

An odd way to look at the hobby of visual amateur astronomy is to note that much of what we do could properly be called historical re-creation. Visual observers who go through the Messier catalogs or the Herschel-2500 list are re-creating the observations and discoveries of specific observers, long ago, often with telescopes of very similar performance to those originally used. With that introduction to allow me to claim that I'm not weird, after all, I shall now admit that lately, I have been consciously doing some historical astronomical re-creation of less common variety.

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First, I have been going through the objects in Admiral William H. Smyth's "Bedford Catalog". Smyth was a British naval officer who served in the Napoleonic wars and for a time thereafter. After his 1828 retirement from the navy, he acquired an excellent 5.9-inch refractor and set about surveying the sky from his observatory in Bedford, England. One result of this work was the "Bedford Catalog", published in 1844, and reprinted a decade or so ago by Willmann-Bell. This publication is often considered to be the first observing handbook for amateur astronomers ever, and it is certainly the first for deep-sky observers. It lists nearly 1000 objects beyond the solar system, in 850 entries.

I bought a copy some years ago, skimmed through it briefly, and then let it sit idle on my shelves. Recently it occurred to me that I -- like Smyth -- have an excellent refractor of six inches or so aperture (mine is a pre-EDT Astro-Physics six-inch f/8 triplet), and wouldn't it be fun to go through the Bedford catalog with it? Indeed ...

Smyth was an excellent writer, with a rare talent for folding scientific exposition, historical commentary, and anecdotes about observing personalities, all in with his observational records. His work avoids the grocery-list aspect of many modern deep-sky guides.

The kind of observing he did is in large part quite different from what amateurs do today: Most of the objects in the "Bedford Catalog" are double or multiple stars. Many are pretty and challenging with my six-inch. Identifying them is occasionally an issue; Smyth often referred to double-star catalogs no longer in common use. Yet he does give coordinates, so a precession calculation and a good set of charts suffice to straighten out most ambiguities. Yet many of the stars listed are easy naked-eye stars, with either greek letters or Flamsteed numbers identifying them in their respective constellations. On the other hand, some of those constellations are no longer recognized today.

A good proportion of the doubles have changed position in their orbits noticeably in the last 160 years. And some of the companions are optical only -- the stars are not physically associated. They are often the most fun to observe, though, because their relative positions have sometimes also changed. Those changes are not because of orbital motion but because of proper motion -- observing optical doubles measured 160 years ago provides solid evidence that the "fixed stars" are not fixed!

Yet what is most fascinating are the occasions when Smyth reports on objects loved by contemporary deep-sky observers. Smyth seems to have known many of them, and to have observed them in ways well known today. For example, in discussing two Virgo galaxies, he mentions using a magnification of 93x -- almost exactly what I would select to observe galaxies with bright nuclei with six inches aperture. Elsewhere is a nice figure showing nearly all the galaxies in Markarian's chain, and other nearby faint ones as well. The identifications are all Herschel catalog numbers -- the New General Catalog did not exist yet -- and one of the Messier galaxies is confusingly mislabeled, but anyone familiar with the area will recognize the group at a glance. Alas, Smyth does not say how many of these he could see with his refractor. And in discussing the double star 52 Cygni, he mentions seeing the wispy nebula that streams past the star -- that's the western part of the Veil.

I am rather more than 500 objects into my Bedford re-survey, and am having a wonderful time. Observers interested in a novel project, or interested in double star work with a small telescope, might join me.

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My second project is less well formed and more telescope oriented. A few months ago, Joe Sunseri advertised an inexpensive brass-tube 80 mm refractor on AstroMart. I thought it might be cool to have one, so I bought it, and spent some time and money adding bits and pieces to match. As a result, I now have a telescope whose optics and mechanical parts are very nearly a functional replica of what a relatively wealthy amateur astronomer might have been proud to own in the first third of the nineteenth century.

The optical tube assembly (OTA) has good-quality Japanese components with no plastic parts. The objective is an excellent 80 mm f/11.4 doublet, without anti-reflection coatings. These details suggest to me that the OTA was manufactured perhaps in the 1960s, likely as part of something intended as much as living-room decoration as a functional telescope. Yet it does function, and functions well. The main tube and focus tube are brass, most everything else is black-anodized.

The OTA came with screws for a finder, but no finder. To maintain the look and feel of the system, I got a small black one from Orion and spent a long session with files hacking the finder base to fit the existing screw holes. I also got Ken Dauzat to make me a custom set of tube rings with brass hardware. (Most of what Ken sells on the internet is rather inexpensive bent-metal telescope bits and pieces, but he seems to be an entirely competent machinist, the tube rings turned out very nicely.) For a mount, I use a contemporary Vixen altazimuth with manual controls, in essence the same mount that Orion sells with the VX-80 refractor, except that my slightly older model has wooden tripod legs.

And, oh, yes, for the equipment kit of this instrument I dug out the set of three Ramsden eyepieces that I laid away, a few decades ago, for just such an occasion. I have focal lengths of an inch, half an inch, and a quarter of an inch, and some of the eyepiece lenses aren't coated, either. These are quite good eyepieces. Their fields of view are narrow by the standards of Plossls and the like, but the polish is excellent. I am confident that they do not compromise the definition of the objective.

If I found a handy time portal to 1820 and stepped through it with this telescope, it would take a hard look by a knowledgeable person to tell that it was not of contemporary manufacture. I suspect that the most obvious out-of-period feature would be the hammertone green finish on some of the parts of the Vixen mounting. The era knew of hammertone, but they got it by beating on metal parts with a hammer, not with paint. Closer examination would reveal the anodizing, and the use of aluminum, pot metal, and a few plastic parts. Such lenses as are coated would be surprising, and taking apart Orion's compact upright-image straight-through finder would yield more surprises. On the other hand, with the exception of the finder innards, if any of the optical parts broke in transit, I could probably find an optician in London who could make an entirely satisfactory replacement.

The mechanical parts of the instrument are all straightforward, though period artisans would probably be astonished at some of the details of the workmanship, and would probably be delighted at the ingenuity of die-casting. Likely the greatest shock would be the "Japan" labels here and there, and the fact that the instrument was not hand-built for some wealthy enthusiast, but mass-produced for relatively poor folks.

So far, the only real project for this telescope -- beyond yet another of my usual Messier surveys -- is to use it regularly, to gain some appreciation for what kind of astronomy it was that people did, and could do, with equipment of bygone eras. The answer seems to be, quite

a lot. An 80 mm instrument is lots more than is necessary for a Messier survey, and is also plenty for the Herschel 400. It's amusing to hear people's reactions to the telescope. They cluck commiseratingly about the small aperture and narrow fields of the Ramsdens, then look through the eyepiece and remark how nice the images are. The OTA is well baffled; I was at Montebello the other night with a half Moon in the sky, happily chasing down Messier objects and fainter things, Ramsden eyepieces and 80 mm aperture notwithstanding.

The telescope is also an eye-catcher. The brass tube is handsome and shiny; people are curious, and want a look through it. It is a good draw at public events; I shall probably bring it to them regularly.

-- Jay Freeman