ZEISS HISTORICA

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

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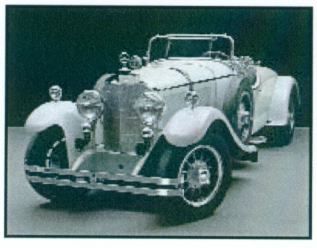


Front cover: a contemporary Mercedes with a Contax direction indicator fixed to the passenger-side wind shield. Dietmar Speidel explores these accessories in his article on page 13.

(Photo from the Daimler-Benz Archive.)

Back cover: The front of a 1938 Zeiss brochure advertising their automobile accessories (a few pages of the same publication are reproduced within).

(Image supplied by Simon Worsley.)

President's letter

As I sit to write this letter, the country and my portion of the Nevada desert has been in the throes of the coldest weather in years. It is a good time to be inside with plenty to do.

I am presently reviewing our Zeiss Historica website, which has been in a frozen state since I tried to modernize our outlook when I was beginning my retirement in 2000. As a result, it is now quite out of date, and I am working with a professional web designer to bring us up to date and also to create a more active and more voluminous website. I have the first draft of the new design for review and I plan to place nearly all of our Zeiss Historica Journal back issues there available for public consumption but withholding the issues of the past five years to ensure those and new benefits for the membership. I am also gathering, scanning and placing into the PDF format a large number of early catalogs for all phases of Zeiss product history under the general subjects of binoculars, microscopes, photography, astronomy, and so on for all to see. Earlier today, I gathered a collection of nine different early Zeiss prism binocular catalogs from 1894 through 1900. They will all be available to the general public to download and even print and thus work in lock step with our primary educational directive. It should be available to all interested parties in its first iteration shortly after the new year. The old URL address was www.zeisshistorica.org; the new URL will be zeisshistoricasociety.org.

Warren Winter has been unable to act fully in his capacity as the Society secretary and so I have stepped in to make sure new members as well as current members receive optimal service from the society. All issues regarding member services should now be directly sent to me. Membership forms are also sent with this issue as memberships expire at the end of the year and receipt of this issue. Please respond to the Treasurer with your continued support via check or credit card information as directed on the form. Six members (Rault, Janson, Hinkelman, McNew, Ptashkman, and Small) have already paid for 2014. Members are welcome to pay for multiple years if they wish.

Along with this issue, we are sending a special reprint of the large format 1905 Carl Zeiss Jena Photo Objectives catalog that includes the cameras of the Palmos Department of the firm. This is in line with the suggestion that I received from Maurice Greeson and it has a commentary on the back cover about this series of catalogs. It contains a great deal of interesting information as well as good images — two of them in color!

Zeiss recently made a decision to change the use of its trademark name by eliminating the use of the name of Carl before the surname of Zeiss in many situations. (See the inside back cover for the details.) The trademark logo has long since used the single name but many products have still used both names up to this point, such as on the rim of the photo lenses.

I have spent the last nine months trying to get my book printed in an appropriate setting and binding. The effort has been a frustrating one, because I finished the writing and the layout as long ago as March. As I write this, I have been told that it has been printed and will be shipped to my location to assemble the offering with its supplementary disk of tables and data. It has 890 pages in 8 ½" × 11" format and covers all of the Zeiss firms that provided photographic products. The title is "Zeiss and Photography" and will be available from camerabooks.com. It has not been priced since we have not yet received the costs of transport from the location in Milwaukee to Las Vegas and later to Oregon. Camerabooks will provide a 10% discount to Zeiss Historica members. My goal was to provide quality color images in addition to history in a size large enough to really see the camera components.

Lastly, I would like to recommend another book written by Rick Nordin entitled "Hasselblad Compendium." It is 368 pages in the 8 1/2" x 11" format and is comprehensive with regard to the camera and its Zeiss lenses.

May you all have a great new year!

The Zeiss operating microscopes

Fritz Schulze, Vineland, Ontario, Canada

Modern work in ophthalmic, neuro, gynaecological, dental and other microsurgeries would have been impossible without these highly developed stereoscopic instruments.

Many of our older readers will have had cataract surgery with an intra-ocular lens implanted to restore their eyesight. Others may have had a brain aneurism or tumor operated on, had spinal surgery, an organ transplant, or even a reimplantation of a severed digit. Another likelihood lately is dental surgery or plastic surgery with a skin transplant for example after burn injury,

That surgery would not have been possible without the operating microscope and up-to-date microsurgical techniques. With this in mind, and with my work at the Zeiss company having been with operating microscopes from the very beginning, I intend here to show how the modern Zeiss operating microscopes evolved over the years, not least by the input of many surgeons, from a simple floor stand-mounted stereomicroscope to a sophisticated motorized computer-supported operating machine, and how microsurgery developed into a new and indispensible medical discipline.

Early beginnings

The first surgeon to use the aid of a microscope was the Norwegian otolaryngologist Carl-Olof Siggram Nylén (1892–1978) who adapted a monocular Leitz-Brinell microscope (designed to be used for hardness testing and having a low magnification and long working distance) in 1921 for inner ear surgery. Shortly thereafter he switched to a binocular stereomicroscope.

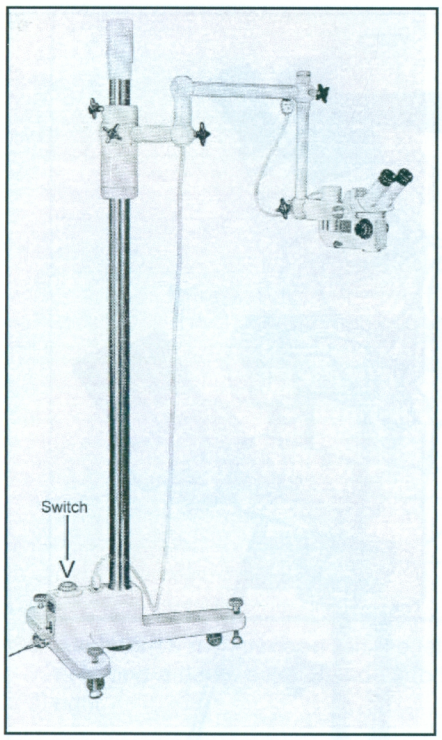
The first German doctor to use a stereomicroscope was Dr Hans Hinselmann (1884–1959) in Bonn. In 1925 he adapted a Leitz stereomicroscope with coaxial illumination to a movable floor stand. He named his design "colposcope" and used it to visualize the female genital organs, particularly for cancer of the cervix. This colposcope, configured with the aid of the local Leitz representative, Hans Hilgers, allowed magnifications from 3.5× to 30×. Despite the threefold improvement in the early detection of cervical cancer afforded with this instrument, resistance by the medical establishment slowed the introduction of colposcopic examinations from becoming routine for some time and were practically unknown in America until the 1970s. I remember being astonished upon my coming to Canada in 1963 to find that the colposcope was virtually unknown, while in Germany almost every gynaecologist used one in his or her office.

Dr Hans Littmann (1908 – 1991), who, with his team, developed the first operating microscope in 1953. Figure 1

First commercial design

After some years of development, Hans Littmann (1908–1991, figure 1), head of Med-Lab at Zeiss Opton Oberkochen, and his team introduced their first operating microscope in 1953 (figure 2). It was based on the well received Stemi 1 with Galilean magnification changer, and it already had many of the features needed in a practical operating microscope. They are: a versatile mobile floor stand, magnification changer, coaxial illumination, and a choice of working distances.

The first application was to otolaryngology, by Horst L. Wullstein (1906–1987) of the Würzburg Policlinic, and it was an instant success used in the beginning mostly for stapes mobilisation (restoration of hearing)



This 1953 operating microscope from Oberkochen already had the necessary features for a practical operating microscope: a mobile floor stand, magnification changer, coaxial illumination, and a choice of working distances. Figure 2

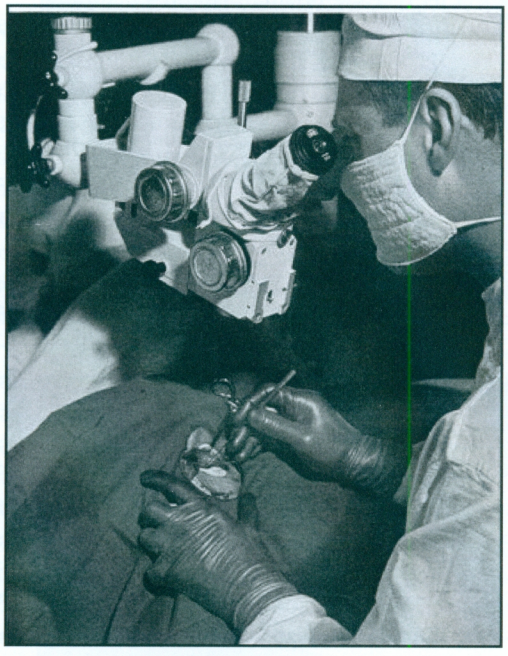
and similar inner-ear procedures. Almost immediately, Dr H. Harms of Tübingen thought the new operating microscope would be useful for eye surgery, in particular corneal transplants. However, he found the reflex caused by the coaxial illumination irritating and upon his suggestion a modified operating microscope with external oblique illumination, and later even a slit illuminator, was designed especially for ophthalmic surgery.

To use the new instrument efficiently, much smaller and more precise needles, forceps, sutures and so on had to be made, In fact an entirely new branch of micro-surgery developed, with new techniques and new procedures hitherto thought impossible (figure 3). Some sutures with needle attached are so small (0.025 mm diameter, or less than half the average thickness of a human hair) as to be almost invisible to the naked eye.

A range of accessories for the Zeiss operating microscope followed in due course: co-observer tubes, camera attachments for still and cine-photography, a double microscope, special modifications for neurosurgery, a ceiling mount, halogen illuminators, motorized zoom, assistant's microscope, and so on. The instrument was also adapted for forensic and technical work (such as art restoration), with a table stand for lab work, or with a short floor stand as a colposcope for gynaecology.

This Zeiss operating microscope was an immediate worldwide success and became the benchmark for all future designs. After several years it was copied first by a Brazilian firm (an almost exact copy of the Zeiss with parts interchangeable!) and then a Japanese one. Another German firm then started production of a competitive instrument, and a few years later an American competitor arrived on the scene. In 1981 Wild-Leitz introduced their operating microscope, which by now has cornered a fair share of the market, while both the American, Brazilian, and the other German manufacturers stopped production or became insignificant on the international market. I think there are still Japanese and Chinese operating microscopes being built.

Modern versions of operating microscopes add features not yet present in the early models, including gimbal stands, fiber illuminators, motorized controls, and computer-assisted navigators. Applications include otolaryngological and ophthalmic surgery, plus neurosurgery, plastic and reconstructive surgery, fertility surgery, dental surgery, and in a very simple version, electrolysis (hair removal).



Microsurgery with the Opmi 1. Notice the sterilizable stainless-steel caps on the control knobs and the sterilizable linen cover on the binocular tube. Figure 3

Features regarded as necessary are:

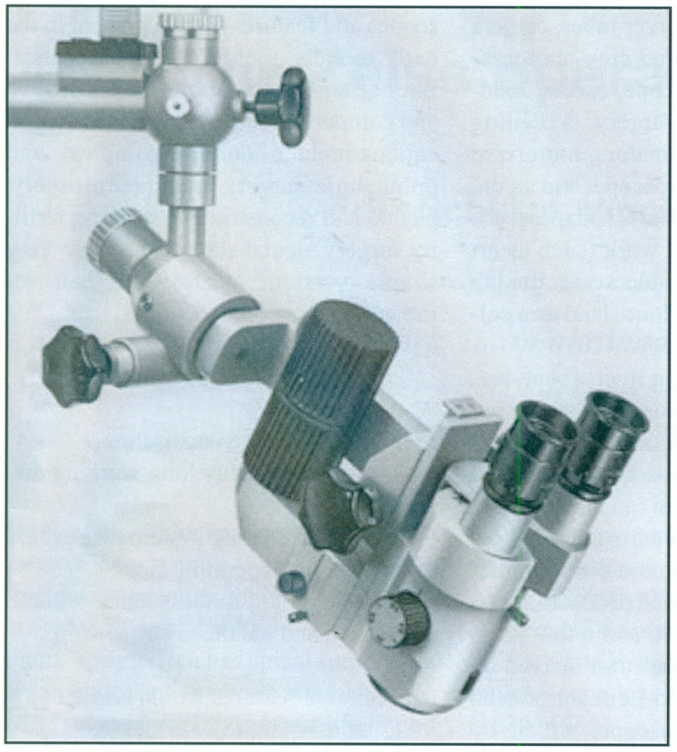
1. Stereoscopic visualisation,
2. A comparatively long working distance,
3. An illuminating system that evenly illuminates the operating field,
4. A stable but mobile stand, with an articulated and balanced suspension..

Desirable features would allow::

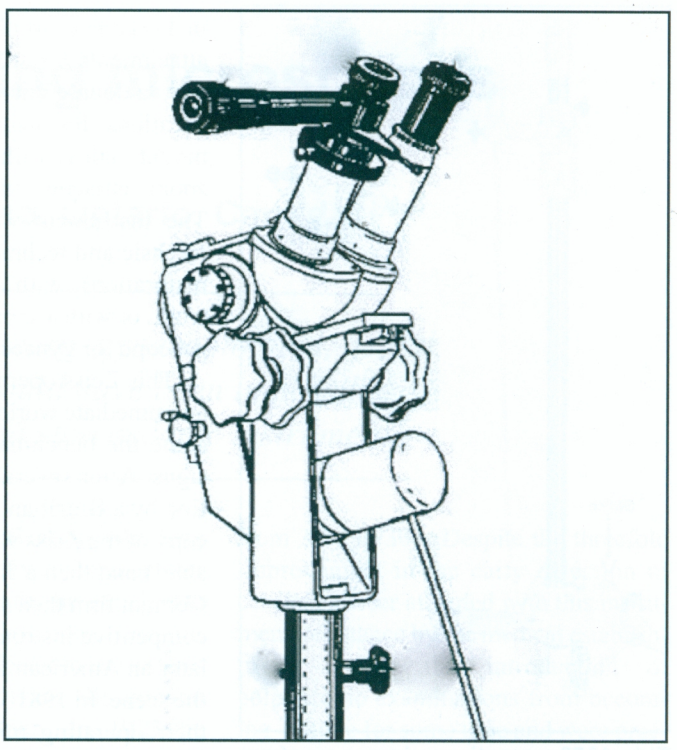
1. an assistant to co-observe,
2. documentation of the procedure,
3. adaptation to a wide range of procedures,
4. the instrument to be kept sterile.

The Zeiss Opmi 1

The Stemi 1 from which Dr Littmann developed his successful model was the first modern stereomicroscope constructed by Zeiss Opton after World War II. It is based on the Galilean principle and has a five-step magnification changer with constant working distance. For the operating microscope named the Opmi 1, first a coaxial illuminator was added with the light from a 6 V 30 W tungsten bulb exiting through the main objective and focused on the operating field. Next the rigid mount was changed to a swivel mount to allow the instrument to be positioned easily both horizontally and vertically in a wide range of angles. The achromatic objective could be exchanged for any objective of 150 mm (ophthalmic), 200mm (general microsurgery and otology), or 300 and 400 mm (laryngology) focal length. The corresponding magnifications ranged from 4.4 to 32.5×. As more applications for this new microscope were found, the range of objectives was extended from 50 mm to



The new shape of the Opmi 1 with a redesigned lamp housing, small knobs for the magnification changer, and single lateral suspension arm instead of the original fork. This picture also shows a geared tilt coupling. Figure 4



The first attempt for providing co-observation. In this demonstration system with a 10× eyepiece the orientation of the visual field varied with the position of the demonstration eyepiece, which is a definite disadvantage. Figure 5

2000 mm with a corresponding range of magnifications from 3 to 165×.

The five-step magnification changer in the cube-shaped body had the factors 0.4 – 0.63 – 1.0 – 1.6 and 2.5 with a stereo base of 22 mm (distance between the optical axes of the two Galilean systems).

The straight and binocular tubes, also derived from the Stemi 1, had initially a tube inside diameter of 30 mm, reduced shortly after to 25 mm. Two eyepieces were offered, 12.5× and 20×, both focusable and equipped to accept reticules. A 10× demonstration eyepiece followed. Several years later Zeiss changed over to high-eyepoint eyepieces with collapsible rubber eyecups that could be used by eyeglass wearers.

The binocular tubes when equipped with an eyepiece actually form telescopes, with a 160 mm focal length. A second shorter set with $f = 125$ mm came out later in order to maintain the compactness of the microscope when more accessories became available.

On the body of the Opmi 1 there were attached two receiver dovetails for accessories. The one in the front accepted a photographic attachment, the one underneath was intended for an electronic flash or a diverting prism to obtain 45° illumination .

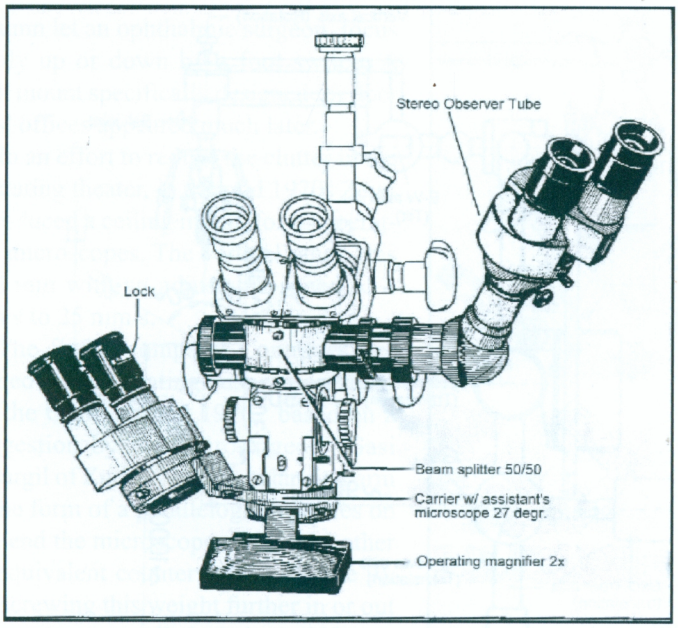
The "horseshoe" fork for tilting was later replaced (figure 4) by a one-sided suspension arm in order not to limit the tilting range, a feature desired for neurosurgery.

The illumination

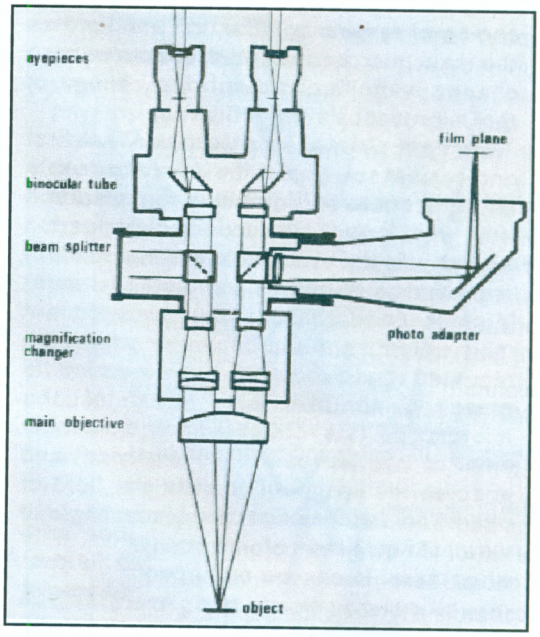
The original Opmi 1 had an integrated illumination system attached to the side opposite the operator. It consisted of a pre-centred 6 V 30 W tungsten bulb, a collector (the diameter of which defined the illuminated field), one each green ("red-free") and daylight filter, and a prism to divert the light through the objective onto the operating field. This prism, with one lenticular surface that acted as condensor, was arranged parallel to the two Galilean systems immediately above the objective, and the filament of the bulb filled its opening exactly. Later models had a larger lamphousing with a 12 V 100 W halogen bulb, recommended for video- and photography, or a separate light source with an optical fiber guide ending directly at the illuminating prism.

The oblique angle of the illumination was equal to half of the angle between the two Galilean systems, therefore, any cavity large enough to allow its base to be visualized stereoscopically also allowed the light to reach it. The so-called red-free filter increased the contrast in the mostly red operating field while the daylight filter reduced the red part of the tungsten light and provided a "colder" light preferred by some surgeons.

Ophthalmologists work almost exclusively with a vertically arranged microscope and oblique illumination. Several solutions were provided for this case. The first one was an attachable prism "diverter" which, clamped under the microscope, diverted the light emanating from the prism so that it fell onto the operating field under an angle of 45°. The second solution was to attach a simple 6 V 15 W low-voltage microscope illuminator by means of an articulated holder to the microscope body — not a very satisfactory solution. Much better was an attachable



Assistant's microscope (on the left) mounted on a rotatable ring, and a beam splitter leading to the observer's tube to the right. Figure 6



The beam splitter in a schematic drawing. The split could be either 50/50, for co-observation, or 70/30, for photography. as here. Figure 7

slit illuminator that provided not only bright oblique illumination but also slit illumination, most desirable when operating on the anterior parts of the eye. This slit lamp with its 6 V 25 W bulb could be moved on an arc-shaped slide to select a suitable angle of incidence.

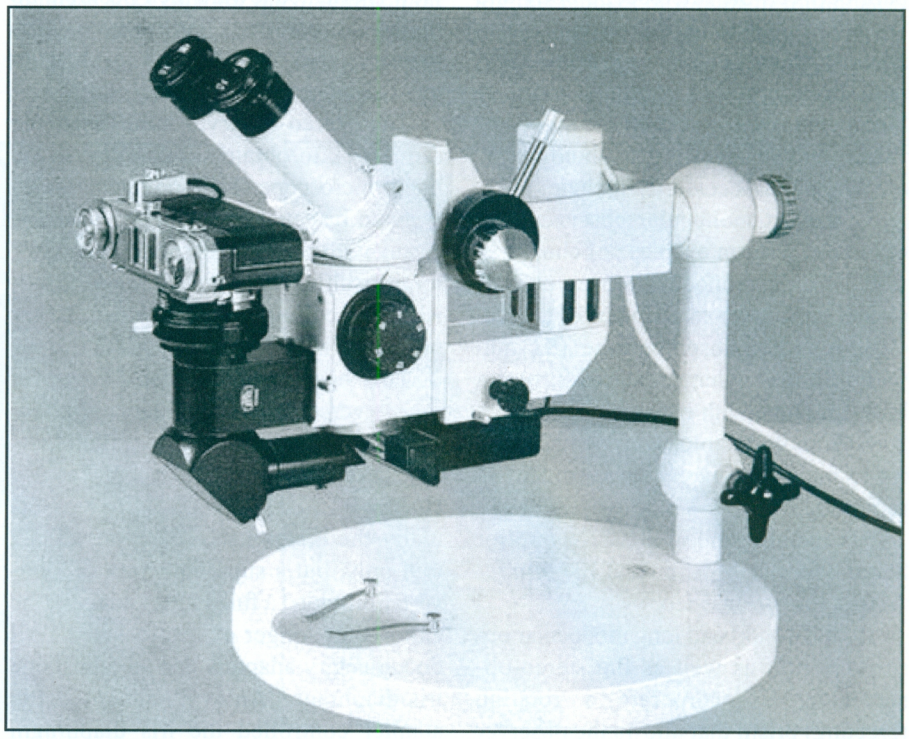
Assistants and observers

Many surgical procedures require the presence of an assistant, and in microsurgery the assistant must be able to see the same operating field as the surgeon and oriented for his or her own position. In some cases it is desirable that the assistant have a larger view with a lower magnification. While in a strictly teaching or observer situation stereoscopy is not absolutely essential, an assistant has to have stereovision. So there are two different systems: one monocular for observation only and one stereoscopic for an assistant.

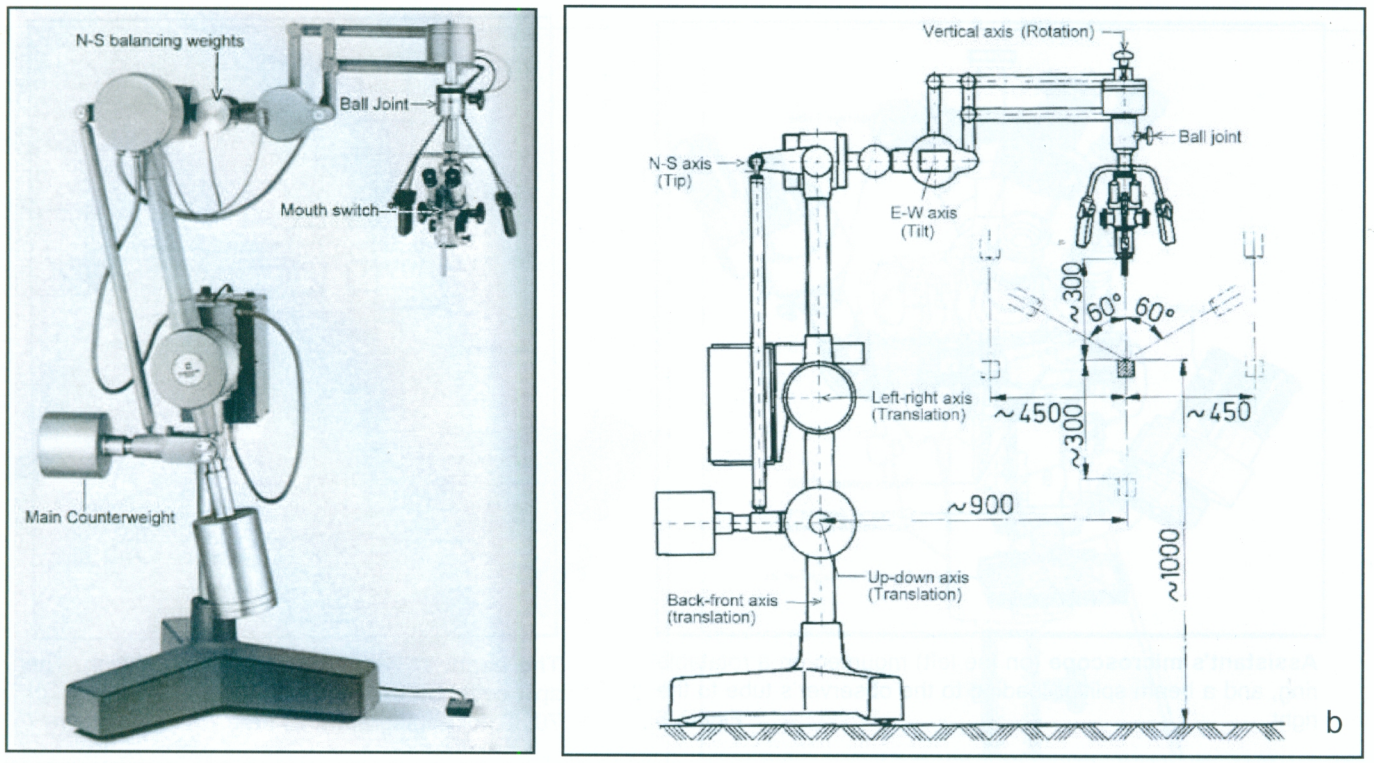
An early attempt was the demonstration eyepiece 10×, an eyepiece with a small internal splitting prism and a lateral extension arm with a second eyepiece (figure 5). A matching regular 10× eyepiece balanced the system. The orientation of the visual field varied with the position of the demonstration eyepiece, which is a definite disadvantage.

When the operating field is fairly flat and accessible, the assistant's microscope 27° can be used (figure 6). This accessory is mounted on a carrier ring either screwed above the objective or incorporating the objective (f = 150 to f = 200 mm only). It is a self-contained microscope that can also be fitted with a simple three-step magnification changer and can be rotated from side to side, providing considerable flexibility of the set-up. The focal length (working distance) of its main objective is 25 mm longer than that of the main microscope.

A great step forward was the introduc-



An Opmi 1 and camera attachment with electronic flash. Both the microscope and camera objectives in this case are 50 mm focal length. Figure 8



The Contraves floor stand as a photograph and a schematic drawing. When the ball joint is loosened, the microscope assembly swings down to find its own vertical axis. The main counterweight can be screwed in and out to balance any extra accesories. Figure 9, a and b

tion of the beam splitter (figure 7). This accessory, inserted into the parallel light path between the microscope body and the binocular tube, contains two beam-splitting prisms, one for each optical system, diverting the light sideways. A 50/50 split, mostly chosen for co-observation, and a 70/30 split for photography are available. Accessories include:

1. A short monocular observer tube (150 mm) with an eyepiece of choice
2. A long monocular observer tube (~ 300 mm) with an eyepiece of choice
3. A stereo-observer tube (83 mm without tube), which requires in turn a binocular tube with eyepieces
4. A photo-adapter with $f = 220$ mm for 35 mm photography via a standard 35 mm camera body
5. Cine-adapters with $f = 74$ mm for Super 8 format, 107 mm and 137 mm for 16 mm format or video.

Both the short and long monocular observer tubes, as well as the stereo-observer tube, incorporate a rotating (erecting) prism that allows the observer to orient the field of view either for observation and teaching – in which case the orientation corresponds to that of the surgeon – or assistant, in which case the view is oriented toward their position. So if the surgeon says, for example: "See the nerve at 3 o'clock," the co-observer must also see it at 3 o'clock.

The stereo-observer tube uses the same trick to obtain stereoscopy as the main microscope: The one optical beam is again bisected by means of a double prism with a reduced stereobase of 7 mm, resulting in a considerably diminished stereo impression, inadequate for assistance but better than nothing.

This beam splitter also allows for more versatile and practical photo adapters, initially for the Zeiss Ikon Contax, later on the motor driven Yashica Contax RTS or 137 MD (figure 8). Normally the image had a diameter of 22 mm only, but a supplementary 2× converter provided a full 35 mm image at the expense of longer exposure times. All documentary adapters had an adjustable iris diaphragm. An available automatic adapter controlled the iris diaphragm through a light sensor covering a central 12 mm diameter area and powered by two long-life batteries. Only 10% of the available light was diverted for the sensor. For cinematography, specially modified Beaulieu Super8 or 16 mm cameras controlled the diaphragm motor by their own sensor.

Stands and suspension systems

The original floor stand, either 1.9 or 2.1 meters high, had a T-shaped base on castors with screws for levelling and locking. These screws were soon replaced by a central brake. The base also contained the power-supply unit, 40 VA, and the optional 80 Ws flash generator. The colposcope version featured a one-meter column.

Several removable lead counterweights could be added or taken off to maintain equilibrium when different accessories were attached to the microscope. As a safety feature a clamp ring under the carriage prevented the microscope from falling. For ophthalmic surgery the axis of rotation needs to coincide with its optical axis, which required a special attachment, and a so-called "motor head" attached to the top of the

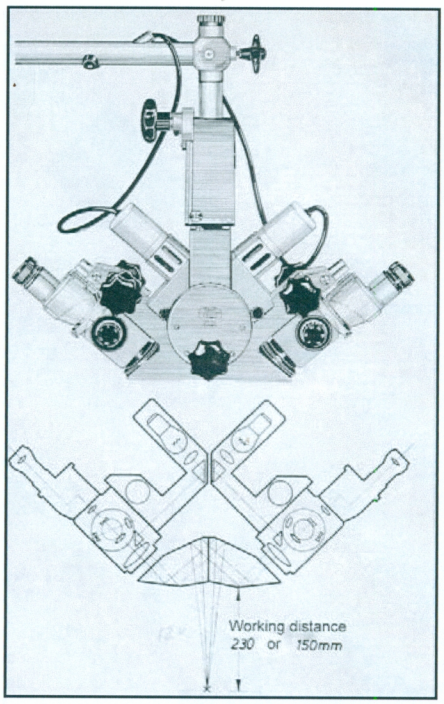
column let an ophthalmic surgeon focus easily up or down by a foot switch. A wall mount specifically designed for doctors' offices appeared much later.

In an effort to reduce the clutter in the operating theater, in the mid 1970s Zeiss introduced a ceiling mount for its operating microscopes. The vertical range was 500 mm with an adjustable speed of 4 mm/s to 25 mm/s.

The Swiss company Contraves designed a free-floating suspension stand for the Opmi around 1976, based on a suggestion by the neurosurgeon Gasi Yaşargil of Zurich. Here a balancing arm in the form of a parallelogram carries on one end the microscope and on the other an equivalent counterweight (figure 9). By screwing this weight further in or out the system can easily be balanced if extra accessories are attached to the microscope.

Asepsis

One important consideration was how to keep the microscope over the operation field in a sterile condition. The first attempts to wipe it with an antiseptic solution were soon discarded as the instrument became rather sticky. Sterilization in a gas chamber overnight was both expensive and impractical. Then sterilizable linen bags with appropriate openings for the objective and eyepieces were employed. These were often designed by the hospital's nurses on an individual basis. Zeiss provided sterilizable stainless steel caps for the magnification changer knobs and similar autoclavable rubber caps for the locking knobs and sleeves for the eyepiece tubes. Eventually disposable sterile plastic drapes fitting a variety of microscope configurations were made available.



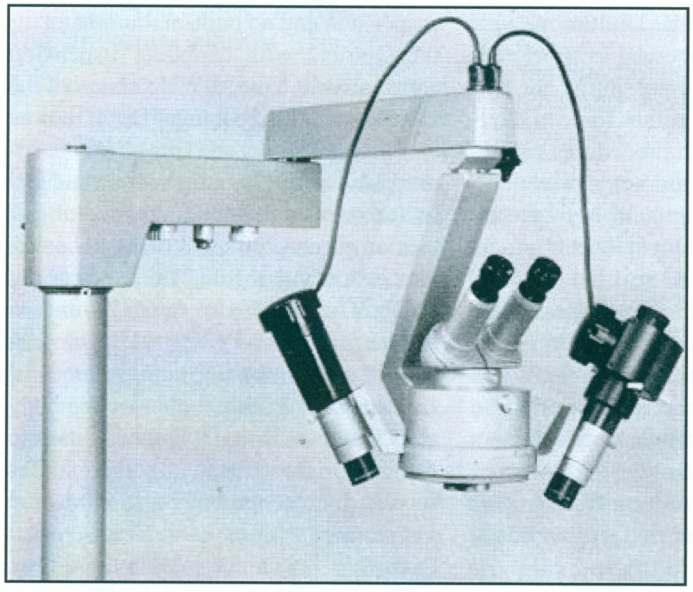
The Diploscope and a schematic drawing. Two surgeons could each view the operation, controlling focus and magnification, from the partner's side. Figure 10

Different versions of the Opmi

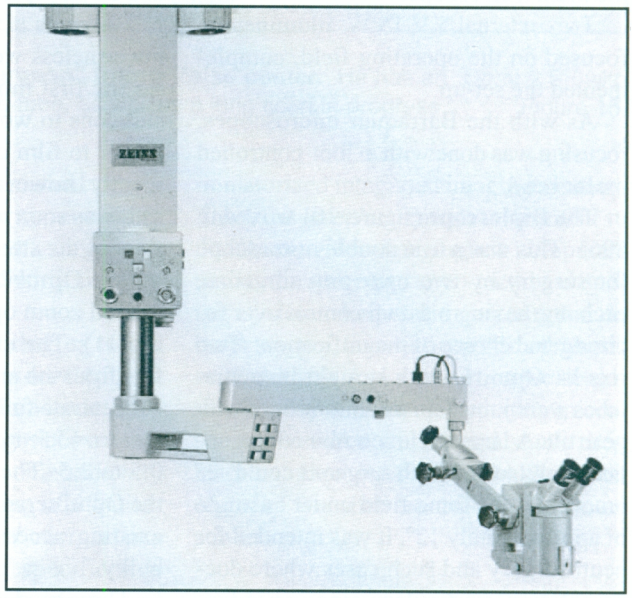
A Dr José Barraquer, who followed his father Ignacio into ophthalmology, adapted the basic Opmi to be a simple operating microscope without magnification changer and internal illumination, but instead with two external angled light sources, one a homogeneous illuminator providing an evenly illuminated circular field, the other being the slit-illuminator familiar to all ophthalmologists. Both could be rotated around the microscope axis. A simple three-step magnification changer could be interposed under the inclined binocular tube. This particular version was called **Opmi 3** or "after Barraquer."

The **Opmi 4** "after Barraquer," a simple arrangement of a microscope body without magnification changer or focusing mechanism, a homogeneous illuminator and a cinecamera with close-up objective, was soon superceded by more versatile equipment.

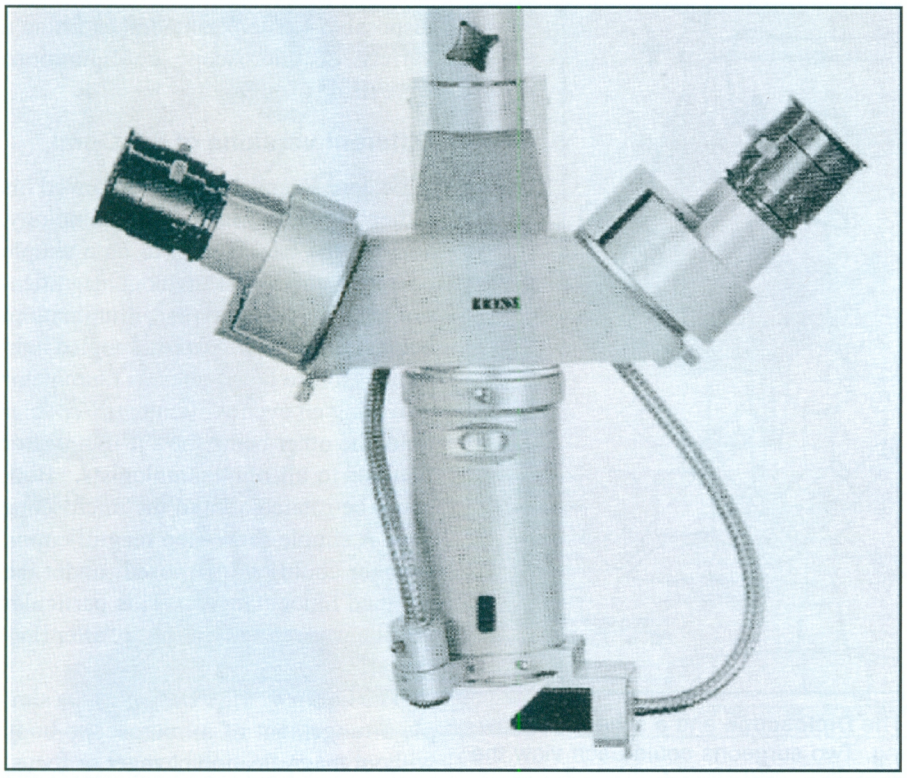
The **Opmi 5** "after Harms" consisted of an Opmi 1 body without either focusing mechanism or a built-in illuminator, suspended for ophthalmic surgery vertically with coaxial mechanical and optical axes and an inclined binocular tube. On



Opmi 2 with vertical suspension for ophthalmic surgery. On the left, an homogeneous illuminator, on the right a slit lamp. Figure 11



Electromechanical ceiling mount with articulated arms similar to those of the floor mount in figure 11 Figure 12



The Opmi 7D (without built-in illuminator and focusing mechanism). It is shown with stereo beam splitter and an oblique and a co-axial fiber illuminator. Figure 13

the suspension shaft was mounted a second rotatable arm angled at 27° carrying a second microscope body with five-step changer and a straight binocular tube. The objective of this microscope had a focal length 25 mm longer than that of the main microscope.

Two external 5 V 15 W illuminators, focused on the operating field, complemented the set-up.

As with the Barraquer microscopes, focusing was done with a foot-controlled motor head.

The **Diploscope** (figure 10) arrived in 1961. This was a true double microscope for surgery by two opposing surgeons, each one having his own control over focusing and choice of magnification. Two regular Opmi 1s with straight binocular tubes were joined in a common fork with gear tilt. A large prism combined the optical paths so that both surgeons could see practically the same field under an angle of approximately 12°. It was intended for neurosurgery and such cases where documentation, particulary cine- or video-documentation, would have been too intrusive via a regular microscope. To obtain a reasonable working distance, the objectives used had focal lengths of either 320 mm for an effective working distance of 150 mm or 400 mm for a working distance of 230 mm. Magnifications ranged from 2 to 20× for 12.5× and 20× eyepieces.

Bulky as it was, the Diploscope was nevertheless well received as it offered, for the first time, the possibility for two surgeons to work together in deep cavities or to film certain procedures conveniently; however, it did not survive long as it was soon made redundant by the arrival of the stereo beam splitter.

The **Opmi 2** (1966) was the first motorized zoom operating microscope.(figure 11). The surgeon, now with hands free from the microscope controls, could concentrate fully on his or her work. The motorized 5× zoom range had the factors 0.5 to 2.5 The general design followed the Opmi series, permitting the use of all existing accessories, but it was rather bulky .

Three models were available

1. A strictly vertical suspension for ophthalmology.

2. A suspension angled at 45° that could be placed in vertical or horizontal orientation as required for ear or hand surgery.

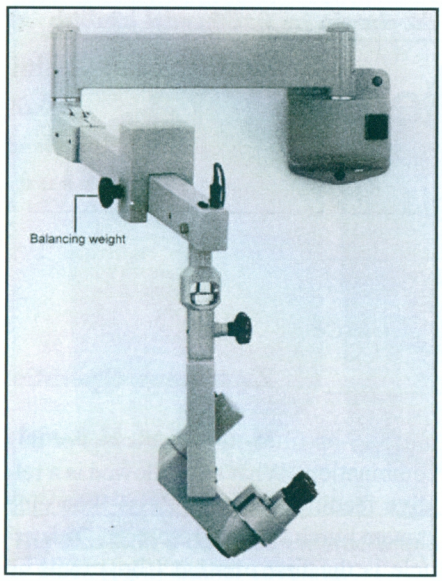
3. The cardanic suspension with which the microscope could be tilted and rotated in the three spatial axes, for neurosurgery.

The **Opmi 6** (1972) was not so bulky, with a body slimmer than the Opmi 2, but still too long, particularly if a beam splitter had to be interposed (figure 12). So the shorter Opmi 6S was introduced, and its shorter length, 90 mm, was achieved by using a smaller zoom range, 4×. The Opmi CS was a version of the Opmi 6 with built-in beam-splitter. The **Opmi 7**, an ophthalmic version of the Opmi 6, was mounted strictly vertically with the rotational axis coaxial with the optical axis. without fine focus or internal illumination. To meet the need of the surgeon to orient the instrument over the eye, Zeiss offered an X-Y coupling with a motorized lateral movement of ± 25 mm in two directions controlled by a joy stick.

The Stereo Beam Splitter was intended to convert a single Opmi into a double one (similar to the Diploscope) for two opposing surgeons. It required, however, a reorientation of the two optical systems in the microscope body by 90° (figure 13). This, in turn, made any lateral suspension arm impossible, hence only the Opmi 7 model with its vertical suspension and no built-in illuminator or the Opmi 2 with cardanic suspension were suitable. This special version of the Opmi was called **Opmi 7D**. If it was used in eye surgery and fitted with the additional XY-coupling, the motorstand had to be extended in height either by an extension piece (300 mm) or by choosing the version with manual crank extension.

The **Opmi 8** was an Opmi 7 with two solid arms on its coupling shaft. One arm carried an illuminator, homogeneous or slit, the other a second microscope body at 27° to the main axis, oriented either to the left or right of the main surgeon.. This second microscope body also contained a motorized zoom system like the usual Opmi 7.

The last of this generation of Zeiss operating microscopes was the wall-mounted **Opmi 9**, a simple and



A basic Opmi 9 on a wall mount, a simple and inexpensive option. Figure 14

inexpensive instrument aimed mainly at doctors' office, teaching labs or veterinarians (figure 14) . It had no focusing device or initial magnification changer; focusing was by moving it on its parallelogram suspension arm unless a simple focusing device ± 12 mm for the objective were attached.

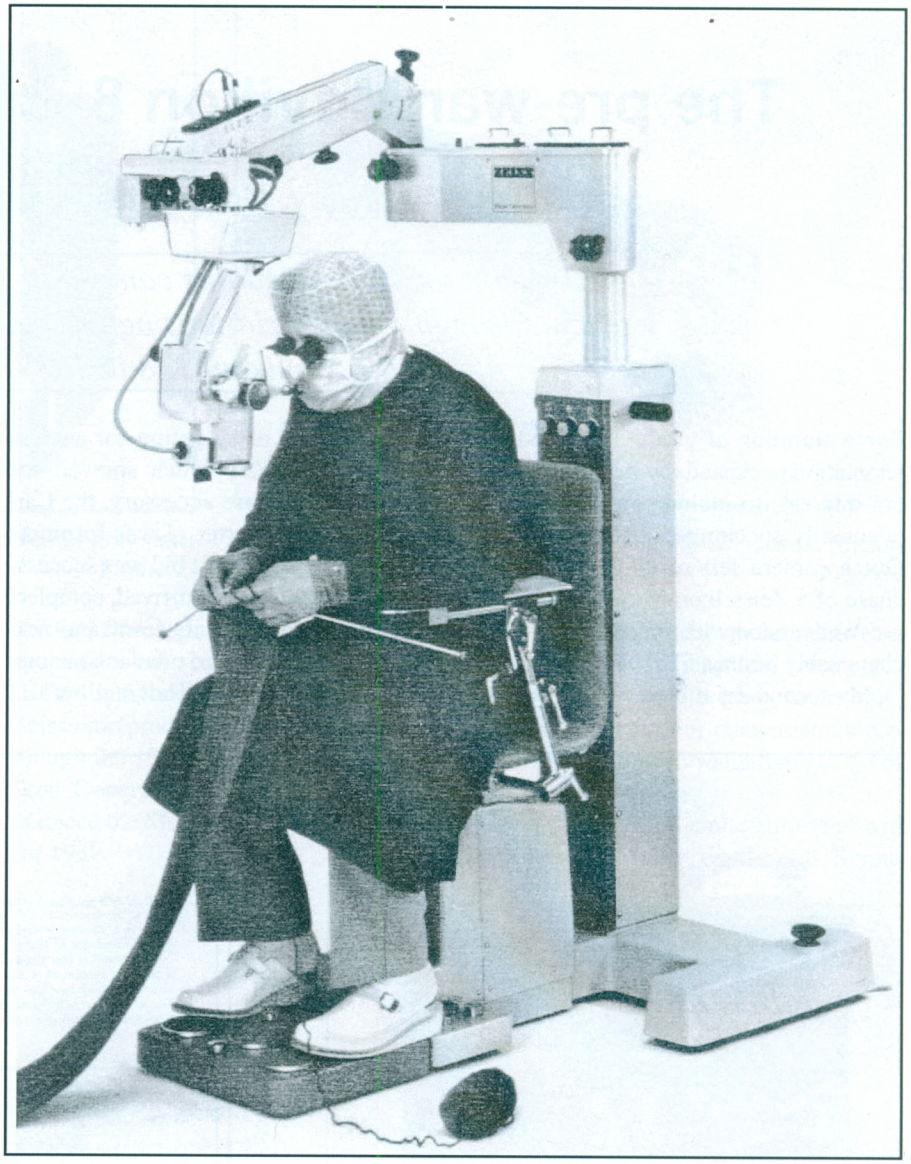
To help meet the need to involve a second surgeon for training or assistance many models of Opmis could be set up for two or more surgeons. Zeiss offered several options, with attachments at 27, 18, or 8 degrees from the main tube.

The Universal stands

All the earlier stands were totally reconfigured after the Opmi 6 was introduced. After Wild-Leitz brought out a floor stand in 1981 with a novel parallelogram arm for easy vertical height adjustment, instead of articulated hinged arms, Zeiss adopted this idea and brought out their own new version, the Universal 2 and 3, to replace all their existing floor stands (except those for the Opmi 9 and 99).

The surgeon controlled all motorized functions with a single-foot panel or a correspondingly equipped operating chair.

For ophthalmic surgery a compact combination floorstand cum operating chair offered maximum comfort. The stand column was arranged behind the surgeon, its arm reaching over the head



The famous "knitting surgeon" from a Zeiss poster. He has an Opmi 6 SF with a beam splitter and tiltable tube, as well as a long scarf in progress. Figure 15

or shoulder. A rather whimsical poster that enjoyed great popularity, especially among the nurses, showed a surgeon in his greens sitting in the chair knitting a long scarf (figure 15).

These developments bring us to the mid 1980s, after which the development of the Zeiss Operating Microscope is almost exponential; the designs of both microscopes and stands become radically different . Rather than being of a "building block" system, the new microscopes are bespoke designed for specific purposes, such as neurosurgery, plastic and reconstructive surgery, dental surgery, ophthalmic surgery, and so on, with miniaturized integrated imaging systems. The CO2 laser became an attachment to the Opmi, video-imaging via computers assists the surgeon, stereo-tactic navigating systems help the neurosurgeon in brain surgery, there is even talk of robotic microsurgery. As I said earlier, we couldn't do today without the operating microscope. We may well spend some time learning about it as it is quite likely that one day we shall benefit from it ourselves.

* * *

All illustrations are from Zeiss publications such as brochures, hand books, instruction manuals, Zeiss Information etc. ❐

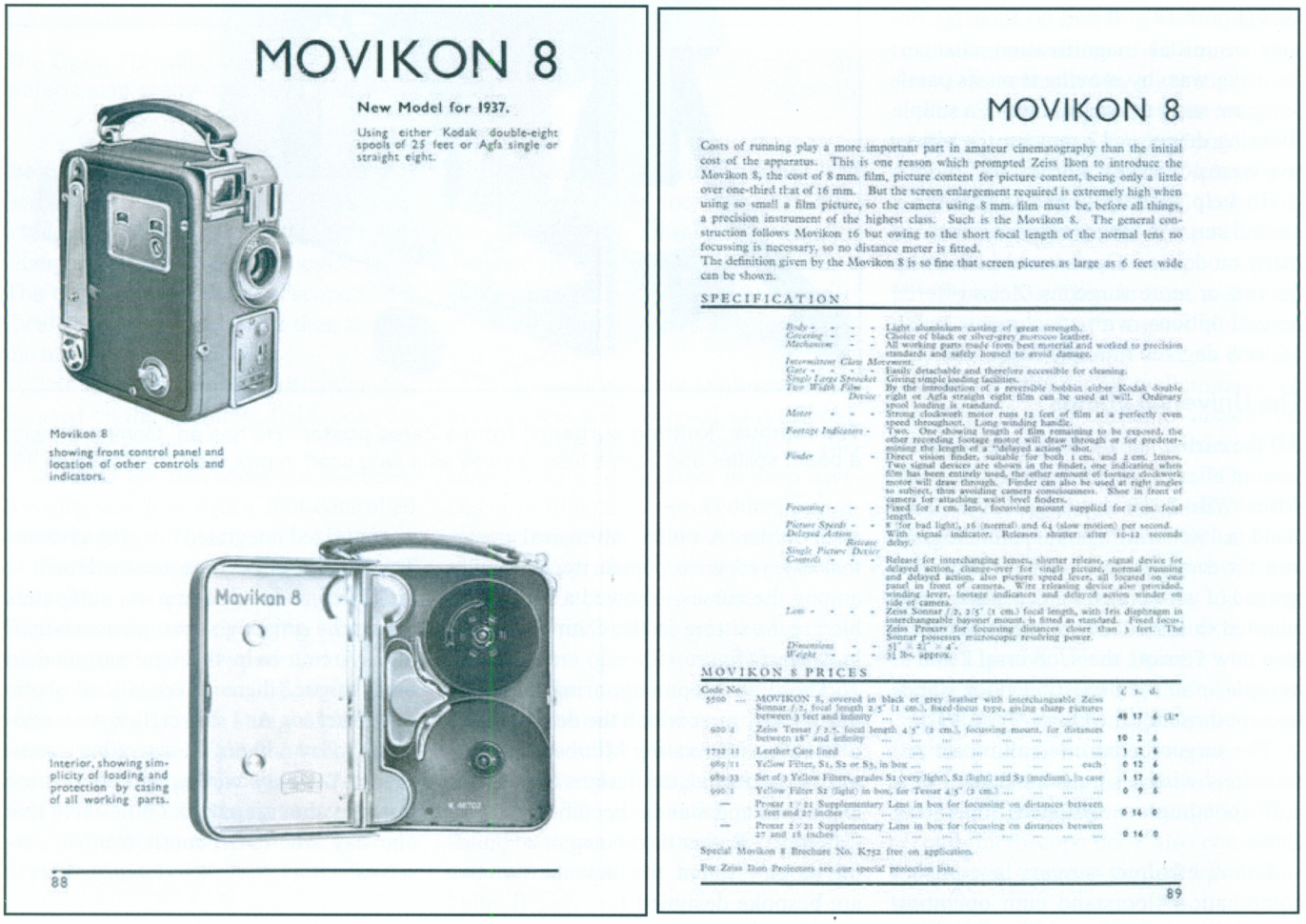
The pre-war Movikon 8 cine camera

Simon Worsley, Nottingham, England

Zeiss Ikon first marketed this camera in 1936, and it went through a few variations before being replaced by the Movikon- K 8 in 1939.

For a number of years I resisted the temptation to expand my Zeiss Ikon camera interests to include cine cameras. I eventually succumbed after a visit to a Dutch camera fair resulted in the purchase of a Zeiss Ikon Movikon 8 — the pre-War version with a fixed focus, interchangeable Sonnar f/2, 1 cm lens.

My second Zeiss Ikon cine camera resulted from an eBay listing for a Zeiss Ikon Movikon-K8, which showed the camera with its rare accessory, the Carl Zeiss Mutar converter. I was fortunate enough that my modest bid was successful and the camera duly arrived, complete with the Mutar with its front and rear caps, original cardboard tubular container and Zeiss Ikon 350/6 "Half Yellow" 32 mm slip-on filter and fitted case for this combination. What has followed is a relative feeding frenzy of Zeiss Ikon cine camera purchases and research. This article is the first of what I hope will be three on the pre-War Movikon 8, Movikon-K8 and Movikon-K16 cine cameras. (For information on the Movikon 16, which predates these three



MOVIKON 8

New Model for 1937.

Using either Kodak double-eight spools of 25 feet or Agfa single or straight eight.

Movikon 8

showing front control panel and location of other controls and indicators.

Movikon 8

Interior, showing simplicity of loading and protection by casing of all working parts.

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MOVIKON 8

Costs of running play a more important part in amateur cinematography than the initial cost of the apparatus. This is one reason which prompted Zeiss Ikon to introduce the Movikon 8, the cost of 8 mm. film, picture content for picture content, being only a little over one-third that of 16 mm. But the screen enlargement required is extremely high when using so small a film picture, so the camera using 8 mm. film must be, before all things, a precision instrument of the highest class. Such is the Movikon 8. The general construction follows Movikon 16 but owing to the short focal length of the normal lens no focussing is necessary, so no distance meter is fitted.

The definition given by the Movikon 8 is so fine that screen picures as large as 6 feet wide can be shown.

SPECIFICATION

Body	Light aluminium casting of great strength.
Covering	Choice of black or silver-grey morocco leather.
Mechanism	All working parts made from best material and worked to precision standards and safely housed to avoid damage.
Intermittent Claw Movement.	
Gate	Easily detachable and therefore accessible for cleaning.
Single Large Sprocket	Giving simple loading facilities.
Five Width Film Device	By the introduction of a reversible bobbin either Kodak double eight or Agfa straight eight film can be used at will. Ordinary spool loading is standard.
Motor	Strong clockwork motor runs 12 feet of film at a perfectly even speed throughout. Long winding handle.
Footage Indicators	Two. One showing length of film remaining to be exposed, the other recording footage motor will draw through or for predetermining the length of a "delayed action" shot.
Finder	Direct vision finder, suitable for both 1 cm. and 2 cm. lenses. Two signal devices are shown in the finder, one indicating when film has been entirely used, the other amount of footage clockwork motor will draw through. Finder can also be used at right angles to subject, thus avoiding camera consciousness. Shoe in front of camera for attaching waist level finders.
Focusing	Fixed for 1 cm. lens, focussing mount supplied for 2 cm. focal length.
Picture Speeds	8 (for bad light), 16 (normal) and 64 (slow motion) per second.
Delayed Action Release	With signal indicator. Releases shutter after 10-12 seconds delay.
Single Picture Device Controls	Release for interchanging lenses, shutter release, signal device for delayed action, change-over for single picture, normal running and delayed action, also picture speed lever, all located on one panel in front of camera. Wire releasing device also provided, winding lever, footage indicators and delayed action winder on side of camera.
Lens	Zeiss Sonnar f 2, 2/5" (1 cm.) focal length, with Iris diaphragm in interchangeable bayonet mount, is fitted as standard. Fixed focus. Zeiss Protars for focussing distances closer than 3 feet. The Sonnar possesses microscopic resolving power.
Dimensions	5½" × 2½" × 4".
Weight	3¼ lbs. approx.

MOVIKON 8 PRICES

Code No.		£ s. d.
5500	MOVIKON 8, covered in black or grey leather with interchangeable Zeiss Sonnar f/2, focal length 2.5" (1 cm.), fixed-focus type, giving sharp pictures between 3 feet and infinity	48 17 6 (1)*
920/2	Zeiss Tessar f/2.7, focal length 4.5" (2 cm.), focussing mount, for distances between 18" and infinity	10 2 6
1732/11	Leather Case lined	1 2 6
969/11	Yellow Filter, S1, S2 or S3, in box	each 0 12 6
969/33	Set of 3 Yellow Filters, grades S1 (very light), S2 (light) and S3 (medium), in case	1 17 6
990/2	Yellow Filter S2 (light) in box, for Tessar 4.5" (2 cm.)	0 9 6
—	Proxar 1 : 21 Supplementary Lens in box for focussing on distances between 3 feet and 27 inches	0 16 0
—	Proxar 2 : 21 Supplementary Lens in box for focussing on distances between 27 and 18 inches	0 16 0

Special Movikon 8 Brochure No. K752 free on application.

For Zeiss Ikon Projectors see our special projection lists.

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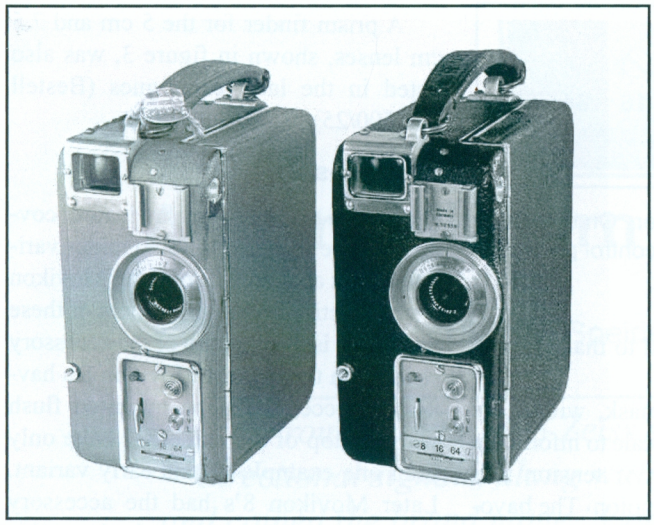
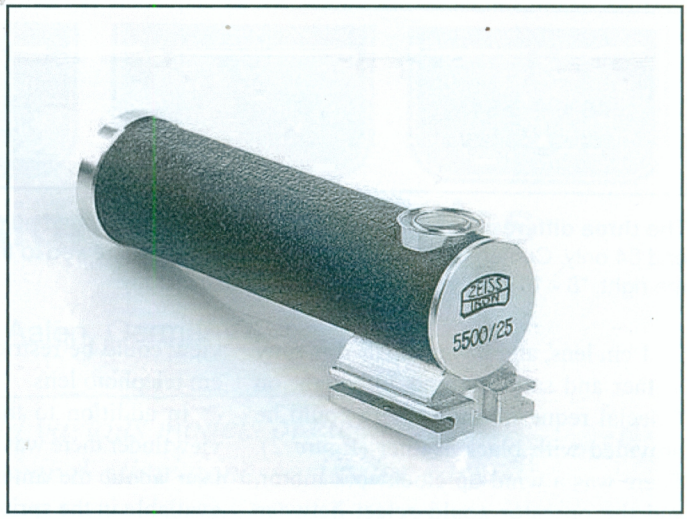
Two pages from the Zeiss Ikon General Catalogue of 1937, announcing the introduction of the Movikon 8 to the British market. With a base price of £48 17s 6d it would be intended for wealthy amateurs. Figure 1



The Movikon 8 could be ordered with a choice of gray (left) or black (right) leather covering. Figure 2



The rare prism finder for the 5 cm and 7.5 cm lenses. (Picture courtesy of Westlicht Auctions, Vienna.) Figure 3

cameras, see the late and much missed Charles Barringer's comprehensive article in the Spring 1989 issue of *Zeiss Historica.)*

The first models

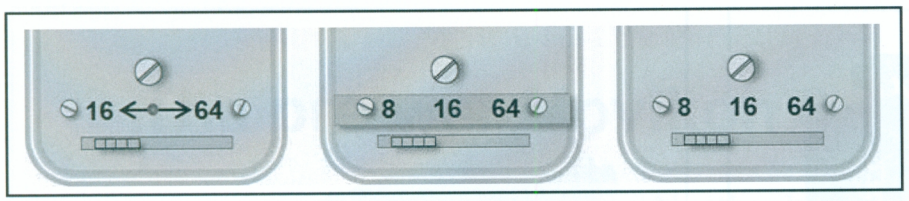
The April 1936 issue of the Zeiss Ikon trade magazine for the German domestic market, *Brücke*, noted that a new 8 mm spool-film cine camera, the Movikon 8 (Bestellnummer 5500), was joining the Zeiss Ikon product range that summer, although the 1937 English-language Zeiss Ikon General Catalogue (figure 1) announced the Movikon 8 as a "New Model for 1937."

It was aimed at the amateur cine market, although with an initial price tag of RM 480,- it would have to be for a wealthy amateur. For comparison a contemporary Contax 3 with a Tessar *f*/2.8 5 cm lens cost RM 495-.

The Movikon 8 came equipped with an interchangeable fixed-focus Sonnar

From February 1936, a brochure announcing the "high-value cine camera for 8 mm film." Figure 4a

From August 1938, this brochure simply claims to be "Round about the Movikon 8". Figure 4b



The three different versions of the feet-per-second speed adjuster. On the left,16 and 64 only. Center, "8 - 16 - 64" on an added plate screwed to the control panel. On the right, "8 - 16 - 64" engraved directly onto the body. Figure 5

f/2 1 cm lens, and it was finished in gray leather and satin chrome, although, on "special request," the camera could be provided with black leather (figure 2). There was a wind-up clockwork motor, and the operator could select between single pictures or 8, 16, and 64 frames per second (although the earliest promotional literature I have seen, dated February 1936, illustrates the camera with only two speeds: 16 and 64 frames per second).

Sharing the same lens bayonet mount as the Movikon 16, initially the only lens listed for the Movikon 8 other than the standard Sonnar *f*/2 1 cm lens was a Tessar *f*/2.7 2 cm telephoto lens (Bestell-Nr 920/4). The Movikon 8's direct-vision viewfinder gave the field of view of the standard 1 cm lens, but by means of an integrated viewfinder mask the field of view could be restricted to that of the 2 cm telephoto lens.

In addition to the mask, within the viewfinder there was a scale to inform the user about the amount of tension still available in the spring motor. The bayonet mount also allowed use of an adapter (Bestell-Nr 5494/14), previously designed for use with the Movikon 16, so that Contax lenses could be used on the Movikon 8. Later catalogue listings (e.g Zeiss Ikon Hauptkatalog 1938) listed these additional lenses for the Movikon 8:

* Sonnar *f*/1.4 2.5 cm – Bestell Nr. 917/1, suitable also for the Movikon-K 16
* Sonnar *f*/2.8 5 cm – Bestell Nr. 917/3, suitable also for the Movikon 16 and the Movikon-K 16
* Sonnar *f*/4 7.5 cm – Bestell Nr. 918/2, suitable also for the Movikon-K 16A.

The intermediate variant with accessory shoe directly over the lens. This particular example has the distance scale in feet, a Sonnar *f*/2 1 cm lens, and serial number W52356. "Made in Germany" is engraved in English on the accessory shoe and in Chinese characters on the side. Figure 6

A prism finder for the 5 cm and 7.5 cm lenses, shown in figure 3, was also listed in the later catalogues (Bestell Nr.5500/25).

Variations

Other than the black or gray leather covering, there were at least two minor variations that appeared during the Movikon 8's production. Most prominent of these variations is the position of the accessory shoe, with the earliest Movikon 8's having the accessory shoe mounted flush with the top of the camera. I have only seen one example of this early variant. Later Movikon 8's had the accessory shoe mounted just above the lens; this differences is well illustrated in these two Zeiss Ikon brochures (figures 4a and b). The earlier *(K736 - Movikon "8" Eine hochwertige Kino-Kamera für Kleinfilm 8 mm)* is dated February 1936 and the later one (*K752 - Rund um die Movikon 8*) is dated August 1938.

The other variation is the sliding scale used to set the frames per second (fps). These three variations can all be seen in figure 5.

Figure 6 shows two views of an unusual example of the "intermediate version" with the lower position for the accessory shoe. This one has the focus scale marked in feet and carries engravings reading "Made in Germany" (in both English and Chinese) and "For China" (in English).

The Movikon 8 was listed in Zeiss Ikon catalogues from 1936 to 1939. The eventual demise of the Movikon 8 was signalled by an announcement in November 1939 issue of *Brücke* that the Movikon 8 "is completely sold out and we would ask that buyers now consider the Movikon-K 8."

Total production figures for the Movikon 8 are hard to estimate due to the lack of data, but from the limited sample size that I have collated, I estimate that approximately 2,500 Movikon 8 cameras were made between 1936 and 1939 in a number of small production batches, each of about 500 units. These numbers are based on the 23 recorded Movikon 8 camera body serial numbers, the *Fabrikationsnummern*, that I have in my database. ❐

Automobile turn signals from Zeiss

Dietmar Speidel, Aalen, Germany

From 1925 to 1933 Zeiss sold various models of electric directional signals, along with several other accessories for cars and coined the brand name "Contax" later adopted for their cameras.

The history of the turn signal in Germany dates back several years before the history of the automobile. Officially it began in 1878, but a year earlier a Richard Preuss in Königsberg was already pondering the problem of direction indication of vehicles. In 1878 he received a patent for his design of passing signals on vehicles:

"Such signals are best combined with the obligatory lanterns in order to be visible also at night and furthermore serve the purpose to indicate the direction the vehicle is about to take as well as to indicate to a passing or approaching vehicle to which side to move to avoid a collision. The coachman can activate a pedal which via a lever linkage moves a lantern at the rear end of the vehicle to read left or right."

Albert Ebner Figure 1

The first German patent for a turn signal for motor vehicles was granted in 1899 to the *Sächsische Accumulatorenwerke AG* in Dresden. A modified lamp attached to an extension of the steering linkage indicated the direction.

The increase in urban traffic brought with it also a proliferation of inventions concerning direction indication. Hundreds of patents for sometimes the most absurd constructions were issued in the period from 1900 to 1925. There were waving arms, arrows and other signs, operated by cables, levers or gears, to be held out by the driver, swung out or stuck out, to name but a few. In view of such exotic devices the participants of a convention of the Berlin Association of Automobile Owners voted against the introduction of direction indicators because the driver would lose the necessary attention at the wheel if he had also to worry about direction indication.

This article is a translated and somewhat shortened version of the original, which was first published in German in *PhotoDeal* 1/2013. We thank the author, Dietmar Speidel, and the publisher, Rudi Hillebrand, for permission and encouragement.

Speidel assembled the illustrations for the original article, and Hillebrand made them available for our use.

Fritz Schulze made the translation.

Albert Ebner

A gifted designer and entrepreneur, Ing. Albert Ebner in Stuttgart (figure 1) was also occupied with the development of anti-theft-devices and direction indicators for automobiles. His design of an electro-

Verkaufs-Gesellschaft
der
Contessa-Camera G.m.b.H., Stuttgart
Paris London
Telegramm-Adresse: Contessawerke.
TELEFON No. 8276.
ABC Code.
Bank-Conti:
STAHL & FEDERER A.-G., STUTTGART.
DRESDNER BANK, FILIALE STUTTGART.
EINGETR. SCHUTZMARKE.
Rotebühlstrasse 171 und 171 B.

Kgl. Amtsgericht

Stuttgart - Stadt.

Stuttgart, den 1. Februar 1911.

15. FEB. 1911

Wir teilen Jhnen mit, dass in den Verhältnissen unserer Gesellschafter keine Änderungen vorgekommen sind, wovon Sie gefl. Notiz nehmen wollen.

Hochachtungsvoll

Verkaufsgesellschaft
der Contessa-Camera
G. m. b. H.

Nach Einsicht zu d. Akten.
Den 17. Februar 1911.
Landrichter

A document from 1911 from the Sales department of Contessa-Camera GmbH signed by Albert Ebner. Albert and his father Carl were the executive directors, and this letter emphasises that no change was to be made in those appointments. Figure 2

magnetic direction indicator was ready for production in 1924, and his anti-theft-device was patented the same year.

His own company in Vaihingen near Stuttgart was working to capacity producing electrical gramophones (the "Electromophon"), so he did not see that he could manufacture these patented devices himself. Therefore he approached Carl Zeiss Jena where, since 1911, searchlights and automobile headlights were being made in a special department.

Zeiss welcomed the possibility to increase its presence in the automobile industry during this period when the economy was slow. On January 10, 1925 Albert Ebner and Carl Zeiss Jena signed a licence agreement for the anti-theft-device and the direction indicator:

> "Albert Ebner is the designer of an automobile anti-theft-device and direction indicator and owns a patent for both devices as well as several patents-applied-for. He hands over these patents with all commercial rights including foreign patents to Carl Zeiss Jena and promises to make available also all future improvements without remuneration. The manufacture of these devices will be by the Contessa Nettel AG under conditions agreed upon with Carl Zeiss. Mr Ebner agrees to aid in the preparation and start of the production and, upon request, to assist with his advice and experience. The remuneration, depending on the amount of his cooperation, will be decided upon annually by the Board of Directors of Contessa AG. In return Mr Ebner will receive a licence fee in the amount of 5% of the net billed value of all devices manufactured and sold under his patent, paid out quarterly."

The *Contessa Nettel AG Fabriken für Feinmechanik* at Stuttgart, being a partner of Carl Zeiss Jena and hence a participant in the licence agreement, was to manufacture the devices. As agreed upon, Ebner's construction of the direction indicator was to be submitted to the patent office by the director of the Contessa Nettel Werke AG, August Nagel.

These business relations involving Albert Ebner, Zeiss Jena, and Contessa Nettel were not spontaneous. Albert Ebner's father, Carl Ebner, was a silent partner at Contessa Nettel, where he was involved in negotiations with Carl Zeiss Jena to secure closer cooperation between the two firms.(See figure 2.)

The founder and director of the Contessa Nettel Werke, Dr August Nagel, was also a member of the board of Albert Ebner's firm, Electromophon AG in Vaihingen/Stuttgart, until 1926.

Contessa Nettel had produced mostly photographic apparatus at this time, but as of 1925–28 direction indicators under the name CONTAX were being manufactured in large quantities (figure 3). Automobile manufacturers such as Daimler-Benz, Daag, Elite, Krupp, Opel, Presto, Simson Supra, Stoewer, and others, as well as automobile dealers in all of Germany, became customers. During the time of the licence agreement another important event occurred: the Zeiss Ikon AG Dresden was formed by the merger of ICA, Contessa Nettel, Ernemann, Goerz and others under the leadership of Carl Zeiss Jena. This new Zeiss Ikon AG also became the owner of the licence for the direction indicator with the result that at the Contessa Nettel factory the tool for imprinting the company name had to be changed to read Zeiss Ikon (figures 4a and b).

Thus the direction indicator with the name "Contax" became the forerunner of the Contax miniature film camera built as of 1932. The syllable CON stands for Contessa-Nettel, and TAX is said to derive from the Greek for "indicating direction."

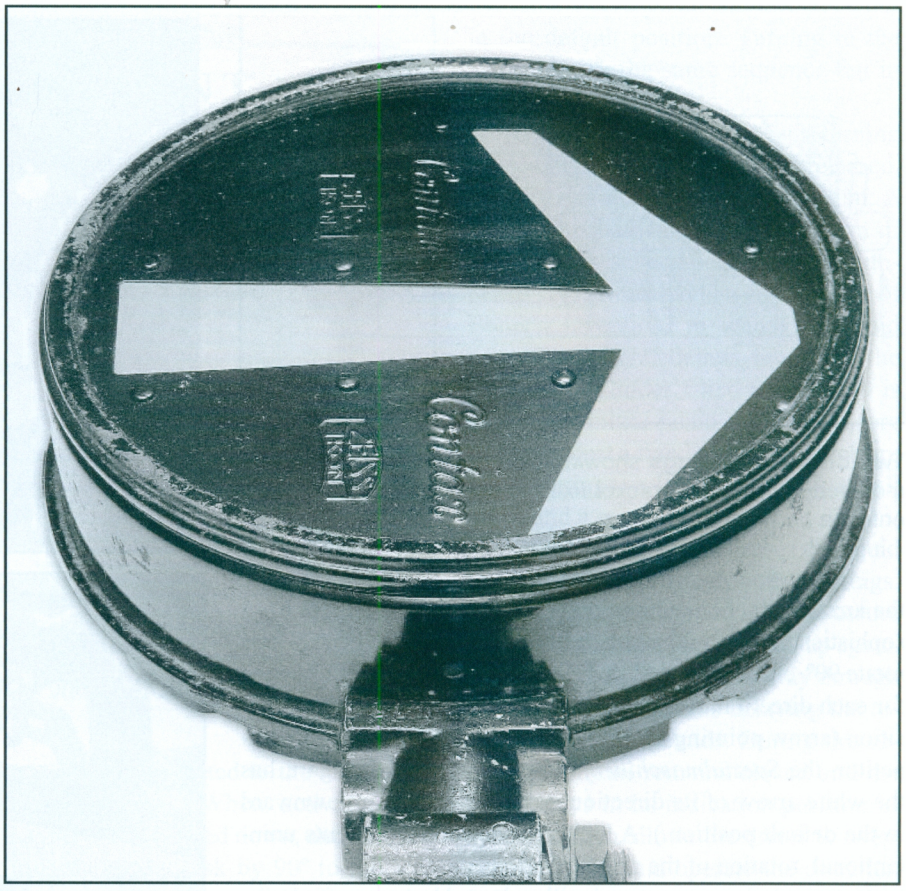
Ebner was paid an advance of 50,000 Reichsmark, to be adjusted later according to the final sales figures. He needed this financial injection desparately to

maintain his factory in Vaihingen, where he had erected a new building in 1922. Until March 1926 Ebner received 5% of the net value of the manufactured and sold devices, but his returns fell to 3% from April 1, 1926 to September 30, 1928. For the third quarter of 1928 this payment amounted to 10,700 Reichsmark. A final contract between Zeiss Ikon AG and Carl Zeiss Jena and Albert Ebner on October 28, 1927 settled all remaining claims and made Zeiss Ikon AG the unrestricted owner of all patents on the direction indicator.

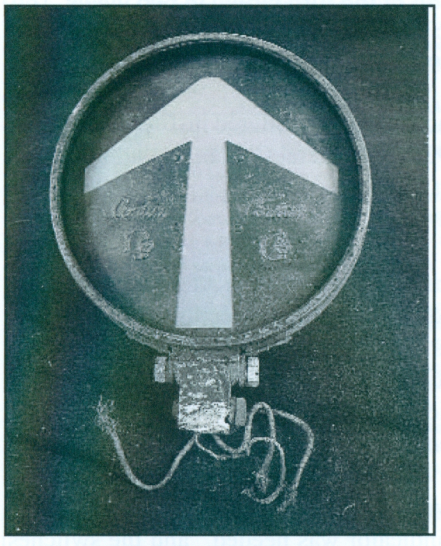
Construction and function

The device consists normally of a black lacquered sheet-metal housing and a switch, with several suggestions on how to install it. In one case the the indicator housing is fastened to the right or left of the vehicle's cab by a special mounting rod. This way the indicator can be seen both from the front and the back (figure 5). Another variation has the indicator mounted on the rear bumper, visible only from behind. The two variations could also be combined. The switch is always installed on the dashboard by the steering wheel.

The cylindrical housing of the bilateral direction indicator has a diameter of 17.5 cm. Both sides are protected by a glass window, behind which are located, on a central axis, two circular disks with



A rare example of a functioning Contax turn signal. This one bears the Zeiss Ikon logo, unlike earlier models from Contessa. Figure 3



Early model of the turn signal with the Contessa-Nettel logo, from before the merger that formed Zeiss Ikon. Figure 4a

Jetzt: Zeiss Ikon A.G.
Contessa-Werk

Zweigfabrik in Böblingen

Contessa-Nettel
Aktiengesellschaft
Stuttgart, den 9. November 1926.

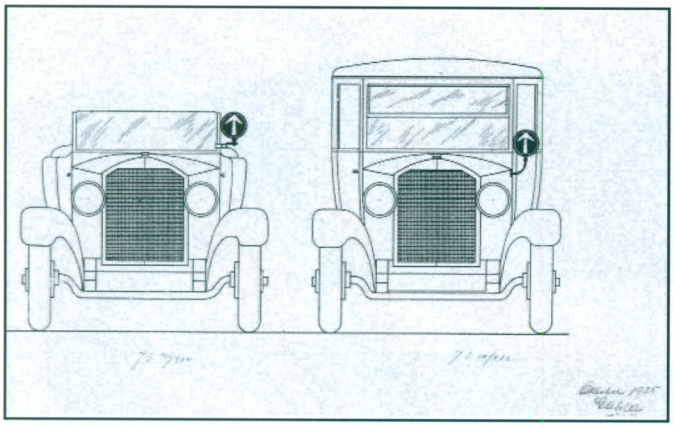
Fabriken für Feinmechanik.

Herrn
Albert Ebner,
Stuttgart.
Klopstockstr.20/Eg.

Direktion
Ca.

Wir nehmen höflich Bezug auf die letzte mit Ihnen gepflogene persönliche Unterredung und senden Ihnen einliegend in doppelter Ausfertigung den Nachtrag zu dem Vertrage mit Ihnen vom 10.Januar 1925 9. April 1926. Sie wollen uns bitte eine Ausfertigung mit Ihrer Unter-

An excerpt from a 1926 letter making certain adjustments to Albert Ebner's contracts with Zeiss Ikon AG. Of interest is the addition above the Contessa-Nettel letterhead that reads "Now Zeiss Ikon A-G." Figure 4b

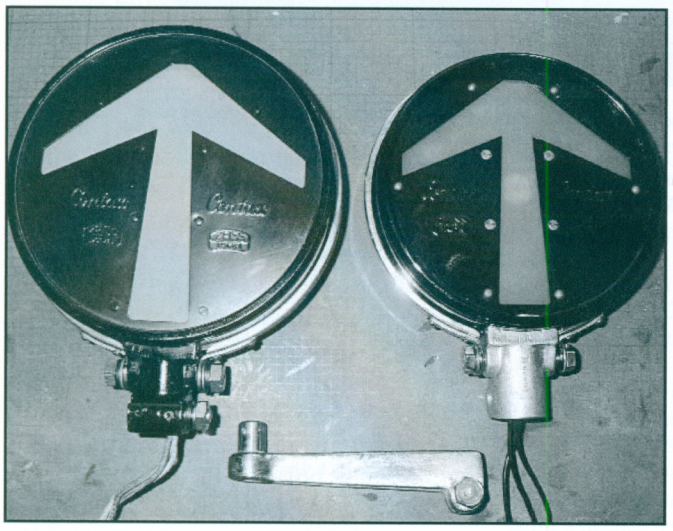


Two original drawings showing how the turn signal could be mounted, either on a bracket fixed to the windshield or directly onto the bodywork of the car. Figure 5

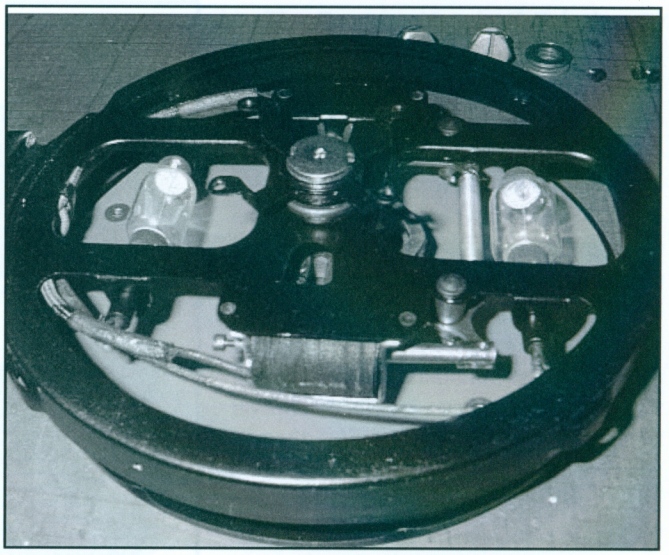
the arrows punched out and orange filters behind (figure 6). A sophisticated solenoid and lever system makes the central axis rotate 90° either to the left or right, one solenoid being assigned for each direction. A spring returns the disks to the default position (arrow pointing upwards) once the power is cut.(A competitor, the *Spezialmaschinenfabrik Eugen Gill*, Stuttgart, has the white arrow of its direction indicator pointing downward in the default position.) A locking mechanism prevents unintentional rotation of the arrow.

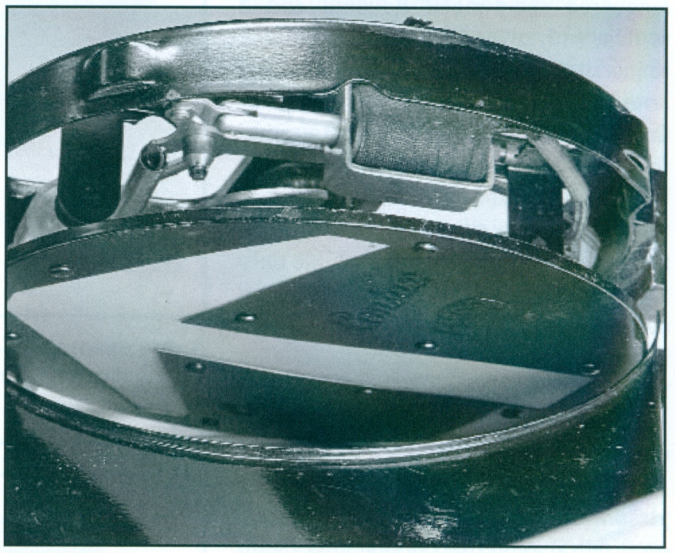
If desired, the arrows can be illuminated by two soffit bulbs controlled by a switch in the cab. This entire device weighed 1.5 kg, and Zeiss Ikon offered as an alternative a smaller unit, 14.5 cm in diameter (figure 7).

An improvement was the addition of a stoplight mounted on top of the rear indicator to signal to the following traffic an intention to brake or stop. Stepping on the brake pedal caused the stoplight to switch on (figure 8).



The two sizes of the turn signal; 17.5 cm diameter on the left and a smaller one, 14.5 cm diameter, on the right. Figure 7





The inner construction of the turn signal in two views. The solenoid rotates the circular disc with the orange arrow, and the light bulb illuminates it at night. Figure 6

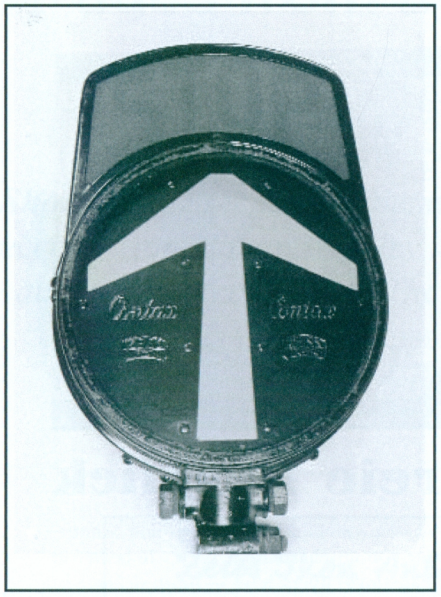
Contax direction indicators were offered in 6 V or 12 V versions. At the end of 1926 the bilateral Contax, including switch and mounting kit, cost 55 Reichsmark.

Automatic return

In November 1927 a patent was granted to Albert Ebner for his completely redesigned and improved direction indicator with automatic return. Zeiss Ikon used only the part of the patent that described the automatic return, and applied it later on also for its semaphor-arm indicators known as "winkers."

There was a problem with these arrows that they would stay "on" if not manually corrected. Albert Ebner's new system solved the problem, with just one indicator on each side of the automobile. No rear indicator was needed, and the switches were, as before, on the dashboard.

In the default position both arrows point upwards. Activating



CARL ZEISS JENA

CONTAX

Der zuverlässige elektromagnetische Fahrtrichtungsanzeiger mit oder ohne Stop-Zeichen.

Fabrikat:
Zeiss-Ikon A.G.,
Contessa-Werk, Stuttgart.

Alleinvertrieb:
Carl Zeiss,
Jena

Farbe des Richtungspfeils nach reichsgesetzlicher Vorschrift
Gelbrot

Fig. 1
Contax mit Pfeil auf Vorder- und Rückseite.

Fig. 2
Contax mit Pfeil nur auf Vorderseite, kombiniert mit Stop-Zeichen.

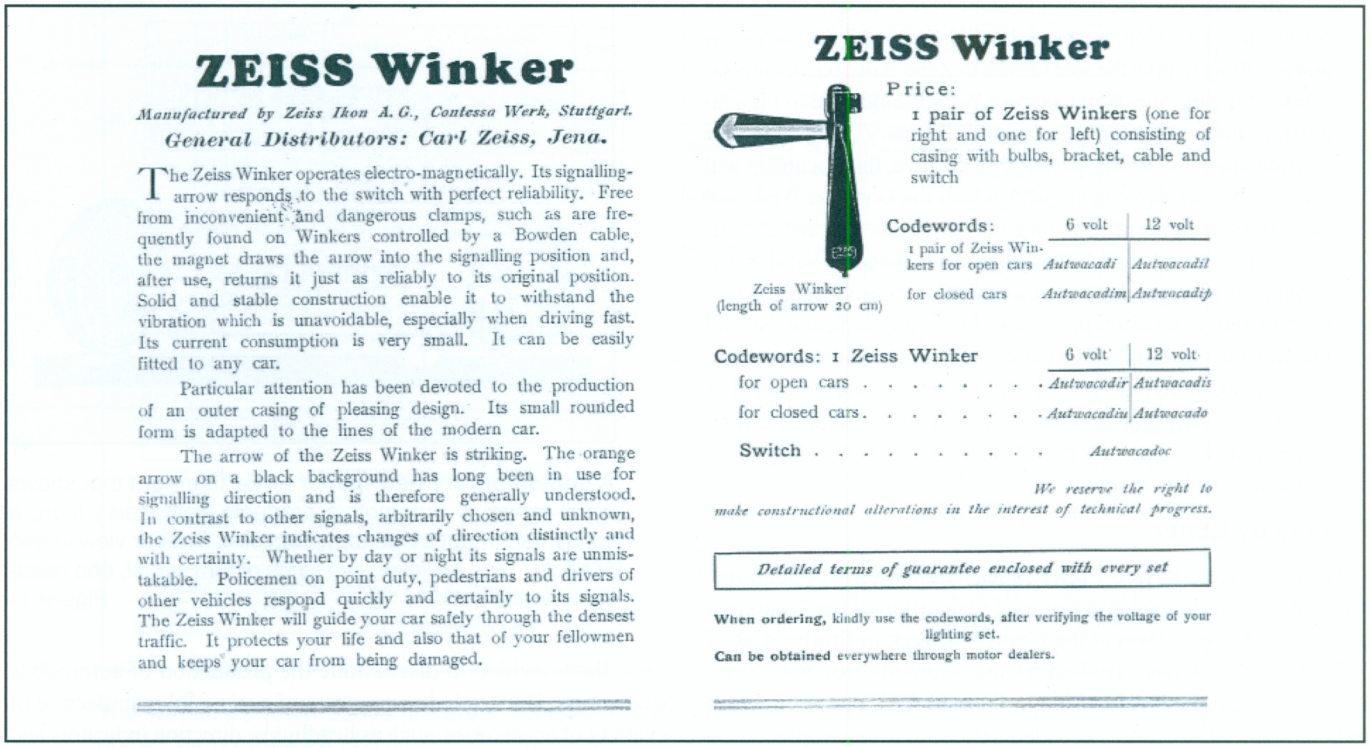
Daß ein **Fahrtrichtungsanzeiger nebst Stoplicht** bei dem heutigen dichten Verkehr ein zweckmäßiges, ja notwendiges Zubehör für jedes Kraftfahrzeug geworden ist, hat sich zur einmütigen Erkenntnis wohl aller Automobilisten durchgerungen. Verschieden weitgesteckt sind indes die Forderungen, die an Fahrtrichtungsanzeiger gestellt werden. Die Firma Carl Zeiss, Jena, hat, getreu ihrer Tradition, sich die Aufgabe gesetzt, ihren Fahrtrichtungsanzeiger *Contax* auch weitestgehenden Ansprüchen gerecht werden zu lassen. Was soll und kann von einem **guten** Fahrtrichtungsanzeiger zwecks sicherer Verkehrsregelung verlangt werden?

The turn signal with the addition of a "Stop" sign on the top. On the left, an example, and on the right an advertisement showing models with and without the Stop sign, which was operated automatically with a switch under the brake pedal. Figure 8

the switch for "Left turn" closes the circuit of the solenoid in the left indicator housing. In its rest position the core of the electromagnet is held by a spring. It is shaped as a toothed rack that engages a gear wheel connected to the axis of the indicator arrow. When activated, the magnet core is pulled down, and the gear turns the arrow disk by 90° to the left. The indicator in the right device remains in the default position. Turning to the right follows the same sequence but in the other indicator.

To avoid having the arrow returning immediately when the switch is released, Ebner designed an ingenious system: A special mechanism delays the return of the arrow by several seconds. This automatic return mechanism is the core of Ebner's invention, in which a "liquid pressure switch" delays return of the arrow. A cylinder filled with liquid is kept in its initial position by a pressure spring against a fixed piston, in which are two openings, a larger one with a ball valve and a smaller one.

Activating the switch causes the liquid to flow quickly through both openings. Upon releasing the switch, the pressure spring pushes the cylinder back up again. But the liquid can now flow only through the small opening, thus delaying the return by several seconds. During this return the circuit remains closed and the arrow stays in its indication position. A special switch allows the driver to override the delay and operate the direction indicator manually.



ZEISS Winker

Manufactured by Zeiss Ikon A. G., Contessa Werk, Stuttgart.

General Distributors: Carl Zeiss, Jena.

The Zeiss Winker operates electro-magnetically. Its signalling-arrow responds to the switch with perfect reliability. Free from inconvenient and dangerous clamps, such as are frequently found on Winkers controlled by a Bowden cable, the magnet draws the arrow into the signalling position and, after use, returns it just as reliably to its original position. Solid and stable construction enable it to withstand the vibration which is unavoidable, especially when driving fast. Its current consumption is very small. It can be easily fitted to any car.

Particular attention has been devoted to the production of an outer casing of pleasing design. Its small rounded form is adapted to the lines of the modern car.

The arrow of the Zeiss Winker is striking. The orange arrow on a black background has long been in use for signalling direction and is therefore generally understood. In contrast to other signals, arbitrarily chosen and unknown, the Zeiss Winker indicates changes of direction distinctly and with certainty. Whether by day or night its signals are unmistakable. Policemen on point duty, pedestrians and drivers of other vehicles respond quickly and certainly to its signals. The Zeiss Winker will guide your car safely through the densest traffic. It protects your life and also that of your fellowmen and keeps your car from being damaged.

ZEISS Winker

Zeiss Winker
(length of arrow 20 cm)

Price:

1 pair of Zeiss Winkers (one for right and one for left) consisting of casing with bulbs, bracket, cable and switch

Codewords:	6 volt	12 volt
1 pair of Zeiss Winkers for open cars	*Autwacadi*	*Autwacadil*
for closed cars	*Autwacadim*	*Autwacadip*

Codewords: 1 Zeiss Winker	6 volt	12 volt
for open cars	*Autwacadir*	*Autwacadis*
for closed cars	*Autwacadiu*	*Autwacado*
Switch	*Autwacadoc*	

We reserve the right to make constructional alterations in the interest of technical progress.

Detailed terms of guarantee enclosed with every set

When ordering, kindly use the codewords, after verifying the voltage of your lighting set.

Can be obtained everywhere through motor dealers.

This English advertisement shows the so-called Zeiss "Winker," a semaphor-type swinging arm by which the driver could indicate the intention to make a turn. Figure 9

A camera, a turn signal, a petrol gauge, and a winker, all bearing the name ""Contax." Figure 10

Albert Ebner and Zeiss Ikon also engaged in the development of semaphore arms, or "winkers," to show direction (see figures 10 and 11).

Ebner had already drafted a proposal for an electromagnetically controlled signal in 1927, and applied for a patent. In October of that year he offered Zeiss Ikon the sole benefits of the expected patent for an enclosed direction signal. But Zeiss Ikon wanted first to explore the feasability of economical construction and profitable manufacture at the Contessa Werk in Stuttgart by the end of February 1928.

> "Mr. Albert Ebner, engineer at Stuttgart, has applied for a patent for his new invention, a closed direction winker for automobiles and is willing to give the sole licence to Zeiss Ikon AG., Contessa-Werk, Stuttgart. The firm Contessa Werk is amenable to his suggestion and reserves a period until February 28, 6 p,m, for consideration. Should the decision be positive, this document will serve as licence agreement under which the Contessa Werk will pay Mr. Ebner a fee of 3% of the net sales value calculated quarterly. The contract shall last as long as the patent is valid and is contingent on a general patent or a comprehensive construction patent being granted on this class of direction indicator. Should the decision be negative, the Contessa Werk is obligated to return all samples, drawings etc. to Mr. Ebner. In case no patent is granted, no obligation remains for the Contessa Werk except to compensate Mr Ebner for his loss incurred because a competitor would now be late in marketing his device."

Patents by Ebner

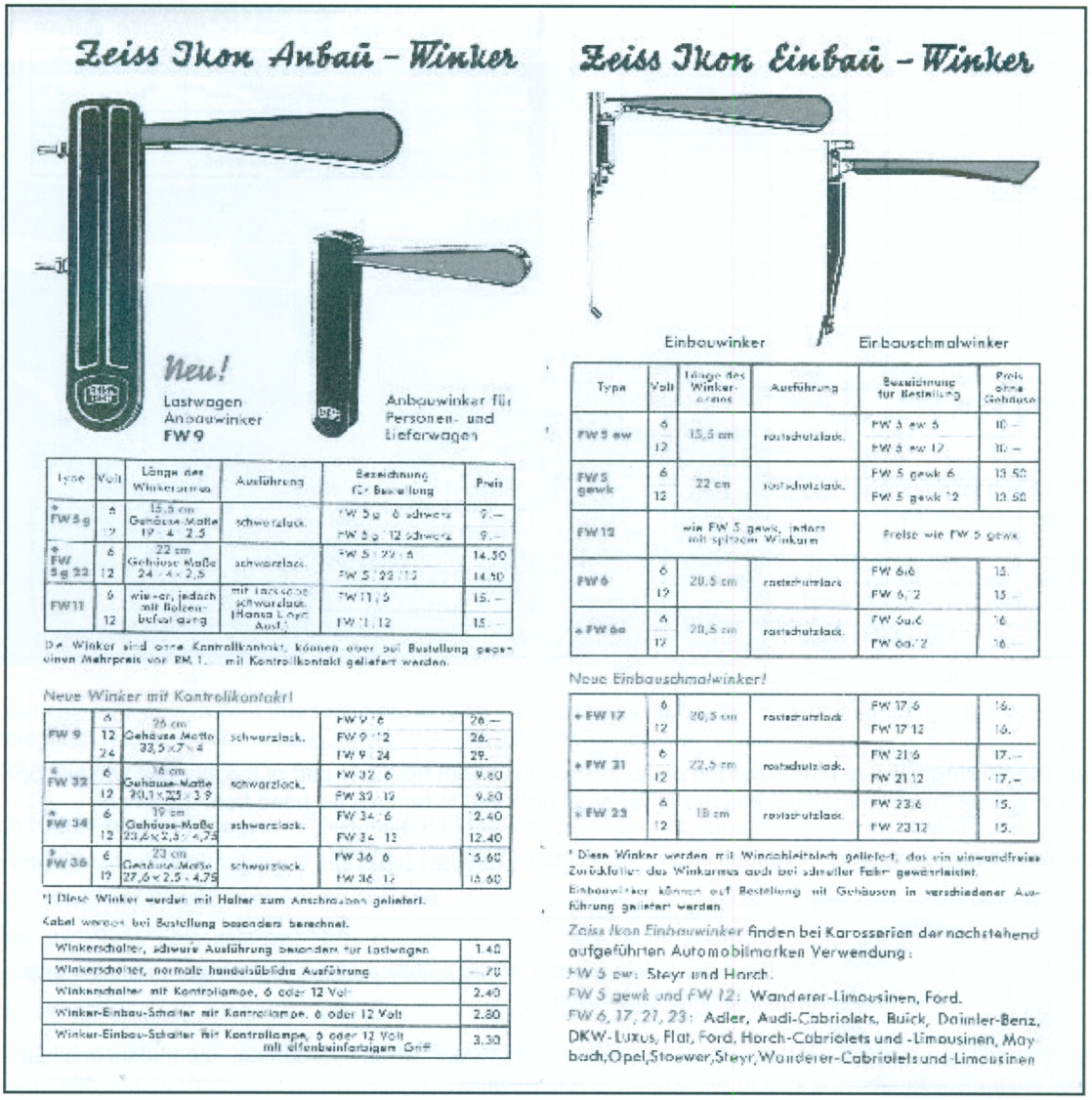
After a positive decision Ebner's ideas and patent applications were applied to the construction and realization of the "winker" produced for Zeiss Ikon at the Contessa Werk in Stuttgart as of 1928.The patents were applied for and granted directly to Zeiss Ikon. Although the production numbers of the Contax direction indicator in 1928 again exceeded 100,000, it was replaced by the new Zeiss Ikon signal, available in two lengths: 17 and 20 cm. But competition in the automobile market offered cheaper products and the turn-over kept shrinking. Several years later

A contemporary newspaper advertisement that shows a full range of automotive products from Zeiss Ikon; a windshield wiper at the top, promising "a clear view in rain or snow," and a winker, two kinds of turn signal, and headlights at the bottom. Figure 11

Zeiss Ikon decided to discontinue the production of automobile accessories. Thus ended many years of successful manufacture of a variety of accessories, such as headlights, direction indicators and signals, fuel gauges, stop lights, contact slide rings on the steering wheel to control the horn, windshield wipers (figure 11), and anti-theft protection devices. ❐

Pages from a 1938 automobile-accessory brochure

Shortly after receiving Dietmar Speidel's manuscript, *published on the previous pages, I received from Simon Worsley a scanned copy of a 1938 Zeiss brochure on the same subject, automobile accessories. The front cover of that publication appears on the back cover of this issue of* Zeiss Historica. *On this and the following page I show a few selections from that brochure.* *The Editor*



Zeiss Ikon Anbau - Winker

Neu!
Lastwagen Anbauwinker FW 9

Anbauwinker für Personen- und Lieferwagen

Type	Volt	Länge des Winkerarmes	Ausführung	Bezeichnung für Bestellung	Preis
* FW 5 g	6 12	15,5 cm Gehäuse-Maße 19 × 4 × 2,5	schwarzlack.	FW 5 g 6 schwarz FW 5 g 12 schwarz	9.— 9.—
* FW 5 g 22	6 12	22 cm Gehäuse-Maße 24 × 4 × 2,5	schwarzlack.	FW 5 g 22 6 FW 5 g 22 12	14.50 14.50
FW 11	6 12	wie vor, jedoch mit Bolzenbefestigung	mit Tarnscope schwarzlack. (Hansa Lloyd Ausf.)	FW 11 6 FW 11 12	15.— 15.—

Die Winker sind ohne Kontrollkontakt, können aber auf Bestellung gegen einen Mehrpreis von RM 1.— mit Kontrollkontakt geliefert werden.

Neue Winker mit Kontrollkontakt!

FW 9	6 12 24	26 cm Gehäuse-Maße 33,5 × 7 × 4	schwarzlack.	FW 9 6 FW 9 12 FW 9 24	26.— 26.— 29.—
* FW 32	6 12	18 cm Gehäuse-Maße 20,1 × 2,5 × 3,9	schwarzlack.	FW 32 6 FW 32 12	9.80 9.80
* FW 34	6 12	19 cm Gehäuse-Maße 23,6 × 2,5 × 4,75	schwarzlack.	FW 34 6 FW 34 12	12.40 12.40
* FW 36	6 12	23 cm Gehäuse-Maße 27,6 × 2,5 × 4,75	schwarzlack.	FW 36 6 FW 36 12	15.60 15.60

*) Diese Winker werden mit Halter zum Anschrauben geliefert.

Kabel werden bei Bestellung besonders berechnet.

Winkerschalter, schwere Ausführung besonders für Lastwagen	1.40
Winkerschalter, normale handelsübliche Ausführung	—.70
Winkerschalter mit Kontrollampe, 6 oder 12 Volt	2.40
Winker-Einbau-Schalter mit Kontrollampe, 6 oder 12 Volt	2.80
Winker-Einbau-Schalter mit Kontrollampe, 6 oder 12 Volt mit elfenbeinfarbigem Griff	3.30

Zeiss Ikon Einbau - Winker

Einbauwinker Einbauschmalwinker

Type	Volt	Länge des Winkerarmes	Ausführung	Bezeichnung für Bestellung	Preis ohne Gehäuse
FW 5 ew	6 12	15,5 cm	rostschutzlack.	FW 5 ew 6 FW 5 ew 12	10.— 10.—
FW 5 gewk	6 12	22 cm	rostschutzlack.	FW 5 gewk 6 FW 5 gewk 12	13.50 13.50
FW 12	wie FW 5 gewk, jedoch mit spitzem Winkarm			Preise wie FW 5 gewk	
FW 6	6 12	20,5 cm	rostschutzlack	FW 6 6 FW 6 12	15. 15.—
* FW 6a	6 12	20,5 cm	rostschutzlack.	FW 6a 6 FW 6a 12	16. 16.—

Neue Einbauschmalwinker!

* FW 17	6 12	20,5 cm	rostschutzlack	FW 17 6 FW 17 12	16. 16.
* FW 21	6 12	22,5 cm	rostschutzlack.	FW 21 6 FW 21 12	17.— 17.—
* FW 23	6 12	18 cm	rostschutzlack.	FW 23 6 FW 23 12	15. 15.

* Diese Winker werden mit Winchleitblech geliefert, das ein einwandfreies Zurückfallen des Winkarmes auch bei schneller Fahrt gewährleistet.

Einbauwinker können auf Bestellung mit Gehäusen in verschiedener Ausführung geliefert werden.

Zeiss Ikon Einbauwinker finden bei Karosserien der nachstehend aufgeführten Automobilmarken Verwendung:

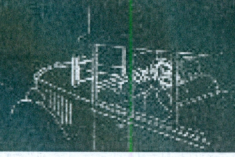
FW 5 ew: Steyr und Horch.

FW 5 gewk und FW 12: Wanderer-Limousinen, Ford.

FW 6, 17, 21, 23: Adler, Audi-Cabriolets, Buick, Daimler-Benz, DKW-Luxus, Fiat, Ford, Horch-Cabriolets und -Limousinen, Maybach, Opel, Stoewer, Steyr, Wanderer-Cabriolets und -Limousinen

The winkers shown above left are for outboard mounting (that is, outside the vehicle) in two sizes; one for heavy trucks and a smaller one for personal vehicles and vans.
The two on the right of this illustration are for inboard mounting, so that they are stored inside the body-work of the vehicle when not activated. The text at bottom right lists the vehicles in which each type should be mounted.

Zeiss Ikon Signalring



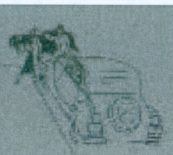
DER ZEISS IKON SIGNALRING „CONTAL"

erlaubt dem Autofahrer das Betätigen des Signalhorns von jeder Stelle des Steuerrades aus. Das Signal wird bei leichtestem Druck auf den Signalring ausgelöst. Der Fahrer braucht zum Signalgeben die Hand vom Steuer nicht zu entfernen und hat das Steuer stets fest in der Hand.

Type	Außendurchmesser mm	Geeignet für Lenkräder mit Außendurchmesser von . . . bis .	Speichenzahl	Ausführung	Bezeichnung für Bestellung	Preis RM
SR I	255	350 bis ca. 400	3	schwarz	SR I/3 schw.	13.–
				chrom	SR I/3 chr.	15.50
			4	schwarz	SR I/4 schw.	13.–
				chrom	SR I/4 chr.	15.50
SR II	280	380 bis ca. 430	3	schwarz	SR II/3 schw.	13.–
				chrom	SR II/3 chr.	15.50
			4	schwarz	SR II/4 schw.	13.–
				chrom	SR II/4 chr.	15.50
SR III	305	400 bis ca. 450	3	schwarz	SR III/3 schw.	13.–
				chrom	SR III/3 chr.	15.50
			4	schwarz	SR III/4 schw.	13.–
				chrom	SR III chr.	15.50
			5	schwarz	SR III/5 schw.	13
SR IV	330	430 bis ca. 500	4	schwarz	SR IV/4 schw.	15.
				chrom	SR IV/4 chr.	17.50
SR V	380	480 und größer	4 u. 5 kombin.	schwarz	SR V schw.	17.–

Auf Wunsch alle Typen mit doppeltem Signalweg, außer SR I, gegen Aufpreis von RM 1

Zeiss Ikon Stoplampen



ZEISS IKON STOP-NUMMERN-LAMPE LN 2

schwarz ackiert, mit Deckelring, chromfarben. Die Schlußlampe hat kombinierte Laschen- und Bolzenbefestigung, ist für jeden Wagen passend und auch für Motorräder geeignet

Type	Ausführung	Bezeichnung	Preis
LN 2	Schwarz mit chromfarben poliertem Deckelring ohne Halter	LN 2	3.10
LN 2 u	Schwarz mit chromfarben poliertem Deckelring mit Halter	LN 2 u	3.30
Schraubenabstand 45 mm			

Neu!

ZEISS IKON STOP-NUMMERN-LAMPE LN 5 MIT RÜCKSTRAHLER

Das Deckschild ist in 3 Felder unterteilt. Im oberen Feld befindet sich das Stoplicht, im mittleren der Rückstrahler, im unteren das Schlußlicht mit Beleuchtung des Nummernschildes.

Type	Ausführung	Bezeichnung	Preis
LN 5	Schwarz mit chromfarben poliertem Deckelring ohne Halter	LN 5	4.60
LN 5 u	Schwarz mit chromfarben poliertem Deckelring mit Halter	LN 5 u	4.80
Schraubenabstand 45 mm			

The Contal "Signal ring" above left allows the driver to sound the horn from any part of the steering wheel.It operates with a very light touch on the ring, and the driver does not need to remove his hand from the wheel.

It was available in black or chrome, in various sizes, priced from 13.00 to 17.50 RM.

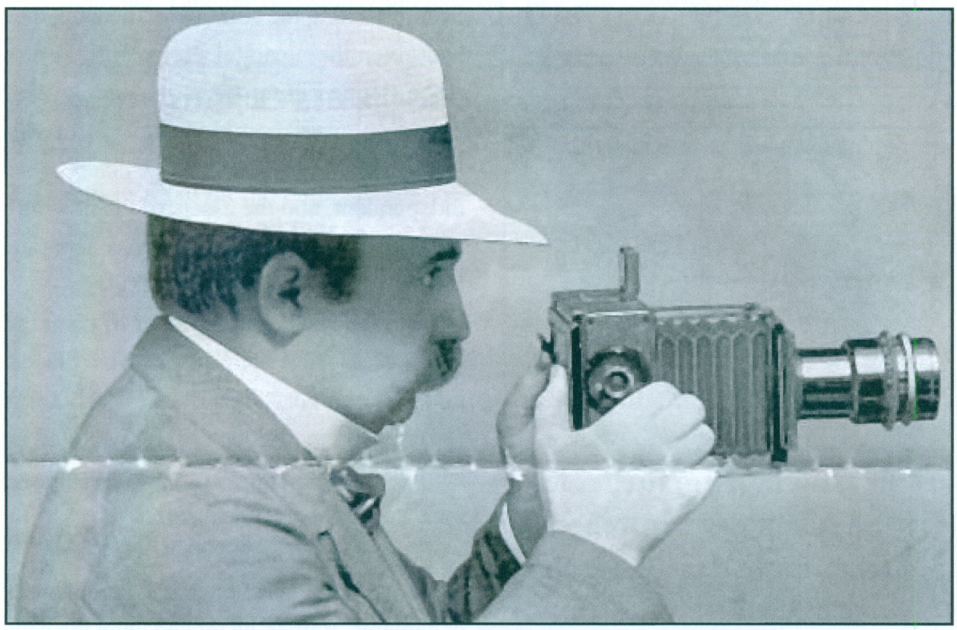
The stoplight shown above right is painted black with a bezel. It has a choice of two fastenings, with bolts or a lug, and is equally suitable for all automobiles and motorcycles.

Below that is a stoplight with three windows. The top one indicates "Stop!" when appropriate, the middle one is a reflector, and the lower window is a light to illuminate the license plate.

Carl Zeiss Jena early photographic catalogs

Larry Gubas, Las Vegas, Nevada

A note to provide some context for the 1905 Photo Objectives catalog reprint supplied to members with this issue of the Journal.



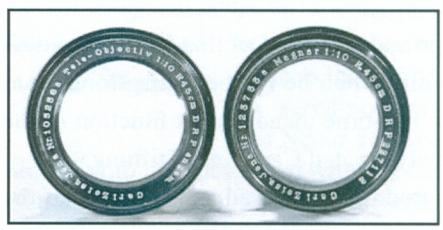
Paul Rudolph using his lens design for a true telephoto lens on a Zeiss Palmos focal plane camera. The photograph was in a 1909 catalog, one of the smaller ones, which was folded so that this image was damaged.

As a companion to this issue of the journal, we are also including a modern reprint of the large Carl Zeiss Jena Photographic Objective catalog of 1905. This catalog originally had a strong board cover instead of the card stock or paper stock cover of the standard Zeiss photographic catalogs of the period between 1890 and 1910.

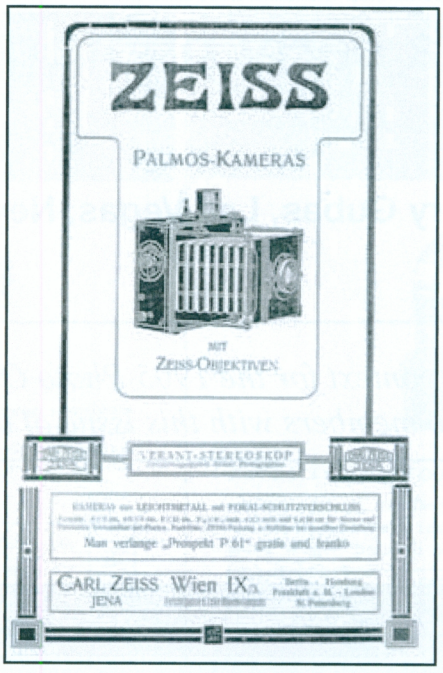
It was much more detailed than the catalogs designed for customer use, and so most were destined for dealers' use only. That some fell into the hands of competitors is confirmed by one example I have seen which has the CP Goerz optical library stamp on the front internal page.

The earliest catalogs were mostly scientific papers for the camera manufacturing firms, discussing the characteristics of the photo lenses. Sometimes they contained many technical and mathematical formulae associated with them and the recommendations of which lenses were appropriate to which size of cameras. Many seem to be written by Dr Paul Rudoph himself, including one titled as his recommendations.All these are now very scarce, but the large catalogs were a departure with many illustrations of the lenses in cut-away form and examples of pictures taken with the lenses and other pictures demonstrating the different characteristics of lenses from wide angle to telephoto. Most of these were shown with the use of different Protar or Zeiss Anastigmat combinations. You can also trace the dating of the trademarks from "Zeiss Anastigmat" to "Protar" in the 1901 large catalog. Some of the illustrations in these large catalogs, such as the one from 1905 in our reprint, also included color examples of actual photographs. It is also clear that the business goals of the company were changing; it had not intended to go into the camera-manufacturing business at first since it wanted to be the lens manufacturer of record to the various and numerous photographic manufacturing firms of the day in Germany and around the world.

Rudolph was the guiding hand and man-



This Magnar lens was originally called a Tele-Objective (left) but after learning the lesson of the Zeiss Anastigmat being too general a name the trademark was changed to Magnar (right).



Covers of the small 6 or 8 page leaflets that Carl Zeiss Jena used for specific product lines. These date from 1906 to 1909.

ager of the Photo Lens department from the outset when Ernst Abbe delegated the design and oversight of that line of business to him when he (Abbe) transitioned into the full-time management function of the newly created Carl Zeiss Stiftung.

Rudolph remained as the leader of the department until 1910, soon after the creation of the International Camera Aktiengesellschaft or Ica, when many of the largest German photographic firms were merged into that organization. Rudolph's department had been the third such Zeiss organization to be created. The first was the main sphere of the firm in Microscopes and the second was the Optical Measurement department under Karl Pulfricht.

For some insight into Rudolph's decision to retire, look at an interesting but now largely forgotten episode that began in 1900. It had been the position of the firm of Carl Zeiss Jena not to go into the business of camera manufacture. It is clear that they were manufacturing photographic materials for the purposes of microscope-based photography, starting from the original work of Roderich Zeiss in the middle 1880s. However, it was their legitimate intention to manufacture the optical components in terms of lenses for photographic purposes when Abbe gave that mission to Rudolph.

In March 1900, Rudolph entered into an agreement with Carl Bentzin, who had a camera-manufacturing business in the nearby city of Görlitz. He, along with some other individuals at Zeiss, privately started this business independently of the Zeiss firm.

By the end of 1901, there were a great number of financial problems at this new firm, including the collapse of the bank that had given them capital. Reluctantly, Ernst Abbe stepped in to protect his employees. The firm was dissolved except for the Bentzin operation in Görlitz, which became independent, and the assets of the now liquidated firm were placed into a separate company named Carl Zeiss Palmos, AG, which made a limited number of cameras and accessories. This firm was placed under the supervision of the Carl Zeiss Stiftung and its products were marketed in conjunction with the Photographic Department of Carl Zeiss Jena.

From this point, it seems that Rudolph was no longer interested in the manufacture of cameras. Rather, he looked upon the new Ica enterprise as a threat to his licensing fees, because he feared that other firms would not buy his lenses for use on their photo products. However, you should understand that it was the goal of the Zeiss firm to make a profit while at the same time protecting the optical and mechanical industries, according to Abbe's declaration in the Stiftung's documents. Rudolph was later called back into national service at Zeiss during World War I.

With Rudolph's leaving, the series of very large catalogs fell out of favor; smaller product-specific leaflets and catalogs came into use but on a smaller scale both on the size and the number of pages. ❐

A Nettar mystery

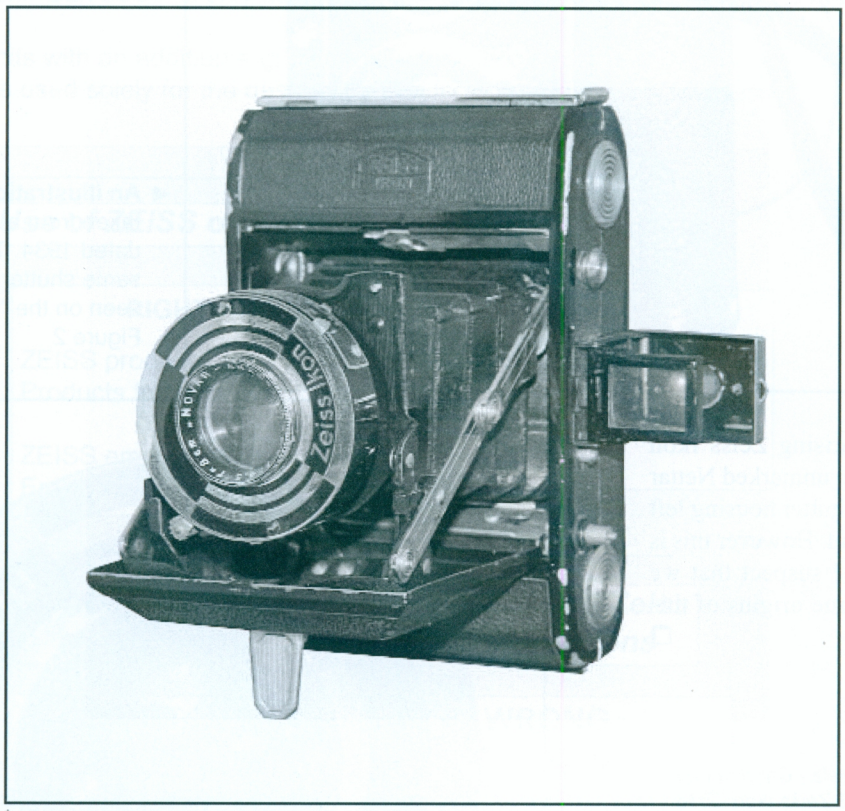
Simon Worsley, Nottingham, England

Here is a Nettar 515 that has a lens and shutter mount seemingly borrowed from an Ikoflex 850/16.

As someone who prowls eBay with an insatiable appetite for Zeiss Ikon camera serial numbers (the "Fabrikationsnummer") and the occasional purchase of a low-cost Zeiss Ikon item, I was intrigued by the listing of a Nettar 515 with an 8 cm lens. I assumed this was a simple typographical mistake on the part of the vendor as all the contemporary catalogue references I had seen of the Nettar 515 series only ever listed the camera with the Nettar 7.5 cm lens (although there are certainly numerous examples of the Nettar 515 equipped with the optically identical Novar 7.5 cm lens – and the later Nettar 516 model was listed[1] with a Novar 7.5 cm lens) but the eBay listing came complete with pictures that seemed to show a standard Nettar 515 body but with a strangely familiar but un-Nettar like shutter/lens housing design and a Novar lens marked 8 cm. I suspected that this camera was a hybrid, the result of changing the original lens/shutter unit from another Zeiss Ikon camera; however, I was intrigued enough to put in my customary low bid, which I was delighted to find was enough to procure the camera.

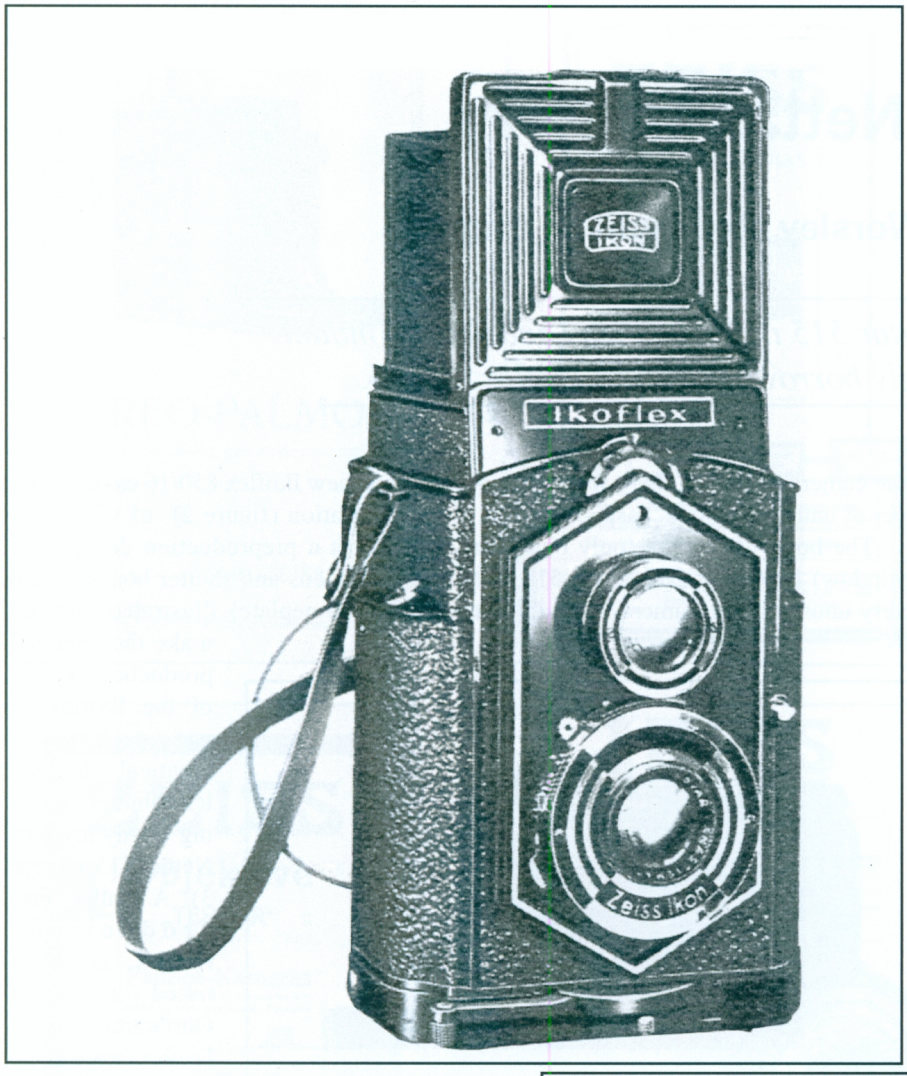
Still expecting a hybrid camera, I was surprised that when I eventually received the camera (figure 1) there were a number of unusual (unique?) aspects to it.

The body was a late (only one film window) 1930s standard Nettar 515, but very unusually the camera body did not have the customary Zeiss Ikon camera body serial number. The shutter/lens housing seems to have been the original one, or at least it was very professionally grafted onto the bellows. After checking my records I found where I had seen it before—a June 1934 Zeiss Ikon brochure.[2] Among the cameras listed was the then new Ikoflex 850/16 camera with an illustration (figure 2) of what I assume was a preproduction design, because the lens and shutter housing (and Ikoflex nameplate) illustrated, did not make the eventual production version of the Ikoflex. It was, however, identical to the lens/shutter housing on my mystery Nettar 515 (figure 3). A similar "preproduction" Ikoflex is illustrated in Bernd Otto's article on the Ikoflex range in the German magazine *PhotoDeal* (No.1/2000) – which suggests that at least two of these pre-production Ikoflex 850/16 were made.



The odd Nettar 515 with a non-standard shutter and lens housing. Figure 1

Assuming that the lens/shutter housing used in the 1934 Ikoflex brochure is the same as the one on my serial-numberless Nettar 515, we are left with the question of why? If the Nettar 515 body had been of the earlier "two film window" type I might have speculated that this was a prototype Nettar 515, but the use of the "one film window" body rules that out. I would like to think that the camera came about either during the latter stages of the War or just



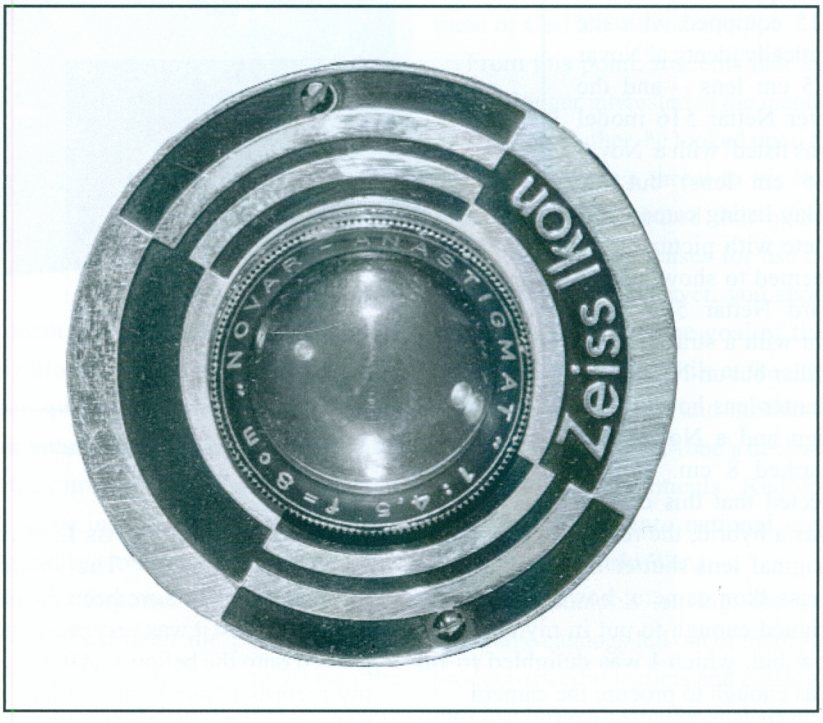
◄ **An illustration of an Ikoflex 850/16** taken from a Zeiss Ikon brochure dated 1934. This camera has the same shutter and lens housing as seen on the "mystery" Nettar. Figure 2

after, when an enterprising Zeiss Ikon employee combined an unmarked Nettar 515 body with a lens/shutter housing left in the spares department. However this is pure speculation and I suspect that we will never know the true origins of this particular camera. ❐

References

1.Zeiss *Ikon C920a Schweiz - Camera und Zubehör* dated April 1943 Zeiss Ikon C576

2-Zeiss Ikon *C576 - Hallo knipst auch* dated June 1934 .



A close-up view of the lens and shutter front plate of the mystery Nettar, which seems to be the same as the one on the Ikoflex, above. ► Figure 3

Zeiss has recently issued some new guidelines on how the company, its products and employees should be identified. We reprint below part of the explanation.

Worldwide consistent brand management

The Essentials at a Glance

The goal in communications is to strengthen the ZEISS brand and to use it consistently in the future. This will ensure that a clearer and more uniform image of ZEISS is communicated. The following basic rules will help. Please see the corresponding directive for more details.

1) **ZEISS**
As much "ZEISS" as possible, as little "Carl Zeiss" as necessary.

2) **Carl Zeiss**
a) As a person: "Carl Zeiss" is only used by itself if the company founder himself is meant

b) In legal units with an addition(e.g. Carl Zeiss Meditec AG):
"Carl Zeiss" is used solely for the description of a legal organizational unit

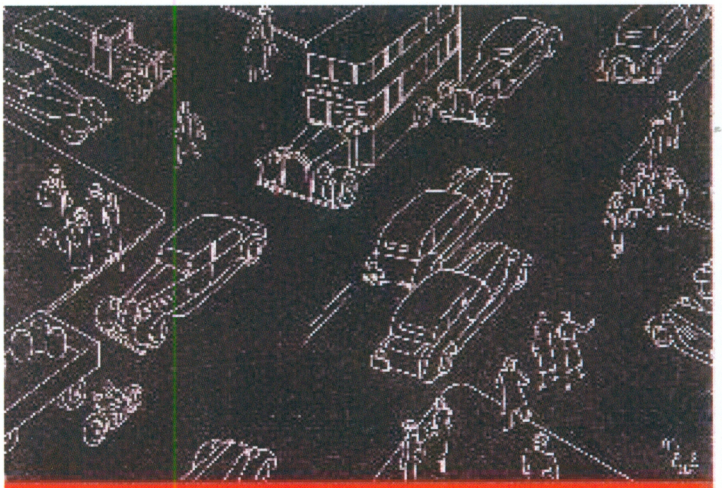
Use of ZEISS on its own and with generic terms:

RIGHT	WRONG
ZEISS products Products from ZEISS	Carl Zeiss products Products from Carl Zeiss
ZEISS employees Employees of ZEISS	

Terms which relate to the person Carl Zeiss or are allocated by external institutions

RIGHT	WRONG
Carl Zeiss Foundation	ZEISS Foundation
Carl Zeiss Research Award	ZEISS Research Award

Back cover: The front of a 1938 Zeiss brochure advertising automobile accessories. Several pages from the brochure are shown on pages 19-20 of this issue, following the article by Dietmar Spiedel on these Zeiss products.



ZEISS IKON

Autozubehör