

The Dekkam File

The Magical Optic of Dr. Weth

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The decade of the 1950s was a watershed for miniature camera optical design. In the beginning we 35mm users had rangefinder cameras and single focal length lenses in sturdy brass mounts. By 1960 we had SLRs, mirror optics, and our earliest tele-extenders and zoom lenses.

If you examine some of the advertising literature for the period you will find all sorts of optical gadgetry, some announced prematurely and never indeed actually marketed, some introduced with much fanfare and still recognizable as precursors of today's more dependable products, and not a few that came and have now long gone without much fanfare or subsequent influence. Dr. Weth's Telestigmar lens fell into that final class.

Dr. Weth, a retired engineer, lived in Berlin and enjoyed hiking in the woods and hills. He also enjoyed photography, but like Barnack of Leica fame he hated having to lug a packful of equipment. And he appears to have been a naturalist of sorts: many of his preferred subjects required the use of long focal length lenses of various strengths. To cut down weight while retaining versatility, he designed his Telestigmat.

The Weth Telestigmat is not so much a lens as it is an optical array. In today's world its function is filled by any number of telephoto zooms, some of which take up even less space and certainly can be used with less fuss. On the other hand, the zooms are heavier and usually have a dozen or more elements, inevitably reducing available contrast on the film; Dr. Weth's lens, mostly filled with air (again, like the early Leicas), never in any of its configurations has more than four glasses and six glass-to-air surfaces—unless, of course, you employ it in conjunction with an accessory extender from a later era.

How, you may well ask, can a lens "never have more than four" elements? Surely it has a fixed number.

This was the trick, the secret, the "magic" of the Telestigmat. For Dr. Weth's pride and joy was a prime lens supplied with two accessory rear elements and a spacer which, used in various combinations, provided four different focal lengths in the range between 175mm and 315mm. To a considerable extent it did what zoom lenses now do, but it did so earlier and certainly more capably than the still-camera zoom lenses that came along during the next ten years after the Telestigmat was marketed.

The four major parts of this lens were the basic prime lens which incorporated diaphragm and focusing assembly; tube "N" (so designated because it is a negative supplementary lens); tube "P" (as you can now guess, a positive supplementary); and "Z" (the spacer tube). An extra unlabeled spacer tube was designed in order to make photographs at close range; this tube has unique qualities to which we shall return later. An adapter was also required to attach the optical assembly to the camera in use; the original design appears to have been intended for use on an Edixa Reflex, a Contax D, or a Praktica, since the apparently original adapter incorporated the thread mount that had been introduced on the Contax S in 1948 and later became known as the "Pentax" mount, or more recently still the "Universal Thread Mount." The Telestigmat itself was first marketed about 1955.

For an historical overview, I am greatly indebted to the original owner of the Telestigmat shown in the illustrations, Allen C. Swarts of Colorado. Mr. Swarts bought it directly from Dr. Weth

himself in Augsburg, Germany, where he was stationed in the United States Army, in 1956 or 1957. He had written Dr. Weth in response to a magazine article about the lens; Dr. Weth was coming from Berlin to Augsburg on other business, and took the opportunity to bring a demonstration lens along with him. At that time Mr. Swarts was using an Exakta. He has written me that Dr. Weth had not previously provided an Exakta mount for his Telestigmar; together, they removed the lens flange from the buyer's camera and Dr. Weth took it back to Berlin with him.

Shortly thereafter, a new Telestigmar arrived in Augsburg, together with a really superb Exakta adapter that also featured a drop-in slot for a filter slightly larger than a standard Series VI, though Series VI filters could be used in an emergency. This particular lens must have been intended all along for export to the United States, because it has an original 1/4" tripod socket on its foot and is labeled "Made in West Germany." Its serial is 1910, but a single serial cannot support much conjecture as to where it fits into a manufacturing sequence, nor how long that sequence lasted.

In 1972 the purchaser, now using an Alpa, again found himself in Germany and again wrote Dr. Weth, asking if an Alpa mount could be provided. It was, but in workmanship it did not match the earlier adapters. It is a fairly roughly machined aluminum ring which is simply fashioned to fit into a late-60s standard T-mount adapter from which the inner flange has been removed. Its female threading is very loose; care must be taken when mounting the intermediate tubes in order not to end with a skewed assembly.

Dr. Weth also told Mr. Swarts that he had at some previous time recomputed the Telestigmar optics for additional sharpness when used on a cine camera system; clearly, doing this would have made it less useful on the full double frame 35mm size, but by then zoom lenses for 35mm cameras were generally available and easier to use than Dr. Weth's design. So far as I can determine, Telestigmar production, which surely was never large, must have ended for good at about this time, and quite possibly even earlier since Dr. Weth himself was probably in the neighborhood of eighty years old by then.

So much for the sketchy history; let us look at the Telestigmar itself. It was supplied disassembled in a nicely plush-lined brown leather case with a strap and storage compartments for the large main component, the individual supplementary tubes, and a camera adapter. A deep crackle-finished lens hood was designed to screw onto the front 57mm thread of the main tube, facing either forward for use or backward for storage; the unusual 57mm threading makes mounting filters a nuisance today.

The prime lens tube looks more or less like any standard accessory lens. It has a presetting ring immediately in front of the aperture ring; clickstops are provided on the presetting ring at about each half F-stop. The focusing ring, mounted toward the rear, has metal knurling and a double helix so that the front of the lens does not rotate during focusing. At the very rear is a more or less standard rotating tripod mount which can be locked by a secondary ring. When I first looked at the lens these two parts (which can be totally unscrewed from the lens tube) had been assembled improperly: the locking ring belongs at the very back, and is relieved in order to allow the auxiliary tubes to fit fully into the main tube. The maker's designation is marked just in front of the focusing ring and the West Germany logo: "Dr. Weth Berlin Telestigmar Nr. 1910."

The most interesting aspect of the main tube is the scale engraved between the maker's logo and the aperture setting ring. This is a very concise set of instructions, combined with an aperture series for each available focal length; because the lengths vary while the front element diameter is constant, the Telestigmar's aperture is not constant throughout its range of applications. The left end of the scale designates the possible operative combinations, while the right end is simply an extension of marked F-stops for each. The combinations and their maximum apertures are marked as follows:

$$N + Z \rightarrow F = 315 : 6.3$$

$$N + P \rightarrow F = 225 : 4.5$$

$$Z \rightarrow F = 250 : 5$$

$$P \rightarrow F = 175 : 3.5$$

Thus the lens can be used as a preset, clickstopped 175mm f/3.5, a 225mm f/4.5, a 250mm f/5.0, or a 315mm f/6.3, depending on the combination of supplementary tubes that are added to the main tube. At first it looks as if the main tube should be known as "F" (and I still find myself so calling it), but in fact the "F" as used here is simply an abbreviation for "Resultant Focal Length."

The tube attachment system is interesting in that it is an interrupted thread. This method was used on a few cameras in the period 1940-1960, perhaps most notably on the Ilford Witness as mentioned below. The interrupted thread is a fully threaded mount into each part of which grooves have been cut, removing the threads from half the original fore-and-aft threading area. It combines the advantageous multiple connection surfaces of a threaded mount with the speed of a bayonet: the male half-threaded unit is socketed into the female one, and a short turn locks them together. The Ilford Witness camera used this system with a standard Leica thread, three cut-outs, and a locking device; unfortunately, there are no locks on the Telestigmar.

And, because Dr. Weth settled for two 90 degree threaded sections fitting into two 90 degree cutouts, it is possible during hurried assembly to cross the threads; again, as was the case with the Alpa mount, the lens will then sit askew relative to its rear tubing. Also, the tubes can come apart during focusing (especially now that the original lubricating grease has stiffened), or while an attempt is being made to affix another tube to a three, four, five, or even six part combination (including the camera mount, extension tube, and the lens hood). Thus the two-section interrupted thread made for extra speed in use, but at the expense of some rigidity in action as well as the very real possibilities of improper alignment of the film with the optical elements and of actually dropping part of lens inadvertently.

These criticisms aside, the threading was done rather cleverly, in a combination of two slightly different diameters and coordinated male-female relationships, so that it is impossible to assemble any combination in incorrect order. Experiment quickly confirms that the named tubes must indeed be added in the order given on the chart.

The only two glass elements in the main tube comprise an apparently cemented doublet entirely contained within the foremost ring of the assembly, well forward of the diaphragm. This is the same general construction used by Leitz in the 400mm and 560mm f/6.8 Telyts, and at reasonable lens speeds makes an entirely adequate long-focus design: in the case of the Telestigmat, as the chart above shows, it produces a 250mm f/5.0 in combination with the empty "Z" tube, whose length is about 33mm.

To achieve 315mm you place the "N" tube between the main unit and the "Z" tube. The camera mount goes onto the back of the "Z" tube. So far as I can tell from examination, the negative-strength "N" tube contains a single glass element; since it is negative, however, and far removed from the front cell when mounted, it makes the 315mm combination a three-element true telephoto design.

As we just saw, the 250mm combination uses only the basic main component, and is therefore a simple two-element objective that recalls the Leitz Telyt lenses mentioned above. Like the negative "N" tube, the positive "P" tube also appears to contain a single element; when combined with the main unit it results in a long-focus three-element 175mm of no clear basic typology.

The 225mm combination of "N" plus "P" plus main unit does not really have enough negative power at the back to be classified a telephoto; it too is simply a long-focus objective, in this case of four elements configured rather like some old Rapid Rectilinear lenses. The original owner of the Weth lens that I have examined recalls that in a magazine article written about 1956 this 225mm

combination was considered the "sharpest," but I suspect that such a conclusion may well have been based largely on the fact that it had one more optical element than any other possible combination of tubes.

The smallest marked aperture for the 315mm focal length is $f/45$; $f/22$ is the smallest available at the 175mm setting; and $f/32$ closes out both the 225mm and 250mm sequences. The focusing ring has no scale, partly because the different focal lengths would need different intermediate distance scalar values. In addition, however, the infinity focus location is not even nearly the same at all focal lengths. Groundglass reflex focusing is absolutely necessary in order to use this optic.

The unmarked extension tube, which is not included in the engraved chart, can be inserted either between the camera mount and the rearmost optical tube, or between the main lens tube and the first additional tube. With the two other adapters, however, only the latter positioning is possible. This choice gave the user some interesting, albeit probably unintentional, variations of coverage in the close-up range, since placing the extension tube in its foremost possible position increases the scale of reproduction when, for example, the "N" tube follows it instead of preceding it.

With the other two adapters, using the extension tube always changes both the effective focal length and the effective f-stop, a situation that must have caused some unexpected results, especially in the days before internal exposure metering was common. Because the 315mm combination does not focus very close by itself, the extension tube is almost a standard accessory for it, and this is truer yet with the 175mm configuration: even with the extension tube added, the 175mm Telestigmat assembly focuses no closer than about seven feet, and the double-male threading of the "Z" tube prohibits its use as an additional extension. The largest object image size on film, roughly a 6:1 minification, is achieved with the extension tube on the 225mm and 250mm assemblies.

Since both "N" and "Z" read the same upside-down as right-side-up, assembling the desired combination in a hurry is not always quick and easy for a photographer in the field. Had Dr. Weth seen fit to put positioning arrows or dots on the auxiliary components of his Telestigmat system, he would have helped both contemporaneous users and distant posterity like me.

It's quite easy to see why the Dr. Weth Telestigmat must have been done in, at least for casual users, by the first half-decent zoom that came along and included the Telestigmat's range of focal lengths. We have seen that exchanging the Telestigmat's tubes can something of a nuisance even if you correctly identify fore and aft and manage not to skew any joints; twirling a ring or push-pulling a slider is a much easier way to manipulate image size and apparent foreground-background perspective

relationships. Further, on 35mm reflex screens of the 1950s and 1960s, the image, especially at smaller apertures with this non-automatic lens, would often have been very difficult to judge; the linkage necessary to augment the total of the four Weth lens configurations, plus the extension tube, into even semi-automatic diaphragm operation with any one camera model, much less a succession of them, would have been dicey at best.

Nowadays, however, screens are much brighter than they were then. Anyway, by now you all know me! Maybe there really were additional advantages to the Weth configuration, apart from its light weight and very few contrast-diminishing glass-to-air surfaces. Having the instrument in my grasp, I had to clean it up (no mean task, alas) and find out. Thus I removed the mounting ring from the 1972 Alpa adapter and put it into the outer shell of a Canon FD T-mount; I could just as well have used the original Pentax or Exakta Weth adapter with the proper Canon mount converter at the back, had I had the latter readily at hand. Then I put the various combinations onto my Canon T90 and tried them.

Simply viewfinding, they looked surprisingly good. Examining results on film, I was even more favorably impressed. This is not a very high-speed unit, but it is a very sharp one for its day, and surprisingly so even now. If the lens had been available to me in 1956, I would surely have tried working with it as an alternative to my much heavier and only marginally faster 150mm and 300mm Kilfitts.

If on your photographic travels you should see a bearded elderly gent cussing in temporary frustration at the complexities of assembling the right configuration of a multi-part telephoto lens, don't hesitate to call out "Hey, Peter!"

After all: who else could it possibly be?

2007 NOTE: An earlier version of this essay appeared originally in Shutterbug magazine in 1992 or early 1993.