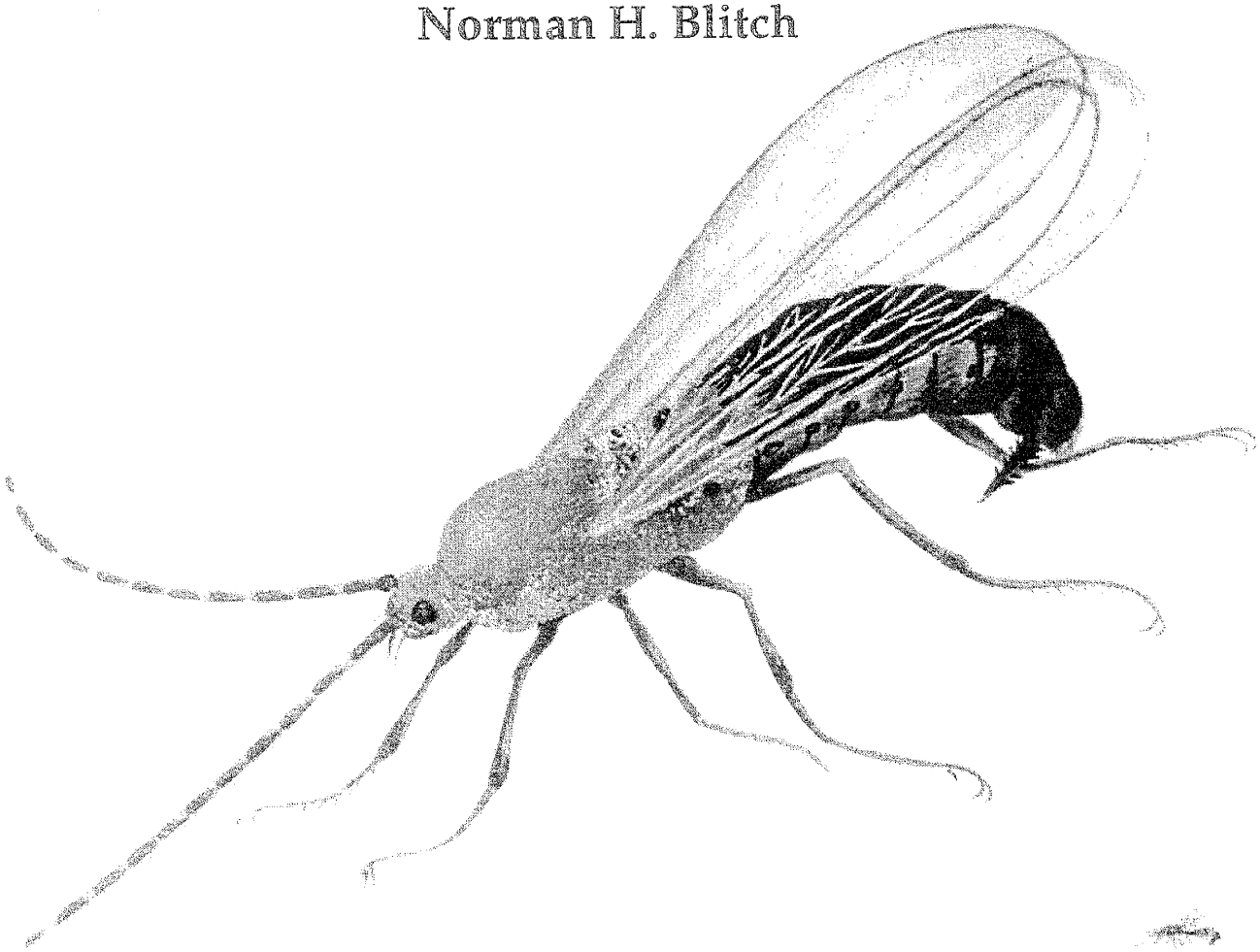
Journal of
THE MICROSCOPICAL SOCIETY OF SOUTHERN CALIFORNIA
Volume 3 Number 12 December 1998

# JOHN HILL ECCENTRIC MICROSCOPIST, 1717-1775

Norman H. Blitch



*Mourning Saw-fly* *Tenthredo luctuosa*

When we first reviewed a John Hill work, in February, 1994, only his *Construction of Timber* (1770, 2nd edition, 1744) was available to us (Figure 1). Since then, we have acquired two other Hill works: *Essays in Natural History and Philosophy* (1752; Figure 2); and *A Decade of Curious Insects* (1773; Figure 3). Hill was also the Editor of the English version of John Swammerdam's *Book of Nature* (1758; Figure 4), previously reviewed in January 1997. According to the *Dictionary of Scientific Biography*, Hill eventually authored, edited or published about 80 works in science.

John Hill was born in Peterborough, Huntingdon, in East Central England and became an apothecary who sold herbal remedies and other plant concoctions as a means of enhancing his income. As an unintended consequence of his early vocation, he became known as a quack. But, his investigations of medicinal herbs and plant husbandry led him into lifelong studies in natural history, biology and mineralogy. Inevitably, he became an accomplished microscopist.

As his first serious publication, Hill undertook the translation of *De Lapidus*, an early work on mineralogy by the Greek Theocrastus, a student of Aristotle. He developed his mineralogical skills in the course of annotating and improving on Theocrastus, using the microscope to update and correct earlier conclusions about a wide variety of minerals. His experimentation and observations led him to write a significant part of the *General Natural History,* published during the years from 1748 to 1752.

The first volume was devoted to classification and description of minerals, following directly from the Theocrastus experience. Volume two was devoted primarily to the subject of scientific classification, and it became the vehicle for Hill's introduction into England of the Linnean system of scientific classification for botany. This was one of the most important of Hill's contributions.

The third and last volume of the general history followed, on the subject of animal life, and Hill included in it his findings from microscopical e:xamination of both fossil and living specimens. It was here that he coined the term "paramecium," still used today, to describe a type of living animalcule. By this time in his career, Hill had become a meticulous and accurate observer, and had already contributed to advancement of knowledge in several fields.

Shortly after finishing his work on the *General Natural History,* Hill published a small book entitled *Es-*

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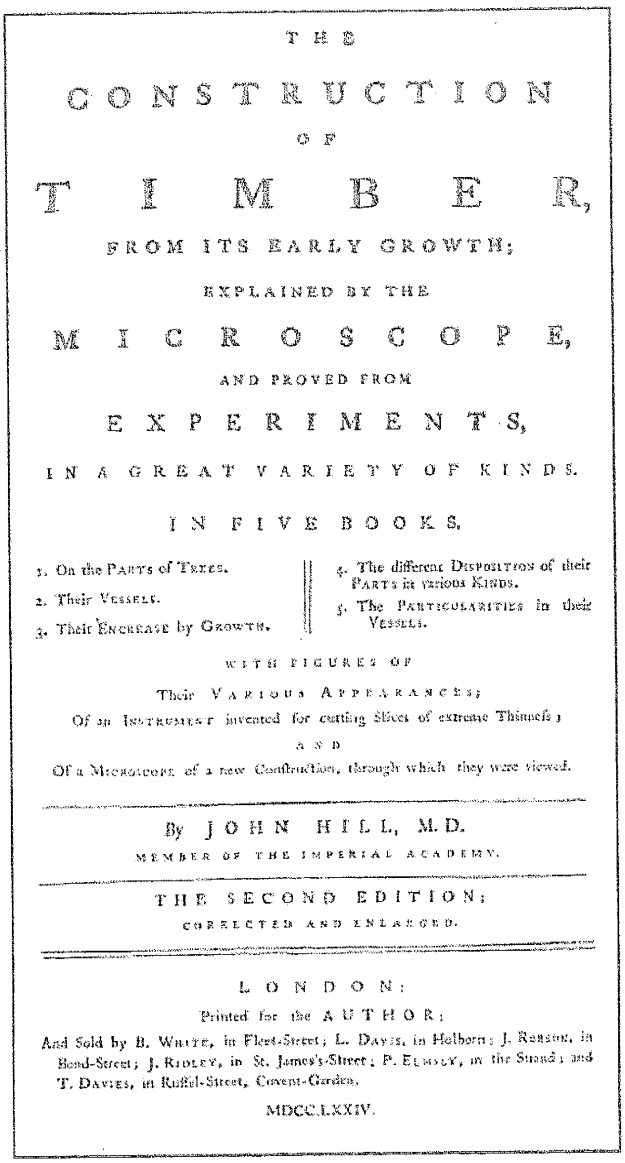


THE

CONSTRUCTION

OF

TIMBER,

FROM ITS EARLY GROWTH;

EXPLAINED BY THE

MICROSCOPE,

AND PROVED FROM

EXPERIMENTS,

IN A GREAT VARIETY OF KINDS.

IN FIVE BOOKS.

1. On the Parts of Trees.
2. Their Vessels.
3. Their Increase by Growth.
4. The different Disposition of their Parts in various Kinds.
5. The Particularities in their Vessels.

WITH FIGURES OF

Their Various Appearances;

Of an Instrument invented for cutting Slices of extreme Thinness;

AND

Of a Microscope of a new Construction, through which they were viewed.

By JOHN HILL, M.D.

MEMBER OF THE IMPERIAL ACADEMY.

THE SECOND EDITION;

CORRECTED AND ENLARGED.

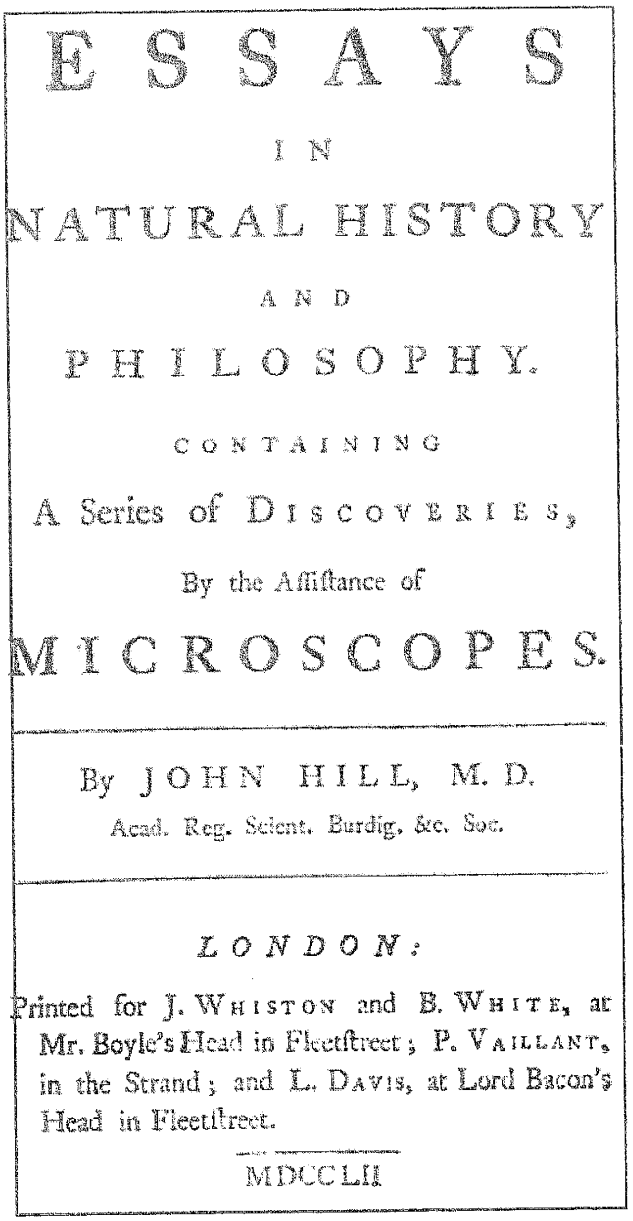
LONDON:

Printed for the AUTHOR;

And Sold by B. White, in Fleet-Street; L. Davis, in Holborn; J. Ranson, in Bond-Street; J. Ridley, in St. James's-Street; P. Elmsly, in the Strand; and T. Davies, in Ruffel-Street, Covent-Garden.

MDCC.LXXIV.

Fig. 1 Title Page, *Construction of Timber*, 2nd Edition, 1774



ESSAYS

IN

NATURAL HISTORY

AND

PHILOSOPHY.

CONTAINING

A Series of Discoveries,

By the Assistance of

MICROSCOPES.

By JOHN HILL, M. D.

Acad. Reg. Scient. Burdig. &c. Soc.

LONDON:

Printed for J. Whiston and B. White, at Mr. Boyle's Head in Fleetstreet; P. Vaillant, in the Strand; and L. Davis, at Lord Bacon's Head in Fleetstreet.

MDCCLII.

Fig. 2 Title Page, *Essays in Natural History and Philosophy*, 1752

*says in Natural History and Philosophy. Containing a Series of Discoveries, By the Assistance of Microscopes.* It comprised nineteen individual essays, each of which was devoted to observations of one specimen, animal or plant, described in detail. It demonstrates Hill's strong powers of observation and prowess as a naturalist. Interspersed with his descriptions are his comments on microscopical matters. For example, in essay number VII, he describes a kind of plant fungus he had observed and then argues for the usefulness of a single lens microscope: "Thus much I have found it necessary to say in Favor of the Use of single Magnifiers of great Power, in the more nice Investigations, because I know their being difficult and disagreeable in the using has thrown them into an unmerited Disregard, a Neglect that will clip the Wings of all succeeding Discoveries. The Microscope, as we hear of it, in the hands of Lewenhoek, and in those of all the other Authors, who have so amazingly seen the Minima of Nature, and who have inspired the World with a Love for its Investigations, was a single Glass of this kind: Almost all the great discoveries which have rendered the Instrument famous, were made by single Glasses." Hill then referred to "that plaything, the double Microscope."

However, in spite of his stated preference for the single lens, Hill's chosen microscope for examination of the wood specimens in his *Construction of Timber* was George Adams' "Variable Microscope" (Figure 5). In *Clay and Court* it is noted that Hill's large plate of the "Variable" was in the 1770 version of "Timber" in the year

A

# DECADE

OF

# CURIOUS INSECTS:

SOME OF THEM NOT DESCRIB'D BEFORE:

SHEWN IN

THEIR NATURAL SIZE;

AND AS THEY APPEAR ENLARG'D BEFORE

THE LUCERNAL MICROSCOPE;

In which the SOLAR APPARATUS is artificially illuminated.

With their HISTORY, CHARACTERS, MANNERS, and PLACES of ABODE;

On TEN QUARTO PLATES, and their Explanations.

DRAWN AND ENGRAVED FROM NATURE.

By J. HILL, M. D.

MEMBER OF THE IMPERIAL ACADEMY.

LONDON:

Printed for the AUTHOR, in St. James's-Street.

And Sold by B. WHITE, in Fleet-Street; P. ELMSLY, in the Strand; PARKER, in Cornhill; BALDWIN, in Pater-noster-Row; RIDLEY, St. James's Street; and J. BALFOUR, at Edinburgh.

MDCC.LXXIII.

Fig. 3 Title Page, *A Decade of Curious Insects*, 1773

THE

# BOOK of NATURE;

OR, THE

## HISTORY OF INSECTS:

Reduced to diftinct CLASSES, confirmed by particular INSTANCES, Difplayed in the Anatomical Analyfis of many SPECIES,

AND

ILLUSTRATED with COPPER-PLATES,

INCLUDING

The Generation of the Frog, the Hiftory of the Ephemeræ, the Changes of Flies, Butterflies, and Beetles;

WITH THE

Original Difcovery of the Milk-Veffels of the Cuttle-Fish, and many other curious Particulars.

By JOHN SWAMMERDAM, M. D.

WITH

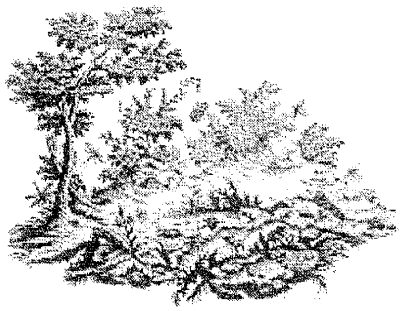
The LIFE of the AUTHOR, by HERMAN BOERHAAVE, M. D.

Tranflated from the Dutch and Latin Original Editions,

By THOMAS FLOYD.

Revifed and improved by NOTES from Reaumur and others,

By JOHN HILL, M. D.



LONDON:

Printed for C. G. SEYFFERT, Bookfeller, in Dean-Street, Soho.

MDCCLVIII.

Fig. 4 Title Page, *Book of Nature*, Swammerdam, 1758

before Adams described it in the 4th edition of his own *Micrographia* in 1771. In his preface, Adams gives credit to an unidentified patron for inspiring the design of the "Variable." According to Hill, it was Hill's own patron, the Earl of Bute, who was reponsible for the design suggestion to Adams (See *The History of the Microscope*, 1932).

A second, "corrected and enlarged" edition of *The Construction of Timber* was published in 1774 (Figure 1). It is a fine ground-breaking study of the microscopic structure of many varieties of woods, presented in some 42 detailed engravings showing microscopic studies of wood sections taken from the shoots of trees. As an example, engraving number 30 in Book IV, Magnolia Glauca is illustrated (Figure 6).

The thin sections of wood were cut with a newly invented "Cutting Engine," (Figure 7) conceived by Hill, who gives credit in his Introduction: "The Cutting Engine is an invention of the ingenious Mr. Cummings. The two or three first were perfected under his own hand: and they are now made for general use by Mr. Ramsden." Hill's "Instrument for cutting Transverse Slices of Wood, for Microscopical Objects" was, indeed, the first microtome, conceived by Hill, designed and executed by Cummings, and manufactured by Ramsden.

The title of John Hill's *The Construction of Timber* sounds more like a building trades manual than a textbook of microscopical observations. Furthermore, in its large-paper folio edition, it is a massive volume, measuring about twelve by nineteen inches. So, it is not readily available in the corner library. But, it is frequently cited in histories of microscopy, such as Clay and Court, *The History of the Microscope* or Brian Bracegirdle, *A History of Microtechnique*.

Finally, we come to an unusual and quite beautiful work by Hill: *A Decade of Curious Insects*, published in 1773, two years before Hill died. It consists of ten engraved and hand-colored plates, each depicting a single winged insect along with a textual description of its

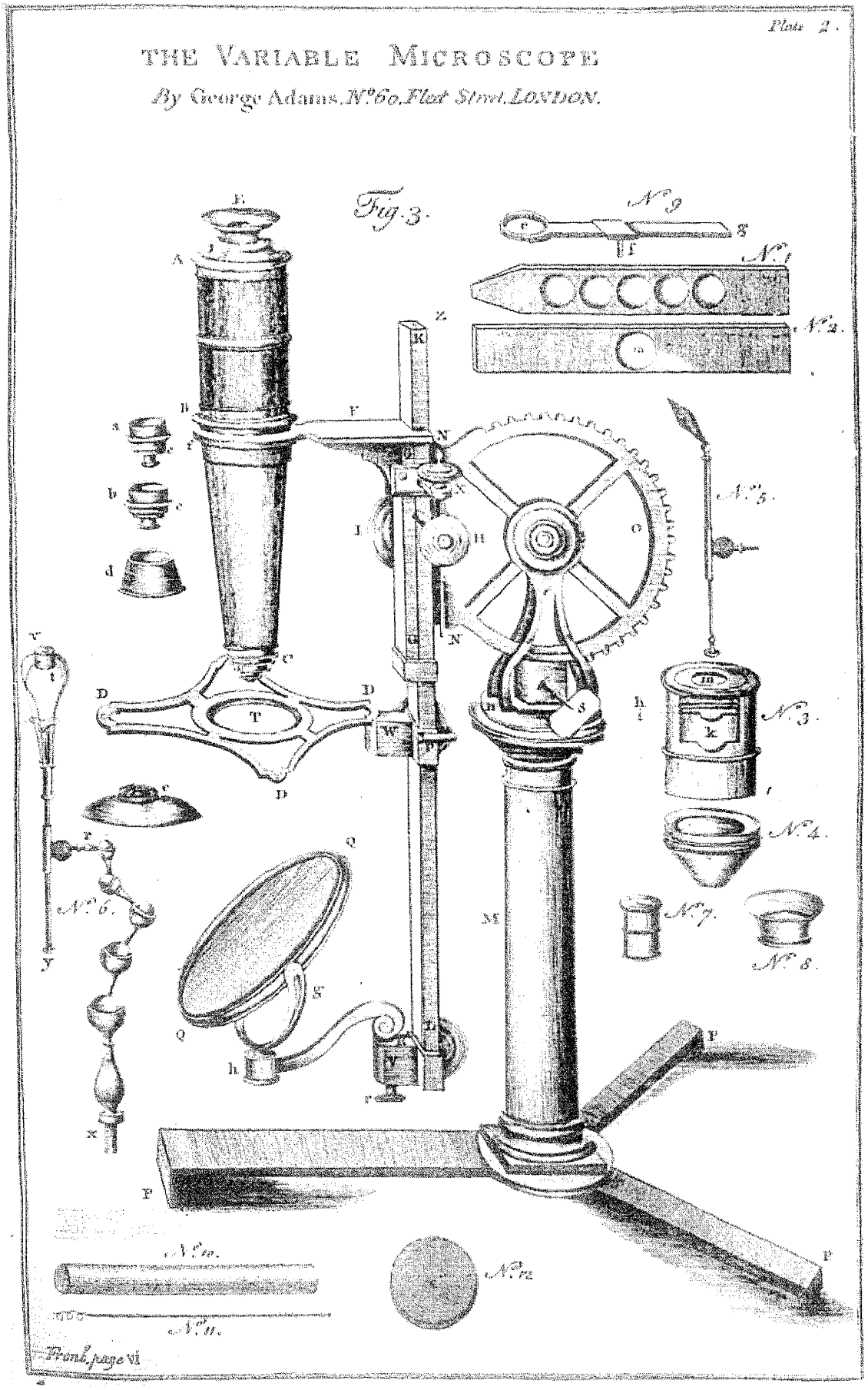



Figure 5 Plate, Variable Microscope by George Adams.

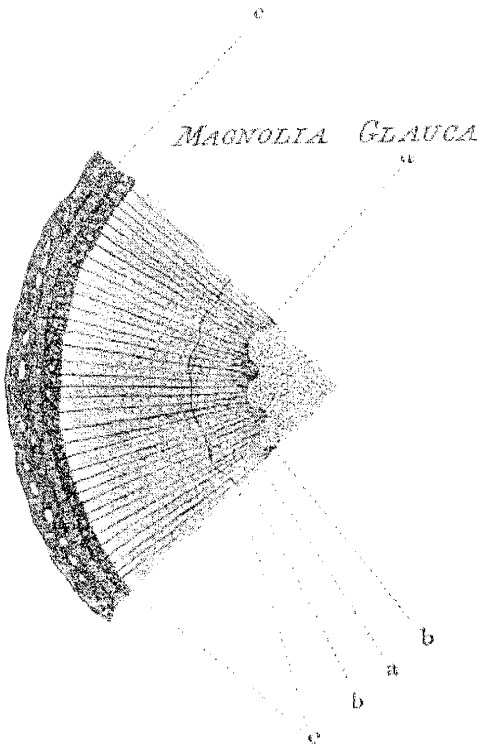



**Figure 6 Plate, Thin section of Magnolia Glauca.**

"history, character, manners and places of abode." The colors of each insect are also described in detail in the text. This work is not widely known, and the book itself is very scarce. A few of the plates are reproduced here (Figures 8- et seq.), but the reproductions may not do full justice to the brilliantly colored originals.

Considering John Hill's great productivity and many contributions to science, why do we refer to him in the title of this review as the eccentric microscopist? Firstly, Hill probably had less formal education than was considered seemly; his M.D. degree was probably purchased rather than earned. And, he became somewhat of a laughing-stock among his peers when, after being awarded a Swedish medal, he dubbed himself "Sir" John Hill and demanded the courtesies that went with the title. He is often still listed in bibliographies as Sir John Hill. Cantankerous Sir John easily fell into personal disputes with contemporaries and was openly contemptuous of the Royal Society, which never accepted him into membership.

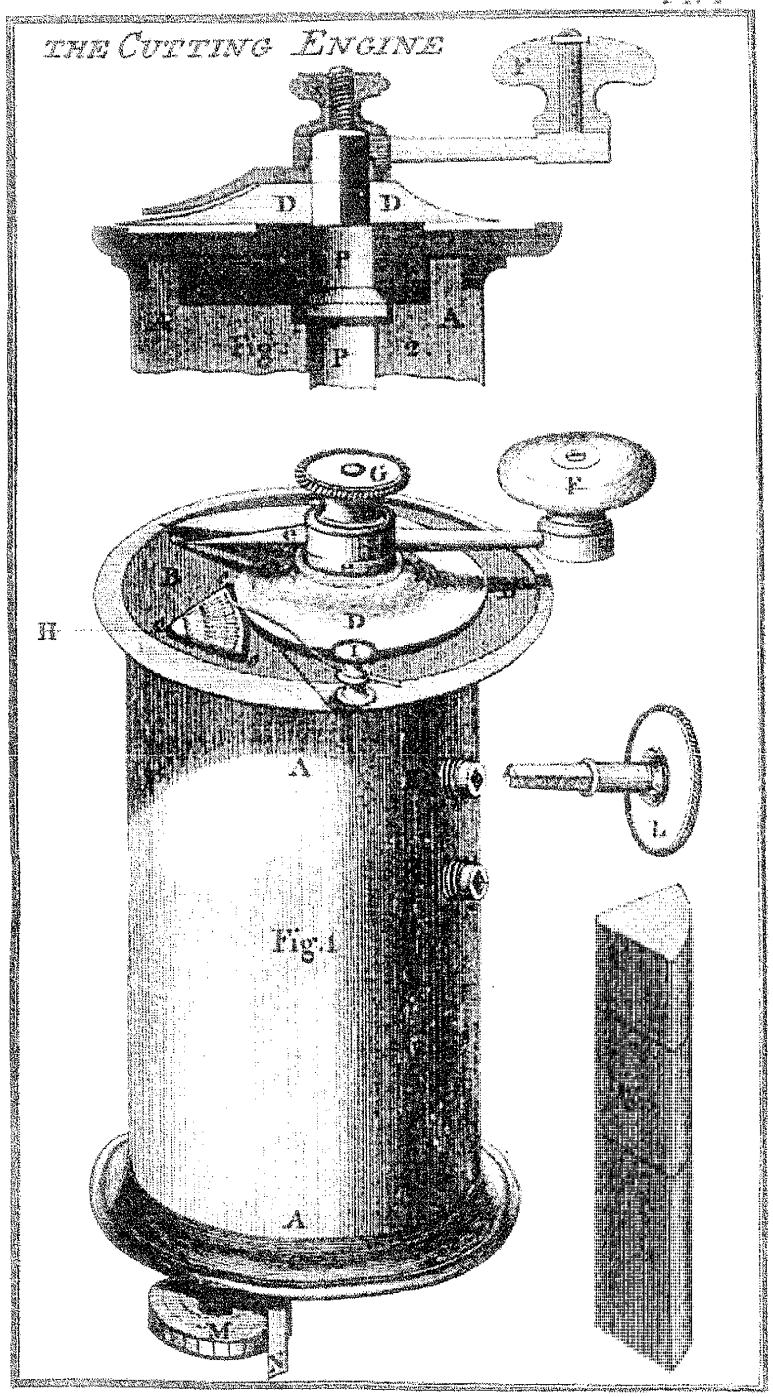



**Figure 7 Plate, Hill's "Cutting Engine," circa 1770.**

Even in his text for the Magnolia Glauca wood section (above, Figure 6) Hill aimed a barb at the Royal society in support of the Italian microscopist Giovanni Maria Della Torre: "The view here given was taken with one of those wonderful glasses made by the Pere de Torre; placed in an apparatus of the double Microscope, instead of the tube. Nothing could show an object more distinctly; and the reverend father deserves the highest praise; whatever fate prevented his receiving it from our Royal Society; whatever blindness or malevolence there injured his fair fame."

Regardless of his shortcomings, John Hill contributed mightily to botanical science, mineralogy and microscopy.

# Figure 8- Color plates, *A Decade of Insects*:

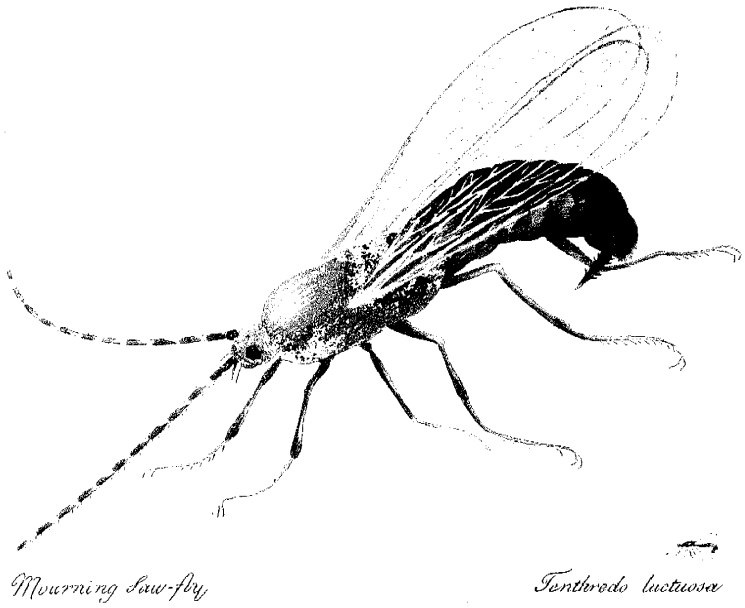



Plate 1 Mourning Saw-Fly

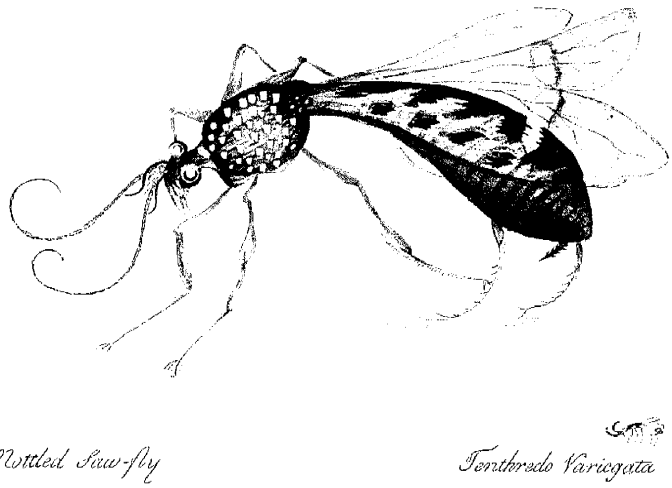



Plate 2 Mottled Saw-Fly

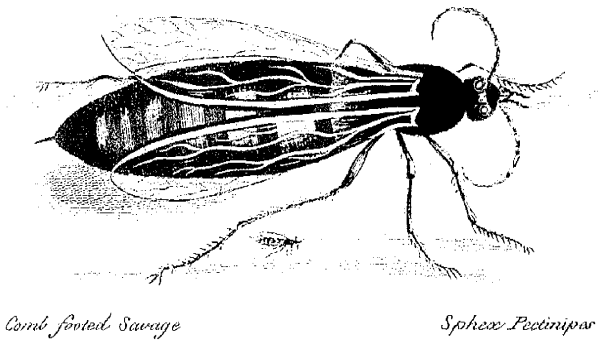
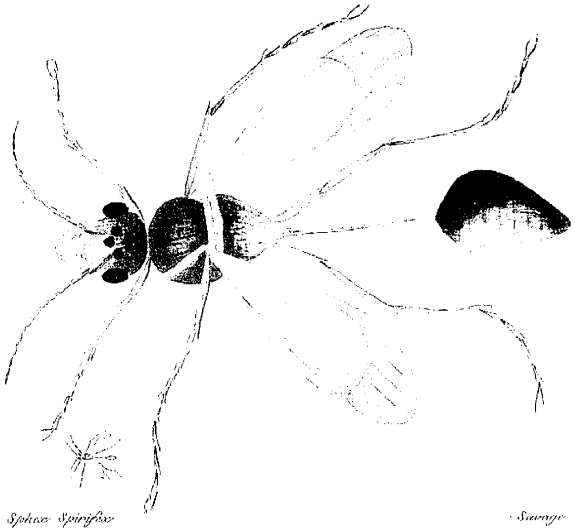



Plate 3 The Comb-footed Savage

Plate 4 The Turner Savage



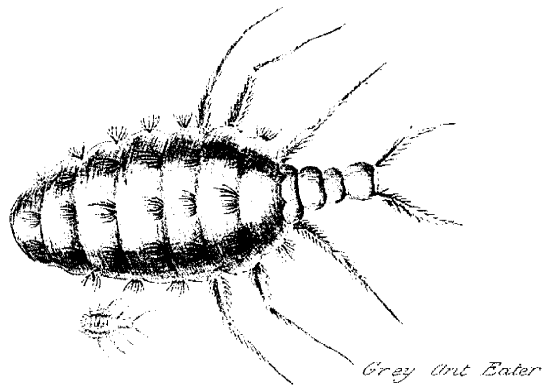




Plate 5 The Grey Ant Eater

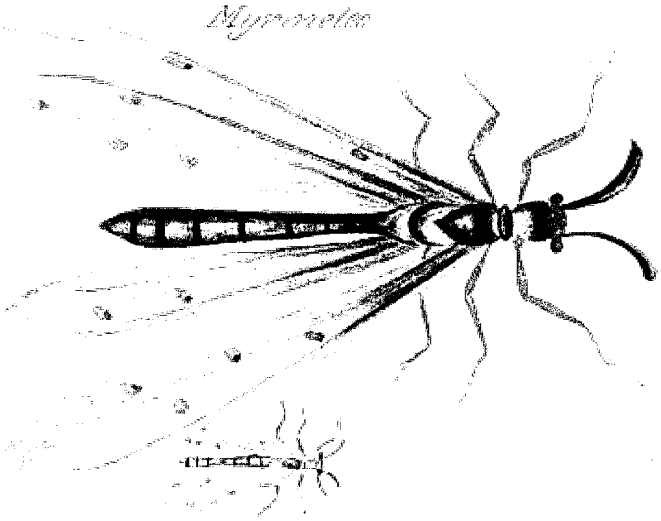


Plate 6 The Oak Leaf Gall Fly

# Figure 8- Color plates, *A Decade of Insects:*

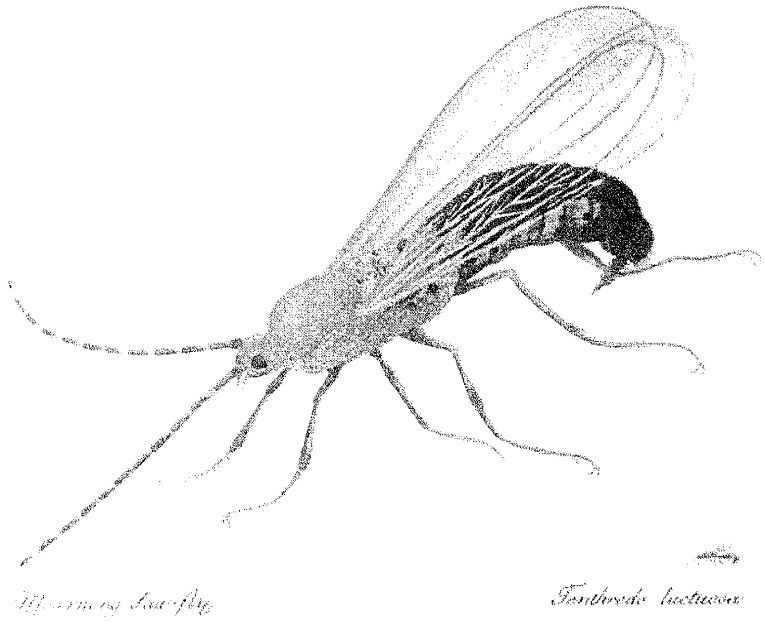


Plate 1, Mourning Saw-Fly

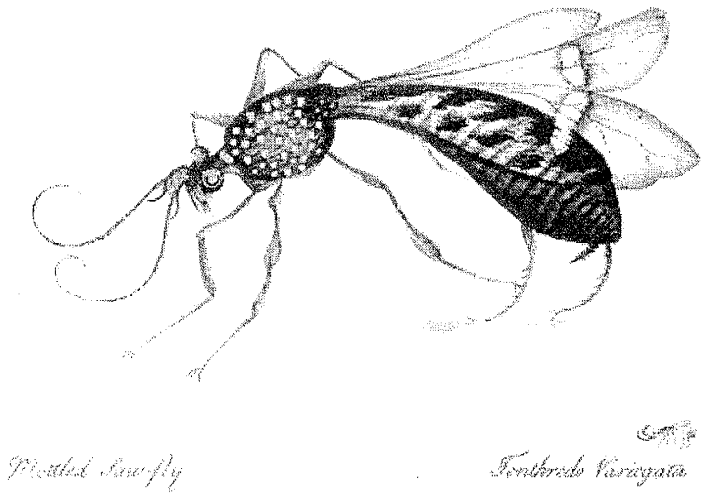


Plate 2, Mottled Saw-Fly

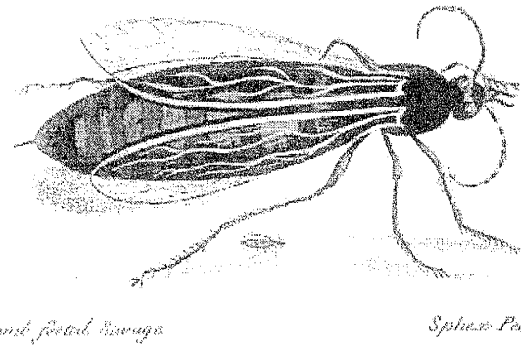
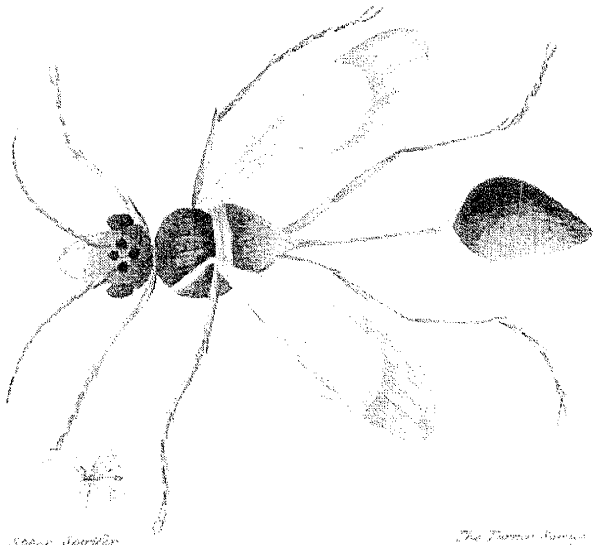


Plate 3, The Comb-footed Savage

Plate 4, The Turner Savage



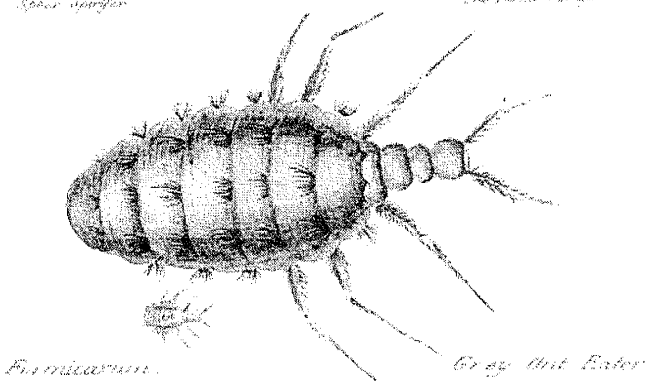


Plate 5, The Grey Ant Eater

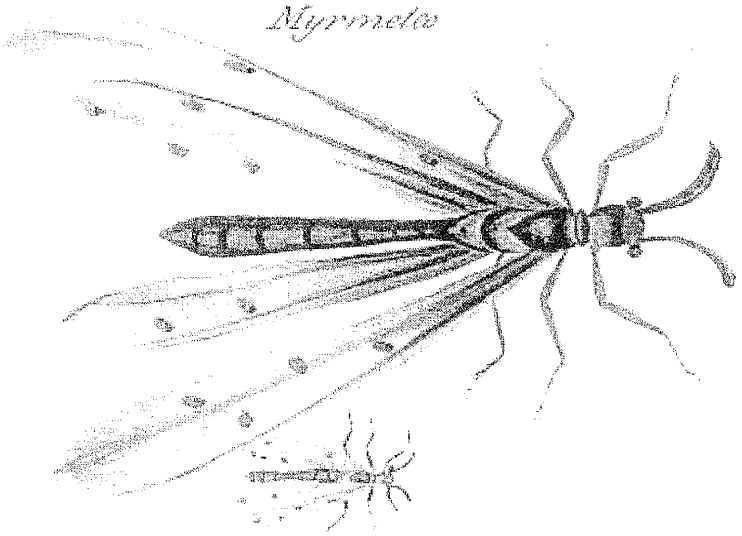


Plate 6, The Oak Leaf Gall Fly

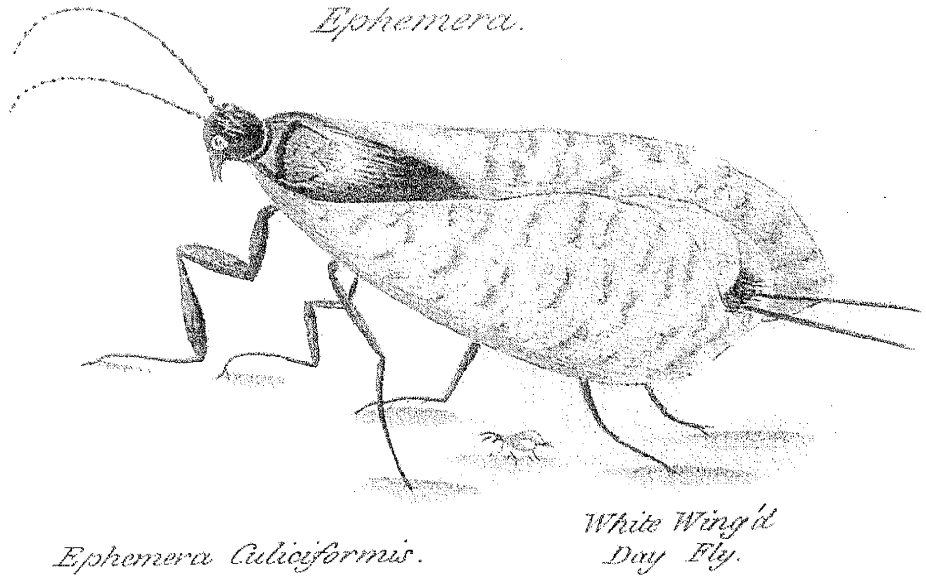



Plate 7, The White Winged Day Fly

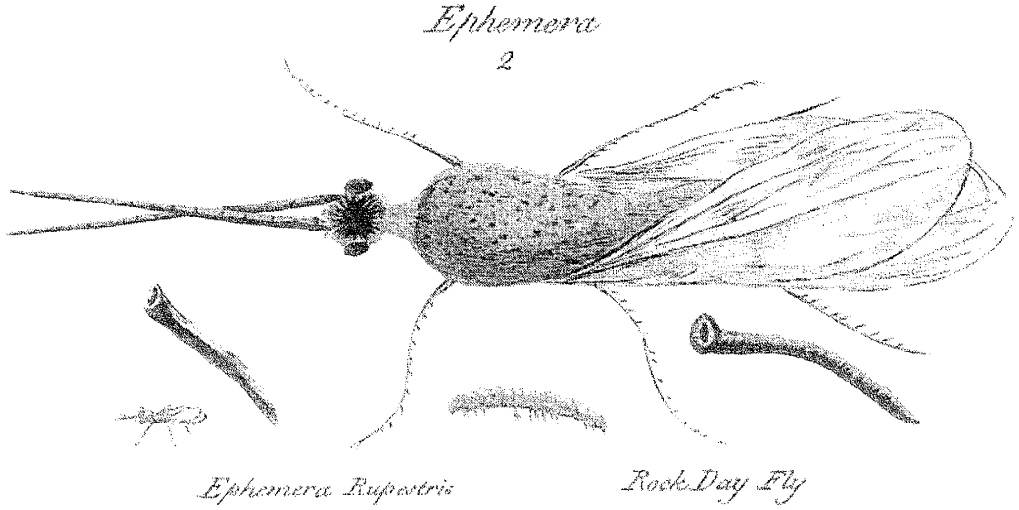



Plate 8, Rock Day Fly (Ephemera)

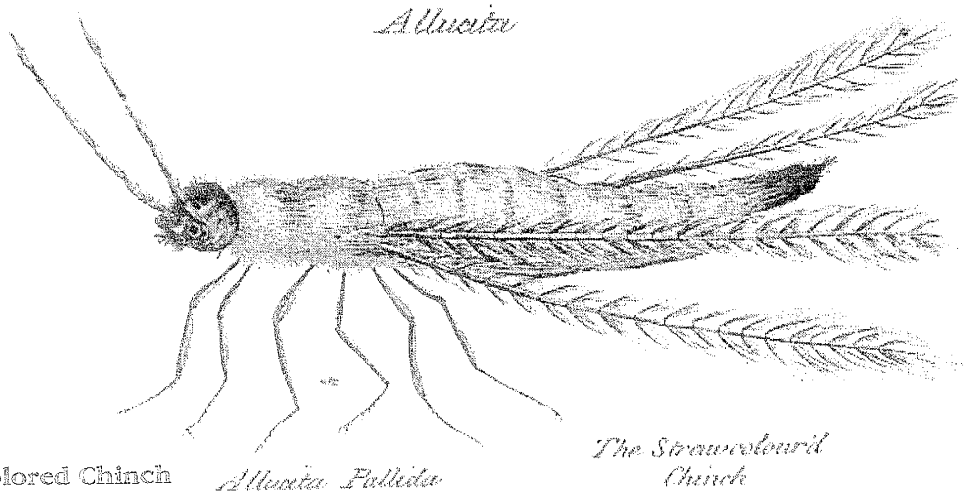



Plate 9, The Straw Colored Chinch

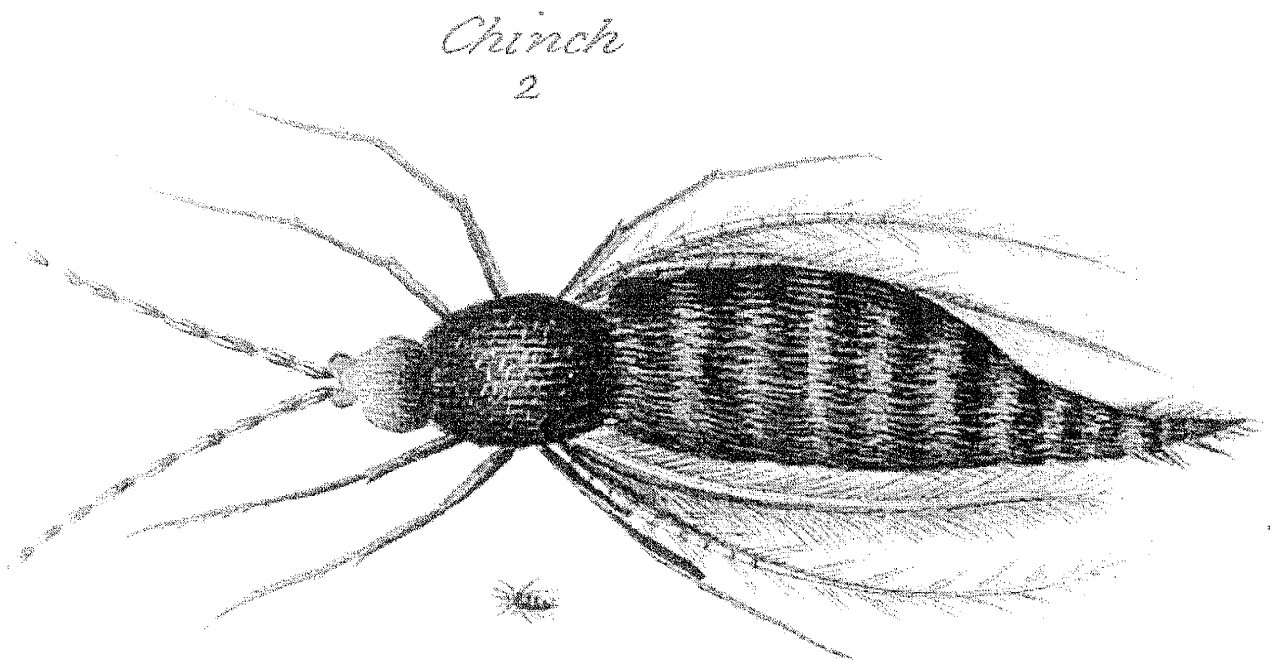



Plate 10, The Tawny Chinch

Allucita fulva. The Tawny Chinch.

# OCTAVO
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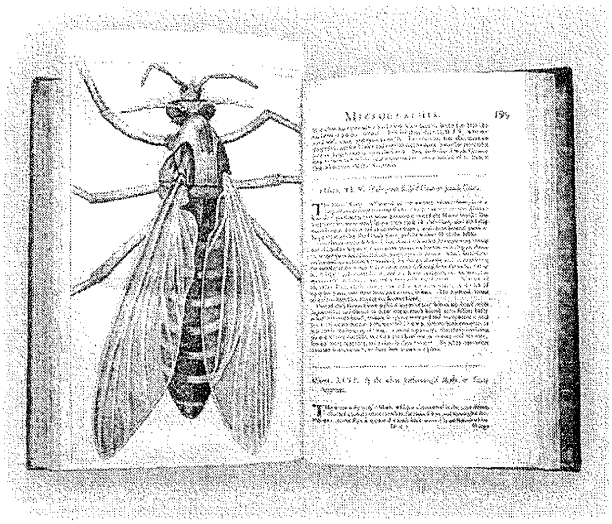

A page from Robert Hooke's *Micrographia.*

In a revolution that may rival the introduction of low cost printing, a small company called Octavo is using digital technology to make the rarest of books available for anyone to view at modest cost in PDF format on CD-ROM. Since Octavo's founding in 1997 by John E. Warnock, chairman and chief executive of Adobe Systems, and by Patrick Ames (who formerly headed Adobe's publishing arm, the company has built a catalogue of over a dozen titles including, of special interest to microscopists, Robert Hooke's 1665 *Micrographia* with a commentary by Brian Ford and Isaac Newton's *Opticks*, with a commentary by Nicholas Humez. Other titles include science, religion and literature.

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OCTAVO continued on page 249

# Carl Zeiss Jena Stativ I, Nr. 30752

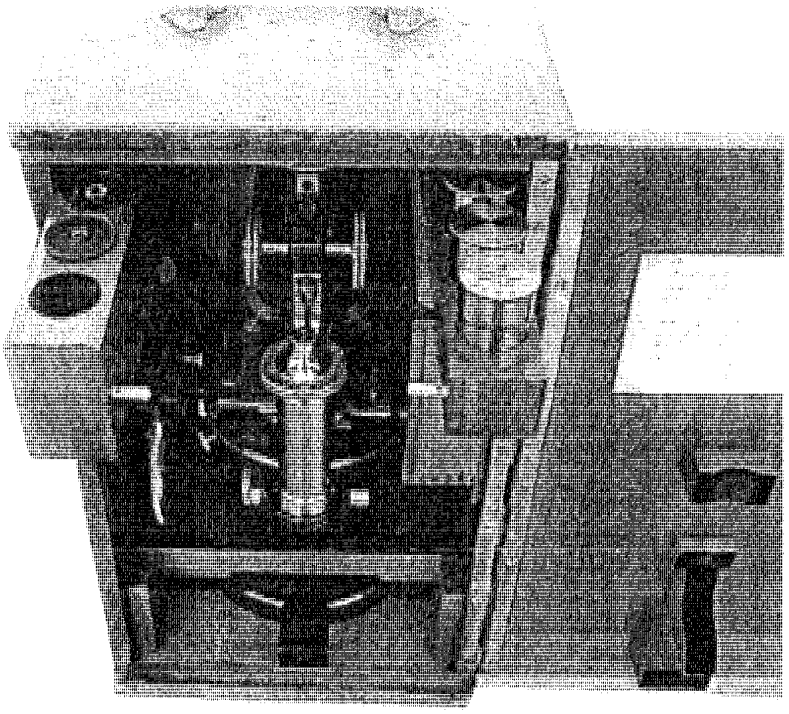
## by Allen Bishop

These photos by Wolfgang Buerner of the L.A. Instrument Co., which were originally in color, were sent to your editor by long-time member Herbert Layfield. They show an example of Zeiss' "Large" stand, also known as the "Stativ I" or "Photomikrographischer Stativ." The last designation was applicable when the stand was fitted with the large-diameter body tube, 100x100 mm square mechanical stage and sliding-wedge single-objective changer.

This stand is equipped with the Nr. 44 or "E" mechanical centerable rotating stage which was made, with only evolutionary changes, until World War II. Olympus made close copies of the E-Stage on their early post-war stands.

The serial number of this stand, 30752, indicates that this stand was made ca. 1900.

Zeiss had already introduced their well-known "jug-handle" style of arm for their stands I and III. The "top loader" fine focusing mechanism, a simple micrometer-screw design, was replaced by the Berger pattern which utilized worm gearing to forestall focus drift. In point of fact, this is likely one of the last large stands produced with the old-style fine focus.



**Zeiss used a very homogenous cabinet design after about 1890. Earlier stands lay flat in their cabinets. Eyepieces on left, lenses in brass capsule on right. Below, right is a small box on sliders, often missing. On left is provision for stowing a removable stage.**

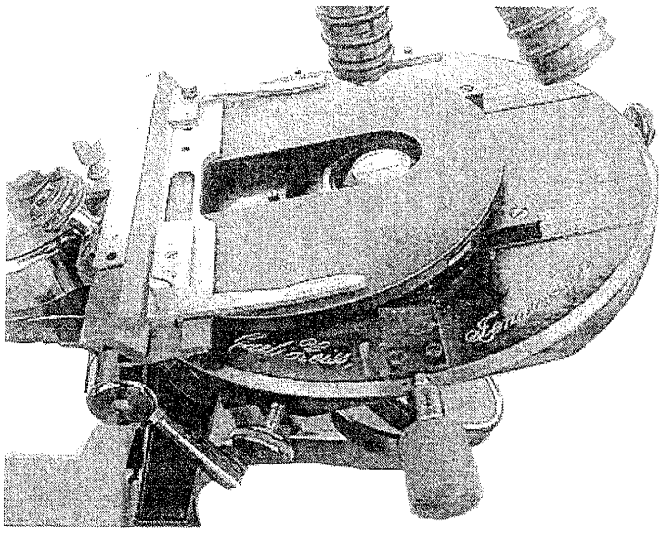
Interestingly, an E-Bay sale earlier in 1998 featured a Zeiss Stand IV with the Serial Nr. 30784, only 32 units away from the Stand I seen here! The Stand IV looks very similar to the Stand I, but is smaller - much like a contemporary B&L "BB" Stand.

I cannot positively identify the objectives on this stand, though the short one with a smooth, slightly conical barrel is almost certainly an "AA", while the lens with the three cannelure rings is probably a "D" or "DD" (Prof. Van Heurck's favorite). The third lens is almost certainly the Zeiss 1/12" immersion.

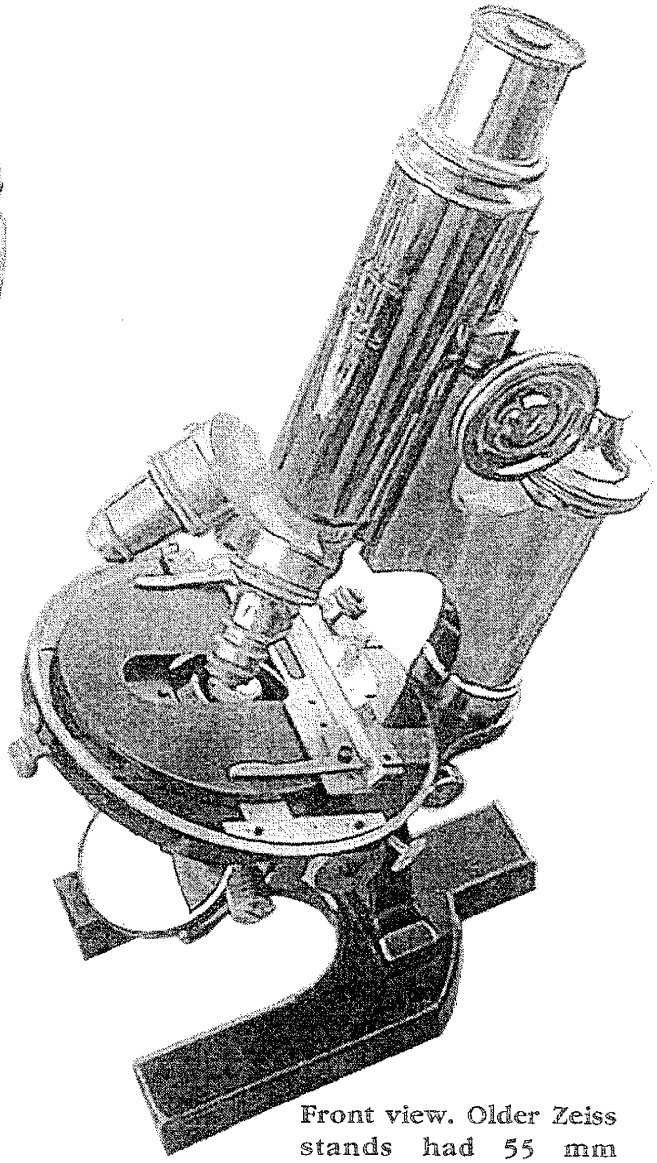
Zeiss, like many contemporary makers, used letter and number designations for objectives and eyepieces; Zeiss carefully phased out this confusing system after WW I.

Even before this stand was made, Zeiss had already made close manufacturing tolerances a watchword. Many components from this stand would interchange with another. However, it would be some years before they introduced stands that were truly modular, or "constructed to gauge," as a British engineer would term it.

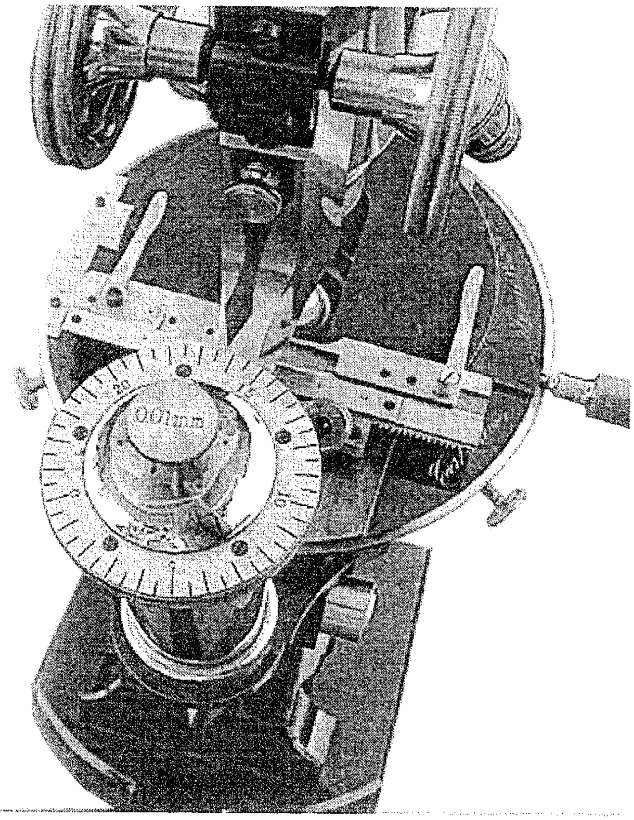
In historical perspective, there is nothing exceptional about this, or any of the Zeiss stands; in fact, they appear rather mundane and they pale alongside a Nachet Grand or a Powell & Leland No. 1. Where Zeiss built their reputation, as we well know, was in their optics. While late editions of books by such authors as Carpenter and Dallinger criticized the overall features of the "Continental" stand design, they could not but admit of the quality of the optics. Zeiss produced many of their lenses specifically for the "250mm Tubuslange" English stands. Furthermore, while a Zeiss Stand I was hardly an inexpensive instrument, it was less expensive than one of the elaborate British microscopes of this era. Magnificent as they are today, the British manufacturers spent far too much effort catering to a leisured amateur clientele, most eager to outdo each other by having the "bestest" and the "mostest." Many valuable developments were made by the likes of Ross and Baker, but in the end the scientists and doctors of medicine adopted the continental type seen here. For many years, Charles Baker, 44 High Holborn, London was the British Zeiss agent.



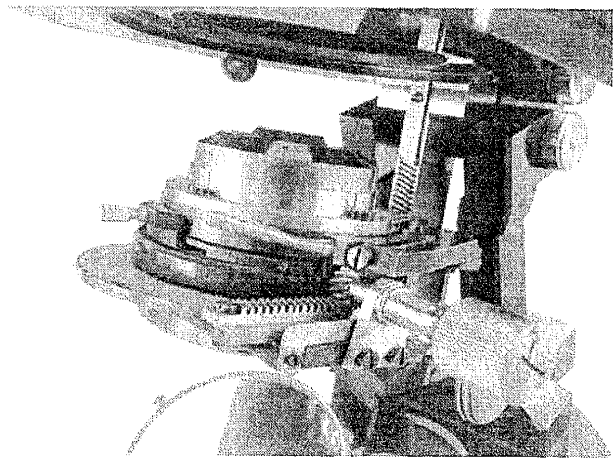
The central oval aperture in the E - stage was enlarged later and the traversing mechanism changed in detail. While the E - stage was basically a simple, rugged mechanism, it used too many small, easily broken screws to hold it together. The upper section was too easily removable; the result being that many are lost and/or the slide retainer bars lost or broken. Note the "tommy bar" tilt lock; only on Stand I.



Front view. Older Zeiss stands had 55 mm diameter mirrors.




The fine focusing wheel with 0.01 mm graduations on a silvered scale. Note the index pointer - frequently bent, broken off, or just gone after nearly 100 years! The E - stage is slightly different in detail from later production.



The "classic" Abbe substage featured an oblique shift feature. There was no provision for centering; that was done in manufacture to Zeiss' satisfaction. What is laughable today is a stand with a battery of Abbe Apochromats, but a totally uncorrected 2 or 3 lens condensor!

# WORKSHOP of the Microscopical Society of Southern California

by: George G. Vitt, Jr.
Date: Saturday, 18 November 1998
Location: Steve Craig's Lab.

1.Steve Craig described his recent visit to the Wm.Andrews Clark Memorial Library with its collection of rare old books. Steve had arranged for a 'field trip' there, sometime in December, for all of our bibliophile members. Ref. the MSSC Christmas party: It will take place on 6 Dec. at **Ernie Meadows'** residence; Herb Gold, Gaylord Moss and Larry Albright comprise the party committee. Steve is now the custodian of most of the MSSC photomicrographic framed prints that we had on exhibition at the Palos Verdes Art Center.

2.**George Vitt** gave a brief report on his computer work with Photoshop. He described the usefulness of 'Channels' and also how he made an 'arranged radiolarians' image, using a single radiolarian. George described the problems to be encountered (and, hopefully, overcome) in photographing a finely faceted diamond. He asked those in attendance for suggestions as to the best lighting arrangement, how to hold the specimen, etc. The problem needs to be further investigated, since the response was a bit 'off-the-cuff.'

3.**Richard Jefts** described several ways of making and observing crystals through the microscope. He displayed a case of 150 capped 4-gram vials, each containing a saturated aqueous solution of a particular chemical compound. He had others which had been dissolved in acetone and alcohol. Richard is using these as starting 'standard' solutions for preparing xtal microslides for microscopic examination. He noted that iodine dissolves best in a solution of potassium nitrate. **George Vitt** described his experiments with bicarbonate of soda, where two parameters were varied: the initial concentration, and the evaporation rate. He noted that the crystal structure and overall pattern were strongly dependent on these factors. **Alan de Haas** noted that potassium dichromate makes excellent crystals especially for dark field and oblique illumination and that one can easily measure the thickness of these crystals. For spectacular visual results he recommended using a supersaturated solution of vitamin C (ascorbic acid). Alan described some dangers that may be encountered when dealing with various chemicals for crystal making: if you have insecticide in the garage, keep iodine away - could be disastrous! Inhalation of toluene is dangerous and could be fatal; benzene is a carcinogen. **Leo Milan** announced that **Bill Hudson** will bring xtal making chemicals for use by the members.

4. Pete Teti suggested that crystal growing would be an excellent subject for a Workshop. **Jim Clark** recommended the use of commonly available chemicals for this work. **Jim Solliday** noted that **Leo Milan** has made a list of crystal forming chemicals that had been originally compiled by the late **Bill Sokol.**

5.**Dave Hirsch** described his recent trip to England, noting that he bought less than 10 pieces at the Science Fair. Some of these were: a U.V. spectroscope by R&J Beck, c.1935; a microscope by Beck. He showed an aluminum portable microscope(Rowe, Rathenau, Germany) in a fine, small, oak case, with a divisible objective which, with draw tube adjustment can give magnifications in the range 75X to 200X. There is a hole in the foot, stage clips, and a substage 3-stop diaphragm, with the mirror working only in one axis. Dave also showed a c.1840 brass microscope (probably French) where fine focus was achieved by a lever on the right side of the body tube. It has a one-sided mirror and a small bullseye. Dave noted that the Customs agents gave them a Hard Time in London.

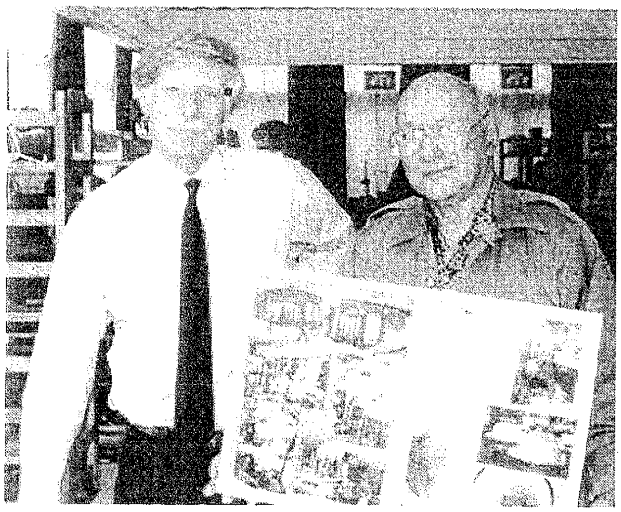
6. **Jim Solliday** described his visit to the New Jersey and Maryland scientific instrument shows. He related that he had obtained from **Ernie Ives** (PMS, England) a set of prepared slides of insects. The specimens are mounted in Ernie's incomparably fine style, which follows the best examples of the best arranged entomological slides of the 19th century. This $40 set will be given as first prize to the best exhibit to be shown at the general (and Gala!) MSSC November exhibition meeting. Jim then showed a B&L c.1912 stereo large surface dissecting microscope with the limb adjustable to accommodate thick specimens. He then displayed these books: *Use & Care of the Microscope*, by B&L, c.1902; *Manipulation of the Microscope* by Idwin Bausch, 1901; *Catalog of the RMS Collection* (the entire collection) by Frank Crisp. (He had been a President of the RMS and had collected some 3,000 microscopes around the world); *A Microscopic Cabinet* by Andrew Pritchard, c.1832, with hand colored plates (a very rare book). It includes a picture of Pritchard's 'jewel microscope', contains the first mention of the use of Canada Balsam as a mounting medium, and the types of test objects that were commonly used in the 'pre-diatom' era; *The Microscopist* by Wythes, MD, 1851-2, in original binding. This is the first publication in the USA on the subject of microscopes.

7. Barry Sobel showed a cased test microscope(Dutch?) and a prism spectroscope by

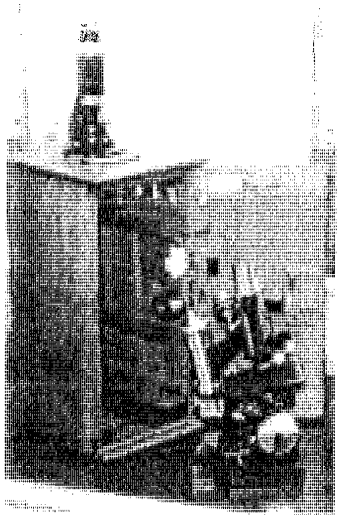
Workshop - continued on page 244

# BEEN THERE, DONE THAT - a brief sojourn in the UK

David L. Hirsch



With Arthur Middleton



The prizes

Inwardly, I chuckled, thinking that I would beat the crowds by going to England in early winter. WRONG! The place was wall-to-wall humanity, mostly tourists. One consolation, it was gratifying to know that only a very small percentage of my fellow travellers were of the same mind set as I; in search of scientific artifacts namely, microscopes of various types and vintages.

Years of similar treks has taught me to travel light. My luggage was contained in a sturdy shoulder bag and one of those roller bags which can be stored in an aircrafts' overhead compartment. In anticipation of finding brass and glass treasures, some people bring along bubble pack and other padding. This is not necessary, since all sorts of discarded packing material is readily available. My concession was a spare tote bag I packed in case I came across a plethora of books and instruments. Fat Chance. My transportation and lodging were via Virgin Atlantic, using one of their holiday packages which are amazingly inexpensive and all-inclusive. I selected a hotel in South Kensington, near the Science and Natural History Museums. My visit to the Science Museum on Saturday gratified my desire to gaze fondly once again, at their fine collection of scientific instruments and to say hello to that silver microscopical monstrosity once owned by King George III.

The main object of the English jaunt was to attend the Science Fair on Sunday, October 25, at the Portman Hotel, London. Having attended the Fair last April, it seemed as if nothing had changed. The same faces in the same places, with a few new ones thrown in. ALLAN and BOBBIE ROBERTS had a table, and most of the dealers held sway in the same locations they occupied since the Battle of Hastings. The merchandise had changed to some degree, although I spotted a number of objects which were offered at the April show. Chatted with ARTHUR MIDDLETON, a well known Covent Garden dealer in scientific instruments and an advocate of discretionary polishing.

Prices, as to be expected, were on the high side. Another inhibitor to sales; many dealers would not accept credit cards, US currency nor travellers checks. My two purchases were from a dealer who accepted US Dollars. My prizes? A pristine Zeiss Jena number four stand and an unusual portable microscope, made in Rathenow, Germany. Every show is bound to have at least one horror story. At this show, a dealer who shall remain nameless, had a bowl of SALTED snacks on his table, as a courtesy to the multitude, but enough to make conservators cringe.

Armed with my 8-day Britrail pass, several towns which in the past, had yielded scientific goodies, were on my itinerary. Unfortunately, due to a glitch in timing, I missed a "really big shew," the antique market in Newark. Arundel, I didn't miss. This is a quaint town featuring a medieval castle, a number of antique shops, and an outdoor antique show every Saturday. A gale-like storm blew in, and since my umbrella was useless in the wind, I got soaked to the bone. The antique show, of course, was cancelled. I should have gone to Portobello Road!

A considerable amount of time was saved by calling ahead to dealers who had instruments available in the past. In York, I visited a shop which yielded a Norremberg Polariscope a few years back. No such luck this time, but I was offered one of those Indian made abominations, listed as a lifeboat compass. Thanks, but no thanks. The British Isles are knee deep in the many antique scientific instruments being pounded out by alleged craftsman in Bombay, or wherever. American purchasers of these fakes can be dou-

Been There - Continued on page 244

Workshop - Continued from page 242

Franz Schmidt, 1905, which allows one to observe both the spectra of the source and that of the specimen. Barry also showed his superb Cuff microscope with case and ALL accessories. This was fully described in the November 1998 issue of the *MSSC Journal*, with many photos.

8. **Fred Hantsch** showed the article "Use of the Camcorder with the Microscope" in the Oct.1998 issue of *Scientific American*. He also described a 3-D 35mm camera which takes three half-frames with prints on lenticular paper. The camera is available from Hammacher-Schlemmer for $90 with processing by the manufacturer only for @ $16.

9. **Bill Hudson** reported that he is working on the cataloging of some 500-600 bottles of chemicals and that **Larry McDavid** is having the uranium glass cut to specs. discussed at an earlier workshop.

10. **John de Haas** showed a Trichinoscope by Meopta (Czech.) c.1950s, with 5X and 10X objectives, used by meat inspectors. This compact microscope is attachable to the top of its case.

11. **Jim Clark** reminded us that the next MSSC general meeting at the Crossroads School would be devoted to members' exhibitions of instruments, apparatus, experiments, demonstrations, books, etc. He offered for sale a current book, *Table Top Machining* which deals with the use of the miniature machine tools made by Sherline Corp. This book can be had from Jim for $30 (a $10 discounted price).

12. **Herb Gold** reported that he has e-mail from **Mr.Dingley** of the Postal Microscopical Society of Australia, with the information that there is available for sale a Queckett dissecting microscope for $1,000.

13. **Gaylord Moss** reported that, during the printing of the October issue of the MSSC Journal, there were some problems at the printer's establishment which, he said, accounts for the reduced image quality. (In fact, long before Gaylord's announcement, several members had commented on the excellent quality of the copy.)

14. **Allen Bishop** commented on the HIGH prices he had seen at the Science Fair in England - giving the example of a Powell & Lealand priced at £18,000! - and saying that very little was being sold. The only item he bought was a Zeiss short mount objective for £60. There he met John Mellon who has a list of microscopes and accessories. Allen's final words were, "It's very expensive to visit England."

15. **Steve Craig** showed some very unusual examples of crystals: A silicon single crystal segment from the semiconductor industry; several very large crystals (Alum, for example) which Steve had prepared for the Moody Institute. These were grown slowly from an aqueous solution under controlled conditions. Steve then showed his vast collection of chemicals in 3" vials, all fitted in a compartmented cardboard case. He encouraged everyone to experiment with crystals for use in microscopy.

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Been There, Done That - Continued from page 243

bly screwed; they might believe the instruments are genuine and not being 100 years or older, the fakes are subject to duty by Customs.

In last month's issue of the MSSC Journal, JOHN deHASS discussed microtomes. By coincidence, a what-not shop in Yorkshire yielded the Leitz hand microtome which he mentioned. The same shop came forth with an unusual item marked: "Ultra-Violet Spectroscope", made by R. & J. Beck, London. I never saw one of this type before. Perhaps some knowledgeable MSSC member can identify it.

The Beck Universal microscope features a loose hanging lever behind the post. The lever acts as a "fine" adjustment. Using a lever to move the course adjustment pinion was rarely done. I found an all-brass (French?) stand, circa 1850, which featured a lever, loosely assembled to the course adjustment pinion shaft. A locking nut on the lever collar secured the lever to the shaft to facilitate fine adjustment.

In my many trips to the UK, I hadn't seen Stonehenge or the Roman baths. The tour package included an all day trip to these attractions. I was impressed, but give me the Grand Canyon and Niagara Falls, any time. I finally got to see "Les Miserables". The staging and acting were superb, but why is it, that my seat, which cost 35 Pounds, never failed to be behind some bloke seven feet tall and built like a bulldozer?

US Customs is absolutely unpredictable. As an upstanding citizen, war veteran and college graduate, I take great pains in filling out my landing card and listing all purchases in detail. So- for the first time in decades, I got the hassle, jet lag and all. The agent searched through my jacket and luggage, asking questions which I assume would apply to aspiring terrorists and drug dealers. He questioned the vintage of every purchase and ended up playing an arpeggio on his calculator. Finally, he waved me through. Big deal.

Where will we be off to next time?

# MSSC Christmas Party

## David L. Hirsch

Let no one deny, that as the years pass, the MSSC Christmas Parties get better and better, where the cameraderie of our members blends favorably with the unsurpassed fare provided by BEVERLY BLACK. The food was superb; tasty hors d'oeuvres, and the main course of turkey, ham, stuffing, cranberries, casseroles and other comestibles, which left us stuffed and happy. I am not a chow hound in the military sense of the word, but I HAD to return to the delicacy laden table for a second helping of that superb baked ham. As is the tradition, members brought the dessert and, as always, those among us who count calories were left with the agonizing decision whether or not to partake in the deliciously wicked offerings. Putting it all together in the ambience of the ERNIE MEADOWS' home, 65 members and their guests enjoyed a most memorable holiday gathering.

As a dude who generated plenty of sawdust and metal chips in my time, I was so emotionally overcome when I saw Ernies' workshop that literally, I had to stand at attention and salute. If a hand or machine tool is lacking from his work area, it is surely because said accoutrement had not yet been invented.

Ernie is one of several MSSC members who is no stranger to blisters, slivers, and the other ecstacies encountered by all avid and ardent cutters of wood and filers of metals. Ernies' handiwork; call them masterpieces, are seen throughout the house. Take for instance, the grandfather clock reposing recumbent on the fireplace mantel. This mahogany beauty rests on a carved hand. The pendulum oscillates in a vertical arc, a phenomenon guaranteed to have Foucault spinning in his grave.

Microscopists, by inclination, affinity, or vocation, never attend any kind of affair without the inevitable instrument in evidence. Be it a wedding, a ritual circumcision, a ship launching or whatever, there will be somewhere in the theater of operations, a microscope. JOHN FIELD brought in a small Leitz 'jug handle' type stand and a MacArthur type microscope. He showed a collection of diatom arrangements by KLAUS KEMP, the preparer of those magnificent slides which are in the collection of several MSSC members.

JIM SOLLIDAY displayed slides, and described a new technique used by Klaus in securing a 'three dimensional' effect. This is done by making several layers of arranged diatoms, separated by cover glasses. If you would like to obtain Klaus Kemp diatom prepared slides, contact Jim Solliday for information at: (714)775-1575, or by email at; jdsolliday@att.net

Jim also announced the auction of the Louise Erb Collection of books relating to microscopy. The auction will be held at the Saturday December 12 Workshop.

STEVE CRAIG showed some 'selected short subjects' via 16mm film, including a cartoon made by an independent producer.

See you-all same time, next year. On behalf of the MSSC membership, I hope you have had a Joyous Holiday and God bless us one and all!

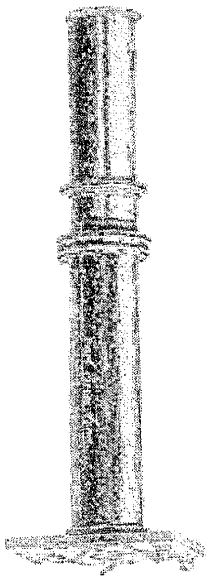
## WANT - SALE - TRADE

Trade Zeiss demo microscope for Pillischer student model, as illustrated on the cover of Gosse's book "Evenings at the Microscope." This model has the small focusing wheel near the objective.

For sale or trade: modern, new condition, Zeiss Planapochromat, oil immersion, 100x, n.a. 1.35, corrected for infinity, anti-reflection coatings and has the smaller diameter threads. Want a pair of 10x wide-field eyepieces.

For Sale: Zeiss 10x planachromat phase (PhV) n.a. 0.2, new condition, corrected for infinity and smaller diameter threads.

contact Roland Mortimer
<roland@domain.com.br>



## E-BAY COMMENT

### David L. Hirsch

A few of us members owning computers discussed our finds obtained via E-bay. If you don't already know (and you should), E-bay is an all encompassing Internet auction activity dealing in myriad goods and services. We microscopical types log in on Antiques (Science Instruments) and a similar sub-category in Collectibles. Microscopes of all vintages and related accessories, along with countless other scientific goodies are to be found in good supply. I dare say that compared to the Science Fair at the Portman Hotel in London, comparable and perhaps better deals can be obtained on E-bay.

# 1998 TITLE INDEX

# 1998 AUTHOR INDEX

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OCTAVO **Continued from page 239.**

The executive editor of Octavo, E.M. Ginger, said such fastidious processing was necessary because, "you get just as much information from the type and the paper and the way it's laid out as you get from the text itself.

Octavo recruits scholars to contribute introductory essays and commentary for each title, and in some cases commissions new translations.

Some scientific titles that are available now are:
Franklin, Benjamin. *Experiments and Observations on Electricity.* London 1751 $25.
Galilei, Galileo. *Sidereus Nuncius.* Venice 1610. $25.
Harvey, William. *Exercitatio Anatomica de Motu Cordis et Sanguinis in Animalibus.* Frankfurt, 1628. $25.
Hooke, Robert. *Micrographia.* London, 1665. $30.

Forthcoming Scientific Titles Include:

Copernicus, Nicolaus. *De Revolutionibus Orbium Coelestium.* Nuremburg, 1543.
Newton, Isaac. *Philosophiae Naturalis Principia Mathematica.* London 1687.
Newton, Isaac. *Opticks.* London, 1704.

Octavo has a descriptive web page at:
http://www.octavo.com.

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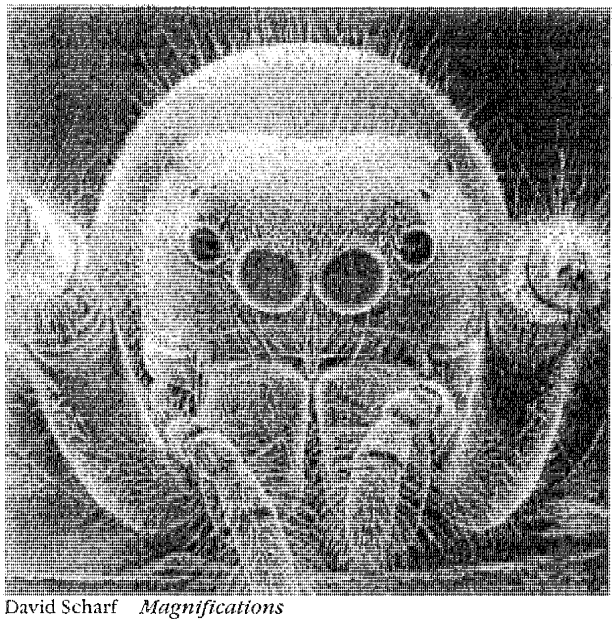

David Scharf *Magnifications*

# January Meeting

## Wednesday, Jan. 20 at 7 PM
## Crossroads School
## 1714 21st Street
## Santa Monica, CA

# Insect Eyes and the Science of Bio - Mimicry

## Don Wolpert

Some of nature's insects provide an insight into how we might solve some of our optical problems. Some insects detect and use polarized light of the day sky for navigation. Others emit pheromones secreted as gasses or liquids, that in the case of the tiver moth, can be detected up to 5 Km away. (Is this the new bomb or drug detector for the future?) The compound eye structure found in more than 3/4 of the species in the animal kingdom permits the optical system of some insects to see above and behind itself and adds the flexibility of variable resolution where it is needed most. The superposition insect eye allows for variable light sensitivity and resolution tradeoffs in real time, a trick we still need to master. Through genetic engineering, we have learned to grow compound eyes. Could this lead to replacement for the visually impaired? The diffractive antireflective surface of the moth eye produces a reflection of 0.15 % over most of the visible spectrum for angles of incidence from normal to fifty degrees.Try this in your coating chamber!

Finally, we will look at structural materials in nature. The abalone shell is being studied because it has the strength of the most advanced synthetic ceramics,;but it is not a brittle.The Bess beetle's cuticle shows a remarkable resemblance to composite materials. Can insects and bugs lead us to the development of new optical structural materials?

Join us for a different view of optics and Bio-Mimicry. As far fetched as it might seem, research is currently being conducted in some of the areas that will be discussed.

ABOUTTHE SPEAKER. Don Wolpert is a senior electro-optical engineer at TRW in Redondo Beach.As a member of the Electro-Optical Systems and Technology department, Don has been engaged in the design and development of electro-optical space payloads. Over the years, Don has studied and researched the Bio-Optics field. He has published articles on the subject,, has given talks to various groups and has been active in bio-technology transfers.The picture you see at left is not our speaker, but one of his subjects.

# Editor's Notes

Do you notice something missing in this issue? Right, no member profile. We can only have profiles if members are willing to write them.

Some people have time to write and I hope more will do so. In the Southern California area, for those of you who are too busy to write, we can do it by interview. I can write the profile from the interview and send it back for review and editing before publication.

It would increase the mutual interest of the group if we could have some more profiles from corresponding members. I encourage any corresponding member who has the time to send me one. For those who do not have time to write a detailed article, just send me a rough draft with information notes and I will do my best to put it together into a chronological whole and send it back for your review.

Everyone enjoys the profiles; lets keep them coming and not miss another month. Thanks.

Gaylord Moss

Annual Southern California
SCIENTIFIC & TECHNICAL
Antique & Collectible Show
L.A. Airport Hilton, Sat. Jan. 31, 1998
*Free 1-5pm; 10-1 Admission $5*
*(Hilton $7parking ticket admits one free)*
Fair organized by The Rational Past
Info: Al or Bobbie Roberts (310)476-6277