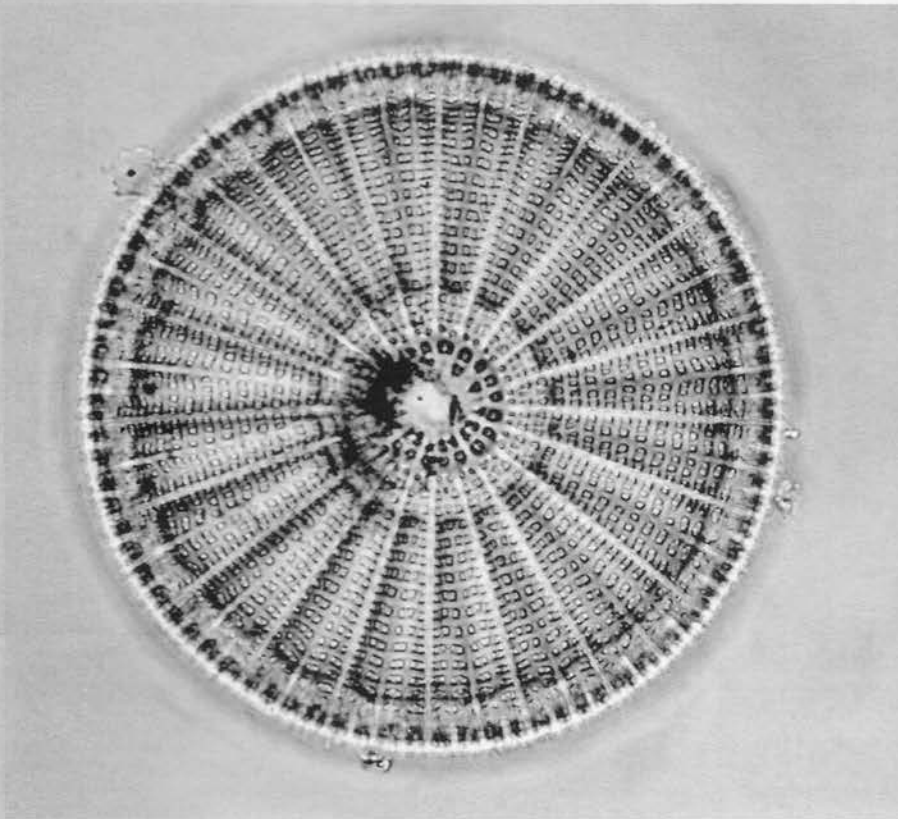




# MicroNews

San Francisco Microscopical Society

Volume 9, #2 April 2014



## Featured Image

*Diatom*  
by Alan Rockefeller

## Courtesy Reminder

*Please pay your 2014 membership dues if you have yet to do so!*

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## The microscope's place in history

If you have recently had an operation or some major dental work, you will be tempted to identify anesthesia as one of the foremost inventions of humankind. You cannot imagine what it would be like to undergo such medical treatment without the benefit of these drugs that block the transmission of pain to the brain. This is just one of the

inventions that changed our lives dramatically. An article in the November 2013 issue of the Atlantic magazine listed *The 50 Greatest Breakthroughs Since The Wheel* by James Fallows. He asked 12 leading scientists, technologists and historians in a variety of fields to list in order of importance the most significant advances and from their response produced a

master list that placed anesthesia, first invented in 1846, far down the list in position 46.

On reflection, I agree that the printing press was the most important innovation, ultimately insuring the education of middle classes and deserves top honors. As I read the arti-

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## SFMS Salutes The Sidewalk Astronomer

Astronomy and microscopy share some of the advances in optics and the need for excellent optics. While astronomical instruments look outward into the void where light has been traveling for an extremely long time, the microscope looks inward toward the minute, trying to reveal structure and function. Both types of instruments serve to extend our senses so that we can better dissect the processes we discover in the universe.

David Perlman, the science writer for the San Francisco Chronicle reported in the February 2, 2014 issue of that paper the recent death of John Dobson, and gave a concise account of this extraordinary man who promoted sidewalk astronomy in San Francisco and in other cities.

You are correct to wonder why we should note the passing of John Lowry Dobson on January 15, 2014 at the age of 98 but the answer is simple. SFMS invited him to speak and he came and shared his views with us on November 10, 2005 at the Randall Museum. His topic was **This Is Your Universe** and in the preamble he added: "So let us go back then, you and I, to those thrilling days of yesteryear when you were a cell and I was a cell in the Precambrian slime."

He gave us an exciting evening exploring the universe. The microscopic world holds many wonders but so does the macroscopic universe and there is a continuum from the subatomic particle to the cosmos. That evening we tried to fathom this thread of knowledge that ties together these extremes.

He led a life that was, in many ways, monastic. Born in Beijing, China, he came to San Francisco in 1927 and graduated from UC Berkeley with a masters degree in chemistry in 1943. The next year he joined the Vedanta Society in San Francisco where he remained as a monk for



*John Dobson (1915-2014) is celebrated for his contributions to amateur astronomy organizations throughout the nation.*

*photo courtesy of earthsky.org*

the next 23 years. He concentrated on astronomy and was asked by his superiors to reconcile astronomy with the teachings of Vedanta. He built a telescope and interested people outside the temple grounds in viewing the heavens.

Eventually he was given the choice to give up telescope building or leave the society. He was expelled in 1967. He co-founded the amateur astronomy organization known as the San Francisco Sidewalk Astronomers.

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Minutes' Report from February 16th, 2014

San Francisco Microscopical Society Minutes for Sunday, February 16, 2014 at 12 noon. Location: 1648 Moreland Dr. Alameda, Ca. 94501

In Attendance: President Werner by cell phone, Vice President Bill Hill, Recording Secretary Mary Ann Scott, Treasurer Myron Chan

The meeting of the San Francisco Microscopical Society Board was called to order at 1:35 pm.

The Recording Secretary asked for approval of the minutes of the Board Meeting, Dec. 13, 2013. Bill motions and Myron seconds the motion.

President's Report: Peter reported that bioslides cost \$50.00 for 20 slides. Three of the slides are diatoms.

Grant committee looking for other members.

Vice President's Report: Bill Hill did not have a report to give.

Other expenditures: Grant recipient, 3 dissecting scopes, historical typing,

**2014 SFMS Officers**  
**(Acting) President: Peter Werner**  
**Vice President: Bill Hill**  
**Treasurer: Myron Chan**  
**Recording Secretary: Mary Ann Scott**

**Next Board Meeting:**  
**Sunday, April 13th, 12pm**  
**1648 Moreland Drive, Alameda, CA**

Treasurer's Report. Myron reported our income for 2013 was \$1,412 from membership dues (one life member) donation and transfer of funds.

Expenses for 2013: \$232.99 for income tax preparation. Sara Sandhu needed \$98.99 to purchase Microsoft Publisher.

postage, printing, website and supplies.

Total Expenses- \$4965.25.  
 Net loss \$3,553.25.

Other business:

Myron and Sara will volunteer at Laurel School. They will bring microscopes to the second grade. The

children will look at bird lice and cheek cells.

Bug Day at the Randall Museum. Volunteers are needed.

Bill reported that there will be a microscopy workshop at S.F. State, and there will be a Lichen Workshop on the 3rd Friday at the College of Marin. They will have microscopes. The focus will be on microscopy.

Time and Place for next Board meeting.

Sunday, April 13th at noon. Location: Mary Ann Scott's house 1648 Moreland Dr. Alameda, Ca. 94501.

Motion to adjourn Myron motions and Mary Ann seconds the motion.

Adjourn at 2:30pm.

*Minutes prepared by  
 Recording Secretary,  
 Mary Ann Scott*

*(continued from pg. 2)*

Its aim is to popularize astronomy among people on the street. John Dobson has beguiled several generations by providing great views of the starry sky and his wide-ranging knowledge of the heavens.

John Dobson, the Sidewalk Astronomer, who has presented his interesting ideas

before many august gatherings of scientists, in November 2005 gave a challenging and provocative lecture before a few SFMS members and a considerably larger group of interested astronomers who gathered at the Randall Museum. In his presentation, he held that Sanskrit writings by sages demonstrated that they had understood the cosmos five

thousand years ago. Einstein equated matter with energy in the famous  $E = mc^2$  equation. John claimed that he never added the  $c^2$  part of the formula that converts the equation into measurable units. Thus, we need only consider energy in attempting to understand the cosmos. So how does the cosmos behave? Only observational information

should be considered in arriving at an understanding. The currently favored Big Bang Theory does not rest on observational data. The three degree K background radiation can be explained by other than the Big Bang Theory.

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## Summer Reading by Peter Werner

I picked up several really good microscopy books via Link+ interlibrary loan recently.

The standout is "Practical Digital Photomicrography" by Brian Matsumoto. It's the book I wish I'd had when I first bought a microscope. Much of it is quite basic from my knowledge base now, but its an \*excellent\* introduction to the basics of microscopy, and what I would recommend to a beginner before diving into anything more optics-heavy. It has one of the best plain-English descriptions of the role of diffraction and orders of light in microscopy, a topic most books on the topic don't explain in a non-technical way. Most importantly from my point of view, there are several chapters on coupling cameras with microscopes, something that's really not covered well in much microscopy education (based on my experience, taking light microscopy classes at three

different schools). I've learned a lot about microscopes and cameras over the years, but precious little about putting the two together in an effective way. This book covers that gap.

I picked up a couple of books by the founder and past president of the modern SFMS, George Needham. The first is "The Practical Use of the Microscope", Needham's 450+ page magnum opus, a compilation of his extensive body of knowledge on microscopy up to 1958, including detailed descriptions of many of the models of microscope current at that time. Too lengthy, probably, for any but the most determined to read cover-to-cover, but an outstanding reference, and with a lot of information I have not seen in more modern sources. I've been reading over (and getting a great deal out of) his chapter on darkfield and Rheinberg microscopy, which he covers in a level of

detail I've seen nowhere else - beyond the Molecular Expressions/ Nikon Microscopy U site's typically lengthy coverage of the topic, even.

The second is his much more concise "The Microscope: A Practical Guide", an introduction to microscopy in about 100 pages. This would be a worthwhile read, with "The Practical Use of the Microscope" being for any topics one wants to dive into further.

Needham's works are a prime example of "orphan works" - still covered under copyright extension (automatically 75 years after the author's death if not actively renewed beyond that - which puts all of Needham's work under copyright until 2041), but very hard to find who exactly the living owner of the copyright actually is. Needham died childless, with two married sisters, and establishing copyright ownership (and hence, online or print publication permission) requires tracing and tracking down their living decedents, if any

- an extremely burdensome process. This is, unfortunately, the fate of much academic work, and court rulings on copyright law so far have been unsympathetic with bringing such works into some form of public domain.

In terms of a more modern short (again, about 100 pages) introduction to the topic, I've also borrowed a copy of Saville Bradbury and Brian Bracegirdle's "Introduction to Light Microscopy". It's probably the book I'd recommend as a followup to "Practical Digital Photomicrography". In fact, I'll probably be scanning parts of it for assigned (or at least strongly recommended) readings for some of my upcoming lectures for the Merritt Microscopy Program. It's part of the Royal Microscopical Society Microscopy Handbooks series, and every book I've seen in that

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Dobson favors the Recycling Model of the cosmos. Dispersion of molecules at the perimeter of the universe, some 14 billion light-years from us, reduces all matter to hydrogen. Under gravitational force, this matter coalesces into new galaxies. These very young galaxies have been recently observed. They do not fit into the Big Bang theory.

I admit that my notes and knowledge limited my ability to understand the rest of the presentation and of the physics involved. The listeners enthusiastically applauded his presentation.

-Henry Schott

*image on the left: telescope at Oakland's Chabot Space & Science Center*



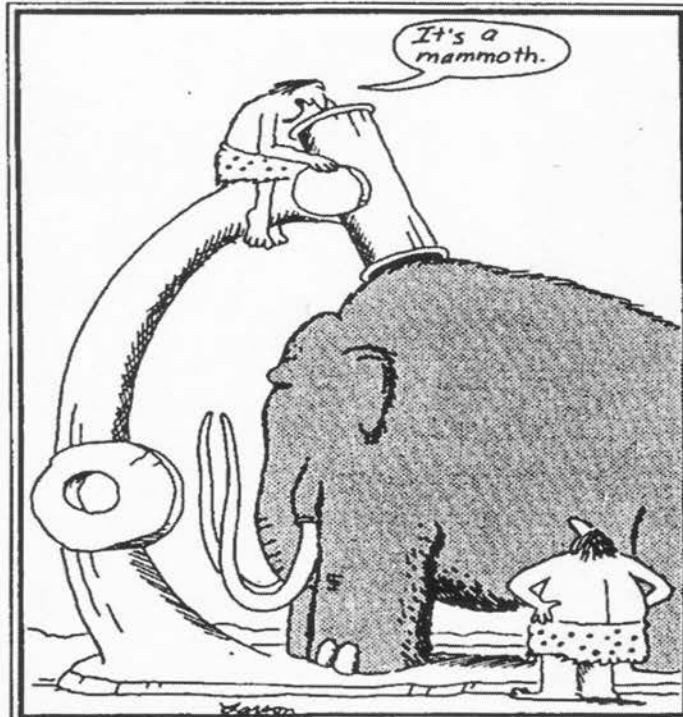
**A microscope's place in history (cont'd)**

*(continued from pg. 1)*

cle, I wondered where I would find microscopes and telescopes, instruments that played such an important role in widening the visual horizon. They were not listed in the middle pages where such inventions as the Gregorian Calendar, 1582, the Cotton Gin, 1793, the Sextant, 1757, and Nuclear Fission, 1939, were listed. When the main consideration is the importance of the invention to the general advancement of civilization then Electricity must rank high and in the Atlantic article it is #2. It is followed by Penicillin, 1928, and then

by Semiconductor Electronics starting in mid-20<sup>th</sup> cen-

in the 13<sup>th</sup> Century. Lenses are high on the list and



**Early microscope**

tury. Finally, we come to #5, Optical Lenses, starting

properly so considering how much we have come to de-

pend upon their ability to reveal a world invisible to our unaided eyes.

Perhaps the Romans knew something about lenses but they failed to experiment and advance the field. They were great engineers but poor experimenters and failed to recognize the value of lenses. The Chinese did know the value of lenses but, having a policy of isolationism, they were not interested in exporting to new markets. Thus, it fell to the European intellectuals to share with each other and with their powerful rulers the benefits of curved lenses to explore what they could not see with the naked eye.

-Henry Schott

*(continued from pg. 4)*

series has been quite good. It's unfortunate that practically everything in that series is now out of print and relatively expensive (typically \$50 on up for 100-page books).

Another book I picked up from the RMS Handbooks series is "Food Microscopy" by Olga Flint. I wish I'd had it around Merritt last semester, since food items seemed to be the samples of choice for student projects. Unfortunately, not all food items

necessarily translate into interesting items under the microscope, or they require certain techniques of preparation or illumination to get meaningful information from. While "Food Microscopy" is not a comprehensive source for the microscopic attributes of any given food, it does outline some extremely interesting experiments and observations one can make of specific foods, and some of them look so interesting that I might have to make a point of trying them out. Some chapters and sections include chapters on mi-

croscopy of food starches and meat products (including specific sections on "The microscopy of Turkish jellies" and "Experiments in sausage microscopy using simple equipment"). There is also a whole chapter on quantitative mold counts of tomato products you can find the *Aspergillus* and *Penicillium* content of your favorite ketchup, if you really want to know. :-) Also, parts of the introductory chapter on the history of food microscopy are an total hoot, and I always appreciate a writer who can introduce humor

into highly technical literature like this.

Finally, I also borrowed the 3-volume "Advanced Light Microscopy" by Maksymilian Pluta, but I'm afraid much of it is over my head. It is very worthwhile source, however, if one wants to get into the optical theory of microscopy (and interference microscopy in particular) on a linear algebra- and calculus-based level.



Stamp

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**FROM: Micro News**  
San Francisco Microscopical Society  
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Hercules, CA 94547-1143

**MEMBERSHIP INFORMATION**

To join the Society, fill in the form available on our web site at [www.sfmicrosoc.org](http://www.sfmicrosoc.org)

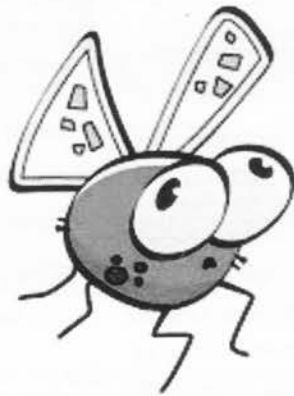
Mail it to : SFMS Treasurer  
435 Melrose Ave  
San Francisco, CA 94127

Make check out to SFMS.  
Dues are \$12. per calendar year. Pay now for 2014  
Life membership is \$144.00

*We are on the Web*

**WWW.SFMICROSOC.ORG**

**TO:**



Hello readership!

Spring is upon us, and with the added sunshine I hope you all find time to enjoy the many exhibits, lectures and galas planned for the upcoming months. SFMS is still in need of volunteers for Bug Day. Spend the day teaching kids and parents about microscopes as they gaze into the eyes of a housefly or examine the fuzzy coat of a bumblebee.

I would also like to focus your oculars on the May 15th fundraiser hosted by our friends at the Mission Science Workshop. Dan Sudran, MSW's Executive Director, is promising a night of fun, food and tinkering in an effort to raise money for the network of workshops. More information will follow, but I encourage you all to mark your calendars in advance.

Wishing everyone a happy season,

Sara Sandhu

**Bug Day**

April 26th, 2014

10am-2pm

Randall Museum

199 Museum Way

San Francisco, CA