MicroNews

San Francisco Microscopical Society Volume 4, #1 January 2009

Come and Enjoy our Meeting on January 13, 2009

SAND

Sand is the product of erosion. The hardest rocks eventually deteriorate as water flows over them and that portion that does not dissolve becomes granules that we see as sand. Since waves erode the objects of a beach, some hard shelled organisms are eventually reduced to granules that, under the microscope show fossil structures. HS

Please send to: HSchott@aol.com short accounts of what you have observed through your microscope.

SO YOU'R BUYING A STEREOMICROSCOPE?

Here is what you need to know! By Michelle Caisse

Typically, a stereomicroscope is a modular system, consisting of a pod, which contains the objective optics, two eyepieces, a focus arm, which holds the pod and contains a rack and pinion focus mechanism, a stand, to which the focus arm attaches. The total magnification of the microscope is a product of the eyepiece's magnification and the objective's magnification. When speaking of the magnification of the scope, usually people give the magnification of the pod, such as 0.7x-3x, which would be 7x-30x if used with 10x eyepieces.

Most of the quality stereo microscopes available today for the hobbyist were manufactured in the 1970's. Good newer scopes start at several times the cost of these and don't provide a greater benefit for our purposes. However, a knowledgeable friend is quite happy with her 20x fixed power scope from Edmund Scientifics (http://scientificsonline.com/category.asp_Q_pc_E_421190_A_c_E_421258)

Magnification changing: Can be fixed (e.g. constant 2x), changeable in steps (e.g. 0.6x, 1.0x, 1.6x, 2.5x), or zoom (continuous change over a range).

Magnification range: The magnification range for zoom stereo microscopes varies from about 1x-2.5x to 0.7x-4.2x (with newer scopes sometimes about 6x). Having a wider range can be useful for some subjects.

Eyepieces: Most commonly 10x, also 15x and 20x. Watch for matched name brand (e.g. Olympus eyepieces on an Olympus scope) versus no-brand replacement eyepieces. If you wear glasses, you will need high-eyepoint eyepieces that allow you to focus when your eyes are a bit farther from the eyepieces.

Stand: Stands come in two basic styles: boom stand, used mainly in industry, and biological type. Boom stands

INSIDE

SAGE ADVICE FOR PRESENTERS AND PRESIDENTS

"REMEMBERED LESSONS"

1. Avoid boring people

"Never make dull speeches that easily could be delivered by someone else. … Not boring others, of course, requires that you take pains not to become boring, as often happens when you begin to bore yourself. A leader's mind must continually be reconfigured through exposure to new patterns of acting and thinking. Reading the same papers and magazines as everyone else around you is not likely to make you an interesting dinner guest, let alone alter your consciousness. In my case, a subscription to the *Times Literary Supplement*, courtesy of my father-in-law, made me more interesting to sit beside than someone whose diet was limited to *Time*, *Newsweek*, or the *Economist*—or *Nature* for that matter."

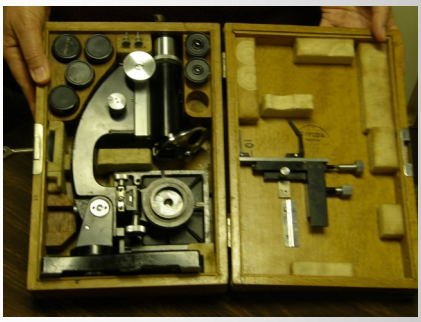
I, for one, would have loved to sit next to him in a discussion. HS

Avoid Boring People by James D. Watson, (2007) Author of *The Double Helix*.

JANUARY 13 MEETING

The Randall Museum will host our January meeting starting at 7:30. There will be several demonstrations of microscopic observations or techniques that will interest old and young members. You can participate by bringing your interesting slides or other demonstration material.

The annual election of officers will take up a short part of the evening. Refreshments will help to make this a celebrations of the New Year.



Tiyoda Folding or Field Microscope

We had a interesting experience at the last Society meeting of seeing the illustrated microscope being set up after it arrived in a neat little case carried by the new owner, Michelle Caisse. She recently purchased it on the internet and while it shows ware it is serviceable. Two features are noticeable, the folding stage and footing or base. We will miss Michelle who is moving to Arizona.

SFMOMA exhibit: Brought to Light:

Photography and the Invisible, 1840-1900

Ends Sunday, January 04, 2009

Modern science and photography flowered simultaneously in the early 19th century, and photography was adopted as a scientific tool from the first years of its invention. Over the course of the century, scientists made pictures using the microscope and the telescope, capturing previously hidden realms both infinitesimally small and unimaginably large. They used photography to analyze motion, to see into faraway galaxies, and to look inside the human body.

Brought to Light includes examples of early scientific (and pseudoscientific) photography and considers what it meant in the 19th century to "see" photographically. Equally importantly, the exhibition invites you to imagine what pictures of the invisible might have meant at a time when the worlds revealed by contemporary technologies such as satellite imaging and PET scans were utterly unimaginable.

http://www.sfmoma.org/exhibitions/exhib_detail.asp?id=332

Communications from Members (Edited)

Still getting settled here in the wonderful Mission district. Anticipate starting up projects around late winter or early spring. It will be a ... fresh slate as I have gotten rid of the ... engineering bench and sold the old house in the Bayview. Am just around the corner from *Discount Builders* which is one of the few really good ... hardware stores in this city.

Really looking forward to developing new analytical techniques using common hardware items. Have a new group here: http://www.noisebridge.net The group is a collective of tinkerers ... . They [have] a good chance to make waves here. There is always the ever present danger that the novelty of cool trendy upscale online scientific and industrial suppliers will undermine the public value of the organization. Only a vigil and diligence will save it from collapsing into only a fond memory. Certainly hope that we could open up the world of microscopy and micro analysis to new blood which we need ... . Take care and happy New Year. Mike Kan

are big, heavy, more expensive, and use more room on the desktop, but they accommodate a thicker & larger specimen.

Some stands have separate coarse and fine focus mechanisms. Fine focus is always rack and pinion operated by a knob. Coarse focus may be another rack and pinion (some Bausch and Lomb), a telescoping pole (Olympus SZ III), or sliding the focus mount on a pole with a knob to set the position (Meiji). Look for convenience and total distance of travel. The stand base may be a simple platform or something that allows transillumination via a mirror or light in the base.

Manufacturers: See "Stereo Microscopes to BUY and to AVOID" at http://www.absoluteclarity.com/buy&avoid.htm. The brands can be a little confusing because there were a series of buy-outs in the 70's and later of B&L, AO, Cambridge Instruments by Leica. In order of availability, the good brands are Bausch and Lomb, American Optical, Olympus, Wise, Nikon (some models), Meiji.

I have an Olympus SZ III (0.7x-4.0x) that is quite nice.

Americal Optical Models: Stereo Star Zoom 580 1x-6x magnification; Stereo Star Zoom 570 0.7x-4.2x magnification; Stereo Star Zoom 569 0.7x-3x Cyclotopic changeable in steps from 0.7x to 2.5x

LIGHT SOURCES Fiber Optic light sources are expensive but have the great advantage of being cool on the specimen, have very white light, and can be as bright as you need it. They require a light source and a light guide. The light sources vary in their wattage, i.e. how bright a bulb they take, and in how noisy they are, because they have a fan to cool the bulb. The bulb is commonly 150 Watts, which is more than adequate.

Light guides come in a variety of lengths and diameters. The come in gooseneck, like the ones we use, that stay put and support their own weight, or flexible ones that you have to support with a stand of some kind. They may be single and double goosenecks. You can also get a ring light that fits on the end of the pod and provides an even cone of light over the specimen. These are very convenient, but you may sometimes want more oblique lighting to highlight the surface features of your specimen.

The problem with fiber optic systems is that each manufacturer offers proprietary bushings to match their diameter light output port to their various diameter light

(Continued on page 4)

PROTOZOOLOGY at November Meeting : Randall Museum

On November 18, 2008, Dr. Gregory Antipa, presented a interesting and informative slide show with many images of protozoa and their role in evolution. We were a small group but keenly followed the presentation and the discussion with which concluded the evening. The synopsis prepared by Bill Heib, gives you the flavor of the evening but in the space available cannot provide the visual experience to which we were treated. Dr. Antipa has been an active SFMS member for many years. His presentation was greatly appreciated. HS

Dr. Gregory Antipa presenting the material on Single Cell Organisms at the November meeting.

SINCLE CELL ORGANISMS: WHO, WHEN, WHERE, HOW

During human history there has always been interest in plants and animals, but it wasn't until the 17th century and the development of the microscope that the existence of single celled organisms was known. It wasn't until two centuries later that their importance in human health and disease was recognized by researchers such as Louis Pasteur and Robert Koch.

Eventually it was recognized that unicellular organisms were very diverse in morphology and physiology. Their classification has been the subject of lively debate. Biologists now generally agree that single celled organisms, or multicellular organisms that cannot be classified as animals, plants or fungi, belong to the Kingdom Protista. The Protista are further divided into eucaryotes which have genetic material enclosed in a nucleus, and prokaryotes that lack a nucleus or nuclear membrane. The latter are bacteria and are subdivided into eubacteria forming the true bacteria and the archaebacteria that form the primitive bacteria. Archaebacteria are commonly known as extremophiles due to their affinity for extremes of temperature, acidity, and salt concentrations.

There are many ways to characterize single cell organisms: by structure (morphology), by environment, by evolutionary development, by biochemical pathways or by association with other organisms such as symbiosis. An example of the latter is possibly an important step in evolution. It has been theorized that Precambrian bacteria entered into a symbiotic relationship with protozoa. This may have given rise to mitochondria and chloroplasts and then later developed into multicellular organisms. (The endosymbiont theory)

Protozoa have recently served as models in research leading to major discoveries. The importance of telomeres (regions at the end of chromosomes) in the aging process of Tetrahymena and other organisms including humans were first noted in protozoa. Ribozymes, RNA molecules that can catalyze changes in its own molecular structure were discovered in a protozoan model. Thus, after having been invisible to human awareness for millennia and enduring periods of sientific obscurity, single cell organisms have claimed a place of importance equal to their evolutionary cousins, plants, animals and higher fungi.

Bill Hieb nemasys4@gmail.com

SFMS Membership Drifting Down but Life memberships are UP!

While we have recently gained some new members, and are pleased by the renewed interest in the society that this represents, past yearly members have been notified that they need to renew their membership by sending $12 to the Treasurer, 20 Drake Lane, Oakland, CA 94611-2613.

Unlike large organizations, we are unable to constantly remind members to renew since the volunteer officers have limited amount of time that can be devoted to this task.

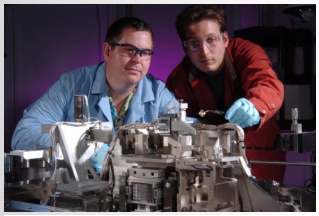
We are pleased to welcome two new LIFE members, John Murdoc and William Uetrecht. Life membership dues ($144) can be paid over four equal payments between now and October 1, 2009. If you have already paid 2009 dues, but want to change to Life Membership, you may subtract the $12 from the first payment.

Life Membership dues are added to the Life Membership Fund that forms an endowment. Interest from this fund is used to supplement the regular annual budget when needed.

Endowments are a very valuable asset since they provide a continuing source of predictable income for the organization. Members may want to include the Society in their will to add to the endowment or to provide funds for specific activities such as education. HS.

MICROSCOPY TODAY

It does not look much like a microscope and the machined parts are hand built and very exotic . No mass production can create x-ray microscopes but they have been around for a while. It is a contrast imaging technology using the difference in absorption of soft x -ray in the water window region (wavelength region: 2.3 - 4.4 nm, by the carbon atom (main element composing the living cell) and the oxygen



Holt—Vienar X-ray Microscope

atom. Some of the first usable X-ray images were produced by Sir Lawrence Bragg with his apparatus in the late 1940's. One method of focusing X-rays is to use a tiny Fresnel zone plate of concentric gold or nickel rings. HS

PLEASE COME TO THE SFMS MEETING

Stamp

SFMS

Yes, we will meet at the Randall in SF on January 13.

Tuesday, at 7:30. Come early before all the refreshments are gone. Bring your favorite microscope slide. Share in this interesting evening where the officers show what they are doing in microscopy.

FROM:

Micro News

San Francisco Microscopical Society
20 Drake Lane
Oakland, CA 94611-2613

MEMBERSHIP INFORMATION

To join the Society,:
fill in the form available at www. sfmicrosoc.org and mail it to the above address with your annual 2009 dues of $12.– made out to SFMS.

Life membership is $144.00

TO:

(Continued from page 2)

guides. They can be expensive and hard to match. Edmund Optics (link below) offers bushings for the Dolan Jenner illuminators for $17 each, plus minimum charge of about $10 for shipping.

Fluorescent ring light: This doesn't seem to be a popular option. Poor spectrum? Not too expensive.

Tungsten lamps: Fairly inexpensive. Can put a lot of heat on the specimen. You can use an inexpensive goose neck high-intensity desk lamp.

BUYING: You can buy from a dealer, from university surplus, or from ebay. Ebay is by far the cheapest, but there is some risk. You will probably have to clean up you purchase and maybe regrease the interocular adjustment or diopter adjustment of the eyepieces. It is possible for the prism mechanism to get out of alignment, but the scopes that were made in the 70's tend to be very rugged. If you buy from a good dealer, you will pay several times as much, but you will have some kind of a guarantee and the scope will come to you in good working condition. University surplus is not inexpensive and the condition is unknown but at least you can look before you buy.

When you buy, make sure you get a complete scope with stand, eyepieces, and pod. Because these are modular, parts are often sold on ebay, but depending on the make or model, you may have a hard time putting together components to get a complete scope and it may be more expensive to do it that way. The same applies to buying a fiber optic illuminator plus light guide.

DEALERS: These are some dealer web sites you can browse: http://www.techinst.com/ (Technical Instruments, Burlingame CA.) http://www.mcbain instruments.com/A stereo micro - scopes.htm (So CA) http://www.absoluteclarity

.com/, http://www.minrescoom http://www. martinmicroscope.com http:// www.microscopestore.com/ default.asp

http:// www.edmundoptics.com/ onlinecatalog/search/ (new microscopes, fiber optic stuff, http://www.surplusshed.com/ pages/category/ microscopes_1.html (surplus stuff - cheap no-brand stereo microscope, hand microtome, cool stuff)

I highly recommend Arthur Rosenfelder, a microscope repair person in Colorado. He often has reconditioned compound and stereo microscopes for sale. He is honest and knowledgeable and his prices are good. I know five people who have bought microscopes from him or had them serviced and all have been satisfied. Rosenfelder Optics: (Specializing in Microscope Service and Repair, Maintaining research and instructional optics since 1980) P.O. Box 164