



Newsletter

Of the

New York Microscopical Society

1 Prospect Village Plaza
(66F Mt. Prospect Avenue)
Clifton, New Jersey 07013-1918
GPS: Latitude 40.8648N, Longitude 74.1540W



Summer 2013

N.Y.M.S. (973) 470-8733

Volume 7 (27) Number 6

Summer Picnic 2013

Where: At the home and Gardens
of Jan and Wiebke Hinsch.

6 Willow St, Woodcliff Lake, NJ 07677
Home: 201-573-9851
Cell: 201-574-6522

When: Sunday July 28, 2013

Noon to 5:00pm

Cost per person: \$35.00



This is also a "Permanently Moving to Florida" party for Don and Stacey O'Leary. Don is a NYMS past President and has been our Curator, Education Chair and Building Manager for many illustrious years. He is also responsible for acquiring our permanent location for NYMS in Clifton, N.J.

In case of rain, we will move the picnic indoors. In the event of sunshine, we will remain outdoors and have a wonderful time enjoying the gardens and some microscopically interesting subjects. Bring a camera; the flowers and various other plants are stupendous. There will be many things to enjoy.

Invitation Request Form for: Summer Picnic hosted by Jan & Wiebke Hinsch
Sunday July 28, 2013, Noon to 5:00 pm

Cost \$35.00 per person

NYMS Member Name: _____ **bringing a guest?** ___ Y/N

Phone (H) _____ **Email H)** _____

Complete this form and send with payment to:
NYMS Picnic, c/o Mel Pollinger, 18-04 Hillery Street, Fair Lawn, NJ 07410-5207

Please respond by July 23, 2013

Board of Managers (updated)

Diaczuk, Peter , pedicopete@earthlink.net ; (212) 237-8896, Expy June 2013,President
Scott, John , nyconsnfdn@aol.com ; Expy June 2015,Vice President, Program Chair
Pollinger, Mel , pollingmel@optonline.net ; (201) 791-9826, ... Expy June 2014,Treasurer, Editor, Librarian
Klaus, Angela , Ph.D., klausang@shu.edu ; Expy June 2015,Secretary, Education Chair
O'Leary, Don , dkoleary@verizon.net ; (201) 368-8849,Expy June 2013,Curator, Facilities Manager
Reffner, John A. , Ph.D., jareffner@cs.com ; (203) 348-8098,Expy June 2014, Awards Chair...President
McCann, Mary , mccanns@tiac.net ;(617) 484-7865,Expy June 2015,Membership Chair
Huemmer, Craig , chuemmer@hotmail.com ; Expy June 2015,Board member
Mayer, Gary , mayer@co.somerset.nj.us ; Expy June 2014,Board member
Perlowitz, Seymour , perlowitzs@hotmail.com ; Expy June 2013,Board member
Reffner, John Jr. , jrr1lp@gmail.com ; (cell): (215) 527-1882, Expy June 2014,Board member
Scal, Roland , Ph.D., rscal@qcc.cuny.edu ; (718) 631-6071,Expy June 2013,Board member

Dues and Addresses

Please remember to mail in your Dues to:

Mary McCann,
Membership Chair
McCann Imaging
161 Claflin Street
Belmont, MA 02478

Junior (under age 18) \$10

Annually

Regular \$30

Student (age 18 or above) \$20

Annually

Supporting \$60 Annually

Corporate (includes one advertisement in NYMS News)

\$175 Annually

Life \$300 (payable within the year)

To avoid missing notices:

Notify Mary McCann and Mel Pollinger if you have changed your address, phone or email.

Awards Given by the New York Microscopical Society

The New York microscopical Society takes great pleasure in recognizing and rewarding individuals who have contributed to either the activities of the society or to furthering microscopy.

These awards are described in our website and in a pdf file for our email newsletter recipients. All members are eligible to nominate individuals for these various awards, and are encouraged to do so.

John A. Reffner, Awards Committee Chairperson

Awards Committee

Chair: John A.
Reffner

Members

Jan Hinsch
Don O'Leary
Mel Pollinger



Mel Pollinger, Editor
18-04 Hillery St.
Fair Lawn, NJ 07410-5207

To Order Your NYMS Lapel Pins

Send a check in the amount of \$12.00 per pin to:
New York Microscopical Society
c/o Mel Pollinger, 18-04 Hillery Street, Fair Lawn, NJ 07410. To avoid shipping & handling charges, pins may be purchased directly at any NYMS meeting for \$10.00.



The Mission of the New York Microscopical Society

is the promotion of theoretical and applied microscopy and the promotion of education and interest in all phases of microscopy.

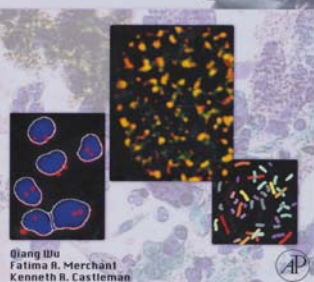
Alternate Meeting Notifications

Please note that due to time constraints in publishing, some meeting notices may be available by calling Mel Pollinger at 201-791-9826, or by visiting the NYMS website, or emailing: pollingmel@optonline.net

Dues for 2013 are due!

Buy and Read a Good Book on Microscopy.

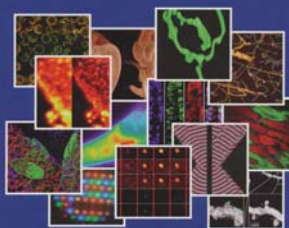
Microscope Image Processing



Qiang Wu
Fatima R. Merchant
Kenneth B. Castleman

HANDBOOK OF BIOLOGICAL CONFOCAL MICROSCOPY

THIRD EDITION



James B. Pawley
Editor

New additions to the NYMS Library

Participating in the EAS in November 2013?

Housing information for the 2013 Eastern Analytical Symposium is now available on the EAS web site, www.eas.org. Just a reminder that the exposition runs from Monday, November 18 to Wednesday, November 20. Show hours each day are 9 am to 4 pm. Set up is on Sunday, November 17 and breakdown begins at 4 pm on Wednesday, November 20.

When making reservations, please pay careful attention to cancellation deadlines and penalties. If you have questions or concerns, please let me know.

Thanks
Sheree

Sheree R. Gold Exposition Director
2013 Eastern Analytical Symposium
easinfo@aol.com
610-742-4981 (cell)

Board Members Positions opening this Summer

If you would like to participate in decision-making for the New York Microscopical Society, contact the Editor, Mel Pollinger for information.

Scale of The Universe – Try it, you'll like it!

<http://www.stumbleupon.com/su/1k0CXS>

Sent in by Earl Verbeek

Inter/Micro 2013

Inter/Micro is an internationally recognized conference that attracts microscopists from all areas of light and electron microscopy. Research presentations during the first three days cover techniques and instrumentation, environmental and industrial microscopy, and forensic and chemical microscopy. The final two days will be a hands on microscopy workshop,

Call for Papers

July 15-19, 2013 - Inter/Micro: 64th Annual Applied Microscopy Conference, Chicago, IL, USA
Titles & Abstracts due by April 15, 2013

Upcoming conferences

July 15-19, 2013

Inter/Micro: 64th Annual Applied Microscopy Conference, Chicago, IL, USA

Hosted by: McCrone Research Institute

Contact: Julie Antia

e-mail: intermicro@mcri.org

julie@mcri.org

www.mcri.org

Phone: 312-842-7100

Fax: 312-842-1078

Why Become A NYMS Member

I believe one can greatly benefit by becoming an active member of the New York Microscopical Society (NYMS). Our members can utilize the various collections at NYMS, in Clifton, NJ - such as its vast library, prepared slide collections, Global sand collection, numerous microscopes for use by its members for their own projects, our antique microscope collection and many other things including a comprehensive email newsletter, technical and hobby-oriented presentations, etc.

All those interested may apply for our microscopy courses and workshops to enhance their knowledge of microscope usage and/or polarized light microscopy. True, there is a lot of technical stuff offered there, but also much for the casual user and/or hobbyist; but for simple answers, members can email or call for help, or make an appointment to come to NYMS headquarters in Clifton.

There is an application for membership included with each newsletter and in our website: [<nyms.org>](http://nyms.org).

Mel Pollinger

Got News? Send it to The Editor. If you have images and/or article related to microscopy, or a letter to the editor, please send it to me. It could be an interesting book, mystery photo, website or anything else you believe may be of interest to your fellow NYMS members, don't be shy, send it to the Editor.

Visitors Always Welcome to NYMS

Although most of our lecture meetings, workshops and classes are held in the NYMS Clifton facility on the last Sunday of the month, the building may be opened for special purposes at other times, by appointment only. For such an appointment, please contact Mel Pollinger by phone at (201) 791-9826, M-F noon to 9:30pm, or by email at pollingmel@optonline.net.

From The Editor... if you have email: Getting the newsletter by email means you can receive an **extended pdf version** that cannot be sent by "snail mail." Even if you only continue your USPS delivery of the newsletter, NYMS needs your email address for reporting priority events and special news. Being able to contact you quickly by email means better communication between you & NYMS■ Mel

Dues for 2013 are due!

Need to use a Microscope?

The various microscopes that are presently set up on the main floor of the New York Microscopical Society building in Clifton, N.J. are there for the use of its members.

Microscope Cleaning Kit

A complete set of tools and accessories to keep your microscope in optimum operating condition. The kit is put together by our Curator/Educational Chairman and available directly from NYMS for only \$35.00 plus shipping & handling, or may be purchased at a meeting. Call or email Mel Pollinger or Don O'Leary for details (see page two for contact numbers).

"Microscopy Today" Magazine For Free

Send an email mentioning NYMS and requesting your free postal mailed subscription, to:

Liz Kasabian <lkasabian@DROHANMGMT.COM> at MSA headquarters.

Sand Collection Obtained: NYMS recently obtained a collection of 225+ small bottles of sand from around the world. Bottles are labeled with locations. Besides the bottles, there are numerous other containers of sands obtained as part of the collection, these are also labeled with locations and/or type of sand. All collected globally up to the 1980's. For additional information please contact Mel Pollinger at pollingmel@optonline.net or (201) 791-9826 up to 9pm weekdays.

Answer to Mystery Photo for May 2013



Foraminifera Rectuvigerina Transversa Did you guess correctly? Photo by Mel Pollinger

Mystery Photo for Summer 2013



Want to take a guess? Send it to me by email or call me: pollingmel@optonline.net, (201) 791-9826

Additional Historical NYMS Supplements

Email Newsletter recipients will also be getting copies of NYMS Newsletter pdf back-Issues from 2007. Copies of older newsletters will be sent as I convert them.

Got something you want to sell, trade or publish in the Newsletter and/or on the website? Write, call or send an email message to:

201-791-9826 or pollingmel@optonline.net (images ok)

or

Mel Pollinger, Editor
NYMS Newsletter
18-04 Hillery Street
Fair Lawn, NJ 07410



Supporting Member

NYMS Newsletter Extended Section, Summer 2013

Directions to NYMS Headquarters

**One Prospect Village Plaza
(66F Mount Prospect Avenue)
Clifton, NJ 07013**

GPS: Intersection of Colfax & Mt. Prospect:

Latitude 40.8656 N, Longitude 74.1531W,

GPS: Our building: Latitude 40.8648 N,

Longitude 74.1540 W

From George Washington Bridge:

Take Interstate Route 80 west to Exit 57A, Route 19 South. Take Route 19 to Broad Street and continue two lights to Van Houten Avenue. Turn Left. Go to second light, Mount Prospect Avenue and turn left. Building 66F is on the left side , one and a half blocks from Van Houton.

From Lincoln Tunnel:

Follow exit road to NJ route three west. Continue to Bloomfield Avenue exit. Turn right to Circle and go three quarters to Allwood Road West. Mount Prospect Avenue is a few blocks on the right (a small street) Turn right and go to first light (Van Houton) continue. Building 66F is on the left side , one and a half blocks from Van Houton.

From North:

Take Garden state Parkway South to Route 46 Clifton Exit. On 46 Make second exit to Van Houton Ave. Continue to third light Mount Prospect Avenue and turn left. Building 66F is on the left side , one and a half blocks from Van Houton.

From Route 46 coming from west:

Take Broad Street Exit in Clifton and follow Directions above from GW Bridge.

From route 46 coming from East: Take Paulson Avenue Exit in Clifton and follow to Second light, Clifton Ave turn right. Go to next light, Colfax, turn left, go three blocks and turn right on Mount Prospect Ave.. Building 66F is half block on right.

Public transportation from NY:

Take NJ Transit train from Penn Station to Secaucus Transfer Station. Change trains to Bergen Line to Clifton (call NJ Transit for schedules). From Clifton Station cross under tracks to first street and go left one block to Mount Prospect Street, turn right and Building 66F is one half block on Right.

If you plan to come by bus or train, please copy the links below into your browser:

http://www.njtransit.com/sf/sf_servlet.srv?hdnPageAction=TripPlannerItineraryTo

http://www.njtransit.com/sf/sf_servlet.srv?hdnPageAction=BusSchedulesP2PTo

http://www.njtransit.com/sf/sf_servlet.srv?hdnPageAction=TrainTo

In This Section:

- Micro-Garden at the Hinsches Part 4
- Stereo microscopes, part 2D
- May 25th presentation by Dr. Crowder
- Summer 2013 Picnic at the Hinsches
- Directions to the Hinsches
- Georgia Micro Soc. Sandfest flyer
- NYMS Items for Sale
- Membership Application
- Last page images

The Garden Under The Microscope

by Jan & Wiebke Hinsch

Part 4

Birds & Feathers

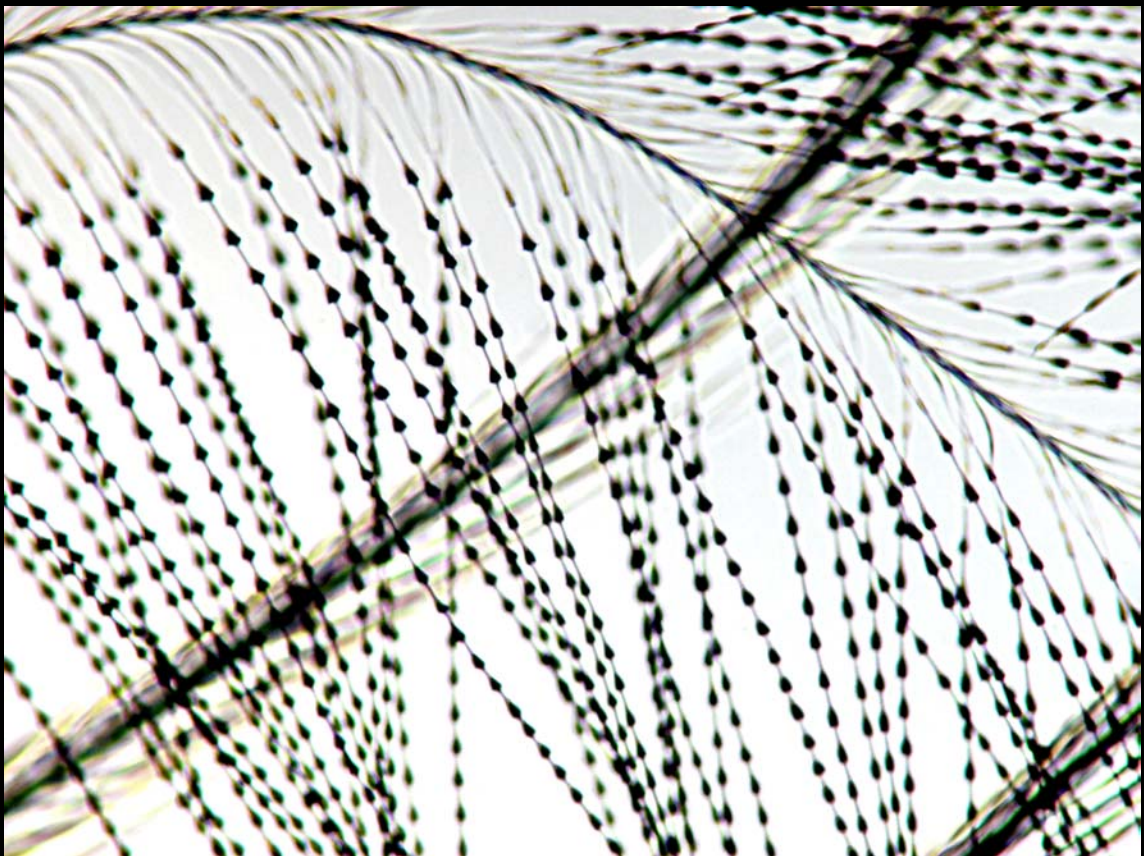


The ruby-throated hummingbird is the only one that ventures into the Northeast, up to Canada. It is a regular visitor in our garden. He builds his nest with moss and spider webs.

Birds & Feathers



Hummingbird feather



European Jay, *Garrulus*, neck feather

Curves of Life



Echinacea



Echinacea showing Fibonacci pattern

Curves of Life

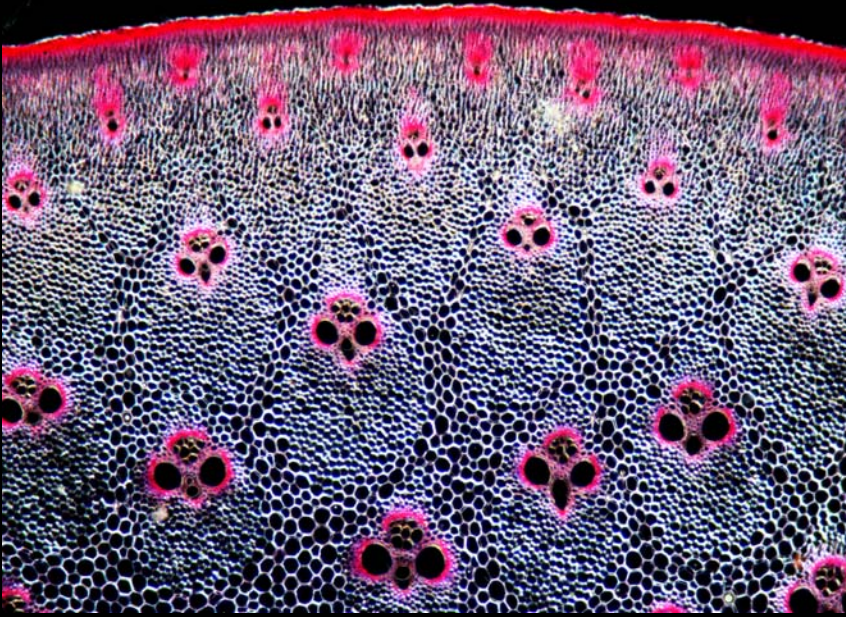


Pine cone



Cycad

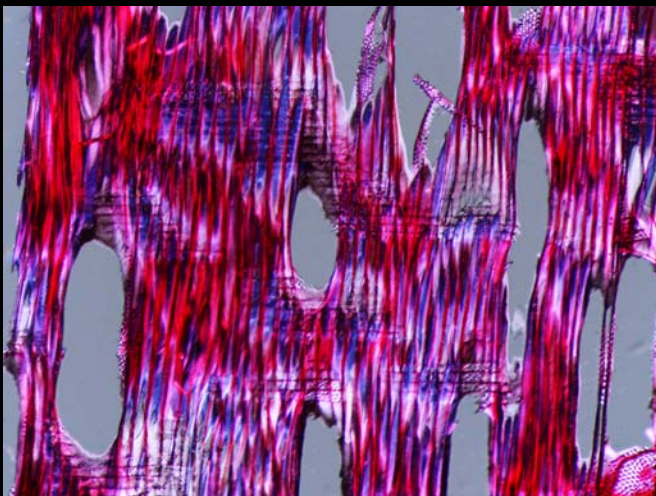
Plant Cross-Sections



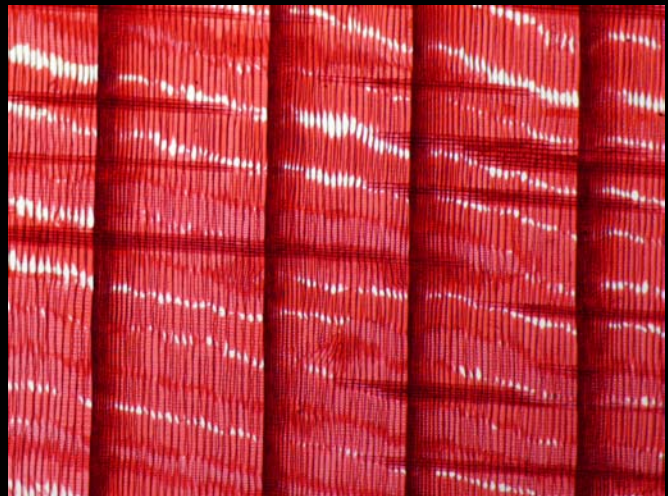
Bamboo Stem



Nerium oleander



Cottonwood *Populus deltoides*

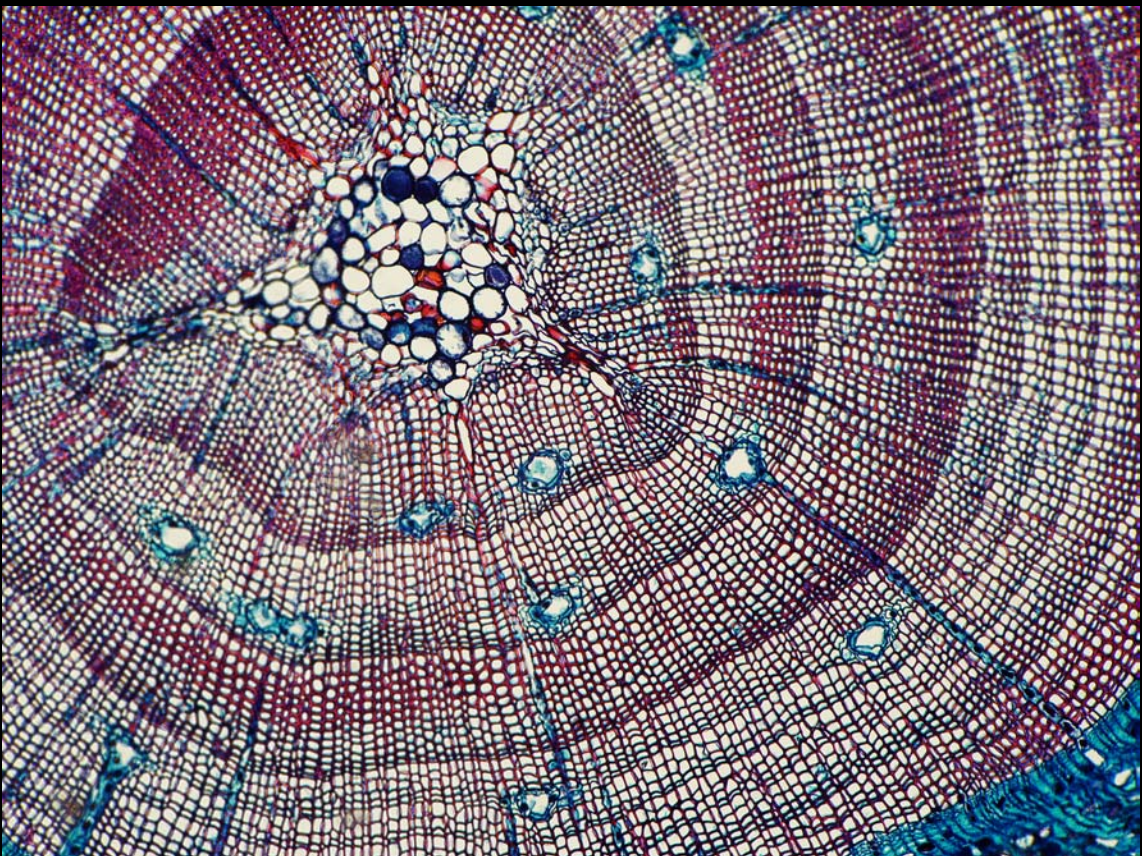


Western Red Cedar

Plant Cross-Sections

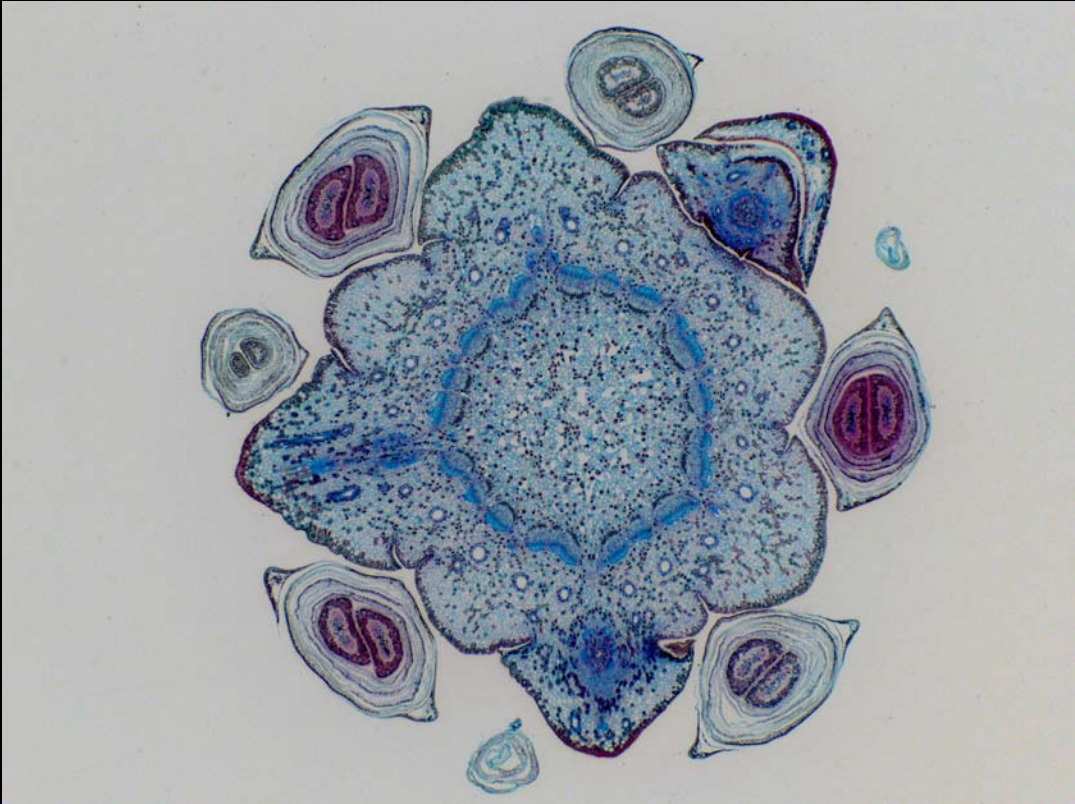


Pinus, one year stem

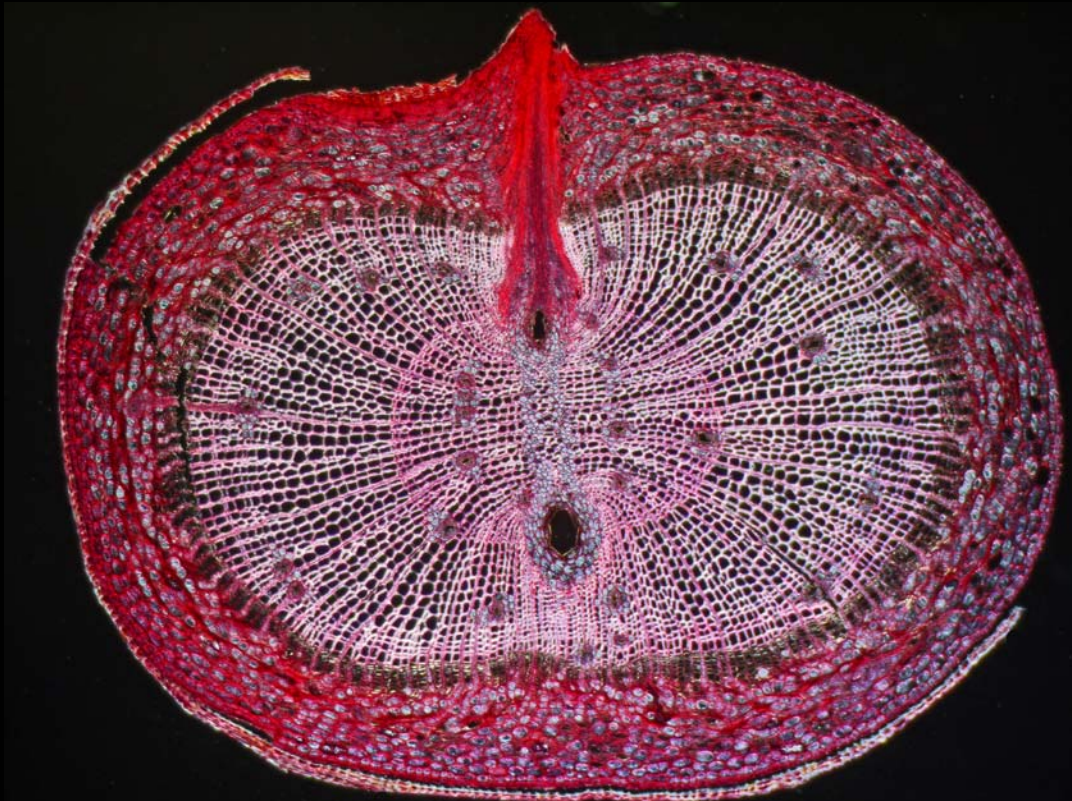


Pine, older stem

Plant Cross-Sections

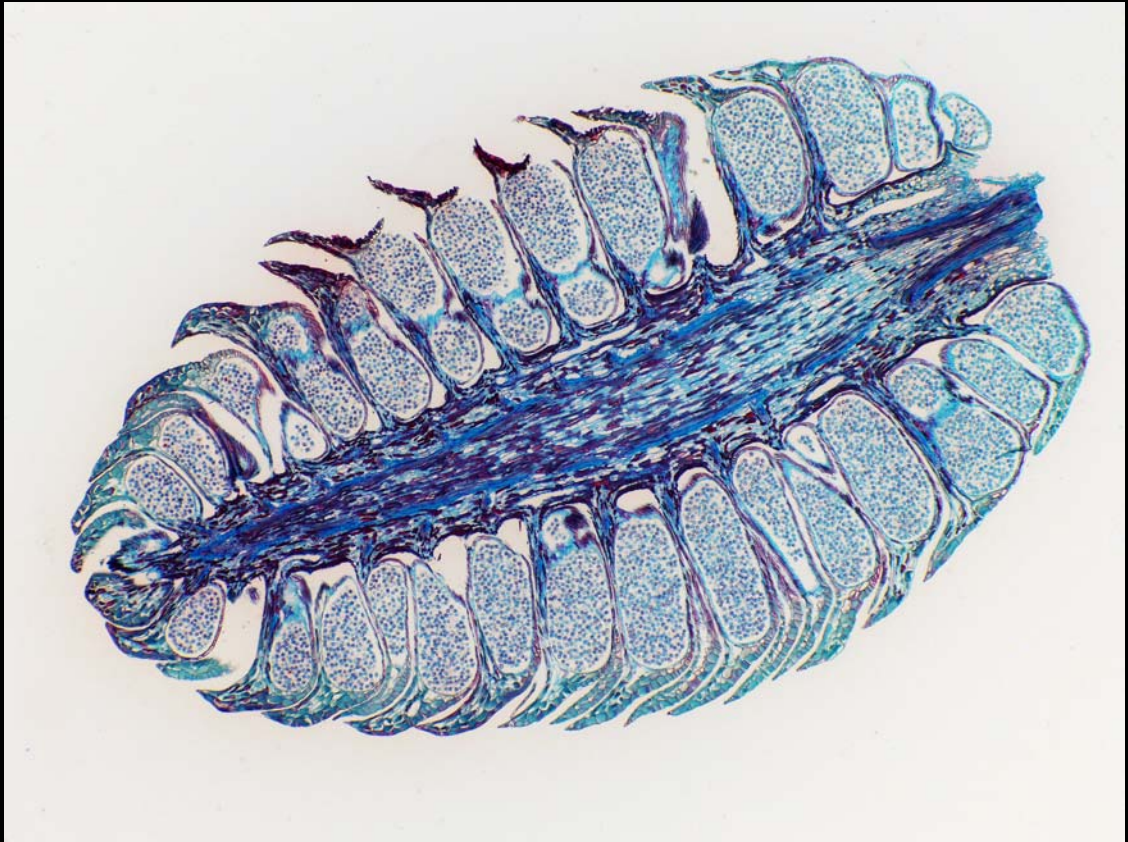


Pinus silvestris, growing tip, (apical meristem)

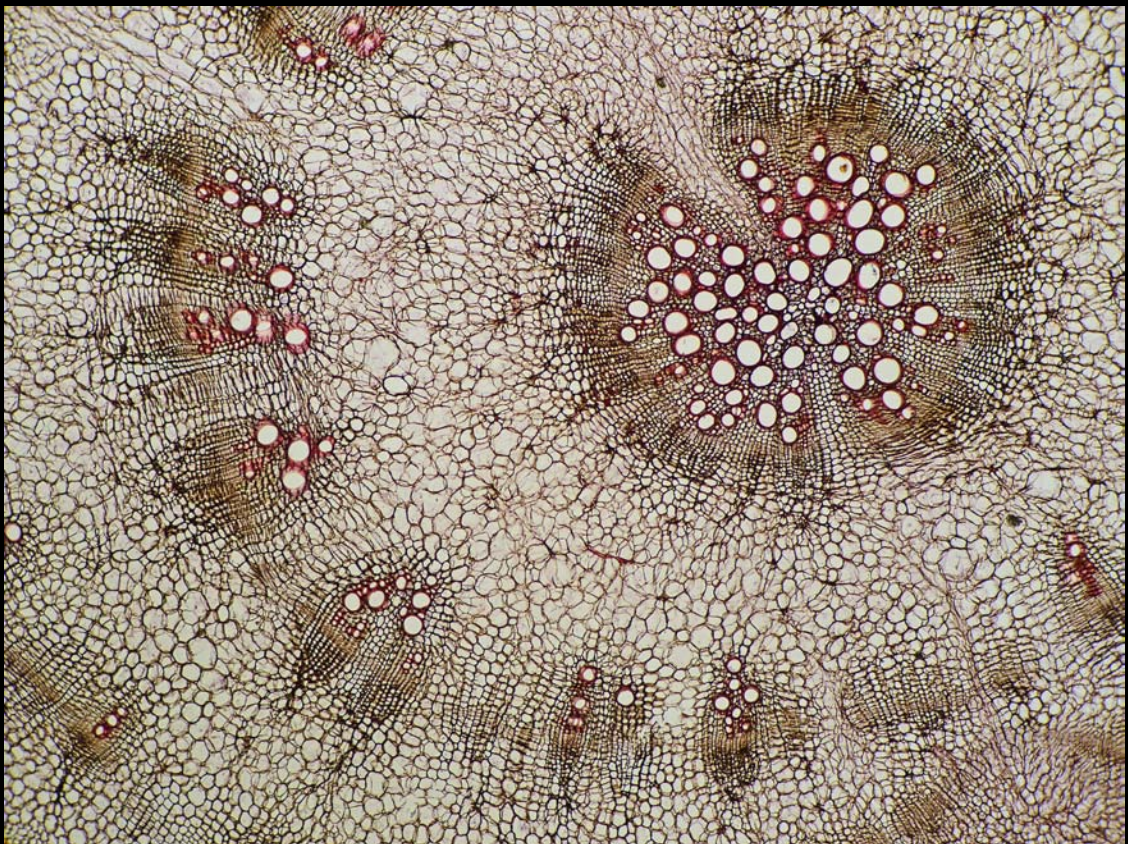


Pine Root

Plant Cross-Sections

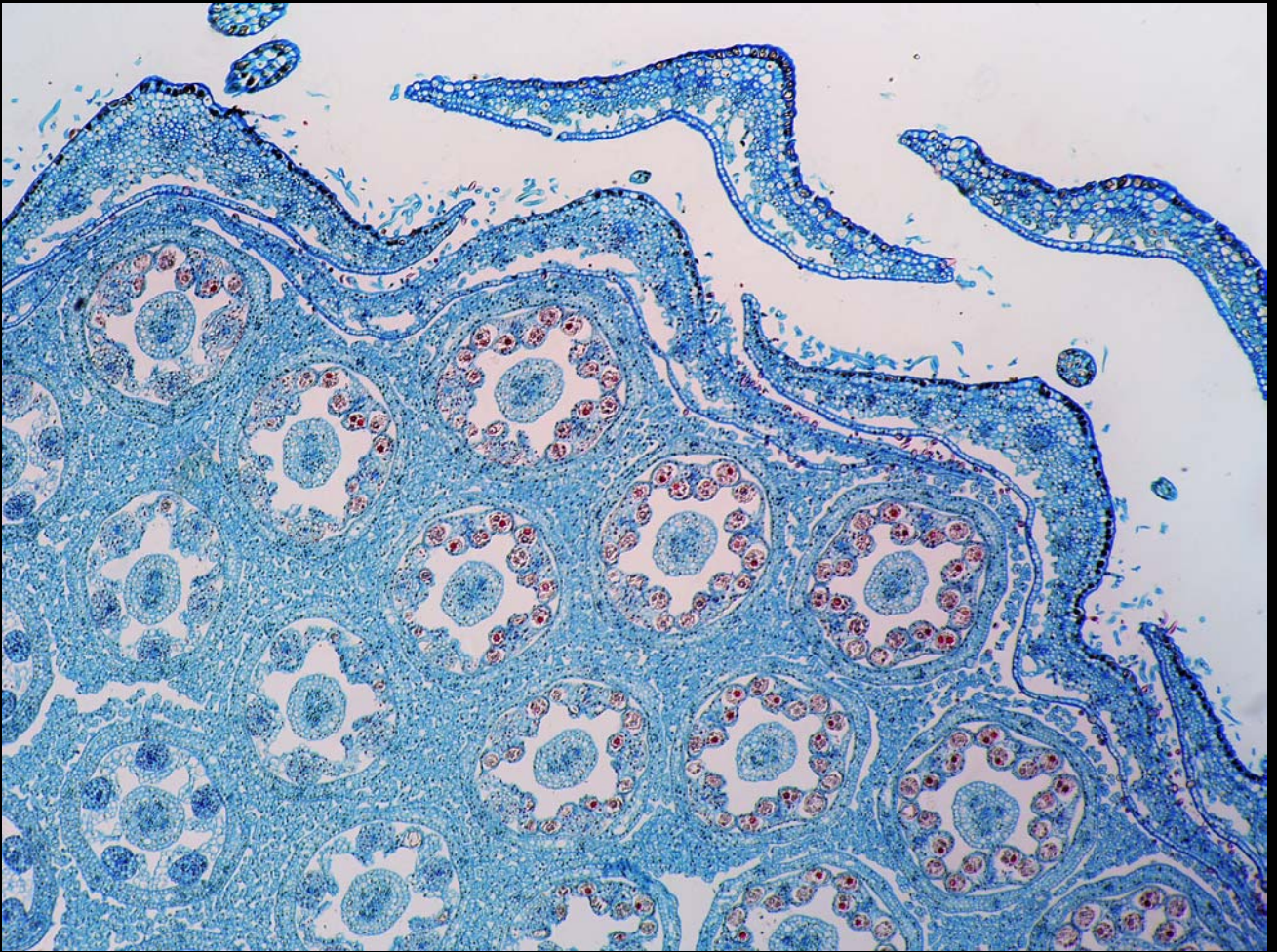


Pinus montana, male flower



Red beet, *Beta vulgaris*

Plant Cross-Sections



Hawks Beard, *Crepis biennis*



THE END

Stereomicroscope

Part 2: Greenough Stereomicroscopes

4th Edition

R. Jordan Kreindler (USA)

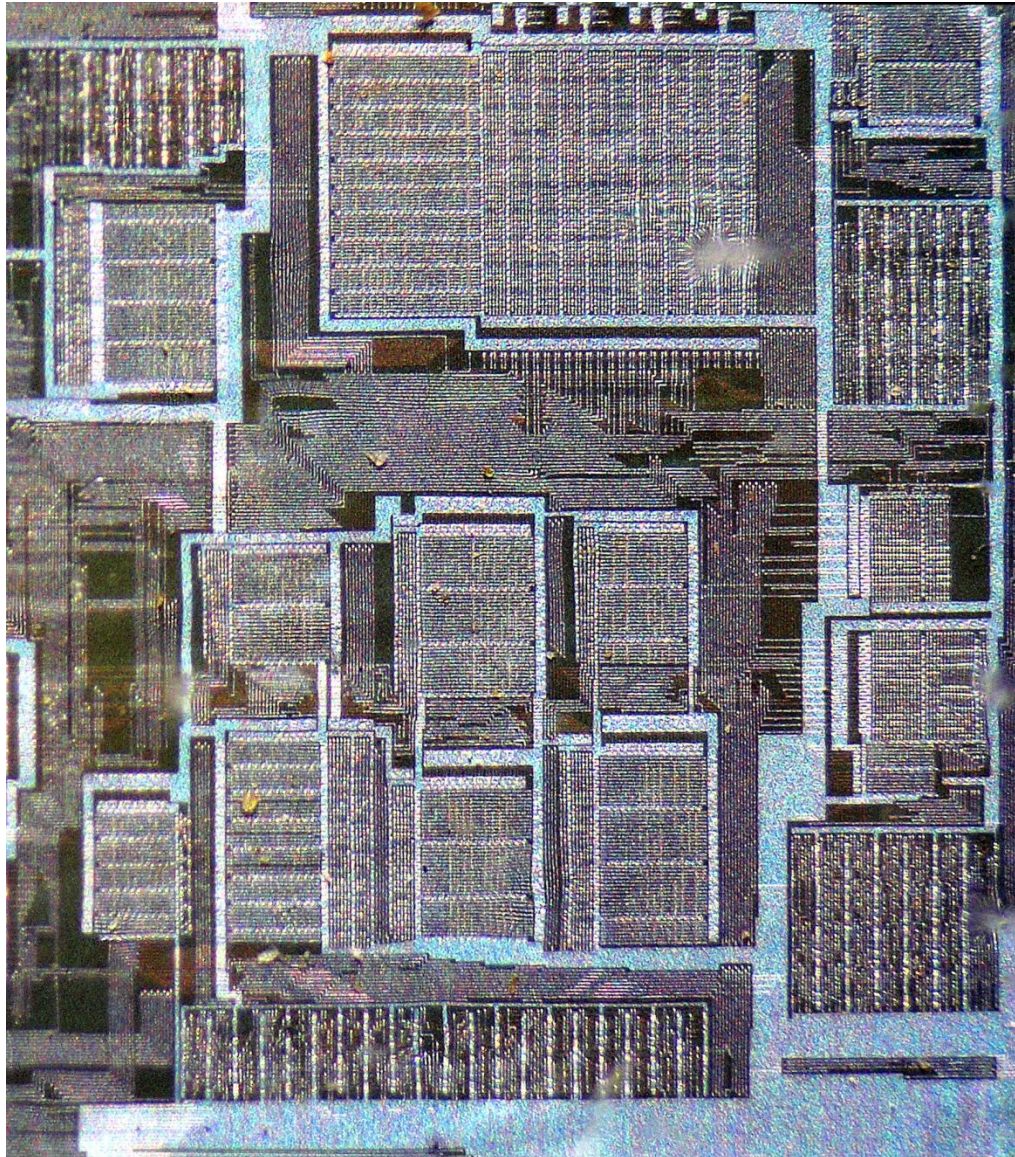


Figure 20. Damaged IC through Greenough Microscope
(See text for more detail)

Background: The Greenough Microscope

In the nineteenth century dissecting microscopes were commonly simple microscopes, Fig 21. Early in the 20th century these were primarily of lacquered brass, with an increase in black enameled areas as the century progressed. At the turn of the 20th century there were increasing demands for improved capabilities from scientists, who were then more frequently using microscopes for analyses. This, along with the advancement of technology, led to many single element simple microscopes being upgraded to short tube monocular instruments containing more complex eyepieces. Whether simple or compound instruments, dissecting microscopes were usually identified by the presence of sides-of-stage screws to connect hand-rests, Figs. 25 and 26. These rests made dissecting work less physically demanding.

However, even with the introduction of short tube instruments, the demand for greater capabilities continued. In response to this demand, microscope makers increased the size and complexity of their instruments to increase sales and satisfy user demands.

A concurrent development, which has continued through today, are portable binocular simple microscopes. Modern versions of these instruments are shown in Figs. 22 and 23. Fig. 22 shows a simple clip-on version, and Fig. 23 a full head-mounted version of a binocular simple microscope. An earlier version, the Collin's Lawson simple binocular dissecting microscope is shown in Fig. 19, Part 1.



Figure 21. Dissecting microscope

Stereo Microscopy

With the development of the Greenough stereomicroscope (see below), capabilities took a significant step forward, with further increases in size and weight. At the start of the twentieth century, dissecting microscopes changed from relatively small portables to benchtop instruments, although smaller instruments were still available.

Figure 22. Simple clip-on stereo binocular microscope



Figure 23. Simple head-band mounted stereo binocular microscope with side-mounted LED illumination

The new Greenough dissecting microscopes were initially designed as modifications to existing biological compound microscopes. These usually included larger stages, and greater working distance between object and objectives. They often saw the absence of substage assemblies, as most dissecting work was done using reflected rather than transmitted light.

Greenough Stereomicroscopes

The Greenough stereomicroscope was invented by American Horatio Saltstall Greenough. [As an aside, Mr. Greenough was the son of, the same named, Horatio Greenough, one of the first American sculptors to gain international recognition.]

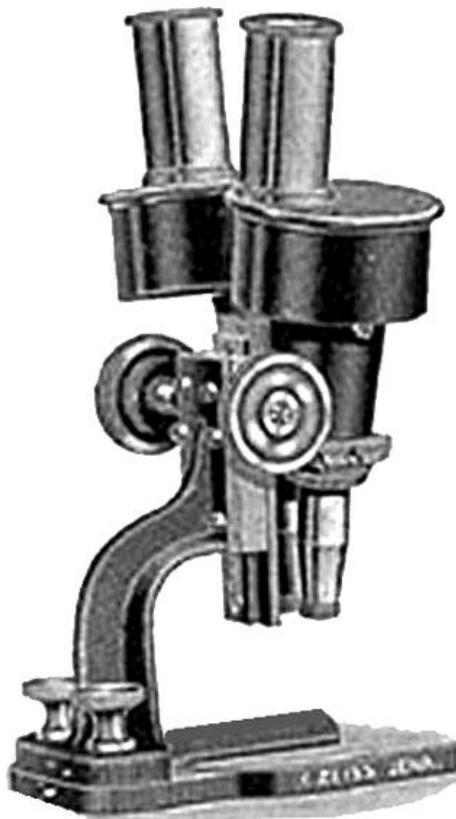


Figure 24. First Modern Stereomicroscope
Zeiss - Greenough Design c. late 1880s

A Greenough stereomicroscope uses dual Porro prisms (named after inventor Ignazio Porro). These internally reflective prisms are used to provide erect images to the eyepieces from light paths which pass through two adjacent objectives, as opposed to the single objective designs of Riddell and Wenham.

Today, Porro prisms are commonly used in microscopes and binoculars. Porro prism instruments are easy to identify owing to the relatively large telltale right angle turn in the viewing path.

Greenough stereomicroscopes are still widely use today. They provides images of objects that are not reversed as is typical with compound high power microscopes (Wade, 1998). Their design is derived from the monocular compound microscope, but here with dual paired microscopes working in unison.

Mr. Greenough was living in Europe at the time he designed his stereomicroscope. He met Ernst Abbe, of the Carl Zeiss Company, at a hotel in the university city of Jena, Germany in 1886. Greenough drew a, now famous, diagram of his stereomicroscope for Dr. Abbe.

At the time Zeiss was possibly Europe's leading microscope maker, and the timing of the meeting was fortuitous. Ernst Abbe was the world's leading expert on optics, and had become Zeiss' partner about a decade earlier in 1875. Dr. Abbe owned about 45% of the Zeiss company.

Stereo Microscopy

He had the technical abilities to understand and improve Greenough's concepts, and was in a position to insure its development.

Greenough microscopes are designed for relatively low magnifications and long working distances. They are typically provided with the capability to adjust the separation of both binocular tubes to accommodate the interpupillary distance appropriate for individual users.

As Marvin Reimer notes (Reimer, 1962), [Greenough] stereomicroscopes are low magnification instruments of necessity. Two objects cannot occupy the same space simultaneously. So, there is a physical limitation on how close the objectives can come to each other. That is, at some point they can be brought no closer.

Although the concept for Greenough's microscope was presented to Dr. Abbe in 1886, it took some engineering modifications before Zeiss produced the first commercial Greenough stereomicroscope in 1897, Fig. 24. This was known as the *Greenough double microscope of Zeiss design*.

The Zeiss company has continued the Greenough design for over 115 years. Zeiss catalogs for its Stemi (Stereomicroscope) series use the tag line, "*Conceived by Greenough, Realized by Zeiss*".

A discussion, including engravings, of a slightly later Zeiss Greenough stand, and an engraving of its light paths can be found in *The Journal of the Royal Microscopical Society* (RMS), (RMS, 1898).

The illustration of this microscope, Fig. 25, shows its debt to the first Zeiss Greenough, Fig. 24. It includes changes such as a one piece stand with substage mirror. It shows the hand-rests and relative dimensions of components of the microscope's body, and provides a link from the original Zeiss Greenough as it evolved to Zeiss Stands XA and XV, Figs. 26 and 32.

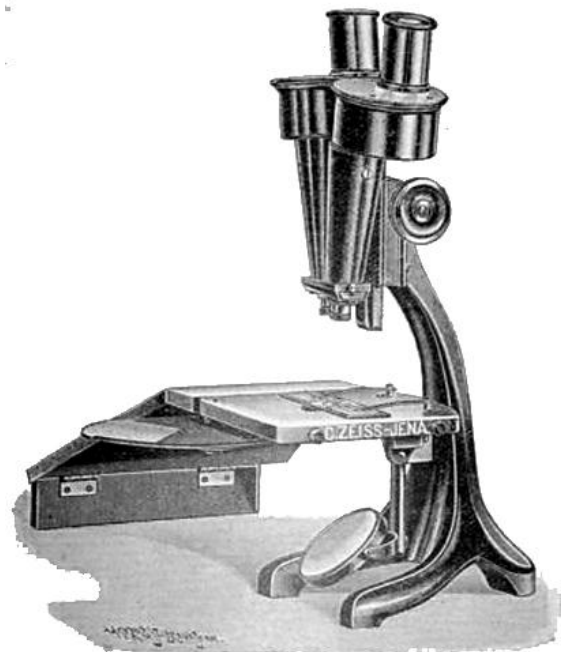


Figure 25. Fig 77 (RMS, 1898)

Fig. 26 shows a Zeiss, Jena stereo Greenough design about three decades later, c. 1930/31. Stand XA is one of the variations of Stand X which was sold in different configurations depending on use. Zeiss used the following designators for Stand X, **A** for upright (from German aufrecht), **b** for boom, and **c** for corneal stands.

Stereo Microscopy

Figure 26. Carl Zeiss, Jena Stand
XA, c. 1930/31



To quote from the Zeiss catalog of 1934,

In these [Greenough] binocular image erecting microscopes, two complete tubes, each with one objective and one eyepiece and inclined at an angle of eight degrees to the perpendicular, are combined into a "double tube" ... [T]he observer receives a stereoscopic impression of the object, whilst the exit pupil is fully utilized. ... The instruments of this class are principally intended for dissecting purposes at low magnifications ... With the necessarily small numerical aperture of the objectives, magnifications exceeding 100 X must, however, be considered empty magnification.

-- (Zeiss, 1934)

Zeiss notes that regardless of the configuration chosen for Stand X, all versions of this stand used the same double Greenough tubes (Zeiss, 1934). This Zeiss Greenough microscope, like the Bausch and Lomb Greenough of roughly the same decade, Fig. 27, is provided with removable, replacement objectives in its standard configuration.

Removable objective sets for Stand X was available in seven different objective magnifications. This Stand was also available, somewhat later, with a conventional-style triple turret, for purchasers comfortable with three magnification options. For these purchasers Zeiss modified this stand so that objective sets, shown here with Stand XA, could be used on a rotatable turret. Although this turret was, obviously an afterthought and looks "tacked on", it allows magnification changes to be made without the need to remove and replace objective sets.

Stand X was designed primarily for dissecting, so it's no surprise that hand-rests are provided in the standard package. The example here comes with three pairs of objectives 4x, 8x, and 12x that are similar in size to the same objective magnifications on Zeiss's Stand XV, Figs. 31 - 33. There are three pair of eyepieces, two Huygens 7x and 15x, and a surprisingly high magnification, 28x orthoscopic, high considering the low numerical aperture of this stereomicroscope's objectives.

Thus, depending on the combination of objectives and eyepieces, there are nine different possible magnifications, although some combinations provide only empty magnification. Considering the non-availability of computer-design lens software at the time of its design, Stand XA provides surprisingly sharp images. It comes with a pair of angled wooden hand-rests, the proximal edge of each connecting to the sides of the microscope's stage and the distal edges resting on the same surface the microscope rests on.

It allows for both incident light and transmitted light via a 70mm substage mirror. However, an external light source is required for incident lighting. The microscope is stored in a purpose-built wood case that holds the hand-rests, the three objectives pairs, and eyepieces.

Stand X was manufactured from 1926 to 1942. Because of their intended use as dissecting instruments, it is usual for stereomicroscopes made in the first half of the 20th century to come with detachable "hand-rests", such as shown here. These hand-rests are typically made of metal and wood, and occasionally all metal.

The Zeiss microscope in Fig. 26 rests on a horseshoe base, and provides coarse focusing via rack and pinion, adjustable using either the left- or right-side knobs. Although this is a Greenough stereomicroscope, it's apparent from its stage clips, stage opening, and substage mirror that its design owes much of its heritage to the biological binocular compound microscope. It has a relatively large and rotatable circular substage plate (not visible in the photo) that provides options for opaque white and black backgrounds, and an opening containing a short open cylinder to hold a condenser or other lens, as is common in biological microscopes. The Zeiss' 1934 catalog (Zeiss, 1934) shows Stand X with a slide on its stage, lending further support to assumptions of its biological compound microscope heritage.

This microscope in its case with accessories weighs 16 pounds 9 ounces, and without its case 7 pounds 2 ounces. It is approximately 13 inches tall as shown, and with its hand-rests attached about 19 inches wide. Clearly, this was designed as a benchtop instrument, rather than for field use.

The relatively low magnification of stereomicroscopes is accompanied by relatively low resolution, compared to higher power compound microscopes. However, this resolution loss is not an issue as more of an object is seen. That is, resolution reduction is balanced by an increased field of view.

Early 20th century stereomicroscopes closely followed Zeiss' Greenough design and were fairly popular, as can be confirmed by the extensiveness of contemporaneous advertisements, and the number of these instruments still available today on the used market.

One example is the Bausch and Lomb (B&L) Greenough microscope in Fig. 27. It is shown here with two pairs of detachable and exchangeable objectives. [Notice the B&L design is similar to the first Zeiss Greenough, Fig. 24, and later contemporary Zeiss Greenough microscopes Figs. 25 and 26.]

In 1929 the price of this B&L microscope with one pair of 40mm objectives and 10x eyepieces was USD \$126, with a second pair of objectives \$149.50, and with a set of three paired objectives \$177.50.

To provide an additional sense of the size and weight of these early Greenough designs, the B&L Greenough Microscope shown in Fig. 27 is, approximately 13" tall and weighs 9 pounds. It is slightly heavier than the contemporary Zeiss Stand of Fig. 24. It comes with a substage mirror

for transmitted light. As with the Zeiss models discussed previously, external illumination is required for incident lighting.

To assist in size and weight comparisons, it is helpful to compare this B&L to an early J Swift and Son brass stereomicroscope of the Riddell-Stephenson design. The Swift stereomicroscope, based on the Riddell-Stephenson design, preceded this B&L by almost three decades. The Swift microscope is approximately 14-1/2" tall and weighs 6 pounds 11.8 ounces, obviously both larger and heavier than the B&L stereomicroscope above. It also provides a dual turret, so magnifications can be changed without having to remove and replace objectives.

Stereo Microscopy



Figure 27. B&L Stereo
Greenough Microscope
Model KA c. 1929

Stereo Microscopy



Figure 28. Photograph through B&L Greenough Microscope

Fig. 28 is a photograph through the microscope in Fig. 25, with its 55mm objectives mounted. It shows a portion of the Treasury seal on a U.S. one dollar bill. It represents one of the applications, i.e., checking for counterfeit currency, for which these microscopes were used.

As can be seen from the picture, images through this over 80 year old microscope still come into sharp focus, with good contrast, and are reasonably flat across the full field of view.

Bausch and Lomb also marketed a range of stereomicroscopes using drum-like turrets rather than the replacement objectives option of Fig. 27 in their 'K' style stereo instruments. These were available with either tilted or untitled body tubes Figs. 29 and 30, and Allen (Allen, 1940) show pictures of some B&L K style stereomicroscopes. These instruments were sold for, perhaps, three decades, with only modest changes over time.

Stereo Microscopy



Figure 29. - B&L Model
BKT-5 with Stand B,
rotating turret, and tilted
eyepiece tubes, c. 1950,

Stereo Microscopy



Figure 30. B&L stereomicroscope AKW-5 with Stand A and non-angled eyepiece tubes, c. 1940

Stereo Microscopy



Figure 31. Zeiss Stand XV objectives detail

Greenough-style stereo instruments use paired dual microscopes, each with their own objective. Thus, the standard-style nosepiece used on a traditional compound microscope when used on a Greenough stereomicroscope has a larger diameter to hold the dual objectives needed for each magnification change. In spite of these size considerations, a number of companies used traditional-style turrets.

The Zeiss Stand XV, c. 1930s, uses a standard-style, and quite large, quadruple turret with four pairs of objectives, Fig. 31. As expected, this turret design on a stereo instrument makes the microscope's width significant, and gives it a unique and unmistakable appearance. There were only 730 copies of Stand XV made between 1934 and 1942 (Gubas, 2008, 2012).

Although some Stand XVs may have been destroyed during World War II, or lost to natural attribution over time, others exist and I would be pleased to receive information about them.

With its metal hand-rests attached, the Stand XV's stage and hand-rests are somewhat reminiscent of a Klingon *Bird of Prey* warship from the TV and movies series *Star Trek*, Fig. 32. While developed for function, this Stand is also, in my opinion, an attractive work of modern art and design.

The example shown here has four pairs of objectives with 2x, 4x, 8x, and 12x magnifications. It comes with two sets of eyepieces, 8x and 12x. It is housed in a wood case with built in storage areas for the microscope, its hand-rests, stage plates, and extra lens sets.

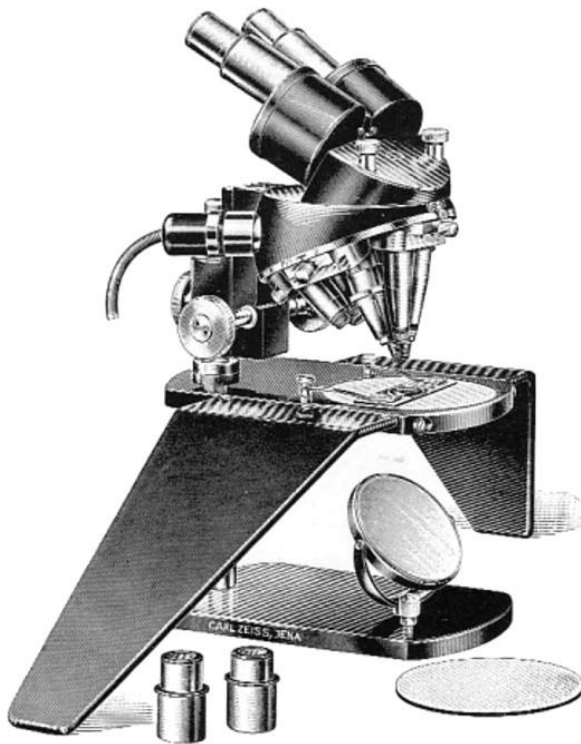
On page 19 of the Zeiss catalog of 1937 (Zeiss, 1937), here Fig. 33 (left), there is an engraving of this model with accessories and attached electric illumination, where this model is identified as a *Stereoscopic Dissecting Microscope Stand XV*. In Fig. 33 is a page from an old CZJ Technical Handbook, discussing this microscope and presenting the same engraving in smaller format. Here the microscope is identified in German.

Stereo Microscopy



Figure 32. Zeiss Stand XV

Stereo Microscopy



Stereoskopisches

Präparier-Mikroskop XV



mit Schrägeinblick und
erweitertem Gesichtsfeld
bestehend aus
schrägem Doppeltubus auf vierfachem Objektiv-
revolver,
mit eingebauter Beleuchtungsvorrichtung für
auffallendes Licht,
durch Zahn und Trieb verstellbar,
an Säulenstativ mit viereckigem Tisch und
Spiegel, einschl. je einer einlegbaren Metall-
und Glaschale,
5 Armstützen und
5 mattenen Glühbirnen,
in Erkenholzschrank RM 380.—

23541

Objektivpaare						Okularpaare mit erweitertem Gesichtsfeld			
2x	4x	8x	12x	17x	21x	6x	8x	12x	18x
28.—	30.—	30.—	36.—	44.—	42.—	20.—	28.—	28.—	30.—

Elektrisches Anschlußgerät für die Beleuchtungseinrichtung:

- a) für Wechselstrom:
1. **Fester Transformator** mit Schalter und Anschlußkabeln für 110 oder 220 Volt RM 35.—*
 2. **Regulierbarer Transformator** mit Medokala, Schalter und Anschlußkabeln für 110 oder 220 Volt RM 51.—*
- b) für Gleichstrom:
- Regulierbarer Widerstand** mit Schalter und Anschlußkabel für 110 oder 220 Volt RM 39.—*
- Ersatzlampen** 8 Volt, 0,8 Amp. matt RM 1.70*

Vergrößerungstabelle *

(Vergrößerungen über 100 sind locale Vergrößerungen)

Objektivpaar	6		8		12		18	
	Vergr.	Schfeld mm	Vergr.	Schfeld mm	Vergr.	Schfeld mm	Vergr.	Schfeld mm
2	12	13	16	12	24	9	36	6
4	—	—	32	6	48	4,5	72	3
8	—	—	—	—	96	2,25	144	1,5
12	—	—	—	—	144	1,5	216	1

Druckschrift: Mikro 510

Figure 33. Engraving of Zeiss Stand XV, and page describing this microscope from old CZJ handbook. Both are shown courtesy and with permission of Carl Zeiss Microscopy, LLC

Stand's XV's unenclosed objectives,, Fig 32, which are similar to other contemporary manufacturer's models, possibly made them less stable than the enclosed, and better structurally supported, later objective pairs that followed, Fig. 34. However, my Stand XV's objective sets show no signs of instability.

Perhaps, because of its large size, relatively high price, and limited sales, Zeiss discontinued production of the Stand XV after the war.

American Optical (Spencer Lens Company)

The American Optical (AO) Company and the C. A. Spencer & Sons Company started as independent entities. AO began in 1833 as an eyeglasses manufacturer in Southbridge, Massachusetts. Charles A. Spencer began in the late 1930s as, perhaps, the earliest successful American microscope manufacturer, working initially out of Canastota, New York and after a number of moves out of Buffalo New York. New York state was also the home of the Bausch and Lomb Optical Company. In 1935 AO bought the Spencer Lens Company, and after this purchase many of their microscopes carried the AO Spencer designation, eventually changing to simply AO.

A less ambitious and more traditional standard-style turret was used by the AO Spencer Company on their AO Series 25, Fig. 34, and AO Series 26, Fig. 35 Greenough microscopes. These microscopes were (are) available (used) with double or triple objective sets on a revolving nosepiece. Both series were originally sold with either vertical or inclined binocular bodies. Series 25 is similar to Series 26, noting that Series 25 had all of the following available: detachable horseshoe base, mirror folk, and hand-rests fitting into horizontal cutouts in the stage (see Fig. 34). Slits for hand-rests were also available on Series 26 stereomicroscopes. Series 25 and 26 are identical, except for the detachable horseshoe base, AO #24, and its associated components that are supplied with the Series 25.

Their turret design was, perhaps, less popular than the later drum-style turrets, Figs. 29 and 30, which allowed for a smaller and, arguably, more attractive microscope. However, standard-style turrets were used by a variety of stereomicroscope manufacturers. The AO Series 25 and 26 provided height adjustment thumbscrews, in addition to the normal rack and pinion adjustment, to allow taller objects to be examined. The Series 25 came in a larger storage case. Both AO models were available without substage apparatus, as objects were most often examined by reflected rather than transmitted light. This is also the reason that many stereomicroscope are found without slide clips, as they were not commonly used for the examination of slides.

Stereomicroscopes using standard-style turrets are still manufactured with dual sets of objectives. Dual objective magnifications on a stereomicroscope allow for a nosepiece relatively similar in size to a quadruple nosepiece on a compound microscope. Stereo objectives, on later microscopes, are often surrounded by protective metal housings, Figs. 34 and 35.

American Optical (AO) also made the Series 27 Greenough microscope, Figs. 36A and B, in both black and gray. The Model 27s were relatively unique, in having a body with two rack and pinion focusing assemblies. The Series 27 stereomicroscope can incline 90 degrees vertically around a built-in joint, allowing it to view objects from the side, e.g., aquariums or terrariums. It came with paired eyepieces and objectives, as with Series 25 and 26.

This Series also provides a slide holder immediately below the objectives as the microscope has no stage. This slide position is sometimes used to protect the objectives, by placing a small glass slide in this position (see left microscope in Fig. 36B). The Model 27 weighs about 9 pounds 10 ounces. It is, thus, a relatively heavy instrument as are most of its cohorts. With 10x eyepieces and a 2x objective. It provides a working distance of 79mm with an associated field diameter of 10mm.

Stereo Microscopy



Figure 34. AO Model 25GL, Courtesy, and with permission of, Jay Stanley, and Classic Optics

Stereo Microscopy



Figure 35. AO Model 25 in Black, with thumb screw height adjustment clearly visible, and with AO Number 24 detachable horseshoe base unit and mirror. If this base were detached, this would be an AO Series 26 stereomicroscope

Stereo Microscopy



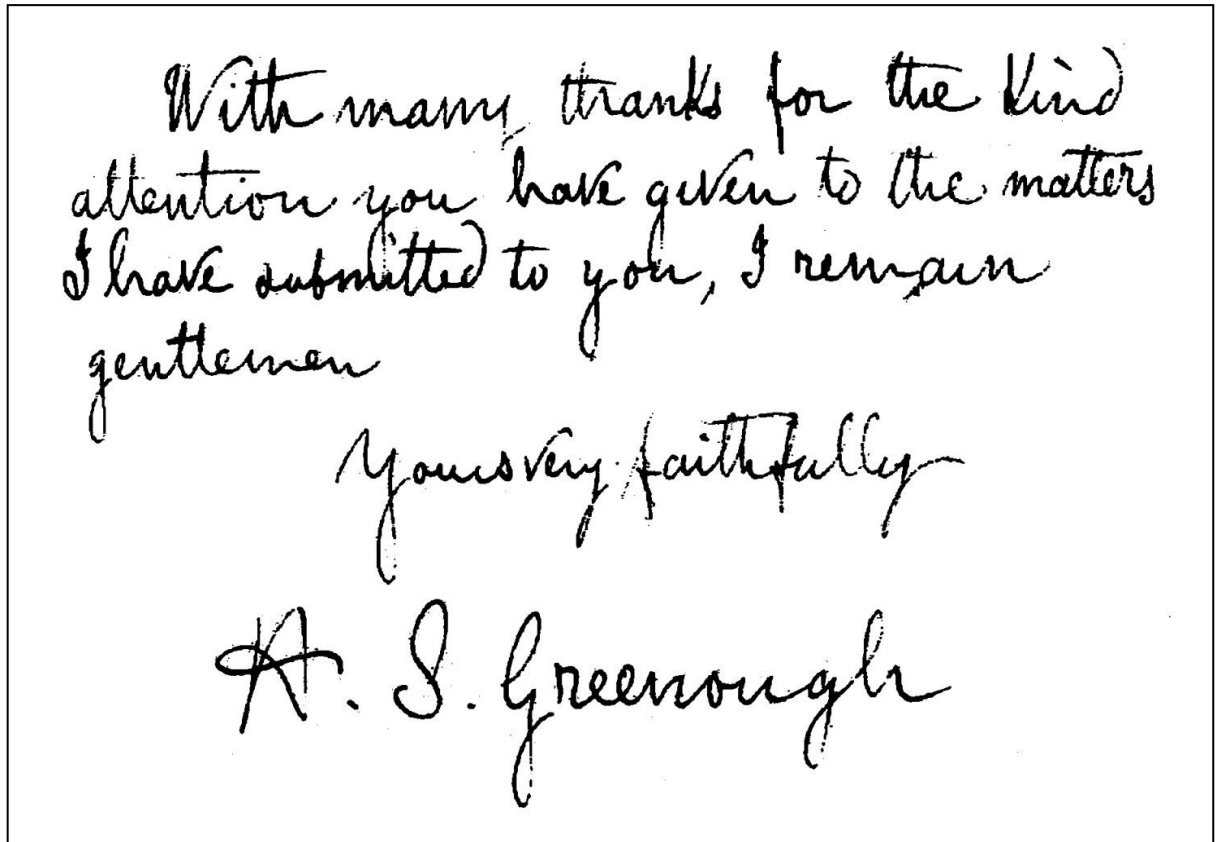
Figure 36A. AO Model 27, with 90 degree rotation around vertical axis. c. 1952

Stereo Microscopy



Figure 36B. AO Model 27s in gray showing the value of dual adjusting knobs for examining either small or large objects.

Fig. 37 shows the last paragraph of a hand-written note, including signature, from Horace Greenough to Zeiss, c. 1890s.



With many thanks for the kind
attention you have given to the matters
I have submitted to you, I remain
gentlemen
Yours very faithfully
A. S. Greenough

Figure 37. Horatio S. Greenough signature from one of his letters sent to Zeiss. c. 1890s
Courtesy of Herr Berndt-Joachim Lau, Carl Zeiss Microscopy GmbH (Lau, 2012).

Greenough microscopes provide excellent 3D images, and with modern computer-designed objectives and eyepieces have wide fields and high resolutions. Greenough's stereomicroscopes in addition to general use have also been designed as instruments for use in specialized applications. Some of these applications are discussed below.

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The author welcomes any suggestions for corrections or improvement.

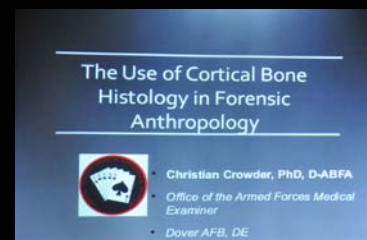
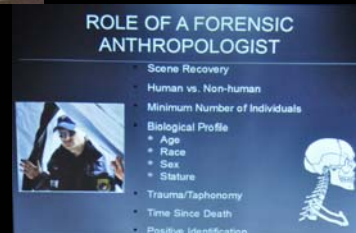
He can be reached at R. Jordan Kreindler: leona111@bellsouth.net

Some Comments on the Presentation at NYMS by Dr. Crowder on 225-May-2013

I enjoyed the lecture by Dr. Crowder very much - he is very knowledgeable and well spoken. The topic was more in my area with regards to homicide and death investigations so his presentation, for me, was very interesting. I like that NYMS is bringing in a variety of lecturers from different fields and interests in microscopy. *Andrew Winter*

I thought it was excellent. The "trialogue" between the pathologists enlivened things a lot, and if the human interest and the photos and sample prep and histological science and sophisticated techniques using little more than we already have in our own NYMS facilities were not engaging enough, that ongoing exchange really enriched the presentation. I wish we could always have presenters who were so obviously at the top of their fields and of their form. *John Scott*

In my opinion, the presentation was very well balanced for a general view of the subject material. I thought the imaging was superb. Dr. Crowder has a very relaxed way of speaking which promotes questions, which he answers honestly, in a friendly manner and without hesitation. I would enjoy having him back for another more in depth presentation now that we have been properly introduced to his world. *Mel Pollinger*



Summer Picnic 2013

**Where: At the home and Gardens
of Jan and Wiebke Hinsch.**

6 Willow St, Woodcliff Lake, NJ 07677

Home: 201-573-9851

Cell: 201-574-6522

When: Sunday July 28, 2013

Noon to 5:00pm

Cost per person: \$35.00



This is also a “Permanently Moving to Florida” party for Don and Stacey O’Leary. Don is a NYMS past President and has been our Curator, Education Chair and Building Manager for many illustrious years. He is also responsible for acquiring our permanent location for NYMS in Clifton, N.J.

In case of rain, we will move the picnic indoors. In the event of sunshine, we will remain outdoors and have a wonderful time enjoying the gardens and some microscopically interesting subjects. Bring a camera; the flowers and various other plants are stupendous. There will be many things to enjoy.

**Invitation Request Form for:
Summer Picnic hosted by Jan & Wiebke Hinsch
Sunday July 28, 2013, Noon to 5:00 pm**

Cost \$35.00 per person

NYMS Member Name: _____ bringing a guest? ___ Y/N

Phone (H) _____ Email H) _____

**Complete this form and send with payment to:
NYMS Picnic, c/o Mel Pollinger, 18-04 Hillery Street, Fair Lawn, NJ 07410-5207**

Please respond by July 23, 2013

Directions to The Home of Jan & Wiebke Hinsch

Jan and Wiebke Hinsch, 6 Willow St, Woodcliff Lake, NJ 07677
201-573-9851, cell phone: **201-574-6522**

Coming from NYC via G. Washington Bridge:

Follow Rt 80/95 and make sure to stay on 80w when 95 branches off south. Go to exit 62 (Saddlebrook/Garden State Pkwy) and follow signs to GS Pkwy north. Take exit 168 to Washington/Hohokus. At the end of the ramp turn right on Washington Avenue and proceed to the first traffic light and turn left onto Pascack Rd. Pass through one traffic light and one blinking light. Soon you will see a church on the right (as a landmark) that looks like an upside-down mushroom. Pass it and go through a downhill right curve. At the bottom you have the Woodcliff Lake reservoir on your right. And here the second little street branching off to the left is Willow St with a willow on the corner. Ours is the first house on the right.
Total distance from exit 168 to our house ca. 2.0 miles

Coming from Tappan Zee Bridge:

Follow 87/287 west to exit 14a which is the entrance to the Garden State Pkwy south. Go to first exit (Schoolhouse Rd) and at the end of the ramp turn left into Spring Valley Rd. Take it through two traffic lights and all the way to the end (T) and turn left onto Fremont Rd. Go about ½ mile to the end (T) and turn right into Pascack Rd. After crossing a traffic light you soon see the Woodcliff Lake reservoir on your left. Third street on the right is Willow St. We are the first house on the right.

Coming from South on Garden State Parkway:

Going North on the Garden State Parkway take exit 168 to Washington/Hohokus. At the end of the ramp turn right on Washington Avenue and proceed to the first traffic light and turn left onto Pascack Rd. Pass through one traffic light and one blinking light. Soon you will see a church on the right (as a landmark) that looks like an upside-down mushroom. Pass it and go through a downhill right curve. At the bottom you have the Woodcliff Lake reservoir on your right. And here the second little street branching off to the left is Willow St with a willow on the corner. Ours is the first house on the right.

Total distance from exit 168 to our house ca. 2.0 miles

We don't have air/con but shady places to relax. Please, dress appropriately. For questions email:

wihinsch@optonline.net

Here are directions for public transportation:

At Port Authority bus terminal take the bus # 11A from platform 220.

The bus runs every hour, 10:15; 11:15; 12:15...

The ride is about 55 to 60 minutes to Hillsdale RR-station (maybe little less on Sundays!). From there you have to call us:

201-573-9851 or cell: **201-574-6522** to be picked up. It's a short ride, but too long to walk. At the little light blue railroad building is a public phone.

The ride is half price for seniors if you get a booklet of blue Reduced Fare Coupons issued by NJ Transit (free!) at the information booth inside the terminal. The tickets can be purchased in the bus ~\$3.60 one way.

Can't wait to have you here!
Wiebke and Jan

ISCS SANDFEST 2013



www.gamineral.org

www.tellusmuseum.org

www.sandcollectors.org

The Georgia Mineral Society, Inc. and Tellus Science Museum are pleased to announce that we will be co-hosting the International Sand Collectors Society **SandFest 2013** at the Tellus Science Museum in Cartersville, Georgia.

November 21 through November 24, 2013

Symposium
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www.iscs.sigmabookstore.com

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N.Y.M.S. Microscope Covers

Item #	Size	Member Price	List Price
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MT-004	Lab Microscope or Large Stereo	\$23.00	\$25.00
MT-005	Large Lab Scope	\$28.00	\$30.00
MT-009	Large Lab Scope with Camera	\$31.00	\$33.00
MT-010	Universal Scope with Camera	\$36.00	\$40.00
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185	Monocular Dissecting Microscope	\$85.00	\$99.00
131	H.S. Student Microscope	\$190.00	\$245.00
131-FLU	H.S. Student Microscope (Fluorescent)	\$200.00	\$255.00
125-LED	H.S. Student Microscope (LED)	\$240.00	\$309.00

Other Items

NYMS Glossary of Microscopical Terms	\$20.00
NYMS Patch	\$5.00
Microscope Cleaning Kit	\$35.00
NYMS Lapel Pin	\$10.00



Model 131

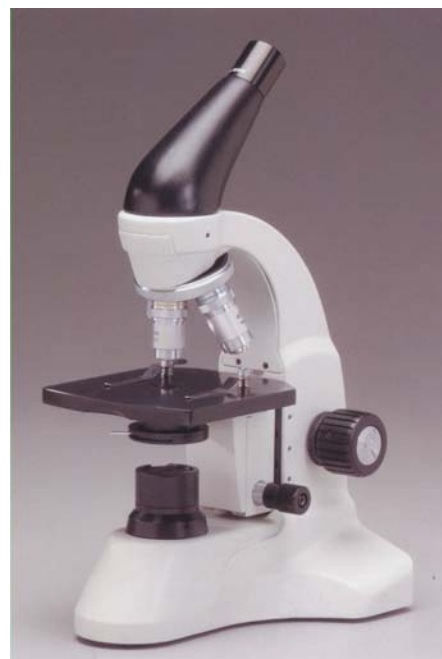
Model 131: Tungsten

Model 131-FLU: Fluorescent



Model 185

Model 185: 20x



Model 125-LED Cordless



New York Microscopical Society

Return to: **Mary McCann**
161 Claflin Street
Belmont, MA 02478

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I hereby apply for membership in the New York Microscopical Society.

Name: (Dr., Ms., Mr.) Nickname
Home Address

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Would you prefer to receive NYMS mail at home ☐ At work ☐ By e-mail (best way) ☐
Principal work or interest in Microscopy

On what topic are you available as a speaker?

Would you like information about NYMS committees? Yes ☐ No ☐ Awards ☐ Membership ☐
Education ☐ Library ☐ Finance ☐ Curator ☐ Housing ☐ Program ☐ Publications ☐ History ☐
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Scientific Publications

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Date of birth (optional if over 18)

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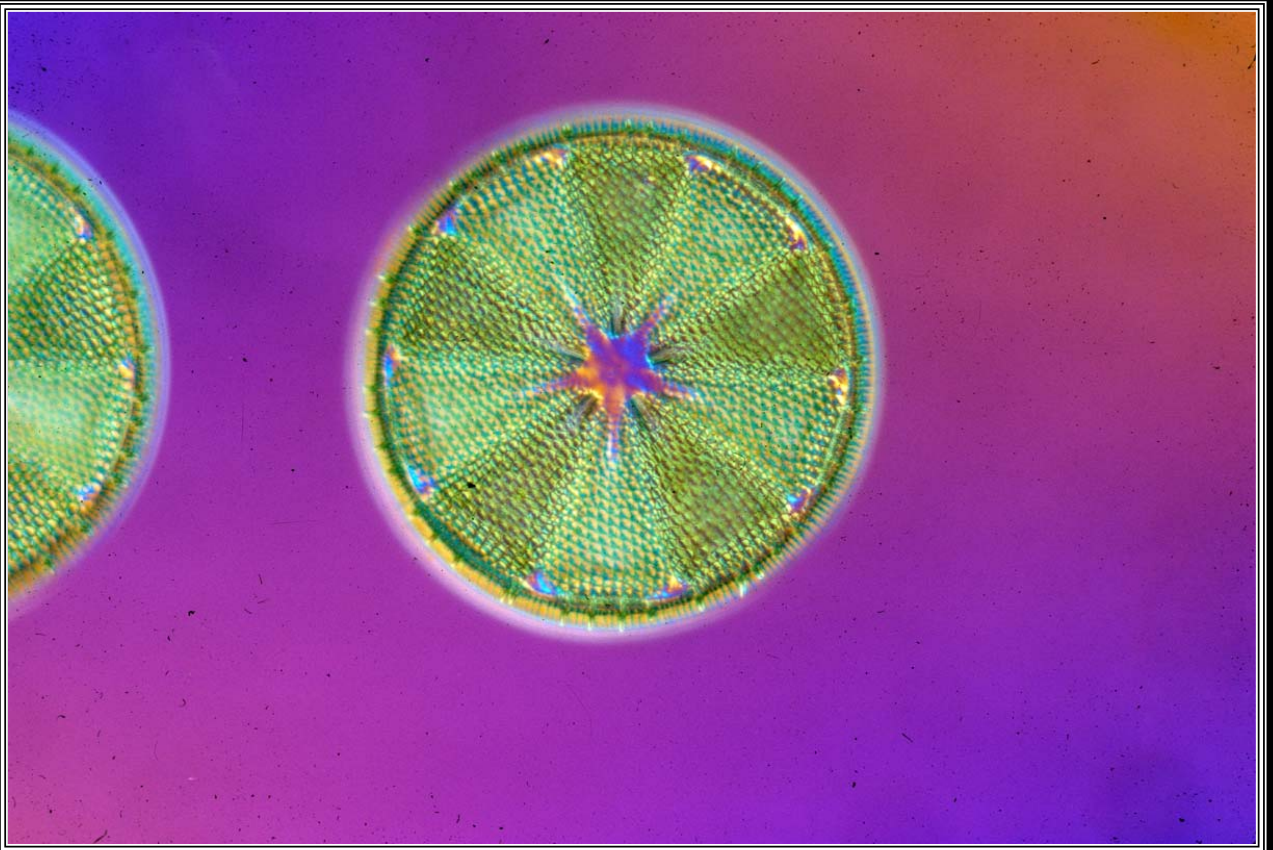
I would prefer my home ☐ work ☐ address/ phone included in the NYMS Directory.

Signature Date

NYMS Headquarters: One Prospect Village Plaza, Clifton, NJ 07013 Telephone (973) 470-8733



Urea, Polarized light, 50x (P1203014)a – Mel Pollinger



Diatom: Actinopterychus heliopelta, D.I.C., 53x - Eric Grave