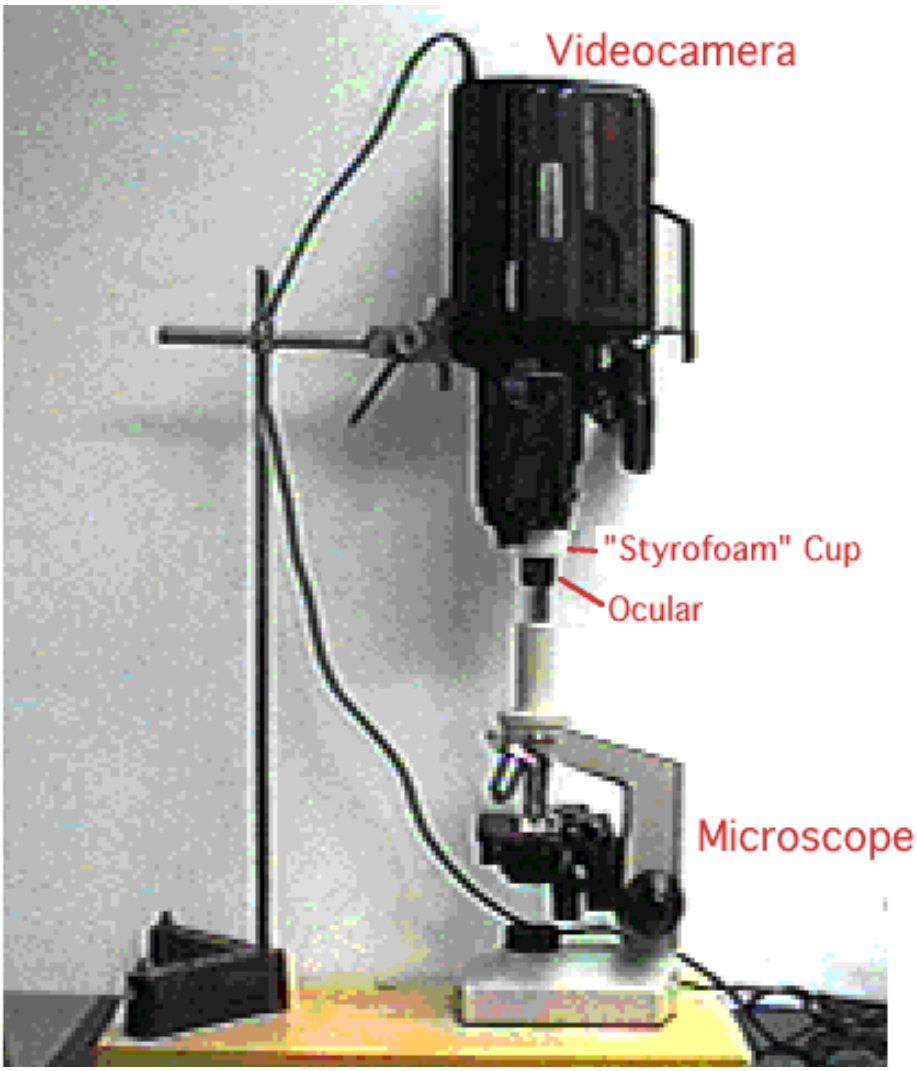
Free VideoMicroscopy

In 1985 I started using videomicroscopy in my biology and physiology classes. I had a used videocamera (probably first generation) that connected to a "portable" VCR. This VCR was connected to another "portable" power supply. A heavy duty mount allowed the camera to be posed directly over the eyepiece of the microscope. A light-tight connector was arranged between the lens of the videocamera and the eyepiece. (Care was taken to not touch the two lens surfaces.)

The output from the VCR could then be shown on a TV monitor to the class. (Videotapes could also be taken of animated objects under the microscope.)

I did an article on this setup for the September, 1986 American Biology Teacher and continued to use this setup for several years. When funds became available for regular microscope videocameras in the early 90's I switched over to that simpler and lighter weight setup.

With the advent of computers having increased memory and hard drives along with video capture cards, it is now possible to digitally "capture" images. These images can be manipulated using software like NIH Image and the results can be incorporated in laboratory exercises as well as student projects.



While the computing costs have come down, regular videomicrographic camera prices are still in the $700 to $1000 range. The $400 units that are meant to function with microscopes as well as do low power magnification often do not work that well in videomicroscopy.

Hence the title Free Videomicroscopy. I have recently found that repair shops that handle videocameras that are only several years old will often be unable to repair the VCR portion of the vidocam. The result is that there are a number of videocams that are beings "thrown-out" because it is not possible to repair the tape mechanism. I took one of these "free throw-outs", mounted it over a student grade Olympus microscope and obtained the images that are identified as T040X.tif, T100X.tif and T400X.tif. These are microscopic views of the thyroid gland. The images can be found in the folder Thyroid. These images can be examined with NIH Image and can also be put in a stack.

The set-up that I used to take these images is shown in Fig1.tif in the folder VidCam. The "free" videocamera in this case happens to be a Pioneer. It is important in setting-up your videocamera to observe the following precautions.

1. Set focus control to Manual.
2. Put the light setting on indoor.
3. Be particularly careful that the videocamera lens does not come into direct contact with the ocular of the microscope. A Styrofoam cup base is serving two functions in the diagram. (It maintains this separation as much as possible and excludes room light from reaching the lens of the camera.)
4. More than likely you will probably want to set the camera lens for infinity, not close-up, and then do all your focusing with the microscope. (The very old videocameras -- that had the VCR as a separate unit -- invariably had very large lenses and these lenses may cause some internal reflection in the image that you see on the screen.)
5. The videocamera connects to a small AC power supply when it is not using the battery. I assume this is the type of hook-up you will want to make. From the power supply there is an RCA plug connection that can go to the video input on your computer to "capture" images. There is also a regular TV video/audio output that you might want to connect directly to the TV and bypassing the computer to show images directly on the television.