

Calvin said it best; "Nothing I do is my fault. My family is dysfunctional and my parents didn't empower me. Consequently, I'm not self-actualized. My behavior is addictive functioning in a diseased process of toxic codependency. I need holistic healing and wellness before I'll accept any responsibility for my actions. I love the culture of victimhood."

Genius!

I now have a seemingly irrefutable logic that will absolve me of any further mistakes I may make when I'm thinking. Been looking for this for a long time. So, with exoneration in hand, remorse and guilt now banished from my psyche, I can proceed with my life's goal of presenting an exceedingly elusive acumen as a defense of past transgressions.

Directing your attention to the matter at hand, as you remember, setting up the lab. I will refrain from further philosophical analytic gymnastics (yes, I hear the collective sigh of relief), and we can continue the saga.

Setting priorities:

While my sagacity is not to be trifled with, getting older does present some physical challenges to rather innocuous endeavors. I mean, I just realized I *can* hurt myself sleeping and I don't get near the advance notice I used to for calls to the loo. The carpentry skills required for the lab renovation won't be beyond my capabilities but may very well tax my patience and marital harmony. With this in mind, I intend to start slowly and then taper off.

Since the actual construction will take some time, I have acquiesced to my insatiable desire for instant micro-gratification and am setting up a temporary observation station. I have dug out a new Trinocular Stereo-Zoom of Chinese manufacture as the instrument for this purpose. Still have twenty-five or so boxes of microscopy "Kit" I have yet to unpack ("Kit" as referred to over the pond, did I get that right?). After searching and reading the entire Micscape library over the past year, I could find no review or mention of this particular model, and so, due to a perceived dearth of information, I believe a review of the instrument is warranted.

Prior to the move, Bri and I purchased everything we thought we could afford to stock up on due to questionable availability here. Clothes, shoes, specialized tools and lab equipment. We were agonizing over the stereo microscope purchase but I won that argument by not telling her I bought it until after we got it. Uh... *that* won't happen again. I have wanted a trinocular stereo scope for some time and after perusing eBay, I decided on the one below. This scope is made by a Chinese manufacturer that supplies them to a network of distributors who slap their own labels on them. These scopes appear to be of excellent quality, are used professionally and look to be identical across the brands, or, as in my example, unbranded, generic and sold by a shop going by the mawkish appellation of "love-happysopping".

Amscope has the corner on these scopes now and there seems to be fewer independent marketeers. Current prices have doubled from Nov of 2021. This scope was never unpacked from its original box until a few months ago.



Advertised with accessories shown as 3.5 – 90X Delivered Nov 2021 \$429.00

First impressions:

This has been my first opportunity to really look at and operate the scope. I'll perform as thorough an analysis as this engineering maestro can.

This thing is heavy!! 46 lbs. assembled (Caution! Hernia crossing, look both ways before lifting). This is an unbranded but identical (minus one feature) model to the AmScope SM-4BT series but was selling for about a hundred dollars less at the time.



This is the “before” picture of the future office/lab. The western half of the second bedroom. The closet area behind the bookcase as well as the shelf above are completely filled with dry boxes of microscopes, accessories, slide making paraphernalia, dissection instruments etc. etc. Temp observation station at lower right.



The observation station.

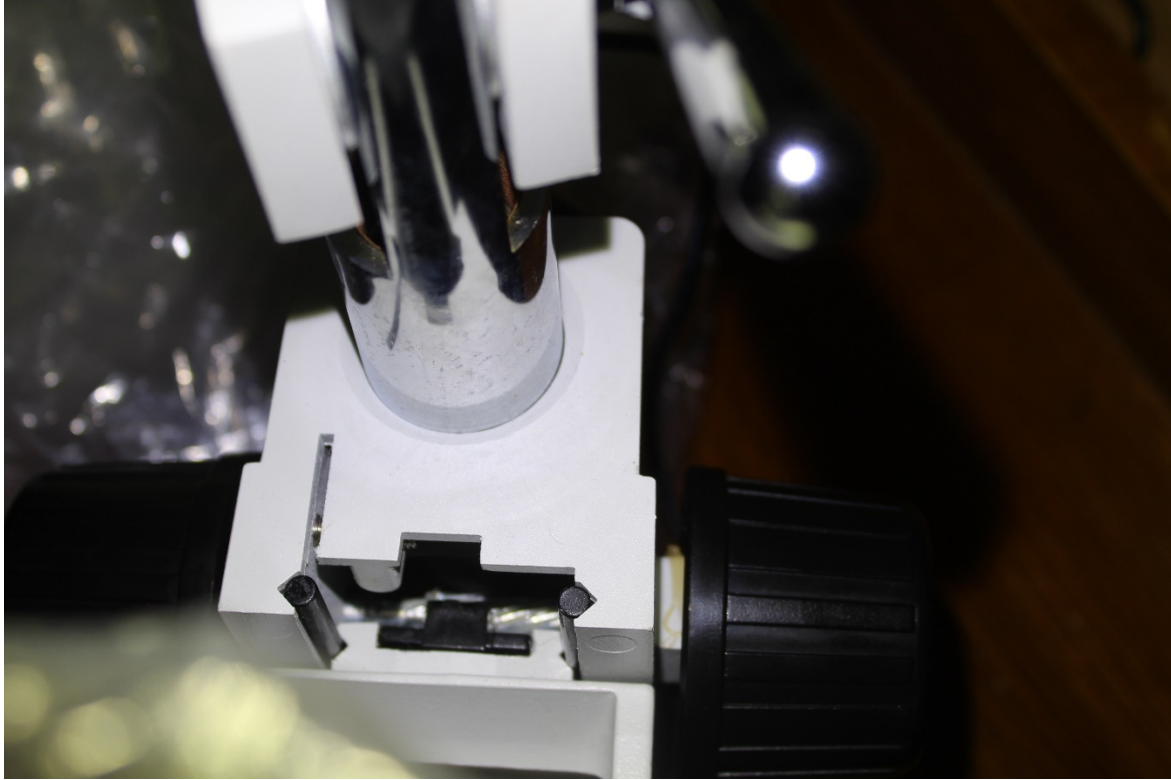
Review:

The scope's construction is quite robust with the base being cast steel, chrome plated steel for the upright and horizontal bars. Everything that attaches to these bars is not magnetic and is probably a heavy zinc alloy with excellent fit and finish on all components.

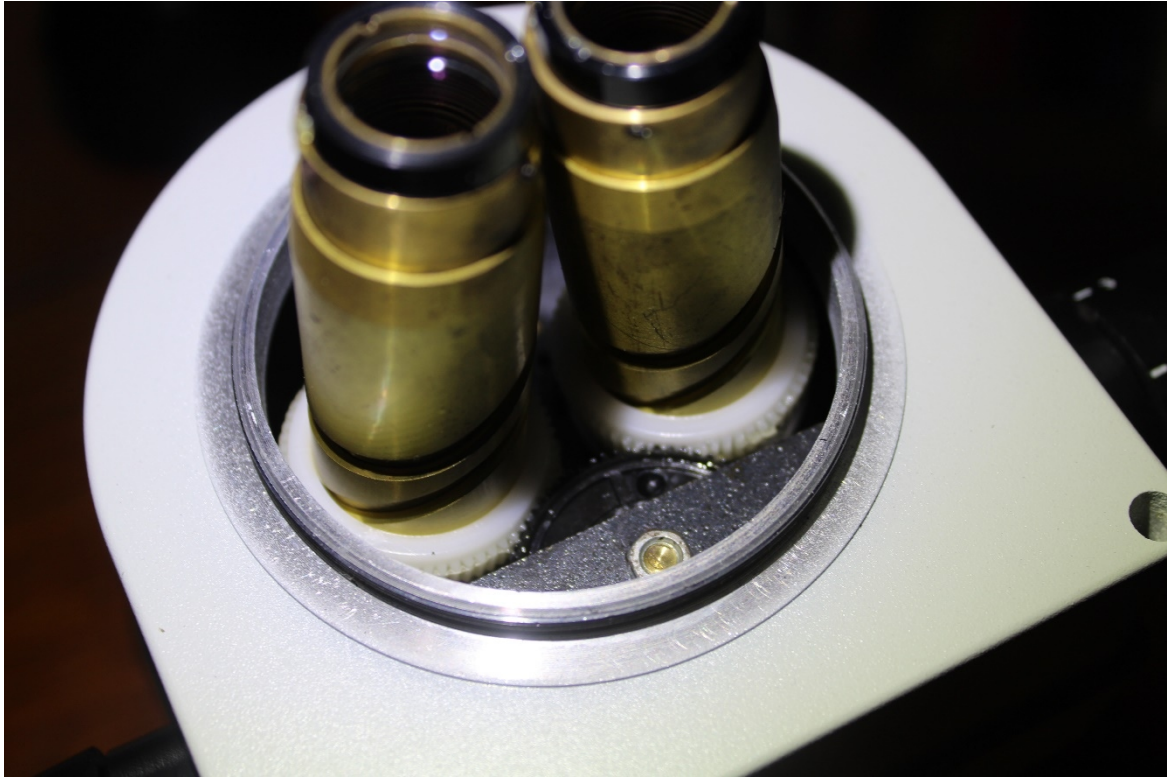
This particular boom stand is quite versatile and rigid when clamped. The double arm boom moves in and out quite easily and smoothly but the vertical movement of the arm on the post does not lend itself easily to precise manipulation. The clamping screws would benefit by having plastic or leather pads on their tips for a better non-marring grip. An easy fix. All fine threads are a UTS class 3 fit (precise) or equivalent metric grade and are easy to engage.

On the image end, the head and optics are of the Greenough design with separate converging light paths (10-12 degrees) and like the Common Main Objective (CMO) scopes, there is a single lens as the final optic but instead of being an "objective lens" to *converge* parallel light paths, it only serves to *magnify* two converging paths. All lenses are coated.

Modern day improvements in plastic compositions and their engineering applications allows for their use in replacing brass as gearing for the focus and zoom functions. The sliding dovetail assembly that the older scope heads move up and down on for focusing, has been replaced by an adjustable plastic friction component and rack (the pinion is steel and helically cut) that, when the actual amount of use the mechanism will see is factored in, should give several lifetimes of use before requiring service.



Modern focusing and tension adjustment mechanism. You can just see the metal helically (spiral) cut pinion



Plastic spur gears for the zoom magnification function.

The trinocular port images thru the left pre-eyepiece lenses only, and has no provision to shut off the shared light (the missing feature). The camera coupling tube is also robust, excellent quality and finish. I will eventually have a specimen tilting system to orient flat specimens perpendicular to the left eye path for photography.

Listed Specifications:

- Head: 45 degrees inclined 360 degrees swiveling trinocular
- Eyepieces: 30mm super widefield and high-eyepoint WF10X/20
- Objective zoom magnification range: 0.7-4.5X
- Zoom Range: 6.5:1
- Maximum Field of View: 1-1/4" (33mm)
- Minimum Field of View: 3/16" (4.75mm)
- Diopter Adjustment: +/-5dp
- Interpupillary Distance: 2-3/16" - 2-15/16"(55-75mm)
- Working Distance: 4" (100mm)
- Boom Stand: 20" double-arm (overall length: 30"), 17" high pillar, 10-1/4"x8-1/4"x2-0" solid cast steel base
- Accessories: eye-guards

Performance stats:

Doing the math, the advertised specifications are as follows using the zoom magnification range:

- | | | |
|---|------------|---------------------------------------------------------------------------|
| a | 3.5–22.5X | with the 10X eyepieces and the 0.5X front or “Barlow” magnification lens. |
| b | 7 - 45X | with the 10X eyepieces and the 1.0X Barlow lens. |
| c | 14 - 90X | with the 10X eyepieces and the 2.0X Barlow lens. |
| d | 10.5-67.5X | with the 30X eyepieces and the 0.5X Barlow lens. |
| e | 21 – 135X | with the 30X eyepieces and the 1.0X Barlow lens |
| f | 42 – 270X | with the 30X eyepieces and the 2.0X Barlow lens |

On my to-do list is to see if there is any noticeable difference in image quality using the different lens combinations where the magnification ranges overlap. The 3.5X to 270X total range seems impressive compared to a lot of models in the same price range but not sure how the scope will perform at magnification over 45X as the working distance (WD) is down to 3/16 (4.76mm) of an inch and at 90X it is 3/32" (2.4mm). At these WD parameters, I believe precise focusing with the available coarse and zoom adjustments will be a challenge, as will be the lighting, so the 270X seems *really* optimistic, but we shall see.

The scope included some accessory optics/tools and I did purchase a separate dimmable 144 LED ring light from AmScope to finish out the package.

Suggested Improvements:

There is the possibility of installing some epi illumination from behind the Barlow lens and close to the eye paths to facilitate the higher magnification ranges and subsequent short working distances. Also, a rotating stage with a vertical adjustment capable of being used for fine focusing.

This is where the romance ends.

The view:

It has been said and I've heard it, "the view never changes unless you're the lead dog" which has nothing to do with our current subject (but these days, when I remember something I write it down immediately).

To assess image quality, I needed a viewing subject. A three-dimensional object with fine detail in order to establish the depth of field limits should fit the bill. I didn't have far to look, there was a bug on the wall next to me. I grabbed a specimen jar and with my cat-like reflexes and speed was able to capture the critter because...well, it didn't move.

My most recent police report describes me (accurately for once) as having close set eyes. The minimum interpupillary distance for this instrument is 2-3/16" (55mm) and this is the absolute maximum for me. Employing the (b) magnification range (10X eyepieces with eye guards and the 1.0X Barlow lens), my eye placement had to be accurate to maintain the stereo view. Resting my eyebrows against the upper rim of the eye-guards provided a remarkably stable and fairly comfortable solution.

At 7X, with the ring LED light turned up to high, at a 4-inch WD, the image was crisp, bright and basically what I had been hoping to see. Changing the objective zoom magnification range requires some major/minor coarse focus correction, depending on the WD. Viewing my recent zoological abduction was very instructive in determining an ergonomically acceptable viewing position, depth of field, and control familiarity while staying within the 7X to 15X range.

Next step was to perfectly focus the image and attach the AmScope Canon 2X relay lens camera adaptor to the trinocular tube to take a picture.



With the camera mirror up and viewing the back screen, the first thing I noticed was the trinocular port image was a completely different magnification than the eyepiece images, dim, upside down, out of focus and reversed. Other than that, it was okay. So, I took a picture



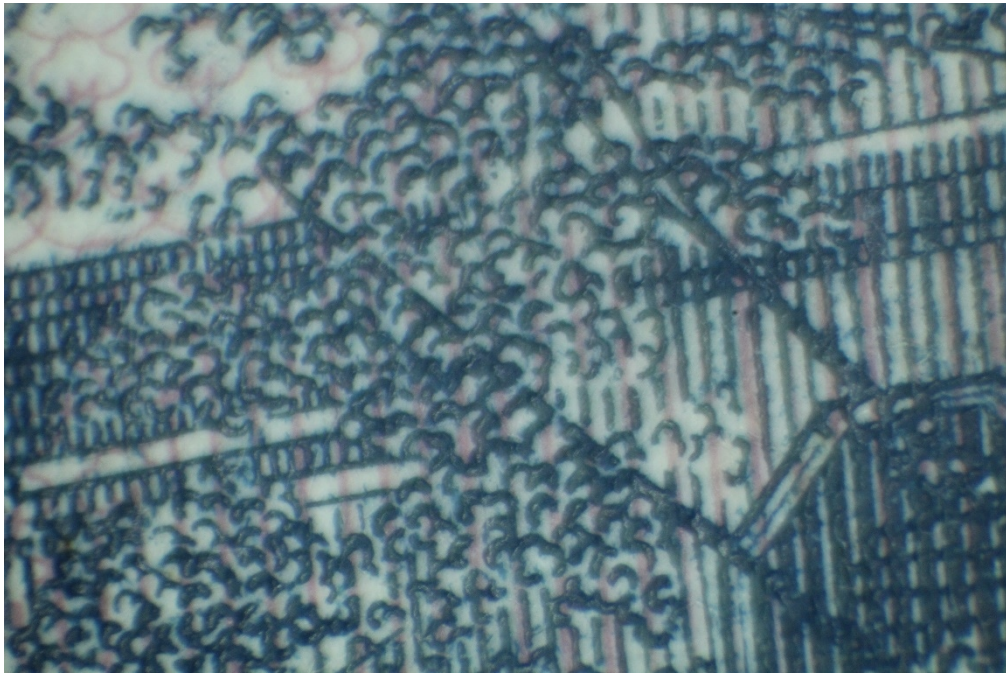
It's horrible.

I took another thru the eyepiece tube.

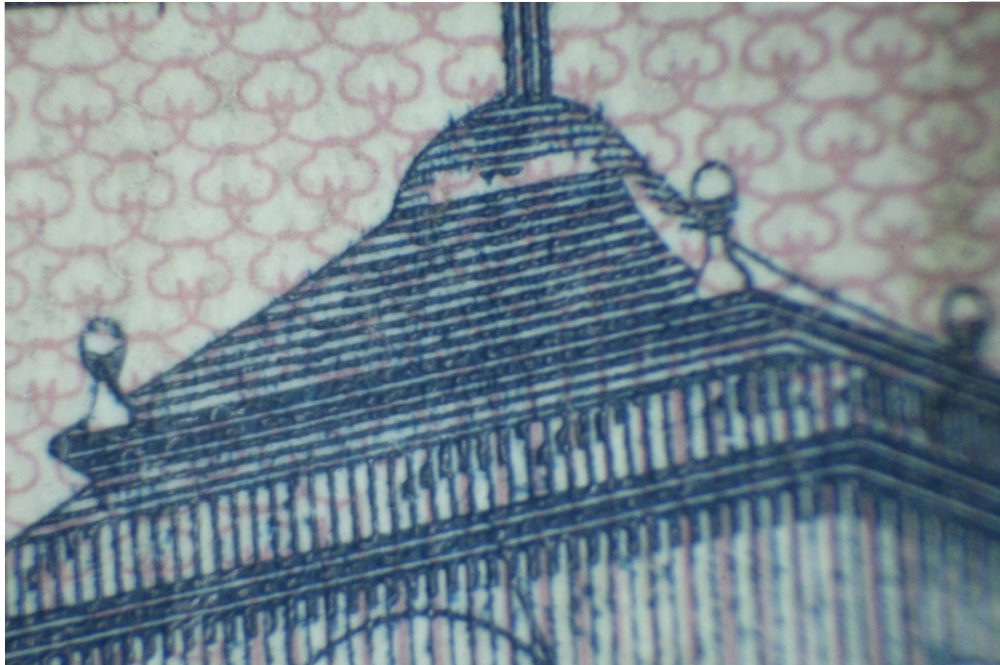


Just as bad.

I tried a detailed flat printed picture of a building on Honduran money



Thru the trinocular tube



Thru the eyepiece tube

Still not the sharp image as directly viewed thru the scope.

I have been told that I am not entirely dim, but only once. After some reflection, I have narrowed this problem down to two things: me and me.

As unapparent as it may be, at this point it's only fair to confess that there are some things in this world that are difficult for me to grasp. On my early resumes, under "Life Achievements", I was only able to list "Learning to ride a tricycle" because I had a mentor. This particular issue with sharpness will require some trial and probably lots of errors on my part to come to a wrong conclusion. Therefore, I submit to you dear reader, and the microscopy gods, a plea for mercy and insight to ease my pain and ignorance.

The camera works well, it does take good sharp pictures. These photos were taken in the automatic mode so a different mode may help. The tri-port images seem to have less depth of field and that would make focusing more difficult. I'm sure additional lighting would improve the image. Stacking hardware may help (I was thinking Zerene Stacker but I will accept alternatives). I have a range of projection eyepieces but no camera adaptor that will accept them.

This is probably as good a place as any to give respite to my mental machinations to resolve this and other world conundrums. My wife and I are going to dig up a plethora of leaf cutter ant hill colonies we found on the property. They are devastating some of our new plantings and we want to get to the huge Queens. What could possibly go wrong?

Adios, à bientôt, Auf Wiedersehen until next time,

Joseph Wilhelm

Politically correct inuendo, insinuation and imputation cheerfully accepted at gwilhelm@metsonmarine.com

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