MicroNews

San Francisco Microscopical Society Volume 3, #1 February . 2008

MicroNews Shorts

If you happen to have some spare change and also are as rich as Bill Gates, you could buy the new 27 million dollar microscope that has been installed at Lawrence Berkeley National Laboratory.

It is the world's most powerful microscope with a resolution of half an angstrom and can image and identify individual atoms.

Drs. U. Dahlmn and P. Denes pointed out that the room housing the microscope will be sealed off with no air flow, no noise, slanting walls to reduce acoustic noise and held at a constant temperature. It rests on a seventy ton concrete block that rides on air cushions to reduce interference from ground vibration. A second such microscope with some additional improvements is in the works.

(Based on Betsy Mason's article in the San Jose Mercury News, January 13, 2008.)

Dues for 2008

If you are a Life member, no dues are due. If you are a student who completed the microscopy course in the Spring 2007 (Dr. Baysdorfer's) class, NO dues are due for 2008.

SFMS Membership dues for 2008 are $12.00 or $144.00 for Life membership.

Send dues to: SFMS Treasurer
20 Drake Lane,
Oakland, CA 94611-2613

Thank you to those who have rejoined!

ELECTION NEWS

Neither Democrats nor Republicans Win President's Office

Much to the dismay of the members of the society, the office of the President of the society remains vacant. Since our past president, Ray Wong, asked to be relieved of the duties of the presidency, and no candidate could be found to take on the few duties that are prescribed for that office, the post remains vacant. Any member who would like to manage this organization and sharpen his or her skills, may apply to the board for temporary appointment until an election can be held. If more than one person should apply, each person will be given some time to acquaint themselves with the office before the runoff election.

Fortunately, we can operate without a president for a limited time. At the last board meeting, the board adopted a resolution that places the presidency in the hands of a board member for a four month stint giving that board member double duty, but not two votes. After four months the presidency moves to another board member. Bill Hill, who is vice president and Program Chair, volunteered to take on the extra task and we are all thankful to him for doing so.

Raymond Wong now becomes the immediate past president who also sits on the board but does not have a vote. As a result of the action of the board, the immediate past president may cast a vote to break a tie, a common function in the bylaws of many organizations. The board also approved the reduction of the number of board members to four with the two positions of secretaries becoming combined. This is an action that is permitted by the constitution. The four positions were filled by the vote taken on January 15, 2008 at the general meeting held at The Randall Museum: President (vacant); Vice President, Bill Hill; Treasurer, Henry Schott; Secretary, Linda Wraxall.

The meeting had two presentations. Peter Barnett gave a

(Continued on page 2)

(Continued from page 1)

PowerPoint presentation of the history of the SF Microscopical Society stressing that the Society has had its ups and downs. It included a picture of some members in the early or mid seventies where several individuals were identified including our stalwart Helmut Will who gave us the second presentation, a progress report on setting up the powerful and highly multifaceted Zeiss microscope described as the Ultraphot IIIb. This microscope

The SFMS's Ultraphot III

will be available to members, by appointment, Monday through Thursday, made with Peter Barnett who has kindly provided space in his laboratory in Richmond. Since the use of this instrument will require some training, we are now **seeking the names of those** who would like to receive this training. Please contact Henry Schott, (hschott@aol.com or 510-339-9609) if you would like to be informed of the first training session.

——0000——

American Optical Series 10 Microstar
(Advanced Laboratory Microscope)

Besides the Zeiss Ultraphot, the Society owns several other microscopes. These microscopes are usually available at the meetings held at the Randall Museum where the microscopes are stored. Some microscopes are also available to be checked out by members for a limited length of time. The treasurer will arrange with you for their loan. Through the good offices of Michelle Caisse, we now have two copies of the 35 page guide to the Microstar. This pamphlet shows the assembly and construction of the microscope and instructions on cleaning. Exploded views and parts lists provide a complete view of the internal arrangement of parts for this microscope. The information was gleaned from the web site that has all the information about American Optical microscopes is:

http://www.xmission.com/~psneeley/Personal/Microscope.htm.

Another resource that might help is the yahoo Microscope group:
http://tech.groups.yahoo.com/group/Microscope/

Michelle is also our webmaster maintaining our web site **www.sfmicrosoc.org**. She is open to suggestions and can be reached at **mcaisse@sonic.net.** Thanks, Michelle, for all the good work you are doing for the Society.

[[[[[[[[[[[[[[[ ]]]]]]]]]]]]]]]

.

Programs, Meetings, and Field Trips

March 11, 2008, Tuesday, at the Randall Museum in San Francisco, at 7:30 PM
Subject: **Diatoms, Recognition and Sources**.
Presenter: Ray Wong and Sara Blauman (?)

March 15, 2008, Saturday, SFMS Board Meeting at 20 Drake Lane, Oakland. Lunch at 12:00 and meeting at 1:00 to 3:00 PM. Lunch by reservation and POT-LUCK, (I need to know what you will bring.) All members are welcome to attend both lunch and board meeting.

May 3-4 2008, Saturday-Sunday Healdsburg Field Trip: **Combination Field Biology Microscopy and Star Party**. Camp out at Langridge-Sahud pasture or arrange for motel. Microscopes and telescopes will be available or bring our own. Bring binoculars or spotting scopes if you have them. (This program is tentative at this time.)

May 1, 2008, Thursday, Joint dinner meeting with CAC, (CA Assoc. of Criminalists), Location and times TBA. Dinner cost about $25. Speaker: **Brian J. Ford,** renowned scientist, see www.brianjford.com.bjford.htm (Can't afford it? Call Treasurer).

(Continued on page 3)

Historical Perspective: Annals of Microscopy

Mr. Darwin Makes An Appearance!

In its fifth year of publication, the quarterly Journal of the New York Microscopical Society was publishing ninety pages of reports of meetings and two or three lead articles as well as well as lists of publications received from other societies and institutions. A few advertisements for microscopes were appended at the end.

"The President, Mr. Charles F. Cox, in the chair" states the report of the February 1st 1889 meeting. Mr. Cox had a surprise for the thirty three members attending that meeting. After Dr. H. Hensoldt addressed the Society on Echinoderms, and what they teach us, Mr. Cox exhibited a letter from Charles Darwin and spoke of the quantity and quality of Charles Darwin's microscopical work. Mr. Cox explained that Darwin devised improvements in the simple dissecting microscope and then read his letter to Professor Owen, Royal College of Surgeons, Lincoln Inn Fields, London. I have copied just a portion of it:

"My Dear Owen:

I do not know whether your MS. instructions are sent in: but even if they are not sent in, I dare say what I am going to write will be absolutely superfluous, but I have derived such infinitely great advantage from my new simple microscope, in comparison to the one, which I used on board the Beagle and which was recommended to me by R. Brown, that I cannot forego the mere *chance* of advantage of urging this on you. The leading point of difference consists simply of having the stage for saucers very large and fixed. Mine will hold a saucer 3 inches in inside diameter. I have never seen such a microscope as mine, though Chevalier's (from whose plan many points of mine are taken) of Paris approaches it pretty closely. I fully appreciate the UTTER ABSURDITY of my giving you advice about the means of dissecting; but I have appreciated myself the enormous disadvantage of having worked with a bad instrument, though thought a few years since the best. Please to observe that without you call especial attention to this point, those ignorant of natural history will be sure to get one of the fiddling instruments sold in shops. … … But pray again believe that feel the absurdity of this letter, and I write merely from the chance of yourself possessing great skill and having worked with good instruments, may not possibly be fully aware what an astonishing difference the kind of microscope makes for those who have not been trained in skill for dissection under water. When next I come to town … I must call on you, and report *for my own satisfaction*, a really (I think), curious point I have made out in my beloved Barnacles. You cannot tell how much I enjoyed my talk with you here, Ever, my dear Owen, Your sincerely, C Darwin

P. S. - If I do *not* hear, I shall understand that my letter is superfluous. Smith and Beck were so pleased with the simple microscope they made for me, that they have made another as a model: if you are consulted by any young naturalists, do recommend them to look at this: I feel quite a personal gratitude to this form of

(Continued on page 4)

(Continued from page 2)

June ?, 2008, Saturday. (Tentative) **Ultraphot:** field trip to Richmond laboratory to see the microscope from 3:00 to 5:00 PM followed by **Annual Dinner** in Berkeley, starting at 6:00 Dinner will be by paid reservation with a partial rebate to those who attend. (Tentative)

Suggestions for future programs should be sent to

Some of the ancillary equipment associated with the Zeiss Ultraphot

On the right are sets of objectives.

Treasurer's Report for 2007

The right of members to know how the Society's funds are spent seems self evident. As treasurer and Editor of the Micro News, I will get the fiscal data into a presentable form as soon as I mail out this issue.

Odd as it may seem, we do not spend enough! We need strategies that will attract new members and that will keep the current members interested and supportive of our aims. These include education and promotion of effective uses of microscopes. With the economy in danger of a recession, we need a plan to pump some of our funds to help boost the market while benefiting the Society. Have you any ideas how we should do this? What program should the board recommend to keep your interest and participation?

SFMICROSOC.ORG

(Continued from page 3)
microscope and quite a hatred to my old one."

Darwin's letter is dated Sunday, March 26, 1848.

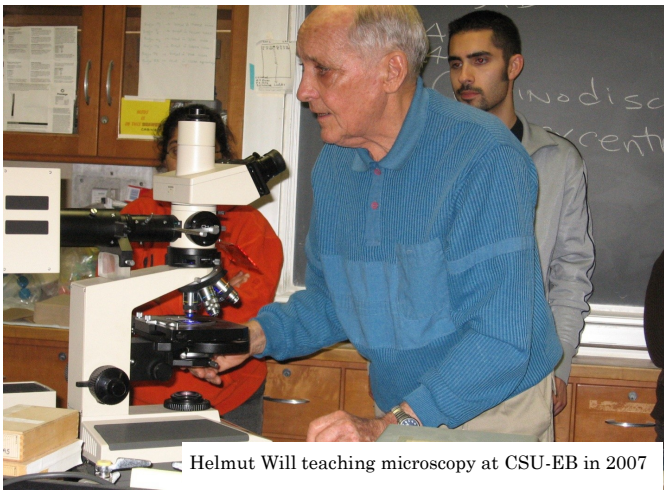
Forensic Anthropology and The Body Farm

Most of you are aware that microscopes play a significant role in modern forensic investigations even if CIS programs seldom portray one. It was with this in mind that I picked up Dr. Bill Bass & Jon Jefferson's book *Beyond the Body Farm, A Legendary Bone Detective Explores Murders, Mysteries, and The Revolution in Forensic Science* at my local library. I had previously learned about the Body Farm located in Knoxville, at the University of Tennessee. In a fenced off wooded area near the University Medical Center, the decomposition of human bodies is studied rigorously in order to learn the processes that may accompany the post-mortem changes.

While the book is a fascinating account of some interesting cases and provides a good overview of the career of Bill Bass, a forensic anthropologist, it only deals with microscopy in Chapter 11, Science At The Cutting Edge. Recounting some of the history of optical microscopy he credits van Leeuwenhoek with "Over the course of some seven decades," ...examining "things no human eye had ever seen before, including sperm cells and bacteria (a discovery the Royal Society refused to believe for years)."

Optical microscopes have their limits and in the case under investigation he turned to Dr. David Joy who took SEM images of bone nicked by a knife which revealed small particles that, small as they were, under X-ray excitation turned out to be cerium oxide, material found in ceramic knife sharpeners. Such a sharpener and a long knife were found in a suspects kitchen. To find out the results of this investigation you will have to read the book, a recommendation I have no difficulty in making to all SFMS members.

H. Schott



Helmut Will teaching microscopy at CSU-EB in 2007

The Beginner Corner

This is a section to help the beginner deal with the apparent complexities of microscopy. These complexities are more apparent than real. Good Practice makes the Master.

"Under his arm he carried an old music book to press plants; in his pocket his diary and pencil, a spy glass for birds, microscope, jack-knife and twine." Ralph Waldo Emerson, essay on "Thoreau",

How do amateur microscopists prepare specimens for viewing under the microscopes?

There are many ways to prepare material for viewing but as a start we need to know at what magnification the object is to be inspected. If the purpose is to see the object in its entirety under relatively low magnification such as less than 40 x then no special preparation needs to be made other than insuring that there is sufficient light. A stereoscopic binocular microscope with auxiliary lenses or a zoom system will give an excellent view of objects such as seeds, flowers, stamps or coins. If the microscopist wants to look at liquids that contain living organisms such as copepods or rotifers, a shallow glass dish placed over a dark background containing a few drops of concentrated organisms will provide an excellent view.

There are hundreds of interesting items that can be inspected by placing them in a small drop of pure water placed in the center of a microscope slide. The mold found on food that has been in the refrigerator too long is easily teased apart and placed on a slide. Bacteria can be grown on a slice of potato that is placed in a jar and kept warm for a few days..

Smaller objects require a more sophisticated technique. There are many substances that are difficult to view because in their normal state, they are opaque and thick, much too thick to let light pass through them. The classic example is the outer bark of trees that form cork. To see the cells that form cork, the specimen must be slices exceedingly thin. The hand held knife or razor is unlikely to cut a flat layer that is sufficiently thin although some people have succeeded in preparing slides this way. It is worth a try to make such a thin slice if only to learn the difficulties that are encountered. The professional instrument used in laboratories is called a microtome and consists of a specimen holder that very slowly advances the specimen that is usually embedded in paraffin or a mixture of beeswax and candle wax. This instrument is both very heavy and costly since it contains many machined parts. (The Society owns a

(Continued on page 5)

Beginner's Corner Continued.

(Continued from page 4)

sledge microtome.) It passes the wax block over the knife on the down stroke and then backs off on the up stroke so that the block does not rub against the back of the knife.

While building a microtome is a time consuming activity, some alternatives for amateurs can be helpful. How can one slice a cross-section of a leaf? Start with a cork from a wine bottle. While many corks today are made of plastic, better wines still come with cork stoppers and a restaurant should be an easy source of such corks. With a sharp knife or razor cut a half inch deep vertical slice to form a groove into which you can place a small specimen. Use a leaf that has some leatheriness to it, such a camellia, but use a young small leaf from which you have cut a quarter inch square near the tip. Trim the cork on each side of the vertical slice so that when you cut your slices you will only cut a small amount of cork on each side of the leaf specimen but be sure that there is enough cork to provide support to the more fragile leaf that you will insert into the vertical cut while paying attention to the orientation of the specimen.

While it is possible to hold the cork, and with a sharp, single-bladed razor, start cutting thin slices, it will be difficult to produce consistent results.

A good razor holder is sold in hardware stores for scarping paint from windows. Ingenuity is called for to design a cork holder, such as a hole in a wooden block, and a razor slide, such as two glass microscope slides fixed to the wooden block on either side of the cork holder hole. The glass slides need to be parallel and level as well as close enough together so that the razor blade will span the space between the two slides as you cut your specimen.

The most difficult aspect of this arrangement is to slowly advance the cork a few microns at a time after each cut. In some microtomes this is accomplished by advancing a metal wedge under the specimen holder by turning a fine threaded screw to push the wedge forward. Pushing against a spongy cork probably will not work well but is worth a try as a learning experience.

Discard your first cut since it will be on the thick side. Place a drop of water on the specimen unless it has been embedded in paraffin. Advance the specimen holder (cork) a tiny fraction, make your cut and immediately pick up the cut leaf cross section with a small brush to transfer it to a glass slide containing a small drop of water. If you have dyes, transfer a drop to the slide, let the dye work its magic for a minute, remove excess moisture with an absorbent paper towel and cover with a cover glass before inspecting the slide under low power. If the slide is opaque the specimen is too thick and you will need to try again. Sometimes cutting a wedge-shaped section will give you a few cells at the edge that are thin enough to see through.

If you succeed to get thin sections, try other materials. If you do not succeed, chalk it up to experience and appreciate what it takes to make good commercial slides.

Next time we will discuss some simple preservatives for specimens.

o-o-o-o-o-o-o-o

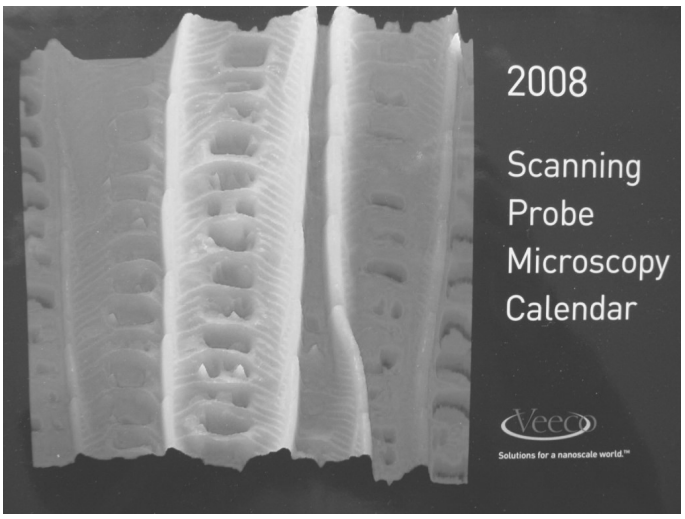
President's Corner

February 2008

(Acting President: Bill Hill)

As a result of our Election Meeting this past Tuesday January 15, I am now (for 4 months) also your President, as well as Vice President/Programs Chair. Ray Wong our previous president could not take another term and the Board had decided that the position of President would be rotated amongst the remaining Board, 4 months at a time. The two secretary positions were collapsed down to one, held by Linda Wraxall. Henry Schott is still our Treasurer.

We decided that March would be *Diatoms Month* with our regular meeting Tuesday March 11, at Randall Museum. Ray Wong will give an 'introductory lesson' about diatoms. We had planned to have a fieldtrip to the Geysers in Sonoma county last year to try and find some diatoms in the mineral rich waters there, but it was called off due to raine. We will try again this year. Michelle Caisse and I will do a reconnaissance run during February. We plan to take our 'diatoms' fieldtrip there after the March 11 meeting, - perhaps Saturday, March 22 or 29. LET ME KNOW YOU PREFERENCES - Bill Hill, aropoika@earthlink.net



What on earth is this? Can you guess? How is it related to Radar-opaqueness? Is it natural or man-made?

The San Francisco Microscopical Society.
***Publisher of* Micro-News**
20 Drake Lane, Oakland, CA 94611-2613

Editor: The Editorial Board
Send articles or news to the above address or call: 510-339-9609.

Scanning Probe Microscopy

If you attended one of the Veeco demonstrations, you will have received a 2008 calendar with some extraordinary microphotographs. As a biologist, I was particularly struck by the cover. It is a false color picture of the surface of a stealth moth's wing. The pattern of ridges makes the wing sturdy and lightweight but more importantly, it also allows it to absorb ultrasonic waves, making the moth less visible and perhaps invisible to its most dangerous predator, bats. The image size is 8 µm. The image comes from Dr. K. Jacobs, Saarland U. , Germany.
Visit www.veeco.com.

(Not a recommendation or endorsement. Provided for information only)

Digital Upgrades for Microscopes

Each of the following suppliers are vendors for a digital camera that slips onto your microscope's ocular tube in place of the eyepiece and connects to your computer. Starting at around $129 for their cheapest model, they provide an easy connection. Check them out. They are derived from a small advertisement by BigCatchUSA in the current Scientific American.

SunriseDino NY : http://www.sunrisedino.com
New Hyde Park, NY 11040

Mineralogical Research Company. http://www.minresco.com, Tel (408) 923-6800, San Jose, CA 95127 elc@minresco.com

PC Gears: http://www.pcgears.com, Torrance, CA 90501

(Not a recommendation or endorsement. Provided for information only)

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

Please share Micro News with someone before recycling.