

Macrophotography



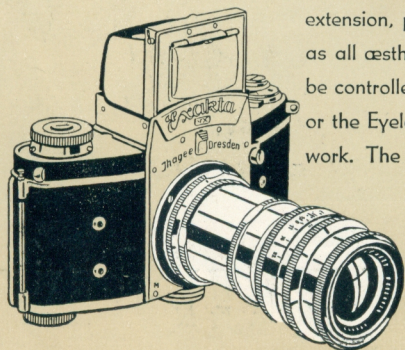
Photomicrography



Head of cockchafer, Dr. Commer, Koeln

Great Magnification of small Objects

for scientists: a professional necessity - for amateurs: an interesting hobby - for the EXAKTA VX camera (as well as for all previous 35 mm EXAKTA models) no problem whatever as to technique and cost. The ground-glass image is always identical with the future picture; there is no parallax even if close-ups are taken at shortest distances. Every reduction of the distance between camera and subject - and this holds true for the EXAKTA as well for any other camera - results in an increase in the distance between lens and filmplane. All one has to do is to increase the lens extension by entirely mechanical means. When working with increased extension, picture area and sharpness, depth of field and color, as well as all æsthetic factors contributing to a carefully composed close-up, can be controlled by the enlarged ground-glass image in the reflex-finder-hood or the Eyelevel Penta Prism (see page 5) as if doing regular photographic work. The ground-glass image is always identical with the picture on the film, since both are formed by one and the same lens. The EXAKTA does not require any auxiliary optical focusing equipment for close-up work, a remarkable feature also from an economic point of view.





Queen of the Night, C. Michel, Nossen

Increase of Extension

is effected by the simplest possible means. It permits to focus down from the range of the lens helical focusing mount to any shorter distance and to obtain any scale of reproduction desired (see Tables page 4). Bayonet Adapter Rings or any number of additional Extension Tubes can be inserted between the interchangeable lens and the EXAKTA body. Consequently, the extension can always be adapted to the working distance at a moment's notice, while the lens helical focusing mount still allows of critical focusing.

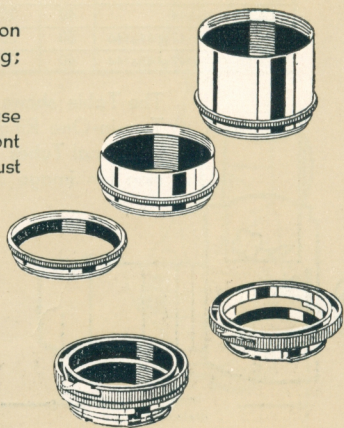
The following accessories are available:

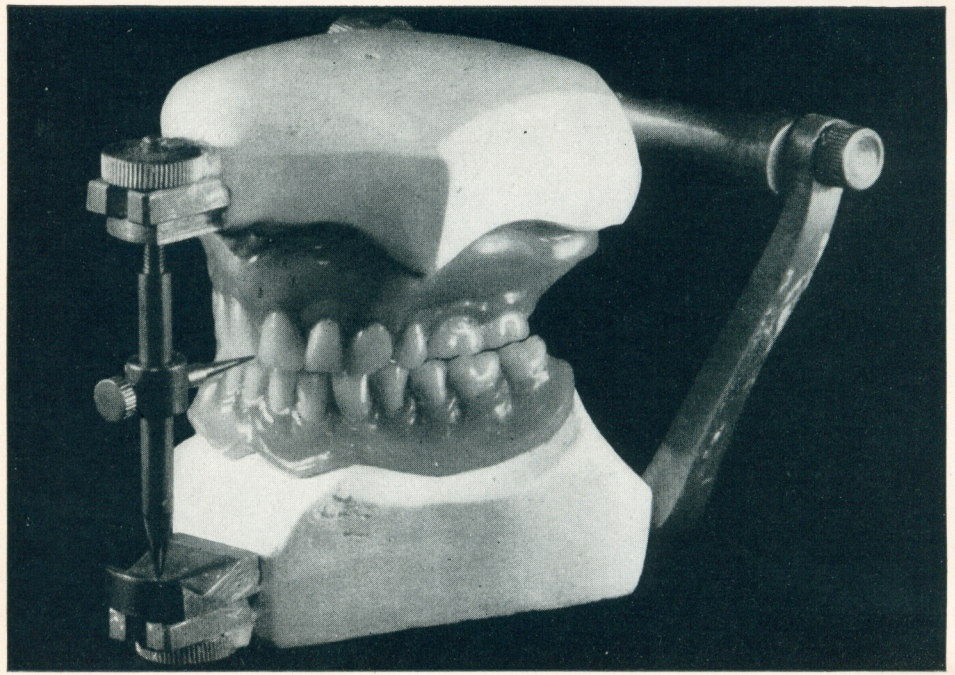
Two-in-One Ring No. 146: It permits the shortest possible extension increase of 5 mm ($\approx \frac{3}{16}$ in.). It is inserted into the camera lens mounting; its front part accepts the lens.

Pair of Bayonet Adapter Rings Nos. 139/141: Extension increase of 10 mm ($\approx \frac{3}{8}$ in.). The back ring is inserted into the camera, the front ring accepts the lens. The two Rings are used screwed together; they must be separated in order to use the

Three Extension Tubes, which have screw threads at both ends. These are supplied in three sizes: No. 142 - 5 mm $\approx \frac{3}{16}$ in.; No. 143 - 15 mm $\approx \frac{19}{32}$ in.; No. 144 - 30 mm $\approx 1\frac{11}{64}$ in., and can be used in any combination, but not without the Bayonet Rings Nos. 139/141. - **The Bayonet Adapter Rings Nos. 139/141 and the Extension Tubes Nos. 142-144** are therefore supplied only as a complete set.

(The above accessories fit also all previous 35 mm EXAKTA models).





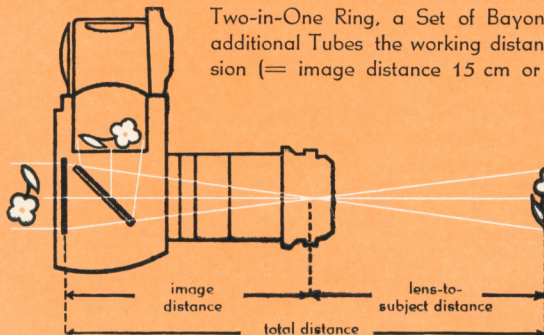
Set of artificial teeth, W. Wurst, Dresden

Extension Tubes Calculated for (description of Nos. see page 3)	extension mm	for 50 mm lenses					for 58 mm lenses				
		total dist. mm	image dist. mm	lens-to- subject dist. mm	exposure factor	scale of repro- duction	total dist. mm	image dist. mm	lens-to- subject dist. mm	exposure factor	scale of repro- duction
No. 146	5	605	55	550	1,2	0,1	794	63	731	1,2	0,09
Nos. 139/141	10	360	60	300	1,5	0,2	462	68	394	1,4	0,17
Nos. 139/141+142	15	282	65	217	1,7	0,3	355	73	282	1,6	0,26
Nos. 139/141+142+146	20	245	70	175	2,0	0,4	304	78	226	1,8	0,35
Nos. 139/141+143	25	225	75	150	2,3	0,5	275	83	192	2,1	0,43
Nos. 139/141+142+143	30	213	80	133	2,6	0,6	258	88	170	2,3	0,52
Nos. 139/141+142+143+146	35	206	85	121	2,9	0,7	247	93	154	2,6	0,60
Nos. 139/141+144	40	203	90	113	3,3	0,8	240	98	142	2,9	0,69
Nos. 139/141+142+144+146	50	200	100	100	4,0	1,0	233	108	125	3,5	0,86
Nos. 139/141+142+143+144	60	202	110	92	4,9	1,2	232	118	114	4,2	1,03

The Table shows distances and scales of reproduction which can be obtained with the Two-in-One Ring, a Set of Bayonet Adapter Rings and Extension Tubes. By using additional Tubes the working distance can be further reduced so that with triple extension (= image distance 15 cm or 17.4 cm) two times magnification will be obtained.

The above figures are calculated for 50 mm and 58 mm lenses focused at infinity. Intermediate values can be obtained by using the lens helical focusing mount. - Increase in image distance requires increase in exposure time; hence the exposure factors. -

Scale of reproduction 0,8 = ratio of size of subject on film (0,8) to its actual size (1).





A Guinea-pig? No! Potato buds, W. Berke, Dresden

The Scope of Macrophotography

Things at which we look very close or even with a magnifying glass, require photographic reproduction from short distances. With its extension tubes the EXAKTA camera meets a wide variety of important requirements of scientific and industrial fields as well as of the work of professional photographers of all kinds. Copy work (pictures, documents, stamps, etc.) is basically simple close-up work. Things that may interest the scientist from a professional point of view, attract the amateur photographer because of their pictorial qualities: insects, flowers, plants, minerals, coins. Nor should the thrill of table-tops be omitted; in this connection. And, finally, the most important part of this kind of work, tiny and insignificant common objects will assume a new and striking appearance when taken at close range and greatly enlarged. With the 35 mm EXAKTA in color macrophotographs can be successfully taken without any effort, since the reflex image shows the true natural colors of the subject.

It goes without saying that any lens may be used with the Extension Tubes. Wide-angle lenses permit shorter working distances, long-focus lenses longer ones; provided that the scale of reproduction remains unaltered. Both possibilities are important. The image can be inspected by the two alternative viewing and focusing devices: the finder-hood for subjects near the ground and when using a tripod (static macrophotography), the Penta Prism for subjects at eye-level and for moving subjects (dynamic macrophotography).



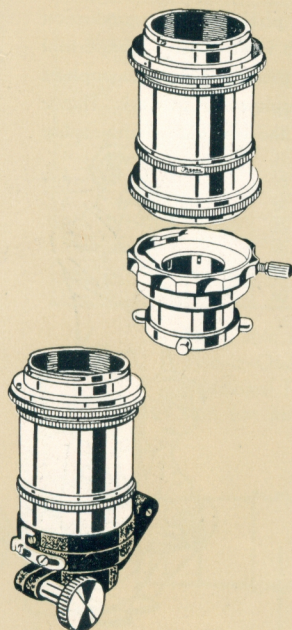


Head of Ephemera larva, Dr. Koelling, Jena

In Photomicrography

the 35 mm EXAKTA replaces any expensive special equipment. The economic 35 mm film (black-and-white and in color), is widely used for serial shots in photomicrography on account of the short exposure times required. The camera is attached to the microscope with either of the two Microscope Attachments. All the advantages of the EXAKTA (true reflex focusing, freedom from parallax) are fully utilized, Photomicrographic work is done without the camera lens, i. e. the microscopic image is projected into the EXAKTA where it is visible on the ground-glass screen for viewing and focusing. The ground-glass image permits the composition not only of the exact picture area, but also of the decisive moment of exposure (essential for photographs of living objects). There are several special focusing glasses available (see page 8) which represent an invaluable aid in photomicrography. Let us stress the basic fact again: The ground-glass image of the EXAKTA and the future picture are always identical even when taking photomicrographs!

Successful photomicrography requires a microscope whose optical equipment is adapted to this field of work. The usual objectives and oculars of compound microscopes generally have a curved field which, in order to obtain uniform definition, must be flattened by using more suitable oculars. For more detailed informations on this subject consult the pertinent technical literature or apply to our "Export Department". When writing, specify in which kind of work you are interested, and indicate all technical data concerning the microscope and the type of illumination used.





Formation of teeth in cat's upper jaw, H. Puffer, Dresden

The two EXAKTA Microscope Attachments

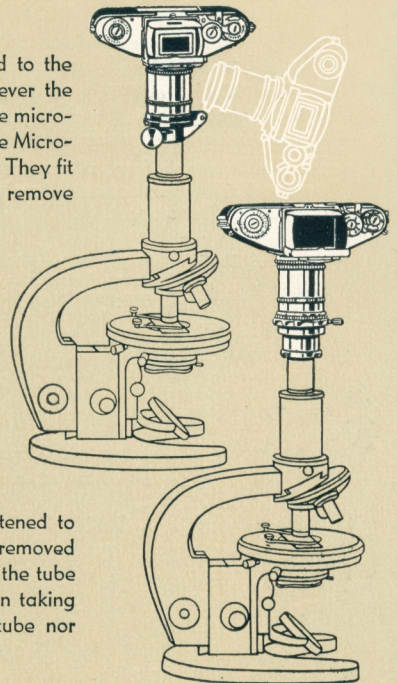
can be used with all 35 mm EXAKTA cameras. When attached to the Microscope the camera can be removed instantaneously whenever the photographic work is to be suspended while the routine work at the microscope (visual microscopic work) continues. The metal tubes of the Microscope Attachments have an inside diameter of 25 mm ($\approx 63/64$ in.). They fit the outsidetube holding the ocular of all standard microscopes: remove ocular, slip on Microscope Attachment, replace ocular, fasten Microscope Attachment to microscope tube by a slight turn of the clamping screw.

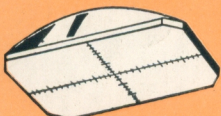
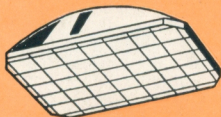
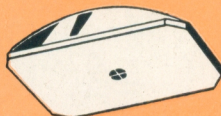
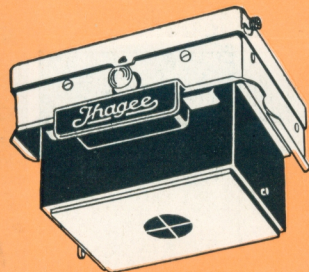
Microscope Attachment Type I (No. 147)

is fitted **with a hinged clamp** so that the camera can be tilted to the side without being taken off when photomicrographic work is suspended.

Microscope Attachment Type II (No. 153)

with bayonet fitting: Top part and bottom part of Microscope Attachment can be separated so that the camera can be removed from the microscope quickly and easily. The bottom part is fastened to the microscope tube by allaround pressure. The top part can be removed after unscrewing the clamping screw. It has been designed to fit the tube mounting of the latest microscopes. This feature is essential when taking photomicrographs of low magnification, in which case neither tube nor ocular of the microscope are used, but the camera lens instead.





Focusing Aids for Photomicrography and Macrophotography

The EXAKTA VX, featuring two interchangeable viewing and focusing systems, permits to use Special Focusing Glasses for various types of work. Especially when taking photomicrographs it will be very often desirable to view the image on the ground-glass, but to focus by the more brilliant microscopic image. For this reason different kinds of focusing glasses with clear centre spot and hair-line cross are available for the EXAKTA VX. The bright microscopic image is visible through the clear centre spot, and the hairline cross prevents the eye from accommodating. As soon as the image seen in the microscope and the hairline cross are equally sharp, the subject is in focus. Yet it is by no means necessary to use these special focusing glasses permanently, because they can be interchanged with the standard or any other kind of focusing glass.

Available are:

Reflex FINDER-HOOD with Ground-Glass with Clear Centre Spot 3 mm Ø No. 30103; 10 mm Ø No. 30104 or **with Clear Glass** No. 30102. (All three types with hairline cross!) The finder-hood must be interchanged as a whole.

For the Penta Prism: Ground-Glass with Clear Centre Spot 3 mm Ø No. 30203; 10 mm Ø No. 30204; **Clear Glass** No. 30202. (All three types with hairline cross!)

The glasses on the Penta Prism can be exchanged easily by the EXAKTA owner himself. An additional accessory for the Penta Prism is an Eye Piece with a hard rubber cup which accepts corrective eye glasses as per the needs of the individual.

Other accessories for Close-up and Microphotographic work with the EXAKTA are:

- 1. The Lens Magnifier** – a special Viewfinder – to be installed in place of the regular Reflex FINDER-HOOD. This special Viewfinder accepts the picture-taking lens of the EXAKTA as a magnifier for critical focusing.
- 2. The Distance Meter** – a Split Image Rangefinder Glass – is very practical for critical focusing in difficult cases of Close-up and Photomicrography.
- 3. The "Vielzweck"** is a very handy assembly of special accessories for Photomicrography and Microphotography. Its main parts are, a Bellows Extension, the Copying Stand and the Holder for duplicating of transparencies.

Detailed information on all accessories and apparatus is contained in special descriptive leaflets which are available upon request. Any information needed about the subject, is furnished upon writing to our Service Department.

Literature: EXAKTA "Kleinbild Photographie"
Miniature Photography by Werner Wurst
EXAKTA "Makro- und Mikrophotographie"
Macrophotography – Photomicrography by Georg Fiedler

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