Happy Holidays

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 2017 **Editor: (201) 791-9826** **Volume 11 (31) Number 8**

NYMS Annual Banquet on 10-Dec-2017 at Landmark Tavern, NYC

See email supplement for more photos honoring retired member & Past President (1973), Annemarie Reimscheussel

New York Microscopical Society Board of Managers

President and Secretary 2017-18, Brooke Kammrath, bkammrath@newhaven.edu; (203) 931-2989, **Manager 2016-2019.**
Vice President 2017-18, John Scott, nyconsnfdn@aol.com; (646)339-6566, Curator, Archivist, Facilities Assistant, Past President, **Manager 2015-2018.**
Treasurer 2017-18, Mel Pollinger, pollingmel@optonline.net; (201)791-9826, Facilities, Editor, Librarian, **Manager 2017-20.**

Manager 2015-2018, Lou Sorkin entsult@aol.com, (914) 939-0917.
Manager 2015-2018, Guy deBaere guydbaere@aol.com; (347) 668-4798 Outreach Program Chair
Manager 2016-2018, Jay Holmes jholmes@igc.org ; (212) 769-5039, Outreach Program Assistant.

Manager 2016-2019, Peter Diaczuk pedicoplanb@gmail.com; (917) 578-3049, Past President.
Manager 2016-2019, Seymour Perlowitz perlowitzs@hotmail.com; (718) 338-6695
Manager 2016-2019, Roland Scal, rscal@qcc.cuny.edu; (718) 631-6071.

Manager 2017-2020, John A. Reffner jareffner@cs.com; (203) 358-4539 Past President.
Manager 2017-2020, John R. Reffner, Jr. jrr11p@gmail.com; (215) 527-1882.
Manager 2017-2020, Andrew J. Winter, ajwinter112@gmail.com, Education Chair.

Dues and Addresses

Please remember to mail in your Dues to:
Mel Pollinger
Treasurer, NYMS
18-04 Hillery St.
Fair Lawn, NJ 07410-5207

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 $500 (payable within the year)
To avoid missing notices:
Notify 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
Peter Diaczuk
John R. Reffner

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 emailing: pollingmel@optonline.net

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Please remember to pay your dues

Buy and Read a Good Book on Microscopy.

Members of our New York Microscopical Society!

Our 2017 Holiday Banquet took place, as scheduled, on Sunday, December 10, at the historic Landmark Tavern, 46th Street and 11th Avenue, in Manhattan!

With 2017-18 NYMS President Professor Brooke Kammrath, PhD presiding, we started with conversation during a waiter and bar service cash bar from 12 noon, then at around 12:45 we began a generous and tasty buffet: mixed greens salad, broiled salmon with asparagus, sauteed chicken in a sauce of peppers, onions, lemon and white wine, pasta primavera, roasted potatoes, mixed vegetables including asparagus, and a mix of grainy and white crusty dinner rolls with butter. Coffee, tea, sodas, and water were served around the tables. We then finished up with cake and pie desserts!

After dinner, our featured speaker was expert microscopist-biologist-botanist-genomist-naturalist Dr Sally Warring, PhD, now a postdoctoral research scholar at the American Museum of Natural History, and active with the Brooklyn Botanical Gardens.

~John Scott~

NEW YORK MICROSCOPICAL SOCIETY BULLETINS

Original-print bulletins can be purchased by NYMS members. The bulletins are limited in number and can be purchased, while they last, at $2.00 each, 8 copies for $10 plus $2.00 S&H. NYMS bulletins, Journals, Yearbooks and other out-of-archive publications may be viewed at the NYMS Library in Clifton, New Jersey. If interested in owning a part of NYMS history, please contact Mel Pollinger by email pollingmel@optonline.net or by daytime phone at (201) 791-9826

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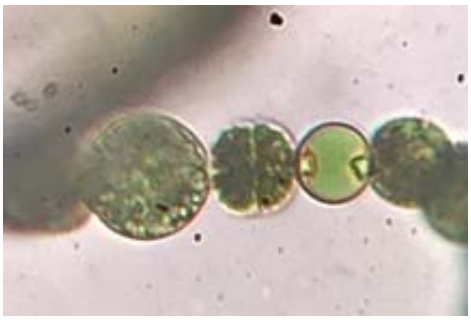
Mystery Photo for Nov-Dec 2017



Answer on pg 4

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November 2017 President's Message

Hello NYMS Members.

The New York Microscopical Society is looking to expand our membership, and we are asking for your help. Do you have a colleague, student, or friend who works with and/or has an interest in microscopy? Then introduce them to NYMS! The Board of Managers has even created an incentive for you: Any member who refers three (3) new members will have their membership dues waived for the year! Or, if you are a life member, you can get a free NYMS microscope cover!

Help us to promote the techniques and applications of microscopy and microanalysis!

Kind Regards,

Brooke Kammrath, Ph.D., D-ABC

Visitors at NYMS table; new EAS location

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 in the months of Jan., Feb., Mar., May, Sep. & Oct. 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 an email address: 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

Need to use a Microscope or Book?

The various microscopes and library are presently for use on the main floor of the New York Microscopical Society building in Clifton, N.J. To arrange for a visit, please contact John Scott, or Mel Pollinger (see pg 2 for details)

NYMS microscope slide collections are available for study at meetings and by appointment.

Additional Historical NYMS Supplements

Email Newsletter recipients can also receive copies of NYMS Newsletter pdf back-Issues from 2007. Copies of older newsletters will be included in the supplement section as I convert them.

Upcoming NYMS events are noted on the NYMS website and in the NYMS Newsletters both printed and email versions.

ANSWER TO MYSTERY PHOTO ON Pg3: *Nostoc* is a genus of cyanobacteria found in various environments that forms colonies composed of filaments of monliiform cells in a gelatinous sheath. The name *Nostoc* was coined by Paracelsus. Live nostoc photomicrograph by Jay Holmes, AMNH

From: "Eastern Analytical Symposium & Exposition" <newsletter@eas.org>
To: <pollingmel@optonline.net>
Sent: Friday, June 23, 2017 2:52 PM

EAS 2017 Award Recipients

EAS Award for Outstanding Achievements in the Fields of Analytical Chemistry
Prof. Janusz Pawliszyn, University of Waterloo
EAS Award for Outstanding Achievements in Separation Science
Dr. Christopher Welch, Welch Innovation, LLC
EAS Award for Outstanding Achievements in Chemometrics
Prof. Barry Lavine, Oklahoma State University
EAS Award for Outstanding Achievements in Magnetic Resonance
Prof. Bernhard Blümich, RWTH Aachen University
EAS Award for Outstanding Achievements in Mass Spectrometry
Prof. Scott McLuckey, Purdue University
EAS Young Investigator Award
Prof. Dwight Stoll, Gustavus Adolphus College
EAS would also like to congratulate our 8 Graduate and Undergraduate Student Awardees
EAS| askeas@eas.org | 732-449-2280 | www.EAS.org

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Sent in by Jay Holmes <jholmes@amnh.org>:
FYI: This looks interesting! A fleet of mini natural history museums. I can't wait to see one in action.
https://www.simonsfoundation.org/2017/10/11/watch-the-worlds-smallest-science-museum/

Sent in by Jay Holmes
I got through school #23 on my PA list.
Ran across this guy, Jay Hosler, which was fun:
http://jayhosler.com/index.html
Drawing Flies blog - http://www.jayhosler.com/jshblog/
Photosynthesis: http://www.jayhosler.com/jshblog/?p=937
Surface area and volume - connection to cell structures:
http://www.jayhosler.com/jshblog/?p=1875
Plus some published research on the educational strategy:
http://www.lifescied.org/content/10/3/309.full.pdf+html
And in print:
https://www.amazon.com/Evolution-Story-Earth-Jay-Hosler/dp/0809043114/ref=sr_1_1?ie=UTF8&qid=1423946299&sr=8-1&keywords=evolution+hosler

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Supporting Member

N.Y.M.S. SUPPLEMENT SECTION

Nov-Dec 2017

In This Section:

Meteorite section, Incident light D.I.C., 50x (P2031617) imaged by Mel Pollinger

NYMS Annual Banquet at Landmark Tavern in NYC 10-Dec-2017, Page 1 of 2


Annemarie Reimsschheussel

NYMS Annual Banquet at Landmark Tavern in NYC 10-Dec-2017, Page 2 of 2

Diatoms from Santorini, Greece

Michael Reese Much FRMS EMS
Bethlehem, Pennsylvania USA

Last July my wife and I took a ten-day tour of Greece, with stops in Athens, Crete and Santorini. Looking forward to opportunities to collect exotic sea water samples, I brought along several 100 ml sample bottles. I was hoping to find new species aside from the usual freshwater species such as *Tetracyclus, Surirella* and *Pennularia*.

There was a beach across from our hotel in Crete, and I collected samples from the rocks on the shoreline and from a freshwater stream leading down to the sea. The seawater samples didn't yield anything of interest when we got home. As for the freshwater stream, I collected some algae and scraped some biofilm from rocks in the stream, but the sample yielded the "usual suspects" – mostly Spirogyra.

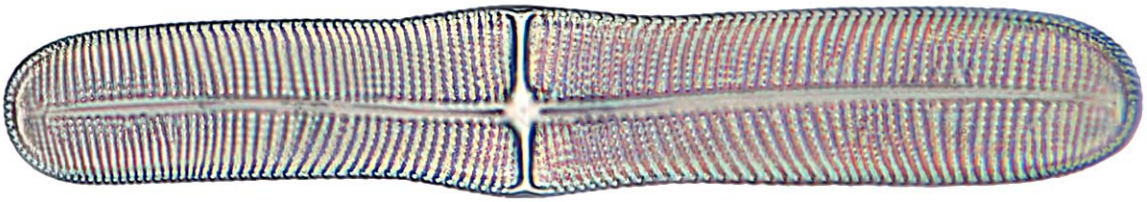
SANTORINI

Santorini is located in the Cretan Sea (a region of the Aegean Sea) between mainland Greece and Crete. Approximately 3,600 years ago a massive volcanic eruption destroyed the island and the eruption is credited with the collapse of the Minoan civilization.

Today, Santorini is a major tourist destination. In the center of this image is Nea Komeni. This is the volcanic cone that is a remnant of the major eruption. To the right is the main island of Thera. The island to the left is Therassia.

Fortunately for my wife and I, our hotel was located in Firostefani, and across the parking lot from our hotel is without a doubt the most iconic Greek Islands travel poster ever. Here is my version:

As is true of most package tours, in the case of Santorini, the tour offered a cruise around The **c**aldera. The term “caldera” refers to the big hole in the center of Santorini. Indeed, the entire inside of the caldera is steep cliffs of volcanic rock.

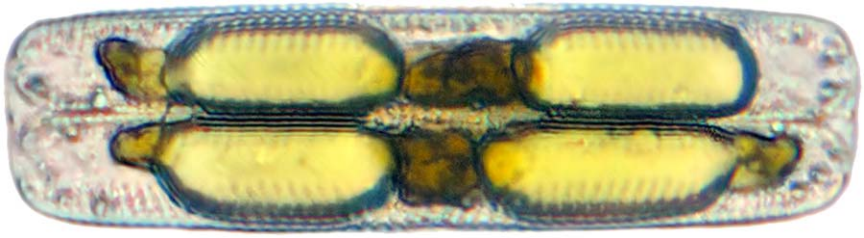


This was our cruise ship for our afternoon trip around the caldera. It actually was not crewed by Greeks, but entirely by Americans. Midway through the cruise we were all treated to ouzo.

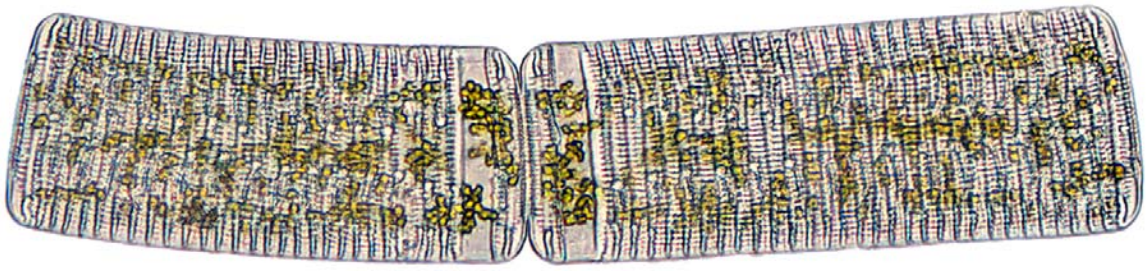
The seas were very high that day, so at one point we went under sail into the wind because the engine could not possibly move the boat forward through the eight foot swells.

At any rate, our first stop was one of the two harbors on Nea Kameni, which is where I was able to get my first samples. The next stop was the harbor of Therasia, where I got two more samples.

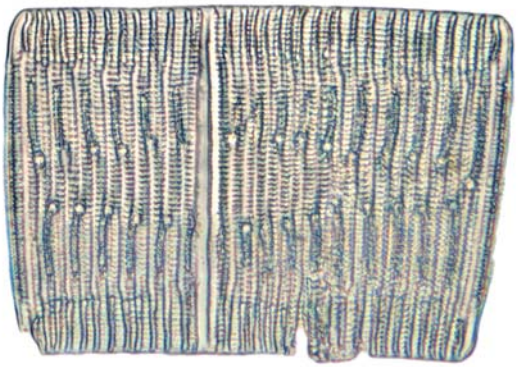
My sampling technique was thus:
At the site I would pluck some of the vegetation and stuff into the sample bottle and then top the bottle off with seawater.

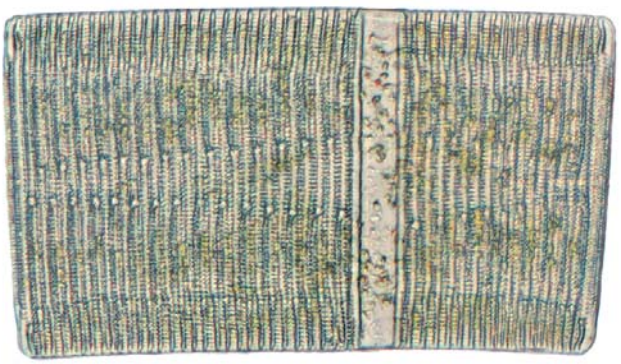


When I got back to the hotel, I would put the bottles out on the room patio in open shade so photosynthesis could continue.

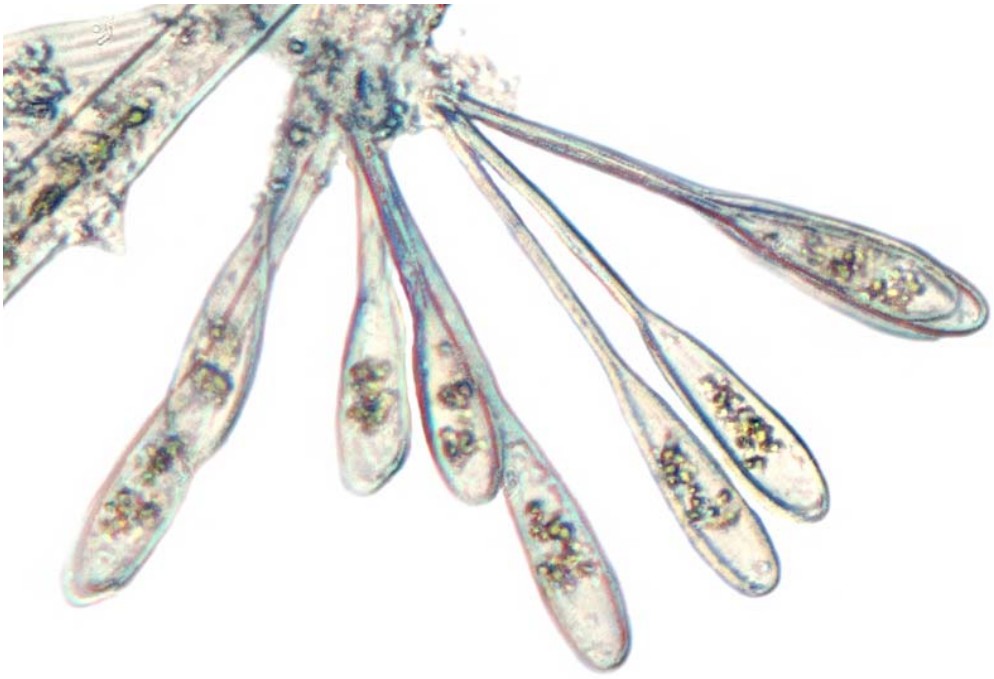


I ended up with five 100 ml sample bottles, which I wrapped in my dirty laundry in a smell-tight plastic bag.

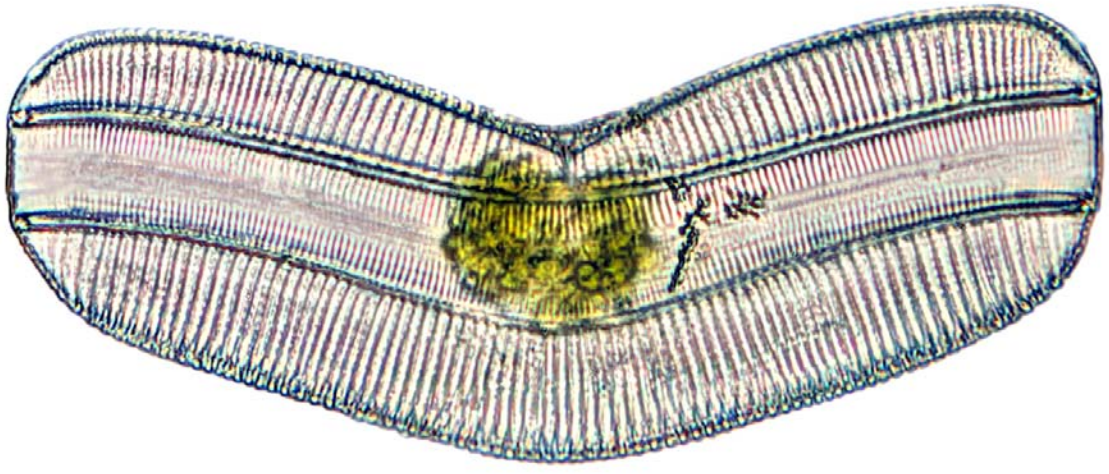


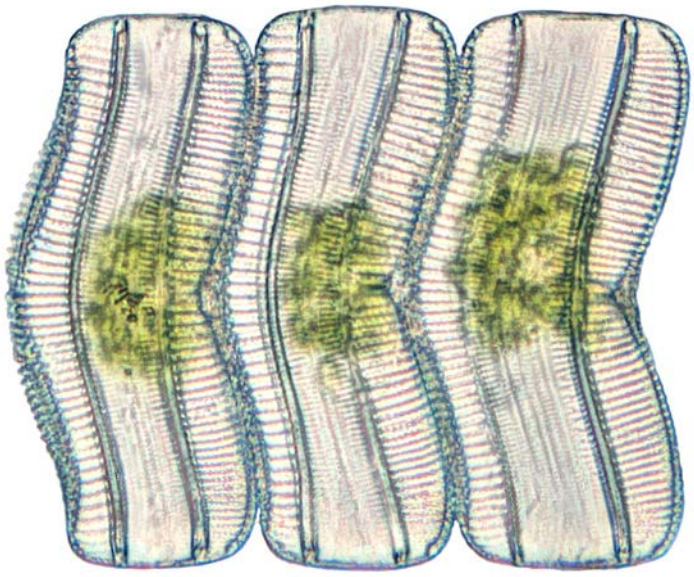


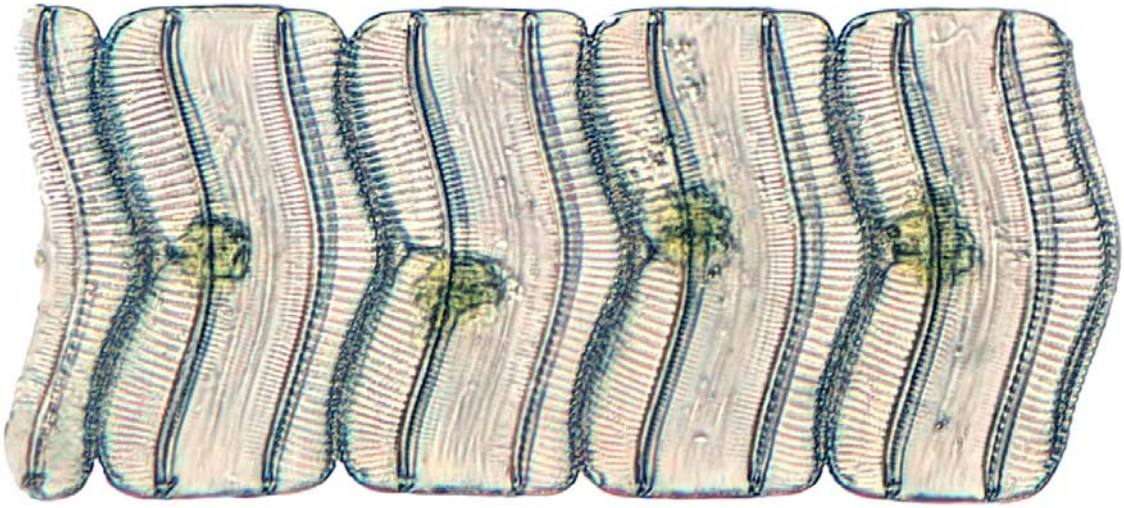
Once home, I strained out the vegetation with a wire tea strainer into baby food jars (we use baby food to sneak meds into one of our cats).

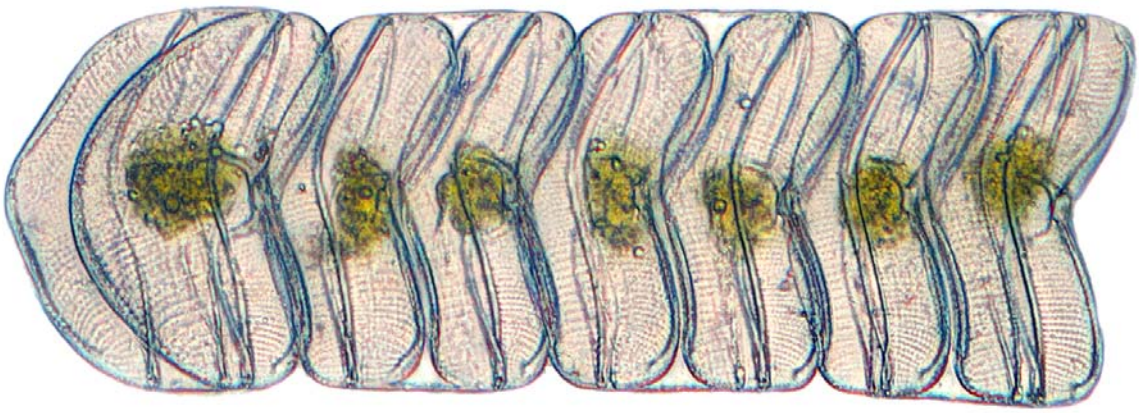


Once the samples had settled down I was rewarded with wonderful new species –

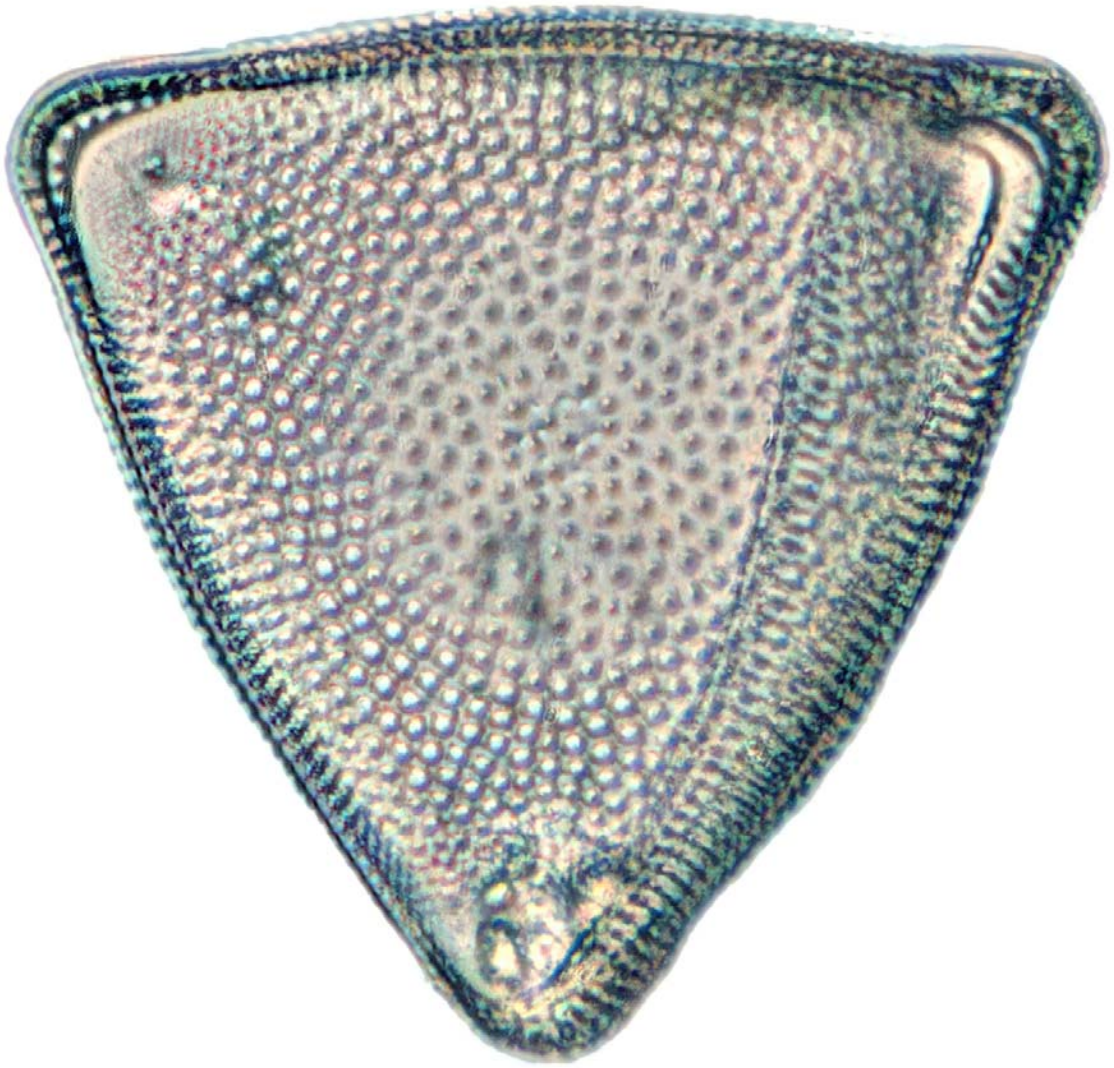


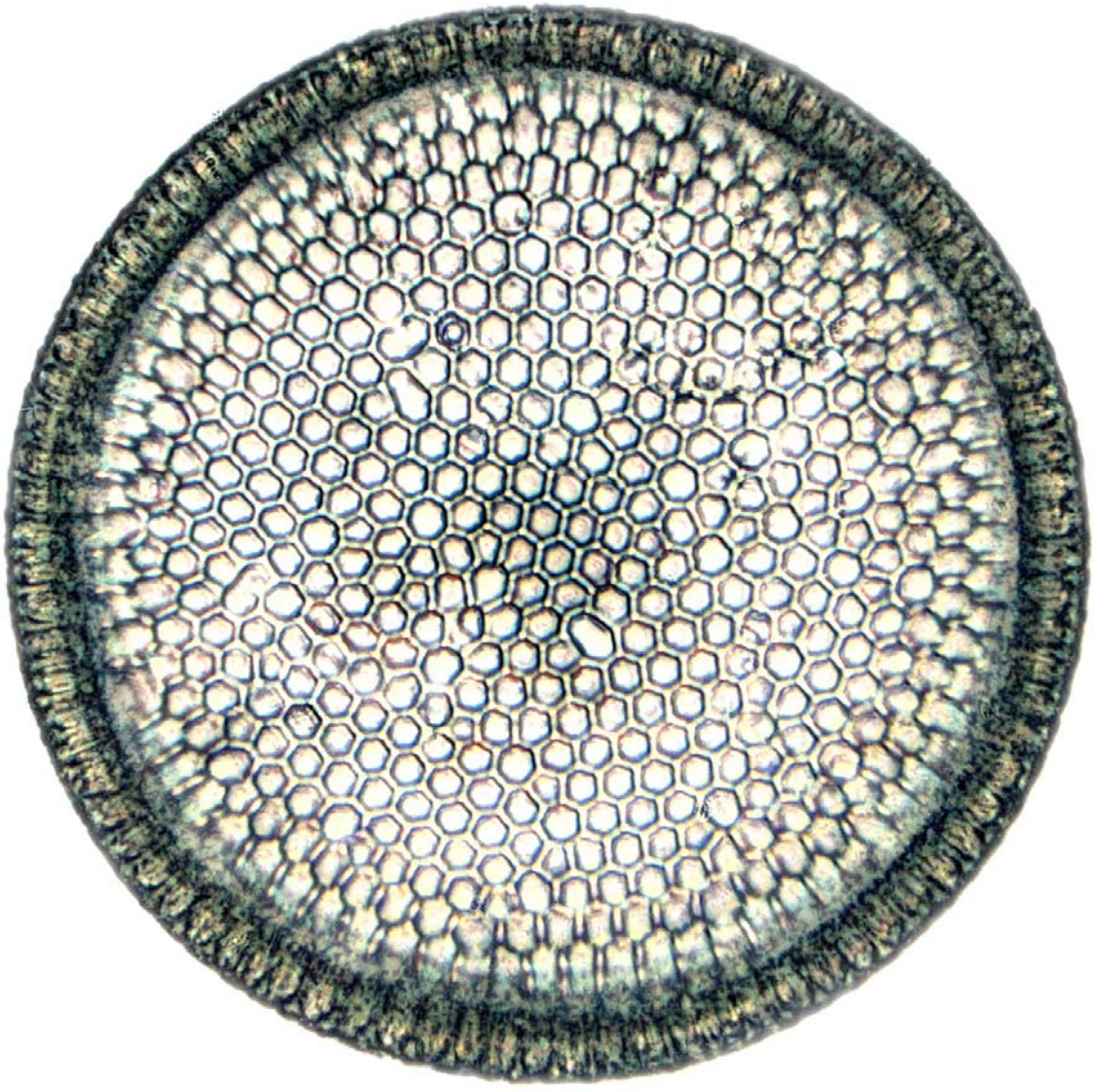




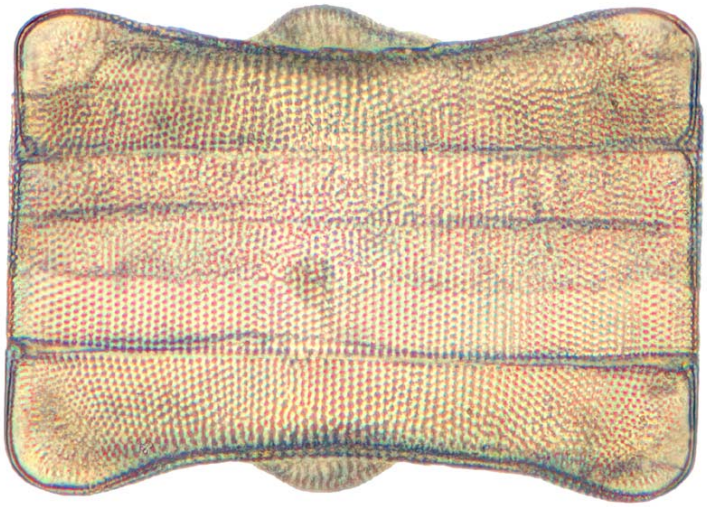


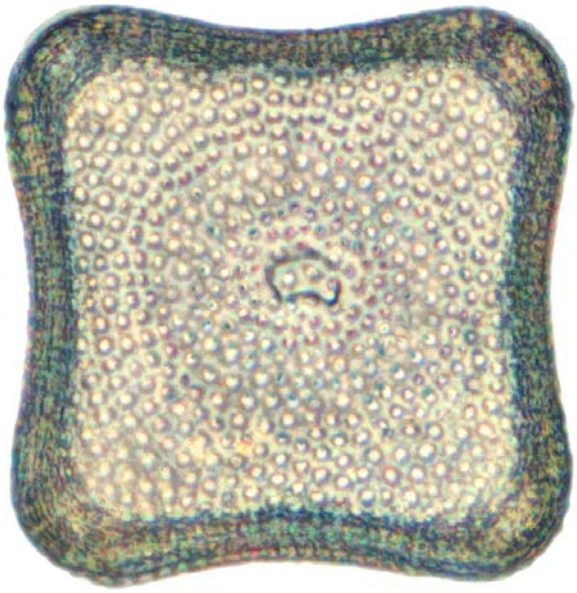
Some of these diatoms were familiar from Diatomaceous Earth samples.





Many of the diatoms were very new to me



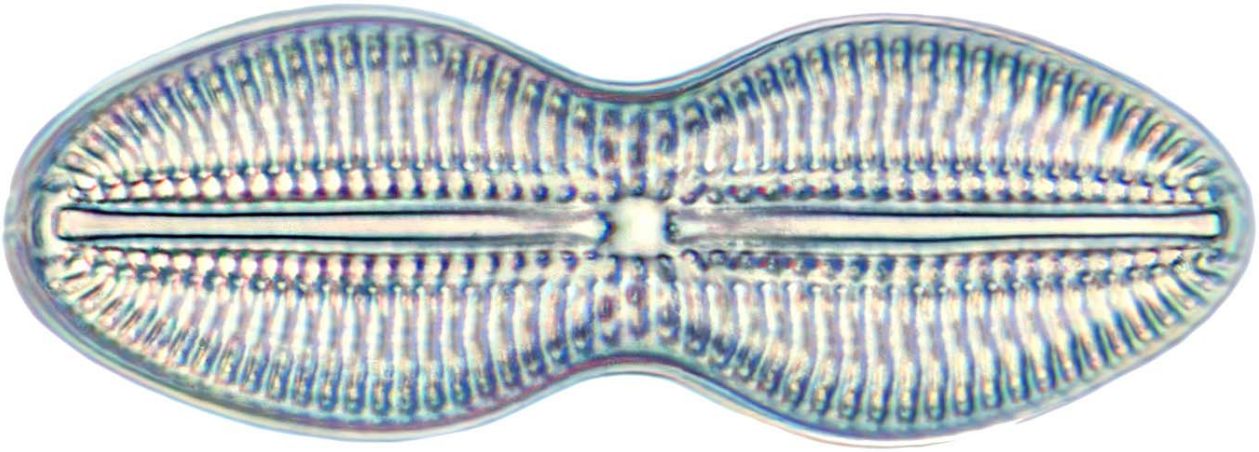


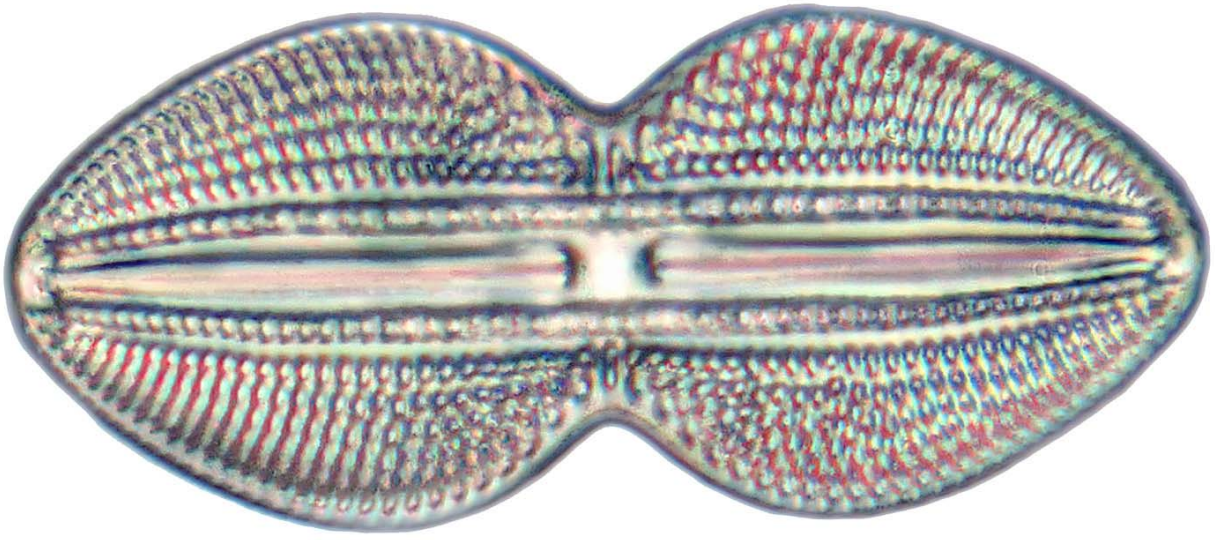
After about two weeks of allowing the samples to continue to photosynthesize, I felt it was time to dissolve the clumps of matter in the samples to see what the result would reveal.

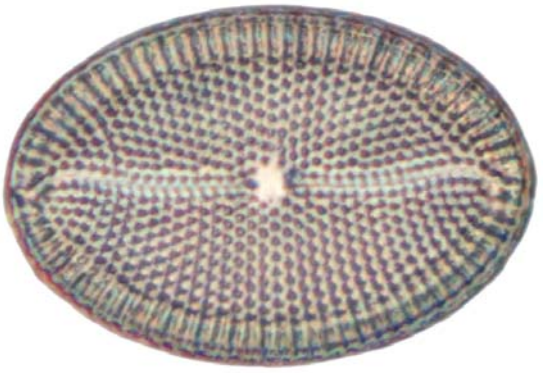
I consolidated the samples into one jar and added 50% Sulphuric Acid to the sample (Note: If you do this, add the acid to the seawater in an outsize container, since the acid will react to the seawater and foam significantly).

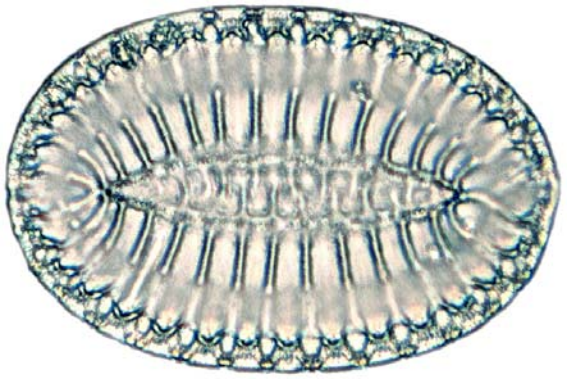
What this does is two things: 1) it dissolves all of the chlorophyll in the specimens and 2) it will break up the clumps we are all familiar with in water samples.

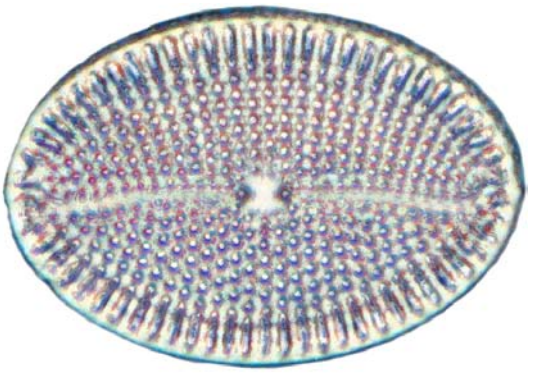
After washing the samples in the acid, I poured off the acid being careful not to disturb the sediment, added water to dilute it, poured it off again, diluted it again and then neutralized the acid with Sodium bicarbonate.

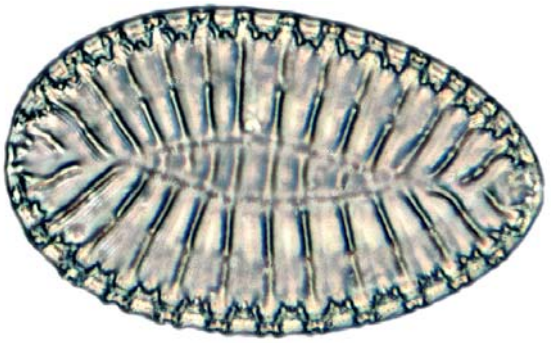


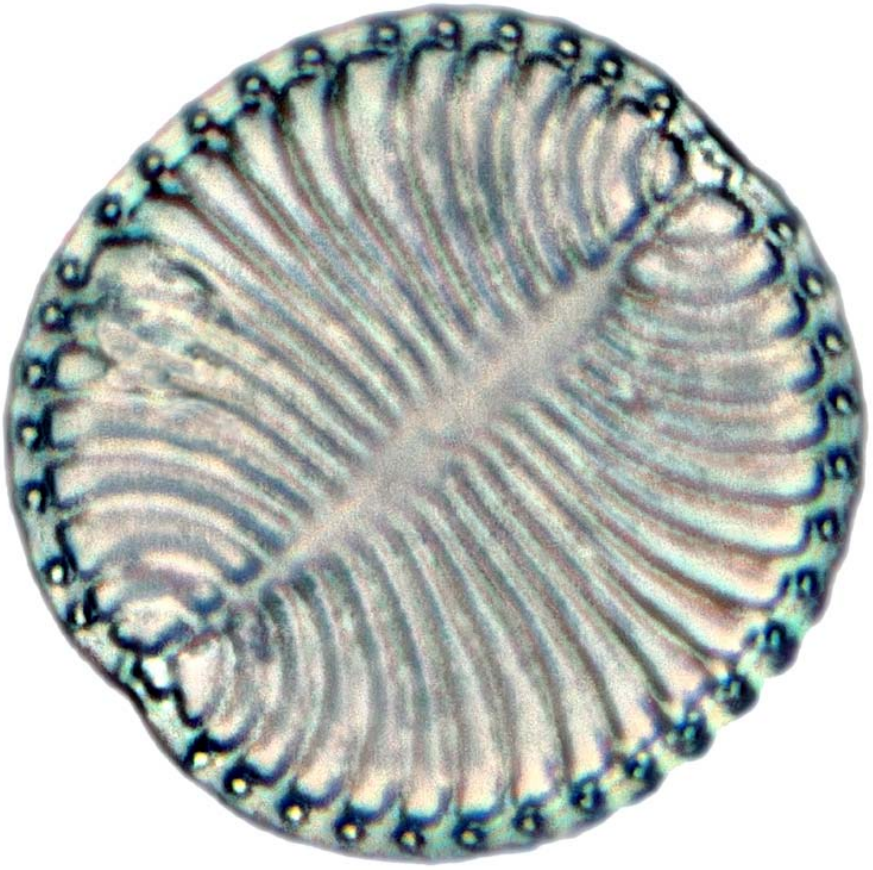












Bonus find –

Foraminiferan – possibly *Cribrostromum textulariforme*

Sunset – Santorini

Michael Reese Much can be contacted at
GLYPTODONT@rcn.com

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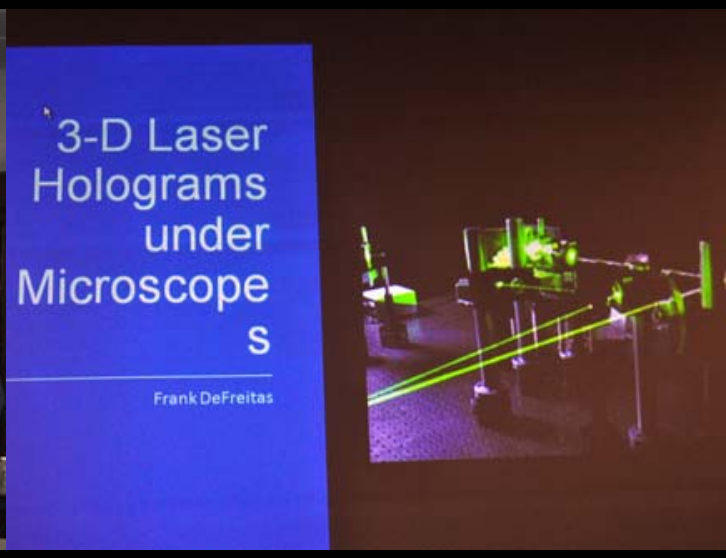
Hello … I'm Frank DeFreitas
I've been working with lasers and holography for 35 years.


3-D Laser Holograms under Microscope s
Frank DeFreitas

What is a Holography?

Unlike photography, holography does not record the optically formed image of the object being recorded. It records the *object wave itself*. This wave is recorded in such a way that subsequent illumination of this record serves to *reconstruct* the original object wave ... even in the absence of the original object.

A visual observation of this reconstructed wave front then yields a view of the object or scene which is practically *indiscernible from the original*.

It is the recording of the object wave front, rather than the object itself, that constitutes the basic difference between photography and holography.

H. M. Smith; Principles of Holography; 2; Wiley & Sons (1969)

The Holography Table Set-up

Overhead view shows:

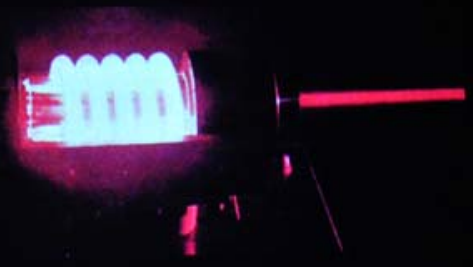
- Object (chess board)
- Heavy Table
- Laser beam
- Mirrors
- Lenses
- Film holder

What is a LASER?

01	02	03	04
Medium can be solid, liquid or gas	Creates a type of light that is: • Monochromatic • Coherent	Needed to make a hologram	Not needed to view a hologram

The First LASER 1960

Operated via short pulses of light.



Known at first as an "Optical MASER"

The First Gas Laser 1960

Ali Javan and William Bennett @ Bell Laboratories

Continuous wave output: HeNe LASER

Thank You!

Frank DeFreitas
holoworld.com

fdefreitas@holoworld.com

484-387-5320

NYMS Greeting and Information table at the new EAS Symposium location. Photos by NYMS President, Brooke Kammrathe, Ph. D.


NEW YORK MICROSCOPICAL SOCIETY
INC. 1877

1973 NYMS PRESIDENT

It was during the same year that I had been chosen to be President of the New York Microscopical Society – the previous year I had been its Vice President. That brought of course more obligations and extra work. A very special occasion was a Symposium, that we were planning to be held for one week in New York City. In later years, the NYMS held its Symposia together with those of the Eastern Analytical Sciences Group of the American Chemical Society. But during my year as President, it was the first such event for the Society and it really was a ground breaking occasion.

It was held at the old "Conrad Hilton" in Manhattan. When I think back –
I just shake my head – how and where in the world did I take the courage from,
to try to tackle such an undertaking!? Yes, I had the "Board of Managers",
members of the Society who tried their best to help with the myriad of tasks:
Insurance, Hotel Contract, Exhibitors, the Program, Speakers,
contracting a guard for the Exhibit, etc, etc.

Another task during that event was the presentation of Awards. The Society had three distinguished Awards:

"Fellowship"
Fellowship may be conferred upon Members in recognition of distinctive achievements in Microscopical Science.

The "Ashby Award", the highest honor of the Society, (not an annual Award), would be awarded only to members who had performed unusual service to the Society. Very few members had so far received this Award – named after George Ashby, who had been President of the Society for 16 years and "…had left a memory of great inspiration to those members who had been under his influence, guidance and counsel".

The Ernst Abbe Memorial Award
Shall be awarded only for outstanding achievements in Microscopy or
outstanding contribution to that science.


Georges (Jerzy) Nomarski
(1919-1997)

George Nomarski

So far, the latter Award had not ever been bestowed upon any recipient. However, there had been an exciting new development in illumination techniques, known as Differential interference contrast microscopy, or "Nomarski Interference Contrast", after its inventor George Nomarski, a polish physicist and optics theoretician. He was educated in Warsaw, finished his education in France and received his diploma from l'Ecole Superieure d'Optique (Grande Ecole). In 1950, Nomarski established the Laboratoire de Microskopie Optique de L'Institut d'Optique and became professor of microscopy and head of the department at his alma mater. He simultaneously conducted research at the Centre National de la Recherche Scientifique (CNRS), where he rose to the Directorship of Research by 1965. (see wikipedia.org)

He most certainly would be a most distinguished recipient of the "Ernst Abbe Memorial Award" of the New York Microscopical Society!

So to my innumerable tasks in organizing this event I had to prepare to give a speech not only about our Society and the Symposium, but about Abbe and the Award and then of course about our guest of honor who had agreed to come from Paris for this event.

I took a week of "Vacation" from Allied and moved into the Konrad Hilton. I was there already on Saturday, because the vendors were setting up their instruments and exhibits. Suddenly I was paged to come down to the side street entrance: A truck was there bringing Jeols Scanning Electron Microscope for the Exhibit. Problem? Well to transport the big instrument from the truck to the entrance required a certain Union. To move the monster to the elevator and load it onto the elevator required another Union and from the elevator to the Exhibition room…you guessed it!. So there I was looking at these bullies of men on the street – of course the Society was always short on funds – money could not speak. I just very meekly said that I am at your mercy. Could you - out of the goodness of your heart - please help me? I need that thing upstairs and I can't do it by myself. Please, please help me.

I never found out which Unions they belonged to, but they all helped and the monster landed upstairs at the right spot – and I shook their hands and thanked them – I felt like hugging them! The other vendors had smaller items and there was no problem getting them to their tables and everybody knew their business and they set up their exhibits.

It was evening and the hired guard came and I finally went to my room and went to bed exhausted. I thought I had just fallen asleep, when the phone rang: but it was 2:00 o'clock in the morning: A Hotel Guard at the other end said: "Miss, there is no guard at your exhibit Room, the French doors to the room are wide open – we are not liable…etc,etc…please come right away, we have to do something about it." Well, I got dressed and went upstairs. There was the Hotel Guard and everything was open. I tried to call the outfit of the "Hire a Guard" or something like it we had a contract with – no answer! So the hotel guard said he would get a chain and a lock and we could use that to lock the French doors. So I held watch over the instruments until the guy returned, we managed to attach the chain and locked it – I thanked the guard who proceeded on his rounds, and I went back to bed.

By that time it was about 3:30! In the morning I called our Mr. Feinberg who had hired the Guard Service and he promised to solve that problem. The rest of that Symposium is like a fog. Unfortunately I did not keep a single Program. The only thing I remember was the last day. There was a Social "Mixer", followed by the Awards Ceremonies and the Banquet . My husband came and joined me for that event.

The evening went off exceedingly well! Herbert and I chatted with guests and friends and finally we were seated for the banquet. I had of course to sit at the Dais, with Professor Nomarski my Table partner. We had a great time chatting together – I remember that he mentioned he liked Wagner's Music – and I admitted that I did not: since Hitler had been an admirer of Wagner's

music- I would not like the same! He laughed and told me his wife dislikes Wagner's music for the same reason! How irrational! He also told me I should not have to do all those organizational duties for the Society – use students!! (Well, he as a Professor could talk!) where would I find students to do the "dirty work"?

Then came the Awards ceremony – guess what: the first Award was the Ashby Award – I had no idea about that – and the recipient was I! Now I had to start with an unprepared Thank You speech! But then I spoke about Abbe and finally about our guest of honor Professor Nomarski, and presented him with the Abbe Award. It was an all around great evening, not just for me, but it seemed that everybody was having a great time. Of course I was also elated, that everything was over and behind me!

I left with Herbert and was assured, that the other Board members would wind up the business with the Hotel.

Photo of Annemarie and her husband Herbert at the 1973 Banquet

– photo taken by Phillip Harrington at the banquet.

Journal of Research on the Lepidoptera 8(1):1-15, 1969(1970)

1160 W. Orange Grove Ave., Arcadia, California, U.S.A. 91006

SCANNING ELECTRON MICROSCOPY ON WING SCALES OF *COLIAS EURYTHEME*

JOHN M. KOLYER AND ANNEMARIE REIMSCHUESSEL

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OPTICAL MICROSCOPY DISCLOSES that the scales on the wings of Lepidoptera may be ribbed lengthwise, with perpendicular cross-ribs to give a network (Gentil, 1935), but finer details cannot be resolved. Transmission electron microscopy has been utilized to study the fine structure of *Morpho* scales (Gentil, 1942; Kinder and Süffert, 1943; Richards, 1944), whose iridescent colors are "structural" and result from diffraction of light by ridges on the scale rather than from the present of pigments. However, in the family Pieridae, including the genus *Colias*, the yellow and/or orange colors are not structural, and transmission electron microscopy has been reported to disclose round and spindle-shaped aggregations of pigment (Yagi, 1954), which consists of a number of pteridine compounds (Watt, 1964). The black scales in the border are colored by melanins.

The present work was undertaken on the premise that the recently-developed method of scanning electron microscopy (SEM) should be particularly well-suited, due to its advantageous magnification range (45-30,000 X) and depth of focus, to examination of the surface structure of the scales. *Colias eurytheme* (Boisduval) was chosen as an example. A particular object was to note possible variations in the fine structure of scales from different areas of the wing.

METHODS

Figure 1 shows a specimen, male, with indication of the areas examined. Small portions of these areas were cut out with a scalpel, and each was mounted on a specimen stub. The specimens were vapor-coated with a thin (300 Angstroms) layer of gold/palladium alloy (60/40) to render them conductive, a prerequisite for examination by SEM. The SEM instrument was a JEOLCO JSM-2, operated at an accelerating voltage of 25 kv. Photomicrographs were prepared with Polaroid P/N Type 55 film at a scan speed of 50 seconds per frame.

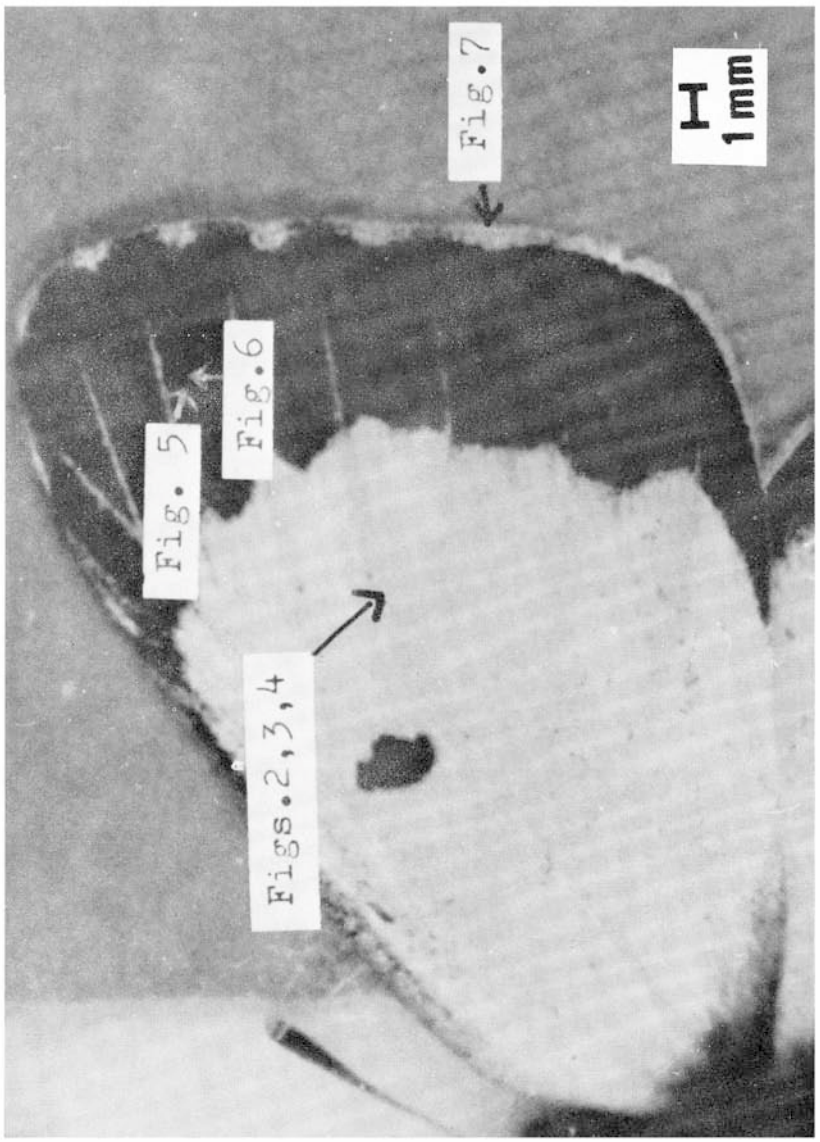


Fig. 1.—*Colias eurytheme*, male. Right forewing, showing location of scales examined.

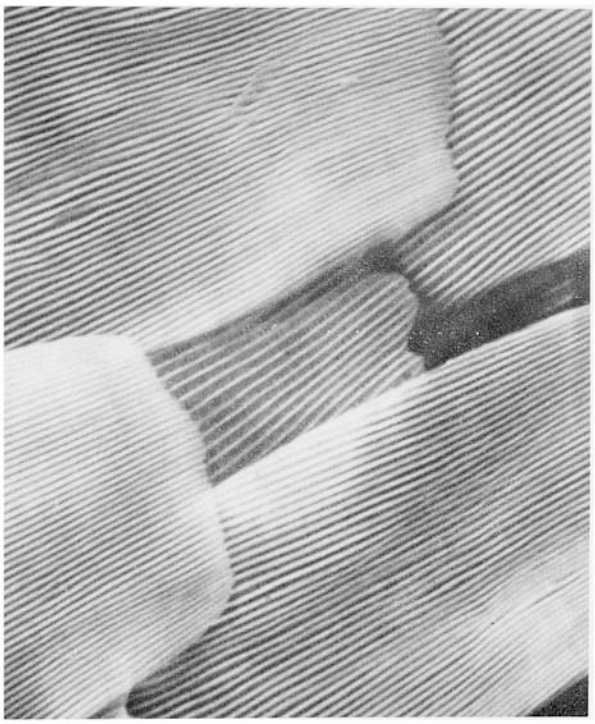
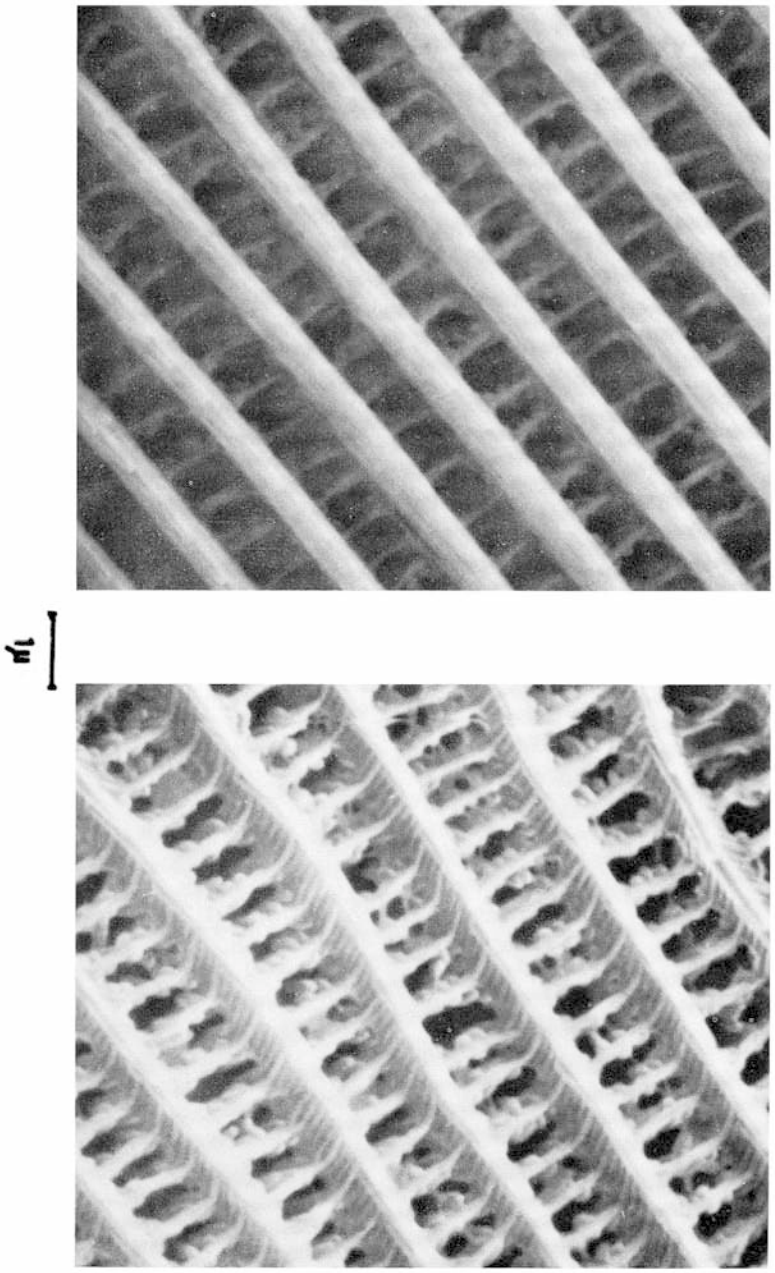


Fig. 2a.—Upper surface, orange scales.

To expose the underside of the scales, the wing was pressed onto a surface coated with contact adhesive (the backing used for Polaroid color prints), and the wing membrane was peeled off to leave the scales perfectly transferred. This method is successful because the peduncles (stems) are loosely held in sockets on the membrane, the scales of the upper and under layers being attached at alternating sockets (Gray, 1961).



Figs. 2b, c.—Upper surface, orange scales.

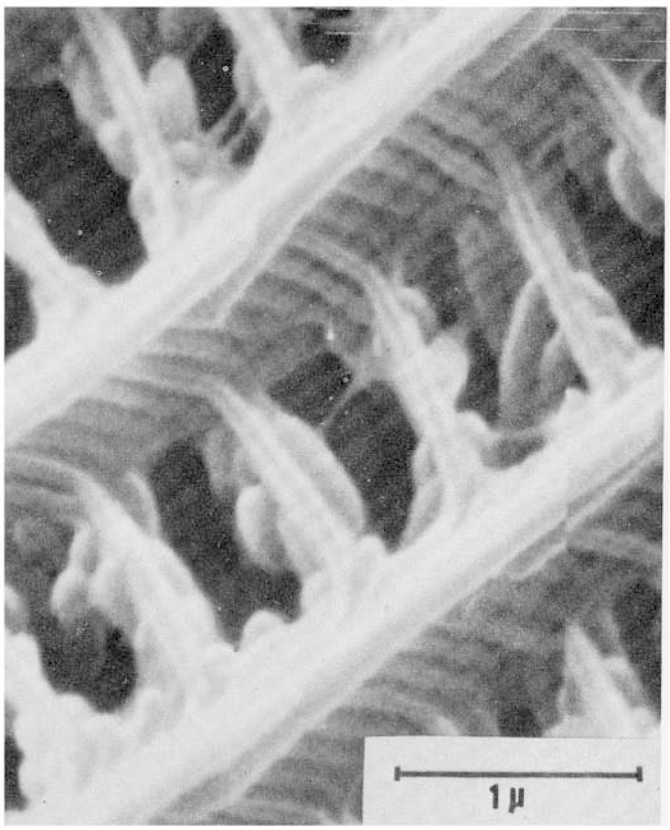


Fig. 2d.—Upper surface, orange scales.

OBSERVATIONS

Results are shown in Figs. 2-7. It is interesting that there are marked differences in fine structure among the four varieties of scales whose upper surfaces were examined and also between the upper and lower surfaces of the same (orange) scale. Butterfly scales long have been described as hollow, as suggested by the holes visible in the photomicrographs. The hollowness of the peduncle seems apparent in Figs. 4b and c. It has been speculated (Portier, 1932) that the scales and peduncles of the genus Parnassius are hollow and therefore admit air, communicate with tracheal capillaries in the wing, and play a role in respiration.

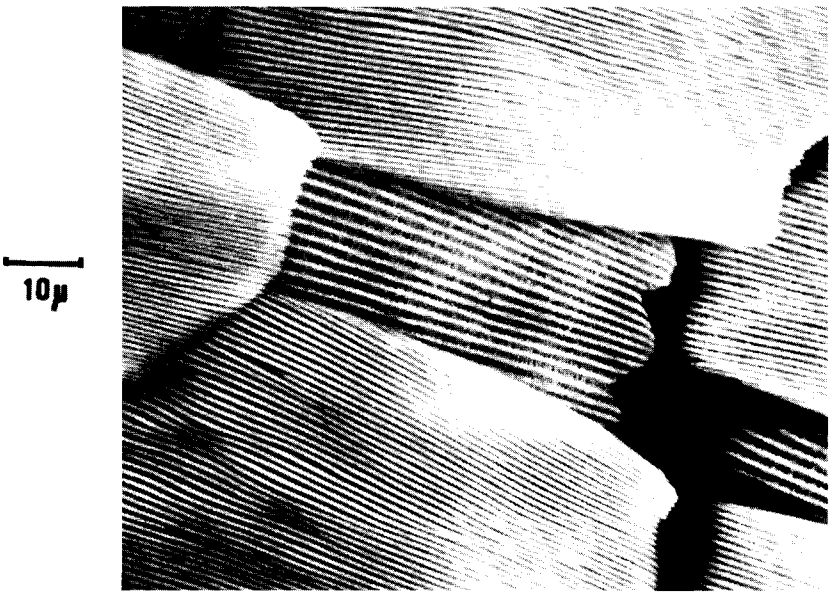
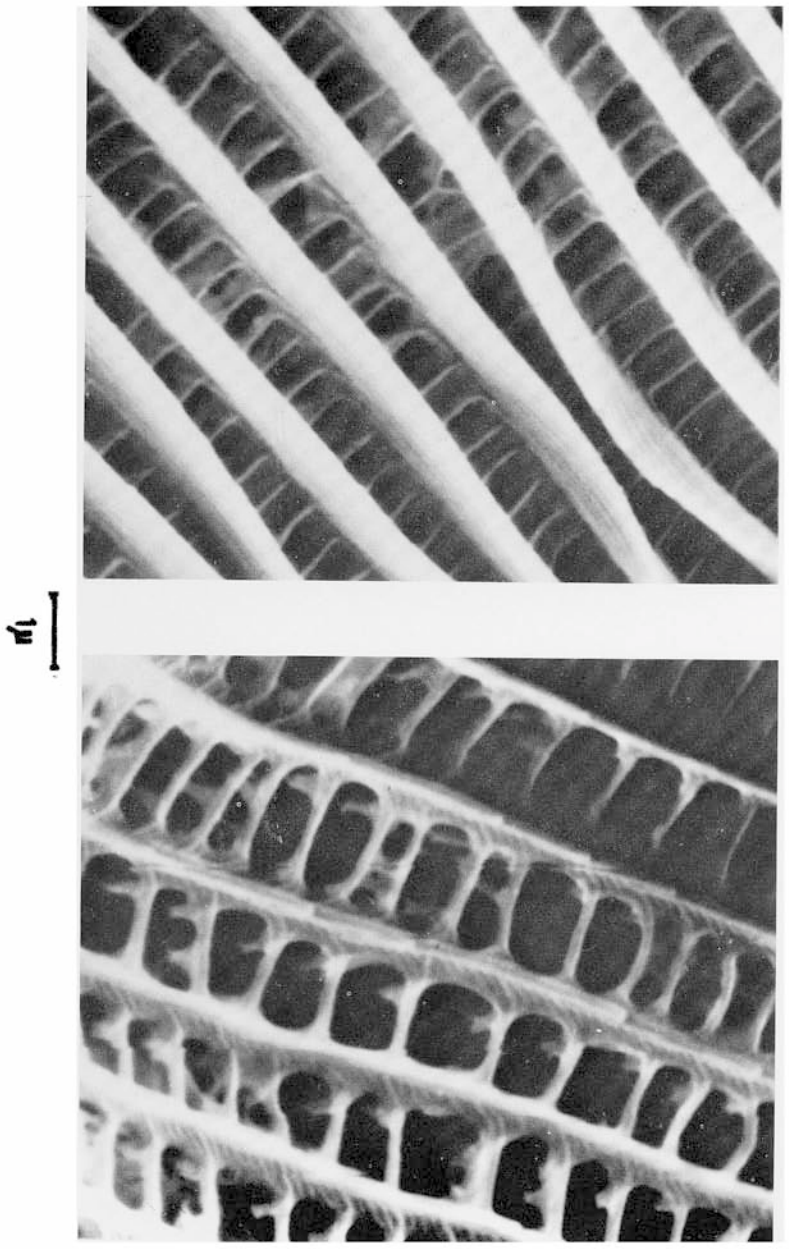


Fig. 3a.—Upper surface, washed orange scales.

The fine structure of the orange scales visible at 10,000X (Figs. 2b and c, 3b and c) resemble a "double grating" or network. The distance between the lengthwise ribs is approximately 1.5 microns, and that between the cross-ribs or connecting ribs ranges from approximately 0.5 to 0.7 micron. The thickness of the cross-ribs is approximately 0.07 micron. In some orange scales the cross-ribs appear to be partially interconnected by a thin skin or membrane (Fig. 2b) whereas in other orange scales most of the cross-ribs are not interconnected but exhibit small ellipsoidal structures that appear to be suspended from them (Figs. 2c and d). The above-described two types of orange scales are found in different positions with respect to the "shingling" arrangement (Fig. 2a) on the wing membrane; the scales with the ellipsoidal particles (Fig. 2c) occupy the lower layer and are partially covered by the upper-layer scales shown in Fig. 2b.



Figs. 3b, c.—Upper surface, washed orange scales.

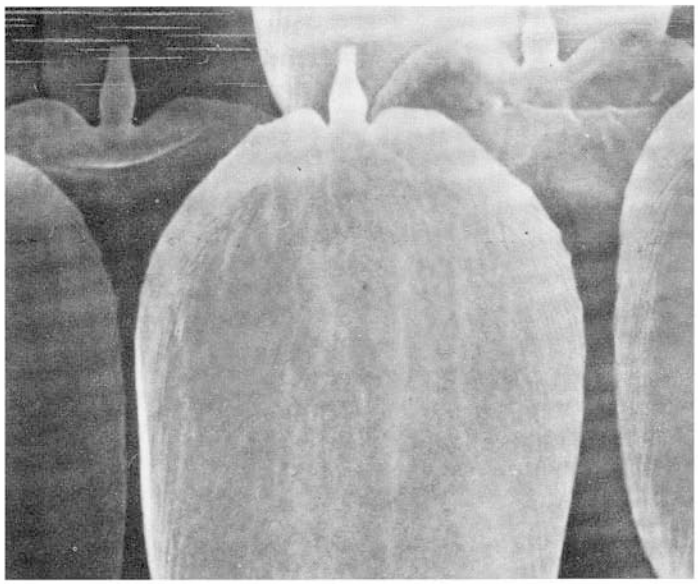
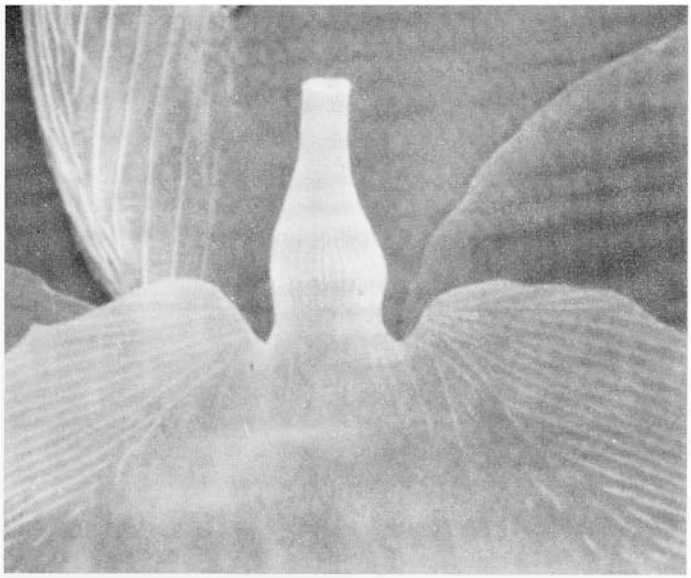
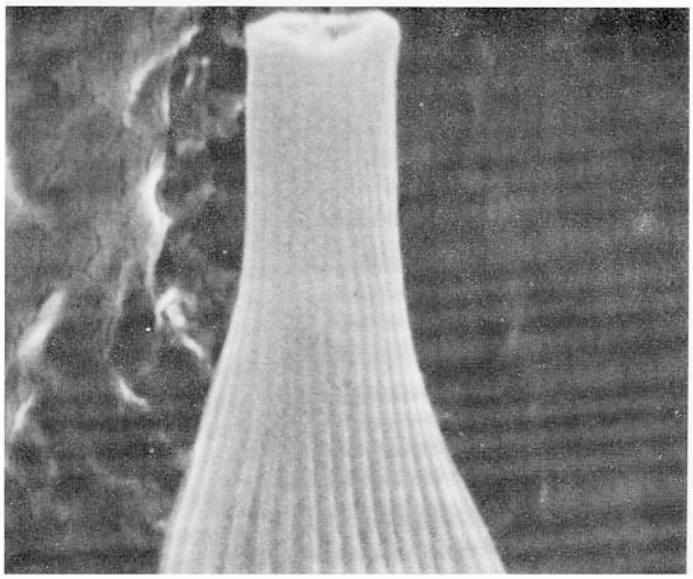


Fig. 4a.—Under surface, orange scales.

The orange color was removed completely by dipping a wing first in 95% ethanol and then for only 20 seconds in 20% aqueous ammonia (the color was transferred to the solution as the pteridines were dissolved as their ammonium salts). Then the wing was dipped in water, then ethanol, and allowed to dry in the air. Photomicrographs of the washed scales are shown in Fig. 3. The treatment seemed to make no change in the upper-layer scales (Fig. 3b vs. Fig. 2b), but in the case of the under-layer scales the suspended particles appear to have been largely removed to give a more open network (Fig. 3c vs. Fig. 2c). Whether and to what extent the ellipsoidal particles are related to the color remains to be established.

The under surface of the orange scale shown in Fig. 4 appears to be without much detailed fine structure. There are no ribs except on the peduncle and the periphery of the scale. This observation suggests that the scale resembles a hollow pouch consisting of two significantly different sheets—a continuous bottom membrane and a cross-ribbed upper sheet which is more or less porous depending on the type of scale and its position on the wing.





Figs. 4b, c.—Under surface, orange scales.

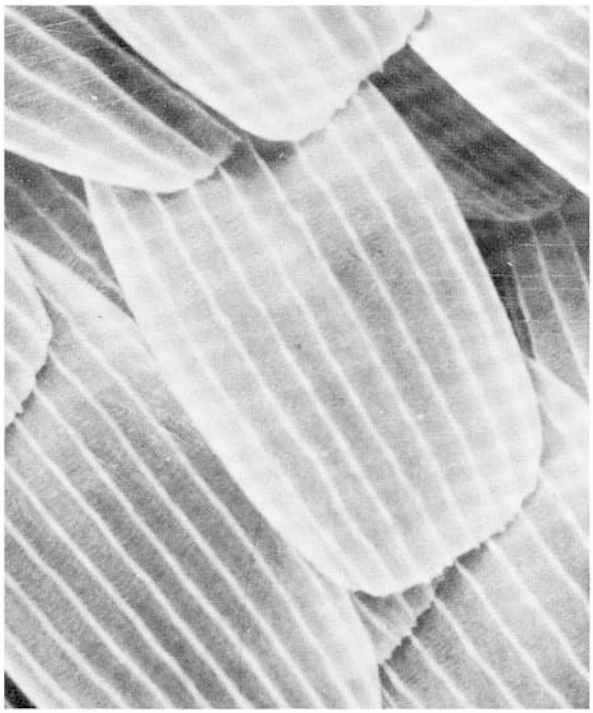
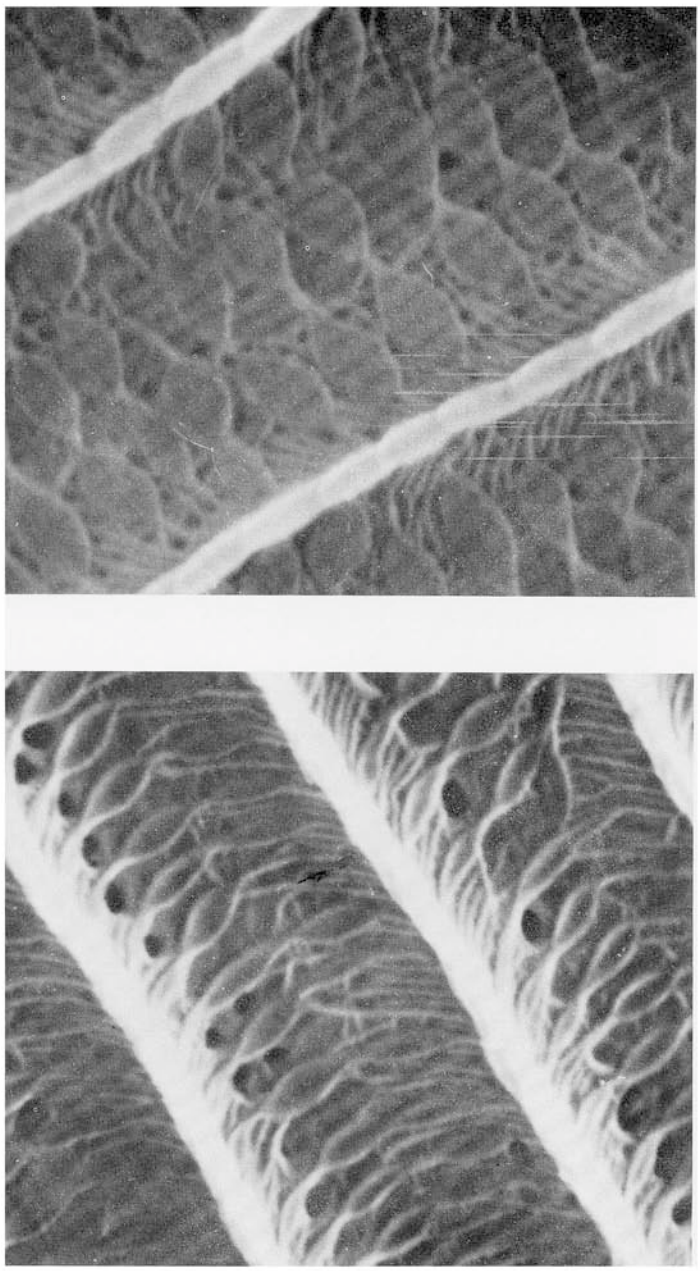


Fig. 5a.—Upper surface, black scales.

The fine structure of the upper surface of the black scales (Fig. 5) is strikingly different from that of the orange scales. The distance between the lengthwise ribs is approximately 3 to 6 microns as compared to 1.5 microns in the orange scales. Also, the trough-like material between the lengthwise ribs of the black scales displays intricate patterns which cannot be described as "cross-ribs" (Figs. 5b and c).

Interspersed among the black scales are brightly-colored yellow scales in which the distance between the lengthwise ribs is approximately 3 to 4 microns. The presence of cross-ribs, and particulate matter in some areas, is indicated (Fig. 6b).



Figs. 5b, c.—Upper surface, black scales.

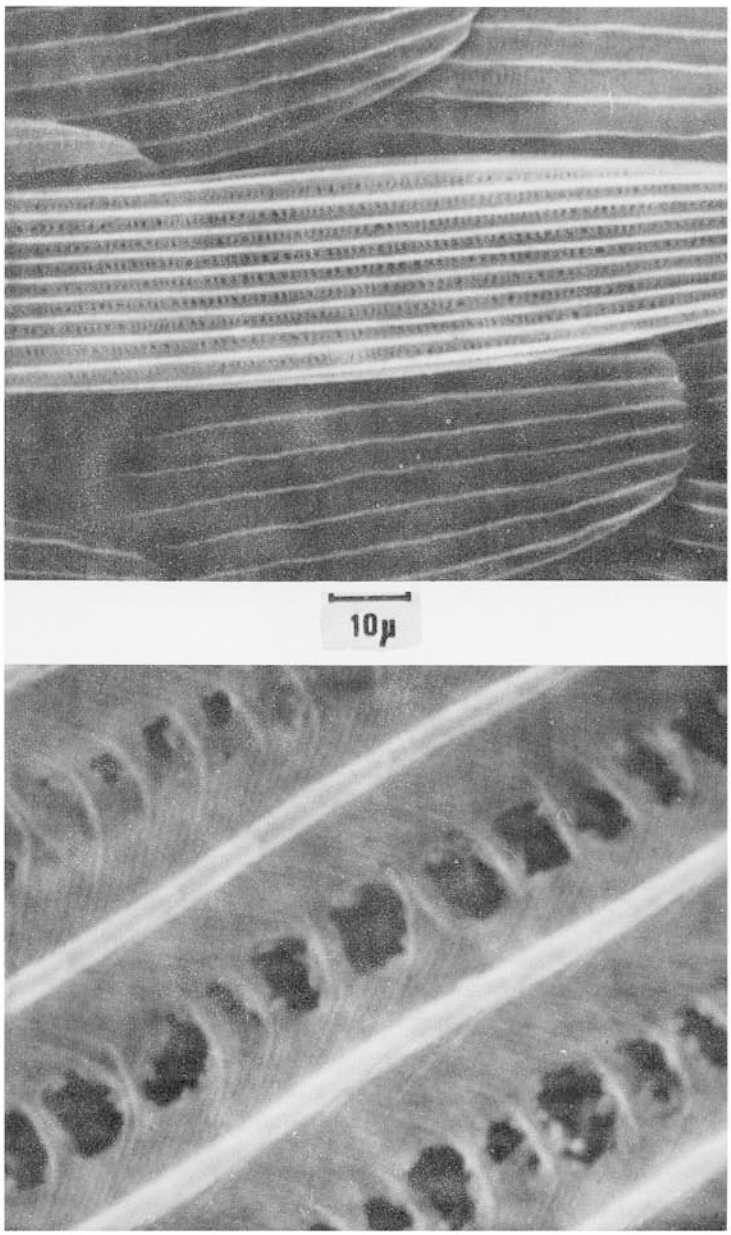


Fig. 6a, b.—Upper surface, yellow scales.

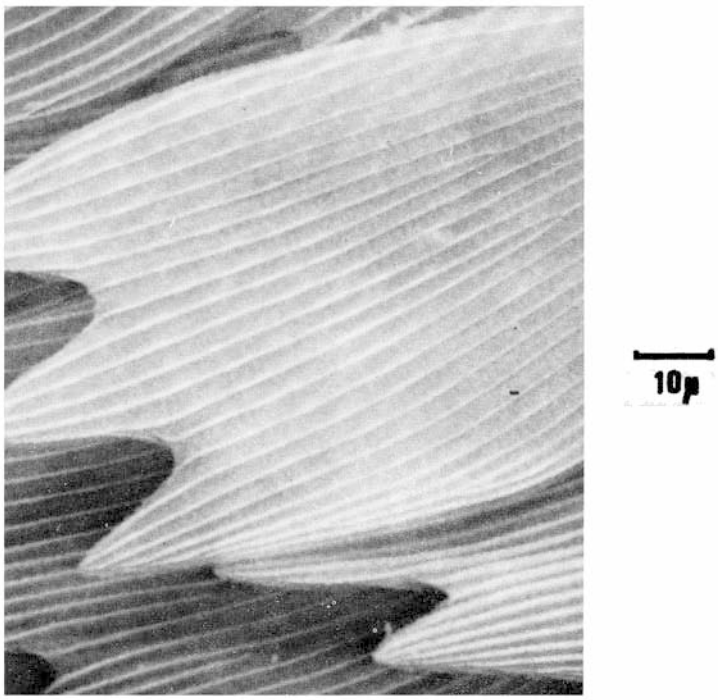
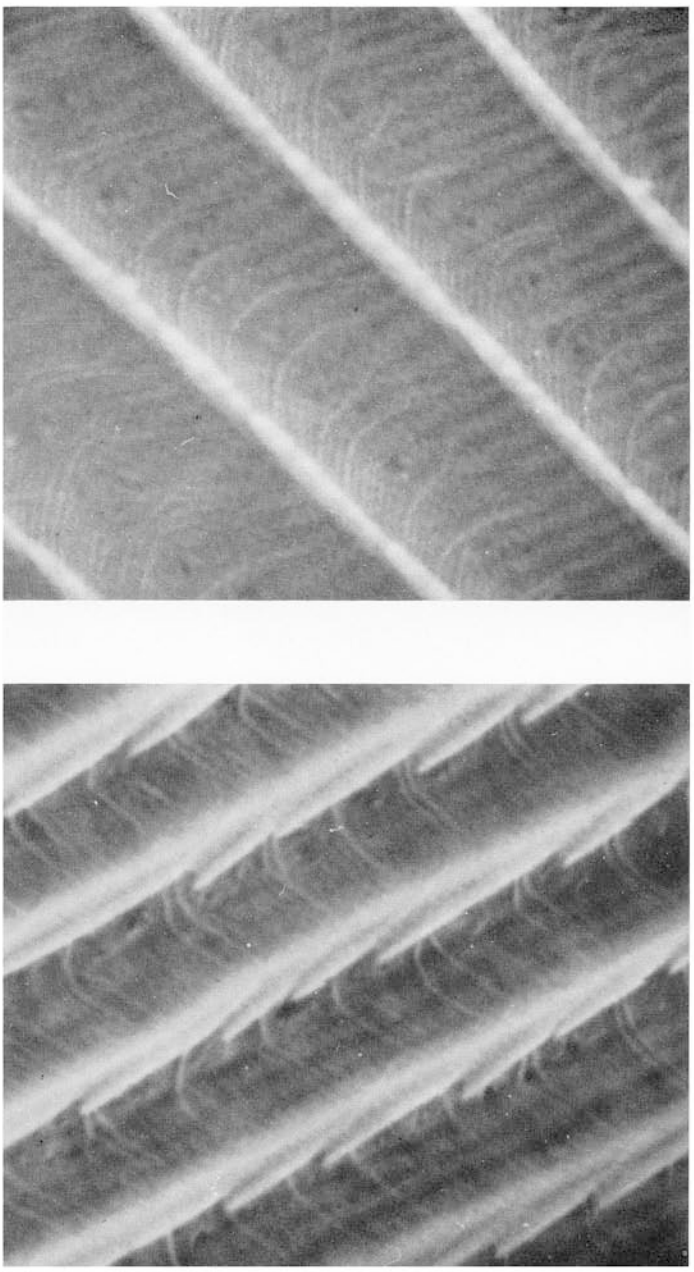


Fig. 7a.—Upper surface, pink fringe scales.

The final type of scales examined, the pink fringe scales, exhibit lengthwise ribs that are approximately 2 to 4 microns apart; the inter-rib distance varies from a minimum of about 2 microns at the basal region to a maximum of about 4 microns toward the tip of the scale. Tilting of the specimen showed clearly that the lengthwise ribs are composed of overlapping short narrow "scales" (Fig. 7c). The material connecting the lengthwise ribs in this case forms a continuous trough and appears to be supported by faintly-visible cross-ribs.



Figs. 7b, c.—Upper surface, pink fringe scales.

SUMMARY

Fine structure varied greatly with color and position. The upper surface of an orange scale, cross-ribbed and perforated between the lengthwise ribs (1.5 microns apart), was strikingly different from the smooth and continuous lower surface as well as from the upper surface of a black scale, on which the ribs (5 to 6 microns apart) were connected by intricately-patterned "troughs". The peduncles (stems), as well as the scales themselves, appear hollow.

ACKNOWLEDGMENTS

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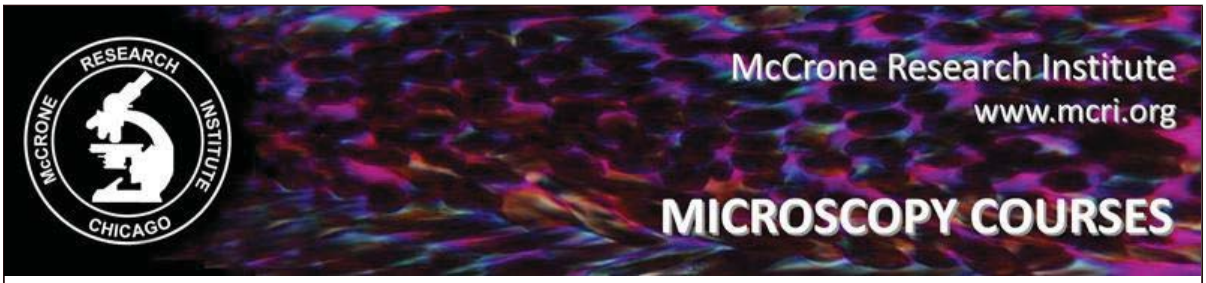

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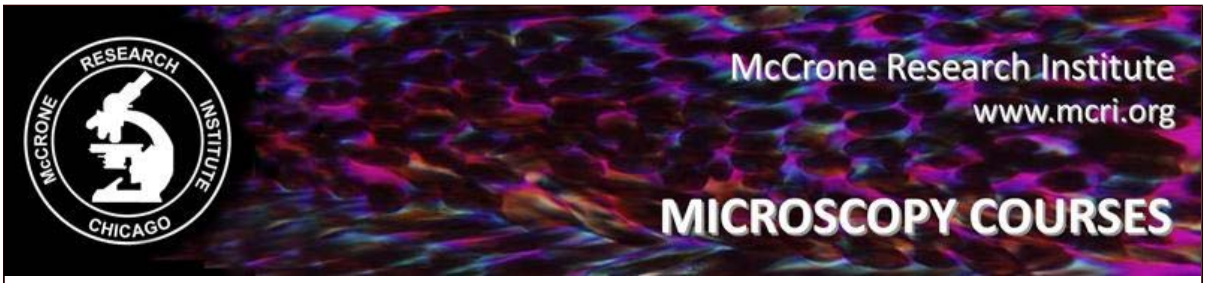

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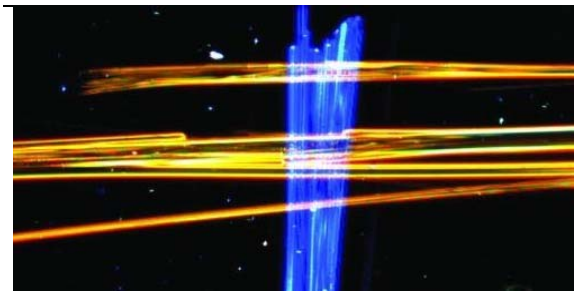
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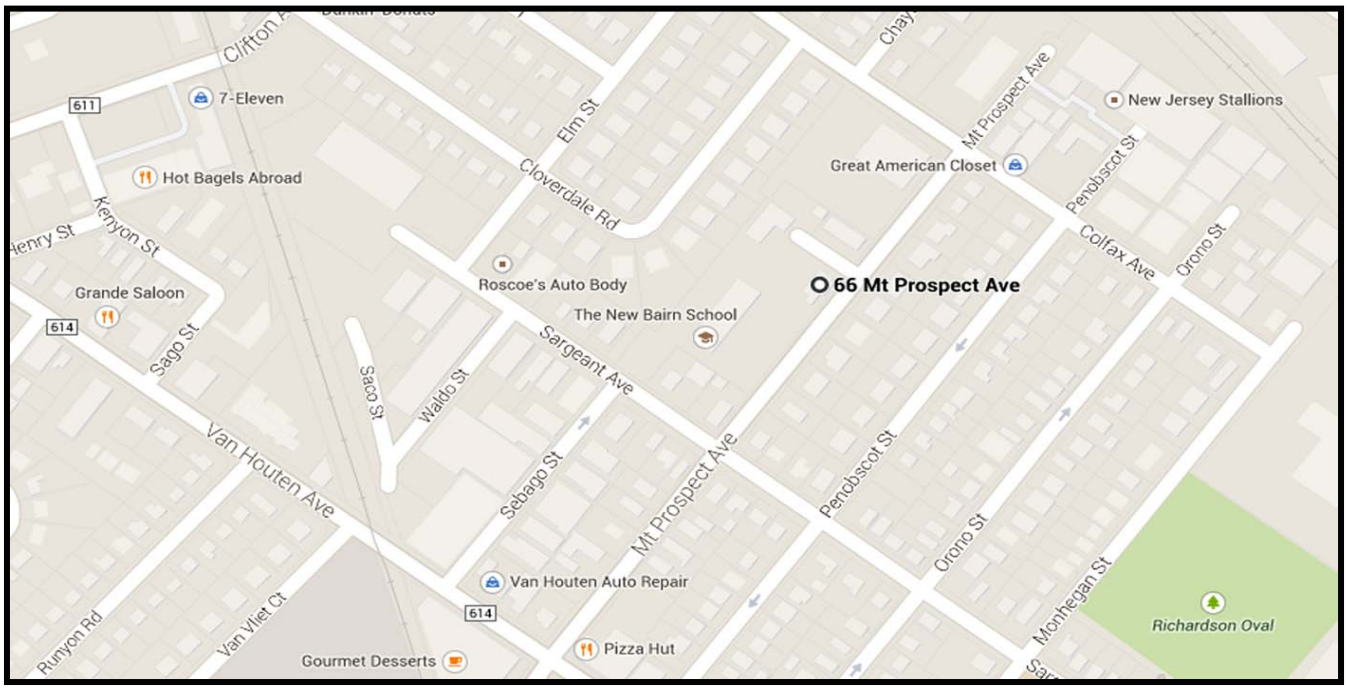

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c/o Mel Pollinger, Treasurer
18-04 Hillery Street
Fair Lawn, NJ 07410-5207

Please Print

I hereby apply for membership in the New York Microscopical Society

Name: (Dr., Ms., Mr., Mrs.)……Nickname:……

Home Address:……

……

Phone: (home or mobile)……Fax: ……Email:……

Work Information: Company Name……Work Address:……

……

Work Phone: ……Email:……

Would you prefer to receive NYMS mail at home? ☐ at work? ☐ by email (*best way*)? ☐

Principal work or interest in microscopy:……

……

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

Academic and Honorary Degrees:

Degree Conferring Institution Date

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Scientific Publications……

……

……

Membership in Scientific Societies……

……

Date of birth (optional if over 18) ……

I have enclosed a check for $..... to cover my application fees for membership.
{Annual $30, Supporting $60, Life $500 (payable within the year), Corporate $175 (includes one advertisement in NYMS News), Junior $5 (under 18 years old), Student (over 18) $20.}

I understand portions of the above information may be used in NYMS publications.

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

Signature……Date……

NYMS Headquarters: One Prospect Village Plaza (66 Mount Prospect Avenue), Clifton, NJ 07013

Fungus on tree, Fair Lawn, NJ, October 2017(DSC8121)b6x4x200: Photo by Mel Pollinger

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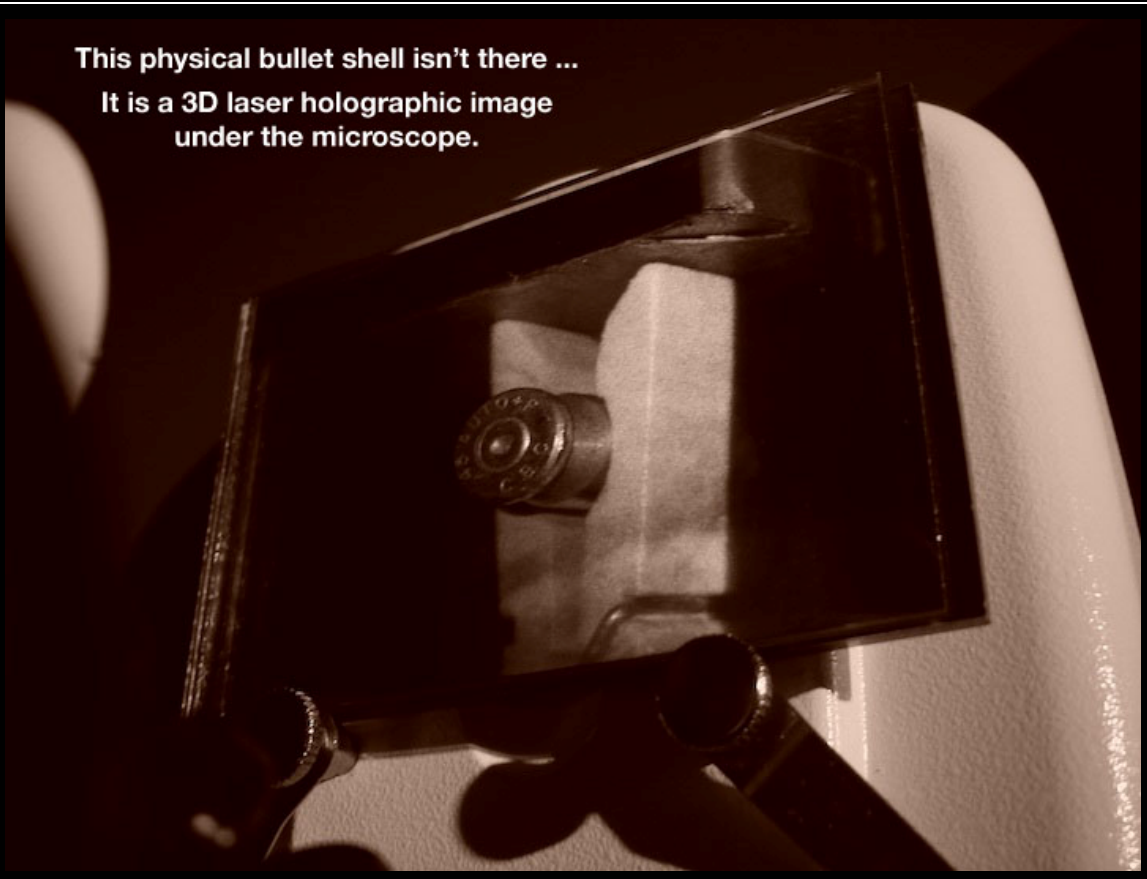
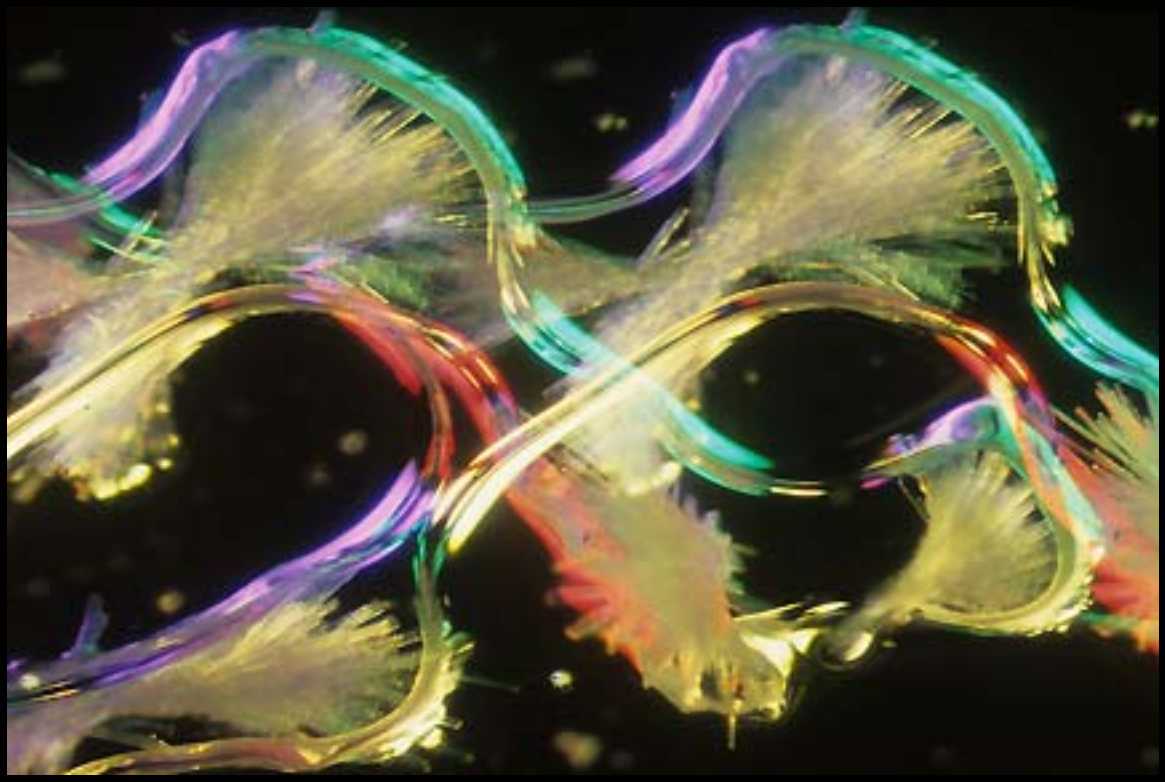
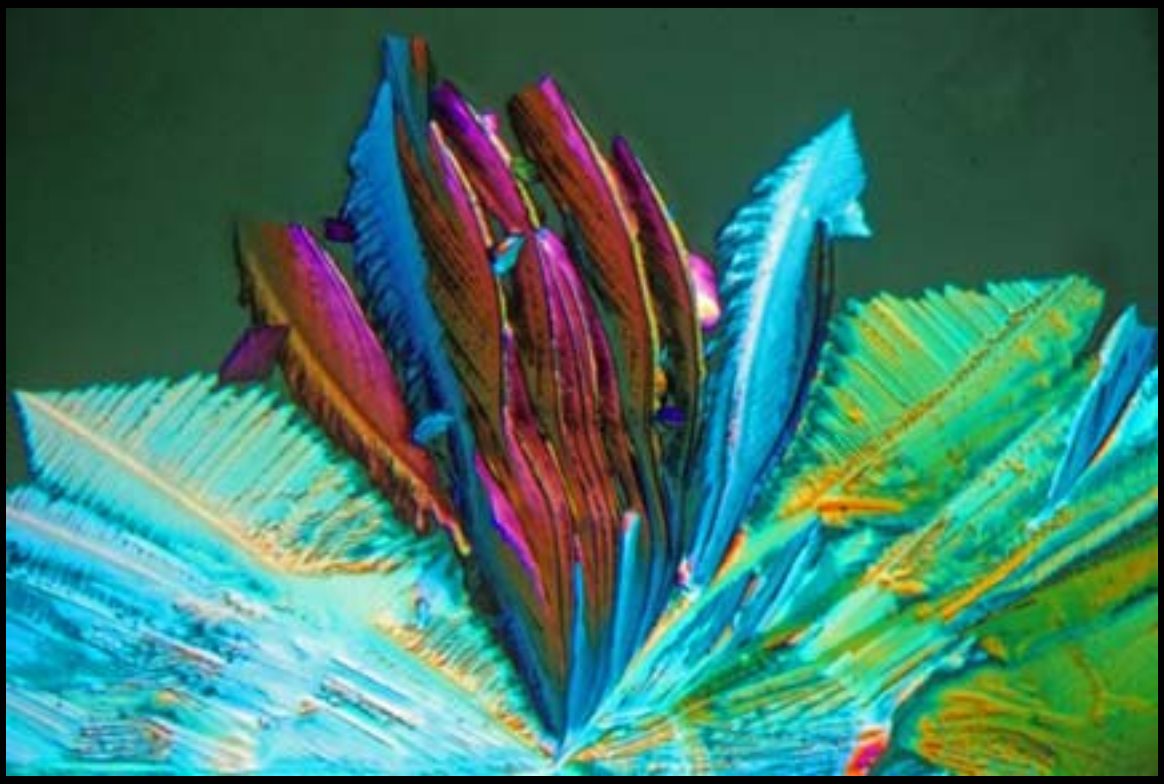


by Frank DeFreitas

Radiolariaa, dark field from prepared slide; Photomicrography by Mel Pollinger



Niacin, Rheinberg illumination, 40x (P1712113)a; Photomicrograph by Mel Pollinger



Arabo-ascorbic acid, Polarized-light, 100x (P1162808)a6x4x72; by Mel Pollinger

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Water flea, live (Daphnia), IMG9170 7x6x72; Captured & photomicrographed by Jay Holmes, AMNH