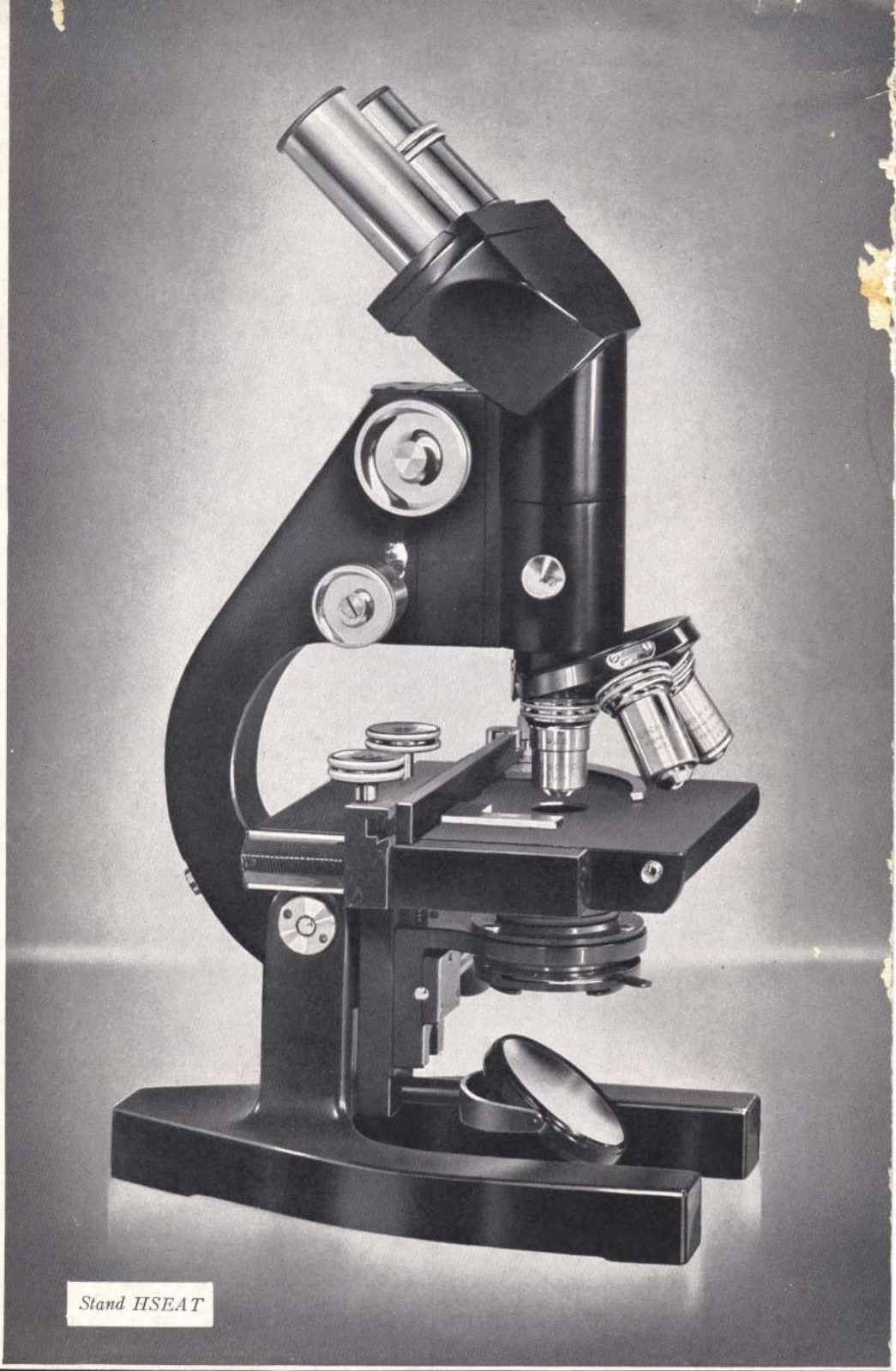
TYPE H LABORATORY MICROSCOPES



Stand HSEAT

BAUSCH & LOMB

MAGNIFICATIONS AND REAL FIELDS

Tube Length—160 mm Projection Distance—254 mm

Achromatic and Fluorite Objectives		Huygenian Eyepieces						
Type	Magnif.	5×	6.4×	7.5×	10×	Micrometer Value with 10× Eyepiece	12.5×	15×
48mm 0.08 Achro	2×	10.0× 10.6mm	12.8× 9.0mm	15.0× 8.6mm	20.0× 7.0mm	0.07060mm	25.0× 6.70mm	30.0× 5.40mm
40mm 0.08 Achro	2.6×	13.0× 8.10mm	16.6× 7.00mm	19.5× 6.60mm	26.0× 5.40mm	0.05400mm	32.5× 5.25mm	39.0× 4.20mm
32mm 0.10 Achro	4.0×	20.0× 5.30mm	25.6× 4.60mm	30.0× 4.40mm	40.0× 3.60mm	0.03530mm	50.0× 3.50mm	60.0× 2.80mm
32mm 0.12 Achro	3.8×	19.0× 5.10mm	24.3× 4.50mm	28.5× 4.10mm	38.0× 3.30mm	0.03300mm	47.5× 3.50mm	57.0× 2.70mm
16mm 0.25 Achro	10×	50.0× 2.90mm	64.0× 1.83mm	75.0× 1.70mm	100.0× 1.40mm	0.01395mm	125.0× 1.38mm	150.0× 1.08mm
8mm 0.50 Achro	21×	105.0× 1.000mm	134.4× 0.880mm	157.5× 0.820mm	210.0× 0.660mm	0.00660mm	262.5× 0.661mm	315.0× 0.521mm
6mm 0.65 Achro	28×	140.0× 0.820mm	179.2× 0.715mm	210.0× 0.661mm	280.0× 0.537mm	0.00540mm	350.0× 0.541mm	420.0× 0.425mm
5.5mm 0.65 Achro	31×	155.0× 0.661mm	198.4× 0.587mm	232.5× 0.544mm	310.0× 0.440mm	0.00435mm	387.5× 0.441mm	465.0× 0.348mm
4mm 0.65 Achro	43×	215.0× 0.490mm	275.2× 0.430mm	322.5× 0.400mm	430.0× 0.320mm	0.00322mm	537.5× 0.325mm	645.0× 0.250mm
4mm 0.85 Fluorite	43×	215.0× 0.478mm	275.2× 0.423mm	322.5× 0.394mm	430.0× 0.313mm	0.00316mm	537.5× 0.319mm	645.0× 0.250mm
4mm 0.85 Achro	45×	225.0× 0.470mm	288.0× 0.413mm	337.5× 0.380mm	450.0× 0.308mm	0.00309mm	562.5× 0.310mm	657.5× 0.247mm
3mm 0.85 Achro	60×	300.0× 0.348mm	384.0× 0.350mm	450.0× 0.282mm	600.0× 0.228mm	0.00230mm	750.0× 0.232mm	900.0× 0.181mm
1.9mm 1.25 Achro	91×	455.0× 0.220mm	582.4× 0.195mm	682.5× 0.180mm	910.0× 0.145mm	0.00145mm	1137.5× 0.147mm	1365.0× 0.114mm
1.8mm 1.25 Achro	97×	485.0× 0.213mm	620.8× 0.180mm	727.5× 0.165mm	970.0× 0.132mm	0.00133mm	1212.5× 0.134mm	1455.0× 0.107mm
1.8mm 1.30 Fluorite	93×	465.0× 0.212mm	595.2× 0.190mm	697.5× 0.175mm	930.0× 0.140mm	0.00140mm	1162.5× 0.142mm	1395.0× 0.111mm
1.7mm 1.30 Achro	102×	510.0× 0.260mm	652.8× 0.183mm	765.0× 0.170mm	1020.0× 0.135mm	0.00135mm	1275.0× 0.140mm	1530.0× 0.108mm

LABORATORY MICROSCOPES

The Bausch & Lomb H type Microscope, which is designed for all general purpose work in the laboratory, will be found optically and mechanically dependable even after years of constant use.

In Schools

The H type Microscope is an admirable instrument to use for laboratory work in educational institutions. The simple HH models have been designed for use in secondary schools where the student first begins the study of the rudimentary structure of simple plant and animal life.

For college science departments and engineering laboratories, the more complete models are necessary. In all cases where instruments are to be used by many students year after year, the exceptionally stable design of the H stand, together with its wear-proof mechanical movements and heavy plated parts, will be appreciated as time goes on. Repair costs on instruments that cannot endure increase from year to year.

In Medicine

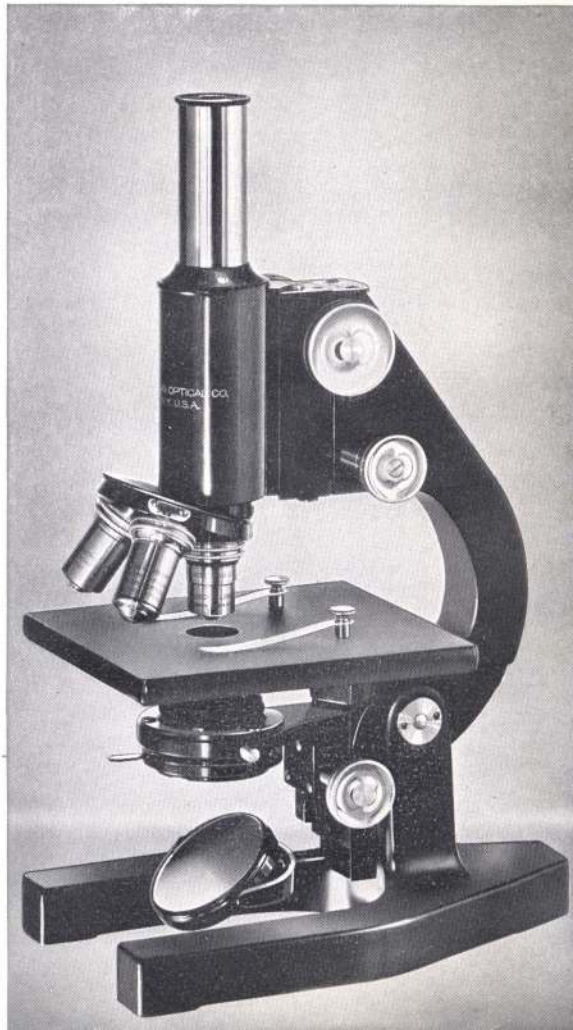
The HA model which is equipped with a mechanical stage is a favorite with physicians and medical students. Its optical system and structural features have been designed to meet the most rigorous requirements of all medical schools.

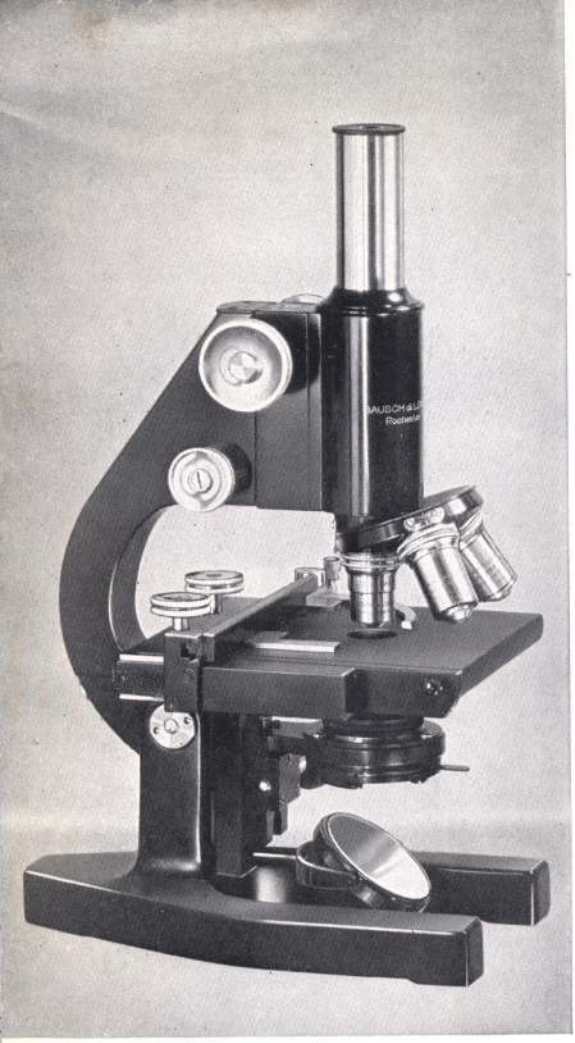
In hospital and professional laboratories the H Microscope will find favor for two very important features—the large stage and the long spring finger on the mechanical stage which will hold slides 50 x 75 mm. The large stage, 115 x 130 mm when cleared, will permit the manipulation of gross specimens and petri dishes of maximum diameter. The long spring finger on the mechanical stage, which facilitates frequent changing of slides, will be appreciated by the laboratory technician who must work with a microscope over long periods of time.

For elementary or low power dark-field work, a dark-field element

Bausch & Lomb H

Monocular Stand, with Plain Stage and Condenser in Rack and Pinion Substage





Bausch & Lomb HA

Monocular Stand with Mechanical Stage A and Condenser in Rack and Pinion Substage.

can be purchased and substituted for the top lens of the Abbe condenser. For the study of living bacteria in liquids, exudates, blood, and other body fluids, either the Paraboloid or Cardioid condenser can be interchanged with the substage condenser.

In Industry

The applications of the Laboratory type Microscope to the needs of modern industry are being expanded almost daily. Practical information about textile yarns and fibres gained through examination with the microscope has helped to develop valuable improvements in textile processes and products. In the paper industry the examination of wood fibres for use in the various grades and kinds of paper can be satisfactorily accomplished.

Dairies, edible and lubricating oil companies, breweries, and fruit companies find many uses for the Laboratory Microscope, in searching for adulterating organisms, microscopic solid particles and fermentation bacteria.

In metallurgy and metallography the lower powers are useful in examining metals for a study of their physical properties.

Colloidal suspensions may be easily studied in a dark field by equipping the H Microscope with either the Paraboloid or Cardioid condenser. Counting slides and measuring eyepieces can be applied when particle sizes or quantities must be checked, as in the study of abrasives, cleaning powders, and of certain food products.

General Description

The H type Microscope is offered in several models, each distinguishable by letters which denote the equipment it carries. These models logically fall into five major groups, and each is available with one of several standard optical equipments. Briefly these groups are:

1. Vertical Monocular Microscope with substage, with (HA) or without (H) mechanical stage.

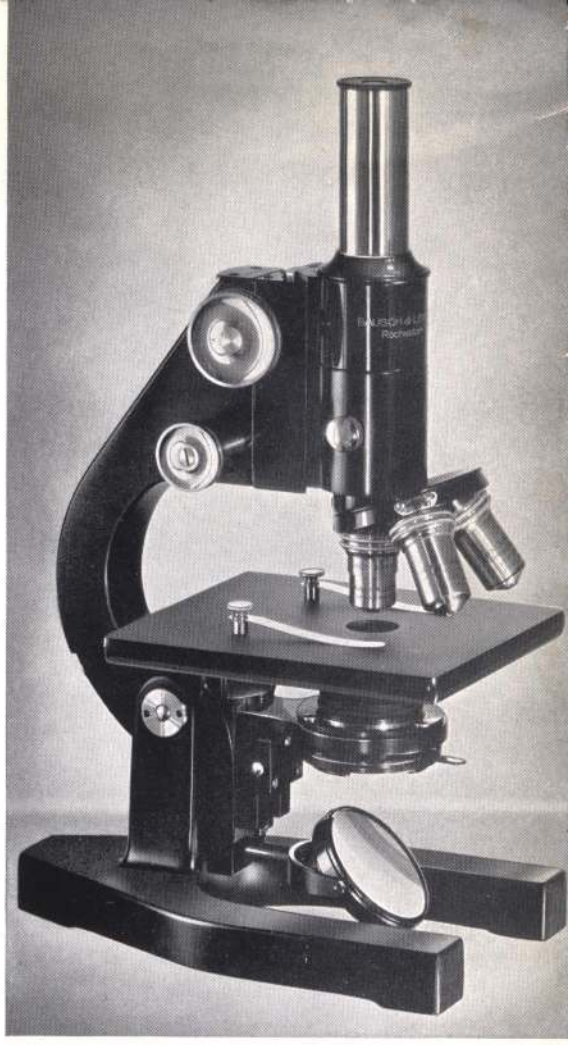
2. Vertical Monocular Microscope (Interchangeable body tube type), with substage. (HS).
3. Vertical Binocular Microscope (Interchangeable body tube type), with substage, with mechanical stage. (HSEA).
4. Inclined Binocular Microscope (Interchangeable body tube type), with substage, with mechanical stage. (HSEAT). Illustrated on cover.

The interchangeable body tube type of construction permits a quick interchange to any type of body tube and marks an outstanding new development in the design of an optical instrument. Binocular vision is directly superior to monocular vision because both eyes are used. Vision is more acute and hence finer detail in the specimen can be observed. The parallel eyepiece tubes eliminate the necessity for convergence, allow full relaxation of the ocular muscles and give complete relief from eyestrain. This is valuable to the microscopist who must use an instrument over prolonged periods of time.

The inclined binocular body tube offers the additional advantage of allowing the microscopist to work in a natural relaxed position when studying specimens where the stage must remain level.

In addition to visual microscopy, the H type Microscope readily lends itself to photomicrography. For this work a substage condenser and a monocular body tube are necessary.

For the examination of translucent or ultra-microscopic particles in a liquid medium, some type of dark field substage condenser is necessary. Dark field condensers can be readily attached to the H type Microscopes for this kind of work. For details, see D-122, "Dark Field Systems."



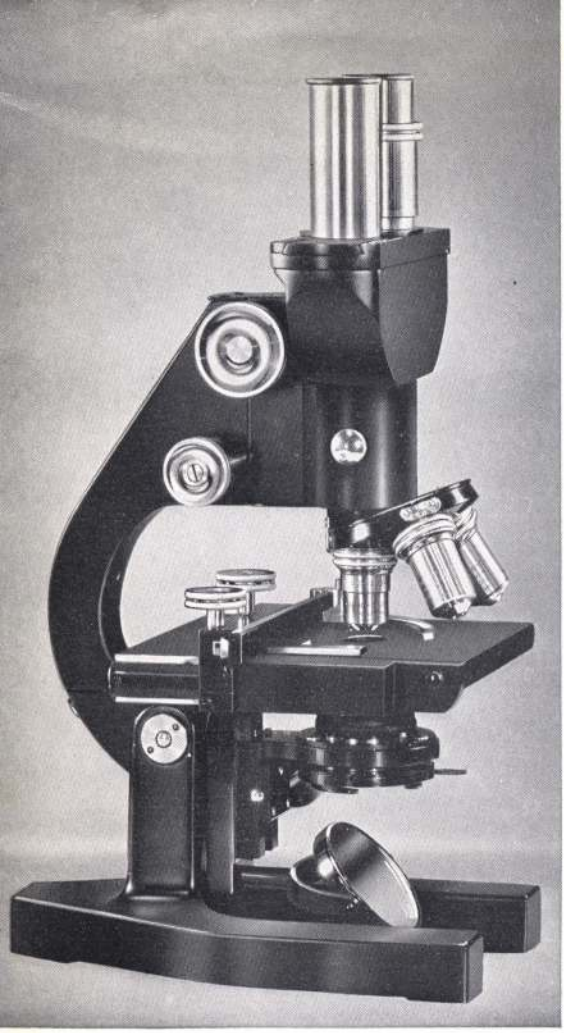
Bausch & Lomb HS

Monocular Stand with Divisible Body Tube, Plain Stage, and Condenser in Rack and Pinion Substage

Mechanical Features

The stand has been designed along modern lines and gives extreme rigidity and balance to the instrument.

Two distinct types of body tubes are available in the H type Microscope. One type consists of a fixed body tube. The other type is divisi-



Bausch & Lomb HSEA

Stand HSE, with Mechanical Stage A and Condenser in Rack and Pinion Substage.

ble so that the monocular, vertical-binocular or inclined-binocular body are interchangeable at will.

In either type, the tube length provides for a fixed distance of 160 mm. The diameter of the monocular tube is 39 mm. A graduated draw tube in place of the fixed tube can be obtained as optional equipment but must be specified when ordering.

The binocular bodies, either vertical or inclined, are made to be attached to any of the HS models. The interchange is quickly accomplished by means of a small knurled button on the side of the body tube.

The eyepiece tubes of the binocular bodies are mounted to permit adjustment (with scale) to suit varying interpupillary distances. Correction for difference in vision between the two eyes can be made by means of a spiral focusing adjustment sleeve on one eyepiece tube.

The stage is rectangular, 115 mm x 130 mm. It is constructed of metal covered with reagent and alcohol-proof vulcanized rubber.

The built-on mechanical stage offers a means of systematically examining an entire slide and recording the positions of fields being viewed. A long spring actuated finger will securely hold slides up to 50 x 75 mm.

For work with 50 x 114 mm slides, of the Breed type for milk smear examination, a special stage of attachable type is available.

A rack and pinion substage provides a means of focusing the substage condenser and accessory equipment. It consists of a full ring condenser holder with clamp for holding the Abbe or other type of condensers and provides ample range of movement.

All H type Microscopes are equipped with the standard rack and pinion coarse adjustment.

The side fine adjustment is of the lever type. It has a stop at either limit of excursion, independent of the driving mechanism. The adjustment automatically ceases to act when the objective touches the slide. The right-hand focusing button has a drum graduated in widely

spaced steps of 2 microns, so that the approximate thickness of a specimen may be measured.

The revolving nosepiece provides for instantaneous interchange from one magnification to another. It is dustproof, light in weight and constructed with a totally inclosed reinforced, conical center, for accurate registration.

All H Microscopes are finished in a rich, lustrous black, impervious to alcohol and the commonly used laboratory reagents. Exposed metallic parts which receive considerable wear are plated with chromium.

Optical Features

Eyepieces, of the Huygenian type, are supplied with each laboratory microscope. The power of each eyepiece is engraved upon the eyelens mount.

Achromatic and Fluorite objectives are supplied as regular equipment on the H Microscopes, depending upon which optical system is selected.

The 10× objective is divisible and thus can be converted into a 4× objective for examining gross specimens, by unscrewing the lower lens element.

All objectives are mounted with the standard "Society Screw" thread. The lens elements are precisely centered and burnished in the individual threadless metal cells without the use of cement, and remain unchangingly centered even though the objectives are taken apart and reassembled for any reason.

The Abbe type, 1.20 N. A., condenser is standard equipment on all laboratory microscopes. This condenser is divisible, consisting of two elements. For work with the higher power objectives both elements of the condenser are utilized. For low power work the upper element can be removed.

Each Abbe condenser is equipped with an Iris diaphragm to control the amount of light entering the condenser and the angle of the emitted cone. A holder is provided below the iris diaphragm to receive a blue glass filter or dark field stop.

For dark field work the upper element of the Abbe condenser can be removed and a dark field element screwed on in its place (See Catalog D-122, "Dark Field Optical Systems").

When the numerical aperture of the objective used is greater than 1.00, a drop of immersion oil should be placed between the top lens surface of the condenser and the bottom surface of the object slide. Otherwise, the useful numerical aperture of the condenser will be limited to 1.00, and only a part of the full aperture of the objective thus utilized. An oil immersion objective of 1.25 N. A. will lose approximately 10% of its efficiency, if the condenser is not immersed as just described.

Additional optical systems can be obtained and used on the microscope, thus fitting the instrument for research work and microscopy of a specialized nature.

The mirror mount contains two 50 mm mirrors, one plane and one concave.

PRICE LIST

Model	Description				Catalog No.	Optics	Code Word	Price
	Body	Stage	Substage	Nose-piece				
H	Vertical Monocular	Plain	Rack and Pinion	Double	31-21-50-06		Agmef	$ 98.50
				Triple	-08		Agmig	135.00
				Triple	-10		Agmoh	158.00
				Triple	-12		Agmuj	173.00
HA	Vertical Monocular	Mechan-ical	Rack and Pinion	Double	31-21-54-06		Agnuk	118.50
				Triple	-08		Agobb	155.00
				Triple	-10		Agocc	178.00
				Triple	-12		Agoff	193.00
HS	Vertical Monocular Divisible Tube	Plain	Rack and Pinion	Double	31-21-59-06		Agnaf	112.50
				Triple	-08		Agneg	149.00
				Triple	-10		Agnih	172.00
				Triple	-12		Agnoj	187.00
HSEA	Vertical Binocular Divisible Tube	Mechan-ical	Rack and Pinion	Double	31-21-64-06		Agott	198.50
				Triple	-08		Agovv	235.00
				Triple	-10		Agozz	258.00
				Triple	-12		Agpag	273.00
HSEAT	Inclined Binocular Divisible Tube	Mechan-ical	Rack and Pinion	Double	31-21-65-06		Agpeh	218.50
				Triple	-08		Agpij	255.00
				Triple	-10		Agpok	278.00
				Triple	-12		Agpul	293.00

Optical Equipments	Objectives	Huygenian Eyepieces	Abbe Condenser
—06	*Achromatic* 10× (16 mm) 0.25 N. A. *Achromatic* 43× (4 mm) 0.65 N. A.	5× 10×	1.20 N. A.
—08	*Achromatic* 10× (16 mm) 0.25 N. A. *Achromatic* 43× (4 mm) 0.65 N. A. *Achromatic* 97× (1.8 mm) 1.25 N. A.*	5× 10×	1.20 N. A.
—10	*Achromatic* 10× (16 mm) 0.25 N. A. *Achromatic* 43× (4 mm) 0.65 N. A. *Fluorite* 93× (1.8 mm) 1.30 N. A.*	5× 10×	1.20 N. A.
—12	*Achromatic* 10× (16 mm) 0.25 N. A. *Fluorite* 43× (4 mm) 0.85 N. A.* *Fluorite* 93× (1.8 mm) 1.30 N. A.*	5× 10×	1.20 N. A.

*Oil Immersion Objective

Note: Figures in parenthesis, as (16 mm), indicate equivalent focus (E.F.) in millimeters. N. A. signifies numerical aperature, or the index of the resolving power of the objective. Eyepieces can be obtained in matched pairs for use on binocular microscopes.

The prices herein are subject to change without notice and to increase for taxes, excises or other charges imposed by governmental authorities with respect to articles listed herein or to the sale thereof.

BAUSCH & LOMB OPTICAL CO.

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D-195, 15, X-35