Journal of
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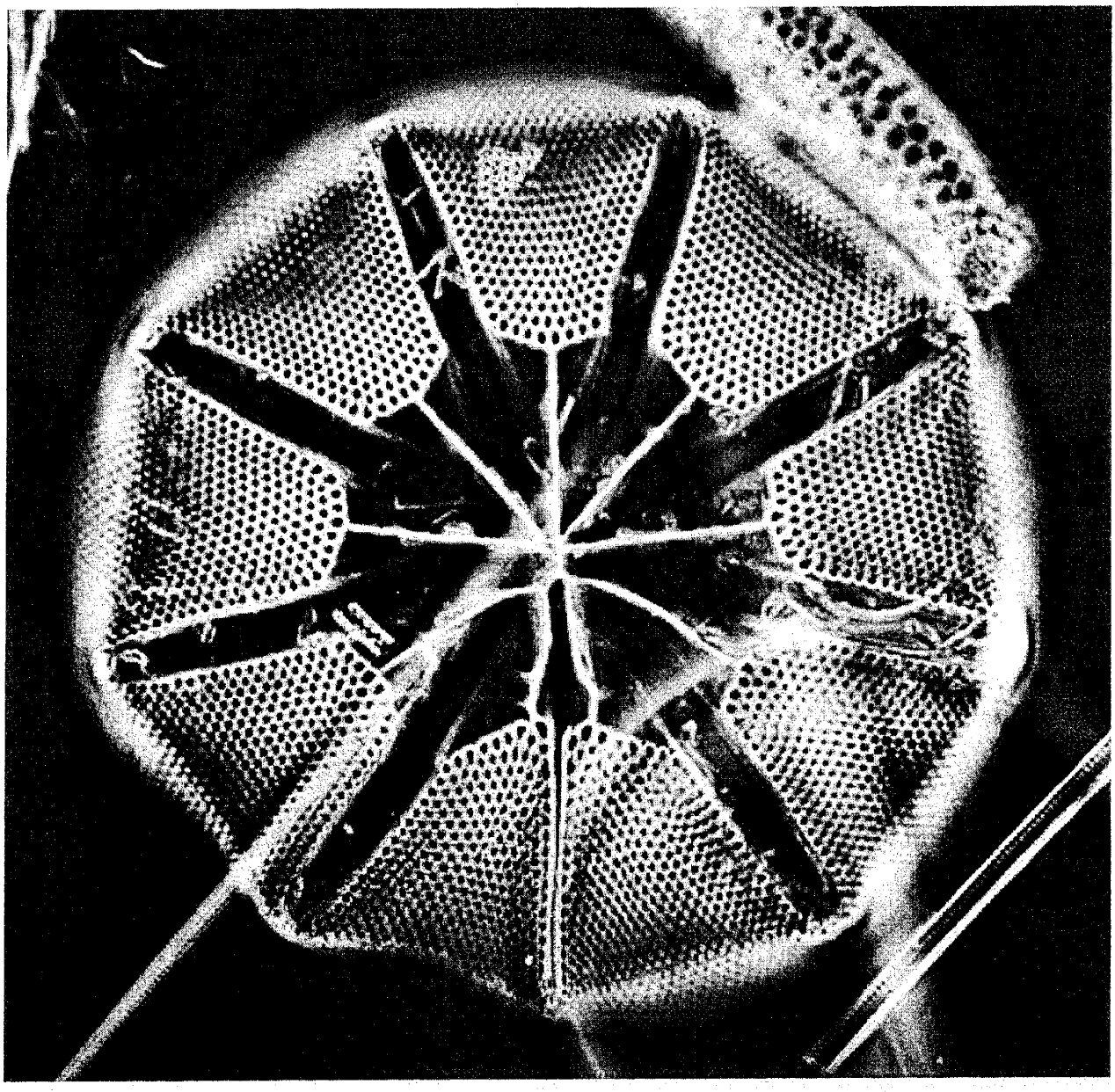
A Discovered, A *Discovery* And A Darwinian Diatom

Richard M. Jefts



One of two, (of the great many), pleasures in life, is the opportunity to acknowledge the help of others - tipping the hat of thanks to someone who has made things easier, more practical and more pleasant. The other is the reflective tracing back of a series of coincidental events that has lead to an unexpected but pleasant and happy ending.

In the first case, and when two such persons are involved, the pleasure is more than simply doubled, and the case at hand does indeed involve two fine gentlemen and fellow microscopists, Mr. Arthur Burton and Mr. Brian Darnton, both of England, Great Britain and the United Kingdom.

Regarding the second case, we are often warned to be suspicious of coincidences, but in fact, they happen surprisingly often, and when they further work out in your favor, it is interesting to note their passing and to accept the outcome with appreciative but often unspoken thanks.

I will get back to Arthur and Brian shortly, and the coincidental events will make up the bulk of the story proper.

Well over a year ago, I added to my enjoyment of occasionally finding diatoms in currently available commercial products, (see this Journal, Diatoms and Dentifrices, October, 1997, and Dietary Diatoms, November, 1998), by putting together a third modest contribution regarding the reclamation and recording of a few diatom specimens from the not too surprising source of a commercial diatomaceous earth, used as a swimming pool filtering agent: see Diatomaceous Earth: Fossil Frustules and Filtration, (again, this Journal), for January, 2000.

On page 7 of that effusion, I included a photomicrograph of a partially damaged diatom, and in the caption said, in part, that the specimen was " ... the most spectacular fragment found" , and added, that " ... I was unable to pin this one down as to either genus or species."

An effort had been made, of course, and a cross section of just a few of the possible sources for identification consisted of Taylors *Notes on Diatoms*, 1929; *Diatoms Of North America*, 1979, by Vinyard; *Diatomees*, Vols. 1 and 2, by Laporte and Lefebure, 1930; *A Treatise On The Diatomaceae*, 1896, by Van Heurck; and Plate No. 137 of A. Schmidts *Diatom Atlas*, 1888, which

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mostly shows the genus Asterolampra, and one slightly indistinct Asteromphalus, fig. 26.

From my partially shattered unknown, it was tempting to lean towards the genus Asteromphalus, but with more assurance had I found more than just this one specimen - and as for species, I was totally at a loss for any identification. At this point, then, it was safer to simply say, 'I Don't know.' See my unknown, Fig. 1. The first event then, may be said to have been the initial finding of this unknown, and, as it turned out, the second shoe to drop was not long in coming.

Within just days of seeing this fossil frustule article in print, I received a box of prepared microscope slides, No. 98/21, from the Postal Microscopical Society, or PMS, of England. For those who may be less familiar with this fine group and its workings, let me digress for a moment. This will also allow the opportunity to briefly tip another long over-due hat of respect and thanks to this most excellent and most unusual organization.

The Postal Microscopical Society of England came about in 1873, with some 36 congenial gentlemen, all with a similar interest, but all widely scattered geographically, and under the initial name of the 'Postal Micro-Cabinet Club.' By 1879, the membership had increased to 100, and the name had become that by which we know it today. Since those early days, and having increased many-fold, the PMS is of still scattered but now near world wide membership, and the purpose and the plan of the Society is the same as it was some 128 years ago.

In method and execution, the Secretary will draw upon a large collection or cabinet of Society owned prepared microscope slides. Although some of these will have been purchased from scientific and commercial establishments, many are donated by skillful mounters from the PMS membership. From this well of material, a small box of (usually) twelve prepared slides is assembled, sometimes all of one discipline, sometimes of mixed and varied subjects. Included is a small blank page Notebook, with the slides themselves only noted, numbered and very briefly described.

The slides and book are then sent out to various 'circuits' in the world, each circuit being a particular country or geographical area ... the United States, for example, is on circuit 'G'. The first member on the first circuits list will receive and hold the contributions for no longer than three weeks, during which time he or she will examine the slides and, (hopefully), will inscribe in the Notebook his or her observations, thoughts and comments regarding one or more (or all) of the prepared slides. Many of us will also add sketches or photomicrographs we have taken, or will paste in illustrations taken or copied from books, magazines or journals that seem appropriate to the slides under examination. For an example of the PMS Notebook page size, and a not untypical Notebook contribution, see this Journal, October, 1999, pp. 205 - 209.

When finished with the slide box and Notebook, they are then sent on or posted to the next member on the circuit, and so on down the list. The last member will then send the package back to the PMS Secretary.

From this, one can readily appreciate the advantage of being a member more towards the end of the slides and Notebooks travels, for by that time, dozens of other member contributions can have easily swelled the Notebook to 75 or 100 or more pages of delightful chit-chat and erudite information.

Because many different boxes are out 'on circuit' at staggered times, all members are assured of a marvelous array of many different slide preparations within relatively short periods of time.

One of the greatest advantages of PMS circuit membership, is the opportunity of handling widely varied and truly wonderful specimens, and to examine and learn of sample preparation and mounting techniques that would be difficult if not impossible to be exposed to in any other way.

Along with circuit membership, the very fine and professionally published periodical *The Balsam Post* is included. It can also be subscribed to separately should one not find a need for the Notebooks and the slides. Either way, it is a treasure trove of microscopical information and is a very valuable offering for the hands-on or working microscopist.

So then, PMS Box No. 98/21 was received and was of considerable interest in general, but slide # 5 proved to be a happy and fortuitous coincidence. It was made up of diverse diatomaceous material, amongst which were some five dozen or so quite spectacular multi-rayed frustules, and in many ways, these were very much like my single unknown specimen. The slide had been prepared by Mr. Brian Darnton, from material obtained originally from dredgings by the British research vessel, *H.M.S. Discovery*, on February 19, 1926, from a mid Atlantic ooze, and from a depth of 1,895 fathoms.

What might now be called the third event fell nicely into place. I was, at this very time, in the throes of composing a letter to Mr. Arthur Burton, regarding two excellent articles he had written and had passed on to me. One was on diatoms and the other was of snow flakes, along with some very fine macrophotographs he had taken of these single and difficult to capture hexagonal snow crystals.

Arthurs contributions to the PMS has been considerable, and in a more professional vein, he has contributed regularly to many newspapers, scientific and medical journals, and has been involved in BBC documentaries. Another specialty of his is designing equipment for, and the taking of, stereomicrographs.

During the course of my letter to Arthur, I mentioned my unknown diatom, its source, etc., and included a sketch I had made of a similar but whole and undamaged specimen. Shortly thereafter, Arthur passed my sketch and comments on to his good friend, Mr. Brian Darnton.

Now Brian, also well known to the PMS fraternity, is considered to be one of the foremost preparers of microscope slides in the field today. Four examples of his work can be seen in the prestigious volume, *Microscopical Mounts And Mounters*, edited by Brian Bracegirdle, and published in 1998: see Plate 14, slides lettered N, O, P and Q. The mount on slide N, incidently, shows one of Brians elegant multi-squared labels - this one designed with 20 numbered microsquares.

It was through his knowledge and known technical skills that the valuable *Discovery* material had been entrusted to his care for cleaning and mounting, so when Brian took one look at my sketch and comments, he not only knew immediately that the genus was unquestionably Asteromphalus, but shortly thereafter, he even narrowed the species down to two possibles, and of these, one single probable.

He then graciously wrote to me, and among many other interesting asides, suggested that my diatom was A. heptactis, but more probably, A. hookeri, as the latter, he said," ...enjoys a variable number of rays." This would appear to be a valid assumption, as, after considerable searching on the 1926 *Discovery* slide # 5, I was able to locate and photograph Asteromphalus specimens exhibiting seven, eight, nine, and in one lone case, ten individual hyaline rays, or pie-shaped sections. See figs. 2 through 13, and to whose brief captions, these slightly more descriptive comments might be of interest:
- For an Asteromphalus with seven rays, see figs. 2 and 3. This is the same diatom but photographed at two different levels or planes of focus, and so exhibiting first white, and then black puncta, beads or dots, respectively. Initial magnification: 375 x. For an Asteromphalus with eight rays, again photographed at two levels of focus, and showing the puncta or beads first as white, then as black, see figs. 4 and then 5: at 375x.
For a nine rayed Asteromphalus, showing the puncta as white at one level of focus, and then black at a second level, see fig. 6 and then fig. 7 . Both at 375x.
For a ten rayed specimen of an Asteromphalus, see fig. 8, showing the puncta or beads as white at one focal plane; then with a slight change of focus, showing the same puncta as being black, fig. 9. Both are at 375x.
At the higher initial magnification of 625x, the eight rayed specimen seen in Figs. 4 and 5 is shown with the puncta or beads as white, then black, when photographed at two levels of focus. See fig. 10, then fig. 11. Finally, we move in tighter for further details on this same eight rayed Asteromphalus, but at the initial magnification of 1175x, and at two levels of focus. Figure 12 shows how critical these focal planes can be, for here, in this single chosen photographic plane of focus, two different levels of puncta are evident. At one level, the puncta appear as black; at a slightly different level, they appear as white. Figure 13, at still another plane of focus, show the puncta as being pretty much all black.

Of special interest, regarding illustrations 2 through 13, note the difference in the details of the radiating webs or strands, depending on the chosen plane or level of focus. As with all diatoms of complex structure, this shows the need for conscious and critical focusing for demonstrating those extra fine details buried in that critical and sometimes difficult to reach third dimension of depth.
Note also, that the specimens demonstrate that qualifying distinction between, let us say, an Asterolampa, where the rays are all equal, and, as we have here, (all of the genus Asteromphalus), where one ray is always of unequal size or narrower than the others.

Then came the final coincidental events in the chain of interesting events. Brian, in his letter to me, also mentioned another possible source of text and illustration of my now no longer totally unknown multirayed diatom. It was *Botany*, Vol. 2, of the scarce and historically important series, *Report On The Scientific Results Of The Exploring Voyage Of H.M.S. Challenger 1873-76* and published in England in 1886. And Brian just happened to know of a copy which might still be available, or as he put it ,"The only copy of the Challenger diatom book at the moment on this globe is in New Zealand ..."

Striking while the iron was at least luke warm, a long distance call to Christchurch, New Zealand confirmed that the volume was still to be had, and eighteen days later the book lay on my desk, open to Plate 5, fig. 2. As kismet or coincidence would further have it, the Challenger illustration was not only the best rendition of an Asteromphalus that I had yet found, but it also had nine rays, just as did my 'unknown.' Even the orientation of the doubled up or disproportionate size rays just happened to be similar. Compare the photocopy from the Challenger book, here as fig. 14, with my initial unknown, fig, 1.

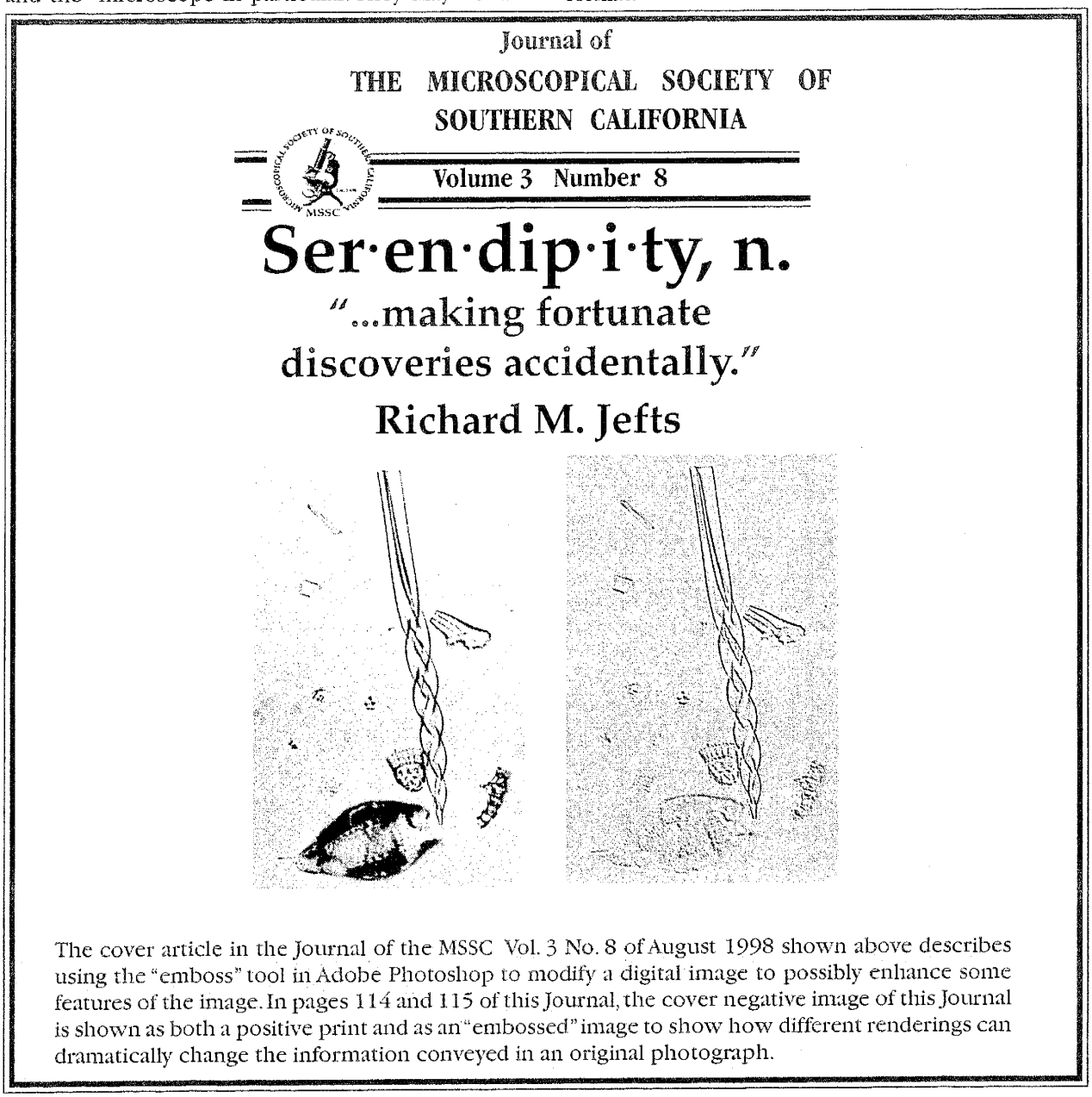
It should be noted that the Challenger nine rayed Asteromphalus was assigned the species name Challengerensis. This was a tip of someones late nine-

teenth century hat to honor that worthy vessel and the importance of the voyage itself. In light of this, and because of the marked similarities, and although admittedly tempting, it might be a debatable point to consider my original unknown, taken from deposits formed 15 million years ago in the shallow seas of what would become a portion of the California coastline, to be of the same species as that dredged up from a mid Atlantic, ancient and abyssal ooze, and from the dramatic depth of 11,370 feet.

However, I am placidly content to call my fossil frustule Asteromphalus hookeri, and much of the pleasure and satisfaction has come from the helping hand of two fine fellow microscopists, from having added to my shelves of books, and from having experienced and from having learned something new ... and all made possible with the discipline of microscopy in general, and the microscope in particular. They may not be the only game in town, but they are still the grandest game in the world.

Microscope: Leitz, Ortholux.
Camera: Olympus PM - 6.
Objectives: Leitz, 40x APO, N.A. 0.95, with correction collar.
Leitz, 90x oil, N.A. 1.32
Eyepieces: Leitz, 7.5x, 10x and 12.5x
Film: Kodak, Tech Pan, #2415, 35mm, B&W.
Filter: Tiffen, #58, dark green.
Developer: Kodak HC - 110, Dilution 'D'.

Figures 1 through 13 inclusive, are photographed directly from the original 35 mm negatives with a Nikon 990 digital camera set in macro mode in which the width of the negative fills the 3.34 megapixel capture format.



The cover article in the Journal of the MSSC Vol. 3 No. 8 of August 1998 shown above describes using the "emboss" tool in Adobe Photoshop to modify a digital image to possibly enhance some features of the image. In pages 114 and 115 of this Journal, the cover negative image of this Journal is shown as both a positive print and as an "embossed" image to show how different renderings can dramatically change the information conveyed in an original photograph.

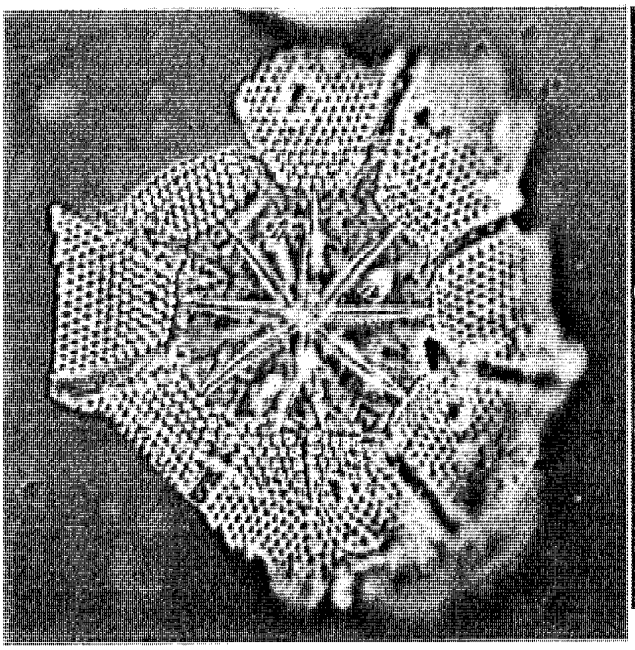


Fig. 1 -Asteromphalus:With nine rays.The original, partially damaged "unknown," showing puncta, beads or dots as both black and white. Initial magnification: 500x.

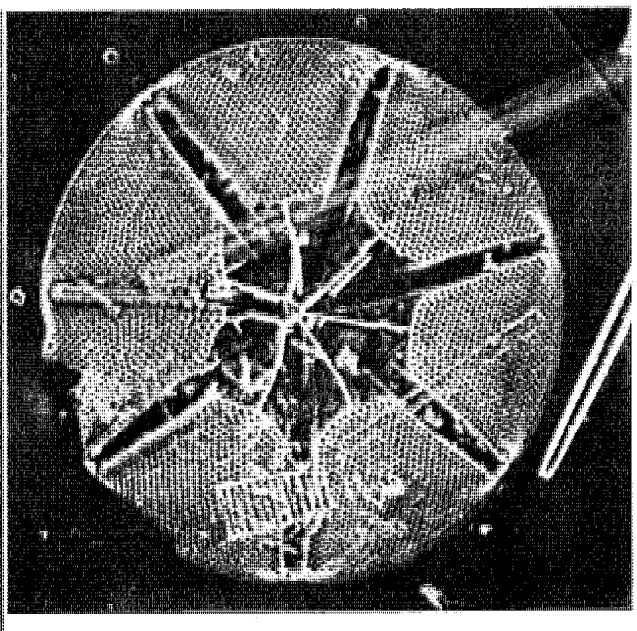


Fig. 3 -The same seven-rayed Asteromphalus as in Fig. 2, but with the puncta shown as black.At 375x.

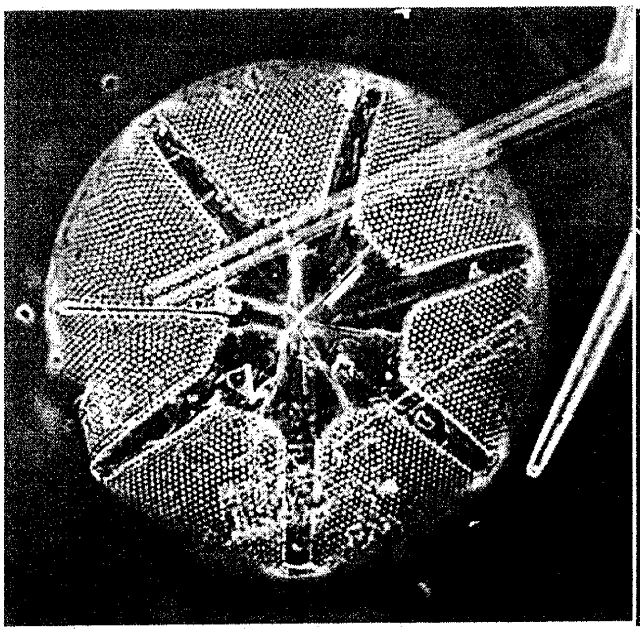


Fig. 2 - Asteromphalus: With seven rays.The puncta or beads are shown as white.At 375x.

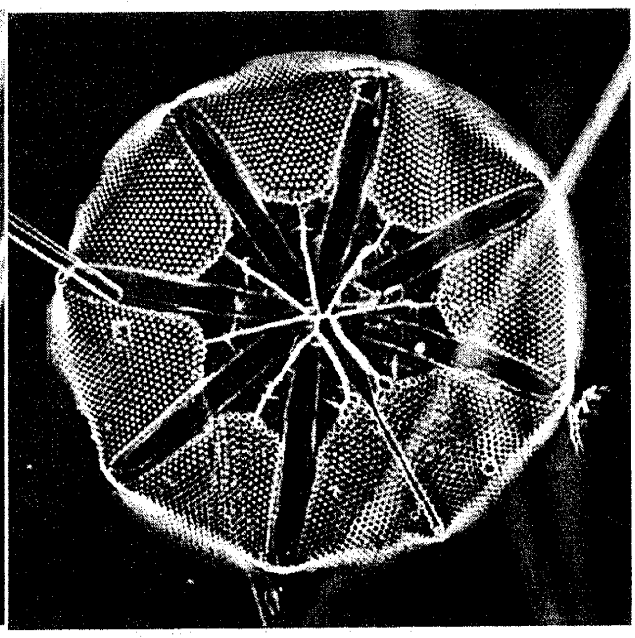


Fig. 4 - Asteromphalus: With eight rays. The puncta shown are mostly white.At 375x.

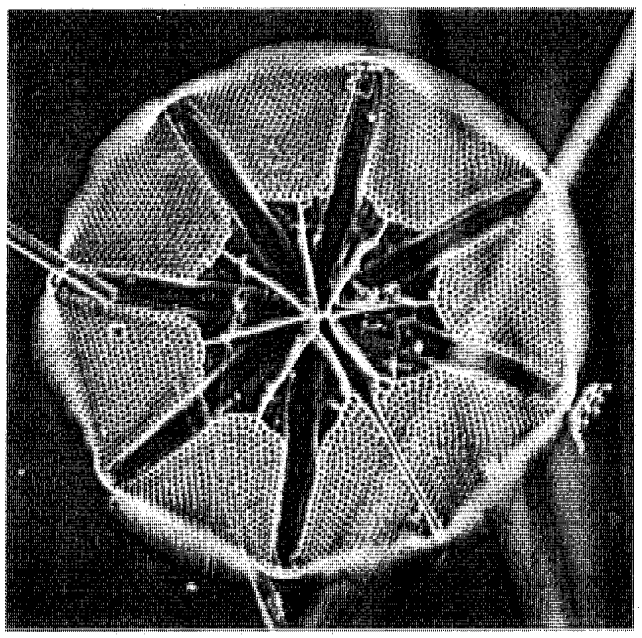


Fig. 5 - The same eight-rayed Asteromphalus as in Fig. 4, but with the puncta shown as black. At 375x.

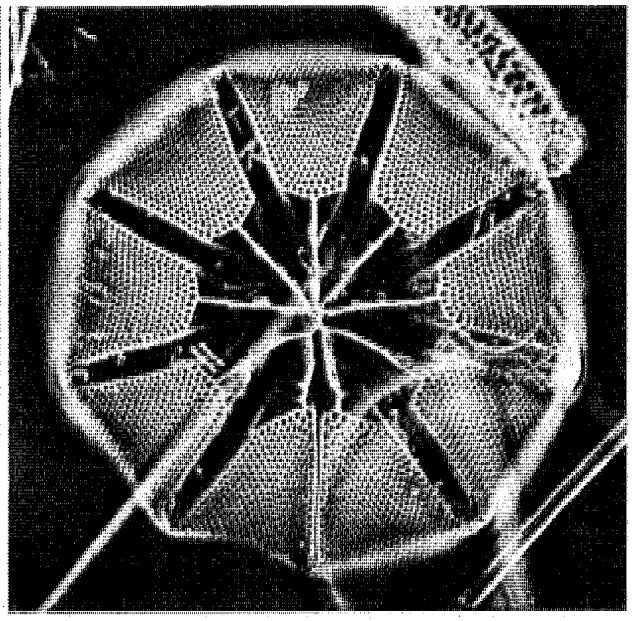


Fig. 7 - The same nine-rayed Asteromphalus as in Fig. 6, but with the puncta shown as black. At 375x. See also front cover.

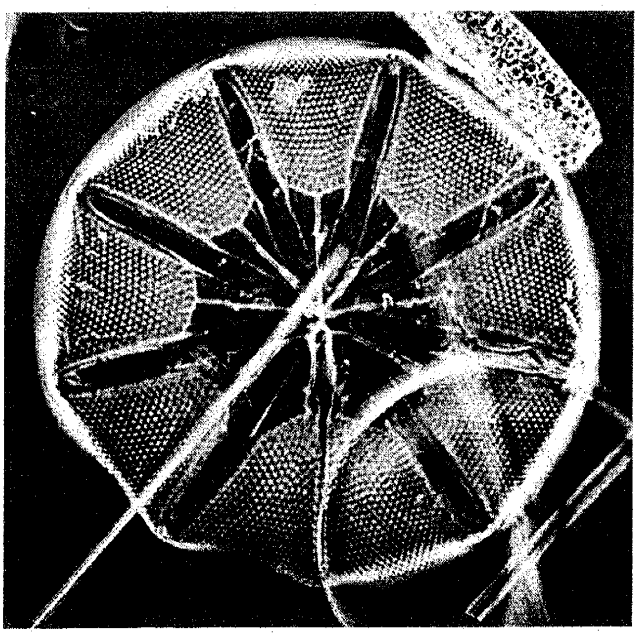


Fig. 6 - Asteromphalus: With nine rays. The puncta are shown as white. At 375x.

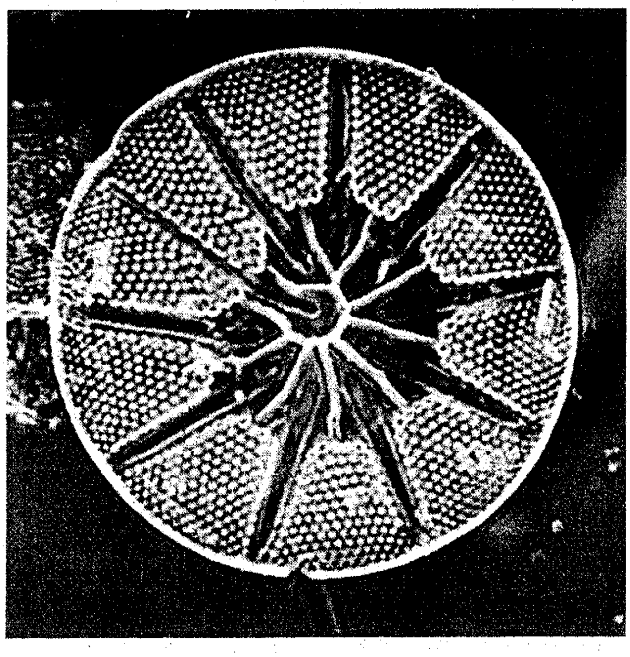


Fig. 8 - Asteromphalus: With ten rays. The puncta are shown as white. At 375x.

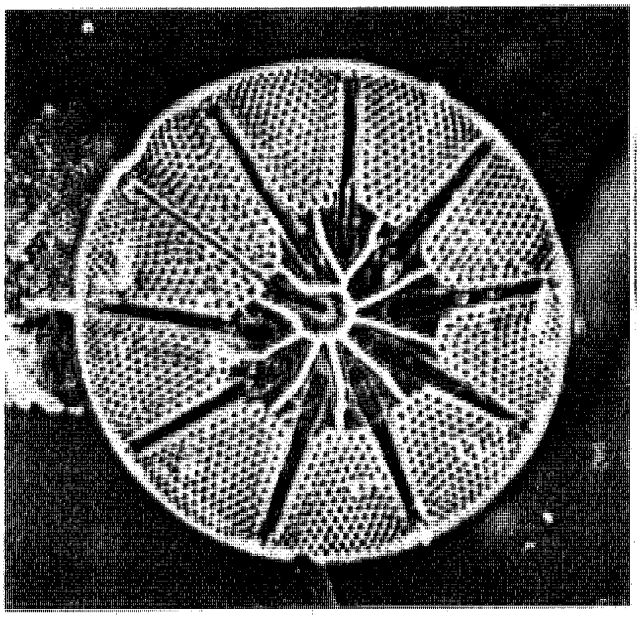


Fig. 9 - The same ten-rayed Asteromphalus as in Fig. 8, but with the puncta shown as black. At 375x.

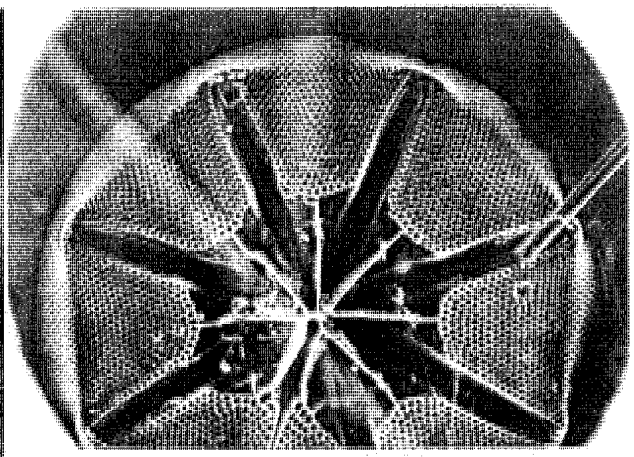


Fig. 11 - The same eight-rayed Asteromphalus seen in Fig. 10, and at 625x, but the puncta appear as black beads or dots.

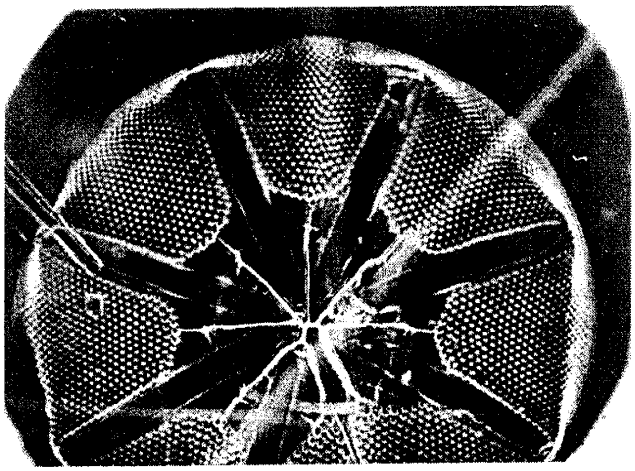


Fig. 10 - The same eight-rayed Asteromphalus seen in Figs. 4 and 5, but at an initial magnification of 625x. The puncta appear white.

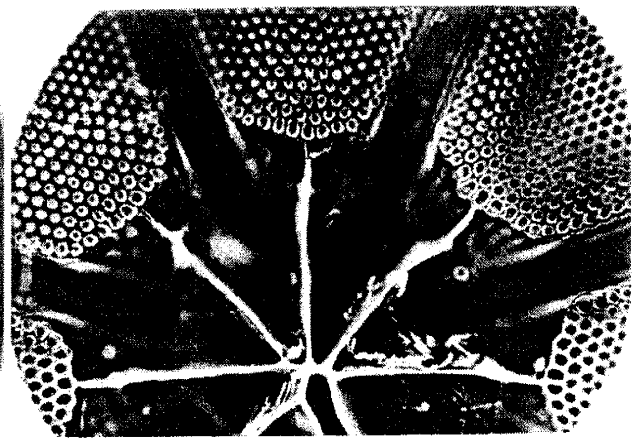


Fig. 12 - The same eight-rayed Asteromphalus as seen in Figs. 4 and 5, but at an initial magnification of 1175x. The puncta appear as both black and white.

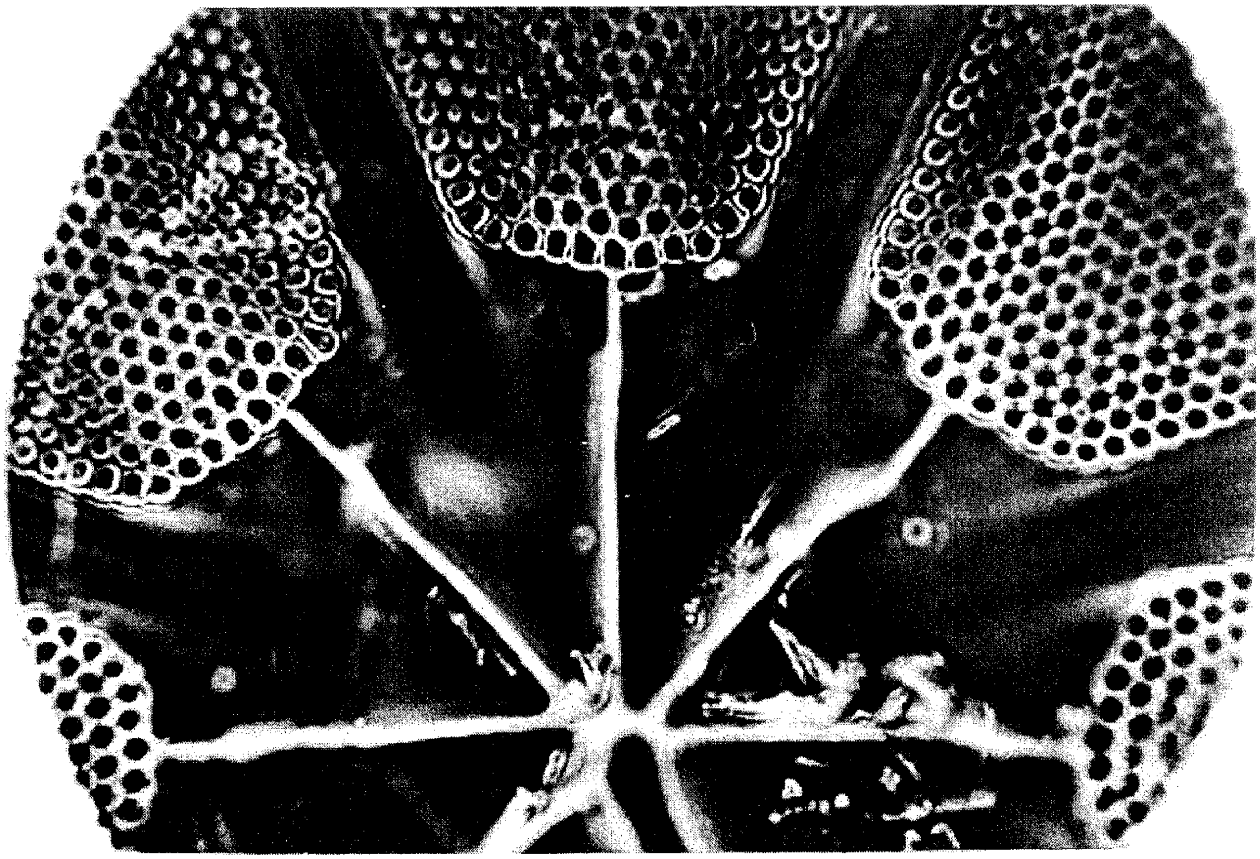


Fig. 13 - The same eight-rayed Asteromphalus seen in Fig. 12, and at 1175x, but the puncta seen are mostly black.

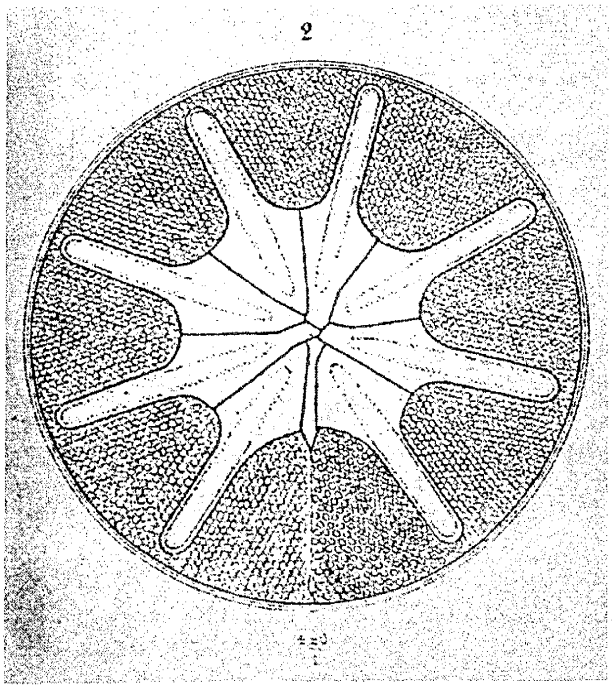
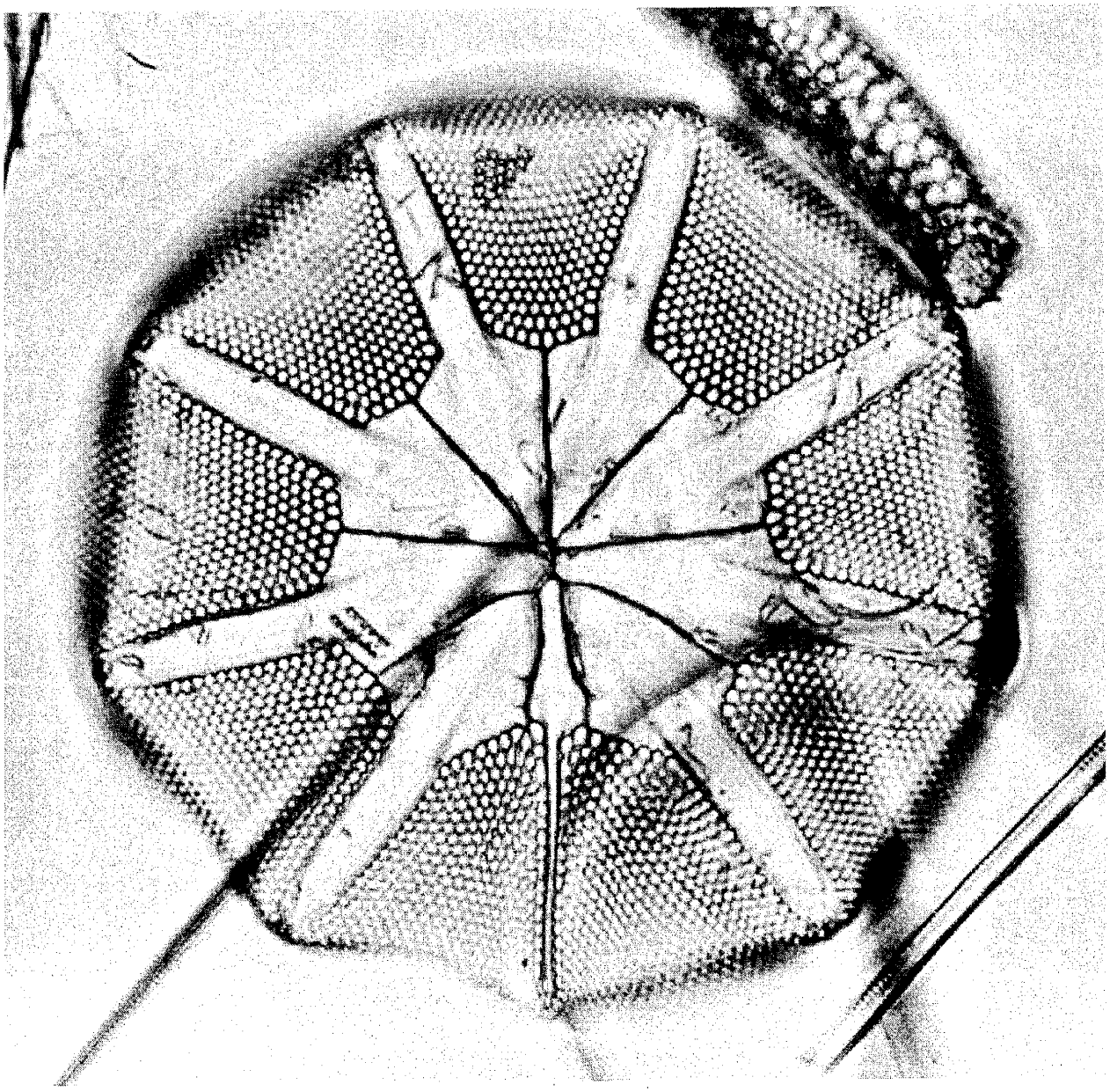
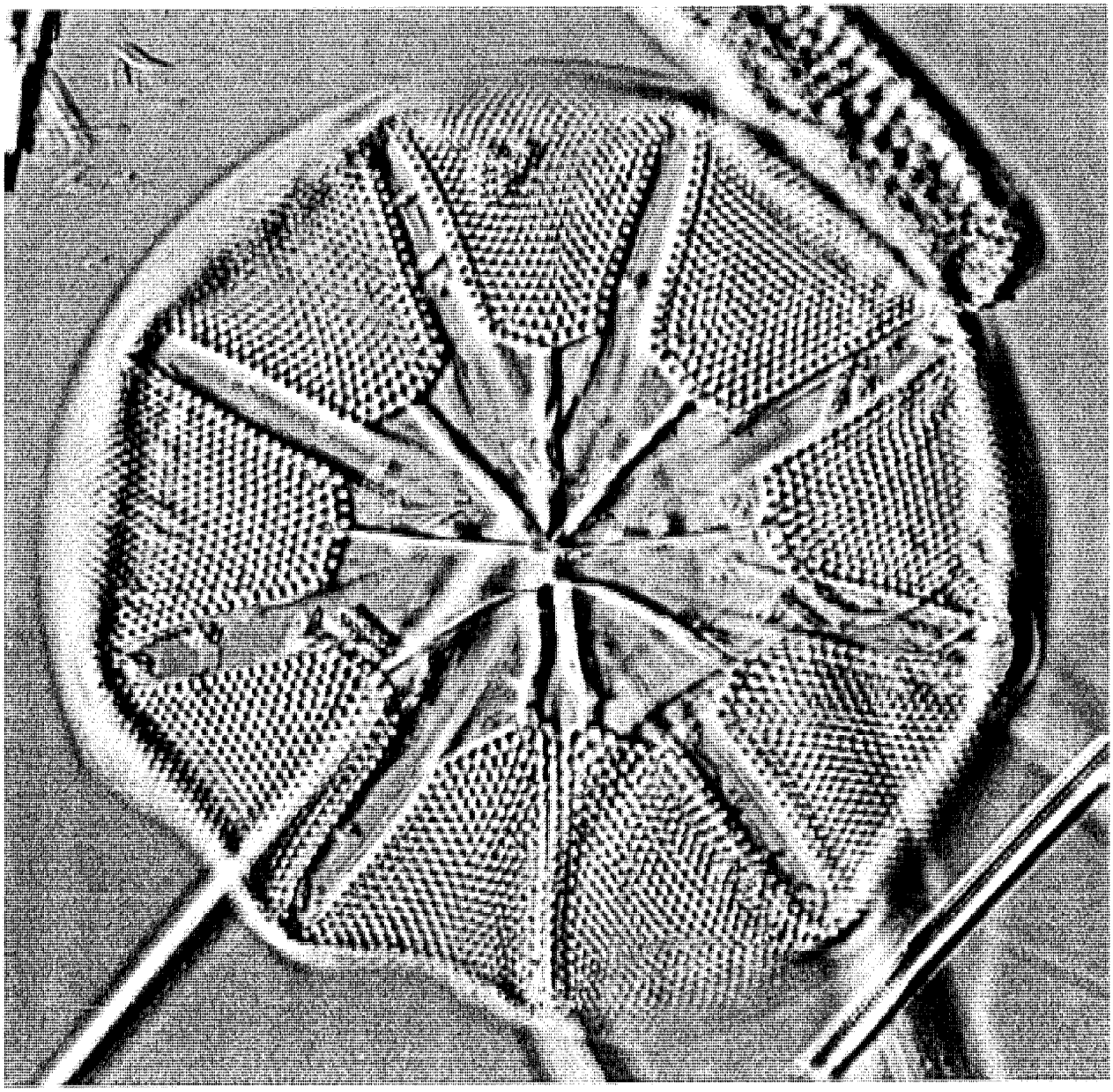


Fig. 14 - Photocopy of Fig. 2, from Plate 5 of the Challenger book, showing a classic nine-rayed Asteromphalus. The magnification is noted as being 440x.



This positive print of the cover photo of this Journal gives a view as seen in bright field looking through the microscope. The transparency of the diatom allows the spicule behind to appear with diffraction and refraction as a deformation of the surface. The negative image on the cover and in Fig. 7 as well as other images dramatically shows the structure giving the effect of dark field observation.



The cover image is again shown above but rendered with the "emboss"tool in Adobe Photoshop. Notice that while the rendering creates an artificial image, it gives another useful view of the structure of the diatom similar to a phase contrast rendering of transparent objects. For a further look at the "emboss" tool, see the Journal article of August 1998 mentioned on page 109.

MICROSCOPY IN AMERICA

Part IV

Listings of Microscopists from the Microscopists" Annual

Stuart L. Warter

Herewith the remainder of the listings from John Phin's 1880 "Microscopists' Annual for 1879." Note that there is some overlap between lists, and that some of those listed as manufacturers are known today only as dealers, as no unique instruments bearing their names are as yet known to exist.

ALPHABETICAL LIST

OF MANUFACTURERS OF AND DEALERS IN MICROSCOPES, OBJECTIVES, OBJECTS, MATERIALS FOR MOUNTING AND FOR INVESTIGATION, DISSECTING INSTRUMENTS, ACCESSORY APPARATUS, GLASS FOR OPTICAL PURPOSES, ETC., ETC.,

IN AMERICA AND EUROPE.

☞ Eng. = England. Even in the case of London it is necessary to write *England* as part of the address, as there are several *Londons* in the United States and Canada.

Amici, Modena.
Baker, C., 244 High Holborn, London, Eng.
Bardou, Paris.
Barnett, J. E., Whitehall street.
Bausch & Lomb Optical Co., 37 Maiden Lane, New York, and Rochester, N. Y.
Beck, R. & J., 31 Cornhill, London, E. C., Eng., and 921 Chestnut street, Philadelphia.
Beneche, 7 Tempelhofer Strasse, Berlin.
Bolton, Thomas, 17 Ann street, Birmingham, Eng.
Bourgogne, Pere et Fils, Paris, France.
Boston Optical Works, 131 Devonshire street, Boston, Mass.
Browning, John, 63 Strand, W. C., London, Eng.
Brunner, Paris, France.
Bulloch, W. H., 126 Clark street, Chicago, Ill.
Bryson, Princes street, Edinburgh, Scotland.
Chance Bros. & Co., Birmingham, Eng., (See Heroy & Marrenner.)
Chevalier, 158 Galerie de Valois, Paris, France.
Cheyney, J. S., 308 Walnut street, Philadelphia, Pa.
Cole, Arthur C., & Son, 53 Oxford Gardens, Notting Hill, London, W., Eng.
Collins, Chas., 157 Great Portland street, London, W., Eng.
Crouch, H., 66 Barbican, London, Eng.
Dallmeyer, 16 Bloomsbury street, London, Eng.
Dancer, J. B., 43 Cross street, Manchester, Eng.
Deane, James, 17 The Pavement, Clapham, London, S. W., Eng.
Eaton, A. K., 65 Henry street, Brooklyn, N. Y.
Eickhoff, August, 381 Broome street, New York, N. Y.
Emmerich, F. J., 38 Maiden Lane, New York, N. Y.

Enock, Frederic, 30 Russell Road, Seven Sisters Road, London, N., Eng.
Field & Son, Birmingham, Eng.
Gall, Jos., 21 Union Square, New York, N. Y.
Gemrig, S. H., 109 South Eighth street, Philadelphia, Pa.
Giering & Co., Rochester, N. Y.
Giessler, Bonn.
Grunow, J. W., 70 West 39th St., New York, N. Y.
Gundlach, E., Rochester, N. Y.
Hansen, Paris, France.
Hartnack, 39 Waisen Strasse, Potsdam.
Hasert, B., Eisnach.
Heroy & Marrenner, 108 Duane street, New York, N. Y.
Hett, H., Albion Grove, Islington, London, Eng.
Highley, S., London, Eng.
His, Basel.
Hone & Thornwaite 416 Strand, London, Eng.
Houghton, G., & Son, 89 High Holborn, London, Eng.
How, James, & Co., 73 Farringdon street, London, Eng.
Hudson & Sons, Greenwich, London, Eng.
Hunter, H., 1132 Broadway, New York, N. Y.
Hunter & Sands, 20 Cranbourne street, London, Eng.
Industrial Publication Co., 14 Dey street, New York, N. Y.
Kahn, B., & Co., 32 Maiden Lane, New York, N. Y.
Kelner, Wetzlar.
King, Bristol, Eng.
King, G., 190 Portland street, London, W., Eng.
Kleine, C. B., 247 Eighth Avenue, New York, N. Y.
Laban, Heath & Co., 30 Hanover street, Boston, Mass.
Ladd, W., 12 Beak-street, Regent street, London, Eng.
Lancaster, J., & Sons, Birmingham, Eng.
Langguth, J. G., 48 Madison street, Chicago, Ill.
Lawley & Son, 78 Farringdon street, London, E.C., Eng.
Laurençot, J. B., 33 Maiden Lane, New York, N. Y.
McAllister, T. H., & Son, 49 Nassau street, New York, N. Y.
McAllister, W. T., Philadelphia, Pa.
Matthews, Portugal street, Lincoln's Inn, London, Eng.
Merz, G. & S., Munich.
Miraud, A., Seur, Paris, France.
Miller Bros., 69 Nassau street, New York, N. Y.
Moller, J. D., Wedel, Holstein.
Murray & Heath, 69 Jermyn street, London, Eng.
Nachet, 17 Rue St. Severin, Paris, France.

Nobert, Barth, Pomerania.
Norman, J. T., 178 City Road, E.C., London, Eng.
Norman, John, 34 Whitecross street, Cripplegate, London, E. C., Eng.
Oelschlager Bros., 162 William street, New York, N. Y.
Ogden, J. T., Boston, Mass.
Parkes & Son, St. Mary's Row, Birmingham, Eng.
Peticolas, C. L., 635 Eighth street, Richmond, Va.
Petit, Chas., 151 High street, Stoke Newington, London, N., Eng.
Philip, R. H., 28 Prospect street, Hull, Eng.
Pike's, Benj., Son & Co., 930 Broadway, New York, N. Y.
Pillischer, 88 New Bond street, London, Eng.
Ploesl, S., Vienna.
Poalk & Sidle, Philadelphia, Pa.
Powell & Lealand, 170 Euston Road, London, Eng.
Prasmowski, 21 Place Dauphine, Paris, France.
Prentice, James, 164 Broadway, New York, N. Y.
Queen, Jas. W., & Co., 924 Chestnut street, Philadelphia, Pa.
Ross & Co., 164 New Bond street, London, Eng.
Russell, Thomas D., 48 Essex street, Strand, London, W.C., Eng.
Schæffer & Co., Magdeburg.
Schick, F. W., 15 Hallesche str., Berlin.
Schrauer, L., 42 Nassau street, New York, N. Y.
Schroeder, 31 Hollandischer Brook, Hamburg.
Sexton, L. R., Rochester, N. Y.
Siebert & Kraft, Wetzlar.
Smith, Chas. V., Carmarthen, Eng.
Spencer, Chas. A., & Sons, Geneva, N. Y.
Steinheil, Munich.
Stendicke, August, 329 East Twenty-third street, New York, N. Y.
Steward, J. H., 406 Strand, London, Eng.
Stodder Chas., (See Boston Optical Works.)
Stone, W., 44 Gloucester street, Holborn, London, Eng.
Sussfield, Lorsch & Co., 13 Maiden Lane, (Agents for Bardou.)
Swift & Son, University street, London, W.C., Eng.
Tate, R. P., 31 Holborn, London, Eng.
Tolles, R. B., (See Boston Optical Works.)
Topping, Amos, 28 Charlotte street, Caledonian-Road, London, Eng.

Verick, C., Rue de Parcheminerie, No. 2, Paris, France.
Wale, George, Paterson, N. J., and 14 Dey street, N. Y.
Wales, William, Fort Lee, N. J.
Wagner, Fred., 41 West Fifth street, Cincinnati, Ohio.
Walmsley, W. H., (See R. & J. Beck).
Ward, Edward, 29 Burlington street, Oxford Road, Manchester, Eng.
Watson & Son, 313 High Holborn, London, Eng.
Weiss & Sons, 62 Strand, London, Eng.
Wetzlar, Leipzig.
Wheeler, Edmund, 48 M, Tollington Road, Holloway, London, N., Eng.
Winspear, J. E., Hull, Eng.
Woolman, Geo., 116 Fulton street, New York, N. Y.
Wray, W., Laurel House, North-hill, Highgate, London, N., Eng.
Zeiss, Carl, Jena.
Zentmayer, Jos., 147 South Fourth street, Philadelphia, Pa.
Zeigler, 23 Friedberger Gasse, Frankfort-on-the-Main.

CLASSIFIED LISTS.

LIST OF MANUFACTURERS OF MICROSCOPES AND OBJECTIVES IN THE UNITED STATES.

Bausch & Lomb Optical Co., Rochester, N. Y., and 37 Maiden Lane, New York, N. Y.
Boston Optical Works, Charles Stodder, Agent, 131 Devonshire street, Boston, Mass.
Bulloch, W. H., 126 Clark street, Chicago, Ill.
Giering & Co., Rochester, N. Y.
Grunow, J., 70 West 39th St., New York, N. Y.
Industrial Publication Co., 14 Dey street, New York, N. Y.
Kleine, C. B., 247 Eighth Avenue, New York, N. Y.
McAllister, T. H., & Son, 49 Nassau street, New York, N. Y.
Miller Bros., 69 Nassau street, New York, N. Y.
Pike's, Benj., Son & Co., 930 Broadway, New York, N. Y.
Poalk & Sidle, Philadelphia, Pa.
Prentice, Jas., 164 Broadway, New York, N. Y.
Queen, Jas. W., & Co., 924 Chestnut street, Philadelphia, Pa.
Schrauer, L., 42 Nassau street, New York, N. Y.
Sexton, L. R., Rochester, N. Y.

Spencer, Chas. A., & Son, Geneva, N. Y.
Tolles, R. B., (See Boston Optical Works.)
Wale, Geo., Paterson, N J., and 14 Dey street, New York, N. Y.
Wales, W., Fort Lee, N. Y.
Walmsley, W. H., 1016 Chestnut street, Philadelphia, Pa.
Woolman, Geo., 116 Fulton street, New York, N. Y.
Zentmayer, J., 147 South Fourth street, Philadelphia, Pa,
* Gundlach, E., Rochester, N. Y.

LIST OF MANUFACTURERS OF MICROSCOPES AND OBJECTIVES IN GREAT BRITAIN.

Baker, C., 244 High Holborn, London, Eng.
Beck, R. & J., 31 Cornhill, London, E.C., and 921 Chestnut street, Philadelphia, Pa.
Browning, John, 63 Strand, W.C., London, Eng.
Bryson, Princes street, Edinburgh, Scotland.
Collins, Chas., 157 Great Portland street, London, W., Eng.
Crouch, H., 66 Barbican, London, Eng.
Dallmeyer, 16 Bloomsbury street, London, Eng.
Dancer, J. B., 43 Cross street, Manchester, Eng.
Field & Son, Birmingham, Eng.
Highley, S., London, Eng.
Hone & Thornwaite, 416 Strand, London, Eng.
How, James, & Co., 73 Farringdon street, London, Eng.
King, Bristol, England.
Ladd, W., 12 Beak-street, Regent street, London, Eng.
Lancaster, J., & Sons, Birmingham, Eng.
Lawley & Son, 78 Farringdon street, London, E.C., Eng.
Murray & Heath, 69 Jermyn street, London, Eng.
Norman, John, 34 Whitecross street, Cripplegate, London, E.C., Eng.
Parkes & Son, St. Mary's Row, Birmingham, Eng.
Pillischer, 88 New Bond street, London, Eng.
Powell & Lealand, 170 Euston Road, London, Eng.
Ross, & Co., 164 New Bond street, London, Eng.
Steward, J. H., 406 Strand, London, Eng.
Stone, W., 44 Gloucester street, Holborn, London, Eng.
Swift & Son, University street, London, W.C., Eng.
Watson & Son, 313 High Holborn, London, Eng.

* Omitted by mistake, from proper alphabetical position.

Winspear, J. E., Hull, Eng.
Wray, W., Laurel House, North-hill, Highgate, London, N., Eng.

LIST OF MANUFACTURERS OF MICROSCOPES AND OBJECTIVES ON THE CONTINENT OF EUROPE.

Amici, Modena.
Bardou, Paris, France.
Beneche, 7 Tempelhofer Strasse, Berlin.
Bœcker, De Heinr., Wetzlar, Germany.
Brunner, Paris, France.
Chevalier, 158 Galerie de Valois, Paris, France.
Hartnack, 39 Weisen Strasse, Potsdam.
Hasert, B., Eisenach.
Kelner, Wetzlar.
Merz, G. & S., Munich.
Miraud, A., Senr., Paris, France.
Nachet, 17 Rue St. Severin, Paris, France.
Plœsl, S., Vienna.
Prasmowski, Paris, France.
Schick, F. W., 15 Hallesche Str., Berlin.
Schroeder, 31 Hollandischer Brook, Hamburg.
Siebert & Kraft, Wetzlar.
Steinheil, Munich.
Verick, C., Rue de Parcheminerie, No. 2, Paris, France.
Wetzlar, Leipzig.
Zeiss, Carl, Jena, Saxe-Weimar, Germany,

LIST OF PREPARERS OF OBJECTS.

Barnett, J. E., Whitehall street, London, Eng.
Bœcker, De Heinr., Wetzlar, Germany.
Bourgogne, Pere et Fils, Paris, France.
Cheyney, J. S., 308 Walnut street, Philadelphia, Pa.
Cole, Arthur C., & Son, 53 Oxford Gardens, Notting Hill, London, W., Eng.
Enock, Frederic, 30 Russell Road, Seven Sisters Road, London, N., Eng,
Hansen, Paris, France.
Hett, A., 4 Albion Grove, Islington, London, Eng.
His, Basel.
Hudson & Sons, Greenwich, London, Eng.

Hunter & Sands, 20 Cranbourne street, London, Eng.
Kaiser, Docteur Edouard, No. 27 Friedenstrasse, Berlin.
Mœller, J. D., Wedel, Holstein.
Nobert, Barth, Pomerania.
Norman, J. T., 178 City Road, E.C., London, Eng.
Peticolas, C. L., 635 Eighth street, Richmond, Va.
Russell, Thomas D., 48 Essex street, Strand, London, W.C., Eng.
Schæffer & Co., Magdeburg.
Smith, Chas. V., Carmarthen, Eng.
Topping, Amos, 28 Charlotte street, Caledonian Road, London, Eng.
Ward, Edward, 29 Burlington street, Oxford Road, Manchester, Eng.
Wheeler, Edmund, 48 M, Tollington Road, Holloway, London, N., Eng.

DEALERS IN UNMOUNTED OBJECTS AND MATERIALS FOR MOUNTING.

Bolton, Thomas, 17 Ann street, Birmingham, Eng.
Deane, James, 17 The Pavement, Clapham, London, S. W., Eng.
Houghton, G., & Son, 89 High Holborn, London, Eng.
King, G., 190 Portland street, London, W., Eng.
Petit, Chas., 151 High street, Stoke Newington, London, N., Eng.
Philip, R. H., 28 Prospect street, Hull, Eng.
Tate, R. P., 31 Holborn, London, Eng.
Zeigler, 23 Friedberger Gasse, Frankfort-on-the-Main.

DISSECTING APPARATUS.

Codman & Shurtleff, 13 Tremont street, Boston.
Eickhoff, August, 381 Broome street, New York, N. Y.
Gemrig, J. H., 109 South Eighth street, Philadelphia, Pa.
Hawksley, 300 Oxford street, London, Eng.
Hernstein, 54 Chatham street, New York, N. Y.
Matthews, Portugal street, Lincoln's Inn, London, Eng.
Otto & Sons, 64 Chatham street, New York, N. Y.
Tiemann, Geo., 67 Chatham street, New York, N. Y.
Weiss & Sons, 62 Strand, London, Eng.

DEALERS IN GLASS FOR OPTICAL PURPOSES.

Chance Bros. & Co., Birmingham, Eng., (See Heroy & Marrenner.)
Emmerich, F. J., 38 Maiden Lane, New York, N. Y.
Heroy & Marrenner, 108 Duane street, New York, N. Y., Agents for Chance Bros., & Co.
Laurençot, J. B., 33 Maiden Lane, New York, N. Y.

IMPORTERS AND WHOLESALE DEALERS.

Emmerich, F. J., 38 Maiden Lane, New York, N. Y.
Kahn, B., & Co., 32 Maiden Lane, New York, N. Y.
Laurençot, J. B., 33 Maiden Lane, New York, N. Y.
Oelschlager Bros., 162 William street, New York, N. Y.
Sussfield, Lorsch & Co., 13 Maiden Lane, New York, N. Y.

GLASS GRINDERS.

The following firms make a specialty of grinding lenses, prisms, etc., for manufacturers of microscopes and telescopes, and for experimental purposes:

Weiskopf, 182 Centre street, New York, N. Y.
Stendicke, August, 329 East Twenty-third street, New York, N. Y.
Eaton, A. K., 65 Henry street, Brooklyn, N. Y.

MICROSCOPE LAMPS.

Barclay & Son, 138 Regent street, London, Eng.
How, James, & Co., 73 Farringdon street, London, Eng.
Heinrichs, C. F., Student Lamps, New York, N. Y.
May, S. Elwood, Mechanical Lamps, 59 Murray street, New York, N. Y.

A Composite Wide Angle View of the May Pond Life Meeting

George G. Vitt Jr.

WORKSHOP of the Microscopical Society of Southern California

George G. Vitt, Jr.

Date: Saturday, 3 June 2000
Location: Ernie Meadows' residence

This was the last MSSC workshop to be held at the residence of our esteemed member, Ernie Meadows. All the members extend their sincere thanks for all the hospitality and camaraderie that Ernie had extended to us for a period of some two years. The July workshop will be held at the residence of Izzy Lieberman.

1. Jim Solliday related that subsequent workshops will be held both at Izzy Lieberman's in W. Los Angeles, with every third workshop at Ken Gregory's residence in Long Beach. This arrangement will make it more convenient for members living at considerable distances south of the Los Angeles area.

2. Herb Gold announced that member Ellen Cohen is recuperating well from her recent leg injury and would appreciate a phone call from any and all members.

3. George Vitt recounted his recent experiments with stereo photography with the digital camera and the making of stereo pairs and 2-color anaglyphs on the computer. George then showed a stereo camera mount with provision to slide the camera, on precision linear bearings, some selected interpupillary distance to take the left and right eye records. This device had been designed and constructed by our late member, Stan Baird, who had specialized in 3-D photography and had manufactured a line of excellent quality equipment of his own design. There followed a discussion on stereo vision.

4. ?? put forth the theory that the Egyptian pyramids were constructed of poured concrete, rather than from solid, quarried stone blocks. The matter remains unresolved.

5. Ken Gregory showed a cased B&L dipping refractometer, complete with its set of prisms, that he had gotten on ebay. Ken also brought for sale ($20) an apparatus used for measuring the extent of human peripheral vision capability, both in azimuth and elevation. The device can be set to any angle of measurement.

6. Stuart Warter showed 4 Student microscopes: a) Made by Miller Brothers, c.1868-1870; b) Daniel Pike (Benjamin Pike's son), c.1867-1870; c) Tolles/Boston Optical Co. 1868, the lenses being dated; d) By an unknown maker, c.1883, the foot being the same as the B&L "Model" mic.

7. Jim Solliday showed an uncased c.1886 "Family" Microscope, 3-rd form, signed: *Bausch & Lomb Optical* Co. The instrument has a japanned cast-iron foot with two pillars supporting the axis which carries the limb. The body can be inclined to any desired angle. The foot is of the early Gundlach pattern. The limb has the classical Bausch & Lomb jug-handle shape. The usual rack & pinion provide the course movement to the body. The body-tube is 4 5/8 inches long with a nickel drawtube providing extension of up to 9 1/4 inches. The stage is made of iron with a top-piece of vulcanite, providing smooth surface action as well as chemical resistance. There is a substage revolving diaphragm plate. This model of the Family Microscope was provided with a swinging tailpiece, which can be moved to a position above the stage. The mirror is a two sided replacement. This substage arrangement was intended to provide oblique illumination. The optical components include one Bausch & Lomb eyepiece, and one contemporary objective marked as 1/2 inch (signed, *Bausch & Lomb Optical Co.*). The overall mechanical condition is quite good. This microscope represents the typical early Gundlach/Bausch & Lomb pattern and is a very rare example of the third form of which Jim was unable to find in any of his (dealer) resale records. The third form Family Microscope was made during the period 1886-1888. At the present time there are no illustrations available, except in the 1887 B&L catalogue (11th edition).

8. Barry Sobel described the incredible capabilities and low price of the Mattel microscope and its accompanying software, which retail for $60. The excellent software allows a movie (or time lapse) to be made through the mic. and all adjustments are by computer control. All one needs is a PC with USB port and a good amount of RAM. Barry recommended that one should call Mattel for their catalog and to buy directly from Mattel (Manhattan Beach, CA). He also recommended that we call Mattel and request that they give us a demonstration.

9. Ed Jones showed some excellent 'Kiddie' books for budding microscopists: a) "The Microscope Book", by

Levine & Johnstone, Sterling Pub. Co., New York, 1953; b) "Fun with your Microscope" (same authors & pub.); c) "The World of the Microscope", by Chen & Edwards, Osborne Pub. Co., 1989.
d) "Complete Book of the Microscope", Osborne Pub.Co.
Ed then showed some microslides with his now famous 'eye candy' - a vast assortment of various types of objects, 1-mm and smaller, mounted in a regular manner on a microslide. Everyone had a chance to observe this display under one of the many stereo mics. that had been brought for sale by John de Haas. Ed announced that he will be the speaker at the MSSC meeting of August 2000, where he will demonstrate his method of preparing small samples for opaque observation under a stereo mic. He urged everyone to bring their stereo mics, light sources, tweezers, etc., and stated that he would bring all specimens necessary. Should be a fun evening indeed!

10. Ron Morris gave some of his experiences while working at Mattel and then described his recent work on storage chips with detail of 0.16 micron size. There was a general discussion on DVDs.

11. Leon Stabinsky showed a fine display of rare Hensoldt pocket microscopes all of which are stored for carrying in a screw-on semicylindrically shaped covers. Leon also offered for sale a chrome plated, micrometer screw (thimble) type pocket microtome by Sartorius of Goettingen.

12. Gaylord Moss discussed the resolution of digital cameras.

13. Larry McDavid mesmerized his audience by exhibiting some electrostatic demonstration apparati of extreme rarity, in perfect condition and of museum quality - made in Italy c.1910. There were two large custompartitioned boxes, each cell of which contained a particular type of apparatus, meant to be attached to an electrostatic machine, to demonstrate a principle in electrostatics. The craftsmanship of each piece was superb. Larry then described his recent fruitful labors in greatly increasing the bandwidth of the multi-computer system in his home. This involved his routing 800-ft of network cable throughout his house and installing DSL. Thus, he can now use simultaneously three computers and FAX via Earthlink, at very high throughputs, for $40/month.

14. Alan de Haas humorously described his fruitless attempt, years ago, of clearing insect specimens in a mixture of sodium hydroxide and clorox - where the end result was the total disappearance of the specimen! He then showed a Zeiss #3 stand with all accessories: a rare cased vertical illuminator with adjustable prism and slide-in anti-flare black aperture plates; BF/DF condenser with lever adjustable stops; an unusual Zeiss low-power long working distance objective where the lens elements are mounted in the upper end of a tube with Society threads at its bottom; a full range of eyepieces; a blood count chamber; a set of 5 Abbe diffraction plates; a rare Zeiss microspectroscope in new condition (not listed in any known literature!); and polarizing equipment with an Ahrens prism analyzer and a Nicol polarizer. This was a mic. outfit to see! Alan then showed a cased Reichert mic. c.1882. Its body tube and stage rotate as a unit about a vertical axis while a substage polarizer remains stationary. The 5-place nosepiece is equipped with Hartnach threads, the base is lead filled, and its case is of Cuban mahogany, which is now extinct.

15. John de Haas exhibited a number of microscopes from the estate of the late member, Fred Hantsch. These were put on auction with proceeds going to Mrs. Hantsch. Those instruments which had not been sold will be brought to the next general meeting for another auction.

We all would like to express our deep sympathy to Mrs. Hantsch at the recent loss of her husband, Fred, who had been a member of MSSC for well over two decades, and who was an expert micro-mineralogist and a good and level-headed friend whose excellent judgement and participation contributed to the betterment of our Society.

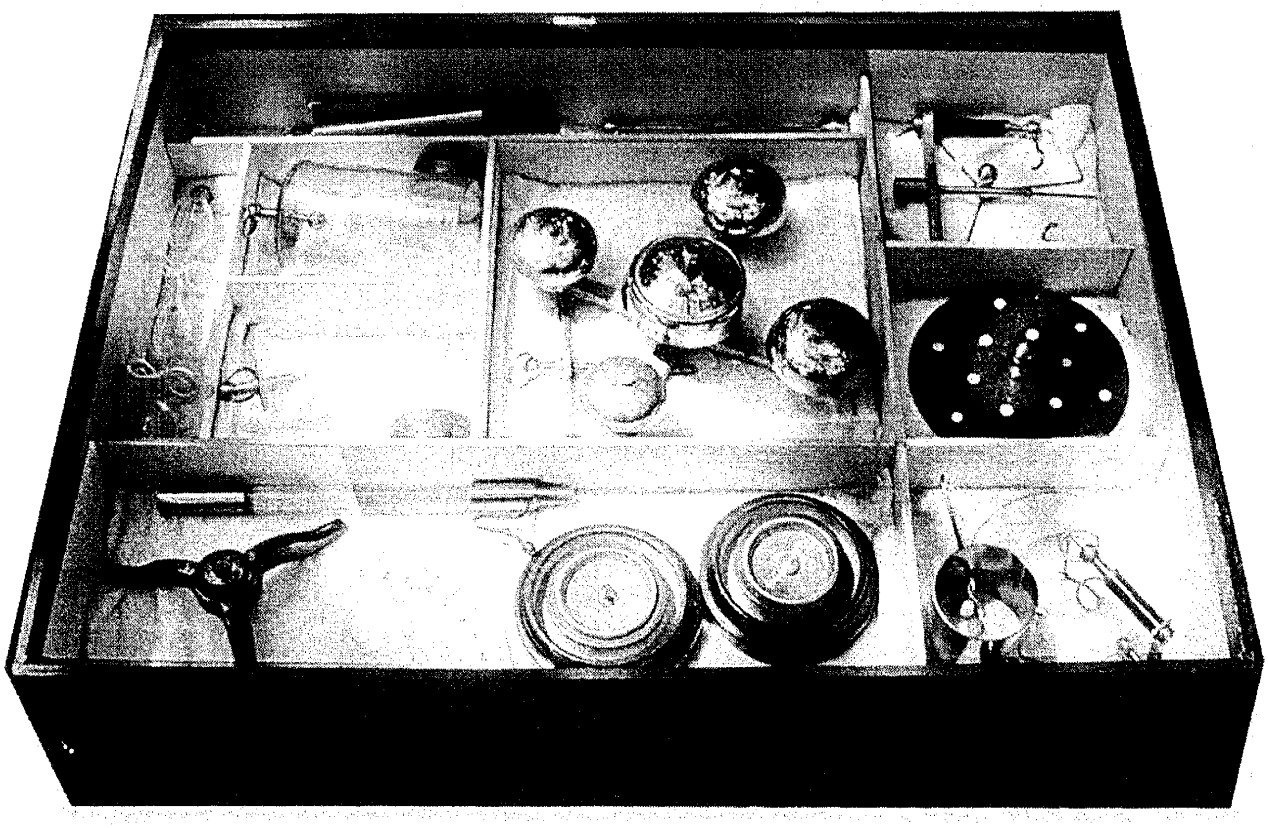
Stan Baird continued from page 124

Having been attached to the camera, the 'top part' is inserted into the 'bottom part' and securely locked in place with the two thumb-screws which impinge against the v-groove cut into its periphery. By loosening the screws slightly, the camera can be rotated to any desired position, and re-locked. This is an extremely useful feature which is a great aid in aligning the camera on a copy stand, or adjusting its angle so that the camera lens is aligned with the optic axis of a microscope eyepiece, for instance. (Very handy for inclined eyepieces).

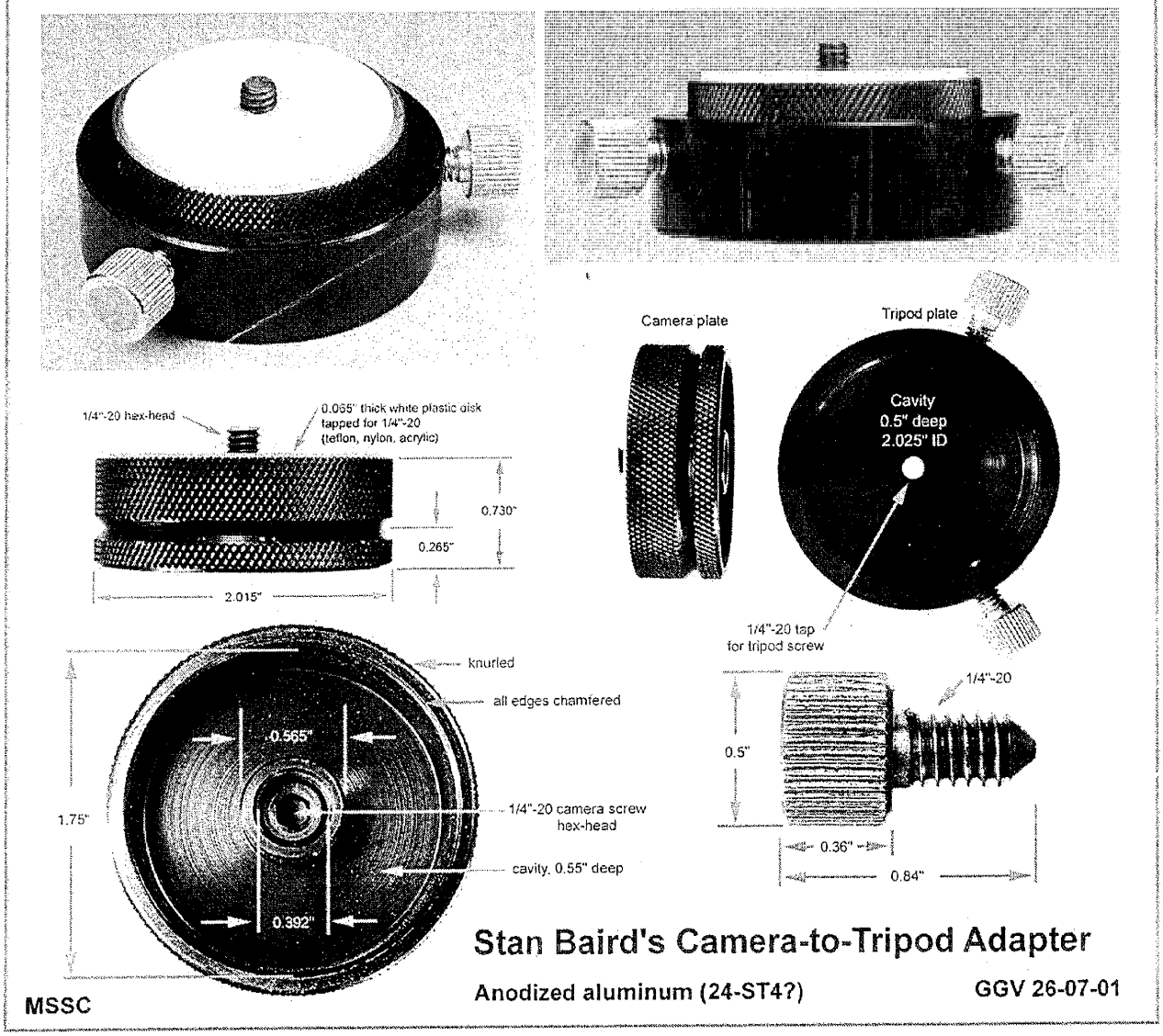
I have several adapters where I have 'permanently' attached the 'bottom parts' to a tripod, copy stands, and stereo slider. This makes it very convenient to switch the camera to any of these mounts with the least amount of trouble.

The adapter is made of black anodized aluminum (probably of the 24-ST4 alloy, which is of medium hardness, easily machined and takes anodizing quite well). Its strength is such that I have had no problems mounting relatively massive 4x5 cameras or spotting telescopes.

The last workshop meeting to be held at the Meadows estate on the patio under the sycamore trees.



Larry McDavid's electrostatic demonstration apparatus



Stan Baird's Camera-to-Tripod Adapter

by George G. Vitt, Jr

The late Stan Baird had been one of the mainstays of MSSC since the early days. Besides being an expert photographer, he had designed and developed a line of original, practical, and very useful products for various types of stereoscopic photography, photomicrography, and general photography. These he marketed through the Company that he had formed. Stan assisted and guided many of our members to higher levels in the art of microscopy and unstintingly gave of his time and expertise. Stan's passing some years ago marked a great loss to MSSC. His camera-totripod adapter has been a constant and dependable companion of mine for many years, and I have not found anything on the market that I would prefer to use in its place.

The adapter consists of two main parts:

1. Bottom part:This part is cup-shaped with a 1/4"-20 threaded central hole for mounting very firmly to a tripod, copy stand, or other apparatus. It has two radially located thumb screws for locking / unlocking the 'top part' which fits into the cup-shaped cavity.

2. Top part: This part is attached to the camera's threaded mounting hole and fits into the cupshaped cavity of the 'bottom part'.A sturdy plastic disk (teflon, nylon) prevents marring of the camera base during the attaching operation. The part is knurled on its outer periphery to insure a firm hand grip when being screwed into the camera. If desired, the steel hex-head screw, which screws into the camera, can be made of the correct length for a custom fit to a particular camera.

Stan Baird - Continued on page 122