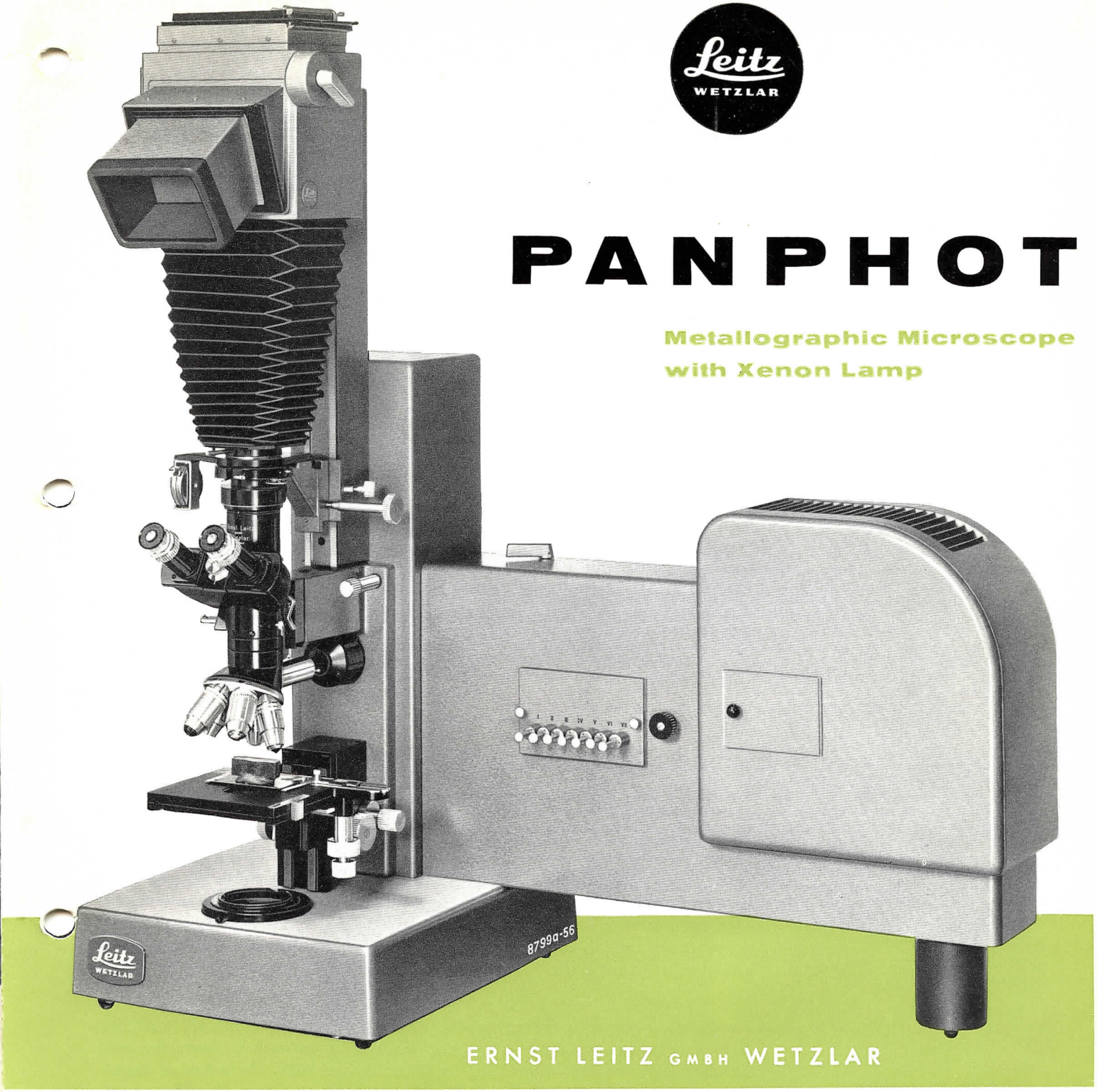
PANPHOT

Metallographic Microscope with Xenon Lamp



ERNST LEITZ GMBH WETZLAR

Photomicrographic apparatus of vertical design for technological investigations
Vertical illuminator with parfocal objectives on revolving nosepiece
Change of standard magnifications without change of eyepiece
Photographic tube with binocular or monocular observation tube
Instantaneous change-over from visual observation to photography
Vertical camera without the interposition of reflecting elements for optimum image quality and short exposure times
Alternative illumination arrangement with filament and Xenon lamps
Unrivalled adaptability, also for microscopy in transmitted light

56 – 10c / Engl.

PANPHOT

The PANPHOT® is a large universal microscope with illuminating arrangement and camera designed for visual observation and photomicrography. As a table unit of the vertical type it takes up relatively little space. It is operated from a convenient working position and permits the use of every kind of optical illumination and methods of investigation in transmitted or incident light. In photomicrography, the direct light path from specimen to photographic emulsion is a notable feature excluding any adverse effect on definition due to deflection. By the avoidance of reflection losses, short exposure times are possible even of weakly reflecting specimens and at high magnifications.

The specimen is placed on the microscope stage with its polished and etched surface facing upwards. **The entire surface of the specimen including the marginal zones can be directly viewed during the examination,** a great advantage in the search for important areas of the polished surface, such as cracks, welding seams, and inclusions. The alignment of such features of special interest in the field of view is rendered even easier by the pencil of rays emerging from the objective, which makes the area to be examined clearly visible as a light-spot. Levelling of the polished surface by means of the hand press forming part of the equipment requires only a few seconds' preparation per specimen, and it is possible to make rapid series of investigations of any number of specimens, as an adjustable stop on the hand press ensures a uniform specimen height.

The optical equipment comprises special systems for metallography suitably graduated in their magnifications and apertures. The range of magnifications covers the usual metallographic **standard values** 50x, 100x, 200x, 500x and 1000x. The individual magnifications are obtained simply by rotating the revolving nosepiece. The total magnification set on the instrument can be read from the front of the revolving nosepiece.

The **alternative illumination arrangement** permits a direct change-over from the **filament lamp** (prefocus 12 volts 60 watts low-voltage lamp) to the **Xenon discharge lamp.** The advantage of this illuminating arrangement lies in the fact that optimum centring of the light beam is preserved when changing from one light source to the other. The Xenon lamp is superior to the conventional carbon arc lamp both in its light output and its operating characteristics. The colour of its light, approximating very closely that of daylight (which is a mixture between direct sunlight and diffuse sky light) is independent of variations in the mains voltage. The current is supplied through a mains rectifier with built-in ignition device. Thus, the Xenon lamp, which is immediately ready for use, is run on d.c., and instantaneous and ciné exposures can be taken without adverse effects from a.c. frequencies.

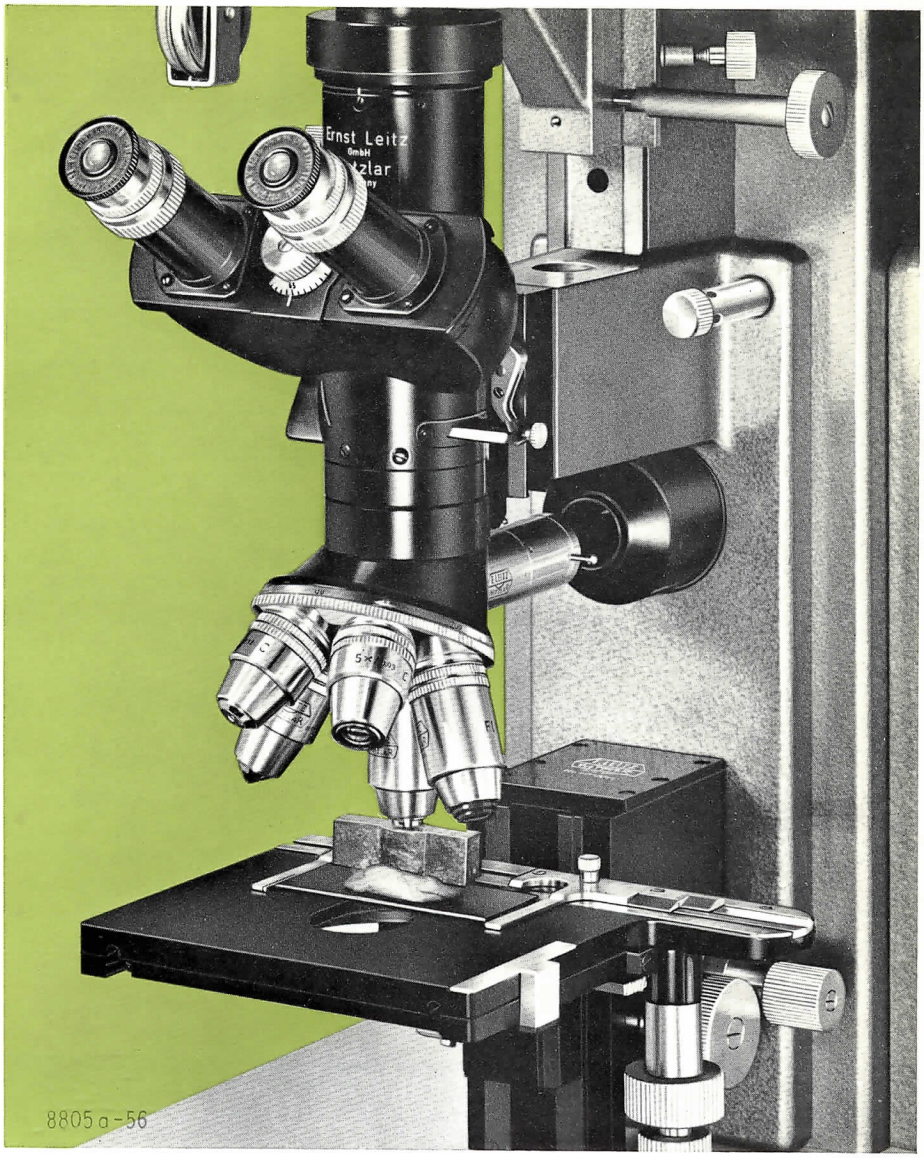
® = registred trade-mark.

Technical Description

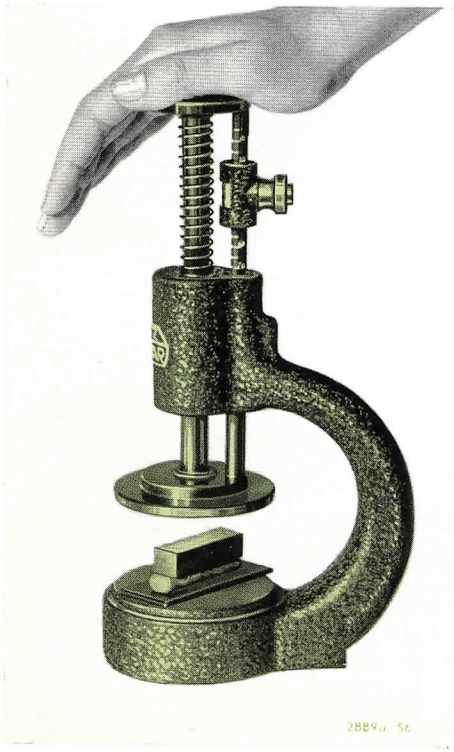
Base with alternative illumination

The base of the PANPHOT enables the entire equipment to be set up free from vibration by using a resilient plate for this purpose. The base is provided with changing devices for camera, microscope, and light sources, and arranged for the alternative use of transmitted and incident light. The lamp holder fitted at the side has been designed for two different light sources to be used as required. It incorporates a 12 volts 60 watts lamp, used with either a ground glass screen, daylight or yellow-green filter, and a high-intensity 150 watts Xenon lamp, which are both easily accessible from the operating position and can be used alternatively as desired. Built-in photographic filters can be introduced as required into the light beam, either singly or in combination, at the touch of a button. The microscope proper is mounted on a detachable bracket. Coarse focusing by rack-and-pinion and fine focusing by means of a micrometer motion on ball-bearings actuate on the vertical adjustment of the object stage, convenient controls being situated on both sides. This makes it possible to use the **phase contrast incident light attachment,** which has proved so successful on the METALLUX® microscope, in addition to the ordinary vertical illuminator. The detachable, square mechanical stage is equipped with coaxial low-set controls for transverse adjustment of the specimen, as well as scales and verniers.

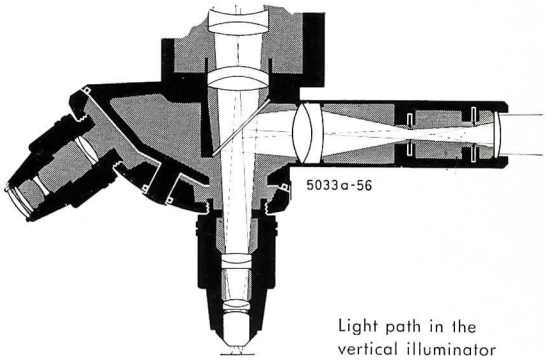
The illuminating light is directed into the objective by means of the vertical illuminator through a variable aperture diaphragm and a highly reflecting plane glass. Five parfocal objectives are provided on a revolving nosepiece. The interchangeable photographic tube FS incorporates inclined binocular eyepiece tubes for visual observation and an upright photo-tube. The changeover from visual observation to photography is effected by pushing the deflecting prism for visual observation out of the light path.



Microscope part of the PANPHOT



Hand press for levelling the polished surface



Light path in the vertical illuminator

The illuminating system

The instrument is equipped with a combined filament and Xenon lamp alternative illumination, which offers all the advantages as a modern photomicrographic illuminating system. The 12 volts 60 watts filament lamp serves as light source for visual observation; its intensity can be adjusted to suit the observer's eye according to the reflective power of the object under examination and the degree of magnification employed. For photography, on the other hand, the Xenon lamp with its exceptional light intensity has been designed. The lamphouse of the 150 watts Xenon lamp is fitted with a condenser, filter holders and igniting unit. The double-walled lamphouse has been designed sufficiently large to ensure effective ventilation. For safety reasons the interior of the lamphouse is only accessible after first removing the plug at the back of the lamphouse (automatic lock). The changeover between the two types of illumination is achieved simply by swinging in or out a small deflecting mirror.

Camera

The **variable 9x12 cm. reflex bellows camera*** has a rack-and-pinion focusing control for macrophotography, time and instantaneous shutter synchronized for flash, cable release, tape measure to determine the bellows extension, two ground glass screens, a clear glass screen, two metal darkslides with adapters for 6.5x9 cm. or 4¼"x3¼", and a focusing magnifier. The generally accepted standard magnifications of 50x, 100x, 200x, 500x, 1000x which are obtained during visual observation with the 10x PERIPLAN® eyepieces, are achieved in photomicrography with the variable bellows camera and the photographic eyepiece N 6.3x at bellows extension of 336 mm.

Instead of the 9x12 cm. bellows camera, it is also possible to supply a **bellows camera with rotating frame for dark slides 5"x4".** The rotating frame enables the darkslides to be arranged in any required position to the specimen and thus to make the best use of the negative format. The darkslide frame of the bellows and of the reflex attachment permit the darkslides mainly in current international use to be employed and the adoption of the Polaroid Land method by which high grade prints on paper can be produced in about 10 seconds. The image is focused on a ground glass screen provided with diagonally arranged strips of clear glass.

An intermediate frame for a single book-type darkslide with adapters for the 6.5x9 cm. or 4¼"x3¼" format is included in the outfit.

To obtain the standard magnification in photomicrography we supply the following attachments without bellows extensions:

Fully automatic microscope camera ORTHOMAT® for picture frame 24x36 mm. on 35 mm. film. Determination of exposure and operation of camera are fully automatic. The range of exposure times is practically unlimited; it covers all tasks likely to occur in photomicrography from speeds of 1/100 sec. to time exposures of long duration (for details see list 54–20).

NORMKAM plate camera with a 6.5x9 cm. darkslide, time and instantaneous shutter with cable release and built-in photographic eyepiece.

Micro reflex attachment with focusing magnifier, double release, intermediate adapter ⅓x, central shutter with lateral focusing telescope and light-screening ring. Any LEICA® body with lens changing thread can be used on the micro reflex attachment. For M-model LEICA cameras a reflex attachment with bayonet or a bayonet adapter is required.

Equipment for photographing general features

For photographing general features of polished specimens, a combination of a special object stage and the following two systems is used:

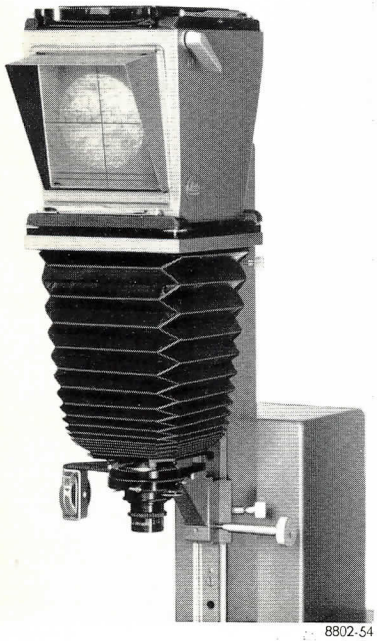
a) General survey illuminator for specimens up to 10 mm. object field in conjunction with the MILAR 50 mm. objective for 9 to 12x magnification.

b) General survey illuminator for specimens up to 60 mm. object field in conjunction with the SUMMAR 12 cm. objective for 2½ to 3x magnification.

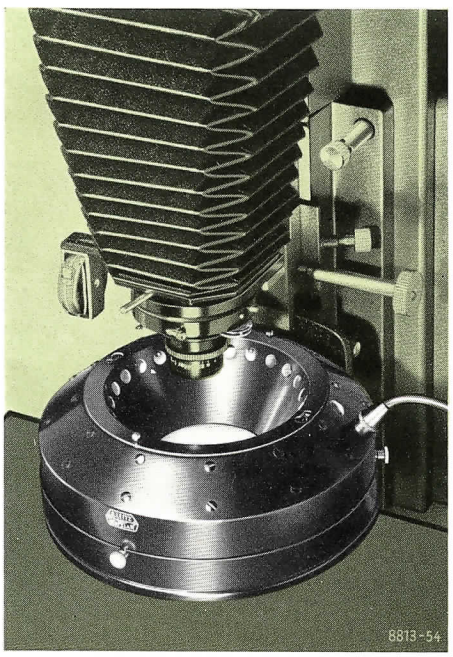
Macrophotography

Macrophotographs of metal fracture surfaces, machine parts, work pieces etc. can be taken within the range of 10x magnification to natural-size reproduction. The photographic lenses of various focal lenghts available for this purpose are screwed directly into the camera, while the object is placed on an attachable macro stage. A ring illuminator is used to light the objects; it permits shadowless illumination as well as special lighting effects. (See adjacent illustration).

* The 9x12 cm. variable reflex camera is normally used for photomicrography. To obtain 24x36 mm. photographs on 35 mm. film, the LEICA is used in conjunction with the micro reflex attachment and LEICA bellows.



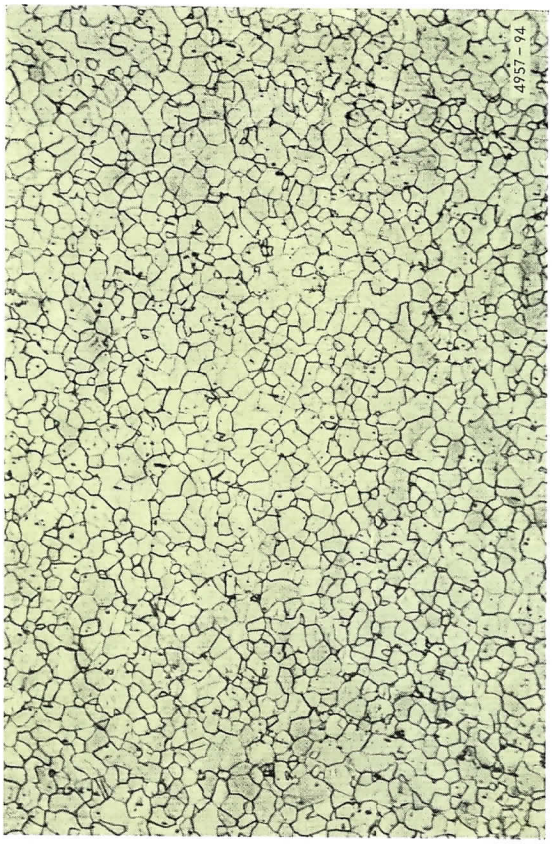
Bellows camera with international back and rotating darkslide frame with outfit for low-power photography



Macro ring illuminator on PANPHOT



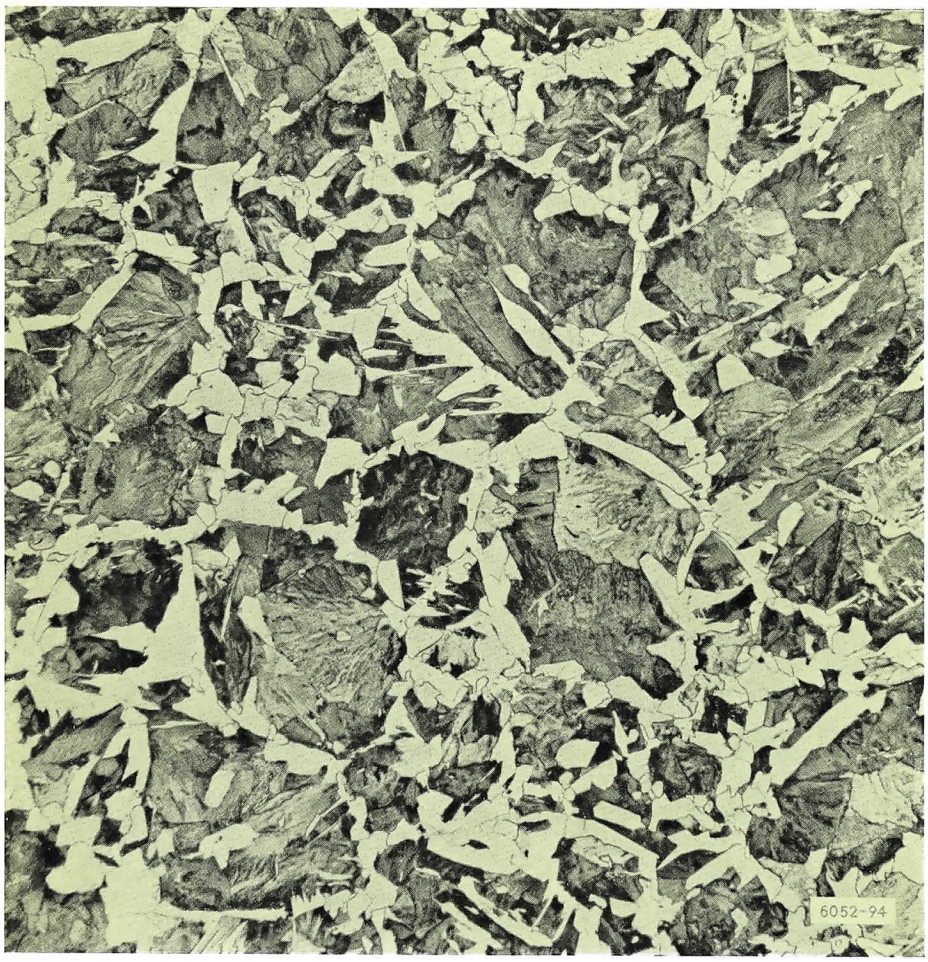
Cast iron 500x, Fl 50x/0.85 objective
photographic eyepiece N 6.3 x h.



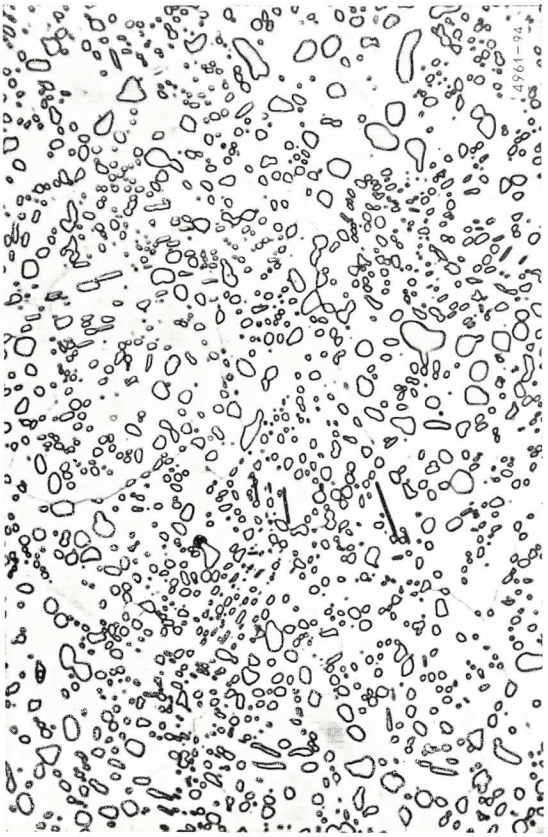
Sheet iron 50x, 5x/0.09 objective,
photographic eyepiece N 6.3 x m.



Al-Si alloy 200x, 20x/0.35 objective,
photographic eyepiece N 6.3 x m.



Steel casting 360x
20x/0.35 objective
photographic eyepiece N 6.3 x m.



Steel, granular perlite, with 0.5% Cr, 1000x,
Fl Öl 100x/1.36 objective,
photographic eyepiece N 6.3 x h.



Chilled casting 1000x,
Fl 100x/0.95 objective,
photographic eyepiece N 6.3 x h.

Design subject to alterations without notice.

ERNST LEITZ
GMBH
WETZLAR
GERMANY

Subsidiary:
Ernst Leitz (Canada) Ltd.,
Midland, Ontario

List **56–10c**/Engl.
Printed in Germany
I/65/LX/L