

Initial thoughts on Choosing a first Microscope

by Forbes Pettigrew

The fork in the road

The choice of a first microscope must necessarily be a compromise.

There are two main reasons for this:

Firstly, because one has not yet decided, nor is in many cases even aware of, what areas of microscopy one would like to concentrate on and therefore what instrument and which capabilities are needed.

Only experience will tell you that and that comes with time and practice.

The second reason is of a more mundane nature - and basically depends on whether your interest in microscopy flourishes or withers.

Put simply, how much money are you willing to bet that you will maintain an interest in this hobby?

One can only guess at how many microscopes lie forgotten in the back of closets or on shelves in garages, forlorn testaments to an initial interest that turned out to be just a passing whim - they must number many thousands.

Finite or Infinite

Most compound microscopes manufactured up to the late 1980s were finite. From then on the big 4 (Leitz/Leica, Nikon, Olympus and Zeiss) and many of the newer manufacturers changed over to infinity.

Most finite microscopes during this period used the same threads on their objectives and standardised the tube length at 160 mm, this meant that the objectives from one manufacture could be used in the stand of another.

This sounds better than it actually is as the fact that the final chromatic aberration correction takes place in the eyepieces in finite systems, the first part takes place in the objectives, means that one also has to use the eyepieces that were designed for the objectives when "borrowing" them.

It does however remain a useful capability, particularly for a specific special objective that allows one to expand the function of ones microscope.

Infinity systems were mainly introduced by manufacturers in order to be able to reduce costs, as it allows the placing of additional components such as say an Optovar without the added cost of a *Telan-lens* at each end, which were needed to make sure it would not impinge on the finite tube length.

In infinity systems the final chromatic aberration correction takes place within the tube, by a fixed tube lens, which effectively weds objectives to a specific manufacture's stand, making their exchange a thing of the past.

Even though the high-end infinity system objectives have had the benefit of the latest design and manufacturing advances, as far as most amateur microscopists are concerned, such advantages are quickly overshadowed when the price of these newer top grade objectives is taken into account.

New or Used

Before we define what *New* and *Used* mean in amateur microscopy we need to state clearly that: - quality microscopes, which are capable of an array of illumination techniques, are by their very nature extremely expensive. They are high-end scientific instruments designed for institutions to conduct research - with budgets to match. We are talking many thousands of Pounds, Euros, Dollars or whatever hard currency one has access to.

We are referring here to the big 4 - Leitz/Leica, Nikon, Olympus and Zeiss, all of which it is true, also produce a simplified range of microscopes that cater to both limited needs and therefore, relatively 'modest' budgets. The amateur microscopist however, almost by his very nature, will inevitably gravitate to an instrument that is capable of offering him some of the more exotic and consequently expensive illumination techniques.

New then, within the field of amateur microscopy, means either extremely expensive high quality modular microscopes, well out of the range of most mortals or generic budget Chinese ones with limited upgradability.

So how does an amateur microscopist with a non-institutional budget access these marvels of optical engineering? Fortunately there is a way - as the very same institutions that buy these expensive instruments also sell them at auctions when they replace/upgrade them at the end of their allotted lifespan for very much less than they paid for them.

One might think that there would be very little to recommend the purchase of an instrument that is at the end of its allotted lifespan - and such would be the case if allotted lifespan were to equal useful lifespan - luckily it does not.

The lifespan allocated by institutions to these instruments ranges from between 15 to 20 years, yet the useful lifespan of these superbly built machines exceeds that by many decades.

The question then remains as to how to obtain such an instrument when as a beginner one lacks the experience to distinguish between those microscopes that are in excellent, good or quite frankly, due to ill use, in bad condition.

The answer lies in reputable dealers and honest forum members.

Just like a reputable dealer, a forum member has a lot to lose if they provide a substandard instrument to a fellow forum member - in this case it simply does not make economic nor social sense to do so.

Why then buy new?

There are three good reasons to buy a new generic budget Chinese microscope - firstly, it allows one to dip a toe (metaphorically speaking) in that other world contained within a drop of water that is amateur microscopy for a modest investment. If it turns out that this hobby is not for one, then the loss, especially if one has shopped prudently, will be limited.

The second reason to buy a new generic budget Chinese microscope is to gain experience. Experience that will allow one to choose which area of amateur microscopy one would like to pursue, as well as the experience that will allow one to venture into the arena of the second hand microscope and so put together an instrument that meets one's needs and wishes.

The third reason to buy new is to avoid the risks that buying used microscopes of uncertain provenance sometimes gives rise to.

One is therefore buying peace of mind - in the shape of a new in a box, guaranteed to work reasonably well or your money back microscope.

Since buying new is in the first and second cases just an interim step on the way to a better instrument or to another hobby, and keeping in mind the very low resale value such a microscope will bring, it is important to buy just the minimum equipment necessary.

For example, one can pick up a trinocular microscope online for less than \$300 dollars, which adequately fulfils these two goals of *Why then buy new?*

As to those who fall into the third category - they will end up missing out on the opportunity to own a very capable quality instrument that is both beautiful and a pleasure to use. It would be a pity to deny oneself that.