ZEISS HISTORICA

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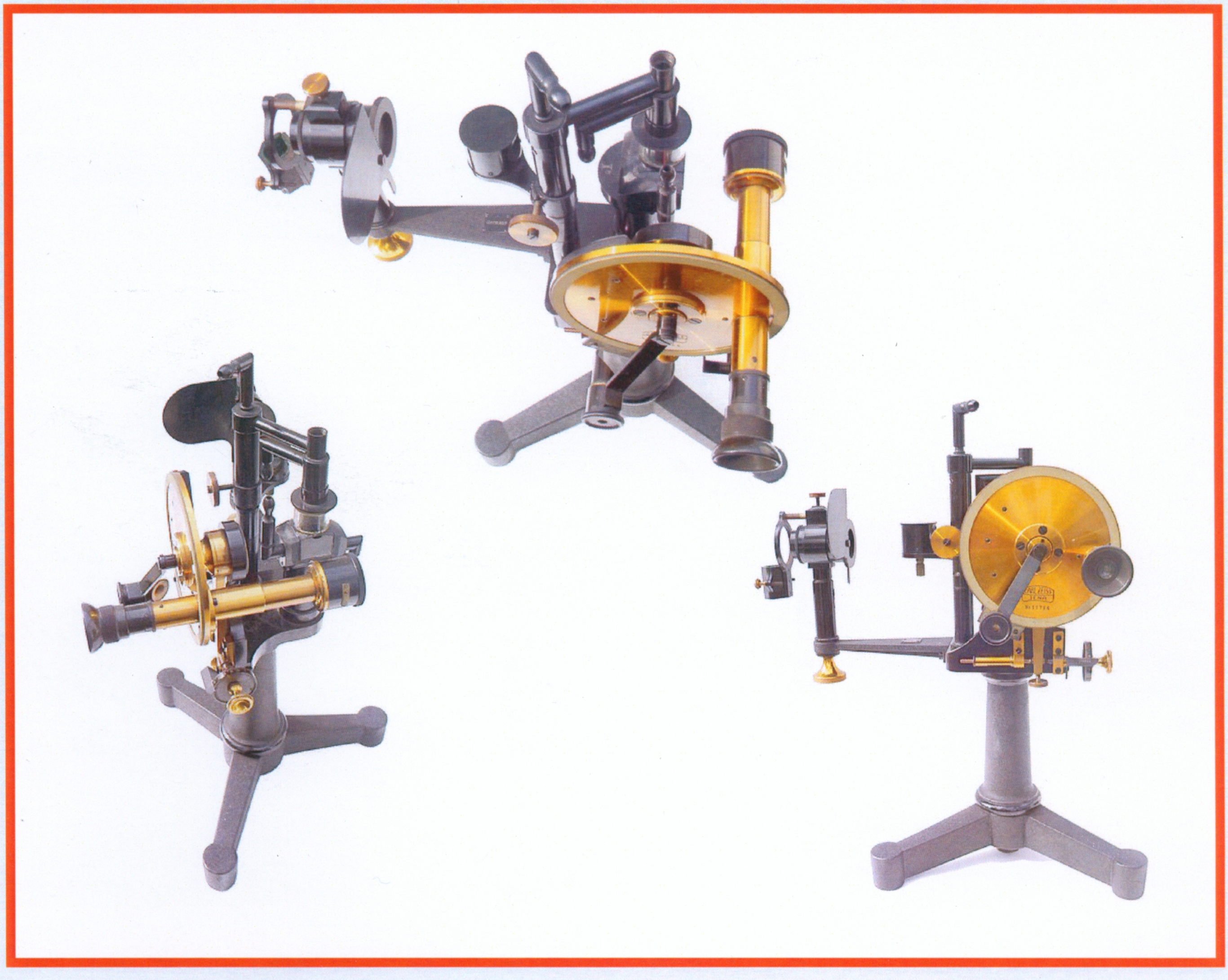

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The Zeiss Historica Society of America is an educational, non-profit organization dedicated to the exchange of information on the history of the Carl Zeiss optical company and its affiliates, people and products from 1846 to the present.

Officers

Material for the journal can be sent to the Editor at 4507 Mountain Path Drive, Austin TX 78759 USA. E-mail: editor@zeisshistorica.org. Annual membership dues: $40 (USA), $50 elsewhere. Credit-card payment option (Mastercard, Visa) is available. Dues include subscription to *Zeiss Historica*, airmail postage overseas. Send general enquiries to PO Box 556, Mount Kisco, NY 10549, USA **Website:** www.zeisshistorica.org

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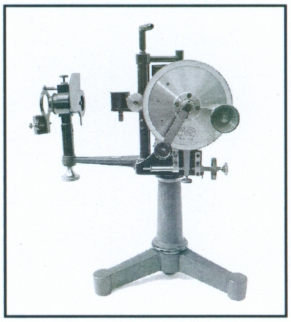
Front cover: Three views (only one shown on right) of a Carl Zeiss "Pulfrich" refractometer from about 1920. This is one of the products of the Optical Measuring Instruments division discussed by Fritz Schulze in his article on page 11. (Images from www.antique-microscopes.com, used with permission)



Back cover: An array of Contax lenscaps selected by Charles Barringer to illustrate typical designs, both pre-war and post-war. A key to the individual caps appears on the inside back cover.

President's Letter

My apologies for the delay in this mailing. I have spent a good bit of my time thus far in 2009 in and out of the hospital with multiple surgeries which has, of course, hindered the accomplishment of any tasks that I had taken on in behalf of the membership. Still further bad news is the fact that our immediate Past President, Charles Barringer, has also developed a serious cancer that is necessitating a strong regimen of chemotherapy. Please consider that he needs some room to undergo and tolerate his situation, and so give him time to recover before we all attempt to contact him. He has set up a webpage wherein he regularly posts his status, and if you wish to leave a message this is where you should go. It is:

http://www.caringbridge.org/visit/charliebarringer

The site is informative and easy to navigate. However, if you paste this address, you might have to press "Control" and click on it simultaneously.

Between these two situations, the list of available active contributors to our writings and research has shrunken considerably. I have not been able to write anything of consequence in more than six months. Just keeping up with the requests to the website is all I can now manage. It is important to acknowledge that Charlie has always been a fount of inspiration and research.

I was able to work with Dr Michael Buckland to duplicate the long-promised DVD of the promotional movies that Emanuel Goldberg produced with his remarkable Kinamo camera, and we have provided it with a two-page synopsis of the four films and how they came to be and were used by the firms of Ica and Zeiss Ikon to promote this product. It is included in this mailing and the use should be relatively self explanatory. It works both on my computer and my DVD/Television but I find the computer easier to manage and quicker to respond. It is also a format used in North America and so it will operate on almost all computers but not all formats of DVD players.

However, I am not able to tackle a longer work such as the promised essay on the various Zeiss companies and products that I promised last issue. I will do my best to tackle that in a month or two, after my recent stay in the hospital reversed my progress of the last six months. In this time of shortage of material, I would ask you to submit ideas or completed texts to our editor to add to the range of materials for our Journal.

On a completely different front, I alert you to a new Zeiss product with the name of "Carl Zeiss Cinemizer." It is a futuristic product that you use with either a Nokia or Apple I-Pod or I-Phone to view 2 or 3 D movies with a slim eyewear footprint, a self-contained battery and an audio feed. It is well worth doing a Google search to see the state of the art of a new kind of optical gear from the research of our favorite company. Another alternative is this extra long website from the Zeiss webpages at zeiss.de which is in German and English:

http://www.zeiss.com/c1257576004518a2/Contents-Frame/e9eff8fab4be9857c125759e002bc076

There are also some interesting new books on Zeiss history that are showing up on German eBay including a history of the Russian seizures of Zeiss and other firms as war reparations. Unfortunately, I am not in position to try and digest any of these at the present time but I would enjoy a commentary from any of our German-speaking members.

Thank you for understanding the delays in contacting me. I will do my best between hospital stays to keep current.

The Herar

Lawrence J. Gubas, Las Vegas, Nevada

Not listed in any catalog, and very infrequently sighted, this pre-war wide-angle lens gives up a few of its secrets.

For a number of years, I have been puzzled by the existence of a lens for the prewar Contax camera that never appeared in any catalog. It was called the Carl Zeiss Jena Herar. The lens data stated that it was an f/3.5 3.5 cm wide-angle lens, and, by observation, it has appeared in both a Contax and a M39 Leica screw lens mount. In the 1990s, this lens would occasionally appear in the catalogs of the large photographic auctions in Germany and an examination of the books by Hans Jürgen Kuc reveals that the lens was known in only three examples at the time of the book's printing in 1992. No additional information was added in his English edition of 2003.

A Herar, one of a series made for the Contax in 1939. This one is coated, but there are too few examples to say that they all were.

I have been fortunate in finding some fragmentary information in quite varied locations, and a summary of these sightings will resolve some of the questions about the lens.

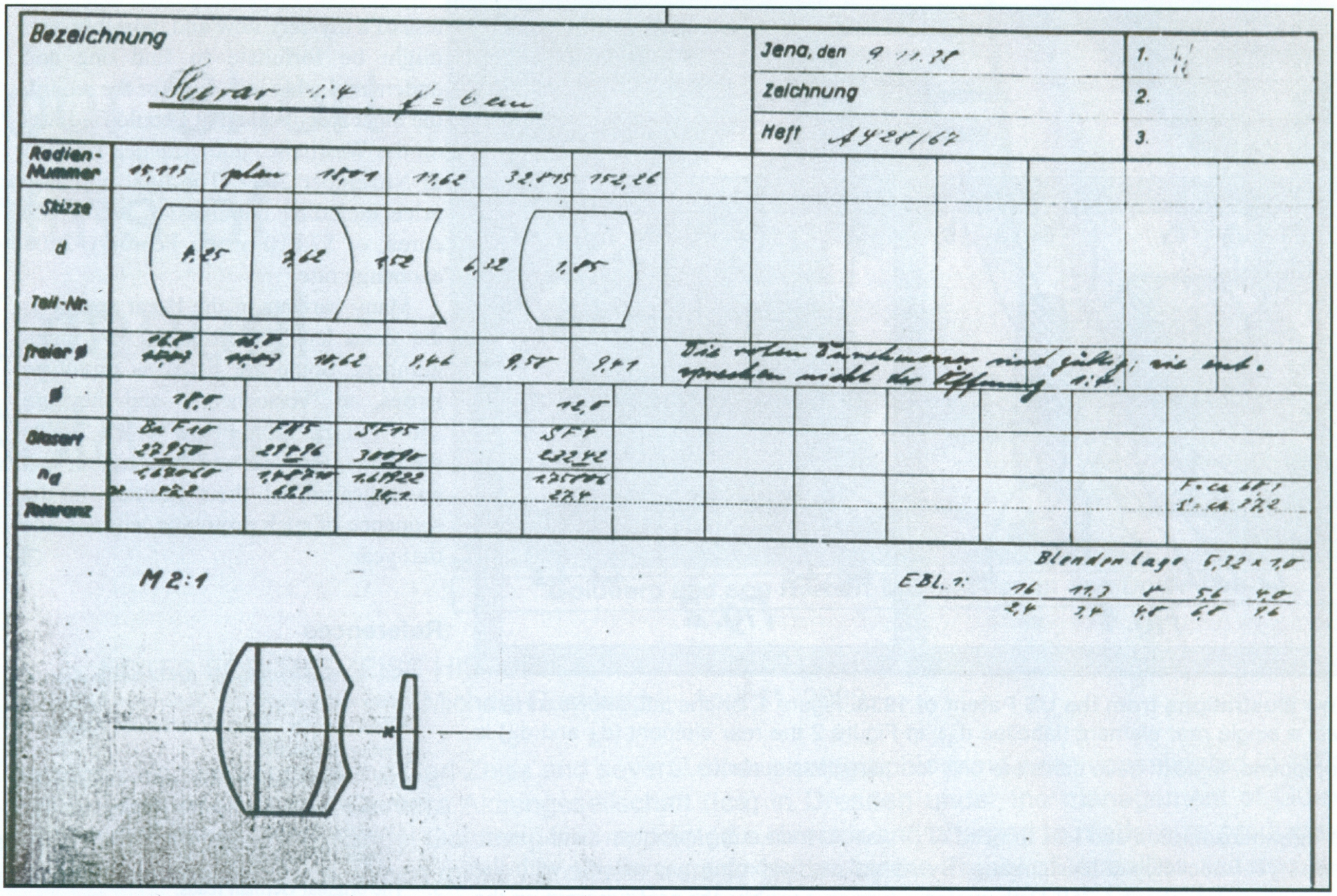
The Kaprelian list

Ed Kaprelian's list of the lenses that were included in the "Zeiss Lens Collection" taken to the US as war reparations by the military in 1945 shows a number of Herar lenses. None of them were mentioned in the first edition of the *Fabrikationsbuch Photooptik–Carl Zeiss Jena* by Hartmut Thiele, so I copied the list and forwarded it to him, and he added them to the second edition of the book.

In Kaprelian's other records, there is also an article from an unidentified German technical magazine of 1939 about this Herar lens and, while it is a nearly illegible photocopy, I was able to discern that the lens was the creation of a Zeiss optical designer named Sylvester Huber. There was a drawing of the lens elements and a German patent number of 652882. I was unable to find a copy of this patent but a search of the US patents uncovered one for Huber numbered 2,124,301, with a drawing that matches the magazine's drawing.

Wandersleb's book

I had no other information about Huber in any other document until a fortunate find on an antiquarian-book Internet site brought me a copy of a 1952 book.[1] The author, Ernst Wandersleb, led the Zeiss photographic lens department for nearly 30 years before World War II, and he made several references to Huber and



A Herar lens card, found in materials from Ed Kaprelian's estate. This one shows an f/4 6 cm example being considered for the Robot cameras. It is dated 9 November 1938, and the lens seems to have been made as a prototype.

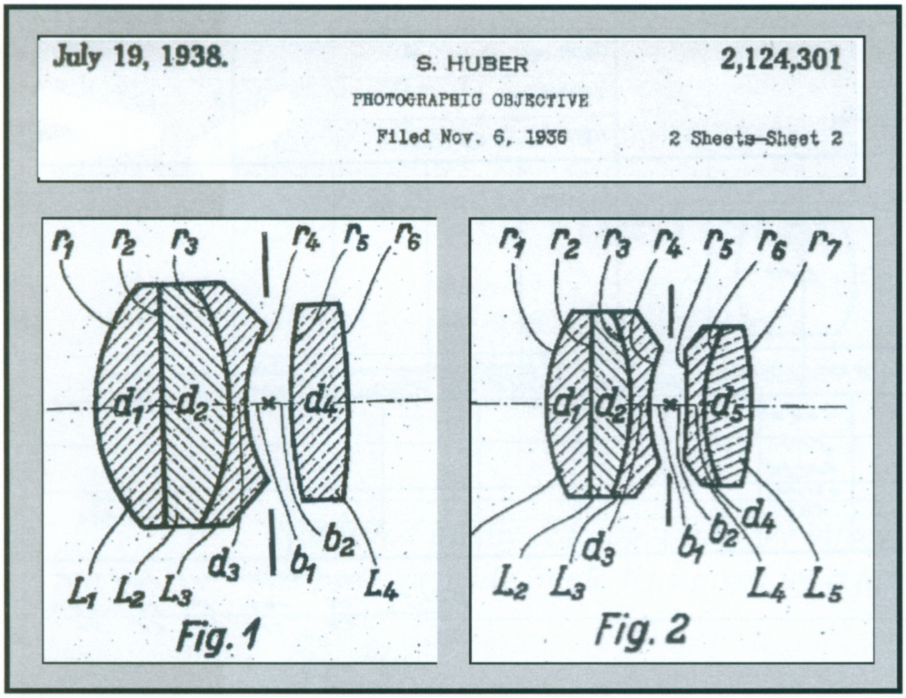
his work in this book. The language is technical German and certainly beyond my translating abilities, but a visit by Rolf Fricke gave me new information from his quick review of the book, which turned out to be basically a treatise on spherical abberation. Wandersleb disagrees with some postulates of Huber, who had worked under him at Zeiss, but he clearly mentions that Huber had been called into military service and was killed in 1941. I was quite shocked because I would have expected it to be unusual for an optical designer to be drafted into the military while so much military design work was being conducted at Zeiss.

While visiting the Zeiss Archives in Jena, I found a copy of a "Business Report for the Photo Department 1940/41." The report states that the Herar was one of the lenses discontinued beginning in 1941. However, there is also the mention of another lens being prepared for the Contax: a Tessar f/3.5 3.5 cm. I have not seen any other mention of such a lens in any other context.

In the 1955 edition of *Das Photographische Objektiv*[2] there are two sentences mentioning Huber and the Herar.[3] My translation is: "Huber at Zeiss succeeded in replacing the air-space between front and middle elements with a fluorite crown glass, so that the objective has only four air–glass surfaces. This lens has become known under the name Herar."

The 1,000-lens production run

I reviewed all the usual books on lens design and all the Contax-related books from 1938 to 1955 and found not a single mention of this lens anywhere. While this is also true of other prototype lenses, one surprising fact about the Herar emerged: There was an actual production of 1,000 lenses in a single batch with consecutive serial numbers between 2,641,001 and 2,642,000. I found no design card in the Zeiss archive but Thiele has a reference to the design as being accomplished on 11 July 1938 with a production date of 1 August 1939. This is somewhat later than the date of the US Patent file, 6 November 1936. It seems that this entire run of lenses went into storage during the war and the whole batch was taken to Russia as part of the removal of all of the war reparations in September 1946. The lenses were originally in the Contax mount, but some were converted (either before the removal or in Russia) into Leica (Russian Fed) mount. It is clear that this lens, with its five elements in two groups, was less expensive to make than the 3.5 cm Biogon or Orthometar, both of which had six elements in four groups. It was submitted for patenting in 1936, about the time that the Biogon came to market. The low number of four air–glass surfaces made it more efficient



Two illustrations from the US Patent of 1938. Figure 1, on the left, shows a Herar with a single rear element (labelled d_4); in Figure 2 the rear element (d_4 and d_5) is compound. In each case there are only four air–glass surfaces.

in light transmission and less in need of the as-yet-undeveloped lens coating. By my own count, about 1,750 Orthometar lenses were made between 1937 and 1945 and 7,996 Biogons in batches of several hundred and so in the same period. A thousand Herars in a single batch in mid-1939 seems excessive. Perhaps it was a marketing problem with more markets becoming unavailable with the war or, possibly, the profit margin on the Biogon was not to be tampered with. Perhaps there was a shortage of fluorite, but as 1,000 lenses were already made that does not seem a major impediment. In any case, I hope that this lens is a bit less of a mystery now and, possibly, you might be fortunate to find one and understand what it is. Just for the record, the most recent sale that I could find was on the Westlicht Photographica Auction in November 2007. The total purchase price including commission was 1,920 euros, or $2,810 at the February 2008 exchange rate.

Many variants of the Herar appear in the Zeiss lens collection in very small numbers. Some are listed as prototype lenses, or "Versuchen," and they are shown in the Table below with a "V" in the name, the year of manufacture, and an indication of their position in the sequence of such prototype lenses made that year. ❐

References

1. *Die Lichtverteilung in der Axialen Kaustik eines mit Sphaerischer Abberation behafteten Objektivs.* Dr. Ernst Wandersleb, Akadamie Verlag Berlin 1952.

2. *Die Wissenschaftliche und Angewandte Photographie, Band I: Das Photographische Objektiv.* Johannes Fluegge, Springer Verlag, Vienna 1955, page 179.

3. The original German reads:

"Ferner gelang es Huber bei Zeiss, den Luftraum zwischen Frontglied und Mittelsglied durch ein Forkron zu eretzen, so dass Objektiv nur vier Fläschen gegen Luft behielt. Es ist unter dem Namen 'Herar' bekanntgeworden."

Recorded Herar lenses

Aperture	Focal Length	Text	Number of Examples	Serial No.	Mount
2	5 cm	V 1938 Nr. 1	1	2,267,989	?
2.8	3.9 cm	Herar	1	2,473,282	?
2.8	8 cm	Herar	1	2,404,300	?
2.8	8 cm	V 1938 Nr. 10	1	2,473,282	?
3.5	3.5 cm	V 1938 Nr. 18	1	2,427,460	?
3.5	3.5 cm	Herar	1,000	2,641,001-2,642,000	Contax
3.5	7.5 cm	V 1936 Nr. 17	1	1,674,882	?
4	3.5 cm	Herar	2	2,473,241-2	?
4	6 cm	Herar	2	2,540,345-6	Robot
4	6 cm	Herar	1	2,566,427	Robot
4	8.5 cm	Herar	1	2,588,389	?
4.5	13.5 cm	V 1938 Nr. 20	1	2,428,900	?
2	1.25 cm	Kino Herar	1	2,613,596	Cine

The Kinamo movie camera

Michael Buckland, Berkeley, California

Emanuel Goldberg developed a camera at Ica in the 1920s that enabled amateurs to make their own movies, and then he enlisted his own family to show them how to do it.

In 1909 the Carl Zeiss Stiftung consolidated its camera and photographic accessories operations into a subsidiary named Internationale Camera Aktiengesellschaft (Ica) in Dresden, Saxony—then the center of the German photographic products industry. In 1917 Zeiss appointed Professor Emanuel Goldberg, head of the photographic department at the Royal Academy for Graphic Arts and Bookcraft in Leipzig, as a Director of Ica to assist Guido Mengel, Ica's tough, self-taught manager.

Goldberg, a Russian scientist who became a naturalized German, had attracted Zeiss's attention through his contributions to aerial photography and ingenious lens-testing equipment. Goldberg had two assignments: to modernize procedures and to develop new military products. Modernization was achieved and was reflected in a stream of patents and registered designs (*Gebrauchsmuster*), but the development of new military products was halted by the severe restrictions on military activities imposed in the Treaty of Versailles.

Goldberg believed that there was a large potential market in equipment for amateur and semi-professional film-making. Ica, which was already making some movie equipment such as film projectors, was reorganized into two divisions, one of which continued the business of still cameras and general photographic accessories such as enlargers. But the other new division was solely involved, under Goldberg's direction, with movie equipment.

Emanuel Goldberg and his son Herbert taking shelter in an alpine shed. This is a frame enlargement from an untitled film made with a Kinamo camera.

The Kinamo camera

A product with which amateurs could successfully make home movies would have to be very easy to use, reliable, and yet inexpensive to manufacture. These constraints led to very severe design requirements. Movies were ordinarily made at that time with hand-cranked machines, requiring a tripod, which, in Goldberg's view, was a severe drawback to film-making. Disposing of the tripod meant dispensing with the crank, leaving two options: An electric motor, which in the early 1920s would also have been a constraint on filming, especially outdoors; or a spring-driven, clockwork motor, which was a difficult engineering

The Kinamo 35 mm cine camera in its original form with a hand crank rather than the later motor drive.This advertisement dates from 1924.

challenge. Ernst Wandersleb, head of the Photo Department at Carl Zeiss, Jena, later recalled a skiing vacation he had taken with Goldberg and others:

> "While we other comrades enjoyed the evening in the cosy hut on the Schwarzwasser Alp, having fun, eating, drinking, smoking, and singing, happy to be far from our jobs, Goldberg unpacked from a backpack an entire arsenal of small tools and worked for hours on the first Kinamo model, which he had brought, a new movie camera that he was developing then in Dresden."

The name Kinamo drew on Goldberg's school-day studies of Greek and Latin: *Kine* (Greek: Motion) + *amo* (Latin: I love) = I love movies! Ica liked to use derivative words such as Kinamofilm, Kinamomann, and a verb *kinamographieren* (to make a film using a Kinamo).

The first Kinamo was brought to market in 1921. It was known as the "N25" because the primary version (product code 5401) used film cassettes containing up to 25 meters of "Normal" (that is, standard 35 mm) film. A variant model (5402) limited to 15 meters of film was also sold.

A spring-driven motor was in experimental use in 1923 and marketed in 1924 for the 5401 model. It was a removable attachment that clamped to the side of the camera, doubling the width. The motor attachment was sold in two versions, with or without a delayed-action release (5401/6; 5401/4 respectively). The delayed-action release allowed the film-maker to act in the film. The scene would be posed and a scrap of paper or a leaf would be inserted in a small clamp on the front of the camera. The film-maker could start the timer and then join the scene. The clamp would release the scrap as a visual signal that the camera was about to start and acting should begin. The delayed-action release was important; with the easy-to-use Kinamo amateurs could make films by themselves, and with the delayed-action release they could even make films of themselves. Hence the promotional tag *Kinamo-Selbstaufnahme.*

The Kinamo had several user-friendly features. The light-tight film cassettes were easily changed even in sunlight. A button allowed the film to be marked at the end of a scene. Above all, the Kinamo was amazingly small, like a modern camcorder. The N25, although a motorized 35 mm camera, was only 15 cm high, 14 cm deep and 10 cm wide (6 × 5.5 × 4 inches). The N25 had a slow speed for slow-moving objects and for trick photography. It could also be used as a still camera.

In 1925 a slightly more elaborate version, the Universal Kinamo (5439) was introduced with two additional film speeds and able to accept an attachment that allowed it to copy existing films in a dark room. (If I have understood this mechanism correctly, a battery-powered light shone in through the lens mount to make a contact print of an existing film on to fresh film stock.) The N25 continued to be sold for about 10% less than the Universal Kinamo.

Amateur film-makers began to adopt 16 mm safety film, which was less expensive than 35 mm. Zeiss Ikon, formed in 1926 from the merging of Ica with other firms, responded with the Kinamo S10 (5490) which used 10 meter cassettes of 16 mm "Schmalfilm" in 1929, followed by an improved model, the KS10 (5490/5).

Zeiss Ikon introduced the Movikon 8 mm and 16 mm movie cameras starting around 1933, and they appear to have completely replaced production of Kinamos by 1938.

Accessories and applications

As well as a tripod and a panoramic tripod head specially for the Kinamo, Ica marketed more specialized accessories.

The Goldberg Mikrophot microscope attachment allowed the filming of tiny objects through a microscope. In the barrel of a microscope a partially silvered mirror is set at a 45° angle, reflecting 99% of light from the object sideways into the lens of the attached Kinamo. The other 1% of the light passes through the mirror into the eyepiece as usual, just enough for the camera operator to use it as a viewfinder and to ensure that the object is in focus.

Zeiss Ikon had an interest in business applications, reflected, for example, in their marketing of bank-check copying equipment. Custom-built systems installed by Zeiss for telephone companies substantially reduced errors and costs in the preparation of subscribers' monthly phone bills. The telephone exchange equipment counted each subscriber's calls on dials resembling automobile odometers. Once a month a clerk would read aloud each subscriber's count and another clerk would write the number down. Subtraction of that subscriber's previous month's count was the basis for the bill. The Zeiss Ikon solution used a Kinamo on a moving frame as a still camera to photograph about a hundred numbers per frame on 35 mm film. A special microfilm reader coupled with a calculator allowed a billing clerk to key the present and previous counts for each subscriber, then pulling a lever would calculate the monthly bill and advance the two films to the next subscriber's numbers. A dramatic improvement in accuracy and efficiency was reported.

Goldberg's use of the Kinamo

Goldberg himself experimented with the Kinamo and produced a number of short films with himself and his family and friends as the actors. In order to encourage sales of the Kinamo these were converted into promotional shorts by adding the Kinamo brand name on intertitles repeatedly stating that this was a Kinamo film, "Filmed handheld with the Zeiss Ikon Kinamo," and *Kinamo-Selbstaufnahme.*

Any film shown to the public had first to be registered with the German film censor and four such films were recorded:

Im Sonneck [In the sunny corner], registered December 5, 1924. 74 m long. Scenes from a day in the life of a child aged about two (Goldberg's daughter Renate Eva, now Mrs Chava Gichon) looked after by her older brother (Herbert Goldberg).

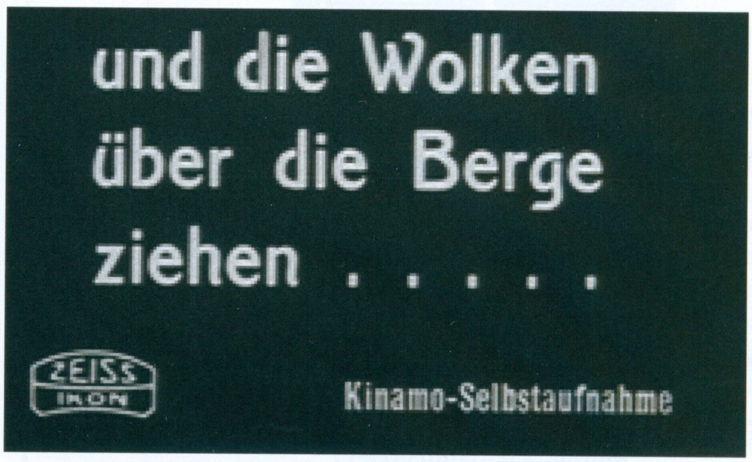
Ferientage am Matterhorn [Holidays at the Matterhorn]. December 5, 1924. 143 m. No copy has been located.

Zeltleben in den Dolomiten [Tenting in the Dolomites]. 9 min 29 sec. November 12, 1925. 130 m. A man and a boy (Goldberg and his son Herbert) and an unidentified youth pitch a tent in a lush alpine valley, and later climb up above the treeline, where they pitch the tent again as night falls.

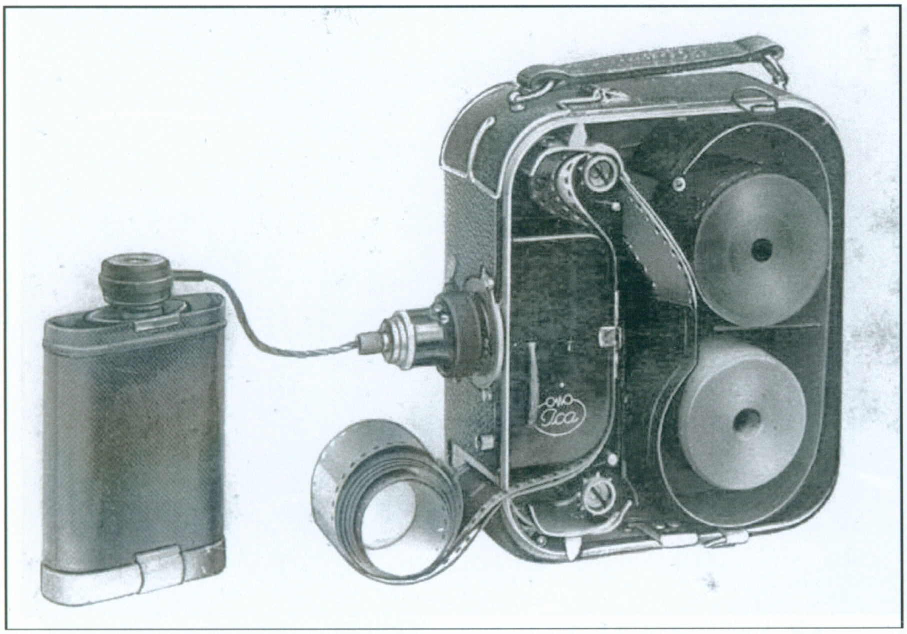
Emanuel and Herbert Goldberg relaxing after pitching their tent, as seen in the film *Zeltleben in den Dolomiten (*Camping in the Dolomites).

Die verzauberten Schuhe: Eine heitere Kinamo-Tragödie [The magic shoes: An amusing Kinamo tragedy]. 12 min 55 sec. September 3, 1927. 230 m. A father (Goldberg) takes his family on a vacation in the Alps and loses his temper, causing his wife and daughter to cry. He storms off into the mountains. The son and a friend follow his tracks through the snow, find him sleeping, and decide to teach him a lesson. They attach a long cord to his shoes and hide at a distance, holding the other end of the cord. When the father awakes and reaches for his shoes, the boys use the cord to pull the shoes out of reach. The father has to keep chasing shoes and returns contrite and apologetic to the happily reunited family. Dramatic changes in the weather parallel the plot.

An untitled fragment, nearly eight minutes long and in the same style, also survives in which a father (Goldberg) takes his son (Herbert) on a Christmas ski



"... and the clouds gather over the mountains." An intertitle from the Dolomite film (1925) includes the Zeiss Ikon logo, and was therefore added later. It also includes the promotional message ("Film yourself with a Kinamo") drawing attention to the delayed-action device that enabled the operator to appear in the scene.



A film-copying device for the Kinamo. The battery-operated light on the left shines through the lens mount to make a contact print from an existing film onto fresh film stock inside the camera.

The Universal Kinamo with spring motor drive. The text continues: "The smallest movie camera allows, among other things, handheld filming without a tripod and filming yourself using a built-in automatic shutter release!", and a pricelist is offered free of charge.

vacation in Sils Marika (Engadin, Switzerland). They take refuge overnight in a farm shed and, returning, find that a parcel of candies awaits them at the post office.

Copies of the first, third and fourth survived in a 16 mm copy of lost 35 mm origins in which the intertitles in the first and third have been updated in or after 1926 to show the Zeiss Ikon logo. A DVD has been created from a digital copy of these three and of the untitled fragment and copies are being made for distribution to Zeiss Historica Society members.

Goldberg was able to act in his own films by setting the Kinamo on a tripod, arranging the scene, setting the delayed-action release, and then taking his place in the scene. Acting started when the delayed-action mechanism released the signal and started the camera.

The marketing message implied in the promotional shorts was that anyone could make films like these of themselves and their own family if they bought a Kinamo. The implication was misleading. In fact these films are far from amateurish, they show very skillful composition, crisp editing, and quite sophisticated use of backlighting, shadows and entrances.

In spring 1927 Goldberg went on a skiing trip in Viggartal (near Innsbruck, Austria) with a group of students from the Technical University in Dresden where he was an adjunct professor in the Institute for Scientific Photography and taught courses on photography and cinematography. Together they made a skiing adventure film involving a romance and an accident: *Ein Sprung... Ein Traum. Eine Kinamogeschichte aus dem Studentenleben.* (A jump ... A dream. A Kinamo story of student life), 405 m. Film censor record dated June 23, 1927. An old nitrate copy was located in the German federal Film Archive in 2008 and new copies are being made.

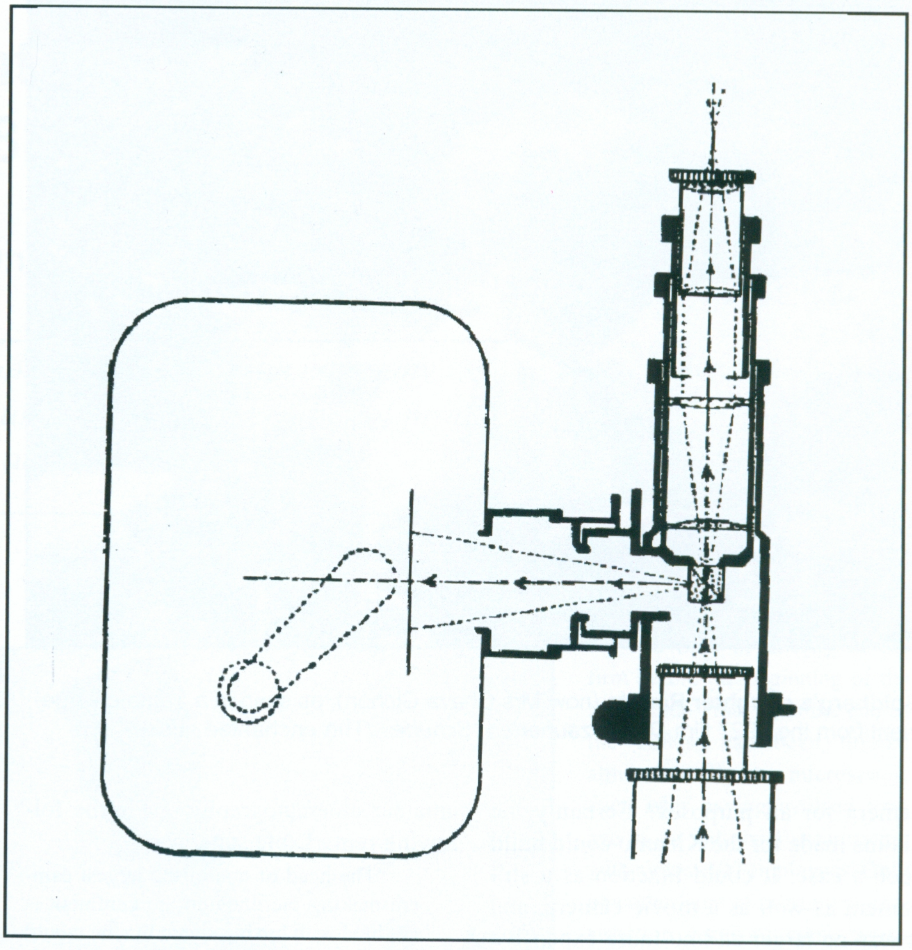
Who else used the Kinamo?

The best documented Kinamo user was Joris Ivens, the famous Dutch pioneer of avant-garde and documentary movies, who wrote about Goldberg and the Kinamo in his autobiography.

The son of a photographic products dealer, Ivens had been sent to Germany to learn about the photographic industry and, in Dresden, worked on the Kinamo assembly line and was befriended by Goldberg. After he returned to the Netherlands, Ivens was inspired by his experiments using a hand-held Kinamo.. He later wrote: "I was, naturally, freed from the rigidity of a tripod, and I had given movement to what, normally, would have had to be a succession of fixed shots. Without knowing it, filming flexibly and without stopping, I had achieved a continuity. That day I realized that the camera was an eye and I said to myself, 'If it is a gaze, it ought to be a living one'." He then used the Kinamo to make a short, fast-paced documentary The Bridge, a symphony of the movements on and around a railway bridge in Rotterdam, and several other films with Kinamos.

Unfortunately, film historians have been heavily preoccupied with æsthetics and personalities and it is generally difficult to know who used what camera for any given film.

The evidence is scarce, but it appears to be the case that the Kinamo was widely used among avant-garde, adventure, and documentary film makers in Europe in the late 1920s and early 1930s including Sepp Allgeier, Wilfried Basse, Ella Bergmann-Michel, Boris Kaufman, Henri Storck, Dziga Vertov, and, later, Jacques Cousteau.



The Mikrophot microscope attachment for the Kinamo. The diagram shows that light from the object to be examined is split by a semisilvered mirror in the microscope barrel, with most going into the Kinamo but enough continuing up into the microscope eyepiece for positioning and focusing.

In 1921 Ica, in collaboration with Contessa-Nettel (Stuttgart) and Mimosa (a film manufacturer in Dresden) began to publish *Photo-Technik*, an attractive and instructive magazine for amateur photographers. It was distributed free through 1925. In 1926 the Ernemann and Goerz companies joined as co-publishers and, effective 1927, Zeiss Ikon, in which all but Mimosa had merged, became the sole publisher. *Photo-Technik* is of interest because it served as a showcase for Ica and Zeiss Ikon products and innovation and it reflects Ica's, and later Zeiss Ikon's, corporate views. There are several articles relating to the Kinamo and some of the illustrations can be recognized as frame enlargements from Goldberg's films. (In 1925 Ica started a separate magazine for cinematography and projection, *Der Bildwerfer,* which was published until 1928).

The Kinamo: an all-purpose camera

The first issue of *Photo-Technik* announced the new Ica Kinamo and also contained an article on what seems to have been a popular topic: the need for a camera that was really versatile, an all-purpose camera. In the German text the adjective "universal" is used. Not surprisingly, given the publishers, the author argues for the Contessa Nettel when used with Mimosa film. The topic of a "universal" camera recurs again in later issues.

The improved 35 mm Kinamo introduced in 1925 was named the Universal Kinamo. Did the name reflect a positioning of the Kinamo to be the dominant

Goldberg's daughter Renate (now Mrs Chava Gichon), as seen in a frame enlargement from the 1927 film *Die verzauberten Schuhe...(*The enchanted shoes*).*

camera for all purposes? Certainly the claims made for the Kinamo could build such a case. It could function as a still camera as well as a movie camera, and it was no larger and no more expensive than a good-quality still camera. Furthermore, a movie camera could outperform a still camera in two ways. First, the human eye, being attracted by movement, would tolerate flaws in image quality in a moving image that would be offensive in a still. Second, if a still image was needed, a short burst of filming provided a series of images from which the best one could chosen, avoiding the common experience of a single still-camera shot being ruined by a blink or mistimed movement. The short focal length of the lens minimized the danger of the subject being out of focus and, it was claimed, the quality of the equipment and the lenses allowed satisfactory enlargements to be made to print sizes commonly used in ordinary still photography. An article in *Photo-Technik* by Kurt Dienstbach argued that it was easier to use a movie camera than a still camera.

Some months later George Brown, the editor of the *British Journal Photographic Almanac,* in an essay on amateur cinematography, made the following remarkable statement:

> "The head of one of the largest camera-making facilities on the continent is credited with having stated that he would be surprised if in 1930 his workpeople were employed in making any amateur cameras but those taking motion pictures."

No source is given, but the signs point to Goldberg: In British writing "on the continent" means continental Europe, excluding the British Isles; Zeiss Ikon was the largest camera firm in Europe and aggressively promoting the Kinamo; the claim is compatible with articles in *Photo-Technik*; it is the kind of startling statement he liked to make; and it hard to imagine who else could or would have made such a statement.

Of course, we now know that it did not happen. Instead, still and amateur film formats diverged with the unexpected success of the Leica, introduced in 1924 with its double-frame 35 mm format, and the shift of amateur filming to 16 mm and smaller. In 1930 Goldberg and his staff were scrambling to make the Contax ready for market.

The small size, ease of use, spring motor, and robust construction made the Kinamo a camera of choice not only for making home movies but also for inconspicuous filming and extreme physical conditions, such as the alpine skiing sequences. It was used by some important film-makers and it has been credited by Kuball with making home movies popular among the wealthy, at least in Germany. The Kinamo did not become a "universal" camera, but it deserves more attention than it has received. ❒

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The Department for Optical Measuring Instruments, 1883–1983

Fritz Schulze, Vineland, Ontario, Canada

In an effort to broaden the production base of the company Ernst Abbe in 1893 laid the foundation for a new line of products for chemical and biochemical analysis.

To most of us in this Society the name "Zeiss" evokes images of cameras, binoculars, telescopes and microscopes. But there is more to Zeiss.

A 1977 Zeiss Newsletter issued by Carl Zeiss Oberkochen lists on the last page eleven specific product divisions: Optical microscopes, Ophthalmic and microsurgical instruments, Electron microscopes, Analytical instruments, Precision measuring instruments for metrology and quality control, Surveying instruments, Instruments for photogrammetry and photo-interpretation, Astronomical instruments and Planetarium projectors, Photographic lenses, Spectacle lenses, and Binoculars. Not mentioned are the departments for "special optics" (actually, defense production) and lithography optics for semiconductor manufacture (which came later). This expansion of the line of products is a consequence of Ernst Abbe's decision to widen the scope of the company's manufacture and to reduce its dependence on one product.

In his speech at the 50th anniversary of the Optical Workshop in Jena on 12 December 1896, Abbe said:

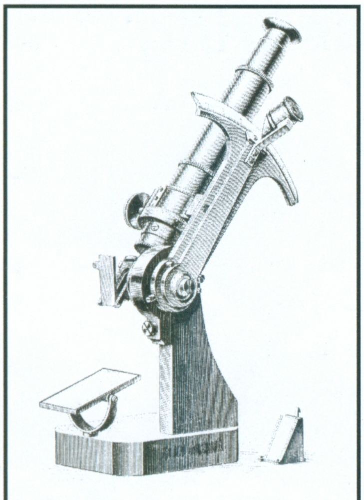
The Zeiss Butter Refractometer, developed by Pulfrich from Abbe's original refractometer. This example was made in 1939 and sold in the US the next year; the softwood base is not original, and the thermometer is missing.

"The field of activity of the firm before the beginning of the 5th decade, that is, at the end of the 1880s, had been limited almost totally to microscopy, even after having evolved long ago to an industrial organisation with almost 400 employees. Only one other area of instrument construction received some attention: the design of such instruments that were required for work on, and research for, the main activity."

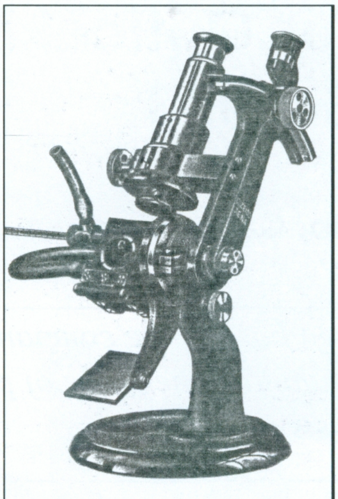
Abbe then goes on to explain that too much concentration on one product carries the inherent danger of instability, particularly at difficult times:

"But from another point of view, in my opinion even more important, a narrow focus on one area can carry a danger. A period of stagnation can begin, the motivating new ideas can dwindle and become depleted. Only a diversity of projects, based on different interests, can provide a font of ideas and motivation for an enterprise, so that even should an individual one temporarily stagnate, the whole will maintain its momentum.

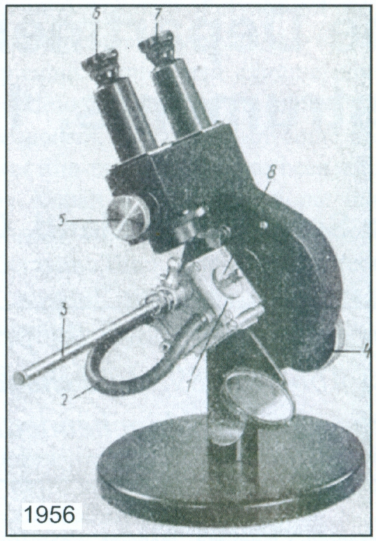
"Our entering new terrain will automatically cause us to compete with established manufacturers who have pioneered these areas. Our competition should, how-



1869



1930



1956

The Refractometer

When a ray of light meets the interface separating two transparent media of different refractive indexes there is one special angle of incidence (for a ray proceeding from the optically denser side) above which no transmission occurs; only reflection. This is the "angle of total internal reflection," and it depends only on the two refractive indexes. In the refractometer the direction of the light proceeds in the opposite direction, passing through a sample (liquid or solid) resting on the horizontal surface of a prism made of glass with a greater refractive index than that of the sample. If the incident ray is at or near the glancing angle along the interface the resulting angle of total internal reflection can be identified in an eyepiece and measured.

The two older instruments shown above are Abbe-type designs from Jena; the other is a VEB product, also from Jena.

ever, not try to wrest business away from them, rather to venture into new unexplored terrain."

One step in this direction was the

Carl Pulfrich (1858–1927)

publication in 1888 of a catalogue of *"Apparatus for Microphotography and Projection"* by Roderich Zeiss, but these products were still directly based on microscopy. Since 1886 Paul Rudolph assisted Abbe in the computation of apochromats and telescope objectives, paid out of his own purse. Abbe now suggested the development of photographic objectives, taking advantage of the new glass types from Schott's Glass Works. Rudolph's first products, the anastigmat Protar, the Unar, the Planar, and the world-famous Tessar were all developed between 1890 and 1902. This was the beginning of the Zeiss photographic department.

Over the years Abbe had designed a number of instruments necessary for measuring data required for manufacturing microscopes and their objectives, such as the thickness of glass plates and lenses, the curvature and focal length of optical components, the refractive index and dispersion of optical glass and immersion liquids, and so on.

These instruments formed the nucleus of the future "Mess-Department" and were initially intended only for in-house use. Their design and construction had involved considerable cost, and, Abbe reasoned, one might as well derive some commercial benefit from them. Carl Zeiss had objected for a long time to the sale of such instruments to third parties but Abbe succeeded in convincing him in the end as such instruments could also be widely used in physical and chemical research.

In his book *Das Zeisswerk und die Carl Zeiss Stiftung in Jena* (1904) Felix Auerbach speaks of six production departments:

Microscopy
Projection and Photography
Photography
Astronomy
Terrestrial Telescopes
Optical Measuring Instruments.

The latter department was subdivided into: Refractometers and Interferometers, Spectroscopes and Spectrographs, and Instruments for Length Measurements.

Two early constructions of Abbe, the vertical-thickness-measuring instrument and the comparator for length measurement (eventually the Vertical Metroscope and the Horizontal Metroscope) became the nucleus of the Feinmess-Department (Department for Industrial Precision Measuring Instruments) and shall not be considered here.

The specific instrument lines I will touch on are, in the sequence of their appearance,

Refractometers,
Spectrometers and Spectrographs,
Interferometers,
Colorimeters and Photometers
Flame Photometers,
Polarimeters.

Abbe had constructed his first refractometer towards the end of 1869, with an improved version in 1871. Carl Zeiss, who had already suffered several strokes and was not well, did not live to see the official start of the new department. He died on 3 December 1888, a few months short of his 72nd birthday.

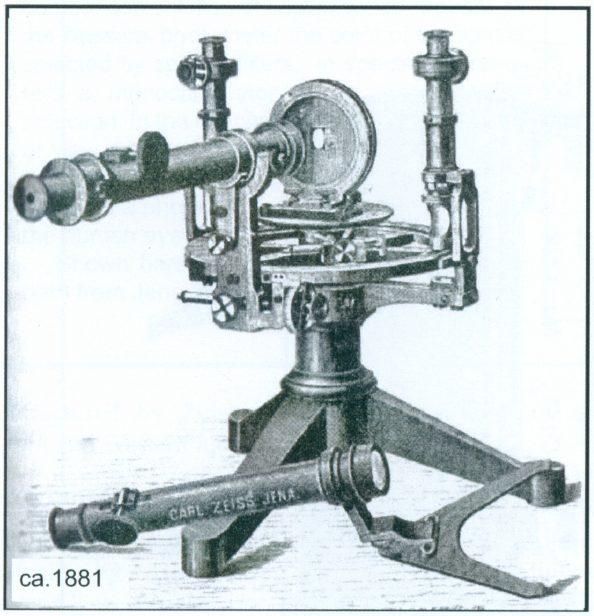
In 1893 Abbe appointed Carl Pulfrich head of the new Department for Optical Measuring Instruments.

Refractometers

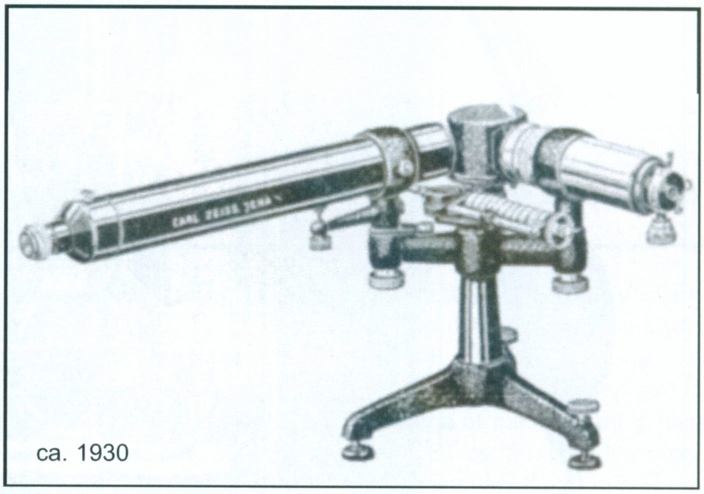
This energetic and vivacious academic was born on 1 September 1858 (he died in 1927) as the oldest son of a teacher, had studied physics, mathematics, and mineralogy and had attracted Abbe's attention by the construction of a refractometer for measuring crystals, glass, and liquids. Some existing instruments at the company were refined by Pulfrich, while others could be put directly into production as they were designed by Abbe. In 1895 Pulfrich added his Refractometer for Chemists, known since then simply as "the Pulfrich." From Abbe's refractometer he developed the Butter Refractometer, the Milkfat Refractometer and the Dipping (or immersion) Refractometer for the determination of the wort and alcohol content of beer. The former two were instrumental in reducing the all-too-common adulteration of milk and butter.

With his Dilatometer Pulfrich designed an instrument for measuring the expansion coefficient of glass, thus enabling the Schott Glass Works to develop heat-resistant glass types and precision thermometer glass. In 1899 Pulfrich concluded his work with analytical instruments and dedicated himself exclusively to stereoscopes and photogrammetric instruments.

Pulfrich's successor was Fritz Löwe



ca.1881



ca. 1930

Spectrometers

The refractive index of a substance such as glass is different for different wavelengths of light. The colors representing all the wavelengths present in white light are refracted at different angles as they pass through a glass prism. We say that the original white light is "dispersed" into a spectrum, with the red light bent least, the blue most. By means of a spectrometer the refractive index and dispersion of solids in the form of a prism can be measured.

Each chemical element, when heated in a flame or spark, emits light of characteristic colors or wavelengths, known as its spectrum. The spectrum can be photographed and by comparison with a spectrum of a known substance elements can be detected and identified. This method is of particular interest to chemists and metallurgists.

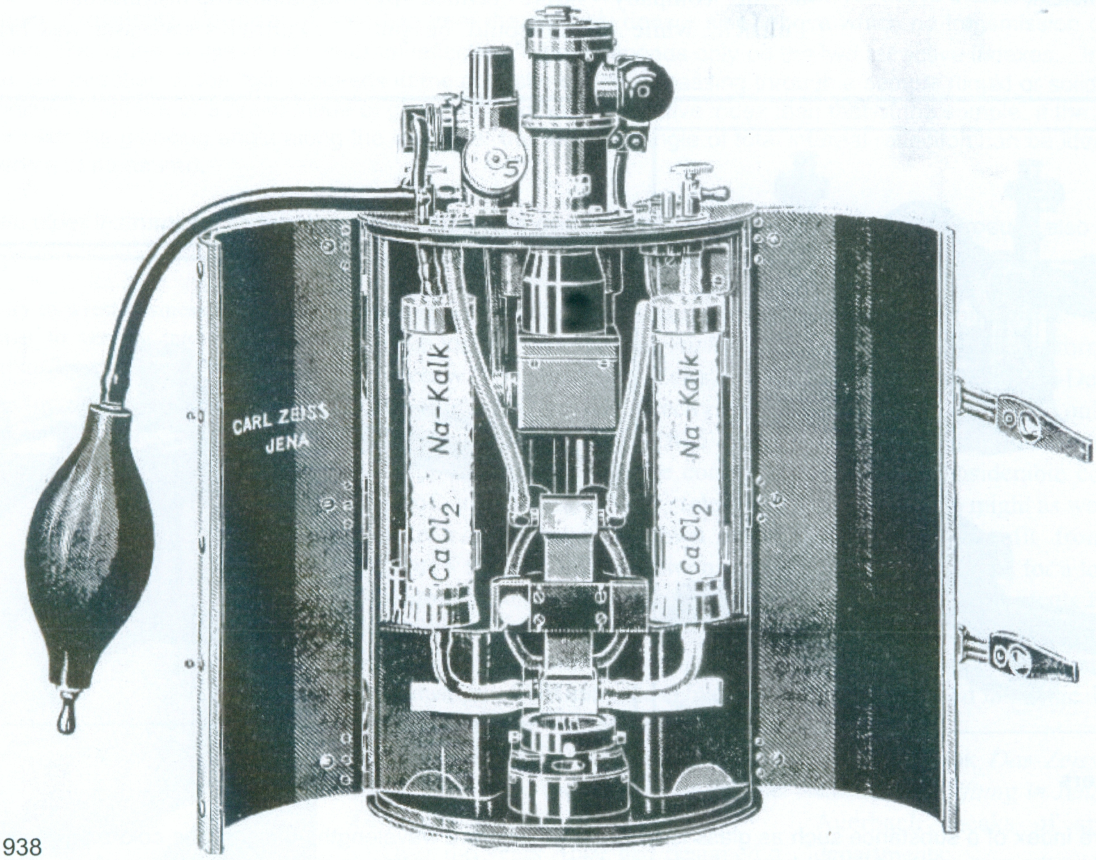
(born 1 September 1874, died 1955 in Jena) under whose guidance the department prospered. The industry quickly recognised the benefits of quality control and the new Zeiss instruments found wide application in the food and chemical factories, sugar refineries, the oil, fat and margarine industry, among wine and fruit growers. There is hardly any medical or veterinary clinic, hospital lab, or health department without Zeiss optical analytical measuring instruments.

In 1940, at the 50th anniversary of his department, Löwe said:

> "The German and North-American food chemists realized early the advantage of optically checking milk, butter, and cheese, the adulteration of which in general has disappeared since the refractometer can detect even 5% water added. The mixing of margarine into butter or cheese can easily be proved by the Butter Refractometer.
>
> "The sugar industry is equally depending on optical control, from checking sugar beets to following the juice through all stations of the refining process. The Hand Sugar Refractometer is most practical for the determination of the ripeness of fruit and grapes in situ, laboratory instruments provide further control and large Process Refractometers, built directly into the vats and evaporation vessels, help the staff of refineries, syrup and jam manufacturers to monitor the water content and to determine the process completion."

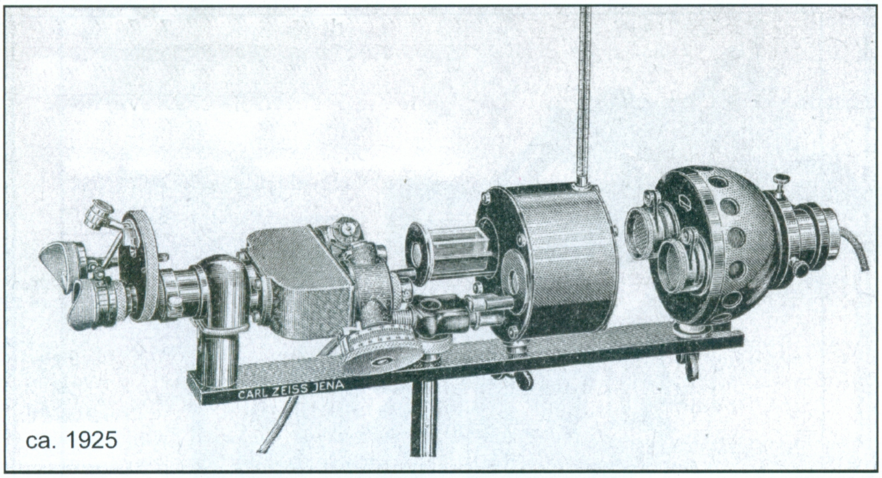
Fritz Löwe (1874–1955)

By 1986 a total of 22 different types of refractometers had been designed and



Interferometers

If two coherent monochromatic light waves, originating from the same source, are divided and brought together again they may "interfere," resulting in light and dark interference fringes. By guiding one ray through air, the other through a sample medium, these fringes may be shifted by an amount depending on the optical or mechanical properties of the sample. The example shown above was used to detect firedamp (methane and other explosive gases) in coal mines and empty storage tanks.

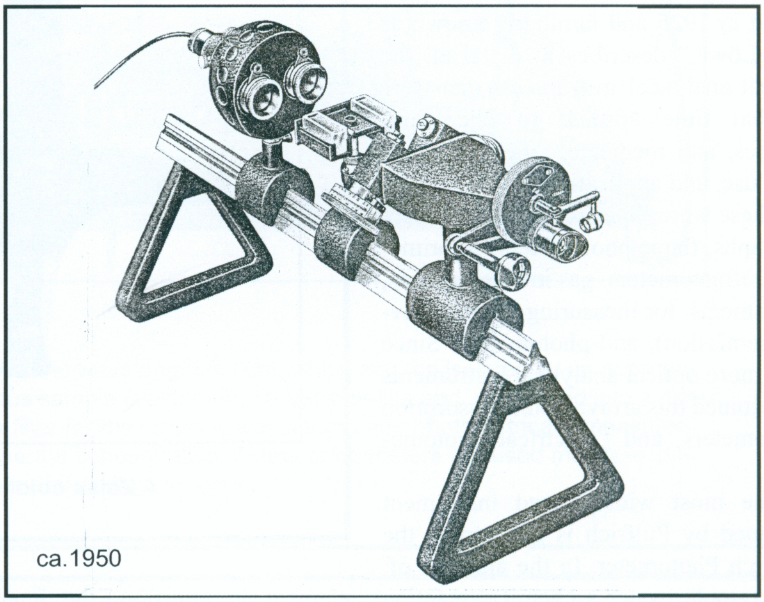


ca. 1925

Photometers

A photometer, originally also called colorimeter, in this context is an apparatus to measure the absorption of light in a solution in order to determine the concentration of a dissolved substance (the "solute"). The absorption is proportional to the concentration. The sample is filled into a glass cuvette of precise length as is a comparison solution of known concentration. In the classical photometer the color of the light is selected by special filters; in spectrophotometers a monochromator allows more precise selection. In the eyepiece two halves of the field of view are then adjusted to equal intensity by means of a measuring drum. In electrophotometers a photocell and galvanometer replace the human eye.

Shown here are two Pulfrich photometers, both from Jena but the later one from the VEB.


ca.1950

manufactured by Zeiss, in both the Eastern and Western locations.

Spectrometers and spectrographs

With the publication of "Chemical Analysis by Observation of the Spectrum" in *Annalen der Physik und Chemie*, in 1860 Gustav Kirchhoff and Robert Bunsen promoted spectrographic analysis as a new and accurate way to determine the components of metals. Their discovery was, however, not accepted in Germany by the chemists of the day until almost 50 years later, while in both England and France suitable spectrographic methods were being developed. It was to a large extent thanks to Löwe that spectrographic analysis of metals became an accepted method.

In 1880 Abbe designed his first spectroscope for the examination of glass samples. In due course larger instruments followed: they included an autocollimation spectroscope and a high-aperture spectrograph (1906), a Féry Spectrograph (1911), a glass/quartz spectrograph used also in astronomy (1913), and after the First World War a steel spectrograph for the analysis of scrap metal. Best known is the Q24 quartz spectrograph of 1933. Spectrographs and related instruments continued to be developed steadily in Jena.

It was at the instigation of Fritz Haber, future Nobel Prize winner, that Löwe explored the possibility of interferometry for the quantitative analysis of gases and liquids. Soon Gas Interferometers became indispensible in the production of medical and industrial gases as well as for the detection of explosive gases (firedamp) in coal mines or empty storage tanks.

Zeiss interferometers

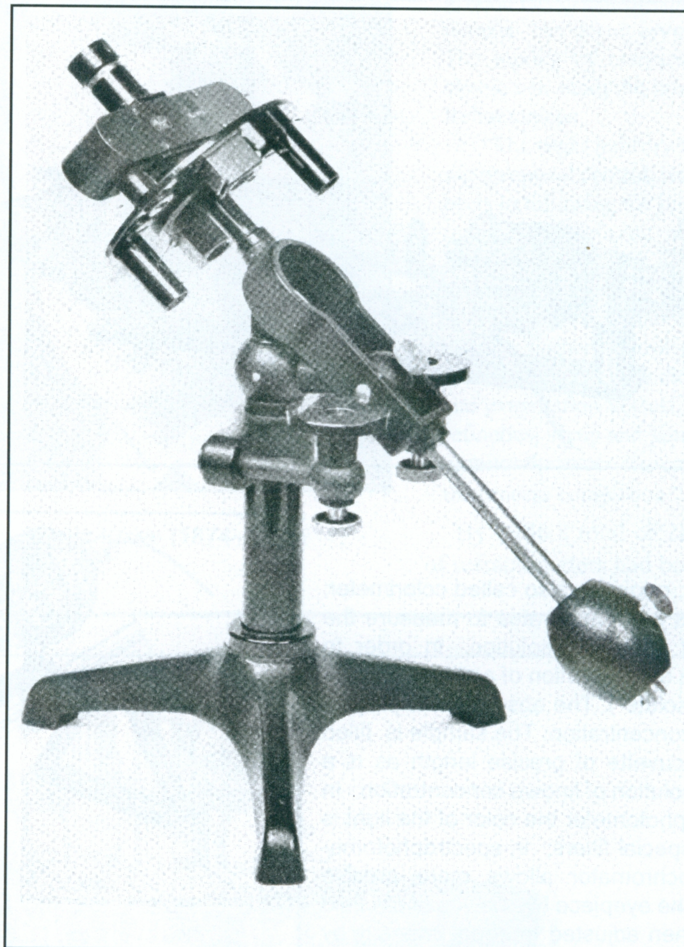
The first instrument of this line was the gas interference refractometer of 1907 followed shortly by the laboratory interferometer (1909), a portable interferometer (1910), and a firedamp interferometer (1913), all designed by Löwe. A large Mach–Zehnder interferometer appeared in 1938, with a modern version, suitable for wind tunnels, made by Zeiss Opton. The firedamp interferometer, for example, was still in production in Oberkochen in 1968.

At Carl Zeiss Oberkochen analytical interferometric instruments together with other interferometric instruments, such as the gauge block interferometer, the interference microscope, and Mach–Zehnder Interferometer were grouped together in the newly formed Info Department (Department for Interferometric Instruments).

Colorimeters and photometers

Löwe's book "Optical Measurements for Chemistry and Medicine," first published in 1925 and familiarly known as "the Löwe," describes in detail all the optical analytical instruments that were at that time applied to chemistry, physics, and medicine, their function, their use, and application tables..

These were: Spectroscopes and spectrographs, flame photometers, colorimeters, refractometers, gas interferometers, instruments for measuring the reflectivity (remission), and photometers. Since then more optical analytical instruments have joined this array: atomic absorption photometers, and electrical photometers.



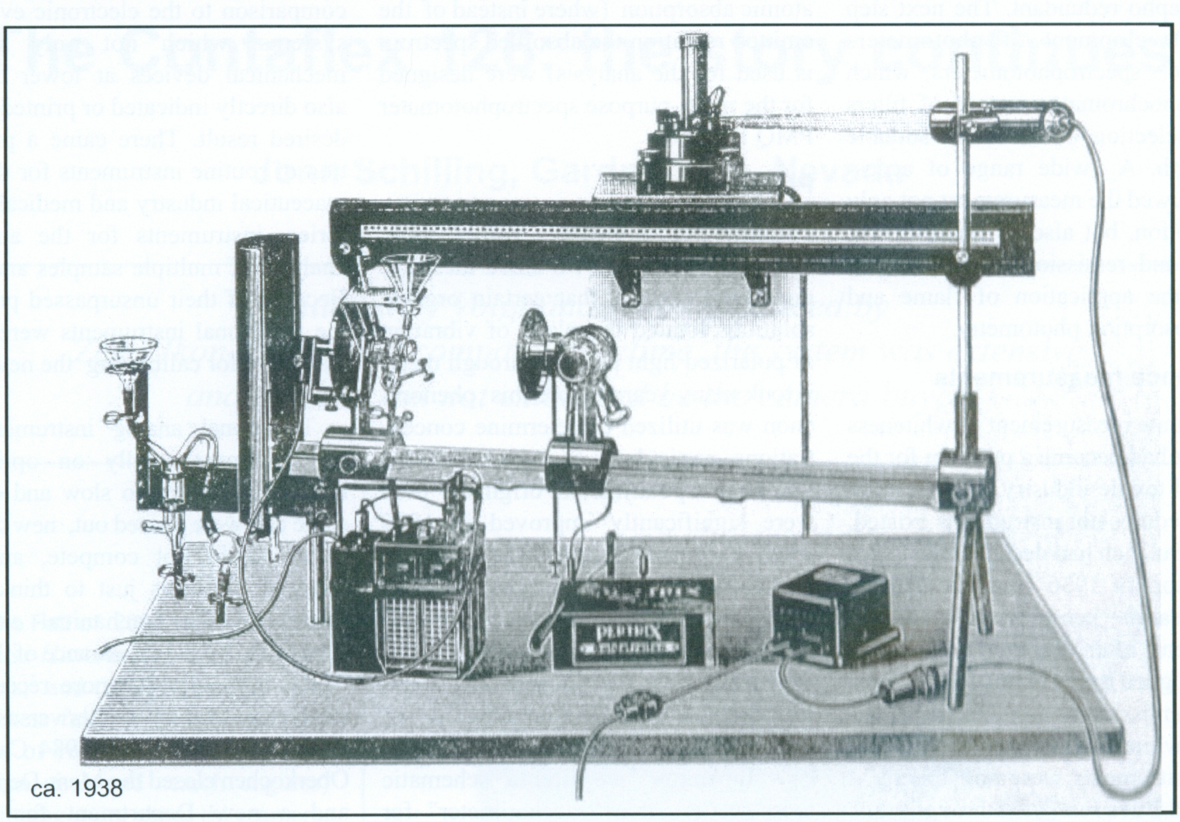
A Zeiss color comparator from about 1923.

The most widely used instrument designed by Pulfrich is his Pupho, the Pulfrich Photometer. In the analysis of, for example, water a chemical reaction brings about a coloration specific to the element in question, the intensity of which is proportional to its concentration and the length of the light path. In the Pulfrich photometer this coloration is compared to a standard solution of known concentration in light of a wavelength at the maximum of absorption. The instrument's principle is simple: light passes through both sample and standard, then through two graduated measuring diaphragms, is then combined in one field of view behind the colored filter. The operator adjusts the measuring diaphragm until both halves of the field appear of identical intensity, then reads off the extinction and absorption on the graduated drum. The actual value is found from tables established by careful calibration. Two books on "Water and Metal Analyses" and "Clinical Photometry" are the standard references for photometric work in industry and medicine.

Gerhard Hansen, 1899–1992

In Löwe's words "The Pulfrich Photometer serves the doctors, pharmacists, chemists, and technical assistants in many laboratories for the examination of blood, serum, urine, feces, spinal fluids, stomach secretions etc both to provide better diagnosis and improve the healing process."

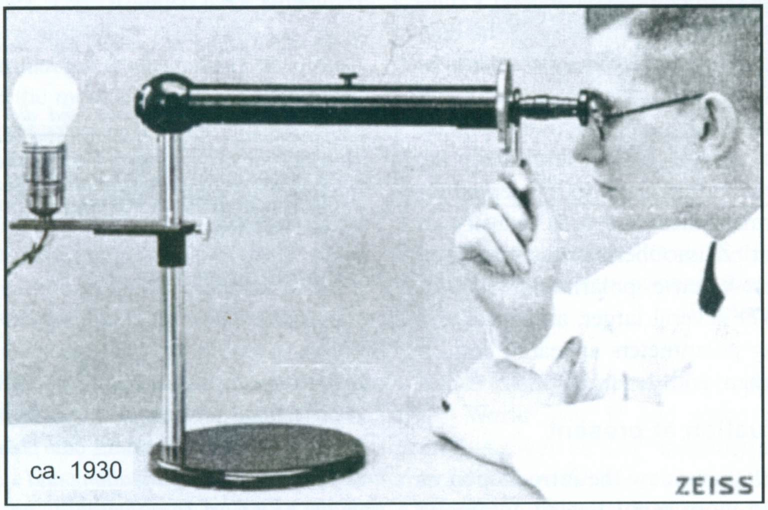
The first Pupho was manufactured in 1927, the last slightly improved version around 1957 (altogether approximately 5000 were produced). A retrofit for photoelectric, objective measurement with the Pupho was designed by Zeiss Opton at that time. It employed modulated light and a galvanometer and was called Wepho for Wechsellicht-Photometer. Soon, however, the new Elko II photometer (also by Zeiss Opton) made the



ca. 1938

Flame photometer

An element excited in a hot flame emits a specific wavelength of light, which can be isolated by an appropriate filter. In the flame photometer the aqueous sample is aspirated carburettor-like and introduced into a gas flame. The emitted light is passed though a filter for the specific wavelength and photometrically measured. A calibration process is required to determine the concentration. Flame photometers are used mainly in clinical laboratories to detect potassium, calcium and sodium in serum.



ca. 1930

1956

Polarimeters from Jena (above) and Carl Zeiss Oberkochen (right).

Pupho/Wepho redundant. The next step in the development of photometers were the spectrophotometers, which use a monochromator instead of filters for the selection of the most suitable wavelength. A wide range of accessories allowed the measurement not only of absorption, but also of fluorescence, turbidity, and remission (reflectance) as well as the application of flame and atomic absorption photometry.

Reflectance measurements

The accurate measurement of whiteness and color had become a problem for the paper and textile industry. Neither standard procedures nor instruments existed. By 1926 Pulfrich had designed the Color Comparator. In 1936 Gerhard Hansen, who became head of the Mess-Department after Pulfrich's death in 1927, designed the Leukometer, a photo-electric remission-photometer to determine the whiteness of paper and textiles. Earlier instruments were still based on the Pupho. But a real breakthrough came in 1952 with the Elrepho, which became the international standard instrument for the pulp and paper industry. In this device a hollow, white, so-called Ulbricht's sphere is internally diffusely illuminated, the sample is held against one opening, and compared to a standard on a second aperture. The entire instrument is calibrated against a compressed tablet of chemically pure white barium oxide powder. Color measurements are made with a set of special color filters.

Instruments for automatic color measurement and a recording instrument with microprocessor followed.

Flame photometers

In flame photometry the sample is sprayed into a flame and the resulting specific spectrum analyzed. The first instrument for flame photometry was built by Zeiss in 1937 — a rather experimental laboratory type. The Filter-Flame photometer PF5 (1956) was the first modern instrument of that type by Carl Zeiss Oberkochen. In Jena separate development took place, ending in the high performance flame photometer known as the "Flapho var." (1988). Attachments for flame photometry and atomic absorption (where instead of the emitted radiation the absorbed spectrum is used for the analysis) were designed for the multi-purpose spectrophotometer PMQ II (CZO).

Polarimeters

Polarimeters appeared rather late. Although it was known since the early nineteenth century that certain organic solutions rotated the plane of vibration of polarized light passing through them, it took many years before this phenomenon was utilized to determine concentrations, particularly of sugar solutions. The simple polarimeters originally used were significantly improved in 1890 when Ferdinand Lippich (1838–1913), an Austrian physicist, designed his half-shadow prism that made precise and reliable measurements possible.

In an 1891 catalogue of Zeiss Microscopes under the heading of "Different optical and mechanical auxiliary apparatus" we find a schematic cross-section of a "saccharimeter" for the determination of sugar content. It is significant that there is no picture of the instrument. I have no information on Zeiss polarimeters before the 1930s. Improved versions came on the market in 1948–9 in West Germany, mostly produced in the Winkel Factory in Göttingen that had a history of manufacturing polarizing instruments. The Prozentpolarimeter was intended exclusively for urine examination in the doctor's office (protein and sugar in cases of diabetes); the larger Circle-Polarimeter 0.05° was designed for more precise measurements in the lab and finally the large circle-polarimeter 0.01° served for the pharmaceutical and food industry. In 1957 Carl Zeiss Oberkochen introduced the photo-electric polarimeter 0.005°. Until 1971 several larger, automatic and recording polarimeters appeared both in Oberkochen and Jena.

The situation at present

In the 1960s we saw the introduction of more and more sophisticated automatic instruments incorporating microprocessors, mostly from the US. The emphasis was on speed and ease of use. Slowly the optical part became less important in comparison to the electronic evaluating systems, which not only replaced mechanical devices at lower cost but also directly indicated or printed out the desired result. There came a proliferation of routine instruments for the pharmaceutical industry and medical laboratories, instruments for the automatic analysis of multiple samples and so on. Because of their unsurpassed precision, the traditional instruments were largely used only for calibrating the newer generation.

Traditional analog instruments that relied almost totally on optics and mechanics were too slow and cumbersome and were phased out, new developments could not compete, and sales dropped. One has just to think of the demise of the mechanical calculator brought on by the appearance of the small digital calculator or, more recently, the word processor and printer versus the traditional typewriter. In 1984 Carl Zeiss Oberkochen closed the Mess-Department and a new Department for Optical Process Technology was formed. But after the unification of East and West Zeiss in 1993, 100 years after Abbe's establishment of the Mess Department, a number of profitable product lines developed at Oberkochen and Jena continued to be manufactured under the new heading of Analytical Technology.

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Zeiss Werkzeitschrift and Zeiss Information as well as various publications and brochures of Carl Zeiss Oberkochen.

Acknowledgments

The author thanks Dr. Wolfgang Wimmer, Archives, Carl Zeiss Jena G.m.b.H., who supplied a number of pictures. Most, though, I copied from various Zeiss publications (including Zeiss magazines, both internal and for customer information, and some from the VEB Carl Zeiss Jena).

The Editor thanks Allan Wissner, at antique-microscopes.com, for the photographs of a 1920 Pulfrich Refractometer used on the front cover. ❒

The Contaflex 126: the story continues

John Schilling, Gardnerville, Nevada

Initiated by Voigtländer and produced by Zeiss Ikon late in that company's lifetime, the system was extensive and elegant, but not embraced by the camera buyer.

Back in the Fall of 2005 I wrote an article for *Zeiss Historica* on the Contaflex 126 camera,[1] and thought I had covered the subject as fully as it deserved. But five years of research on the Internet (via auction sites and search engines) got me thinking more about this camera, its lenses and accessories. By early 2009 the camera had become a collectible, rather than a "user," because the film format has been discontinued, but nevertheless its story has continued since 2005.

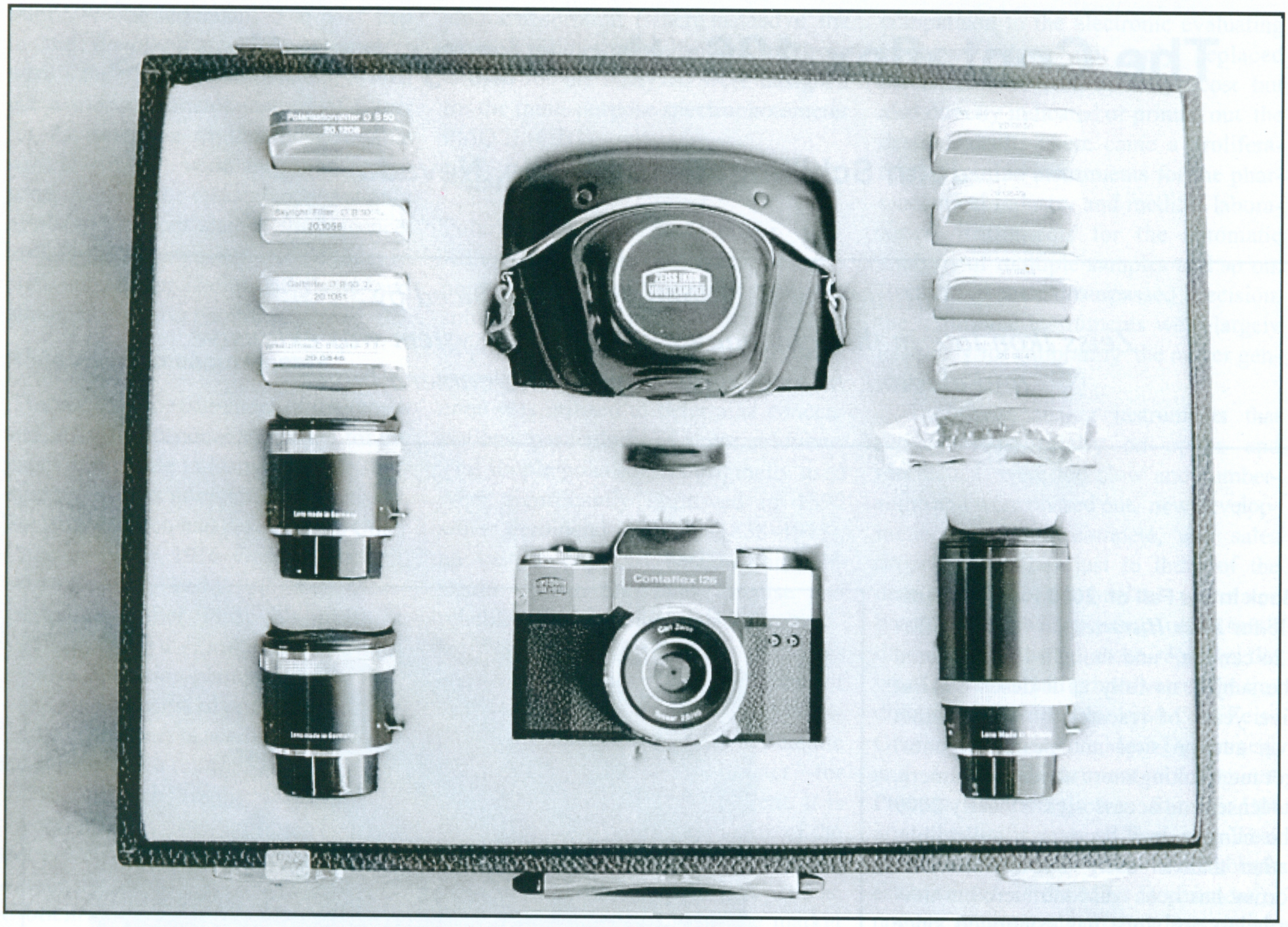
From the perspective of 1967 and earlier, when Voigtländer was developing what became known as the Contaflex 126, it must have appeared that they and Zeiss Ikon between them were producing the best (and, therefore, one of the most expensive) single-lens-reflex camera for the 126 cartridge — also called the Instamatic format. But as we shall see it seems that the cameras still listed by ZIV (Zeiss Ikon Voigtländer) in the USA in 1971 were the same bodies that were made in 1967 when the model was first marketed. Obviously the business forecasts of 1967 did not turn out to be correct. As if to make things worse, Oberkochen then developed the 25 mm Distagon and 200 mm TeleTessar for the Contaflex 126. It would be interesting to know if Zeiss Oberkochen made a profit on these lenses it sold to Zeiss Ikon, but surely Zeiss Ikon could not have made any money reselling them onto the retail market.

The Contaflex 126, introduced in 1967 to accommodate the then-new Instamatic film cartridges. It now appears that all existing examples were made in that first year, 1967. (Photograph from The Leica Shop, used with permission)

Other film formats have appeared since World War II and since disappeared. As well as this "Instamatic" 126 size there were the 110, the disc, and the APS sizes. None of these last three attracted the attention for "serious" cameras (that is, expensive ones) that the 126 format did, although the APS format lives on as the size of the sensor in point-and-shoot digitals and many of the DSLRs also.

Who made the Contaflex 126?

All the sources I have consulted agree that the camera, which was originally badged as the Icarex 126, was developed by Voigtländer. But opinions diverge regarding what happened in 1967 and



A salesman's display case for the Contaflex 126. It contains: Slots for the camera body with 45 mm lens and for the ever-ready case; close-up lenses 2.0,1.0,0.5,0.3,0.2; yellow color filter for black and white film; skylight filter for all films; Contapol; screw-over rubber lens shade; eyepiece rubber cup; and 32 mm, 85 mm, and 135 mm lenses. No provision was made for the later 25 mm and 200 mm lenses. (Photograph by the author.)

thereafter. The contemporary records from the factories of Zeiss Ikon and of Voigtländer cannot be found, and possibly no longer exist.

The Fall 1993 issue of *Zeiss Historica* had an excellent interview of Wolf Wehren by Hans-Juergen Kuc. Wehren was in charge of Public Relations for Zeiss Ikon from 1956 until the closing of that firm. He then joined the Public Relations department of Carl Zeiss, subsequently retiring.

Wehren, a Zeiss Historica member, sent me a very informative email some years ago.[2] He wrote:

"The Pantar lenses and the respective wide-angle and tele components for the Contaflex alpha, beta, and prima [35 mm cameras] were made by Rodenstock, Munich. Some of their mounts were engraved Zeiss Ikon, others carried only the name Pantar and the optical data.

"In 1966 the Icarex 126 was introduced at Photokina. The name was changed to Contaflex 126 because it was well known. The camera had been developed by Voigtländer but was manufactured in the Stuttgart plant of Zeiss Ikon. A total of 7 lenses became available. The Pantar 2.8/45 mm was made by Rodenstock and carried Zeiss Ikon on the mount. All other lenses had Zeiss names (Distagon, Tessar, Sonnar, Tele-Tessar) and Carl Zeiss engraved on the mount. As far as I can remember, all of these lenses were designed and made by Zeiss in Oberkochen.

"The lenses for the Icarex 35 mm camera were designed and made by Voigtländer. The decision as to which cameras and lenses were to be manufactured where was always made by Zeiss in Oberkochen since they owned both Zeiss Ikon and Voigtländer. The purchase of Voigtländer by Zeiss turned out to be a fatal mistake which later contributed to the fall of Voigtländer and Zeiss Ikon."

Enquiries to Oberkochen by ZHS President Larry Gubas and by me for cross sections of the Contaflex 126 lenses have not been answered.

The 1971 ZIV in America price list includes the 25 mm Distagon and the

Contaflex126 prices in America, 1968 and 1971

Cat. no.	Item	1968 price	1971 price
10.1100	Contaflex 126 body	$139.95	
	Contaflex with 45 mm Tessar	174.95	
23.1015	Ever-ready case	19.50	
various	B50 close-up lenses	8.00	$13.50
various	B50 color filters	7.00	10.00
20.0715	Screw-over lens hood	4.50	6.00

Data from a March 1968 ZHS reprint and a 1971 ZIV price list in the ZHS archives.

200 mm Tele-Tessar. The latter lens came with a red plush-lined leather case and a hand grip. (see the illustration on this page). The case had provision for the grip as well as the lens. Zeiss was not always clear about whether or not a leather case and grip was included with a given Tele lens — a situation that also shows up in the lists for Tele lenses for the Contarex.

A sales disaster

Various Internet sources agree that the Contaflex 126 was introduced in 1967 and continued in production until 1971 (although some say until 1973, when Zeiss Ikon was no longer in business). However, the camera bodies in my collection and dozens offered for sale on Internet auction sites over the last six or seven years all have serial numbers with "N" prefixes. A serial number beginning with N signifies production in 1967. (Each year Zeiss started a new series of numbers prefixed by a letter specific to that year.) One source (Pacific Rim Camera) states that 25,000 bodies were produced. As I mentioned above, the camera still appeared in the 1971 ZIV price list; so if all the bodies on offer had the "N" serial one can assume they were from the original 1967 run and had not been sold.

Many experts (including camera specialists, camera-club websites, and so on) speculate that the poor sales record of the Contaflex 126 was attributable to the lack of a pressure plate in the 126 cartridge. None of them mention the extremely high price of these cameras, which I believe contributed to their poor sales record. One calculation made in 2005 compares the 1969 list prices with then-current dollars, and makes the price of a Contaflex 126 equivalent to $1,035.00 in 2005 dollars.

The B50 filters and lens shade were also used as accessories for the various Icarex models.

A complete system

Zeiss Ikon fully supported the system concept for this camera. In addition to the seven lenses and the B50 filter system from the Icarex program, various leather cases were on offer:

The complete system also included an adapter for the 8 × 30 B monocular.

A salesman's display case (see photograph on page 20) housed the camera body, ever-ready case, and 32 mm, 85 mm, and 135 mm lenses as well as places for the rubber lens shade, rubber eyecup, filters, closeup lenses, and the Contapol polarizing filter. The top was removable so that the salesman could lay the bottom of the case and its contents on a countertop. There are no slots for the 25 mm and 200 mm lenses, which were both introduced a year or two after the original 1967 launch. Even as early as 1969 it was probably already evident to the Zeiss Ikon sales department that the Contaflex 126 was a sales failure, yet these two very expensive lenses were introduced at about that time.

The more common lenses for the Icarex and Contaflex 126 used the Zeiss B50 filter mount. There was a rubber lens shade that threaded onto the outside of the lenses unlike the similar rubber shade for the 35 mm Contaflex, which screws inside the lens ring. All the currently available lens shades are threaded to fit a female thread in the outer lens mount.

I have not been able to find a commercial adapter for the B50 mount to, say, a 49 or 52 mm filter size. I do have an adapter to take the B50 mount down to 49 mm, which I found offered by Internet auction a few years ago by an individual who had ten of them, but his offer has not reappeared since. I assume that the market for this adapter proved to be slim or non-existent. ❒

References

1. *Zeiss Historica,* volume 27, Fall 2005, pages 16–19.
2. Email from Wolf Wehren.
3. ZIV (America) price list, 15 February 1971. In the ZHS archives.

The 200 mm lens, shown with the grip attached to the tripod socket. The lens hood is retracted. Photo: The Leica Store, used with permission).

Editor's essay

The longevity of a camera design

John T. Scott, Austin, Texas

The German manufacturer Ica was formed in 1909 by a complex merger involving Hüttig, Krügener, Wünsche and Palmos. Then in 1926 it disappeared into the new Zeiss Ikon via another merger, along with Contessa Nettel, Ernemann, and Goerz. I have been struck by how a given camera design could persist through this 17-year period with very little change.

From 1913 to 1925 and beyond

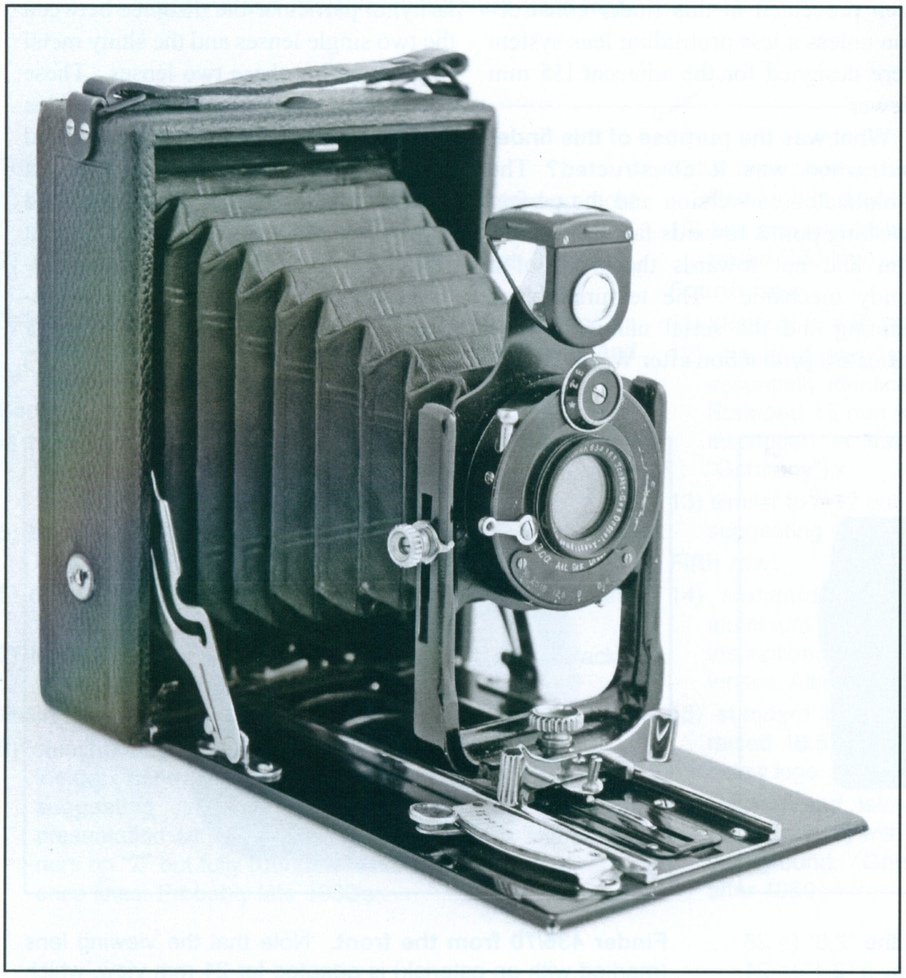
The other day I was looking through an issue of a little magazine called "Better Photos," published by Sears, Roebuck and Co. in Chicago. This is Volume 1, Number 1, dated February 1913. Sears, Roebuck, of course, was a well-known US department and mail-order store, and the 28-page magazine appeared to exist as a vehicle for their own advertising. (I do not know if there ever was a "number 2.") My attention was caught by the advert on the back cover, illustrated here, which shows an Ica camera very similar to my 9 × 12 cm 146 Volta. As you can see from the two illustrations the cameras are virtually identical except for the shape of the box or body into which everything folds. The one from Sears, "Model One," has the typical rounded ends of a rollfilm camera of the period (although the description says "uses either plates or roll film") whereas mine is rectangular like all plate cameras of that time (although I do have a rollfilm back for it). In every other respect they are identical. Mine has an f/6.8 13.5 cm Doppel-Anastigmat Hekla lens, number 634363, which is one of the lenses offered by Sears. "Model One"

An advertisement from 1913, published in "Better Photos" vol.1 no.1. Compare "Model One" with the 146 Volta, opposite

An Ica design appears to have survived virtually unaltered from 1913 or earlier to the 1926 merger and on into the Zeiss Ikon era

is described as "for 3¼ × 4¼ Pictures," which — in inches — is not exactly 9 × 12 cm but would be an easy modification.

On the Web at www.vintagephoto.tv, a site called "Scott's Photographic Collection" (alas, no relation to me) includes an Ica A.G catalog and a list of products from 1922. My camera is listed there as the 146 Volta Klapp (that is, folder). So the design lasted at least from 1913 to 1922. Looking further, I find that H. D. Abring, in *von Daguerre bis Heute*, does not list a Volta but does illustrate an Ica Maximar 207, a 9 × 12 plate camera that looks exactly like the Volta, with the same lens and shutter, except that the Maximar has a double-extension baseboard and the Volta and Sears cameras are single extension. Again, an easy modification. The Maximar viewfinder adds a built-in level. Abring dates this Maximar as "circa 1925." D. B. Tubbs, in *Zeiss Ikon Cameras 1926–39,* also shows the Maximar 207 9 × 12, with double extension, and gives a detailed description of its features, which closely match those of the earlier models. Tubbs dates his illustration to 1927–38, by which time we are in the Zeiss Ikon period. The selection of lenses changes to familiar Zeiss names: Novar, Dominar, Prominar, and Tessar.



A 146 Volta 9×12 plate camera from Ica. Identical and similar designs are recorded from 1913 to the 1926 Zeiss Ikon merger and beyond. (Photo: J. T. Scott)

Just how unique is this design?

Admittedly all 9 × 12 folding cameras in this early part of the twentieth century, from all manufacturers, show a strong family resemblance. But careful examination appears to show details, such as the design of the struts that lock the baseboard into position, that are unique to Ica and could have been stamped out by the same tools from 1913 on to 1938.

Envoi

From my perusal of "Better Photos" (1913) I turned to one of today's photographic magazines, and there I found advertising and editorial descriptions of this month's offerings from Nikon, Canon, Pentax and Sony (all digital, of course); brand-new designs all calculated to make last month's new models instantly obsolete. ❐

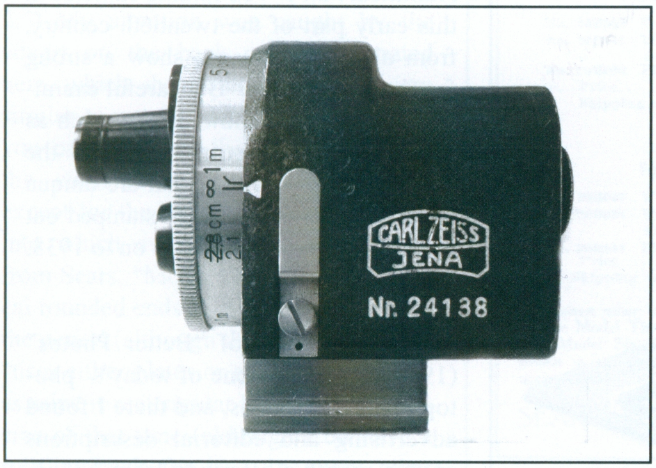
A strange 436/70 finder – precursor of the 440 finder?

Stefan Baumgartner, Lund, Sweden

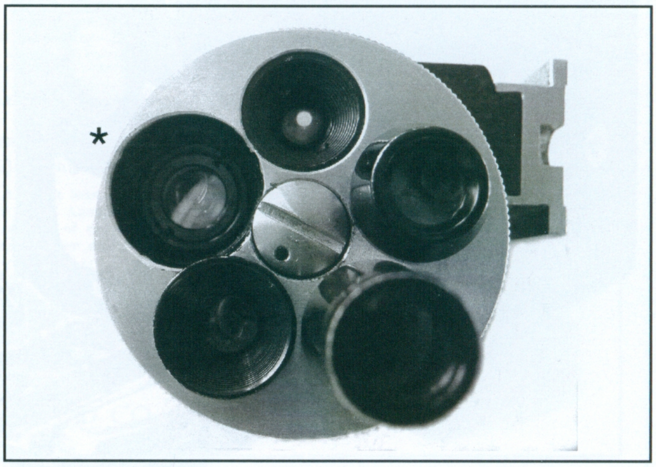
I recently came across a version of a 436/70 viewfinder that, at first sight, did not look special, except for the rarer "crackle" type of painting. A close inspection, however, revealed an unexpected feature: Instead of a 28 mm view, a 21 mm view was incorporated, as shown by the crossed-out "2,8" and the addition of a "2,1" below, instead (figure 1). An immediate question for me was: Why would such an old type of finder harbor a 21 mm view if no lenses for this focal length were available? It should be remembered that the first finders with 21 mm view were the multifocal finder (cat. # 440), which became available from Zeiss Ikon Stuttgart when the 21 mm Biogon was launched in 1954, and the special 21 mm finder (cat. # 435).

To achieve a wide-angle view, several adaptations needed to be accomplished. First, further aluminum around the (previous) 28 mm view had to be milled away to free the view to the approximately 90 degrees required for a 21 mm lens. The engineers went as far as they could, leaving almost no metal between the two adjacent viewers, leading to a broken rim that probably occurred over time due to handling (figure 2). Second, a new lens system had to be inserted fulfilling the task of an extreme wide-angle viewer to provide a sharp and distortion-free view. A close inspection revealed that the newly incorporated lens system consists of two separate lenses. As far as the quality of the viewer is concerned, the view is sharp and almost distortion-free. However, the barrel of the adjacent 135 mm lens extends into the upper-right corner of the view, which probably could not have been prevented in this finder construction unless a less protruding lens system were designed for the adjacent 135 mm viewer.

What was the purpose of this finder and when was it constructed? The complicated conversion and the perfect finishing points towards factory conversion and not towards the work of a handy mechanic. The textured black painting and the serial number 24138 indicate a production after World War II. Similarly textured black painting was used for the post-war inverted-image Flektoskop at that time. These were associated with 180 and 300 mm Sonnar lenses made during 1948–1950, giving a hint as to its production date. As far as the actual conversion to the 21 mm finder is concerned, we know that the first examples of the 21 mm Biogon for the Contax were launched in 1954. Thus, it is likely that Zeiss converted this finder between 1948 and 1954 to test the feasibility of the construction. At present, it is unclear if this conversion was accomplished at Zeiss Ikon Stuttgart or at Carl Zeiss Jena, but the former sounds more logical. Experience from this construction may have been incorporated into the design of the final finder 440. If the two 21 mm viewing lens systems (that of this particular finder 436/70 and that of finder 440) are examined under high magnification, then one can see a close similarity, in particular the distance between the two single lenses and the shiny metal ring separating these two lenses. These observations further strengthen the idea that this modified 436/70 might indeed be a precursor of the 440 finder. The final version of the 440 finder, however, gained a lot because its design is shorter than that of the 436/70 finder and, most importantly, it has a parallax-correction foot, a feature that the user of a 436/70 finder never had the chance to experience. ❐



Viewfinder 436/70 from the side. Note that the "2,8" (= 28 mm focal length) is crossed out and replaced by a "2,1" (= 21 mm focal length). The crackle finishing and the late serial number suggest a production after World War II. Figure 1



Finder 436/70 from the front. Note that the viewing lens (marked with an asterisk) is adapted for 21 mm view, which made further changes necessary — including milling away metal to free the view of approximately 90°. Figure 2

On the Back Cover:

The Society's Past President Charles Barringer has arranged these sixteen lens caps as samples of the styles adopted by Carl Zeiss and Zeiss Ikon for their Contax lenses over many years.

All the lenscaps illustrated are push-on 42 mm inner diameter, suitable for standard 5 cm/50 mm Contax lenses as well as many others in the lineup. "Aluminum" designates an aluminum cap painted in a matte aluminum finish that can be removed. Glossy finish caps probably left the factory as painted caps. "Gripping surface" is the collar that extends down on the lens.

Several types of mechanism were used to prevent losing the cap: the most common consists of three or more dimples in the cylindrical surface — over time these will scratch even the hardest chrome. Cuts, defining user-adjustable tabs, are often seen. The most expensive and effective are the plush-lined caps.

Many lenscaps shown have counterparts in other sizes, ranging from (in my collection) 23 mm to 84 mm ID in the plush-lined leather caps; 35.5, 37, 51 and probably larger diameters in aluminum.

I am unaware of any Zeiss or Zeiss Ikon threaded lenscaps but would love to be proven wrong. I think we must credit the Japanese with the invention, or at least introduction, of the nearly ubiquitous spring-loaded threaded cap of today.

I would be thrilled to have other styles shown to me, or to have my uncertainties as to origin or era discussed and corrected.

Charlie Barringer

Top row:

1) standard prewar aluminum CZJ cap, as delivered on most chrome Contax lenses, stamped 16.5 mm wide logo;
2) ditto, but with tiny "Germany" inscription at 6 o'clock, designating export market production;
3) leather cap with gold CZJ logo, dark blue plush interior, as fitted to most black and nickel finish Contax lenses and many CZJ lenses on other cameras.

Second row:

4) heavy gauge aluminum postwar CZJ cap. Obverse has crinkle black paint and raised logo; reverse is painted matte black, has "Germany" decal(!);
5) black plastic CZJ 1950's era (and later) cap with raised logo;
6) no-logo cap identical to #1 in curvature, materials, and finish;
7) black plastic CZJ 1950's era cap with molded crackle finish, raised logo, "Germany" under logo.

Third row:

8) aluminum spun cap with blue plush gripping surface inside; central medallion is a separate element, suggesting very limited production for special presentation situations. Zeiss Ikon logo with sharp corners on "Z" but fully rounded "S" and mildly curved reference lines. Probably late 1930's;
9) flat-front plain cap with small (10 mm wide) stamped Zeiss Ikon logo in doublet lens outline. 1930's;
10) late prewar cap in black paint obverse with 12 mm wide raised CZJ logo, polished external gripping surface.

Fourth row:

11) identical to # 9) but with black finish;
12) standard early postwar cap from Zeiss Oberkochen essentially identical to #1 in shape, material, and finish. Stamped 15 mm wide Zeiss Opton logo and "Germany" inscription in Italics below logo. (Also seen without "Germany");
13) similar to # 12 but with raised Zeiss Opton logo, perhaps suggesting more limited production.

Fifth row:

14) standard shape, material but more polished raw aluminum finish, simple upper case "ZEISS" stamped inscription. No confirmed origin; possibly Coburg-made lenses. Also known in painted aluminum finish;
15) standard postwar Carl Zeiss (Oberkochen) cap with raised 16.5 mm wide logo in doublet frame, "Germany" below logo. I suspect this also exists with a stamped logo;
16) widespread late-era polyethylene plastic Carl Zeiss (Oberkochen) with raised block "ZEISS" logo on textured background. "Germany" on inner surface. Ubiquitous after 1960.


CARL ZEISS
JENA
ZEISS
IKON
ZEISS
OPTON
Germany
ZEISS
CARL
ZEISS
Germany
ZEISS
SWITZERLAND