

## The papered slides of C M Topping

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### Summary

Charles Morgan Topping (Fig.1) was born on 23 May 1800 to Elizabeth Ginder (c.1766–1818), and Amos Topping (c.1763–1817). He was elder brother to Amos and to sisters Elizabeth, Sarah and Hannah. His father was a master printer with a workshop at 3 Playhouse Yard, Blackfriars, London, working for such notable firms as Hatchard, Bookseller to the Queen. Charles's father pre-deceased his mother, and in her will she left half the family's business to Charles on attaining the age of 21, and the other half to his younger brother Amos, when he reached his majority. Charles married Sarah Preston on the 15th March 1824.

In recent years Topping has been the subject of a number of articles [1]. We hope to add to this body of knowledge by illustrating the surprising variety of slide papers that have been identified as Topping's between 1840 and 1874. We have tried to clarify the chronology and to consider the significance of these variations.



FIG. 1. Charles Morgan Topping 1799–1874. Microphotograph slide made by William Moginie. Photomicrograph of this used by kind permission of Trevor Gillingwater

Topping belonged to the artisan class, whose lives were not considered to be of any interest at that period. However, current methods of research have revealed a surprising amount of personal information about his life, not all of which is pertinent to this paper. The 1841 census gives his occupation as 'Printer'. It lists his wife Sarah, 37, two daughters Sarah Ann 13 and Harriet 5, and three sons, Charles 14, Amos 10 and Henry, 3. So, in 1841, he had a wife and 5 children between the ages of 3 and 14 to support. Archival material such as letters, accounts, pamphlets or even a catalogue have not been found as yet, consequently his slides are the most tangible evidence of his career.

### Introduction

Topping is justifiably considered to be one of the most renowned of Victorian makers of preparations for the microscope. His output was considerable, spanning at least forty years and covering most of the categories of mounted objects investigated during the 19th century. Interest not just in the preparations, but also in those who made them has been increasing in the last few years. The relatively recent advent of the Internet has greatly facilitated finding evidence to support a broader view of the production of slide makers from 1830 onwards. The brief period covering the transition from bone sliders to glass slips, with balsam as the mounting medium of choice, is of particular interest.

Andrew Pritchard was the pre-eminent person associated with this earlier period. His small book *A list of 2000 microscopic objects* published in 1835 illustrates the comprehensive inventory that he offered. An inventory of this size would have necessitated a number of slide makers. Whether they were in-house or, as seems more likely, individuals in their own homes or workshops, is as yet unresolved.

The output of Topping is somewhat easier to chart. His diamond-engraved slides have been described in the previous paper referenced above. This paper will consider the rest of his production, although both engraved and

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papered mounts appear to have been made concurrently.

Identification of a specific maker's slides is dependent on five main criteria: signed labelling, recognisable patterned papers, style of mounting, comparison with other comparable preparations and last but certainly not least, handwriting. It is the last of these that has provided much of the attribution of unusual Topping papered slides. Inevitably this is a somewhat subjective process, with the inherent risk of seeing what one wishes to see, unless a rigorous procedure of comparison and questioning is followed.

### Period 1840-50

It is indeed fortunate that a group of signed Topping slides with plain green papers dated to the year 1840, has survived (Fig.2). These give a confirmed date and slide paper on which to build a chronology. Each of these slides consists of two equal-sized glass slips with the specimen in balsam between them. This method was in common use when balsam first became the mountant of choice, before glass covers were commercially available. The diamond-engraved double slip preparations, sometimes with additional printed labels and edged with red sealing wax, were ascribed to W. Darker and retailed by Pritchard [2].

Two of the signed Topping slides in this group have the cut-out descriptive labels similar to or possibly sourced from Pritchard's list of 2000 preparations of 1835. Three slides have slight variations in size, being roughly 3x1 inch. One of the unsigned green papered mounts of horse chestnut has the same subject and arrangement as the signed Topping mount. The two smaller slides, measuring 2 x ¾ inch, also contain wood sections. One of these is of particular interest, as it contains two sections of oak from the *Royal George*. This three deck, 100 gun ship of the line was lost in an accident at Spithead in 1772. Detailed salvage work was carried out on the *Royal George* principally by the Deane Brothers, in 1834-36. Sections of oak from the ship became available to Topping. This second group has cut out printed labels (Fig.3).

No definitive evidence has as yet been uncovered to show where Charles Topping learned his trade. However, it is clear that during the ear-

liest period of his own business he used plain papers to cover his slides.

The availability of glass of sufficient quality to be used for microscope slides during most of the first half of the 19th century was limited, and the cost high. A tax on glass and windows had been introduced in 1696. It was not until 1845 that the glass tax was repealed, as was the window tax six years later. This led to an unprecedented reduction in the price of glass. Prior to this the effects of the tax resulted in a scarcity and variable quality of the material used in early glass microscope slides. There were often variations in colour, thickness and size. No standardisation of slip size existed until a resolution by the committee of the Microscopical Society of London was passed in 1839. It suggested slip sizes of 3 inches by 1 and 3 inches by 1½, for preparations intended for its own cabinet. Individuals still cut the glass for their own slides and cover glasses, using a cutting-board and diamond kept by the Curator. Slides of this period very often have rough edges. There were exceptions to the rule; the slides of William Darker are often beautifully finished with chamfered edges.

The use of mica to cover the specimen declined during the first quarter of the 19th century. The earliest glass covers were individually made and of all shapes and sizes, no doubt dependent on available material. There was no uniformity of glass covers until the introduction of commercially made covers in 1840, when Chance Brothers of Birmingham are recorded as producing thin covers, 200 to 300 to the inch in thickness. This transformed slide making into an easier, faster and more uniform process [3].

When Topping began to advertise and develop his enterprise he knew that a recognisable and saleable product was a necessity in attracting new clients and creating a viable business. He would have been familiar with the various commercial methods employed by Pritchard. In contrast to the number of slide makers supplying that firm, Topping was a sole trader, when he started his business around the age of forty. By the middle of the century Topping was established as a slide preparer of note. His contacts with Professor Quekett, and the Microscopical Society of London, of which he became an associate member in 1846, would have served him well in advancing his enterprise.

<sup>2</sup> Originally published in the Winter 2010 Quekett Journal of Microscopy, Issue 41, pages 311-321



Fig. 2 C.M. Topping signed slides, dated 1840.

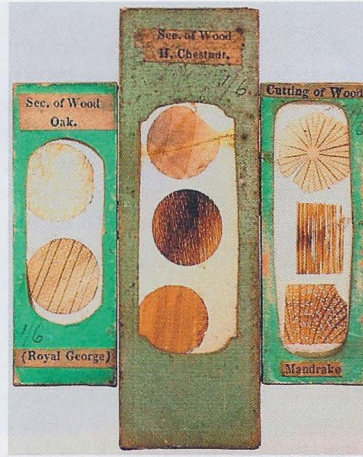


Fig. 3 Solid green papered slides, c. 1840.



Fig. 4 Topping presentation slide, c. 1845.

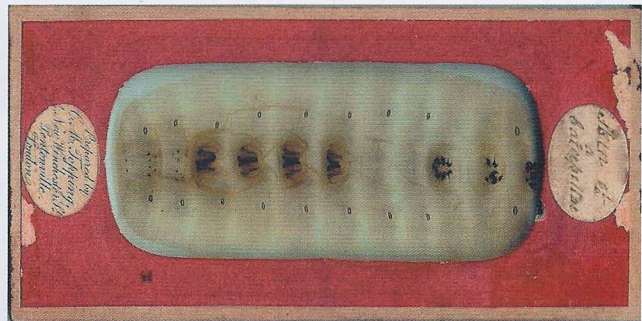
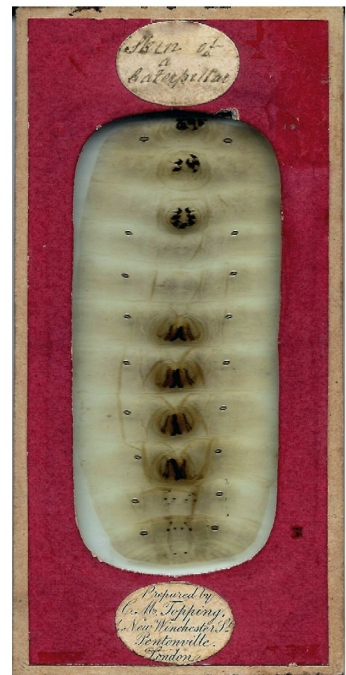


Fig. 5 Large (2" x 4") exhibition slide, Skin of Caterpillar, c. 1850.



Fig. 6 Various paper colours with generic "Star" pattern designs, c. early to mid 1840s.



The distinctive appearance of slides was arguably one of the most important elements in attracting the attention of potential buyers. Paper as a covering for glass slides, did not come into use until the 1830s. It is probable that plain and marbled papers were the earliest available. The latter were a popular covering material for book covers and end-papers, the method of marbling having been brought to England during the 17th century. A group of 1830s microscope slides currently being researched, has marbled papers. A very fortuitous Topping survival is a marbled papered slide of the hair of the brown beaver. The additional small printed labels on the reverse indicate that it was part of a set. It carries a later label of the Royal Microscopical Society stating that it was presented by C. M. Topping (Fig 4). In the 1849 first list of the MSL's slide collection of 300 preparations, 50 had been donated by Topping, including slides of animal hairs. Topping would only have given the Society slides that he had himself made [4].

The Judges' report on Topping's exhibits at the Great Exhibition of 1851 gives an interesting insight into his success and standing amongst his peers at this momentous and historic event:-

Topping (No. 667) exhibits five cases of microscopic objects.

The contents of the first case are, - test objects adapted to the present state of microscopic science, ranging from two inches power up to one-twelfth of an inch of large aperture; also some of the most beautiful of the fossil infusoria.

Case 2 - Contains fossil and recent vegetable structures.

Case 3 - Dissections of insects. In this case are large dissections of the respiratory systems of the silkworm, caterpillar, and larvae of beetles: all these are mounted in Canadian Balsam.

Case 4 - Sections of fossil teeth, bones, and shells, &c. In this case there is a diamond, showing woody structure, and sections of oriental and Scotch pearls.

Case 5 - Contains injected animal tissues.

Mr. Topping has mounted the greater part of these objects in Canada balsam: he remarks that this is the only medium which will permanently preserve specimens of natural history as objects for the microscope, and that he uses chrome yellow, instead of vermilion, for injections, with which material he can inject the minutest capillaries.

Mr. Topping's methods of mounting and preserving objects, are many of them of his own invention; he deserves to be distinguished above other exhibitors, as he was one of the first in the field, and perseveringly overcame many difficulties which others following after had not to encounter. His anatomical injections are admirable, as are also those of Hett (No.249), but in this branch neither of them is an original inventor, but are followers of John Quekett, Esq., of the Royal College of Surgeons.

A Prize Medal was awarded to Mr. Topping.

In *The Medical Times* Saturday of 19 July 1851 appeared the following comments:-

The Great Exhibition The two best collections are that of Mr. Topping, which includes animal, vegetable, and mineral preparations, and that of Mr. Hett, which contains injected animal specimens only.

Mr. Topping has long been known as one of the best, if not the most successful, of those who carry on the preparation of microscopic objects as the business of life; and his preparations may always be depended on for their beauty, and neatness with which they are mounted.

A few preparations associated with this important event have been identified. The large slides of 'dissections in balsam' of the respiratory systems of silkworms, caterpillars and the larvae of beetles are striking examples [5]. The upper side of these was covered in plain red paper and the backing paper is cream coloured. On the lower label these carry the 4 New Winchester Street address, which was listed in the 1848 first edition of Quekett's *Practical Treatise on the Microscope* (Fig 5).

Lithography was invented by Alois Senefelder in Bohemia in 1796. In 1837 a coloured version of lithography called chromolithography was patented by Godefroy Engelmann. This was the first true method for making multi-coloured prints. It was a tedious process because a different stone needed to be used for each individual colour; which mean using 20 or more stones to produce one image. A considerable advance was the rotary press printing machine invented by Richard March Hoe, in New York City in 1843. It speeded up the printing process and reduced the price of printed papers of all kinds. It is therefore possible to date the introduction of patterned printed papers suitable for microscope slides to the early years of the 1840s.

It is logical to suppose that the first printed chromolithographic slide papers would have

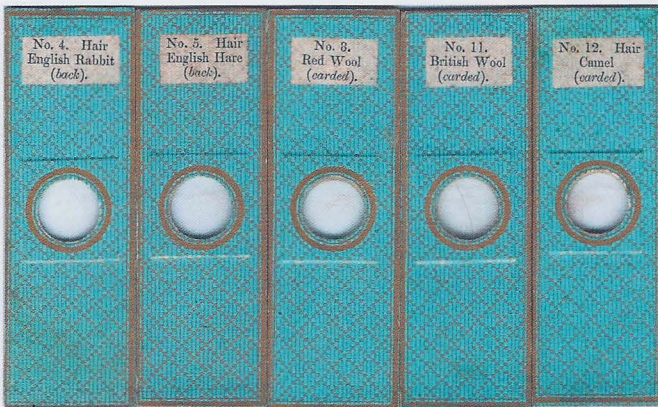
<sup>5</sup>Originally published in the Winter 2010 Quekett Journal of Microscopy, Issue 41, pages 311-321



Fig. 7 Blue "Star" papers with Abraham & Dancer labels, dating them to between 1841 and 1845.



Fig. 8 Plain blue papered slides, c. mid 1840s.



**Microscopical Memoranda.**

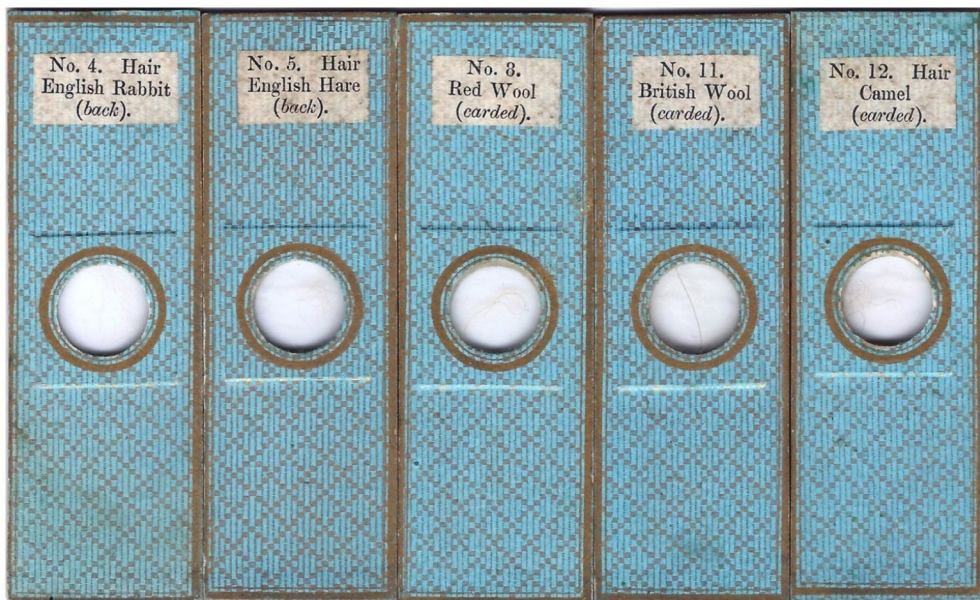
*Topping's Objects Illustrative of the Process of Felting.* - We have recently received from Mr. C. M. Topping (whom we had occasion to recommend to the attention of microscopists at page 16 of our Journal) a set of twelve slides, containing the hairs of various animals, the fur or wool of which is used for felting. The objects are numbered according to their tendency to felt, and, independent of their being generally interesting as objects of structural beauty, they are the more so to those particularly interested in the subject as a branch of manufacture. We recommend the set to all classes of observers.

We observe that Mr. Topping uses strips of mahogany veneer, (instead of slips of glass) with a hole bored through the centre for the glass to fix the object upon. This is a decided improvement over the old plan. -Editor

Fig. 9 Partial group from a later set of Topping's 12 Felting Hair slides, c. mid 1840s, and (above) the original notice from 1841.



Fig. 10 Green papers with same design pattern as above, c. mid 1840s.



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been of simple design, probably for cost reasons. Blue, black, red and green papers with a simple star design in gold have been identified with Topping's handwriting on the labels (Fig 6). However the mid-blue papers are likely to have preceded the other colours in this pattern. They have the specimen description handwritten on the papers themselves, whereas the others have oval labels top and bottom. It is fortunate that some examples of the mid-blue starred papers without labels have been found associated with Abraham & Dancer, dating them to the years 1841-45 (Fig 7).

It is probable that the Topping slides with a rather coarse plain darkish blue with oval white labels top and bottom were also prepared during the first half of the 1840s (Fig 8).

Two particularly interesting groups of slides have come to light. They have a more complicated printed pattern. A diagonal gold lattice work is enclosed by a gold line round the slide edges. The probable earlier set in this group has a pale blue background. These five slides have printed labels and are part of a set of twelve wools and hairs used in felting. One of the earliest records of Topping's preparations describes a set of 12 mahogany mounted slides of hairs for felting (6, and Fig.9). The second part of this group of papered slides carries the unmistakable Topping handwriting on the upper oval labels, and are pale green in colour (Fig 10).

However, it was not long before the gold-patterned papers familiar to those who have old slides, were available. Pritchard's *Microscopic objects* of 1847 included a page of six intricate gold patterned front papers ready for cutting out and attaching to a slide (Fig 11). This small volume was on sale to the public, so the trade would already have had access to attractive and varied slide papers by that date.

Little time elapsed before the "generic star" printed papers seen in the early 1840s were superseded by the custom-printed papers available by the latter half of the 1840s. There was a period in the mid 1840s when Topping was using a variety of different papers as well as the plain glass diamond engraved slides to present his work to the public. The relative rarity of some of these papers indicates that this was a brief period, before he settled on the gilt and green papered "CMT" design.

### Period 1850-70

A surprising variety of patterns and colours of paper have been identified on Topping slides. This poses a number of questions as to dating and the aims and intentions of this maker in utilising such variations of livery for his preparations. It is accepted that there are two familiar patterns most associated with Topping slides. The first has a pale green background with a gold border and a longitudinal wavy line gold pattern, not dissimilar to the Pritchard page of papers described above (Fig 12). This was followed by his final and most familiar choice of paper, a red background with printed gold border, transverse stripes and a central oval with longitudinal lines within it (Fig 13).

A possible dating for the first use of Topping's red papers is indicated by his inclusion on the lower label of the award given to him at the Great Exhibition, 1851. He would have incorporated C.M. Topping, Exhibition Prize Medal Class X on his slides as soon as he could get the papers printed, so a date in the early 1850s is likely (Fig 14). It has been possible to identify a paper which combines the earlier pattern on the pale green slides with the later red coloured papers, but with the gold pattern more heavily embossed. These are also distinguished by having cream coloured backing papers, found on his other large exhibition slides. All have the 4. New Winchester Street address, dating them to 1848-1862 (Fig 15).

The attribution of other alternative papers is based on the patterned area around the specimen. The green papers have the lattice pattern carried on round the central oval opening within a border; the red papers have the pattern going across the oval and in a border. Some examples of the earlier pattern on the red/gold papers have a much larger central oval covering about half the area of the slide, and without any pattern in it. A variation of this with smaller plain central ovals and roundels has been found in red and blue (Fig 16).

Topping's green papers had a plain white oval at the top for specimen details; his printed initials in script or his name and address are occasionally found in the lower oval. The lower oval was covered when the slide was sold into the trade. The red papers have two named roundels in addition to the ovals, with Topping's name. Those sold within the trade had either named



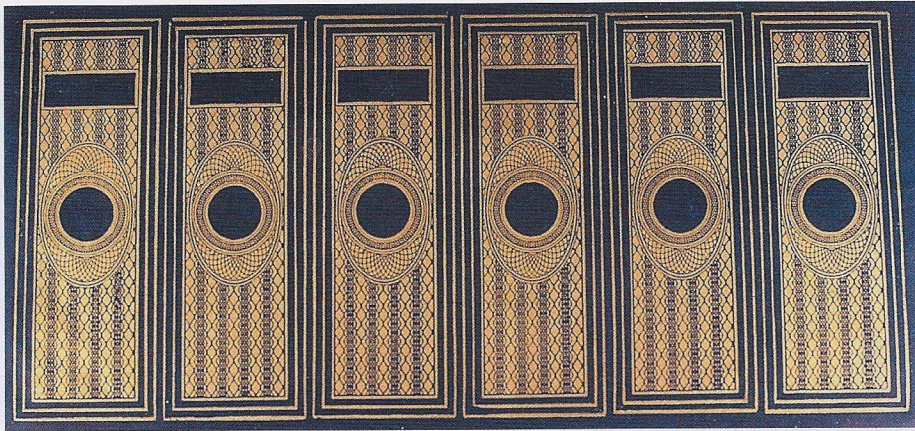


Fig. 11 Page of lithographed papers from Pritchard's "Microscopic Objects", 1847.

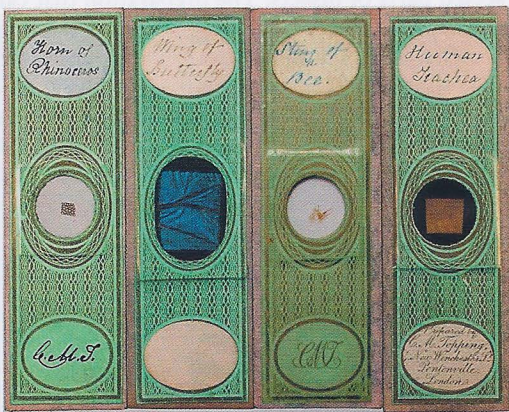


Fig. 12 Topping's well known green patterned papers, probably in use from later 1840s to mid 1850s.



Fig. 13 The familiar red papers with "C.M. Topping" in roundels, probably introduced c. 1850 and in use to early 1870s.

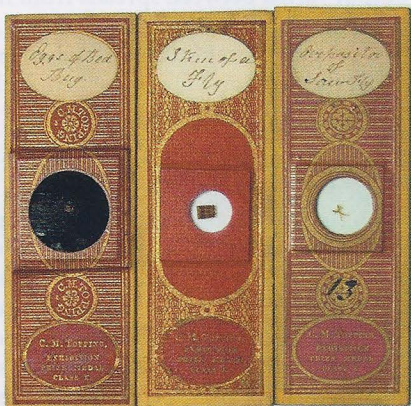
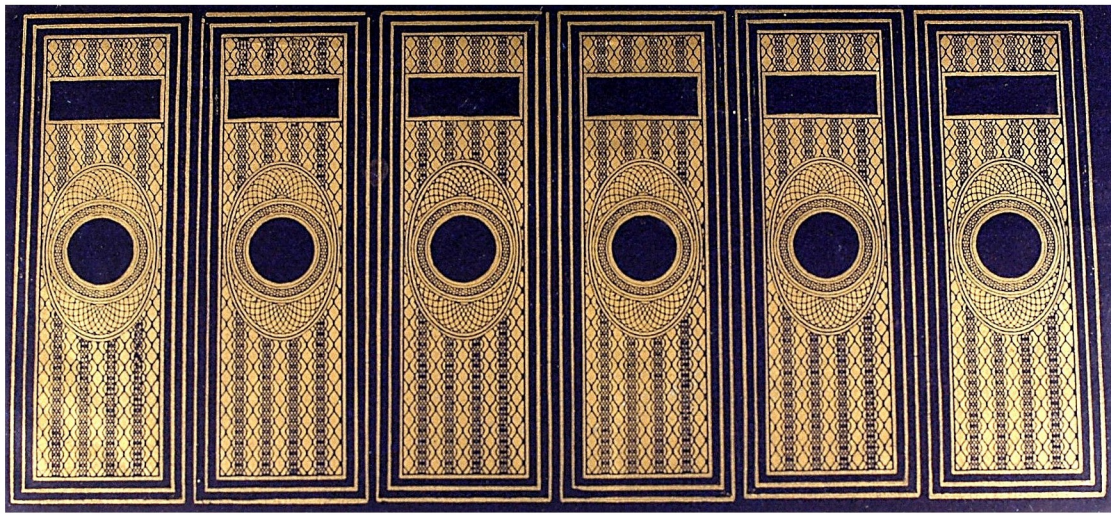


Fig. 14 Red paper design variations, all with 1851 "Exhibition Prize Medal" notation, early 1850s ~ 1860s.



Fig. 15 Unusual red paper variation using exhibition mounting, with same pattern as earlier green paper slides, c 1850.



or a circular design with a central cross motif in the roundels. The number of the latter suggests that trade business formed a not inconsiderable proportion of his sales.

Topping's intention in using such a variety of coloured top papers and unusual designs identified in recent years, is open to conjecture. The deep blue and pale mauve slides are rare and most interesting. They all have the last and most familiar pattern, with Topping's name in the roundels above and below the specimen. Fortuitously one has the date 1861 in Topping's handwriting, and the initials JHS. This would suggest that it was supplied to the firm of J. H. Steward before their own printed oval name labels were available. Similarly another in this group with Topping's handwriting, has the name J. Amadio 1858 (Fig 17).

Dated slides are helpful in building a time-line. A red-papered slide of 'Infusoria from Guano' which came from Ichaboe island, has a date on the lower label of 1847 in Topping's handwriting. The "Ichaboe guano rush" lasted for a brief time, from 1843 to 1845. Walker-Arnott reports that Topping was one of the first to note the diatom *Arachnoidiscus*, which he found in this guano [7] and Fig 18. Topping supplied samples of Ichaboe guano to C.G. Ehrenberg, who described *Arachnoidiscus* in his paper on *Hemiptychus* in 1848. This slide has brought to light additional evidence of the important connections that Topping had made, and his standing in the world of microscopical science.

The red papers were clearly used by Topping on his slides prior to 1862. The logical conclusion is that the production of slides with the green and red papers overlapped before the use of the green papers was discontinued, probably in the 1850s.

As no account books or ephemera of any kind relating to the firm have as yet been found, conclusions can at best be tentative. Small businesses must of necessity consider any option to promote sales. Topping was in an increasingly competitive field, and from an early date willingly sold to both trade and private customers [8]. The latter would have paid more for his preparations and mounting instruction, but good trade customers could provide a regular source of income. Special orders either trade or private, may have resulted in the unusual papers and designs on some of his slides.

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## Main subjects prepared

Quekett's list of slides in his 1848 edition is the only one, albeit incomplete, that records some of Topping's preparations during the 1840s. A brief overview of the subjects prepared by him may be helpful.

The histological slides using the injected corrosion method without pressure, which he developed, are justifiably admired for his innovative expertise and skill. Hett and Hyrtl are the only other preparers who made commercial numbers of this type of slide. Topping also offered injected specimens for transmitted light viewing.

Most of his entomological slides were dissected parts of insects. The preparation that can be called his signature slide, the proboscis of the blowfly, comes within this group. He mounted this from the 1840s onward (Fig 19). Large entomological slides by Topping are relatively scarce, and included superb tracheal systems, beetle larvae and caterpillar skins. Many small whole insects and parasites were prepared.

Polarising subjects are well represented with green paper covers. He chose proportionally more animal and vegetable specimens than chemical or petrological ones.

Diatoms, sometimes described as infusoria on earlier slides, were part of his inventory although not one of the more prolific subjects. His output varied between spreads from named localities, to spreads of a particular species, with a single or small arranged group of a specific diatom in the minority. Diatoms were included in his list of test slides.

Petrological and fossil specimens are well represented. Whenever he could procure unusual subjects such as mineral sections from the Pyramids, they were offered for sale. Igneous and sedimentary rocks were listed, as was gold from different localities, and crystallised silver. He offered a comprehensive selection of coal fossils from England and abroad, sometimes in triple sections. This period had seen an increasing interest in fossils of all kinds, from *Xanthidia* in flint to sections of dinosaur bones, and Topping sought to meet the demand.

His marine slides included a considerable number of sponge spicules, young oysters, fish scales and teeth, star fish, algae, foraminifera, shell sections, palates and deep sea soundings.



Fig. 16 Red paper design, and (right) variations of Topping's standard paper design with blank roundels, 1850s ~ 1860s.

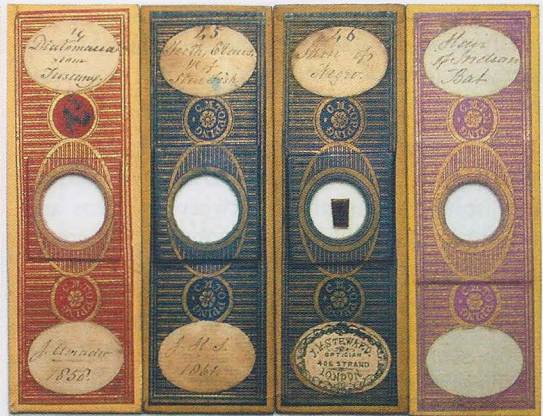


Fig. 17 Topping's standard design with (left) paper covered roundels, and unusual dark blue and mauve papers, c. 1860.

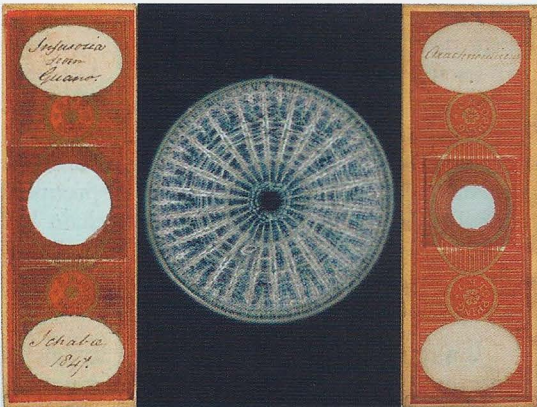


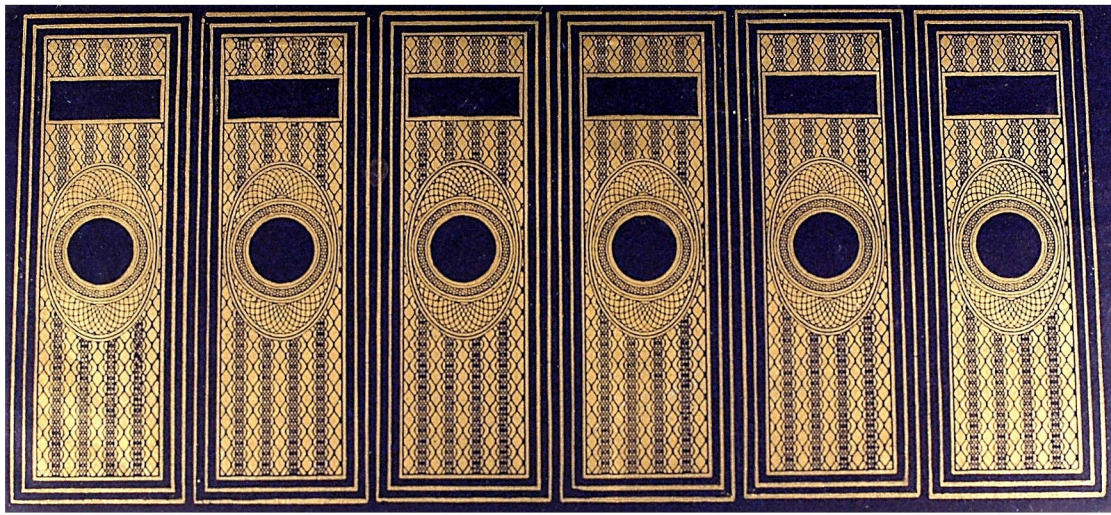
Fig. 18 Topping Ichaboe Is. Infusoria 1847, and single specimen slide of Arachnoidiscus, standard red papers.



Fig. 20 Part of a numbered set, green papered slides, c. 1850.



Fig. 19 Topping's famous signature mount "Proboscis of Blow Fly", showing various examples from 1840 ~ 1860s.



Topping sold excellent wood sections, especially double and triple specimens, stained transverse sections of stems, petals, pollen, seeds, leaf sections and hairs.

Test slides were very popular during the 19th century. There were considerable achromatic and spherical variations between one lens and another, even from the same maker. It became the fashion to test lenses and optical combinations by using an appropriate test subject, depending on the magnification employed. The proboscis of the blowfly was an excellent test slide, as was the pygidium of the flea, scales and hairs of certain insects and selected diatoms, mounted both dry and in balsam.

Topping sold numbered sets of slides with his green papered covers and would supply educational sets if required [9] and Fig.20. He mounted both opaque and transmitted light preparations.

It is quite common to find Topping slides with subsidiary lower labels of J. Amadio, J.H. Steward, C. Baker and J. Browning, amongst others.

## Conclusion

The incomplete picture of this Victorian maker of microscope slides garnered from the evidence of his mounts and the limited details in Quekett's book together with a few comments and advertisements in contemporary literature and censuses, is indeed tantalising. He is recognised as a leading exponent of his art and was known to the luminaries of the period, in addition to having associate membership of the leading microscopical society: at that period those in trade were not admitted to full membership. Quekett's diaries give a few important insights into his probable mentoring of Topping, and the exchange of material for mounting [10].

Quekett's position and standing was such that he could obtain a wide range of histological specimens from the Zoological Society of London, founded in 1826. It is probable that such doors would not have opened quite so readily for Topping, but the acquisition of a comprehensive range of specimens was fundamental to his business. Exchanges of the raw material for finished slides would have been an element in building a

circle of suppliers. Contacts in the museums for special interest subjects such as mummy cloth, papyrus and fossils, gave Topping a limited commercial edge. These small volume rarities would have attracted interest, but were a minor part of his output.

Slide preparers could not afford to spend too much time sourcing specimens – it was the hours at the workbench that provided income. There was in all probability an ancillary circle of those who hunted for the specimens to sell to the slide makers. In the 1861 Census the business was listed at 4 New Winchester Street, Clerkenwell, London, and Topping was described as a Microscopic Anatomist. He is shown as employing 3 men, one of whom was probably his son Amos. However it does indicate that his enterprise was successful enough to be able to pay for additional staff. As in any successful commercial endeavour, efficient and appropriate sources of supply of raw material are vital to success. Quekett's diary records the exchange of unmounted histological specimens for Topping's diatom material. This chain had another recorded link; that of Professor Bailey of Westpoint, New York [11]. He sent diatom samples described as Infusoria, to Topping.

Interest has burgeoned in the somewhat esoteric study of Victorian and later preparers of microscope slides, as modern methods of research have encouraged new participants into the field. Already the benefits have been apparent with the increased number of articles on the subject. Slowly but surely research into the familiar names seen on microscope slides is identifying and revealing more of the people themselves. It can be argued that this is not a necessity in understanding the evolution of slide making, but it most certainly adds to the historical knowledge of the period in a number of unexpected ways, not least of all in human terms.

## Acknowledgements

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11. Quekett J. ref.2 above, see p.376.

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