

## H2O'C Engineering News - January 2004

### Computer Microscopes Distributed to Water Utilities

Several years ago, when Intel Corp. elected to discontinue marketing toys, they donated 365 of their remaining QX3+ 'play' microscopes to be distributed for the benefit of water quality studies. As a result, through the Bloomington, Illinois Water Department, members of the Illinois Lake Management Association (ILMA) have been awarded an Intel computer microscope. In addition, as part of Bloomington/H2O'C's 2003 water treatment plant operator training program, 120 Illinois utility participants received a complimentary computer microscope. One has also been donated to the Columbia (MO) Public Library.

<http://micro.magnet.fsu.edu/optics/intelplay/index.html>

When first marketed, Intel's QX3+ computer microscope sold for about \$100. Now, another company, Digital Blue, appears to have taken over ownership. The Digital Blue version is available from the National Geographic Society for \$70.

The QX3+ computer microscope can be illuminated from top or bottom to provide images at 10x, 60x and 200x magnification. Displayed images can be saved to file (archived). The plastic-encased microscope is very robust and can be removed from its stand and hand-held over objects such as pitted copper pipe, if you happen to have some around. If the object swims around in its plastic dish, the microscope can also take extended movies to the limit of the memory available on your computer. To record slowly-developing movement, such as sludge undergoing zone settling over several hours in an Imhoff cone, the microscope can also be set for time-lapse photography. (To some less dedicated waste watchers, viewing sludge settle, even for just two minutes, might be considered boring.)

Intel intended the microscope to be utilized with the software they provided that was solely compatible with Windows computers. Predictably, an Apple aficionado quickly created and made available free Mac OS-compatible software (MiXscope.dmg) that appears more scientific and is far quieter than Intel's child-oriented original.

The potential for the scientific and technical use of the electronic microscope has not been lost on major microscope manufacturers, such as Nikon and Olympus. Both companies have introduced their own competitive versions of computer microscopes (Nikon Coolscope; Olympus MIC-D). These can be seen on their websites:

<http://www.nikonusa.com/template.jsp?cat=5&grp=97>

[http://www.olympusamerica.com/seg\\_section/seg\\_product.asp?p=1&product=717](http://www.olympusamerica.com/seg_section/seg_product.asp?p=1&product=717)

We bring this story to you because we believe that every water utility laboratory should have a microscope. To paraphrase Yogi Berra, 'you can see a lot by looking.'

### 100% ink-free!

As the seasonal flow of catalogs and calendars with stunning color photographs of bears, bunnies and birds rolled in, we come across the occasional accompanying envelope explaining that it had been printed on 100% recycled, 30% post-consumer waste, process chlorine-free (PCF) paper, using vegetable oil-based inks containing less than 5% volatile organic compounds (VOCs). While our H2O'C Engineering Newsletter consumes still fewer natural resources, you still have the option of 'opting out'. A simple request to [tom@h2oc.com](mailto:tom@h2oc.com) will promptly get you off our mailing list. Alternately, if you have associates who are looking for marginally productive ways to occupy their working hours, we will be happy to add them to our list.

### Zoom, zoom, zoom,...

The Florida State University, Tallahassee, Florida has a very interesting Java applet on their website. Starting with a view of the Milky Way Galaxy viewed from a distance of 10+23 meters (10 million light years), it zooms towards Earth by orders of magnitude. When it finally reaches a large Oak tree on the Earth's surface (1 meter), it begins a descent into an Oak leaf until it reaches the level of quarks viewed at 10-16 meters (100 attometers).

<http://micro.magnet.fsu.edu/primer/java/scienceopticsu/powersof10/index>

Happy New Year!

- John and Tom  
H2O'C Engineering, LLC