ZEISS HISTORICA

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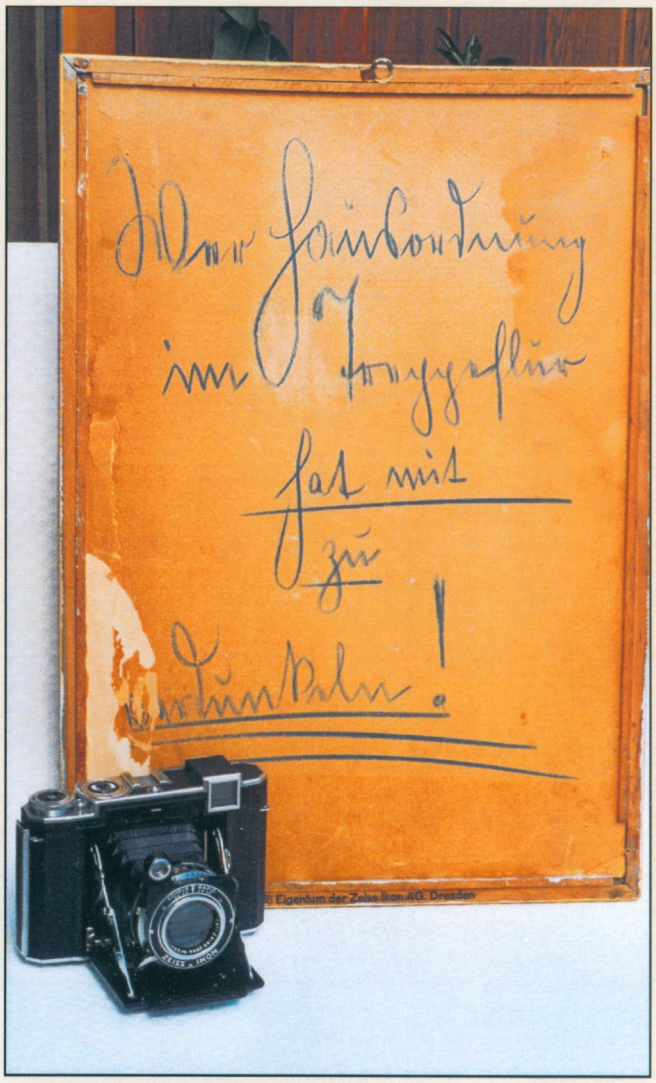

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The Zeiss Historica Society of America is an educational, non-profit organization dedicated to the exchange of information on the history of the Carl Zeiss optical company and its affiliates, people and products from 1846 to the present.

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

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Front cover: A poster board from wartime Germany, advertising the Super Ikonta 532/16 on the front. The back side, however, bears a hand-written exhortation to air-raid wardens: "*If you have staircase duty, help dim the lights.*"

Illustrations provided by Bernd K. Otto, whose article begins on page 10.

Back cover: A collection of printers' blocks found by Rolf Fricke. Others are shown on the inside back cover, where there is also a discussion of both sets.

President's Letter

Again I sit to write the President's letter with some anxiety as it has been a difficult year for many of us. Until December I have not been able to sit down with a clear head to write anything in terms of an article or the long-promised monograph on the many different arms of the firms related to Carl Zeiss Jena and Zeiss Ikon. I will do my best to get that done for the Spring 2010 issue. I spent a good deal of this time in the hospital or at home trying to recover from some dangerous blood clots in my lungs and legs and two serious abdominal infections at the site of my surgeries over the past two years. I am very much concerned with my own longevity and that of others in our circle. Charlie Barringer is still undergoing strong chemotherapy for his cancer and the best that can be said is that it is currently at a stalemate. The side effects of the therapy do take a toll on the individual as well as the family, as I can tell you from my own difficult experiences of 1992.

The work of the society is currently falling into the strong hands of Terry Scott who is the treasurer and editor and Warren Winter who, as secretary, has been doing the difficult job of keeping our records, storing our valuable back issues and corresponding with the membership and others who inquire. This is a lot sitting in the hands of just two people. We are now no longer neighbors now that Terry has moved to Texas and I am in Nevada. The sending out of the mailings is no longer a social event that brings the working hands of the society together. I commend these two guys for all that they are doing, but it is important the we become more of a collective organization and not just a subscription to interesting historical articles about Zeiss and Zeiss products.

It is also fearsome that no matter how provocative I am in these letters, or if we send out something that was (to me) as spectacular a find as the Goldberg videos from the early Kinamo camera, that I receive absolutely no feedback from the membership at all. We are going to need help, and soon, if we are going to survive past a few more years. So I ask you to consider how you can contribute to the prosperity of our group. Please let me know if you can be helpful to us as we do this labor of love. It is not just an activity to fight off early Alzheimer's for any of us. Please take the time to contact me and let me know what you can do to help, even if it is only a request as to what subjects that we have not covered that would provoke your interest.

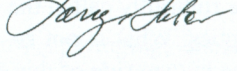
I was very happy to see that we have a contribution in this issue from Hans Keller who worked at Zeiss for his entire career. He brings an article to us about Ernst Abbe, without whom there would have been no Zeiss since he was the mind and research arm of the science as well as the business. This is a subject in which we have not scratched the surface for many years. I have not read the article as I like to get things fresh from the Journal as a member, but few outside of Germany know the incredible contributions to society and science that were the work of this man. Hans will give us that German perspective, I am sure.

Many of our members attended a wonderful autumn meeting in Rathenow, Germany (a suburb of Berlin and the location of the oldest of the German optical firms, Emil Busch. That organization became a member firm of the Carl Zeiss Stiftung beginning in the 1920s.) There was a great deal of discussion and presentations as well as interesting exhibits. I was happy to hear of these events but I was not in any condition to travel. I hope to make the trip to Portland, Oregon where their next meeting is scheduled for Labor Day 2010.

I have received an extended presentation on the history of the Zeiss firm, Hensoldt, which was presented at the meeting in Rathenow, and I will be working with Jack Kelly to fashion an article or articles based on this thorough presentation. The author of this material is Walter Besenmatter, a retired designer of Zeiss binocular instruments whose verbal English is excellent but he feels that it must be organized differently and structured by a native English speaker.

In recent years, Zeiss has changed their structure into a collection of firms organized around shares of stock. Some of these shares are being used as rewards to innovative staff members. This is so that they could be sold back to the firm at a future date at a gain based on the success of the business but the control for all of the stock still resides in the Carl Zeiss Foundation (Stiftung). This was controversial for many of the older members of the firm but, like many other research and development organizations, it is vital to take aggressive steps to retain good people to support the firm's goals.

I hope this new year brings a better world for us all. As one who is on Medicare I have my worries, but as an individual I have my hopes and dreams. My best wishes to each one of you. I hope to hear from you soon.



Ernst Abbe, a man ahead of his time

H. Ernst Keller, Midlothian, Virginia

Carl Zeiss's colleague, friend and partner was not only a highly skilled scientist who worked out the theory of image formation in microscopes and designed improved lenses for them, but also proved to be an enlightened employer.

When I joined Zeiss, more than fifty years ago, Abbe's legacy, not only as the great scientist he undoubtedly was, but perhaps even more as a person with a deep social conscience and a sincere concern for his fellow human beings fascinated me greatly. I was even then determined to learn more about Abbe the man and to aspire to some of his ideals.

I soon realized that no other decision of Carl Zeiss had such a far reaching impact on the company he founded as did his choice of Ernst Abbe to help establish a more scientific foundation to building microscopes. Abbe's work in this area was so successful that Zeiss later entrusted to him, as partner and successor, the management of the firm. Abbe's contributions to microscopy and optics in general have become legend. We need think only of his theory of image formation based on diffraction, the so-called sine condition, his formula for dispersion and so on, and of the many optical devices that bear his name from Abbe Condenser and Abbe Refractometer to Abbe Comparator, to see that he could be rightfully called the father of modern optics. What is not so widely known is the human side of this eminent physicist and mathematician that became so much part of his genius.

Abbe, about 1894

Early years

Born in 1840 in Eisenach, Thuringia (which was also Johann Sebastian Bach's birthplace, 155 years earlier), Abbe grew up in very modest circumstances. His father, a printer and typesetter, could not find work in his trade and switched to spinning and weaving in a local worsted mill. Eventually he worked his way up to foreman. Here Abbe saw firsthand the beginning of a transition from the employment of tradesmen in a benevolent and humane working environment toward industrialism with sometimes ruthless, if not intentional, exploitation of workers. Abbe's frequent visits to his father's workplace, where he saw the employees working 14 to 16 hours a day with no benefits or protection, left a deep impression.

A very gifted, inquisitive and conscientious child, whose parents could not afford the education he deserved and longed for, he came to the attention of the mill owner, who with some other patrons financed Abbe's high-school and pre-college education. Thanks to excellent grades he was able to enter the University in Jena at 17. A brilliant student and winner of several prizes, his fame prompted the city of Eisenach to give him a stipend that allowed him, after four semesters in Jena, to continue his studies in Göttingen, well known for its mathematics and physics faculties.

His PhD dissertation confirming the equivalency principle between heat and mechanical forms of energy was highly praised. After interludes at the University in Frankfurt, and a few years of independent research and some teach-

ing, he took up a professorship in mathematics, physics and astronomy in Jena in 1870.

He joins Carl Zeiss

Abbe first met Carl Zeiss in 1867, at which time Zeiss's mechanical-optical studio had already attained some fame by offering high-quality loupes, microscopes, vision aids, lab equipment and balances to the scientific community. Somewhat frustrated about his inability to build microscope optics more reproducibly and with predictable quality rather than by the time-consuming empirical method of mixing and matching lenses towards an acceptable performance, Zeiss was desperately looking for help from academia. After an earlier attempt with another scientist failed, he finally succeeded in recruiting Ernst Abbe, first just on a consulting basis. Abbe immersed himself in the optical challenges Zeiss presented to him. He soon discovered that Snell's laws of refraction, which he perfected with his sine condition for aberration-free imaging, could not by themselves explain the image formation in the microscope, the resolution limits, contrast conditions and the dependence on wavelength and aperture. The two men became good friends, and after extensive research and experimentation—and after almost going broke—they succeeded in putting microscope optics on a more scientific footing. Out of all this came milestone papers on the light efficiency of optical instruments, especially microscopes, on the theory of photometry and its application to loupes, telescopes and microscopes, on the theory of the microscope and the critical importance of the numerical aperture, on optical testing devices for microscope objectives and much more.

Abbe's improved immersion objectives were a great boost to the success of Zeiss microscopes. At first he used water, and then later the so-called homogenous oil immersion with cedar wood oil, which found wide acceptance in the scientific world. In the mid 1870s annual sales had amounted to around 250 microscopes, but by the early 1880s sales grew to 800–1000 instruments.

Carl Zeiss fully recognized Abbe's contribution and offered him an equal partnership in the company.

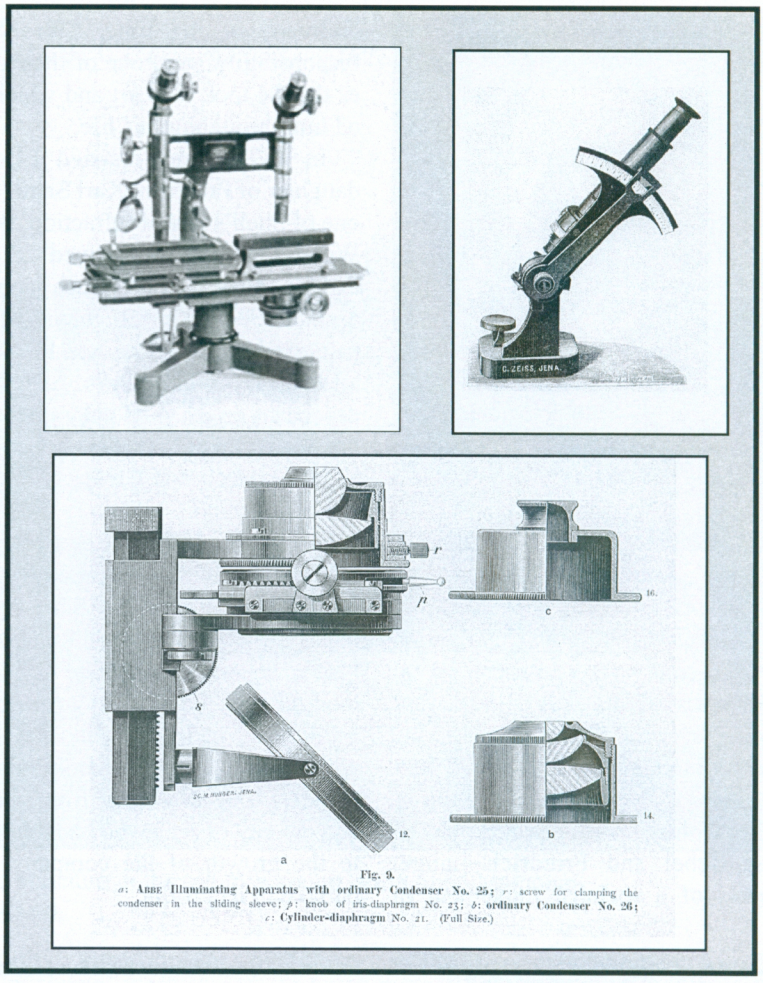


Fig. 9.
a: Abbe Illuminating Apparatus with ordinary Condenser No. 25; *r*: screw for clamping the condenser in the sliding sleeve; *β*: knob of iris-diaphragm No. 23; *b*: ordinary Condenser No. 26; *c*: Cylinder-diaphragm No. 21. (Full Size.)

Some of Abbe's many instrument designs. Top left, the Abbe Comparator; top right, his Refractometer, and below, his Condenser

What we all know Abbe best for is his diffraction theory of image formation, which became a critical milestone in the development of modern optics. Initially widely attacked, Abbe painstakingly defended his theory and developed a series of experiments that disbelievers could perform on their own to confirm the validity of his theory. In extensive correspondence with members of the Royal Microscopical Society in London, who later bestowed an honorary membership on Abbe, he finally succeeded in persuading even his staunchest opponents.

Otto Schott arrives

Another crowning contribution to microscopy was of course the design and calculation in 1886 of the Apochromat with improvements in the correction for spherical and chromatic aberrations.

Realization of the design, however, required optical materials and glasses that did not exist at the time. By fortuitous circumstance Otto Schott, a chemist specializing in glass, arrived in Jena and the triumvirate of Schott, Abbe and Zeiss made it possible to produce high-performance microscope optics in a predictable fashion, which in turn helped Zeiss, the company, to grow rapidly and become highly profitable. In partnership with Zeiss, and with financial support from Prussia and the Academy of Science in Berlin, the Schott Glassworks and its extensive research laboratories were established.

Social issues

Throughout Abbe's upbringing, social issues like the gap between poverty and

Otto Schott

wealth, the integration and motivation of the industrial worker in society were always on his mind. Already in the mid 1860s he became aquainted with the zoologist Anton Dohrn, who would later found the Marine Biological Station in Naples. Dohrn introduced Abbe to August Bebel and Friedrich Lange, exponents of a socialist movement in Germany at the time. "Wealth is a responsibility" was one of their premises that he took to heart and which guided him throughout his life.

In 1871 Abbe married Elise, the daughter of Professor Karl Snell (not the one of Snell's law of refraction; that was Willebrord Snell who lived 250 years earlier). Elise provided much support and encouragement for the coming decades, particularly through the late 1880s when, after a nervous breakdown, Abbe became dependent on drugs. Totally dedicated to the well-being of his company, he chose to let his health take a back seat to everything else on his mind.

By the mid 1880s Zeiss and Schott had become highly successful and the personal wealth of the three partners, later joined by Zeiss's son Roderich, had grown substantially. Abbe gave much thought about how best to utilize this wealth; he had long felt that all the workers, at all levels, mainly within the company but also those from academia and the city of Jena who had contributed to the growth of the company should partake in its profits.

Paul Rudolph (designer of the Tessar), **Ernst Abbe** and **Otto Schott** (left to right). Abbe appears to be pointing out to Rudolph that his bicycle has lost its chain.

Abbe formulated something like a "corporate will," if there is such a thing, in an attempt to distribute the corporate profits as justly and equitably as possible. His partners Carl Zeiss and Otto Schott were in full agreement with these plans, only Roderich Zeiss objected. After Carl Zeiss died in 1888, long and sometimes heated negotiations between Abbe and Roderich, during which Abbe threatened to resign, finally led to Roderich's resignation with a generous settlement.

The Foundation

Now Abbe was free to put his ideas to the test, and he established the Carl Zeiss Foundation, officially announced in 1896, fifty years after the founding of the company. Typical of his modesty, he named this trust after his friend.

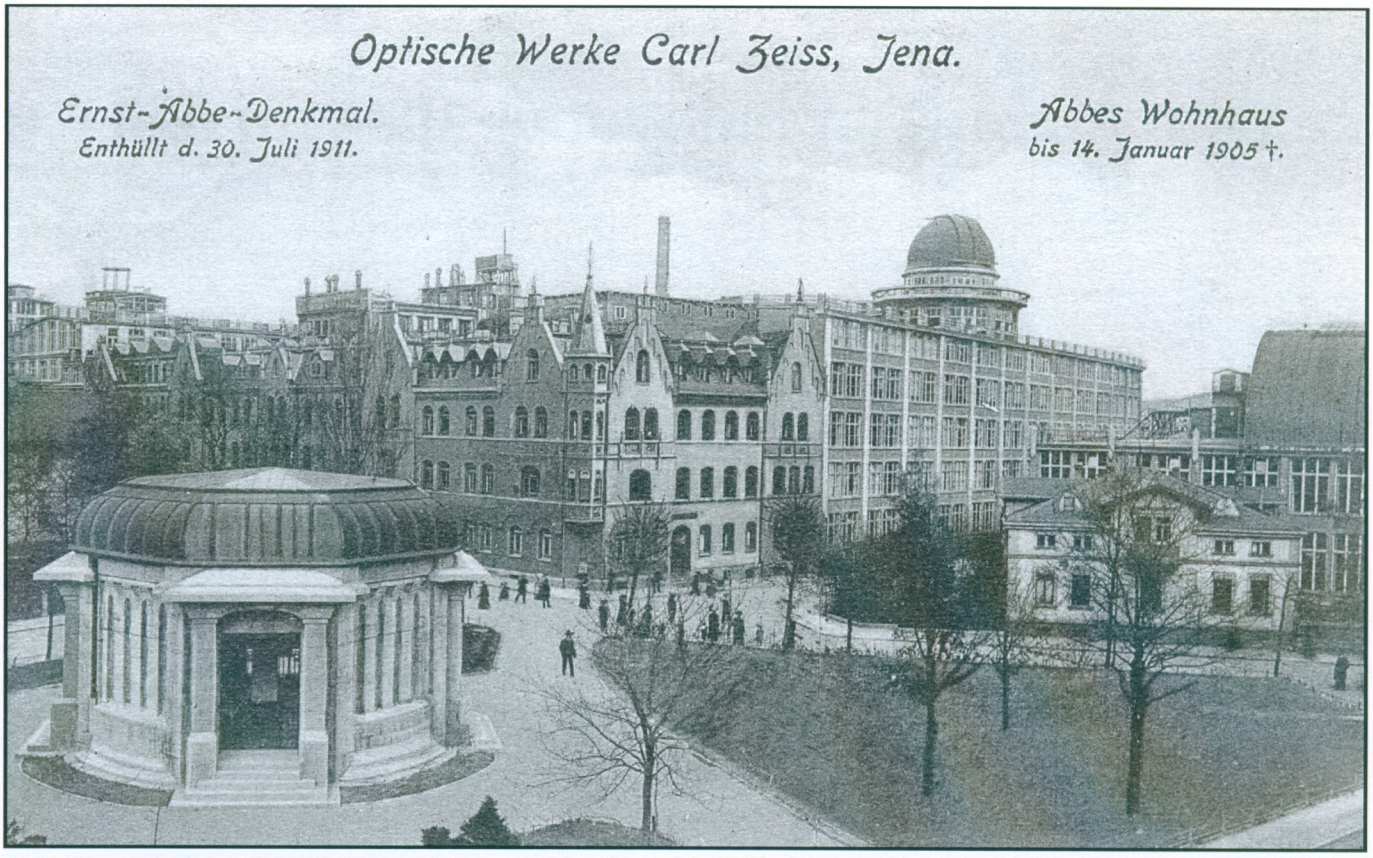
This trust or foundation, with a major endowment from the personal wealth of both Abbe and Schott, became the legal owner of both companies and was to be overseen by the State of Thuringia, where Jena is located..

The statutes of the Foundation, which Abbe formulated over ten years in great detail and during many sleepless nights, define the goals, the obligations, the legal structure and the organization in very clear terms. The eminent physicist and very successful CEO of the company had created a masterful legal document, which in many respects is still in force over 100 years later.

He stresses that the Foundation is to remain a private trust, overseen by the ministry of culture of the State of Thuringia. Zeiss and Schott have their own board of directors. An outside Foundation Executive mediates where necessary between the two companies.

I can just briefly list some of the most important goals, rules and changes, particularly innovative for the time, that have by and large governed the two companies over the last century:

Sustain, grow and support all areas of precision optical activities, not only in the companies but in general for the benefit of mankind. Assure the economic viability of the companies as a source of reliable income for all workers and for



The Carl Zeiss optical works in 1912. The round structure in the left foreground is the Abbe Memorial. At the right, behind the trees, is the Abbe family's house.

the maintenance of all social and health obligations.

Provide strong support for the mathematics and natural science departments of the university.

Provide a healthy and pleasant community environment by close cooperation with and strong support of the city of Jena.

Abbe at the gate of his house, visible at the right of the picture above.

Provide benefits for all workers: an 8-hour workday, paid vacation, a pension for all, also covering spouses and children, direct profit sharing, from which board members are excluded, company-paid health insurance for workers and dependents and one particularly interesting rule: the highest paid worker in the company cannot earn more than ten times the income of the lowest paid worker. [*Author's comment: apply this rule to some present-day CEOs!*]

No discrimination because of race, religion or political orientation.

Job protection and substantial payments in case of termination.

A freely elected worker's council to represent the interests of all workers.

Abbe had great hopes that his ideas for corporate structure and governance, which after some persuasion and against strong opposition were finally approved by the Prussian government, would set a standard for others to follow. This was not to be, however. But we do know that many now government-mandated laws that were enacted in the last century follow Abbe's far-sighted and revolutionary concept.

So it is not surprising that Abbe, during all his active time at Zeiss, was revered by all his coworkers. A strong sense of belonging and of being part of a productive and well motivated team fostered an exceptional company loyalty. For himself, Abbe's modesty shunned praise, demanded openness and honesty. Considered a bit cold by those who did not know him well, his rough shell covered not only his scientific genius but a wonderful, warm and compassionate heart.

At his death in 1905 the whole city of Jena mourned the loss of this remarkable human being.

* * *

The illustrations accompanying this article were provided by Larry Gubas, President and Archivist of the Zeiss Historica Society. ❐

Otto Schott, an innovative glassmaker

Lawrence J. Gubas, Las Vegas, Nevada

Arriving at just the right time to make the novel glasses for Abbe's lens designs, Schott became a vital part of the Carl Zeiss operations and founded his own very successful company.

The son of a glassmaker originally from Lorraine, Otto Schott was born in 1851 at Witten in Westphalia. His father, who was himself a descendant of glassmakers and ashburners, had — like most glassmakers —done some moving around, having gone first to Lyon and then to Westphalia where he married and settled down. The elder Schott acquired through his industry and economy a modest fortune and invested it in a glass factory that was later converted into a corporation. He could afford to send his sons to college (a big deal in those days, because it permitted the sons to enter the business world at a higher level as scientists or managers and work at a totally different social level). But, because there were seven children in the family, young Otto had to work during the university vacations in the chemical industry.

Starting in 1870, Otto Schott studied at Aachen, Würzburg and Leipzig and was graduated in 1875. At first, he studied chemistry in relation to glassmaking. His doctoral thesis was entitled: "The Mistakes in the Manufacture of Windowglass." However, this young scientist had dreams that reached far beyond the field of making common glass. He had discovered what he thought would be a new science, to which he intended to devote his life's work: Pyrochemistry. Glassmaking was only a small part of his dream.

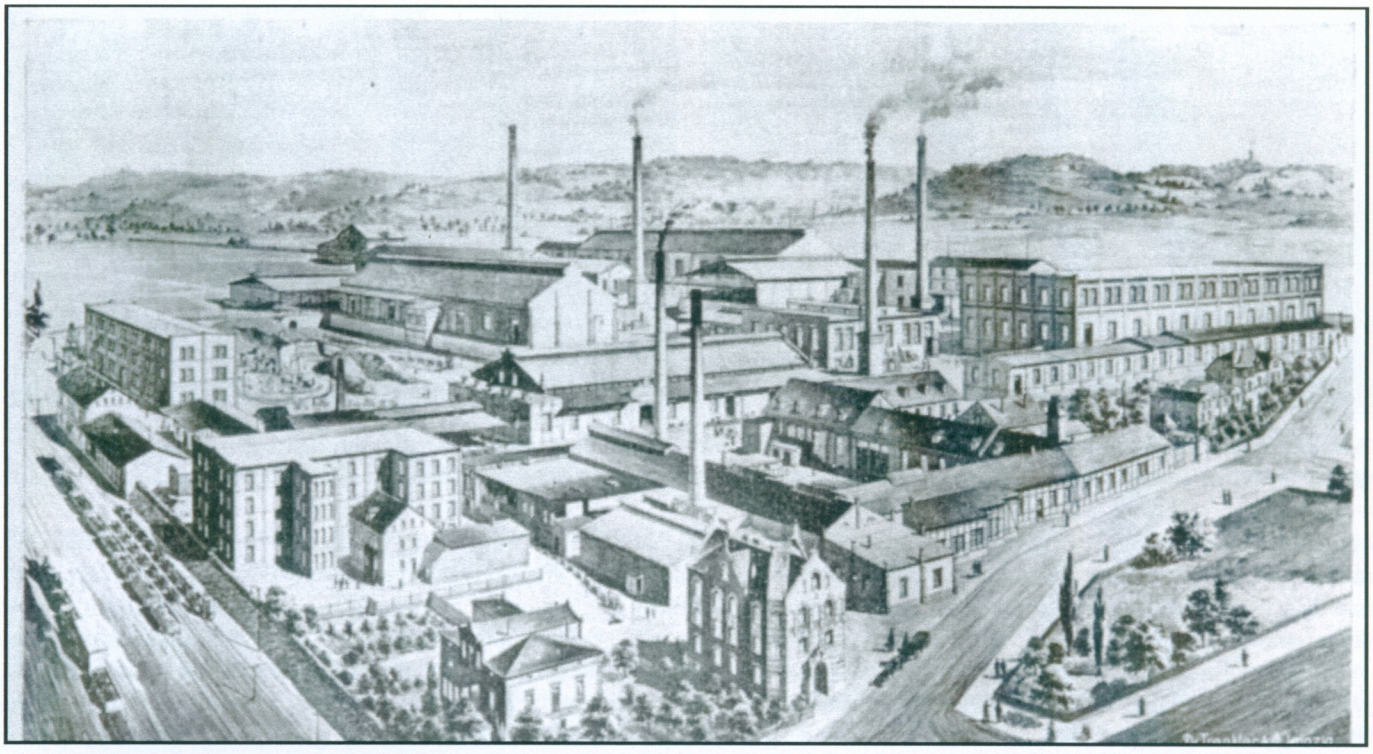
In the preceding article, "*Ernst Abbe, a man ahead of his time*," H. Ernst Keller details the contributions of Abbe to the Zeiss enterprise. Here, Larry Gubas adds some detail on the support given by Otto Schott's work at the same time.

His stated professional goal was a "general, well planned study of the melting of compounds, comprising the whole field of inorganic nature." This sounded very utopian considering the times, and one would consider him to be headed for a career as an eccentric. However, today Schott Pyrochemistry is an established field. Armies of scientists labor in this discipline today and much capital has been devoted to it. Young Schott was determined to succeed, but after getting a good dose of parental common sense, he realised that in addition to ambition and devotion he needed money. The kind of money required was far beyond what his father could offer and beyond the means of many entrepreneurs of the day.

He had grown up in a glass factory and always returned to it on his holidays. He also inherited a bit of the wanderlust that the profession was famous for in earlier times. Once he finished his studies, he left to take a look at the state-of-the-art glass factories of the day in England and France. For his first job, he went to Spain to establish a chemical factory, and he followed that with a glass plant. When he returned home in 1879, he was determined to look into the heart of glass. He started his life's work in the basement of his father's house.

Making samples for Abbe

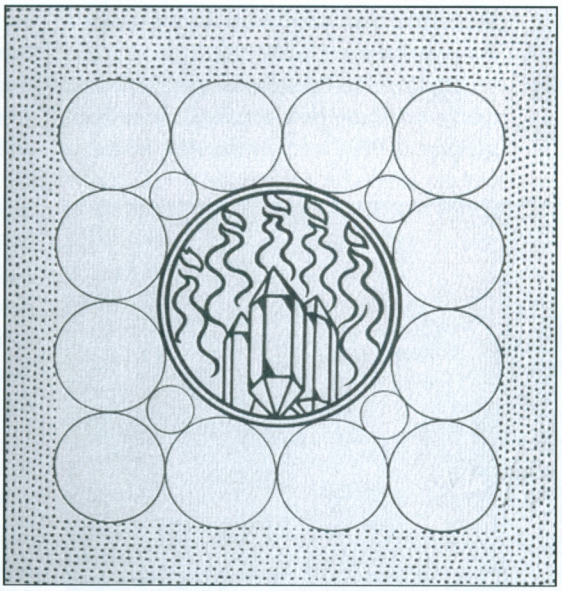
His work in special glasses came to the attention of Ernst Abbe in 1879, and in 1881 they conducted joint experiments together in developing new glasses. Schott was working and creating glass samples back at Witten in his father's plate-glass factory, and Abbe with his personal assistant Paul Riedel examined



The Schott Glassworks in 1930, before the town grew to add the residences later built around it.

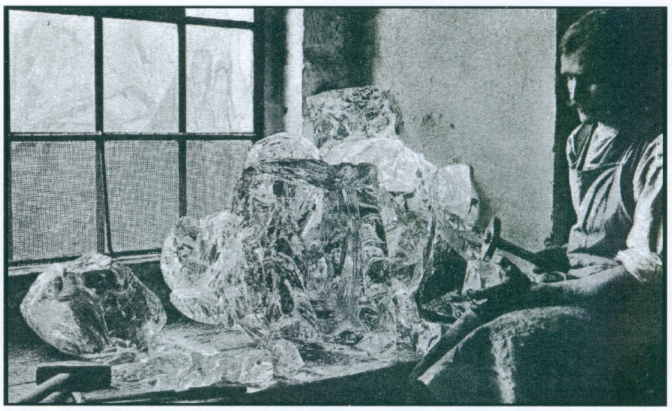
the results with the use of Abbe's newly improved spectrometer in Jena. One of the really intriguing elements of Schott's attempts to gain Abbe's attention included a specification for a microscope design for pyrochemical studies.

Schott already understood the plea that Abbe had made in many venues, including the Royal Microscope Society in London. Abbe had stated that he had carried the mathematics of glass design to make lenses for various instruments as far as he could. He needed different glasses to improve his microscopes and his other experimental devices. In his little stove in his father's basement (referred to as "the alchemists' stove) Schott began to try out his theories in practice. In May 1879, he tried a rare lithium oxide. The resulting glass was necessarily one with different properties. He took his samples and packed them in cotton and sent them to Abbe to see if these could meet their common purpose. Unfortunately, they did not. However, he was the first glassmaker to come to Abbe with anything resembling a new glass and so, he was suitably impressed. Abbe's return letter was disappointing but nevertheless it strengthened Schott's self-confidence. He now knew that no one else had made experiments of this sort and so he was ahead of all of his contemporaries.



Early Schott trademark by Zeiss artist Erich Kuitan.

He studied more about mineralogy and addressed the issue of the brightness of various compounds in the hope that it would lead him to a better result. In 1880, he came to the conclusion that he was working on too small a scale and asked Abbe to support him in constructing a true glass factory, because his experiments had proven to him that small amounts of glass would have too many defects. At this point, Abbe disagreed and said the path of knowledge was not in a glassworks but rather a chemical laboratory. Schott tried flux after flux with strict scientific process, and for another year he worked in his basement. He took a trip to Jena to discuss his progress and his impatience with Abbe, who gave him counsel and encouragement. Schott had conducted 130 melts of inorganic compounds of all sorts in Witten and sent the results of each to Jena to Abbe. Abbe set up a small experimental test station. Lot number 93, in autumn 1881, produced a glass with the right quality. When combined with melt 77, the problem of the "secondary spectrum" (a



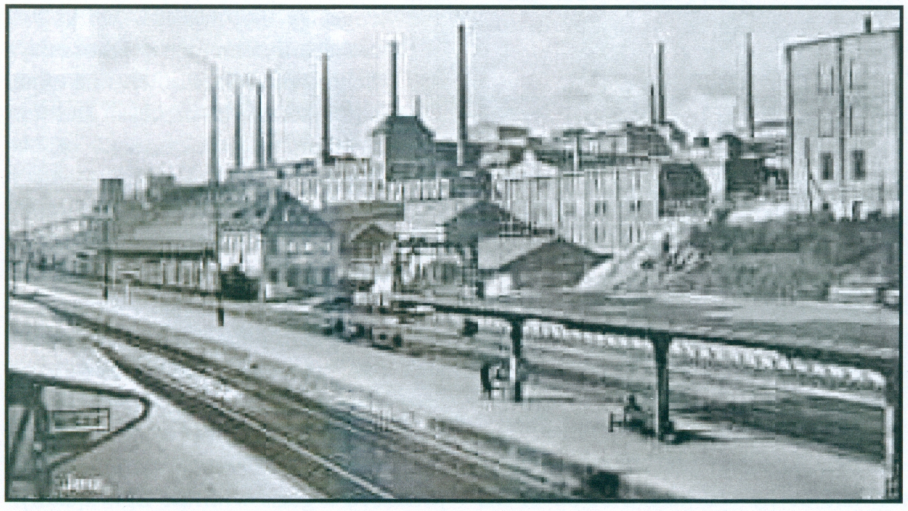
Two postcards showing steps in the production of Schott glass. On the right is a worker with the result of a large melt of optical glass. On the left, two employees commence work on the smaller pieces broken out from the original melt.

chromatic aberration) disappeared almost completely. In one year, Schott had found something quite close to what Abbe was looking for.

However, in further experiments, the glass lost some of its brightness and a film began to develop. Schott had not succeeded perfectly, but he had advanced the cause. He was too close to give up and with further modifications he was able to produce the glass that Abbe wanted. From each setback, Schott took pains to analyze his result further. He was now able to convince Abbe that the quantity of the glass in his melts was too limited. In addition, he had discovered that his limited facilities created dangerous poison gases, which also damaged the optical properties of the new glass.

They built a small lab in 1882 in Jena, with gas furnaces, the new "Fletcher" burners, and heavy blowers with which 15 kilograms of glass could be melted at a time. The first results were again disappointing. With Abbe and his scientific support nearby, Schott did not despair. He planned his work more carefully and slowly. He was soon rewarded with melts that reflected his calculations and he knew he was at the door of success. But to succeed he knew he would have to build a complete glassworks immediately although this small laboratory had exhausted his financial resources. Not even Carl and Roderich Zeiss had the funds available to support this effort, and they were also aware of the possibility of failure.

Luckily, the Prussian government had many projects that required improved glass and they were interested in helping, but they wanted some measure of success to make such an investment. Fortunately, with the assistance of a boyhood friend, a Dr Wiebe, who was on the staff under Dr Förster of the Royal Standardizing Committee, Schott was told of a glass problem that hampered one of their prized projects. They needed a dependable thermometer. Schott was able to find a suitable glass from his recent projects and, suddenly, the government wanted to bring Schott to Berlin to work for them.

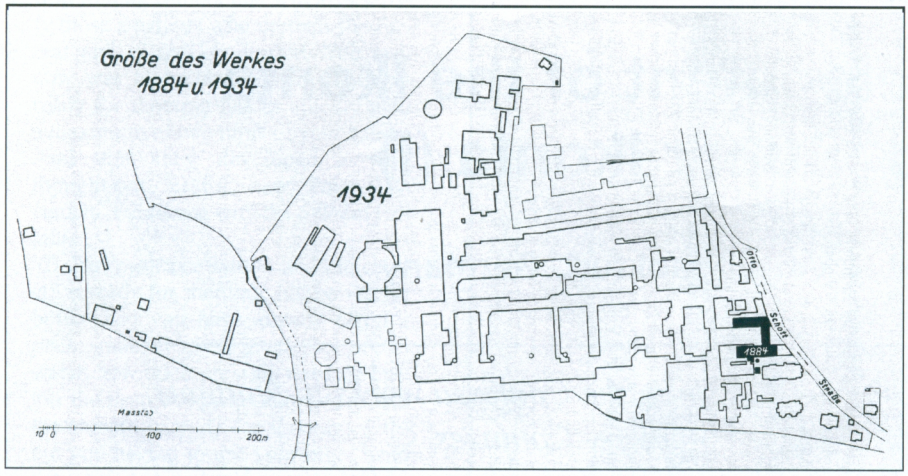


This view of the Glassworks from the Jena West train station shows that products could be shipped directly from the factory.

A glassworks of his own

Here Abbe and his new stature in the scientific world stepped in. He was able to convince Roderich and Carl Zeiss of the importance of having a glassworks in Jena. He was also able to use his influence with the government to convince Dr Förster that they could allocate the money intended for Schott's laboratory in Berlin to transform the existing Jena laboratory into a glassworks. Förster saw that would be an accomplishment of a much higher level and was able to convince his government agency to provide a grant for this purpose.

Schott, Abbe and the two Zeisses signed a founders' contract to create "The Glass Technical Laboratory of Schott and Associates." The government grant was 60,000 marks, while the partners contributed another 60,000 marks. On September 1, 1884, Elise Abbe had the honor of ceremonially firing up the first furnace. It was fed by a new gas generator from Siemens that provided the necessary high degree of heat and it



Growth of the Schott Glass Works from 1884 to 1934. The original 1884 building is in solid black at the lower right; by 1934 all the outlined buildings had been added.

was outfitted with the finest tools of the day along with some innovations designed and created by Schott and Abbe themselves.

One of the conditions of the Prussian governmental aid was the development of thermometer glass that would not become almost useless after a few operations at high temperatures. This thermometer glass was the first contract that was delivered out of specimens from some previous Schott melts. (The basic formula for that thermometer glass is still being used to this day.)

Other members of the optical industry received several new kinds of glass to try out. Within two years, Schott and Associates issued its first price list with 44 kinds of optical glass, of which 20 were completely new. The price list enumerated the optical qualities of each type of glass via exact measurements. Success did not come overnight to the firm but Schott and Abbe developed the product line and Abbe began to construct new instruments that would begin the growth of the glassworks as well.

An "incredible success"

Otto Schott lived in a daze of creation. In 1888, the laboratory offered 13 additional optical glass variations. In 1891, they introduced the Schott compound glasses for water-level pipes for steam boilers. In 1892, Schott discovered heat-proof borosilicate glass, then the first apparatus glass for the chemical industry that showed an extensive resistance to the effects of chemical substances. Chemistry was able to march forward at a higher level of accuracy than ever before due to Schott glass. Prior to the Schott success most of the scientific world relied on the optical glass of just two firms: The Chance Brothers Optical Works in Great Britain and Feil (later Parra-Mantois S. A.) in France.

Abbe soon made his first new microscope objectives and exhibited them in 1886. Czapski calculated new telescopic objectives, which were manufactured by the Carl Bamberg firm in Berlin until Carl Zeiss entered this portion of the business directly until 1899. (Bamberg was a Zeiss apprentice who had moved on to found his own firm and was also a great help in the negotiations with the Prussian military. His firm would later be known as the Askania works.) The photographic possibilities of Schott's new glasses excited practitioners around the world almost immediately. When Schott isolated one glass that was capable of being fashioned into prisms appropriate for binoculars, Abbe entered a patent and began another new part of the business function within months.

Schott glass was an incredible success for all concerned. The needs of the firm were radically different from that of Carl Zeiss: The costs associated with keeping the furnaces fired at all times and the need for around-the-clock staff to man the glassworks made the enterprise quite expensive, but it became a business of its own well beyond the firm of Carl Zeiss while at the same time giving Zeiss the opportunity to use new glasses for the lens formulas developed by Abbe and the other new scientists working at Carl Zeiss. Both firms became very successful, with new product after new product, and each leading their industry worldwide. Schott would remain at the helm of his firm until he retired in 1926, whereupon he watched his son Erich continue in his footsteps although he had given his share of the ownership in the firm to the Zeiss Stiftung in 1919. Otto Schott continued to live in the shadows of his many chimneys until his death in 1935.

For anyone especially interested in the lists of glasses, the problems in manufacture, the preparation time in days, and the composition of the pots and materials, the best source that I have found is the 1902 publication of H. Hovestadt called "Jena Glass and its scientific and industrial applications." It shows the Schott's scientific method with regard to all of his work and it documents both the successes and the failures. ❐

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The development of the Ikonta and Super Ikonta (I)

Bernd K. Otto, Frankfurt, Germany

These are the Zeiss Ikon cameras, from the Contessa works in Stuttgart, that rival the legendary Contaxes for diversity in design and high product quality.

The scientific magazine Kosmos, in its October 1929 issue, wrote of the Ikonta as a new photographic sensation (see figure on right), but the camera had already been available in the shops for four months. The Ikonta 520/2 with the 6×9 cm format, the simple f/6.3 10.5 cm Novar Anastigmat and the inexpensive Derval shutter was offered as "the latest thing" in catalogue C352, April 1929.

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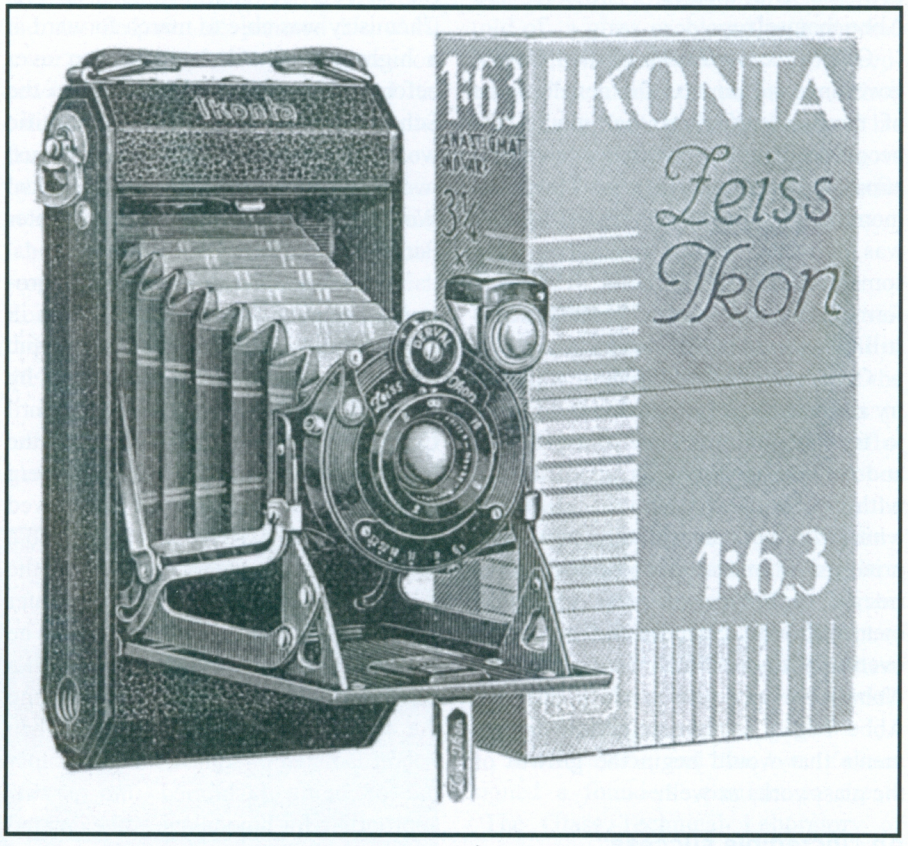
It was supposed to be available at the dealers for 40 Reichsmarks beginning in June 1929. Catalogue C402, June 1929, no longer mentions an intended delivery date, thus suggesting that delivery was already in progress. However, the announced price of 40 RM seems to have been a miscalculation, because in September the sales department set the price at RM 48.00. This is astonishing, because now for an Ikonta you had to put down three times as much as for a Box Tengor 6×9.

"What," you will ask, "did the new Ikonta 520/2 have to do with the Box Tengor 54/2?" The Kosmos magazine I quoted above gives an answer:

"The success of the world famous Zeiss Ikon box camera Box Tengor, which, because of its handling, is ready for shooting so quickly, has prompted the Zeiss Ikon AG, Dresden to present to the market a counterpart in the form of a roll-



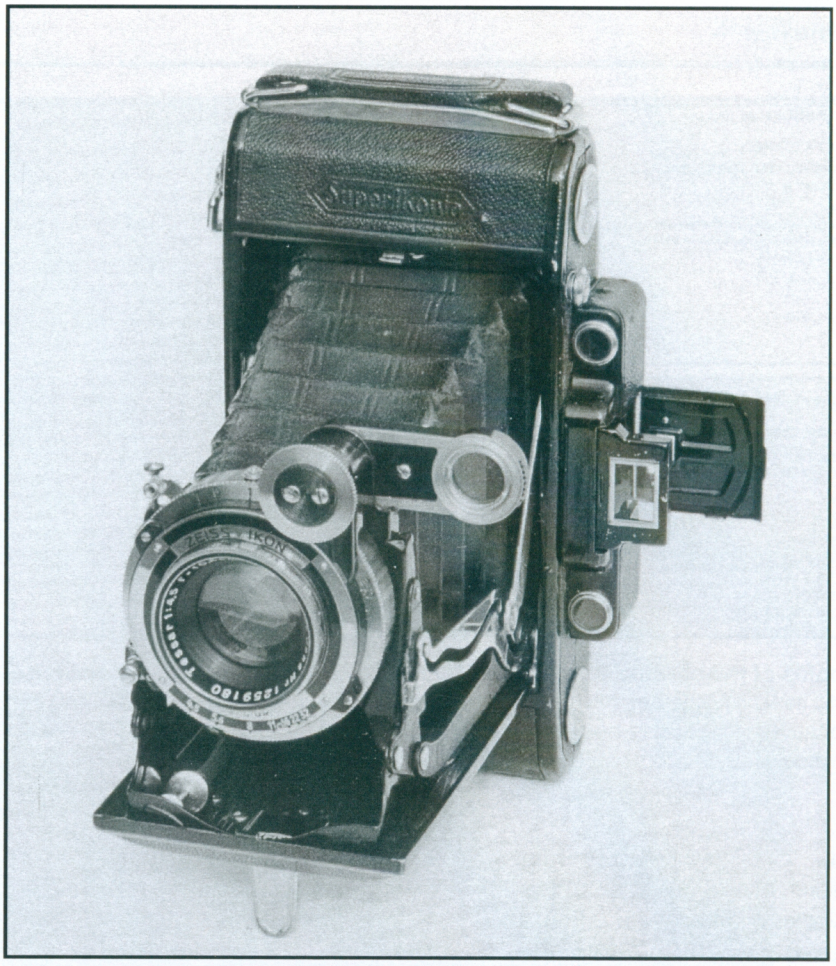
This advertisement from "Kosmos" magazine hails the Ikonta 502/2 in October 1929. It has the 6×9 format, a Novar f/6.3 10.5 cm lens and Derval shutter.

film folding camera that will also satisfy those amateurs who prefer a flat format and is quickly usable. The task now was to build a camera that was ready for shooting just as quickly with a maximum of two turns of your hands. And thus they developed a well thought-out, useful, new Zeiss-Ikon camera: the Ikonta with the 6×9 cm format.

Just push one button and the camera is ready for shooting; hit the second button and you have already taken a photograph. It gives great pleasure to watch how upon pressing the first button the drop bed snaps downward and the camera is ready for shooting without you having to use your other hand for support. A real self-erecting camera (or "spring" camera) in the true sense of the word. The main advantage however, is that the Ikonta is equipped with a very fast lens, a Novar Anastigmat f/6.3. It is therefore not only a fast self-erecting camera but also one which, because of its fast anastigmat allows you to catch quickly moving momentary views."

Not even after my many years of research in the Zeiss-Ikon field would I have thought of comparing a simple box camera to this extremely well built roll-film camera. However, the ideology behind this new camera was at first planned just this way. In the following documentation about the product variety you will learn that during its presence on the market between 1929 and 1960 the Ikontas and Super Ikontas were changed and improved several times and pretty soon lost this initially intended similarity to the Box.

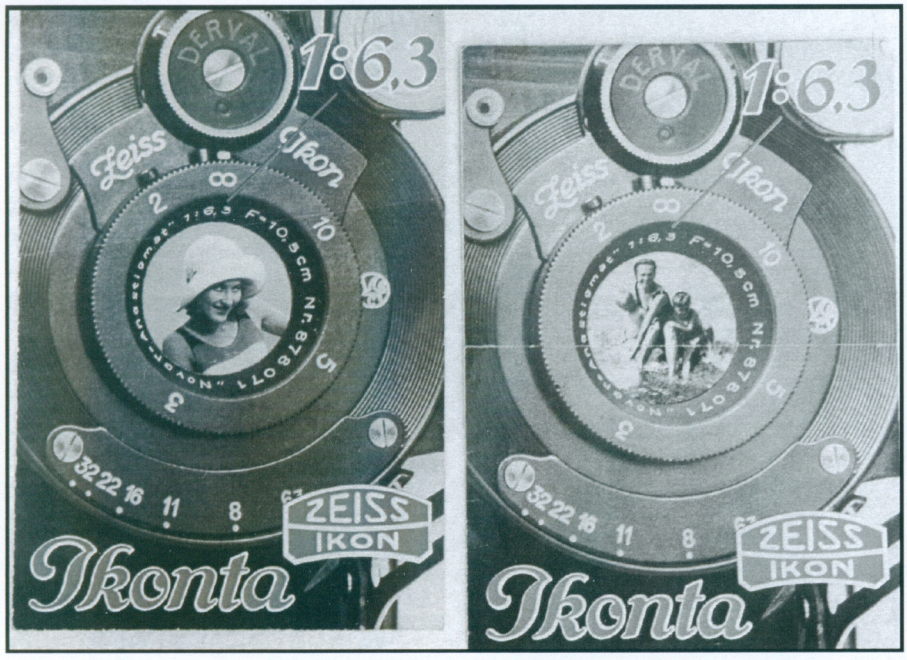
It is interesting to see that Zeiss-Ikon did not emphasize this connection to the Box in their own publications. Their public-relations people propagated the slogan "Ikonta – The modern and convenient camera for everybody" and the initial brochure C 415 then changed the slogan to



Two Super Ikontas. Model I (top), from 1933/34, has an f/4.5 10.5 cm Tessar and Compur shutter. Bottom, Model II of 1936 (Bestellnummer 531/2) has a Compur Rapid shutter. Both cameras are in the 6×9 format. ▶

Two copies of the brochure for Ikonta 520/2, which had been announced at a price of RM 40 in April 1929. Already by September the price was raised to RM 48, and the first brochures (top) had to be hurriedly and inexpertly altered to show the new price. In later brochures (bottom) the new price was more neatly included.

"Ikonta – The popular Spring Camera" in August 1929. Surely the rather low price was supposed to help sell a newly constructed camera in high numbers. The price change that was put in place shortly after the market presentation had to be carefully touched up in the catalogue that had already been printed. Only on close inspection can you detect that the previously printed RM 40.00 had been changed to a slightly enlarged RM 48.00. (See the illustration above). In October 1929 came new flyers with the price now printed in the correct size. At the same time the graphic designers changed the small photograph within the glass area of the Novar lens on the first page of the flyer. In the C 415 brochure this lens opening was purposely punched out in order to allow a free view onto a photograph actually placed on the third page.(See figure below.) The second flyer that was especially produced for the Ikonta, C 433 from March 1930, is designed and folded just as elaborately and is held together by a hexagonal Zeiss-Ikon film seal that was glued to the empty rear page. The frontispiece shows a young lady who smiles at her new Ikonta. There was no camera name, no marketing slogan; the customer was supposed to get interested, open the seal and then find all the information on the inside. There a second Ikonta model is also presented; for a price almost three times higher, you could now acquire a self-erecting "spring"camera with a Tessar f/4.5 10.5 cm in a Compur shutter.



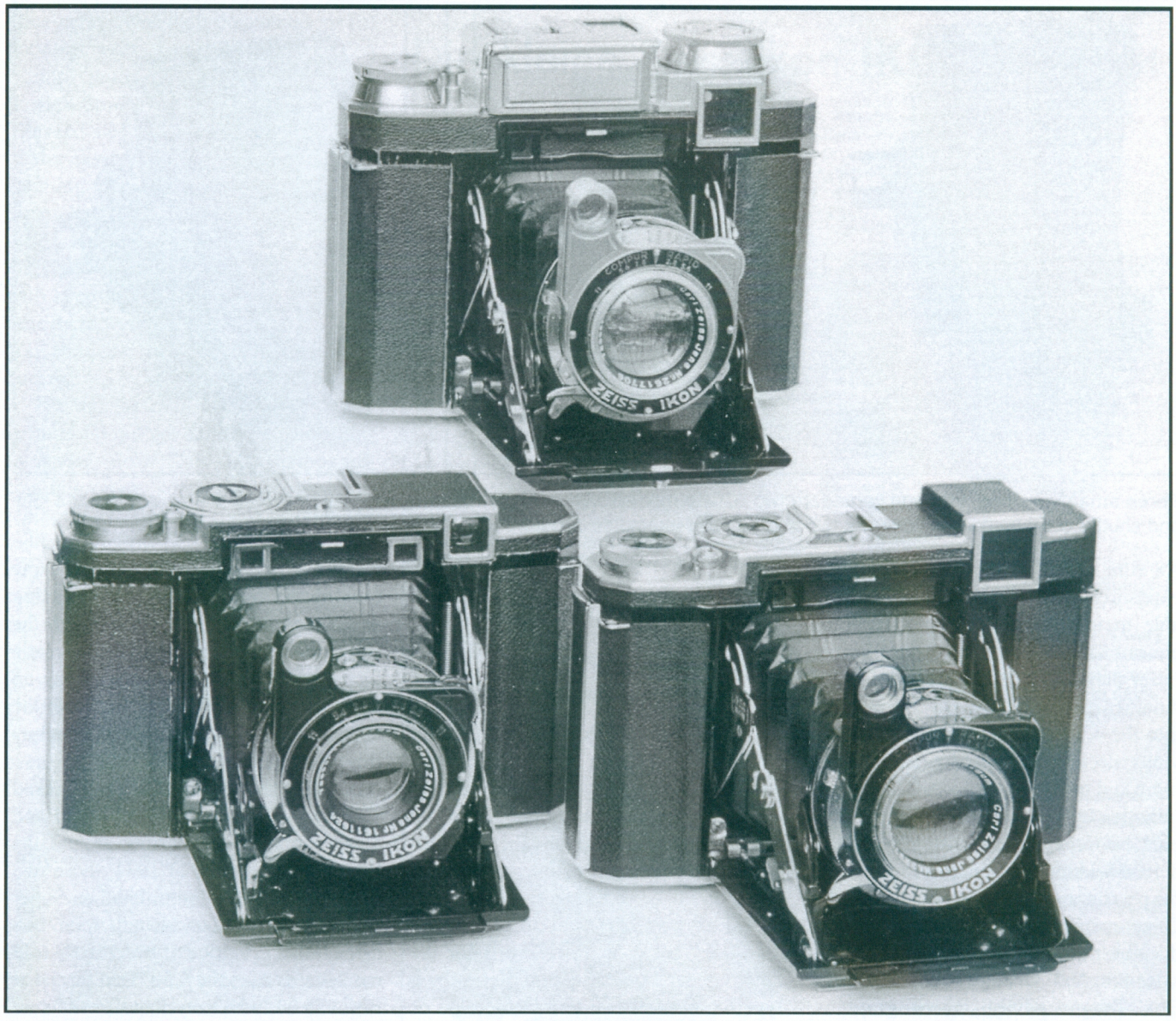
Front covers of the first Ikonta brochures, from October 1929 (left) and August 1929 (right). The Novar lens in the illustrations had been punched out to allow a view to a circular portion of the photograph on page 3.

Already, just nine months after the Ikonta had first been introduced, the comparison to the Box Tengor has disappeared.

The Ikonta in many formats

The third flyer, C 443, published about one year later in June 1930, closes the gap between the first inexpensive Ikonta for RM 48.00 and its follow-up model for RM 120.00. For RM 75.00 the customer could now get the new version with a Dominar-Anastigmat f/4.5 10.5 cm in the slightly downgraded Telma shutter. The brochure further offered two other new Ikontas in the then still-popular 5×7.5 cm format. They consisted of the simple Novar/Derval combination for RM 44.00 and the Tessar/Compur version for RM 108.00. In the US the new Ikontas appeared with the names Ikomat C and D. The reduced format of 5×7.5 cm was offered only to the end of 1931.

In April 1931 the Zeiss Ikon AG presented yet another format. With the roll-film size "N" the 6×9 format had been reduced to 5×7.5. Now, the roll-film type D allowed a frame size of 6.5×11 cm. This new Ikonta format was supposed to be available by May 1931. Between 1934 and 1936 you could order cameras in the "double format" version



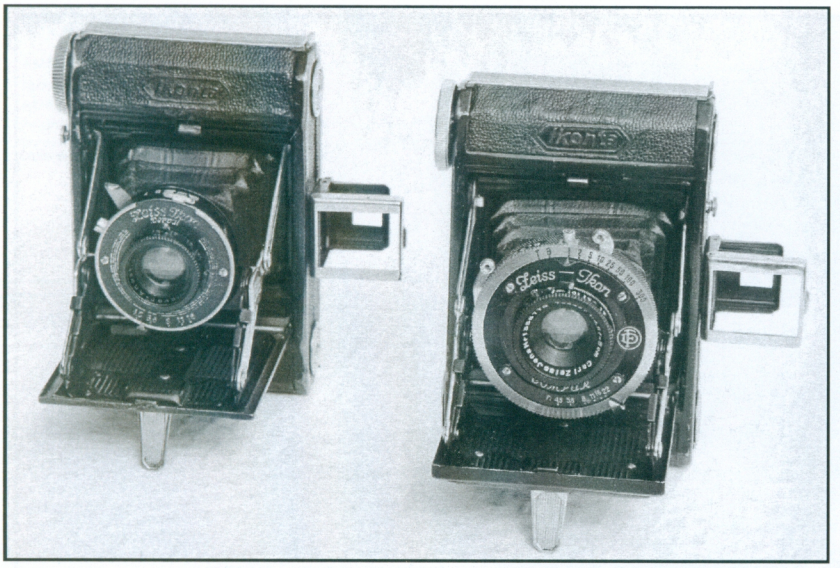
Three Super Ikontas. Bottom left: model 530/16, bottom right, model 532/16. At top is a 533/16 with built-in light meter.

with insert masks for the 5×6.5 cm format. The 6.5×11 format was taken off the market in 1936.

Flyer C 477 then surprised the customers with yet another new format. From April 1930 customers had already known the Box Tengor 3×4 and since October 1930 the so-called Baby Box from the Tengor series. Also the Kolibri in the 3×4 format had many happy customers since October 1930. It was therefore logical and consistent to adjust the already well liked Ikonta to this size, which is close to the miniature format of 24×36 mm, in April 1931. Roll film type A8 was used. In its advertisements Zeiss Ikon depicted this "unbelievably small waistcoat pocket camera" with a weight of 290 grams together with a match box to emphasize the camera's measurements of 2.7×7×10 cm. This marketing trick had already been used by the H. Ernemann AG of Dresden in 1909/10 when they presented the small Heag XV (4.5×6 cm).

The inexpensive 3×4 version with a Novar f/6.3 in a Derval shutter at a price of RM 35.00, (see the figure on page 14) and the new downgraded 6×9 camera with Frontar in a Special shutter for RM 32.00, brought Zeiss Ikon again rather close to its own Box competitors. The Frontar lens with a lens aperture of f/9 as well as the Special shutter, which compared to the Derval shutter was even simpler, came very close to the features of a Box Tengor. The Box Tengor 6×9 (54/2) now only cost half the price of a simple Ikonta 6×9 (520/2A).

The beginning of 1932 not only brought customers a further extension of the 3×4 camera field to six possible combinations (see the figures on page 14 and, in the Far Eastern market, page 16) but also the fifth Ikonta format. With



Three small versions. Left and center are two 520/18 models with the 3×4 format, which was delivered in a choice of eight lens and shutter combinations. These are two middle-price examples. On the right is a 530 Super Ikonta in the 4.5×6 format.

A8 film in the 3×4 format to yield 16 exposures, Zeiss Ikon had already been able to improve its use and economy enormously. However, from former times they still knew the 4×6.5 format. Another splitting of the BII 8 film (6×9) into the 4.5×6 format, which in the previous decade had once again become more and more popular, was based on an initiative by Zeiss Ikon. The 4.5×6 format, compared to 4×6.5, has a height–width relation that is much better for photography (see figure above right). Of course, Zeiss Ikon immediately introduced a new Box Tengor 4.5×6 into its sales program. Dealers could now order Box Tengor advertisement graphics, which had an Ikonta 3×4 integrated into the graphic design. There it was again: the comparison with the box camera!

In October 1933 Zeiss Ikon wanted to crown the present Ikonta series with a new "Super Ikonta." In the dealer's magazine *Bruecke*, issue 7/1933, we can read the following:

> "Strong optics alone isn't good enough, alas. You also have to be able to master them. No doubt: In the seasons with less light the photographic results of roll-film camera owners showed severely lower quality. The ingenious "Two-point-setting" patented by Zeiss Ikon automatically created well focused photographs, as long as favorable light conditions allowed the necessary stopping down of the lens. The Pernox film 26 Scheiner now has the advantage to extend the time range for the use of this convenient two-point setting.
>
> With the days getting shorter, however, the time has arrived when amateurs had to rely on the reserve speed of their completely opened lens."

The new Super Ikonta 530/2

So, what was missing was a roll-film camera with which you could focus sharp pictures with a complete opening, easily and without a tripod. Since the Ikonta had by now become the best selling roll-film camera of its class, it was only natural to put a rangefinder onto the Ikonta type 520/2 U.Cp.S. (where "U.Cp.S." refers to instructions for the shipping department, telling them which type to select. "U" defines the type of Tessar, "Cp" stands for Compur, and "S" signifies self-timer). By then this model had a patented self-erecting (spring) mechanism. For the rangefinder the design department could, of course, fall back onto the improved rotating-wedge system, which in the meantime was being used with the Contax. It was on the one hand very robust and on the other hand very exact, paired with quick-acting setting dials. Further, Zeiss Ikon equipped the new Super Ikonta with double-expoure prevention in the shutter release. The included film-channel insert mask made it a real double-format camera for either 16 exposures in the 4.5× 6 cm or eight with the 6×9 cm format (shown on page 11).

The optical viewfinder with a very handy cover snapped open at the same time as the camera, and the marketing department offered the camera with the slogan: "Super Ikonta with automatic focusing." The customer had to pay an additional RM 44.00 compared with the comparable Ikonta model in order to buy this new and improved camera.

Zeiss Ikon customers naturally asked also for the already existing 6.5×11 and 4.5×6 cm formats. Starting around the beginning or middle of 1934, those two formats could also be ordered as Super Ikontas. The small and handy 4.5×6 format camera at a price of RM 156.00 sold much better than the 6.5×11cm format at RM 175.00, which by this time was no longer in much demand. In addition there was a "Volks"-Super Ikonta with an f/4.5 10.5 cm Triotar in an inexpensive Klio shutter for RM 135.00, and this was expected to become a best seller. In August 1934 Zeiss Ikon equipped the Super Ikonta 4.5×6 cm, (catalogue number 530) with a brand new shutter-release mounting that made exposure a lot easier for portrait- and landscape-oriented photographs. The new Compur Rapid 00 shutter also allowed the customer to use an exposure time of 1/500 second with this handy self-erecting camera.

The format turns square

In March 1935 the sales department added yet another format to the variety

of cameras. Already in September of the previous year they had made a first attempt with the introduction of the Ikoflex-Spiegelreflex (mirror reflex). The next step was to transfer this format to the Ikonta/Super Ikonta. During its planning phase Zeiss Ikon preferred the Super Ikonta to the Ikonta and at first developed a compact die-cast camera that allowed a choice between Tessars with apertures of f/3.5 or f/2.8. At this time there were no other 6×6 f/2.8 cameras available from other camera producers.

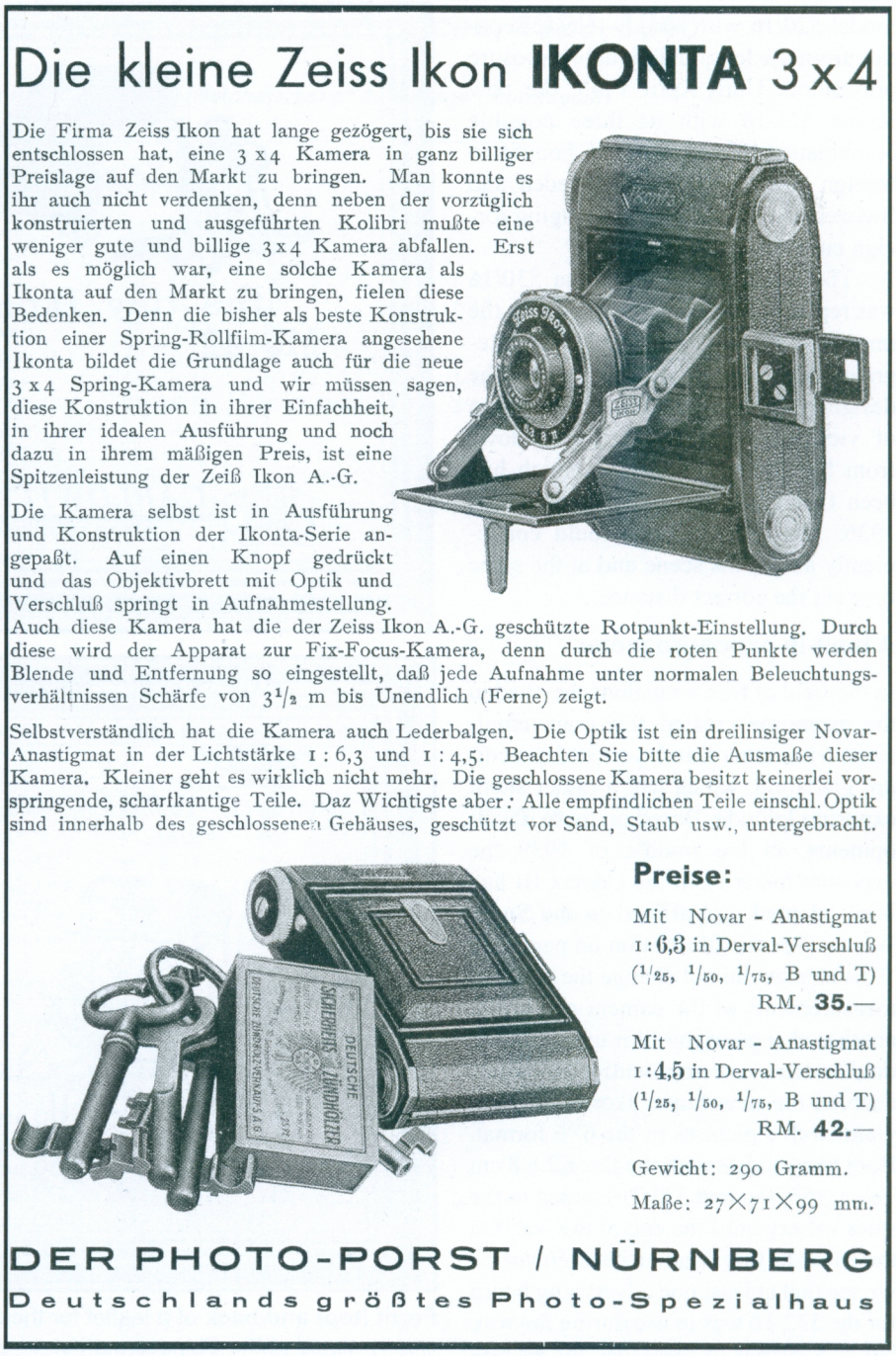
The first series of these 530/16 Super Ikontas did not yet have automatic film-transport locks. The new exposure-counting clock, which was supposed to replace the customary check through the red film window on the rear of the camera, caused pictures to overlap when the settings were not exact and because it did not have a autostop. Finally, at the beginning of 1936, cameras were sold for which the technicians had solved this problem. However, it was not possible to upgrade the cameras that had already been sold. Internally the new Super Ikonta was now called a large format Contax.

Only eleven exposures per roll

There was one little disadvantage, however, with this new technical achievement since the B II 8 Film (120) did not now give twelve pictures, as it used to when the transport was checked through the red window, but only gave eleven exposures. At the same time as the Super Ikonta 6×6 was introduced the new Zeiss Ikon Pernox film with panchromatic emulsion was also presented to the public. Its sensitivity was set at 16/10 DIN and required film windows with movable metal covers. For the films that until then had been sensitized orthochromatically, an open red viewer had been enough. In April 1937, the B II film spool was governed by a new DIN regulation; from then on the numbering from 1 to 12 for the 6×6 format was printed on the center of the backing paper.

From 1935 on one could also order the Ikontas and Super Ikontas with an Albada viewfinder. The big advantage when using it was that you could keep both eyes open during the aiming process and therefore one had a 3-D view. You would not lose the feeling for distances and could see everything in front of you. Zeiss Ikon got a patent on the viewer, which had been developed by the Dutch general and hobby photographer Lieuwe van Albada, and thus avoided competition from other camera companies.

For the Super Ikonta 6×6 the Albada view finder (433/16) was not put on sale until January 1936. In the US Carl Zeiss Inc. used the name Super Ikonta B 2 ¼ x 2¼ for this camera. This Super Ikonta 530/16 was offered until mid 1937. In April of 1937 the normal Ikonta was added in this 6×6 format. Four lens/shutter combinations were available until mid-1938. Then the designers improved



Die kleine Zeiss Ikon **IKONTA** 3 x 4

Die Firma Zeiss Ikon hat lange gezögert, bis sie sich entschlossen hat, eine 3 x 4 Kamera in ganz billiger Preislage auf den Markt zu bringen. Man konnte es ihr auch nicht verdenken, denn neben der vorzüglich konstruierten und ausgeführten Kolibri mußte eine weniger gute und billige 3 x 4 Kamera abfallen. Erst als es möglich war, eine solche Kamera als Ikonta auf den Markt zu bringen, fielen diese Bedenken. Denn die bisher als beste Konstruktion einer Spring-Rollfilm-Kamera angesehene Ikonta bildet die Grundlage auch für die neue 3 x 4 Spring-Kamera und wir müssen sagen, diese Konstruktion in ihrer Einfachheit, in ihrer idealen Ausführung und noch dazu in ihrem mäßigen Preis, ist eine Spitzenleistung der Zeiß Ikon A.-G.

Die Kamera selbst ist in Ausführung und Konstruktion der Ikonta-Serie angepaßt. Auf einen Knopf gedrückt und das Objektivbrett mit Optik und Verschluß springt in Aufnahmestellung. Auch diese Kamera hat die der Zeiss Ikon A.-G. geschützte Rotpunkt-Einstellung. Durch diese wird der Apparat zur Fix-Focus-Kamera, denn durch die roten Punkte werden Blende und Entfernung so eingestellt, daß jede Aufnahme unter normalen Beleuchtungsverhältnissen Schärfe von $3^1/_2$ m bis Unendlich (Ferne) zeigt.

Selbstverständlich hat die Kamera auch Lederbalgen. Die Optik ist ein dreilinsiger Novar-Anastigmat in der Lichtstärke 1 : 6,3 und 1 : 4,5. Beachten Sie bitte die Ausmaße dieser Kamera. Kleiner geht es wirklich nicht mehr. Die geschlossene Kamera besitzt keinerlei vorspringende, scharfkantige Teile. Daz Wichtigste aber: Alle empfindlichen Teile einschl. Optik sind innerhalb des geschlossenen Gehäuses, geschützt vor Sand, Staub usw., untergebracht.

Preise:

Mit Novar - Anastigmat 1 : 6,3 in Derval-Verschluß ($^1/_{25}$, $^1/_{50}$, $^1/_{75}$, B und T) RM. **35.—**

Mit Novar - Anastigmat 1 : 4,5 in Derval-Verschluß ($^1/_{25}$, $^1/_{50}$, $^1/_{75}$, B und T) RM. **42.—**

Gewicht: 290 Gramm.

Maße: 27×71×99 mm.

DER PHOTO-PORST / NÜRNBERG

Deutschlands größtes Photo-Spezialhaus

This advertisement from Photo-Porst for the 3×4 Ikonta promises pictures "in a snap, but accurate."

model 520/16 with a body release separate from the lens, and double-exposure prevention. Until April 1945, the new Ikonta 521/16 with its three possible combinations could only be bought in foreign countries such as Sweden and Switzerland for the sake of bringing foreign currency into the country.

The modified Super Ikonta 530/16 was replaced by the end of 1937 with the improved model 532/16 with an integrated viewfinder and rangefinder. The designers had adopted the combination of viewfinder and rangefinder windows from the Contax II and III, which had been first shown at the Leipzig Fair in 1936. The photographer could conveniently aim at his scene and at the same time set the correct distance.

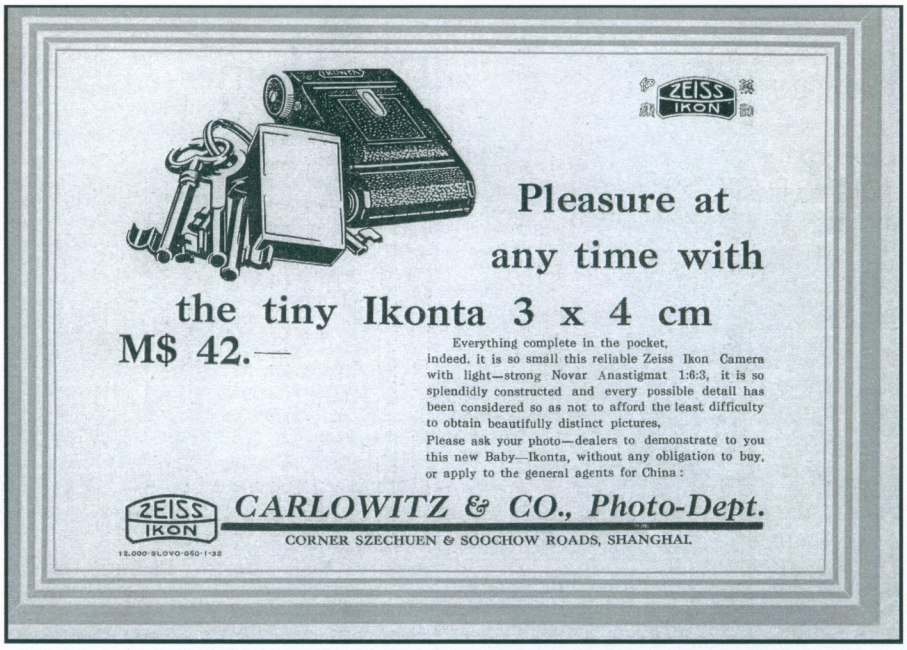
A built-in exposure meter

In the field of film emulsions they had in the meantime created fine-grain emulsions with rather thin layers and a medium gradation, which had a rather small exposure latitude. Based on these developments, in the middle of 1939 the exposure meter from the Contax III had been adopted and affixed to the Super Ikonta. (See the illustration on page 13.) This change did not change the size and measurements of the camera much. Yet another change of the film transport and double-exposure prevention systems enabled the new Super Ikonta to again yield twelve pictures in the 6×6 format. Both 6×6 models with the fast f/2.8 8 cm Tessar (532/16 and 533/16) added to the sales variety until the end of the war. On the cover of this issue of *Zeiss Historica* we see that at least one advertising board for the 532/16 was in use during the war, but as a carrier of messages for air raid wardens!

The 4.5×6 (530) and 6×9 (530/2) Super Ikontas also received technical improvements. In the middle of 1936 and by the end of 1936 respectively they were given the body-mounted shutter release and reliable double-exposure prevention. Additionally, chromium plating on the metal parts of the camera brightened the outer appearance from the earlier mostly gloomy black color. The new Super Ikontas II 531 and 531/2 (illustrated on page 11) were offered by Zeiss Ikon until the end of production in the middle of 1945. The last catalogue in my possession, produced for Sweden in April of 1945, lists seven Ikonta and seven Super Ikonta combinations in the 4.5×6, 6×6 and 6×9 formats. I cannot say whether Zeiss Ikon was still producing cameras for the civilian sector or whether it was fully occupied with producing for the military. It is also possible that in the last years before the war ended they sold cameras that had been produced earlier and stored until then.

On the next two pages I list all the prewar Ikonta/Super Ikonta lens, shutter, and format combinations, with prices. ❐

In a later article I will describe the development of the Ikonta and Super Ikonta from the resumption of production after the War until 1960.



Front (top) and back of a leaflet for the 3×4 Ikonta issued by a Shanghai firm and clearly aimed at the Chinese market.

Ikonta and Super Ikonta models and prices, 1929–1945

Serial letter	*Lens*	*Aperture/ Focal Length*	*Shutter*	*Price (Reichmarks) at date range (month/year)*			
Ikonta 6×9 cm Bestellnummer 520/2 June 1929 to June 1937							
A	Frontar	9.0/12cm	Spezial	32.- *4/31*	29.- *1/32 - 10/32*		
G	Dominar	4.5/10.5 cm	Telma	75.- *7/30*	63.- *1/32 – 6/32*		
E	Novar	6.3/10.5cm	Derval	40.- *6/29*	48.- *9/29*	43.- *1/32*	48.- *1/33 - 12/33*
E	Novar	6.3.10.5cm	Telma	52.- *4/31*	47.- *1/32*	52.- *1/33 - 12/33*	
I	Novar	4.8/9.5cm	Telma	59.- *1/32*	65.- *1/33 - 4/33*		
I	Novar	4.8/9.5cm	Compur OO	79.- *6/32*	87.- *1/33 - 4/33*		
I	Novar	4.5/11cm	Telma	68.- *8/33*	60.- *12/33*	70.- *2/34 - 7/36*	
I	Novar	4.5/11cm	Compur OS	94.- *8/33*	80.- *12/33*	90.- *2/34*	85.- *3/35 - 7/36*
I	Novar	4.5/11cm	Compur OSR	95.- *4/35 - 7/36*			
U	Tessar	4.8/9.5cm	Compur OO	99.- *1/32*	104.- *1/33 - 4/33*		
U	Tessar	4.5/10.5cm	Compur OS	120.- *2/30*	115.- *4/31*	104.- *6/32*	108.- *1/33 - 4/33*
				95.- *12/33*	105.- *2/34*	100.- *3/35 – 7/36*	
U	Tessar	4.5/10.5cm	Compur OSR	110.- *12/34*	115.- *9/36 – 6/37*		
L	Tessar	3.8/10.5cm	Compur OSR	138.- *4/35 – 6/37*			
Ikonta 5×7.5 cm Bestellnummer 520/14 July 1930 to October 1931							
E	Novar	6.3/8cm	Derval	44.- *7/30 - 10/31*			
U	Tessar	4.5/8cm	Compur OOS	108.- *7/30 - 10.31*			
Ikonta 6.5×11 cm Bestellnummer 520/15 May 1931 to November 1936							
E	Novar	6.3/12cm	Derval	54.- *5/31*	49.- *1/32*	54.- *1/33*	49.- *2/34 – 11/36*
E	Novar	6.3/12cm	Telma	54.- *1/32*	60.- *1/33*	53.- *2/34 – 11/36*	
I	Novar	4.5/12cm	Telma	75.- *8/33*	65.- *2/34 – 7/36*		
I	Novar	4.5/12cm	Compur OS	98.- *8/33*	88.- *2/34*	83.- *3/35 – 7/36*	
I	Novar	4.5/12cm	Compur OSR	93.- *4/35 – 11/36*			
U	Tessar	4.5/12cm	Compur OS	130.- *5/31*	117.- *1/32*	123.- *1/33*	108.- *2/34 – 12/35*
U	Tessar	4.5/12cm	Compur OSR	113.- *4/35 – 11/36*			
Ikonta 3×4 cm Bestellnummer 520/18 June 1931 to June 1937							
E	Novar	6.3/5cm	Derval	35.- *6/31 4/33 - 8/33*		32.- *1/32*	34.- *2/34 – 4/35*
I	Novar	4.5/5cm	Derval	42.- *6/31 4/33 - 8/33*		38.- *1/32*	39.- *2/34 – 4/35*
I	Novar	4.5/5cm	Telma	46.- *1/32*	51.- *8/32*	43.- *2/34 – 4/35*	
F	Novar	3.5/5cm	Compur OO	70.- *1/32*	77.- *8/32*	69.- *2/34*	64.- *3/35 – 9/36*
F	Novar	3.5/5cm	Compur OOR	74- *12/34 – 6/37*			
U	Tessar	4.5/5cm	Compur OO	84.- *1/32*	92.- *8/32*	85.- *2/34*	75.- *4/34 – 4/35*
L	Tessar	3.5/5cm	Compur CO	102.- *1/32*	112.- *8/32*	88.- *2/34*	83.- *3/35*
L	Tessar	3.5/5cm	Compur COR	93.- *3/35 – 6/37*			
Ikonta 4.5×6 cm Bestellnummer 520 January 1932 to October 1937							
E	Novar	6.3/7.5cm	Derval	43.- *1/32*	47.- *1/33*	43.- *2/34 – 7/36*	
E	Novar	6.3/7.5cm	Telma	49.- *8/32*	51.- *1/33*	47.- *2/34 – 7/36*	
I	Novar	4.5/7.5cm	Telma	57.- *1/32*	63.- *1/33*	54.- *2/34 – 7/36*	
I	Novar	4.5/7.5cm	Compur OO	76.- *1/32*	84.- *1/33*	68.- *2/34*	63.- *3/35 – 6/36*
I	Novar	4.5/7.5cm	Compur OOR	80.- *12/34*	73.- *4/36 – 8/35*		
F	Novar	3.5/7.0cm	Compur OO	90.- *1/33*	75.- *2/34*	70.- *3/35*	
F	Novar	3.5/7.0cm	Compur OOR	105.- *12/34*	80.- *4/35*	84.- *10/37*	
U	Tessar	4.5/7.5cm	Compur OO	96.- *1/32*	106.- *1/33*	94.- *2/34*	89.- *3/35*
U	Tessar	4.5/7.5cm	Compur OOR	99.- *12/34 – 8/35*			
L	Tessar	3.5/7.0cm	Compur OO	114.- *10/32*	125.- *1/33*	100.- *2/34*	95.- *3/35 – 12/35*
L	Tessar	3.5/7.0cm	Compur OOR	105.- *12/34*	109.- *10/37*		

continued overleaf . . . . . ▶

Ikonta 6×6 cm Bestellnummer 520/16 February 1937 to May 1938

I	Novar	4.5/7.5cm	Telma OO	59.- *2/37 – 10/37*	
I	Novar	4.5/7.5cm	Klio OO	64.- *2/37 – 10/37*	
F	Novar	3.5/7.5cm	Compur OO	84.- *2/37 – 10/37*	
L	Tessar	3.5/7.5cm	Compur OOR	115.- *2/37 – 10/37*	

Ikonta 4.5×6 cm Bestellnummer 521 February 1938 to April 1945

F	Novar	3.5/7.5cm	Compur OO	86.- *5/38 – 7/42*	*(4/45 Sweden)*
L	Tessar	3.5/7.5cm	Compur OO	120.- *5/38 – 7/42*	*(4/45 Sweden)*

Ikonta 6×6 cm Bestellnummer 521/16 February 1938 to April 1945

I	Novar	4.5/7.5cm	Klio	72.- *6/38 – 7/42*	
F	Novar	3.5/7.5cm	Compur OO	93.- *4/38 – 7/42*	*(4/45 Sweden)*
L	Tessar	3.5/7.5cm	Compur OOR	123.- *4/38 – 7/42*	*(4/45 Sweden)*

Ikonta 6×9 cm Bestellnummer 521/2 February 1938 to April 1945

I	Novar	4.5/11cm	Compur OS	78.- *5/38 – 7/42*	*(4/45 Sweden)*
F	Novar	3.5/10.5cm	Compur OS	86.- *2/39 – 7/42*	*(4/45 Sweden)*
F	Novar	3.5/10.5cm	Compur OSR	96.- *4/38 – 7/42*	
U	Tessar	4.5/10.5cm	Compur OS	102.- *5/38 – 7/42*	
L	Tessar	3.5/10.5cm	Compur OSR	135.- *5/38 – 7/42*	*(4/45 Sweden)*

Super Ikonta (I) 6×9 cm Bestellnummer 530/2 September 1933 to October 1939

H	Triotar	4.5/10.5cm	Klio	135.- *5/34*	120.- *3/35 – 4/37*	
U	Tessar	4.5/10.5cm	Compur OS	159.- *9/33*	149.- *3/35*	168.- *2/37 – 5/38*
U	Tessar	4.5/10.5cm	Compur OSR	159.- *4/35*	168.- *10/37 – 10/39*	
L	Tessar	3.8/10.5cm	Compur OS	195.- *2/37 - 5/37*		
L	Tessar	3.8/10.5cm	Compur OSR	187.- *8/35 – 7/37*		

Super Ikonta II 6×9 cm Bestellnummer 531/2 May 1936 to April 1945 (chrome plated from June 1938)

F	Novar	3.5/10.5cm	Compur OS	155.- *2/39 – 7/42*	*(4/45 Sweden)*
U	Tessar	4.5/10.5cm	Compur OS	180.- *2/38 – 7/42*	*(4/45 Sweden)*
L	Tessar	3.8/10.5cm	Compur OSR	225.- *4/36 – 5/37*	
L	Tessar	3.5/10.5cm	Compur OSR	225.- *10/37 – 7/42*	*(4/45 Sweden)*

Super Ikonta (I) 4.5×6 cm Bestellnummer 530 May 1934 to August 1937

L	Tessar	3.5/7cm	Compur CO	156.- *5/34*	146.- *4/35*	165.- *5/37*
L	Tessar	3.5/7cm	Compur COR	166.- *12/34*	156.- *4/35 – 10/35*	

Super Ikonta II 4.5×6 cm Bestellnummer 531 December 1936 to April 1945 (chrome from May 1938)

L	Tessar	3.5/7cm	Compur COR	195.- *9/36 – 7/42*	*(4/45 Sweden)*
F	Novar	3.5/7.5cm	Compur CO	145.- *2/37 – 7/42*	*(4/45 Sweden)*

Super Ikonta 6.5×11 cm Bestellnummer 530/15 February 1934 to August 1938

H	Triotar	4.5/12cm	Klio	150.- *5/34*	135.- *3/35 – 2/37*	
U	Tessar	4.5/12cm	Compur OS	175.- *2/34*	165.- *3/35 – 11/36*	
U	Tessar	4.5/12cm	Compur OSR	175.- *3/35*	184.- *5/37 – 8/38*	*(6/39 England)*

Super Ikonta 6×6 cm Bestellnummer 530/16 April 1935 to May 1938 (Film transport lock from January 1936)

L	Tessar	3.5/8cm	Compur OSR	210.- *4/35*	225.- *4/37 – 7/37*
P	Tessar	2.5/8cm	Compur OSR	235.- *4/35*	245.- *4/36 – 5/38*

Super Ikonta I 6×6 cm Bestellnummer 532/16 December 1937 to April 1945

P	Tessar	2.8/8cm	Compur OSR	260.- *12/36 – 7/42*	*(4/45 Sweden)*

Super Ikonta II 6×6 cm Bestellnummer 533/16 June 1939 to April 1945

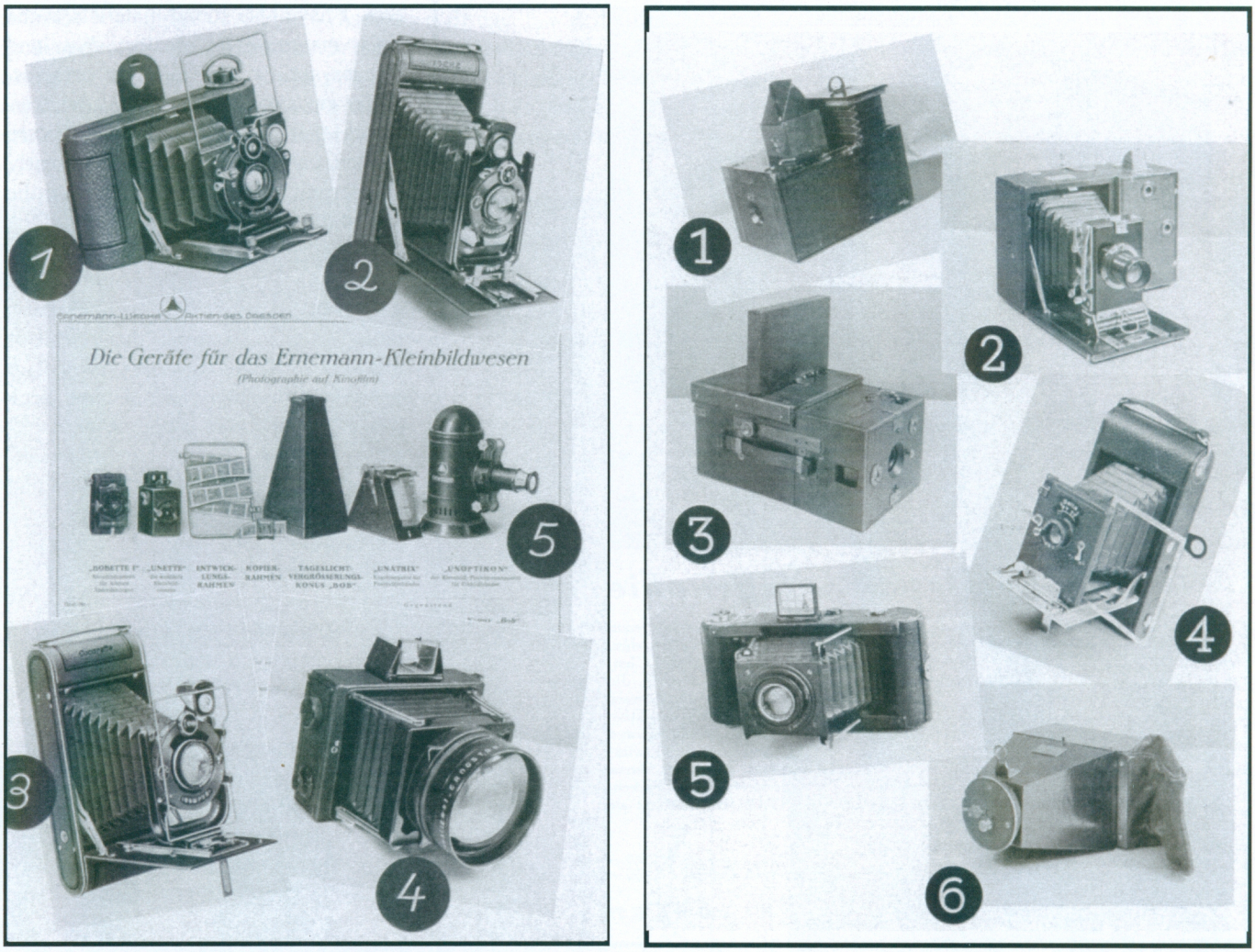
P	Tessar	2.8/8cm	Compur OSR	375.- *6/39 – 7/42*	*(4/45 Sweden)*

A Zeiss Ikon camera collection?

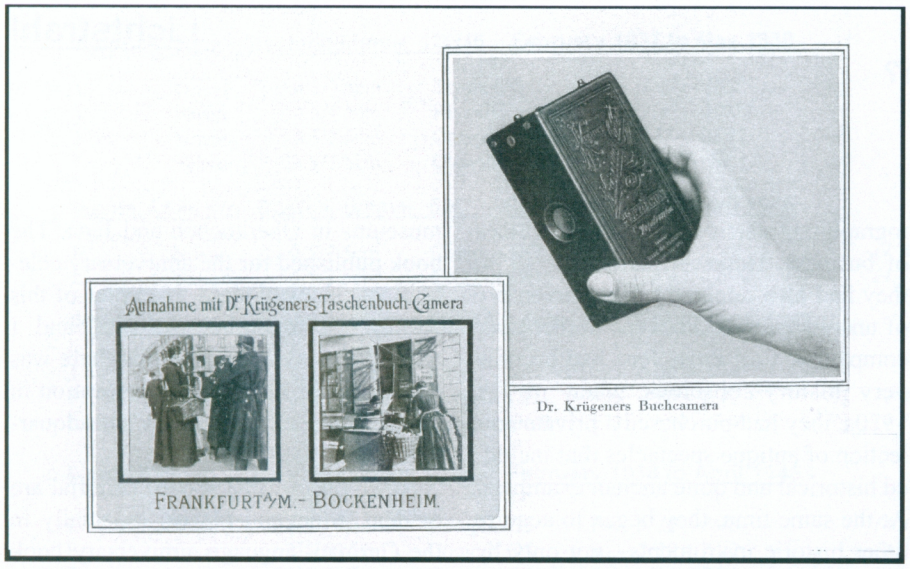
Larry Gubas

In 1937, Zeiss Ikon celebrated what they called "The 75th Anniversary of Zeiss Ikon," despite the fact that the company was actually founded only in 1926. They took the founding of R. Hüttig of Berlin, the oldest company involved in the merger, in 1862 as the point of origin of the eleven-year-old Ica–Ernemann–Goerz–Contessa-Nettel combination. (Hüttig had become part of Ica in 1909.) By that time, 1937, Zeiss-Ikon had clearly begun to enjoy great success with multiple lines of photographic products as well as other lines of business. However, as late as 1934, they had also retained a large inventory of unsold cameras from the predecessor companies. Carl Zeiss Jena had become very history-conscious when in the 1920s, they had purchased a private collection of antique spectacles that included historical and quite ancient examples. At the same time, they began to acquire other historic instruments, not only by Zeiss but also other optical and mechanical firms, that are now on exhibit in museums in Oberkochen and Jena. The book published for the anniversary celebrations showed many examples of this sort of photographic material, and I think that we can assume that there was also a similar museum in preparation in Dresden where the company's headquarters was located.

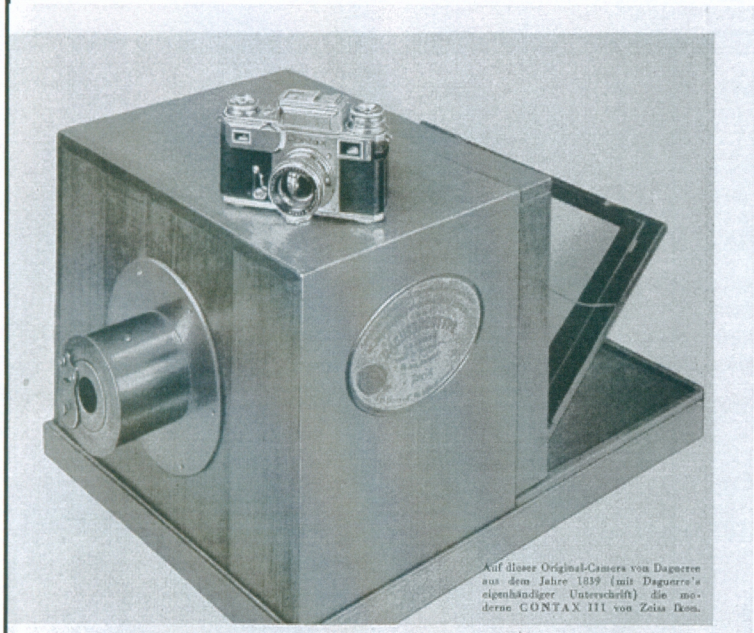
Examples of this sort of material are evident in several places, especially in the German-language anniversary book mentioned above. Small paragraphs identifying the predecessor firms were



From the *Brücke* Collection. Left: 1, Ica Icarette 6×6. 2, Goerz Tenax. 3, Contessa Nettel Cocarette. 4, Ernemann Ermanox. 5. a collection of Ernemann miniature apparatus. Right: 1, Hüttig Detective Camera. 2, Hüttig Excelsior. 3,Wünsche Mars Camera. 4, Dr. Krügener rollfilm camera. 5. Carl Zeiss Jena Palmos rollfilm camera. 6, Goerz "Ango" camera.



Dr. Krügener's Taschenbuch ("pocketbook")camera. From the 75th anniversary book.



This Zeiss Ikon Advertisement shows the Contax III compared in size with an early Daguerreotype camera.

accompanied by pictures of such cameras. I have also found materials in the Zeiss magazine *Brücke* that show and discuss similar and different cameras. There are also contemporary advertisements that show the new miniature Contax cameras alongside some early Daguerreotype cameras, to compare the size of the earlier camera with that of the newer models. Since the senior executives of Carl Zeiss were major players on the board of management of Zeiss Ikon, I would also suspect that a sense of this sort of technical history present in the parent company would have been positively supported. These prior examples of historical photographic breakthroughs would appeal to the older and more affluent customer base.

I would think that this collection would have been held in the safe of the basement of the former Ica building at 76 Schandauer Straße along with other models and prototype cameras of the day. Unfortunately, this location was the site of the huge bombing of Dresden during February 1945, which destroyed the assembly line of the miniature cameras that had been key to the success of the company during those prewar years. After the bombing, the Russian army came into Dresden and claimed the factory and their contents into their defini-

tion of war reparations. What might have been salvageable was quickly thrust into trains bound for Kiev and Krasnogorsk, where materials designated for potential Russian manufacture were reassembled. However, nothing from the basement was thought to be salvageable and so they were discarded into the rest of the bombing rubble.

I think that there is sufficient material to corroborate this deduction on my part but since there are no records of the firm's transactions surviving the war or the reparations, I can only think of what might have been there.

Lichtstrahl

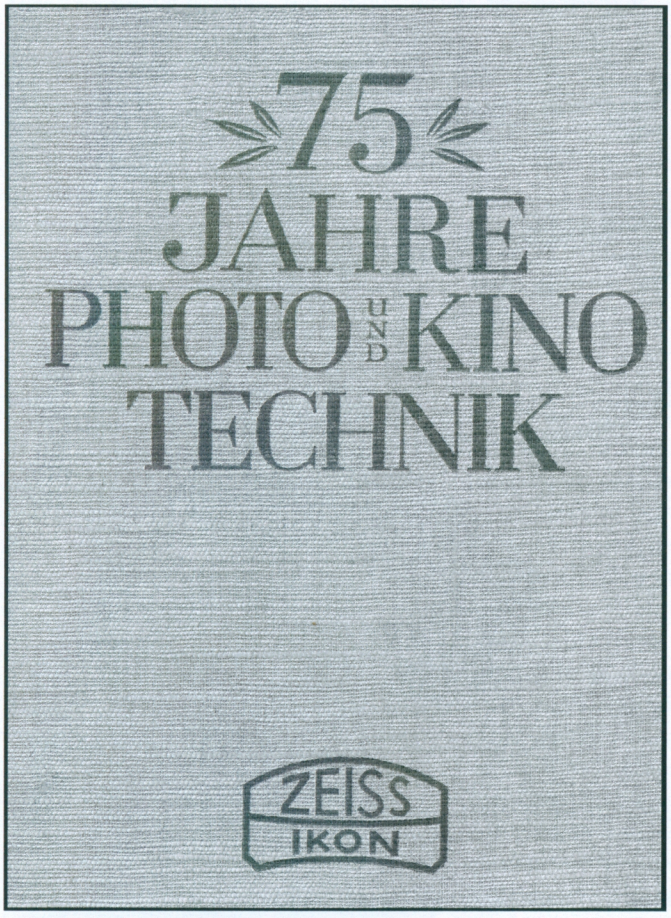
Zeiss Ikon Trademarks

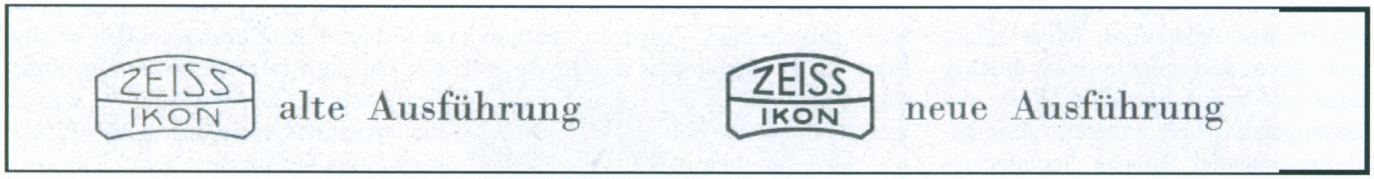
Larry Gubas

Over the course of time, the image of a company changes. The same is true of a firm's trademark, and, for me, one of the Zeiss Ikon mysteries was the change of the Zeiss Ikon trademark in the mid-1930s. The lens cell was a trademark from the beginning in 1926 but a change in the font inside the trademark was confusing. It was not until I was able to secure some copies of the dealer's magazine for the firm that I was able to determine an accurate time for this change. Then I was able to understand and make some reasoned deductions about many of the interesting facets of this change.

This publication, entitled *Brücke* ("Bridge"), was the link between Zeiss Ikon and its dealers. It is extremely rare to find and was (I believe) available only in German and French in the pre-war years. It covers the years from 1932 to 1942 based on my observation. It was renewed after the war years but never came to the US in any form except possibly to the sales staff at Carl Zeiss USA.

In reviewing a collection of these magazines, I was able to determine the time period of using the two different trademarks. The first time I noticed the trademark in the new form was in the April 1936 edition. You will find an





The older design (left) contrasted with the later one, on the right.

image of the cover accompanying this text which is also a declaration of the 75th anniversary of the founding of the firm.

Notice that the font of the trademark in the upper left of the title page shows the lens cell trademark with the last two letters of the word Zeiss in the form of backward "Z"s. This was the original form from the earliest days in 1926. However, in the image at the bottom of the page, there is a small logo inside a laurel crown commemorating the 75th anniversary of the firm. (This is a bit of a stretch as the firm was created in 1926, as I mentioned in the preceding article. The predecessor firm of R. Hüttig was founded in Berlin in 1862. The text states that the original four workers of that firm had increased to 7000 in 1936.)

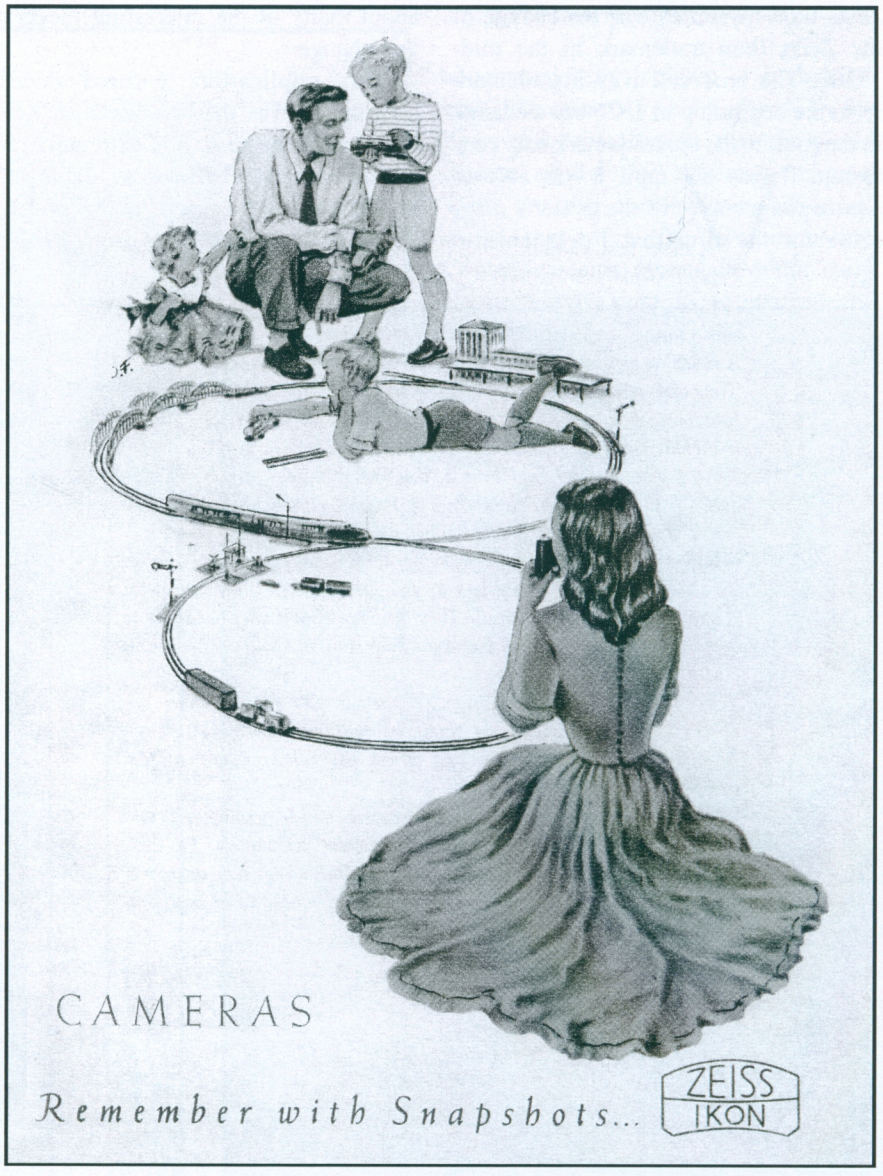
The older trademark was not immediately replaced in the next issue and it took some time to use up the old stock of catalogs and materials. It was not until a much later edition of *Brücke* that an explanation of the change appeared, in the January 1938 edition of the magazine.

As usual, the explanation is brief but a bit surprising. The statement says that the Art Nouveau lettering was upgraded by Professor Herril Deffke of Berlin. It also announced that larger advertising items such as enamel or glass signage should be returned to the factory for replacement.

The Zeiss Ikon 25th anniversary was also commemorated by the issuance of a large linen hardbound book (30 × 22 cm, or approximately 8 ½ x 11 ¾ inches) that covers the history of photography, the predecessor companies, the new products and the other lines of the business of the firm (such as mechanical adding machines, security systems, and so on). It was available only in German and was published in November 1937.

It is clear that this book and the logo change were part of a modernization program at the firm, using a typical German public-relations program to commemorate the anniversary and the pedigree of the firm as it produced state-of-the-art photo products.

It is interesting to note that there was another anniversary book published in 1951 to commemorate the 25th anniversary of the firm in its new location in Stuttgart and it was printed in both English and German. The logo would be modernized several different times in the post-war era but it would remain in the lens-cell format and later include the name of theVoigtländer firm in the late 1960s and early 1970s. ❐



Cover of a 1950 camera brochure. Do you remember a time when a father would wear a necktie, and a mother a dress, to play with their children?

Book reviews

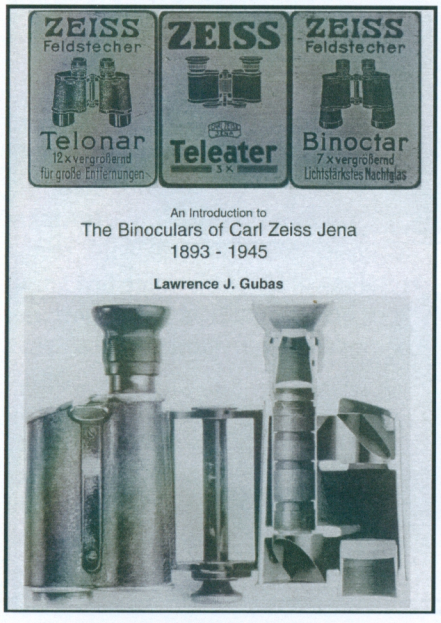
An Introduction to The Binoculars of Carl Zeiss Jena 1893–1945
by Lawrence J Gubas, 255pp. Illustrated.
Self Published, New Jersey. 2004, 2nd Printing. $39.95

A Survey of Zeiss Microscopes 1846-1945,
by Lawrence J Gubas, 318pp. Illustrated.
Self Published, Las Vegas NV. 2008. $69.00

Reviewed by Robert Carter, Toronto, Ontario

These are the first two books of a trilogy about Carl Zeiss, covering binocular products and microscopes respectively. The author has started the third book, which will address Zeiss and Zeiss-Ikon cameras and lenses. These are must-have books for all camera and optical-instrument collectors as well as those interested in the history of technology.

An Introduction to The Binoculars of Carl Zeiss Jena 1893–1945 begins by revealing the impact prism binoculars had on telescopes and the other observation instruments of the day. Acknowledging the debt owed to microscope research, Gubas unfolds the story of the early days of Zeiss, keeping the perspective on its binocular research and manufacture. Many names familiar to those who collect mainly cameras pop up in the narrative. Gubas then moves on to marketing the prism binocular, a necessary activity to introduce a scientific instrument to nonscientific people in many diverse fields. This section includes color reproductions of ads directed at the weekend sailor, hunter, nature-lover, theatre-goer and others who would find binoculars of value. The marketing chapter is followed by an interesting section devoted to identifying Zeiss trademarks. From trademarks, we move on to a detailed chronological history of binocular manufacture, including extensive illustrations from catalogues of the day. This section covers decades of manufacture and designs. In the section pertaining to World War II, there is an interesting table of the code words used to identify manufacturers of various military instruments.The book finishes with two appendices containing helpful data for the collector. First is a complete list of the models, basic characteristics, manufacture dates, and a cross reference to sections and pages in the body of the book. This is followed by a table detailing annual and cumulative production by year from 1894 to 1991. A last-minute addendum to the book clarifies the relationship between Zeiss and Bausch & Lomb from 1905 to 1940.



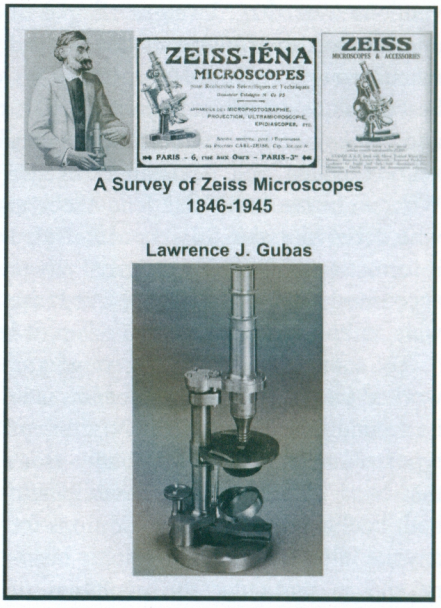
These books can be bought from:

Camerabooks,
12034 SW Horny Hollow Trail,
Crooked River Ranch, OR 97760, USA

(www.camerabooks.com)

Members of the Zeiss Historica Society are granted a 10% discount on these or any item ordered from Camerabooks. Mention the ZHS when placing your order.

A Survey of Zeiss Microscopes 1846–1945. Like automobiles, there are considerable similarities across microscope brands in any given period. Zeiss greatly aided this similarity with its practice of sharing its inventions with other manufacturers. For example most of the Leitz stands I have (and a Reichert) use an Abbe condenser. This book has a more extensive write-up on the early days and people who made Zeiss such a colossus in optical research and manufacture. It was the unique "Stiftung" [*Foundation*]created by Abbe that ensured Zeiss would evolve and thrive after he and his contemporaries were gone. This aspect of Zeiss introduced social ideas decades ahead of other companies, industries, and even countries. Gubas takes many pages to



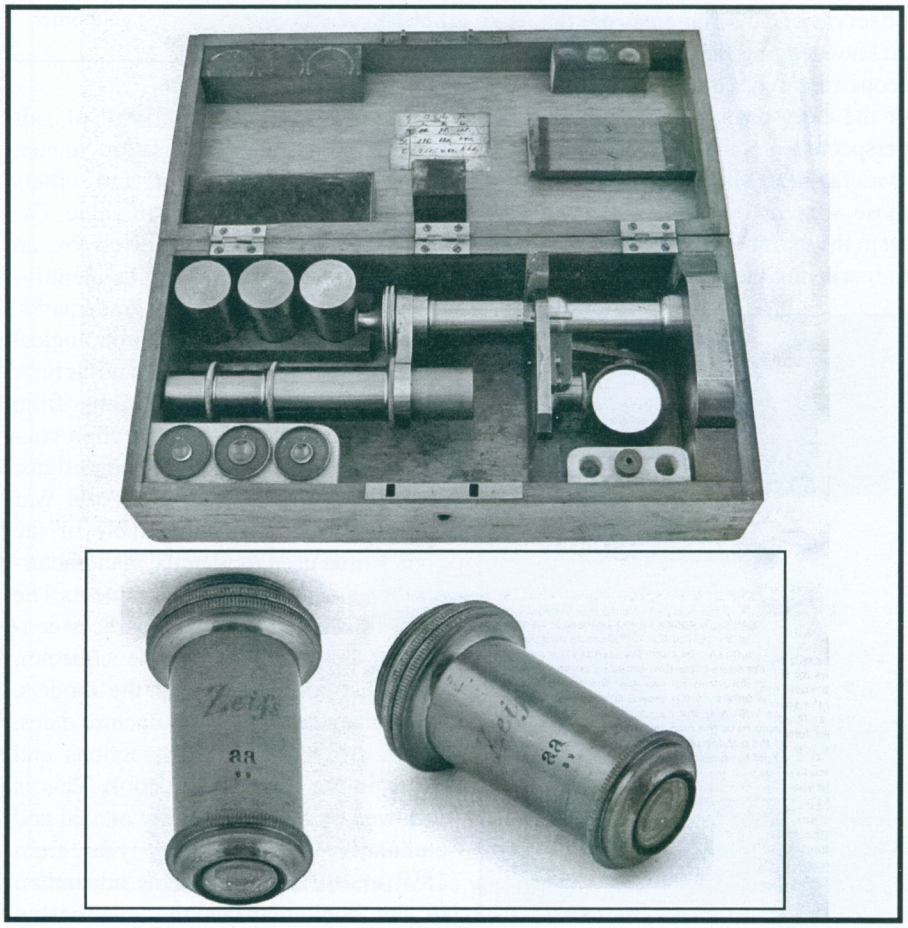
recount the various acquisitions by Zeiss, many well known in the optical and photographic industries. These were not hostile take-overs, but instead financial and technical assistance on request from respected firms who produced goods of high quality. *Microscopes* is profusely illustrated by both black and white catalogue engravings and advertisements plus color photographs of various instruments, mostly held in private collections.

As with the binoculars book, the bulk of the pages is taken up with an illustrated and annotated chronological listing of all the models Zeiss produced. The listing is divided into chapters covering various periods such as "the Abbe Era," "Early 20th Century," and "Post World War I Stands — 1920s." The chapters begin with a short overview of the period followed by the illustrations, each with very detailed and informative captions. The last three chapters cover oddities, photographic systems, and accessories. The book ends with three appendices and a bibliography. The first appendix combines model, serial number, and volume manufactured from 1846 to 1900. The second appendix is a more complicated list of selected serial numbers from 1900 to 1945. This list is split into models, serial numbers and date manufactured. Tracing Zeiss product models and date of manufacture is made difficult by changes in serial-number assignment and model-number conventions over time. Using a sample of one, I found that I own a model D stand manufactured around May, 1929. My best previous determination was c. 1925 and (incorrectly) model B. Gubas acknowledges the assistance of Dr Wimmer of the Carl Zeiss Jena Archive, where he was able to record selected information from the original huge accounting ledgers that survived the wars and political changes.

To some extent *Microscopes* is a work in progress. While *Binoculars* is in its second printing and relatively free of typos, *Microscopes* suffers badly from that bane of all writers. Nevertheless, both books are worthwhile additions for anyone interested in photographic history and in particular the evolution of Zeiss and its part in the German optical industry. The third book of the trilogy — on Zeiss and Zeiss-Ikon cameras and lenses — is underway. While you are waiting its publication, do yourself a favor and buy these two books. The story they tell is fascinating! ❐

* * *

This review appears simultaneously in Photographic Canadiana, *Vol. 35 no. 3, Dec. 2009 – Jan. 2010, the Journal of the Photographic Historical Society of Canada. The images above and below are taken from these two books.*



Printers' Blocks

The blocks shown on the back cover and above were recently discovered in a book shop in Jena by ZHS member Rolf Fricke. Those above resemble the Carl Zeiss Jena trademark with other locations substituted for Jena. "Milano" is a large wooden block for the sales office in Milan, Italy; the other two, in metal, are for locations where Zeiss had subsidiary manufacturing and repair firms. At lower left is one from Györ in Hungary, and to its right is one from St Petersburg in Russia.

The Milano item can date from any time from 1903 to 1945, but the two smaller ones have to date from 1903 to about 1918 when those locations were active. The two last logos appeared on both binocular and lower-tier astronomical devices.

The blocks on the back cover that picture a Zeiss product are mostly from the 1920s. I have also seen these images in the advertising of those days. However, the blocks that use "Carl Zeiss" and "Zeiss Ikon" in a lens cell are of a design dating from the postwar years. This particular Carl Zeiss without a location trademark was used from 1954 until 1970. 1954 was the date when the Oberkochen location won legal judgments that permitted it to use the name and other trademarks. It went out of use when the East and West German competitors came to a settlement in a London court in 1970.

—Larry Gubas

The examples shown on the back cover are all the usual "reverse reading" blocks that produce a correct image when printing directly onto paper or other medium, for example in a sheet-fed press.

Those above, on the other hand, are "right-reading" blocks that could be used when stamping an image in relief from the reverse side of a sheet. Alternatively they could have been used to make an intermediate reverse-reading block.

Note that St Petersburg became Petrograd in 1914 (and then Leningrad in 1924), which helps to date one of the blocks above.

—The Editor


CARL
ZEISS
ZEISS
IKON
CARL
ZEISS
CARL
ZEISS
ZEISS
PUNKTAL