



MicroNews

San Francisco Microscopical Society

Volume 1:1

September, 2000

President's Message . . .

Welcome to the premier issue of *MicroNews*, a publication that the SFMS will attempt to produce three or four times a year with the hope that membership interest will be high enough that we can publish more frequently as time goes on.

As recently discussed, we have found it unreasonable to expect any one person to provide the program for every one of our meetings and we must enlist the help of the membership in that area. So, too, must we enlist the help of as many members as possible in providing suitable articles if we are to continue this publication.

The object is to share with all of our members – as well as other microscopical societies who will also receive *MicroNews* – useful information of any and all kinds relating to microscopy.

Information of all kinds will be welcome, be it at the level of the rank beginner or that of the most experienced professional microscopist.

We hope this will prove to be useful.

Robert D. Griffin, President

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A (very) Brief History of the San Francisco Microscopical Society

In San Francisco on June 4, 1870, a meeting was held by several interested people in an effort to form a scientific society devoted to microscopy. Nothing happened until about a year later when, on March 14, 1871, the London microscope manufacturer Joseph Beck visited SF and at the Cosmopolitan Hotel he exhibited a new microscope. Beck's new microscope was the catalyst needed and, finally, on April 5, 1872, a group of 30 people met at 649 Clay St. in San Francisco. This founding group of the San Francisco Microscopical Society agreed on a proposal that required the original members to pay an initial \$10.00 fee, then \$2.50 per month "to purchase a binocular microscope and accessories." These 30 members elected the following slate of officers:

President C. Mason Kinne

Vice President – Mr. Mouser

Recording Secretary - E.J. Wicker

Corresponding Secretary - Charles W. Banks

Treasurer - Arthur M. Hickox

The Society's rooms, as they were called in Society publications were designed for meetings and to allow a place for members to use the Society's microscopes, extensive library, and extensive slide collection. Meetings usually featured formal papers presented by Society members. Space prohibits a complete listing of the titles, but a few examples of the earliest papers are:

Kustel, Guido, "Eflorescence of Silver." December 6, 1872

Stour, A. B., "Hygiene - Water Tanks on Top of Houses." December 4, 1873

Edwards, Henry, "Sugar-Cane Weevil." 1874

C. Mason Kinne "How a Fly Walks." 1875

These meetings were either covered by members of the press or, on other occasions, manuscripts of papers presented were provided to the press. These were published in the daily newspapers of the time, principally the *Alta California*. Clippings of these articles were maintained by the secretary and filed with the society's records.

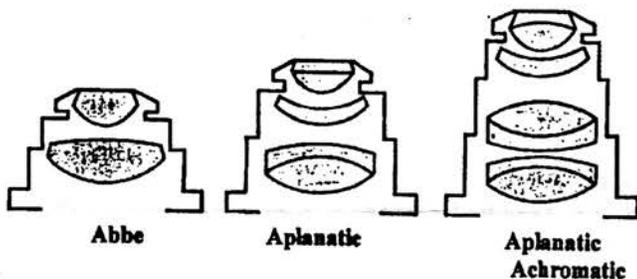
The incorporation of the Society, although coming at a time of great wealth in California associated with gold, silver, and the coming of the railroad to California (Leland Stanford - one of the railroad tycoons was an Life Member of the Society), coincided with a severe economic depression in the State, that lasted will into the 1880s. During these years, the Society's fortunes

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The Condenser . . .

Webster's New World Dictionary defines "condenser" as a lens or series of lenses for concentrating light rays on an object or area. In terms of transmitted light microscopy this means a light collecting device part of the microscope substage assembly.

Old or very inexpensive microscopes have an adjustable plane/concave mirror below the stage as light collecting component. The first improvement was the addition of condensing lenses. It was not until the late 1800's that Ernst Abbe designed the first real condenser. It is still the most basic condenser today, mostly supplied with student microscopes. It consists of 2 lens elements with an adjustable iris diaphragm. It can be used with immersion oil, achieving numerical apertures up to 1.25 (resolution to ~ 0.8 micron). It does not correct for chromatic and spherical aberrations. Structures within images usually display some colored fringes. Overall the illumination is quite satisfactory.



An important improvement over the Abbe condenser was the aplanatic condenser. By adding a third lens it was possible to correct spherical aberrations. When used with immersion oil, numerical apertures of 1.4 (resolution to ~ 0.18 micron) are possible.

There was also an achromatic condenser correcting for chromatic aberrations. It is rarely in use today. However, the combination of the two latter types, the achromatic Aplanatic condenser gives the best results and is furnished today with practically all research microscopes. When oiled, maximum apertures of 1.4 are possible, and when used dry NA's close to 1.0 may be reached. There are different designs. Some include swing out top elements to allow for full illumination of the field at objective magnifications of 10x or less. The Aplanatic, achromatic and aplanatic achromatic condensers come equipped with adjustable iris diaphragms and sometimes with a slot for filters.

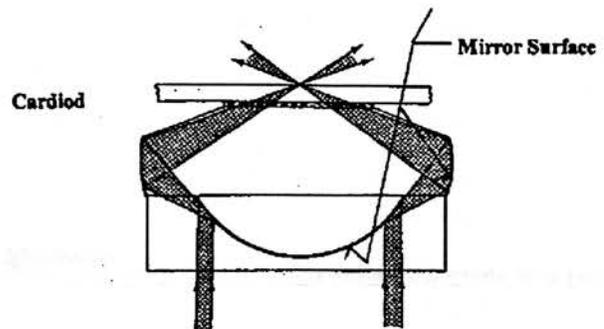
The condenser is mounted on a focusable substage assembly. With better quality and research

microscopes, the condenser can also be centered. (More on this and the subject of illumination (Critical, Koehler, etc.) in a future newsletter.)

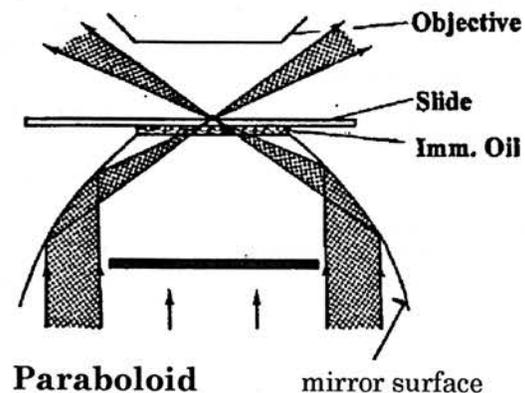
In reflected or incident light microscopes, the objective acts as its own condenser. (More on this also in a future newsletter.)

Darkfield Condensers

A unique condenser is the Darkfield condenser. It is installed in place of a brightfield condenser. It works as follows: the light from the center of the condenser is blocked and only the part at the periphery in the form of a hollow cone of light is transmitted toward the specimen and bypassing the objective. Only the light diffracted by the structures of the object enters the objective. The image displays a black background



with the structures lit up. There are two types: The paraboloid and the cardioid design. Usually there are two special versions: an oil immersion type for high magnification and a dry one for low power. Darkfield helps to image subjects of low contrast such as diatoms.



... by Helmut Will

Fall Workshop on

Lichens

There will be a fall workshop on lichen identification, structure, and hand cutting of thin sections, on 16 Sept, 2000. The location will be Hensil Hall Room 301, on the San Francisco State University Campus, 19th Ave. and Potrero. The room has a number of good modern compound microscopes available as well as several stereo binocular scopes. Persons wishing to use their own instruments for whatever reason are free to do so.

This is a rescheduling of the workshop that was scheduled for May, 2000, but had to be postponed due to the unavailability of the room key.

The workshop will be presented by Mikki McGee, of the California Lichen Society and San Francisco Microscopical Society. It will emphasize the structure of lichens and the making of simple but very usable and beautiful preparations without elaborate equipment and procedures. Chemistry and supplies will be provided. There will be some lichen material and keys available for people wishing to practice identifying lichens.



Cladonia "chlorotica"

Brief History . . .

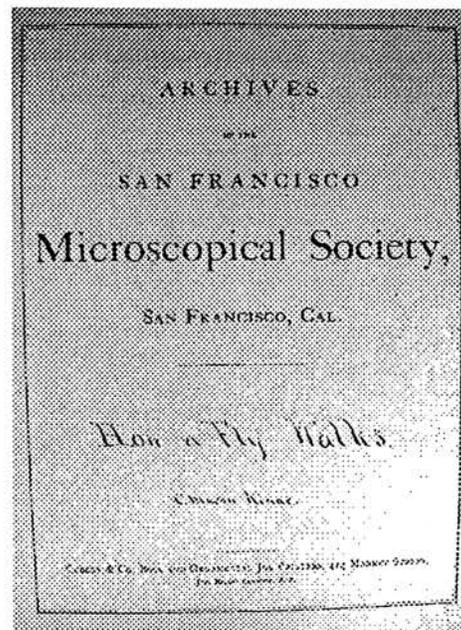
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waned as "those who patronized the Society...found they could make other uses of their funds."

As the depression ended and membership and activity of the Society increased in the late 1880s and 1890s, regular schedules of meetings were published. In addition to the regular meetings, exhibitions were sponsored by the Society on an annual basis. These exhibitions provided an opportunity for the general public to look at microscopical subjects and specimens prepared and presented by members of the society and, in some instances, visiting scientists. In the 1870s and 1880 these exhibitions were very well attended affairs, held in various public meeting halls both in San Francisco, for example at Irving Hall on then and now very fashionable Post St., as well as in locations in San Francisco's much more civilized neighbors to the East: Oakland and Berkeley.

The Minute book for the society shows, as its last entry, the date of December 6, 1905. Four months later, on April 6, 1906, the SFMS became a memory as the Earthquake and fire destroyed most of the city. Happily, the records and even some of the equipment was rescued from the general devastation of the City. Exactly how the records and at least some of the equipment survived is not known.

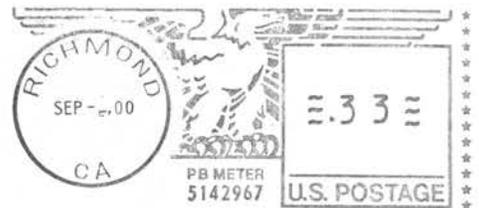
by Peter Barnett



Cover sheet for a manuscript from the Bancroft Library (UC). The text of this paper, presented to the SFMS on September 9, 1875, will be in the next issue of *MicroNews*.



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