

Mary Ann Booth, 1843-1922

by Brian Stevenson

As a well respected, professional scientist, Mary Ann Booth was a rare woman of her times. She was widely published, was sought after for lectures, and for many years served as microscopy editor for scientific magazines such as *The Observer*, *Practical Microscopy*, and *The Guide to Nature*. She was elected as a Fellow of the Royal Microscopical Society in 1889. At that time, there were only two other female Fellows of the RMS: Miss Eliza Catherine Jelly, of Redhill, Surrey, and Miss Vida Annette Latham, of the Dental Department, Michigan University, Ann Arbor, Michigan USA. In addition, Booth was a Fellow of the American Association for the Advancement of Science and of the Royal Photographic Society, and a member of the American Microscopic Society, the Brooklyn Institute of Arts and Sciences, and the Daughters of the American Revolution. In 1915, she was described as “one of the greatest living authorities on photographs taken through a microscope”.

Booth's microscope slides of diatoms and pollens were especially well regarded for their even distribution of specimens and high quality finish. Her slides are nowadays encountered with some frequency at auctions on both sides of the Atlantic, attesting to her substantial output and world-wide customer base.



Figure 1. Examples of microscope slides produced by Mary Ann Booth. She began microscopy studies in 1877, and is known to have sold slides by 1884. The address of Longmeadow, Massachusetts date these slides to before 1898; by that date she lived in Springfield, Massachusetts. The majority of Booth's advertisements refer to her diatom mounts, and these are by far the most abundant today. Diatom mounts chiefly consisted of strews, although diatoms in situ on seaweeds are frequently encountered. Booth was also well regarded for her slides of pollens, both stained and unstained. Other subject matter, such as the section of pine wood at lower left, are less common.

Mary Ann Booth was born September 8, 1843 in Longmeadow, Massachusetts, daughter of Samuel and

Rhoda Colton Booth. Both parents came from old families of the area. Samuel's first wife had died in 1839, leaving him with a 1 year old son. Samuel and Rhoda married ten months later, a common occurrence of the times. Mary Ann was their only child. A biography of the Booth family described Samuel as both a practical man and one driven to scientific pursuits. His *"career was a remarkable illustration of the ordering of a whole life with one end in view, and that end the gratification of a scientific instinct"*. Orphaned at the age of 14, Samuel dropped out of school and applied himself to farming. *"Mr. Booth spent the first fifty years of his life in unremitting toil, carefully and skillfully cultivating his farm in Longmeadow, practicing economy and wisely investing his surplus funds. At the end of that period he found himself in the position in which he had been trying to reach, and from that time until he became too weak to move about his house, he was busily at work. The subjects of his study were mineralogy, geology and general natural history . . . his collection of mounted specimens of our native birds is interesting and fairly complete. His collection of minerals and fossils was almost unlimited, nearly every available nook and corner of the buildings on his premises being filled during his life with specimens. His collection of Indian relics was without doubt the largest in the vicinity, and included specimens from almost every state in the union and from Canada"*. Many scientists and collectors can relate to the following: *"Mr. Booth worked persevering and steadily when it seemed as if the result of his collections must be solely the pleasure which he himself derived from them. But they gave him a happy old age, and an interest in life at a period when most interests fail. Indeed, Mr. Booth's physician positively stated that his interest in nature was the means of prolonging his life"*.

Several published records describe Mary Ann as having been *"invalid"*, but do not reveal the nature of her handicap. She never married.

Mary Ann helped her father throughout his life. Summers at the sea shore reportedly got her interested in microscopy. That may explain her later expertise and fascination with diatoms.

Family history reports that Booth began her microscopy studies in 1877. By the following year, she was advertising to exchange *"marine algae, diatoms in situ on algae, musci, hepaticae, ferns, lichens, lycopodiaceas, etc., . . . for any good mounted objects"*, and *"marine algae for the herbarium; Northern N. E. and Florida species particularly desired; named species, for dried alga of those sections"*. Her skills at diatom collecting and cleaning advanced quickly, as Booth advertised in 1878 that she wanted to obtain *"a good stage micrometer, in exchange for fine diatoms and other desirable material"*. In 1878, the San Francisco Microscopical Society reported that they obtained specimens of the diatoms *Tabellaria flocculosa* and *Fragilaria virescens* from exchange with Mary Ann Booth. Those diatoms were probably not mounted on slides, as suggested by an exchange advertisement in that year's *American Naturalist* for *"Diatoms: Rhabdonema adriatica, Synedra ulna, splendens and superba, Tabellaria flocculosa, Fragilaria virescens, Isthmia nervosa, diatomaceous earths and other unmounted material, for named diatoms or other good mounted objects. M. A. Booth, Longmeadow, Mass"*. In 1880, she advertised *"Pleurosigmas and other unmounted Diatoms, both Fresh Water and Marine; also Marine Algae, Ferns, and a large quantity of miscellaneous microscopical material in exchange for good mounted objects"*.

All this shipping of glass containers led to run-ins with the Post Office, as described in an 1884 letter to the *American Monthly Microscopical Journal* (Figure 2).

CORRESPONDENCE.

Mailing Packages of Diatoms.

To THE EDITOR :—I have been much interested in the past in practical articles on mounting. Wish there might be something on preparing fluid mounts. Have gained many valuable suggestions from the JOURNAL as to the minutiae of mounting.

Can you tell me, through the JOURNAL, how one can send small exchanges to foreign countries? There seems no limit to the vials of fluid as diatoms which one may receive from them. I have received as many as 20 vials in one box, but if I send one vial containing a few drops, even in a tightly corked wooden flask, it is returned to me from the New York post office stamped 'liable to injure and deface the mails.'

M. A. BOOTH.

[The only way to send specimens of diatoms in fluid abroad is to put letter postage on them. Abroad, post offices are established for the convenience of the people, to encourage intercommunication, and in Holland one can send butter, herrings, and perishable merchandise by mail, and even have the bills collected and the amounts returned for a trifling fee.

Let some one put a dried herring in the New-York post office, and see how far it would go! Our postal laws are absurd in many respects, but they would not be so bad if the officials saw fit to use discretion in interpreting them, instead of acting like automata.—ED.]

Figure 2. A letter from Mary Ann Booth to the *American Monthly Microscopical Journal*, published November, 1884.

By 1884, Booth had clearly acquired substantial skills in slide making. The November issue of the *American Monthly Microscopical Journal* reported having received "excellent mounts" of mosquito scales and *Tabellaria flocculosa* diatoms from Miss Booth (Figure 3). The scales were "evenly distributed over the field", a remarkable feat. In 1886, a member of the Torrey Botanical Club (New York) wrote to his colleagues in the Club's *Bulletin*, "Diatom Slides. It may be of interest to some of our readers who are interested in diatoms, to know that Miss M. A. Booth, of Longmeadow, Mass., makes a specialty of preparing microscopical slides of named species as well as of general deposits. These slides are well-mounted and reliably named, and those who are seeking certain species to complete collections will do well to send for her list".



B

—We have received a few excellent mounts of late which deserve to be mentioned in this place. From Miss M. A. Booth we have a dry mount of scales from a mosquito which are so evenly distributed over the field that we are tempted to ask her how it was done, and to request an answer for the benefit of our readers. She has also favored us with a fine preparation of *Tabellaria flocculosa*, a common diatom, but a good one to mount.

C

Mosquitoes and their Scales.

TO THE EDITOR:—At the risk of provoking jealousy between New Jersey and Long Island, I will tell how I procured the material from which my slide of mosquito scales, referred to in the November number of the JOURNAL, was obtained. Driving on Long Island we encountered a swarm of mosquitoes so thick that we had to brush them away from before our faces in order to see the horse. Bethinking ourselves that we had with us some large-mouthed ounce vials for collecting purposes, we removed the cork from one of them, and it was soon filled with live and lively mosquitoes. Replacing the cork, they died, but not until they had well denuded themselves of their scales. This was three seasons ago, and although I have made many slides of mosquito scales since that time, my supply shows little signs of diminution. This may seem like a mosquito story, but for its verification I can still show those identical mosquitoes.

M. A. BOOTH.
LONGMEADOW, MASS., Nov., 1884.

Figure 3. It is a rare treat to find details of a specific item in one's collection. **(A)** A Mary Ann Booth preparation of "scales of mosquito", "illustrative of the productiveness of Long Island – summer of 1882". **(B)** An 1884 note from the editors of the *American Monthly Microscopical Journal*, describing a similar slide. Professional slide makers frequently sent samples of their work to journals such as this, in the hope of free advertising. **(C)** A response letter from Booth to the same journal, describing how she acquired the mosquito scales "three seasons ago" (i.e. 1882). Note how Booth evaded the journal's real question, which was how she distributed the scales evenly across the slide. A burgeoning professional, she was already wise enough not to give away production secrets.

Booth earned a Diploma of Honor in Entomology (Women's Department) at the 1884-85 New Orleans World's Industrial and Cotton Centennial Exposition for her "prepared slides for the microscope".

Her slide-making skills were discussed at length in *The Journal of the Royal Microscopical Society*, in 1886. They noted that Booth had a standing offer to replace any slide that failed (such as colored sealing cement leaked into the clear mounting medium), but no one had ever take up the offer. Her secret was white zinc cement. She also noted that she used brass curtain rings to make cells on slides. "Why do Dry Mounts Fail? Miss M. A. Booth, in looking over her collection of slides, representing the work of European and American preparers, with a view to noting their keeping qualities, has been so surprised at the number of failures as to query whether permanence in microscopical work is possible. Why is it that so large a proportion of dry mounts fail? Obviously because that motto which should emphatically be the microscopist's motto, *festina lente*, is not heeded by all workers. The advances in the merely mechanical portions of mounting have evidently not kept pace with those in its purely scientific departments, or else microscopists sometimes forget to take counsel of their good common sense in the use of cements. In her collection are slides which have cost hours of skilful manipulation and yet are utterly ruined because of inattention to the details of the proper use of a cement. How do we sometimes apply balsam to a mount? By running it under the cover and trusting to capillary attraction to fill the field. But why should this law of capillary action be operative in the case of the balsam and suspended in that of the cement? From careful observation and a not limited experience—speaking of dry mounts of diatoms and the like - Miss Booth is convinced that success or failure depends not so much upon the kind of cement used, as upon the care with which it is used.

In her own work, however, she has fixed upon white zinc as the most reliable cement, and has sent out hundreds of slides made with this cement, accompanied with the request that all failures be returned, so that

she might replace them with perfect slides; but not a slide has ever been returned. It has been her experience that white zinc properly prepared and properly used never fails. The secret of success with good white zinc is, that the rings shall be thoroughly dry, prepared at least forty-eight hours, and preferably more, before using. It may be objected that so much drying consumes too much time. Slides can be ringed at the rate of a gross an hour, and this at odd moments when no other species of microscopical work is possible. These slides, packed in rack boxes, occupy but little space, are free from dust, and reliable slides are always ready for immediate use. In deep cells for opaque mounts, it is not found that those slides whose cells contain an aperture are any more free from dewy deposits upon the cover than those which are hermetically sealed.

The following form of cell she has found very satisfactory. Use no volatile substance within the cell; paste a dead black paper upon a white (not much glazed, and therefore absorbent) one, and from this cut with a gun-punch disks of the desired size; centre a slide, and paste a disk upon it (black side down), to exclude the light; upon this cement with gold size a brass curtain-ring, flattened or not, according to the depth of the cell required; run on a background with any shade of water-colour paint which best exhibits the object, leaving a white margin around the edge of the cell; cement the cover with a small quantity of white zinc to the ring; colour the cell as may be desired; run on the copal mixture [already described] giving added security to the cover and rounding out the cell. This makes a neat and durable mount, and no dewy deposits have ever, to her knowledge, appeared upon the covers of cells so made.

With regard to the prevention of "dewing" in transparent mounts, she has found it essential that the objects should be thoroughly dry. If diatoms, use the covers direct from the brass mounting table; or if such as have been breathed upon, as scales, see that the moisture is fully evaporated, and in sealing, use the smallest quantity of cement consistent with a perfect adhesion of the coverglass".

In 1887, *The Microscope* reported, "We learn that Miss M. A. Booth, Longmeadow, Mass., is giving instructions in slide-mounting. They who have seen samples of her work should be glad of an opportunity to learn how it is done. We wish her success in this new field".

She later published tips on making slides, such as this, from 1898, "Spreading Diatoms. An extended experience in the preparation of diatom mounts leads me to a directly opposite conclusion from that expressed by Mr. Bryan in the December number of the *Journal*. I am convinced that there need be no difficulty whatever in the even distribution of diatoms on covers save in the case of *Synedras* or other lengthy forms, mingled with smaller species - small *Melosiras*, for instance - when the long forms prevent an even access of the smaller frustules to the different portions of the field. Experience has demonstrated to me that the persistent tendency of the fluid containing the diatoms in suspension to collect at the centre of the covers is due to the aforesaid covers not being thoroughly clean. Thus, I clean my covers in sulphuric acid, wash thoroughly, and keep them until desired for use in vials of alcohol. If the covers are allowed to remain in acid too long - say, two or three days - they appear as if burned in fire. I find that they should remain in acid over night only, when they will be found to be in good condition. If, however, in my haste I mitigate the acid treatment by abbreviating it to two or three hours, the covers work like those of Mr. Bryan, and no amount of coaxing will induce the appropriate amount of fluid to cover them. This indicates to me that the brief immersion in acid has not sufficed to remove the greasy film imparted by handling. Sometimes immersion in undilute alcohol will remedy this trouble. Returning the covers to the acid bath always does. Spreading diatoms evenly on the cover is such a simple thing to do, and withal so easy in ninety-nine cases out of a hundred, that it surprises me that anyone can be content to mount unevenly distributed diatoms. Moreover, it seems to me that to attain the best results our care should be to eliminate impurities, not to introduce them. M. A. BOOTH, F.R.M.S., Editor of the 'Observer'."

Advertisements from the 1890s onward indicate that Booth had begun selling more than just her own microscope slides. An advertisement from 1891 indicates that she was a distributor for Eduard Thum's slides of arranged diatoms and butterfly scales (Figure 4A). By 1892, she was advertising books for sale, and was distributing the *International Journal of Microscopy*, from England (Figure 4B and C). She also offered to present public lectures on microscopy and other subjects (Figure 4D). Booth's advertisements of her microscope slide business continued until well into the twentieth century (Figure 4E).

A TO MICROSCOPISTS.—After July 1 the price of my well-known slides will be the uniform one of 50c. each, \$5.00 per dozen. Send 2c. stamp for catalogue and 50c. for slide of Podura scales, test, or other diatoms, or of miscellaneous objects. Thum's "Oh, My!" slides of arranged diatoms, gorgeous butterfly scales, etc., at lowest rates.

M. A. BOOTH, F. R. M. S., Longmeadow, Mass.

B Amateur Microscopists.

—ORDER YOUR—

Microscopical Books, Instruments, and Supplies

of M. A. Booth (Micro. Editor of THE OBSERVER). Test plates of 20 diatoms, dry, in Balsam, or in Styraç, at the Very Lowest rates. Give me a trial order for anything you need in the Microscopical Line.

M. A. BOOTH, (F. R. M. S.,)

LONGMEADOW, - - - MASS.

\$5.00. Carpenter on the Microscope, 7th (American) edition for \$5.00! Postage 38 cents, M. A. BOOTH, (F. R. M. S.,) Longmeadow, Mass.

C \$4.98!

Carpenter. "The Microscope and Its Revelations."

The 7th, the American (Blakiston) edition, the latest and best, publisher's price, \$6.00, for \$4.98! If by mail, 38 cents for postage.

Microscopes, Microscopical Accessories, and Books.

TEST PLATES OF TWENTY DIATOMS A SPECIALTY, AT LOWEST RATES.

YOU WILL WANT

A Good English Journal.

Try the International Journal of Microscopy, containing the Journal of the English Postal Club, notices of English scientific works, etc. Subscription \$1.75, postpaid.

M. A. BOOTH, (F. R. M. S.,)

Micro. Editor of THE OBSERVER,

LONGMEADOW, - - - MASS.

D POPULAR LECTURES. The Microscope in Nature.

Illustrated by Lantern Slides.

By Miss M. A. BOOTH, F. R. M. S.

(Late Editor Practical Microscopy.)

For Terms and Testimonials address M. A. BOOTH, 32 Byers Street, Springfield, Mass.

E Diatom Slides

My well known diatom slides, American and foreign, recent and fossil, \$4.00 per dozen postpaid.

M. A. BOOTH

60 Dartmouth St. Springfield, Mass

Figure 4. Advertisements published by Mary Ann Booth. (A) 1891, from the American Monthly Microscopical Journal. (B) January, 1892, from The Observer. (C) May, 1892, from The Observer. By this date, Booth had realized the attraction of selling an item for a couple of pennies below a whole dollar. (D) 1898, from The Journal of Applied Microscopy. (E) 1915, from The Transactions of the American Microscopical Society.

Mary Ann Booth featured prominently in a 1915 magazine article on amateur scientists, entitled "The Irregulars of Science". A photograph of Booth accompanied the article, as did a photomicrograph that was presumably taken by her (Figures 5 and 6). Booth was described thusly,

"Almost any scientific directory gives a sketch of Miss Mary A. Booth of Springfield, Massachusetts, Fellow of the Royal Microscopical Society of England, Fellow of the American Association for the Advancement of Science, and one of the greatest living authorities on photographs taken through a microscope. Her work appears in scientific circles and in museums all over the world; and yet her entire laboratory is contained in one corner of the guest room in her home, and the apparatus is surprisingly simple and compact. When a guest comes, the laboratory shuts off as a closet, and the room is again a sleeping chamber.

Miss Booth started her great work casually. A helpless invalid in a chair at the seashore one Sunday morning, she admired some sea weeds which a friend brought to her, and promised to mount them on paper. That aroused her interest, and she gathered other specimens for herself. Soon she acquired a microscope, and slowly but surely she broadened the field of her endeavors.

A bumble bee, caught in her garden, gave her seventeen different kinds of parasites which she mounted and photographed with her photomicrographic camera. This gave her a new interest, and as a result, a few years ago she undertook the great task of a study of the parasitic life of the Pacific Coast.

Surgeon-General Rupert Blue asked her to prepare photomicrographs to be used in San Francisco in the public campaign against bubonic plague and she accomplished this work with great success. At the present time she is devoting all the time she can spare to preparing for the National Museum, at the invitation of Dr. L.O. Howard, a print of every one of her photomicrographs of parasites, which, when completed, will make an album collection running up into the thousands.

'People have the erroneous idea that costly apparatus is necessary for scientific work,' she says. 'It seems to me that the simpler the tools one can do good work with, the better.' And she tells of a dapper young man who had heard of her scientific reputation, coming to get her to do some micrographic work for him, but dropping the matter when he saw the homeliness of her apparatus".

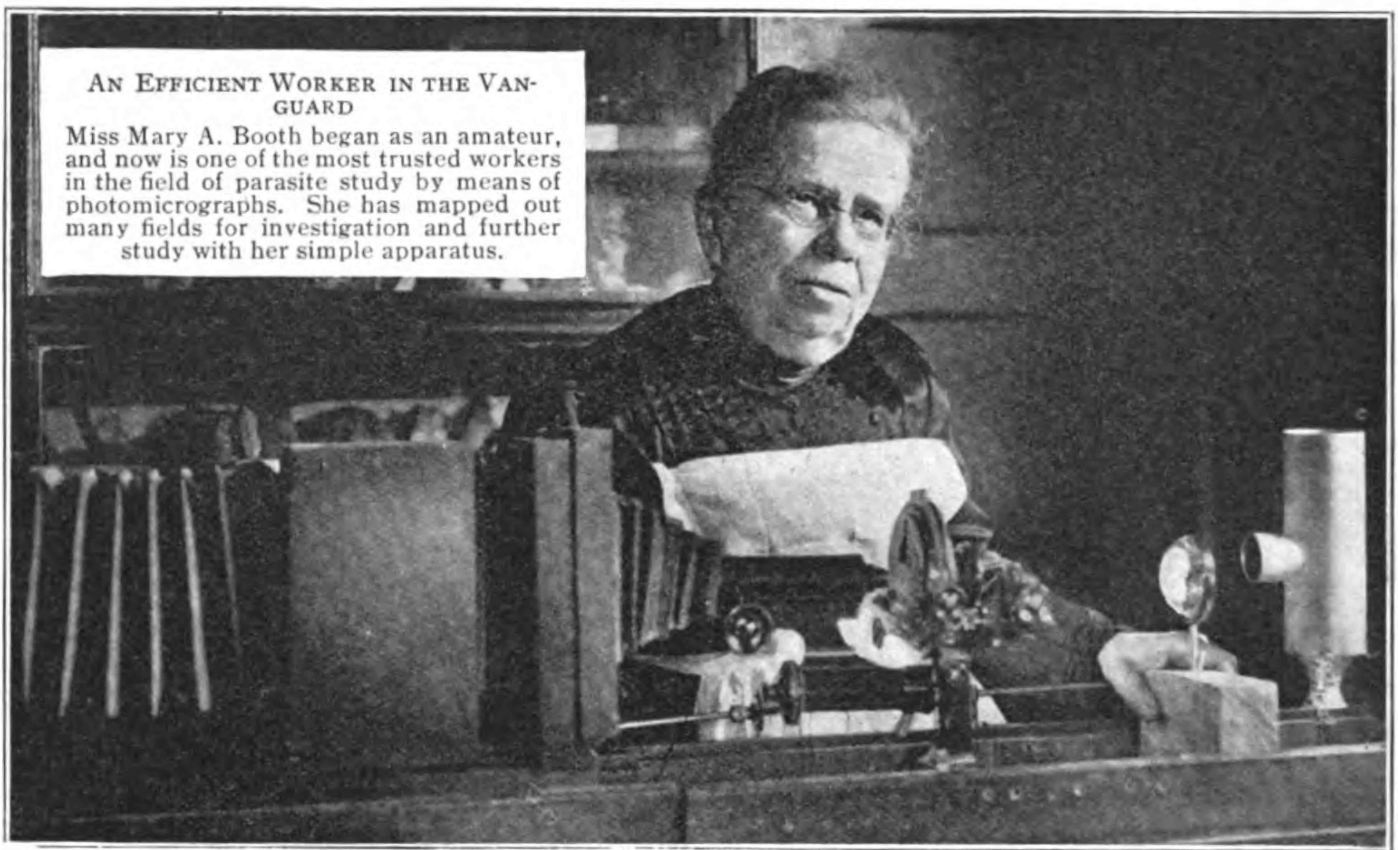


Figure 5. A ca. 1915 photograph of Mary Ann Booth, seated behind the apparatus she used to photograph microscopical objects.

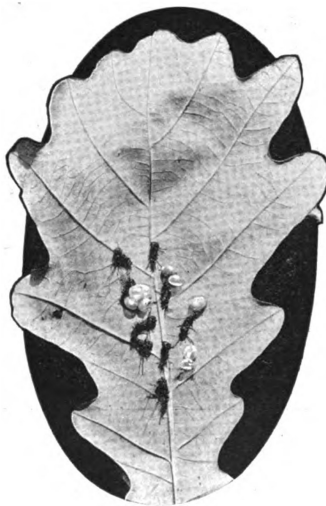


Figure 6. A photograph of a moth caterpillar emerging from an egg, which accompanied the magazine article “The Irregulars of Science”. Mary Ann Booth was the only person discussed in the article who was known for photography, so this was presumably her work.

In 1916, Booth donated a series of her photomicrographs to the Springfield Museum of Natural History, “*Photomicrography is the art or process of enlarging minute objects by means of the microscope and reproducing the enlarged image by photography. A recent valuable accession at the Museum of Natural History is a photomicrograph of the flea of a mouse, the gift of Miss Mary A. Booth of this city. This flea is one of the carriers of the dread disease known as bubonic plague, of which the most serious outbreak in the United States occurred a few years ago in San Francisco. The flea not only transmits the disease from rat to rat, but also from rat to man. The plague always occurs among the rodents before many cases develop in man. Hence, an accurate knowledge of these insects is important to prevent flea breeding among rats, mice, and ground squirrels. The photomicrograph exhibited is the first of a collection which Miss Booth is preparing for the museum. The collection will show a series of woods and insect appendages. Miss Booth's skill in photomicrography is unique; her work has won honors at the great expositions, and she has been elected a fellow of the Royal Microscopical Society of London, the Royal Photographic Society of Great Britain, and the American Association for the Advancement of Science. The museum in her home city is fortunate in receiving this gift of specimens of Miss Booth's valuable work*”.

Mary Ann Booth died on September 15, 1922, at the age of 79. Both the *New York Times* and the *New York Tribune* carried obituaries, “*Mary A. Booth, photo-microscopist of international fame and one of the leading women of science in this country, died suddenly in her home late this afternoon. She was 77 (sic) years old. Miss Booth was born in Longmeadow, Mass., and was educated in the schools of that town and Wilbraham. Miss Booth became especially well known when Surgeon General Blue was waging his successful campaign against the bubonic plague in San Francisco in 1907-08*”.

This and other articles on historical microscopy can also be seen at <http://microscopist.net>

Resources

American Journal of Microscopy and Popular Science (1878) Exchange offers from M.A. Booth, Vol. 3, pages 120 and 140

American Journal of Microscopy and Popular Science (1878) Report from the San Francisco Microscopical Society, on diatom slides obtained from M.A. Booth, Vol. 3, page 190

American Monthly Microscopical Journal (1880) Exchange offers from M.A. Booth, Vol. 1, pages 20, 80, 100, 120 and others

American Monthly Microscopical Journal (1881) Exchange offer from M.A. Booth, Vol. 2, page 20

American Monthly Microscopical Journal (1882) Exchange offers from M.A. Booth, Vol. 3, pages 80 and 120

American Monthly Microscopical Journal (1884) Note on M.A. Booth's mosquito scale slide, Vol. 5, page 219

American Monthly Microscopical Journal (1886) Exchange offers from M.A. Booth, Vol. 7, pages 60 and 119

American Monthly Microscopical Journal (1891) Advertisement from M.A. Booth, Vol. 12, page 168

American Naturalist (1878) Exchange offer from M.A. Booth, Vol. 12, page 766

Booth, Mary Ann (1884) Mailing packages of diatoms, *American Monthly Microscopical Journal*, Vol. 6, page 100

Booth, Mary Ann (1884) Mosquitoes and their scales, *American Monthly Microscopical Journal*, Vol. 5, page 20

Booth, Mary Ann (1892) Spreading diatoms, *Journal of Microscopy and Natural Science*, Vol. 11, pages 136-137

Booth, Mary Ann (1892) Diatoms of California, *Popular Science News*, Vol. 32, page 43

"C.H.K." (1886) Diatom slides, *Bulletin of the Torrey Botanical Club*, Vol. 14, page 131

Cutter, William F. and William F. Adams (1910) *Genealogical and Personal Memoirs Relating to the Families of the State of Massachusetts*, Vol. 3, pages 1467-1469

Dearden, William H. (1915) The irregulars of science, *Illustrated World*, Vol. 24, pages 450-455

Educational Exhibits and Conventions at the World's Industrial and Cotton Centennial Exposition, New Orleans, 1884-'85 (1886) Women's Department Diplomas of Honor, Entomology. US Government Printing Office, Washington, DC, page 217

Guide to Nature (1908) "Announcement, beginning with the May issue, Miss M.A. Booth, of Springfield, Massachusetts, will take charge of a department of 'Practical Microscopy'. Miss Booth was for many years an editor of *The Observer* magazine, and is well known to all who use the microscope for serious scientific work or for pleasure", Vol. 1, page 27

Hardwicke's Science-Gossip (1889) Exchange offer from M.A. Booth, Vol. 25, page 284

Journal of Applied Microscopy (1898) Advertisement from M.A. Booth, Vol. 1, unnumbered page

Journal of the Royal Microscopical Society (1886) Why do dry mounts fail?, page 720

Journal of the Royal Microscopical Society (1889) New Fellows, page 319

Journal of the Royal Microscopical Society (1889) Finishing slides, page 471

The Microscope (1886) Exchange offers from M.A. Booth, Vol. 6, pages 48, 120, 240 and 264

The Microscope (1887) Note that M.A. Booth will be offering slide-making instructions, and acknowledgment that the journal received "five bottles of washed diatoms from various sources; also, slides of same, exceedingly well mounted", Vol. 7, page 250

New York Times (1922) Obituary of M.A. Booth, issue of Sept. 16

New York Tribune (1922) Obituary of M.A. Booth, issue of Sept. 16

The Observer (1892) "Microscopy, Contributions and queries in regard to microscopical work are requested. Address all communications to the editor of this department, M. A. Booth, PO Box 51, Longmeadow, Mass.", Vol. 3, unnumbered front pages of April, May, June and other issues

The Observer (1892) Numerous advertisements from M.A. Booth, Vol. 3, unnumbered pages in the "advertiser" sections

Proceedings of the American Society of Microscopists (1885) "Miss M.A. Booth distributed to the members present samples of Atlantic coast diatoms procured and prepared by herself", Vol. 7, page 207

Springfield City Library Bulletin (1916) Photomicrographs, Vol. 37, page 106

United States of America census records, accessed through ancestry.com

Transactions of the American Microscopical Society (1915) Advertisement from M.A. Booth, Vol. 34, classified advertisement section, unnumbered page

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Published in the November 2011 issue of Micscape Magazine, www.micscape.org