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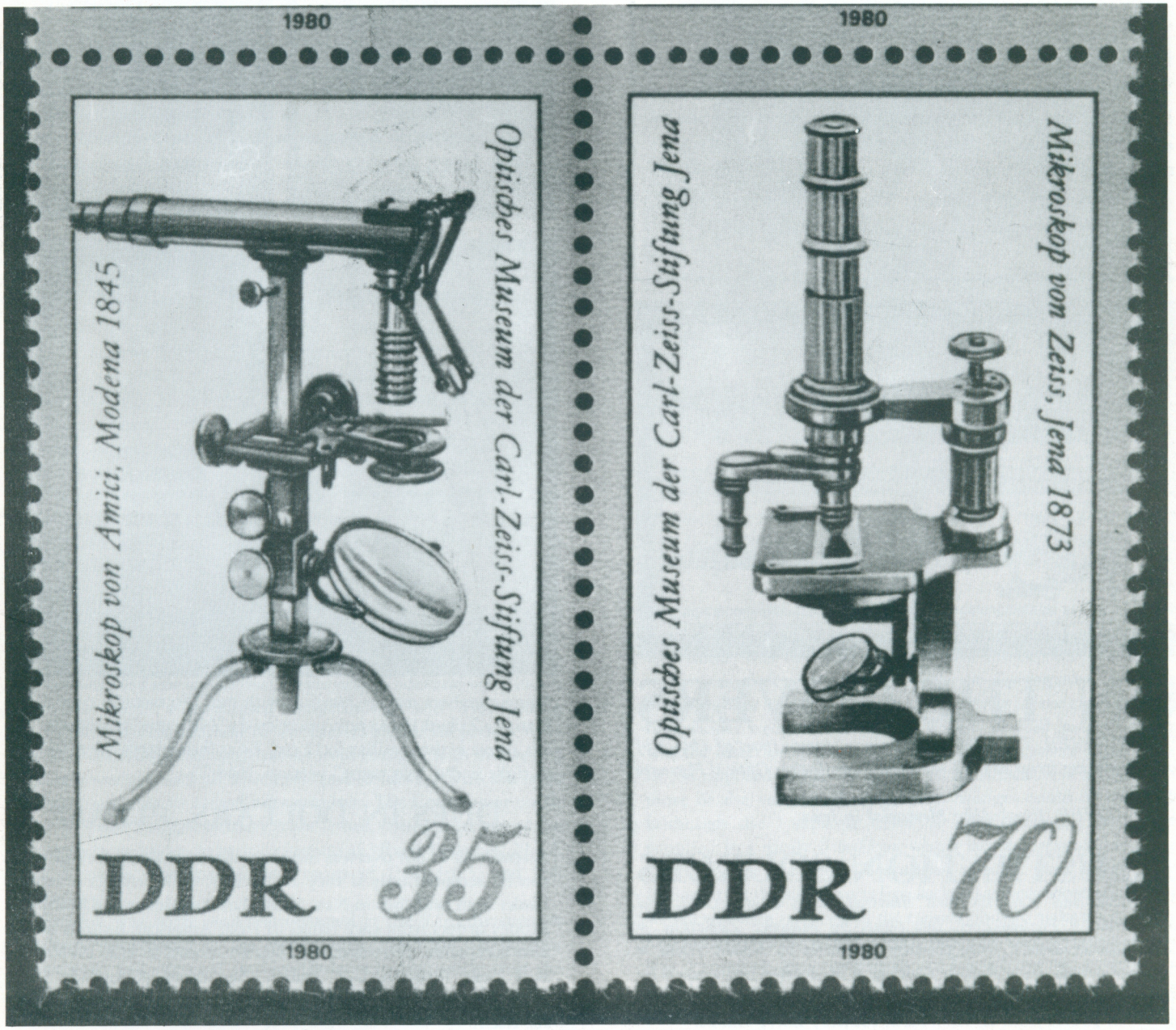

The Zeiss Historica Society of America is an educational, non-profit society dedicated to the study and exchange of information on the history of the Carl Zeiss optical company and affiliates, its people and products from 1846 to the present.

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Address all enquiries to:
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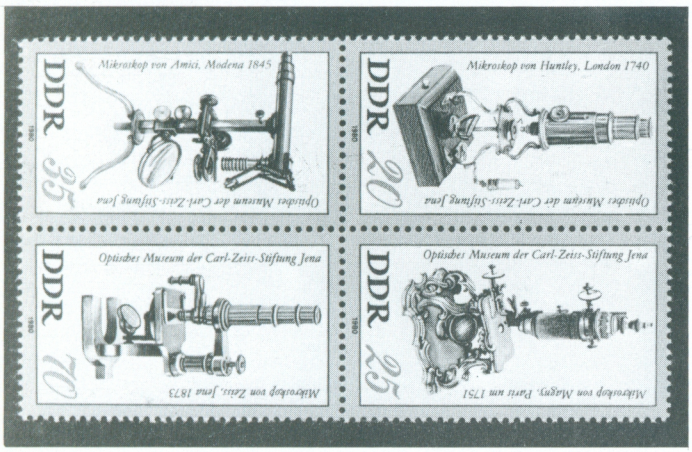


ON THE COVERS

FRONT COVER. Two 1960 East German stamps (part of a block of four) featuring items in the Carl Zeiss Foundation Optical Museum in Jena.

BACK COVER. Ernst Abbe Memorial in Jena.

ILLUSTRATION SOURCES

Front cover and "Zeiss By Mail" illustrations by Charles Gellis and the Editor. • Plateholders, this page, by Maurice Zubatkin. • Leica/Contax article, from pre-war brochures by Robert Helm. • Telescope article, from Rodger Gordon. • Measuring instruments by Nick Grossman. • Goerz adding machine by the Editor. • Abbe Memorial photos from R. A. Wetzel, courtesy Larry Gubas.

ADDRESS CORRECTION

The Editor's apologies to PTN Publishing Company, who kindly gave the Society permission to reprint Dr. Robert Smith's "Four Horsemen of Microscopy" article in the last issue, for incorrectly listing their address. The correct address of PTN is 210 Crossways Park Drive, Woodbury, N.Y. 11797. Phone: (516) 496-8000. PTN publishes "Pro Imaging Systems", which now incorporates "Technical Photography" and "Functional Photography". It was in "Functional Photography" that Dr. Smith's article first appeared.

"NO NAME" PLATEHOLDER

Many members may be familiar with the "No name" Contax. But Maurice Zubatkin has now uncovered a "No name" plateholder. At left above is the familiar 9x12 cm. Zeiss Ikon plateholder (665/7), at right is the "No name" version, (664/7).

DUES IN DOLLARS, PLEASE

A reminder to our overseas members that annual membership dues can be accepted only if they are in U.S. dollar checks drawn on banks with branches in New York, Los Angeles or San Francisco. Money orders from such banks or from American Express are are also acceptable, provided that they are drawn in U.S. dollars and will clear through U.S. banks. The costs of cashing other remittances have in some case actually exceeded the membership fee itself!

COMPARING THE PREWAR LEICA AND CONTAX

Robert A. Helm, Cincinnati, Ohio

PART II

CLOSEUP AND MACRO PHOTOGRAPHY

Accessories for closeup and macro photography with the Leica and Contax were basically of three types.

(1) Rangefinder devices, well adapted for hand held shots at moderately close distances.

(2) Simple framing devices with supplementary positive front lenses of various diopter strengths for fixed distance closeups. These were designed to "sit" on any flat object and could be operated successfully with little training. In an age when the "Photostat" was the only copying machine, such accessories provided an alternative method for reproducing legal documents, books, hospital charts, etc.

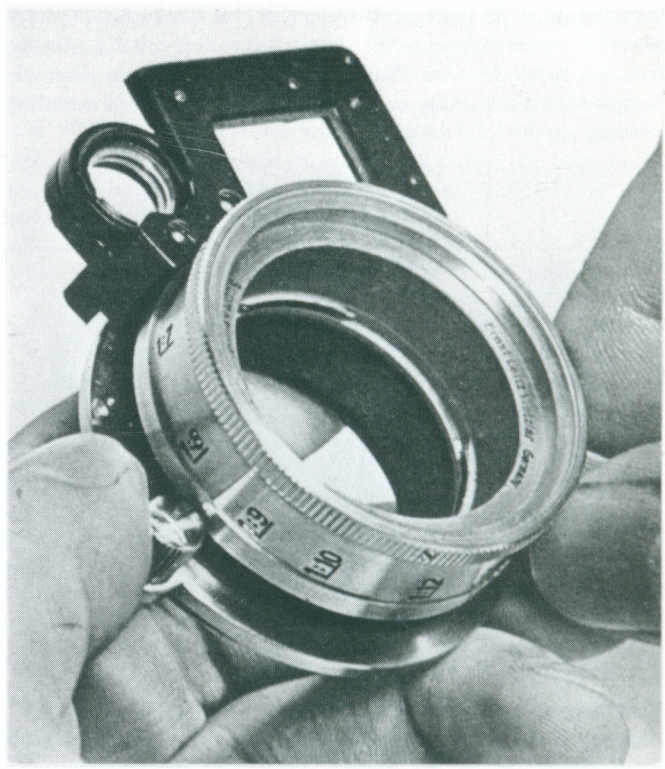
An individual, not otherwise interested in photography and needing to do a large volume of such copying, would generally choose the Leica Standard model (with a 5 cm. Elmar) since it had no rangefinder and was, therefore, much less expensive than a Contax or rangefinder Leica. Thus Leitz supplied a somewhat wider variety of such inexpensive paraphernalia for copying at various distances than did Zeiss Ikon.

(3) Devices utilizing either "sequential" or reflex ground glass imaging.

Leitz made an "Optical Short Distance Focusing Device" for use with any rangefinder Leica; it was generally referred to by its code name: NOOKY. Interposed between the camera and a 5 cm. Elmar or Hektor lens, a NOOKY (or NOOKY-HESUM for the 5 cm. Summar) extended rangefinder focusing to all distances between 1 meter and 42 cm. (40 in. and 16.5 in.). The NOOKY had two upward projections: (1) a glass wedge positioned in front of one rangefinder window; (2) an open frame located in front of the viewfinder window. As the lens was focused, two sides of this frame automatically moved to both compensate for parallax and appropriately modify the size of the viewfinder image.

Zeiss Ikon made the "Contameter" for the Contax I and II (and a slightly modified version for the Contax III to compensate for the greater height imposed by the meter). Unlike Leica's NOOKY, the Contameter did not utilize the Contax rangefinder and viewfinder, but was itself a combined rangefinding and viewfinding instrument which attached to the camera's clip. Its prisms were fixed so that rangefinding distances were changed with the use of 3 separate wedges, each of which was placed (always with the same orientation) over its rangefinder window. The Contameter outfit also included 3 supplementary front lenses, fitting over any of the camera's 5 cm. lenses, to permit closeups at 3 fixed distances: 20, 12, and 8 inches (for image:object ratios of 1:10, 1:6.5, and 1:4, respectively).

Parallax was fairly well compensated at the 8 in. distance. A wedged foot, placed in the camera clip, tilted the Contameter downward and centered its viewfinder window nearly over the camera's lens. A foot with less wedge was located on the reverse side of the Contameter. When this foot was inserted into the clip, only approximate parallax compensation occurred at the 12 in. and 20 in. distances since, with such an inversion of the Contameter, its viewfinder was less well centered over the camera's lens. There were some practical problems with the Contameter. A hurried photographer might not match a front lens with the corresponding rangefinder wedge, resulting in a grossly blurred image. Less fatal was the insertion of the wrong foot into the camera clip for the 8 in., as opposed to the 12 in. and 20 in. distances. Finally, one or more of the very small rangefinder wedges could be easily lost (although the 7 separate items of the Contameter outfit were supplied in a nicely fitted box which largely prevented spillage).

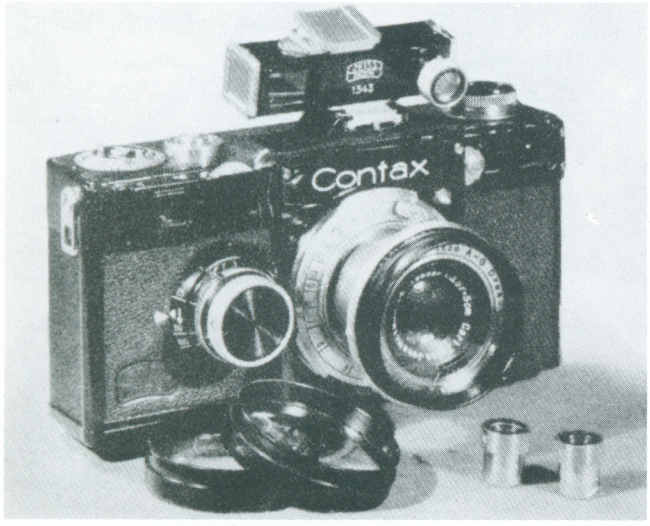


The Optical Short Distance Focusing Device (NOOKY), interposed between the Leica and a 5 cm. collapsible lens, permitted rangefinder focusing and parallax corrected viewing from 3.5 feet to 16.5 inches. A scale on the mount enabled photographs to be taken with predetermined image: object ratios.

I shall use the term "sequential ground glass focusing" to indicate that the subject was first focused and composed on a screen which was then replaced by the camera body to make the exposure. Leitz made two devices to greatly facilitate such replacement. One was a rotating copier consisting of fixed front and rotating rear circular plates. A ground glass screen with a central clear spot and crosshair was a permanent part of the rear plate. On the opposite

periphery of the rear plate a Leica body was attached so that the format and focal plane of the camera and screen were congruent. Any suitable Leica lens was mounted on the front plate (with or without a focusing tube and various extension tubes interposed, depending on the desired image:object ratio). By rotating the rear plate about an axle, the ground glass was first brought into line with the lens. After satisfactory composition and focus were achieved (with detachable 5X and 30X magnifiers), the rear plate was rotated to bring the camera in line with the lens so that the identical image could be photographed.

The second Leitz device as a sliding copier, often called a "Focaslide". It consisted of two elongated front and rear plates, joined together by dovetailing parallel grooves. The Leica camera was connected to the rear plate adjacent to the same type of permanently attached focusing screen as that featured on the rotating copier. As with the latter, a lens was screwed to the front plate or to intermediate tubes. After composing and focusing on the screen (with the same 5X and 30X magnifiers), the camera was brought into position by sliding the rear plate in the dovetailing grooves.



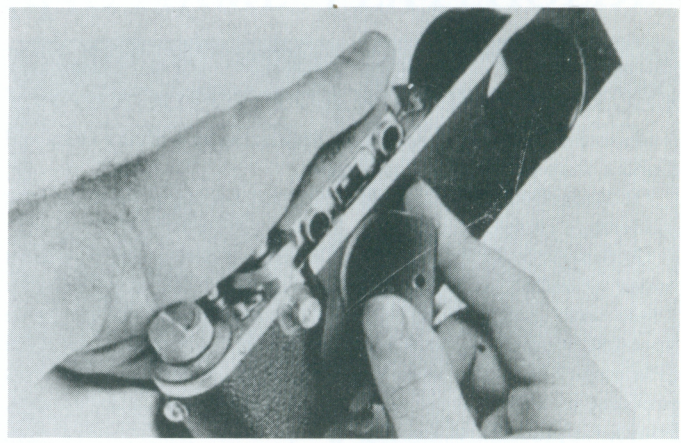
The Contameter, mounted on a Contax I with a rangefinder wedge in place and a positive supplementary lens over the 5 cm. Zeiss Tessar, is set for photographing objects at 8 inches. Additional rangefinder wedges and supplementary lenses are also shown for use at 12 and 20 inches. When these are used, the Contameter is inverted so that its alternate "foot" is placed in the camera's accessory clip. (The same Contameter served for both the Contax I and II, but that for the Contax III had "feet" which were slightly more angulated.)

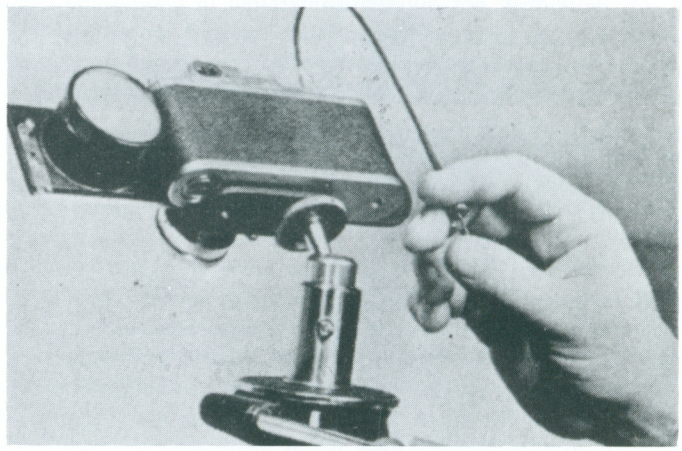
Both the rotating copier and the Focaslide were relatively inexpensive and very efficient devices; the latter was more popular because it was smaller, simpler, and about 1/3 cheaper. Leitz made special Micro Summar lenses in a wide variety of focal lengths. These were ideal for small object photography. Used with various extension tubes and a focusing mount, magnifications on film exceeding even 20x could be achieved with either copier.

Sequential ground glass focusing with the Contax was comparatively primitive. (A rotating copier, similar to Leitz's prewar model, did not appear until the 1950's.) Taking advantage of the bayonet mount, a plain ground glass screen (or one combined with a 90° 3x magnifier) was initially bayoneted to a focusing mount and lens (with or without interposed extension tubes). After composing and focusing, the screen was removed and the Contax was bayoneted into place.

Zeiss apparently supplied only one lens for photographing small objects, a 1 cm. f/1.6 Mikrotar. With various tubes this lens could be used to magnify objects on film from 4x to 25x. For such high magnifications there was a special combined screen and magnifier with the same weight as a Contax II, reducing the likely occurrence of a change in focus if a lighter weight screen were replaced with a heavier camera body.

A Los Angeles machinist, D. Paul Shull, manufactured versions of his SPEED-O-COPY for both the Leica and the Contax. It consisted of three plates joined by hinges. A suitable lens (with or without interposed extension tubes) was mounted on the middle plate; the camera body was attached to the lower plate. On the upper plate was a fixed ground glass to which a Shull 8x (or Leitz 5x or 30x) magnifier could be fitted. In use the upper plate was first folded over the middle plate for composing and focusing; then the





Above, fastening the Leica to the sliding plate of the Sliding Focusing Copying Attachment. Below, making close-ups. Here, the camera has been slid over into the photographing position.

lower plate was folded over the middle plate to make the exposure. Shull's SPEED-O-COPY was a simple, inexpensive device, well designed and well made. It was a real boon for the prewar Contax owner, and even some Leica users preferred it to Leitz's copiers.

Reflex ground glass imaging for closeup and macro work was provided by both Leitz and Zeiss Ikon. The 13.5 cm. f/4.5 Hektor was supplied with a special short mount, allowing this lens to be focused from Inf. to 5 ft. with the PLOOT which acted like a 63mm. extension tube. With the interpositioning of various additional extension tubes, an ideal macro setup could be achieved. Leitz also catalogued a special reflex unit, consisting basically of a PLOOT and a 9 cm. Elmar, for medical and industrial applications; it was well adapted to dental and corneal photography.

Zeiss Ikon did not employ its Flektoskop for macro imaging, but rather supplied the Panflex, a special mirror reflex housing. The axis of its eyepiece was located high above, but parallel to, the photographic lens axis. This configuration provided room to house an internal optical system which produced an upright and laterally correct image for eye level viewing. The Panflex was well

adapted to the horizontal format; for a vertical picture, the necessary 90° rotation of the entire Panflex unit was somewhat awkward because of the instrument's height.

As might be expected from companies whose origins were so intimately associated with microscopes, both firms manufactured devices for high magnification photomicrography. Zeiss' Miflex and Leitz's Micro-Ibso were rather similar, but the latter was focused through an eyepiece whereas the Miflex projected the microscope's image onto a ground glass screen. Both employed front shutters to avoid even slight vibration from their cameras' focal plane shutters. Leitz sold the Micro-Ibso separately but also catalogued a complete outfit which included a Leitz microscope.

WHICH WAS THE BETTER SYSTEM?

This question, often vehemently debated, will be discussed only with reference to the Contax II and III (both from 1936) versus the two Leica models of about the same period, the IIIa (from 1935) and the IIIb (from 1938). (The black Contax I will not enter into this discussion because all photographic historians agree that the two *chrome* Contax models were Zeiss Ikon's premier rangefinder cameras in the prewar era. Nor will the 1940 Leica IIIc be considered since it was really a wartime model, generally unavailable in the United States.) The answer to this question, based on today's historical perspectives, might be quite different from that of an original purchaser who had no access to all of the data which have now accumulated. Perhaps the evidence presented below will allow each reader to make his or her own judgement regarding this 50 year old question.

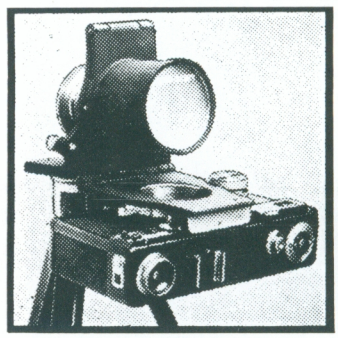
LENSES. The Carl Zeiss Sonnars, in focal length of 5 cm., 8.5 cm., 13.5 cm., and 18 cm., and the 3.5 cm. Biogon were the most highly developed lenses of their day. Computed by Bertele, these lenses combined high speed with excellent correction and contrast because they utilized relatively numerous cemented elements with only 6 air-glass interfaces; so important before the advent of lens coating.

Leitz had nothing comparable to the Sonnars and the Biogon. But the fixed, 5 cm. f/3.5 Leitz Elmar established the reputation of the Leica early on, and later the interchangeable Elmars in many focal lengths (3.5 cm., 5 cm., 9 cm., 13.5 cm.) maintained the traditional superb quality of Leica negatives. Leitz made other lenses for special purposes: the light weight 10.5 cm. f/6.3 Elmar for the alpinist; the soft focus 9 cm. f/2.2 Thambar with detachable center spot for portraiture; the 7.3 cm. f/1.9 Hektor, a rival of the Zeiss 8.5 cm. f/2 Sonnar, for stage and other available light photography. The Leitz 2.8 cm. f/6.3 Hektor reached the wide angle limit before the war. It was coupled to the rangefinder and was superior to the Zeiss 2.8 cm. f/8 Tessar which had to be focused by scale. At the other end of the range the Leitz 40 cm. f/5 Telyt was a true telephoto design with its barrel length shorter than its focal length. It was more practical than the Zeiss 50 cm. Fernobjectiv. The latter's physical length was rather unwieldy, and its speed was quite slow at f/8.

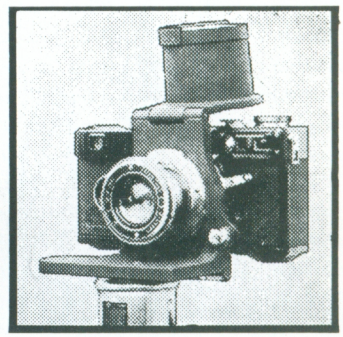
LENS MOUNTS. Before the Leica M3 appeared in 1954, Leitz disdained the use of any bayonet mount, claiming that true rigidity and longevity could only be achieved with a heavy thread. The Leica screw mount was accurate and rugged, but in use it was certainly slower and less convenient than the inner and outer bayonet lens mounts of the Contax. Zeiss Ikon must be given credit for pioneering the bayonet mount in 35mm. photography.

The Contax double bayonet (inner for 5 cm. lenses and outer for all other focal lengths) was already perfected when it was introduced, and it was never changed during the life of the Contax from 1932 to 1961. Anyone who examines the Contax mount and focusing system cannot fail to be impressed by its precision and ruggedness. However, there was a fundamental problem with the rangefinder focusing of 5 cm. Contax lenses because they did not have their own focusing mounts. The Contax's rangefinder images were brought into coincidence by rotating the lens mount, and distance could be measured either with or without a lens in place. This meant that all 5 cm. lenses had to have the same focal length to achieve exact focus.

Today the focal length of a Leitz lens is said to fall within a tolerance of 0.002 cm., but a prewar "5 cm." Elmar could be actually as long as 5.2 cm.. Leitz engraved code numbers on the barrels of lenses to indicate their true focal lengths. For example, the codes, 8, 7, 6, etc. indicated focal lengths of 5.19 cm., 5.16 cm., 5.13 cm., etc., respectively. Leitz manufactured different focusing cams for various groups of coded focal lengths. The cam which most closely corresponded to the *true* focal length of any given lens was then selected for attachment to that lens. Thus a Leica rangefinder focused slightly differently with Elmars having, e.g., true focal lengths of 5.2 cm. and 5.0 cm.. Such was not the case with the Contax! Its very accurate rangefinder focused in an identical manner with all "5 cm." lenses regardless of the true focal length of each. *Perhaps* this explained why the 5 cm. f/3.5 Elmar achieved such an outstanding reputation as opposed to the 5 cm. f/3.5 Tessar on the Contax, even though both lenses were of the same construction (Tessar formula).



Ready to Focus.



Ready to photograph.

Speed-O-Copy, shown here with black Contax I.

RANGEFINDERS; VIEWFINDERS. The Contax rangefinder was undoubtedly more accurate than that of the Leica, and the camera's combined rangefinder-viewfinder image represented an outstanding optical achievement for that era. But serious Contax photographers seldom made use of this feature, opting for the exact, parallax corrected image afforded by the Zeiss Universal Revolving Viewfinder, just as many Leica fans continued to opt for Leitz's VIDOM finder even after the separate rangefinder and viewfinder oculars were placed very close together on the IIIb. (Actually either finder could be used in the accessory clip of the other camera, but the foot of the Zeiss finder had an indentation which engaged a pin, set in the foward portion of the Contax clip, insuring perfect alignment on the camera body. A single spring in the Contax accessory clip also provided a firmer grip than the plain clip used on all Leica models through the 1935 IIIa; however, a new and much improved accessory clip, with two spring-loaded pressure rails imbedded in its floor, appeared on the 1938 IIIb.)

One Contax rangefinder image was faintly tinted pink and the other green, aiding in the recognition of non-coincidence. With hard use the Leica rangefinder, more often than that of the Contax which utilized a long, solid glass prism, sometimes required adjustment, particularly to line up the images vertically. The set-screw to accomplish the latter adjustment could be easily reached from the outside after removing a single covering screw. With time, or perhaps an excessively moist environment, the rangefinder images of both cameras might become dim due to deterioration of the Leica semi-silvered or Contax semi-gilded surfaces. Repair was

relatively simple on either camera so long as parts remained available.

SHUTTERS. The vertical shutters (formed by multiple metal slats) of some prewar chrome Contax cameras no longer function, although this problem is certainly not as frequent as with the earlier versions of the black Contax I. Some shutters may merely need replacement of a broken tape, a relatively frequent problem with all Contax models; others may require a more difficult and prohibitively expensive repair, beyond the capabilities of many repairmen.

Barnack's simpler horizontal cloth shutter, operating from 1/20th to 1/500th sec. (and to 1/1000th from 1935), was reliable almost from the start. Time has demonstrated the remarkable longevity of this basic Leica shutter. It has simply seldom worn out

The PLOOT, shown on the right, was ideal for macro work. In the left upper illustration, the Leica camera is rotated to take a vertical picture through a 9 cm. lens, mounted on two extension tubes. In the left lower figure, the Leica is set for horizontal imaging through a considerably extended 5 cm. f/2.0 Summar. (However, the f/3.5 Elmar was the preferable 5cm. lens for macro photography.)

with even 50 to 60 years of use. If the shutter of an old Leica ceases to function (usually from lack of use), generally only cleaning and lubrication, rather than any expensive repair or replacement of parts, are required to restore it to working order. Leica slow speeds down to 1 sec. (available from 1933) tend to get out of adjustment with time, but these speeds can be accurately tuned by any camera repairman familiar with the Leica.

SHUTTER SPEED DIALS. On the chrome Contax models, all speeds (1/1250th to 1/2th sec. and B for bulb) were set (either before or after cocking the shutter) on a single dial, located on top of the shutter winding and film advancing knob. This arrangement was generally considered to be advantageous as opposed to two dials on the Leica, one on the camera's top for 1/1000th to 1/20th sec. and Z (for bulb) and a second dial on the front for 1/20th to 1 sec. and T (for time). The shutter speed dial on top of the Leica was designed for speed adjustments to be made only after the shutter was cocked (but *knowledgeable* Leica owners could reset all speeds before cocking). With release of the shutter the Leica's main speed dial rotated, while the Contax speed dial remained stationary. Zeiss Ikon made much of this apparent advantage in its advertising. But Leitz took advantage of the rotating dial to develop a primitive external device for flash synchronization (code name: SYNCO). In 1939 synchronization was improved by means of a special baseplate (code name: BLITZ). Zeiss Ikon produced no flash synchronization devices for any prewar Contax.

SHUTTER RELEASE. The Leica shutter release was softer and smoother than the shorter but somewhat stiff release of the Contax. The Contax had a self-timer so that, in addition to the dubious advantage of permitting self-portraiture, a vibration-free shutter release could be achieved if one forgot to bring along a cable release. No prewar Leica posessed a self-timer.

SIZE AND WEIGHT. Here the Leica clearly had the edge. Its small size and rounded ends led to a handling ease which has perhaps never been equaled by any 35 mm. camera.

GENERAL CONSTRUCTION. Both cameras were very well made and could tolerate hard usage. There were no plastic parts. Loading the Leica by removing its bottom plate was perhaps more convenient than loading the Contax, but the latter's removable back permitted the use of a plate film and ground glass accessory. Whenever a Leica lens was removed, the precise rangefinder cam could possibly be traumatized if the rear metal lens cap was not immediately screwed into place. (Anyone contemplating purchase of a pre-owned Leica rangefinder lens should always run a finger over this cam to detect any rough spots.

The Contax was covered with black leather which has generally held up well; localized small protrusions of the leather sometimes developed over screw heads, usually on the camera's back. (Collectors often refer to these as "Zeiss bumps".) Leitz covered the Leica with black vulcanite in place of leather. Occasionally this cracked and chipped (or even peeled off as a larger piece), but it has generally proved to be quite durable. Unlike the Leica, which had no obvious portals for entry of dust, dirt, or sand, the prewar Contax had three sites where particles could enter: (1) About the wheel used by the middle finger to focus many of the lighter lenses; (2) About the small protrusion which was displaced (to release the focusing wheel from its infinity lock) when attaching a lens to the outer bayonet; (3) In the opening on top of the camera through which the frame counter was viewed. (Only the latter portal was eliminated on the postwar Contax.)

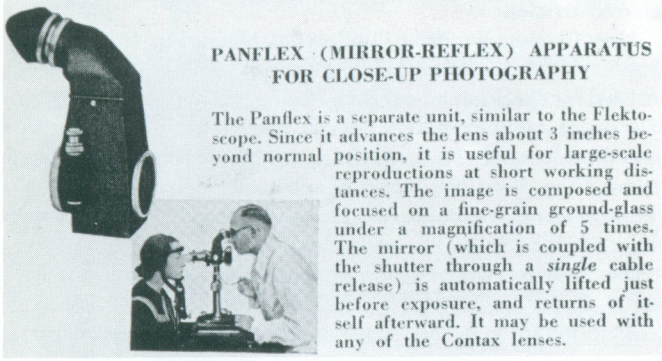
ACCESSORIES. Both cameras were well adapted to perform many special functions. However, Ernst Leitz provided a wider range of useful accessories than did Zeiss Ikon, and Leica accessories were often more highly developed. The PLOOT was a particularly outstanding device. It could be used conveniently for horizontal and vertical formats because the mask under the ground glass rotated automatically when only the Leica body was turned. This was more convenient than rotating the tall Zeiss Panflex with its attached Contax body, lens, and perhaps extension tubes. The PLOOT's upright image was preferable to the Flektoskop's inverted image. Another fine feature was 5x magnification of the entire ground glass with *quickly* available conversion to 30x aerial central focusing.

CONVERTIBILITY. None of the versions of the Contax I could be upgraded to a Contax II or III, but a Contax II could be converted to a Contax III to obtain the built-in exposure meter. No Contax II or III could be converted to a postwar Contax IIa or IIIa (or to a similarly synchronized type of camera). In the prewar era any Leica (except the rare Compur and 250 exposure models) could be converted to a more advanced model up to and including the IIIa (but not the IIIb). Any such prewar Leica (except the IIIb) could, in the postwar period, be intrinsically synchronized for flash by conversion to a so called "black dial *type*" Leica IIIf (with a slow speed dial on the front) or a "black dial *type*" Leica IIf (without slow speeds).

To fully understand the nature and magnitude of such conversions, the reader must have some acquaintance with postwar Leica models. When the wartime Leica IIIc first appeared in 1940,

Leitz introduced some internal and external changes in the basic design of this and subsequent models; as a result the length of the camera increased from 133 to 136mm.. Because of this fundamental alteration, Leitz could never fashion an exact duplicate of a postwar Leica from a prewar model, hence the use of the above italicized word, "type". The actual "black dial" IIIf and IIf models (both with the longer body) came out in 1950-1951. Both had a synchronization dial beneath the main speed dial; these coaxial dials could be rotated independently.

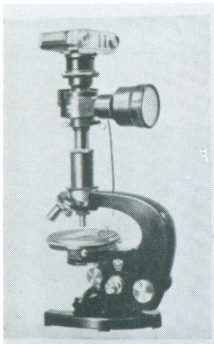
The synchronization dial was engraved with black numbers from 0 to 20. After consulting a table listing the many types of flash bulbs available, the photographer would set the synchronization



PANFLEX (MIRROR-REFLEX) APPARATUS FOR CLOSE-UP PHOTOGRAPHY

The Panflex is a separate unit, similar to the Flektoscope. Since it advances the lens about 3 inches beyond normal position, it is useful for large-scale reproductions at short working distances. The image is composed and focused on a fine-grain ground-glass under a magnification of 5 times. The mirror (which is coupled with the shutter through a *single* cable release) is automatically lifted just before exposure, and returns of itself afterward. It may be used with any of the Contax lenses.

The Zeiss Ikon Panflex unit for close-ups.



MIFLEX ATTACHMENT FOR THE MICROSCOPE

With the Miflex attachment the CONTAX body is used on a complete microscope. A specially designed mount insures rapid and vibrationless fitting of the camera. The Miflex can be readily removed from the microscope and replaced in a few seconds. It can be used with eye pieces of different magnifications. The image is projected on a ground glass screen and can be observed up to the instant of exposure. The reflex prism for projecting the image on the ground glass is simultaneously displaced when pressing the shutter cable release, thus giving the full intensity of the light. The Miflex shutter has speeds from 1 second up to 1/100th second.

Miflex attachment, shown here with Contax II.

dial to the appropriate number for the bulb and shutter speed being used. This setting introduced the correct delay between the instant of closure of the flash bulb circuit and the opening of the camera's shutter. A zero delay for electronic flash was obtained with a synchronization setting at 2 with any shutter speed up to 1/30th sec.. (On the 1952-1953 "red dial" IIIf and IIf cameras a similar synchronization dial was imprinted with red numbers from 0 to 20. These models had lighter and faster traveling shutters for electronic flash synchronization up to 1/50th sec., conversion to this lighter shutter was never available.)

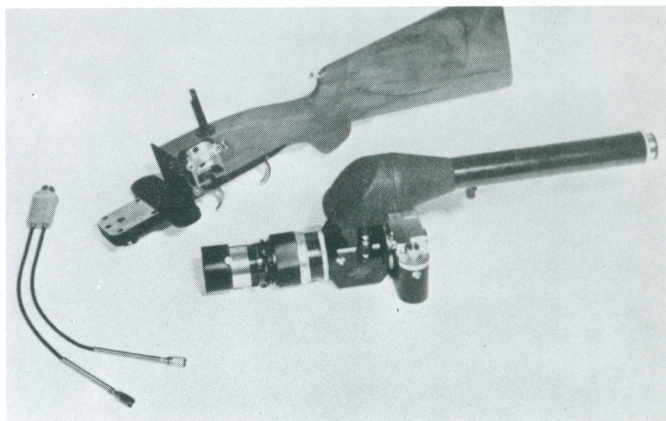
In making the conversion of a prewar "short body" Leica to a "black dial IIIf type" or "black dial IIf type", Leitz placed the entire prewar internal camera mechanism into a new IIIa body (with a slow speed dial) or into a new "IIa" body (my coined designation for a non-existent prewar model with a 1/1000 sec. top speed but without slow speeds). Each body was equipped with typical "black dial" synchronization (up to 1/30th sec. for electronic flash), but with a different printed table of synchronization dial settings for the zero and other delays. There was a standard flash cord socket in the same location as on the postwar "f" models. These upgraded cameras retained the 3/4 inch separation of rangefinder and viewfinder oculars, characteristic of the II, III and IIIa models as opposed to the placement of these oculars very close together on IIIb, IIIc, IIc, IIId (very rare), IIIf, IIf, and IIIg Leica cameras.

If an owner of a prewar 36 exposure, focal plane shutter Leica (other than the IIIb) submitted it to Leitz for flash synchonization during the 1950's, he or she would be delighted (and usually surprised) to receive a camera which appeared to be brand new! And if that owner had sent in a black rather than a chrome Leica, the

The Leica IIIb had an improved accessory clip with two spring loaded rails in its base to firmly grasp the "foot" of an accessory.

camera would be returned with a new, rich, black enamel finish even though chrome had been the standard Leica finish since 1935. Leitz evidently kept a supply of new, unfinished, 133mm. bodies on hand for such conversions, applying the same finish as that of the submitted camera (thus avoiding a mismatch if the customer happened to own some black accessories). The camera's original serial number would be imprinted on the new body. (Leitz *never* changed a serial number on a converted Leica; thus the original year of its manufacture could always be determined from published tables.)

Which camera system was superior? From today's perspective I would have to vote for the Leica (specifically the Leica IIIa) because of Leitz's more extensive line of accessories, the greater long term reliability of the Barnack shutter, and Leitz's splendid postwar



The Leica Gun, disassembled.

program for conversion to an *externally new*, flash synchronized, "f type" camera. (It is disheartening that the last prewar model, the Leica IIIb, was never included in any update program.)

However, if I had been in the market for such a camera system 50 years ago (a preposterous supposition due to insufficient funds, not age), my choice would have undoubtedly been a Contax II. My selection of lenses would have surely included two Bertele classics, the 8.5 cm. f/2 Sonnar and the 3.5 cm. f2.8 Biogon. The fields of these lenses would have been accurately delineated with a Zeiss Revolving Viewfinder. And that viewfinder would have included a turret for 18 cm. lenses because I know that I would have succumbed to temptation when the 18 cm. f/2.8 Olympia-Sonnar became available in its original rangefinder mount. No doubt I would have later also acquired a Panflex for macro work. But all of this is a personal dream. The important question is: Which camera system do *you* think was better?

ZEISS MECHANICAL MEASURING INSTRUMENTS

Nicholas Grossman, Rockville, Maryland
and Barry Abel, Hamilton, Montana

Interchangeability of component parts is a basic concept in mass production. This contrasts with the individually hand-fitted assembly method. To achieve interchangeability and realize the consequent economic benefits, the components are designed and fabricated with allowances for dimensional variations. This preset dimensional variance is called "tolerance".

To ascertain whether a part meets allowable tolerance limits, shops can utilize direct and differential measuring techniques. Carl Zeiss' establishment of the Precision Measuring Instrument Department-Fe was dealt with in an article in Volume 9, Number 1, Spring, 1987 issue of Zeiss Historic Journal.

Figure 1 illustrates two of the differential dimensional measuring instruments produced by the Fe Department prior to World War II. They were designed to measure the inside dimensions of internal combustion engine cylinders, compressors, rifle and gun barrels. Figure 2 shows a Passimeter, serial number 4655. (This should not be confused with the "snap gauges" designated by Zeiss as "Passameters" and illustrated in the above referred article).

Zeiss Catalog Fe 200-e, "Industrial Measuring Instruments", October 1934, describes this instrument as follows: "Passimeters are used for checking bores. Each Passimeter can be used with one of a set of interchangeable contact heads enabling it to span a considerable range. The head contacts with the bore at three points representing locations upon a spherical surface." (This is a technical error: it should say cylindrical surface). This instrument was made for the market using English units.

The capacities of the five measuring heads shown in Figure 3 are: 1 11/16″, 1 13/16″, 1 7/8″, 1 15/16″ and 2″. The scale graduations are in 0.0001″ units, and the scale range is ± 0.0025″. The catalog specifies the maximum measuring error of the instrument as ± 0.00008″. This degree of precision requires a controlled environment. To enable the periodic checking and adjustment of the instruments, the Catalog states that "...we are

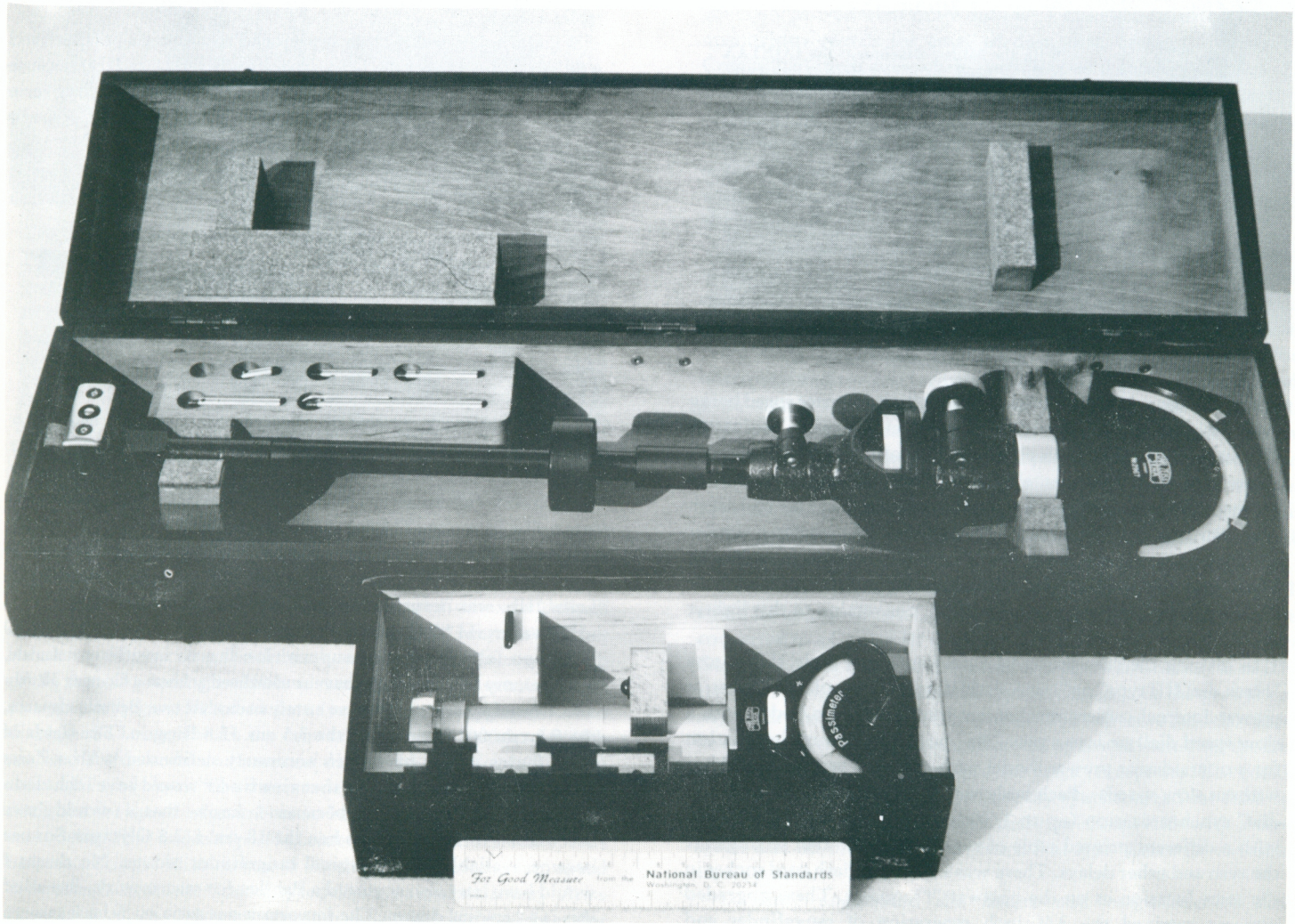


Figure 1. Bore Meter (top) and Passimeter (bottom).

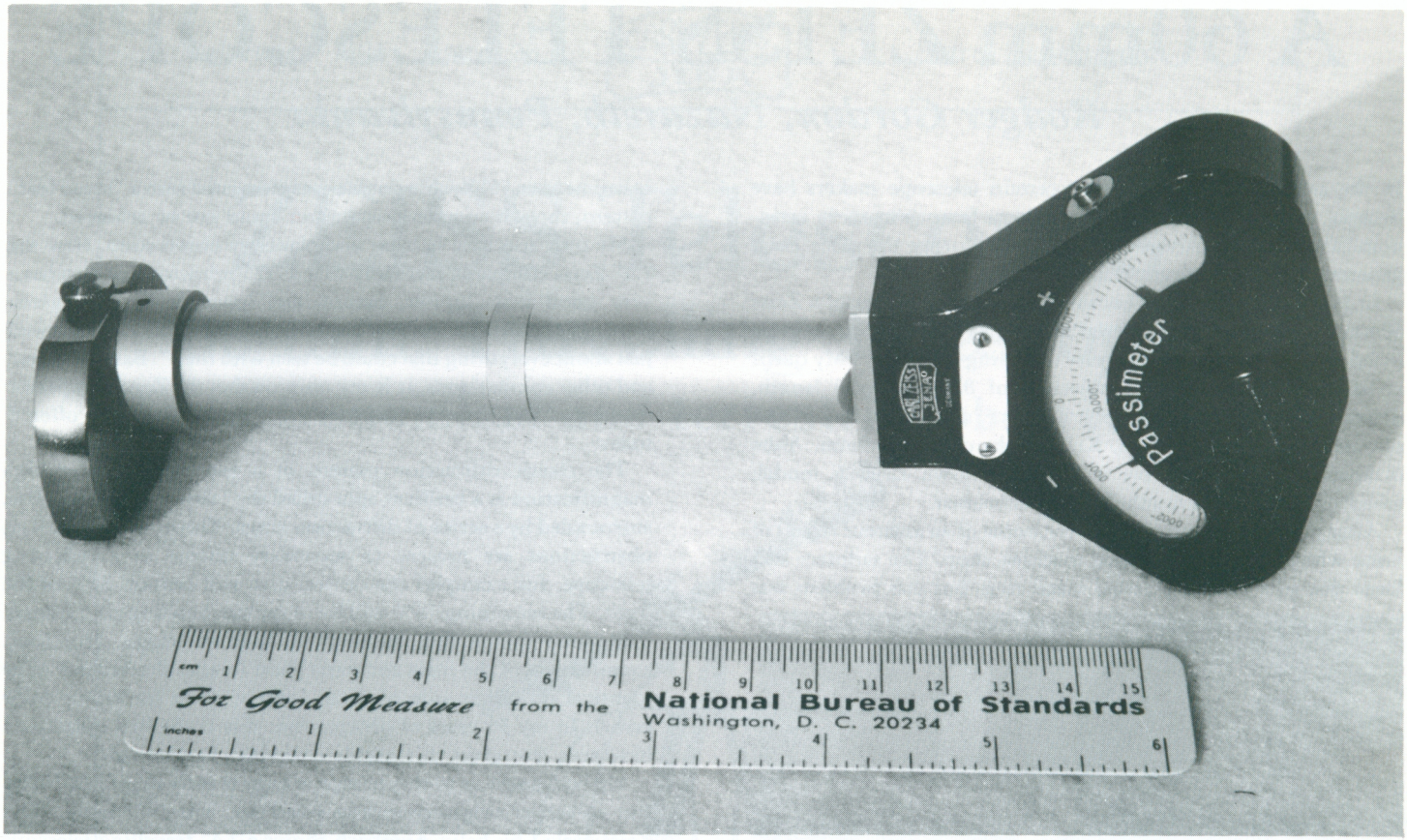


Figure 2. Closeup of the Passimeter.

prepared to furnish standard ring gauges of desired sizes." Further details were provided in Zeiss Folder Fe 203.

The Bore Meter shown in Figure 4 is a differential measuring instrument with two-point contacts for measuring inside diameters. The greatest working depth is 12". The contact surfaces are semi-spherical. The range is from 70mm. to 220mm. It is covered by five interchangeable extension gauge pins.

Figure 5 is a close-up of the measuring end of the instrument. This instrument, serial number 2967, was also calibrated in English units. The scale graduations are 0.00005", and the differential measuring range is ±40/10000". (The gauge pins have metric dimensions, but this has no effect on the measuring process).

The authors were unable to locate a catalog description of this specific instrument. Catalog Fe 200-e shows a similar instrument that is equipped, however, with a standard Zeiss dial gauge rather than the illustrated indicator. The Catalog states "This gauge is used for measuring the internal diameter of cylindrical bores. A valuable feature is the automatic centering of the contact head." The authors assume that this Bore Meter was either a custom-made instrument or was produced in very limited quantity.

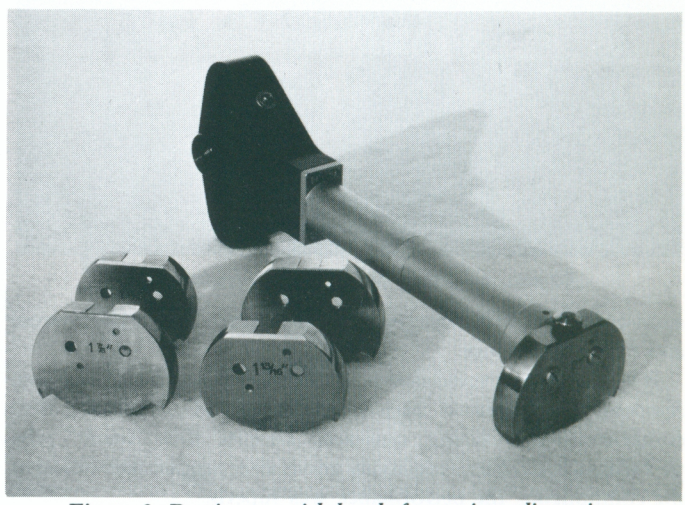


Figure 3. Passimeter with heads for various dimensions.

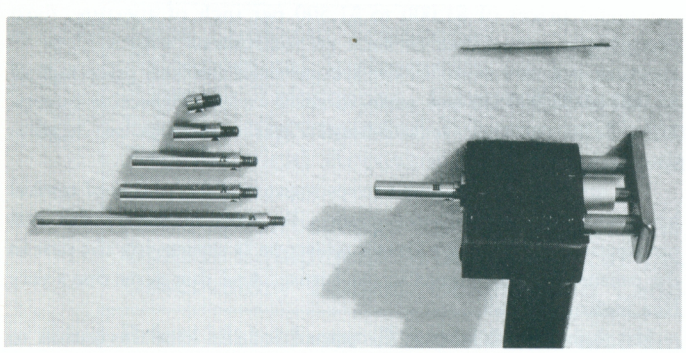


Figure 5. Measuring end of the Bore Meter.

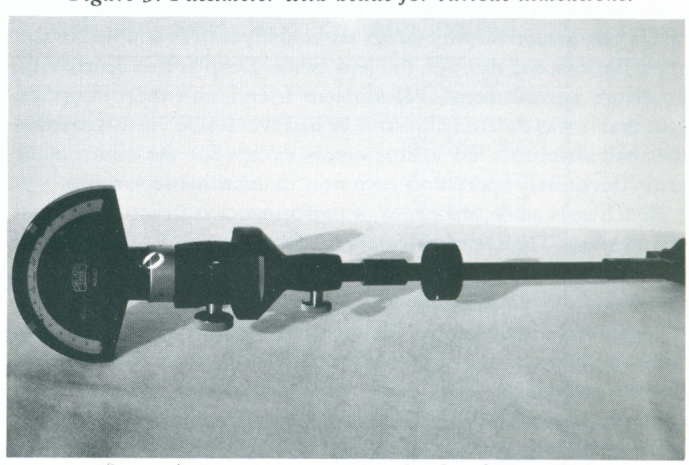


Figure 4. Bore Meter reaches depths of up to 12".

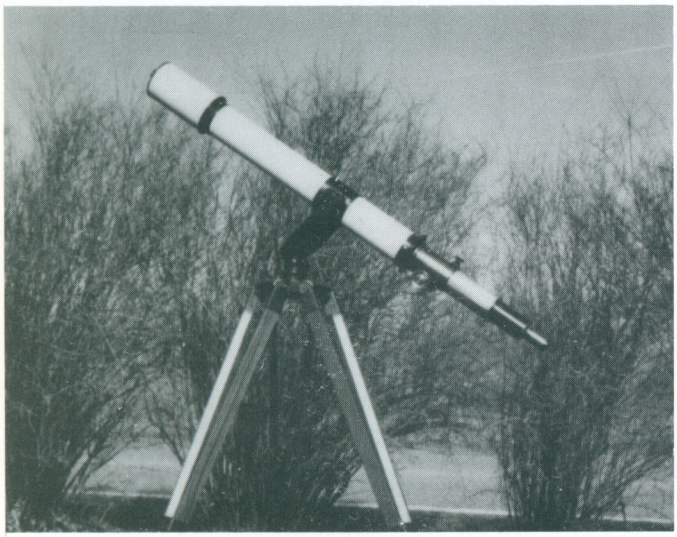
A 60mm ZEISS TELESCOPE

Rodger Gordon, Nazareth, Pennsylvania

In the astronomical community, certain telescope makers have become legendary. In the U.S., the most famous name in astronomical optics was Alvan Clark, while in Europe the name Zeiss generates the same instant respect.

In July 1987, the author became the fortunate owner of a Zeiss 60mm. refractor telescope, serial number 8519. The instrument is listed in Zeiss Catalog 28 as their "travelling telescope". My outfit consists of a 60mm. f14.2 objective of 850mm. focal length, dewcap, dustcap, tube assembly, tailpiece, altazimuth mount and two oculars. One is a 40mm. Kellner; the other is a 9mm. Abbe orthoscopic. The objective is the well-known Zeiss E model, which is a standard Fraunhofer-type achromat.

After purchase, it was taken to the home of an amateur friend of mine who has a well-equipped machine shop. The tailpiece was loose due to a broken internal metal ring, but this problem was soon corrected. The objective was also disassembled for internal and external cleaning.



60 mm. travelling telescope as it looks today.

It was then discovered that at some earlier time the lens had been removed and replaced backwards in its cell, with the flint component now facing outward. Despite this "insult", the performance had been reasonably good; after proper orientation of the components, the performance was superb.

An auto-collimation test was performed on the lens. This bench test is very sensitive. Any errors are actually seen as doubled in size since light passes through the lens twice. Despite this sensitivity, no errors were detected. My amateur friend, an expert in optics, said that it was the first objective he had ever tested via this method that had absolutely no visible errors except for the minor color error (secondary spectrum) common in achromatic systems.

Bench tests aside, the proof of performance is in actual celestial observation. The Dawes formula for resolution is R=4.56 divided by the objective's diameter in inches. A 2.4″ telescope like mine should resolve double stars at 1.8 arc/seconds.

Tests on the well-known "double-double" star, E1 and E2 Lyrae, whose components are 2.7 and 2.2 arc/seconds apart, showed both to be resolved at 94X, with dark sky visible between both components. Another double star, Pi Aquilae, has a separation of 1.4 arc/seconds — well below the limit of a 2.4″ telescope. This star is actually listed as a test object for a 3″ telescope. With my instrument at 141X, this double was elongated into a "bread loaf" pattern, though complete separation could not be achieved.

My own specialty is lunar and planetary observation. Here the 2.4″ Zeiss compared favorably to a 3″ f15 refractor that also has a very good lens. Jupiter, Saturn, and lunar detail were given thorough examinations with both instruments. The Zeiss showed just about everything that could be seen with the 3″. Based on these and other comparisons, it is my opinion that the Zeiss is superior to most of the Japanese instruments of similar apertures offered today.

The classic diffraction pattern of a star image under high magnification is a brilliant spot called the "airy" or "central" disc, surrounded by a series of diffraction rings. Theory states that if no obstructions are present (a secondary mirror in a reflecting telescope, for example) the central disc will contain 84% of the light. The remaining 16% will lie in the surrounding ring system. The Zeiss shows this textbook diffraction image. Moreover, examination of the intra and extra focal images shows them to be identical on either side of focus (except again for minor color error). In my 36 years of observation, this is the first objective I have seen that gives this highly desirable characteristic.

My best guess as to this telescope's age is early to middle 1920s. But an earlier origin cannot be ruled out. The 1925 book, "Das Zeisswerks" by Felix Auerbach shows a 2.4″ travelling telescope (with slow motion controls) on page 60. The Zeiss Astro catalog of 1928 and the Zeiss price list of 1932 show the same instrument, but only the "AS" and "B" objectives are listed for it. The "AS" is a two lens semi-apochromat; the "B" is a full apochromat using three lenses. However, the Zeiss 28 catalog lists the instrument as being available with "E", "A", and "B" objectives. Probably the "E" was discontinued later on (at least temporarily) and the "A" is undoubtedly an earlier semi-apochromat that was later replaced by the "AS".

Recently the author purchased most of the equipment of a retired amateur astronomer. Included was a 7mm. Zeiss orthoscopic eyepiece of 60 degrees apparent field that had been originally purchased in 1934. A comparison of performance characteristics between it and two "modern" eyepieces, a 7.4mm. Ploessl and an 8mm. orthoscopic revealed the Zeiss to be superior both in contrast and definition, despite the fact that it was uncoated.

Over the past ten to fifteen years, telescopes of classic design made by the "old masters" have become highly desirable items in the amateur community. As a result, there has been a veritable price explosion due to the increased demand for a limited supply.

It is not unusual for instruments of Clark, Mogey or Zeiss to command prices of $1,000 to $1,500 per inch of aperture. Even though the appearance of such an instrument with a 3″ to 5″ aperture is a rare event in the second-hand market, price tags of $4,000 to $8,000 do not seem to scare away prospective buyers. Like Zeiss cameras, second-hand Zeiss telescopes are highly-sought.

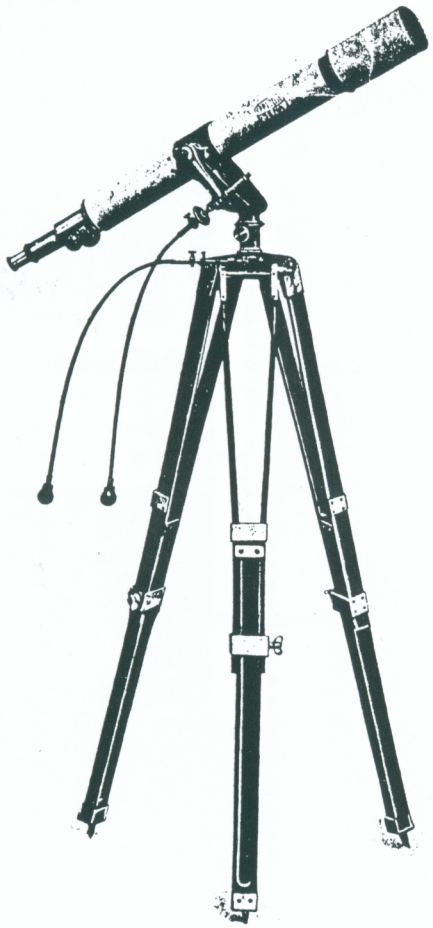
The appreciation of one's investment in these pieces of optical history is of course important. To me, however, the real satisfaction in owning a classic telescope is preserving the past in the present for enjoyment in the future. And that gives one a very fine feeling indeed.

My thanks to Nicholas Grossman for his kind invitation to submit this article to Zeiss Historica.

ZEISS Telescopes

60-mm. Travelling Telescopes

for astronomical and terrestrial observations



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Catalogues relating to the following subjects will be sent free on application:

Title	Catalogue Reference Title
Zeiss Look-out Telescopes	Astro 26
Astronomical Instruments	Astro 30
Azimuth Telescopes, Comet Finders	Astro 31
Equatorially mounted Telescopes, Refractors, Reflecting Telescopes	Astro 32
Astronomical Accessory Instruments, Micrometers, Astro-photographic Cameras	Astro 33
Astro-spectroscopes and Spectrographs, Measuring Appliances	Astro 33
Optical Equipment of Astronomical Instruments	Astro 34
Observatory Domes, Observation Ladders, Rising Platforms	Astro 35

Price List of our Astronomical Instruments will be sent with every Astro Catalogue

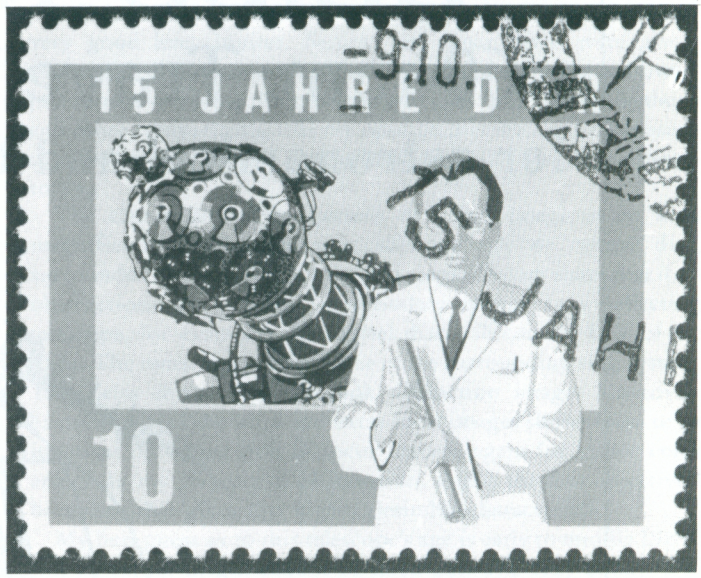
Page from Zeiss "Astro 28" catalog/instruction book.

ZEISS BY MAIL

Zeiss people, places, and products have been widely reproduced on the postage stamps of many countries. On these pages is a selection of some of these stamps, all from the post-WWII era.

Where given, catalog numbers are those from the Scott catalog. Stamps were provided by Charles Gellis and Nick Grossman. Most of the identifying information is by Charles Gellis.

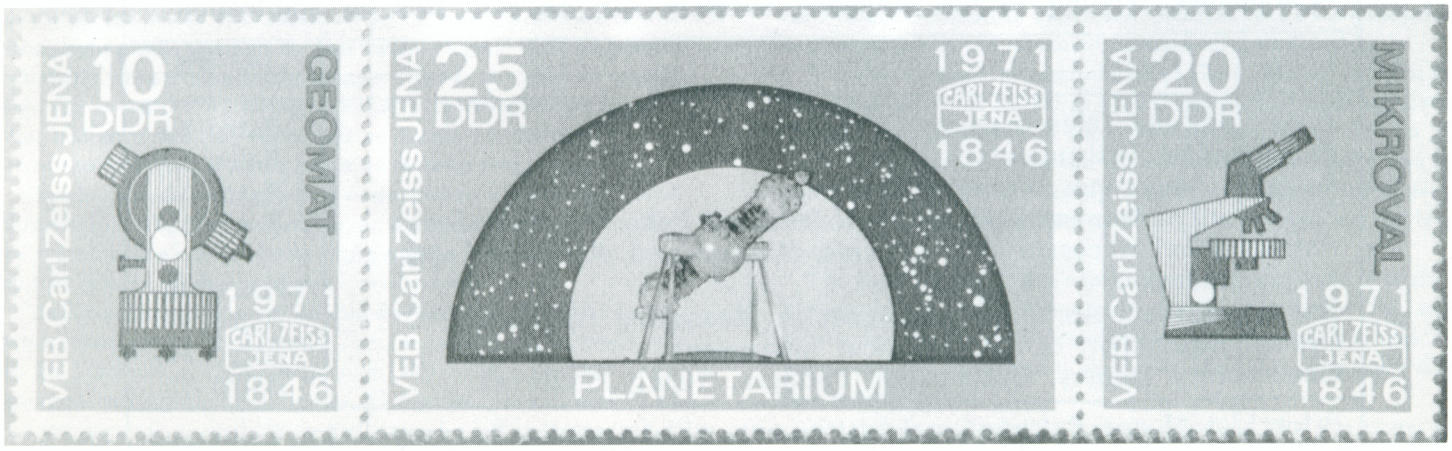
E. Ger. #253, 1955. Zeiss Universal Microscope Type Lu-We in the background, 35mm. Exakta in the foreground.



E. Ger. #733, 1964. Planetarium (probably a Zeiss Star Projector.) Series commemorates 15th anniversary of the DDR.

Hungary #2341, 1975. Albert Schweitzer commemorative with E type Zeiss monocular microscope at right.

E. Ger. #312, 1956. Carl Zeiss Optical Works in Jena. Series commemorates 110th anniversary of the Works.



E. Ger. 1971. Series shows VEB Carl Zeiss Jena instruments.

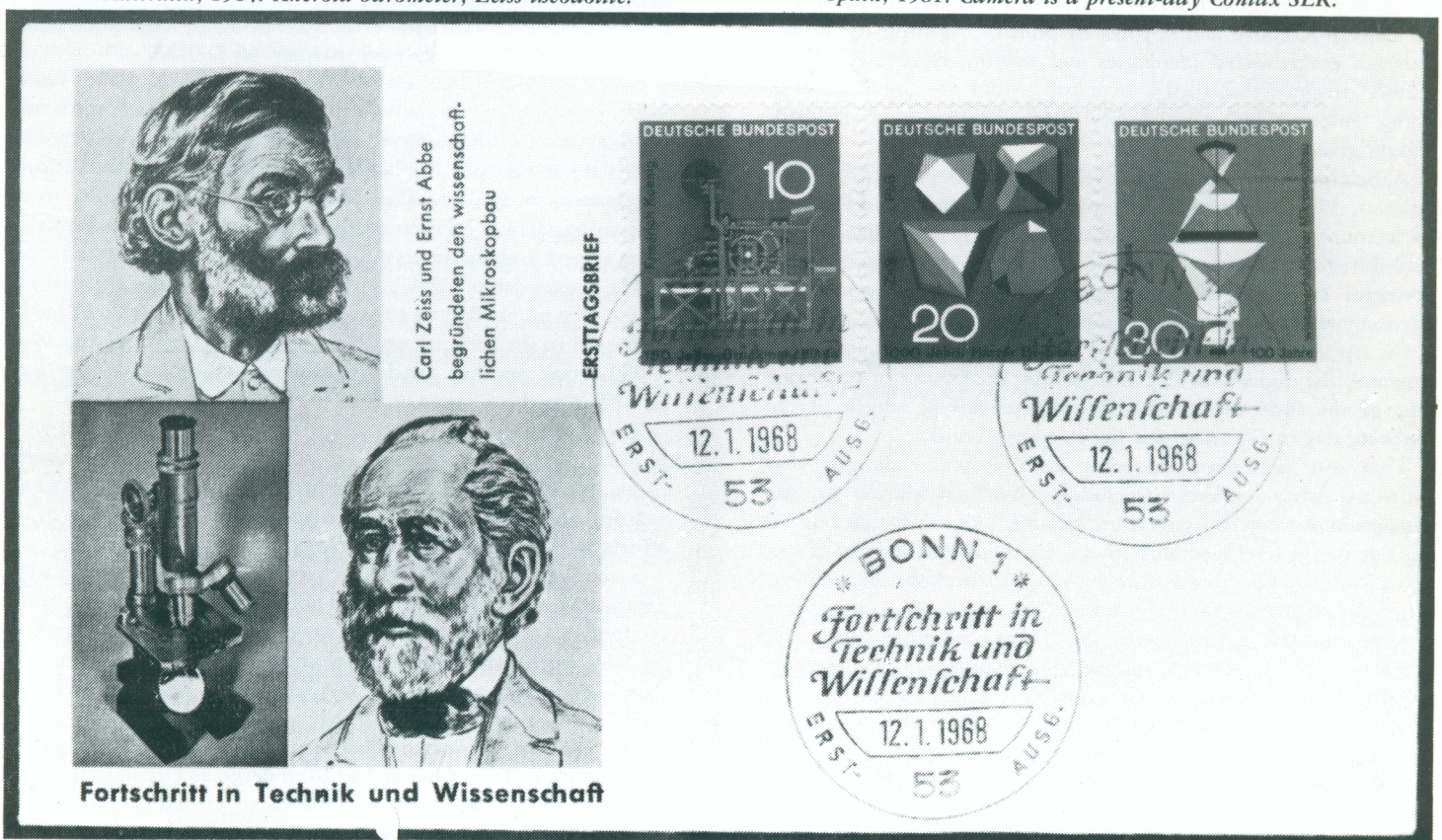
E. Ger. 1965. Zeiss binocular microscope.

E. Ger. #898, 1967. 2-meter Zeiss reflector.

E. Ger. #785, 1965.

Australia, 1984. Aneroid barometer, Zeiss theodolite.

Spain, 1981. Camera is a present-day Contax SLR.



W. Ger. #980 (30pf.), 1968. First day cover with Zeiss and Abbe. Cover marks 100 years of microscope and optical design.

ERNST ABBE AND THE FOUNDATION

S. Takeda, Tokyo, Japan

The intent of this article is to share with the members of Zeiss Historica my observations about the role of Dr. Ernst Abbe, in the course of the evolution of the Zeiss Workshops into the Carl Zeiss Foundation. I wish to examine the ideals that Abbe had and their realization in the Foundation. It may be taken for granted though, that Dr. Abbe should have never had such an opportunity to implement his philosophy, had it not been for the great foresight of Carl Zeiss.

It was Abbe, however, who made the work of Zeiss immortal. He did so in a unique way that had never been preceded nor has yet been imitated. Today, it still attracts the interest of, and deserves the admiration of, the student of sociology, administrative ethics, philosophy, and the history of business enterprises.

The uniqueness of his ideals and the realization thereof can best be observed in the spirit embodied in the Charter of the Foundation. It should be noted, however, before looking into the details of the Charter that the very notion of forming a Foundation as the supreme administrative organ of an entire group of enterprises was unique. It meant that the objectives and modus operandi of profit-making enterprises had to be subordinated to the objectives of a non-profit organisation like the Foundation.

To the best of my knowledge, nowhere else and at no other time until today has any commercial undertaking assumed this sort of structure. It may be that the idea of the Foundation was conceived by Abbe to provide the Zeiss group with its own life, free from the eternal conflict between capital and labor. It would position the group as a "Werkgemeinschaft" that would continue the pursuit of its objectives above and beyond all political fighting for power between controversial ideologies and warring classes. Dr. Abbe further dreamed that such a structure would prevent labor from being "enslaved" by wages. Rather, "subordination and superiority should give way to justice."

Abbe's ideals can be observed everywhere in the paragraphs of the Charter. He prohibited hiring to be influenced by the ethnic background, religious and or political beliefs of the employee. He prohibited the exercise of any control over the extracurricular activities of employees, as long as such activities would not adversely affect their duties as employees or citizens.

On April 1, 1900, Zeiss adopted the eight-hour working day. In England, the eight-hour day was gaining acceptance in the major part of the industrial sector. But the prevailing length of the working day in Germany was ten to twelve hours.

This was publicised, together with recommendations that protected labor's interest (including, but not limited to, the restriction of compulsory working hours of industry to nine hours a day) at the general assembly of the German Machine Industries Association by Dr. Abbe in August of 1901. Dr. Abbe then became target of hostile criticism by almost all the attendants — attendants who represented the nucleus of the German machinery industry. Abbe tried to convince them that such change would eventually benefit them. He cited various statistical evidence that demonstrated the potential improvement in morale and productivity which would result from reducing the number of compulsory working hours. (Later, Abbe's ideas evolved into one of the central concepts of productivity which were proclaimed in Philadelphia in 1944 by the ILO).

The originality of Dr. Abbe's ideals could be seen in more radical form. He went so far as to prohibit any attempt to control competition by patents, when such patents covered inventions or improvements which would be useful for basic purposes of study and scientific research and development. This prohibition was to be in effect forever.

He also tried to specify the areas on which the enterprises belonging to the Foundation should focus their resources. He defined these areas as those in which highly professional work is required. Such work would not necessarily be acknowledged or supported by others because of its originality. Hence it was destined to be solitary work. Yet such ought to be the nature of the work in the areas thus defined, even if it were to constitute an unrewarding undertaking from an entrepreneurial point of view.

In light of contemporary theory and practice of business administration, the ideals that Abbe conceived and implemented tend to appear excessively utopian. But to Abbe, obviously, "work" was not "business" but rather a "mission" which would enhance the welfare of the public. In his own words: "Wir alle gehoeren nicht uns selber", or "We don't belong to ourselves alone."

He realized his ideal of making Zeiss immortal in the form of the Foundation (May, 1889). He had finally succeeded in identifying an acceptable way to dispose of all the equity he held in Zeiss. It would benefit the public and research if it were given to the Foundation. It would preclude the risk of the enterprise being exploited for the benefit of any individual, including himself.

He also tried to remove a final potential danger: any possible desire for material gain by Dr. Roderich Zeiss, the heir of Carl Zeiss. Roderich Zeiss was then the partner of Dr. Abbe.

It was difficult, to say the least. It is said that Dr. Abbe's health was significantly impaired during this period by insomnia and habitual use of medicine to relieve the insomnia. There was conflict in his mind between his belief in his ideals, and his emotional attachment to the late Carl Zeiss to whom he felt he owed everything. It was approximately two years before Dr. Roderich Zeiss agreed to abandon his equity and donate it to the Foundation.

The remainder of Abbe's task was to provide the Foundation, now only a purely de jure entity, with a life or spirit that had to be expressed in the form of words, in absence of any better means.

This took another good five years to complete. It was then published as the Charter or Constitution of the Foundation.

The difficulties that Dr. Abbe had to overcome were of a philosophical nature. First, he had to make this manifestation of his ideals in such a way that it would remain effective under any given political and or socioeconomic situation. One can find traces of his efforts in his meticulous phraseology.

Second, he had to deal with such exhaustive details as extra wage payments for overtime work, paid holidays, and so forth. All had to be done in a tone and manner consistent with the sections in which he dealt with more generic, ideological subjects. The Charter was published in Jena on the 26th of August, 1896. Eight and half years later, this restless and overworked man passed away.

My personal interest has been to study the changes that the Foundation and the Charter had to undergo as circumstances and powers around it changed. The first change followed the

(Continued on following page)

LICHTSTRAHLEN

Light Rays: Notes of Interest to Those Interested in Zeiss and Its History

A GOERZ SURPRISE

Among the dozens of business machines displayed in the Museum fuer Verkehr und Technik in West Berlin (Trebbinerstrasse 9) is this single Goerz printing adding machine from 1930. Manufacturer was indeed the Goerz which later became part of Zeiss Ikon: Optische Anstalt C. P. Goerz AG, Berlin Friedenau.

SUMMER MEETING IN GERMANY

On July 23 and 24, 1988, a number of members of the Society gathered in Hamburg for an informal meeting. Attending were Hans-Juergen Kuc, Siegfried Schlegel, Wolfgang Frank, Willy Schelong, Kurt Juettner, James Cornwall, Joachim Kammerer (from Zeiss Oberkochen), J.J. Rault, Simon Worsley, Allen Numano, S. Takeda, Charles Barringer, Nick Grossman and Siegfried Schaub.

Topics discussed by the group included the serial numbers used on pre-war Zeiss, Jena and Zeiss Ikon equipment, a comparison of the qualities of post-war Contarex lenses with current Yashica/Contax lenses, and an examination of the numerous Contax prototype lenses which have surfaced from 1929-1931.

The meeting also included a trip to Vierhofen to view Willy Schelong's large and varied collection of Zeiss equipment.

In the preliminary stages are plans for a 1989 summer meeting in Germany, possibly to include a visit to Zeiss Oberkochen. If possible, date and place will be published in the Spring Issue of the Journal.

NEW KUC BOOK

Visiting Hans Juergen Kuc in Hamburg in August, the Editor had the opportunity to see paste-ups of the third of Kuc's authoritative books on Zeiss equipment. It will cover, in great detail, the post-war Contaflex and Contarex cameras. A review will appear in the next issue of the Journal.

Kuc welcomes visits by Zeiss Historica members when in Hamburg. His large and well-equipped store "Die Camera" (Phone: 040 / 271 33 51) is located at Muehlenkamp 11, a short ride from the Hamburg Hauptbahnhof on the #108 bus.

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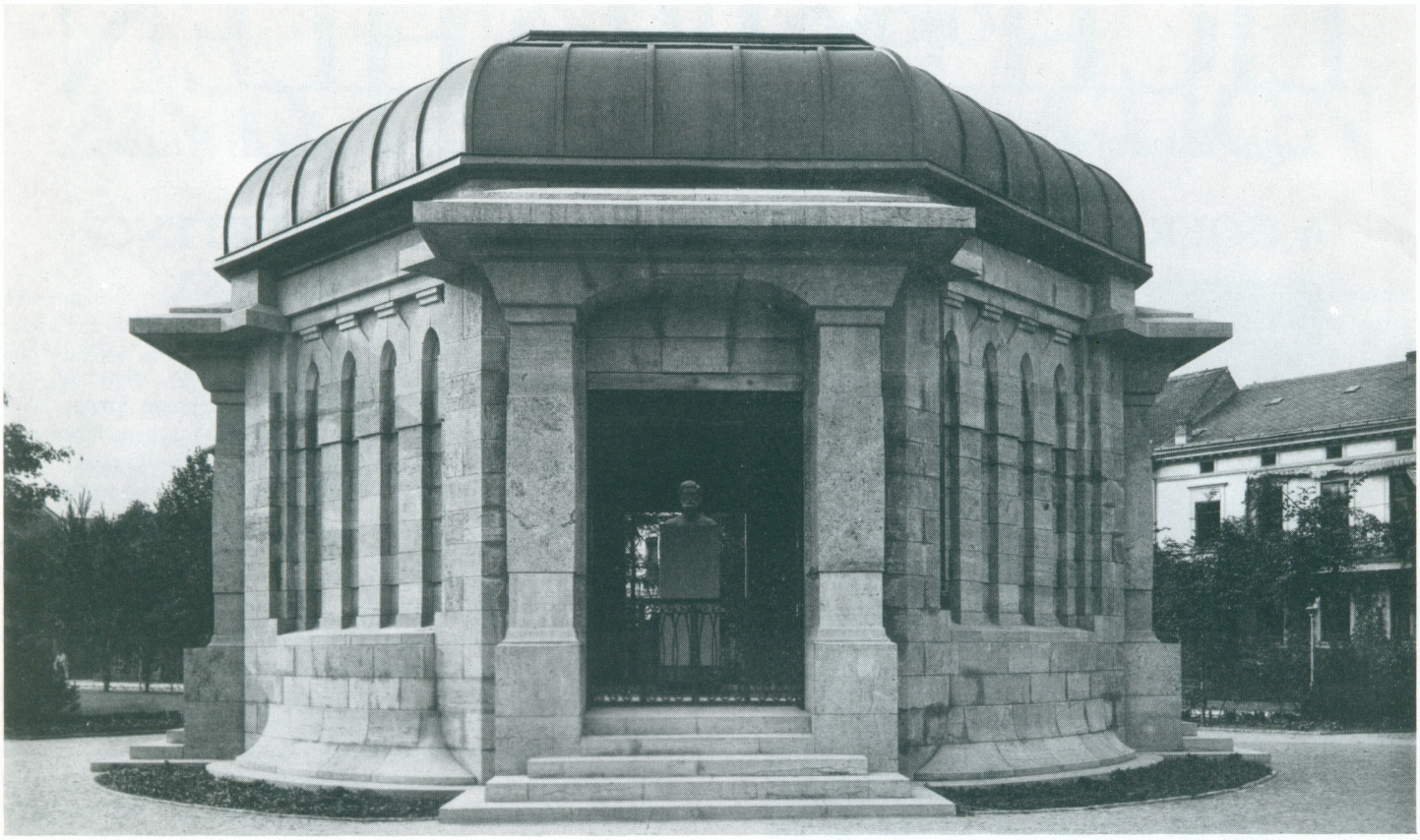
termination of World War I, and the ensuing liquidation of the Grand Duchy of Saxe-Weimar under whose law the Foundation had maintained its jurisprudential personality. The second was the liquidation of the Weimar Republic, and the continuance of the Foundation under the National Socialists' government. The third change was the result of World War II, which is too well-known to be reiterated here.

If I have another opportunity to share my point of view with other members of the Society, I shall try to cover the history of the Foundation after July 1945. It was then that, following a very brief period of occupation by United States forces, that the province of Thueringen, where the Foundation was then domiciled, was transferred to the occupation forces of the Soviet Union.

In the meantime, I wish to invite those who are interested in further study of the historical aspects of the Carl Zeiss Foundation to peruse the following bibliographical resources. They are, in my opinion, the classic masterpieces in the category. It is to them which I owe much of my enlightenment.

- *Statut der Carl-Zeiss-Stiftung*
  Dr. Ernst Abbe
  Jena, den 26. August 1896
- *Werden und Wesen der Carl-Zeiss-Stiftung*
  Dr. Friedrich Schomerus
  1955 (2. durchgesehene Auflage)
  Gustav Fischer Verlag — Stuttgart
- *Geschichte des Jenaer Zeisswerkes 1846-1946*
  Dr. Friedrich Schomerus
  1952 348 pages
  Piscator Verlag — Stuttgart
- *Der Fall "Zeiss"*
  Herr Frank Heintzeler
  1972 194 pages
  Nomos Verlagsgesellschaft — Baden-Baden
- *Glaeserne Wunder*
  Herr Friedrich (Fritz) Scheffel
  orig. 1938 (3. Auflage ueberarbeitet und erweitert von Herrn C. Doberman
  (3rd edition reworked and supplemented by Mr. C. Doberman)
  1965 410 pages
  Verlag Braun & Schneider — Muenchen



Ernst Abbe memorial in Jena. Memorial was erected in 1909 by Abbe's admirers and the Carl Zeiss Foundation. Building is by Henry van de Velde; relief is one of several in the interior by Meunier. Bust of Abbe inside building is by Max Klinger. (Photos made prior to 1930.)