ZEISS HISTORICA

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Table of Contents

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 73 Winsor Place, Glen Ridge, NJ 07028 (e-mail: jscott@netcommail.com) or to any Officer. Please send all other correspondence to Zeiss Historica Society, 24 Valley Drive, Randolph, NJ 07869, USA. Annual membership dues: $35 (USA), $45 elsewhere. Dues include subscription to Zeiss Historica, airmail postage overseas.

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__Front Cover:__ Charles Barringer illustrates his article on pages 14–17 with this picture of his #860/24 TLR Contaflex equipped with an f/2.8 8cm Sucher-Objektiv and an f/2.8 5cm Tessar taking lens, shown here with three Sonnars (f/2 8.5cm, f/4 13.5cm, and an early style f/2 5cm) and sundry accessories and literature.

__Back Cover:__ This young lady admiring her Ikonta 520/2 appeared on the cover of a 1931 Zeiss Ikon catalog. (From the collection of Larry Gubas.)

President's Letter

I have the sad duty to inform you of the passing of Maurice Zubatkin, who had been our Treasurer and Secretary for more than 15 years. He was a dear and gentle man who, through his efforts, held our Society together over that time. He was more than a friend to many of us and overcame many severe physical hardships to be so helpful. He was very sad to give up his office in the Society last year but he knew that he was quite ill. A picture of Maurice is adjacent to this letter.

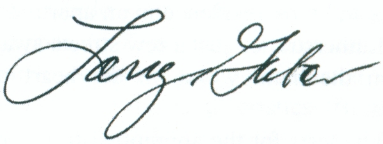
Maurice had dispersed much of his collection over the past ten years, but there is a very large and unique collection of photographic media that remains. If anyone knows of someone interested in a collection of more than 2,000 examples of film and plate film in their original boxes, please contact me. His wife, Evelyn, would like to find it a good home.

Maurice and Evelyn Zubatkin at the 2002 annual meeting of the Society. (Photo: Michael Kersten)

I would like to address some questions that came to me since the last issue. The first is about the annual meetings. I was asked why no meetings have been scheduled outside of the Tri-state New York area. The answer is simple. We get people to come to meetings in this area. We have tried such meetings elsewhere but, including one in Los Angeles many years ago, fewer than seven people have come to those meetings. This becomes more interesting since I will be retiring to Nevada later this year. No one else has organized a meeting in the past five years beside myself. Will someone else step forward to have a meeting in another location? I would be happy to support him.

Some folks have asked for a slightly different "dividend" in the future. The best suggestion is for a Zeiss Historica lapel pin. If there is sufficient interest in this, I will make arrangements for 2005. This year's dividend is in two parts, with special interest to our very active binocular community within Zeiss Historica. It is a color catalog from the 1920s and a nice brochure on the use of binoculars supplied to us by our friends at the Sports Optics Division of Carl Zeiss at the Hensoldt firm in Wetzlar, Germany. Our review board was encouraged by the quality of the item and very happy to merge it with the reprint.

As I am running out of space, I thank you all for your support and tell you that I hope to have another annual meeting here in the NY/NJ area in November before I head into the sunset. By the way, notice that this retiring member is holding down the jobs of President, Archivist, Secretary, Treasurer, Webmaster and Meeting Officer. As I leave New Jersey that will become more difficult for our wonderful editor, John Scott. Help would be appreciated. You will receive the same pay as I currently do.



Fritz Jakobsmeier

Lawrence J. Gubas, Randolph, New Jersey

After a challenging apprenticeship in Jena, his promising career with Zeiss was derailed by World War II. Then, with new skills, he made a life in the United States.

Fritz Jakobsmeier was born in Bottrop, in the state of Westphalia in Germany, on 22 September 1921. This area is in the heart of the coalmining region of Germany, and Fritz's father Friedrich-Wilhelm had been a mining engineer before he was wounded in World War I, losing an eye and acquiring shrapnel wounds over much of his body.

This article is based on my conversations with Fritz and Marga Jakobsmeier in Lubbock, Texas, 21–23 October, 2003. All the photographs were provided by Fritz. *—LG*

Apprenticeship

At fifteen Fritz was given the opportunity to test for a position as a mechanical apprentice at Carl Zeiss in Jena. He traveled the 333 kilometers to Jena twice to be tested, and after completing these tests successfully was granted the apprenticeship starting in April 1937. By this time his father, now aged 42, could no longer work and was given a small pension. The family moved to Jena and took residence in an apartment on Lutherstraße, just a few streets away from the main works in the heart of Jena.

The tests for the apprenticeship were unique and very detailed. In one, he was asked to place his hands under a black cloth where there were twelve steel balls, and he was asked to place them in order of weight from lowest to highest. The actual size of the balls was identical, and the difference in weight was very slight. Jakobsmeier placed in the top three of his group in the Zeiss evaluation process; these top three scorers were identified but not in order. The rest of the top ten were also identified, but no one was told where they specifically were ranked to avoid creating any competition.

The fine mechanical training that he received was a yearlong process that was nearly identical for all of the new apprenticeships. At the end of the first year, the firm would decide which area each apprentice would join. Jakobsmeier was placed in a special group of sixteen to be trained as a "*Technischer Kaufmann*" and, while this term translates literally to "technical salesman," the job actually was quite different. The duties of this group as they continued their training were to work in every department of the firm, so that eventually they could go out into the sales offices anywhere in the world and teach the customers the proper use of the equipment they were buying and could demonstrate the instruments at instrument fairs and sales locations.

Training as Technischer Kaufmann

The training included an intense period in each of the major workshops at Zeiss. Almost all the departments were covered except for the planetariums and the large astronomical instruments, which were so specifically different that they had specialized staff members who trav-

Fritz Jakobsmeier in the Luftwaffe with his Contax II. Overleaf, in the desert with his Movikon and, again, with the Contax II.

eled to install these large devices. The sixteen apprentices in the *Technischer Kaufmann* program were divided into eight groups of two each to give them the best opportunity to learn almost individually all of the areas.

In addition, there was language training. Jakobsmeier had a language teacher for both Spanish and English, because he would probably be sent abroad after completion of the training. This was in addition to his typical 48-hour week. An additional part of the training included a regular sit-down session, for each team of two, with a research scientist who worked for the firm but who was most likely also a university professor. This scientist would explain to them in detail about the scientific principles involved with the department and the apparatus in which they were receiving practical training. At the end of every week each *Technischer Kaufmann* apprentice would have to prepare a typewritten report on what he had learned during that week. He was paired with a single partner for more than two years, and their complete program was handed to them at the beginning. After his total training, Jakobsmeier took the journeyman's examination and was given his certificate.

All the staff were trained to work within very close tolerances. Once a part was completed, a senior member of the department would inspect it thoroughly to be sure that the part was made exactly to the specification. This was true for each individual part, and when the parts went to the assembly area, they were all re-evaluated at each stage of production. Parts that were not up to standard were recycled into metal, glass or other bins to be discarded as scrap. Small adjustments could be made at the sales office, but for detailed repair the instrument was sent back to Jena.

Lens production

Jakobsmeier worked for two weeks in the photographic department where lenses were assembled. He used many of the specially developed tools there for constructing the diaphragm or iris for the lenses. There were precise tests to ensure that the lens was transmitting light as specified and that the opening was precise.

Schott optical glass was cooled over an extended period of time in a controlled environment to bring the glass from the ovens to room temperature. During the period of cooling, the glass was stored in containers of potash and was automatically cooled degree by degree over the six-week period until it was suitable for use. If the cooling was done too quickly, the glass would have internal stresses and the consistency of the refractive index of the glass would be lost.

The typical process for lens production would start with a batch of glass shipped to Zeiss from Schott, and the batch would have to be evaluated with regard to all its characteristics. Because each batch was not precisely identical,

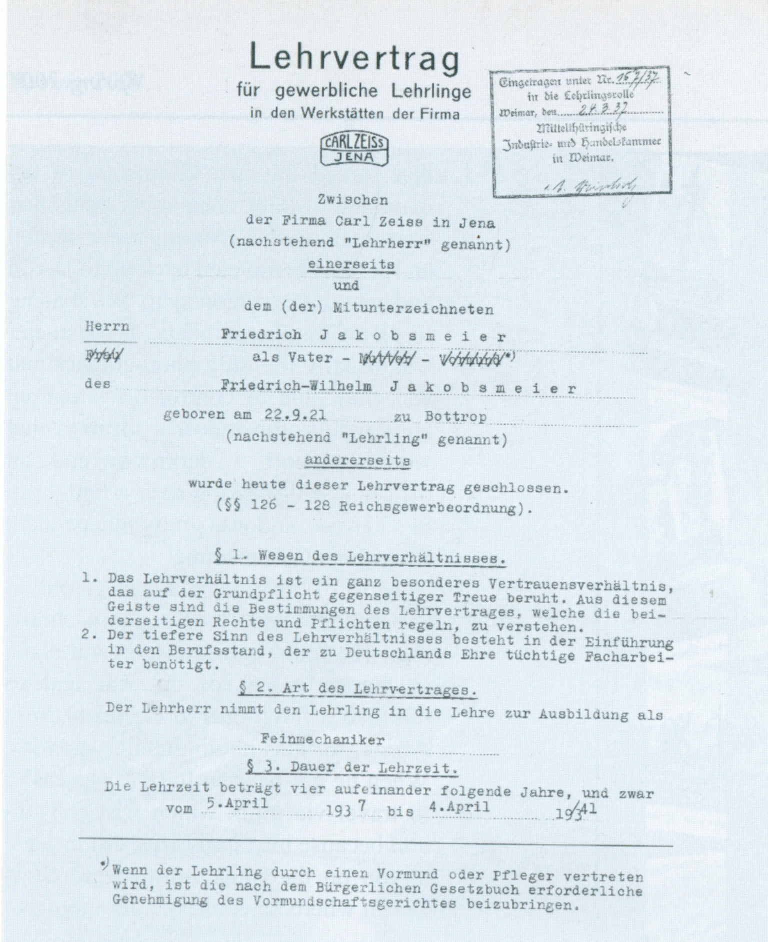
the calculations for grinding the curvatures of the product needed to be recalculated based on the properties of each batch. So the characteristics were sent to a building across the street from the main plant on the corner of Schillerstraße and Teichgraben, where there were staff members whose main purpose was to calculate the use of that glass within the plant. There were about 45–50 members of the staff whose only job was to calculate lens properties. Their mathematical skills were employed to identify, based on the properties of each new batch of glass, the exact formulation of the various kinds of lenses used throughout the firm. The work week for all other Zeiss employees was 48 hours at that time, but these *Rechnern* or calculators only worked 36 hours a week because it was considered very taxing work. This same building also housed the exhibition hall for all of the products of the factory, and during his apprenticeship Jakobsmeier was responsible for those exhibits.

The photographic lenses were then sent to be ground and polished. Zeiss had developed precise machines for grinding the lenses, and they had a special machine of their own design for the parabolic curvatures. Each lens would be then evaluated and sent to the department where they would be placed into the shutter or other mount for the lens.

Each member of the department had a specialty in the production effort, and over the course of time they would be cross trained in the other skills in the department. The quality control was quite exacting, and not only the product but also the employee was evaluated on their individual product, whether it was a piece of ground glass, a spring or a brass or other metallic part. The firm of Zeiss wanted no product returned as defective. Exactitude and strength of the product were highly prized. For instance, the tube for a particular part, whether it was for a microscope six inches (15 cm) long or for a periscope 20 or more feet (6 m) long, was constructed out of a single piece of metal and drilled out, to ensure the strength and uniformity of the product.

In the case of microscopes, Zeiss was convinced that their product was superior, with objective lenses made to a very strict specification. Leitz objectives, on the other hand, were offered in groups of three so that the customers could select the one that they preferred.

General Erwin Rommel, commander of the Afrika Korps in the desert, 1940–43.



Lehrvertrag
für gewerbliche Lehrlinge
in den Werkstätten der Firma
CARL ZEISS JENA

Eingetragen unter Nr. 157/37 in die Lehrlingsrolle
Weimar, den 24.3.37
Mitteltüringische Industrie- und Handelskammer in Weimar.

Zwischen
der Firma Carl Zeiss in Jena
(nachstehend "Lehrherr" genannt)
einerseits
und
dem (der) Mitunterzeichneten
Herrn Friedrich Jakobsmeier
~~Frau~~ als Vater - ~~Mutter~~ - ~~Vormund~~*)
des Friedrich-Wilhelm Jakobsmeier
geboren am 22.9.21 zu Bottrop
(nachstehend "Lehrling" genannt)
andererseits
wurde heute dieser Lehrvertrag geschlossen.
(§§ 126 - 128 Reichsgewerbeordnung).

§ 1. Wesen des Lehrverhältnisses.

1. Das Lehrverhältnis ist ein ganz besonderes Vertrauensverhältnis, das auf der Grundpflicht gegenseitiger Treue beruht. Aus diesem Geiste sind die Bestimmungen des Lehrvertrages, welche die beiderseitigen Rechte und Pflichten regeln, zu verstehen.
2. Der tiefere Sinn des Lehrverhältnisses besteht in der Einführung in den Berufsstand, der zu Deutschlands Ehre tüchtige Facharbeiter benötigt.

§ 2. Art des Lehrvertrages.

Der Lehrherr nimmt den Lehrling in die Lehre zur Ausbildung als Feinmechaniker

§ 3. Dauer der Lehrzeit.

Die Lehrzeit beträgt vier aufeinander folgende Jahre, und zwar vom 5.April 1937 bis 4.April 1941

*) Wenn der Lehrling durch einen Vormund oder Pfleger vertreten wird, ist die nach dem Bürgerlichen Gesetzbuch erforderliche Genehmigung des Vormundschaftsgerichtes beizubringen.

Fritz Jakobsmeier's apprenticeship contract, entered into on 24 March 1937. He began his four-year training two weeks later, on 5 April 1937, as a "fine mechanic," but was soon selected to train as a *Technischer Kaufmann.*

Jakobsmeier ultimately reported to a Dr Günther (ZWA) who was in charge of a group of mostly medical and measuring departments. In July 1938, Fritz's father's physical condition was serious enough for him to spend some time in the hospital, and on a Sunday, his mother was told that the senior Jakobsmeier had died of pneumonia. In the family's opinion, this was not true; they believed that because he could no longer work and contribute he was a victim of euthanasia decreed by the government. There were clear disparities in the documentation of the death and the information process, but the family was in a difficult position. Fritz continued his apprenticeship but there was little income for the family. As a result, he went to see Dr Hugo Schrade, the head of personnel, who thoughtfully found a job for his widowed mother.

Service with the Luftwaffe

While Jakobsmeier's apprenticeship was being hastened by the war in Europe, his partner in the *Technischer Kaufmannn* apprenticeship program was planning to apply for a national scholarship and he encouraged Fritz to apply as well, which he did. This scholarship, for university education, was given to those of great promise but whose families were of limited means. As part of the process, the candidate had to undergo aptitude and practical testing. He was required to document his heritage back four generations. This was a painstaking process, and the result was all placed on a single, triple-folded piece of paper that showed his family tree. The purpose was partly to ensure that none of the ancestors had any Jewish blood but also to validate the financial worth of the family. Jakobsmeier was fortunate and talented enough in this endeavor that he was one of sixteen young Germans across the country selected for this scholarship. Zeiss was proud of his success and promised to hold a position for him on completion of his university career.

Jakobsmeier was, however, at another crossroads; he could either go to university or finish his two-year military obligation at this point. He figured that it was better to get the military obligation out of the way and concentrate on his schooling and career later without the specter of military service hanging over his head. On a trip to Weimar, he was rejected by the army but was accepted by the Luftwaffe. He began his basic training, and on one very cold day, when they were training outside, everyone was asked if they had any knowledge of photography. Jakobsmeier — looking for an opportunity to get out of the cold — raised his hand. When he said that he had been apprenticed at Zeiss, he was selected for the Luftwaffe's photography program. After basic training, he was sent to Berlin for a special three-month-long course where all branches of the German military sent men to be trained in the standard military photographic program. Jakobsmeier was in the first of these classes, January to March 1940, and he assumes others were also conducted but does not know how many. The school was conducted under the "OKW," the equivalent of the Joint Chief of Staff of the military, and he was a part of the Air Force Ministry of Propaganda.

The photographic training was quite technical and complete. Most of those in the program were professional photographers and members of the movie industry in Germany at that time. Jakobsmeier feels that he was able to make considerable progress because he did not have the cinematographers' habits of taking extra time to measure the focus precisely and shooting and reshooting a lot of "takes." He was able to react spontaneously and make good quality images of events as they happened, and thus he was able to get a good product without hesitation. After graduation, he received the standard equipment issue for the Luftwaffe, which consisted of a Leica with a standard Elmar lens and an Arnold and Richter (Arriflex) movie camera and lenses.

In his first year, Jakobsmeier was sent to Sicily (April 1940). Later he went to Africa where he documented

Ueber den Brenner geht die Fahrt

Tropische Vegetation in Süditalien

Fahrt durch den Isthmus von Corinth

In Rom: Blick auf die Peterskirche und die Vatikanstadt

In einem Hafen Süditaliens

Der Weg eines Werkskameraden nach Afrika

Unser Werkskamerad Friedrich Wilhelm Jakobsmeier, zuletzt in Abt. Ausst, hat uns Aufnahmen der verschiedenen Stationen seines Weges zur Front in Afrika eingesandt. Er ist jetzt als PK-Bildberichterstatter wieder an der Front in Afrika. In mehreren der letzten Wochenschauen wurde er als Bildberichter mitgenannt.

Die Engelsburg, einstmals Grab römischen Kaisers Hadrian

Auf klassischem Boden

Das Nationaldenkmal, im Vordergrund das Trajansforum in Rom

Vor dem Start nach Afrika

Besuch der Filmschauspielerin Carola Höhn

Vor der Abfahrt

Auf einem Flugplatz in Afrika

The back cover of a Zeiss magazine filled with Jakobsmeier's images from the campaign in north Africa. His reports made him a minor celebrity at home.

many events for the Afrikacorps. In his first assignments through Italy, he was able to travel back to Germany twice, and he changed his equipment from the Leica to Contax II and the Arriflex for a Zeiss Ikon Movikon 16, the latter with an interchangeable sliding device for three lenses. The Arriflex was just too big to operate effectively from the back seat of a Messerschmidt 110 fighter plane. The change from the Leica to Contax was based on a personal preference. He was able to get 8.5 cm and 5 cm Sonnar lenses for the Contax.

Jakobsmeier was able to set up a darkroom at all of his locations, and he developed and printed his own film. The prints and movie film were sent back to the Luftwaffe Photo headquarters in Berlin with exact documentation of what or who was photographed. Much of his Movikon material from Africa appeared in the newsreels that appeared in the movie theaters, and when he returned home on leave or read his mail, he found he was a bit of a celebrity on account of that.

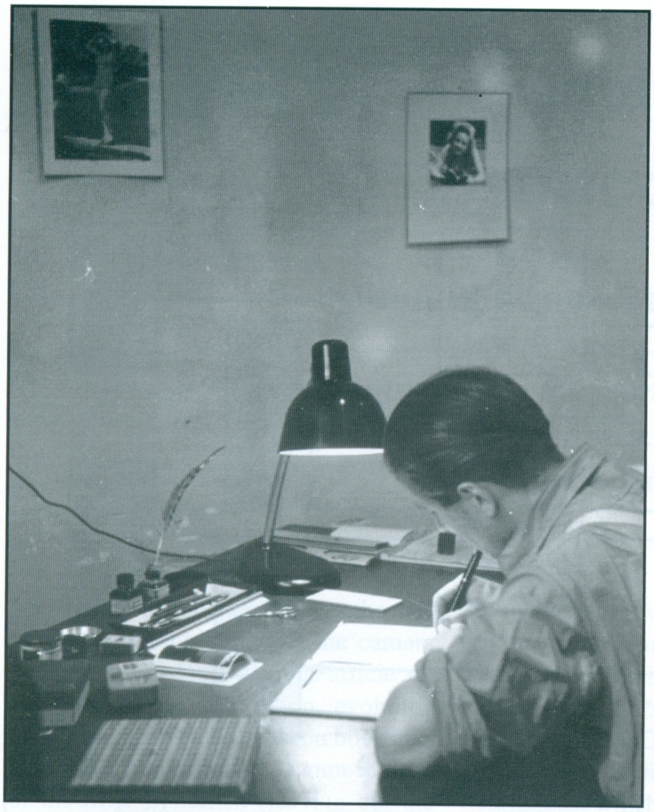
Jakobsmeier was accompanied by an artist who would draw pictures for local use and for returning to the Berlin headquarters. He still has some pictures of the desert camps, military installations and aircraft that he lived in and around, and he photographed a few of the important personalities of the day such as Field Marshall Erwin Rommel. When the Allied Forces gained the upper hand in Africa in 1943, he was moved back to Sicily and when the Allies came there too, he evacuated himself and his equipment in a specially designed amphibious Volkswagen car that forded the two kilometers to the mainland of Italy. The larger boats that were making this crossing were strafed and sunk. He traveled back up to Berlin and was later stationed in Wiesbaden. In all of his assignments, Jakobsmeier was usually the only photographer and was thus able to control his situation. He would commandeer a location that would support a darkroom and an office, usually taking over a bathroom in a hangar, and was pretty independent from the other personnel.

Most of the time he would go out on assignments largely of his own choosing. He could gain transport via plane in the early part of the war and so returned a few times to Germany from Africa to get photographic supplies. When he got back to Italy it was easier to travel via train, which was convenient because his family was still in Jena, a stop on the route from the south to Berlin where he could get his supplies.

Marriage and peacetime

In Wiesbaden he met a girl named Marga and after a few months, their relationship became serious and an engagement party was held at a large local hotel. They were married a few months later but, in the meantime, he was told to go to France, to the airport at Orly, south of Paris. He and an associate went unescorted and unarmed via train at about the time of the Normandy invasion. On the return trip, he purchased a large supply of French lipstick at a department store in Paris and brought it back to his bride. Soon after their marriage in 1944, Marga became pregnant and, with the war coming closer to Wiesbaden, they brought her to Jena, which was clearly safer at the time. His position in Wiesbaden also became untenable and so he was ordered back to Berlin and was soon traveling to Bavaria.

When the word came out that Hitler had been killed, Jakobsmeier assumed that, since he had sworn allegiance to the Führer, he was no longer a soldier and therefore he began to make his way back to Jena. Arriving home, he found that his daughter, Julie, had been born on the day that the Americans entered



Jakobsmeier in his office in Wiesbaden.

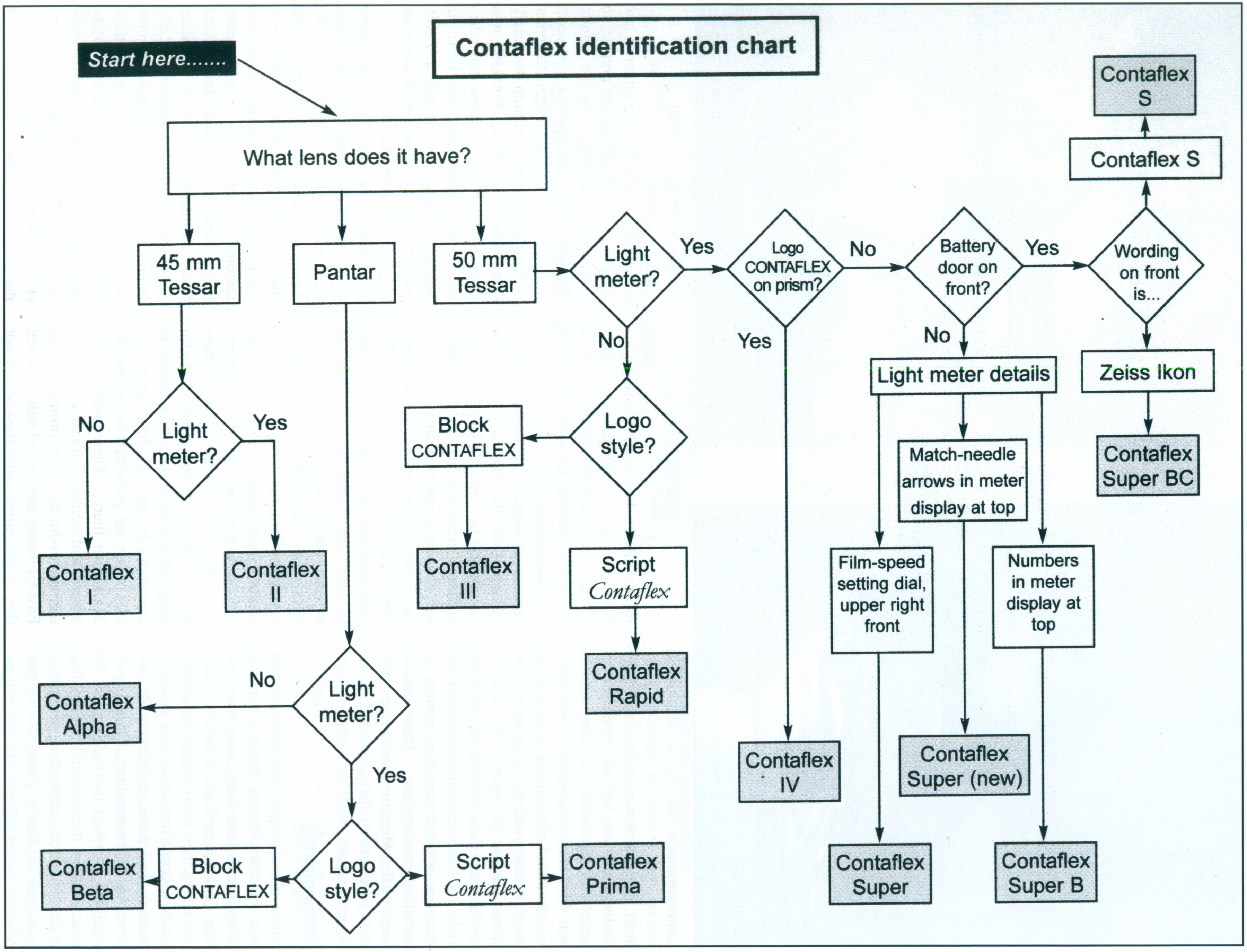
Fritz and Marga in Lubbock, Texas.

Jena. There was work to be done in the factory and since he had completed his apprenticeship in the marketing area, it was there that he was placed. After two months, the Americans left Jena without much warning and the Russians walked in soon as the Americans left. Jakobsmeier was soon writing up massive orders of technical equipment that the Russians wanted, and they wanted an awful lot of everything. There was no hope of regaining his scholarship since the government that provided it no longer existed.

Watchmaking

Some months later, Jakobsmeier sent his wife back to her father's home in Wiesbaden where things were more stable. On her arrival, she found the building where they lived, which included a jewelry store (her father was a watchmaker), had been completely demolished by Allied bombing. Marga's parents had survived the bombing in the basement but the shop and the building were a total loss. Somehow, the family managed to find a place to live and Marga's father began his business again from scratch. He foresaw the problems with living in the Russian zone and kept Marga and the baby with him. He then created an address and a bank account for Jakobsmeier in Wiesbaden. At an appropriate time, Fritz applied for permission from the Russians to join his family, and because Marga's father had created a record of his domicile there, he received permission from the Russian General Dobrowolsky to join them. When he was questioned en route, Jakobsmeier claimed that he was going to Jena from Wiesbaden instead of the reverse and he was "turned back" to Wiesbaden. At this point Fritz now had a wife and daughter to support and there was no good reason to go back to Jena. He knew that the senior members of Zeiss had been evacuated to Heidenheim to the south in Baden Württemberg, but there was no point in trying to join them because he had heard that they were not permitted to restart the Zeiss firm there. There were further stories that some of those Zeiss staff members who had been brought out of East Germany committed suicide when they heard rumors that they would not be permitted to work. His father in law suggested that Jakobsmeier prepare to become a watchmaker in the family business, and so he spent a few years learning the trade and began to repair watches under supervision in the family shop. He felt that watchmaking was quite easy for him, because the tolerances were much larger than those he had been taught to work with at Zeiss, and after a few years he became an accredited watchmaker.

In the years that he spent being accepted in the watchmaking trade, Jakobsmeier made many friends in the American military. With their help he and the family immigrated to the US in 1952 and began a family business in Lubbock, Texas. Fritz became a member of the community and a trustee of Texas Tech, a university with a sprawling 3,000 acre (1200 ha) campus in the city of Lubbock. Fritz and Margie have now retired from the watchmaking business, although he still repairs more than an occasional Rolex watch to permit their retirement and his interest in traveling to the exotic parts of the world, such as the Inca cities of South America. ❐


Contaflex identification chart
Start here.......
What lens does it have?
45 mm Tessar
Pantar
50 mm Tessar
Light meter?
No
Yes
Contaflex I
Contaflex II
Light meter?
No
Yes
Contaflex Alpha
Logo style?
Block CONTAFLEX
Contaflex Beta
Script Contaflex
Contaflex Prima
Light meter?
Yes
No
Logo style?
Block CONTAFLEX
Contaflex III
Script Contaflex
Contaflex Rapid
Logo CONTAFLEX on prism?
Yes
No
Contaflex IV
Battery door on front?
Yes
No
Light meter details
Film-speed setting dial, upper right front
Contaflex Super
Match-needle arrows in meter display at top
Contaflex Super (new)
Numbers in meter display at top
Contaflex Super B
Wording on front is...
Contaflex S
Contaflex S
Zeiss Ikon
Contaflex Super BC

Contaflex SLR instruction books

Paul Edstrom, Stanchfield, Minnesota

Owners' manuals for the many versions of Zeiss Ikon's popular single-lens reflex show as much variation and evolution as the cameras themselves.

Ah, The Instruction Book....the last resort when problems with the camera nearly overwhelm us. In this article we will look at the description, evolution and importance of instruction books for researching the thirteen 35 mm models of the SLR Contaflex (leaving out the Contaflex 126 as I think it should be treated as a separate system). The books themselves are just as important, historically, as are the cameras in the history of Zeiss Ikon. They bring together information associated with the particular model, relevant photographic knowledge of the time, accessory equipment and the Zeiss numbering system all in one handy pocket-size manual. Here we will be interested primarily with the characteristics of the instruction book, leaving camera identification out except as it reflects on these books. I have made every effort to ensure the accuracy of the data presented, but I know that there may well exist information unknown to me.

The thirteen models

There are thirteen primary models of the Contaflex SLR, and each instruction book gives a good description of the one for which it is written. The models are, in the approximate order of introduction, I, II, III, IV, Alpha, Beta, Rapid, Super (first), Prima, Super B, Super (new), Super BC and S. Contaflex I and Contaflex II have several distinct model variations, which are identified to some degree in the instruction books.

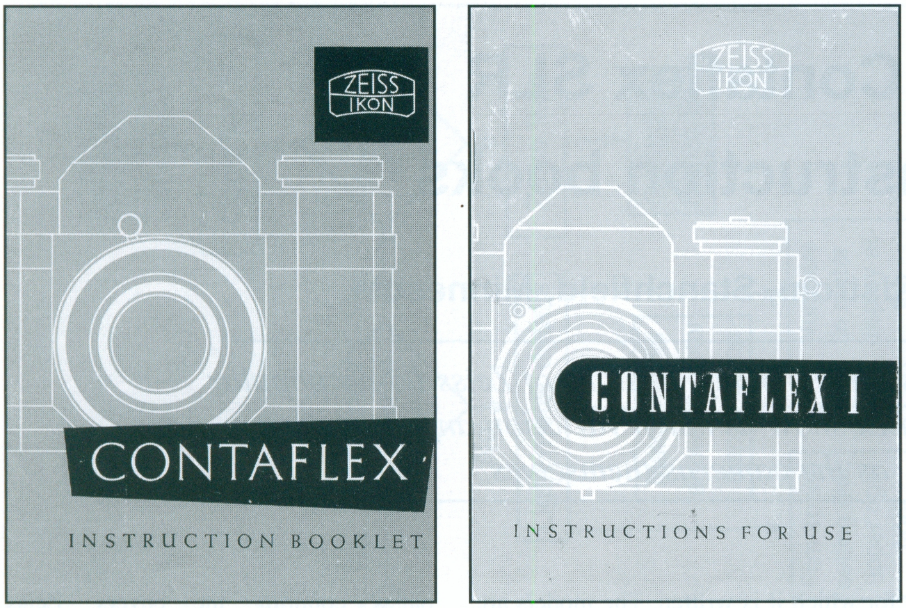
The Contaflex I came in four distinct designations in the dealer literature, and for purposes of instruction-book research we can divide it into two main classes by the absence or presence of X flash synchronization. The first two designations did not have X sync and the second two did. The Contaflex II was initially produced with a two-range light meter, and the instruction book goes into great detail on how and when to use either range. The Contaflex Super B and Super (new) each come with either the Synchro-Compur or Synchro-Compur-X shutter. The remaining models are reasonably consistent within each model, although there are still a few very minor differences.

Physically the instruction books evolved over time just as the cameras did. The ones for models I and II were 10.75 cm × 14.85 cm (4.2" × 5.8"), while the later models for Super B, Super (new), Super BC and S were 9 cm × 14.6 cm (3.5" × 5.7"). This doesn't sound like a lot, but the narrower size is much easier to fit into a shirt pocket. The thickness changed with a reduction in page numbers for the latest models. Six models, I through Beta, had 44 pages counting the covers. Zeiss seemed to like to do this as the first inside page is numbered 5! That is because the front and back cover each has a fold-out page with information that may be handy while the instruction book is opened to an internal page. Zeiss starts counting with one and two as the outside front cover and its flap, and three and four as the inside of the cover and flap. Similarly, the back cover, with a flap, counts as four pages. The Super (new) is the shortest with 16 pages, while the Super BC and S have 20 and the Super B has 24. The Rapid and Super (first) have 48 pages, making them the longest. The longer instruction books need the additional pages because of detail incorporated on the use of many of the accessories such as lenses, filters, Proxars, Steritar, flash, and so on.

Front and back covers

The cover itself has also changed over time. Three main cover colors were used, beginning with an odd tan/pink/salmon hue on the six models I through Beta. If several instruction books are placed side by side it is evident that there are variations in hue and intensity. Whether this is due to printing variations or sunlight exposure or just aging of the inks is difficult to determine. The second color scheme, based on blue, was used for the Rapid, Super (first) and Prima. All the books from I through Prima have an outline drawing

◀ **All the SLR Contaflex models** in a flowchart to assist identification. For the chart to work properly, you must start at the top left corner ("What lens...?") and proceed according to the arrows until you reach one of the gray boxes that identifies each model.



Front covers of two Contaflex I instruction books, with and without the model I identifier. (On the left, 1954; on the right, 1955.)

of the particular camera on the front cover. On the Rapid and Super (first) the camera is yellow, on the Prima it is red and on the I through Beta it is the same color as the rest of the cover. The covers on the rest of the lineup from Super B through S are in combinations of red, black and white. All of these except the S have actual photographs of the camera on the front. The S is primarily red with "Contaflex Super BC" near the bottom and no picture on the front.

The back cover is the key in identifying when the instruction book was published. Zeiss Ikon, like other German (and Russian) publishers, had a habit of assigning an identifying number and date to just about every piece of paper they published. That makes research so much easier and straightforward. The instruction books from I through Prima have a consistent pattern of placing the date code near the bottom right corner of the back cover and the camera model number near the bottom left. The date code is readily identified by its constant four digit format in the form of MMYY where MM is the month and YY are the last two digits of the year. The English-language versions also have an author's name near the bottom. The few examples in this study of German and Swedish-language books do not identify an author.

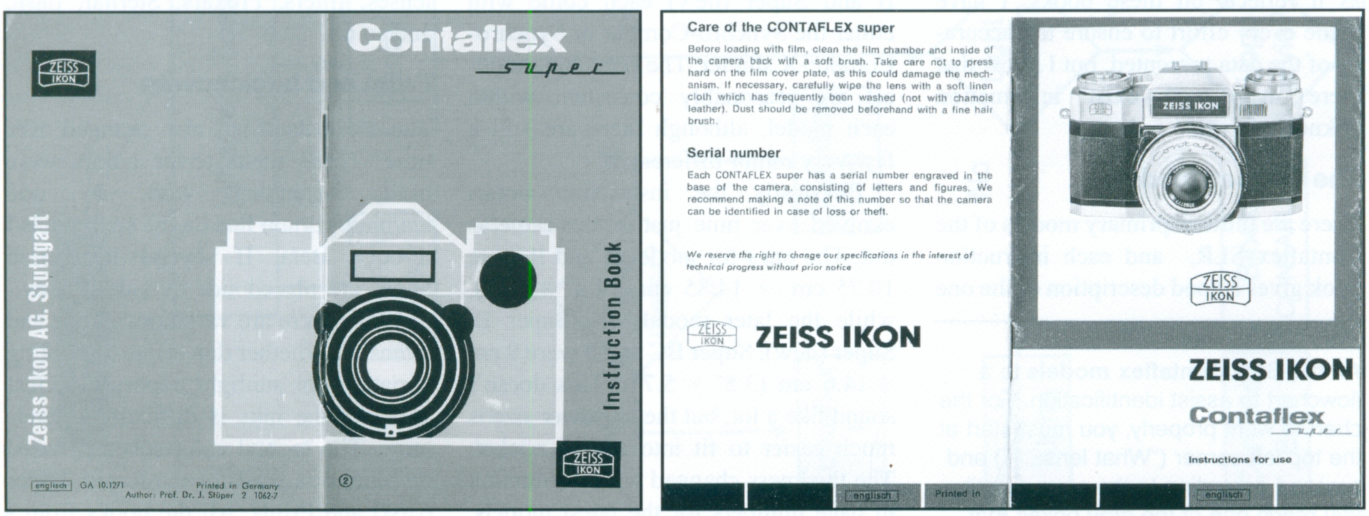
A very friendly and helpful feature of these instruction books is the foldout front cover with a picture of the camera and identifiers pointing to the controls and features. The corresponding list is sometimes on the foldout leaf (earlier examples), page three and sometimes on the next page to the right, page four. The back-cover foldout is a continuation of the list of controls and a different view of the camera.

Text and charts

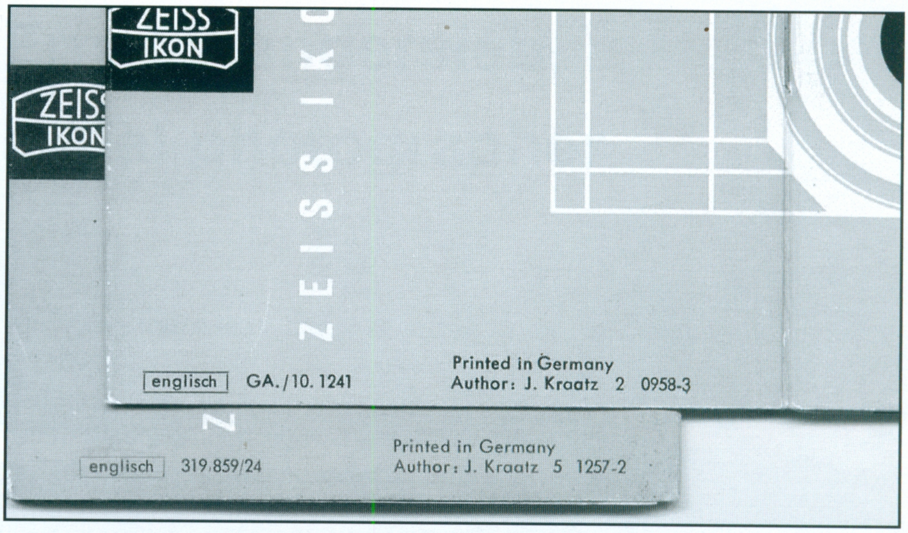
As might be expected the first part of the main text is a detailed explanation of how to use the camera. Operation of the controls is covered very carefully, with an order of presentation pretty much as needed to put the camera in use. The assumption is that the user has only a passing acquaintance with cameras and photography. A single sheet equivalent to today's "quick start guides" would have been helpful for the serious user.

Somewhere in the book, occupying at least one page, is a depth-of-field chart to guide the user in this difficult-to-discern area. The earlier instruction books also had a conversion chart for the different film-speed schemes a user might need to use. The early ones listed five: ASA, Scheiner European, Scheiner USA, Weston and DIN.

The middle group of instruction books had several additional charts thought to be beneficial to the user. The



Instruction books for the first Super and the Super (new), opened out to show front and back. On the left, 1962. Right, 1965.



Back covers of two Contaflex instruction books, showing old (below) and new (above) model numbering schemes. Below, 1957; above, 1958.

> *A Conciliatory Proposal*
>
> We are convinced that you would like to have a look at the "intestines" of the CONTAFLEX, that you are interested in the internal mechanism of this little wonder of optical and mechanical precision. You would like to know what makes it tick? Wouldn't you? But, please, don't try to open the camera with pliers and screwdrivers, the CONTAFLEX would certainly not agree with it. We quite understand this longing and for this reason we have published a cross section of the camera on the last page of this booklet. There you can clearly see the light rays coming through the lens being supplied to the eye by way of the mirror and the viewfinder. The numbers of this drawing refer to the following parts:

Translation humor from an early manual for the Contaflex model I (1954). The text excerpted here goes on to show a numbered list of parts in a sectioned drawing inside the back cover.

flash-bulb chart for X and V, or M shutter settings was probably useful to many, but the Proxar supplementary lens focus distance and reduction ratio probably saw little use. The chart for Proxars used with the close-up Steritar B surely had very little call. The later books for the Super (new) and onwards eliminated many of the charts and descriptions that were already in the supplementary-equipment instructions.

The last several pages in most of the instruction books are devoted to the many accessories Zeiss had available. These included cases, lenses, flashes, filters, Proxar close-up lenses, Steritar stereo attachments, cable release, and microscope adapter. Later there were interchangeable backs, copy stands, projectors and more. Zeiss wanted the user to be aware of the many uses of the camera system. Coincidently they might make some additional profits in the bargain.

Model changes

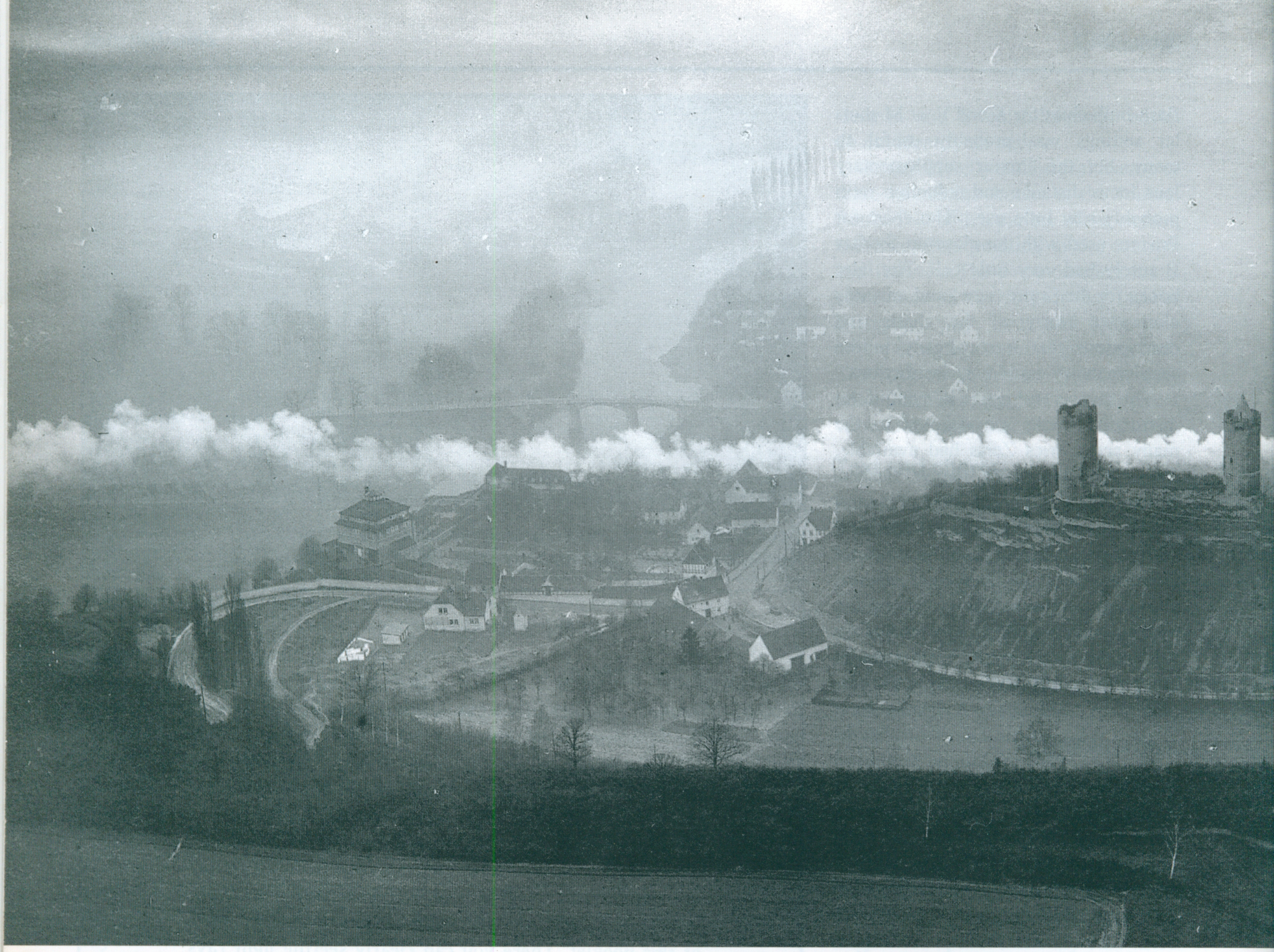
There were a couple of peculiarities to be dealt with in the instruction books during model changes. The first is with the Contaflex II, which was initially released with a dual-range light meter. The book takes three pages to explain how to use it. The description is quite involved, but the light-meter implementation is definitely not user friendly. For this reason, or others, Zeiss changed the later model II light meter to a single range, with correspondingly simple instructions. At the time of the change there were apparently a number of the earlier instruction books in inventory that were not going to be thrown away. Zeiss therefore issued the old book along with an addendum sheet that does little more than modify the light-meter instructions. It is two sided and the size of a normal page so that it can be conveniently tucked in and kept for use. As with most other literature a number and date code are assigned.

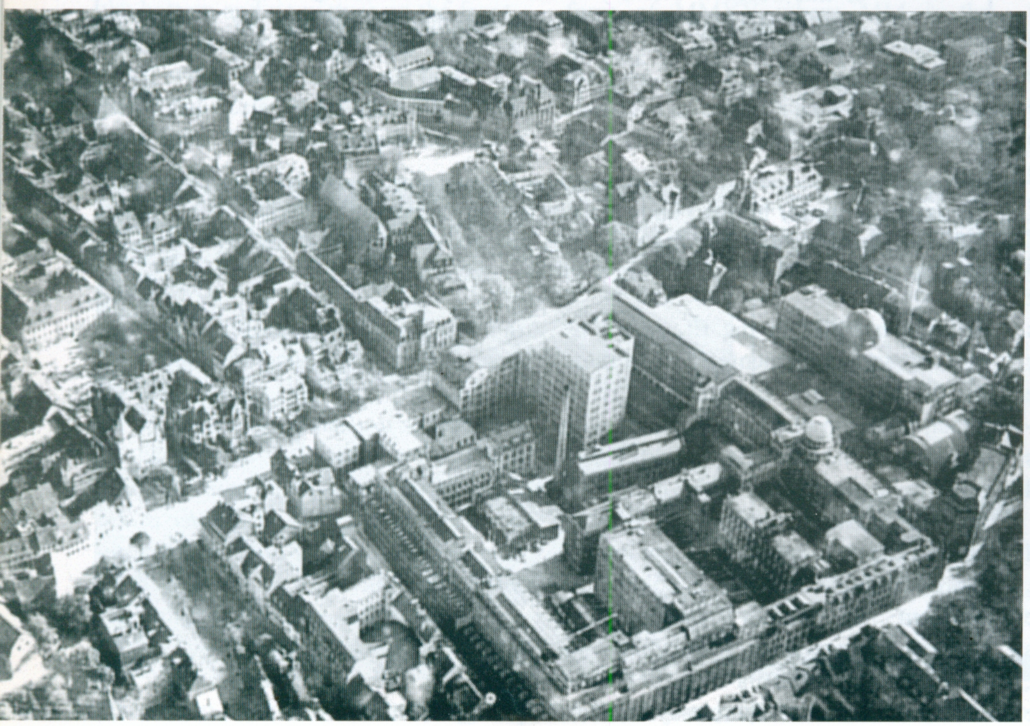
The second model change required major changes in the instruction books. During 1958 the Rapid superseded the III with significant appearance changes but few functional changes. Again, there was apparently excess stock of the instruction book for the III, so a new method was implemented to use them for the new Rapid camera. A piece of paper, white on black, was printed with a picture of the Contaflex Rapid. It was sized to be pasted over the Contaflex III on the existing books and thereby change them to match the new model. An addendum sheet again solved the problem of minor discrepancies between the new and old models. This new sheet also had its own identification and date code. There may be additional addendum sheets for other purposes, especially in other languages.

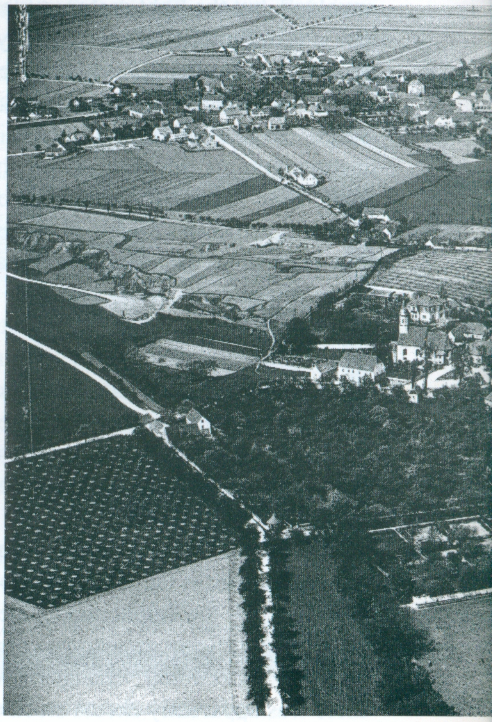
* * *

I would like to thank Larry Gubas for his help and consultation on this article and especially for reference to several instruction books I don't have. The reader is also referred to a three-part article on the Contaflex SLR cameras in issues III/98, IV/98 and I/99 of the magazine Photo Deal (www.photodeal.de), written by Bernd Otto.

I can be contacted by email at: paul@edstrom.net ❐







Ernst Wandersleb, aerial photographer

Well known as a lens designer for Carl Zeiss Jena, and manager of the photographic division from 1911 until 1939 (see the profile by Larry Gubas, *Zeiss historica,* Spring 1999), Ernst Wandersleb was also a keen photographer himself. Not only that, he was also a mountaineer, supporter of choral singing and other musical pursuits — and balloonist!

The photographs reproduced here are just three of many he took during balloon flights over Thuringia and Saxony, and occasionally as far afield as the Baltic and the Alps. They were taken with a Minimum Palmos 9 cm × 12 cm camera fitted with a Tessar 15 cm f/6.3 objective.

The top picture was taken on 11 December 1910, above Camburg, as an early-morning train passed the ruins of Burg Saaleck.

Below left is an aerial view of Jena showing the Zeiss works in 1910.

Below right is the village of Glaubitz, near Riesa, as seen from an altitude of 100 m.

These photographs, and several others by Wandersleb, were reproduced in *Innovation, the Magazine from Carl Zeiss,* no. 12, February 2003, as part of an article by Heinz-Peter Brogiato and Katarina Horn of the Institute of Regional Geography in Leipzig.

We are indebted to Dieter Brocksch of the Technical Information Center, Carl Zeiss Oberkochen, who made the photographs available to us, and to Brogiato and Horn from whose article the summary information given above was drawn. ❐

Hartmut Thiele's *Fabrikationsbuch Photooptik Carl Zeiss Jena* and the real world

Charles Barringer, Haddonfield, NJ

Detailed study of the information on lens serial numbers contained in this book, and comparison with independently assembled data, reveal some discrepancies in what is generally a very useful compilation.

I have had a long-term interest in the various Zeiss firms producing lenses for photography, in Zeiss Ikon, and in the serial numbers with which these firms (among others, of course) uniquely identify their products. As many of you are aware, I have for many years been compiling a list of Zeiss photo lenses of all origins and types, and it now includes information on more than 27,000 lenses. Thus, when Hartmut Thiele's *Fabrikationsbuch Photooptik Carl Zeiss Jena* appeared in 2002 I had great hopes for profound revelations in this field. I had hoped the information in Thiele's book would complement the data in my own list in a way that would reveal some of the hitherto hidden secrets of the connections between dates and serial numbers, quantities of the various types and specifications produced, the beginning of systematic T-coating, quantities of lenses produced in various mounts, evolutionary design changes, and so forth.

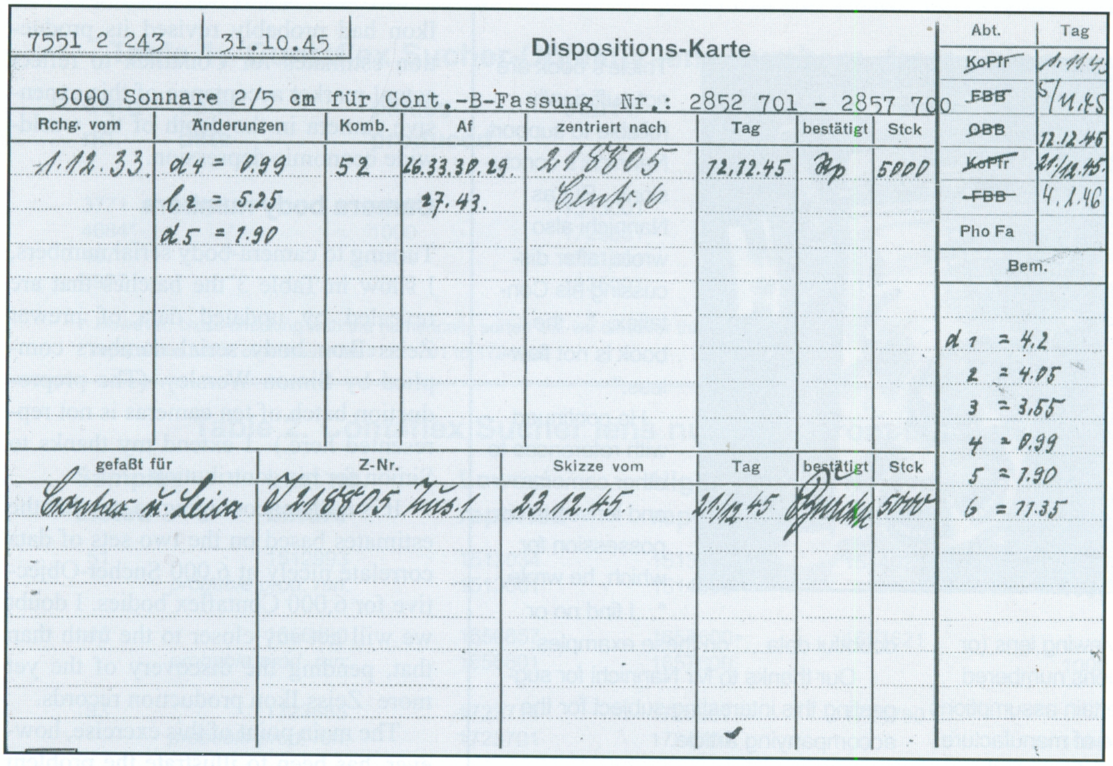
My main interest is in the era corresponding to the existence of Zeiss Ikon as a camera maker, 1926–1972, constituting the first two thirds of Thiele's purview. After analyzing and working with the book for more than a year, I can assert that the dating question is nicely dealt with. However, at least for the period of my main interest, a frustrating proportion of the information inscribed on the cards constituting the basis of Thiele's work is unclear, inconsistent with observed data, wrong, or missing. Because there have been a major war, at least two substantial regime changes, and radical changes in Zeiss's corporate structure and in manufacturing technology during that time, the preservation of the Zeiss lens-production cards and their discovery in these early days of the new millennium verges on the miraculous. That there are lots of holes, gaps, and mistakes during this period should be considered normal, and I accept this. But I will also continue to keep my own records to provide, as much as possible, a reality check for the factory records, as well as to document production by other Zeiss factories.

I do not wish to imply that there is only spotty information revealed in Thiele's lists. There are Tessars ad infinitum, and enough Pancolars and Sonnars, Tevidons and Biotars, to satisfy the most avid Carl Zeiss Jena enthusiast. Nor is this article a blanket condemnation of the book or its contents—far from it. Thiele is an essential reference compilation for anyone interested in the production of photographic lenses between 1926 and 1990 at Carl Zeiss Jena. Most of the lacunae are due either to the disappearance of some cards or their separation from the "mother lode," or to changes that might have occurred after the cards were written but prior to the final release of the lens to the market. Unfortunately, other inconsistencies seem to be internal to the database used to create the compilation, making it difficult to place one's entire trust in the document.

So when one of our members submitted a brief article explaining his fascination with Thiele and how he had found it useful in several respects relative to his own collection of Zeiss and Zeiss equipment (see box, page 16), our Editor, knowing my interest in the topic, passed the draft along to me with a few questions. Studying the article I came to the reluctant conclusion that the author's observations constituted a perfect example of the need for Thiele to be taken cautiously, of the need to compare the data, if possible, with observed data to provide the basis of any really meaningful conclusions. Using the author's example of the Contaflex TLR, let me walk you through the process.

A case history

The twin-lens Contaflex is a perfect object of study for several reasons. First, by most estimates, not very many of them were made. Second, each camera has a Zeiss Ikon serial number on the body, another number on the fixed Carl Zeiss Jena Sucher-Objektiv (viewing lens), and a third number on the



7551 2 243 | 31.10.45

Dispositions-Karte

5000 Sonnare 2/5 cm für Cont.-B-Fassung Nr.: 2852 701 - 2857 700

Rchg. vom	Änderungen	Komb.	Af	zentriert nach	Tag	bestätigt	Stck
1.12.33	d4 = 0.99	52	26.33.30.29.	218805	12.12.45	Hp	5000
	l2 = 5.25		27.43.	Centr. 6			
	d5 = 1.90						

Abt.	Tag
~~KoPfr~~	1.11.45
~~FBB~~	5/11.45
~~OBB~~	12.12.45
~~KoPfr~~	21/12.45.
~~FBB~~	4.1.46
Pho Fa	

Bem.

d 1 = 4.2
2 = 4.05
3 = 3.55
4 = 0.99
5 = 1.90
6 = 11.35

gefaßt für	Z-Nr.	Skizze vom	Tag	bestätigt	Stck
Contax u. Leica	V 218805 Aus. 1	23.12.45.	21/12.45	[illegible]	5000

A Zeiss "*Dispositions-Karte*" of the type studied by Hartmut Thiele. This particular one records a batch of 5,000 f/2 5cm Sonnars ordered in October 1945 and delivered in December of that year.

interchangeable taking lens. Third, Simon Worsley wrote an in-depth article about serial numbers of cameras and CZJ lenses (*Zeiss Historica*, Autumn, 1993) featuring, among others, this camera model well before Thiele came out, so independent corroboration also exists. Worsley has graciously furnished updated information for this article.

Remember that Thiele deals only with Carl Zeiss lens numbers, and not with Zeiss Ikon camera numbers (or dates), so let us take the unique element of the Contaflex, the 8 cm f/2.8 Sucher Objektiv, to scrutinize in cross check (yet again) how many Contaflex cameras were made. Thiele's data, taken from his alphabetical sort (Table 2 on his page 221) is shown in our Table 1.

Thus 5000 of these lenses were programmed for production between March 1934 and February 1936. An author's note in the Thiele compilation reveals that "Tenax 24×36" was the name of the forerunner of the Contaflex, unraveling that mystery, and no other 8 cm f/2.8 Sucher Objektiv lenses were made, helpfully avoiding confusion. And since we believe that Zeiss Ikon was the only client for this lens, it follows that the Sucher Objectives were delivered soon after fabrication and, at some later time, installed on Contaflex cameras.

Comparison with another list

Turning to my own list, I have assembled the data about this lens in Table 2. In that table, "Last no. before" and "Next no. after" designate the nearest lens or camera of different specification, thus setting the "bookends," that is, the limits on the production batch in question.

Comparing the two tables, we can see that Thiele and I agree on the first batch. The lenses reported to me in that group are relatively evenly distributed from the lowest unit through the highest, there are no "interlopers" (other lens types within the group under consideration), and the "bookends" are tight, leading me to the conclusion that the respective batches can be extrapolated to meet at 00/01. This satisfies the assumption that, whenever possible, allocations of number groups were made to start and end at "round" numbers.

The second batch, entirely missing from Thiele, can be defined from my list as probably going from 1656601 to 1657600, for 1000 lenses. Thiele supports this hypothesis, showing a batch of 3 cm f/2.8 Tessars ending at 1656600 and a short run of 19 cm f/3.5 Tessars beginning at 1657601.

The third batch correlates well, once the curious and disturbing internal inconsistency mentioned above in my footnote to Table 1 (where the data on the same card is listed differently in two lists) is factored in. We also agree on the bookends of the run.

The fourth batch presents problems that are not so easy to explain. I deduce a batch of 1000 Sucher Objectives from 1752701 to 1753700, a gap in Thiele between a group of various lenses made in batches of one or two each and 1000 f/1.5 5 cm Sonnars for Contax. As shown, I have no data immediately below 1752701 but I do have a run of 5 cm f/1.5 Sonnars just above.

(Demonstrating another frequent inconsistency in Thiele, my list shows these Sonnars as being for both Contaflex and for Contax. I have many

Yasuo Nannichi of Toyama, Japan, a longtime Zeiss Historica Society member, sent me a brief note last year that contained this illustration of his TLR Contaflex and some details about it. Specifically, he examined the data in Hartmut Thiele's book on the taking lens, a 5 cm f/2 Sonnar, number 166016X, and the viewing lens (or Sucher), an 8 cm f/2.8 lens numbered 172447X, and made certain assumptions about the camera's date of manufacture.

As Charles Barringer shows in the accompanying article, the data in Thiele's book are not sufficiently reliable to support Nannichi's conclusions. But as Nannichi also wrote, after discussing his Contaflex, "…the book is not flawless."

He continued with references to other cameras and lenses in his possession for which, he wrote, "…I find no or doubtful data…" on these examples.

Our thanks to Mr Nannichi for suggesting this interesting subject for the accompanying article.

—John T. Scott

examples of production runs of lenses listed by Thiele in one mount (most often Contax) being reported on other Zeiss Ikon "miniatures." This discrepancy between observed data and those on the lens cards studied by Thiele suggests that Zeiss Ikon received lenses from Jena without mounts and then performed the mounting in Dresden according to their production needs.)

The fifth and seventh reports probably represent either mistranscribed or misreported numbers (for example, 1755… instead of 1753…), or lens types (Sucher 8 cm f/2.8 instead of Sonnar 5 cm f/2). Sometimes the probable correct alternative is obvious; if the two lenses shown as 1755… are interpreted as 1735…, they fit nicely in the preceding batch, and it is easy to understand how the 3 and the 5 could be confused. Sometimes, as with number 1831631, there is no easy explanation.

Thiele and I agree on the sixth run from 1781001 to 1782000.

The last batch shows another discrepancy. The first 1000 listed in Thiele correlates well with my list, but there is not a single correlation in the second thousand. However, there are no other lenses shown in that number range, either in Thiele or in my list. I interpret this to be an example of Zeiss Ikon's having cancelled the order for the second 1000 lenses after the numbers had been assigned by Carl Zeiss Jena. This seems especially likely, because this is the last run on record; by then Zeiss Ikon had probably revised its production estimates for Contaflex to reflect actual market acceptance of this expensive camera in the depth of the worldwide economic depression.

Camera body numbers

Turning to camera-body serial numbers, I show in Table 3 the batches that are revealed by updated data of prewar Zeiss Ikon body serial numbers complied by Simon Worsley. (The preproduction batch of ten cameras is not represented here.) I extend my thanks to Simon for his contribution.

It is quite encouraging to see that the estimates based on the two sets of data correlate nicely at 6,000 Sucher-Objective for 6,000 Contaflex bodies. I doubt we will get any closer to the truth than that, pending the discovery of the yet more Zeiss Ikon production records.

The main point of this exercise, however, has been to illustrate the problem that this sort of industrial archæology presents, even when dealing with what would seem to be pretty complete information. As is the case almost anywhere, quantity is no substitute for quality, and the sheer volume of data found and reported by Hartmut Thiele leaves tantalizing gaps whose significance is unfortunately out of proportion to their number.

Despite these problems, Thiele's compilation remains a truly significant step in the often thankless task of estimating production by Carl Zeiss Jena. Its existence gives me hope that more such data yet remain to be discovered in Jena, and prompts me to express the regret that nothing similar has ever been revealed for the postwar production of lenses by Carl Zeiss in Oberkochen.

Any and all serial number infomration concerning photographic lenses and products bearing the name "Zeiss" in any form, or related to cameras produced by Zeiss Ikon, are requested by the author to provide additional grist for this mill. Please contact me at charzov@comcast.net to provide data or for further discussion. My heartfelt thanks go to all those who have already contributed information, and thanks in advance for new participation. ❐

Fabrikationsbuch Photooptik – Carl Zeiss Jena, 2nd revised edition, can be obtained from:

Petra Kellers Photo/ACR Book Service,
15965 Forest Hill Drive, Boulder Creek, CA 95006, USA.
http://www.camerabooks.com

US list price $75.00; ZHS members receive their usual 10% discount.

Table 1. Contaflex Sucher-Objektiv lens numbers, from Thiele

Card no.	calc. date	pieces produced	start #	end #	mount	delivery date
3771	20/03/34	1000	1513001	1514000	Tenax 24×36	15/03/34
4684*	"	1000	1723001	1724000	Contaflex	30/08/35
4871	"	1000	1781001	1782000	Contaflex	07/12/35
4977	"	2000	1835001	1837000	Contaflex	18/02/36

* However, cross-checking with the numerically sorted list, we discover that Card # 4684 reports this batch of lenses from #1723701 to 1724700.

Table 2. Contaflex Sucher lens numbers, from the Barringer list

Samples Listed	Last no. before	Lowest reported	Highest reported	Next no. after	Estimated total produced
51	1512993	1513034	1513980	1514025	
	probable prod. run:	1513001	1514000		1000
45	1656490	1656657	1657600	1657621	
	probable prod. run:	1656601	1657600		1000
93	1723665	1723714	1724687	1724780	
	probable prod. run:	1723701	1724700		1000
39	1752310	1752709	1753628	1753757	
	probable prod. run:	1752701	1753700		1000
02	1755337	1755382	1755501	1755513	—
13	1780974	1781014	1781974	1782788	
	probable prod. run:	1781001	1782000		1000
01	1831472	1831631		1832781	—
17	1832781	1835025	1835962	1837109	
	probable prod. run:	1835001	1836000		1000

Table 3. Contaflex TLR body serial numbers

	Samples listed	Last no. before	Lowest reported	Highest reported	Next no. after	Est. total produced
A)	48	Y 83801	Y 84181	Y 85297	Y 86049	
	probable production run:		Y 84001	Y 85500		1500*
B)	55	Z 29583	Z 42002	Z 42976	Z 43064	
	probable production run:		Z 42001	Z 43000		1000
C)	42	A 45930	A 46001	A 46968	A 47247	
	probable production run:		A 46001	A 47000		1000
D)	50	A 49496	A 49503	A 50511	A 51475	
	probable production run:		A 49501	A 51000		1500
E)	27	A 75481	A 75528	A 76043	A 76979	
	probable production run:		A 75501	A 76500		1000

* Possibly 2000 units in this batch

These estimates presume that batches were made in increments of 500 pieces, based on observation. Although that is generally the case, sometimes batches of fewer than 500 cameras have been observed.

The Voigtländer Prototype 132 — the camera that might have changed the world

Bernd K. Otto, Frankfurt, Germany

Shortly after the Carl Zeiss Foundation took over Voigtländer in 1956, work ended on the development of a revolutionary camera that embodied features not found elsewhere for years.

During the late 1950's a reflex camera was constructed that was at the time clearly more advanced than anything produced by any other firm in the world. This camera can undoubtedly be regarded as a milestone in the development of camera construction, yet it is still unknown to most people today. Let us look into how this paradox came about.

Walter Swarofsky

In the course of my research into the development of the Icarex I had the opportunity of talking on several occasions with the designer of that camera, Walter Swarofsky. From him I learned of a focal-plane reflex camera that he designed, starting in early 1956, which at the time was called the Voigtländer Prototype 132. Swarofsky's team wanted to devise an SLR with outstanding technical features that would enable it to achieve profitable sales, even when competing with other products that might come on the market at about the same time.

If we look at what was available then, we find that Zeiss Ikon had the complete rangefinder Contax system and the SLR Contaflex of 1953 with its Compur shutter, but no focal-plane-shutter SLR. Leitz made the Leica IIIg and the M3, and eight years later, the Leicaflex. Developments at East German Zeiss had got as far as the Contax/Pentacon FBM by 1958.

Earlier versions of this article appeared in *PhotoDeal,* I (2000), in German, and in *Voigtländer Matters,* Summer 2001, in English. We are grateful to these two publications for permission to print.

All photographs appearing with this article are by Bernd Otto.

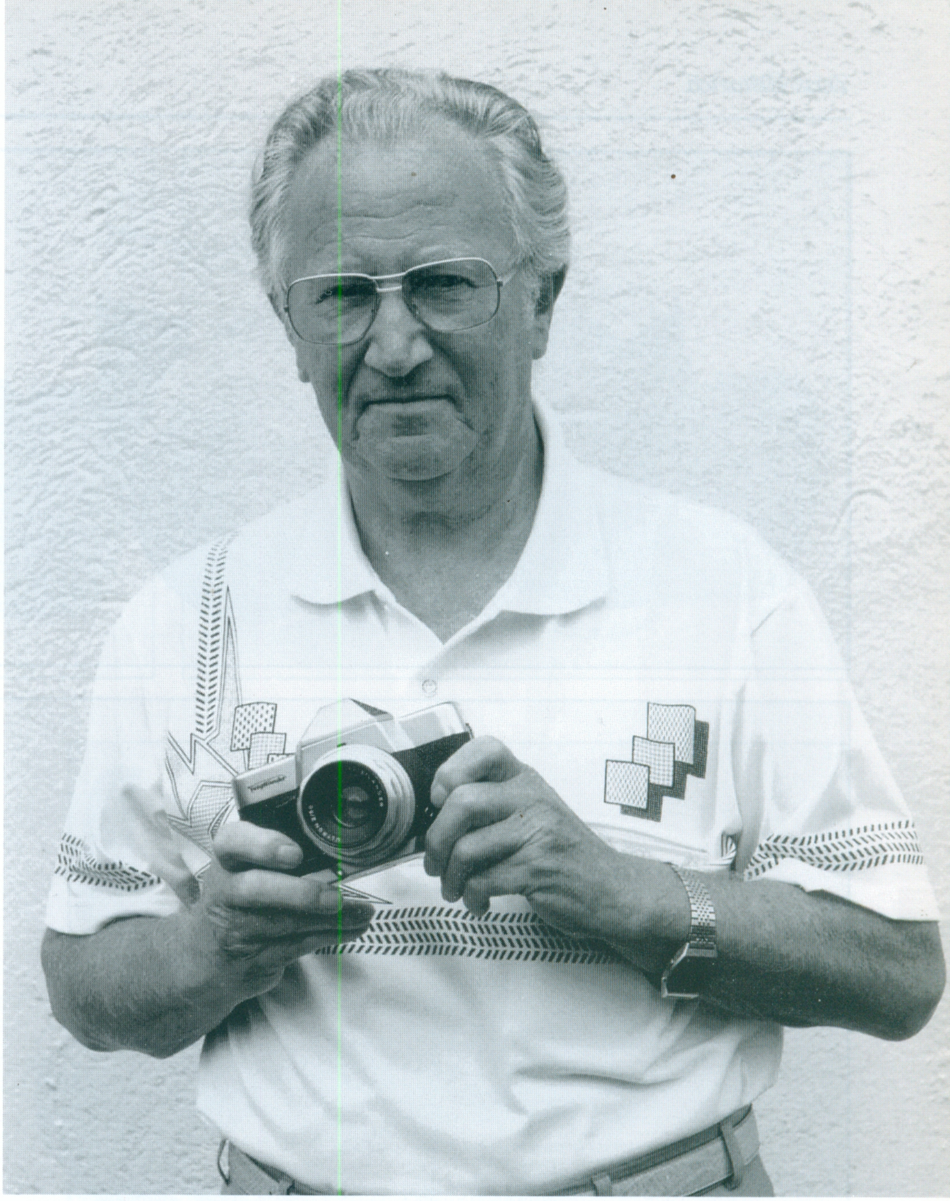
Zeiss takes over

In May 1959 further development work on Swarofsky's project 132 ended, and only two working prototypes still exist. By this time Voigtländer was no longer owned by the chemical company, Schering, and on 18 May 1956 the Carl Zeiss Foundation, totally without publicity, had assumed ownership of all the Voigtländer shares. Thus the Foundation controlled two camera manufacturers, Zeiss Ikon and Voigtländer. One would normally expect a sensible rationalisation between the two firms to reduce manufacture of similar items, sharing production and joint research, and in the general direction of business.

We can now see, however, that things went on unchanged after the purchase of Voigtländer, the most historic and oldest photographic manufacturer, just as they had after the big merger of 1926 (involving Contessa Nettel, Ernemann, Goerz and Ica).

Back then to the type 132. At Photokina in 1958 Zeiss Ikon premiered the new top-of-the-line Contarex, a combination of the best-selling Contaflex and the world-famous Contax, although it did not get to dealers' shelves until the beginning of 1960. I have given an extensive account of the Contarex (in Photo Deal III/95 to 1/96). By now, 44 years after its introduction, the Contarex still enjoys a high reputation among camera collectors. When one reflects that the aborted Voigtländer 132 camera influenced all the characteristics and technical qualities of the Contarex, one feels a strong sense of annoyance that it was never built.

What then does this camera have that other manufacturers were only able to introduce on their models years later? Outstanding, certainly, is the modern wholly enclosed and particularly elegant shape, with no protruding controls to spoil it. The hitherto universally employed cloth or metal focal-plane



Walter Swarofsky in 2003 with one of the surviving Prototype 132 cameras.

shutter was replaced by an entirely new metal slide shutter, containing a variable-width slot bounded by two sliders. The shutter mechanism controlled the opening slider, which, running across the film plane in the short time of 8 ms, permitted exposures as short as 1/1000th second and B. Moreover, flash synchronisation was possible at was then the sensational speed of 1/100th second. Only years later did Japanese firms, ignorant of this Voigtländer invention, succeed in producing similar mechanisms.

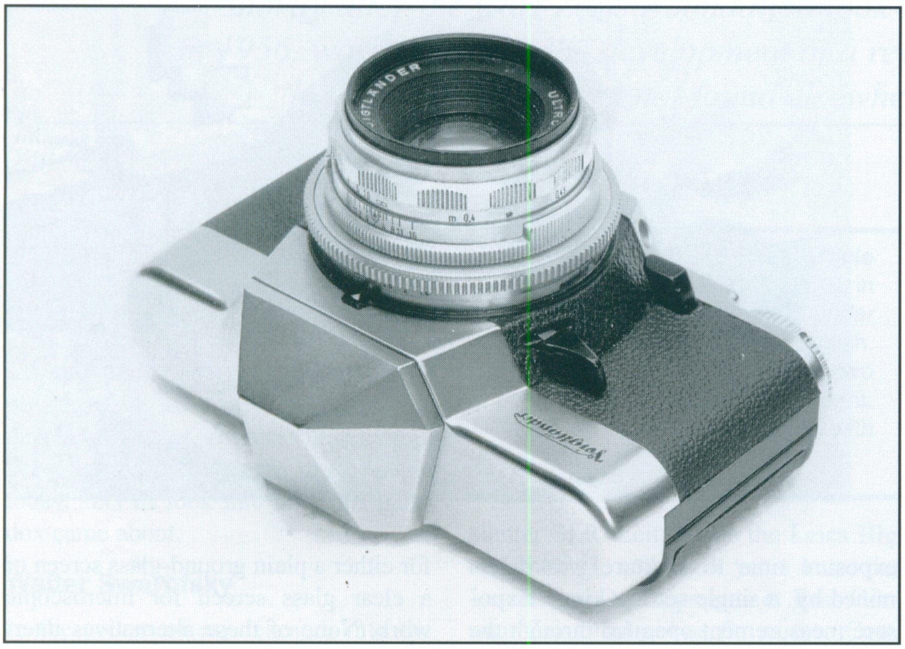
The Prototype 132 has an instant-return mirror that, after the exposure, opens the diaphragm up to full aperture. The Contarex also has an instant-return mirror but it does not re-open the diaphragm.

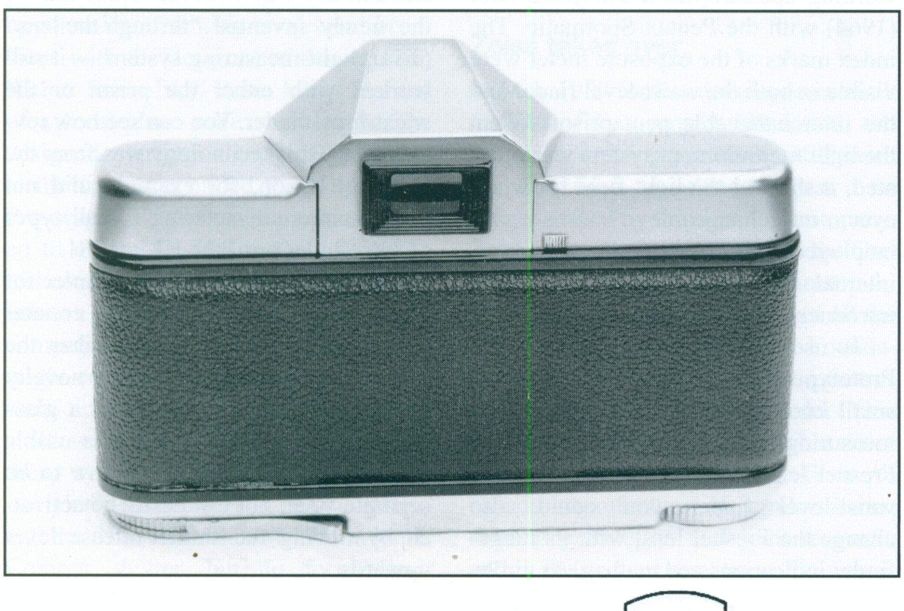
The light meter

There are both waist-level and prism finders for the 132 and they are interchangeable. In this case, how could a reliable light-meter system work? Not by an externally built-on selenium meter, such as in the so-called "Bullseye," but by a wholly new system whereby a CdS photocell held on the end of a rod was pushed into the light path behind the lens. The relationship of exposure time to aperture was determined by a single setting ring. Exposure measurement operated through the working aperture, as it did years later (1964) with the Pentax Spotmatic. The index marks of the exposure meter were visible in both the waist-level finder and the interchangeable pentaprism. When the light measurement system was operated, it showed the light field for whatever interchangeable lens was employed. For the Contarex range, internal light measurement was only introduced with the Super in 1967.

To use the light meter system of the Prototype 132, you had only to push a small knob, which in turn pushed the measuring cell over the middle of the Fresnel lens. As well as the prism and waist-level finder you could also change the Fresnel lens, with its rangefinder indications and matte glass circle, for either a plain ground-glass screen or a clear glass screen for microscopic work. None of these alternatives interfered in any way with the operation of the newly invented "through the lens" (TTL) light-measuring system — it still worked with either the prism or the waist-level finder. You can see how revolutionary this technology was from the fact that Nikon, for example, did not provide internal metering for all types of viewfinder until the F3 in 1981.

The type 132 has a film counter for 20 or 36 exposures, and the counter automatically returns to zero when the folding back is opened. Another novelty is that the film is held flat by a glass pressure plate. The self-timer is usable at all speeds and does not have to be separately set, but can easily be activated by moving the shutter release lever upwards.





After light has passed via the mirror, and the diaphragm has automatically closed down to the aperture value determined by the light meter, at speeds over 1/60 second one can revert to the original viewing situation, avoiding the break in finder image.

The proposed range of lenses

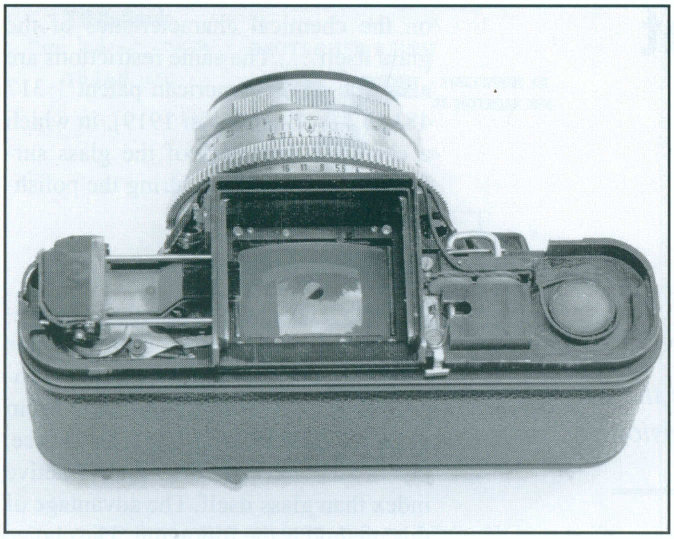
Along with the Skoparex f/3.5 35 mm lens, the Color Skopar f/2.5 50 mm lens and the Ultron f/2.5 50 mm lens were envisaged as the standard optics. The lens range was to be completed by an f/2.8 90 mm portrait lens and an f/2.4 200 mm long-focus lens, together with the f/4 135 mm Dynarex, and an f/2.9 36–82 mm zoom (a novelty in those days). Incidentally, the mechanism of this first push-pull zoom lens was designed by Swarofsky himself. In the surviving information sheet that remains with the two prototypes there is also talk of an f/5.6 500 mm mirror lens.

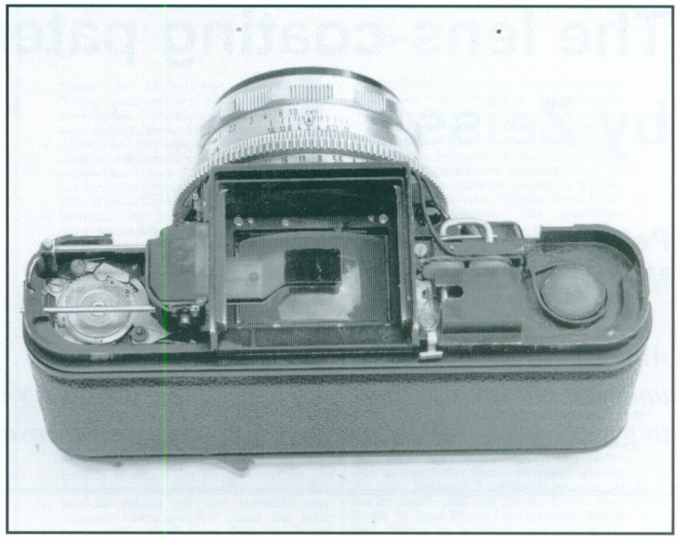
The 132 is made up of 607 components in two main groups. The camera housing with the shutter, the shutter wind, the film wind, and counting mechanism make up one group, and the mirror and its folding system and their actuating and control mechanisms, the iris system and self timer the other.

All the other components were fitted on to these two main groups and, because of good access for adjustment from above, they would have been easy to service. The price range at the time would clearly have been below 1,000 Marks.

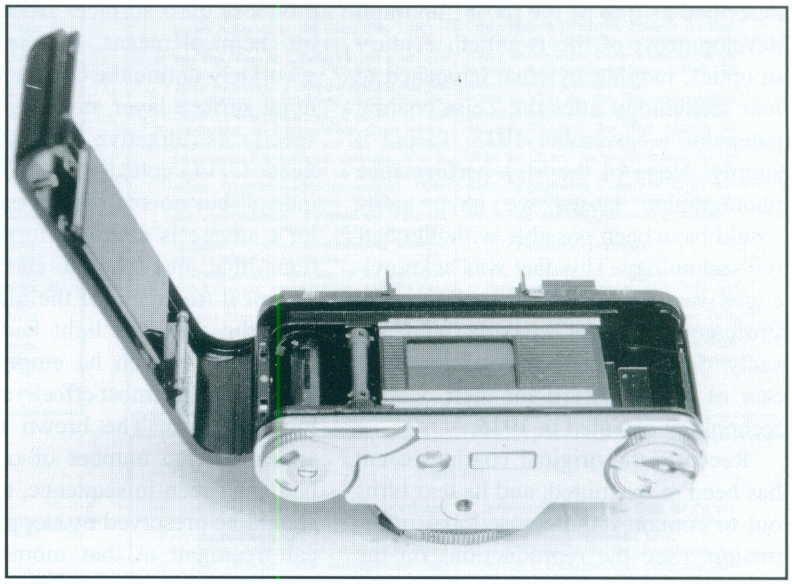
All in all, putting the type 132 into production in 1960 would certainly have had a worldwide effect on camera development. Those in charge of the business at that time, who were unable to recognise the technical innovations I have described and who made the wrong decisions, must bear a not inconsiderable share of the responsibility of the concern's later disasters. Even to have made use of these innovations in the Contarex range would have had a positive effect. ❐

◀ **Three views of the Prototype 132** showing its clean lines.

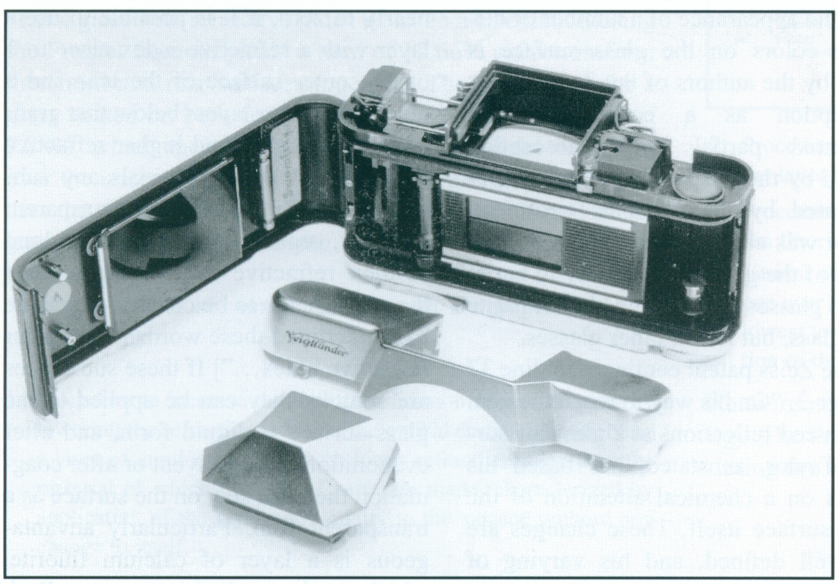




▲ **Two views of the light sensor,** retracted on the left and in metering position on the right. The movement is controlled by pushing the small lever beneath the shutter release, visible in the top photograph on page 20



With the back open, one can see the film-transport mechanism and the glass pressure plate. ▶



◀ **With the camera top and the prism housing** removed, the clean interior is revealed.

The lens-coating patent by Zeiss

Peter Hennig, Stockholm, Sweden
Milos Paul Mladek, Vienna, Austria

Already by 1935, the Carl Zeiss company of Jena understood that multiple coating of lens surfaces was the way to go to reduce reflections and increase light transmission.

Lens-coating technology could be described as one of the most important developments of the twentieth century in optics, judging by what happened to lens technology after the Zeiss coating patent of 1 November 1935. To put it simply: None of the high-performance photographic lenses we have today would have been possible without coating technology. This fact was acknowledged two years ago when Zeiss and Professor Alexander Smakula (who had, sadly, died in 1983), received the 2002 Star of Vision Award for their coating technology patented in 1935.

Recently the original coating patent has been re-examined, and its text turns out to contain rather sensational information. (See the reproductions on the next page.) This old patent fully covers modern multicoating technology as well as the original single coating.

Dennis Taylor's discovery

The Zeiss patent first describes what happens when a light beam hits a surface separating two transparent media with different refractive indexes, and explains the formula of Augustin Jean Fresnel (equation 2). From line 49 on, it relates the prior history from H. Dennis Taylor's British patent of 1904. Taylor looked at some old objectives and noticed that aged glass was more transparent than freshly polished glass. He quoted the Fresnel formula and stated that the improved translucency was probably due to a change of the refractive index of the aged surface layer of the lens (page 2, lines 5–7). Taylor then produced glass surfaces artificially aged by chemical means. But he could not accurately define the content of his artificial surface layer, nor was he able to specify its refractive index (the text, in lines 13/14, actually reads "reflective index," but no such index exists). Taylor's advice is confined to the instructions that one should carry through chemical treatment of the glass surface until the reflected light had a certain brown tint, which he empirically had found to be the most effective for reducing reflection. The brown tint would appear after a number of other colors had been seen in sequence, and the tint should be preserved by stopping chemical treatment at that moment, before even other colors might appear (line 25 on). The appearance of a number of different colors on the glass surface is taken by the authors of the Zeiss patent description as a consequence of unwanted partial color absorption caused by the unspecified surface layer generated by the chemical treatment. Taylor was able to generate the desired aging of the glass surface only in barite crown glasses and a single kind of barite flint glass, but not in other glasses.

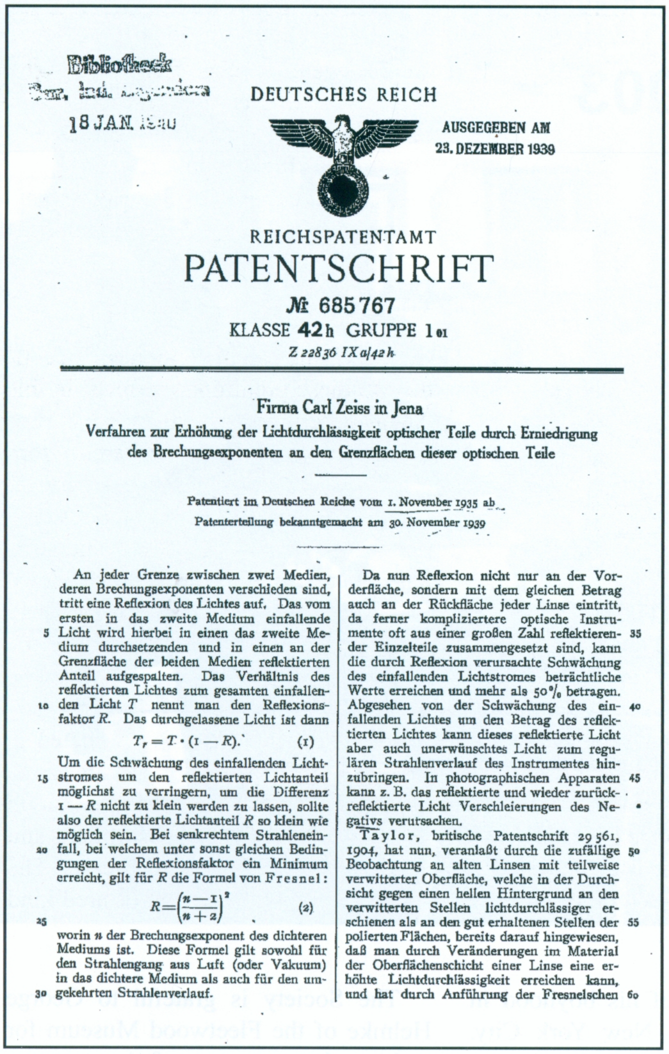
The Zeiss patent continues, at line 37 of page 2: "On his way to reach the goal of reduced reflections at a glass/air surface Taylor, as stated, has based his efforts on a chemical alteration of the glass surface itself. These changes are not well defined, and his varying of these surface changes depends entirely on the chemical characteristics of the glass itself….. The same restrictions are also true of the American patent 1 317 481 [by W. Bugbees in 1919], in which a chemical treatment of the glass surface is recommended during the polishing process."

The Zeiss concept

In line 55, the patent continues: "In contrast to these preliminary efforts, in this patent description an invention is proposed, in which layers different from glass are used to cover the lens surface, layers that have a different refractive index than glass itself. The advantage of this method is the following: The choice of the new surface layer can be made to give the desired refractive index for the given situation, and its specifications are totally independent of the characteristics of the glass that is to be coated. It can be well reproduced at any time. Coating substances may be used that do not cause any unwanted absorptions and thus no light intensity decrease. The layer may be put onto any desired kind of glass."

Multiple layers

At line 74 we read: "And finally it is possible to attach more layers on the glass surface, one after the other, of which each and every one has a refractive index lower than the previous one, which means that there is even the possibility of reducing the reflection losses nearly to zero, if it is possible to use a layer with a refractive index close to 1 on the outer surface of the lens and a number of other layers below that gradually have higher and higher refractive indices. As coating materials any substances can be used that are transparent for light, organic or inorganic, as long as their refractive index is lower than the glass that is to be coated. [Someone has underlined these words, "…a lower refractive index…"] If these substances are soluble, they can be applied to the glass surface in liquid form, and after evaporation of the solvent or after coagulation they can stay on the surface as a transparent film. Particularly advantageous is a layer of calcium fluorite, which can be applied in vacuum. Both



DEUTSCHES REICH

AUSGEGEBEN AM 23. DEZEMBER 1939

REICHSPATENTAMT

PATENTSCHRIFT

№ 685767

KLASSE 42h GRUPPE 1 01

Z 22836 IX a/42 h

Firma Carl Zeiss in Jena

Verfahren zur Erhöhung der Lichtdurchlässigkeit optischer Teile durch Erniedrigung des Brechungsexponenten an den Grenzflächen dieser optischen Teile

Patentiert im Deutschen Reiche vom 1. November 1935 ab

Patenterteilung bekanntgemacht am 30. November 1939

An jeder Grenze zwischen zwei Medien, deren Brechungsexponenten verschieden sind, tritt eine Reflexion des Lichtes auf. Das vom ersten in das zweite Medium einfallende Licht wird hierbei in einen das zweite Medium durchsetzenden und in einen an der Grenzfläche der beiden Medien reflektierten Anteil aufgespalten. Das Verhältnis des reflektierten Lichtes zum gesamten einfallenden Licht T nennt man den Reflexionsfaktor R. Das durchgelassene Licht ist dann

$$T_r = T \cdot (1 - R). \qquad (1)$$

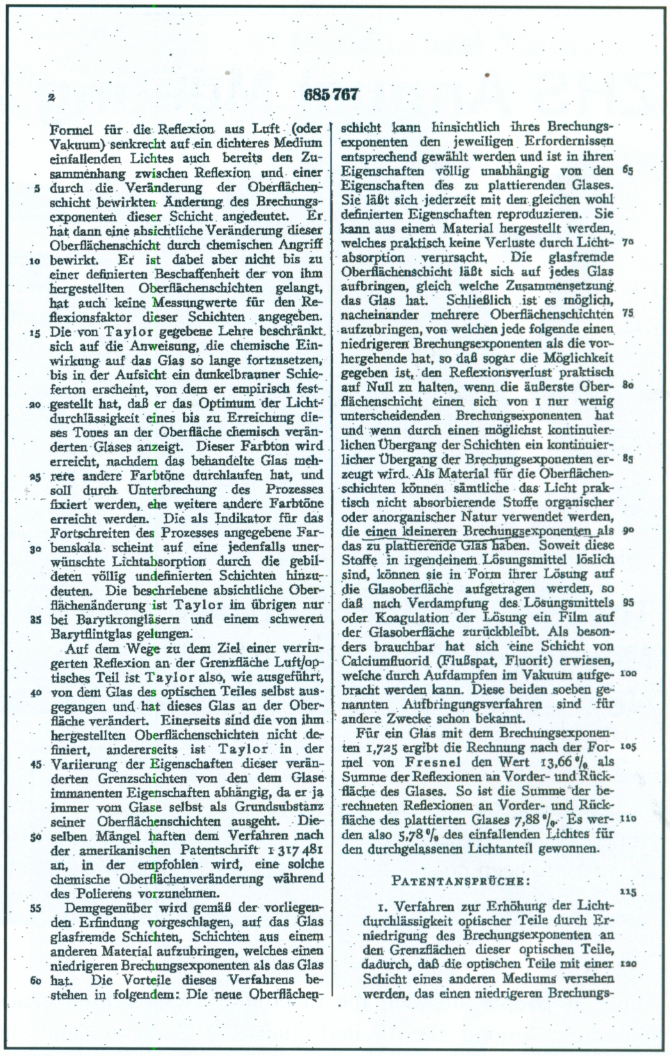
Um die Schwächung des einfallenden Lichtstromes um den reflektierten Lichtanteil möglichst zu verringern, um die Differenz $1 - R$ nicht zu klein werden zu lassen, sollte also der reflektierte Lichtanteil R so klein wie möglich sein. Bei senkrechtem Strahleneinfall, bei welchem unter sonst gleichen Bedingungen der Reflexionsfaktor ein Minimum erreicht, gilt für R die Formel von Fresnel:

$$R = \left(\frac{n-1}{n+2}\right)^2 \qquad (2)$$

worin n der Brechungsexponent des dichteren Mediums ist. Diese Formel gilt sowohl für den Strahlengang aus Luft (oder Vakuum) in das dichtere Medium als auch für den umgekehrten Strahlenverlauf.

Da nun Reflexion nicht nur an der Vorderfläche, sondern mit dem gleichen Betrag auch an der Rückfläche jeder Linse eintritt, da ferner kompliziertere optische Instrumente oft aus einer großen Zahl reflektierender Einzelteile zusammengesetzt sind, kann die durch Reflexion verursachte Schwächung des einfallenden Lichtstromes beträchtliche Werte erreichen und mehr als 50% betragen. Abgesehen von der Schwächung des einfallenden Lichtstromes um den Betrag des reflektierten Lichtes kann dieses reflektierte Licht aber auch unerwünschtes Licht zum regulären Strahlenverlauf des Instrumentes hinzubringen. In photographischen Apparaten kann z. B. das reflektierte und wieder zurückreflektierte Licht Verschleierungen des Negativs verursachen.

Taylor, britische Patentschrift 29 561, 1904, hat nun, veranlaßt durch die zufällige Beobachtung an alten Linsen mit teilweise verwitterter Oberfläche, welche in der Durchsicht gegen einen hellen Hintergrund an den verwitterten Stellen lichtdurchlässiger erschienen als an den gut erhaltenen Stellen der polierten Flächen, bereits darauf hingewiesen, daß man durch Veränderungen im Material der Oberflächenschicht einer Linse eine erhöhte Lichtdurchlässigkeit erreichen kann, und hat durch Anführung der Fresnelschen



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Formel für die Reflexion aus Luft (oder Vakuum) senkrecht auf ein dichteres Medium einfallenden Lichtes auch bereits den Zusammenhang zwischen Reflexion und einer durch die Veränderung der Oberflächenschicht bewirkten Änderung des Brechungsexponenten dieser Schicht angedeutet. Er hat dann eine absichtliche Veränderung dieser Oberflächenschicht durch chemischen Angriff bewirkt. Er ist dabei aber nicht bis zu einer definierten Beschaffenheit der von ihm hergestellten Oberflächenschichten gelangt, hat auch keine Messungwerte für den Reflexionsfaktor dieser Schichten angegeben. Die von Taylor gegebene Lehre beschränkt sich auf die Anweisung, die chemische Einwirkung auf das Glas so lange fortzusetzen, bis in der Aufsicht ein dunkelbrauner Schieferton erscheint, von dem er empirisch festgestellt hat, daß er das Optimum der Lichtdurchlässigkeit eines bis zu Erreichung dieses Tones an der Oberfläche chemisch veränderten Glases anzeigt. Dieser Farbton wird erreicht, nachdem das behandelte Glas mehrere andere Farbtöne durchlaufen hat, und soll durch Unterbrechung des Prozesses fixiert werden, ehe weitere andere Farbtöne erreicht werden. Die als Indikator für das Fortschreiten des Prozesses angegebene Farbenskala scheint auf eine jedenfalls unerwünschte Lichtabsorption durch die gebildeten völlig undefinierten Schichten hinzudeuten. Die beschriebene absichtliche Oberflächenänderung ist Taylor im übrigen nur bei Barytkrongläsern und einem schweren Barytflintglas gelungen.

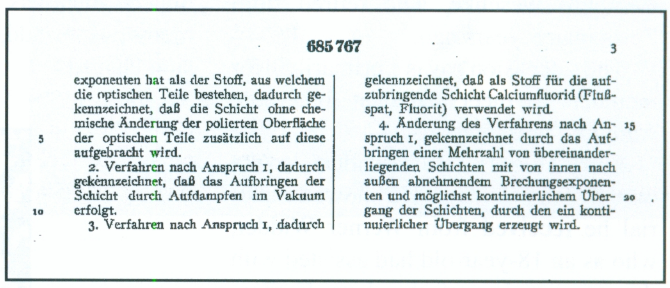
Auf dem Wege zu dem Ziel einer verringerten Reflexion an der Grenzfläche Luft/optisches Teil ist Taylor also, wie ausgeführt, von dem Glas des optischen Teiles selbst ausgegangen und hat dieses Glas an der Oberfläche verändert. Einerseits sind die von ihm hergestellten Oberflächenschichten nicht definiert, andererseits ist Taylor in der Variierung der Eigenschaften dieser veränderten Grenzschichten von den dem Glase immanenten Eigenschaften abhängig, da er ja immer vom Glase selbst als Grundsubstanz seiner Oberflächenschichten ausgeht. Dieselben Mängel haften dem Verfahren nach der amerikanischen Patentschrift 1 317 481 an, in der empfohlen wird, eine solche chemische Oberflächenveränderung während des Polierens vorzunehmen.

Demgegenüber wird gemäß der vorliegenden Erfindung vorgeschlagen, auf das Glas glasfremde Schichten, Schichten aus einem anderen Material aufzubringen, welches einen niedrigeren Brechungsexponenten als das Glas hat. Die Vorteile dieses Verfahrens bestehen in folgendem: Die neue Oberflächenschicht kann hinsichtlich ihres Brechungsexponenten den jeweiligen Erfordernissen entsprechend gewählt werden und ist in ihren Eigenschaften völlig unabhängig von den Eigenschaften des zu plattierenden Glases. Sie läßt sich jederzeit mit den gleichen wohl definierten Eigenschaften reproduzieren. Sie kann aus einem Material hergestellt werden, welches praktisch keine Verluste durch Lichtabsorption verursacht. Die glasfremde Oberflächenschicht läßt sich auf jedes Glas aufbringen, gleich welche Zusammensetzung das Glas hat. Schließlich ist es möglich, nacheinander mehrere Oberflächenschichten aufzubringen, von welchen jede folgende einen niedrigeren Brechungsexponenten als die vorhergehende hat, so daß sogar die Möglichkeit gegeben ist, den Reflexionsverlust praktisch auf Null zu halten, wenn die äußerste Oberflächenschicht einen sich von 1 nur wenig unterscheidenden Brechungsexponenten hat und wenn durch einen möglichst kontinuierlichen Übergang der Schichten ein kontinuierlicher Übergang der Brechungsexponenten erzeugt wird. Als Material für die Oberflächenschichten können sämtliche das Licht praktisch nicht absorbierende Stoffe organischer oder anorganischer Natur verwendet werden, die einen kleineren Brechungsexponenten als das zu plattierende Glas haben. Soweit diese Stoffe in irgendeinem Lösungsmittel löslich sind, können sie in Form ihrer Lösung auf die Glasoberfläche aufgetragen werden, so daß nach Verdampfung des Lösungsmittels oder Koagulation der Lösung ein Film auf der Glasoberfläche zurückbleibt. Als besonders brauchbar hat sich eine Schicht von Calciumfluorid (Flußspat, Fluorit) erwiesen, welche durch Aufdampfen im Vakuum aufgebracht werden kann. Diese beiden soeben genannten Aufbringungsverfahren sind für andere Zwecke schon bekannt.

Für ein Glas mit dem Brechungsexponenten 1,725 ergibt die Rechnung nach der Formel von Fresnel den Wert 13,66% als Summe der Reflexionen an Vorder- und Rückfläche des Glases. So ist die Summe der berechneten Reflexionen an Vorder- und Rückfläche des plattierten Glases 7,88%. Es werden also 5,78% des einfallenden Lichtes für den durchgelassenen Lichtanteil gewonnen.

PATENTANSPRÜCHE:

1. Verfahren zur Erhöhung der Lichtdurchlässigkeit optischer Teile durch Erniedrigung des Brechungsexponenten an den Grenzflächen dieser optischen Teile, dadurch, daß die optischen Teile mit einer Schicht eines anderen Mediums versehen werden, das einen niedrigeren Brechungs-



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exponenten hat als der Stoff, aus welchem die optischen Teile bestehen, dadurch gekennzeichnet, daß die Schicht ohne chemische Änderung der polierten Oberfläche der optischen Teile zusätzlich auf diese aufgebracht wird.

2. Verfahren nach Anspruch 1, dadurch gekennzeichnet, daß das Aufbringen der Schicht durch Aufdampfen im Vakuum erfolgt.

3. Verfahren nach Anspruch 1, dadurch gekennzeichnet, daß als Stoff für die aufzubringende Schicht Calciumfluorid (Flußspat, Fluorit) verwendet wird.

4. Änderung des Verfahrens nach Anspruch 1, gekennzeichnet durch das Aufbringen einer Mehrzahl von übereinanderliegenden Schichten mit von innen nach außen abnehmendem Brechungsexponenten und möglichst kontinuierlichem Übergang der Schichten, durch den ein kontinuierlicher Übergang erzeugt wird.

methods of coating (by liquid and by vacuum) are not new, but already known from other processes."

Still on page 2, the main text of the patent closes with: "For a glass with refractive index of 1.725 a calculation using the Fresnel formula yields a total of 13.66% reflection from the front and rear surfaces together. The calculation for a glass coated on both front and rear surface gives a total of 7.88%, which means a gain in transmitted light of 5.78% over the uncoated glass." In this paragraph the German text uses the word *plattiert* for "coated." That word is now obsolescent in this context, having been replaced by *vergütet* or *blaubelegt.*

The patent closes on pages 2/3 with a numbered list of patent claims:

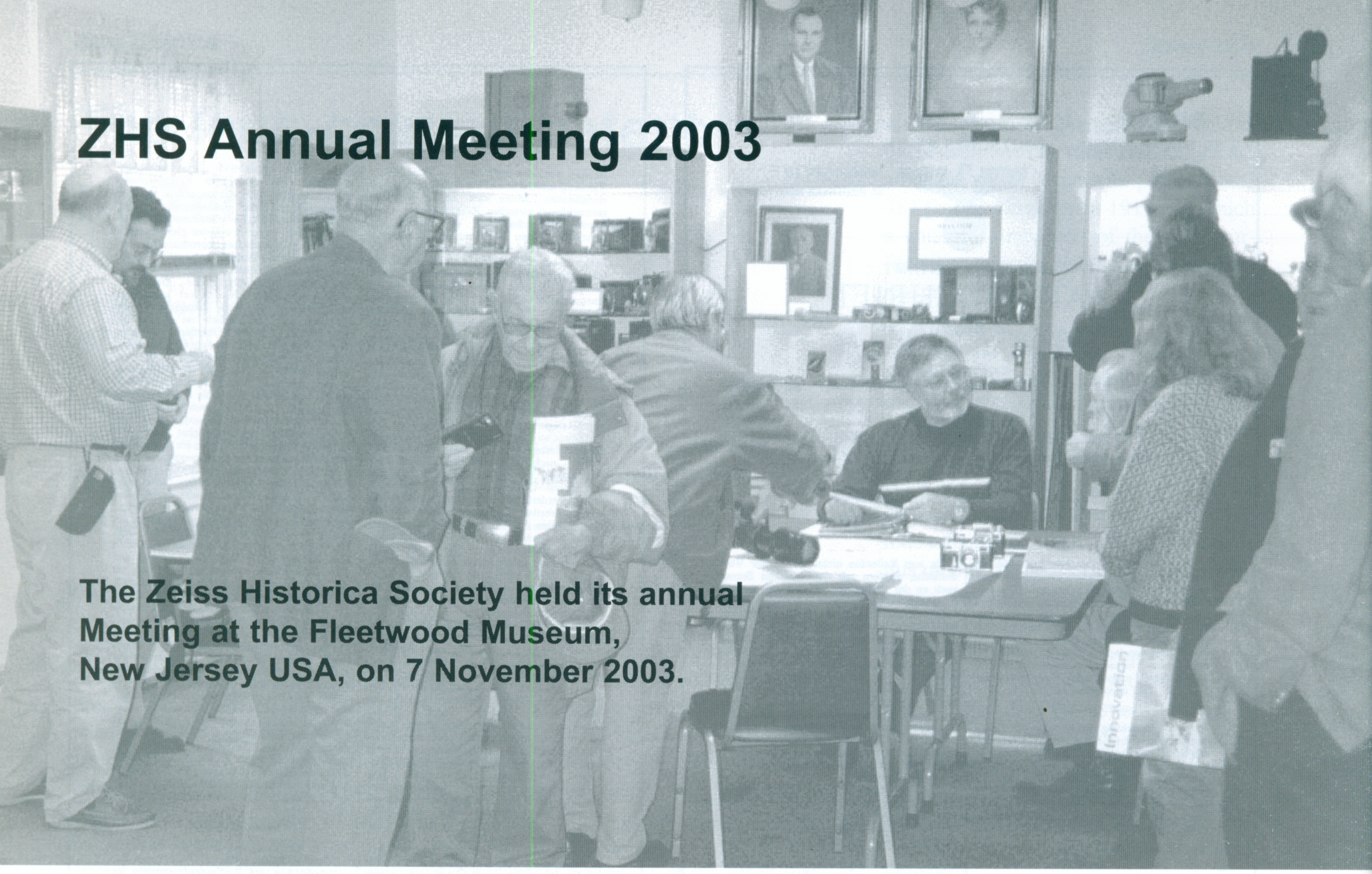
1. Procedure to increase the light transmission of optical parts by lowering the refractive index on the optical surfaces by applying a layer of another medium with lower refractive index than the material of which the optical parts are made, characterized by application of the layer additionally to the surface without any change to itself.
2. Procedure following claim 1, characterized by an application of the layer by means of vacuum evaporation.
3. Procedure following claim 1, characterized by the use of calcium fluoride (fluorspar).
4. Variant of claim 1, characterized by the use of multiple layers one over the other with a refractive index that decreases from the lowest to the outer layer to achieve a suitably continuous transition of the refractive index.

Zeiss immediately took advantage of this multilayer technology. The first coated Zeiss lenses, made in the late 1930's and during the war, contained at least three layers of coating.

* * *

The Patent, No: DE 685 767, can be studied at:
http://depatisnet.dpma.de ❐

ZHS Annual Meeting 2003



The Zeiss Historica Society held its annual Meeting at the Fleetwood Museum, New Jersey USA, on 7 November 2003.

About 35 people attended the meeting, including, among the invited guests, Bernhard Weschke, who retired from Zeiss many years ago.

The occasion was primarily for members to meet and chat, but there were two presentations.

Larry Gubas, ZHS President, spoke on the Jena Contax. He showed material he received from Werner Widder, who as an 18-year-old had assisted with the construction of the Jena Contax. Pictures and copies of the original technical drawings of the newly redesigned Contax II and III cameras were on display. The redesign was necessary because of the total destruction of the Contax assembly line at Zeiss Ikon Dresden, as well as the loss of the technical drawings, parts and materials, in the bombing of February 1945.

Several examples from the collection of Charles Barringer of these rare cameras were shown.

Nick Grossman spoke about the early days of camera collecting and the acquisition of photographic equipment, with reminiscences of his boyhood in Budapest and, later, New York City. Several members present had their own memories to add, and a lively discussion ensued.

The Society is grateful to George Helmke of the Fleetwood Museum for making the resources of the museum available for the meeting and providing his warm support. ❐

The Fleetwood Museum

At the Annual Meeting....

(Photographs by John T. Scott)

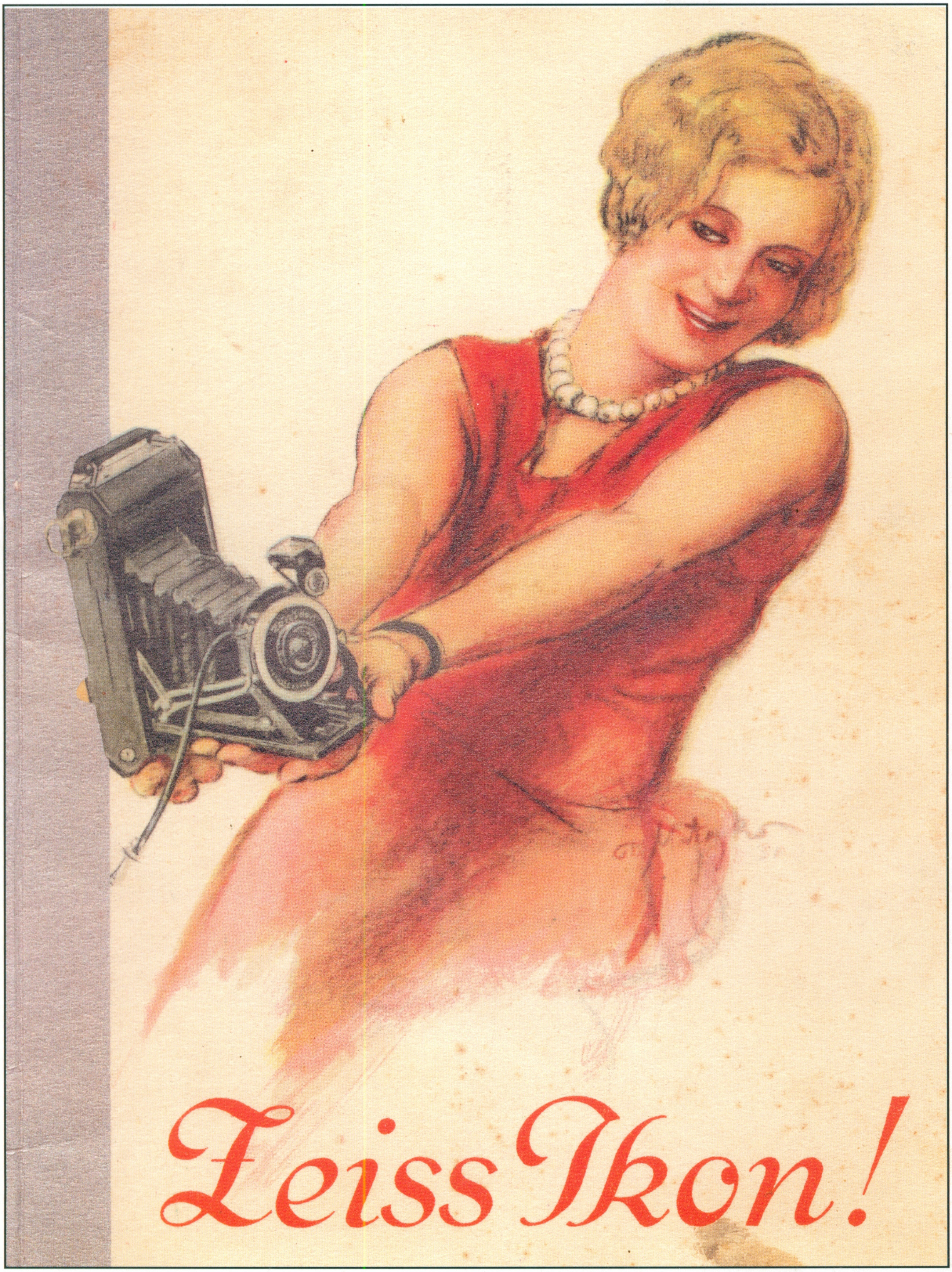
◄ **ZHS President** Larry Gubas (left) and Past President Charles Barringer (right) examining an item from the archives. The blueprints for the Contax IV are in the foreground.

George Helmke of the Fleetwood Museum pointing out one of the exhibits. ►

A wooden camera by S. Lubin of Philadelphia attracts close attention.

▼

Back cover: A 1931 Zeiss Ikon catalog from Larry Gubas's collection shows an Ikonta 520/2 and its proud owner. ►


Zeiss Ikon!