The Amateur Diatomist

Volume 5 Part I.

Editorial

Ok, it's taken us a few years to get around to completing (beginning) this project.

After much fretting and further loss of hair we have settled on the format, simple and straight-forward to navigate. What's more it should work on all browser platforms (at least we hope it does - if you can't read this then it doesn't - but you won't be able to tell us!)

We haven't, as yet, settled on a publication schedule as this will depend on the number of articles we get in or/and our ability to write them.

Keep visiting though, as the letters and exchanges sections will be updated as and when input demands.

We make no apologies (sorry) for our articles using British spelling conventions. Articles from abroad will be reproduced as received. However, articles in languages other than English must include an English translation as, though we have a smattering of French and German, we are essentially and shame-facedly mono-lingual (and even English presents us with some problems).

I would entreat all our readers to submit articles of interest to the wider diatomist community, and if writing isn't your forte then perhaps a few photographs and captions.

Lastly, we hope you enjoy this issue, and thanks to the support of the subscribers to the former printed volumes. None of this would have happened without you (**we just might need someone to blame**).

The Search for St. Peter

A number of times I have encountered slides bearing the location 'St. Peter, Hungary' and a number of other Hungarian locations. Pin-pointing the sites was somewhat fraught due mostly to the fact that Hungary today is not the Hungary of yesteryear. Hungarian samples were almost non-existent and it occurred to me that if the

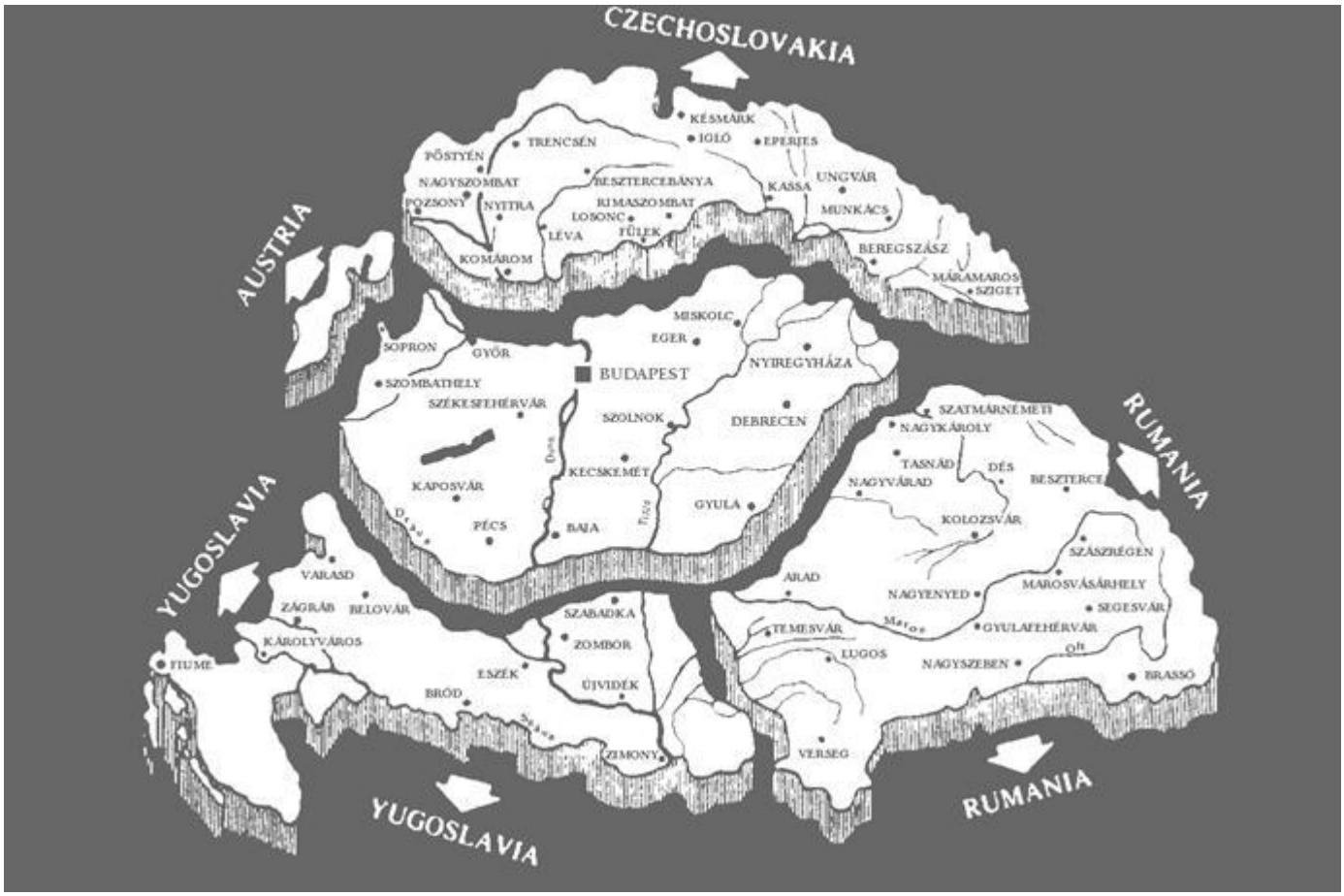
sites could be identified then maybe it would be possible to re-sample the locations. The following, then, is the first part of the story.

My initial task was to compile a list of the Hungarian locations referenced or mentioned in various publications on the Diatomaceae and to this was added references from actual slides and collections.

Most references are pre-WWI, so the subsequent break-up of Hungary following the signing of the Treaty of Trianon on the 4th of June 1920, and the subsequent re-naming of villages, towns, and regions meant that some location names no longer existed.

The territorial conditions of the Treaty required Hungary to surrender more than two-thirds of its pre-war occupied land. Romania acquired Transylvania; Yugoslavia gained Croatia, Slavonia, and Vojvodina; Slovakia became a part of Czechoslovakia; and Austria also acquired a small piece of pre-war Hungarian territory.

The map below provides pictorial detail of which regions of Hungary were reassigned.



Dismemberment map of Hungary (1921)

Diatom/Diatomite Sample Sites.

The sample site names vary considerably in published references, on sample tubes and on finished slides. This is no great surprise as the names themselves and the way they are pronounced has tended to generate names that are phonetic, mis-spelt, mis-translated or downright incomprehensible to non-Hungarian language speakers.

Abany Scanto	Demind	Izsopallaga Serges	Skazal
Abazjszants	depot du Castel	Jastraba	St. Peter
Alsv-Esztergdly	Dolje	Karand	Struhar
Also Esztergally	Dubravica	Kavna	Strukar
Also-Esztergally	Du Bronica	Kawna	Szakal
Also Estergaly	Eger	Kekkv	Szakel
Also Estergally	Elesd	Kekko	Szelcse

Apez Zagywaszanto	Erdvbenge	Kis-Ker	Szelcz
Aranyos	Erdvbinye	Koggik	Szent Peter
Bajtha	Etzerguly	Kopecz	Szent-Peter
Balaton See	Felsoesztergaly	Kvrmvcz	Szentendre
Balatonsee	Felso Esztergally	Magyar Hermany	Szt. Peter
Bibarck Talva	Felso-Esztergally	Magyar Kermany	Szurdock
Bibarczfalva	Felso Estergaly	Mocsar	Szurdok
Bori	Felso Estergally	Mogyorod	Szurdpuspoki
Bodos	Felso Estingally	Nagy Curtos	Szurdok-
Borostelek	Gyvngyvs-Pata	Nagy Kurtos	Puspoki
Boros-Telek	Hidas	Ngermergy	Szurdokpuspoki
Bory	Hlinik	Nyermegy	Talya
Bremia	Holling	Palogla	Thallya
B|j|t	Hosszuheteny	Platten See	Tokaj
Castel	Hosszzhetiny	Plattensee	Tokay
Czekehaza	Izopalla-Serges	Saint Peter	Zagyvaszants
Demend	Izsopallaga	Skakal	

Abany Scanto(see *Abazjszants*)
Hustedt Collection Accession #22118
This is probably a phonetic best guess.
Abazjszants
In Abazj Hegykvzi district in the county of Borsod-Abazj-Zemplin
Also Estergaly (see *Alsvesztergdly*)
Hustedt Collection Accession #22222
Also Estergally (see *Alsvesztergdly*)

Alsv-Esztergdly (see *Alsvesztergdly*)

Also Esztergally (see *Alsvesztergdly*)

Also-Esztergally (see *Alsvesztergdly*)

Alsvesztergdly
Originally in the Besztercebanya district of Neogrdd.
"Mergel von Alsv-Esztergdly im Comitate Neogrdd" in "Beitrage zur Kenntniss der Fossilen Bacillarien Ungarns" by Josef Pantocsek 1903-5
Now Dolni Strhare in the Banska Bystrica district, Slovakia
Apez Zagywaszanto (see *Zagyvaszants*)
Hustedt Collection Accession #5318
Aranyos
Mentioned/referenced in "Beitrage zur Kenntniss der Fossilen Bacillarien Ungarns" by Josef Pantocsek 1903-5
Possibly Aranyosgadany in the district of Picsi in the county of Baranya, or Aranyosapati in the district of Vasarosnaminyi in the county of Szabolcs-Szatmar-Bereg.
Bajtha
Mentioned/referenced in "Beitrage zur Kenntniss der Fossilen Bacillarien Ungarns" by Josef Pantocsek 1903-5 "Mergel von Bajtha im Comitate Hont". Now the town of Bajtava in the Novi Zamky district South west Slovakia (previously Bajta, in Hont District [Hungarian])
Hustedt Collection Accession #22592 (Bajtha, Hont)
Balatonsee (see *Balaton See*)
Balaton See
Hustedt Collection Accession #5501/6893/22594-22614/25648/25649
Bibarck Talva (see *Bibarczfalva*)
William A. Terry Collection
Bibarczfalva
Hustedt Collection Accession #6549
Bodos
Hustedt Collection Accession #26625
Hanna Database (Fossil Marine)
Bori (see *Bory*)

Boros-Telek (see *Borostelek*)
(from Pantocsek) (Boros-Telek)
Borostelek
In 1913 called Borostelek in Bihar County. Now called Borsa - in Romania.
Hustedt Collection Accession #4593/6931
Hanna Database (Fossil Marine)
Bory
(Bori - In 1913 in the district of Bati in the county of Hont) (now in Slovakia Levice District) (Bory (Hungarian: Bori) is a village and municipality in the Levice District in the Nitra Region of south-west Slovakia)
Hustedt Collection Accession #4585/4586/6932
Hanna Database - Lower Pliocene (Fossil Marine)
Bremia
John A. Shulze Collection (no further references found)
Hustedt Collection Accession #6963 (Bremia Ravna)/6964
Hanna Database (Recent Freshwater)
B|j|t
Hustedt Collection Accession #6979 (B|j|t Varna 1898)
Castel
Letter from J.F. Burke to A.L. Brigger October 7 1970 - "*On the slides marked Castel, Hung. I am adding a supplementary label with Szurdok-Puspoki. The latter is the geographic designation . Somewhere between 1934 and 1938, someone tied the name Castel to the fossil marine deposit at Szurdok-Puspoki to distinguish it from the brackish water deposit that Pantocsek had worked on.*"
Upper Miocene (Fossil Marine)
Castel M. Szurdok, Puspoke
(should be Szurdok-Puspoki - (in 1913 in the district of Hatvani in the county of Heves)) See Szurdokpuspoki below.
Hustedt Collection Accession #6993 (Castel Hungary, near Szurdokp|spvki)
Castel, Szurdokpuspoki
(Benthic Marine Fossil) See *Szurdokpuspoki* below.
Czekehaza
Mentioned/referenced in "Beitrage zur Kenntniss der Fossilen Bacillarien Ungarns" by Josef Pantocsek 1903-5
In Borsod-Abauj-Zempl district.
Latitude (DMS): 480 16' 60 N
Longitude (DMS): 210 13' 0 E
Demind
Now Demandice in Slovakia - formerly Demend in Nitra region, Levice district
Hustedt Collection Accession #6551/7029
Demend (see *Demind*)
Mentioned/referenced in "Beitrage zur Kenntniss der Fossilen Bacillarien Ungarns" by Josef Pantocsek 1903-5
depot du Castel (see *Castel*)
Hanna Database Miocene (Fossil marine)
Dolje
Hanna Database Recent Freshwater
Possibly - Dolje is a settlement on the right bank of the river Soča northwest of Tolmin in the Littoral region of Slovenia.
Dubravica
Mentioned/referenced in "Beitrage zur Kenntniss der Fossilen Bacillarien Ungarns" by Josef Pantocsek 1903-5. (Dubravica in the Banska Bystrica region now in Slovakia still called Dubravica - although the map shows Dubrava)
Hustedt Collection Accession #4594/4595/4596/7047
Hanna Database Lower Pliocene (Fossil Freshwater)
Du Bronica (see *Dubravica*)
John A. Shulze Collection (probably a mis-spelling of Dubravica - see above)
Eger
Hanna Database
470 53' N, 200 28' E
Eger (German: Erlau) is a city in northern Hungary, the county seat of Heves, east of the Matra Mountains.
Elesd
Formerly in Elesdi district in Bihar County - now in Romania
Also there is currently an Elesd in the Baranya region of Hungary

"Mergel von Elesd im Comitate Bihar" in "Beitrage zur Kenntniss der Fossilen Bacillarien Ungarns" by Josef Pantocsek 1903-5
Hustedt Collection Accession #4598/4599
Erdvbenge (see *Erdvbinye*)
Mentioned/referenced in "Beitrage zur Kenntniss der Fossilen Bacillarien Ungarns" by Josef Pantocsek 1903-5.
Erdvbinye
This is probably Erdőbinye in the district of Tokaji in the county of Borsod-Abazj-Zemplin.
Hustedt Collection Accession #7077
Etzerguly
(1945) (should probably be Esztergaly [Felsoesztergaly or Alsoesztergaly]) See *Felsoesztergaly* and *Alsoesztergaly*
Felso Estergaly (see *Felsvesztergdly*)
Felso Estergally (see *Felsvesztergdly*)
Felso Estingally (see *Felsvesztergdly*)
John A. Shulze Collection (mis-spelling)
Felso Esztergally (see *Felsvesztergdly*)
Hustedt Collection Accession #4590
Hanna Database
Felso-Esztergally (see *Felsvesztergdly*)
Felsoesztergaly (see *Felsvesztergdly*)
Felsvesztergdly
John A. Shulze Collection
"Mergel von Felsv-Esztergdly im Comitate Neogrdd" in "Beitrage zur Kenntniss der Fossilen Bacillarien Ungarns" by Josef Pantocsek 1903-5
Felsuesztergaly - in the district of Balassagyarmati in the county of Nsgrad (currently in Slovakia called Horne Strhare)
Gyvngyvs-Pata
Mentioned/referenced in "Beitrage zur Kenntniss der Fossilen Bacillarien Ungarns" by Josef Pantocsek 1903-5. Gyvngyvspata in the district of Gyvngyvsi in the county of Heves.
Gyvngyvs is a town in Heves county in Hungary, 80 km (50 mi) east of Budapest. Situated at the foot of the Sarhegy and Matra mountains.
Hustedt Collection Accession #4584
Hanna Database (Lower Pliocene, Fossil Brackish)
470 64' N, 200 00' E
Hidas
Hustedt Collection Accession #4589
In the region of Picsvaradi in the county of Baranya
Hlinmk
Frederick Habirshaw Collection
Hlinmk (Hungarian: Agyagos) is a small hamlet, since 1968 part of Vrbova nad Vahom (Hungarian: Vagf|zes) municipality
Holling
Hustedt Collection Accession #26862 (Holling, bei Sopron)
Hosszuheteny (see *Hosszzhetiny*)
Hustedt Collection Accession #7223
Hosszzhetiny
In the region of Komlsi in the county of Baranya
Izsopallaga
(from Pantocsek - appears to be a different location from Izsopallaga Serges - Pantocsek mentions both these locations)
Izopalla-Serges (see *Izsopallaga Serges*)
Hustedt Collection Accession #6552
Izsopallaga Serges
(from Pantocsek) (In 1913 in the district of Ilesdi in the county of Bihar) (Serges - In 1913 in the district of Ilesdi in the county of Bihar) (both currently in Romania)
Hustedt Collection Accession #7242
Jastraba
Frederick Habirshaw Collection
Jastraba appears to be the Slovakian name of Karvaly in the Banska Bystrica region in Ziar nad Hronom district.
Karand
(from Pantocsek) - probably now in Romania (originally Hivizkarand, or Toplicakarand)
Hustedt Collection Accession #4583
Kavna

Mentioned/referenced in "Beitrage zur Kenntniss der Fossilen Bacillarien Ungarns" by Josef Pantocsek 1903-5. (unable to find further references)

Kawna

Hanna Database

Kekko (see *Kikkő*)

Hanna Database

Kikkő

(in the district of Balassagyarmati in the county of Nsgrad) (Now in Slovakia - called Modr} Kameň (German: Blauenstein; Hungarian: Kikkő) is a town and municipality in the Veľk} Krtm District of the Banska Bystrica Region of southern Slovakia)

It is located in the Krupina Plain (Slovak: Krupinska planina) on the Krtm and Riečka rivers. It is around 5 km from Veľk} Krtm and 50 km from Zvolen and is the smallest town in Slovakia.

"Mergel von Kekkv im Comitate Neogrdd" in "Beitrage zur Kenntniss der Fossilen Bacillarien Ungarns" by Josef Pantocsek 1903-5

Hustedt Collection Accession #4582/7270

Kis-Ker

Mentioned/referenced in "Beitrage zur Kenntniss der Fossilen Bacillarien Ungarns" by Josef Pantocsek 1903-5. Probably a mis-spelling of Kisbir in the district of Kisbiri in the county of Komarom-Esztergom.

Koggik

possibly Kozjak though this is in Slovenia so this is unlikely

(unable to find further references)

Kvpecz

(possibly in the region called Trencsin, in Hungary) (in 1913 in the district of Miklssvari in the county of Haromszik) (Now in Romania)

Hustedt Collection Accession #4600 (Kvpecz, Siebenb|rgen)

Hustedt Collection Accession #4601/4602/25951/26624

Kopecz (see *Kvpecz*)

Kvrmvcz

Mentioned/referenced in "Beitrage zur Kenntniss der Fossilen Bacillarien Ungarns" by Josef Pantocsek 1903-5

Magyar Kermany (see *Magyarhermany*)

Magyarhermany

(In 1913 in the district of Homorsdi in the county of Udvarhely) (currently in Romania).

Mentioned/Referenced in "Beitrage zur Kenntniss der Fossilen Bacillarien Ungarns" by Josef Pantocsek 1903-5

Mocsar

Hustedt Collection Accession #4591

Mogyorsd

Mentioned/referenced in "Beitrage zur Kenntniss der Fossilen Bacillarien Ungarns" by Josef Pantocsek 1903-5 - "Mergel von Mogyorod im Comitate Pest". Mogyorsd in the district of Gvdvllői in the county of Pest.

Nagy Curtos (see *Nagy K|rtvs*)

Nagy K|rtvs

(in 1913 in the district of Balassagyarmati in the county of Nsgrad) (Should be Nagyk|rtvs or Nagy k|rtvs) (Middle Neogene (Bremia, Nagy Kurtos, and Szt. Peter, Hungary).

The Neogene Period is the youngest portion of the Tertiary Period of the Cenozoic Era. It comprises both the Pliocene and Miocene Epochs (approximately 2-24 Millions years ago).

Nagy Kurtos would appear now to be in Slovakia - and called VELKY KRTIS and is very close to Potor (see Szent Peter)

Veľk} Krtm District (okres Veľk} Krtm) is a district in the Banska Bystrica Region of central Slovakia. Until 1918, the district was split between the Hungarian counties of Hont and Nsgrad.

Veľk} Krtm lies at an altitude of 200 metres (656 ft) above sealevel and covers an area of 15.028 square kilometres (5.8 sq mi). It is situated in the Krupinska planina, at the foothills of Javorie, around 15 kilometres (9 mi) north of the Hungarian border and around 75 kilometres (47 mi) south of Banska Bystrica.

There are a wealth of Mineral Springs in this region.

Hustedt Collection Accession #6274

Hanna Database

Nagytapolcsany

(Meakin Collection No. 192) Actually Nagytapolcsany (now Topolcany, Slovakia)

Topoľčany (Slovak: Veľki Topoľčany before 1920; German: (Gro_)

Topoltschan; Hungarian: Nagytapolcsany) is a town in the Nitra Region of Slovakia.

Ngermegy (see *Nyermergy*)

Hustedt Collection Accession #4597

Nyermegy

(from Pantocsek) possibly now in Romania (called Nermiş)
Palogla
(Recent Fresh Water)
Hanna Database
Platten See (see *Plattensee*)
Plattensee
Hustedt Collection Accession #6345
Saint Peter (see *Szent-Peter*)
Hanna Database
Skakal (see *Szakal*)
Skazal (see *Szakal*)
St. Peter (see *Szent-Peter*)
Hanna Database
Struhar (see *Strukar*)
Hustedt Collection Accession #4592
Pliocene
Strukar
Hanna Database
Possibly 48054'00"N 19028'00"E (Slovakia)
Szakal (see *Szakal*)
Hustedt Collection Accession #4603/4604
Hustedt Collection Accession #6503/6504
Hanna Database
Szakel (see *Szakal*)
Szakal
probably Nsgradszakal.
Also **Skazal** - John A. Shulze Collection (mis-spelling)
"Mergel von Szakal im Comitate Neogrdd" in "Beitrage zur Kenntniss der Fossilen Bacillarien Ungarns" by Josef Pantocsek 1903-5
Szelcz (see *Szelcse*)
John A. Shulze Collection
Hanna Database
Szelcse
In the Banksa Bystrica Region (now in Slovakia - called Selce)
Szent Peter (see *Szent-Peter*)
Hustedt Collection Accession #4587/4588
Hustedt Collection Accession #6505/6506/6507/6508
Szent-Peter
Now in Slovakia - called Pttor.
Pttor is a village and municipality in the Veľki Krtm District of the Banska Bystrica Region of southern Slovakia.
"Mergel von Szent-Peter im Comitate Neogrdd. " in "Beitrage zur Kenntniss der Fossilen Bacillarien Ungarns" by Josef Pantocsek 1903-5
Miocene
Szentendre
near Demir Capa, Hungary
Hanna Database (Fossil) (Miocene)
470 40' N (est.), 1900 02' E (est.)
Szt. Peter (see *Szent-Peter*)
Hanna Database
Szurdoc P|spvki (see *Szurdokp|spvki*)
Hustedt Collection Accession #4606/4607
Szurdock (see *Szurdokpuspvki*)
Szurdok (see *Szurdokpuspvki*)
Szurdok-Puspoki (see *Szurdokpuspvki*)
Hanna Database
(Samples collected from Szurdok-Puspoki in the Matra Mountains of Hungary)
470 55' N, 200 00' E
Szurdokpuspvki
(diatomite quarry) (in 1913 in the district of Hatvani in the county of Heves)
Mentioned/Referenced in "Beitrage zur Kenntniss der Fossilen Bacillarien Ungarns" by Josef Pantocsek 1903-5 also simply as Szurdok.
Szurdokp|spvki (Hungary) lies at the south-western foot of the Matra mountain, in the Zagyva river, where , running out of the mountains, the valley of the river broadens. In the East, it is bordered by the western foothills of the Matra mountain (the Muzsla Hill 805 ms, the Nagy-Koncszr Hill 640 ms, the Kis-Koncszr Hill

594 ms, the Istenfa Peak 444ms), and in the West, by the gentle slopes of the Cserhat mountain, which turn into mounds here.
The first part of the name of the village, refers to the ravine like valley that can be found between the mountains around the village, which lies at the entrance of the ravine.
Diatoma Mine, Szurdokp|spvki, Matra Mts., Nsgrad Co., Hungary (Diatomaceous earth mine with great open pit.)
Middle Miocene diatomite.
Hustedt Collection Accession #4605
Szurdoc P|spvki (see Szurdokp|spvki)
Hustedt Collection Accession #4606/4607
Szurdpuspoki (see *Szurdokp|spvki*)
(1930) - K. D. Kemp Location List
Szurdoc P|spvki (see *Szurdokp|spvki*)
Szudokpuspoki (see *Szurdokp|spvki*)
Hanna Database
Talya (see *Thallya*)
Thallya
John A. Shulze Collection
Probably Tallya - a village in Borsod-Abazj-Zemplin county, Northern Hungary, 45 kilometres from county seat Miskolc, in the famous Tokaj-Hegyalja wine district.
Tallya is located at 48014′N 21013′E.
Also mentioned/referenced in "Beitrage zur Kenntniss der Fossilen Bacillarien Ungarns" by Josef Pantocsek 1903-5 - as Talya
Tokaj
In the district of Tokaji in the county of Borsod-Abazj-Zemplin
Tokay (see *Tokaj*)
Frederick Habirshaw Collection
Zagyvaszants
In the region of Hatvani in the county of Heves

Current map of a portion of Slovakia with original Hungarian location labels added.

Some of the above mapped locations are confirmed in publications by the late Marta Hajos of the Hungarian Geological Institute.

Glossary

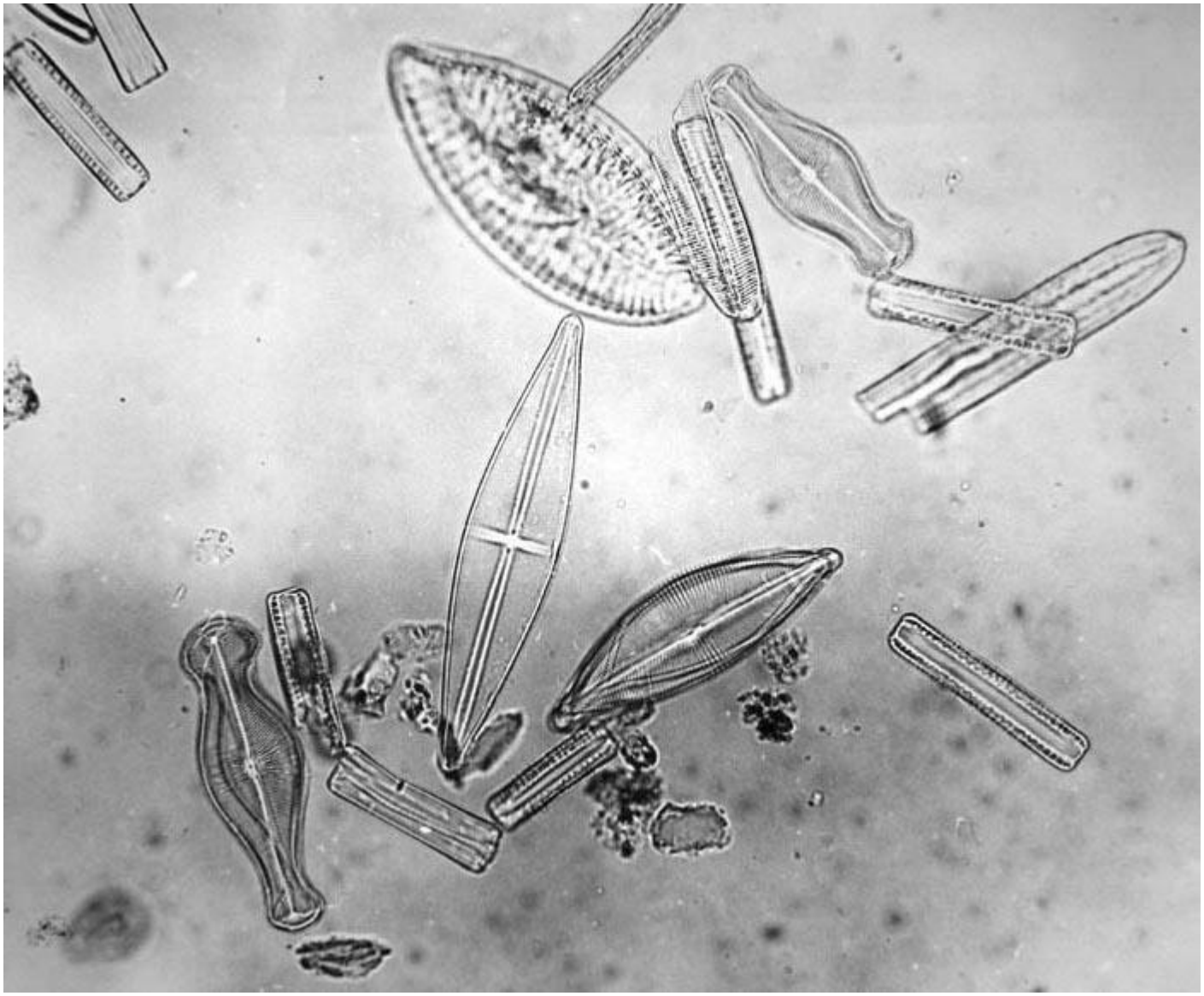
To English:
Ungarn (German) = Hungary
Magyarorszag (Hungarian) = Hungary
Veľk} (Slovak) = Great or Big
Nagy (Hungarian) = Great, Big or Large
Felso (Hungarian) = Top

Also (Hungarian) = Bottom
Dolne (Slovak) = Lower
Horne[Horna] (Slovak) = Upper
Szent (Hungarian) = Saint (Santa)
Castel (Hungarian) = Castle
Mergel (in Pantocsek) = Marl (sedimentology)
From English:
diatom = diatoma (Hungarian)
diatomaceous = diatoma-, diatomas (Hungarian)
diatomaceous earth = kovafvld, diatomafvld (Hungarian)
diatomaceous shale = diatomapala (Hungarian)
diatomite = diatomit (Hungarian)
diatom ooze = diatomas iszap (Hungarian)
datomite = (Slovak) diatomit
diatomaceous = (Slovak) diatomejska
diatomaceous earth = (Slovak) zemlja

Kentmere, Kent Mere/Kentmere

The eastern bank is inaccessible, although there is a fishing entrance near the top. However, a footpath runs along the western shore from the works entrance to the south up to Kentmere village to the north. Parking can be difficult, however, as it is a popular place.
Grid Ref: NY 455 029
Elevation; 148 m (487 feet)
Size; 900m x 150m (2925 x 470 feet)
Area; 6.0 hectares (14.85 acres)
Depth; 9m (30 feet)
Source: http://www.f22.org.uk/lakes/Kentmere_Tarn/index.htm
This article was prompted by the generous bequest of an archive of printed material and notes left to an editor by John Clegg.

Image courtesy of Cambridge University

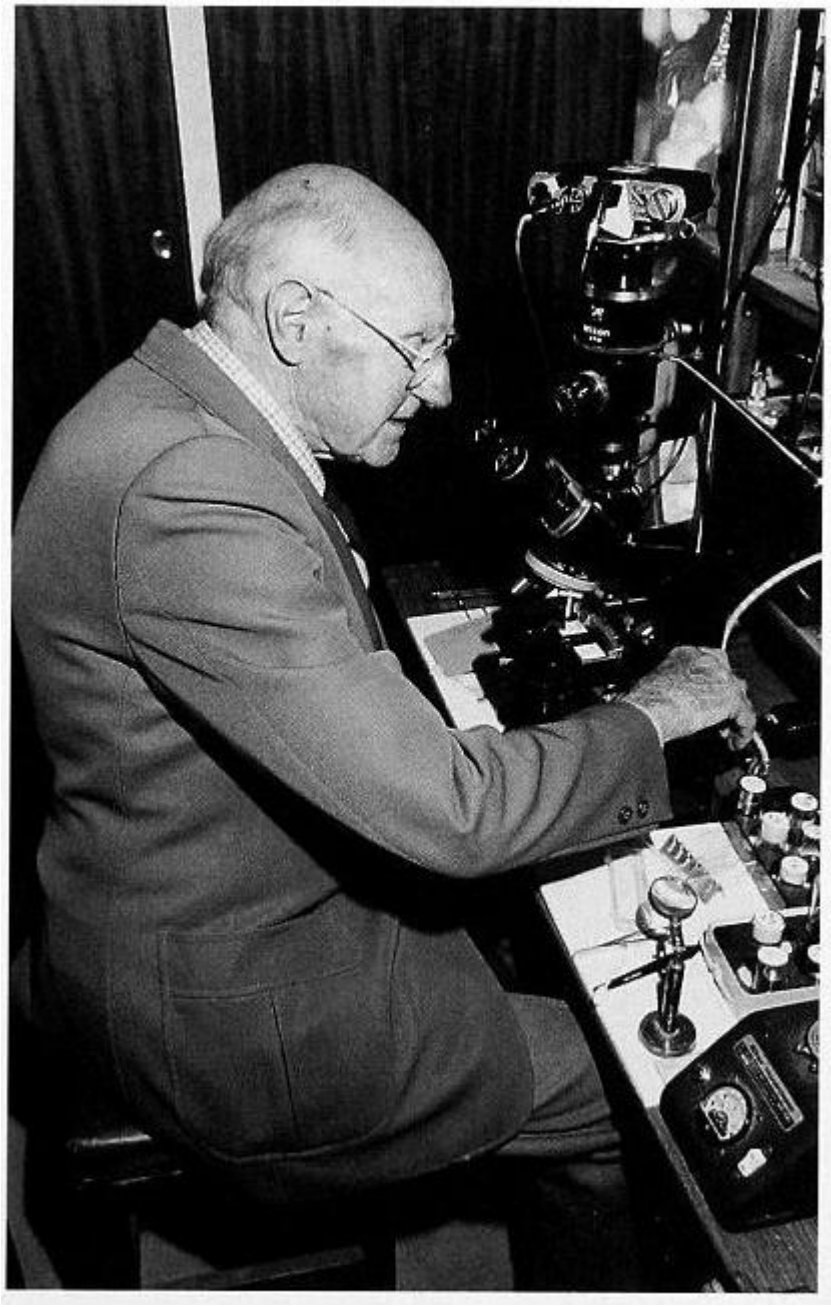


Kentmere Diatoms (from an original print) [Slide by] © John Clegg 1985

The same slide, the same field of view, re-photographed by Steve Edgar using phase contrast.
Note that some diatoms have moved.

The accumulation of papers, letters and notes was preparatory to his paper, in conjunction with Elizabeth Y. Haworth, on the Kentmere deposits (Diatoms of the Kentmere Diatomite Deposits Ser.4. Vol.XII. pg.285).

Further investigations, with the aid of the internet, have identified other information together with later papers on the history of the area.



John Clegg

Kentmere strews

Strew slides of Kentmere deposit material to accompany this article are available from Klaus Kemp, who has a number of samples. Please specify the strew sample tube numbers required and he will quote you the cost. Send requirements to: klaus.kemp@talktalk.net

Kentmere Diatomite, Cumberland, Tube 950B, K.D.Kemp, Collected April 1964
Kentmere Diatomite, Westmorland, Tube 577B, K.D.Kemp, Fine, Collected April 1964
Kentmere Diatomite, Westmorland, Tube 618B, K.D.Kemp, Coarse, Collected April 1964
Kentmere Large, Westmorland, Tube 300B, Coarse
Kentmere Medium, Westmorland, Tube 273B
Kentmere, Cumbria, Tube 838R, B.Hartley (Tube 2697), F.F\W
Kentmere, Diatomite Westmorland, Tube 392B, K.D.Kemp. Cleaned 1980
Kentmere, Westmoreland, Tube 068B, Collected 1934

Klaus provides the following information regarding the collection of his Kentmere Sample:
"I was very lucky to be able to collect this, as I was actually going on holiday with Sheila and diverted to the Kentmere site (as one does) only to find that it was closing down and luckily for me some worker with a dumper was shoving Diatomite around to level the ground. A quick word and pleading/grovelling (Editors Note: This is a Lancashire euphemism for “give me sample or I’ll drag you off the dumper and drive it over you”.) he let me grab chunks of the stuff from the digger. I get the impression from the sample that this was underlying what would have been exposed earth and therefore suffered little in the way of weathering."

The original lake, the lower of two, was formed when a retreating glacier blocked the neck of the valley with rubble it had picked up in its travels down the valley. This 'moraine' effectively blocked the free passage of the River Kent (initially meltwater) which then formed a shallow lake. Further retreat of the glacier deposited other moraines behind which other small lakes formed. The deposit, best described as Holocene, the epoch immediately after the Pleistocene, began to accumulate following the last period of glaciation. Eventually only two substantial bodies of water remained. The upper lake acted as a settling pool for anything suspended in the water of the River Kent and only cleaner water continued down the valley into the Kent Mere.
A number of articles have speculated on exactly when Kent Mere was actually drained. John Clegg (in Diatoms of the Kentmere Diatom Deposits, Clegg & Haworth, Microscopy July-December 1985) put the date at around 1876.
Quite why he should do this is unclear as his archive contained a paper by D. Walker (Studies in the Post-glacial History of British Vegetation XIV. Skelsmergh Tarn and Kentmere, Westmorland 1954), in which it is stated that the lake existed in 1820 but had disappeared shortly thereafter having been drained. Walker 'guesstimated' the draining to have occured around 1840. On a visit to Kentmere in April of 1985 John Clegg recorded the details he was given concerning the history, one of which states “Lake drained Oct. 1876 by Isaac Wilson of The Hall”, and it is this date that he settled on. Dr. Henry Stolterforth (of Chester) prior to 1888 is recorded as identifying nearly seventy species from the Kentmere deposit but no list has been located.
From The Geology of the Country round Kendal (1888).
"The flat alluvial tract above this barrier seems to be the site of an old lake, emptied by the natural deepening of the cut through the barrier. The lower basin, formerly occupied by the mere after which the village is named, has been artificially drained by cutting through the rock below Millrig. Patches of ‘diatomaceous earth’ occur beneath the peat in parts of this old basin. Nearly 70 species of Diatomaceae have been determined from this deposit by Dr. Stolterforth, of Chester, to whom I submitted specimens."

Matthew Henry Stiles, in his paper Kentmere Diatoms (North Western Naturalist June 1934) simply said "Some years ago there was a beautiful lake here."

There are a number of reasons to move this date back a few years, or at least to bracket it more precisely. There is evidence to support two, or even three, phases of draining of the Mere and Marsh.
The History, Directory & Gazetteer of Cumberland & Westmorland, 1829 states that the lake is there, as per the description below:

KENTMERE township and chapelry forms a narrow vale, 2 miles in length, shut in by lofty fells, and distant 9 miles NW. by N. of Kendal. It is watered by the river Kent, which rises a little to the north, and here forms a LAKE one mile long, abounding with trout, perch, and wild ducks, and margined by swampy grounds, so that it cannot be approached, except at one point at the foot of a mountain, where a boat is moored. Between this and Long Sleddale, about 1½ mile eastward, upon the fell, is another large *tarn*, called *Skeggles-water*, in which are pike and perch. Here are *blue slate* quarries, and *blue limestone*. The houses are all scattered, except the hamlet of *Green Quarter*, which gives name to that part of the township, on the east side of the Kent, the other division being called *Crag Quarter*, from the huge broken rocks which divide it from Applethwaite and Hugill, and at the foot of one of which stands the ancient tower-building, *Kentmere-Hall*, occupied by a farmer. C. Wilson, Esq. is owner of the lake and part of the township.

History, Directory & Gazetteer of Cumberland & Westmorland, 1829

In a paper - The Occasional Papers of The Staveley and District History Society Number 14 The Extractive Industries of Kentmere. Lead-Slate-Diatomite - By Christopher Gregory October 2000, is the following:
"A survey made for Christopher Wilson in 1802, and another by Hodgson in 1824, both show broadly similar outlines of a lake wider and longer than the present tarn, the former with its boundaries labelled "boggy ground". The Corn Rent map (1836-38) in the Kendal Archives clearly shows the river -and nothing wider - flowing due southward through the site of the present tarn. Land on each side is divided and numbered and the ownership listed."
And also The Occasional Papers of the Staveley & District History Society - The Kentmere Reservoir and local Water Mills By Joe Scott October 2003:
"Christopher Wilson of Rigmaden, Lord of the Manor and chief landowner of Kentmere and his tenant William Martindale of Kentmere Hall Farm drained the waters of Kentmere Tarn so completely that when the 1836 Corn Rent map was drawn there was no tarn there... ...just a river flowing between newly-reclaimed pastures and meadows. In the Kent valley there were many other drainage schemes, though none with so dramatic an effect.
This drainage caused problems for water-mills on the Kent and its tributaries. In the 1840s the Kent powered seven mills in Kentmere and Staveley, and nine others between Cowan Head and Sedgwick, plus four on the Gowan, four on the Sprint and five on the Mint. The growth of industry made possible by this use of water-power was the main reason for the rise in population and prosperity. But as the Westmorland Gazette put it in August 1844, "Agricultural improvement in draining land, however beneficial in itself had the effect of depriving the mill-owners of a large quantity of water-power, the waters going down more rapidly and of course much sooner running away. For several years and especially during the past summer great difficulty has been experienced by the mill-owners on the Kent."
On the face of it this would put an initial draining scheme between 1829 and 1836, the result of which would appear to have produced ‘workable’ land. However, the same paper continues:
"This evidence would put the drainage in the early 1830s; but Paul Wilson, Lord Lieutenant of Westmorland, whose family owned Kentmere Hall and extensive land (and still own the mineral rights) puts the drainage nearer 1840. This would accord with the construction of Kentmere Reservoir in 1845/48, designed to regulate the river and keep it flowing during summer droughts for the benefit of the numerous mills downstream (notably James Cropper's paper mills at Burneside, which still control the reservoir). The new reservoir would not have been needed while the original tarn existed. The 1840 date is supported by a technical article by D Walker in “The New Phytologist” 1955. Several independent local sources agree in supporting a second date some thirty years later for the drainage. In the “Westmorland Gazette” of 18 Nov 1871 tenders were "invited for ... diversion... and deepening... of the Kent at Millrigg bend... (for) drainage of Kentmere tarn meadows."
From "A Brief History of Kentmere" (http://kentmere.org/AbriefhistofKmere.pdf):
"In the 1830s Kentmere Tarn was drained by the Wilsons of Kentmere Hall in the expectation that the reclaimed land would be of high quality. However, the land drainage schemes also caused their own problems. Drainage meant the loss of water holding bogs which maintained the steady flow of water into the river which the mills needed."
A map of this period from “A Description of Scenery in the Lake District”, by William Ford (1839) still shows the tarn:

and from the same publication (1843 edition):
"Kentmere Tarn is in a narrow vale, about two miles in length. The Tarn is one mile long, and cannot be approached except at one point, owing to the swampiness of its margin."
A map from 1784 is almost identical and has been identified as that used by West in all his editions.

The fact that the basis for West s later maps is this 1784 version the later editions can be discounted as proving the continued existence of the mere.

From "A Topographical Dictionary of England (1848)":
"The chapelry comprises by computation nearly 4000 acres, and includes a narrow vale abounding with picturesque scenery; the lake was a broad expanse of water about a mile in length, surrounded by lofty fells which rendered it almost inaccessible, and though it has been recently drained, the spot has a singularly romantic appearance."
Certainly the tarn was no longer in existence by the time of the publication of the History & Directory of Westmorland, 1851:

> KENTMERE township and chapelry consists principally of a narrow vale, about three miles in length, shut in by lofty fells, and is distant nine miles N.W. by N. of Kendal. It is watered by the river Kent, which rises a little to the north, and formed a lake or mere, one mile in length, which was drained off several years ago. A large reservoir, covering about eight acres of land, has been lately made here to preserve a supply of water, in dry weather, for the mills on the river Kent.
>
> *History & Directory of Westmorland, 1851*

A Complete Guide to the English Lakes, by Harriet Martineau (1855):
" if familiar with the old description of the district, he will look for Kentmere Tarn, and wonder to see no trace of it. It is drained away; and fertile fields now occupy the place of the swamp, reeds and shallow

water which he might have seen but a few years ago. While this tarn existed, the mills at Kendal were very irregularly supplied with water."
The History, Topography & Directory of Westmorland, 1885 supports the post 1840 date:

KENTMERE CHAPELRY.

This extensive township and chapelry lies about 9 miles N.W. by N. of Kendal. It consists of a narrow vale, about four miles in length, margined on either side by lofty fells, which, in the south, approach very closely together, almost hemming in the valley. Through the vale flows the Kent, which here formerly spread out its waters into a *mere* about a mile in length, and hence the name Kentmere. But some forty years ago the utilitarian spirit of the age crept into the recesses of Kentdale. The little lake, which was a beauty-spot in the dale, must be got rid of as a profitless encumbrance, and its bed converted into smiling fields. At vast trouble and expense a channel was cut, "and lo! in place of a lake a marsh! the rental of which is probably not equal to the amount which would have been annually taken at the inn from fishermen, if the lake had been suffered to remain."

History, Topography & Directory of Westmorland, 1885

It would appear that the initial attempt to drain the mere was thwarted, after initial success. This may have been due to the drainage channel becoming blocked or pressure from the mill-owners to reinstate the mere, the latter seems the more likely reason.
It was again drained around 1840 which resulted in the disappearance of the mere, only to be replaced by marshland, unsuitable for cultivation. Then in the early 1870s further work was carried out to drain the 'meadows'.

In 1870-72, John Marius Wilson's Imperial Gazetteer of England and Wales included the following, supporting an earlier date:
"A marshy lake, about a mile long, called Kentmere tarn, formerly lay in its bottom, surronnded by swamps, and frequented by wild ducks; but this has been drained and made arable."
However, in The Curious Traveller through Lakeland by Jessica Lofthouse (1954) the inference is that the mere existed even at this date.
"The Kent once ran out of its high mountains into a flat dale bottom which had been most effectively dammed by the debris of glacial moraine. Here the Kent Mere spread across the valley floor, a place for fish and water fowl until, less than a century ago, the natural dam was partly breached and the water began to drain away. I have met old people who told of the mere of their youth, where fishing was still possible and lads could skate in hard frost. Then came the complete draining of the lake and the discovery of thick deposits of clay containing diatoms just beneath the overlying beds of peat. And the number of uses to which this diatomite clay can be put is surprising. We use it in face powder and in metal polish; it gives an egg-shell finish to paints and goes into the making of paper, rubber, plastic and floor- coverings; it is used in almost everything which is insulated against heat and cold and in eliminating sound, and where containers for chemicals are manufactured, and in filtering liquids of all kinds there diatomite clay has its use also. As the clay in the old mere bed is more than twenty feet in depth and extends over 150 acres the supplies should keep industry going for a long time to come.
From the fell we saw little sign of the works and at Long Houses we were beyond the old lake levels."

Let us now skip forward to about 1928 and the “re-discovery” of the diatomaceous deposits.

Our focus is now on two men, partners in a mining engineering enterprise in Derbyshire - J. T. Browne and Philip Ireland (there were another two partners though their names are not known [possibly S. S. Hughes and J. W. Nelson both of whom are mentioned in 1934 at which point Philip Ireland’s name is absent]). The following newspaper cutting (undated unfortunately, but must be from around 1929) described the discovery of the Kentmere deposit.

EARTH TO IMPORT.

DISCOVERY IN BED OF OLD LAKE.

THREE FEET LAYER.

From OUR SPECIAL CORRESPONDENT.

KENTMERE VALLEY,
Westmorland,
Wednesday.

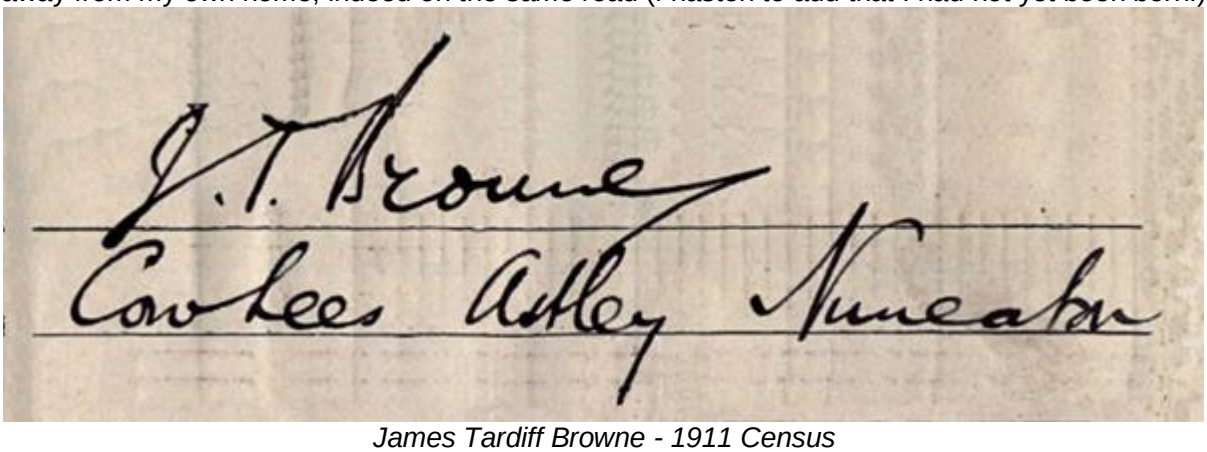
A GREY clod of earth found by Mr. J. T. Browne, a mining engineer, of Buxton, in this beautiful valley has led to the discovery of diatomite under the bed of the vanished lake which gave Kentmere its name.

Mr. Browne sent the earth, which his knowledge suggested might be valuable, for scientific examination, and was informed that it was pure diatomateous earth—a siliceous deposit which has many commercial uses.

A survey revealed that he had stumbled on what may prove to be one of the largest deposits of diatomite in the world. The bed of the vanished lake covers 160 acres and the grey-coloured earth is three feet thick. Hitherto Britain has been paying Germany and the United States about £20

James Tardif Browne

I have always maintained that life is brim full of happy coincidences (though my something will turn up philosophy has been the subject of much ridicule). In 1901 James Tardif Browne was living less than half a mile away from my own home, indeed on the same road (I hasten to add that I had not yet been born.)

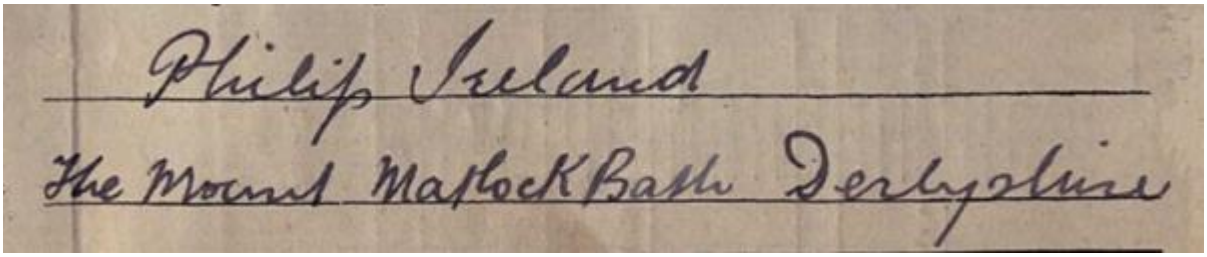


James Tardiff Browne - 1911 Census

Philip Ireland

Philip Ireland s grandfather (Jacob Giles James Ireland, an American) had been a Woollen Manufacturer in the area and also in 1851 Mayor of Kendal. Philip Ireland's father (George Washington Ireland [an American influence in naming here]) was also a Woollen Manufacturer living at Staveley a couple of miles downstream from the site of the mere (and where the mills were located).

Philip Ireland was born late 1863 or early 1864. In 1881 he was described as an Architects pupil. From that point until 1891 he slips from the radar, but reappears briefly in 1891 when he marries Frances Jane Lickley at the Parish Church, Stalton on the Hill, Lancashire. Frances Jane appears in the 1891 Census alone, no trace of her husband. However, by 1901 the couple are living at Bradford Villa, Matlock, Derbyshire, with no occupation, but living on own means .



Philip Ireland signature from the 1911 Census

In 1911 they are still resident in Matlock, at The Mount, subsisting by virtue of Private Means . It would appear that on a visit to his family (most of whom remained in the locale) he was walking with James Tardif Browne (a mining engineer see above) the Kentmere meadows and was taken by the discolouration of the earth.

Note: in Understanding Geology (n.d.)
"The Diatomaceous earth of Kentmere, in the English Lake District, occupies an old lake basin of this kind (lenticular beds laid down in proglacial lakes). The deposit consists of diatom frustules mixed in varying proportions with clay and peaty matter, and is dark brown when fresh, but rapidly changes colour to deep olive green on exposure to the air. In its natural condition it is extremely porous."
(also almost word for word in The Petrology of the sedimentary rocks by Frederick Henry Hatch 1938)

The two collected a sample and sent it to the National Physical Laboratory for evaluation. The report that resulted confirmed the presence of a considerable percentage of diatomite in the sample. Quick to see the value of such a deposit, they took out a lease on the land and formed a small company Porosity Ltd., to exploit the find.
It was estimated that the deposit covered about 64 acres and was from 3 to 35 feet thick. The area was still marshy and working the old bed would not have been easy. The Leeds Firclay Company Ltd., took an interest in the business and together the two companies in 1929 formed a subsidiary The Kentmere Diatomite Company Limited. The Chemical Age (1929) reported:

"Kentmere Diatomite Company Ltd., 3-4 Clement's Inn, Strand, London, W.C.2. Private Co. Registered July 12. Nominal Capital #300 in #5 shares. To carry on the business of manufacturers, importers and exporters of and dealers in all kinds of metallurgical, calcareous, carbonaceous... to acquire from Porosity Ltd., certain freehold property forming part of the Millrigs Estate at Kent-mere, Westmorland, and the residue of a...."

COMPANY MEETINGS

THE LEEDS FIRECLAY COMPANY

THE KENTMERE DIATOMITE INTEREST

We have recently acquired an interest in the Kentmere Diatomite Company, Limited, which works a deposit of diatomaceous earth recently discovered in Westmorland and is the only known deposit in England. We are commencing immediately at one of our works the manufacture of high-grade insulating material from this diatomite, and we confidently anticipate a very satisfactory addition to our turnover and profits. The deposit extends to more than 100 acres, and as the depth is 15ft. and upwards, it will be seen that the "life" is not a short one. There are numerous uses for diatomite other than for the manufacture of insulating bricks, and we are actively exploiting them.

The Times (London, England), Monday, Nov 04, 1929

By 1934 a new company was formed as evidenced by an entry in The Chemical Age (1934):
"Kencert Products, Ltd., Waterford Bridge Works, Kentmere, Westmorland. - Registered March 28. Nominal Capital #12,000. To Acquire (l) trade mark No. 517719 registered in class 4, (2) the business specialists in diatomite products carried on by S. S. Hughes, J. T. Browne and J. W. Nelson at Waterford Bridge Works, Kentmere, Westmorland, as the "Kencert Products Co.," and (3) from the Kentmere Diatomite Co. Ltd., land, forming part of Kentmere Hall Farm, Kentmere."
Note: The Kentmere Diatomite Company Ltd wasn't struck from the Companies House register until 1970.
In The London Gazette of 8th June 1943 the demise of this company was recorded:
"KENCERT PRODUCTS Limited.
AT an Extraordinary General Meeting of Kencert Products Limited, duly convened, and held at the registered office of the Company, Waterford Bridge Works, Kentmere in the county of Westmorland, on the 1st day of June 1943, the following Resolution was duly passed as a Special Resolution:
'That the Company, Kencert Products Limited, be wound up voluntarily, and that Mr. Henry Gee, Accountant, Euston Road, Morecambe, be, and is hereby, appointed Liquidator for the purposes of such winding-up.'
THOMAS HILLMAN, Chairman."
Fortunately the workings had already been acquired (in April 1943) by a subsidiary of The Cape Asbestos Co. Ltd, Cape Insulation Limited and latterly, in February 1974 by British Industrial Sand Ltd.

Philip Ireland died, aged 85, on the 16th August 1949 at Matlock Derbyshire, where he was living at a property called Westmor . He left effects worth #194 1s. 9d., which on the face of it wasn t a fortune. However, his wife died, aged 83, on the 31st July 1950 leaving #2990 6s. 6d., a slightly more reasonable amount. The couple did not have any children.

CAPE ASBESTOS

MOST SUCCESSFUL YEAR IN COMPANY'S HISTORY

Our Kentmere diatomite plant has worked at full capacity and this, combined with the manufacture of insulating compositions, now made extensively in these works, has resulted in a profitable year's operations.

The Times Tuesday, June 12th, 1951

The method of excavating the diatomite was determined by the marshy nature of the land. The water level was artificially increased thus flooding the area (effectively restoring the tarn) and a huge dredging apparatus was installed that scraped the mud from an ever increasing fan, depositing it in rows where it air dried before being transported to a huge rotating drying oven where it was subsequently calcined and ground.

In 'The Curious Traveller through Lakeland' by Jessica Lofthouse 1954:

"This was our approach to Windermere one September day, one quite memorable for its golden sunshine and the colourful tapestry of the landscape. We followed the Kent out of Kendal, to Burneside Hall and along the Staveley lane as far as Godmund Hall where we turned along the fell-edge tracks, discovering parts of Westmorland rarely heard of though they are so near highways. We came over high ridges to the Kentmere valley where we stayed the night, then over higher fells to Troutbeck and the Windermere country the following morning. Such an approach I commend to any wanderer in no particular hurry " to get there ". There is nothing which is not fair to look upon nothing aggressively modern, unless it be the diatomite works in the lower part of Kentmere, and nothing to disturb a peace which must have wrapped Over Staveley and Hugill since they were given these names."
Access to the site is now highly restricted, though no active work is being done. It is believed that the concrete stanchions that once held the dredging tower still remain.

From samples examined by William Henry Stiles, Ernest Neaverson, Round and John Clegg (amongst others) more than 90 species (some rare) have been recorded.

The following taxa list is that produced in the paper by Clegg and Haworth, based on Round, to which has been added the taxa observed by Stiles and Neaverson. Stiles used Van Heurck as his reference. Frank Round s paper "THE LATE-GLACIAL AND POST-GLACIAL DIATOM SUCCESSION IN THE KENTMERE VALLEY DEPOSIT" is particularly useful as it provides succession information, using which will allow the identification of the layer from which a particular sample is derived. This is highly recommended further reading.

Achnanthes calcar Cleve 1891
Achnanthes exigua Grun 1880
Achnanthes exigua var. *hetervalvata* Krasske 1923
Achnanthes flexella (Kutz. 1844) Brun 1880
Achnanthes lanceolata (Breb. 1849) Grun. 1880
Achnanthes lanceolata var. *elliptica* Cleve 1891
Achnanthes linearis (W.Smith 1856) Grun. 1881 [possibly *A. pusilla* (Grun. 1880) de Toni 1891]
Achnathes minutissima Kutz. 1833
Achnanthes peragalli Brun et Heribaud 1893
Amphipleura pellucida Kutz. 1833
Amphora ovalis Kutz. 1844 [also noted by Stiles 1934]
Amphora ovalis var. *affinis* (Kutz.) [This noted only by Stiles 1934]
Amphora ovalis var. *libyca* (Ehr. 1840) Cleve 1894
Amphora ovalis var. *pediculus* (Kutz. 1844) Van Heurck 1885 [also noted by Stiles 1934]
Anomoeoneis exilis (Kutz. 1844) Cleve 1891
Anomoeoneis exilis var. *lanceolata* Mayer 1919
Caloneis bacillum (Grun. 1863) Meresch. 1906
Caloneis latiscula (Kutz. 1844) Cleve 1894
Caloneis silicula (Ehr. 1843) Cleve 1894 [noted as *Navicula limosa* (Kutz.) by Stiles 1934 and as *Navicula gibberula* (Kutz.) by Neaverson 1934]
Caloneis ventricosa var. *truncatula* (Grun. 1880) Meister 1912
Campylodiscus noricus var. *hibernicus* (Ehr. 1845) Grun. 1862 [also noted as *Campylodiscus hibernicus* var. *noricus* by Stiles 1934]
Ceratoneis arcus (Ehr. 1838) Kutz. 1844
Ceratoneis arcus var. *amphioxys* (Rabh. 1853) Brun.1880
Cocconeis placentula Ehr. 1838 [also noted by Stiles 1934 and Neaverson 1934]
Cocconeis placentula var. *lineata* [noted only by Stiles 1934]
Cocconeis Scutellum Ehrenb. [noted only by Stiles 1934]
Colletonema lacustre (Ag.) H.V.H. [noted only by Stiles 1934]
Cyclotella antiqua W. Smith 1853
Cyclotella comta (Ehr. 1844) Kutz. 1849
Cyclotella comta (Ehrenb) var. *radiosa* Kutz [noted only by Stiles 1934]
Cyclotella meneghiniana Kutz. 1844
Cyclotella striata (Kutz.) Grun. [noted only by Stiles 1934]
Cymatopleura elliptica (Breb. 1844) W. Smith 1851
Cymatopleura solea (Breb. 1838) W. Smith 1851
Cymbella affinis Kutz. 1844
Cymbella aspera (Ehr. 1839) Cleve 1894 [noted as *Cymbella gastroides* (Erhenb.) by Stiles 1934]
Cymbella cesatii (Rabh.1853) Grun 1881
Cymbella cistula (Hemp. 1828) Kirchner 1878 (also noted by Neaverson 1934]
Cymbella cuspidata (Kutz.) [noted only by Stiles 1934]
Cymbella cymbiformis (Ehrenb.) [noted only by Stiles 1934]
Cymbella delicatula Kutz. 1849

Cymbella Ehrenbergii Kutz. 1844
Cymbella gracilis (Rabh. 1853) Cleve 1894 (probably *C. lunata* W. Smith 1853)
Cymbella laevis Naegli 1849
Cymbella lanceolata Agardh 1830 [also noted by Stiles 1934]
Cymbella lanceolata var. *longa* [noted only by Stiles 1934]
Cumbella lanceolata fo. *Boeckii* (Grun.) [noted only by Stiles 1934]
Cymbella microcephala Grun 1881
Cymbella naviculiformis Auersw. 1861 [also noted as *Cymbella cuspidata* var. *naviculiformis* (Aures.) by Stiles 1934]
Cymbella parva (W. Smith 1853) Wolle 1890
Cymbella prostrata (Berkeley 1832) Grun. 1880 [also noted as *Encyonema prostratum* (Ralfs) by Stiles 1934]
Cymbella sinuata Greg. 1856
Cymbella Thumensis (Mayer 1919) Hust.1945
Cymbella ventricosa Agardh. 1830
Denticula tenuis Kutz. 1844
Denticula tenuis Kutz. var. *frigida* [noted only by Stiles 1934]
Diatoma hiemale (Lyngbye 1819) Heiberg 1863
Diatoma hiemale var. *mesodon* (Ehr. 1838) Grun. 1880
Diatoma vulgare Bory var. *lunaris* [noted only by Stiles 1934]
Didymosphenia geminata (Lynbye 1819) Schmidt 1899 [also noted as *Gomphonema geminatum* by Stiles 1934 and Neaverson 1934]
Diploneis domblittensis var. *subconstricta* A. Cleve 1895
Diploneis finnica (Ehr. 1838) Cleve 1891
Diploneis ovalis (Hilse 1861) Cleve 1891 [also noted by Neaverson 1934]
Diploneis Petersenii Hust. 1937
Encyonema caespitosum (Kutz.) [noted only by Stiles 1934]
Encyonema turgidum (Grun.) [noted only by Stiles 1934]
Epithemia argus Kutz. [noted only by Stiles 1934]
Epithemia argus var. *amphicephala* Grun. [noted only by Stiles 1934]
Epithemia Hyndmanni W. Smith 1850 [also noted by Neaverson 1934]
Epithemia sorex Kutz. 1844 [also noted by Stiles 1934 and Neaverson 1934]
Epithemia turgida (Ehr. 1830) Kutz 1844 [also noted by Neaverson 1934]
Epithemia turgida var. *granulata* (Ehr. 1836) Grun. 1880 [also noted by Neaverson 1834]
Epithemia zebra (Ehr. 1833) Kutz. 1844 [also noted by Stiles 1934 and Neaverson 1934]
Epthemia zebra var. *porcellus* (Kutz. 1844) Grun. 1862
Epithemia zebra var. *saxonica* (Kutz. 1844) Grun. 1862
Eunotia arcus (Ehrenb.) [noted only by Stiles 1934]
Eunotia diodon Ehr. 1838
Eunotia exigua (Breb. 1849) Rabh. 1864
Eunotia faba (Ehr. 1854) Grun. 1881
Eunotia flexuosa Kutz. [noted only by Stiles 1934]
Eunotia formica Ehr. 1843
Eunotia gracilis (Ehr. 1843) Rabh.1864 [also noted by Stiles 1934 and Neaverson 1934]
Eunotia lunaris (Ehr. 1832) Grun. 1881
Eunotia major Wm. Sm. Rab. [noted only by Stiles 1934]
Eunotia parallela Ehr. 1841
Eunotia pectinalis (Dillwyn 1809 Kutz.1844) Rabh. 1864 [also noted Neaverson 1934]
Eunotia pectinalis var. *minor* fo. *impressa* (Ehr. 1854) Hust. 1930
Eunotia pectinalis Kutz. var. *ventris* Grun. [noted only by Stiles 1934]
Eunotia praerupta Ehr. 1843
Eunotia praerupta var. *inflata* Grun. 1881
Eunotia robusta var. *diadema* (Ehr. 1837) Ralfs 1861
Eunotia robusta var. *tetradon* (Ehr. 1838) Ralfs 1861 [also noted by Neaverson 1934]
Eunotia veneris (Kurz. 1844) O.Mull. 1898
Fragilaria brevistriata Grun. 1881
Fragilaria capucina Desm. 1825 [also noted by Neaverson 934]
Fragilaria capucina var. *mesolepta* Rabh. (1861) 1864
Fragilaria construens (Ehr. 1854) Grun .1862 [also noted by Stiles 1934]
Fragilaria construens var. *binodis* (Ehr. 1843) Grun. 1862
Fragilaria construens var. *venter* (Ehr. 1854) Grun. 1881 [also noted by Stiles 1934]
Fragilaria crotonensis Kitton 1869
Fragilaria leptostauron (Ehr. 1854) Hust. 1931
Fragilaria leptostauron var. *dubia* (Grun. 1862) Hust. 1931
Fragilaria mutabilis (Wm. Sm.) Grun. [noted only by Stiles 1934]

Fragilaria pinnata Ehr. 1843 [also noted by Stiles 1934 and Neaverson 1934]
Fragilaria vaucheriae (Kutz. 1833) Peterson 1928
Fragilaria viriscens Ralfs 1861 [also noted by Neaverso 1934]
Fragilaria viriscens var. *capitata* Ostrup 1910
Frustulia rhomboides (Ehr. 1843) de Toni 1891
Frustulia rhomboides var. *saxonica* (Rabh. 1851) de Toni 1891
Gomphonema acuminatum Ehr. 1832 [also noted by Neaverson 1934]
Gomphonema acuminatum var. *Brebissonii* (Kutz. 1849) Grun. 1881
Gomphonema acuminatum var. *coronata* (Ehr. 1840) W. Smith 1853
Gomphonema acuminatum var. *trigonocephala* (Ehr. 1854) Grun. 1880
Gomphonema bohemicum Reichelt et Fricke 1902
Gomphonema constrictum Ehr. 1830 [also noted by Stiles 1934 and Neaverson 1934]
Gomphonema constrictum var. *capitatum* [noted only by Stiles 1934]
Gomphonema geminatum (Lyngb.) Ag. [noted only by Stiles 1934]
Gomphonema gracile Ehr. 1838 [also noted by Stiles 1934]
Gomphonema intricatum Kutz. 1844 [also noted by Stiles 1934]
Gomphonema intricatum var. *pumila* Grun 1881
Gomphonema montanum Schumann [noted only by Stiles 1934]
Gomphonema montanum var. *commutatum* Grun [noted only by Stiles 1934]
Gomphonema olivaceoides Hustedt 1950
Gomphonema olivaceum (Horne. 1810) Breb. 1838
Gomphonema parvulum Kutz. 1849
Gomphonema parvulum Kutz. var. *lanceolatum* [noted only by Stiles 1934]
Gomphonema ventricosum Greg. 1856
Gyrosigma acuminatum (Kutz. 1833) Rabh. 1853 [also noted as *Pleurosigma acuminatum* (Kutz.) Grun. by Stiles 1934]
Gyrosigma attenuatum (Kutz. 1833) Rabh. 1853.
Hantzschia elongata (Hantzsch 1860) Grun. 1880
Melosira arenaria Moore 1843 [also noted by Neaverson 1934]
Melosira distans (Ehr. 1836) Kutz. 1844
Melosira distans var. *alpigena* Grun. 1881
Melosira italica ssp. *subarctica* O. Mull 1906
Melosira lirata var. *lacustris* Grun. 1882
Melosira lirata var. *seriata* O. Mull 1898
Meridion circulare (Grev. 1822) Agardh 1831 [also noted by Stiles 1934]
Meridion circulare var. *constricta* (Ralfs 1843) Grun. 1881
Navicula Americana Ehr. 1843
Navicula anglica (Ralfs.) [noted only by Stiles 1934]
Navicula appendiculata (Kutz.) [noted only by Stiles 1934]
Navicula bacillum Ehr. 1843
Navicula borealis (Ehrenb.) [noted only by Stiles 1934]
Navicula capitata Ehr. 1838
Navicula cari var. *angusta* Grun. 1881
Navicula cocconeiformis Greg. 1856
Navicula cryptocephala Kutz. 1844
Navicula cuspidata Kutz. 1844 [also noted by Neaverson 1934]
Navicula dicephala Ehr. 1837
Navicula elliptica (Kutz.) [noted only by Stiles 1934]
Navicula gastrum (Ehr. 1841) Kutz. 1844
Navicula humilis (Donk.) [noted only by Stiles 1934]
Navicula iridis var. *lata* [noted only by Stiles 1934]
Navicula iridis var. *undulata* [noted only by Stiles 1934]
Navicula iridis amphirhynchus (Ehrenb.) [noted only by Stiles 1934]
Navicula Jarnfeltii Hust. 1936
Navicula lanceolata (Agardh 1830) Ehr. 1838
Navicula Legumen (Ehrenb.) [noted only by Stiles 1934]
Navicula mesolepta (Ehrenb.) var. *Termes* [noted only by Stiles 1934]
Navicula mutica Kutz. 1844
Navicula oblonga Kutz. 1834 [also noted by Neaverson 1934]
Navicula placentula (Ehr. 1841) Kutz. 1844
Navicula polyonca (Breb.) [noted only by Stiles 1934]
Navicula pseudo Bacillum (Grun.) [noted only by Stiles 1934]
Navicula pseudoscutiformis Hust. 1930
Navicula pupula Kutz. 1844
Navicula pupula fo. *rectangularis* (Greg. 1854) Hust. 1961

Navicula pupula var. *capitata* Skvor. & Meyer 1928
Navicula pupula var. *elliptica* Hust. 1911
Navicula pusilla (Wm.Sm.) [noted only by Stiles 1934]
Navicula radiosa Kutz. 1844 [also noted by Stiles 1934 and Neaverson 1934]
Navicula radiosa (Kutz.) var. *acuta* [noted only by Stiles 1934]
Navicula rhyncocephala Kutz. 1844
Navicula Seminulum (Grun.) [noted only by Stiles 1934]
Navicula Schonfeldii Hust. 1930
Navicula Scutelloides (Wm.Sm.) [noted only by Stiles 1934]
Navicula Smithii (Breb.) [noted only by Stiles 1934]
Navicula stauroptera (Grun.) [noted only by Stiles 1934]
Navicula stauroptera var. *parva* (Grun.) [noted only by Stiles 1934]
Navicula tuscula Ehr. 1840
Navicula viridula var. *rostellata* (Kutz. 1844) Cleve 1895
Navicula vulpina Kutz 1844
Neidium affine (Ehr. 1841) Pfitz. 1871
Neidium affine var. *amphirhynchus* (Ehr. 1843) Cleve 1894
Neidium dubium (Ehr. 1843) Cleve 1891
Neidium Hitchcockii (Ehr. 1843) Cleve 1894 [also noted as *Navicula Hitchcockii* (Ehrenb.) by Stiles 1934]
Neidium iridis (Ehr. 1843) Cleve 1894 [also noted as *Navicula Iridis* (Ehrenb.) by Stiles 1934 and as *Navicula firma* (Kutz.) by Neaverson 1934]
Neidium iridis var. *amphigomphus* (Ehr. 1841) Mayer 1917 [also noted as *Navicula iridis Amphigomphus* (Ehrenb.) by Stiles 1934]
Nitzschia amphibia Grun. 1862
Nitzschia angustata Grun 1880 [also noted by Neaverson 1934]
Nitzschia angustata var. *acuta* Grun. 1880
Nitzschia denticula Grun. 1880
Nitzschia dissipata (Kutz. 1844) Grun 1880
Nitzschia sigmoidea (Nitzsch. 1817) W. Smith 1853
Nitzschia vitrea Norman fo. *major* [only noted by Stiles 1934]
Pinnularia Braunii (Grun. 1880) Cleve 1895
Pinnularia dactylus Ehr. 1843
Pinnularia divergens W. Smith 1853 [also noted by Neaverson 1934]
Pinnularia esox Ehr. 1841
Pinnularia gentilis (Donkin 1872) Cleve 1895
Pinnularia gibba Ehr. (1830) 1843
Pinnularia gibba fo. *subundulata* Mayer ex Hust. 1930
Pinnularia gibba var. *linearis* Hust. 1930
Pinnularia interrupta W. Smith 1853
Pinnularia major (Kutz. 1833) W. Smith 1853 [also noted by Stiles (as *Navicula major*) 1934 and Neaverson 1934]
Pinnularia mesolepta (Ehr. 1843) W. Smith 1853 [also noted by Neaverson 1934]
Pinnularia microstauron (Ehr. 1843) Cleve 1891
Pinnularia nobilis Ehr. (1840) 1843 [also noted by Stiles (as *Navicula nobilis*) 1934 and Neaverson 1934]
Pinnularia platycephala (Ehr. 1854) Cleve 1891
Pinnularia semicruciata (A. Schmidt 1875) A. Cleve 1895
Pinnularia subsolaris (Grun. 1882) Cleve 1895
Pinnularia viridis (Nitzsch 1817) Ehr. 1843 [also noted by Stiles (as *Navicula viridis*) 1934 and Neaverson 1934]
Pleurosigma Spencerii Wm. Sm. var *Smithii* Grun
Rhopalodia gibba (Ehr. 1830) O. Mull. 1897 [also noted by Neaverson 1934]
Rhopalodia parallela (Grun. 1862) O. Mull. 1895
Stauroneis acuta W. Smith 1853 [also noted by Neaverson 1934]
Stauroneis anceps Ehr. 1843 [also noted by Stiles 1934]
Stauroneis anceps fo. *gracilis* Rabh. 1864
Stauroneis obliqua (Greg.) [noted only by Stiles 1934]
Stauroneis phoenicentron (Nitzsch 1817) Ehr. 1843 [also noted by Stiles 1934 and Neaverson 1934]
Stauroneis Smithii Grun 1860
Stephanodiscus Hantzschii Grun 1880
Surirella biseriata Breb. 1835 [also noted by Stiles 1934 and Neaverson 1934]
Surirella elegans Ehr. 1843 [also noted by Stiles 1934]
Surirella linearis W. Smith 1853 [also noted by Stiles 1934]
Surirella linearis var. *constricta* Grun. 1862.
Surirella linearis var. *Helvetica* (Brun. 1880) Meister 1912
Surirella robusta Ehr. 1840 [also noted Neaverson 1934]

Surirella robusta var. *spledida* Ehrenb. [noted only by Stiles 1934]
Synedra amphicephala Kutz. 1844 [also noted by Stiles 1934]
Synedra capitata Ehrenb. [noted only by Stiles 1934]
Synedra parasitica (W. Smith 1856) Hust. 1930
Synedra ulna (Nitzsch 1817) Ehr. 1838 [also noted by Stiles 1934]
Synedra ulna var. *biceps* (Kutz. 1844) Schonfeldt 1913
Synedra ulna var. *Danica* (Kutz. 1844) Van Heurck 1881 [also noted by Stiles 1934]
Synedra ulna var. *oxyrhynchus* (Kutz. 1844) Van Heurck 1881
Synedra ulna var. *subaequalis* (Grun.) [noted only by Stiles 1934]
Synedra ulna longissima [noted only by Stiles 1934]
Tabellaria fenestrata (Lyngbye 1819) Kutz. 1844 [also noted by Neaverson 1934]
Tabellaria flocculosa (Roth. 1797) Kutz. 1844 [also noted by Neaverson 1934]
Tetraccyclus lacustris Ralfs 1843 [also noted by Stiles 1934 and Neaverson 1934]
It is almost certain that a collection at the site (other than from a core in the mere itself) will produce some asbestos and also some rather unexpected diatoms. A quote from a paper in the Journal of the Barbados Museum and Historical Society by J. H. Robinson writing in the mid 1930s states:
"Thirty-five years ago, about twenty tons of Oceanic Earth were quarried from a spot situated in a depression in the hills some distance inland from Bethesda. The earth was packed in bags, transported by mules to a siding on the Barbados Government Railway, dispatched to Bridgetown and thence shipped to the British Diatomite Co. of Manchester, England, to be tested..."
Though the British Diatomite Co. did not operate the Kentmere deposits it was really the only nearby processing plant and it is likely that this and other consignments from various localities around the world would have made their way there for processing and possibly analysis. Any that proved of a lesser quality probably made their way onto the spoil heaps which were subsequently flattened and landscaped.

It would be interesting to find out what the rabbit warrens spoil heaps actually turn up!

DIATOMS FROM THE KENTMERE DEPOSIT.

By E. NEAVERSON, D.Sc., F.G.S.

(Read March 13th, 1934.)

Nearly fifty years ago STRAHAN mentioned[1] that "nearly seventy species of Diatomaceæ have been determined from this deposit by Dr. STOLTERFOTH, of Chester, to whom I submitted specimens." Extensive search in literature by Dr. G. H. MITCHELL failed to reveal a published list, and further search by Mr. A. NEWSTEAD among the material at Chester Museum likewise proved unsuccessful. It was therefore decided to examine the diatoms afresh, and some thirty-one samples, obtained by boring into the deposit to a maximum depth of about twenty feet, were sent to the writer by Dr. MITCHELL.

Sixteen localities are represented by samples taken from various depths, some by one, others by two or more specimens. It has become evident, however, that the diatom assemblage is virtually constant throughout the mass of the deposit, and, consequently, a "Table of Distribution" is unnecessary. Moreover, such a table may even be misleading, for it gives an impression of precision which is not justified by the facts. It seems better to consider the diatoms in somewhat arbitrary groups determined by frequency of occurrence; but first some general features of the deposit invite discussion.

While some of the samples are fairly pure specimens of diatomaceous earth, most of them contain a proportion of decomposing moss-leaves and spores, and also of detrital mineral grains (chiefly quartz and chlorite). The grains are angular or sub-angular in shape, a condition which is consistent with derivation from the surrounding glacial deposits. The sample from the locality marked A on the map (p. 143) has

[1] STRAHAN, A. 1888. "The Geology of the Country around Kendal, Sedbergh, Bowness and Tebay," p. 41, *Mem. Geol. Survey*.

The first page of the Neaverson paper.

W. A. Firth species list

This next small snippet will be of use, we hope, to whosoever out there owns a William Allott Firth 87 species Type Slide, and quite specifically the one that the following species list belonged to.

The specimens were mounted in Styrax, arranged in five rows. The specimens are from a considerable range of locations, both recent and fossil, including some from Hungary.

Diatomaceæ

Type - slide

87 sp.

"Mounted in Styrax."

W. A. FIRTH.

Row 1

1	Actinocyclus	Barkleyi	Australia
2	do	Ehrenbergii	New Jersey USA.
3	do	moniliformis	New Hebrides
4	do	Ralfsii	Chabor Guano
5	Actinoptychus	undulatus	New Jersey USA
6	do	do var.	Peruvian Guano
7	do	Stella	Hungary
8	do	splendens	Peruvian Guano
9	do	hexagonus	Madagascar
10	do	maculatus	Oamaru NZ
11	do	haliomphi?	California
12	Auliscus	pinnosus	E. Africa
13	do	Coelatus var	do.
14	do	Oamarensis	Oamaru NZ.

Row 2.

1	Aulacodiscus	amoenus var	Oamaru NZ.
2	do	Kittoni "amherstia	Burma.
3	do	africanus	Congo River
4	do	Molleri	New Jersey USA
5	do	Kittoni	California
6	Ectodiscus	superbus.	Barbadoes
7	Coscinodiscus	borealis?	Japan
8	do	centralis	Maryland USA
9	do	radiatus var	Algeria
10	do	spiniferus.	Oamaru NZ.
11	do	perforatus	Gensimo Guano

Row 3.

1	Coscinodiscus	Simbirskianus	Simbirsk Russia
2	do	Normanii	Cambodia
3	do	Symbolophorus	Russia

	Row 3 (continued)		
5	Arachnodiscus	Ehrenbergii	Mexico
6	do	do var	California
7	do	do var	Hungary
8	Stictodiscus	Californicus	Redondo Cal.
9	Heliopelta	Leuwenhoekii	Calvert Co USA.
10	Eupodiscus	Jonesianus	Trinidad
11	do	Rogersii	Bermuda Virginia
	Row 4.		
1	Biddulphia	pulchella frustule	Burma
2	do	do valve	do
3	do	Tuomeyi (frust view	New Zealand
4	do	do (girdle	do
5	do	reticulata	Burma.
6	do	aurita	Valparaiso
7	Terpsinoe	intermedia (frust,	Mobile USA
8	do	do valve	do
9	Grammatophora	marina	California
10	do	oceanica?	Naples
11	do	macilenta	Constantinople
12	Achnanthes	longipes	Long Is. USA.
13	Cocconeis	dentellum	Turkey.
14	do	inspersa	Kerguelen Is.
15	Entomoneis	producta	Oamaru NZ.
16	Gomphonema	geminatum	Derwentwater
17	Cymbella	gastroides	Maidstone
18	do	cuspidata	L. Morne Belfast
19	Epithemia	Hyndmanii	Aberdeen
20	Rhabdonema	minutum	Samoa
21	Hemidiscus	cuneiformis	Moron Spain

Row 4

1	Navicula	lyra	E. Africa
2	do	maculata	Leith Do Wash
3	do	Splendida var	Philippine Is.
4	do	praetexta	Redondo Cal
5	do	crabro var	Old Monica "
6	Plagiodiscus	nervatus	Manilla
7	Melosira	dor var	Oamaru NZ
8	Pinnularia	cardinalis	Ordie Scotland
9	do	lata	Collin Ordie Belfast
10	do	dactylus	Manie Wash.
11	do	nobilis	Toomebridge Ireland
12	Surirella	nobilis	Inverness.
13	do	Splendida	Holland
14	Stephanopyxis	Valida	Oamaru NZ.
15	Cymatopleura	Hibernica	Toomebridge Ireland
16	Stauroneis	Phoenicenteron.	do
17	Trinacria	verbuscosa	Oamaru NZ.
18	do	excavata	Fire Is Iceland
19	do	regina	do

Row 5.

1	Tricratium	favus	Hungary
2	do	megastomum	Madagascar
3	do	arcticum ☐	Old Cove Cal
4	do	do ^	do
5	do	nobile	Amanino Russia
6	do	Archangelskianum	do
7	do	crenulatum	Oamaru NZ
8	do	Kinkerianum	do
9	do	majus	do
10	do	rugosum	do
11	Solium	exceptum	Mors Jutland

The label below shows a similar Firth printing of his name.

The slides below depict some of the label formats he used.

Some Notes on William Allott Firth:
b. 1853 Barnsley, Yorkshire
bp. 1st January 1854, All Saints, Darton, West Yorkshire
parents - Joseph (a Bleacher) and Emma Firth of Swithen
m. Ellen Margaret Stringer June Quarter 1885 Belfast Vol.1. pg.351.
d. 26th July 1923.
Schooled at the Royal Belfast Academical Institution.

Entered Queens University, Belfast in 1869 to read Theoretical and Practical Chemistry, but attended only two terms.

Joined Belfast Naturalists Field Club (with his father) about 1876 until about 1897, during some of which time he served on the Committee.

Known as a painter and musician.

In Science Gossip June 1877 Exchanges Column -

'A few slides of "Synapta", with anchors and plates, and crystals of Zeolite for Polariscope, to exchange for other interesting slides. - William A. Firth, Whiterock, Belfast.'

In Science Gossip August 1877 Exchanges column -

'Specimens of Synapta inhaerens in exchange for good Micro. Slides. - William O. Firth, Whiterock, Belfast.'

In Science Gossip November 1877 Exchange Column -

'Wanted, samples of New Nottingham and other good foreign Diatomaceous deposits. Two co. Antrim Earths and well mounted slides to offer in exchange. - Communicate with W. A. Firth, Whiterock, Belfast.'

In Science Gossip March 1878 Exchange Column -

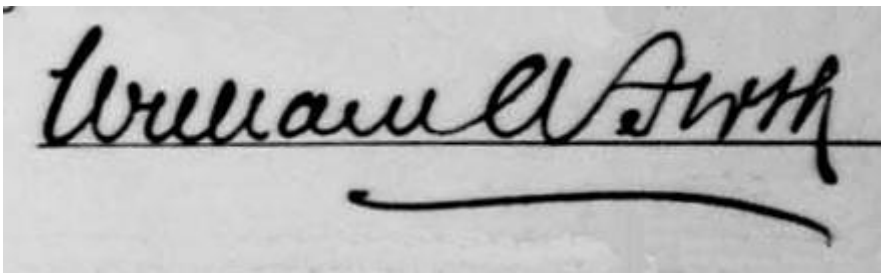
'Wanted, recent Diatoms from Monterey Bay and Cuxhaven Mud, Diatomaceous Earth from Stoneyford, County Antrim, and well-mounted slides offered in exchange. - William A. Firth, Whiterock, Belfast.'

In the Quekett Microscopical Club members list of 1881 - W. A. Firth of Whiterock, Belfast - elected July 22nd 1881

W. A. Firth read a paper before the Belfast Naturalists Field Club 17th June 1888 on the Confusion between the Mourne localities. And included a list of Diatoms from Lough Mourne.

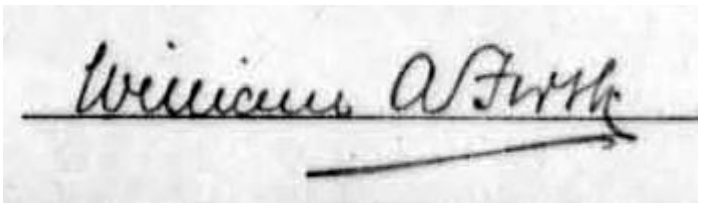
In 1888 Firth, entered and was placed 11th (#2 2s prize) in the Fry and Company's Dry Plate Competition (for negatives taken on their plates). The subject matter was not recorded.

Extract from Photo-micrography, Edmund J. Spitta, The Scientific Press Ltd, 1899.
"We know of no mounter of diatoms in the United Kingdom that can surpass Mr. Firth, of Clifton Park Avenue, Belfast, and few that can equal him, save Mr Gatrell, of Barnes, whose work is of the most excellent quality; [Whilst these pages are passing through the press Mr. Gatrell has sent us some Amphipleura pellucida mounted in realgar and other diatoms in quinidine and piperine which are of the highest order of merit, especially the Amphipleura pellucida, which of late has been so difficult to obtain.] but Thum, of Leipzig, and Moller, of Wedel Holstein, also supply slides of exceptional merit and perfection."
In the 1901 Census he is recorded, aged 48, a Linen Bleacher at Springfield Road, Antrim. Also present his wife Ellen Firth (41), his sons William Stringer Firth (14), Herbert Victor Firth (13), Stanley Firth (6) and daughters Ellen Firth (11) and May Firth (1). All the children were born in Antrim, his wife was born in Middlesex. The entire family belonged to the Church of Ireland denomination. All except the youngest could read and write.



William Allott Firth signature - 1901 census

In the 1911 Census he is recorded, aged 56, a Master Bleacher, in Ravenhill Road (Ormeau, Down). Also present his wife Ellen W. Firth (51), his sons William Stringer Firth (24, an Optician), Herbert Victor Firth (23, an Ironmonger), Stanley Firth (16, an apprentice in the Tea trade) and daughters Ellen Firth (21, a typist) and May Firth (11, a Scholar). All the children were born in Belfast, his wife was born in Middlesex. The entire family belonged to the Church of Ireland denomination.



William Allott Firth signature - 1911 census

W. A. Firth used the pseudonym Micro and also Diatom when advertising in English Mechanic and World of Science as below:
February 2nd, 1912 - *'Microscopical. - Slide, 12 Selected Diatoms, Loch Doon, Scotland. Styrax mounting 1s. - Micro. Ravenhill Road, Belfast.'*
August 9th, 30th, 1912. - *'Microscopical. - Selected Diatoms. Slide 12 various beautiful species North America 1s. - Micro, 348 Ravenhill Road, Belfast.*
September 13th, 1912. - *'Microscopical. - Slide, 12 Selected diatoms. Maryland, 1s.; California, 1s.; Alexandria, 1s. - Micro, 348 Ravenhill Road, Belfast.*
October 4th, 1912. - *'Microscopical. - Slide, 12 selected Diatoms, Seaweed, California, 1s.; Hungary, 1s. - Micro, 348 Ravenhill Road, Belfast.'*

November 15th, 1912 - *'Micro. Slide. 12 selected Diatoms, Styrax mounting. Madagascar, 1s.; Lamlash, 1s. - Micro, 348 Ravenhill Road, Belfast.*
November 29th, 1912 - *'Microscopical. - Slide 12 selected Diatoms Jacksons Paddock Oamaru 1s. Singapore, 1s. - Micro, 348 Ravenhill Road, Belfast'*
December 6th, 1912 - *'Microscopical. - Slide, 12 selected Diatoms. Hungary. 1s.; Jutland, 1s.; Inverness, 1s. - Micro, 348 Ravenhill Road, Belfast.'*
December 6th, 1912 - *'Microscopical. - Slide, 12 selected Diatoms. New Jersey. 1s.; Boglands, Belfast, 1s. - Micro, 348 Ravenhill Road, Belfast.'*
December 20th, 1912 - *'Microscopical. - Slide, 12 selected Diatoms. Singapore. 1s.; Brazil, 1s.; Canada. 1s. - Micro, 348 Ravenhill Road, Belfast.'*
December 27th, 1912 - *'Microscopical. - Slide, 12 selected Diatoms. Monmouth, Maine, with Navicula rhomboides. 1s. - Micro, 348 Ravenhill Road, Belfast.'*
January 3rd, 1913 - *'Microscopical. - Slide 12 selected Diatoms, Styrax mounting. California, 1s. Maryland, 1s. - Micro, 348 Ravenhill Road, Belfast.'*
January 10th, 1913 - *'Microscopical. - Slide 12 selected Diatoms. Oamaru, New Zealand, 1s. , Jutland, 1s. - Micro, 348 Ravenhill Road, Belfast.'*
January 24th, 1913 - *'Microscopical. - Slide 12 selected diatoms. Sponge sand, 1s., California, 1s. - Micro, 348 Ravenhill Road, Belfast.'*
Notice of his death in Belfast Telegraph (1923)

Addresses:-
Springfield Terrace, Belfast (1885)
95 City View Terrace, Falls Road, Belfast (1887-1890)
Glenview Terrace, Springfield Road, Belfast (1890-1894)
92 Clifton Park, Belfast (1897)
Springfield Road, Antrim (1901) 25 Victoria Gardens, Belfast (1901)
31 Ponsonby Avenue, Belfast (1903)
7 Parkend Street (1904-1907)
348 Ravenhill Road (1908)
Ravenhill Road (1911)

Piperine

Name: Piperine

Synonyms: Piperidine, 1-piperoyl-, (E,E)-; 1,3-Benzodioxol-5-yl-1-oxo-2,4-pentadienyl-piperine; Piperidine, 1-(5-(1,3-benzodioxol-5-yl)-1-oxo-2,4-pentadienyl)-, (E,E)-; Piperin; 1-Piperoylpiperidine

I have not seen any mounts where the medium is Piperine though I was kindly sent a slide by a colleague who admitted that he was unable to find anything on the slide at all. The slide in question was a wooden slide with a suitable hole and recess cut into it to take a mount set between two coverslips. On taking the slide from its case the very first thing I noticed was that this particular element, the coverslip sandwich, was missing. When I pointed this out to my benefactor, he immediately grasped the importance of this and said "That explains why I couldn t find the specimen then!".

Piperine is the chemical that gives pepper its characteristic kick. However, it is also made commercially.

Whilst the Dingley P. Fuge article Spread Diatom Slides" reprinted in the Balsam Post Issue No. 78 (January 2008) pp42-43, suggests Piperine as a mounting medium in its pure state the following extract from a longer paper suggests that Piperine alone is somewhat prone to charring when melting and may also be a little fragile and suggests a Piperine/Antimony Bromide mixture as more suitable.

From - 'The Littoral Diatoms of the Liverpool and Port Erin Shores' (1932) - F. M. Ghazzawi, B.Sc. Cairo, and Department of Oceanography, Liverpool University

The diatoms have to be mounted in a suitable medium. The visibility of markings such as the striation of diatoms is proportional to the difference between the refractive indices of the object and the medium in which it is mounted. The refractive index of the diatom silex is about 1.43, hence the diatom is not seen in concentrated sulphuric acid, as this has nearly the same refractive index. Canada balsam (n=1.54), monobromide of naphthalene (n=1.658), and styrax are among the media that have higher refractive indices than that of silex. I find Canada balsam and styrax unsuitable owing to their low coefficient of visibility. Mono-bromide of naphthaline is a liquid and is therefore unsuitable.

A good mounting medium is a simple one that I have come across by mere chance and I think it is stable. A slide was found in the Liverpool Oceanography Lab., and on examination I found it to contain Pleurosigma angulatum mounted in a yellowish solid medium. On the slide is written "Piperine and antimony bromide", obviously indicating that this is the mounting medium. The striations of Pleurosigma are clear and distinct in every detail. It is also very astonishing that, though the mounting was dated March 22nd, 1891, it is still as perfect as if it had been prepared today, despite its forty years of age, a fact which is evidence of the stability of the medium. This then must be a very good medium of high refractive index, which is not recorded in any of the references to Diatomaceae in the Journal of the Royal Microscopical Society from 1860.

I was supplied with both piperine and antimony bromide, and with the help of Dr. Daniel, I started to utilise it, with, I believe, considerable success.

Piperine is an inexpensive alkaloid of the formula C17H14N03. It is almost insoluble in water. It is only a very weak base and on hydrolysis gives piperidine and piperic acid. It can be obtained in a very pure state as straw-coloured crystals, with a melting point of 1280 C. When it is melted it dissolves the tribromide of antimony (SbBr3) very freely. Piperine, if heated alone directly on a bunsen flame, melts quickly into a colourless liquid which chars (blackens) with continued heat. All this may take place in the course of one minute. Bromide of antimony (SbBr3) melts at a lower temperature and also into a transparent liquid. Both solidify again immediately they are removed from the source of heat. In their liquid state while still hot, if they are allowed to mix, an orange or yellowish colour is produced, the intensity of the colour being dependent upon the proportion of both substances. Piperine must be used in excess of the bromide of antimony, for if the latter is in excess it crystallises out on cooling, with the result that a turbid, useless medium is formed. Different proportions of piperine and antimony bromide have been prepared and sent to the Geological Department here to find out the refractive indices. Unfortunately, I have been informed that they were unable to find these, as the medium is insoluble in their oils. It seems, however, from the examination of the various slides prepared with this mounting medium in different proportions that the best proportion is 2 parts of piperine to 1 part of SbBr3. Here the diatoms with their striation are so very distinct and clear that nothing more in this direction can be desired. Two parts by weight of piperine are taken with one part by weight of SbBr3, and both are finely ground together in a mortar in their solid state, when a yellow colour immediately develops. I do not know whether this yellow material is a new chemical compound, or not.

A small portion of this solid medium is put on a slide, or a cover slip, with dry diatoms. The slide or cover slip is now put on a hot plate the temperature of which must not greatly exceed 1280 C (which is the melting point of piperine). Under no circumstances should this medium be heated directly on the flame. As soon as the mounting medium melts completely either lower a cover glass, or a slip, on it and take it away immediately from the source of heat, when it solidifies.

A few notes on Dingley P. Fuge.

Fuge, Reverend Dingley P.
(1874-1944)
Fellow of the Royal Microscopical Society
addresses - 24 Melrose Street, Great Hosten, Bradford & 20 Scarborough Road, Shipley.
Portrait in The Microscope page 267 Vol. V. No. 10 May 1945
Died at Shipley aged 70 Years 13th December 1944. Methodist Minister for 45 years. Served in Boer War as Chaplain. Most of his working life spent in Yorkshire on circuits including, Great Horton, Keighley, Shipley and Wakefield. A serious illness left him a semi-invalid at about the age of 52 at which point he was transferred to the supernumerary list of Pastors. The increase in leisure time associated with this event led him more and more to microscopy which served to take his mind off his infirmity. He was, in early years, interested in Botany but gradually specialised in Diatomaceae. This interest led him to communicate with many of the leading diatomists of the day and he contributed many articles to journals (The Microscope and Watsons Microscope Record). He was a Fellow of the Royal Microscopical Society and a member of the Postal Microscopical Society.
Articles in The Microscope
Coscinodiscus - A diatom Note - September 1938
Marine Diatoms - August 1937
The Genus Cymbella with special reference to Two of its Common Species - September 1937
Botany and the Microscope - An introductory note - October 1937
The Genus Pleurosigma - November 1937
The Mounting of Selected Diatoms - January 1938
Articles in Watsons Microscope Record
Note on the Reserve Cellulose or Hemi-Cellulose in the Wood Fibres of the Black Poplar - September 1924 (no. 3)

Navicula viridis - September 1928 (No. 15)
Coscinodiscus. An Introductory note to the Genus - January 1929 (No. 16)
Pleurosigma angulatum - May 1929 (No. 17)
The Collection and Preparation of Diatoms - September 1929 (No. 18)
Unusual Diatom Forms - May 1930 (No. 20)
Three Diatoms from Yorkshire - May 1931 (No. 23)
Triceratium - May 1931 (No. 26)
Two New Kittonias: A Diatom Note - May 1936 (No. 38)
Kittonia (?) virgata G. & S. With a Note on the Genus Hemiaulus and its Mucro - January 1937 (No. 40)
Other papers:
Article in Journal of The Royal Microscopical Scoiety Series III - 1937 pages 183-185 – “Nitzschia firthii spec. nov., a Diatom from Chinese Canned Fish.”.
Article in The Journal of the Barbados Museum and Historical Society February 1934 pages 1-5 “A note on diatoms in general and the fossil diatoms of Barbados in particular”
“Diatom notes: Part 3. Concerning Pinnularias and others” - Fuge, D.P. in: Practical Microscopy Jul/Aug 1935 PG: 6-7 and 33
“Diatom notes: No. 4. How to examine a diatom and introductory to classification” - Fuge, D.P. in: Practical Microscopy PG: 4-5 and 32-33
“Diatom notes: No. 6. The genus Navicula” - Fuge, D.P. in: Practical Microscopy PG: 4-5 and 35-36
“Diatom notes: No. 5. Concerning details of valve structure” - Fuge, D.Pin: Practical Microscopy PG: 6-8 and 34-35
“Diatom notes: A natural history study” - Fuge, D.P. in: Practical Microscopy Sep/Oct 1935 PG: 8-9 and 34
“Diatom notes: Part II. Collection and preparation” - Fuge, D.P. in: Practical Microscopy May/Jun 1935 PG: 12-14, and 35-36
“Diatom notes: I. Introductory diatoms and the amateur microscopist” Fuge, D.P. in: Practical Microscopy Mar/Apr 1935 PG: 6-8, and 33

Six Degrees of Separation

The title of this piece refers to the concept that anyone and everyone is, on average, only six person to person links away from any other person on the planet. The proposition was originally framed by Frigyes Karinthy and subsequently popularized in a play written by John Guare.

This doesn't mean that you can pick six friends or/and relations and via those six alone reach your target person. The reality is slightly different. Let us say that I have 40 friends and each of them has 40 friends and each of their friends have 40 friends and so on, then were a network map created then all the people in the world would appear on it (probably everyone a number of times) and the shortest route from you to any other person on that map would be somewhere around six 'hops'. You cannot predict which six people these may be (unless you are looking for a celebrity and you already know someone that moves in such circles).

What, you may ask, has this to do with diatomists?

Well, it occurred to me that if this premise were true then it should be possible to locate anyone in the world that was living next to a diatomite deposit and via this simple return route get hold of any deposit in the world, no matter how remote.

You might think this somewhat fanciful but some of the large IT companies have researched this concept and in the case of Facebook have found that the actual degree of separation amongst its clientele is as low as 4.74 (obviously an average) and those users of Twitter are an average of only 4.67 hops away from any other Tweeter.

Why not try it. Pick an obscure location (even an historical one) and get emailing - let us know the results.

Of course, the Editors can't do this as we don't have enough friends!

Sozodont

Uses of Diatomite

Readers of the printed version of The Amateur Diatomist may recall in the last issue of that title (and if you can't then look in the Archive) that the Uses of Diatomite featured Wright's Red Star Cleaning Powder,

whose source material was Keene, New Hampshire. This material was also used by Hall & Ruckel in their tooth powder product Sozodont.

Evidence for this comes not only from the slides but also:

CENTRAL NEW YORK MICROSCOPICAL CLUB, SYRACUSE, N. Y.

The first annual soiree was held at Greyhound Hall, Nov. 24, 1886. A very large number of exhibits were reported and a large number of different instruments. Besides the usual interesting objects exhibited on such occasions there were shown: Embryo chick—60 hours' incubation; bolting cloth; fresh-water Rhizopods; itch insect; sozodont tooth-powder, composed of diatoms from Keene, N. H.; Bacillus cholera Asiatica; micrococcus rabies, or germs of hydrophobia; method of enumerating blood-corpuscles; native-gold crystal; circulation of blood in tail of fish; willow-blight in place; broken spore fruits of willow-blight; eye of lobster; crystals of maple-sugar; anchors and plate from Synapta.

American Monthly Microscopical Journal January 1887

A number of slides of Sozodont diatoms have been seen by the author and modern slides from the deposit source may still be available via Klaus Kemp who lists the site (934B) in his Locality listings.

Sozodont is interesting in that it was a product backed by a huge marketing budget and indeed became so commonplace and synonymous that it even appeared in the literature of its time.

A Tramp Abroad by Mark Twain

Half an hour later I was sitting on a bench inspecting, with strong interest, a noble monolith which we were skimming by--a monolith not shaped by man, but by Nature's free great hand--a massy pyramidal rock eighty feet high, devised by Nature ten million years ago against the day when a man worthy of it should need it for his monument. The time came at last, and now this grand remembrancer bears Schiller's name in huge letters upon its face. Curiously enough, this rock was not degraded or defiled in any way. It is said that two years ago a

stranger let himself down from the top of it with ropes and pulleys, and painted all over it, in blue letters bigger than those in Schiller's name, these words:
"Try **Sozodont**;" "Buy Sun Stove Polish;" "Helmbold's Buchu;" "Try Benzaline for the Blood."
He was captured and it turned out that he was an American. Upon his trial the judge said to him:
"You are from a land where any insolent that wants to is privileged to profane and insult Nature, and, through her, Nature's God, if by so doing he can put a sordid penny in his pocket. But here the case is different. Because you are a foreigner and ignorant, I will make your sentence light; if you were a native I would deal strenuously with you. Hear and obey: --You will immediately remove every trace of your offensive work from the Schiller monument; you pay a fine of ten thousand francs; you will suffer two years' imprisonment at hard labor; you will then be horsewhipped, tarred and feathered, deprived of your ears, ridden on a rail to the confines of the canton, and banished forever. The severest penalties are omitted in your case--not as a grace to you, but to that great republic which had the misfortune to give you birth."
Slips of Speech, by John H. Bechtel
Gums, Overshoes
"Tom is outside, cleaning his gums on the mat." While a mat will do very well for overshoes, a tooth-brush and **sozodont** would be better for the gums.
Roughing It by Mark Twain
I have had the same driver tell it to me two or three times in the same afternoon. It has come to me in all the multitude of tongues that Babel bequeathed to earth, and flavored with whiskey, brandy, beer, cologne, **sozodont**, tobacco, garlic, onions, grasshoppers--everything that has a fragrance to it through all the long list of things that are gorged or guzzled by the sons of men. I never have smelt any anecdote as often as I have smelt that one; never have smelt any anecdote that smelt so variegated as that one.
Urban American Society - Author Unknown
"A good example of the last method was **Sozodont**, a tooth powder. By putting the name of the product everywhere, its makers hoped to have people think of the name Sozodont as a synonym for tooth powder. Foreign visitors to the United States saw the word Sozodont so much that they thought it was another name for the nation.
The makers of **Sozodont** used every excuse to get their product across to consumers, as illustrated by a newspaper ad on January 2, 1887:
Hark! the New Year bells are ringing,
How they laugh as they are swaying in the frosty air!
Opening up a fortune golden
To our hopes, though sight is holden
In this world of care...
And this New Year fast advancing,
Like a swift steed, gay and prancing,
Must be sure to find
Teeth well brushed each night and morning
With sweet **SOZODONT**, adorning
Lips, whose words are kind.
The Pioneer's Ball by Mark Twain
The queenly Mrs. L. R. was attractively attired in her new and beautiful false teeth, and the bon jour effect they naturally produced was heightened by her enchanting and well sustained smile. The manner of this lady is charmingly pensive and melancholy, and her troops of admirers desired no greater happiness than to get on the scent of her **sozodont**-sweetened sighs and track her through her sinuous course among the gay and restless multitude.

Despite all these claims it was reported later that, although there was no 'grit' in Sozodont, the abrasive qualities of the calcined diatomaceous earth, so efficient at removing plaque and tartar, also actually wore away the tooth enamel.

The calcining process back in the 1890s wasn' as efficient as todays processes which is why many whole frustules were to be found in the tooth powder.

William Henry Hall and John H. Ruckel were friends with shops on Greenwich Street in New York. In the early 1850's they went into business together, and by 1863 they were manufacturing a dentifrice called Sozodont. In 1869 Hall and Leonard W. Warner acquired the business of L.R. Herrick (Herrick's Family Medicines), and other preparations like Dr. J.R. Stafford's Iron & Sulphur Powders and Stafford's Olive Tar. Later they developed or bought Lubin's Violette Tooth-Powder, Hall & Ruckel's Improved Seidlitz Powders and Walnut Leaf Hair Restorer.

At the same time that Sozodont was being advertised another product from the same company was being promoted - Sozoderma.

Although I have never heard mention of diatom material in Sozoderma I wonder whether this product was what today we would call an exfoliating product for the removal of the upper layers of the skin. Perhaps there are diatom mounts out there sourced from this product as well.

Field Microscopes VIII

Stamped - Junior. Made in Germany.

The microscope was actually made by the firm of Spindler & Hoyer, Gvttingen around 1925.

This is probably my favourite portable microscope. It is compact and magnifies up to 200 times by means of a triplet, dividing objective and a No.3 (magnification unknown) eyepiece. Neither the objective nor the eyepiece have any indication of magnifying powers. When packed in its black laquered brass cylindrical case it measures 14cm high with a 4cm diameter. At 430 grams it isn't a trouser pocket item but it is carried easily in jacket or backpack. The microscope is pretty easy to deploy as well. The two parts of the cylinder unscrew from the body of the microscope, the three legs are screwed in place and you're ready for action. It's main drawback is the small mirror. The three legs have pointed ends so it is very easy to wedge into a post or tree at a convenient height, and in this horizontal position the mirror, though small, can be angled to capture sufficient light to illuminate your subject.

When unpacked from its case and assembled it stands a mere 15cms high. The whole is beautifully engineered and finished in black and chrome. Focussing is by sliding the main draw tube. The main disadvantage is what to do with the lens elements if you decide to split the triplet, they are small and could easily be lost.

The model appeared in Baird & Tatlock, Ltd. Scientific Apparatus Catalogue No. 60

The following description accompanied the illustration:

Provided with nickel-plated draw tube, standard eyepiece, stage and plane mirror. The compound objective gives three powers of magnification from 20 to 200. The instrument is fitted with a removable tripod, the whole screwing into an oxidized brass case 5 1/2 in. long, 1 1/2 in. diam. Particularly suited for Nature Study.

I have very little information concerning the firm of Spindler & Hoyer and what little I do have has been gleaned from the internet.

Julius Adolf Hoyer (1874-1943) joined the firm of August Becker (Gvttingen) in 1889 as an apprentice mechanic and after completing his apprenticeship was with Wilhelm Lambrecht of Diederichs in Gvttingen. He later entered the firm of Max Kohl of Chemnitz, where he met another techinician August Spindler (1870-1927). In 1898 he returned to Carl Diederichs running his small workshop with four other employees and Spindler. The range of instruments produced in the workshops of Spindler & Hoyer was very extensive, including demonstrations equipment, telescopes, microscopes, scales, electrostatic generators, ophthalmometers, Optical Benches, spherometers, spectrometers, compasses, magnetometers, voltameters, seismographs, binoculars and sextants.

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pH - A Dummies Guide

by Mike Woof

pH its meaning and measurement.

The concept of pH was first introduced in 1909 by a Danish chemist S.P.L Sorensen and later refined in 1924 to the system used to this day. The pH scale is a logarithmic one and is defined as minus the logarithm of the hydrogen ion concentration -log (H+). Being logarithmic each unit is ten times the value of the previous one and one hundred times the next but one, i.e. pH 3 is ten times as acidic as pH 4 and one hundred times as acidic as pH 5. The scale ranges from 1 to 14 with lower values being more acidic and higher value more basic, a figure of 7 being neutral.

The measure of the degree of acidity or alkalinity is important in many fields such as medicine, horticulture and chemistry among others.

pH in living systems.

Human skin	5.5
Urine	6.0
Blood	7.4
Soil	5 - 8
Sea water	8

pH indicators. Many naturally occurring materials can indicate pH levels such as Litmus (a lichen extract) used in pH paper to give a simple acid red/alkaline blue indication. Anthocyanins present in red cabbage, blueberries and many flowers also show colour change from acid to alkaline and the colour of hydrangea flowers changes according to the acidity of the growing medium.

A wide range of synthetic materials are now available:-

Indicator	Low pH	Transition range	High pH
Methyl red	red	4.4-6.2	yellow
Bromophenol blue	yellow	3.0-4.6	purple
Bromothymol blue	yellow	6.0-7.6	blue
Neutral red	red	6.8-8.0	yellow
Phenolphthalein	colourless	8.3-10.0	fuchsia

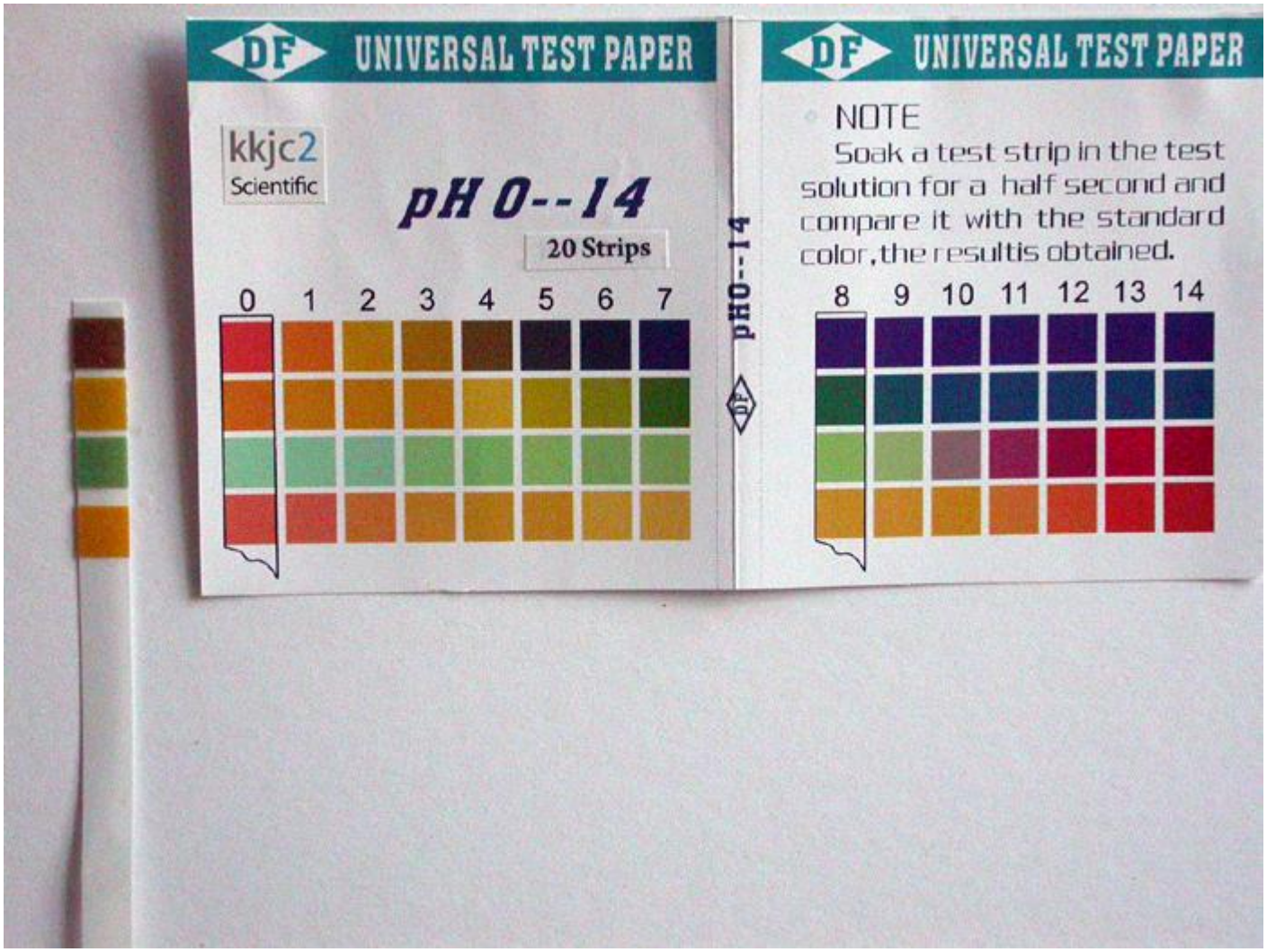


Figure 1.

Mixtures of these may be used as wide range or universal indicators. Such materials are used on test strips which are dipped in the test solution and the resultant colour change compared to a standard chart (Fig. 1) these strips can be wide or narrow range depending on the accuracy required and are an economical way to determine pH.

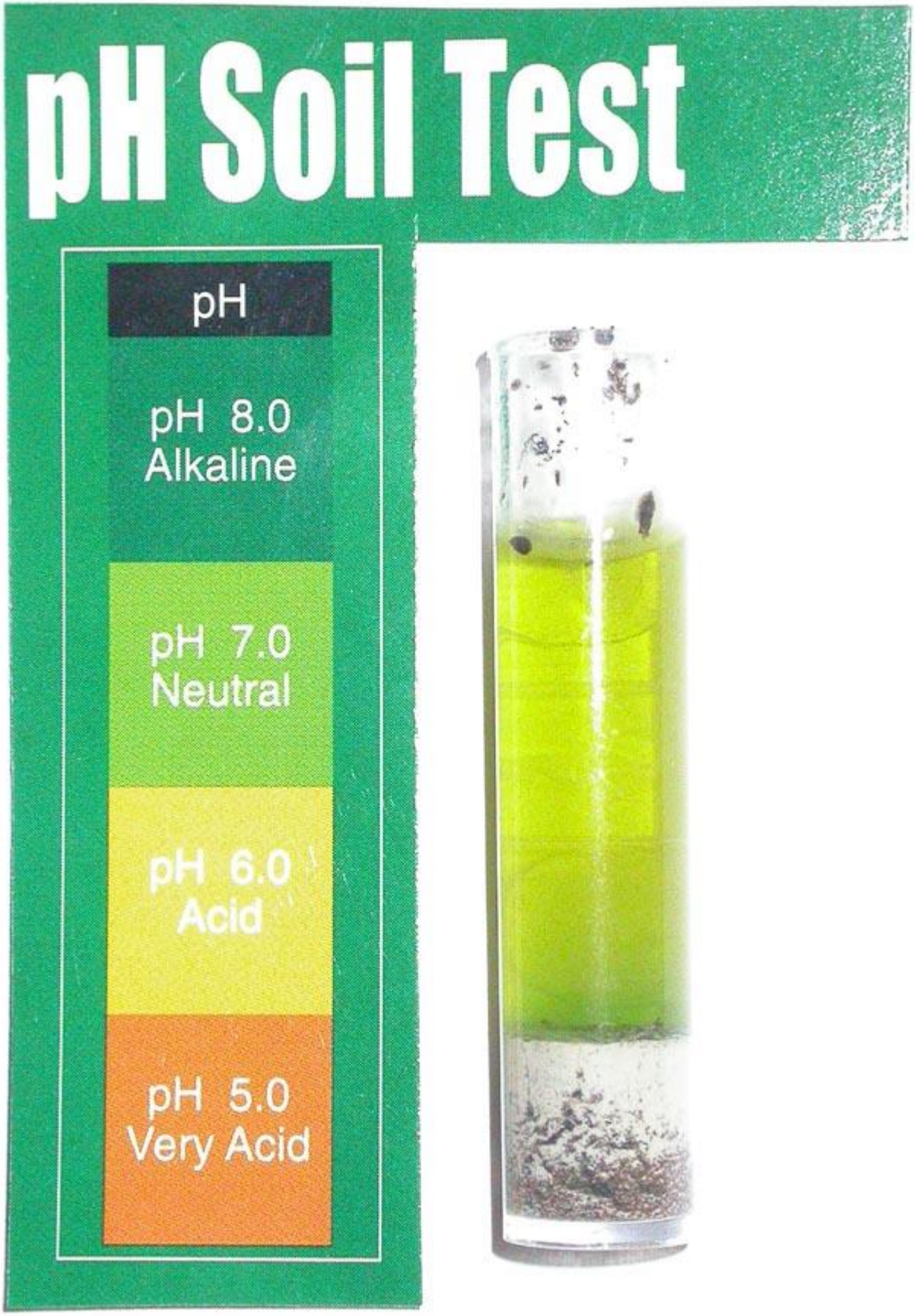


Figure 2.

Gardeners will be familiar with the soil test kits available which give an approximate value for soil acidity (Fig. 2) the soil is mixed with distilled water and a small sachet of the indicator solution is added, after allowing the solution to settle the colour developed is compared with a reference chart supplied with the kit.

Figure 3.

All the above measurement systems are somewhat subjective and are only accurate to little better than one pH unit, for greater accuracy other methods are available such as the Lovibond Tintometer in which an indicator solution is added to the sample and the colour developed is compared with a set of standard glass reference discs to give an accuracy approaching 0.2 pH units.(Figs. 3 & 4) A selection of such discs is available for different indicators. In the laboratory the colour developed would be measured with a spectrophotometer to give the most accurate result.

Figure 4.

The most accurate method for pH determination is by use of an electronic meter (Fig. 5) these were introduced in the early1950s but the first models were large cumbersome devices of doubtful stability as the DC amplifiers within them were very difficult to keep stable. With the advent of modern microelectronics these problems have been overcome and now simple pocket instruments are readily and cheaply available. (Fig. 6)

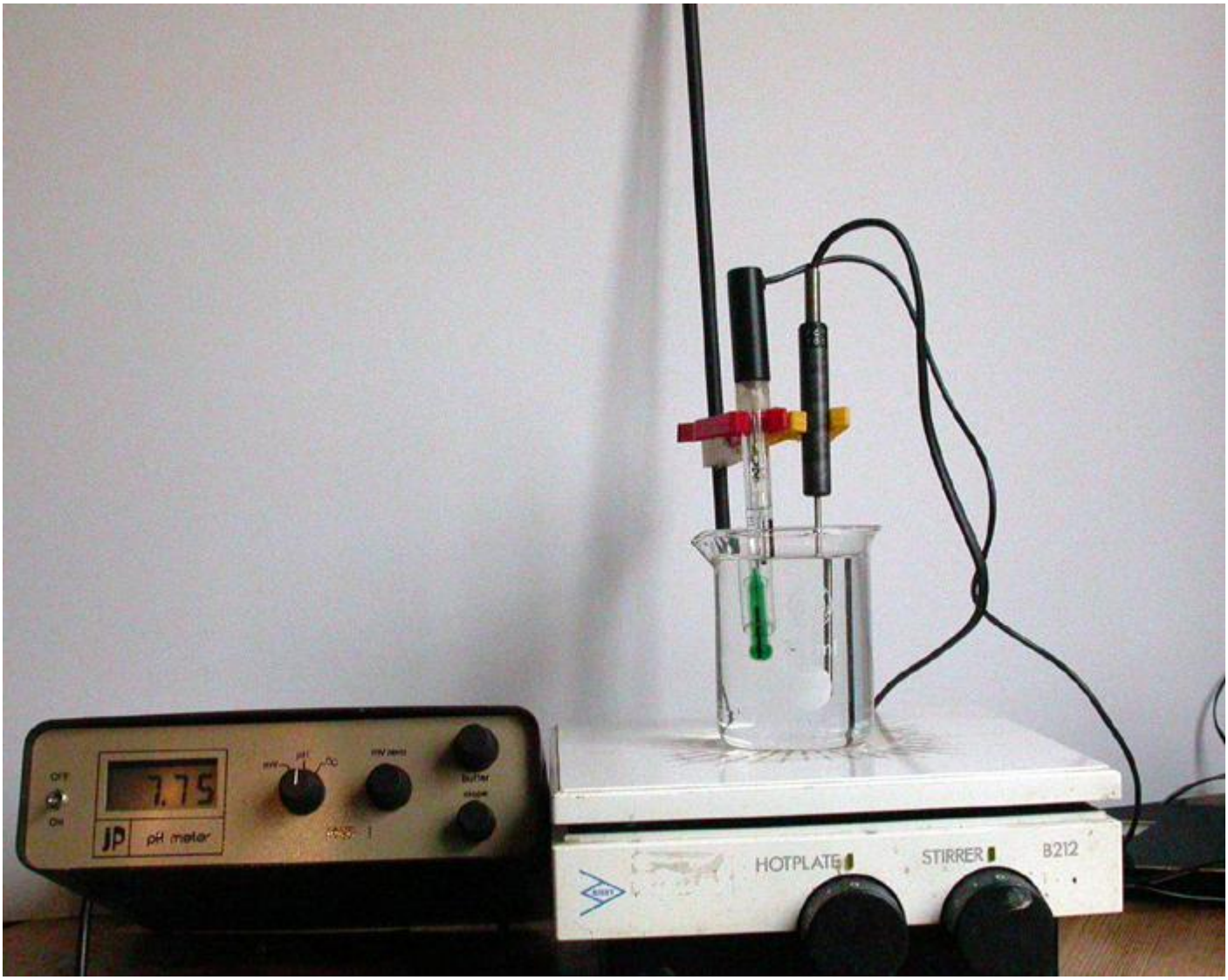


Figure 5.

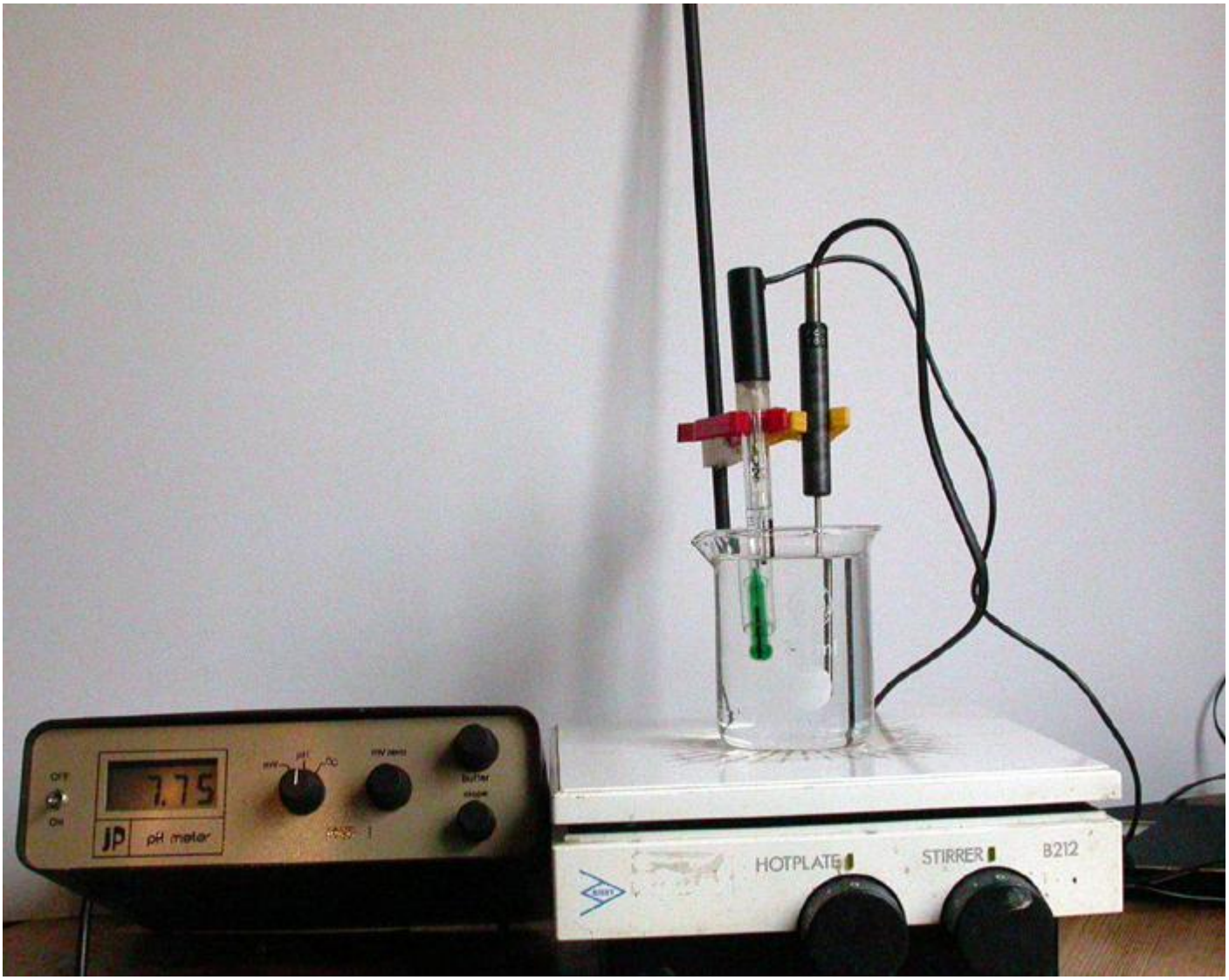
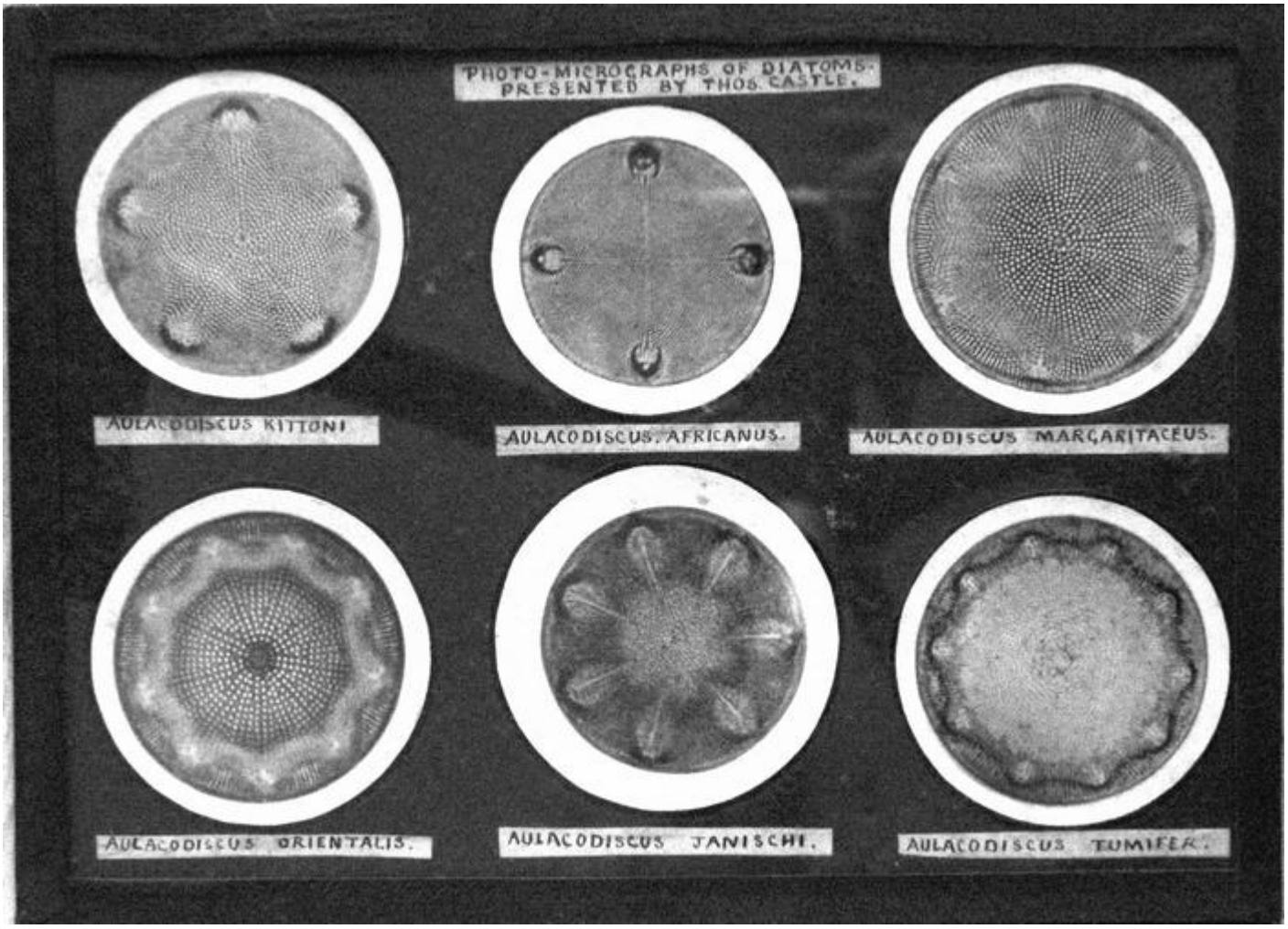


Figure 6.

In order to achieve the greatest accuracy several factors must be taken into account as temperature and high salt concentrations can affect results.

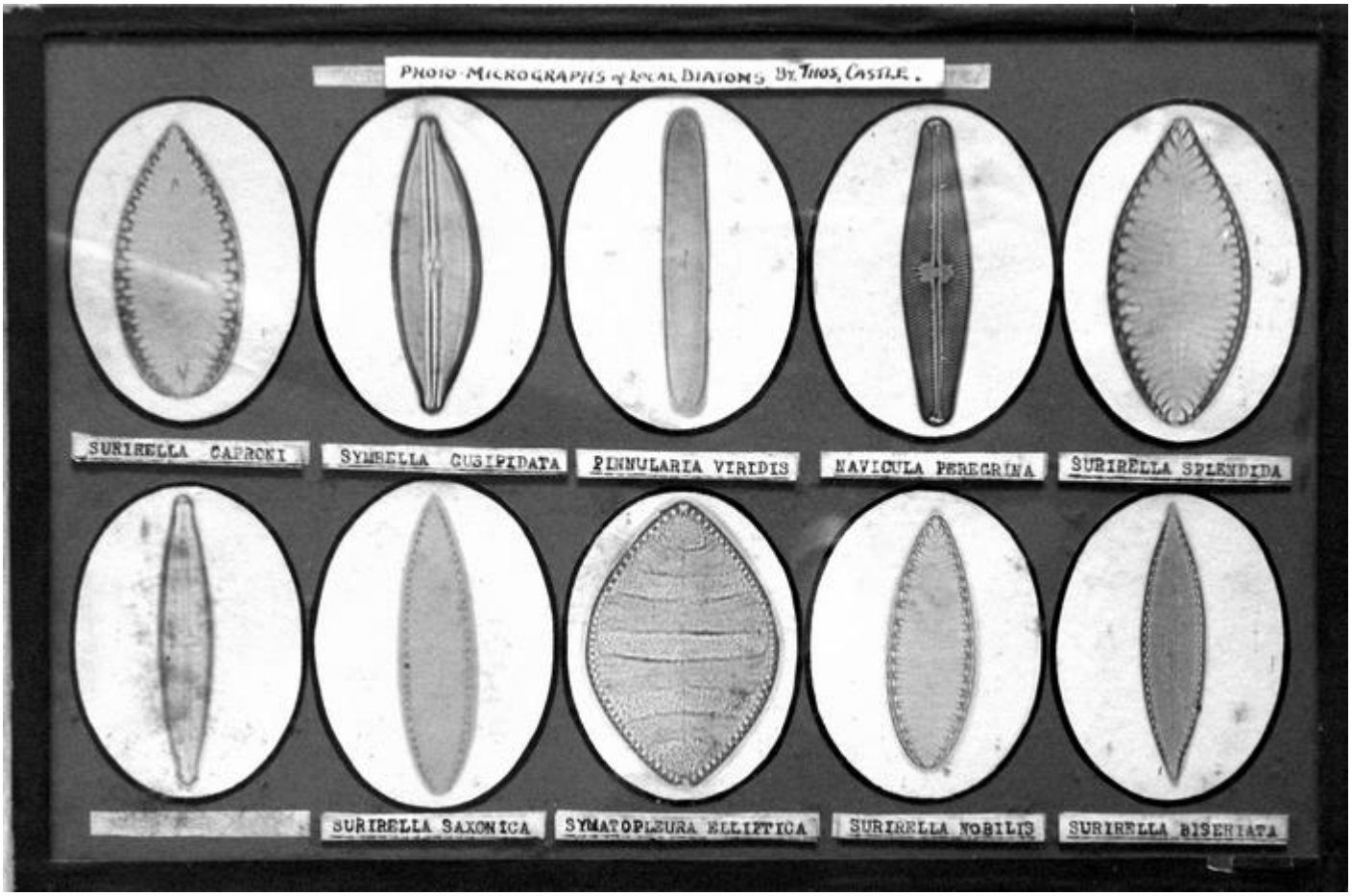
The Work of Thomas Castle

by Steve Gill and Geoff Mold



A few years ago one of the authors (Geoff) acquired a number of mounted photographs, mostly of diatoms.

The photographs were mounted on card (usually 6 to a card) with a protective sheet of glass, the three elements being neatly taped together with a binding tape on all four edges. The resultant 'frame' being 12 inches x 8 inches.



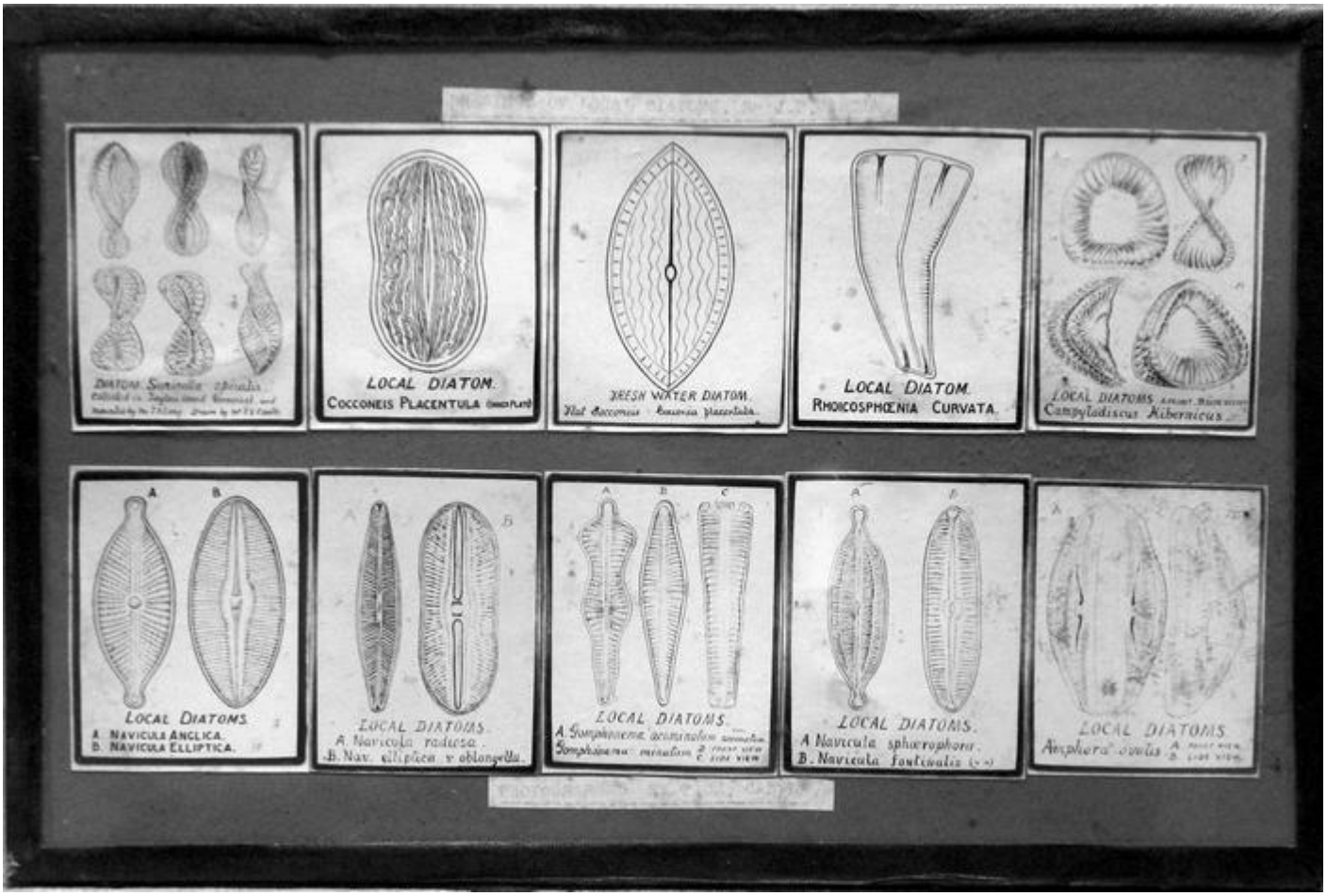
As well as numerous diatoms there were other microscopical subject matter, such as insect scales. Also included were some architectural photographs, some fossils and some shells.

Apart from guessing that Thomas Castle was from the Heckmondwike area of Yorkshire (some of the architectural photographs are from this locale) we didn't have any further information. Searches for photographers with the name Thomas Castle drew a blank.

Some years later a chance reference to his election to the Yorkshire Naturalists Union in 1903 supplied a vital piece of information - an address - Spring Cottage, Norristhorpe Lane, Heckmondwike.

With this scant information it was now possible to trace through the census records and locate this individual. There was still a chance that this person was not the man we were looking for and indeed at first viewing we weren't at all sure. The Thomas Castle of this address in the 1901 Census was recorded as a Worsted Woollen Cloth Designer and his eldest daughters (18 and 16) as Worsted Weavers.

Fortunately, one of the mounted cards also contained some drawings of diatoms, and these bore the information that the diatoms were mounted by J. A. Long and the drawings were by J. E. Castle. In the 1901 Census there was indeed a son John Edward Castle (a Scholar, aged 13) in the household and by the time of the 1911 census he was described as being an Assistant Cloth Designer, and thus presumably schooled in the arts.



It is worth noting that John Albert Long was resident not far from their township.

Further references then came along and we were now sure we had our man.

An advertisement in Exchanges column of the Naturalists' journal and naturalists' guide: Volume 10 (British Field Club - 1901) stated "Thomas Castle, Spring Cottage, Norristhorpe Lane, Heckmondwike, is open to exchange specimens of land, fresh water, or marine shells". and in the same Journal Vol. 11. of 1902 "The Heckmondwike Naturalists' Society. - Feb. 15. Mr. T. Castle presided. Attendance moderate."

In 1906 a reference appeared in The Naturalist:
"YORKSHIRE NATURALISTS AT INGLETON,
May 12-14, 1906.
The Conchological Section was represented by its president,
Mr. W. Denison Roebuck, F.L.S., of Leeds, and its secretary,
Mr. Thomas Castle, of Heckmondwike, and also by Mr.
John Wm Carter, F. E.S., of Bradford. The day was spent in
Helks Wood,..."
Thomas Castle was born on the 8th March 1857 and baptized on the 14th June 1857 at Emmanuel, Lockwood, Yorkshire. His parents were John (a Warp Sizer) and Sarah Ann Castle of Whitehead Common.

At the age of 14 (recorded in the 1871 Census) he was a Woollen Weaver. By 1881 he had become a Worsted Woollen Cloth Designer, a job he held until he ceased working.

He married Sarah Jane Medley in 1880 and together they had 6 children, including the aforementioned John Edward Castle.

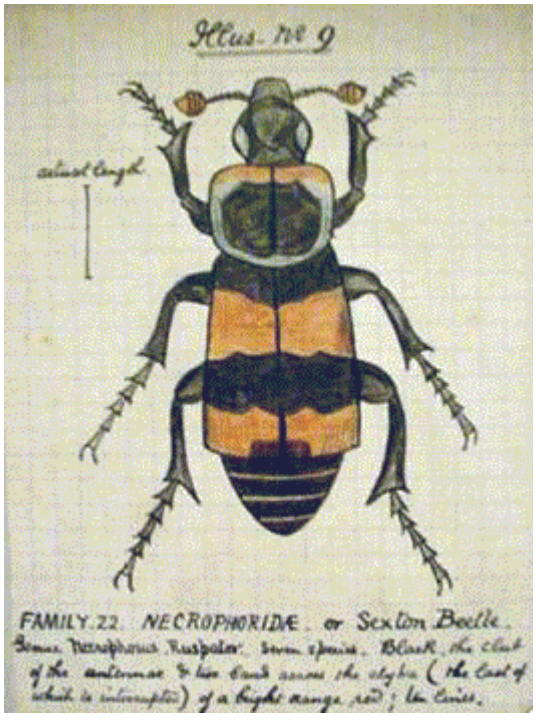
His interests obviously spanned a large number of disciplines, including diatoms and photography. In 1903 his botanical interest is recorded in the following cuttings from the Naturalist 1903 and Nature Study 1903.

FLOWERING PLANTS.

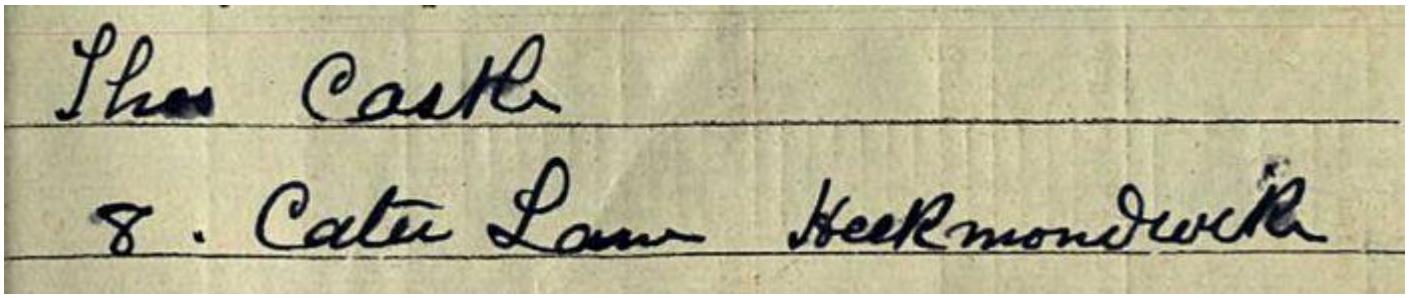
Abnormal Figwort in Spen Valley.—During the past week I found on the banks of the Spen at Smithies, Heckmondwike, an abnormal specimen of Figwort (*Scrophularia nodosa* L.) growing near normal plants of this species. Instead of having the usual square stem and decussate leaves, this plant has a six-sided stem and a whorl of three leaves at each node. The leaves of a whorl spring from alternate faces, and alternate with each other at succeeding nodes from the base of the stem upwards. This arrangement is continued to the inflorescence, a branch arising in the axil of each of the three bracts of a whorl. The specimen has been placed under the care of Mr. J. Ackroyd, recorder of the Heckmondwike Naturalists' Society.—T. CASTLE, Heckmondwike, 6th July 1903.

Figwort Freak.—Early in July I found on the banks of the River Spen, at Smithies, Heckmondwike, a curious plant of the common Figwort, growing near others of the same species. It had a six-sided stem, with three leaves at each joint, arising from alternate sides of the six-sided stem to those immediately above or below, which arrangement obtains from the root to the apex of the plant. There is also an absence of the usual leafy bracts and flower stalks arising from the axils of the leaves, the flowers, which are identical with the common form, growing in the usual terminal pannicle at the apex of the stem, and the only noticeable difference in the leaves is a lighter shade of green. Anyone interested may have permission to examine the above, which has been placed in the care of the recorder of the society—Mr. J. Ackroyd, King Street, Heckmondwike.—THOS. CASTLE, President.

Further information might at some time be forthcoming by virtue of the fact that he is recorded above as being President of the Heckmondwike Naturalists' Society and if any records are still extant a little more detail of his life can be later printed. He also drew insects.



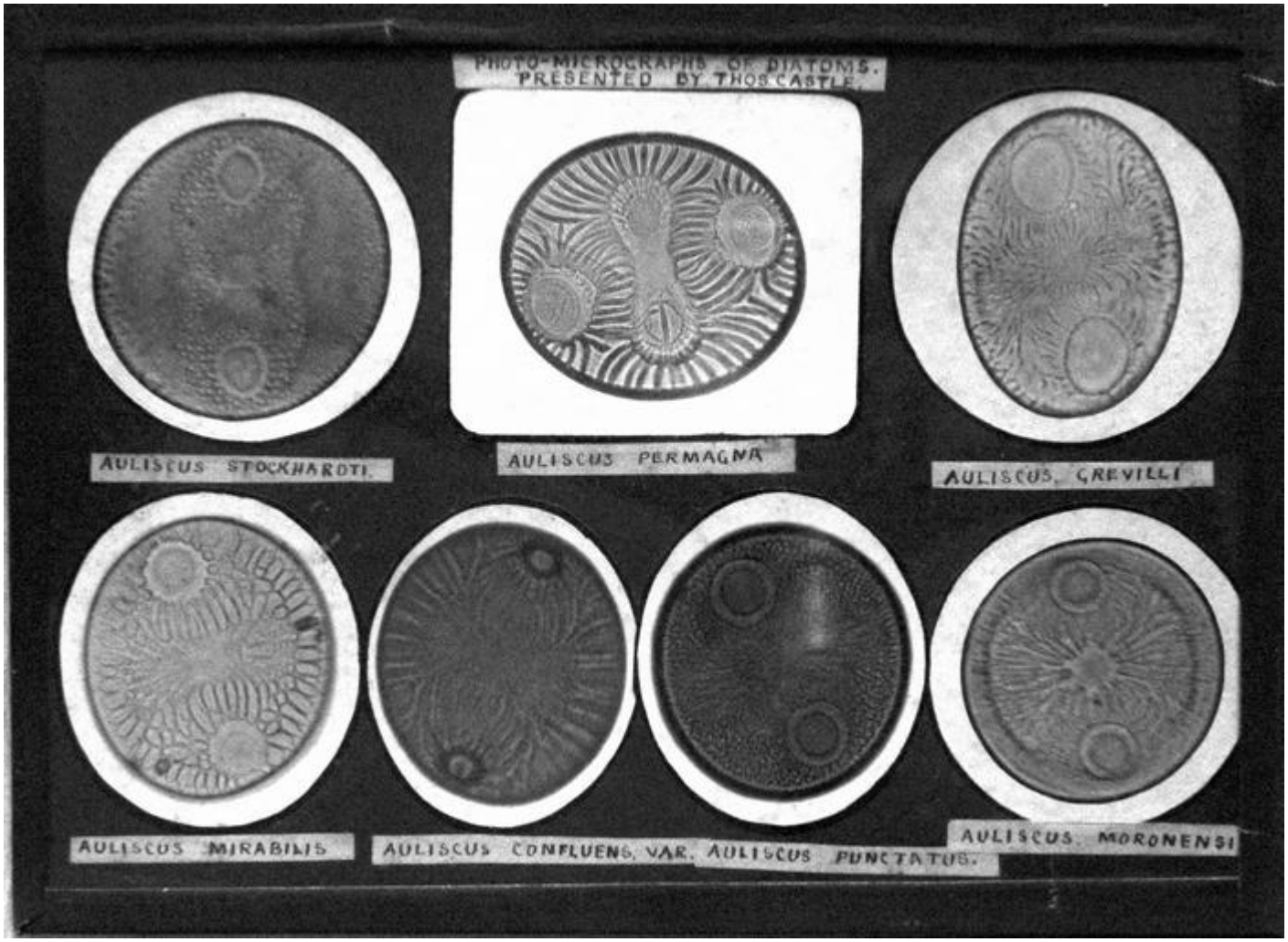
In 1911 he was living at 8 Cater Lane, Heckmondwike.

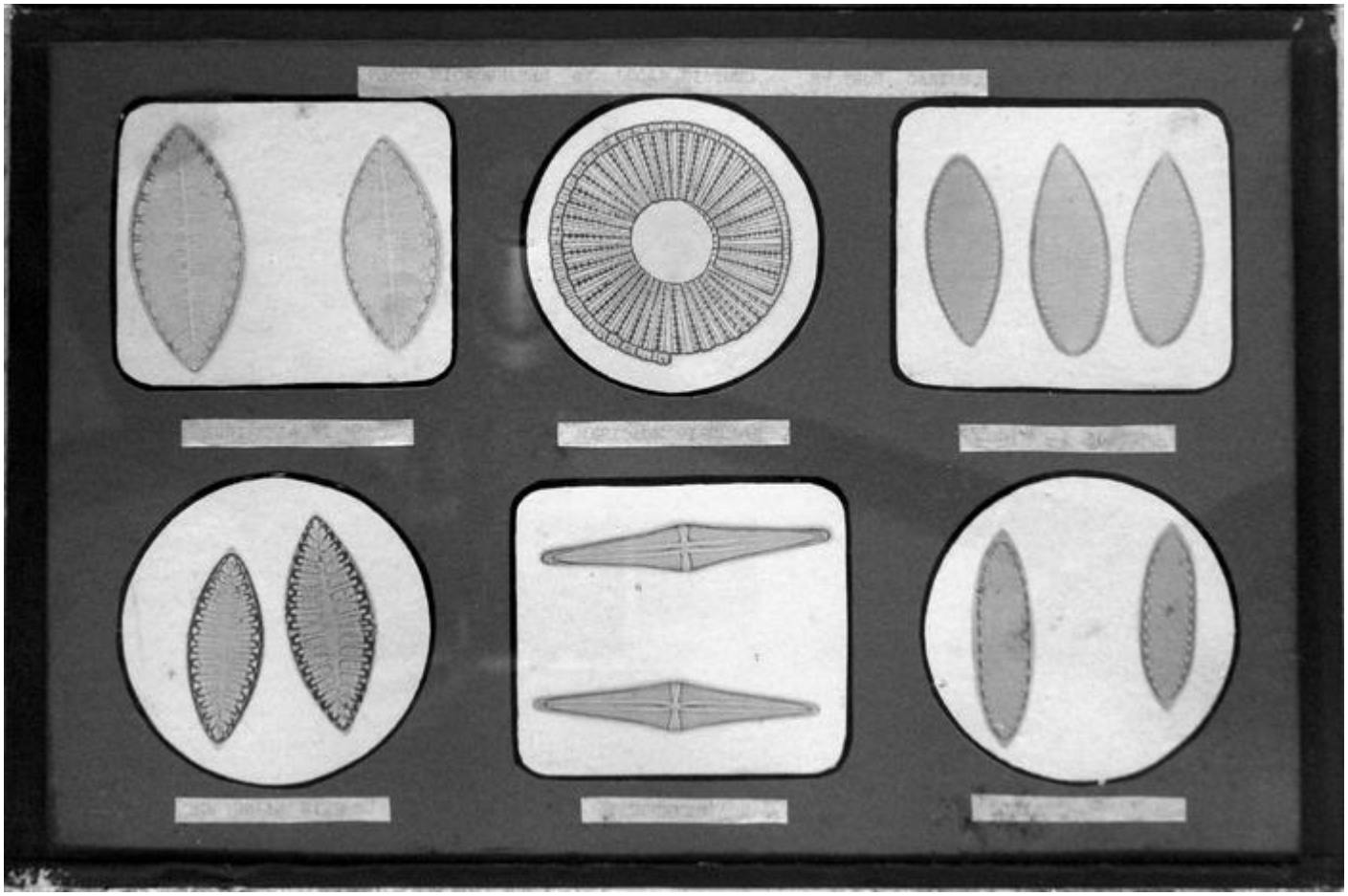


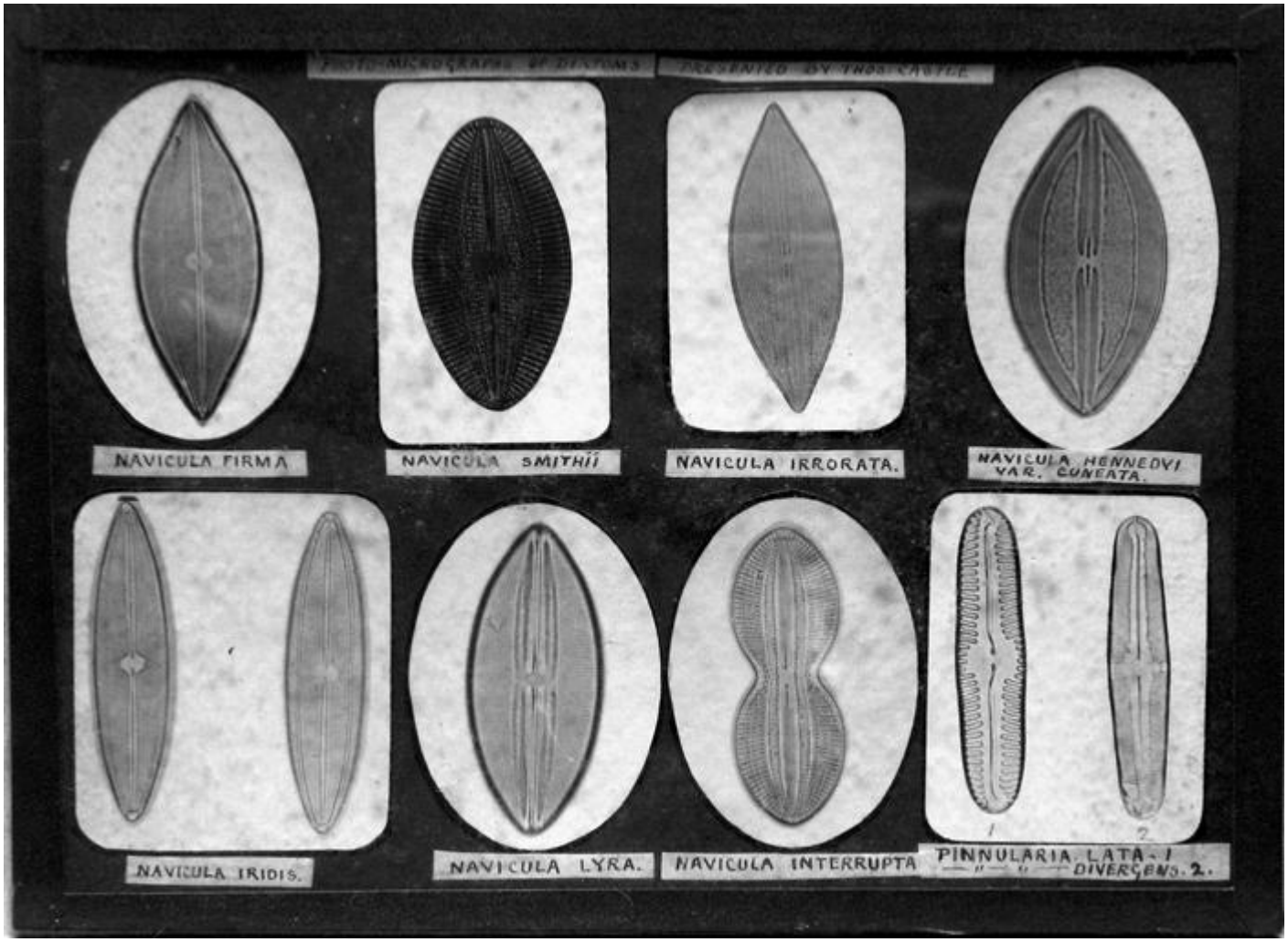
Thomas Castle signature - 1911 census

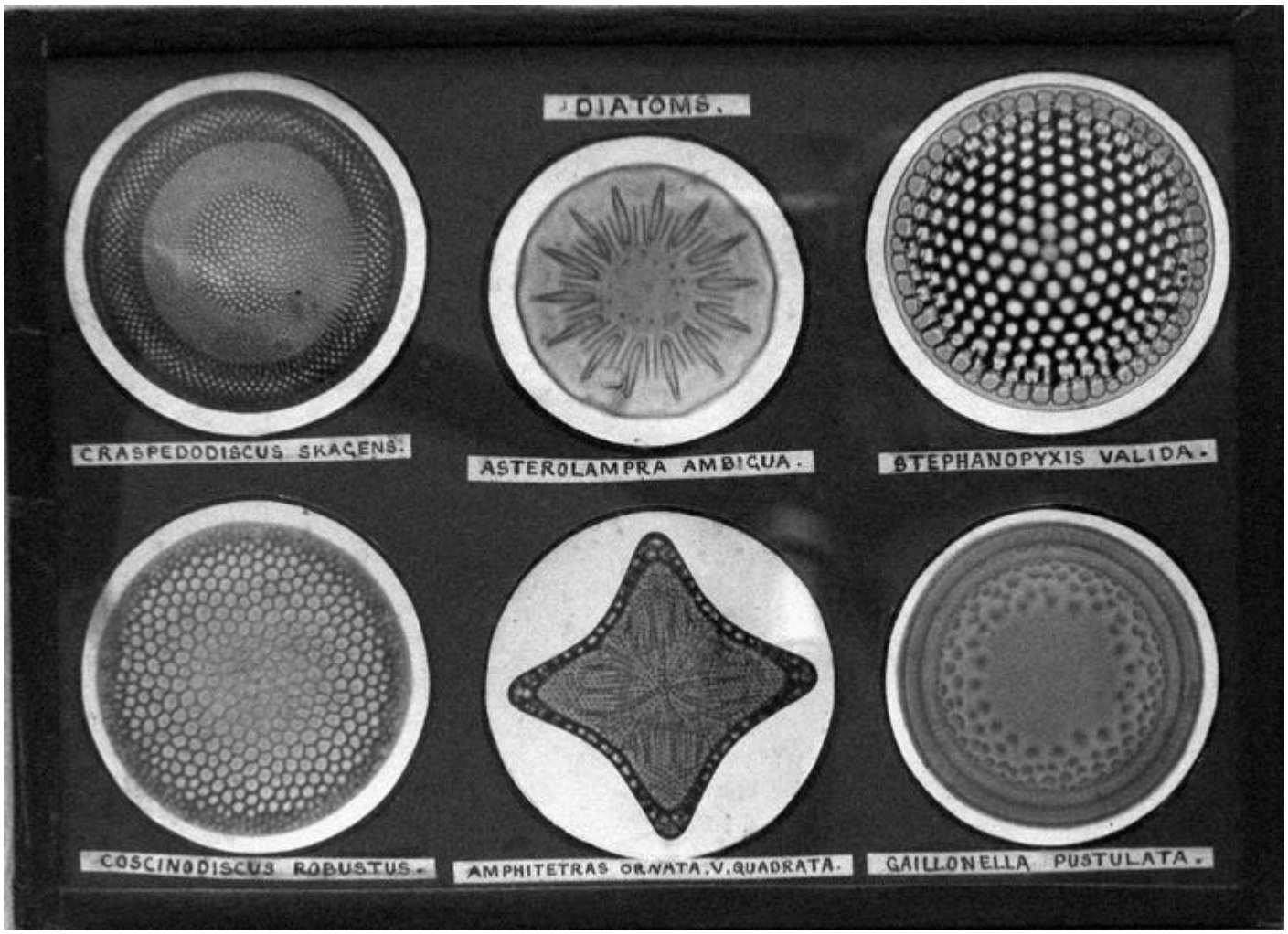
He died on the 17th March 1930 when at 86 Huddersfield Road, Liversedge. His wife, Sarah Jane, died shortly thereafter, on 1st December 1932.

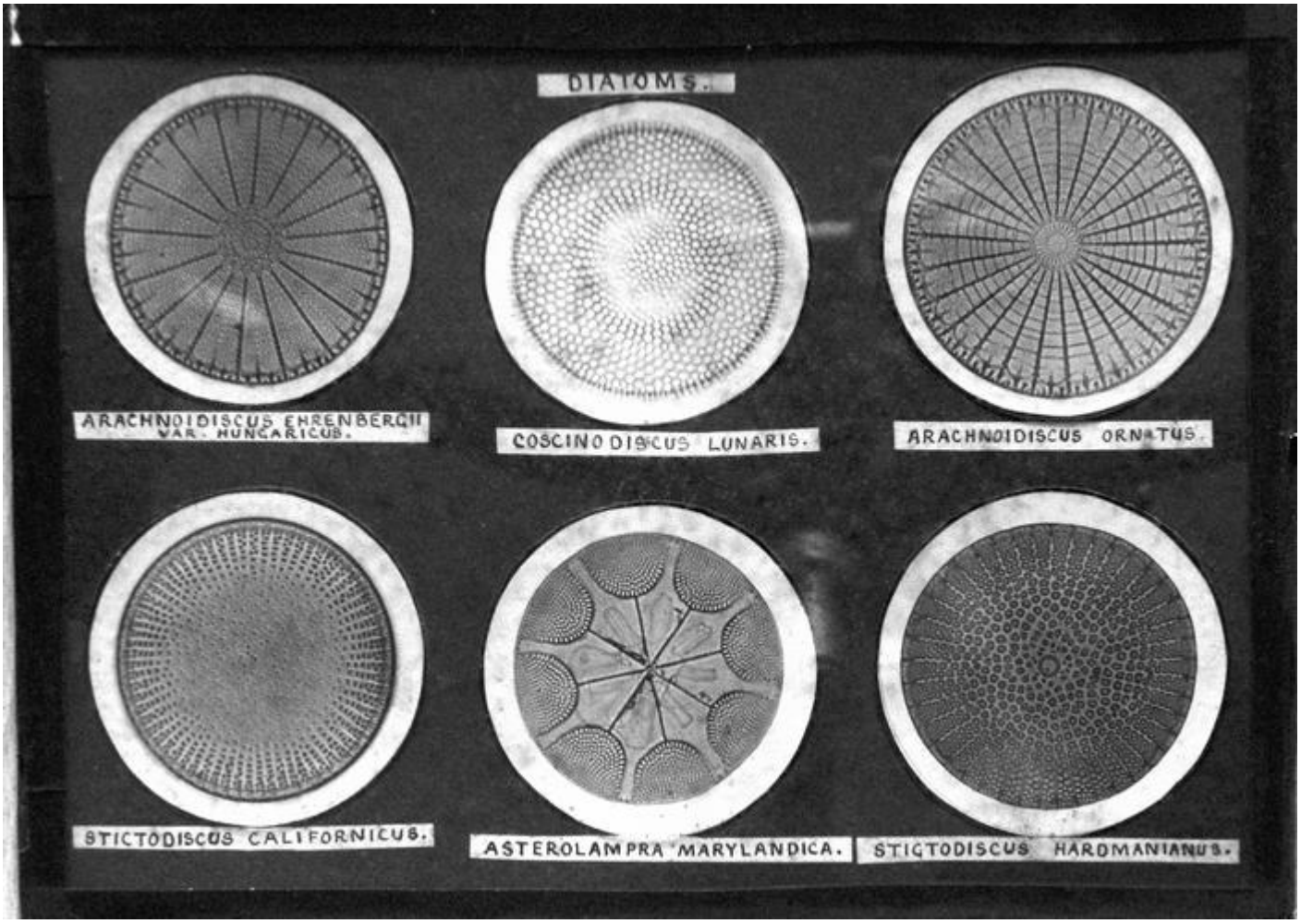
The images below are samples of the mounted cards.

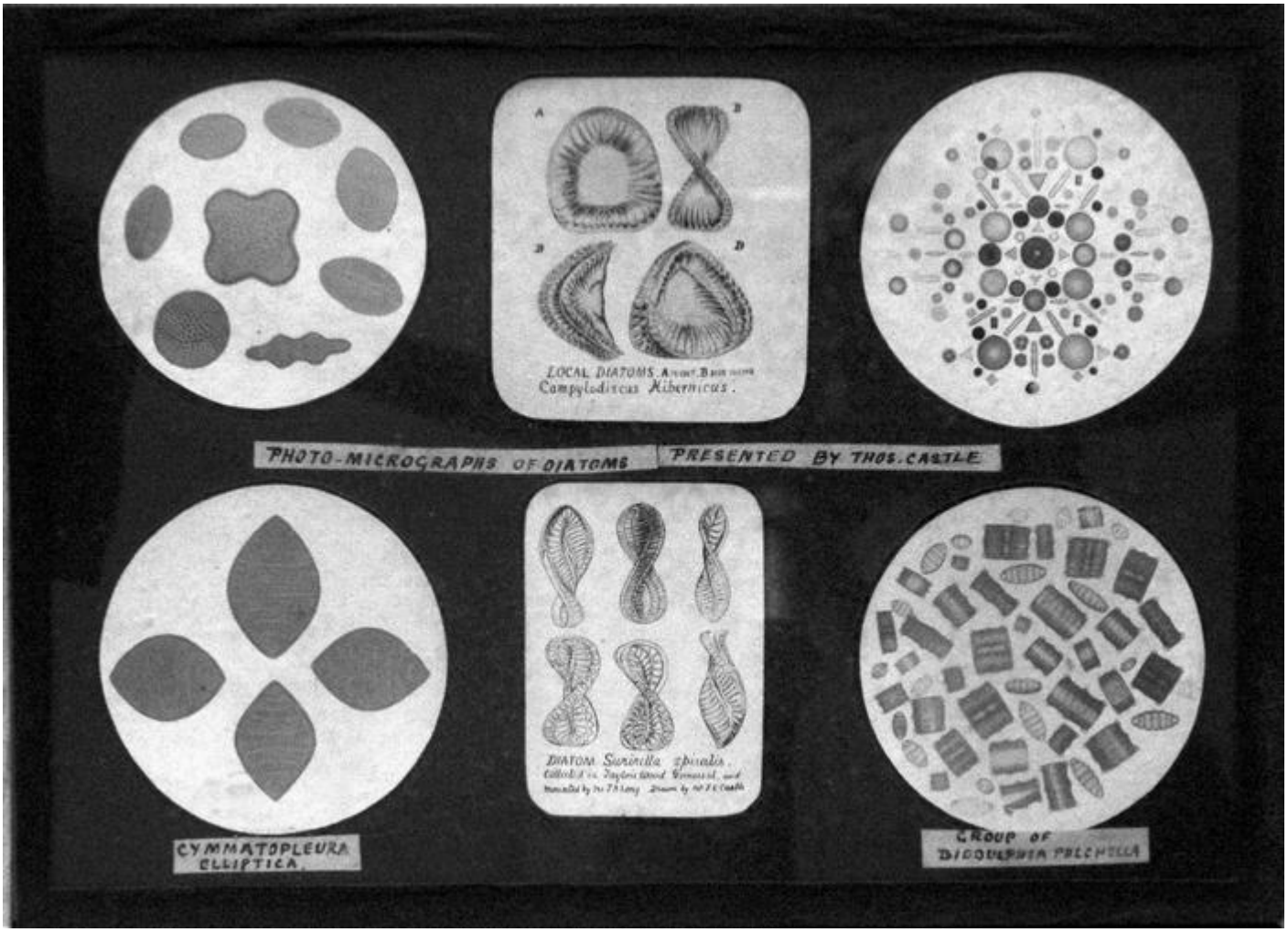


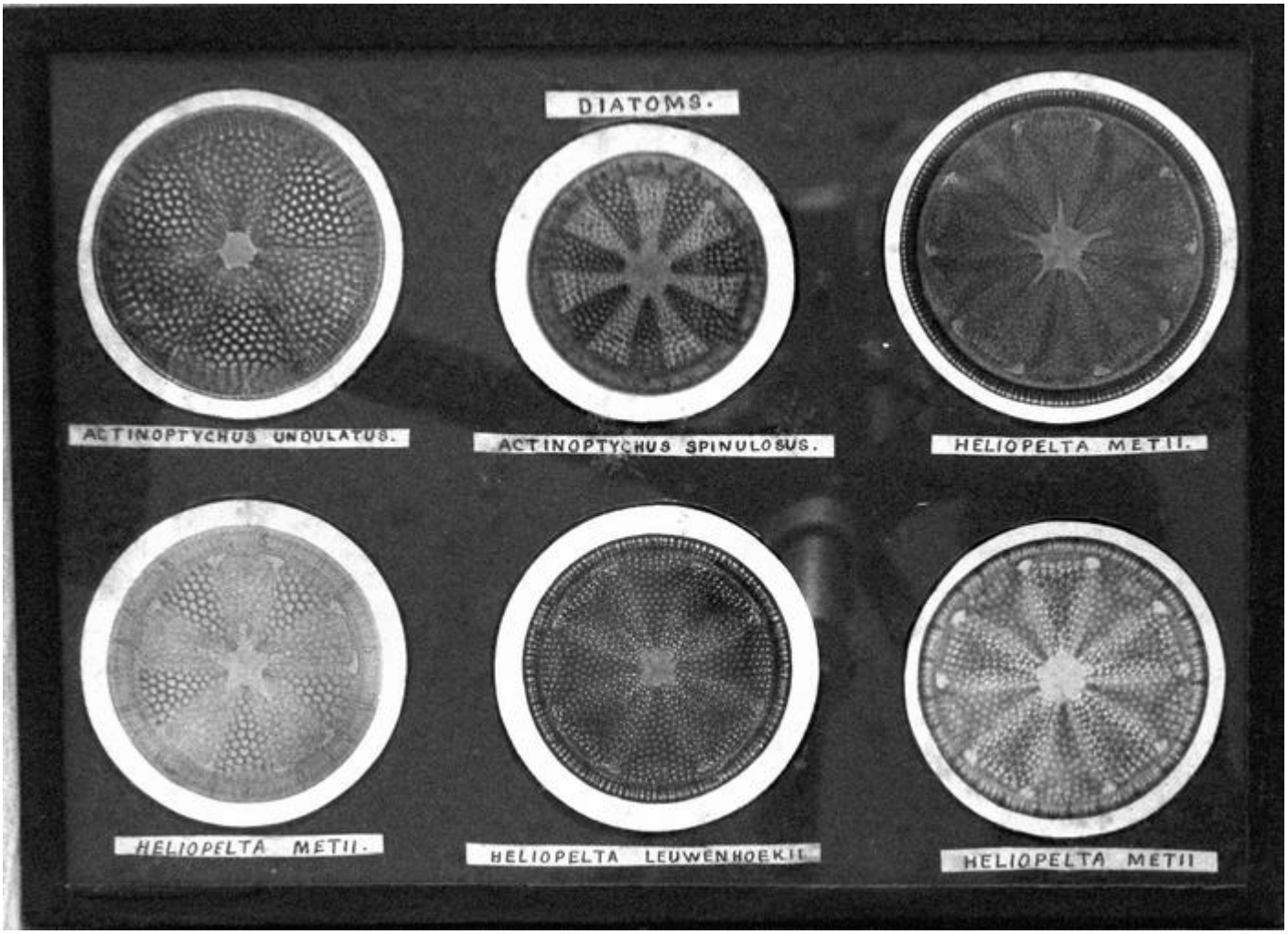


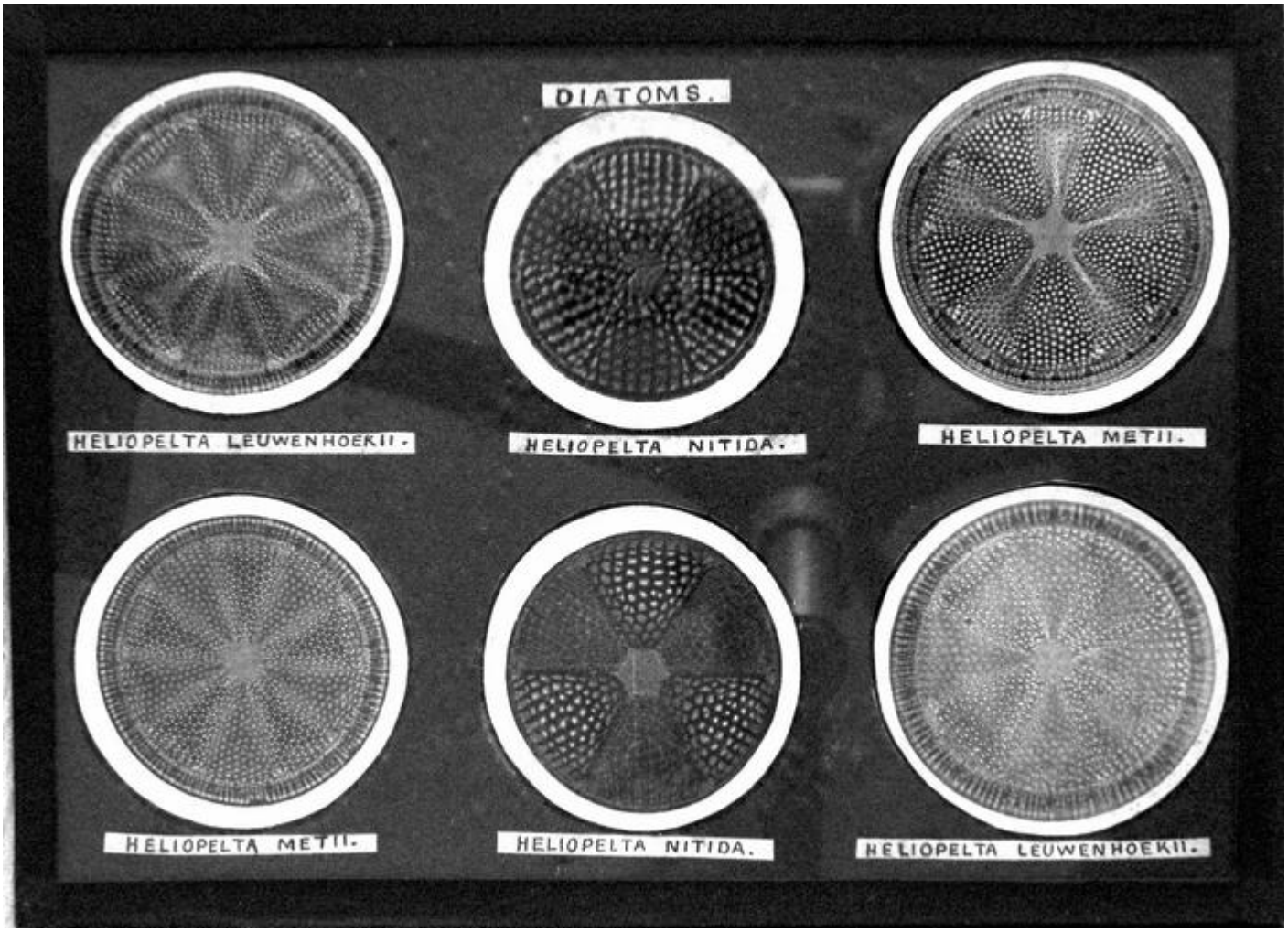

NAVICULA FIRMA
NAVICULA SMITHII
NAVICULA IRRORATA.
NAVICULA HENNEDVI VAR. CONFATA.
NAVICULA IRIDIS.
NAVICULA LYRA.
NAVICULA INTERRUPTA
PINNULARIA LATA - 1
" " DIVERGENS - 2.

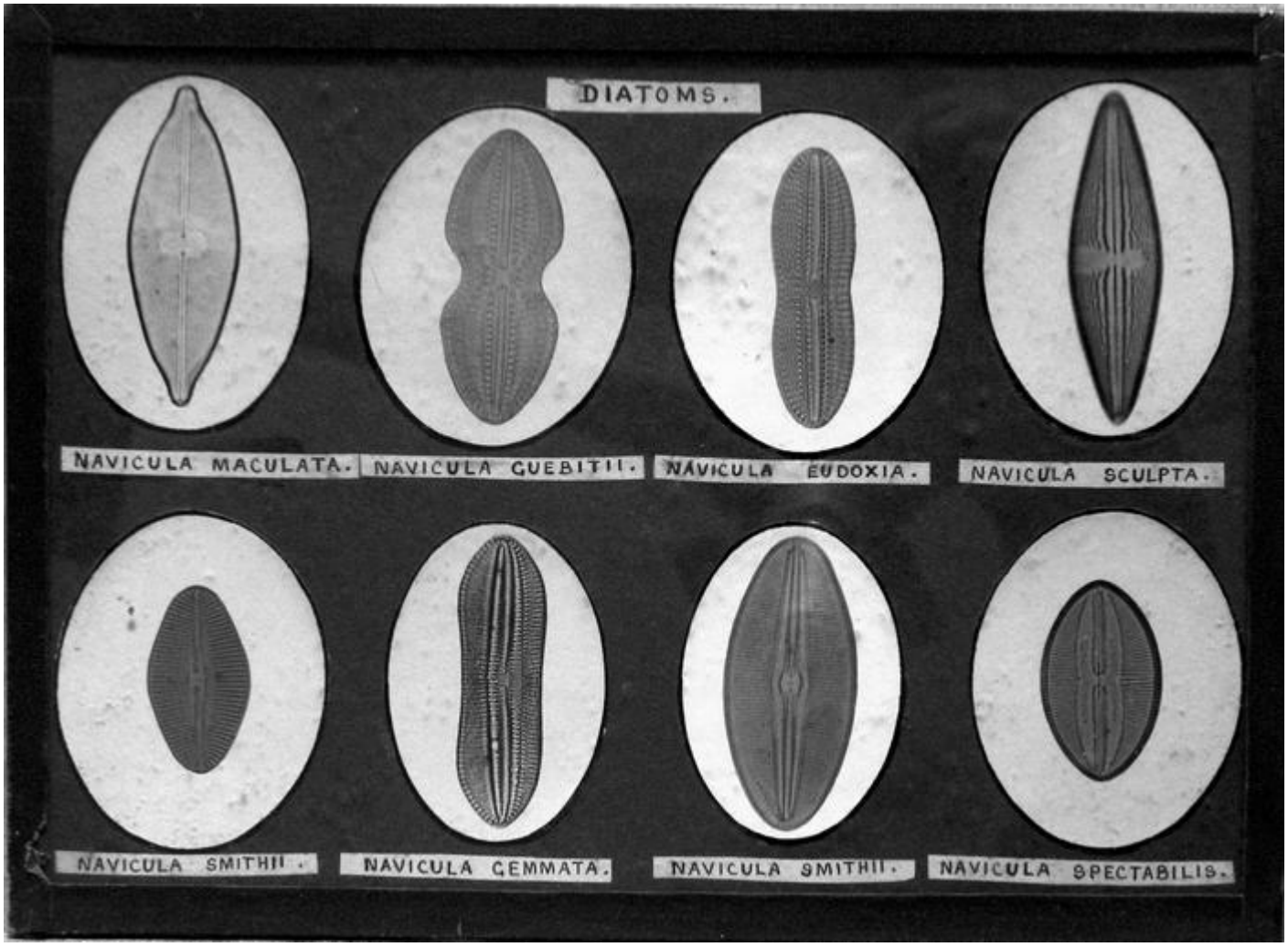

DIATOMS.
CRASPEDODISCUS SKAGENS.
ASTEROLAMPRA AMBIGUA.
STEPHANOPYXIS VALIDA.
COSCINODISCUS ROBUSTUS.
AMPHITETRAS ORNATA, V. QUADRATA.
GAILLONELLA PUSTULATA.


DIATOMS.
ARACHNOIDISCUS EHRENBERGII VAR. HUNGARICUS.
COSCINODISCUS LUNARIS.
ARACHNOIDISCUS ORNATUS.
STICTODISCUS CALIFORNICUS.
ASTEROLAMPRA MARYLANDICA.
STICTODISCUS HARDMANIANUS.


LOCAL DIATOMS. A front. B side view
Campylodiscus Hibernicus.
PHOTO-MICROGRAPHS OF DIATOMS
PRESENTED BY THOS. CASTLE
DIATOM Surirella spiralis.
CYMMATOPLEURA ELLIPTICA
GROUP OF DIDYMOSPHENIA GEMINATA


DIATOMS.
ACTINOPTYCHUS UNDULATUS.
ACTINOPTYCHUS SPINULOSUS.
HELIOPELTA METII.
HELIOPELTA METII.
HELIOPELTA LEUWENHOEKII.
HELIOPELTA METII


DIATOMS.
HELIOPELTA LEUWENHOEKII.
HELIOPELTA NITIDA.
HELIOPELTA METII.
HELIOPELTA METII.
HELIOPELTA NITIDA.
HELIOPELTA LEUWENHOEKII.


DIATOMS.
NAVICULA MACULATA.
NAVICULA QUEBITII.
NAVICULA EUDOXIA.
NAVICULA SCULPTA.
NAVICULA SMITHII.
NAVICULA GEMMATA.
NAVICULA SMITHII.
NAVICULA SPECTABILIS.

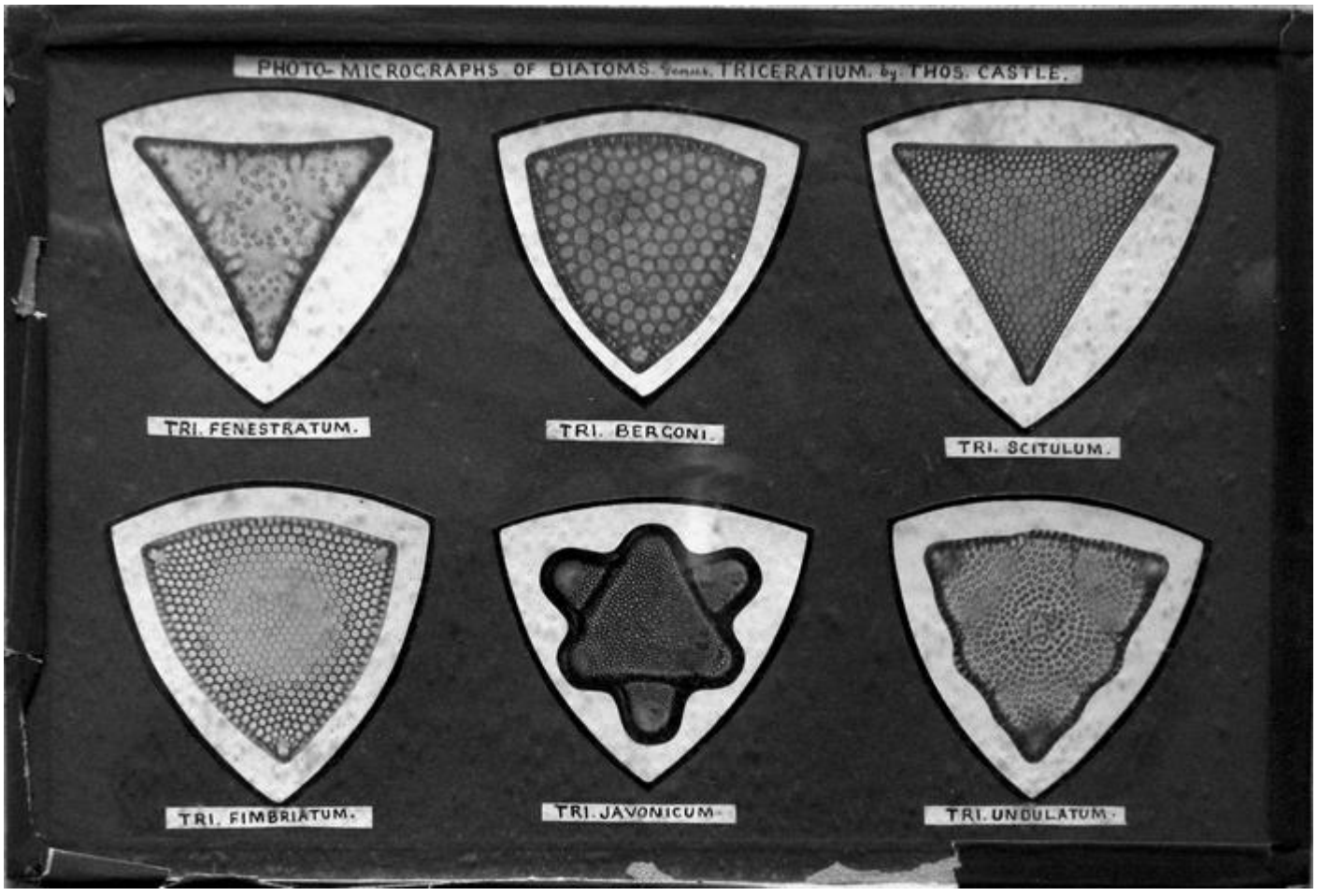
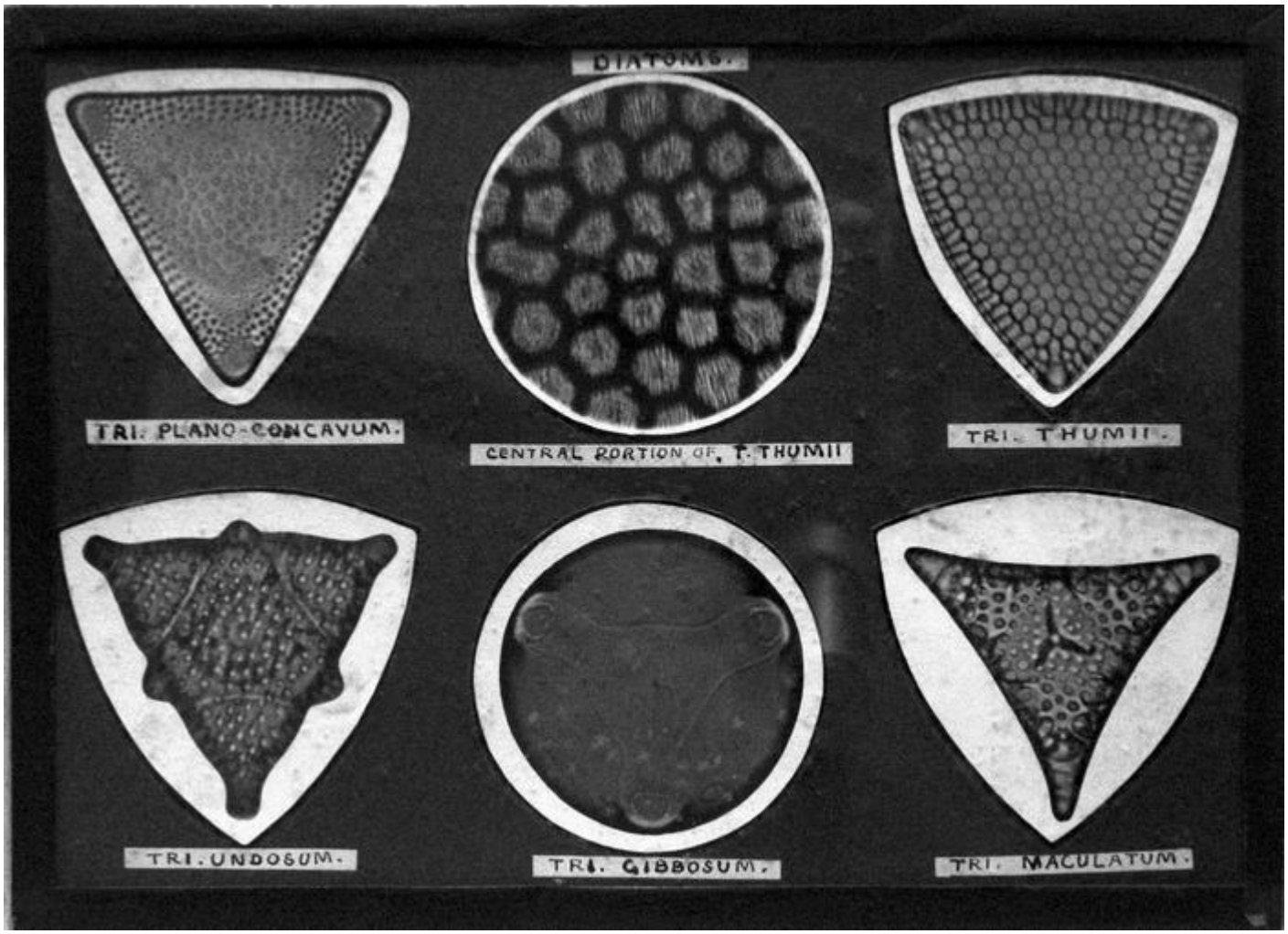
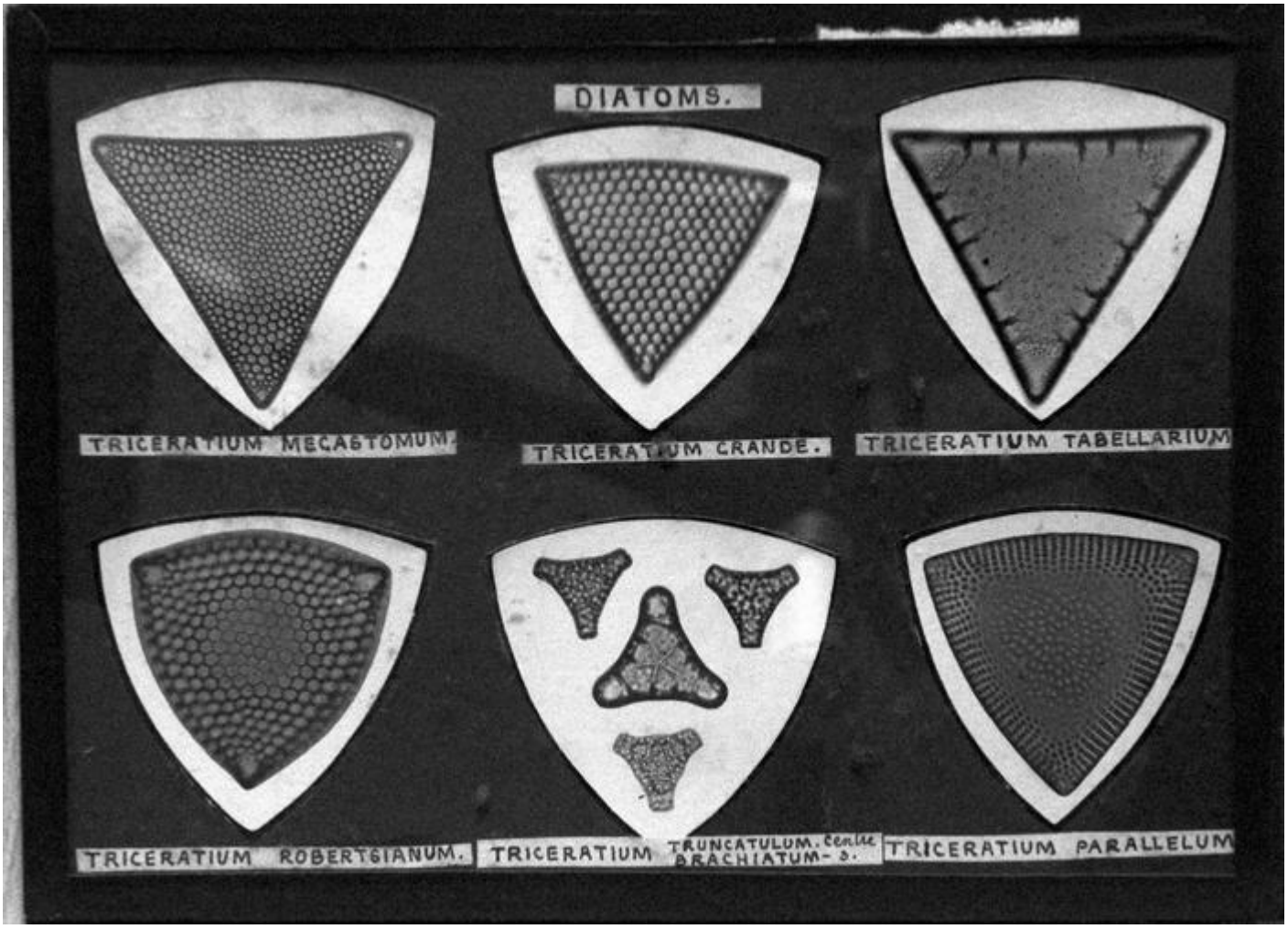
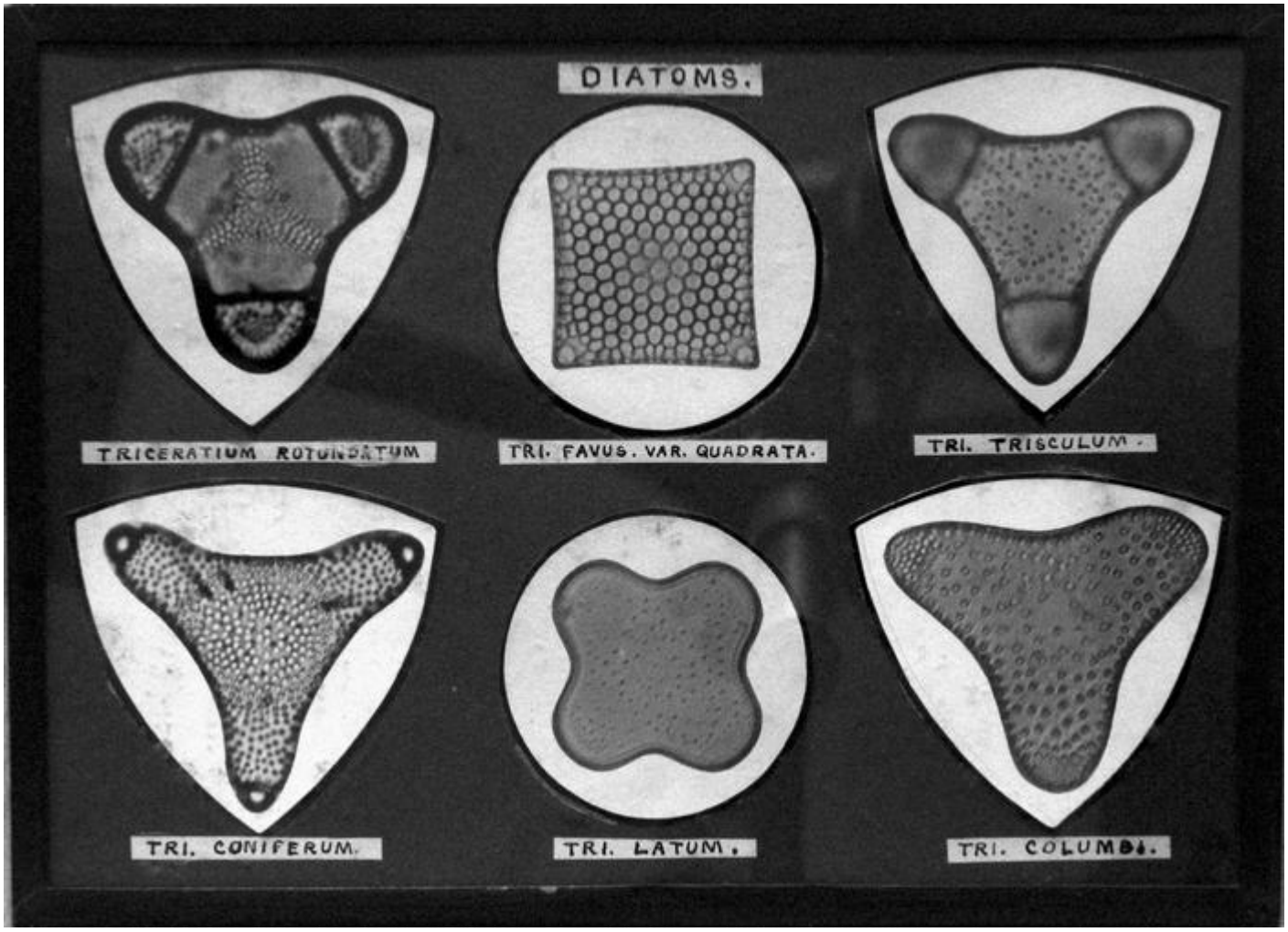
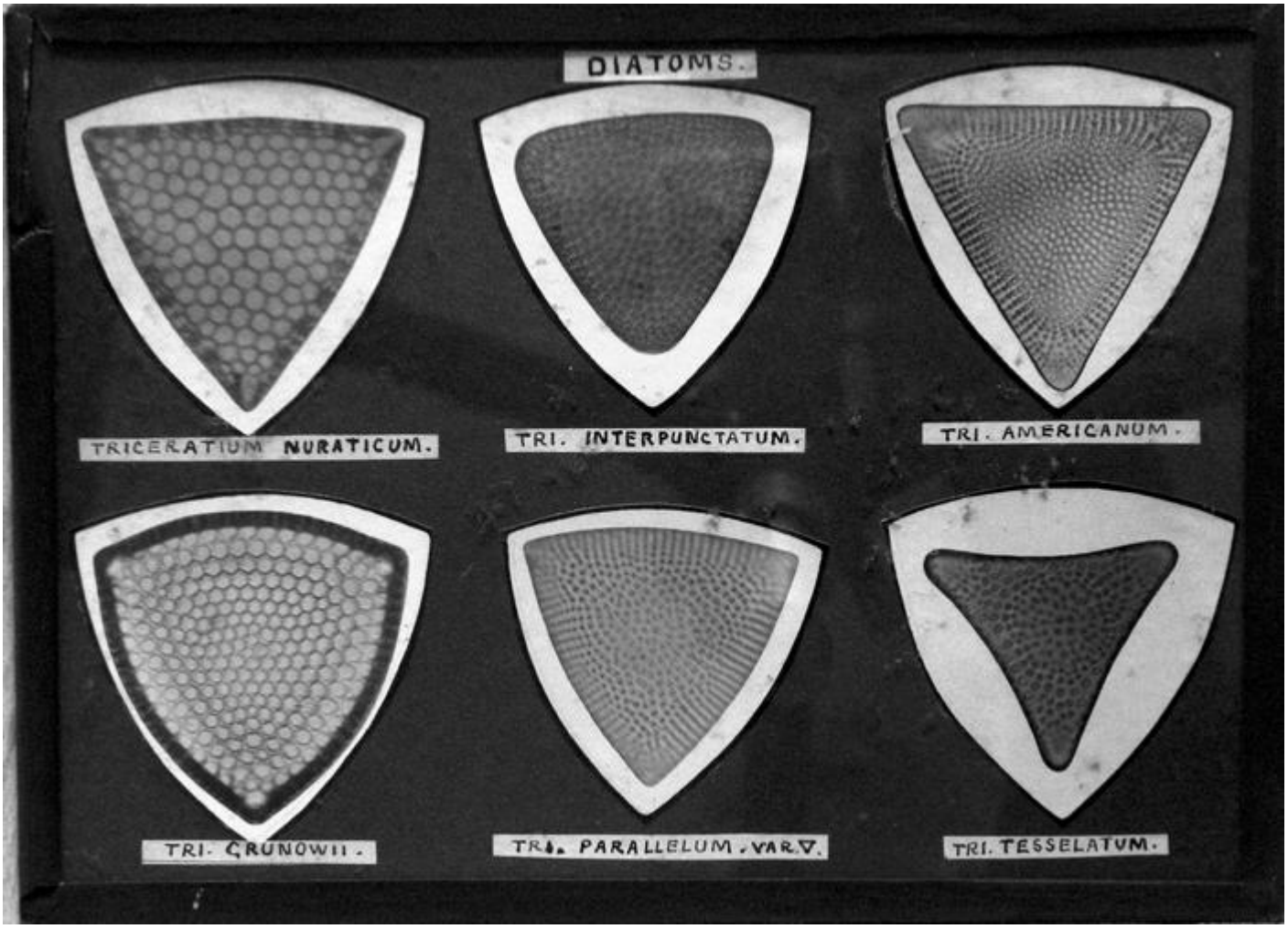


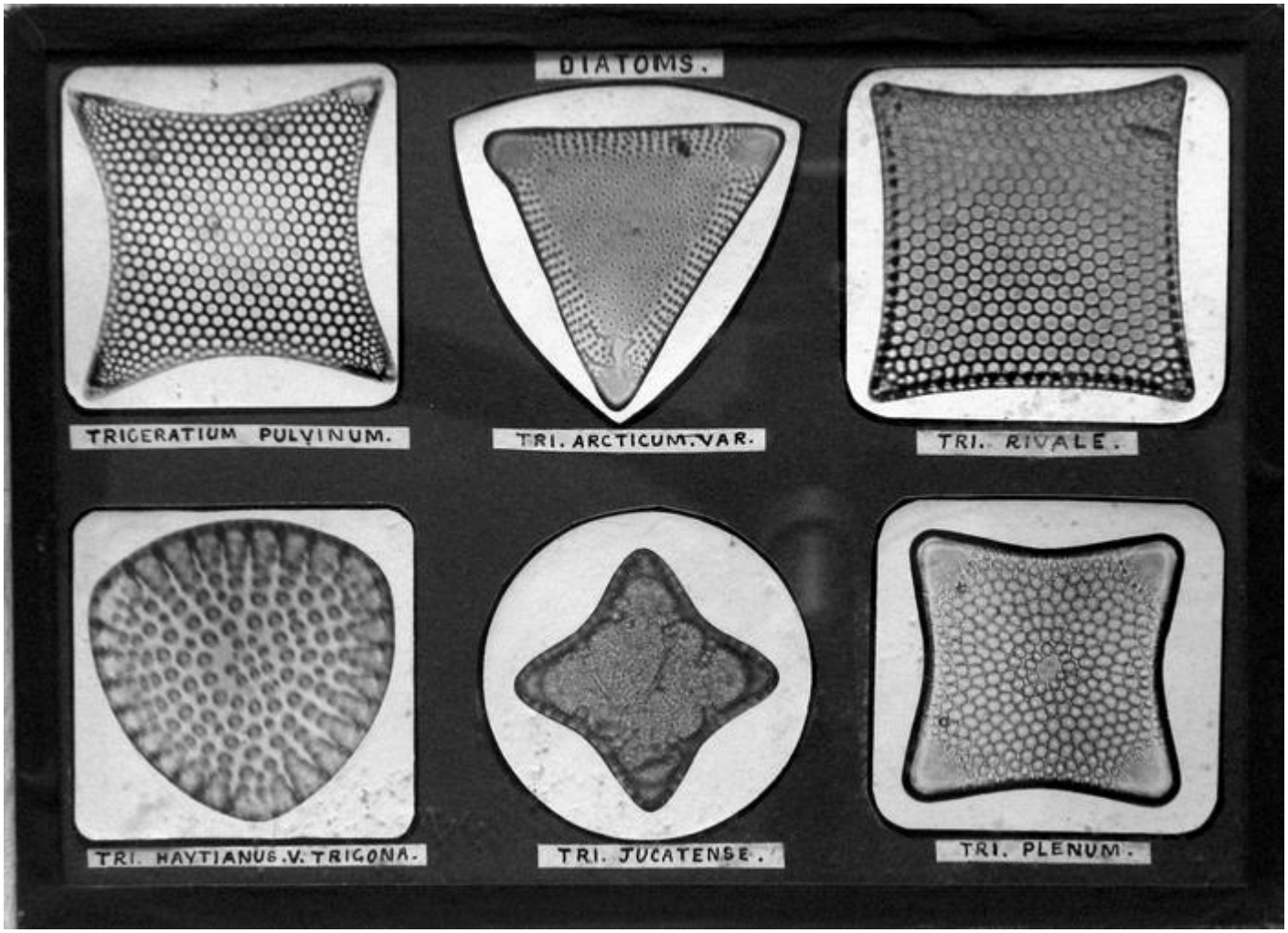
PHOTO-MICROGRAPHS OF DIATOMS. Genus. TRICERATIUM. by THOS. CASTLE.
TRI. FENESTRATUM.
TRI. BERGONI.
TRI. SCITULUM.
TRI. FIMBRIATUM.
TRI. JAVONICUM.
TRI. UNDULATUM.


DIATOMS.
TRI. PLANO-CONCAVUM.
CENTRAL PORTION OF T. THUMII
TRI. THUMII.
TRI. UNDOSUM.
TRI. GIBBOSUM.
TRI. MACULATUM.


DIATOMS.
TRICERATIUM MECASTOMUM.
TRICERATIUM GRANDE.
TRICERATIUM TABELLARIUM
TRICERATIUM ROBERTSIANUM.
TRICERATIUM TRUNCATULUM. Centre BRACHIATUM- s.
TRICERATIUM PARALLELUM


DIATOMS.
TRICERATIUM ROTUNDATUM
TRI. FAVUS. VAR. QUADRATA.
TRI. TRISCULUM.
TRI. CONIFERUM.
TRI. LATUM.
TRI. COLUMBI.


DIATOMS.
TRICERATIUM NURATICUM.
TRI. INTERPUNCTATUM.
TRI. AMERICANUM.
TRI. GRUNOWII.
TRI. PARALLELUM. VAR. V.
TRI. TESSELATUM.


DIATOMS.
TRICERATIUM PULVINUM.
TRI. ARCTICUM. VAR.
TRI. RIVALE.
TRI. HAYTIANUS. V. TRIGONA.
TRI. JUCATENSE.
TRI. PLENUM.

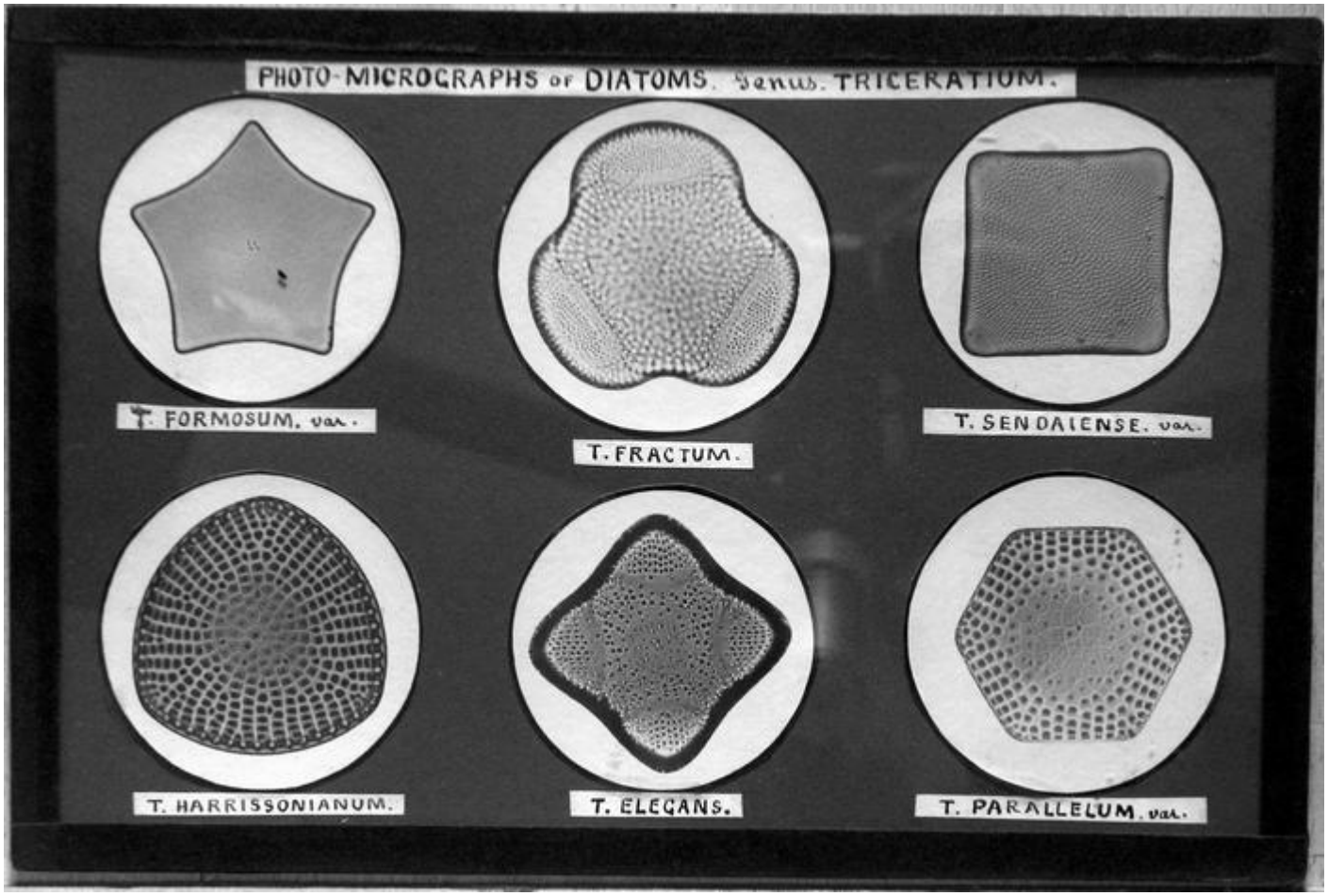


PHOTO-MICROGRAPHS OF DIATOMS. Genus. TRICERATIUM.
T. FORMOSUM. var.
T. FRACTUM.
T. SENDAIENSE. var.
T. HARRISSONIANUM.
T. ELEGANS.
T. PARALLELUM. var.

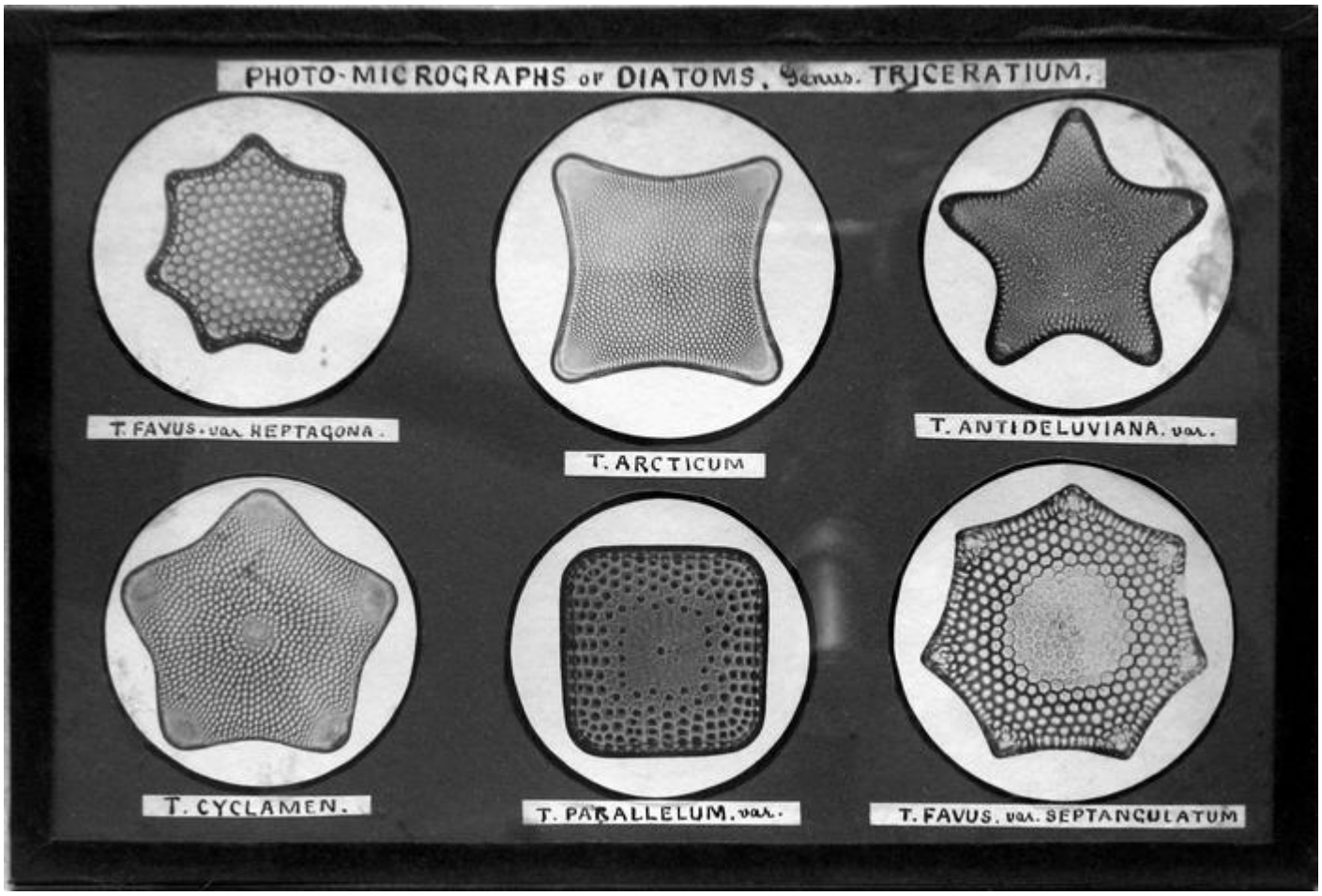


PHOTO-MICROGRAPHS OF DIATOMS, Genus. TRICERATIUM.
T. FAVUS. var. HEPTAGONA.
T. ARCTICUM
T. ANTIDELUVIANA. var.
T. CYCLAMEN.
T. PARALLELUM. var.
T. FAVUS. var. SEPTANGULATUM

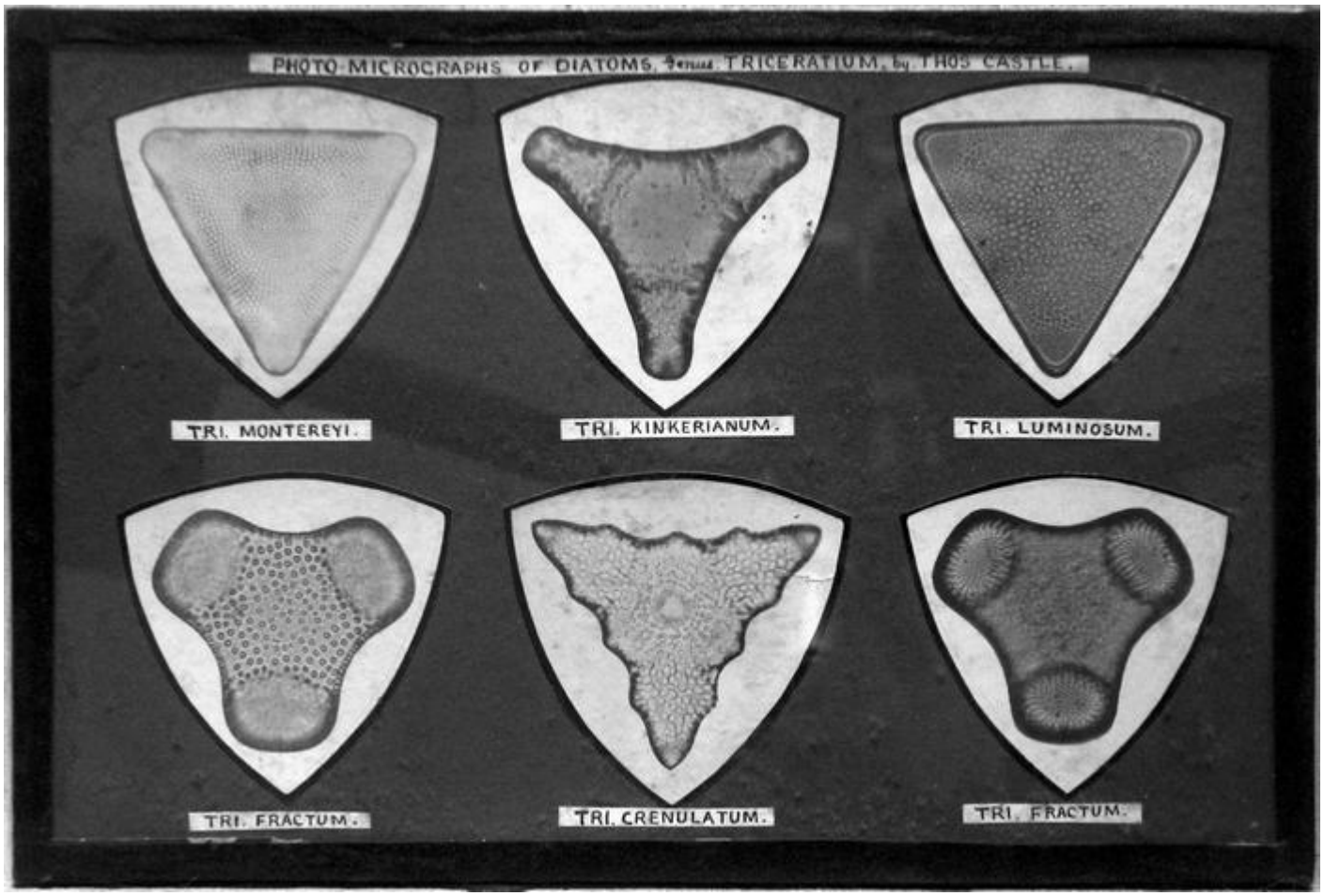


PHOTO-MICROGRAPHS OF DIATOMS, Genus TRICERATIUM. By THOS CASTLE.
TRI. MONTEREYI.
TRI. KINKERIANUM.
TRI. LUMINOSUM.
TRI. FRACTUM.
TRI. CRENULATUM.
TRI. FRACTUM.

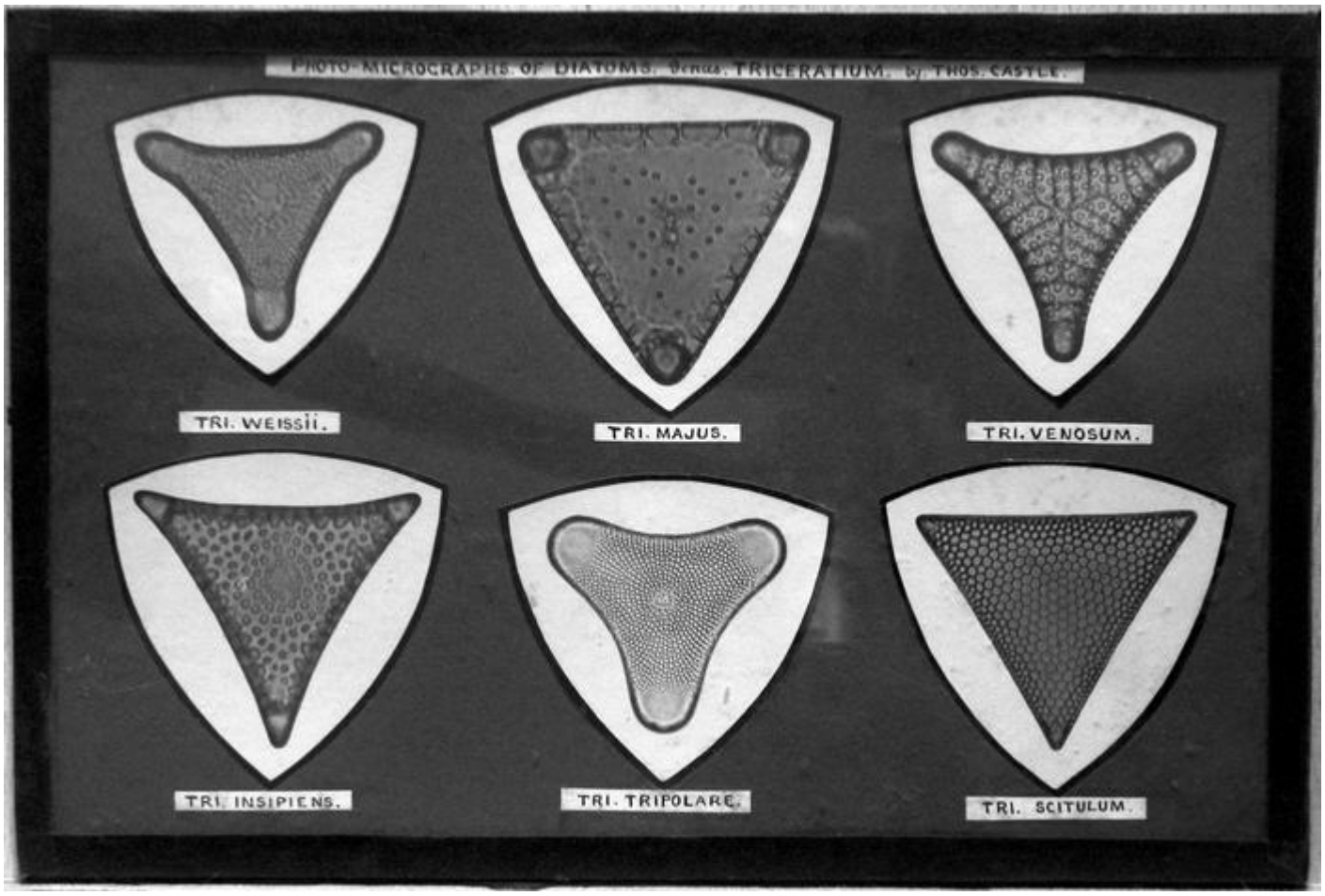


PHOTO-MICROGRAPHS OF DIATOMS: GENUS TRICERATIUM. BY THOS. CASTLE.
TRI. WEISSII.
TRI. MAJUS.
TRI. VENOSUM.
TRI. INSIPIENS.
TRI. TRIPOLARE.
TRI. SCITULUM.

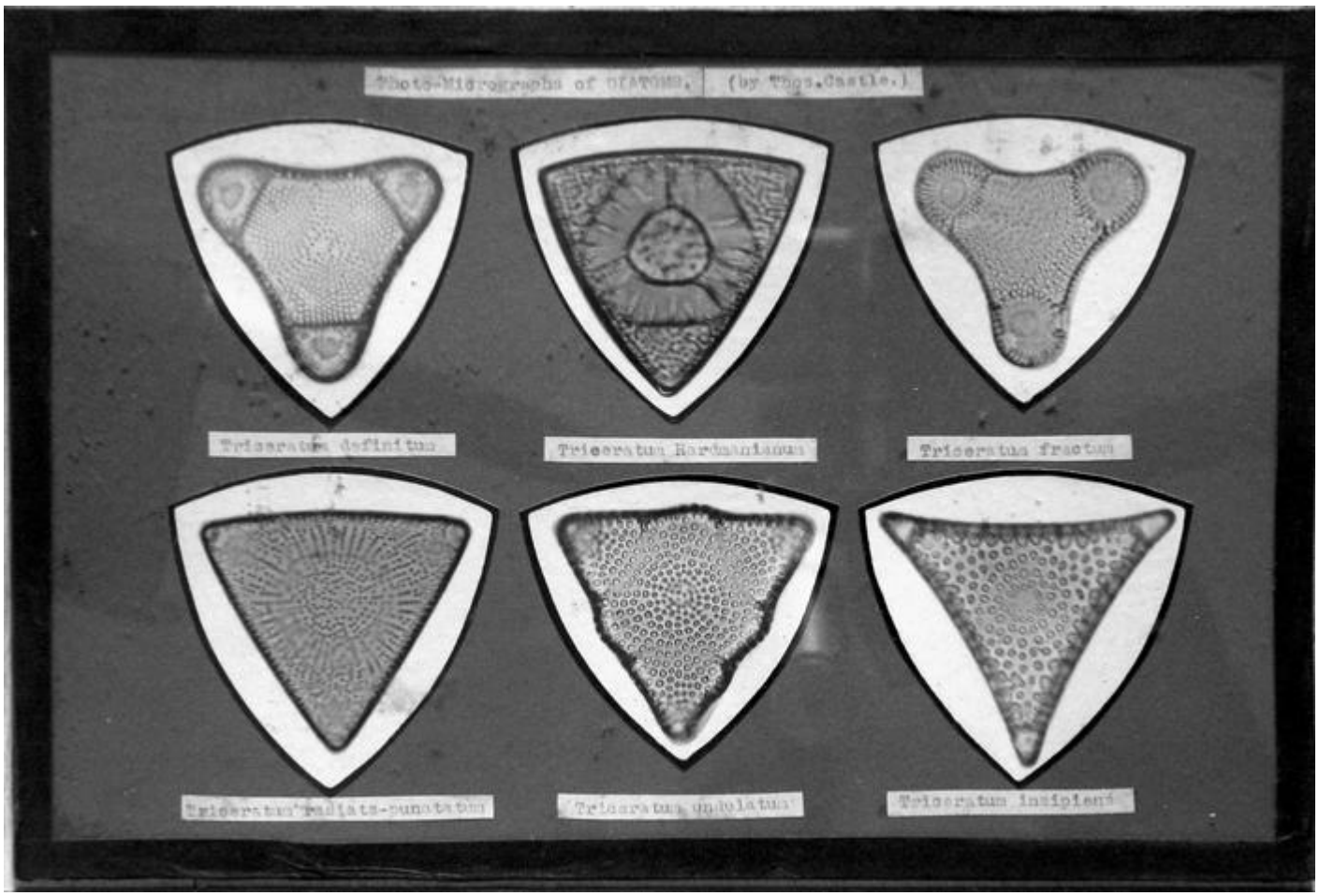
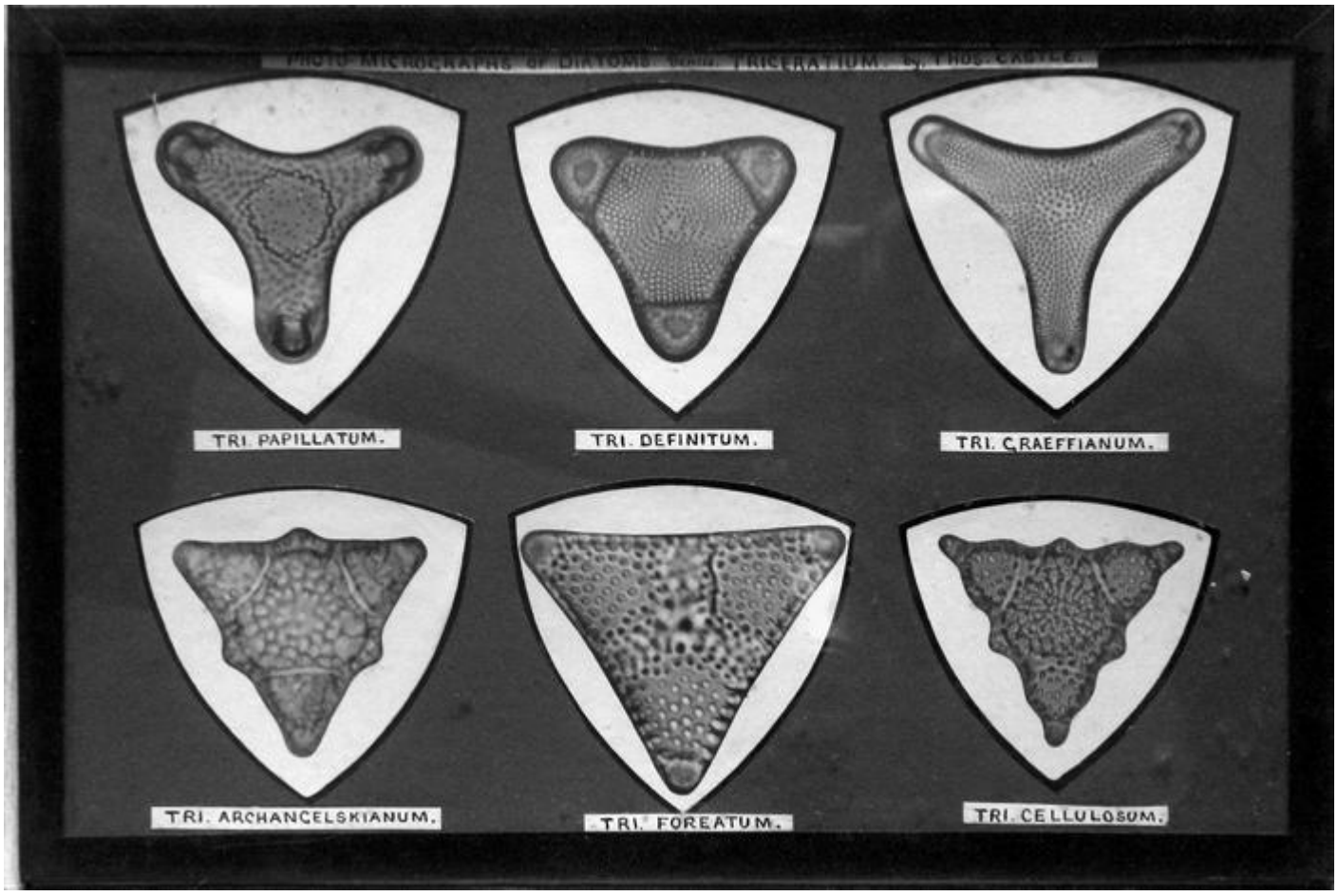
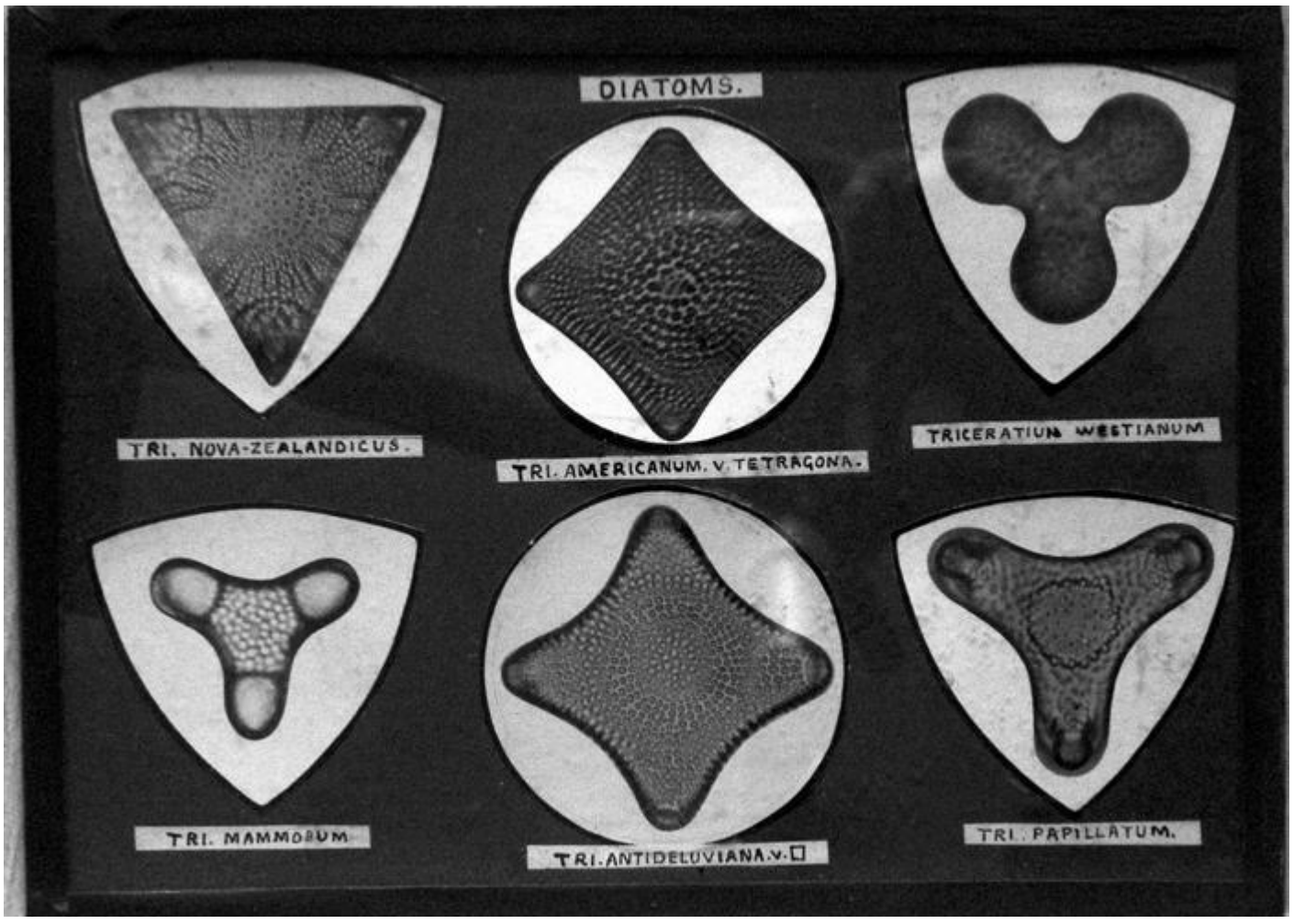
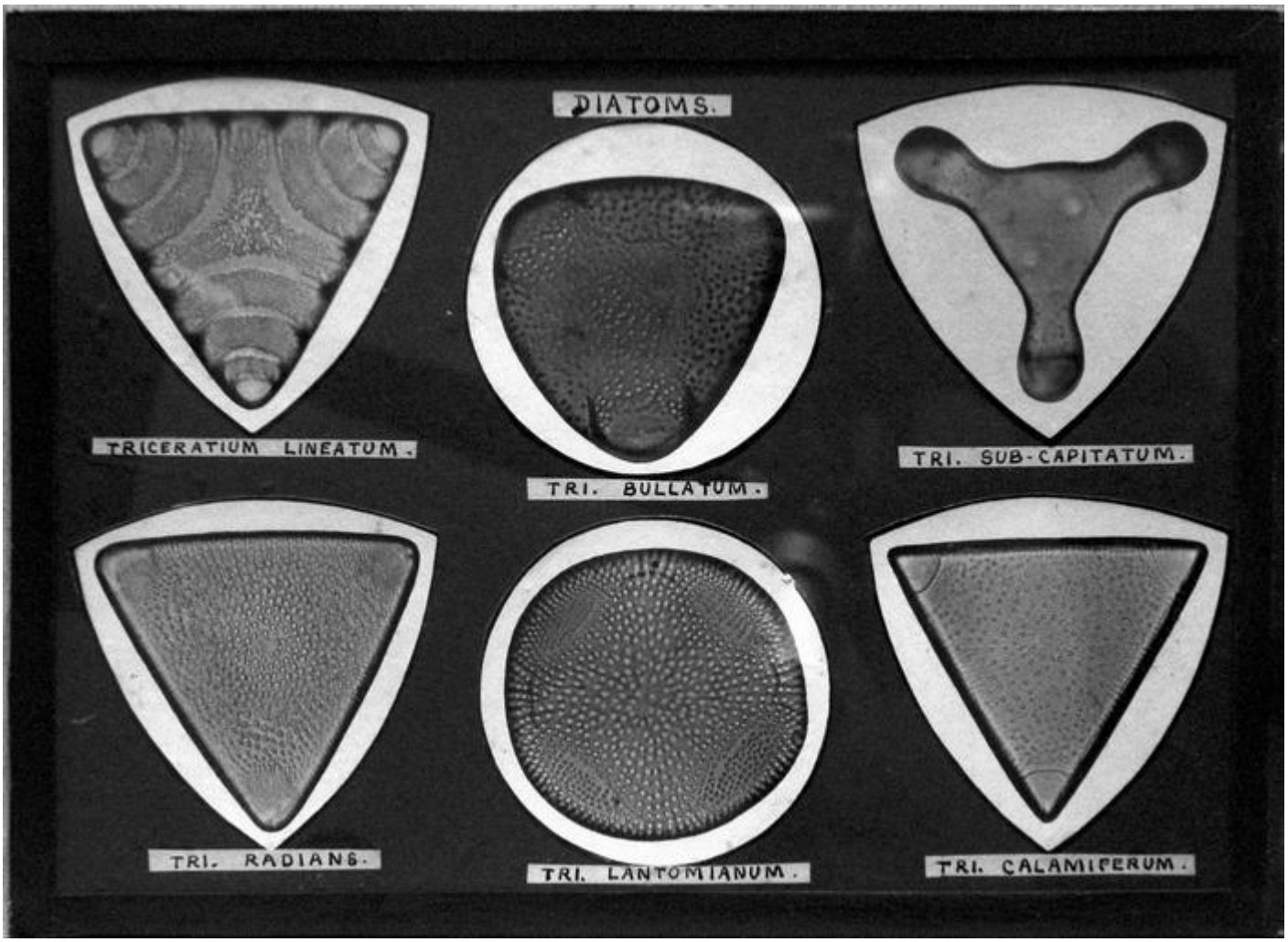
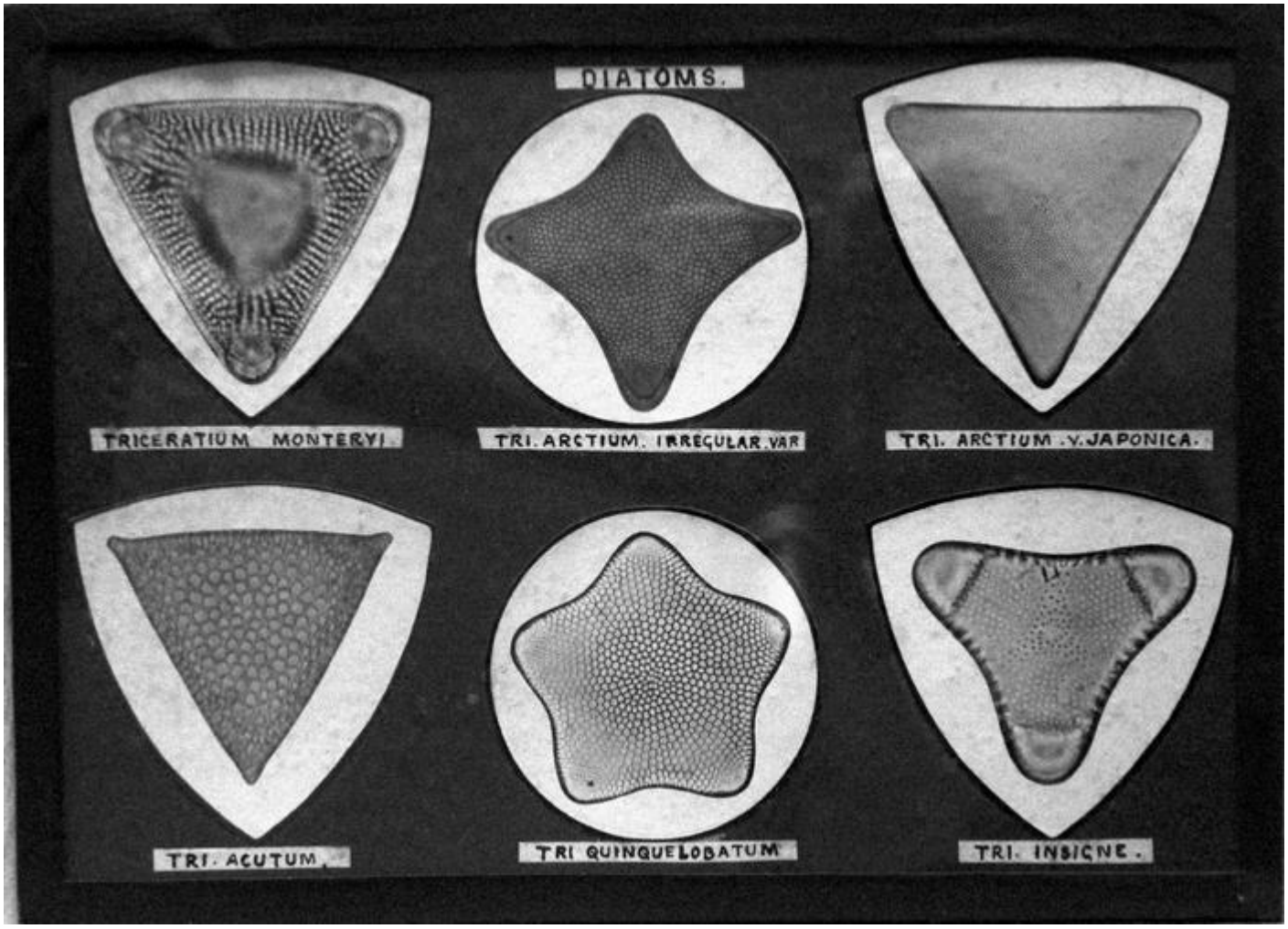


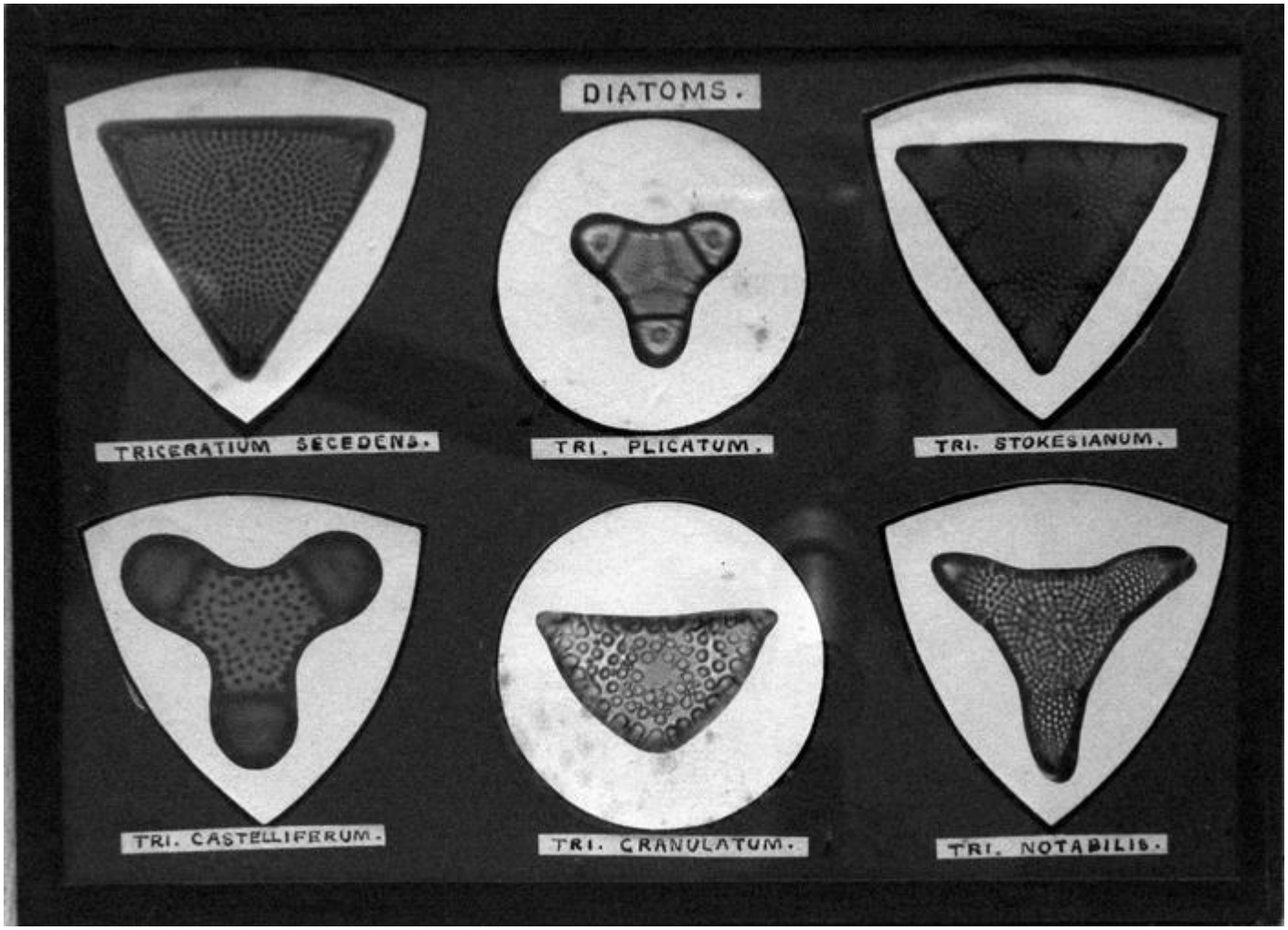
Photo-Micrographs of DIATOMS. (by Thos.Castle.)
Triceratium definitum
Triceratium Barbadiense
Triceratium fractum
Triceratium radiato-punctatum
Triceratium undulatum
Triceratium insipiens


TRI. PAPILLATUM.
TRI. DEFINITUM.
TRI. GRAEFFIANUM.
TRI. ARCHANCELSKIANUM.
TRI. FOREATUM.
TRI. CELLULOSUM.


DIATOMS.
TRI. NOVA-ZEALANDICUS.
TRI. AMERICANUM. V. TETRAGONA.
TRICERATIUM WESTIANUM
TRI. MAMMOSUM.
TRI. ANTIDELUVIANA. V.
TRI. PAPILLATUM.


DIATOMS.
TRICERATIUM LINEATUM.
TRI. BULLATUM.
TRI. SUB-CAPITATUM.
TRI. RADIANS.
TRI. LANTOMIANUM.
TRI. CALAMIFERUM.


DIATOMS.
TRICERATIUM MONTERYI.
TRI. ARCTIUM. IRREGULAR.VAR
TRI. ARCTIUM .V. JAPONICA.
TRI. ACUTUM.
TRI QUINQUELOBATUM
TRI. INSIGNE.



Diatoms in Colour

Spike Walker's Diatoms in Colour Gallery

Spike Walker will probably need no introduction, however, a quick word or two will serve as a reminder of his achievements.

Born in 1933, the son of a £2.50-a-week warehouse worker with a passionate belief in the value of education for which he himself had had little opportunity. Had his first microscope at the age of 11 a toy replaced a few years later by a simple but optically superior instrument from the 1920 s. First photomicrographs (by direct projection onto bromide paper) at 14. Hons. B.Sc. in Zoology from Liverpool University (where his interests in microscopy and free-living Protista were fairly firmly discouraged) in 1956. Took up a career in teaching Biology in various schools and colleges until his early retirement in 1989. First freelance work in 1965 a set of transparencies of freshwater Algae and Protozoa taken using electronic flash for a biological supply company. Amateur Photomicrography (ISBN 0 240 50121 5), of which he is still justly proud, was published by Focal Press in 1961. Awarded the Royal Microscopical Society s Glauert (gold) Medal in 1982, the RPS Combined Royal Colleges Medal for photographic services to Medical Science, and numerous prizes in international photomicrographic competitions over a period of 40 years.

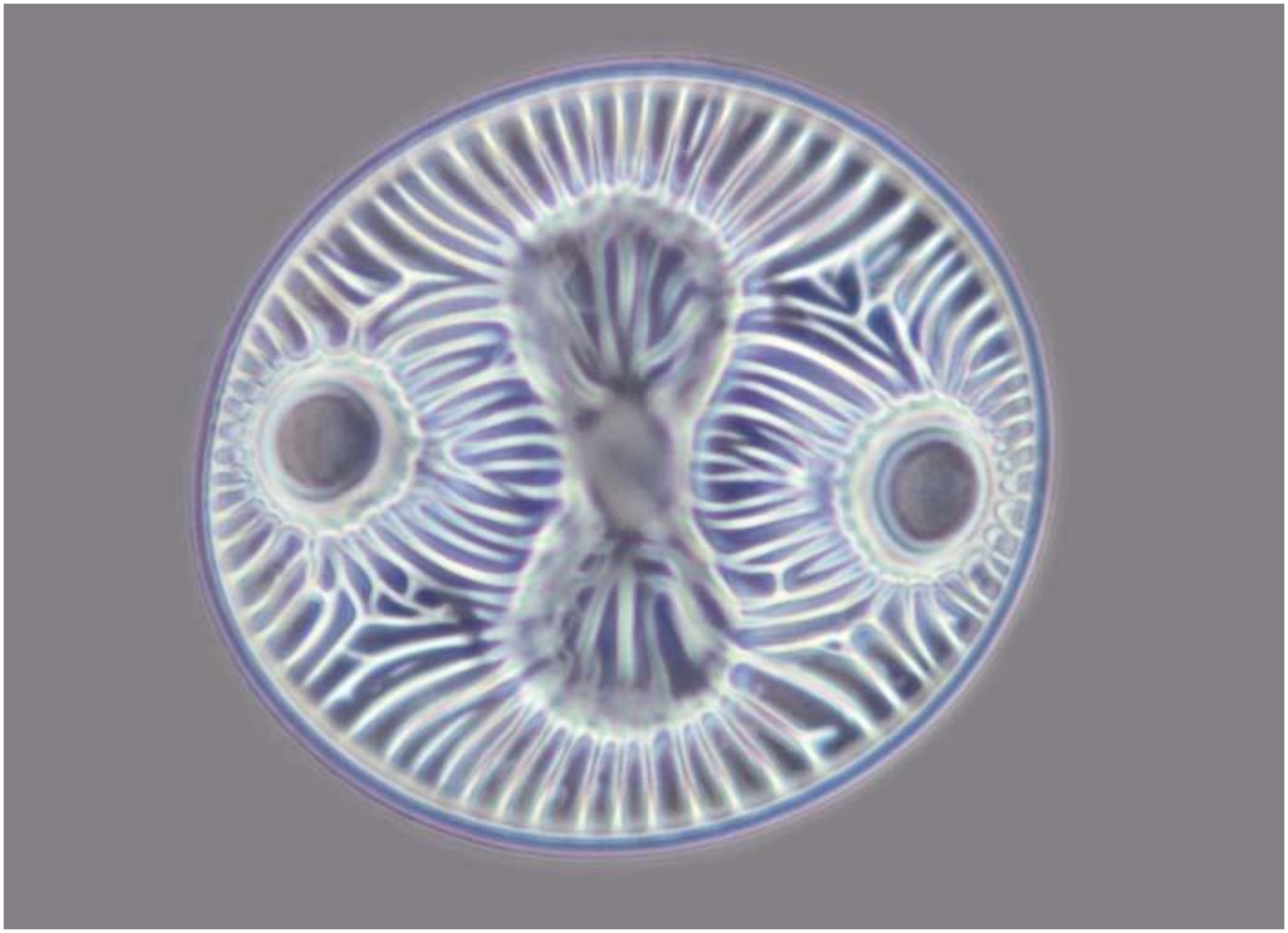
Photo libraries: Alamy, Getty Images, Photo Researchers, and Wellcome.

For the last 20-or-so years has worked in what was originally the garage, sharing it with a very large assortment of hand-me-down and rescued Zeiss equipment from the 1960s and 1970s (someone once remarked that there was only room for two people in his lab. if they were hopelessly in love) and one or the other of his two cats. His conversion to digital photography was completed with the acquisition of a Canon 1Ds Mk ll in 2005 (plus a 5D Mk ll in 2009) and he is now realizing his life-long goal to be able to present images from the microscope as being worth looking-at in their own right.

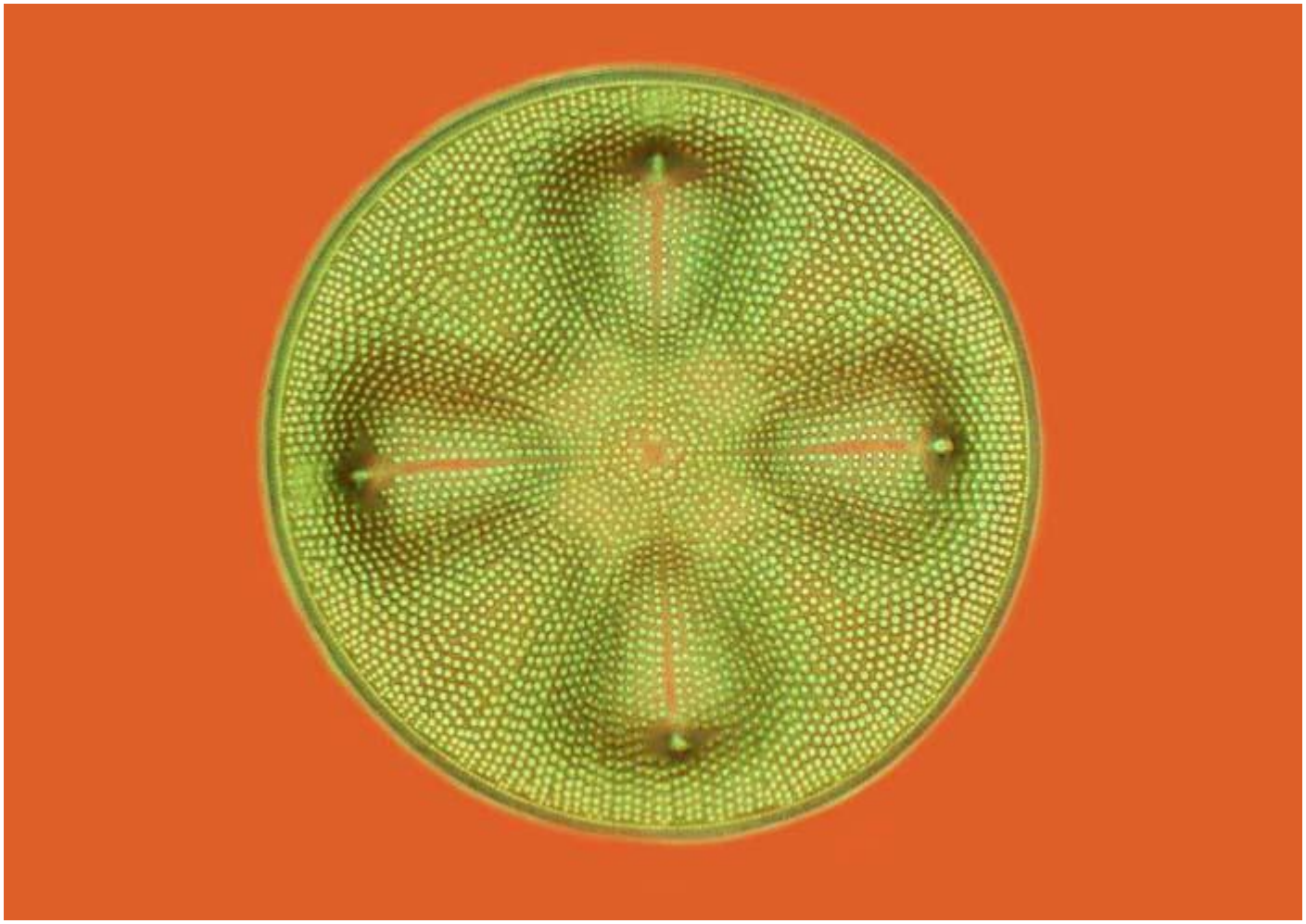
Has two enthusiastic daughters and a hugely supportive wife - with approximately 28 microscopes on the premises, she needs to be - who nevertheless despairs of his time management.

The editors are privileged to know him as a friend who as well as selflessly sharing his knowledge, over a couple of G and Ts regales us with hilarious anecdotes.

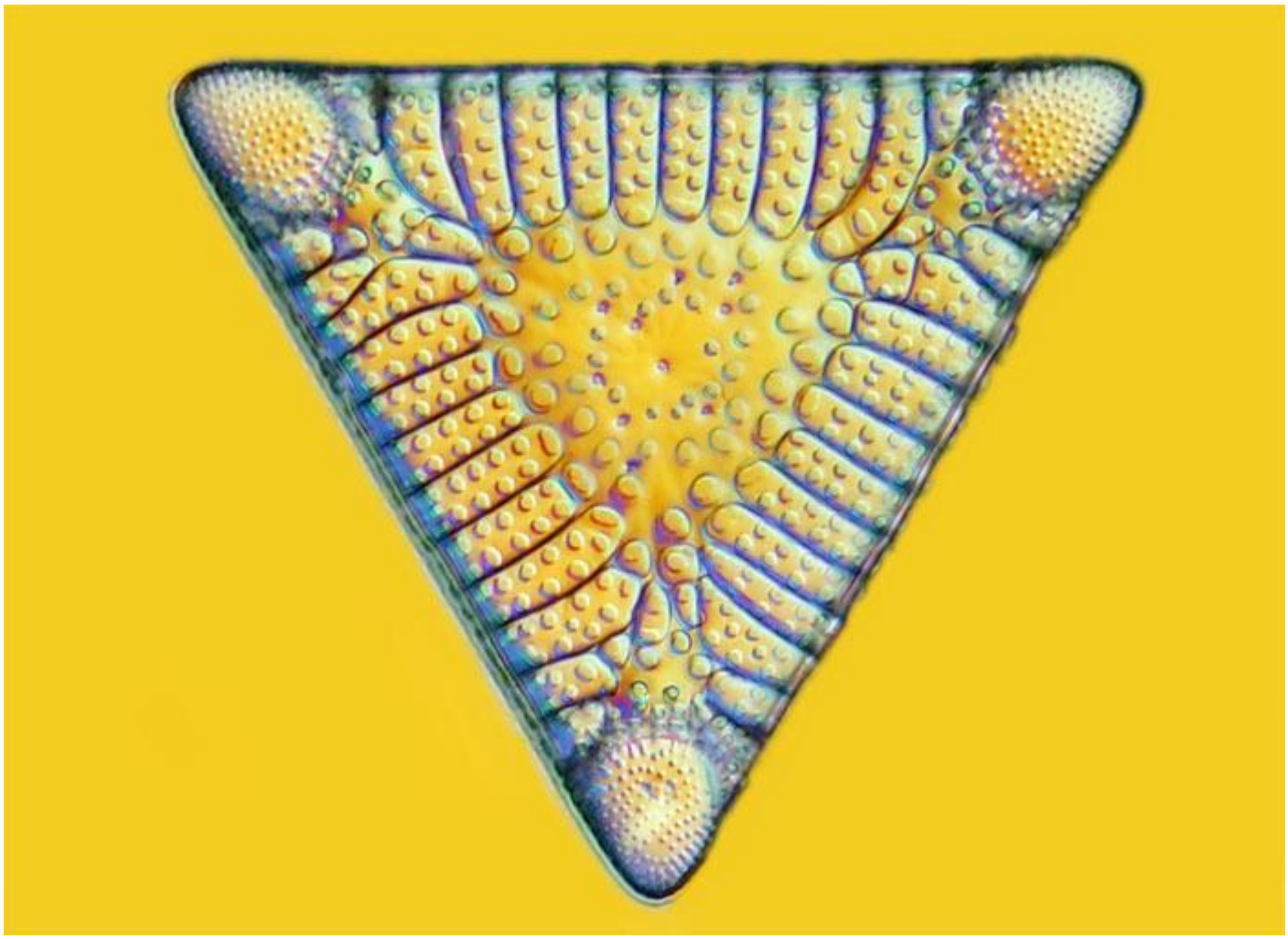
Auliscus scultptus



Auliscus scultptus



Aulacodiscus formosus



Triceratium

Old Papers - Revisited

THE SOPHOGRAPH.

Vol.VII. 1890

A Spoonful of Mud.

WHILE at Crystal Lake one day last autumn, I gathered and put in a bottle a little of the brown and green coating found on the bottom in the quiet water just below the dam. Placing a minute portion of this under the microscope, I looked down the brass tube into a strange country peopled by wonderful shapes.

In the water were green globes floating, whirling hither and thither, curious colorless animals swam rapidly about changing shape with Proteus-like rapidity. Across the field of view stretched filaments of the plant which forms the green scum on water, beautifully marked with bright green spiral bands. But the most interesting things I saw were brown spindle shaped objects, some of which lay quiet, some moved backward and forward without pause. These were diatoms.

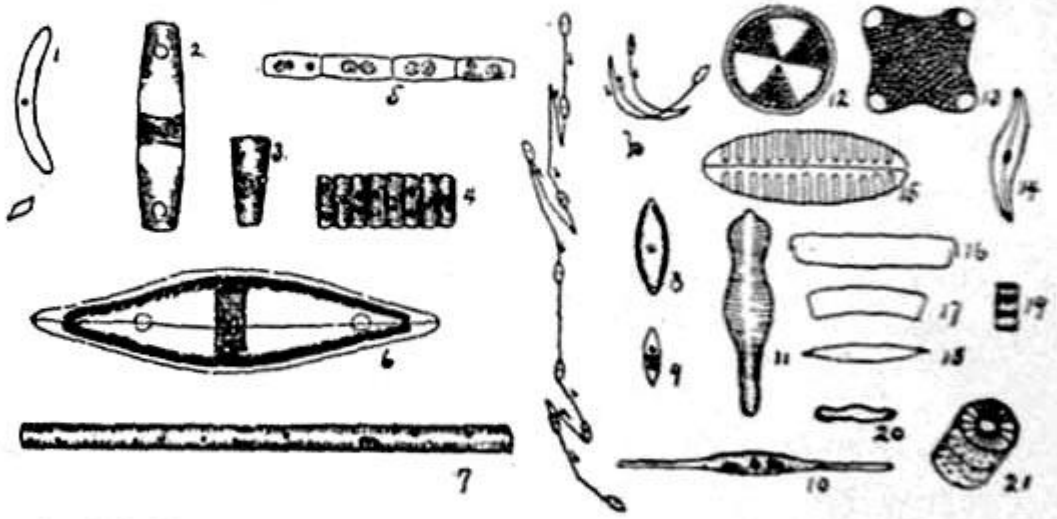
Although possessing the power of motion these minute organisms are not animals but plants. In the system of plant classification they are assigned to the class *cryptogamia* sub-class *algæ*, order *diatomacear*. But there are other points of similarity to the lower animals than motion, for each diatom consists of a single cell enclosed by a shell of silex. The shell is in two parts, one slipping over the other like the lid on a pill box. Fig. 16 is a diagrammatic view of a diatom, showing the halves slipping together.

Across the valve, sometimes at the middle, sometimes near one side, there is usually a line, termed the *raphe* with

enlargements at the center and the ends, shown in fig. 14. The *raphe* is probably a cleft through which the diatom comes in contact with the water outside.

A majority of species are oblong or spindle shaped as shown in the figures, so that the halves of the shell resemble little troughs; but there are many other shapes: round, figs. 12 and 21, wand like fig. 7, wedge shaped fig. 3, curved fig. 1, sigmoid fig. 14, or eccentric shapes as figs. 11, 13, and 20.

On the shells are markings, or sculpturings to which they owe much of their interest as microscopical objects. The most common marking is fine lines which I have attempted to represent in figs. 2, 7 and 11. There may be a coarser ribbed appearance; fig. 15, or the shell, may be cov-



ered with fine crossing lines like the engine turning on the back of a watch. With a good microscope the lines are seen to be rows of minute protuberances.

The contents of the frustule, as a single diatom is technically termed, is a protoplasmic mass with a band of different density extending across the middle in which is found a nucleus. Next each valve is a brown plate called endochromse, which answers the same purpose as chlorophyll in common plants.

Outside the shell is a gelatinous envelope which in some species fastens the shells together in chains as in fig. 4 and 5. These chains are very easily broken, and from this fact the order received its name (Gr. diatomous, cut through.)

Their nutriment and the silica to make the shells are derived from the water.

The motion of a diatom consists of a series of easy impulses by which it is propelled a certain distance. The motion is then reversed and continues to alternate in like manner as long as the diatom is in vigorous growth. I have endeavored, at the center of the cut, to show the path of a diatom during nine minutes. The successive positions were each reached in a minute from the one before. The motion is entirely mechanical, for when a diatom meets an obstacle it stops till the time of the forward movement has elapsed then moves back again. Often the path is curved. The cause of the motion has never been satisfactorilly determined. The best explanation offered is that of Prof. H. L. Smith. As noted above the interior is divided into two parts. One of these parts imbibes water by endosmosis, pushing the halves of the shell farther apart at that end and consequently bringing them closer together at the other end thus driving the water, which is between the shell and the membrane, around the cell contents, out through the minute orifice at the end of the *raphe*. The reaction of the jet pushes the diatom forward. The endosmosis then occurs in the other half of the cell causing a movement in the opposite direction. Only the spindle-shaped and oblong forms have much motion. The motion appears rapid under the microscope but really is slow. The most agile move at the rate of an inch in three minutes, while the slowest would take an hour to move that far.

Reproduction presents curious phenomena. It takes place in two ways. (1) Self-division; the nucleus divides, a double membrane grows from juncture of the valves to

the center, two new valves are deposited and separation takes place, making two complete diatoms. But each new half shell slips inside the old part to which it belongs, hence the diatoms grow smaller and smaller at each successive subdivision till at last they would approximate the mathematical point. Now comes reproduction by conjugation. Two diatoms approach each other and discharge their contents which unite and increase greatly in size. From this mass one, or in the majority of cases, two new diatoms are formed, which are *twice* the size of the old ones. In this way the normal size is preserved.

It takes, on an average, six days to complete the self-division. By a simple calculation we can get an idea of the immense number that may come from a single individual. After twenty-five divisions there would be 33,554,432 and after fifty divisions 1,125,899,906,842,624 individuals if all should live.

Diatoms are found every where. Every stream, ditch, pond or watering trough will furnish specimens, and they are even found in moist places, on wet rocks and about the roots of plants. The most favorable place for their growth is in sluggish streams, where they form a brown coating on the bottom, of which our classic Boneyard furnished good specimens last fall. They are also inhabitants of salt water, being found in all zones and at all depths. Nos. 17, 18 and 19 are sea forms obtained from an oyster. They are especially abundant in the Antarctic region. Between 60 and 80 degrees, south latitude, such myriads occur that they color the water and the ice brown. Near Victoria Land there is a deposit of their shells four hundred miles long, one hundred and twenty miles wide and of unknown depth. In these seas where there is so little land and no other plant life, diatoms take the place of higher vegetation, furnishing the oxygen, without which animals could not exist. They also serve as food for the mollusca and low forms of animal life,

which in turn are devoured by higher animals; consequently it is principally by means of diatoms that the animal life of those latitudes subsists.

Diatoms occupy an important place in geological history. It has been estimated that one-fourth of the mud in the Thames is composed of diatom shells. In other rivers the proportion is higher so that, carried to the mouth, they block up the channels and form deltas. The obstructions at the mouth of the Mississippi are partly caused by them. Large deposits are found in various countries. A noted one underlies Richmond, Va.; another at Bilin, Austria, is forty feet thick, but the largest known deposit is at Place au Camp, on the Columbia river, where there is a stratum five hundred feet thick composed almost wholly of their shells.

The diatom deposits are of much use in the arts. They compose the common polishing powder or Tripoli. Fig. 12 was drawn from a specimen found in a tooth powder called Sozodont. The finest porcelain is made of a clay chiefly composed of their shells.

In Norway and Sweden the peasants, in times of scarcity, mix a diatomaceous earth, which they call "bergmehl," with the flour used for making bread. Its chief action, perhaps, is to simply increase the bulk and thus satisfy the immediate cravings of hunger, but there may actually be some nutriment in the dried cell contents. A similar substance called "tanah" is used for food in Java.

Dynamite is infusoral earth consisting of diatom remains impregnated with nitro-glycerine.

An important use of diatoms is their employment as test objects for microscopes. The power of the instrument to bring out clearly the delicate markings on some species indicating the quality of the lenses, and it has been said that they have contributed more to the improvement of the microscope than all other causes combined.

Thum Type Plate A

We are not sure of the origin of the following pages. Clearly they are not the original list associated with the Type Plate.

Any information regarding the slide to which it refers or should anyone recognise the handwriting please let us know.

Catalogue of

Thum Type Plate. A.

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Corners are marked by diatom
Eupodiscus Argus.

—

Row. 1.

1. Coscinodiscus omphalanthus.
2. " oculus iridis.
3. " tuberculatus.
4. " radiatus.
5. " triangulatus.
6. Actinocyclus Barkleyi.
7. Aulacodiscus margaritaceus.

Row. 2.

1. Eupodiscus radiatus.
2. Auliscus coelatus.
3. Arachnoidiscus Ehrenbergii.
4. Stictodiscus Californicus.
5. Asteromphalus sincetus.
6. Podosira maculata.
7. Hyalodiscus macinus.
8. Stephanopyxis Cymonii.
9. Actinoptychus undulata.
10. " heliopelta.

Row. 3.

1. Ethmodiscus japonicus?
2. Coscinodiscus Trinitatis.
3. Terpsinoe musica.
4. Odontotropis cristata.
5. Rhabdonema Adriaticum.
6. Campylodiscus Daemelianus.
7. " Thuretii.
8. " noricus.
9. " " (sidu)
10. " eximus.

/

Row. 4.

1. Surirella fastuosa.
2. " striatula.
3. " turgida.
4. " Capronii.
5. Pinnularia dactylis.
6. " major.
7. Navicula Yarrensis.
8. " Smithii.

Row. 4. continued.

9. Navicula viridis.
10. " permagna.
11. " lyra.
12. " Hennedyi.
13. " praetexta.
14. " Pandura.
15. " gemmata.
16. " Lessinensis.

Row. 5.

1. Stauroneis aspera.
2. Synedra fulgens.
3. Nitzschia tryblionella.
4. " notabilis.
5. Pleurosigma formosum.
6. " affine.
7. " Balticum.
8. Melosira Borreri.
9. Biddulphia pulchella.
10. " " (hide)

Row 5. continued.

11. Biddulphia rhombus.
12. Corconeis scutulum.
13. Grammatophora serpentina.
14. Cerataulus turgida.

/

Row. 6.

1. Synedra vegna.
2. Diceratium favus.
3. " scutulum.
4. " Arcticum
5. " antediluvianum.
6. " "
7. " spinosum.
8. " "
9. " ? armatum.

/

Notes on Eduard Thum:

Eduard Thum (1847-1926)

Eduard Thum was born 7th April 1847.

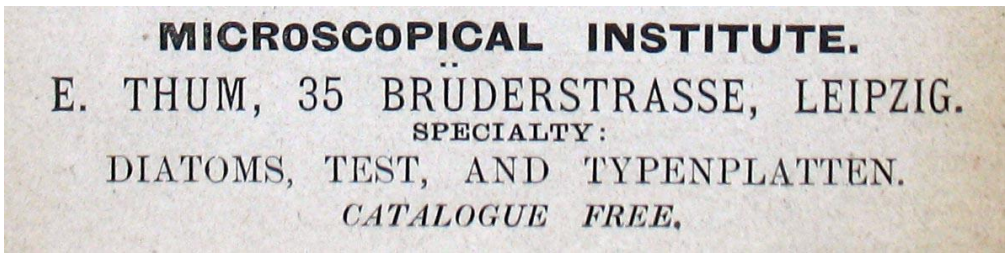
Owner and Founder of Institut fur Mikroskopie, 35 Bruderstrasse, Leipzig to 1894 and then situate at Johannis-Alle. Originally an instrument maker, ceased this at 28 to take up mounting slides.

As a young man he developed an interest in microscopical plants and animals and mounted such for the microscope. At the age of 28 he abandoned his trade as a scientific instrument maker in favour of preparing microscopic objects, a trade which he continued for the rest of his life.

His training as an instrument maker served him well when it came to making collecting apparatus and processing equipment for diatoms.

When he first began his mounting business he would mount most objects but gradually began to speciliase in the creation of laid preparations. At first he did this with Radiolaria but soon concentrated on Diatoms.

In 1906 the Institut was integrated into the Franckh'sch Verlagsnandlug in Stuttgart. Thum, however, just continued to produce his beloved diatom preparations.



The Journal of the Postal Microscopical Society April 1887

Sample slide

Gutter Snipes

With the cost of petrol ever rising the expenses incurred by simply driving to your favourite sampling location have sky-rocketed. We were presented with two simple options:

1. Get a bicycle
2. Look closer to home

Option 1 was really a non-starter for two very good reasons (a) we editors are not the fittest bunch in the world and the sight of our rotund and flabby forms astride bicycles would almost certainly be the cause of a number of accidents involving other road users (b) we editors are renowned for being unbalanced (mentally and physically) and we would in all likelihood fall off.

We didn't want to choose a location that required no effort to sample, but didn't want to overdo it either. We settled on a five rung stepladder (which we had to carry from the shed, therefore exercise was involved) and sample the gutters of our houses and outbuildings.

These are interesting environments as they are subject, here in the UK, to extremes of climate (well it feels really cold in the Winter and miserable the rest of the year). In the late Autumn and Early Spring they are almost permanently damp. In Summer they are mostly dry with just occassional dousings and in Winter exposed to sub-zero temperatures. They are also exposed, in the Summer months, to considerable UV. If you are in an acid rain zone then the habitat might be mildly acidic.

Inclement weather throughout the 'summer' put this particular feature on hold. Nonetheless it is our intention to pursue this particular line and any results from readers collections would be much appreciated.

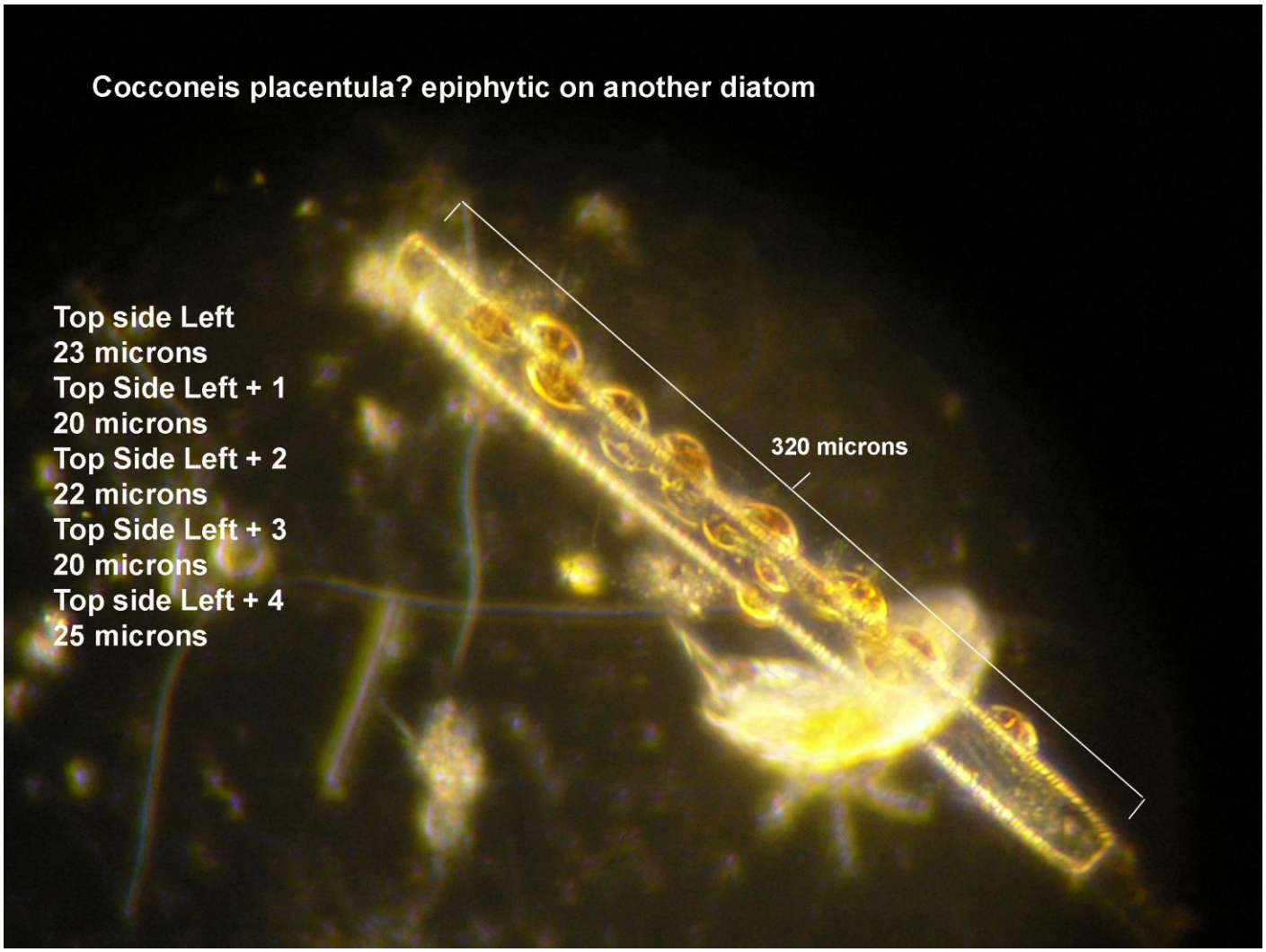
Epiphytic Diatoms

An epiphyte is an organism (generally a plant) that grows upon another plant or upon another identifiable single object. The organism is not parasitic upon the host organism.

In the case below, of a non-motile diatom on a motile diatom, it appears to simply be 'on for the ride'.

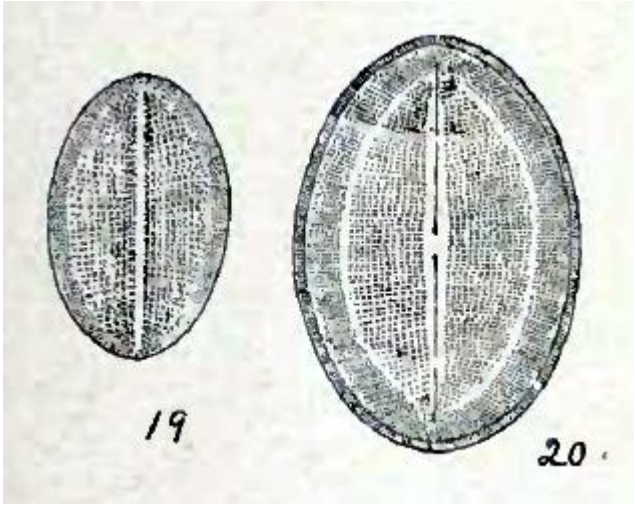
John Judson writes:

"From a diatom sample collected from a stream near Derby. The 'knobbly diatom' is 320 microns long and a *Lacrymaria sp.* has no problem swimming under it or the one that joined it while I was watching. What do you think the attachments are?"



Photograph by John Judson. Annotation by the editors.

Cocconeis placentula is a monoraphid diatom. This means that one valve has a raphe and the other does not.



from The Diatomaceae of Philadelphia and Vicinity by Charles S. Boyer (1916)

It is also one of the commonest freshwater species and is particularly fond of (if a diatom has the ability to have a penchant for) attaching itself to filamentous algae.
If there are any other suggestions as to identification (*Cocconeis pediculus* perhaps), please let us know.