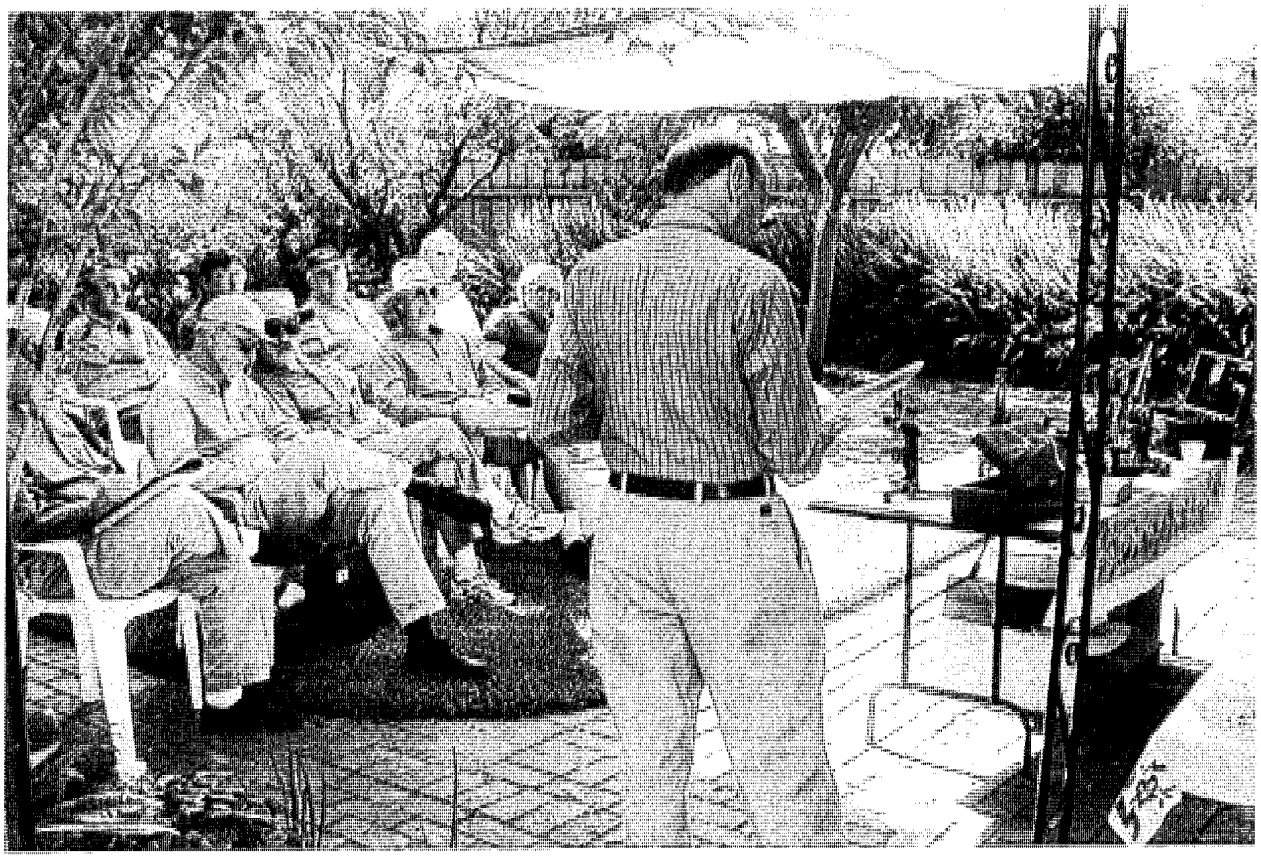
Journal of
THE MICROSCOPICAL SOCIETY OF SOUTHERN CALIFORNIA
Volume 5 Number 9 September 2000

WORKSHOP of the Microscopical Society of Southern California

Featuring Seibert Microscopes

by George G. Vitt, Jr.

Saturday, 3 September 2000
at Ken Gregory's residence



Stuart Warter presenting a brief history of Seibert and Co.

This workshop was held, for the first time, at Ken Gregory's residence. It was a meeting that everyone enjoyed to the fullest and was an unqualified success. Ken is to be congratulated for his planning, effort, and hospitality. Besides the show and tell aspect of the workshop, we had the pleasure of seeing, among other things, Ken's extensive library, microscope collection, and the detailed model of a fully rigged Galleon that he is constructing. Those who did not attend, really 'missed out'!

This workshop's main feature was a display and discussion of Seibert microscopes..

1. Jim Solliday reminded us of the new Workshop calendar: One at Ken's and two at Izzy's. On 28 October 2000 there will be a special workshop at Ken Gregory's residence, on the occasion of the visit of Mike Dingley who heads the Postal Microscopical Club in Australia <michaeld@amsg.austmus.gov.au>. Since Mike is writing a book on the subject of portable (pocket) microscopes, members are urged to bring in such microscopes so that they may be photographed for inclusion in this publication. It should be quite a meeting, especially since Mike is an old friend of the MSSC.

2. Ken Gregory introduced his guest, Ms.Jessie Underwood, who is a professor at Cal State Long Beach, doing interesting research in such things as insect genetics.

3. George Vitt told of his recent successful experience with the installation and use of the ATI 'Rage Orion' video accelerator PCI card, for a PowerPC, which holds 16 MB of video RAM, supports resolutions up to 1600x1200 at millions of colors, and costs $130 before a $30 rebate. A most useful feature is that the ATI software reads the model number and performance characteristics recorded in the firmware of the monitor, and automatically configures itself to that particular monitor.

Seibert: Microscopes by the German firms of Seibert & Krafft and W&H Seibert (all simply marked "SEIBERT") were exhibited by Jim Solliday, Stuart Warter, and Ken Gregory (see photos).

4. Stuart Warter gave a history (which follows) of the Seiberts and their firms, based on information in the Danish book "Mikroskopets Historie" by Harald Moe (which also includes an account of some of the more prominent scientific users of Seibert microscopes), and on other sources.

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MICROSCOPICAL SOCIETY OF SOUTHERN CALIFORNIA

The brothers Wilhelm (1840-1928) and Heinrich (1842-1907) Seibert were apprenticed to Karl Kellner in Wetzlar, and continued to work for that firm until, after the death in 1869 of C.F. Belthle, Kellner's successor, the firm was absorbed by Leitz, and the brothers left Wetzlar. They worked in a number of other cities until 1871, when, with the financial backing of Georg Krafft, they bought the business of Ernst Gundlach in Charlottenburg (a suburb of Berlin), as Gundlach left to emigrate to the United States. The brothers, with their firm of Seibert & Krafft, returned to Wetzlar in 1872, apparently maintaining business in both places until at least 1877, as by 1878 they no longer maintained a Berlin address. The firm expanded rapidly, establishing a presence in Vienna in 1873, London in 1876, and Paris in 1900. In addition, they had returned to Berlin in 1896.

Throughout this period, they produced microscopes with the parallelogram fine focus arrangement designed by Gundlach, and used on his instruments before he left Germany. By the turn of the Century, they had adopted the form of instrument produced by Zeiss. Some time between 1884 and 1891 Krafft's name was dropped, and the firm became known as W&H Seibert. They were bought out by Ernst Leitz in 1917, although the firm name continued to be used for a number of years thereafter.

Microscope development on the continent had lagged behind that in England, since the continental microscopes were limited by being developed from the relatively primitive 1811 drum microscope design of Joseph Fraunhofer. While a few European researchers, during the middle and latter Nineteenth Century, used domestic microscopes (e.g. Pasteur a Nachet, and Karl Naegli one by Oberhaeuser), many preferred the larger and more versatile English instruments. A surprising number, however, are known to have used microscopes by the Seiberts: Robert (=Heinrich Hermann Robert) Koch, known for his work with anthrax, tuberculosis, and cholera microorganisms, worked with Seibert (and Hartnack) microscopes and photographed the tuberculosis bacilli with a horizontal photomicrographic apparatus built by Seibert & Krafft to the design of the German physiologist Gustav Fritsch; Austrian cytologist Walther Flemming in his pioneering studies on cell division; Hans Christian Gram, developer of the Gram stain; Carl Albert Blume, who made major advances in the understanding of tuberculosis; Ernst Schmiegelow, a medical professor in King Frederick's Hospital; and the Nobel Prize winning physiologist, August Krogh.

The microscope exhibited by Stuart Warter is identical to the one used by Gram in 1882, which is preserved in a museum, and a photograph of which is shown in Moe's book. It is somewhat smaller than the largest instrument shown, is similarly accessorized with interchangeable sliding substages and dual mirrors, but has only a single coarse focus wheel. The microscope used by August Krogh is the largest one illustrated in the book and is similar to the largest one shown by Jim Solliday, but with a typical continental horseshoe foot rather than the English style claw foot of Jim's example (see photo). The microscope shown by Ken Gregory (see photo) is also similar, but has a simpler substage arrangement. The instrument used by Ernst Schmiegelow is the smallest model, also with the horseshoe foot, the illustrated example of which dates from 1878. No example of this model was exhibited on the table.

5. Jim Solliday gave further historical details (which follow) of the firm of Seibert (1872-1925).

In 1871, under the pressure of the Franco-Prussian War, Mr. E. Gundlach sold his microscope making business to Seibert & Krafft, and moved to America in 1872 (Warner, Rittenhouse, Vol.10/1). Gundlach was best known for his optical work (objectives). By 1883 the firm was still known as Seibert & Krafft, of Wetzlar Germany. In 1884, Wilhelm and Heinrich Seibert (W&H Seibert) continued business without the name of Krafft. From that time on the firm became known as W&H Seibert of Wetzlar. The firm was in business as W&H Seibert from 1884 to ca. 1925. By 1900, W&H Seibert added an office in Berlin at, 52 Luisenstrasse, Berlin N.W. (FI/290). The letterhead had the location as W&H. Seibert, Wetzlar/Berlin, Germany. Wilhelm and Heinrich stated that they had sold 10,000 stands by 1900, in which year W&H Seibert added offices at 52 Luisenstrasse, Berlin N.W. (FI/290). The firm continued until at least 1925-26.

A sampling of European makers c. 1890, German: W.H. Seibert, Wetzlar., Engelbert & Hensoldt, Wetzlar., Leitz, Wetzlar., Schiek, Berlin., Schmidt & Haensch, Berlin., Winkel, Gottingen., Zeiss, Jena (Moe/1 98).

Seibert's Large Stand No. 1: Jim then described his Seibert 'Large Stand No.1', c.1887: signed: W. & H. Seibert, Wetzlar. Serial No.5449, Stand 1, (Stativ I, Grosses Mikroskop). This is the Large Microscope with graduated circular, rotatable and centering stage, an all brass first class Continental microscope with "C" pillar and reversed micrometer fine adjustment. It stands on a large wye shaped foot with the pillar arranged off to one side or in a "C" configuration (see photo). The most notable feature is the heavy parallelogram mechanical fine focus movement whose adjustment is at the base of a cylindrical limb and acts on the stout parallel arm movement. Coarse adjustment is by the usual rack & pinion.

The Stage and Substage: The circular stage is graduated into 360 degrees, with two centering screws conveniently located on the backside of the stage plate. The underside of the stage is fitted with a dovetailed

slide which holds the substage condensing apparatus, of which two types are supplied. The first has an adjustable lever, which slides a simple cylinder up and down along the optic axis. This cylinder accepts four different stops (caps). A mirror with an articulated stem is attached to the under side of the stage with a turned screw holding it in place. This mirror can be rotated from below to above the stage for epi illumination. The second condensing apparatus is an optical Abbe system with a swing-out diaphragm holder which can be moved on a rack to oblique positions (for oblique illumination) and accepts a variety of Waterhouse stops. The whole apparatus is slid into position under the stage on dovetails and retains its own mirror in a fixed position at the bottom of the plate. With this second condenser in place the user can have two mirrors attached to the stage.

Accessories: Included with the stand are 9 objectives and 4 oculars. Objectives are stored in a small-leatherette hinged box. Oculars include a No.I, two No.II's and a No.III with micrometer slot. Finally, there are two micrometer ocular slides, which fit into the No.III eyepiece.

A leather slide box contains a fine C. Zeiss "Objectnetznmikrometer", which is inscribed with a system of measuring lines and used as a haemocytometer. The microscope is very heavy and remains in perfect condition. The bodytube is five inches long high and has a drawtube and a four-place nosepiece. The instrument is stored in a beautiful polished mahogany case with precisely made fittings for the accessories. The case has a hinged lid with large locking and a keyed lock.

Another Seibert (see photo): Also exhibited was a superb W&H Seibert Continental stand, s/n 10952. This is an all brass Continental referred to as Stand No.3 (Stativ 3), a mid-range microscope. It is supported on a heavy rectangular pillar having a clutch assisted cradle joint. The fine adjustment is mounted at the top of the limb with coarse movement by rack & pinion. The triple nosepiece holds three signed Seibert objectives. Also, found in the case, with its original brass can, is a 1/12th inch immersion objective with correction collar. All three dry objectives are stored in a leather-bound fitted box with a hinged lid. The mahogany case features a working lock and brass handle. The overall condition is very good.

6. Ken showed an Olympus 35mm photomicrographic camera recently obtained on ebay. The compact unit has a photomicrographic eyepiece and a sliding beamsplitter which directs the light either to the eye, the camera or to an attachable exposure meter. There is provision to make the film plane and the observed image parfocal, and the shutter is floating to reduce vibration. The unit is in excellent condition.

7. Alan de Haas showed a superb, mint, very rare, very high precision, beautifully cased measuring instrument made by Societe Genevoise de Physique and used by watch/clock makers for precise dimensional and angular measurements of any and all parts of a watch mechanism including the gears (see photo). This instrument was something to behold and catalyzed some lively discussions. The microscope body tube is equipped with any one of three supplied objectives, and can be tilted from a vertical to a horizontal position, as the measurement situation demands. The entire head, mounted on dovetails, is moved in x-y with precision vernier calibrated micrometer screws. A crosshair reticle is centerable to the optic axis by lockable, opposing pairs of screws in the x-y planes, in exactly the same manner as found in the earlier theodolites and other surveying instruments. The rotating stage is vernier calibrated for angle measurements, and there is a substage pinhole attachment which enables the instrument to be used as a high precision profilometer, the illumination being provided via a gimbaled substage mirror. Alan showed a 1895-1910 SIP catalog in which similar, though simpler, instruments are illustrated.

8. Ms. Jessie Underwood, Ken's guest and evolutionary biologist at Cal. State Long Beach, CA, told about her work on butterflies, which involves the quantification of chromosomes. Later, she will investigate the hybridization of fish. She currently is using a Nikon E-800 mic. with a CCD camera by Optonics which is computerized to perform image analysis. She hopes to do fluorescence work in the near future. There followed an animated discussion which included the effects of the color temperature of ambient light on the sex of offspring.

9. Herb Gold showed a small optical haemometer (see photo) by Zeiss Ikon for the measurement of sugar content in blood. It functions on the visual comparison of the sample color against a calibrated adjustable standard, as seen in a split-field. The sample is contained in a square cross-section glass cuvette, inserted in the optical path. After a manual adjustment for visual equality of the two adjacent fields, the sugar content is read from a magnified, calibrated internal circular scale.

10. John De Haas reported that he has a good quantity of foraminifera from Catalina Island which, to his delight, are as clear as glass! He is in the process of making microslides of these samples.

11. John Fedel introduced us to a new interest of his: model rocketry! He showed a 6-ft high streamlined and finned rocket that he had built from a kit which, with a 54mm solid fuel cartridge, can ascend to 1500-ft and descend on a deployable 48" diameter parachute.

He described the telemetering and remote-control possibilities and the simulation software used for design and prediction of performance of rockets. All launches are done in safe inaccessible areas and the activity is closely controlled for safety reasons. Turning now to microscopy, he noted that his use of the didymium filter solved the problem of the undesirable green cast exhibited in some of his photomicrographs.

12. Gaylord Moss gave high praise to Richard Jefts' flatbed scanner, the Epson Mod. 1200U, with its transparency unit. He said that it was very fast in operation, gives 1200x2400 resolution, and can scan transparencies up to 4x5". He also noted that, in his experience, the scanner software provided with this model is superior to that supplied by other companies. Richard Jefts showed several excellent 8x10" computer prints of photomicrographs of diatoms that he had done recently. Gaylord reported that he had given the Mattel/Intel computerized microscope to Al Herman who wished to experiment with it.

13. Jack Levi showed some books by Alfred Russell Wallace, author of books on natural selection, and described the life of this early investigator of the natural sciences who preceded Darwin in his theory of evolution. Working in the Malay Archipelago, he had described his theories in letters to Darwin, which triggered the latter to pursue a similar course. Being a great distance from England, and not having the support, as Darwin had, of the entrenched 'old-boys academicians' such as Huxley, Wallace had been preempted by Darwin and never received his just recognition. Jack noted his book on Australasia ; "Social Environment and Moral Progress"; and a small volume of his lectures which he gave to blue-collar people to enlighten them on matters scientific.

14. Bill Davies showed an excellent Italian reproduction, c. 1970, of a Cuff microscope (see photo).

15. Pete Teti told of the classic Charles Eames movie being shown at the L.A. Science Museum which concerns itself with the many orders of magnitude of dimensions, from portraying the universe and going down to the dimension of the DNA molecule.

After the workshop, a group of ten went to the Long Beach Coco's for lunch and more conversation.

Foreward from the Dover paperback edition of Sir Isaac Newton's *OPTICKS*

Fortunate Newton, happy childhood of science! He who has time and tranquillity can by reading this book live again the wonderful events which the great Newton experienced in his young days. Nature to him was an open book, whose letters he could read without effort. The conceptions which he used to reduce the material of experience to order seemed to flow spontaneously from experience itself, from the beautiful experiments which he ranged in order like playthings and describes with an affectionate wealth of detail. In one person he combined the experimenter, the theorist, the mechanic and not least, the artist in exposition. He stands before us strong, certain, and alone: his joy in creation and his minute precision are evident in every word and in every figure.

Reflexion, refraction, the formation of images by lenses, the mode of operation of the eye, the spectral decomposition and the recomposition of the different kinds of light, the invention of the reflecting telescope, the first foundations of colour theory, the elementary theory of the rainbow pass by us in procession and finally come his observations of the colours of thin filmjs as the origin of the next great theoretical advance, which had to await, over a hundred years, the coming of Thomas Young.

Newton's age has long since been passed through the sieve of oblivion, the doubtful striving and suffering of his generation has vanished from our ken; the works of some few great thinkers and artists have remained, to delight and ennoble us and those who come after us. Newton's discoveries have passed into the stock of accepted knowledge: this new edition of his work on optics is nevertheless to be welcomed with warmest thanks, because it alone can afford us the enjoyment of a look at the personal activity of this unique man.

ALBERT EINSTEIN

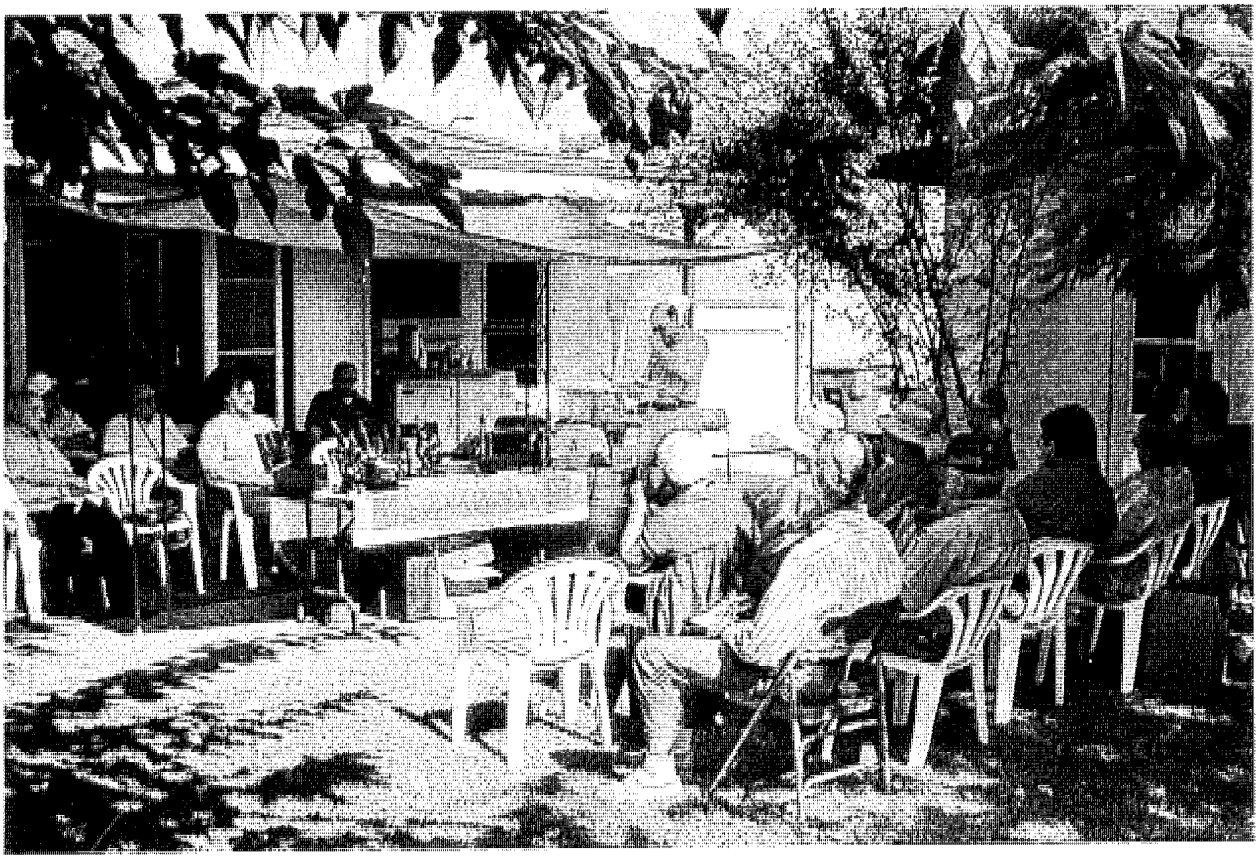
This very readable edition of *OPTICKS* is enhanced by an excellent preface by Sir Edmond Whittaker and a preface by I. Bernard Cohen in which letters and other information add and put into context the remarkable powers of experiment, analysis and intuition that were present in Sir Isaac Newton.

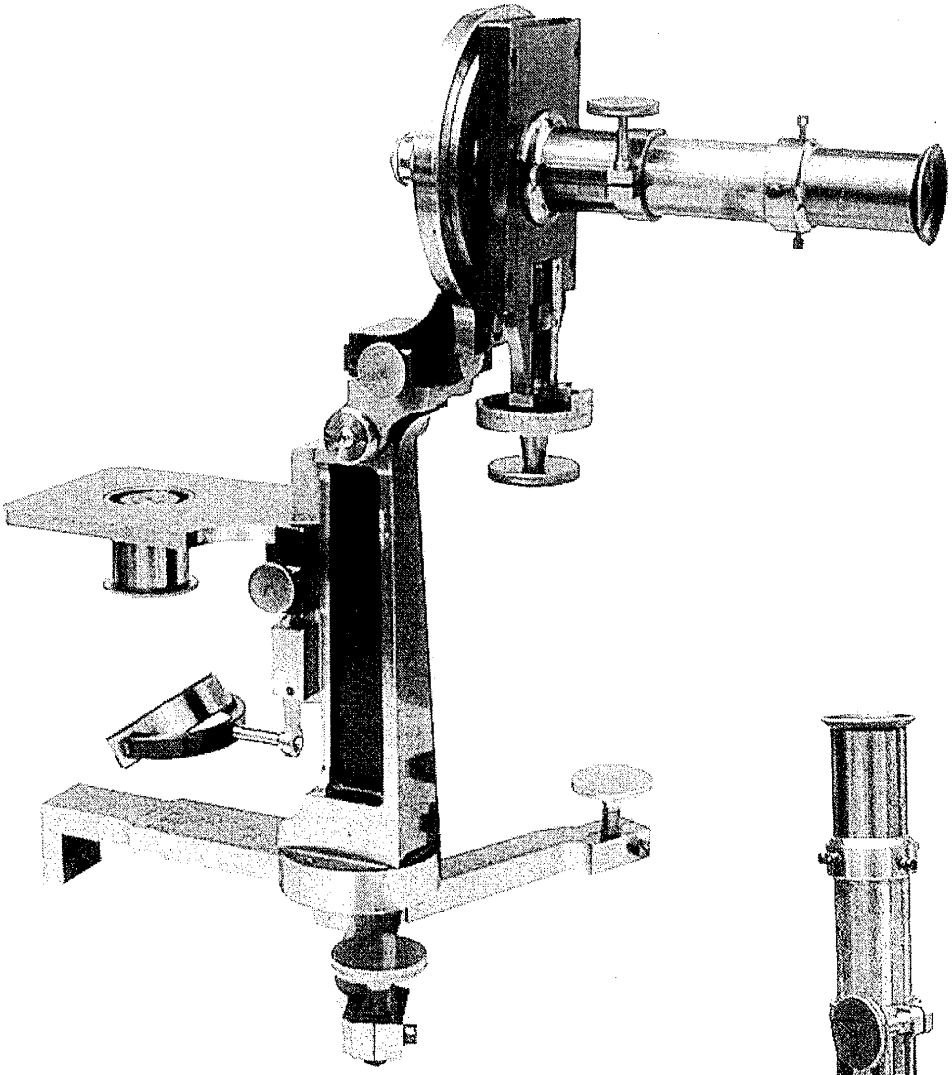
Now, going on 300 years after it was written, *OPTICKS* continues to be a delightful way to enjoy a creative mind as well as a lesson on experiment and observation.

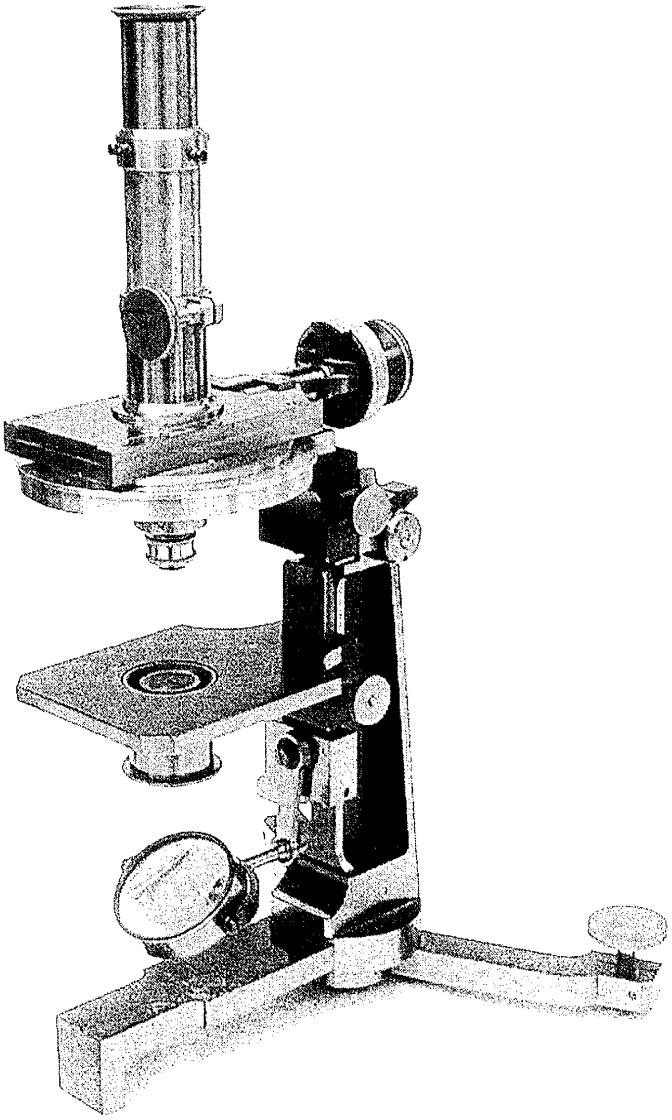
Ed.

This Dover edition, first published in 1952, is an unabridged and unaltered republication of the work originally published by G. Bell and Sons, Ltd., in 1931.
Library of Congress Catalog Card Number: 52-12165.

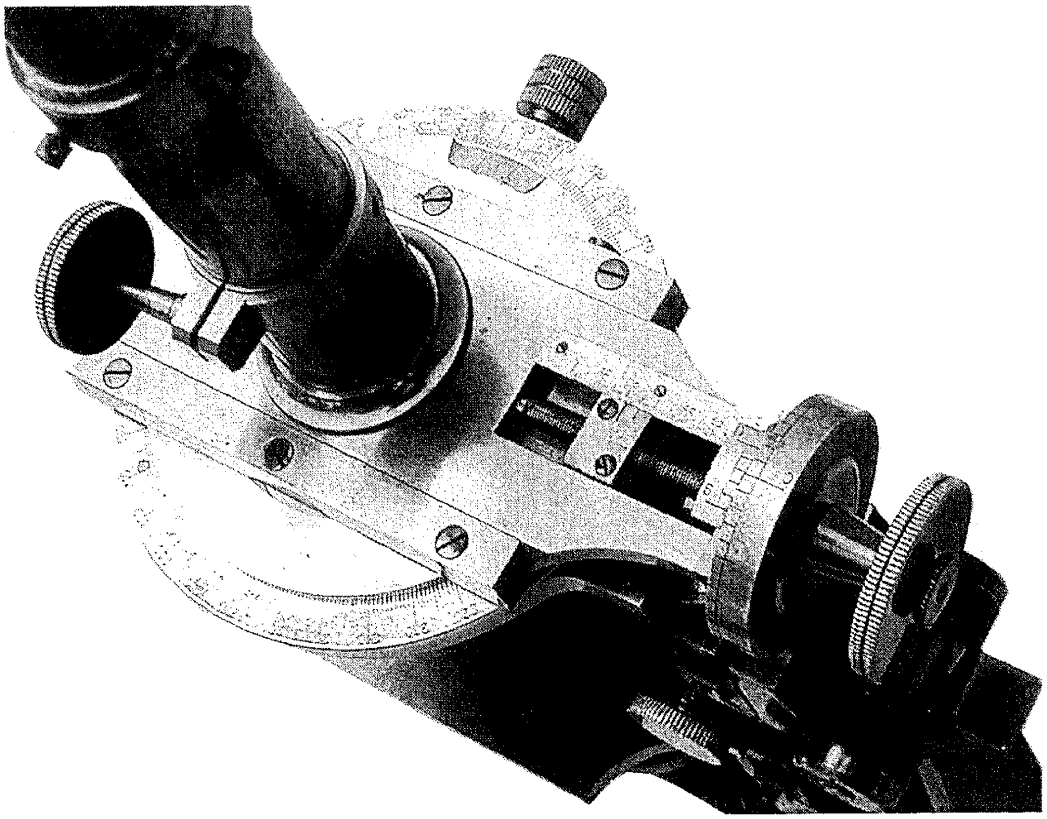
Views of the September Workshop at Ken Gregory's.







Alan de Haas showed a superb, mint, very rare, very high precision, beautifully cased measuring instrument made by Societe Genevoise de Physique and used by watch/clock makers for precise dimensional and angular measurements of any and all parts of a watch mechanism including the gears



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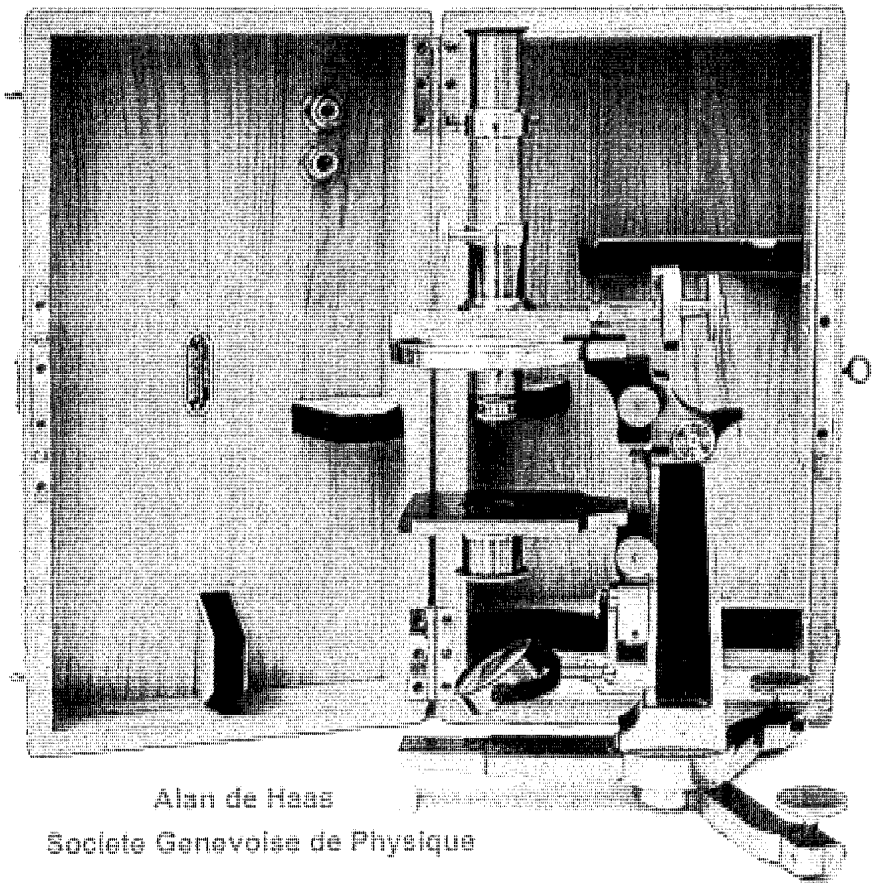
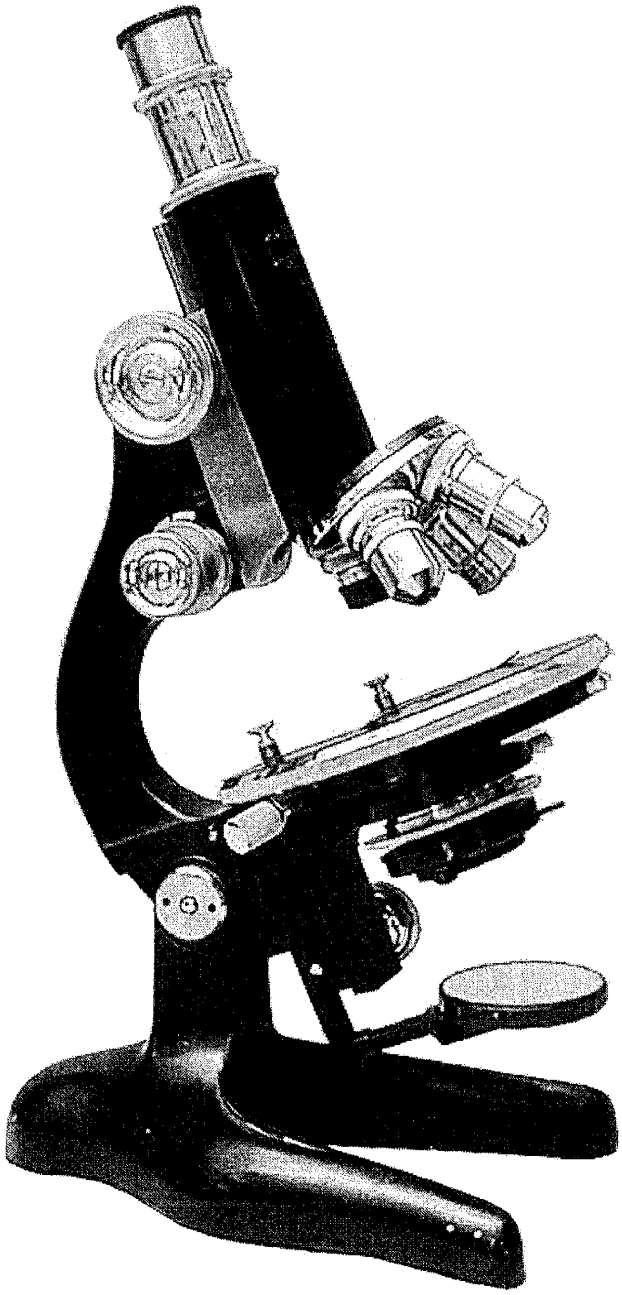
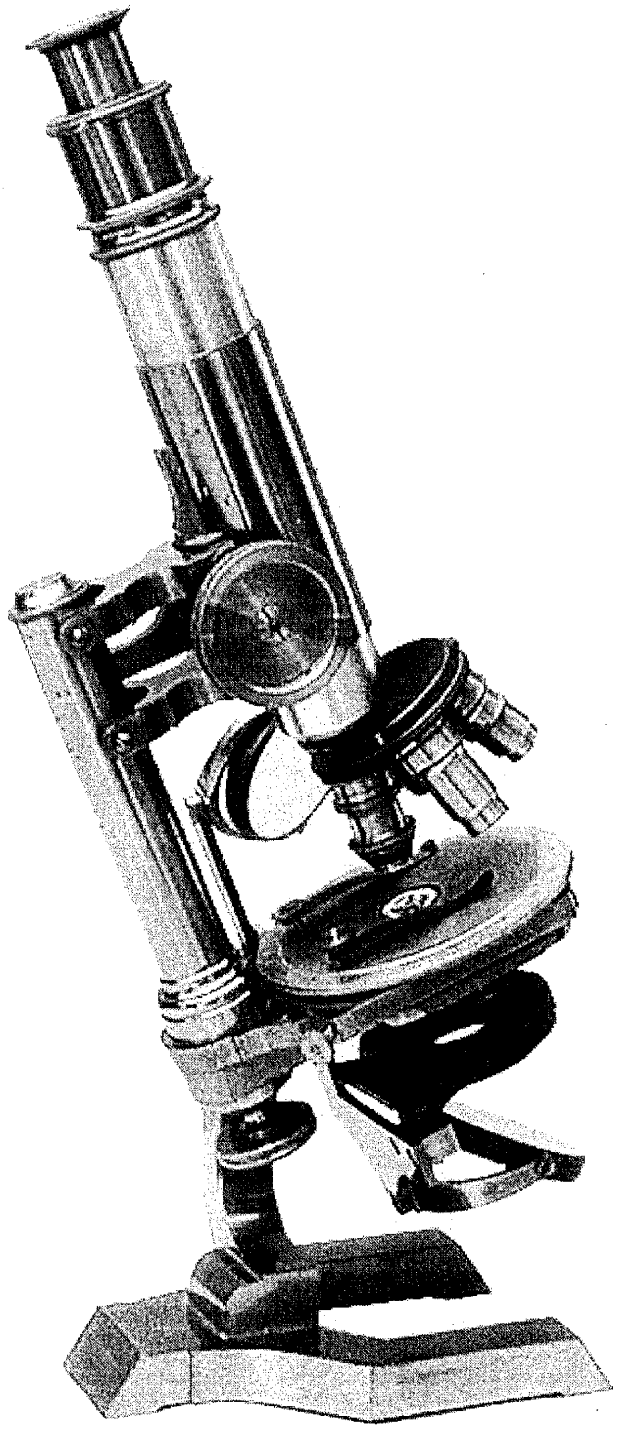
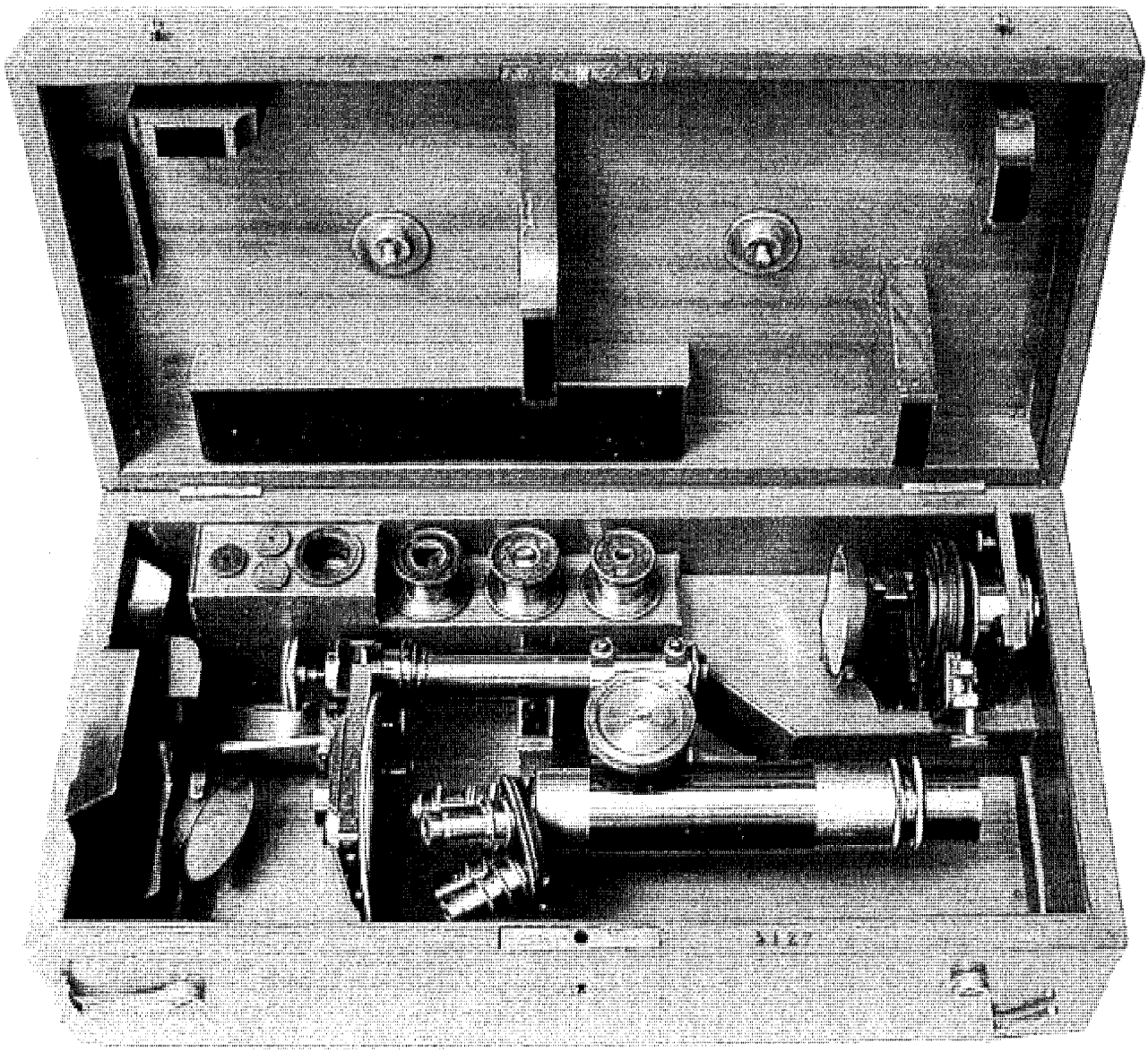




This stand is owned by Jim Solliday and is one of the last microscopes made by the firm of W & H Seibert, ca 1926.

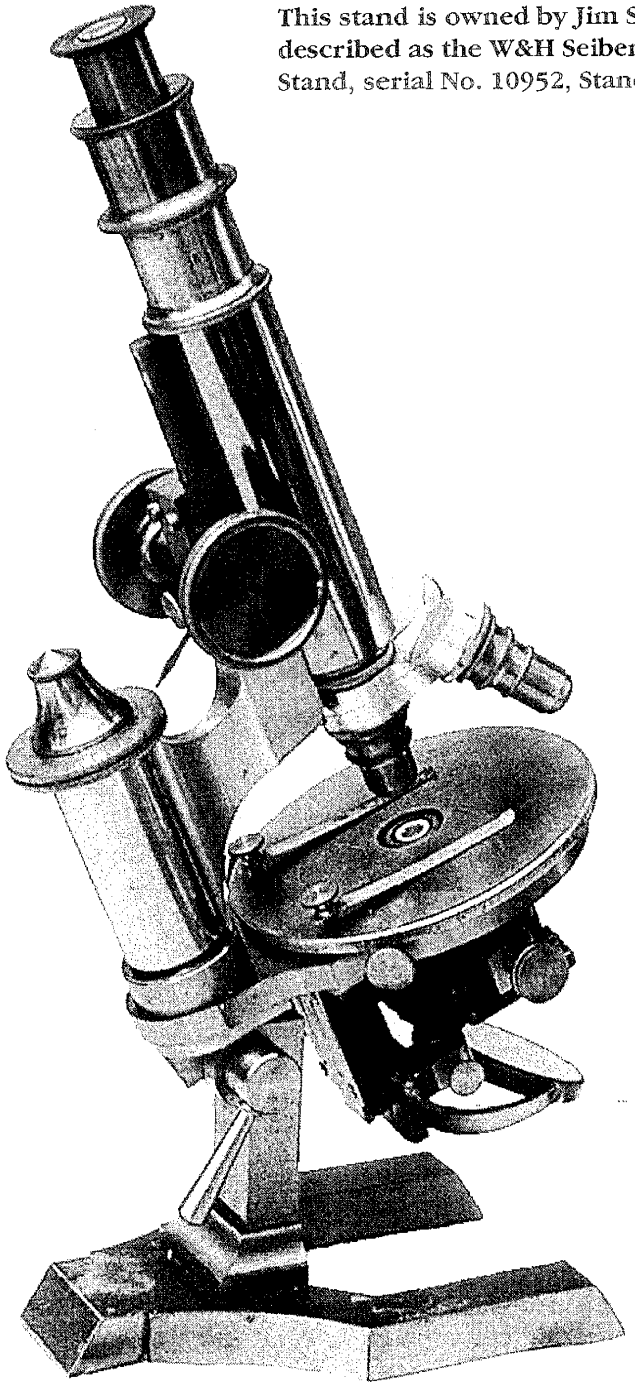


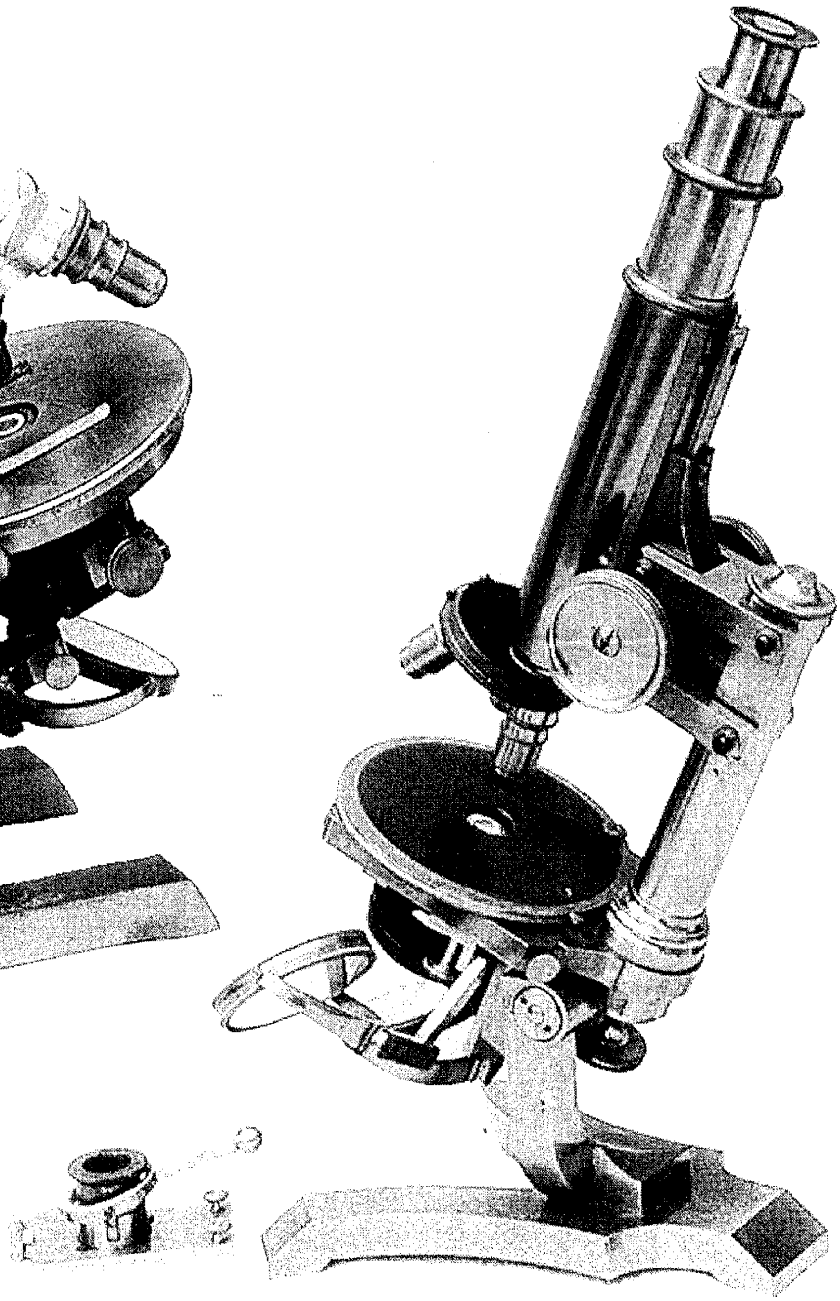
This stand was owned by Stuart Warter and is identical to the one used by Gram in 1882.



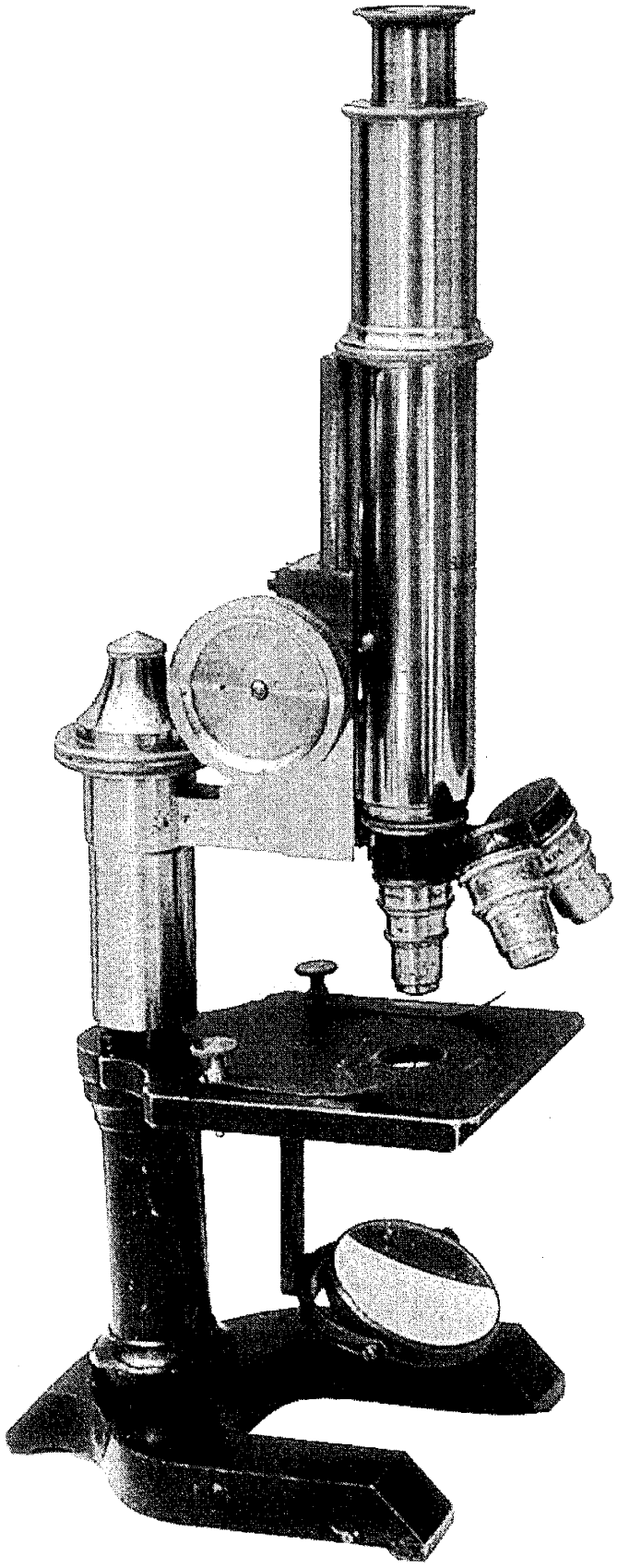
This Siebert stand owned by Stuart Warter is identical to the one shown previously but is shown in its case.

This stand is owned by Jim Solliday and is described as the W&H Seibert Continental Stand, serial No. 10952, Stand No. 3.

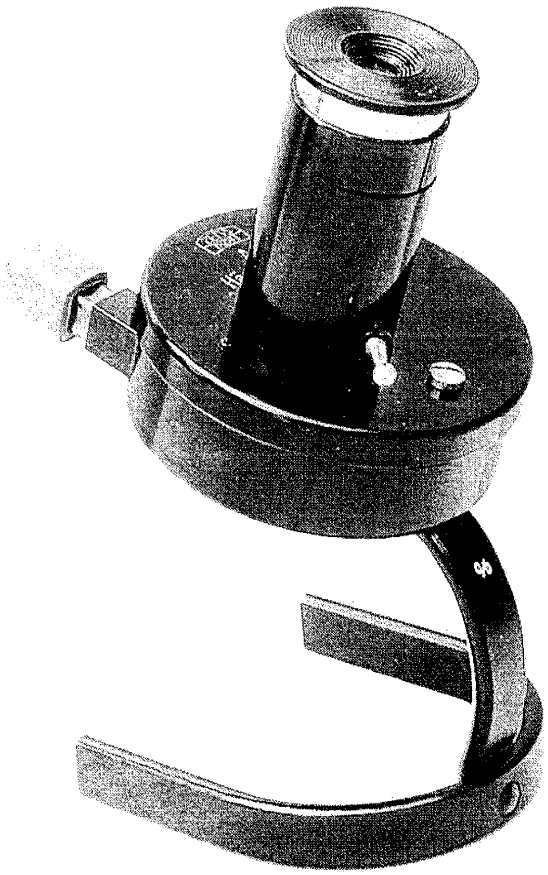




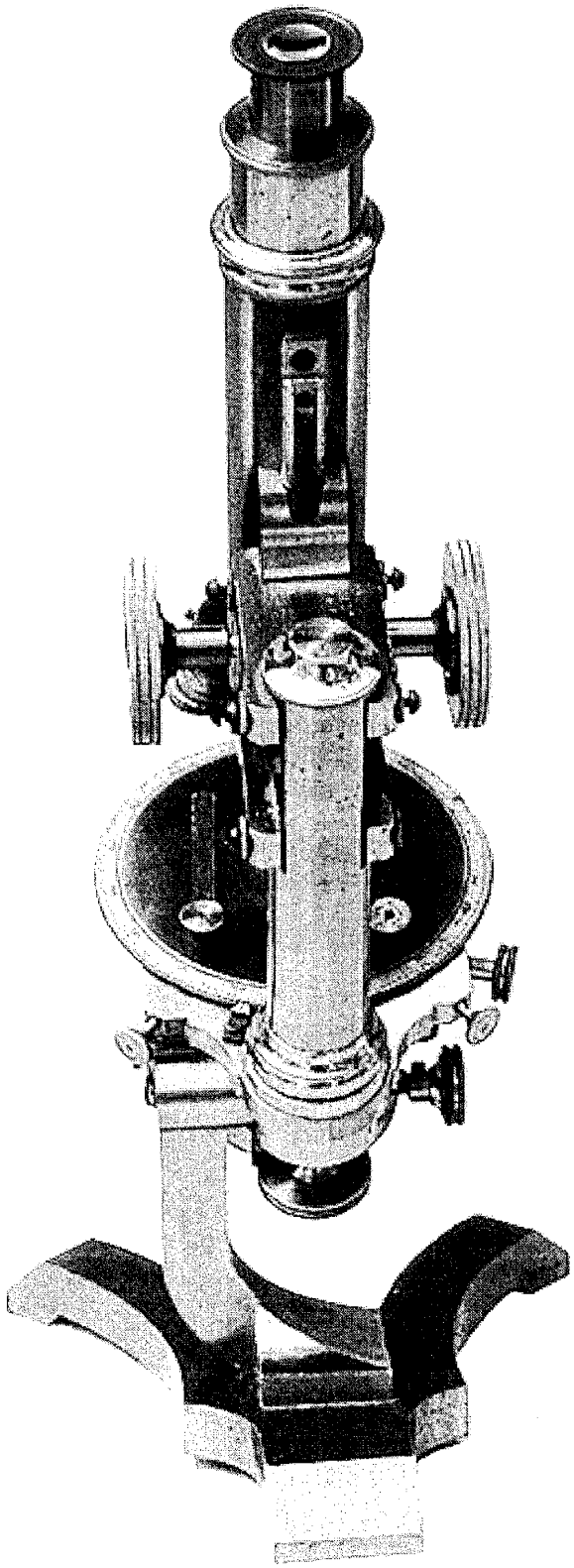
This stand is owned by Jim Solliday and is described as the Seibert's Large Stand No. 1, ca. 1887, Serial No. 5449, best model.



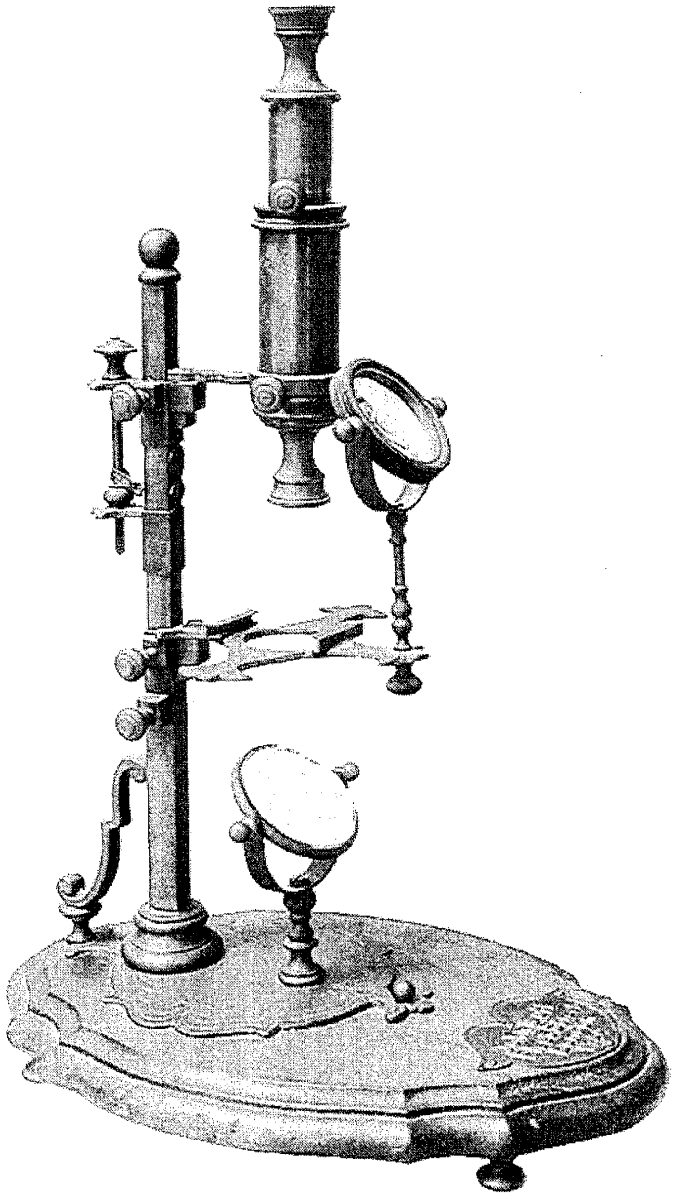
This stand is owned by Jim Solliday and represents Seibert Stand No. 6 from the late 1890's. It does not have an inclination joint.



Herb Gold's small optical haemometer



This stand is owned by Ken Gregory and is one of Seibert's First Class Stands. It has a substage which is a bit smaller than on the one that Jim exhibited, but is otherwise much the same.



Bill Davies' excellent Italian reproduction, c. 1970, of a Cuff microscope.

The Meeting of 18 August, 2000

Hands-On Arrangement of Micro-Objects by Ed Jones

reported by David L. Hirsch

The meeting room was knee deep in microscopes of all makes and models, from a vintage Bausch & Lomb dissecting microscope to a setup with closed circuit TV. 24 eager members and some guests spent a very pleasant and rewarding evening creating unique slides under the watchful eye of ED JONES. Ed is a long-time MSSC member; an experienced microscopist by both vocation and avocation. Ed is a criminalist with the Ventura County Sheriff's Department. In the past, he has given a number of presentations to our Society concerning the use of the microscope to identify various substances to aid in the resolution of many kinds of crimes.

Over the years, Ed has developed a unique form of slidemaking. As our good friend, KLAUS KEMP works with diatoms and butterfly scales to create delicate geometrical patterns, Ed utilizes materials such as seeds, shells, microcircuitry, gunpowder particles and other small items to create script and a variety of graphical objects.

During the evening, Ed showed us all how to make such arrangements providing the materials for everyone to do so.

The material kits that Ed had put together were remarkable and represented great effort.They each contained packets of various tiny objects such as: seeds, iron spheres, microcircuits, gunpowder, colored glass beads, shells and shiny metallic flakes. Each packet had the materials sorted and organized so that each kind of seed or type of gunpowder could be identified. All the members realized that the assembly of the 35 kits of all these materials was an enormous task that Ed undertook to make the project even more exciting tas each tiny object was interesting in itself. Each kit also had a comprehensive sheet which covered "Microstuff Identification Keys" and "Instructions For Micromanipulation"

Now, on with the show!

Ed had brought a video camera equipped microscope so that he could demonstrate micromanipulation on the screen.

All the participants had brought stereo microscopes for the job. A stereo binocular microscope of about 60 power is preferred, allowing a three dimensional visualization of the subject.

Ed had stressed the need for really sharp and correctly aligned tweezers and he showed how to align and sharpen them on a stone.

Before making an arrangement, the first step is to pick out and sort the materials that will be used.The sticky part of Post-it notes is ideal for storing sorted material ready for use in the design.

A simple way to hold the arrangement that is quite permanent is to attach it to double backed tape (the kind that is peeled to leave a thin transparent layer on a surface with one side stuck to the glass slide and the other open on top to receive the arranged micro parts.

There was a great flurry of activity as members worked on their own microslides spelling the letters MSSC on a glass slide with their own choice of objects.

When each slide was complete Ed showed it to the room at large on the video monitor.

There was an amazing variety with all sorts of aesthetic ideas with some very beautiful arrangements.

We all owe Ed Jones a debt of gratitude for a very enjoyable and entertaining evening with the acquisition of new skills beside.

The Microprojector

David L. Hirsch

Microscopic images can be presented in a number of ways including:
1. Direct observation through a microscope or magnifier.
2. Via a closed circuit where the image appears on a TV monitor.
3. Projection on a screen surface, etc.

Each of the forementioned methods has both advantages and limitations. In this discourse, presentation of am image by microprojection will be discussed. Historically, the projection of an image was effected by means of the camera lucida (light chamber), and the camera obscura (dark chamber). The camera lucida is defined as: "an instrument that by means of a prism or mirrors and often a microscope causes a virtual image of an object, as seen in a plane mirror, for example, to appear as if projected upon a plane surface so the object can be traced"

The camera obscura is defined as: "a darkened enclosure having an aperture usually provided with a lens, or a hole of small diameter, such as a pinhole, through which light from external objects enters to form an image of the objects on the opposite surface". The image so formed will be both inverted and reversed".

There are two types of images; real and virtual. The real image can be projected onto a suface. The virtual image is an image (as seen in a plane mirror) formed of virtual foci.

PROJECTORS AND MICROPROJECTORS. Light passing sequentially through a condensing lens, a transparency such as a photographic or prepared microscope slide and a magnifying lens system will project a real image on a surface in its path.

Accordingly, the microprojector is an electro-optical device utilizing a projecting lens assembly (or a compound microscope array) for projecting on a screen, an enlarged image of a microscopic object. As the distance from the lens increases, the size of the magnified image also increases. If the level of illumination at the source remains constant, the brightness of the image, in turn, decreases. Under such a condition, projected images can best be seen in a space where the ambient light is minimized.

There are various types of microprojectors available today. Some of the older types include:

1. Bioscope Model No. 60A.

2. Ken-A-Vision Model Tech "A".

3. B&L Triple Purpose.

4. B&L Model AA. Arc lighted.

The Bioscope microprojector will be discussed in this article. Subsequent articles will discuss and critigue the other instruments listed above.

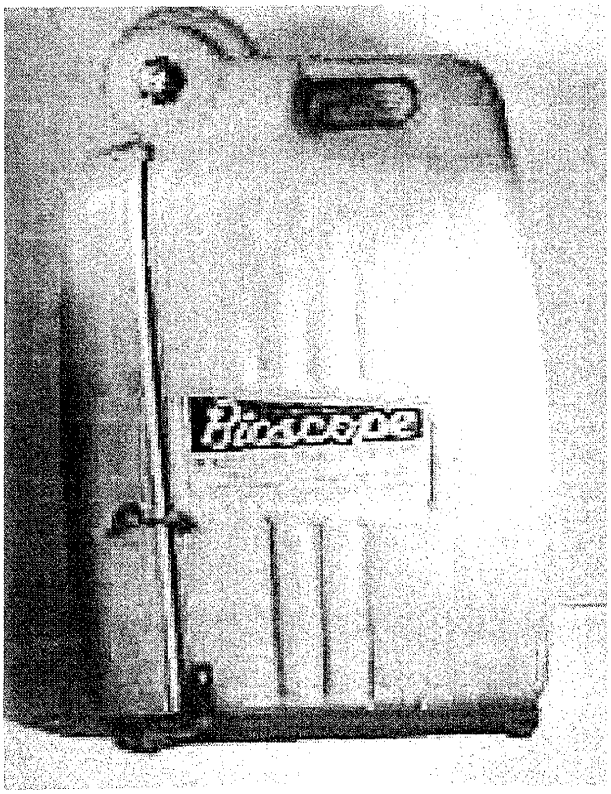


Fig. 1 The Bioscope Model No. 60A Microprojector

THE ENCLOSURE. This self-contained, portable instrument was made on the 1950's by the Bioscope Manufacturing Company of Tulsa, Oklahoma. This microprojector is characterized by rapid setup, portability, storage capability, and a projected image of high quality. It was produced in several models. The case is 7" wide x 10.5" deep x 16" high, with a wrinkled surface texture. It is made of gray molded ABS, a tough and durable thermoplastic material. The door edge is reinforced with aluminum trim, held to the case by means of a hook closure.

THE MAIN OPTICAL ASSEMBLY. Figs. 2 and 3. The illumination and optical systems comprise the main optical assembly. This assembly is integral with the mounting arm, and is designed to be stored in the case. The arm assembly swings upward on a friction joint and is retained in a vertical operating position.

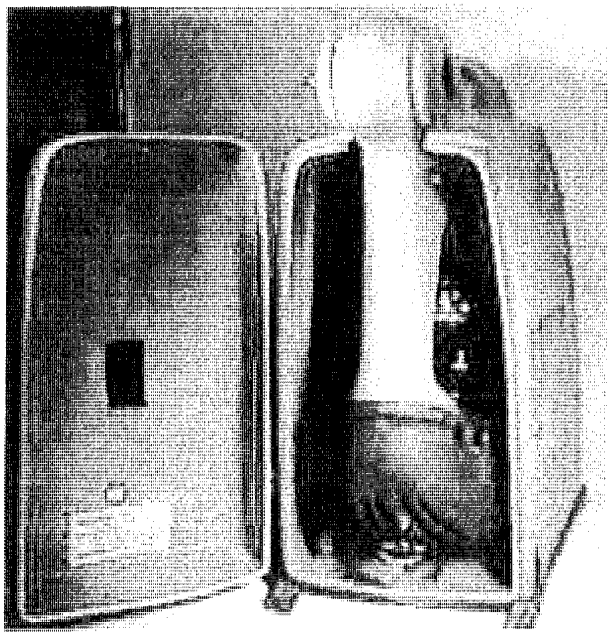


Fig. 2

ELECTRICAL SYSTEM. The transformer, Fig. 4, is rated at: 110 VAC, 60 Hz, 100VA. The voltage is stepped down to 20 volts secondary, which powers the lamp. An on-off toggle switch is located on the upper right hand side of the case.

ILLUMINATION SYSTEM. Illumination is supplied by a GE 5a/G16.5/3 incandescent lamp. The lamp housing, Fig. 3a, consists of an upper and lower aluminum casting with a black crinkled surface finish. The upper housing is secured to the lower portion with a knurled, black bakelite knob. The design of the housing provides for convection cooling of the lamp. There is a plano-convex condensing lens in the housing below the lamp. A swivel mount, Fig. 5a, assembled to the

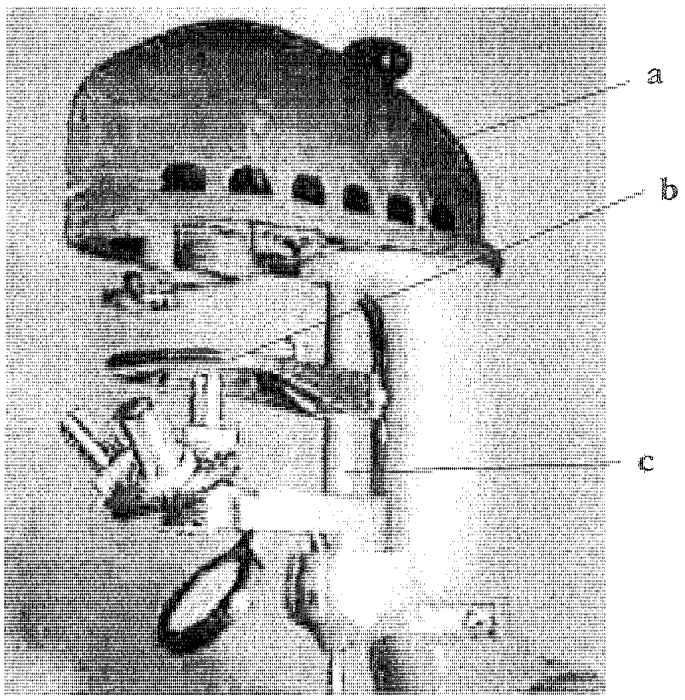


Fig. 3

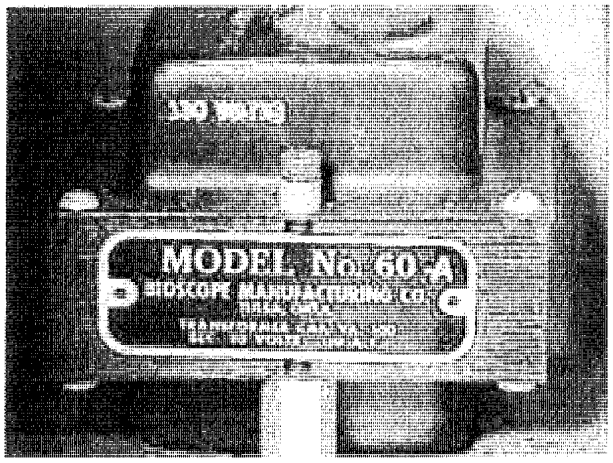


Fig. 4

bottom of the lower housing casting, contains both a neutral filter and a Polaroid element serving as the analyzer, either of which may be positioned in the optical path by rotating the mount.

STAGE MOUNT. Figs 3b and 5b. The stage is 3" outside diameter with a 1.5" diameter opening, and is equipped with a pair of stage clips. The inboard end of the arm clamps to a 0.5" diameter vertical rod, Fig. 3c. The stage can be pre-set in a vertical or radial orientation and secured to the rod by means of a clamping nut.

OPTICAL SYSTEM. Figs. 3,5,6,7 and 8. A triple objec-

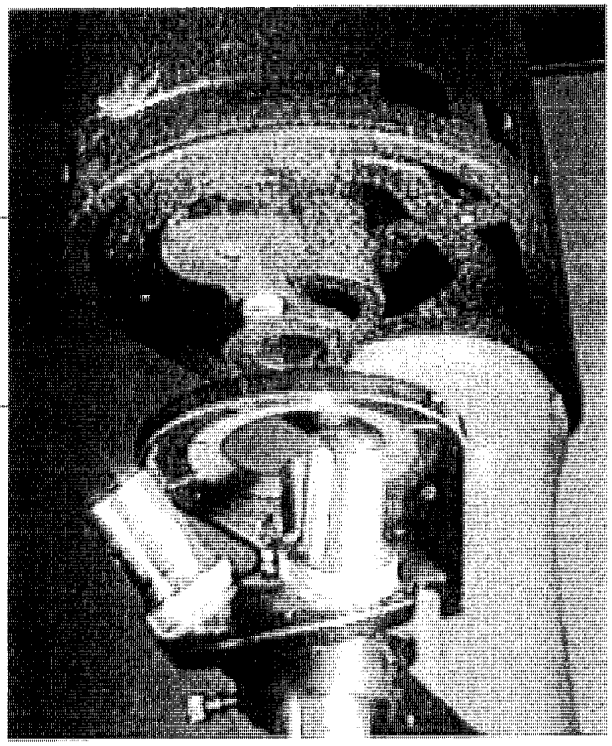


Fig. 5

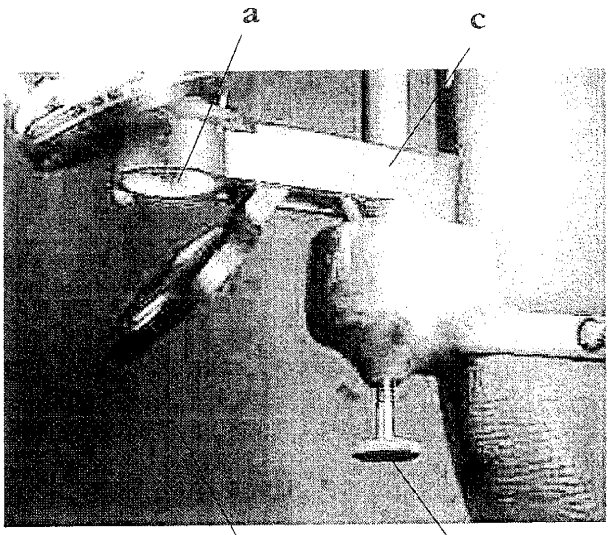


Fig. 6

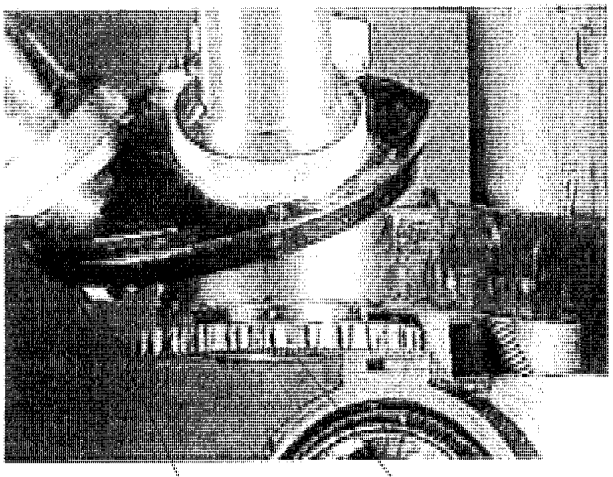


Fig. 7

tive nosepiece is adapted to project the magnified image to the screen surface.The three objectives used are: 10mm, 0.25 n.a; 20mm, 0.40 n.a. and 65mm, 0.38 n.a. The nosepiece assembly is attached to an arm which mounts beneath the stage arm. Beneath the objective arm, at the nosepiece section, is a counterbored hole, Fig. 6a, which is sized to retain either a focussing tube, Fig.8a, or a polarizer module, Fig.7a.A knurled head screw , Fig. 7b, retains either the focussing tube or the polarizer holder.

Beneath the objective holding arm is a plane mirror, Fig. 6b, mounted on a hinge.The mirror swings into position for projecting the image onto a vertical screen. The inboard end of the arm, Fig. 6c, fits over a vertical rod which, in turn, is secured to an aluminum bracket mount at the lower end.A vertically actuated, knurled head focussing wheel, Fig. 6d, raises or lowers the arm holding the objectives.A coil spring secures the latter arm to the bracket mount and serves to keep the objective arm assembly firmly seated by eliminating backlash.

In the operating position, the overall height of the projector is 26.5".The distance from the stage top is approximately 21.4".

OPERATION.The operation of the Bioscope is straightforward.After opening the case door, rotate the arm assembly to the topmost position. Actuate the light switch. Rotate objective mount to place desired objective in the optical path. Rotate the filter holder into one of three positions: clear of optical path; with either the filter or the polarizing element aligned with the optical path.

The opening, fig. 6a, beneath the stage may be left as is; fitted with the long lens assembly for increased magnification; or fitted with the polarizer holder.

Place a prepared slide, or a slide holding a loose specimen atop the stage and align the object with the optical path.The stage clips may be used for retaining the slide. Adjust the focussing wheel until a clear image appears. Manually move slide on the stage to show area of interest.The projected image of a bee's knee is shown in Fig. 9.

The polarization feature is used for observing specimens such as organic or inorganic materials which have been deposited in crystalline form on glass slides. Rotate the swivel mount, Fig 5a, to place the polaroid disc (the analyzer) into the optical path.Assemble the

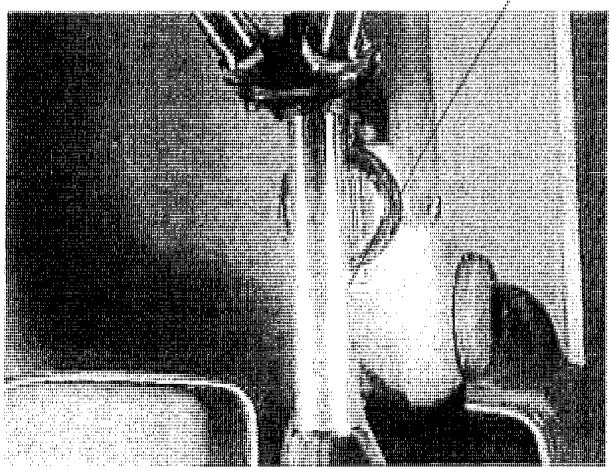


Fig. 8

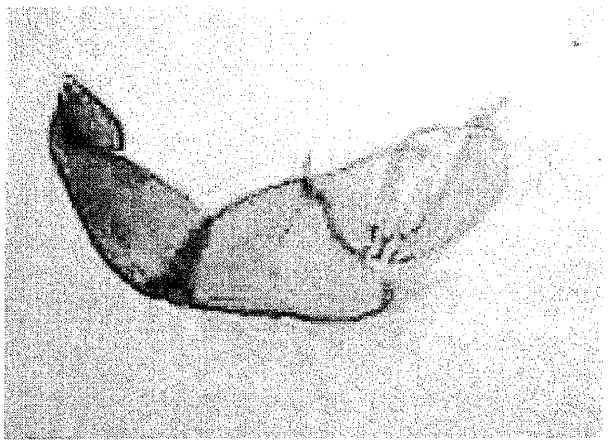


Fig. 9

polarizer module, Fig. 7a, into the counterbored hole and lightly secure with the knurled head screw. With the lamp on and the specimen in focus, slowly rotate the module to vary the configuration and coloration of the polarized light which is being projected on the screen.

PROJECTION SURFACES. To achieve an optimum image, two factors apply:

1. The image should be viewed in a space having subdued ambient light.

2. The surface upon which the image is projected should not have a degrading effect on the image. A lenticular surface, such as that of a high quality movie screen would serve to increase the brightness of the projected image.

SOME AFTERTHOUGHTS. The Bioscope projector in its various models, was used extensively in educational institutions as a group teaching aid. Having achieved obsolescence, these instruments have been replaced by state-of-the-art systems such as closed circuit TV used in conjunction with light microscopes. Microprojectors such as the Bioscope may be found in the marketplace, usually at nominal prices.

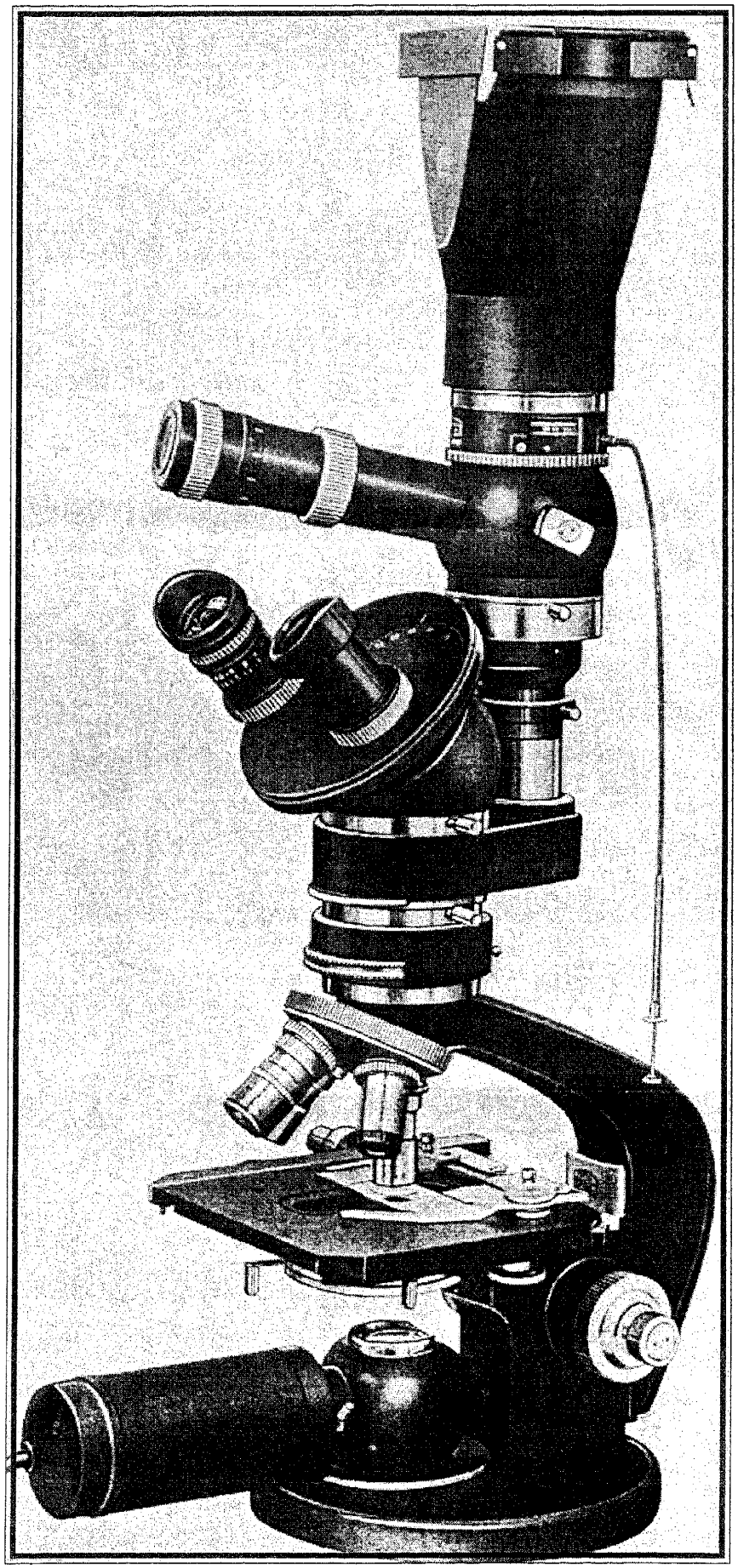
The first Post World War II Zeiss Binocular Microscope, the W Stand.

The camera system is the main feature. It was designed by Dr. Kurt Michel.

The illuminator was of the attachable type. Focusing of the condensor was accomplished by a helical mount and not by rack & pinion.

The mechanical stage was mounted on a block fixed to the circular base. Focusing of the objectives depended upon the limb being raised or lowered by a co-axial coarse and fine control knob.

Thanks to member Herbert Layfield, Whittier California.



MSSC October Meeting

Wednesday, October 18 at 7 PM.
Crossroads School, 1714 21st Street
Santa Monica, CA.

The Microscope and the Computer

James D. Solliday

The program for the October 18th, meeting will be a seminar on the emerging relationship between the microscope and the computer. For some time now, a very interesting phenomenon has been taking place; it has to do with the blending of old technology with new.

Microscopes are, for the most part, imaging tools and have been around for centuries.The computer on the other hand is quite new and in the short time it has been around, it has been used to enhance almost all of man's many tools.The microscope is no exception and when it comes to imaging, in particular, the computer has created a myriad of new microscope technologies.

On Wednesday night, the viewer will be given the chance to get better acquainted with this new technology and how it can be used to facilitate his or her field of microscopy.This program is intended to benefit the average member of the Society and not to exhibit the extremely unique and esoteric new application of the computer. The idea is to introduce the members to technology that is readily available and to encourage their imagination, and eventually their participation. Most of the technologies we have become so dependent upon for so many years are now undergoing dramatic changes.

Another intention of this program is to bring the members up-to-speed on some of these changes. This will include digital cameras vs. film cameras, video projection vs. film projection. Also discussed will be scanning technologies, image processing, presentation technique and software. Use and demonstration of computer programs such as PhotoShop and PowerPoint will be exhibited. Don't miss the fun, bring your curiosity and questions and be ready to see a computerized slide show featuring beautiful images taken through the microscope.

Special Event

Portable and Traveling Microscopes with a slide presentation by Mike Dingley, president of the Australian Postal Microscopical Society

Saturday, October 28 at Ken Gregory's residence.

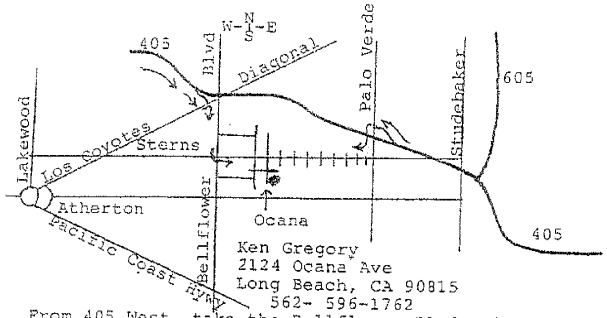
Our corresponding member from Australia, Mike Dingley, president of the Australian Postal Microscopical Society will be visiting us for a few days at the end of October to meet members and to collect photographs for a book he is preparing on portable and traveling microscopes.

He will be on his way home after presenting a slide show to the Queckett Club in England and has consented to give us the same show at Ken's that morning.

Also, at this special workshop on the 28th, lets bring our portable microscopes to show and discuss with Mike and to help him with research and photographs for his book.

Mike has also been asked by friends in Australia to video tape some of our meeting so they can see some of us and get a feeling for our meetings.

It promises to be a most interesting morning with lunch at a nearby restaurant afterward. Don't miss it.



From 405 West, take the Bellflower Blvd Exit which ends on the Diagonal. Jog left,then Right onto Bellflower Blvd. Go to Sterns, turn Left, thru the Mall, turn Rt. on Ocana (2nd street). From 405 E or 605, exit at Palo Verde, Lt. on Palo Verde, then Rt. on Sterns, then left on Ocana Ave.

Saturday , November 4 November Workshop at the Lieberman's