Two Odd Mid 20th Century Microscopes for Youngsters

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It is refreshing to be back at writing about my small collection of children microscopes and microscope sets dating back to the late 1940s, 1950s and 60s. As I have stated before, many of these microscopes where more than just toys. They were usable instruments with fairly good optics that provided youngsters with their first views of the microscopic world. Amateur microscopists and many scientific/ medical professionals owe a significant portion of their interests and/or careers to the availability of these microscopes back then.

Among these microscopes there was always some peculiar or odd design. Recently while perusing the collection I found two microscopes that definitely fall into this category. The microscopes are from different manufacturers that came up with the same idea. What follows is a description of these two instruments.

The first of the two microscopes is the ATCO model No. 1365 pictured below (figure 1).

Figure 1

ATCO distributed Japanese made children's microscopes in the United States during the 50s and 60s. The model 1365 included a wood carrying case. This was a standard feature of

most Japanese children's microscopes sold during that era. It gave them an attractive professional look. The body of this ATCO microscope is typical of those manufactured in Japan at this time, all metal with few if any plastic parts. The microscope is smaller than a conventional standard student microscope standing at 10 inches from base to ocular. There are no standard size oculars or objectives either. The feature that makes this microscope different than its brethren is the dual oculars. In this particular design the oculars are mounted giving the impression that you are looking at a microscope with a binocular head.

A closer inspection reveals a monocular microscope with a swivel mount for two oculars providing high (15X) and low (10X) magnification respectively. When combined with the four available objective lenses at the lower end of the optical tube assembly (figures 2 and 3) magnifications of up to 400x with the 10X eyepiece or 600X using the 15X eyepiece can be achieved. The maximum usable magnification is really near 300X. It is easy to swing from one ocular to the other and by using this dual ocular head ATCO avoided the complications of a zoom mechanism.

Figure 2

The second microscope is the Gilbert model No. 13081 seen in its original wooden box with typical 1950s graphics, original manual and some accessories (figure 4).

Figure 3

It reflects the 1950s-60s deco design. Gilbert Co. was an American manufacturer of model trains in the 20th century but also produced a line of educational sets that encompassed physics, biology, chemistry and astronomy. Among these was an excellent line of microscope sets. The first Gilbert microscopes were made of metal but by the late 1950s and into the 60s the design changed to a more stylised form more in tune with what is now called the “Atomic Era”. The base of this microscope is metal but most of the microscope body is plastic with conical objectives mounted in the plastic turret. The ocular is positioned at about 45 degrees to provide a comfortable viewing angle. Inside the plastic sphere between ocular and objectives lies a small first surface mirror that directs the light toward the ocular. Gilbert called this design the mirro-flector. This Gilbert has the same swivel mounted dual oculars design found in the ATCO but they gave them the catchy name of quick-switch power eyepiece. In this case they are marked L (low power) and H (high Power). A close-up of the oculars can be observed in figure 5. The optical quality of the Gilbert is similar to that of the ATCO with the highest usable power near 250X.

Figure 4

Figure 5

Both the ATCO and Gilbert microscopes have average optical quality with chromatic aberration being the most common problem. Average maximum usable magnification is about 300X. Above this level resolution is lost due to the chromatic aberration. While the focusing mechanism in the ATCO is the rack and pinion type that moves the optical tube, the Gilberts uses a moving stage and the mechanism relies on pressure exerted by a rubber insert on the shaft of the focusing knobs.

The question in everyone's mind is, do they work? Although I must confess that they are a bit awkward and not necessarily the best looking microscopes around, the swivel head does its job and provides for a comfortable change of magnifying power when needed. One problem that may arise is alignment with the optical tube but the swivel mechanism remains surprisingly well aligned. The other problem is dust that can enter the optical tube more easily because the eyepiece sits at a small distance from the tube leaving a small space open to the external environment.

Mechanically, the rigid metal structure of the ATCO is definitely a plus in providing stability. The focusing mechanism is also more precise and smoother than that of the Gilbert. Use of a plastic body by Gilbert probably translated into some savings but at the cost of rigidity and stability. Nonetheless as a budding microscopist 52 years ago I was lucky to own a Gilbert microscope similar to the one discussed here but without the swivel

ocular head and never had any problems with the focusing mechanism. In fact it was a set that I enjoyed a lot due to the excellent instruction manual filled with many experiments and the topic of a future article.

In summary, both the ATCO and Gilbert microscopes with dual ocular heads are odd but usable designs directed at youngsters. The fair to good optics provided sufficient resolution to observe a plethora of microscopic subjects and as an introduction to microscopy they served their purpose quite well. The ATCO gets a nod due to a more rigid construction but the Gilbert compensates with a much more comprehensive and instructional manual.

Those of us who later graduated into professional grade microscopes will always be thankful for the availability and reasonable cost of these microscopes during our younger years. Today it is nice to see that, after a hiatus of many years, a new generation of good quality microscopes directed at young minds is now becoming available. Hopefully a new generation of microscope enthusiasts is in the making.

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