

PART II

COMPOUND MONOCULAR

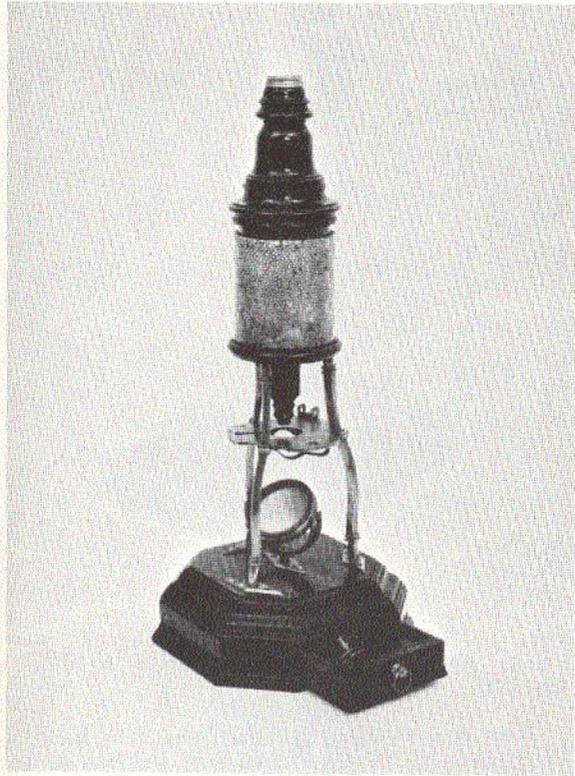


Fig. 329. Matthew Loft, London, England; compound monocular; C. 1725. (AFIP 518901 - 66-6193)

The octagonal wooden box base of this instrument (Fig. 329) is 6-1/2 x 6-1/2 inches and has an accessory drawer at the front. Three square, bent legs, 6-3/8 inches high and screwed to diamond-shaped plates on the base, support a brass plate to which is attached the base of the body tube. The gimbal for the 1-1/2-inch-diameter single mirror is set in a diamond-shaped plate in the center of the base. The irregular shaped brass stage fits into grooves on the legs. The central aperture is 7/8 inch in diameter. There is a small fixture attached with a spring bottom for a fish-plate and openings for stage forceps and condenser.

The upper portion of the sliding body tube is of dark wood and the lower portion of cardboard covered with green paper and graduated

markings. The 2-7/8-inch-long nosepiece is of wood with a screw fitting for the wood-encased objective. The biconvex eye lens is 7/8 inch in diameter and protected by a brass dust cap. The field lens is 1-1/2 inches in diameter. The outer body tube is covered in a mottled black and white shagreen and the lower edge has a wooden rim. Height is 16-1/4 inches.

Accessories are 2 objectives set in wood casings; fish-plate; 2 ivory sliders, brass slider; and 3 glass sliders. The instrument appears to be identical to Culpeper's first form microscope made by Matthew Loft. Loft, a waterman of Lambeth, was apprenticed to Thomas Gay, Master of Spectacle Makers Company, in 1744 and 1745, and made many of the Culpeper model microscopes. ■



Fig. 330. Edmund Culpeper, London, England; compound monocular; C. 1730. (AFIP 518933 - 66-6225)

The upper portion of the sliding body tube of this instrument (Fig. 330) is of dark polished wood and the lower portion is covered with green velum. The outer tube is covered with a mottled black and white shagreen with a brass rim at the top and a wooden rim at the bottom; it has a rack and pinion adjustment. The 2-1/8-inch-long brass tapered nosepiece screws into the lower end of the body tube. The objective, in a brass cell, screws into the nosepiece.

The wooden base is 5-1/4 inches in diameter. The gimbal for the 1-5/8-inch single flat mirror is attached to the center of the base. Three 3-7/8-inch-high slender, turned pillars of brass attached to the base support the 3-1/2-inch-diameter recessed brass stage. Three 2-inch-high brass pillars, located above the stage, support a 2-1/2-inch-diameter brass plate to which is attached the base of the outer body tube. A 2-inch-diameter engraved glass plate set in brass fits into the recessed portion of the stage.

The biconvex eye lens is 7/8 inch in diameter and is covered with a brass dust cap. The field lens is 1-1/2 inches in diameter. Height is 14 inches. Accessories include a fish-plate; 17 ivory sliders; convex lens; and black and white disc. Culpeper did not sign his microscopes, but instead attached his trade cards to the instruments' carrying cases, as in this instance; this is his third form. ■

AFIP 518926. Edmund Culpeper, London, England; compound monocular; C. 1730. *Not illustrated.*

This instrument is a duplicate of Fig. 330 (AFIP 518933) but has no rack and pinion adjustment, no field lens, and no glass stage plate. Attached to the stage is a Bonanni spring stage and a condenser. No Culpeper trade card is attached, and the shagreen covering of the body tube is of a different mottling. Height is 14 inches. Accessories are 4 objectives. ■

AFIP 518884. Edmund Culpeper, London, England; compound monocular; C. 1730. *Not illustrated.*

The shagreen covering of the outer body tube of this instrument closely resembles that of Fig. 330 (AFIP 518933). It does not have rack and pinion adjustment. Accessories are 4 objectives; ivory and brass diaphragm cone; 2 ivory talc boxes; fish-plate; and tweezers. Height is 13-3/4 inches. Markings on the

pyramidal case reveal where Culpeper's trade card had been attached. ■

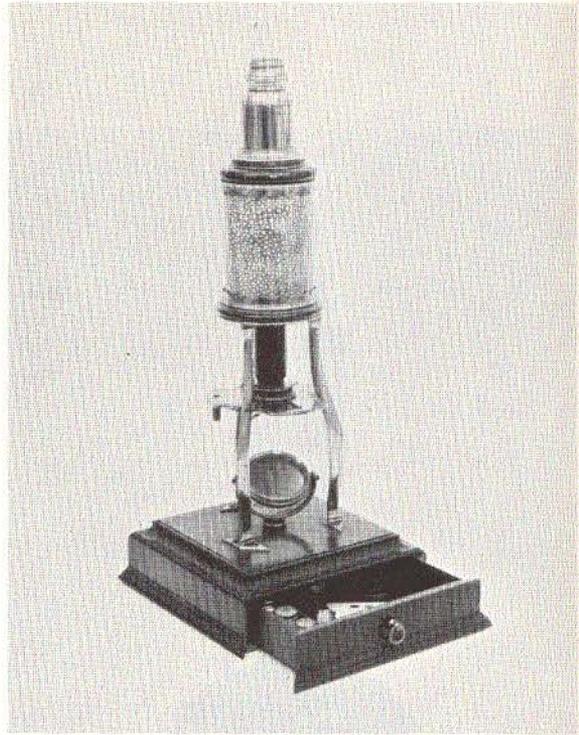


Fig. 331. John Cuff, London, England; compound monocular; C. 1730. (AFIP 518932 - 66-6192)

The box base of this instrument (Fig. 331) is 6-5/8 x 6-5/8 x 2-1/4 inches and has an accessory drawer at the front. A 1-1/2-inch-diameter single mirror is inserted in the center of the base. Three triangular-shaped pillars, 6-1/2 inches high, support a brass plate to which is attached the base of the body tube. The irregular-shaped, brass stage fits into grooves on the pillars and has brass clips on the underside, a Bonanni spring stage, and three openings for forceps and condenser.

The upper portion of the sliding body tube is brass and has a 3/4-inch-diameter biconvex eye lens and a 1-3/8-inch-diameter field lens. The lower portion of the body tube is cardboard covered with green paper with gold stripes. A dark wooden rim with a brass screw fitting is at the top. The 2-3/4-inch wooden nosepiece has a brass screw fitting for the brass-encased objective. The outer body tube is covered with mottled red and white fish-skin and has a brass ornamental rim at the top and bottom.

Accessories are 4 objectives; brass diaphragm cone; fish-plate; tweezers; convex eye lens; 3 ivory sliders; glass object slide; and an ivory talc box. Height is 16-1/4 inches. Although not signed, it appears to be identical to an instrument described in the literature and attributed to John Cuff, with the exception that it has a wooden nosepiece instead of brass. ■

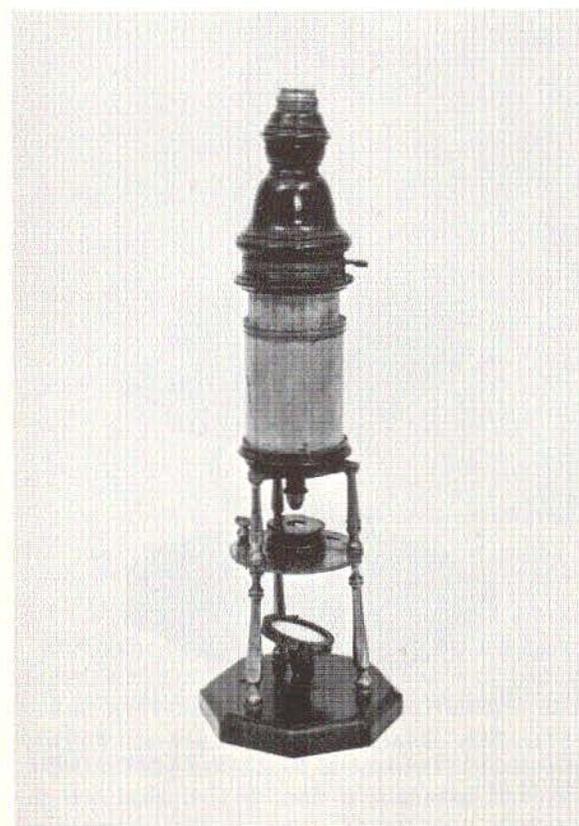


Fig. 332. Maker unknown; compound monocular; C. 1740. (AFIP 518935 - 66-6190)

The octagonal mahogany base of this Culpeper-Scarlett-type instrument (Fig. 332) is 5-1/4 inches in diameter. A gimbal for the 1-1/2-inch single mirror with ebony back is screwed into the center of the base. Three 3-3/4-inch-high slender brass pillars support and pass through the 3-1/2-inch-diameter stage. Three 2-1/4-inch-high similar pillars directly above the first three support the 3-1/2-inch-diameter brass plate to which is screwed the outer body tube. The stage has a 1-1/4-inch-diameter central aperture for a screw-on Bonanni spring stage.

The upper section of the 11-inch-long body tube is dark wood surrounded by a narrow brass

rim with a projection and a brass eye, and contains a field lens. The lower portion is covered with a grayish velum, has a 2-inch-long tapered nosepiece and a screw-on objective. The eyepiece has a biconvex lens and a dust cap. The outer body tube is cardboard covered with green paper, with a brass rim at the top and a wooden and a brass rim at its lower end. Accessories are 2 objectives; lieberkühn with lens; Bonanni spring stage; brass slider; and glass stage plate. Height is 16-1/4 inches. ■



Fig. 333. Matthew Loft, London, England; compound monocular; C. 1740. (AFIP 518936 - 66-6193)

This instrument (Fig. 333) is similar to Fig. 329 (AFIP 518901) with the following differences: The legs are free of ornamentation and the stage is of a different shape and slightly larger. It has no fixture on the stage for the fish-plate but has a slot with a spring underneath; there is a mounting on the stage for forceps. The diamond-shaped brass plates on the base are smaller and the mirror is set on a triangular brass plate. The objective is encased in brass.

Accessories are 5 objectives; Bonanni spring stage; live-box; 2 ivory boxes for mica and springs; fish-plate, glass for the stage opening; ivory stage plate; 16 ivory sliders; and condensing lens. Height is 16-1/4 inches. It is identical to that described in the literature as the "second form of the Culpeper microscope made by Matthew Loft." ■

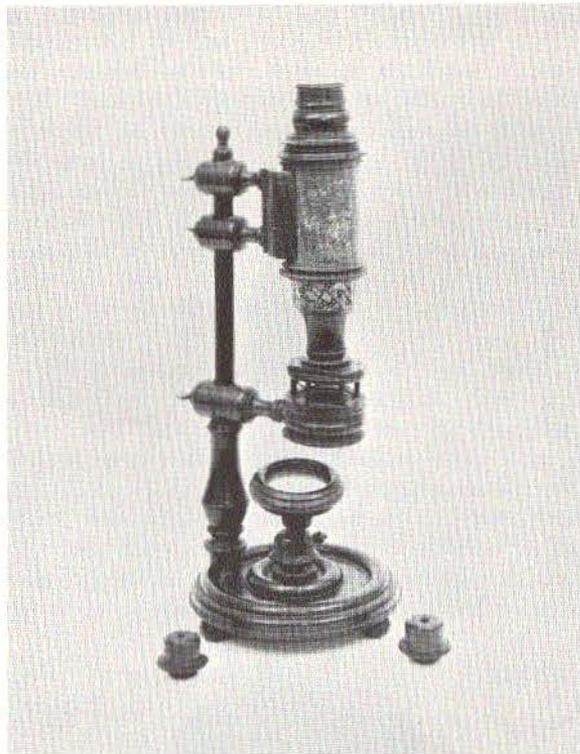


Fig. 334. Maker unknown; Nuremberg, Germany; compound monocular; C. 1744. (AFIP 518887 - 66-6214)

The frame of this instrument (Fig. 334) is well turned and substantially constructed of dark wood; the base is 5-1/4 inches in diameter. The 1-1/2-inch-diameter mirror is inserted into a slotted block in the center of the base. The 11-1/2-inch-high pillar is a turned rod and fits into the base. The 2-inch-diameter spring stage fits into an arm that slides on the pillar. Two similar, but smaller, arms at the top of the pillar screw into a block attached to the outer body tube.

The 3-inch-long body tube is cardboard covered with a red, white and black decorative paper and is set in wooden rims at the upper and lower edges. The drawtube is 5-3/8 inches high, also made of cardboard covered with the

same type paper, and has a wooden rim at the top and a 1-3/8-inch-long nosepiece. The objective is enclosed in a screw-on wooden cap. The 5-1/8-inch-long eyepiece is of wood, partly covered with decorative paper, has a field lens and an eye lens, and slides into the drawtube. Accessories are 2 objectives in wooden caps, and 2 wooden sliders. ■

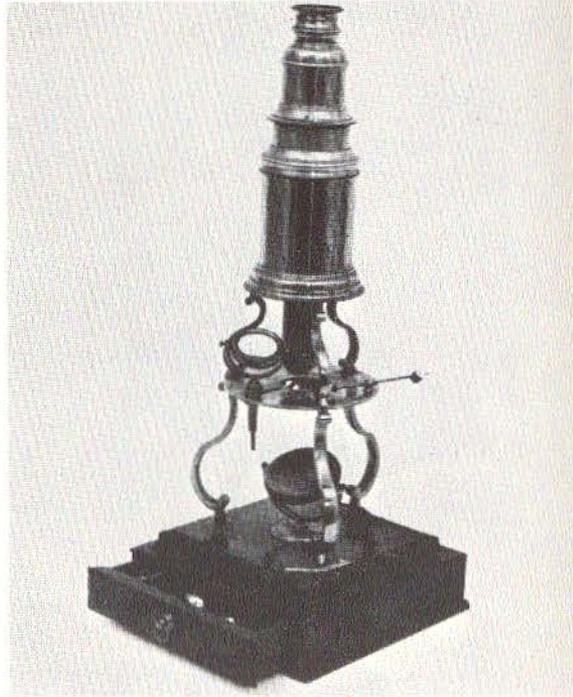


Fig. 335. George Sterrop, London, England; compound monocular; C. 1745. (AFIP 518914 - 66-6197)

This all brass instrument (Fig. 335) is on a box base 6 inches square and 2 inches high. It is similar to Fig. 336 (AFIP 518928) with the exception that the legs are S-curved, the stage is round, the sliding body tube is all brass, and the nosepiece is 2-1/4 inches long. Accessories are 4 objectives; lieberkühn; cone diaphragm; forceps; brass slider; and stage condenser. Height is 15-1/4 inches. It is signed, "Sterrop, London, Fecit." ■

The box base of this all-brass instrument (Fig. 336) is 6-1/2 x 6-1/4 x 2-1/4 inches, with an accessory drawer at the front. The gimbal for the 1-5/8-inch-diameter single mirror is inserted into the base. Three 6-1/8-inch-high curved legs are set in diamond-shaped plates screwed to the base and attached to the base



Fig. 336. George Sterrop, London, England; compound monocular; C. 1750. (AFIP 518928 - 66-6207)

of the outer body tube. The stage is irregular shaped, with scalloped edges. It has a $3/4$ -inch central aperture, and openings for forceps and fish-plate.

The sliding body tube is all brass. The convex eye lens is $3/4$ inch in diameter and the field lens $1-1/4$ inches. There is a sliding brass dust cap on the eyepiece. The nose-piece is $2-3/4$ inches long and has a sliding tube lieberkühn carrier. Accessories are 4 objectives; cone diaphragm; Bonanni spring stage; live-box; fish-plate; lieberkühn; 2 concave lenses; tweezers; 4 ivory sliders; and ivory talc box. Height is $15-1/2$ inches. It is signed, "George Sterrop, Maker," and is one of the earliest Culpeper-type microscopes made entirely of brass. ■

The base of this all-brass instrument (Fig. 337) is a $6-3/8$ -inch-square wooden box with an accessory drawer. A 3-inch-high rectangular block with a curved arm is screwed to a brass plate attached to the base. A gimbal for a $1-3/4$ -inch single mirror is inserted into the

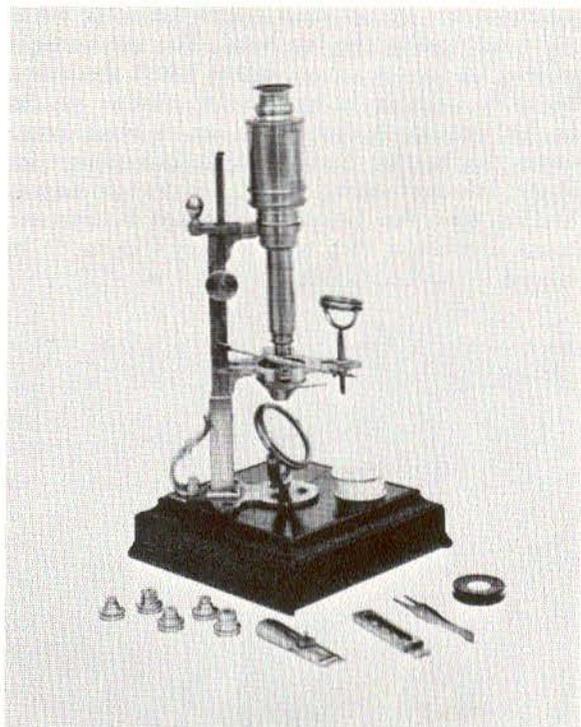


Fig. 337. John Cuff, London, England; compound monocular; C. 1750. (AFIP 518896 - 66-6206-1)

front of the plate. Two $4-3/4$ -inch-high vertical, rectangular pillars, one behind the other, fit into the brass block. One pillar is stationary, the other is adjustable by rack and pinion.

The stage, in the form of a cross, is screwed to a projection on the movable pillar, has a $1-1/4$ -inch-diameter aperture with cone diaphragm and openings for forceps and condenser. A 2-inch-long arm with a ring front for the body tube is fitted over the pillars, and screwed to a projection on the front of the adjustable pillar. The body tube is 7 inches long. The fixed nose is $2-1/2$ inches long and has a screw fitting for the objective. The upper section of the body tube has an eye lens and a field lens. Height is 14 inches. Accessories are 6 objectives; fish-plate; stage forceps; tweezers; brass object slider; and ivory talc box. It is signed, "J. Cuff, Londini, Invt. et Fecit." ■

AFIP 518909. George Sterrop, London, England; compound monocular; C. 1750. Not illustrated.

This Cuff-type instrument is similar to Fig. 337 (AFIP 518896) with the following differences: The gimbal for the $1-1/2$ -inch-diameter

single mirror is set in a 2-inch-diameter brass plate screwed to the box base. The two vertical pillars fit into a square brass block 2 inches high. Adjustment is by Hevilus screw. Height is 14 inches. Accessories are 5 objectives; cone diaphragm; fish-plate; glass plate for stage; Bonanni spring stage; 2 ivory talc boxes; sliding tube for lieberkühn; stage condenser; brass diaphragm ring, and 5 ivory sliders. It is signed, "Sterrop, London, Fecit." ■

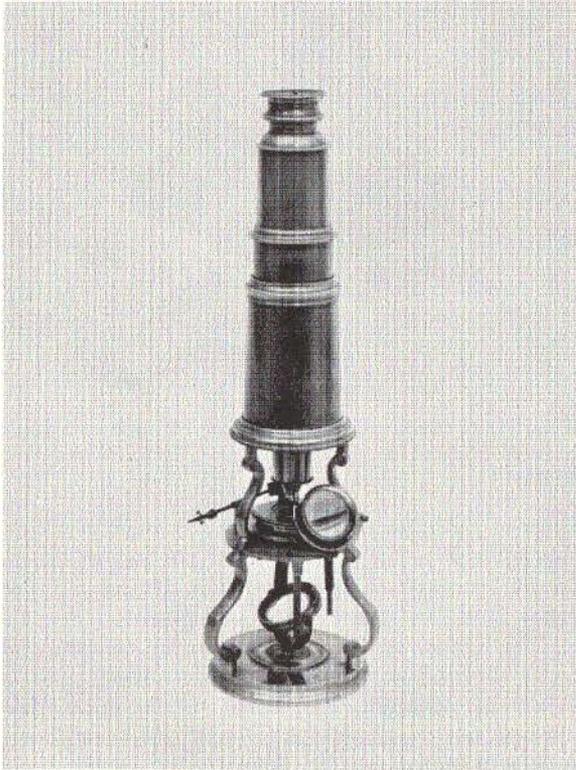


Fig. 338. Maker unknown; compound monocular; C. 1750. (AFIP 518895 - 66-6202-1)

The base of this all-brass Culpeper-type microscope (Fig. 338) is 2-7/8 inches in diameter; the gimbal for the 1-inch mirror is screwed to the base. Three S-shaped pillars, 4-3/8 inches high, are screwed to the base and to the plate to which the body tube is screwed. Slots have been cut into the pillars to hold the 2-1/2-inch-diameter stage. A Bonanni spring stage fits into the 7/8-inch-diameter aperture on the stage; fixtures for forceps and condenser are attached to the stage.

The sliding body tube has a 1/2-inch-diameter eye lens, and a 1-1/8-inch-diameter field lens. The 1-7/8-inch-long tapered nosepiece has a screw-on objective. The outer body tube is

2-7/8 inches long, 1-1/2 inches in diameter at the top, and 2-1/8 inches at the bottom. Height is 10-3/8 inches. Accessories are 3 objectives; Bonanni spring stage; stage condenser; needle with a brass handle; ivory slider; 2 glass tubes; brass tweezers; and a 7/8-inch-diameter lens. ■

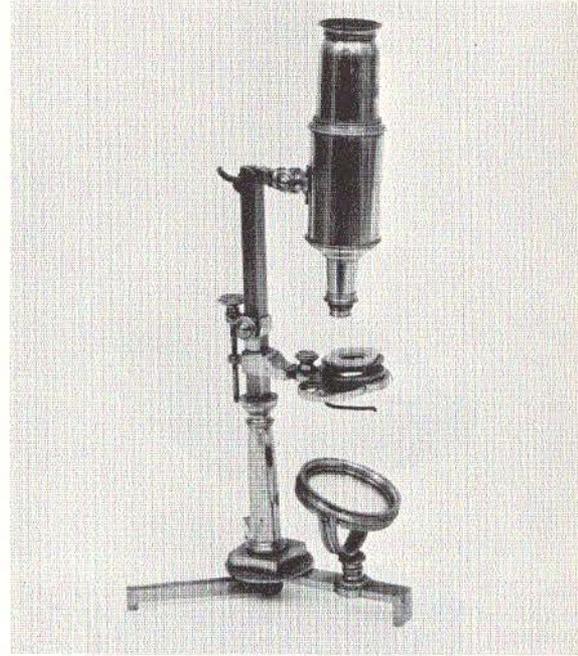


Fig. 339. Benjamin Martin, London, England; compound monocular; 1750. (AFIP 518908 - 66-6233)

This all-brass instrument (Fig. 339) has a folding tripod base. The gimbal for the 2-1/2-inch-diameter single mirror screws into a fixture mounted on the front section of the tripod. The pillar is 7-1/2 inches high, and the lower 3 inches are round and tapered and fixed to a square block mounted on a circular plate in the center of the tripod; the upper section is square. The rotating stage is half round with scalloped edges (Martin's 3-cell stage) and is mounted to a block that fits over the pillar; it has an Hevelius screw adjustment.

The 5-1/2-inch-long body tube is attached by a short arm and compass joint to the top of the pillar; the nosepiece and eyepiece screw to the tube. There is an eye lens, field lens and objective. Height is 10-3/8 inches. Accessories are an objective, and a Bonanni spring stage. Although not signed, this instrument appears to be a duplicate of that described in the literature as "Martin's 1750 'Universal' microscope." ■

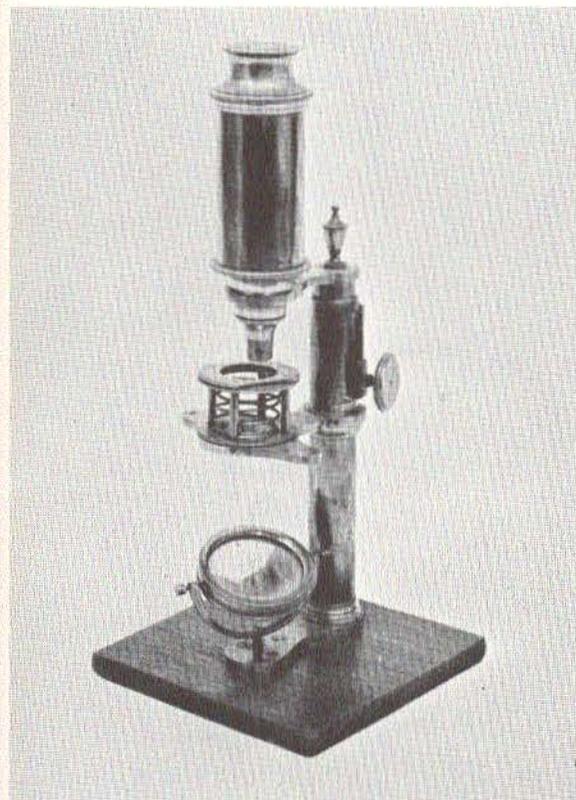


Fig. 340. Spiegel, Amsterdam, Holland; compound monocular; C. 1750. (AFIP 518888 - 66-6230)

This instrument (Fig. 340) is mounted on a $4\frac{1}{2} \times 4\frac{5}{8}$ -inch wooden base. The gimbal for the $1\frac{1}{2}$ -inch single mirror is inserted into a curved brass plate screwed to the base. The 6-inch-high pillar consists of two round tubes, one sliding within the other by means of rack and pinion. The Ayscough stage with screw-on Bonanni spring stage is on an arm that fits over the pillar. The movable arm for the body tube screws on the top of the pillar.

The $4\frac{1}{2}$ -inch-long body tube screws into the arm, has a field lens, and a short cone nose for the screw-on lieberkühn and objective. The eyepiece screws into the tube and has a biconvex lens. Height is $10\frac{1}{8}$ inches. Accessories are 2 objectives and 5 ivory sliders. In the accessory drawer of the pyramidal-shaped carrying case is a handwritten label, "Spiegelmicroscop, midden 18' cen., Hollandschwerk." ■

AFIP 518925. Spiegel, Amsterdam, Holland; compound monocular; C. 1750. *Not illustrated.*

This instrument is almost identical to Fig. 340 (AFIP 518888) with the exception that it

has an Hevelius screw adjustment. It may have had a rack and pinion originally, as there are two small holes for screws in the upper section of the outer pillar. Accessories are 2 objectives; biconvex lens; stage condenser; stage forceps; and 13 ivory sliders. Height is $10\frac{1}{8}$ inches. ■

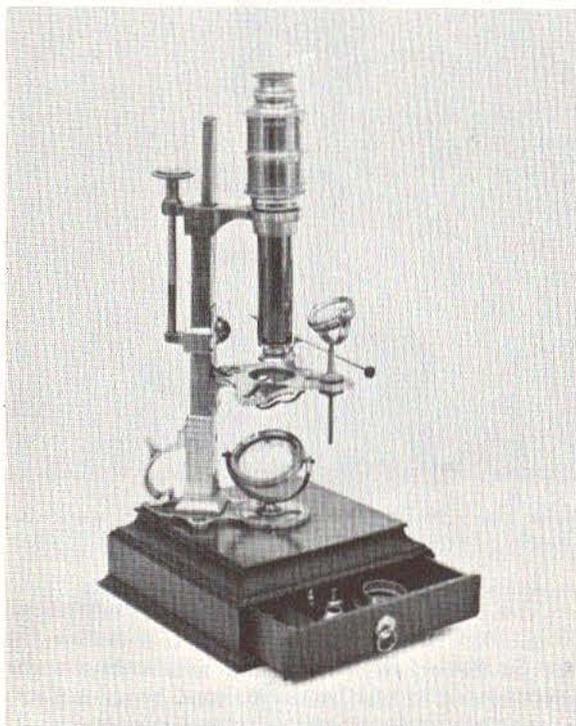


Fig. 341. Maker unknown; compound monocular; C. 1750. (AFIP 518889 - 66-6209-1)

This Cuff-type instrument (Fig. 341) is similar to those by Cuff, Dollond, Sterrop and Adams. The chief difference is that the stage of this instrument revolves horizontally while all the others are stationary. Accessories are 5 objectives; Bonanni spring stage; cone diaphragm; fish-plate; magnifying glass; lieberkühn; sliding tube for lieberkühn; tweezers; brass slider; and a glass tube. Height is 14 inches. ■

This Cuff-type microscope (Fig. 342) is mounted on a wooden base $6\frac{5}{8}$ inches in diameter. The eye lens is composed of two biconvex lenses. It is similar in all other respects to the Cuff types herein described. Accessories are 5 objectives; lieberkühn; tweezers; eye lens, concave object glass; and live-box. Height is $12\frac{1}{4}$ inches. ■

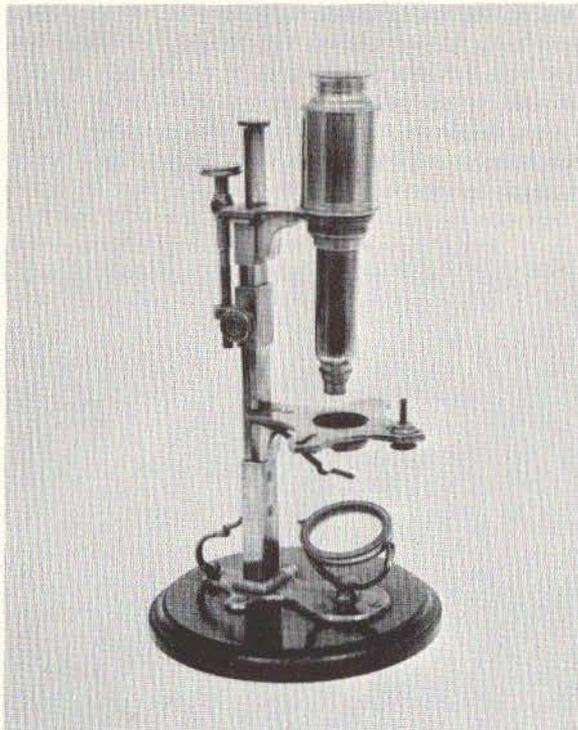


Fig. 342. Maker unknown; compound monocular; C. 1750. (AFIP 518899 - 66-6211-1)

The wooden box base of this instrument (Fig. 343) is $6\text{-}\frac{3}{4}$ x $6\text{-}\frac{3}{4}$ x $1\text{-}\frac{1}{2}$ inches, is set on three brass feet, and has a drawer for accessories at the front. A round wooden disc, 6 inches in diameter and $1\text{-}\frac{3}{8}$ inches thick, is mounted on the base. The gimbal for the $1\text{-}\frac{5}{8}$ -inch-diameter single mirror is set into a fixture in the center of the disc. A ring-shaped brass plate is inserted into the disc, to which the legs are screwed.

Three curved brass legs $3\text{-}\frac{1}{2}$ inches high support the $3\text{-}\frac{1}{2}$ -inch-diameter circular stage. Three similar legs, $2\text{-}\frac{1}{4}$ inches high, directly above the first three, are attached to the stage and to the brass base to which the body tube is attached. The stage has a $\frac{7}{8}$ -inch central aperture, and openings for forceps and condenser. The upper portion of the sliding body tube is of dark wood, has a $\frac{7}{8}$ -inch-diameter eyepiece, a brass sliding dust cap, and a $1\text{-}\frac{7}{8}$ -inch-diameter field lens. The lower section is cardboard covered with green paper and graduated markings. The nosepiece is wood, $2\text{-}\frac{1}{4}$ inches long, with a brass fitting for the objective. The outer body tube is mottled black and white shagreen and has a brass rim at the top and bottom.

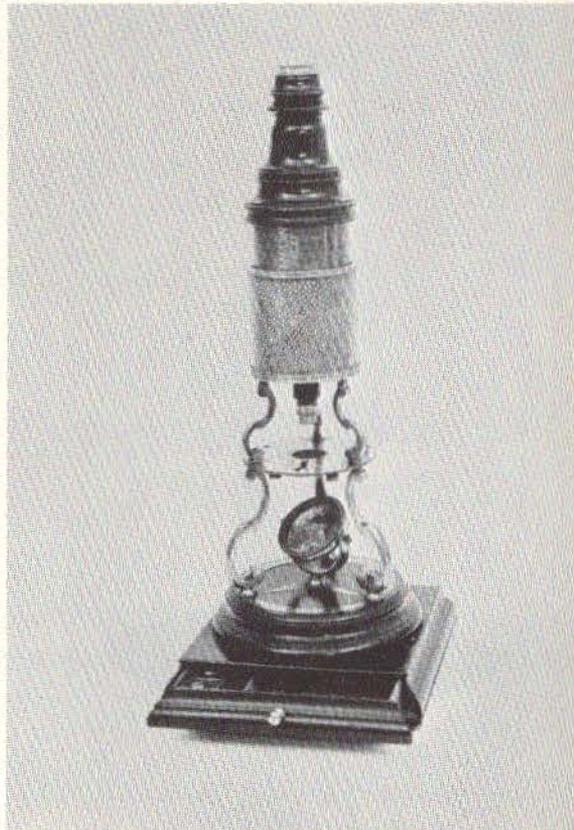


Fig. 343. I. Mann, London, England; compound monocular; C. 1750. (AFIP 518924 - 66-6196)

Accessories are 4 objectives; a fishskin-covered box containing three ivory and two brass sliders; and a hand magnifying glass. Height is 16 inches. It is signed, "I. Mann, Fecit." There were three generations of Manns who were instrument makers. ■

The circular base of this Culpeper-type dark wooden instrument (Fig. 344) is $4\text{-}\frac{7}{8}$ inches in diameter and rests on three wooden buttons. The $1\text{-}\frac{3}{8}$ inch-diameter mirror is inserted into a slotted block in the base. Three $4\text{-}\frac{1}{4}$ -inch turned legs are inserted into the base and support the $3\text{-}\frac{3}{8}$ -inch-diameter stage plate.

The $2\text{-}\frac{3}{4}$ -inch-long outer body tube is cardboard covered with dark fishskin with a wooden rim at the top. The sliding body tube is also of cardboard covered with red and white paper. The rim and nosepiece are of wood, the objective is fixed, and the eyepiece contains an eye lens and a field lens. Height is $12\text{-}\frac{7}{8}$ inches. Branded on the base is a circle with the initials, "RC." ■

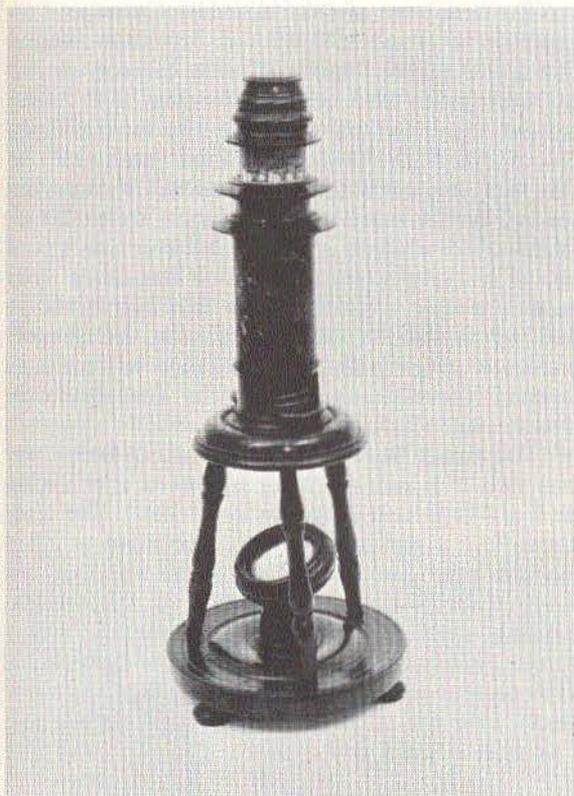


Fig. 344. "RC", Nuremberg, Germany; compound monocular; C. 1750. (AFIP 518910 - 66-6212)

AFIP 518902 "CR", Nuremberg, Germany; compound monocular; C. 1750. *Not illustrated.*

This instrument is similar to Fig. 344 (AFIP 518910) but is of a lighter colored wood and it has an eye lens, field lens and objective. Height is 13 inches. Branded on the base in an ellipse are the initials, "CR." ■

The box base of this instrument (Fig. 345) is 6-1/4 x 6-1/4 x 2 inches with a drawer for accessories at the front. A 6-inch-diameter wooden disc, 1 inch thick, is set on the base. A 5-1/2-inch-diameter brass circular rim is screwed to the disc, to which the three legs are attached. The gimbal for the 1-1/2-inch-diameter single mirror is inserted into a fixture that is attached to a curved, triangular-shaped brass plate that extends to each of the three legs. The legs are curved, 3-1/4 inches high, and capped with fittings into which is fixed the star-shaped stage. The stage is recessed in the center, has an aperture for a Bonanni screw-on spring stage, and openings

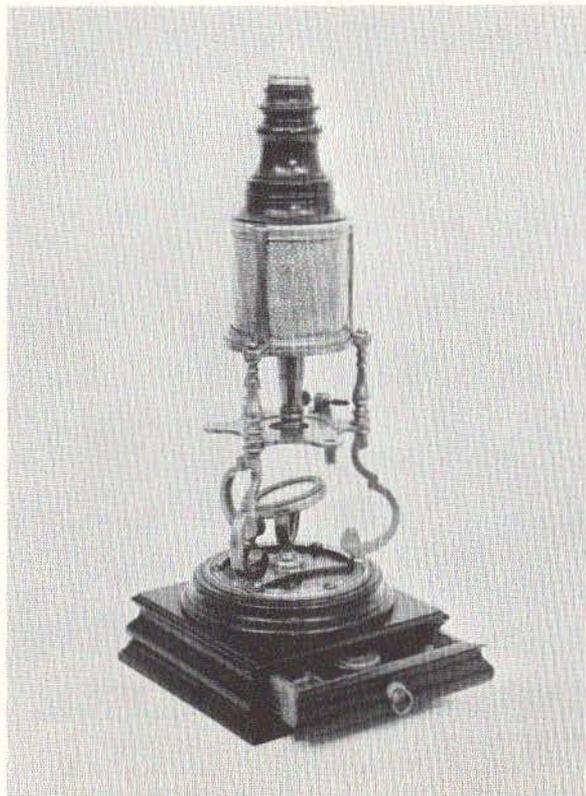


Fig. 345. Maker unknown; compound monocular; C. 1750. (AFIP 518931 - 66-6195)

for a forceps and condenser. Three 2-inch turned brass legs, attached to the three curved legs, support the brass rim for the body tube.

The upper portion of the sliding body tube is dark wood and the lower section is cardboard covered with green velum. The biconvex eye lens is 5/8 inch in diameter and the field lens 1-1/8 inches in diameter. A sliding brass dust cap is at the top of the eyepiece. The brass cone-shaped nosepiece is 2 inches long. The outer body tube is covered with mottled red and white shagreen, has a brass rim at the top and bottom, and three vertical brass strips. Accessories are 3 objectives; Bonanni spring stage; brass tweezers; and forceps. Height is 15-3/4 inches. ■

This instrument (Fig. 346) is similar to, but larger than, Fig. 352 (AFIP 518916) and is all wood with the exception of the body tube, draw-tube and eyepiece which are cardboard covered with paper, and capped with wooden rims. It has an eye lens, field lens and objective. Height is 8-1/2 inches. Branded on the base is a circle with the initials, "IM." ■

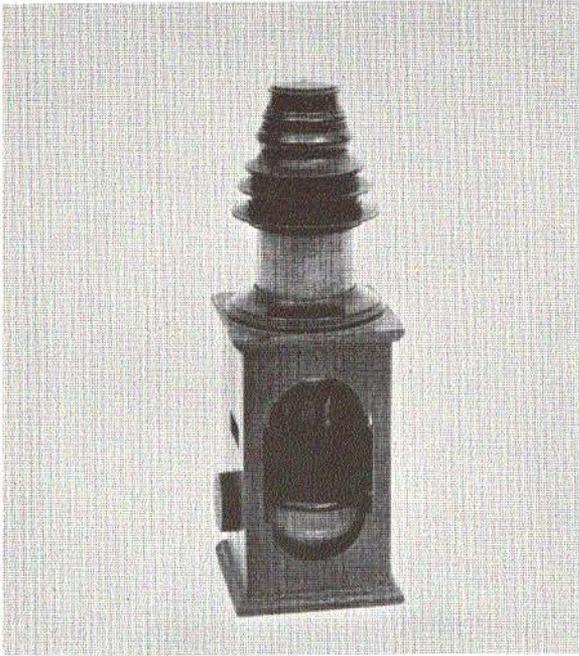


Fig. 346. "IM", Nuremberg, Germany; compound monocular; C. 1750. (AFIP 518904 - 66-6216)

The box base of this all-brass Culpeper-type instrument (Fig. 347) is 6-1/4 inches square and 2-1/2 inches high with an accessory drawer at the front. The gimbal for the 1-1/2-inch single mirror is inserted into the base. Three 3-1/2-inch-high S-shaped legs are set in diamond-shaped plates screwed to the base and extend to the base of the stage. Three 2-1/2-inch-high S-shaped legs extend from the top of the stage to the plate to which the outer body tube screws. All the legs are connected to slotted sections into which the 3-5/8-inch-diameter stage is fitted. The stage has a 1-inch central aperture, openings for forceps, condenser, and fish-plate.

The upper section of the sliding body tube has two 3/4-inch-diameter biconvex eye lenses and a 1-3/8-inch-diameter field lens. The eyepiece has a sliding dust cap. The nose is 2-3/4 inches long and screws into the base of the body tube. Accessories are 4 objectives; sliding tube for lieberkühn; Bonanni spring stage; live-box; cone diaphragm; lieberkühn; fish-plate; concave glass for the stage aperture; ivory talc box; and ivory slider. It is signed, "Urings, Fecit." ■

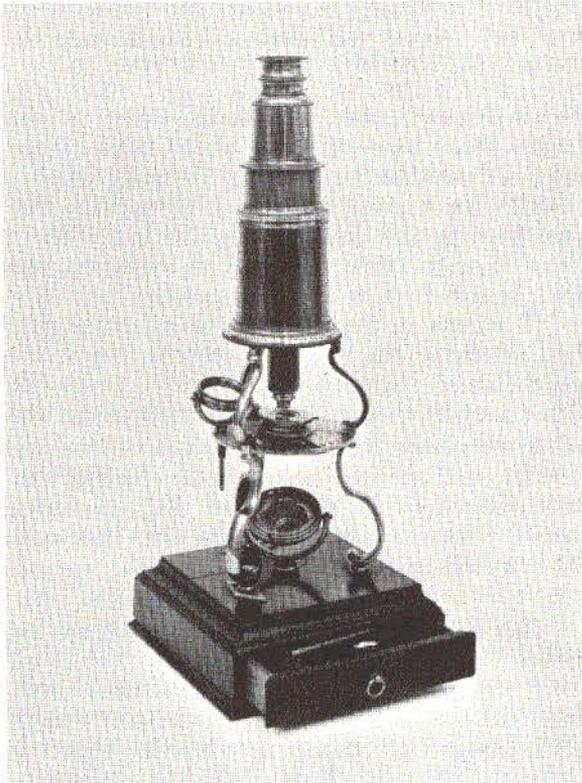


Fig. 347. Urings, London, England; compound monocular; C. 1752. (AFIP 518915 - 66-6198)

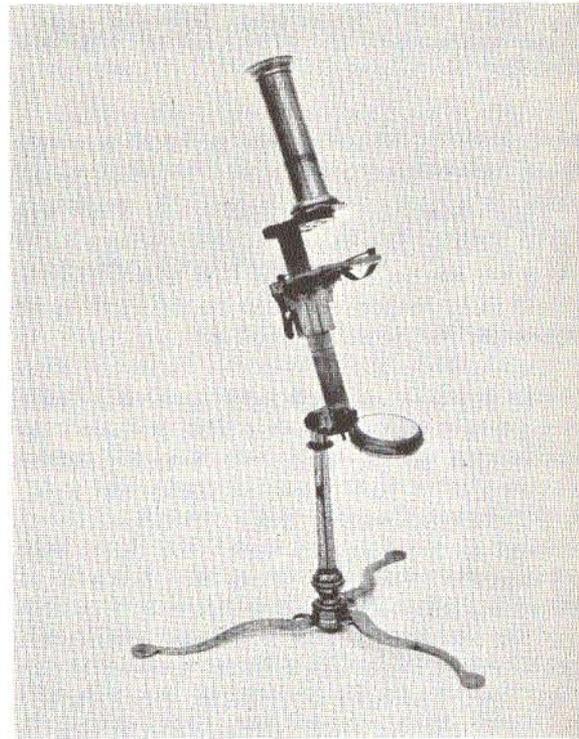


Fig. 348. Francis Watkins, London, England; compound monocular; before 1754. (AFIP 518893 - 66-6221)

The base of this all-brass instrument (Fig. 348) is a curved folding tripod that screws to the bottom of the 3-1/2-inch-high octagonal pillar. The body, stage and mirror are mounted on a half-round limb that is hinged to the top of the pillar and may be inclined. The 1-1/8-inch single mirror is on a compass joint at the lower end of the limb. The 1-1/2 x 1-1/4-inch stage is mounted on a sliding block on the limb, and has a 3/8-inch aperture.

The 2-3/4-inch-long body tube screws into a flat transverse arm that is attached to the top of the pillar. On the underside of the arm is a rotating wheel of 6 objectives. The eye lens is biconvex. Accessories are stage forceps; brass box for sliders; and a flat, round glass for the stage. ■

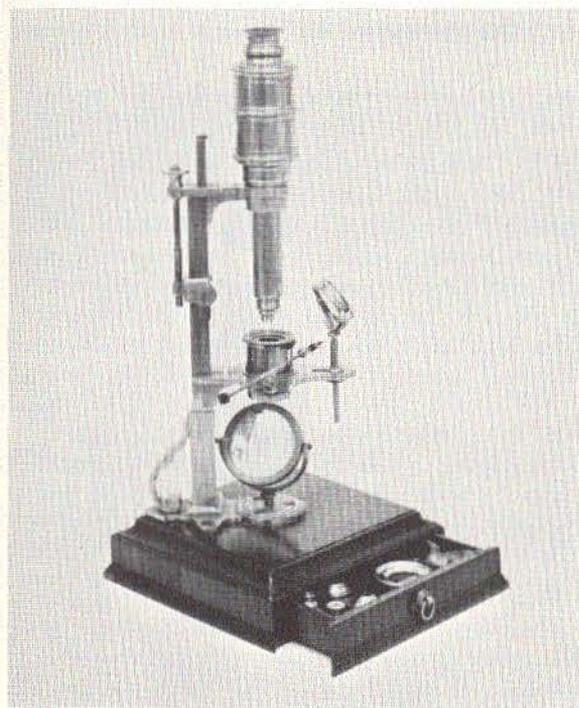


Fig. 349. George Adams, London, England; compound monocular; C. 1755. (AFIP 518922 - 66-6224-1)

This Cuff-type microscope (Fig. 349) is similar to Fig. 337 (AFIP 518896). The Bonanni spring stage differs in that it extends below the stage where the diaphragm cone is attached. Glass tubes may be inserted into the upper section of the spring stage. Accessories are 5 objectives; cone diaphragm; fish-plate; live-box; tweezers; magnifying glass; concave glass for stage opening; ivory talc box; 7 ivory

sliders; and glass tubes. Height is 14 inches. It is signed, "Made by Geo. Adams, Inst. Maker to the Prince of Wales." ■

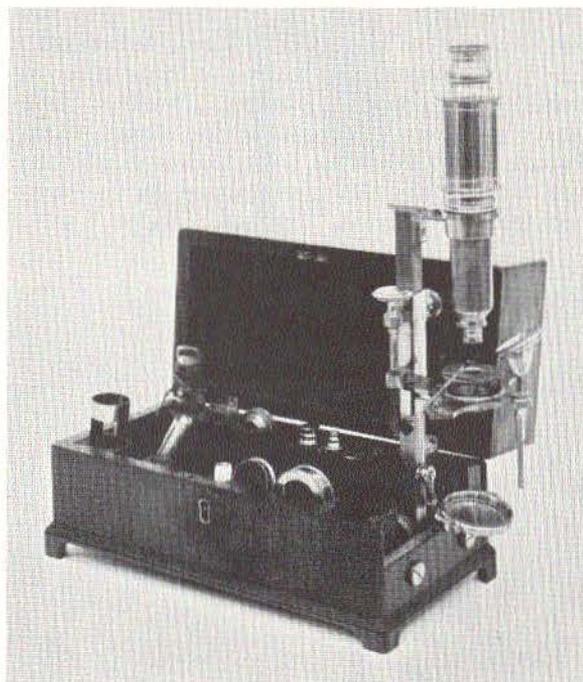


Fig. 350. Edward Nairne, London, England; compound monocular; C. 1760. (AFIP 518938 - 66-6219-1)

The box of this chest microscope (Fig. 350) is 11-1/4 x 5-3/4 x 5-1/2 inches. The 8-inch-high pillar fits into a hinged joint that is screwed to one end of the box; when not in use it may be folded into the box. The gimbal for the 1-1/2-inch-diameter single mirror is connected to a swinging arm screwed to the pillar. The Cuff-type cross-shaped stage fits over a 2-1/4-inch-high collar on the pillar. A 1-inch-high collar above carries both the fine and coarse adjustments.

The 6-3/4-inch-long body tube fits into an opening on the arm that is screwed to the top of the pillar. The body tube, of the usual Cuff-type but without a drawtube, has a single eye lens and field lens. The nose is 2-3/4 inches long with a screw fitting for the objective. Accessories are 3 objectives; lieberkühn; sliding tube for lieberkühn; fish-plate; cone diaphragm; live-box; Bonanni spring stage; ivory talc box; ebony & ivory discs; flat and concave glass plates for stage; 2 cardboard diaphragms; 3 glass tubes; and stage forceps and condenser. Height is 15 inches. It is signed, "Nairne, London." ■

AFIP 518920. Dollond, London, England; compound monocular; C. 1760. *Not illustrated.*

This instrument is identical to Fig. 350 (AFIP 518938) with the exception that the Hevelius screw is slightly longer. Accessories are 5 objectives; lieberkühn; sliding tube for lieberkühn; cone diaphragm; live-box; fish-plate; tweezers; Bonanni spring stage; stage forceps; ivory talc box; ivory slider; glass tube; and concave and flat glass plates for the stage opening. It is signed, "Dollond, London." ■

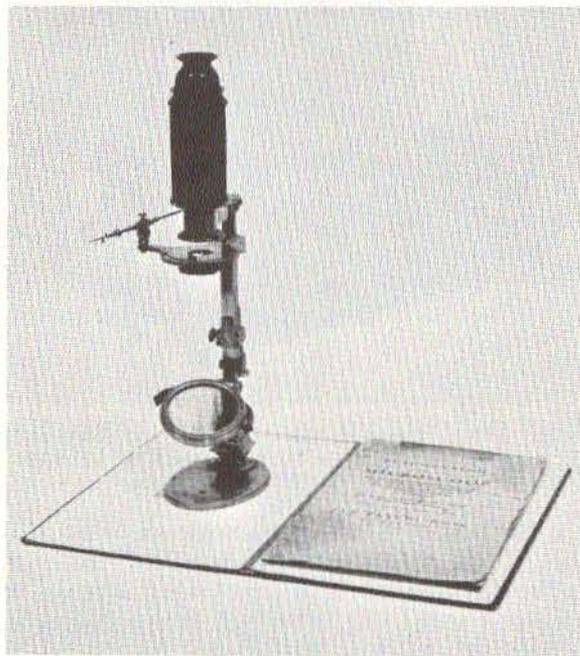


Fig. 351. Jan Paauw, Jr., Leyden, Holland; compound monocular; C. 1760. (AFIP 518907 - 66-6201-1)

This instrument (Fig. 351) is all brass with the exception of the body tube, and may be used as either a simple or compound microscope. The oval base is 3-1/2 x 2-1/2 inches, and attached to the rear is a slotted fixture into which fits the 5-inch-high stationary pillar; this permits inclination of the entire instrument. The gimbal for the 2-3/4-inch-diameter double mirror is screwed to a hinged block attached to the front of the pillar that permits tilting the mirror upward. A sliding pillar, inserted into two rectangular blocks, fits close to the stationary pillar. Coarse adjustment is achieved by a short fine screw inserted in a block that encompasses both pillars. Fine adjustment is by a 2-inch-long Hevelius screw attached to the rear of the pillars.

The 1-7/8-inch-diameter stage has a 1/2-inch-diameter aperture, a 1-inch-long curved arm for the forceps, and a Bonanni spring stage. The stage, screwed to an opening in a 1 x 5/8-inch block attached to the pillar, may be tilted upward. A 3/4-inch-long block on a swivel joint is attached to a movable fixture on the top of the sliding pillar. The 3-3/4-inch-long body tube is of cardboard covered with black shagreen, and screws into a ring fixed to a 7/8-inch-long arm inserted into the block and fixed by means of a small screw. The eyepiece and base of the body tube are of black horn.

Accessories are 2 lieberkühns; a holder for the lenses when used as a simple microscope; 5 lenses with ivory caps; a concave and a flat glass for the stage opening; 2 brass diaphragms; and ivory slider. Height is 11 inches. An illustrated, descriptive article by the maker came with the instrument. ■

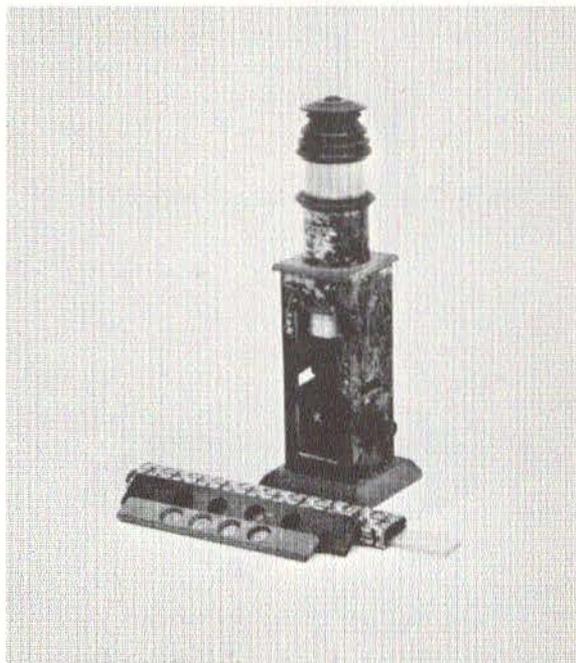


Fig. 352. W. Burucker, Nuremberg, Germany; compound monocular; C. 1760. (AFIP 518916 - 66-6215)

The wooden base of this instrument (Fig. 352) is 2-1/4 inches square. A 1-1/2-inch-square by 4-inch-high paper-covered cardboard box is attached to the base; the front of the box is cut away 7/8 x 2-7/8 inches. The 1-inch-diameter single mirror is encased in wood, and is mounted on a half-round wooden rod fastened to the lower section of the box by wooden buttons.

The cardboard outer body tube with a hardwood ring at the top is secured to the box. The sliding body tube, 4-1/2 inches long, is of cardboard with a wooden ring at the top and a wooden nosepiece with objective. The cardboard eyepiece is 3 inches long with wooden fittings for the eye lens and field lens. The only accessories are 2 wooden sliders. Height is 7 inches. It is signed, "W. Burucker"; it is a Nuremberg copy of Martin's pocket reflecting microscope. ■

AFIP 518997. W. Burucker, Nuremberg, Germany; compound monocular; C. 1760. *Not illustrated.*

This instrument is similar to Fig. 352 (AFIP 518916). The outer paper covering of the box on this model is light brown and the body tube is dark green with a seal marked, "A. W. Meynen LaHave." It is signed, "W. Burucker." ■

AFIP 518923. Dollond, London, England; compound monocular; C. 1770. *Not illustrated.*

This Cuff-type instrument is similar to Fig. 337 (AFIP 518896). The single mirror is 1-3/4 inches in diameter and the body tube is 8 inches high. Accessories are 5 objectives; Bonanni spring stage; cone diaphragm; sliding tube for lieberkühn; fish-plate; lieberkühn; tweezers; brass slider and round glass plate for the stage. Height is 14-3/4 inches. It is signed, "Dollond, Lond."

Originally a solar microscope came with this instrument, but only the following accessories for the solar microscope are in the case: Wilson-type microscope; 6 capped lenses; spring stage with rotating disc; ivory slider; and 3 glass tubes. ■

The telescopic tripod base of this all-brass microscope (Fig. 353) folds downward. At the center of the tripod the 10-1/4-inch-high rectangular pillar terminates in a pin that rotates in a socket and is fixed by a screw clamp. The gimbal for the 2-7/8-inch-diameter double mirror is attached by a double compass joint to a block that slides on the pillar. Above this is a biconvex lens, 1-3/8 inches in diameter, on a 1-inch-long arm that is attached by a double compass joint to a block with a screw clamp.

The 3-1/4-inch-diameter stage has a 2-5/8-inch aperture and openings for forceps and glass bottle. The stage is hinged to fold upward and may be adjusted by a rack and pinion screwed

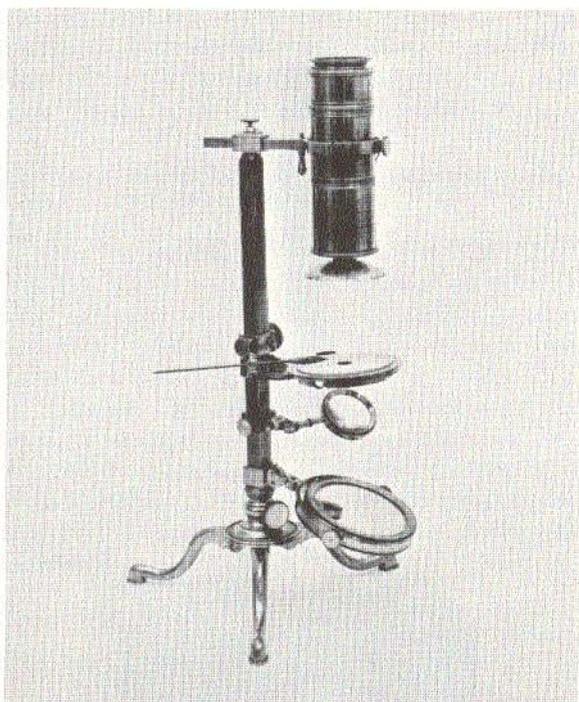


Fig. 353. L. F. Dellebarre, Leyden, Holland; compound monocular; C. 1777. (AFIP 518898 - 66-6279)

to a block that fits over the pillar. A compass joint 4 inches from the top of the pillar permits the body to be moved to a horizontal position. The top of the pillar terminates in a socket with screw clamp in which the pin of the slotted fitting for the arm rotates, thus permitting an arc movement.

The sliding arm holds the body tube by a cloth-lined split ring with spring catch and screw clamp. The 5-1/2-inch-long body tube is in three sections, the lower section with a 1/2-inch-long screw nosepiece for objective and lieberkühn; the middle section is the drawtube with Martin's between-lens; and the third section is the eyepiece that screws into the middle section. The eyepiece has three 3/8-inch-diameter biconvex lenses covered with a sliding dust cap. Height is 16-1/2 inches. Accessories are 4 objectives; lieberkühn; glass stage plate; stage forceps; fish-plate; brass slider; and glass tubes. It is signed, "L. F. Dellebarre." ■

The box base of this Cary-type instrument (Fig. 354) is 6-1/8 x 4-1/8 x 1-1/2 inches. The 4-1/2-inch-high pillar screws to the top of the box. The gimbal for the 1-1/4-inch-diameter single mirror is on a pin that is inserted into

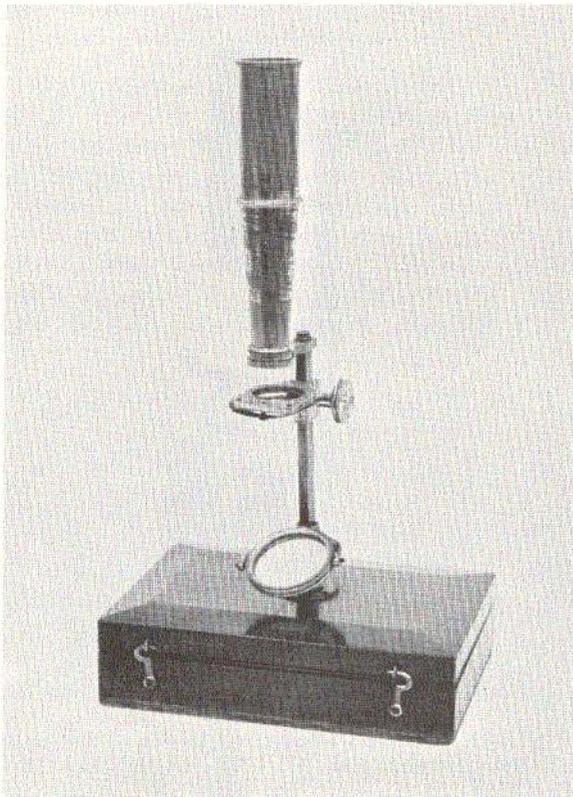


Fig. 354. Maker unknown; compound monocular; C. 1750. (AFIP 518891 - 66-6218)

the pillar. The upper 3-1/4-inch section of the pillar is rectangular in shape with a rack at the back. The 1-1/8-inch-square stage has a projection at the back and is screwed to the casing that carries the pinion. A 1-3/4-inch-long arm is screwed to the top of the pillar.

The 4-3/4-inch-long body tube screws to the arm, has a field lens, and a 2-1/2-inch cone nose with a screw-in objective. The eyepiece has two convex lenses. Height is 10-1/2 inches. Accessories are 7 objectives; live-box; 2 liberkithns; glass for the stage opening; and 3 wooden sliders. ■

This cabinet of optical instruments (Fig. 355), probably made by George Adams or Benjamin Martin, consists of Cuff-type, solar, and Wilson-type microscopes.

The Cuff-type microscope has a folding tripod base to which screws a 6-1/2-inch-high pillar comprising two rectangular sections fitted closely together, and which fit into an outer casing 2-3/4 inches long. A second outer casing, 1-1/4 inches long, slides over the pillar. At the top of the pillar is a third outer casing to



Fig. 355. Maker unknown; cabinet of optical instruments; C. 1780. (AFIP 518869 - 66-6227)

which is attached a 3-inch-long arm for the 8-inch-long body tube. The second and third outer casings have a projection at the back into which fits an adjustment screw that motivates one section of the pillar while the other remains rigid. The stage is in the form of a Maltese cross and is screwed to a support on the front of the pillar. The gimbal for the 1-5/8-inch-diameter single mirror is inserted into the tripod base.

The solar microscope consists of a 4-3/4-inch-square brass plate and a 7-1/8 x 2-1/4-inch mirror. A butterfly nut on the brass plate adjusts the mirror. A 3-1/4-inch tube, 1-1/2 inches in diameter, screws into the plate. The 2-1/2-inch-long Wilson-type microscope with rack and pinion screws into the tube.

Accessories for the Cuff-type microscope are Bonanni spring stage; cone condenser; fish-plate; live-box; stage condenser; tweezers; glass tubes; two ivory sliders; ivory box for mica and springs; and 3 wooden sliders. Accessories for the solar microscope are a special low-power projecting lens with rack focusing attached to a square Bonanni spring stage, and a dovetail sliding bar with 6 lenses. All of these items are packed in a sharkskin-covered box. ■

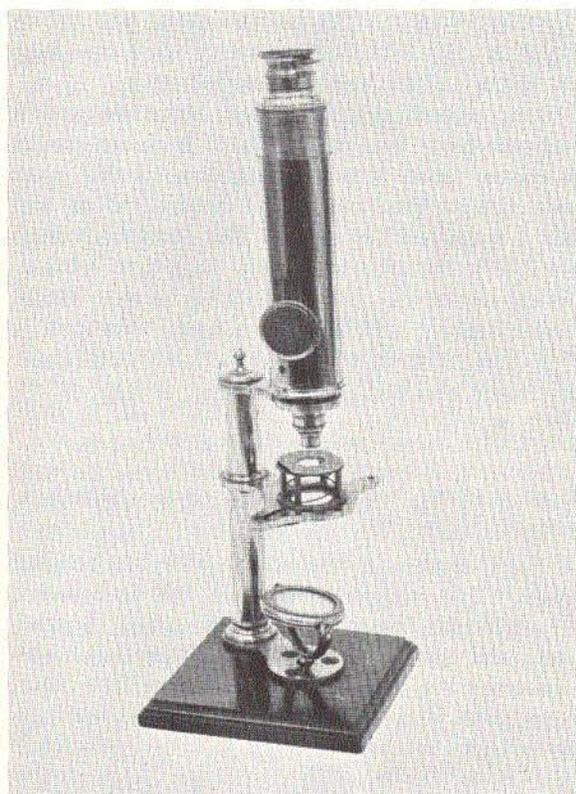


Fig. 356. Maker unknown; compound monocular; C. 1790. (AFIP 518911 - 66-6226-1)

The wooden base of this all-brass microscope (Fig. 356) is 4-1/4 inches square. The gimbal for the 1-1/4-inch-diameter single mirror is inserted into the front of the brass plate on the base. A 5-1/2-inch-high round brass pillar is fixed to the rear of the plate; the fixed Ayscough stage is mounted on the pillar.

The 7-inch-long body tube screws into an opening in the 3-inch-long arm that extends from the top of the pillar. The sliding body tube is focused by rack and pinion and mounted on the side of the outer body tube. The eye lens is biconvex and there is a field lens. Accessories are Bonanni spring stage; 3 objectives; cone diaphragm; glass for the stage opening; and brass slider. The instrument combines features of the Cuff and the Culpeper microscopes.

AFIP 518937. Maker unknown; compound monocular; C. 1790. *Not illustrated.*

This instrument is similar to Fig. 356 (AFIP 518911) with the exception that it is mounted on a box base. The body tube is 5-5/8 inches long and 1-1/4 inches in diameter. The eye lens

and the field lens each consist of two biconvex lenses. Accessories are 3 objectives; fish-plate; live-box; glass plate; ivory talc box; and stage forceps. Height is 12-3/4 inches. ■

AFIP 518885. Maker unknown; compound monocular; C. 1790. *Not illustrated.*

This instrument is similar to Fig. 356 (AFIP 518911) but is larger. It is mounted on a brass plate screwed diagonally on the 6-inch-square box base. The pillar is 6-1/2 inches high, and the body tube 7-3/4 inches long and 1-3/8 inches in diameter. Accessories are 4 objectives; box for mica and springs; Bonanni spring stage; live-box; cone diaphragm; lieberkühn; sliding tube for lieberkühn; fish-plate; glass for stage opening; and 7 ivory sliders. Height is 14-5/8 inches. ■

AFIP 518921. Maker unknown; compound monocular; C. 1790. *Not illustrated.*

This instrument is similar to Fig. 356 (AFIP 518911) except that the body tube does not screw into the arm and the nose is shorter. Accessories are 4 objectives; box for mica covers; live-box; Bonanni spring stage; stage forceps; stage condenser; fish-plate; lieberkühn; brass slider; and ivory slider. ■

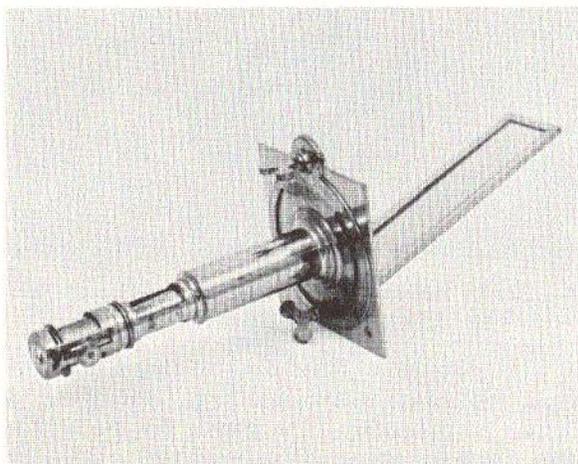


Fig. 357. Dollond, London, England; compound monocular; C. 1790. (AFIP 518868 - 66-6205)

The 4-3/4-inch-square brass plate of this solar microscope (Fig. 357) has a Cuff rack and pinion with endless screw and sector to the 7-1/4 x 2-1/4-inch mirror. The body tube is

3-1/2 inches long and 1-1/4 inches in diameter, and has a drawtube. A lens screws into the body tube and the tube screws into the center of the brass plate. The drawtube is 5-1/2 inches long; the upper 1-1/4 inches are cone shaped with a lens at the base. A Wilson-type microscope, 2-1/8 x 1-1/4 inches, with rack and pinion screws into the outer cutaway casing that covers the conical end of the drawtube. Accessories are 3 field lenses; brass tweezers; and ivory slider. It has a mahogany carrying case, and is signed, "Dollond, London," ■

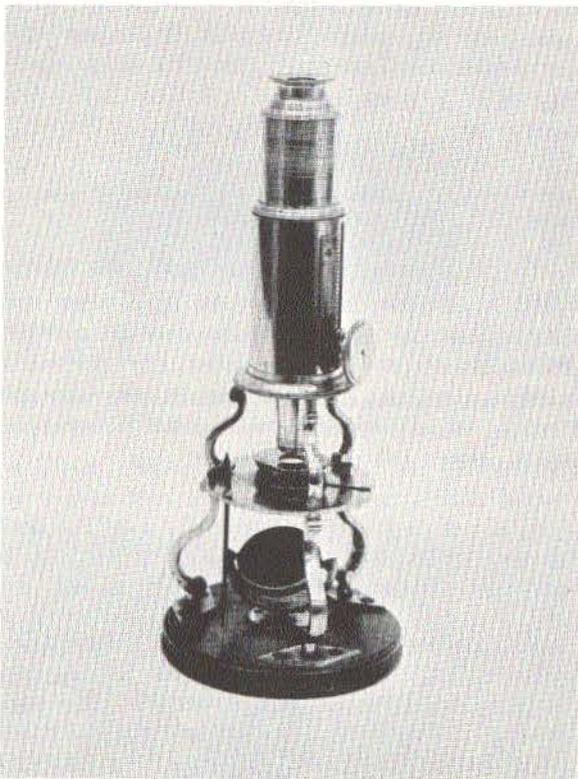


Fig. 358. Maker unknown; compound monocular; C. 1790. (AFIP 518930 - 66-6199)

The circular wooden base of this Culpeper-type, all-brass instrument (Fig. 358) is 4-1/8 inches in diameter. The gimbal for the 1-1/4-inch-diameter mirror is inserted into a circular brass plate screwed to the base. Three 2-3/8-inch-high S-shaped legs set in diamond-shaped plates extend from the base to the stage. Three 1-1/2-inch-high S-shaped legs extend from the top of the stage to the plate to which the outer body tube screws. All the legs are connected to slotted sections into which the 2-7/8-inch-

diameter stage is fitted. The stage has a 7/8-inch-diameter central aperture, and openings for forceps and condenser or fish-plate.

The eyepiece contains a biconvex and a plano-convex lens and an 1-1/8-inch-diameter biconvex field lens, and screws to the inner body tube. The nose is 1-1/2 inches long and has a screw-on objective. The outer body tube is 2-7/8 inches long with rack and pinion. Accessories are Bonanni spring stage; objective; forceps; and 2 ivory sliders. Height is 10-1/2 inches. It is similar to, but smaller than, one made and signed by Dollond of London, C. 1790. ■

AFIP 518906. Maker unknown; compound monocular; C. 1790. Not illustrated.

This instrument is similar to Fig. 358 (AFIP 518930) but somewhat smaller. It is mounted on a circular brass plate 3-1/8 inches in diameter, and has only one convex eye lens. Accessories are Bonanni spring stage; fish-plate; condenser diaphragm; 3 objectives; forceps; ivory tale box; and 5 ivory sliders. Height is 10-1/4 inches. ■



Fig. 359. A. Dellebarre, Leyden, Holland; compound monocular; C. 1797. (AFIP 518892 - 66-6239)

This all-brass instrument (Fig. 359) has a folding tripod base. The 9-1/8-inch-high pillar is inserted into the base with a wing nut. The gimbal for the 2-5/8-inch-diameter double mirror is on a double compass joint attached to a block by a screw clamp that slides over the pillar. Above this is a biconvex lens on a 1-inch vertical arm that is screwed to a 1-inch horizontal arm on a double compass joint fixed to a block by a screw clamp. The 3-inch-diameter stage with a 2-3/8-inch aperture is hinged to a block so as to fold downward. The stage is focused by a pinion working on a rack at the front of the pillar.

A 4-inch-long arm slides into a block that fits on top of the pillar. The 4-3/4-inch-long body tube is fitted on the arm, and is in three sections. The eyepiece has two biconvex lenses and a dust cap. Accessories are 4 objectives; stage condenser; live-box; 2 ivory talc boxes; brass slider; 2 wooden sliders; and brass diaphragm. ■

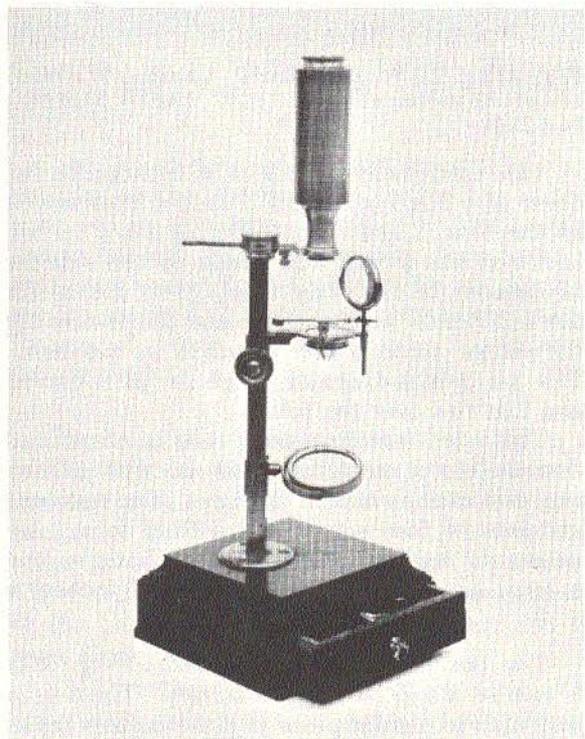


Fig. 360. W. & S. Jones, London, England; compound monocular; before 1798. (AFIP 518945 - 66-6278)

The box base of this instrument (Fig. 360) is 6-3/8 inches square with an accessory drawer. The 9-inch-high square pillar is fixed

to a circular plate screwed to the base. The gimbal for the 1-7/8-inch double mirror is attached to a block on the pillar. The Ayscough stage is screwed to a block on the pillar and has rack and pinion adjustment. The stage has openings for forceps, condenser, and fish-plate. The 6-1/4-inch-long body tube with aquatic motion is mounted on an arm attached to the top of the pillar; a wheel of objectives is attached to the body tube. The eyepiece has a triple eye lens.

Accessories are lieberkühns with lens and without lens; condenser ring; 2 lenses for use as a simple microscope; stage condenser; Bonanni spring stage; live-box; fish-plate; stage forceps; tweezers; glass for stage opening; brass object holder; brush; lancet; and rotating object slider. Height is 18 inches. It is signed, "W. & S. Jones, 30 Holborn, London." ■



Fig. 361. Maker unknown; compound monocular; C. 1800. (AFIP 518905 - 66-6242)

The base of this Martin-type drum microscope (Fig. 361) is 2-1/2 inches in diameter. A 6-5/8-inch-high tubular pillar, with cutaway front and back for a distance of 5-1/2 inches, is fixed to the base. The 1-1/2-inch-diameter single mirror is on a pivot. The fixed circular stage

is 1-3/4 inches in diameter, has a central aperture and openings for forceps and condenser. There are slits in the side of the stage and the tube, and a spring beneath the stage for sliders; there are also holes below the stage for a glass tube.

The 7-inch-long tube screws into an inner tube with rack cut in the side; the pinion is screwed to the outer tube. The eyepiece slides into the tube, has a field lens and two convex eye lenses. Accessories are 4 objectives; live-box; stage forceps; stage condenser; glass for the stage; glass tube; and mica box. Height is 10-1/4 inches. ■

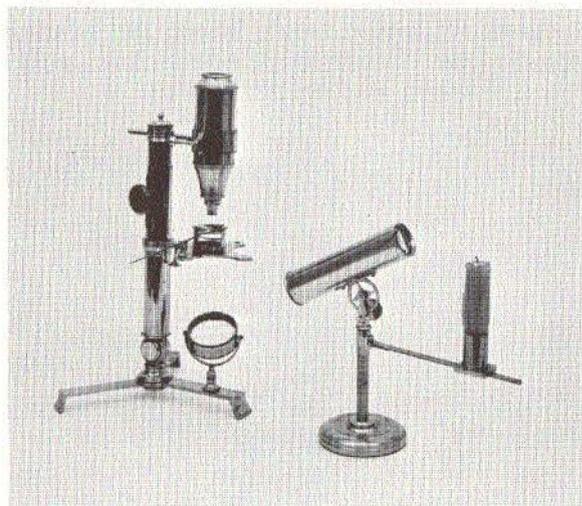


Fig. 362. Hartog van Laun and Sons. Amsterdam, Holland; compound monocular; C. 1800. (AFIP 518890 - 66-6280-1)

The base of this instrument (Fig. 362) is a folding flat tripod; the gimbal for the 1-7/8-inch-diameter double mirror is mounted on the front section of the tripod. The 7-1/8-inch-high pillar is round and consists of two tubes, one sliding within the other by means of rack and pinion. The arm and spring collar for the body tube slide into the top of the pillar. The cross-shaped stage slides into a collar on the pillar. The body tube is 5-1/2 inches long and has two convex lenses. The eyepiece has a biconvex lens and the cone-shaped nose has a screw-on objective.

Accessories are dissecting stage; condenser; stage forceps; Bonanni spring stage; 4 objectives; live-box; magnifying glass; and candle holder with condenser lens. Height is 12-1/2 inches. It is signed, "H. van Laun en Zoonan, Amsterdam." ■

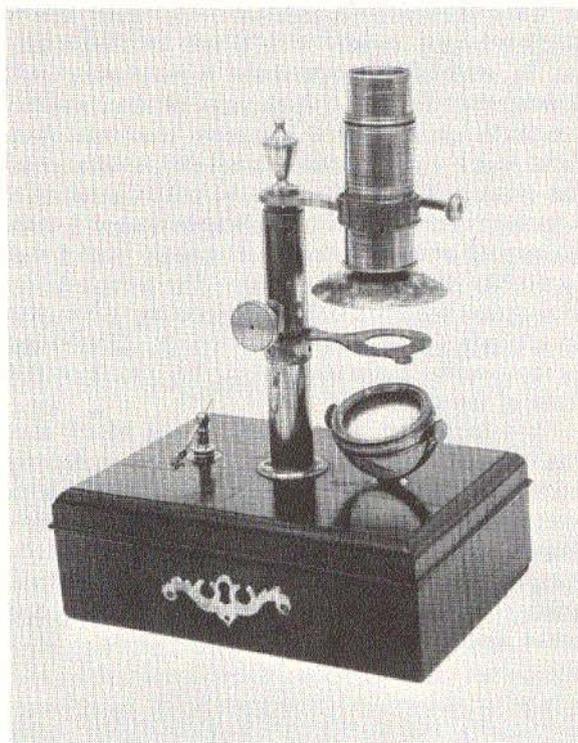


Fig. 363. L. F. Dellebarre, Leyden, Holland; compound monocular; C. 1800. (AFIP 518886 - 66-6238)

This instrument (Fig. 363) is mounted on the cover of a box 7 x 5 x 2-1/2 inches that serves as the base. The round pillar is 4-3/4 inches high and has a rack and pinion on the side for adjustment of the body tube. The gimbal for the 1-3/8-inch single mirror and the fixture for the stage forceps are attached to the base. The 1-1/2-inch-diameter stage is on a curved arm that fits over the pillar.

The 3-3/4-inch-long body tube is suspended from the top of the pillar by an arm with a brass ring that clamps around the tube. The eye lens consists of four lenses and a field lens. Accessories are 2 objectives; stage forceps; and a large lieberkühn. Height is 7-1/2 inches. ■

The box base of this instrument (Fig. 364) is 6-9/16 x 4-5/16 x 2-3/8 inches. The 5-1/8-inch-high triangular pillar is attached to a brass plate on the lid of the base. The gimbal for the 1-inch-diameter double mirror is attached to a compass joint on a triangular block that slides over the pillar. A 1-3/8-inch-diameter stage is hinged to a block on the pillar and is adjusted by rack and pinion; the stage tilts upward.

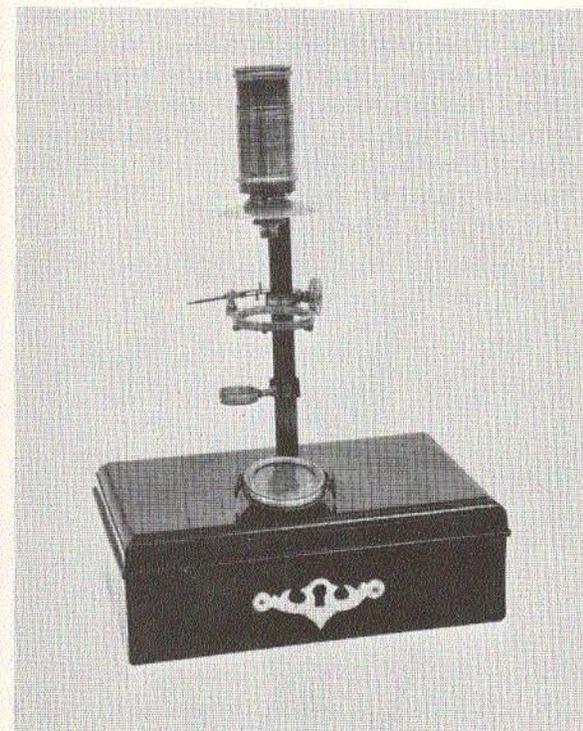


Fig. 364. L. F. Dellebarre, Leyden, Holland; compound monocular; C. 1800. (AFIP 518894 - 66-6194-2)

The 2-inch-long body tube screws into an opening on the arm that fits on the top of the limb. The eye lens consists of four lenses and is covered with a screw cap. Accessories are a telescopic base to which the microscope may be screwed; 2 objectives; lieberkühn; stage forceps; 3 boxes for mica; and 12 octagonal opaque objects. ■

The base of this instrument (Fig. 365) is a folding tripod. The gimbal for the 1-1/2-inch-diameter single mirror is mounted on the front section of the tripod, and the 6-inch-high round pillar is screwed to the center of the tripod. The 1-1/2-inch-diameter stage has a projection at the back and slides over the pillar, and is focused by rack and pinion.

The 6-inch-long body tube screws into the arm, has a field lens, and a short cone-shaped nose for the screw-on objective. The eyepiece contains two lenses. Accessories are Bonanni spring stage with condenser; 3 objectives; lieberkühn with lens; stage forceps; stage condenser; live-box; and fish-plate. Height is 12-1/8 inches. It is signed, "J. M. Kleman & Zoon, Amsterdam." ■

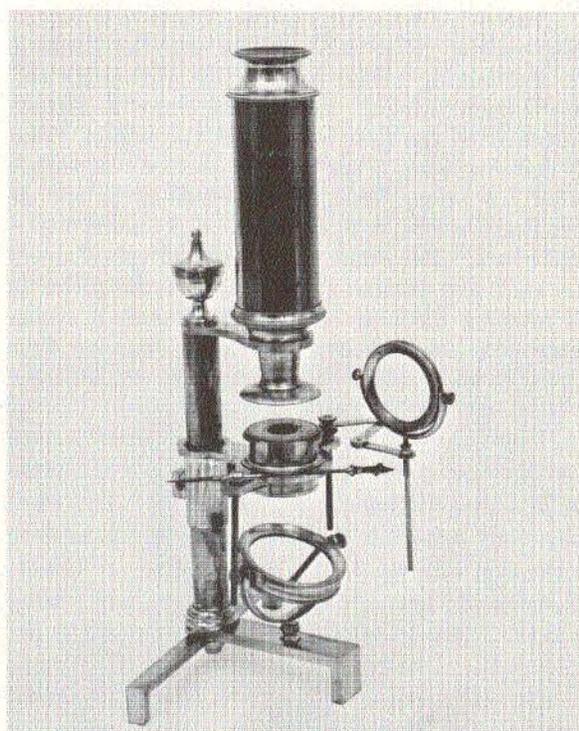


Fig. 365. J. M. Kleman & Son, Amsterdam, Holland; compound monocular; C. 1800. (AFIP 518929 - 66-6234)

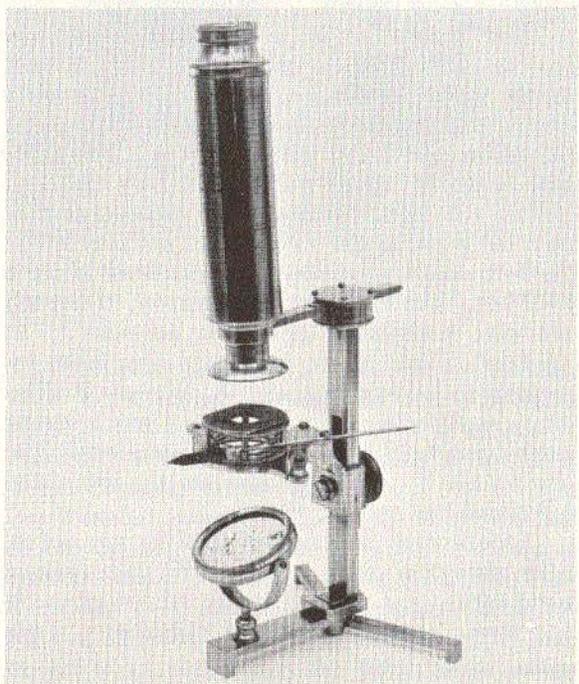


Fig. 366. Harmanus van Deyl, Amsterdam, Holland; compound monocular; 1807. (AFIP 518919 - 66-6235)

The 6-1/8-inch-high pillar of this achromatic microscope (Fig. 366) slides into an opening in the folding tripod base. The gimbal for the 1-3/4-inch single mirror fits into a fixture mounted on the front section of the tripod. The 2-inch-diameter stage has projections at either side for stage forceps and condenser, and at the back where it is screwed to a curved vertical block. The stage may be moved up and down by rack and pinion. At the top of the pillar is a rotating circular box, 1-1/8 inches in diameter and 1/2-inch thick, with an opening from front to back into which slides the 4-inch horizontal arm for the body tube.

The 6-1/4-inch-long body tube screws into an opening at the end of the arm and the nose is a screw fitting for a lieberkühn. The sliding body tube has a field lens and a screw-on eyepiece with one lens. Accessories are lieberkühn with brass focus ring; Bonanni spring stage; 2 objectives; fish-plate; stage forceps; tweezers; live-box; and 2 wooden diaphragm rings. Height is 13-1/4 inches, and it is signed, "Harms van Deyl, Invt et fecit, Amsterdam." ■

AFIP 518802. Hendrik Hen, Amsterdam, Holland; compound monocular; C. 1807. *Not illustrated.*

This instrument is mounted by a compass joint on a flat, folding tripod base. The gimbal for the mirror is attached to a curved stem on a casing on the pillar; the mirror is moved along the pillar and fixed with a screw. The Cuff-type stage is moved on the pillar by rack and pinion. A Martin's three-cell superstage may be fixed to the stage. There are two body tubes, the longest of which has two eye lenses and a field lens; the eyepiece is engraved, "Door mij als een uitneemend proefstuk bevonden. A. Ypelaar" [This is an excellent specimen according to my experiences. A. Ypelaar.]* The shortest tube has a spheric eye lens, a strong magnifying field lens, and a between-lens. The arm for the body tube slides into the top of the pillar and has aquatic motion.

Accessories are an illuminating apparatus, after Swaving, with a tube with two lenses; candlestick and an adjustable mirror; dissecting stage; rotating disc of 6 objectives; 6 ob-

jectives, 3 with lieberkühn mirrors; Bonanni spring stage; bar for object sliders; magnifying lens; live-box; diaphragm cone; lens with frame; stage forceps; brass object slider; 3 brass diaphragm rings; and a crystal box with glass trays for living objects. It is signed, "Hendrik Hen." ■



Fig. 367. Reballio & Son, Rotterdam, Holland; compound monocular; C. 1820. (AFIP 518913 - 66-6236)

The 5-inch-high curved pillar of this instrument (Fig. 367) is attached to a compass joint that is fixed to a flat, curved base. The gimbal for the 1-inch-diameter single mirror is on an arm screwed to the pillar. The 2-1/4 x 1-7/8-inch stage plate is on a curved flat arm also screwed to the pillar; beneath the stage plate is a wheel of diaphragms. The stage may be moved backwards and forwards and side to side by means of a spring lever that extends from the stage to a projection of the stage plate. The 6-1/2-inch-long body tube has rack and pinion adjustment. The eyepiece is 4-3/8 inches long and slides in; the short cone nose screws in. It is 10 inches high and has a button-type objective accessory. It is signed, "Reballio & Zoon, Rotterdam." ■

*A. Ypelaar, 1735-1811, was a well-known Dutch maker of microscopic preparations. It is possible that this microscope is the same as the one used by Ypelaar in 1807.

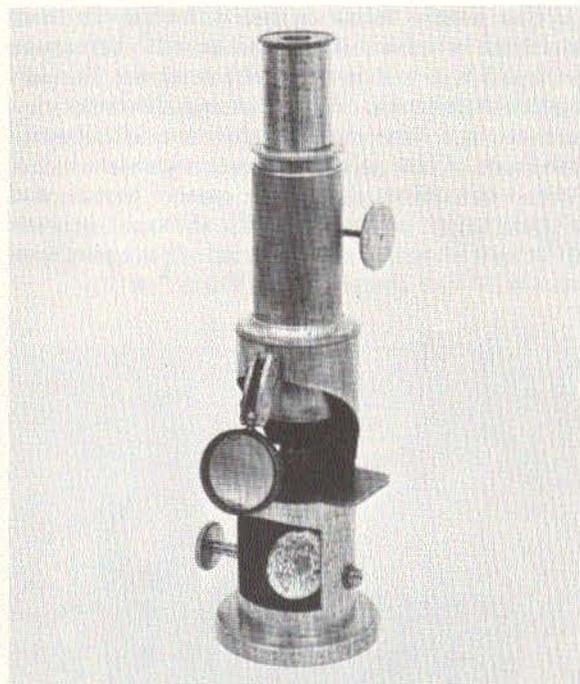


Fig. 368. Maker unknown; compound monocular; C. 1835. (AFIP 518883 - 66-6245)

The circular base of this instrument (Fig. 368) is 2-5/8 inches in diameter. A 5-inch-high tubular pillar is fixed to the base. It is cut away in front to house the 1-1/8-inch-diameter single mirror and the 2-9/16 x 1-1/2-inch stage. The 6-inch-long body tube has rack and pinion coarse adjustment. A condensing lens on an arm with ball-and-socket joints is attached to the front of the pillar. Height is 10 inches. ■

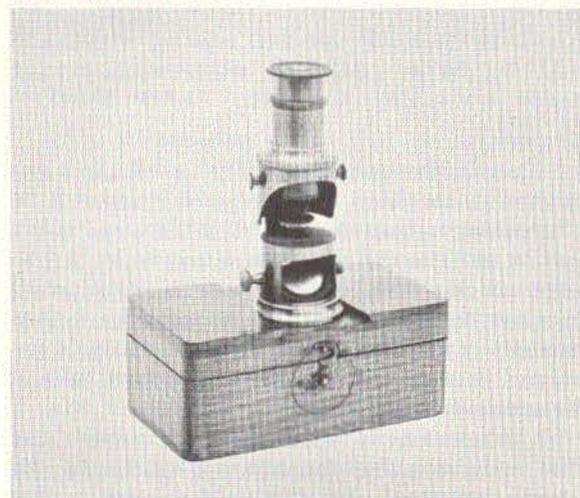


Fig. 369. Bertrand, Paris, France; compound monocular; C. 1839. (AFIP 518940 - 66-6220)

This miniature drum microscope (Fig. 369) is known as a mineral or furnace type. The base is 1 inch in diameter, and slides into the top of its 1-5/8-inch-high box container. A square cut in the lower section contains the single mirror on a milled-head pivot; the top of the lower section is the stage. At the top of the stand is a screw-in cylinder into which the body tube slides. The objective and ocular screw in. ■



Fig. 370. Georges Oberhauser, Paris, France; compound monocular; C. 1848. (AFIP 518917 - 66-6247)

This instrument (Fig. 370) has a circular base 4-1/4 inches in diameter and a cylinder body, 2-1/4 inches high and 3-1/4 inches in diameter, with an opening in front. It houses a 1-inch-diameter double mirror on a pivot. The 3-5/8-inch-diameter stage is fixed to the top of the cylinder body, has a 1-1/8-inch central aperture and a projection at the back. Beneath the stage is a socket for accessories used for lighting objects. The stage and the upper part of the microscope may be turned; the mirror being fixed to the base, lighting of the object varies when the microscope is turned. Oberhauser's turning stages are modifications of

Strauss-Durckheim. The 3-1/8-inch-high circular pillar is fixed to the stage projection and carries a fine adjustment with the screw head at the base. A 3-1/8 x 1-3/8-inch arm is attached to the pillar and a sprung tube, 2-3/4 inches high, into which the body tube slides.

The body tube is 8-1/8 inches long and has a screw ring division in the central section. An adjustable condenser and a thin black stage with a revolving diaphragm are on a separate stand. Accessories are 5 oculars; 3 objectives; and a socket and handle for under the stage. Height is 12 inches. It is signed, "Georges Oberhauser, Place Dauphine 19, Paris, No. 1454"; this is the "grand microscope achromatique" model. ■

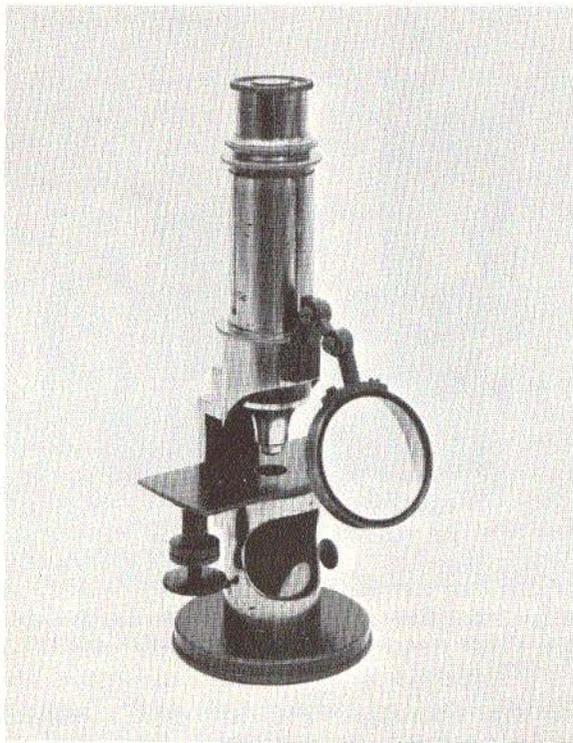


Fig. 371. Georges Oberhauser, Paris, France; compound monocular; C. 1848. (AFIP 518903 - 66-6246)

The circular base of this instrument (Fig. 371) is 2-3/4 inches in diameter. A 4-1/2-inch-high tubular pillar is cut away in front for the mirror box and stage. An upper section of the pillar, 2-1/8 inches high, is attached to the main pillar and is sprung for the body tube. The sliding body tube is 5-1/4 inches long, has a screw-in cone-shaped nose and a slide-in eyepiece.

The single mirror is 1-1/8 inches in diameter and is on a milled-head pivot. The stage is 3-1/8 x 1-1/2 inches with a screw fine adjustment beneath. There is a bull's-eye condenser on a hinged adjustable arm attached to the front of the pillar. Accessories are 4 oculars; 3 objectives; tweezers; camera lucida; and a polarizing apparatus with 2 Nicol prisms. Height is 8 inches. It is signed, "Georges Oberhauser, Place Dauphine 19, Paris." ■

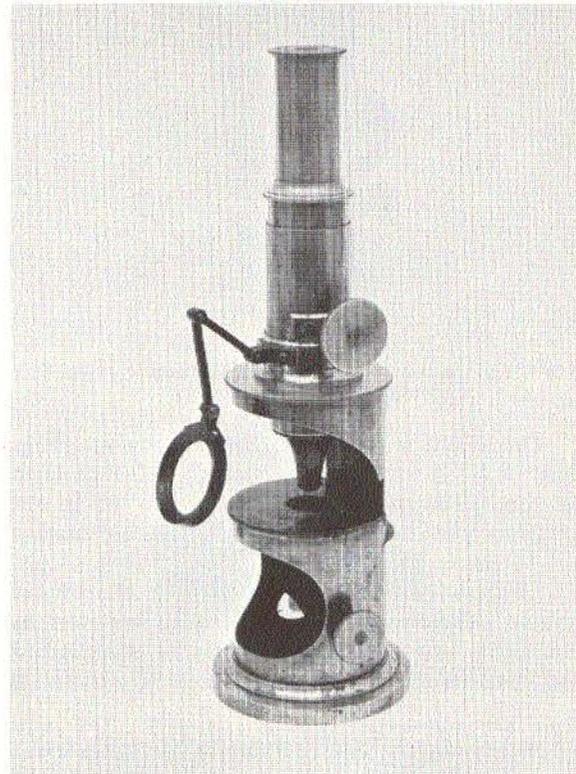


Fig. 372. N. P. Lerebours, Paris, France; compound monocular; C. 1850. (AFIP 518912 - 66-6243)

This instrument (Fig. 372) is of the same design as the drum microscope reintroduced by Oberhauser about 1835. The base is 3-1/4 inches in diameter and is fixed to the 5 x 2-5/8-inch tubular body. The lower section is cut away to house the 1-1/4-inch-diameter double mirror. A second cutaway section houses the stage; beneath the stage is a wheel of diaphragms with five apertures.

A condenser is mounted on the outer tube. The body tube fits into the top of the tubular body, has rack and pinion focusing, and a screw-in eyepiece. The mount for the objective consists of two cones one inside the other, to

each of which the various small lenses may be screwed. This device made possible combinations of the lenses in such a way that they are not screwed against each other, but remain apart at fixed distances. Accessories are ocular; glass stage plate; live-box; ebony disc with ivory plate; brass slide tray; tweezers; and 3 anatomic needles. Height is 10-1/4 inches. It is signed on the ocular, "Lerebours á Paris." ■

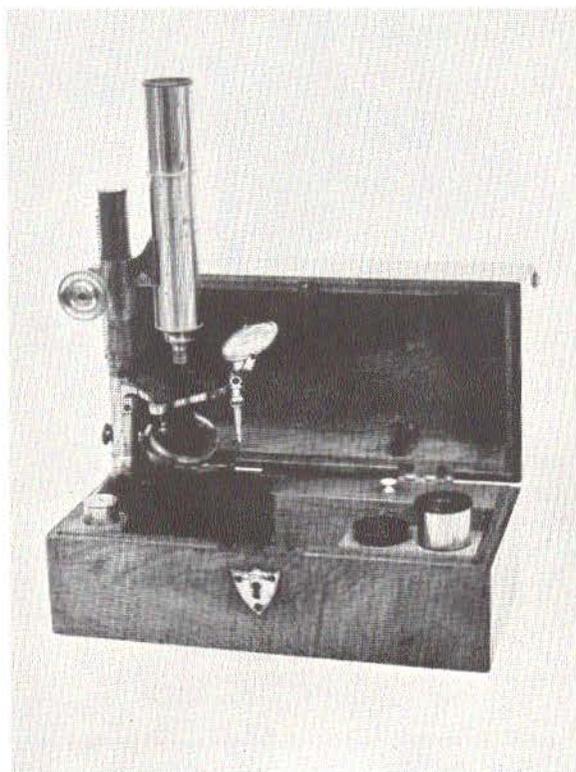


Fig. 373. G. Merz and Son, Munich, Germany; compound monocular; C. 1850. (AFIP 518934 - 66-6240)

This microscope (Fig. 373) is screwed to one end of its wooden carrying case by means of a hinge. The pillar is 7-1/4 inches high, and the gimbal for the 1-1/4-inch-diameter single mirror is on a pin inserted through the pillar. Beneath the elliptical-shaped stage is a single aperture diaphragm and a screw adjustment for the stage plate. An arm for the condensing lens is attached to the stage.

The 6-1/4-inch-long body tube on a curved arm is attached to the pillar, has rack and pinion adjustment, and a screw-in eyepiece and cone nose. Accessories are 2 oculars; objective; and ivory slider. Height is 13 inches. It is signed, "G. Merz und Söhne in München." ■



Fig. 374. Nacet & Son, Paris, France; compound monocular; C. 1860. (AFIP 518900 - 66-6241)

This instrument (Fig. 374) is mounted on a solid curved base 4 x 2-5/8 inches; a 1-3/8-inch-high round pillar with a hinged joint is fixed to the base. The gimbal for the 1-1/8-inch single mirror is on a short arm connected to a swivel joint. The stage is 2-1/2 x 3 inches with a projection at the back. There is a wheel of diaphragms beneath the stage and a sliding slide holder on top of the stage. The 3-inch arm for the body tube is fixed to the 3-inch limb with screw fine adjustment. A condensing lens fits into a groove on the front of the arm.

The 6-inch-long body tube slides into a sprung casing. It has a drawtube, a fixed cone nose, and a slide-in eyepiece. Accessories are 2 oculars and 2 objectives. Height is 9-1/2 inches. It is Nacet's small inclining model and is signed, "Nacet et Fils, Rue Serpente 16, Paris." ■

AFIP 518918. Lerebours and Secretan, Paris, France; compound monocular; C. 1860. *Not illustrated.*

This instrument is identical to Fig. 372 (AFIP 518912) except that pinions for the mirror and

rack are on the left side rather than the right. Accessories are an ocular and forceps. Height is 10-1/4 inches, and it is signed, "Lerebours et Secretan á Paris." ■

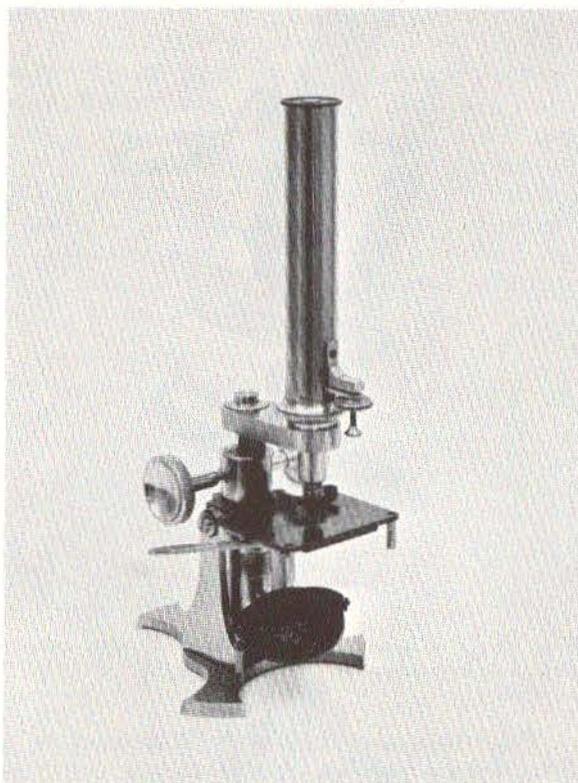


Fig. 375. Maker unknown; compound monocular; C. 1860. (AFIP 518927 - 66-6237)

The 4-3/4-inch-high tubular pillar of this instrument (Fig. 375) is suspended between two 3-1/2-inch-high uprights that are screwed to the English-type base. The gimbal for the 1-5/8-inch single mirror is on a pin inserted into the pillar. Beneath the stage is a wheel of diaphragms with five apertures and a lever adjustment for backward and forward motion. Attached to the upper part of the pillar are two large pinions for the rack contained within the pil-

lar. The 3-inch-long arm for the body tube is attached by a large screw to the top of the rack. The 6-3/4-inch-long body tube screws into the arm and has a fine adjustment at the front. Accessories are an ocular; objective; and condensing lens. Height is 12-1/2 inches. ■

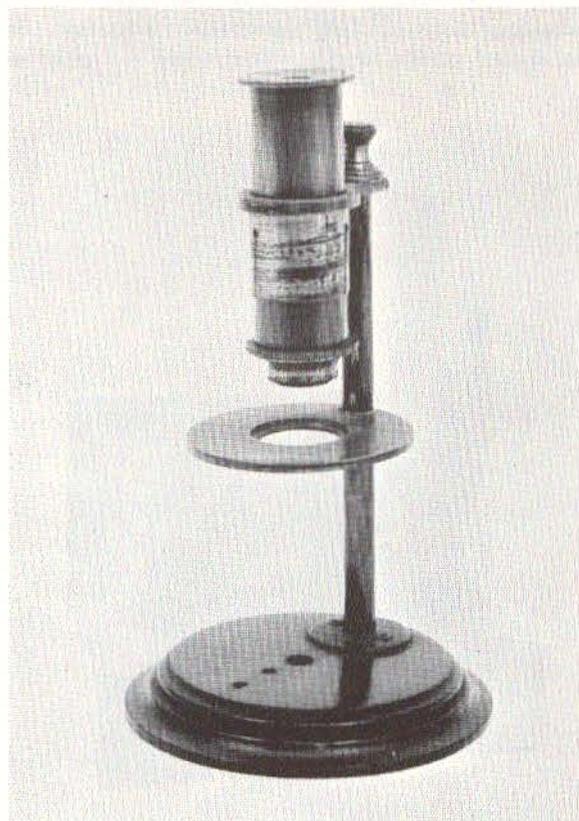


Fig. 376. Maker unknown; compound monocular; C. 1860. (AFIP 518939 - 66-6273)

The wooden base of this instrument (Fig. 376) is 2-5/8 inches in diameter and screwed to it is a 3-1/2-inch-high pillar. The 1-3/8-inch-diameter stage is fixed to the pillar. The 2-1/4-inch-long body tube slides into an arm attached to the top of the pillar. The eyepiece has two convex lenses. Height is 4-1/2 inches. ■

SIMPLE MICROSCOPES



Fig. 377. Maker unknown; reproduction of an original simple microscope made about 1675 by Antoni van Leeuwenhoek of Leyden, Holland; reproduction date unknown. (AFIP 518880 66-6267)

This wooden model (Fig. 377) is 2-3/8 inches in overall length and 1/2 inch at greatest width. The lens, mounted between two brass plates within the outer wooden casing, also acts as a diaphragm. Around the wooden casing is a wire bent to form an object holder. ■

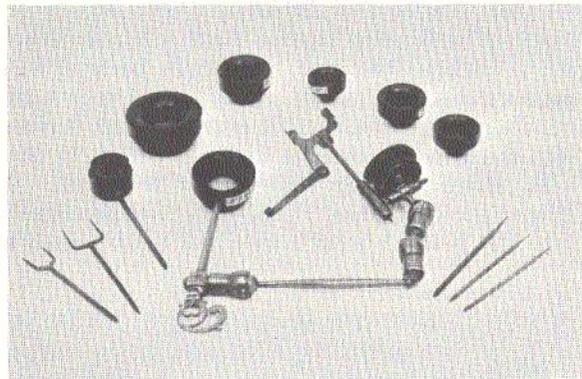


Fig. 378. Johan van Musschenbroek, Leyden, Holland; simple; C. 1690. (AFIP 518858 - 66-6254)

This instrument (Fig. 378) has the objective mounted in a turned circular cell that is attached to one end of a 2-inch-long arm. Hinged to the arm by a ball-and-socket joint is another arm with two ball-and-socket joints terminating in a socket for the various objects. There are

seven objectives and seven rods with ends of various patterns to which different types of objects may be fixed, and which may be attached to the arm. The ball-and-socket joints, an invention attributed to both Johan van Musschenbroek and his elder brother, Samuel, were called "Musschenbroek's nuts." The instrument is signed with the marks of the van Musschenbroeks: "The oriental lamp," and "the crossed keys." This is his first form. ■

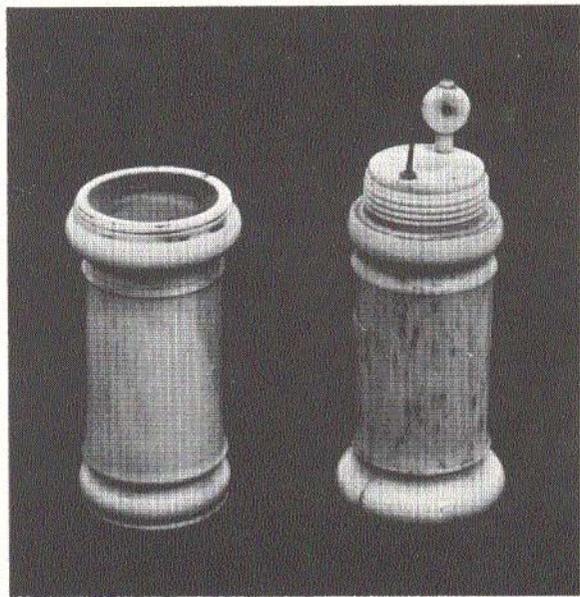


Fig. 379. Maker unknown; simple; C. 1700. (AFIP 518853 - 66-6274)

This bone flea glass (Fig. 379) consists of two 2-inch-long sections that may be screwed together. One section has a lens at one end and an object holder and lens holder at the opposite end. The second section has a lens at one end. ■

AFIP 518856. Maker unknown; simple; C. 1700. *Not illustrated.*

This instrument is similar to Fig. 379 (AFIP 518853), but measures only 3-1/4 inches. ■

AFIP 518854. *Maker unknown; simple; C. 1700. Not illustrated.*

This bone flea glass is similar to Fig. 379 (AFIP 518853) but consists of three sections. The smaller section, 1 inch long and 1 inch in diameter is a flea glass. One 2-inch-long section contains an object holder and lens holder at one end and a 3/8-inch-diameter lens at the opposite end. The third section is 2 inches long and has a 5/8-inch lens at one end. The three sections are screwed together with a protective cap at each end. Length is 5 inches. ■

AFIP 518855. *Maker unknown; simple; C. 1700. Not illustrated.*

This instrument is a duplicate of Fig. 379 (AFIP 518853). ■



Fig. 380. *Maker unknown; simple; C. 1720. (AFIP 518861 - 66-6270)*

The body of this brass, Wilson-type screw-barrel microscope (Fig. 380) is 2-1/4 inches high and 1 inch in diameter. The inner tube is 1-1/2 inches long and contains a condenser. The outer tube is 1-5/8 inches long, has a lens, a steel spring, and a spring clamp slide holder. The detachable ivory handle is 1-3/4 inches long. Accessories are 5 lenses; lieberkühn; tweezers; 5 ivory sliders; brass object holder for living objects; and 3 brass pins. ■

AFIP 518862. *Maker unknown; simple; C. 1720. Not illustrated.*

This brass, Wilson-type screw-barrel microscope is similar to Fig. 380 (AFIP 518861) but smaller; there is no handle. Accessories are 2 lenses; 3 ivory sliders; brass slider; and an ivory talc box. ■

AFIP 518870. *Maker unknown; simple; C. 1720. Not illustrated.*

This Wilson-type screw-barrel instrument is similar to Fig. 380 (AFIP 518861) but has a brass handle rather than ivory. ■

AFIP 518863. *Maker unknown; simple; C. 1720. Not illustrated.*

This Wilson-type screw-barrel microscope is similar to Fig. 380 (AFIP 518861). Accessories are 5 lenses; 6 ivory sliders; brass live-box; and 3 glass tubes for live objects and a brass pin for cleaning. ■



Fig. 381. *Maker unknown; simple; after 1738. (AFIP 518859 - 66-6264)*

This compass microscope (Fig. 381) consists of a wooden handle with a brass ferrule 3-1/2 inches long. A flat brass plate, 2-1/4 inches long, one end of which is 3/4-inch wide cut away to 1/8-inch at the opposite end, screws into the handle. A lens and a 5/8-inch lieberkühn screw into the wide end of the plate. A hinged socket for the 3-inch-long forceps screws into the plate 3/8-inch from the narrow end. ■



Fig. 382. *Maker unknown, simple; C. 1740. (AFIP 518860 - 66-6271)*

This compass microscope (Fig. 382) is 6-1/4 inches long. At one end is a 2-1/4-inch-long wooden handle with ferule. Inserted into the handle is a 2-7/8-inch-long rod with a gimbal for the 1-inch condenser. A hinged flat object holder slides over the rod. The instrument may have been made from a stage condenser. ■

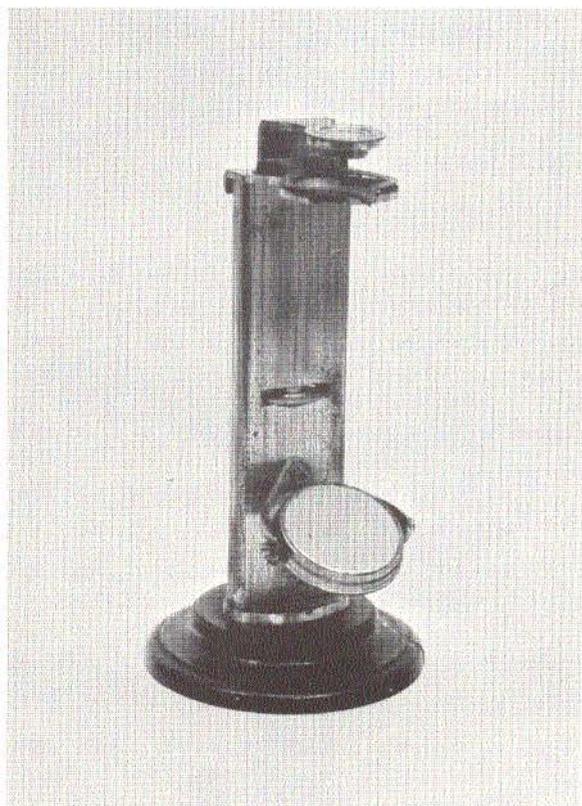


Fig. 383. Maker unknown; simple; C. 1760. (AFIP 518881 - 66-6251)

The circular wooden base of this instrument (Fig. 383) is 3-5/8 inches in diameter. A rectangular hollow pillar, 5-3/4 x 1-1/2 x 3/8-inch, is screwed to the base. The gimbal for the 1-1/2-inch single mirror is screwed to the pillar. The 1-3/8-inch circular stage and a circular spring clip are screwed to the top of the pillar. A brass plate within the pillar may be adjusted with a control in the center of the pillar. The plate is bent at the top to form a 1-inch arm for the lens holder. Accessories are 3 lenses; 3 wooden sliders; and a wooden pyramidal case. This instrument is similar to one in the Utrecht University Museum in Holland which was presented by the Foundation of Renswoude, and was probably the work of one of the wards of that Foundation. ■

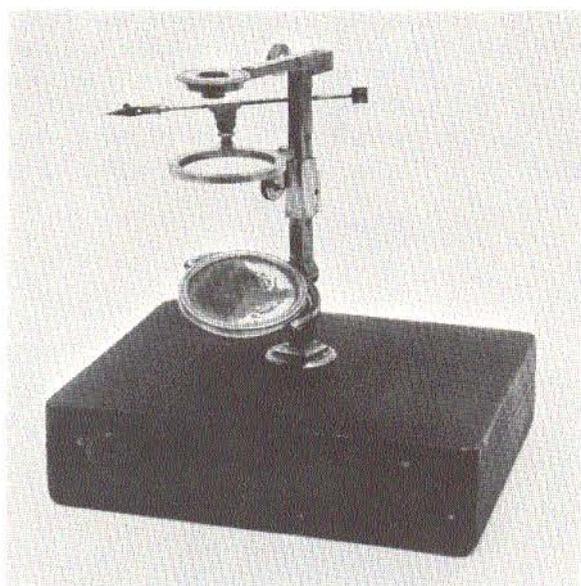


Fig. 384. Dollond, London, England; simple; C. 1760. (AFIP 518879 - 66-6249)

The 5-inch-high rectangular pillar of this instrument (Fig. 384) screws into the shark-skin-covered box that serves as the base. The gimbal for the 1-3/4-inch-diameter single mirror is inserted into the pillar. A rack and pinion on the pillar controls the 1-3/4-inch circular stage that has a 1-3/4-inch aperture. At the top of the pillar is a 2-3/8-inch-long arm for the lens. Accessories are 5 lenses; 4 lenses with lieberkühns; 6 ivory sliders; and an ivory talc box. It is signed, "Dollond, London." ■



Fig. 385. Maker unknown; simple; C. 1760. (AFIP 518866 - 66-6268)

This all-brass compass microscope (Fig. 385) has a circular base 1-1/4 inches in diameter that supports the 2-1/4-inch-high slender pillar. The lens is attached to a 3/8-inch-long arm that is inserted at the top of the pillar. There is a sliding fixture on the pillar for a forceps. ■



Fig. 386. Maker unknown; simple; C. 1760. (AFIP 518872 - 66-6250)

The wooden base of this dissecting instrument (Fig. 386) is 5-1/8 inches in diameter. Three 4-1/2-inch-high brass pillars, two round and one rectangular, arise from the base. The 4-inch-diameter stage with a 1-inch central aperture is screwed to the pillars. Above the stage is a 3-3/4-inch swinging arm for the lens with rack and pinion attached to the rectangular pillar. A gimbal for the 1-1/2-inch mirror is inserted into the base. Accessories are 7 lenses. ■

This pocket botanical microscope (Fig. 387) is T-shaped. At the end of a vertical 1-1/2 x 5/16-inch grooved, brass plate, into which slides an adjustable object holder, is fixed a horizontal 3/8 x 5/8-inch brass plate. A 1/2-inch-diameter lens holder and a 1-inch-long ivory handle are hinged to the ends of the horizontal plate and fold onto the grooved plate. ■

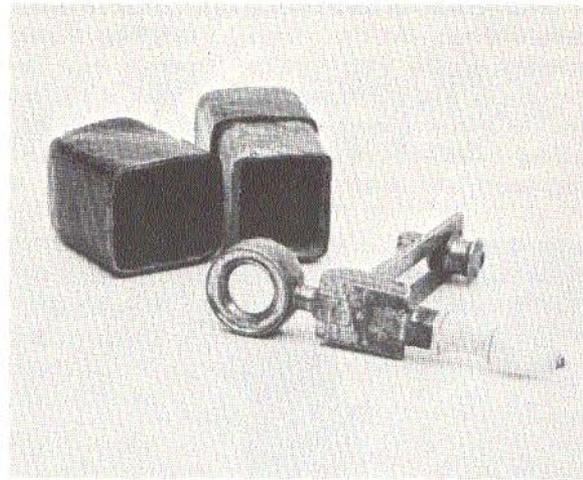


Fig. 387. Maker unknown; simple; C. 1775. (AFIP 518851 - 66-6262)

When folded the instrument fits into a leather-covered cardboard case. Although not signed, it is similar to, but smaller than, a similar instrument attributed to W. & S. Jones of London. ■

AFIP 518852. Maker unknown; simple; C. 1775. Not illustrated.

This instrument is a duplicate of Fig. 387 (AFIP 518851). ■

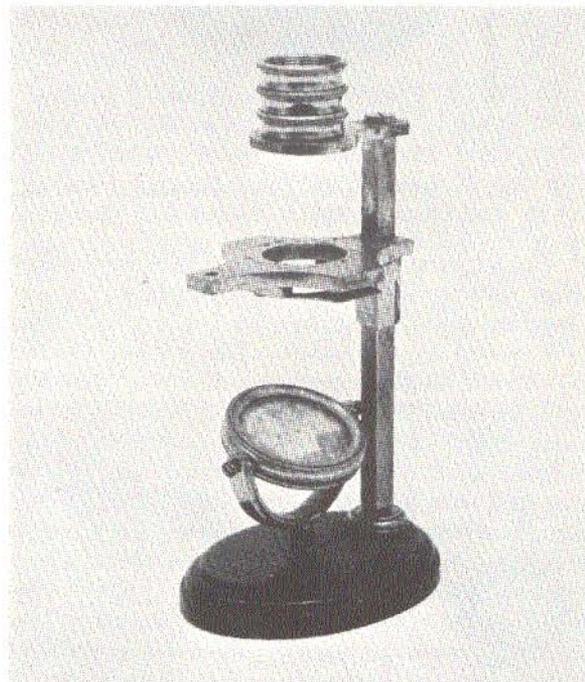


Fig. 388. Maker unknown; simple; C. 1798. (AFIP 518865 - 66-6248)

The oval base of this botanical microscope (Fig. 388) is $2\frac{3}{8} \times 1\frac{3}{4}$ inches. The gimbal for the 1-inch-diameter single mirror and a $3\frac{3}{8}$ -inch-high square pillar are inserted into the base. Attached to the pillar by means of a sliding box is the cross-shaped stage, $1\frac{1}{2} \times 2$ inches, with a $\frac{9}{16}$ -inch aperture. An object holder is inserted into an opening in the stage. An arm for the lens carrier is screwed to the top of the pillar. Three lenses, that may be used singly or in combination, are screwed to the lens carrier. Accessories are stage forceps and 3 ivory sliders. It is similar to instruments made by W. & S. Jones of London and Angleterre of Holland. ■



Fig. 389. Maker unknown; simple; C. 1800. (AFIP 518857 - 66-6265)

This instrument (Fig. 389) consists of a conical brass tube, one end of which has a low-power lens in a screw cap. At the opposite end is a 1-inch-diameter object glass in a screw cap. A wooden handle, $2\frac{5}{16}$ inches long, is inserted into the brass tube. Length is 4 inches. ■

The base of this all-brass dissecting instrument (Fig. 390) is $2\frac{1}{8}$ inches in diameter. Arising from the center of the base is a $3\frac{1}{4}$ -inch-high round pillar. The gimbal for the $\frac{9}{16}$ -inch single mirror is on a short movable arm that fits over the base of the pillar. The $1\frac{1}{4} \times 1\frac{1}{8}$ -inch stage, incurved at the back, has a $\frac{1}{4}$ -inch aperture, is screwed to the pillar, and has a rack and pinion control. Screwed to the top of the pillar are three movable lens holders, one above the other, which may be used individually or together. Height is $4\frac{1}{4}$ inches. ■



Fig. 390. Maker unknown; simple; C. 1800. (AFIP 518864 - 66-6255)

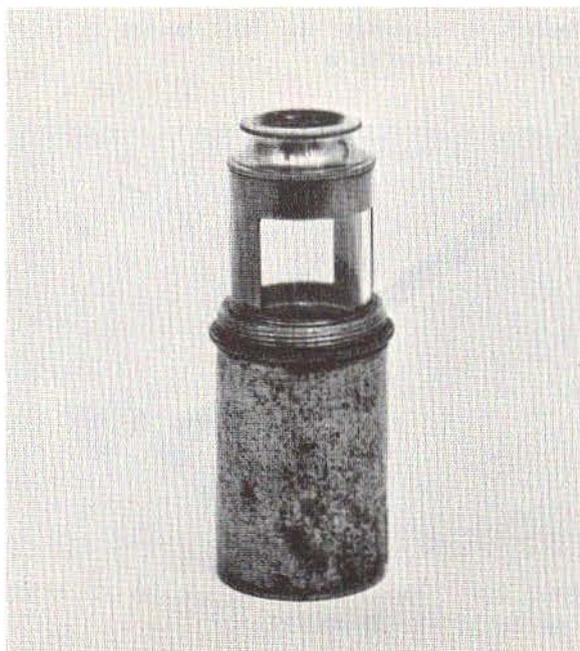


Fig. 391. Maker unknown; simple; C. 1840. (AFIP 518874 - 66-6257)

This instrument (Fig. 391) consists of a brass cylinder 1 inch high and 1 inch in diameter. Part of the wall has been cut away leaving two $\frac{3}{8}$ -inch-wide strips. A glass cylinder

fits into the outer brass cylinder. On one end of the glass cylinder is a flat glass plate that is held in position by a brass ring that screws to the cylinder; a brass lens holder, 3/4-inch in diameter, screws into the opposite end of the cylinder. The instrument may be screwed into or onto a brass case 1-3/4 inches high. Although not signed it is similar to instruments made by the Frenchman, F. V. Raspail. ■

AFIP 518875. Maker unknown; simple; C. 1840. Not illustrated.

This instrument is a duplicate of Fig. 391 (AFIP 518874). ■

AFIP 518878. Maker unknown; simple; C. 1840. Not illustrated.

This instrument is similar to Fig. 391 (AFIP 518874) but slightly larger, measuring 1-3/8 inches high, and 1-1/16 inches in diameter; the lens holder is 13/16 inch in diameter. ■

AFIP 518876. Maker unknown; simple; C. 1840. Not illustrated.

This microscope is similar to Fig. 391 (AFIP 518874) but is 1-3/8 inches high and 1-1/2 inches in diameter; the lens holder is 1-1/8 inches in diameter. ■

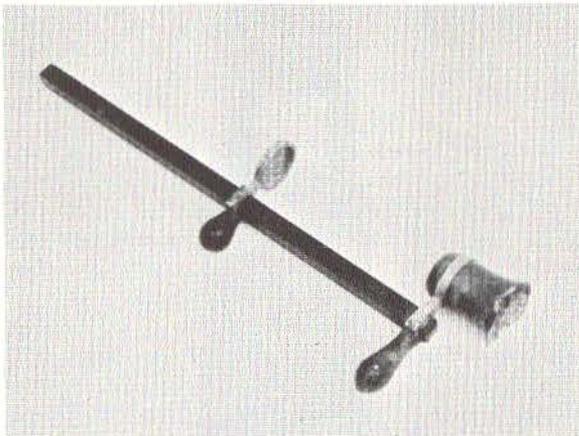


Fig. 392. Maker unknown; simple; C. 1850. (AFIP 518882 - 66-6272)

This French-made instrument (Fig. 392) was used for examining corn. The lens is a cone-shaped wooden fitting 1-1/2 inches long. It is attached by a metal ring and arm to a calibrated, square ebony rod 9-5/8 inches long. The metal object stage slides over the opposite end of the rod. ■

AFIP 518877. Maker unknown; simple; C. 1850. Not illustrated.

This instrument is a duplicate of Fig. 379 (AFIP 518853). ■

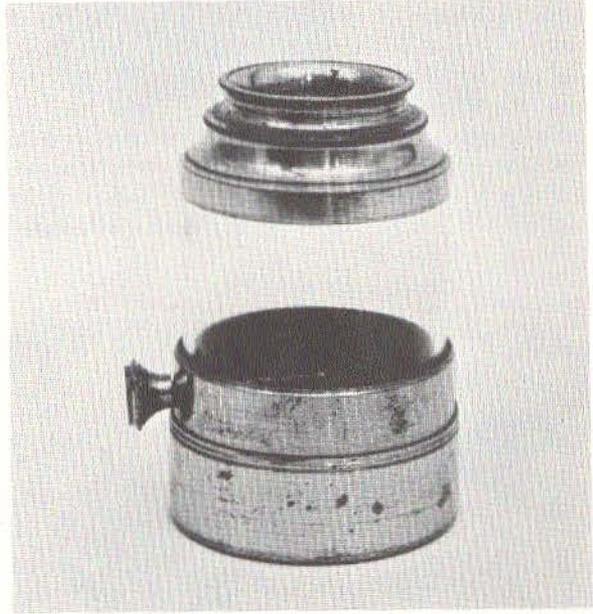


Fig. 393. Maker unknown; simple; C. 1850. (AFIP 518873 - 66-6256)

This instrument (Fig. 393), probably made by Raspail, consists of a glass cylinder 1-1/4

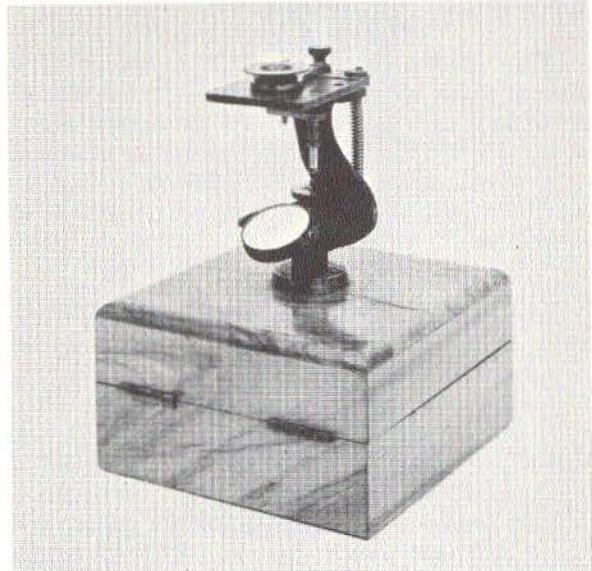


Fig. 394. Carl Zeiss, Jena, Germany; simple. C. 1865. (AFIP 518871 - 66-6266)

inches high and 1-1/2 inches in diameter capped with brass ends. An object pin with a brass knob is inserted into the lower brass end. A 1-3/4-inch-diameter flat glass is inserted into a brass ring that screws to the base of the glass cylinder. A 1-1/8-inch-diameter lens holder screws into the upper brass rim. ■

The 1-inch circular base of this dissecting instrument (Fig. 394) is screwed to a 4-1/2 x 4-1/2 x 2-1/2-inch wooden box; a curved arm arises from the center of the base. A 1-3/4-

inch-high circular pillar fits into a projection on the arm. At the top of the pillar is attached the movable lens holder; a micrometer screw at the base of the pillar permits adjustment of the lens holder. The stage is 1-1/2 x 1-11/16 inches, has a 1/2-inch aperture, and is screwed to the arm. An adjustable condensing lens is on a rod attached to the underside of the stage. The gimbal for the 1-inch double mirror is screwed to the arm. Accessories are 2 lenses. Height is 3-1/2 inches. It is signed, "825/574 Zeiss, Jena." ■