lacustris <Fw>
Whissonsett

Slide No. 95
Amphiprora paludosa
Epithemia constricta
Mastogloia braunii var. pumila
Nitzschia apiculata
Nitzschia capitellata *Hustedt* <Fw>
Nitzschia hungarica
<Fw>
Nitzschia sigma var. diminuta <M>
Nitzschia sigma var. rectiuscula <M>
Nitzschia subsalina *No such thing in Van Landingham - must be Brackish*
Stephanodiscus hantzschianus [*Identified by Albert Grunow*] <Fw>
Breydon (*Water*)

Slide No. 96
Amphiprora paludosa
Epithemia constricta
Mastogloia braunii var. pumila
Nitzschia apiculata
Nitzschia capitellata *Hustedt* <Fw>
Nitzschia hungarica
<Fw>
Nitzschia sigma var. diminuta <M>
Nitzschia sigma var. rectiuscula <M>

Nitzschia subsalina *No such thing in Van Landingham - must be Brackish*
Stephanodiscus hantzschianus <Fw>
Breydon (*Water*)

Slide No. 97
Navicula clepsydra *Donkin = Trachyneis clepsydra (Donkin) Cleve*
<M>
Hunstanton Sands

Slide No. 98
Pleurosigma elongatum <M>
Breydon *Water*

Slide No. 99
Pleurosigma decorum {*fine*}
Runham

Slide No. 100
Melosira nummuloides <M>
Surirella ovalis <Fw>
Synedra pulchella <Fw>
Synedra pulchella var. <Fw>
Yarmouth

In many cases the location name gives no real indication as to the collection point which is a problem for those that wish to return to the collection sites to examine material today. A look at a contemporary map of the various areas, in conjunction with the preferred habitat of the species, might provide some indication of specific location. The following is a best guess at locations.

Acle
(from Old English - ac-leah - oak-mead)
Freshwater site
See below.
: (Slide No. 26)

Acle 'Doles'
Freshwater site
Likely to be the marshy area between Acle and Acle Dike. The River Bure runs nearby. Just off the A47 midway between Norwich and Great Yarmouth.
: (Slide No. 27)

Brancaster, Stomach of Oyster
(The castle camp of Bran or The Castle of the Raven)
Marine
See below.
: (Slide No. 81)

Brancaster, Stomachs of Cockles
Marine
On the North coast beyond Hunstanton there are two Brancasters adjacent one to the other. Brancaster and Brancaster Staithe, both on the A149. However, the site is probably Brancaster Bay immediately north of Brancaster, where there extensuve sands ideal for cockles.
: (Slide No. 55)

Breydon (*Water*)

A really mixed location of all habitats.

Breydon Water (now represented as simply River Yare on most maps) is a large tidal area, the most easterly in Britain. Stretching almost 5km from Great Yarmouth to Burgh Castle. Three of Norfolk's rivers enter Breydon Water. The River Bure at the Great Yarmouth end and the River's Yare and the Waveney at the Burgh Castle end.

This area of water is sometimes very lightly brackish, at other quite brackish and after a high tide is almost marine. This constant fluctuation in salinity probably explains the diversity of forms to be found therein. Obviously some Freshwater and Brackish loving forms can tolerate marinre conditions for a short time.

: (Slide Nos. 3, 11, 13, 14, 15, 16, 21, 28, 29, 38, 39, 40, 43, 56, 58, 93, 95, 96, 98)

Castleacre (Castle Acre)

Freshwater site

Directly north of Swafham, some 4 miles, the village of Castle Acre is on the banks of the River Nar. There are numerous ponds and pools in the region of the remains of the Priory. Take the A1065 North from Swafham.

: (Slide No. 46)

Colney

Freshwater

Suburbs of Norwich, just off the A47. A stream runs adjacent to the old village.

: (Slide No. 91)

Cromer

(from Old English crawa - a crow and mere or lake)

Marine Site

Cromer is a coastal town at the junction of the A148 and A149 situate at the north east extremity of the Norfolk coast.

: (Slide Nos. 8, 9, 10, 69, 74, 75, 77, 82)

Docking

Freshwater

Directly east approximately 7 miles, of Heacham, on the B1454. No streams evident on map. There is, however, a pond in The Park and another in the southern area of the village.

: (Slide No. 89)

Edgefield Heath

Freshwater

There are two possible locations, next door to each other, just south-west of Holt on the B1149. Edgefield and Edgefield Green.

: (Slide Nos. 24, 25)

Titchwell

Freshwater/Brackish

Titchwell is a small village on the A149 some 8 miles from Hunstanton. The location is likely to be the saltmarsh area that now forms the RSPB nature reserve. It contains some predominantly freshwater lagoons.

: (Slide No. 60)

Flordon

Probably Freshwater

About ten miles south of Norwich a stream runs through this small village. Head south on the A140 from Norwich and turn for Tasburgh.

: (Slide No. 12)

Heacham

Freshwater site

The Heacham River runs through Heacham, which is about three miles below Hunstanton. Heacham is on the Wash side of the A149. A large lake exists in the grounds of The Hall.

: (Slide Nos. 1, 2)

Heigham

(from Old English - heah ham - high home)

Freshwater site

There is a parish of Heigham in Norwich and also a Potter Heigham (Heigham Potter). There is no indication as to exactly where this collection point is.

: (Slide No. 20)

Heigham, moss washing

Freshwater, see above

: (Slide Nos. 33, 66)

Hellesdo(e)n

(The woody vale)

Freshwater site

A sub-district of Norwich, in the North-west suburbs, on the banks of the River Wensum.

: (Slide Nos. 5, 71)

Hickling Broad

Freshwater site

Some 7 miles distant from Ormesby Broad, North and slightly West. Head towards Hickling Green, past Suton off the A 149 between Caister-on-sea and North Walsham.

: (Slide Nos. 64, 65)

Horning

Freshwater (probably Horning Fen, see below)

: (Slide No. 23)

Horning Fen

Freshwater site

Just North East of Norwich, approximately 9 miles) off the A1191.
: (Slide No. 76)

Hunstanton
(The town of Hunstan)
Brackish
There are couple of streams, running North-South and discharging into Heacham Harbour, south of Hunstanton, that could be the collecting point of this sample. I can see no toher likely area within Hunstanton itself.
: (Slide No. 50)

Hunstanton Sands
Marine but with some Brackish species.
A coastal town on The Wash with extensive sandy beaches. A 149 north of King's Lynn.
: (Slide Nos. 61, 62, 63, 80, 97)

King's Lynn
(maybe Old English hlynn - a torrent running over rocks or linne - a pool)
Freshwater or brackish. See Lynn, below.
: (Slide No. 22)

Lynn
Freshwater site – Probably South Lynn –up river. See Lynn, below.
: (Slide No. 47)

Lynn
Marine - East Lynn, South Lynn or West Lynn – mouth of the Lynn. These three areas form the outlying areas of King's Lynn itself. King's Lynn, at the mouth of the Great Ouse, is at the very least tidal at this point. The river discharges into the Wash. The A17, A148, A149, A47, and A10 converge on King's Lynn.
: (Slide Nos. 30, 52)

On Zostera. Yarmouth/Cromer
Marine
Cromer is a coastal town at the junction of the A148 and A149 situate at the north east extremity of the Norfolk coast.
: (Slide No. 51)

Ormesby
(the dwelling of Orm)
Freshwater site, probably Ormesby Broad - see below.
: (Slide Nos. 4, 44, 45, 53, 54)

Ormesby Broad
Freshwater site

Ormesby Broad is still accessible and is crossed by the A149, north-west of Great Yarmouth.
: (Slide Nos. 85, 86, 87, 88)

Ormesby, Parish drain
Freshwater
: (Slide No. 90)

River Bure
Brackish – probably just upstream of the inlet into Breydon Water but could be the same as the Runham samples - below.
: (Slide Nos. 70, 72, 73)

Runham
Brackish
Runham is a village to the north-west upstream of the River Bure. The collection site is likely to be the River Bure close to the road between Runham and Stokesby.
: (Slide Nos. 92, 99)

Scratby
Probably Marine
A coastal collection of a few houses some two miles north of Caister-on-Sea and about three miles west of Ormesby Broad. There appears to be no significant amount of surface freshwater in the immediate vicinity.
: (Slide No. 49)

St. Faiths
Freshwater site
The only St. Faiths I have managed to locate is about 5 miles north of Norwich. Access from the B1149 at Horsford, signposted to Felthorpe. The area is known as St. Faith's Common which has marshy, waterlogged areas most of the year round.
: (Slide Nos. 31, 68)

Tittleshall
(the nook of Tyttla)
Freshwater site
Likely to be ponds or ditches. No significant waterways in the vicinity.
Situated some eight miles north-west of Dereham.
: (Slide No. 36)

Wells
(from Old English - wella - a spring or well)
Marine
Wells-next-the-sea to give this town its correct title. The collection points are likely to be sand/mud area on the coast immediately north of the town. A road leads out of the town, from the A149, to this area. There are also extensive salt marshes to the north east of the town.
: (Slide Nos. 37, 41, 48)

Whissonsett
Freshwater site
A small village (not far from Tittleshall), about eight miles NNW of Dereham. There is a reasonably sized drain running close by between Hamrow and Horningtoft. There is also a pond, possibly all that remain of the moat at the Hall.
: (Slide Nos. 67, 83, 84, 94)

Yarmouth
Marine site – probably Yarmouth Sands
Now Great Yarmouth and probably referring to the beaches thereabouts.
: (Slide Nos. 6, 32, 34, 35, 42, 57)

Yarmouth
Probably freshwater stream on Yarmouth beach
: (Slide No. 100)

Yarmouth Harbour
Marine
The harbour area.
: (Slide Nos. 17, 18, 19)

Yarmouth Sands
Marine - See Yarmouth
: (Slide No. 59)

Species List

Achnanthes brevipes {3} {69}
Achnanthes coarctata {33}
Achnanthes lanceolata {66}
Achnanthes longipes {48}
Actinocyclus roperi {63}
Actinocyclus subtilis {69}
Actinoptychus splendens {19}
Actinoptychus undulatus {35}
Amphiprora alata {6} {73}
Amphiprora constricta {73}
Amphiprora paludosa {70} {73} {95} {96}
Amphiprora plicata {11}
Amphitropis vanheurckii {58}
Amphora arcus {70}
Amphora ovalis {47}
Amphora salina {72}
Bacillaria paradoxa {13}
Biddulphia aurita {35}
Biddulphia baileyi {35}
Brebissonia boeckii {3}
Campylodiscus clypeus {28} {29} {7}
Campylodiscus costatus {36}
Campylodiscus hibernicus {36}
Campyloneis grevillei {82}
Campylosira cymbelliformis {35}
Ceratoneis arcus {68}
Chaetoceros armatum {59}
Chaetoceros wighami {58}
Cocconeis binotata {82}
Cocconeis scutellum {51} {82}
Cocconeis scutellum var. stauroneiformis {51}
Cocconema cistula {2}

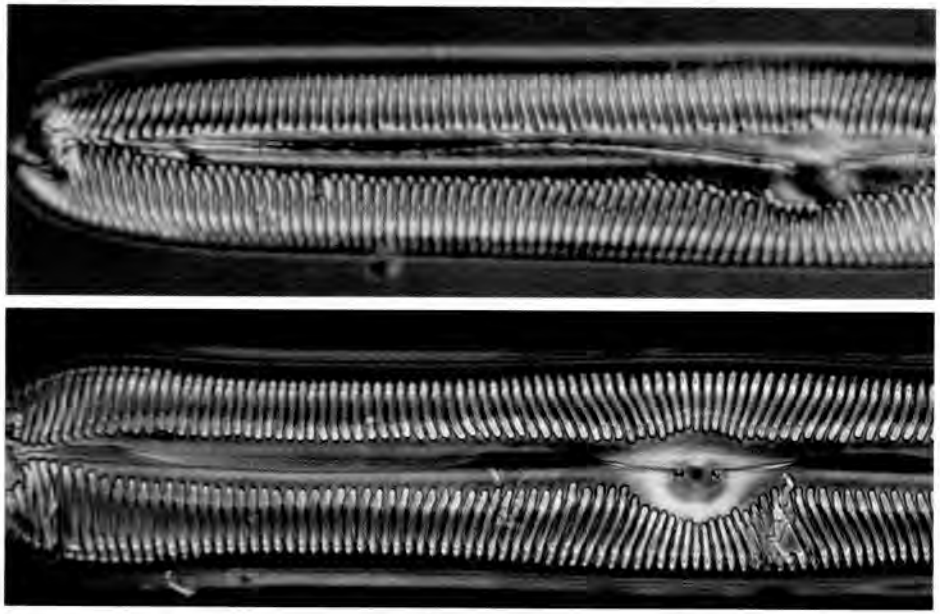
Cocconema lanceolatum {20} {26} {54} {66}
Colletonema neglectum {3}
Coscinodiscus radiatus {55}
Cyclotella comta {88}
Cyclotella kuetzingiana {88}
Cyclotella punctata {21} {3}
Cymatopleura elliptica {26}
Cymatopleura solea {23} {26}
Cymbella americana {46}
Cymbella amphicephala {64}
Cymbella cistula {2}
Cymbella ehrenbergii {46} {47}
Diatoma elongata {88}
Donkinia recta {61} {62}
Encyonema caespitosum {88}
Encyonema prostratum {88}
Epithemia constricta {95} {96}
Epithemia sorex {12}
Epithemia turgida {53} {54}
Epithemia turgida var. ventricosa {58}
Epithemia zebra {12}
Eunotia diodon {89}
Eunotia papilio {89}
Eunotia pectinalis var. undulata {31}
Eupodiscus argus {17}
Fragilaria capucina {31}
Fragilaria parasitica {85} {86}
Fragilaria parasitica var. constricta {85}
Fragilaria parasitica var. constricta {86}
Fragilaria parasitica var. trigona {85} {86}
Fragilaria tenuicollis {88} {87}
Fragilaria undata {64}
Gomphonema acuminatum var. coronata {53} {54} {66}
Gomphonema constrictum {2}
Gomphonema geminatum {1}
Gomphonema kamschatica {74}
Gomphonema ventricosum {1} {2}
Grammatophora serpentina {82}
Hantzschia amphioxys {61} {62} {66}
Hantzschia amphioxys var. {66}
Hantzschia marina {61} {62}
Hantzschia rupestris {66}
Hantzschia virgata {61} {62} {80}
Homoeocladia martiana {81}
Isthmia enervis {77}
Isthmia nervosa {8}
Licmophora abbreviata {49}
Mastogloia braunii var. pumila {95} {96}
Mastogloia dansei {11}
Mastogloia smithii {11}
Melosira arenaria {5}
Melosira borreri {56}
Melosira dickiei {78}
Melosira juergensii {13}
Melosira nummuloides {100}
Melosira orichalcea {4}
Melosira spiralis {79}
Meridion circulare {91}
Navicula ambigua {64}
Navicula ampliata {46}
Navicula anglica {66}
Navicula anglicum {66}
Navicula appendiculata {33}
Navicula bacillaris {64}
Navicula bacillum {64}

Navicula barklayana {61} {62}
Navicula biceps {64}
Navicula bohemica {7}
Navicula brebissonii var. {90}
Navicula cardinalis {65}
Navicula clepsydra {97}
Navicula cryptocephala {53} {54}
Navicula cuspidata {44}
Navicula cymbula {44}
Navicula cyprinus {30}
Navicula didyma {69}
Navicula elegans {42}
Navicula elginensis {66}
Navicula elliptica {66}
Navicula firma {46}
Navicula firma var. subampliata {46}
Navicula formosa {37}
Navicula formosa var. hibernica {34}
Navicula gastrum {66}
Navicula gigas {65}
Navicula granulata {61} {62}
Navicula humerosa {61} {62}
Navicula humilis {44}
Navicula laevissima {64}
Navicula leptostoma {66}
Navicula limosa {67}
Navicula major {26}
Navicula mesolepta {64}
Navicula mesotyla {44}
Navicula nobilis {26}
Navicula northumbrica {61}
Navicula oblonga var. {26}
Navicula oblonga var. acuta {53} {54}
Navicula ovalis {11}
Navicula palpebralis {61}
Navicula pectinalis {50} {61} {62}
Navicula peregrina {11} {42}
Navicula pupula {66}
Navicula radiosa {53} {54}
Navicula rhomboides {83} {84}
Navicula rhynchocephala {53} {54} {66}
Navicula sculpta {11} {58} {7}
Navicula scutelloides {88}
Navicula seminulum {66}
Navicula serians {24} {25}
Navicula sphaerophora {67}
Navicula subsalina {11}
Navicula tumens {11}
Navicula varians {90}
Navicula viridis {66}
Navicula westii {32} {6}
Nitzschia amphibia {66}
Nitzschia angustata {67}
Nitzschia apiculata {70} {95} {96}
Nitzschia bilobata {21}
Nitzschia capitellata {95} {96}
Nitzschia circumsuta {16} {21}
Nitzschia constricta {70}
Nitzschia hungarica {15} {95} {96}
Nitzschia hybrida {70}
Nitzschia linearis {53} {54}
Nitzschia paradoxa {13}
Nitzschia punctata {70}
Nitzschia sigma {70}
Nitzschia sigma var. diminuta {95} {96}
Nitzschia sigma var. rectiuscula {95} {96}

Nitzschia sigmoidea {26} {46} {53} {54}
Nitzschia sinuata {33}
Nitzschia subsalina {95}
Nitzschia subsalina {96}
Nitzschia tryblionella {58}
Odontidium hiemale {89}
Pleurosigma acuminatum {44}
Pleurosigma affine {93}
Pleurosigma angulatum {43}
Pleurosigma attenuatum {53} {54}
Pleurosigma balticum {32} {38}
Pleurosigma decorum {99}
Pleurosigma elongatum {41} {98}
Pleurosigma formosum {40}
Pleurosigma hippocampus {34} {92}
Pleurosigma intermedium {52}
Pleurosigma lacustre {44}
Pleurosigma scalprum {34} {43}
Pleurosigma speciosum {40}
Pleurosigma spenceri {44}
Pleurosigma strigilis {34} {58} {92}
Pleurosigma strigosum {37} {39}
Rhabdonema arcuatum {9}
Rhabdonema minutum {10} {69}
Schizonema grevillei {57}
Scoliopleura tumida {28} {29}
Scoliopleura westii {6}
Stauroneis acuta {26}
Stauroneis anceps {53} {54} {64}
Stauroneis anceps var. amphicephala {46}
Stauroneis gracilis {64} {66}
Stauroneis gregorii {43}
Stauroneis phoenicenteron {26} {64}
Stauroneis salina {11}
Stauroneis smithii {90}
Staurosira construens {85} {86}
Staurosira harrisonii {71}
Stephanodiscus astraea {88}
Stephanodiscus hantzschianus {95} {96}
Surirella angusta {90}
Surirella brightwellii {60}
Surirella constricta {21}
Surirella elegans {76}
Surirella gemma {32}
Surirella linearis {90}
Surirella ovalis {100} {33}
Surirella ovata {22}
Surirella pinnata {88}
Surirella spiralis {27}
Surirella splendida {27}
Surirella striatula (?) var. {21}
Surirella striatula {14}
Synedra affinis {13} {3} {74}
Synedra delicatissima {85} {86}
Synedra fulgens {82}
Synedra gaillonii {75}
Synedra investiens {49}
Synedra pulchella {3} {100}
Synedra pulchella var. {100}
Synedra splendens {45}
Synedra ulna {45}
Synedra ulna var. {45}
Tabellaria flocculosa {31}
Tetracyclus lacustris {94}
Triceratium exiguum {85} {86}
Triceratium favus {18}

35mm/Digital comparison

Two Pinnularia photos (different species) the top one taken on 35mm slide film and the lower with a 3 megapixel digital camera. An interesting comparison of results. Neither image has been post-processed in any way.



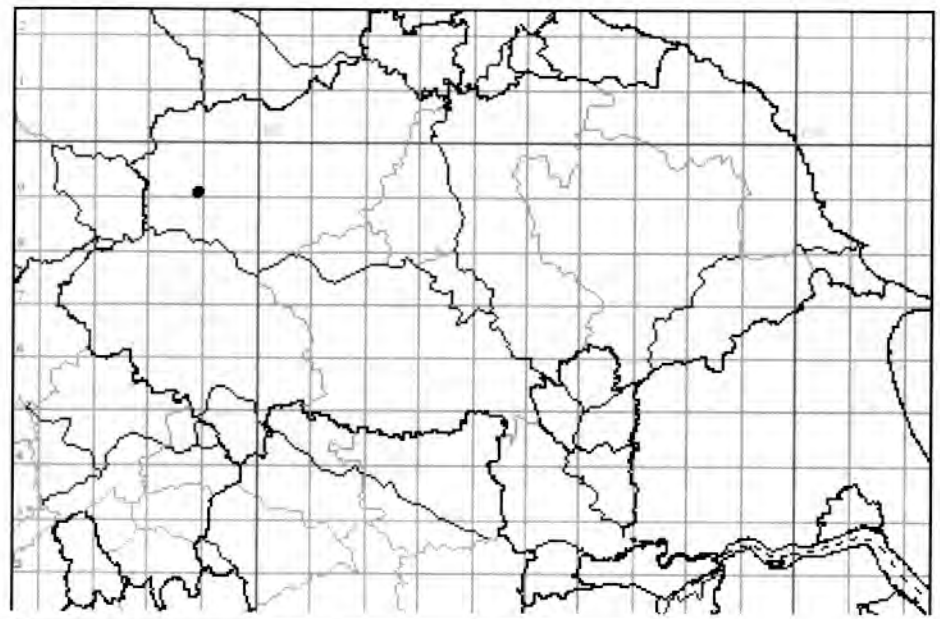
MapMate recording Software

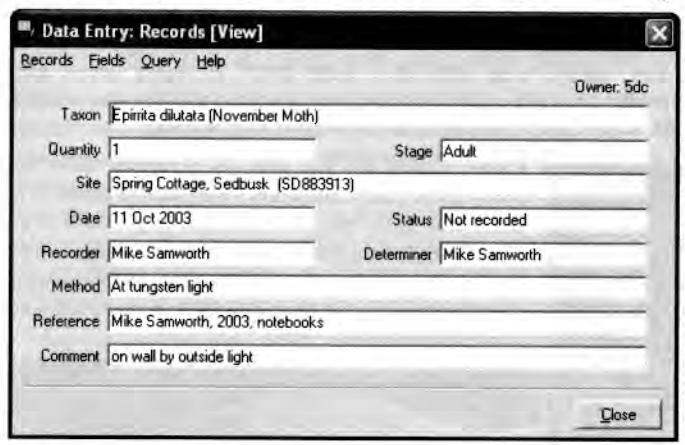
MapMate is a database program designed to record and manage biological data and to share the data with other users, Biological Recording Schemes and Records Centres. It can produce maps of the distribution of species recorded. MapMate is not a simple, or 'flat', database in which all records are held in one large table, as in a spreadsheet. It is what is called a 'relational database', having a number of linked tables.

Instead of, for example, having to type in the species name for each record, you select the species from a list which is held in a separate table within the database Similarly the sites where you record are entered into a table of sites. Once a site and its details have been entered into this table you do not need to type in the site name again when you enter subsequent records from that site. Your actual record consists of a set of references to the data in the associated tables. This not only removes the tedium of re-entering the details each time but it ensures that the same data is used consistently and it can be changed, for all records, if any amendment becomes necessary (e.g. if a more accurate Grid Reference is obtained).

I have been using MapMate for about a year now, to record the moths found in my moth trap over a period of time at the same site. Whilst it took me a little time to get to grips with the system of entry, once I did, it makes entry quite simple. For this group, all vernacular and Scientific names are already in the system, meaning little typing is needed. I am sure that it would not be too difficult a job to ask the author to add a diatom list, and this is something I shall be looking into. The other thing I really need to get to grips with is the powerful system for finding patterns in data, and extracting site lists, etc. Like many things, it is spending time with the software that will reap rewards.

Large Yellow Underwing (Noctua pronuba)





If anyone wishes to have a look at this software then a look at their website will explain a great deal that cannot be shown here. It is at: www.mapmate.co.uk

It can be obtained from Teknica Ltd at The White House Montacute Road Stoke Sub Hamdon Somerset TA14 6UQ.

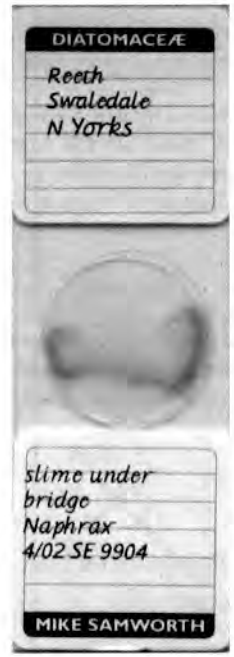
It is said to be written "by Recorders for Recorders" and is very reasonably priced, with good online support. Worth having a look at.

Favourite Locations

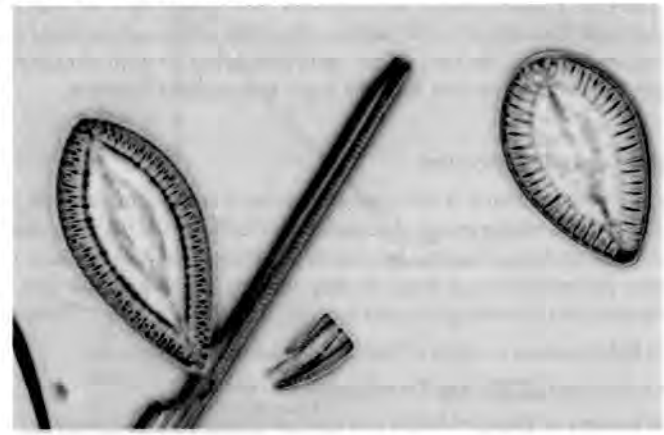
Reeth bridge

I think I first visited Reeth in 1988. Despite the fact that I lived and worked in Malhamdale during the mid-eighties Swaledale was not an area I had been to. In 1988 I took a large group of sixth-formers to Keld Youth Hostel for a Biology fieldtrip, and it was during this week that I first glimpsed Reeth. Each year I took similar trips up to the area, and so to Reeth, but never sampled for diatoms, simply I had not developed an interest in them yet. Then in 2000 I moved to Wensleydale, just a twenty minute drive away, and had more time to explore. During such walks, I ventured underneath the road bridge, to be faced by a 'damp patch' as shown below. The resulting sample contained mostly Surirella ovalis, in quite some quantity, and this was viewed live before hot acid treatment, whereupon it was mounted in Pleurax and Naphrax.

I have visited this site now, on a regular basis for nearly three years. Sometimes the patch is rather dry, and yields little, but often it is just as productive as ever. When taking the photographs of the site shown here I did get some strange looks from ramblers who passed, especially as they struggled to see what was on my white spoon!



Reeth is on the B6270 about 8 miles west of the North Yorkshire town of Richmond. Swaledale is a fantastic, wooded dale, dominated by the River Swale, with numerous small villages. The bridge is 2 minutes walk from the green, at SE 99 04.



PHOTOSYNTHESIS

Being an explanation of a remarkable chemical process

By D.S. & R.J. Gill, with a little help from some eminent scientists.

'A plant derives its energy from Photosynthesis'. This is an oft heard phrase which masks the underlying, quite remarkable, series of reactions by which the plant actually produces compounds to use as energy in areas that have nothing to do with Photosynthesis at all. Green plants contain a pigment called Chlorophyll which can be considered as the agent responsible for making light energy available to the underlying chemistry. Diatoms also contain a form of Chlorophyll - Xanthophyll - which performs the same function. Chlorophyll is concentrated in bodies called Chloroplasts - in diatoms, Xanthoplasts or Plastids - which may be of a regular shape (the most usual state) or take on many different forms within the same cell.

These organelles allow a plant to fix carbon dioxide, utilising hydrogen from a water molecule to reduce to a carbohydrate that is further used for energy. Photosynthesis can be shown by a simple equation:

Thus:

$$n\mathrm{CO_2} + n\mathrm{H_2O} \longrightarrow (\mathrm{CHO})n + \mathrm{O_2}$$

Usually

$$6CO_2 + 6H_2O \Longrightarrow C_6H_{12}O_6 + 6O_2$$

However, the simplicity of this equation masks the beauty of the true process by which energy is derived. Photosynthesis encompasses two major sets of reactions, these are the Light Dependent Reaction or in old parlance 'the light phase and the Light Independent Reaction or as it was once known 'the dark phase'. Both phases link to form a chain in which the products of the Light Dependent Reaction 'fuel' the Light Independent Reaction.

Light Dependent Reaction

Our first consideration is the Light Dependent Reaction. In this light and water are used in what is known as a photosystem. Adenosine Di-Phoshate (ADP) is synthesised by the addition of a phosphate group to become Adenosine Tri-Phosphate. The addition of this Phosphate group is called phosphorylation. Water is also split by photolysis (the use of light) which produces hydrogen ions, free electrons and oxygen.

The light reaction consists of two distinct methodologies:-

Photosystem I (P700) and Photosystem II (P680)

The process of phosporylation can use just photosystem I (cyclic) or both photosystem I and II (non cyclic).

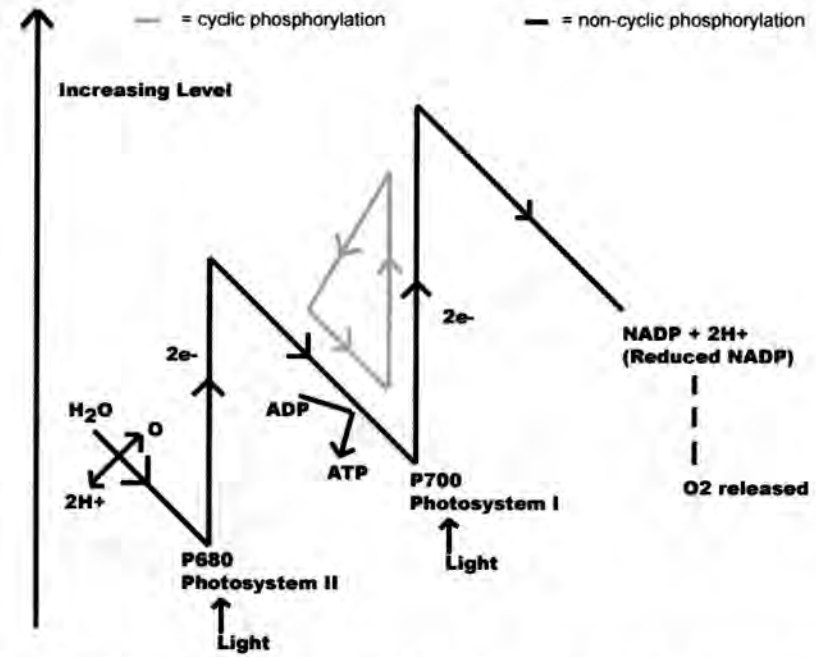
Cyclic Phosphorylation

Cyclic phosphorylation occurs when Photosytem I absorbs light and passes it on to chlorophyll a. The electrons produced by the photolysis of water become excited to a higher energy level and consequently are emitted by the chlorophyll. Normally this release would cause the electron to fall back into the photosystem by losing energy as flouresecence, however, instead an electron acceptor molecule captures it and returns it to the chlorophyll a. The energy release is channeled to allow phosphorylation of ADP. Thus this process produces a cycle of the same electrons being excited by captured light.

Non-cyclic Phosphorylation

Non-cyclic phosphorylation is also known as the 'Z-scheme' (named after the diagramatic representation of the energy accumulator), and uses the same basic energy gradients and electron carriers, however, it does not cycle the electrons. Instead both photosystems use light energy to excite electrons which then get captured by an electron acceptor very much like the cyclic reaction. This time, however, the electron acceptors are passed down a chain of electron carriers leaving the photosystem positively charged and thus further electrons will be attracted to the system. Phosphorylation occurs as the electrons lose energy whilst passing along the electron carrier chain.

The above two processes might conveniently be thought of as 'an electron pump'.



Now phosphorylation has been described in a little detail, the fate of the hydrogen ions produced by photolysis needs to be considered. The oxygen that is produced as a by-product of photolysis is the reason that plants are so important for the continuation of most animal life. The hydrogen ions produced combine with Nicotinamide Adenine Dinucleotide Phosphate (NADP) which as a consequence become reduced.

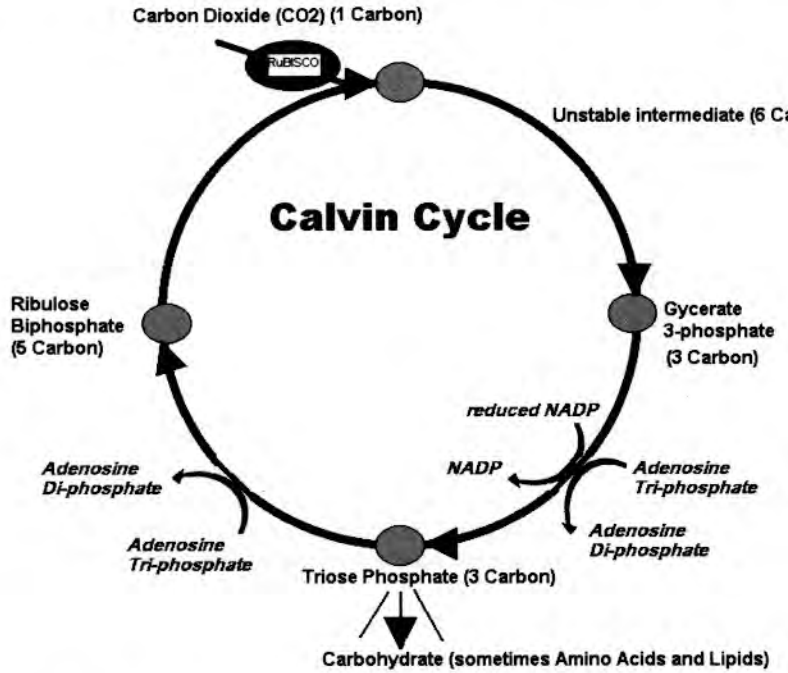
It is the production of ATP and reduced NADP that provides the fuel for the next stage in photosynthesis!

Light Independent Reaction

This reaction also known as the dark reaction is named such as it does not directly use light as the source of energy to produce carbohydrates (the name was changed from the Dark Reaction as it was felt that the name implied that it only happened during night time or when there was no light present - the reality is that it is simply a reaction that is underway at any time but requires no light energy to proceed). In this set of reactions a cycle is formed, also known as the Calvin cycle discovered by the Nobel Prize winning scientists Calvin, Benson and Bassham 1946-1953.

Firstly carbon dioxide is extracted from the air by the plant, it then combines with a 5 carbon molecule called Ribulose Bisphosphate(RuBP) with the aid of the most common enzyme in the world Ribulose Bisphosphate Carboxylase(RuBISCO). However, this new 6 carbon molecule is

very unstable and splits into two 3 carbon molecules called Gycerate 3-phosphate (GP). It is now that the products of the Light Dependent Reaction are used. GP combines with hydrogen released from reduced NADP and the energy used to do this comes from the splitting of the high energy bond attaching that extra phosphate group in ATP, which action produces ADP and a free phosphate. The ADP and NADP are then released to again be used by the Light Dependent Reaction. The 2 GP molecules have now been converted to 2 TP (Triose Phosphate) molecules which are then used to produce carbohydrate molecules. Some of these molecules condense to form hexose phosphates, sucrose, starch and cellulose and others regenerate RuBP and thus maintain the Calvin Cycle.



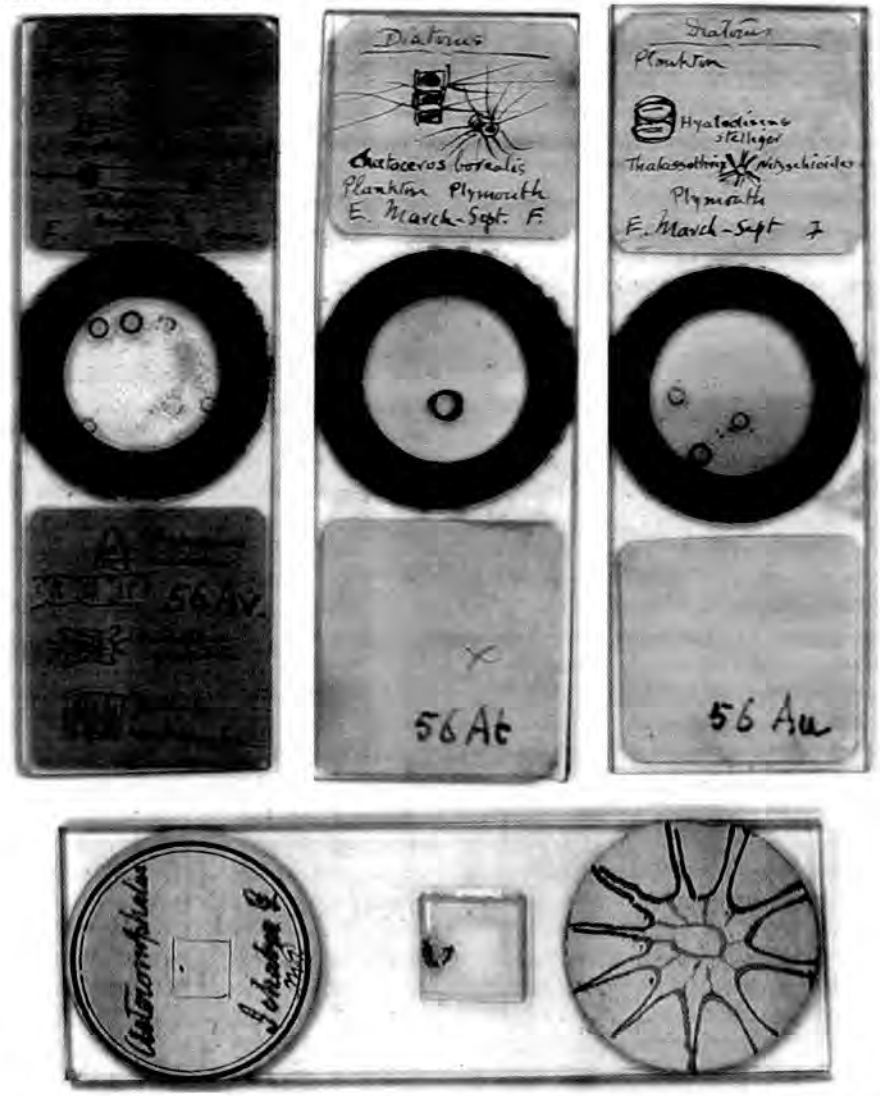
This is a simplified version of events but serves to illustrate the beauty of the cycle.

So, what is the remarkable thing about these reactions?

Well, if you haven't noticed already, when you think of human industry and its perpetual striving for efficiency and recycling, we still have a long way to go before we achieve the recycling exhibited by plants. Plants take in what we consider a waste product, convert it into a useful energy source for both themselves and animals, and pump out their own waste product which is vital to the existence of life on earth and when we've finished with their waste (Oxygen) and release it back as CO2 they continue their cycle and breath life back into the atmosphere. Of all the plants in the world producing Oxygen the Diatoms are estimated to produce 50-60% of the worlds Oxygen. So our interest in them and their welfare should not be restricted to an appreciation of their silicaceous frustules.

Working Slides

The slides below represent working mounts that convey a substantial amount of information on their labels as drawings of the frustules present. It is remarkable that such a wealth of information may be packed into such a small space. The labels are of little more than the standard size on slides of the normal 3 x 1.



It is not clear who the mounter was but any information regarding these or other similar mounts would be of interest.

Cymatopleura solea

Whilst researching another article, I came across some interesting material on diatoms written in 'English Mechanic'. A regular contributor, was N E Brown, who readers may be familiar with as the author of a little book on the genus Arachnoidiscus. This particular note however, referred to one of my favourite diatoms, namely Cymatopleura solea. The note went as follows;

" MICROSCOPICAL : CYMATOPLEURA SOLEA.

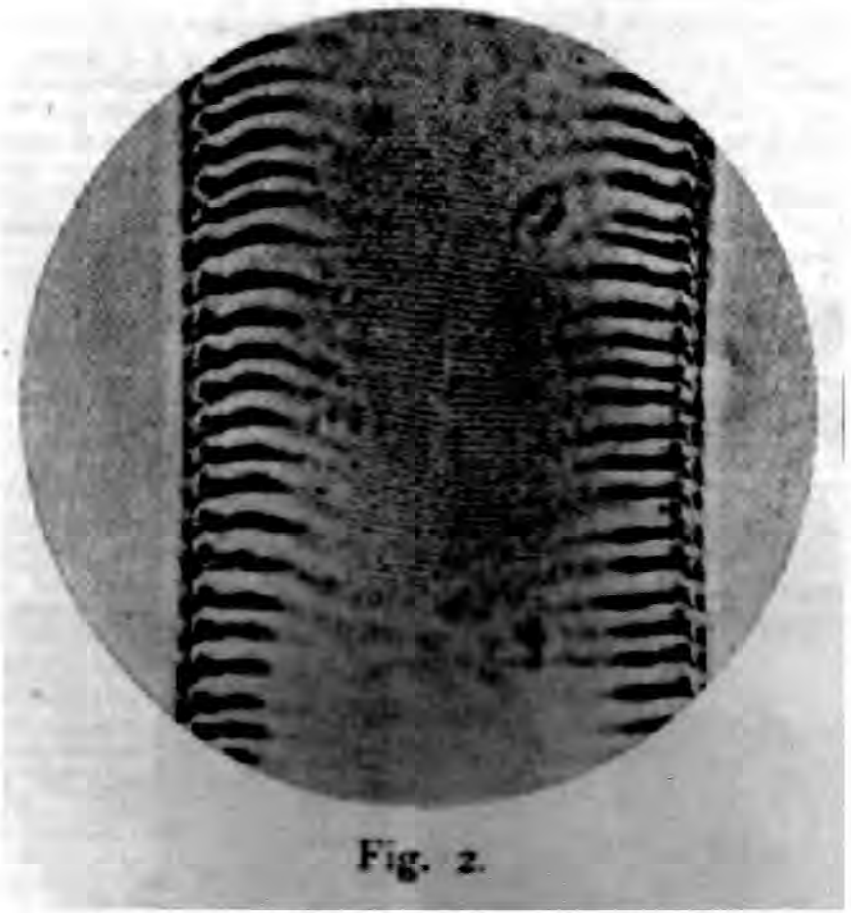
[129] - In the "E.M." for November 15, 1918, p. 196, Mr E. R. Blakeley wrote concerning the structure of Cymatopleura solea, and commented upon Dr. Spitta's picture of this diatom in "Microscopy" p. 385. t. 12 f. 2, where Dr. Spitta states that he had not been able to resolve the fine striae or lines upon this species into dots. But Mr. Blakeley states that "those 'lines' are really composed of an irregular network (very irregular indeed) made up of cavities of differing sizes and shapes." He adds however, "the general appearance seems to me much coarser than one would expect from the photo in Spitta's book."

Through the kindness of Mr. J. A. Long, of Westgate Hill, Bradford, who is one of the best modern mounters of diatoms, I have been favoured with a view of a photograph of Cymatopleura solea made by Mr. Blakeley showing with exquisite clearness the structure he describes, and I find that he has mistaken a much coarser structure for that which Dr. Spitta describes and figures so admirably. For Mr. Blakeley's excellent photograph shows that the irregular network is not the resolution of the fins striae Dr. Spitta figures, but fine cross partitions between the coarser transverse bars or lines of this diatom, the very fine striation being also represented upon Mr. Blakeley's photograph. I have two slides of this species, one in styrax, and one a dry mount. On my specimens in styrax I find that these small cross partitions are not very easy to perceive, even with a 1-15 inch oil immersion objective. On the dry specimens, however, they are so distinct that I can see them very clearly indeed under binocular vision, even with a Watson 1/6 of N.A. .74, using central light without a stop or screen of any kind; a green screen, however, makes them more distinct. So that at a magnification of about 300 diameters with this Watson lens they appear like dots between the coarser bars. This structure is not shown on Dr. Spitta's picture and forms no part of the fine transverse striae represented in that figure, and which are also shown along the central part of Mr. Blake|ey's photograph.

As I seem to understand it from a binocular as well as a monocular examination of it under high powers, the shell of C. solea. when viewed from the outside may be roughly compared with a boat roofed over, the roof having very convex elevations and concave depressions along it. The structure of this roof may also be compared with that of the roof of a house. The outer surface is covered with a very thin membrane comparable to the slates of a roof. It is this outside membrane that bears the very fine transverse striations represented in Dr. Spitta's picture, and it seems to me that I can indistinctly see that they are formed of such, but I cannot be certain of this. Under this membrane are the coarse transverse bars, when shown in both figure and photograph, they may be compared with the rafters of a roof, and like the latter, they extend from a central ridge to the margin, but not in a continuous curve or slope; between them are the short cross-partitions forming the small compartments or net work described by Mr. Blakeley. Under these bars and their cross-partitions is another thin membrane, which forms the inner surface of the shell, and may be compared with the ceiling of a roof, these three structures of outer membrane, bars, and inner membrane forming the thiconess of the shell. I have not

examined this inner membrane very closely, but it appears to bulge into a little pimple under each of the cells or compartments formed by the cross-paetitions between the bars, it is probably minutely dotted. N. E. B. "

It should assist readers in reading through the above article to have in front of them a copy of Spitta with the aforementioned photomicrographs. For those not possessing a copy, or not one to hand, these are shown below, though obviously the quality will have suffered a little in being scanned and then printed in this publication.



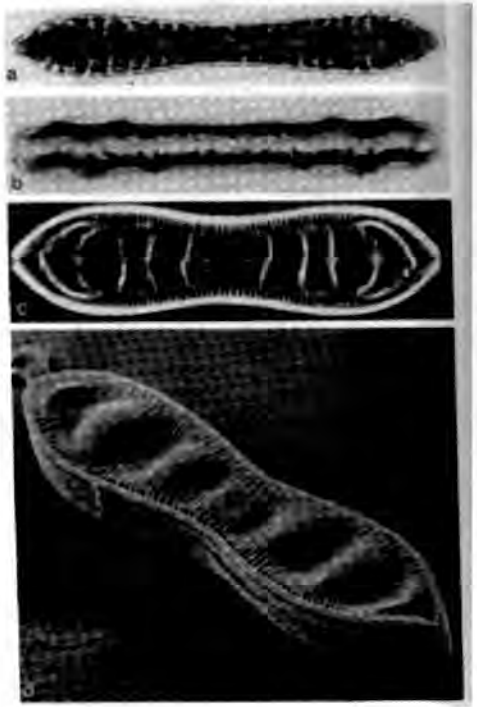
Dr. Spitta's picture of this diatom in "Microscopy" p. 385. t. 12 f. 2, Plate XII.

The following is the section from Spitta on test objects;

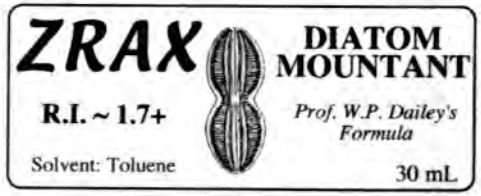
"In the floor of this little valve, which is very narrow, may be seen, when carefully searched for, if necessary with the aid of oblique green light, a series of closely arranged transverse lines. They appear as if roughly ruled, and engender the belief that they could be broken into dots, but we have never been able to do so, however. They are very delicate, and are extremely difficult to photograph on account of their great transparency; any diffusion of focus in the objective and they may be entirely invisible. Fig 2, Plate XII. Koristka 1.5mm apochromatic. See explanation to Plate."

This explanation is as follows;

"A most useful and delicate test-object. If looked at with a three-quarter cone and a x12 ocular-direct white light – faintly marked transverse striae should just be visible when emplying a fine semi-apochromat or an apochromatic objective. Oblique white light reveals these striations – towards the median line particularly – as abruptly interrupted. Each striation should be so distinctly define that it can be seen to terminate in rather a *round-shaped extremity*. An inferior combination will most likely fail to show the blunt ends, or perhaps may even fail to show the striations at all, the floor of the valve appearing a foggy desert void of detail. With a three-quarter cone (which is usually necessary) this object is a very searching test, and may enable the microscopist to differentiate between objectives which otherwise perform equally well."



Of course none of these workers had the advantage of electron micrographs, and shown below is a modern TEM (far left) photograph, and a recently taken photograph, using DIC (near left).



Properties of Zrax

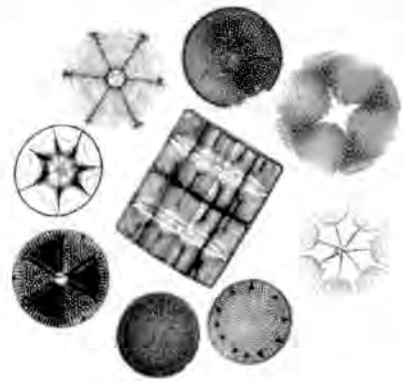
Zrax is a new synthetic resin designed for use as a high refractive index microscope slide mounting medium for diatom samples. Developed by Chemistry Professor W. P. Dailey (dailey@sas.upenn.edu) using a proprietary process, Zrax is currently available in the United States from Professor Dailey and in Europe from Mr. Klaus Kemp (www.diatoms.co.uk). Zrax, a condensation product between naphthalene and formaldehyde, is similar in chemical composition to Hyrax and Naphrax, neither of which are still produced. Zrax in the form of a clear light yellow solid resin has a refractive index of at least 1.7. Unlike Naphrax, and to some degree Hyrax as well, Zrax is permanently stable and does not present any "droplets" or other impurities in the final mount. The neutral resin has a softening temperature of about 100 °C and is thermally stable to at least 250°C. It is soluble in toluene and xylene but not alcohol. Water, however, is not tolerated in the mount, and should be removed carefully from the sample, slide and cover by heating before mounting. There are no studies on the safety risks associated with Zrax but users are expected to follow appropriate chemical safety procedures during use and cleanup in order to minimize personal exposure and environmental impact. It is understood that purchasers and end users use Zrax at their own risk.

Preparing a Working Solution of Zrax

In the U.S., Zrax is currently supplied as a solid resin in clear one ounce bottles and must be dissolved in toluene prior to use. Toluene is available as a paint thinner in most hardware and paint stores. The unfilled portion of the bottle is filled with toluene and mixed several times a day over the course of several days until a homogeneous solution results. For use, a portion of this solution is transferred to a separate container and additional toluene is added until a freely dropping solution results.

Making Microscope Mounts with Zrax

Several methods for making microscope mounts with Zrax may be used. All require some form of heating to remove the toluene solvent. The most convenient form of heat is a hot plate set close to the boiling point of water (100°C). Several drops of diluted Zrax are placed onto the slide which is then gently warmed until most of the solvent has evaporated. The cover with sample is placed onto the resin and heating is continued overnight. Prolonged heating at these temperatures does no harm. For samples that are mounted directly onto the slide, several drops of diluted Zrax are dropped onto the sample and the solvent is removed by warming on the hot plate. The cover is placed onto the resin and heating is continued overnight. Excess mountant is easily removed from the cooled slide by a single-edged razor blade. Ringing the slide cover is not necessary.



Obituary: Prof. Dr. Ramón MARGALEF (1919-2004)

by

Saúl Blanco

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Dr. Ramón Margalef (1919-2004). Courtesy of Stazione Zoologica Anton Dohrn

Dr. Ramón Margalef passed away in Barcelona on May 23, 2004. He is considered worldwide as one of the creators of modern ecological theory, and a main contributor to current biological sciences through works as "On certain unifying principles in Ecology" (1963), "Perspectives in Ecological Theory" (1968) or "Ecology" (1974). Prof. Margalef was one of the promoters of limnology in Spain, but his encyclopaedic knowledge also included oceanography and biophysics. Since the early 1940s, he published hundreds of articles and books describing exhaustively the phycoflora of Spain and some South American countries; studying, in somecases for the first time, both marine and freshwater habitats in the Iberian Peninsula. In the field of diatomology, adding some taxonomic contributions (Table 1), he created a reference collection for Catalonia, now placed at the Barcelona Botanical Institute. The species Amphora margalefii X. Tomàs in S. Sabater, X. Tomàs, J. Cambra, & H. Lange-Bertalot is dedicated to him. He was also a pioneer in the use of bioindicators ("The indicator organisms in biology", 1955), thus providing a basis for the present development of aquatic environmental sciences in Spain. He kindly supported the research of his colleagues, especially young scientists, improving substantially with many collaborations. World phycologists are in debt to Prof. Margalef due to his constant efforts devoted to the development of this science.

A list of works by Prof. Margalef to 2002 is available at http://tinyurl.com/2x5co. Articles concerning algae are referenced in Cambra et al. 1998 and Aboal et al. 2003.

Table 1. List of diatom taxa described or emended by R. Margalef and co-workers. From Silva, 2004.

Asterionella mediterranea (J. Pavillard) R. Margalef 1951 (Publ. Inst. Biol. Apl. Barcelona 9: 5-131)

Asterionella mediterranea subsp. pacifica (E.E. Cupp) R. Margalef (Publ. Inst. Biol. Apl. Barcelona 9: 5-131)

Chaetoceros melchersianus R. Margalef 1967 (Mem. Soc. Cien. Nat. La Salle 25: 141-208)

Chaetoceros pachyceros R. Margalef & M. Durán 1953 (Publ. Inst. Biol. Apl. Barcelona 13: 5-78)

Campylodiscus noricus var. ornatus R. Margalef 1948 (Flora, fauna y comunidades bióticas de las aguas dulces del Pirineo de la Cerdaña. Estación de Estudios Pirenaicos, Zaragoza, 226 pp.)

Neidium iridis var. amphigompus f. curta R. Margalef 1956 (Publ. Inst. Biol. Apl. Barcelona 22: 43-152)

Neidium iridis var. amphigompus f. maior R. Margalef 1956 (Publ. Inst. Biol. Apl. Barcelona 22: 43-152)

Rhizosolenia alata subsp. indica (H. Peragallo) R. Margalef & M. Durán 1953 (Publ. Inst. Biol. Apl. Barcelona 13: 5-78)

Rhizosolenia hebeata subsp. semispina (V. Hensen) R. Margalef 1951 (Publ. Inst. Biol. Apl. Barcelona 9: 5-131)

Rhizosolenia imbricata subsp. shrubsolei (P.T. Cleve) R. Margalef 1951 (Publ. Inst. Biol. Apl. Barcelona 9: 5-131)

Bibliography:

Aboal M, Álvarez-Cobelas M, Cambra J & Ector L 2003. Floristic list of the non marine diatoms (Bacillariophyceae) of Iberian Peninsula, Balearic Islands and Canary Islands. Updated taxonomy and bibliography. Diat Monogr 4: 1-639.

Cambra J, Álvarez-Cobelas M & Aboal M 1998. Lista florística y bibliográfica de los clorófitos (Chlorophyta) de la Península Ibérica, Islas Baleares e Islas Canarias. Asociación Española de Limnología. Listas de la Flora y fauna de las aguas continentales de la Península Ibérica. 614 pp.

Silva P (comp.) 2004. Index Nominum Algarum. University Herbarium, University of California, Berkeley. Available at http://ucjeps.berkeley.edu/INA.html.

Classic Texts

- The Romance of Natural History by Philip Henry Gosse

This text, though not highly technical, is beautifully written and reveals some interesting views on Flint formation.

Let us look now at another class of labourers by whom mighty deeds are performed, though the performers themselves are so inconceivably minute, that to say they bear the same relation to the coral polyps that a mouse does to an elephants would be greatly to overrate their dimensions. They are, in fact, invisible to the sharpest sight, except when aggregated together. I refer to the Diatomaceae.

Of late years the attention of microscopic observers has been largely and increasingly occupied by a tribe of organic beings which are found to exist in all parts of the world, in fresh and salt waters chiefly, and present a great variety of species as well as of form and markings. They consist of a glassy shell, formed of flint, inclosing a soft coloured substance, generally of a golden yellow or brown hue. This is called the endochrome, and the shell is called the frustule. The latter has a determinate form, which often assumes extraordinary elegance, and is usually marked with series of specks, which are either knobs or pits, arranged in the most varied and exquisite patterns. They may exist either as isolated forms, or, more commonly, as united into long chains, or other connected figures. These are called Diatoms. They have spontaneous movements, and hence they were considered, when first discovered, to be animals; but the

opinion now generally prevails, that they are plants of a very low grade.

The influence of these tiny atoms upon this world in which we live is almost beyond belief." The whole bottom of the ocean," observes Dr Barclay Montgomery, "seems to be in great measure made up of these bodies. Sir John Ross and other Arctic explorers speak of a large, bank called the Victoria Barrier, 400 miles long, and. 120 miles wide, composed almost entirely of infusoria. During the last week I was engaged in examining a sounding from the bottom of the ocean at the depth of 2000 fathoms, on the exact spot where the Atlantic telegraph unfortunately gave way; although the quantity was minute still I discovered a great number of interesting forms. What is known as Tripoli powder in the arts consists almost entirely of fossil deposits of the siliceous coats of diatoms, which from their hardness form an excellent means of polishing metals; these fossil deposits are very numerous and in great quantity in different parts of the world. The town of Richmond, in the United States, is built upon a stratum of these bodies twenty feet in thickness; in California and America generally, in Bohemia, throughout Europe and Africa, and even in our own country, we find similar deposits, varying of course in the different species present. . . . . I have been enabled to examine some of the curious raised fossil beach near Copiapo in Chili, which is gradually forming into stone. Though this beach is one mile from the present shore, and 180 feet above the level of the sea, yet I have found in it diatoms of the same species as those that occur on the shore at the present day; the diatoms are also found in a fossil state in peat, coal, bog iron-ore, flint, and the chalk formation. Thus, in a geological view, though individually invisible yet numerically they per form a most important part in the crust of the earth a part more important than all the mighty monsters that lived in ages past . . . . What purpose do these bodies serve? It is highly possible that they form, in a great measure, the food of all the minor aquatic animals more highly organised than themselves; I have often found, on examining shrimps, that their stomachs, which are situated behind the eyes, are entirely filled with diatoms. That the siliceous shell passes through nearly intact, there can be no doubt, but it is certain that the internal structure, the endochrome, may be digested and form the nutritive portion; in this view I am borne out by referring to guano - a most prolific source of fossil diatoms. Here we find abundance of siliceous shells, in fact their presence or absence is now the test of the genuineness of the article;- these, in past ages, must have been consumed by small marine animals, these again consumed by fish, and these in their turn by birds: in guano I have noticed the proportion of diatoms to be in some specimens nearly 1 in 500 parts. A correspondent from Callao, writing to the Illustrated London News, on the Cincha guano islands, says the export of guano from the islands has increased considerably during the last ten years; between 300,000 tons and 400,000 tons are the annual amount at present: here, in a very moderate calculation, from one spot alone, we have the annual removal of 500 tons of diatoms*. * Report of Cornwall Polyt. Soc. for 1857

The agency of these mighty but minute forms has been still further developed in some researches of great interest which have been very recently published by Dr Wallich. He has ascertained that they exist in a free, swimming condition, in various regions of the ocean, and at various depths from the surface downward; that their multitude is incalculable; and that they afford sustenance to immense numbers of molluscans and crustaceous animals, which in their turn constitute the food of the most gigantic creatures of the deep. Dr Joseph D. Hooker had noticed the vast profusion of Diatomaceae in the Antarctic Sea; and he was struck by the conspicuous appearance presented by their masses imbedded in the substance of the ice, or washed up on its surface by the action of the billows.

Dr Wallich found the surface of the Bay of Bengal and the Indian Ocean to be crowded with masses of minute life forming yellow streaks, flakes, and tufts, intermixed

with glistening points, which, when examined proved to be recognisable forms of the organisms in question. The mighty scale on which the Diatomaceae really exist, did not become manifest, however, until he reached the Atlantic, between the Cape and St Helena*. * See Annals Nat. Hist. for January 1860; and Quarterly Journ. Micr. Sci. for January 1860.

"It was here that, for many degrees, and in bright, breezy weather, the ship passed through vast layers of sea-water so thronged with the bodies of a species of Salpa (S. mucronata) as to present the consistence of a jelly. What their vertical limits were, it was impossible to discover, owing to the speed at which the ship was moving. They appeared to extend deep, however, and in all probability, were of a similar character to the aggregations of what is called whale-food in the higher latitudes. Each of these Salpae measured about half an inch in length; but so close was their aggregation, that, by a sudden plunge of an iron-rimmed towing-net, half the cubic contents, from which all water had percolated, generally consisted of nothing but one thick gelatinous pulp. Each individual presented a minute yellow digestive cavity, of the size of a millet-seed, which contained Diatomaceae, Foraminifera, and other organic particles.

"If we take into account the numbers of Diatomaceae and Foraminifera that must exist in order to afford even a small integral proportion of the diet of these creatures, the vast renewal of supply that must be perpetually going on, and the equally vast multitude of these Diatom-consumers that yield, in their turn, a source of food to the gigantic Cetaceans and other large creatures of the sea,it becomes possible, in some measure, at least, to form an estimate of the manner in which the deep-sea deposits become accumulated."

The same observer has, with great ingenuity, applied these facts to the solution of that much-vexed question, the origin of the masses of flint that are found in the chalk. Diatoms are found in great numbers in these nodules but the difficulty was, how to account for their aggregation in these irregular masses. This is solved by the hypothesis that they are the excrement of whales,the insoluble remains of the Diatoms, originally devoured by the Molluscs which in their turn found a grave in the stomach of the Cetacean." We find that the siliceous particles of the Diatomaceae, Polycistina, Acanthometrae, and Sponges, exist not only in a state of the utmost purity, but that they occur precisely in that state of minute subdivision which favours the solvent or aggregative process in an eminent degree. We see that they are gathered together by the Salpae, in the first instance, from the element in which they live, and that they are freed of all, or nearly all, their soft portions, by the action of the digestive cavities of these creatures. We find that the Salpae again in inconceivably vast numbers, afford almost the entire food of the largest orders of Cetaceans; and I therefore think we are able to infer, with certainty, that, in the complex stomachs and intestines of the latter, the further process of aggregation of siliceous particles goes on upon a gigantic scale, aided by the presence of the alkalies, and that the aggregated masses being voided at intervals, slowly subside, without interruption to the bed of the ocean."

Darwin records having seen clustered objects in the sea near Keeling Atoll, which he does not name, but which from the figures he has given must have been Diatoms. But all the streaks and bands of colour seen on the ocean are not attributable to plants: some of them are certainly of an animal nature.

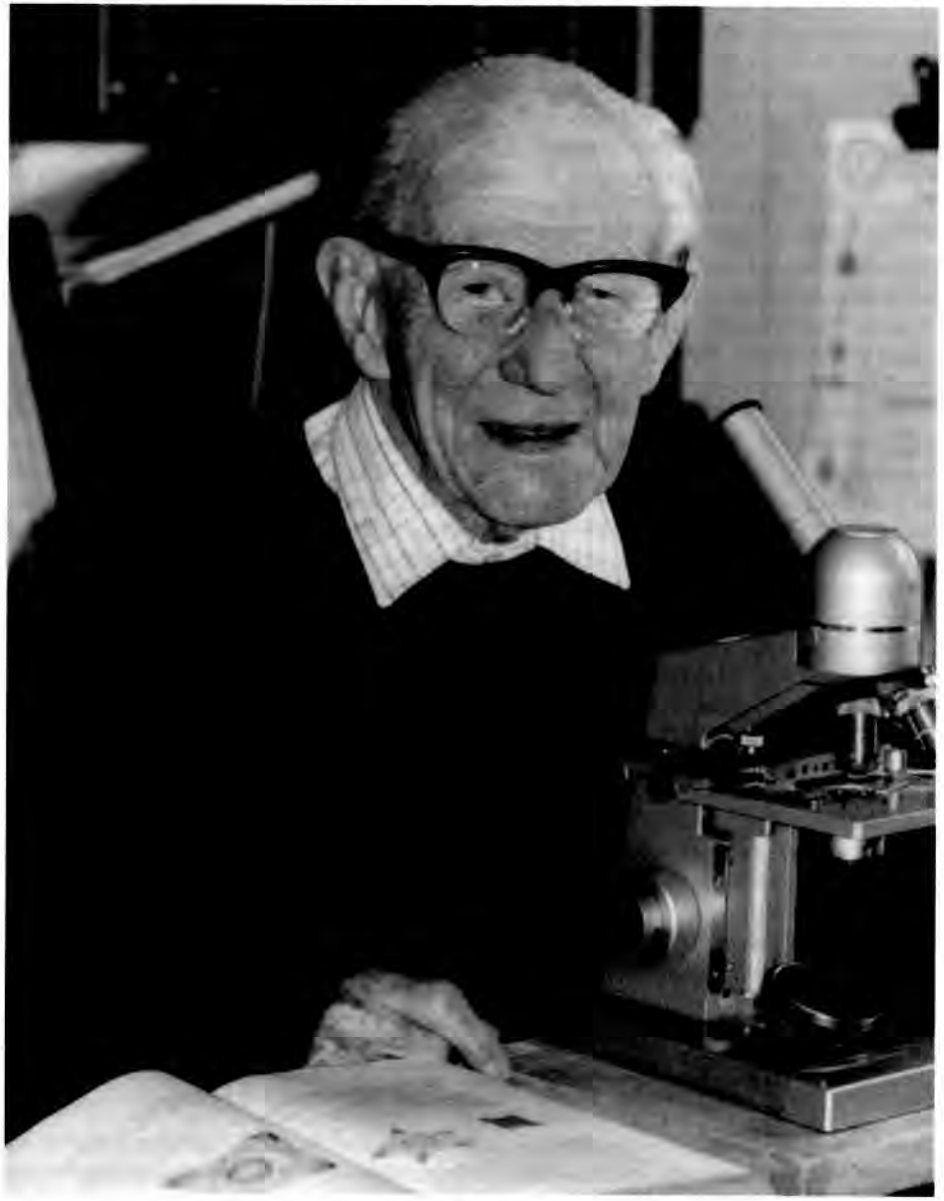
An audience with Norman Ingram Hendey

In July of 2004, on a visit to Cornwall to see Trevor Tolputt, I was delighted to hear that an arrangement had been made for me to visit a famous and influential diatomist - Norman Ingram

Hendey.

It was with considerable dismay that I was shortly after told that following a fall at home and his subsequent admission to hospital, Norman had passed quietly away.

Not only had this remarkable man published much on the Diatomaceae but he had also reached the venerable age of 101 on January 31st 2004. His mind was still as active as ever it was though



he was dismissive of any contribution he might further make. Despite his loss of hearing and his limited eyesight he was still able to guide one through his work and publications.

Having, some time since, given up microscope work his collections and slides had been passed to the British Museum where they will continue to be worked on.

A man of strict routine I was allowed only a short time to sit with him and discuss his work. Norman was definately of the 'old school', dismissive of Electron Microscopy, though he acknowledged the part it is playing in the Taxonomy of his beloved diatoms - "I need to understand how an image is formed and I can understand conventional optics."

His main interest was in the discovery of new forms. He instructed Horace Barber on the methods for drawing from the microscope, an art form in that Norman was particularly accomplished in, and as everyone knows Horace soon surpassed his master, a feat of which Norman was particularly proud.

Norman participated in microscopy to the end, however, and as President of the Kernow Microscopical Society he was influential in their direction.

Had there been more time available I am sure I would have been told more of his interesting and varied life.

Some time ago I was emailed with an anecdote which I shall reporduce here.

"During the Second World War, Norman was actively involved in Naval Intelligence as a civilian expert. That gave him the opportunity to travel widely - an opportunity only very few people would have had in normal life at that time - and he made good use of it by visiting Dallas Hanna in San Francisco, for instance. Being an inveterate diatomist, he also exploited his wanderings by collecting diatom samples from exotic places, war or no war. Sometimes these samples went to the UK by diplomatic mail (I don't expect many diatomists can boast of that...) but when the war was nearly over, Norman had a fair batch of materials left, which he decided to put in a box for delivery to the UK by ship. Then Retribution caught up with him, because that ship was the last to be torpedoed and sunk by a U-boat in the Atlantic..... So if a future survey should dredge up diatoms from Guam, the Solomon Islands, Aleutians or whatever in the middle of the Atlantic, you'll know who is responsible for this case of 'fouling of the diatom flora'."

Just before I left Norman gave The Amateur Diatomist permission to use any of his published material in the furtherance of the publication. This most generous gesture I am sure we will take advantage of in the future.

This marks the passing of yet another of our talented 'amateurs' and is a grievous loss to his family and all that knew him.

Diatom Collections

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fax + 44 161 275 26 76
1. Chaffers

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The Castle Museum,
Norwich, Norfolk, NR13 3JU, UK
tel + 44 1603 22 36 42

1. Brightwell, T.

2. Hurrell

Hurrell, H. E.

Harry Edward Hurrell, F.R.M.S.

Elected to Quekett Microscopical Club 20th December 1901. In 1939 Quekett Microscopical Club Members list at 60 Albany Road, Great Yarmouth.

Corresponding Member of the Manchester Microscopical Society 1887/1888/1889 living at 22 Regent Street, Great Yarmouth.

Present at the Quekett Microscopical Club Conversazionne on Tuesday 12th October 1937 at the Rooms of The Royal Society of London, Burlington House, Piccadilly, W.1. showing - Freshwater Polyzoa.

Present at the Quekett Microscopical Club Conversazione on Tuesday 11th October at Burlington House, showing - Freshwater Polyzoa - Plumatella fungosa.

In a notebook of Leonard Sandall H. E. Hurrell is given as at address 25 Regent Street, Great Yarmouth. July 1886 - The Scientific Enquirer

Fish Skins. - Send stamped addressed envelope for a specimen of the skin of the Spotted Dog Fish, cleaned and ready for mounting dry, to H.E.Hurrell, 1, Church Plain, Great Yarmouth.

The above advertisement also appeared in the August 1886, September 1886, Issues.

October 1886 - The Scientific Enquirer

Beautiful Plant Scales.-For leaves of the Sea Buckthorn (Hippohae rhamnoides) coverend with beautiful plarising scales, or for opaque objects; send stanped addressed envelope to H.E.Hurrell, 1, Church Plain, Great Yarmouth.

The above advertisement also appeared in the Noveber 1886, September 1886, Issues.

Two words from the editors

To all those that have supported us and made it possible for us to go into the 3rd volume:

An arrangement by Klaus D. Kemp

Field Microscopes (IV)

Beck Portable microscopes

Beck produced a wide range of portable microscopes, some being more portable than others. My personal favorite is the Baby London, also I think the most practical - the case fitting into the palm of ones hand. An ideal pocket instrument. If you can find one, then snap it up, they are not that common.

Beck Microscopes.

This catalogue first deals with the simplest forms of compound microscopes and proceeds through the various types of more elaborate instruments up to the most complete research microscopes, and binocular microscopes in all forms are then described. Particulars and prices of microscopic apparatus and accessories are given after which micro-projectors are dealt with. A complete range of magnifiers and reading glasses completes the catalogue.

For convenience all microscope outfits are shown with prices of the stand and apparatus given separately, so that with any change in the outfit the alteration in price can be at once determined.

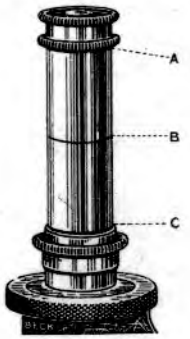
Simplex Microscope.

No. 75

No. 77

Simplex Microscope

All classes of microscopic examination do not require an instrument of the highest magnification, with its consequent elaboration and high cost. There is much work where a simple instrument of moderate power is all that is necessary. The Simplex microscope meets this requirement. Where a simple microscope is required which can be readily set up and manipulated, the Simplex will be found a most satisfactory instrument. Although simple in design, it is made with the same precision of workmanship as our standard instruments. It is of moderate size, the illustration being approximately one-third size.



In the No. 75, the base and the limb are a solid construction and of sufficient size and weight to ensure the instrument standing firmly, either in its vertical or inclined position.

The focussing adjustment is operated by a large milled ring placed in a convenient position accessible to either hand. The stage measures 3½ in. × 3¼ in., and is provided with stage clips for holding the object.

The drawtube is adjustable in length by means of which the magnifying power is changed.

The range of magnifying powers obtainable is ×35 to ×200. The drawtube is engraved with lines as indicated in diagram, and the following table gives the magnifying powers with the drawtube set at these positions and with the two eyepieces.

Drawtube set at position.	×6 Eyepiece.	×15 Eyepiece.
A	35	120
B	55	150
C	75	200

Intermediate magnifying powers are obtained at intermediate positions. The object glass and eyepieces are of the standard series, and the optical performance is, therefore, equal to that of our larger instruments, so that clear and distinct definition, with good field of view, is obtained.

The instrument is contained in a strong case, which measures 9½ in. × 6½ in. × 5¼ in.

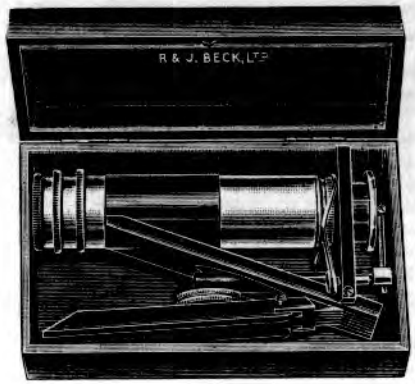
In No. 76 the limb is fitted on to a horseshoe base without stage so that the microscope can be place direct upon a large object or surface. The focussing adjustments and the magnifying powers are similar to the No. 75 as described above.

No. 75 Simplex microscope complete, without case £4 10 0

No. 76 Simplex microscope complete, with case 4 17 6

No. 77 Simplex microscope on horse-shoe base, without case 4 4 0

5

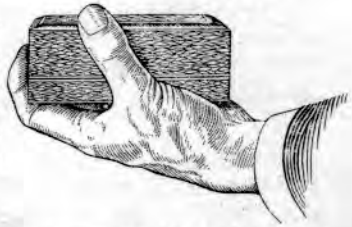


No. 2580 Baby London Microscope.

The Baby London microscope is an ideal instrument for those who study nature, pond life, etc. It can readily be carried in the pocket and is so easily set up that examinations can be made in the field with the greatest ease. It is also most useful to medical men for the carrying out of cursory examinations.

It is extremely portable, and yet forms a complete and efficient microscope. It uses standard object glasses and eyepieces of all powers. All the necessary adjustments are provided, including sliding coarse adjustment and fine adjustment. There is a drawtube giving a varying tube length up to 160 mm. The case in which it is contained measures 5¼ in. by 2½ in. by 2 in.

A complete range of accessories including substage condensers is supplied. The mirror usually supplied with the microscope is concave, but when the instrument is fitted with a substage condenser, a flat mirror is provided. This can be supplied in place of the concave or as an extra, the mirrors being interchangeable in the fitting which carries them.



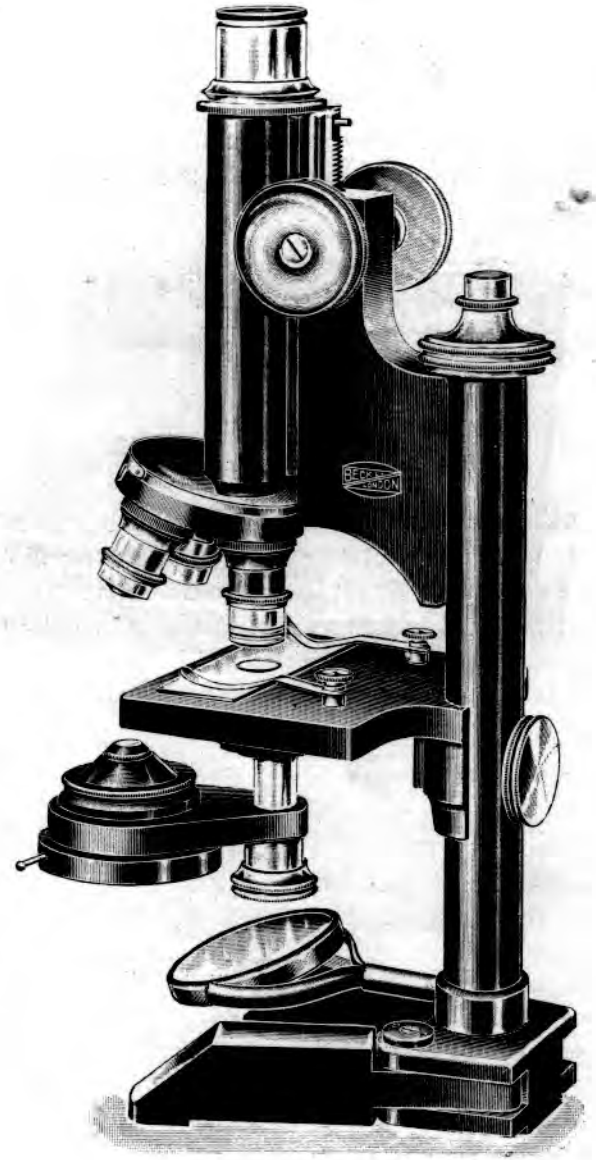
To enable substage apparatus to be used a tubular fitting is supplied which screws into a thread in the stage. Two forms of substage condensers are supplied, the Abbe with iris diaphragm, and a combined condenser and spot lens. The latter is suitable for both transparent and dark ground illumination with low power object glasses. In order to obtain dark ground illumination with this condenser, a central patch stop which is attached to an arm is swung into position, thus an object can be easily viewed with transparent or dark ground illumination by merely swinging the stop in or out of position.

The polariser of the polarising apparatus also fits into the tubular substage fitting, the analyser fitting over the eyepiece.

For holding unmounted objects, there are supplied stage forceps and the cork object holder. The latter is suitable for examining fairly large flies, beetles, leaves, etc., the objects being attached to the cork by means of entomological pins. Both of these pieces of apparatus have rotating motions so that the object under examination can be viewed from every aspect.

		£	s	d
No. 2580.	**Stand** only, in case...	£3	0	0
No. 2580A.	Baby London microscope, with 1 eyepiece (× 10) and ⅔ in. object glass in case	4	4	0
No. 2583	Substage tube	0	2	0
No. 2584	Abbe condenser with iris diaphragm	1	15	0
No. 2585	Spot lens and condenser	1	3	0
No. 2586	Polarising apparatus...	3	7	6
No. 2587	Extra flat mirror	0	5	0
No. 2588	Bull's eye condenser on stand	0	11	6
No. 2589	Stage forceps	0	5	6
No. 2590	Cork object holder with pins	0	3	6

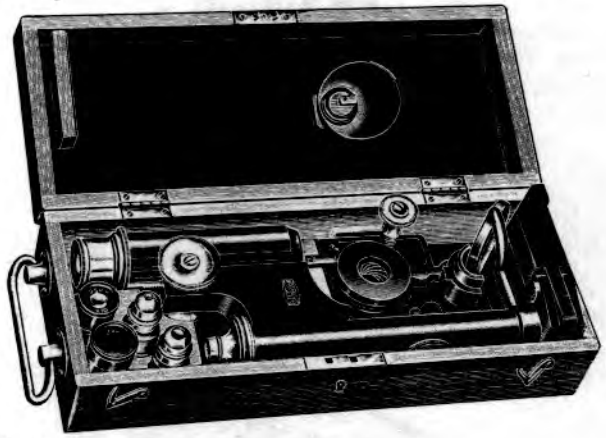
Extra eyepieces, object glasses, etc., at listed prices.



No. 3755 Portable Microscope.

No. 3755 Portable Microscope

This microscope provides, at a moderate price, an instrument which, when set up, is of standard size, and possesses all the usual and necessary adjustments for general and medical work. It has rack and pinion coarse adjustment and fine adjustment by micrometer screw. The stage measures 3¾ in. × 3 in. The substage is focussed by a screw and milled head, and can be swung out of the axis if desired. The object glasses and eyepieces are of our standard series. The instrument is packed with a very strong teak case with lock and key and carrying handle, measuring 3¼ in. × 5¼ in. × 13¼ in.



No. 3755.	Stand only in case			£11 0 0
No. 3755A.	Stand in case	£11 0 0		
	No. **3260.** 2 Eyepieces, 42 m/m. (× 6) and 25 m/m. (× 10)	1 4 0		
	No. **3231A.** ⅔ in. Object glass, 16 m/m.	0 12 0		
	No. **3234A.** ⅙ in. Object glass, 4 m/m.	2 13 0		
	No. **3285.** Abbe condenser and Iris diaphragm	1 9 6		
	No. **3301.** Triple nosepiece	1 10 0		
				£18 8 6
No. 3755B.	No. **3755A** as above	£18 8 6		
	No. **3251.** 1/12 in. Object glass 2 m/m. oil immersion ...	3 18 6		
	No. **760.** Cedar oil bottle and supply of oil	0 2 0		
				£22 9 0

The following additional apparatus can be supplied, and is contained in separate cases :—

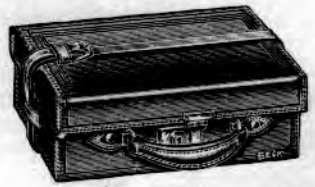
No. **3305.**	Detachable mechanical stage ... ... extra	£7 5 0	
No. **3779.**	Angular eyepiece attachment ... ... extra	2 0 0	

No. 3745 Pathological Microscope.

Portable model.

No. 3745 Portable Pathological Microscope.

This portable microscope is on the design of our No. 3740 Pathological but the heavy base is replaced by folding legs as will be seen in the illustration on page 52. While the portability has been taken into consideration, the instrument is so designed that when set up it is as rigid as the other models of the Pathological microscope. The outfit No. 3745A packs into a leather case 11 × 7 × 4¼ in., with lock and key, strap and carrying handle. The case for outfit No. 3745B is slightly longer.



The only part of the stand which is removed when being packed into the case is the top part of the stage, and the whole outfit forms an extremely efficient microscope for those who are constantly requiring an instrument while travelling.

No. 3745.	Stand only in case				£27 2 6
No. 3745A.	Stand in case	£27	2	6	
	No. 3260. 2 Eyepieces, 42 m/m. (×6) and 25 m/m. (×10)	1	4	0	
	No, 3231. ⅔ in. Object glass 16 m/m.	1	10	0	
	No. 3234. ⅛ in. Object glass 4 m/m.	3	15	0	
	No. 3251. 1/12 in. Object glass 2 m/m. oil immersion	3	18	6	
	No. 760. Cedar oil bottle, with dipper, ground on cap and supply of oil	0	2	0	
	No. 3286. Abbe condenser	2	10	0	
	No. 3301. Triple nosepiece	1	10	0	
					£41 12 0
No. 3745B.	Stand only in case	£27	2	6	
	No. 3260. 2 Eyepieces, 42 m/m. (×6) and 25 m/m. (×10)	1	4	0	
	No 3231. ⅔ in. Object glass 16 m/m.	1	10	0	
	No. 3232. ⅓ in. Object glass 8 m/m.	3	5	0	
	No. 3234. ⅛ in. Object glass 4 m/m.	3	15	0	
	No. 3237. ⅛ in. Object glass, oil immersion 3 m/m. N.A. 1.2	7	10	0	
	No. 3293. High power focussing dark ground illuminator in centring fitting	6	2	6	
	No. 3397. Metal holder for ½ m/m. slides	0	6	6	
	No. 3398. 12 ½ m/m. slides for No. 3397	0	5	0	
	No. 3288. Achromatic condenser N.A.1 in centring fitting	6	10	0	
	No. 3301. Triple nosepiece	1	10	0	
	No. 3750. Topley top stage	0	17	6	
					£59 18 0
No. 3780.	High power binocular eyepiece, straight model				10 10 0
No. 3781.	Ditto angular model				13 10 0
No. 3260.	Extra eyepieces for binocular each				0 12 0

The binocular eyepiece is supplied in a separate case.

Any apparatus can be added or omitted at a corresponding addition or reduction of price.

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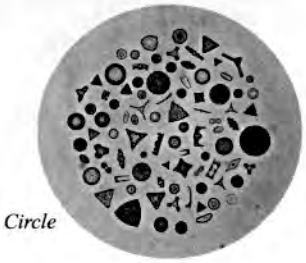
Images

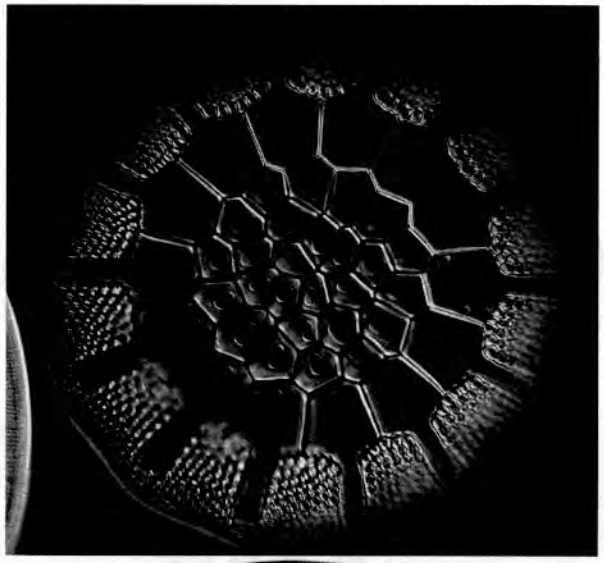
A number of images have been sent in that are ideal for illustrating the capabilities of both digital cameras and associated software. The first two are by Stephen Nagy who mounts his own slides both selected and arranged.

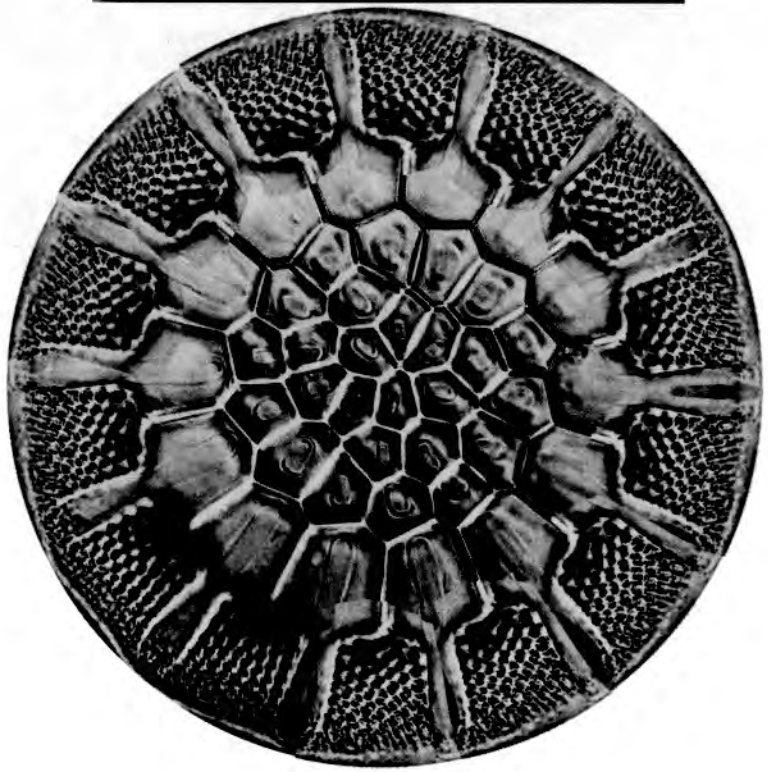
Asterolampra from Oamaru



Oamaru Circle

The next two are from Mike Samworth to show the manipulation capabilties of image software.





The next issue of

The Amateur Diatomist

In the next Issue:-

Field Microscopes - Meopta

The Alga-Flora of
West Yorkshire (diatoms)
by West and West

Mills - Lower Slaughter

Diatoms and the Family

Lawrence Hardman

Sales, Wants and Exchanges

Correspondence

Notes for contributors.

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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.