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Binocular Microscopes.

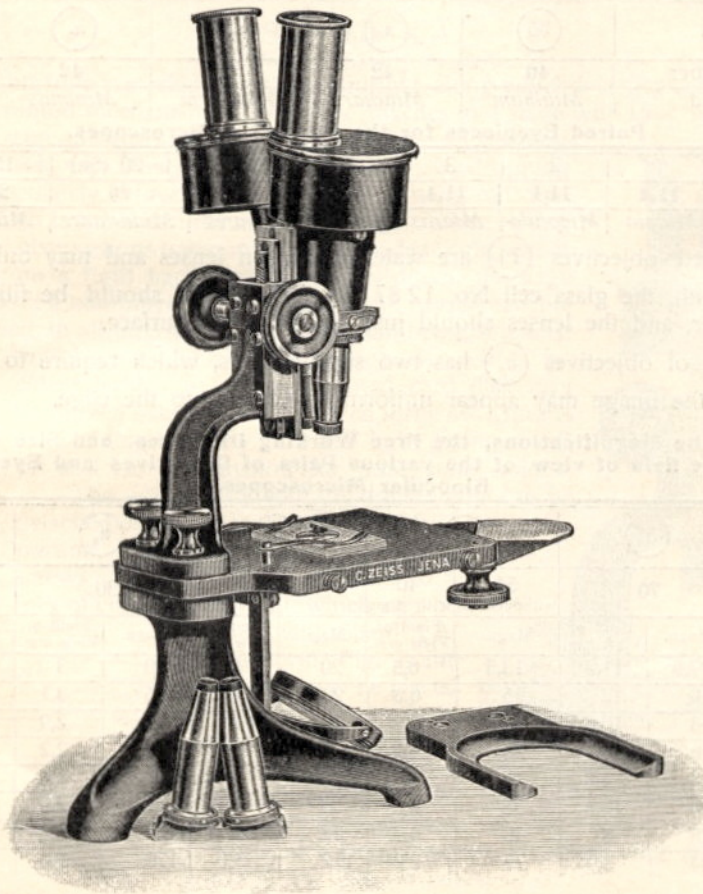


Fig. 1 (about $\frac{1}{3}$ nat. size).

Stand X A.

464

Leaflet: Mikro 375.

1923

Stand X.

This stand consists of two complete microscopes provided with image erecting Porro pairs of prisms. These are set at an angle of about $7\frac{1}{2}^{\circ}$ to the median axis, so as to form a binocular tube. The resulting double tube is focussed by a rack and pinion motion. The two images of the object are fused into a single image in such a manner that the exit pupil of the instrument is turned to full account and the united images produce a good stereoscopic effect. The object is not merely seen with both eyes but also stands out in wonderful relief. To achieve this the paired objectives require to be correctly centred with respect to the two tubes. To facilitate their interchange they are mounted upon a single slide. They require to be centred separately for each individual stand. When ordering objectives for an existing stand it is therefore necessary to send the double tube to the works for adaptation¹⁾.

We provide a selection of five pairs of objectives. These should be used in conjunction with Huygens and orthoscopic eyepieces.

Paired Objectives for the Binocular Microscopes²⁾.

Notation	(55)	(a ₀)	(a ₂)	(a ₃)	(Pl)
Basic Number	40	42	42	42	53
Codeword	Mialham	Mialhar	Mialharia	Mialmas	Miami

Paired Eyepieces for the Binocular Microscopes.

Notation	1	2	3	10× (4)	15× (5)	f=20 (5a)	f=15 (6)	f=9 (7)
Basic Number	11,4	11,4	11,4	11,4	11,4	26	26	34
Codeword	Miapia	Miapiulo	Miaras	Miaremos	Miares	Middelader	Middel	Miargyrit

The paired objectives (Pl) are water-immersion lenses and may only be used in conjunction with the glass cell No. 12 87 20. This vessel should be filled up to the rim with water, and the lenses should just dip below its surface.

The pair of objectives (a₀) has two slip-on stops, which require to be employed in order that the image may appear uniformly sharp up to the edge.

Table giving the Magnifications, the Free Working Distances, and Size of the Object included in the field of view of the various Pairs of Objectives and Eyepieces of the Binocular Microscopes.

	(55)	(a ₀)	(a ₂)	(a ₃)	(Pl)
Free Working Distance in mm.	70	54 without stops 40 with stops	40	30	35
Pair of Eyepieces	Magn. Field of View mm.	Magn. Field of View mm.	Magn. Field of View mm.	Magn. Field of View mm.	Magn. Field of View mm.
H 1	7,5 11,3	13,5 6,5	20 4,3	30 3	34 2,6
H 2	9 12	15 6,8	23 4,5	35 3,1	39 2,7
H 3	13 10,5	22 6,2	34 4,1	50 2,9	57 2,5
H 10×	16 8,1	28 4,7	43 3,1	63 2,2	71 1,9
H 15×	25 4,8	43 2,8	65 1,9	94 1,3	108 1,1
f=20 (5a)	20 10,8	35 6,3	53 4,1	77 2,9	87 2,5
f=15 (6)	28 8	48 4,7	72 3,1	104 2,1	120 1,9
f=9 (7)	44 3,9	77 2,2	112 1,6	170 1,0	195 0,9

1) When this is not practicable for any special reason it should be noted in the order, and in this case it will be necessary to send at least a pair of objectives (other than the paired objectives (Pl)) which are accurately centred for the binocular tubes in question. Otherwise it will not be possible to supply the objectives in a well centred condition.

2) The paired objectives are still those of the old notation and are engraved accordingly. The same applies to some extent to the eyepieces.

The new Eyepieces H 4 $\times$, 5 $\times$ and 7 $\times$ are not available for use with these paired objectives. In order that the stereoscopic effect may result, the two microscope tubes should be set to the individual distance between the observer's eyes. This is accomplished by turning about their axes the drums containing the pairs of Porro prisms. The available range in the interocular distance is 55 to 73 mm. The smallest distance obtainable in the case of the paired Eyepieces No. 1 is 59 mm.

Disparity in the brightness of the two component images as well as small differences in the sights of the observer's eyes do not sensibly impair the stereoscopic impression¹⁾.

In the event of these differences in the two eyes exceeding a certain moderate amount, the resulting lack of definition should be corrected by slipping appropriate spectacle lenses over the eyepieces when working without spectacles, which is much to be preferred. In all cases the spectacle lenses used in this way should be those correcting the sight for near, since eyes applied to a microscope invariably accommodate for near.

These stands are primarily intended for dissecting and mounting under low magnifications (such as are obtainable with simple magnifiers), but they are likewise available, without loss in the optical performance, for higher magnifications, as stated in the preceding table.

Stand X A.

(as illustrated on the front page.)

The double tube is carried by a curved upright, along which it is displaced by the action of a rack and pinion mechanism. The whole attaches to a stage with foot by means of two screws. The stage measures 100 $\times$ 100 mm., and has an opening 33 mm. in diameter, which may be reduced to 20 mm. by dropping in a stop. Immediately below the stage there is a swing-out disk, one half of which is white and the other half black. When swung in, it admits of observations being made with incident light, either on a dark or on a light back-ground. Lower down, the stage has attached to it a combined concave and plane mirror capable of being moved in all directions, the instrument being intended

for observation with transmitted, as well as incident light. A lightly mounted card disk may be slipped over the mirror, which furnishes a means of obtaining diffusely reflected light giving a soft yet uniform illumination for transparent objects.

The upper body with the double tube can be detached from the lower stage and foot portion, after releasing the two fixing screws. It may then be attached to a fork of vulcanite or metal, which can be supplied with Stand X A.

In this form (Fig. 2) the instrument may be placed upon objects of any shape which are to be examined (such as metal plates, cloths, and such like). In particular, it may then be used as a Dermatoscope for examining affections of the skin and for like purposes.

Stand X A is supplied in a wooden case.

The double tube X B may be used on the tripod foot of Stand X A in conjunction with a straight upright (No. 12 49 30, Codeword *Micabis*), as shown in Fig. 3).

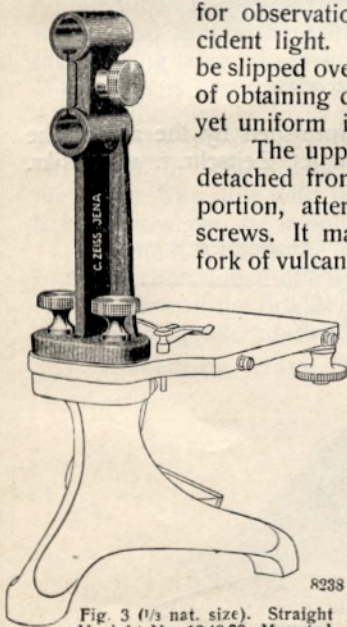


Fig. 3 (1/3 nat. size). Straight Upright No. 12 49 30 Mounted on the foot of Stand X A.

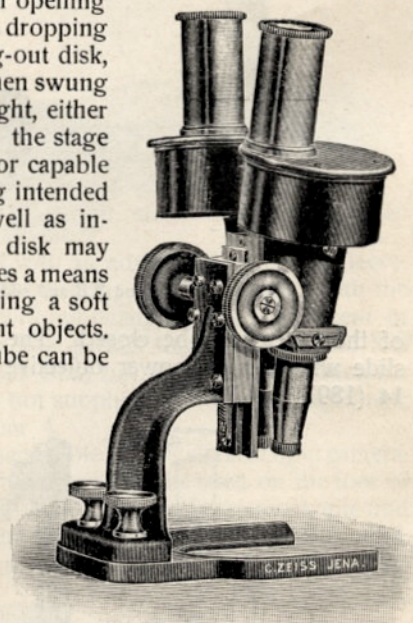
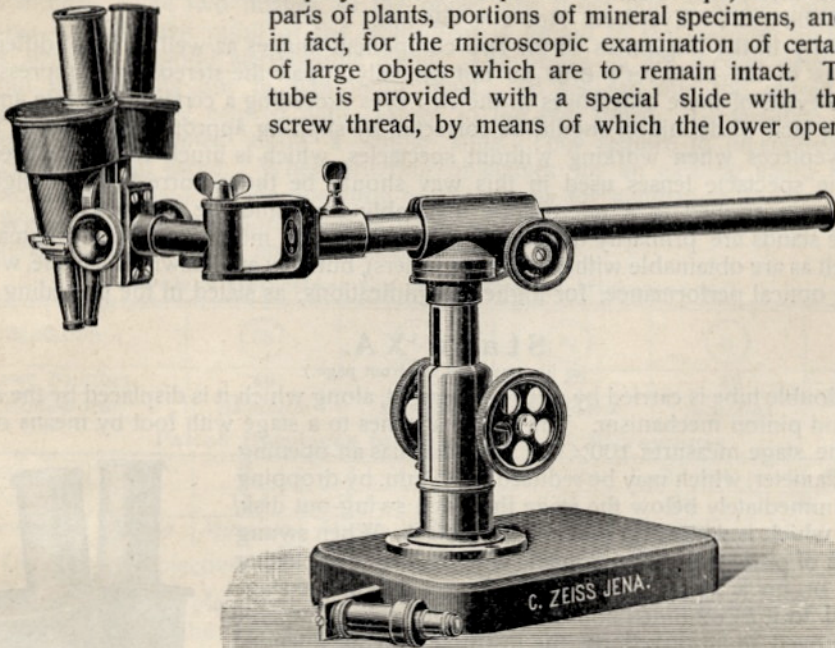


Fig. 2 (1/3 nat. size). Dermatoscope, being the upper part of Stand X A with vulcanite fork.

1) E. ABBE, *Gesammelte Abhandlungen*, Vol. I, pp. 313–324.

Stand XB.

Stand XB is primarily intended for the examination and preparation of objects which are too large to be accommodated on the stage of Stand XA. It may also be employed as an aquarium microscope, for viewing large parts of plants, portions of mineral specimens, and such like, in fact, for the microscopic examination of certain portions of large objects which are to remain intact. This double tube is provided with a special slide with the standard screw thread, by means of which the lower opening of one



63 a

Fig. 4 (1/4 nat. size).

Stand XB and slide with objective for monocular observation.

of the tubes may be closed. The other tube may then be furnished by the aid of the slide with a high power objective for monocular observation (cf. Zeitschr. f. wiss. Mikr. 14 (1897) 5-10.

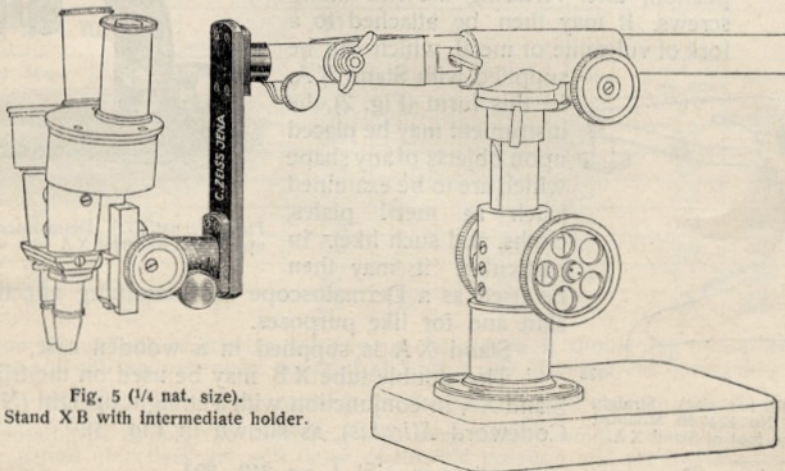


Fig. 5 (1/4 nat. size).

Stand XB with intermediate holder.

8240

Apart from the double tube, Stand XB is supplied in two different forms:

Stand XB Nr. 12 50 70 (Fig. 4). This stand, which is mounted on a heavy rectangular metal base, is fitted with three rack-and-pinion motions and is capable of four different rotations. The appropriate use of these motions admits of a large object with quite irregular contours being surveyed in every detail. The tube may not, however, be lowered so far as to bring into focus the plane of the working table or the surface upon which the instrument has been placed. This requires the use of an intermediate bar fitting Nr. 12 49 11 (Fig. 5). The stand is supplied in an alder case.

Stand XB No. 12 50 90. This stand (Fig. 6) consists of a stiff upright rising from a foot with two long toes at right angles to one another. A horizontal arm about 30 cm. long carried by a clamping sleeve can be slid along this upright and displaced horizontally. The double tube is the same as that furnished with Stand XB Nr. 12 50 70. In this case the coarse vertical and lateral motions require, however, to be made by hand. Focussing during observation may then be completed with the aid of the rack-and-pinion motion of the double tube. The whole can be readily lowered so as to bring the surface of the working table into focus. The upright is furnished with an additional clamping sleeve. When this is brought up to the bar sleeve and fixed in position, the bar together with the double tube may be freely swung about the upright without changing the adjustment in height. The radial range in this arrangement is even a little greater than that of Stand XB Nr. 12 50 70. The double tube is supplied in an alder box, but no case is provided for the stand. The slide with the standard screw thread is not supplied with this arrangement; it may, however, be supplied to order. Basic number 4.

In the XB stands the double tube is readily interchangeable with a stereoscopic camera. In conjunction with the straight upright No. 12 49 30 this camera may be used on the foot of XA in place of the double tube. Respecting this see DRÜNER, Ueber Mikrostereoskopie und eine neue vergrößernde Stereoskopkamera, Zeitschr. f. wiss. Mikroskopie, 17 (1900) 281—293.

Dissecting Stage No. 12 49 18 (Fig. 7). In the event of the Stands XB being

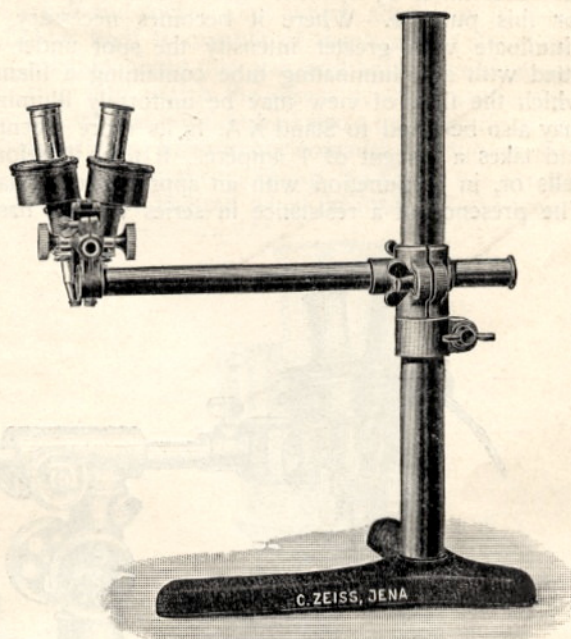


Fig. 6 (about 1/6 nat. size). Simplified Stand XB. 442

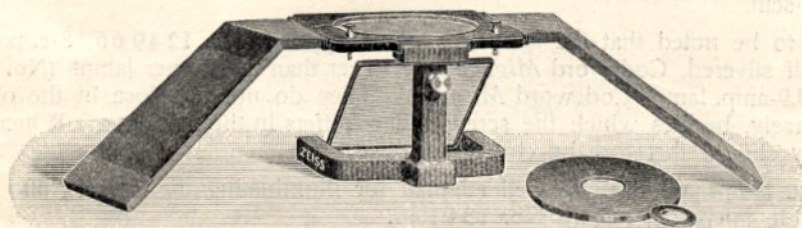
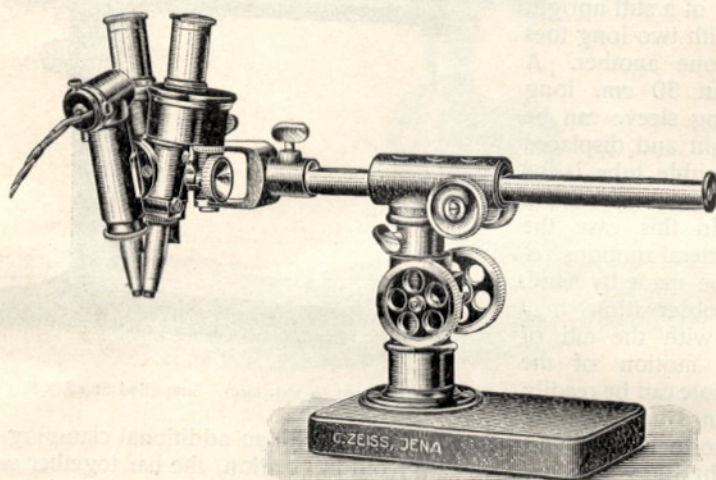


Fig. 7 (1/6 nat. size). Dissecting Stage

8239

required for dissecting in transmitted light, we would recommend the addition of the Dissecting Stage No. 12 49 18.

Illuminating Attachment No. 12 49 60. The Stands X B serve in the first place for observation by incident light. As a rule, incident daylight or lamp-light is sufficient for this purpose. Where it becomes necessary, however, in certain investigations to illuminate with greater intensity the spot under observation, the double tube may be fitted with an illuminating tube containing a filament lamp and two lenses, by means of which the field of view may be uniformly illuminated (Fig. 8). This illuminating tube may also be fitted to Stand X A. In its more recent form the lamp is adjusted for 6 volts and takes a current of 1 ampère. It may therefore be operated from three accumulator cells or, in conjunction with an appropriate resistance, from the electricity supply system. The presence of a resistance in series with it, has the advantage that the intensity of the



7861

Fig. 8 (about $\frac{1}{3}$ nat size).
Stand X B with illuminating attachment No. 12 49 60

illumination may be graduated by varying the strength of the current. The resistance coils should not, however, be cut out beyond the marked index, otherwise the small lamp is liable to blow. Two renewal lamps are provided.

When ordering the illuminating attachment for use with an existing instrument, the upper body of X A or the double tube of X B together with a pair of objectives should be sent.

It is to be noted that the lamps, as now supplied (No. 12 49 66, 8-c. p. lamp for 6 volts, half silvered, Codeword *Migaba*) are larger than the former lamps (No. 12 49 65, $7\frac{1}{2}$ -volt, 0.9-amp. lamp, Codeword *Micamus*). They do not therefore fit the old mount, and conversely, besides which the screw fitting differs in the two cases. When ordering lamps, they should therefore be clearly specified.

GREIL lamps are likewise well adapted for illuminating the objects, and similarly, the inclinable microscope lamp No. 13 91 40.

Respecting the use of the binocular tubes in conjunction with the large P. MAYER Dissecting Stand see our pamphlet Mikro 270.

Heller Object Holder for Entomological Work.

In this arrangement a rectangular base has at one of its shorter sides a block with two screw holes for the attachment of the carrier with the double tube X A. One of the long sides is fitted with a motion bar to which a movable arm attaches by a strong spring clamp. The arm is attached to the clamp by a ball-and-socket joint which admits of its being moved in all directions. The object holder itself is capable of displacement along, and rotation about this arm, and has a revolving cork ring into which the insect needles may be stuck in a vertical position, and also a folding strip of cork for sticking them in horizontally. In addition, there is a smaller spring clamp, by which the pin may be held by its head when the insect is to be viewed

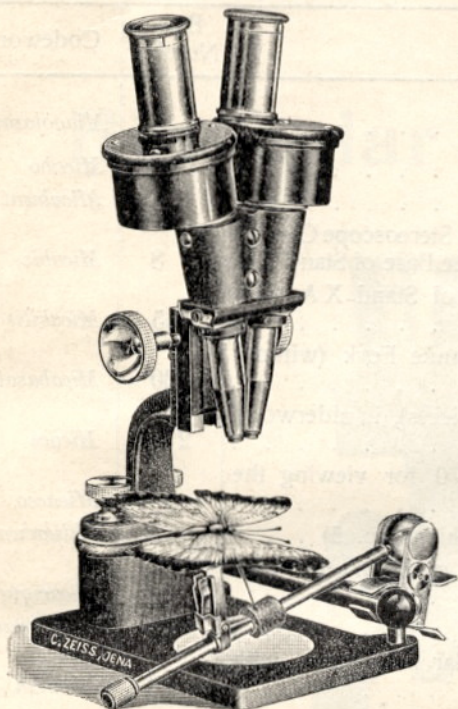


Fig. 9 ($\frac{1}{3}$ nat. size).
Heller Object Holder.

8243

from below. The base accommodates a removable opal glass plate, which furnishes a light back-ground to the objects under examination.

For observation this holder is used in conjunction with the standard body of the binocular Stand X A, or the double tube of Stand X B attached to a straight upright.

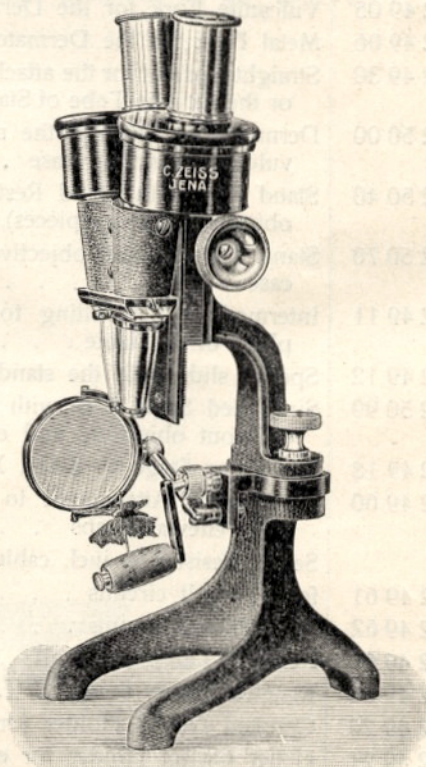


Fig. 10 ($\frac{1}{3}$ nat. size).
Cranked Object Holder.

7463

Cranked Object Holder.

For the convenient study of insects the body of Stand X A may be provided with a special holder, with the aid of which the objects may be viewed from all sides. To this end, the double tube is attached by its two screws to a base fitted with a cranked holder, which is mounted in a ball-and-socket joint, and at its lower bar has a long cork sleeve suitable for the reception of insects secured by pins. By this arrangement every portion of the upper and lower surface of the object may be brought in rotation into the focal plane of the two objectives. Under the cranked object holder, the foot is fitted with a plane and a concave mirror, capable of movements in all directions, which furnishes the requisite light to those portions which are not readily accessible to direct light.



The instruments as actually made are not necessarily in strict accordance with the illustrations, but are subject to modification and improvement.

We shall be pleased to provide electros of the figures contained in this leaflet for the illustration of scientific publications.

Unauthorised reproduction of illustrations and subject matter is not permitted.

Prices.

Identif. No.	Description	Basic Number	Codeword
12 87 20	Glass Cell for (Pl)	3	<i>Miagolammo</i>
12 49 05	Vulcanite Fork for the Dermatoscope	6	<i>Micabo</i>
12 49 06	Metal Fork for the Dermatoscope	6	<i>Micabunt</i>
12 49 30	Straight Upright for the attachment of the Stereoscope Camera or the Double Tube of Stand XB to the Base of Stand XA	8	<i>Micabis</i>
12 50 00	Dermatoscope (being the upper body of Stand XA with vulcanite fork), in case	155	<i>Micabitis</i>
12 50 40	Stand XA with Hand Rests and Vulcanite Fork (without objectives and eyepieces), in case	220	<i>Micabasalt</i>
12 50 70	Stand XB (without objectives and eyepieces), in alderwood case	270	<i>Micace</i>
12 49 11	Intermediate Bar Fitting to No. 12 50 70 for viewing the plane of the table	13	<i>Micaceo</i>
12 49 12	Special slide with the standard screw thread (p. 5)	4	<i>Miluarum</i>
12 50 90	Simplified Stand XB with alderwood case for the tube (without objectives and eyepieces)	160	<i>Micacique</i>
12 49 18	Dissecting Stage to Stand XB	40	<i>Micaceous</i>
12 49 60	Illuminating Attachment to the binocular microscope with two renewal lamps	40	<i>Micariah</i>
	Series Resistance, incl. cable with plug connector		
12 49 61	for 110-volt circuits	at current market prices	<i>Micalete</i>
12 49 62	for 220-volt circuits	"	<i>Micamini</i>
12 49 65	Renewal Lamp 7½ volt	"	<i>Micamus</i>
12 49 66	Renewal Lamp 6 volt, 8 c. p.	"	<i>Migaba</i>
12 49 20	Cranked Object Holder for entomological studies	37	<i>Militesa</i>
12 49 21	Heller Object Holder for entomological studies	40	<i>Militesem</i>

From the basic numbers quoted in this Price List the selling prices may be calculated as follows:

For the selling price in
 at the present time is equal to the basic number multiplied by
 e. g. basic number 100

The prices so computed are

for prepayment in cash or by cheque in the currency stated above.

Prices are subject to change without notice. Goods are forwarded at the cost and risk of the consignee.