## **UCA,** Flensburg, Germany**.**

They are mainly known as the source of the scarce Ucaflex, with at least 2 lenses.
**Unalux** f1.9, 5cm at No100,78x.
also reported with:
**Elolux** f1.9/50mm.

## **Vallantin,** Op(ticie)n, Paris.

This was noted on a substantial (c.80mm front glass) Petzval lens also marked Mon Cle de N. B. Delahaye where the latter may be the owner or vendor. It is fitted with Waterhouse stops, just possibly after sale, since when bought the rack drive overlapped the engraving making it hard to read. The lacquer layer was very thin on this item. It was not numbered.
Another was noted at auction on a 7.5x7.5in wet plate camera. This was engraved as No308x, *"Vallantin Opn., de 1840 a 1856, Ctre des ateliers de Mr. Lerebours, Paris."*
He also made a pair of small brass meniscus stereo lenses at No2,231 on a 8x5in Ross camera noted at auction.

## **Varimex**, Poland

They were noted for an **Emitar** f4.5/45mm No18,49x on a blue Alfa 35mm camera.

## **Varioprox,** Japan

This will be a trade name rather than a maker and was noted on a variable close-up lens No664017 (?April 1966?) probably using 2 lenses at varying separation to focus another to 1ft. Black finish with c.54mm thread at the front.

## **V.E.F**., Poland.

also see Minox for **Valsts Electro-Techniska Fabrik**, Riga, Latvia
The original lens was the:
**Minostigmat** f3.5/15mm on original stainless steel Minox. (One source says **Minostigmatic**).

## **C.C.Vevers**, Leeds, Eng(lan)d.

This is the engraving on a brass RR. Channing and Dunn know them at several addresses from about 1887-1900, all in the Leeds area but only as camera makers. This RR then seems to be linked with buying in lenses for resale on the cameras, and it is certainly a 7.5in Rapid Rectilinear for 7x5in also marked 'Made In France', one of the few branded lenses of the period to show the French origin. It seems a slightly down-market brass cased item from the 1880s in the old 2in flange, made of rather softer brass than some English makers used and with little sign of laquer left and with the then old Waterhouse stops rather than an iris. But it should be added that it had had a hard life so it is hard to judge the original quality.

## **Vieth,** Solingen, Germany.

The Inflex camera for 127 used a **Zeyer Anastigmat** f3.8/50mm in about 1950.

## **Vines** Cameras, UK.

They sold a set of agented lenses for SLR's such as a f3.5/135mm for M42.

## **Virlot,** France.

He seems to have supplied RRs about 1905.

## **Vistavision.**

This was the Paramount Studios wide screen process, using cameras from Mitchell Camera Corp. and lenses of 21-152mm

## Vivitar, USA.

Agent for the UK was D.Williams, 5-9 Glasshouse Yard, London, EC1A-4JP. (1973)
In 1980, Vivitar UK Ltd, Vivitar House, Nuffield Way, Abingdon, Oxon OX14-1RP. (O235 26600)
Vivitar seem to be an American initiated firm (said to have an agreement with NASA) with capital to develop new lens designs with improved features, who later transferred production to Japan. The first Series 1 lenses were of very high quality and have become a specialized collector interest. This is almost unique among lens makers without a related camera brand at that period and customer interst seems to have developed during the sales period and has been maintained since- it is not an overnight affair. One point is that they did described their lenses as a 'hedge investment' something few other makers considered. "Quality lenses last a long time .. give pleasure and possibly even profit". (advert. in Modern Photo 04/1979, p14.)
In an article in Amateur Photo 04/10/1978, Blackman says Vivitar did design their lenses but subcontracted manufacture and controlled quality. There may be small print here. In B.J.P. 02/02/1979, p92 T.Hughes lists 3 categories of lens. Series 1 were top of the tree, designs by Vivitar themselves, with NASA support. Next, there were lenses eg TX to fill in gaps in other makers programs such as macros. These shaded into bought-in lenses which bear a strong resemblance to other commercial lenses since this is what they were- often in medium to long sizes where the industry was strongest.
We think production was from about 1965. (See Camera 35, 06/1965, p49 'new') Launch items were f5.6, 300mm, 5g/4c: f3.5, 200mm, 4g/3c; f5.6, 200mm, 4g/3c; f2.8, 135mm, 4g/4c; f3.5, 135mm, 4g/3c. They were really well received.

**Initial items.**

| | | |
|---|---|---|
| | f1.9 | This was a floating element design to focus close-up. |
| | f2.5 | 90mm This was a macro lens with optical converter to 1:1. |
| **Series 1** | f1.9 | 28mm This was reviewed favourably in Modern Photo 04/1978 p124, and used a floating element design. |
| **Series 1** | f2.3 | 135mm 6-glass The 6g/6c layout is a bit like the 200mm below. |
| **Series 1** | f3.0 | 200mm 6-glass The layout in Viv002 includes a field flattener. Users were very impressed, especially with the performance at f3.0. |
| **Series 1** | f3.5 | 70-210mm SLR Magazine, Dec. 1973, Oct 1974, p67. "Caused a stir'. |
| **Series 1** | f2.8 | 35-85mm Varifocal zoom. |
| **Series 1** | f4.5 | 90-180mm Zoom. Macro Series 1 noted 04/1979. It was costly and eventually discounted, possibly due to excess stocks in the UK. The prototype was demonstrated in 1976, it uses 18g/12c and was noted in B.J.P. 16/06/1978 p509 when 'new'. |
| **Vivitar** | f2.8 | 90mm This was a 6-glass/4 component, Gauss type. |
| **Vivitar** | f3.5 | 135mm This was a very compact lens. |
| **Vivitar** | f2.8 | 135mm A lens to this specification was noted in T.Hughes, B.J.P. 02/02/1979 p92 who felt it benefitted from some stopping down as would usually occur in close-up work and then was a good lens with unexceptional handling. In Modern Photo 07/1971 p43advert. it is an air-spaced 5g as 1+1+1+i+1+1 and its shortness and 20oz weight was stressed. |
| **Vivitar** | f1.5 | 135mm Camera 35 August/Sept 1967, p57. This was originally for NASA, and was a very unusual or unique lens. There were other very big fast lenses around that time but they may have been rather later: They included Soligor, Rolmax Ina and of couse Nikon. But whether any had a common source is doubtful. |
| **Vivitar** | f5.6 | 200mm |

High speed wide angles Modern Photo 04/1979 p140:

| | | |
|---|---|---|
| **Vivitar** | f2 | 28mm |
| **Vivitar** | f2 | 24mm |

**1970 items** (Camera 35, 04/1970, p52, 02/1969, p48) They had a 5 year garantee in 1973. There were then a total of 33 lenses in the product range.

| | | |
|---|---|---|
| | f3.8 | 20mm Auto 1970, Preset 1969. Auto, focus to 6in. |
| | (f3.8 | 21mm in a May 1972 list) |
| | f2.5 | 28mm Auto 1970. Preset iris in 04/1973 This is f2.8 auto in a May 1973 list. In 1973, |

it focussed to 12in.

| | | |
|---|---|---|
| | f2.8 | 35mm Auto 1970, Preset 1969. Focus to 4.5ft. |
| | f3.5 | 35mm Preset in 04/1973 also |
| | f2.8 | 55mm This macro lens went to 1:1 without an extra tube and was a flat field design with 5g/4c and was supplied for most 35mm SLR cameras. |
| | f1.8 | 85mm Preset 04/1972 |
| | f2.8 | 105mm Auto in a May 1972 list |
| | f2.8 | 135mm Auto 1970, Preset 1969. Focus to 4.5ft. |
| | f3.5 | 135mm Auto 1970.Preset 04/1973 |
| | f3.5 | 200mm Auto 1970, Preset, 1969. Focus to 6ft. |
| | f5.5 | 300mm Auto 1970?, Preset 1969. |
| | f6.3 | 400mm Auto and preset 04/1973 |
| | f6.5 | 500mm in 04/1973 as well Preset only. |
| | f8.0 | 800mm at £188 (1973) |
| **Zoom** | f4.5 | 70-150mm Flat field type, macro. See Practical Photography, 01/1979 p77. |
| | f3.5 | 55-135mm in 1972 |
| | f4.5 | 90-230mm |
| | f4.5 | 75-260mm (04/1973 only) *NB Zooms were auto iris only!)* |

The above were normally auto iris but by 04/1973 there were a Vivitar Auto T4 set as well as an T2 preset series. These covered most of the above and others may have been available at times.

In Oct 1978, the program had **fixed mount** lenses as:
f2.8/24mm; f2.8/28mm; f2.8/35mm; f2.8/135mm; f3.5/200mm; f5.6/300mm with zooms f3.8/70-150mm; f3.8/75-205mm; and f5.0/100-300mm. The Zoom f4.5 80-200mm was seen in an advert in Modern Photo 04/1980, p64 with12g/9c design. There was also a f2.5/28mm, f2.8/55 macro, f5.6/400mm, f3.5/35-105mm, f3.8 85-205mm, in the advert. in Amateur Photo 12/10/1977. For the 70-150mm see advert. in Modern Photo 04/1977, p16. Later there was a f3.8 24-48mm which was the widest angle zoom for the period. (Modern Photo 06/1978, advert p4) with 10g/9c and quite compact. In 1979 there was a new f4 80-200mm Vivitar zoom (B.J.P. 30/03/1979, p293)
Two **enlarging lenses** were noted in B.J.P. 28/12/1979 p1265, and these were Series 1 enlarging lenses with **floating** elements in a 8-glass 6component f2.5/50mm lens and 6g/5c in a f4.0/80mm lens.
An earlier **VHE** series was made in f2.8/50; f3.5/50mm; f5.6/80mm; f5.6/100mm; f5.6/135mm; and f5.6/150mm. They used rare earth glass Pop Photo 08/1977 p73 advert.

There were a number of new products at Photokina 1980 (B.J.P. 18/04/1980 p369) including 2 'continuous macrofocussing zooms ie macro at all foci, as:

| | | |
|---|---|---|
| **Vivitar** | f3.8 | 70-150mm CMF one touch |
| **Vivitar** | f3.8 | 75-205mm CMF Zoom (See B.J.P. 13/06/1980 p559) The main feature was macro focusing, in all foci not just at the shortest. One touch design, it used a 12g/8g layout. Thus it differed from the lens seen by Hughes in B.J.P. 02/02/1979 p93 which was a 15g/10c design and rated as surprisingly sharp. There was also a : |
| **Vivitar** | f3.5 | 17mm wide angle. |

There were also a series of **TX lenses** which used interchangable mounts so that a change of camera did not mean changing lenses- just the mounts at £13.95 in bayonet or £7.65 in M42 screw. They were made 1977-1978 in:
f2.8/24mm*; f2.8/28mm; f2.5/28mm*; f2.8/35mm*; f2.5/135mm*; f2.8/135mm; f3.5/200mm*; f5.6/300mm; f5.6/400mm; f4.5 90-230mm; f5.0 100-300mm; and f3.5/35-105mm. Several* were reviewed in Modern Photo 04/1976 p118. They were not just T-4 retreads but new designs. The f5.6/300mm at No3,790,9393 seems to be a very compact one from the review in Modern Photo 04/1980, p1320. It was well received.
It does seem likely that the optics were the same in both sets of mounts.
There were also outfit bags, 4 flash guns, a V1 Enlarger for up to 6x7cm with Vivitar f2.8/50mm; f3.5/50mm; f5.6/80mm lenses.

**Solid Cats**
Perkin Elmer are said to have established the design concept, commercialized it, and then handed over the project to Vivitar for production. These were solid glass at first, but were heavy and then the use of bulk plastic was considered, but it seems these were scarcely or never sold. They seem to have been made as follows:

f8.0, 600mm; f8.0, 800mm?; f11 800mm. These may have the same mirror but differ in the other optics so that the focus was changed. The 600mm was listed in the UK but at £581.63 +£13.50 for a mount in 10/1978. Sales could have been slow as this was then a very high price! But they probably were bought by the police and military for surveillance purposes, and secondhand examples have been reported since. The Vivitar version has been described as more chunky and larger than the Perkin Elmer and both can be amazingly good. One advantage is that they do not alter focus with changes in temperature as long lenses and normal mirrors do. For the layout see Viv001.

**Zooms**

**Vivitar** f3.5 70-210mm This is an item remembered with affection by a correspondent. It cost £213.75 in Oct 1978 with the hood £4.5 extra.
**Vivitar** f2.8 35-85mm This was noted in 10/1978 as Series 1 at £196.87.
**Vivitar** f3.8 24-48mm This was noted in 10/1978 as Series 1 at £213.75 for M42.
**Vivitar** f4.5 90-180mm
**Vivitar TZ mount** f3.8 70-150mm Noted in B.J.P. 29/09/1978, p837 as 'new' as a 12g/9c design.
**Tele Extenders** These were a item which sold very well and are now a common item in 2x.

A **Millenium list in AD 2000** shows 11 items, all but one of which are zooms.

| | | | |
|---|---|---|---|
| **Series 1 AF** | f3.5/4.5 | 19-35mm | 13g/11c |
| Series 1 AF | f2.8/f3.8 | 28-105mm | 15g/13c |
| Series 1 AF | f4.2/f6.5 | 28-210mm | 15g/13c inc aspheric |
| Series 1 AF | f4.0/f6.3 | 28-300mm | 17g/15mm |
| Series 1 AF | f4/f5.6 | 70-300mm | 12g/9c |
| Series 1 AF | f4.5/f6.7 | 100-400mm | 12g/9c |
| **AF** | f3.5/f5.6 | 28-80mm | 8g/8c |
| AF | f3.5/f5.6 | 28-210mm | 14g/12c |
| AF | f4.5/f5.6 | 70-210mm | 10g/7c |
| AF | f5.6/f6.7 | 100-300mm | 10g/8c |
| AF | f3.5 | 100mm | 5g/4c Macro lens |

## **Voigtlaender and Son**, London, UK.

Voigtlaender of Wien and Braunschweig, Germany, certainly had a London sales office for part of the 19 Century, and at least one lens survives and has been reported which is engraved "Voigtlander and Son/London" at No785x (apparently about 1860?). It is a brass Petzval portrait lens, now incomplete. The engraving differs in text from the normal "Voigtlaender und Sohn/ in Wien und Braunschweig", and also the engraving letter forms are rather more upright with less elongated serifs and a deeper hollow in the initial serif. It may be a forgery and with no relation to the Voigtlaender businesses; or it may have been a subcontract job originating in the UK at a time when supplies from Germany were hard to obtain or when the exchange rate made imports hard to sell. It follows Voigtlaender practice in using different threads at front and rear of the barrel so that the front was not usable as a landscape lens.

## **The Voigtlaender and Son Optical Co.** New York, USA.

This seems to be the USA branch agency selling equipment, but there do seem to be some interesting features. Firstly, the serial numbers seem to occur in the "omitted" group at No55-61,000, which may actually be one set aside for New York. They do seem to be original Braunschweig items, but the engraving seems slightly different as in:

"No57,09x Telephoto Collinear No4 'The Voigtlaender and Son Opt. Co., New York"
"No62,43x No2 Voigtlaender Dynar 4 3/4inch in a Wollensak automatic shutter USPat. 765 006"
**"**No58,86x Heliar 4.5/141mm Voigtlaender & Son, New York.

but possibly the details have been slightly changed in transmission. (As usual, the last digit is deleted for anonymity.)

## **Voigtländer A.G., Wien, Austria, later Braunschweig, (Brunswick), Germany.**

UK agents noted included: Marion, 1889, of 22-3 Soho Square London.
F.G.Phillips, 44, Farringdon St., London, EC4 (1926)
Peeling and van Neck, 4/6 Holborn Circus, London EC1 (1931)

Voigtländer were important instrument makers to the court in Vienna well before the coming of photography,

the firm being founded in 1756 by Johann Christoph Voigtländer, and being well placed to make lenses for the new process since the Court arranged the design of a special lens by Petzval at the suggestion of Prof von Ettingshausen who had been present at the publication of the Daguerre process. The family had come from the Hartz mountains in the mid-18C. J.C. Voigtländer (1732-1797) was succeeded by his son Johann Friedrich (1779-1859). The firm seems to have been exclusively a mechanical one for many years until J.F.Voigtländer in 1815, (and he may have been responsible for a Camera Lucida No225 with 12in column noted at auction.) Eder notes Voigtländer senior (ie J.F.?) had learned to grind and polish lenses in England. (Wilhelm Friedrich Voigtländer had his technical training from S. Stampfer (1792-1864) of the Polytechnical Institute, where the director was J.J.Prechtl (1778-1854).) Then they seem to have extended into opthalmic lenses and were granted an Imperial patent for opera glasses in 1823 as a result of inventing the binocular design, (possible then or later with help from Petzval)- previously opera glasses had been merely small Galilean telescopes. These binoculars seem to have been sold widely in the 19 Century and prismatic binoculars came later, about 1897. There was also the availability of optical glass from the Waldstein plant in Vienna, which secured key employees from the declining Munich plant, now Fraunhofer was dead. In fact there seems to be a picture of official backing from Government for the Technical school to support the industry in aquiring information on lenses and glass from Benediktbeuren and on glass from Guinand to boost a new Viennese industry. Since Petzval was also officially supported with pay as a Professor and labour in design it is not surprising that he approached Voigtländer's firm (ie Johann Friedrich Voigtländer (1779-1859) and Peter Friederich von Voigtländer (1812-1878), for information on the properties (Refractive index and dispersion) of the glasses available- these would be needed as these were then not well known products on a free market. (There was a note of Voigtlaender's death on 07/04/1878 in B.J.P. 17/05/1878, and he was mentioned for his making the Petzval Portrait and Orthoscopic lenses).

Thus it was easy to understand their taking up photographic lens making. Once Petzval had made his design, he showed it to Voigtländer and it was made, a cardboard camera constructed, probably hurriedly and an amateur A. Martin (1812-1882) tried it out. It was then put into production quickly. This was officially fostered. Over the years they made a large number of other designs and by the 1950's these numbered some 644 lens types in some 32 layouts. Thus on the bases of history, quality and production they are one of the major lens collector targets. Sadly the relation between Peter Wilhelm Friedrich Voigtländer and Petzval did not last, being publicly sundered in 1857, and this may have been due to Voigtländer's failure to sell both of the designs Petzval made, as well as the lowered profits from the lens due to the failure to patent it- for which Voigtländer may not have been to blame. (There was a suggestion that Petzval was initially offered a business deal or alliance and declined it. Certainly Voigtländer made a one-off payment later of some 2000florins and may not have been able to patent it as the design was Petzval's. Equally Voigtlaender were used to being given designs and help for free  eg from Prechtl  and Stampfer of the Polytechnical Institute. but there do seem to have been purely personal problems as well.)

Certainly the "metal camera" initially sold was a success, some 600 reputedly being sold between May 1840 and 1842. Now in 1845, Voigtländer married Nanny Langenheim, widow of Zincke-Sommer, and his stepson, Dr Hans Zincke-Sommer became the mathematician in charge of lens design effectively in place of Petzval, though Zincke-Sommer also was holding an outside post eg. at the Carolo Wilhelmina Institute at Braunschweig, then a newly founded Technical High School.  His commercialized designs now seem to have been fairly conventional: he probably was responsible with Friedrich Voigtländer for the RR and later Euryscop lenses but he seems also to have designed a portrait lens which however was not sold, and predicted that the Petzval type could be made much faster- as it was!There is a slight feeling that F. Voigtländer rejected good ideas, but the company was to offer an f2.3 Patzval in c.1870 and later an all cemented version in 1878. F. Voigtländer was also involved with Scheffler and Kaempfer on the Kollinear.  Later designs may have been bought-in or leased (Triplet), until the relation with Dr Hans Harting began. Dr Harting was Technical Director by 1899, along with Dr Kaempher and must also be responsible for the initiation of the new range of metal cameras then going into production of undoubted quality and interest. Later the firm was amalgamated with (1) Schering and Kahlbaum in the 1920's as no Voigtländer family was available to succeed, and (2) after WW2 with Carl Zeiss (Oberkochen) in 1956 and from then the same freedom in independant design and commercial action must have been lost.

Voigtländer were not glass makers and depended on outside supplies, first from normal glass makers, such as P. L. Guinand at Les Brenets (then run by Widow Rosalie Guinand with Th. Daguet and A. Berthet) and from J. Waldstein of Vienna, possibly from Benediktbeuren, and later of course from Schott and Genossen, when they were able to make the Euryscop from the new glasses in the late 1880's. This became a trade

name which was so famous that others seem to have adopted it and Euryscops from several makers other than Voigtländer are found and can confuse collectors.

Production was in Vienna (Wien) initially and 600 All-Metal cameras were made from Jan 1841- late 1842. (Gernsheim says only 70 metal cameras were made in 1841.) It was still in production in 1846, as well as several sliding box cameras of nut-wood (Walnut?) so that production reached lens No4,033 by 1852 and No7,200 was produced in 28/05/1858, and in 1862, No10,000 was produced. The nutwood cameras may complicate the body count however. A serious suggestion is that lens production switched to Brunswick at No 4,000 in 1849-1852. It was about then that the Waldstein glass plant was closed.

*This section is based on the lens section of the Voigtlaender Verein's "Checklist of Voigtlaender Cameras and Equipment" with thanks, and especial acknowledgment to their Secretary Dr C. Haupt for permission to quote from his Table of Lens serial number dates, which extend the official ones in the Gravierungs Buchen. The original Checklist was produced about 1975, and has been successively extended, especially after a very valuable visit to Carl Zeiss, Oberkochen in 1977, to whom thanks are due. Since then almost uniquely, a second listing of Voigtlaender lenses has appeared in Udo Afalter's excellently illustrated book, "Voigtlaender Kameras und Objektive" publ. Lindemanns Verlag, 1998, ISBN 3-89506-137-9 so that a comparison is possible of what seem to be independant studies. The information on the serial numbers has been extended with data supplied to the Voigtlaender Verein by Mr J. Halfweg, with information on an intermediate period partly from Verein experience and partly from dating using Compur shutter numbers to date lenses. This last is obviously less definite than the other data, although there were some key figures in the original registers held in Oberkochen.*

**Voigtländer SERIAL NUMBERS**

This data is based on the "Objektiv Gravierungs Buchen" in the archive at Carl Zeiss Oberkochen, for 1885 to 1929. Some additional notes are included, and those in *italics* are from other sources of unknown validity. Eder gives a useful list of the introduction dates of new big sizes in Voigtländer Petzvals. Note that while the metal camera began with low serial numbers, the very early part of the engraved number series is uncertain and the lenses sold separately may possibly not be in sequence with those sold fixed to the "metal camera". The numbers subsequently are in one series with few exceptions, and initially represent lenses made as singles or in very small groups of items, and were listed virtually day by day.

| Year | Lens serial no. | Notes |
|---|---|---|
| 05/1840 | | First Petzval Portrait produced. In the first lenses it was accepted practice to unscrew the front cell, fit a stop and replace the cell (Eder). Later loose or curtain stops were used. |
| 184? | 1796 | Marked "Voigtländer & Sohn in Wien" |
| *1849* | | *A request was made to Braunschweig for permission to open a factory, and purchase of a site, and permission granted in 02/09/1852. This was initiated by P.W.Voigtländer. The management there was by his son, Friedrich Voigtländer. The optical trade in Vienna began to shrink from then on.* |
| *1852/1853* | | *Production of lenses at Braunschweig begins. It has been suggested that at No 4,000 production switched to Braunschweig and ended at Vienna.* |
| *(1852)* | *(4033)* | |
| 1854 | 4 - 5000 | From about 1852-62 they are engraved "aus Wien und Braunschweig" |
| *1856* | | *Introduction of the 5in dia. Portrait lens at 450 talers. (Dietzler, competitor, offered a 6in version).* |
| 1859 | | *All portrait lenses are now fitted with the Waterhouse type stops.*(Eder) |
| *1860* | | *Introduction of two versions of a 6in portrait lens, differing as long and short focal lengths.(14.3kg weight, 420 talers.)(Eder)* |
| *1861* | | *Eder gives 22/02/1862 as the day of a special holiday to celebrate the 10,000th lens being produced, at Brunswick. Eder gives production as roughly 2,000 per year to then.* |
| 1862 | 10,000 | Now "aus Braunschweig" but still mainly Petzvals.*To here, they made some 10,000/22years=454 lenses in an average year. Actually the engraving "Wien/ Braunswcheig" continued at least up to No30,46x, and it was the "und" which was omitted. This was the occasion for P.W.Voigtländer being knighted.*(Eder gives 1866) |
| 1864 | | *Introduction of an 8in dia. portrait lens in answer to a lens of 7in by Busch of Rathenow. Anton Friedrich was manager of the Vienna branch and it was sold (normal price 1,000 talers) to Ludwig Angerer, but used for display on a* |

*Voigtländer stand in Berlin in 1865. It was Serial No16,000.*

*1868* *Death of the head (?Friedrich?) of the old factory in Vienna, after 120 years production. Production there ends.Note also the timing of the Waldstein glass plant history*.

1876 Voigtlaender dies and Friedrich R. von Voigtlaender takes over.

*1878* *Sale of an improved Petzval design (Frerk). This may be the f2.3.*

1884 27449 Portrait, landscape, Euryscope and Wide Angle

1885 30,000 *Note that 29,000/45years= only some 645 lenses in an average year.*

1886 31,000 *Eder reports the first nameless Euryscop was brought to him in Vienna then.*

1887 32,000 Now the major production was of the Euryscope

33,704 Marked "Voigtländer & Sohn Braunschweig" so Wien finally is omitted at about Serial Number 30-33,000

1888 34,000 Also Daguerre (Petzval?) and Landscape, *Jena glass introduced.*

1889 36,000 Note that "Victorias" were separately numbered - *?Possibly these were especially large items e.g. for 10x12in plates as some very large Pertvals have been reported. One account mentions one at a serial number below 1,000 from Braunschweig rather than Vienna.*

1890 38,000 - 39496 In the 1880's production seems to be about 1,750 lenses per year. B. Coe lists a Voigtlaender 4-blade shutter from that year.

1891 40,000 *Dr. Rudolph of Zeiss calculated the Anastigmat, and Voigtländer were licencees for the new designs.*

1892 41,911

1893 43,685 Collinear design patented

1894 45,431 Production now includes Collinear and Anastigmat

1895 46,454 (Anastigmat production will end here)

1896 47,771 There was now major Collinear production

1897 49,084

1898 54,168 New items were the TeleObjektiv and Cooke triplet

*It was in 1898 that F.W.Voigtlaender concluded that as he had no direct successor (he had 4 daughters), he must turn the sole-owner concern into a limited liability company under the name Voigtlaender & Sohn AG with himself as Managing Director and Dr Kaempher and Dr Miethe as Directors. Dr Miethe left in 1899 to work in Berlin, leaving Dr Hans Harting to lead the firm until he retired in 1909. He lead the firm to new products such as microscopes, binoculars, and telescopes as well as rifle and gun sights.*

1899 54,896 Collinear sort lens *("omitted 55-61,000")* [*Some of the omitted lenses in fact occur in the Voigtländer Collection, so possibly this block was reserved for prototypes*. *But it does include the Triple Anastigmat below and just could be used for these lenses made under license.* Others seem to occur from Voigtlaender New York as explained above.]

*About 1900 the business became a limited company.*

1900 65,691 Triple Anastigmat (Cooke ??) *Heliar lens produced.*

1901 68,193

1902 70,682

1903 72,638 Lenses now include the Heliar and Apo Collinear

1904 75,479 Lenses now include the Dynar *By now the employees numbered some 300 workers +35 seniors and sales staff.*

1905 79,288 *The manufacture of popular cameras was begun here.*

1906 83,477 *The firm now moved to Campestrasse to a new 4 storey building.*

1907 88,057 (The list omits 90,000 - 95,000)

1908 97,999 *100,000 is a Heliar. This was held in the museum at Brunswick for many years, and was later offered for sale in the UK.*

"Cameras" listed inc. Karpf, Kodak, Koilos, Delta, Compound, and Polyscop.

1909 101,649 Retirement of Dr Harting.

1910 105,778 Heliar/ Unicum also Radiar, Collinear, Stereo

1911 110,347

1912 113,569 Inc. Helomar

1913 118,634 - 125,975 (Numbers 122,001 - 123,000 were for America in 1913.

1914 126,001

1915 132,726 *The firm now moved production to a new site and buildings at Braunschweig-Gliesmarode, the offices staying at Campestrasse. The plant was very busy during the War and employees increased to 1,000 + 150 office staff*.

1916 137,682

1917 139,108
1918 142,853
1919 144,419
1920 154,426
1921 160,008 *(It is interesting that No166,57x was fitted in a 1918 dialset Compur No337,26x.)*
1922 172,136
1923 194,086 *The employees had decreased to 600 + 100 by now and business was very difficult, and the firms finances in a poor state.*
1924 216,948
1925 227,929 f3.5 Heliar,Trinastigmat, Avus, Triare, Fokars, Vorsatz Linsen These were ssued o*ver the years 1923- Death of F.R. von Voigtlaender, aged 79. He had no male heir, and was the last of 4 generations of Voigtlaenders in the firm. Two sons predeceased him. He made a great reputation soon after he took over with the launch of the more rapid Euryscope lenses and later the Kollinears. In 1925 he sold the firm to Schering and in 1925 they ended all production of non-photographic items. By 01/01/1927, Schering had obtained 99% of the shares, and they amalgamated the interests they had in Wubben (albums, of Berlin) and Dresdener Trockenplattefabfrik Richard Jahr AG to produce Voigtlaender & Sohn AG. There was a steady switch to mass production of all items to assist film sales with cheap cameras.*
1926 248,505 Skopar, Voigtar, TeleDynar, Heliostigmat
1927 279,710
1928 365,562 Perkeo 6x9cm with Voigtar
1929 537,338 Photar *(A Heliar No520,91x was noted in a Compur No475,01x of 1922.)*
1930 *Bessa camera produced.*
*1933 A Skopar No671174 was noted in a rimset Compur No2,125,57x, of 1933.*
*1934 Skopars Nos 803,22x and 815,37x were noted in rimset Compurs No2,538,55x and 2,565,42x. (c.1934)*
*1934 A Heliar No88047x was noted in a Rimset Compur No2,659,34x.*
*1935*
*A Heliar No1,026,69x was noted in a rimset Compur No3,038,80x (c.1935)*
*Voigtlaender formed a joint company with Gevaert of Antwerp to deal in their products, especially films. This was to last to 1945.*
1934 1,000,000 included. *Note a Heliar No1,052,264 was noted in a Compur Rapid No 5,107,90x, which should be a 1938 shutter number which suggests some lenses were held in stock for a while.*
*There is evidence that there are missing numbers about here as the maker caught up with unnumbered lenses made earlier. The gap is thought to be at about No1.15-2.03million, corresponding to some 900,000 lens numbers. It seems to be well established as a feature among Voigtlaender collectors.*
1937 2,000,000 included
1939-1940 *It seems that No2,500,000 was probably made about the beginning of WW2.*
*1942 A Heliar No2,718,53x was noted in a rimset Compur No3,038,80x*
*There seem to be missing numbers here, possibly used on Baby Bessa cameras or wartime productions, at about 2,600,000. It is assumed that postwar production recommenced at about No2,700,000.*
*1945 2,700,000*
1947 3,000,000 included. *Collecting experience suggests that either No3,000,000 was made later, possibly about 1949, or that old numbers were retained and made up then.*
1949 *Color Skopar produced.*
1950 *Ultron and Nokton produced. Ultrons are from about No3,16x,xxx for Prominent. Lenses from June 1951 will be in SynchroCompur shutters. From 1952, most of these will lack serial numbers on the outside of the shutters.*
*An Ultron No3,465,25x was noted on a Vitessa at shutter No7,524,xxx c1952, but another at No3,311,24x was in a Compur Rapid with a much older number, nominally from 1940. There do seem to be anomalies.*
*1951(Jun)3,220,000*
*1952(Jan)3,300,500*
*1953(Jan)3,461,400*
*1954(Jan)3,600,000*
*1955(Jan)3,731,000*
*1956(Jan)4,001,000 Lens No4,000,000 was a Nokton and the parts were made in late 1955, but the lens*

*was assembled and officially numbered in 06/01/1956 to celebrate the 200th year of the foundation of the firm in Vienna.*
1956 4,000,000 included. *It was in 1956 that Schering sold their interest in Voigtlaender to Carl Zeiss Oberkochen.*
*1957(Jan)4,303,000*
*1958(Jan)4,514,000 Bessamatic produced and in 1959, the Zoomar lens.*
*1959(Jan)4,802,000*
*1960(Jan)5,033,000*
1960 5,000,000 included
*1961(Jan)5,473,000*
*1962(Jan)5,900,000*
*1963(jan)6,219,000*
*1964(Jan)6,423,000*
*1965(Jan)6,664,222.*
*1971 9,999,999-10,000,150 These were a special batch of Heliar lenses made in Summer 1971.*

Initially production was of very small batches or singles. This changed in the early 20th century and by 1927, batches of 2,000 Skopars or Voigtars were normal - or 1,000 Stereflektoscops. This is one of the few occasions when camera names occur in the lens register. Much of the data for the years 1945-1965 was supplied to the V.V. by Mr J. Halfweg.

**Petzval Portrait**
Layout Q001. This layout is a generic, rather than original.
May 1840 Type This is often merely called the Petzval and is typically a rather bulky, long brass lens with an aperture of f3.7 and made in a range of foci to match the then formats- focal lengths are seldom specified. There were 4 glasses, the front two being an "old landscape meniscus" in design and usable as such.The rear was far behind it and was air spaced. Each part was separately achromatised. It was ready in August 1840, and listed for sale in 1841. It is likely that initially it was sold only on the "Metal Camera". The original lens is or was***** in the Austrian Labor Museum, Vienna, (Musem of Austrian Handicraft or Technological Museum) and has a front glass 39mm dia. aperture 39mm and focal length of 150mm. The front is light crown and flint, the rear is heavy crown and flint or "hard crown and flint". (Dr Eder, quoted from Photo. Correspondenz *in* Photography, 22/06/1899, p424). It covered 30°.(The detailed designs are in Eder's Handbuch, 1893, Vol 1, Part 2 p114; Photogr. Objektive, Ed 3 1911)) Petzval described the design in *Bericht ueber die Ergibnisse einiger dioptrischer Untersuchungen (Sept 1843) but the details were kept secret to Voigtländer and himself.* The prototype was on a pasteboard tube camera possibly made by Petzval so Martin could try out the lens-it was later presented to the museum by v. Voigtländer himself. The lens was costly at 100 guilders. The public were to learn of the lens in a lecture by Prof Ettingshausen to the Lower Austrian Trade Association at Vienna in 02/11/1840 and 08/12/1840.

*******It seems that the Voigtlaender collection was combined with the Kodak collection at Rochester, USA after WW1 to help fund the Austrian Museum during a difficult period.*

It was calculated, a rare thing in those days of trial and error, the design team involving Petzval and a team of artillery students from the artillery school who were probably set to calculate Snell's law and follow rays through candidate designs, with Petzval progressively modifying the layout until a good lens was found. (see Tradition, 1, 4, 1962, p16). This suggests very official support for the work and Eder says Archduke Ludwig put several soldiers trained in mathematics to work with Petzval and his assistant, Riesinger.

The lenses evolved with time. Initially they were said to be up to 4 zoll in diameter (4x2.61cm=10.44cm, as 1 zoll=2.61cm). The mounts were first plain, at No4,000 approx. and then fitted with a Waterhouse slot by No8,000 approx. and presumably later with an iris. (The original design was not very well colour corrected, and they seem to have been improved throughout the industry as a result of complaints by Townson (1840), Martin (1840) and Claudet (1843) and it was to be Lerebours in Paris who first adjusted the correction so the photographic and visual foci coincided. Doubtless Voigtländer will have followed this.) The examples seen do not allow the front glass to be rear mounted for use as a meniscus lens (it is in a smaller thread) though it would work well for this. In the UK Antoine Claudet was a licensee for the Daguerre process and early noted the Petzval lens on a visit to Paris and imported them for the first time to the UK. He was a well known man and this would have triggered off sales. It seems that a little later Voigtländer opened a Knightsbridge, London,

establishment in the 1850's (G. Hough, Photographica, 84, p11, 1998) and this may have helped UK distribution. A brass lens No679x (about 1856) was accompanied with a rare item: the wooden box made for it, and with Nos 488x for 8x8in and 21,51x some 19in tall, were noted in English auction lists.
Certainly these Petzvals are the most common early Voigtländer lenses in the UK. Finish was in superb brass, laquered and with very smooth thread action to the cells, and excellent rack focus. They seem to be mainly in larger sizes, eg. 52mm front glass, about 200mm and 79mm, about 300mm in focus. Voigtländer at Braunschweig seem to have kept one of the originals in use in the museum mounted in a large blade shutter and an example picture taken in Feb. 1939 is shown in M.C.M. 4/1939.p440. And use today of an 1852 lens in 1998 showed excellent centre sharpness even on pan film, with a progressive fall-off away from the centre, the soft areas printing in a very attractive fashion. It was still capable of excellent work. It was 14x faster than Daguerre's original, and centrally was very sharp by any standard, but had severe fall-off due especially to curved field, and a rather longer lens than usual is needed for any format as a result. As the older Daguerre and wet plate processes went out of use, some were redundant and there seems to have been a trend to use them as "Magic Lantern" projection lenses for which they were ideal. Several have been found attached to such Victorian projectors. A feature according to Eder was the progessive increase in size of Petzvals as customers and makers tried to outdo each other. Eder's table is incorporated above.
*see also Orthoscop below. Conrady quotes von Rohr as using glasses Crown= 1.517, Flint= 1.575.

**1840 f3.7 type**
**(a)** This 1840 type will thus be the first.
There must be versions of it.
(b) Thus Lerebours and later others such as Dallmeyer, 'improved' the colour corrections and Voigtlaender will have followed within a year or so.
(c) There certainly were lenses with Waterhouse stops soon after the suggestion was published, probably by1859?
It would have met demands for extra speed, and there seems to be an attempt to obtain this.
(d) It is worth noting that the 6in diameter lens came in two differing foci, suggesting two different apertures were involved in 1860.

*Fig 004 001 Voigtlaender Petzval Portrait lenses (l) No430x and (r) No 799x.*
*There can be confusion. Thus a Petzval No15,70x was noted with an iris- the iris must be a retrofit as the lens would have sold in c.1863 with a slot but not an iris. It was a 42cm f3.16 lens (ie 13.3cm across) and must have been really costly and still highly valued some 20 years later when the adaptoin was made.*

**1870 f2.3** version, designed by H. Zincke-Sommer (V 003) A faster, but narrower angle version, especially to photograph children. No details.
**1878 Petzval Lens-**Version with the rear glasses cemented for better contrast and less flare. This version was less sharp as the spherical corrections were less good, and it may be some sort of a soft focus lens or for projection. The design was by Voigtländer himself. Note that Zinke-Sommer may well have suggested such an item earlier and found Voigtländer initially unresponsive. (Eder) It seems from Afalter's list that this may be the same as the last and next items, as he noted only one as 'Portraet Objektiv Serie 1a f2.3'.
*It may be this which was noted in the B.J.P. 27/07/1979 p728: idem, 25/07/1879 as Patent No4756 to G. Nawrocki of Voigtlaender und Sohn for a new compound lens for Portraiture which avoided the faults of the old lens of unequal focus components and divided rear cell, with a new design of greater speed, and lower distortion. This was obtained by altering the proportions of the foci of the cells and especially the form of the rear, so that these can now be cemented avoiding two reflective surfaces. But it leaves unanswered whether Nawrocki was a Patent agent or a designer.*
**1885** There seems to be another **improved Petzval** this year but there are no details.
**1888 "Petzval Portrait Lens Series 1a f2.3"** Initially for 22° and by 1900, this covered 28° and was said to be free from coma. It was later sold in 1900 as an early cinema lens, where the speed and sharpness were needed and the narrow angle was no problem. Also it was used for portraits in poor light. But note the

'Projektos' below seems to be a slower lens.

**Portrait Quick Worker** f3.16 (based on the front diameter). This was made in 2.0, 2.5, 3.0, 3.5, 4.0in and this will be a Petzval. [Afalter lists this as from 1877, in 174-395mm to cover 70°; it has not actually been seen.]

**1888 "Petzval Noted Portrait Lens Series 1".** This was **an f3.2** made in 6.5-14in (V 002) to cover 28° and was a fast portrait and projection lens. This was still listed in 1908 along with the f2.3 Petzval. Afalter seems to agree with the aperture, and series number, and knows it as a projection lens so it is likely that this type was also sold under this trade name for projection. But the example seen may be a movie version, as Afalter lists only 17, 21, 25, 31, and 40cm, which seem longer than the next lens which is certainly a projection lens from the barrel.(It seems to be a reissue of the 1870 lens but any difference may have been lost in time.) "**Projektos"** Petzval lens of about f3.2 and 12cm, No116,970 (c.1912) in a nickel barrel mount for 35mm movie projection. It forms a brilliant but not too sharp image but may not be under correct test conditions, ie it was forming an image from infinity. The trade name was not in the USA catalog though the lenses do seem to be much the same.

**Stereopticon Projecting Lenses** These were noted in the 1915-1916 USA catalog, in 5 sizes, to work at f3.2 using Jena glass. They sound like f3.2 Petzvals but in a special mounting. They were also recommended for enlarging and all were fitted with rack + Pinion focusing.

| | | |
|---|---|---|
| 6.75in | 2.125in dia | 2.75x2.75in covered |
| 8.25in | 2.75in dia | 3.5x3.5in covered |
| 9.75in | 3.25in dia. | 4x4in covered |
| 12.25in | 3.75in dia. | 4.75x4.75in covered |
| 15.75in | 4.25in dia | 6x6in covered. |

**Victorias** As suggested above, these may have been the largest size in Petzvals, with very big glasses and mounts. Lenses of at least 8in dia. have been reported, but it is not known which sizes qualified. They are certainly a rare item, made in small numbers.

Voigtländer made Petzval lenses at least to 1924, and probably later for studio use and as projector lenses but one source suggests that the Portrait Euryscop was their favoured product from the 1880's onwards. One continued use of Petzval lenses was as projection lenses for the new movie industry.

**[1872 Spherically Corrected Doublet** This was designed by H. Zincke-Sommer. This design was to be used in principle for the Nicola Perscheid a generation or so later. It was intended by Zincke-Sommer for use as a portrait lens, but was not produced perhaps due to a feeling that Petzval (and later portrait RR) lens sales might suffer from the competition. There may then have been doubts as to the wisdom of making a soft focus lens which it would have been to some extent. (*THIS IS NOT A PETZVAL.)*]

*About 1872* **Periscop** (Steinheil) at Serial Number No17,83x This has been reported as engraved Voigtlaender and also Steinheil Periscop, so it may well be made under license, and the date can only be approximate but will be after 1865. No example has been noted in this study.

**Telephotography** The early teleaccessory units made use of Petzvals as the prime lens for the sake of their high central sharpness and speed, and Marriage in his book (Telephotography, 1901, p14) describes a special Voigtländer Petzval with the rear lens or component adjustable with a scale and pointer on the outside of the barrel to set for a flatter field. It was used with Telenegative Series 11. Some Voigtländer Petzvals seem to have the rear glasses reversed as in the Dallmeyer design.

**Petzval <u>Orthoscop</u> Len**s. f8.7 This can be regarded as the portrait layout taken to a further stage in the design to give a rectilinear lens for outdoor use. It gives a flatter field and less distortion, and wider angle of cover. It was initially refused by Voigtländer as too slow for the Daguerre process and later revived by Petzval who persuaded another optician, Dietzler, to make it in a slightly revised form. Voigtländer then had to make it as the Orthoscop and used a mount which allowed the front glass to be used as a landscape meniscus. The Voigtländer type is said to be f8.7, but imitators such as the Ross Orthographic are slower at about f14 and may be better lenses as a result. They are still fully usable, and this is an important design as the first advanced outdoor lens in photography. When Voigtländer fitted stops, they were behind all the glasses, while Ross placed them in the middle of the optics. (see Lake-Price, p48; Photo News, 1/4/1849, p38). Lake-Price

suggests the need to shade the lens, eg with a hat or a box, and used it as a lens for work large sizes such as 18x14in when travelling, as it was a compact lens and easy to carry on a journey. He was aware of the larger size image it produces relative to the camera extension. (Layout V 004 for Voigtländer, G 005 for the Ross version.) Traill-Taylor also mentions this and was almost prophetic in suggesting the idea of the telephoto lens!
(WARNING Not all lenses sold as Orthoskops were of this type- it seems to have been used as a name for other designs by other makers.)

**Landscape Meniscus**
Voigtländer must have sold meniscus lenses as he discusses these in the interview in Photo News 1859, but they have not been found in the UK in our experience. He does say that the front of the Orthoscop can be used as such. But note the lens threads in the Petzvals do not facilitate this. And there seem to be no examples of Voigtlaender meniscus lenses on the UK market, while several Petzval portraits have been noted- so the meniscus will have been a minor part of the business. Incidentally, there have been reports of "apparent meniscus lenses" where the front cell of a Petzval is missing. They usually are not too sharp, and will show 4 bright reflexions instead of two.
A note in B.J.A. quoted under Petzval suggests Voigtländer refused Petzval's main idea for a casket set based on the Portrait plus Orthoscop with the front and barrel serving in both lenses. This could have been due to the design of the metal camera preventing its use with such a set of products.
**Wide Angle Landscape Meniscus.** In 1888, a new version meniscus was offered, listed in the B.J.A. 1889 p599. It was made in 10 sizes to cover 5x4in to 26x22in at f15 and gave 76-90° coverage with less distortion. It was well corrected for colour and spherically well enough corected for use at near full aperture for instantaneous exposures. Thus 11.5in was for 12x10in. It was a meniscus type lens, and represented the use of 'new' Jena glass allowing it to replace an older version with less covering power. A typical late 19C design is in Q007. [Afalter seems to list this as the Single Landscape f15.5 Series IX, from 1888, for 80°( which is in good agreement,) made as 144-711mm.]

**Stereo Lenses** A stereo lens pair Nos 23,835/30,384 was noted at auction- the numbers are far apart, and may represent a replacement or additional purchase.

**RR and Euryscop.**
Voigtländer possibly could not have followed the new RR designs in 1866 with me-too products for patent reasons. Their first RR's seem to carry no product name but may have been called Euryscop from the start and Eder gives this as 1886. Collecting experience has thrown up examples at No21,93x (Series 11, late 1882?), 25,80x (about 1883) working at f7.0 max., and 30,45x(1885), all in brass with Waterhouse slots in the first and last and an iris in No25,80x in now stiff condition. Two types were noted: two were f7.0 max, while the other was about f6.0 and probably sold as a portrait version. There is some indication the RR series dated from 1877, and that there was later confusion over this and the date of the beginning of the 'Euryscop series with Jena glass' which cannot be before 1886. Eder says that the first new-glass Euryscop lenses were still without a trade name but they probably were marked soon, judging from the B.J.A. Centenary note. What is certain is that some of these older RR lenses are not engraved with Euryscop or any type name- all carry "Voigtländer & Sohn/Wein/Braunschweig" together with a size number and serial number only. An interesting point is that on No30,46x there are two Waterhouse slots at opposite sides, so that the stop plate could be a long strip pulled progressively through the lens for different apertures. But this was probably a conversion by a repairer: it is a very unusual arrangement. Most of these lenses use Waterhouse stops- an exception being No25,80x, which has an iris carefully engraved from f7-f64, though now partly unusable. It may be this was some sort of a retrofit though it looks to be very well done at the works. The B.J.P. 1977 mentioned the Centenary of the type, calling it Euryscope, and saying they were a Zincke-Sommer design, and emphasising the high quality of the results. They would not have Jena glass in 1877. Logically there should be a Wide Angle version but this has not been seen. Eder says he saw the first f6 Voigtländer RR in 1886, and these were only later named Euryscop. Later Eder says the aperture was later increased and Voigtländer largely replaced the Petzval portrait sales with Portrait Euryscops, and attributes the design to Zincke-Sommer with Voigtländer. A collection was given to the Graphische Lehr- und Versuchanstalt in Vienna.This would correspond to Series 1,11 and 111 as Portrait, normal and Wide Angle respectively. [Here Afalter lists Euryscop statistics for 1896, which are interesting as including Series 1, f4; Series III (apparently in 2 versions); both f4.5; Series IV, f6.3; Series IVa f7; Series V, f6.3; and Series VI,f7.7; giving foci and coverages in each case.]
An interesting list in 1888 gives:

**[Portrait RR]** The early Euryscopes are harder to recognize as they are not marked Euryscope or Portrait and this needs to be deduced. It is necessary to look for a Voigtlaender with the same 2 bright +1 faint reflexion front and rear.
**[Series I** This was not noted as a Euryscop and it seems likely that the Series I was the Petzval Portrait above. But note that the Portrait RR will have a development history, and that the lists seen are fairly late ones. One hint is that ?an f5 approx was noted at No30,46x (1885) on a c.15in lens, size 5. This will be pre-Jena glass, but note that the difference between f4.5 and f5 might not be noticed here.]

*Fig 004 005 Voigtlaender RR lenses (not marked Euryscop) No21,93x and 30,46x.*

**Portrait Euryscop Series 11** f4.0 This was made in 7.66, 9.75, 11.5, 14, 17.5in where the use of 11.5in was suggested for 10x8in. This will probably include Jena glass and be after about 1886, and have been noted at auction at No31,63x (1886). One note says new in 1886, and most are f4.0, but the longer lenses are f5.0, so this type may shade into the above.The slight doubt is that the normal RR portrait lenses seem to have been f5 up to the introduction of Jena glass in 1886, and Voigtlaender would have had a Portrait Euryscop before then.
[This may be the same lens as Afalter lists as **Series I** f4.0 for 70° in 202, 263, 309, 378, 470mm but the foci seem rather different.]

*Fig 004 007 Voigtlaender Euryscopes Nos 33,34x and 35,01x with WAR Nos36,20x and 67,93x.*

***[The previous version read here:***
***Portrait Euryscop f4.0*** *4.5-17in and f5.0 from 17in (see Photo News, 10/9/1886) This was "New in 1886" Layout is V011. Actual sizes were:*
*No3, 2in dia, 7.66in focus, f4.0; No4, 2.5in, 9.75in focus f3.9; No5, 3in dia., 11.66in f3.9; No6, 3.5 in dia., 14.5in focus, f4.14; No7, 4in dia., 17.66in focus, f4.4.*
*These above were probably in rack+pinion mounts as a separate list is in "rigid mounts" ie barrels. This list is different and includes:*
*No1a, 1.5in, 6.5in focus; No2a, 1.75in dia. f4.3, 7.5in focus; No 3a, 2in dia, 8.4in focus f4.2; No4a, 2.5in, 10.8in focus f4.32; No5a, 3in dia, 13in focus f4.33; No6a, 3.5in dia, 15.5in focus f4.43; No7a, 4in dia., 19.5in focus f4.9; No8a, 5in dia., 25in focus f5.0. (The f numbers have been calculated today and suggest that the series differ. And also that the f numbers changed with focus, as was common in those days. One finding then is that it is not sufficient to look just at the f number of the first in the series.)*
*Amateur Photo. 03/04/1891 refers to an f4.0 series of 10 sizes in 4.5-10in, and an f6.0 series in 9 sizes in 6.0-32in. "The recent increase in aperture is due to the use of Jena glass".]*

**Portrait Euryscop Series 111** f4.5 This was made in 6.5, 7.5, 8.66, 10.6, 13.0, 15.5, 19.5, 25in. It was suggested to use 10.6in for 10x8in. This has a typical RR 2+2 design, rather as Voi 011. It was still listed in the UK in 1908.
In the 1915-16 USA list it was as:
No2 8in 1.8in dia 3.25x4.25in covered

| | | | |
|---|---|---|---|
| No3 | 8.25in | 2.125in dia | 4x5incovered |
| No4 | 11.25in | 2.6in dia | 5x8in covered |
| No5 | 14in | 3.16in dia | 6.5x8.5in covered |
| No6 | 16.25in | 3.75in dia | 8x10in covered. |

This list quotes the angle covered as 40°, "about natural in portrait lenses".
[Here Afalter lists the same Series III but distinguishes 2 types:
(a) This was made 1886-1904, for 70° as a Portrait lens for a bigger angle of coverage in 163-658mm.
(b) The other was made 1904-1928 for 32° as a Portrait lens in 170-660mm.
At present this seem a puzzling overlap, especially the very big decrease in angle covered.]

**Extra Rapid Euryscop Series 1V** f6.0 This was made in 4.0, 6.5, 8.25, 10.0, 11.5, 14.33, 17.5, 21.33, 24.5, 32in. It was suggested to use 11.5in for 10x8in. [This is in quite good agreement with Afalter list of a Series IV at f6.3, for 70° in 127-1070mm probably in 1896.] No example has yet been noted.
**Euryscope Series 1Va** f7.0 This was made for the photography of heads and busts but as it has a comparatively flat field, it can also be used for groups and general purpose work. It was noted as 120-660mm and has been seen as No67,93x (c.1900) a brass finish barrel mounted lens of c.14in (360mm?) with iris. This proved to be a fine sharp lens centrally, with good contrast for an old and used item.
[This is in line with Afalter's data, but his suggested coverage of 40° seems modest.]

In the USA list in 1915-1916 Series IVa was listed for 50° as:

| | | | |
|---|---|---|---|
| No2 | 10in focus | 1.75in dia | 5x7in covered |
| No3 | 11.5in | 2.33in | 6.5x8.5in |
| No4 | 14in | 2.5in | 8x10in |
| No5 | 17in | 3.125in | 11x14in |
| No6 | 20in | 3.5in | 14x17in |

**Euryscope Series V** f6.3 [Afalter lists this as for a wider angle of 75° using the new Jena glass, in 138-487mm, but it has not been noted among those seen in the UK, possibly due to confusion with the Series IV above.]

**Rapid Series (Series VI)** f7.75 This was made in 6.0, 8.25, 10.75, 13, 16, 20, 24, 28, 32in. for 60-75° It was suggested to use 13in for 10x8in so it is a normal angle lens. [It seems to be the same as Afalter's Euryscope Series VI with bigger Field at f7.7 where a 358mm would be used for 21x26cm. It was made in 145-1080mm and covered 78°.]

There should be new-glass types in 1888, (see Eder) and the series do not quite agree with the above. In England, an 1891 list has only two types, f4.0 and f6.0, and then Jena glass was a novelty to mention as leading to faster lenses. These can be identified as the Series 1 Portrait and the Series IV f6.0/f6.3, and it is possible that the other sizes were taking time to become available. (One suprising point is that Voigtlaender are not in the B.J.A. 1889: there is a possibility that the introduction of the lenses with the new glasses was less smooth than one might now think.

**Wide Angle Euryscop Series VII** This was listed as 4.5-7.5in in 1890 in the B.J.A., and 4.0-7.0in in 1895 by the Rochester Optical Co. It covers 65-85° and was an "improved Euryscop" so it was not the first type. The example seen was coded Series V11 (about f12) and was No86,20x (1906) and is in brass with a slot for a Waterhouse stop. [This is in keeping with Afalter's listing of an f12.5 Series VII in 113-342mm in Germany.] This is a small compact lens giving a contrasty sharp image, and may be more useful than the bigger lenses today. The above example was No7 about 13in and probably covered 16x12in originally but was happily used on a 10x8in camera. An unusual feature was that the barrel could rotate in the large brass mount to keep the Waterhouse slot at the top under all conditions- a nice touch!
[One deduction from advertising is that Voigtlaender discontinued the wide angle Euryscope in favour of the Kollinear much more quickly than other fims many of whom went on making WAR lenses for a long time.]

Old Euryscop lenses can show barrels much darkened by corrosion where the clear lacquer has failed to protect the brass. Removal of this mess can lead to a fresh brass surface but careful work can show a brown layer on the surface. This seems to be copper left as the zinc in the brass selectively is leached out by the corrosion. The copper may seem to stain the barrel if relacquered, but at least keeps the original surface.

In 1925, Frerk still lists the Portrait Aplanat Euryscope **Series 111 at f4.5** and the Euryscope **Series 1Va** at f7.0 as still being available. But this may have been the run out of old lines.
Collecting experience has shown several small lenses of about 55mm such as No121,69x which was used on a movie camera by Butcher for Alfred Darling of Hove. Another was sold as a 55mm Euryscope on a hand cranked 35mm movie camera in London in the 1990's. Others were f6.3/55mm on a 29mm thread flange, at Nos 124,86x and 115,64x; and just may also have been for macro photography. They do not show up in the normal trade lists.
The trade name **Euryscop** was used by others, probably illegally, though the exact terms of a trade name in those days are now obscure. It is thus not a reliable guide to a Voigtländer made item, as it was used by Perken Son and Rayment, Talbot Eamer and Co., London Stereoscopic Co., "Aristos", Black Bank, and Clement et Gilmer. Some of these were selling lenses from imports, eg. as agents of C&G, but Perken were lens makers. This is going to be a complex field to untangle.
It will be about this time that Voigtlaender began the manufacture of a 4-bladed shutter, with mechanical timing and dial set speeds. It is illustrated in B. Coe's "From Daguerre to instant picture" p205, but has not been seen and may be rare. There was also a later Turbo shutter, at least as prototypes. [It was just possibly overtaken by the Compur Rapid.].
In the 1890's Voigtlaender certainly had a branch in London, and it is likely that there was some sort of representation right through the period from the first Knightsbridge office: UK was a profitable market and also London was the best place to trade with much of the Brirish Empire. Reports of lenses with Voigtlaender/London just may be the result of an attempt to take advantage of Imperial Preference which was a period trade preference regulation in favour of UK goods entering the then Colonies.

**Anastigmats**
The design of the **Anastigmat** by Rudolph of Zeiss in 1890 ushered in a new era and any company unable to offer one was doomed to long term decline. There are reports that Voigtländer designed an early anastigmat, possibly like the Concentric, but did not offer it for sale due to the glasses being unstable. And that they were near production of the Kollinear when Steinheil tried to patent his Orthostigmat- a lens with a basically similar layout. Voigtländer at first were able to obtain a licence from Zeiss to make and sell Anastigmats to their patents. (One of these anastigmats was auctioned at Christies in 02/1999 as part of a lot, but they are basically scarce in the UK.) However this seems to have been a short lived arrangement ending in 1895, and Voigtländer probably then were able to develop sales of the **Collinear** (or Kollinear in German), based as above on one of the three main layouts of 3+3 symmetrical anastigmat. They were able to offer these from 1895. The designs were very near ones made for Steinheil for the Orthostigmat (above), and they may in fact have involved patents jointly held. Some are actually said to carry the number of the Steinheil patent, (Brit. Pat. 12949/1895; 18723/1896). These have not been seen or reported. [Eder says Voigtländer were all prepared for making it at the time Steinheil filed for cover, and that they eventually agreed to share the Patents, especially as Steinheil had already suffered a long battle with Goerz over the right to patent the design. The relation with Zeiss may have partly depended on new staff and buildings being prepared at Jena to allow Zeiss to make their own designs in quantity] The designers for Voigtländer were H. Scheffler and Dr D. Kaemfer, D.R.P. 88,505 of 28/11/1893; Brit. Pat. 12,949 of 07/1895; quoted in Photo. Korres. 1894, p495). For the UK sale see Photography 31/01/1895. It was introduced as f6.3, f7.7 and f9.0 versions.

**Zeiss Anastigmats under license**.
These are listed well by Afalter for the German market, but seem to be almost unknown in the UK, although one was noted at auction and a Ser V f18/240mm has been noted from c.1891. This is probably because they were not sold here as Ross was the licensee. Afalter says they were made in:

| | |
|---|---|
| Series II f6.3 in 85-590mm | 85° |
| Series IIa f8.0 in 110-433mm | 75° |
| Series III f8.0 in 96-586mm | 85° |
| Series IIIa f9.0 in 120-820mm | 97° |
| Series IV f12.5 in 62-1228mm | 100°/80° |
| Series V f18 in 86-1660mm | 110°/90° (A 240mm example has been noted in the UK as above.It was made to DRPat No56,109 of 1890, Voigtlaender No40,620 and is in brass. The actual engraving is: Voigtlaender & Sohn/Braunschweig/No40620//D.R.P.56109/ Anastigmat V 1:18/No5 and had a clear aperture of about 12mm corresponding to a 240mm f18 lens. Stop holes were 32/16/8/4/2 ie not in an f series. Both cells showed 2 bright and 1 faint reflexions.) |

These are quite near the Ross data and 2 + 3 designs are shown for the first 4 series. Again the Series V has

2 quoted angles depending on size.
Series VII/VIIa f12.5/6.3 in cells of 183-1050mm.

By 1915, the USA catalog says "most of our lenses are of new constructions, based on the calculations of Dr Harting, FRPS."
Incidentally, the Catalog contains a Confidential list of discounts, ie profit margins for their dealers. Those carrying a regular stock (unspecified) of their supplies are recognized as dealers and entitled to a trade discount of :
Lenses, cameras, shutters, prismatic binoculars, opera glasses and Projecting lenses 33.33%
Telephoto lenses and attachments, reversing prisms, and accessories such as cases, filters, flanges, caps 25%.
There was no charge to fit lens cells to a shutter, and lenses were available on 10 days trial and were then returnable if not sold if in perfect condition. Cameras were not supplied on trial, but could be supplied to dealers for customers to inspect with a view to purchase and were returnable within 3 days of receipt if unsold, subject to the dealer paying all shipping costs. There was a liberal lens exchange policy for dealers carrying a representative stock of items.
Finally, there was a further Profit Sharing Scheme from 01/01/1912, for dealers carrying a representative stock and vigorously promoting it, and this lead to credit refunds of 5 to 12% of annual purchases of $300 and upwards. This was on all Voigtlaender items, as follows:

| | |
|---|---|
| $300 | refund of 5% thereof. |
| $600 | 6% thereof |
| $1,000 | 8% thereof |
| $2,000 | 9% thereof |
| $3,000 | 10% thereof |
| $4,000 | 12% thereof. |

[This seems to allow a mark-up of some $1300 on sale of $2700 of stock purchased, or 48% if there was a turnover of $3000.]
There were some interesting items also. Thus:
Voigtlaender **opera glasses** were in 4 types then.
No100 was finished in black enamel and Morocco leather.
No200 was in aluminium, with black enamel and Morocco leather.
No900 is pearl mounted and the metal work is gold plated giving a most attractive appearance.
No950 and 951 are in aluminium and pearl mounted and supplied in silk lined plush bags.
In addition, the glasses varied in the number of 'Lignes', an obsolete measure of length, so the plainer types were made in 4 sizes, the fancy in 2 sizes.

| No | Lignes | Price$ | No | Lignes | Price$ | No | Lignes | Price$ |
|---|---|---|---|---|---|---|---|---|
| 100 | 13 | 8.25 | 200 | 13 | 9.75 | 900 | 13 | 15.00 |
| | | | | | | 950 | 13 | 15.00 |
| 101 | 15 | 8.75 | 201 | 15 | 10.50 | 901 | 15 | 16.00 |
| | | | | | | 951 | 15 | 16.00 |
| 102 | 17 | 9.75 | 202 | 17 | 11.25 | | | |
| 103 | 19 | 10.75 | 203 | 19 | 12.25 | | | |

**Binoculars** benefitted from some 160 years experience in the making of optical instruments. These were prismatics, using two conventional prisms, rather after the Abbe/Zeiss patents which had expired by then and were made in 3 magnifications and several objective diameters.

| Magnification | Dia. of Objective(mm) | Angle of View° |
|---|---|---|
| 6 | 21 | 7 |
| 6 | 24 | 7.5 |
| 6 | 25 | 8.5 |
| 6 | 30 | 9 |
| 6 | 36 | 8 |
| 6 | 42 | 7.8 |
| 8 | 21 | 7 |
| 8 | 30 | 7 |
| 12 | 30 | 4 |

Prices of binoculars were from $31 to $63, mainly depending on the diameter of the objectives.

Magnifiers These were round tubular units for use with cameras, and came in 2 types.
Series A This was a 3g/1c optic of flint and crown, using a (+)glass surrounded by two (-)glasses. It was made a 6x, 8x, 12x power and was very large in diameter and flat field ('perfectly aplanatic'). Price was $7.50 in any size.
Series B This was a less expensive unit, of two separate glasses for $3.00.

Cameras were from about $40 with a Radiar lens to $165 with a Stereo Alpine, and lenses were about $27 up to $293 for a big Kollinear II. Thus a dealer might be averaging $60 per invoice and need to shift 5 or 10 items to reach the profit-sharing and about 2 per week for the maximum rate. It is likely that only a dealers in a big center would achieve this.

The Voigtlaender Anastigmats were initially the Kollinear- or spelling as Collinear for export markets.
**Kollinear** was made in several series, and there may be changes in the designs. Users say that the performance is very good but that the colour correction can be less good than other types, and the faster series may lack ultimate sharpness. Frerk writing in 1926, says the old versions were in f5.4 and f6.8, and that the line was simplified in 1921 when R. Richter redesigned the Kollinear as an f6.3 in all sizes. Today, demand for Kollinear seems to be increasing and prices are rising, perhaps as it is more flexible in use than Dagor, the main 3+3 symmetrical competitor. The angle covered was good but not outstanding. The first list noted is from a Rochester Optical catalogue for 1899.
*{Note Do **not** confuse these with the Collineograph, of H. Ernemann qv.}*
There were 3 main types of 3+3 symmetrical anastigmat. The most successful was the Goerz Dagor and the next most important was the Voigtlaender Kollinear and Steinheil Orthostigmat, which are to products basically of the same design group, and finally, the Watson Holostigmat was a third basic type, though Zeiss had also used this layout. A fourth could be envisaged but never actually used commercially.

**Kollinear** f5.6 This was made in 3.5-7.875in
This may be **Series 1**, or the f6.3 series may have initially been a complete series. There may have been an f7.7 series for up to 85° as suggested in Photography 31/01/1895. The iris was graduated in Stolze's system which can complicate the apertures!

**Kollinear Series 11** This seems to be the most common from experience, and today are usually available if you look. They were general purpose lenses with an extra rapid classification but also highly corrected and with the advantage of being convertible to a lens of twice the focus.Thus it is useful for landscapes, long focus work, interiors and copying. Unusually, no angle of cover is given in the USA list but two formats for each focus are listed. The Layout is Voi012 and in 1914 it was made as:
f5.4 2.375in for 1.5x1.5in; 2.75in for 1.75x2.5in; 3.5in for 3.25x3.25in; 4.75in for 3.25x4.25in; 5.5in for 4.25x4.75in; 6.0in for 4x5in; 7.0in for 4.5x6.5in; 8in for 6.5x8.5in; and also 9.0in, 12, 13.5, 15, 17.5, 20cm;
f6.3, 25cm for 5x8in; 31cm for 6.5x8.5in, 37cm for 8x10in, 44cm for 12x15in , 52cm, 60cm for 14x17in. It covers about 80° in all sizes. The above formats are at full aperture, and are increased at medium stops. Thus the 6in then covers not 5x4in but even 5x7in.
All sizes from No2 to No6 ie 4.75in to 12in inclusive were avaialable as cells to fit to shutters.
This may not have applied in other years but the lenses seen fit the scheme. It is normally classed as a fine lens but the f5.4 seen has not been a very useful lens in experience, but this example may have been poor. The f6.8 and f6.3 are much sharper and less flarey. It was also covered by DRP 88,505. [Afalter seems to have the same series of apertures and foci in Germany in 1910, but notes it covers 60°. This may be at full aperture.]

**Kollinear Series 111** It was covered by D.R.P. 88,505. (Voi013) This seems to be scarcer, and may be aimed at shutter mounting as it is smaller. It covers up to 90° stopped down. It was made in:
f6.8 7.0, 9.0, 10.5, 12.0, 13.5, 15, 18cm, where it was suggested to use 15cm for 5x4. But note the lenses found are f6.3 and seem to be of this period.


*004 011 Voigtlaender Kollinear f6.3 No162,88x and 2x W/A Kollinear at Nos 66,204 and 228,30x.*

In the USA list it was as:

2.25in for 2.25x3.25in; 3.5in for 2.75x3.25in; 4.25in for 3x3.25in; 4.75in for 3.25x4.25in; 5.375in for 3.75x4.5in; 6in for 4x5in or 5x7in stopped down; 6.5in for 3.25x5.5in; 7.125in for 5x7 or 6x8in stopped down.

f7.7 20, 25, 31, 37, 44, 52, 58cm. Use 13.5cm for 5x4. It covers about 90°.

In the USA list it was as:

8in for 6x8in; 10in for 7x9in or 8x10in stopped down; 12in for 8x10in; 14.5in for 11x14in; 17.5in for 14x17in; 20.5in for 16x18in; 23in for 18x22in.

All sizes from 1A to 6 ie 4.25in to 12in inclusive were avaialable in cells to fit shutters.

A Collinear II No5 f7.7 ie 10in was noted at No49,11x.

[Afalter seems to have the same lens in Germany in 1910, but notes it covers 66°. Rather than underline a difference in angle, one is probably with the iris fully open and the other stopped down.

He notes 3 Casket sets as follows: for 9x12cm, with 143, 209, 262mm cells for 97mm and up.
for 13x18cm, with 224, 262, 358mm cells for 138mm, etc.
for 18x24cm with 262, 358, 447, 538mm cells, 172mm, etc.

These were listed but have not been seen in the UK.]

**Kollinear f6.3** This was the R. Richter redesign for the postwar market. It was <u>not</u> in the 1915-1916 USA catalog.This was a fine universal lens, sharp and flare free and it was suggested to use 18cm for 13x18cm, but it covers 80° so a 13.5cm covers 13x18cm very well. This will be the best today if available. These are in black enamel finish where seen. They were made in many sizes listed in the Afalter Table from 70-520mm, but rather few were in the UK adverts, as sales were difficult just after WW1 and later tended to concentrate on cameras rather than lenses after about 1926. Thus the B.J.A. 1928 p642 and 1929 both have:

Collinear f6.3 A Universal Convertible Lens

| | |
|---|---|
| 4.125in | £6.00 |
| 4.75in | £6.40 |
| 5.25in | £7.20 |
| 6.0in | £7.75 |
| 8in | £12.00 |
| 12in | £25.2in |

Big examples did come in after WW1 as is shown by a biggish f6.3/37cm for a 10x8in camera in a Kent studio but this was actually probably a Series II from the date (1921). It may be easier to find a sample of Richter's design on a small camera.

One question is when sales switched from say Collinear Series III f6.8/7.7 and Series II f5.4/6.3 to the one new product with f6.3. Afalter suggests they were sold from 1928 to WW2, and this would make the f6.3 Collinears actually seen from the 1920's the old type. This does not really fit with Kollinear 12cm f6.3 No166,573 (1921) in a Dialset Compur Nr 337,260 (1918?) which rather suggests small sizes perhaps were introduced earlier or the Kollinear was made in f6.3 for use in shutters, which is also possible. It is noted that Kingslake says Richter joined Voigtlaender in 1914, and Goerz in 1923, which tends to support an early 1920's introduction for his design. Frerk suggests 1921, and this agrees with the lens seen.
There is some sign from the drawings (Voi016, and Voi012) that the design of the Kollinear was altered, possibly by Richter for the 1920's, and that the later ones have a thicker second glass and some cylindrical wall at the edge. It is not known if this is a real difference however, but it is nearer the layout of the next process lens.(Voi015) The f6.3 was made in f6.3 for up to 80° in shorter (to 20cm) foci, 70° in longer foci. It was a general purpose professional lens. Early versions from 1900-1914 of Kollinear were in brass finish but in the 1920's the f6.3 was in black enamel.

*Fig 004 009 Voigtlaender Kollinear (l) f6.3 at Nos 54,85x (1899) and 46,370 (1895);(r) f5.4 at Nos 54,37x and 117,67x.*

A typical advert. with cameras is in B.J.A. 1925, p746, where the three lenses on the Tourist are Radiar f6.8, £8.40, Kollinear f6.3, £11.56, Heliar f4.5, £6.00. It was also on the Alpine. By the B.J.A. 1931, p590advert., the range was only 5.25in in Compur, 6in in several barrel mount or in shutter, 8in and 12in (same).
**Casket sets** were sold based on these for use on 9x12, 13x18, 18x24cm, with 3 or 4 or even 5 components. A casket set was still listed in 1924, but these do seem unknown in the UK. [Afalter lists Sets A,B,C,D,E for different sizes with the f6.3 Collinear].

**Weit Winkel Kollinear** f12.5 In 1931, it was only in barrel mount, as 4.125, 4.75, 6.0, 7.125, 8.0, 10in. (B.J.A. 1931, p590). This will be the Series IV as follows, the German style having continued into the UK advert. (This was also seen in a list as f6.8/180mm, but it is likely to be the usual postwar Kollinear or a misprint for the Series IV below.)
**Kollinear Series 1V** This was a wide angle version, normally at f12.5 max. (Voi014) It covered up to 100° when stopped down and was made in: 10.5, 12, 15, 18, 20, 25, 32, 44, 58, 80, 100cm. Use 20cm for 10x8in. In the 1915-1916 USA list, it is as:
4in for 4x5in or 4.25x6.25in closed down; 4.75in for 5x7in; 6in for 6x8in or 8.5x10.5in closed down; 7.125in for 8x10in; 8in for 9x11in; 10in for 11x14in.
It was covered by D.R.P. 88,505. (Peeling & van Neck, B.J.A. 1931, p590) Late examples are not marked with

a series. They were made till WW2 or nearly, as one is No2,283,30x, about 1938, in 15cm for 5x7in (or bigger).
An earlier series was made as **Kollinear 1V** but at f11.3 max. and was seen at No66,20x from 1900. It is in brass finish.
These seem to be moderately common in the UK in the sense that two have been noted or seen. The late one is an especially fine lens in use, and may actually be more desirable today than the faster types which can have lower contrast.

**Kollinear f9.0/f8.0** Slower versions of the Kollinear were initially offered from 1895, for process work. The f9 was the original but Dr Harting mentioned **the f8** in 1901 in the Photo. Journal 1901, 25, 323. These are at least scarce in the UK. These may initially be non-apo lenses- the concept of an apo lens was probably unusual up to 1900. [This comment is based on the Zeiss Catalog of that date, where the term is not used on a 'new concept lens' which is offered at a considerably increased cost. qv.]
The non-apo is not listed in the 1915-1916 USA catalog.

**ApoKollinear f9.0** Layout V 015 for 30-40°. This version was introduced in 1900 and may be still another version to the ones above which are likely to be non-apo versions. The two may have sold in parallel for some time. The apo was certainly an impressive lens with very thick glasses. The maximum aperture varied, from f9.0 at 200mm to f12.5 at 1000mm.
In the USA catalog, it is listed as:

| Focus | Dia of glass | Covers at f9-11 | Covers at f16-64 |
|---|---|---|---|
| 12in focus | 1.5in | 8x10in | 10x12in |
| 17in | 1.875in | 10x12in | 14x17in |
| 20in | 2.375in | 12x16in | 16x20in |
| 24in | 2.75in | 16x20in | 20x24in |

The designer was Dr Harting F.R.P.S. (See Photo Jnl. 1901, 25, p323). It was again made under D.R.P.88,505, (Voi015). {Afalter has the same lens and foci, but dates it from 1904-1928, which is in good agreement.] It has not been actually noted in the UK but old process lenses are not too often seen. One comment is that there was no hint that the ordinary user might find it a useful item. Thus sales were limited to process workers. It was expensive, but not amazingly so: if the 12in lenses are compared, the Series II f6.3 is $95, the Series III f7.7 is $90 and the Apo f9 is $97 and for colour sensitive material will be the sharpest.

As in the advertisements, Lummer shows the Kollinear with the interface swept back to a knife edge while in the same book he shows the Orthostigmat glasses to have a cylindrical edge to them. He suggests that Beck licensed from Voigtländer, which is possible even though the lenses carry Steinheil's name as well as Bck's, but this shows how complex the situation had become. Early lenses were marked in the Stolze system, with f3.1 as a basis so that f6.3 was marked as 3. This was still made this way in the 1920's. The above angles covered are those given in the literature, but may be optimistic by modern standards, and in general the Kollinear covers rather less angle than either the Dagor or the Holostigmat do. But it was good enough to sell in the UK into the late 1920's and it and the wide angle version seems to have been made to 1940. Incidentally the original patent by Kaempher seems to cover another 3+3 symmetrical layout, but this was never actually used.

**A note about Shutters!**
The 1915-1916 USA list summarizes the then situation over shutter mounting. All sizes of Dynar and the medium sizes of Collinear Series II and III were avaialble to fit in blade shutters, normally at a few dollars less. The shutters used were Wollensak Autex, Wollensak Optimo, Deckel Compound or ? Compur and Acme.

**Triplet**
Voigtländer were a sub-licensee for the Cooke triplet patented in the UK as No22,607/1893, from TTH of Leicester, and made these from the later 1890's (say 1898) as portrait, cine (Voi009) and projection lenses. An early example seems to be 'f6.8/140mm *Cooke Linse Triple Anastigmat H.D.Taylor Pat. Serial No 59,731 to D.R.P. 86,757'* which was found in Switzerland in AD2001 as a lens in a focusing iris mount- composed of 3 bolts running in 3 slot in a barrel. The unit is very light and probably from a Klapp or just possibly a reflex. Iris to f50. The number is in one of the missing group about 1899.

Frerk notes that Voigtländer were the first German maker, without further comment. This also explains how Dr

Harting was able to explore the designs of the Heliar and Dynar which are generally regarded as triplets with extra glasses added. There is some space for humour here as the Taylor design was expressly chosen to minimize the number of glasses and he began with 3 achromatic pairs and reduced them to three singles- only for Dr Harting to revive two of them. (There have been reports of Voigtländer having a triplet design patent to help their position as well as being licensed but this may merely be to the Harting types).
The Cooke patents would be valid protection into the new century, but may have become more widely licensed as the years went on. Thus the Voigtländer triplets changed from being premium items in 1900 to being mundane ones in the 1930's. They were on sale in the UK in 1914 as the Helomar but probably were sold here after the Patents ran out in about 1908. [They have not been seen and sales in the UK may have been limited in competition with the TTH originals.]

**Portrait Anastigmat f4.5** This was for portrait, instantaneous photography and projection. A fast lens! (Voi030) It was made by 1908 and perhaps 1900, and one of the older of the type. There was a big distance from glass 1 to glass 2 here, and two heavy Barium flint positive glasses were used, and it gave excellent correction and covered 48°. Use 24cm for 13x18cm, and it is also a fine projection lens. It was covered by D.R.P. 86,757. [This will agree with Afalter's account of the Portrait lens in f4.5 in 80-600mm, which he dates as 1904-1928 in Germany. But note that he finds the Portrait is very unsymmetrical where here it is the next item which seems to be of this type. It may just be that the diagrams were exchanged in some publication.]

**Triple Anastigmat** f4.5 This trade name was used for a series of triplets made under DRPat 86,757 made for many years as a portrait lens. Listed in 1908, manufacture may actually have begun earlier. (V029) since it is probably the Cooke Series 3. It uses 2 barium crown positives and a light flint negative and the iris and shutter are behind the 2nd glass. It is a superb general purpose lens and has no cemented surfaces. Use 18cm for 13x18cm, but it covers 16x21cm closed down. It was made in f6.8 to 15cm, and then f7.7 in larger sizes and f9.0 up to 830mm. The layout was very unsymmetrical, and a lower price design, and may have been continued as the Voigtar series. It was covered by D.R.P. 86,757.
**Triple Anastigmat f6.8** This may be the earlier version, as noted above at No59,731 and later rather overtaken by more saleable faster f4.5 lenses. Note D.R.P. 586,757 also coverd this.
Post WW1 this was known in f6.8 to 18cm, and then f7.7 to 83cm f9.0.

**Triplet Projection Lens** This was noted as Layout V 028 (B.J.A. 1914, p1130advert) This is a fairly symmetrical triplet, rather like the Helomar in a black and brass barrel with rack and pinion focussing. It seems to have been introduced to extend the sales of the Petzval type such as 'Projektos'.

**Helomar**
This was a very fast general purpose lens, noted in B.J.A. 1914 p1126, etc. The speed varied with the focus. The trade name does not seem to be used in Germany as it does not appear in Afalter's list, and in general several trade names of triplets may differ with country. [Afalter does list two Triplet lenses however.]
**Helomar** f3.2 This was offered as f3.2 in 4.75, 6in, then being the f3.5 below. It was mainly for movie use and was used over a moderate angle- a warning when used for normal photography! (B.J.A. 1914). It was a rather nearly symmetrical design.
Here the 1915-1916 USA list is informative, with:
In f3.2 max.

| | | |
|---|---|---|
| No0 | 1.375in | M.P.Film ie Movie |
| No1 | 2in | Movie |
| No2 | 2.5in | Movie |
| No3 | 3in | Movie |
| No4 | 3.5in | Movie |
| No5 | 4in | Movie |
| No6 | 4.75in | 2.5x3.5in |
| No7 | 6in | 3.25x4.25in |

All the above could be had in focusing mount, eg for movie use as well as in iris mount.
The next are f3.5 max.

| | | |
|---|---|---|
| No8 | 7.125in | 4x5in |
| No9 | 9.5in | 5x7in |

The last 2 items were in iris mount only and probably sold as large format lenses.

**Helomar** f3.5 This was made in 7.125, 9.5in (B.J.A. 1912, 788) Layout V027. At this stage it

was a rather narrow angle design for 40°. This suggests this has much in common with the Portrait Anastigmat, and it may be a replacement. The trade name was not in use in 1926 when Frerk noticed it only on old cameras. It was also reused in the rangefinder Bessa about 1936-1938, when it was the low cost option (at 152RMark) to the Skopar (172RM)and Heliar (192RM) and here all were in Compur Rapid shutters so there is a direct comparison of the lens cost.

[Brillantar f4.5 7.5cm This was a triplet on an early 6x6 TLR like a Brillant at No231,30x reported in an anonymous shutter 25-100 TB but probably actually a Welta camera and NOT of Voigtlaender make.]

**Voigtar** This was the standard budget priced triplet in the period c.1925-1940 and was fitted to very large numbers of the cheaper Brillant and folding cameras. It was eventually made in f3.5, f4.5, f6.3, f7.7, f9.0. (Layout V 031) and the layout may have varied from unsymmetrical to nearly symmetrical as the aperture increased- these were not just all taken out of one box. It was fitted to Vag, Avus, Bessa, Brillant, Jubilar, and most of the less exotic cameras of the period 1918-1939, but not to Superb, Prominent Rollfilm or Virtus for example. Thus commercially it was a most important product. It covered a normal angle, a 90mm being fitted for 5x8cm, and 105mm being fitted for 6x9 and 120mm fitted for 6.5x11cm. It may not have been made in larger sizes as it was not an option for the 9x12 Bergheil for example.
The Voigtar was one of the features of the Perkeo 6x9cm in 1929 (B.J.A. 1929, p297) and of the 'new' Bessa 6x9cm with an f7.7 in 1930 and in 1931 with an f6.3/4.125in (B.J.A. 1931, p291). All these were and are good performing cameras, especially the f6.3 due to the greater aperture making camera shake less serious. It was a very good lens for what were fairly low cost cameras. Thus Voigtar made real friends and was extended to other models- it was on the Rollfilm, Vag, and Avus in 1929, but not the Tourist or Stereoflectoscope in 1929. And an early TLR Brillant used an f7.7 Voigtar, with 3 distance settings (B.J.A. 1933, p259). It would be one with a metal body and was the beginning of a long line.
The faster ones such as f3.5 on the Bessa 66 may have been less sharp (from considerable user experience in the 1950's) but the real problem there may have been shake, as the side release on the Bessa 66 was not as ideal as it looked, with too many linkages for perfection and a tendency to add shake rather than avoid it! Not all Voigtar lenses are numbered which may suggest a lack of pride in them- while Skopar and Heliar are serial numbered but often on the rear of the mount- not too convenient when the customs wish to check the numbers. One suggestion is that a Bessa with a Skopar or Heliar would be a wiser purchase.
In more modern times there was an f8.0/44mm **Voigtar** on the Bessy S which is said to be an achromat.

**Radiar f6.8** This was the budget option on the Bergheil Tourist cameras in the 1914 B.J.A. and the 1915-1916 USA list. Initially this was thought to be another budget priced triplet. However this use suggests it was a 4 glass dialyt, and it was noted that it was convertible to give cells of 2x the focus. These need to be used at f22 for real sharpness. It was not available separately, only on the cameras.

| | | |
|---|---|---|
| Bergheil 3.25x4.25in | Radiar f6.8 | $40 ot $45 with spring back. |
| Bergheil3.25x5.5in | Radiar f6.8 | $48 or $53 with spring back. |

It was the budget version, in the senses that the plain 3.25x4.25in camera cost $40 with Radiar, $55 with Collinear III and $62.5 with Collinear II.
It was noted on a VP Bergheil in 1927, but used also on bigger sizes. Note that Frerk lists Radiar as a 4glass dialyt, so the design may have changed. It was discontinued by the 1933 list, and only Heliars shown.

**Voigtländer Anastigmat** f6.3, f7.7, f9.0 This was essentially another Triplet from the Voigtar and Triplet group, and may be an earlier name for them. It was listed in 1908.

**Avuskop** seen as an f7.5 135mm lens. This seems to be another triplet but note that Dr Kingslake lists an **Avus** as a reversed Skopar type design with 4 glasses, ie a "rasset" type design. Frerk notices it as a good low priced triplet.

**Vaskar** This was an f4.5 triplet made in 75, 80, 105mm (Layout V 032) for sale after WW2 and was coated and possibly redesigned. It was used on budget priced TLR and folders such as the 6x6cm Perkeo noted in B.J.A. 1953, p252. The definition was described as "good and the negatives ...more than adequately sharp".

| | | |
|---|---|---|
| **Color Lanthar** | f2.8 | 50mm A budget type triplet, with rare earth glass, used on late 35mm cameras. |
| **Lanthar** | f2.8 | 50mm This is thought to be the same. |

Good performance was available from this type of design, especially as the name suggests new glass and a

redesign, and Q033 is a generic for a modern quality triplet. Note the thick glass and near symmetrical layout.
**Lanthom** f2.6 50mm This was seen at No4,626,245 (1958?) in a Prontor SVS shutter (iris f3.5 *sic* - f16) and with front cell focusing from ?Inf to c.1.1m. It seemed to have 3 separate glasses in front of the iris and 1 behind, and the lens is both deep (30mm) and also protrudes well (15mm) in front of the shutter. This would suggest a Q21 type design. It illuminated 24x36mm well and central sharpness was very good though some fall off at the edges seemed to occur. It was used mounted on a 11.5 tube to a Canon 7 camera. Only one example is known and it just may be some type of prototype.

**Heliar: This is really a group of lenses!!**

The Heliar was an in-house anastigmat design and rather important to Voigtländer as a result. It was also fast at a time when speeds were rising. It was first issued in 1900 to a design (Brit Pat No13,441/1902) by Dr Hans Harting (1868-1951) applied for well before the Tessar was published. (Frerk says 'in the office of Dr H Harting, the *regierungsrat*= administrative adviser- which is much the same.') It was "a brilliant anastigmatic objective working at a full aperture of f4.5" in all sizes. Thus it was fast enough to compete with the Zeiss Planar and Dallmeyer Stigmatic as well as the Cooke Triplets, and users noted that the image had a very attractive quality though this is something which is hard to define. It rapidly became a favourite and old examples are still sought after if in good order. Most are in brass, or brass with black enamel, but Eder mentions Voigtländer used Magnalium (aluminium/magnesium alloy) for the barrels of some. The original was essentially a triplet with a thin concave glass capping each of the outer surfaces. But unlike the original triplet, it could be made more nearly symmetrical. (DRPat. 124,934/1900; USPat 716,035; BPat 22,962). Later designs departed from the symmetrical rather more (DRPat 143,889, BPat 13,441/1902) and these are an improvement. It must be noted that Voigtländer went on engraving the original patent number at least to 1914 so it is not a useful guide in purchase of the original type of lens. Rather, the original may be very scarce or not produced as it was overtaken by the later type. It seems that pictures of the late Emperor of Japan with a Heliar lens were so liked that this was subsequently insisted on by him and this has left a legacy interest in this lens in the Orient. This is separate from the demand for the related ApoLanthar which is looked for on purely optical grounds.

*Note* that H.Harting is quoted by R.Kingslake as the author of *"Optics for Photographers",* translated F.R.Fraprie, American Photographic Publishing Co, Boston, 1918. (This has not been seen!) He had previously worked for Zeiss, as Abbe's assistant, and left Voigtländer in 1908 to work in the German Patent Office, and later for Zeiss again.

**(a) Heliar** f4.5 2.0-24in Use 16.5in for 10x8in On sale 1900-1902 onwards. Here coverage is only about 50° and now seems good but more limited in use than some others. They were suggested for use on reflex cameras and for press photography and have been noted on large format press cameras from several makers. In the studio, they were esteemed as portrait lenses, which explains the very large sizes supplied. The small ones were for movie (probably!), stereo (below) and in small hand cameras. Layout V017. This layout shows the modified lens with curved surfaces at 3 and 6, not the first type. The modified type has been seen at Nos 99,93x (1908) in brass and at No139,09x (1917) in black enamel. The negative glasses are light flint and the positives the heaviest baryta crown. (Eder, Jahrb. 1903, p117). It was covered by D.R.P. 124,934 and 143,889. Heliar was listed in 1914 (B.J.A. p1126, 1915-1916 USA list) as follows:
1.375in for 1x1in in the USA (1915).
50mm for 2x1.25in; 62mm for 2x1.5in; 70mm for 2x1.5in; 85mm for 2x2in;
100mm for 2.75x2in; 125mm for 3.5x2.5in; 130mm for 4.25x3.25in;
150mm for 4.75x3.5in; 180mm for 5.5x4in; 210mm for 6x4in;
240mm for 7x5in; 300mm for 8.5x6.5in; 360mm for 9.5x7in;
420mm for 10.5x8.25in; 48in for 12x10in; 60in for 16x12in.
[These sizes are the same as Afalter quotes for German supplies, but the UK advert. says "Angle of view 50° while he quotes 66°]
One outlet for small Heliars was the Stereo-'photoskop and 'flektoscop cameras, where Heliar pairs were noted as follows:
'flektoscop: 804,82x/80870x view: 113,61x/--: 114,44x/--: 89,25x. 643,43x (view), 641,98x (take); (view) 380,06x, (take) 370,97x; (view) 182,21x, (take) 182,61x; (view) 538,93x (take) 496,36x.The Heliars always seem to have sequential numbers.
'photoscop: 115,69x (2x);
Important applications included most of the early Voigtlaender cameras such as Vida, Heliar reflex, Tourist, and Heliar plate camera, with later the Bergheil.

*Fig 004 013 Voigtlaender Heliar f4.5 (l) 24cm No99,93x and (r) 42cm No139,098.*

**(b) Dynar** f5.2, f6.0 4.75in for 3.25x4.25in, 5.5, 6.0, 7.125in Layout V018.
The 1915 USA list has 4.75in for 3.25x4.25in; 5.375in for 3.5x4.5in; 6in for 4x5in; 6.5in for 3.25x5.5in; 7.125in for 5x7in; 8.25in for 6x8in; 10in for 6.5x8.5in; 12in for 10x8in.
The Dynar covers up to 60° and was sold from 1903, and into the 1920's as an f5.5. It was still listed in 1926. It was a cheaper option to the Heliar as an 8.25in Dynar cost $47 in barrel and a 8.25in Heliar cost $68. But it did have the real advantage that the glasses of all sizes of Dynar were available mounted to fit shutters.
After the introduction of the Zeiss Tessar in 1902, Harting would have realized the value of the positive curve in the rear component of the Tessar's design and may have wished to follow it in a revised Heliar, and this was the Dynar which was sold from about 1904. (DRPat 154,911, 124,934, 143,889,USPat 765,000/1903). The Dynar seems also to be covered under the Heliar patents above (eg. D.R.P. 124,934). In fact the Dynar was the better design version and it is surprising that Voigtländer continued to sell both but the Heliar had developed a prestige and mystique, and in practice the Dynar was sold as a slower version, usually in shutters on more modest cameras until the 1920's. This meant the customer had the choice in small sizes and seems to have chosen Heliar, while sales of the large sizes lenses for the portrait and studio business was kept for the Heliar. A late advert. for Dynar was on the Steofotoscope in B.J.A. 1925, p747 where Dynars was the only option. Therefore it is not a very easy lens to find today and can often be overlooked when seen as it is often rather modest in size and appearance. A personal opinion is that it is an easier lens to live with than early Heliars as the angle covered is more normal. Both the examples seen were from 1904-1905 suggesting that sales were initially good but flagged prewar as the Heliar reputation grew. An 18cm f6 Dynar illuminated 10x8 and the corner image at 15ft was probably useful at small apertures, so that the Dynar covered a wider angle in emergencies than the original Heliar.
[Afalter quotes the same foci from Germany, as 12, 13, 15, 18cm, and says the angle covered was 63°.]

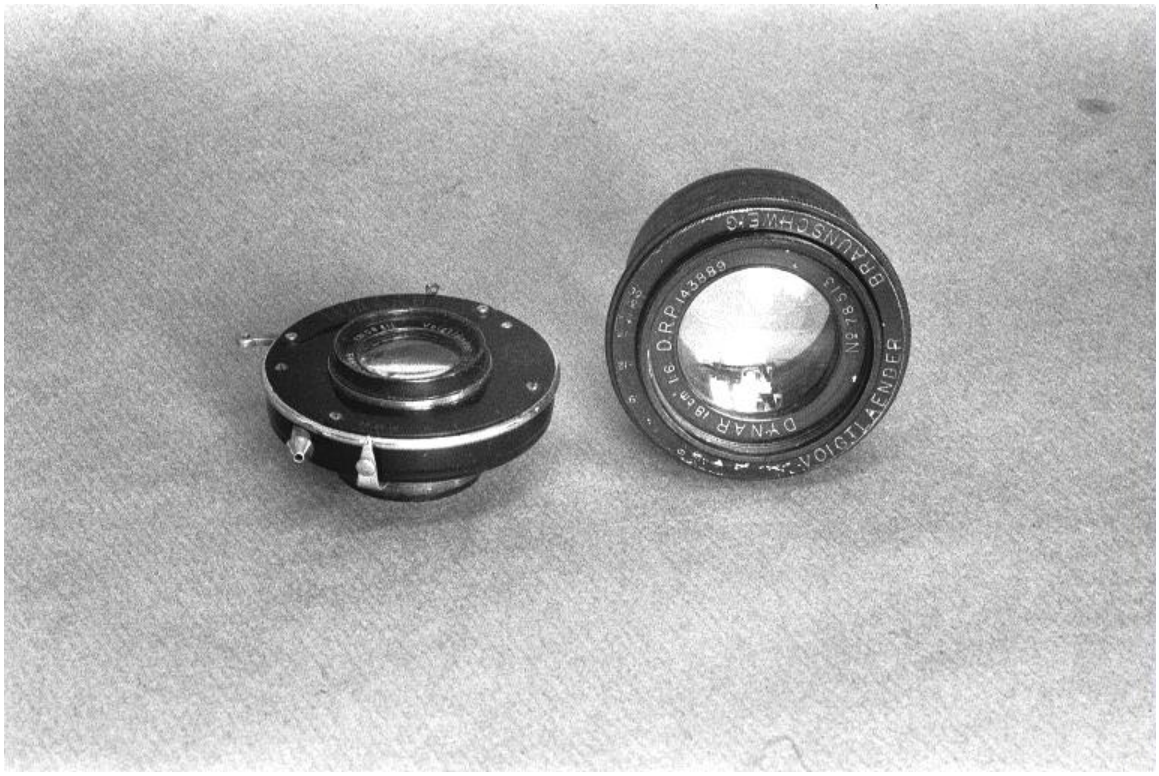

*Fig 004 019 Voigtlaender Dynar f6 in (l)12cm No80,183(1905) and (r)18cm No78,51x (1904).*

**c) Oxyn** f9.0, f15 in longer foci, It was made in 14-36in, and covered 30°.
The USA list has it as:

| | | | |
|---|---|---|---|
| No1 | 14.25in | f9 | 14x14in |
| No2 | 16.5in | f9 | 16x16in |
| No3 | 20in | f10 | 18.5x18.5in |
| No4 | 23.5in | f10 | 22x22in |
| No5 | 31.5in | f11 | 27.5x27.5in. |

It was supplied with Waterhouse stops, in a set of 6 round ones and 5 with square openings. Note the USA list seems to lack the very longest types.
This is an uncommon process lens, at least in the UK, and uses a Heliar type front element and a Dynar rear one. It was made under DRPat 154,910, USPat 766,036/1903 to Layout V 019.
[Afalter quotes the same range of foci, giving formats covered.]

After WW1 the **Dynar** (V021) was short lived and the main product became the **Heliar** (V020) now with a version of the old Dynar layout. A scarce lens was the **Universal Heliar** which kept the old Heliar layout but added a movable centre glass to allow control over the softness. The normal Heliar was offered in two speeds. It now covered a normal angle, such as 105mm for 6x9. It was an excellent lens and used on many of the folders and TLR's as the premium item. Thus it is quite common in smaller sizes to about 135mm but less so in longer sizes.

There was a patent to H. Deser of Voigtländer DRP 636,166/1933 for an improved Heliar type lens using an Oxyn type layout to cover some 52° and glasses G1 +4= 1.6577/51.2; G2 + 3= 1.5813/40.8; G5= 1.6070/40.2, but it is not known if it was made commercialy. (see below under f2.8 Heliar).

**(d) Heliar** Two series were made at different speeds.
f4.5 105, 114, 120, 135, 150, 165, 180, 210, 240mm but larger sizes may have been made. It was coded Series 1 in one list. On the Bergheil 6x9cm, there was an option of Heliar 105mm or 120mm, and of 135mm and 150mm for 9x12cm. This may have merely been a matter of taste! A select version was on the Prominent roll film in 1934. (B.J.A. 1934, p299).
[Afaltar illustrates a **Kart**heliar 48cm 1:4.5 at No223,xxx from the late 1930's where Kart suggests it was used for map making- it seems to mean card, map or chart rather than portrait in German.]
f3.5 105, 120, 135, 150, 165, 180, 210mm (Layout V 022) Coded Series 1

Now it was suggested to use for 9x12cm an f4.5/15cm but an f3.5/165cm lens, so using a focal length equal to the diagonal should be the rule.
These Heliars will be updated designs, quite likely with R.Richter involved, and they were 'new' in B.J.A. 1925, p359. They were initially launched as 3/4in (2cm) to 12in (30cm) and were to cover an angle of 45°. Thus 6.5in was for 3.25x4.25in 1/4plates and 8.25in for 6x4in plates. These were big lenses but not very thick back to front. And were described as exceedingly sharp and brilliant in their definition. [Afalter adds a 70mm version and 240mm and 300mm, the latter being large studio lenses.]

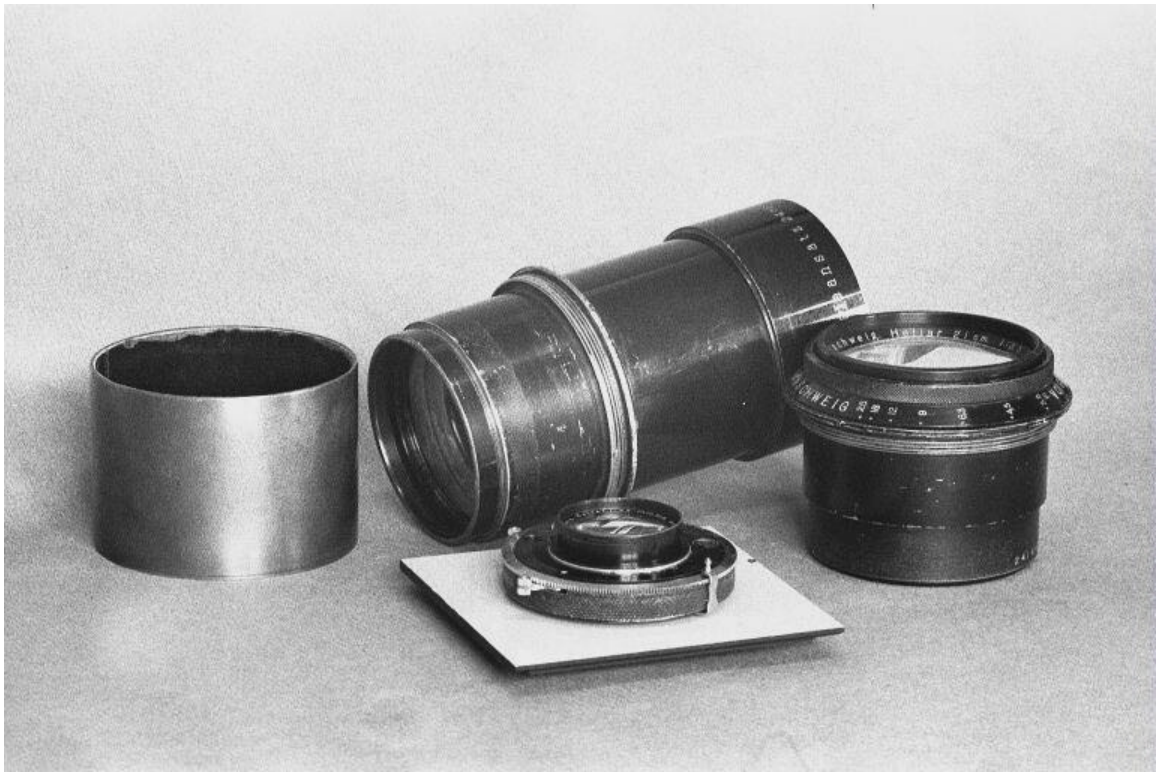

*Fig 004 017 Voigtlaender Heliar f3.5/21cm No241,80x with extended Teleansatz 24cm -126mm (NoNo).*

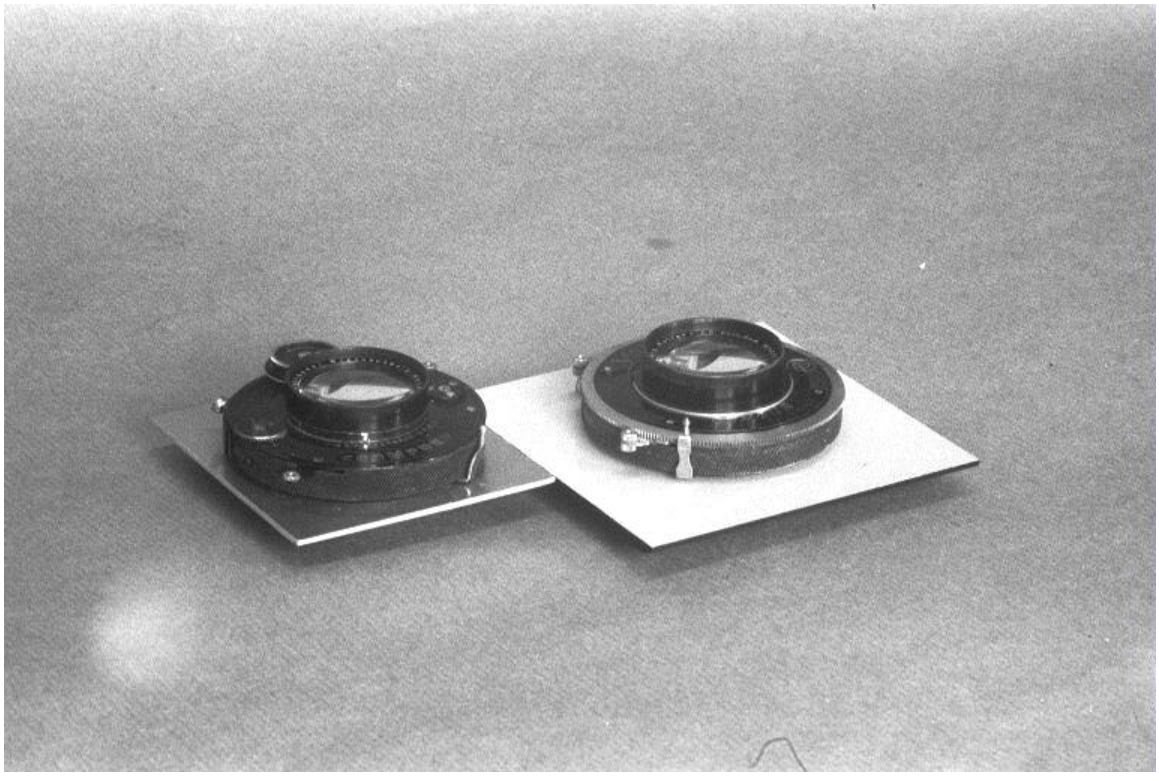

*Fig 004 025 Two Voigtlaender Heliar lenses in shutters (l)f4.5/135mm No359,81x) and (r) f3.5/105mm No637,93x.*

Experience of these Heliars has been very good- they are sharp and cover a good angle- say 114 or even 105mm for 5x4, and are free from ghost images. But contrast in uncoated lenses can seem low, compared to others of similar complexity such as Q15 types. This has been noted in clean f3.5/105 and f4.5/105mm examples, though a f3.5/75mm passed without comment. The difference was noticed especially when several lenses were in use on one roll of film. It may be wise therefore to pay real attention to the lenshood and perhaps curtail the exposure slightly when they are used other than under very favourable conditions. Having said this, the negatives printed well and more easily than very contrasty ones from a multi-coated modern lens. (So there is a moral somewhere!)
Later other focal lengths were added: certainly there was a 75mm for the Bessa 6x6cm and 6x4.5cm but an 80mm has also been noted in an advert. fitted to a 6x9cm Bergheil.
**Heliar for Movie** f4.5 52mm This lens was reported in movie mount, but few details are available. There may have been a 70 or 75mm lens as well. [In fact, Afalter has a list of movie lenses in 35mm, 42mm, 50mm in f4.5 and 30mm, 35mm, 42mm, 50mm in f3.5. These were probably made in small numbers and do not seem to have figured much in UK adverts. One only has been noted, as above.]
**Heliar** f4.5 A later list gives: 75, 105, 135, 150, 180, 210, 240, 300, 360, 420, 480mm. It was then suggested to use 180mm for 5x4in but in fact 150mm was often used. These are fine lenses of traditional type which is a way of saying they may have gone without change for many years.
*Some examples noted are:*
*(a) Bergheil, with green leather: Heliar, f4.5/105mm No446,12x in dialset Compur;*
*No736,51x in rimset;*
*f4.5/120 No803,88x;*
*(b) A famous application was to the rollfilm Prominent at lens Nos 786,85x, 787,09x; 840,92x, 880,18x; 880,475, and 880,76x. These had the same external curves as others, eg at No540,29x so they were probably not a special version.*

*(c) Virtus: f3.5/75mm No 905,57x;*
There is a note in an advert. by Bennett of Oxford St, London W1 in Am. Photo. 04/06/1958 p31 that they had the sale of discontinued f4.5/150mm Heliar lenses in Synchro Compur shutters at £22.50 in factory packing- though they describe them as 5 element which seems incorrect. This is probably the time when Zeiss were switching the factory over to new types of product.

**(e) Universal Heliar** f4.5 This was made (or listed!) in a range of foci from 333-450mm in 1932, and to 480mm in 1929. Actual foci were 300mm for 6.5x8.5in; 360mm for 7x9.5in; 420mm for 10x8in; 480mm for 10x12in in 1926. (B.J.A. 1927, p677) It had adjustable softness arranged on a prominent scale round the front cell, to adjust the position of the centre glass. This was the original Heliar layout (B.J.A. 1926, p335, 705; Advert. Layout V 023). It seems to have initially been as 9.5in for 8.5x5in and 11.75in for 8.25x6.25in. An example noted was a f4.5/48cm No437,63x.
It was still listed well after WW2 from Zeiss Ikon-Voigtlaender. This is one of the high value portrait lenses, probably especially so for modern coated examples in good condition though old ones are still sought after.

(f) About 1920, a small number of **f4.5 Heliar** lenses were made, apparently with a **4-glass Skopar** layout. This may have been before the name Skopar was developed and was seen at No 148,65x on a 120mm f4.5 lens. Several possible explanations have been considered such as a WW1 contract (as they are not engraved Voigtländer), or that they were prototypes before the name Skopar was developed. Or even that they were a bought-in item.

(g) After WW2 the **Heliar** was continued, perhaps without redesign in the larger sizes but coated and as the f4.5 and f3.5 Color Heliar. The f4.5 has been seen in 150mm, 180mm and 210mm, and is said to be also in 240 and 300mm. There were also novel lenses with Heliar layout but new names, such as the ApoLanthar and ApoSkopar.

**Heliar** f2.8 50mm, 105mm? This is shown as a dimensioned drawing in a Compur Rapid 00 shutter on p130 of Pritschow's book, and may have been planned for production about 1942 and never made it due to the War. The layout seems to be conventional Dynar/Heliar type. There have also been adverts in USA seeking a f2.8/105mm lens, and a f2.8 105mm Color Heliar was listed in a B&J list in the 1960's.

**Heliar** f2.8 This is shown as a patent drawing in Merte's article in Pritschow's book as a 1933 patent, to H. Deser of Voigtländer, and has an unsymmetrical "Oxyn" type layout.The aperture is not obvious until compared with Cook's article in Photo Jnl. Oct 1949, p223 where an f2.8 5glass "Oxyn" type lens is discussed. The average field position is quite flat, but there is quite a lot of astigmatism and the spherical aberrations are undercorrected at larger apertures, by about 0.5% but the lens would be set to allow for this and when closed to f8 the depth of field would cover the error up. But Voigtländer may have felt this was not good enough and not made it, or just not had a suitable camera. The proposed glasses were G1=G4= 1.6577/51.4; G2=G3=1.5813/40.8; G5=1.6070/40.2. These do not seem very extreme types so the lens probably could have been made.

**Color Heliar** f3.5 This seems to have been in 105mm only, to layout V 025, or App071. There is a contemporary patent to A.W.Tronnier for a lens of this type in D.R.Pat 888,772,03/09/1953; USPat 2,645,156. It was noted on Bessa II at No3,150,69x and 3,571,96x.

(**h) ApoLanthar** f4.5 105, 150, 210, 300mm (Layout V025)
This seems to be another Tronnier design, and used heavy element glass for excellent color correction. It has a unique reputation for the period (about 1950?). Later examples, probably after 1956, are made with non-radioactive glass and may be preferred though they may not have the slightly warm tone of the originals. It is also faster than many large format lenses which makes it useful in some applications. The rendering of out-of-focus areas is also praised. In 1999, a professional opinion was 'wonderful colour fidelity' throughout the normal format but there is actual colour fringing if you go too far off the well corrected centre image. Do Not push this! Thus good samples continue to sell at high prices comparable to new lenses, often to users in Japan.
Collecting experience shows many heavily used examples, scratched or with balsam faults, and these are now hard to repair.
The most frequent lenses noted at auction are the rare examples mounted on Bessa II models, noted at Nos 3,670,69x, 3,602,97x, 3,602,97x- ie a close group of numbers. This does leave a question open: how a radioactive lens came to be fitted to a folder, where the lens is close to the film when folded. One suggestion is that the customer ordered this version, and it was fitted!

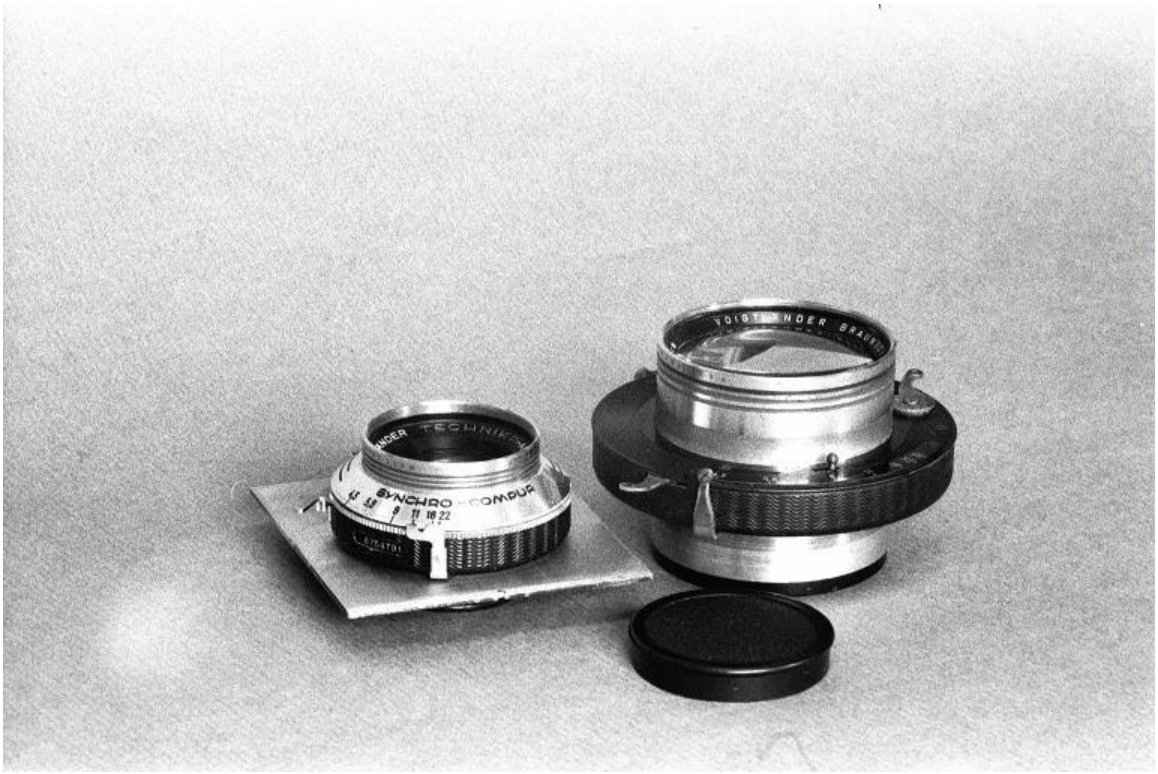


fig *004 015 Voigtlaender ApoLanthar f4.5 105mm No5,159,34x and (r) 210mm No4,688,207 in Compound shutter.*
Non-Bessa **105mm** lenses were noted at Nos 4,444,43x5, 159,34x and 4,088,65x.
Larger **150mm** lenses were noted at Nos 4,022,04x, 3,780,14x, 3,918,85x, 3,841,53x, 3,683,91x, 3,743,19x,

5,577,01x, 8,721,14x
and **210mm** lenses at Nos 3,270,56x, 4,167,35x, and 4,688,20x

**(i)Universal Heliar f4.5** 300, 360, 420mm. This is the traditional adjustable softness lens continued postwar. [Afalter suggests a 210mm was also made.] It was now listed in Compound shutters.

**(j) ApoSkopar** f8.0 75, 150mm
f9.0 210, 300, 450, 600mm.
Inspite of the name, this uses a 5-glass Heliar type layout V 026. and is Heliar related. Small examples are very desirable camera lenses of high sharpness and contrast, and the 210 or 150 would be ideal on a 5x4in camera. It has been seen in barrel mount with a removable front ring which discloses a thread for a prism as used in process work. And in Compound III shutter which seems very big for a lens of this type. Both were f9/210mm and there was nil compatability between them- different cell threads and shutter to flange threads and so on. It was interesting then that the serial numbers (Nos 3,585,47x and 3,585,46x) were very close as if they were imported as one batch but in different styles for different markets eg. as a process lens and as a studio lenses in shutter. There was a small one for the Prominent.

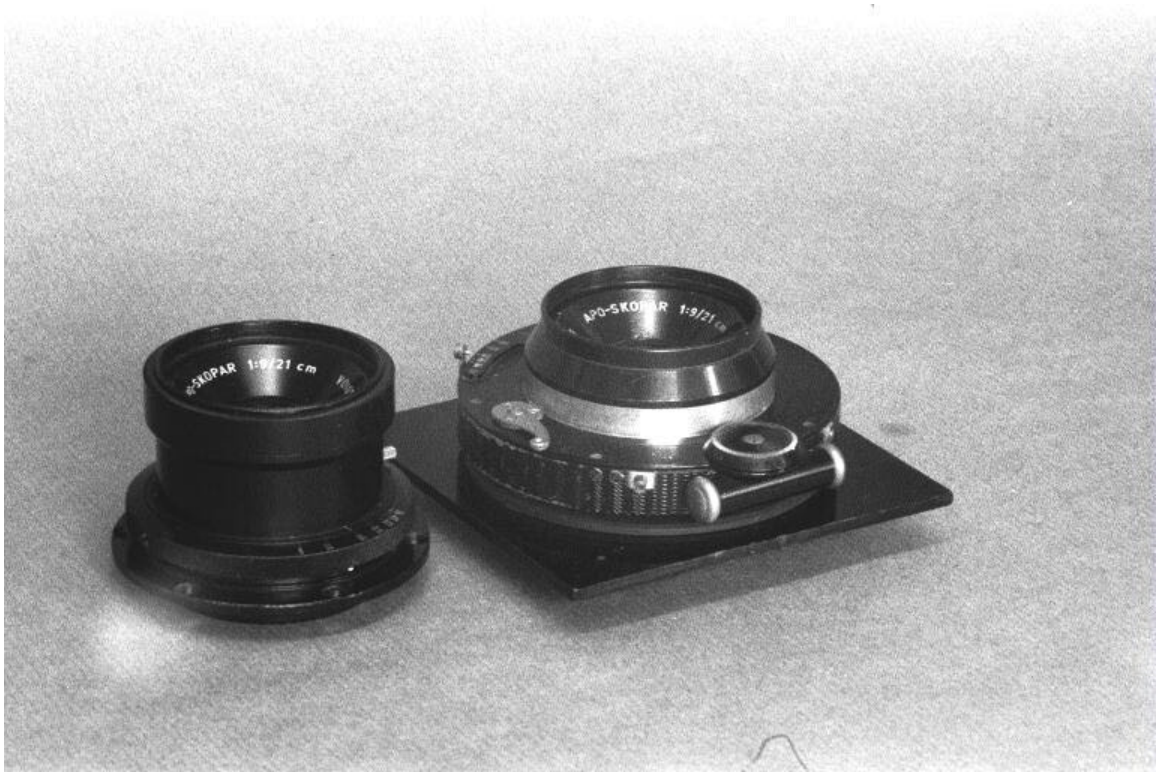

*Fig 004 033 Apo-Skopar lenses f9/210mm in barrel and (r) in Compound shutter.*

**Four Glass Triplets.**
Voigtländer do not seem to have made a 4-glass triplet until after WW1 and probably even then only for the 1927 season. The patent cover on the Zeiss Tessar was effective over part of this period, perhaps until about 1920. Then the curious Heliar (type f) was produced, perhaps as a prototype.

Fig *004 027 Voigtlaender f4.5 Heliar (apparently a 4-glass type) and Projektos projection lens, fc.3 12cm No116,970.*

And once it came (to judge from the adverts.) in 1927, they always had a Skopar in their list. These were really good lenses, especially the f4.5 versions, and were redesigned after WW2 when the Color Skopar was introduced- here the curves are different from the old type. (See also ApoSkopar above.) The coverage seems to be about 55° when given. (Skopar was an "old" trade name, being used pre-1914 for a rifle sight, which probably was de-emphasised in postwar marketing.)

**(Skopar** f6.3 This must be an early and unusual type, possibly in large sizes. There are no details of what may be just a misprint.)

**Skopar** f4.5 50, 55, 80?,83, 105, 114, 135, 150, 165, 180, 210, 240, 300mm. Some of these were for formats now forgotten but then needing a lens to match for size. The 83mm was used for 5x8cm, 105mm for 6x9cm, and the 120mm for 6.5x11cm. Skopar was not normally fitted to Bergheil, but was on premium quality cameras such as the Superb and Virtus, as f4.5 and f3.5 in the last case. The f4.5 layout was V034. A small version was on the Virtus 16-on camera (B.J.A. 1934, p302).

[Afalter does not detail the small versions, but adds a 36cm as the largest- possibly the UK importer did not think sales would pay for the extra print as it would be a very big item to sell in every way!]

**Skopar** f3.5 55, 75, 105mm

These came later, apparently in 1932 for the 1933 season, when they are on the Perkeo 3x4cm as a 55mm lens. (B.J.A. 1933, p588) Later they appeared on most of the rollfilm cameras, but do not seem to have been made in big format sizes to rival the Heliar. The designer was H. Deser and these were standard lenses on Bessa, Virtus and Superb cameras, etc. where 75mm was used for 4.5x6cm and 6x6cm formats, and these were intermediate in price to the Voigtar and Heliar options. They were really good for most purposes. The layout is shown in App072 for a Skopar f3.5. Typically for 55° coverage. Superb was noted in B.J.A. 1934, p296, with Helomar view lens, and Perkeo in B.J.A. 1933, p273, 589advert. with a f4.5, or f3.5 for 3x4cm. There was also a Heliar f3.5 option.

By the 1920's, the Collinear f6.3 was the cheapest option on Bergheil, the Heliar f4.5 being more costly.

**Skopar, cine** f2.7 12.5mm This design was made as a few, possibly only 2 lenses, for the Voigtlaender 8mm cine camera prototypes, eg at Nr 2,068,800, and one model was coded VAG/1938, which is just possibly a date. They were auctioned at Christies' in Dec 1996. But note Ariel reports some of the lenses on prewar Nizo cameras so they were probably was a commercial product then.

**Color Skopar** f3.5 50, 80, 105mm A 150mm was listed by B&J secondhand. (App070)
f2.8 50mm

f2.8 35mm for Vito C folder

The **Color Skopar** seems to have sold from about 1951, with layout V 035. It seems that the new type may be covered by A.W.Tronnier's patents, USPat 2,573,511+2 of 30/10/1951; Fr Pat. 997,736/1949; and the use of higher refractive index glass lead to reduced astigmatism and spherical aberration. The postwar f3.5 Skopar was a very desirable item, sold at a very reasonable price at a time when too many German cameras imported to UK were fitted with 3-glass lenses of big apertures and rather mundane sharpness. As a result the Vito B won many friends for Voigtländer. The later f2.8 was also very good but did not have quite the same position.

**ReproSkopar** f3.5, f9.5 These were for process and enlarging work, and are of uncertain date.
**Avus**: Dr Kingslake refers to this as a reversed layout but no example is known here. [It also does not seem to figure in the Afalter study.]

**Other Lens Types.**
**Pre-WW1 Designs.**

**Zeiss Anastigmats** from 1890-1895 approx. These were made as licencees and the arrangement was rather short lived, perhaps merely while Zeiss were building production capacity to make them at Jena. They may have been restricted to sale in Germany as they have not been met in the UK, except for one auctioned as a part lot at Christies in 1999. Here note Eder's comment that sales of the Anastigmat in Germany were initially slightly disappointing, and note that Afalter does list them.(Some are noted above.)

**Tele-Negative Accessory** These were a 3g/1c negative lens fitted to a tube with a rack and pinion focusing movement and were made in some 6 sizes, coded Nos 1-6, for 3-4x linear magnifications. The example seen was brass finished and optically is a 3-glass negative version of a Kollinear component. The B.J.A. 1928, p361-2 says Dr Adolphe Miethe (c.1860-1927) designed some early telephoto units and U. Afalter "Voigtlaender Kameras and Objective" p209, indicates these were the Voigtlaender teleaccessory units.
An example in brass was seen as No1 at No66,14x, from 1900, and probably matched a 120-135mm lens. It was listed in 1914 as:
Nos 1, 2, 3, 4, 5, 6, but without further detail.
The 1915 USA list has 5 types:

| Number | Positive lens | Negative Lens | Acceptable + lenses | Formats | Extensions |
|---|---|---|---|---|---|
| No1 | for 3.5in positive | -1.25in | 3-4in | 3.25x4.25 to 6.5x8.5in | 3-11in |
| No2 | for 4.75in | -1.25in | 3.5-5.5in | 3.25x4.25 to 8x10in | 5.5-16in |
| No3 | 5.875in | -2in | 5.5-6.5in | 3.25x4.25in to 8x10in | 7-20.5in |
| No4 | 7in | -2.625in | 7-8.5in | 4x5in to 10x12in | 9-26in |
| No5 | 9.25 to 10in | -3.75in | 9.5-12in | 4x5in to 12x14in | 12-32in |

The first two probably differ in the front threads for a lens mount as the optic is the same and this may explain why 3 products are listed where other lists have only 4.
[In contrast, Afalter lists 4 sorts in -33, -51, -67 -97mm in 1910.]
Both of these sources illustrate a unit with the rear barrel and negative lens protruding behind the panel/flange. But in the example seen at No66,14x, the rear cell is fixed at just behind the flange, inside most panels, and the rack moves the prime lens forward relative to it. This may be an older type, or for smaller sizes only. It would be more prone to vibration and less well balanced than the later type. It was supplied in a small leather covered box.


*Fig 004 023 Voigtlaender Tele accesories (l) in brass No66,140 and (r) in black enamel as -12cm No101,496.*

**Special Telephoto Attachment** These were a similar negative with an adjustable or fixed separation. They could be used on hand cameras with 2.5x magnification. These may be the series in black enamel finish. Two sizes were noted in UK, 3 in USA:
(1) for 4.75in prime lenses. This may be the USA listed item for 3.25x4.25in. This seems to be the well known unit.
(2) for 6in prime lenses. This may be the USA listed item for 4x5in.
(3)USA list also has a unit for 3.25x5.5in
Frerk notes the special value of the black Tele-Tubus which fitted *inside* the 'Alpine' camera, for its convenience and balance in this fitting. It gave 2.5x increase in size. It is illustrated, eg. in Afalter's book on p24, and is a much better unit than that above as it is now better balanced- but needs more camera extension, and access to the interior (or a removable panel). It was seen at No101,49x (1909) as (for?) '12cm' at -97mm (focus), while Afalter illustrate the same item as No99,485 (1909). They came in a round leather covered case, marked "Voigtlaender" in gold.

**Rigid Tube Types**
Afalter also lists two rigid tube types: Tube A for 135mm and Tube B for 180mm. It was a big version of these for 210mm which was noted after WW1 as follows.
There was also a very large version in the 1920's for lenses such as the f3.5/210mm Heliar at No241,80x (1925?)(on the Heliar) and the unit is marked "TeleAnsatz 24cm, 126mm" with no serial number so it was probably designed for a slightly longer lens and is -126mm focus. It differs since the unit is in front of the panel and the Heliar is on a push-pull movement. This was probably used as a rough focusing device with the cameras rack work used for fine focus. It is a really useable item especially if stopped down somewhat.

**Post WW1 Designs.**
A factory history says 1925 was "the start of large scale production"- this can only suggest a change in methods and mass production techniques since Voigtländer were well established by then, to put it mildly. By then W. Schade had left (he designed for Voigtländer late pre-war) but Richter may have been responsible for the new designs.These seem rather numerous as if an active group had spent some years modernizing the product line. Among the telephotos, the special **Tele attachment** seems to have continued. Thus the "126mm" example above was seen matched to a **Heliar** f3.5 21cm lens at No 241,80x (1925) and in fact proved to be a useful combination. But they are now unusual items. Like most makers, Voigtlaender was now making fixed separation telephotos of greater speed.

**Kino-TeleAnastigmat** f4.5 eg for 23.4cm This was made in 145, 200, 234mm with Layout V 036, App077. This can be seen as a reversed Skopar with some imagination! Or as a Petzval type with increased separation of the glasses. It is probably the same as the next item. It was covered by D.R.P. 444,150, the same patent as the f6.3 Tele-Dynar. It was noted about 1926, for movie use.
**TeleDynar** f4.5 This seems to be the same again under another name. (Layout V 008) But Frerk in Germany distinguishes carefully this 4-glass 2+1+1 design from T/Dynar, and says it was issued in March 1925 in apertures f4.5 and f6.3, so Voigtländer were selling two f6.3 series. He confirms the f4.5 was primarily for movie use, and a narrow angle lens, made in 14.5, 20, 23.4cm as above. It was covered by D.R.P. 444,150, at least in the f6.3 version.

**TeleDynar** f6.3 This was made in 140 for 6x9cm, 200 for 6x9cm, 250 or 255 for 9x12cm, 290 for 9x12cm, and 320mm for 10x15cm. Bellows extensions were respectively:100mm, 140mm, 180mm, 200mm, 225mm. In the B.J.A. 1926, p355, p705advert.;1927, p677, and 1931, these were 5.5, 7.875, 10, 11.375, 12.625in).
Both 4 and 5-glass versions may have existed. They were often made to exchange with the lens cells on Bergheil or Avus cameras, and in fact the adverts list these cells only in all sizes (B.J.A, 1931, p590) (Layout V 038) and this can make a purchase today an uncertain one as they can be hard to rematch to old Compur or Compound shutters especially as they are often highly priced items on the collector market. One contributor (M.Glanfield) points out that Dial and Rimset Compurs, and Ibsor shutters were involved as well as Skopar and Heliar prime lenses, all tending to increase the range of fittings possible. The answer should be to record the fitting with the Dynar but this is often absent, and even the original leather case is scarce.
This was a very compact lens, the 11.5in version having only 3in overall length. Often they used about the same infinity setting as the prime lens they replaced, so they could be used on small plate cameras with limited extension. It was also available separately in Compur shutters and these could be a wiser purchase today. (B.J.A. 1926, p355). The f6.3 was a 2+1+2 design of 5 glasses and 3 components, and matched the Dynar at least in number- and the design actually resembles Dynar to some extent. Frerk list it as 25.5 or 29cm for 9x12cm, and in 14, 20, 25.5, 29, 32cm. (D.R.P. 444,150)

**Heliostigmat**
This seems to be one lens product with slightly different descriptions for small and big versions.

**Cine Heliostigmat = Kino Heliostigmat f2.5** in 35, 42, 50, 75, 100mm or 1.375, 1.625, 2.0, 3.0, 4.0in. The layout here is very similar to V 037and it covers 35° only. It was noted in B.J.A. 1927, p334, 677advert., where the author writes as if the large format version was familiar to him and welcomes these smaller versions of large aperture and pleasing definition. They are not detailed in the adverts. which do treat the small as versions of the large ones. Covering power was good and most or all could be used on movie 35mm film and the 4in was suitable for miniature plates, ie. ?VP. This seems to be another "rasset" or reversed Skopar and was still made in 1930. It may have been developed under H. Deser's German Patent No 444,150/1925 which gave two examples, the second covering some 37°. It used glass G1=1.6143/56.4; G2+4= 1.6462/33.9; G3= 1.5835/41.9.
**Heliostigmat f2.5** This was made in 21 and 33.5cm (8.25 and 13.25in) for portraiture on 1/4 and 1/2plate respectively, as the Portrait Heliostigmat to cover 30°. (B.J.A. 1927, p331, 677advert.) It was described as sharp, colour corrected and especially good for child photography. It may now seem forgotten, but in 1926, was one of the fastest and earliest big lenses on the market- after the f2 Ruo and f2 Ernostar but much more of an achievement than is now realized. Thus the range of foci will divide into short movie lenses and long portrait lenses. The overall range seems to be:

f2.5 32-280 or 335mm [*Note Afalter says 210 and 315mm in Germany]*

This was also used as a projection lens. At least the projection version was made for a long period up to 1930 or later. Layout was V 037.

**W.Z. Enlarging Lens f8** This was a soft focus lens of periscopic 2 glass layout (roughly Ste 002) supplied in the 1920's @ £3.25 (a modest price), and listed by Frerk and others. It was made only in f8/7in(=18cm) and is fairly small at 2.25in dia and 1.25in long. (B.J.A. 1926, p337, 706) Note that this use at the enlarging stage is technically the wrong point to introduce softness and does raise a point. Possibly it was just that it was low priced and sold. Thus an auction list has a **18cm W.Z. taking** lens listed at No230,23x on a Miral Reflex camera for 5.5x3.5in which itself looks older than this but it may be a retrofit of the above type of lens. And this is in line with the entry in Afalter's book which shows it as a black finished lens with iris and easy to use

on a camera. This Miral was by Talbot & Eamer who Channing and Dunn date as flourishing 1884-1923, but perhaps making Mirals mainly about 1900-1914. So there is a possibility that the W.Z. may have been initially a camera lens and then continued for enlarging? or just swapped over? Well, Afalter also says it was for enlarging- so that was what Voigtlaender intended.)
Two points do occur here.
One is why W.Z? The German seems to be Weichzeichner for soft focus, but the capitalization seems unneeded. An option just might be that a local photographer Walter Zilly played a part in the development. See photo credit in Frerk, 'Lichtbildkunde', Tafel (Fig) 2 p443 approx. to Walter Zilly-Braunschweig for pictures taken with a 'Tele-Dynar f6.3'.
Secondly, it is a periscopic layout, and there is a hint that Voigtlaender made a few in cooperation with Steinheil about 1870, and it seems possible that it existed as a continuing product but one supplied on request rather than being advertised untill this new use was found.

**Rectifier/Magnifier** This was 'new' in B.J.A. 1927, p321 and had both a magnifier on a tube to examine the ground glass screen but also a roof prism which could reverse the image locally either vertically or horizontally by rotating it.
**Projectos** This series of Petzval projection lenses (2 + 1+1 type) was issued and noted in B.J.A. 1927, p307 and came in barrel diameters of 2.4375in (61.91mm); 2.0625in (52.38mm) and 1.625in (41.275mm), and in each diameter there were more than a score of different focal lengths.Thus an appropriate lens can be chosen. The smallest is standard size for cine projectors and ranged from 2-8in, all at £2.10

**WW2**
In WW2, items were marked ddx.
Brunswick was bombed in Jan 1944 and again in 13 August. The Voigtlaender plant will have suffered some damage but seems to have survived as a working concern.
The plant was visited after the War by the B.I.O.S. team and they reported that the labour force was 1600 during the war, and 1300 after it, the persons visited being Herr Oehme, Managing Director, Herr Meixner, Works Manager, Herr Nolte, Commercial Manager, and Prof Pahlitzsch, Technical. The general offices were at Campestrasse, and the plant at Gliesmarode, a suburb. Some 700 polishing spindles were in use, and a first class f3.5 4-glass anastigmat could be made with 30min labour time, (cost below 1 shilling English), and could sell at 19.2Rms. At the time, the company said there were no patents of real value, and it was judged that innovation had been aimed at the production methods rather than at novelty, though the company said there were plans to make Contax-fit lenses, as 36mm/f3.5; 50mm, f3.5,f1.4; 75mm/ f3.5; 105mm/ f4.5; 200mm/f4.5, as well as a 8mm camera and projector. (This may have involved to some extent a diversion operation! But prototypes of the 8mm cameras at least existed as mentioned above under "Skopar f2.7" and it may have been a specialized cine product.) There had been an attempt to design a 35mm camera prewar, using both Leica and Contax features, but this had been dropped. The works was described as well equipped, and used diamond cutting wheels 'Diametal' from Dr W. Mueller and ground glasses to predetermined thickness using one blank with a known thickness ground in as a marker per tool using iron oxide as abrasive. There were no criticisms of quality as had been made by an earlier BIOS visit.

**Other Post WW2 items.**
*Voigtländer was an independant firm in the Schering group to 1956, when it became part of Carl Zeiss and later the Brunswick plant was used to source Zeiss photographic lenses. Later it was transferred to Zeiss Ikon. Production ended with the transfer of lens making largely to the Orient. The payroll was given as 2,600 in 1957.*
These postwar lenses will normally be antireflection coated. Voigtländer coatings were hard and the lenses are usually still in good condition. But it is worth checking on purchase, especially on early or well used equipment. ApoLanthar in particular seems to suffer, due to heavy use and possibly to its softer special glass.
**Telomar** f5.5 This was made in 100, 180, 240, 360, 450. It was a large format tele often in Compur shutters. The layout was a 2+1+1+1 type. This is a sought after type and commands a premium to other use lenses. The layout in App075 may be one version but has a cemented rear pair. *This is the normal product, sold for large format cameras and even it is comparatively scarce.*
**Telomar** f5.5 for reflex housing, supplying 100-350mm focal lengths according to one list, another source says it was made in f4.7, 150mm; f4.7 227mm. (Layout V 039) Perhaps two series existed and included the next item.
**Telomar** f4.8 145mm This was made for 6x6cm as a Prototype only.

**R-Nokton X-Ray Recording Lens** A rare f1.5-f0.85 series for up to 150mm for recording X-Ray fluorescent traces onto 70mm and other film which was near or in contact with the rear glass. A high speed lens of up to f1.2 was revealed in A.W.Tronnier's USPat. 2,861,500 and may be one of this group. These do not seem to have sold in the UK but have been seen in Germany. [Afalter illustrates one of the cameras.]

**Ultragon** This was a Voigtländer wide angle lens, made in several specifications. Coverage was for up to 90°. These are rare and very desirable use and collector items. It seems to be a Gauss with a front simplified [rather as in the Unilite, Planar or Xenotar]. It does not seem to have sold in the UK possibly due to production being mainly before imports were easy from Germany. Large format lenses tended to be deemphasized after the formation of Zeiss Ikon-Voigtlaender in 1956 at about the time this might have sold.
f5.5 115mm for 9x12cm to cover 90°.
f4.5 60 and 80mm for 6x9cm and 9x12cm respectively. These were listed for the Linhof Super Technika 111 about 1950.
*[The trade name Ultragon seems to have been used elsewhere for a process or technical lens.]*

**Postwar 35mm Lenses, etc.**
**Ultron**
This was a new postwar series based on Gauss designs. By collating the patents and BIOS reports, it does seem that A.W.Tronnier was responsible here. The result was typically a top class f2 lens, but there were several products under the name**.**

**Ultron** f2.3 90mm A prototype designed for the TLR protype (Modern Photo. 02/1964). Sadly this camera was not put into production.
**Ultron** f2.0 50mm Layout V 041 This was a novel air-spaced 6-glass Gauss type. The designer was probably A.W.Tronnier (USPat 2,627,204+5/03/02/1953.) It was used on the Prominent, Vito 111, Vitessa and was prototypic in Leica mount from about 1950 or 1949, ie. it is quite early postwar. The extra air- space was no problem once coating had been developed, and the separate surfaces allowed more freedom to the designer in correcting the lens- in fact something for nothing! It was a real trend setter and this air-space is now regularly used by designers in advanced designs. (Note Tronnier had shown a preference for this type of layout in 1936 or so for Schneider Xenon designs.) But note the details vary, even for Prominent mounted lenses. At Nr3,163,824, the lens has a black surround to the front glas. An example for Prominent at Nr3,265,xxx has the front glass surround in matt white metal, ("white face") and the same very bright blue coating, and sliding retainer catch as the previous lens- this catch and coat colour are probably a good guide to an 'early' Prominent lens. (MCM May 1950) as the pale blue coat and sliding catch seem to be "normal" on early lenses but the lack surround is not: the very first do seem to have had a black surround, which went and came back again! One comment is that serial number is not always a guide to the order of manufacture. These took 47mm filters, and the next type added a piano key type retainer catch. Other external black paint sections also were applied, eg at the front and rear of the mounts. Also later lenses in addition take 49mm filters as well as 47mm.
**Ultron** f1.9 A prototype Vito 111 with this lens No6,299,87x was sold at auction in 1997. The lens was not numbered.
**Repro Ultron** This was for close-up work on the Prominent.
**Ergon** f2.0 50mm? for Vito 111. This was a prototype for the Ultron/Vito combination.

**Nokton**
This was the ultra speed Gauss, in a version designed to give good back clearance. It really only exists as the lens for the Prominent but note the small print.
**Nokton** f 1.5 50mm This was normally for Prominent, also occasionally for Leica and Contax. With 7-glasses, the type was probably related to USPat 2,646,721/1953; 2,662,447/1953. It was a Gauss in layout, V042. This was standard on the Prominent and this type is fairly easy to find. Rare versions were sold in USA (mainly) for M39 and won many friends as the best f1.5 available in the late 1950's. [Afalter mentions it was also mounted for SLR's Exakta and M42.]
It was a fine design and still is. It was this Gauss design Zeiss chose for the Contax 1V prototypes probably as a result both of its quality and compact rear glass. It has a rear clearance at infinity of about 33mm, so it clears the M39 flange at 28.8mm. (But it must have been hard to fit to SLR cameras. The Exakta examined would need about 37mm clearance to be quite free of the mirror, although it would be a little less in the centre of the frame. It is possible the mirror was slightly cut to reduce the clearance needed, or the camera was used only in close-up. But Nokton is not really a lens for the SLR.) This was seen for Prominent at Nr3,339,63x,

3,785,xxx, 4,001,85x and is a much more advanced product than the Ultron above. Coating is brown + violet for example and the surround is black, and the catch is hinged. It was new on the Prominent at the May 1951 Photokina (MCM 5/1951). Nokton also was made in the white face version like the Ultron. A dating point is that cameras after June 1951 were fitted with SynchroCompur shutters. (Before that they were Compur Rapids.)

*Note that early Prominent cameras did not have a fully standardized register and that care may be needed in exchanging some early lenses.They were introduced to the public as a unnamed prototype at the Koln Fair in 1950 (MCM June 1950) with 50mm f1.5, f2.0, f3.5 lenses as well as a 24mm wide angle and a 100mm f5.5 Telomar. The report suggests the Telomar was a surprise, with the rear component behind the reflex and interchangeable 150mm front cell but this may be a misunderstanding. Early Prominent lenses can be unsual in coating colour (pale blue), type of lock to secure on the body and a Nokton with a stud in the top of the mount has been reported- just possibly to position a close-up device. It is thought that it is the standard lenses which have most of these unusual features. This may be the result of the exchange lenses having been delayed by a year or so, few being produced before 1953. A possible cause would e shortages, eg of new glasses or other materials or the need to finalize the designs, eg of the coupling. This probably means that the Angenieux Retrofocus has a more real priority as an inverted tele than the dates of announcement would suggest.*

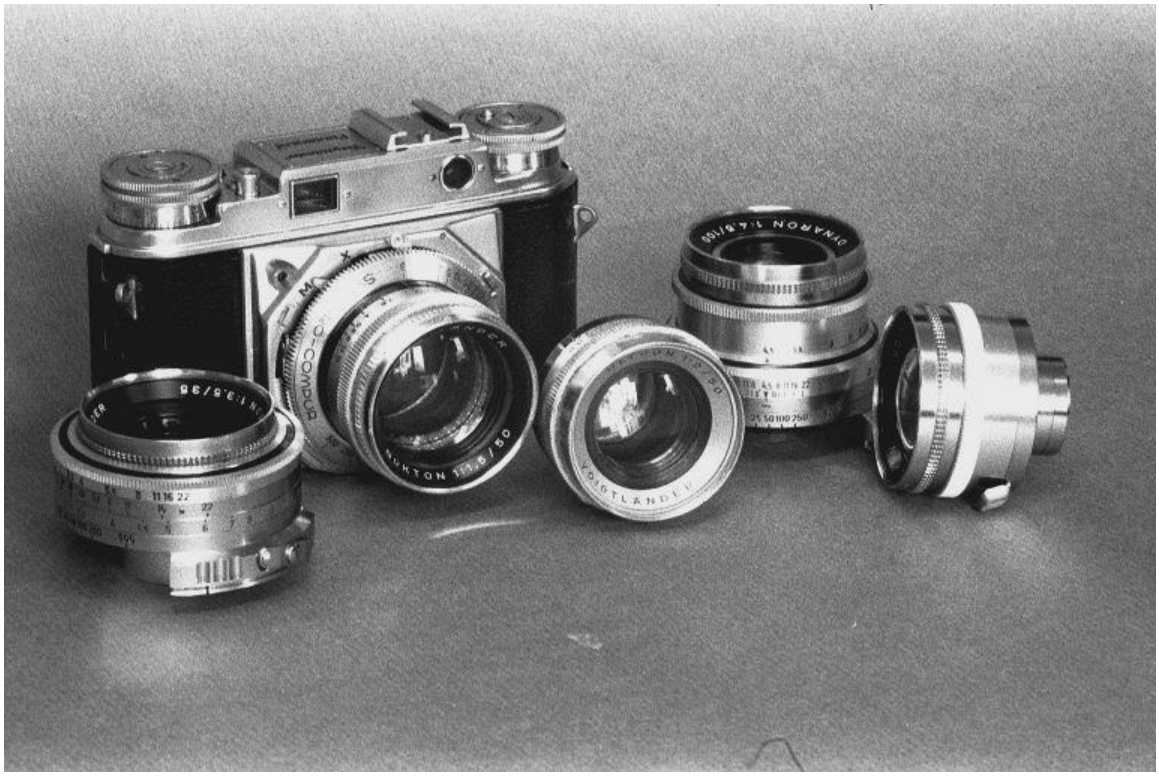


*Fig 004 029 Voigtlaender Prominent outfit with Skoparon, Nokton f1.5 (2x), Ultron f2, and Dynaron.*

**Septon** f2.0 50mm for Bessamatic, and Ultramatic. The layout (App076) seems to be an extension of the Ultron with an extra glass to compound glass 3, and is a very desirable and sought after Voigtlaender lens. However, several have been noted with balsam faults eg in No5,659,09x, so it is an item to inspect with care on purchase. The problem seems to occur in front of the iris and may partly result from exposure of the lenses to sunlight during display in dealers windows before sale. Septon is often found on Ultramatics.

*Fig 004 031 Bessamatic outfit with Skoparex, f2.8 Skopar X, Septon f2 and Dynarex.*

(**Anon)** f0.95 60mm for an SLR prototype which was designed but never sold. The prototype was shown in Modern. Photo. 02/1964.
**Repro Skopar** for Prominent for copying work.

**Skoparon** f3.5 35mm for Prominent. This is a 5-glass retrofocus design, and in 1951 among the first for a 35mm still camera. The retrofocus design idea was known in movie circles from TTH use on Technicolor cameras before WW2; and other retrofocus designs were in use, especially for sub-standard cine such as 16mm, examples being lenses from, it is thought, J.Schneider in the Cinegon and Angenieux in the Retrofocus. But Angenieux and Voigtländer about dead-heated in their use for still 35mm and started a trend, especially as Voigtländer had planted a definite marker with the 24mm Ultragon for 94° which was shown for Prominent at Photokina in 1950, albeit as a prototype. (MCM, 6/1950, p349, S. Bowler). But see note above on delays in the supply of Prominent fitting lenses.
*Thus the Prominent lenses are f3.5/35mm Skoparon (common), f2.0/50mm Ultron (common), f1.5/50mm Nokton (common), f3.5/50mm Color-Skopar (common), the ReproSkopar (rare?), f4.5/100mm Dynaron (common), f5.5/100mm Telomar (rare), f4.5/150mm Super Dynaron (rare) and Ultragon f5.8/24mm (prototypic). Tentatively, the most abundant is the f1.5 Nokton, a very desirable lens.*
**Color Skoparex** f3.5 50mm This was a prototype lens, sold on Prominent at auction 1997.
**Color Skoparex** f2.3 40mm on VF 135 (1970's?)
**Lanthar** f5.6 24mm on Vitoret 110 EL.
**Skoparex** f3.4 35mm This was a 6-glass retrofocus design for Bessamatic. (Probably App073)
**Skopagon** f2.0 35mm This was a 9-glass retrofocus design for Bessamatic. (Probably App074)
**Skoparet** f3.5 35mm for Vitessa T.
**Color Skopar** f2.8 40mm for Vf 101 in 1974.
**Ultragon** f5.8 24mm A 5-glass strongly retrofocus design which was prototypic for use on the Prominent with a Reflex Housing. It was never offered commercially and seems an "odd" item as a 24mm lens did not really need a reflex unit to focus it. Was this not designed for the Voigtländer SLR for which an f0.95 and f1.2 were contemplated? Certainly it was not the same type of design as the large format Ultragons above.

**Dynaron** f4.5 100mm Telephoto for Prominent This may be from USPat 2,662,446/15/12/1953. [A correspondent has said there is either an error in one of these long lens entries or an extra item but so far the question has not been resolved.]
**Super Dynaron** f4.5 150mm This is added as possibly the missing item: it was probably seen an

*uncoupled* longer lens in the 1970's which then was a hard-to-sell item.
**Telomar** f5.5 100mm This was as prototype or at least very rare on the Prominent I reflex unit. It normally seems to have a chrome surround to the glass, even at No3.6million, as if parts had remained in stock here long after the white faced Ultron and Nokton were all made up, numbered, and sold. [Afalter also notes a prototypic **Telomar** f5.5/180mm].
**Dynaret** f4.8 100mm This was for Vitessa T (Layout V 044).
**Dynarex** f3.4 90mm ] These are both 6-glass designs.
**Dynaret** f4.8 100mm]
**Super Dynaret** f4.0 135mm, also f4.5, 150mm, also f4.0, 200mm.
**Super Dynaron** as above or partly.

**Zoomar** f2.8 36-82mm Zoom. The designer was Dr Back see Modern Photo, 1975/7.
This was introduced in 1958 for the Bessamatic (Instructions 296/46 09-13 A / 459 Oe for Exakta fit suggests April 1959 for this version) and some were sold for other cameras such as Alpa, Exakta M42 and Retina Reflex. The latter type use a spring wound auto release system coupled to the camera by a flexible cable which has two entry points for left (Exakta) and right release cameras and which may have required special adjustment for depth of release action. The camera mount was retained at the back by 3 screws and looks to be easy to change and was an extra in some lists. The bucket type case seen was ex-Perrin California and the production may have been related to Zoomar Corp interests. These were listed by Heaton in the UK for some years (1960-1963) but sales eg at Nr4,834,64x, must have been limited by the price (£160 approx.) Two really different designs for this lens have been published in Cox, Kingslake and in Modern Photo. There is a suggestion that the design was revised several times and the relative numbers are still unknown. Modern Photo and Cox show lenses with a flat front surface and this is certainly the normal type in the makers 1959 leaflet (296/46 09-13A/459 Oe) and offered for sale today. Prof. Kingslake's drawing shows one with a convex front and this has also been seen though it is rarer.


Fig *004 021 Voigtlaender Zoomars (l) for Exakta No4,834,49x and (r) Bessamatic f2.8 36-82mm No4,849,22x.*
Zoomar is a notable feature, eg at auction, and serial numbers noted have been Nos4,871,05x, 4,849,22x; 4,849,22x, 4,912,67x, 4,912,30x, 4,933,97x, 4,934,41x, 4,985,12x, 4,985,63x and 6,820,47x; but it is not known which if any are curved front.
The basic idea may go back to R. Richter of Zeiss in 1937. (Layouts: Flat front V 046; Convex, V 047). A moving giant model was a feature of the stand at Photokina in Oct 1960.
The Russian Rubin-1 zoom is very like, and even fits the same bayonet. Mr Rees of the Voigtlaender Verein allowed a comparison of the reflections in a Rubin and a real Zoomar, and they were very alike, even in number

and position, etc. but there did seem to be an extra faint one in front of the iris in the Rubin which may just be a difference in the handling of a cemented surface as to coat or R.I. difference, as the drawing seems to be the same layout as the flat front zoomar. The Rubin uses a helical movement for the zoom action.
Some of the background to the Zoomar design by Dr Back may be in J.S.M.P.E. 12/1946, p464 and B.J.A. 1948, p141, althought the printer has attributed it to 'Black'. He is describing zoom lenses with full compensation with strictly linear displacements of the lens cells.

**Lenses in M39**

Voigtlaender produced its new designs ahead of the opposition after the War, and as a result at times was arguably ahead of the major system camera makers. They offered quite a number of f1.5/50mm Nokton lenses about 1950 in USA and probably gave the M39 market quite a surprise as these were probably the best lenses of this speed then made. They also made a few prototypic f1.9 and f2/50mm lenses but may have never sold comercially. And M.J.Small suggests they also made a f3.5/105mm lens, again possibly prototypic. (See also Bessa series below!)

**For Bessamatic and Ultramatic** These will be German made lenses.

| | | | |
|---|---|---|---|
| **Ultragon** | f5.8 | 24mm | Prototype, above. |
| **Skoparex** | f3.4 | 35mm | |
| **Skopagon** | f2.0 | 40mm | |
| **Color Skopar** | f2.8 | 50mm | This is actually a Color Skopar X, and this may indicate either the mounting or still another redesign- or both! |
| **Septon** | f2.0 | 50mm | |
| **Dynarex** | f3.4 | 90mm | |
| **Dynarex** | f3.8 | 100mm | |
| **Super Dynarex** | f4.0 | 135mm | |
| **Super Dynarex** | f4.0 | 200mm | |
| **Super Dynarex** | f5.6 | 350mm | |
| **Zoomar** | f2.8 | 36-82mm | |

**Late items for Icarex SLR.** This was a Zeiss Ikon-Voigtlaender product.

| | | | |
|---|---|---|---|
| **Color Pantar** | f2.8 | 50mm | These were a 3-glass triplet type. |
| **Ultron** | f1.8 | 50mm | Early types had a concave front glass to improve corrections. It was a version of the Gauss layout. |
| | f1.8 | 50mm | Later type are normal convex front and were a Gauss 6-glass. |
| **Skoparex** | f3.4 | 35mm | This was a retrofocus type lens. |
| **Dynarex** | f3.4 | 90mm | |
| **Super Dynarex** | f4.0 | 135mm | |
| **Telomar** | f5.0 | 400mm | This was a high quality 3-glass triplet.(Modern Photo 03/1963). |

One suggestion is that a few **Zoomar** f2.8 36-82mm lenses were also offered initially.
The last ZI-V Icarex was the Icarex SL 706 which was marketed in France by a dealer as the Ifbaflex and these had an **Ifbaflex** f1.8/50mm lens, presumably a ZI-V Planar or Ultron under another name, as the mount seems to be very close to the German lens.

**For VSL1 from Singapore**

| | | | |
|---|---|---|---|
| **Color Skoparex** | f2.8 | 25mm | |
| **Color Skoparex** | f2.8 | 35mm | |
| **Ultron** | f1.8 | 50mm | This probably should be Color Ultron. One list also quotes a f2.0/50mm version. |
| **Color Ultron** | f1.4 | 55mm | for VSL 3. |
| **Color Dynarex** | f2.5 | 85mm | |

Another list gives f2.8/85mm

| | | | |
|---|---|---|---|
| **Color Dynarex** | f4.0 | 135mm | |
| **Color Dynarex** | f4.0 | 200mm | |
| **Fish Eye** | f3.5 | 14mm | This was a full frame type for 180° about 1980. |

**Movie and Cine**

Voigtlaender lenses were used periodically although the company seems only once to have entered the camera market, and actually never really developed a presence. Ariel's list has a very early Darling camera

with a Euryscope f7.7/38mm for 17.5mm from 1899/1900, as well as a projector with a f2.5/34mm lens, probably a Petzval of the faster type. Several small Euryscopes have been noted in the UK, normally f7.7/50mm for movie or possibly for macrophotography. Later from a 1908 Pathe, Ariel lists a Heliar f4.5/51mm and then has two Scopar (sic) f2.7 12.5 and f2.8/50mm lenses on a 1936 Nizo 8mm camera. Ariel also refers to a Voigtlaender prototype camera for 8mm dating from about 1945 with the f2.7 Skopar above and this may be the one in the BIOS report.

**Bessa-L and R for 35mm.**

In 1998, a new Voigtlaender camera appeared (review: Amateur Photographer 01 May 1999) with a rigid non-reflex body with M39x28.8mm mount and register, supplied with two lenses and matching finders. The lenses were also sold with bayonet adapters. It was extended in 2000 with a Bessa-R rangefinder version [which about dead-heated with the launch of the Konica Hexar in bayonet mount]. Some of the background came out in Amateur Photo 07/10/2000 p5 where it was noted that Mr Hirofumi Kobayashi President of Cosina designed the first 15mm optic himself and then launched the programme built round it. By 10/2000 they began to offer the lenses in other ways. Thus the f2.5/125mm 11g/9c macro ApoLanthar was to be for most of the older manual 35mm SLRs

**Heliar** f5.6 12mm This was promised at £597 in Sept 2000. It was in black or chrome and came with a matching finder. The review in Am. Photo 23/09/2000 said it was a rather special wideangle to cover 110° horizontally and it is nearly rectilinear, with only minor distortion. There was said to be some vignetting at above f9.2, with corner illumination down about 70%. (This actually seems slight given the angle covered to the corner of 120° or 60° defined as the angle A° away from the axis- or the half angle covered. Here cosA is 0.500 so cos2A is 0.25 and cos4A is 0.0625. It used to be thought a designer was doing well to increase illumination to cos3A, here 0.125 or 12.5% while the Am Photo reports 30% is actually being acheived here.

**Heliar** f4.5 15mm aspheric, sold at £264 with finder, in black or chrome. This is a deep-sunk lens with limited rear clearance, complex in design, and again startlingly good performance. It was one of the early ones, in 1999.

**Snapshot Skopar** f4.0 25mm This is said to be a surprisingly simple retrofocus type with a startlingly good performance. The example noted was in chrome but black was available by AD2000.

The next are in AD2000 (Am. Photo. 22/01/2000 p6)

**Ultron** f1.9 28mm This from 12/2000 was for L39 mount with 9g/7c inc aspherical.s

**Skopar** f2.5 35mm This optic came in 2 versions of the mount, as a 'classic' in black or chrome, at £220, or as a 'pancake' in black at £176.

**Ultron** f1.7 35mm This was in black or chrome in AD2000.

**Nokton** f1.5 50mm in black finish; later it was in black or chrome in AD2000

**Color Heliar** f2.5 75mm This was in black or chrome in AD2000 at £264.

**ApoLanthar** f3.5 90mm This was for M39 screw with 6g/5c from late AD2000. See review by J.Harrison and S.Bell in Am. Photo 07/04/2001 p55 who note the fine machining and centering of an excellent lens. It was amde in silver or black and had a 10 blade iris.

**ApoLanthar Macro** f2.5 125mm for use to 1:1 with manual SLRs.

These are clearly new designs with no Braunschweig connexion but maintaining a great tradition, and the short foci mean there is no problem in focusing. The camera may be derived from a microscope or other recording camera. The series has since been extended with longer lenses.

**Lens Designers**

Who designed lenses for Voigtländer? Such lists are hard to make, and will omit worthy candidates but this is a first attempt, inspite of these limitations. More information on personnel would be welcome.

J. Petzval about 1840, designed: Portrait and Orthoscop

H. Zincke-Sommer, much of the 19C, especially on: Petzvals and Euryscops

Voigtländer: same.

[G. Nawrocki, 1879 on Petzval Patent]

H. Scheffler: Kollinear.

D. Kaempfer: Kollinear.

Dr Adolph Miethe, q.v. He is credited with the teleaccessory.

H. Harting: Heliar, Dynar, Oxyn.

W.E.Schade: about 1910-1914.

R.Richter: 1914-1923. Kollinear f6.3

Deser, about 1933: f2.8 Heliar?
A.W.Tronnier: post 1945? Ultron? Nokton?
R.H.Naumann: 1945-1954.
At the end of WW2, the BIOS team recorded the following personnel:
Herr Adolphe Oemer, Managing Director, (not listed initially).
Herr Stocker, Works Manager, later replaced by Herr Meixner.
Herr Nolte, Commercial Manager (later).
Prof Pahlitzsch, Chief Technician (=Technical Director?)
Dr. Zollner, Optical Department. (early postwar?)
Herr Baumgartner, Designer. (early postwar?)
Herr Fridolin Berthel worked in the computer design work at an early stage.

Landmark Voigtländer lenses must include the Petzval Portrait and Orthoscop, possibly the Euryscop and Kollinear and some of the modern lenses are very desirable such as Nokton, Ultron, and ApoLanthar, and note that the Skoparon is a dead heat for a "retrofocus first" for 35mm still photography.

## **Vrederborch** Kamerawerk, Nordenham, Germany.

**Nordinar Anastigmat** f3.5/45mm on a Felicette L.

## Vogel, Philadelphia, USA.

They have been noted for a 9in brass lens with Waterhouse stops. Also, a **'Vogel' portrait** lens was noted at auction on a J.Taylor, Sheffield 1/1plate camera.

## **Voyager** Imaging System

The imaging system on the Voyager in B.J.P. 24/11/1978, p1022 is given as :
f3.5 200mm
f8.5 1500mm
No makers name was given.