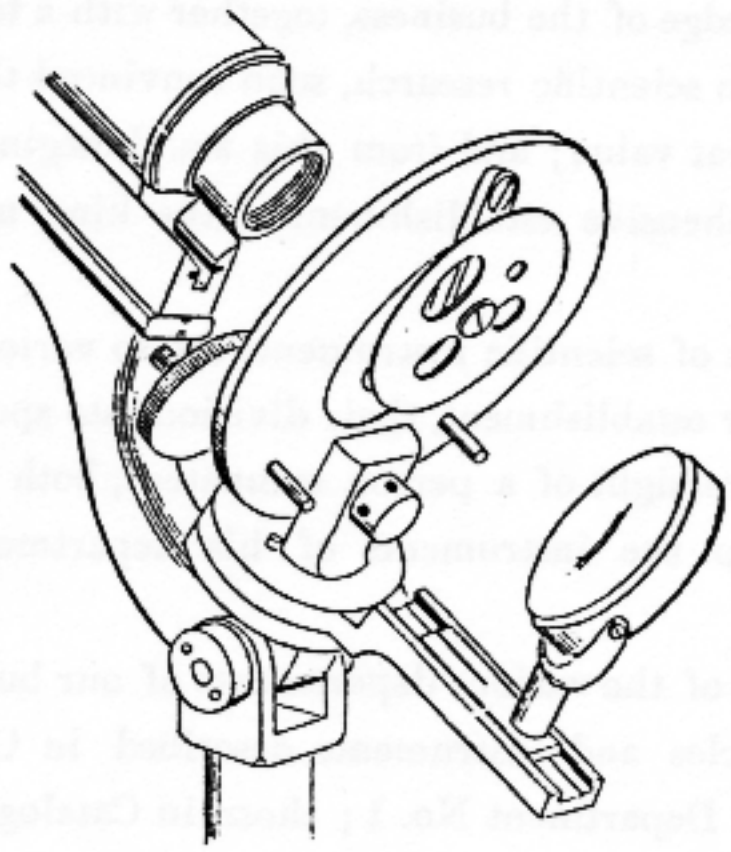
PRICED AND ILLUSTRATED CATALOGUE

OF

MICROSCOPES AND ACCESSORIES

MAGNIFYING GLASSES,

STEREOSCOPES, GRAPHOSCOPES, ETC.,



MADE, IMPORTED, AND SOLD, WHOLESALE AND RETAIL,

—BY—

JAMES W. QUEEN & CO.,

924 Chestnut St. and 925 Sansom St.,

PHILADELPHIA.

SEVENTY-SECOND EDITION.

1890.

Please let friends interested in Science see this Catalogue.

NOTICE.

THE Optical Instrument business, of which this catalogue is a partial exponent, was established over thirty years ago by Mr. James W. Queen, of this city, who had been previously connected for more than a quarter of a century with the oldest optical firm in the United States.

Though small and unpretending as his store and business were at the outset, Mr. Queen's thorough knowledge of the business, together with a full appreciation of the wants of those engaged in scientific research, soon convinced the community that his was an institution of great value; and from this small beginning rapidly grew the largest and most comprehensive establishment of the kind not only in the United States, but in the world.

The character and uses of scientific instruments are so varied and the stock now so large as to require, in our establishment, their division into special departments, each of which is under the oversight of a person competent, both by his knowledge and business ability, to keep the instruments of his department up to the highest standard.

For a brief conspectus of the various departments of our business, we refer to page 3 of cover. The articles and instruments described in Catalogues D, E, and F are under the charge of Department No. 1; those in Catalogue A, Department No. 2; in Catalogues B and C, Department No. 3; those in Catalogues I, J, K, L, and M, Department No. 4; those in Catalogue G and H, Department No. 5; in Catalogue N, Department No. 6; those in Catalogue O, Department No. 5½.

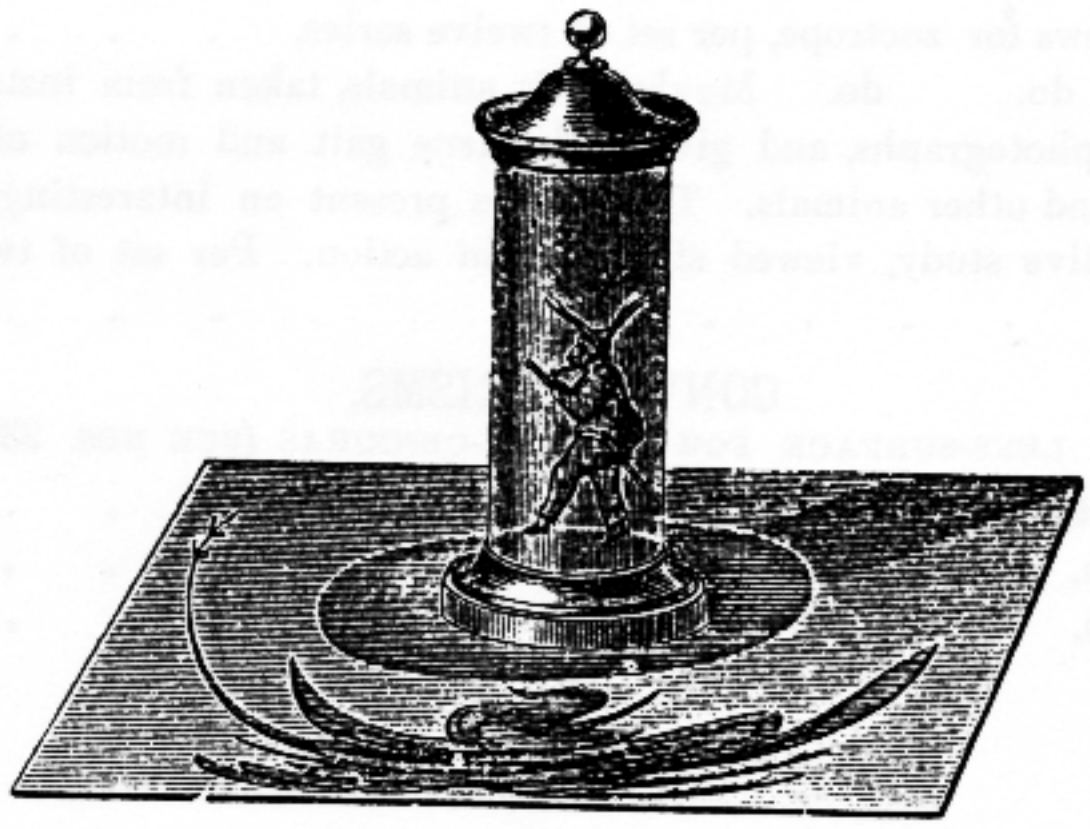
ALL ORDERS FOR, OR CORRESPONDENCE RELATING TO, ARTICLES NAMED IN THIS CATALOGUE, SHOULD BE PLAINLY ADDRESSED AT THE HEAD OF THE LETTER-SHEET "TO DEPARTMENT NO. 3." This will save occasional delay and trouble, as with so extensive and varied a business as ours it is sometimes a matter of difficulty to determine to which department a letter refers.

It is our intention to make and sell none but perfect instruments in each of the departments of our business, and to supply to our customers the article or articles ordered or that will be best suited for the purposes wished to be accomplished.

JAMES W. QUEEN & CO.

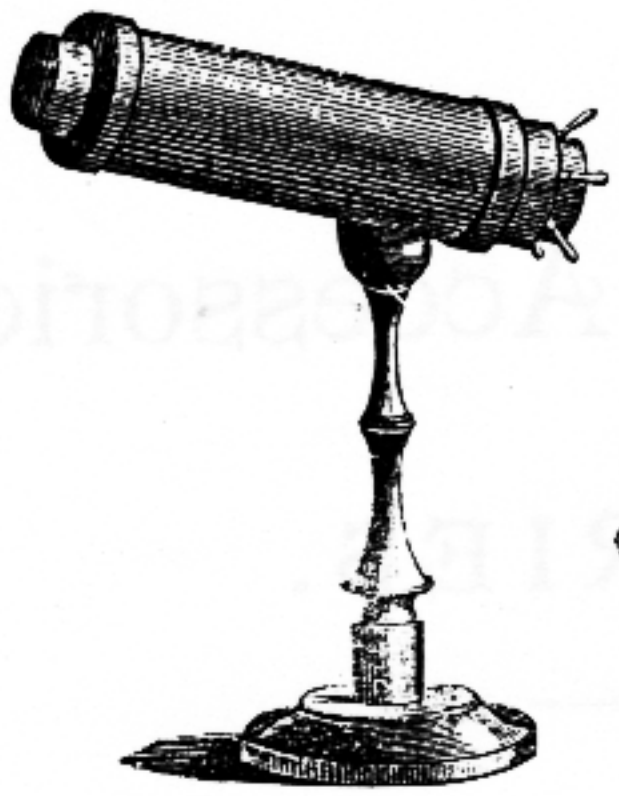
Microscopes, Accessories, AND SUNDRIES.

FINE OPTICAL TOYS.

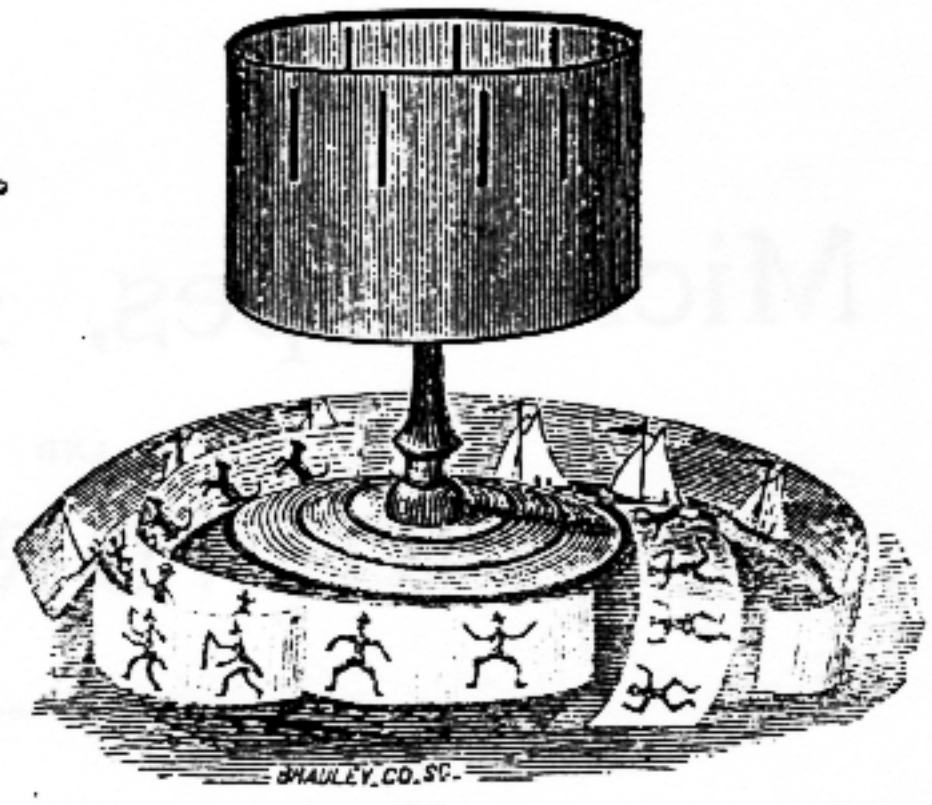


1712.

No.		Price.
1712.	Anamorphoscope, a cylindrical mirror, with 24 distorted figures, which appear perfect on being looked at in the mirror, . .	$1 75
1743.	Parlor Kaleidoscope, with revolving brass front, containing richly colored glasses (some of which contain fluids); on walnut stand (folding); the finest article made, ...	2 50
1744.	Zoetrope, or "Wheel of Life;" a mechanical and optical toy, affording an admirable exemplification of the persistence of vision. The spinning of the drum or cylinder brings into view the varying forms or positions of a figure, in rapid succession, until they blend into a perfect image full of motion and natural action. By placing the apparatus in a suitable light, a number of persons can examine it at the same time. It is an instructive scientific toy, which affords entertainment to old and young, and makes a much appreciated gift to a child. With twelve series of figures, (extra views may be supplied—see following page), ...	2 50



1743.



1744.

No.		Price.
1745.	Extra views for zoetrope, per set of twelve series, ...	$0 60
1746.	Do. do. do. Muybridge's animals, taken from instantaneous photographs, and giving the true gait and motion of the horse and other animals. The figures present an interesting and instructive study, viewed singly or in action. Per set of twelve series, ...	1 00

CONVEX PRISMS.

WITH CONVEX LENS-SURFACE FOR CAMERA-OBSCURAS (SEE NOS. 2364 TO 2368).

1782.	Camera-obscura Prism,	2	inches long,	16	inches focus,	.	.	2 00
1783.	Do.	do.	2½	do.	32	do.	.	4 50
1784.	Do.	do.	3	do.	32	do.	.	5 50

1785.

FOR STEREOSCOPES.

1785. Prisms for Stereoscopes, 1⅝ inches square, per pair, finished edges, . 60

MICROSCOPE AND TELESCOPE LENSES

OF FINEST QUALITY, FOR EYE-PIECES, ETC.

1800.	Double-Convex, or Plano-Convex Lens,	1	inch diameter,	2	inches focus,		75
1801.	Do.	do.	¾	do.	1½	do.	75
1802.	Do.	do.	⅝	do.	1¼	do.	75
1803.	Do.	do.	½	do.	1	do.	75
1804.	Do.	do.	⅜	do.	¾	do.	75
1805.	Do.	do.	¼	do.	½	do.	75
1806.	Do.	do.	3/16	do.	¼	do.	75
1807.	Do.	do.	⅛	do.	⅛	do.	75

NOTE—Other sizes and foci will be made to order, and prices quoted on application.

BULL'S-EYE LENSES FOR CONDENSERS.

FOR USE WITH THE MICROSCOPE, LARYNGOSCOPE, ETC.

No.						PRICE.
1808.	Plano-Convex,	1½	inches diameter,	2	inches focus,	$1 25
1808½.	Do.	2	do.	2½	do.	1 75
1809.	Do.	2½	do.	3	do.	2 25
1809½.	Do.	3	do.	3¾	do.	3 00

COSMORAMA LENSES.

(Used for cosmoramas or dioramas, camera-obscuras, graphoscopes, and various purposes.)

1810.	Double- or Plano-Convex Lens,	8	inches diameter, and either 30, 36, 48 or 72 inches focus, each,	4 00
1811.	Double- or Plano-Convex Lens,	7	inches diameter, same foci as 1810, each,	3 00
1812.	Double- or Plano-Convex Lens,	6	inches diameter, of either 16, 24, 30, 36, 48 or 72 inches focus, each,	2 50
1813.	Double- or Plano Convex Lens,	5	inches diameter, of either 15, 18, 20, 24, 30, 36, 48 or 72 inches focus, each,	1 75
1814.	Double- or Plano-Convex Lens,	4	inches diameter, of either 12, 14, 16, 18, 20, 24, 30, 36, 48 or 72 inches focus, each,	1 25
1815.	Double- or Plano Convex Lens,	3	in. diam., any focus 6 to 36 in., each,	75
1816.	Do.	do.	2 in. diam., any focus 5 to 36 in., each,	60
1817.	Do.	do.	1¼ in. diam., any focus 3 to 48 in., each,	50

NOTE.—Other sizes and foci will be made to order, and prices quoted on application.

NICOL'S PRISMS,

FOR POLARIZING LIGHT.

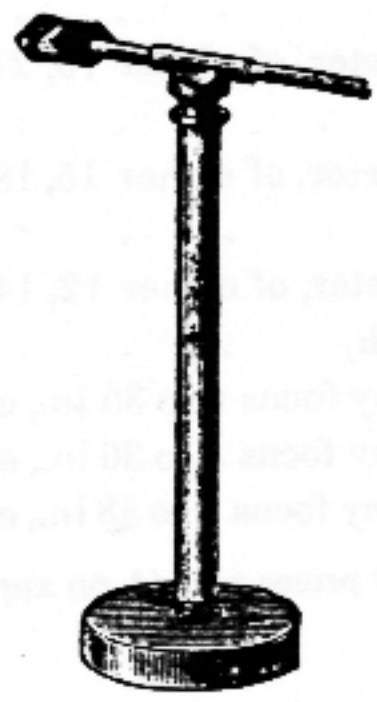
To examine an object by polarized light, it is placed between two of these prisms, called "polarizer" and "analyzer," the latter being the one nearest the eye. (Size is measured along either side of either face.)

2024.

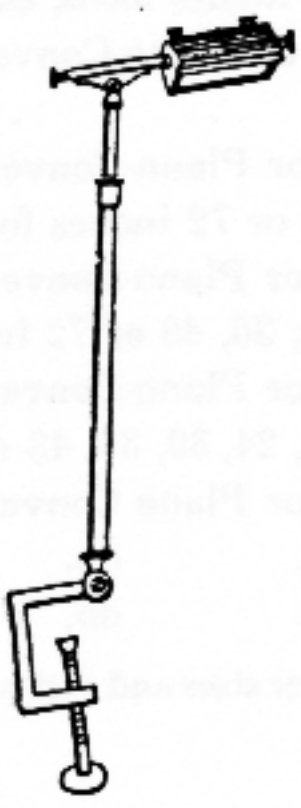
2024.	Nicol's Prism of	Iceland Spar,	8	millimetres across face,		2 25
2025.	Do.	do.	9	do.	do.	2 75
2026.	Do.	do.	10	do.	do.	3 50
2027.	Do.	do.	11	do.	do.	4 00
2028.	Do.	do.	12	do.	do.	4 75
2029.	Do.	do.	14	do.	do.	6 75

No.							Price.
2030.	Nicol's Prism of Iceland Spar,	16	millimetres	across face,	.	.	$9 75
2031.	Do.	do.	20	do.	do.	. . .	20 00
2032.	Do.	do.	8	do.	cut perpendicular to axis,		3 25
2033.	Do.	do.	9	do.	do.	do.	4 25
2034.	Do.	do.	10	do.	do.	do.	5 00
2035.	Do.	do.	11	do.	do.	do.	5 75
2036.	Do.	do.	12	do.	do.	do.	6 50
2037.	Do.	do.	14	do.	do.	do.	8 00
2038.	Do.	do.	16	do.	do.	do.	13 00
2039.	Do.	do.	20	do.	do.	do.	25 00

CAMERA LUCIDA.



2360.



2361

2360. Camera Lucida, with circular base and vertical extension rod, in case, 7 50

2361. Camera Lucida, with clamp for edge of table and two extension rods, in case, ... 10 00

2362. Camera Lucida, with clamp for edge of table, with two extension rods, two tinted glasses, and two spherical convex lenses, in case, 20 00

This instrument is well adapted for copying to scale, or taking drawings direct from the objects, as the outlines are reproduced exactly as seen by the eye, with correct perspective and with absolutely no distortion.

Directions for Using the Camera Lucida.

(Remarks apply especially to Nos. 2361, 2362, but the principle is the same in No. 2360.)

The instrument being fixed by the screw and clamp to the table and paper on which the drawing is to be made, its stem should be inclined so as to bring the prism nearly over the centre of the paper, and the pin, on which the prism turns, placed truly horizontal.

The prism is next to be turned upon its pin, till the transparent rectangular face be placed opposite to the objects to be delineated, when the upper black surface of

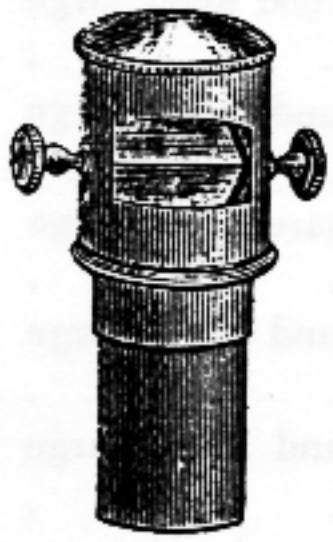
the eye-piece will be on the top of the instrument; and through the aperture in this the artist is to look perpendicularly downward at his paper.

The artist then, looking through the eye-hole, directly downward at his paper, should see the objects he wishes to draw apparently distributed over the paper. For, since the pupil of the eye is larger than the eye-hole, he sees through both halves of the hole at the same time without moving his head. He sees the paper through the nearer half, and sees the objects at the same time through the farther half, apparently in the same direction, by means of reflection, through the prism.

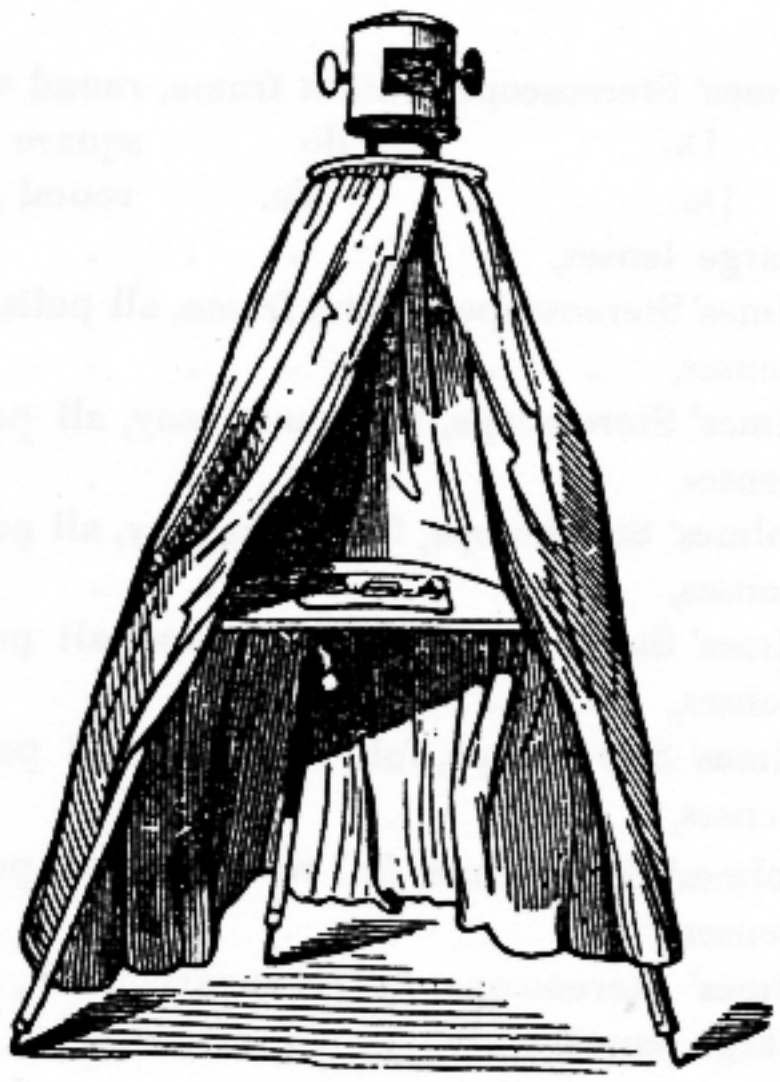
Practice will enable the artist to hold the eye in such an intermediate position (varying according as the object or the paper happens to be most illuminated) that both will be sufficiently visible for the purpose of delineation, though not quite so clear as to the naked eye. It may be found desirable to either shade the paper or the object according as one or the other is overcome by the superior brightness of the other. (No. 2362 has two tinted glasses to modify the brightness of the object, and two lenses to use between the prism and the object, or between the prism and paper —as may be required—to facilitate the focusing together of image and pencil point.) Always use a nicely sharpened pencil.

The farther the prism is removed from the paper, that is, the longer the stem is drawn out, the larger the objects will be represented in the drawing. The farther the object be removed from the prism the smaller will it appear upon the paper.

CAMERA OBSCURAS.



2364.

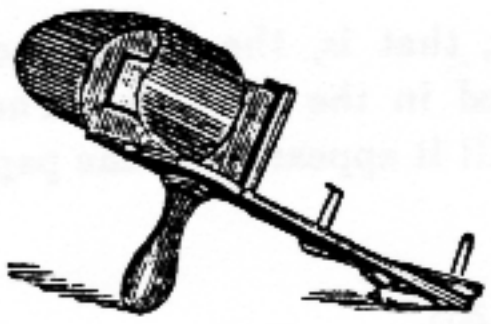


2367.

No.		Price.
2364.	Camera Obscura Head or Lens, without box; a prismatic lens, mounted in brass. This is the best kind of lens for a Camera Obscura, as it forms both lens and mirror. Prism 1⅝ inches long, . . .	$5 00

No.		Price.
2365.	Camera Obscura Head, prism 1⅞ inches long,	$7 50
2366.	Do. do. 2⅛ do.	10 00
2367.	Improved Camera Obscura. This is recommended as the best drawing apparatus yet introduced; it is light and portable, and can be used to satisfaction by persons entirely unacquainted with drawing; each,	20 00
2368.	Improved Camera Obscura—smaller size,	17 50

STEREOSCOPES.



2371.

2380.

2371.	Holmes' Stereoscope, walnut frame, round walnut hood,	75
2371½.	Do. do. square do. large lenses,	1 25
2372.	Do. do. round polished tulip wood hood, large lenses,	1 00
2373.	Holmes' Stereoscope, walnut frame, all polished, rose-wood hood, large lenses,	1 75
2374.	Holmes' Stereoscope, full mahogany, all polished, round hood, large lenses,	1 75
2374½.	Holmes' Stereoscope, full mahogany, all polished, square hood, large lenses,	1 50
2375.	Holmes' Stereoscope, full tulip-wood, all polished, round hood, large lenses,	2 25
2376.	Holmes' Stereoscope, full rose-wood, all polished, round hood, large lenses,	2 25
2376½.	Holmes' Stereoscope, full rose-wood, all polished, square hood, large lenses,	1 75
2377.	Holmes' Stereoscope, full Hungarian ash, all polished, round hood, large lenses,	2 25
2380.	Holmes' Stereoscope, walnut frame, round polished rose-wood hood, on stand; may be used separate from stand,	1 25
2382.	Holmes' Stereoscope, full rose-wood, all polished, round hood, on polished stand; may be used separate from stand,	3 00

(Styles of stereoscopes constantly changing—when ordering state whether a similar article may be substituted if we have not exactly the one ordered.)

STEREOSCOPIC PICTURES.

Paper Views.

Of these we have a large assortment. We name some of the more important, with prices below:

Braun's fine Swiss and German views, $1.50 per dozen; Braun's views in Holland, Belgium, France, Spain, Italy, and Egypt, $1.00 per dozen; fine English scenery, $1.00, $2.50, and $3.00 per dozen; Scotch (Wilson's), $3.00 per dozen; views in Egypt and the Holy Land, $2.00 and $3.00 per dozen; Italian and Tyrolese, $2.00 and $3.00 per dozen; American (including Rocky Mountains, Niagara, Minnesota, White Mountains, Mauch Chunk, Yosemite Valley, Philadelphia, Washington, etc.), from $1.00 to $1.50 per dozen; views of Statuary and fine colored Life-groups, $3.00 per dozen; English colored groups, $2.00 per dozen; plain (uncolored) groups, $1.50 per dozen; "illuminated" or semi-transparent colored paper views, $1.50 (buildings, French), and $3.00 per dozen (comic, Satanic).

Glass Views.

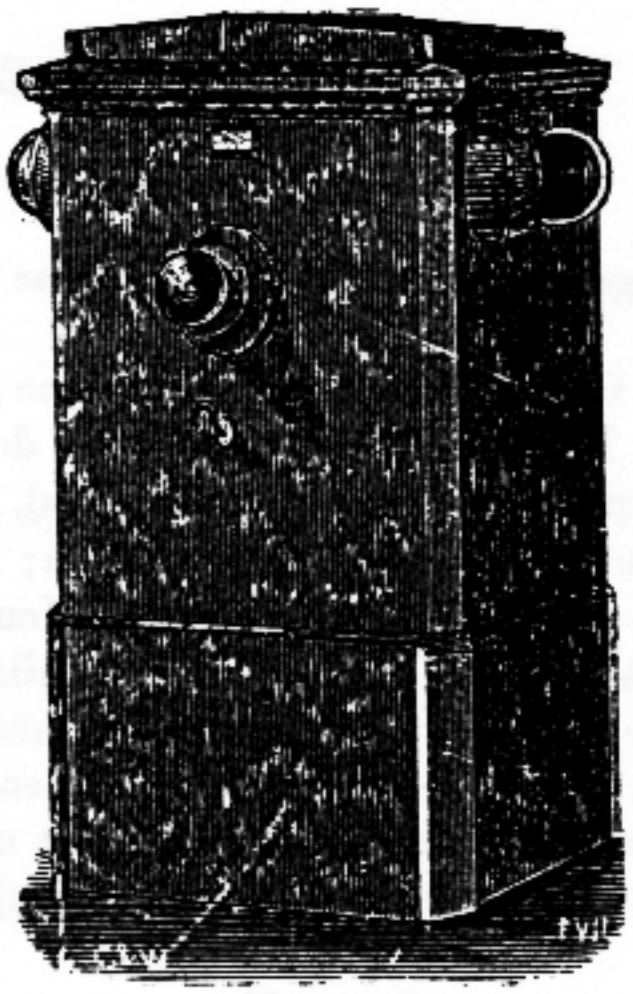
These comprise a large variety of exquisite Swiss and German views, many views of statuary in the Paris Louvre, ruins of Paris after the war, other Continental, and some English views. Of American glass views, we have White Mountains, Niagara Falls, Katskill Mountains, and some views in Pennsylvania; some of the American views are colored. We have also a large stock of photographs of the Moon, taken by Warren De La Rue, F. R. A. S. Our prices are as follows: Finest Foreign, $7 50 per dozen; Paris Louvre, $5.00; Ruins of Paris, $2.50; American views (plain), $3 00; American views (colored), $5.00 per dozen. The above are, respectively, 75 cents, 50 cents, 25 cents, 30 cents, and 50 cents, each, in less quantities than ½ dozen; stereoscopic views of the Moon, 50 cents each.

The above partial list will give a fair idea of the extent of our stock, which, of course, comprises many which are not here named. Where the choice is left to us, we exercise great care in making an interesting selection. Views will also be sent for selection in cases where a sufficient deposit is made, or best reference given, expressage to be paid both ways by the purchaser.

All our views are *original photographs*. We do not keep "copies."

CABINET STEREOSCOPES.

No.		Price.
2400.	Cabinet Stereoscope, polished mahogany, holding 50 paper or glass views. Price, without pictures, ...	$15 00
2401.	Cabinet Stereoscope, in polished mahogany, with two sets of lenses, having rack-and-pinion adjustment for focus, holding 100 paper views. Price, without pictures, ...	25 00
2402.	Cabinet Stereoscope, in polished walnut, with rack-and-pinion adjustment for focus, holding 50 paper or glass views. Price, without pictures, ...	22 50 to 27 50 (According to style of molding, etc.)
2403.	Cabinet Stereoscope, finished in polished rosewood, with rack-and	



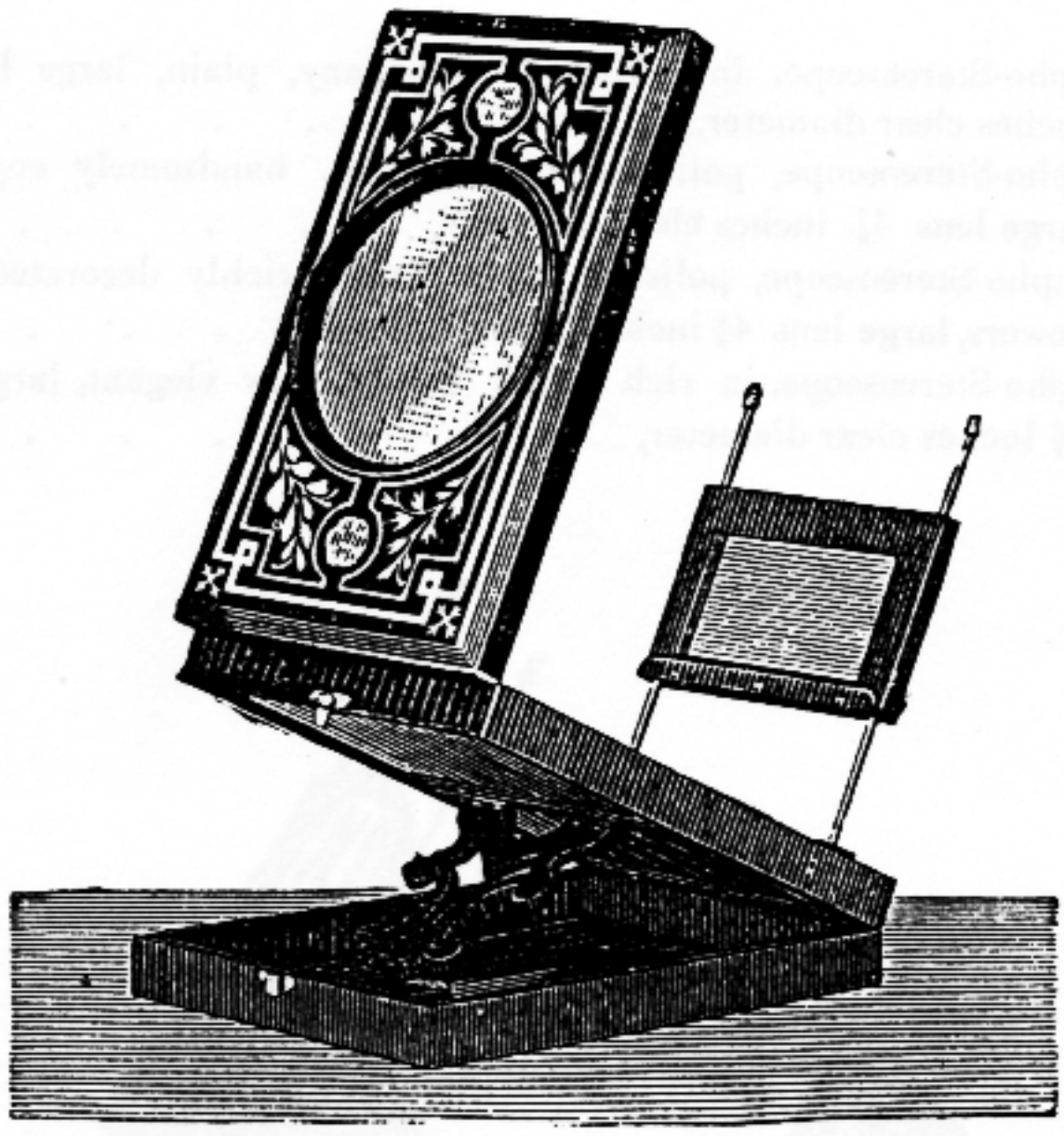
2401.

No.		Price.
	pinion adjustment for focus, holding 50 paper or glass views. Price, without pictures, ... (According to style of molding, etc.)	$27 50 to $32 50
2404.	Cabinet Stereoscope, finished in black handsomely polished and decorated with flowers, very rich and beautiful, with rack-and-pinion adjustment for focus, holding 50 paper or glass views. Price, without pictures, ...	35 00
2405.	Tall Cabinet Stereoscope for standing on floor (with castors), finished in either polished walnut, rosewood, or thuja (a light wood, much like birdseye maple), with rack-and-pinion adjustment for focus, holding 200 paper or glass views. Has fine achromatic lenses, and a special reflector for giving a strong light with glass views. Price, without pictures, ...	75 00
2406.	The same, but for 100 views only, and of plainer pattern, .	60 00

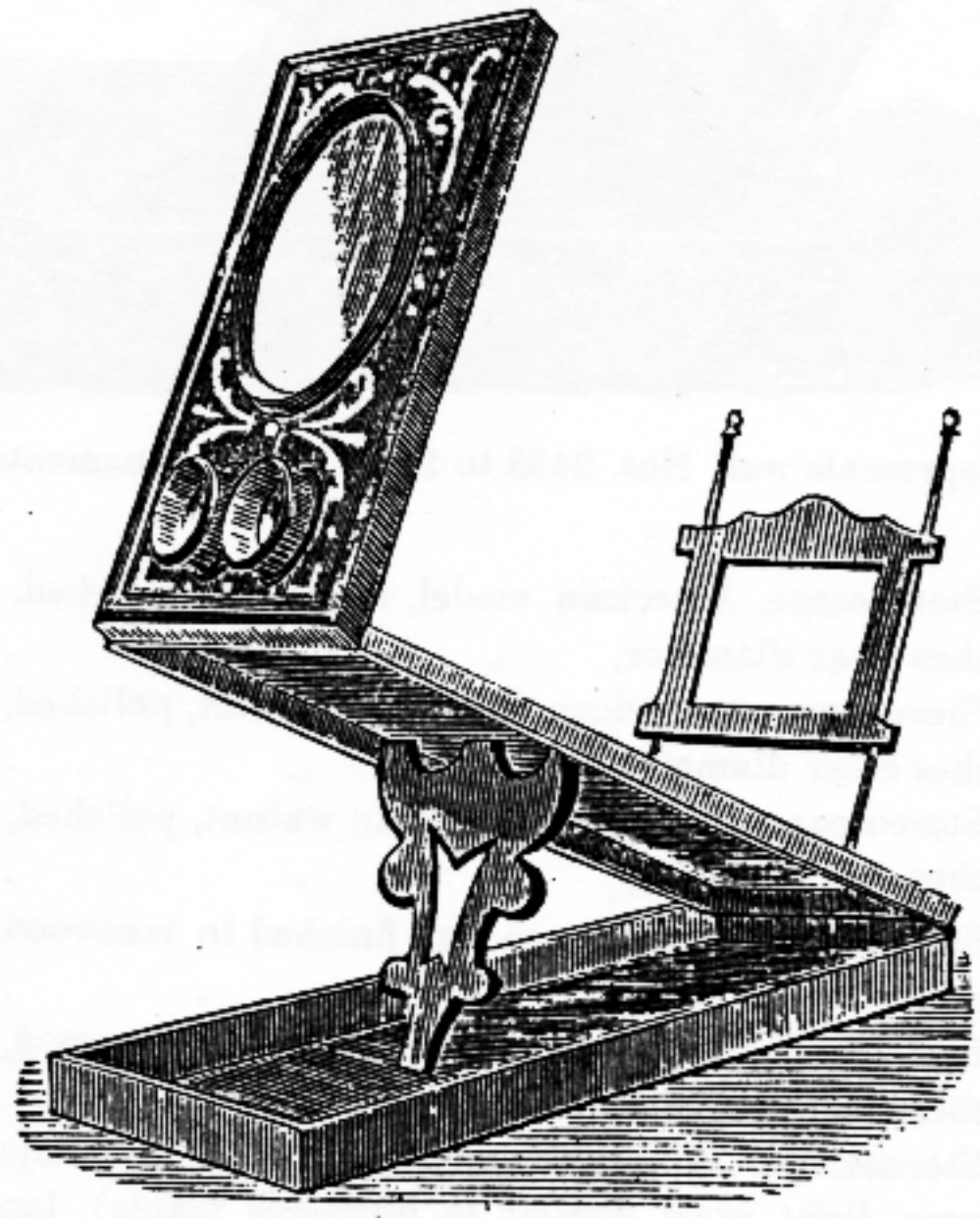
N. B.—*Nos.* 2405 *and* 2406 *are not kept in stock usually, but can only be made up to order, in about three to four months.*

GRAPHOSCOPES, ALL FOLDING.

2420.	Graphoscope, in polished mahogany, lens 3¾ inches clear diameter,	4 00
2421.	Do. polished, black finish, handsomely engraved, lens 3¾ inches clear diameter, ...	5 00
2422.	Graphoscope, polished, black finish, richly decorated with flowers, lens 3¾ inches clear diameter, ...	5 50
2425.	Grapho-Stereoscope, in polished mahogany, plain, large lens 3¾ inches clear diameter, ...	4 50
2426.	Grapho-Stereoscope, polished, black finish, handsomely engraved, large lens 3¾ inches clear diameter, ...	5 50
2426½.	Grapho Stereoscope, polished, black finish, richly decorated with flowers, large lens 3¾ inches clear diameter, ...	6 00



2421.



2425–2429.

No.		Price.
2427.	Grapho-Stereoscope, in polished mahogany, plain, large lens $4\frac{7}{8}$ inches clear diameter,	$7 50
2428.	Grapho-Stereoscope, polished, black finish, handsomely engraved, large lens $4\frac{7}{8}$ inches clear diameter,	10 00
2428½.	Grapho-Stereoscope, polished, black finish, richly decorated with flowers, large lens $4\frac{7}{8}$ inches clear diameter,	10 50
2429.	Grapho-Stereoscope, in rich curled walnut, very elegant, large lens $5\frac{3}{4}$ inches clear diameter,	15 00

Represents well Nos. 2433 to 2440, except ornamentation.

2433.	Grapho-Stereoscope, American model, in walnut, polished, large lens $4\frac{7}{8}$ inches clear diameter,	16 00
2434.	Grapho-Stereoscope. American model, in walnut, polished, large lens $5\frac{5}{8}$ inches clear diameter,	25 00
2435.	Grapho-Stereoscope, American model, in walnut, polished, large lens $6\frac{5}{8}$ inches clear diameter,	28 00
2436.	Grapho-Stereoscope. American model, finished in rosewood, large lens $5\frac{5}{8}$ inches clear diameter,	25 00
2437.	Grapho-Stereoscope, American model, finished in rosewood, large lens $6\frac{5}{8}$ inches clear diameter,	31 00
2438.	Grapho-Stereoscope. American model, finished in Thuja wood (a handsome, light wood, similar to birds-eye maple), large lens $5\frac{5}{8}$ inches clear diameter,	27 00

No.		Price
2439.	Grapho-Stereoscope, American model, finished in Thuja wood, large lens 6⅝ inches clear diameter,	$33 00
2440.	Grapho-Stereoscope, American model, finished in Thuja wood, large lens 7⅝ inches clear diameter; *has chain movement for focus,*	50 00

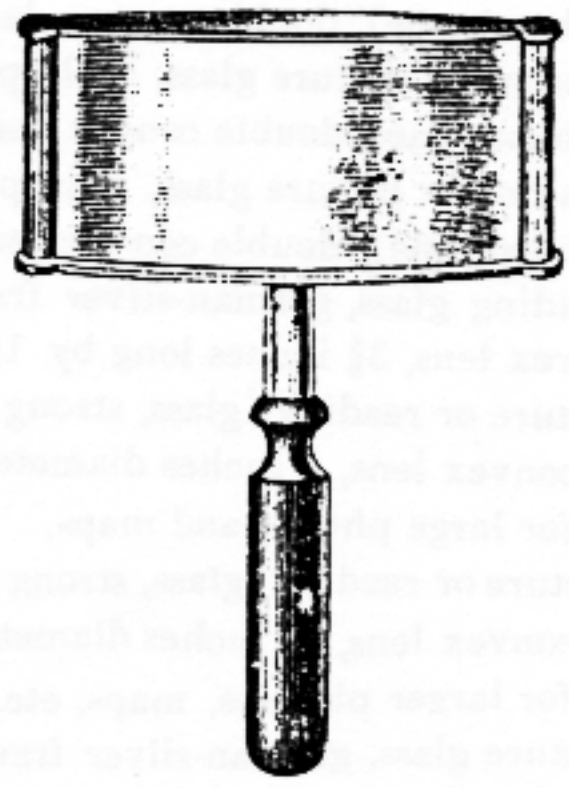
(The prices on Graphoscopes and Grapho-Stereoscopes do not include any views.)

GRAPHOSCOPE VIEWS.

We have photographic views for the Graphoscope in various sizes, at 20 cents, 25 cents, 50 cents, 75 cents, and $1.00 each; and we shall be glad to make selections when requested to do so.

READING AND PICTURE GLASSES.

2800–2815.



2818.

(Nos. 2800 to 2815 are well suited for examining photographs and maps, fine print, engravings, etc; they are also much used by aging persons to assist the sight in reading, more particularly the larger sizes. No. 2818 is especially suitable for the latter use.)

2800.	Reading or picture glass, nickeled frame, double-convex lens, 1⅞ inches diameter,	75
2800½.	Reading or picture glass, nickeled frame, double-convex lens, 2⅛ inches diameter,	85
2801.	Reading or picture glass, nickeled frame, double-convex lens, 2⅜ inches diameter,	1 00
2801½.	Reading or picture glass, nickeled frame, double-convex lens, 2⅝ inches diameter,	1 25
2802.	Reading or picture glass, nickeled frame, double-convex lens, 3 inches diameter,	1 50

No.		Price.
2803.	Reading or picture glass, nickeled frame, double-convex lens, 3½ inches diameter,	$2 00
2804.	Reading or picture glass, nickeled frame, double-convex lens, 4 inches diameter,	2 50
2805.	Reading or picture glass, nickeled frame, double convex lens, 4½ inches diameter,	3 00
2806.	Reading or picture glass, blackened brass frame, two plano-convex lenses, 2⅜ inches diameter,	1 25
2808.	Reading or picture glass, blackened brass frame, two plano-convex lenses, 3½ inches diameter,	2 50
2810.	Reading or picture glass, gold-plated metal frame, ivory handle, (very handsome), double-convex lens, 2⅛ inches diameter,	1 50
2811.	Reading or picture glass, gold-plated metal frame, ivory handle, (very handsome), double-convex lens, 2⅜ inches diameter,	2 25
2812.	Reading or picture glass, gold-plated metal frame. ivory handle, (very handsome), double-convex lens, 3 inches diameter,	3 00
2813.	Reading or picture glass, gold-plated metal frame, ivory handle, (very handsome), double-convex lens, 4 inches diameter,	4 00
2814.	Reading or picture glass, gold-plated metal frame, ivory handle, (very handsome), double convex lens, 4¼ inches diameter,	5 50
2815.	Reading or picture glass, gold-plated metal frame, ivory handle, (very handsome), double-convex lens, 4½ inches diameter,	6 50
2818.	Reading glass, german-silver frame, black wood handle, double convex lens, 3⅝ inches long by 1¾ inches wide,	2 00
2819.	Picture or reading glass, strong nickeled frame, black handle, double-convex lens, 5 inches diameter, short focus and powerful; excellent for large photos and maps,	4 00
2820.	Picture or reading glass, strong nickeled frame, black handle, double-convex lens, 6½ inches diameter, short focus, and powerful; suitable for larger pictures, maps, etc.,	7 50
2821.	Picture glass, german-silver frame, black handle, double-convex lens, 5¾ inches diameter; for looking at pictures on the wall, or objects at several feet distance, not for near objects,	4 50
2825.	Perspective glass, german-silver frame, black handle, double-concave lens, 2¾ inches diameter; used by artists and others for reducing size of landscape or portrait, in making drawings from nature, or in copying; similar in its effect to the claude lorraine, page 154 of catalogue E,	1 75

MICROSCOPES.

"Within the last few years, the microscope has become so firmly rooted among us, that little need be said in its praise. The time has long passed away when it was held in no higher estimation than an ingenious toy; but it is now acknowledged that no one can attain even a moderate knowledge of any physical science without a considerable acquaintance with the microscope and the marvelous phenomena which it reveals. The geologist, the chemist, the mineralogist, the anatomist, or the botanist, all find the microscope a useful companion and indispensable aid in their interesting and all-absorbing researches, and, with every improvement in its construction, have discovered a corresponding enlargement and enlightenment of the field displayed by the particular science which they cultivate.

"But even to those who aspire to no scientific eminence, the microscope is more than an amusing companion, revealing many of the hidden secrets of nature, and unveiling endless beauties which were heretofore enveloped in the impenetrable obscurity of their own minuteness.

"No one who possesses even a pocket-microscope of the most limited powers can fail to find amusement and instruction even though he was in the midst of the Sahara itself. There is this great advantage in the microscope, that no one need feel in want of objects as long as he possesses his instrument and a sufficiency of light.

"Many persons who are gifted with a thorough appreciation of nature in all her vivid forms are debarred by the peculiarity of their position from following out the impulses of their being, and are equally unable to range the sea-shore in search of marine creatures, or to traverse the fields and woods in the course of their investigations into the manifold forms of life and beauty which teem in every nook and corner of the country. Some are confined to their chambers by bodily ailments, some are forced to reside within the very heart of some great city, without opportunities of breathing the fresh country air more than a few times in the course of the year; and yet there is not one who may not find an endless series of common objects for his microscope within the limits of the tiniest city chamber. So richly does nature teem with beauty and living marvels, that even within the closest dungeon-walls a never-failing treasury of science may be found by any one who knows how and where to seek for it.

"There is little doubt but that if any one with an observant mind were to set himself to work determinedly merely at the study of the commonest weed or the most familiar insect, he would, in the course of some years' patient labor, produce a work that would be most valuable to science and enroll the name of the investigator

among the most honored sons of knowledge. There is not a mote that dances in the sunbeam, not a particle of dust that we tread heedlessly under our feet, that does not contain within its form mines of knowledge as yet unworked. For if we could only read them rightly, all the records of the animated past are written in the rocks and dust of the present."—*J. G. Wood, Common Objects of the Microscope.*

"In the working of the microscope the advantages to be derived are very great, both in a physical and mental point of view. In the first place, it greatly improves the sense of touch, for the manipulations required in the preparation and mounting of objects, and in handling the microscope generally, cannot but greatly develop the delicacy of that sense. Again, accuracy of vision is greatly improved.* When a person first looks through a microscope objects appear hazy and indistinct, but after a time he sees what is pointed out to him, or what he finds written about the specimen under observation, and by degrees he is able to observe and describe things for himself till, as in the case of the accomplished microscopist, he is enabled to unravel the most complicated structures and organisms. All this time his powers of observation are being greatly strengthened, and he is undergoing a course of mental discipline which he will find of the greatest value to him in the ordinary affairs of life." —*Microscopical News (from the Chairman's Address before the Windsor and Eton Scientific Society).*

OPTICAL PRINCIPLES OF THE MICROSCOPE.

Microscopes may be divided into two classes, simple and compound. The former class may contain several lenses or glasses, but generally consists of a single lens; but the compound microscope must consist of at least two glasses, the one near the object to be examined, and commonly called the objective, the other near the eye, and called the eye-piece. This class is subdivided into monocular and binocular instruments, in which the object is viewed with one or both eyes, as their names imply. The following remarks on the principles involved in the construction of the microscope are taken from the article contributed by Andrew Ross to the *Penny Cyclopædia.*†

"The use of the term *magnifying* has led many into a misconception of the nature of the effect produced by convex lenses. It is not always understood that the so-called magnifying power of a lens applied to the eye, as in a microscope, is derived from its

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* We think this is not so much, perhaps, that the image formed on the retina is clearer, as that the mind becomes trained to perceive more fully the features of the image there depicted; although it is true, we believe, that use of the microscope frequently has a beneficial effect on the accuracy of the sight in the strict sense. While the accuracy of vision may be improved, it is possible that a too long continued use of the microscope, especially if with an unsuitable light, may cause a weakness of the eye, just as may persistent reading by too weak a light; but it will not do this if one's own sensations of weariness, or pain (natural safeguards in this as in other matters of daily life), are regarded. For the proper manner of using the microscope, and an additional note bearing on this point, see pages 24 and 25.

†This article has since been published separately, in book form, price 75 cents (No. 3957½ of this Catalogue).

enabling the eye to approach more nearly to its object than would otherwise be compatible with distinct vision. The common occurrence of walking across the street to read a bill is, in fact, magnifying the bill by approach, and the observer, at every step he takes, makes a change in the optical arrangement of his eye, to adapt it to the lessening distance between himself and the object of his inquiry. This power of spontaneous adjustment is so unconsciously exerted, that, unless the attention be called to it by circumstances, we are totally unaware of its exercise.

"In the case just mentioned, the bill would be read with eyes in a very different state of adjustment from that in which it was discovered on the opposite side of the street, but no conviction of this fact would be impressed upon the mind. If, however, the supposed individual should perceive on some part of the paper a small speck, which he suspects to be a minute insect, and if he should attempt a very close approach of his eye for the purpose of verifying his suspicion, he would presently find that the power of natural adjustment has a limit; for when his eye has arrived within about ten inches, he will discover that a further approach produces only confusion. But if, as he continues to approach, he were to place before his eyes a series of properly arranged convex lenses, he would see the object gradually and distinctly increase in apparent size by the mere continuance of the operation of approaching. Yet the glasses applied to the eye during the approach from ten inches to one inch, would have done nothing more than had previously been done by the eye itself during the approach from fifty feet to one foot. In both cases the magnifying is effected really by the approach, the lenses merely rendering the latter periods of the approach compatible with distinct vision.

"In saying that an object appears larger at one time, or to one person, than another, it is necessary to guard against misconception. By the apparent size of an object, we mean the angle it subtends at the eye, or the angle formed by two lines drawn from the centre of the eye to the extremities of the object. In fig. 1, the lines A E and B E, drawn from the arrow to the eye, form the angle A E B, which, when the angle is small, is nearly twice as great as the angle C E D, formed by lines drawn from a similar arrow at twice the distance. The arrow A B will therefore appear nearly twice as long as C D, being seen under twice the angle, and in the same proportion for any greater or lesser difference in distance. The angle in question is called the angle of vision, or the visual angle.

"The magnifying power of a single lens depends upon its focal length, the object being, in fact, placed nearly in its principal focus, or so that the light which diverges from each point may, after refraction by the lens, proceed in parallel lines to the eye, or as nearly so as requisite for distinct vision. In fig. 2 A B is a double convex lens, near which is a small arrow to represent the object under examination, and the cones drawn from its extremities are portions of the rays of light diverging from those points and falling upon the lens. These rays, if suffered to fall at once upon the pupil, would be too divergent to permit their being brought to a focus upon the retina by the optical arrangements of the eye. But being first passed through the lens, they are bent into nearly parallel lines, or into lines diverging from some points within the limits of distinct vision, as from C and D. Thus altered, the eye receives them precisely as if they emanated from a larger arrow

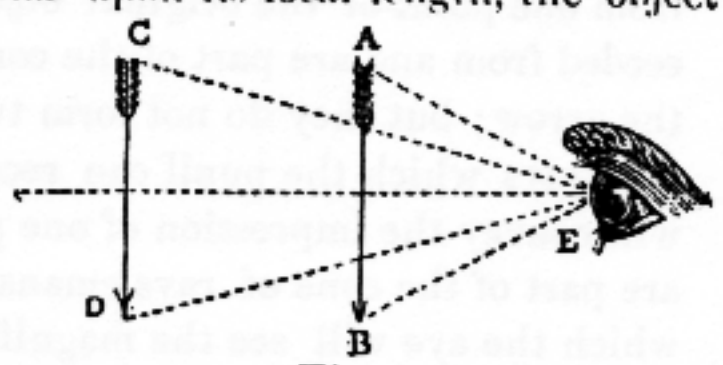


Fig. 1.

placed at C D, which we may suppose to be ten inches from the eye, and then the difference between the real and the imaginary arrow is called the magnifying power of the lens in question. The focal length of the eye usually ranges from six to twelve or fourteen inches, so that the distance we first assumed of ten inches is very near the true average, and is a convenient number, inasmuch as a cipher added to the denominator of the fraction which expresses the focal length of a lens gives its magnifying power. Thus a lens whose focal length is one-sixteenth of an inch is said to magnify 160 times.

"The annexed fig. 3 shows the course of the rays through a compound microscope of two lenses. The rays proceeding from the object A B are so acted upon by the lens C D, near it, and thence called the object-glass, that they are converged to foci

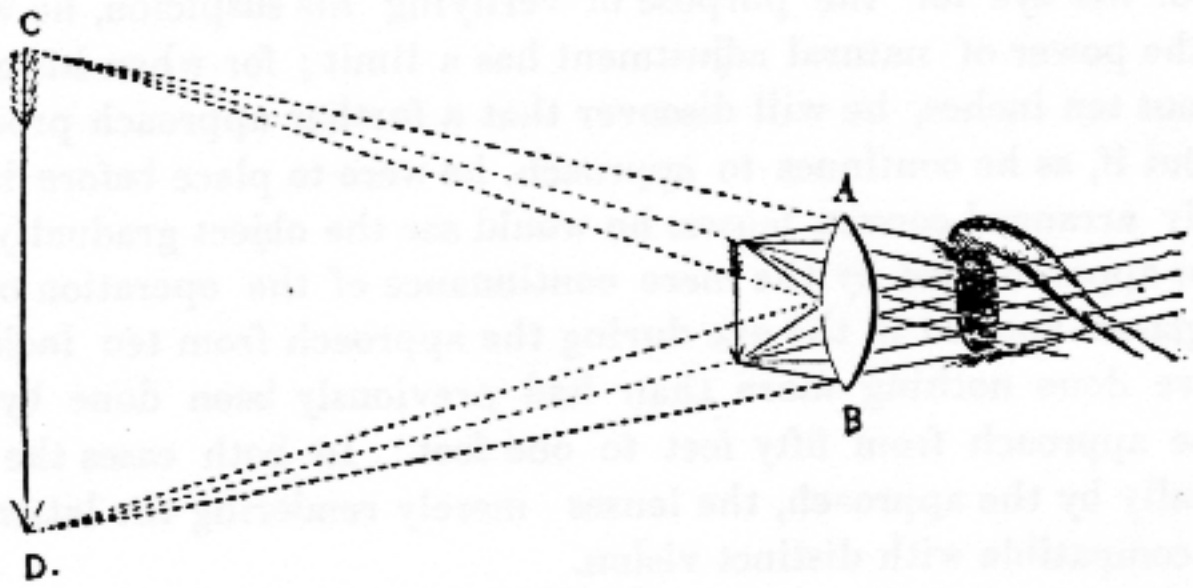


Fig. 2.

in A′ B′, where they form an enlarged image of the object, as would be evident if a piece of oiled paper or ground glass were placed there to receive them. They are not so intercepted, and therefore the image is not rendered visible at that place but their further progress is similar to what it would have been had they really proceeded from an object at A′ B′. They are at length received by the eye-lens L M, which acts upon them as the simple microscope has been described to act on the light proceeding from its object. They are bent so that they may enter the eye at E in parallel lines, or as nearly so as is requisite for distinct vision. When we say that the rays enter the eye in nearly parallel lines, we mean only those which proceed from one point of the original object. Thus the two parallel rays M E have proceeded from and are part of the cone of rays C A D, emanating from the point A of the arrow; but they do not form two pictures in the eye, because any number of parallel rays which the pupil can receive will be converged to a point by the eye, and will convey the impression of one point to the mind. In like manner the rays L E are part of the cone of rays emanating from B, and the angle L E M is that under which the eye will see the magnified image of the arrow, which is evidently many times greater than the arrow could be made to occupy in the naked eye at any distance within the limits of distinct vision. The magnifying power depends on two circumstances: First, on the ratio between the anterior distance A C or B D and the posterior focal length C B′ or D A′; and secondly, on the power of the eye-lens L M. The first ratio is the same as that between the object A B and the image A′ B′: this and the focal length or power of the eye-lens are both easily obtained, and their product is the power of the compound instrument.

"Since the power depends on the ratio between the anterior and posterior foci of

the object-glass, it is evident by increasing that ratio any power may be obtained, the same eye glass being used; or, having determined the first, any further power may

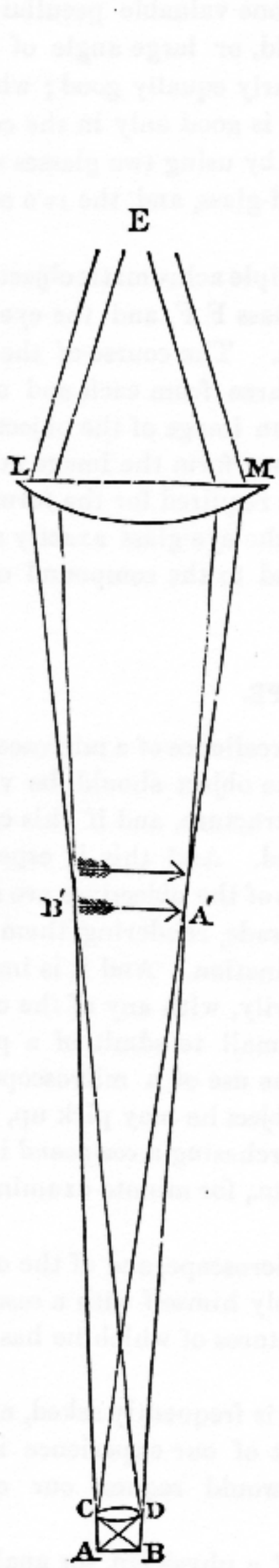


Fig. 3.

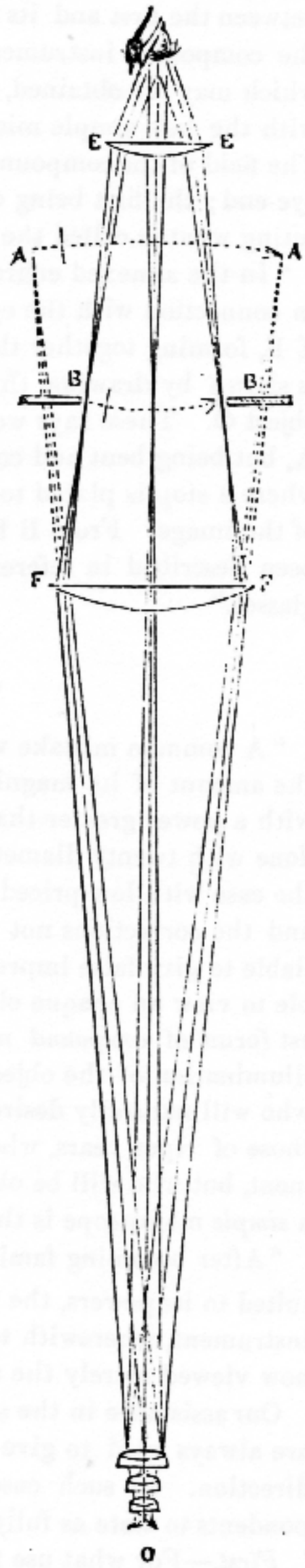


Fig. 4.

be obtained by increasing that of the eye-glass; and thus, by a pre-arrangement of the relative proportions in which the magnifying power shall be divided between the

outfit to be had within the price named will not answer the purpose, in which case we can so inform you at once.

Third.—Mention any other points that may occur to you to aid us in advising in the case intelligently, and with a full knowledge of your want.

We can recommend as an excellent book in this connection, *Hints on the Selection and Use of the Microscope*, by John Phin (no. 3955 of this catalogue). It is intended for beginners, and is a thoroughly good and practical treatise; and even those who are further advanced in the art can derive much instruction and profit from it.

GENERAL HINTS ON THE USE AND CARE OF THE MICROSCOPE.

If not properly cared for even the finest instrument will soon become disordered, and often seriously injured, become unsatisfactory in use, and bring discredit upon the maker. It is, therefore, obviously to our own interest, as well as for the advantage of our customers, that we give the following few points regarding the proper care and use of a microscope:

In removing an eye-piece, or extending draw-tube, take the outer tube firmly with one hand, and with the other extend the eye-piece or draw-tube steadily *without twisting*. This will prevent scratching.

The fitting parts (unlacquered) of eye-pieces, draw-tube, sub-stage accessories, etc., should not be handled; or, if this should be unavoidable, they should be at once wiped off with a dry cloth to prevent tarnishing. If dirt should, however, accumulate, it may usually be cleaned off with a little oil (kerosene or sperm is good), being careful to wipe off dry afterward; occasionally it may be necessary to use whiting (or better Vienna lime), cleaning it off well finally. Emery must under no circumstances be used upon any part of the microscope, nor polishing powder of any kind upon the lenses or lacquered parts.

Lacquered parts may be simply wiped with a soft dry cloth or chamois skin in the direction of the grain; or a little kerosene may be used if necessary. Kerosene is very useful as a general cleaning agent for the microscopist, and may be used alike on lacquered and unlacquered surfaces. It is excellent for the removal of balsam, being cleanly, easily used, and free from stickiness.

The lenses and mirrors may be occasionally cleansed with a soft, unstarched linen handkerchief (the older the better), using light pressure, and a little moisture from the breath if necessary. The *fronts* of objectives may be cleaned in this way, but it is generally better to send to us if any of the inner surfaces require cleaning. Eye-pieces may be taken apart for the purpose of cleaning, care being taken to replace each lens, as cleaned, in its proper place.

Should the coarse adjustment be found in course of time to work too easily, it may usually be remedied by tightening the two small screws acting upon the bearings of the pinion.

Ball and socket joints may readily be tightened by unscrewing the cap and adding a little packing *behind* the ball, taking care to screw up again sufficiently tight.

Once or twice every year the microscope body should be racked entirely out. The slide on the body, and the corresponding part of the arm, or bar, should then be thoroughly cleaned from all grease and dirt with a little watch oil, which should finally be wiped off dry or very nearly so; the body may then be replaced. Atten-

tion to this one point will frequently make all the difference between a very rough-working rack and a very smooth one.

In using the binocular as a monocular instrument it is only necessary to withdraw the prism about ¼ inch, thus leaving the field of the direct tube entirely clear where required.

The highest power giving both fields fully and equally illuminated with the binocular microscope (without the use of the sub-stage condenser, or specially short mountings to the objectives) is the one-half inch. It is also the highest power by which an opaque object can be conveniently illuminated under ordinary conditions.

Till some experience is gained in working with the higher powers, it will be found convenient to use a lower power objective as a *finder* for the more minute objects; when found and placed in the centre of the field, replace the objective by the one required.

In using the monocular microscope it is recommended to accustom one's self to keeping both eyes open, concentrating the attention upon the microscopic image. This may generally be done without effort, after some practice; and it will, we think, be found to be of advantage in the direction of avoiding a strain which is caused (in part) by the unequal use of the two eyes. The eye shade (no. 3463) is a device which enables one to do this with greater ease. It has lately been suggested that the blank should be white instead of black; if found more suitable or agreeable, the manner of making the conversion neatly and permanently will readily suggest itself.

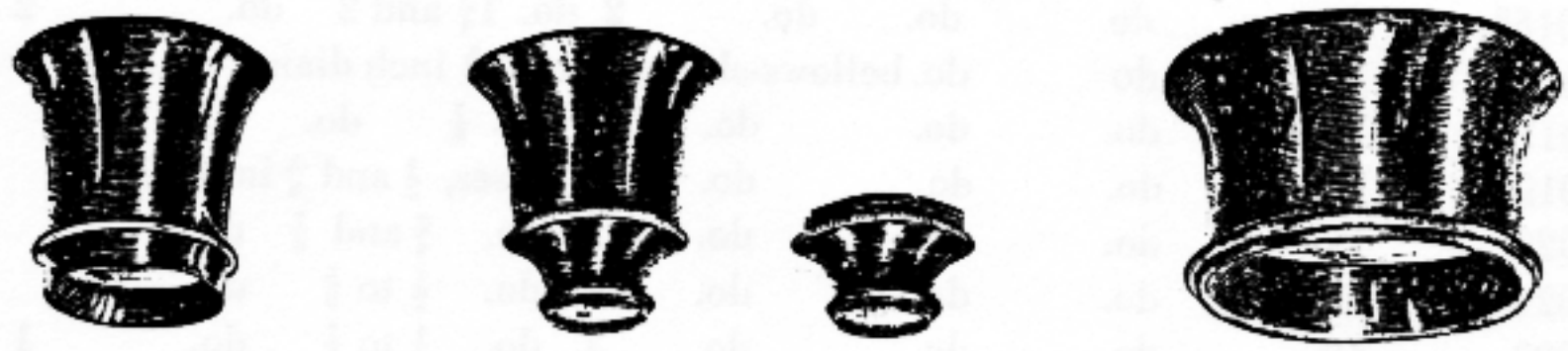
In using immersion objectives, first find the object as above, and then before screwing the objective upon the microscope, apply sufficient water to form a small bead large enough to cover the surface of the lens, then screw the objective in place, and focus until the water unites objective and object, when a perfect result will be obtained without difficulty. The principal advantages possessed by the immersion system for high-power objectives are: *1st*, the greatly increased working distance obtained; *2d*, the possibility of a large increase of aperture over dry lenses, and *3d*, diminished sensibility to the disturbing influence of the cover glass (varying thicknesses) upon the corrections. Homogeneous-immersion (or oil-immersion) lenses possess these advantages in an increased degree; indeed, the effect of varying thicknesses of cover glass in causing aberrations is practically annulled, so that the collar adjustment is often entirely omitted in the finest objectives made on this system.

SIMPLE MICROSCOPES.

NOTE.—A convenient and simple rule to determine the power of any simple microscope or single lens used as a magnifier is to divide ten (inches) by the focal length of the lens in inches. Thus, if a lens has 1 inch focus its power is $10 \div 1 = 10$: if ½ inch focus the power will be $10 \div \frac{1}{2} = 20$. When the lens is a thick one, or a system is made up of two or three single lenses, it is nearly accurate in determining the focus to take the measurement from the middle of the lens or system to the focal point. In taking such measurements with any lens, take the image of a distant object, not closer than about 30 feet.

WATCHMAKERS' AND ENGRAVERS' GLASSES.

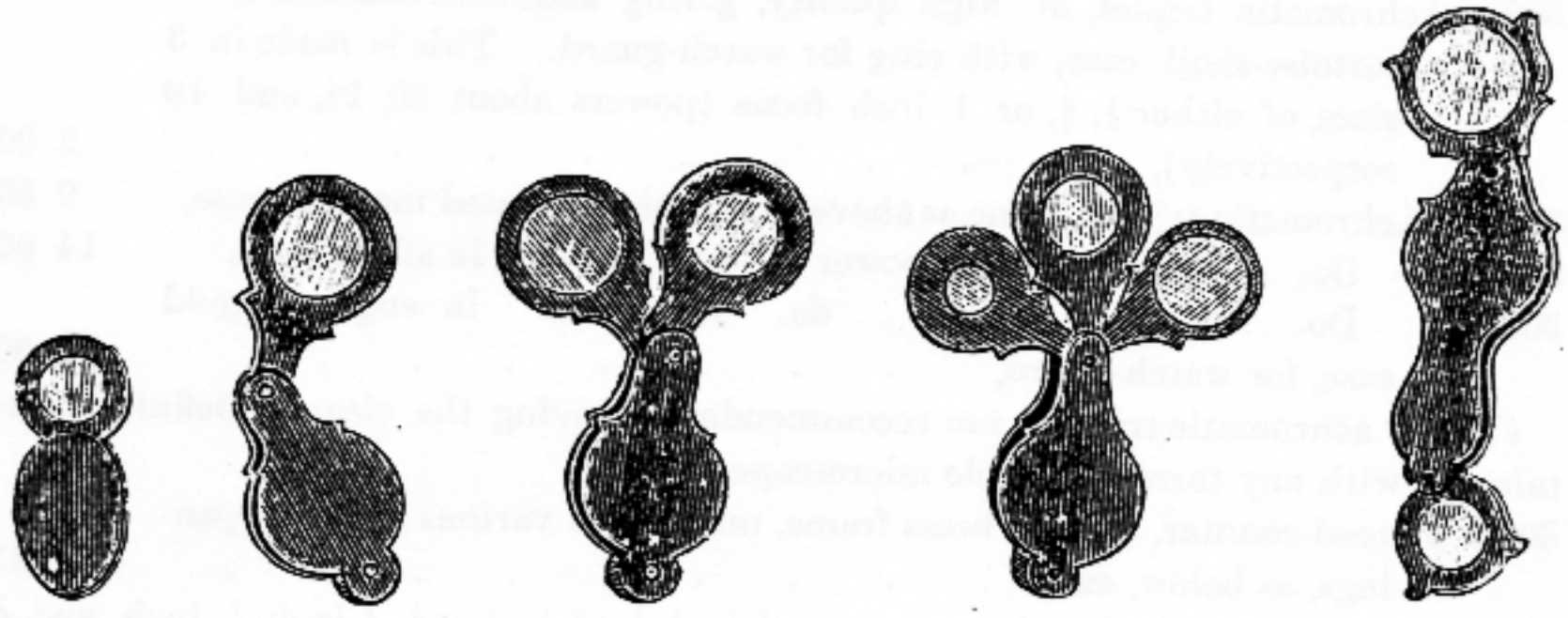
No.		Price.
3000.	Watchmaker's glass, 1 double-convex lens, ⅜ to 1¼ inch diameter, in hard-rubber frame; various powers, each, . . .	$0 40



3000. 3001. 3004-5.

No							Price.
3000½.	Watchmaker's glass, 1 double-convex lens, ⅜ to 1¼ inch diameter, in hard-rubber frame, with light spring to hold it in place when in use, by passing around the head; an admirable and convenient device,						$0 75
3001.	Watchmaker's glass, 2 lenses giving high power; separable, to give low power and larger field; in hard-rubber frame, . .						75
3002.	Engraver's glass, 1 double-convex lens, ¾ to 1 inch diameter; in horn frame, ...						35
3002½.	Engraver's glass, 1 double convex lens, 1⅜ inch diameter, in horn,						75
3003.	Do.	do.	2 plano-convex lenses, ¾ to ⅞ inch diam., in wood.				75
3004.	Do.	do.	do.	do. 1⅜	do.	in hard	2 00
3005.	Do.	do.	do.	do. 1⅞	do.	rubber.	3 00

POCKET MAGNIFIERS, ETC.

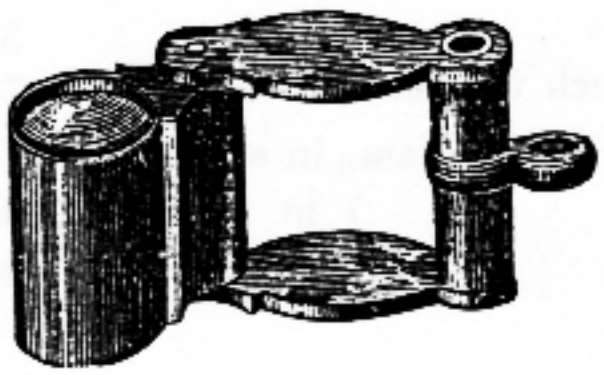


3010. 3016. 3019. 3022. 3025.

3010.	Pocket-glass, hard-rubber case, oval shape, 1 lens, ¾-inch diameter, .							30
3011.	Do.	do.	do.	do.	1 do. 1	do.	.	40
3012.	Do.	do.	do.	do.	1 do. 1¼	do.	.	60
3012½.	Do.	do.	do.	do.	1 do. 1⅜	do.	.	75
3013.	Do.	do.	do.	do.	1 do. 1¾	do.	.	90
3013½.	Do.	do.	do.	do.	1 do. 2	do.	.	1 15
3014.	Do.	do.	do.	do.	2 do. ⅞ and 1 in. diam.,			80
3014½.	Do.	do.	do.	do.	2 do. 1 and 1¼	do.		1 00
3015.	Do.	do.	do.	do.	2 do. 1¼ and 1½	do.		1 25

No. PRICE.

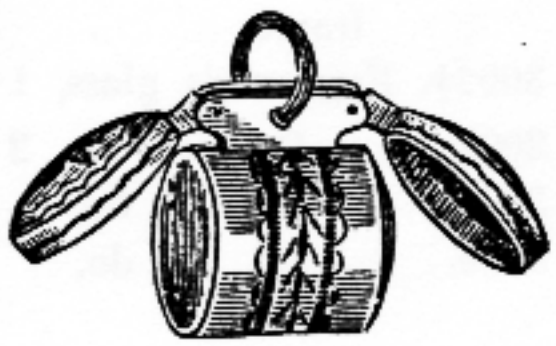
3015½. Pocket-glass, hard rubber case, oval-shape, 2 lens, 1½ and 1¾ in. diam., $1 65
3015¾. Do. do do. do. 2 do. 1¾ and 2 do. 2 15
3016. Do. do do. bellows-shape, 1 lens, ⅝ inch diam., 40
3017. Do. do. do. do. 1 do. ⅞ do. 50
3019. Do. do. do. do. 2 lenses, ½ and ⅝ in. diam., 60
3020. Do. do. do. do. 2 do. ¾ and ⅞ do. 75
3022. Do. do. do. do. 3 do. ½ to ⅝ do. 80
3023. Do. do. do do. 3 do. ½ to ⅞ do. 1 00
3024. Do. do. do. do. 2 do. ⅜ and ½ do.
with diaphragm (high power), ... 75
3024½. Pocket-glass, hard-rubber case, bellows-shape, 3 lenses, ⅜ to ⅝ inch diameter, with diaphragm; compact and powerful, . . . 1 25
3025. Pocket-glass, hard-rubber case, with 1 lens ⅜ inch diameter, of high power, at one end, and 1 lens ¾ inch diameter, of medium power, at the other end; a convenient form, ... 1 25



3027.

3030.

3037.



3039.

3027. Achromatic triplet, of high quality, giving exquisite definition, in tortoise-shell case, with ring for watch-guard. This is made in 3 sizes, of either ½, ¾, or 1 inch focus (powers about 20, 14, and 10 respectively), ... 9 00
3027½. Achromatic triplet, same as above, but in nickel plated metallic case, 9 50
3028. Do. do. giving power of 40 diameters, in silver case, 14 00
3028½. Do. do. do. do. 40 do. in engraved gold case, for watch-guard, ... 20 00

(These achromatic triplets are recommended as giving the clearest definition obtainable with any form of simple microscope.)

3030. Thread-counter, folding brass frame, made with various sizes of openings, as below, each 35

a. ¼ inch square; *b*. ½ inch square; *c*. ½ inch by ¼ inch; *d*, ½ inch, ¼ inch, and ⅛ inch; *e*. large ¼ inch (cashmere glass).

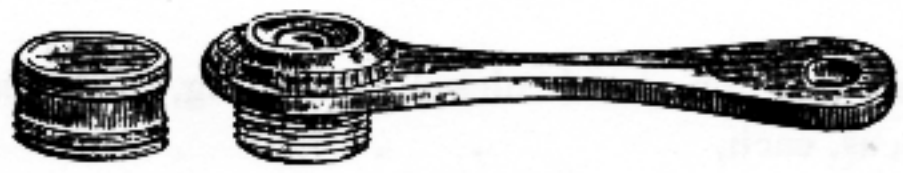
3030½. Thread-counter, large folding brass frame, large lens, ½ inch square opening, ... 1 25
3031. Thread-counter, folding german-silver or nickeled frame, made with various sizes of openings as below, each, ... 75

a. ¼ inch square; *b*. ½ inch square; *c*. ½ inch by ¼ inch; *f*. small round opening (linen glass).

3032. Thread-counter, folding german-silver or nickeled frame, with 2 plano-convex lenses, sometimes called "achromatic;" made with 2 sizes of openings, as below, each 1 00

a. ¼ inch square; *b*. ½ inch square.

3033. Thread-counter, folding brass frame, largest size, for coarse fabrics, 1-inch square opening, ... 1 75



3034.

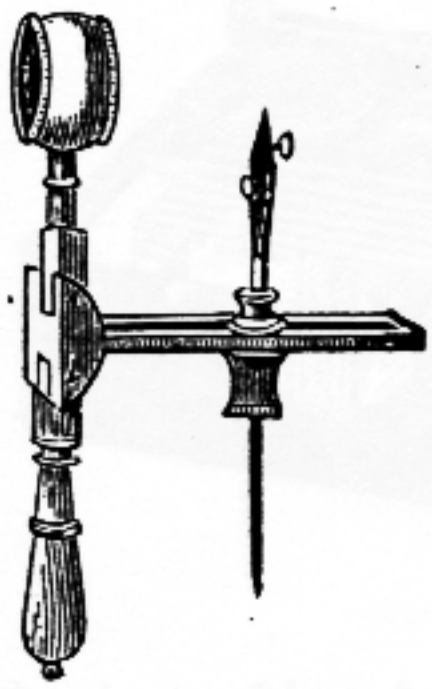
No.		Price.
3034.	Collector's pocket microscope, consisting of a Stanhope lens, in nickel-plated frame, with glass cover, forming a sort of live-box, in which the object is placed; power about 25 diameters. A very useful article in collecting excursions; a drop of water, for example, containing animaculæ, diatoms, algæ, or other objects, being placed on the flat surface of the lens, the cover is screwed in place and the object examined by simply holding the instrument up to the light, .	$0 75
3035–S.	Coddington lens, brass frame, about $\frac{5}{8}$ inch equivalent focus (small),	1 00

[To obtain the power in diameters in this and similar cases divide 10 (inches) by the equivalent focal length (in inches); thus $10 \div \frac{5}{8} = 16$ diameters.]

3035–L.

3035–M.	Coddington lens, brass frame, about $1\frac{1}{8}$-inch focus (medium), .	1 50
3035–L.	Do. do. do. $1\frac{1}{2}$ do. (large), .	2 00
3036.	Do. silver frame and handle, about $\frac{3}{8}$ inch focus, .	2 25
3037.	Do. do. with cover, do. $\frac{3}{8}$ do.	2 50
3037½.	Do. do. do. larger size, about 1-inch focus, ...	4 00

3042.



3044.

3040½.

3041.

3045.

3048.

3038.	Coddington lens, $\frac{5}{8}$-inch focus, with cover, nickel-plated (like 3027½), .	2 00
3039.	Do. $\frac{1}{2}$ do. do. silver-plated and engraved,	4 50
3040.	Do. $\frac{1}{2}$ do. do. gold-plated and engraved,	5 50

No.		Price
3040½*a*.	Charm microscope, hard nickel mounting, $\frac{7}{16}$-inch diameter, $\frac{1}{8}$-inch focus, each,	$0 25
3040½*b*.	Charm microscope, hard nickel mounting, $\frac{9}{16}$-inch diameter, $1\frac{1}{8}$-inch focus, each,	35
3041.	Microscope, with glass cage for seeds or live insects, new pattern, simple and effective,	50
3042.	Microscope for insects, etc., with glass cage, reversible into brass case (small),	50
3042½.	Microscope, for insects, etc., with glass cage, reversible into brass case (medium),	75
3043.	Microscope, for insects, etc., with glass cage, reversible into brass case (large),	1 00
3044.	Flower microscope, with forceps for holding objects; folds in pocket case,	2 25
3045.	Microscope on brass tripod, with screw adjustment for focus,	75
3045½.	Do. do. do. do., extra large,	1 00
3046.	Do. do. do. do., nickeled,	1 00
3048.	Focusing glass, for photographers' use, very powerful,	75

THE UNIVERSAL POCKET MICROSCOPE.

3049.

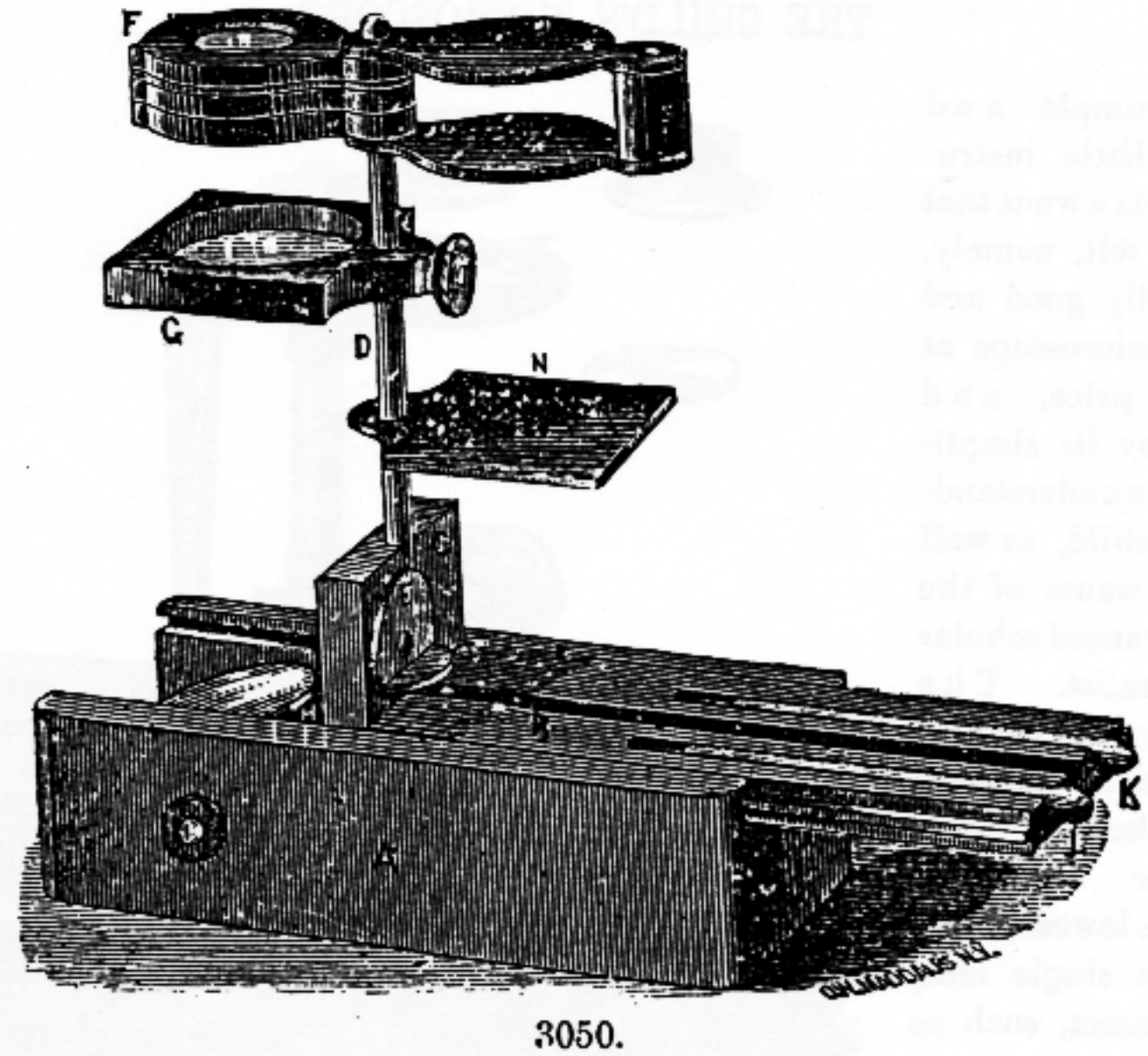
3049. The Universal Pocket Microscope, here figured in case, is suitable for botanical and general use, for such transparent objects as require a high power. This instrument gives a power of about 50 diameters, obtained by a compound system of lenses so proportioned as to correct the spherical aberration and give clear and distinct definition. It has an accurately working screw adjustment for precise

No. PRICE.

focusing; an object-holder which is easily operated by one hand and which acts as a compressor as well; a separate single lens for larger (transparent or opaque) objects; 3 plain glass slips, and 3 prepared objects. The tube is nickeled-plated, and the whole is packed into a case (with clasp) about 2½x2x1 inches. We think this will prove to be a valuable pocket microscope for physicians' use, as by its means they will be able readily to make observations, without delay, which may be of considerable value in the diagnosis of a case, ... $4 00

SIMPLE MICROSCOPES, WITH STANDS.

THE EXCELSIOR MICROSCOPE.



3050.

3050. THE EXCELSIOR MICROSCOPE.—The neat walnut case furnished with this microscope, and into which it packs, serves as a stand when in use, as shown. It contains an adjustable mirror for illumination of transparent objects; when opaque objects are under examination, the diaphragm shown at N is used to shut off the light. This is supported by a steel stem, which also carries the stage and lenses. There are three lenses, which may be used separately from the stand and carried in the pocket when desired. The stage slides smoothly upon the stem for focusing, and may be clamped in posi-

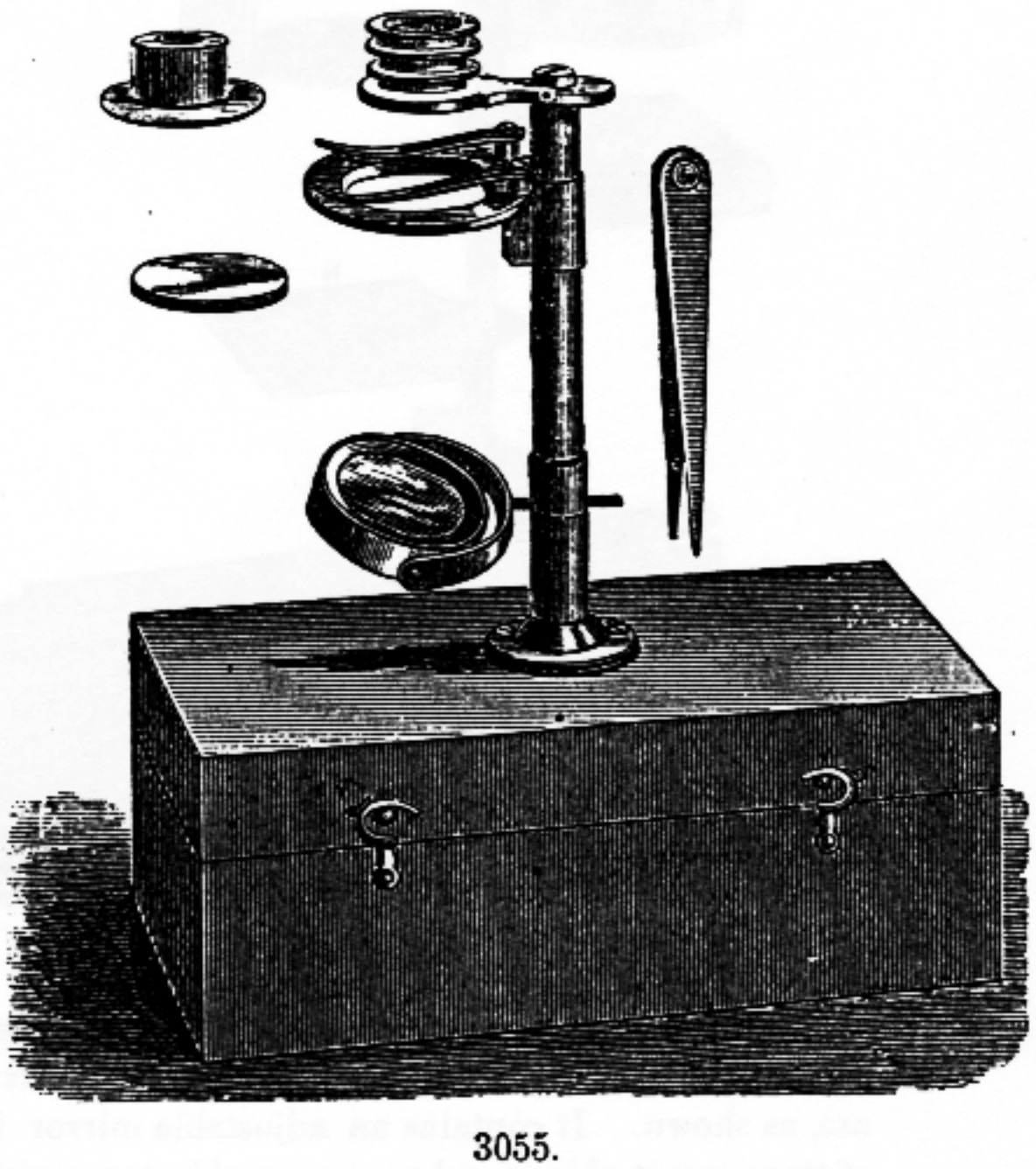
No. PRICE.

tion by the set-screw; it may be used for the examination of objects in water, or reversed and used with the flat side up, if preferred. When folded into case the whole instrument only occupies a space 3x1½x1 inches. The power ranges from about 5 to 20 diameters, which is sufficient to show the separate corpuscles of frog's blood, and a very great variety of interesting objects. As a dissecting microscope, its efficiency may be greatly increased by temporarily screwing the case fast to a board about 6 inches square (as recommended by John Phin—see his book, no. 3955 of this catalogue); this may be done without defacing the instrument. Price, with 2 needles in handles for dissecting, ... $2 75

3051. THE EXCELSIOR MICROSCOPE, as above described, but with only 2 lenses (power about 5 to 15 diameters), with 2 needles in handles for dissecting, ... 2 50

THE CHILD'S MICROSCOPE.

This simple and compact little instrument meets a want that has been felt, namely, for a really good and efficient microscope at a low price, and adapted by its simplicity to the understanding of a child, as well as to the wants of the more advanced scholar or naturalist. The magnifiers or lenses are three in number, and can be used separately, or combined. With the lowest power or largest single lens, a large insect, such as a bee or fly, can be examined without any further preparation than placing it in the insect box which accompanies the instrument. With the three lenses combined, a power of 33 diameters can be obtained, which is quite sufficient to show many of the larger animaculæ in pond or ditch water, the scales from a butterfly's wing, pollen grains of plants, and thousands of other interesting and easily obtained objects requiring considerable magnifying power.



3055.

The illustration gives a very good general idea of the instrument, which consists of a neat walnut box as a base, into which the microscope packs when not in use; an upright brass stem, which screws into the lid of the box, and which carries the stage on a sliding tube, and at its top, firmly fixed, the arm which holds the lenses. The focus is adjusted by sliding the stage up or down, so that the eye is not obliged to move its position, as is the case with all instruments in which the focusing is effected by moving the lens. The mirror for reflecting the light through transparent objects is mounted on a universal joint, so as to be readily turned in any direction toward the source of light.

It is much more readily managed by a novice than a compound microscope, and has, with the three lenses combined, almost as much magnifying power as the cheapest of the latter; whilst, unlike it, "The Child's Microscope," is equally well adapted to the examination of large opaque objects, such as beetles, flies, or flowers.

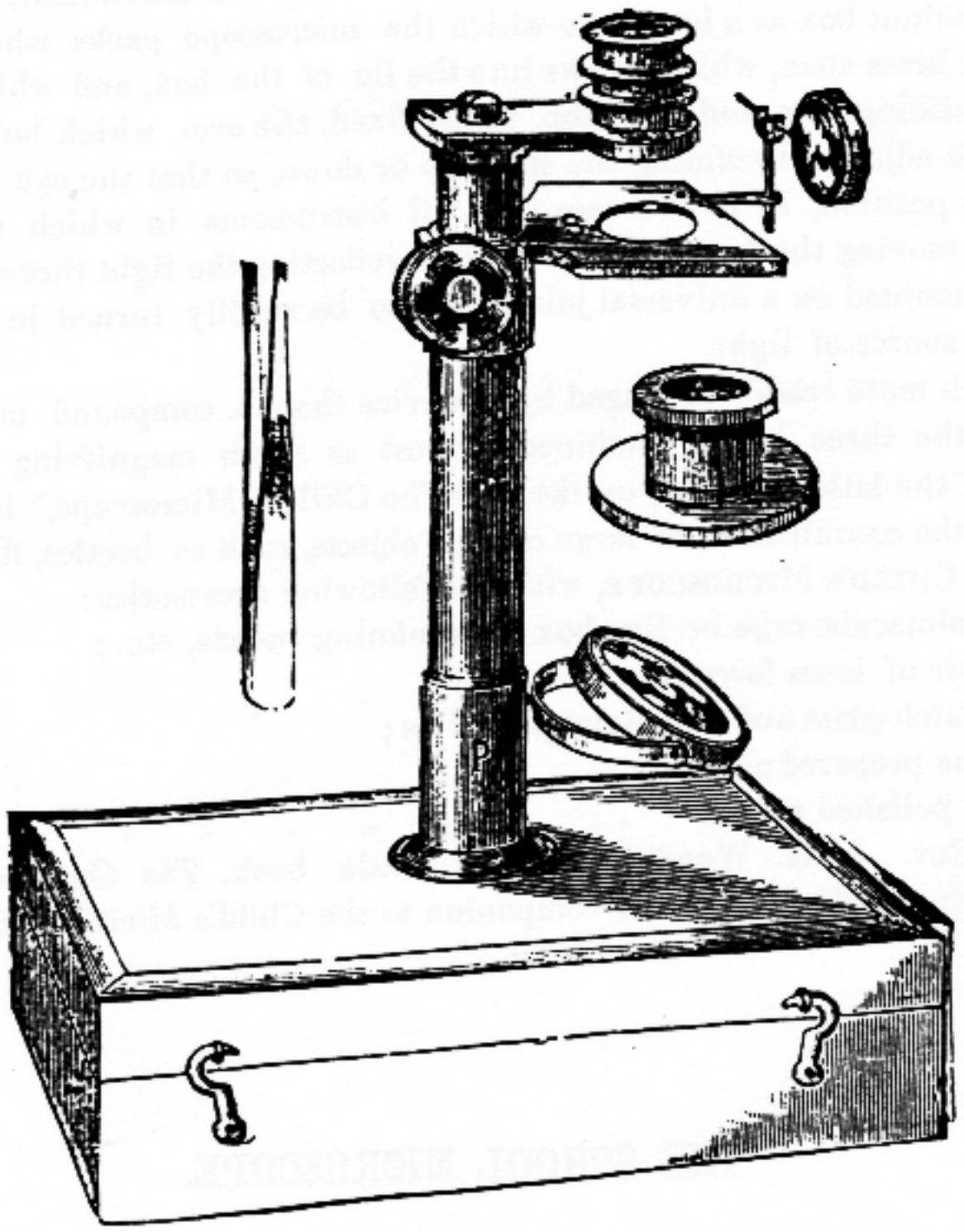
8055. THE CHILD'S MICROSCOPE, with the following accessories:

Animaculæ cage or live-box for confining insects, etc.;
Pair of brass forceps;
Watch-glass and two plain glass slips;
One prepared object;
In polished case, ... $3 50

NOTE.—Rev. J. G. Wood's excellent little book, *The Common Objects of the Microscope* (no. 3964), is a useful companion to the Child's Microscope.

THE SCHOOL MICROSCOPE.

This instrument consists of a tubular stem about five inches high, the lower end of which screws firmly into the lid of the box wherein the instrument is packed when not in use. To the upper end of this stem the stage is firmly fixed; the lower end carries a mirror. Within the tubular stem is a pillar having a rack cut into it, against which a pinion works that is turned by a milled head; and the upper part of this pillar carries a horizontal arm which bears the lenses, so that by turning the milled head the arm may be raised or lowered, and the requisite focal adjustment obtained. Three lenses are supplied, and by using them either separately or in combination, a range of powers of about 8 to 30 diameters is obtained. This instrument is peculiarly adapted for educational purposes, being well fitted for the examination of botanical specimens, small insects or parts of insects, water-fleas, the larger animalcules, and other such objects as young people may readily collect and examine for themselves; and those who have trained themselves in the application of it to the study of nature are well prepared for the advantageous use of the compound microscope. But it also affords to the scientific inquirer all that is essential to the pursuit of such investigations as are best followed out by the concurrent employment of a simple and a compound microscope, the former being most fitted for the preparation and the latter for the examination of many kinds of objects; and it may be easily adapted to the purposes of dissection by placing it between arm-rests or blocks of wood, or books piled one on another so as to give a support for the hand on either side, at or near the level of the stage.

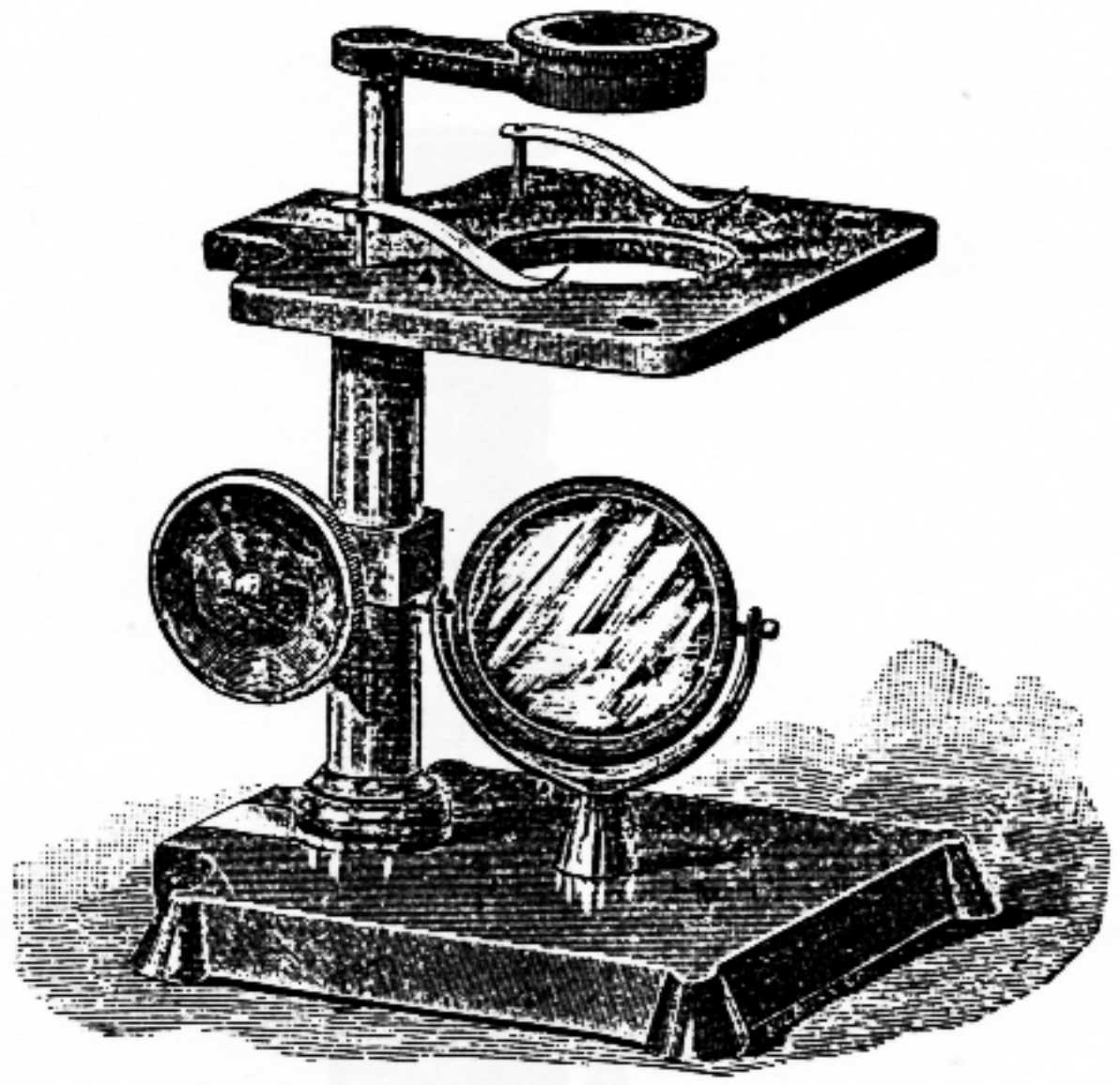


3056.

No.		Price.
3056.	The School Microscope, with the following accessories: Condensing lens for lighting opaque objects at night; Live-box for confining insects or examining objects in water; Brass forceps for handling small objects; Watch-glass, plain slides, and one prepared object. In polished case, ...	$6 00

COMPACT DISSECTING MICROSCOPE.

3057. The Compact Dissecting Microscope has all the elements of the ordinary dissecting microscope, and, besides these, the important feature that, when folded, it is brought into a very small compass, and without any sacrifice of firmness when set up for use. The cut represents the microscope for use. The base is neatly japanned and of large dimensions. The stage is of brass, blackened, has spring clips, and in its centre contains a removable glass disc. It is of convenient height, so that any amount of work may be done without any fatigue to the arms or hands. The arm holding the lenses may be swung aside, being adjustable in a triangular rack-rod, and is arranged with society-screw, thus permitting the use of low



3057.

(Hand-rests not shown.)

No. PRICE.

power objectives, such as 1 inch, ¾ inch, and ½ inch, which make excellent dissecting lenses. The rack-and-pinion adjustment works perfectly smooth and without any lost or lateral motion. The mirror is detachable from the base, and can be readily attached to the stage for oblique light or illumination of opaque objects. In folding, the rack is brought down and arm detached, the stage swings backwards on the pillar and the base on the stage, so that the space occupied is merely the size of the base, and thickness of this, stage and arm. Two mounted lenses, respectively of 2 and 1 inch focus, and nickel-plated pliers, accompany the instrument. The whole packed in neat case, with receptacles for each part, . $12 00

3057*a*. DETACHABLE HAND-RESTS, for use in dissecting, add, . . . 2 00

3057*b*. SINGLE LENS, of ¾ inch, ½-inch, or ¼-inch focus, each, . . . 1 50

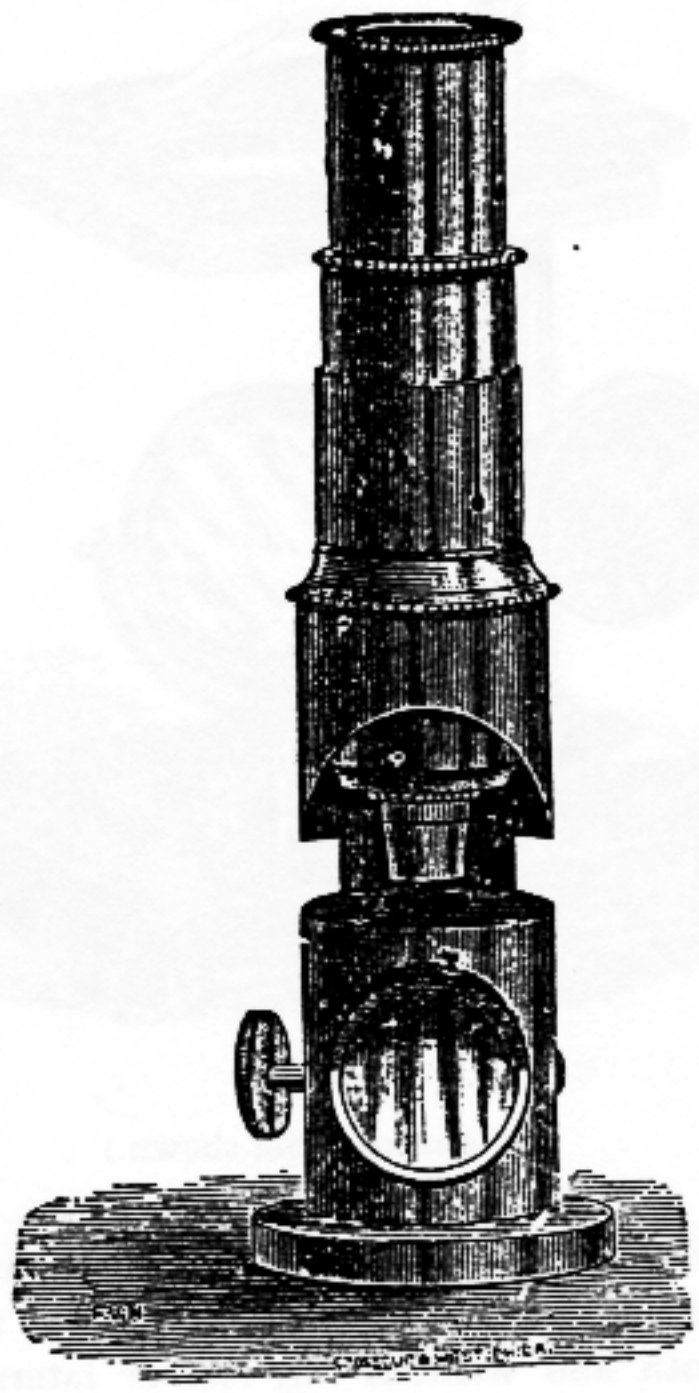
3058 CODDINGTON LENSES, same foci as above, each, ... 4 00

3059 ACHROMATIC TRIPLETS, giving large, flat field and beautifully clear definition, same foci as above, each, ... 9 00

BOYS' COMPOUND MICROSCOPE.

3060. BOYS' COMPOUND MICROSCOPE, ... $2 50

This instrument is a well-made and substantial one, and well adapted to the study of objects requiring rather more power than can be conveniently obtained with a *simple* microscope. It will show satisfactorily the larger animalculæ in pond-water, the scales from a butterfly's wing, and similar minute objects. The stand is of pol-



3060.

ished brass, handsomely lacquered, with one eye-piece and one object-glass, magnifying when combined about 40 diameters or 1,600 times. One prepared object, two glass slips, and a pair of brass forceps, are furnished with it, and the whole is packed in a neat, polished walnut wood case.

The magnifying power, as understood by microscopists, is in diameters. A popular way is to give the area or superficies; and, as the object is magnified equally in all directions, this power is obtained by squaring the diameter.

The Rev. Mr. Wood's little work, entitled, *Common Objects of the Microscope* (no. 3964 of this catalogue), is highly recommended for the use of beginners in the study. It will be found useful as an aid to the management of the microscope, and as a guide to the various kinds or classes of objects, and their collection and preservation. It is illustrated with 400 engravings, printed in colors, and costs but 50 cents.

We have a great variety of popular objects, well prepared, and mounted on paper covered glass slides (no. 3914 of this catalogue), which are specially suited to the capacity of this and other cheap microscopes. They cost $1.25 per dozen, or 15 cents each.

UNIVERSAL HOUSEHOLD MICROSCOPE.

3061.

No.

3061. UNIVERSAL HOUSEHOLD MICROSCOPE, ... PRICE. $5 00

This complete and powerful instrument has the essential parts and general design of a first-class modern microscope. It is simple in construction and of convenient design, and is well adapted for family use, affording amusement and instruction to young and old.

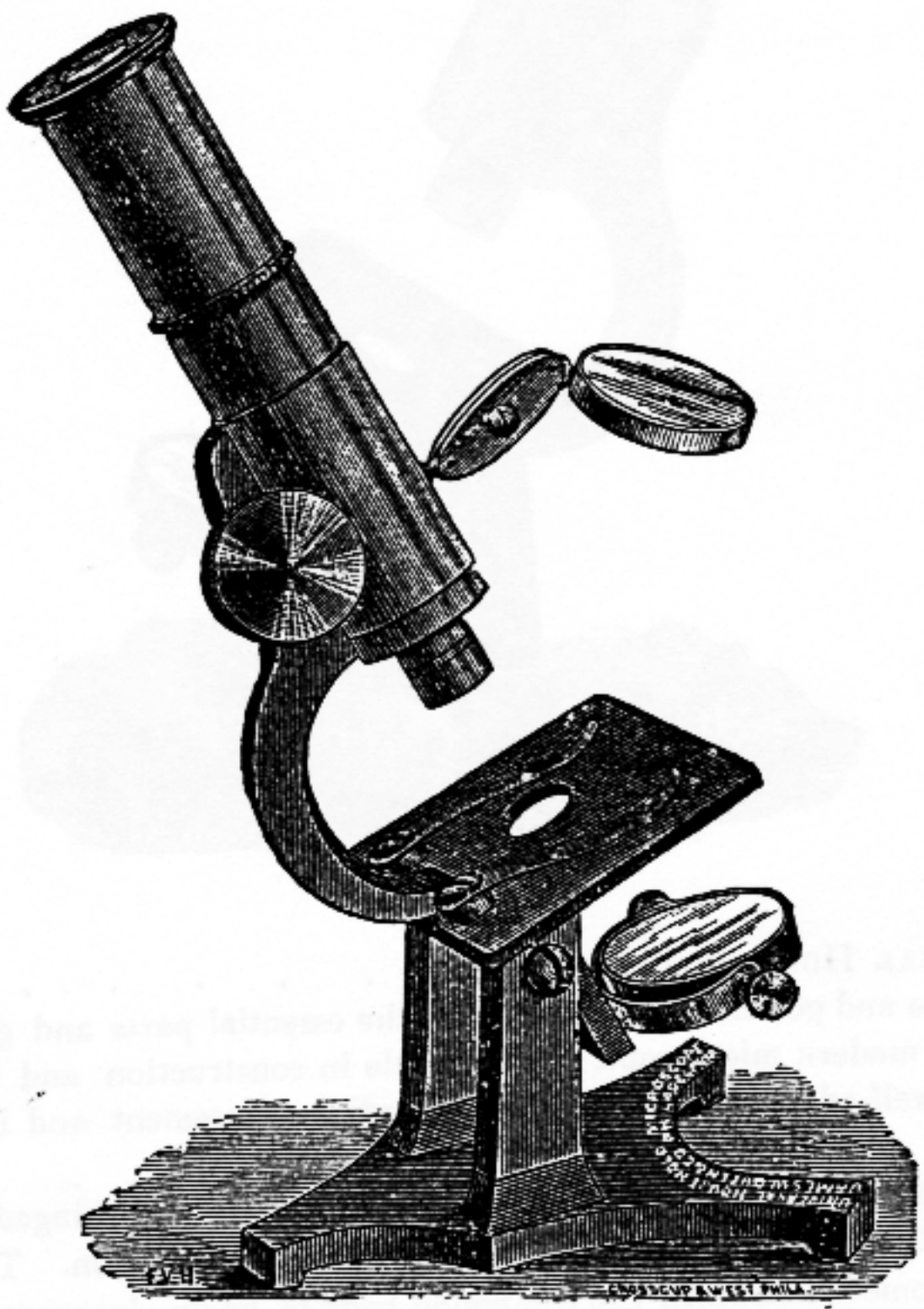
The stand is eight inches in height, as shown in the cut, with hinged joint, allowing it to be inclined to any angle for convenience of observation. The base is of cast iron, handsomely japanned, the compound body of finely lacquered brass, with draw-tube for increasing the power of the object-glasses. These are two in number, and give in connection with the draw-tube a range of powers from 30 to 100 diameters, or from 900 to 10,000 times. The stage is of ample size, and is provided with spring clips for holding the object while under observation; beneath is a concave mirror, conveniently jointed, for the illumination of all transparent objects. A great variety of the ordinary animalcules of pond-water can be shown with this instrument; cheese mites, vinegar eels, etc., are well shown with its lowest power. One

prepared object. two glass slips, and a pair of brass forceps are furnished with it, and the whole is packed in a neat and strong walnut wood case.

No. PRICE.

3062. UNIVERSAL HOUSEHOLD MICROSCOPE, the same as no. 3061, with the addition of an *achromatic* object-glass, composed of three separable achromatic lenses (powers ranging from 30 to 175 diameters). This is recommended as greatly increasing the power and clearness of image or definition, and adds greatly to the usefulness of the instrument, ... $8 00

UNIVERSAL HOUSEHOLD MICROSCOPE.



3063.

3063. UNIVERSAL HOUSEHOLD MICROSCOPE, the same as no. 3061, but with the addition of rack-and-pinion adjustment for focus, and condensing lens for giving a better illumination to opaque objects; concave mirror, and two objectives, giving, in conjunction with the draw-tube, a range of powers from 30 to 100 diameters. One prepared object, two glass slips, and brass forceps accompany

No. PRICE.

each instrument, and the whole is packed in a neat polished mahogany case. This instrument is handsomely finished, and makes an elegant gift for young persons of an investigating bent of mind, $7 50

3064. UNIVERSAL HOUSEHOLD MICROSCOPE, same as no. 3063, but with dividing *achromatic* object-glass giving range of powers from 75 to 290 diameters. This has proved to be one of the best selling of our various styles of Household Microscopes, and has the advantage over no. 3063 in greatly increased power, as well as a more colorless and perfect image, afforded by the achromatic object-glass, ... 12 00

NOTE.—As a useful hand-book to accompany these microscopes, we recommend Wood's *Common Objects of the Microscope* (no. 3964); or, for those who look forward to getting a finer instrument after a time, Phin's *Microscopy for Beginners* (no. 3955½).

THE AMATEUR MICROSCOPE.

3065.

No. PRICE

3065. THE AMATEUR MICROSCOPE.—The cut is one-third actual size. Base of iron, neatly japanned, of ample size, and firm in any position of the instrument. Body tube of brass, 8 inches long. Smooth rack-and-pinion adjustment for focus, with which as high a power as a one-sixth may be adjusted. Stage with adjustable spring clips, which may be removed if required. Revolving diaphragm of four apertures beneath the stage. Concave mirror on arm swinging laterally (for oblique light), or above the stage for the illumination of opaque objects. The microscope is supplied with one (no. 2) eye-piece, and one excellent half-inch object-glass, which, by dividing, will give powers of 50 and 110 diameters, a power which, when accompanied by such clearness of image (definition), as here obtains is quite high enough for the majority of objects likely to be examined in the class-room, or by the lover of nature for his own instruction and amusement. In neat and strong walnut case, with brass handle and lock. A thoroughly good instrument, ... $23 00

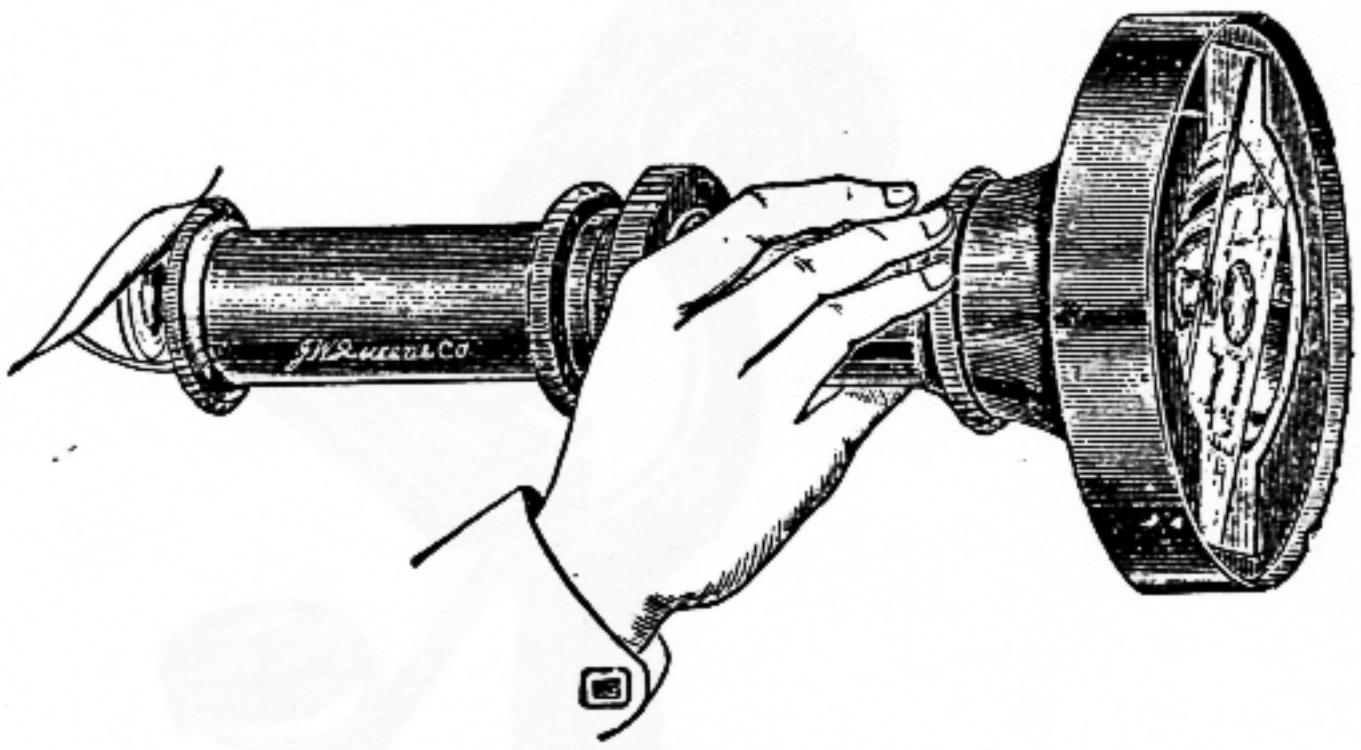
3066. No. 3 eye-piece, giving powers of 50, 110, and 165 diameters, . . 4 00

3067. THE AMATEUR MICROSCOPE, same as no. 3065, but with the addition of a one-sixth inch object-glass, no. 3429, with society-screw adapter and cap, giving powers from 50 to 360 diameters, . . 28 00

3068. THE AMATEUR MICROSCOPE (no. 3065 or 3067) may be supplied with a good screw fine adjustment for very delicate focusing at an additional cost of 5 00

(This addition is recommended as desirable where powers of over 200 diameters are to be used.)

THE "CONVENIENT" CLASS MICROSCOPE.



3073.

3073. THE NEW CLASS MICROSCOPE, here illustrated, has many features to recommend it. The circular base contains a large lieberkuhn mirror, acted upon by a spring, which holds the object in place by light pressure, allowing the object to be moved so as to bring any desired part in view. This mirror affords a brilliant illumination

No. PRICE.

for opaque objects. There is a one-half inch objective, of excellent correction, furnished, which, in connection with a first-class Huyghenian eye-piece, will give a power of about 80 diameters. To give a lower power, of about 45 diameters, it may be divided. To use the microscope, place the object (either transparent or opaque) in position, as shown; hold it pointing to the light;* focus by sliding the optical tube; and if you wish to pass around a class, tighten the large clamp-screw (shown near the fore-finger) so that the focus cannot be altered. We can recommend this as a most convenient and efficient class microscope. The powers are those which are most useful for objects in general, and have the society-screw. It has a neat polished case, one object and two thin plain glass slides, between which any suitable object may be placed, the pressure of the spring acting as a compressor as well as serving to hold them in any position. Price, . . . $12 50

"The Class Microscope is a great success, according to verdict of the class.

"R. J. CURTISS.

"I found the Class Microscope even better than I had expected, and its workings entirely satisfactory.

"CHAS. T. MCCLINTOCK,

"*Prin. School of Biology, College of Liberal Arts (Chautauqua University.)*

"THE TOURIST."

THE TOURIST MICROSCOPE is constructed upon a popular English model, to meet the want of a portable instrument for use at the seaside, etc. It is exceedingly compact when folded, occupying only the space of $6\frac{1}{2}$x$3\frac{1}{4}$x$2\frac{3}{8}$ inches, and when set up as shown in cut, sets very firmly, having a good broad spread of base. It is of brass throughout, well made; has axis for inclination to any angle, and plane and concave mirrors with adjustments for obliquity. For illumination of opaque objects the mirror bar may be removed and replaced in the reverse position, thus bringing mirrors above the stage. The instrument stands 12 inches high when draw-tube is extended as shown in illustration; there is society-screw, carrying an achromatic object-glass of $\frac{4}{10}$ths inch focus, which divides to $\frac{8}{10}$ths, giving powers ranging from 40 to 140 diameters.

3077. THE "TOURIST," with coarse and fine adjustments (by rack-and-pinion and screw), with live-box and forceps, in mahogany case, . 22 50

3078. THE "TOURIST," with coarse adjustment only (by rack-and-pinion), with live-box and forceps, in mahogany case, ... 21 00

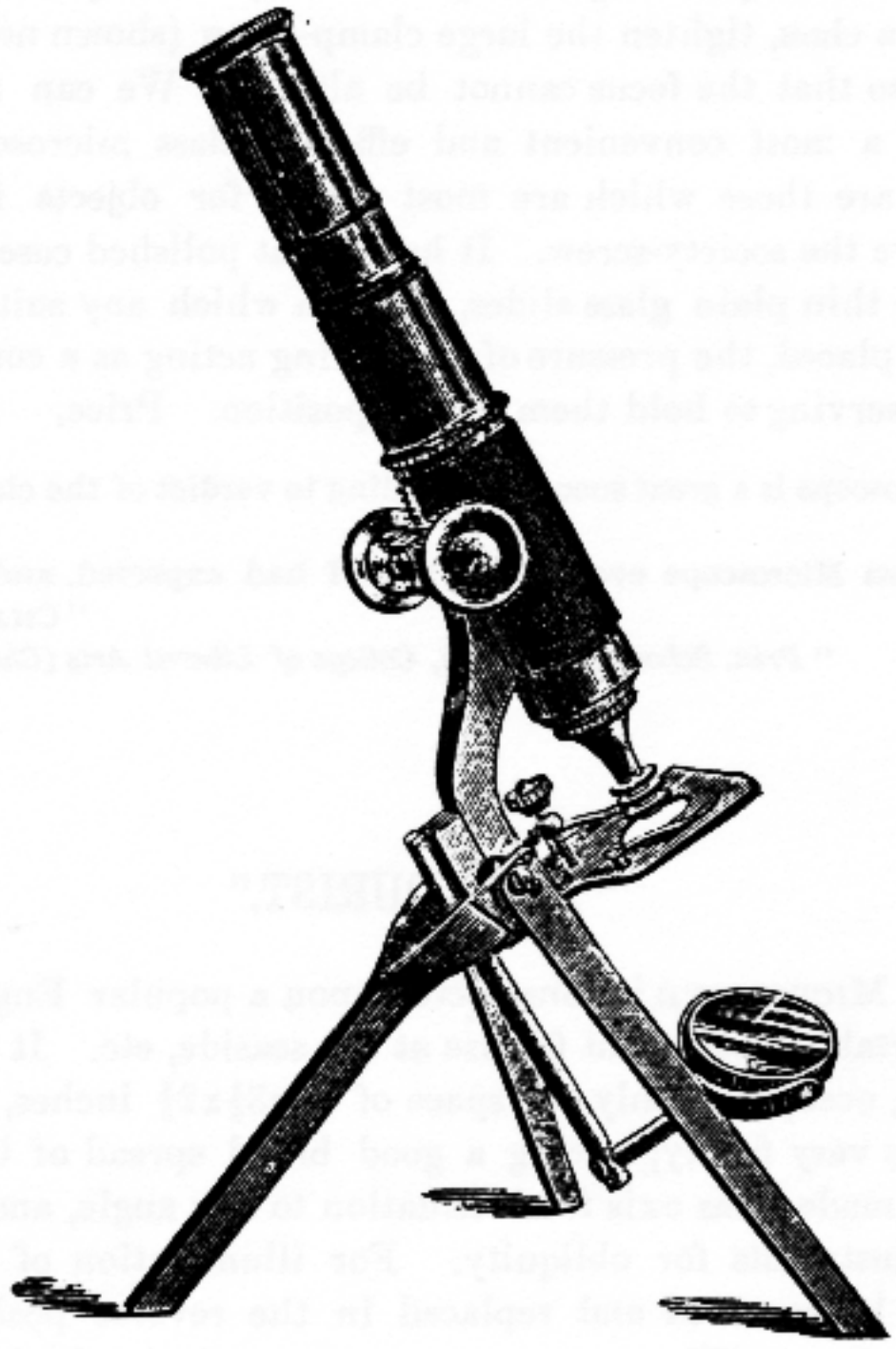
3079. THE "TOURIST," with coarse and fine adjustments (by cloth-lined slip-tube and screw), with live-box and forceps, in mahogany case, 17 50

3080. THE "TOURIST," with coarse adjustment only (by cloth-lined slip-tube), with live-box and forceps, in mahogany case, . . . 16 00

NOTE.—In case the purchaser has objectives of his own, or prefers a different choice, the 4-10 inch objective above mentioned may be omitted, and allowance made.

*Direct light from a window, or a gas or lamp flame placed within a short distance.

THE TOURIST MICROSCOPE.



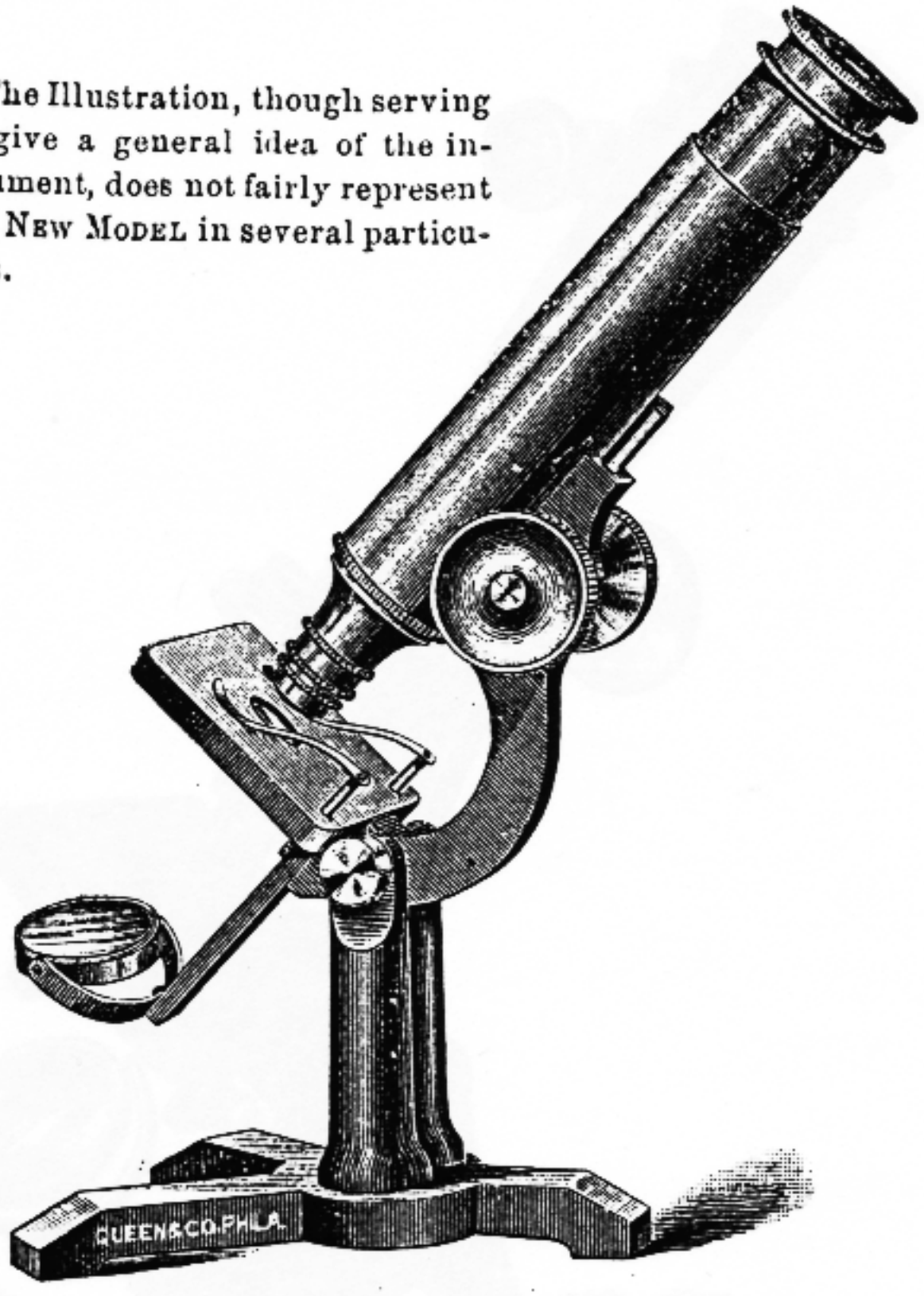
3077.

THE PHYSIOLOGICAL MICROSCOPE.

3090. To supply the demand for a microscope very low in price, but still capable of performing the daily work required by physicians and others, we have introduced this instrument. There are two lenses, ½ inch and ⅛ inch, of a high grade; the latter will show lines on *P. angulatum* (about 50,000 per inch), a remarkable and unprecedented feature in such an instrument. It is furnished with draw-tube,

THE PHYSIOLOGICAL MICROSCOPE.

The Illustration, though serving to give a general idea of the instrument, does not fairly represent the NEW MODEL in several particulars.



3090

(Illustration about $\frac{2}{3}$ natural size.)

concave mirror on arm swinging laterally (or above the stage for aiding in the illumination of opaque objects), axis for inclination, spring clips, etc., and has rack-and-pinion adjustment for focus of first-class construction. Is fitted complete with

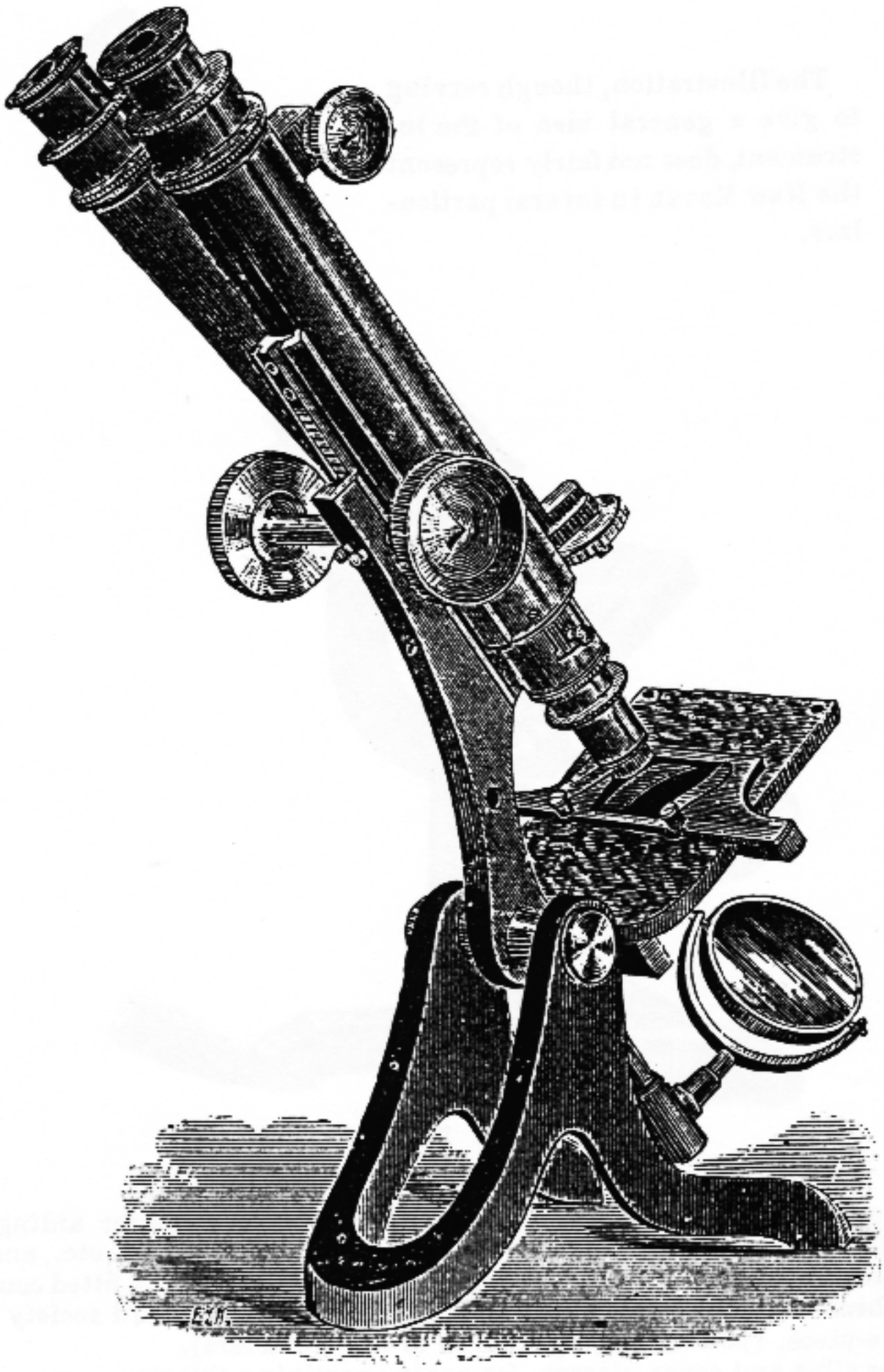
2 achromatic objectives, $\frac{1}{2}$ inch and $\frac{1}{5}$ inch, having standard society screw,
1 eye-piece, (power ranging from 25 to 440 diameters),
Glass slips and cover glasses, for use in examining objects.
In neat upright walnut case, - - - - - - $20 00

This Instrument is one that we can heartily recommend for its thorough construction and the excellence of its lenses.

A PHYSICIAN, who is an expert and enthusiastic microscopist, writes us:

"My young friend came over from ——— last week and brought his Physiological 'scope' for my inspection. He is simply delighted with it. It is the only one of that model I have seen, and I was surprised at its performance. * * * For all ordinary work of a physician it will certainly answer every practical purpose.

THE HISTOLOGICAL BINOCULAR MICROSCOPE.



3103.

This microscope, as illustrated at no. 3103, is 14 inches high when arranged for use, of brass throughout, and handsomely finished. The draw-tubes have rack-and-pinion adjustment for distance between the eyes. Rack-and-pinion and fine lever adjustments for focus. Large and firm stage, having new form of sliding object-carrier which gives a very smooth and easy motion. Revolving diaphragm with 3 apertures, which, with the sub-stage tube, is removable for the purpose of obtaining oblique light. Plane and concave mirrors, 2 inches in diameter, with all adjustments; for illumination of opaque objects, they may be swung above the stage.

This is a compact and convenient working binocular. The objectives are of

high quality, and the tubes are large, giving a large field. Nos. 3103 and 3104 are good outfits, but we shall be glad to furnish estimates of any modification that may be required.

3103. The Histological Microscope, binocular, as above described, with the following accessories:
One pair no. 1 eye-pieces;
One eye-piece, no. 2;
One object-glass, 1-inch focus, 25° aperture;
One do. ¼ do. 100° do.
(Power ranges from 50 to 450 diameters.)
One glass slip with ledge and covers.
In upright portable mahogany case, with handle, and lock and key, ... $80 00

3104. The Histological Microscope, binocular, with
One pair no. 1 eye-pieces
One eye-piece, no. 2;
One object-glass, 1-inch fo[illegible] 25° aperture;
One do. ¼ do. 100° do.
One glass slip with ledge and covers;
Bull's-eye condenser, on separate stand;
Spot-lens, for dark ground illumination;
Polarizing apparatus, with selenite;
Neutral tint camera lucida;
Animalculæ cage;
Stage micrometer, $\frac{1}{100}$ and $\frac{1}{1000}$;
Zoophyte trough;
Stage-forceps.
In upright mahogany case, ... 105 00

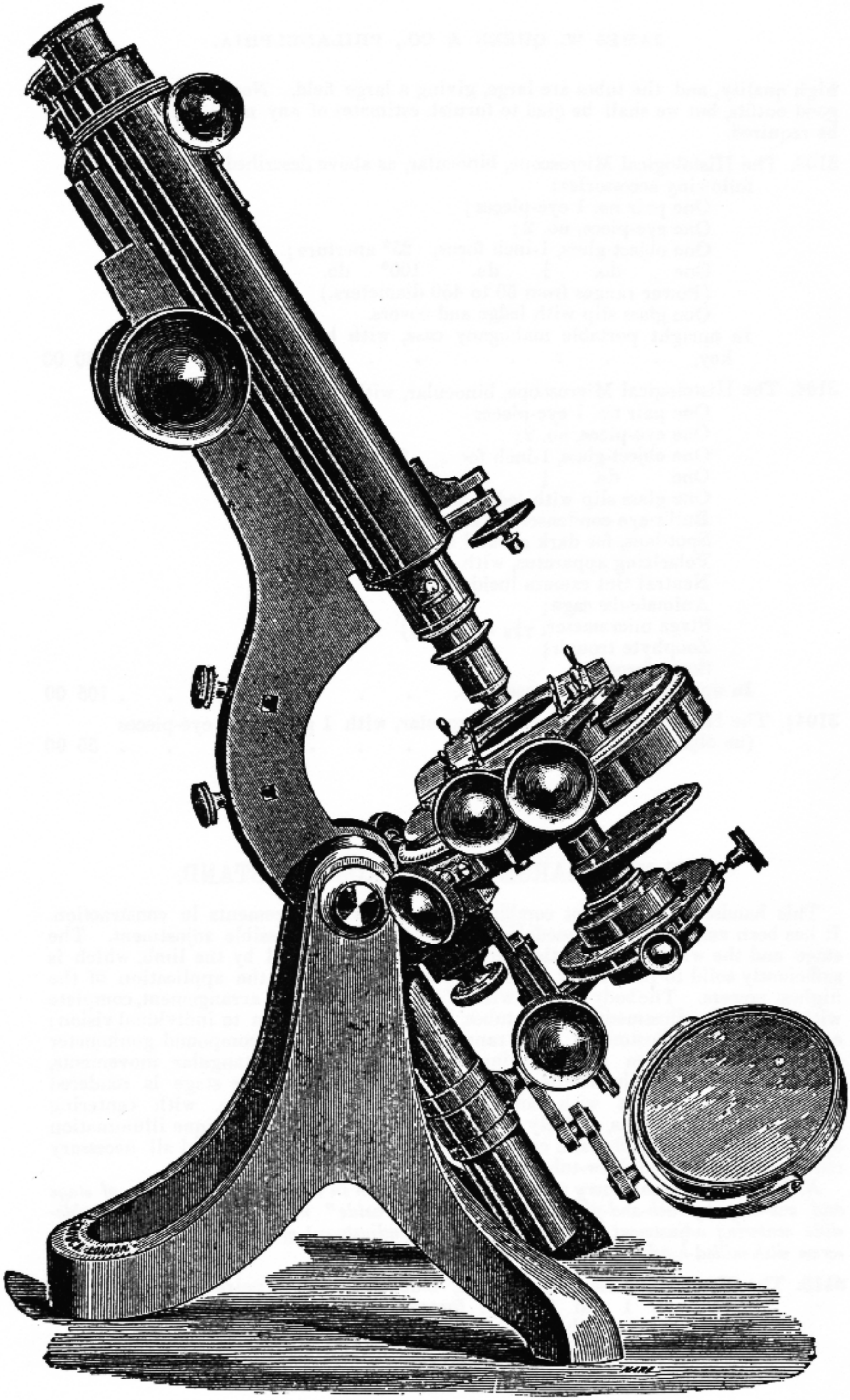
3104½. The Histological Microscope, binocular, with 1 pair no. 1 eye-pieces (no objectives), in case, ... 55 00

THE NEW LARGE-BEST MICROSCOPE STAND.

This handsome instrument combines very recent improvements in construction. It has been very carefully remodeled, and includes every possible adjustment. The stage and the whole of the optical arrangements are carried by the limb, which is sufficiently solid to practically abolish vibration, even with the application of the highest powers. The body is fitted with Wenham's binocular arrangement, complete with rackwork adjustment to draw-tubes, for perfect adaptation to individual vision; coarse and fine adjustments, with range for all objectives; compound goniometer stage, graduated upon silvered ring, with rotary and rectangular movements, and new centering adjustments, by which the rotation of the stage is rendered instantaneously perfect with any objective. New sub-stage, with centering and focusing adjustments, entirely removable by lateral slide for oblique illumination by the mirror. Large flat and concave mirrors, with double crank and all necessary movements, graduated draw-tube

N. B.—There are some very recent features not shown in the cut, as the rotation of stage and sub-stage by rack-and-pinion; the "swinging aside" motion of sub-stage; double-slide centering adjustment to sub-stage; the fine adjustment of new construction having screw with milled-head placed at the side of the arm.

3115. The New Large-Best Microscope, binocular, with 2 pairs of eye-pieces, nos. 1 and 2, stage forceps, and hand pliers, in best mahogany case, with best brass handle and lock, and fittings for accessory apparatus, ... 350 00



3115.

(Now modified in several particulars—see description).

3116. The New Large-Best Microscope, binocular, as described above, with the following accessories, viz.:

One pair eye-pieces, no. 1;
One do. no. 2;
Draw-tube;
1½-inch object-glass, 20 degrees angle of aperture;
⅔-inch do. 30 do. do.
⅓-inch do. 100 do. do.
} power ranges from about 35 to 600.
Condensing lens, largest, on stand;
Stage-forceps and hand pliers;

The whole packed in best upright mahogany case, with side-case for accessories, ... 400 00

3117. The New Large-Best Microscope, binocular, as described above, with the following accessories, viz.:

One pair eye-pieces, no. 1;
One do. do. no. 2;
One eye-piece, no. 3;
One do. no. 4 (½-inch), solid;
One variable low power objective;
One 3-inch objective;
One 2-inch do.
One 1-inch do.
One ½ inch do.
One ¼-inch do., of long working distance;
One ⅛-inch do., adjustable;
One 1/15-inch do., (oil-immersion);
} Power ranges from about 15 to 4,000 diameters.
One best screw-micrometer eye-piece for finest measurements;
Comparison stage micrometer, ruled 100 and 1,000 per inch, and 10 and 100 per millimetre;
Achromatic condenser with revolving diaphragm of various sized apertures and central and oblique stops, etc.;
Draw-tube, graduated;
Polarizing apparatus, with selenite and large prisms (all parts revolving);
Wenham paraboloid, for dark-ground illumination;
Bull's-eye condenser, largest, for opaque objects, etc.;
Live-box, largest, adapted to use with achromatic condenser or paraboloid;
Facility nose-piece for quickly changing objectives;
Parabolic illuminator, for use with opaque objects when the most brilliant illumination is required;
Holman life-slide;
Do. current-slide;
Do. syphon-slide;
Stage-forceps, and best curved steel forceps;
Best microscopic lamp with all adjustments;
Revolving microscope table with polished walnut top; may be set and rotated at any height.

The microscope is packed in best upright mahogany case, and the accessories in an inner side case, ... $730.00

We will make any other desired grouping of accessory parts and microscope, and name price on application.

THE ACME No. 5 MICROSCOPE.

An instrument of thorough construction, with adjustments smooth and perfect in action, the lenses being of especial excellence and clearness of definition.

We can recommend this microscope to pharmacists as an efficient instrument for their requirements; also for general school use, in showing the tissues of plants, circulation of blood, and multitudes of other interesting objects.

Simplicity, strength, and *solidity,* with low cost of construction, are especially claimed for this microscope. The base is a heavy tripod, so proportioned that the microscope is very firm when vertical or inclined. The collar, in which the body tube slides, is firmly dovetailed with and screwed fast to the arm.

The mirror (concave) is of the same ample size as in the ACME No. 4, and swings laterally for oblique light, or over the stage for illumination of opaque objects. A revolving diaphragm to regulate the illumination is attached beneath the stage.

By means of the draw-tube, the full English tube-length of ten inches may be obtained when desired.

The plan of constructing the fine adjustment has the following invaluable features which especially fit it for classwork in the laboratory:

First (and principally). Perfection of action: the upper plate carrying the object, must respond instantly to the movement of the screw, upward by positive action, downward by the spring of the plate; and without any lateral or side motion; these, of course, are the essential features of a good fine adjustment.

Second (and important). This perfect action will continue as at first; as there are no joints to wear loose or become strained, there can be developed no lost motion nor lateral motion, by wear or rough handling, all excepting the screw being made practically one solid piece.

Third. It is inexpensive in construction.

(An objection is sometimes made that one side of the stage-plate is moved, while the other is not, thus elevating one side more than the other. We only ask those to whom this may appear an objection to make a practical and careful test. They will find that this objection is utterly invalid in practice, as the range of motion required is very slight; at mid-range the stage-plate is strictly horizontal.)

We can well recommend this microscope to medical students, and to physicians who may not desire to purchase a more expensive instrument, as efficient for histological work and urinary analysis.

It has society-screw, and is furnished with good 1-inch and $\frac{1}{3}$-inch objectives, and one Huyghenian eye-piece, in upright case with handle. Powers range from 40 to 350 diameters; the $\frac{1}{3}$-inch is a lens of such good definition (and sufficient aperture) that it will resolve *P. angulatum.*

No. 3118. Price, complete, in case, ... $28 00

S. H. GAGE, Professor of Histology and Microscopy, Cornell University, says:

"The Acme No 5 microscope sent for examination came duly, and has been thoroughly examined by me and by representatives of the Departments of Botany and Entomology. We are all very much pleased with it.

"It seems to me that this is the best microscope for the price that I have ever seen.

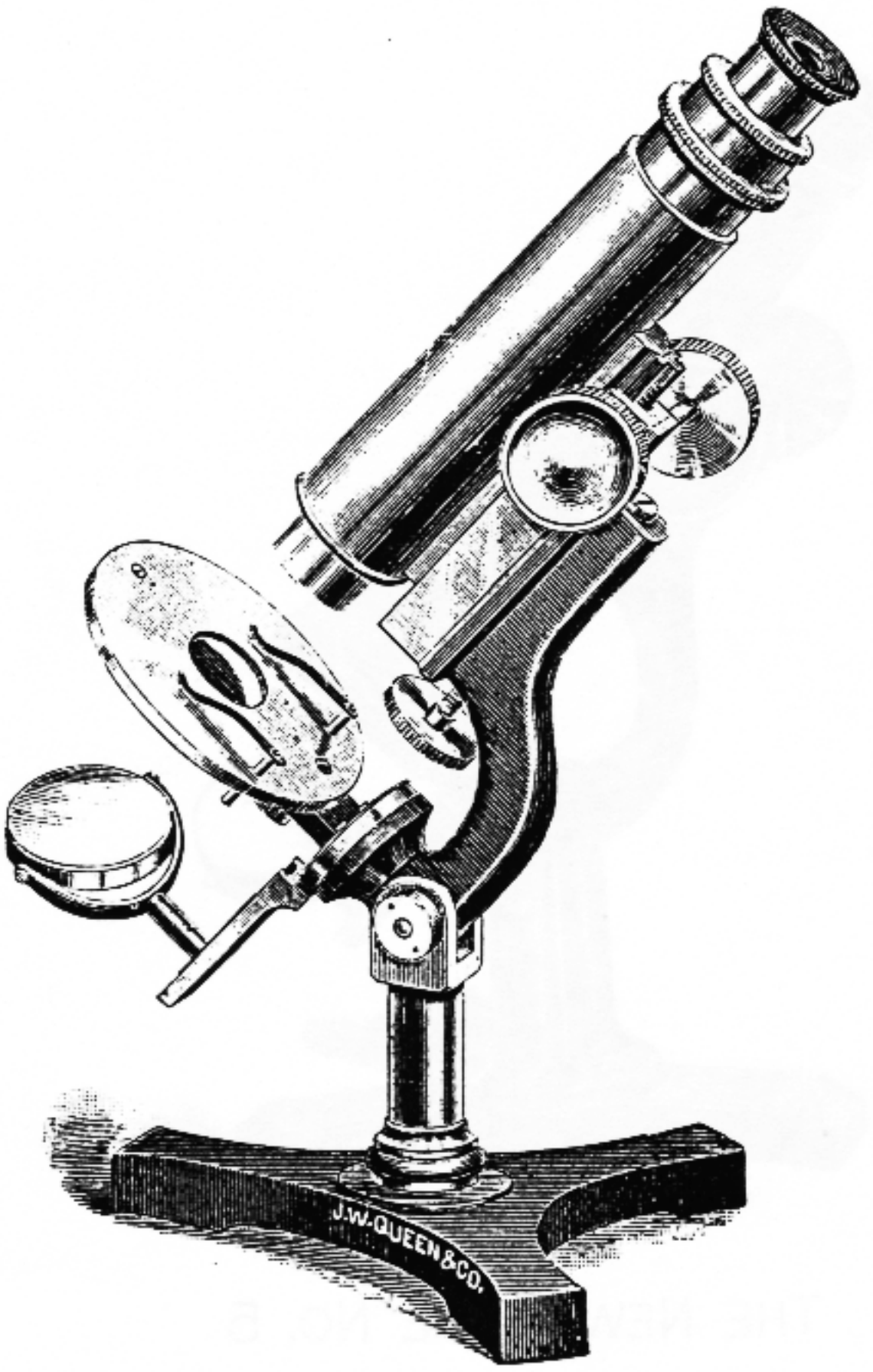
(Signed) "SIMON H. GAGE."

3119. Acme No. 5 Microscope, with rack and pinion of very perfect construction, instead of the sliding-tube adjustment. In case, . . . $35 00

3120. Extra eye-piece, to increase power to 500 diameters, ... 3 00

THE NEW ACME NO. 5

WITH RACK AND PINION



THE ACME NO. 4 MICROSCOPE STAND

No. 3121.

We have already outfitted a number of College laboratories with these microscopes and shall be glad to refer intending purchasers to Professors in such institutions who have them in charge. One of these says:

"It gives me pleasure to state to you that after very careful and repeated tests of the 12 'Acme Microscopes,' purchased from you for this College, I have found them to be excellent instruments for students in biological work. They stand handling admirably. The delicate adjustment attached to the stage works much more conveniently and accurately than was at first anticipated. I prefer this position of the adjusting screw to the old method, because it is more convenient for the hand while working."

THE ACME MICROSCOPE, No. 4.

The "Acme," No. 4, is a microscope of solid though elegant design, well made, easily manipulated, and adequate to do work of a very high grade.

The position of the fine adjustment, which was a "new departure," has been found to be of great convenience. It is not tiresome. This fine adjustment is of great delicacy and truth of motion in the axis and will focus a 1-20th inch objective, or higher, with perfect ease and exactness. Wear can readily be taken up.

The excellent features of this instrument enable us to recommend it especially for the use of physicians, as well as of students in medicine and biology. We also recommend it to the attention of teachers of natural science in our high schools, etc., as an instrument well fitted for such work.

This microscope has a neatly japanned tripod base and arm, the latter mounted on highly finished brass pillar with stout inclination joint. The body-tube is of the convenient length, for use in the vertical position, of 6½ inches, which may be increased, by means of the draw-tube, to the standard length of 10 inches or over; it takes eye-pieces of 1¼ inches diameter, thus giving the advantage of a large field. The draw-tube has society-screw for attachment of amplifier, etc. The rack-and-pinion movement is of great accuracy and delicacy; it has a long slide, giving steadiness and allowing the use of low powers. Every rack movement is adjusted with such accuracy that a ⅕-inch objective may be easily and accurately focused. The mirrors, plane and concave, are mounted to slide (to or from the object) upon the radial mirror-bar, which turns about the object as a centre; for the illumination of opaque objects the mirror may be thrown above the stage. The stage is circular, of brass, 3¼ inches in diameter, and ⅛ inch in thickness, with our standard screw in central aperture, into which screws the tube for carrying accessories, such as polarizing apparatus and various other kinds of illuminating apparatus.

The diaphragm for regulating the light is mounted upon a new plan which has the merit of great convenience, and is well shown in the outline cut; it is upon a hinged arm, which may be instantly swung completely aside, when oblique light is desired, or the attachment of accessories. A spring stop brings each opening nicely central.

The spring-clips are made in such a way that under them the slide may be moved with perfect ease and smoothness—an apparently trifling matter, but really of great importance to the worker. The eye-pieces have removable caps.

3121. ACME MICROSCOPE STAND, No. 4, with one eye-piece only, in finished walnut case, with drawer; (is not complete for use without objectives, for lists of which see pages 53 to 55), ... $30 00

3122. ACME MICROSCOPE, No. 4, with
2-inch eye-piece;
1-inch do.
1-inch object-glass, about 20° aperture.
⅕-inch do. about 100° aperture.

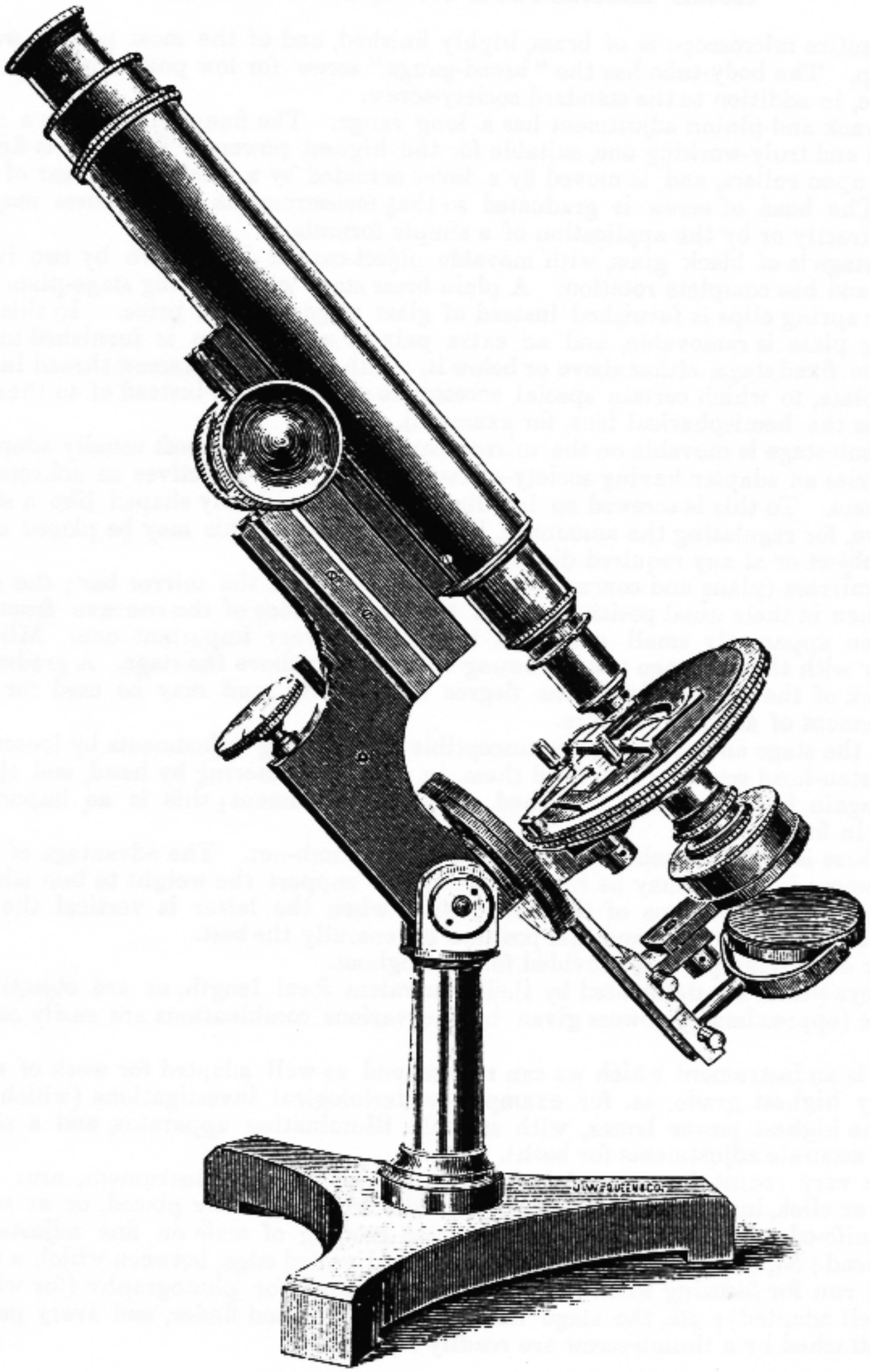
The above combination will give a range of powers of about 40 to 600 diameters; the lenses give clear and excellent definition (the $\frac{1}{5}$-inch will easily resolve *Pleurosigma angulatum*). The microscope is well adapted to receive still higher powers, the fine adjustment working with perfect delicacy and steadiness; and the tube under the stage allows the attachment of accessories, such as illuminating apparatus for use with high powers on bacteria, etc. For those who require higher powers and additional accessories, we shall be glad to assist in the selection of a suitable outfit; no. 3122½ (below) is a good selection.
Price, in finished walnut case, with drawer, ... $55 00

3122½. ACME MICROSCOPE, No. 4, with
2-inch eye-piece;
1-inch do.
2-inch objective, to give low power with large field;
1-inch do.
$\frac{1}{5}$-inch do.
} range of power from 20 to 600 diameters.
Bull's-eye condenser on stand;
Polarizing apparatus with selenite;
Beale's camera-lucida, for drawing;
Stage micrometer, 100 and 1,000 per inch;
Eye-piece micrometer;
Spot-lens for dark ground illumination;
Zoophyte trough for water plants, etc.;
Live-box for animalculæ, insects, etc.;
Stage-forceps;
Fine-pointed steel forceps, nickel-plated;
The above accessories are all neatly fitted into the case. Price, complete, ... $95 00

PARFOCAL EYE-PIECES.

Referring to the article in the April (1886) issue of the MICROSCOPICAL BULLETIN, on "changing eye-pieces without altering focus, etc.," we announce that we are prepared to furnish eye-pieces as there described, with our Acme microscopes, at a slight additional expense.

We have named these eye-pieces PARFOCAL, meaning "of equal focus," from the Latin *par* (equal) and *focus* (same in English).



THE ACME NO. 3 MICROSCOPE

(SEE PAGE 48)

ACME MICROSCOPE No. 3, NEW MODEL.

The entire microscope is of brass, highly finished, and of the most perfect workmanship. The body-tube has the "broad-gauge" screw for low powers of excessive aperture, in addition to the standard society-screw.

The rack and pinion adjustment has a long range. The fine adjustment is a very delicate and truly-working one, suitable for the highest powers. The body is firmly carried upon rollers, and is moved by a lever actuated by a screw at the rear of the arm. The head of screw is graduated so that measurements of thickness may be made directly or by the application of a simple formula.

The stage is of black glass, with movable object-carrier held down by two ivory points, and has complete rotation. A plain brass stage with rotating stage-plate and delicate spring clips is furnished instead of glass stage at a less price. In this the rotating plate is removable, and an extra pair of spring clips is furnished to use with the fixed stage, either above or below it. Both stages have a screw thread in the lower plate, to which certain special accessories may be fitted, instead of to the sub-stage (as the hemispherical lens, for example).

The sub-stage is movable on the mirror bar, is of the gauge most usually adopted, and carries an adapter having society-screw, for the use of objectives as achromatic condensers. To this is screwed an iris diaphragm, conveniently shaped like a short objective, for regulating the amount of light to a nicety. This may be placed close to the object or at any required distance.

The mirrors (plane and concave) are also adjustable on the mirror bar; the mirrors, when in their usual position, rest at the focal distance of the concave from the object, an apparently small point, but in reality a very important one. Mirrors alone or with the sub-stage may be swung obliquely, or above the stage. A graduated disk back of the stage registers the degree of obliquity, and may be used for the measurement of angular aperture.

Both the stage and sub-stage are susceptible of centering adjustments by loosening the capstan-head screws which hold them in position, centering by hand, and tightening again by a steel key furnished with the instrument; this is an important feature in fine work.

The base is firmly attached to the pillar by a thumb-nut. The advantage of this arrangement is that it may be rotated in order to support the weight to best advantage in different positions of the body; thus, when the latter is vertical the toe should be placed forward, and this position is generally the best.

Wear of moving parts is provided for throughout.

The eye-pieces are designated by their equivalent focal length, as are objectives; thus the (approximate) powers given by the various combinations are easily calculated.

This is an instrument which we can recommend as well adapted for work of even the very highest grade, as, for example, bacteriological investigations (which require the highest power lenses, with suitable illuminating apparatus, and a stand having accurate adjustments for both).

Some very recent features of design—as applied to this instrument, are: *1st*, a stop, or click, into which the mirror bar falls when centrally placed, or at zero; *2d*, a knife-edge, or index, for more accurate reading of scale on fine adjustment screw head; *3d*, the latter is made with a doubled milled edge, between which a cord may be run for focusing when the microscope is used for photography (for which it is well adapted); *4th*, the stage has stop for Maltwood finder, and ivory points being attached by a thumb-screw are readily adjustable.

3123.	Acme Microscope No. 3, monocular, glass stage, iris diaphragm, one ocular (no objectives), in neat walnut case, ...	$63 00
3124.	Acme Microscope No. 3, monocular, plain rotating brass stage, iris diaphragm, one ocular (no objectives), in case, ...	55 00
3132.	¾-inch objective, 27° aperture, ...	8 00
3133.	⅕-inch do. 100° do.	15 00

These lenses give clear, sharp definition, and we recommend them very highly as an outfit for either 3123 or 3124. We also recommend that an additional ocular (no. 3134, see below) be obtained; in this case the powers will range from about 60 to 700 diameters. The price of the complete microscope is readily seen by simply adding the prices of stand and objectives (and an extra ocular if taken) together; thus, the prices of 3124, with ⅔ and ⅕ objectives and 2 oculars, is $83.00.

3134.	Extra oculars, 2-inch, 1-inch, and ½-inch focus, each, ...	$5 00
3139.	Movable object-carrier, fitting on stage of Acme No. 4 (may also be used on No. 3, 3124), ...	2 00
3155½.	Glass stage-plate, square (Zentmayer form), with stop for Maltwood finder, fitted to No. 3 or No. 4, with adjustable ivory point to regulate pressure, ...	5 00
3161.	Rotating mechanical stage for Acme Microscope no. 3 or 4, giving accurate and smooth rectangular motions (of good range) by rack-and-pinion and screw, operated by milled heads conveniently placed,	22 00

(*For list of other lenses (objectives) of higher or lower power, see pages* 53 *to* 55; *for list of accessories of various kinds, see pages* 56 *to* 70.)

A PHYSICIAN writes:

"I like my Acme No. 3 more, the more I use it."

A PROFESSOR in the ——— Agricultural College writes:

"Will you kindly inform me what would be your lowest price for six Acme No. 4 microscopes; or five of these and one of the No. 3.

"I think very highly of the No. 4 we have, but would like to add several to my list."

We have recently supplied the biological laboratory of a Western university with twelve ACME No. 4's. The professor writes as follows regarding them:

"The microscopes are certainly what they are represented to be throughout; they are going to answer our purpose admirably, I think. The adjustments, by the way, on these instruments are certainly first-class."

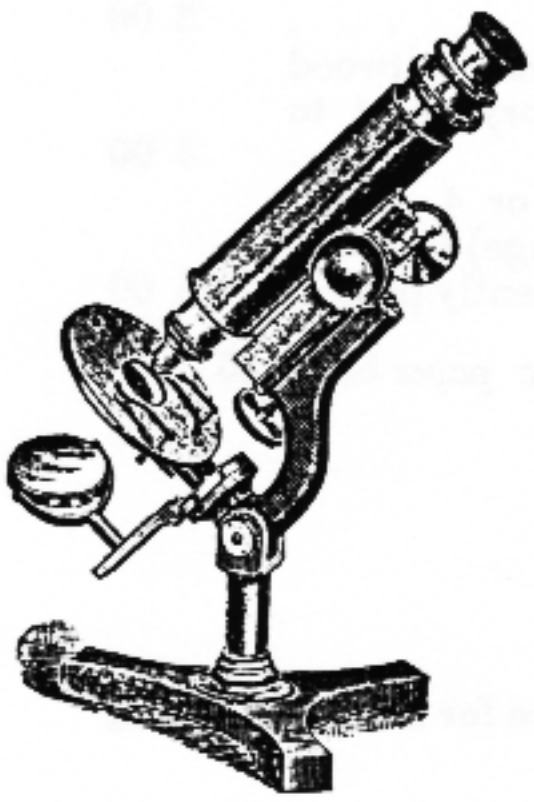
We do not publish names for reasons which may be obvious, but shall be glad to place intending purchasers in communication with these and other workers with the ACME MICROSCOPES.

Since we have undertaken the manufacture of the Acme Microscopes, we have attained in them a thoroughness of workmanship and perfection of adjustment which is a constant source of satisfaction to their owners as well as to ourselves.

In the Acme Microscopess, we especially pride ourselves on the accurate fitting and smooth working of the focal adjustments, which may be called the vital points of a microscope.

TO PHYSICIANS!

The Acme No. 3 Microscope



is adapted for finest work in Bacteriology, etc., as well as for ordinary daily use in urinary analysis. With 3-5 inch and 1-5 inch objectives, 2 eye-pieces (power 50 to 700), glass slides and covers, in case, $83.00.

With same outfit, but with addition of the 1-15 inch oil immersion objective and substage condenser, (power 50 to 1,600), $150.00.

The Acme No. 4 Microscope

is pre-eminently the practicing physician's microscope, having lenses of such power and quality as will clearly show the diagnostic test of consumption (Bac. tuberculosis), and amply efficient for urinary analysis, etc.

With 1 in. and 1-5 in. objectives, 2 eye-pieces (power 40 to 600), glass slides and covers, in case, $55.00.

The Acme No. 5 Microscope

is an instrument of simple but thorough construction, with good lenses, and at a minimum cost, admirably adapted for physicians' daily use in urinalysis, etc. With 1 inch and 1-5 inch objectives, of excellent quality, one eye-piece (power 40 to 350), in plain case, $28.00.

This is now also made with first-class rack and pinion adjustment (instead of the sliding-tube), in plain case, $35.00; or in walnut case, $36.50.

JAMES W. QUEEN & CO.,

MAKERS OF THE ACME MICROSCOPES,

924 Chestnut Street, Philadelphia, Pa.

THE NEW ACME No. 5 MICROSCOPE

is, by its solidity and simplicity of construction and the superior excellence of its lenses, ESPECIALLY ADAPTED FOR LABORATORY USE in the hands of students.

A professor in one of our Western Medical Colleges writes:—"I was much pleased with the instrument. It seemed to me to furnish what I have often thought might be accomplished, viz.: an instrument of good ordinary working ability and without more than the minimum of expense in the mounting. When we are prepared to furnish laboratory, I shall communicate with you further."

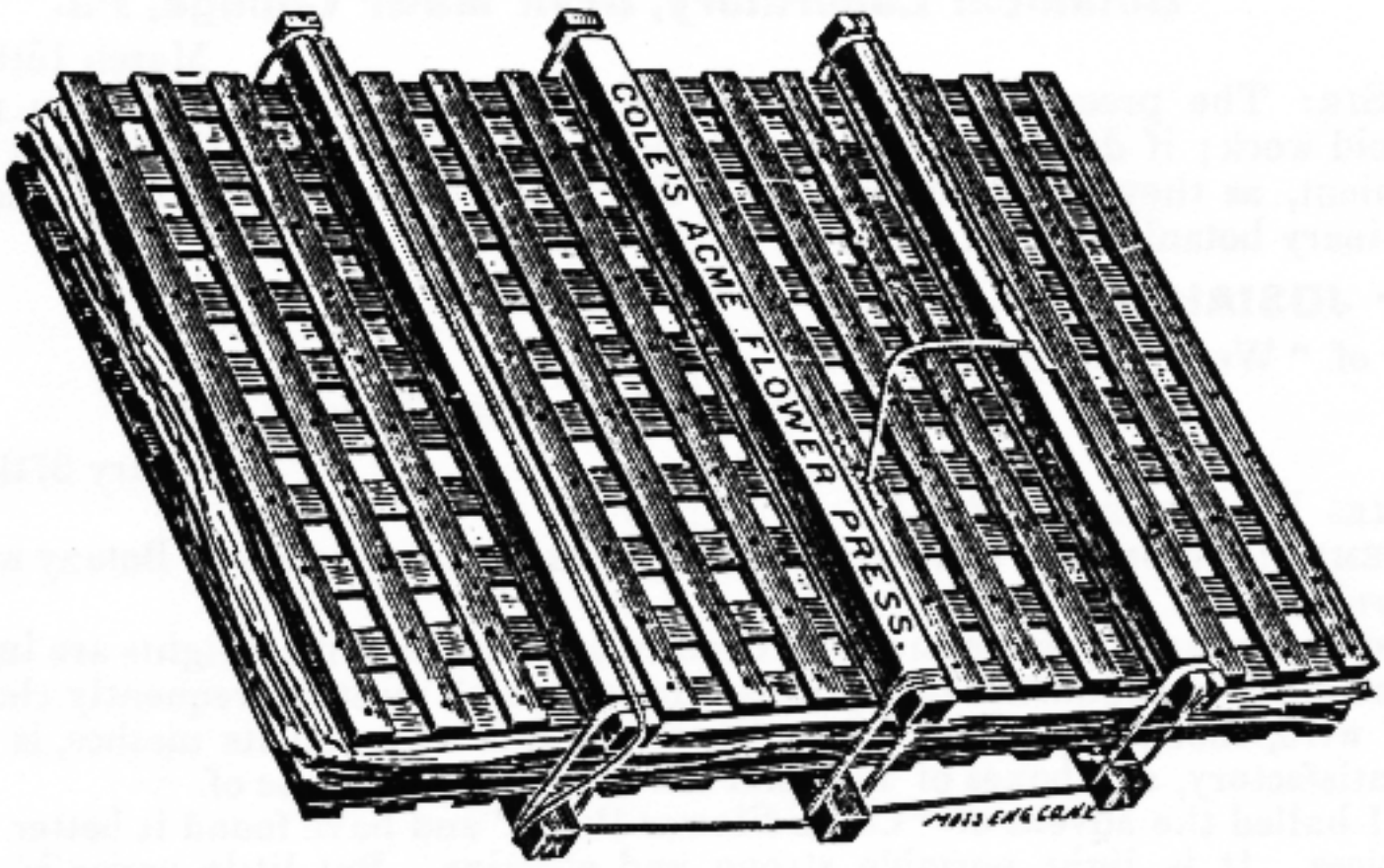
Name will be given on application.

The Acme No. 5 (with rack and pinion) has been on trial for a few days, and I have the following report to make: It is satisfactory except in the arrangement of the spring clips which are too stiff and not adjustable.* The optical parts are excellent. Send us half a dozen Acme No. 5 (rack and pinion) as soon as possible.

Name will be given on application.

*These objections have now been overcome.

The Acme Plant Press.



A Plant Press should be Simple, Portable, Strong, and above all a Rapid Dryer of Specimens.

The ACME consists of two lattice-work frames of walnut strips fastened at each crossing by brass nails clinched on the under side. To each frame are secured three walnut cross-pieces, one of which bears a double spring belaying-pin which holds the free end of the binding cord. This form combines maximum strength with minimum weight. The press is light enough to be carried easily on botanical excursions, thus avoiding the injury to delicate specimens, through withering or breaking, in collecting boxes.

Being made of lattice-work and using a rapidly absorbing paper, it is the quickest drying press yet invented. Hung out of a window in the sunlight and air, or over a stove or other source of heat, it dries specimens so quickly that their natural colors are very perfectly preserved.

From one to fifty or more specimens may be pressed equally well at one time. The necessary pressure is secured by winding the cord (a hard doubled and twisted twine), about the grooved ends of the cross-pieces on one side, as shown in the cut; one hand is then placed on a cross-piece, and the weight of the body holds the frames together while the cord is bound about the other ends of the cross-pieces and secured by simply drawing it under the spring belaying-pin. This method of securing the frames is proved superior to screws or straps because of its lightness, simplicity, and elasticity.

Size A, 12x18 inches; with straw boards and drying paper, ...	$2.25
Size B, 10x14 do. do. do. do. do.	2.00

OPINIONS OF EXPERIENCED TEACHERS:

Professor A. N. PRENTISS, M. S.:

Botanical Laboratory, Cornell University, Ithaca, N. Y.

DEAR SIRS: I regard Cole's Plant Press as serviceable and convenient, especially where the collector is traveling and a portable press is desired.

Professor E. L. GREGORY:

Botanical Laboratory, Bryn Mawr College, Pa.

March 15th, 1888.

DEAR SIR: The presses give satisfaction in every way, and I find them particularly useful for field work; if delicate plants are to be pressed when fresh, these light presses are very convenient, as they may be carried into the field with very little more inconvenience than an ordinary botanizing box.

Professor JOSIAH KEEP, A. M.,

Author of "West Coast Shells":

Mills College, Alameda County, Cal.,

February 27th, 1888.

Messrs. JAMES W. QUEEN & Co.:

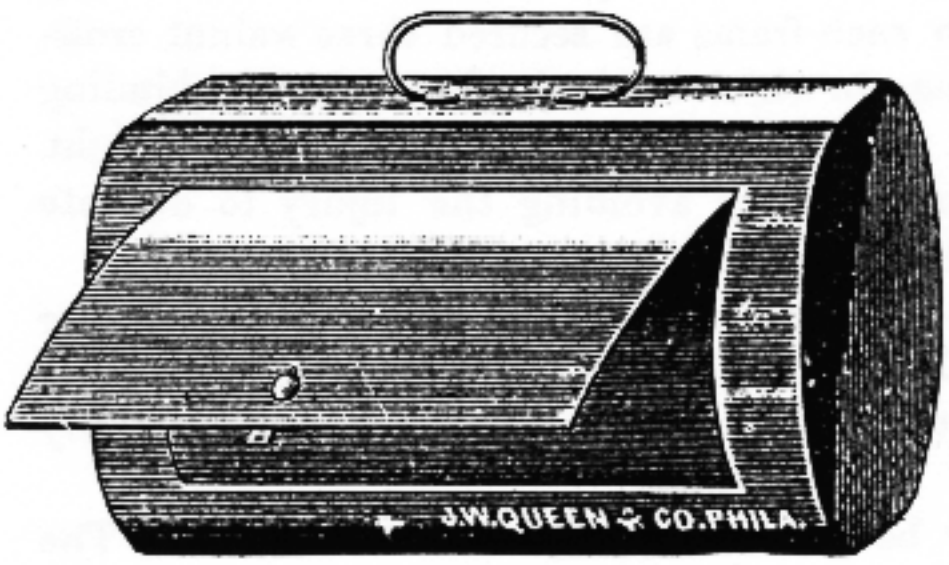
GENTLEMEN: To provide suitable Flower Presses for a large class in Botany was formerly a difficult problem.

Good screw-presses are expensive and cumbersome, boards with weights are inconvenient, while both require an abundance of absorbent driers, which must be frequently changed.

Woven wire, though allowing the moisture to escape through its meshes, is too flexible to be very satisfactory, and boxes of hot sand can seldom be made use of.

Hence I hailed the advent of "Cole's Flower Press," and have found it better than any of the old devices. It is light, portable, strong, and effective. But little paper is needed, and plants dry rapidly when it is exposed to the sunshine or in-door heat. We used these presses last season with much satisfaction, and I gladly recommend them to other teachers.

BOTANICAL COLLECTING CASES,



Japanned inside and out, in two sizes:

$1.50 (12x7½x3½); and $1.75 (15x8¼x4¼).

Lid fastens by bolt operated by a button, which cannot catch in the clothing.

These cases are now supplied with a light and neat strap, at no advance in price; or strap may be omitted and allowance made.

Special estimates made for any required quantity for class use.

BOTANICAL PAPERS:

DRYING PAPER,

18 by 24 (for doubling to 12 by 18), 25 cents per quire.

(This is the size used in our full-size plant press; we can, however, furnish other sizes to order if wanted in lots of 100 sheets or more.)

MOUNTING PAPER,

white, firm, and close grained, 11½ by 16½; 25 cents per quire, $4.40 per ream.

GENUS COVERS,

of heavy, fine quality paper, 23½ by 16¾; 3 cents per sheet, $2.25 per 100.

ACHROMATIC OBJECT-GLASSES.

QUEEN'S OBJECTIVES FOR THE AMATEUR OR STUDENT.

No.							Price
3175.	1¾	inches focus,	13	degrees	aperture	(nearly),	$ 7 00
3176.	⅞	do.	30	do.	do.	do.	12 00
3177.	½	do.	45	do.	do.	do.	9 00
3178.	⅕	do.	100	do.	do.	do.	15 00
3179.	1/10	do.	immersion,				19 00

To the large number of students and others who desire good objectives at a moderate price, we recommend these lenses. They are made to our order by one of the most noted opticians; the most of them from special and new formulæ worked out especially for us. To the ⅞ inch, we call special attention; it is a low-power lens (not higher than most "1 inch" objectives), of large aperture, flat field, and sharp definition. The 1¾ inch and ½ inch are of smaller relative aperture. The former is a triplet combination of good performance; the latter is especially recommended as a most useful lens of excellent quality. The ⅕ inch easily resolves P. angulatum, and is a good working lens. The 1/10 inch also gives good definition, and has great working distance. All have standard society-screw, and are cased in neatly-engraved and substantial brass boxes.

Our Oil-Immersion 1-15 inch is Emphatically a Lens for the Bacteriologist and Others Engaged in Fine Work Requiring High Powers with Fine Definition.

It Combines the Large (Numerical) Aperture of about 1.28, *with Long Working Distance.*

Price, $60.00.

Dr. Shakespeare, who was appointed a Commissioner by the United States Government to visit Southern Europe (and later India) to investigate the cholera, its cause, nature, prevention, etc., and who has recently returned, writes us:

The new 1/15-inch oil-immersion lenses which you sent me a few days ago for examination I find so satisfactory for bacteriological investigation that I will purchase one of them.

E. O. Shakespeare.

Phila., *December* 1*st*, 1886.

SPENCER'S FIRST-CLASS SERIES.

DRY OBJECTIVES.

3185.	3	inch	focal length,	13	degrees	angular aperture,	$25 00
3186.	2	do.	do.	20	do.	do.	30 00
3187.	1	do.	do.	40	do.	do.	40 00
3188.	⅔	do.	do.	47	do.	do.	30 00
3189.	½	do.	do.	100	do.	do.	50 00
3190.	¼	do.	do.	135	do.	do.	40 00
3191.	⅛	do.	do.	150	do.	do.	45 00
3192.	1/15	do.	do.	150	do.	do.	65 00

HOMOGENEOUS-IMMERSION OBJECTIVES.

3193.	$\frac{1}{4}$ inch,	120°	bal. angle,	1.32	numerical aperture,	$75 00
3194.	$\frac{1}{6}$ do.	125°	do.	1.35	do.	75 00
3195.	$\frac{1}{10}$ do.	116°	do.	1.29	do.	65 00
3196.	$\frac{1}{16}$ do.	125°	do.	1.35	do.	80 00
3197.	$\frac{1}{15}$ do.	115°	do.	1.28	do.	80 00
3198.	$\frac{1}{16}$ do.	125°	do.	1.35	do.	120 00
3199.	$\frac{1}{25}$ do.	126°	do.	1.35	do.	150 00
3200.	$\frac{1}{50}$ do.	100°	do.	1.17	do	250 00

The homogeneous immersion objectives are in first-class adjustable mountings, and have sufficient range of adjustment to admit of the use of glycerine, or water, as the immersion medium, with good working distance. They are adjusted to work at the closed point, with homogeneous immersion fluid, and standard length of main tube.

BIOLOGICAL SERIES.

3201.	$\frac{1}{8}$ inch,	105°	bal. angle,	1.21	numerical aperture,	$50 00
3202.	$\frac{1}{18}$ do.	105°	do.	1.21	do.	85 00
3203.	$\frac{1}{30}$ do.	105°	do.	1.21	do.	135 00
3204.	$\frac{1}{60}$ do.	105°	do.	1.21	do.	250 00

This new series has been specially constructed to meet the demand of workers in bacteria, general histology, etc., work requiring perfect definition and flatness of field, very long working distance and corrections for spherical and chromatic aberration most effective with light central, or nearly so. These objectives meet such requirements to a high degree; the working distance, of the one-thirtieth, for example, is over *one one hundredth* of an inch. At the some time their resolving power is equal to that of any objective having no larger angle. They are all in first class adjustable mounting, the adjustment having range sufficient to allow of their being used either with water, glycerine, or homogeneous fluid as immersion medium.

SPENCER'S PROFESSIONAL SERIES.

3210.	3 inch focus,	13	degrees angle of aperture,			$25 00
3211.	2 do.	16	do.		do.	18 00
3212.	1 do.	33	do.		do.	20 00
3213.	$\frac{2}{3}$ do.	36	do.		do.	20 00
3214.	$\frac{1}{2}$ do.	70	do.		do.	25 00
3215.	$\frac{1}{4}$ do.	115	do.		do.	adjustable, 30 00
3215½.	$\frac{1}{6}$ do.	105	(bals.)	do.	do.	immersion adjustable, 40 00
3216.	$\frac{1}{6}$ do.	175		do.	do.	dry and imm. do. 40 00
3217.	$\frac{1}{8}$ do.	175		do.	do.	do. do. do. 40 00
3217½.	$\frac{1}{10}$ do.	113	(bals.)	do.	do.	immersion do. 50 00
3218.	$\frac{1}{15}$ do.	100	(bals.)	do.	do.	do. do. 60 00
3219.	$\frac{1}{18}$ do.	180		do.	do.	dry and imm. do. (100° bals.), 70 00

The Professional series, though of smaller angle than the first-class, are strictly *first-class* in workmanship. The powers above the one-half inch are in adjustable mountings, with graduated collar. The "dry and immersion" objectives of this series are corrected as dry lenses, for central light, and have good working distance. By oblique light, they are corrected to work as water immersion, and are more than the equivalent of 180° air angle. The "immersion" objectives of this series will all resolve *A. pellucida* in balsam.

BAUSCH & LOMB OPTICAL CO.'S OBJECTIVES.

FIRST-CLASS SERIES.

Dry-working Lenses.

No.							Price.
3240.	3 inch focus,	16	degrees	angular aperture,			$18 00
3241.	2 do.	22	do.	do.			18 00
3242.	1 do.	45	do.	do.			25 00
3243.	½ do.	98	do.	do.	adjustable,		30 00
3244.	⅙ do.	110	do.	do.	do.		34 00
3245.	¼ do.	140	do.	do.	do.		40 00

Homogeneous Immersion Lenses.

3246.	¼ inch focus,	140°	bals.	angle (1.43 numerical aperture),	adjustable,		100 00
3247.	⅕ do.	do.	do.	do.	do.	do.	70 00
3248.	⅙ do.	do.	do.	do.	do.	do.	70 00
3249.	⅛ do.	do.	do.	do.	do.	do.	75 00
3250.	1/10 do.	do.	do.	do.	do.	do.	80 00
3251.	1/12 do.	do.	do.	do.	do.	do.	90 00
3252.	1/16 do.	do.	do.	do.	do.	do.	125 00
3253.	1/25 do.	do.	do.	do.	do.	do.	200 00

Nos. 3243 and 3244 are furnished in non-adjustable mountings, at $3.00 less than listed prices. Each of the homogeneous immersion lenses is accompanied with a vial of suitable immersion fluid, with instructions for making. The ¼-inch, owing to the large size of the lenses, is made only with the "broad-gauge" screw.

PROFESSIONAL SERIES.

3254.	4 inch focus,	10	degrees	angular aperture,			$13 00
3255.	3 do.	12	do.	do.			13 00
3256.	2 do.	15	do.	do.			13 00
3257.	1 do.	36	do.	do.			15 00
3258.	¾ do.	40	do.	do.			15 00
3280.	½ do.	65	do.	do.			18 00
3281.	¼ do.	125	do.	do.	adjustable,		24 00
3282.	⅙ do.	165	do.	do.	do.	immersion,	23 00
3283.	⅛ do.	170	do.	do.	do.	do.	25 00
3284.	1/10 do.	170	do.	do.	do.	do.	28 00
3285.	1/12 do.	175	do.	do.	do.	do.	30 00
3286.	1/16 do.	175	do.	do.	do.	do.	35 00

STUDENT'S SERIES.

3287.	4 inch focus,	6	degrees	angular aperture,		6 00
3288.	3 do.	9	do.	do.		6 00
3289.	2 do.	12	do.	do.		6 00
3290.	1 do.	20	do.	do.		6 00
3291.	¾ do.	27	do.	do.		8 00
3292.	½ do.	42	do.	do.		9 00
3293.	⅘ do.	55	do.	do.		13 00
3294.	¼ do.	100	do.	do.		14 00
3295.	⅕ do.	110	do.	do.		15 00
3296.	⅙ do.	115	do.	do.		18 00
3297.	1/12 do.	130	do.	do.		24 00

Nos. 3294 to 3297, in adjustable mountings, $3.00 additional.

CROUCH'S OBJECTIVES.

No.						Price.
3325.	4 inch focus,	9	degrees	angular aperture,		$9 50
3326.	3 do.	12	do.	do.		13 50
3327.	2 do.	15	do.	do.		13 50
3327½.	2 do.	12	do.	do.		8 00
3328.	1½ do.	20	do.	do.		13 50
3329.	1 do.	25	do.	do.		13 50
3329½.	1 do.	16	do.	do.		7 50
3330.	⅔ do.	25	do.	do.		13 50
3331.	½ do.	40	do.	do.		18 00
3332.	¼ do.	100	do.	do.	adjustable,	28 00
3332½.	¼ do.	100	do.	do.	non-adjustable,	14 00
3333.	⅕ do.	100	do.	do.	adjustable,	28 00
3333½.	⅙ do.	100	do.	do.	non-adjustable,	16 00
3334½.	1/10 do.	120	do.	do.	do.	25 00

The above, generally, we can supply at once from stock; we do not list here all of Crouch's Objectives. Lieberkuhns can be furnished for most of the low-power Objectives.

WM. WALES' OBJECTIVES.

FIRST QUALITY.

3350	4-inch focus,	9	degrees	aperture,		$15 00
3351.	3 do.	12	do.			17 00
3352.	1½ do.	23	do.			17 00
3353.	1 do.	25	do.			17 00
3354.	⅔ do.	30	do.			17 00
3355.	24/100 do.	75	do.	adjustable,		30 00
3356.	4/100 do.	95	do.	do.		35 00
3357.	4/100 do.	115	do.	do.		40 00
3358.	⅕ do.	100	do.	do.		30 00
3359.	⅕ do.	135	do.	do.		35 00
3360.	⅕ do.	170	do.	do.		40 00
3361.	1/100 do.	170	do.	do.	immersion,	45 00
3362.	1/150 do.	170	do.	do.	do.	60 00
3363.	1/225 do.	160	do.	do.	do.	100 00

ECONOMIC SERIES.

3364.	1-inch focus,	15	degrees	aperture,		6 00
3365.	⅔ do.	20	do.			6 00
3366.	⅕ do.	80	do.			12 00
3367.	1/10 do.	120	do.	immersion,		20 00

The above, in neat engraved boxes, $1.00 extra each.

"MEDICAL" OBJECTIVES.

For those who need objectives of higher grade than the French triplets, but who do not wish to pay the price of a first-class adjustable lens, we can recommend the following, which we call our "MEDICAL" OBJECTIVES. They are all of good quality (the high powers being especially recommended), while the prices will be found very reasonable. The ⅛th and 1/11th will resolve *Pl. angulatum by central light.*

3406.	⅕ inch, dry,	70°	air	aperture,	8 00
3408.	⅙ do.	85°	do.		9 00
3410.	⅛ do.	130°	do.		12 00
3411.	⅛ inch immersion,	130°	air	aperture,	16 00
3412.	1/11 do.	140°	do.		18 00

FRENCH OBJECTIVES.

These are doublet or triplet Achromatic combinations, dividing to give lower power when required. They are made with a small French screw; but can be furnished with an adapter having the society-screw, at 75 cents additional.

3426.	½ inch focus,	25	degrees angular aperture,			$3 00
3427.	3/10 do.	30	do.	do.		3 50
3429.	¼ do.	50	do.	do.		4 00
3430.	⅕ do.	55	do.	do.		6 00
3431.	1/10 do.	55	do.	do.		7 00
3432.	1/11 do.	60	do.	do.		8 00
3433.	⅛ do.	80	do.	do.		7 50
3433½.	1/12 do.	100	do.	do.		9 00
3434.	1/10 do.	120	do.	do.		12 00

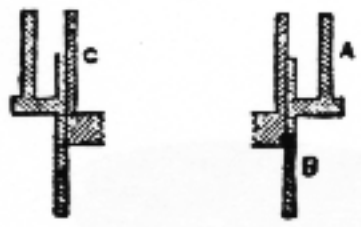
ACCESSORY APPARATUS.

ALPHABETICALLY ARRANGED.

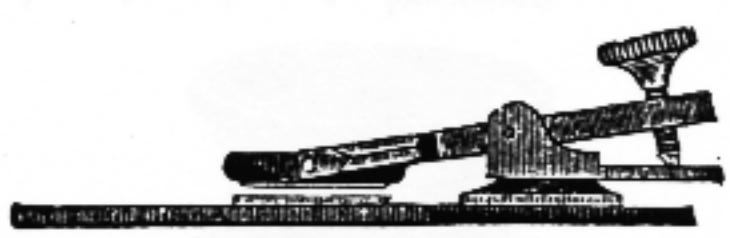
NOTE.— *When ordering accessories state for what microscope they are intended.*

No.		Price.
3435.	Adapter with Society-screw, and focusing adjustment, to fit tube beneath stage, (see *Microscopical Bulletin*, February, 1884,)	$2 00
3436.	Adapter with Society-screw for use of Object-glass as Achromatic Condenser, to fit tube beneath stage,	1 00
3437.	Adapter as above, with screws for accurately centering (as in No. 3529),	6 00
3438.	Do. on stand, with lengthening arms and ball and socket joint, for use of Object-glass as Achromatic Condenser,	4 00
3439.	Amplifier, Achromatic, for increasing the power and working distance of any objective, with Society-screw, to screw into draw-tube,	7 50
3440.	Blue-glass Slip, 3x1, for neutralizing the yellowness of artificial light,	15
3441.	Blue-glass Disk, unmounted, to fit diaphragm,	30
3442.	Do. do. mounted, to fit sub-stage tube,	1 25
3443.	Do. do. do. with Society-screw,	1 25
3444.	Do. Rainey's Compound, for obtaining the most perfect whiteness of artificial light attainable; on stand with ball and socket joint,	9 00

3445.



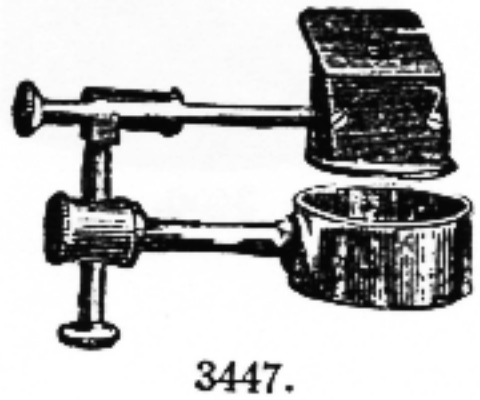
3435 (SECTIONAL).



3451.

3452.

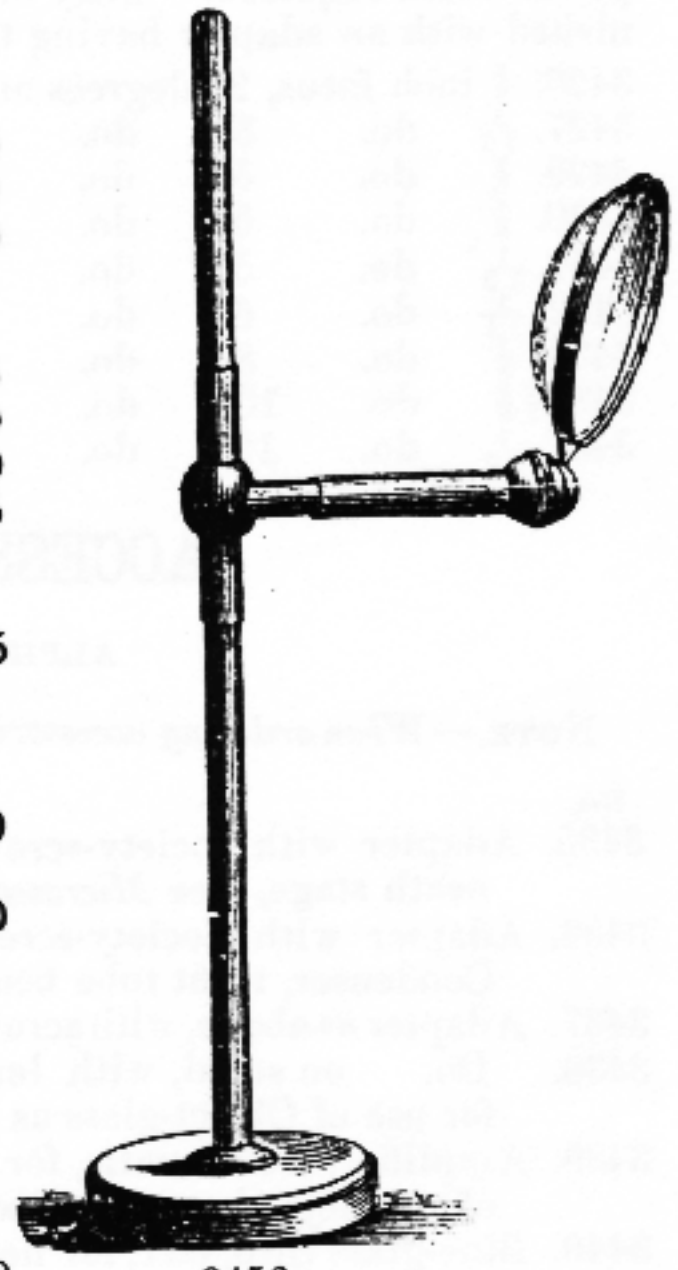
3445.	Camera-Lucida, for drawing objects, Beale's Neutral-tint; for Zentmayer's or Beck's Microscopes, $3.00; for Crouch's,	2 50
3446.	Camera-Lucida, prism form, allowing the use of the microscope in an inclined position,	6 00



3447.

3453.

No.		Price.
3447.	Camera-lucida, prism form, allowing the use of the microscope in a vertical position,	$8 00
3448.	Camera-lucida, steel disk,	6 50
3449.	Do. Wollaston's prism,	6 50
3450.	Do. do. with lens to facilitate accurate vision of pencil point,	8 75
3451.	Compressor, lever form,	8 50
3452.	Do. reversible,	9 00
3453.	Do. Wenham's,	2 25
3454.	Condenser, for illumination of opaque objects, on stand, with iron base, 1½-inch lens,	2 25
3455.	Condenser, for illumination of opaque objects, on stand, with brass base, and ball and socket joint, lens 1⅝-inch diameter,	4 00
3456.	Condenser on large brass stand, bull's-eye lens, about 2½ inches diameter,	8 50
3456½.	Diffraction-plate and set of diaphragms, with rotating adapter, to illustrate experimentally Abbe's theory of microscopic vision (see *Carpenter*, 6th ed., pp. 186 to 191); can be used with Zeiss' 1¼-inch objective (price $11.00), or other lens of same power,	5 00

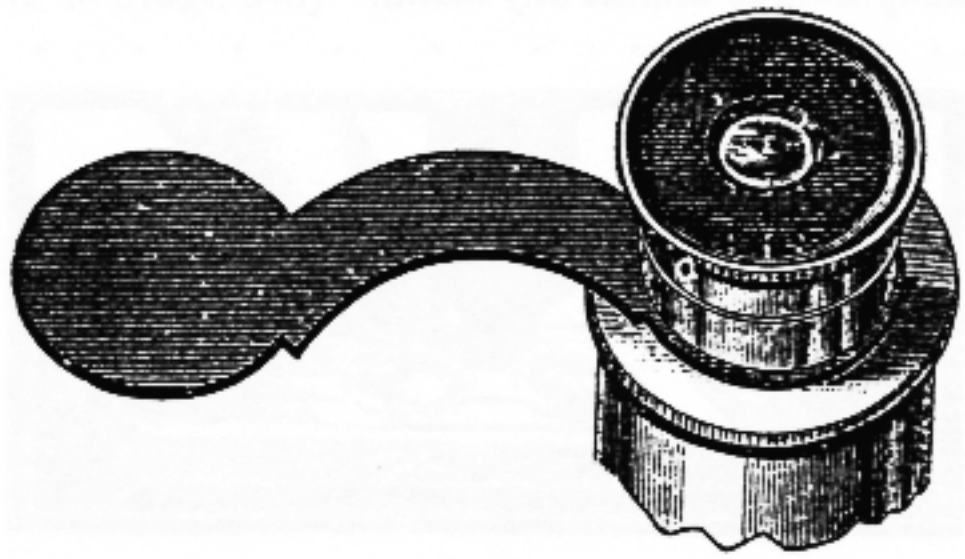


3456.

3457.	Draw-Tube, graduated, for any microscope,	4 00
3458.	Erecting-Glass, to screw into Draw-Tube. This allows the Compound Microscope to be used as a dissecting instrument, with considerable range of power (with same object-glass) and increase of working distance,	6 00

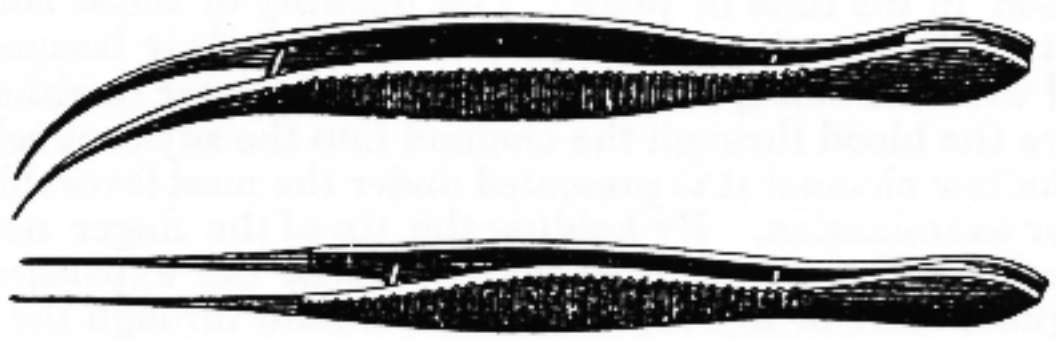
3460.

No.		Price
3459.	Eye-Pieces (or Oculars) for largest Microscopes, . $6.00, $6.50, and	$7 00
3460.	Do. for intermediate or Student's size, ...	5 00
3461.	Eye-Pieces, Kelner's Orthoscopic (Achromatic construction), giving a fine, large, clear field, ...	8 00
3462.	Eye-Pieces, solid, of either ½, ⅓ or ¼-inch focus; these are advantageous when very high powers are required, . . $8.00 and	7 50



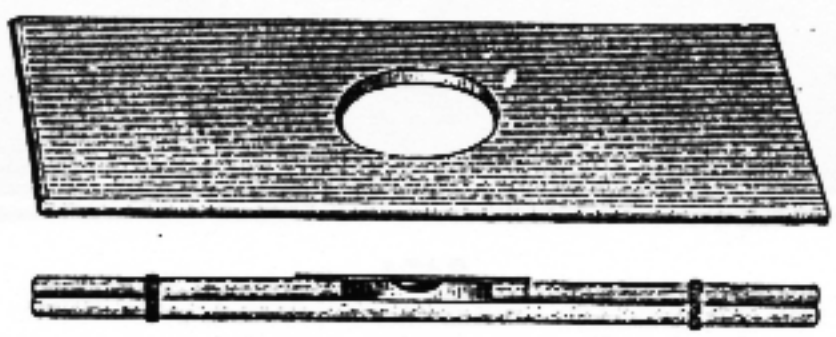
3463.

3463. Eye-shade, for use with Monocular Microscope. With this valuable little piece of apparatus *both eyes* may be kept open with perfect ease, and the microscope used for long periods with much less fatigue to the eyes than without. Fitted to any microscope for . . . 1 00



3464.

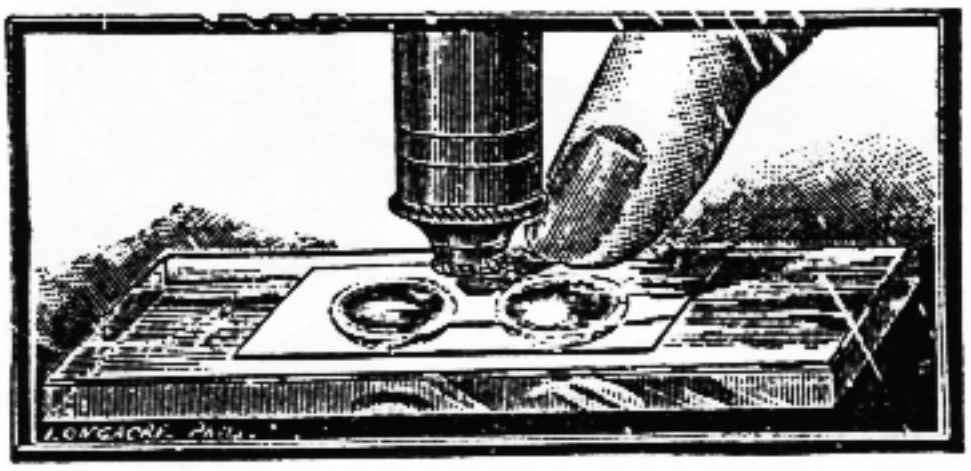
3464.	Forceps: for list of these see pages 75–76, ...	1 25
3465.	Frog-Plate, for showing circulation of the blood, ...	4 50
3466.	Glass Slip, 3x1 inch, with ledge, for examination of liquids and for general use, ...	20
3467.	Glass Slip with ledge (as above) and concave centre, . . .	35
3468.	Goniometer, Leeson's Double-image, with divided circle, to fit over eye-piece, ...	20 00
3469.	Goniometer Eye-Piece with divided circle, and a system of parallel lines ruled on glass; eye-lens adjustable for focus, . . .	15 00



3470.

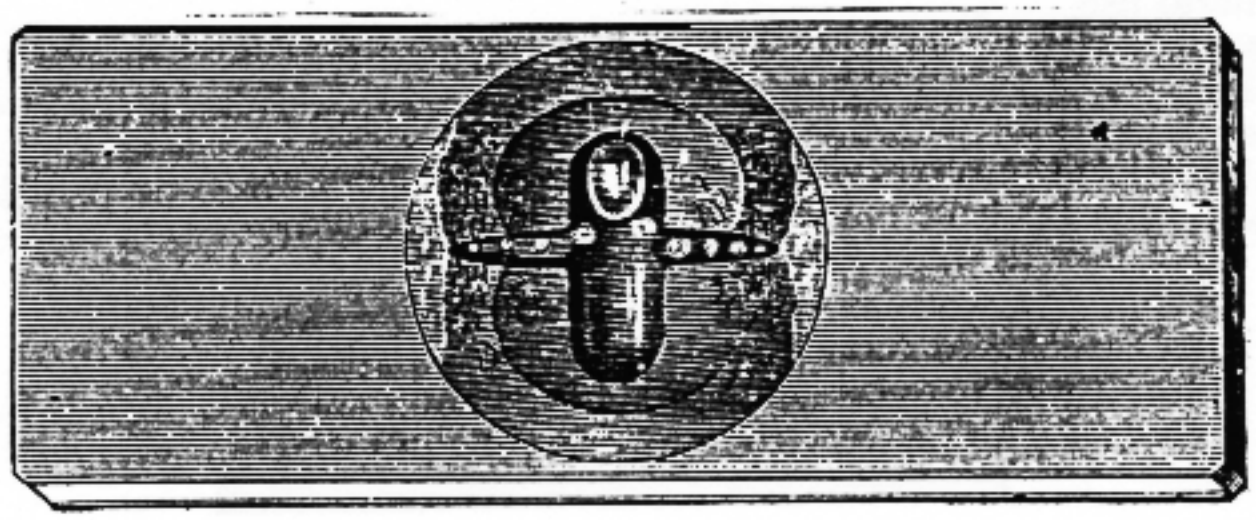
3470. Growing Slide or Moist Chamber, Deby's form, with covers, etc., in box. (For description, see *English Mechanic*, Jan. 14th, 1881, also *Amer. Mo. Mic. Jour.*, Feb., 1881). Specially suitable for minute

No.		Price.
	objects, such as may be contained in a small drop of water, attached to the under side of the cover-glass, ...	$0 50
3471.	Hemispherical Lens, for securing great obliquity of illumination, especially with wide aperture immersion lenses. Unmounted; to be attached to under surface of the slide by means of glycerine or other suitable fluid, ...	1 50
3472½.	Hemispherical Lens, in new and ingenious mounting, for attaching to edge of stage (the design of Mr. John W. Sidle); making this accessory adaptable to almost any stand. (See figure of No. 3515½, page 150), ...	4 50



3473.

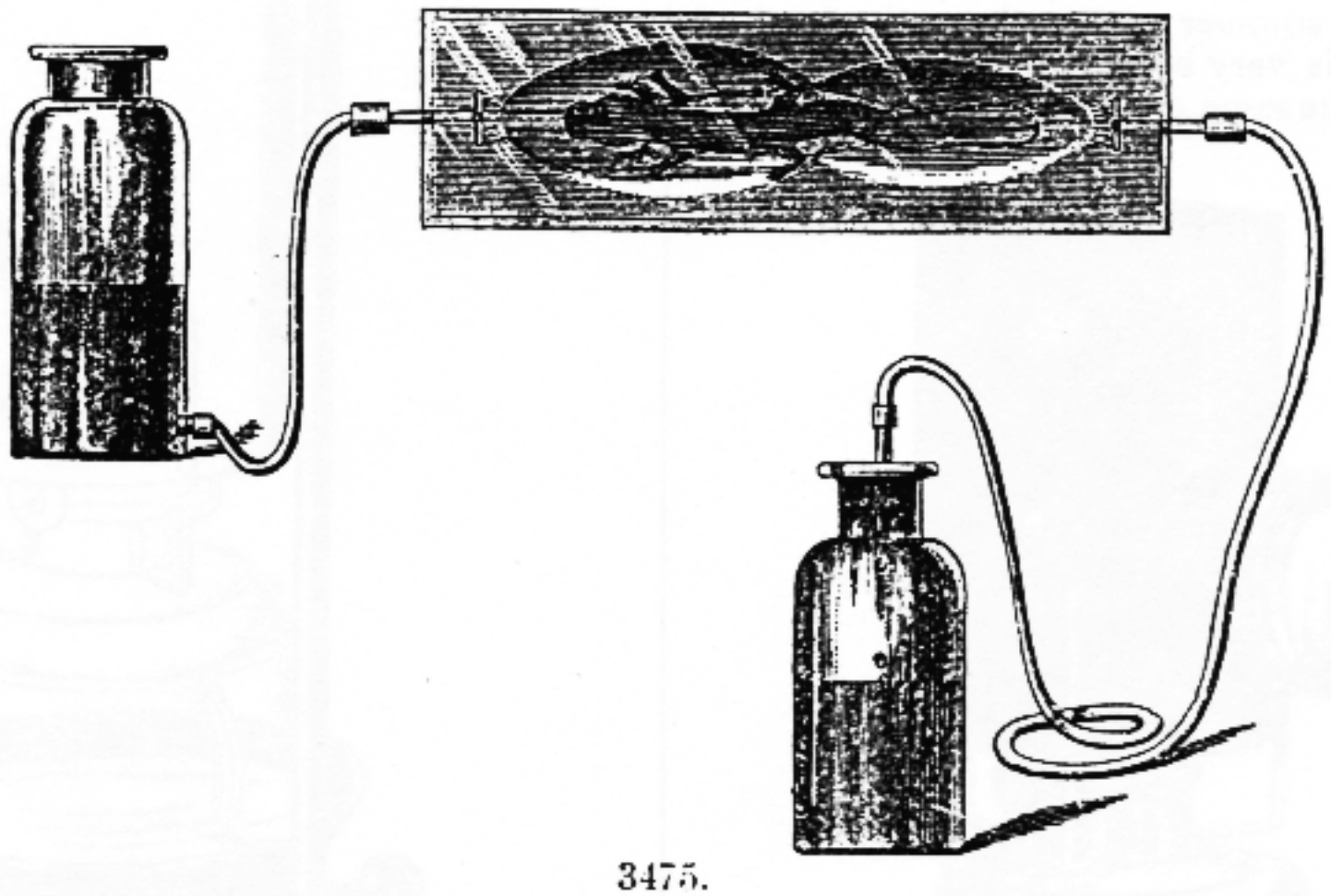
3473. Holman's Current Slide consists of a slip of glass 3x1 inch, containing two concave cells connected by a narrow and shallow channel. If a few drows of blood be placed in these cells, and a cover of thin glass be pressed down, some of the blood, finding its way between the surfaces in contact, will dry, and act as a cement to hold the fluid blood in the cells in place. The quantity of blood being insufficient to fill the cells, a considerable amount of air becomes imprisoned with the blood, and the expansion of the air in either cell will drive the blood through the channel into the adjacent cell, and in the shallow channel it is presented under the most favorable condition for examination. By holding the tip of the finger near one or the other cell, the heat is enough to cause the expansion and a consequent more or less rapid flow of the fluid through the channel. This flow may be arrested, or continued and reversed at will, by change of position of the finger, so that any particles floating in the liquid can pass in succession across the field, but can be arrested and examined with ease at will. Price, with covers, . . . 1 50



3474.

3474. Holman's Life Slide, for keeping alive, and ready at hand for examination, small organisms such as Infusoria, etc. The cavities and groove occupy a circular surface-of the slide about ¾-inch in diameter, which is covered, when in use, with a circular piece of microscopic glass 1 inch in diameter. When the smaller forms are inclosed in one of these life slides, to get access to the air they seek

No.		Price.
	the edges of the cover, and range themselves in a zone, at a short distance from its rim, close to where the air comes in contact with the water. Being thus situated, in accordance with the law that compels them to take up these positions, they can be viewed with the highest powers of the microscope, and their true nature and habits well studied. Price, with cover, ...	$1 50



3475.

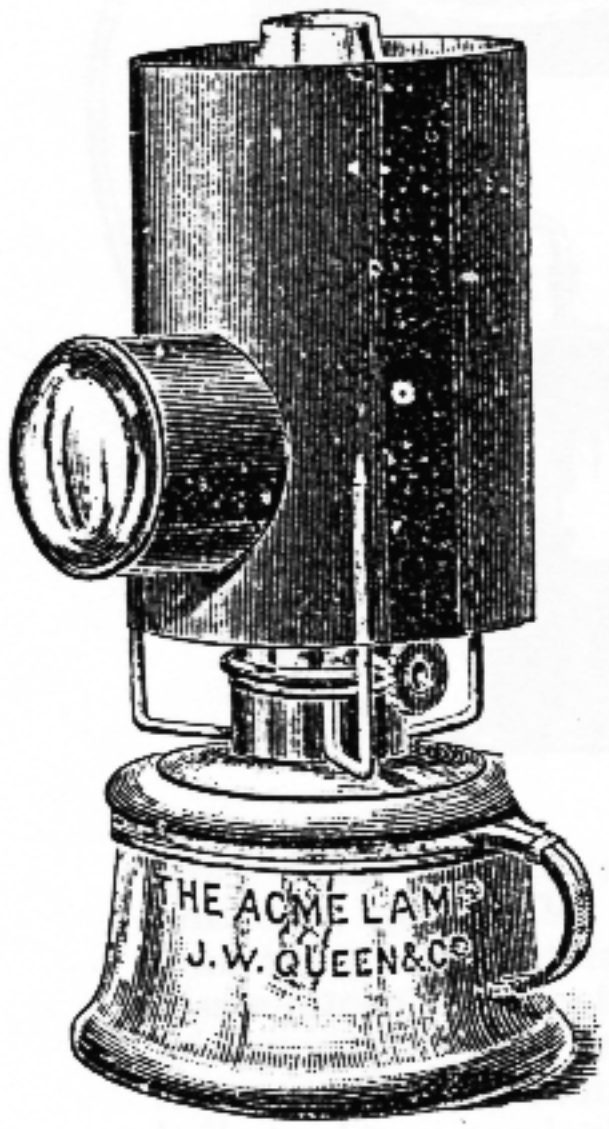
3475.	Holman's Syphon Slide is a modification of the "Life" and "Current" slides, whereby living objects of suitable size and habits can be retained under observation uninterruptedly for days or even weeks. A current of water is made to flow continuously through the chamber containing the object, so that the processes of respiration, circulation, digestion and nutrition, the phenomena of inflammation, and the effects of some classes of poisons, may be studied at leisure and under perfectly natural or entirely controllable conditions. For use with the Projecting Lantern, in projecting the images of living objects upon the screen, this apparatus is absolutely perfect—the flow of fresh water through the chamber being so constant that its inmates are entirely free from inconvenience during the most protracted exhibition. The position of the slide, when in use, should be slightly *above* the level of the reservoir, while the escape-tube must rest *below* the same, thus insuring a veritable *syphon* action in the apparatus; a constant flow of water being secured in connection with the required atmospheric pressure for the retension of the cover on the slide. It is not necessary to have bottles specially fitted for use with this apparatus; any vessel capable of holding water will answer, it being only necessary to insert the end of one tube in the reservoir, and by gently sucking at the end of the other establish a flow of the water, which will continue so long as the reservoir contains any. Price, with covers and rubber tubes, but without bottles, ...	4 00
3476.	Iris Diaphragm, with Society-screw, to attach to sub-stage, . .	5 00
3477.	Do. larger size, more perfect, to fit sub-stage tube, . .	7 50
3478.	Do. with Society-screw at each end, to use above the object-glass: by varying aperture in this way great penetration may be obtained with a glass of wide aperture, ...	9 00

The New Acme Lamp

FOR MICROSCOPIC USE.

In this lamp the highest efficiency has been attained at the lowest cost.

The careful and exact application of a finely figured, ground and polished bull's-eye lens permits the use of a very small flame and wick. This feature will, we anticipate, prove a valuable one for summer work, where the heat of most lamps is very objectionable. The bull's-eye used is the same as in one of our best stand-



condensers, and so powerful is the beam of light produced by it that (by actual test) sufficient light is obtained for a 1-12 inch objective, using only the usual substage condenser (as our no. 3529) when the lamp is at the distance of *three feet from the mirror.*

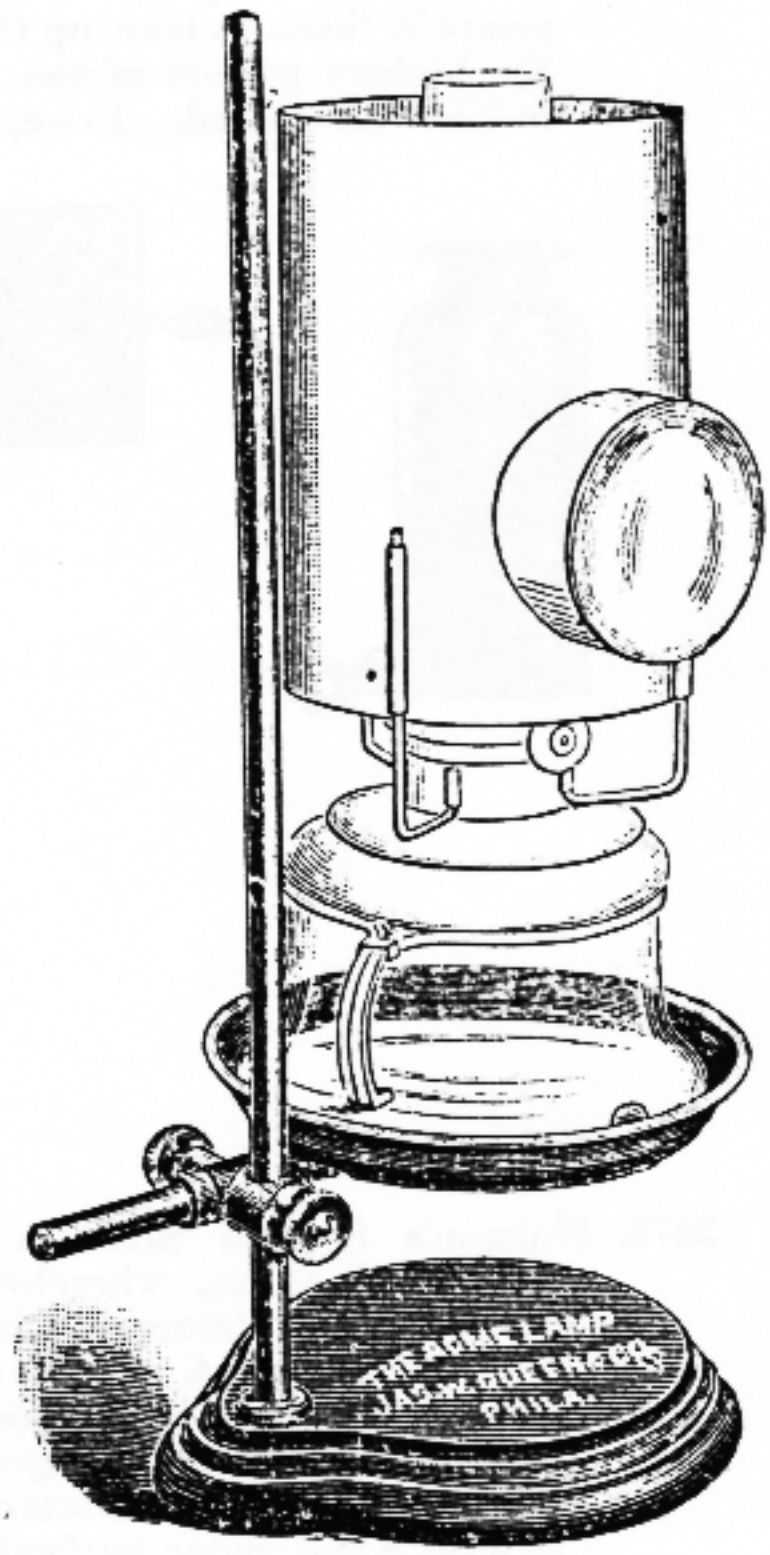
Various adjustments are provided for: thus, the lens may be set higher or lower, in order that the light may be thrown exactly upon the mirror or object. The flame may be placed flatwise or edgewise toward the lens, as preferred.

The shade is japanned outside, but is bright inside, in order that it may become but little heated by absorption from the radiation of the flame.

The handle, being of brass, obviates the danger from breakage incident to glass handles.

The price, in a neat box, complete, is $1.75.

A neat lamp-holder with stand, having all the adjustments to raise and lower, or incline the lamp, will be furnished at $1.75, making total cost $3.50.



PROF. M. L. SEYMOUR, of the ILLINOIS NORMAL UNIVERSITY, says:

"No worker with the microscope can afford to be without the improved **Acme Microscope Lamp.** Please send me another."

DR. W. P. MANTON, Editor of *The Microscope*, says:

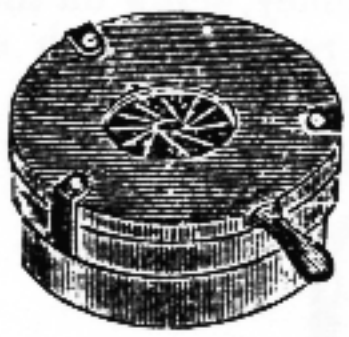
"I have personally tested your **Acme Lamp,** and find it admirable. Please send me another for my own use, with bill."

DR. THOS. S. STEVENS, of Trenton, N. J.:

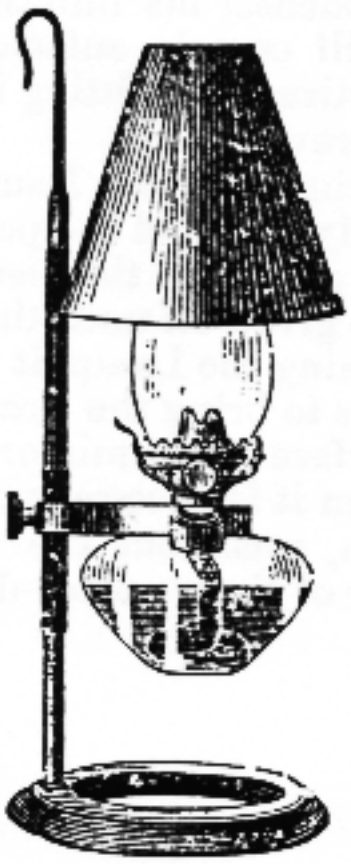
"I am delighted with **The Acme Lamp.** It is a perfect gem."

NEW FEATURES OF THE ACME LAMP

are the BLUE-TINTED and GROUND GLASSES (which may be used separately or together): they may be added at a cost of $1.00. The former will be found of universal value, while the latter will prove especially useful with low and medium powers.

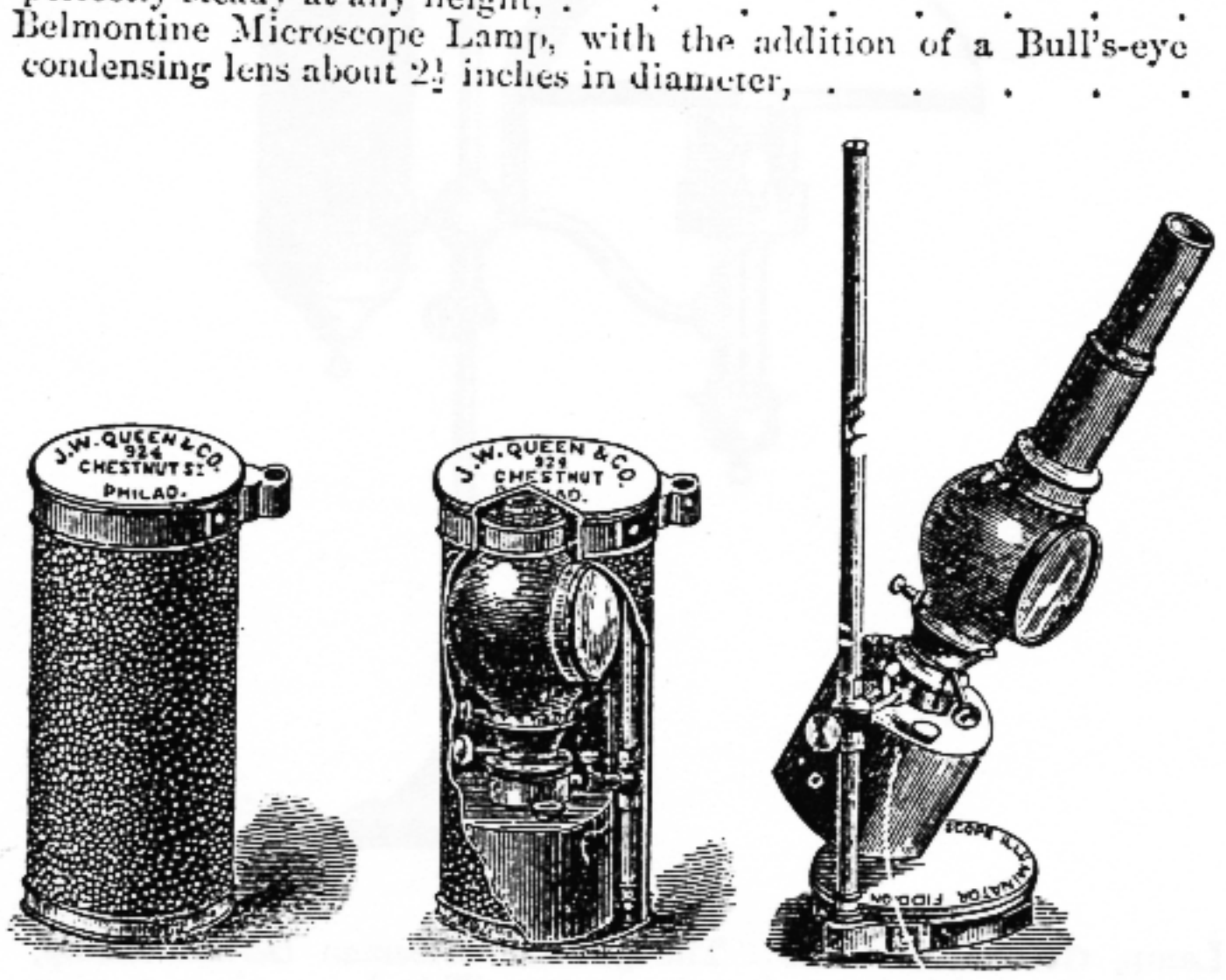


3477.



3479.

No.		Price.
3479.	Lamp, Belmontine. This very portable, simple and cheap lamp, is arranged to carry the flame at any desired height above the table, thus adapting it to the use of all sizes of microscopes. The shade is of paper, enameled green on the exterior, affording full protection to the eyes, and emitting no heat. The base is heavy, and the lamp perfectly steady at any height, ...	$6 50
3479½.	Belmontine Microscope Lamp, with the addition of a Bull's-eye condensing lens about 2½ inches in diameter, ...	13 50



3480.

3480. Lamp, Fiddian's Portable. This very convenient and useful Lamp has been designed to combine the qualities of other microscope lamps, together with greater portability, the whole fitting into a brass tubular box 3x6 inches, the exterior of which is covered with morocco leather, the lid forming the stand of the Lamp. The metallic chimney being telescopic, occupies a very small compass;

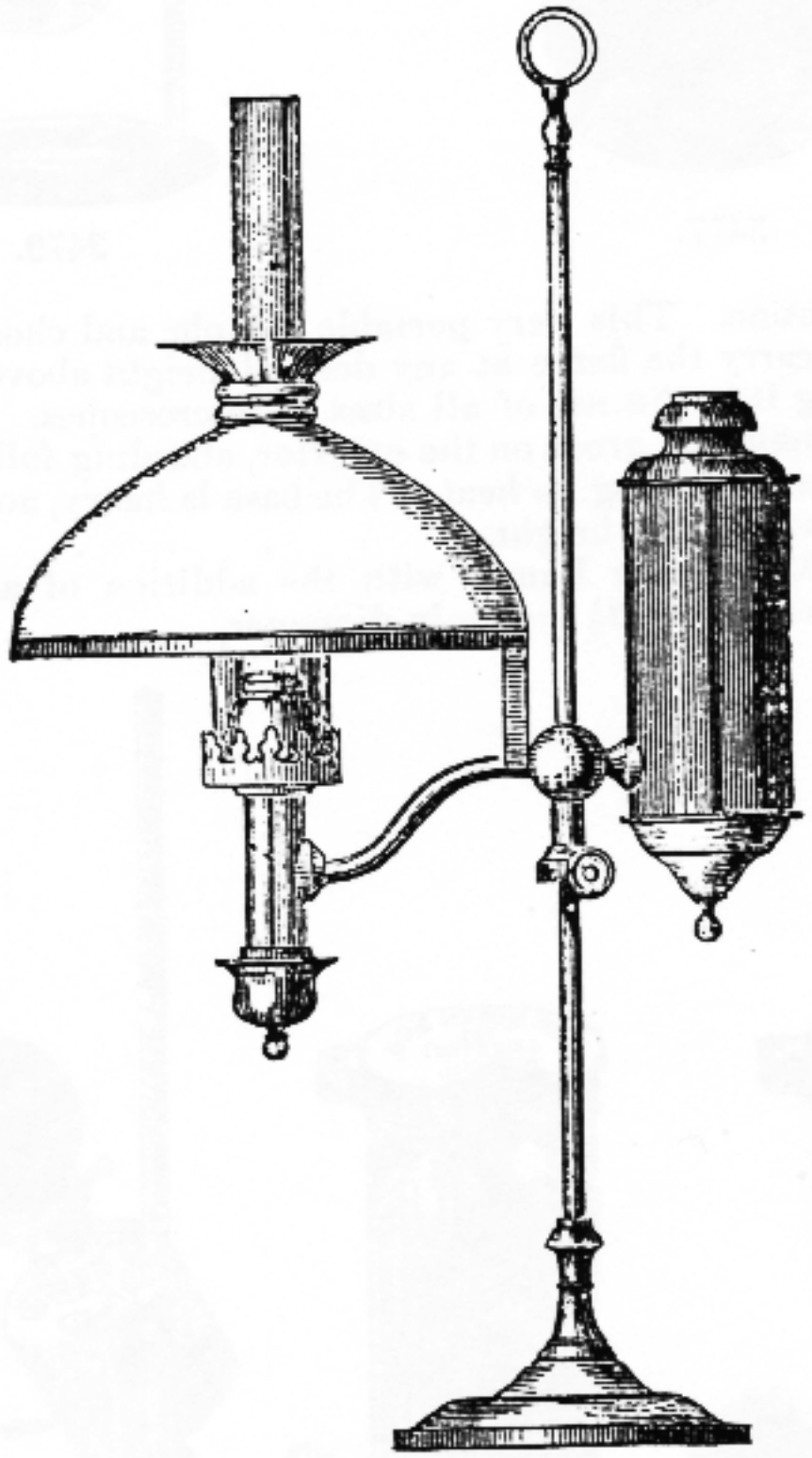
No. PRICE

the condenser fits into the cell in front. The reservoir is of brass, and will contain sufficient petroleum for six hours' consumption. The entire Lamp fitting into the case from the top, the escape of the oil is prevented.

In trimming the Lamp, care should be taken that the wick is perfectly dry, and the petroleum of good quality; also that none of the oil gets upon the metallic chimney or reservoir, or a bad smell will be given off until the oil is burnt away.

In using the Lamp, it will be found convenient to slightly incline it, so as to bring the broad surface of the flame more parallel with the surface of the mirror of the Microscope.

When it is necessary to re-line the chimney, screw off the sliding portion, wash out the old lining, and re-coat it with superfine plaster of Paris; when dry, it will be ready for use, . . $15 00



3482.

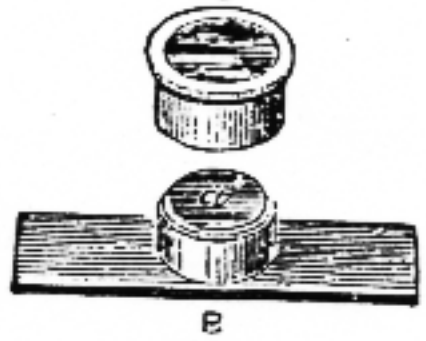
3482. Lamp, German Students'. The genuine Kleeman *German* Lamp, large size, with latest improvements. This lamp gives a very superior and steady light, and with ordinary care will emit neither smell nor smoke. The wick should be trimmed regularly. If a crust has formed, do not disturb it, but only remove any little point or unevenness that may occur; do not use the scissors unless the wick, through uneven draft, should have coaled or charred unevenly. By this method you will have an even flame, and the wick will last

PRICE

much longer than when cut frequently. If your lamp should make a humming noise, which is caused by the shank of the chimney being of the wrong length, raise the chimney slightly, or change it for one with a longer shank. Price, with one white shade and chimney, nickel-plated, ... 4 00

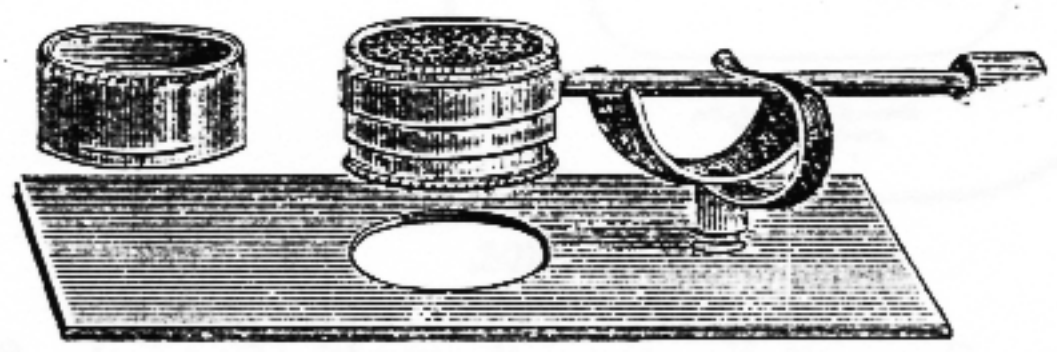
3483. Chimneys, each, ... 15
3484. Do. blue-tinted, each, ... 20
3485. White Shades, each, ... 25
3486. Blue or green Shades, each, ... 75
3487. Decorated Shades, each, ... 1 25
3488. Wicks, per dozen, ... 25
3489. Live-Box (or Animalcula-Cage), large size, ... 3 00

3490.



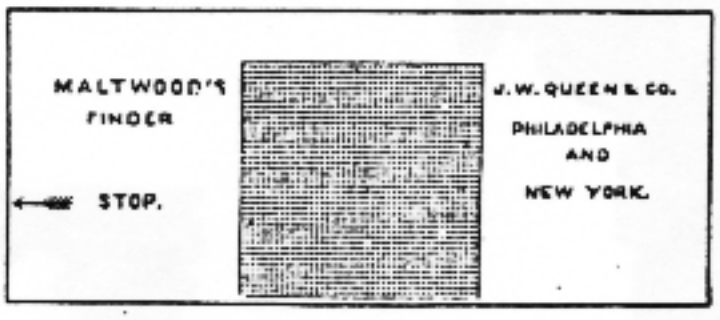
3491.

3490. Live-Box, medium size, ... 2 25
3491. Do. small size, ... 1 25
3492. Do. for use with Sub-stage Condenser or Paraboloid, . . 3 50



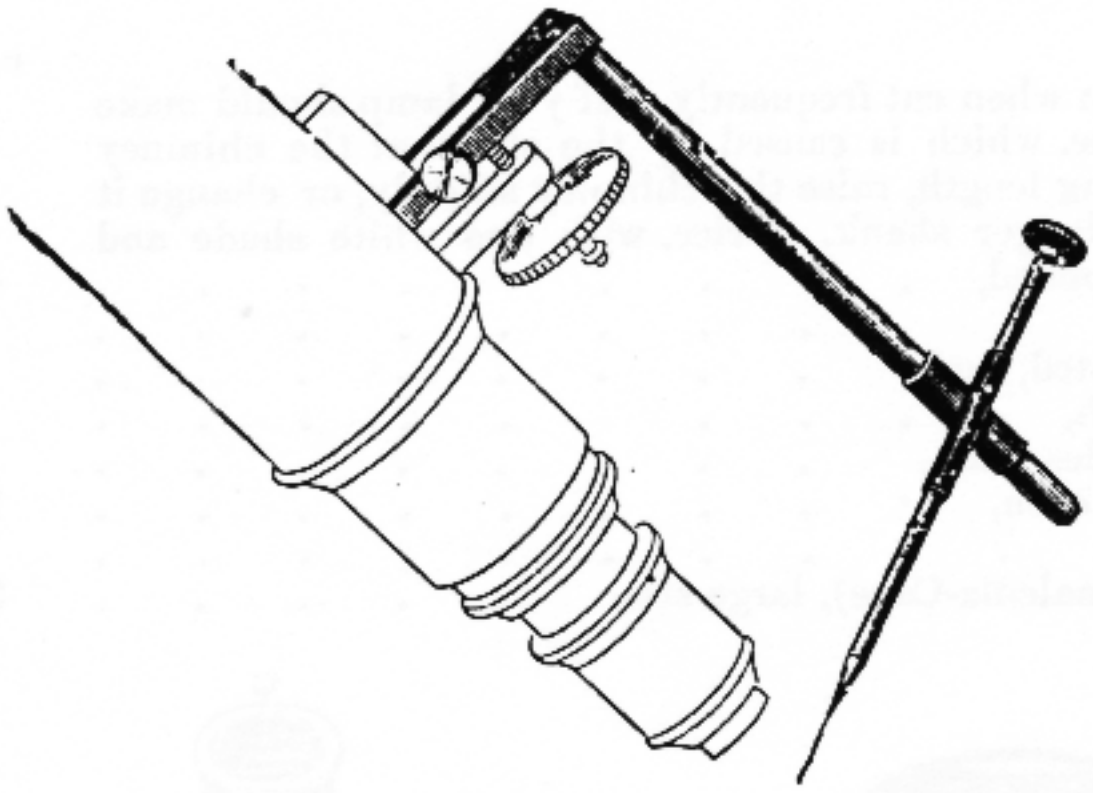
3493.

3493. Live-Cage, intended for the study of live insects; with carrier having complete motions. It is constructed on the same principle as the ordinary live-box, but, instead of glass, bobbinet is used, in order to confine the insect better and without injury. An extra cover of glass, is furnished, however, and may be used if preferred. The cage may be rotated in the optic axis of the microscope, in order that the object may be illuminated in the best manner, . . . 2 50

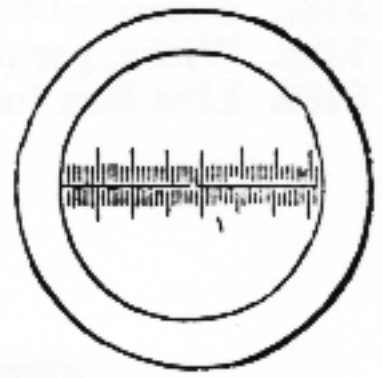


3494.

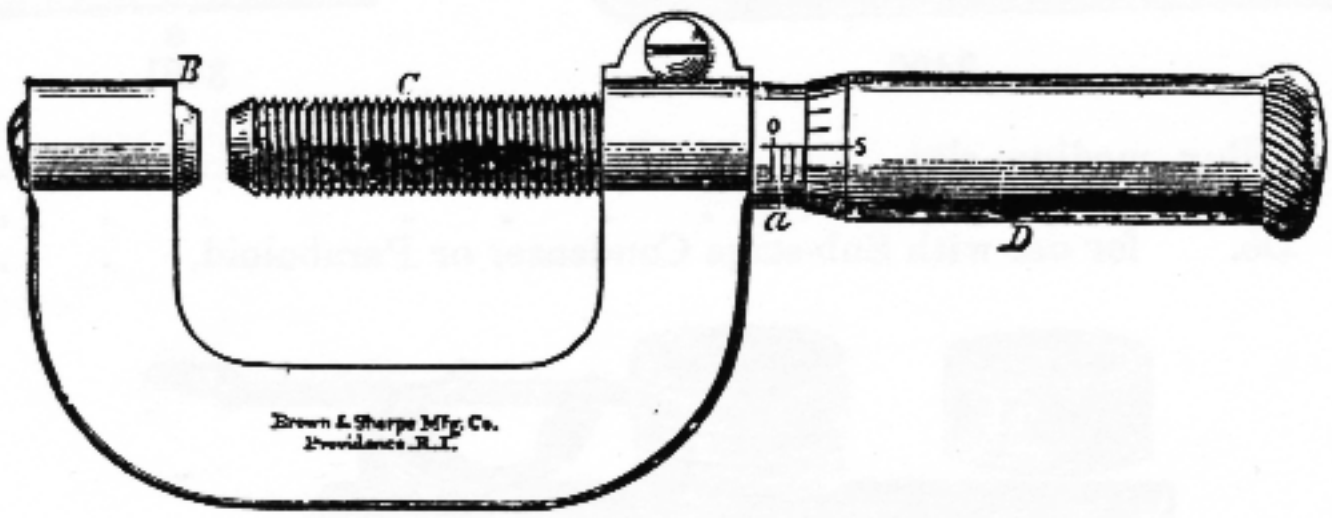
3494. Maltwood Finder, for re-finding a particular object on a slide, . . 3
3495. Mechanical Finger, Kain's form, for arranging or handling Diatoms, etc. Can be fitted to any microscope which has the fine adjustment to nose-piece as in No. 3100 or 3096, ... 2 50



3495.



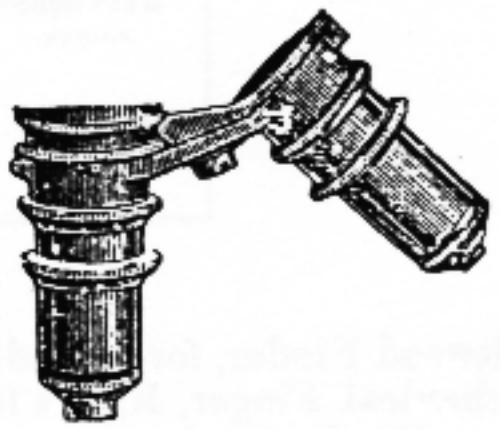
3498.



3496.

No.		Price.
3496.	Micrometer Gauge, reading to one-thousandth of an inch. Suitable for pocket, and very useful for measuring accurately thickness of cover glass, sheet metals, wires, etc.,	$1 00
3497.	Micrometer, Jackson's (Eye-piece Micrometer), with screw for accurately adjusting. Fitted to any eye-piece for	6 00
3498.	Micrometer (Eye-piece Micrometer), ruled on glass disk. Fitted to any eye-piece,	1 50

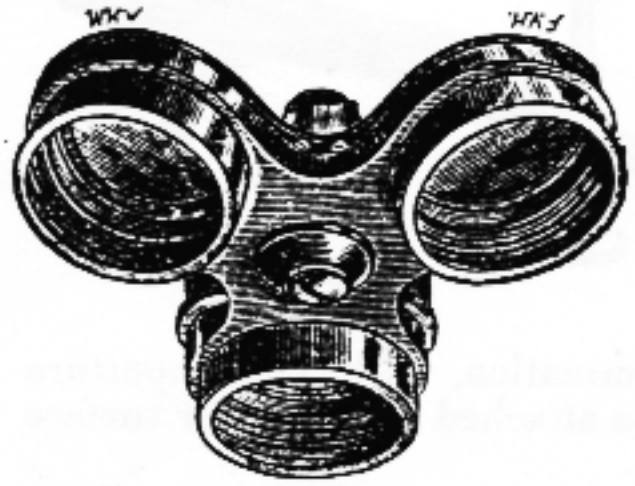
3503.



3504.

3499.	Micrometer, Ramsden's screw (Eye-piece Micrometer), with divided Micrometer head, for the finest and most accurate measurements.	40 00

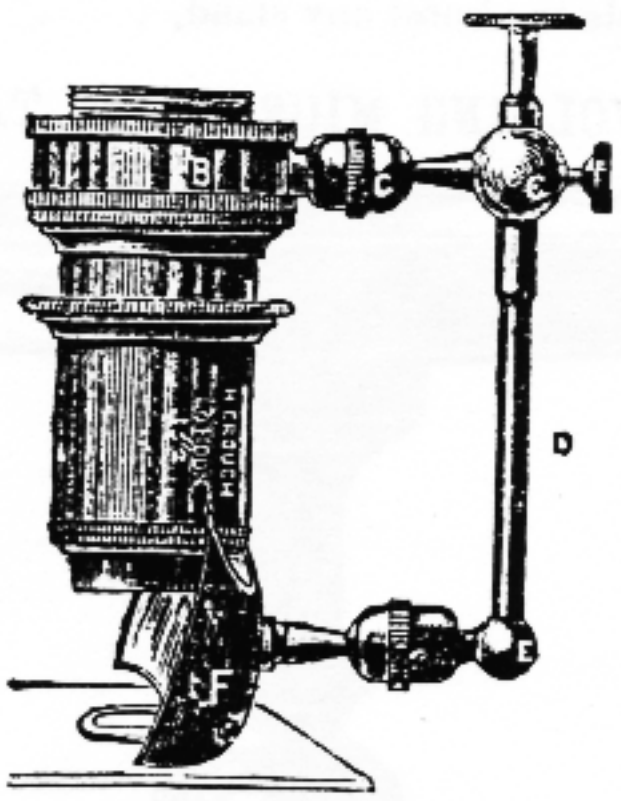
No.		Price
3500.	Micrometer ruled on glass slip, 3x1 (Stage Micrometer), divided to $\frac{1}{100}$ and $\frac{1}{1000}$-inch,	$1 25
3500½.	Micrometer, inch scale, extra long, with 40 divisions $\frac{1}{100}$, 10 divisions $\frac{1}{1000}$, and 25 divisions $\frac{1}{2500}$, as recommended by Dr. J. J. Woodward,	2 00
3501.	Micrometer divided to $\frac{1}{10}$, $\frac{1}{100}$ and $\frac{1}{1000}$ centimeter,	1 75
3501½.	Do. metric scale, extra long, with 10 divisions 1 mm., 10 divisions $\frac{1}{10}$ mm., 100 divisions $\frac{1}{100}$ mm.,	2 25
3502.	Do. with Metric and English scales ruled side by side for comparison,	3 00
3503.	Nose-Piece, Single, centering, for exactly centering the objective to the rotation of the stage, or to the sub-stage condenser. It also answers admirably as a centering adapter for carrying the sub-stage condenser,	5 50
3504.	Nose-Piece, Double, for instantly changing objectives; angular form,	5 00



3505.

3506.

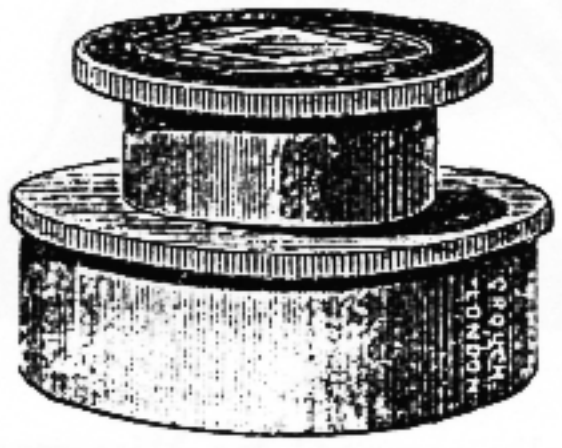
3505.	Nose-Piece, Triple, angular,	12 00
3506.	Do. Quadruple, of aluminium (very light), angular,	42 50



3507.

3507. Parabolic Illuminator for opaque objects, with universal mounting; with lengthening rod adjusting to forms of various objectives, 9 00

ANALYZER.

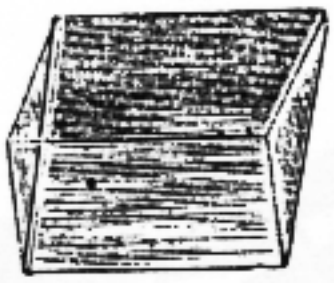


POLARIZER.

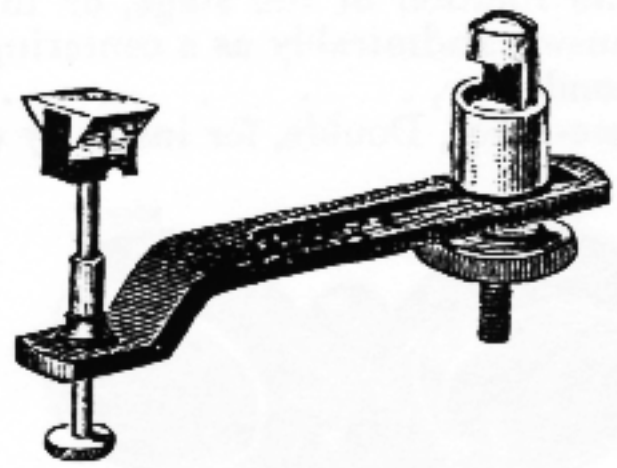
SELENITE.

3509.

No.		Price.
3508.	Polariscope, with Selenite, for Crouch's Histological Monocular Microscope,	$11 00
3509.	Polariscope, with Selenite, for Crouch's Histological or Students' Microscope, with larger Prisms,	13 50
3510.	Polariscope, with Selenite, for Crouch's Large Microscope, with large Prisms and revolving Selenite,	30.00
3511.	Polariscope, with Selenite, mounted in ring to screw into stage, to allow of its independent rotation; for Acme No. 3 Microscope,	13 50
3512.	Polariscope, with rotating Selenite, and larger Polarizing Prism; for Acme No. 2 Microscope,	18 00



3514.



3515½.

3514.	Prism, Woodward's, for oblique illumination, with large aperture immersion lenses; unmounted; to be attached to the under surface of slide with glycerine,	1 25
3515.	Prism, Woodward's, in mounting to fit sub-stage, with sliding adjustment,	5 00
3515½.	Prism, Woodward's, in new and ingenious mounting, for attaching to edge of stage (the design of Mr. John W. Sidle), making this accessory adaptable to almost any stand,	4 50

REVOLVING MICROSCOPE TABLE.

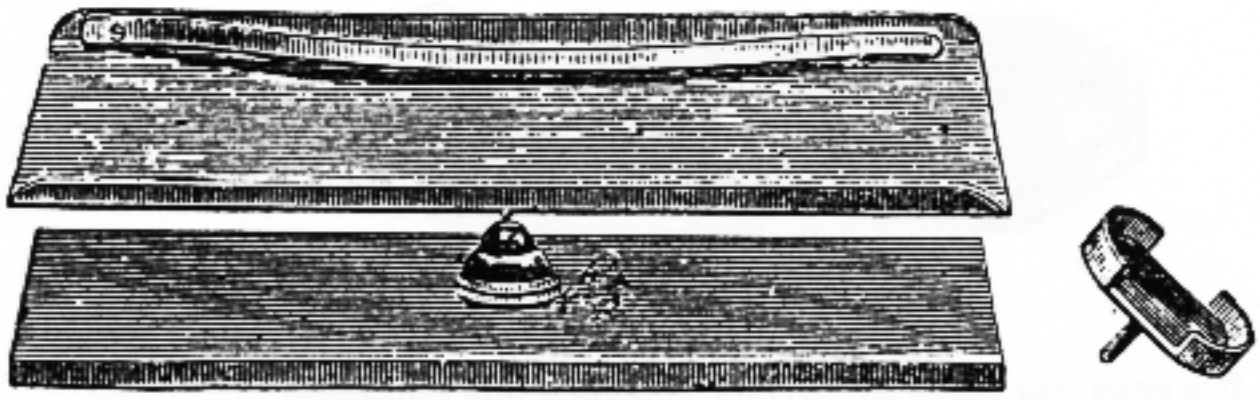
3516.

3516.	Revolving Table, especially arranged for Microscopic purposes, in walnut. with handsome leather top,	30 00

QUEEN'S REVOLVING MICROSCOPE TABLE.

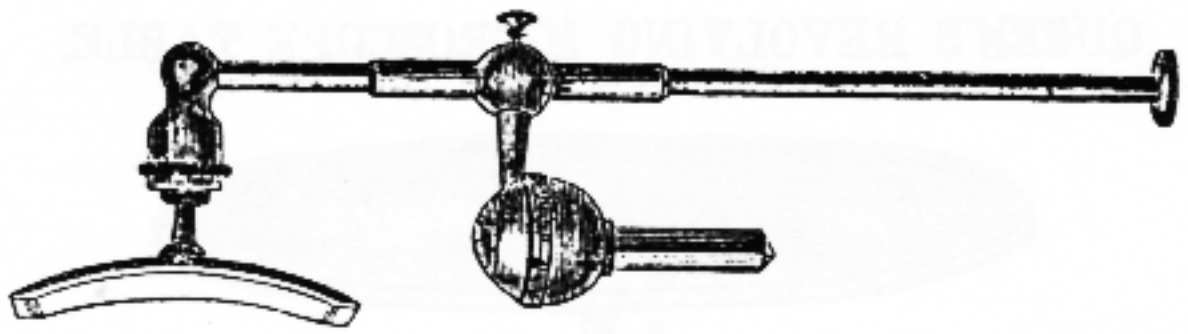
3517.

No.		Price.
3517.	Queen's Revolving Microscope Table has been constructed especially for use with the microscope, and is designed to meet the want of a cheap, though good, revolving table. It has a very heavy and firm tripod base of cast iron, handsomely finished, and of neat and graceful appearance. The top is of handsomely finished walnut, 28 inches in diameter. A novel feature is that the top may be set and rotated at any height, from 26 inches up, thus adapting it to microscopes of different sizes. The table is of substantial and first-class workmanship throughout, and is one that we can thoroughly recommend, .	$12 00
Crating for shipment, ...		80



3518.

3518.	Rotating Object Holder, answering the purpose of a Rotating Stage for opaque objects; with ball and socket joint, two disks, and slide holder, ...	3 00
3519.	Selenite, mounted on 3x1 slip, for use with Polariscope to exhibit colors in objects not of suitable thickness: good, $1.00; best, . .	1 50
3520.	Selenite, mounted in a brass slip with ledge to serve as object-carrier (Selenite-Stage), ...	3 25
3521.	Selenite Stage, Darker's, with 3 Selenites (revolving by screw motion) giving 13 tints, ...	17 50
3522.	Selenites, Darker's series, fitted to sub-stage of any first-class Microscope, ...	33 00

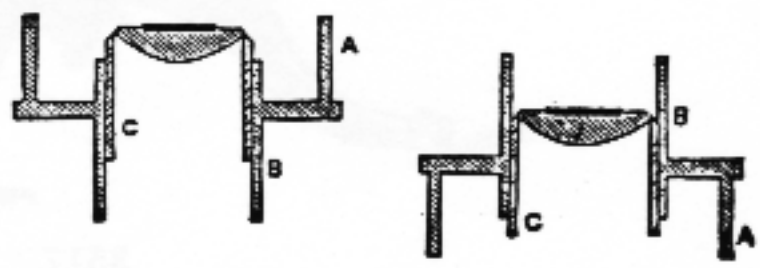


3523.

No. PRICE.

3523. Silvered Side Reflector on stand, or fitted to arm of Microscope; for illumination of opaque objects, giving an intense and excellent illumination, ... $9 00

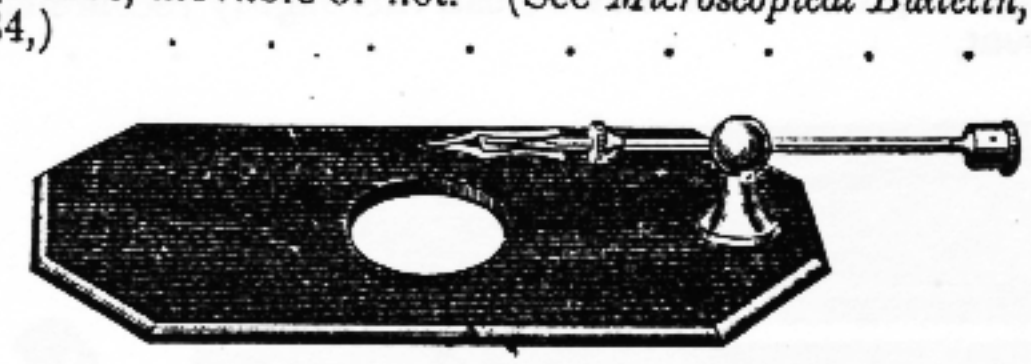
3524.



3525 (SECTIONAL).

3524. Sorby's Spectroscope Eye-Piece, in case, ... 50 00

3525. Spot-Lens for dark-ground illumination (new form of mounting with focusing adjustment, may be used on instruments with standard size sub-stage tube, movable or not. (See *Microscopical Bulletin*, February, 1884,) 4 00



3526.

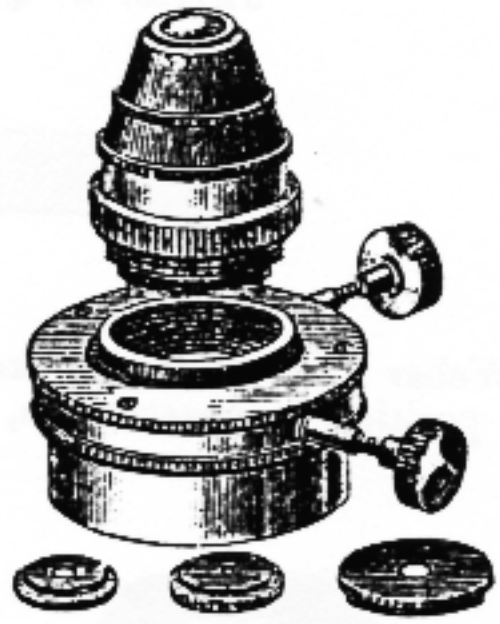
3526. Stage Forceps, on slide or carrier (simple but efficient), . . . 1 50

3527.

3526½. Stage Forceps, ordinary, ... 2 25
3527. Do. best, fitted to stage, ... 2 75
3528. Do. 3-pronged, for holding Minerals, etc., ... 5 00

3529. Sub-stage Condenser, Queen's New, with apertures of about 20°, 40°, 70° and 110°; dividing combination for use with high or low

3528.

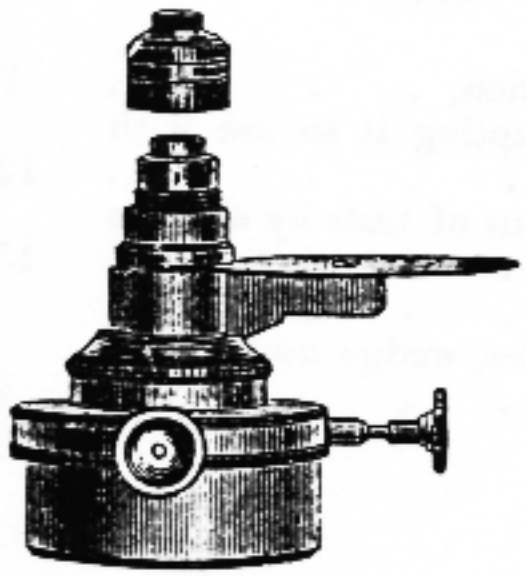


3529.

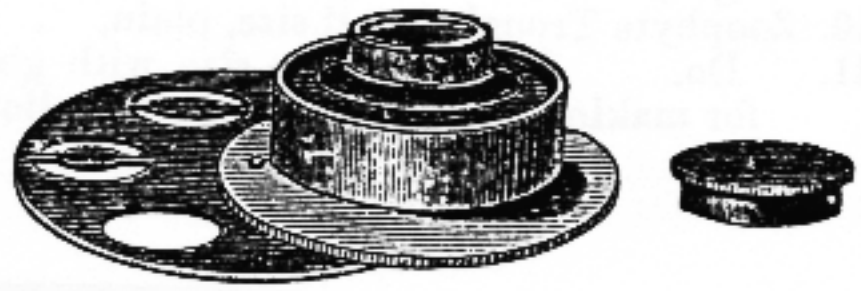
No. PRICE

powers, with 3 caps, blue-tinted glass, and complete adjustments for centering. This is highly recommended, and is efficient even with the highest powers, ... $13 50

3530 Sub-stage Condenser, Queen's New, same as above, but without centering adjustments and blue-glass, ... 8 00



3531.



3532.

3531. Sub-stage Condenser, Beck's, with revolving Diaphragm, containing various-sized apertures for central light; and stops for oblique and dark-ground illumination; with centering adjustments, and caps. The improvements we have added increase greatly its optical performance, ... 33 00

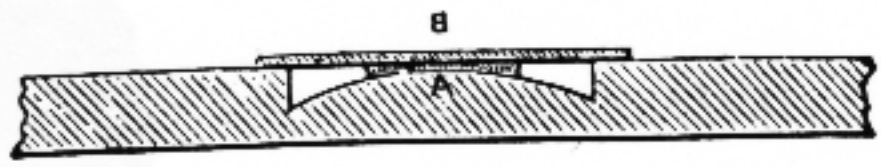
3531½. Sub-stage Condenser, Crouch's new form, wide aperture, with cap and two revolving Diaphragms superposed, having respectively 6 and 10 apertures, which can be combined in various ways: the combination can be divided to use with lower powers, ... 47 00

3532. Sub-stage Condenser, Webster's form, with cap and stops for dark-ground or oblique illumination. Specially adapted for Crouch's Students' or Histological Microscope, ... 15 50

3533. Sub-stage Condenser, Webster's form, same as above, but mounted for instruments having a movable sub-stage, ... 18 50

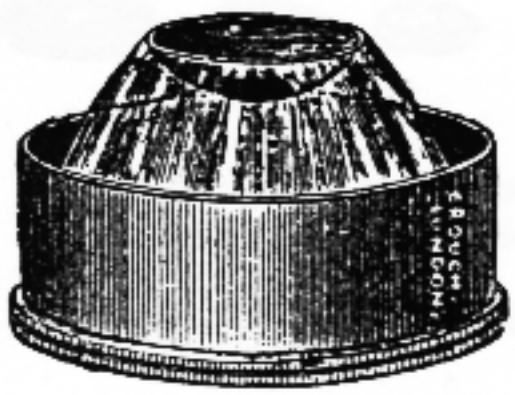
3534. Sub-stage Illuminator, Universal, combining all the accessories necessary for the examination of transparent objects, whether by polarized light, dark-ground illumination, condensed light, etc. The Polarizer is a large prism, and has two Selenites. The Condenser is fitted with central stops for dark-ground illumination, cap for preventing diffusion, blue-glass and rack adjustment for focusing. Is specially applicable to Crouch's Students', Intermediate and Largest Microscope. Price, with analyzing prism complete, ... 32 00

3535. Vertical Illuminator, with Queen's new form of Diaphragm for the resolution of rulings or lined objects mounted on the cover, using an immersion objective of over (82° balsam or) 1.00 numerical aperture. This accessory is very highly recommended for the above purpose; it may also be used with the full aperture and with dry-working objective as an Opaque Illuminator 4 50

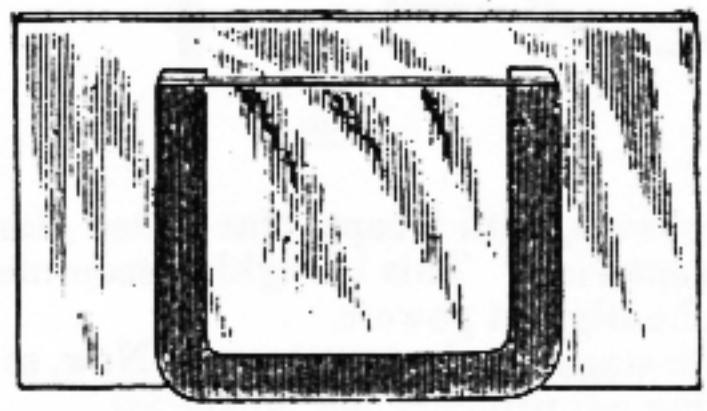


3536.

No.		Price.
3536.	Weber Life Slide, for keeping minute organisms alive and in a position for observation, ...	$0 75 .

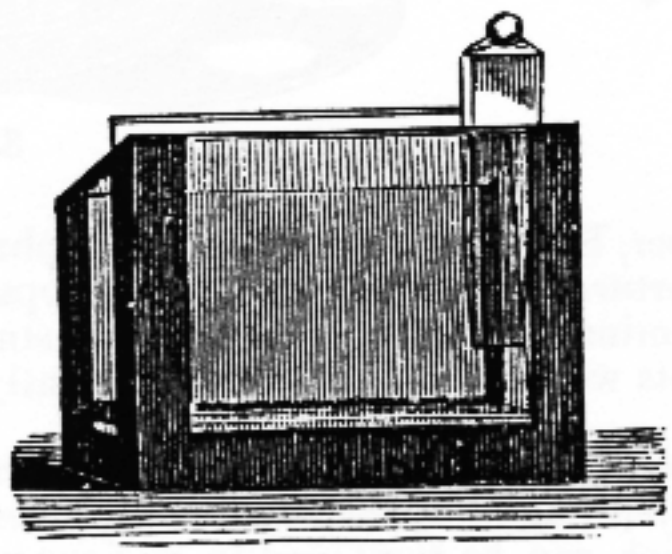


3537.



3540.

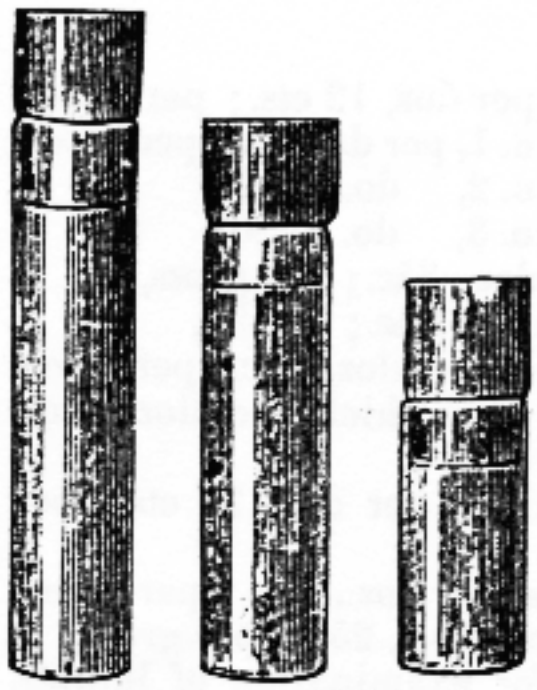
3537.	Wenham Paraboloid, for dark-ground Illumination, ...	7 50
3538.	Wenham Paraboloid, with adjustable stop, adapting it to use with objectives of different apertures, ...	12 00
3539.	Wenham's Reflex Illuminator, for the resolutions of tests by oblique light, ...	15 00
3540.	Zoophyte Trough, small size, plain, ...	60
3541.	Do. do. medium size, with glass plates, wedge and spring for making the cell more or less shallow, ...	2 50



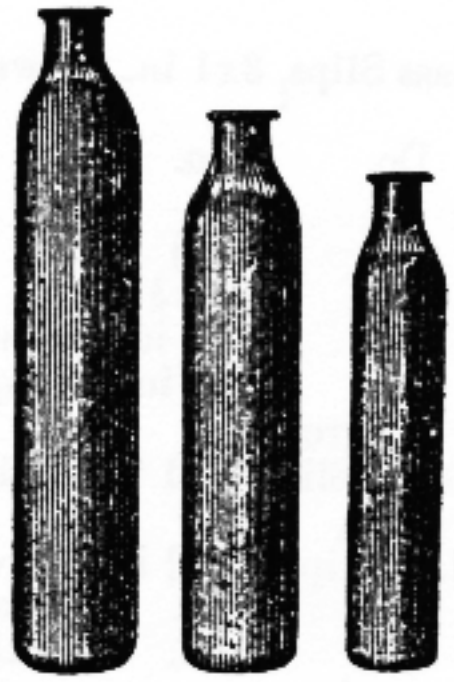
3542.

3542.	Zoophyte Trough, large size, with plates, wedge and spring, . .	3 00
3543.	Zoophyte Trough, Botterill's form, which may be taken apart for cleaning. (See Phins' "Practical Hints, etc.," Third Edition, page 134),	2 50

APPARATUS FOR COLLECTING OBJECTS.



3651.



3652.

No.		Price.
3650.	Collecting Boxes, for insects, with glass covers, each,	$0 10
3651.	Collecting Bottles, round, per dozen,	35
3652.	Do. flat, each,	.10 to .15
3653.	Wright's Microscopic Collecting Bottle.	2 50

3653.

3654.

Microscopists will find this new form of Collecting Bottle an indispensable companion in their pond-hunting excursions, for collecting and retaining the various minute objects that may be obtained in water by the dipping bottle. It consists of a bottle with a movable brass cap, in which is fastened two small tubes with screw tops. One of these (A) projects a little higher than the other; in which is fixed the funnel (C) when in use. The other tube (B) has a trumpet-shaped form, across the mouth of which a piece of fine muslin is stretched; the loose funnel shown is placed in the outer tube, and the water containing the various organisms which it is wished to retain is poured into it. As soon as the bottle is full the water rises through the porous material placed across the lower end of this inner tube, and flows over, retaining behind and in the bottle the various *diatoms, volvox, desmids, entomostraca, &c.*, which may have been floating therein.

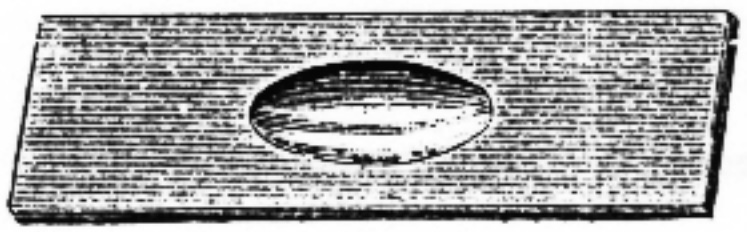
3654. Queen's Collecting Case, with sling strap for the shoulder, containing Bottles, Tubes, Net, &c. Particularly recommended for Microscopical Excursions, ... 4 00

3660. Collecting Cane, handsomely made and finished, with heavy brass ferule, in which a screw is cut to hold either ring with bottle, hooked-knife, dredge, ring for net, or spoon, all of which are furnished with it at 7 50

MATERIALS FOR PREPARING AND MOUNTING OBJECTS.

SLIPS.

No.						PRICE.
3680.	Glass Slips, 3x1 in., crown, unfinished edges, per doz, 12 cts.; per gross,					$1 00
3681.	Do.	do.	do.	smooth edges,	No. 1, per doz., 30; per gross,	2 50
					No. 2, do. 25; do.	2 25
					No. 3, do. 20; do.	2 00
3681*a*.	Do.	3x1½	do.	do.	do. per doz., 35c.; per gross, . .	3 50
3681*b*.	Do.	1⅞x1⅛	do.	do.	do. do. 25c.; do., . .	2 50
3682.	Do.	3x1 in., patent plate, smooth edges, per doz., 35c.; per gross,				3 50
3683.	Do.	3x1 in., fine quality, extra thin ($\frac{1}{24}$ in. thick), per doz., 25c.; per gross,				2 50
3683½.	Glass Slips, 3x1 in., $\frac{1}{24}$ in. thick, "extra white," per doz., 30 cts.; per gross,					3 00
3684.	Glass Slips, 2⅜x¾ in., crown, unfinished edges, per doz., 12c.; per gross,					1 00
3685.	Do.	do.	do.	smooth edges, per doz., 25c.; per gross, .		2 50
3686.	Do.	do.	with concave centres, for examination of liquids, per dozen,			1 00
3687.	Glass Slips, 3x1 inch, with concave centres, for examination of liquids, per dozen,					1 00



3687½.

3687½.	Glass Slips, like 3687, but with oval concavities, per dozen, . .	1 50
3688.	Wooden Slips, 3 by 1 inch, with hole $\frac{1}{32}$ inch in diameter, for mounting objects between thin glass, per dozen, 20 cents; if with background for opaque objects, per dozen, ...	25
3689.	Glass Slips, 3 by 1 inch, smooth edges, with glass cells of different sizes and depths, attached by marine glue, per dozen, ...	2 50

CELLS.

3690.	Glass Rings, for making cells as above, per dozen, ...	1 00
3691.	Block-tin Rings, for making cells as above, per dozen, ...	20
3691*a*.	White-metal Rings, with beveled edges, very neat, per dozen, . .	25
3691½.	Brass Rings, for making cells, assorted sizes, ordinary style, per dozen,	15
3691½*a*.	Do. do. do. with beveled edges, very neat, per dozen, ...	35
3692.	Ebonite (vulcanite or hard rubber) Rings, assorted sizes and depths, per dozen, ...	15

COVER-GLASS.

3693*a*.	Thin Glass, in sheets; No. 1 ($\frac{1}{140}$ to $\frac{1}{200}$ inch thick), per ounce, . .	1 20
3693*b*.	Do. do. do. 2 ($\frac{1}{100}$ to $\frac{1}{140}$ inch thick), do. . .	80
3693*c*.	Do. do. do. 3 ($\frac{1}{70}$ to $\frac{1}{100}$ inch thick), do. . .	60
3694.	Thin Glass Squares, No. 3, ½ to 1 inch square, per doz., 15 cts.; per oz.,	1 00
3695.	Do. do. do. 2, do. . do. do. 18 cts.; do.,	1 50
3695*a*.	Thin Glass Oblong Covers (rectangular), No. 2, all sizes, per oz., .	1 50
3696.	Thin Glass Squares, No. 1, ½ to 1 inch square, per doz., 20 cts.; per oz.,	2 00
3697.	Do. Circles, do. 3, ¼ to 1 inch diam., do. 18 cts.; do.,	1 50
3698.	Do. do. do. 2, do. do. do. 20 cts.; do.,	2 00
3699.	Do. do. do. 1, do. do. do. 25 cts.; do.,	2 75
3700.	Do. do. $\frac{1}{200}$ to $\frac{1}{250}$ inches thick, do. 35 cts.; do.,	4 00

MOUNTING MEDIA, ETC.

No.		Price.
3701.	Canada Balsam, filtered, in flexible tubes, each,	$0 25
3702*a*.	Do. do. prepared with benzole for use without heat, per bottle,	50
3702*b*.	Do. do. do do. chloroform, for use without heat, per bottle,	50
3703.	•Damar-and-Balsam Mounting Medium, for use without heat, per bottle,	50
3703½.	Oil of Cloves, per bottle,	30
3704.	Glycerine, pure, do.	25
3704½.	Do. prepared with camphor-water, for delicate vegetable tissues (as Algæ), per bottle,	25
3705.	Glycerine Jelly, per bottle,	50
3705*a*.	Glycerine and Gum-mounting Medium, for delicate tissues that will not bear the heat necessary to mount with glycerine jelly,	40

STAINING FLUIDS, ETC.

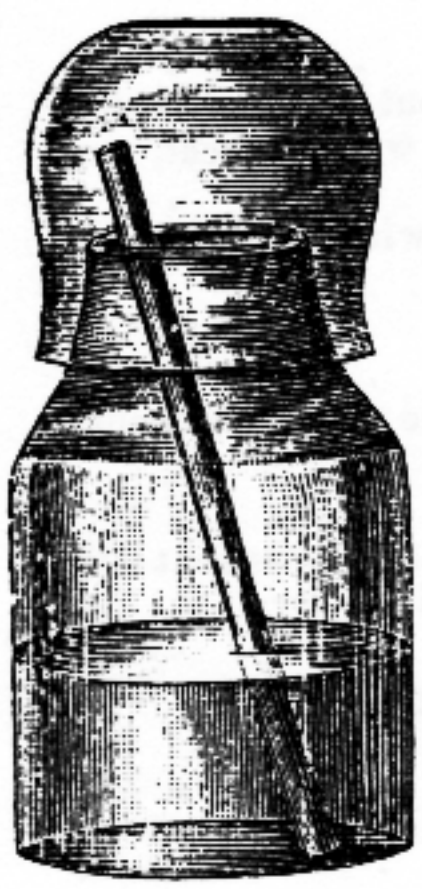
3705½.	Hæmatoxylin,	25
3706*a*.	Ammonia-Carmine,	25
3706*b*.	Borax-Carmine,	25
3706*c*.	Picro-Carmine, dry,	30
3706*d*.	Eosin,	20
3706½*a*.	Aniline Violet,	20
3706½*b*.	Do. Blue,	20
3706½*c*.	Do. Green,	20
3706½*d*.	Do. Red (magenta, fuchsin),	20
3706½*e*.	Burrill's Stain, for *Bacillus tuberculosis*, with directions. (See *Microscopical Bulletin*, February, 1884, also June, 1887,)	35
3707*a*.	Sulph-indigotate of Soda, dry,	30
3707½*a*.	Osmic Acid, $\frac{1}{32}$ oz, in glass capsule,	2 00
3708*a*.	Carmine Injecting Gelatine (Seiler's), per oz.,	1 00

CEMENTS.

3708½.	Brunswick Black, with brush in cork, per bottle,	25
3709.	Asphalte, do. do. do.	25
3709½.	Do. quick drying, do. do. do.	35
3710.	Gold Size. do. do. do.	25
3711*a*.	Marine Glue, hard, per box,	35
3711*b*	Do. fluid, with brush, per bottle,	35
3711*c*.	Do. do. colorless, with brush, per bottle,	40
3713.	Bell's Cement, do. do.	50
3714.	White Zinc Cement, do. do.	50

GLASS SUNDRIES.

3715.	Watch Glasses, flat bottom, per dozen,	40
3716.	Dipping Tubes, each,	10
3717.	Dropping Tubes, with rubber bulb, each,	05
3718.	Capped Bottles, for holding mounting fluids, with glass pipette, each,	35
3719.	Dropping Bottles, with glass bulbs, each,	20
3720.	Do. do. do. rubber top, will supply a large quantity of fluid promptly,	25



3718.

3719.

3720.

No.					Price
3721.	Pipettes, with bulb, each,				$0 25
3722.	Test Tubes, 3 to 8 inches long, each, 3 to 8 cents; per dozen,				30 cts. to 75
3723.	Small Bell Glass, for preserving objects from dust during preparation,				50

INSTRUMENTS.

3724.	Spring Compressor, of German silver wire, for holding down thin covers in mounting specimens, per dozen,				40
3725.	Spring Compressor, wood, per dozen,				25
3726.	Brass Forceps, 3¼ inches long, straight,				15
3726*a*.	Do.	3¼	do.	curved points,	20
3726*b*.	Do.	3¼	do.	curved on the flat (Mounting Forceps),	25
3726½.	Do.	5	do.	very delicate,	1 00
3727.	Steel Forceps, nickel-plated, with fine points; a good, plain article,				50
3727½.	Cover Forceps, brass, opening by pressure. (See Phin on the Microscope, page 218),				30

3728.

3728 Steel Forceps, 4 inches long, nickel-plated, straight, ... 75

3729.

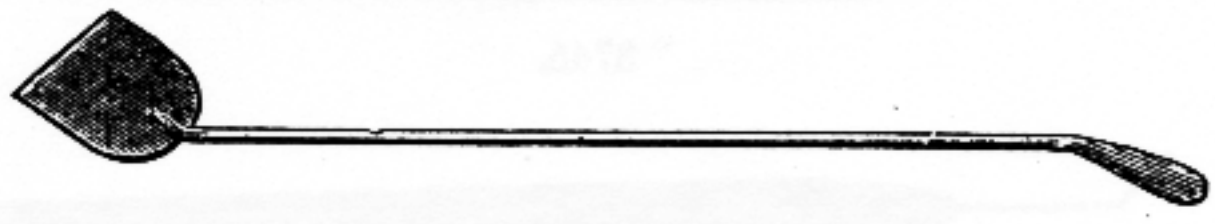
3729. Steel Forceps, 4 inches long, nickel-plated, curved, ... 75

3730.

No.		Price.
3730	Steel Forceps, 4 inches long, nickel-plated, curved, very delicate,	$1 00

3731.

3731.	Steel Forceps, 4 inches long, nickel-plated, straight, very delicate,	1 00
3733.	Combined Knife and Trowel, for transferring objects from one solution to another, or to the slide; a most convenient tool, . . .	75



3733½.

3733½.	Nickel-plated Trowel, or Lifter, ...	50

3734. 3735. 3736.

3733. 3742. 3741. 3740. 3739

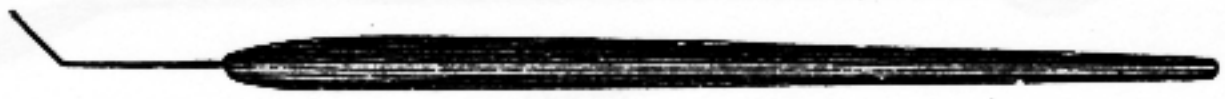
3734.	Dissecting Scissors, very delicate, straight points, ...	1 50
3735.	Do. do. curved do.	1 50
3736.	Do. do. elbow do.	1 50
3738.	Elbow Scissors, with strong blades for cutting elytra and legs of beetles, etc., ...	1 25
3739 to 3742.	Small Dissecting Knives, each, ...	75

No.		Price.
3743.	Knife in strong Ebony Handle, for cutting Sections, with 3752 to 3755, in morocco case,	$3 25
3744.	Knife, same as above, but extra large size, in morocco case,	5 00

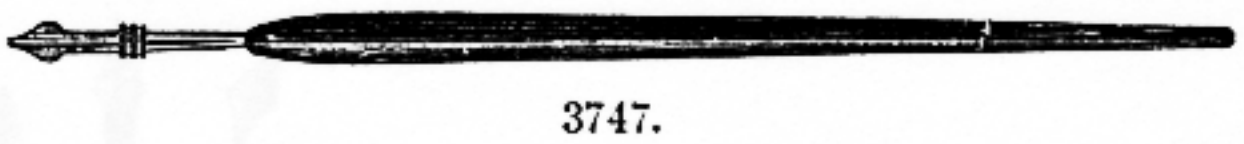
3743.

3745.	Dissecting Needles, straight ebony handles, each,	15
3746.	Do. do. hook points, do. do.	15
3747.	Dissecting-Needle Holders, with binding screw, each,	20
3748.	Valentine Knife, for making thin sections of soft substances,	6 50

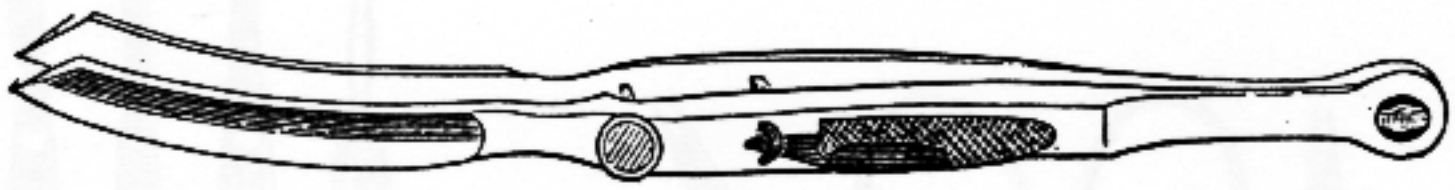
3745.



3746.

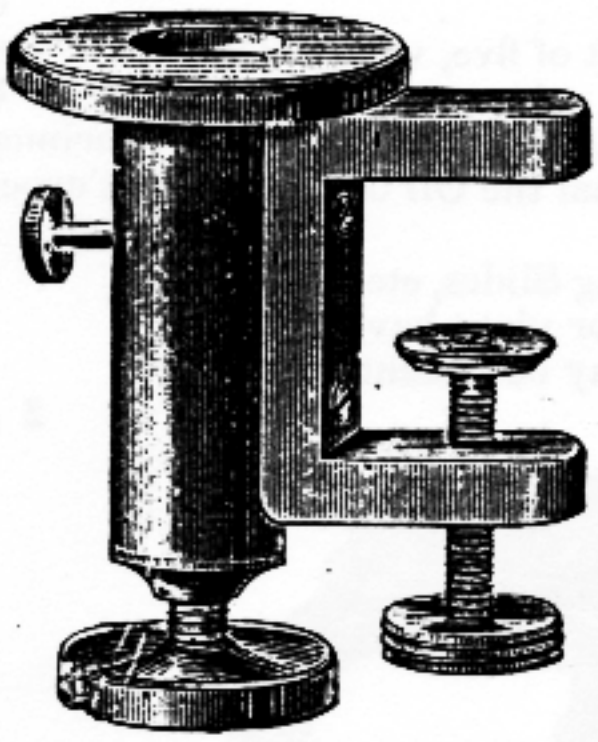


3747.

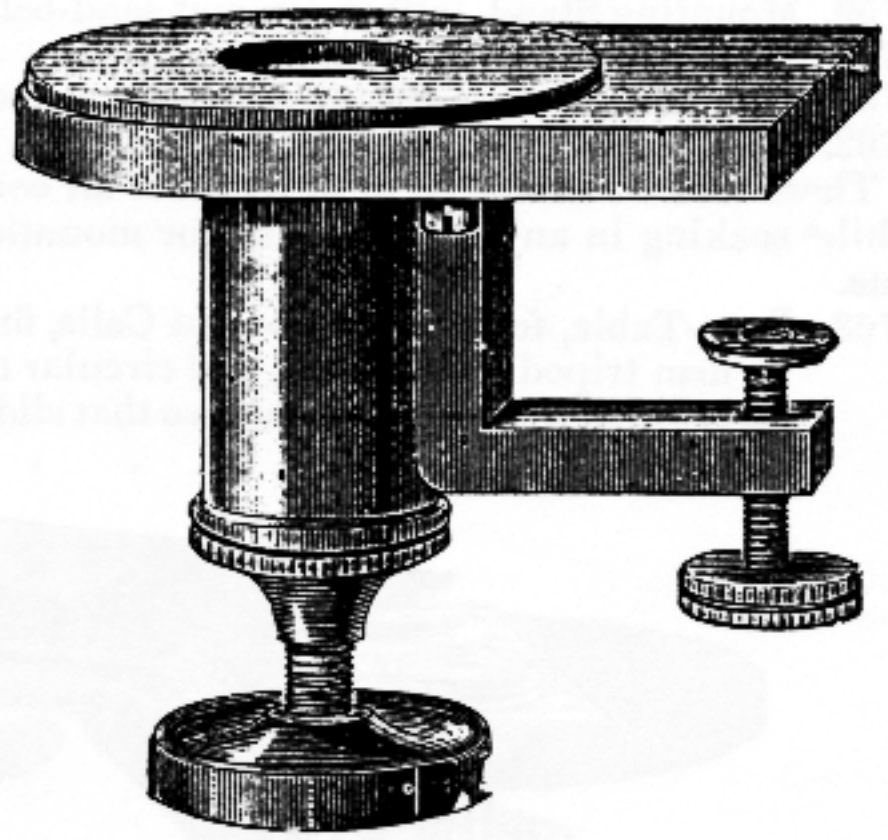


3748.

3749.	Morocco Leather Case of Dissecting Instruments, containing one pair Forceps (3729), one pair Scissors (3734), three Dissecting Knives 3740–2), two Needle Holdlers (3747), with Needles,	7 00
3750.	Morocco Leather Case of Dissecting Instruments, containing one pair Forceps (3730), one pair Scissors (3734), one pair Scissors (3735), three Dissecting Knives (3739–41), two Needle Holders (3747), with Needles, one Valentine's Knife (3748),	14 00
3751.	Morocco Leather Case of Dissecting Instruments, containing two pairs of Forceps (3730–31), two pairs of Scissors (3734-35), one pair Spring Scissors (3737), four Dissecting Knives (3739–42), two Needle Holders (3747), with Needles, one Valentine's Knife (3748),	23 00
3752.	Section Instrument, with glass top, and clamp to fasten to table, for cutting soft tissues,	7 50
3752½.	Section Instrument, with glass top and clamp, for cutting hard tissues,	8 00
3753.	Do. Army Medical Museum Pattern, with large glass top and clamp to fasten to table, for cutting soft tissues,	10 00
	The above has arrangements for taking up all wear, and is recommended as the best Section Instrument in the market.	
3754.	Section Instrument, same as No. 3753, but arranged to cut either hard or soft tissues at pleasure, new model,	22 50
3755.	Section Instrument (Rutherford's Microtome), Army Medical Museum Pattern (No. 3753), with ice-box for freezing,	15 00
3755½.	Section Instrument (Ether Freezing Microtome), complete, with Atomizer, $20.00; without Atomizer,	16 00

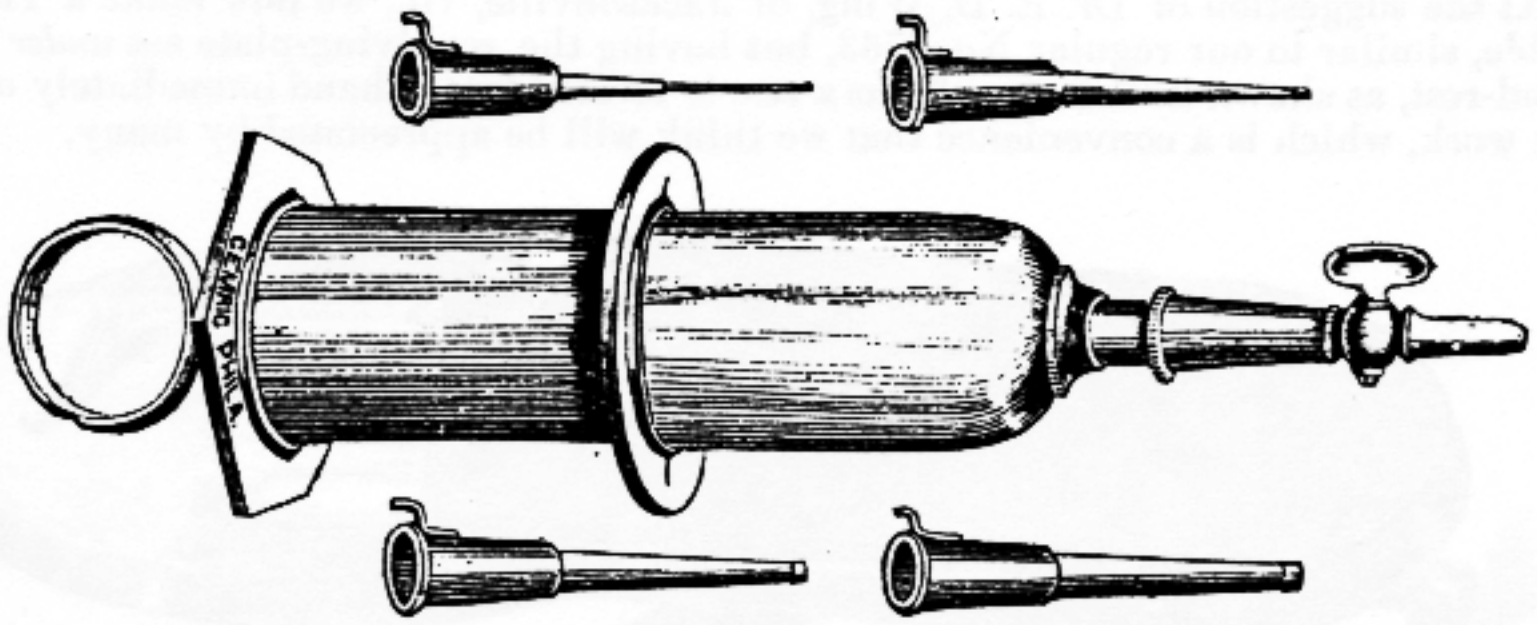


3752-52½.



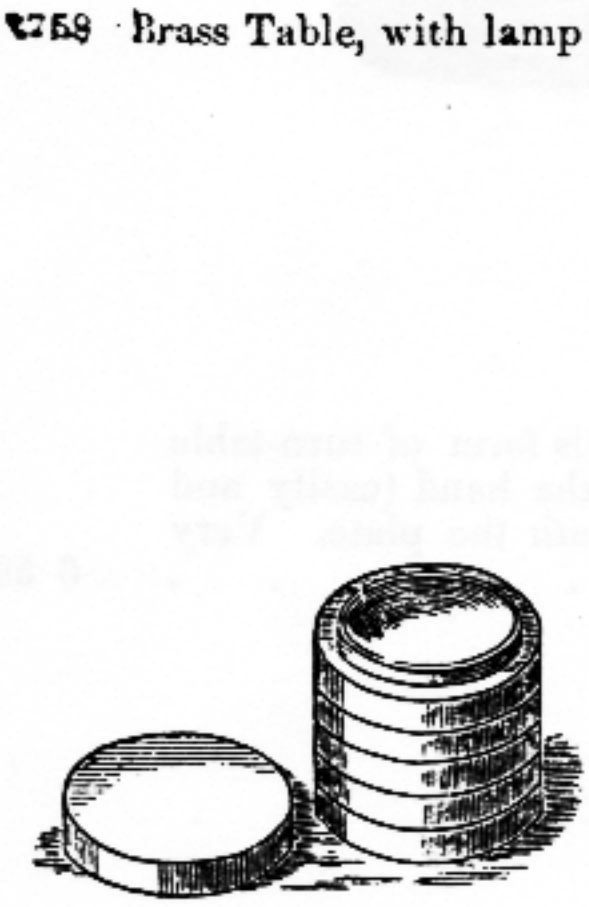
3753.

No.		Price
3756	Injecting Syringe, of brass, with four pipes and stop-cock, in case, .	$9 00
3757.	Do. of German silver, with six pipes and two stop-cocks, in fine morocco case, ...	12 00

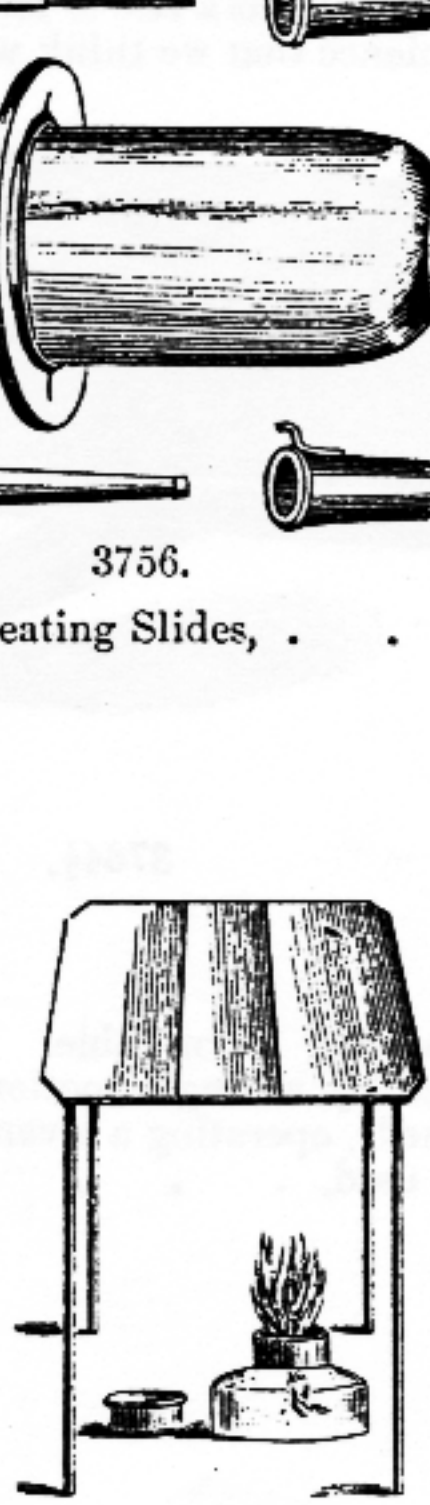


3756.

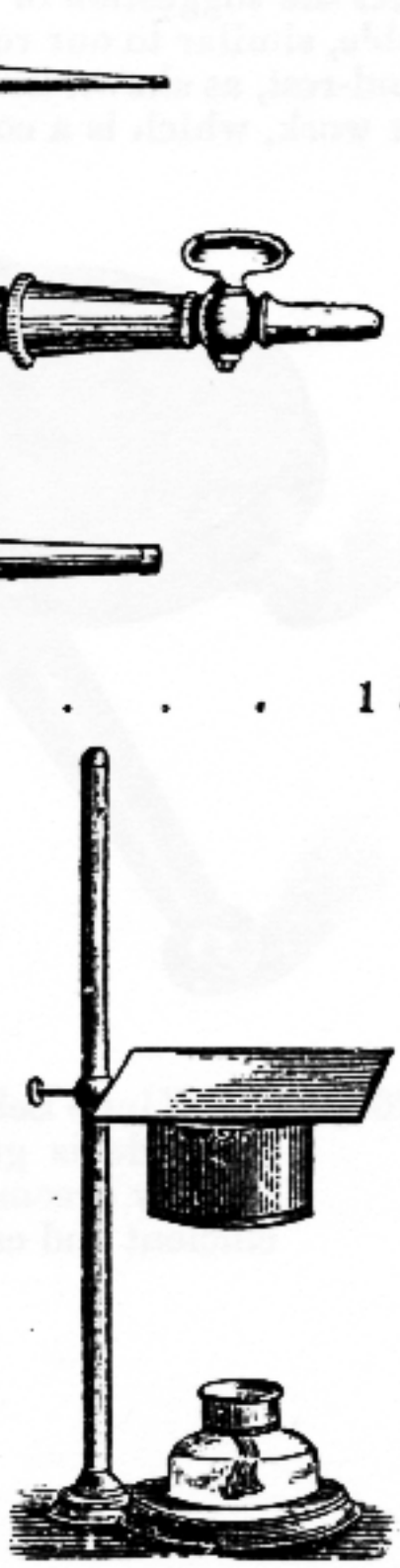
3758 Brass Table, with lamp for heating Slides, ... 1 50



3761-62.



3758.

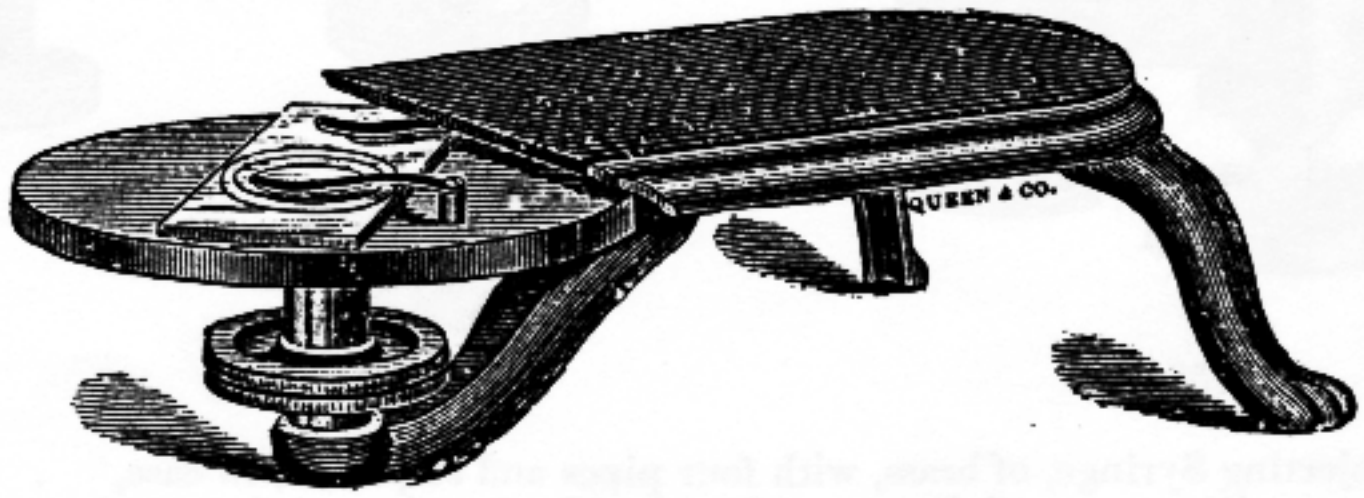


3759.

No.		Price.
3759.	Mounting Stand, with lamp and sand-bath,	$2 50
3760.	Small Glass Spirit-Lamp, with cover,	60
3761.	Porcelain Saucers, 2⅜ inches diameter, per nest of five, with cover,	60
3762.	Do. 3⅛ do. do. do. do.	80

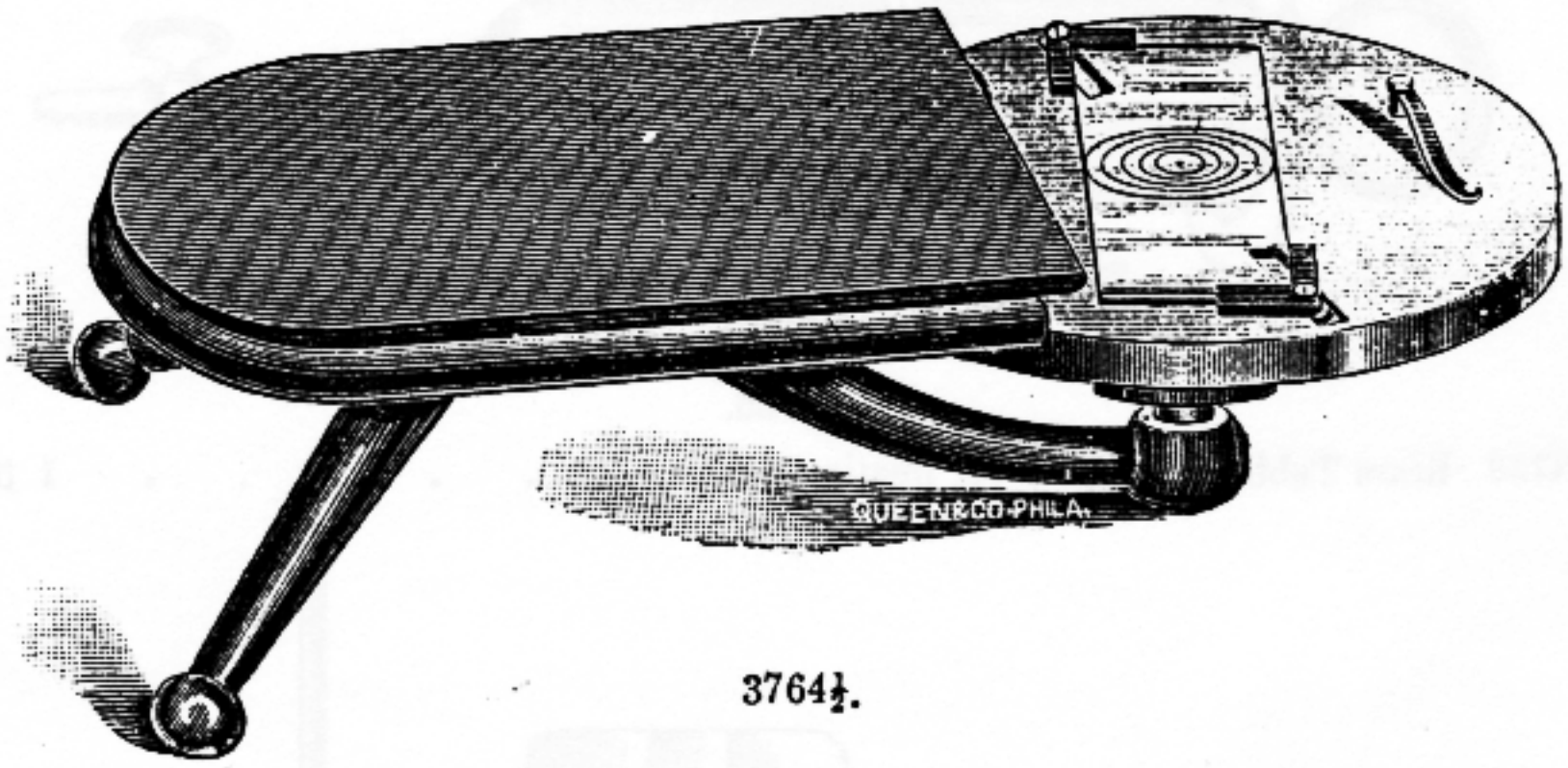
These will be found the most useful of all contrivances for holding small specimens while soaking in any medium, and for mounting from the Oil of Cloves or Turpentine.

3763 Turn-Table, for making Cement Cells, finishing Slides, etc. This has a firm tripod metal stand, and circular table or plate, having concentric rings turned in the face, so that slides may be instantly centered by the eye, ... 2 50



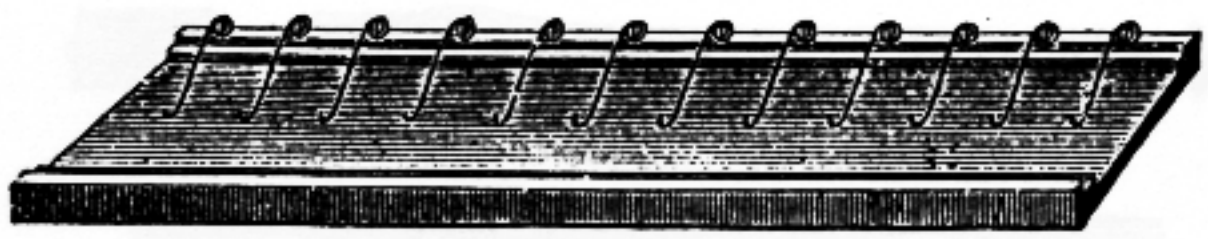
3763½ Queen's Comfortable Turn-Table, ... 3 00

At the suggestion of Dr. E. D. Wing, of Jacksonville, Ill., we now make a Turn-Table, similar to our regular No. 3763, but having the revolving-plate set *under* the hand-rest, as shown in the cut. Thus a rest is formed for the hand immediately over the work, which is a convenience that we think will be appreciated by many.



3764½.

3764½. The Kinne Self-centering Turn-Table. In this form of turn-table the slide is grasped by a single motion of the hand (easily and quickly accomplished), operating a lever beneath the plate. Very efficient and easily used, ... 6 50



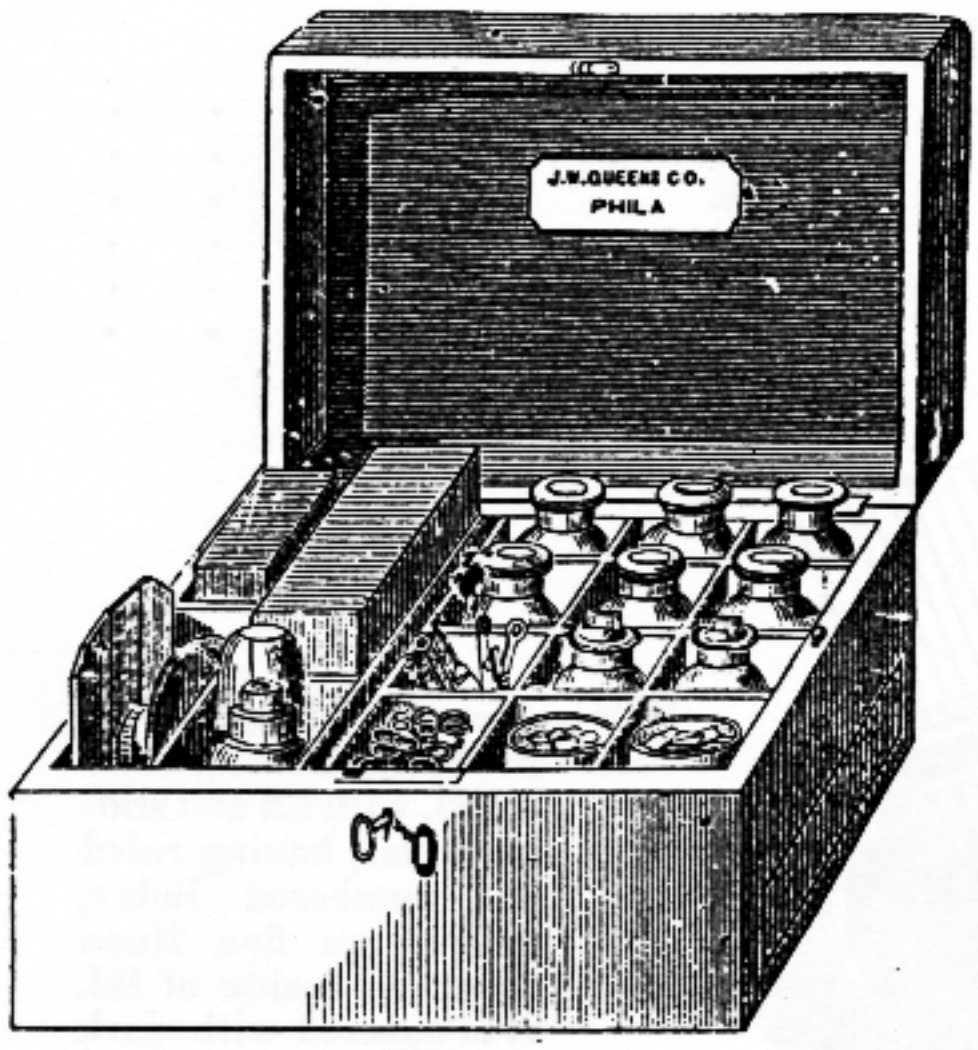
3765.

No. PRICE.

3765. Jackson's Drying Board, with spring clips, for hardening one dozen balsam mountings at once, ... $1 00

3766*a*. Queen's Mounting Cabinet, consisting of a neat polished walnut case, with lock and key, containing:

1 Bottle of Pure Glycerine (3704),
1 Do. Oil of Cloves (3703½),
1 Do. Absolute Alcohol,
1 Do. Magenta (3706½*d*).
1 Do. Methyl A. Green (3706½*c*),
1 Do. Pure Benzole.
1 Do. White Zinc Cement (3714),
1 Do. Gold Size (3710),
1 Do. Brunswick Black (3708½),
1 Tube Canada Balsam (3701),
1 Capped Bottle (3718) containing Balsam prepared to use without heat (3702*a*),
1 Dropping Bottle (3719),
2 Do. Tubes (3717),
2 Dipping Tubes (3716),
½ Dozen Watch Glasses (3715),
1 Wide-mouth Jar for Solutions,
1 Pair Cover Forceps (3727½),
1 Knife (3739),
2 Camel's-hair Brushes with Handle,
1 Pair Steel Forceps (3731),
2 Needle Holders, Bone Handle,
1 Pair Scissors (3734),
½ Dozen Spring Compressors (3724),
1 Brass Table with Lamp (3758),
1 Comfortable Turn Table (3763½),
1 Nest of Saucers (3761),
6 Dozen Glass Slips (3681, No. 1),
¼ Ounce Circles Assorted (3698, No. 2),
¼ Do. Squares do. (3695, No. 2),
1 Dozen Block Tin Rings (3691),
1 Do. White Metal Rings, Beveled (3691*a*),
1 Do. Ebonite Rings (3692),
100 Square Labels (3776), $24 00

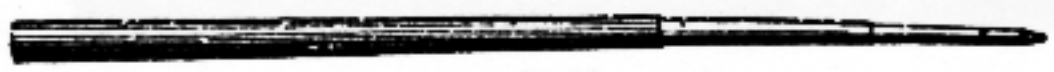


3766.

3771.

3766½. Improved Double Punch, for making cells from sheet wax, . . . 1 50
3767. Punches for labels, various sizes, ... 75 cents to 1 25
3768. Glazier's Diamond, ebony handle, selected quality, ... 4 00
3769. Do. do. do. with keys, ... 4 50
3770. Writing do. with wooden handle, ... 2 25
3770½. Do. do. do. lathe-turned point, and reversible nickel-plated handle, forming a case for carrying in the pocket, . . 3 50

3768.



3770.

No.						Price.
3771.	Diamond, for cutting circles of thin glass,					$7 50
3772.	Hot-water Drying Case, of heavy planished copper, for drying tissues and hardening Balsam mountings; will harden 144 objects at once,					15 00

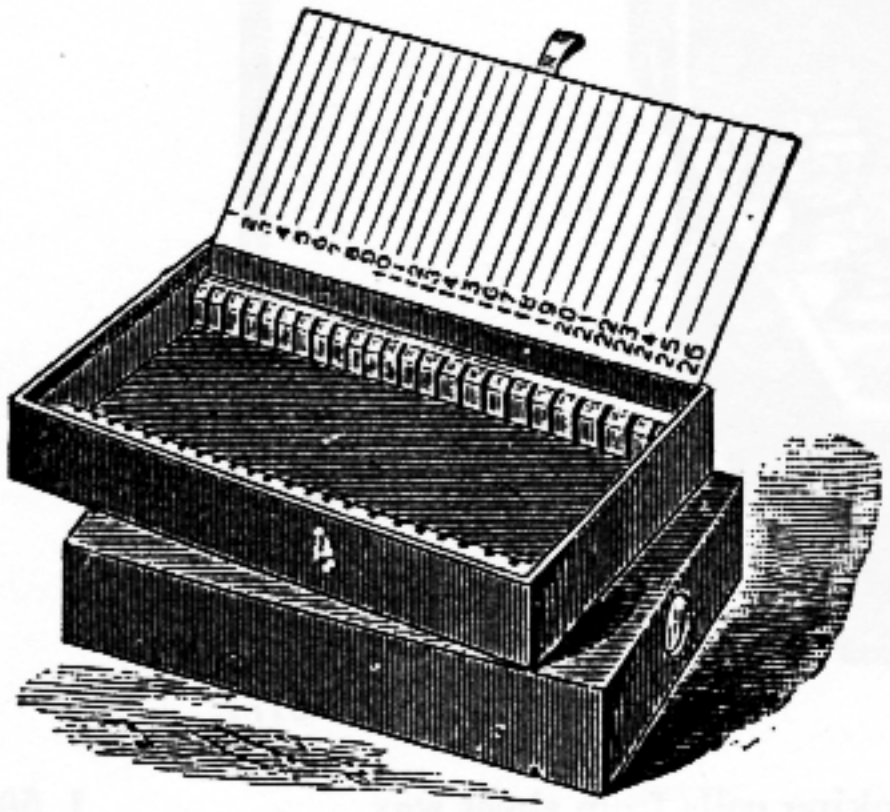
LABELS AND COVERS FOR SLIDES.

3773. Adhesive Gilt Fronts, 3 by 1 inch, per 100, ... 25
3774. Adhesive Gilt Backs, 3 by 1 inch, per 100, ... 20
3775. Adhesive Gilt Fronts, for covering small-sized slides, per 100, ... 20
Backs or Fronts, if with holes punched, per 100, extra, ... 15
3776. Adhesive Labels, square, with border, assorted colors, per 100, . . . 25
3777. Adhesive Labels, plain white, round or oval, per 100, ... 10

Samples of all labels and covers will be sent free on application.

BOXES AND CABINETS FOR OBJECTS.

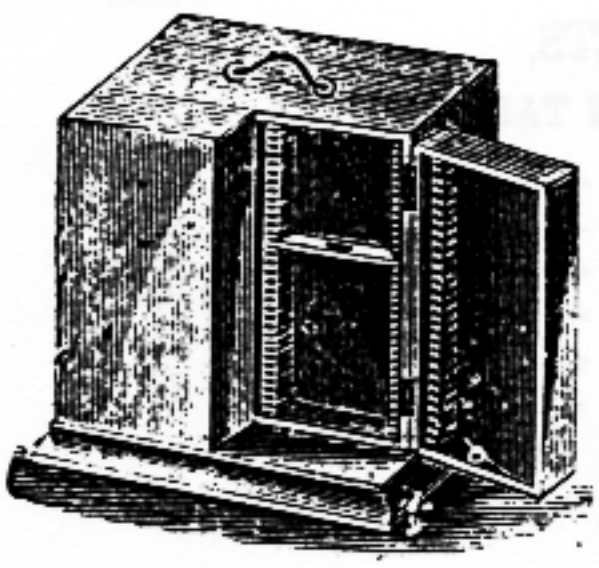
3800.	Mailing Box, of whitewood, for	1	object,	. . . . .		6
3801.	Do.	do.	3	do.	. . . . .	8
3802.	Do.	do.	6	do.	. . . . .	10
3803.	Do.	do.	12	do.	. . . . .	10
3804.	Do.	do.	25	do.	. . . . .	10
3805.	Card-board Rack Box,		12	do.	. . . . .	12



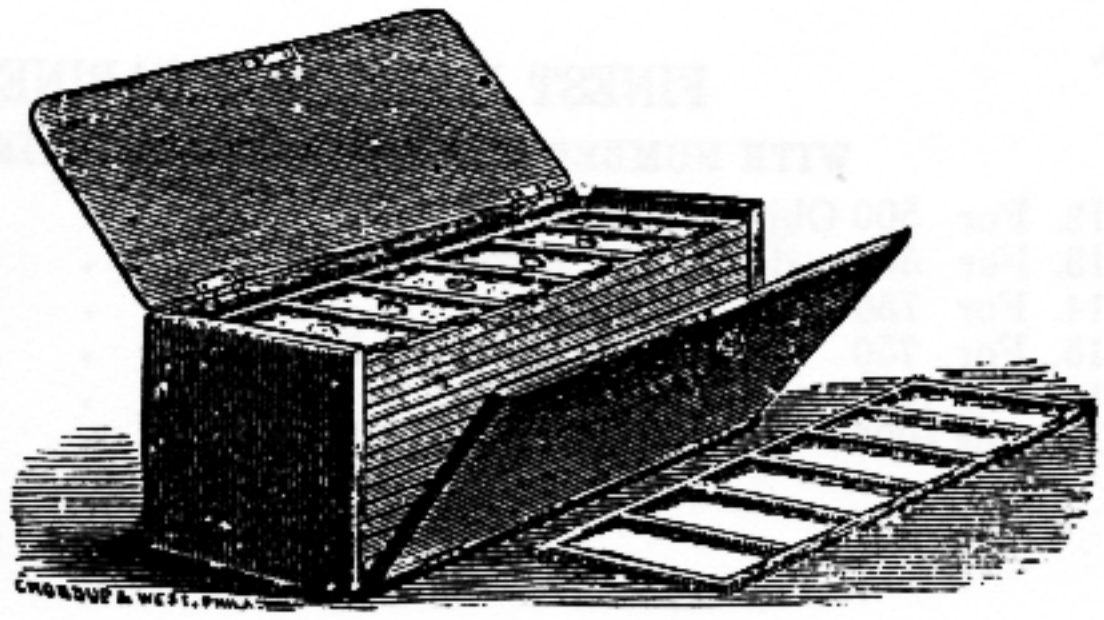
3805½.

3805½. New Slide Box, to hold 26 objects, of stout card-board, with lid and sliding cover, having ruled and numbered index, printed on fine linen paper on inside of lid. It is covered with dark green bookbinder's cloth, and is made in the neatest and most substantial manner, . . 35

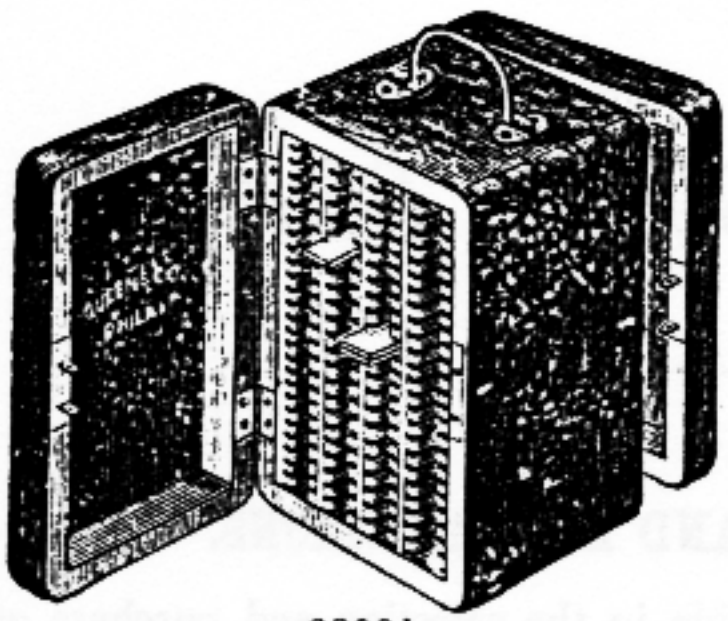
3806.	Portable Cabinet, of	whitewood,	4	trays,	holding	24	objects,	1 00
3807.	Do.	mahogany,	6	do.		36	do.	2 00
3808.	Do.	do.	12	do.		72	do. with lock,	3 25
3808½.	Do.	do.	12	do.		144	do. do.	5 00
3809.	Do.	walnut, with racks, holding				200	do. shellac finish, with brass handle; a compact and excellent cabinet,	4 50



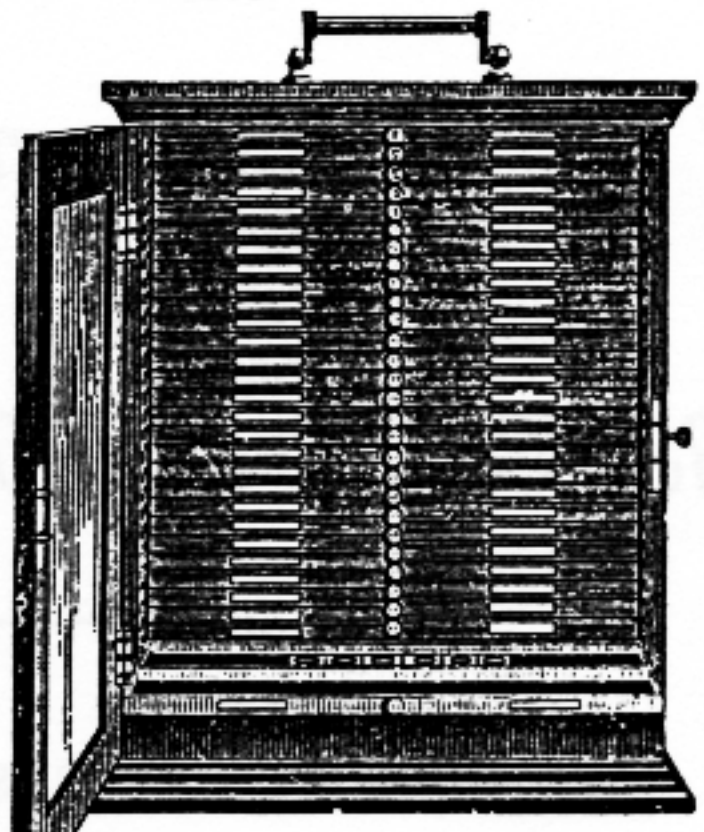
3809.



3808.



3809½.

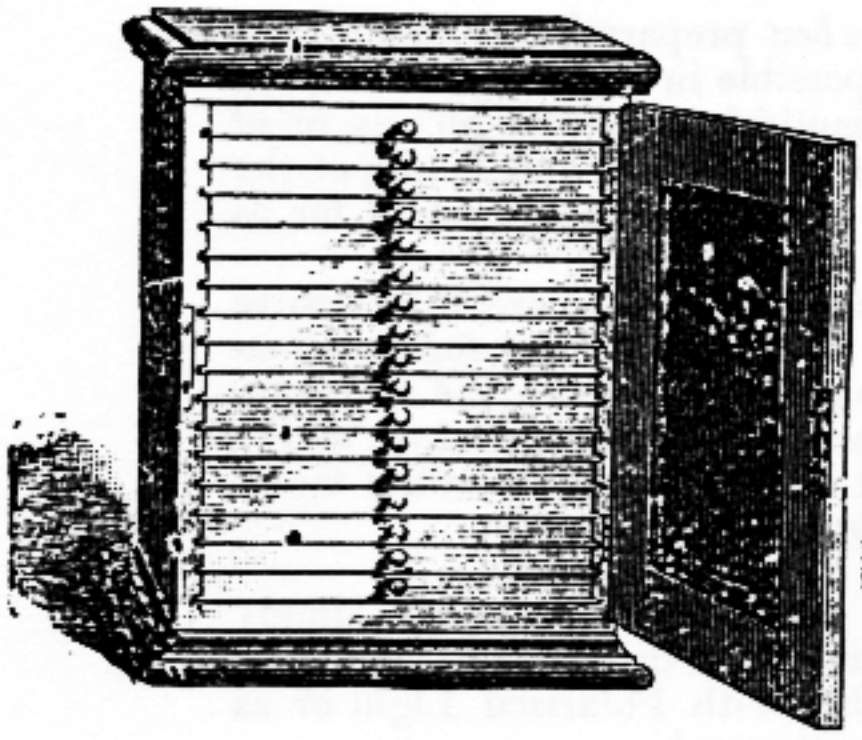


3817.

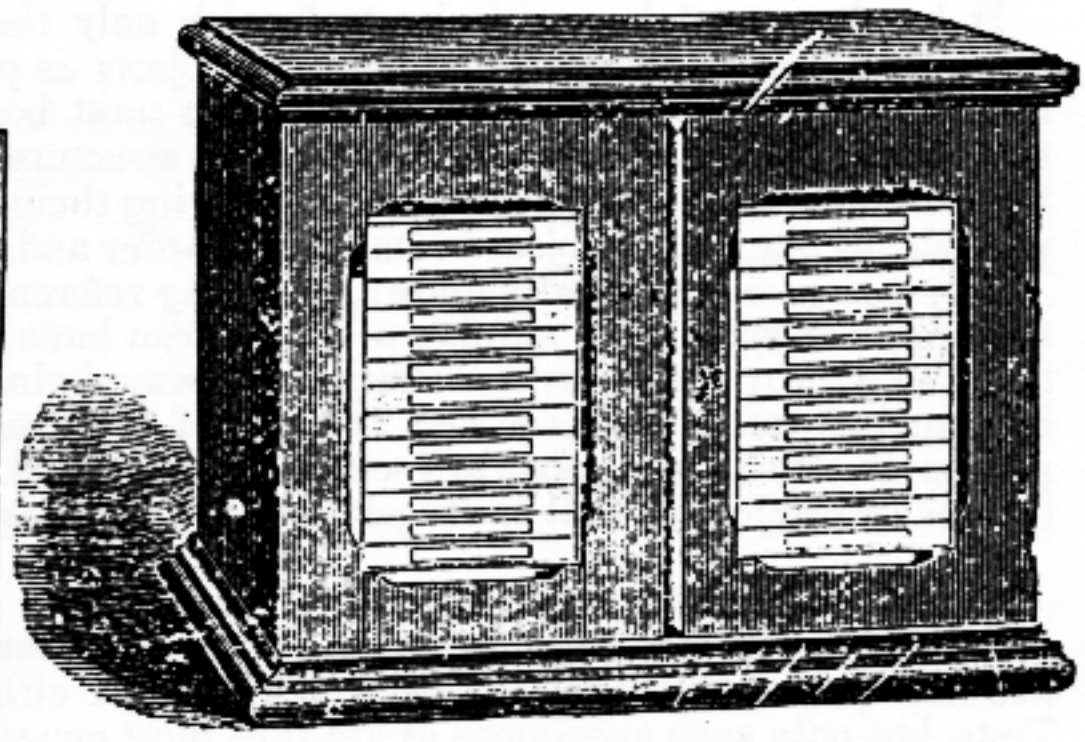
No.		Price.
3809½.	Portable Cabinet, walnut, with racks, holding from 200 to 400 objects (the latter number, if slides are placed back to back, which can generally be done except where the objects are mounted in deep or large cells); neatly finished, with strong handle and locks, . .	$5 00

QUEEN'S POPULAR CABINETS,

OF POLISHED MAHOGANY, WITH RAISED LEDGES IN EACH DRAWER TO ALLOW OF THE EASY REMOVAL OF OBJECTS.



3810½.



3811½.

3810½.	For 350 Slides, 17 drawers, with lock, ...	16 00
3811½	For 600 do. 15 do. do. glass panel doors, . . .	24 00

No.				Price.
		FINEST MAHOGANY CABINETS,		
		WITH NUMBERED KNOBS AND PORCELAIN TABLETS.		
3812.	For 500	Objects, solid door,		35 00
3813.	For 500	do. with glass-panel door,		40 00
3814.	For 750	do. solid door,		44 00
3815.	For 750	do. with glass-panel door,		50 00
3816.	For 1000	do. solid door,		55 00
6817.	For 1000	do. with glass-panel door,		70 00

A CLASSIFIED LIST

OF

FIRST-CLASS MICROSCOPIC OBJECTS,

INTRODUCTORY REMARKS AND EXPLANATIONS.

Although this Catalogue is intended as a guide in the selection and purchase of objects, yet it is obvious that no such list can be strictly correct for any considerable time, since new objects are being added continually, and the vacancies that occur cannot always be filled instantly. It must therefore be understood that these objects can be supplied on demand with *probability* rather than *certainty;* hence, it is advisable, when ordering, to name a few more than the number actually required. In this Catalogue about 4,000 objects are comprised; of these it may be calculated that more than one-half will be found in stock. All objects will be procured, *if possible*, when ordered, and orders are solicited for any object desired, even if not named in the Catalogue, as it is our aim to keep and supply the fullest assortment of Microscopic Objects to be found in this country.

It has been, and is, our desire to furnish only *the best* preparations. We do not think it desirable to introduce as many objects as possible in each department, but rather to rest satisfied with such as are the most beautiful as natural objects, or of their kind the best illustrations of special structure or function, and hence, of the highest interest. In arranging and classifying them, we have endeavored, as far as possible, to place each object in its natural order and relationship.

Any person confidentially known, or giving reference to those who are, if he desires to purchase a reasonable number of objects, can have an assortment sent for examination and approval, the express charge both ways being at his expense, the objects to be returned *within one week*, and the risk of damage or loss in transit borne by the purchaser. Such specimens are sent securely packed in rack boxes, affording facilities for inspection, as well as for packing and returning those not chosen.

Instead of making separate lists of Polariscope and Test Objects, we simply designate the former by an asterisk (*), and the latter by a dagger (†). We have not attempted to mark *all* that may be examined either with Polarized Light or as Tests, but only such specimens as are thus most generally used.

Division I.—THE ANIMAL KINGDOM.

Section I.—VERTEBRATA.

DR. SEILER'S MICROSCOPIC PREPARATIONS.

Each set comprises twenty-four objects, contained in a neat walnut cabinet, arranged diagonally so as to enable one to read all the headings at a glance. The labels are printed, and give a short description, beside the name, of the most important points shown in the specimen.

Larger and special sets will be furnished to order.

3830.—Pathological Series. Price, $15.00.

1. Lung, Phthisis, Man.
2. Do. Tuberculosis, Man.
3. Do. Interstitial Pneumonia, Man.
4. Do. Croupous Pneumonia, Man.
5. Do. Catarrhal Pneumonia, Man.
6. Kidney, Large White, Man.
7. Do. Fatty, Man.
8. Kidney, Amyloid, Man.
9. Do. Interstitial Nephritis, Man.
10. Do. Cirrhosis, Man.
11. Liver, Nutmeg, Man.
12. Do. Cirrhosis, Man.
13. Do. Yellow Atrophy, Man
14. Do. Jaundice, Man.
15. Spleen, Amyloid, Man.
16. Heart, Fatty, Man.
17. Aorta, Atheroma, Man.
18. Tonsil, Hypertrophy, Man.
19. Mammary Gland, Scirrhus, Man.
20. Intestine, Tubercular, Man.
21. Stomach, Scirrhus, Man.
22. Brain, Sclerosis, Man.
23. Uterus, Fibroid, Man.
24. Ovary, Cyst, Man.

3831.—Histological Series. Price, $15.00.

1. Lung, Normal, Child.
2. Do. Fœtus, 7 M., Human.
3. Kidney, Normal, Child.
4. Do. Injected, Cat.
5. Liver, Normal, Man.
6. Spleen, Normal, Man.
7. Heart, Normal, Man.
8. Aorta, Normal, Man.
9. Intestine, Normal, Man.
10. Do. Injected, Cat.
11. Stomach, Normal, Man.
12. Do. Frog.
13. Tongue, Injected, Cat.
14. Skin, Sole of Foot, Man.
15. Brain, Normal, Man.
16. Medulla Oblongata, Normal, Man.
17. Uterus, twelve days after delivery, Human.
18. Ovary, Normal, Human.
19. Muscular Fibre, Injected, Cat.
20. Mammary Gland, Normal, Human.
21. Testicle, Normal, Child.
22. Toe, Fœtus, 7 M., Human.
23. Finger, Fœtus, 7 M., Human.
24. Wrist, Fœtus, 7 M., Human.

3832.—Tumor Series. Price, $15.00.

1. Round-celled Sarcoma.
2. Spindle-celled Sarcoma.
3. Spindle and Round-celled Sarcoma.
4. Enchondroma.
5. Osteo—Sarcoma.
6. Mixoma.
7. Inter-canalicular Fibroma (Breast).
8. Fibro Myoma.
9. Rhabdo Myoma.
10. Papilloma.
11. Adenoma, Breast.
12. Glandular Epithelioma, Breast.
13. Cylinder-celled Epithelioma.
14. Epithelioma, Uterus.
15. Do. Lip.
16. Carcinoma, Stomach.
17. Do. Liver.
18. Medullary Carcinoma, Breast.
19. Scirrhus, Breast.
20. Colloid Carcinoma.

ANATOMICAL PREPARATIONS (in Sets). By ARTHUR C. COLE & SON.

3835.—Series No. 1. 24 Pathological Preparations—Human.

1. Lung, in Phthisis.
2. Do. Catarrhal Pneumonia.
3. Do. Croupous Pneumonia.
4. Liver, Amyloid, not universal in lobules.
5. Do. Cancer.
6. Do. Cirrhosis, universal in lobules.
7. Do. Fatty, not universal in lobules.
8. Do. Indurated.
9. Liver, Syphilitic, showing fibrous bands at margin.
10. Kidney, Scarlet Fever, Desquamative Nephritis.
11. Kidney, advanced Bright's disease, tubes and vessels much distended.
12. Kidney, Fatty degeneration
13. Kidney, Cirrhosis, showing inter-tubular fibroid gr'th
14. Kidney, Contracted constitutional Syphilis.
15. Spleen, Amyloid (or Sago).
16. Stomach, Cancer.
17. Hypertrophied Lymphatic Gland from Neck.
18. Schirrus Mammæ, round Cells elongating into Spindle Cells.
19. Uterus, Fibroid Tumor, showing Spindle Cells.
20. Epithelioma of Lip.
21. Do. of Hand.
22. Do. of Vulva.
23. Malignant Tumor from Neck.
24. Vascular Tumor of Perinæum.

In case, with list of subjects, $15.50

3836.—Series No. 2. 24 Physiological Preparations.

1. Man, Tongue, Transverse Section.
2. Do. Ileum, Transverse Section.
3. Do. Kidney, injected from Artery only.
4. Do. Kidney, from Artery and Vein.
5. Do. Skin, Vertical Sec'n.
6. Do. Brain, cerebellum.
7. Do. do. cerebrum.
8. Do. Stomach.
9. Man, Pancreas.
10. Do. Placenta.
11. Do. Cuticle, showing hair follicles.
12. Do Thyroid Gland.
13. Cat, Ileum, Transverse Section.
14. Do. Lung.
15. Do. Brain, cerebrum.
16. Do. Tongue, Transverse Section.
17. Do. Liver, two Colors.
18. Cat, Bladder, Transverse Section
19. Dog, Stomach of Puppy.
20. Pig, Parotid Gland.
21. Rabbit, Colon, mucous membrane.
22. Do. Ileum, mucous membrane.
23. Do. Kidney, from Artery and Vein.
24. Do. Tongue, Transverse Section.

In case, with list of subjects, $15.50

3837.—Series No. 3. 24 Educational Preparations.

1. Adipose tissue.
2. Connective tissue.
3. Yellow elastic tissue.
4. Striped Muscular fibre.
5. Unstriped do. do.
6. Tendon, Long. Section.
7. Do. Transverse Sec'n.
8. Yellow elastic Cartilage of Cow's Ear.
9. Hyaline Costal Cartilage.
10. Bone, Long. Section.
11. Do. Transverse Section.
12. Do. Skull, Transverse Sec.
13. Scalp, showing hair shafts.
14. Nerve fibres.
15. Do. Cells.
16. Skin, Vertical Section.
17. Tooth, Vertical Section.
18. Capillaries in Pia-Mater.
19. Pigment Cells.
20. Lung of Cat, Injected.
21. Liver do. do.
22. Brain do. do.
23. Kidney of Rabbit.
24. Ileum Do.

In case, with list of subjects, **$15.50**

(*From the* BRITISH MEDICAL JOURNAL, *Oct. 30th*, 1875.)

We have just had an opportunity of inspecting a series of microscopic slides prepared by Arthur C. Cole & Son, of Liverpool. These slides illustrated both healthy and morbid tissues, and the sections brought out well the different structures, and were chosen from good specimens. As to the mounting, it was all that could be desired, and the sections, in size and amount of surface, exceed anything we have hitherto seen. The staining is done by a process peculiar to Messrs. Cole, and is far superior to any in use elsewhere. Taken altogether, they are the most perfect and beautiful things of the kind ever offered for public sale. This is not only our own opinion, but that of some of the most expert microscopists of the day, who have testified to the excellence of these slides. For teachers wishing illustrations for their class-teaching, they will be found very acceptable, while to students commencing their histological researches, they will be invaluable, not only for their demonstrating power, but as models to be aimed at as the students themselves become experts in the art.

3838.—Pathological Preparations—Human. (Injected, Stained, and both Injected and Stained.) By A. C. Cole & Son.
Each, 75 cents; per dozen, $7.50.

ARM—
Keloid growth after gunshot wound.
Myxoma.

ARTERIES—
Aortic Valve ossified.
Cerebral, organizing Thrombus in Syphilis.
Chronic thickening.

BLADDER—
Chronic Cystitis.

BONE—
Caries.
Clavicle, Enchondroma.
Femur, Round-celled Sarcoma.
Frontal, Recurring Periosteal Tumor.
Frontal, Spindle-celled Sarcoma.
Humerus, Periosteal Sarcoma.
Occiput of Infant, Naevus.
Parietal, Gumma.
Patella, Fibroid Cyst.
Scapula, Alveolar Sarcoma.

BRAIN—
Encepaloid Cancer.
Cerebellum, Locomotor Ataxia.
Cerebrum, Acute Inflammation
Cerebrum, Atrophy.
Do. General Paralysis.
Do. Meningitis.
Do. Softening.
Dura-Mater, much thickened.
Medulla Oblongata, Diabetes.
Do. do. Locomotor Ataxia.
Medulla Oblongata, Myelitis.
Pons Varolii, Diabetes.
Do. General Paralysis.
Do. Locomotor Ataxia

BREAST—
Cancer.
Do. Recurrent Fungoid.

Cystic Adenoma.
Fibroid Cyst.

COLON—
Acute Inflammation.
Mucous Polypus.

DIAPHRAGM.
Calcareous Nodule.

EAR.
Myxoma.

EYE—
Spindle-celled Sarcoma, Melanotic.

FACE—
Cancer.
Epithelioma.

FOOT—
Corn.
Epithelioma.

HAND—
Epithelioma.
Fibriod Cyst.
Round-celled Sarcoma.

HEART—
Fatty Degeneration.
Do. Infiltration.
Fibroid Degeneration.
Pericarditis.

ILEUM.
Amyloid Degeneration.
Enteritis.
Inflammation.
Tubercle.
Ulceration.
Do. Typhoid.

JAW—
Cancer.
Epithelioma.
Fibroid Cyst.
Soft Wart.
Tumor, Bony.
Do. Myeloid.

KIDNEY—
Bright's Disease.
Atrophy.
Amyloid.
Cirrhosis.
Cirrhotic and Amyloid.
Fatty.
Embolism.
Gouty or Red Degeneration.
Hypertrophied.
Indurated.
Medullary Cancer.
Nephritis, Acute. (Desquamative, Scarlet Fever, etc.)
Nephritis, Chronic. (Suppurative, etc.)
Strictured (Cystic).
Tubercle.

KNEE—
Joint, Softened.

Osteo-Sarcoma.

LIP—
Epithelioma.

LIVER—
Abscess.
Amyloid Degeneration.
Do. and Fatty Degeneration.
Cancer and Cirrhosis.
Carcinoma.
Cirrhosis.
Cirrhotic and Vascular Tumor.
Fatty Degeneration.
Indurated with Atrophy of Lobules.
Nutmeg.
Parenchymatous, Inflammation.
Peculiar Fat in Lobules.
Red Atropy.
Syphilitic.

LUNG—
Acute Bronchitis.
Carcinoma.
Catarrhal Pneumonia.
Croupous do.
Embolic do.
Emphysema.
Empyema.
Hæmorrhagic Pneumonia.
Melansarcoma.
Miliary Tubercle.
Phthisis.
Pleurisy.
Pneumonia.
Pyæmic Tuberculosis.
Round-celled Sarcoma.
Syphilitic.
Saw-grinder's.
Smothered Child.
Tubercle.
Tubercular Pneumonia.

LYMPHATIC GLAND—
Cancer.
Carcinoma.
Chronic Inflammation.
Spindle-celled Sarcoma.

MESENTERY—
Spindle-celled Sarcoma.

MUSCLE—
Fatty Tubercle.
Fatty Infiltration.
Inflamed.
Do. in Hip Disease.
Pseudo-hypertrophic Paralysis
Trichinous.

NECK—
Elephantiasis.
Enlarged Strumous Gland.
Simple Lymphadenoma.

OVARY—
Cancer.
Dermoid Tumor.

PANCREAS—
Carcinoma.

PENIS—
Epithelioma.
Prepuce, Chancre.

PROSTATE GLAND—
Carcinoma.
Enlarged.

SCALP—
Recurrent Sarcoma.

SKIN—
Cancer.
Granulations in Healing Sore.
Do. Ulcer.
Hypertrophied.
Inflamed.
Lupus vulgaris.
Pityriasis.
Plastic Effusion from Foot after Inflammation.
Scarlet Fever.
Small Pox, Hæmorrhagic.
Do. Simple.
Tattooed.

SPINAL CORD, *from Various Regions*—
Degeneration of the Nerve Cells.
Fracture.
General Paralysis.
Hydrophobia.
Insanity.
Locomotor Ataxia.
Tetanus.

SPLEEN—
Amyloid (or Sago).
Calcareous Cicatrix.
Embolism.
Enlarged, in Chronic Heart Disease.
Inflammation.
Leukaemia.
Tubercle.

STOMACH—
Chronic Catarrh.
Passive Congestion.
Thickening.

SUPRA-RENAL CAPSULE—
Addison's Disease.

TESTICLE—
Fibroid Degeneration.
Indurated.
Sarcoma, Cystic.
Do. Round-celled.

THIGH—
Papilloma.

THYROID GLAND—
Bronchocele.

TONGUE—
Cavernous Tumor.
Epithelioma.
Ulcer.

TONSILS—
Enlarged,

UTERUS—
Chronic Leucorrhœa.
Polypus.
Spindle-celled Sarcoma.

VULVA—
Epithelioma.

3839.—Histological Preparations. (Injected, Stained, and both Injected and Stained.) By A. C. Cole & Son. Each, 75 cents; per dozen, $7.50.

Air Bladder of Sturgeon.*
Artery, Human.
Bladder, Cat.
Do. Human.
Bone (Femur), Human.
Do. do. do. Fœtal.
Do. (Humerus), do.
Do. (Parietal), do.
Do. (Tibia), do.
Brain (Cerebellum), Cat.
Do. do. Human.
Do. do. Monkey.
Do. (Cerebrum), Cat.
Do. do. Human.
Do. do. Monkey.
Do. (Medulla oblongata), Cat.
Do. do. do. Human.
Do. do. do. Monkey.
Do. (Pons Varolii), Human.
Cartilage, yellow fibrous, Ear of Cow,
Do. Human, from Sternum.
Do. do. Fœtal.
Do. cellular, Ear of Mouse.
Claw, Fowl.*
Do. Polar Bear.*
Do. Wild Cat.*
Colon, Cat.
Do. Human.
Do. Rabbit.
Crystalline Lens, Human, showing ultimate fibre.
Cuticle, Human.
Epithelium, do. from Mouth.
Eyelid, do.
Finger-Nail, Human.*
Foot, Dog.
Foot-pad, Cat.*
Hoof, Horse.*
Do. Ox.*
Do. Sheep.*
Horn, Antelope.*
Do. Buffalo.*
Do. Rhinoceros.*
Ileum, Cat, mucous membrane.
Do. Dog, do.
Ileum, Human, mucous membrane.
Do. do. Trans. Section.
Kidney, Cat.
Do. Fowl.
Do. Human, Adult.
Do. do. Child.
Do. Rabbit.
Do. Snake.
Larynx, Human, Fœtal.
Do. do. Infant.
Liver, Cat.
Do. Human.
Lung, Cat.
Do. Fowl.
Do. Human, Adult.
Do. do. Fœtal.
Do. Snake.
Lymphatic Gland, Cat.
Do. do. Human.
Mammary do. do.
Do. do. do. in Lactation.
Muscle, Cat.
Do. Human, voluntary.
Do. do. involuntary.
Nose, Human.
Œsophagus, Cat.
Olfactory Bulb, Cat.
Optic Nerve, Human.
Do. do. Sheep.
Ovary, Cat.
Do. Human, Adult.
Do. do. Child.
Pancreas, Human.
Parotid Gland, Human.
Penis, Human.
Do. Monkey.
Do. Rabbit.
Do. Rat.
Placenta, Human.
Prostate Gland, Human.
Scalp, Human, Caucasian.
Do. do. Negro.
Skin, Frog, showing pigment cells.
Do. Human, African, showing pigment cells.
Skin, Human, Caucasian.
Spinal Cord, Cat.
Do. do. Horse
Do. do. Human, Long. Sec.
Do. do. do Tran. do.
Spleen, Human.
Stomach, Cat.
Do. Dog.
Do. Fowl.
Do. Human.
Sub-maxillary Gland, Cat.
Do. do. Human
Supra-renal Capsule, Cat
Do. do. Human.
Tendon, Giraffe.*
Do. Human.*
Do. Ostrich.*
Testicle, Cat.
Do. Human, Adult.
Do. do. Child.
Do. do. Infant.
Thymus Gland, Human
Thyroid do. do.
Tongue, Cat.*
Do. Human.
Do. Rabbit.
Do. Snake.
Tooth, Calf, Transverse Sect.
Do. Human (Incisor), Long. Section.
Do. Human (Incisor), Tran Section.
Do. Human (Molar), Long. Section.
Do. Human (Molar), Tran Section.
Do. Myliobates.
Do. Sheep.
Do. Wild Cat.
Do. Zygobates.
Umbilical Cord, Human.
Uterus, Human, Adult.
Do. do. Infant.
Whalebone.*
Yellow Elastic Tissue, Neck of Cow.
Yellow Elastic Tissue, Neck of Giraffe.

3840.—Blood, Spermatozoa and Urinary Deposits. Each, 60 cents; per dozen, $6.00.

BLOOD DISCS—
Amphiuma.
Bat.
Camel.
Canary.
Cat.
Dog.
Domestic Fowl
Eel.
Hedge-hog.
Horse.
Lepidosiren.
Man.
Monkey.
Mouse.
Ostrich.
Ox.
Pigeon.
Salamander.
Salmon.
Sheep.
Slow-worm.
Sparrow.
Sturgeon.
Swallow.
Toad.
Triton.
White Mouse.

HÆMATOCRYSTALLIN—
From Human Blood. (75 cts.)

SPERMATOZOA—
Ass.
Boar.
Bull.
Camel.
Deer.
Dog.
Elephant.
Fish.
Goat.
Horse.
Man. (75 cts.)
Mouse.
Newt.
Rabbit.
Rat.
Rhinoceros.
Sheep.
Wolf.

URINARY DEPOSITS—
Carbonate of Lime, Horse.
Do. do. Man.
Chloride of Sodium.
Cholesterine.
Creatinine.
Cystine, or Cystic Oxide.
Hippuric Acid.
Leusine.
Murexide.
Nitrate of Urea.
Oxalate of Lime, Dumb-bell form.

Oxalate of Lime, Ellipsoidal form.
Oxalate of Lime, Octahedral form.
Oxalate of Urea.
Oxalurate of Ammonia.
Phosphate of Ammonia, amorphous.
Phosphate of Lime.
Sugar in Diabetes.
Do. of Milk.
Taurine.
Triple Phosphate, Rhombic.
Do. do. Stellate.
Do. do. in Catarrh of Bladder.
Do. do. in Hepatitis.
Do. do. do. (Syphilitic).
Triple Phosphate, in Hip-Joint Disease.
Do. do. in Paralysis.
Do. do. in Renal Calculus.
Do. do. in Rheumatism.
Do. do. in Ulceration of Knee-Joint.
Tube Casts. $1.00
Tyrosine.
Urate of Ammonia.
Do. of Lime.
Do. of Magnesia.
Do. of Soda.
Urea.
Uric Acid from Boa Constrictor
Do. do. Man.
Do. do. do. Fusiform.
Uric Acid from Man, Rectang'r
Do. do. do. Rhombic.
Do. in Cirrhosis of Liver.
Do. in Congest'n of L'ngs.
Do. in Dysentery.
Do. in Eczema.
Do. in Gastralgia.
Do. in Gastric Fever.
Do. in Gout.
Do. in Hæmaturia.
Do. in Pneumonia.
Do. in Rheumatism (Ac.)
Do. in Rheumatic Endocarditis.
Do. in Rheumatic Fever.
Do. do. Gout.
Do do. Pericarditis.
Do. in Scurvy.

3841.—Feathers, Hair and Scales. Each, 50 cts.; per doz., $5.00.

FEATHERS—
Albatross.
Cassowary, Quill.*
Domestic Fowl.
Eider Duck (showing transition from Down to Feather).
Goldfinch.
Humming Bird (opaque).
Nightingale.
Ostrich.
Owl.
Parrot.
Peacock.
Penguin.
Pigeon.
Sun-Bird.

HAIR—
Ant-Eater (Section).
Bat, American.†
Do. Australian.†
Do. British.†
Do. Indian.†
Beaver.
Brahmin Bull.*
Cat.
Deer (Section).
Egyptian Mummy.
Elephant.
Do. (Section, from tail).*
Ermine.
Goat (Mohair).*
Giraffe.
Do. (Section, from tail).
Gorilla.*
Harte-beest (Section).
Hippopotamus (do. from tail.)
Horse, woven.*
Lion, Whisker (Section).*
Man.
Do. Beard.*
Do. Eyebrow.*
Do. Fœtal.
Do. (Section).
Mole.
Monkey.
Mouse.
Do. Indian.†
Do. White.*
Ornithorhyncus.
Porcupine, Quill (Section).*
Rabbit.
Rat.*
Reindeer (Body). Cellular.*
Do. (Legs), Bristly.*
Russian Sable.
Seal.
Do. Whisker (Section).*
Sheep (Coarse Eng'h Cheviot).
Do. (Merino).
Siberian Mammoth (Section).
Squirrel.
Walrus, Whisker (Section).*
Water Rat.
Whale, Eyelash (Section).

SCALES—
Carp.*
Dog-Fish.*
Eel.*
Gudgeon.*
Perch.*
Shark.*
Sole.*
Sturgeon.*

SKIN, *with Scales in situ*—
Dog-Fish (opaque).
Eel.*
Shark (opaque).
Sole do.
Do. *

Section II.—ARTICULATA.

3842.—Parasitic Insects, Acari, etc. Each, 50 cts.; per doz., $5.00.

Bed-Bug, Cimex lectularius, Male.
Bed-Bug, Cimex lectularius, Female.
Body Louse, Pediculus vestimenti. 75 cts.
Book Mite, Cheyletus eruditus. 75 cts.
Cheese Mite, Male and Female. 75 cts.
Chigoe (or Jigger), Pulex penetrans.
Crab Louse, Pediculus pubis, Male. $1.00.
Crab Louse, Pediculus pubis, Female. $1.00.
Face Insect, Demodex folliculorum. 75 cts.
Flea of Cat, Pulex felis.
Do. Dog, Pulex canis.
Do. Fowl, Pulex gallinæ.
Flea of Man, Pulex irritans, Male.
Flea of Man, Pulex irritans, Female.
Harvest Bug, Trombidium autumnale.
Head Louse, Pediculus capitis, Male.
Head Louse, Pediculus capitis, Female.
Head Louse, Pediculus capitis, Egg.
House Mite, Glyciphagus cursor. 75 cts.
Itch Insect, Sarcoptes scabiei, $1.00.
Itch Insect, Sarcoptes scabiei, Male and Female. $2.00.
Itch Insect, Sarcoptes scabiei, Male, Female and Larva. $2.50.
Itch Insect, Sarcoptes scabiei, Male, Female, Egg and Larva. $3.00.
Itch Insect, from Cat, with Larva. $1.25.
Louse of Dog.
Do. Domestic Fowl.
Do. Mouse.
Do. Monkey.
Do. Peacock.
Do. Pigeon.
Do. Swallow.
Do. Vampire Bat.
Mange Insect, from Horse, Male, Female and Larva. $2.00
Meal Mite, Tyroglyphus farinæ.
Parasite of Bee.
Do. Beetle.
Sheep Tick, Melophagus ovinus.

3843.—Whole Insects (not Parasitic). Each, 75 cts.; per doz., $7.50

Ant, Formica rufa.
Ant-Lion, Myrmeleon formicarius, Larva.
Asparagus Beetle. Crioceris Asparagi (opaque).
Blow Fly, Musca vomitoria.
Blow Fly, Musca vomitoria, Larva (Maggot).
Bot Fly, Larva.
Carpet Beetle, Anthrenus muscorum, Larva.
Cattle Fly, Musca corvina.
Centipede, Lithobius forcipatus.
Click Beetle, Larva (Wire Worm).
Crane Fly, Tipula oleracea. $1.00.
Cuckoo Spit, Aphrophora spumaria.
Dragon Fly, larva.
Drone Fly, Heliophilus pendulus.
Earwig, Forficula auricularis.
False Scorpion, Chelifer.
Frog Hopper, Amblycephalus viridis.
Gall Fly, Cynips.
Glow-worm, Lampyrus noctiluca, Male.
Glow-worm, Lampyrus noctiluca, Female.
Gnat, Culex pipiens, Male.
Do. do. Female.
Do. do. larva.
Grasshopper, Locusta viridis.
Green-scale Beetle, Cassida viridis, pupa.
Honey Bee, Apis mellifica.
Hornet, Vespa crabo.
House Fly, Musca domestica.
Ichneumon Fly, Ophion luteum.
Lace-wing Fly, Chrysopa perla.
Do. C. perla, larva.
Lady-Bird, Coccinella.
Do. do. larva.
Do. do. pupa.
Midge, Psychoda.
Mosquito, Culex, Male.
Do. do. Female.
Plant Bug, Tingis Cardui (opaque).
Plant Bug, Tingis foliacea (opaque).
Plant Bug, Tingis hyalina (opaque).
Plant Louse of Rose, Aphis Rosæ.
Privet Hawk Moth, Sphinx ligustri, young larva.
Saw Fly, Allantus scolopacea.
Scissor-Bug, Capsus planicornis.
Scorpion Fly, Panorpa vulgaris.
Shadow Watcher, Syritta pipiens.
Spider, Garden, Epeira diadema.
Spider, Ground, Lycosa agrestica.
Spider, Harvest, Phalangium cornutum.
Spider, House, Aranea labyrinthica.
Spider, Jumping, Salticus scenicus
Spider, Marsh, Lycosa piratica
Spider, Water, Argyroneta aquatica.
Tussock Moth, young larva.
Wasp, Vespa vulgaris.
Water Beetle, Gyrinus natator
Do. do. larva.
Water Beetle, Hygrotus elegans
Do. do. larva
Water Boatman, Notonecta glauca.
Water Boatman, Notonecta glauca, pupa.
Water Scorpion, Nepa cinerea.
Water Skater, Gerris lacustris.
Weevil, Hypera nigrirostis (opaque).

3844.—Insect Anatomy, displayed complete on one Slide. Each, $2.50.

Biting Fly, Hæmatophota pluvialis.
Blow Fly, Musca vomitoria.
Butterfly, Argynnis Paphia.
Earwig, Forficula auricularis.
Garden Spider, Epeira diadema.
Honey Bee, Apis mellifica.
Scorpion Fly, Panorpa vulgaris.
Wasp, Vespa vulgaris.

3845.—Parts of Insects, etc. Each, 50 cents; per dozen, $5.00.

ABDOMEN—
Beetle, Curculio (opaque).
Moth, from Ecuador (opaque).
Sand Bee, from West Africa (opaque).
Weevil, Prepodes spectabilis (opaque).

ANTENNÆ—
Blow Fly.
Cockchafer.
Cockroach.
Gnat, Male.
Do. Female.
Sedge Fly.
Sphinx Moth.
Wasp.

EGGS—
Butterfly, Cenonympha (opaque).
Butterfly, Chrysophanus (opaque).
Butterfly, Hipparchia Janira (opaque).
Butterfly, Polyommatus Alexis (opaque).
Butterfly, Small Heath (opaque).
Common Veneer Moth (opaque).
Goat Moth, Cossus ligniperda (opaque).
Latticed Heath Moth (opaque).
Parasite of Buzzard do.
Do. Crane, do.
Do. Goose, do.
Do. Owl, do.
Do. Pig, do
Sedge Fly, Sialis suturalis (opaque).

ELYTRA—
Diamond Beetle (opaque). 60 c.
Tiger do. do.
Water do. Dytiscus.*
Weevil, Hypomeces squamosus (opaque).
Weevil, Prepodes spectabilis (opaque).

EXUVIUM (CAST SKIN)—
Dermestes, larva (for Parabola).
Ephemera (for Parabola).
Tortoise Beetle, do.

EYES—
Beetle, showing multiplied images. (60 cts.)
Bee Fly.
Blow Fly.
Do. (Simple).
Butterfly.
Dragon Fly.
Drone Fly.
House Fly.
Moth (opaque).
Spider, "

FOOT—
Caterpillar.
Water Beetle, Dytiscus.
Do. do. (opaque).
Do. Spider (opaque).

GIZZARD—
Centipede.*
Cockroach.*
Cricket.*
Diamond Beetle.*
Water Beetle, Acilius.*
Do. Dytiscus.*
Weevil, Cyphus.*

HAIR—
Bird-catching Spider.
Caterpillar of Tiger Moth.
Do. Vapor do.
Centipede.
Dermestes, larva.†

HALTERES (OR BALANCERS)—
Blow Fly.
Crane Fly.

HEAD—
Cricket.
Diamond Beetle (opaque).
Hive Bee.

Mosquito (showing lancets).
Weevil, Eupholus (opaque).
Do. Hypomeces, do.

LANCETS—
Bed Bug, Cimex.
Flea, Pulex.
Gnat, Culex.

LEG AND FOOT—
Ant.
Blow Fly.
Diamond Beetle (opaque).
Drone Fly
Honey Bee.
Hornet.
Sand Bee (opaque).
Snipe Fly.
Spider.
Tiger Beetle (opaque).
Tortoise-shell Butterfly (opaque).
Water Beetle, Dytiscus.*
Do. Gyrinus.
Weevil, Prepodes (opaque).

MOUTH—
Bee.
Garden Spider.
Wasp.
Water Boatman.

OVIPOSITOR—
Blow Fly.
Gad Fly.
Gall Fly.
Grasshopper.
Harvest Fly, Cicada.
Ichneumon Fly.
Moth, Brindle Beauty.
Saw Fly.
Spider.

PALPI—
Butterfly.
Spider.

PROBOSIS (OR TONGUE)—
Blow Fly.† (75 cts.)
Butterfly.
Gad Fly.
Hive Bee.
House Fly.
Moth.
Rhingia.
Saw Fly.

PYGIDIUM—
Flea.†

SCALES—
Amathusia Horsfieldii.
Buff Tip Moth.
Clothes Moth, Tinea vestianella
Diamond Beetle.
Forester Moth.
Gnat, Culex pipiens.†
Hipparchia Janira.†
Iphias glaucippe. [and $1.00.
L. curvicollis († Podura) 75 cts.
Lepisma saccharina.† (60 cts.)
Morpho Menelaus.†
Papilio Paris.
Peacock Butterfly.
Petrobius maritimus.† (60 cts.)
Pieris Brassicæ.
Do. Napi.
Do. pyrrha.
Do. Rapae.
Podura plumbea.† (60 & 75 cts.)
Polyommatus Alexis.
Do. Argus.
Do. Corydon.
Privet Hawk Moth, Sphinx ligustri.
Tortoise-shell Butterfly.
Vanessa Atalanta.

SEXUAL ORGANS—
Blow Fly.
Drone Fly.
Humble Bee.

SILK—
Silkworm.
Spider.

SKIN—
Bird-catching Spider.
Garden Spider.
Silkworm.
Water Beetle, larva.

SPINNERETS—
Silkworm.
Spider.

SPIRACLES—
Blow Fly.
Do. larva.
Cricket.
Drone Fly.
Dytiscus, larva.

STING—
Humble Bee.
Honey do.
Hornet.
Wasp.

TRACHEÆ—
Caterpillar of Vanessa.
Centipede.
Water Beetle, Dytiscus, larva. (75 cts.)

WING—
Atlas Moth (opaque).
Bee, showing hooklets.
Blow Fly.
Earwig.
Gnat, Culex pipiens.
Goat Moth, Cossus (opaque).
Harvest Fly, Cicada.
Hornet.
Morpho Anexbia (opaque). 60 c.
Do. Menelaus do. 60 c.
Ornithoptera Cræsus (opaque).
Do Richmondii do.
Papilio Paris do.
Peacock Butterfly do.
Do. do. (embryonic) (opaque).
Red Admiral Butterfly (embryonic) (opaque).
Sangala gloriosa (opaque).
Urania Fernandina do.
Water Beetle, Gyrinus.

3846.—Scales of Butterflies, arranged to form Bouquets and Vases of Flowers, etc.; very handsome. Prepared by Harold Dalton. Each, $2.50 to $15.00.

3847.—Crustaceans. Each, 60 cents; per dozen, $6.00.

Caligus rapax (Marine Parasite).
Cirrhi of Sea Acorn, Balanus balanoides.*
Crystal of Carbonate of Lime in Tail of Shrimp.*
Cyclops quadricornis.
Exuvium of Prawn.*
Fish-louse, Argulus foliaceus (fresh-water).
Pigment Cells in Tail of Shrimp
Shell of Barnacle, Vertical Sec.
Shell of Crab, Superficial Sec.
Do. do. Vertical do.
Spider Crab (opaque).
Water Flea, Daphnia pulex.*
Young of Crab, 1st Stage.

3848.—Worms. Each, 75 cents; per dozen, $7.50.

Ascarides, and Ova, from Lion.
Cysticercus from Pike Fish.
Do. do. Rabbit.
Do. do. do., Head of.
Eels from Sour Paste, Anguillula glutinis.
Do. from Vinegar, Anguillula aceti.
Entozoon from Cuttle Fish.
Do. do. Horse.
Filaria from Human Blood.
Do. do. Lion.
Hydatid from Aorta of Hartebeest.
Do. from Liver of Man.
Rotifer vulgaris.
Tape-worm, Tænia solium, segment.
Do. Tænia solium, ova
Teeth of Medicinal Leech.
Trichina spiralis, Encysted.
Do. do. mature form, both Sexes on one slide $1.00.

Section III.—MOLLUSCA.

3849.—Palates. Each, 60 cents; per dozen, $6.00.

Cuttle Fish, Octopus.*
Cellar Snail, Zonites.
Chiton.*
Doris.
Garden Snail, Helix.*
Haliotis.*
Do. (opaque).
Janthina.*
Limnæus.
Limpet, Patella.*
Do. do. (opaque).
Nerita.*
Neritina.
Paludina.
Periwinkle, Littorina.
Do. do. (opaque)
Planorbis.
Purpura lapillus.
Trochus zizyphinus.*
Do. do. (opaque)
Whelk, Buccinum.*

3850.—Shell Sections, etc. Each, 75 cents; per dozen, $7.50.

EMBRYO OYSTERS—
In Balsam.*
In Fluid, moving.* $1.00
Opaque.

SECTIONS OF SHELL—
Cuttle Fish (so-called "bone").*
Common Oyster.
Conus nanus.*
Cerithium rugosum.
Cypræa annulus.
Mother-of-Pearl, Haliotis splendens.
Mother-of-Pearl, Haliotis, from Japan.
Do. Pearl Oyster, Avicula.
Pearl, Alasmodon margaritifera
Pinna pectinata.*
Terebratula australis.

3851.—Polyzoa. Each, 60 cents; per dozen, $6.00.

Bicellaria ciliata, showing "Bird's-head" processes.
Bicellaria grandis.*
Do. tuba (opaque).
Bugula avicularia, showing "Bird's-head" processes.
Bugula Murrayana.*
Canda reptans (opaque).
Catenicella plagiostoma.
Cellularia ciliata.*
Do. do. (opaque).
Do. scruposa. do.
Crisia eburnea do.
Crisia eburnea.*
Flustra foliacea (opaque).
Do. paraceta.*
Gemellaria loriculata.*
Membranipora pilosa (opaque).
Notamia bursaria.

Section IV.—RADIATA.

3852.—Echinodermata. Sections, 75 cents each; $7.50 per dozen; others 60 cents each; $6.00 per dozen.

Brittle Star Fish, Ophiocoma, neglecta (opaque).
Pedicellariæ of Echinus.
Do. of Uraster.
Pentacrinoid Larva of Antenodon.

PLATES FROM SKIN—
Wheel-shaped, Chirodota panænsis.
Wheel-shaped, Chirodota panænsis, group of 9, arranged, $1.25.
Wheel-shaped, Chirodota variabilis.
Wheel-shaped, Chirodota variabilis, group of 7, arranged, $1.25.
Wheel-shaped, Myriotrochus Rinkii. $1.25.
Wheel-shaped, Myriotrochus Rinkii, group of 4, arranged, $2.75.
Echinus.
Holothuria from Australia.
Do. do. Fiji Islands.
Do. do. Monterey Bay
Do. do. Navigator's Island.
Do. do. New Zealand.
Do. do. Port Curtis.
Do. do. do. Essington
Do. do. do. Philip.
Do. do. Torquay.
Do. atra.
Do. edulus.
Do. Floridana.
Do. fusco-cinerea.
Holothuria impatiens.
Do. Savignyi.
Do. tremula.
Pseudo-cucumis Pacificus.
Stichopus chloronotus.
Do. monacarius.

PLATES AND ANCHORS FROM SKIN—
Synapta from Australia.
Do. do. New Zealand.
Do. Besselii.
Do. digitata.
Do. dubia. $1.50.
Do. glabra.
Do. do. group of 4 each, arranged, $1.25.
Do. Godeffroyi.
Do. inhærens.
Do. Kefersteinii.
Do. molesta. $1.50.
Do. recta. $1.00.
Do. similis. $1.00.
Do. and Chirodota, group of 13, arranged, $2.00.
Do. and Chirodota, group of 19, arranged, $3.50.
Do. Chirodota and Myriotrochus, group of 33, arranged, $4.50.

SHELL—
Echinus (Section).
Spatangus (opaque).

SKIN—
Holothuria, plates *in situ*.
Synapta, plates and anchors *in situ*.

SPINES—
Brissiopsis.*
Do. from Barbadoes (opaque).
Echinanthus, do.
Echinocardium australe (opaque).
Laganum Tonganense.
Spatangus (opaque).
Do. etc., from Bermudas (opaque), very fine, $1.25.
Star Fish, Ophiocoma rosula (opaque).
Do. Palmipes membranaceus (opaque).

SECTIONS OF SPINES—
Acrocladia trigonaria.
Cidaris imperialis.
Diadema Savignyi.
Dorocidaris abyssicola.
Echinocidaris purpurascens.
Echinometra lucunter.
Do. heteropora.
Echinotrix Petersii.
Echinus, longitudinal.
Do. group of 13, arranged. $6.00.
Do. from Bermudas, group of 9, arranged, $1.00.
Do. from Philippine Id.
Do. atratus.
Do. esculentus.
Do. lividus.
Mespilia globulus.
Orthocidaris hystrix.
Parasalenia gratiosa.

3853.—Zoophytes (or Polypes). Each, 60 cents; per dozen, $6.00.

Anguinaria spatulata.*
Do. do (opaque).
Campanularia volubilis.
Do. raridentata.
Plumularia falcata.
Do. simplex.
Sertularia argentea.
Do. do (opaque).
Do. rosea do.
Thoa halecina.

SECTIONS OF CORAL—
Distichopora. $1.00.
Hydnophora.
Madrepora.
Seriatopora. 75 cts.

SPICULES—
Alcyonium digitatum.
Alcyonium murale.*
Do. tuberculosum.
Gorgonia setosa.
Do. verrucosa.
Do. mixed (opaque).
Isis Hippuris.
Lophogorgia Palma.
Melitæa ochracea.
Plexaura antipathes.

Section V.—PROTOZOA.

3854.—Sponges. Each, 60 cents; per doz., $6.00.

SECTIONS—
Dendrospongia.
Smyrna Sponge.
Spongilla.
Sycon ciliatum.

SPICULÆ—
Dusideia.
Euplectella.
Geodia.
Do. (opaque).
Grantia (calcareous).
Halichondria.
Hyalonema.
Papillina (pin-shaped).
Spongilla (fresh-water sponge).
Stelleta Grubii.
Tethya.
Sponge from Samoa.
Do. biclavate.
Do. sphero-stellate.

3855.—Foraminifera and Polycystina. Each, 60 cents; per dozen, $6.00.

FORAMINIFERA—
From Adriatic Sea.
Do. Bay of Bengal.
Do. Bermuda, selected (opaque), including Orbiculina, Orbitolites, Peneroplis, etc. $1.00.
From Chalk, Dover, England.
Do. do. Kent, do.
Do. do. *in situ*.
Do. Cuxhaven.
Do. Gulf Stream.
Do. Levant.
Do. Samoa.
Arranged for Paraboloid. $1.00.
Alveolina (Section). $1.25.
Eozoon Canadense (Section). $2.00.
Globerina (Challenger Expedition, 1875).
Lagena sulcata.
Orbiculina complanata (Section). $1.00.
Orbitolites (Section). $1.00.
Polystomella scrobiculata (Section). 75 cts.
Rotalia ornata, (Section).
Siderolina Spenglerii.

POLYCYSTINA—
From Barbadoes.
Do. do. (opaque).
Do. do. (*in situ*).
Do. do. arranged (opaque). $2.25.
From Nankoori.
Arranged, group of 4-8 (opa.; $1.25.
Arranged, group of 8-16 (opaque). $2.75.
Astromma Aristotelis.
Do. various.
Haliomma Humboldtii.
Stylodyctya gracilis.

Division II.—THE VEGETABLE KINGDOM.

Section I.—PHÆNOGAMIA.

3862.—Double-stained Vegetable Objects; by the Best American and Foreign Preparers. Each, 60 cents; per dozen, $6.00.

BLADDERS of Utricularia.

FLOWER of Spring Beauty, Claytonia.

FRUIT—
Burdock, Lappa, Section.
Cherry, Prunus, do.
Horse Chestnut, Æsculus, Section, showing spiral vessels.
Lemon, young, Section, showing oil-cells.
May Apple, Podophyllum, Section.
Pear, Pyrus, Section, showing raphides.
Walnut, Juglans, Section.

LEAF—
Allspice, Section.
Cyperus alternifolius.
Deutzia scabra, showing stellate hairs.*
Deutzia gracilis, showing stellate hairs.*
Drosera rotundifolia, showing glands.
Euphorbia Ipecacuanha, showing latex vessels.
Ficus elastica, Section, showing cystoliths.
Fuchsia, showing raphides.
Galium pilosum, showing special oil-cells.
Hepatica triloba.
Limnanthemum lacunosum, showing stomata.*
Melissa officinalis.
Mexican Soap-plant, Trans. Section, showing bundles of woody tissue.
Nerium Oleander, Section.
Nettle, showing cystoliths and stinging hairs.

OVARY—
Datura Stramonium, Section.
Passion Flower, Passiflora, Section.
Tiger Lily, L. tigrinum, Section.
Trumpet Creeper, Tecoma radicans, Section.

Tulip, Tulipa Gesneriana, Sec.
Tulip-tree, Liriodendron Sec.

PETIOLE of Ricinus Communis, Section.

PITCHER—
Nepenthes distillatoria.
Nepenthes Rafflesiana, showing cylindrical water-glands.
Sarracenia variolaris, showing oval glands.

ROOT of Opuntia, Trans. and Long. Sections, showing annular and spiral deposits.

SPADIX of Calla Lily, Trans. Section, ovaries *in situ*.

SPATHE of Calla Lily, Trans. Section.

STEM—
Caladium, Trans. Section.
Dracæna Braziliensis. 2.
Do. terminalis. 2.
Elder, S. Canadensis, Sec., showing nucleated cells.
Hazel, Corylus Americana, Trans. Section.
Hazel, Corylus rostrata, Trans. Section.
May Apple, Podophyllum, Trans. Section.
Milk-weed, A. cornuti, Trans. Section.
Nerium Oleander. 2.
Papyrus, Trans. Section.
Pine, Pinus Strobus, Long. Section, showing pitted structure.
Poke, Phytolacca, Trans. Section.
Reed, Phragmites, Trans. Section.
Ricinus communis, Trans. Section.
Ricinus communis, Long. Section.
Thistle, C. lanceolatum, Trans Section.

3863.—Sections of Woody and other Stems (unstained).

The number 3 indicates that there are 3 Sections on the Slide, transverse, tangential and radial.

Three on a Slide, 75 cts.; per doz., $7.50. Others, 60 cts.; per doz., $6.00.

Ailanthus glandulosa. 3.
Akebia quinata.
Alder, Alnus glutinosa. 3.
Almond, Amygdalus communis. 3.
Araucaria excelsa. 3.
Arbutus unedo. 3.
Aristolochia serpentaria.
Ash-leaved Maple, Negundo aceroides. 3.
Ash, Fraxinus excelsior. 3.
Aspen, Populus tremula. 3.
Australian Nettle, Laportea gigas. 3.
Bamboo, Bambusa vulgaris. 2.
Banksia oblongifolia.
Barberry, Berberis vulgaris. 3.
Beech, Fagus sylvatica. 3.
Bignonia capreolata.
Birch, Betula nigra. 3.
Birthwort, Aristolochia Sipho.
Boswellia papyrifera.
Box, Buxus sempervirens. 3.
Buckthorn. Rhamnus Frangula
Burdock, Lappa officinalis. 2.
Cabbage Palm. 2.
Cactus hexagonus. 3.
Cassia fastigiata. 3.
Celtis australis. 3.
Century Plant, Agave Americana. 2.
Chilian Pine, Araucaria imbricata. 3.
Clematis Vitalba.
Coffee Shrub, Coffea Arabica. 2.
Cycas revoluta. 3.
Cypress, Cupressus sempervirens. 3.
Date Palm, Phœnix dactilifera. 2.
Dogwood, Cornus alba. 3.
Dragon-wood, Draccena Draco. 2
Elder, Sambucus nigra. 3.
Gleditschia sinensis. 3.
Gooseberry, Ribes Grossularia. 3
Grape Vine, Vitis riparia. 3.
Do. do. vinifera. 3.
Gutta percha Tree, Isonandra Gutta. 3.
Hawthorn, Cratægus Oxyacantha. 3.
Hazel, Corylus Avellana. 3.
Holly, Ilex Aquifolium. 3.
Honduras Mahogany. 3.
Honeysuckle, Lonicera Caprifolium. 3.
Hop Hornbeam, Ostrya Virginica. 3.
Hornbeam, Carpinus Betulus. 3
Ivy, Hedera Helix. 3.
Juniper, Juniperus communis. 3.
Labrador Tea, Ledum palustre. 3.
Larch, Larix Europæa. 3.
Lilac, Syringa vulgaris. 3.
Linden, Tilia Europæa.
Mespilus coccinea. 3.
Mock-orange, Philadelphus coronarius. 3.
Monstera deliciosa.
Mountain Ash, Sorbus Aucuparia. 3.
Oak, Quercus pedunculata. 3.
Do. do. Robur. 3.
Do. do. Suber (Cork Oak). 3.
Olea Europæa. 3.
Oleander, Nerium Oleander. 3.
Orange, Citrus Aurantium. 3.
Palm, Areca pumila.
Do. Chamærops excelsa. 2.
Paper Birch, Betula papyracea. 3.
Passion Vine, Passiflora cærulea. 3.
Pear, Pyrus communis. 3.
Pepper Plant, from Australia.
Pomegranate, Punica granatum. 3.
Prickly Pear, Opuntia major.
Privet, Ligustrum vulgare. 3.
Quince, Cydonia vulgaris. 3.
Rattan, Calamus Rotang.
Rose, Rosa sempervirens. 3.
Ruscus aculeatus.
Rush, Juncus tenuis.
Sarsaparilla, Smilax aspera.
Screw Pine, Pandanus odoratissimus.
Sloe, Prunus spinosa. 3.
Smilax syphilitica.*
Snow-ball Tree, Viburnum Opulus. 3.
Spanish Broom, Spartium scoparium. 3.
Spindle Tree, Euonymus Europæus. 3.
Styrax officinale. 3.
Sugar Cane, Saccharum officinarum. 2.
Tamarind Tree, Tamarindus Indica. 3.
Tectona grandis.
Thunbergia unidentata.
Upas Tree, Antiaris toxicaria.
Walnut, Juglans nigra. 3.
Washingtonia gigantea. 3.
Willow, Salix fragilis. 3.
White Mulberry, Morus alba. 3.
White Pine, Pinus Strobus, tangential Section.
White Pine, Pinus Strobus, radial Section, showing glandular (?) dots.†
Yellow Pine. 3.

3864.—Miscellaneous Vegetable Objects. Each, 60 cents; per dozen, $6.00.

ANTHER of Water Lily, Nymphæa, Section.

BARK of Cinnamon Tree, Cinnamomum Zeylonicum, Section.

Bark of Cork Oak, Quercus Suber, Section.

CUTICLE—
Deutzia scabra, showing stellate hairs.*

Eleagnus, showing stellate hairs.*
Loasa aurantiaca.*
Onion, Allium Cepa, showing crystals.
Pitcher of Nepenthes.

Rice Straw, siliceous.
Stangeria paradoxa.
Wheat Straw, siliceous.

FIBRES—
Cotton.
Flax, Irish.
Do. from New Zealand.
Hemp, Manila.
Do. Russian.
Jute, from Calcutta.

FRUIT—
Anise, Pimpinella Anisum, Sec.
Caraway, Carum Carui, do.
Carrot, Daucus Carota, do.
Coriander, Coriandrum sativum, Section.
Cummin, Cuminum Cyminum, Section.
Fool's Parsley, Æthusa Cynapium, Section.
Hemlock, Conium maculatum, Section.
Parsley, Petroselinum sativum, Section.
Pepper, Piper alba, Section.

HAIRS from Leaf of Adystoma.*
Do. do. do. Tillandsia.
Do. do. Stamens of Tradescantia.

HUSK of Pine Seed, showing resin and gum cells.

LEAF—
Deutzia scabra, showing stellate hairs.*
Do. do. (opaque).
Mullein, Section, showing branched hairs.
Onosma taurica (opaque).
Water Lily, Nymphæa, Section, showing internal hairs.

OVARY of Poppy, Section, cell contents preserved.

PETALS—
Crown Imperial, Fritillaria imperialis.
Geranium.
Pansy, Viola tricolor.
Peony, Pæonia officinalis.
Poppy, Papaver somniferum.

PETIOLE of Water Lily, Nuphar luteum, Section, showing internal hairs.

PITH of Elder, Sambucus (simple cellular tissue), Sec.
Do. do. Rice-paper Plant, Aralia papyrifera.

POLLEN—
Cobœa scandens.
Convolvulus.
Cuphea platycentra.
Geranium.
Hazel, Corylus Avellana, *in situ* (opaque).
Do. showing development of pollen-tubes.
Hollyhock, Althea rosea.
Do. *in situ* (opaque).
Hyacinth.
Lily, Lilium aurantium.
Nasturtium.
Passion Flower, Passiflora.
Portugal Pine, Pinus Pinaster.
Do. do. (opaque).
Scarlet Flax.
Scotch Fir.
Do. do. (opaque).
Tulip, do.

RAPHIDES in Cactus.
Do. in Rhubarb.

ROOT—
Alkanet, Alkanna tinctoria, 2.
Althæa, 2.
Aristolochia rotunda, 2.
Arum.
Asarabacca, Asarum Europæum, 2.
Colchicum, 2.
Dandelion, Taraxacum densleonis, 2.
Elder, Sambucus Canadensis, 3.
Hedge Hyssop, Gratiola officinalis, 2.
Iris florentina, 2.
Pyrethrum, 2.
Sedge, Carex arenaria, 2.
Soapwort, Saponaria officinalis, 2.

SEEDS, WHOLE—
Alyssum Olympicum.
Bouncing Bet, Saponaria officinalis (opaque).
Loasa aurantiaca (opaque).
Lobelia inflata, do.
Nemesia versicolor. do.
Parnassia palustris, do.
Paulownia imperialis.
Poppy, Papaver somniferum (opaque).
Portulaca grandiflora (opaque).
Silene ornata, do.
Snap-dragon. Antirrhinum majus (opaque).
St. John's Wort, Hypericum perforatum (opaque).
Trumpet Creeper, Tecoma radicans.
Wood Sorrel, Oxalis stricta, (opaque).

SEEDS—SECTION—
Attalea funifera (Coquilla nut).
Cola acuminata (Cola nut).
Henbane, Hyoscyamus niger.
Mustard, Sinapis nigra.
Peach, Amygdalus Persica.
Pepper, Piper nigrum.
Poppy, Papaver somniferum.
Phytelephas macrocarpa (Vegetable Ivory Nut).
Quince, Cydonia vulgaris.
Stramonium.

SHELL of Cocoa Nut, Section.

SPIRAL VESSELS—
From Seed of Cobœa scandens.
Do. do. of Collomia grandiflora.

STARCH—
Arrow-root.*
Barley.*
Oats.*
Pea.*
Potato.*
Rice.*
Sago.*
Tous les Mois.*
Wheat.*

STONE of Cherry, Prunus Avium.

WING of Seed of Eccremocarpus.*

3865.—A Series of 24 Preparations, Illustrating the Structure of the Higher Orders of Plants. In Case, $12.50.

This shows the most important features of plant structure, from the simple cell and its contents to the most elaborate tissue formations. We have been careful to select such specimens as will clearly show the special feature desired. Professor C. E. Bessey, of the Iowa Agricultural College (whose kind assistance in arranging this set we acknowledge), says, "I have no objection to the use of my name in connection with so good a set." The classification adopted is that of Bessey's Botany for High Schools and Colleges.

THE CELL—
1. Protoplasm and nucleus in cells of ovary of poppy (stained).
2. Cell-wall in pollen of Japanese lily; this specimen shows reticulated markings.
3. Cell-formation by union in Spirogyra (sexual mode: conjugation), showing zygospores *in situ*.

PRODUCTS OF THE CELL—
4. Chlorophyll-grains in cells of leaf of moss.
5. Starch-grains in cells of tuber of potato, section.
6. Aleurone grains in castor-bean (Ricinus), section.
7. Crystals (prisms) in scales of onion bulb.
8. Oil-cells or receptacles in rind of lemon, section.

TISSUES—
9. Single cells, Protococcus (Alga), from trunk of tree. (This also shows cell-multiplication by division.)
10. Spurious tissue in Hydrodictyon utriculatum (fresh-water Alga).
11. Parenchyma (simple cellular tissue), pith of elder (Sambucus), trans. section.
12. Collenchyma, stem of Solanum, trans. section. (Stained.)
13. Sclerenchyma, shell of cocoanut (Cocos nucifera), two sections.
14. Fibrous tissue, shown as bast in longitudinal and transverse section of Peruvian-bark (Cinchona).
15. Laticiferous tissue, second form (reticulately anastomosing vessels), in root of Scorzonera. (Stained.)
16. Sieve tissue, from Cucurbita, longitudinal and transverse sections.

TRACHEARY TISSUE—
17. Spiral, reticulated, and annular vessels in Impatiens, longitudinal section.
18. Scalariform vessels in root-stock of fern, Aspidium, longitudinal section.
19. Pitted or dotted vessels, in longitudinal section, of Sassafras.
20. Tracheides, in longitudinal-radial section, of pine; showing also transverse sections of the medullary rays.

EPIDERMAL SYSTEM—
21. Epidermal cells, shown in vertical section of Marchantia.
22. Stomata and cells of cuticle of Iris.
23. Trichomes, shown by stellate hairs or scales from Eleagnus argentea.

FIBRO-VASCULAR SYSTEM—
24. Fibro-vascular bundles of endogenous stem, as shown in longitudinal and transverse sections of stem of Indian corn (Zea Mais).

Section II.—CRYPTOGAMIA.

3866.—Ferns, Mosses, Etc. Each, 60 cents; per dozen, $6.00.

CUTICLE—
Fern, Polypodium, showing Stomata, etc.
Scouring Rush, Equisetum.*

FRONDS OF FERNS—
Adiantum pedatum, double-stained.
Angiopteris erecta (opaque).
Aspidium marginale, double-stained.
Aspidium Noveboracense, double-stained.
Aspidium Thelypteris, double-stained.
Asplenium Filix-fœmina, double-stained.
Cystopteris fragilis, double-stained.
Dicksonia punctilobula, double-stained.
Gymnogramma (opaque).
Lygodium palmatum, double-stained.
Woodsia obtusa, double-stained.

FRUIT (SECTIONS)—
Equisetum hyemale.
Funaria hygrometrica.

MOSSES—
Bryum capillare.
Hookera lucens.
Hypnum prælongum.
Jungermannia hyalina.
Mnium cuspidatum.
Sphagnum cymbifolium.

PERISTOMES OF MOSS—
Funaria hygrometrica.
Do. do. (opaque).
Polytrichum commune, do.

SCALARIFORM VESSELS FROM ROOT-STOCK—
Fern, Aspidium.
Do. Osmunda.

SCALES FROM FERNS.
Cheilanthes Eckloniana.*
Elaphoglossum squamosum.*
Goniopalebium sepultum.*
Nothochlæna maranta.*

SPORES—
Equisetum.
Lycopodium.
Stem of Club-moss, Selaginella, selaginoides, 2 Sections.

3867.—Fungi and Lichens. Each, 60 cents; per dozen, $6.00.

Bramble Brand, Aregma bulbosum (opaque).
Bunt Fungus in Corn, Uredo fœtida.
Chain Brand, Xenodochus carbonarius.
"Chignon" Fungus, Sclerotium Bugelianum.
Corn Mildew, Puccinia graminis.
Corn Smut, Ustilago segetum.
Fungus from Elder (Sambucus)
Fungus from Pepper Plant, Aspergillus candidus.
Gooseberry Cluster-cups, Æcidium grossulariæ.
Mould from Jam, Aspergillus umbellatus.
Do. mucor mucedo.
Do. Penicillium glaucum.
Potato Mould, Peronospora infestans.
Red Rust, Trichobasis rubigovera.
Rust or Corn Mildew, Puccinia graminis.
Sarcina ventriculi, from Man.
Smut in Ear and Grain of Wheat.
Spiral Fungus, Trichia chrysosperma.
Spores of Bramble Brand (Aregma bulbosum.)
Do. Yeast Plant.
Spores and Filaments of Peziza coccinea.
Star Fungus, Asterosporium Hoffmanii.
Truffle, Tuber æstivum, Section.

3868.—Algæ (Excepting Diatoms). Each 60 cts.; per doz., $6.00.

Batrachospermum monilliforme.
Calithamnion corymbosum.
Do. roseum.
Ceramium ciliatum.
Do. pellucidum.
Chætophora elegans.
Chondrus crispus.
Cladophora refracta.
Dasya coccinea.
Delesseria sinuosa.
Draparnaldea glomerata.
Ectocarpus litoralis.
Griffithsia setacea.
Hydrodictyon utriculatum.
Micrasterias denticulata (Desmid).
Nostoc alpinum.
Pediastrum ellipticum, etc. (Desmids).
Plocamium vulgare.
Polysiphonia fastigiata.
Do. fibrillosa.
Do. parasitica.
Ptilota elegans.
Do. plumosa.
Rhizoclonium rivulare.
Spirogyra nitida.
Volvox globator, 75 cents.
Zygnema (in conjugation).

3869.—Diatoms (Fossil, etc.) (Localities named only). Each, 50 cents; per dozen, $5.00.

CEMENT-STONE from Island of Mors.

DIATOMACEOUS EARTH—
From Berlin.
Do. Canada West.
Do. Cherryfield, Maine.
Do. Christianstad, Sweden.
Do. Cornwallis, Nova Scotia.
Do. Dolgelly, Wales.
Do. Duck Pond, Maine.
Do. East Stoughton, Mass.
Do. Franzensbad, Bohemia.
Do. French's Pond, Albany, N. Y.
Do. Great Salt Lake Desert.
Do. Ipswich, Massachusetts.
Do. Kamtschatka.
Do. Laconia, New Hampshire
Do. Livorno, Italy.
Do. Lough Mourne, Ireland.
Do. Luneburgh, Hanover.
Do. Monmouth, Maine.
Do. Monterey, California.
Do. Monticello, New York.
Do. Moron, Spain.
Do. Morris County, N. J.
Do. Mull, Scotland.
Do. Nottingham, Maryland.
Do. Oran, Algeria.
Do. Petersburg, Virginia.
Do. Providence, R. I.
Do. Richmond, Virginia.
Do. Salem, Massachusetts.
From Sierra Nevada.
Do. Southern Australia.
Do. Sing Sing, New York.
Do. South Bridgeton, Maine.
Do. Tokay, Hungary.
Do. Toome Bridge, Ireland.

DIATOMS FROM MARINE ALGÆ—
Algoa Bay.
Honduras.
Japan.

DIATOMS FROM SHIP'S HULL—
Atlantic Ocean. 80 cts.
Java. 80 cts.
Spitzbergen. 80 cts.

EDIBLE EARTH from Java.

FRESH-WATER MUD from Porto Rico.
From Trondhjem, Norway.
Do. Wedel, Denmark.

GUANO—
From Baker's Island.
Do. California.
Do. Canary Islands.
Do. Chincha Islands.
Do. Ichaboe Island.
Do. Lobos de Tierra.
Do. Patagonia.
Do. Peru.
Do. Saldanha Bay.
From St. Helena.

MOUNTAIN MEAL (BERG-MEHL).
From Finland.
Do. Lapland.
Do. Santa Fiora, Italy.
Do. Sweden.

PEAT from Hammerfest, Norway.
Do. do. Premnay, Scotland.

SALT-WATER MUD (Marsh Earth), from Wedel, Denmark.

SEA SOUNDINGS—
From Atlantic Ocean, 2,076 fathoms.
Do. Campeachy Bay.
Do. Carpentaria Gulf.
Do. Cuxhaven, Germany.
Do. Davis Straits (at great depth). 80 cts.
Do. Indian Ocean, 2,200 fathoms.
Do. Japan.
Do. Kiel, Denmark.
Do. Persian Gulf, 504 fathoms
Do. Samoa.
Do. Tongataboo.

TRIPOLI from Bilin, Bohemia.

3870.—Diatoms (Named). Each, 50 cents; per dozen, $5.00.

Achnanthes longipes.
Do. subsessilis.
Actinocyclus Ralfsii.
Actinoptychus splendens.
Do. undulatus.
Amphiprora alata.
Amphitetras antediluviana.
Amphora lævis.
Arachnoidiscus Ehrenbergii.
Do. Do. *in situ*, on Seaweed.
Arachnoidiscus Japonicus.
Do. ornatus.
Aulacodiscus Crux.
Auliscus sculptus.
Biddulphia pulchella.
Do. rhombus.
Campylodiscus Clypeus.
Do. Echineis.
Do. spiralis.
Ceratoneis Arcus.
Do. lunaris.
Climacosphenia moniligera.
Cocconeis Pediculus.
Do. placentula.
Do. Scutellum.
Cocconema Cistula.
Do. lanceolatum.
Colletonema vulgare.
Coscinodiscus Oculus Iridis.
Do. radiatus.
Cyclotella Meneghiniana.
Cylindrotheca gracilis.
Cymatopleura Solea.
Cymbella affinis.
Do. amphicephala.
Do. gastroides.
Cymbella ventricosa.
Diatoma elongatum.
Do. vulgare.
Endostaurum crucigerum.
Epithemia constricta.
Do. gibba.
Do. Hyndmannii.
Do. turgida.
Eunotia gracilis.
Do. undulata.
Eupodiscus Argus.
Fragilaria capucina.
Do. minima.
Do. virescens.
Gephyria media.
Gomphonema acuminitum.
Do. geminatum.
Do. gracile.
Do. olivaceum.
Do. robustum.
Grammonema striatulum.
Homœocladia Martiniana.
Isthmia enervis.
Do. nervosa.
Do. do. *in situ*, on Seaweed.
Licmophora flabellata.
Do. Pappeana.
Mastogloia Braunii.
Melosira arenaria.
Do. varians.
Meridion circulare.
Do. constrictum.
Navicula amphisbæna.
Do. Clepsydra.
Do. didyma.
Do. gibba.
Navicula hemiptera.
Do. major.
Do. mesolepta, var. sirveroneiformis.
Navicula oblonga.
Do. radiosa.
Do. serians.
Do. splendida.
Nitzschia Amphioxys.
Do. obtusa.
Do. Sigma.
Do. Schweinfurthii.
Odontidium hyemale.
Do. longissima.
Do. mesodon.
Odontodiscus subtilis.
Podosira maculata.
Pyxidicula cruciata.
Rhabdonema Adriaticum.
Do. arcuatum.
Schizonema Grevillei.
Scoliopleura tumidum.
Solium exsculptum.
Stauroneis gracilis.
Do. lanceolata.
Do. Phœnicenteron.
Stephanodiscus Niagaræ.
Surirella striatula.
Synedra affinis.
Do. familiaris.
Do. pulchella.
Do. splendens.
Tabellaria fenestrata.
Do. flocculosa.
Terpsinoë musica.
Toxonidea insignis.
Triceratium membranaceum.

3871.—Selected Diatoms. (From 1 to 12 Specimens on each Slide.) Each, 60 cents; per dozen, $6.00.

Actinocyclus dubius.
Do. Ehrenbergii.
Do. moniliformis.
Actinoptychus Halioqyx.
Do. hexagonalis.
Do. splendens.
Do. undulatus.
Amphitetras antediluviana.
Do. ornata.
Arachnoidiscus Ehrenbergii.
Do. ornatus.
Asterolampra Marylandica.
Aulacodiscus Combesii.
Do. Crux.
Do. formosus.
Do. Johnsoni.
Do. Kittoni.
Do. mammosus.
Do. margaritaceus.
Do. scaber.
Auliscus Macrænus.
Do. sculptus.
Biddulphia aurita.
Do. Baileyi.
Do. pulchella.
Do. reticulata.
Do. Roperiana.
Campylodiscus Clypeus.
Do. latus.
Do. limbatus.
Do. Ralfsii.
Cerataulus turgidus.
Cestodiscus ovalis.
Cocconeis punctatissima.
Corinna elegans.
Coscinodiscus concavus.
Do. Normanii.
Do. oblongus.
Do. patellæformis.
Do. tuberculatus.
Craspedodiscus elegans.
Creswellia superba.
Endyctia oceanica.
Euodia Barbadense.
Do. gibba.
Eupodiscus Argus.
Do. radiatus.
Heliopelta Metii.
Hemiaulus alatus.
Do. Polycystinorum.
Isthmia enervis.
Do. nervosa.
Navicula clavata.
Navicula Johnsoniana.
Do. Lyra.
Do. notabilis.
Do. pandurata.
Do. Smithii.
Do. strangulata.
Nizschia panduriformis.
Orthoneis splendida.
Pleurosigma elongatum.
Do. formosum.
Solium exsculptum.
Stictodiscus Californicus.
Do. Kittonianus.
Surirella lata.
Do. opulenta.
Synedra robusta.
Do. ulna.
Do. undulata.
Triceratium Arcticum.
Do. Favus.
Do. Do. var. septangulare.
Triceratium megastomum.
Do. orbiculatum.
Do. Robertianum.
Do. scitulum.
Trinacria Regina.

3872.—Test Diatoms. (Thin-covered, Dry or in Balsam.) Each, 60 cents; per dozen, $6.00.

Amphipleura pellucida.
Cymatopleura elliptica.
Fragilaria capucina.
Frustulia Saxonica.
Navicula cuspidata.
Do. rhomboides.
Grammatophora marina.
Do. subtilissima.
Hyalodiscus Stelliger.
Do. subtilis.
Nitzschia curvula.
Do. sigmoidea.
Do. obtusa, var.
Pleurosigma acuminatum.
Do. æstuarii.
Do. angulatum.
Do. attenuatum.
Do. Balticum.
Do. elongatum.
Do. fasciola.
Pleurosigma formosum.
Do. Hippocampus.
Do. macrum.
Do. quadratum.
Do. Spencerii.
Rhizosolenia styliformis.
Striatella unipunctata.
Surirella Gemma.
Triceratium Favus.

MOLLER'S ARRANGED DIATOMS.

No.					Price.
3873.	Slides, with 6 to 18 Specimens,	in Balsam,			$1 50
3874.	Do.	do. 18 to 36	do.	do.	3 00
3875.	Do.	do. 36 to 50	do.	do.	4 50
3876.	Do.	do. 50 to 65	do.	do.	6 00
3877.	Do.	do. 65 to 80	do.	do.	7 50

Groups similar to the above may also be had dry-mounted, on a dark background, for the Lieberkuhn.

3878. Diatomaceen Typen Platte, No. 1, contains 392 typical species and varieties, arranged in four quadrangles, the classification being that of Professor A. Grunow, of Vienna. A printed and bound catalogue is furnished with it, which gives the names of the different species, stating whence obtained, whether fossil or recent, salt-water or fresh. Mounted in Balsam. Price, in morocco case, ... 30 00

3879. Diatomaceen Typen Platte, No. 2, contains 100 species, and is accompanied with a printed catalogue. Mounted in Balsam. Price, with morocco case, ... 12 00

3880. Diatomaceen Typen Platte, No. 3, is similar to No. 2, but has the name of each Diatom photographed beneath it, so that specimen and name may be seen at one view. Contains 100 individual Diatoms, but only 80 species. In morocco case. 13 00

3881. Diatomaceen Probe Platte, No. 1, is a collection of twenty Diatoms, arranged in a single line, and graduated according to their value as test objects. In Balsam. Price, with morocco case and printed catalogue, ... 6 00

3882. Diatomaceen Probe Platte, No. 2, the same as No. 1, but mounted dry, . . 7 50

Division III.—THE MINERAL KINGDOM.

3889.—Fossil Sections. Each, 75 cents; per dozen, $7.50.

COAL—
Australian.
Chinese.
Derbyshire, England.
Dudley, England.
Lancashire, England, containing very rare and some unknown fossil plants: Calamites, Calamodendron, Dictyoxylon, Sigillaria, Stigmaria, Lepidodendron, etc. 75 cts. to $4.00.
Oldbury, England.
Pennsylvania.
Cannel Coal.
White Coal from Australia.

COPROLITES from Lyme-Regis.

FLINT with various organic remains, Spiculæ, Xanthidiæ, Corals, etc.

FOSSIL BONE, Dinornis giganteus (New Zealand).
Do. do. Iguanodon.
Do. do. Man (Guadaloupe).
Do. do. Mastodon.
Do. do. Pterodactyl.

FOSSIL CORAL, Cladopora.

FOSSIL FERN, Rhizome.
Do. do. Spores, in Coal.

FOSSIL FORAMINIFERA in Limestone.

FOSSIL PALATE of Ray.

FOSSIL PYXIDICULA (?) in Flint.

FOSSIL TOOTH of Shark.

FOSSIL WOOD from Australia.
Do. do. do. California.
Do. do. do. India.
Do. do. do. Maidstone, England.
Do. do. do. Stafford, England.
Do. do. do. West Indies, Palm.
Do. do. Schleidenites compositus, St. Thomas.

JET, Whitby.

LAURENTIAN SERPENTINE containing Eozoon Canadense.

NUMMULITIC LIMESTONE, Foundation of Egyptian Pyramid.

OOLITE, Secondary formation.

3890.—Mineral Sections. Each, 75 cents; per dozen, $7.50.

Agates, various.*
Aragonite.*
Asbestos.*
Asbestiform Serpentine.*
Avanturine.*
Barytes.*
Basalt from Fingal's Cave.*
Do. do. Giant's Causeway.*
Breccia Marble from Labrador.*
Carrara do.*
Chalcedony, Cornwall, Eng.*
Conglomerate.*
Dolerite.
Feldspar, from Labrador.*
Gneiss.*
Granite from Aberdeen.*
Do. do. Greenland.*
Do. do. Virginia.*
Greenstone from Guernsey.*
Greywacke, various, Germany.
Heliotrope, Bloodstone.
Hornblende.
Hypersthene, from Labrador.
Italian Alabaster.*

Lapis Lazuli.
Lava from Vesuvius.
Lepidolite.*
Limestone from an Aqueduct.
Do. do. Himalayas.
Do. do. Niagara.
Do. Magnesian, from Dudley, Eng.
Do. Oolitic, from Clifton, England.
Do. Oolitic, from Normandy, France.
Malachite from Russia.*
Mica.*
Moss Agates, various.*
New Red Sandstone, Cumberland, England.*
Old Red Sandstone, Scotland.*
Obsidian, Mexico.
Do. Mount Hecla.
Do. do. Shasta.
Do. Vesuvius.
Opaline from Labrador.

Pitch-stone from Isle of Arran, Scotland.
Porphyry from Cumberland, England.
Do. Artificial (Porphyrine).
Quartz.*
Do. showing fluid in cavities.
Satin Spar.*
Selenite, Fibrous.*
Serpentine, Green.
Do. Red.
Slag, from Copper furnace.
Do. do. Iron do.
Spherulitic Felsite, Isle of Arran
Stalactite from English Cave.
Sun-stone from Norway.
Syenite from Dresden.
Talc, with Manganese crystals *in situ*.
Wavellite from North Carolina*
Zeolite from Giant's Causeway*

3891.—Chemical Crystals. Each, 50 cents; per dozen, $5.50.

Æsculine.*
Alum.
Amygdaline.
Antimony (needles), opaque.
Arsenious Acid (White Arsenic).
Asparagine.
Berberine, opaque.
Bichromate of Potash.*
Binoxalate Do. *
Bitartrate of Ammonia.*
Do. Potash.
Do. Thallium.*
Boracic Acid.*
Borate of Ammonium.*
Do. Potash.*
Borax.*
Bromo-cyanide of Mercury and Potassium.*

Cadmium.*
Cantharidine, from Spanish Fly.*
Carbozotate of Urea.*
Chlorate of Barium.*
Do. Potash.*
Chloride of Barium.*
Do. Cadmium.*
Do. Sodium.
Citrate of Soda.*
Citric Acid.*
Copper, Native Crystals, opaque.
Fatty Acid, Cholesterin.*
Do. Margaric.*
Do. Palmitic.*
Do. Sebacic.*
Do. Stearic.*

Gold Crystals, very fine, Fern like, $3.00.
Kinate of Quinia.*
Lactate of Zinc.
Meconine.*
Mercury, from Mercurial Vapor.
Molybdate of Ammonium.*
Monoxalate of Potassium.*
Morphine, from Opium.
Murexide, Dichromatic crystals.
Muriate of Barytes.*
Naphthaline.*
Narcotine.*
Nitrate of Cobalt.*
Do. Lead.
Do. Potassium.*
Nitro-prusside of Sodium.*

Oxalate of Ammonia.*
Do. Soda.
Do. Thallium.*
Oxide of Lead, iridescent, opaque.
Phloridzine.*
Picrate of Ammonia.
Do. Magnesia, opaque.
Platino-cyanide of Ammonium
Do. Barium.*
Do. Calcium.*
Do. Lithium.*
Do. Magnesium.
Platino-cyanide of Potassium.*
Do. Strontium.*
Do. Yttrium.*
Prussiate of Potash.*
Pyrogallic Acid.*
Salicine.*
Silver, arborescent crystals, opaque, 75 cents.
Strychnine.
Sugar, from Beet Root.*
Sugar of Milk.
Sulphate of Ammonia and Magnesia.*
Sulphate of Brucine.*
Do. Cadmium.
Do. Cobalt and Potassium.*
Sulphate of Copper.*
Do. Copper and Magnesium.*
Sulphate of Copper and Potassium.*
Sulphate of Lime.*
Sulphate of Lime, moving in fluid.* 75 cents.
Sulphate of Magnesium.
Sulphate of Nickel and Potassium.*
Sulphate of Strychnine.
Do. Thallium.
Do. Zinc.*
Sulpho-cyanide of Potassium.*
Sulphur.*
Sulphuret of Iron, for Liebekuhn.
Tartaric Acid.*
Tartrate of Lime.*
Do. do. moving in fluid.* 75 cents.
Tartrate of Potassium.*
Do. Thallium and Potassium.

Division IV.—ARTIFICIAL MICROSCOPIC OBJECTS.

3898.—Micro-Photographs. Each, 50 cents; per dozen, $5.00.

Address to Light, by Milton.
A Glimpse at an English Homestead.
Apollo and Daphne.
A Portrait badly paid for
Apostrophe to the Ocean, Byron.
"Bab Ballads," Captain Reece, R. N.
Balmoral Castle.
Benjamin Franklin.
Cupid and Psyche.
Dignity and Impudence,
Dr. Carpenter, (W. B).
Ecce Homo.
Fingal's Cave.
Genesis, Chap. I. (New Version after Darwin).
George Washington.
Gray's Elegy.
Group of Elephants, from life.
Grove of Cocoa Palms, India.
Hamlet's Soliloquy.
Happy as a King.
Jesus bearing the Cross.
Laying down the Law.
Morning Hymn, Milton.
Niagara Falls.
Origin of Species, made easy.
Panoramic View of Paris.
Paul Preaching at Athens, (Raphael).
Planet Jupiter, Belts and Moons.
Planet Saturn, Rings and Moons.
President Lincoln and ten Union Statesmen.
Psalm of Life, by Longfellow.
Pyramid of Ghizeh.
Rustic Felicity.
Sermon on the Mount.
Signing of the Declaration, 1776.
Song of the Shirt.
"Suffer Little Children to come unto Me."
Taking Down from the Cross.
The Bashful Lover and the Maiden Coy.
The Bower of Adam and Eve, Milton.
The Creed.
The Crucifixion, (M. Angelo).
The Death of the Stag.
The Declaration of Independence $1.00.
The Gardener's Daughter.
The Great Rosse Telescope.
The London *Times*, 14,000 words. 75 cts.
The London *News*, Illustrated.
The Lord's Prayer.
The Moon.
Do. do. Two Phases, Full and Gibbous. 75 cts.
The Stag at Bay.
The Ten Commandments.
The Three Graces.
The Village Blacksmith, by Longfellow.
Title-page of *Punch*.
Una and the Lion.
Yarn of the Nancy Bell.
Windsor Castle.

MICROSCOPIC RULINGS.

3900. TEST-PLATE of 19 Bands, from 1-100 to 1-6,000 of a millimetre (approximately 2,500 to 152,400 per inch, ... $18 00
3902. TEST-PLATE of 26 Bands, from 1-5,000 to 1-250,000 of an inch, ... 25 00
3904. Do. 18 do. do. 1-5,000 to 1-120,000 do. 15 00
3906. Do. ruled from 1-5,000 to 1-60,000, ... 10 00
3908. Do. do. 1-5,000 to 1-50,000, ... 8 50
3910. Do. do. 1-2,000 to 1-30,000, ... 7 00
3911. ABBE'S TEST-PLATE, for proving objectives in respect of spherical and chromatic aberration. (See *American Monthly Microscopical Journal*, October, 1883), . . 3 00

Queen's Selection of Fine Objects for Schools.

1. Human lung, section, double-injected (arteries red, veins blue), showing air-cells and capillaries.
2. Bone, section, showing haversian canals, lacunæ, and canaliculi.
3. Human blood, showing corpuscles.
4. Reptilian blood, showing corpuscles and nuclei
5. Feather of humming-bird, showing transition from down to feather.
6. Hair of sheep (wool), showing the imbricated surface and curled form, which give it its well known felting properties.
7. Hair of mouse, showing cellular structure of medulla.
8. Silk fibre from cocoon spun by caterpillar of Bombyx mori.
9. Scale of fish (eel), cycloid.
10. Parasitic insect (head-louse, body-louse, or flea).
11. Antenna of moth, feather-shaped.
12. Eye of beetle, compound, showing multiplied images just above the object.
13. Leg and foot of honey-bee, with dilated tibiæ, showing pollen-brushes.
14. Sting of wasp, showing barbs, sheath, and poison-sacs.
15. Ovipositor of cabbage butterfly.
16. Proboscis of blow-fly, showing pseudo-tracheæ or rows of teeth.
17. Spinneret of spider (organ for secreting and spinning silk).
18. Spiracles (or stigmata) of Dytiscus beetle, with scales and hair, preventing the entrance of foreign bodies to the tracheæ.
19. Tracheæ, or breathing-tubes, of caterpillar, of Vanessa, showing stiffening by spiral fibres.
20. Scales of butterfly's wing, *in situ*, showing arrangement and striated structure.
21. Trichina spiralis, or pork-worm, encysted in the flesh.
22. Tongue, or palate of a snail, or other mollusk, showing serrated or toothed structure.
23. Foraminifera, fossil, from chalk, consisting of the calcareous shells of these minute protozoans.
24. Parenchyma, or simple cellular tissue, pith of elder, Sambucus.
25. Prosenchyma (pointed wood-cells), dotted ducts, and medullary rays shown in three sections, transverse, longitudinal-radial, and longitudinal-tangential, of Sassafras wood.
    (This also illustrates the structure of the exogenous stem.)
26. Transverse section of the endogenous stem, showing isolated fibro-vascular bundles.
27. Spiral vessels, in longitudinal section of Impatiens or Rheum.
28. Stomata, or breathing pores, in cuticle of Iris.
29. Starch-grains in cells of potato (cell contents).
30. Plant-crystals in cuticle of onion (cell contents).
31. Fibres of cotton, from seed of Gossypium (muslin).
32. Fibres of flax (bast-tissue of Linum usitatissimum) or linen.
33. Pollen of Japanese lily, showing markings on cell-wall.
34. Transverse section ovary of poppy, showing ovules *in situ*.
35. Fructification of fern, double stained, showing sporangia, or spore-cases; some specimens show spores also.
36. Spores of Equisetum, showing spiral filaments, or "elaters," for disseminating the spores.
37. Mould, Mucor mucedo, or other fungus, showing mycelium, or vegetative part, and fructification.
38. Marine Alga, or seaweed; Pilota or other good specimen.
39. Fresh-water Alga, Spirogyra, showing arrangement of chlorophyll in spiral bands.
40. Fresh-water Alga, Spirogyra, showing formation of zygospores by conjugation of adjacent filaments (sexual mode of reproduction).
41. Fresh-water Alga, unicellular, showing multiplication by cell division (asexual mode of reproduction).
42. Fossil diatomaceous earth from Richmond, Va., showing sculptured discoid forms.
43. Fossil diatomaceous earth, showing longitudinal forms.
44. Diatoms, Biddulphia, showing box-like structure.
45. Fossil stems and roots of ferns, from coal measures, England.
46. Fatty acid, to show formation of crystals by heating and gradual cooling.
47. Micro-photograph, portrait, late President James A. Garfield.
48. Micro-photograph, of fine print; 1st chapter of Genesis, new version, according to Darwin; or other selection.

Price per set, neatly cased, ... $23 00

Queen's New Series of Textile Fibres

VEGETAL FIBRES—

1. Cotton, hairs from seed of Gossypium herbaceum.
2. Jute, from stem of Corchorus textilis.
3. Hemp, from stem of Cannabis sativa.
4. Flax, from stem of Linum usitatissimum.
5. New Zealand flax, from stem of Phormium tenax.
6. Ramie, or China grass, from stem of Boehmeria tenacissima.
7. Manila hemp, from petiole of Musa troglodytarum.
8. Cocoanut fibre (coir), from husk of cocoanut, Cocos nucifera.

ANIMAL FIBRES—

9. Wool, hair of sheep, showing imbricated structure and curled form, which give it the property of felting.
10. Mohair, hair of Angora goat.
11. Alpaca, wool from Llama.
12. Silk fibre, from cocoon spun by caterpillar of Bombyx mori.

Price, in neat box, ... $5.50

SERIES OF WOOLS AND OTHER ANIMAI HAIRS AND FIBRES (TEXTILE).

1. Silk fibre.
2. Sheep's wool, ordinary.
3. "Heath-mutton" wool.
4. East India wool.
5. Cheviot. Leicester.
6. From Lincoln sheep.
7. Wool from Rügen.
8. Merino, "super electa."
9. Merino, "prima."
10. Do. "secunda."
11. Do. "quarto."
12. Do. ordinary.
13. Goat-hair.
14. Mohair (Angora goat).
15. Cashmere goat, Brazil.
16. Camel-hair.
17. Vicuna-hair or wool.
18. Alpaca do. do.
19. Llama do. do.
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