

Microscope slide maker “W M P”
probably William Melville Paterson, 1856-1884

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Microscope slides by “W. M. P.” are relatively scarce (Figure 1 and B. Bracegirdle’s *Microscopical Mounts and Mounters* plate 41, slide H). The few I have seen are all of diatoms. Two labels are present, of the same style as William Firth, the Barbour Brothers, and several other late-1800s diatomists. The upper label is machine-printed “diatomaceae”, while the lower label has the maker’s printed initials. The handwriting is tidy and unique. Searches of historical documents indicate that the most probable maker of these slides was William Melville Paterson, a chemical engineer who lived on the east coast of England and had a strong interest in microscopic studies of diatoms. His slides date from a brief period in the late 1870s.



Figure 1. A microscope slide by “W.M.P.”, a strew of mixed diatoms rich in *Pleurosigma attenuatum* collected from the Humber estuary. The Humber is about 80 miles (approximately 130 km) south of William M. Paterson’s home in Loftus, Yorkshire.

SCOTTISH TRIPOLITE.

By W. M. PATERSON.

IN the autumn of last year I received a sample of what was supposed, by the friend who gave it me, to be a sample of clay. I happened by chance to examine it under the microscope recently, and was surprised to find that it consisted almost entirely of fossil or sub-fossil diatomaceæ. The sample received is of a greyish white colour, and remarkable on account of its extreme lightness.

On being calcined the colour, evidently due to a trace of organic matter, disappears, leaving behind a powder of the purest white. A portion of the calcined on being submitted to analysis gave the following result:—

Silica	95·66
Alumina.. .. .	3·08
Oxide of iron.. .. .	trace
Lime	0·28
Further loss on ignition ..	1·25
	<hr/>
	100·27

The sample contained little sand, and readily dissolved to the extent of 92·4 per cent in solution of potassium hydrate.

From the above analysis it will be seen that this deposit varies considerably from the celebrated Barbadoes tripolite, or that from Sweden, the former containing 10 per cent of calcium carbonate, and the latter 6 per cent (analysed by Dr. Phipson, *vide* CHEMICAL NEWS, vol. xxxiv., p. 108).

Its composition agrees very closely, however, with that from the Puy de Dôme, France, which was found by Fournier to contain:—

Silica	87·2
Alumina and oxide of iron ..	2·8
Water	10·0
	<hr/>
	100·0

If the above were calcined it would be composed as follows, agreeing pretty closely with the Scotch sample:—

Silica	97·0
Alumina and oxide of iron ..	3·0
	<hr/>
	100·0

The diatoms are finely preserved, the valves belonging chiefly to the elongated type; but there are a great many of a very small round species difficult to resolve. One of the best is *Pinnularia dactylus*; *Surirella eraticula* is also very abundant. Figures of these species with others which occur may be seen on page 342 of the last edition of Dr. Carpenter's work on the "Microscope," in which a woodcut is given of a very similar diatomaceous deposit from Mourn Mountain, Ireland.

The deposit from which the above sample was taken occurs on Ciste Mairearad, one of the highest of the Grampians, on the Glen Feshie side, Inverness-shire, on the estate of Sir George Macpherson Grant, of Ballindalloch and Invereshie. The deposit is of unknown extent, but the sample was taken from a spot where about an acre of it is exposed, varying from 1 to 4 feet in depth, containing no stones or gravel, and very little sand.

It is not used for any purpose in the neighbourhood; the fact of there being no vegetable growth upon it, and its remarkable lightness having attracted the notice of my friend Mr. Duncan Clark, of Auchlean, Glen Feshie, to whom I am indebted for samples of it.

I hope shortly to be able to get more information concerning this deposit.

Loftus Iron Company, Saltburn-by-the-Sea,
March 29, 1877.

Figure 2. Chemical and microscopical characterization of a diatomaceous earth, from 1877. Written when Paterson was about 21 years old, this is the earliest known evidence of his interest in diatoms and microscopy.

A W. M. P.—Many thanks for the sample of Diatomaceous earth from Inverness-shire.

C *Gomphonema germinatum*, a pure gathering of “Challenger” soundings, *Globigerina*, etc.; also, 8 European earths. Good marine and guano diatoms, unmounted, wanted in exchange. W. M. Paterson, Westfield Terrace, Loftus, England.

E FOSSIL DIATOMACEÆ, &c.—Some months ago I received a piece of cement-stone from the island of Fūr, coast of Denmark. It is a poor variety of limestone, and if a portion be dissolved in acid, the residue, when examined, is seen to consist of interesting marine forms of diatomaceæ, chiefly species of *Triceratium*, I believe, possibly *Amphitetras*, also a few *Coscinodisci*, and a great many small *Polycystinæ*, and *Actiniscæ*. Is this stone generally known to microscopists? I have not been able to get any information concerning it. Dr. Carpenter mentions *Triceratium* occurring in a fossil state only in the Bermuda and Richmond earth.—*Will. Paterson.*

H FRAGILLARIA VIRE-CENS, a pure gathering, in exchange for guanos, recent material, &c.—W. M. Paterson, Loftus.

B SAMPLES of a new Diatomaceous deposit, from Inverness-shire, exchanged for other deposits, or gatherings of good Diatoms or Polycystinæ.—W. M. Paterson, Westfield-terrace, Loftus-in-Cleveland.

D DIATOMS, twenty-one fossil and sub-fossil earths (material) from various parts of the world. Good recent Diatoms wanted (material), marine species preferred. Send list to W. M. Paterson, Westfield-terrace, Loftus.

F DIATOMS.—Material from Santa Monica, containing, among other good forms, *Aulacodiscus fulcher*, *Actinoptychus Grindlii*, &c. &c. Also material from islands of Fur, Trinacria, &c., very fine. Guanos and recent material required. Send list.—W. M. Paterson, Westfield-terrace, Loftus.

G Diatoms, *Isthmia enervis*, *Campylodiscus clypeus*, both pure; best Jutland cement-stone, etc. Wanted, good recent Pacific coast material. Correspondence invited. W. M. Paterson, Loftus, England.

I P. HIPPOCAMPUS, pure, dry, and balsam slides. Also other pure gatherings. Wanted a good sample of the Yarra deposit.—W. M. Paterson, Loftus.

Figure 3. Advertisements and notes from William M. Paterson, regarding diatoms for microscopy. (A) A note from the editors of ‘*Hardwicke’s Science-Gossip*’ thanking Paterson for a gift of diatomaceous earth, 1877. (B) An exchange advertisement by Paterson, from the same 1877 issue of ‘*Hardwicke’s Science-Gossip*’ as A. This diatomaceous earth was presumably the same characterized by Paterson in Figure 2. (C) Exchange offer from an 1878 issue of ‘*The American Microscopist*’. (D) Exchange from an 1878 issue of ‘*Hardwicke’s Science-Gossip*’. (E) A descriptive note on the diatoms found in ‘cement stone’ (‘cementstein’) from Fūr island, Jutland, Denmark. This became a well-known source of diatoms for microscopists. From ‘*Hardwicke’s Science-Gossip*’, 1878. (F) Another exchange from an 1878 issue of ‘*Hardwicke’s Science-Gossip*’. (G) Exchange request from ‘*The American Microscopist*’, 1879. (H and I) Exchange offers from two different issues of ‘*Hardwicke’s Science-Gossip*’, 1879.

William Paterson was born in Minories, Middlesex, during the winter of 1856. His father, also named William, was a merchant. William and his younger brother, James, appear to have lived a fairly comfortable life for a while, as the 1861 census recorded a live-in maid. Life probably took a drastic turn in 1862, when father William died in April. For the next 15 years, the whereabouts of the two boys and their mother, Ellen, are unknown, as they have not been located in the 1871 census or other records. Both parents were originally from Scotland, and Paterson later mentioned having Scottish friends, so it is possible that Ellen took the boys home. However, they are not identifiable in the 1871 Scottish census.

Paterson turned up again in 1877, writing from Loftus, Yorkshire, England, near the North Sea coast (Figure 2). His letter and the 1881 census indicate that he was a metallurgical engineer for the Loftus Iron Company, in Saltburn-by-the-Sea. Paterson’s letter to *The Chemical News* described both chemical and microscopic investigations of a diatomaceous earth sent to him by a friend in Invernesshire, Scotland. He also posted offers to exchange that raw material with other microscopists (Figure 3 A and B).

William Paterson apparently had a fair bit of experience in making microscope slides by 1877, claiming to “have mounted many”. That year he published two brief notes in *Hardwicke’s Science-Gossip* on cleaning and preparing microscope slides:

“On Cleaning Microscopic Slides - For removing Canada balsam from spoilt or useless slides, turpentine is, I believe, in general use. If the slides be immersed for about two minutes in strong sulphuric acid, heated to

about 100° Fahr., the balsam will be decomposed into a filmy substance, easily got rid of by washing with cold water. If the acid is cold, the time will be somewhat longer. Circles of asphalt and rubber, the deposit of carbon from a lamp, which is sometimes very difficult to remove by other means, turpentine from beakers, bottles, &c., may be done in the same manner.—W. M. Paterson.”

“Dry Mounting - I would like to draw the attention of those readers who are in want of a good method for mounting objects dry, with asphalt cells, to a method I found out some time ago, and which I have since used with complete success. The methods to be found in text-books, at present, are briefly as follows : 1. Make a ring, dry it, warm over a lamp until slightly soft, and having placed the object in position, adjust the cover. 2. The former method is sometimes varied by making two rings; the second after the first has dried. 3. Narrow rings of paper are introduced between the ring and cover, and a few other modifications of these processes. The whole of the foregoing methods are liable to the objection that the medium employed for making the cell, asphalt and rubber, or whatever else it may be, runs in by capillary attraction, and either spoils the object or renders the slide unsightly. Of the above-mentioned methods, I decidedly prefer the first one, but I could not depend on it six times out of ten, and have many a time spoiled both slide and temper. Most microscopists seem to have battled against the material ‘running in’, a propensity which I have, to some degree, taken advantage of. Take a slide, and with the turn-table make two narrow concentric rings of asphalt-and-rubber varnish, the inner one-half, and the outer seven-eighths of an inch in diameter, and fill up the space between the two with varnish, so as to make a thin cell of varnish, with an interior a half-inch in diameter. Dry the slide in an oven, slightly warmed, and when quite dry, make a narrow ring of varnish on the extreme outer edge of the cell, and having placed the object in position, or, according to circumstances, before the first ring was made, adjust a cover, pressing it down slightly. The varnish is generally only flattened out, and only occasionally spreads to the edge of the cell encircling the object. The reason for its not ‘running in’, is simply because very little capillary attraction is offered to the film of varnish by the dry cell and cover, compared with the capillary attraction offered to varnish by two plain surfaces of glass, as is the case when the old methods are employed. When the cover has become fixed, the slide should be finished by making a ring on the cover, corresponding with the cell beneath. My experience with this method relates to diatoms and chemical salts, and I have succeeded so well that I have not yet spoiled a single slide - and I have mounted many - even including those used in performing the test experiments. In mounting chemical salts, care must be taken that the level of the ring is above that of the object.—W. M. Paterson, Loftus.”

Paterson continued to post exchange offers for the next two years, in magazines in both England and the US (Figure 3). By 1878, he had acquired a “gathering of ‘Challenger’ soundings”, those being deep water collections of microscopic marine life collected by the HMS Challenger between December 1872 and May 1876. He also offered at least 21 different diatom gatherings from “various parts of the world”.

I have not located any exchange offers or other documents of Paterson’s involvement with microscopy after 1879. The 1881 census located him in Loftus, working as a “metallurgical chemist” and living with his widowed mother.

William Paterson died April 18, 1884, at the age of 27, in Loftus. He was buried, however, at St. Andrews, Fifeshire, Scotland. The 1891 census recorded mother Ellen living in Dover, Kent, with her younger son, James, and his family. Ellen died in Scotland during October, 1896, and was buried in St. Andrews, Scotland, beside her elder son.

This and other histories of early microscopy can also be read on the author’s web site, <http://microscopist.net>

Resources

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Paterson, William M. (1877) Dry mounting, *Hardwicke's Science-Gossip*, Vol. 13, pages 160-161

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England census, birth and death records, accessed through ancestry.co.uk

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Hardwicke's Science-Gossip (1877) Exchanges, Vol. 13, page 120

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