

ESTABLISHED 1680.

CATALOGUE
OF
SCIENTIFIC INSTRUMENTS.

PART I.

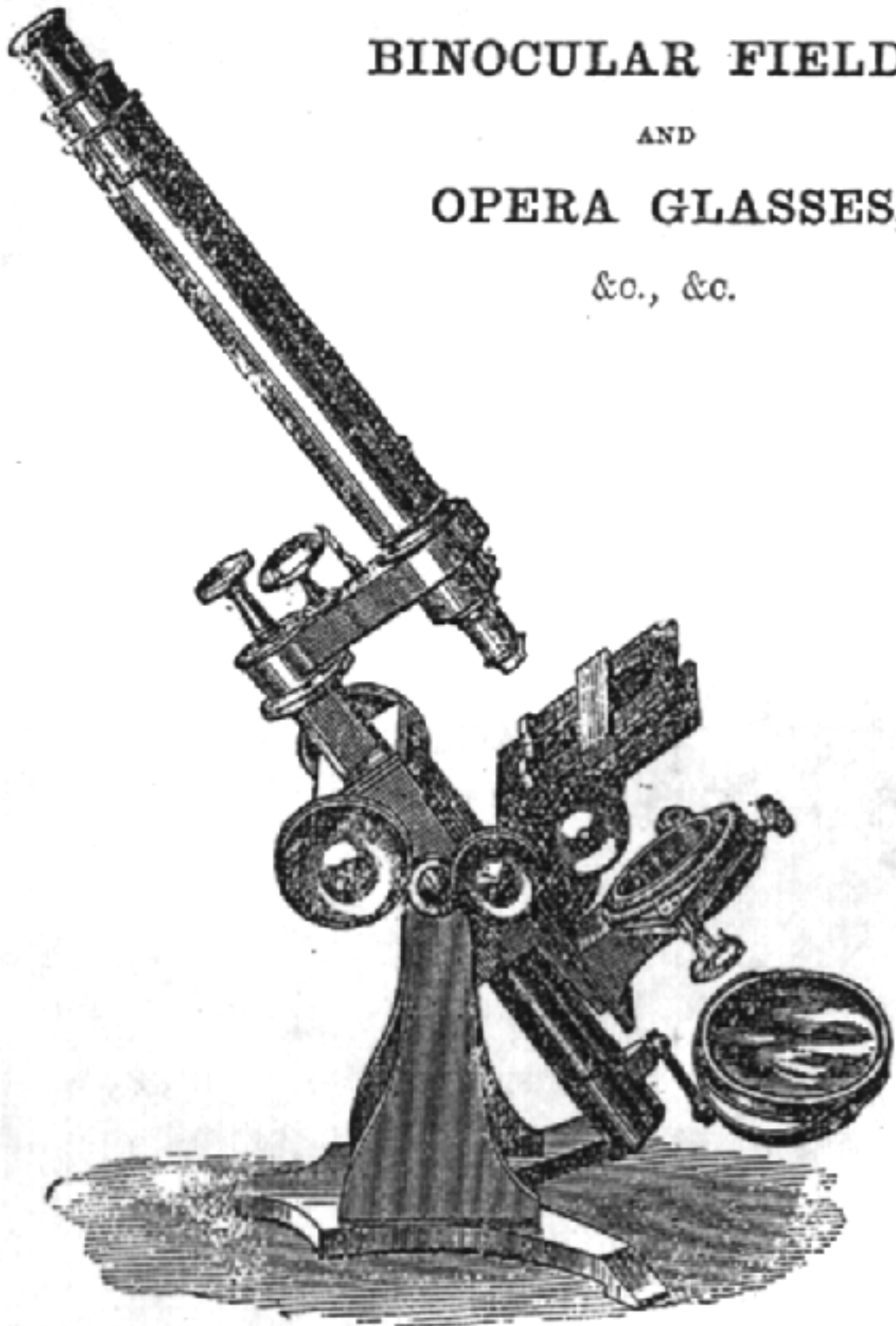
MICROSCOPES,
Microscopic Apparatus and Objects, Spectroscopes,

BINOCULAR FIELD

AND

OPERA GLASSES,

&c., &c.



JAMES HOW & CO.,

(Successors to George Knight & Sons),

5, ST. BRIDE STREET, (late of 2, Foster Lane,) LONDON.

ESTABLISHED 1680.

JAMES HOW & CO.,

SUCCESSORS TO

GEO. KNIGHT & SONS,

Chemical & Philosophical Instrument Makers

TO

HER MAJESTY THE QUEEN.

THE ROYAL INSTITUTION OF GREAT BRITAIN.

THE ROYAL OBSERVATORY, GREENWICH.

THE WAR OFFICE.

THE BOARD OF ORDNANCE.

THE ADMIRALTY.

THE EAST INDIA GOVERNMENT.

THE GOVERNMENTS OF RUSSIA, SPAIN, THE BRAZILS, &c.

THE GOVERNMENT SCHOOL OF MINES.

THE ROYAL ARSENAL, WOOLWICH.

THE METROPOLITAN BOARD OF WORKS.

THE BOARD OF TRADE.

THE HONOURABLE CORPORATION OF THE TRINITY HOUSE.

THE UNIVERSITIES OF OXFORD, CAMBRIDGE, LONDON, &c.

Satisfactory References required on opening New Accounts.

Cheques should be crossed "LONDON AND WESTMINSTER BANK," and Post Office Orders made payable at the Chief Office, St. Martin's-le-Grand.

Country and Foreign Orders must be accompanied by a remittance.

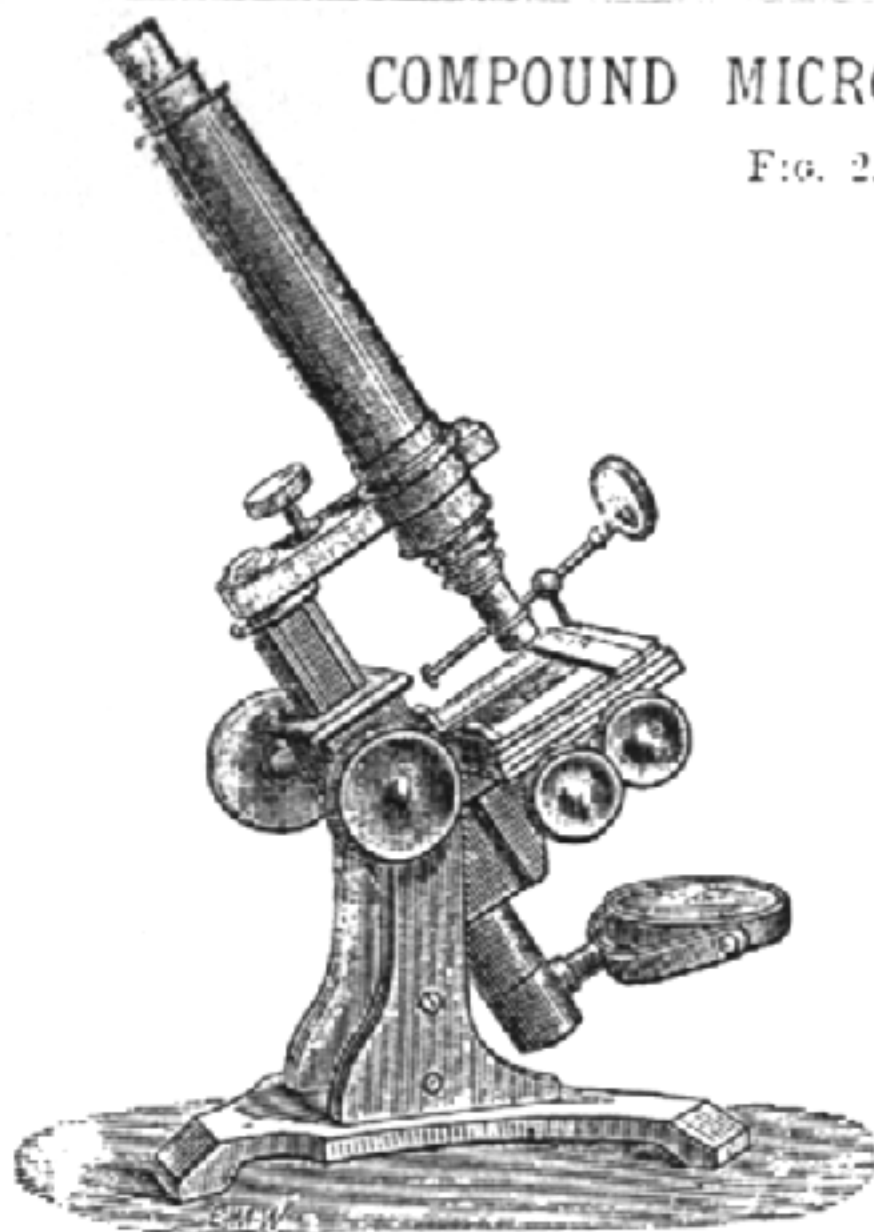
5, ST. BRIDE STREET, FLEET STREET,

Three Doors North of Ludgate Circus (late 2, Foster Lane),

LONDON.

COMPOUND MICROSCOPES.

FIG. 2.

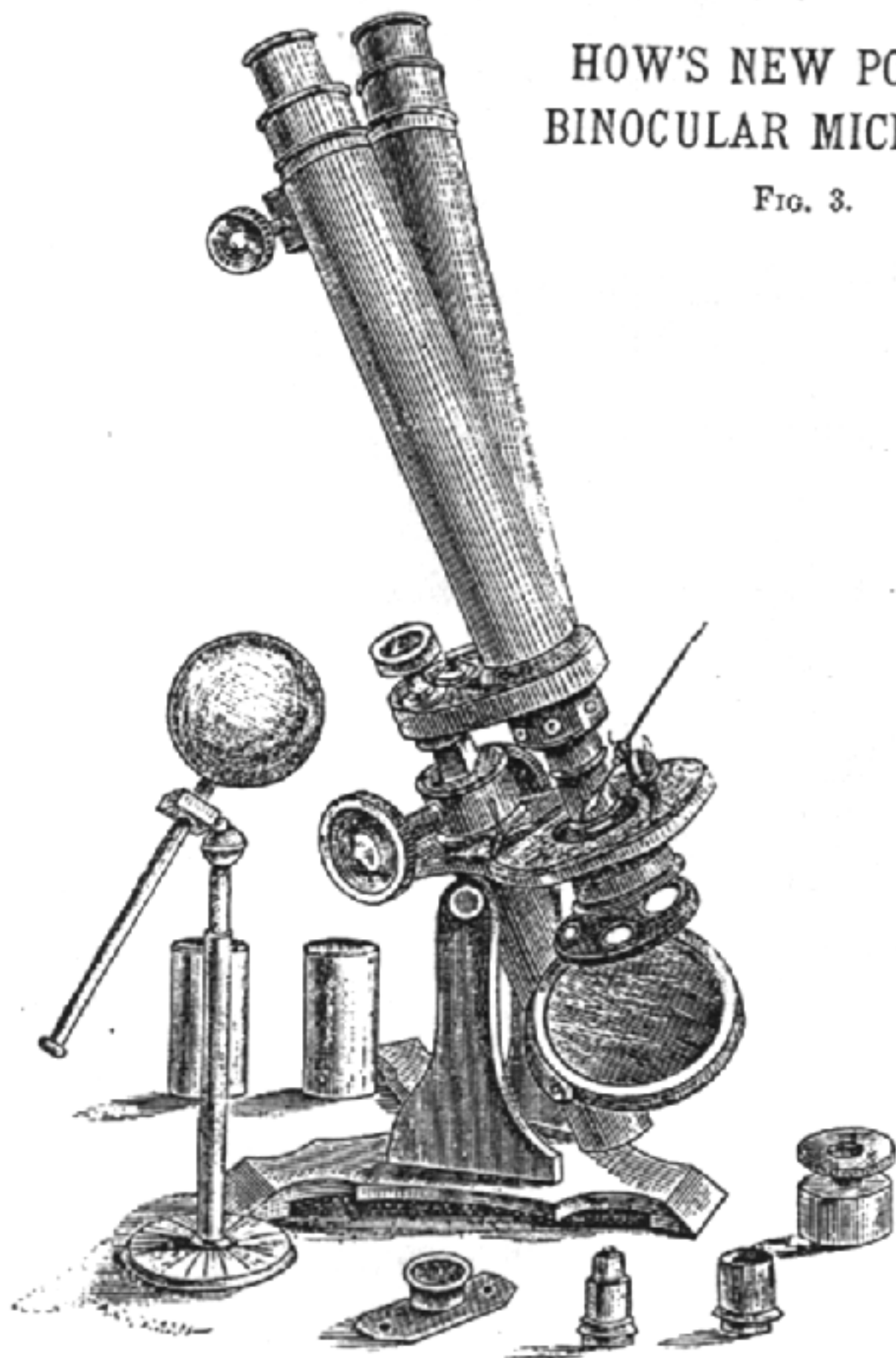


- No. 1.**—Compound Binocular Microscope Stand, of most improved construction, with combined rack and pinion to draw tubes, coarse and fine adjustment to body, the latter with divided milled head concentric rotating stage, divided on silver ring to 360 degrees, with 1 inch motion in rectangular directions by rack and pinion, clamping arrangement for fixing the instrument at any inclination, secondary stage (divided to 360 degrees), with universal motion for holding and adjusting the various polarizing and illuminating apparatus placed beneath the object, plain and concave mirrors, mounted on double jointed arm for oblique illumination, two pairs of eye pieces, A and B 36 10 0
- No. 2.**—Compound Microscope Stand, with rotating stage, having 1 inch motion in rectangular directions by rack and pinion, coarse and fine adjustment to body, graduated draw tube, secondary stage, with universal motion for adjusting all the illuminating and polarizing apparatus placed beneath the object, plain and concave mirrors, two eye pieces, A and B. 24 0 0
- The same, with BINOCULAR ARRANGEMENT, combined rack and pinion to draw tubes, two pairs of eye pieces, A and B 30 0 0
- No. 3.**—Compound Microscope Stand, Fig. 2, with rotating stage, having $\frac{3}{4}$ inch motion in rectangular directions by rack and pinion, coarse and fine adjustment to body, draw tube, plain and concave mirrors, two eye pieces, A and B 15 0 0
- The same, with BINOCULAR ARRANGEMENT, combined rack and pinion to draw tubes, two pairs of eye pieces, A and B.. .. . 20 0 0

| | | | |
|---|----|----|----|
| No. 4.—Compound Microscope Stand, with rotating stage, rectangular motions by rack and pinion, draw tube, coarse and fine adjustment to body, plain and concave mirrors, two eye pieces, A and B.. | £ | s. | d. |
| The same, with BINOCULAR ARRANGEMENT, combined rack and pinion, adjustment to draw tubes, two pairs of eye pieces, A and B.. | 8 | 9 | 0 |
| The Cabinet Binocular Microscope.—Binocular Compound Microscope, with combined racks, to draw tube, rotating stage having motions in rectangular directions by rack and pinion, coarse and fine adjustment to body, plain and concave mirrors, two pairs of eye pieces, A and B, 2 inch, 1 inch, and $\frac{1}{4}$ inch object glasses, polariscope and selenite stage, spot lens for dark ground illumination, condenser on stand, animalculæ cage, stage forceps, brass forceps, and case of dipping tubes, the whole packed in mahogany cabinet .. | 11 | 10 | 0 |
| | 20 | 0 | 0 |

HOW'S NEW POPULAR BINOCULAR MICROSCOPE.

FIG. 3.



£ s. d.

How's New Popular Binocular Microscope, Fig. 3, with coarse and fine adjustment to body, combined racks to draw tubes, sliding stage, plain and concave mirrors, one pair of eye pieces, 1 inch and 2 inch, also $\frac{1}{4}$ inch object glasses, condenser on stand, polarizing apparatus and selenite stage, animalcule cage, stage forceps and brass forceps, in mahogany case 12 12 0

HOW'S COMPLETE MICROSCOPE.

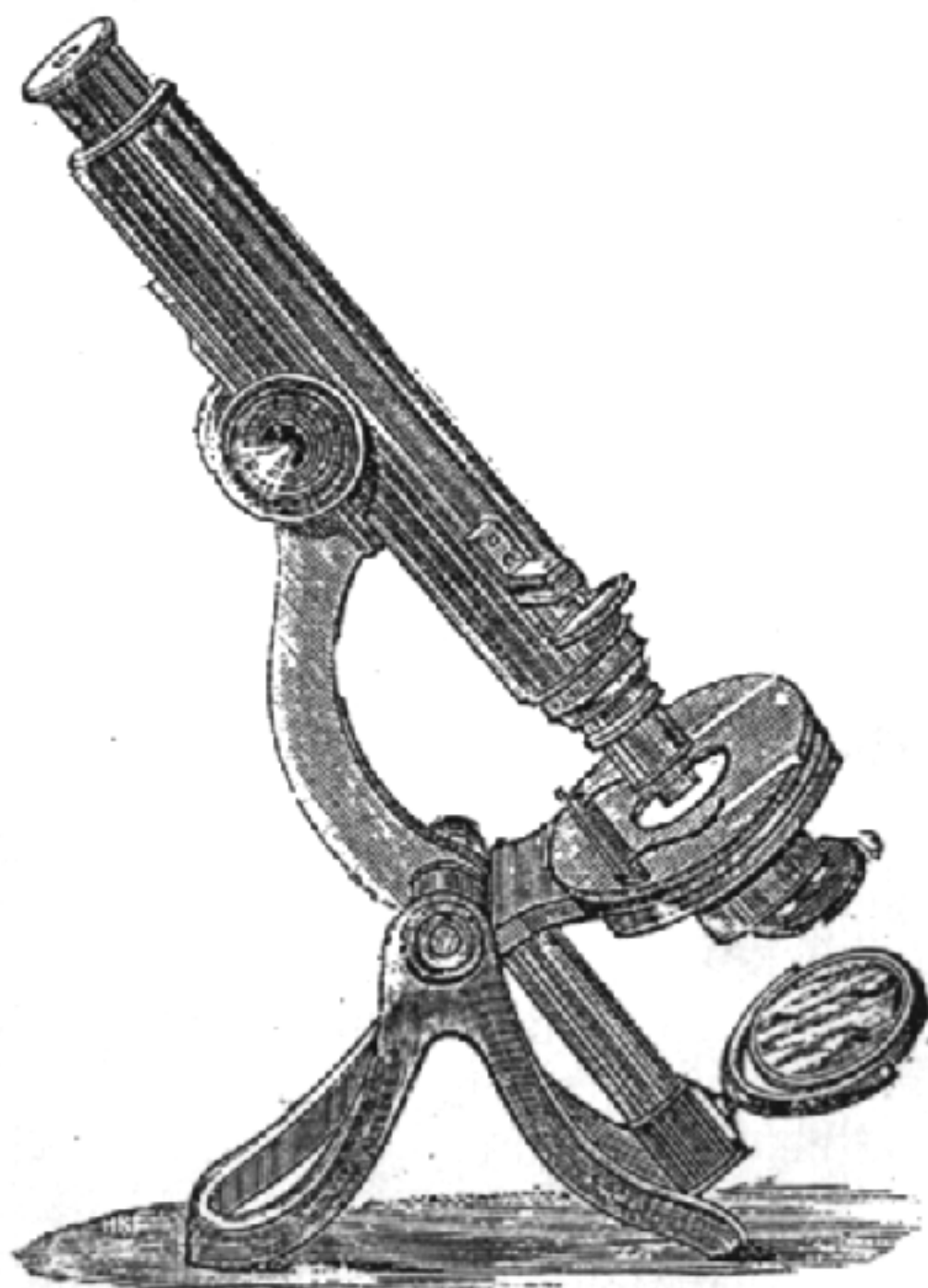


FIG. 4.

£ s. d.

How's Complete Microscope, an elegant and complete Instrument on the Jackson Model, Fig. 4 ; coarse and fine adjustment to body, concentric stage with sliding object holder, 2 eye pieces A and B, revolving diaphragm, condenser on stand, polarizing apparatus (with large prisms) and selenite stage, spot lense, Rainey's light modifier, live box, stage forceps, brass forceps, and 3 separate object glasses, viz : $\frac{1}{4}$, 1, and 2 inch, the whole in compact mahogany cabinet 13 15 0

THE MEDICAL MICROSCOPE.

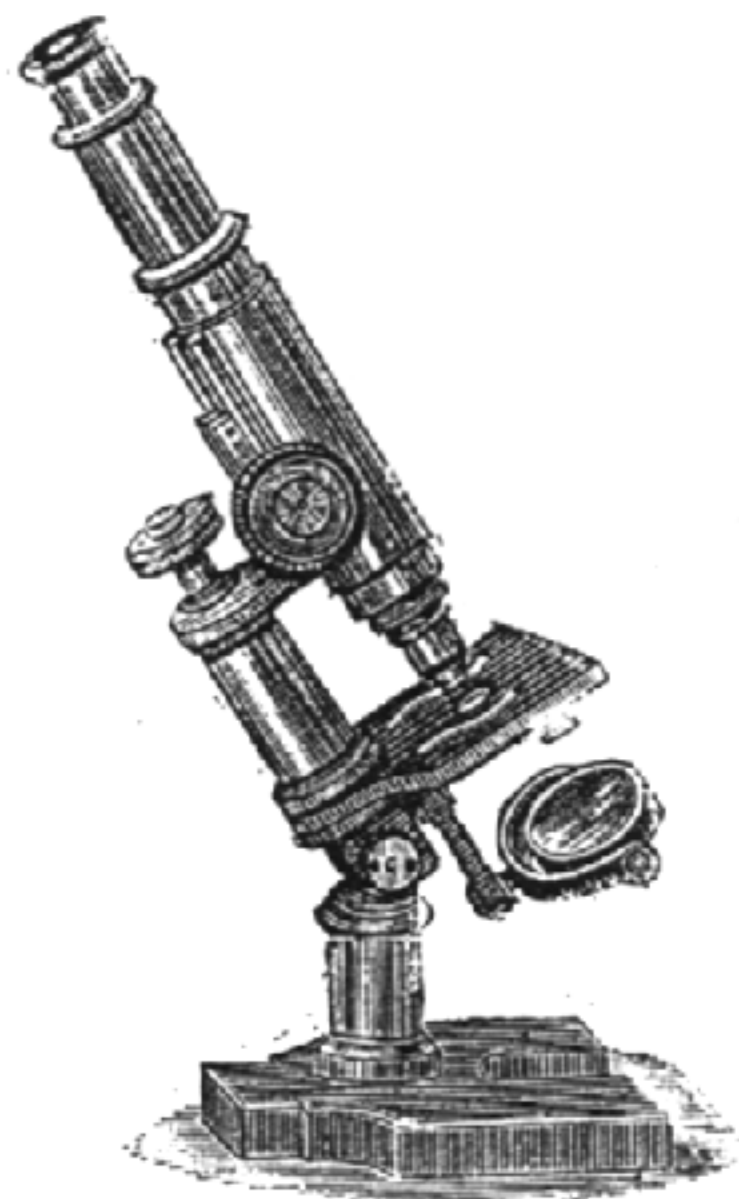


FIG. 5.

| | £ | s. | d. |
|--|---|----|----|
| The Medical Microscope on the continental model, Fig. 5, with sliding body,* fine screw adjustment, 2 eye pieces, in mahogany case | 3 | 3 | 0 |

* If with rack adjustment in place of the sliding motion as in Fig. 5, 21s. extra.

| | | | | | | | | | |
|-------------------------------|----|----|----|----|----|----|---|----|---|
| 1 inch Object Glass for ditto | .. | .. | .. | .. | .. | .. | 1 | 4 | 0 |
| $\frac{1}{4}$ " Ditto | .. | .. | .. | .. | .. | .. | 1 | 10 | 0 |
| Stand Condenser | .. | .. | .. | .. | .. | .. | 0 | 10 | 6 |

JAMES HOW & CO., 5, St. Bride Street, London, E.C.

HOW'S STUDENTS' MICROSCOPE.

£5 5s. 0d.

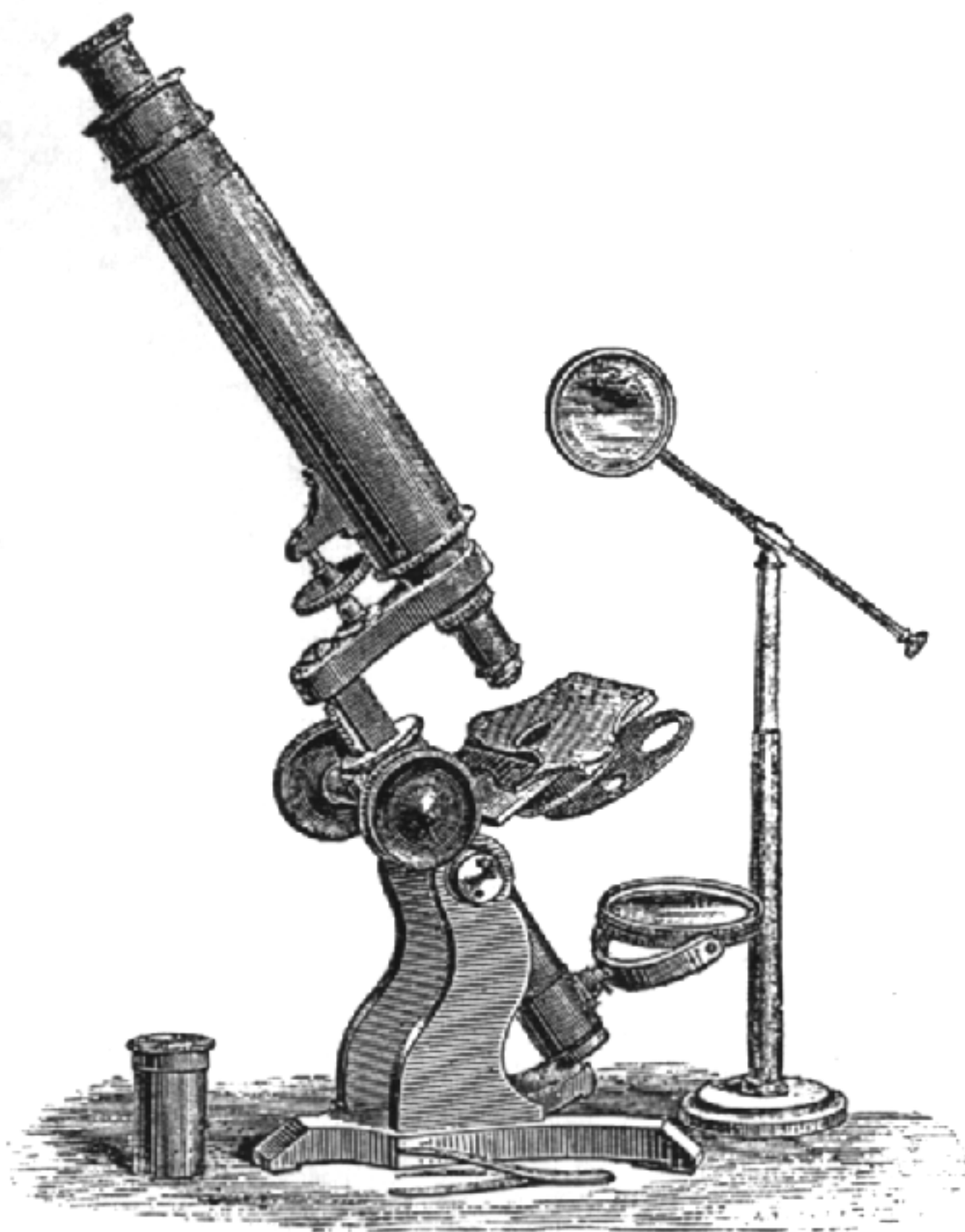


FIG. 6.

£ s. d.

| | | | | | | | | |
|---|----|----|----|----|----|---|---|---|
| How's Students' Microscopes, Fig. 6, with brass stand, coarse and fine adjustment, draw tube, improved stage with universal motions, one eye piece, dividing object glass (English), $\frac{1}{4}$, $\frac{1}{2}$, and 1 inch, in brass box, condenser on stand, brass forceps in mahogany case, with drawer and fittings | .. | .. | .. | .. | .. | 5 | 5 | 0 |
| Ditto, with separate Object glasses, $\frac{1}{4}$ and 1 inch | .. | .. | .. | .. | .. | 7 | 0 | 0 |
| Addition of mechanical and rotating stage to Students' Microscope | .. | .. | .. | .. | .. | 2 | 2 | 0 |

JAMES HOW & CO., 5, St. Bride Street, London, E.C.

APPARATUS FOR STUDENTS' MICROSCOPE.

| | £ | s. | d. |
|---|---|----|----|
| Eye Piece (A) | 0 | 10 | 0 |
| Ditto (C) | 0 | 12 | 0 |
| Camera Lucida | 0 | 12 | 0 |
| Beale's Neutral Tint Reflector | 0 | 7 | 0 |
| Polarizing Apparatus.. .. . | 1 | 5 | 0 |
| Selenite for ditto | 0 | 1 | 6 |
| Spot Lens for dark ground illuminations | 0 | 8 | 0 |
| Eye Piece with micrometer | 0 | 15 | 0 |
| Stage Micrometer | 0 | 5 | 0 |
| Animalculæ Cage | 0 | 4 | 0 |
| Stage Forceps | 0 | 4 | 6 |
| Frog Plate | 0 | 7 | 6 |

NOTICES FROM SCIENTIFIC WORKS.

"This imposing-looking instrument is of fair workmanship, suitable for all ordinary investigations, well deserving a place among cheap microscopes for the student. The stand is of brass, firm, and well finished; the body is fitted with coarse and fine adjustments for focussing, and a draw tube for increasing the magnifying power of the eye piece. The stage has an arrangement, simple but novel in its construction, by which a near approach to a universal movement is obtained. The movable, or upper plate, is held to the fixed lower plate with springs, and, although offering a convenient resistance, allows of a smoothness of motion quite remarkable. It resembles the magnetic stage, but is far more reliable, and can be moved upwards, downwards, laterally, or in a slanting direction, thus enabling the microscopist to follow living objects with great facility, superseding, to some extent, the more expensive mechanical stage. A dividing set of object glasses is supplied with the B eye piece, thus giving a range of power from 40 to about 200 diameters. The powers are of English workmanship, but differ from the higher priced objectives in having smaller angular apertures which is, perhaps, a legitimate mode of lessening the cost. The instrument being made with the universal screw, other objectives of a better class can be added at any time. There is also a condenser, mounted on a brass stand, for the illumination of opaque objects. The whole is fitted in a mahogany case, with drawer for objects."—*Hogg's History of the Microscope.*

"Mr. How now comes forward with a new pattern, which deserves a high place amongst cheap microscopes. The brass work is very good, the stage has a new arrangement for facilitating its motions, which is one of the best we have seen. . . . The powers are very well furnished and corrected. They are of English make, and differ from higher priced ones in having much smaller angles of aperture. . . . Small-angled powers are much more easy to manage, and, having greater penetration, are best fitted for beginners. All ordinary objects are beautifully shown with How's cheap objectives."—*Intellectual Observer.*

"Mr. How of 2, Foster Lane, supplies a remarkably cheap but good Students' Microscope. The body is fitted with coarse and fine adjustments, and possesses a draw tube. It gives a good large field. There is a single concave mirror, and a condenser on stand is supplied with the instrument. The arrangement of the stage is exceedingly simple and good. Movement in every direction is very easily effected, and the mechanism, from its simplicity, is not likely to get out of order. The object glass supplied with the instrument is an English combination of 1, $\frac{1}{2}$, and $\frac{1}{4}$ inch; but, at a slight additional cost, this may be exchanged for one which, though also a combination, is much superior in quality, and capable of very useful performance."—*British Medical Journal.*

| | | | | | | | | | | |
|--|----|----|----|----|----|----|----|--------|----|------|
| | | | | | | | | £ | s. | d. |
| How's Educational Microscope.—Achromatic Microscope, | | | | | | | | | | |
| with coarse and fine adjustment to body, one eye piece, sliding stage, | | | | | | | | | | |
| condenser on stand, stage forceps, animalculæ cage, dividing object | | | | | | | | | | |
| glass of good quality, and 1 and 2 inch, packed in neat mahogany | | | | | | | | | | |
| case | .. | .. | .. | .. | .. | .. | .. | 3 | 15 | 0 |
| Educational Microscopes | .. | .. | .. | .. | .. | .. | .. | 2 | 2 | 0 |
| | | | | | | | | from 0 | 7 | 6 to |

TRAVELLING MICROSCOPE.

| | | | | | | | | | | |
|---|----|----|----|----|----|----|----|---|----|----|
| | | | | | | | | £ | s. | d. |
| The Portable Tripod Microscope, with sliding body and fine | | | | | | | | | | |
| screw adjustment, one eye piece, condenser, animalculæ cage, stage | | | | | | | | | | |
| forceps, and brass box to contain two object glasses fitting into the | | | | | | | | | | |
| draw tube of the instrument, the whole packed in a small mahogany | | | | | | | | | | |
| case, forming a very portable and effective instrument, well suited | | | | | | | | | | |
| to the requirements of the travelling naturalist | .. | .. | .. | .. | .. | .. | .. | 4 | 4 | 0 |
| The Portable Tripod Microscope Stand | .. | .. | .. | .. | .. | .. | .. | 2 | 2 | 0 |
| Eye Piece for ditto | .. | .. | .. | .. | .. | .. | .. | 0 | 10 | 6 |

MICROSCOPE CASES.

| | | | | | | | | | | |
|--|----|----|----|----|----|----|----|---|----|----|
| | | | | | | | | £ | s. | d. |
| Solid Polished Mahogany Cabinet, with drawers and fittings, | | | | | | | | | | |
| For No. 1 Microscope | .. | .. | .. | .. | .. | .. | .. | 5 | 0 | 0 |
| For No. 2 ditto | .. | .. | .. | .. | .. | .. | .. | 3 | 10 | 0 |
| For No. 3 ditto | .. | .. | .. | .. | .. | .. | .. | 2 | 2 | 0 |
| For No. 4 ditto | .. | .. | .. | .. | .. | .. | .. | 1 | 5 | 0 |

ACHROMATIC OBJECT GLASSES.

| Object Glass. Inches. | Angular Aperture. Degrees. | MAGNIFYING POWER, WITH EYE PIECE. | | | | Price in Brass Box. | | |
|--------------------------|-------------------------------|-----------------------------------|-----|-----|-------|---------------------|----|----|
| | | A. | B. | C. | D. | £ | s. | d. |
| 4 | 9 | 10 | 16 | 30 | 35 | 1 | 4 | 0 |
| 3 | 10 | 13 | 20 | 35 | 56 | 1 | 4 | 0 |
| 3 | 12 | 13 | 20 | 35 | 56 | 1 | 15 | 0 |
| 2 | 12 | 20 | 32 | 55 | 90 | 1 | 4 | 0 |
| 2 | 15 | 20 | 32 | 55 | 90 | 1 | 15 | 0 |
| 1½ | 14 | 25 | 40 | 70 | 112 | 1 | 4 | 0 |
| 1½ | 20 | 25 | 40 | 70 | 112 | 1 | 15 | 0 |
| 1 | 16 | 37 | 60 | 105 | 170 | 1 | 4 | 0 |
| 1 | 24 | 37 | 60 | 105 | 170 | 1 | 15 | 0 |
| | 18 | 60 | 100 | 145 | 270 | 1 | 5 | 0 |
| | 30 | 60 | 100 | 145 | 270 | 2 | 0 | 0 |
| | 40 | 95 | 153 | 265 | 420 | 2 | 0 | 0 |
| * | 100 | 95 | 153 | 265 | 420 | 3 | 15 | 0 |
| | 70 | 195 | 310 | 540 | 850 | 2 | 0 | 0 |
| * | 100 | 195 | 310 | 540 | 850 | 3 | 17 | 6 |
| | 80 | 270 | 425 | 630 | 900 | 2 | 2 | 0 |
| | 100 | 420 | 670 | 900 | 1,200 | 3 | 3 | 0 |
| * | 125 | 420 | 670 | 900 | 1,200 | 5 | 0 | 0 |

Those marked * have an adjustment for covered and uncovered objects.

The above Object Glasses cannot be surpassed for definition, penetration, flatness of field, &c.

APPARATUS FOR COMPOUND MICROSCOPES.

EYE PIECES.

| | | | | | | £ | s. | d. |
|--------------------------------------|-------------|----|----|----|----------|---|----|------|
| Eye Piece, A, B, and C | .. | .. | .. | .. | each | 0 | 10 | 6 to |
| Ditto | D, E, and F | .. | .. | .. | .. | 0 | 17 | 6 |
| Harley's Shades to Eye Pieces | .. | .. | .. | .. | per pair | 0 | 3 | 6 |
| Pointer, adapted to A or B Eye Piece | .. | .. | .. | .. | each | 0 | 6 | 0 |
| Erector.. | .. | .. | .. | .. | .. | 0 | 16 | 0 |
| Kelner's Orthoscopic Eye Piece | .. | .. | .. | .. | from | 1 | 1 | 0 |

MICROMETERS.

| | | | | | | | | |
|---|----|----|----|----|----|---|----|---|
| 100 Thread Screw Micrometer of best construction, with screw divided to 100 | .. | .. | .. | .. | .. | 4 | 15 | 0 |
| Jackson's Eye Piece Micrometer, with adjusting Screw | .. | .. | .. | .. | .. | 1 | 1 | 0 |
| Eye Piece for ditto | .. | .. | .. | .. | .. | 1 | 0 | 0 |
| Eye Piece B, with Micrometer | .. | .. | .. | .. | .. | 7 | 18 | 6 |
| Micrometer on circle for Eye Piece | .. | .. | .. | .. | .. | 0 | 6 | 0 |
| Stage Micrometer | .. | .. | .. | .. | .. | 0 | 5 | 6 |
| Maltwood's Finder in case | .. | .. | .. | .. | .. | 0 | 7 | 6 |
| Brass Stage Plate for use with same | .. | .. | .. | .. | .. | 0 | 3 | 6 |

POLARIZING APPARATUS.

| | | | | | | | | |
|--|----|----|----|----|-----------|---|----|------|
| Polarizing Apparatus.. | .. | .. | .. | .. | from | 1 | 5 | 0 to |
| Selenite Films.. | .. | .. | .. | .. | each from | 0 | 1 | 6 |
| Ditto, in Brass Mount | .. | .. | .. | .. | .. | 0 | 3 | 0 |
| Darker's Revolving Selenite Stage with set of three Selenites in Brass Box | .. | .. | .. | .. | .. | 2 | 2 | 0 |
| Tourmaline Cap for Eye Piece | .. | .. | .. | .. | from | 0 | 15 | 0 |

ILLUMINATING APPARATUS.

| | | | | | | | | |
|--|----|------|------|------|------------------------------|------|-------|---|
| Gillett's Achromatic Condenser | .. | .. | .. | .. | .. | 6 | 6 | 0 |
| Plain Achromatic Condenser | .. | .. | .. | .. | .. | 2 | 2 | 0 |
| Kelner's Orthoscopic Eye Piece, with series of Stops for use as a Condenser.. | .. | .. | .. | .. | from | 2 | 2 | 0 |
| Reade's Hemispherical Condenser, with Adjustable Diaphragm.. | .. | .. | .. | .. | .. | 1 | 15 | 0 |
| Kingsley's Illuminator, with Diaphragms | .. | .. | .. | .. | .. | 1 | 0 | 0 |
| Webster's Condenser | .. | .. | .. | .. | .. | 1 | 0 | 0 |
| Reade's Diatom Prism on Stand | .. | .. | .. | .. | .. | 1 | 0 | 0 |
| Amici's Prism on Stand | .. | .. | .. | .. | 2 0 0 and | 3 | 0 | 0 |
| Parabolic Condenser for dark ground illumination | .. | .. | .. | .. | 1 5 0 to | 1 | 12 | 0 |
| Spot Lense for ditto | .. | .. | .. | .. | 0 8 0 to | 0 | 12 | 0 |
| Rainey's Light Modifier | .. | .. | .. | .. | .. | 0 | 5 | 0 |
| Stand Condensers | .. | .. | .. | .. | 10/6, 12/6, 17/6, 1 5 0, and | 1 | 12 | 0 |
| Stage Condenser | .. | .. | .. | .. | from | 0 | 16 | 0 |
| Silver Side Reflector for attachment to the stage or body of Microscope | .. | .. | .. | .. | .. | 1 | 6 | 0 |
| Silver Parabolic Reflector for attachment between lower part of body of Microscope and Objective | .. | .. | .. | .. | .. | 1 | 7 | 6 |
| Lieberkuhns for Object Glass | .. | 20/- | 17/6 | 16/- | 10/6 | 10/- | | |
| Lister's Dark Wells and Holder for use with above | .. | 2 | 1½ | 1 | ½ | ¼ | inch. | |
| | .. | .. | .. | .. | per set from | 0 | 12 | 6 |



FIG. 7.

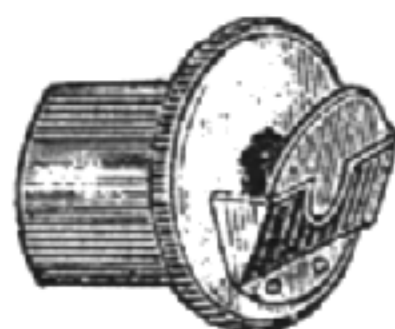


FIG. 8.

CAMERA LUCIDAS, &c.

| | £ | s. | d. |
|--|------|----|------|
| Wollaston's Camera Lucida | from | 0 | 12 0 |
| Ditto ditto best form, fig. 7 | | 1 | 10 0 |
| Beale's Neutral Tint Reflector, fig. 8 | | 0 | 7 0 |

ANIMALCULÆ CAGES, COMPRESSORIA, &c.

| | | | | | | | | |
|--|------|---|---|---|------|---|----|---|
| Animalculæ Cage | each | 0 | 4 | 6 | to | 0 | 12 | 6 |
| Lever Compressorium | | | | | from | 1 | 2 | 0 |
| Spring Compressorium | | | | | | 0 | 15 | 6 |
| Reversible Compressorium for high powers | | | | | | 0 | 7 | 6 |

| | | | | | | | | | |
|---|--|---|---|---|-----|----|----|---|---|
| Brook's Double Nose Piece for rapidly changing the Object Glasses | | | | | | 0 | 16 | 0 | |
| Ditto ditto with bent arm | | | | | | 1 | 0 | 0 | |
| Brass Frog Plate | | 0 | 7 | 6 | and | 0 | 12 | 6 | |
| Stage Forceps | | | 0 | 4 | 6 | to | 0 | 8 | 6 |
| Brass Forceps | | | 0 | 1 | 0 | to | 0 | 5 | 6 |

SPECTROSCOPES.

£ s. d.

Micro-Spectroscope, of most improved construction, for exhibiting two spectra in the field of view at the same time; the smaller prism is removable, so that a single spectrum can be observed if desired. The instrument is furnished with two slits at right angles to each other, with adjustments for regulating their width, achromatic eye piece, with rack and pinion adjustment, for accurately focussing the spectral lines. The stage for holding Sorby's tubes, wedge cells, &c., can be removed, together with the reflecting mirror, when not required. This instrument fitted to any microscope

5 5 0

Pocket Spectroscope, of sufficient power to show Fraunhofer's line, &c., in ease

1 1 0

Ditto, with adjustable slit

1 10 0

Adapting the above to microscope

0 10 0

The Student's Spectroscope, on tripod stand

3 10 0

Spectroscope, with two prisms

4 10 0

Ditto, with graduated circle and prism for comparative spectra

5 5 0

Bunsen's Burner, for use with above

from 0 2 0

Stand, for holding platinum wire for ditto

0 3 6

Sorby's Tubes

per doz. 0 2 6

Sorby's Wedge Cells

0 6 0

HOW'S MICROSCOPE LAMP.

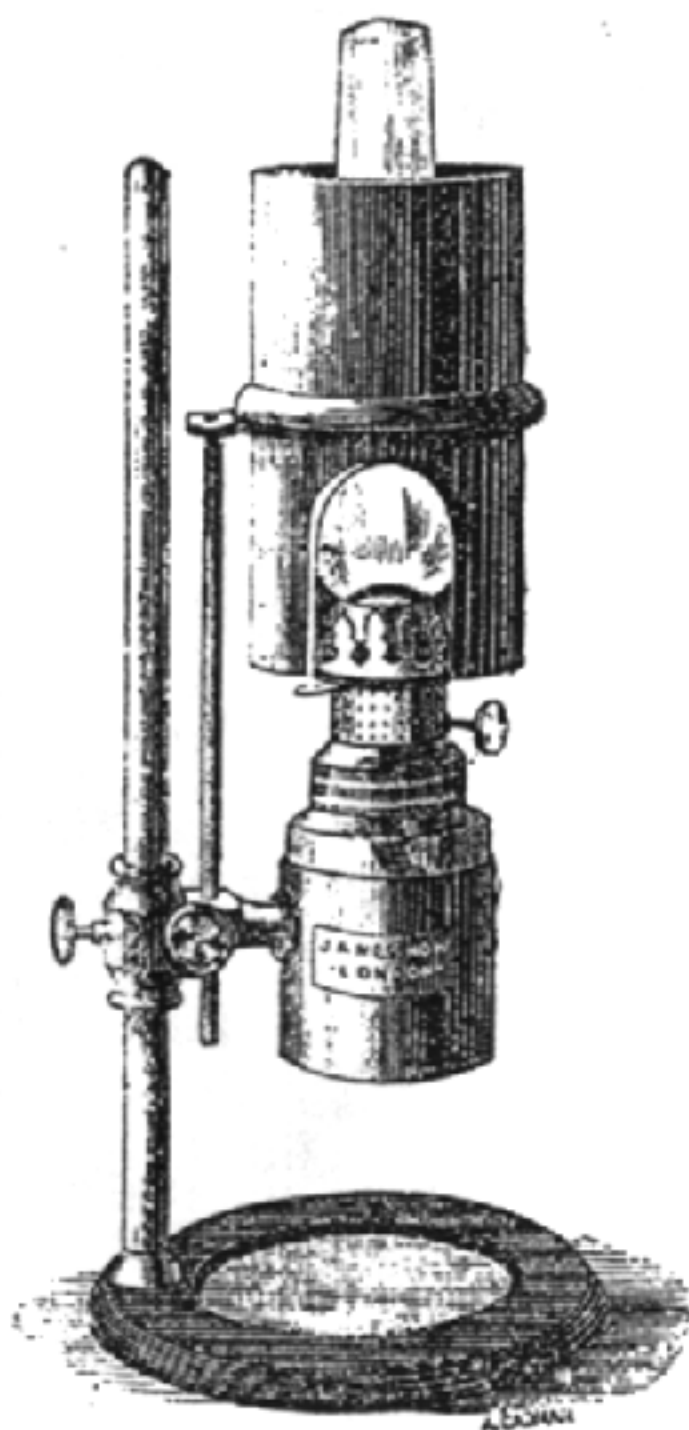


FIG. 9.

The most efficient Lamp, at a moderate price, yet offered to the Microscopist. It is fitted with Hailes's porcelain shade, and has all necessary adjustments; the glass reservoir is protected by a brass case, from which it can be readily removed and in which it rotates, so that either the edge or flat side of the flame can be turned towards the opening of the shade. The shade can be adjusted to its proper height in relation to the flame, and clamped in that position by means of the screw facing the observer (see Figure); the whole can then be moved up or down upon the pillar, and clamped at the required height by the screw to the left of cut, without deranging the adjustment of the shade. The lamp mount is hinged, so that the gallery, &c., may be turned back to facilitate the cutting and trimming of the wick.

| | £ | s. | d. |
|---|---|----|----|
| How's Microscope Lamp, with porcelain shade (Fig. 9) | 0 | 11 | 6 |
| Black Screen (conical), fitting upon the top of the porcelain shade .. | 0 | 0 | 6 |
| Case for Lamp, in polished pine with handle | 0 | 3 | 6 |
| Ditto, in Mahogany | 0 | 5 | 6 |
| Condenser for Lamp, with brass mount | 0 | 12 | 0 |
| Blue Glass in frame, to fit Condenser | 0 | 2 | 6 |
| Extra Lamp Glasses per doz. | 0 | 3 | 0 |
| Hailes's Porcelain Shade | 0 | 1 | 0 |
| Wire Support and Green Shade, to convert the Lamp into an ordinary Reading Lamp | 0 | 2 | 0 |

A P P A R A T U S, &c.,
FOR PREPARING AND MOUNTING MICROSCOPIC OBJECTS.

| | | | |
|--|---|----|---|
| Glass Slips, 3 by 1 in., polished edges per doz. | 0 | 0 | 8 |
| Ditto ditto unground | 0 | 0 | 4 |
| Dished Glasses, 3 by 1 in. | 0 | 3 | 0 |
| Ditto large size for dissecting each | 0 | 2 | 6 |
| Glass Stage Plates | 0 | 0 | 9 |
| Ditto Dissecting Troughs each from | 0 | 2 | 6 |
| Glass Cells of various shapes per doz. | 0 | 3 | 0 |
| Vulcanite ditto per 100 | 0 | 1 | 6 |
| Thin Glass Squares per oz. | 0 | 4 | 0 |
| Ditto Circles | 0 | 5 | 6 |
| Zoophyte Troughs from 1/9 to | 0 | 4 | 6 |
| Glass Troughs for fish each | 0 | 7 | 6 |
| Page's Wood Forceps | 0 | 2 | 6 |
| Whirling Table for making cells, finishing slides, &c. | 0 | 7 | 6 |
| Machine for cutting sections of wood, &c. from | 0 | 15 | 0 |
| Chisel for use with same each | 0 | 2 | 6 |
| Spring Mounting Clips per doz. | 0 | 1 | 6 |
| Smith's Mounting Instruments each | 0 | 8 | 6 |
| Air Pump and Receiver for preparing objects from | 1 | 5 | 0 |

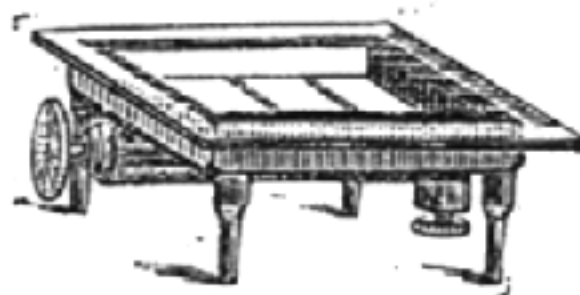


FIG. 10.

| | | | |
|---|---|----|---|
| Small Air Pump, especially constructed for microscopical purposes, with brass vacuum chamber (capable of holding two slides) and plate glass cover, in mahogany case 16/, Fig. 10 | 0 | 18 | 6 |
| Brass Table for mounting objects each | 0 | 5 | 0 |
| Spirit Lamp for use with ditto from | 0 | 1 | 6 |
| Cutting Diamond each | 0 | 17 | 6 |
| Writing Diamond | 0 | 7 | 6 |
| Instrument for cutting circles of thin glass, in case from | 1 | 1 | 0 |
| Glass Capped Bottles for Canada balsam, &c. each | 0 | 1 | 3 |

| | | | | | | £ | s. | d. | |
|--|--------------------------------|----------------|----------------|----------------|----------------|----------------|-------|------|---|
| Brass Syringe for injecting animal tissues, with stopcock.. | $\frac{1}{2}$ oz. size | | | | | 0 | 8 | 6 | |
| Ditto ditto ditto .. | 1 oz. " | | | | | 0 | 10 | 6 | |
| Nose Piece for the above, with silver tubes of different sizes | each | | | | | 0 | 1 | 6 | |
| Glass Spirit Lamp (stoneware, wick holder) | from | | | | | 0 | 1 | 0 | |
| Ditto ditto (brass, wick holder):— | | | | | | | | | |
| | Capacity | $1\frac{1}{2}$ | 2 | 3 | 4 oz. | | | | |
| | Each | $1/6$ | $1/9$ | $2/$ | $2/6$ | | | | |
| Retort Stand | 3' and | | | | | 0 | 5 | 6 | |
| Test Tubes, hard German glass:— | | | | | | | | | |
| | Length, inches | 2 | 3 | 4 | 5 | 6 | | | |
| | Per doz. | 5d. | 6d. | 10d. | 1/ | $1/3$ | | | |
| Test Tube Stands (teak) for 6 tubes | | | | | | | 0 | 1 | 0 |
| " " " 12 " | | | | | | | 0 | 1 | 6 |
| " " " 8 " and pegs | | | | | | | 0 | 1 | 9 |
| " " (mahogany) 8 " | | | | | | | 0 | 3 | 0 |
| " " " 16 " | | | | | | | 0 | 3 | 6 |
| Berlin Porcelain Dishes (flat bottoms):— | | | | | | | | | |
| | Diameter, inches | $2\frac{3}{4}$ | 3 | $3\frac{1}{2}$ | 4 | $4\frac{1}{2}$ | 5 | 6 | |
| | Each | 6d. | 8d. | 9d. | 1/ | $1/2$ | $1/5$ | $2/$ | |
| Berlin Porcelain Capsules and Covers:— | | | | | | | | | |
| | Diameter, inches | 1 | $1\frac{1}{4}$ | $1\frac{1}{2}$ | $1\frac{3}{4}$ | $2\frac{1}{4}$ | | | |
| | Each | 3d. | 5d. | 7d. | 9d. | 11d. | | | |
| Watch Glasses | per dozen, from | | | | | 0 | 2 | 0 | |
| Pipettes | each 3d. and | | | | | 0 | 0 | 6 | |
| Conical Test Glasses | 1 oz., 6d.; 3 oz., 7d.; 4 oz., | | | | | 0 | 0 | 9 | |
| Small Test Bottles, with capillary orifices and glass caps.. | each | | | | | 0 | 1 | 0 | |
| Wash Bottles | " | | | | | 0 | 1 | 6 | |
| Dropping Bottle, Schuster's | " | | | | | 0 | 0 | 6 | |
| Dropping Bottle, improved form, with pipette and elastic top, in case, $1/3$ & | " | | | | | 0 | 1 | 6 | |
| Small Glass Syringe | each | | | | | 0 | 1 | 0 | |

MOUNTING MATERIALS.

| | | | | | | £ | s. | d. |
|----------------------------------|---------------------------------|--|--|--|--|---|----|----|
| Canada Balsam | per bot. | | | | | 0 | 1 | 0 |
| Glycerine, pure | " 6d. & | | | | | 0 | 1 | 0 |
| Damar | " | | | | | 0 | 1 | 0 |
| Glycerine Jelly | " | | | | | 0 | 1 | 0 |
| Deane's Gelatine Medium | " | | | | | 0 | 1 | 0 |
| Turpentine | " | | | | | 0 | 0 | 6 |
| Asphalte Varnish | " | | | | | 0 | 0 | 6 |
| Gold Size | " | | | | | 0 | 0 | 9 |
| Bell's Cement | " | | | | | 0 | 1 | 0 |
| Staining Solution, Carmine | " | | | | | 0 | 0 | 9 |
| Ditto ditto, Logwood | " | | | | | 0 | 0 | 9 |
| Alcohol | per lb. $4/$, per oz. | | | | | 0 | 0 | 4 |
| Benzole | " $2/6$, " | | | | | 0 | 0 | 3 |
| Chloroform | per oz. $1/$, methylated do. " | | | | | 0 | 0 | 6 |
| Potash Solution | " | | | | | 0 | 0 | 2 |
| Marine Glue | per Bottle 6d., per lb. | | | | | 0 | 1 | 3 |

SIMPLE MICROSCOPES.



FIG. 11.



FIG. 12.



FIG. 13.

| | | £ | s. | d. |
|--|-----------|---|----|----|
| Pocket Lenses, in horn cases, Fig. 11, 1 power, 2/- ; 2 ditto, 3/- ; | | | | |
| 3 ditto | | 0 | 3 | 6 |
| Ditto in tortoiseshell case, 1 power, 4/6 ; 2 ditto, 8/6 | | | | |
| 3 ditto | | 0 | 10 | 6 |
| Ditto in tortoiseshell mount, with 3 powers, and dia- | | | | |
| phragm, best make | | 0 | 15 | 0 |
| Ditto with 2 powers and Coddington | | 0 | 12 | 6 |
| Watchmakers' Glasses | from | 0 | 1 | 0 |
| Engravers' Glasses, best form with double lenses .. | 1/6, 6/-, | 0 | 9 | 0 |
| Coddington Lens, in German Silver | 5/6 | 0 | 7 | 6 |
| Ditto ditto in Standard Silver | | 0 | 10 | 6 |
| Stanhope Lens, | from | 0 | 3 | 0 |
| Seed Microscope, with tripod stand | | 0 | 2 | 6 |
| Ditto ditto with glass bell | | 0 | 4 | 6 |
| Lenses for examining Maps, Prints, Photographs, &c., Fig. 12, Diam. | | | | |
| 2½ inch, 4/6 ; 3 inch, 5/6 ; 3½ inch, 6/6 ; 4 inch | | 0 | 7 | 6 |
| Ditto, in shut up case for the pocket, Fig. 13 | 0 1 3 to | 0 | 4 | 6 |

DISSECTING INSTRUMENTS, &c.,

| | £ | s. | d. |
|--|---|----|----|
| Valentin's Knife, for making sections of soft substances, in case.. | 0 | 17 | 6 |
| Scalpels, with ivory handles, large and small each | 0 | 1 | 9 |
| Steel Forceps, curved or straight " | 0 | 2 | 6 |
| Ditto plated with nickel " | 0 | 3 | 6 |
| Needle Holders " | 0 | 2 | 6 |
| Scissors " | 0 | 2 | 9 |
| Ditto elbow curve " | 0 | 4 | 6 |
| Microtomes each from | 0 | 5 | 0 |
| Stuffing Forceps, with scissor handles each | 0 | 2 | 6 |
| Directors, plated metal " | 0 | 2 | 0 |
| Brain Scoops, double " | 0 | 1 | 9 |
| Set of Microscopical Dissecting Instruments, consisting of two scalpels, needle holder, steel forceps, and scissors, in mahogany case for the pocket | 0 | 16 | 0 |
| Set of Instruments for Bird Stuffing, &c., consisting of dissecting scissors, double brain scoop, stuffing forceps, director, forceps, one each scalpel, large and small, side cutting pliers, piercer, needles, the whole in neat mahogany case | 1 | 15 | 0 |

APPARATUS FOR COLLECTING MICROSCOPIC OBJECTS.

| | £ | s. | d. |
|---|---|----|----|
| Collecting Stick from | 0 | 1 | 6 |
| Collecting Stick, spring clip and bottle " | 0 | 3 | 6 |
| Ditto with telescope, lengthening joint, forming a convenient Walking Stick " | 0 | 7 | 6 |
| Ditto ditto with spring clip, collecting bottle, and weed knife | 0 | 10 | 6 |
| Spring Clip, screwing into collecting stick.. .. . " | 0 | 1 | 9 |
| Ring for Gauze Net " | 0 | 1 | 9 |
| Spoon for gathering Diatoms " | 0 | 1 | 3 |
| Weed Knife " | 0 | 2 | 6 |
| Strainer " | 0 | 0 | 9 |
| Drag Hook, for collecting water weeds from | 0 | 1 | 9 |
| Collecting Bottles and Tubes, various per doz. from | 0 | 2 | 0 |
| Set of 6 Collecting Bottles of light clear glass, in japanned case for the pocket " | 0 | 3 | 6 |
| Set of 6 Tubes, with wood caps in leather case " | 0 | 5 | 0 |
| Portable sets of Microscopic Collecting Apparatus, with telescope stick from | 1 | 15 | 0 |
| Wright's Collecting Bottle " | 0 | 5 | 0 |

MICROSCOPIC OBJECTS.

VEGETABLE.

| | £ | s. | d. |
|---|---|----|----|
| Sections of Wood (exogenous and endogenous), Cuticles, Spiral Vessels, Ducts, Glands, Hairs, Pollen, Spores, Seeds, &c. each from | 0 | 1 | 0 |
| Specimens of Fossil Wood, comprising sections of the plants of the Coal Measures, Calamites, Lepidodendron, Sigillaria and Stigmaria, Asterophyllites, Lyginodendron, Heterangium, Rachiopteris, Myelopteris, Psaronius, Kaloxylon, &c., and also Fossil Wood from various other geological formations from 2/ to | 1 | 0 | 0 |
| Diatomaceæ (recent and fossil) from | 0 | 1 | 0 |
| Test Objects " | 0 | 1 | 6 |

ANIMAL.

| | £ | s. | d. |
|--|----------|----|-----|
| Foraminifera and Polycistina.. .. . | from | 0 | 1 0 |
| Sponges (sections of), Spicules, Gemmules, &c. .. . | .. | 0 | 1 0 |
| Spicules of Gorgonia, Alcyonia, &c. .. . | .. | 0 | 1 0 |
| Sections exhibiting the Structure of Shell .. . | .. | 0 | 1 6 |
| Palates of Mollusca | .. | 0 | 1 0 |
| Echinus Spines (sections of) | .. | 0 | 1 6 |
| Spicules of Chirodota, Synapta, &c. .. . | .. | 0 | 1 0 |
| Insects (mounted whole) | .. | 0 | 1 6 |
| Insects (parts of): Antennæ, Tongues, Heads, Feet, Wings, Scales, Spiracles, Tracheæ, Stomachs, &c., &c. .. . | .. | 0 | 1 0 |
| Sections of Bones of Mammals, Birds, Reptiles, and Fish (recent and fossil) | .. | 0 | 1 6 |
| Sections of Teeth (recent and fossil) | .. | 0 | 1 6 |
| Blood Discs, Pigment Cells, &c. | .. | 0 | 1 0 |
| Anatomical Injected Preparation (transparent) | 1/6, 1/9 | 0 | 2 0 |
| Ditto ditto (opaque) | from | 0 | 2 0 |
| Urinary Deposits, &c... .. . | .. | 0 | 1 0 |

MINERAL.

| | | | |
|--|------|---|-----|
| Sections of Flint, Agate, Limestone, Granite, &c. .. . | from | 0 | 1 6 |
|--|------|---|-----|

POLARISCOPE.

| | | | |
|---|------|---|-----|
| Crystals of various Salts, objects selected from various Animal, Vegetable, and Mineral Preparations | from | 0 | 1 0 |
|---|------|---|-----|

**SPECIAL and CAREFULLY SELECTED SERIES of MICROSCOPICAL ROCK
SECTIONS, IGNEOUS, METAMORPHIC, and SEDIMENTARY,**

COMPRISING

GRANITES, SYENITES, PORPHYRIES, TRACHYTES, RHYOLITES,
DIORITES, GABBROS, DOLERITES, BASALTS, PITCHSTONES,
OBSIDIANS, SCHISTS, SLATES, SERPENTINES, &c.;
NUMMULITIC, MILLIOLITE, OOLITIC, CORALLINE, AND OTHER
LIMESTONES.

Altered Rocks from Charnwood Forest, the North of Ireland, &c.

Veauvian and other Lavas for comparison with the older Rocks.

ROCK SECTIONS PREPARED TO ORDER.

SETS OF PHYSIOLOGICAL AND PATHOLOGICAL PREPARATIONS FOR STUDENTS, &c.

| | | | | | | | | £ | s. | d. |
|-----------|--|------------|-------|-------|-------|-------|-------|---|----|----|
| Series A. | 24 Physiological Preparations in Polished Pine | Horizontal | | | | | | 2 | 2 | 0 |
| | Cabinet | .. | .. | .. | .. | .. | .. | 2 | 2 | 0 |
| Series B. | Ditto | | ditto | | ditto | | ditto | 2 | 2 | 0 |
| Series C. | 24 Pathological | ditto | | ditto | | ditto | | 2 | 2 | 0 |

CABINETS FOR MICROSCOPIC OBJECTS.

| | | | | | | | | £ | s. | d. |
|--|----|----|----|----|----|----|------|---|----|----|
| Polished Pine Cabinet, with drawers, in which the objects lie flat— | | | | | | | | | | |
| To contain 200 objects | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | 0 |
| " 250 | .. | .. | .. | .. | .. | .. | .. | 1 | 12 | 0 |
| " 500 | .. | .. | .. | .. | .. | .. | .. | 2 | 10 | 0 |
| " 1,000 | .. | .. | .. | .. | .. | .. | .. | 3 | 10 | 0 |
| Polished Mahogany Cabinets, with drawers— | | | | | | | | | | |
| To contain 200 objects | .. | .. | .. | .. | .. | .. | from | 1 | 12 | 6 |
| " 250 | .. | .. | .. | .. | .. | .. | .. | 2 | 12 | 0 |
| " 500 | .. | .. | .. | .. | .. | .. | .. | 3 | 3 | 0 |
| " 1,000 | .. | .. | .. | .. | .. | .. | .. | 4 | 0 | 0 |
| Portable Horizontal Slide Case, in Polished Pine— | | | | | | | | | | |
| To contain 3 dozen objects | .. | .. | .. | .. | .. | .. | .. | 0 | 3 | 6 |
| " 6 | .. | .. | .. | .. | .. | .. | .. | 0 | 5 | 6 |
| Mahogany Slide Case, to contain 144 objects in a vertical position, with lock and key | | | | | | | | 0 | 16 | 0 |
| Deal Boxes covered with Cloth, to contain objects in a vertical position. | | | | | | | | | | |
| To contain $\frac{1}{2}$ dozen objects | .. | .. | .. | .. | .. | .. | .. | 0 | 0 | 6 |
| " 1 | .. | .. | .. | .. | .. | .. | .. | 0 | 0 | 8 |
| " 2 | .. | .. | .. | .. | .. | .. | .. | 0 | 1 | 0 |
| " 3 | .. | .. | .. | .. | .. | .. | .. | 0 | 1 | 9 |
| " 6 | .. | .. | .. | .. | .. | .. | .. | 0 | 2 | 9 |

ALL WORKS ON THE MICROSCOPE SUPPLIED.

Apparatus for collecting and preserving objects of Natural History, comprising Entomological Nets, Collecting, Drying, and Store Boxes, Setting Boards, Cabinets, Botanical Collecting Boxes and Drying Paper, Dredging Nets, Geological Hammers, Bags, Portable Sets of Blowpipe Apparatus, Compasses, Clinometers, Aneroid and Mountain Barometers, Pedometers, and all other necessaries for the travelling naturalist or explorer.

JAMES HOW & CO., 5, St. Bride Street, London, E.C.

OPERA AND FIELD GLASSES.

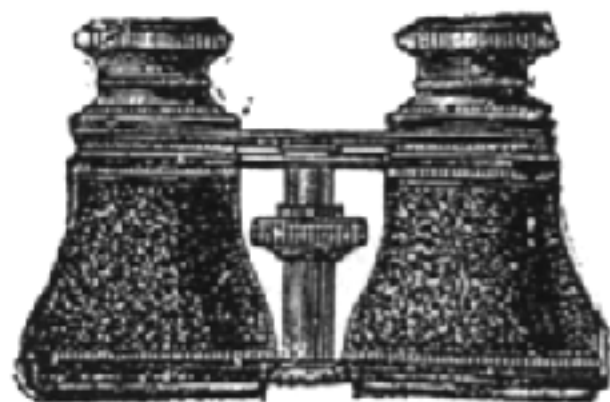


FIG. 14.



FIG. 15.

ACHROMATIC BINOCULAR OPERA GLASS.

| | | | | | £ | s. | d. |
|---|----|----|----|----|---|----|----|
| Leather body, 6 lenses, $1\frac{1}{4}$ inch object glass, in case.. | .. | .. | .. | .. | 1 | 8 | 0 |
| Ditto ditto $1\frac{1}{2}$,, ditto ditto .. | .. | .. | .. | .. | 1 | 11 | 6 |
| Ditto ditto $1\frac{3}{4}$,, ditto ditto .. | .. | .. | .. | .. | 1 | 18 | 6 |

ACHROMATIC BINOCULAR OPERA GLASS.

| | | | | | | | |
|---|----|----|----|----|---|----|---|
| Leather body, 12 lenses, $1\frac{1}{2}$ inch, object glass, in case | .. | .. | .. | .. | 2 | 5 | 6 |
| Ditto ditto $1\frac{1}{2}$,, ditto ditto .. | .. | .. | .. | .. | 2 | 10 | 0 |
| Ditto ditto $1\frac{3}{4}$,, ditto ditto .. | .. | .. | .. | .. | 2 | 18 | 0 |

ACHROMATIC BINOCULAR OPERA GLASS.

| | | | | | | | |
|---|----|----|----|----|---|----|---|
| Ivory body and gilt mountings, 12 lenses, $1\frac{1}{4}$ inch object glass in case .. | .. | .. | .. | .. | 2 | 15 | 0 |
| Ditto ditto ditto $1\frac{1}{2}$,, ditto ditto .. | .. | .. | .. | .. | 3 | 3 | 0 |
| Ditto ditto ditto $1\frac{3}{4}$,, ditto ditto .. | .. | .. | .. | .. | 3 | 15 | 0 |

ACHROMATIC BINOCULAR OPERA GLASS.

| | | | |
|---|---|----|---|
| Leather body and gilt mountings, 12 lenses, $1\frac{1}{4}$ inch object glass, in case | 2 | 10 | 0 |
| Ditto ditto ditto $1\frac{1}{2}$,, ditto ditto | 2 | 16 | 0 |
| Ditto ditto ditto $1\frac{3}{4}$,, ditto ditto | 3 | 10 | 0 |

FIELD GLASSES.

ACHROMATIC BINOCULAR FIELD OR RACE GLASS,
WITH LEATHER SLING CASE.

| | | | | | £ | s. | d. |
|--|----|----|----|----|---|----|----|
| Leather body, japanned mountings, with sunshades, 6 lenses, $1\frac{1}{2}$ inch object glasses | .. | .. | .. | .. | 1 | 12 | 0 |
| Ditto ditto $1\frac{3}{4}$ inch ditto .. | .. | .. | .. | .. | 1 | 16 | 0 |
| Ditto ditto $1\frac{1}{2}$,, ditto .. | .. | .. | .. | .. | 2 | 0 | 0 |
| Ditto ditto $2\frac{1}{4}$,, ditto .. | .. | .. | .. | .. | 2 | 5 | 0 |
| Ditto ditto $2\frac{1}{2}$,, ditto .. | .. | .. | .. | .. | 2 | 10 | 0 |

**ACHROMATIC BINOCULAR FIELD OR RACE GLASS,
WITH LEATHER SLING CASE.**

| | | | | | | | £ | s. | d. |
|--|-------|----|---|-------|----|----|---|----|----|
| Leather body, japanned mountings, with sun shades, 12 lenses, 1½ inch object glasses | | | | | | | 2 | 2 | 0 |
| Ditto | ditto | 1½ | „ | ditto | .. | .. | 2 | 7 | 6 |
| Ditto | ditto | 1¾ | „ | ditto | .. | .. | 2 | 12 | 6 |
| Ditto | ditto | 1⅞ | „ | ditto | .. | .. | 3 | 0 | 0 |
| Ditto | ditto | 2¼ | „ | ditto | .. | .. | 3 | 10 | 0 |
| Ditto | ditto | 2½ | „ | ditto | .. | .. | 4 | 0 | 0 |

The “Empress” Field Glass of very best construction, unsurpassed for brilliancy of definition, with triple achromatic object glasses and eye pieces adjusting, sun shades in patent leather sling case. Diameter of object glass, 2¼ inch

5 5 0

HOW & CO'S UNIVERSAL BINOCULAR FIELD GLASS.

Leather body, japanned slides, sun-shades, in sling case

1 5 0

BINOCULAR OPERA, FIELD, AND MARINE GLASS.

These contain three series of lenses, of different powers, adapting them either for the opera, field, or sea-side, with a simple and elegant contrivance by which they may instantly be altered to suit either of the above purposes; with leather body, 1¼ inch object glass, in sling case, Fig. 15

3 13 6

Ditto ditto 2½ inch ditto

4 10 0

Aluminium Achromatic Field Glasses of best construction, 12 lens combination, with Russia leather body, and bright aluminium mountings, adjustable sunshades, and sling case, 1½ inch object glasses

4 17 6

Ditto, 1½ inch object glasses

5 15 6

„ 1¾ „ „

6 12 0

„ 2¼ „ „

8 0 0