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

Nov-Dec 2011 **N.Y.M.S. (973) 470-8733** **Volume 5 (25) Number 9**

NYMS Banquet 2011 at Landmark Tavern

Peter Diaczuk receives Ashby Award

Landmark Tavern at 46th St & 11th Ave., NYC

Angela Klaus made Fellow of NYMS

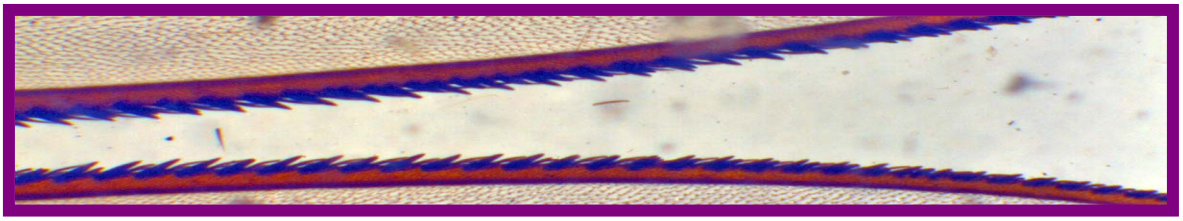
Craig Heummer & Gary Mayer (both not present) were also made Fellows of NYMS

Seymour Perlowitz made Fellow of NYMS

Guy deBaere made Fellow of NYMS

John Scott made Fellow of NYMS

Wing edges of Blowfly, 40x – image by Mel Pollinger



Save a Tree: Get The Newsletter By Email – It's Faster!

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

Dues and Addresses
Please remember to mail in your Dues to Mary McCann, Membership Chair (see this page for address).

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 and me if you have changed your address, phone or email.

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.

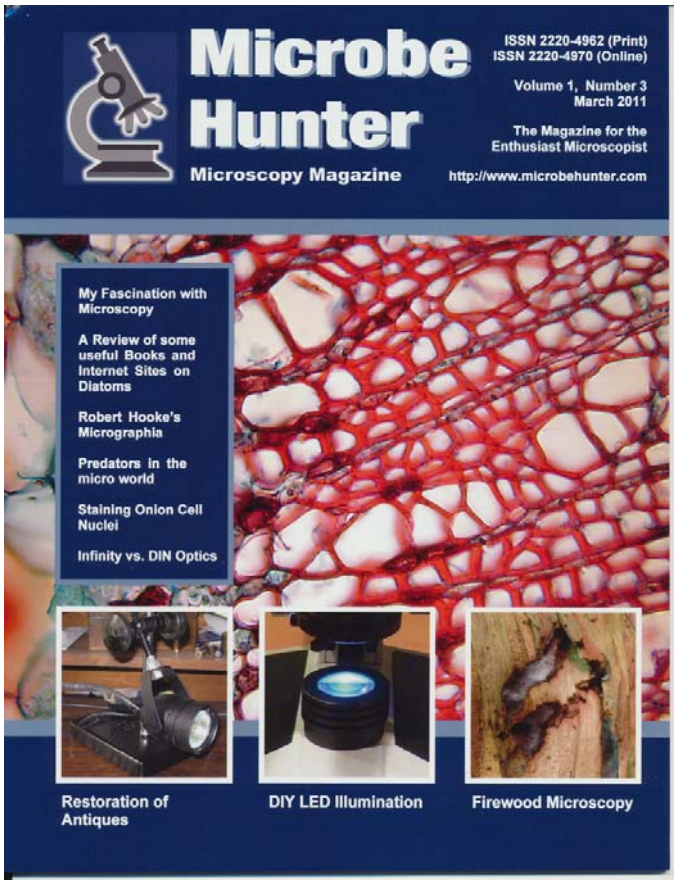
Alternate Meeting Notifications
Please note that due to time constraints in publishing, some meeting notices may be available by calling Mel Pollinger at 201-791-9826, or by visiting the NYMS website.

****

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.

Buy and Read a Good Book on Microscopy.

New Microscopical Magazine



Microbe Hunter Microscopy Magazine became available in January 2011 . NYMS has volume 1, number 1-11 for 2011 with number 12 to be ordered. It is produced as a downloadable pdf file and also a printed version; the cover of the March 2011 issue is shown above. I suggest you inspect the printed version at NYMS before making an ordering decision. My own opinion of this magazine's physical attributes is as follows: Very high quality printing on heavy glossy paper pages with color images comparable to professional magazines. The covers are of high quality glossy card stock and also high quality printing.

What's inside are well-written articles on microscopes, visible-light microscopy and imaging by various contributors. The magazine is be written for the microscope enthusiast in easy-to-understand language with excellent image printing. The articles appear to assume the reader has somewhat more than basic knowledge of microscopes and microscopy. In my opinion, the magazine is both quite educational and equally entertaining.

www.microbehunter.com

Mel Pollinger

****

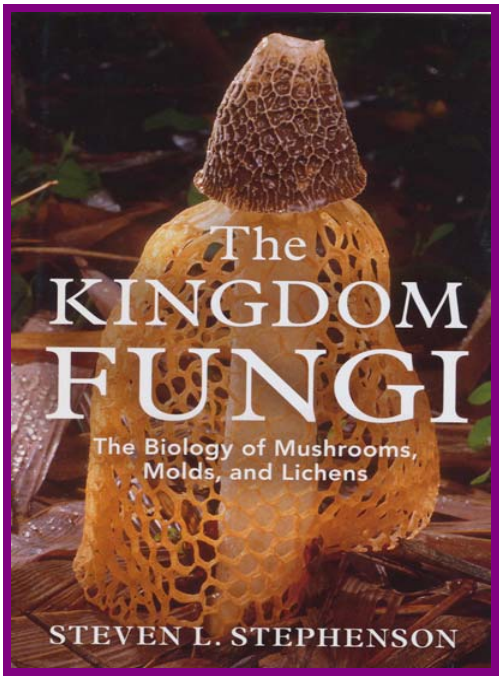
NYMS Booth at EAS 2011

Mel & Phyllis manning the booth

Student group and Dr. Brettel from Cedar Crest College, Allentown, PA

****

New Book in NYMS Library



Well written, superb graphics and loads of information. Come to Clifton and read it.

****

Some Sad News

Past President Pauline Leary's mother recently passed away. We offer Pauline and her family our heartfelt condolences.

Need to use a Microscope?

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

NYMS Open Tuesday Evenings by appointment only.NYMS Headquarters at Clifton, NJ will be open to members from 8:00pm to 10:00 pm most Tuesday evenings. Those members wishing to visit must call Don O'Leary to confirm. Don's cell-phone number is (201) 519-2176.

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).

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

Answer to Mystery Photo for October 2011

The image is that of bear bone trabeculae and was taken using a Leica M205C stereoscope with incident illumination at about a 45 degree angle to the bones' surface. Bone trabeculae are the bony spicules within spongy bone tissue that contain the marrow. The image came up while Imaging tool marks in bone. The marker at the lower left of the image = 1.0 mm.

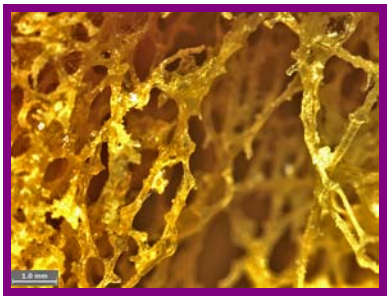
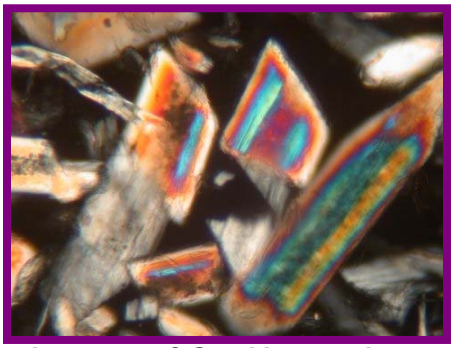


Image by Ms. Rebecca Smith.

Correctly guessed by Seymour Perlowitz

****

Mystery Photo for Nov-Dec 2011



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

EASTERN ANALYTICAL SYMPOSIUM & EXPOSITION

Supporting Member

Directions to NYMS Headquarters

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

GPS: Intersection of Colfax & Mt. Prospect: Latitude 40.8656 N, Longitude 74.1531 W

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 ProspectAve.. 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

Photos Taken at The NYMS Banquet 2011

Photos Taken at The NYMS Banquet 2011

NYMS Booth at EAS 2011

Dear NYMS Member,

Dues Are Due in January

NYMS Membership dues for 2012 are now payable. We are in the process of setting up a full program of speakers, courses, workshops and celebrations at our Clifton headquarters in 2012. NYMS values your support and participation.

Please make sure to include your current email address. Email communications are particularly useful for announcing any short-term program changes, and provide convenient means for sending supplementary materials. In addition email saves paper and postage - and saves you space. If you have a web site related to your microscopy interests please let us know – we'll add it to the roster.
And--Please include any of your Contact information that has changed in the last two years.

NYMS MEMBERSHIP CONTACT INFORMATION
Name:
Email address: (please print clearly) _____
Address for Newsletter? Email :__Y/N Home _____
Work _____
Microscopy Related Website _____

Address:
Telephone: Work_____ Home:_____

Microscopy interests:
I do Light ____Electron _____ Other (what?) _____ microscopy
I use microscopes at Work _____ Home_____
I use microscopes for Research _____ Teaching _____ QC _____ Hobby _____ other _____
Mostly I view specimens that are: Biological ___ Industrial _____ describe? _____
Or Other (what?)
I also enjoy viewing (what?)_____
In microscopy I am a Professional _____Amateur _____ Beginner_____

Are you interested in working on NYMS Committees? Awards ____ Membership ____ Education ____ Library ____ Finance ___ Curator ___ Program ____ Publications ____ History _____

Checks should be made out to NYMS. Updated contact information may be included with your check to the address below, or it may be sent by email to me at mccanns@tiac.net,
Mary McCann
Regular Membership: $30 per year. Supporting Membership: $60 per year. Life Membership is $300, payable within 1year Corporate Membership: $175
Junior Membership (18 or under): $10
Student Membership (over 18 & a student) is $20

Thank you for your response!

Mary McCann
NYMS Membership Chair
161 Claflin Street
Belmont MA 02478

N.Y.M.S Microscope Covers

Number	Size	Member Price	List
MT-003	Small Microscope or Stereo	$ 18.00	$ 20.00
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
MT-012	X-large Scope	$ 45.00	$ 50.00

N.Y.M.S. Microscopes

Dissecting Microscope	$ 59.00	$ 99.00
H.S.Student Microscope	$169.00	$199.00
H.S.Student Microscope (Fluorescent)	$179.00	$215.00
H.S.Student Microscope(L.E.D.)	$199.00	$240.00

Other Items

N.Y.M.S. Pens	$ 5.00
N.Y.M.S. Glossary	$ 20.00
N.Y.M.S. Paperweight	$ 12.00
N.Y.M.S. Patch	$ 5.00
N.Y.M.S. Lapel Pin	$ 10.00
N.Y.M.S. Microscope Cleaning Kit	$ 35.00

Scientist From Malvern Instruments Receives Prestigious Award For Outstanding Contributions To The Science Of Microscopy

Dr E. Neil Lewis, Chief Technology Officer at Malvern Instruments can now count the prestigious Ernst Abbe Memorial Award of the New York Microscopical Society among his accolades.

He received the award, presented in recognition of his outstanding contributions to the science of microscopy, on 17 November 2011 during the 50th Eastern Analytical Symposium & Exposition in New Jersey, and he joins a list of previous recipients who have made significant contributions to the field. Dr. Lewis is being recognized specifically for the development of chemical imaging microscopy.

The Ernst Abbe Memorial Awards session was chaired by Dr. John A. Reffner from John Jay College and Dr Lewis's plenary lecture covered morphological and Raman spectroscopic measurements of complex heterogeneous materials.

Malvern Instruments scientist receives Ernst Abbe Memorial Award at 50th anniversary of the Eastern Analytical Symposium

Prior to his award presentation, visitors to EAS 2011 had an initial opportunity on Tuesday afternoon to hear Dr Lewis discuss the physical and chemical heterogeneity of biopharmaceutical products using imaging, light scattering and vibrational spectroscopy. His colleague, Dr Linda Kidder from Malvern's Analytical Imaging team, also spoke about 'Combined Particle Analysis and Raman Spectroscopy of a Nasal Spray: Chemically-Confirmed API Particle Size Distribution' on Wednesday morning.

Paul Walker, Managing Director of Malvern Instruments said: "To be marked out as having an influence on the development of a field as important as microscopy is a significant accomplishment, and it is a privilege at Malvern that we can count such exceptional scientists as Neil Lewis among our team. I am delighted to add my

congratulations to him on this prestigious award."

Neil Lewis received his PhD in Chemistry from the Polytechnic of Wales in the UK and did his postdoctoral fellowship at the National Institutes of Health (NIH) in the Laboratory of Chemical Physics in the USA. He was tenured by the NIH in 1992 and subsequently held the position of Senior Biophysical Researcher. In 1999 he left to lead a new effort in developing chemical imaging systems as a Founder and President of Spectral Dimensions, Inc (SDI); the company was acquired in July 2006 by Malvern Instruments.

Dr. Lewis is the author of more than 70 peer-reviewed scientific papers, patents and book chapters. He is the recipient of numerous awards which include the Meggers Award in 1992 and again in 1994, presented by the Society of Applied Spectroscopy; the Heinrich Award in 1995, presented by the Microbeam Analysis Society for Outstanding Young MAS Scientist; the Outstanding Contribution to the Physical Sciences Award in 1997, presented by the Washington Academy of Sciences and the 2004 Williams-Wright Award presented by the Coblentz Society. In 2007 he was honoured by the University of Glamorgan in Wales with the award of an Honorary Doctorate of Science for his contribution to science and innovation. In 2009 he received the Anachem Award from the Association of Analytical Chemists which recognises an outstanding analytical chemist who has advanced the art and science of the field. He is a Fellow of the Society of Applied Spectroscopy and a Fellow of the Royal Society of Chemistry.

MODERN MICROSCOPY JOURNAL

Microscopy in the Home Shop : Constructing a Scanning Light Photomacrography System

by Ted Clarke

Sunday, March 13, 2005 (revised 6/10/2006)

All images appear at the end of the article.

I was amazed by the scanning light photomacrography images Jim Gerakaris showed in his Inter/Micro-84 presentation a "Second Look at Scanning Light Photomacrography". My own talk on "Method for Calculating Relative Apertures for Optimizing Diffraction- Limited Depth of Field in Photomacrography" complemented Jim's talk by demonstrating the limitations of conventional photomacrography even with the aperture diaphragm stopped-down so much that the loss in image detail started to become visible.[1] Jim's talk was my first exposure to the apparently unlimited depth of field with the Dynaphot scanning light photomacrography system.[2] My article on photography of fractured parts and fracture surfaces in Volume 12 of the ASM Handbook includes a description of the Dynaphot and comparison fractographs taken with and without scanning.[3] This article also includes a table and graph based upon my optimum aperture analysis. The front cover of the Dynaphot sales brochure has a spectacular scanning light photomacrograph by Darwin Dale of the head of a fly, shown in Figure 1. The Dynaphot and its operating principles are well explained on the second page of the brochure, shown in Figures 2 & 3. There is some confusion caused by the brochure's diagram in Figure 3, which claims that the specimen is scanned vertically through a thin sheet of light. The patent drawing by the inventor of the method, Dan McLachman Jr, clearly shows in Figure 4 that the beam of light from the slit lamps converges to a minimum thickness where it intersects the optical axis of the camera objective.

The effect of the illuminating beam converging and diverging at the edges of the field being recorded and the diffraction limited minimum beam thickness at the center of the field was the subject for my later publication of a mathematical analysis of the scanning method including a photograph and description of a scanning illumination system of my own design to be used on my very robust and precise photomacrography stand.[4] This stand is intended for use in photographing parts and fracture surfaces of significant weight and is based upon restored components of an early twentieth century bench-lathe. The stand with the completed scanning light system is shown in Figure 5. A microscope eyepiece adapter with a 10X high eyepoint eyepiece is shown mounted in place of a parfocal Olympus 35 mm camera back. This eyepiece adapter was initially intended as an aid in viewing the fine details and as a relay lens for an eyepiece-mounted Nikon Coolpix 995 digital camera to be used for test exposures prior to final recording on film. I was pleasantly surprised to find that the test exposures with the digital camera were of high quality, even with the shutter held open on B (bulb) setting for 12 second scans. Figure 6 is a scanning light photomacrograph of the head of a house fly taken with this now completed system. The 35 mm film camera would record a much larger field area at somewhat higher resolution than the digital camera.

My photomacrography stand initially used the Olympus Auto Bellows, except for the bellows rail. The gray cast iron, double dovetail sided bellows rail for my stand is somewhat longer than the Olympus aluminum rail and held at both ends in sliders. These sliders mate with the guiding surfaces of the lathe bed vertical column for coarse adjustment of the bellows rail position using the long feed screw shown in Figure 7. These sliders are locked to the lathe bed before the adjustment for final focus is made with the micrometer head at the end of the bellows rail. The bellows rail dovetail and mating surfaces of the sliders were hand scraped for a very precise fit and alignment with the lathe bed axis. The all-metal camera and lens mounting boards shown in Figure 7, replaced the earlier Olympus components to provide much higher rigidity, and to eliminate the crack prone plastic inserts mating with the bellows rail in the Olympus system. The X-Y feed slides from the lathe are shown attached to a jackscrew driven knee slide in Figure 8. This slide provides the vertical feed for scanning when motor driven. The cast iron slide for the knee, made in my home shop, was precision hand scraped and fitted with a tapered gib for maximum rigidity. The dial indicator shown in Figure 8 is used to determine when to open and close the camera shutter.

In order to assure the slide is moving at a uniform speed upward, I allow an initial 0.100" of scan travel before reaching the position where the shutter is opened with a cable release. An adjustable micro switch shuts off the scanning drive motor if it is not first switched off based upon the dial indicator reading for the end of the scan. The jackscrew, 0.025" elevation per screw revolution, is driven through a 20:1 gear reduction box salvaged from an electric drill. A 0.1 HP AC-DC motor with a belt reduction is used to drive the gear box through a flexible shaft. The motor speed is governed by a variable speed controller. The scanning exposure is controlled by suitable combinations of scanning speed and slit illumination intensity.

The illumination system described in my earlier article is shown in Figure 9 configured to scan the head of a fly, shown in Figure 6. Figure 10 is a close-up showing the fly between the illuminating lenses. The blue cables at the sides of the Figure 9 are portions of a bifurcated fiber-optic light-guide connected to adjustable sliders containing the slits. The ends of the light-guides are linear fiber arrays measuring 0.50 mm x 14 mm. These light-guide ends are positioned 6 mm behind the 10 mm long by 0.025 mm slit openings formed between two razor blade segments. The inner two sliders contain Spiratone macro lenses with a 35 mm focal length. Color balancing 80A filters are mounted in caps on the outer ends of these lenses. The system is configured to produce a 5 mm wide beam at 0.5X magnification of the slit sources to illuminate the fly head for the image in Figure 6 obtained with the Olympus 38 mm focal length macro lens set at f/4 with the bellows length set for 5X magnification. The illuminating lenses are set at f/4 giving an illumination NA of 80% of the imaging numerical aperture (NA). The numerical apertures are calculated from the following equation using magnification M_i = 2X for the cone of light illuminating the specimen. The lens relative aperture setting (f/no) is the focal length of the lens divided by twice the lens opening diameter.

$$NA = \frac{M_i}{2\ f/no\ (M_i + 1)}$$

Eyepiece inspection of the portions of the field illuminated by the slit system revealed objectionable diffraction artifacts when the illumination NA was reduced much below that of the imaging NA. This same condition applies to brightfield illumination with the light microscope.

The sliders containing the slit sources and the lenses mount on a 610 mm long dovetail slide obtained from Edmund Industrial Optics. These sliders incorporate vertical dovetail mounts permitting the lenses and slits to be adjusted vertically for beam alignment. The aligning operation begins by rotating the caps containing the slits on the mating tubes containing the fiber-optic linear arrays until an image of the slit formed by the adjacent macro lens exhibits a full length image of the slit with uniform brightness. These angular positions are then locked with the thumb screws in the caps. The next operation is to align the slits so they are the same distance above the stage and parallel to the stage. A right angle monocular microscope with a 5X objective and 15X graticule eyepiece was fabricated for this operation shown being done in Figure 11. The next operation is to align the illumination lenses so that both beams are coaxial. The slit sources are moved to near the opposite ends of the horizontal slide for this operation with one of the illumination lenses removed from its mount. The remaining lens is then used to form the image of the adjacent slit on the end of the cap containing the other slit. The illuminating lens is then adjusted up or down until the image of the illuminated slit is centered relative to the opposite slit. The other illuminating lens is then installed for the final part of the aligning operation shown in Figure 12. The bellows lens with the 10X viewing eyepiece is used to center and focus the slit images at one of the sharp edges of an aluminum pyramid test target.The right angle microscope is also used for this operation as an aid for establishing precise focus of both slits on the pyramid edge. The illumination lens not previously aligned vertically is then adjusted vertically so that both slit images are exactly coincident on the edge of the pyramid when viewed with the right angle microscope.

I expected the high magnification images to be the most difficult for this system to achieve with uniform high resolution and even illumination. My initial tests of the scanning system were with a

45 degree inclined flat target covered with a patch of mm graph paper and 5X magnification for the bellows lens set at f/4 for an intended 50X final magnification with an NA of 0.1. This target would reveal uneven illumination as well as variation in the resolution of the matted paper fibers. The graph paper was oriented so that one set of lines was parallel to the stage and facing one of the slit sources. A circle was drawn at the center of the target with a graphite pencil and the system aligned with the slit and camera lens both focused on the horizontal graph line passing through the circle. Figure 13 shows the very narrow scan line for this condition. The stage was manually raised and lowered for Figures 14 and 15. The scan line, indicated between arrows, greatly broadens near the edges of the field along the axis of the slit illumination lens so that it falls just within the high resolution portion of the depth of field. The system was covered with a light-proof cloth tent for the scanning light image of this target shown in Figure 16. Note that the illumination and paper fiber resolution are uniform across the entire field. The graphite coated circle becomes an ellipse with the graphite coating giving rise to specular reflection of the scanning light beam. This test needs to be repeated with recording on 35 mm film. The edges of the field in the direction of the short axis of the ellipse (highest and lowest portions of the field) would be expected to be blurred by the further broadening of the illuminating beam thickness with the field width 1.5 times wider on the film image.

The fly head was photographed with the digital camera using broad area lighting from the side in addition to the stationary ring of light from the two opposed slit light sources for the image in Figure 17. This was done for comparison with a scanning light image of the same field of view shown in Figure 18. Comparison of these images demonstrates that the scanning method does not faithfully record the black hair patterns. Another problem with the scanning image is the lack of clues to judge depth of the features because the images are isometric projections and lack out-of-focus regions. This missing information is evident in the low magnification side view of the fly head shown in Figure 19. This conventional photomacrograph was recorded with the Nikon Coolpix lens at maximum magnification and broad area lighting. Engineering drawings typically contain front, top, and end views of a subject to aid in three dimensional visualization. Jim Gerakaris showed that the best way of obtaining the missing depth perception is to record stereo pairs with the scanning light method.

This article is the first progress report for my now functional scanning light photomacrography system. A large capacity eucentric stage has been built so that stereo pairs can be easily recorded. This stage was described in my article *Eucentric Stage for Recording Stereo Pair Photomicrographs*, originally publshed in the September 2005 issue of Microscopy Today. My original calculations of the field size limitations of the scanning light method need to be revised now that I know that the NA of the illumination beam must be significantly greater than anticipated. The theoretical field size limits need to be verified by experiments using 35 mm film recording covering a wide range in magnification. These results can be the subjects for future articles.

References

1. Clarke, T. M. “Method for Calculating Relative Apertures for Diffraction-Limited Depth of Field in Photomacrography”; *The Microscope* **1984**, 32, 219-258.
2. Gerakaris, J. “A Second Look at Scanning Light Photomacrography”; *The Microscope* **1986**, 34, 1-8.
3. Clarke, T. M., "Photography of Fractured Parts and Fracture Surfaces," *Metals Handbook*, Ninth Edition, Volume 12, *Fractography*, ASM International, 1987.
4. Clarke, T. M. “Image field Size Limitation for Scanning Light Photomacrography”; *The Microscope* **1993**, 41, 21-30.

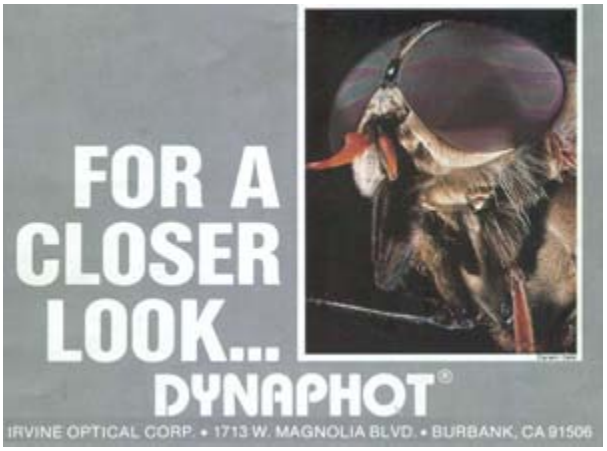


Figure 1

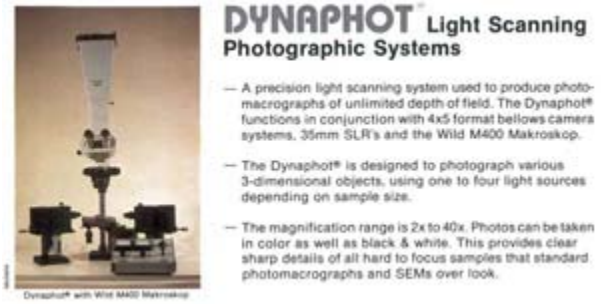


Figure 2

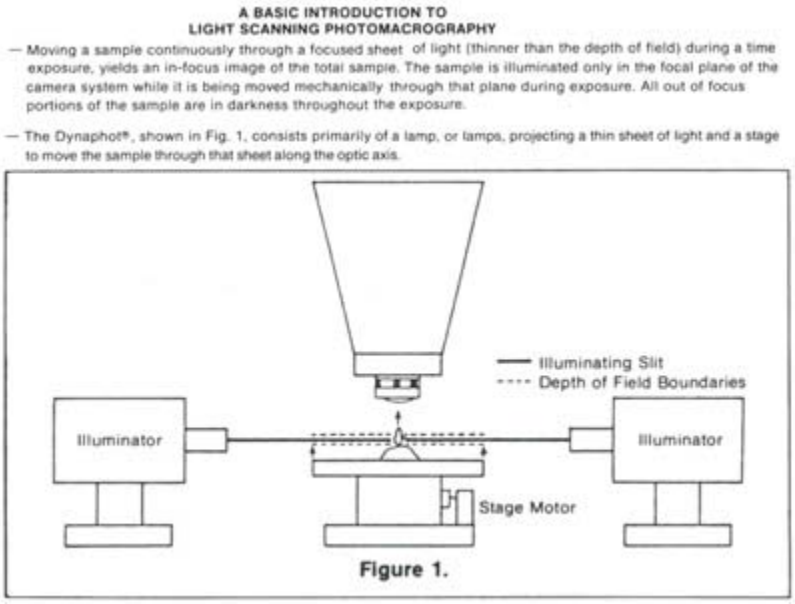


Figure 3

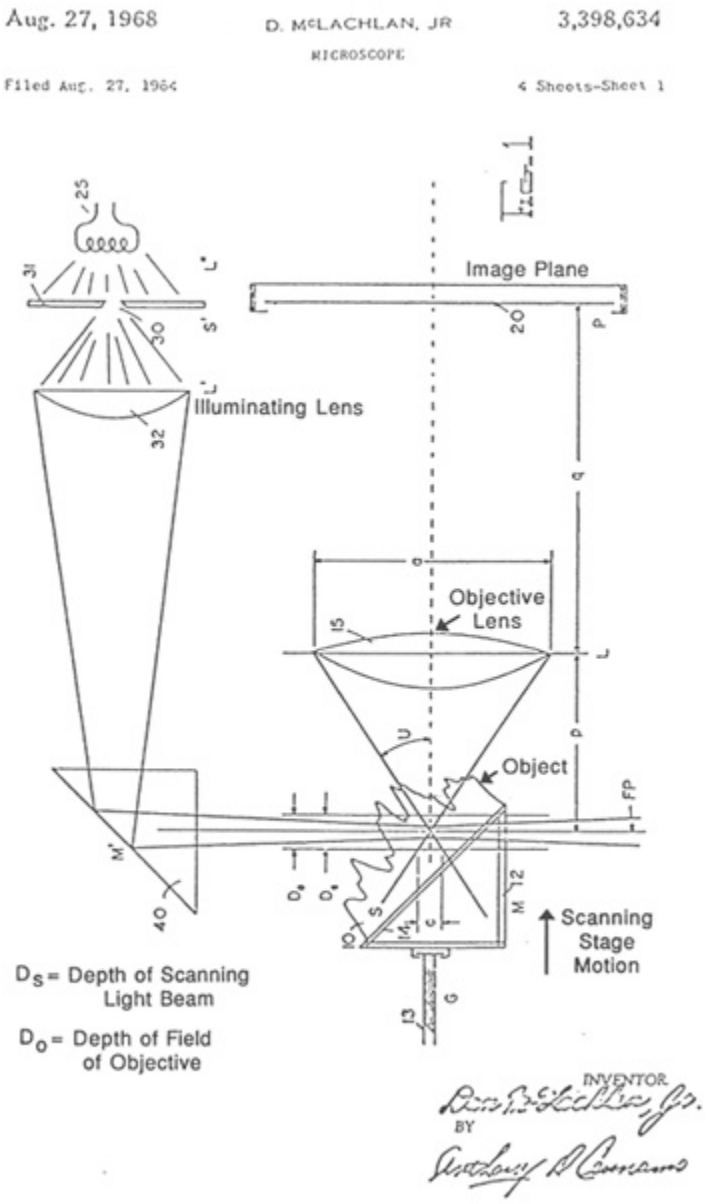


Figure 4

Figure 5

Figure 6

Figure 7

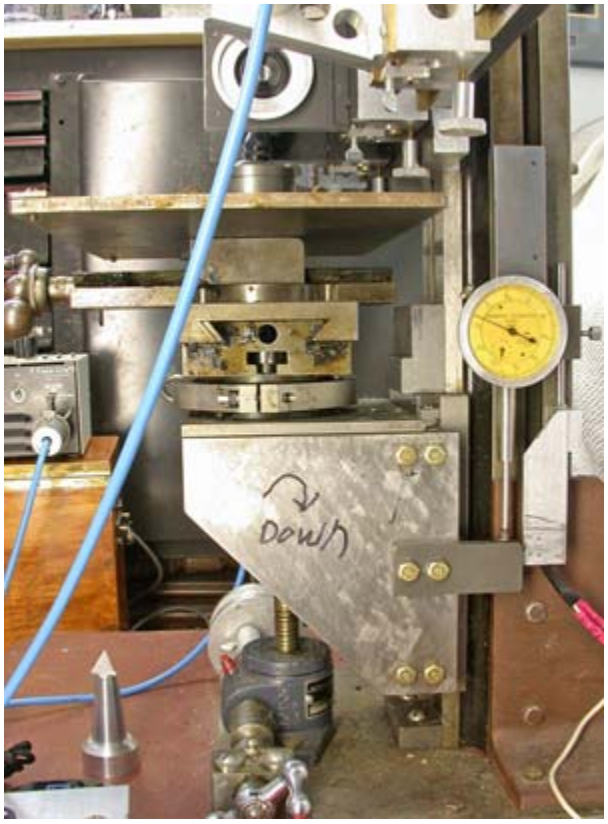


Figure 8

Figure 9

Figure 10

Figure 11

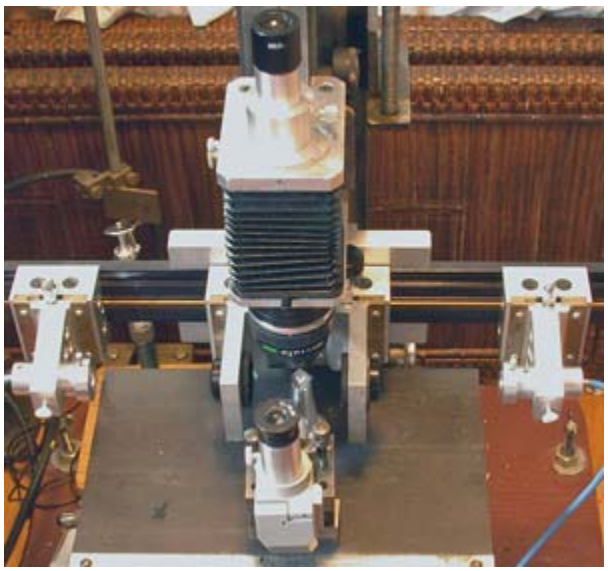


Figure 12

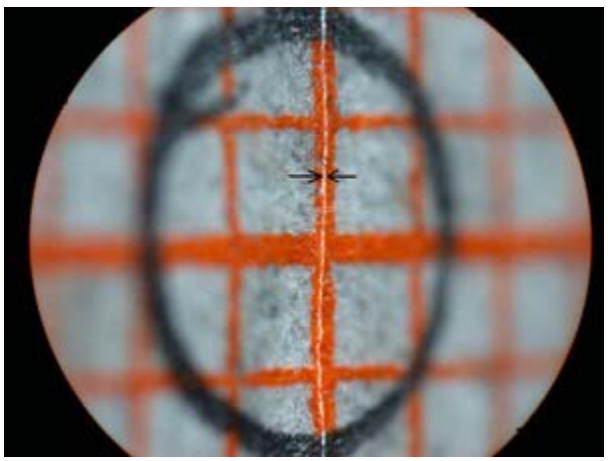


Figure 13

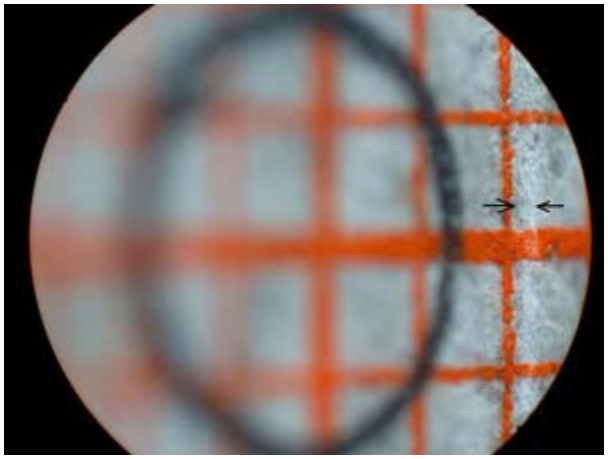


Figure 14

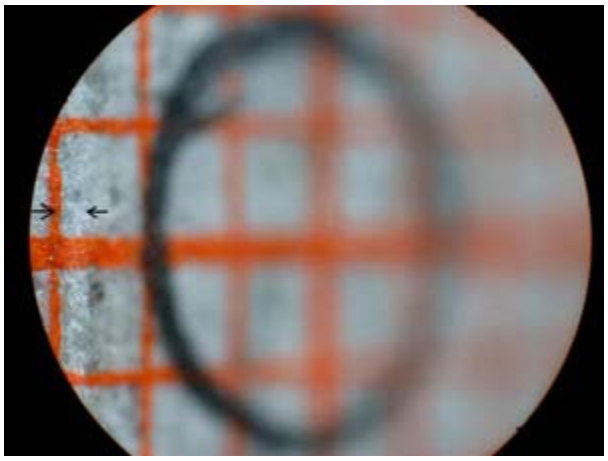


Figure 15

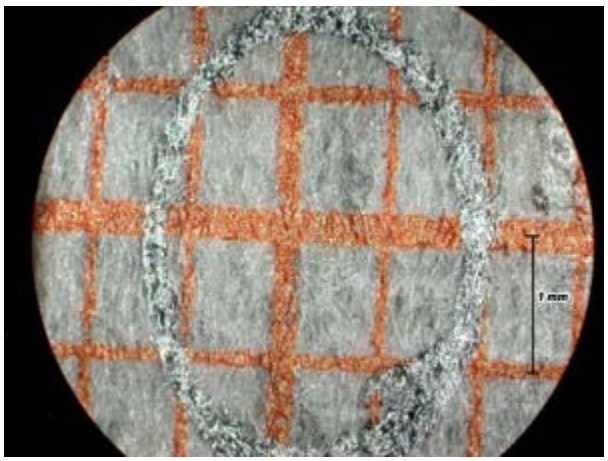


Figure 16

Figure 17

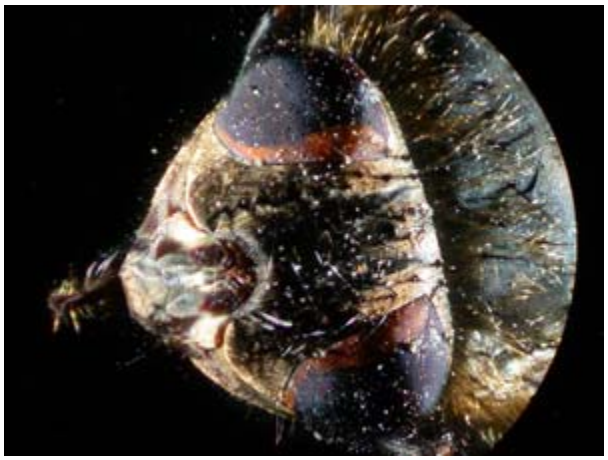


Figure 18

Reprinted from Modern Microscopy (Cambridge University Press) with permission of the author, Ted Clarke."

Figure 19

Stamps and Microscopes

Fritz Schulze

In an earlier article I wrote about how you can derive more pleasure from a small and modest microscope collection by studying and comparing the individual design features such as the fine focusing mechanisms, the nosepieces, the bases etc.
Another way to enjoy microscopes without even possessing one is through stamps. You will be surprised how many stamps feature a microscope once you start looking. My own theme stamp collection extends even to eyeglasses, magnifiers and various optical instruments, even to some relevant cancellation stamps.

My interest in such theme stamps was aroused by the issue in 1981 of a beautiful set of 8 stamps by the Deutsche Bundespost (Fig. 1) which included an early binocular microscope by Nachet/Paris dated ca. 1880 (compare Billings catalogue, 2nd edition, fig. 265), and an earlier monocular microscope by George Adams/London dated ca. 1770 (compare Billings catalogue, 2nd. edition, fig. 27) with the typical tilting gear wheel. All these stamps had a surcharge for the benefit of the youth.
Soon afterwards I obtained a set of two similar stamps from the former GDR (since 1990 united with the Federal Republic of Germany) showing instruments from the Museum of the Carl Zeiss Foundation in Jena (Fig. 2). One is a Culpeper-type microscope by Huntley/London. dated 1740, the other is a horizontal microscope by Amici dated 1845 .These stamps are dated 1980.
Also in 1981 the Republic of South Africa issued a 5 c stamp in support of the National Cancer Association showing the well-known Carl Zeiss Standard Gfl microscope (Fig. 3). When I learned of this, I quickly dashed off a letter to the Zeiss office in Johannesburg asking them, if possible, to send me a sample. They sent me half a dozen!
A white Carl Zeiss Standard Gfl microscope altered with artistic licence (Fig. 4) appears on a Brazilian 30.00 centavos(?) stamp issued in 1983 in support of Cancer Prevention. The instrument pictured has an unrealistically long objective and lacks the illuminator. Until about the end of the 50s Carl Zeiss, or more correctly Zeiss Winkel, offered the Gfl in white lacquer particularly for private doctors' offices - at a corresponding surcharge, of course.

Not all microscopes on stamps are so easily identifiable. Some are only partially shown such as only the upper tube on the 3c US stamp for Harvey W. Wiley (50th anniversary Pure Food and Drug Laws), on others the artistic or generic rendition by the artist makes them impossible to identify, or they are shown simply too small or indistinct.

An A.O-Spencer (?) microscope is shown on an American 18c stamp "Disabled doesn't mean Unable" (Fig. 5) while Dr. George Papanicolaou (born 1883 in Greece, since 1928 in the US, died in 1962) uses what appears to be a Carl Zeiss F stand from 1934 on another American 13c stamp promoting early cancer detection by the well-known Pap Test (Fig .6) developed by him. Not being a philatelist I have not bothered to check in catalogues as to the issue dates of these - and other - stamps. This may be a project for the future.

The Leitz Ortholux is featured on a Netherland stamp also dedicated to cancer research (Fig. 7) and a Wild M11 portable microscope on a stamp of the Republic of Guinea for National Health (Fig. 8). Dr. Robert Koch (1843 - 1910), the discoverer of the tubercle and cholera bacillus and recipient of the 1905 Nobel prize for Physiology, is honoured by the stamps of six countries: Djibouti, Hungary, Guinea, Zimbabwe, Germany (2x), and Cayman Islands (Fig. 9). Koch first worked on the Anthrax bacillus and later also did reseach on tripanosomiasis in Africa. Zeiss donated the 10,000th objective, a homogeneous oil immersion lens, to Dr. Koch in 1904, while E. Leitz gave him their 100,000th microscope in 1907.I do not know what make of microscope Dr. Koch used, the illustrations on the stamps differ widely. The one on the German 144c (?) stamp of 2005 *100 Years Nobel Prize Robert Koch* shows a pre-1900 stand with a drawing prism, the Zimbabwe stamp of 1982 features what could be a Wild fluorescence microscope.

Dr. Louis Pasteur, in turn, is recognized on a stamp issued by Turkey in 1995 on the occasion of the 100th anniversary of his death, showing him holding a culture bottle, with his microscope in the background (Fig. 10). The Norwegian physician G. Armauer Hansen (1814 - 1912) discovered the bacillus that causes leprosy (also called Hansen's disease) in 1874. We are reminded of his achievement by a stamp from the Republic of Dahomey (Fig. 11). Last but not least we find Dr. Albert Schweitzer (1875 - 1965) on a Hungarian stamp (Fig. 12). Why the Transkei, of all places, would issue a stamp commemorating Antony van Leeuwenhoek, "father of the microscope" (1632 – 1723), with a stamp is a mystery, but the irony is the modern microscope silhouette blended in over his portrait (Fig. 13).

A very nice 17p stamp originating from the Falkland Islands and titled "The Voyages of Darwin" shows a beautiful picture of his microscope, which looks like an Ellis-type aquatic microscope by Jones (Bracegirdle 10/27) or one by Dollond/London (Billings, 2nd edition, fig.384) .A number of small insets show amoebae, worms, plants and an insect. Two stripes left and right show silhouettes of terrestrial and aquatic animals (Fig. 14). The last of these stamps to be mentioned especially is one issued in 2000 by Canada Post titled "*vox non echo"* with a picture of Dr.Armand Frappier (1904 - 1991) "Champion Disease Fighter" holding a cullture bottle with a 1940's monocular microscope in the background, which could be a Bausch & Lomb Model G. *Vox non echo* = "you will be the voice" was Dr. Frappier's motto. He founded the Quebec *Institut national de la recherche scientifique* and specialized in tuberculosis (Fig. 15).

A microscopic theme without a microscope is presented by the German stamp of 1968 "Hundert Years of Scientific Microscope Design" which illustrated the principle of image formation in the microscope. Fig. 16 shows a first-day-cover which I can't explain: by the quality of the paper of the envelope compared with another first-day-cover from Carl Zeiss Oberkochen (Fig. 17) and by the illustration of a microscope of definitely GDR design (the "East German Zeiss) it is an East German envelope with West German stamps and cancellation!

In 1839 the Microscopical Society of London, now the Royal Microscopical Society, was formed. 150 years later a series of stamps issued by the Royal Mail (British Post Office) with microscopic motifs (Fig. 18) commemorates this historic event. Looking at British stamps, a 1999 43p Millennium stamp is covered by an almost life-size picture of a culture of Alexander Fleming's penicillin mold (discovered in 1928), and another Millennium stamp has a rather scary scanning electron microscope picture of the head of a Brazilian ant *Gigantiops destructor* (Fig.19).

Next in line are specialty microscopes such as electron microscopes. A Canadian 37c stamp from 1968 features the first Canadian-made electron microscope (in 1938 by the University of Toronto, now accessible to the public in the Ontario Science Centre) (Fig.20). Sweden honoured the 1982 Nobel Prize winner Dr. Christoper A Klug (University of Alabama, stem cell research) with his electron microscope on a 3.10 Kronor stamp. In 1975 the Academy of Science of the GDR was celebrated with a 25 Pfg. stamp showing a large electron microscope on a background of a chemical refinery (Fig.21). The reproduction of a Japanese stamp with an electron microscope is, unfortunately, rather poor.

Lastly, in 1989, the GDR issued a nice stamp commemorating 100 years of the Carl Zeiss Foundation Jena (although it did no longer exist there legally) with the picture of a modern metroscope, an industrial measuring microscope and one of the first type of instruments Abbe designed for production outside the regular microscope programme (Fig. 22).

As an example of a cancellation stamp I include one from Wellesley Mass. commemorating the second century of microscopes from Carl Zeiss 1868-1968 (Fig. 23).

Outside the scope of this article are my other stamps of slitlamps, magnifiers, eyeglasses, telescopes, binoculars, theodolites, cameras, great discoverers, inventors, scientists etc. totalling almost 100. Where did I find them all? Some came by regular mail or I obtained them from the local post office, others I found in a grab box of a stamp dealer, some I copied from illustrations in books or other publications, such as a beautiful calendar from the National Museum of Health and Medicine, Washington, DC, I was given by a generous friend, and, as I said, the ones with the Zeiss Standard Gfl microscope I scrounged from my helpful colleagues abroad. I must add, though, that of some of the copied stamps I do not know the correct original size. When the illustration was suspiciously large I reduced it to reasonable dimensions. Still, although not a philatelist or purist, I nevertheless enjoy their motifs and designs and the amount of information that can be derived from them and it gives me pleasure to leaf through my stamp collection and marvel at the variety of "microscopic stamps".

In conclusion I should like to mention a totally different area where microscopes can be found: in architecture as sculptures or paintings particularly on scientific buildings, in graphic art e.g. in advertisements or brochures, in programmes of schools and universities. There is ample scope for the microscope-minded to search and discover - often with a smile and chuckle at the artist's distorted impression of our "beloved instrument".

Fig. 1 Microscope by Nachet / Paris and by Adams / London

Fig. 2 Microscope by Huntley / London and by Amici

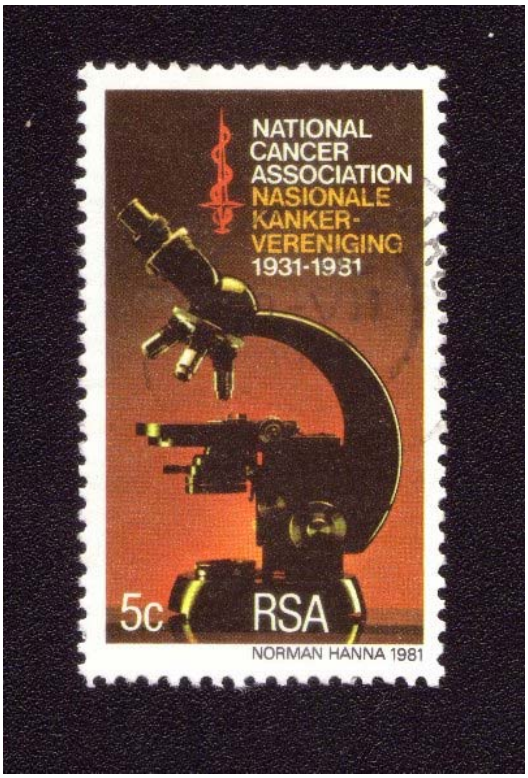


Fig. 3 Carl Zeiss Standard Gfl

Fig. 4 Zeiss Winkel Standard Gfl

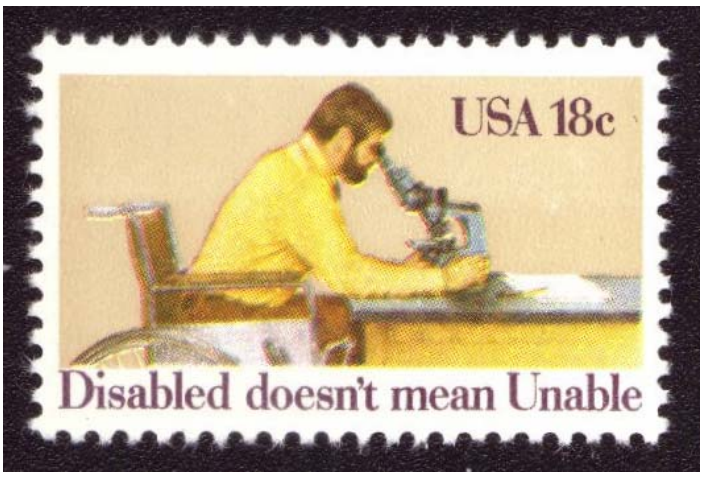


Fig. 5 AO-Spencer Microscope

Fig. 6 Carl Zeiss Jena Stand F

Fig. 7 Leitz Ortholux

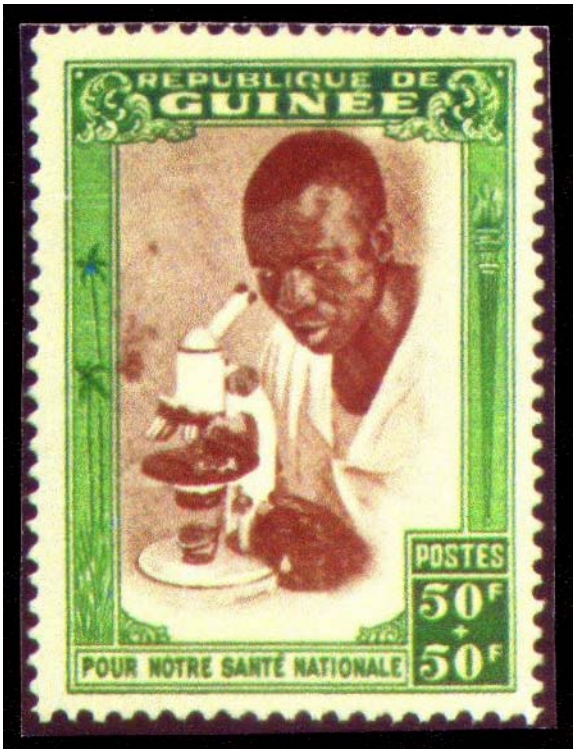


Fig. 8 Wild M 11 (Portable)

Fig. 9a Stamps in honour of Dr. Robert Koch with different microscopes

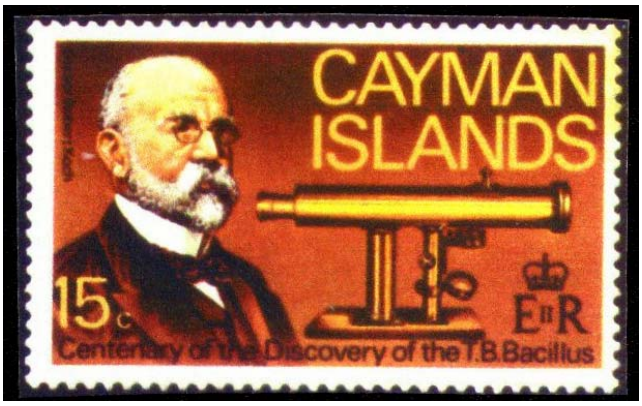


Fig. 9b

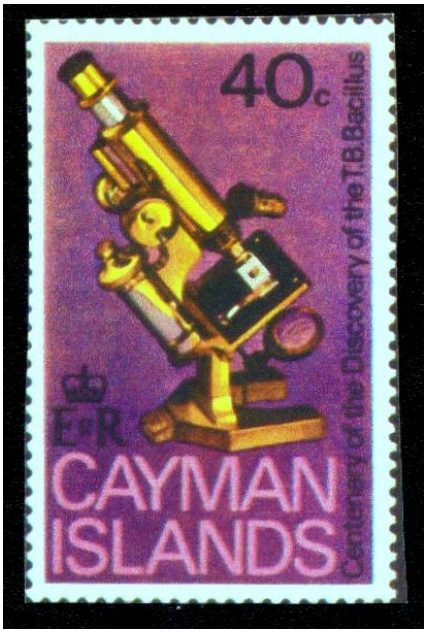


Fig. 9 b and c
Discovery of
Tb Bacillus by Robert Koch
The 15 c stamps shows an interesting choice of microscope

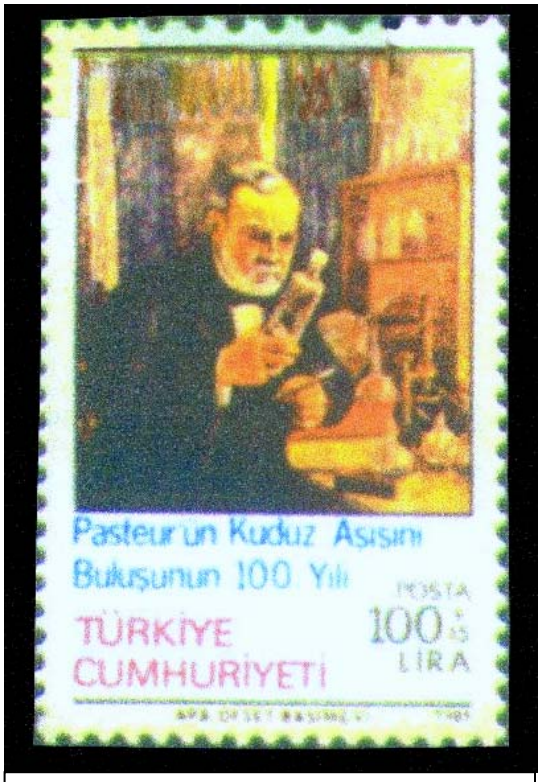


Fig. 10 Dr. Louis Pasteur

Fig. 11 Dr. Hansen

Fig. 12 Dr. Albert Schweitzer

Fig. 13 Antony von Leeuwenhoek

Fig. 14 Darwin's Microscope

Fig. 15 Dr. Armand Frappier

Fig. 20 First Canadian Electron Microscope

Fig. 16 First Day Cover of special German stamp for 100 years of Scientific Microscope Design.
Above: presumably East German envelope cancelled in Oberkochen/West Germany with complete set of stamps including 1000 years of mining in the Harz Mountains and 150 years of printing presses.

Fig. 17 Below: West German envelope with stamp of imaging path in microscope only. FDC are normally cancelled at the Bonn Post Office, Carl Zeiss obtained special permission for this particular cancellation stamp.

Fig. 18 Set of Stamps issued in 1989 by the Royal Mail commemorating 150 years of the Royal Microscopical Society of London
35p = microschip 600x, 32p = blood cells 500x, 27p = blue fly 5x, 19p = snow flake 10x

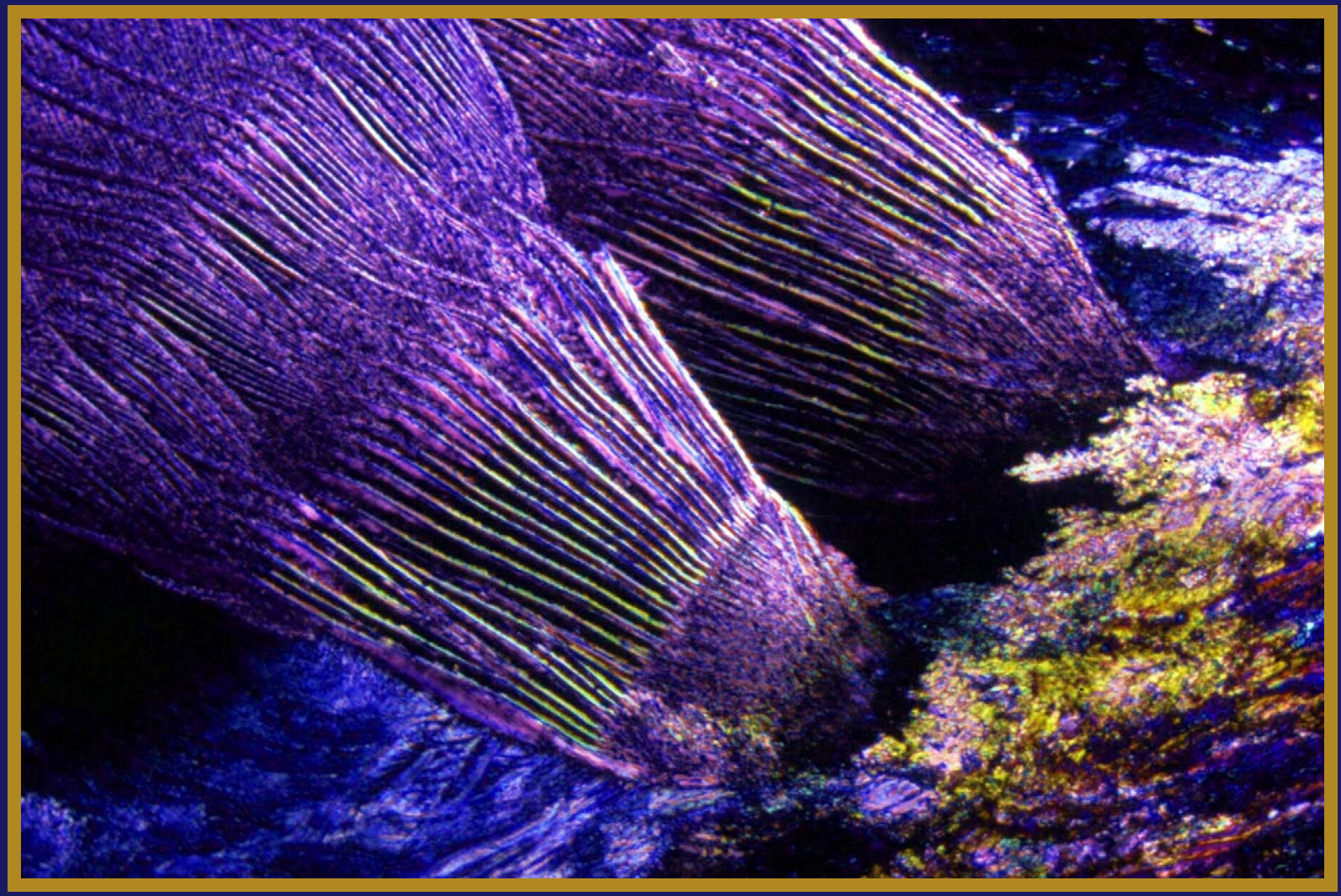
Fig. 19 Two Millennium stamps
The left is from a catalogue, it is missing the denomination

Fig. 21 Three stamps featuring electron microscopes: Japan (?), the German Democratic Republic, and Sweden

Fig. 22 Metroscope: 100 years Carl Zeiss Foundation (GDR) silve rbackground
Fig. 23 Cancellation stamp with Carl Zeiss logo 1977 (USA)

Fig. 24 A selection of stamps with microscopes
The 5c Canadian stamp (top, second from left) shows a linear drawing of a microscope on the right.
Third stamp from left features Harvey W. Wiley "30th anniversary, Pure food and Drug Laws (USA)
The Cancer and Diabetes stamps are also American ones.

(PS: the alignment of the illustrations is somewhat crooked. This is due to the fact that these little things are not easy to line up on the scanner and often move when the lid is put down.)



Malonic acid, 50x

Polarized light (P0692205)

Photomicrograph by Mel Pollinger