My 70 year journey with microscopes and the pursuit of perfection.

When I was 10 years old, I found a small wooden box in one of my grandmother's closets. It contained a brass instrument and a couple of glass pieces.
Fortunately, my aunt knew what it was. She showed me how to use it with one of the slides that were in the box. I remember, the slide was of an insect leg. I was so impressed. What a magical instrument. Of course they gave it to me. I went nuts with it. I looked at everything I could find. I was going to see the origins of life and answers to the many questions I had. I still remember that I wanted to know why a blade of grass could cut my fingers. I was awed, when I saw that the edge of a blade of grass under my microscope looked like a saw.

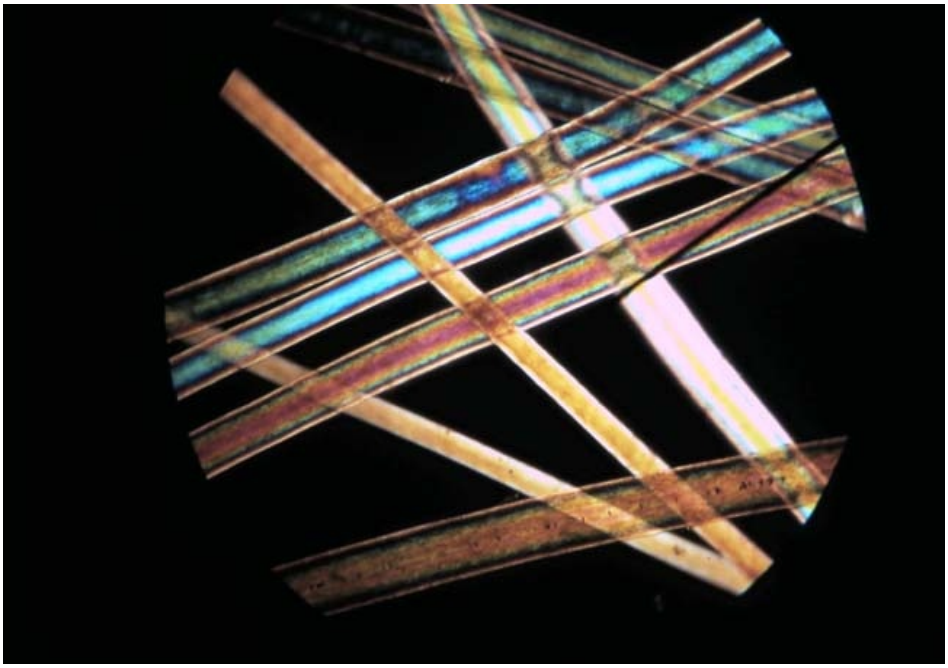
But soon I discovered the limits of this instrument. I estimated then that the magnification was only about 40X. I was getting desperate. I heard that there were supposed to be all kinds of life in a drop of water. I took a drop from the faucet and examined it, but I could see nothing. I blamed it on the low magnification
Years later, I bought a toy microscope from a friend, which boasted a magnification of 300X. But this instrument would not even show me what I could see with my old one. After this my interest waned or went other directions. I married and emigrated to Canada.

Christmas 1964: My wife surprised me with a Tasco microscope. She bought the most expensive one, the department store had. It had powers from 40X to 1200X. A condenser in the stage and even fine focus adjustment. I have to mention that up to about 100X its performance was fair.

But now I was going to be educated: I bought a booklet:"Hunting with the microscope". This opened up a whole new world. We had a lake not too far from our house. This lake seemed to teem with everything in the book. I have not seen such variety anywhere since. If you live in Calgary: it's Chestermere lake.

My first lab setup: Homemade illuminator. Ground glass in front of a bulb is still the best setup for the price. I had zillions of parameciums in that test tube. I even saw one dividing under this microscope. Awesome!

I started to make my own slides. I was especially interested in hair. One reason was that they are so easy to mount. Just soaked them in xylene and then put a drop of Canada balsam on it. After more than 40 years, these slides are still in good shape.



To get a small assortment of slides with animal hair, I went to the zoo and pulled hair out of monkeys, deer and what ever I could get my hands on. I held an apple toward the monkey cage and when he reached out I pulled hair out of his arm
Under polarized light, hair from a Baboon's arm, I was able to attain in the Calgary Zoo. I made the polarizers from pieces out of cheap sunglasses.
When I saw somebody wearing a fur coat, I went over and started a conversation, complimenting on the coat to find out what is was. Usually, I was able to pull a few hair out of the coat for my collection.

My problem with the Tasco was, I could not get more detail under higher magnification. I experimented with illumination, filters etc. I read all the books in the public library available on the subject. I started to doubt the quality of my instrument. I found out about standard size objectives, N.A., chromatic and spherical aberration and the functions of a substage condenser.

1966: I saw an instrument in an optical supply store's window:

I had to have it. Now I had N.A.! Wow! What a difference: the size of the field, the resolution and the contrast. It was so much easier on the eye. I remember looking at a butterfly's wing. The Tasco's magnification was correct, but it gave not more detail, just larger. But with this one I saw crisp markings in each scale. This microscope had a 0.65 NA condenser built into the stage. Adequate for a 40X objective. I was still wondering if I am missing something, like a real substage condenser and what I would be able to see.
After moving to Minnesota, I visited the local Zeiss dealer. He had a lot of Bausch & Lomb used microscopes with substage condenser, mechanical stage and mirror. I purchased one.

Then I built my own Köhler lamp which gave me excellent visual images, but it was hard to set up and a pain when changing power.

Automotive bulb and a lens from Edmund Scientific.

My conclusion and recommendation:
I never seemed to be satisfied and was always wondering if I am seeing what a microscope was supposed to show. I acquired different microscopes from Zeiss, AO, Lomo with apos, Swift with phase contrast, expensive Chinese microscopes, different condensers, filters etc. I learned a lot by experimentation and reading all the books I could find. Finally I realized that a standard size microscope with a simple illumination will show you all there is to see and marvel about.

I am a lazy person and I came to the conclusion that I like equipment which is easy to use and set up. Luckily, now there are microscopes and cameras which are easy to setup and use. You just plug it in, stick in your camera, turn on your computer and have fun.

Microscopy is one of the most satisfying hobbies. The weather is always right. There is no limit on subjects to look at. And an instrument costing less than $200 can give you real magnification which reach the limit of resolution in visible light.

You can now buy brand new trinocular microscopes for less than $300. Reviews on these are good enough to make them seem acceptable. I paid over $1000 for the instrument below. The optical and mechanical quality is very good.

Accuscope, trinocular, easy to use, easy on the eye.

My travel companion
4X, 10X, 20X and 40X objectives. Changed to monocular to lower the weight.

Some of my toys

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