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The Zeiss Historica Society of America is an educational, non-profit organization dedicated to the exchange of information on the history of the Carl Zeiss optical company and its affiliates, people and products from 1846 to the present.

Officers

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Front cover: This very unusual Werra covered with brown material is one of the rare versions mentioned in Joachim Arnz's article on page 8. (Photograph by Manfred Herrmann.)

Back cover: Six of the advertising placards by the artist René Ahrlé that are discussed by Bernd K.Otto in his article on page 15. They are described in the article and on the inside back cover of this issue.
(Images supplied by Bernd Otto.)

President's Letter

It has been a difficult six months for me. After enduring three years of intermittent sieges with infections from a previous surgery, when antibiotics only gave partial relief, the infections became much more aggressive. They could no longer be held off without further surgery to remove a mesh and replace it with another with a lower possibility of rejection. That surgery was finally scheduled and performed in early September along with a nearly three-week hospital stay for recovery and aggressive treatment by a coalition of intravenous antibiotics and two more weeks of treatments at home. While this sidelined me for a time with side effects, as it stands at this writing I am well on the way to being a normal person for the first time in a number of years. I am, of course, no longer young, but I have a good number of personal projects ahead of me including my own book on Zeiss's role with regard to photography. It is getting closer to being done; 728 pages are now completed and I have moved from 1890 to 1957 and have a goal to get to the present day. Hopefully, this will be done by the Spring issue.

Stephan Paetrow's book titled "Birds of a Feather, 20 years of Reunification at Carl Zeiss" is about the uniting of the firms of Carl Zeiss in a most precarious time for both Zeiss Oberkochen and VEB Carl Zeiss Jena. It is published by the Carl Zeiss Archives and is available in both German and English editions. Find it via the Internet by its title.

Then there is Bernd Otto's book, to be published this month (according to Lindemanns' website, http://www.lindemanns.de/shop/fotobuchhandlung/start.php). It is to be available in German and English and the book can be found by searching on the name of Bernd Otto. Unfortunately, our efforts to have a supply sent to me for further dispersal did not make any sense financially, so it has to be purchased via this website. You might also like to contact *www.camerabooks.com*, who may have access to this publication.

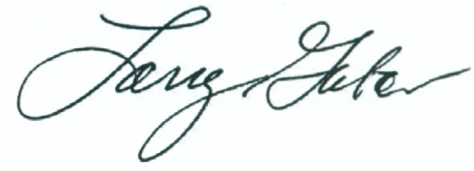
I have a copy of the new book about the Contarex and its array of lenses by Pierpaolo Ghisetti and Marco Cavina, but I need more time to make a proper review. I promise that by our next issue.

In this issue we have an essay by the Zeiss optical designer, Dr Hubert Nasse, about the history of the Tessar lens — still a viable product today, nearly 110 years after its first sale. Our relationship with the modern embodiment of the company that created our collected treasures is currently at the highest level in our existence. We hope to continue to support each other in our historical endeavors.

I did not get any offers of help regarding the upgrade of our Internet site. After I recover some more, I will seek permission of the officers for financial support of my effort to upgrade the site. But I still hope for an offer from among the membership before I take this further.

I do have a suggestion for the next dividend, but it is a very large publication of the Carl Zeiss Photo Lens catalog from the early 1900s. This luxurious example of a Zeiss catalog will require a larger investment than normal, due to its size and possible use of complex colors. This should be ready by the Spring issue of the journal and because of its weight, it will increase the expenditure for mailing. My friend the Treasurer assures me that it can be done, but I need time to reproduce and scan it. I am reluctant to send it to someone via the mails as it is fragile and I have already lowered its life with some damaging in my first efforts to scan it. I still am happy to hear of any special item that you might have that would be worth reproducing.

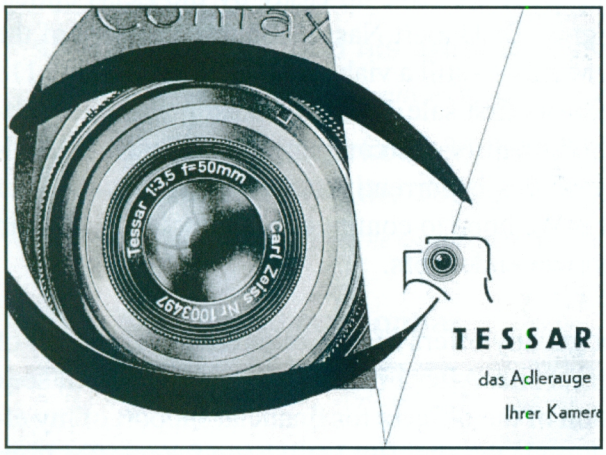
Best wishes to all of you,



The Tessar

H. H. Nasse, Oberkochen, Germany

The story of the creation and development of one of the most successful camera lenses of all time.



The "Eagle Eye of your Camera"

In the European optical industry and at Carl Zeiss, in particular, lenses with different design principles were given special names: Tessar, Planar, Sonnar, Biogon and Distagon are examples of famous Zeiss lens names. Almost all of these names come from a time when optical calculations were done without the help of computers. While we can now calculate several thousand surfaces each second with ray tracing, back then it took two minutes to calculate the path of a single ray of light through a single lens surface. At that time, the search for usable solutions with which the aberrations of the lens elements could be sufficiently reduced was accordingly difficult. Intuition, experience and extensive knowledge were required even more than they are now for the design and optimization of good lenses. This makes it much more understandable that the successful result to what was often years of work required a name.

The word Tessar was derived from the Greek word *tessares* meaning four. It expresses that this lens is composed of four lens elements. Correspondingly, the patent from 1902 stresses the following properties:

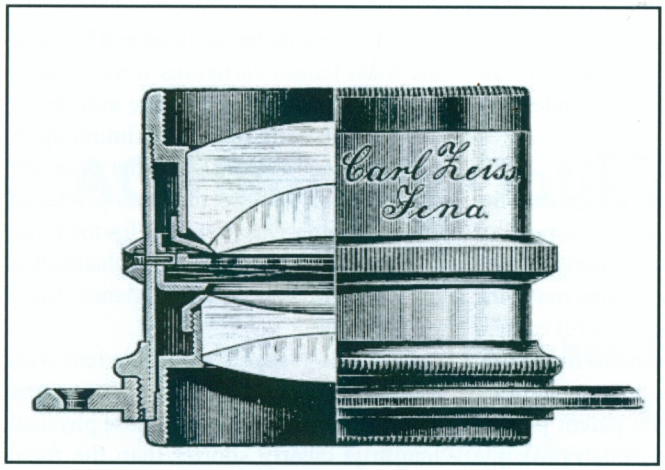
"A spherical, chromatic and astigmatic corrected lens comprising four lens elements divided into two groups by the diaphragm. One of these groups consists of two elements separated by air, the other of two cemented elements. The refractive power of the surfaces separated by air is negative, that of the cemented surface positive."

You can often find articles explaining that this optical design is the improvement of the Cooke Triplets from Dennis Taylor — a three-element lens with a negative element in the middle — in which one of the exterior positive elements has been replaced by a cemented group to create the Tessar. There is, of course, some relationship between the two designs due simply to the similarity of the usable solutions to lens-correction problems. Nonetheless, the inventor of the Tessar, Paul Rudolph, took an entirely different approach. He had calculated two predecessors, the Protar and the Unar, which were completely different from the Triplet. The Tessar contained parts of these two lenses, just like a child has genes from its mother and father.

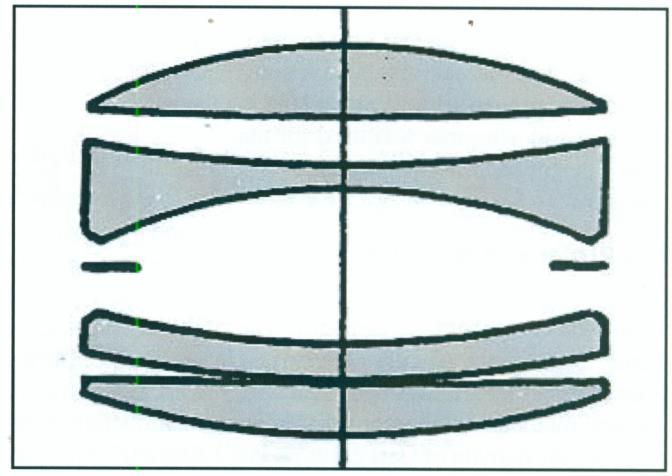
The predecessors to the Tessar were based on the key glass innovations of the 1880s. At the age of 26, physics professor Ernst Abbe joined the microscope workshop of Carl Zeiss in 1866 with the goal of establishing a scientific basis for the construction of microscopes. A key corollary of his fundamental work was that new types of glass were required to make microscope lenses even more powerful. He found a partner in chemist Otto Schott who found a solution to this task in the short period from 1880 to 1886. It quickly became obvious that these new Schott glasses were not only useful in microscopy, but also ideal for improving

This article is *Zeiss Historica*'s slightly abbreviated version of the original work of Hubert Nasse, which can be found (in English) on the World Wide Web at http://www.zeiss.com/C12567A8003B8B6F/EmbedTitelIntern/CLN_39_en_Tessar/$File/CLN39_en_tessar.pdf,
or, more simply, by searching the Web for "Nasse lens names Tessar."

The complete version includes MTF curves for several Tessars, from 1897 to the present.



The Zeiss Protar, an anastigmat from the 1890s, with focal length 230 mm and aperture f/9.



The Zeiss Unar. The design of the front element was copied for the Tessar (see below).

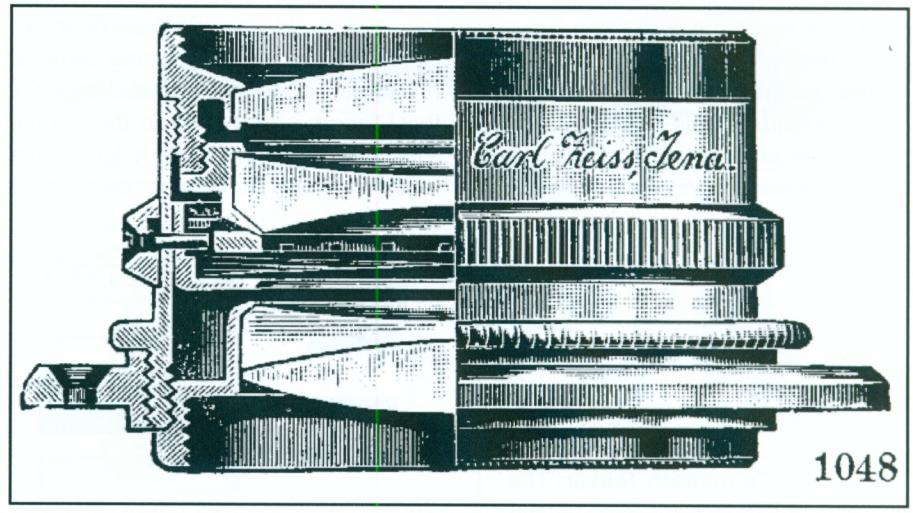
camera lenses. This potential, and economic considerations such as how Carl Zeiss could become more crisis-proof through diversification, led Carl Zeiss to manufacture camera lenses beginning in 1890.

All camera lenses built before 1890 exhibited considerable deficiencies in image quality, particularly when they were not extremely slow. Although spherical aberrations, chromatic aberrations and distortion were corrected relatively well on the new symmetrical lenses available from the 1860s (the Aplanat from Steinheil and the Rapid Rectilinear from Dallmeyer in England), field curvature and astigmatism were so large that a lens focused to infinity in the center of the image frame delivered crisp images at the edge of an image of objects less than one meter away. This had to be taken into consideration while composing the image to ensure that the photos would not be entirely unusable. For example, interior scenes always had to be photographed from a corner of the room.

Beginning with the Anastigmat

The first camera lenses from Carl Zeiss were called "Anastigmat" and described how the company was able to considerably reduce the above-described problem. It was derived from the Greek word *stigma*, meaning point. Astigmatism is the aberration that does not generate a point-shaped focus. The word "anastigmat" is therefore a double negative, a "non-non-point" lens. The first and simplest anastigmats were made up of four lens elements, arranged in two cemented groups.The front element is an old achromat, that is, a color-corrected pair of lens elements, made of the old types of glass: a crown glass with a low refractive index and relatively minor dispersion (color dispersion) and a flint glass with a higher refractive index and higher dispersion. Flint glass, by the way, got its name from the use of flint as a supplier of silicon dioxide, the base material for glass. Flint glass also contained lead oxide, which improved its viscosity when melted, making it easier for glassblowers to work with. At the same time, its refractive index increased, giving glass dishes more shine.

As a result of the combination of refractive index and dispersion, manufacturers had to apply to the cemented surface of the achromats the curvature een in the sectional drawing to achieve the desired chromatic correction. With this surface curvature, it was possible to master spherical aberrations, but not astigmatism. But that changed with the new achromats made from the new types of glass melted by Otto Schott. These new types of glass were known as dense crown glass because they combined a relatively high refractive index with lower color dispersion. The combinations of refractive index and dispersion now available made a correction for astigmatism.possible. However, with the new achromats, very little could be done to influence the spherical aberrations.



The first Zeiss Tessar, aperture f/6.3, based on the Unar and Protar anastigmat designs shown above.

Therefore, it was a logical idea to combine both types of achromats with complementary properties to create a lens in which an old achromat was used for the front element and a new achromat for the rear element.

The Protar and the Unar

Later, front and rear groups consisted of up to four cemented lens elements. The name Anastigmat finally became a generic term for all lenses corrected with the new methods and was no longer exclusively the domain of Carl Zeiss, so the Zeiss lenses went by the name "Protar" from 1900 on. They represented considerable progress for the time, but still exhibit significant aberrations if compared with lenses from the 1960s.

In 1899, Paul Rudolph found that the effect of the cemented surface in the anastigmats could also be achieved using suitable spacing between stand-alone lens elements. This led to the "Unar," consisting of four single, non-cemented lens elements. The further analysis of these two systems led Paul Rudolph to conclude that a mixture of the two would demonstrate the best behavior. This resulted in the birth of the Tessar, which was composed of the front element of the Unar and the rear element of a simple Protar, and featured an aperture of f/6.3. At a time when apertures of f/8 and f/20 were common, this was a really "high-speed" lens. Furthermore, its correction was quite good for the times, despite rather moderate glass material efforts. This was important back then because anti-reflective coatings had not been invented, meaning that all systems featuring multiple lens elements and glass-to-air surfaces suffered from a lack of contrast resulting from stray light. The maximum aperture of the Tessar soon increased to f/4.5 and f/3.5 as a result of the new calculations from Ernst Wandersleb.

A model used worldwide

The ingeniously simple design and the good performance in every aspect of lenses with moderate maximum aperture and with medium focal lengths made the Tessar one of the most successful camera lenses ever. During the term of the patent, Carl Zeiss issued many licenses to other manufacturers, and when patent protection ended in 1920, the design principle was used around the world. It was the standard lens on many cameras well into the 1970s. During this period, it was also continuously improved, without changing the general design, simply because of advances in glass technology. The resulting increases in performance demonstrate the potential of the basic idea. From the outside, a Tessar from 1920 looks exactly the same as one from 1965, but the image quality of the newer lens is considerably better.

Variations on the original name

The Tessar brand name was and still is modified with prefixes:

Apo-Tessars were made of special types of glass to achieve better chromatic correction, which is required, for example, in the graphic arts.

Pro-Tessars were not intended for professional photography as you might suspect based on the name. They were complex attachment systems and customers were able to replace the front lens element of a Tessar on some cameras (Contaflexes, Retinas.....) to change the focal length and transform the normal lens into a wide-angle or tele lens. From today's perspective, these convertible lenses were a technical dead end because the focal length variations were modest, yet still required rather large and heavy attachments with a low maximum aperture. The reason for this rather unfavorable solution was that the mass-produced central shutter was preferred for too long. Most cameras today with interchangeable optics have a high-performance focal plane shutter.

The **Tele-Tessar** is a true tele lens with a positive front group and a negative rear element, that is, a system whose physical length is clearly shorter than the focal length, which makes long focal lengths more convenient. There is no similarity to the Tessar's general design and is simply intended to utilize the popularity of the name.

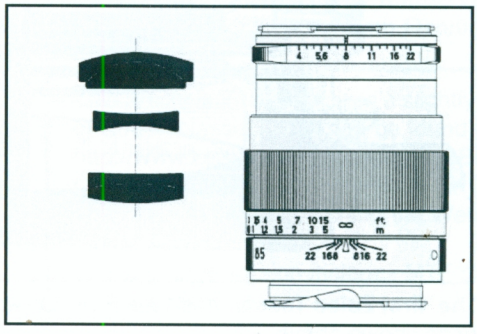
The **Tele-Apotessar** incorporated special types of glass for outstandingly good correction of chromatic aberrations.

The **Vario-Tessar** also has little in common with the general design of its namesake. Its name expresses that this Vario (zoom) lens delivers good performance at a moderate price — like the famous Tessar.

With the **Tele-Tessar T* 4/85 ZM** it is even more difficult. This is in no way a tele lens with a reduced physical length like the earlier Tele-Tessars; it is a nearly symmetrical lens and is therefore practically distortion-free. If you are looking for famous ancestors with the same lens cross section, you will find the Heliar from Voigtländer — but Carl Zeiss does not have any property rights to this name.

Lenses for mobile phones

The name Tessar lives on in our state-of-the-art miniature lenses for camera modules in the mobile phones of our partner Nokia. The similarity to the classic Tessar is that four lens elements are usually used. The small size is also related and is an absolute must for the small volume of a pocket-sized device. However, the functionality of this tiny lens no longer has anything to do with the original Tessar patent; it is usually designed with four lens elements with aspheric surfaces. The resolution of these small and economical optics is far superior to the best 35 mm lenses – but this is due to the short focal length and the small image field. ❐



A modern Tessar: The Tele Tessar ZM 85 mm f/4 for the 35 mm format.

AG Hahn für Optik und Mechanik, Kassel

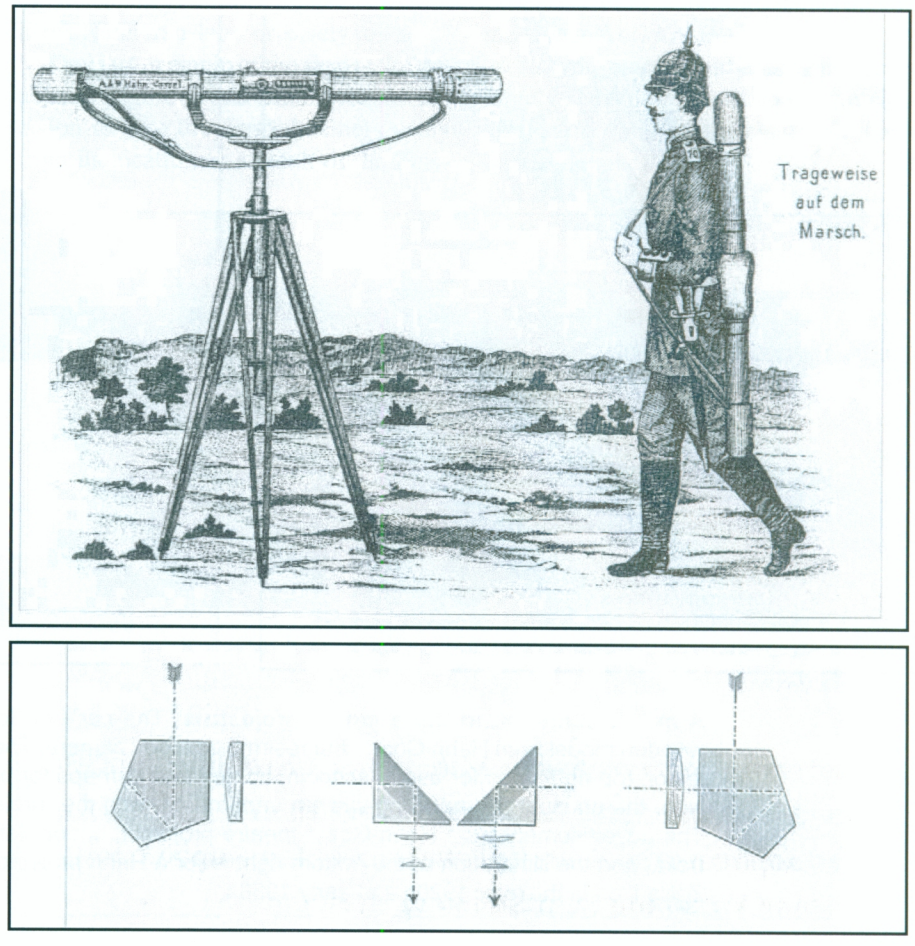
Larry Gubas, Las Vegas, Nevada

One of the more obscure of the companies that made up the new firm of Zeiss Ikon after the mergers reveals some details of its products, both during and after World War II.

Some years ago, I wrote an early commentary for *Zeiss Historica* about the fusion, in 1926–1929, of many German photographic manufacturing companies into the new firm of Zeiss Ikon. One of these firms was Hahn, which had been in partnership in several joint ventures with CP Goerz. My article from 1984 mentioned the firm in very few words, because the history of this firm was somewhat cloudy and vague in all of the documents that I could find at that time. Since then the world of the internet, and specifically eBay, has broadened our visual knowledge somewhat and this is my opportunity to widen our perspective of this firm that was taken into Zeiss Ikon and, within a few years, almost totally disappeared.

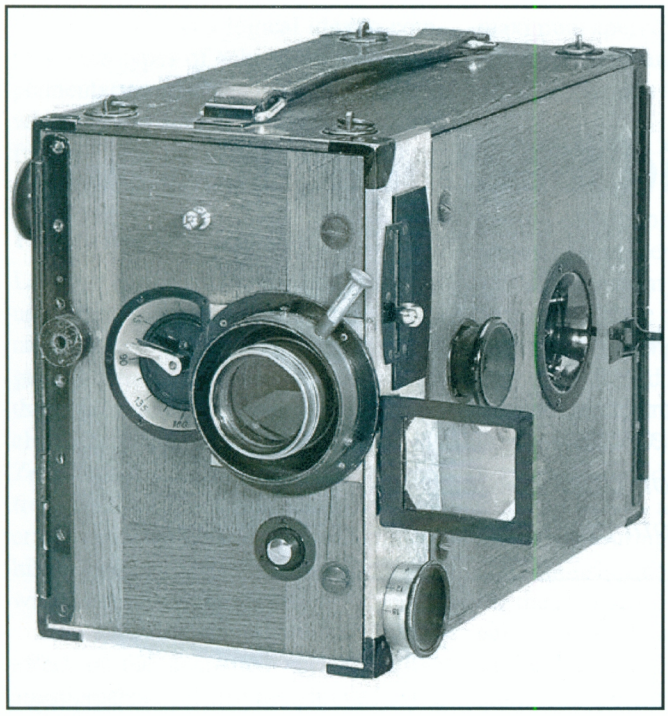
Products for the military

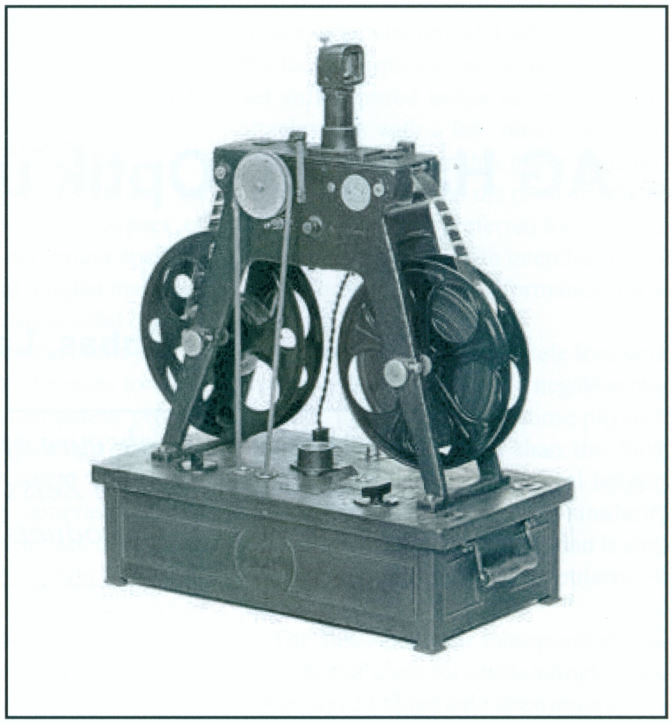
Hahn was apparently a manufacturing firm somehow related to the firm of M. Hensoldt of Wetzlar in the 1890s, making war materiel products based on Hensoldt designs. An example of this is the prismatic rangefinder (figure 1). At this time the firm was known as A & R. Hahn, Cassel (the city of Cassel was renamed Kassel in 1926). In 1910, Hahn began some joint projects with Goerz on some cinematic products, including

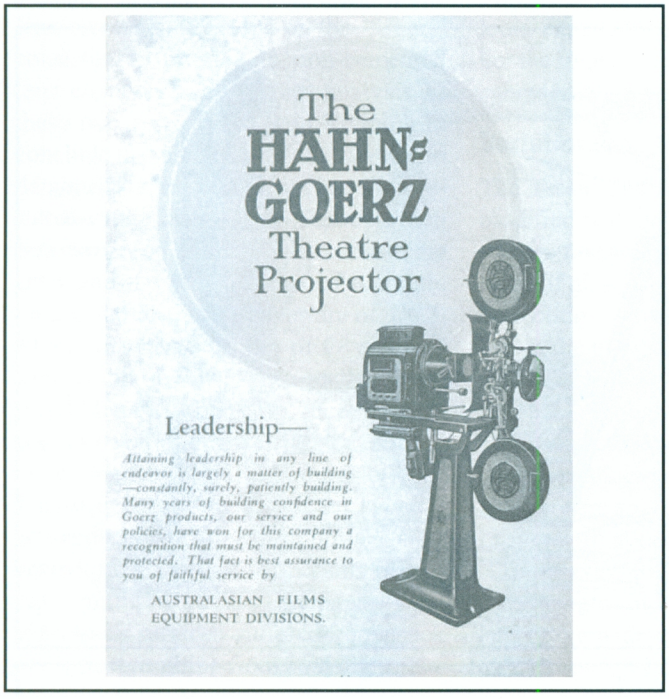


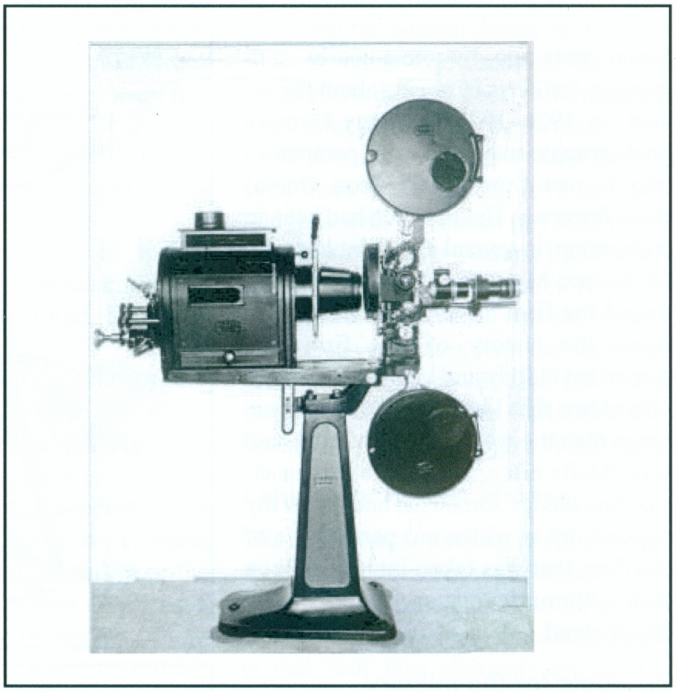
Prismatic rangefinder on its tripod ready for use (above) and being conveniently carried over the shoulder. The optical ray diagram (below) shows how the two sets of prisms allow for a wide baseline.

Figure 1









A movie camera and three movie projectors. The camera, top left, is an early wooden model from Hahn Goerz that resembles a box camera. The Hahn-Goerz projector, top right, was for use in schools, homes and perhaps for business meetings. Note the unusual film-handling system underneath, with the projection lens on top. The advertisement for a Hahn-Goerz theatre projector, bottom left, came from Australia, and the illustration at the bottom right is for a Hahn projector that was sold by Zeiss Ikon in the later 1920s and early 1930s. Figure 2

An advertisement for Hahn-Goerz surveying equipment that predates the Zeiss-Ikon period. Figure 3

The lock and key products of Hahn and Zeiss Ikon show the logos of the two companies, both on the advertisements such as that above left, and on the keys themselves, above right. Figure 4

wooden cameras that used Goerz lenses, and personal as well as professional projectors (figure 2).

After the War

Both Hahn and Goerz had been intensely invested in the manufacture of military equipment during World War I, but they were financially devastated by the immediate effect of the Treaty of Versailles, which forbade the manufacture of anything related to military equipment by German firms. They did make some surveying levels, theodolites and transit systems, but other firms would ultimately out-compete them in the marketplace (figure 3).

Locks and keys

One alternative left to Hahn was the small business of security systems, at that point limited to the manufacture of lock and key systems. That business, which they entered with great vigor, was carried over into Zeiss Ikon (figure 4) and stayed as an activity of the Zeiss organizations until it was sold off in 1989. Over the years, these products became more and more sophisticated; many of the key systems they offered allowed access to certain levels within the location while limiting others. The logo for the firm was the image of a rooster crowing since the name Hahn translates precisely to "hen."

One last example of the firm is the letterhead (figure 5) that announced the decision to take the firm's business away from its location as a result of the Zeiss Ikon merger in 1928 and stating that the business would thenceforth be located in the Goerz Works in Berlin.

As you can see, my information is largely deduced from the advertising images of the period, which had little if any textual detail. ❐

The announcement by Hahn of the merger into Zeiss Ikon. Relocation into the Berlin Goerz works eliminated Hahn's presence in Kassel. The letterhead shows the earlier logo and the substantial physical plant of the Hahn firm. Figure 5

The Werra: Some interesting rarities

Joachim Arnz, Jena, Germany

For this novel design from Jena in East Germany, here are some hard-to-find accessories and prototypes of further developments of the original camera.

One camera stands out from the enormous variety of 35 mm rangefinder cameras that were marketed in the 1950s and 60s – the Werra. Because of its unique design and considerable further development that led to a variety of models and interesting technical solutions, this camera deserves to be looked at in more detail. In hindsight we can see that, with the Werra, a camera system was available for the serious amateur, as was described by Yasuo Nannichi in the Fall 1992 issue of *Zeiss Historica*. He not only described the various camera models but also mentioned the problems and issues of the post-war era.

The post-war environment

Though Carl Zeiss Jena at that time had been engaged in precision engineering for more than a hundred years and was an undisputed market leader, camera manufacture was a totally new development. *(Remember that the many pre-War cameras commonly referred to as 'by Zeiss' were actually made by Zeiss Ikon in Dresden – Editor.)* We should recall that in the fall of 1945 the Russian occupiers demanded the production of the pre-war Contax II. Immediately after World War II, with all the damage caused by heavy bombing and with the lack of raw material, it was a tremendous task to establish a full-fledged production line for all the required Contax parts. Over ninety per cent of the machines and other production equipment were lost to the dismantling that had started in the fall of 1945 — with catastrophic consequences. Huge efforts were required to replace, as soon as possible, the confiscated machines for a manufacturing company the size of Carl Zeiss Jena. Fortunately the company had their own production facilities for these very special machines. With that, a sound basis was created, and finally all problems could be solved ingeniously, and the production got going.

Joachim Arnz is the son of Hugo Arnz who, in 1929, founded the Hugo Arnz Optische Werkstätte, a well-known maker of filters and other photographic accessories. By the end of World War II Joachim was the company owner trying to keep it as an independent operation, but it eventually became integrated into the VEB ("People's Owned Company") Jenaer Glaswerk Schott.

This article originally appeared, in German, in *Photographica Cabinett* 56 (September 2012). The translation is by Manfred Herrmann, who also took the photographs.

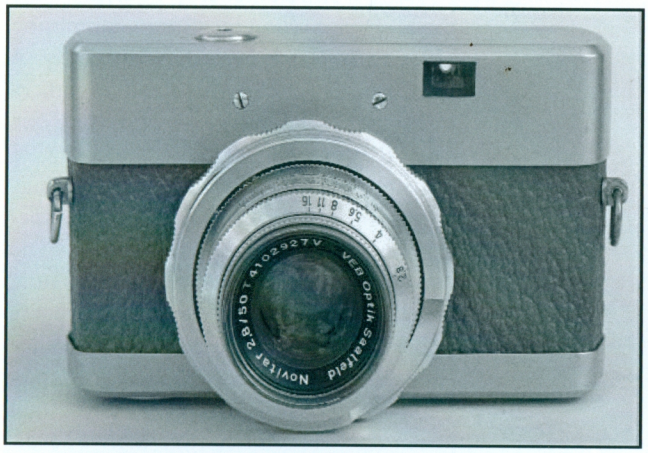
The losses of both human and material assets due to the war were huge. Production for non-military purposes had already ceased in 1939. Thus the backlog demand including cameras was immense after the war.

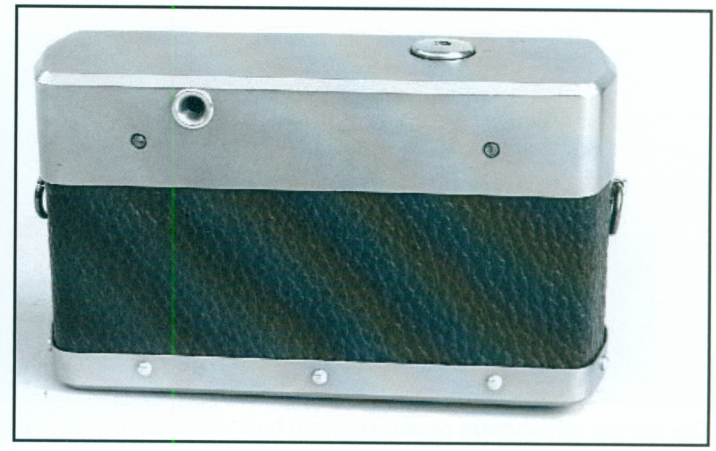
Initially, the biggest companies were kept busy for reparation purposes only. The many smaller companies, including those rather adventurous ones that manufactured cameras in basements and garages, could not meet the demand. At Jena alone four of those mini production facilities existed, and their products were sold right away.

The birth of the Werra

Most likely at the beginning of the 1950s the idea of the Werra was born, initially under the leadership of chief construction engineer Helmut Scharffenberg and Hermann Friebe. As the construction engineer of the Leningrad spring-motor drive camera – similar to the well-known Robot – the latter had already earned his stripes. The construction team got more members, and not much later the prototype of "The camera with the new face" could be presented to the world. This was the Werra 1. With its dimensions of 116×78×68 mm it was the smallest Werra ever (figure 1). The newly computed three-element Noritar f/2.8 50 mm lens was manufactured by VEB Optik Saalfeld, a company that was originally founded in 1913 by CZJ as the Optische Anstalt Saalfeld for the production of ophthalmic and inexpensive camera lenses; it is located 25 miles south of Jena. Obviously that lens did not meet expectations, because when batch production started it was replaced by the newly computed Tessar f/2.8 50 mm, which has an excellent optical image quality.

Eisfeld, a small town on the banks of the river Werra, was chosen for the production site; the river's name became that of the new camera. Eisfeld is located 56 miles southwest of Jena and borders





The prototype Werra, the smallest of all the models, seen here in front, back and side views. The lens, a 50 mm f/2.8 Novitar, is also a prototype, or "Versuch," experimental design. Note in the side view that the flash synchronization socket is on the lens ring and not on the camera body (near where the neckstrap attachment is here) as is the case with later models. Figure 1

Bavaria. In 1952 the Eisfeld production facilities were integrated into the VEB CZJ, and production started following the usual teething problems.

The stereo attachment

Simultaneously the production of accessories was started, in order to make the camera more respectable. In the 1950s stereo photography was very popular, and so the Werra was to get its customized stereo attachment, as shown in figure 2 attached to a Werra 3. The delicate construction was supposed to match the small camera, and the two panels that were to cover the front face would have been quite useful. For unknown reasons this particular attachment was never produced; in 1956 it was replaced by the stereo attachment from the large CZJ stereo program (where it was intended for the Exa and Exakta cameras).

The double Werra connector

This small device (figure 3) is designed to connect two Werra cameras safely and easily, for example a Werra 2 with the built-in exposure meter and a Werra 3 with the coupled rangefinder, or one Werra with a black-and-white film and another one with a color film. It could also be used for stereo photography with two Werra cameras bearing identical lens details and identical films.

Close-up attachments 1 and 2

These accessories consisted of two close-up lenses, one with a focal length of 690 mm and the other with focal length 340 mm. When mounted on the Tessar f/2.8 50 mm the result would be as shown in the Table below. These close-up attachments (figure 4) enabled Werras from model 3 onwards to make use of their built-in coupled rangefinders.

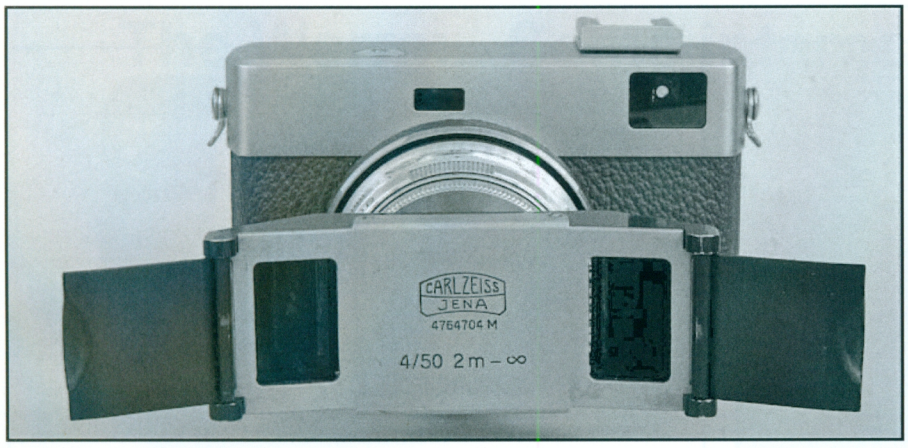
The colored Werra cameras

The camera shown on the cover of this issue of *Zeiss Historica* is a Werra 4 with a Synchro-Compur shutter; it is a design sample with a brownish color. There were also variations in yellow and red. It seems that these stylish versions did not find a wider approval, so no bulk production was started.

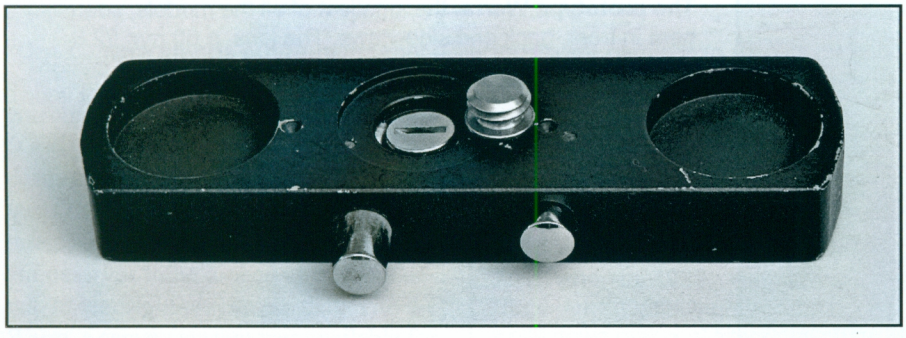
The Microscope Werra

This camera (figure 5) came without a lens because images were made with spe-

Close-up attachment	Image distance meters	feet	Reproduction Scale
None	∞ – 0.8	∞ – 2.6	1 : ∞ – 1 : 13.5:
Type 1	0.79 – 0.44	2.6 – 1.3	1:13.5 – 1:6.5
Type 2	0.42 – 0.31	1.3 – 1	1:6.5 – 1:4.2
Types 1 plus 2	0.3 – 0.26	1 – 0.8	1:4.2 – 1:3.1



The stereo attachment never went into bulk production. This one is shown fixed to a Werra 3. Figure 2



The double Werra connecting device, which could be used to offer a choice of film or to enable stereo work. Figure 3

cial microscope lenses such as the planachromatics. The coupling to the camera was done with a device connecting the microscope lens to the camera's lens tube. The image section and the exposure time were selected by means of a dedicated apparatus. The shutter was a Prontor Press with exposure times of 1-1/125 s, B and T. Apart from that the camera had the usual Werra features.

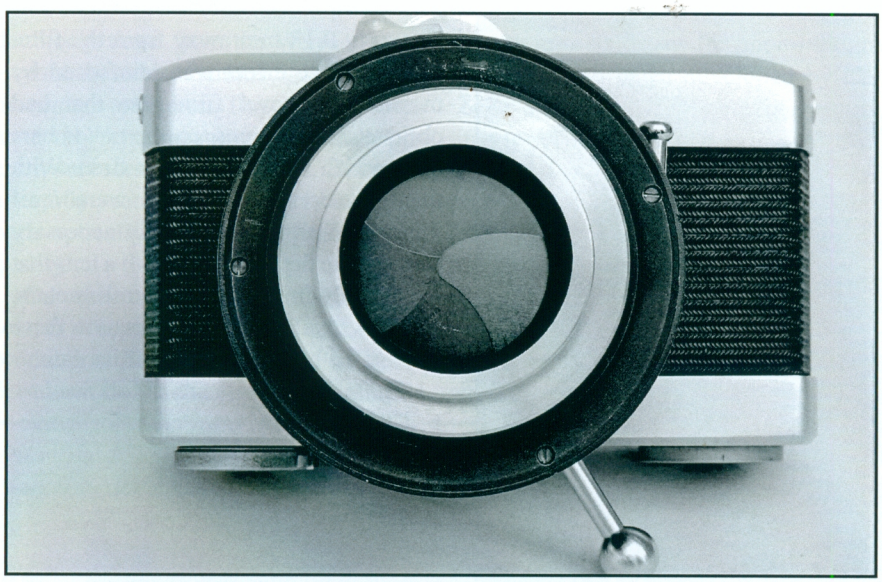
Werraflex SLR

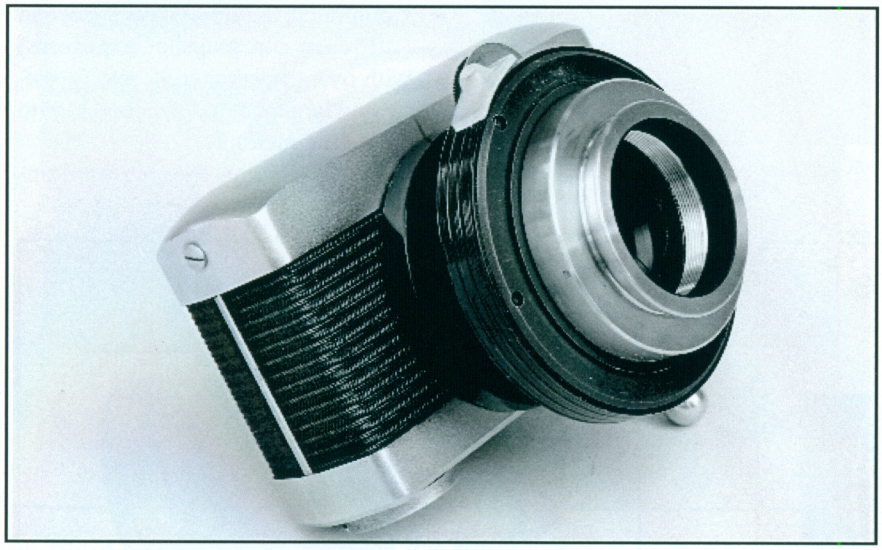
Construction work towards a single-lens-reflex version of the Werra began in 1955, simultaneously with the rangefinder camera. Some stumbling blocks had to be removed instantly. A leaf shutter suitable for an SLR camera was simply not available. Importing one was for cost reasons not feasible, so CZJ had to develop and produce such a shutter starting from scratch. A simple functional sequence was designed: The shutter is cocked by turning the lens ring, the mirror covers the film in a 45 degree position, which is also the position for setting the exposure data and focusing. After releasing, the mirror clears the light path and the shutter runs off. The diaphragm that has been set is also the aperture for focusing; the mirror does not swing back, and there is no exposure meter.

The evolution from design status to a properly working camera must have been a labor of Sisyphus, marked by many setbacks. The "Zeissians," however, never give up, and their resourcefulness is exemplary.

But when the camera finally found its feet, as in the example shown in figure 6, it was already too late. The main competitor in Dresden suspected that they would lose their monopoly and arranged that in the course of a restructuring process the development and production of cameras be only permitted there. As was later demonstrated, this camera design did not have a promising future due to its limited usage, especially with regard to additional lenses. The SLR cam-

The Werra close-up attachments. Left, type 1 on a Werra 5, and **right**, both types 1 and 2 with their leather case. Figure 4





The Microscope Werra, shown in three views. Figure 5

era with the focal plane shutter is unbeatable as a result of its versatility. Last but not least it was a question of prestige to have an SLR camera as part of the Werra camera line. Apart from that the Werraflex was well done. Sizewise it fits perfectly well with its rangefinder sisters and was a CZJ masterpiece.

The 1960 x-ray camera

The x-ray camera that was based on the Werra, with its f/0.85 40 mm lens, represented an excursion into optical computation.

This 35 mm camera (figure 7) was custom made by CZJ for the X-ray fluorescence photography of human lungs. Tuberculosis was a very common disease, especially in the post-war era, and in order to control it the population of the GDR was checked annually by means of mobile X-ray devices. The only way to record the images as shown on the X-ray screen was to photograph them. However, the problem was the insufficient brightness of that screen, and the requirement for short exposure times in order to prevent blurred images and ensure reduced exposure to X-rays. Both conditions required ultra fast lenses – at that time a major leap. Fifty years ago it was truly pioneering masterpiece for optics computing and optics technology.

Initially the X-ray screen shot was taken on a medium format film for further diagnostic evaluation. This format required a focal length of 100 mm, and the first CZJ was an f/0.85 100 mm lens. However, with fifteen million thorax exposures annually the costs would have been immense and therefore it was attempted to cut them down by reducing the film format to an image size of 24 mm diameter and the lens to a focal length of 40 mm.

The f/0.85 Versuch (that is, "test" or prototype) lens is an advanced triplet variation consisting of eight elements in order to meet the sophisticated optical requirements. The final negative element, as shown on the right side of the ray diagram of the 40 mm version in figure 7, was added for very special reasons. First, it was to flatten the image plane, and second it prevented the film from flexing out of focus, because that element's flat side

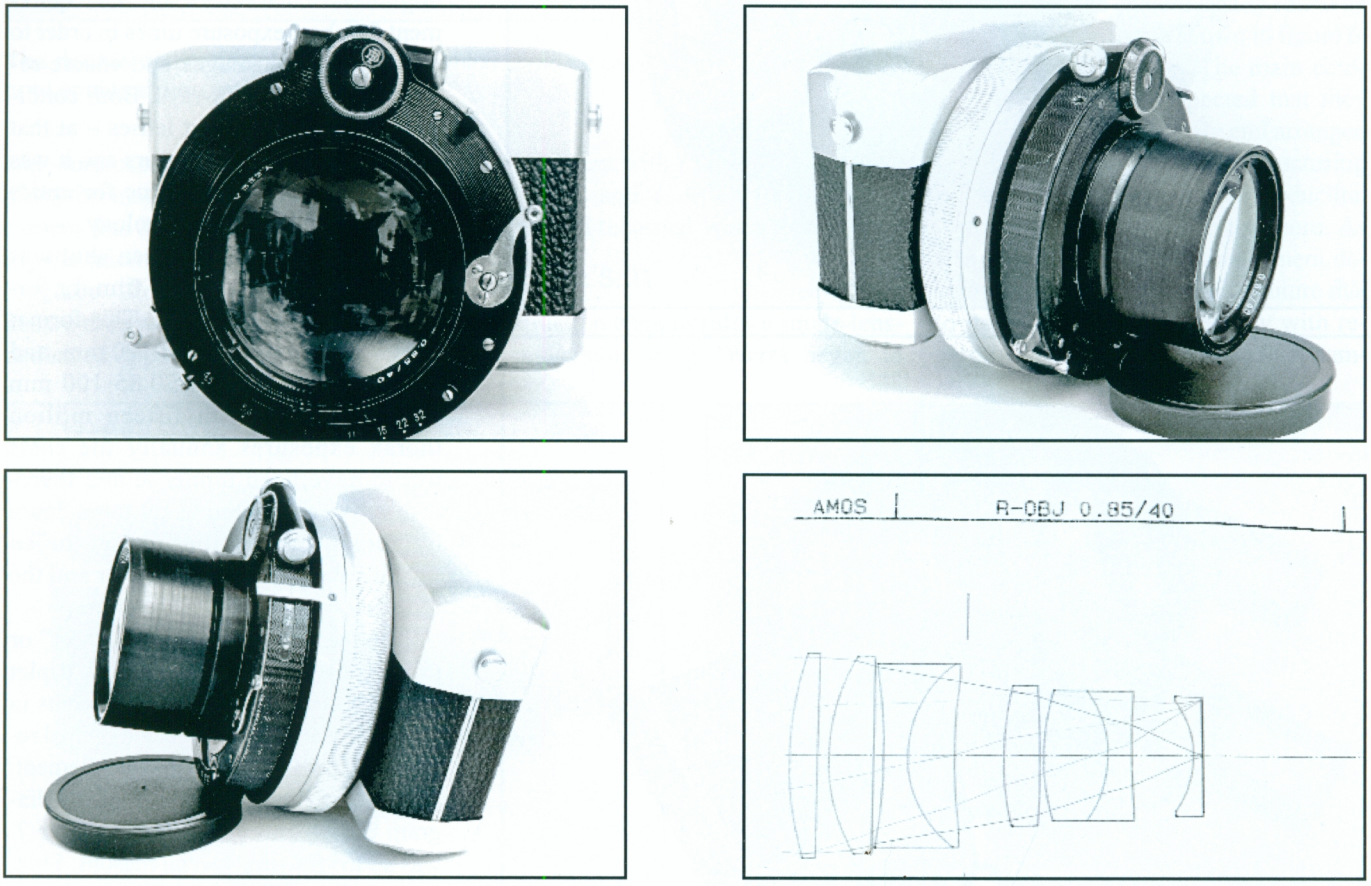
The Werraflex. It had a leaf shutter, like the West German Contaflex. Figure 6

was only 0.18 mm away from the film. This positive effect was reinforced by means of a novel film gate that had oblique corrugations on the raised bars over which the perforations slide. With these features the images were optimized, which was especially necessary because the depth of field with a lens that fast is only in the range of millimeters. By the way, all Werra cameras have these corrugated bars flanking the film gate.

The technical data are as follows:

- Chromatically corrected for wavelengths 486, 546 and 582 nm (these are appropriate for fluorescence emission),
- Entry pupil diameter 47 mm,
- Exit pupil diameter 24 mm,
- Compound shutter 1-1/100 second (sufficient for snapshot exposures) with overall diameter 90 mm (possibly too large, but judged necessary to prevent vignetting).

All the remaining features were un-



The special prototype x-ray lens with an aperture of f/0.85, seen from the front and in two side views. At lower right is an optical ray diagram for the 40 mm focal-length version. Figure 7

doubtedly those from the Werra camera – center-based leaf shutter, cocking, film movement and so on. This was of course no usual Werra because as a special camera it served special purposes. But even after fifty years it is still fully functioning both optically and mechanically. CZJ quality!

Our short excursion into the sublime school of optics computing and optics production has ended now. For some decades it had been admirably continued by the famous lenses for photolithography that have been developed by Carl Zeiss Oberkochen. Since the requirements for the field of microelectronics rise constantly, the performance of lenses increases correspondingly – they keep moving, right at the constantly moving edge of possibility.

The present highlight of Carl Zeiss Oberkochen is the 193 nm immersion lithography lens – it costs five million euros, its weight is 2,205 pounds (1 metric ton) and its height is more than 3 feet (1 meter).

The Werra mat-super — the last of the Werra line. The back (shown below left) has, on the right, the shutter release sliding lever. The button marked "A" in the middle turns off the automatic exposure feature and allows manual settings using the rings visible on the picture, below right, around the lens. Figure 8

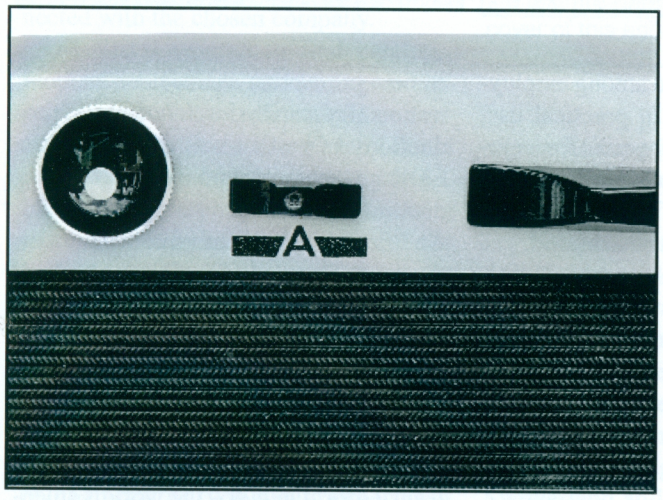
The Mat-super and Supermatic

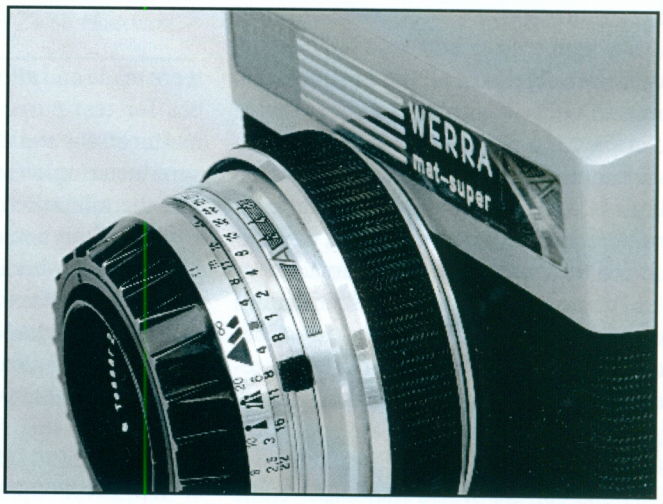
The visible distinction of these two cameras from around 1965 when compared to the earlier Werra cameras is the shift of the release lever – no longer a button – to the camera back for design reasons. The Werra mat-super (figure 8) is the final stage of the production of Werra cameras, and represents on the then-current level of development. The aim was to provide the undiscerning amateur with a reliable automatic exposure.

The function is as follows: After confirming the film speed, the shutter speed is set by moving the pointer for the built-in exposure meter (visible in the viewfinder) to the middle of the aperture scale, depending on the brightness of the object to be photographed. Finally, the release lever on the camera back is pushed to the right – the shutter is now released on the basis of the pre-set shutter speed and the resulting aperture.

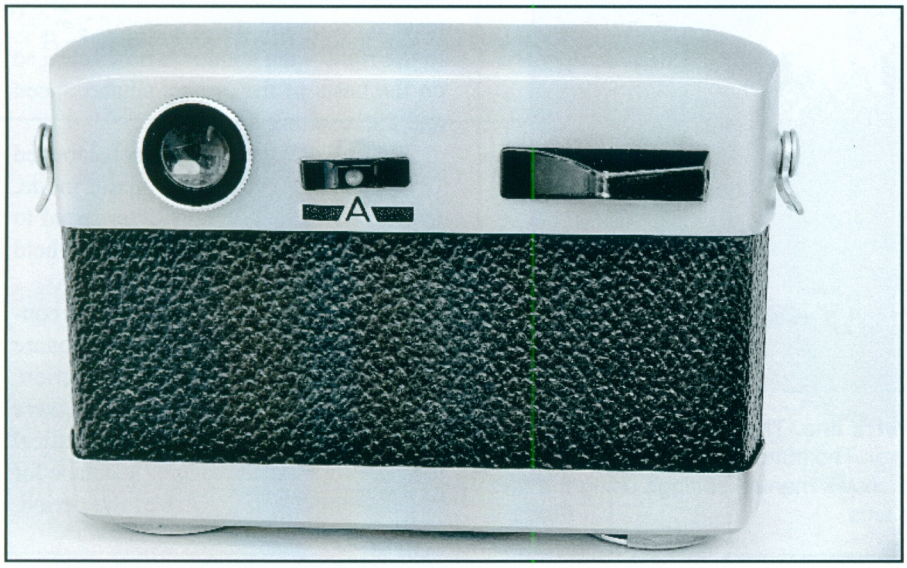
The lever on the camera back, labelled "A," switches off the automatic mode, and allows aperture and shutter speed to be set manually when using a hand-held exposure meter.

It should be emphasized that this coupling of aperture, shutter, and exposure meter is a totally mechanical function. Today's battery-driven microchips were not available at that time. This technical solution deserves the highest accolade for the construction engineers of the period,





The Werra Supermatic (left), in a design sample. The back of the camera (below left) is the same as that of the Mat-Super on the preceding page, except that this one has the standard covering rather than the "herringbone" effect of the one on the Mat-Super. This prototype is shown fitted with the f/4 100 mm Cardinar, and that lens is illustrated below right. Figure 9



who were able to fit all the functional elements under the only slightly enlarged chromed top plates. In addition to two variators there are the transmissions, levers, push rods, gear wheels and gear racks, coil springs and so on that were required for the camera to function.

The Supermatic (figure 9) had an even more complicated technical design, because the three interchangeable lenses required modified aperture transmissions.

The end

The end for the Werra mat-super came unexpectedly after about one hundred were made and allocated among employees for test purposes. In practical use, malfunctions and discrepancies for exposure metering were detected. For example, the tolerance of ± ¼ aperture value for slide films could not be achieved, and breakdowns were quite common.

In short, after almost fifteen successful years time had run out for the Werra camera. But the balance is impressive:

In 1956, 100,000 Werra cameras were delivered.

In 1960; 450,000.

In 1964; 800,000.

1966 marked the end of the Werra camera production at Eisfeld. The localization of research, development and production at Dresden was ordered by the GDR government, and in 1967 the production of binoculars started at Eisfeld. And finally in 1985 the whole camera industry at Dresden (Pentacon) was integrated into a federal holding company, the CZJ trust with a total of 67,000 employees.

In 1990, one year after the fall of the iron curtain, came the end of CZJ; some 3,000 employees stayed at Jena – *sic transit gloria mundi* – the world's splendor vanishes. ❐

René Ahrlé and his artistic poster designs

Bernd K. Otto, Frankfurt am Main, Germany

Among the artists whose work appeared on Zeiss's posters and placards during the 1930s, René Ahrlé stands out for his talented style.

Sooner or later all serious collectors come to a point where they want to focus their collections on a specific brand of camera. Soon they realize that it is impossible to collect everything in the infinite flood of products, and the desire for completion has to be tempered. Having made the decision, the supply of cameras and lenses from the favorite company will often dry up quickly. The well-known auctioneer and collector in Cologne, James E. Cornwall, put it well in his catalogues, adding "for the advanced collector who already has everything" to his descriptions. The time had now come to be on the lookout for all additional items that were in any way connected with the chosen company.

At first I wanted to find catalogs, product prospectuses, operating and repair manuals, followed by corporate documents of all kinds. Then promotional items such as writing cases, ashtrays, card games etc. caught on quickly with me. This extension of the range of the collection includes charming company products that are much more difficult to trace than the actual photographic "hardware" – shop window posters designed by creative artists.

Interestingly almost all photographic companies used to advertise not with photographs, as you would expect, but graphic images. These artistic designs adorned catalog covers, newspaper advertisements, were installed as enamel plates on the outside walls of shops or, as in the examples to be discussed here, were hung in shop windows as posters.

The Zeiss Ikon AG, like their predecessor companies, employed several artists for long periods of time. The designer Ludwig Hohlwein (1874–1949) became well-known, almost even a celebrity, in the field of German advertising art. (See the example on page 16.) He had worked first for the Heinrich Ernemann AG, in Dresden, along with numerous other photographic companies, then for Ernst Leitz, in Wetzlar. Years ago I discovered what is probably the most famous photo-enamel sign of his design at a "non-photographic" flea market in Switzerland and was able to acquire it. This 1913/14 design is very rare, but in such great demand that a few years ago a smaller replica was produced using the original, now outdated enamelling technique.

This article was first published in the III/2009 issue of PhotoDeal, in German. Trevor Richards made the English-language translation from which this version was prepared , and it appears here by permission of the author.

Several colored illustrations keyed to the text are reproduced on the back cover of this edition of *Zeiss Historica*.

In March/April 1985 the Print Room of the Stuttgart State Gallery organized a retrospective on Hohlwein's posters from 1906 to 1940. However, this article is largely devoted not to Ludwig Hohlwein but another artist who signed his work at times with only a small "a" but sometimes, fortunately, with his complete surname, "aHRLé." (See the images on page 18.) It would be difficult to learn something today about a commercial artist whose creative period was in the 1930s if all we had to go on was his name. In the case of the posters signed with a small "a" it would have been quite impossible, but because we do have the full name Ahrlé and because this artist has descendants we have more help.

Today René Ahrlé's 85-year-old son Ferry lives in Frankfurt am Main and Berlin. Ferry came to prominence as a portrait painter of contemporaries such as Maria Schell and Yehudi Menuhin, and F. Dostoevsky. Another specialist field is "painted music." Ferry Ahrlé has written ten books and designed several hundred film posters. For his work he was awarded the Federal Cross of Merit 1st class, the Cross of Honour for Science and Art from the Republic of Austria, and

Ludwig Hohlwein, the "Master of reductionism," produced this enamel sign for the Ernemann AG of Dresden in 1914.

the Goethe Plaque of his home town, Frankfurt am Main. Ferry Ahrlé was kind enough to provide me with a photograph (reproduced opposite) and information about the life of his father René.

René Ahrlé's career

René Ahrlé was born on 28 October 1893 as Hermann Ahrle in Frankfurt am Main and died there on 1 April 1976. Two years after his death an appreciation by Walter Weisbecker appeared in the *Frankfürter Allgemeine* newspaper, from which I would like to quote the following summary of his life.

Ahrlé responded once to a friend who had advised him to be more economical with his considerable income: "Why? I'm walking a tightrope, and if I fall, at least I'll have had a full, colorful life."

He was a versatile and yet easy-going artist, with not only artistic abilities but also literary and theatrical talent. His well-developed technical instincts and knowledge came in useful in all professional questions. Ahrlé began his career as a goldsmith in Hanau. [*Hanau, an ancient city 25 km (about 15 miles) east of Frankfurt, is renowned for its goldsmiths. Editor*] Pretty soon he attended the Arts Academy, where he became a student of Professor William Schultz, who was a leading staff member of the satirical magazine *Simplicissimus*. At first Ahrlé created set designs for the stage of the Grand Ducal State Theatre in Hanau. After World War I he became Associate Editor and Art Director of the *Frankfurter Revue*, a bi-monthly magazine for society, theater, fashion and sports.

He married at age 24 and set up his own art studio in his home. In time many major firms became customers and Ahrlé quickly earned a lot of money. When he drove his Bugatti around town he caused quite a stir. He soon moved from his home town into a 24-room villa in Berlin, which by then had become the undisputed major German city. Here he won contracts from Deutsche Shell AG and Kodak AG, Stuttgart, amongst others, as well as advertising for the soap powder Persil. Zeiss Ikon AG, Dresden, got in contact in 1936. This large company was still placing the emphasis conservatively on paintings in the assignments they gave René Ahrlé.

From very early on Ahrlé used photography in many advertising assignments. He became well-known for his clearly devised publicity photographs and photomontages, sometimes serving as a model himself. To make the montages he did not work with scissors and glue, as John Heartfield did, but used instead the Fader contour retouching technique to put the images directly on photographic paper. In these works he made masterful photographic miniatures, as Ludwig Hohlwein had already done graphically. Meyers' *Enzyklopädisches Lexikon* (1978) even credits Ahrlé as the inventor of the photomontage.

After World War II he worked with the advertising agency of William Heumann. But other advertising agencies also saw their chance in the early boom years of the German economic miracle. Ahrlé – not someone who would go to look for customers himself – would rather wait for them to come to him. In 1964 he visited Venice to attend an exhibition, and

René Ahrlé (right) in 1974, with his second wife Sigrid and son Ferry (left), two years before René's death. (Photograph courtesy of Ferry Ahrlé.)

he liked it so much that he spontaneously settled in the city on the water. Since he could not generate any income in Venice from his work in advertising, he created together with his second wife (his first died in 1951) a business designing large silk shawls and scarves. Ahrlé, spoiled by success for so long, had to accept financial restrictions. In 1971, Ferry brought his 78 year-old father back to Frankfurt, the city of his birth.

René Ahrlé died in Frankfurt aged 83 after a successful life as an artist with all its ups and downs. The Folkwang Museum in Essen, which specializes in the medium of photography, has been showcasing Ahrlé's work since 1989 in a permanent exhibition. The newspaper *Die Welt*, in a column written for the 100th anniversary of his birth in 1993, described the German commercial artist as a pioneer and one of the most important figures in the history of advertising.

Photography in advertising

At first photography was largely rejected as an advertising medium. As I mentioned above, it is perhaps surprising that this applied equally to advertising for the photographic industry itself. Line drawings were considered to be artistically superior and better able to represent the message the client wished to convey. The Zeiss Ikon AG presented its new camera models, such as the Contax I, II, and III, Contaflex, and Super Ikonta, not with photographs made by the studio cameras in their own advertising department, but by designs from such well-known commercial artists as Walter Biedermann, Kurt Hilscher, Fred Schittler and, from the beginning of 1936 to mid-1938, René Ahrlé. The colorful artwork of these posters was supposed to contrast with the monotonous color of the shop-window displays with their customary black and silver cameras, and attract attention.

Of course, the visual language of each individual artist is very pronounced. Walter Biedermann's work is striking because of his strictly functional, concise, factual style, which always strives for a reduction to the essentials of the job. The necessity for a poster design to avoid distracting visual elements was stated masterfully by the great Hohlwein, and was also a formative influence on Walter Biedermann. Fred Schittler appeared to be completely contrary to this approach by producing almost naturalistic "photographs" with his brush.

This photo-realism must have come from his use of reference photographs and seem more like realistic, everyday picture stories. Ahrlé, however, always tried to capture the mood artistically in such a way as to involve the viewer, although with both artists you can see that photographic material had been used for the graphic execution. However, the advertising message that the poster was to convey had to be specifically worked out in advance. Interestingly, the Zeiss Ikon AG exerted no design limitations or control on the artists working for them at that time. But they did not manage to equal Hohlwein's great poster art. With just a few lines or spaces, he was able to compose compelling, effective posters in which missing elements are often connected in the observer's mind only by association.

As well as these painted designs, in the 1930s some so-called "performance samples" appeared in the windows of photographic shops. These were contact prints on bromide paper from 35 mm or medium-format negatives to be compared with big enlargements made from the same negatives. They could thereby provide proof of the quality of the cameras and their lenses. Gradually they ousted the artistic posters and took over their advertising space.

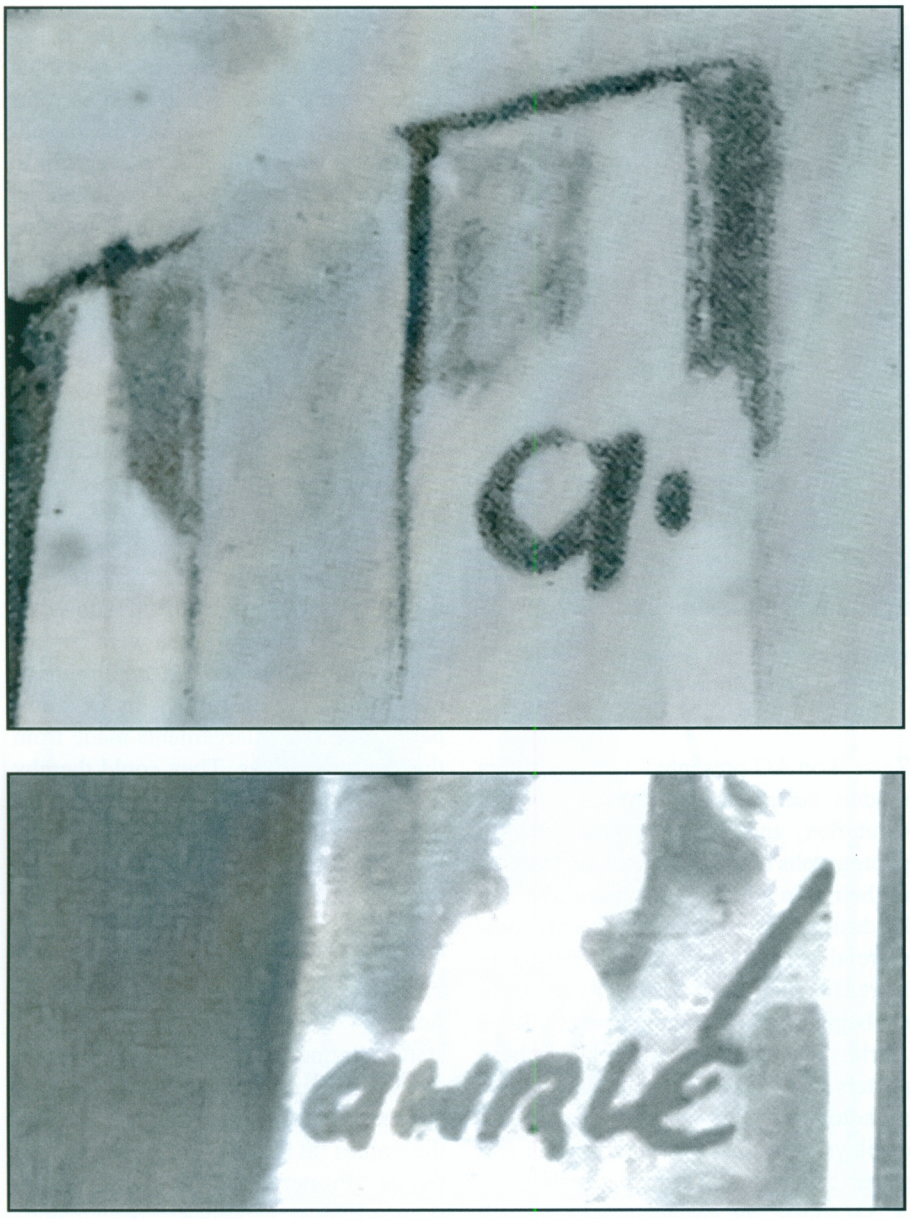
Ahrlé's posters

For window advertising Zeiss Ikon offered 24×33 cm posters with display stands. Framed posters in sizes 33×48 or 48×65 cm could also be ordered from the advertising department. On the back of the frames (at first brown, later gold) the words "Property of Zeiss Ikon" were stamped. Most window-dressing materials had to be returned to the company after a successful campaign, and perhaps this is the reason that so few originals can be found today.

(*Many of the images discussed in the following paragraphs are reproduced in color on the back cover of this issue of* Zeiss Historica.)

One of René Ahrlé's first designs for Zeiss Ikon was made in June 1936, and it was offered as a cinema slide and also as a summer poster. The poster entitled "Capture all the beauty with Zeiss Ikon cameras," (no. 1 on the back cover) shows a mother instructing her daughter in the use of a 6×9 Ikonta.

The topic of the next poster in the Olympics summer of 1936 was a "Photo



The two signatures used by René Ahrlé. At the top is the simple single letter "a" he used at first; below that is the more complete "aHRLé" version..

cabinet" that Zeiss Ikon had presented the previous year. (*This was reproduced on the back cover of the Spring 2011 issue of* Zeiss Historica*, with a description of the "cabinet" on page 10 of the issue.)* It was supposed to help bring order to photographers' collections of negatives. This small cabinet lovingly fashioned in the 1930s art-deco style had a wooden body with nine labeled drawers. Anyone who purchased three 6×9 roll films simultaneously would receive them packed in a velvet-lined box. The empty boxes were then used to order 6×9 negatives by subject, such as architecture, interiors, landscapes, portraits, travel, sports, still life, animals and miscellaneous. The chest then cost RM 2.30 and today is as rare as the corresponding poster.

The next design contract (July 1936) was devoted to the new Zeiss Ikon Pernox panchromatic film introduced in May 1935. The caption on the poster (no. 2) reads "All the colors of the rainbow are reproduced precisely on Zeiss Ikon film." A young lady placed strategically in the center of the picture contemplates a beautiful rainbow, and provides effective advertising with a 6×9 Super Ikonta in her left hand and, in her right hand, the new panchromatic film.

In October of that year Ahrlé's poster for the coming winter was for indoor photography with high sensitivity film and a fast Zeiss Ikon camera. The mother in the illustration (no. 3) is using her new Ikoflex II, introduced in January 1936. With an f/3.5 lens and the "high" senstivity of the new 16/10 DIN film, the only photographs that could be taken indoors without flash would have been in daylight.

Another poster, from June 1937, shows a father changing the retractable Sonnar on his Contax, while the mother has the Tele-Tessar 18 cm f/6.3 ready (no. 4). That long lens will be used later to photograph the ruins shown in the distance. Their daughter holds some small accessory in her right hand; it might be a metal box for Zeiss Ikon film, but you can make your own guesses. The caption for this poster reads: "Master exposures by these three — Zeiss Ikon Camera, Zeiss Lens and Zeiss Ikon film."

René Ahrlé no longer signed with a small "a" in these last examples of his creative work for the Zeiss Ikon AG that I have but, like the first poster in my possession, "aHRLé." At first, in January 1938, the customer is reminded to take a camera from Zeiss Ikon along even when going out for winter sports (no. 5). This dashing skier, however, was drawn without a camera dangling, because at that time in Germany there was the first limitations on the sale of equipment to the civilian population.

Later, in May 1938, the customer is urged to "capture the summer with a camera and film of Zeiss Ikon" (no. 6). But neither of these designs heralds the introduction of a new product or camera model.

Most of these poster designs adorned the front pages of the in-house trade magazine, *Die Brücke*, or were offered as modified versions of 6×6 slides for cinema advertising. From the summer of 1938 until January 1943, when *Die Brücke* ceased to be provided to the photo trade, I know of some more new sample proofs but no more painted poster designs. ❐

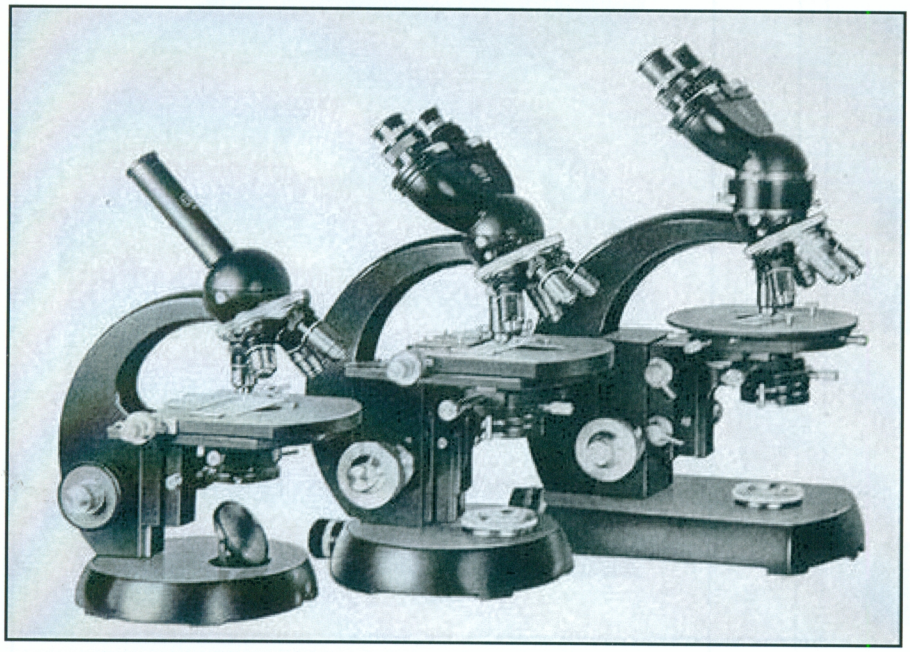
Carl Zeiss (Oberkochen) transmitted-light microscopes in the 1960s

John Schilling, Gardnerville, Nevada

Reminiscences by a Carl Zeiss sales representative of his work on the US West Coast and his training in Oberkochen and elsewhere

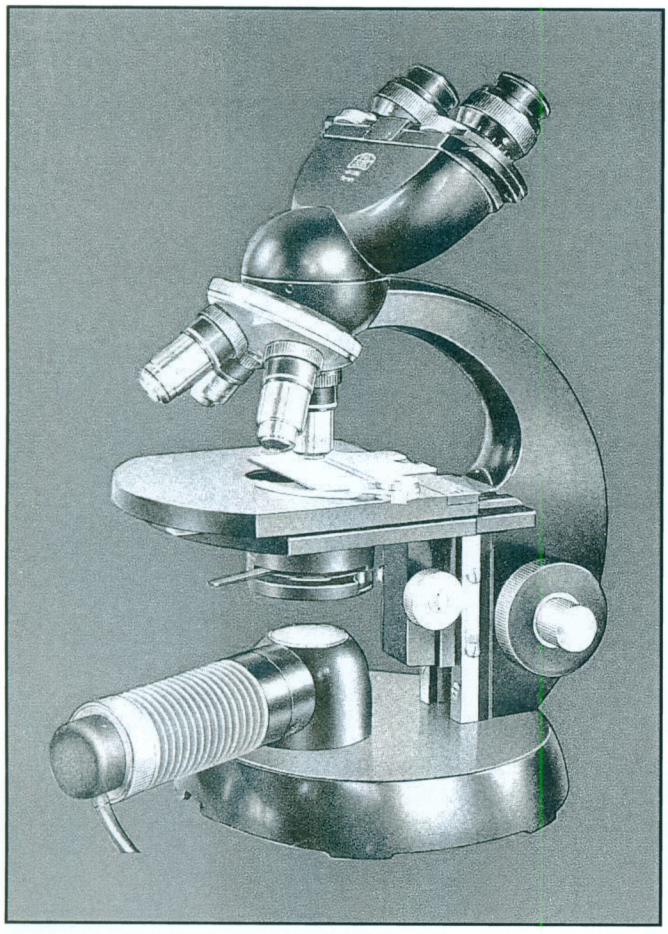
I began my 31-year career in the field of microscopes in 1957, a period of expansion and renewal in the educational, medical, and industrial worlds. New colleges and universities, hospitals, medical research laboratories, governmental and private industries were being founded. Moreover, existing institutions and businesses were being enlarged as well as modernized.

Of all the microscopes sold at that time, H. Ernst Keller has estimated that 70% were for transmitted-light applications. The pre-World War II standard microscopes, (those with a mirror on the microscope base for use with a separate illuminator, and separately-mounted coarse and fine focusing controls) were being put into storage or sold off. They were replaced with modern designs from American Optical, Zeiss Winkel and Zeiss Opton. In 1954 the latter two were merged into the trade name Carl Zeiss. (The owner of a hotel in Aalen, near Oberkochen, told me of Dr G. Kuhn who traveled between the British Zone of Occupation, site of the Zeiss Winkel facility, and Oberkochen in the American Zone, the site of Zeiss Opton. In those first few years after the end of hostilities it required special permission to make such trips between the Zones. Dr Kuhn was the *Geschaftsleiter* of the foundation when I met him in 1963, and he may well have had much influence in the combining of the two facilities.)

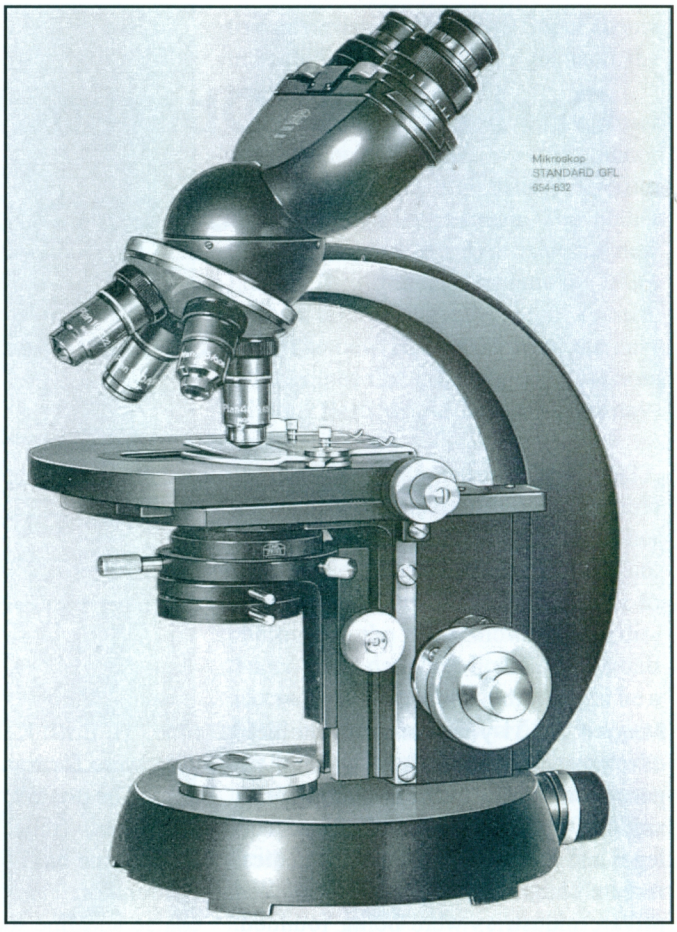


Three "Standards": left to right, the Junior, the GFL, and the WL.

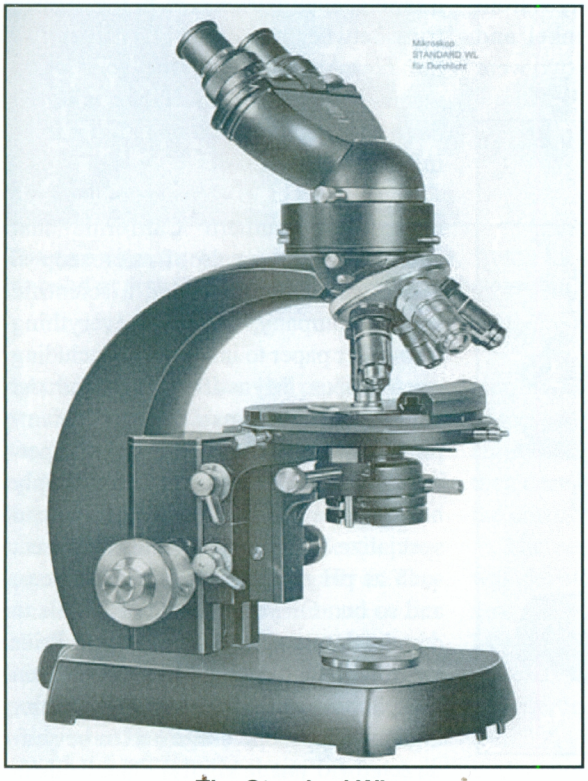
I was hired in 1957 by one of the three dealers in Southern California that specalized in the sale of microscopes. There was a fourth dealer, a scientific supply company, that sold everything from filter paper to instruments including microscopes. My work background and education had been as a chemist. My employer, who had high hopes of competing with the largest scientific supply house on the Pacific Coast, wanted me to specialize in instruments and equipment such as pH meters, analytical balances, and so on. Oh yes, I would also have to demonstrate and sell microscopes. Prior to joining that dealer I had never even looked through a microscope! My "training" in microscope usage had to be self-directed (to put it kindly). The dealer's showroom included some models from



The KF

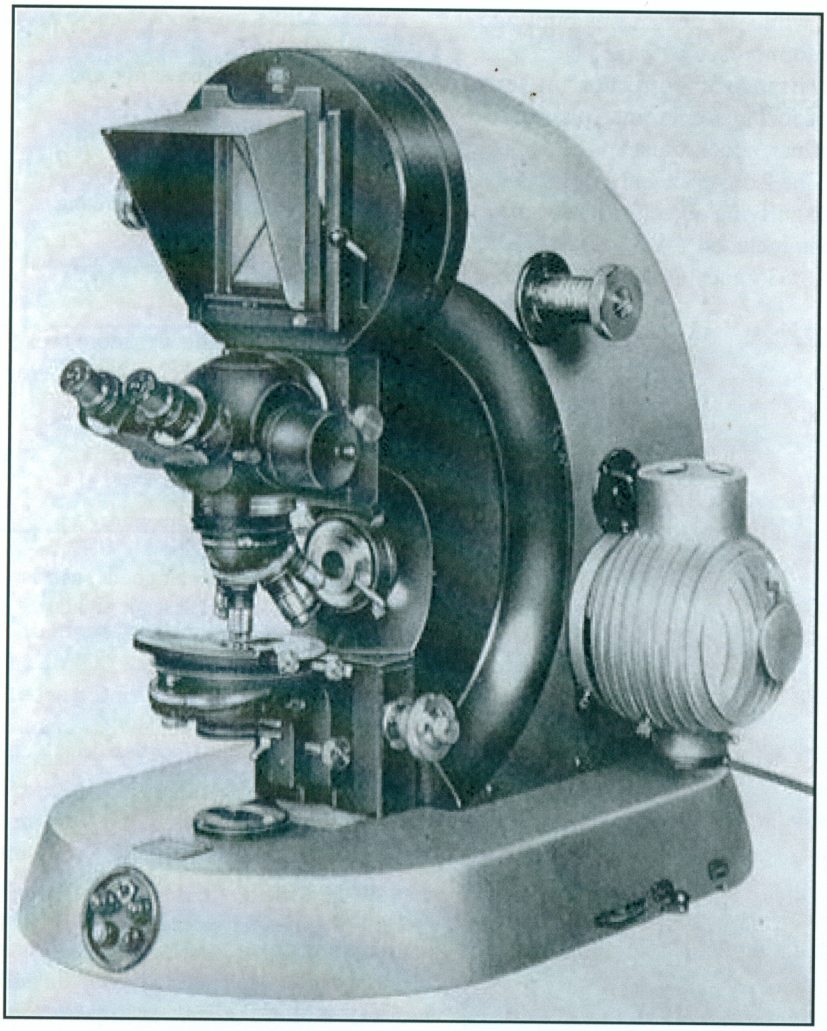


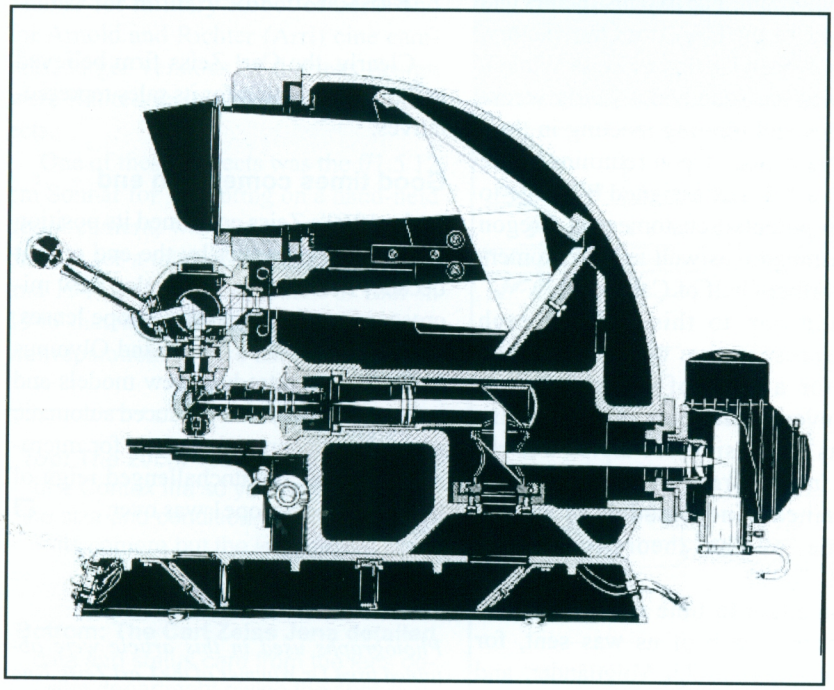
The GFL



The Standard WL

The Photomicroscope I





The Ultraphot II (above) and a diagram of the light paths through it.

American Optical, Carl Zeiss, Carl Zeiss Jena, Cooke Troughton & Simms, Leitz, Reichert, and Unitron. So I had the showroom and some instruction manuals and a few prepared microscope slides. If that degree of self-direction were not enough, the management was more interested in dollar sales volume than individual manufacturers, so no one of their franchised lines were promoted over any other. However, given the quality, the newly designed objective lenses, and of course the anti-reflection coatings on the lenses, it was no surprise that I definitely began to favor specifying Zeiss rather than the other brands available to the dealer.

Zeiss's competition

The competition included American Optical's "Cycloptic" model stereo microscopes. Wild also supplied stereo microscopes as well as their M20 compound microscope. Some of the Zeiss alternatives have been described in the pages of *Zeiss Historica* by Charles Gellis, who wrote on the "Early Postwar Development of Zeiss Microscopes" in the Spring 1997 issue (page 3). He described microscope models and optics produced by Zeiss Winkel and Zeiss Opton. And I wrote in the Spring 2007 issue (page 2) on the "Opton" stereo and Jena "Citoplast" (also known as the SMXX) stereo microscopes.

At the time, 1957, American Optical had a sales office in Southern California. Carl Zeiss was represented in the entire Western US by Martin Silge, who was based in San Francisco in a one-room, one-desk office. The Leitz representative worked out of his home in the San Francisco Bay area and was responsible for much of the Western United States. There were no representatives from Unitron, Reichert, Carl Zeiss Jena or Cooke, Troughton & Simms at all except in the East Coast of the US.

Leitz and Reichert

The competion for Carl Zeiss in the highest quality realm was Leitz. They had introduced new models after 1945, but they all had separate coarse and fine focusing controls and some models had these controls positioned inconveniently high with

respect to the table height. The star of their line was the Ortholux, which had been introduced as far back as 1937. In 1957, Leitz had a mixture of 37 mm and 45 mm adjustment length objective lenses. (Adjustment length is the distance from the shoulder of the objective to the specimen plane). A special extension tube with a correction lens (called PLEZY) could be ordered so that "37 mm" objectives could be mounted on the nosepiece along with a "45" mm objective with a degree of compatibility. Clearly this was a transitional state of affairs. The Ortholux stand was highly favored by researchers despite its separate focusing controls, which were conveniently located not too far above the table surface, and the fine focus had a one-micron sensitivity. In fact, the dealer sold three Ortholux stands equipped with Carl Zeiss Planachromat objectives to a large oil company.

The Reichert Zetopan was the main competitor to the Leitz Ortholux. The Zeiss Photomicroscope I was far more expensive than the Leitz or Reichert large stands, and it was not until after 1960 or so that the Carl Zeiss Universal microscope (basically a Photomicroscope without the built-camera) was produced to provide effective competition at a similar price level. Ernst Keller has told me that the Photomicroscope was so popular that despite its price, delivery time was one year or more.

Zeiss models

The Zeiss range of models in both size and sophistication started with the KF model. It was followed by the GFL, WL, Photomicroscope I, and Ultraphot II (all illustrated on these pages).

Many components were designed in common. All models from KF through Ultraphot II used the same binocular tube and whatever objective lenses the user selected. Condensers fitted on a centerable mount (called the "Z") in most of the models except for the KF. That model used a sleeve-mount system for the condenser. The KF could be supplied with several different bright-field condensers as well as a phase contrast condenser.

The "Optovar" magnification changer could be supplied separately for the GFL and WL, while the device was built into the Photomicroscope and Ultraphot stands. The range of "correction" in Zeiss objectives included achromat, planachromat, neofluar, apochromat and planapochromat. The 2.5 × planachromat was the lowest magnifying objective. Other magnifications included 4×, 6.3×, 10×, 16×, 25×, 40×, 63× and 100 ×.

Training: New York and Oberkochen

In late 1959 H. Ernst Keller was assigned to the Los Angeles area. In the first year or so he had an office but no showroom or applications lab for training or demonstrations. Recently, he told me that one of his initial tasks was to bring peace among the three dealers and the large laboratory supply house. The competition was at times quite bitter, resulting in competitive bidding wherein the "winner" received an order but with little or no profit.

In mid 1960 I was interviewed by Mr Keller and in a trip I made to the Bay Area I was interviewed by Martin Silge (his home was in Oakland, California). Shortly thereafter, I was hired by Carl Zeiss, Inc. (New York).

In stark contrast to my "self-training" for the 1957–1960 job, I was trained for two weeks in the Carl Zeiss, Inc. New York Showroom. The two instructors had both come to the USA from the factory, which had been labeled as Zeiss Winkel. Carl Zeiss Inc. also had a yearly week-long sales and training meeting in their New York office. Upon returning to the West Coast, I was assigned by Silge to travel to potential customers in Oregon and Washington as well as to customers in the northern half of California.

In addition to this training each sales representative was sent to Germany for a total of seven or more weeks every four years. All this training was expensive for Zeiss but resulted in their representatives being well trained in new models as well as in some of the theoretical background.

In addition to time spent mostly in Oberkochen, each of us was sent, for some days, to Hensoldt, Voigtländer, and Zeiss Ikon. In 1963, the training was set up as follows:

* 2 weeks, MESS (spectrophotometers, and so on.)
* 1 week, FE/INFO (measuring and surface-finish instruments)
* 2 weeks, MIKRO (transmitted and reflected-light microscopes).
* 1 week, MED (slit lamps, operating microscopes)
* 1 week, ELO (electron microscope and particle size analyzer)

1n 1968, my schedule was more broad and may have been determined by my previous experience:

* 1 day, FE Guest Laboratory (Metrology)
* 2 days, INFO Guest Laboratory (interference microscopy)
* 1 day, FERN (consumer goods such as binoculars and rifle telescope sights)
* 3 days, Göttingen (microscopes)
* 2 days, Hensoldt (binoculars, light section microscope)
* 3 days, ELO Guest laboratory
* 1 day, OPTO Aaien (Eyeglass lens production)
* 1 day, PLAN (planetarium)
* 1 week, MED (Slit lamps, operating microscopes)
* 1 week, MIKRO (transmitted and reflected-light microscopes)
* 1 week, MESS (reflectance instruments, refractometers, etc.)
* 1 day, ZEISS IKON (Contarex zoom lenses, etc.)

Clearly, the Carl Zeiss firm believed in thorough training for its sales representatives.

Good times come to an end

In the 1960's Zeiss continued its position as a leader. However by the end of that decade, Leitz began to develop new microscope models and microscope lenses. By the early 1970's Nikon and Olympus had begun to introduce new models and new optics. They also produced automatic exposure attachment cameras for microscopes. Thus, the unchallenged reign of the Photomicroscope1 was over. ❐

* * *

Photographs used in this article were obtained from Dr Wimmer of the Carl Zeiss Jena archives, from Fritz Schultze of Canada, and from the Ultraphot II manual.

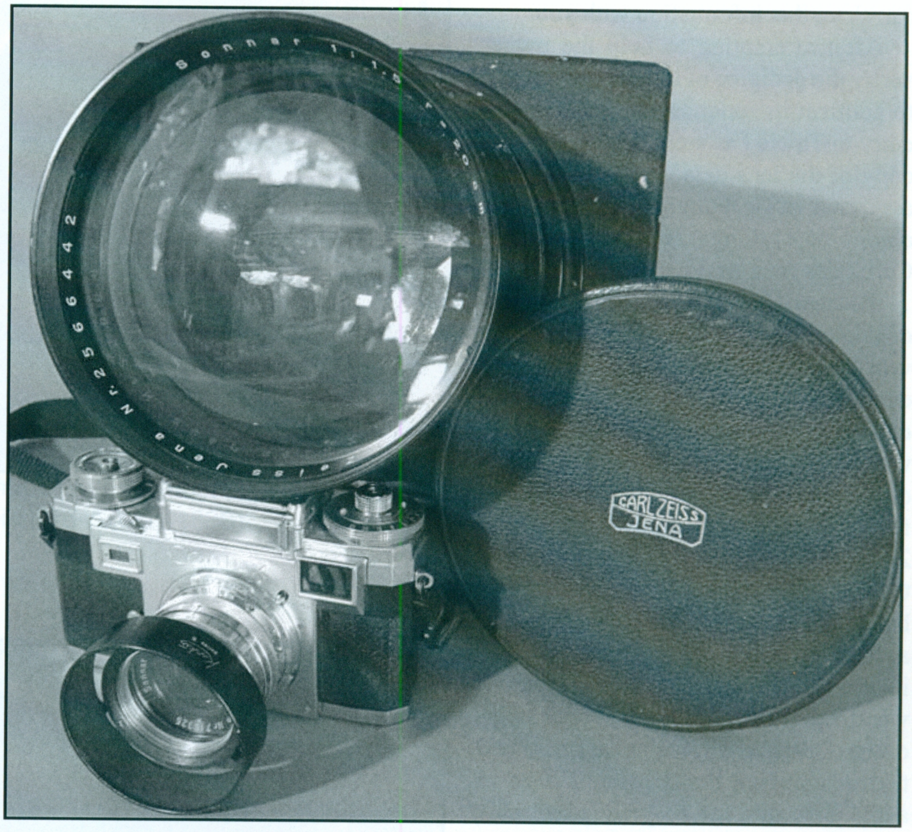
The f/1.5 20 cm Sonnar

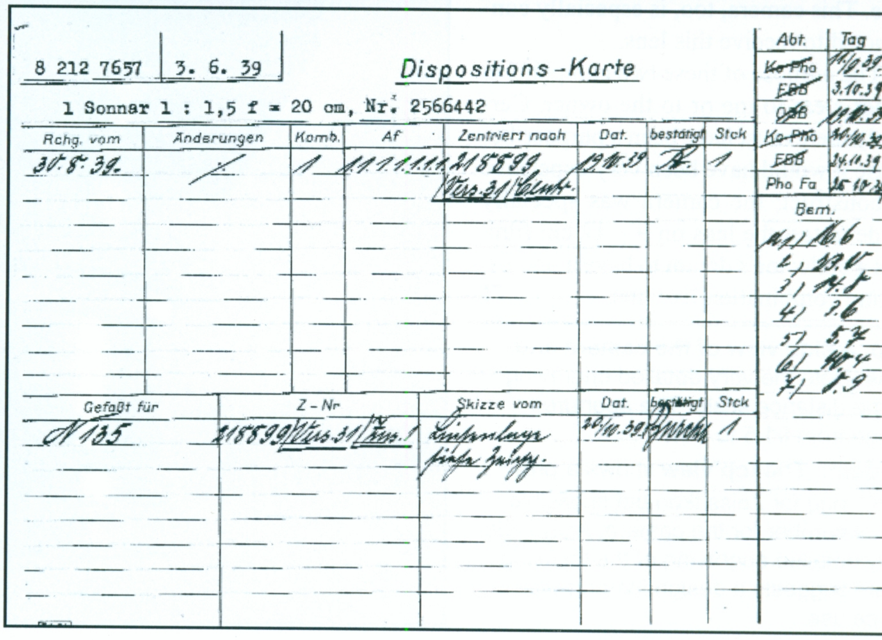
Larry Gubas, Las Vegas, Nevada

Details of a one-of-a-kind very large lens and the camera specially made to test it.

The incredible optical performance of the f/1.5 5 cm Sonnar, constructed by Ludwig Bertele in 1932 for the Contax camera, is well recorded. We know that the patent for the lens was held by Zeiss Ikon, not Carl Zeiss Jena, and that the lens was not available to any manufacturer other than Zeiss Ikon until the German military began to seek that lens's performance for other cameras during the war. However, except for a limited number of Leica screw-mount lenses and a short telephoto version of the f/4 7.5 cm Sonnar for military Robot cameras and for Arnold and Richter (Arri) cine cameras, larger versions of the lens design were limited to some very special projects.

One of these projects was the f/1.5 12 cm Sonnar for mounting on a hand-held aerial camera, which was made in four batches for a total of 307 copies in 1943 and 1944 and a special batch of four in 1946 that went to Russia as part of the war reparations. These data are based on





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Dispositions-Karte

1 Sonnar 1 : 1,5 f = 20 cm, Nr. 2566442

Rchg. vom	Änderungen	Komb.	Af	Zentriert nach	Dat.	bestätigt	Stck
30.8.39.	./.	1	1.1.1.1.1.1.	218599 Vers. 31/Cent.	19.10.39	[illegible]	1

Abt.	Tag
Ko-Pho	11/10.39
EBB	3.10.39
OBB	11.10.39
Ko-Pho	14/10.39
EBB	24.10.39
Pho Fa	25.10.39

Bem.

Gefaßt für	Z-Nr	Skizze vom	Dat.	bestätigt	Stck
N 135	218599 Vers. 31/Cent.	[illegible]	20/10.39	[illegible]	1

Top: The 20cm Tessar perched on top of a Contax IIIa so you can appreciate the size and condition. It is mounted on its camera but the lens almost completely obscures the camera.

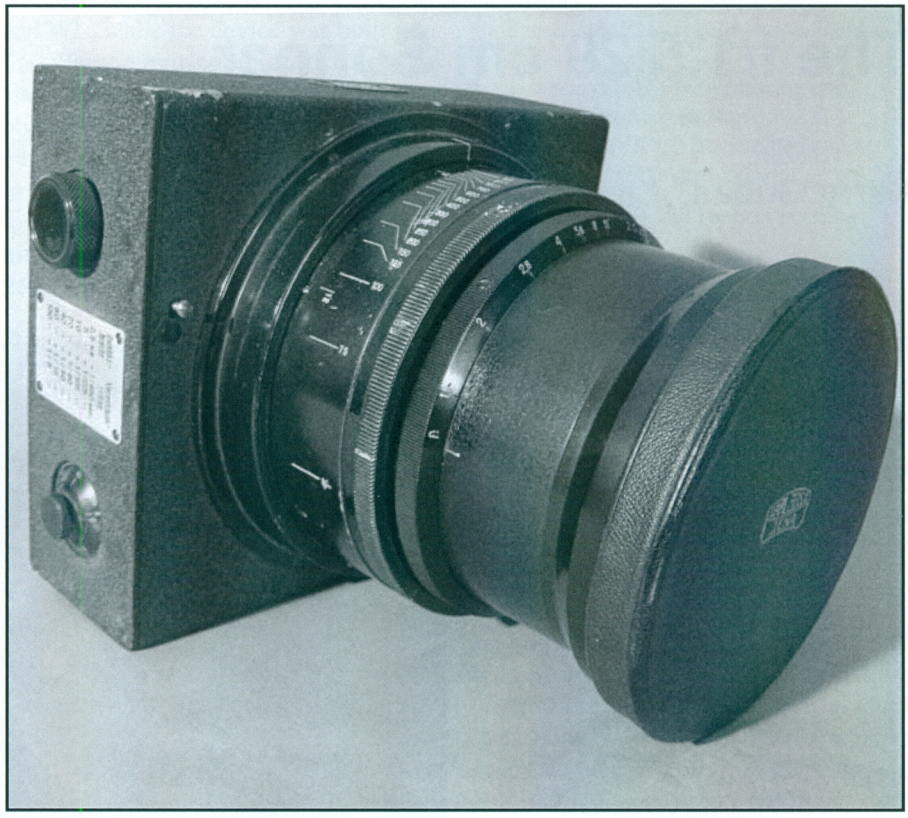
Bottom: The Carl Zeiss Jena detailed data and status card from the lens design department giving the specifications and dates for this unique lens.

the research performed by Hartmut Thiele on the Zeiss data cards found in the Optical Museum records in Jena. However, there was one more such lens listed in those data cards that fits the specifications of the 20 cm lens discussed here. Fortunately, I have been allowed to see the images of this lens, which sits in a private collection, and I am amazed at the size and quality of this lens. Now I can share the information with you.

After attempting to help the owner verify the pedigree of his lens, I was able to confirm its uniqueness with a single entry in Thiele l as well as by securing a copy of the lens data cards through the assistance of Dr Wolfgang Wimmer who, among other things, is in charge of the Carl Zeiss Jena Archive.

The records indicate that this is a one-of-a-kind example of this very large and very fast lens. The design calculation is dated 30 August 1939, but the actual date of manufacture was 7 May1940. The lens was found with a special camera typical of much earlier designs for a 9 × 12 cm format focal-plane shuttered camera from Zeiss Ikon and predecessor firms such as the Nettel. It does appear, however, to have been especially made for this lens, as we see from its size and materials. The internal body of the camera is made from wood, but it is totally covered with an industrial metal shell with a darkened and textured surface that I presume was to avoid flare into the very wide lens surface. This camera, too, is especially constructed to receive this lens.

The purpose of these two components is not clear to me or to the owner. Certainly there must have been a purpose because it would have been very expensive to construct; the camera was specially made to test the lens on 9 × 12 cm film. It is a collector's dream to have a one-of-a-kind combination like this. ❐



Top: A side view of the camera and lens. Note the very detailed engraving of the distance scale. The apertures range from f/1.5 to f/11.

Bottom: The top view shows a pre-1937 logo for Zeiss Ikon but no visible serial number for the camera. Again, the very detailed engraving of the focusing scale suggests a design for long-distance use.

ON THE BACK COVER:

Six of René Ahrlé's poster designs for Zeiss Ikon

René Ahrlé's life and work
are discussed in detail in Bernd Otto's article on page 15

1. "Capture all the beauty with Zeiss Ikon cameras" (June 1936)
2. "All the colors of the rainbow are reproduced precisely on Zeiss Ikon film" (July 1936)
3. "Take photographs indoors with a fast camera from Zeiss Ikon" (October 1936)
4. "Master exposures by these three – Zeiss Ikon camera, Zeiss lens, and Zeiss Ikon film" (June 1937)
5. "Take a Zeiss Ikon camera on winter sports" (January 1938)
6. "Capture the summer with a camera and film from Zeiss Ikon" (May 1838)


Alles Schöne festhalten
mit Cameras von
ZEISS
IKON

◀ 1

3 ▶


Heimaufnahmen
mit einer lichtstarken
Camera von
ZEISS
IKON

2
▼


Alle Regenbogenfarben
tonwertrichtig
auf Film von
ZEISS
IKON


Meisteraufnahmen durch diese drei:
Zeiss Ikon Camera,
Zeiss Objektiv,
Zeiss Ikon Film!
ZEISS
IKON

◀ 4

6 ▶

5
▼


Auch zum
Wintersport
eine Camera von
ZEISS
IKON


Den Sommer einfangen
mit einer Camera
und mit Film von
ZEISS
IKON